RE: COVID Immunization and DM Discussion

From: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
To: Sagar, Brian HLTH:EX <Brian.Sagar@gov.bc.ca>
Cc: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Sent: November 3, 2020 8:50:27 AM PST

Hi Brian,
I added a few items, highlighted in yellow.
Cheers,
Martin

From: Sagar, Brian HLTH:EX
Sent: November 2, 2020 6:41 PM
To: Lavoie, Martin HLTH:EX
Subject: RE: COVID Immunization and DM Discussion

Hi Martin,
Here is DRAFT new wording for IGR to shape the DM's discussion of COVID imms planning, per our phone conversation.
Interested in your thoughts.
Reminder of the 9am deadline.
Brian

CURRENT STATUS

FPT Deputies have had a number of discussions on the federal government's proposed Common Statement of Principles on COVID Immunization. The National Advisory Committee on Immunization (NACI) is expected to launch its interim guidance on key populations for COVID Immunization on November 3rd.

POTENTIAL DISCUSSION POINTS

- PT's share views on and define COVID immunization planning items where collaboration, alignment, and uniformity are paramount (e.g., national allocation criteria, public messaging/communication/education, reporting of vaccine metrics, reporting of adverse events), as well as define items where regional flexibility and adaptation are acceptable.

- PT's discuss and define roles and responsibilities for leading all key items* required for COVID immunization planning and implementation, including the federal role and PT roles.

  * Key items include: vaccine authorization (notice of compliance by Health Canada, national contracts and procurement, allocation, distribution, recommendations on use and prioritization (i.e. NACI), administration of doses (i.e. vaccination), inventory tracking, reporting of doses administered, identification and reporting of Adverse Events Following Immunization (AEFI's), common content for public and professional information and education (including websites, media, FAQ's, KM's)

- Consider the role of a **no-fault vaccine injury compensation program** (ideally national) as discussed and recommended in the National Immunization Strategy refresh reports.

- PT's discuss a schedule of future meetings to ensure regular, ongoing collaboration and information sharing to guide, inform and troubleshoot COVID immunization planning, implementation, follow-up, and evaluation. Of particular importance is defining ahead of time the decision-making processes to be used if/when challenges occur, in the context of the currently complex and multi-level set-up that includes various levels of government, FPT committees, and national bodies, to name a few.

EXPECTED OUTCOME

- PTs have an opportunity to discuss and collaborate on current planning for and implementation of COVID immunization, to highlight any concerns and opportunities for collaboration, and to ensure alignment and coordination where required.

From: Sagar, Brian HLTH:EX
Sent: November 2, 2020 4:00 PM
To: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Subject: COVID Immunization and DM Discussion
Hi Martin,
See the email below from IGR. BC DM asked to lead a 5 to 10 minute P/T discussion about COVID imms planning on Nov 13.
I think additional P/T discussion of planning and coordination is a good use of the DMs' time.
Are there any other big picture, hot topics that you'd like put forward for consideration? Or any specific items that need to be NAMED for the discussion about planning and coordination (distribution, public engagement and data/reporting are top of my list)?
Brian

Subject: COVID Immunization and DM Discussion
Hi Brian,
ON has approached BC to lead a discussion amongst PT DM's on the topic of COVID immunization on Nov. 13. At the present time only 5 minutes is allotted to this item, however we will discuss further with ON to extend this time to perhaps 10 minutes. The following draft frames the discussion: personally, I think it would be interesting to focus on where federal jurisdiction on vaccines ends and where provincial jurisdiction begins. Also, it would be interesting to outline all the fpt players. Please let me know your initial thoughts on possible areas to focus on, and if you think BC is in a position to provide some leadership on this topic. Your initial thoughts would be welcome by tomorrow at 9:00 am.
Richard

CURRENT STATUS

FPT Deputies have had a number of discussions on the federal government's proposed Common Statement of Principles on COVID Immunization. The National Advisory Committee on Immunization (NACI) is expected to launch its interim guidance on key populations for COVID Immunization on November 3rd.

POTENTIAL DISCUSSION POINTS

- s.13

- PTs' provide updates on their planning for the implementation of COVID immunization, including considerations and concerns.
- PTs share views on the status of FPT discussions on immunization and potential path forward and opportunities for collaboration.

