From: 21(1)
To: Russell, Dr. Jennifer (DH/MS)
Cc: Macumber, Jenny (DH/MS)
Subject: Re: Confirming NB invites for CADTH Roundtable Event in May on "Long COVID"/Post–COVID & Models of Care
Date: April 18, 2022 9:25:34 PM

Hi Jennifer - I just heard late Thursday last week that June 1st is now the “tentative date” for this and it should be confirmed soon. I will keep you posted for sure.

21(1)
CADTH / ACMTS

From: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Sent: Monday, April 18, 2022 9:21:44 PM
To: 21(1)
Cc: Macumber, Jenny (DH/MS) <Jenny.Macumber@gnb.ca>
Subject: Re: Confirming NB invites for CADTH Roundtable Event in May on "Long COVID"/Post–COVID & Models of Care

What is the date, 21(1)

From: 21(1) @cadth.ca>
Sent: Wednesday, April 13, 2022 10:16:23 AM
To: Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Cc: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Coulombe, Dan (DH/MS) <Dan.Coulombe@gnb.ca>; Burkhardt, Tracey (DH/MS) <Tracey.Burkhardt@gnb.ca>; Dell, Dave (DH/MS) <dave.dell@gnb.ca>; Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Liston, Heidi (DH/MS) <Heidi.Liston@gnb.ca>
Subject: Confirming NB invites for CADTH Roundtable Event in May on "Long COVID"/Post–COVID & Models of Care

Good morning,

In follow-up to my note below, CADTH (in collaboration with its expert stakeholder panel) is convening a pan-Canadian Roundtable event next month to discuss “Long COVID” and related models of care.

The event will be by invitation only for approximately 25 stakeholders, including individuals with lived experience. The purpose of this event will be to raise awareness of the condition, hear from jurisdictions who are further along in this area, allow for exchange/collaboration regarding related care approaches/models of care, identify current efforts underway & potential knowledge gaps to be addressed (avoiding any duplication of efforts) etc. Engaging the right people for this event will be key to its success.

Two New Brunswick representatives will be invited to attend. The plan is to send these invites to 2 senior NB Health leaders involved in this space who can then accept the invitation or delegate the invite to an appropriate NB representative.

I would welcome your input/confirmation of the two NB invitations. Unless I hear otherwise, I will suggest your names, Eric and Jennifer, for the initial NB invites as follows:

- Eric Levesque, Acting ADM, Health Services & Programs
- Dr. Jennifer Russell, CMOH

Let me know if you'd prefer otherwise or have any questions at this time. More details will be available shortly and in the invitation that will be forthcoming.

Thank you,
21(1) [redacted]

[redacted]
CADTH / ACMTS

From: [redacted]
Sent: March 17, 2022 10:21 AM
To: 'Carolin.Galvin' <carolin.galvin@gnb.ca>; 'Higdon, Penny (DH/MS)' <penny.higdon@gnb.ca>; 'Wendy.Donovan@gnb.ca' <Wendy.Donovan@gnb.ca>; Suzanne Clair <suzanne.clair@gnb.ca>; 'Landsburg, Shelley (DH/MS)' <Shelley.Landsburg@gnb.ca>; 'Kimberley.Barker@gnb.ca' <Kimberley.Barker@gnb.ca>; 'Dr. Yves Leger' <Yves.Leger@gnb.ca>; 'Mark.McKelvie@gnb.ca' <Mark.McKelvie@gnb.ca>; 'dr.andrew.salmon@gnb.ca' <dr.andrew.salmon@gnb.ca>; 'Chalifoux, Mathieu (DH/MS)' <mathieu.chalifoux@gnb.ca>; Dan Coulombe <Dan.Coulombe@gnb.ca>; 'Tracey Newton (Tracey.Newton@gnb.ca)' <tracey.newton@gnb.ca>; 'Jean Daigle (Jean.Daigle@horizonnb.ca)' <jean.daigle@horizonnb.ca>; 'jacques.duclos@vitalitenb.ca' <jacques.duclos@vitalitenb.ca>; Margaret Melanson (Margaret.Melanson@HorizonNB.ca)

<margaret.melanson@horizonnb.ca>; 'MacGibbon, Eileen (HorizonNB' <Eileen.MacGibbon@HorizonNB.ca>; 'Brien, Dr. Susan (HorizonNB' <Susan.Brien@HorizonNB.ca>; 'Strack, Barry (HorizonNB)' <Barry.Strack@HorizonNB.ca>; Brigitte Sonier-Ferguson (Brigitte.Sonier-Ferguson@vitalitenb.ca) <brigitte.sonier-ferguson@vitalitenb.ca>; 'natalie.banville@vitalitenb.ca' <natalie.banville@vitalitenb.ca>; 'Dr.Gordon.Dow@HorizonNB.ca' <dr.gordon.dow@horizonnb.ca>; Smyth, Dr. Daniel (HorizonNB) <Dr.Daniel.Smyth@HorizonNB.ca>; 'Douglas.Doucette@HorizonNB.ca' <douglas.doucette@horizonnb.ca>; 'Josee Gagnon (josee.gagnon@vitalitenb.ca)' <josee.gagnon@vitalitenb.ca>; 'Faith Louis (faith.louis@horizonnb.ca)' <faith.louis@horizonnb.ca>
Cc: 'Dr. Jennifer Russell ' <jennifer.russell@gnb.ca>; Mark Wies <mark.wies@gnb.ca>; Levesque, Eric J. (DH/MS) <eric.levesque2@gnb.ca>; France Desrosiers (Dr.France.Desrosiers@vitalitenb.ca) <dr.france.desrosiers@vitalitenb.ca>; Dr. John Dornan (HHN) <john.dornan@horizonnb.ca>
Subject: FYI: CADTH Undertaking Full Review of Evidence related to "Long COVID" (Post–COVID-19) / À titre d'information : L'ACMTS entreprend un examen complet des données probantes sur le syndrome post-COVID-19

Le texte français suit.

Good morning all,

Having seen stories about "Long COVID" in the local news, I wanted to ensure you were aware that CADTH is proceeding to conduct a Condition Level Review on Post–COVID-19 (or "Long COVID"). A "Condition Level Review" is an assessment of the evidence on a range of health technologies and emerging issues on all aspects of the condition, including prevention, identification, treatment and management.

As you may be aware, we have produced some initial reports on long COVID and also hosted a Webinar on this topic in October. The various, currently-available long COVID resources from CADTH are listed below.

For your information, we are working with other partners on this project and have convened a stakeholder panel involving PHAC, Ontario Ministry of Health, Alberta Health Services, various clinical experts and patient representatives.

The main effort currently underway is the full scoping review which I understand should be completed and posted in the next month. It will map all the available evidence and identify the knowledge and evidence gaps in this space and indicate where there is more room for evidence synthesis. Based on these findings and input from our customers (like you) we may pursue some of those identified topics for rapid reviews, etc. (Here is a link to the Scoping Review Project Protocol.)

In addition, a pan-Canadian Summit on long COVID is being explored with a likely focus being guideline development for long COVID and models of care.

We appreciate that post-COVID-19 is an evolving condition and that evidence needs may

differ or change rapidly across jurisdictions with time. **We certainly welcome requests for any specific evidence needs from you at any time and will look forward to your input on this project as it evolves**. Please don't hesitate to touch base if you have any questions, suggested input or information needs at this time.

Thanks,
21(1)

CADTH's Current Post-COVID Resources

- Post-COVID Condition Level Review General Landing Page
- Horizon Scan, September 2021: *An Overview of Post–COVID-19 Condition (Long COVID)*
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- *Hospital News* article, January 2022: *Long COVID and what it means for a struggling health care system*

**

Bonjour,

Après avoir lu de nombreuses publications dans les médias sur la COVID-19 de longue durée, je tiens à vous informer ou à vous rappeler que l'ACMTS procède à un examen global d'une maladie sur la COVID-19 de longue durée (aussi appelée syndrome post-COVID-19). Il s'agit d'une évaluation des données probantes portant sur diverses technologies de la santé et sur les questions émergentes touchant tous les aspects de la maladie, qu'on pense à la prévention, à la détection, au traitement ou à la prise en charge.

Comme vous le savez sans doute, l'ACMTS a déjà produit ses premiers rapports sur la COVID-19 de longue durée et a tenu un webinaire à ce sujet en octobre dernier. Les ressources de l'ACMTS présentement accessibles sur le syndrome post-COVID-19 figurent à la fin de ce message.

À titre d'information, nous collaborons avec certains partenaires pour mener à bien ce projet. Dans ce contexte, nous avons regroupé les parties prenantes suivantes : l'Agence de la santé publique du Canada (ASPC), le ministère de la Santé de l'Ontario, Alberta Health Services (AHS), des cliniciens experts et des représentants des patients.

Les principaux travaux en cours portent sur l'examen complet de la portée, dont la publication sur le site Web est attendue le mois prochain. L'examen permettra de présenter

la structuration des données probantes, de recenser les connaissances et de relever les lacunes dans les données en un même endroit, en plus d'indiquer les autres possibilités de synthèse de données probantes. À la lumière des constatations dégagées et des observations de la clientèle (dont vous faites partie), nous serons en mesure de poursuivre les travaux sur certains aspects au moyen d'examens rapides ou d'autres types d'évaluations. Voici un lien vers le protocole de l'examen de la portée (en anglais).

En outre, nous envisageons de tenir un sommet pancanadien sur le syndrome post-COVID-19 qui aura vraisemblablement pour thème l'élaboration de lignes directrices pour le syndrome post-COVID-19 et les modèles de soins.

Nous reconnaissons que le syndrome post-COVID-19 est une affection en évolution et que les besoins en matière de données probantes à son sujet varient ou se transforment selon la région ou le moment. **Assurément, nous accueillons les requêtes de données probantes particulières dont vous pourriez avoir besoin. De plus, nous espérons avoir votre avis sur ce projet au fil de son évolution.** N'hésitez pas à communiquer avec nous si vous avez des questions, des suggestions ou des demandes de renseignements.

Cordialement,
21(1) [redacted]

Ressources de l'ACMTS sur le syndrome post-COVID-19

- Page d'accueil : La COVID-19 de longue durée : examen global d'une maladie
- Analyse prospective, septembre 2021 : Vue d'ensemble du syndrome post-COVID-19 (COVID-19 de longue durée) (en anglais)
- Résumé d'examen de la portée, septembre 2021 : Résumé d'examen de la portée – La COVID de longue durée : examen global d'une maladie (en anglais)
- Examen de la portée – Protocole : La classification et les interventions cliniques en contexte de syndrome post-COVID-19 : examen de la portée - Protocole (en anglais)
- Webinaire de l'ACMTS, octobre 2021 : Les répercussions de la COVID-19 de longue durée
- Communiqué de l'ACMTS, décembre 2021 : Un nouvel examen de l'ACMTS vient aider les systèmes de santé à comprendre et à prendre en charge les effets à long terme du syndrome post-COVID-19
- Article dans la revue *Hospital News*, janvier 2022 : Long COVID and what it means for a struggling health care system (en anglais)

21(1) [redacted]
CADTH / ACMTS

L'ACMTS s'efforce de fournir des sources fiables et crédibles d'information, particulièrement en ce qui a trait aux preuves produites par des organismes reconnus d'évaluation des technologies de la santé (ETS), lorsque disponibles, pour offrir un meilleur appui à ses clients. Cet avis ne signifie pas que l'ACMTS endosse officiellement l'information fournie et n'engage aucunement sa responsabilité.

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Modifiez vos préférences sur Mon ACMTS ou désabonnez-vous des messages courriel de l'ACMTS.

From:	Elliott, Jennifer (DH/MS)
To:	McGowan, Joan (DH/MS); Leger, Dr. Yves (DH/MS)
Cc:	Clair, Suzanne (DH/MS); Levesque, Eric J. (DH/MS); Russell, Dr. Jennifer (DH/MS)
Subject:	Long COVID
Date:	April 18, 2022 9:56:42 PM
Importance:	High

Good evening Yves and Joan;

Reaching out this evening to ensure we have on the agenda this week the possibility of one or two of the RMOHs and SPAs taking on a medical review of Long COVID. 26(1)(a) [redacted]

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Eric and Dr Russell have also been invited to an upcoming Long COVID event CADTH is planning.

Thanks all, hope everyone had a great weekend.

Jennifer Elliott
Assistant Deputy Minister/Sous-ministre
NB Department of Health / Ministère de la santé du Nouveau-Brunswick
Phone / Téléphone : 506-470-1122
E-mail / Courriel : jennifer.elliott@gnb.ca
www.gnb.ca

From: Leger, Dr. Yves (DH/MS)
To: (DH/MS)Regional MOH
Subject: FW: Long COVID
Date: April 18, 2022 10:04:28 PM
Importance: High

To discuss in the coming day or two…hoping to have one or more of you interested in taking this on as I won't have time.

Yves

Dr. Yves A. Leger, MD, MHSc, FRCPC
Acting Deputy Chief Medical Officer of Health
Medecin-hygeniste en chef ajoint par interim

N.B. Department of Health / Ministère de la Sante du N.B.

From: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Sent: April 18, 2022 9:57 PM
To: McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Cc: Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
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Condition

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www.gnb.ca

From: Barker, Dr. Kimberley (DH/MS)
To: Leger, Dr. Yves (DH/MS)
Cc: (DH/MS)Regional MOH
Subject: Re: Long COVID
Date: April 18, 2022 10:23:42 PM

Happy to take this on as it was part of my Gant chart work plan for last year and is still on it. Would of course love to have a partner in crime

Sent from my iPhone

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>
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>
> Yves
>
> Dr. Yves A. Leger, MD, MHSc, FRCPC
> Acting Deputy Chief Medical Officer of Health
> Medecin-hygeniste en chef ajoint par interim
>
> N.B. Department of Health / Ministère de la Sante du N.B.
>
> ---
>
> **From:** Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
> **Sent:** April 18, 2022 9:57 PM
> **To:** McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
> **Cc:** Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
> **Subject:** Long COVID
> **Importance:** High
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E-mail / Courriel : jennifer.elliott@gnb.ca
www.gnb.ca

From: Rahman, Dr. Arifur (DH/MS)
To: Barker, Dr. Kimberley (DH/MS); Leger, Dr. Yves (DH/MS)
Cc: (DH/MS)Regional MOH
Subject: Re: Long COVID
Date: April 18, 2022 10:32:56 PM

Hi Kim,

Please count on me, I am happy to be the partner in crime...

Thank you,

Arifur

Get Outlook for Android

From: Barker, Dr. Kimberley (DH/MS) <Kimberley.Barker@gnb.ca>
Sent: Monday, April 18, 2022, 10:23 p.m.
To: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Cc: (DH/MS)Regional MOH <DHRegMOH@gnb.ca>
Subject: Re: Long COVID

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Sent from my iPhone

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> To discuss in the coming day or two…hoping to have one or more of you interested in taking this on as I won't have time.
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> Yves
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> **Sent:** April 18, 2022 9:57 PM
> **To:** McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>; Leger, Dr. Yves (DH/MS)

<Yves.Leger@gnb.ca>
Cc: Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
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From: Leger, Dr. Yves (DH/MS)
To: Elliott, Jennifer (DH/MS); McGowan, Joan (DH/MS)
Cc: Clair, Suzanne (DH/MS); Levesque, Eric J. (DH/MS); Russell, Dr. Jennifer (DH/MS)
Subject: RE: Long COVID
Date: April 19, 2022 10:46:59 AM

Hi Jennifer,

26(1)(a) [redacted]

Managing Long COVID, ie complications from an infection, are the realm of the acute care system, similarly to how public health would not typically be involved in developing clinical guidelines for managing complications from a meningitis or gonorrhea infection f example…. Public health focuses on primordial, primary and at times secondary prevention, however managing complication from a condition is what we would call tertiary prevention and typically the purview of the acute care system.

I can certainly find a few MOHs who would have interest in this topic, and I'm sure would be happy to participate in a process around this issue, 26(1)(a) [redacted]

Yves

Dr. Yves A. Leger, MD, MHSc, FRCPC
Acting Deputy Chief Medical Officer of Health
Medecin-hygeniste en chef ajoint par interim

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Subject: Long COVID
Importance: High

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From: Elliott, Jennifer (DH/MS)
To: Leger, Dr. Yves (DH/MS); McGowan, Joan (DH/MS)
Cc: Clair, Suzanne (DH/MS); Levesque, Eric J. (DH/MS); Russell, Dr. Jennifer (DH/MS)
Subject: RE: Long COVID
Date: April 19, 2022 12:00:01 PM

Good morning;

26(1)(a) [redacted]

[redacted]

Let's discuss.

Jennifer

From: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Sent: Tuesday, April 19, 2022 10:47 AM
To: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>
Cc: Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Subject: RE: Long COVID

Hi Jennifer,

26(1)(a) [redacted]

Managing Long COVID, ie complications from an infection, are the realm of the acute care system, similarly to how public health would not typically be involved in developing clinical guidelines for managing complications from a meningitis or gonorrhea infection f example…. Public health focuses on primordial, primary and at times secondary prevention, however managing complication from a condition is what we would call tertiary prevention and typically the purview of the acute care system.

I can certainly find a few MOHs who would have interest in this topic, and I'm sure would be happy to participate in a process around this issue, 26(1)(a) [redacted]

Yves

Dr. Yves A. Leger, MD, MHSc, FRCPC
Acting Deputy Chief Medical Officer of Health

Medecin-hygeniste en chef ajoint par interim

N.B. Department of Health / Ministère de la Sante du N.B.

From: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Sent: April 18, 2022 9:57 PM
To: McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Cc: Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Subject: Long COVID
Importance: High

Good evening Yves and Joan;

Reaching out this evening to ensure we have on the agenda this week the possibility of one or two of the RMOHs and SPAs taking on a medical review of Long COVID. 26(1)(a) [redacted]

Below is a summary of current Post-COVID resources received from CADTH.

- Post-COVID Condition Level Review General Landing Page
- Horizon Scan, September 2021: *An Overview of Post–COVID-19 Condition (Long COVID)*
- Preliminary Scoping Summary for CLR, September 2021: *Scoping Summary - A Condition-Level Review on Post-COVID 19 Condition (Long COVID)*
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- CADTH News Release, December 2021: New CADTH Review Aims to Help Health Systems Understand and Manage the Long-Term Impact of Post–COVID-19 Condition
- *Hospital News* article, January 2022: *Long COVID and what it means for a struggling health care system*

Eric and Dr Russell have also been invited to an upcoming Long COVID event CADTH is planning.

Thanks all, hope everyone had a great weekend.

Jennifer Elliott
Assistant Deputy Minister/Sous-ministre
NB Department of Health / Ministère de la santé du Nouveau-Brunswick

Phone / Téléphone : 506-470-1122
E-mail / Courriel : jennifer.elliott@gnb.ca
www.gnb.ca

From: COVID-19 Public Enquiries / Demandes publiques COVID-19 (DH/MS)
To: R1SETripleCNBRegistry
Subject: FW: Long covid
Date: April 20, 2022 11:55:00 AM

Good morning,

Can someone from the long haul study respond to Tara below?

Department of Health COVID-19 Public Enquiries Team/ l'Équipe de demandes publiques COVID-19 du Ministère de la Santé

For the most up-to-date information, please visit our dedicated COVID-19 website/Pour obtenir les informations les plus récentes, veuillez visiter notre site Web dédié à la COVID-19:
www.gnb.ca/coronavirus

● Be Informed ● Be Safe ● Be Prepared ● Be Kind ●
● Soyez informé ● Soyez protégé ● Soyez préparé ● Soyez bienveillant ●

From: Crain, Krista (DH/MS) <Krista.Crain@gnb.ca> **On Behalf Of** Shephard, Dorothy Hon. (DH/MS)
Sent: April 19, 2022 1:17 PM
To: DH Correspondence / Correspondance MS (DH/MS) <DHMC.CMMS@gnb.ca>
Subject: FW: Long covid

From: 21(1) [redacted]
Sent: Monday, April 18, 2022 3:11 PM
To: Shephard, Dorothy Hon. (DH/MS) <Dorothy.Shephard@gnb.ca>
Subject: Long covid

ATTENTION! External email / courriel externe.

Hello Ms Shephard,
I am writing you as a sufferer of what is now called "long covid". My symptoms are often debilitating and my life has been put on hold even though I am no longer infected with covid.
I am not alone as there are many others New Brunswickers suffering along with me. We need help and a long covid clinic in New Brunswick. I am not asking for anything more than what other Canadians have access to in their home provinces.

Please help us,

21(1) [redacted]

From: 21(1)
To: Levesque, Eric J. (DH/MS); Russell, Dr. Jennifer (DH/MS)
Cc: Elliott, Jennifer (DH/MS); Leger, Dr. Yves (DH/MS)
Subject: RE: CADTH Roundtable Event on "Long COVID": Confirmed for June 1st & Invitations Coming Next Week
Date: April 22, 2022 3:39:30 PM

Good afternoon - Just touching base to advise you that June 1st has been confirmed as the date for this CADTH Roundtable Event on Long COVID. I understand that your official invitations should be arriving early next week.

Happy Friday & happy weekend too,
21(1)

[redacted]
CADTH / ACMTS

CADTH endeavours to provide credible sources of information, in particular available evidence from recognized Health Technology Assessment (HTA) organizations, where available, as an added support to our customers. No official endorsement of this information by CADTH is intended as a result of this message.

L'ACMTS s'efforce de fournir des sources fiables et crédibles d'information, particulièrement en ce qui a trait aux preuves produites par des organismes reconnus d'évaluation des technologies de la santé (ETS), lorsque disponibles, pour offrir un meilleur appui à ses clients. Cet avis ne signifie pas que l'ACMTS endosse officiellement l'information fournie et n'engage aucunement sa responsabilité.

From: Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>
Sent: April 13, 2022 10:46 AM
To: 21(1) [redacted]@cadth.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Cc: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Dan Coulombe <Dan.Coulombe@gnb.ca>; Burkhardt, Tracey (DH/MS) <Tracey.Burkhardt@gnb.ca>; Dell, Dave (DH/MS) <dave.dell@gnb.ca>; Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Heidi Liston <heidi.liston@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Subject: RE: Confirming NB invites for CADTH Roundtable Event in May on "Long COVID"/Post–COVID & Models of Care

Hi 21(1) [redacted]

Yes, that works. We can decide who best to attend from there. Thanks very much for connecting on this.

Regards,

Éric Levesque

Acting Assistant Deputy Minister / Sous-ministre adjoint par intérim
Health Services and Programs / Services et programmes de santé
Department of Health / Ministère de la Santé

Phone / Téléphone : 506-470-9783
E-mail / Courriel : eric.j.levesque@gnb.ca
www.gnb.ca

From: 21(1) [redacted] @cadth.ca>
Sent: Wednesday, April 13, 2022 10:16 AM
To: Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Cc: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Coulombe, Dan (DH/MS) <Dan.Coulombe@gnb.ca>; Burkhardt, Tracey (DH/MS) <Tracey.Burkhardt@gnb.ca>; Dell, Dave (DH/MS) <dave.dell@gnb.ca>; Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Liston, Heidi (DH/MS) <Heidi.Liston@gnb.ca>
Subject: Confirming NB invites for CADTH Roundtable Event in May on "Long COVID"/Post–COVID & Models of Care

ATTENTION! External email / courriel externe.

Good morning,

In follow-up to my note below, CADTH (in collaboration with its expert stakeholder panel) is convening a pan-Canadian Roundtable event next month to discuss "Long COVID" and related models of care.

The event will be by invitation only for approximately 25 stakeholders, including individuals with lived experience. The purpose of this event will be to raise awareness of the condition, hear from jurisdictions who are further along in this area, allow for exchange/collaboration regarding related care approaches/models of care, identify current efforts underway & potential knowledge gaps to be addressed (avoiding any duplication of efforts) etc. Engaging the right people for this event will be key to its success.

Two New Brunswick representatives will be invited to attend. The plan is to send these invites to 2 senior NB Health leaders involved in this space who can then accept the invitation or delegate the invite to an appropriate NB representative.

I would welcome your input/confirmation of the two NB invitations. Unless I hear otherwise, I will suggest your names, Eric and Jennifer, for the initial NB invites as follows:

- Eric Levesque, Acting ADM, Health Services & Programs
- Dr. Jennifer Russell, CMOH

Let me know if you'd prefer otherwise or have any questions at this time. More details will be available shortly and in the invitation that will be forthcoming.

Thank you,
21(1) [redacted]

[redacted]
CADTH / ACMTS

From: 21(1) [redacted]
Sent: March 17, 2022 10:21 AM
To: 'Carolin.Galvin' <carolin.galvin@gnb.ca>; 'Higdon, Penny (DH/MS)' <penny.higdon@gnb.ca>; 'Wendy.Donovan@gnb.ca' <Wendy.Donovan@gnb.ca>; Suzanne Clair <suzanne.clair@gnb.ca>; 'Landsburg, Shelley (DH/MS)' <Shelley.Landsburg@gnb.ca>; 'Kimberley.Barker@gnb.ca' <Kimberley.Barker@gnb.ca>; 'Dr. Yves Leger' <Yves.Leger@gnb.ca>; 'Mark.McKelvie@gnb.ca' <Mark.McKelvie@gnb.ca>; 'dr.andrew.salmon@gnb.ca' <dr.andrew.salmon@gnb.ca>; 'Chalifoux, Mathieu (DH/MS)' <mathieu.chalifoux@gnb.ca>; Dan Coulombe <Dan.Coulombe@gnb.ca>; 'Tracey Newton (Tracey.Newton@gnb.ca)' <tracey.newton@gnb.ca>; 'Jean Daigle (Jean.Daigle@horizonnb.ca)' <jean.daigle@horizonnb.ca>; 'jacques.duclos@vitalitenb.ca' <jacques.duclos@vitalitenb.ca>; Margaret Melanson (Margaret.Melanson@HorizonNB.ca) <margaret.melanson@horizonnb.ca>; 'MacGibbon, Eileen (HorizonNB' <Eileen.MacGibbon@HorizonNB.ca>; 'Brien, Dr. Susan (HorizonNB' <Susan.Brien@HorizonNB.ca>; 'Strack, Barry (HorizonNB)' <Barry.Strack@HorizonNB.ca>; Brigitte Sonier-Ferguson (Brigitte.Sonier-Ferguson@vitalitenb.ca) <brigitte.sonier-ferguson@vitalitenb.ca>; 'natalie.banville@vitalitenb.ca' <natalie.banville@vitalitenb.ca>; 'Dr.Gordon.Dow@HorizonNB.ca' <dr.gordon.dow@horizonnb.ca>; Smyth, Dr. Daniel (HorizonNB) <Dr.Daniel.Smyth@HorizonNB.ca>; 'Douglas.Doucette@HorizonNB.ca' <douglas.doucette@horizonnb.ca>; 'Josee Gagnon (josee.gagnon@vitalitenb.ca)' <josee.gagnon@vitalitenb.ca>; 'Faith Louis (faith.louis@horizonnb.ca)'

<faith.louis@horizonnb.ca>
Cc: 'Dr. Jennifer Russell ' <jennifer.russell@gnb.ca>; Mark Wies <mark.wies@gnb.ca>; Levesque, Eric J. (DH/MS) <eric.levesque2@gnb.ca>; France Desrosiers (Dr.France.Desrosiers@vitalitenb.ca) <dr.france.desrosiers@vitalitenb.ca>; Dr. John Dornan (HHN) <john.dornan@horizonnb.ca>
Subject: FYI: CADTH Undertaking Full Review of Evidence related to "Long COVID" (Post–COVID-19) / À titre d'information : L'ACMTS entreprend un examen complet des données probantes sur le syndrome post-COVID-19

Le texte français suit.

Good morning all,

Having seen stories about "Long COVID" in the local news, I wanted to ensure you were aware that CADTH is proceeding to conduct a Condition Level Review on Post–COVID-19 (or "Long COVID"). A "Condition Level Review" is an assessment of the evidence on a range of health technologies and emerging issues on all aspects of the condition, including prevention, identification, treatment and management.

As you may be aware, we have produced some initial reports on long COVID and also hosted a Webinar on this topic in October. The various, currently-available long COVID resources from CADTH are listed below.

For your information, we are working with other partners on this project and have convened a stakeholder panel involving PHAC, Ontario Ministry of Health, Alberta Health Services, various clinical experts and patient representatives.

The main effort currently underway is the full scoping review which I understand should be completed and posted in the next month. It will map all the available evidence and identify the knowledge and evidence gaps in this space and indicate where there is more room for evidence synthesis. Based on these findings and input from our customers (like you) we may pursue some of those identified topics for rapid reviews, etc. (Here is a link to the Scoping Review Project Protocol.)

In addition, a pan-Canadian Summit on long COVID is being explored with a likely focus being guideline development for long COVID and models of care.

We appreciate that post-COVID-19 is an evolving condition and that evidence needs may differ or change rapidly across jurisdictions with time. **We certainly welcome requests for any specific evidence needs from you at any time and will look forward to your input on this project as it evolves**. Please don't hesitate to touch base if you have any questions, suggested input or information needs at this time.

Thanks,
21(1)

CADTH's Current Post-COVID Resources

- Post-COVID Condition Level Review General Landing Page
- Horizon Scan, September 2021: *An Overview of Post–COVID-19 Condition (Long COVID)*
- Preliminary Scoping Summary for CLR, September 2021: *Scoping Summary - A Condition-Level Review on Post-COVID 19 Condition (Long COVID)*
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- CADTH News Release, December 2021: New CADTH Review Aims to Help Health Systems Understand and Manage the Long-Term Impact of Post–COVID-19 Condition
- *Hospital News* article, January 2022: *Long COVID and what it means for a struggling health care system*

**

Bonjour,

Après avoir lu de nombreuses publications dans les médias sur la COVID-19 de longue durée, je tiens à vous informer ou à vous rappeler que l'ACMTS procède à un examen global d'une maladie sur la COVID-19 de longue durée (aussi appelée syndrome post-COVID-19). Il s'agit d'une évaluation des données probantes portant sur diverses technologies de la santé et sur les questions émergentes touchant tous les aspects de la maladie, qu'on pense à la prévention, à la détection, au traitement ou à la prise en charge.

Comme vous le savez sans doute, l'ACMTS a déjà produit ses premiers rapports sur la COVID-19 de longue durée et a tenu un webinaire à ce sujet en octobre dernier. Les ressources de l'ACMTS présentement accessibles sur le syndrome post-COVID-19 figurent à la fin de ce message.

À titre d'information, nous collaborons avec certains partenaires pour mener à bien ce projet. Dans ce contexte, nous avons regroupé les parties prenantes suivantes : l'Agence de la santé publique du Canada (ASPC), le ministère de la Santé de l'Ontario, Alberta Health Services (AHS), des cliniciens experts et des représentants des patients.

Les principaux travaux en cours portent sur l'examen complet de la portée, dont la publication sur le site Web est attendue le mois prochain. L'examen permettra de présenter la structuration des données probantes, de recenser les connaissances et de relever les lacunes dans les données en un même endroit, en plus d'indiquer les autres possibilités de synthèse de données probantes. À la lumière des constatations dégagées et des observations de la clientèle (dont vous faites partie), nous serons en mesure de poursuivre les travaux sur certains aspects au moyen d'examens rapides ou d'autres types d'évaluations. Voici un lien vers le protocole de l'examen de la portée (en anglais).

En outre, nous envisageons de tenir un sommet pancanadien sur le syndrome post-COVID-

19 qui aura vraisemblablement pour thème l'élaboration de lignes directrices pour le syndrome post-COVID-19 et les modèles de soins.

Nous reconnaissons que le syndrome post-COVID-19 est une affection en évolution et que les besoins en matière de données probantes à son sujet varient ou se transforment selon la région ou le moment. **Assurément, nous accueillons les requêtes de données probantes particulières dont vous pourriez avoir besoin. De plus, nous espérons avoir votre avis sur ce projet au fil de son évolution.** N'hésitez pas à communiquer avec nous si vous avez des questions, des suggestions ou des demandes de renseignements.

Cordialement,
21(1) [redacted]

Ressources de l'ACMTS sur le syndrome post-COVID-19

- Page d'accueil : La COVID-19 de longue durée : examen global d'une maladie
- Analyse prospective, septembre 2021 : Vue d'ensemble du syndrome post-COVID-19 (COVID-19 de longue durée) (en anglais)
- Résumé d'examen de la portée, septembre 2021 : Résumé d'examen de la portée – La COVID de longue durée : examen global d'une maladie (en anglais)
- Examen de la portée – Protocole : La classification et les interventions cliniques en contexte de syndrome post-COVID-19 : examen de la portée - Protocole (en anglais)
- Webinaire de l'ACMTS, octobre 2021 : Les répercussions de la COVID-19 de longue durée
- Communiqué de l'ACMTS, décembre 2021 : Un nouvel examen de l'ACMTS vient aider les systèmes de santé à comprendre et à prendre en charge les effets à long terme du syndrome post-COVID-19
- Article dans la revue *Hospital News*, janvier 2022 : Long COVID and what it means for a struggling health care system (en anglais)

21(1) [redacted]
CADTH / ACMTS

Thank you.
To Unsubscribe from CADTH electronic messages or edit your preferences on MyCADTH.

From: Barker, Dr. Kimberley (DH/MS)
To: Rahman, Dr. Arifur (DH/MS)
Cc: McKelvie, Dr. Mark (DH/MS); (DH/MS)Regional MOH
Subject: Re: Long Covid
Date: April 22, 2022 7:44:24 PM

Really interesting and thanks for sending along Arifur. Look forward to seeing where the department would like to take this

Sent from my iPhone

> On Mar 29, 2022, at 2:12 PM, Barker, Dr. Kimberley (DH/MS) <Kimberley.Barker@gnb.ca> wrote:
>
> Thanks Mark, I know that we ran out of time to talk about long Covid today but I wonder whether we could potentially ask Matt and Shannon to tell us what the capacity is for them to pick up where we left off with the 2000 Covid cases that are already consented to participating in the long-haul Covid study here in New Brunswick? I don't wanna take up any more MOH time so perhaps we could just get updates in an email?
>
> Sent from my iPhone
>
> > On Mar 29, 2022, at 11:52 AM, Rahman, Dr. Arifur (DH/MS) <Dr.Arifur.Rahman@gnb.ca> wrote:
> >
> > Thank you, Mark.
> >
> > Arifur
> >
> > ---
> >
> > **From:** McKelvie, Dr. Mark (DH/MS) <Mark.McKelvie@gnb.ca>
> > **Sent:** March 29, 2022 12:51 PM
> > **To:** (DH/MS)Regional MOH <DHRegMOH@gnb.ca>
> > **Subject:** Long Covid
> >
> > Here is the document I mentioned from WHO.
> > I'm also attaching one from the UK that has a number of clinical practice guidelines about managing long-term effects (it's also referenced in the WHO document).
> > Mark

From: Barker, Dr. Kimberley (DH/MS)
To: Rahman, Dr. Arifur (DH/MS)
Cc: Leger, Dr. Yves (DH/MS); (DH/MS)Regional MOH
Subject: Re: Long COVID
Date: April 22, 2022 8:11:25 PM

Would love to have you as a partner in crime. Perhaps we could both agree to have it on our work plan and add to an agenda next week with Yves to discuss what he would like in terms of who will take this on. Huge thanks

Sent from my iPhone

> On Apr 18, 2022, at 10:32 PM, Rahman, Dr. Arifur (DH/MS) <Dr.Arifur.Rahman@gnb.ca> wrote:
>
> Hi Kim,
>
> Please count on me, I am happy to be the partner in crime...
>
> Thank you,
>
> Arifur
>
> Get Outlook for Android

From: Barker, Dr. Kimberley (DH/MS) <Kimberley.Barker@gnb.ca>
Sent: Monday, April 18, 2022, 10:23 p.m.
To: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Cc: (DH/MS)Regional MOH <DHRegMOH@gnb.ca>
Subject: Re: Long COVID

Happy to take this on as it was part of my Gant chart work plan for last year and is still on it. Would of course love to have a partner in crime

Sent from my iPhone

> On Apr 18, 2022, at 10:04 PM, Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca> wrote:
>
> To discuss in the coming day or two…hoping to have one or more of you interested in taking this on as I won't have time.
>
> Yves

Dr. Yves A. Leger, MD, MHSc, FRCPC
Acting Deputy Chief Medical Officer of Health
Medecin-hygeniste en chef ajoint par interim

N.B. Department of Health / Ministère de la Sante du N.B.

From: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Sent: April 18, 2022 9:57 PM
To: McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Cc: Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Subject: Long COVID
Importance: High

Good evening Yves and Joan;

Reaching out this evening to ensure we have on the agenda this week the possibility of one or two of the RMOHs and SPAs taking on a medical review of Long COVID. 26(1)(a) [redacted]

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Eric and Dr Russell have also been invited to an upcoming Long COVID event CADTH is planning.

Thanks all, hope everyone had a great weekend.

Jennifer Elliott
Assistant Deputy Minister/Sous-ministre
NB Department of Health / Ministère de la santé du Nouveau-Brunswick
Phone / Téléphone : 506-470-1122
E-mail / Courriel : jennifer.elliott@gnb.ca
www.gnb.ca

From: Elliott, Jennifer (DH/MS)
To: Donovan, Wendy (DH/MS); Clair, Suzanne (DH/MS)
Subject: FW: Post COVID-19 Condition Scan #21
Date: April 25, 2022 12:29:50 PM
Attachments: OCSO Post-COVID Condition Scan21_Apr22_2022.pdf

For the teams reference.

Jennifer

From: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>
Sent: Monday, April 25, 2022 12:01 PM
To: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Subject: FW: Post COVID-19 Condition Scan #21

FYI

From: Northwood, Brandon (PHAC/ASPC) <brandon.northwood@phac-aspc.gc.ca> **On Behalf Of** Cidsc Secretariat (PHAC/ASPC)
Sent: April 25, 2022 10:59 AM
To: annick.descormiers@msss.gouv.qc.ca; Barbara.Yaffe@ontario.ca; BethHalfyard@gov.nl.ca; Brenda Clement <brenda.clement@novascotia.ca>; Caroline_NewBerry@gov.nt.ca; Catherine.Elliott@gov.yk.ca; charlene.mack@gov.ab.ca; cindy.rogers@health.gov.sk.ca; Claudia Kraft <Claudia_Kraft@gov.nt.ca>; colette.gaulin@msss.gouv.qc.ca; Colleen.Kovach@yukon.ca; Daniel.Warshafsky@ontario.ca; Danuta.Skowronski@bccdc.ca; Werker, Denise (PHAC/ASPC) <Denise.Werker@phac-aspc.gc.ca>; Dilan_Patel@gov.nt.ca; Emily.Karas@oahpp.ca; Eveline.Toth@msss.gouv.qc.ca; Fiona.kouyoumdjian@ontario.ca <Fiona.kouyoumdjian@ontario.ca>; George.Doyle-Bedwell@novascotia.ca; Smadi, Hanan (DH/MS) <Hanan.Smadi@gnb.ca>; Heather Morrison <hgmorrison@gov.pe.ca>; Heather_Hannah@gov.nt.ca; Helene.Venables@msss.gouv.qc.ca; Jan.McFadzen@yukon.ca <Jan.McFadzen@yukon.ca>; Jayne Boutilier <jayne.boutilier@novascotia.ca>; Jessica.Hopkins@oahpp.ca; Jing.Hu@gov.ab.ca; JPawa@GOV.NU.CA; Julie.Kryzanowski@health.gov.sk.ca; Julie_A_Miller@gov.nt.ca; Kelly.dean@novascotia.ca; KKulleperuma@GOV.NU.CA; louise.valiquette@inspq.qc.ca; Marie-Andree.Leblanc@msss.gouv.qc.ca; Martin.Vogel@oahpp.ca; martine.fortier@msss.gouv.qc.ca; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; mayank.singal@bccdc.ca; Dr. Marguerite Cameron <mcameron@ihis.org>; michelle.murti@ontario.ca <michelle.murti@ontario.ca>; mireille.barakat@inspq.qc.ca; monika.naus@bccdc.ca; MP <marieve.pelletier@inspq.qc.ca>; MPS <marie-pascale.sassine@inspq.qc.ca>; OCMHO@health.gov.sk.ca; prahman@mun.ca; richard.masse@msss.gouv.qc.ca; Richard.Mather@oahpp.ca; RosannSeviour@gov.nl.ca; Sanaz.Vaseghi@health.gov.sk.ca; Santina.Lee@gov.mb.ca; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; shelley.deeks@novascotia.ca; Tim.hilderman@gov.mb.ca; Wajid.ahmed@ontario.ca <Wajid.ahmed@ontario.ca>; Siu, Winnie (PHAC/ASPC) <winnie.siu@phac-aspc.gc.ca>
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Subject: Post COVID-19 Condition Scan #21

ATTENTION! External email / courriel externe.

TAC Members,

Attached is the latest COVID-19 environmental scan.

This biweekly product presents an overview of the current state of knowledge, and emerging evidence on **Post COVID-19 Condition** (Apr 9th – Apr 22nd).

Thanks,
TAC Sec't

POST COVID-19 CONDITION

OCSO BIWEEKLY SCAN OF EVIDENCE #21

April 9-April 22, 2022

SCOPE

This biweekly update presents an analysis of new evidence, guidance and issues related to post COVID-19 condition (commonly referred to as 'long COVID') and synthesizes the current state of knowledge. Comprehensive lists of details and resources on this issue are available at the Office of the Chief Science Officer.

CURRENT STATE OF KNOWLEDGE

The typical duration of acute COVID-19 illness is two to four weeks. However, some patients have described debilitating symptoms persisting or recurring for weeks or months after acute illness. The range of symptoms reported is broad, and can vary from mild to more severe and debilitating effects that can affect both young and older individuals, regardless of the severity of their initial COVID-19 symptoms in the acute stage. These symptoms are often described as, Post COVID-19 condition (WHO terminology), post-acute sequelae of SARS-CoV-2 infection (PASC), and long COVID (used by patient groups). Affected individuals are commonly referred to as COVID-19 long-haulers. While scientific knowledge on these conditions is building, there is still much that is unknown about this condition. There have been reports of more than 100 symptoms or difficulties with everyday activities.

There is limited data suggesting that the condition may be more likely to develop in those:

- who were hospitalized during acute infection;
- had more than 5 COVID symptoms during the acute phase;
- have pre-existing respiratory disease;
- are older;
- are women; and
- have other co-morbidities or have higher BMI.

Typical therapeutic itinerary involves consultations with multiple specialists and puts emphasis on self-management (rest & relaxation, self-pacing, etc). Emerging evidence points to the importance of multidisciplinary care given the heterogeneity of symptoms associated with Post COVID-19 condition. Multidisciplinary teams in "long COVID" clinics have been set to include professionals from the following fields: rehabilitation, respiratory and cardiac consultants, physiotherapists, occupational therapists, psychologists, etc.

It is anticipated that Post COVID-19 condition will have medium and long-term impact on public health in Canada. Further research with an equity lens on the predisposing conditions and risk factors is needed. Based on research to date, and reviewed by the Public Health Agency of Canada as part of a living systematic review, 56% of individuals who have had COVID-19 reported the presence of one or more symptoms 12 weeks after diagnosis. About 58% of children had 1 or more symptoms 4 weeks or more after their initial COVID-19 infection. Post COVID-19 condition will have implications for the economy, as well as federal programs including disability benefits, employment related measures and sick pay, among others. It is reported that 10% of adults are unable to return to work in the long term. The WHO has said that about one in 4 people infected with COVID-19 have experienced a post-COVID-19 condition for at least 1 month. One in 10 people experience symptoms lasting beyond 12 weeks.

This week's scan includes a systematic review published in the *Journal of Infectious Diseases* examining the global prevalence of Post COVID-19 Condition, as well as a rapid review published by *Public Health Ontario* on Post-Acute COVID-19 Syndrome (PACS) in adults.

GUIDELINES OR STANDARDS

- **WHO** has developed a clinical case definition of post COVID-19 condition by Delphi methodology that includes 12 domains, available for use in all settings. This first version was developed by patients, researchers and others with the understanding that the definition may change as new evidence emerges and our understanding of the consequences of COVID-19 continues to evolve.
    - "*Post COVID-19 condition occurs in individuals with a history of probable or confirmed SARS CoV-2 infection, usually 3 months from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis. Common symptoms include fatigue, shortness of breath, cognitive dysfunction but also others and generally have an impact on everyday functioning. Symptoms may be new onset following initial recovery from an acute COVID-19 episode or persist from the initial illness. Symptoms may also fluctuate or relapse over time.*"
    - **WHO:** Q&A page on Post-COVID-19 Condition (February 2022).

- **US CDC** describes Post-COVID conditions as a range of new, returning, or ongoing health problems people experience four or more weeks after first being infected with the virus that causes COVID-19. The CDC highlights the various types of post-COVID conditions such as: Multiorgan Effects of COVID-19, Effects of COVID-19 Illness or Hospitalization, and 'New or Ongoing Symptoms'. The CDC posted Interim Guidance for healthcare providers on Evaluating and Caring for Patients with Post-COVID Conditions. Post-COVID conditions can be considered a disability under the Americans with Disabilities Act (ADA). The CDC also released information on Caring for People with Post-COVID Conditions.

- UK **NICE**: Rapid guidelines for managing the long-term effects of COVID-19 (Updated March 2022).

- **Chartered Society of Physiotherapy** in UK published its COVID-19 rehabilitation standards, which includes guidance about community-based rehab for people with COVID-19 and long COVID (July 2021).

- Guidelines to help doctors manage long COVID patients published in *British Journal of General Practice* (August 2021).

- UK **NHS** guidance for Post-COVID syndrome assessment clinics (April 2021).

- **CIHI** guidance for clinicians to ensure that data supports monitoring for Post-COVID conditions.

- Guidance for **Canadian Rehabilitation and Exercise Professionals** on Post COVID-19 condition and rehabilitation management strategies (August 2021).

- **Government of Canada**: COVID-19 for health professionals - Post COVID-19 condition

- **Center for Effective Practice** – COVID-19: Clinical Guidance for Primary Care Providers - Long-term symptoms / Post-acute sequelae of COVID-19 (PASC)

- Guideline S1: Long COVID: Diagnostics and treatment strategies (*Wiener klinische Wochenschrift*)

- American Academy of Physical Medicine and Rehabilitation (**AAPM&R**): Cognitive Symptoms Guidance and Breathing Discomfort Guidance.

- Royal Australian College of General Practitioners (**RACGP**) guidance for GPs caring for 'long COVID' patients.

- European Society of Clinical Microbiology and Infectious Diseases (**ESCMID**): Rapid guidelines for assessment and management of long COVID

- **ACAS** (UK-based Advisory, Conciliation and Arbitration Service): Long COVID – advice for employers and employees

NATIONAL AND INTERNATIONAL DEVELOPMENTS (*APR 9-APR 22*)

CANADA

- (NEW) Public Health Ontario has released a rapid review on Post-Acute COVID-19 Syndrome (PACS) in adults. The report highlights hospitals could be strained by an increase in ER visits, patient care, and need for rehabilitation teams as more people deal with lingering effects of the virus.
- (NEW) Victoria (BC) has opened its first long-COVID clinic at Royal Jubilee Hospital.

UK

- (UPDATED) 90 long COVID clinics have been set up across England to provide specialist help to those who need it. Similar centres have opened in Northern Ireland, while in Scotland and Wales patients are referred to different services, depending on their specific symptoms.

US

- (NEW) Nearly 1 in 4 privately insured long COVID patients diagnosed between October 2021 and January 2022 have breathing abnormalities, while chronic cough or fatigue were diagnosed in about 1 in 5 patients each, according to data analysis by FAIR Health provided to Morning Consult.

EMERGING SCIENTIFIC EVIDENCE (*APR 9-APR 22*)*

EVIDENCE PRODUCTS

TITLE AND AUTHOR	EVIDENCE TYPE	SUMMARY
Global Prevalence of Post COVID-19 Condition or Long COVID: A Meta-Analysis and Systematic Review (Chen et al)	Systematic Review (Available in *J Infect Dis*)	Study aims to examine the worldwide prevalence of post COVID-19 condition, through a systematic review and meta-analysis. 50 studies were included, and 41 were meta-analyzed. Global estimated pooled prevalence of post COVID-19 condition was 0.43. Hospitalized and non-hospitalized patients have estimates of 0.54 and 0.34, respectively. Regional prevalence estimates were Asia— 0.51, Europe— 0.44, and North America— 0.31. Global prevalence for 30, 60, 90, and 120 days after infection were estimated to be 0.37, 0.25, 0.32 and 0.49 respectively. Fatigue was the most common symptom reported with a prevalence of 0.23, followed by memory problems.
Long COVID and Long Chain Fatty Acids (LCFAs): Psychoneuroimmunity implication of omega-3 LCFAs in delayed consequences of COVID-19 (Yang et al)	Review (Available in *Brain Behav Immun*)	Mechanisms of neuropsychiatric complications of long COVID damages from direct CNS viral involvement, unresolved systemic inflammation and oxidative stress, maladaptation of the renin-angiotensin-aldosterone system and coagulation system, dysregulated immunity, the dysfunction of neurotransmitters and HPA axis, and the psychosocial stress imposed by societal changes in response to this pandemic. Long chain omega-3 PUFAs might have favorable effects on immunity, inflammation, oxidative stress and psychoneuroimmunity at different stages of SARS-CoV-2

		infection. Omega-3 PUFAs and their metabolites, including specialized pro-resolvin mediators, accelerate the process of cleansing chronic inflammation, altering the HPA axis, modulating neurotransmission via lipid rafts and restoring tissue homeostasis, and offer a promising strategy for long COVID.
Common Molecular Pathways Between Post-COVID19 Syndrome and Lung Fibrosis: A Scoping Review (Bergantini et al)	Scoping Review (Available in *Front Pharmacol*)	Aim of scoping review was to identify and systematize main pathogenetic mechanisms believed to be involved in this phenomenon, in order to highlight the same molecular aspect of the lung. Authors identified all primary studies involving post COVID-19 syndrome with pulmonary fibrosis as a primary endpoint by performing data searches in various systematic review databases. Quality of study has been assessed through SANRA protocol. Total of 32 studies involving were included, included the possible involvement of inflammatory cytokines, concerned the renin-angiotensin system, the potential role of galectin-3, epithelial injuries in fibrosis, alveolar type 2 involvement, Neutrophil extracellular traps and the others implied other specific aspects.

SELECT PRIMARY RESEARCH

TITLE AND AUTHOR	SOURCE	SUMMARY
Cardio-Pulmonary Dysfunction Evaluation in Patients with Persistent Post-COVID-19 Headache (Aparisi et al)	*Int J Environ Res*	Authors conducted a case-control analysis nested in a prospective cohort study. Individuals were recruited from August 2020 to December 2020. A cohort of 70 COVID-19 patients was evaluated. Patients with headaches (n=10; 14.3%) were more frequently female (100% vs. 58.4%) and younger. No between-group differences in laboratory analysis, resting echocardiography, cardio-pulmonary exercise test, or pulmonary function tests were observed.
Post-Acute Covid Neurological Symptoms among Doctors and Nurses in A Tertiary Care Hospital: An Observational Study from Bangladesh (Bhattacharjee et al)	*Mymensingh Med J*	Study aims to observe the post-acute neurological symptoms among doctors and nurses of Mymensingh Medical College Hospital, a tertiary care hospital in Bangladesh, after they recover from initial infection or among the asymptomatic cases. A total of 100 subjects were interviewed over the phone for the presence or absence of neurological symptoms four weeks post Covid-19 infection. Total 54 doctors and 46 nurses were evaluated; the male-female ratio was 1:1.77, the mean age was 35.6±7.6 years. Post-acute COVID neurological symptoms (PACNS) were present in 60% of respondents. Fatigue (51%) was the most common symptom, followed by sleep disturbance, headache, myalgia, loss of taste and smell.
Abnormal quantitative pupillary light responses following COVID-19 (Bitirgen et al)	*Int Ophthalmol*	Study aimed to characterize alterations in pupillary light reflex responses in subjects following coronavirus disease 2019 (COVID-19), especially those with long-COVID. The median time after the diagnosis of acute COVID-19 was 4 months. Dynamic pupillometry reveals significant alterations in contractile pupillary light responses, indicative of parasympathetic dysfunction after COVID-19.
COVID-19 patients require multi-disciplinary rehabilitation approaches to address persisting symptom profiles and restore pre-COVID quality of life (Faghy et al)	*Expert Rev Respir Med*	Study aimed to identify pertinent areas impacting quality of life (QoL) following a COVID-19 infection. Participant health was reduced because of COVID-19 symptoms ("Good health" to "Poor health" P<0.001). Survey respondents who work reported ongoing issues with performing moderate (83%) and vigorous (79%) work-related activities.

Serological Biomarkers at Hospital Admission Are Not Related to Long-Term Post-COVID Fatigue and Dyspnea in COVID-19 Survivors (Fernández-de-Las-Peñas et al)	*Respiration*	Cohort study aimed to investigate the association between serological biomarkers at the acute phase of infection at hospital admission with the development of long-term post-COVID fatigue and dyspnea. The prevalence of post-COVID fatigue and dyspnea was 72.8% and 17.2% at 6 months and 45.4% and 13.6% at 12 months after hospital discharge, respectively. Patients exhibiting post-COVID fatigue exhibited a lower hemoglobin level, higher lymphocyte count, and lower neutrophil and platelets counts, whereas those exhibiting post-COVID dyspnea had a lower platelet count and lower alanine transaminase, aspartate transaminase, and LDH levels. Lower platelet count and lower LDH levels were associated but just explaining 4.5% of the variance, of suffering from post-COVID fatigue and dyspnea, respectively.
Impact of the post-COVID-19 condition on health care after the first disease wave in Lombardy (Mannucci et al)	*J Intern Med*	Using the regional population administrative database including all the 48932 individuals who survived COVID-19 and became PCR negative for SARS-CoV-2 by May 2020, incident mortality, re-hospitalizations, attendances to hospital emergency room and outpatient medical visits were evaluated over a mid-term period of 6 months, in 20521 individuals managed at home, 26016 hospitalized in medical wards and 1611 in intensive care units (ICU). In individuals previously admitted to ICU and medical wards, re-hospitalizations, attendances to hospital emergency rooms and out-patient medical visits were much more frequent in the 6-month period after SARS-CoV-2 negativization than in the same pre-pandemic period. Performances of spirometry increased more than 50-fold, chest CT scans 32-fold in ICU-admitted cases and 5.5-fold in non-ICU cases, electrocardiography 5.6-fold in ICU cases and two-fold in non-ICU cases. Use of drugs and biochemical tests increased in all cases.
Developing a model for predicting impairing physical symptoms in children 3 months after a SARS-CoV-2 PCR-test: The CLoCk Study (Nugawela et al)	*medRxiv*	Objective was to develop and internally validate a model to predict children and young people most likely to experience at least one impairing physical symptom 3 months after a SARS-CoV-2 PCR-test and to determine whether the impact of these predictors differed by SARS-CoV-2 infection status. A total of 50,836 children and young people were approached; 7,096 (3,227 test-positives, 3,869 test-negatives) who completed a questionnaire 3 months after their PCR-test were included. 39.6% (1,279/3,227) of SAR-CoV-2 PCR-positives and 30.6% (1,184/3,869) of SARS-CoV-2 PCR-negatives had at least one impairing physical symptom 3 months post-test. The final model contained predictors: SARS-COV-2 status, number of symptoms at testing, sex, age, ethnicity, self-rated physical and mental health, feelings of loneliness and four EQ-5D-Y items before testing. Internal validation showed minimal overfitting with excellent calibration and discrimination measures.
Predictors of Persistent Symptoms after SARS-CoV-2 Infection among Healthcare Workers: Results of a Multi-site Survey (Pop-Vicas et al)	*Infect Control Hosp Epidemiol*	Goal of study was to characterize the post-acute sequelae of COVID-19 in health care workers (HCWs) 4 weeks after their initial COVID-19 diagnosis. Eligible participants included all HCW identified through occupational health to have had at least one laboratory-confirmed positive COVID-19 PCR diagnosis between March 1, 2020 – January 15, 2021.
Cardiac impairment in Long Covid 1-year post-SARS-CoV-2 infection (Roca-Fernández et al)	*medRxiv*	Study investigated the 12-month trajectory of cardiac impairment in individuals with Long Covid. The technical success of this multiorgan assessment in non-acute settings was 99.1% at baseline, and 98.3% at follow up, with 99.6% and 98.8% for CMR respectively. Of individuals with Long Covid, 102/534 19%] had cardiac impairment at baseline; 71/102

		had complete paired data at 12 months. Of those, 58% presented with ongoing cardiac impairment at 12 months. High sensitivity cardiac troponin I and B-type natriuretic peptide were not predictive of CMR findings, symptoms, or clinical outcomes. At baseline, low LVEF, high RVEDV and low GLS were associated with cardiac impairment. Low LVEF at baseline was associated with persistent cardiac impairment at 12 months.
Course of post COVID-19 disease symptoms over time in the ComPaRe long COVID prospective e-cohort (Tran et al)	*Nat Commun*	Researchers analysed data from 968 adult patients with a confirmed infection enrolled in the ComPaRe long COVID cohort, a prospective e-cohort in France that began in Dec 2020, with analysis up to Oct 2021. Day-by-day prevalence of post COVID-19 symptoms was determined from patients' responses to the Long COVID Symptom Tool, a validated self-reported questionnaire assessing 53 symptoms. Among patients symptomatic after 2 months, 85% still reported symptoms one year after symptom onset. Evolution of symptoms showed a decreasing prevalence over time for 27/53 symptoms (e.g., loss of taste/smell); a stable prevalence over time for 18/53 symptoms (e.g., dyspnoea); and increasing prevalence over time for 8/53 symptoms (e.g., paraesthesia).
Dysfunctional breathing diagnosed by cardiopulmonary exercise testing in 'long COVID' patients with persistent dyspnoea (Frésard et al)	*BMJ Open Respir Res*	Study aimed to describe occurrence and identify clinical predictors of dysfunctional breathing(DB) among patients following COVID-19 infection. Cardiopulmonary exercise testing was performed in 51 patients living with 'long COVID' and persistent dyspnoea. DB mostly without hyperventilation was found in 29.4% (n=15), respiratory limitation with gas exchange abnormalities (RL) in 54.9% (n=28) and O2 delivery/ utilisation impairment (D) in 15.7% (n=8). When compared with RL individuals, patients with DB were younger, had significantly less severe initial infection, a better transfer capacity for carbon monoxide, higher oxygen consumption, a better ventilatory efficiency slope and higher SpO2.
Health behaviours the month prior to COVID-19 infection and the development of self-reported long COVID and specific long COVID symptoms: A longitudinal analysis of 1,811 UK adults (Paul et al)	*medRxiv*	Study aims to assess the influence of health behaviours (e.g., exercise, smoking) immediately preceding an index infection. In the month before infection with COVID-19, poor quality sleep increased the odds of long COVID as did average quality sleep. Results point to the importance of sleep quality for long COVID, potentially helping to explain previously demonstrated links between stress and long COVID. Results also suggest that exercise and smoking may be modifiable risk factors for preventing the development of difficulty with self-care.
Risk factors and multidimensional assessment of long COVID fatigue: a nested case-control study (Margalit et al)	*Clin Infect Dis*	Fatigue is the most prevalent and debilitating long COVID symptom, however risk factors and pathophysiology of this condition remain unknown. Authors assessed risk factors for long COVID fatigue and explored its possible pathophysiology.
Long COVID occurrence in COVID-19 survivors (Sugiyama et al)	*Sci Rep*	Cross-sectional study aimed to investigate post-acute consequences of COVID-19. Among 127 patients who had recovered from COVID-19, 52.0% had persistent symptoms at a median of 29 days IQR 23-128] after COVID-19 onset. Among patients with mild COVID-19, 49.5% had sequelae. The most frequent symptoms were olfactory disorders (15.0%), taste disorders (14.2%), and cough (14.2%). Multivariate analysis showed that age was an independent risk factor for sequelae (adjusted odds ratios AOR] for ≥ 60 years vs. < 40 years). Possible psychological distress was noted in 30.7% (17.9% of males, 45.0% of females). Female sex and the

		presence of sequelae were independent risk factors for psychological distress. Of all participants, 29.1% had possible impairments in work performance. Experiences of stigma and discrimination were reported by 43.3% of participants.
Post COVID – 19 neurological disorders; a single center experience; a case series (Ahmad et al)	*Ann Med Surg*	Study aims to estimate the neurological diseases which develop after COVID-19 infection. A total number of 59 patients infected with SARS-CoV2 were included. The majority of the patients had mild symptoms 32 (54%), 12 (20%) patients developed severe symptoms. Headache was the most common presenting symptom 27(46%) followed by fatigue in 8 (13.5%). The majority of the patients 55 (91.6%) presented with no focal signs. MRI was done for 27 (46%) patients without abnormal finding in 22 cases. Nearly 22 (37.3%) cases were diagnosed as recurrent episodes of migraine or new onset of migraine. All patients were managed according to the underlying pathology, only (28, 47.5%) patients were known to be completely recovered.
Persistent Overactive Cytotoxic Immune Response in a Spanish Cohort of Individuals With Long-COVID: Identification of Diagnostic Biomarkers (Galán et al)	*Front Immunol*	Study analyzed usefulness of several demographic, clinical, and immunological parameters as diagnostic biomarkers of Long-COVID in one cohort of Spanish individuals who presented signs and symptoms of this syndrome after 49 weeks post-infection, in comparison with individuals who recovered completely in the first 12 weeks after the infection. We determined that individuals with Long-COVID showed significantly increased levels of functional memory cells with high antiviral cytotoxic activity such as CD8+ TEMRA cells, CD8±TCRγδ+ cells, and NK cells with CD56+CD57+NKG2C+ phenotype. With the use of these immune parameters and significant clinical features such as lethargy, pleuritic chest pain, and dermatological injuries, as well as demographic factors such as female gender and O+ blood type, a Random Forest algorithm predicted the assignment of the participants in the Long-COVID group with 100% accuracy.
COVCOG 1: Factors Predicting Physical, Neurological and Cognitive Symptoms in Long COVID in a Community Sample. A First Publication From the COVID and Cognition Study (Guo et al)	*Front Aging Neurosci*	Study documented characteristics of our sample of 181 individuals who had experienced COVID-19 infection, and 185 who had not. We explore which factors may be predictive of ongoing symptoms and their severity, as well as conducting an in-depth analysis of symptom profiles. Finally, we explore which factors predict the presence and severity of cognitive symptoms, both throughout the ongoing illness and at the time of testing. The main finding from this first analysis is that that severity of initial illness is a significant predictor of the presence and severity of ongoing symptoms, and that some symptoms during the initial illness—particularly limb weakness—may be more common in those that have more severe ongoing symptoms.

*Note: Content may have been published prior to this scan period but was only available through applying our search strategies during this period.

COMMENTARIES, LETTERS AND OPINION PIECES (*APR 9-APR 22*)

- Lessons from Long COVID: working with patients to design better research (*Nat Rev Immunol*): For a condition that is still emerging, with poorly defined characteristics and underlying mechanisms, involving people with lived experiences can help to design studies that truly capture the reality of the condition. In Long COVID, the classical epidemiological approach of using health-care-based studies does not work well on its own, because there is huge variation and significant deficiency in diagnosis, clinical coding and management strategies. Scientific research sets the medical and care agenda for patients with chronic illnesses. It also influences the wider social and economic agenda for people living with these conditions.

- Pediatric Long COVID and Myalgic Encephalomyelitis/Chronic Fatigue Syndrome: Overlaps and Opportunities *(Pediatr Infect Dis J):* Overlap of symptoms between long COVID and ME/CFS is substantial and includes fatigue, post-exertional malaise, cognitive impairment, sleep disturbance and light-headedness. Both conditions are more frequent in females than males. Neither condition can be reliably diagnosed with laboratory findings, although such testing can help exclude other similar conditions. Treatment focuses on symptom management. While no single pharmacologic agent is effective for all long COVID or ME/CFS patients, this should not encourage therapeutic nihilism, as many effective treatments exist for the common features such as orthostatic intolerance, pain, headaches and insomnia. More work will be needed to identify whether the prevalence of orthostatic intolerance is as high in long COVID as it is in ME/CFS, and whether the risk factors for pediatric ME/CFS (including allergic inflammation, female sex, peak onset in adolescence and heritable risk factors such as joint hypermobility) apply to post-COVID conditions.

MEDIA HIGHLIGHTS (*APR 9-APR 22*)

CANADA

- **Could Paxlovid help treat long COVID? Here's what we know (Global News):** Reports of two patients who found relief from long COVID after taking Pfizer Inc's antiviral Paxlovid, including a researcher who tested it on herself, provide intriguing evidence for clinical trials. Scientists caution that these cases are "hypothesis-generating only" and not proof that the drug caused relief of lingering symptoms. But they lend support to a leading theory that long COVID may be caused by the virus persisting in parts of the body for months, affecting patients' daily lives long after acute symptoms disappear. Best evidence so far comes from a National Institutes of Health (NIH) study, currently under peer review, in which researchers conducted autopsies in 44 people who died of COVID-19 or another cause but were infected with COVID. They found widespread infection throughout the body, including in the brain, that can last more than seven months beyond the onset of symptoms. Paxlovid is currently authorized for use in the first days of a COVID infection to prevent severe disease in high-risk patients.
- **Women with long-haul COVID-19 have more symptoms than men, study finds (CTV News):** A new study has found that women who suffer from long-COVID typically experience more symptoms than their male counterparts. The report, published in Journal of Women's Health, found that females were "significantly more likely" to exhibit difficulty swallowing, fatigue and chest pain at long-term follow-up compared to men. Previous studies show that women are less prone to developing severe disease than men in acute phase of COVID-19, however, researchers note few studies have assessed sex-differences in regards to long COVID.

GLOBAL

- **Long Covid: Ambulance worker credits food supplements to alleviate symptoms (BBC):** An ambulance worker who was off duty for 14 months with long Covid said taking a daily probiotic and food supplement had been "life-changing". He credits a treatment trial, led by scientists in Cambridge, for his improved health and return to work. Oncologist Prof Robert Thomas, who led the study, said the team concentrated natural substances which are available in commons foods into capsule form. The capsules are classed as a food, not a drug, so are therefore unregulated and cannot be prescribed by the NHS, but are available to buy.
- **Thousands of long COVID patients feared to be missing out on disability benefits (Independent):** Just 1,584 people with the condition have been assessed by the government for Personal Independence Payment (PIP), and only 937 of these have successfully secured the benefit. But figures for last month show that 322,000 people in the UK were reporting that their ability to undertake day-to-day activities had been limited "a lot" by long Covid, according to the Office for National Statistics. Some 172,000 of these said they had struggled every day for the past 12 months. Politicians and campaign groups warn not enough has been done to remove barriers to applying for financial aid.

POST COVID-19 CONDITION RESOURCES

- (NEWLY ADDED) Health Education England (HEE) e-learning modules: long COVID programme
- Voices of Long COVID (US): Voices of Long Covid campaign features testimonials from a diverse group of people ages 18-29 who are suffering from long-term complications of COVID-19 infection.

- Dignity Health (US): COVID-19 and Chronic Illness Recovery Program based in the U.S. has helped over 2,000 people struggling with COVID long-term effects ("COVID long haulers"). Treatment is exercise-based for lingering or long-term conditions (sequelae) from having the virus.

- Altea (Switzerland): A network for sharing evidence-based information on the long-term effects of COVID-19.

- Pandemic-Aid Networks: Long COVID research library.

- Post-COVID-19 Functional Status Scale: An overview of a patient self-reported scale that helps to support assessment of functional status and recovery after the SARS-CoV-2 infection.

- Ontario College of Family Physicians: Resources on Post-COVID Condition.

- Agency for Clinical Innovation (Australia): Living Evidence - post acute sequelae of COVID-19.

- Pre-populated literature searches: Long COVID search (LitCovid) and Long COVID search (NIH)

- PAHO Webinar Series on Post COVID-19 Condition launched 17 February, 2022, from 10:30 am to 12:30 pm (EST).

- Body Politic COVID-19 Support Group (Global): Housed on the Slack app, group members have access to dozens of different channels, which give space for more personal discussion. Some of the channels include those specifically for medical professionals, parents of children with Covid-19, LGBTQ+ individuals, BIPOC+, and different regions around the world.

- Patient-Led Research Collaborative (Global): Self-organized group of Long COVID patients working on patient-led research around the Long COVID experience.

- British Heart Foundation (UK): UK-based foundation with resources on long COVID.

- COVID Long Haul (Canada): Canada's largest online platform for COVID survivors, their family members and anyone searching for the most up-to-date information about the pandemic. There is a COVID long-haulers support group and a Report on Pan-Canadian Long COVID Impact Survey (PDF) (June 2021)

- BC ECHO for Post-COVID-19 Recovery (Canada): BC ECHO for Post-COVID-19 Recovery is a learning community of specialists and community health-care providers who use case-based learning to improve care for those recovering from symptoms post-COVID-19.

- Long Covid Support (UK): Peer support and advocacy group aiming to facilitate international peer support and campaigning in the UK for recognition, rehabilitation and research into treatments.

- Long COVID SOS (UK): Long-term sufferers formed the LongCovidSOS campaign to put pressure on the UK government to recognise the needs of those with Long Covid, and to raise awareness among the general public and employers.

- Survivor Corps (US): One of the largest and fastest growing grassroots movements connecting, supporting, and mobilizing COVID-19 Survivors to support research. They have a list of Post-COVID Care Centers (PCC) and a PCCC Best Practices Guide.

- The Center for Chronic Illness (US): Aims to promote well-being and decrease isolation for those impacted by chronic illness through support and education. Their online support groups are professionally-facilitated and offer psychoeducational tools for coping.

- Blooming Magnolia (US): Mission is to empower others by providing a platform to strengthen & protect mental health and support those afflicted with Long-Covid through education and funding of therapeutic research. They have a list of support groups and resources on their website.

- Long COVID Alliance (US): US-based network of patient-advocates, scientists, disease experts, and drug developers who have joined together to leverage their collective knowledge and resources to educate policy makers and accelerate research to transform our understanding of post-viral illness.

- Long COVID Kids (UK/US/Canada): Parent & patient led advocacy & support group based in the UK.

- Long COVID Physio (US & UK): International peer support, education and advocacy group of Physiotherapists living with Long COVID, founded in November 2020 by Physiotherapists living with Long COVID from the UK and US.

- Patient-Led Research Collaborative (Global): Group of Long COVID patients working on patient-led research around the Long COVID experience.

- CANCOV- Patient resources (Canada): CANCOV is a research platform grounded in a prospective longitudinal 1-year cohort study of patients infected with COVID-19.

- COVID Patient Recovery Alliance (CPRA) (US): CPRA aims to bring together leaders in business, health care, research, academia, data and analytics, and patient advocacy to develop solutions that coordinate diverse data sources, inform models of care, and ensure adequate payment for long-COVID patients. Their report outlines recommendations for federal policymakers to promote recovery.

- British Lung Foundation (UK): UK-based charity sharing resources on navigating the NHS, breathlessness support, movement and energy support for long COVID patients.

- Living with Long COVID (US): COVID-19 Long-Haulers and Post-COVID Support Community.

***Note**: Previous OCSO Post COVID-19 Condition Scans can be found here.*

From: Clair, Suzanne (DH/MS)
To: (DH/MS)NB Public Health COVID Response Team
Subject: FW: Post COVID-19 Condition Scan #21
Date: April 25, 2022 1:30:57 PM
Attachments: OCSO Post-COVID Condition Scan21_Apr22_2022.pdf

FYI

From: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Sent: April-25-22 12:30 PM
To: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>
Subject: FW: Post COVID-19 Condition Scan #21

For the teams reference.

Jennifer

From: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>
Sent: Monday, April 25, 2022 12:01 PM
To: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Subject: FW: Post COVID-19 Condition Scan #21

FYI

From: Northwood, Brandon (PHAC/ASPC) <brandon.northwood@phac-aspc.gc.ca> **On Behalf Of** Cidsc Secretariat (PHAC/ASPC)
Sent: April 25, 2022 10:59 AM
To: annick.descormiers@msss.gouv.qc.ca; Barbara.Yaffe@ontario.ca; BethHalfyard@gov.nl.ca; Brenda Clement <brenda.clement@novascotia.ca>; Caroline_NewBerry@gov.nt.ca; Catherine.Elliott@gov.yk.ca; charlene.mack@gov.ab.ca; cindy.rogers@health.gov.sk.ca; Claudia Kraft <Claudia_Kraft@gov.nt.ca>; colette.gaulin@msss.gouv.qc.ca; Colleen.Kovach@yukon.ca; Daniel.Warshafsky@ontario.ca; Danuta.Skowronski@bccdc.ca; Werker, Denise (PHAC/ASPC) <Denise.Werker@phac-aspc.gc.ca>; Dilan_Patel@gov.nt.ca; Emily.Karas@oahpp.ca; Eveline.Toth@msss.gouv.qc.ca; Fiona.kouyoumdjian@ontario.ca <Fiona.kouyoumdjian@ontario.ca>; George.Doyle-Bedwell@novascotia.ca; Smadi, Hanan (DH/MS) <Hanan.Smadi@gnb.ca>; Heather Morrison <hgmorrison@gov.pe.ca>; Heather_Hannah@gov.nt.ca; Helene.Venables@msss.gouv.qc.ca; Jan.McFadzen@yukon.ca <Jan.McFadzen@yukon.ca>; Jayne Boutilier <jayne.boutilier@novascotia.ca>; Jessica.Hopkins@oahpp.ca; Jing.Hu@gov.ab.ca; JPawa@GOV.NU.CA; Julie.Kryzanowski@health.gov.sk.ca; Julie_A_Miller@gov.nt.ca; Kelly.dean@novascotia.ca; KKulleperuma@GOV.NU.CA; louise.valiquette@inspq.qc.ca; Marie-Andree.Leblanc@msss.gouv.qc.ca; Martin.Vogel@oahpp.ca; martine.fortier@msss.gouv.qc.ca; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; mayank.singal@bccdc.ca; Dr. Marguerite Cameron <mcameron@ihis.org>; michelle.murti@ontario.ca <michelle.murti@ontario.ca>;

mireille.barakat@inspq.qc.ca; monika.naus@bccdc.ca; MP <marieve.pelletier@inspq.qc.ca>; MPS <marie-pascale.sassine@inspq.qc.ca>; OCMHO@health.gov.sk.ca; prahman@mun.ca; richard.masse@msss.gouv.qc.ca; Richard.Mather@oahpp.ca; RosannSeviour@gov.nl.ca; Sanaz.Vaseghi@health.gov.sk.ca; Santina.Lee@gov.mb.ca; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; shelley.deeks@novascotia.ca; Tim.hilderman@gov.mb.ca; Wajid.ahmed@ontario.ca <Wajid.ahmed@ontario.ca>; Siu, Winnie (PHAC/ASPC) <winnie.siu@phac-aspc.gc.ca>
Cc: Cidsc Secretariat (PHAC/ASPC) <cidsc_secretariat@phac-aspc.gc.ca>
Subject: Post COVID-19 Condition Scan #21

ATTENTION! External email / courriel externe.

TAC Members,

Attached is the latest COVID-19 environmental scan.

This biweekly product presents an overview of the current state of knowledge, and emerging evidence on **Post COVID-19 Condition** (Apr 9th – Apr 22nd).

Thanks,
TAC Sec't

From: Leger, Dr. Yves (DH/MS)
To: Elliott, Jennifer (DH/MS); McGowan, Joan (DH/MS)
Cc: Clair, Suzanne (DH/MS); Levesque, Eric J. (DH/MS); Russell, Dr. Jennifer (DH/MS)
Subject: RE: Long COVID
Date: April 25, 2022 5:53:38 PM

In follow up to your request, Drs Barker and Rahman would interested in this piece of work.

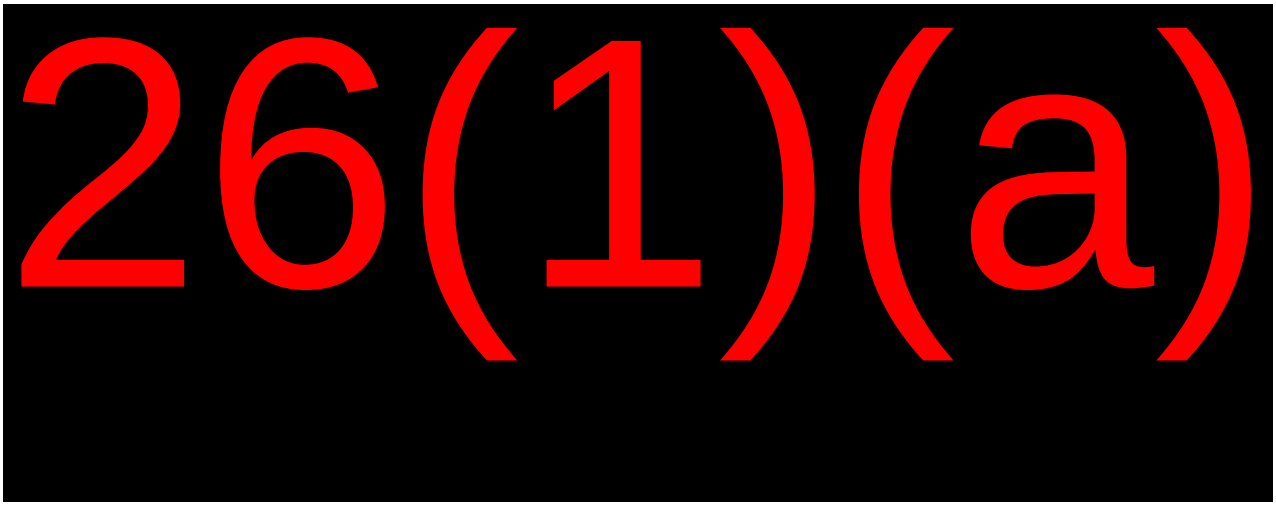
Yves

Dr. Yves A. Leger, MD, MHSc, FRCPC
Acting Deputy Chief Medical Officer of Health
Medecin-hygeniste en chef ajoint par interim

N.B. Department of Health / Ministère de la Sante du N.B.

From: Leger, Dr. Yves (DH/MS)
Sent: April 19, 2022 10:47 AM
To: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>
Cc: Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Subject: RE: Long COVID

Hi Jennifer,



Yves

Dr. Yves A. Leger, MD, MHSc, FRCPC
Acting Deputy Chief Medical Officer of Health
Medecin-hygeniste en chef ajoint par interim

N.B. Department of Health / Ministère de la Sante du N.B.

From: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Sent: April 18, 2022 9:57 PM
To: McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Cc: Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Subject: Long COVID
Importance: High

Good evening Yves and Joan;

Reaching out this evening to ensure we have on the agenda this week the possibility of one or two of the RMOHs and SPAs taking on a medical review of Long COVID. 26(1)(a) [redacted]

Below is a summary of current Post-COVID resources received from CADTH.

- Post-COVID Condition Level Review General Landing Page
- Horizon Scan, September 2021: *An Overview of Post–COVID-19 Condition (Long COVID)*
- Preliminary Scoping Summary for CLR, September 2021: *Scoping Summary - A Condition-Level Review on Post-COVID 19 Condition (Long COVID)*
- Scoping Review - Project Protocol: *Clinical Classification and Clinical Interventions for Post–COVID-19 Condition: A Scoping Review - Project Protocol*
- CADTH Webinar, October 2021: The Implications of Long COVID
- CADTH News Release, December 2021: New CADTH Review Aims to Help Health Systems Understand and Manage the Long-Term Impact of Post–COVID-19 Condition
- *Hospital News* article, January 2022: *Long COVID and what it means for a struggling health care system*

Eric and Dr Russell have also been invited to an upcoming Long COVID event CADTH is planning.

Thanks all, hope everyone had a great weekend.

Jennifer Elliott
Assistant Deputy Minister/Sous-ministre
NB Department of Health / Ministère de la santé du Nouveau-Brunswick
Phone / Téléphone : 506-470-1122
E-mail / Courriel : jennifer.elliott@gnb.ca

From: Barker, Dr. Kimberley (DH/MS)
To: RaaFat Gad, Dr. Rita (DH/MS)
Cc: Leger, Dr. Yves (DH/MS); McKelvie, Dr. Mark (DH/MS); Rahman, Dr. Arifur (DH/MS); Salmon, Dr. Andrew (DH/MS)
Subject: Re: Long COVID resources
Date: April 29, 2022 11:25:04 AM

Thanks Rita, 26(1)(a) [redacted]. Thanks again for sharing

Sent from my iPhone

> On Apr 29, 2022, at 10:58 AM, RaaFat Gad, Dr. Rita (DH/MS) <Rita.RaaFatGad@gnb.ca> wrote:
>
> Hello all,
> FYI- PHO has published 2 knowledge synthesis product on long COVID, and the effect of vaccination on the occurrence of long COVID from literature published to-date
> Impact of Vaccination on Post-Acute COVID-19 Syndrome (PACS) – What We Know So Far (publichealthontario.ca)
> Post-Acute COVID-19 Syndrome (PACS) in Adults (publichealthontario.ca)
> Best,
> Rita

From:	Leger, Dr. Yves (DH/MS)
To:	(DH/MS)Regional MOH
Subject:	FW: Post COVID-19 Condition Scan #21
Date:	May 4, 2022 8:41:21 AM
Attachments:	OCSO Post-COVID Condition Scan21_Apr22_2022.pdf

Dr. Yves A. Leger, MD, MHSc, FRCPC
Acting Deputy Chief Medical Officer of Health
Medecin-hygeniste en chef ajoint par interim

N.B. Department of Health / Ministère de la Sante du N.B.

From: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>
Sent: May 4, 2022 8:33 AM
To: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Subject: FW: Post COVID-19 Condition Scan #21

As discussed.

From: Chalifoux, Mathieu (DH/MS)
Sent: April 25, 2022 12:01 PM
To: Elliott, Jennifer (DH/MS); 'Leger, Dr. Yves (DH/MS) (Yves.Leger@gnb.ca)' <Yves.Leger@gnb.ca>
Subject: FW: Post COVID-19 Condition Scan #21

FYI

From: Northwood, Brandon (PHAC/ASPC) <brandon.northwood@phac-aspc.gc.ca> **On Behalf Of** Cidsc Secretariat (PHAC/ASPC)
Sent: April 25, 2022 10:59 AM
To: annick.descormiers@msss.gouv.qc.ca; Barbara.Yaffe@ontario.ca; BethHalfyard@gov.nl.ca; Brenda Clement <brenda.clement@novascotia.ca>; Caroline_NewBerry@gov.nt.ca; Catherine.Elliott@gov.yk.ca; charlene.mack@gov.ab.ca; cindy.rogers@health.gov.sk.ca; Claudia Kraft <Claudia_Kraft@gov.nt.ca>; colette.gaulin@msss.gouv.qc.ca; Colleen.Kovach@yukon.ca; Daniel.Warshafsky@ontario.ca; Danuta.Skowronski@bccdc.ca; Werker, Denise (PHAC/ASPC) <Denise.Werker@phac-aspc.gc.ca>; Dilan_Patel@gov.nt.ca; Emily.Karas@oahpp.ca; Eveline.Toth@msss.gouv.qc.ca; Fiona.kouyoumdjian@ontario.ca <Fiona.kouyoumdjian@ontario.ca>; George.Doyle-Bedwell@novascotia.ca; Smadi, Hanan (DH/MS) <Hanan.Smadi@gnb.ca>; Heather Morrison <hgmorrison@gov.pe.ca>; Heather_Hannah@gov.nt.ca; Helene.Venables@msss.gouv.qc.ca; Jan.McFadzen@yukon.ca <Jan.McFadzen@yukon.ca>; Jayne Boutilier <jayne.boutilier@novascotia.ca>; Jessica.Hopkins@oahpp.ca; Jing.Hu@gov.ab.ca; JPawa@GOV.NU.CA; Julie.Kryzanowski@health.gov.sk.ca; Julie_A_Miller@gov.nt.ca; Kelly.dean@novascotia.ca; KKulleperuma@GOV.NU.CA; louise.valiquette@inspq.qc.ca; Marie-Andree.Leblanc@msss.gouv.qc.ca; Martin.Vogel@oahpp.ca; martine.fortier@msss.gouv.qc.ca;

Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; mayank.singal@bccdc.ca; Dr. Marguerite Cameron <mcameron@ihis.org>; michelle.murti@ontario.ca <michelle.murti@ontario.ca>; mireille.barakat@inspq.qc.ca; monika.naus@bccdc.ca; MP <marieve.pelletier@inspq.qc.ca>; MPS <marie-pascale.sassine@inspq.qc.ca>; OCMHO@health.gov.sk.ca; prahman@mun.ca; richard.masse@msss.gouv.qc.ca; Richard.Mather@oahpp.ca; RosannSeviour@gov.nl.ca; Sanaz.Vaseghi@health.gov.sk.ca; Santina.Lee@gov.mb.ca; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; shelley.deeks@novascotia.ca; Tim.hilderman@gov.mb.ca; Wajid.ahmed@ontario.ca <Wajid.ahmed@ontario.ca>; Siu, Winnie (PHAC/ASPC) <winnie.siu@phac-aspc.gc.ca>
Cc: Cidsc Secretariat (PHAC/ASPC) <cidsc_secretariat@phac-aspc.gc.ca>
Subject: Post COVID-19 Condition Scan #21

ATTENTION! External email / courriel externe.

TAC Members,

Attached is the latest COVID-19 environmental scan.

This biweekly product presents an overview of the current state of knowledge, and emerging evidence on **Post COVID-19 Condition** (Apr 9th – Apr 22nd).

Thanks,
TAC Sec't

From: Chalifoux, Mathieu (DH/MS)
To: LeBlanc, Shannon (DH/MS)
Subject: FW: Long COVID
Date: May 6, 2022 1:46:39 PM

FYI

From: Houser, Chantal (HorizonNB) <Chantal.Houser@Horizonnb.ca>
Sent: May 6, 2022 1:44 PM
To: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>
Subject: Re: Long COVID

Enrollment for the data in the poster was collected from 12-March-2020 to 14-August-2021 so the participants included were infected between those dates. We have additional participants enrolled who were infected after 14-August-2021 but they were not included in this analysis.

From: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>
Sent: Friday, May 6, 2022 12:34 PM
To: Houser, Chantal (HorizonNB) <Chantal.Houser@Horizonnb.ca>
Subject: RE: Long COVID

Good morning Ms. Houser,

Quick question on the poster; do you know the timeframe of the included participants? I.e. with infection between X date – Y date?

Thank you,

Matt

From: Houser, Chantal (HorizonNB) <Chantal.Houser@Horizonnb.ca>
Sent: May 6, 2022 11:51 AM
To: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>
Subject: Re: Long COVID

Hi Mathieu,

No problem! I will reach out with updates as we get further along in the process.

Thanks,
Chantal

From: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>
Sent: Friday, May 6, 2022 11:35 AM
To: Houser, Chantal (HorizonNB) <Chantal.Houser@Horizonnb.ca>

Subject: RE: Long COVID

Good morning Ms. Houser,

Thank you for sending along! Will review the material.

Please let us know when the manuscript is finished (or earlier if you would be willing to share a draft!)

Thanks,

Matt

From: Houser, Chantal (HorizonNB) <Chantal.Houser@Horizonnb.ca>
Sent: May 6, 2022 10:40 AM
To: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>
Subject: Re: Long COVID

Hi Mathieu,

Sorry for the delay in getting this to you.

I have attached above the poster that 21(1) (Dr. Smyth's medical student) presented at the AMMI conference in April. These are only preliminary results - we are currently working on writing a more comprehensive manuscript.

Thanks,
Chantal

From: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>
Sent: Tuesday, May 3, 2022 4:24 PM
To: Houser, Chantal (HorizonNB) <Chantal.Houser@Horizonnb.ca>
Subject: RE: Long COVID

Good evening Ms. Houser,

I hope you have been well!

I'm just wondering if you have had any luck in securing the summary that you had discussed with me earlier in April?

Thank you for your time and collaboration,

Matt

From: Houser, Chantal (HorizonNB) <Chantal.Houser@Horizonnb.ca>
Sent: April 4, 2022 1:18 PM
To: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>
Subject: Re: Long COVID

Hi Mathieu,

Anytime tomorrow afternoon is good for me - let me know when works best for you!

I will reach out to Alex to get the most recent copy of his presentation.

Thanks,
Chantal

From: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>
Sent: Friday, April 1, 2022 5:03 PM
To: Houser, Chantal (HorizonNB) <Chantal.Houser@Horizonnb.ca>; Materniak, Stefanie (HorizonNB) <Stefanie.Materniak@HorizonNB.ca>
Subject: RE: Long COVID

Good evening Ms. Houser,

I would be very interested in 21(1) findings, if you happen to have them available.

Would Tuesday afternoon work for you?

Thanks,

Matt

From: Houser, Chantal (HorizonNB) <Chantal.Houser@Horizonnb.ca>
Sent: April 1, 2022 8:54 AM
To: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; Materniak, Stefanie (HorizonNB) <Stefanie.Materniak@HorizonNB.ca>
Subject: Re: Long COVID

Hi Mathieu,

Happy to discuss the registry and findings. I am available next week - let me know when works best for you.

21(1) (a medical student of Dr. Smyth's) is presenting preliminary data at the Association

of Medical Microbiology and Infectious Disease conference next week - I can send that information along as well.

Thanks,
Chantal

From: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>
Sent: Thursday, March 31, 2022 2:46 PM
To: Materniak, Stefanie (HorizonNB) <Stefanie.Materniak@HorizonNB.ca>
Cc: Houser, Chantal (HorizonNB) <Chantal.Houser@Horizonnb.ca>
Subject: RE: Long COVID

Good afternoon Ms. Materniak,

I'm doing well, thank you!

I appreciate you putting me in contact with Ms. Houser.

Ms. Houser, would you have some time to discuss in the near future?

Thank you,

Matt

From: Materniak, Stefanie (HorizonNB) <Stefanie.Materniak@HorizonNB.ca>
Sent: March 31, 2022 12:59 PM
To: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>
Cc: Houser, Chantal (HorizonNB) <Chantal.Houser@Horizonnb.ca>
Subject: Re: Long COVID

Good day Mathieu,

I am well, thank you, and hope you are too!

I've copied Chantal Houser, Dr. Smyth's research coordinator in Moncton, who has been more involved as of late in the registry than I am. I'm sure she'd be pleased to discuss the registry with you

Kind regards,
Stefanie

From: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>
Sent: March 29, 2022 4:04 PM
To: Materniak, Stefanie (HorizonNB) <Stefanie.Materniak@HorizonNB.ca>

Subject: Long COVID

Good afternoon Ms. Materniak,

I hope you're doing well!

I'm just wondering if you have time to discuss the registry activities / findings at some point this week?

Thanks,

Mathieu Chalifoux, M.Sc (Epidemiology) – Chief Epidemiologist / Épidémiologiste en chef
Public Health and Integrated Community Care / Santé publique et soins communautaires intégrés
Department of Health / Ministère de la santé
Phone / Téléphone : (506) 470-9627
E-mail / Courriel : Mathieu.Chalifoux@gnb.ca

From:	Lachapelle, Stephane (PHAC/ASPC) on behalf of Cidsc Secretariat (PHAC/ASPC)
To:	annick.descormiers@msss.gouv.qc.ca; Barbara.Yaffe@ontario.ca; BethHalfyard@gov.nl.ca; Brenda Clement; Caroline_NewBerry@gov.nt.ca; Catherine.Elliott@gov.yk.ca; charlene.mack@gov.ab.ca; cindy.rogers@health.gov.sk.ca; Claudia Kraft; colette.gaulin@msss.gouv.qc.ca; Colleen.Kovach@yukon.ca; Daniel.Warshafsky@ontario.ca; Danuta.Skowronski@bccdc.ca; Werker, Denise (PHAC/ASPC); Dilan_Patel@gov.nt.ca; Emily.Karas@oahpp.ca; Eveline.Toth@msss.gouv.qc.ca; Fiona.kouyoumdjian@ontario.ca ; George.Doyle-Bedwell@novascotia.ca; geraldine_whiteford@gov.nt.ca; Smadi, Hanan (DH/MS); Heather Morrison; Helene.Venables@msss.gouv.qc.ca; Jan.McFadzen@yukon.ca ; Jayne Boutilier; Jessica.Hopkins@oahpp.ca; Jing.Hu@gov.ab.ca; JPawa@GOV.NU.CA; Julie.Kryzanowski@health.gov.sk.ca; Julie_A_Miller@gov.nt.ca; Kelly.dean@novascotia.ca; KKulleperuma@GOV.NU.CA; louise.valiquette@inspq.qc.ca; Marie-Andree.Leblanc@msss.gouv.qc.ca; Martin.Vogel@oahpp.ca; martine.fortier@msss.gouv.qc.ca; Chalifoux, Mathieu (DH/MS); mayank.singal@bccdc.ca; Dr. Marguerite Cameron; michelle.murti@ontario.ca ; mireille.barakat@inspq.qc.ca; monika.naus@bccdc.ca; MP; MPS; OCMHO@health.gov.sk.ca; prahman@mun.ca; richard.masse@msss.gouv.qc.ca; Richard.Mather@oahpp.ca; RosannSeviour@gov.nl.ca; Sanaz.Vaseghi@health.gov.sk.ca; Santina.Lee@gov.mb.ca; LeBlanc, Shannon (DH/MS); shelley.deeks@novascotia.ca; Tim.hilderman@gov.mb.ca; Wajid.ahmed@ontario.ca ; Siu, Winnie (PHAC/ASPC)
Cc:	Cidsc Secretariat (PHAC/ASPC); Cornelisse, Mette (PHAC/ASPC)
Subject:	OCSO Post COVID-19 Condition Scan #22
Date:	May 9, 2022 1:35:54 PM
Attachments:	OCSO Post-COVID Condition Scan 22_May 6_2022.pdf

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For your info TAC members… On behalf of the *Office of the Chief Science Officer*

Subject: OCSO Post COVID-19 Condition Scan #22

On behalf of the *Office of the Chief Science Officer*, please find attached the latest COVID-19 environmental scan.

This biweekly product presents an overview of the current state of knowledge, and emerging evidence on **Post COVID-19 Condition** (Apr 23-May 6).

Many thanks,

Office of the Chief Science Officer | Bureau de la conseillère scientifique en chef
Office of the President | Bureau du Président
Public Health Agency of Canada | Agence de la santé publique du Canada

POST COVID-19 CONDITION

OCSO BIWEEKLY SCAN OF EVIDENCE #22

April 23-May 6, 2022

SCOPE

This biweekly update presents an analysis of new evidence, guidance and issues related to post COVID-19 condition and synthesizes the current state of knowledge. Comprehensive lists of details and resources on this issue are available at the Office of the Chief Science Officer.

CURRENT STATE OF KNOWLEDGE

According to the World Health Organization (WHO), post COVID-19 condition (PCC) refers to persistent symptoms occurring 12 weeks or more after an acute COVID-19 infection, which persist or reoccur for a minimum of 8 weeks. The most common symptoms include fatigue, cognitive problems (e.g., memory, concentration), respiratory issues, and mental health issues (e.g., anxiety, depression). PCC is also referred to as long COVID, post-acute sequelae, post COVID-19 symptoms, and post-acute COVID-19 syndrome. Prior to the WHO definition, a number of studies reported on post-acute sequelae (PAS) from 4 to 12 weeks post diagnosis. While scientific knowledge on these conditions is building, there is still much that is unknown about this condition. There have been reports of more than 100 symptoms or difficulties with everyday activities.

There is limited data suggesting that the condition may be more likely to develop in those:

- who were hospitalized during acute infection;
- had more than 5 COVID symptoms during the acute phase;
- have pre-existing respiratory disease;
- are older;
- are women; and
- have other co-morbidities or have higher BMI.

(UPDATED) There is currently no specific treatment for long COVID. We do not know why some people develop long COVID while others are not affected. The impacts of vaccination on PCC or PAS are important, given early estimates of the burden of PCC suggest >50% of individuals with confirmed COVID-19 infection have reported at least one PCC symptom more than 12 weeks after diagnosis. Typical therapeutic itinerary involves consultations with multiple specialists and puts emphasis on self-management (rest & relaxation, self-pacing, etc). Emerging evidence points to the importance of multidisciplinary care given the heterogeneity of symptoms associated with PCC. Multidisciplinary teams in "long COVID" clinics have been set up to include professionals from the following fields: rehabilitation, respiratory and cardiac consultants, physiotherapists, occupational therapists, psychologists, etc.

It is anticipated that Post COVID-19 condition will have medium and long-term impact on public health in Canada. Based on research to date, and reviewed by the Public Health Agency of Canada as part of a living systematic review, 56% of individuals who have had COVID-19 reported the presence of one or more symptoms 12 weeks after diagnosis. About 58% of children had 1 or more symptoms 4 weeks or more after their initial COVID-19 infection. Post COVID-19 condition will have implications for the economy, as well as federal programs including disability benefits, employment related measures and sick pay, among others. It is reported that 10% of adults are unable to return to work in the long term. The WHO has said that about one in 4 people infected with COVID-19 have experienced a post-COVID-19 condition for at least 1 month. One in 10 people experience symptoms lasting beyond 12 weeks.

This week's scan includes a scoping review on Post-COVID-19 Condition published by *CADTH*, as well as a review published in *Nutrients* examining the potential role of vitamin D in long COVID.

GUIDELINES OR STANDARDS

- **WHO** has developed a clinical case definition of post COVID-19 condition by Delphi methodology that includes 12 domains, available for use in all settings. This first version was developed by patients, researchers and others with the understanding that the definition may change as new evidence emerges and our understanding of the consequences of COVID-19 continues to evolve.
    - "*Post COVID-19 condition occurs in individuals with a history of probable or confirmed SARS CoV-2 infection, usually 3 months from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis. Common symptoms include fatigue, shortness of breath, cognitive dysfunction but also others and generally have an impact on everyday functioning. Symptoms may be new onset following initial recovery from an acute COVID-19 episode or persist from the initial illness. Symptoms may also fluctuate or relapse over time.*"
    - **WHO:** Q&A page on Post-COVID-19 Condition (February 2022).

- (UPDATED) **US CDC** describes Post-COVID conditions as a wide range of new, returning, or ongoing health problems that people experience after first being infected with the virus that causes COVID-19. The CDC posted Interim Guidance for healthcare providers on Evaluating and Caring for Patients with Post-COVID Conditions. Post-COVID conditions can be considered a disability under the Americans with Disabilities Act (ADA). The CDC also released information on Caring for People with Post-COVID Conditions. CDC is using science to learn more about post-COVID conditions.

- UK **NICE**: Rapid guidelines for managing the long-term effects of COVID-19 (Updated March 2022).

- **Chartered Society of Physiotherapy** in UK published its COVID-19 rehabilitation standards, which includes guidance about community-based rehab for people with COVID-19 and long COVID (July 2021).

- Guidelines to help doctors manage long COVID patients published in *British Journal of General Practice* (August 2021).

- UK **NHS** guidance for Post-COVID syndrome assessment clinics (April 2021).

- **CIHI** guidance for clinicians to ensure that data supports monitoring for Post-COVID conditions.

- Guidance for **Canadian Rehabilitation and Exercise Professionals** on Post COVID-19 condition and rehabilitation management strategies (August 2021).

- **Government of Canada**: COVID-19 for health professionals - Post COVID-19 condition

- **Center for Effective Practice** – COVID-19: Clinical Guidance for Primary Care Providers - Long-term symptoms / Post-acute sequelae of COVID-19 (PASC)

- Guideline S1: Long COVID: Diagnostics and treatment strategies (*Wiener klinische Wochenschrift*)

- American Academy of Physical Medicine and Rehabilitation (**AAPM&R**): Cognitive Symptoms Guidance and Breathing Discomfort Guidance.

- Royal Australian College of General Practitioners (**RACGP**) guidance for GPs caring for 'long COVID' patients.

- European Society of Clinical Microbiology and Infectious Diseases (**ESCMID**): Rapid guidelines for assessment and management of long COVID

- **ACAS** (UK-based Advisory, Conciliation and Arbitration Service): Long COVID – advice for employers and employees

NATIONAL AND INTERNATIONAL DEVELOPMENTS (*APR 23-MAY 6*)

CANADA

- (NEW) A survey by Viral Neuro Exploration (VINEx), Neurological Health Charities Canada and COVID Long-Haulers Support Group Canada ran between March 23-April 13, 2022 and received responses from 1,050 long haulers in 9 provinces and 1 territory. 87% of respondents identified as women and 10.5% of respondents identified as a visible minority or member of a minority cultural community. Only a quarter of respondents were initially believed and received appropriate care when they described their long COVID symptoms to a health-care professional. Over 80% of respondents say long COVID has had a negative or very negative impact on their brain health. Over 70% had to take leave from work as a result of living with long COVID, with some having to leave the workforce.
- (NEW) Alberta Health Services, along with the University of Alberta, is conducting the first large-scale survey on the impacts of long COVID in the province.

UK

- (NEW) UK Office of National Statistics: The odds of reporting long COVID symptoms 4 to 8 weeks after a first 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; after adjusting for socio-demographic characteristics.

US

- (UPDATED) Long COVID may already affect between 7 and 23 million Americans who previously had the virus, or up to 7% of the U.S. population, according to the U.S. Government Accountability Office.

EMERGING SCIENTIFIC EVIDENCE (*APR 23-MAY 6*)*

EVIDENCE PRODUCTS

TITLE AND AUTHOR	EVIDENCE TYPE	SUMMARY
Cardiovascular complications and outcomes among athletes with COVID-19 disease: a systematic review (Alosaimi et al)	Systematic Review (Available in *BMC Sports Sci Med Rehabil*)	A systematic search on post COVID-19 infection quantitative studies among athletes was conducted following MeSH terms in Medline, Cochrane Library, Ovid, Embase and Scopus (through 15 January 2022). This study provides a low prevalence of CV complications secondary to COVID-19 infection in short-term follow-up. Early recognition and continuous assessment of cardiac abnormality in competitive athletes are imperative to prevent cardiac complications.
Long COVID and neuropsychiatric manifestations (Efstathiou et al)	Review (Available in *Exp Ther Med*)	There is accumulating evidence in the literature indicating that a number of patients with COVID may experience a range of neuropsychiatric symptoms, persisting or even presenting following the resolution of acute COVID-19. Among the neuropsychiatric manifestations more frequently associated with 'long COVID' are depression, anxiety, post-traumatic stress disorder, sleep disturbances, fatigue and cognitive deficits, that can potentially be debilitating and negatively affect patients' wellbeing, albeit in the majority of cases symptoms tend to improve over time. Given the alarming effects of 'long-COVID', interdisciplinary cooperation for the

		early identification of patients who are at a high risk of persistent neuropsychiatric presentations, beyond COVID-19 recovery, is crucial to ensure that appropriate integrated physical and mental health support is provided, with the aim of mitigating the risks of long-term disability at a societal and individual level.
An overview of post COVID sequelae (Shukla et al)	Review (Available in *J Basic Clin Physiol Pharmacol*)	The clinical spectrum and long-term course of this clinical entity must be better understood. Post-COVID syndrome affects a wide spectrum of individuals (16–87%), with pneumological and cognitive symptoms being the most common. Pulmonary fibrosis was the most common organic consequence seen in post-COVID patients. Post-COVID-19 syndrome can have a major impact on the health of survivors. Working-age patients should seek rehabilitation and follow-up in interdisciplinary rehabilitation programmes. COVID-19-related healthcare demands will continue to climb for the foreseeable future. For COVID-19 survivors' long-term mental and physical health, present outpatient infrastructure will be utilised, scalable healthcare models will be built, and cross-disciplinary collaboration will be required.
Vitamin D: A Role Also in Long COVID-19? (Barrea et al)	Review (Available in *Nutrients*)	Vitamin D is an immunomodulatory hormone with proven efficacy against various upper respiratory tract infections. Vitamin D can inhibit hyperinflammatory reactions and accelerate the healing process in the affected areas, especially in lung tissue. Vitamin D deficiency has been associated with the severity and mortality of COVID-19 cases, with a high prevalence of hypovitaminosis D found in patients with COVID-19 and acute respiratory failure. Thus, there are promising reasons to promote research into the effects of vitamin D supplementation in COVID-19 patients. However, no studies to date have found that vitamin D affects post-COVID-19 symptoms or biomarkers. Based on this scenario, this review aims to provide an up-to-date overview of the potential role of vitamin D in long COVID-19 and of the current literature on this topic.

SELECT PRIMARY RESEARCH

TITLE AND AUTHOR	SOURCE	SUMMARY
Reducing fatigue-related symptoms in Long COVID-19: a preliminary report of a lymphatic drainage intervention (HH et al)	*Cardiovasc Endocrinol Metab*	Paper presents an analysis of a case series of the first 20 patients' data collected in clinical practice to evaluate the potential of a possible alternative treatment for Long COVID. None of the participants had a prior diagnosis of chronic fatigue syndrome, and all were new attendees to the clinics at the time of initial assessment. The average number of treatment sessions was 9.7 in men and 9.4 in women. The reduction in profile of fatigue-related states (PFRS) scores was 45% in men and 52% in women. The highest subscale scores on average were for fatigue, with the lowest for somatic symptoms. All subscale scores showed, on average, a similar reduction of approximately 50% postintervention, with the reduction in score relating to a decrease in the severity of symptoms.
Modelling potential acute and post-acute burden of COVID-19 under the Australian border re-opening plan (Angeles et al)	*BMC Public Health*	Authors develop a model by which to estimate the potential acute and post-acute COVID-19 burden using disability-adjusted life years (DALYs) associated with the re-opening of Australian borders and the easing of other public health measures, with particular attention to longer-term, post-acute consequences and the potential impact of permanent functional impairment following COVID-19. Mortality was responsible for 72-74% of the total base case COVID-19 burden. Long COVID and post-

		intensive care syndrome accounted for at least 19 and 3% of the total base case DALYs respectively. When included in the analysis, potential permanent impairment could contribute to 51-55% of total DALYs lost.
COVCOG 2: Cognitive and Memory Deficits in Long COVID: A Second Publication From the COVID and Cognition Study (Guo et al)	*Front Aging Neurosci*	Authors in study assess this sample on tests of memory, language, and executive function. They hypothesize that performance on "objective" cognitive tests will reflect self-reported cognitive symptoms and that some symptom profiles may be more predictive of cognitive performance than others, perhaps giving some information about the mechanism. They found a consistent pattern of memory deficits in those that had experienced the COVID-19 infection, with deficits increasing with the severity of self-reported ongoing symptoms. Fatigue/mixed symptoms during the initial illness and ongoing neurological symptoms were predictive of cognitive performance.
Pulmonary and Renal Long COVID at Two-year Revisit (Guo et al)	*Research Square prepub*	Authors performed proteomic and metabolomic analyses of 991 blood and urine specimens from 144 COVID-19 patients with comprehensive clinical data and up to 763 days of follow up. Data showed that the lungs and kidneys are the most vulnerable organs in long COVID patients. Study depicts the longitudinal clinical and molecular landscape of COVID-19 with up to two-year follow-up and presents a method to predict pulmonary and renal long COVID.
Respiratory symptoms and radiological findings in post-acute COVID-19 syndrome (Jutant et al)	*ERJ Open Res*	In the COMEBAC (Consultation Multi-Expertise de Bicêtre Après COVID-19) cohort study, 478 hospital survivors were evaluated by telephone 4 months after hospital discharge, and 177 who had been hospitalised in an intensive care unit (ICU) or presented relevant symptoms underwent an ambulatory evaluation. New-onset dyspnoea and mild fibrotic lesions were frequent at 4 months, but the association of new-onset dyspnoea, fibrotic lesions and low D (LCO) was rare.
Coding Long COVID: Characterizing a new disease through an ICD-10 lens (Pfaff et al)	*medRxiv*	Authors leverage the largest publicly available HIPAA-limited dataset about patients with COVID-19 in the US to examine the heterogeneity of adoption and use of U09.9, the ICD-10-CM code for "Post COVID-19 condition, unspecified." Results include a characterization of common diagnostics, treatment-oriented procedures, and medications associated with U09.9-coded patients, which give us insight into current practice patterns around Long COVID. They established the diagnoses most commonly co-occurring with U09.9, and algorithmically clustered them into three major categories: cardiopulmonary, neurological, and metabolic.
Clinical features, therapeutic outcomes and recovery period of long COVID (Takakura et al)	*Research Square prepub*	Study aimed to characterize the clinical features of long COVID, by surveying 286 patients who received care in our outpatient clinic for long COVID from May 2021 through December 2021. Results show median number of symptoms was 2.8. Most frequent symptoms were respiratory manifestations (52.1%), followed by fatigue (51.4%). Respiratory symptoms, fatigue, and headache/arthralgia were major complaints in the initial phase, whereas hair loss was a major complaint in the late phase, suggesting that the chief complaint of patients with long COVID may vary temporally. The best treatment outcome was observed for pulmonary symptoms, and hair loss had the worst outcome. Smoking habit was an independent risk factor for slowing the recovery period from long COVID.
Persistent COVID-19 symptoms in a community study of 606,434 people in England	*Nat Commun*	Authors use data from rounds 3–5 of the REACT-2 study (n = 508,707; September 2020 – February 2021), a representative community survey of adults in England, and replication data from round 6 (n = 97,717; May 2021) to estimate the prevalence and identify predictors of persistent

(Whitaker et al)		symptoms lasting 12 weeks or more; and unsupervised learning to cluster individuals by reported symptoms. At 12 weeks in rounds 3–5, 37.7% experienced at least one symptom, falling to 21.6% in round 6. Female sex, increasing age, obesity, smoking, vaping, hospitalisation with COVID-19, deprivation, and being a healthcare worker are associated with higher probability of persistent symptoms in rounds 3–5, and Asian ethnicity with lower probability.
Detection of Male Hypogonadism in Patients with Post COVID-19 Condition (Yamamoto et al)	*J Clin Med*	Authors set up an outpatient clinic specializing in long COVID in February 2021 and have been investigating post COVID-19 condition. A retrospective analysis was performed for 39 male patients in whom serum free testosterone (FT) levels were measured out of 61 male patients who visited the clinic. Among the 39 patients, 19 patients (48.7%) met the criteria for late-onset hypogonadism. Symptoms including general fatigue, anxiety, cough and hair loss were more frequent in LOH group than in non-LOH group. Blood hemoglobin level was slightly, but significantly, lower in the LOH group. Serum level of FT was positively correlated with levels of blood hemoglobin and serum total protein and albumin in total population, whereas these interrelationships were blurred in LOH group.
SingStrong-A singing and breathing retraining intervention for respiratory and other common symptoms of long COVID: A pilot study (Cahalan et al)	*Can J Respir Ther*	Study evaluated a breathing retraining and singing programme to address common long COVID symptoms in 21 participants who completed at least 10 classes. Participants showed significant pre-post-intervention improvements in all breathlessness symptoms, fatigue, usual activities, and pain/disability.
Clustering analysis reveals different profiles associating long-term post-COVID symptoms, COVID-19 symptoms at hospital admission and previous medical co-morbidities in previously hospitalized COVID-19 survivors (Fernández-de-Las-Peñas et al)	*Infection*	Aim was to identify subgroups of COVID-19 survivors exhibiting long-term post-COVID symptoms according to clinical/hospitalization data by using cluster analysis in order to foresee the illness progress and facilitate subsequent prognosis. Anxiety/depressive levels and sleep quality were assessed with the Hospital Anxiety and Depression Scale and Pittsburgh Sleep Quality Index, respectively. Cluster analysis was used to identify groupings of COVID-19 patients without introducing any previous assumptions, yielding three different clusters associating post-COVID symptoms with acute COVID-19 symptoms at hospital admission. The identified subgrouping may reflect different mechanisms which should be considered in therapeutic interventions.
Reduced Cell Surface Levels of C-C Chemokine Receptor 5 and Immunosuppression in Long Coronavirus Disease 2019 Syndrome (Gaylis et al)	*Clin Infect Dis*	In an exploratory trial treating "long COVID" with the CCR5-binding antibody leronlimab, authors observed significantly increased blood cell surface CCR5 in treated symptomatic responders but not in nonresponders or placebo-treated participants. These findings suggest an unexpected mechanism of abnormal immune downmodulation in some persons that is normalized by leronlimab.
[A new challenge: post-COVID syndrome in teenagers] (Perrin et al)	*Rev Med Suisse*	In this specialized consultation for pediatric post-COVID syndrome, authors offer a global and multidisciplinary follow-up to patients and their families, supporting them progressively resuming physical and mental activity, and pursuing school attendance to avoid dropout.

Persistent Lung Injury and Prothrombotic State in Long COVID (Xiang et al)	*Front Immunol*	Aim of study is to investigate the basis of pulmonary susceptibility during sequelae and the possibility that prothrombotic states may influence long-term pulmonary symptoms of COVID-19. Considering the important role of microthrombus and arteriovenous thrombus in the process of pulmonary functional lesions to organic lesions, authors further study the possibility that prothrombotic states, including pulmonary vascular endothelial cell activation and hypercoagulability, may affect long-term pulmonary symptoms in long COVID. Early use of combined anticoagulant and antiplatelet therapy is a promising approach to reduce the incidence of pulmonary sequelae.
The Relationship between Physical Activity and Long COVID: A Cross-Sectional Study (Wright et al)	*Int J Environ Res*	The relationship between long COVID symptoms and physical activity (PA) levels are unclear. In this cross-sectional study, authors examined this association, and the advice that individuals with LC received on PA. New Zealand physical activity questionnaire short form (NZPAQ-SF) was adapted to capture current and pre-COVID-19 PA levels and activities of daily living (ADLs). Participants reported how PA affected their symptoms, and what PA advice they had received; 477 participants completed the survey. Participants reported the effect of PA on LC symptoms as: worsened (74.84%), improved (0.84%), mixed effect (20.96%), or no effect (28.72%). Research is needed to understand how to safely return to PA without worsening LC symptoms.

*Note: Content may have been published prior to this scan period but was only available through applying our search strategies during this period.

COMMENTARIES, LETTERS AND OPINION PIECES (*APR 23-MAY 6*)

- Caring for the carers: understanding long COVID in our diverse healthcare workforce (*BMJ*): Healthcare workers may also be more likely than the general population to be affected by long COVID, with a disproportionate burden among ethnic minorities. A wide range of nationally funded research studies have been initiated in the UK to better understand the long term impact of SARS-CoV-2 infection on physical and mental health, and how to enhance the diagnosis and treatment of long COVID. However, these studies have largely, to date, focused on the general population, with a critical gap in research on long COVID among healthcare workers, and ethnic minority groups in particular. Research looking at the prevalence of long COVID among healthcare workers will be vital in generating key recommendations and personalised interventions for addressing social and health inequities.

- Long COVID: aiming for a consensus (*The Lancet*): There are concerns about differences in terminology, with some public health experts and policy makers avoiding the term long COVID. The use of different terms can raise worries, especially among those with lived experience of the condition who originally coined the term long COVID. Many issues have been raised by patient-researchers and other adopters of the term. One issue is epistemic injustice in medicine, including the poor recognition of patient-led expertise. Patient perspectives emphasise the tradition in medical history that those who first identify and describe a condition, name it. In the case of long COVID, it was people with lived experience of it who brought it to the world's attention and described it via a wide range of methods. The first publication on prolonged symptoms of COVID-19 was authored by patient-researchers with long COVID, later known as the Patient-Led Research Collaborative. Another issue is that the severity, features, and urgency of long COVID—as highlighted by patients—are not fully addressed within the framework of other terms and definitions.

MEDIA HIGHLIGHTS (*APR 23-MAY 6*)

CANADA

- **Public health agency to assess how many Canadians struggle with long COVID (Globe and Mail):** Federal agencies are trying to get a handle on how many Canadians may be suffering from long COVID as researchers learn more about the mysterious after-effects of the virus. PHAC and Statistics Canada have launched a survey to try to get a broad idea of how common it is for people to feel lingering effects after COVID-19 infection, which can be difficult to identify and even harder to track. "We probably anticipate that the impact of long COVID is going to be quite substantial," Dr. Tam said at a media briefing.
- **Racial bias in Canada's health care system makes diagnosing long COVID even more challenging, experts say (Globe and Mail):** Black, South Asian and Indigenous people have made up the largest proportions of cases of COVID-19 and COVID-related hospitalizations in many parts of the country, and some researchers theorize that these groups also have higher rates of long COVID. But without a lab test to diagnose the syndrome, and with barriers to treatment among racialized and immigrant communities, advocates worry that studies into long COVID may be leaving out the people who are suffering the most.

GLOBAL

- **The Children Left Behind by Long COVID (Bloomberg):** Estimates of the number of children who face long-term symptoms are far from precise, but they probably range from 5% to 10% of those infected with the virus, says Daniel Griffin, an infectious diseases expert at Columbia University. Even at the lower end of the estimates, that translates to more than a half-million children of the 13 million so far infected. (Studies of infected adults indicate that an estimated 10% to 30% may have long COVID. There isn't much known about who gets long COVID or why, which puts it in a frustrating category of mysterious illnesses that occur after infections such as Lyme disease or mononucleosis.
- **COVID Drug Paxlovid Might Also Fight Long COVID (US News):** A series of case reports from researchers at the University of California, San Francisco (UCSF) shows some success with Paxlovid in treating patients with long COVID. One-third of people infected with the coronavirus are thought to develop symptoms such as fatigue, headaches and brain fog associated with long COVID. Paxlovid has U.S. FDA emergency use authorization to treat COVID-19 patients who are older than 65 or have underlying health conditions such as obesity, diabetes or cancer. The pill includes the antivirals nirmatrelvir and ritonavir.

POST COVID-19 CONDITION RESOURCES

- (NEWLY ADDED) PASC Guide (University of Michigan): A resource for people with PASC/long COVID.
- Health Education England (HEE) e-learning modules: long COVID programme
- Voices of Long COVID (US): Voices of Long Covid campaign features testimonials from a diverse group of people ages 18-29 who are suffering from long-term complications of COVID-19 infection.
- Dignity Health (US): COVID-19 and Chronic Illness Recovery Program based in the U.S. has helped over 2,000 people struggling with COVID long-term effects ("COVID long haulers"). Treatment is exercise-based for lingering or long-term conditions (sequelae) from having the virus.
- Altea (Switzerland): A network for sharing evidence-based information on the long-term effects of COVID-19.
- Pandemic-Aid Networks: Long COVID research library.
- Post-COVID-19 Functional Status Scale: An overview of a patient self-reported scale that helps to support assessment of functional status and recovery after the SARS-CoV-2 infection.
- Ontario College of Family Physicians: Resources on Post-COVID Condition.
- Agency for Clinical Innovation (Australia): Living Evidence - post acute sequelae of COVID-19.
- Pre-populated literature searches: Long COVID search (LitCovid) and Long COVID search (NIH)
- PAHO Webinar Series on Post COVID-19 Condition launched 17 February, 2022, from 10:30 am to 12:30 pm (EST).

- Body Politic COVID-19 Support Group (Global): Housed on the Slack app, group members have access to dozens of different channels, which give space for more personal discussion. Some of the channels include those specifically for medical professionals, parents of children with Covid-19, LGBTQ+ individuals, BIPOC+, and different regions around the world.

- Patient-Led Research Collaborative (Global): Self-organized group of Long COVID patients working on patient-led research around the Long COVID experience.

- British Heart Foundation (UK): UK-based foundation with resources on long COVID.

- COVID Long Haul (Canada): Canada's largest online platform for COVID survivors, their family members and anyone searching for the most up-to-date information about the pandemic. There is a COVID long-haulers support group and a Report on Pan-Canadian Long COVID Impact Survey (PDF) (June 2021)

- BC ECHO for Post-COVID-19 Recovery (Canada): BC ECHO for Post-COVID-19 Recovery is a learning community of specialists and community health-care providers who use case-based learning to improve care for those recovering from symptoms post-COVID-19.

- Long Covid Support (UK): Peer support and advocacy group aiming to facilitate international peer support and campaigning in the UK for recognition, rehabilitation and research into treatments.

- Long COVID SOS (UK): Long-term sufferers formed the LongCovidSOS campaign to put pressure on the UK government to recognise the needs of those with Long Covid, and to raise awareness among the general public and employers.

- Survivor Corps (US): One of the largest and fastest growing grassroots movements connecting, supporting, and mobilizing COVID-19 Survivors to support research. They have a list of Post-COVID Care Centers (PCC) and a PCCC Best Practices Guide.

- The Center for Chronic Illness (US): Aims to promote well-being and decrease isolation for those impacted by chronic illness through support and education. Their online support groups are professionally-facilitated and offer psychoeducational tools for coping.

- Blooming Magnolia (US): Mission is to empower others by providing a platform to strengthen & protect mental health and support those afflicted with Long-Covid through education and funding of therapeutic research. They have a list of support groups and resources on their website.

- Long COVID Alliance (US): US-based network of patient-advocates, scientists, disease experts, and drug developers who have joined together to leverage their collective knowledge and resources to educate policy makers and accelerate research to transform our understanding of post-viral illness.

- Long COVID Kids (UK/US/Canada): Parent & patient led advocacy & support group based in the UK.

- Long COVID Physio (US & UK): International peer support, education and advocacy group of Physiotherapists living with Long COVID, founded in November 2020 by Physiotherapists living with Long COVID from the UK and US.

- Patient-Led Research Collaborative (Global): Group of Long COVID patients working on patient-led research around the Long COVID experience.

- CANCOV- Patient resources (Canada): CANCOV is a research platform grounded in a prospective longitudinal 1-year cohort study of patients infected with COVID-19.

- COVID Patient Recovery Alliance (CPRA) (US): CPRA aims to bring together leaders in business, health care, research, academia, data and analytics, and patient advocacy to develop solutions that coordinate diverse data sources, inform models of care, and ensure adequate payment for long-COVID patients. Their report outlines recommendations for federal policymakers to promote recovery.

- British Lung Foundation (UK): UK-based charity sharing resources on navigating the NHS, breathlessness support, movement and energy support for long COVID patients.

- Living with Long COVID (US): COVID-19 Long-Haulers and Post-COVID Support Community.

***Note**: Previous OCSO Post COVID-19 Condition Scans can be found here.*

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Cc:	Cidsc Secretariat (PHAC/ASPC)
Subject:	For TAC member input (Due June 1) - Post COVID-19 Condition
Date:	May 20, 2022 9:41:48 AM
Attachments:	3.A. ii Post COVID-19 condition.pptx

TAC Members,

In follow-up to the presentation on Wednesday (May 18) at TAC on *Post COVID-19 Condition – Review of Current Evidence and Opportunities for a Way Forward*, please find below the discussion questions for which we are seeking your input. We have also re-attached the deck presentation.

1. Interest in receiving an updated dashboard on FPT actions on post-COVID-19 condition?
2. Help validate or suggest additional content?
3. Interest in promoting web panel link to specific groups?
4. Interest and capacity to contribute to work on evidence-based guidelines and tools?

We would appreciate your responses by COB Wednesday, June 1.

Thanks,
TAC Sec't

Public Health Agency of Canada | Agence de la santé publique du Canada

Canada

Post COVID-19 Condition – Review of Current Evidence and Opportunities for a Way Forward

Update to TAC prepared by the Centre for Surveillance and Applied Research

May 18, 2022

PROTECTING AND EMPOWERING CANADIANS TO IMPROVE THEIR HEALTH

What we shared at our last meeting in November 2021

- Summary of what we know and knowledge gaps
- Example of international initiatives in policy areas of interest to Canada
- Update on current actions at the Federal level
- Opportunities for a way forward

Outline for today

- What we know – Update on emerging science and policy interventions
- Knowledge gaps – Update on research and surveillance priorities
- What we are doing – Update on Health Portfolio actions and planned activities
- Discussion – Opportunities for engagement for TAC / SAC

What we know – Update on emerging science and policy interventions

Emerging scientific evidence

Prevalence

- 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
- A recent survey was conducted in health care workers in QC (6,061 cases and 4390 controls) [*preprint*] and found that:
  - prevalence of post COVID-19 condition at 12 weeks was 40% (653/1746) among non-hospitalized cases and 68% (27/37) among hospitalized cases
  - A substantial proportion of non-hospitalized cases with 4-week post-COVID condition often or very often reported cognitive dysfunction with no decline at 12 weeks (e.g. impact on concentration - 33% at both 4 and 12 weeks)
- 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 +).

Risk factors and effect of vaccination

- A recent systematic review and meta-analysis found that risk factors included:
  - female sex
  - experiencing severe acute COVID-19 or having been hospitalized for acute COVID-19 infection
- Preliminary findings from a recent evidence brief developed by PHAC suggest that vaccination may help reduce the risk of developing post COVID-19 condition (however, more research is needed as findings are based on a few studies)

Emerging scientific evidence – Cont'd

- 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

- A recent survey was conducted in health care workers in QC (6,061 cases and 4390 controls) [*preprint*] and found that:
  - prevalence of post COVID-19 condition at 12 weeks was 40% (653/1746) among non-hospitalized cases and 68% (27/37) among hospitalized cases
  - A substantial proportion of non-hospitalized cases with 4-week post-COVID condition often or very often reported cognitive dysfunction with no decline at 12 weeks

What we know - Policy and program interventions

Canada

- PTs are starting to take action in this area and Post COVID-19 condition clinics have been in some provinces, with a clear focus on interdisciplinary care
- A scan of PT actions is underway by PHAC to provide additional information on current state.
- Current actions include:
  - QC: $20.5M to support 15 specialized Long COVID treatment clinics as well as further research on the condition.
  - ON: A COVID-19 Rehabilitation Clinic has been established in association with the University Health Network (UHN).
    - COVID-19 Science Advisory Table studying and preparing evidence briefs on Long COVID
  - BC: 5 Long COVID recovery clinics funded under the BC Post-COVID-19 Interdisciplinary Clinical Care Network

USA

- US President Biden has directed government agencies to take additional steps to research and treat post COVID-19 condition. The US Government will issue a report in about 4 months detailing available services and support for those who suffer from the condition.

Knowledge gaps – Update on research and surveillance priorities

Knowledge gaps

Prevalence, preventive interventions, treatments, recovery

- No robust prevalence estimates in Canada, particularly among children, Indigenous populations, and racialized populations
- Too early to determine the risk of post COVID-19 condition associated with the Omicron variant
- More evidence is needed on recovery trajectories
- There is currently no universally agreed-upon approach to diagnosis and treatment of post COVID-19 condition
- Only limited evidence still about the impact of vaccination

Biological mechanisms

- Significant research evidence gaps currently exist regarding the underlying biological mechanisms to fully estimate the health impacts of post COVID-19 condition and how to address them

Social and economic impacts

- 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.)

Key surveillance and research priorities and challenges

Surveillance

- Longitudinal population-based surveys (self-report of symptoms)
- Other sources, e.g. electronic health records and data linkage

Research

- More funding for basic science on physiopathology
- Stronger research designs
  - Ex: prospective and longitudinal, use of control groups when possible…
- Take advantage of specialized clinics being established to integrate research component

Challenge

- May need different types of control groups
  - Few people now never exposed to at least one variant, different status of vaccination, etc.