EXPECTED OUTCOME

- PTs have an opportunity to discuss current planning for COVID immunization, to highlight any concerns and opportunities for collaboration.

feds will likely be seeking some type of 'agreement' with the PTs related to COVID vaccine pgm

From:	Naus, Monika [BCCDC] <Monika.Naus@bccdc.ca>
To:	Gustafson, Reka [BCCDC] <reka.gustafson@phsa.ca>, Hassam, Noorjean [BCCDC] <Nhassam@bccdc.ca>, Hrycuik, Lorie [EXT] <Lorie.Hrycuik@gov.bc.ca>, Lavoie, Martin <Martin.Lavoie@gov.bc.ca>, Hrycuik, Lorie HLTH:EX, Lavoie, Martin HLTH:EX
Cc:	Achampong, Bernard <Bernard.Achampong@gov.bc.ca>, Brian.Sagar [EXT] <Brian.Sagar@gov.bc.ca>, donna.jepsen@gov.bc.ca [EXT] <donna.jepsen@gov.bc.ca>, Henry, Bonnie [EXT] <bonnie.henry@gov.bc.ca>, Achampong, Bernard HLTH:EX, Sagar, Brian HLTH:EX, Jepsen, Donna HLTH:EX, Henry, Bonnie HLTH:EX
Sent:	December 4, 2020 6:04:46 PM PST

Fyi, I responded to Erin Henry at PHAC on the enclosed draft below. I think that it was just a trial balloon out to me as CIC cochair, and they are not quite ready to proceed with it at this point in time, but it's likely to come back either to us or the Ministry or PHO.
Thank you,
Monika

. . . . . .

Monika Naus MD FRCPC
Medical Director, Communicable Diseases & Immunization Service
Medical Head, Immunization Programs & Vaccine Preventable Diseases
BC Centre for Disease Control
monika.naus@bccdc.ca
Tel 604.707.2540
Cell s.15
Assistant: Jessica Taylor (Monday - Wednesday) and Esther Cummings (Thursday/Friday) mnds.assist@bccdc.ca Tel 604 707 2519
I gratefully acknowledge that I live on the territory of the Coast Salish Peoples.

From: Naus, Monika [BCCDC]
Sent: Tuesday, December 01, 2020 7:00 PM
To: 'Henry, Erin (PHAC/ASPC)'
Cc: Deehan, Heather (PHAC/ASPC) ; Pennock, Jennifer (PHAC/ASPC) ; Apse, Krista (PHAC/ASPC) ; Charos, Gina (PHAC/ASPC) ; Gravelle, Natalie (PHAC/ASPC) ; House, Althea (PHAC/ASPC) ; Naus, Monika [BCCDC]
Subject: RE: Draft Confirmation Form, COVID vaccine safety
Hi Erin
I'm not sure it would require 'ministerial' sign off, but likely 'ministry'.
Thank you,
Monika

. . . . . .

Monika Naus MD FRCPC
Medical Director, Communicable Diseases & Immunization Service
Medical Head, Immunization Programs & Vaccine Preventable Diseases
BC Centre for Disease Control
monika.naus@bccdc.ca
Tel 604.707.2540
Cell s.15
Assistant: Jessica Taylor (Monday - Wednesday) and Esther Cummings (Thursday/Friday) mnds.assist@bccdc.ca Tel 604 707 2519
I gratefully acknowledge that I live on the territory of the Coast Salish Peoples.

From: Henry, Erin (PHAC/ASPC) [mailto:erine.henry@canada.ca]
Sent: Tuesday, December 01, 2020 3:30 PM
To: Naus, Monika [BCCDC] <Monika.Naus@bccdc.ca>

Cc: Deehan, Heather (PHAC/ASPC) <heather.deehan@canada.ca>; Pennock, Jennifer (PHAC/ASPC) <jennifer.pennock@canada.ca>; Apse, Krista (PHAC/ASPC) <krista.apse@canada.ca>; Charos, Gina (PHAC/ASPC) <gina.charos@canada.ca>; Gravelle, Natalie (PHAC/ASPC) <natalie.gravelle@canada.ca>; House, Althea (PHAC/ASPC) <althea.house@canada.ca>
Subject: RE: Draft Confirmation Form

Thanks Monika for the feedback and perspectives. There will actually be a presentation next week by our policy group on Vaccine Injury Compensation. Good to know that the agreement would be signed at the Ministerial Level in BC and I agree, each PT would likely like to tailor it to their specifications.
I can't speak to payment of vaccine as I'm sure that is a very senior level discussions. For the supplies that was kept at an ADM level.
Erin

Erin E Henry
Director l Directrice
Immunization Programs and Pandemic Preparedness Division l Division des programmes d'immunisation et de la préparation aux pandémies
Centre for Immunization and Respiratory Infectious Diseases (CIRID) l Centre de l'immunisation et des maladies respiratoires infectieuses (CIMRI)
Public Health Agency of Canada l Agence de la santé publique du Canada
130 Colonnade Road , Room 158A, AL 6501A
Tel: 613-960-4562, Cell: s.15