What we are doing – Update on Health Portfolio Actions

Portfolio actions to date have focussed primarily on generating and synthesizing evidence

Funded Research
LEAD: CIHR

CIHR has invested ~$17.7M in targeted rapid response funding to support 41 research projects on post COVID-19 condition

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

Surveillance
LEADS: PHAC, Statistics Canada, CIHI

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

Synthesize and Disseminate Evidence

- Best Brains Exchange (May 2021) *Leads: CIHR, PHAC*
- CSAR Systemic reviews of scientific studies on prevalence, risk factors, preventative interventions *Lead: PHAC*
- OCSO bi-weekly scans of new/emerging research *Lead: PHAC*
- Web content *Lead: PHAC*

Engagement & Collaboration

- PTs - updates to TAC and SAC *Lead: PHAC*
- National health organizations/health professional associations *Lead: PHAC*
- Patient partnerships *Lead: PHAC*
- International - WHO, UK, GloPID-R *Leads: PHAC, CIHR*
- Emerging engagement on economic modelling: *Lead: PHAC*

Canadian COVID-19 Antibody and Health Survey (CCAHS) – Cycle 2

- In April 2022, PHAC, Statistics Canada and the COVID-19 Immunity Task Force (CITF) launched the CCAHS Cycle 2

- Primary objectives of the survey are to:
  - estimate the prevalence of post COVID-19 condition in Canada, overall and by different subpopulations
  - characterize the clinical presentation of post COVID-19 condition in terms of the range, prevalence and duration of symptoms reported
  - identify risk factors contributing to the development of post COVID-19 condition
  - examine the general impacts of post COVID-19 condition on daily functioning

- The survey will also aim to better understand the general impacts of the pandemic on the health and well-being of Canadians, as they relate to:
  - the prevalence of other chronic conditions and symptoms; and
  - the challenges that Canadians may have faced in accessing healthcare

- Target population:
  - 100 000 randomly selected Canadians aged 18 years and older across the ten provinces living in private households (excludes the Territories)
  - Excludes individuals in institutions, on-reserve & on military installations

Canadian COVID-19 Antibody and Health Survey (CCAHS) – Cycle 2

- The CITF is leveraging the survey to include the addition of test kits, including:
  - Dried Blood Spot (DBS) kits - to estimate the number of Canadian adults who have infection-acquired and/or vaccine-induced antibodies to SARS-CoV-2
  - PCR test kits – to detect active SARS-CoV-2 infections

- Current Status:
  - Survey invitations and test kits are being sent in three waves, with a 2-month period of data collection and follow-up after each wave:
    - Wave 1 (including only DBS test kits) sent in April and Wave 2 (including DBS and PCR test kits) sent in early May 2022
      - Wave 3 invitations (including DBS and PCR test kits) scheduled for mail-out in June
    - Follow-up period involves sending reminders to potential respondents via letters, SMS text messages, and telephone calls

  - Promotional activities include a joint news release, proactive media outreach, outreach to provincial public health authorities, and social media campaigns

  - Statistics Canada in the process of deeming in select PHAC employees so that we can jointly validate, confront and analyze survey results on Statistics Canada's Protected B Secure Research Environment

Supplementary Web Panel

- In an effort to supplement the results from the CCAHS cycle 2, PHAC and Statistics Canada have offered PT health authorities and other stakeholders the opportunity to participate in a targeted crowdsourcing opportunity

- The web panel would involve making the survey questions included in the CCAHS available through an open web link that can be disseminated to key populations of interest

- Participating jurisdictions would be responsible for:
  - Identifying the populations of interest
  - Developing a promotion plan
  - Promoting and disseminating the survey link to potential respondents
  - Providing resources to assist in the data validation and confrontation within Statistics Canada's collaborative portal

- To date, four provinces have expressed interest in leveraging the web panel to collect data on post COVID-19 condition within their jurisdiction: BC, MB, PEI and ON

- Discussions are ongoing regarding next steps and timelines for implementation

Other data sources

1. **Canadian Primary Care Sentinel Surveillance Network (CPCSSN)**
   - PHAC is conducting an exploratory analysis of EMR data available through CPCSSN for all primary care patients between 2018-2021
   - A comparison of health and resource utilization indicators in the time periods before and after COVID-19 diagnosis will serve as a proxy measure for identifying potential cases of post COVID-19 condition in Canada

2. **Canadian Chronic Disease Surveillance System (CCDSS)**
   - PHAC is working with select provinces to determine the feasibility of using existing surveillance systems, such as the CCDSS, to include a COVID-19 flag

3. **Canadian COVID-19 Emergency Department Rapid Response Network (CCEDRRN)**
   - CCEDRRN investigators are currently leading a study aimed at determining the prevalence of post COVID-19 condition among patients visiting Emergency Departments across Canada
   - The study will also examine risk factors for developing post COVID-19 condition, and the impact of this condition on patients' reported quality of life and health service use

Synthesizing and Disseminating Evidence

- Ongoing scans of evidence and policy responses
  - **Office of the Chief Science Officer** 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)
  - Original report – January 13, 2022
- Systematic reviews (PHAC/CSAR)
  - 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 – Update planned for the week of May 23**

Engagement and Collaboration

Engagement with experts and other government departments/levels

- **Provincial and territorial governments** – updates to SAC and TAC
- Collaboration with **academic experts** on systematic reviews and surveillance
- Office of the Chief Science Officer (PHAC) broader scientific network
- **PHAC led Inter-Departmental Working Group**: PHAC, HC, CIHR, Stat Can, ISC, ESDC, CIHI
- Emerging collaboration on economic modelling

National health organizations / professional associations

- College of Family Physicians of Canada (information-sharing for guidelines development)
- Canadian Paediatric Society (surveillance of Post COVID-19 condition through CPSS)

Patient partnerships

- Panel of individuals living with post COVID-19 condition whose valuable input from a patient's perspective have supported various PHAC-led initiatives (i.e. web content, rating of outcomes for systematic reviews, etc.) (September 2021 – March 2022)

International engagement to share latest scientific evidence

- E.g. WHO, the UK National Institute for Health and Care Excellence, etc.

Where to next – planned activities

Planned activities at PHAC

- **Strengthening public health surveillance**, including:
  - Development and implementation of a follow-up survey – examine longer -term outcomes
  - Additional data sources from existing surveillance systems
- **Planning the development and dissemination of evidence-based guidelines and tools** for health professionals and for Canadians
  - Guidance for the identification, prevention and management (including models of care) of post COVID-19 condition
  - Adapted to the Canadian context, and for diverse populations (e.g. indigenous, racialized, etc.) where feasible
- **Facilitate coordination and information sharing** by creating a FPT dashboard of actions on post COVID-19 condition

In summary

- Post COVID-19 condition is a complex condition that requires longer term dedicated studies to better understand the condition and its impacts on health, society and workforce / labour market.

- Health Portfolio will collaborate with PTs and other stakeholders to:

  - **Generate the evidence needed** to better understand post COVID-19 condition and estimate the impact (health and economic) in Canada, including on vulnerable populations
    - Seeking expressions of interest for the web panel of the CCAHS.

  - **Monitor** national and international evidence and responses

  - **Develop and disseminate evidence-based guidelines** for patients and health care professionals that are adapted to the Canadian context

  - **Explore potential policy directions and interventions to support** for those with post COVID-19 condition

Discussion – opportunities for engagement

- Interest in receiving updated dashboard on FPT actions on post COVID-19 condition?
  - Help validate or suggest additional content?
- Interest in promoting web panel link to specific groups?
- Interest and capacity to contribute to work on evidence-based guidelines and tools?

Annex – for additional information

Emerging scientific evidence

Risk factors

- A recent systematic review and meta-analysis *(preprint)* on risk factors for post COVID-19 condition (≥ 12 weeks) found:
  - Large associations (OR≥2) with:
    - Hospitalization in acute stage and non-recovery at 12-21 weeks, dyspnea and return to work
    - Severe/critical acute COVID 19 and cognitive impairment
  - Small to moderate associations (OR ≥1.5-1.99)
    - Female sex and non-recovery, fatigue, dyspnea and functional capacity
    - Severe/critical acute COVID 19 and non-recovery and depression
    - ≥1 comorbidities and non-recovery
    - Chronic pulmonary disease and fatigue
    - COPD with cognitive impairment
    - >5 symptoms in the acute phase and fatigue
- Most findings were of low or very low certainty, often from risk of bias and inconsistency/single studies
- Findings are most applicable to those experiencing post Covid-19 condition at ≥22 weeks after Covid-19 illness
- Few studies adjusted for any SES/social factors
- Only 3 risk factors (female sex, need for hospitalization and severe/critical Covid-19 illness severity) had associations with >1 outcome

From: Chalifoux, Mathieu (DH/MS)
To: Desnoyers, Guillaume (VitaliteNB); Garceau, Richard (VitaliteNB); LeBlanc, Shannon (DH/MS)
Subject: Quebec - Long COVID / Lyme
Date: May 20, 2022 1:55:03 PM

Good afternoon team,

Came accross this article which may be of interest: https://montrealgazette.com/news/local-news/quebec-opening-15-long-covid-and-lyme-disease-clinics

Thanks,

Mathieu Chalifoux, M.Sc (Epidemiology) – Chief Epidemiologist / Épidémiologiste en chef
Public Health and Integrated Community Care / Santé publique et soins communautaires intégrés
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From:	Northwood, Brandon (PHAC/ASPC) on behalf of Cidsc Secretariat (PHAC/ASPC)
To:	annick.descormiers@msss.gouv.qc.ca; Barbara.Yaffe@ontario.ca; BethHalfyard@gov.nl.ca; Brenda Clement; Caroline_NewBerry@gov.nt.ca; Catherine.Elliott@gov.yk.ca; charlene.mack@gov.ab.ca; cindy.rogers@health.gov.sk.ca; Claudia Kraft; colette.gaulin@msss.gouv.qc.ca; Colleen.Kovach@yukon.ca; Daniel.Warshafsky@ontario.ca; Danuta.Skowronski@bccdc.ca; Werker, Denise (PHAC/ASPC); Dilan_Patel@gov.nt.ca; Emily.Karas@oahpp.ca; Eveline.Toth@msss.gouv.qc.ca; Fiona.kouyoumdjian@ontario.ca ; George.Doyle-Bedwell@novascotia.ca; geraldine_whiteford@gov.nt.ca; Smadi, Hanan (DH/MS); Heather Morrison; Helene.Venables@msss.gouv.qc.ca; Jan.McFadzen@yukon.ca ; Jayne Boutilier; Jessica.Hopkins@oahpp.ca; Jing.Hu@gov.ab.ca; JPawa@GOV.NU.CA; Julie.Kryzanowski@health.gov.sk.ca; Julie_A_Miller@gov.nt.ca; Kelly.dean@novascotia.ca; KKulleperuma@GOV.NU.CA; louise.valiquette@inspq.qc.ca; Marie-Andree.Leblanc@msss.gouv.qc.ca; Martin.Vogel@oahpp.ca; martine.fortier@msss.gouv.qc.ca; Chalifoux, Mathieu (DH/MS); mayank.singal@bccdc.ca; Dr. Marguerite Cameron; michelle.murti@ontario.ca ; mireille.barakat@inspq.qc.ca; monika.naus@bccdc.ca; MP; MPS; OCMHO@health.gov.sk.ca; Paul.Hasselback@yukon.ca; prahman@mun.ca; richard.masse@msss.gouv.qc.ca; Richard.Mather@oahpp.ca; RosannSeviour@gov.nl.ca; Sanaz.Vaseghi@health.gov.sk.ca; Santina.Lee@gov.mb.ca; LeBlanc, Shannon (DH/MS); shelley.deeks@novascotia.ca; Tim.hilderman@gov.mb.ca; Wajid.ahmed@ontario.ca ; Siu, Winnie (PHAC/ASPC)
Cc:	Cidsc Secretariat (PHAC/ASPC)
Subject:	OCSO Post COVID-19 Condition Scan #23
Date:	May 26, 2022 3:22:05 PM
Attachments:	OCSO_Post-COVID Condition Scan_23_May20_2022.pdf

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TAC Members,

On behalf of the *Office of the Chief Science Officer*, please find attached the latest COVID-19 environmental scan.

This biweekly product presents an overview of the current state of knowledge, and emerging evidence on **Post COVID-19 Condition** (May 7-May 20).

Thanks,
TAC Sec't

POST COVID-19 CONDITION

OCSO BIWEEKLY SCAN OF EVIDENCE #23

May 7-20, 2022

SCOPE

This biweekly update presents an analysis of new evidence, guidance and issues related to post COVID-19 condition and synthesizes the current state of knowledge. Comprehensive lists of details and resources on this issue are available at the Office of the Chief Science Officer.

CURRENT STATE OF KNOWLEDGE

According to the World Health Organization (WHO), post COVID-19 condition (PCC) refers to persistent symptoms occurring 12 weeks or more after an acute COVID-19 infection, which persist or reoccur for a minimum of 8 weeks. The most common symptoms include fatigue, cognitive problems (e.g., memory, concentration), respiratory issues, and mental health issues (e.g., anxiety, depression). PCC is also referred to as long COVID, post-acute sequelae, post COVID-19 symptoms, and post-acute COVID-19 syndrome. Prior to the WHO definition, a number of studies reported on post-acute sequelae (PAS) from 4 to 12 weeks post diagnosis. While scientific knowledge on these conditions is building, there is still much that is unknown about this condition. There have been reports of more than 100 symptoms or difficulties with everyday activities.

There is limited data suggesting that the condition may be more likely to develop in those:

- who were hospitalized during acute infection;
- had more than 5 COVID symptoms during the acute phase;
- have pre-existing respiratory disease;
- are older;
- are women; and
- have other co-morbidities or have higher BMI.

There is currently no specific treatment for long COVID. We do not know why some people develop long COVID while others are not affected. The impacts of vaccination on PCC or PAS are important, given early estimates of the burden of PCC suggest >50% of individuals with confirmed COVID-19 infection have reported at least one PCC symptom more than 12 weeks after diagnosis. Typical therapeutic itinerary involves consultations with multiple specialists and puts emphasis on self-management (rest & relaxation, self-pacing, etc). Emerging evidence points to the importance of multidisciplinary care given the heterogeneity of symptoms associated with PCC. Multidisciplinary teams in "long COVID" clinics have been set up to include professionals from the following fields: rehabilitation, respiratory and cardiac consultants, physiotherapists, occupational therapists, psychologists, etc.

It is anticipated that Post COVID-19 condition will have medium and long-term impact on public health in Canada. Based on research to date, and reviewed by the Public Health Agency of Canada as part of a living systematic review, 56% of individuals who have had COVID-19 reported the presence of one or more symptoms 12 weeks after diagnosis. About 58% of children had 1 or more symptoms 4 weeks or more after their initial COVID-19 infection. Post COVID-19 condition will have implications for the economy, as well as federal programs including disability benefits, employment related measures and sick pay, among others. It is reported that 10% of adults are unable to return to work in the long term. The WHO has said that about one in 4 people infected with COVID-19 have experienced a post-COVID-19 condition for at least 1 month. One in 10 people experience symptoms lasting beyond 12 weeks.

This week's scan includes a white paper analysis of private healthcare claims published by FAIR Health in the US, as well as a systematic review preprint examining long COVID symptomatology.

GUIDELINES OR STANDARDS

- **WHO** has developed a clinical case definition of post COVID-19 condition by Delphi methodology that includes 12 domains, available for use in all settings. This first version was developed by patients, researchers and others with the understanding that the definition may change as new evidence emerges and our understanding of the consequences of COVID-19 continues to evolve.
    - *"Post COVID-19 condition occurs in individuals with a history of probable or confirmed SARS CoV-2 infection, usually 3 months from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis. Common symptoms include fatigue, shortness of breath, cognitive dysfunction but also others and generally have an impact on everyday functioning. Symptoms may be new onset following initial recovery from an acute COVID-19 episode or persist from the initial illness. Symptoms may also fluctuate or relapse over time."*
    - **WHO:** Q&A page on Post-COVID-19 Condition (February 2022).

- **US CDC** describes Post-COVID conditions as a wide range of new, returning, or ongoing health problems that people experience after first being infected with the virus that causes COVID-19. The CDC posted Interim Guidance for healthcare providers on Evaluating and Caring for Patients with Post-COVID Conditions. Post-COVID conditions can be considered a disability under the Americans with Disabilities Act (ADA). The CDC also released information on Caring for People with Post-COVID Conditions. CDC is using science to learn more about post-COVID conditions.

- UK **NICE**: Rapid guidelines for managing the long-term effects of COVID-19 (Updated March 2022).

- **Chartered Society of Physiotherapy** in UK published its COVID-19 rehabilitation standards, which includes guidance about community-based rehab for people with COVID-19 and long COVID (July 2021).

- Guidelines to help doctors manage long COVID patients published in *British Journal of General Practice* (August 2021).

- UK **NHS** guidance for Post-COVID syndrome assessment clinics (April 2021).

- **CIHI** guidance for clinicians to ensure that data supports monitoring for Post-COVID conditions.

- Guidance for **Canadian Rehabilitation and Exercise Professionals** on Post COVID-19 condition and rehabilitation management strategies (August 2021).

- **Government of Canada**: COVID-19 for health professionals - Post COVID-19 condition

- **Center for Effective Practice** – COVID-19: Clinical Guidance for Primary Care Providers - Long-term symptoms / Post-acute sequelae of COVID-19 (PASC)

- Guideline S1: Long COVID: Diagnostics and treatment strategies (*Wiener klinische Wochenschrift*)

- American Academy of Physical Medicine and Rehabilitation (**AAPM&R**): Cognitive Symptoms Guidance and Breathing Discomfort Guidance.

- Royal Australian College of General Practitioners (**RACGP**) guidance for GPs caring for 'long COVID' patients.

- European Society of Clinical Microbiology and Infectious Diseases (**ESCMID**): Rapid guidelines for assessment and management of long COVID

- **ACAS** (UK-based Advisory, Conciliation and Arbitration Service): Long COVID – advice for employers and employees

NATIONAL AND INTERNATIONAL DEVELOPMENTS (*MAY 7-MAY 20*)

CANADA

- No updates.

UK

- (NEW) A large UK study in *BMJ* suggests that COVID-19 vaccination after infection lowers the odds of persistent symptoms, with a 12.8% initial decline after the first dose and an 8.8% drop after the second—although the long-term effects are unclear. Published May 18th, the observational study included 28,356 participants aged 18 to 69 years in the Office for National Statistics COVID-19 Infection Survey who had received one or more doses of the AstraZeneca/Oxford adenovirus vector or the Pfizer/BioNTech or Moderna mRNA vaccines after COVID-19 infection. The study period spanned the emergence and dominance of the SARS-CoV-2 Delta variant but preceded the emergence of Omicron.

US

- (NEW) A white paper was released by FAIR Health in the US analyzing Private Healthcare Claims using the Official ICD-10 Diagnostic Code. Effective October 1, 2021, ICD-10 code U09.9 was introduced for "post COVID-19 condition, unspecified." Key findings from Paper:
  - The majority (75.8 percent) of patients diagnosed with a U09.9 post-COVID condition had not been hospitalized for COVID-19.
  - Among patients who presented with a U09.9 post-COVID diagnosis, 81.6 percent of females had not had a COVID-19 hospitalization compared to 67.5 percent of males.
  - The age group 36 to 50 was the most likely to be diagnosed with U09.9 post-COVID conditions; 34.6 percent of patients with that diagnosis were in that age group.
  - Females were more likely than males to be diagnosed with U09.9 post-COVID conditions. Females made up 59.8 percent of the population of patients with that diagnosis, while males made up 40.2 percent. By comparison, within the cohort of people diagnosed with COVID-19 in the FAIR Health repository, 53.8 percent of patients were female and 46.2 percent were male.
  - Of patients who presented with a U09.9 post-COVID condition, 30.7 percent had no identified preexisting chronic comorbidities.
  - The three diagnoses most commonly co-occurring on the same claim line with the U09.9 post COVID diagnosis in patients across all ages and genders were abnormalities of breathing (23.2 percent of patients with post-COVID conditions), cough (18.9 percent) and malaise and fatigue (16.7 percent).

EMERGING SCIENTIFIC EVIDENCE (*MAY 7-MAY 20*)*

EVIDENCE PRODUCTS

TITLE AND AUTHOR	EVIDENCE TYPE	SUMMARY
Identifying who has long COVID in the USA: a machine learning approach using N3C data	Systematic Review (Available in	Post-acute sequelae of SARS-CoV-2 infection, known as long COVID, have severely affected recovery from the COVID-19 pandemic for patients and society alike. Long COVID is characterised by evolving, heterogeneous symptoms, making it challenging to derive an unambiguous definition.

(Pfaff et al)	*Lancet Digit Health*)	Studies of electronic health records are a crucial element of the US National Institutes of Health's RECOVER Initiative, which is addressing the urgent need to understand long COVID, identify treatments, and accurately identify who has it? The latter is the aim of this study.
Cognitive disorders and sleep disturbances in long COVID (Schilling et al)	Narrative Review (Available in *Nervenarzt*)	What is known about the occurrence of cognitive disorders and sleep disturbances in long COVID? What are the influencing factors and what is known about the course over time and possible underlying mechanisms? What treatment options are available? In a narrative review, the most important findings on cognitive disorders and sleep disturbances in long COVID are presented. An overview of cohort studies with data on the prevalence and influencing factors of both symptom complexes is given. Current knowledge and hypotheses on pathophysiological mechanisms are presented and an outlook on treatment approaches is given. About one in five of those affected report cognitive impairment more than 3 months after SARS-CoV-2 infection and about one third report sleep disturbances. The latter comprise symptoms of insomnia as well as hypersomnia. Cognitive impairment and sleep disturbances occur in patients with all levels of initial disease severity. There are indications of an improvement of cognitive deficits over time but further longitudinal studies are needed. In addition to the prognosis, the underlying disease mechanisms are still insufficiently understood.
Oxytocin, the panacea for long-COVID? a review (Diep et al)	Review (Available in *Horm Mol Biol Clin Investig*)	In this hypothesis paper, authors explore the underlying mechanisms for long-COVID and how the oxytocinergic neurones could be infected by SARS-CoV-2 leading to a reduction in plasma oxytocin (OXT). They aim to review the relevance of OXT and hypothalamic function in recovery from long-COVID symptoms and pathology, through exploring the pro-health effects of the OXT neuropeptide. A review of published literature was surveyed using Google Scholar and PubMed. Numerous experimental data can be shown to correlate with OXT and long-COVID symptoms and conditions, thus providing strong circumstantial evidence to support our hypothesis. It is postulated that the reduction in plasma OXT due to acute and post-viral damage to the hypothalamus and oxytocinergic neurones contributes to the variable multi-system, remitting and relapsing nature of long-COVID.
Long Covid: A Systematic Review and Meta-Analysis of 120,970 Patients (Di Gennaro et al)	Review (Available in *SSRN-Lancet prepub*)	Aimed to summarize the state-of-the-art literature in relation to long COVID symptomatology, using a systematic review and meta-analysis of observational studies. A systematic search in several databases was carried out up to 12 January 2022 for observational studies reporting the incidence rate of long COVID signs and symptoms divided according to body systems affected and defined using the World Health Organization criteria. Among 11,162 papers initially screened, 196 studies were included, consisting of 120,970 participants who were followed-up for a median of six months. The incidence of any long COVID symptomatology was 56.9%. General long COVID signs and symptoms were the most frequent, digestive issues the less frequent. Higher percentage of females moderated the onset of any, neurological, general and cardiovascular long COVID symptomatology, whilst higher mean age was associated with higher incidence of psychiatric, respiratory, general, digestive and skin conditions. The incidence of long COVID symptomatology was different according to continent, age and follow-up length.

SELECT PRIMARY RESEARCH

TITLE AND AUTHOR	SOURCE	SUMMARY
The associations of long-COVID symptoms, clinical characteristics and affective psychological constructs in a non-hospitalized cohort (Ocsovszky et al)	*Physiol Int*	Study aimed to evaluate the mid-term associations of the long-COVID symptoms and affective factors in a cohort of non-hospitalized patients. A total of 166 patients were enrolled in this study, including 119 sedentary/non-athlete and 47 athlete subjects at Post-COVID Outpatient Clinic of Semmelweis University. They found a positive association between the level of depressive symptoms and anxiety and long-COVID symptom count, while life satisfaction and social support correlated negatively with the long-COVID symptom count. Higher haemoglobin levels and lower LDL-cholesterol were also shown to be moderating factors. A regression model showed that symptoms during acute infection, depression, age, and life satisfaction are predictors of the long-COVID symptom count. The presence of pre-existing affective or anxiety problems was also associated with higher reported long-COVID symptom count. Furthermore, they found significant association between pre-existing mental health problems and the investigated psychological constructs. It appears that long COVID-19 is associated with acute symptoms and mental factors.
Trajectory of long covid symptoms after covid-19 vaccination: community based cohort study (Ayoubkhani et al)	*BMJ*	Aim was to estimate associations between covid-19 vaccination and long covid symptoms in adults with SARS-CoV-2 infection before vaccination. 28 356 participants in the Office for National Statistics COVID-19 Infection Survey aged 18-69 years who received at least one dose of an adenovirus vector or mRNA covid-19 vaccine after testing positive for infection. Mean age of participants was 46 years, 55.6% were women, and 88.7% were of white ethnicity. 23.7% reported long covid symptoms of any severity at least once during follow-up. A first vaccine dose was associated with an initial 12.8% decrease in the odds of long covid, with subsequent data compatible with both increases and decreases in the trajectory. A second dose was associated with an initial 8.8% decrease in the odds of long covid, with a subsequent decrease by 0.8% per week. The likelihood of long covid symptoms was observed to decrease after covid-19 vaccination and evidence suggested sustained improvement after a second dose, at least over the median follow-up of 67 days.
LOng COvid Multidisciplinary consortium Optimising Treatments and servIces acrOss the NHS (LOCOMOTION): protocol for a mixed-methods study in the UK. (Sivan et al)	*BMJ Open*	Authors seek to optimise long COVID care both within and outside specialist clinics, including improving access, reducing inequalities, helping self-management and providing guidance and decision support for primary care. Study aims to establish a 'gold standard' of care by systematically analysing current practices, iteratively improving pathways and systems of care. This mixed-methods, multisite study is informed by the principles of applied health services research, quality improvement, co-design, outcome measurement and learning health systems. It was developed in close partnership with patients and with front-line clinicians.
Post COVID-19 condition of the Omicron variant of SARS-CoV-2 (Morioka et al)	*medRxiv*	No epidemiological data on post coronavirus disease (COVID-19) condition due to Omicron variant has been reported yet. This was as a single-center, cross-sectional study, that interviewed via telephone the patients who recovered from Omicron COVID-19 infection (Omicron group), and surveyed via self-reporting questionnaire those patients infected with other strains (control group). Data on patients' characteristics, information regarding the acute-phase COVID-19, as well as presence and duration of COVID-19-related symptoms were obtained.

Persistent Post COVID-19 Symptoms and Functional Status after 12-14 weeks of recovery, Tamil Nadu, India, 2021 (Rubeshkumar et al)	*J Infect*	The knowledge about long COVID-19 is evolving day by day. Multiple articles published in the Journal of Infection discussed the persistent symptoms, quality of life, and functional status post recovery. Long COVID symptoms were reported in 12 countries and none were from LMIC. The proportion of the Indian Population who have been experiencing the symptoms following the recovery is unknown. Understanding the burden of post COVID-19 symptoms is vital in planning the health systems for essential Post COVID care. Authors assessed the burden of persistent post COVID-19 symptoms and functional status after 12-14 weeks among those recovered from COVID-19 in Chennai, Tamil Nadu, India.
Exploring invisibility and epistemic injustice in Long Covid-A citizen science qualitative analysis of patient stories from an online Covid community (Ireson et al)	*Health Expect*	Aim of this organic research is to explore the physical and epistemic challenges of living with Long Covid. Unlike any previous pandemic in history, online Covid communities and 'citizen science' have played a leading role in advancing our understanding of Long Covid. As patient-led research of this grassroots Covid community, a team approach to thematic analysis was undertaken of 66 patient stories submitted online to covid19-recovery.org at the beginning of the Covid-19 pandemic between April and September 2020. The overriding theme of the analysis highlights the complexities and challenges of living with Long Covid. Our distinct themes were identified: the life-changing impact of the condition, the importance of validation and how, for many, seeking alternatives was felt to be their only option. Long Covid does not easily fit into the dominant evidence-based practice and the biomedical model of health, which rely on objective indicators of the disease process. Patient testimonies are vital to understanding and treating Long Covid, yet patients are frequently disbelieved, and their testimonies are not taken seriously leading to stigma and epistemic injustice, which introduces a lack of trust into the therapeutic relationship.
Long COVID Optimal Health Program (LC-OHP) to Enhance Psychological and Physical Health: Protocol for a Feasibility Randomized Controlled Trial (Al-Jabr et al)	*JMIR Res Protoc*	Despite the negative impact of long COVID on people's lives and functioning, there is no validated treatment or even rehabilitation guidance. What has been recommended thus far is the adoption of holistic management approaches. The Optimal Health Program (OHP) is a brief 5-session, plus booster, psychosocial program designed to support mental and physical well-being that has been used effectively for a range of chronic conditions. This study examines the feasibility and acceptability of employing an especially customized version of OHP (long COVID OHP LC-OHP]) to improve psychological and physical health of people with long COVID.
The Impact of COVID Vaccination on Symptoms of Long COVID: An International Survey of People with Lived Experience of Long COVID. Strain (Sherwood et al)	*Vaccines*	Aimed to survey people living with long COVID, evaluating the impact of their first COVID vaccination on their symptoms. Patients with long COVID were invited to complete a web-based questionnaire through postings on social media and direct mailing from support groups. 900 people participated in questionnaire, of whom 45 had pre-existing myalgic encephalomyelitis or chronic fatigue syndrome (ME/CFS) but no evidence of COVID infection, and a further 43 did not complete the survey in full. The demographics and symptomology of the remaining 812 people were similar to those recorded by the UK Office of National Statistics. Following vaccination, 57.9% of participants reported improvements in symptoms, 17.9% reported deterioration and the remainder no change. Larger improvements in symptom severity scores were seen in those receiving the mRNA vaccines compared to adenoviral vector vaccines.

Respiratory muscle dysfunction in long-COVID patients (Hennigs et al)	*Infection*	Independent of initial disease severity or pathological pulmonary functions tests, fatigue, exertional intolerance and dyspnea are among the most common COVID-19 sequelae. Hypothesized that respiratory muscle dysfunction might be prevalent in persistently symptomatic patients after COVID-19 with self-reported exercise intolerance. In a small cross-sectional pilot study (n = 67) of mild-to-moderate (non-hospitalized) and moderate-to-critical convalescent (formerly hospitalized) patients presenting to our outpatient clinic approx. Findings point towards respiratory muscle dysfunction as a novel aspect of COVID-19 sequelae.
Prevalence of vitamin D deficiency among patients attending Post COVID-19 follow-up clinic: a cross-sectional study. (Hussein et al)	*Eur Rev Med Pharmacol Sci*	Limited data currently available has suggested that vitamin D deficiency may play a role in COVID-19 cases. However, to our knowledge, no study has examined the frequency of vitamin D deficiency in post-COVID-19 cases and its effect on the symptom severity. The aim of this study is to both screen the frequency of vitamin D deficiency in post-COVID-19 syndrome patients and to study its relation to persistent symptoms. A cross-sectional, single-center study was conducted involving all cases attending post-COVID-19 follow-up clinic from November 2020 to May 2021. The study included 219 post-COVID-19 cases, 84% had deficient vitamin D levels (< 20 ng/dL); 11.4% had insufficient level (20-30 ng/dL) and only 4.9 % reported normal level. There was no link between levels of vitamin D with either the acute or post-COVID-19 symptoms in the studied groups. Despite the prevalence of vitamin D deficiency among the study population, no association was observed between the levels of vitamin D and post-COVID-19 symptoms.
Persistent serum protein signatures define an inflammatory subset of long COVID (Talla et al)	*bioRxiv*	Attempts to classify subsets of PASC by symptoms alone have been unsuccessful. To molecularly define PASC, authors evaluated the serum proteome in longitudinal samples from 55 PASC individuals with symptoms lasting ≥60 days after onset of acute infection and compared this to symptomatically recovered SARS-CoV-2 infected and uninfected individuals. These findings help to resolve the heterogeneity of PASC, identify patients with molecular evidence of persistent inflammation, and highlight dominant pathways that may have diagnostic or therapeutic relevance.
Neuropsychiatric symptoms in post COVID-19 long haulers (Alghamdi et al)	*Acta Neuropsychiatr*	Aimed to screen for the neuropsychiatric signs detected 6 months after infection by SARS-CoV-2 and to determine whether vaccination has an effect on them. An online survey was conducted among participants who had been diagnosed with laboratory-confirmed SARS-CoV-2 infection. A total of 2218 individuals, including 1358 females and 860 males, with an age range of 12-70 years, submitted their responses. The respondents experienced cognitive dysfunction, mood alteration, depression, tinnitus, sleep disorders, and loss of taste and smell, with prevalence rates ranging from 18.9% (tinnitus) to 63.9% (loss of taste and smell).More respondents who received two doses of BNT162b2 vaccine showed persistent symptoms than those in the other groups. Disease severity and female sex were identified as potential determinants of the development and persistency of such symptoms. Post-COVID neuropsychiatric symptoms were present in considerable percentages of the study participants with SARS-CoV-2 infection, persisting for >6 months in up to 7.6% of the participants.

Predictors of Submaximal Exercise Test Attainment in Adults Reporting Long COVID Symptoms (Romero-Ortuno et al)	*J Clin Med*	Adults with long COVID often report intolerance to exercise. Cardiopulmonary exercise testing (CPET) has been used in many settings to measure exercise ability but has been conducted in a few long COVID cohorts. Eighty participants were included. Findings suggest that exercise tolerance in adults with long COVID has potential to improve over time. Longitudinal research should assess the extent to which this may occur and its mechanisms.
Post-acute health care burden after SARS-CoV-2 infection: A retrospective cohort study among 530,892 adults (McNaughton et al)	*medRxiv*	Aim was to assess the burden of post-acute health care use after a positive versus negative polymerase chain reaction (PCR) test for SARS-CoV-2. Retrospective cohort study of community-dwelling adults January 1, 2020 to March 31, 2021 in Ontario, Canada, using linked population-based health data. Individuals with a positive SARS-CoV-2 PCR test were matched 1:1 to individuals who tested negative based on hospitalization, test date, public health unit, sex, and a propensity score of socio-demographic and clinical characteristics. The health care utilization rate was the number of outpatient clinical encounters, homecare encounters, emergency department visits, days hospitalized, and days in long-term care per person-year. Among 530,232 unique, matched individuals, mean age was 44 years, 51% were female, and 0.6% had received ≥1 COVID-19 vaccine dose. The mean rate of health care utilization was 11% higher in test-positive individuals. Post-acute health care utilization after a positive SARS-CoV-2 PCR test is significantly higher compared to matched test-negative individuals. Given the number of infections worldwide, this translates to a tremendous increase in use of health care resources. Stakeholders can use these findings to prepare for health care demand associated with long COVID.
STIMULATE-ICP-CAREINEQUAL - Defining usual care and examining inequalities in Long Covid support: protocol for a mixed-methods study (part of STIMULATE-ICP: Symptoms, Trajectory, Inequalities and Management: Understanding Long-COVID to Address and Transform Existing Integrated Care Pathways (Ramasawmy et al)	*medRxiv*	Individuals with Long Covid represent a new and growing patient population. In England, fewer than 90 Long Covid clinics deliver assessment and treatment informed by NICE guidelines. However, a paucity of clinical trials or longitudinal cohort studies means that the epidemiology, clinical trajectory, healthcare utilisation and effectiveness of current Long Covid care are poorly documented, and that neither evidence-based treatments nor rehabilitation strategies exist. In addition, and in part due to pre-pandemic health inequalities, access to referral and care varies, and patient experience of the Long Covid care pathways can be poor. In a mixed methods study, we therefore aim to: (1) describe the usual healthcare, outcomes and resource utilisation of individuals with Long Covid; (2) assess the extent of inequalities in access to Long Covid care, and specifically to understand Long Covid patients' experiences of stigma and discrimination. Methods and analysis A mixed methods study will address our aims. Qualitative data collection from patients and health professionals will be achieved through surveys, interviews and focus group discussions, to understand their experience and document the function of clinics. A patient cohort study will provide an understanding of outcomes and costs of care. Accessible data will be further analysed to understand the nature of Long Covid, and the care received.

*Note: Content may have been published prior to this scan period but was only available through applying our search strategies during this period.

COMMENTARIES, LETTERS AND OPINION PIECES (*MAY 7-MAY 20*)

- **Are vaccines a potential treatment for long covid? (*BMJ*):** Vaccination to reduce risk of reinfection remains important for people with long covid, and evidence so far suggests that benefits are likely to outweigh any harms. Three outcomes are possible after vaccination: no change in symptoms (most likely), improvement (best case), or deterioration (worst case).Unfortunately, many unknowns remain about the long term prognosis of long covid, including the effect of booster vaccines or recurrent covid-19. More research is needed on the link between antibody titres and symptoms over time before we can hope to predict the effects of vaccination on individuals.

- **Stop dismissing the risk of long covid (*Washington Post*):** Vaccines seem to help reduce the risks of long covid, but they don't make it uncommon. Again the data are highly variable. A Veterans Affairs study estimates vaccination lowers the risk by 13 percent, while two British studies estimate a 40 to 50 percent lower risk. Maybe the best study, involving more than 240,000 U.S. patients, suggests vaccines cut the risk of long covid from roughly 17 percent to 3 percent. That is not rare. Worse still, we have no treatments for the condition, and NIH has yet to establish a platform to rapidly conduct robust clinical trials to evaluate treatments, such as prolonged antiviral use, immune modulators and other shots in the dark such as anti-cholesterol drugs or antidepressants.

MEDIA HIGHLIGHTS (*MAY 7-MAY 20*)

CANADA

- **Over 75% of long COVID patients in the U.S. not hospitalized for initial illness, study finds (Globe and Mail):** A large new study has analyzed data from the first few months after the code took effect, and the results paint a sobering picture of long COVID's serious and ongoing impact on people's health and the U.S. health care system.
- **Half of patients hospitalized with COVID-19 still experiencing at least one symptom two years later (CTV News):** Two years after being hospitalized with COVID-19, survivors of the virus are still not back at the same level of health as those who never caught it, according to a new study.And half of those patients are still experiencing at least one virus-related symptom, suggesting that long COVID might end up affecting patients for even longer than anticipated. The research, published in journal The Lancet Respiratory Medicine, follows 1,192 patients hospitalized with COVID-19 in Wuhan, China between early January 2020 and late May 2020.

GLOBAL

- **The pandemic's true health cost: how much of our lives has COVID stolen? (Nature News):** Theo Vos, an epidemiologist at the Institute for Health Metrics and Evaluation (IHME) at the University of Washington has presented unpublished data to US authorities to help them get a handle on how the lingering symptoms could affect people's ability to work. The findings suggest that in 2020 and 2021, an estimated 4.6 million people in the United States had symptoms that persisted for at least three months. The group's definition of long COVID revolves around three clusters of symptoms, centring on fatigue, cognitive problems and ongoing respiratory issues. More than 85% of these cases came as a result of a bout of COVID-19 that did not require hospital treatment.
- **Can AI Identify Patients With Long COVID? (Psychology Today):** Patients with long COVID have persistent or n symptoms for more than four weeks after a SARS-CoV-2 infection. There are no tests for long COVID, which has made it a challenge for healthcare professionals to identify it. In a new study, AI (artificial intelligence) learning has accurately identified long COVID using data from electronic health records.

POST COVID-19 CONDITION RESOURCES

- (NEWLY ADDED) Lullabies for long COVID (UK): An online program developed in collaboration with the English National Opera could help with rehabilitation, by improving mental health and symptoms of breathlessness.

- (NEWLY ADDED) Solve Long Covid Initiative (US): The Solve ME/CFS Initiative is a non-profit organization that serves as a catalyst for critical research into diagnostics, treatments, and cures for myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS), Long Covid and other post-infection diseases.

- PASC Guide (University of Michigan): A resource for people with PASC/long COVID.
- Health Education England (HEE) e-learning modules: long COVID programme
- Voices of Long COVID (US): Voices of Long Covid campaign features testimonials from a diverse group of people ages 18-29 who are suffering from long-term complications of COVID-19 infection.
- Dignity Health (US): COVID-19 and Chronic Illness Recovery Program based in the U.S. has helped over 2,000 people struggling with COVID long-term effects ("COVID long haulers"). Treatment is exercise-based for lingering or long-term conditions (sequelae) from having the virus.
- Altea (Switzerland): A network for sharing evidence-based information on the long-term effects of COVID-19.
- Pandemic-Aid Networks: Long COVID research library.
- Post-COVID-19 Functional Status Scale: An overview of a patient self-reported scale that helps to support assessment of functional status and recovery after the SARS-CoV-2 infection.
- Ontario College of Family Physicians: Resources on Post-COVID Condition.
- Agency for Clinical Innovation (Australia): Living Evidence - post acute sequelae of COVID-19.
- Pre-populated literature searches: Long COVID search (LitCovid) and Long COVID search (NIH)
- PAHO Webinar Series on Post COVID-19 Condition launched 17 February, 2022, from 10:30 am to 12:30 pm (EST).
- Body Politic COVID-19 Support Group (Global): Housed on the Slack app, group members have access to dozens of different channels, which give space for more personal discussion. Some of the channels include those specifically for medical professionals, parents of children with Covid-19, LGBTQ+ individuals, BIPOC+, and different regions around the world.
- Patient-Led Research Collaborative (Global): Self-organized group of Long COVID patients working on patient-led research around the Long COVID experience.
- British Heart Foundation (UK): UK-based foundation with resources on long COVID.
- COVID Long Haul (Canada): Canada's largest online platform for COVID survivors, their family members and anyone searching for the most up-to-date information about the pandemic. There is a COVID long-haulers support group and a Report on Pan-Canadian Long COVID Impact Survey (PDF) (June 2021)
- BC ECHO for Post-COVID-19 Recovery (Canada): BC ECHO for Post-COVID-19 Recovery is a learning community of specialists and community health-care providers who use case-based learning to improve care for those recovering from symptoms post-COVID-19.
- Long Covid Support (UK): Peer support and advocacy group aiming to facilitate international peer support and campaigning in the UK for recognition, rehabilitation and research into treatments.
- Long COVID SOS (UK): Long-term sufferers formed the LongCovidSOS campaign to put pressure on the UK government to recognise the needs of those with Long Covid, and to raise awareness among the general public and employers.
- Survivor Corps (US): One of the largest and fastest growing grassroots movements connecting, supporting, and mobilizing COVID-19 Survivors to support research. They have a list of Post-COVID Care Centers (PCC) and a PCCC Best Practices Guide.
- The Center for Chronic Illness (US): Aims to promote well-being and decrease isolation for those impacted by chronic illness through support and education. Their online support groups are professionally-facilitated and offer psychoeducational tools for coping.

- Blooming Magnolia (US): Mission is to empower others by providing a platform to strengthen & protect mental health and support those afflicted with Long-Covid through education and funding of therapeutic research. They have a list of support groups and resources on their website.

- Long COVID Alliance (US): US-based network of patient-advocates, scientists, disease experts, and drug developers who have joined together to leverage their collective knowledge and resources to educate policy makers and accelerate research to transform our understanding of post-viral illness.

- Long COVID Kids (UK/US/Canada): Parent & patient led advocacy & support group based in the UK.

- Long COVID Physio (US & UK): International peer support, education and advocacy group of Physiotherapists living with Long COVID, founded in November 2020 by Physiotherapists living with Long COVID from the UK and US.

- Patient-Led Research Collaborative (Global): Group of Long COVID patients working on patient-led research around the Long COVID experience.

- CANCOV- Patient resources (Canada): CANCOV is a research platform grounded in a prospective longitudinal 1-year cohort study of patients infected with COVID-19.

- COVID Patient Recovery Alliance (CPRA) (US): CPRA aims to bring together leaders in business, health care, research, academia, data and analytics, and patient advocacy to develop solutions that coordinate diverse data sources, inform models of care, and ensure adequate payment for long-COVID patients. Their report outlines recommendations for federal policymakers to promote recovery.

- British Lung Foundation (UK): UK-based charity sharing resources on navigating the NHS, breathlessness support, movement and energy support for long COVID patients.

- Living with Long COVID (US): COVID-19 Long-Haulers and Post-COVID Support Community.

***Note**: Previous OCSO Post COVID-19 Condition Scans can be found here.*

From: Day, Barbara (DH/MS)
To: Leger, Dr. Yves (DH/MS); Chalifoux, Mathieu (DH/MS); LeBlanc, Shannon (DH/MS); Power, Michaela (ECO/BCE); Kilfoil, Valerie (ECO/BCE); Enos, Coreen (ECO/BCE)
Subject: FOR APPROVAL: MEDIA REQUEST: 21(1) – Global – Long COVID - May 27
Date: May 27, 2022 11:44:00 AM

Looks great to me – looping in Matt and Dr. Leger for review.

I'm including some of Dr Leger's soundbites on the roundtable in June, from the CBC article last week.
Province to discuss long COVID models of care at national roundtable in June | CBC News

NAME: 21(1)
OUTLET: Global
CONTACT #: 21(1)
EMAIL: 21(1) @globalnews.ca
DEADLINE TO SEND RESPONSE TO REPORTER:
ROUTINE (Yes or No):
REQUEST:
I'm reaching out from Global News to see if you have up to date information on New Brunswickers with long COVID? If you have a number of people who have reported to have long-term symptoms, and how long this lasts on average, that would be great.

PROPOSED RESPONSE:

26(1)(a)

From: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Sent: May 27, 2022 11:21 AM
To: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Enos, Coreen (ECO/BCE) <Coreen.Enos@gnb.ca>
Subject: MEDIA REQUEST: 21(1) – Global – Long COVID - May 27

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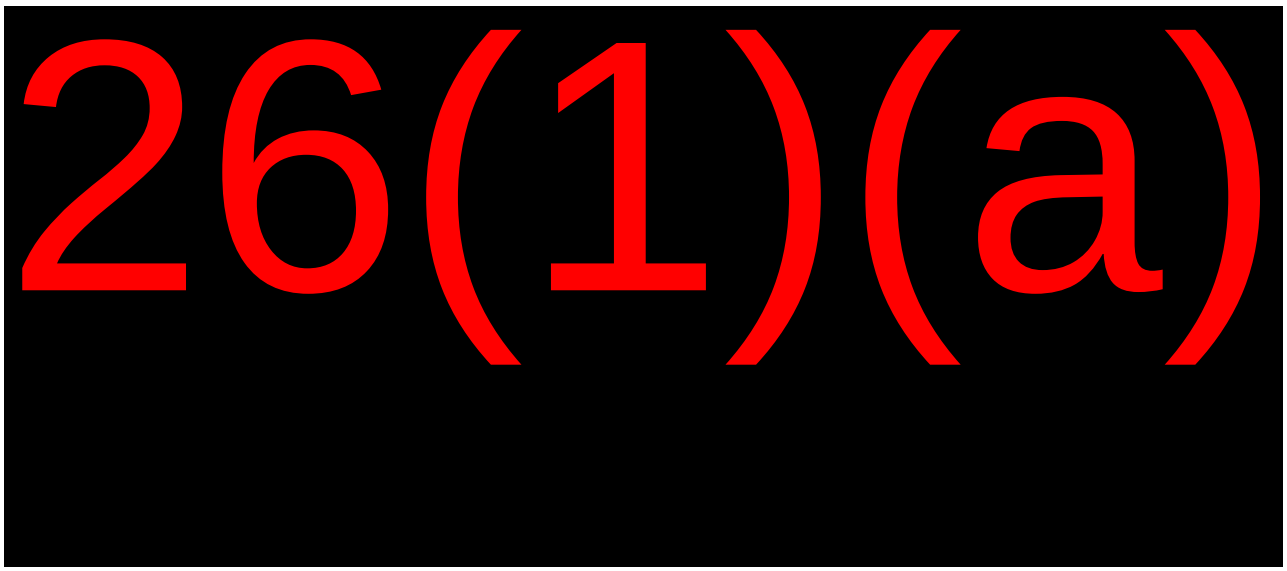
26(1)(a)



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PROPOSED RESPONSE:

From: 21(1) @globalnews.ca>
Sent: Friday, May 27, 2022 11:07 AM
To: Guenard, Michelle (ECO/BCE) <Michelle.Guenard@gnb.ca>
Subject: Media request: NB long COVID

Hi Michelle,

I'm reaching out from Global News to see if you have up to date information on New Brunswickers with long COVID? If you have a number of people who have reported to have long-term symptoms, and how long this lasts on average, that would be great.

Thank you,

21(1)

[redacted]
2110 Gottingen Street | Halifax, Nova Scotia B3K 3B3
T: 902 481-4429 **C:** 21(1) [redacted]
E: [redacted] @globalnews.ca

From: Day, Barbara (DH/MS)
To: Power, Michaela (ECO/BCE)
Subject: RE: FOR APPROVAL: MEDIA REQUEST: 21(1) – Global – Long COVID - May 27
Date: May 27, 2022 1:26:00 PM

Lovely

From: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Sent: May 27, 2022 12:49 PM
To: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Enos, Coreen (ECO/BCE) <Coreen.Enos@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Subject: RE: FOR APPROVAL: MEDIA REQUEST: 21(1) – Global – Long COVID - May 27

A clean version for review with the study removed.

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PROPOSED RESPONSE:

26(1)(a)

From: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>
Sent: May 27, 2022 12:18 PM
To: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Enos, Coreen (ECO/BCE) <Coreen.Enos@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Subject: Re: FOR APPROVAL: MEDIA REQUEST: 21(1) – Global – Long COVID - May 27

Good afternoon all,

Agree with Dr. Leger. Study enrollment has stopped at this point so no use on bringing it up.

Thanks,

Matt

From: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Sent: Friday, May 27, 2022 12:10:39 PM
To: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Enos, Coreen (ECO/BCE) <Coreen.Enos@gnb.ca>
Subject: RE: FOR APPROVAL: MEDIA REQUEST: 21(1) – Global – Long COVID - May 27

Thanks…. If it is aligned with previous statements then that's fine, 26(1)(a) [redacted]

mat, what do you think?

Dr. Yves A. Leger, MD, MHSc, FRCPC
Acting Deputy Chief Medical Officer of Health
Medecin-hygeniste en chef ajoint par interim

N.B. Department of Health / Ministère de la Sante du N.B.

From: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Sent: May 27, 2022 11:45 AM
To: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Enos, Coreen (ECO/BCE) <Coreen.Enos@gnb.ca>
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Province to discuss long COVID models of care at national roundtable in June | CBC News

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Subject: Media request: NB long COVID

Hi Michelle,

I'm reaching out from Global News to see if you have up to date information on New Brunswickers with long COVID? If you have a number of people who have reported to have long-term symptoms, and how long this lasts on average, that would be great.

Thank you,

21(1)

2110 Gottingen Street | Halifax, Nova Scotia B3K 3B3
T: 902 481-4429 **C** 21(1)

16(1.1)

16(1.1)

From: Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>
Sent: Monday, May 30, 2022 5:22 PM
To: Guenard, Michelle (ECO/BCE) <Michelle.Guenard@gnb.ca>
Subject: FW: Updated web content: Post COVID-19 condition || Contenu Web mis à jour : Après la COVID-19

FYI.

Valerie Kilfoil
Director of Communications/Directrice des communications
Department of Health / Ministère de la Santé
(506) 444-4583

Le français suit…

New studies are showing long-term effects of COVID-19 among individuals infected with SARS-CoV-2, or post COVID-19 condition. The Public Health Agency of Canada has updated the Canada.ca web page on post COVID-19 condition and the symptoms and treatment page to bring disease outcomes into context. The web content also provides Canadians with accurate information that they can use to help make an informed decision on vaccination. Media lines to follow.

Post COVID-19 condition
https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/symptoms/post-covid-19-condition.html

COVID-19 for health professionals: Post COVID-19 condition
https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/health-professionals/post-covid-19-condition.html

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De nouvelles études montrent les effets à long terme de la COVID-19 chez les personnes infectées par le SRAS-CoV-2 ou après la COVID-19. L'Agence de la santé publique du Canada a mis à jour la page Web Canada.ca sur le Syndrome post-COVID-19 et la page sur les symptômes et traitement pour mettre les résultats de la maladie en contexte. Le contenu le Web fourni également aux Canadiens des renseignements exacts qu'ils pourront utiliser pour prendre une décision éclairée sur

la vaccination. Les infocapsules suivront.

Syndrome post-COVID-19
https://www.canada.ca/fr/sante-publique/services/maladies/2019-nouveau-coronavirus/symptomes/syndrome-post-covid-19.html

COVID-19 pour les professionnels de la santé : Syndrome post-COVID-19
https://www.canada.ca/fr/sante-publique/services/maladies/2019-nouveau-coronavirus/professionnels-sante/syndrome-post-covid-19.html

Carolle Wilson

Communications Officer, Pandemic Communications Response Directorate (FPT Communications)
Health Canada and Public Health Agency of Canada / Government of Canada
Carolle.a.wilson@hc-sc.gc.ca
343.552.1874

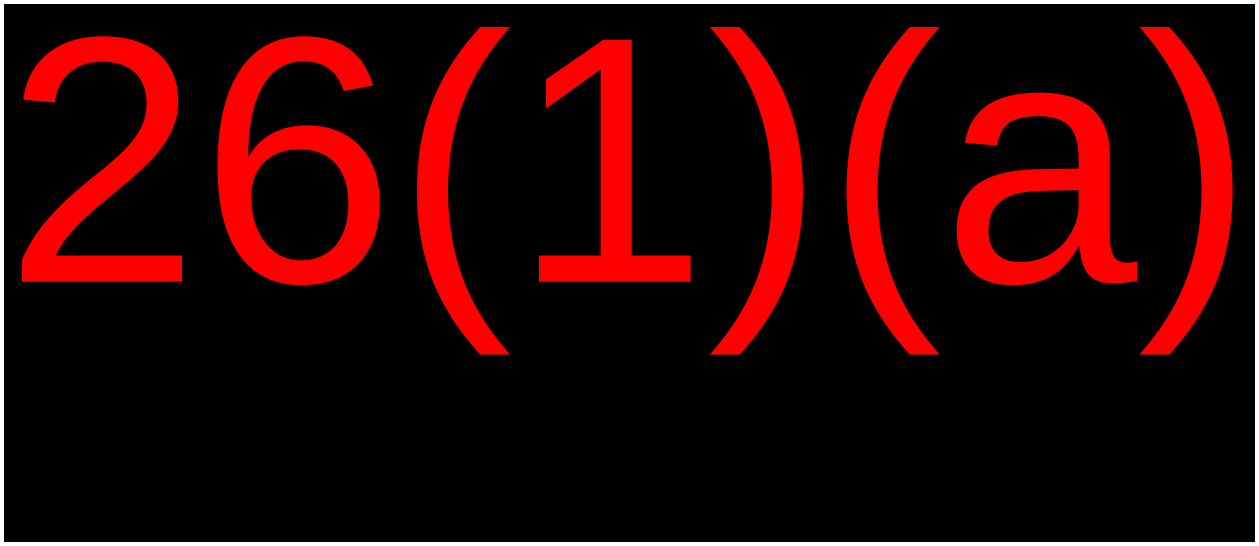
Agente des communications, Direction de la communication en cas de pandémie (Communications FPT)
Santé Canada et l'Agence de la santé publique du Canada / Gouvernement du Canada
Carolle.a.wilson@hc-sc.gc.ca
343.552.1874

From: Day, Barbara (DH/MS)
To: LeBlanc, Shannon (DH/MS); Guenard, Michelle (ECO/BCE)
Subject: RE: MORNING HEALTH NEWS MONITORING 6 1 2022
Date: June 1, 2022 9:12:00 AM

Hi Shannon, does the following information on long covid make sense?

I want to submit to the group, but want an accuracy check first!

LONG COVID KMs.



From: Guenard, Michelle (ECO/BCE) <Michelle.Guenard@gnb.ca>
Sent: June 1, 2022 8:52 AM
To: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>; Campbell, Tyler (ECO/BCE) <Tyler.Campbell@gnb.ca>; MacLean, Dave (ECO/BCE) <Dave.MacLean@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Bowie, Adam (ECO/BCE) <Adam.Bowie@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Enos, Coreen (ECO/BCE) <Coreen.Enos@gnb.ca>; McDavid, Kris (HorizonNB) <Kris.McDavid@HorizonNB.ca>; Duguay-Lemay, Nadine (VitaliteNB) <Nadine.Duguay-Lemay@vitalitenb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>; Macumber, Jenny (DH/MS) <Jenny.Macumber@gnb.ca>; McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>
Cc: Crain, Krista (DH/MS) <Krista.Crain@gnb.ca>; Sully, Jason (DH/MS) <Jason.Sully@gnb.ca>
Subject: RE: MORNING HEALTH NEWS MONITORING 6 1 2022

Looping in Shannon who is covering for Mathieu

From: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Sent: Wednesday, June 1, 2022 8:50 AM

To: Guenard, Michelle (ECO/BCE) <Michelle.Guenard@gnb.ca>; Campbell, Tyler (ECO/BCE) <Tyler.Campbell@gnb.ca>; MacLean, Dave (ECO/BCE) <Dave.MacLean@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Bowie, Adam (ECO/BCE) <Adam.Bowie@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Enos, Coreen (ECO/BCE) <Coreen.Enos@gnb.ca>; McDavid, Kris (HorizonNB) <Kris.McDavid@HorizonNB.ca>; Duguay-Lemay, Nadine (VitaliteNB) <Nadine.Duguay-Lemay@vitalitenb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>; Macumber, Jenny (DH/MS) <Jenny.Macumber@gnb.ca>; McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>
Cc: Crain, Krista (DH/MS) <Krista.Crain@gnb.ca>; Sully, Jason (DH/MS) <Jason.Sully@gnb.ca>
Subject: RE: MORNING HEALTH NEWS MONITORING 6 1 2022

See below re long covid in CAPS

Dr. Yves A. Leger, MD, MHSc, FRCPC
Acting Deputy Chief Medical Officer of Health
Medecin-hygeniste en chef ajoint par interim

N.B. Department of Health / Ministère de la Sante du N.B.

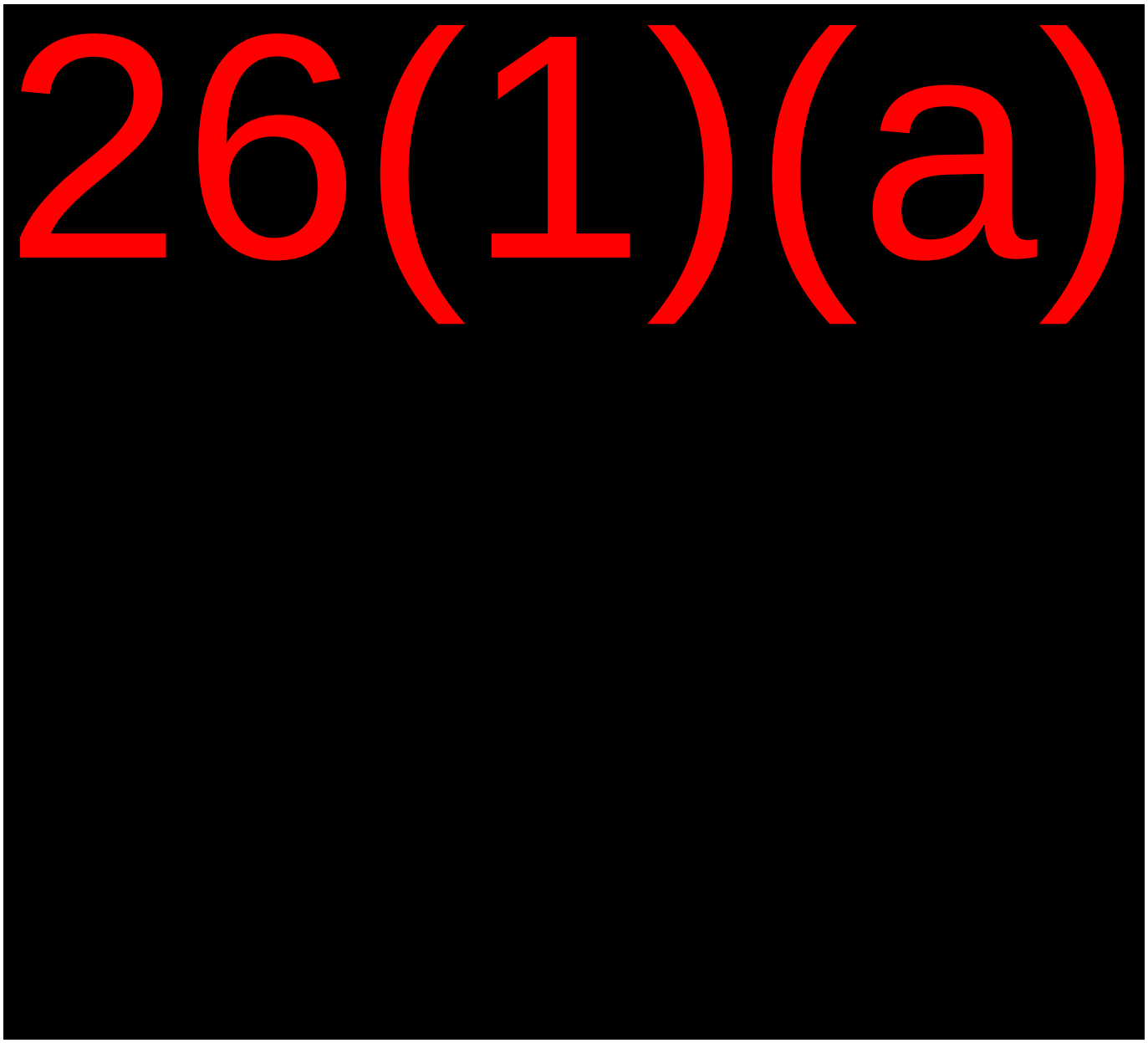
From: Guenard, Michelle (ECO/BCE) <Michelle.Guenard@gnb.ca>
Sent: June 1, 2022 8:40 AM
To: Campbell, Tyler (ECO/BCE) <Tyler.Campbell@gnb.ca>; MacLean, Dave (ECO/BCE) <Dave.MacLean@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Bowie, Adam (ECO/BCE) <Adam.Bowie@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Enos, Coreen (ECO/BCE) <Coreen.Enos@gnb.ca>; McDavid, Kris (HorizonNB) <Kris.McDavid@HorizonNB.ca>; Duguay-Lemay, Nadine (VitaliteNB) <Nadine.Duguay-Lemay@vitalitenb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>; Macumber, Jenny (DH/MS) <Jenny.Macumber@gnb.ca>; McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>
Cc: Crain, Krista (DH/MS) <Krista.Crain@gnb.ca>; Sully, Jason (DH/MS) <Jason.Sully@gnb.ca>
Subject: FW: MORNING HEALTH NEWS MONITORING 6 1 2022

NOTE: MICHAELA IS OFF TODAY SO TEMPLATING AND APPROVALS MAY NOT GO AS SMOOTHLY – WE'LL DO OUR BEST

LEGISLATURE SITS AT 10:00 – need messaging by 9:30AM please

MESSAGING ADDITIONS FOLLOWING MORNING CALL WITH MINISTER:

26(1)(a) [redacted]



From: Guenard, Michelle (ECO/BCE)
Sent: Wednesday, June 1, 2022 7:47 AM
To: Sully, Jason (DH/MS) <Jason.Sully@gnb.ca>; Shephard, Dorothy Hon. (DH/MS) <Dorothy.Shephard@gnb.ca>; Crain, Krista (DH/MS) <Krista.Crain@gnb.ca>
Subject: MORNING HEALTH NEWS MONITORING 6 1 2022

CTV NEWS ATL – NS INTRODUCES NEW ER POLICY TO REDUCE OFFLOAD TIMES
Paramedics will take low risk patients to ER waiting rooms instead of waiting with them Low risk = normal vitals and who can sit, stand or walk independently. Continue to wait with high risk patients

INFORMATION MORNING FREDERICTON
Preparing for high heat days

Child and Youth Advocate bill

CBC RADIO
Lamrock children's rights
Estrabrooks
Covid UPDATE
Alliance returns
Public Transit
Province proposes industrial tax rate
Food and fuel program

TV LEAD STORIES
CBC
Estrabrooks
Child and Youth advocate
GLOBAL
Child and Youth advocate
Trail system

CTV
Cost of Living
NB's visitor information centers won't reopen this year
Federal COVID-19 restrictions extended for another month
RCMP release sketch of attempted abduction/assault

TELEGRAPH JOURNAL
Long Covid
Bloc Queboicois using NB unilingual Lieutenant Gov to irk libs
Problems with Maple App – people complaining appts cancelled
Province proposes new industrial tax rates
20M food and fuel program coming
NB posts new Blue Green Algae signage

RADIO CANADA
Northern gannets with avian flu in the Atlantic – 50 carcasses found in northern nb
Rescue at sea for Miscou fishermen
Possible abduction on route 180
Follow up on Dumont Oncologists departure
Alliance party returns
Kevin Arseneau takes public transport

ACADIE NOUVELLE
Loads of crab waiting for buyers
Alliance party returns
Grand Falls inclusive playground

From: Guenard, Michelle (ECO/BCE)
To: Day, Barbara (DH/MS); LeBlanc, Shannon (DH/MS)
Subject: RE: LONG COVID TWEET RE: CASE DEFINITION
Date: June 1, 2022 12:18:09 PM

Thank you!
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From: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Sent: Wednesday, June 1, 2022 12:10 PM
To: LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Guenard, Michelle (ECO/BCE) <Michelle.Guenard@gnb.ca>
Subject: RE: LONG COVID TWEET RE: CASE DEFINITION

Here's a copy/paste quote from PHAC webpage, on Post COVID, referenced by 21(1)

"There's currently no universally agreed-upon approach to diagnose and treat post COVID-19 condition. If you think you have post COVID-19 condition, talk to your health care provider about how to manage your symptoms."

Post-COVID-19 condition - Canada.ca

From: LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>
Sent: June 1, 2022 12:01 PM
To: Guenard, Michelle (ECO/BCE) <Michelle.Guenard@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Subject: RE: LONG COVID TWEET RE: CASE DEFINITION

Please see my notes synthesized below;

- Although the WHO has developed a clinical case definition for post COVID-19 condition (Long COVID), a national clinical case definition has yet to be established.
- NB along with our federal partners, continue to review the literature, gather evidence and monitor public health outcomes to help inform our understanding of post COVID-19 condition.

From: Guenard, Michelle (ECO/BCE) <Michelle.Guenard@gnb.ca>
Sent: Wednesday, June 1, 2022 11:46 AM
To: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>
Subject: LONG COVID TWEET RE: CASE DEFINITION

Hi Barbara and Shannon,

I'm leaving Dr. Leger off for now – he's tied up with Monkeypox. He's been saying there still isn't a case definition but 21(1) says there is.
I'll need messaging for her about this. 21(1) is also asking.

https://twitter.com/s_awde7/status/1531992716686540805

Michelle Guenard
Communications Officer / Agent des communications
Department of Health / Ministère de la Santé

Tel/tél (506) 444-5221
Cell (506) 230-0692

From:	Northwood, Brandon (PHAC/ASPC) on behalf of Cidsc Secretariat (PHAC/ASPC)
To:	annick.descormiers@msss.gouv.qc.ca; Barbara.Yaffe@ontario.ca; BethHalfyard@gov.nl.ca; Brenda Clement; caroline_newberry@gov.nt.ca; Catherine.Elliott@gov.yk.ca; charlene.mack@gov.ab.ca; cindy.rogers@health.gov.sk.ca; Claudia Kraft; colette.gaulin@msss.gouv.qc.ca; Colleen.Kovach@yukon.ca; Daniel.Warshafsky@ontario.ca; Danuta.Skowronski@bccdc.ca; Werker, Denise (PHAC/ASPC); Dilan_Patel@gov.nt.ca; Emily.Karas@oahpp.ca; Eveline.Toth@msss.gouv.qc.ca; Fiona.kouyoumdjian@ontario.ca ; George.Doyle-Bedwell@novascotia.ca; geraldine_whiteford@gov.nt.ca; Smadi, Hanan (DH/MS); Heather Morrison; Helene.Venables@msss.gouv.qc.ca; Jan.McFadzen@yukon.ca ; Jayne Boutilier; Jessica.Hopkins@oahpp.ca; Jing.Hu@gov.ab.ca; JPawa@GOV.NU.CA; Julie.Kryzanowski@health.gov.sk.ca; Kelly.dean@novascotia.ca; KKulleperuma@GOV.NU.CA; louise.valiquette@inspq.qc.ca; Marie-Andree.Leblanc@msss.gouv.qc.ca; Martin.Vogel@oahpp.ca; martine.fortier@msss.gouv.qc.ca; Chalifoux, Mathieu (DH/MS); mayank.singal@bccdc.ca; Dr. Marguerite Cameron; michelle.murti@ontario.ca ; mireille.barakat@inspq.qc.ca; monika.naus@bccdc.ca; MP; MPS; OCMHO@health.gov.sk.ca; Paul.Hasselback@yukon.ca; prahman@mun.ca; richard.masse@msss.gouv.qc.ca; Richard.Mather@oahpp.ca; RosannSeviour@gov.nl.ca; Sanaz.Vaseghi@health.gov.sk.ca; Santina.Lee@gov.mb.ca; LeBlanc, Shannon (DH/MS); shelley.deeks@novascotia.ca; Tim.hilderman@gov.mb.ca; Wajid.ahmed@ontario.ca ; Siu, Winnie (PHAC/ASPC)
Cc:	Cidsc Secretariat (PHAC/ASPC)
Subject:	OCSO Post COVID-19 Condition Scan #24
Date:	June 6, 2022 10:53:02 AM
Attachments:	OCSO_Post-COVID Condition Scan_24_June3_2022.pdf

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TAC Members,

On behalf of the *Office of the Chief Science Officer*, please find attached the latest COVID-19 environmental scan.

This biweekly product presents an overview of the current state of knowledge, and emerging evidence on **Post COVID-19 Condition** (May 21-June 3).

Thanks,
TAC Sec't

POST COVID-19 CONDITION

OCSO BIWEEKLY SCAN OF EVIDENCE #24

May 21-June 3, 2022

SCOPE

This biweekly update presents an analysis of new evidence, guidance and issues related to post COVID-19 condition and synthesizes the current state of knowledge. Comprehensive lists of details and resources on this issue are available at the Office of the Chief Science Officer.

CURRENT STATE OF KNOWLEDGE

According to the World Health Organization (WHO), post COVID-19 condition (PCC) refers to persistent symptoms occurring 12 weeks or more after an acute COVID-19 infection, which persist or reoccur for a minimum of 8 weeks. The most common symptoms that we know of in adults include: fatigue, memory problems, sleep disturbances, shortness of breath, anxiety and depression, general pain and discomfort, difficulty thinking or concentrating and post-traumatic stress disorder (PTSD). There is still a lot that we don't know about post COVID-19 condition in children.

PCC is also referred to as long COVID, post-acute sequelae, post COVID-19 symptoms, and post-acute COVID-19 syndrome. Prior to the WHO definition, a number of studies reported on post-acute sequelae (PAS) from 4 to 12 weeks post diagnosis. The Public Health Agency of Canada (PHAC) released a review of the current international evidence (November 2021). Over 100 symptoms or difficulties conducting usual activities of daily living were reported.

There is limited data suggesting that the condition may be more likely to develop in those:

- who were hospitalized during acute infection;
- had more than 5 COVID symptoms during the acute phase;
- have pre-existing respiratory disease;
- are older;
- are women; and
- have other co-morbidities or have higher BMI.

There's currently no universally agreed-upon approach to diagnose and treat post COVID-19 condition. Early evidence suggests that vaccination with 2 or more doses may help reduce the risk of developing post COVID-19 condition if infected. Emerging evidence points to the importance of multidisciplinary care given the heterogeneity of symptoms associated with PCC. Multidisciplinary teams in "long COVID" clinics have been set up to include professionals from the following fields: rehabilitation, respiratory and cardiac consultants, physiotherapists, occupational therapists, psychologists, etc.

(UPDATED) People who have been hospitalized or who needed intensive care during recovery appear to be at greater risk of experiencing longer-term effects. However, recent research shows about 30% to 40% of people who weren't hospitalized for their initial COVID-19 infection still report symptoms beyond 12 weeks. Canadians suffering from PCC and who are unable to work because of their symptoms may be eligible for support through: Employment and Skills Development Canada's Employment Insurance (EI) Program and Canada Pension Plan Disability Benefits.

This week's scan includes a *US CDC* Report on post–COVID conditions among adult COVID-19 survivors, as well as a review/meta-analysis on the symptoms and signs of long COVID.

GUIDELINES OR STANDARDS

- **WHO** developed a clinical case definition of PCC in October 2021. This first version was developed by patients, researchers and others with the understanding that the definition may change as new evidence emerges.
    - *"Post COVID-19 condition occurs in individuals with a history of probable or confirmed SARS CoV-2 infection, usually 3 months from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis. Common symptoms include fatigue, shortness of breath, cognitive dysfunction but also others and generally have an impact on everyday functioning. Symptoms may be new onset following initial recovery from an acute COVID-19 episode or persist from the initial illness. Symptoms may also fluctuate or relapse over time."*
    - **WHO:** Q&A page on Post-COVID-19 Condition (February 2022).

- **US CDC** describes Post-COVID conditions as a wide range of new, returning, or ongoing health problems that people experience after first being infected with the virus that causes COVID-19. The CDC posted Interim Guidance (Updated June 2021) for healthcare providers on Evaluating and Caring for Patients with Post-COVID Conditions. Post-COVID conditions can be considered a disability under the Americans with Disabilities Act (ADA). The CDC also released information on Caring for People with Post-COVID Conditions (Updated March 2022). CDC is using science to learn more about post-COVID conditions.

- UK **NICE**: Rapid guidelines for managing the long-term effects of COVID-19 (Updated March 2022).

- **Chartered Society of Physiotherapy** in UK published its COVID-19 rehabilitation standards (July 2021).

- Guidelines to help doctors manage long COVID patients published in *British Journal of General Practice* (August 2021).

- UK **NHS** guidance for Post-COVID syndrome assessment clinics (April 2021).

- Guidance for **Canadian Rehabilitation and Exercise Professionals** on Post COVID-19 condition and rehabilitation management strategies (August 2021).

- **Government of Canada**: COVID-19 for health professionals - Post COVID-19 condition (continuously updated)

- **Center for Effective Practice** – COVID-19: Clinical Guidance for Primary Care Providers - Long-term symptoms / Post-acute sequelae of COVID-19 (PASC) (last updated April 2022)

- *Wiener klinische Wochenschrift*: Guideline S1: Long COVID: Diagnostics and treatment strategies (December 2021)

- American Academy of Physical Medicine and Rehabilitation (**AAPM&R**): Cognitive Symptoms Guidance & Breathing Discomfort Guidance (December 2021).

- Royal Australian College of General Practitioners (**RACGP**) guidance for GPs caring for patients with post–COVID-19 conditions (December 2021).

- European Society of Clinical Microbiology and Infectious Diseases (**ESCMID**): Rapid guidelines for assessment and management of long COVID (February 2022)

- **ACAS** (UK-based Advisory, Conciliation and Arbitration Service): Long COVID – advice for employers and employees (last reviewed April 2022)

- (RECENTLY ADDED) **Ontario Health** Post COVID-19 Condition - Guidance for Primary Care (PDF)

- (RECENTLY ADDED) **Scottish Government Guidelines:** Managing the long-term effects of COVID-19

NATIONAL AND INTERNATIONAL DEVELOPMENTS (*MAY 21-JUN 3*)

CANADA

- (NEW) A team of researchers at the University of Manitoba are trying to better understand how long COVID is affecting Manitobans, and health-care providers here are working to help people with symptoms. Dr. Alan Katz, a physician and health services researcher at the Manitoba Centre for Health Policy, is part of a team using data from Manitoba health records to see whether those with a positive PCR test for COVID-19 went on to seek care for symptoms that could be related to long COVID. The team is launching a survey in the coming weeks to collect data from people who tested positive on a rapid antigen test.

UK

- (NEW) According to data published on June 1 by the UK Office for National Statistics, an estimated 2 million people living in private households in the UK (3.1% of the population) were experiencing self-reported long COVID (symptoms continuing for more than four weeks after the first suspected COVID-19 infection that were not explained by something else) as of May 1, 2022.

US

- (NEW) According to a recent US CDC Report, as more persons are exposed to and infected by SARS-CoV-2, reports of patients who experience persistent symptoms or organ dysfunction after acute COVID-19 and develop post-COVID conditions have increased. COVID-19 survivors have twice the risk for developing pulmonary embolism or respiratory conditions; one in five COVID-19 survivors aged 18–64 years and one in four survivors aged ≥65 years experienced at least one incident condition that might be attributable to previous COVID-19.

EMERGING SCIENTIFIC EVIDENCE (*MAY 21-JUN 3*)*

EVIDENCE PRODUCTS

TITLE AND AUTHOR	EVIDENCE TYPE	SUMMARY
Postacute Sequelae of Severe Acute Respiratory Syndrome Coronavirus 2 Infection (Hope et al)	Review (Available in *Infect Dis Clin North Am*)	Postacute sequelae of SARS-CoV-2 or long COVID is an emerging syndrome characterized by multiple persisting or newly emergent symptoms following the acute phase of SARS-CoV-2 infection. For affected patients, these prolonged symptoms can have a relapsing and remitting course and may be associated with disability and frequent health care utilization. Although many symptom-driven treatments are available, management remains challenging and often requires a multidisciplinary approach. This article summarizes the emerging consensus on definitions, epidemiology, and pathophysiology of long COVID and discusses what is understood about prevention, evaluation, and treatment of this syndrome.
The Multifaceted Manifestations of Multisystem Inflammatory	Review (Available in *Pathogens*)	Although the first reports indicated that activity of the virus is centered in the lungs, it was soon acknowledged that SARS-CoV-2 causes a multisystem disease. This new pathogen causes a variety of syndromes, including asymptomatic disease; mild disease; moderate disease; a

Syndrome during the SARS-CoV-2 Pandemic (Pérez-Gómez et al)		severe form that requires hospitalization, intensive care, and mechanical ventilation; multisystem inflammatory disease; and a condition called long COVID or postacute sequelae of SARS-CoV-2 infection. Some of these syndromes resemble previously described disorders, including those with no confirmed etiology, such as Kawasaki disease. After recognition of a distinct multisystem inflammatory syndrome in children, followed by a similar syndrome in adults, various multisystem syndromes occurring during the pandemic associated or related to SARS-CoV-2 began to be identified. A typical pattern of cytokine and chemokine dysregulation occurs in these complex syndromes; however, the disorders have distinct immunological determinants that may help to differentiate them. This review discusses the origins of the different trajectories of the inflammatory syndromes related to SARS-CoV-2 infection.
Symptoms and signs of long COVID: A rapid review and meta-analysis (Healey et al)	Review (Available in *J Glob Health)*	Aimed to synthesise the evidence on long COVID to guide future research, policy and practice. We searched Medline and Embase for longitudinal cohort studies from January 2020 to July 2021 that investigated adults with long COVID at least four weeks after acute infection. Risk of bias was assessed using the Joanna Briggs Institute checklist for cohort studies. Random-effects meta-analyses were performed with subgroup analysis by follow-up time (4-12 vs more than 12 weeks). 19 studies were included, 13 of which included patients hospitalised with COVID-19. The total sample size was 10 643 and the follow-up time ranged from 30 to 340 days. Risk of bias was assessed as high in one study, moderate in two studies and low in the remaining 16 studies. The most common symptoms and signs seen at any time point in long COVID were fatigue dyspnoea, olfactory dysfunction, myalgia, cough and gustatory dysfunction. High heterogeneity was seen for all meta-analyses and the presence of some funnel plot asymmetry may indicate reporting bias. No effect of follow-up time was found for any symptom or sign included in the subgroup analysis. We have summarised evidence from longitudinal cohort studies on the most common symptoms and signs associated with long COVID. High heterogeneity seen in the meta-analysis means pooled incidence estimates should be interpreted with caution. This heterogeneity may be attributable to studies including patients from different health care settings and countries.

SELECTED RESEARCH

TITLE AND AUTHOR	SOURCE	SUMMARY
Symptom variation, correlations, and relationship to physical activity in Long Covid: intensive longitudinal study (Burton et al)	*medRxiv*	People with Long Covid describe multiple symptoms which vary between and within individuals over relatively short time intervals. We aimed to describe the real-time associations between different symptoms and between symptoms and physical activity at the individual patient level. Methods and Findings Intensive longitudinal study of 82 adults with self-reported Long Covid (median duration 12-18 months). Data collection involved a smartphone app with 5 daily entries over 14 days and continuous wearing of a wrist accelerometer. Data items included 7 symptoms (Visual Analog Scales) and perceived demands in the preceding period (Likert scales). App data was suitable for analysis from 74 participants (90%) comprising 4022 entries representing 77.6% of possible

		entries. Symptoms varied substantially within individuals and were only weakly auto-correlated. The strongest between-subject symptom correlations were of fatigue with pain (partial coefficient 0.5) and cognitive difficulty with light-headedness (0.41). Symptoms, including fatigue, were inconsistently correlated with prior or subsequent physical activity: this may reflect adjustment of activity in response to symptoms. Delayed worsening of symptoms after the highest activity peak was observed in 7 participants. Symptoms of Long Covid vary within individuals over short time scales, with heterogenous patterns of symptom correlation.
Inflammation during early post-acute COVID-19 is associated with reduced exercise capacity and Long COVID symptoms after 1 year (Durstenfeld et al)	*medRxiv*	Mechanisms underlying persistent cardiopulmonary symptoms following SARS-CoV-2 infection (post-acute sequelae of COVID-19 "PASC" or "Long COVID") remain unclear. The purpose of this study was to elucidate the pathophysiology of cardiopulmonary PASC using multimodality cardiovascular imaging including cardiopulmonary exercise testing (CPET), cardiac magnetic resonance imaging (CMR) and ambulatory rhythm monitoring. We performed CMR, CPET, and ambulatory rhythm monitoring among adults > 1 year after PCR-confirmed SARS-CoV-2 infection in the UCSF Long-Term Impact of Infection with Novel Coronavirus cohort (LIINC; NCT04362150) and correlated findings with previously measured biomarkers. Cardiopulmonary symptoms and elevated inflammatory markers present early in PASC are associated with objectively reduced exercise capacity measured on cardiopulmonary exercise testing more than 1 year following COVID-19. Chronotropic incompetence may explain reduced exercise capacity among some individuals with PASC.
COVID-19 persistente y dolor crónico. ¿Estamos preparados? Presentación de tres casos clínicos y revisión de la literatura (Salazar et al)	*Dolor*	Long COVID is a term that describes a group of multiorganic symptoms that affect patients who have suffered from COVID-19 and who remain symptomatic for a sustained period of time after the acute phase of the disease. Amongst those symptoms, pain is one of the most frequently reported, shaping into different specific syndromes such as persistent thoracic pain, generalized pain, arthralgia, myalgia and cephalalgia. Multiple mechanisms can explain the onset and perpetuation of chronic pain in these patients. It is known that SARS-CoV-2 is a neurotropic virus that can alter the somatosensory nervous system and which can also cause an intense autoimmune response with effects on multiple organs and systems. We present three clinical cases of long COVID where pain was the main symptom altogether with anxiety, depression, insomnia, catastrophic thoughts related to pain, cognitive impairment and post-traumatic stress disorder. These all show the existing complexity in the management of this new-found entity. Given the extensive number of SARS-CoV-2 infections reported globally, chronic pain in relation to long COVID can become a public health issue. Therefore, it is necessary to make it visible and to establish strategies to prevent it and confront it.
Rehabilitation Therapy of Patients with Post COVID Symptoms in Nakhchivan "Duzdag" Physiotherapy Center (Allahverdiyeva et al)	*Azerbaijan Med J*	Rehabilitation is important for patients with post COVID-19 syndrome. Association of COVID-19 infection with multisystem involvement, as well as the existence of post-COVID syndrome has been proven. The use of modern opportunities of sanatorium and health resort treatment makes it possible to develop effective specialized post-COVID rehabilitation programs. Experience of working with patients with post-COVID syndrome demonstrated the importance and necessity of various rehabilitation programs, in particular speleotherapy. Speleotherapy is the perfect

		procedure for respiratory system recovery after COVID-19-related illness. Dry salt aerosol improves drainage function of respiratory tract and sodium chloride significantly reduces the swelling of the bronchial mucous membranes. Inhalation of finely dispersed salt particles prevents bacterial growth. Most importantly, speleotherapy has a positive effect on rehabilitation after acute respiratory distress syndrome. Underground rehabilitation center ''DUZDAG'' with potential opportunities related to the restoration of a curative environment and its continuous regeneration, which has no analogs in the world speleotherapy practice.
Cognitive dysfunction following COVID-19 infection (Hadad et al)	*J Neurovirol*	The present study aims to characterize cognitive performance in patients experiencing cognitive symptoms post-COVID infection. Patients evaluated at a post COVID clinic in Northern Israel who endorsed cognitive symptoms were referred for neurologic consultation. The neurologic work-up included detailed medical history, symptom inventory, neurological examination, the Montreal Cognitive Assessment (MoCA), laboratory tests and brain CT or MRI. Between December 2020 and June 2021, 46 patients were referred for neurological consultation (65% female), mean age 49.5. On the MoCA test, executive functions, particularly phonemic fluency, and attention, were impaired. In contrast, the total MoCA score, and memory and orientation subscores did not differ from expected ranges. Disease severity, premorbid condition, pulmonary function tests and hypoxia did not contribute to cognitive performance. Cognitive decline may affect otherwise healthy patients post-COVID, independent of disease severity. Our examination identified abnormalities in executive function, attention, and phonemic fluency.
Whole-Body Cryostimulation: A Rehabilitation Booster in Post-COVID Patients? A Case Series (Piterà et al)	*Appl Sci*	The purpose of this case series is to provide some preliminary evidence about the role of whole-body cryostimulation (WBC) as an effective adjuvant for the recovery of patients with the post-COVID-19 condition (PCC). We recruited seven patients with previously confirmed SARS-CoV-2 infection and symptoms of PCC of different severities for a comprehensive rehabilitation program, including WBC. The main symptoms were dyspnea, chronic and muscular fatigue, chronic pain, and poor sleep quality. Moreover, some patients presented high levels of hematological markers of inflammation. Because we provided a range of interventions, including nutritional and psychological support along with physical exercise and physiotherapy, we could not determine to what extent WBC may per se have accounted for the clinical and functional improvements. However, for all reported cases, it was observed that the introduction of WBC sessions represented a turning point in the patient's subjective and objective improvements related to health and functioning.
A global systematic analysis of the occurrence, severity, and recovery pattern of long COVID in 2020 and 2021 (Hanson et al)	*medRxiv*	Objective was to estimate by country and territory of the number of patients affected by long COVID in 2020 and 2021, the severity of their symptoms and expected pattern of recovery. We jointly analyzed ten ongoing cohort studies in ten countries for the occurrence of three major symptom clusters of long COVID among representative COVID cases. Analyses are based on detailed information for 1906 community infections and 10526 hospitalized patients from the ten collaborating cohorts, three of which included children. Globally, in 2020 and 2021, 144.7 million people suffered from any of the three symptom clusters of long COVID. This corresponds to 3.69% (1.38-7.96) of all infections. The fatigue, respiratory, and cognitive clusters occurred in 51.0%, 60.4% and 35.4% of long COVID cases, respectively. Those with milder acute COVID-

		19 cases had a quicker estimated recovery (median duration 3.99 month]) than those admitted for the acute infection (median duration 8.84 months). At twelve months, 15.1% continued to experience long COVID symptoms.
Long COVID after breakthrough SARS-CoV-2 infection (Al-Aly et al)	*Nat Med*	The post-acute sequelae of SARS-CoV-2 infection have been described, but whether breakthrough SARS-CoV-2 infection (BTI) in vaccinated people results in post-acute sequelae is not clear. In this study, we used the US Department of Veterans Affairs national healthcare databases to build a cohort of 33,940 individuals with BTI and several controls of people without evidence of SARS-CoV-2 infection, including contemporary (n = 4,983,491), historical (n = 5,785,273) and vaccinated (n = 2,566,369) controls. At 6 months after infection, we show that, beyond the first 30 days of illness, compared to contemporary controls, people with BTI exhibited a higher risk of death and incident post-acute sequelae including cardiovascular, coagulation and hematologic, gastrointestinal, kidney, mental health, metabolic, musculoskeletal and neurologic disorders. The results were consistent in comparisons versus the historical and vaccinated controls. Compared to people with SARS-CoV-2 infection who were not previously vaccinated (n = 113,474), people with BTI exhibited lower risks of death and incident post-acute sequelae. Findings suggest that vaccination before infection confers only partial protection in the post-acute phase of the disease; hence, reliance on it as a sole mitigation strategy may not optimally reduce long-term health consequences of SARS-CoV-2 infection.
Long COVID: A proposed hypothesis-driven model of viral persistence for the pathophysiology of the syndrome (Buonsenso et al)	*Allergy Asthma Proc*	The purpose of report was to review causes of long COVID syndrome and suggest ways that can provide a basis for a better understanding of the clinical symptomatology for the of improved diagnostic and therapeutic procedures for the condition. Extensive research was conducted in medical literature data bases by applying terms such as "long COVID" associated with "persistence of the SARS-CoV-2 virus" "spike protein' "COVID-19" and "biologic therapies." In this model of the long COVID syndrome, the persistence of SARS-CoV-2 is hypothesized to trigger a dysregulated immune system with subsequent heightened release of proinflammatory cytokines that lead to chronic low-grade inflammation and multiorgan symptomatology. The condition seems to have a genetic basis, which predisposes individuals to have a diminished immunologic capacity to completely clear the virus, with residual parts of the virus persisting. This persistence of virus and resultant hyperproduction of proinflammatory cytokines are proposed to form the basis of the syndrome.
Symptom burden correlates to impairment of diffusion capacity and exercise intolerance in long COVID patients (Kersten et al)	*Sci Rep*	This study aimed to relate the physical and mental burden of symptoms of long COVID patients to the findings of a somatic evaluation. In patients with persistent long COVID symptoms three months after acute infection we assessed physical and mental health status using the SF-36 questionnaire. The cohort was dichotomised by the results (upper two quartiles vs. lower to quartiles) and compared with regard to transthoracic echocardiography, body plethysmography (including diffusion capacity), capillary blood gas analysis and 6-min walk test (6-MWT). From February 22 to September 13, 2021, 463 patients were prospectively examined, of which 367 completed the SF-36 questionnaire. A positive correlation between initial disease severity (need for hospitalization, intensive care medicine) and resulting symptom burden at

		follow-up could be demonstrated. Patients with impaired subjective physical and mental status were significantly more likely to be women. Significant correlation between symptom severity and reduced exercise tolerance in the 6-MWT and diffusion capacity for carbon monoxide. In long COVID patients, initial disease severity is correlated with symptom burden after at least 3 months of follow-up. Highly symptomatic long COVID patients show impaired diffusion capacity and 6-MWT despite average or mildly affected mechanical lung parameters.
Generalizable Long COVID Subtypes: Findings from the NIH N3C and RECOVER Program (Reese et al)	*medRxiv*	Accurate stratification of patients with long COVID would allow precision clinical management strategies and could enable more focussed investigation of the molecular pathogenetic mechanisms of this disease. However, the natural history of long COVID is incompletely understood and characterized by an extremely wide range of manifestations that are difficult to analyze computationally. In addition, the generalizability of machine learning classification of COVID-19 clinical outcomes has rarely been tested. We present a method for computationally modeling long COVID phenotype data based on electronic healthcare records (EHRs) and for assessing pairwise phenotypic similarity between patients using semantic similarity. Using unsupervised machine learning (k-means clustering), we found six distinct clusters of long COVID patients, each with distinct profiles of phenotypic abnormalities with enrichments in pulmonary, cardiovascular, neuropsychiatric, and constitutional symptoms such as fatigue and fever. There was a highly significant association of cluster membership with a range of pre-existing conditions and with measures of severity during acute COVID-19. We show that the clusters we identified in one hospital system were generalizable across different hospital systems.
Neuropsychological manifestations of long COVID in hospitalized and non-hospitalized Brazilian Patients (Braga et al)	*NeuroRehabilitation*	Objective was to identify the cognitive and psychiatric disorders in patients with long COVID or Post-Acute Sequelae of COVID (PASC) and explore the association between disease severity during the acute phase and persistent neuropsychological manifestations. 614 adults were assessed an average of eight months post-infection. Participants were, on average, 47.6 y.o., who sought rehabilitation for neuropsychological problems. Patients were evaluated using the Barrow Neurological Institute Screen for Higher Cerebral Functions (BNIS), Phonemic Verbal Fluency and Clock Drawing tests (NEUPSILIN) for executive functions, and the Hospital Anxiety and Depression Scale (HADS). The BNIS score was significantly below reference values in all subscales, especially affect and memory. Verbal Fluency and Clock Drawing subtest results were also lower. Patients with PASC tested high for anxiety/depression, but there was no statistically significant relationship between HADS and BNIS scores.

*Note: Content may have been published prior to this scan period but was only available through applying our search strategies during this period.

COMMENTARIES, LETTERS AND OPINION PIECES (*MAY 21-JUN 3*)

- Long COVID in children and young people: uncertainty and contradictions (*Br J Gen Pract):* It is not known whether all children with long COVID will recover and how long this will take. Parents' narratives suggest that symptoms can increase and decrease in severity, that symptoms may come and go, and that it is not uncommon to have a period of apparent recovery and then develop symptoms again 6 months later. Families report new symptoms over a year after infection, and that the course of the illness and 'recovery' are not linear. This uncertainty is difficult for young people and their

families to live with and compounds the direct impact of the condition on siblings and parents, including financial, when parents need to take time off work. The varied presentation of long COVID, particularly the neuropsychiatric complications, can cause uncertainty for GPs, making the diagnosis difficult. Whatever this uncertainty for clinicians, however, primary care must play a key role in supporting young people with long COVID and their families, liaising with schools where necessary. Children and young people need to be believed by their GP. At the time of writing, access to specialist long COVID clinics for children and young people is limited, with only 15 hubs across England, so GPs have the primary responsibility of managing children with long COVID.

- A proposal to apply brain injury recovery treatments for cognitive impairment in COVID-19 survivors (*Int J Neurosci*): There is still little information about the nature and broader prevalence of cognitive problems during post-infection in COVID-19 survivors. This is also the case for pathobiological findings related to these complications. In the meantime, there is mounting alarm regarding potential long-term outcomes of COVID-19, with descriptions of 'long COVID' symptoms keeping up into the chronic stage, which include 'brain fog'. The cognitive impairment or brain fog creates many difficulties in daily activities and makes problems for those who wish to successfully return to their job. The author proposes to apply brain injury recovery treatments for cognitive impairment in COVID-19 survivors.

MEDIA HIGHLIGHTS (*MAY 21-JUN 3*)

CANADA

- **COVID-19 data void in Canada could hamper understanding of virus's lingering impact, say experts (Globe and Mail):** A lack of data tracking Canadians who have had COVID-19 could hinder efforts to understand potential post-infection conditions, such as diabetes and brain fog, experts have warned. American data showed an additional 18 cases of diabetes per 1,000 people if they had COVID-19.

GLOBAL

- **Why do people get long COVID? A virus that may cause MS could reveal clues (US News Today):** Scientists are looking at reactivation of latent viruses, and other existing post-infection syndromes, for answers about long-haul COVID-19. Although the mechanisms of SARS-CoV-2 are different from those of true latent viruses – the coronavirus might not stick around in the body as long as or in the same ways as, say, EBV. Whether or not someone develops severe symptoms related to a viral infection also may depend on other factors such as the microbiome and genetics.

POST COVID-19 CONDITION RESOURCES

- (NEWLY ADDED) C19 Recovery Awareness (US): The mission of the Long Haul COVID Fighters is to provide support for those whose health has been affected by COVID-19, promote public awareness and education regarding lengthy COVID recovery, and advocate for the medical, mental health, and social interests of long haul COVID survivors.

- (NEWLY ADDED) COVID-19 Virtual Library of Health Data and Evidence (Canada): Resources to knowledge products, data and evidence on the impacts of COVID-19, which includes post COVID-19 condition. This is a searchable collection of products funded and published by the Government of Canada.

- Lullabies for long COVID (UK): An online program developed in collaboration with the English National Opera could help with rehabilitation, by improving mental health and symptoms of breathlessness.

- Solve Long Covid Initiative (US): The Solve ME/CFS Initiative is a non-profit organization that serves as a catalyst for critical research into diagnostics, treatments, and cures for myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS), Long Covid and other post-infection diseases.

- PASC Guide (University of Michigan): A resource for people with PASC/long COVID.

- Health Education England (HEE) e-learning modules: long COVID programme

- Voices of Long COVID (US): Voices of Long Covid campaign features testimonials from a diverse group of people ages 18-29 who are suffering from long-term complications of COVID-19 infection.

- Dignity Health (US): COVID-19 and Chronic Illness Recovery Program based in the U.S. has helped over 2,000 people struggling with COVID long-term effects ("COVID long haulers"). Treatment is exercise-based for lingering or long-term conditions (sequelae) from having the virus.
- Altea (Switzerland): A network for sharing evidence-based information on the long-term effects of COVID-19.
- Pandemic-Aid Networks: Long COVID research library.
- Post-COVID-19 Functional Status Scale: An overview of a patient self-reported scale that helps to support assessment of functional status and recovery after the SARS-CoV-2 infection.
- Ontario College of Family Physicians: Resources on Post-COVID Condition.
- Agency for Clinical Innovation (Australia): Living Evidence - post acute sequelae of COVID-19.
- Pre-populated literature searches: Long COVID search (LitCovid) and Long COVID search (NIH)
- PAHO Webinar Series on Post COVID-19 Condition launched 17 February, 2022, from 10:30 am to 12:30 pm (EST).
- Body Politic COVID-19 Support Group (Global): Housed on the Slack app, group members have access to dozens of different channels, which give space for more personal discussion. Some of the channels include those specifically for medical professionals, parents of children with Covid-19, LGBTQ+ individuals, BIPOC+, and different regions around the world.
- Patient-Led Research Collaborative (Global): Self-organized group of Long COVID patients working on patient-led research around the Long COVID experience.
- British Heart Foundation (UK): UK-based foundation with resources on long COVID.
- COVID Long Haul (Canada): Canada's largest online platform for COVID survivors, their family members and anyone searching for the most up-to-date information about the pandemic. There is a COVID long-haulers support group and a Report on Pan-Canadian Long COVID Impact Survey (PDF) (June 2021)
- BC ECHO for Post-COVID-19 Recovery (Canada): BC ECHO for Post-COVID-19 Recovery is a learning community of specialists and community health-care providers who use case-based learning to improve care for those recovering from symptoms post-COVID-19.
- Long Covid Support (UK): Peer support and advocacy group aiming to facilitate international peer support and campaigning in the UK for recognition, rehabilitation and research into treatments.
- Long COVID SOS (UK): Long-term sufferers formed the LongCovidSOS campaign to put pressure on the UK government to recognise the needs of those with Long Covid, and to raise awareness among the general public and employers.
- Survivor Corps (US): One of the largest and fastest growing grassroots movements connecting, supporting, and mobilizing COVID-19 Survivors to support research. They have a list of Post-COVID Care Centers (PCC) and a PCCC Best Practices Guide.
- The Center for Chronic Illness (US): Aims to promote well-being and decrease isolation for those impacted by chronic illness through support and education. Their online support groups are professionally-facilitated and offer psychoeducational tools for coping.
- Blooming Magnolia (US): Mission is to empower others by providing a platform to strengthen & protect mental health and support those afflicted with Long-Covid through education and funding of therapeutic research. They have a list of support groups and resources on their website.
- Long COVID Alliance (US): US-based network of patient-advocates, scientists, disease experts, and drug developers who have joined together to leverage their collective knowledge and resources to educate policy makers and accelerate research to transform our understanding of post-viral illness.
- Long COVID Kids (UK/US/Canada): Parent & patient led advocacy & support group based in the UK.

- Long COVID Physio (US & UK): International peer support, education and advocacy group of Physiotherapists living with Long COVID, founded in November 2020 by Physiotherapists living with Long COVID from the UK and US.

- Patient-Led Research Collaborative (Global): Group of Long COVID patients working on patient-led research around the Long COVID experience.

- CANCOV- Patient resources (Canada): CANCOV is a research platform grounded in a prospective longitudinal 1-year cohort study of patients infected with COVID-19.

- COVID Patient Recovery Alliance (CPRA) (US): CPRA aims to bring together leaders in business, health care, research, academia, data and analytics, and patient advocacy to develop solutions that coordinate diverse data sources, inform models of care, and ensure adequate payment for long-COVID patients. Their report outlines recommendations for federal policymakers to promote recovery.

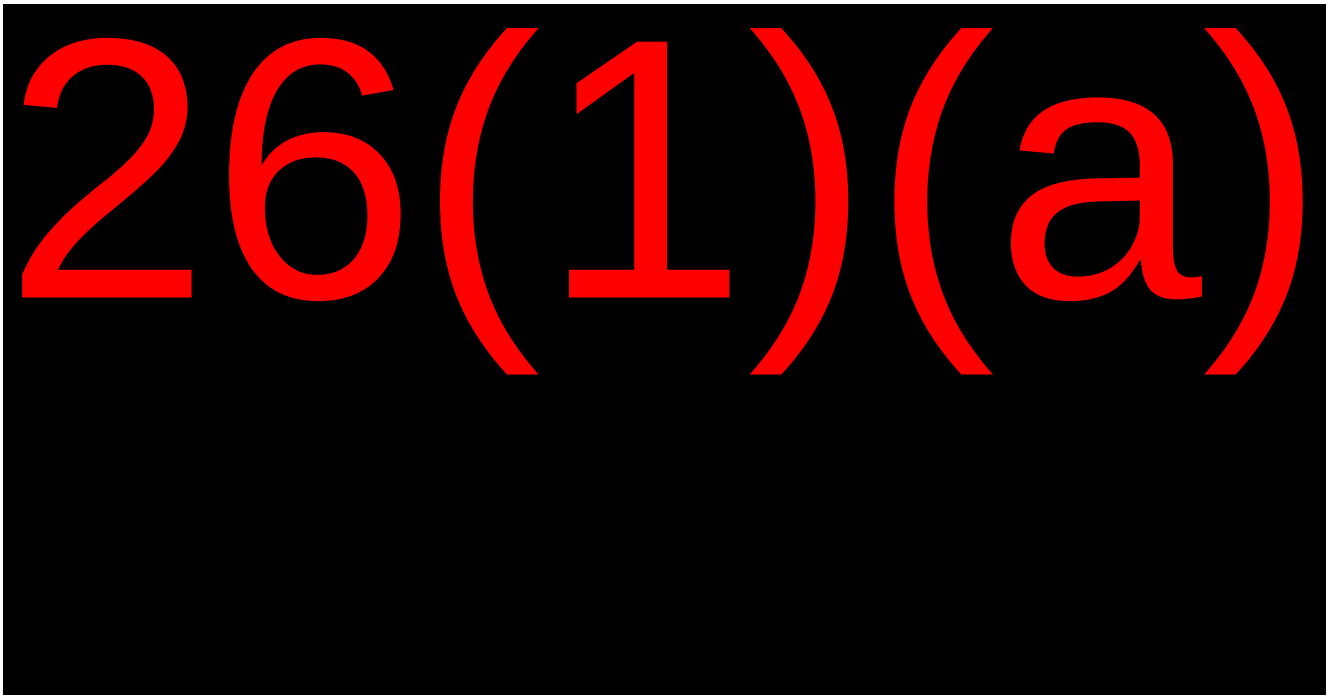
- British Lung Foundation (UK): UK-based charity sharing resources on navigating the NHS, breathlessness support, movement and energy support for long COVID patients.

- Living with Long COVID (US): COVID-19 Long-Haulers and Post-COVID Support Community.

***Note**: Previous OCSO Post COVID-19 Condition Scans can be found here.*

From:	Levesque, Eric J. (DH/MS)
To:	Guenard, Michelle (ECO/BCE); Power, Michaela (ECO/BCE); Day, Barbara (DH/MS); Kilfoil, Valerie (ECO/BCE)
Cc:	Chalifoux, Mathieu (DH/MS); LeBlanc, Shannon (DH/MS); Leger, Dr. Yves (DH/MS); Elliott, Jennifer (DH/MS)
Subject:	RE: HOT TOPICS - Excess Deaths + vaccination rates +long covid +COVIDWATCH Tuesday
Date:	June 6, 2022 11:02:08 PM

Long COVID bullets for consideration:



From: Guenard, Michelle (ECO/BCE) <Michelle.Guenard@gnb.ca>
Sent: Monday, June 6, 2022 5:23 PM
To: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>; Shephard, Dorothy Hon. (DH/MS) <Dorothy.Shephard@gnb.ca>; Sully, Jason (DH/MS) <Jason.Sully@gnb.ca>; Crain, Krista (DH/MS) <Krista.Crain@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>
Cc: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Subject: HOT TOPICS - Excess Deaths + vaccination rates +long covid +COVIDWATCH Tuesday

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Barbara sent these HOT TOPICS KMs on excess deaths, vaccination rates.

Tuesday morning she'll supply the latest COVIDWATCH Tuesday stats.

Do we have lines handy on reporting of variants?

Here are notes from Barbara – which will be approved by Mathieu or Shannon tomorrow before

being added to your binder

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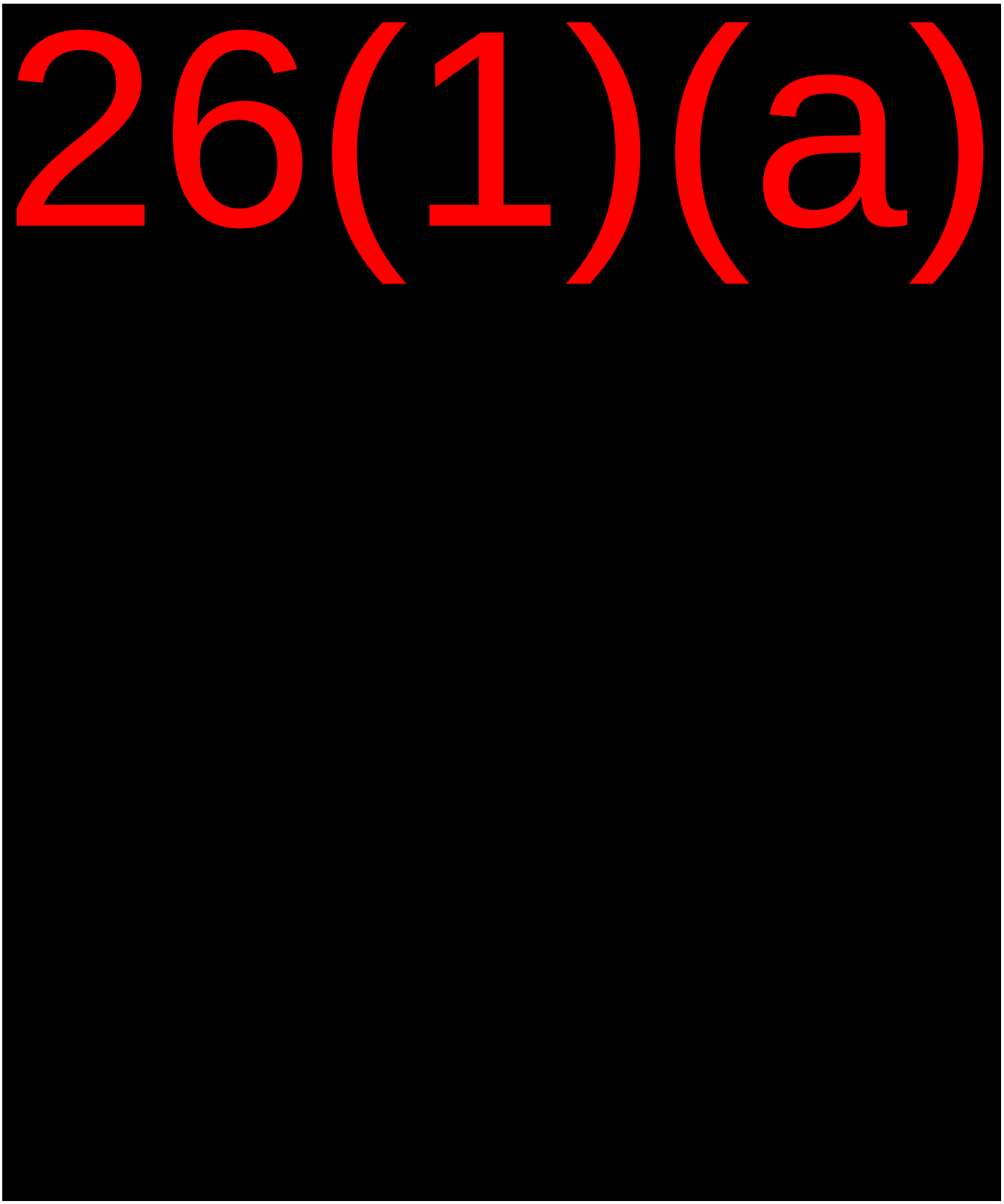

From: Day, Barbara (DH/MS)
To: Clair, Suzanne (DH/MS); Donovan, Wendy (DH/MS)
Subject: FW: HOT TOPICS - Excess Deaths + vaccination rates +long covid +COVIDWATCH Tuesday
Date: June 7, 2022 10:18:00 AM

From: Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>
Sent: June 6, 2022 11:02 PM
To: Guenard, Michelle (ECO/BCE) <Michelle.Guenard@gnb.ca>; Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>
Cc: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Subject: RE: HOT TOPICS - Excess Deaths + vaccination rates +long covid +COVIDWATCH Tuesday

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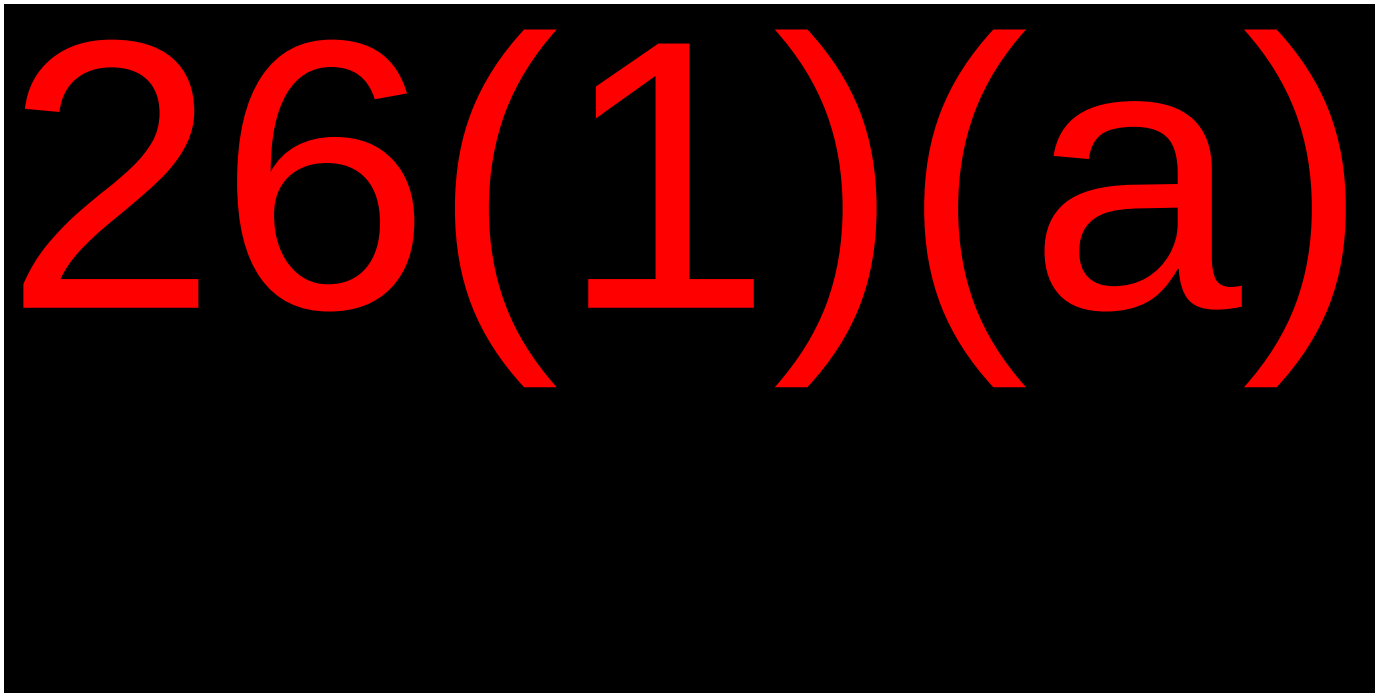

From: Guenard, Michelle (ECO/BCE) <Michelle.Guenard@gnb.ca>
Sent: Monday, June 6, 2022 5:23 PM
To: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>; Shephard, Dorothy Hon. (DH/MS) <Dorothy.Shephard@gnb.ca>; Sully, Jason (DH/MS) <Jason.Sully@gnb.ca>; Crain, Krista (DH/MS) <Krista.Crain@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>
Cc: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>

Subject: HOT TOPICS - Excess Deaths + vaccination rates +long covid +COVIDWATCH Tuesday

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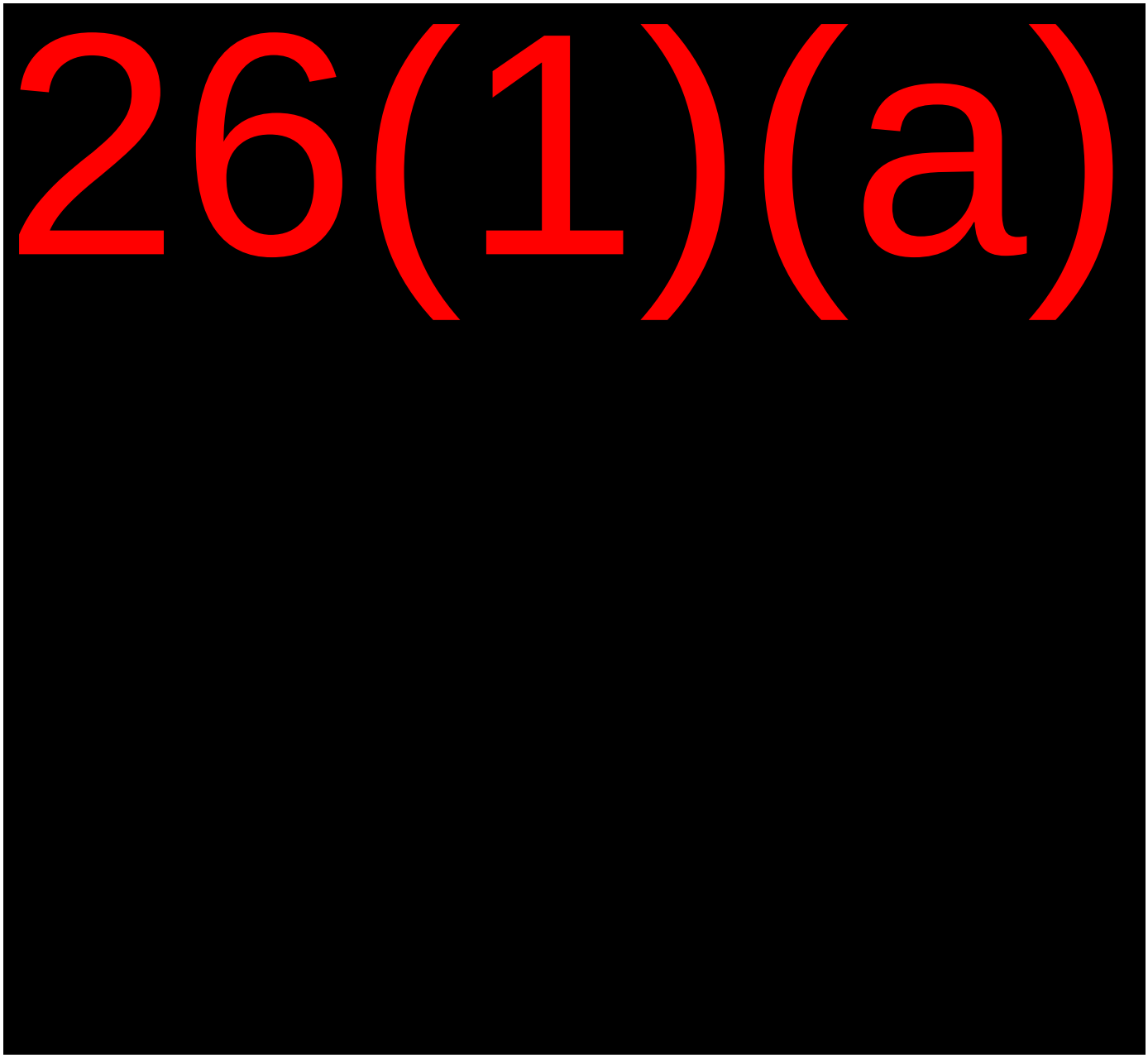


26(1)(a)

From:	Guenard, Michelle (ECO/BCE)
To:	Sully, Jason (DH/MS); Shephard, Dorothy Hon. (DH/MS); Crain, Krista (DH/MS); Kilfoil, Valerie (ECO/BCE); Day, Barbara (DH/MS); Power, Michaela (ECO/BCE); Elliott, Jennifer (DH/MS)
Cc:	Levesque, Eric J. (DH/MS); Liston, Heidi (DH/MS); Burkhardt, Tracey (DH/MS); Russell, Dr. Jennifer (DH/MS); Leger, Dr. Yves (DH/MS); Macumber, Jenny (DH/MS); Gilmore, Emily (DH/MS)
Subject:	FYI - 21(1) long COVID story published
Date:	June 9, 2022 12:46:25 PM

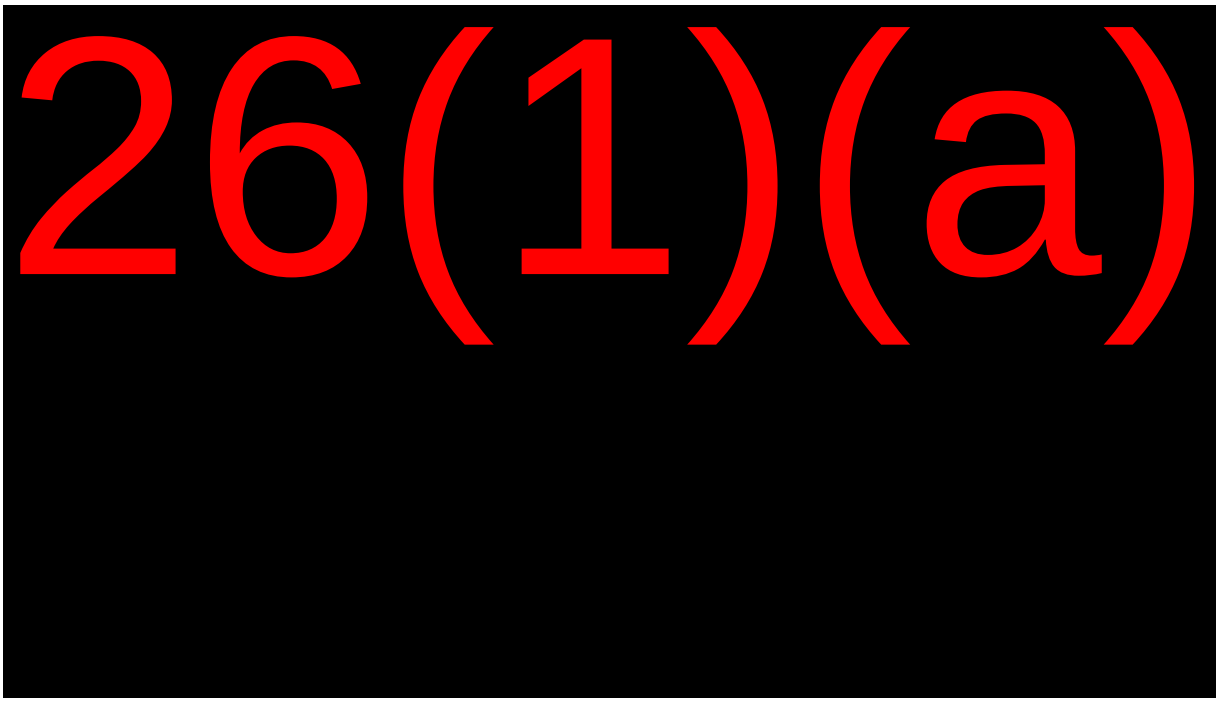
https://www.cbc.ca/news/canada/new-brunswick/long-covid-new-brunswick-help-health-kilfoil-awareness-day-1.6482107

Michelle Guenard
Communications Officer / Agent des communications
Department of Health / Ministère de la Santé

Tel/tél (506) 444-5221
Cell (506) 230-0692

From: Day, Barbara (DH/MS)
To: Power, Michaela (ECO/BCE)
Cc: Vass, Alex (ECO/BCE); Kilfoil, Valerie (ECO/BCE)
Subject: RE: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM
Date: June 15, 2022 10:30:00 AM

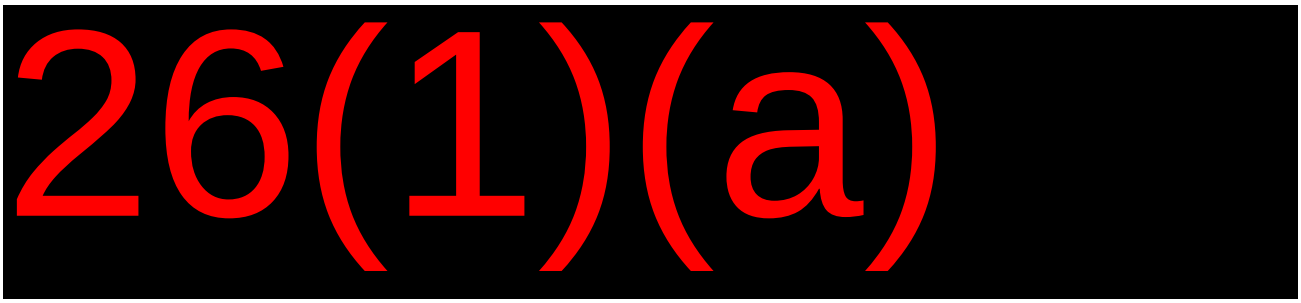
Thank you Michaela!
I have some updated messaging on long COVID from the Leg in session last week as well:



From: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Sent: June 15, 2022 10:27 AM
To: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Cc: Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>
Subject: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM

Barbara,

This was the media response for the end of May,



Do you know what came out of that roundtable discussion?

NAME: 21(1) [redacted]
OUTLET: CTV
CONTACT #: 21(1) [redacted]
EMAIL: 21(1) [redacted]@bellmedia.ca
DEADLINE TO SEND RESPONSE TO REPORTER: 5 PM
ROUTINE (Yes or No):
REQUEST:

I'm getting in touch just looking for some information for a story I'm doing on long COVID today.

I'm wondering if NB health is still tracking Long COVID cases in the province, and if not, when that stopped and why.

PROPOSED RESPONSE:

From: 21(1) [redacted]
Sent: Wednesday, June 15, 2022 9:06 AM
To: coreen.enos@gnb.ca
Subject: Query regarding LONG COVID from CTV Atlantic

Hello Coreen, I hope you are doing well!

I'm getting in touch just looking for some information for a story I'm doing on long COVID today.

I'm wondering if NB health is still tracking Long COVID cases in the province, and if not, when that stopped and why.

I'm working on a story for CTV News at Six tonight.

Please let me know if it's possible to get that information. Thanks so much,

21(1) [redacted]

21(1)

CTV News Atlantic

21(1)

From: Day, Barbara (DH/MS)
To: Chalifoux, Mathieu (DH/MS); LeBlanc, Shannon (DH/MS); Elliott, Jennifer (DH/MS); Kilfoil, Valerie (ECO/BCE); Vass, Alex (ECO/BCE)
Cc: Power, Michaela (ECO/BCE)
Subject: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM
Date: June 15, 2022 10:46:00 AM

Good morning everyone – we have a media request on long COVID. See proposed response, taken from Eric's bullets last week.
Can we add anything else in?

NAME: 21(1)
OUTLET: CTV
CONTACT #: 21(1)
EMAIL: 21(1) @bellmedia.ca
DEADLINE TO SEND RESPONSE TO REPORTER: 5 PM
ROUTINE (Yes or No):
REQUEST:

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I'm wondering if NB health is still tracking Long COVID cases in the province, and if not, when that stopped and why.

PROPOSED RESPONSE:

26(1)(a)

From: [redacted]
Sent: Wednesday, June 15, 2022 9:06 AM
To: coreen.enos@gnb.ca
Subject: Query regarding LONG COVID from CTV Atlantic

Hello Coreen, I hope you are doing well!

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I'm working on a story for CTV News at Six tonight.

Please let me know if it's possible to get that information. Thanks so much,

21(1)

[redacted]

CTV News Atlantic

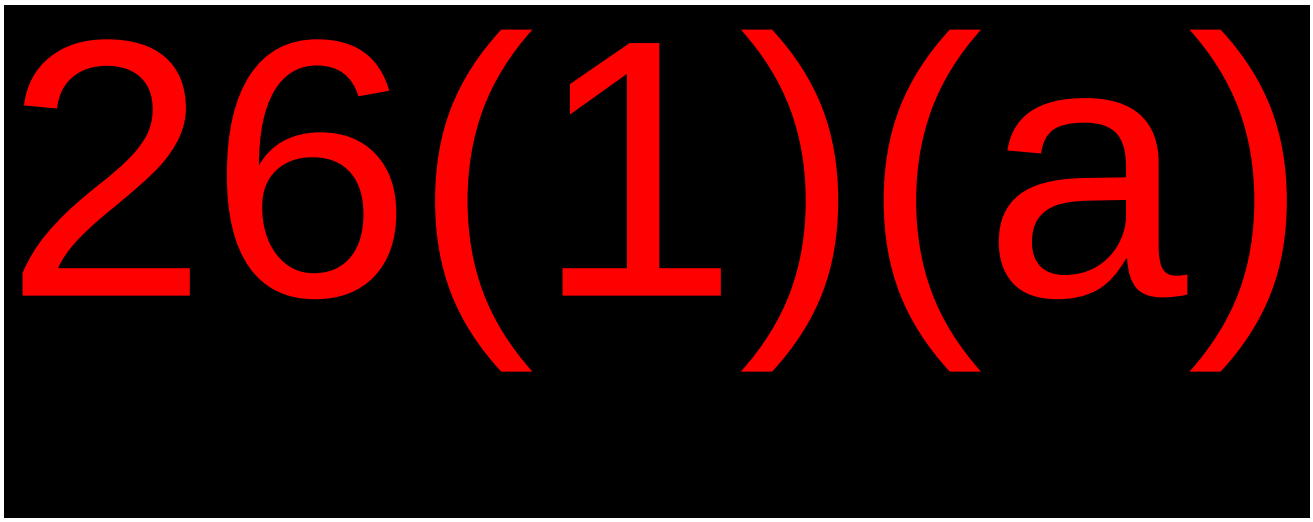
21(1) [redacted]

From: Day, Barbara (DH/MS)
To: McDavid, Kris (HorizonNB)
Cc: Chalifoux, Mathieu (DH/MS); Kilfoil, Valerie (ECO/BCE); Power, Michaela (ECO/BCE)
Subject: Media Request: Long COVID - CTV
Date: June 15, 2022 11:02:00 AM

Good morning Kris!

Just sending along our response to a media request on Long COVID since it notes the registry. Let me know if you have any concerns. Thanks!

PROPOSED RESPONSE:



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Barbara Day

COVID-19 Response Team / Équipe d'intervention COVID-19
NB Department of Health / Ministère de la santé du Nouveau-Brunswick
Fredericton, NB

From:	LeBlanc, Shannon (DH/MS)
To:	Levesque, Eric J. (DH/MS); Elliott, Jennifer (DH/MS); Day, Barbara (DH/MS); Chalifoux, Mathieu (DH/MS); Kilfoil, Valerie (ECO/BCE); Vass, Alex (ECO/BCE)
Cc:	Power, Michaela (ECO/BCE)
Subject:	RE: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM
Date:	June 15, 2022 12:08:10 PM

Barb,

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Thanks,
Shannon

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Sent: Wednesday, June 15, 2022 12:07 PM
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Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
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Subject: RE: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM

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To: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>
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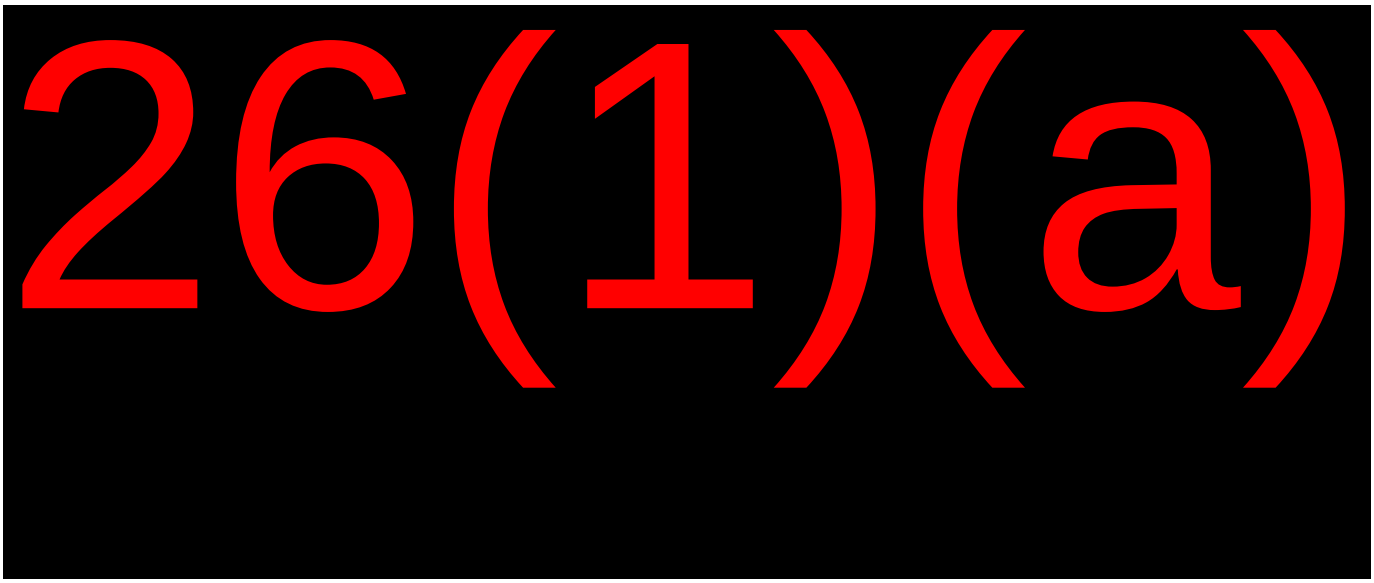

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21(1)

[redacted]

CTV News Atlantic

21(1) [redacted]

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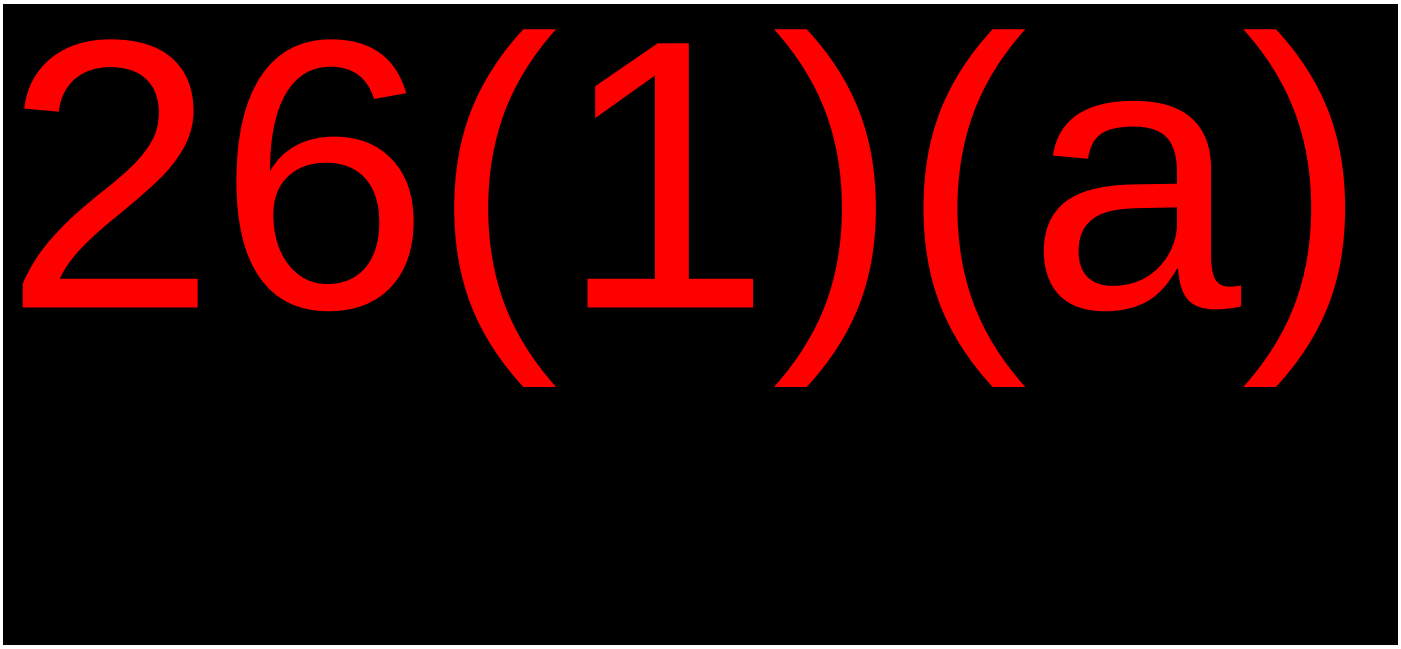
To: McDavid, Kris (HorizonNB)
Cc: Chalifoux, Mathieu (DH/MS); Kilfoil, Valerie (ECO/BCE); Power, Michaela (ECO/BCE)
Subject: RE: Media Request: Long COVID - CTV
Date: June 15, 2022 12:22:00 PM

Thanks Kris! A few edits were just made – for your records, revised version is below.