From: Naus, Monika [BCCDC] [mailto:Monika.Naus@bccdc.ca]
Sent: 2020-12-01 5:24 PM
To: Henry, Erin (PHAC/ASPC)
Cc: Deehan, Heather (PHAC/ASPC); Pennock, Jennifer (PHAC/ASPC); Apse, Krista (PHAC/ASPC); Charos, Gina (PHAC/ASPC); Gravelle, Natalie (PHAC/ASPC); House, Althea (PHAC/ASPC); Naus, Monika [BCCDC]
Subject: Re: Draft Confirmation Form

Hello Erin
This may vary by P/T but in BC I think it would likely be signed off by the Ministry and I'm guessing there s.13

At what level are things like payment for vaccine and equipment being raised?
And what about the vaccine injury compensation scheme or similar that I've seen a line about but no further details have been discussed.
s.13

Thank you,

Monika

. . . . . .

Monika Naus MD FRCPC
Medical Director, Communicable Diseases & Immunization Service
Medical Head, Immunization Programs & Vaccine Preventable Diseases

BC Centre for Disease Control
monika.naus@bccdc.ca
Tel 604.707.2540
Cell s.15

From: erine.henry@canada.ca
Sent: November 28, 2020 9:26 AM
To: Monika.Naus@bccdc.ca
Cc: heather.deehan@canada.ca; jennifer.pennock@canada.ca; krista.apse@canada.ca; gina.charos@canada.ca; natalie.gravelle@canada.ca; althea.house@canada.ca
Subject: Draft Confirmation Form

Hi Monika,
Our policy team has drafted a confirmation form outlining what Feds are responsible for and what PTs are responsible for. It would be signed by the PT representative along with myself as Federal Co-chair of CIC. I would love your feedback on the content and whether you think this should be signed at our level or higher at the SAC level.
Let me know your thoughts and happy to discuss.
Erin

Request for EOC via my gov.bc.ca account

From: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
To: Brown, Ross Dr [VCH] <Ross.Brown@vch.ca>, XT:Lavery, John HLTH:IN <john.lavery@phsa.ca>
Cc: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Sent: December 8, 2020 4:08:35 PM PST

Ross, John,
I just received this request from Ian Rongve's team to prepare an information BN on two aspects – vaccine planning and rollout, and vaccine injury compensation program.
Instructions are pasted below, and it came with three attached documents. PPH Division is not the planning lead, so are not directly included in this request.
Once complete, I will send it back via our electronic approval system that I have access to.
We can chat about this later.
Martin

1. CHREM to collaborate with PPH, PHO, and Dr. Ross Brown as required. Bullets Template is attached.
2. Regarding Vaccine Planning and Roll-out, BC Program Bullets should outline key perspectives on readiness, progress, key developments and upcoming milestones, as well as any key issues/risks/challenges;
3. regarding (potential) Vaccine Injury Compensation (Program), Bullets should outline highlights of BC MOH perspective and any recent or planned discussions on the topic, including any indication of scope, funding model, or other key aspects.
4. Recently prepared BC Program Bullets for Dec. 3 FPT Health Ministers' call and Dec. 10 First Ministers' Meeting, are included for context.
5. Contact Chad Vandermolen, Sylvia Blake, or Richard Almond if any questions
6. PPH indicates they do not have the required information. Please collaborate with Dr. Ross Brown on Bullets content. Please approve and forward draft to CHREM docs once completed, for Ian's review and approval. CHREM to return to IGR following Ian's review and approval.

Dr. Martin Lavoie | Deputy Provincial Health Officer (Acting)
Office of the Provincial Health Officer, Ministry of Health
PO Box 9648 Stn Prov Govt, Victoria, BC V8W 9P4
Cell: s.17 E: Martin.Lavoie@gov.bc.ca
Assistant: Ashley Halicki
T: (778) 974-3935 E: Ashley.Halicki@gov.bc.ca

RE: ALERT - eApprovals Item ID: 25550 - Item Forwarded - - Due 12/10/2020

From: Vandermolen, Chad HLTH:EX <Chad.Vandermolen@gov.bc.ca>
To: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Cc: Samra, Kevin HLTH:EX <Kevin.Samra@gov.bc.ca>
Sent: December 8, 2020 4:20:31 PM PST

There's been no discussion on any of the FPT DM or Minister calls. From the notes I've seen from the Premiers'/PM table, FMM, I haven't seen any discussion there either. Also, there wasn't any discussion at the PT Immunization Forum table on Monday; in fact, I flagged the issue, hoping to generate some intel, but the Ontario Chair just indicated it would be brought forward as a topic on a future Agenda. Unless Brian Sagar or someone else has more specific intel, I think just the general background and a recommended position will meet our needs for this initial discussion. Perhaps Ian Rongve may have some thoughts too, when he reviews the draft.
--Chad