From: McDavid, Kris (HorizonNB) <Kris.McDavid@HorizonNB.ca>
Sent: June 15, 2022 12:20 PM
To: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Cc: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: RE: Media Request: Long COVID - CTV

Thanks Barb, no concerns from my end.

Kris McDavid
Senior Communications Advisor / Conseiller principal en communications
Communications and Community Relations / Communications et Relations communautaires
Horizon Health Network / Réseau de santé Horizon
(506) 626-1681
Kris.McDavid@horizonnb.ca
horizonnb.ca/news

From: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Sent: June 15, 2022 11:02 AM
To: McDavid, Kris (HorizonNB) <Kris.McDavid@HorizonNB.ca>
Cc: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
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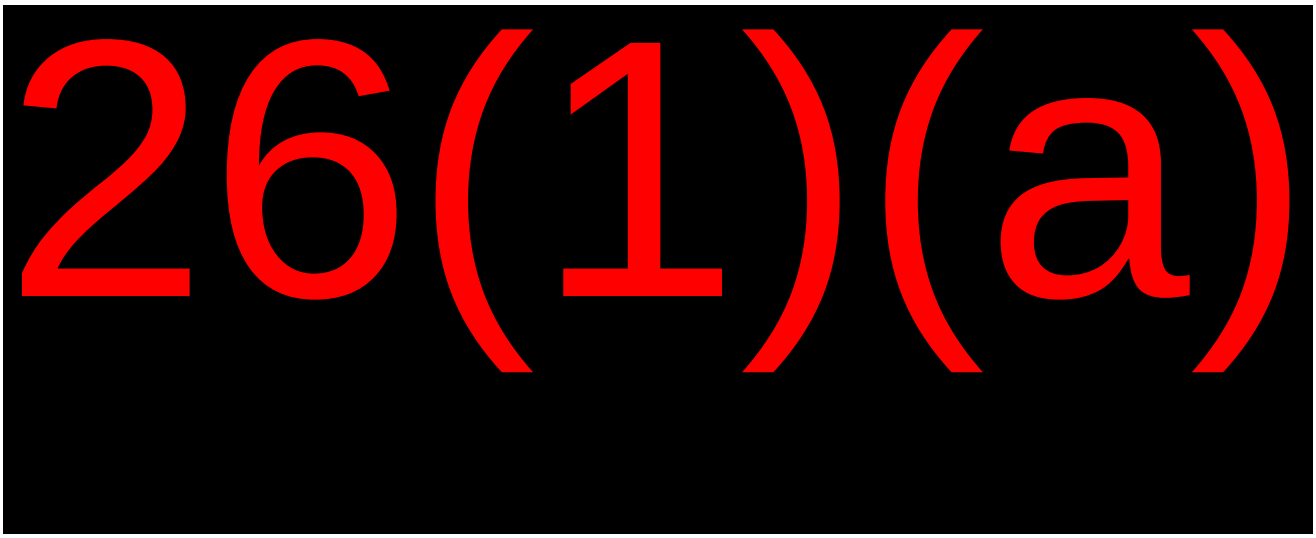

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Fredericton, NB

From:	Day, Barbara (DH/MS)
To:	Elliott, Jennifer (DH/MS); Power, Michaela (ECO/BCE); LeBlanc, Shannon (DH/MS); Levesque, Eric J. (DH/MS); Chalifoux, Mathieu (DH/MS); Kilfoil, Valerie (ECO/BCE); Vass, Alex (ECO/BCE)
Subject:	RE: Revised for approval: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM
Date:	June 15, 2022 1:54:00 PM

ECO is reworking some of the language. Stay tuned.

From: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Sent: June 15, 2022 1:36 PM
To: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>
Subject: RE: Revised for approval: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM

I will leave this one to Eric as lead on this file at this time.

Jennifer

From: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Sent: Wednesday, June 15, 2022 1:09 PM
To: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>
Subject: RE: Revised for approval: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM

Hi everyone,

I am checking on the status of this approval.

Thank you,

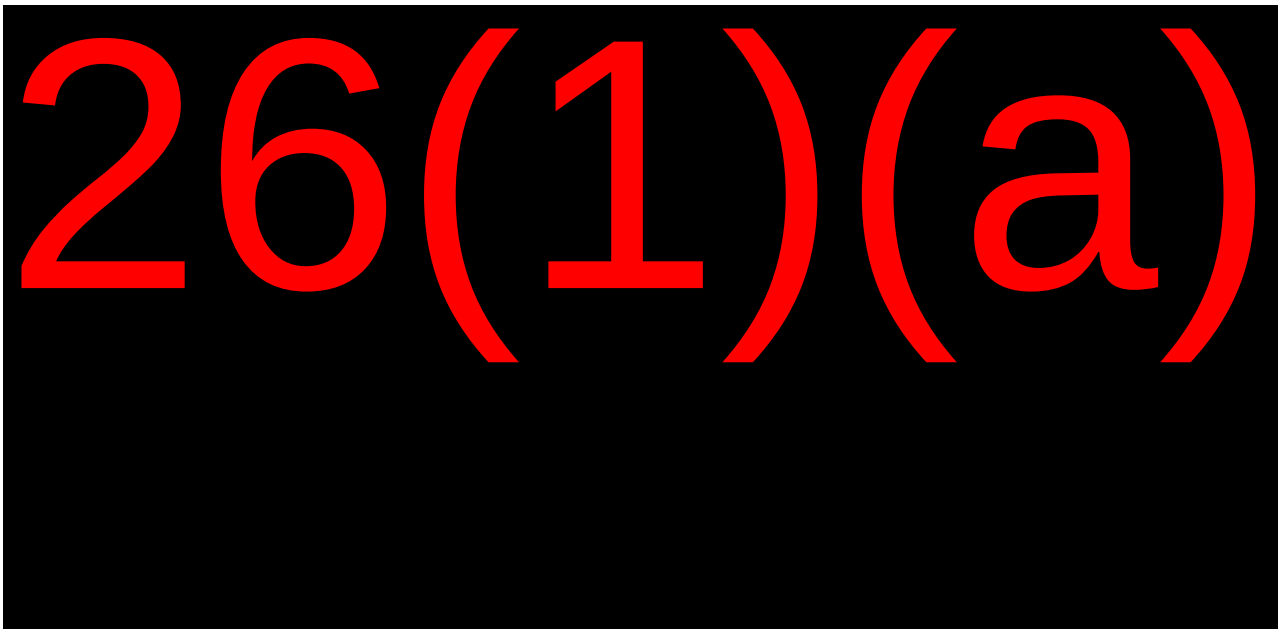
Michaela

From: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Sent: June 15, 2022 12:19 PM
To: LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: Revised for approval: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June

15 5PM

Will do - here's the revised version for review and approvals.

FOR APPROVAL:



From: LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>
Sent: June 15, 2022 12:08 PM
To: Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>
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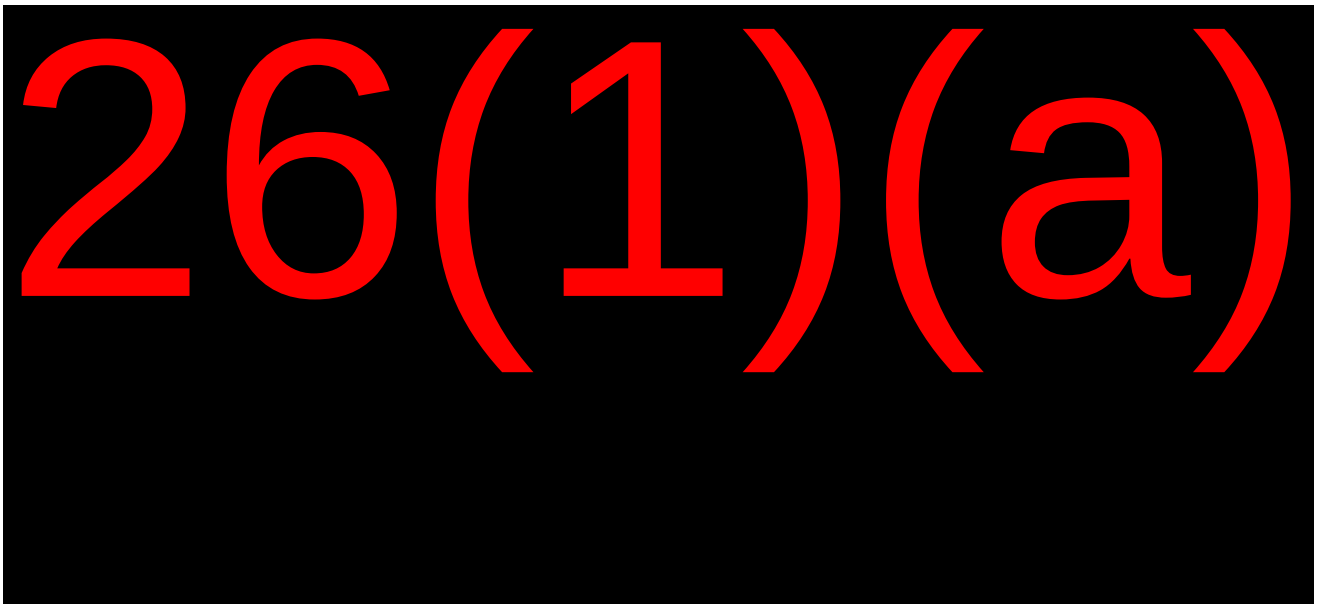

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[redacted]

CTV News Atlantic

21(1) [redacted]

From: MacDonald, Tammy (PHAC/ASPC) on behalf of CCMOH SECRETARIAT / CMHC (PHAC/ASPC)

To: Amy Riske; Andre Corriveau; Barbara Yaffe; Bedward, Cristina (PHAC/ASPC); CCMOH SECRETARIAT / CMHC (PHAC/ASPC); Dr. Asim Masood; Dr. Bonnie Henry; Dr. Brent Roussin; Dr. Deena Hinshaw; Dr. George Giovinazzo; Dr. Janice Fitzgerald; Russell, Dr. Jennifer (DH/MS); Dr. Kieran Moore; Dr. Luc Boileau; Dr. Michael Patterson; Dr. Saqib Shahab; Dr. Shannon McDonald; Dr. Shelley Deeks; Dr. Yves Jalbert; Leger, Dr. Yves (DH/MS); Evan Adams; Heather Morrison; Hostrawser, Bonnie (PHAC/ASPC); Jazz Atwal; Jing Hu; Julie Kryzanowski; Kami Kandola; Kathryn Suh; Kathryn Suh; Khatchadourian, Rouben (PHAC/ASPC); Marie D"aoust Gauthier ; Njoo, Howard (PHAC/ASPC); Paul Hasselback; Ponic, Pamela (PHAC/ASPC); Reka Gustafson; Rosann Seviour; Sharma, Supriya (HC/SC); Tam, Dr.Theresa (PHAC/ASPC); Tom Wong; Vincent Beswick-Escanlar

Cc: CCMOH SECRETARIAT / CMHC (PHAC/ASPC); Abdisamed, Samira (PHAC/ASPC); Abraham, Natalia k (PHAC/ASPC); Allison, Catherine (HC/SC); Archibald, Chris (PHAC/ASPC); Arnold, Eric (PHAC/ASPC); Barton, Kimby (PHAC/ASPC); Bayley, Michael (PHAC/ASPC); Belanger, Christopher (PHAC/ASPC); Bell, Tammy (PHAC/ASPC); Bent, Stephen (PHAC/ASPC); Bunka, Kathy (PHAC/ASPC); Capes, Jennifer (PHAC/ASPC); Carew, Maureen (PHAC/ASPC); Carignan, Kelly (PHAC/ASPC); Carter, Luke (HC/SC); Caux, Marie-Michele (HC/SC); CCMOH Secretariat; Cidsc Secretariat (PHAC/ASPC); Conly, Meghan (HC/SC); Connor, Kelly (HC/SC); Cronin, Niall (PHAC/ASPC); Davies, Stephanie (PHAC/ASPC); Dubuc, Martine (PHAC/ASPC); Evans, Cindy (PHAC/ASPC); Ferland, Claudia (PHAC/ASPC); Ferrer, Marvin (HC/SC); Fitzgerald-Husek, Alanna (PHAC/ASPC); Forbes, Nicole (PHAC/ASPC); Foster, Barbara (PHAC/ASPC); Galanis, Eleni (PHAC/ASPC); Galus, Dianne (PHAC/ASPC); Gaudreau, Marc-Andre (PHAC/ASPC); Gilmer, Jennifer (PHAC/ASPC); Grant, Andrew (PHAC/ASPC); Heisz, Marianne (PHAC/ASPC); Henry, Erin E (PHAC/ASPC); HPOC Chief Operations / Chef COPS (PHAC/ASPC); HPOC Stakeholders / Parties prenantes COPS (PHAC/ASPC); Hunter, Laurie (PHAC/ASPC); Tong, Jeffrey (HC/SC); Joyal, Martin (PHAC/ASPC); Kahn, Zoe (HC/SC); Kaplan, Maxwell (PHAC/ASPC); Knelsen, Ryan (PHAC/ASPC); Lachapelle, Stephane (PHAC/ASPC); Landry, Lisa (PHAC/ASPC); Langevin, Chantal (PHAC/ASPC); Laroche, Julie A (PHAC/ASPC); MacDonald, Diane (PHAC/ASPC); MacDonald, Tammy (PHAC/ASPC); McDonald, Alexa (PHAC/ASPC); McGarr, Holly (PHAC/ASPC); McGrath, Joanna (PHAC/ASPC); Motiwala, Fatema (PHAC/ASPC); Ngai, Shirley (PHAC/ASPC); Noorbhai, Aalia (HC/SC); Northwood, Brandon (PHAC/ASPC); Ogunnaike-Cooke, Susanna (PHAC/ASPC); Peterson, Katie (PHAC/ASPC); Belanger, Philippe (PHAC/ASPC); PHISC Secretariat / Secretariat Du CDISP (PHAC/ASPC); PHN Comms / RSP (HC/SC); Plamondon, Gabrielle (PHAC/ASPC); Poliquin, Guillaume (PHAC/ASPC); Purkis, Julia (PHAC/ASPC); Raymond, Barbara (PHAC/ASPC); Robinson, Kerry (PHAC/ASPC); Rodin, Rachel (PHAC/ASPC); Russo, Laura (HC/SC); Salvadori, Marina (PHAC/ASPC); Sciberras, Jill (PHAC/ASPC); Turbett, Scott (PHAC/ASPC); Sicard, Nadine (PHAC/ASPC); Simison, Bethany (PHAC/ASPC); St-Aubin, Candice (PHAC/ASPC); Stephenson, Katarina (PHAC/ASPC); TAC Secretariat ; Talat, Barkhaa (PHAC/ASPC); Yalkin, Tolga (HC/SC); Tong, Jeffrey (HC/SC); Tunis, Matthew (PHAC/ASPC); Ugnat, Anne-Marie (PHAC/ASPC); Warshawsky, Bryna (PHAC/ASPC); Wong, Louis (PHAC/ASPC); Alison Taylor; Aman Saini; Salmon, Dr. Andrew (DH/MS); Rahman, Dr. Arifur (DH/MS); Ashley Halicki; Avis Gray; Brian Emerson; Carol Kurbis; Carrie Murphy; Catherine O"Keefe; Celete Loewe; Christine Drummond; Cindy Rogers; Colleen Dudar; Colleen Kovach; D Jones; Daniele Behnsmith; French, Danielle (DH/MS); David Jones (david.butler-jones@sac-isc.gc.ca); David Sabapathy; Dawn Osciak; Debbie Panchyshyn; Dhara Arundhati; Diane Lu; Dominique Elien-Massenat; Doreen Tachaberry; Dr. Daniel Warshafsky; Dr. James Brooks; Dr. Michelle Murti; Dr. Peter Clifford; Eilish Cleary; Elaine Look; Elizabeth Choi; Elizabeth Samuels ; Erin Bentley; Ernest Ebert; Evan Sotiropoulos; Eveline Toth; Fiona Kouyoumdjian; George Doyle-Bedwell; Gillian MacDonald; Smadi, Hanan (DH/MS); Helene Venables; J E Sherren; Jason Letto; Jeffrey Catterall; Elliott, Jennifer (DH/MS); Jennifer White; Jenny Green; Macumber, Jenny (DH/MS); Jessica Irvine; Sargent, Jessica (DH/MS); McGowan, Joan (DH/MS); Joann Majerovich ; Jocelyn LeBlond; Jonathan Smith; Jordyn Lerner; Juanita Follett; Dean, Kelly (Ext.); Khan, Ibrahim; Barker, Dr. Kimberley (DH/MS); Laura Hillier; Laurel Thompson; Lisa Haubrich; Lyn Yeo; Lynda Earle; Lynda Tjaden; Marcia Anderson ; Dr. Marguerite Cameron; Marianne Henderson; Marie-France Raynault (marie-france.raynault.ccsmtl@ssss.gouv.qc.ca); Marilyn Massey; McKelvie, Dr. Mark (DH/MS); Chalifoux, Mathieu (DH/MS); Michael Nicolls; Michele Deschamps; Michelle Sveinson; Natalie Theriault; NBPH CRT (DH/MS); van der Pluijm, Nina (DH/MS); Parminder Thiara; Patty Beck; Petiquan, Alexandre; Richard Baydack; RaaFat Gad, Dr. Rita (DH/MS); Rosana Salvaterra; Rosemarie Ramsingh ; Sadhana Thiyanavadivel; Samantha Salter; Samantha Thomas; Sanaz Vaseghi; Sangeeta Gupta; Sarah Barkley ; Sarin, Chris; LeBlanc, Shannon (DH/MS); Landsburg, Shelley (DH/MS); SK Single Window; Gauvin, Sophie (DH/MS); Stacey Burns; Clair, Suzanne (DH/MS); Sylvie Poirier; Tami Denomie; Tanya Straight; Tim Hilderman; Tracey Aylward; Valerie Bérard ; Valerie Fontaine; Wajid Ahmed; Donovan, Wendy (DH/MS); YK Surveillance

Subject: FYI: Post-COVID Condition / PVI : Le syndrome post-COVID-19

Date: June 16, 2022 10:12:48 AM

Attachments: Long COVID deck - for PTs (with Canadian data).EN.pptx
Deck Syndrome Post Covid19 PTs.FR.pptx

ATTENTION! External email / courriel externe.

Good morning SAC members,

At the June 6th HMM, Minister Duclos committed to sharing information on Post-COVID condition; as such, we are forwarding the attached for your information and awareness. SAC has been briefed on the studies underway and when more data becomes available (around mid-fall), results will be

provided to SAC for a discussion on next steps.

Thank you,
SAC Secretariat

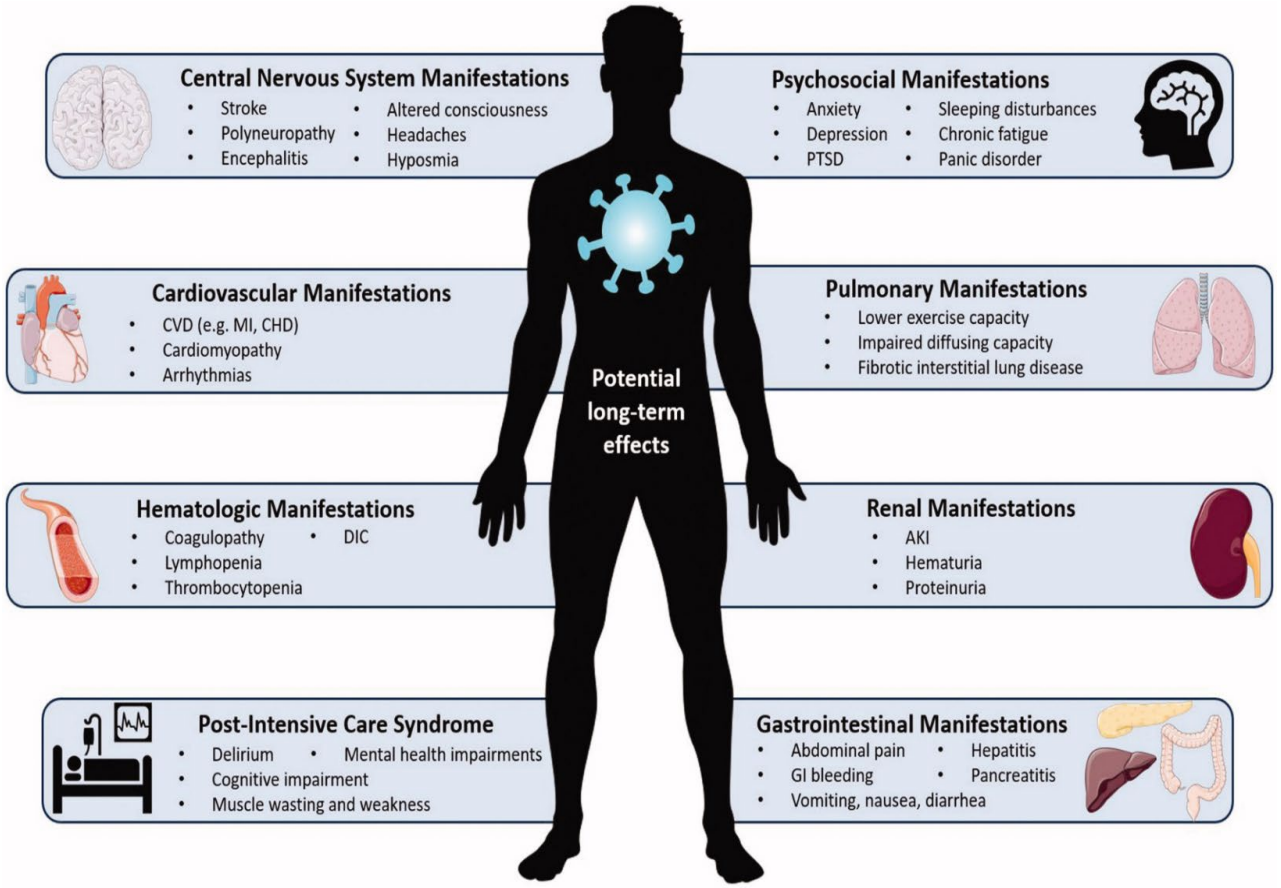
Public Health Agency of Canada | Agence de la santé publique du Canada

Canadian Institutes of Health Reseach | Instituts de recherche en santé du Canada

Canada

Update on Post COVID Condition: Review of Scientific Evidence, Federal Actions and Way Forward

What is post COVID-19 condition or Long COVID?



Higgins et al, *Crit Rev Clin Lab Sci,* 2020

- First clinical case definition of post COVID-19 condition in adults (WHO, 2021) refers to symptoms that cannot be explained by an alternative diagnosis and that are experienced at 12 weeks or more after the onset of COVID-19.
- It can affect both **adults and children**.
- **Broad range of symptoms** including fatigue, shortness of breath, cognitive dysfunction but also others and generally have an impact on everyday functioning.

- Symptoms **fluctuate in intensity and frequency** and impact different organ systems, making diagnosis more challenging.
- Absence of a **universally accepted case definition** for post COVID-19 condition.

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 disproportionally 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 International Context

USA

- No robust estimate about common post COVID-19 condition is, but a recent White paper presents evidence about the characteristics of individuals diagnosed with long COVID:
  - 75.8% had not been hospitalized for COVID-19; Individuals aged 36 to 50 years old were more likely to be diagnosed with long COVID compared to other age groups; 30.7% of patients with long COVID had no identified pre-existing comorbidities
- The Biden Administration announced an accelerated whole-of-government effort to prevent, detect and treat long COVID, including:
  - Delivering high-quality care, services, and supports for individuals experiencing Long COVID
  - Research to understand, prevent, diagnose, treat, Long COVID

UK

- It is estimated that 1.3 million people were experiencing self-reported long COVID symptoms 12 weeks after initial infection
- Guidelines to support clinicians: “COVID-19 rapid guideline: managing the long-term effects of COVID-19” (May 2022)
- Support for specialized interdisciplinary clinics
  - UK: NHS England and NHS Improvement funded the establishment of long COVID assessments clinics for adults and children. CAD $230 million so far

International cooperation to address knowledge gaps

- G7 Science Ministers meeting in June 2022 to strengthen international cooperation to address post COVID-19 condition

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

Engagement and Collaboration

Experts and other government departments/levels

- **Provincial and territorial governments** – regular updates at several FPT tables
- Collaboration with **academic experts** on systematic reviews and surveillance
- Office of the Chief Science Officer (PHAC) broader scientific network
- **PHAC led Inter-Departmental Working Group**: PHAC, HC, CIHR, Stat Can, ISC, ESDC, CIHI
- Emerging collaboration on economic modelling

National health organizations / professional associations

- Canada's Drug and Health Technology Agency (CADTH) (national roundtable on models of care)
- College of Family Physicians of Canada (information-sharing for guidelines development)
- Canadian Paediatric Society (surveillance of Post COVID-19 condition in children)

Patient partnerships

- Panel of individuals living with post COVID-19 condition
  - whose valuable input from a patient's perspective have supported various PHAC-led initiatives (e.g., web content, rating of outcomes for systematic reviews)

International engagement to share latest scientific evidence

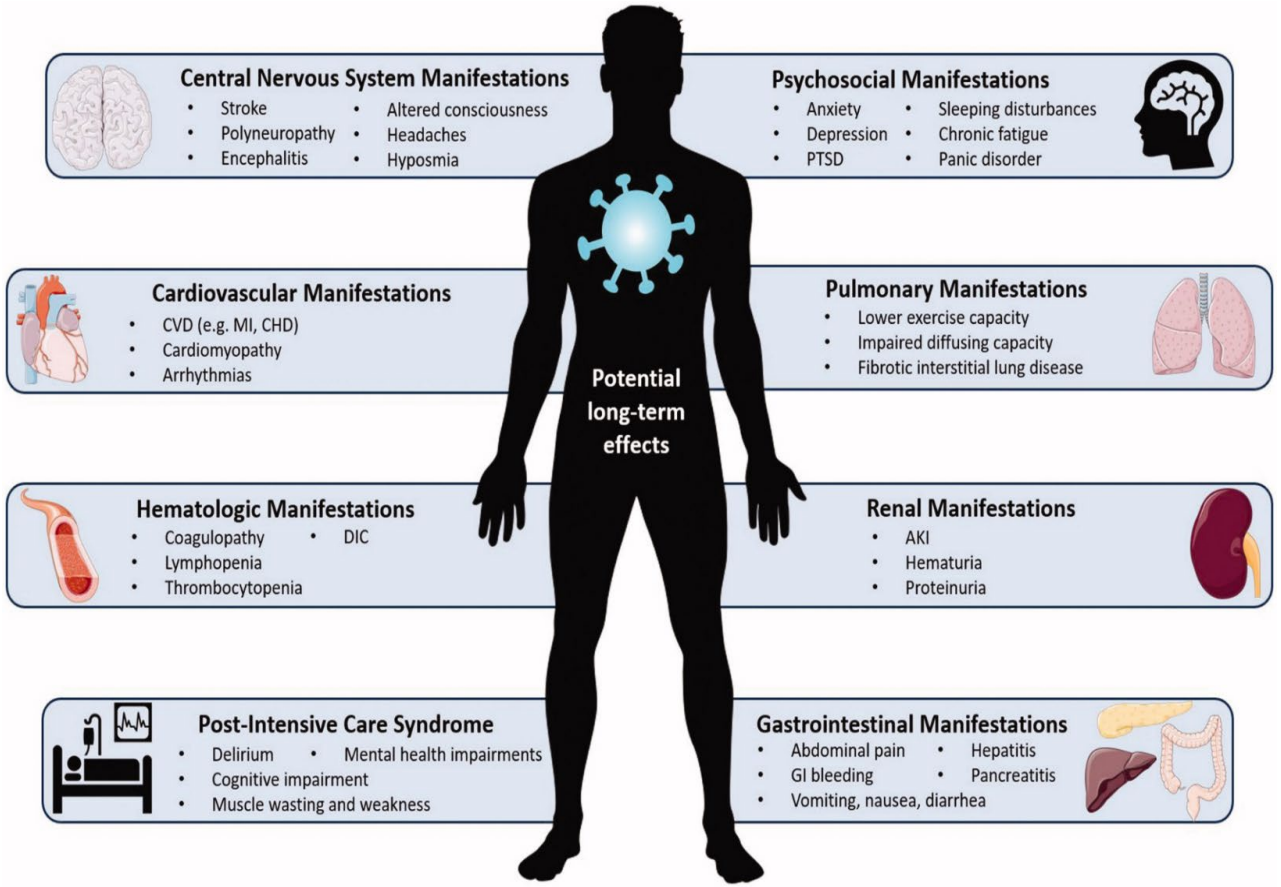
- e.g. WHO, the UK National Institute for Health and Care Excellence

Public Health Agency of Canada | Agence de la santé publique du Canada
Canadian Institutes of Health Reseach | Instituts de recherche en santé du Canada

Canada

Mise à jour sur le syndrome post-COVID-19 : Examen des preuves scientifiques, des mesures fédérales et de la voie à suivre

Qu'est-ce que le syndrome post-COVID-19 ou COVID longue?



Higgins et al, *Crit Rev Clin Lab Sci,* 2020

- La première définition de cas clinique du syndrome post COVID-19 chez l'adulte (OMS, 2021) fait référence à des symptômes qui ne peuvent être expliqués par un autre diagnostic et qui sont ressentis 12 semaines ou plus après l'apparition de la COVID-19.
- Elle peut toucher **aussi** bien les **adultes que les enfants**.
- **Large éventail de symptômes** comprenant la fatigue, l'essoufflement, le dysfonctionnement cognitif mais aussi d'autres et ayant généralement un impact sur le fonctionnement quotidien.
- Les symptômes **fluctuent en intensité et en fréquence** et touchent différents systèmes organiques, ce qui rend le diagnostic plus difficile.
- Absence d'une **définition de cas universellement acceptée** pour le syndrome post-COVID-19.

Nouvelles preuves scientifiques

Prévalence - il existe un large éventail d'estimations de la prévalence chez les personnes précédemment infectées.

- Selon l'OMS, 10 à 20 % des personnes infectées par la COVID-19 développeront le syndrome post-COVID-19.
- Plusieurs études **(avant Omicron**) ont révélé qu'environ 30 à 40 % des personnes qui n'ont pas été hospitalisées pour leur infection initiale par la COVID-19 présentent encore des symptômes après 12 semaines.
- Un **examen systématique récent avec méta-analyse** (137 études ; jusqu'en décembre 2021) [*SSRN Lancet prepub*] ont révélé que :
  - la prévalence de tout symptôme de la COVID longue était de 54 % (IC 95 % : 34-73 %) à 6 mois et de 54 % (IC 95 % : 44-65 %) à 12 mois de suivi
  - les symptômes neuropsychiatriques présentent une prévalence à long terme plus élevée et une persistance plus longue que les symptômes physiques.

Preuves scientifiques émergentes - con't

Facteurs de risque et effet de la vaccination

- **Les femmes** semblent être touchées de manière disproportionnée.
  - Un récent livre blanc américain a révélé que 60 % des personnes diagnostiquées comme souffrant du syndrome post-COVID-19 étaient des femmes (contre 40 % chez les hommes).
- Une récente étude systématique et une méta-analyse ont révélé que les facteurs de risque comprenaient :
  - sexe féminin
  - ceux qui ont souffert d'une infection aiguë grave de la COVID-19 ou qui ont été hospitalisés pour une infection aiguë à la COVID-19
- Des recherches préliminaires suggèrent que la **vaccination (2 doses) pourrait réduire le risque** de développer le syndrome post-COVID-19 en cas d'infection. (Cependant, d'autres recherches sont necessaires.)

Impact socio-économique

- Les preuves de l'**impact sur l'emploi** émergent
  - Sur la base d'un examen des études mondiales :
    - entre 9 et 22 % des individus ne travaillaient pas 3 mois ou plus après une infection aiguë
    - 10-46% ont dû réduire leur horaire de travail

Nouvelles variantes

- D'après une nouvelle enquête menée au Royaume-Uni, la probabilité de déclarer des symptômes de la COVID longue quatre à huit semaines après une première infection au coronavirus (COVID-19) était 49,7 % plus faible dans les infections compatibles avec la variante Omicron BA.1 que dans celles compatibles avec la variante Delta chez les adultes qui étaient doublement vaccinés au moment de l'infection (Remarque : la définition officielle de la COVID longue est de 12 semaines et plus).

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.

Ce que nous ne savons pas - résumé des principales lacunes en matière de connaissances

- Quels sont les mécanismes biologiques sous-jacents permettant d'estimer pleinement les impacts sanitaires du syndrome post-COVID-19 et comment y remédier

- Compréhension imprécise des impacts du syndrome post-COVID-19 indépendamment des impacts plus larges de la pandémie.
  - Par exemple, l'impact de la pandémie sur la santé mentale et les longs symptômes COVID liés à la santé mentale.

- À l'heure actuelle, il **n'existe aucun traitement** pour le syndrome post-COVID-19.

- Aucune mesure préventive claire, à part la prévention de l'infection initiale par la COVID-19. Quelques preuves de l'effet protecteur de la vaccination COVID-19 (2 doses) contre la SPC, mais les preuves sont limitées.

- Il est trop tôt pour déterminer le risque du syndrome post-COVID-19 associé aux différentes variantes.

- Le **fardeau du syndrome post-COVID-19 au Canada** est inconnu.
  - Proportion de la population touchée, dans tous les sous-groupes, en particulier chez les enfants, les populations autochtones et les populations racialisées.
  - Les preuves sont insuffisantes à ce jour pour déterminer les impacts socio-économiques du syndrome post COVID-19 et son impact sur le système de soins de santé et l'économie au sens large ; cependant, des travaux préliminaires sont en cours pour générer les premières preuves des impacts au Canada.

Comprendre l'impact du syndrome post-COVID-19

- **Les données/preuves de recherche spécifiques au Canada** peuvent ne pas être disponibles avant un certain temps.
  - Les IRSC prévoient des investissements supplémentaires dans la recherche sur la COVID longue, mais il faudra peut-être plusieurs années avant que ces investissements ne produisent des résultats clairs et solides.
  - Bien que les résultats préliminaires de l'Enquête canadienne sur les anticorps anti-COVID-19 et la santé soient attendus entre août et octobre 2022, les résultats définitifs ne seront pas disponibles avant le début de 2023. En outre, selon les taux de réponse à l'enquête, il se peut que les informations sur la prévalence par sous-groupes spécifiques de la population ne soient pas disponibles.
  - Nous pourrions avoir besoin de nous appuyer sur des preuves internationales émergentes pour le court terme.

- Il sera difficile d'estimer l'**impact socio-économique** du syndrome post-COVID-19
  - Les investissements actuels dans la recherche financée par les IRSC ont surtout porté sur la recherche clinique ou biomédicale. Les études sur les impacts socio-économiques peuvent ne pas être couvertes.
  - Le manque de données sur le syndrome post-COVID-19 (c'est-à-dire la prévalence, les facteurs de risque, la pathophysiologie, les trajectoires de guérison et l'utilisation des soins de santé, les effets sur le travail et les rôles de soins, etc.
    - Le travail peut commencer avec les meilleures preuves internationales disponibles à ce jour, et sera ensuite affiné lorsque des estimations plus solides seront disponibles.
- **Les groupes de patients** se mobilisent, au Canada et à l'étranger - des appels à l'action de la part des organisations de patients et de soins de santé sont attendus.

Contexte national actuel

Le fardeau du syndrome post-COVID-19 est inconnu au Canada

- Il n'existe pas encore d'estimations solides de la fréquence du syndrome post-COVID-19 au Canada, en particulier chez les enfants, les populations autochtones et les populations racialisées.

- Les preuves sont insuffisantes à ce jour pour déterminer les impacts socio-économiques du syndrome post-COVID-19 et son impact sur le système de santé et l'économie au sens large (par exemple, le retour des enfants à leurs activités normales, le retour des adultes au travail, l'impact sur les soignants, l'utilisation des services de soins de santé, etc.)

Une série d'activités fédérales et des PT en cours

- Les activités des PT comprennent le développement de traitements spécialisés et de cliniques de récupération, ainsi que des initiatives de recherche et de surveillance.

- Diverses actions du portefeuille de la santé sont en cours pour combler les lacunes, améliorer la compréhension et soutenir la coordination FPT des efforts (voir l'aperçu à la diapositive 10).

Le contexte international actuel

USA

- Il n'existe pas d'estimation robuste sur la prévalence du syndrome post-COVID-19, mais un récent livre blanc présente des données sur les caractéristiques des personnes diagnostiquées avec la COVID longue:
  - 75,8 % n'avaient pas été hospitalisés pour la COVID-19 ; les personnes âgées de 36 à 50 ans étaient plus susceptibles d'être diagnostiquées avec une COVID longue par rapport aux autres groupes d'âge ; 30,7 % des patients avec une COVID longue n'avaient pas de comorbidités préexistantes identifiées.
- L'administration Biden a annoncé un effort accéléré de l'ensemble du gouvernement pour prévenir, détecter et traiter la COVID longue, y compris :
  - Fournir des soins, des services et des aides de haute qualité aux personnes qui vivent une expérience de longue durée.
  - Recherche pour comprendre, prévenir, diagnostiquer, et traiter la COVID longue

ROYAUME-UNI

- On estime que 1,3 million de personnes présentaient des symptômes de la COVID longue déclarés par elles-mêmes 12 semaines après l'infection initiale.
- Lignes directrices pour soutenir les cliniciens : " *COVID-19 rapid guideline : managing the long-term effects of COVID-19* " (mai 2022).
- Soutien aux cliniques interdisciplinaires spécialisées
  - ROYAUME-UNI : NHS England et NHS Improvement ont financé la création de longues cliniques d'évaluation de la COVID longue pour les adultes et les enfants. 230 millions de dollars canadiens jusqu'à présent

Coopération internationale pour combler les lacunes en matière de connaissances

- Réunion des ministres de la science du G7 en juin 2022 afin de renforcer la coopération internationale pour faire face au syndrome post-COVID-19

Actions actuelles du portefeuille de la santé à ce jour : Principalement axé sur la collecte et la production de preuves et l'engagement.

Recherche financée

Les IRSC ont investi ~17,7 millions de dollars pour financer 41 projets d'intervention rapide ciblant la recherche sur le syndrome post-Covid-19.

D'autres projets de recherche sur le syndrome post-COVID-19 ont été financés par des concours non ciblés.

Surveillance

- Évaluation des sources de données pour la surveillance du syndrome post-COVID-19 au Canada
- Enquête canadienne sur les anticorps COVID-19 et la santé (lancée au printemps 2022)

Synthétiser et diffuser les données probantes

- *Best Brain Exchange* (mai 2021)
- Examens systématiques des études scientifiques sur la prévalence, les facteurs de risque et les interventions préventives.
- Analyses bihebdomadaires des recherches nouvelles/émergentes
- Contenu du site

Engagement et collaboration

- Mises à jour provinciales et territoriales
- Organisations nationales de santé/associations de professionnels de la santé
- Partenariats avec les patients
- International - OMS, Royaume-Uni, GloPOD-R
- Engagement sur la modélisation économique

Activités à venir concernant le syndrome post-COVID-19

- Les IRSC continueront d'investir dans la recherche sur les effets à long terme des infections à la COVID-19 sur les Canadiens, ainsi que sur les impacts plus larges de la COVID-19 sur la santé et les systèmes de soins de santé.

- L'ASPC **soutiendra la surveillance des données et de la santé publique et élaborera des outils et des lignes directrices**
  - En partenariat avec Statistique Canada, des organisations universitaires, les provinces et territoires et le Groupe de travail sur l'immunité contre la COVID-19, nous avons élaboré et lancé l'Enquête canadienne sur les anticorps et la santé liés à la COVID-19 au printemps 2022.
    - La première enquête de population sur le syndrome post-COVID-19 au Canada permettra d'estimer la prévalence chez les adultes au Canada, de décrire les facteurs de risque et d'examiner l'impact sur la santé globale et le fonctionnement quotidien.
  - Une enquête de suivi est prévue en 2023.
  - L'ASPC continuera à chercher des sources de données supplémentaires sur le syndrome post-COVID-19 à partir des systèmes de surveillance existants
  - En outre, l'ASPC élaborera des lignes directrices fondées sur des données probantes et adaptées au contexte canadien pour l'identification, la prévention et la gestion (y compris des modèles de soins) du syndrome post-COVID-19.

Exemples d'investissements des IRSC dans la recherche sur la COVID longue

- **IRSC** a déjà investi **17,7 millions de dollars** pour financer **41 études de recherche ciblées sur le syndrome post-COVID-19.**

- **Étude de cohorte prospective canadienne COVID-19 (CANCOV) (2,1 M$)**
  - Consortium de recherche canadien étudiant l'ensemble des impacts sanitaires et des facteurs de risque de la COVID-19.
  - Les résultats préliminaires montrent une série de symptômes associés au syndrome post-COVID-19.
  - Étude de la manière dont le syndrome post-COVID-19 peut entraîner une invalidité à plus long terme et implications pour les Canadiens qui ont contracté la COVID-19

- **Étude longitudinale canadienne sur le vieillissement (investissement permanent de 8 millions de dollars par an)**
  - Une recherche de plus de 20 ans sur la santé de plus de 50 000 adultes canadiens.
  - En 2020, le projet a pivoté vers l'étude des effets de la COVID-19 sur les personnes âgées, en étudiant les impacts sur la santé physique et mentale, ainsi que les changements dans l'accès aux services de santé.

- **Le réseau COVID-19 Evidence Network to support Decision-making** et la **Strategy for Patient-Oriented Research Evidence Alliance** examinent les meilleures données disponibles sur les modèles de soins pour les personnes vivant avec le syndrome post-COVID-19.

Activités de surveillance actuelles de l'ASPC

Mesurer et surveiller l'ampleur et l'impact du syndrome post-COVID-19 et des symptômes connexes au Canada, en partenariat avec Statistique Canada, les organisations universitaires, les provinces et les territoires.

Enquête canadienne sur les anticorps COVID-19 et la santé (printemps 2022)

La première enquête de population sur le syndrome post-COVID-19 au Canada sera réalisée :

- Estimer la prévalence du syndrome post-COVID-19 chez les adultes au Canada
- Décrire les facteurs de risque ainsi que la gamme, la prévalence et la durée des symptômes signalés.
- Examiner l'impact du syndrome post-COVID-19 sur la santé globale et le fonctionnement quotidien.

Comment :

- Collaboration ASPC\Statistiques Canada\Groupe de travail canadien sur l'immunité (GTCI)
- L'échantillon cible est de 100 000 Canadiens âgés de 18 ans et plus sélectionnés au hasard dans les 10 provinces.
- Le CITF s'appuie sur l'enquête pour inclure des kits de test de la tache de sang séché (DBS) pour tester les anticorps du SRAS-CoV-2 acquis par l'infection et/ou induits par le vaccin. Les répondants qui choisissent d'effectuer le volet du test DBS recevront un rapport personnalisé de leurs résultats.
- La collecte des données se poursuit jusqu'en juin 2022. Résultats préliminaires attendus entre août et octobre 2022 ; les résultats définitifs seront publiés au début de 2023.

Évaluation d'autres sources de données pour la surveillance du syndrome post COVID-19 au Canada

- Utilisation des données des dossiers médicaux électroniques et des systèmes de surveillance existants pour les maladies chroniques
- Syndrome post-COVID-19 chez les enfants au Canada : étude du Programme canadien de surveillance pédiatrique (en cours d'élaboration)

Synthèse et diffusion des données probantes actuelles de l'ASPC

Analyses continues des preuves et des réponses politiques

- Analyses bihebdomadaires des recherches nouvelles / émergentes sur le syndrome post-COVID-19
- Synthèse vivante COVID-END/SPOR - rôle potentiel pour des mises à jour régulières sur la COVID longue

Examens rapides et mémoires sur les preuves (ASPC / financé par l'ASPC)

- Dossier de preuves vivantes sur les associations et la sécurité de la vaccination COVID-19 et le syndrome post-COVID-19
- Mise à jour 1 - 14 avril 2022 (en cours de finalisation pour distribution dans le tracker de cette semaine)

Examens systématiques (ASPC)

- Facteurs de risque et interventions préventives pour le syndrome post-COVID-19 : revue systématique vivante (Pré-impression mars 2022)
- Prévalence des effets à long terme chez les personnes diagnostiquées avec la COVID-19 : une revue systématique vivante (Pré-impression juin 2021 ; en cours d'examen par les pairs)

Événements et produits d'échange de connaissances et de traduction

- Échanges Meilleurs Cerveaux (mai 2021)
- Contenu Web sur Canada.ca

Engagement et collaboration

Experts et autres ministères/niveaux de gouvernement

- **Gouvernements provinciaux et territoriaux** - mises à jour régulières à plusieurs tables FPT
- Collaboration avec des **experts universitaires** sur les examens systématiques et la surveillance
- Réseau scientifique élargi de l'Office of Chief Science Officer (PHAC)
- **Groupe de travail interministériel dirigé par l'ASPC** : ASPC, SC, IRSC, Stat Can, ISC, ESDC, CIHI
- Collaboration émergente en matière de modélisation économique

Organisations nationales de santé / associations professionnelles

- Agence canadienne des technologies de la santé et des médicaments (ACMTS) (table ronde nationale sur les modèles de soins)
- Collège des médecins de famille du Canada (partage d'informations pour l'élaboration de lignes directrices)
- Société canadienne de pédiatrie (surveillance du syndrome post-COVID-19 chez les enfants)

Partenariats avec les patients

- Panel d'individus vivant avec le syndrome post-COVID-19
  - dont les précieuses contributions du point de vue des patients ont soutenu diverses initiatives de l'ASPC (p. ex. contenu du site Web, évaluation des résultats pour les examens systématiques).

Un engagement international pour partager les dernières preuves scientifiques

- Par exemple, l'OMS, le National Institute for Health and Care Excellence du Royaume-Uni.

From: NBPH_CRT (DH/MS)
To: Leger, Dr. Yves (DH/MS)
Cc: Donovan, Wendy (DH/MS); Clair, Suzanne (DH/MS)
Subject: FW: inquiry
Date: June 17, 2022 10:39:04 AM
Attachments: Long COVID deck - for PTs (with Canadian data).EN.pptx
Deck Syndrome Post Covid19 PTs.FR.pptx

Hi Dr. Leger,

As an update, we received a very comprehensive overview Powerpoint on Long COVID from PHAC this week (attached). I have asked Sharmeen to look for any relevant research that is not included in that presentation. Has the decision been made as to how we will engage with Ability NB – a presentation or provide them with reputable information? 26(1)(a) [redacted]

Thank you,

Lori

From: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Sent: Thursday, June 16, 2022 9:06 AM
To: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Subject: RE: inquiry

These would be their current clients or referrals from other community partners, which could be a primary care provider, but most are from SCCR, EMP, SD and other community agencies.

At this point the province is going with the WHO definition from the latest discussion I have heard.

26(1)(a) [redacted]

Jennifer

From: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>
Sent: Thursday, June 16, 2022 8:30 AM
To: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Cc: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Subject: RE: inquiry

As I sent my first note this morning I had an additional thought.

AbilityNB has indicated that they have “started to see referrals of individuals experiencing possible effects of long COVID-19 with symptoms impacting mobility"….Do we have any concerns (I am thinking liability) that individuals are being treated/diagnosed as long COVID without a case definition? Secondly, would these referrals be coming from a Physician?

With Thanks,

16(1.1) [redacted]

Wendy Donovan
Executive Director / Directrice générale
Public Health / Santé publique
COVID Response Team / équipe d’intervention COVID
NB Department of Health / Ministère de la santé du Nouveau-Brunswick

Phone / Téléphone : 506.461.1391
E-mail / Courriel : Wendy.Donovan@gnb.ca

From: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Sent: Thursday, June 16, 2022 7:58 AM
To: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Cc: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Subject: Re: inquiry

I agree with you, Yves.

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From: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Sent: Thursday, June 16, 2022 7:11:32 AM
To: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Cc: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Subject: RE: inquiry

I guess the first question we would need to ask is whether or not we want to start doing training/inservice for those who request it? 26(1)(a) [redacted]

[redacted]

My two cents. But if you prefer another approach let me know…

Y

Dr. Yves A. Leger, MD, MHSc, FRCPC
Acting Deputy Chief Medical Officer of Health
Medecin-hygeniste en chef ajoint par interim

N.B. Department of Health / Ministère de la Sante du N.B.

From: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Sent: June 15, 2022 6:11 PM
To: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Cc: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Subject: Fwd: inquiry

Should we assign to MOH like Rita, for example? Or CRT?
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From: Liston, Heidi (DH/MS) <Heidi.Liston@gnb.ca>
Sent: Wednesday, June 15, 2022 4:20:43 PM
To: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Cc: McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>; Macumber, Jenny (DH/MS) <Jenny.Macumber@gnb.ca>
Subject: RE: inquiry

Hi Jennifer,

Do you have one person in mind you would like to give this presentation, are you looking for either Yves or Jennifer to create a presentation, or share what information we know at this time? I do understand there is still work happening with federal partners on this subject.

Please provide direction on how you would like to proceed with such requests.

Many thanks,
Heidi

From: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Sent: Wednesday, June 15, 2022 12:11 PM
To: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Cc: McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>; Liston, Heidi (DH/MS) <Heidi.Liston@gnb.ca>; Macumber, Jenny (DH/MS) <Jenny.Macumber@gnb.ca>
Subject: Fwd: inquiry

Get Outlook for iOS

From: 21(1) [redacted]@abilitynb.ca>
Sent: Wednesday, June 15, 2022 9:14:50 AM
To: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Subject: inquiry

ATTENTION! External email / courriel externe.

Hi Dr. Russell, I hope you are well. Ability NB is a partner of the Department of Health and delivers planning and navigation services to persons with a mobility disability through allied health and human service workers. We have recently started to see referrals of individuals experiencing possible effects of long COVID-19 with symptoms impacting mobility. These individuals fit our mandate but we really would value some training regarding long COVID-19 as the information out there is difficulty to determine in terms of reliability. Would you have a contact at Health that could provide us with an in-service, even 1.5 hours for presentation and discussion would be great. We want to be better prepared to understand how to support these individuals.

With appreciation,

21(1) [redacted]

Ability New Brunswick Inc. /Capacité Nouveau-Brunswick Inc.
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Fredericton NB E3B 7G5
21(1) [redacted]
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Follow us/suivez-nous sur:

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@AbilityNB

www.youtube.com/user/abilitynb

We recognize and respectfully acknowledge that Ability New Brunswick works on unceded traditional lands of the Mi'kmaq, Wolastogiyik, Passamaquoddy, Penobscot, and Abenaki-Wabanaki Confederacy peoples.

Nous reconnaissons respectueusement que Capacité Nouveau-Brunswick travaille sur le territoire ancestral non cédé des nations mi'kmaq, wolastoqiyik, peskotomuhkati, penobscot et de la confédération abénakis-waban-aki.

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 disproportionally 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.

From: Chowdhury, Sharmeen (DH/MS)
To: NBPH_CRT (DH/MS)
Cc: LeBlanc, Shannon (DH/MS)
Subject: RE: Post-COVID Condition / PVI : Le syndrome post-COVID-19
Date: June 20, 2022 2:59:16 PM

Good afternoon Lori,

This PHAC presentation is extensive. I found anther study form UK that can be added to what already sent by PHAC. Summary is -

According to this case-control observational study, the SARS-CoV-2 Omicron variant is less likely to cause long COVID than previous variants. The study found that the odds of developing long COVID after infection were 20% to 50% lower during the Omicron wave in the United Kingdom compared to Delta. The likelihood varied depending on the patient's age and the timing of their last vaccination.

Thanks
Sharmeen

Sharmeen Chowdhury, M.Sc (Clinical Epidemiology), MD
Epidemiologist
Public Health New Brunswick
Phone : 709-764-5910
E-mail : **Sharmeen.Chowdhury@gnb.ca**

From: NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>
Sent: June 16, 2022 3:00 PM
To: Chowdhury, Sharmeen (DH/MS) <Sharmeen.Chowdhury@gnb.ca>

Subject: FW: Post-COVID Condition / PVI : Le syndrome post-COVID-19

Hi again Sharmeen,
As a follow-up to the email ask I sent you earlier today, this arrived today from PHAC. It seems very comprehensive and seems to include what we know to date about long COVID. I don't want you to have to spend a lot of time looking for research that may be included in this presentation. This may be enough but I would still appreciate it if you have time to look at it and see if there may be anything missing that you may be able to find.

Lori

From: MacDonald, Tammy (PHAC/ASPC) <tammy.macdonald@phac-aspc.gc.ca> **On Behalf Of** CCMOH SECRETARIAT / CMHC (PHAC/ASPC)
Sent: Thursday, June 16, 2022 10:11 AM
To: Amy Riske <Amy.Riske@yukon.ca>; Andre Corriveau <ACorriveau@gov.nu.ca>; Barbara Yaffe <barbara.yaffe@ontario.ca>; Bedward, Cristina (PHAC/ASPC) <cristina.bedward@phac-aspc.gc.ca>; CCMOH SECRETARIAT / CMHC (PHAC/ASPC) <ccmoh.secretariat-cmhc@phac-aspc.gc.ca>; Dr. Asim Masood <Dr.Asim.Masood@CSC-SCC.GC.CA>; Dr. Bonnie Henry <bonnie.henry@gov.bc.ca>; Dr. Brent Roussin <brent.roussin@gov.mb.ca>; Dr. Deena Hinshaw <deena.hinshaw@gov.ab.ca>; Dr. George Giovinazzo <george.giovinazzo@cic.gc.ca>; Dr. Janice Fitzgerald <JaniceFitzgerald@gov.nl.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>; Dr. Kieran Moore <kieran.moore1@ontario.ca>; Dr. Luc Boileau <luc.boileau@inesss.qc.ca>; Dr. Michael Patterson <mpatterson@gov.nu.ca>; Dr. Saqib Shahab <saqib.shahab@health.gov.sk.ca>; Dr. Shannon McDonald <shannon.mcdonald@fnha.ca>; Dr. Shelley Deeks <shelley.deeks@novascotia.ca>; Dr. Yves Jalbert <yves.jalbert@msss.gouv.qc.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>; Evan Adams <evan.adams@sac-isc.gc.ca>; Heather Morrison <hgmorrison@gov.pe.ca>; Hostrawser, Bonnie (PHAC/ASPC) <bonnie.hostrawser@phac-aspc.gc.ca>; Jazz Atwal <Jazz.Atwal@gov.mb.ca>; Jing Hu <Jing.Hu@gov.ab.ca>; Julie Kryzanowski <Julie.Kryzanowski@health.gov.sk.ca>; Kami Kandola <kami_kandola@gov.nt.ca>; Kathryn Suh <Kathryn.Suh@CSC-SCC.GC.CA>; Kathryn Suh <ksuh@toh.ca>; Khatchadourian, Rouben (PHAC/ASPC) <Rouben.Khatchadourian@phac-aspc.gc.ca>; Marie D'aoust Gauthier <marie.daoust-gauthier@msss.gouv.qc.ca>; Njoo, Howard (PHAC/ASPC) <howard.njoo@phac-aspc.gc.ca>; Paul Hasselback <Paul.Hasselback@yukon.ca>; Ponic, Pamela (PHAC/ASPC) <pamela.ponic@phac-aspc.gc.ca>; Reka Gustafson <reka.gustafson@phsa.ca>; Rosann Seviour <RosannSeviour@gov.nl.ca>; Sharma, Supriya (HC/SC) <supriya.sharma@hc-sc.gc.ca>; Tam, Dr.Theresa (PHAC/ASPC) <theresa.tam@phac-aspc.gc.ca>; Tom Wong <Tom.Wong@sac-isc.gc.ca>; Vincent Beswick-Escanlar <VINCENT.BESWICK-ESCANLAR@forces.gc.ca>
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Subject: FYI: Post-COVID Condition / PVI : Le syndrome post-COVID-19

ATTENTION! External email / courriel externe.

Good morning SAC members,

At the June 6th HMM, Minister Duclos committed to sharing information on Post-COVID condition; as such, we are forwarding the attached for your information and awareness. SAC has been briefed on the studies underway and when more data becomes available (around mid-fall), results will be provided to SAC for a discussion on next steps.

Thank you,
SAC Secretariat

From: NBPH_CRT (DH/MS)
To: Chowdhury, Sharmeen (DH/MS)
Subject: RE: Post-COVID Condition / PVI : Le syndrome post-COVID-19
Date: June 20, 2022 3:07:00 PM

Thank you so much for your work on this. Very interesting that Omicron is less likely to cause long COVID! I agree PHAC presentation is very extensive.26(1)(a) [redacted]

Lori

From: Chowdhury, Sharmeen (DH/MS) <Sharmeen.Chowdhury@gnb.ca>
Sent: Monday, June 20, 2022 2:59 PM
To: NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>
Cc: LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>
Subject: RE: Post-COVID Condition / PVI : Le syndrome post-COVID-19

Good afternoon Lori,

This PHAC presentation is extensive. I found anther study form UK that can be added to what already sent by PHAC. Summary is -

According to this case-control observational study, the SARS-CoV-2 Omicron variant is less likely to cause long COVID than previous variants. The study found that the odds of developing long COVID after infection were 20% to 50% lower during the Omicron wave in the United Kingdom compared to Delta. The likelihood varied depending on the patient's age and the timing of their last vaccination.

Thanks
Sharmeen

Sharmeen Chowdhury, M.Sc (Clinical Epidemiology), MD
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Sent: June 16, 2022 3:00 PM
To: Chowdhury, Sharmeen (DH/MS) <Sharmeen.Chowdhury@gnb.ca>
Subject: FW: Post-COVID Condition / PVI : Le syndrome post-COVID-19

Hi again Sharmeen,
As a follow-up to the email ask I sent you earlier today, this arrived today from PHAC. It seems very comprehensive and seems to include what we know to date about long COVID. I don't want you to have to spend a lot of time looking for research that may be included in this presentation. This may be enough but I would still appreciate it if you have time to look at it and see if there may be anything missing that you may be able to find.

Lori

From: MacDonald, Tammy (PHAC/ASPC) <tammy.macdonald@phac-aspc.gc.ca> **On Behalf Of** CCMOH SECRETARIAT / CMHC (PHAC/ASPC)
Sent: Thursday, June 16, 2022 10:11 AM
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Subject: FYI: Post-COVID Condition / PVI : Le syndrome post-COVID-19

ATTENTION! External email / courriel externe.

Good morning SAC members,

At the June 6th HMM, Minister Duclos committed to sharing information on Post-COVID condition; as such, we are forwarding the attached for your information and awareness. SAC has been briefed on the studies underway and when more data becomes available (around mid-fall), results will be provided to SAC for a discussion on next steps.

Thank you,
SAC Secretariat

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Subject:	OCSO Post COVID-19 Condition Scan #25
Date:	June 21, 2022 10:56:27 AM
Attachments:	OCSO Post-COVID Condition Scan_25_June17_2022.pdf

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TAC Members,

On behalf of the *Office of the Chief Science Officer*, please find attached the latest COVID-19 environmental scan.

This biweekly product presents an overview of the current state of knowledge, and emerging evidence on **Post COVID-19 Condition** (June 4-17).

Thanks,
TAC Sec't

POST COVID-19 CONDITION

OCSO BIWEEKLY SCAN OF EVIDENCE #25

June 4 - June 17, 2022

SCOPE

This biweekly update presents an analysis of new evidence, guidance and issues related to post COVID-19 condition and synthesizes the current state of knowledge. Comprehensive lists of details and resources on this issue are available at the Office of the Chief Science Officer.

CURRENT STATE OF KNOWLEDGE

According to the World Health Organization (WHO), post COVID-19 condition (PCC) refers to persistent symptoms occurring 12 weeks or more after an acute COVID-19 infection, which persist or reoccur for a minimum of 8 weeks. The most common symptoms that we know of in adults include: fatigue, memory problems, sleep disturbances, shortness of breath, anxiety and depression, general pain and discomfort, difficulty thinking or concentrating and post-traumatic stress disorder (PTSD). There is still a lot that we don't know about post COVID-19 condition in children.

PCC is also referred to as long COVID, post-acute sequelae, post COVID-19 symptoms, and post-acute COVID-19 syndrome. Prior to the WHO definition, a number of studies reported on post-acute sequelae (PAS) from 4 to 12 weeks post diagnosis. The Public Health Agency of Canada (PHAC) released a review of the current international evidence (November 2021). Over 100 symptoms or difficulties conducting usual activities of daily living were reported.

There is limited data suggesting that the condition may be more likely to develop in those:

- who were hospitalized during acute infection;
- had more than 5 COVID symptoms during the acute phase;
- have pre-existing respiratory disease;
- are older;
- are women; and
- have other co-morbidities or have higher BMI.

There's currently no universally agreed-upon approach to diagnose and treat post COVID-19 condition. Early evidence suggests that vaccination with 2 or more doses may help reduce the risk of developing post COVID-19 condition if infected. Emerging evidence points to the importance of multidisciplinary care given the heterogeneity of symptoms associated with PCC. Multidisciplinary teams in "long COVID" clinics have been set up to include professionals from the following fields: rehabilitation, respiratory and cardiac consultants, physiotherapists, occupational therapists, psychologists, etc.

People who have been hospitalized or who needed intensive care during recovery appear to be at greater risk of experiencing longer-term effects. However, recent research shows about 30% to 40% of people who weren't hospitalized for their initial COVID-19 infection still report symptoms beyond 12 weeks. Canadians suffering from PCC and who are unable to work because of their symptoms may be eligible for support through: Employment and Skills Development Canada's Employment Insurance (EI) Program and Canada Pension Plan Disability Benefits.

This week's scan includes a systematic review preprint examining non-pharmacological therapies for post-viral syndromes, including Long COVID, as well as a NIH Director's Blog discussing how Artificial Intelligence could advance our understanding of Long COVID.

GUIDELINES OR STANDARDS

- **WHO** developed a clinical case definition of PCC in October 2021. This first version was developed by patients, researchers and others with the understanding that the definition may change as new evidence emerges.
    - *"Post COVID-19 condition occurs in individuals with a history of probable or confirmed SARS CoV-2 infection, usually 3 months from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis. Common symptoms include fatigue, shortness of breath, cognitive dysfunction but also others and generally have an impact on everyday functioning. Symptoms may be new onset following initial recovery from an acute COVID-19 episode or persist from the initial illness. Symptoms may also fluctuate or relapse over time."*
    - **WHO:** Q&A page on Post-COVID-19 Condition (February 2022).

- **US CDC** describes Post-COVID conditions as a wide range of new, returning, or ongoing health problems that people experience after first being infected with the virus that causes COVID-19. The CDC posted Interim Guidance (Updated June 2021) for healthcare providers on Evaluating and Caring for Patients with Post-COVID Conditions. Post-COVID conditions can be considered a disability under the Americans with Disabilities Act (ADA). The CDC also released information on Caring for People with Post-COVID Conditions (Updated March 2022). CDC is using science to learn more about post-COVID conditions.

- UK **NICE**: Rapid guidelines for managing the long-term effects of COVID-19 (Updated March 2022).

- **Chartered Society of Physiotherapy** in UK published its COVID-19 rehabilitation standards (July 2021).

- Guidelines to help doctors manage long COVID patients published in *British Journal of General Practice* (August 2021).