From: Lavoie, Martin HLTH:EX
Sent: December 8, 2020 4:11 PM
To: Vandermolen, Chad HLTH:EX
Subject: FW: ALERT - eApprovals Item ID: 25550 - Item Forwarded - - Due 12/10/2020
Chad, are you aware of any discussions at FPT tables about vaccine injury compensation program? I have good general background on what this is, and it was mentioned in a number of documents we reviewed recently (I think I added that element the first time around), but I have not heard anything related to this since then. I would highly recommend a national program over a provincial one.
M

From: HLTH eApprovals <donotreply@sp.gov.bc.ca>
Sent: December 8, 2020 12:56 PM
To: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Subject: ALERT - eApprovals Item ID: 25550 - Item Forwarded - - Due 12/10/2020

Vandermolen, Chad HLTH:EX [Assignee] forwarded an eApprovals item to Lavoie, Martin Deputy PHO for action

Comment: PPH indicates they do not have the required information. Please collaborate with Dr. Ross Brown on Bullets content. Please approve and forward draft to CHREM docs once completed, for Ian's review and approval. CHREM to return to IGR following Ian's review and approval.

#:

Title: BC Program Bullets re Covid-19 Immunization Planning and Roll-out & Vaccine Injury Compensation

Full Name:

Due Date: 12/10/2020

Category: Meetings - BC Program Note (IGR)

Go to item...

Vaccine Items on Fri., Dec. 11 FPT DMs of Health Agenda

From:	Vandermolen, Chad HLTH:EX <Chad.Vandermolen@gov.bc.ca>
To:	Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Cc:	Samra, Kevin HLTH:EX <Kevin.Samra@gov.bc.ca>, Blake, Sylvia HLTH:EX <Sylvia.Blake@gov.bc.ca>, Almond, Richard HLTH:EX <Richard.Almond@gov.bc.ca>
Sent:	December 9, 2020 10:57:21 AM PST

Hi Martin,

Further to our call of a short while ago, the vaccine items on the draft Agenda are set out below. Glad that the Vaccine Injury Support Program appears to be evolving as we had hoped. Hope this additional info/context assists you in completion of eApp 25550 - BC Program Bullets re Covid-19 Immunization Planning and Roll-out & Vaccine Injury Compensation.

3. **Update on Logistics and Distribution Operations– *for information*** • DMs will be joined by Major General Dany Fortin to receive an update on vaccine readiness preparations underway through the NOC, including the status of coordination with PT distribution centres.	*20 min.*
4. **Vaccine Injury Support (VISP) Program – *for information/discussion*** • DMs will receive an update on the federal government's intent to establish a federally-funded, pan-Canadian, Vaccine Injury Support Program (VISP).	*20 min.*

IGR will advise if we learn any further relevant developments.

Sincerely,

Chad

RE: URGENT - Request for EOC via my gov.bc.ca account

From: Miller, Haley HLTH:EX <Haley.Miller@gov.bc.ca>
To: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>, XT:Naus, Monika HLTH:IN <monika.naus@bccdc.ca>, Hassam, Noorjean [BCCDC] <Nhassam@bccdc.ca>
Cc: Lavoie, Martin <martin@martinlavoie.ca>
Sent: December 9, 2020 11:08:29 AM PST

Hi there – I will happily draft the BN on the planning and rollout.
Haley

From: Lavoie, Martin HLTH:EX
Sent: December 9, 2020 11:06 AM
To: XT:Naus, Monika HLTH:IN ; Hassam, Noorjean [BCCDC] ; Miller, Haley HLTH:EX
Cc: Lavoie, Martin
Subject: URGENT - Request for EOC via my gov.bc.ca account
Importance: High

Noorjean, Monika,
(Haley, please see Q for you below – this is urgent and your help would be really appreciated if you can)
To prepare for an FPT DM meeting on Friday, we need to prepare a BN that will give our DM the needed background on two aspects. The first one is about vaccine planning and rollout. I can take care of the second one (vaccine injury compensation program).
Monika, I just heard that the feds just shared their intent to set up a vaccine injury compensation program nationally and they will discuss this at the FPT DM meeting on Friday.
We need this by afternoon Thursday (tomorrow) and we may be ok later on Thursday if needed…
I wonder if HEMBC colleagues or **Haley** could help us with that. I copied Haley already.
Details I just got from intergovernmental relations:

Update on Logistics and Distribution Operations– *for information*

DMs will be joined by Major General Dany Fortin to receive an update on vaccine readiness preparations underway through the NOC, including the status of coordination with PT distribution centres.

Vaccine Injury Support (VISP) Program – *for information/discussion*

DMs will receive an update on the federal government's intent to establish a federally-funded, pan-Canadian, Vaccine Injury Support Program (VISP).

Dr. Martin Lavoie
Deputy Provincial Health Officer (Acting)
Office of the Provincial Health Officer, Ministry of Health

From: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Sent: December 8, 2020 4:09 PM
To: Brown, Ross Dr [VCH] <Ross.Brown@vch.ca>; XT:Lavery, John HLTH:IN <john.lavery@phsa.ca>
Cc: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Subject: Request for EOC via my gov.bc.ca account
Importance: High

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Once complete, I will send it back via our electronic approval system that I have access to.
We can chat about this later.
Martin

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4. Recently prepared BC Program Bullets for Dec. 3 FPT Health Ministers' call and Dec. 10 First Ministers' Meeting, are included for context.
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Dr. Martin Lavoie | Deputy Provincial Health Officer (Acting)
Office of the Provincial Health Officer, Ministry of Health
PO Box 9648 Stn Prov Govt, Victoria, BC V8W 9P4
Cell: s.17 E: Martin.Lavoie@gov.bc.ca
Assistant: Ashley Halicki
T: (778) 974-3935 E: Ashley.Halicki@gov.bc.ca

RE: URGENT - Request for EOC via my gov.bc.ca account

From: Hassam, Noorjean [BCCDC] <Nhassam@bccdc.ca>
To: Lavoie, Martin <Martin.Lavoie@gov.bc.ca>, Naus, Monika [BCCDC] <Monika.Naus@bccdc.ca>, Miller, Haley [EX] <haley.miller@gov.bc.ca>, Lavoie, Martin HLTH:EX, XT:Naus, Monika HLTH:IN, Miller, Haley HLTH:EX
Cc: Lavoie, Martin <martin@martinlavoie.ca>
Sent: December 9, 2020 1:21:23 PM PST

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Thank you Haley, my cell is s.15 call or text.
Noorjean

From: Lavoie, Martin HLTH:EX [mailto:Martin.Lavoie@gov.bc.ca]
Sent: Wednesday, December 09, 2020 12:01 PM
To: Hassam, Noorjean [BCCDC] ; Naus, Monika [BCCDC] ; Miller, Haley [EX]
Cc: Lavoie, Martin
Subject: RE: URGENT - Request for EOC via my gov.bc.ca account
EXTERNAL SENDER. If you suspect this message is malicious, please forward to spam@phsa.ca and **do not** open attachments or click on links.

Just confirming that Haley offered to take the lead and she may reach out to you for some details.
M

From: Hassam, Noorjean [BCCDC] <Nhassam@bccdc.ca>
Sent: December 9, 2020 11:58 AM
To: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>; XT:Naus, Monika HLTH:IN <monika.naus@bccdc.ca>; Miller, Haley HLTH:EX <Haley.Miller@gov.bc.ca>
Cc: Lavoie, Martin <martin@martinlavoie.ca>
Subject: RE: URGENT - Request for EOC via my gov.bc.ca account

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

We can do this for sure, Martin, I want to make sure of the level of information. Who will know this and can I talk to them for a couple of minutes?

From: Lavoie, Martin HLTH:EX [mailto:Martin.Lavoie@gov.bc.ca]
Sent: Wednesday, December 09, 2020 11:06 AM
To: Naus, Monika [BCCDC] <Monika.Naus@bccdc.ca>; Hassam, Noorjean [BCCDC] <Nhassam@bccdc.ca>; Miller, Haley [EX] <haley.miller@gov.bc.ca>
Cc: Lavoie, Martin <martin@martinlavoie.ca>
Subject: URGENT - Request for EOC via my gov.bc.ca account
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Deputy Provincial Health Officer (Acting)
Office of the Provincial Health Officer, Ministry of Health

From: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Sent: December 8, 2020 4:09 PM
To: Brown, Ross Dr [VCH] <Ross.Brown@vch.ca>; XT:Lavery, John HLTH:IN <john.lavery@phsa.ca>
Cc: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
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Dr. Martin Lavoie | Deputy Provincial Health Officer (Acting)
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PO Box 9648 Stn Prov Govt, Victoria, BC V8W 9P4
Cell: s.17 E: Martin.Lavoie@gov.bc.ca
Assistant: Ashley Halicki
T: (778) 974-3935 E: Ashley.Halicki@gov.bc.ca

RE: Dec. 3 The Hills Times Article re National Vaccine Injury Compensation Program.

From: Vandermolen, Chad HLTH:EX <Chad.Vandermolen@gov.bc.ca>
To: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Sent: December 9, 2020 2:55:35 PM PST

Ah, thank you so much. I figured an accessible copy would be findable somewhere. My thanks to your assistant. I'm glad we have benefit of your knowledge and expertise in this area. Hopefully, the time is ripe!