- UK **NHS** guidance for Post-COVID syndrome assessment clinics (April 2021).

- Guidance for **Canadian Rehabilitation and Exercise Professionals** on Post COVID-19 condition and rehabilitation management strategies (August 2021).

- **Government of Canada**: COVID-19 for health professionals - Post COVID-19 condition (continuously updated)

- **Center for Effective Practice** – COVID-19: Clinical Guidance for Primary Care Providers - Long-term symptoms / Post-acute sequelae of COVID-19 (PASC) (last updated April 2022)

- *Wiener klinische Wochenschrift*: Guideline S1: Long COVID: Diagnostics and treatment strategies (December 2021)

- American Academy of Physical Medicine and Rehabilitation (**AAPM&R**): Cognitive Symptoms Guidance & Breathing Discomfort Guidance (December 2021).

- Royal Australian College of General Practitioners (**RACGP**) guidance for GPs caring for patients with post–COVID-19 conditions (December 2021).

- European Society of Clinical Microbiology and Infectious Diseases (**ESCMID**): Rapid guidelines for assessment and management of long COVID (February 2022)

- **ACAS** (UK-based Advisory, Conciliation and Arbitration Service): Long COVID – advice for employers and employees (last reviewed April 2022)

- **Ontario Health** Post COVID-19 Condition - Guidance for Primary Care (PDF)

- **Scottish Government Guidelines:** Managing the long-term effects of COVID-19

NATIONAL AND INTERNATIONAL DEVELOPMENTS *(JUNE 4 - JUNE 17)*

CANADA

- (UPDATED) It is unclear how many specialized clinics there are in Canada for long COVID, although some estimates put the number at 20+. In Manitoba, there are no multidisciplinary, long-COVID clinics.

UK

- (NEW) The risk of developing long covid is lower among people with the Omicron variant of SARS-CoV-2 than with Delta, shows an analysis of self reported data to the UK ZOE covid app. Researchers from King's College London looked at data logged by 56,003 adults who tested positive between 20 December 2021 and 9 March 2022, when the omicron variant was dominant. They compared these with 41,361 who tested positive between 1 June 2021 and 27 November 2021, when the Delta variant was most common.
- (NEW) Official Statistics released June 15 from the COVID-19 Schools Infection Survey, England: round 3 questionnaire analysis, March 2022 - Long COVID. Findings show:
    - Nearly 1 in 50 (1.8%) primary school pupils (years from reception to year 6) and nearly 1 in 20 (4.8%) secondary school pupils (years 7 to 13) had experienced long COVID following their most recent COVID-19 infection.
    - Significantly more secondary school pupils who reported having COVID-19 had experienced loss of smell or taste, cardiovascular symptoms, or systemic symptoms (fever or high temperature) than those who reported not having had COVID-19.
    - Secondary school pupils in years 7 to 13 with long COVID were significantly more likely to have a probable mental disorder (28.1%) than those without long COVID (12.3%).

US

- No updates.

EMERGING SCIENTIFIC EVIDENCE *(JUNE 4 – JUNE 17)**

EVIDENCE PRODUCTS

TITLE AND AUTHOR	EVIDENCE TYPE	SUMMARY
A primer on Post-COVID-19 conditions and implications for clinical pharmacists (Cluck et al)	Review (Available in *J Am Coll Clin Pharm*)	In the wake of the acute illness, many survivors fully recover and return to baseline, while others suffer from a wide range of lingering symptoms collectively known as "post-COVID conditions". The recognition of these conditions as a clinical entity represents the first step in developing a targeted plan for recovery and symptom mitigation. While interventions to directly minimize or reduce new, recurrent, or persistent symptoms are currently unknown, pharmacists can play a key role in optimizing management of these patients.
Fibromyalgia in the new era of SARS-CoV-2 infection and post-COVID-	Scoping Review (Available in	Objective of review was to map the available medical evidence on the impact of COVID-19 and PCS in patients with and without a diagnosis of fibromyalgia prior to infection. Exploratory systematic review in PubMed

19 syndrome: A scoping review (Tuta-Quintero et al)	*Revista Colombiana de Reumatologia)*	and Scopus with data on fibromyalgia in the population surviving SARS-CoV-2 infection.The clinical trial records of the World Health Organization databases were reviewed. Results showed survivors of COVID-19 with or without a previous diagnosis of fibromyalgia may present an increase in chronic pain, insomnia, joint stiffness, and deterioration in quality of life. Population with a history of fibromyalgia may be more affected by psychological stress, tissue damage to neuromuscular structures, and inflammation due to SARS-CoV-2 infection.
Non-pharmacological therapies for post-viral syndromes, including Long COVID: A systematic review (Chandan et al)	Systematic Review (Available in *medRxiv*)	Post-viral syndromes (PVS), including Long COVID, are symptoms sustained from weeks to years following an acute viral infection. Non-pharmacological treatments for these symptoms are poorly understood. This review summarises evidence for the effectiveness of non-pharmacological treatments for symptoms of PVS. It also summarises the symptoms and health impacts of PVS in individuals recruited to studies evaluating treatments.

SELECTED RESEARCH

TITLE AND AUTHOR	SOURCE	SUMMARY
Association of Lung Fibrotic Changes and Cardiological Dysfunction with Hypertension in Long COVID-19 cohort (Tauekelova et al)	*medRxiv*	The prevalence and symptoms associated with long COVID and its comorbidities have not been established. Between May and September 2020 we included 312 patients with post-COVID-19 from 21 primary care centers if they had any persistent symptoms for at least three months from the first onset of the disease. Of 312 persons investigated, there was no significant gender difference between post-COVID-19 clinical manifestations except for memory dysfunction and anxiety, more prevalent among female participants. Chalder Fatigue Score was predominant in female participants (243, 78%). 39 (12.5%) participants reported having type 2 diabetes mellitus, and 158 (50.64%) had hypertension. Our study provides valuable clues for long-term post-sequelae in a cohort of the Long COVID-19 subjects. We demonstrated a strong association of signs of cardiac dysfunction, lung fibrotic changes, increased hemoglobin, fibrinogen, and ferritin with hypertension but not with other comorbidities.
A core outcome set for post-COVID-19 condition in adults for use in clinical practice and research: an international Delphi consensus study (Munblit et al)	*Lancet Respir Med*	Research on post-COVID-19 condition is expanding but, at present, no agreement exists on the health outcomes that should be measured in people living with the condition. To address this gap, we conducted an international consensus study, which included a comprehensive literature review and classification of outcomes for post-COVID-19 condition that informed a two-round online modified Delphi process followed by an online consensus meeting to finalise the core outcome set (COS). 1535 participants from 71 countries were involved, with 1148 individuals participating in both Delphi rounds. Eleven outcomes achieved consensus for inclusion in the final COS: fatigue; pain; post-exertion symptoms; work or occupational and study changes; survival; and functioning, symptoms, and conditions for each of cardiovascular, respiratory, nervous system, cognitive, mental health, and physical outcomes. Recovery was included a priori because it was a relevant outcome that was part of a previously published COS on COVID-19. The next step in this COS development exercise will be to establish the instruments that are most appropriate to measure these core outcomes.

Post-COVID-19 memory complaints: Prevalence and associated factors (Ahmed et al)	*Neurologia*	Memory complaints resulting from COVID-19 may have a significant impact on the survivors' quality of life. Unfortunately, there is insufficient information available on memory loss and its relationship to COVID-19. Therefore, the purpose of this research was to determine the prevalence of memory complaints in post-COVID-19 patients and to find potential contributing factors. A cross-sectional survey was conducted on 401 individuals who had previously been diagnosed with COVID-19 at four COVID testing centers situated across Bangladesh. The MAC-Q questionnaire was used to evaluate memory. A binary logistic regression model was fit to study the variables related to memory complaints, with a p-value of <0.05 deemed statistically significant. Memory complaints was prevalent in 19.2% of the post-COVID patients. Individual predictor analysis revealed that among the treatment modalities, steroids and antibiotics were associated with impaired memory. Multiple logistic regression showed that individuals who recovered from COVID-19 within six to twelve months were more likely to have memory deficits. Even though age, sex, oxygen demand, and hospitalization were not linked with memory complaints, rural residents exhibited more significant memory complaints than urban residents. Conclusion: Nearly one-fifth of the COVID-19 patients suffer from various degrees of memory complaints within one year.
COVID-19, Long COVID Syndrome, and Mental Health Sequelae in a Mexican Population (Villalpando et al)	*Int J Environ Res*	The aim of this study was to evaluate whether a relation between COVID-19, Long COVID, and the prevalence of mental health disorders exist. A total of 203 people from Tabasco were included in this study, answering a survey integrated by three dominions: General and epidemiological data, the DASS-21 test (to determine the presence of signs or symptoms suggestive of depression, anxiety, and/or stress) and an exploratory questionnaire about Long COVID syndrome. Of the 203 people surveyed, 96 (47.29%) had had COVID-19 and 107 (52.71%) had not; from the ones that had COVID-19, 29 (30.21%) presented mental health disorders and 88 (91.66%) presented at least one symptom or sign of Long COVID syndrome; meanwhile, 31 (32.29%) presented 10 or more symptoms or signs. From the comparison between the population with previous mental health disorders and COVID-19 and those without background disorders or COVID-19, the results were the following: 27.58% vs. 16.82% presented severe depression, 48.27% vs. 17.75% presented severe anxiety, and 27.58% vs. 20.56% presented severe stress.
Long COVID-19 Liver Manifestation in Children (Cooper et al)	*J Pediatr Gastroenterol Nutr*	Our aim was to describe pediatric patients who recovered from COVID-19 and later presented with liver injury. This is a retrospective case-series study of pediatric patients with post-COVID-19 liver manifestations. We report five pediatric patients who recovered from COVID-19 and later presented with liver injury. We report two distinct patterns of potentially long COVID-19 liver manifestations in children with common clinical, radiological, and histopathological characteristics after a thorough workup excluded other known etiologies.
Characterization of long COVID-19 manifestations and its associated factors: A prospective cohort study from Iran (Larijani et al)	*Microb Pathog*	The aim of this study was to evaluate the incidence of post-acute COVID-19 syndrome and to identify the associated risk factors as well as to compare new and persistent symptoms at different post-acute phases. Totally 254 individuals from Pasteur Institute of Iran (or/and their relatives) were investigated who had a previously confirmed COVID-19 PCR test. 249 cases progressed the symptoms to acute phase among which 64.1% reported at least one symptom in post-acute phase.

		Neurological sequelae were found as the most frequent symptom (91.6%). There was a significant association between the underlying diseases, age and acute phase symptoms to the post-acute phase syndrome susceptibility.
Post COVID-19 condition and its physical, mental and social implications: protocol of a 2-year longitudinal cohort study in the Belgian adult population (Smith et al)	*Arch Public Health*	The purpose of this paper is to describe the COVIMPACT study, which aims to set up a cohort of people who have been tested positive for COVID-19 and study the evolution of their physical, mental and social health over the medium (3 months) and long term (two years), and the factors associated with an (un)favorable evolution. COVIMPACT is a longitudinal cohort study organised over a two-years period between April 2021 and April 2023. The eligible population is all people aged 18 years and older, living in Belgium, with a recent COVID-19 infection and contacted by the health authorities for contact tracing. In total, 48% of the cohort participants appeared to fit the proposed case definition of PCC (i.e. report at least one symptom related to their COVID-19 infection three months afterwards).
Post-COVID Condition in Adults and Children Living in the Same Household in Italy: A Prospective Cohort Study Using the ISARIC Global Follow-Up Protocol (Buonsenso et al)	*Frontiers in Pediatrics*	Emerging evidence shows that both adults and children may develop post-acute sequelae of SARS-CoV-2 infection (PASC). The aim of this study is to characterise and compare long-term post-SARS-CoV-2 infection outcomes in adults and children in a defined region in Italy. A prospective cohort study including children (≤18 years old) with PCR-confirmed SARS-CoV-2 infection and their household members. A significantly higher proportion of adults compared to children reported at least one persistent symptom at the first follow up. Adults had more frequently coexistence of several symptom categories at both follow-up time-points. Female gender was identified as a risk factor for PASC in adults (p 0.02 at 1–3 months and p 0.01 at 6–9 months follow up), but not in children. We found no significant correlation between adults and children symptoms. In the paediatric group, there was a significant difference in persisting symptoms between those with confirmed SARS-CoV-2 infection compared to controls at 1–3 months follow up, but not at 6–9 months. Our data highlights that children can experience persistent multisystemic symptoms months after diagnosis of mild acute SARS-CoV-2 infection, although less frequently and less severely than co-habitant adults.
Comprehensive clinical assessment identifies specific neurocognitive deficits in working-age patients with long-COVID (Holdsworth et al)	*PLoS One*	Post-COVID illness has become a common, disabling complication of this infection. Therefore, it presents a significant challenge to global public health and economic activity. Comprehensive clinical assessment of previously well, working-age adults in full-time employment was conducted to identify physical and neurocognitive deficits in those with severe or prolonged COVID-19 illness. 205 consecutive patients, age 39 years, 84% male, were assessed 24 weeks after acute illness. 69% reported ≥3 ongoing symptoms. One third of lung function tests were abnormal. Cognitive assessment identified a specific deficit of the same magnitude as intoxication at the UK drink driving limit or the deterioration expected with 10 years ageing, which appears to contribute significantly to the symptomatology of long-COVID.

*Note: Content may have been published prior to this scan period but was only available through applying our search strategies during this period.

COMMENTARIES, LETTERS AND OPINION PIECES *(JUNE 4 – JUNE 17)*

- Post-COVID-19 condition in children: a COS is urgently needed (*Lancet Respir Med*): Research into post-COVID-19 condition in children and young people is lagging behind that in adults. This gap might partly be due to studies early in the pandemic indicating that children and young people infected with SARS-CoV-2 were mainly asymptomatic or had mild symptoms. Later studies have shown that post-COVID-19 condition can affect both children and adults even after mild COVID-19. The prevalence of post-COVID-19 condition in children and young people is unclear, with studies suggesting that between 4% and 66% of those who have had COVID-19 can be affected, depending on the outcome definition and methods used. There is an urgent need to initiate projects that aim to develop a core outcome set (COS) and associated measurement and data harmonisation tools for research on post-COVID-19 condition in children and young people.

- Using AI to Advance Understanding of Long COVID Syndrome *(NIH Director's Blog)*: A recent study, published in *Lancet Digital Health*, shows that a well-trained computer and its artificial intelligence can help understand long COVID. Researchers found that computers, after scanning thousands of electronic health records (EHRs) from people with Long COVID, could reliably make the call. The results, though still preliminary and in need of further validation, point the way to developing a fast, easy-to-use computer algorithm to help determine whether a person with a positive COVID test is likely to battle Long COVID.

MEDIA HIGHLIGHTS *(JUNE 4 – JUNE 17)*

CANADA

- **Specialized clinics to treat long COVID are in demand and physicians say they can't keep up (*CBC News*):** Doctors say demand is growing for specialized clinics to treat post-COVID condition, in part due to increased awareness of what symptoms are. While clinics have opened in a number of locations, the wait lists are also growing. With a lack of funding and staffing, physicians say they can't keep up. Dr. Kieran Quinn, clinician scientist at Sinai Health and the University of Toronto, is leading a large research program looking at health services for people with post-COVID condition.
- **A 'tsunami' of long COVID cases is about to hit, and some say the health-care system isn't ready (*Ottawa Citizen*):** "It is predicted that long-term COVID will lead to a substantive and sustained impact on our health system," Senator Stan Kutcher told a long COVID awareness conference this week. "And let's remember this is a system that can be currently characterized as running on empty." Kutcher, a psychiatrist specializing in adolescent mental health who serves as an independent senator, has focused on issues such as vaccine disinformation since being appointed to the Senate. He is calling for changes — including a focus on health system readiness and better disability support — to help people suffering from long COVID. He was speaking as part of a virtual town hall to mark National Long COVID Awareness Day in Canada. The event was organized by the group COVID-19 Resources Canada and featured researchers, physicians and patients.

GLOBAL

- **Clues to Long COVID (*Science*):** "The two diseases"—acute COVID-19 and Long Covid—"aren't very different," posits David Lee, an emergency medicine doctor at New York University Grossman School of Medicine. He suspects microclots explain many chronic symptoms. At least 70% of Long Covid patients have respiratory problems, he estimates, and at least 30% suffer from dysautonomia, in which abnormalities in the autonomic nervous system disrupt heart rate, breathing, and digestive function. Many suffer from fatigue and what's often called "brain fog." Tiny clots in the brain could explain cognitive troubles, Lee notes; or clots may kill small fiber nerve cells and drive dysautonomia. But solid evidence that microclots cause Long Covid symptoms is still lacking.

POST COVID-19 CONDITION RESOURCES

- (NEWLY ADDED) Long COVID Physio: Long COVID Physio is an international peer support, education and advocacy, patient-led association of Physiotherapists living with Long COVID and allies. They post various educational videos on long COVID.

- (NEWLY ADDED): John Hopkins Medicine - Long-Term Effects of COVID-19

- C19 Recovery Awareness (US): The mission of the Long Haul COVID Fighters is to provide support for those whose health has been affected by COVID-19, promote public awareness and education regarding lengthy COVID recovery, and advocate for the medical, mental health, and social interests of long haul COVID survivors.

- COVID-19 Virtual Library of Health Data and Evidence (Canada): Resources to knowledge products, data and evidence on the impacts of COVID-19, which includes post COVID-19 condition. This is a searchable collection of products funded and published by the Government of Canada.

- Lullabies for long COVID (UK): An online program developed in collaboration with the English National Opera could help with rehabilitation, by improving mental health and symptoms of breathlessness.

- Solve Long Covid Initiative (US): The Solve ME/CFS Initiative is a non-profit organization that serves as a catalyst for critical research into diagnostics, treatments, and cures for myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS), Long Covid and other post-infection diseases.

- PASC Guide (University of Michigan): A resource for people with PASC/long COVID.

- Health Education England (HEE) e-learning modules: long COVID programme

- Voices of Long COVID (US): Voices of Long Covid campaign features testimonials from a diverse group of people ages 18-29 who are suffering from long-term complications of COVID-19 infection.

- Dignity Health (US): COVID-19 and Chronic Illness Recovery Program based in the U.S. has helped over 2,000 people struggling with COVID long-term effects ("COVID long haulers"). Treatment is exercise-based for lingering or long-term conditions (sequelae) from having the virus.

- Altea (Switzerland): A network for sharing evidence-based information on the long-term effects of COVID-19.

- Pandemic-Aid Networks: Long COVID research library.

- Post-COVID-19 Functional Status Scale: An overview of a patient self-reported scale that helps to support assessment of functional status and recovery after the SARS-CoV-2 infection.

- Ontario College of Family Physicians: Resources on Post-COVID Condition.

- Agency for Clinical Innovation (Australia): Living Evidence - post acute sequelae of COVID-19.

- Pre-populated literature searches: Long COVID search (LitCovid) and Long COVID search (NIH)

- PAHO Webinar Series on Post COVID-19 Condition launched 17 February, 2022, from 10:30 am to 12:30 pm (EST).

- Body Politic COVID-19 Support Group (Global): Housed on the Slack app, group members have access to dozens of different channels, which give space for more personal discussion. Some of the channels include those specifically for medical professionals, parents of children with Covid-19, LGBTQ+ individuals, BIPOC+, and different regions around the world.

- Patient-Led Research Collaborative (Global): Self-organized group of Long COVID patients working on patient-led research around the Long COVID experience.

- British Heart Foundation (UK): UK-based foundation with resources on long COVID.

- COVID Long Haul (Canada): Canada's largest online platform for COVID survivors, their family members and anyone searching for the most up-to-date information about the pandemic. There is a COVID long-haulers support group and a Report on Pan-Canadian Long COVID Impact Survey (PDF) (June 2021)

- BC ECHO for Post-COVID-19 Recovery (Canada): BC ECHO for Post-COVID-19 Recovery is a learning community of specialists and community health-care providers who use case-based learning to improve care for those recovering from symptoms post-COVID-19.

- Long Covid Support (UK): Peer support and advocacy group aiming to facilitate international peer support and campaigning in the UK for recognition, rehabilitation and research into treatments.

- Long COVID SOS (UK): Long-term sufferers formed the LongCovidSOS campaign to put pressure on the UK government to recognise the needs of those with Long Covid, and to raise awareness among the general public and employers.

- Survivor Corps (US): One of the largest and fastest growing grassroots movements connecting, supporting, and mobilizing COVID-19 Survivors to support research. They have a list of Post-COVID Care Centers (PCC) and a PCCC Best Practices Guide.

- The Center for Chronic Illness (US): Aims to promote well-being and decrease isolation for those impacted by chronic illness through support and education. Their online support groups are professionally-facilitated and offer psychoeducational tools for coping.

- Blooming Magnolia (US): Mission is to empower others by providing a platform to strengthen & protect mental health and support those afflicted with Long-Covid through education and funding of therapeutic research. They have a list of support groups and resources on their website.

- Long COVID Alliance (US): US-based network of patient-advocates, scientists, disease experts, and drug developers who have joined together to leverage their collective knowledge and resources to educate policy makers and accelerate research to transform our understanding of post-viral illness.

- Long COVID Kids (UK/US/Canada): Parent & patient led advocacy & support group based in the UK.

- Long COVID Physio (US & UK): International peer support, education and advocacy group of Physiotherapists living with Long COVID, founded in November 2020 by Physiotherapists living with Long COVID from the UK and US.

- Patient-Led Research Collaborative (Global): Group of Long COVID patients working on patient-led research around the Long COVID experience.

- CANCOV- Patient resources (Canada): CANCOV is a research platform grounded in a prospective longitudinal 1-year cohort study of patients infected with COVID-19.

- COVID Patient Recovery Alliance (CPRA) (US): CPRA aims to bring together leaders in business, health care, research, academia, data and analytics, and patient advocacy to develop solutions that coordinate diverse data sources, inform models of care, and ensure adequate payment for long-COVID patients. Their report outlines recommendations for federal policymakers to promote recovery.

- British Lung Foundation (UK): UK-based charity sharing resources on navigating the NHS, breathlessness support, movement and energy support for long COVID patients.

- Living with Long COVID (US): COVID-19 Long-Haulers and Post-COVID Support Community.

***Note**: Previous OCSO Post COVID-19 Condition Scans can be found here.*

From: Day, Barbara (DH/MS)
To: Robichaud-Savoie, Janique (DH/MS)
Cc: Levesque, Eric J. (DH/MS)
Subject: Re: MEDIA REQUEST: 21(1) – TELEGRAPH-JOURNAL – LONG COVID DISABILITY
Date: June 22, 2022 2:26:57 PM

Hi Janique,

Yes - ty! SD is leading, and I don't think we need to add anything today -but may be asked for some lines once the info is out there.

Get Outlook for iOS

From: Robichaud-Savoie, Janique (DH/MS) <Janique.Robichaud-Savoie@gnb.ca>
Sent: Wednesday, June 22, 2022 2:04:02 PM
To: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Cc: Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>
Subject: FW: MEDIA REQUEST: 21(1) – TELEGRAPH-JOURNAL – LONG COVID DISABILITY

Hi Barb, did you get what you needed on this one? thanks.

Janique Robichaud-Savoie
Directrice générale, Soins de santé primaires
Executive Director, Primary Health Care
Department of Health/Ministère de la Santé
(506) 453-6962

From: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Sent: June 22, 2022 11:19 AM
To: Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>
Cc: Robichaud-Savoie, Janique (DH/MS) <Janique.Robichaud-Savoie@gnb.ca>
Subject: FW: MEDIA REQUEST: 21(1) – TELEGRAPH-JOURNAL – LONG COVID DISABILITY

fyi

Jennifer

From: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Sent: Wednesday, June 22, 2022 11:14 AM
To: Howland, Rebecca (ECO/BCE) <Rebecca.Howland@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>; Bowie, Adam (ECO/BCE) <Adam.Bowie@gnb.ca>
Cc: Macfarlane, Bruce (DH/MS) <Bruce.Macfarlane@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>; Enos, Coreen (ECO/BCE) <Coreen.Enos@gnb.ca>; Duguay, Robert (ECO/BCE) <Robert.Duguay@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>
Subject: RE: MEDIA REQUEST: 21(1) – TELEGRAPH-JOURNAL – LONG COVID DISABILITY

Adding in Jennifer Elliott for awareness.

From: Howland, Rebecca (ECO/BCE) <Rebecca.Howland@gnb.ca>
Sent: June 22, 2022 11:03 AM
To: Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>; Bowie, Adam (ECO/BCE) <Adam.Bowie@gnb.ca>
Cc: Macfarlane, Bruce (DH/MS) <Bruce.Macfarlane@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Enos, Coreen (ECO/BCE) <Coreen.Enos@gnb.ca>; Duguay, Robert (ECO/BCE) <Robert.Duguay@gnb.ca>
Subject: MEDIA REQUEST: 21(1) [redacted] – TELEGRAPH-JOURNAL – LONG COVID DISABILITY

Looping in the team at Health for their awareness.

Rebecca

NAME: 21(1) [redacted]
OUTLET: **TELEGRAPH-JOURNAL**
CONTACT #: 21(1) [redacted]
EMAIL: 21(1) [redacted] @brunswicknews.com
DEADLINE TO SEND RESPONSE TO REPORTER: **4:30 P.M.**
ROUTINE: No.
REQUEST:

1) Ability NB says that post-COVID condition, or long COVID, has become its own type of disability, and provincial services will have to adjust for that reality. Does Social Development have any policy or process in place for applicants to disability assistance who have symptoms of long COVID that are interfering with their ability to work and fulfill basic needs?

2) Is someone with post-COVID condition eligible for disability support from the province? If no, why not? If yes, specifically, what supports?

3) Has the province received any applications for disability assistance due to long COVID? If so, how many to date?

Working with SD for a response

From: 21(1) [redacted] @brunswicknews.com>
Sent: Wednesday, June 22, 2022 10:44 AM
To: Howland, Rebecca (ECO/BCE) <Rebecca.Howland@gnb.ca>
Subject: Request

Good morning Rebecca,

I'm looking for the following information on provincial disability services. My deadline is 4:30 p.m.

1) Ability NB says that post-COVID condition, or long COVID, has become its own type of disability, and provincial services will have to adjust for that reality. Does Social Development have any policy or process in place for applicants to disability assistance who have symptoms of long COVID that are interfering with their ability to work and fulfill basic needs?

2) Is someone with post-COVID condition eligible for disability support from the province? If no, why not? If yes, specifically, what supports?

3) Has the province received any applications for disability assistance due to long COVID? If so, how many to date?

Thank you,

--

21(1) [redacted]

[redacted]
https://tj.news

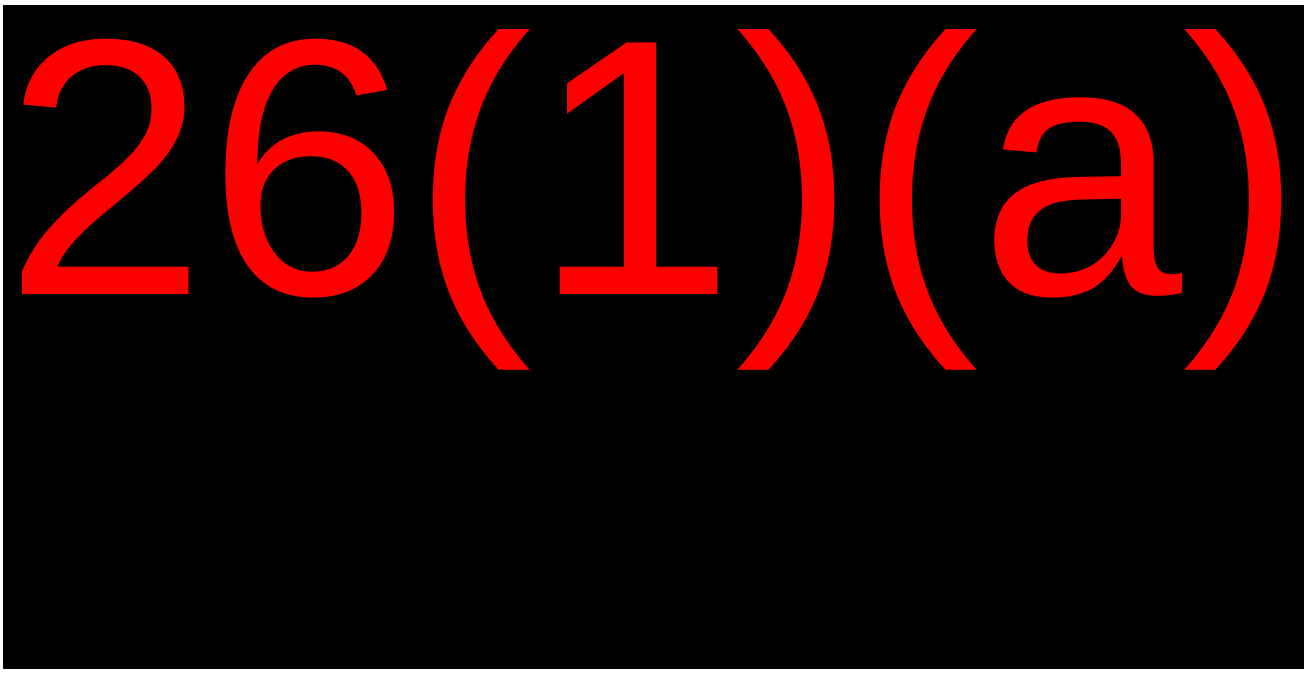
From: Day, Barbara (DH/MS)
To: Clair, Suzanne (DH/MS)
Subject: Revised for approval: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM
Date: June 23, 2022 1:54:00 PM

And here's the latest on long COVID from media responses. The last two lines are key for messaging going forward.

From: Day, Barbara (DH/MS)
Sent: June 15, 2022 12:19 PM
To: LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: Revised for approval: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM

Will do - here's the revised version for review and approvals.

FOR APPROVAL:



From: LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>
Sent: June 15, 2022 12:08 PM
To: Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Chalifoux, Mathieu

(DH/MS) <Mathieu.Chalifoux@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: RE: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM

Barb,

Can you make sure we never indicates this previously in a Long COVID response.

Thanks,
Shannon

From: Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>
Sent: Wednesday, June 15, 2022 12:07 PM
To: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: RE: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM

The last sentence is inaccurate. The patient list recently created by the RHAs created was for research purposes and has since stopped adding new patients to the list. It was never established as a formal provincial registry of Long COVID patients in the province.

From: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Sent: Wednesday, June 15, 2022 11:48 AM
To: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: RE: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM

Coying in Eric

Jennifer

From: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Sent: Wednesday, June 15, 2022 10:46 AM
To: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>

From:	NBPH_CRT (DH/MS)
To:	Clair, Suzanne (DH/MS)
Cc:	NBPH_CRT (DH/MS)
Subject:	RE: Update
Date:	June 24, 2022 2:31:51 PM
Attachments:	Long COVID deck - for PTs (with Canadian data).EN.pptx Deck Syndrome Post Covid19 PTs.FR.pptx image001.png

---

Hi Suzanne,

I reached out to Sharmeen….

We did get these presentations from PHAC.

Sophie

From: Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>
Sent: Friday, June 24, 2022 9:26 AM
To: NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>
Subject: FW: Update

Hi,

See email trail below. The only long covid piece of work I am aware of is the presentation to Ability NB. Are you aware of something specifically for NBMS?

I know we were still waiting on response from Jennifer E.

However I wonder if his reference to pull together some good reliable resources to share with those who request what she is referring to?

See copy of email below I found.

From: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Sent: Thursday, June 16, 2022 7:11:32 AM
To: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Cc: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Subject: RE: inquiry

I guess the first question we would need to ask is whether or not we want to start doing training/inservice for those who request it? 26(1)(a) [redacted]

26(1)(a) [redacted]

My two cents. But if you prefer another approach let me know…

From: Landsburg, Shelley (DH/MS) <Shelley.Landsburg@gnb.ca>
Sent: Thursday, June 23, 2022 4:33 PM
To: Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>
Subject: FW: Update

Shelley

Shelley Landsburg BN RN MPH
Director / Directrice
Prevention and Control / Prévention et contrôle
Public Health New Brunswick/ Santé publique Nouveau-Brunswick

Tel: (506) 444-2706
Fax: (506) 453-8702
E-mail/courriel: Shelley.landsburg@gnb.ca
www.gnb.ca

From: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Sent: June 23, 2022 4:31 PM
To: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Landsburg, Shelley (DH/MS) <Shelley.Landsburg@gnb.ca>
Subject: Fwd: Update

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From: Rahman, Dr. Arifur (DH/MS) <Dr.Arifur.Rahman@gnb.ca>
Sent: Thursday, June 23, 2022 4:09:17 PM
To: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Cc: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>; McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>
Subject: RE: Update

Hi Dr. Russell,

I am not aware of this document, I will enquire about the document and provide an update to you. 26(1)(a) [redacted].

Arifur

From: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Sent: June 23, 2022 3:47 PM
To: Rahman, Dr. Arifur (DH/MS) <Dr.Arifur.Rahman@gnb.ca>
Cc: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>; McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>
Subject: Update

Hi Arifur,
I am looking for an update on clinical info that was supposed to be drafted to send to clinicians through NBMS on Long Covid. Has this been completed? 26(1)(a) [redacted]

Jennifer Russell, **BA, BSc, MD, CCFP**
Chief Medical Officer of Health
Médecin-hygiéniste en chef
NB Department of Health/Ministère de la santé

Ph/Tél: (506) 444-2112
e-mail/courriel : jennifer.russell@gnb.ca

From: Day, Barbara (DH/MS)
To: NBPH_CRT (DH/MS)
Subject: FW: Revised for approval: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM
Date: June 28, 2022 10:08:00 AM

Here you go!

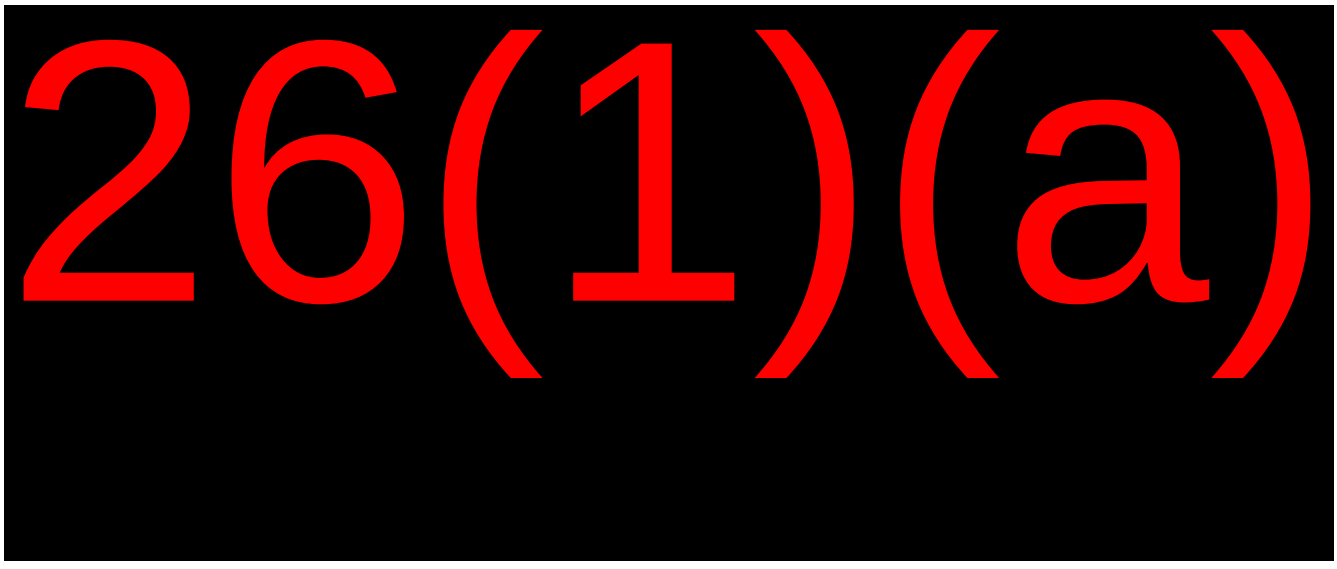
From: Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>
Sent: June 15, 2022 2:28 PM
To: Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: RE: Revised for approval: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM

I'm good with this.

From: Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>
Sent: Wednesday, June 15, 2022 2:00 PM
To: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: RE: Revised for approval: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM

Just made some tweaks to add plan language and to tightened up the response. Please review. I believe the context and meaning stays the same.

Alex



26(1)(a)

From: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Sent: June 15, 2022 12:19 PM
To: LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: Revised for approval: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM

Will do - here's the revised version for review and approvals.

FOR APPROVAL:

26(1)(a)

From: LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>
Sent: June 15, 2022 12:08 PM
To: Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: RE: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM

Barb,

Can you make sure we never indicates this previously in a Long COVID response.

Thanks,
Shannon

From: Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>
Sent: Wednesday, June 15, 2022 12:07 PM
To: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: RE: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM

The last sentence is inaccurate. The patient list recently created by the RHAs created was for research purposes and has since stopped adding new patients to the list. It was never established as a formal provincial registry of Long COVID patients in the province.

From: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Sent: Wednesday, June 15, 2022 11:48 AM
To: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: RE: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM

Coying in Eric

Jennifer

From: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Sent: Wednesday, June 15, 2022 10:46 AM
To: Chalifoux, Mathieu (DH/MS) <Mathieu.Chalifoux@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>; Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>; Vass, Alex (ECO/BCE) <Alex.Vass@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: MEDIA REQUEST: 21(1) – CTV – Long COVID Update - June 15 5PM

Good morning everyone – we have a media request on long COVID. See proposed response, taken from Eric's bullets last week.

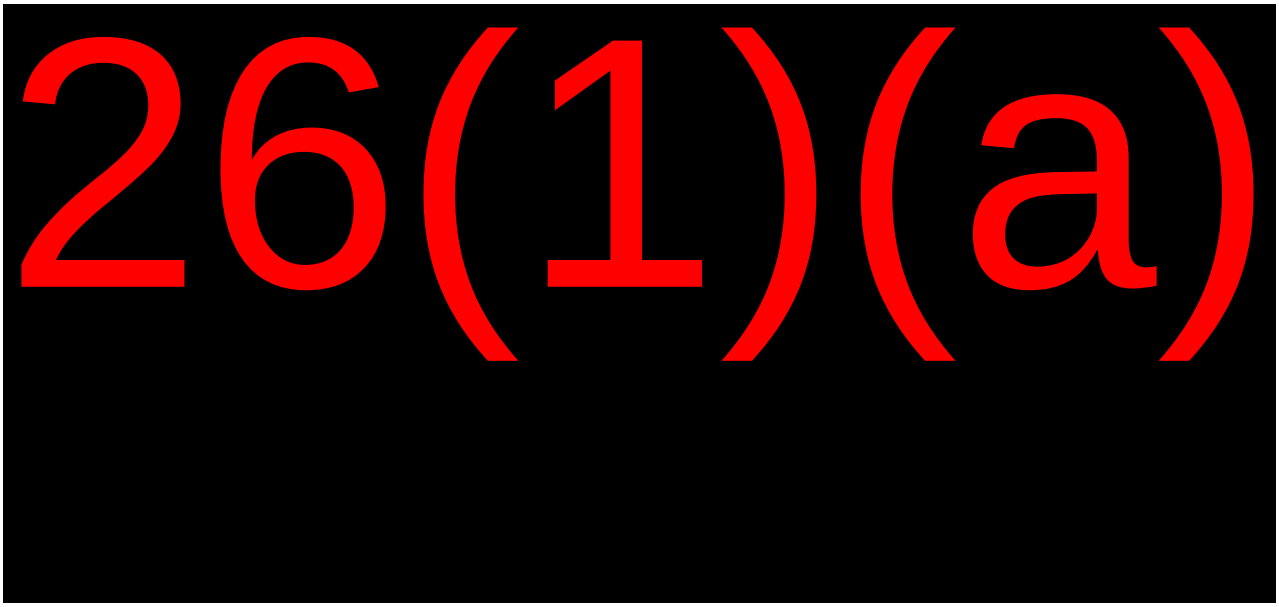
Can we add anything else in?

NAME: 21(1) [redacted]
OUTLET: CTV
CONTACT #: 21(1) [redacted]
EMAIL: 21(1) [redacted] @bellmedia.ca
DEADLINE TO SEND RESPONSE TO REPORTER: 5 PM
ROUTINE (Yes or No):
REQUEST:

I'm getting in touch just looking for some information for a story I'm doing on long COVID today.

I'm wondering if NB health is still tracking Long COVID cases in the province, and if not, when that stopped and why.

PROPOSED RESPONSE:



From: [redacted]
Sent: Wednesday, June 15, 2022 9:06 AM
To: coreen.enos@gnb.ca
Subject: Query regarding LONG COVID from CTV Atlantic

Hello Coreen, I hope you are doing well!

I'm getting in touch just looking for some information for a story I'm doing on long COVID today.

I'm wondering if NB health is still tracking Long COVID cases in the province, and if not, when that stopped and why.

I'm working on a story for CTV News at Six tonight.

Please let me know if it's possible to get that information. Thanks so much,

21(1)

[redacted]

CTV News Atlantic

21(1) [redacted]

From: Elliott, Jennifer (DH/MS)
To: Clair, Suzanne (DH/MS)
Cc: NBPH_CRT (DH/MS)
Subject: RE: inquiry
Date: June 28, 2022 6:23:57 PM

Thanks I will respond and add these links.

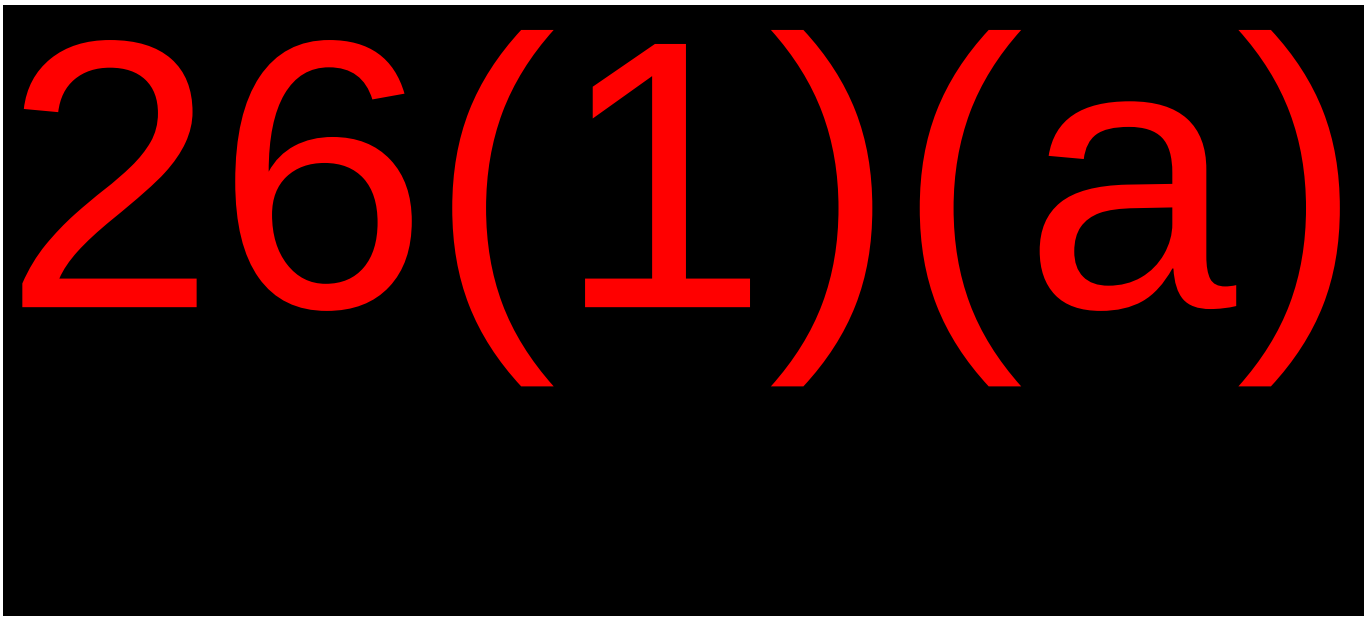
Jennifer

From: Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>
Sent: Tuesday, June 28, 2022 4:03 PM
To: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Cc: NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>
Subject: FW: inquiry

Hi Jennifer,

Just wanting to close the loop on the Ability NB inquiry. I am not certain that a response was sent. We have drafted following response used some wording that has been used for media responses. If ok, would you want it sent from Dr. R email or Public Enquiries email?

Thanks
Suzanne



From: NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>
Sent: Tuesday, June 28, 2022 3:48 PM

To: Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>
Subject: FW: inquiry

From: NBPH_CRT (DH/MS)
Sent: Friday, June 17, 2022 2:53 PM
To: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Cc: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>
Subject: FW: inquiry

Hi Jennifer,
See my question below to Dr. Leger and his answer. Please advise on whether a decision has been made on how we plan to engage with Ability NB.

Lori

From: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Sent: Friday, June 17, 2022 2:44 PM
To: NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>
Cc: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>
Subject: RE: inquiry

No I don't think so…. Would refer you back to Jenn Elliot on that one. I provided my recommendation but I don't know if further discussion have occurred on this.

Yves

Dr. Yves A. Leger, MD, MHSc, FRCPC
Acting Deputy Chief Medical Officer of Health
Medecin-hygeniste en chef ajoint par interim

N.B. Department of Health / Ministère de la Sante du N.B.

From: NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>
Sent: June 17, 2022 10:39 AM
To: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Cc: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>
Subject: FW: inquiry

Hi Dr. Leger,

As an update, we received a very comprehensive overview Powerpoint on Long COVID from PHAC this week (attached). I have asked Sharmeen to look for any relevant research that is not included in that presentation. Has the decision been made as to how we will engage with Ability NB – a presentation or provide them with reputable information? 26(1)(a) [redacted]

Thank you,

Lori

From: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Sent: Thursday, June 16, 2022 9:06 AM
To: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Subject: RE: inquiry

These would be their current clients or referrals from other community partners, which could be a primary care provider, but most are from SCCR, EMP, SD and other community agencies.

At this point the province is going with the WHO definition from the latest discussion I have heard.

26(1)(a) [redacted]

Jennifer

From: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>
Sent: Thursday, June 16, 2022 8:30 AM
To: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Cc: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Subject: RE: inquiry

As I sent my first note this morning I had an additional thought.

AbilityNB has indicated that they have “started to see referrals of individuals experiencing possible effects of long COVID-19 with symptoms impacting mobility"….Do we have any concerns (I am thinking liability) that individuals are being treated/diagnosed as long COVID without a case definition? Secondly, would these referrals be coming from a Physician?

With Thanks,

16(1.1) [redacted]

*

Wendy Donovan
Executive Director / Directrice générale
Public Health / Santé publique
COVID Response Team / équipe d'intervention COVID
NB Department of Health / Ministère de la santé du Nouveau-Brunswick

Phone / Téléphone : 506.461.1391
E-mail / Courriel : Wendy.Donovan@gnb.ca

From: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Sent: Thursday, June 16, 2022 7:58 AM
To: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Cc: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Subject: Re: inquiry

26(1)(a) [redacted], Yves.

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From: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Sent: Thursday, June 16, 2022 7:11:32 AM
To: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Cc: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Subject: RE: inquiry

I guess the first question we would need to ask is whether or not we want to start doing training/inservice for those who request it? 26(1)(a) [redacted]

26(1)(a) [redacted]

My two cents. But if you prefer another approach let me know…

Y

Dr. Yves A. Leger, MD, MHSc, FRCPC
Acting Deputy Chief Medical Officer of Health
Medecin-hygeniste en chef ajoint par interim

N.B. Department of Health / Ministère de la Sante du N.B.

From: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Sent: June 15, 2022 6:11 PM
To: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Cc: Donovan, Wendy (DH/MS) <Wendy.Donovan@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Subject: Fwd: inquiry

Should we assign to MOH like Rita, for example? Or CRT?
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From: Liston, Heidi (DH/MS) <Heidi.Liston@gnb.ca>
Sent: Wednesday, June 15, 2022 4:20:43 PM
To: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Cc: McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>; Macumber, Jenny (DH/MS) <Jenny.Macumber@gnb.ca>
Subject: RE: inquiry

Hi Jennifer,

Do you have one person in mind you would like to give this presentation, are you looking for either Yves or Jennifer to create a presentation, or share what information we know at this time? I do understand there is still work happening with federal partners on this subject.

Please provide direction on how you would like to proceed with such requests.

Many thanks,
Heidi

From: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Sent: Wednesday, June 15, 2022 12:11 PM
To: Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>; Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>

Cc: McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>; Liston, Heidi (DH/MS) <Heidi.Liston@gnb.ca>; Macumber, Jenny (DH/MS) <Jenny.Macumber@gnb.ca>
Subject: Fwd: inquiry

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From: 21(1) [redacted] @abilitynb.ca>
Sent: Wednesday, June 15, 2022 9:14:50 AM
To: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Subject: inquiry

ATTENTION! External email / courriel externe.

Hi Dr. Russell, I hope you are well. Ability NB is a partner of the Department of Health and delivers planning and navigation services to persons with a mobility disability through allied health and human service workers. We have recently started to see referrals of individuals experiencing possible effects of long COVID-19 with symptoms impacting mobility. These individuals fit our mandate but we really would value some training regarding long COVID-19 as the information out there is difficulty to determine in terms of reliability. Would you have a contact at Health that could provide us with an in-service, even 1.5 hours for presentation and discussion would be great. We want to be better prepared to understand how to support these individuals.

With appreciation,

21(1) [redacted]

Ability New Brunswick Inc. /Capacité Nouveau-Brunswick Inc.
440 rue Wilsey Road, Suite 102
Fredericton NB E3B 7G5
21(1) [redacted]
[redacted]
www.abilitynb.ca

Follow us/suivez-nous sur:

www.facebook.com/AbilityNewBrunswick

@AbilityNB

www.youtube.com/user/abilitynb

We recognize and respectfully acknowledge that Ability New Brunswick works on unceded traditional lands of the Mi'kmaq, Wolastogiyik, Passamaquoddy, Penobscot, and Abenaki-Wabanaki Confederacy peoples.

Nous reconnaissons respectueusement que Capacité Nouveau-Brunswick travaille sur le territoire ancestral non cédé des nations mi'kmaq, wolastoqiyik, peskotomuhkati, penobscot et de la confédération abénakis-waban-aki.

From: Clair, Suzanne (DH/MS)
To: NBPH_CRT (DH/MS)
Subject: FW: inquiry
Date: June 29, 2022 8:36:10 AM

FYI – you may have been BCC'd as well

From: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Sent: Tuesday, June 28, 2022 6:36 PM
To: Haley Flaro <haley.flaro@abilitynb.ca>
Subject: FW: inquiry

Good evening Haley,

I am reaching out to provide you some links that you may find helpful regarding your request for staff training regarding post COVID-19 condition, commonly known as long COVID-19 . Knowing you were looking to better understand how AbilityNB can best support individuals experiencing side effects, especially those with impacted mobility.

As discussed last week, research into this new condition is just starting to emerge and it may be a while yet before we have clear direction regarding prevention, treatment and support. As discussed the Department of Health and both regional health authorities are looking at how best to deliver programs and services with those experiencing post COVID-19 condition, while meeting the objectives of the Provincial Health Plan.

For the most up-to-date information and resources on post COVID-19 condition, the following websites maybe helpful to you and your staff:
Post-COVID-19 condition (long COVID) - Canada.ca
Living with Persistent Post-COVID Symptoms (phsa.ca)
Coronavirus disease (COVID-19): Post COVID-19 condition (who.int)

As noted I will keep you posted as more formal pathways and supports emerge in the coming days.

Talk soon, and thank-you for ongoing support AbilityNB provides to New Brunswickers.

Best regards,
Jennifer

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From: 21(1) [redacted] @abilitynb.ca>
Sent: Wednesday, June 15, 2022 9:14:50 AM
To: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>
Subject: inquiry

Hi Dr. Russell, I hope you are well. Ability NB is a partner of the Department of Health and delivers planning and navigation services to persons with a mobility disability through allied health and human service workers. We have recently started to see referrals of individuals experiencing possible effects of long COVID-19 with symptoms impacting mobility. These individuals fit our mandate but we really would value some training regarding long COVID-19 as the information out there is difficulty to determine in terms of reliability. Would you have a contact at Health that could provide us with an in-service, even 1.5 hours for presentation and discussion would be great. We want to be better prepared to understand how to support these individuals.

With appreciation,

21(1) [redacted]

Ability New Brunswick Inc. /Capacité Nouveau-Brunswick Inc.
440 rue Wilsey Road, Suite 102
Fredericton NB E3B 7G5
21(1) [redacted]
www.abilitynb.ca

Follow us/suivez-nous sur:

www.facebook.com/AbilityNewBrunswick

@AbilityNB

www.youtube.com/user/abilitynb

We recognize and respectfully acknowledge that Ability New Brunswick works on unceded traditional lands of the Mi'kmaq, Wolastogiyik, Passamaquoddy, Penobscot, and Abenaki-Wabanaki Confederacy peoples.

Nous reconnaissons respectueusement que Capacité Nouveau-Brunswick travaille sur le territoire ancestral non cédé des nations mi'kmaq, wolastoqiyik, peskotomuhkati, penobscot et de la confédération abénakis-waban-aki.

From: NBPH_CRT (DH/MS)
To: Sargent, Jessica (DH/MS); Clair, Suzanne (DH/MS)
Subject: RE: Long Covid
Date: June 29, 2022 8:37:00 AM

Good morning,
Jessica, we worked on a reply to Ability NB and it was sent by Jennifer so the loop is closed on this one as well. For future inquiries or work on long COVID, I have created a folder In Sharepoint entitled "Post COVID condition" and added the PHAC Powerpoint (F &E) and my docs for public and health care professionals. Here is the link : Post covid condition - All Documents (gnb.ca)

Lori

From: Sargent, Jessica (DH/MS) <Jessica.Sargent@gnb.ca>
Sent: Tuesday, June 28, 2022 10:57 AM
To: Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>; NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>
Subject: RE: Long Covid

Great thanks!

From: Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>
Sent: June 28, 2022 10:51 AM
To: Sargent, Jessica (DH/MS) <Jessica.Sargent@gnb.ca>; NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>
Subject: Long Covid

Talked to Dr Leger and he says Dr Rahman is working on a memo for NBMS. So no to-do for us now. Told him to reach out if he they need anything from us.

Suzanne Clair, MPH, RD
Director / Directrice
COVID Response Team/lÉquipe de réponse COVID
Public Health New Brunswick/Santé publique du Nouveau-Brunswick
Department of Health/ Ministère de la Santé
(506) 471-7433

From: Elliott, Jennifer (DH/MS)
To: Russell, Dr. Jennifer (DH/MS); Leger, Dr. Yves (DH/MS)
Cc: Macumber, Jenny (DH/MS); McGowan, Joan (DH/MS)
Subject: Long Covid letter to PCP
Date: June 30, 2022 10:22:27 AM

Good morning;

Eric and I just got off a call this am with the RHA VP medical and operations looking at a framework for long covid care and knowledge transfer for NB.

I noted the MOHs were working on a high-level letter to go out to primary care providers noting what we know at this point, WHO definition and links.

I noted that I would share with them for input as well before it goes out, therefore looking for an update on when this would be ready? Hoping for early next week at the latest.

Thanks for the update and attention to this request.

Jennifer

Jennifer Elliott
Assistant Deputy Minister/Sous-ministre
NB Department of Health / Ministère de la santé du Nouveau-Brunswick
Phone / Téléphone : 506-470-1122
E-mail / Courriel : jennifer.elliott@gnb.ca
www.gnb.ca

From: Leger, Dr. Yves (DH/MS)
To: Elliott, Jennifer (DH/MS); Russell, Dr. Jennifer (DH/MS)
Cc: Macumber, Jenny (DH/MS); McGowan, Joan (DH/MS)
Subject: RE: Long Covid letter to PCP
Date: June 30, 2022 10:28:16 AM

Dr. Rahman is working on it and has indicated he should have a draft to me at some point today. So yes early to mid next week should be doable

Y

Dr. Yves A. Leger, MD, MHSc, FRCPC
Acting Deputy Chief Medical Officer of Health
Medecin-hygeniste en chef ajoint par interim

N.B. Department of Health / Ministère de la Sante du N.B.

From: Elliott, Jennifer (DH/MS) <Jennifer.Elliott@gnb.ca>
Sent: June 30, 2022 10:22 AM
To: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>; Leger, Dr. Yves (DH/MS) <Yves.Leger@gnb.ca>
Cc: Macumber, Jenny (DH/MS) <Jenny.Macumber@gnb.ca>; McGowan, Joan (DH/MS) <Joan.McGowan@gnb.ca>
Subject: Long Covid letter to PCP

Good morning;

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Jennifer

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Phone / Téléphone : 506-470-1122
E-mail / Courriel : jennifer.elliott@gnb.ca

From:	Leger, Dr. Yves (DH/MS)
To:	Russell, Dr. Jennifer (DH/MS); Elliott, Jennifer (DH/MS)
Subject:	draft long covid for HCP
Date:	July 2, 2022 11:37:40 AM
Attachments:	Post COVID-19 Conditions guidance_NBMS.docx

See attached, first draft from Dr. Rahman

Since I'm not completely clear on what you are looking for, I am sharing the initial draft. 26(1)(a) [redacted]

Thoughts?

Yves

Dr. Yves A. Leger, MD, MHSc, FRCPC
Acting Deputy Chief Medical Officer of Health
Medecin-hygeniste en chef ajoint par interim

N.B. Department of Health / Ministère de la Sante du N.B.

From:	Northwood, Brandon (PHAC/ASPC) on behalf of Cidsc Secretariat (PHAC/ASPC)
To:	annick.descormiers@msss.gouv.qc.ca; Barbara.Yaffe@ontario.ca; BethHalfyard@gov.nl.ca; Brenda Clement; caroline_newberry@gov.nt.ca; charlene.mack@gov.ab.ca; cindy.rogers@health.gov.sk.ca; Claudia Kraft; colette.gaulin@msss.gouv.qc.ca; Colleen.Kovach@yukon.ca; Daniel.Warshafsky@ontario.ca; Danuta.Skowronski@bccdc.ca; Dilan_Patel@gov.nt.ca; Emily.Karas@oahpp.ca; Eveline.Toth@msss.gouv.qc.ca; Fiona.kouyoumdjian@ontario.ca ; George.Doyle-Bedwell@novascotia.ca; geraldine_whiteford@gov.nt.ca; Smadi, Hanan (DH/MS); Heather Morrison; Helene.Venables@msss.gouv.qc.ca; Jan.McFadzen@yukon.ca ; Jayne Boutilier; Jessica.Hopkins@oahpp.ca; Jing.Hu@gov.ab.ca; JPawa@GOV.NU.CA; Julie.Kryzanowski@health.gov.sk.ca; Kelly.dean@novascotia.ca; KKulleperuma@GOV.NU.CA; louise.valiquette@inspq.qc.ca; Marie-Andree.Leblanc@msss.gouv.qc.ca; Martin.Vogel@oahpp.ca; martine.fortier@msss.gouv.qc.ca; Chalifoux, Mathieu (DH/MS); mayank.singal@bccdc.ca; Dr. Marguerite Cameron; michelle.murti@ontario.ca ; mireille.barakat@inspq.qc.ca; monika.naus@bccdc.ca; MP; MPS; OCMHO@health.gov.sk.ca; Paul.Hasselback@yukon.ca; Plamondon, Mireille (PHAC/ASPC); prahman@mun.ca; richard.masse@msss.gouv.qc.ca; RosannSeviour@gov.nl.ca; Sanaz.Vaseghi@health.gov.sk.ca; Santina.Lee@gov.mb.ca; LeBlanc, Shannon (DH/MS); shelley.deeks@novascotia.ca; Sudit.Ranade@yukon.ca ; Tim.hilderman@gov.mb.ca; Wajid.ahmed@ontario.ca ; Siu, Winnie (PHAC/ASPC); Yasmin.Khan@oahpp.ca
Cc:	Cidsc Secretariat (PHAC/ASPC); Cornelisse, Mette (PHAC/ASPC)
Subject:	OCSO Post COVID-19 Condition Scan #26
Date:	July 5, 2022 9:47:23 AM
Attachments:	OCSO Post-COVID Condition Scan_26_July 1_2022.pdf

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TAC Members,

On behalf of the *Office of the Chief Science Officer*, please find attached the latest COVID-19 environmental scan.

This biweekly product presents an overview of the current state of knowledge and emerging evidence on **Post COVID-19 Condition** (June 18-July 1).

Thanks,
TAC Sec't

POST COVID-19 CONDITION

OCSO BIWEEKLY SCAN OF EVIDENCE #26

June 18-July 1, 2022

SCOPE

This biweekly update presents an analysis of new evidence, guidance and issues related to post COVID-19 condition and synthesizes the current state of knowledge. Comprehensive lists of details and resources on this issue are available at the Office of the Chief Science Officer (OCSO).

CURRENT STATE OF KNOWLEDGE

According to the World Health Organization (WHO), post COVID-19 condition (PCC) refers to persistent symptoms occurring 12 weeks or more after an acute COVID-19 infection, which persist or reoccur for a minimum of 8 weeks. The most common symptoms that we know of in adults include: fatigue, memory problems, sleep disturbances, shortness of breath, anxiety and depression, general pain and discomfort, difficulty thinking or concentrating and post-traumatic stress disorder (PTSD). There is still a lot that we don't know about post COVID-19 condition in children.

PCC is also referred to as long COVID, post-acute sequelae, post COVID-19 symptoms, and post-acute COVID-19 syndrome. Prior to the WHO definition, a number of studies reported on post-acute sequelae (PAS) from 4 to 12 weeks post diagnosis. The Public Health Agency of Canada (PHAC) released a review of the current international evidence (November 2021). Over 100 symptoms or difficulties conducting usual activities of daily living were reported.

There is limited data suggesting that the condition may be more likely to develop in those:

- who were hospitalized during acute infection;
- had more than 5 COVID symptoms during the acute phase;
- have pre-existing respiratory disease;
- are older;
- are women; and
- have other co-morbidities or have higher BMI.

There's currently no universally agreed-upon approach to diagnose and treat post COVID-19 condition. Early evidence suggests that vaccination with 2 or more doses may help reduce the risk of developing post COVID-19 condition if infected. Emerging evidence points to the importance of multidisciplinary care given the heterogeneity of symptoms associated with PCC. Multidisciplinary teams in "long COVID" clinics have been set up to include professionals from the following fields: rehabilitation, respiratory and cardiac consultants, physiotherapists, occupational therapists, psychologists, etc.

People who have been hospitalized or who needed intensive care during recovery appear to be at greater risk of experiencing longer-term effects. However, recent research shows about 30% to 40% of people who weren't hospitalized for their initial COVID-19 infection still report symptoms beyond 12 weeks. Canadians suffering from PCC and who are unable to work because of their symptoms may be eligible for support through: Employment and Skills Development Canada's Employment Insurance (EI) Program and Canada Pension Plan Disability Benefits.

This week's scan includes an article published in the *Lancet* examining long COVID symptoms in children aged 0–14 years in Denmark, as well as research published in *Radiology* revealing the causes of long COVID via lung-imaging research at Western University.

GUIDELINES OR STANDARDS

- **WHO** developed a clinical case definition of PCC in October 2021. This first version was developed by patients, researchers and others with the understanding that the definition may change as new evidence emerges.
    - *"Post COVID-19 condition occurs in individuals with a history of probable or confirmed SARS CoV-2 infection, usually 3 months from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis. Common symptoms include fatigue, shortness of breath, cognitive dysfunction but also others and generally have an impact on everyday functioning. Symptoms may be new onset following initial recovery from an acute COVID-19 episode or persist from the initial illness. Symptoms may also fluctuate or relapse over time."*
    - **WHO:** Q&A page on Post-COVID-19 Condition (February 2022).

- **US CDC** describes Post-COVID conditions as a wide range of new, returning, or ongoing health problems that people experience after first being infected with the virus that causes COVID-19. The CDC posted Interim Guidance (Updated June 2021) for healthcare providers on Evaluating and Caring for Patients with Post-COVID Conditions. Post-COVID conditions can be considered a disability under the Americans with Disabilities Act (ADA). The CDC also released information on Caring for People with Post-COVID Conditions (Updated March 2022). CDC is using science to learn more about post-COVID conditions.

- UK **NICE**: Rapid guidelines for managing the long-term effects of COVID-19 (Updated March 2022).

- **Chartered Society of Physiotherapy** in UK published its COVID-19 rehabilitation standards (July 2021).

- Guidelines to help doctors manage long COVID patients published in *British Journal of General Practice* (August 2021).

- UK **NHS** guidance for Post-COVID syndrome assessment clinics (April 2021).

- Guidance for **Canadian Rehabilitation and Exercise Professionals** on Post COVID-19 condition and rehabilitation management strategies (August 2021).