From: Lavoie, Martin HLTH:EX
Sent: December 9, 2020 2:31 PM
To: Vandermolen, Chad HLTH:EX
Cc: Lavoie, Martin HLTH:EX
Subject: FW: Dec. 3 The Hills Times Article re National Vaccine Injury Compensation Program.
There you go. It was accessible via another paper and my assistant found it. See weblink below.
And interestingly Kumanan Wilson was part of the national task group that I was co-chairing and our report included a section on vaccine injury compensation program. I am glad to see that he is still talking about it.
Martin
https://www.thestar.com/opinion/contributors/2020/11/25/its-time-canada-had-a-national-vaccine-injury-compensation-program.html

From: Vandermolen, Chad HLTH:EX <Chad.Vandermolen@gov.bc.ca>
Sent: December 9, 2020 2:04 PM
To: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Subject: Dec. 3 The Hills Times Article re National Vaccine Injury Compensation Program.
FYI. This article would probably be of quite a bit of interest, but unfortunately appears to be behind a subscription firewall:
https://www.hilltimes.com/2020/12/03/its-time-canada-had-a-national-vaccine-injury-compensation-program/274541

Re: Draft IBN - COVID-19 Vaccine Planning - Dec 9 2020

From: Miller, Haley HLTH:EX <Haley.Miller@gov.bc.ca>
To: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Sent: December 9, 2020 9:22:15 PM PST

Thank you Martin! High praise. Told you I like BNs.... :)
I agree about the length. I could make it into 2 pages easily and append the rest.
I'll await your thoughts!
Haley

Sent from my iPhone

> On Dec 9, 2020, at 9:20 PM, Lavoie, Martin HLTH:EX wrote:
>
> Bonsoir Haley,
> I will finish reviewing it tomorrow morning – I am close to being done. I also added a section on a no-fault vaccine injury compensation program.
> Your BN is excellent, and I don't have any significant edits. I will ask Chad how long this BN should be, unless you know already, as it might be a bit long.
> Cheers,
> Martin
>
> **From:** Miller, Haley HLTH:EX
> **Sent:** December 9, 2020 5:33 PM
> **To:** Lavoie, Martin HLTH:EX
> **Subject:** Draft IBN - COVID-19 Vaccine Planning - Dec 9 2020
> Hi Martin!
> So nice to connect today. Attached is my first draft BN for the DM. I could use your thoughts on what to say in the reporting section, and what advice to provide (I'm thinking that we'll commit to brief up senior leadership on a daily basis and ad hoc as required?).
> Thanks so much,
> Haley

Conversation with Chad Vandermolen

From:	Lavoie, Martin HLTH:EX <martin.lavoie@gov.bc.ca>
To:	Vandermolen, Chad HLTH:EX, Lavoie, Martin HLTH:EX
Sent:	December 10, 2020 10:50:17 AM PST

Lavoie, Martin HLTH:EX 10:28 AM:
Hi Chad. I was wondering how long the IBN in eApp can be. There is a lot of content to cover, and knowing what the limit is would help.

Chad Vandermolen 10:28 AM:
No upper limit

Chad Vandermolen 10:29 AM:
As long as all is relevant and as concise as possible

Lavoie, Martin HLTH:EX 10:30 AM:
super. Haley and I have a solid draft already. It covers both the implementation and logistics in BC, and background info on no-fault national vaccine injury compensation program.

Chad Vandermolen 10:30 AM:
Fantastic, many thanks for the update

Chad Vandermolen 10:31 AM:
I'm sure it will be great

Chad Vandermolen 10:36 AM:
Martin, I reached out to Health Canada today to confirm the 24/7 Canada Vaccine Operations Centre contact info. I'm assuming you, Dr. Henry and Dr. Ross Brown already have this info. Is that correct?

Chad Vandermolen 10:36 AM:
If not I can forward along

Chad Vandermolen 10:37 AM:
The feds noted on the Joint DM call yesterday morning that PTs could reach out 24/7 with any urgent vaccine-related questions, so I wanted to ensure we had the info handy

Chad Vandermolen 10:37 AM:
I couldn't find it on the Gov't of Canada website this morning, so I obtained it from my Health Canada contacts

Lavoie, Martin HLTH:EX 10:38 AM:
It may be in an email somewhere, but I don't know. Please send it along and I will make sure the EOC has it on speed dial.

Chad Vandermolen 10:38 AM:
Will send along shortly. Thanks

RE: Dec. 3 The Hills Times Article re National Vaccine Injury Compensation Program.

From: Henry, Bonnie HLTH:EX <Bonnie.Henry@gov.bc.ca>
To: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>, Brown, Ross Dr [VCH] <Ross.Brown@vch.ca>, Achampong, Bernard HLTH:EX <Bernard.Achampong@gov.bc.ca>, Sagar, Brian HLTH:EX <Brian.Sagar@gov.bc.ca>, XT:Lavery, John HLTH:IN <john.lavery@phsa.ca>, XT:Naus, Monika HLTH:IN <monika.naus@bccdc.ca>, Reka Gustafson <Reka.Gustafson@phsa.ca>, Hrycuik, Lorie HLTH:EX <Lorie.Hrycuik@gov.bc.ca>
Sent: December 10, 2020 11:23:29 AM PST

We have discussed this at SAC and it is in the works.
b

Dr Bonnie Henry
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Victoria, BC
V8W 9P4
Bonnie.henry@gov.bc.ca
Phone: s.17; s.19
I gratefully acknowledge that I live and work on the traditional unceded territory of the Lekwungen Peoples, specifically the Songhees and Esquimalt First Nations. Hay'sxw'qu Si'em

---

From: Lavoie, Martin HLTH:EX
Sent: December 9, 2020 3:30 PM
To: Henry, Bonnie HLTH:EX ; Brown, Ross Dr [VCH] ; Achampong, Bernard HLTH:EX ; Sagar, Brian HLTH:EX ; XT:Lavery, John HLTH:IN ; XT:Naus, Monika HLTH:IN ; Reka Gustafson ; Hrycuik, Lorie HLTH:EX
Cc: Lavoie, Martin HLTH:EX
Subject: FW: Dec. 3 The Hills Times Article re National Vaccine Injury Compensation Program.
Importance: High

This article came out recently and IGR sent me a copy earlier today.
I have been adding this important topic to various FPT meeting backgrounders to ensure it was raised at national tables. It appears the feds have heard us and are moving forward with this (or so it sounds).
The establishment of this program has been recommended for years, and Canada has been the only one (with Russia) without a national no-fault program – as a member of the G8. Québec was the only province in Canada with such a program.
About 10 years ago, the total estimate to run such a program was around $5 million. Going through the legal system based on tort litigation, each case could cost $1M+.
Cheers,
Martin

From: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Sent: December 9, 2020 2:31 PM
To: Vandermolen, Chad HLTH:EX <Chad.Vandermolen@gov.bc.ca>
Cc: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Subject: FW: Dec. 3 The Hills Times Article re National Vaccine Injury Compensation Program.

There you go. It was accessible via another paper and my assistant found it. See weblink below.
And interestingly Kumanan Wilson was part of the national task group that I was co-chairing and our report included a section on vaccine injury compensation program. I am glad to see that he is still talking about it.
Martin

https://www.thestar.com/opinion/contributors/2020/11/25/its-time-canada-had-a-national-vaccine-injury-compensation-program.html

Updated: IBN - COVID-19 Vaccine Planning - Dec 10 2020

From:	Miller, Haley HLTH:EX <Haley.Miller@gov.bc.ca>
To:	Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Sent:	December 10, 2020 12:07:42 PM PST
Attachments:	IBN - COVID-19 Vaccine Planning - Dec 10 2020.docx, Toronto Star article on Vaccine injury compensation program.docx

Hi Martin,
Just so you have a clean copy. I have sent the sequencing question to Monika but I am not confident I'll hear back in time for our deadline today. Re: nine sites in January – we have a deadline of midnight tonight to identify additional sites so the number will likely be increased, but we won't have that for the deadline either.
I expect the DM is aware of the dynamic nature of this work so a snapshot in time I think is sufficient. 😊
Haley

MINISTRY OF HEALTH
INFORMATION BRIEFING NOTE

Cliff #

PREPARED FOR: Steve Brown, Deputy Minister **- FOR INFORMATION**

TITLE: COVID-19 Vaccine Planning and Rollout

PURPOSE: To provide the Deputy Minister with information on BC's plan to implement the province's COVID-19 vaccine program

BACKGROUND:
The COVID-19 vaccine program is anticipated to be the most complex immunization program delivered in BC to date. Leveraging on established immunization practices and strategies, and supported by pandemic planning, BC's immunization strategy will ensure a coordinated, well-organized, and effective roll-out of COVID-19 vaccination in the province. The governance structure in place is a nimble, adaptable structure that allows for flexibility in the event of uncertainty and changing circumstances, such as changes related to product availability, managing multiple different products, storage requirements, and potentially different indications for use.