- **Government of Canada**: COVID-19 for health professionals - Post COVID-19 condition (continuously updated)

- **Center for Effective Practice** – COVID-19: Clinical Guidance for Primary Care Providers - Long-term symptoms / Post-acute sequelae of COVID-19 (PASC) (last updated April 2022)

- *Wiener klinische Wochenschrift*: Guideline S1: Long COVID: Diagnostics and treatment strategies (December 2021)

- American Academy of Physical Medicine and Rehabilitation (**AAPM&R**): Cognitive Symptoms Guidance & Breathing Discomfort Guidance (December 2021).

- Royal Australian College of General Practitioners (**RACGP**) guidance for GPs caring for patients with post–COVID-19 conditions (December 2021).

- European Society of Clinical Microbiology and Infectious Diseases (**ESCMID**): Rapid guidelines for assessment and management of long COVID (February 2022)

- **ACAS** (UK-based Advisory, Conciliation and Arbitration Service): Long COVID – advice for employers and employees (last reviewed April 2022)

- **Ontario Health** Post COVID-19 Condition - Guidance for Primary Care (PDF)

- **Scottish Government Guidelines:** Managing the long-term effects of COVID-19

NATIONAL AND INTERNATIONAL DEVELOPMENTS *(JUNE 18 - JULY 1)*

CANADA

- (NEW) Cause of long-COVID symptoms revealed by lung-imaging research at Western University**.** Using a functional MRI where patients inhale xenon gas, researchers can see in real-time what it is happening inside the lungs. Preliminary results show symptoms are related to microscopic abnormalities that affect how oxygen is exchanged from the lungs to red blood cells. The research was published Tuesday in Radiology. Having participants inhale the gas while being scanned by the MRI allowed researchers to see how the 500 million air sacs in the lungs deliver oxygen to the blood. In the case of long-COVID patients, the transition of the oxygen was depressed compared to healthy volunteers.
- (NEW) The Government of Yukon has formed a working group to learn more about post COVID-19 condition and those who are experiencing its effects. The working group will rely on emerging research and personal experiences to develop information and resources for Yukoners, or those caring for Yukoners, with post COVID-19 condition.

UK

- (NEW) Symptoms of long COVID are more frequently reported by women, those with poor overall health before the pandemic, and those aged 50 to 60, according to a new UK-based study in *Nature Communications.* The study was based on results gathered from 6,907 people with self-reported COVID-19 from 10 population-based longitudinal health surveys in the United Kingdom that had been in place prior to the pandemic.

US

- (NEW) A statewide May 2022 survey of Oregon residents (n=695) indicated unvaccinated Oregonians were about 2.5 times more likely to suffer from long COVID than vaccinated. While the sample of Native Americans is relatively small, the survey found that over 30% of them report suffering from long COVID, compared to state average of 8%. Every single Native American in the survey who reported having had COVID also indicated suffering from long COVID. The effects of long COVID also appear to have an outsized impact on people with 'some college' (38% of individuals in this group that had COVID) and those with bachelor's degrees (27% of this group's COVID+ individuals). It is unclear why this is the case, but the differences are statistically significant.

EMERGING SCIENTIFIC EVIDENCE *(JUNE 18 - JULY 1)**

EVIDENCE PRODUCTS

TITLE AND AUTHOR	EVIDENCE TYPE	SUMMARY
Cardiopulmonary exercise testing to evaluate post-acute sequelae of COVID-19 ("Long COVID"): a systematic review and meta-analysis (Durstenfeld et al)	Systematic Review (Available in *medRxiv)*	Objective was to estimate effect of COVID-19 infection on exercise capacity including those with and without LC symptoms and to characterize physiologic patterns of limitations to elucidate possible mechanisms of LC. Included studies of adults with SARS-CoV-2 infection at least three months prior that included CPET measured peak VO2. By meta-analysis of 9 studies including 404 infected individuals, peak VO2 was lower among infected versus uninfected individuals. Meta-analysis of 9 studies with 464 individuals with LC, peak VO2 was lower compared to those without symptoms. Deconditioning was common, but

		dysfunctional breathing, chronotropic incompetence, and abnormal oxygen extraction were also described.
Sex differences in sequelae from COVID-19 infection and in long COVID syndrome: a review (Sylvester et al)	*Review (Available in Curr Med Res Opin)*	We conducted literature reviews to uncover differential effects of sex on sequelae from COVID-19 and on long COVID syndrome. COVID-19 sequelae in the categories of psychiatric/mood, ENT, musculoskeletal, and respiratory were significantly more likely among females (vs. males), whereas renal sequelae were significantly more likely among males. The likelihood of having long COVID syndrome was significantly greater among females, with the odds of ENT, GI, psychiatric/mood, neurological, dermatological, and other disorders significantly higher among females and the odds of endocrine and renal disorders significantly higher among males. Sex-disaggregated differences for COVID-19 sequelae and long COVID syndrome were observed.
Impact of COVID-19 vaccination on long COVID: a systematic review and meta-analysis (Byambasuren et al)	Systematic Review (Available in *medRxiv)*	We aim to assess impact of COVID vaccinations administered (i) before and (ii) after acute COVID-19, including vaccination after long COVID diagnosis, on the rates or symptoms of long COVID. The most common long COVID symptoms studied include fatigue, cough, loss of smell, shortness of breath, loss of taste, headache, muscle ache, trouble sleeping, difficulty concentrating, worry or anxiety, and memory loss or confusion.. Current studies suggest COVID-19 vaccinations may have protective and therapeutic effects on long COVID. More robust comparative observational studies and trials are urgently needed to clearly determine effectiveness of vaccines in prevention and treatment of long COVID.
A health and lifestyle framework for management of post covid-19 syndrome based on evidence-informed management of post-polio syndrome: a narrative review (Dean et al)	Review (Available in *Eur J Pyshiother*)	We conducted a narrative review to establish the basis for an evidence-informed health and lifestyle framework that underlies the management of post-polio syndrome, as a prototype for managing post covid-19 syndrome. Multi-morbidity, the non-communicable diseases (NCDs) and their risk factors, is strongly associated with SARS-CoV-2 susceptibility and poor outcomes including death. Poliomyelitis survivors may exhibit debilitating sequelae decades after infection, thus their presentations are often confounded by limitations associated with NCDs and their risk factors. An evidence-informed health and lifestyle framework is described. Its 3 levels of analysis and intervention include: (1) health status; (2) lifestyle practices (smoking; nutrition; weight; sedentariness, activity/exercise; sleep; stress); and (3) the 3 levels of WHO's International Classification of Functioning, Disability and Health.
The role of physical activity for post-covid-19 syndrome (Cherneva et al)	Review (Available in *General Medicine*)	This review aims to summarize data, regarding post-COVID-19 syndrome, as well as, to explain that regular physical activity could reduce many of the symptoms and long-term effects of COVID-19 infection.

SELECTED LITERATURE

TITLE AND AUTHOR	SOURCE	SUMMARY
Long COVID symptoms in SARS-CoV-2-positive children aged 0–14 years and matched controls in Denmark	*Lancet Child Adolesc Health*	After the acute phase of SARS-CoV-2 infection, children can develop long COVID symptoms. We aimed to investigate the prevalence of long-lasting symptoms, the duration and intensity of symptoms, quality of life, number of sick days and absences from daycare or school, and

(LongCOVIDKidsDK): a national, cross-sectional study (Kikkenborg et al)		psychological and social outcomes in children aged 0-14 years who had been infected relative to controls with no history of infection.
The presence of symptoms within 6 months after COVID-19: a single-center longitudinal study (Emecen et al)	*Ir J Med Sci*	Aim was to describe presence of symptoms in COVID-19 patients within 6 months after diagnosis and to investigate the associated factors in terms of reporting symptoms. Total of 5610 patients agreed to participate in study. Symptom frequency was 37.2%, 21.8%, and 18.2% for first, third, and sixth months. Tiredness/fatigue, muscle or body aches, and dyspnea/difficulty breathing were most common symptoms. Older age, female gender, bad economic status, current smoking, being fully vaccinated before COVID-19, having more health conditions (≥ 3 conditions), having more symptoms (> 5 symptoms), and hospitalization (intensive care unit) were associated with reporting of symptoms.
Long COVID: care and support needs from the perspective of "long-haul" patients and primary care practitioners - a mixed-methods study from Baden-Wuerttemberg (Stengel et al)	*Z Evid Fortbild Qual Gesundhwes*	Aim of study was to explore experiences and ideas for continued development of medical care of long COVID from the patients' (PAT) and primary care practitioners' (PCP) perspective. Between third and fourth COVID-19 wave in Germany, a mixed methods study was conducted by patients and PCPs in districts in Baden-Wuerttemberg to a paper-based questionnaire. Responses of n = 72 PCPs and n = 126 PAT showed heterogeneous assessment regarding satisfaction with medical care of long COVID as well as perception of attitude towards patients and their disease in both groups. Results support an interdisciplinary, intersectoral and interprofessional stepped-care concept for long COVID in Germany with PCPs as first contact persons, integration of specialized contact points and knowledge transfer.
Prevalence of COVID-19 and Long COVID in Collegiate Student Athletes from Spring 2020 to Fall 2021: A Retrospective Survey (Massey et al)	*medRxiv*	We surveyed a convenience sample of 18 collegiate school administrators, representing about 7,000 student athletes. According to survey responses, 9.8% of student athletes tested positive for COVID-19 in spring 2020 and 25.4% tested positive in the academic year of fall 2020 to spring 2021. About 4% of student athletes who tested positive from spring 2020 to spring 2021 developed Long COVID, defined as new, recurring, or ongoing physical or mental health consequences occurring 4 or more weeks after SARS-CoV-2 infection.
Long Coronavirus Infection is Associated with Significant Sleep Disturbances as Detected by Wearable Health Devices (Mekhael et al)	*J Med Internet Res*	We assess long-term effects of COVID-19 through sleep patterns from continuous signals collected via wearable wristbands. Patients with a history of COVID-19 were compared to a control arm of individuals who never had COVID-19. Study includes 122 COVID-19 patients and 588 controls. Total sleep time was positively correlated with respiratory rate (RR) and oxygen saturation (SpO2). Increased awake sleep phase was correlated with increased heart rate (HR), decreased RR, heart rate variability (HRV), and SpO2. Increased light sleep time was correlated with increased RR and SpO2 in COVID-19 group. Deep sleep duration was correlated with decreased HR, and increased RR and SpO2. When comparing different sleep phases, long COVID-19 patients had decreased light sleep time and decreased deep sleep.
Characterising patterns of COVID-19 and long COVID symptoms: Evidence from nine UK longitudinal studies (Bowyer et al)	*medRxiv*	We analysed individual symptom prevalences and characterised patterns of COVID-19 and long COVID symptoms across nine UK longitudinal studies, totalling over 42,000 participants. Conducting latent class analyses separately in three groups ('no COVID-19', 'COVID-19 in last 12 weeks', 'COVID-19 > 12 weeks ago'), data did not support presence of more than two distinct symptom patterns, representing high and low

		symptom burden, in each group. Comparing high symptom burden classes between 'COVID-19 in last 12 week,' and 'no COVID-19' groups we identified symptoms characteristic of acute COVID-19, including loss of taste and smell, fatigue, cough, shortness of breath and muscle pains or aches. The identified symptom patterns among individuals with COVID-19 > 12 weeks ago were strongly associated with self-reported length of time unable to function as normal due to COVID-19 symptoms, suggesting that the symptom pattern identified corresponds to long COVID.
Evidence of recent Epstein-Barr virus reactivation in individuals experiencing Long COVID (Peluso et al)	*medRxiv*	Epstein-Barr virus (EBV) reactivation has been proposed as a driver of Long COVID (LC). In cohort of 294 hundred adults with history of COVID-19, we observed that LC symptoms such as fatigue and neurocognitive dysfunction at median 4 months following initial diagnosis were associated with serological evidence of recent EBV reactivation, but not with ongoing EBV viremia. Long COVID was also observed in the small proportion without evidence of prior or recent EBV infection, suggesting EBV reactivation is not a prerequisite for this condition.
Natural course of post COVID-19 condition and implications for trial design and outcome selection: A population-based longitudinal cohort study (Ballouz et al)	*medRxiv*	Objective was to evaluate longer-term symptoms and health outcomes within a cohort of SARS-CoV-2 infected individuals in Switzerland (1543 adults with confirmed SARS-CoV-2 infection and 628 adults without infection). 25% of infected individuals did not recover by 6 months. Of those, 67% and 58% also did not recover at 12 and 18 months after infection, respectively. Hospitalization for acute COVID-19, pre-existing fatigue and pain or discomfort, and presence of specific systemic, cardiovascular, or musculoskeletal symptoms at 6 months were associated with persistent non-recovery. Symptom prevalence was higher among infected individuals compared to non-infected individuals at 6 months and 12 months.
Prevalence of long COVID in a national cohort: longitudinal measures from disease onset until 8 months follow up (Petersen et al)	*Int J Infect Dis*	In this longitudinal study from the Faroe Islands, we present prevalence of long COVID in mainly non-hospitalised patients who were followed for up to 8 months. 226 individuals participated at baseline of which 170 participants had more than 3 months follow-up. Of these, 39% reported persistent symptoms median 168 days after the acute phase and 8% reported severe persistent symptoms. Most prevalent symptoms were fatigue (16%) and smell (17%) and taste (14%) dysfunction. Long COVID was more common in people reporting daily medication use.
Long COVID burden and risk factors in 10 UK longitudinal studies and electronic health records (Thompson et al)	*Nat Commun*	The frequency of, and risk factors for, long COVID are unclear among community-based individuals with a history of COVID-19. To elucidate the burden and possible causes of long COVID in community, we coordinated analyses of survey data from 6907 individuals with self-reported COVID-19 from 10 UK longitudinal study (LS) samples and 1.1 million individuals with COVID-19 diagnostic codes in electronic healthcare records (EHR). Proportions of presumed COVID-19 cases in LS reporting any symptoms for 12+ weeks ranged from 7.8% and 17%. Increasing age, female sex, white ethnicity, poor pre-pandemic general and mental health, overweight/obesity, and asthma were associated with prolonged symptoms in both LS and EHR data, but findings for other factors, such as cardio-metabolic parameters, were inconclusive.

*Note: Content may have been published prior to this scan period but was only available through applying our search strategies during this period.

COMMENTARIES, LETTERS AND OPINION PIECES *(JUNE 18-JULY 1)*

- Difficult questions about long COVID in children (*Lancet Child & Adolescent Health*): A small proportion of children have had serious sequelae of SARS-CoV-2 infection itself, with the most dramatic being multisystem inflammatory syndrome in children (MIS-C). A less well-defined entity, termed long COVID or post-COVID-19 condition, has been suggested, referring to children with long-lasting symptoms after SARS-CoV-2 infection that are not explained by another disease. In contrast to MIS-C, the symptoms attributed to long COVID are non-specific and occur frequently in otherwise healthy children; headache, mood swings, abdominal pain, and fatigue are all common, and, although they can be symptoms of a disease, they often are not. The occurrence of these symptoms after infection with SARS-CoV-2 does not necessarily mean that they are caused by the infection.

- Glacial pace for U.S. Long Covid grants (*Science*): NIH RECOVER's flagship, an observational study of up to 40,000 people, has come under fire from patient advocates and some scientists who say it lacks transparency and is moving far too slowly. As of 6 June, the study had signed up 3712 adults, or 21% of its adult enrollment target of 17,680. Among children, numbers are even lower: Ninety-eight children are participants in a study aiming to enroll 19,500 of them. Critics note that other countries have been more nimble. By July 2021, the UK had funded 15 Long Covid research projects aimed at diagnosis and treatment. An independent review published by the Rockefeller Foundation found that, as of February, NIH had funded just eight of 200 Long Covid trials listed in the US ClinicalTrials.gov database. NIH acknowledges the critiques and says it has already "obligated or committed" the $1.15 billion, slated to be spent over 4 years. NIH added in a statement that it expects to announce winners of the long-awaited January funding within 2 weeks. And the agency says it has dedicated multiple staff to RECOVER, reinforced by other NIH experts and the outside firm Deloitte. But given the growing concern about the condition—recent estimates are that one in five U.S. COVID-19 survivors is afflicted—U.S. researchers say more urgency is needed.

MEDIA HIGHLIGHTS *(JUNE 18 – JULY 1)*

CANADA

- **The evolving picture of long COVID (CMAJ):** People exposed to SARS-CoV-2 in the spring of 2020 — before vaccines, variants, and new therapeutics — may not experience the same long-haul symptoms as those exposed during the later Delta and Omicron waves. There also needs to be more understanding of the mechanism of the disease, which could open a door to potential treatment, says Alain Piché, a microbiologist, infectious disease physician, and director of a post-COVID clinic in Sherbrooke. "At this point, we really need new drugs or known drugs that will be effective against long COVID, because I'm seeing so many patients that have a huge impairment on their daily lives," he says.
- **Experts explore long COVID-19 treatments as thousands of Albertans seek relief (Globe & Mail):** Neeja Bakshi, medical director of Park Integrative Health in Edmonton, described long COVID as a very debilitating condition, impacting work and home lives. Dr. Bakshi launched a long COVID treatment program in January. So far, they have seen about 100 patients and are receiving nearly 20 referrals a week from people across Alberta and from neighbouring provinces that either have long wait times or different programs. James Wood, a spokesperson with Alberta Health Services, said about 2,250 Albertans have been "referred to specialty medicine" as of May due to post-COVID symptoms lasting longer than three months. Mr. Wood said the agency's Rehabilitation Advice Line, which provides free advice to people with persistent COVID-19 symptoms, has also connected with more than 8,700 people.

GLOBAL

- **How common is long COVID? Why studies give different answers (Nature):** Enormous databases do not necessarily allow scientists to solve long COVID mysteries, such as how well vaccination protects against the condition. Another issue is how symptoms are recorded in the claims and electronic medical records. Doctors often record codes for several symptoms and conditions, but they rarely list a code for every symptom a patient is experiencing, and the choice of codes for a given condition might vary from one doctor to the next. This could lead to differences in whether and how long COVID is reported.

POST COVID-19 CONDITION RESOURCES

- Long COVID Physio: Long COVID Physio is an international peer support, education and advocacy, patient-led association of Physiotherapists living with Long COVID and allies. They post various educational videos on long COVID.

- John Hopkins Medicine - Long-Term Effects of COVID-19

- C19 Recovery Awareness (US): The mission of the Long Haul COVID Fighters is to provide support for those whose health has been affected by COVID-19, promote public awareness and education regarding lengthy COVID recovery, and advocate for the medical, mental health, and social interests of long haul COVID survivors.

- COVID-19 Virtual Library of Health Data and Evidence (Canada): Resources to knowledge products, data and evidence on the impacts of COVID-19, which includes post COVID-19 condition. This is a searchable collection of products funded and published by the Government of Canada.

- Lullabies for long COVID (UK): An online program developed in collaboration with the English National Opera could help with rehabilitation, by improving mental health and symptoms of breathlessness.

- Solve Long Covid Initiative (US): The Solve ME/CFS Initiative is a non-profit organization that serves as a catalyst for critical research into diagnostics, treatments, and cures for myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS), Long Covid and other post-infection diseases.

- PASC Guide (University of Michigan): A resource for people with PASC/long COVID.

- Health Education England (HEE) e-learning modules: long COVID programme

- Voices of Long COVID (US): Voices of Long Covid campaign features testimonials from a diverse group of people ages 18-29 who are suffering from long-term complications of COVID-19 infection.

- Dignity Health (US): COVID-19 and Chronic Illness Recovery Program based in the U.S. has helped over 2,000 people struggling with COVID long-term effects ("COVID long haulers"). Treatment is exercise-based for lingering or long-term conditions (sequelae) from having the virus.

- Altea (Switzerland): A network for sharing evidence-based information on the long-term effects of COVID-19.

- Pandemic-Aid Networks: Long COVID research library.

- Post-COVID-19 Functional Status Scale: An overview of a patient self-reported scale that helps to support assessment of functional status and recovery after the SARS-CoV-2 infection.

- Ontario College of Family Physicians: Resources on Post-COVID Condition.

- Agency for Clinical Innovation (Australia): Living Evidence - post acute sequelae of COVID-19.

- Pre-populated literature searches: Long COVID search (LitCovid) and Long COVID search (NIH)

- PAHO Webinar Series on Post COVID-19 Condition launched 17 February, 2022, from 10:30 am to 12:30 pm (EST).

- Body Politic COVID-19 Support Group (Global): Housed on the Slack app, group members have access to dozens of different channels, which give space for more personal discussion. Some of the channels include those specifically for medical professionals, parents of children with Covid-19, LGBTQ+ individuals, BIPOC+, and different regions around the world.

- Patient-Led Research Collaborative (Global): Self-organized group of Long COVID patients working on patient-led research around the Long COVID experience.

- British Heart Foundation (UK): UK-based foundation with resources on long COVID.

- COVID Long Haul (Canada): Canada's largest online platform for COVID survivors, their family members and anyone searching for the most up-to-date information about the pandemic. There is a COVID long-haulers support group and a Report on Pan-Canadian Long COVID Impact Survey (PDF) (June 2021)

- BC ECHO for Post-COVID-19 Recovery (Canada): BC ECHO for Post-COVID-19 Recovery is a learning community of specialists and community health-care providers who use case-based learning to improve care for those recovering from symptoms post-COVID-19.

- Long Covid Support (UK): Peer support and advocacy group aiming to facilitate international peer support and campaigning in the UK for recognition, rehabilitation and research into treatments.

- Long COVID SOS (UK): Long-term sufferers formed the LongCovidSOS campaign to put pressure on the UK government to recognise the needs of those with Long Covid, and to raise awareness among the general public and employers.

- Survivor Corps (US): One of the largest and fastest growing grassroots movements connecting, supporting, and mobilizing COVID-19 Survivors to support research. They have a list of Post-COVID Care Centers (PCC) and a PCCC Best Practices Guide.

- The Center for Chronic Illness (US): Aims to promote well-being and decrease isolation for those impacted by chronic illness through support and education. Their online support groups are professionally-facilitated and offer psychoeducational tools for coping.

- Blooming Magnolia (US): Mission is to empower others by providing a platform to strengthen & protect mental health and support those afflicted with Long-Covid through education and funding of therapeutic research. They have a list of support groups and resources on their website.

- Long COVID Alliance (US): US-based network of patient-advocates, scientists, disease experts, and drug developers who have joined together to leverage their collective knowledge and resources to educate policy makers and accelerate research to transform our understanding of post-viral illness.

- Long COVID Kids (UK/US/Canada): Parent & patient led advocacy & support group based in the UK.

- Long COVID Physio (US & UK): International peer support, education and advocacy group of Physiotherapists living with Long COVID, founded in November 2020 by Physiotherapists living with Long COVID from the UK and US.

- Patient-Led Research Collaborative (Global): Group of Long COVID patients working on patient-led research around the Long COVID experience.

- CANCOV- Patient resources (Canada): CANCOV is a research platform grounded in a prospective longitudinal 1-year cohort study of patients infected with COVID-19.

- COVID Patient Recovery Alliance (CPRA) (US): CPRA aims to bring together leaders in business, health care, research, academia, data and analytics, and patient advocacy to develop solutions that coordinate diverse data sources, inform models of care, and ensure adequate payment for long-COVID patients. Their report outlines recommendations for federal policymakers to promote recovery.

- British Lung Foundation (UK): UK-based charity sharing resources on navigating the NHS, breathlessness support, movement and energy support for long COVID patients.

- Living with Long COVID (US): COVID-19 Long-Haulers and Post-COVID Support Community.

***Note**: Previous OCSO Post COVID-19 Condition Scans can be found here.*

From: LeBlanc, Shannon (DH/MS)
To: Day, Barbara (DH/MS); Mullin, Tanya (DH/MS); Guenard, Michelle (ECO/BCE)
Cc: Power, Michaela (ECO/BCE)
Subject: RE: Canadian study suggests reason behind long COVID
Date: July 5, 2022 10:45:14 AM

Good Morning,

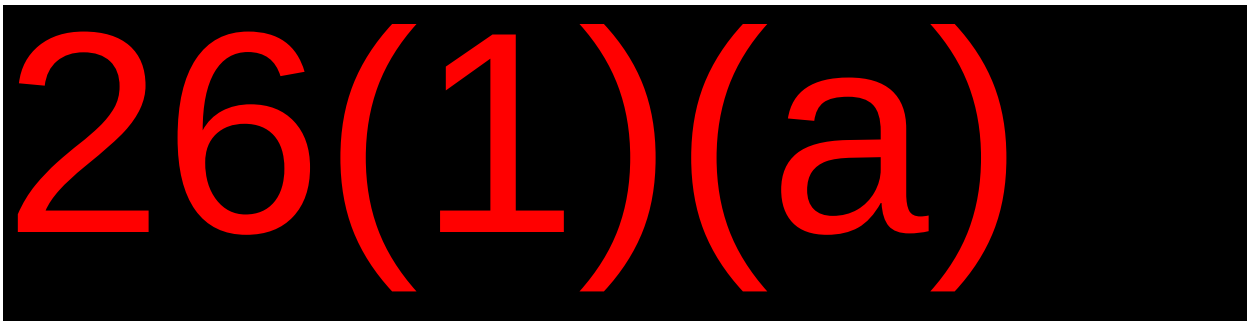
I believe the statement is still accurate. I am unsure of when they stopped adding new patients to the registry, but I believe it was during the most recent wave of the pandemic.

Shannon

From: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Sent: Tuesday, July 5, 2022 10:37 AM
To: Mullin, Tanya (DH/MS) <Tanya.Mullin@gnb.ca>; Guenard, Michelle (ECO/BCE) <Michelle.Guenard@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: RE: Canadian study suggests reason behind long COVID

I think we need to clarify with 21(1) on the registry – adding Shannon.

This is the last line I have on the registry. Not sure if the results will be published, per her story below.



From: Mullin, Tanya (DH/MS) <Tanya.Mullin@gnb.ca>
Sent: July 5, 2022 10:24 AM
To: Guenard, Michelle (ECO/BCE) <Michelle.Guenard@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Subject: RE: Canadian study suggests reason behind long COVID

Sorry no, I don't have anything on the study.

Tanya

From: Guenard, Michelle (ECO/BCE) <Michelle.Guenard@gnb.ca>
Sent: July 5, 2022 9:51 AM
To: Mullin, Tanya (DH/MS) <Tanya.Mullin@gnb.ca>
Cc: Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: FW: Canadian study suggests reason behind long COVID

Tanya,
Do you know anything about this study?
21(1) is one of the reporters booked today.
Michelle

From: Guenard, Michelle (ECO/BCE)
Sent: Tuesday, July 5, 2022 9:11 AM
To: Russell, Dr. Jennifer (DH/MS) <Jennifer.Russell@gnb.ca>; Gauvin, Sophie (DH/MS) <Sophie.Gauvin@gnb.ca>
Cc: LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>
Subject: FW: Canadian study suggests reason behind long COVID

We'll print this out for the binder.
Wanted to make sure Dr.Russell is aware.

From: Kilfoil, Valerie (ECO/BCE) <Valerie.Kilfoil@gnb.ca>
Sent: Tuesday, July 5, 2022 9:04 AM
To: Guenard, Michelle (ECO/BCE) <Michelle.Guenard@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Subject: Canadian study suggests reason behind long COVID

For the binder

Canadian study suggests reason behind long COVID

21(1) |Legislature Bureau
Canadian researchers have found a possible cause for shortness of breath in those with post-COVID-19 condition, commonly known as long COVID.

That study, funded by Ontario's Ministry of Health and Long-Term Care, looked at 40 patients aged between 18 and 80 years, with an average age of 35, who tested positive between April and October 2021.

There were 34 patients with "post-acute COVID-19-syndrome" (PACS), 22 of which were not hospitalized.

The authors observed an abnormal transfer of oxygen from red blood cells into the lungs for all 34 patients, regardless of hospitalization.

"Together, the abnormal MRI and CT findings were consistent with abnormal gas exchange stemming from the alveolar tissue barrier and pulmonary vascular compartments," they wrote in the study, published in the journal Radiology.

New Brunswick's regional health authorities have been studying health outcomes and symptoms in those who had COVID-19 through a registry of over 400 people. However, to date, no findings have been released.

Valerie Kilfoil
Director of Communications/Directrice des communications
Department of Health / Ministère de la Santé
(506) 444-4583

From: COVID-19 Public Enquiries / Demandes publiques COVID-19 (DH/MS)
To: Forsythe, Sheri (PO/CPM)
Subject: RE: Long covid
Date: July 8, 2022 9:03:00 AM

Hi Sheri,

The group that was part of the study were responding to the clients directly so we do not have a copy of a response in our email account.

Tanya

Department of Health COVID-19 Public Enquiries Team/ l'Équipe de demandes publiques COVID-19 du Ministère de la Santé

For the most up-to-date information, please visit our dedicated COVID-19 website/Pour obtenir les informations les plus récentes, veuillez visiter notre site Web dédié à la COVID-19:
www.gnb.ca/coronavirus

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● Soyez informé ● Soyez protégé ● Soyez préparé ● Soyez bienveillant ●

From: Forsythe, Sheri (PO/CPM) <Sheri.Forsythe@gnb.ca>
Sent: July 8, 2022 8:46 AM
To: COVID-19 Public Enquiries / Demandes publiques COVID-19 (DH/MS) <COVID-19NB@gnb.ca>
Subject: FW: Long covid

Good morning,

Was this ever dealt with and if so, could I have a copy for the file.

Thank you,

Sheri Forsythe
Correspondence Coordinator/Coordinatrice de la correspondance
Office of the Premier/Cabinet du premier ministre

From: COVID-19 Public Enquiries / Demandes publiques COVID-19 (DH/MS) <COVID-19NB@gnb.ca>
Sent: Wednesday, April 20, 2022 11:55 AM
To: R1SETripleCNBRegistry <TripleC-NBRegistry@HorizonNB.ca>
Subject: FW: Long covid

Good morning,

Can someone from the long haul study respond to 21(1) below?

Department of Health COVID-19 Public Enquiries Team/ l'Équipe de demandes publiques COVID-19 du Ministère de la Santé

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From: Crain, Krista (DH/MS) <Krista.Crain@gnb.ca> **On Behalf Of** Shephard, Dorothy Hon. (DH/MS)
Sent: April 19, 2022 1:17 PM
To: DH Correspondence / Correspondance MS (DH/MS) <DHMC.CMMS@gnb.ca>
Subject: FW: Long covid

From: 21(1) [redacted]
Sent: Monday, April 18, 2022 3:11 PM
To: Shephard, Dorothy Hon. (DH/MS) <Dorothy.Shephard@gnb.ca>
Subject: Long covid

ATTENTION! External email / courriel externe.

Hello Ms Shephard,
I am writing you as a sufferer of what is now called "long covid". My symptoms are often debilitating and my life has been put on hold even though I am no longer infected with covid.
I am not alone as there are many others New Brunswickers suffering along with me. We need help and a long covid clinic in New Brunswick. I am not asking for anything more than what other Canadians have access to in their home provinces.

Please help us,

21(1) [redacted]

From: Forsythe, Sheri (PO/CPM)
To: COVID-19 Public Enquiries / Demandes publiques COVID-19 (DH/MS)
Subject: RE: HPRM: RE: Long covid
Date: July 8, 2022 9:56:00 AM

Ok, thank you. I'll put a note in the file.

Have a great day,

Sheri

From: COVID-19 Public Enquiries / Demandes publiques COVID-19 (DH/MS) <COVID-19NB@gnb.ca>
Sent: Friday, July 8, 2022 9:04 AM
To: Forsythe, Sheri (PO/CPM) <Sheri.Forsythe@gnb.ca>
Subject: HPRM: RE: Long covid

Hi Sheri,

The group that was part of the study were responding to the clients directly so we do not have a copy of a response in our email account.

Tanya

Department of Health COVID-19 Public Enquiries Team/ l'Équipe de demandes publiques COVID-19 du Ministère de la Santé

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Thank you,

Sheri Forsythe
Correspondence Coordinator/Coordinatrice de la correspondance
Office of the Premier/Cabinet du premier ministre

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Subject: FW: Long covid

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Sent: Monday, April 18, 2022 3:11 PM
To: Shephard, Dorothy Hon. (DH/MS) <Dorothy.Shephard@gnb.ca>
Subject: Long covid

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I am not alone as there are many others New Brunswickers suffering along with me. We need help and a long covid clinic in New Brunswick. I am not asking for anything more than what other Canadians have access to in their home provinces.

Please help us,

21(1)
[redacted]
[redacted]

From:	Lachapelle, Stephane (PHAC/ASPC) on behalf of Cidsc Secretariat (PHAC/ASPC)
To:	annick.descormiers@msss.gouv.qc.ca; Barbara.Yaffe@ontario.ca; BethHalfyard@gov.nl.ca; Brenda Clement; caroline_newberry@gov.nt.ca; charlene.mack@gov.ab.ca; cindy.rogers@health.gov.sk.ca; Claudia Kraft; colette.gaulin@msss.gouv.qc.ca; Colleen.Kovach@yukon.ca; Daniel.Warshafsky@ontario.ca; Danuta.Skowronski@bccdc.ca; Dilan_Patel@gov.nt.ca; Emily.Karas@oahpp.ca; Eveline.Toth@msss.gouv.qc.ca; Fiona.kouyoumdjian@ontario.ca ; George.Doyle-Bedwell@novascotia.ca; geraldine_whiteford@gov.nt.ca; Smadi, Hanan (DH/MS); Heather Morrison; Helene.Venables@msss.gouv.qc.ca; Jan.McFadzen@yukon.ca ; Jayne Boutilier; Jessica.Hopkins@oahpp.ca; Jing.Hu@gov.ab.ca; JPawa@GOV.NU.CA; Julie.Kryzanowski@health.gov.sk.ca; Kelly.dean@novascotia.ca; KKulleperuma@GOV.NU.CA; louise.valiquette@inspq.qc.ca; Marie-Andree.Leblanc@msss.gouv.qc.ca; Martin.Vogel@oahpp.ca; martine.fortier@msss.gouv.qc.ca; Chalifoux, Mathieu (DH/MS); mayank.singal@bccdc.ca; Dr. Marguerite Cameron; michelle.murti@ontario.ca ; mireille.barakat@inspq.qc.ca; monika.naus@bccdc.ca; MP; MPS; OCMHO@health.gov.sk.ca; Paul.Hasselback@yukon.ca; Plamondon, Mireille (PHAC/ASPC); prahman@mun.ca; richard.masse@msss.gouv.qc.ca; RosannSeviour@gov.nl.ca; Sanaz.Vaseghi@health.gov.sk.ca; Santina.Lee@gov.mb.ca; LeBlanc, Shannon (DH/MS); shelley.deeks@novascotia.ca; Sudit.Ranade@yukon.ca ; Tim.hilderman@gov.mb.ca; Wajid.ahmed@ontario.ca ; Siu, Winnie (PHAC/ASPC); Yasmin.Khan@oahpp.ca
Cc:	Cidsc Secretariat (PHAC/ASPC); Wilkinson, David (PHAC/ASPC)
Subject:	PHAC OCSO Post COVID-19 Condition Scan #27
Date:	July 19, 2022 8:58:57 AM
Attachments:	OCSO Post-COVID Condition Scan_27_July15_2022.pdf

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Subject: OCSO Post COVID-19 Condition Scan #27

TAC members,

On behalf of the *Office of the Chief Science Officer*, please find attached the latest COVID-19 environmental scan.

This biweekly product presents an overview of the current state of knowledge, and emerging evidence on **Post COVID-19 Condition** (July 2- July 15).

TAC sec't, on behalf of the *Office of the Chief Science Officer, Public Health Agency of Canada | Government of Canada*

POST COVID-19 CONDITION

OCSO BIWEEKLY SCAN OF EVIDENCE #27

July 2-July 15, 2022

SCOPE

This biweekly update presents an analysis of new evidence, guidance and issues related to post COVID-19 condition and synthesizes the current state of knowledge. Comprehensive lists of details and resources on this issue are available at the Office of the Chief Science Officer (OCSO).

CURRENT STATE OF KNOWLEDGE

According to the World Health Organization (WHO), post COVID-19 condition (PCC) refers to persistent symptoms occurring 12 weeks or more after an acute COVID-19 infection, which persist or reoccur for a minimum of 8 weeks. The most common symptoms that we know of in adults include: fatigue, memory problems, sleep disturbances, shortness of breath, anxiety and depression, general pain and discomfort, difficulty thinking or concentrating and post-traumatic stress disorder (PTSD). There is still a lot that we don't know about post COVID-19 condition in children.

PCC is also referred to as long COVID, post-acute sequelae, post COVID-19 symptoms, and post-acute COVID-19 syndrome. Prior to the WHO definition, a number of studies reported on post-acute sequelae (PAS) from 4 to 12 weeks post diagnosis. The Public Health Agency of Canada (PHAC) released a review of the current international evidence (November 2021). Over 100 symptoms or difficulties conducting usual activities of daily living were reported.

There is limited data suggesting that the condition may be more likely to develop in those:

- who were hospitalized during acute infection;
- had more than 5 COVID symptoms during the acute phase;
- have pre-existing respiratory disease;
- are older;
- are women; and
- have other co-morbidities or have higher BMI.

There's currently no universally agreed-upon approach to diagnose and treat post COVID-19 condition. Early evidence suggests that vaccination with 2 or more doses may help reduce the risk of developing post COVID-19 condition if infected. Emerging evidence points to the importance of multidisciplinary care given the heterogeneity of symptoms associated with PCC. Multidisciplinary teams in "long COVID" clinics have been set up to include professionals from the following fields: rehabilitation, respiratory and cardiac consultants, physiotherapists, occupational therapists, psychologists, etc.

People who have been hospitalized or who needed intensive care during recovery appear to be at greater risk of experiencing longer-term effects. However, recent research shows about 30% to 40% of people who weren't hospitalized for their initial COVID-19 infection still report symptoms beyond 12 weeks. Canadians suffering from PCC and who are unable to work because of their symptoms may be eligible for support through: Employment and Skills Development Canada's Employment Insurance (EI) Program and Canada Pension Plan Disability Benefits.

This week's scan includes a systematic review examining the link between diabetes and long COVID, as well as a study by Manhas et al. on a rehabilitation framework for post-COVID conditions (PCC) to support persons with PCC in Alberta, Canada.

NATIONAL AND INTERNATIONAL DEVELOPMENTS *(JULY 2 – JULY 15)*

CANADA

- (NEW) On July 7th, the Government of Canada announced they will be investing $10 million to create a pan-Canadian platform to advance research into the effectiveness and clinical challenges of new COVID-19 treatments in non-hospitalized patients. The Canadian ADAptive Platform Trial of COVID-19 Therapeutics in Community Settings (Can-ADAPT COVID) will be led by Dr. Andrew Pinto. Dr. Pinto will investigate outpatient medications for COVID-19 such as nirmatrelvir/ritonavir and provide key insights into whether treatments prevent hospitalization and post COVID-19 condition ("long COVID").
- (NEW) A study by Manhas et al. describes the development and composition of a codesigned, multidisciplinary, integrated, systematic rehabilitation framework for post-COVID conditions (PCC) that spans the care continuum to streamline and standardize rehabilitation services to support persons with PCC in Alberta, Canada.
- (NEW) The new post-COVID rehab program at The Ottawa Hospital combines physiotherapy and occupational therapy, but also includes an important core of mental health supports

UK

- (NEW) According to recent UK ONS data, of triple-vaccinated adults, 4.5%, 4.2% and 5.0% self-reported having long COVID 12 to 16 weeks after a first laboratory-confirmed coronavirus (COVID-19) infection compatible with the Omicron BA.1, Omicron BA.2 or Delta variants, respectively, using data to 27 May 2022. There was no statistical evidence of differences in the odds of reporting long COVID between infections compatible with the Omicron BA.1, Omicron BA.2 and Delta variants among adults who were triple vaccinated when infected; this was after statistically adjusting for socio-demographic characteristics for all comparisons, and for time since last vaccine dose when comparing Omicron BA.1 and BA.2.

US

- (NEW) CDC published a checklist designed to help patients and caregivers get the most out of appointments with healthcare providers for post-COVID conditions.

EMERGING SCIENTIFIC EVIDENCE *(JULY 2 – JULY 15)**

EVIDENCE PRODUCTS

TITLE AND AUTHOR	EVIDENCE TYPE	SUMMARY
Post COVID-19 complications, adjunct therapy explored, and steroidal after effects (Sonkar et al)	Review (Available in *Can J Chem)*	Review discusses various post-COVID-19 complications observed and adjunctive therapies used along with common COVID-19 treatment and spotlights their side effects and consequences. This review provides the latest literature on COVID-19, which emphasizes the subsequent complications in various organs, side effects of drugs, and alternative regimens used to treat COVID-19.
Association of COVID-19 with Diabetes: A Systematic Review and Meta-Analysis	Systematic Review *(Available in*	Emerging evidence suggests that long COVID-19 may lead to a wide range of post-acute sequelae outcomes, including new onset of diabetes. Aim of this meta-analysis was to estimate the incidence of newly diagnosed diabetes in survivors of COVID-19. Multiple electronic databases

(Ssentongo et al)	*Research Square)*	(MEDLINE, Scopus, Cochrane Central Register of Controlled Trials and the World Health Organization Global Literature on Coronavirus Disease) and clinical trial registries were searched to June 25, 2022, for studies reporting the association of COVID-19 and diabetes. Two investigators independently assessed studies for inclusion. Risk of bias was assessed using the Newcastle-Ottawa Scale. We estimated the effect of COVID-19 on incident diabetes by random-effects meta-analyses using the generic inverse variance method. We identified 5 eligible studies consisting of 1,130,773 COVID-19 patients and 16,630,187 controls. Median age was 43 years and 34.8 % were female. COVID-19 was associated with a 74% higher risk of incident diabetes. Average risk of bias assessment was 7.5. In this systematic review and meta-analysis, COVID-19 was associated with higher risk for developing new onset diabetes among survivors.

SELECTED LITERATURE

TITLE AND AUTHOR	SOURCE	SUMMARY
Searching for Factors Influencing the Severity of the Symptoms of Long COVID (Mińko et al)	*Int J Environ Res Public Health*	The purpose of this study was to look for factors that influence the type and severity of Long COVID symptoms. In total, 932 individuals with a history of COVID-19 were qualified for the study using an original questionnaire based on the COVID-19 Yorkshire Rehab Screen (C19-YRS) questionnaire. Older adults were more likely to report problems with mobility and in performing daily activities. Those with a higher BMI showed significantly more symptoms such as dyspnea at rest and on exertion, feelings of chronic fatigue, problems with mobility and in performing daily activities. The data show that those with Long COVID should receive multidisciplinary help including additional medical and psychological support. Particular attention should be paid to elderly and obese persons.
Safety and efficacy of low dose naltrexone in a long covid cohort; an interventional pre-post study (O'Kelly et al)	*Brain Behav Immun Health*	In this single centre interventional pre post study, the safety of Low Dose Naltrexone (LDN) was explored in patients with Post COVID-19 Syndrome (PCS). Patients were recruited through a Post COVID clinic, had a baseline quality of life questionnaire in symmetrical Likert format, were prescribed 2 months of LDN and repeated the same questionnaire at the end of the second month. Patients were monitored to adverse events. 52 patients participated of whom 40 (76.9%) were female. Median age was 43.5 years. Healthcare workers represented the largest occupational cohort n = 16(34.8%). Median time from diagnosis of COVID-19 until enrolment was 333 days. 38 participants (73.1%) were known to commence LDN, two of whom (5.3%) stopped taking LDN post commencement due to new onset diarrhoea and also described fatigue. In total 36(69.2%) participants completed the questionnaire at the end of the two-month period. Improvement was seen in 6 of 7 parameters measured; recovery from COVID-19, limitation in activities of daily living, energy levels, pain levels, levels of concentration and sleep disturbance, improvement in mood approached but was not significant. LDN is safe in patients with PCS and may improve well-being and reduce symptomatology in this cohort.
Post COVID-19 condition diagnosis: A population-based cohort study of occurrence, associated	*Research Square prepub*	Our aim was to investigate these aspects in SARS-CoV-2 positive individuals with and without a post COVID-19 condition diagnosis. We conducted a population-based cohort study of adults in the entire Stockholm Region, Sweden, with a positive SARS-CoV-2 test from 1 March

factors, and healthcare use by severity of acute infection (Hedberg et al)		2020 to 31 July 2021, stratified by severity of the acute infection. The study outcome was a post COVID-19 condition diagnosis registered any time 90 to 360 days after positive test. We performed Cox regression models to assess baseline characteristics associated with post COVID-19. Individuals with post COVID-19 were then propensity-score matched to individuals without post COVID-19 to assess healthcare use beyond the acute infection. Among 204 805 SARS-CoV-2-positive individuals, the proportion receiving a post COVID-19 diagnosis was 1% among individuals not hospitalized for their COVID-19 infection, 6% among hospitalized, and 32% among ICU-treated individuals. Female sex was associated with post COVID-19 among non-hospitalized and hospitalized individuals, with interactions between age and sex. Among individuals with post COVID-19, the monthly proportion with outpatient care visits after the infection compared to before the infection was substantially elevated up to one year after the acute infection, with substantial proportions of this care attributed to care related to post COVID-19.
Long COVID and symptom trajectory in a representative sample of Americans in the first year of the pandemic (Wu et al)	*Sci Rep*	We use a sample representing the U.S. community population from the Understanding America Study COVID-19 Survey, which surveyed around 8000 respondents bi-weekly from March 2020 to March 2021. Our final sample includes 308 infected individuals who were interviewed one month before, around the time of, and 12 weeks after infection. About 23% of the sample experienced new-onset symptoms during infection which lasted for more than 12 weeks, and thus can be considered as having long COVID. The most common new-onset persistent symptoms among those included in the study were headache (22%), runny or stuffy nose (19%), abdominal discomfort (18%), fatigue (17%), and diarrhea (13%). Long COVID was more likely among obese individuals and those who experienced hair loss, headache and sore throat) during infection. There was a lack of evidence relating risk to age, gender, race/ethnicity, education, current smoking status, or comorbid chronic conditions. This work provides national estimates of long COVID in a representative sample after accounting for pre-infection symptoms.
Remodeling of T Cell Dynamics During Long COVID Is Dependent on Severity of SARS-CoV-2 Infection (Wiech et al)	*Front immunol*	We performed longitudinal studies of mild, moderate and severe COVID-19-convalescent patients, at two time points (3 and 6 months from the infection), to assess the dynamics of T cells immune landscape, integrated with patients-reported symptoms. We show that alterations among T cell subsets exhibit different, severity- and time-dependent dynamics, that in severe convalescents result in a polarization towards an exhausted/ senescent state of CD4+ and CD8+ T cells and perturbances in CD4+ Tregs. CD8+ T cells exhibit a high proportion of CD57+ terminal effector cells, together with significant decrease of naïve cell population, augmented granzyme B and IFN-γ production and unresolved inflammation 6 months after infection. Mild convalescents showed increased naïve, and decreased central memory and effector memory CD4+ Treg subsets. Patients from all severity groups can be predisposed to the long COVID symptoms, and fatigue and cognitive dysfunctions are not necessarily related to exhausted/senescent state and T cell dysfunctions, as well as unresolved inflammation that was found only in severe convalescents. In conclusion, post-COVID-19 functional remodeling of T cells could be seen as a two-step process, leading to distinct convalescent immune states at 6 months after infection. Our data imply that attenuation of the functional

		polarization together with blocking granzyme B and IFN-γ in CD8+ cells might influence post-COVID alterations in severe convalescents.
Detection of Post-COVID-19 Patients Using Medical Scent Detection Dogs—A Pilot Study (Twele et al)	*Front Med*	Previous research proved dogs' ability to detect acute SARS-CoV-2 infections, but has not yet shown if dogs also indicate samples of patients with post-COVID-19 condition (Long COVID). Nine dogs, previously trained to detect samples of acute COVID-19 patients, were confronted with samples of Long COVID patients in two testing scenarios. In test scenario I (samples of acute COVID-19 vs. Long COVID) dogs achieved a mean sensitivity (for acute COVID-19) of 86.7% and a specificity of 95.8%When dogs were confronted with Long COVID and negative control samples in scenario IIa, dogs achieved a mean sensitivity (for Long COVID) of 94.4 and a specificity of 96.1%. In comparison, when acute SARS-CoV-2 positive samples and negative control samples were comparatively presented (scenario IIb), a mean sensitivity of 86.9 and a specificity of 88.1% was attained. This pilot study supports the hypothesis of volatile organic compounds (VOCs) being long-term present after the initial infection in post-COVID-19 patients. Detection dogs, trained with samples of acute COVID-19 patients, also identified samples of Long COVID patients with a high sensitivity when presented next to samples of healthy individuals.
Development of a Novel Care Rehabilitation Pathway for Post-COVID Conditions (Long COVID) in a Provincial Health System in Alberta, Canada (Manhas et al)	*Phys Ther*	The purpose of this study was to describe the development and composition of a codesigned, multidisciplinary, integrated, systematic rehabilitation framework for post-COVID conditions (PCC) that spans the care continuum to streamline and standardize rehabilitation services to support persons with PCC in Alberta, Canada. A collaborative, consensus-based approach was used, involving 2 iterative provincial taskforces in a Canadian provincial health system. The first taskforce (59 multidisciplinary stakeholders) sought to clarify the requisite facets of a sustainable, provincially coordinated rehabilitation approach for post-COVID rehabilitation needs, based on available research evidence. The second taskforce (129 multidisciplinary stakeholders) translated that strategy and criteria into an operational framework for provincial implementation. Both taskforces sought to align with operational realities of the provincial health system. The summation of this collaborative, consensus approach resulted in the Provincial Post COVID-19 Rehabilitation Response Framework (PCRF). The PCRF includes 3 care pathways across the care continuum, specifically targeting in-hospital care, continuing care, and community-based care, with 3 key elements: (1) the use of specific symptom screening and assessment tools to systematically identify PCC symptoms and functional impairments; (2) pathways to determine patients' rehabilitation trajectory and to guide their transition between care settings; and, (3) self-management and education resources for patients and providers.
Chronic fatigue, depression and anxiety symptoms in Long COVID are strongly predicted by neuroimmune and neuro-oxidative pathways which are caused by the inflammation during acute infection (Al-Hakeim et al)	*medRxiv*	The severity of the Long COVID physio-affective phenome is largely predicted by peak body temperature (BT) and lowered oxygen saturation (SpO2) during the acute infectious phase. This study aims to delineate whether the association of BT and SpO2 during the acute phase and the Long COVID physio-affective phenome is mediated by neurotoxicity (NT) resulting from activated immune-inflammatory and oxidative stress pathways. We recruited 86 patients with Long COVID (3-4 months after the acute phase) and 39 healthy controls and assessed serum C-reactive protein (CRP), caspase-1, interleukin (IL)-1β, IL-18, IL-10, myeloperoxidase (MPO), advanced oxidation protein products (AOPP), total antioxidant

		capacity (TAC), and calcium (Ca), as well as peak BT and SpO2 during the acute phase. Cluster analysis revealed that a significant part (34.9%) of Long COVID patients (n=30) show a highly elevated NT index computed based on IL-1β, IL-18, Caspase-1, CRP, MPO and AOPP. Partial Least Squares analysis showed that 61.6% of the variance in the physio-affective phenome of Long COVID is explained by the NT index, lowered Ca, peak BT/SpO2 in the acute phase, and prior vaccinations with Astra-Zeneca or Pfizer. The most important predictors of the physio-affective phenome are Ca, CRP, IL-1β, AOPP and MPO. The infectious-immune-inflammatory core of acute COVID-19 strongly predicts the development of physio-affective symptoms 3-4 months later, and these effects are partly mediated by neuro-immune and neuro-oxidative pathways.
Using Logistic Regression to Predict Long COVID Conditions in Chronic Patients (Kulenovic et al)	*Stud Health Technol Inform*	This paper presents a method for predicting selected long COVID conditions in chronic and multimorbidity patients. It produces a logistic regression model for each long COVID condition by examining electronic medical records (EMRs) of COVID-19 patients and taking their chronic conditions as predictors. The models were developed and tested using the Jumpstart EMR database, provided in the COVID-19 Research Environment of Hopkins University, containing about 250,000 EMRs of the outpatient and ambulatory COVID-19 patients across the US. They are illustrated by predictions of 20 prevalent acute and chronic long-COVID conditions in patients diagnosed with frequent pre-COVID chronic diseases. These models can aid in investigating long COVID impacts on various chronic patients, finding their underlying pathophysiology, and establishing guidelines for their treatment and prevention.
The Role of Acupuncture for Long COVID: Mechanisms and Models (Williams & Moramarco)	*Med Acupunct*	Objective was to establish an evidence-based role for acupuncture as a safe and effective treatment for managing Long COVID in the integrative medical setting. Background: COVID-19 progresses to a chronic state, termed Long COVID, in about 30% of cases with estimates as high as 40% for prolonged illness. Symptoms are diverse and range over several body systems, including unrelenting fatigue, persistent malaise, chronic pain, and mood changes. Early clinical reports suggest acupuncture can effectively address both symptoms and the underlying causes of Long COVID. Historically, acupuncture is well defined in Traditional Chinese Medicine writings to treat influenza-like febrile illnesses. Contemporary scientific literature and case studies support the value of acupuncture for symptoms associated with acute and chronic respiratory viral infections, such as influenza, including SARS and COVID-19. Recent reports provide early evidence of acupuncture's effectiveness in managing Long COVID symptoms and may also have disease-modifying benefits.
Deriving and validating a risk prediction model for long COVID-19: protocol for an observational cohort study using linked Scottish data (Daines et al)	*BMJ Open*	In this protocol, we describe plans to develop a prediction model to identify individuals at risk of developing long-COVID.We will use the national Early Pandemic Evaluation and Enhanced Surveillance of COVID-19 (EAVE II) platform, a population-level linked dataset of routine electronic healthcare data from 5.4 million individuals in Scotland. We will identify potential indicators for long-COVID by identifying patterns in primary care data linked to information from out-of-hours general practitioner encounters, accident and emergency visits, hospital admissions, outpatient visits, medication prescribing/dispensing and mortality. We will investigate the potential indicators of long-COVID by performing a matched analysis between those with a positive reverse transcriptase PCR (RT-PCR) test for SARS-CoV-2 infection and two control

		groups: (1) individuals with at least one negative RT-PCR test and never tested positive; (2) the general population (everyone who did not test positive) of Scotland. Cluster analysis will then be used to determine the final definition of the outcome measure for long-COVID. We will then derive, internally and externally validate a prediction model to identify the epidemiological risk factors associated with long-COVID.
Long COVID in K18-hACE2 mice causes persistent brain inflammation and cognitive impairment (Sriramula et al)	*Research Square prepub*	We establish an animal model of long COVID by eliciting mild disease in K18-hACE2 mice. Following recovery from infection with a low dose of SARS-CoV-2, K18-hACE2 mice show the characteristic lung fibrosis associated with SARS-CoV-2 infection, which correlates with increased expression of the pro-inflammatory kinin B1 receptor (B1R). These mice also have elevated expression of B1Rs and inflammatory markers in the brain and exhibit cognitive impairments such as elevated anxiety and attenuated exploratory behavior. Our data demonstrate that K18-hACE2 mice exhibit persistent effects of SARS-CoV-2 infection on brain tissue, revealing the potential of this model for investigating long COVID. The results further imply that elevated B1R expression may drive the long-lasting inflammatory response associated with SARS-CoV-2 infection.
Race, Ethnicity, and Utilization of Outpatient Rehabilitation for Treatment of Post COVID-19 Condition (Hentschel et al)	*PM&R*	Objective was to examine factors associated with outpatient rehabilitation use following COVID-19 and to ascertain whether differential incidence of sequelae explain variation in post-COVID rehabilitation utilization by race and ethnicity. U.S. adults with COVID-19 during 2020 in the TriNet X database were participants. From 406,630 laboratory-confirmed COVID-19 cases, we identified 8,724 individuals who received outpatient rehabilitation and matched 28,719 controls. Of rehabilitation users, 43.3% were 40 years old or younger, 54.8% were female, 58.2% were white, 17.9% were African American/Black, 2.1% were Asian, 13.0% were Hispanic, 39.2% had no comorbidities, and 40.3% had been hospitalized for COVID-19. Dyspnea (20.4%), fatigue (12.4%), and weakness (8.2%) were the most frequently identified symptoms. Although there were no racial differences in the incidence of the 6 post COVID-19 condition symptoms considered, African American/Black individuals were significantly less likely to receive outpatient rehabilitation than their white counterparts. Hispanic individuals had higher outpatient rehabilitation utilization and a significantly higher incidence of post-COVID fatigue.
Neurological long-COVID in the outpatient clinic: Two subtypes, two courses (Grisanti et al)	*J Neurol Sci*	In this study, we evaluated a population of patients with prior COVID-19 infection who showed signs and symptoms consistent with neurological long-COVID. We prospectively collected demographic and acute phase course data from patients with prior COVID-19 infection who showed symptoms related to neurological involvement in the long-COVID phase. Firstly, we performed a multivariate logistic linear regression analysis to investigate the impact of demographic and clinical data, the severity of the acute COVID-19 infection and hospitalization course, on the post-COVID neurological symptoms at three months follow-up. Secondly, we performed an unsupervised clustering analysis to investigate whether there was evidence of different subtypes of neurological long COVID-19. 109 patients referred to the neurological post-COVID outpatient clinic. Clustering analysis on the most common neurological symptoms returned two well-separated and well-balanced clusters: long-COVID type 1 contains the subjects with memory disturbances, psychological impairment, headache, anosmia and ageusia, while long-COVID type 2

		contains all the subjects with reported symptoms related to PNS involvement. The analysis of potential risk-factors among the demographic, clinical presentation, COVID 19 severity and hospitalization course variables showed that the number of comorbidities at onset, the BMI, the number of COVID-19 symptoms, the number of non-neurological complications and a more severe course of the acute infection were all, on average, higher for the cluster of subjects with reported symptoms related to PNS involvement.
A Case-Crossover Phenome-wide Association Study (PheWAS) for Understanding Post-COVID-19 Diagnosis Patterns (Haupert et al)	*medRxiv*	Objective was to assess which diagnoses appear more frequently after a COVID-19 infection and how they differ by COVID-19 severity and vaccination status. We applied a case-crossover phenome-wide association study (PheWAS) in a retrospective cohort of COVID-19 survivors, comparing the occurrences of 1,649 diagnosis-based phenotype codes (PheCodes) pre- and post-COVID-19 infection periods in the same individual using a conditional logistic regression. Patients tested for or diagnosed with COVID-19 at Michigan Medicine from March 10, 2020 through May 1, 2022. We compared the rate of occurrence of 1,649 disease classification codes in "pre-" and "post-COVID-19 periods". We studied how this pattern varied by COVID-19 severity and vaccination status at the time of infection. Using a case-crossover PheWAS framework, we found mental, circulatory, and respiratory disorders to be strongly associated with the "post-COVID-19 period" for the overall COVID-19-positive cohort. A total of 325 PheCodes reached phenome-wide significance and top hits included cardiac dysrhythmias, respiratory failure, insufficiency, arrest and anxiety. In the patients with severe disease, we found stronger associations with many respiratory and circulatory disorders, such as pneumonia and acute pulmonary heart disease and the "post-COVID-19 period," compared to those with mild/moderate disease. Our results confirm that patients experience myriad symptoms more than 28 days after SARS-CoV-2 infection, but especially mental, circulatory, and respiratory disorders.

*Note: Content may have been published prior to this scan period but was only available through applying our search strategies during this period.

COMMENTARIES, LETTERS AND OPINION PIECES *(JULY 2 – JULY 15)*

- **Call for action: Health services in the European region must adopt integrated care models to manage Post-Covid-19 Condition (*Lancet*):** With the emergence of Post-Covid-19 Condition there is now a further increase in the overall rehabilitation needs within health systems. In a call for action, the recommendation is to: 1) Build capacity for early identification and recognition of symptoms of Post-Covid-19 Condition, 2) Strengthen primary health care to manage Post-Covid-19 Condition when medically indicated, and to be the point of referral for more severe cases, 3) Acknowledge the need for individualized long-term rehabilitative care for persons with Post-Covid-19 Condition, and 4) Strengthen the health system to be able to provide an individualised multidisciplinary care pathway in which patient's multi-system symptoms and rehabilitation needs are assessed and managed, informed by real world outcome data and patient experience.

- **Long COVID: A New Challenge for Prevention of Obesity in Women *(American Journal of Lifestyle Medicine):*** Long COVID affects individuals that do not recover for several weeks or months following the onset of symptoms of COVID-19. Obesity could play a role in the long COVID syndrome. During the pandemic, various factors contributed greatly to aggravating obesity in women leading to a pro-inflammatory and prothrombotic status. This commentary explores the relationship between long COVID and obesity in women.

MEDIA HIGHLIGHTS *(JULY 2 – JULY 15)*

CANADA

- **Montreal study looks for ways to treat COVID-19 long-haulers crippled by lingering symptoms (CBC News):** Dr. Thao Huynh is a researcher and epidemiologist-cardiologist with the McGill University Health Centre (MUHC) and she is conducting a study on the long-haul impacts of COVID-19 with the aim of better understanding the disease and treating its symptoms. Huynh said her research has so far uncovered clear indicators of heart damage in patients who have these long-COVID symptoms. Her study is uncovering active heart inflammation or heart scarring. There are also heart palpitations and other abnormalities, she said. In fact, a third of patients have heart problems, she said. The brain is also affected, she added, and the brain and heart are closely related. She said about 80% long-COVID patients are women and she believes it is an autoimmune issue. However, she admits, not everybody agrees with her on that. What is clear is that many people, including doctors and nurses, are crippled by the symptoms, she said. Huynh's Impact Quebec COVID-19 Long Haul Study launched a year ago.
- **Rehab program gives hope to 'long COVID' sufferers (CBC News):** A ground-breaking rehab program at The Ottawa Hospital is offering hope to people suffering from "long COVID." Its estimated that about four million Canadians have been infected, which means some 400,000 may have long COVID. Many sufferers report intense fatigue, trouble catching their breath, brain fog, anxiety and depression. The new post-COVID rehab program at The Ottawa Hospital combines physiotherapy and occupational therapy, but also includes an important core of mental health supports.

GLOBAL

- **Long Covid: what we know about it and how best to treat it (The Guardian):** Being vaccinated and boosted seems to protect against long Covid. Estimates of those with Covid who will develop long Covid range from 5% to 30%, but applying this prevalence to the general population is problematic. Prof Gail Matthews from the Kirby Institute is a lead investigator on the Adapt study examining patients for long Covid, which has been running since mid 2020. While there are some children who experienced more severe symptoms affecting function, most children who have symptoms after three months “are doing well and improve over time”.

POST COVID-19 CONDITION RESOURCES

- (NEWLY ADDED) Recovery & Rehabilitation After COVID-19: Resources for Health Professionals (Alberta Health Services)
- (NEWLY ADDED) ZB MED preprint Viewer: Website includes 45.543 COVID-19 related preprints from medRxiv and bioRxiv, ChemRxiv, ResearchSquare, arXiv and from Preprints.org. They have recently developed and incorporated a long COVID classifier based on state-of-the-art methods and manually curated data by experts
- Long COVID Physio: Long COVID Physio is an international peer support, education and advocacy, patient-led association of Physiotherapists living with Long COVID and allies. They post various educational videos on long COVID.
- John Hopkins Medicine - Long-Term Effects of COVID-19
- C19 Recovery Awareness (US): The mission of the Long Haul COVID Fighters is to provide support for those whose health has been affected by COVID-19, promote public awareness and education regarding lengthy COVID recovery, and advocate for the medical, mental health, and social interests of long haul COVID survivors.
- COVID-19 Virtual Library of Health Data and Evidence (Canada): Resources to knowledge products, data and evidence on the impacts of COVID-19, which includes post COVID-19 condition. This is a searchable collection of products funded and published by the Government of Canada.
- Lullabies for long COVID (UK): An online program developed in collaboration with the English National Opera could help with rehabilitation, by improving mental health and symptoms of breathlessness.
- Solve Long Covid Initiative (US): The Solve ME/CFS Initiative is a non-profit organization that serves as a catalyst for critical research into diagnostics, treatments, and cures for myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS), Long Covid and other post-infection diseases.
- PASC Guide (University of Michigan): A resource for people with PASC/long COVID.

- Health Education England (HEE) e-learning modules: long COVID programme
- Voices of Long COVID (US): Voices of Long Covid campaign features testimonials from a diverse group of people ages 18-29 who are suffering from long-term complications of COVID-19 infection.
- Dignity Health (US): COVID-19 and Chronic Illness Recovery Program based in the U.S. has helped over 2,000 people struggling with COVID long-term effects ("COVID long haulers"). Treatment is exercise-based for lingering or long-term conditions (sequelae) from having the virus.
- Altea (Switzerland): A network for sharing evidence-based information on the long-term effects of COVID-19.
- Pandemic-Aid Networks: Long COVID research library.
- Post-COVID-19 Functional Status Scale: An overview of a patient self-reported scale that helps to support assessment of functional status and recovery after the SARS-CoV-2 infection.
- Ontario College of Family Physicians: Resources on Post-COVID Condition.
- Agency for Clinical Innovation (Australia): Living Evidence - post acute sequelae of COVID-19.
- Pre-populated literature searches: Long COVID search (LitCovid) and Long COVID search (NIH)
- PAHO Webinar Series on Post COVID-19 Condition launched 17 February, 2022, from 10:30 am to 12:30 pm (EST).
- Body Politic COVID-19 Support Group (Global): Housed on the Slack app, group members have access to dozens of different channels, which give space for more personal discussion. Some of the channels include those specifically for medical professionals, parents of children with Covid-19, LGBTQ+ individuals, BIPOC+, and different regions around the world.
- Patient-Led Research Collaborative (Global): Self-organized group of Long COVID patients working on patient-led research around the Long COVID experience.
- British Heart Foundation (UK): UK-based foundation with resources on long COVID.
- COVID Long Haul (Canada): Canada's largest online platform for COVID survivors, their family members and anyone searching for the most up-to-date information about the pandemic. There is a COVID long-haulers support group and a Report on Pan-Canadian Long COVID Impact Survey (PDF) (June 2021)
- BC ECHO for Post-COVID-19 Recovery (Canada): BC ECHO for Post-COVID-19 Recovery is a learning community of specialists and community health-care providers who use case-based learning to improve care for those recovering from symptoms post-COVID-19.
- Long Covid Support (UK): Peer support and advocacy group aiming to facilitate international peer support and campaigning in the UK for recognition, rehabilitation and research into treatments.
- Long COVID SOS (UK): Long-term sufferers formed the LongCovidSOS campaign to put pressure on the UK government to recognise the needs of those with Long Covid, and to raise awareness among the general public and employers.
- Survivor Corps (US): One of the largest and fastest growing grassroots movements connecting, supporting, and mobilizing COVID-19 Survivors to support research. They have a list of Post-COVID Care Centers (PCC) and a PCCC Best Practices Guide.
- The Center for Chronic Illness (US): Aims to promote well-being and decrease isolation for those impacted by chronic illness through support and education. Their online support groups are professionally-facilitated and offer psychoeducational tools for coping.
- Blooming Magnolia (US): Mission is to empower others by providing a platform to strengthen & protect mental health and support those afflicted with Long-Covid through education and funding of therapeutic research. They have a list of support groups and resources on their website.

- Long COVID Alliance (US): US-based network of patient-advocates, scientists, disease experts, and drug developers who have joined together to leverage their collective knowledge and resources to educate policy makers and accelerate research to transform our understanding of post-viral illness.

- Long COVID Kids (UK/US/Canada): Parent & patient led advocacy & support group based in the UK.

- Long COVID Physio (US & UK): International peer support, education and advocacy group of Physiotherapists living with Long COVID, founded in November 2020 by Physiotherapists living with Long COVID from the UK and US.

- Patient-Led Research Collaborative (Global): Group of Long COVID patients working on patient-led research around the Long COVID experience.

- CANCOV- Patient resources (Canada): CANCOV is a research platform grounded in a prospective longitudinal 1-year cohort study of patients infected with COVID-19.

- COVID Patient Recovery Alliance (CPRA) (US): CPRA aims to bring together leaders in business, health care, research, academia, data and analytics, and patient advocacy to develop solutions that coordinate diverse data sources, inform models of care, and ensure adequate payment for long-COVID patients. Their report outlines recommendations for federal policymakers to promote recovery.

- British Lung Foundation (UK): UK-based charity sharing resources on navigating the NHS, breathlessness support, movement and energy support for long COVID patients.

- Living with Long COVID (US): COVID-19 Long-Haulers and Post-COVID Support Community.

***Note**: Previous OCSO Post COVID-19 Condition Scans can be found here.*

From: NBPH_CRT (DH/MS)
To: Day, Barbara (DH/MS)
Subject: FW: Media Request - 21(1) - BNI - Long COVID Questions....
Date: August 29, 2022 10:57:00 AM
Attachments: 2022-06-28-post covid condition-public.docx

Some info to help with answer. Would epi have stats on numbers? I don't think so?
Lori

From: Bowie, Adam (ECO/BCE) <Adam.Bowie@gnb.ca>
Sent: Monday, August 29, 2022 10:30 AM
To: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>; Landsburg, Shelley (DH/MS) <Shelley.Landsburg@gnb.ca>
Cc: McCarthy, Abigail (DH/MS) <Abigail.McCarthy2@gnb.ca>; Berry, Shawn (ECO/BCE) <Shawn.Berry@gnb.ca>; Hatchard, Sean (ECO/BCE) <Sean.Hatchard@gnb.ca>; Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>; Trevors, Jeremy (ECO/BCE) <Jeremy.Trevors@gnb.ca>
Subject: Media Request - 21(1) - BNI - Long COVID Questions....

Another request from 21(1), though this one isn't needed until Tuesday afternoon:

NAME: 21(1)
OUTLET: BNI
CONTACT #: 21(1)
EMAIL: 21(1)@brunswicknews.com
DEADLINE TO SEND RESPONSE TO REPORTER: EOD on Tuesday
ROUTINE (Yes or No): No
REQUEST

1. I'm wondering if the province has any data on how many NBers have long-COVID?
2. How does the province define long-COVID?
3. Some other areas in the county have long-COVID clinics — does NB have this? Where are they? If not, what treatment options are available for those with long-COVID?
4. How is the province working to support people with long-COVID who also have other conditions? How does this compare to the treatment received by those who don't have other conditions?

Adam Bowie
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Post COVID-19 Condition (Long COVID)

What is Post COVID-19 Condition?

- Some people still experience physical or psychological symptoms more than 12 weeks after getting COVID-19. This is called post COVID-19 condition (also known as long COVID). Post COVID-19 condition is **not** COVID-19. Symptoms can be quite different from those experienced during the initial infection. It refers to the longer-term effects some people experience after their COVID-19 infection.
- Post COVID-19 condition may occur in some people weeks or months after their initial infection.
- It can affect both adults and children but is much more common in adults.
- There is a broad range of symptoms including tiredness, shortness of breath, problems with attention span, learning, memory, problem solving and other symptoms that generally have an impact on everyday life.
- Symptoms can be worse and more frequent in some people versus others and affect different organ systems, making diagnosis more challenging.
- Post COVID-19 condition can affect many systems in the body including central nervous system, mental health, heart function, lung function, kidney function, bloodstream, GI system.

How Common is it?

- 10-20% among those infected with COVID-19 will develop post COVID-19 condition.
- Post COVID-19 Condition is more common in:
    - women
    - those who experienced severe acute COVID-19
    - those who had been hospitalized for acute COVID-19 infection
- Symptoms associated with mental health and brain function tend to stay longer than physical symptoms.

Prevention:

- The best way to currently prevent post COVID-19 condition is to avoid getting infected.
- Vaccination (2 doses) may reduce the risk of developing post COVID-19 condition if infected.
- The Omicron variant is less likely to cause long COVID than previous variants.

What We Don't Know:

- Why do some people get it and others do not?
- What part of the mental health impacts are from post COVID-19 condition and what impacts are from the pandemic in general?
- At this time, there is no universally agreed-upon approach to diagnose and treat post COVID-19 condition.
- There is not enough evidence to date to determine the impacts of post COVID-19 condition and its impact on the healthcare system and the broader economy.

Public Health New Brunswick
June 2022

What is Being Done?

- The Public Health Agency of Canada (PHAC) also collaborated with Statistics Canada on a new population-based Canadian COVID-19 Antibody and Health Survey launched in April 2022.
- Provincial and territorial officials along with medical and scientific experts met the first week of June to discuss new research regarding post COVID-19 condition.
- Canada is reviewing published studies on post COVID-19 condition to identify:
    - which symptoms are most common
    - its associated risk factors
    - how to prevent it
    - how many individuals (adults and children) are having difficulties with regular activities and daily living
    - how common these long-term effects are in Canada

Support

Canadians suffering from post COVID-19 condition and who are unable to work because of their symptoms may be eligible for support through:

- Employment and Skills Development Canada's employment insurance (EI) program
- Canada Pension Plan Disability benefits

Helpful links for more information:

Living with Persistent Post-COVID Symptoms (phsa.ca)

Post-COVID-19 condition (long COVID) - Canada.ca

Coronavirus disease (COVID-19): Post COVID-19 condition (who.int)

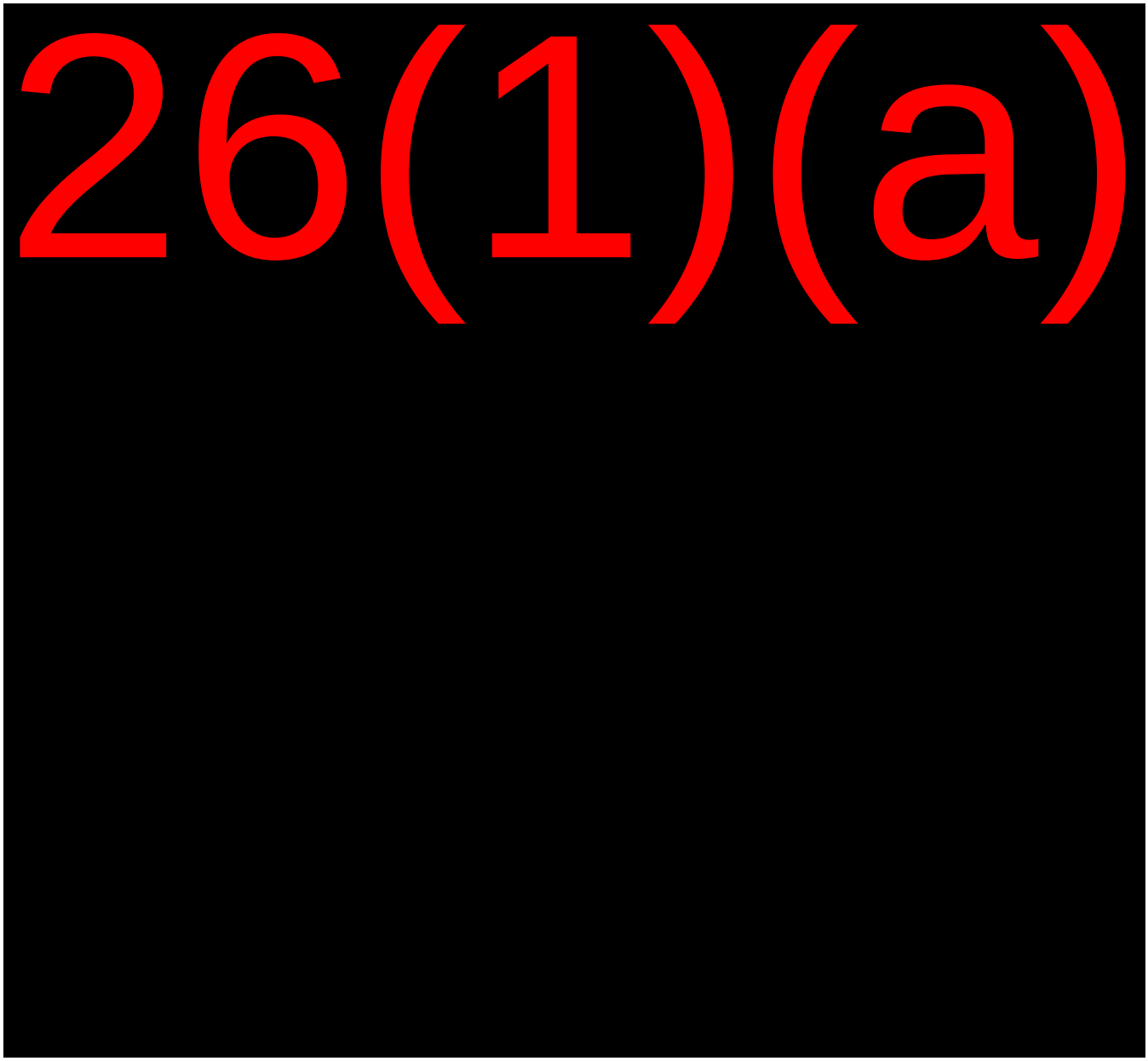
From: Day, Barbara (DH/MS)
To: LeBlanc, Shannon (DH/MS); NBPH_CRT (DH/MS); Clair, Suzanne (DH/MS)
Cc: Bowie, Adam (ECO/BCE); Mullin, Tanya (DH/MS)
Subject: Media Request - 21(1) - BNI - Long COVID Questions....
Date: August 29, 2022 4:08:00 PM
Attachments: 2022-06-28-post covid condition-public.docx

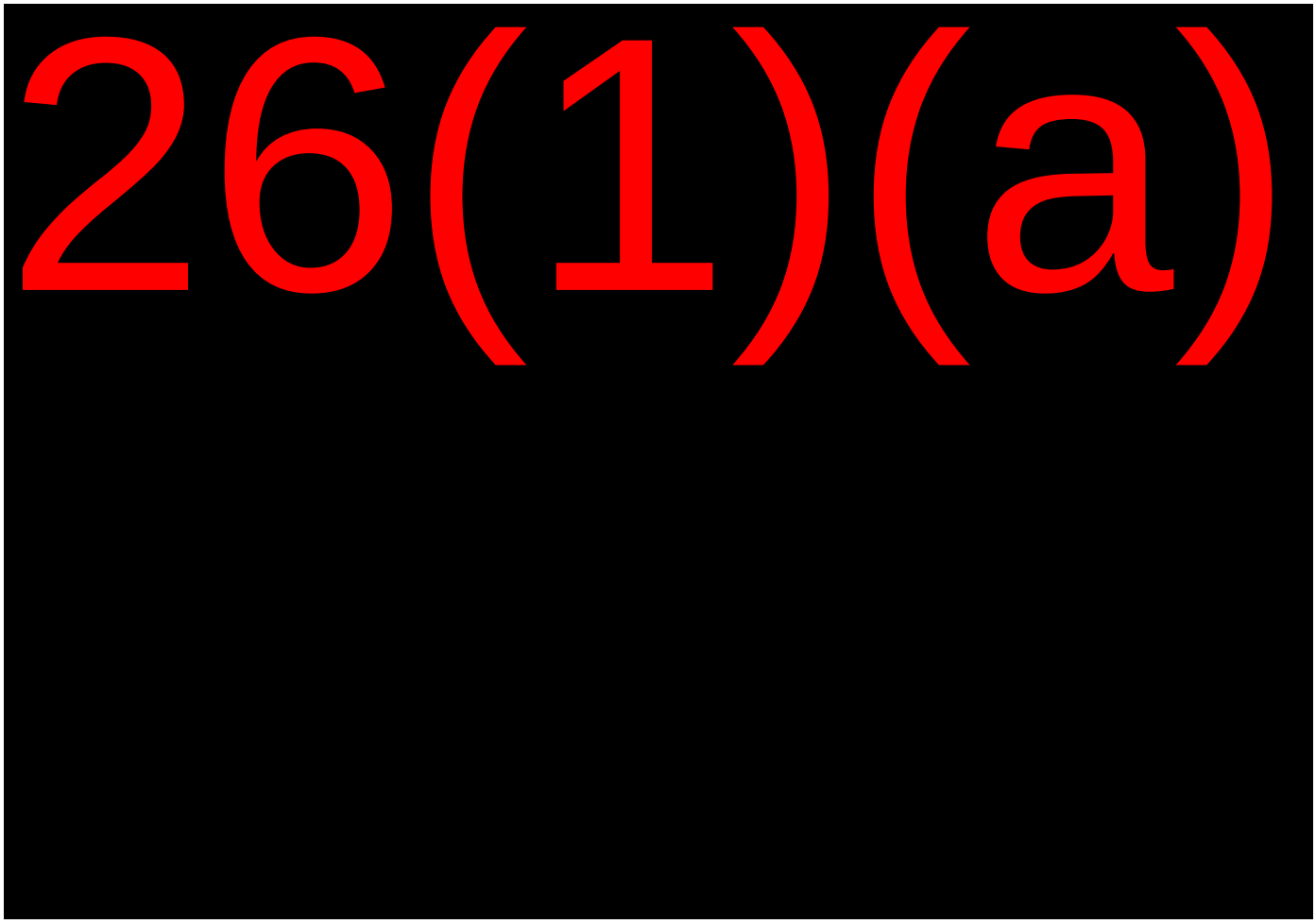
Good afternoon everyone,

Sending around a media request on long covid due tmrw afternoon – the proposed responses are based off messages shared by Lori (thank you, Lori) as well as content from PHAC / the CDC, and stock answers from July.

Pls edit as needed :)

PROPOSED RESPONSE:





From: NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>
Sent: Monday, August 29, 2022 10:57 AM
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Subject: FW: Media Request - 21(1) - BNI - Long COVID Questions....

Some info to help with answer. Would epi have stats on numbers? I don't think so?
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From: Bowie, Adam (ECO/BCE) <Adam.Bowie@gnb.ca>
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Cc: McCarthy, Abigail (DH/MS) <Abigail.McCarthy2@gnb.ca>; Berry, Shawn (ECO/BCE) <Shawn.Berry@gnb.ca>; Hatchard, Sean (ECO/BCE) <Sean.Hatchard@gnb.ca>; Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>; Trevors, Jeremy (ECO/BCE) <Jeremy.Trevors@gnb.ca>
Subject: Media Request - 21(1) - BNI - Long COVID Questions....

Another request from 21(1), though this one isn't needed until Tuesday afternoon:

NAME: 21(1) [redacted]
OUTLET: BNI
CONTACT #: 21(1) [redacted]
EMAIL: 21(1) [redacted]@brunswicknews.com
DEADLINE TO SEND RESPONSE TO REPORTER: EOD on Tuesday
ROUTINE (Yes or No): No
REQUEST

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Adam Bowie

Communications Officer / Chargé de communication
Department of Health / Ministère de la Santé
Cell / Cellulaire: 506-440-8709
Office / Bureau: 506-478-3798
adam.bowie@gnb.ca

From: Day, Barbara (DH/MS)
To: Bowie, Adam (ECO/BCE); LeBlanc, Shannon (DH/MS); NBPH_CRT (DH/MS); Clair, Suzanne (DH/MS)
Cc: Mullin, Tanya (DH/MS)
Subject: RE: Media Request - 21(1) - BNI - Long COVID Questions....
Date: August 30, 2022 1:50:00 PM
Attachments: Long_covid_part1.PNG
long_covid_part2.PNG
long_covid_part3.PNG

Here's the article for those who don't have media monitoring or a subscription.

From: Bowie, Adam (ECO/BCE) <Adam.Bowie@gnb.ca>
Sent: Tuesday, August 30, 2022 1:45 PM
To: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>; Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>
Cc: Mullin, Tanya (DH/MS) <Tanya.Mullin@gnb.ca>
Subject: RE: Media Request - 21(1) - BNI - Long COVID Questions....

Hey folks…

Reporter has asked if I was still working on this one.

This story also went online this morning, which references an RHA-led survey of hundreds of NBers about the possible neurological effects of Long COVID:

https://tj.news/telegraph-journal/101952969

Thought I'd include it for your awareness.

Adam

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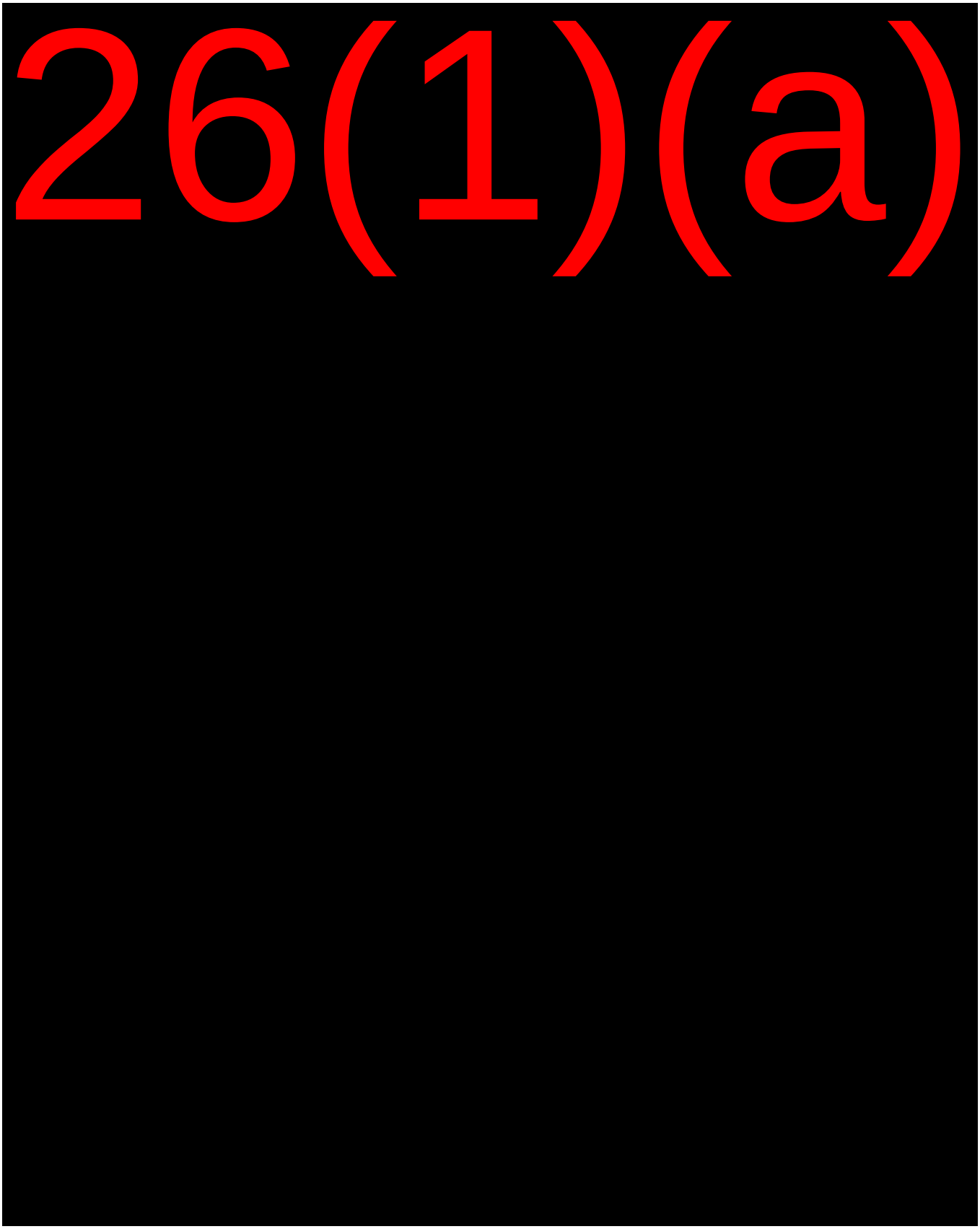
Cc: Bowie, Adam (ECO/BCE) <Adam.Bowie@gnb.ca>; Mullin, Tanya (DH/MS) <Tanya.Mullin@gnb.ca>
Subject: Media Request - 21(1) - BNI - Long COVID Questions....

Good afternoon everyone,

Sending around a media request on long covid due tmrw afternoon – the proposed responses are based off messages shared by Lori (thank you, Lori) as well as content from PHAC / the CDC, and stock answers from July.

Pls edit as needed :)

PROPOSED RESPONSE:



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Subject: Media Request - 21(1) - BNI - Long COVID Questions....

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OUTLET: BNI
CONTACT #: 21(1)
EMAIL: 21(1) @brunswicknews.com
DEADLINE TO SEND RESPONSE TO REPORTER: EOD on Tuesday
ROUTINE (Yes or No): No
REQUEST

1. I'm wondering if the province has any data on how many NBers have long-COVID?
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Adam Bowie
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Department of Health / Ministère de la Santé
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Office / Bureau: 506-478-3798
adam.bowie@gnb.ca

Andrew Waugh | Political Editor

A study about the neurological effects of "long" COVID-19 on 134 New Brunswickers is about to be submitted to a scientific journal, and the results will then be made public.

“Vitalité Health Network recruited a total of 335 participants for the COVID Registry (TripleC-NB)," Vitalité's Brigitte Sonier-Ferguson, vice-president of university mission, performance and quality, said in an email.

"The data is still being analyzed by Horizon Health Network researchers. An ongoing study on neurological effects of long COVID by Dr. [Ludivine] Witkowski, clinician researcher, is about to be submitted to a scientific journal. The results on 134 participants will be revealed following publication.”

Long COVID is where symptoms of the virus lingers for weeks, months, or longer.

“Post COVID-19 condition may occur in some people after infection," the Public Health Agency of Canada told Brunswick News earlier this year.

"You can get post COVID-19 condition if you were hospitalized or needed intensive care during recovery or had a mild to severe infection with symptoms or even mild infection without symptoms.

“You may experience symptoms even if you weren’t formally tested and diagnosed with COVID-19. This may have been due to limited testing capacity at the beginning of the pandemic.

“Post COVID-19 condition is not COVID-19. Symptoms can be quite different from those during the initial infection. It refers to the longer-term effects some people experience after their COVID-19 illness. The condition can affect both adults and children.”

"You may experience symptoms even if you weren't formally tested and diagnosed with COVID-19. This may have been due to limited testing capacity at the beginning of the pandemic.

"Post COVID-19 condition is not COVID-19. Symptoms can be quite different from those during the initial infection. It refers to the longer-term effects some people experience after their COVID-19 illness. The condition can affect both adults and children."

More to come ...

From: Clair, Suzanne (DH/MS)
To: LeBlanc, Shannon (DH/MS); Bowie, Adam (ECO/BCE); Day, Barbara (DH/MS); NBPH_CRT (DH/MS)
Cc: Mullin, Tanya (DH/MS); Berry, Shawn (ECO/BCE); McCarthy, Abigail (DH/MS); Power, Michaela (ECO/BCE)
Subject: RE: Media Request - 21(1) - BNI - Long COVID Questions....
Date: August 31, 2022 1:31:29 PM

I am Ok with response.

From: LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>
Sent: Wednesday, August 31, 2022 12:52 PM
To: Bowie, Adam (ECO/BCE) <Adam.Bowie@gnb.ca>; Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>; Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>
Cc: Mullin, Tanya (DH/MS) <Tanya.Mullin@gnb.ca>; Berry, Shawn (ECO/BCE) <Shawn.Berry@gnb.ca>; McCarthy, Abigail (DH/MS) <Abigail.McCarthy2@gnb.ca>; Power, Michaela (ECO/BCE) <Michaela.Power@gnb.ca>
Subject: RE: Media Request - 21(1) - BNI - Long COVID Questions....

Good here.

From: Bowie, Adam (ECO/BCE) <Adam.Bowie@gnb.ca>
Sent: Wednesday, August 31, 2022 12:22 PM
To: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>; Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>
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Subject: RE: Media Request - 21(1) - BNI - Long COVID Questions....

I'm OK with that. No issues on my end.

Adam

From: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Sent: August 31, 2022 12:21 PM
To: Bowie, Adam (ECO/BCE) <Adam.Bowie@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>; Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>
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Subject: RE: Media Request - 21(1) - BNI - Long COVID Questions....

Hi folks…

Would this work for this request?

NAME: 21(1)
OUTLET: BNI
CONTACT #: 21(1)
EMAIL: 21(1) @brunswicknews.com
DEADLINE TO SEND RESPONSE TO REPORTER: EOD on Tuesday
ROUTINE (Yes or No): No
REQUEST

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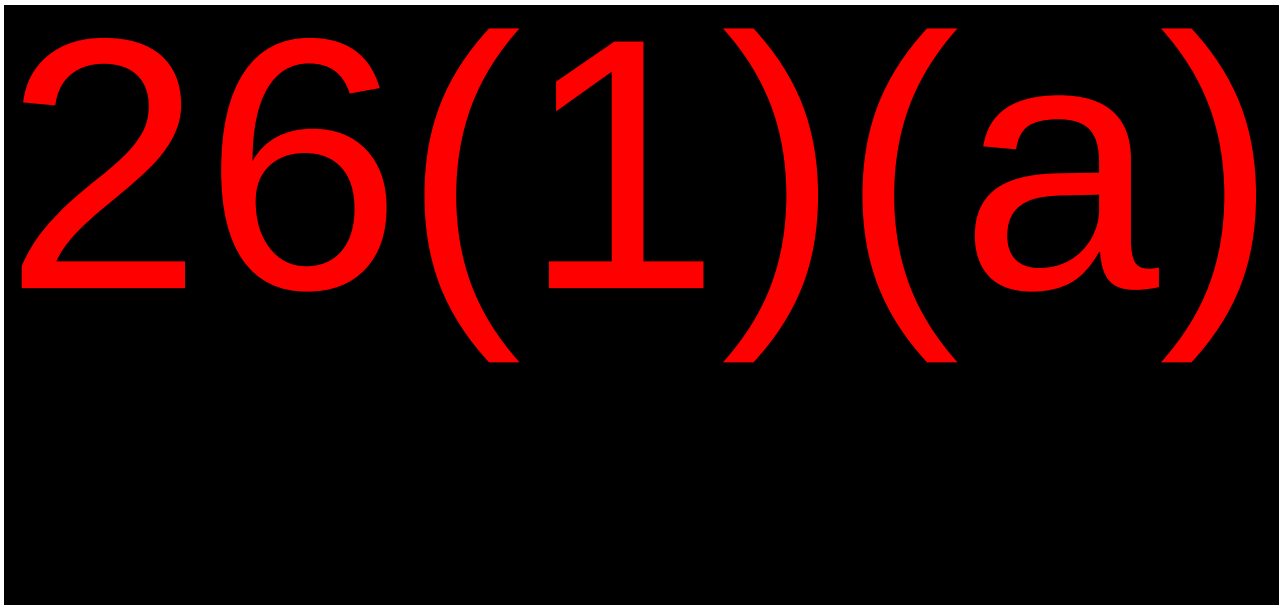

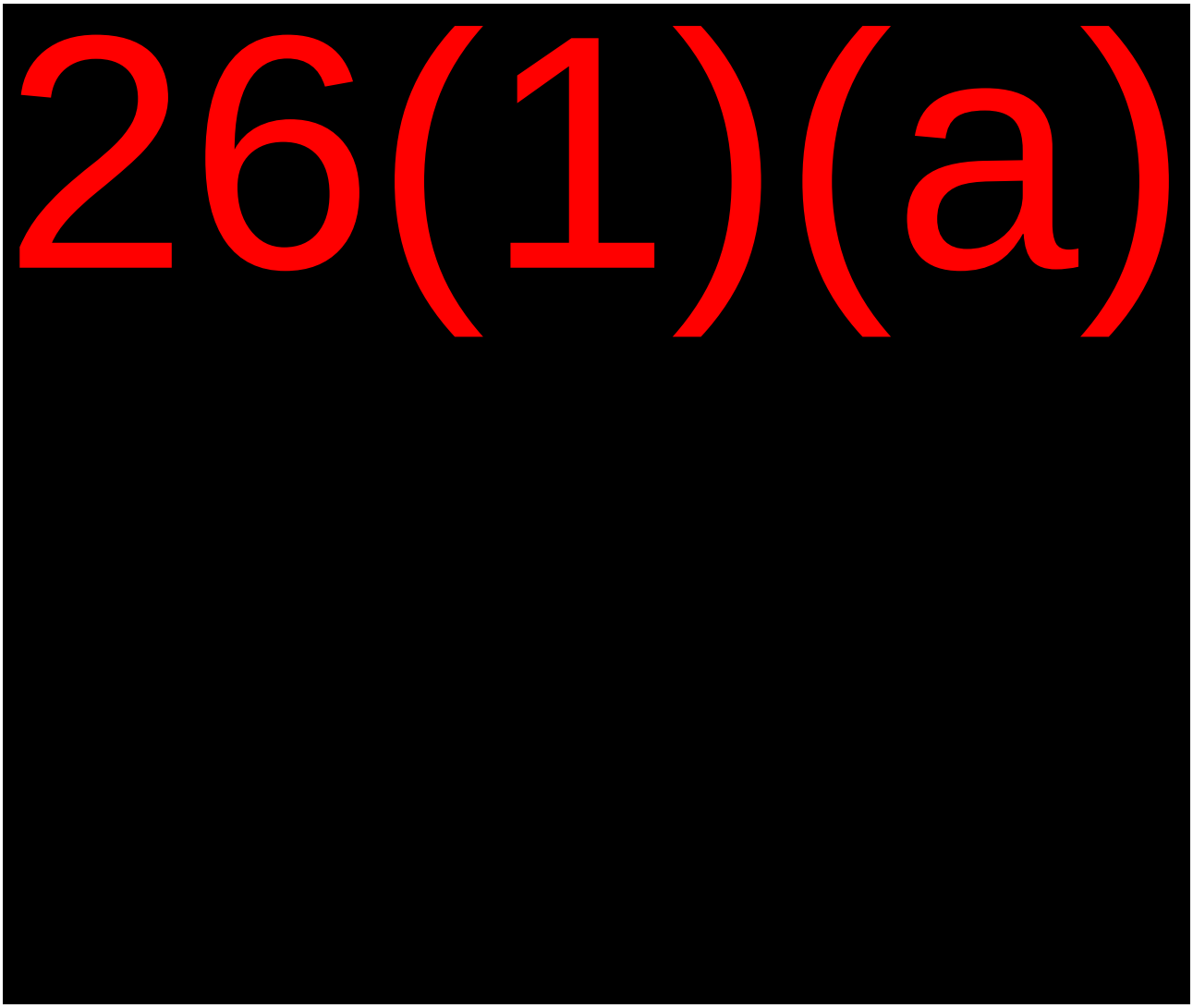

From: Bowie, Adam (ECO/BCE)
Sent: August 30, 2022 2:00 PM
To: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>; LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>; Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>
Cc: Mullin, Tanya (DH/MS) <Tanya.Mullin@gnb.ca>
Subject: RE: Media Request - 21(1) - BNI - Long COVID Questions....

I'll work on a response once the COVIDWATCH invus are over. Not sure we need to get into everything we have there, since a lot of what was shared is general, and based on national stats, etc. Like the 10-20 per cent stuff, specifically.

From: Day, Barbara (DH/MS) <Barbara.Day@gnb.ca>
Sent: August 30, 2022 1:58 PM
To: LeBlanc, Shannon (DH/MS) <Shannon.LeBlanc@gnb.ca>; Bowie, Adam (ECO/BCE)

<Adam.Bowie@gnb.ca>; NBPH_CRT (DH/MS) <NBPH_CRT@gnb.ca>; Clair, Suzanne (DH/MS) <suzanne.clair@gnb.ca>
Cc: Mullin, Tanya (DH/MS) <Tanya.Mullin@gnb.ca>
Subject: RE: Media Request - 21(1) - BNI - Long COVID Questions....

Thanks Shannon. For some additional background info, we were aware of the TripleC-NB registry research, and fielded quite a few questions on it last year, but always sent media to the RHAs since it was led by their researchers. Clinicians, researchers within the RHAs pursue their own research regularly, not sure if there's much to add from DH at this time other than to send along what we have.

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Subject: RE: Media Request - 21(1) - BNI - Long COVID Questions....

I do not have any additional comments to add for the questions below.

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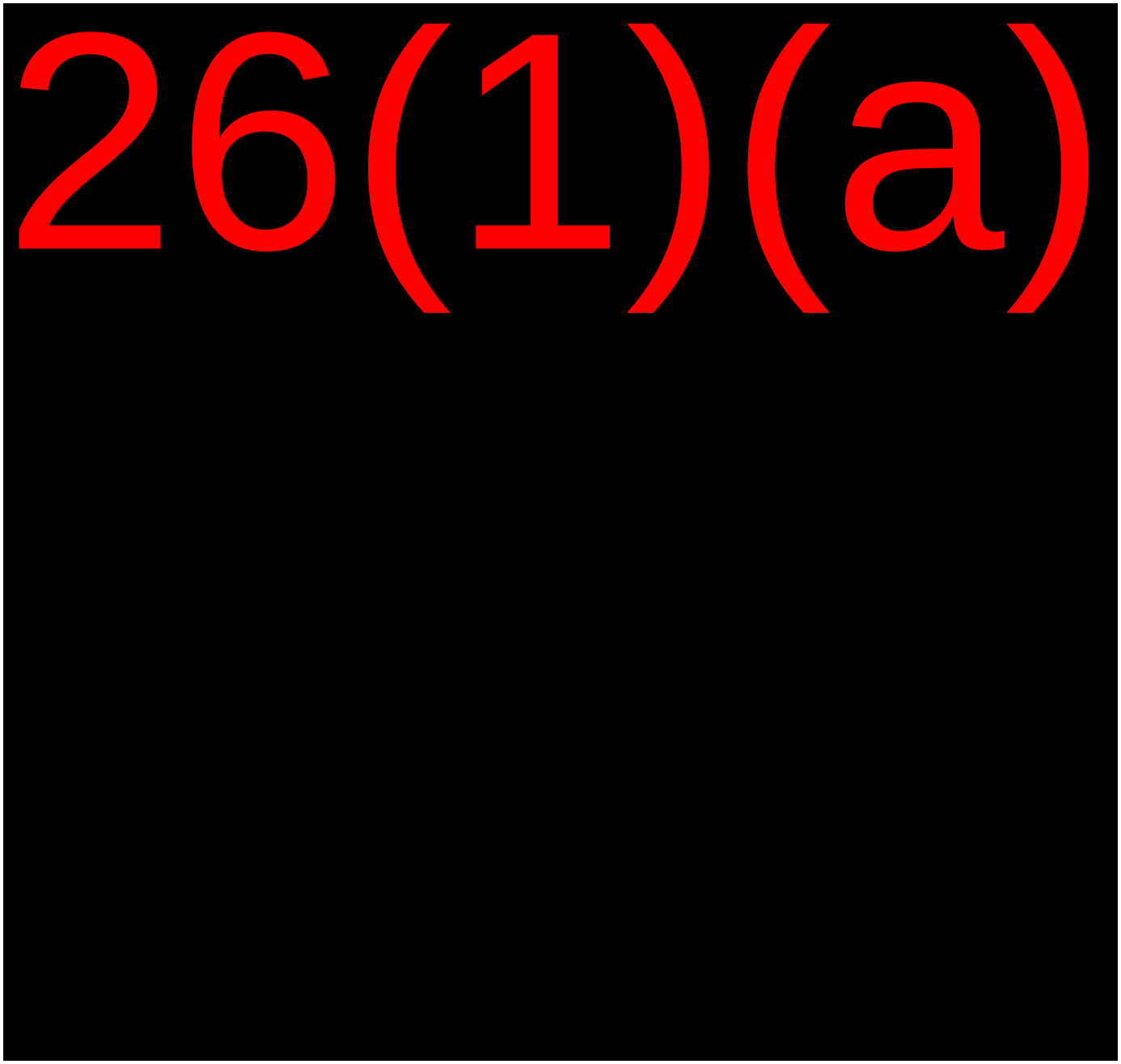

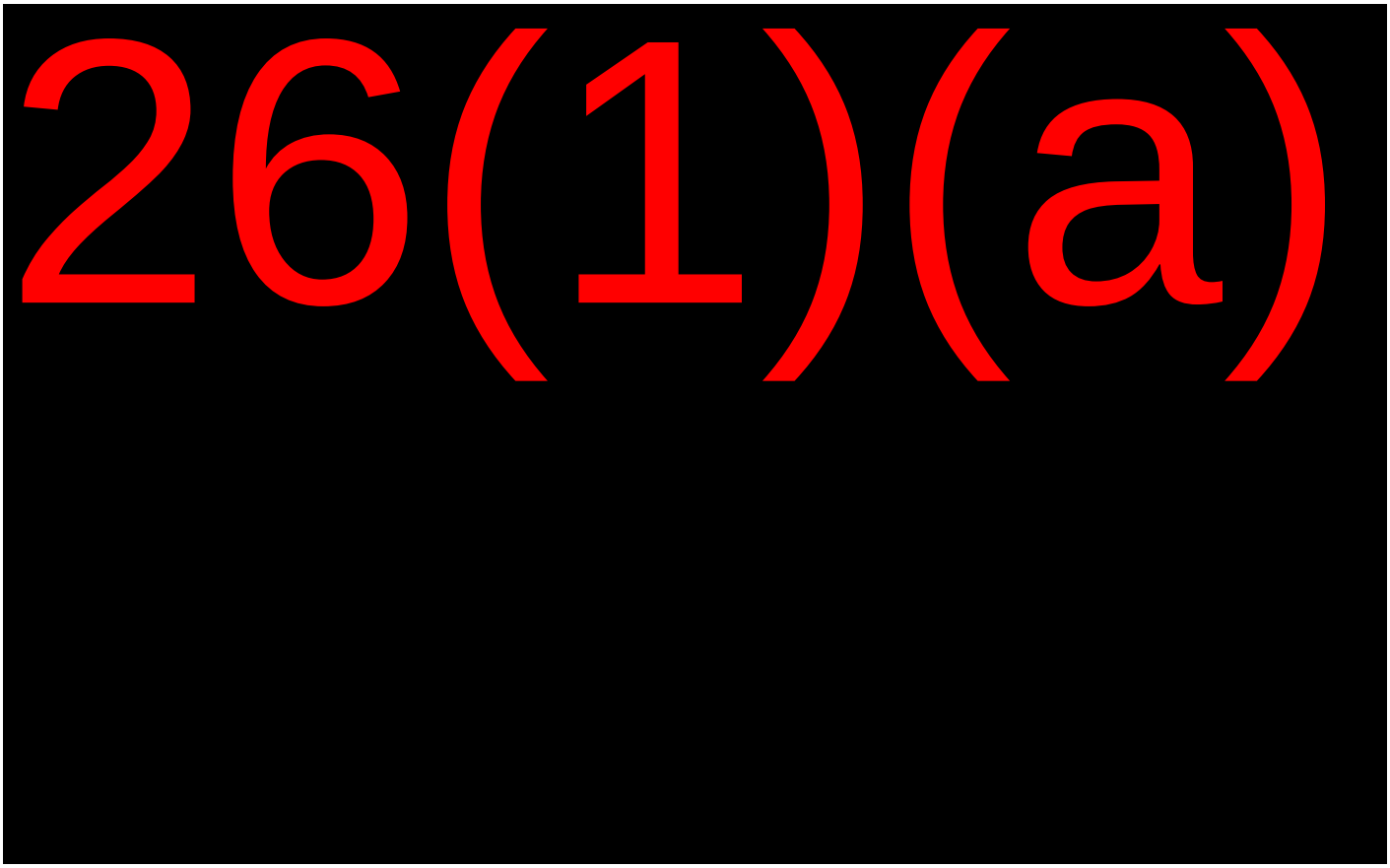

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OUTLET: BNI
CONTACT #: 21(1)

EMAIL: 21(1) [redacted] @brunswicknews.com
DEADLINE TO SEND RESPONSE TO REPORTER: EOD on Tuesday
ROUTINE (Yes or No): No
REQUEST

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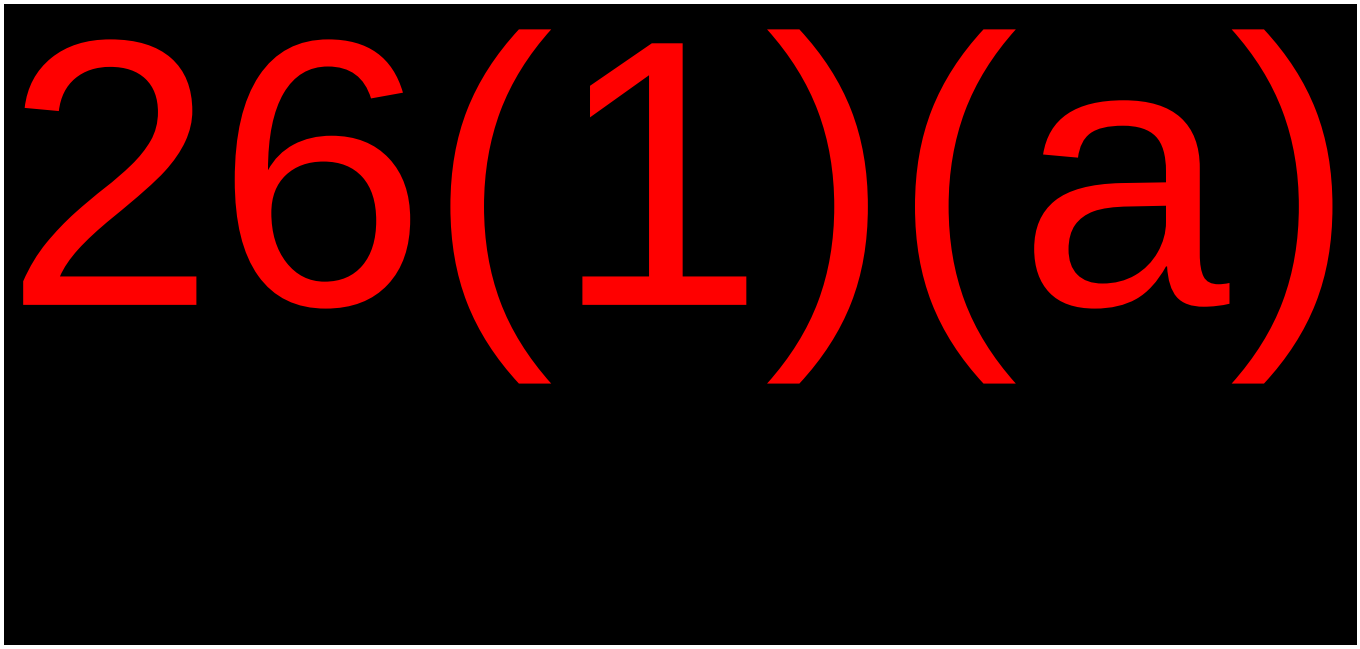
Communications Officer / Chargé de communication
Department of Health / Ministère de la Santé
Cell / Cellulaire: 506-440-8709
Office / Bureau: 506-478-3798
adam.bowie@gnb.ca

From:	Day, Barbara (DH/MS)
To:	Bowie, Adam (ECO/BCE); Landsburg, Shelley (DH/MS); Donovan, Wendy (DH/MS); NBPH_CRT (DH/MS); Clair, Suzanne (DH/MS); Chalifoux, Mathieu (DH/MS); LeBlanc, Shannon (DH/MS)
Cc:	McCarthy, Abigail (DH/MS); Berry, Shawn (ECO/BCE); Hatchard, Sean (ECO/BCE); Power, Michaela (ECO/BCE); Trevors, Jeremy (ECO/BCE); Mullin, Tanya (DH/MS)
Subject:	RE: Media Request - 21(1) - BNI - Long COVID questions...
Date:	September 20, 2022 4:22:00 PM

Hi,

I've tailored our previous answer to her questions – please see below for edits/suggestions.

PROPOSED RESPONSE:



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Subject: Media Request - 21(1) - BNI - Long COVID questions...

Hi all…

We've received this request from BNI. It's similar to ones we've received from them before, though with some extra detail. Feel free to take a look at it, and make some suggestions.

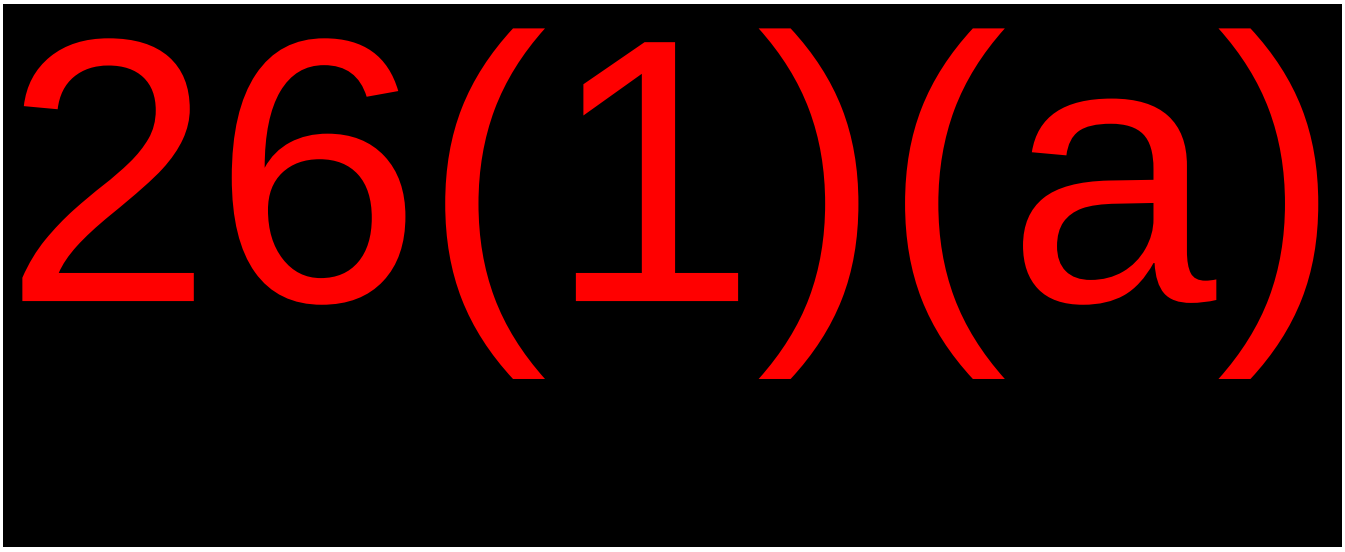
NAME: 21(1) [redacted]
OUTLET: BNI
CONTACT #: 21(1) [redacted]
EMAIL: [redacted]@brunswicknews.com
DEADLINE TO SEND RESPONSE TO REPORTER:
ROUTINE (Yes or No):
REQUEST:

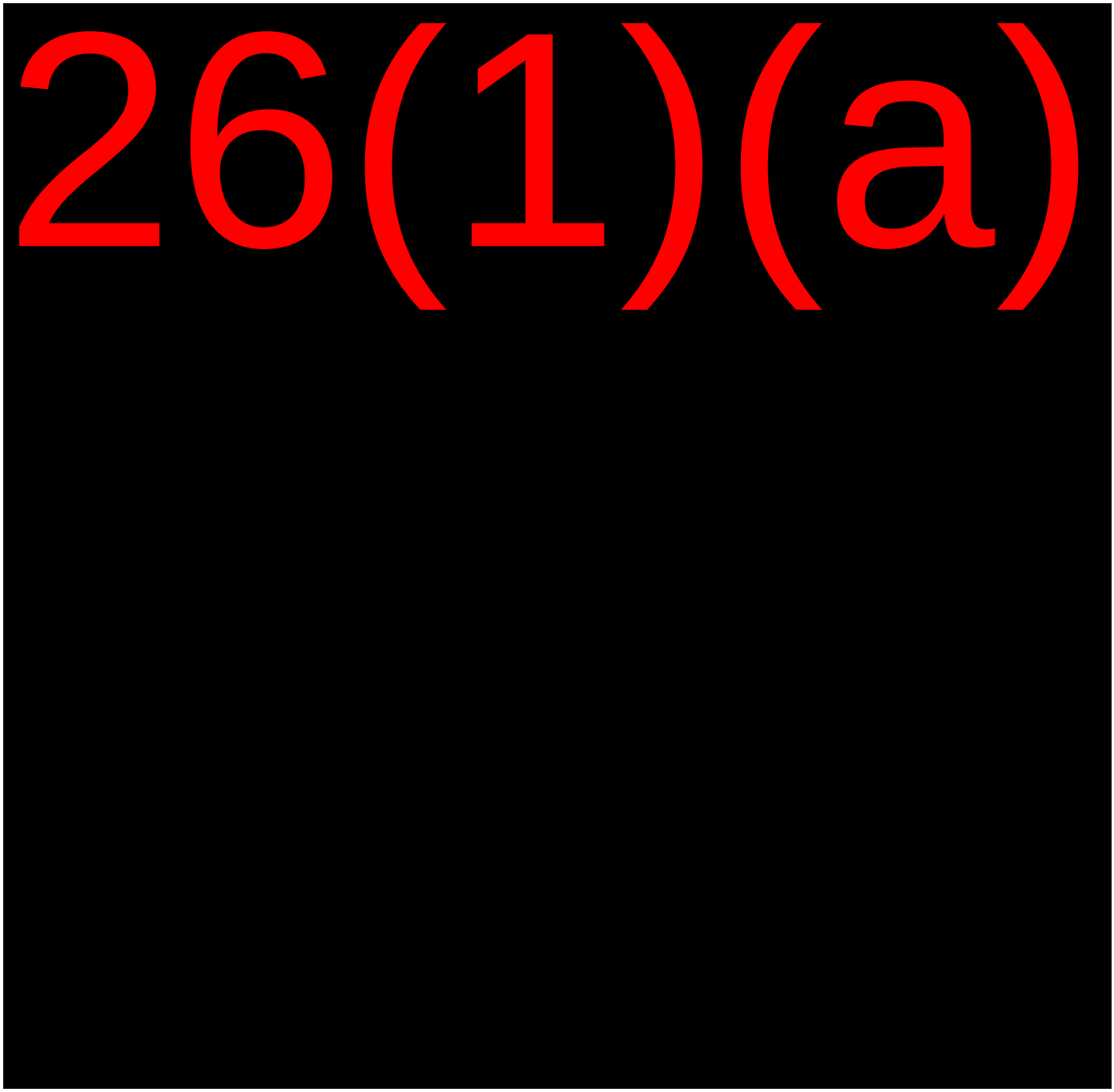
I'm working on a story following the announcement from Ontario's top doctor yesterday that a plan and funding decisions for Long COVID are in the works. Essentially, with Ontario expected to make funding decisions for a long COVID strategy creating standard definitions and treatment protocols, I'm wondering if New Brunswick is in the process of doing the same? Or if it would ever consider doing so?

1. I know you mentioned last time we spoke about long covid that all new diseases, syndromes and health conditions require a case definition in order to be tracked, managed and diagnosed — wondering if the province is working on creating a case definition?
2. Is there any possibility that the province will be putting funding specifically towards a long covid strategy? Do you have any idea when they will do so/how much would be funded?
3. Is the province looking into creating a long covid strategy at all? What aspects are being looked at and what could the strategy look like?
4. The Ontario doctor said it's important to understand what additional resources could help people with long COVID, such as rehabilitation, occupational health treatment and physiotherapy. Would New Brunswick ever consider launching specialized clinics to treat long covid like the ones that exist in some other provinces?
5. If not funding or a strategy, is the province doing anything else to look into the effects of long covid on New Brunswickers?

It would be great to also speak to the health minister or get a comment from him if possible.

PROPOSED RESPONSE:





Adam Bowie
Communications Officer / Chargé de communication
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Emerging scientific evidence – con't

Risk Factors and Effect of Vaccination

- **Females** appear to be disproportionally 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.

Current International Context

USA

- No robust estimate about common post COVID-19 condition is, but a recent White paper presents evidence about the characteristics of individuals diagnosed with long COVID:
  - 75.8% had not been hospitalized for COVID-19; Individuals aged 36 to 50 years old were more likely to be diagnosed with long COVID compared to other age groups; 30.7% of patients with long COVID had no identified pre-existing comorbidities
- The Biden Administration announced an accelerated whole-of-government effort to prevent, detect and treat long COVID, including:
  - Delivering high-quality care, services, and supports for individuals experiencing Long COVID
  - Research to understand, prevent, diagnose, treat, Long COVID

UK

- It is estimated that 1.3 million people were experiencing self-reported long COVID symptoms 12 weeks after initial infection
- Guidelines to support clinicians: “COVID-19 rapid guideline: managing the long-term effects of COVID-19” (May 2022)
- Support for specialized interdisciplinary clinics
  - UK: NHS England and NHS Improvement funded the establishment of long COVID assessments clinics for adults and children. CAD $230 million so far

International cooperation to address knowledge gaps

- G7 Science Ministers meeting in June 2022 to strengthen international cooperation to address 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 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

Post COVID-19 Condition (Long COVID)

Defining Post COVID-19 Condition

The World Health Organization (WHO) defines post COVID-19 condition as:

"[…] occurring in individuals with a history of probable or confirmed SARS CoV-2 infection, usually 3 months from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis. Common symptoms include fatigue, shortness of breath, cognitive dysfunction but also others and generally have an impact on everyday functioning. Symptoms may be new onset following initial recovery from an acute COVID-19 episode or persist from the initial illness. Symptoms may also fluctuate or relapse over time."

- Post COVID-19 condition typically appears in adult patients. However, emerging evidence shows that children may also develop chronic, persisting symptoms after COVID-19 infection.
- Symptoms fluctuate in intensity and frequency and impact different organ systems, making diagnosis more challenging.
- Absence of a universally accepted case definition for post COVID-19 condition.
- Post COVID-19 condition can affect many systems in the body and can include the following manifestations (*reference: Higgins et al, Crit Rev Clin Lab Sci, 2020):*
    - central nervous system
    - psychosocial
    - Cardiovascular
    - Pulmonary
    - Hematologic
    - Renal
    - Post-intensive care syndrome
    - gastrointestinal

Prevalence:

- 10-20% among those infected with COVID-19 will develop post COVID-19 condition *reference: WHO*
- Several studies (before Omicron) found that about 30% to 40% of people who weren't hospitalized for their initial COVID-19 infection still reported symptoms beyond 12 weeks.
- neuropsychiatric symptoms showed a higher long-term prevalence and longer persistence than physical symptoms

Risk Factors:

- Female sex
- those who experienced severe acute COVID-19 or having been hospitalized for acute COVID-19 infection. *reference: systematic review and meta-analysis*

Protective Factors:

- 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).

- Omicron variant is less likely to cause long COVID than previous variants (20% to 50% lower during the Omicron wave compared to Delta)

Impact:

- Employment - up to 22% were not working 3 months or more after acute infection, 10-46% had reduced work schedules.
- Health - Over 80% of Long COVID study 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. *Reference: A recent pan-Canadian survey*

What We Don't Know:

- We do not know the underlying biological mechanisms to fully estimate the health impacts of post COVID-19 condition and how to address them.
- There is an 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)
- There is currently no universally agreed-upon approach to diagnose and treat post COVID-19 condition.
- There are no clear preventative measures, aside from preventing initial COVID-19 infection
- There is some evidence on the protective effect of COVID-19 vaccination (2 doses) against it but evidence is limited.
- PHAC continues to monitor new developments to learn more about other preventive measures that can be taken.
- In Canada, we do not know the proportion of population affected, across sub-groups, particularly among children, Indigenous populations, and racialized populations.
- There is 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.

What is Being Done?

- Internationally there are research studies and new guidelines to support clinicians and engagement to share latest scientific evidence.

- Research is being funded in Canada (but results may not be known for months to years).

- PHAC surveillance is happening in Canada - 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.

- PHAC Bi-weekly scans of new/emerging research is happening.

- Engagement and collaboration among provinces, territories and federal government is ongoing.

New Brunswick

The Department of Health and both regional health authorities are looking at how best to deliver programs and services with those experiencing post COVID-19 Condition, while meeting the objectives of the Provincial Health Plan.

The patient list that was created for research purposes by the Regional Health Authorities is no longer adding new patients. The list was never established as a formal provincial registry of Long COVID patients in the province.

Relevant links:

Living with Persistent Post-COVID Symptoms (phsa.ca)

Post-COVID-19 condition (long COVID) - Canada.ca

The Public Health Agency of Canada (PHAC) recently released a review of the current international evidence (PDF).

COVID-19 for health professionals: Post-COVID-19 condition (long COVID) - Canada.ca

Post COVID-19 Condition: Guidance for Primary Care (ontariohealth.ca)

Coronavirus disease (COVID-19): Post COVID-19 condition (who.int)

Long-term effects of COVID-19 on children/youth

As COVID-19 has spread through communities, children have often been spared the worst of the disease's impacts. The spectre of long COVID developing in children is very important to understand the impacts of the pandemic for younger people. Most people who survive COVID-19 recover completely. But for some, the poorly understood condition that's become known as long COVID can last for months or may be years. This condition was first described in adults. However, several studies have now reported a similar phenomenon, including symptoms such as headache, fatigue and heart palpitations, in children, even though they rarely experience severe initial symptoms of COVID-19. Estimates of how common long COVID is in children vary depending on the jurisdictions, demographics, and several other factors.

A paediatrician at the Gemelli University Hospital in Rome, led the first attempt to quantify long COVID in children. In this study[1], 129 children aged 6–16 years were interviewed who had been diagnosed with COVID-19 between March and November 2020. The study reported that more than one-third had one or two lingering symptoms 4 months or more after infection, and a further one-quarter had three or more symptoms. Insomnia, fatigue, muscle pain and persistent cold-like complaints were common among them, a pattern similar to that seen in adults with long COVID. Even children who had mild initial symptoms, or were asymptomatic, were not spared these long-lasting effects.

Data released by the UK Office of National Statistics (ONS) showed that in 2021, 9.8% of children aged 2–11 years and 13% aged 12–16 years reported at least one lingering symptom five weeks after a positive diagnosis.[2] Results from the data released by the UK ONS in 2022 reported the long-COVID symptoms among school students. The School Infection Survey (SIS)[3] ran for the 2020 to 2021 academic year and was set up to monitor prevalence of COVID-19 infection and presence of antibodies among pupils and staff within a sample of schools in England. Of survey respondents (n=434), 12.3% of secondary school pupils (95% confidence interval; 8.5% to 16.9%) with a previously confirmed COVID-19 infection reported experiencing ongoing symptoms more than four weeks from the start of the infection. Among those experiencing ongoing symptoms, the most common symptom reported was "weakness or tiredness" (46.3%), followed by loss of smell, loss of taste, headache, muscle ache, cough, anxiety, low mood, and shortness of breath. The SIS estimates appear lower than those reported by the CLoCk study (University College London and Public Health England Children and young people with Long COVID (CLoCk) study).[4] In the CLoCK study, the presence of physical symptoms three months post-test was around 14 percentage points higher in children (11-17 years old) who had initially tested positive for COVID-19 compared with the control group (who had initially tested negative). The study also reported that tiredness and headaches were the most common symptoms three months after COVID-19 infection. Another report released in 2021 found that one-quarter of children who were surveyed after discharge from hospital in Russia post-COVID-19, had symptoms more than five months later.[5]

However, other study results reported different rates among children. Data gathered by the Virus Watch study, which tracks infections and symptoms in more than 23,000 households across England and Wales found that only 4.6% of children with evidence of SARS-CoV-2 infection had persistent symptoms lasting more than 4 weeks.[6] Another UK study found a similar rate. Of more than 1,700 schoolchildren who tested positive for SARS-CoV-2, only 4.4% had symptoms, such as headache, fatigue and loss of smell, that persisted; 1.6% had symptoms that remained for at least 8 weeks.[7]

One of the challenges to identify how many kids develop long COVID is that there are no set diagnostic criteria for long-COVID. A literature review by the UK National Institute for Health Research, reported that long COVID could be a collection of four different syndromes, including post-intensive care syndrome, post-viral fatigue syndrome and long-term COVID syndrome.[8]

The COVID-19 pandemic and its associated mitigation strategies had significant psychosocial, behavioral, socioeconomic, and health impacts, which were exacerbated in vulnerable groups.[9-11] Pediatric populations experiencing health disparities prior to the COVID-19 pandemic were at increased risk of infection and other COVID-19 related consequences (e.g., prolonged school closings, low resources to support online learning, parent job loss, high prevalence of community morbidity and mortality due to COVID-19).[12,13]

Long-Term Effects on Mental and social Health

The most common mental health issues reported in the pediatric population throughout the COVID-19 pandemic were anxiety and depression. From two non-hospitalized cross-sectional studies in China, one examined mental health effects in primary schools and the other in junior and senior high schools, with both studies reporting anxiety and depression during home confinement during the first few months of 2020.[14,15] Mental health effects associated with the COVID-19 pandemic included depressive symptoms, severe anxiety, and patient-specific mental and social health complaints.[16]

For older children, behavioral symptoms reported included clinginess, distraction, irritability, and fear of asking questions about the epidemic.[10] Other findings related to mood and emotional status included increases in being affectionate, restless, and frustrated.[17] The behavioral health of non-hospitalized children with COVID-19 had been reported by parents to have been worsening as the pandemic was progressing.[18] Additionally, a study among adolescents aged 8-18 years in The Netherlands reported significant worse PROMIS T-scores on all domains including peer relationships, anger, sleep related impairment, poor Global Health, social health complaints, effect on atmosphere at home, and negative impacts of the COVID-19 regulations on daily life.[16]

Canadian research

Canadian children had great impacts on mental health during the COVID-19 pandemic. Research from The Hospital for Sick Children (SickKids) shows a large majority of children and youth experienced harm to their mental health during the COVID-19 pandemic. Greater stress from social isolation, including both the cancellation of important events and the loss of in-person social interactions, was strongly associated with mental health deterioration.[19] Factors like the lack of contact with peers and teachers, the fear of health and death of family members, and the decreased structure in daily living seem to have contributed to increased anxiety, depression, and behavioural problems in many children and youth.[20] Results from two cross-sectional studies conducted in the spring of 2020 and the fall of 2020 on over 2000 Canadian children and youth age 9–16 years found that more youth were bored (34%), worried (27%), and sad (15%) during the pandemic than before the pandemic (Maximum City 2021).[21] In a Canadian study of 184 adolescents from the community who were assessed on four occasions over the course of two years before the pandemic, and again during the pandemic, researchers found that

"anxiety and depression scores were significantly higher than previous trajectories would have predicted".[22]

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