The immunization strategy is broken into four quarters with quarter one beginning on January 1, 2021. A preliminary phase is underway during the month of December 2020, with the first doses of vaccine to be received and administered the week of December 14, 2020, with additional shipments set to arrive the weeks of December 21 and 28, 2020. All health authorities are ready to receive and administer vaccine. Everyone in BC eligible to receive a COVID-19 vaccine will be offered it at no cost by the end of 2021.

Details for each key areas of our plan are provided in the following sections.

Governance

BC activated the Immunize BC Operations Centre on December 2, 2020, led by Dr. Ross Brown from Vancouver Coastal Health, and with membership from the Office of the Provincial Health Officer, the Ministry of Health, regional health authorities including the First Nations Health Authority, BC Centre for Disease Control (BCCDC), Health Emergency Management BC, Emergency Management BC, Canadian Armed Forces, and Canadian Red Cross. The Immunize BC Operations Centre is responsible for planning, organizing, coordinating, and supporting the operationalization of the rollout of COVID-19 vaccine in BC in collaboration with the Public Health Agency of Canada.

Vaccine Products

Depending on which vaccines receive approval from Health Canada, up to seven vaccine products will be used in BC, with mRNA vaccines from Pfizer (approved by Health Canada on December 9, 2020) and Moderna (approval is pending) arriving first. Both mRNA vaccines require sub-zero temperature environments (-80C and -20C respectively); the VPO-EOC is procuring freezers and specialized shipping containers to support storage and transport capacity in the province. The remaining vaccines that are

not yet approved are fridge-stable, and BC has sufficient fridge capacity in its public health units, pharmacies, and physician offices, and existing means to transport/ship them appropriately.

Priority Populations

The National Advisory Committee on Immunization makes recommendations for the use of vaccines in Canada and identifies groups at risk for vaccine-preventable diseases for whom vaccination should be targeted. BC Public Health leadership, in collaboration with the Provincial Health Officer, the First Nations Health Authority, and Indigenous leaders have adapted and refined these recommendations for COVID-19 vaccination to identify priority populations for early vaccination in BC. These populations have been identified in consideration of multiple and novel vaccine products, the complexity of cold-chain management, minimizing vaccine wastage, vaccine safety, areas with a high concentration of COVID-19 cases, and equitable geographical distribution.

First priority groups

- Long-term care and assisted living residents and staff, staff and patients at chronic care hospitals and home care staff and clients
- Health-care facility staff for COVID-19 patients in settings like Intensive Care Units, COVID-19 wards and emergency departments, testing sites and immunization clinics
- Essential visitors to long-term care and assisted living facilities
- Indigenous people living in rural and remote locations
- High risk people living in group settings like shelters
- People over 80 years old

Second priority groups

In spring 2021 as more vaccine becomes available, a second phase of vaccination will begin for:

- Older people under age 80 in descending five-year-age groups, with a focus on the oldest people first
- Indigenous people living on or off reserve
- Key frontline workers including:
    - Healthcare workers
    - Police
    - Fire and first responders
    - People working in grocery stores
    - Teachers
    - People working in transportation
    - People working in manufacturing and production facilities

Once the priority groups have been offered vaccine, immunization will be broadened to the rest of the eligible population. As of December 10, 2020, people who are pregnant, people who have a contraindication to the vaccine, people under the age of 16, people who have a severe acute fever or symptoms of COVID-19, and people who have a compromised immune system are not eligible to receive the vaccine.

Logistics

Security

Efforts internationally, nationally, provincially, and at the local level are being undertaken to ensure the safe arrival, distribution, and administration of COVID-19 vaccines. Active monitoring for threats against the vaccine supply, cold-chain processes, storage, and clinics is underway. Health authority oversight in each stage of the transportation process will occur alongside security personnel.

Access to Vaccination

For the month of December 2020, Pfizer has restricted the movement of vaccine off site once delivered in BC. This means people who work in long-term care and assisted living facilities will have to access the vaccine in one of the two sites in Vancouver Coastal and Fraser Health.

In January 2021, Pfizer will begin distributing to additional sites throughout the province (in all health authorities), and the doses will be permitted to be further distributed to secondary sites. Planning is underway to develop a queue system for priority populations to make appointments to be vaccinated in public health units, pharmacies, physician offices, and other facilities that are identified.

December 8 – December 28, 2020

An exercise to test capacity for the safe reception of vaccine in BC occurred successfully on **December 8, 2020**, using the shippers, boxes, dry ice, and monitoring devices that will be used in vaccine transport.

The first delivery of vaccine is planned for the week of **December 14, 2020**, when 3,900 doses of vaccine will be shipped directly from Pfizer to two sites in the lower mainland to be stored in ultralow temperature freezers. All 3,900 doses (2 trays per site, with 975 doses per tray) will be administered as the first dose in a two-dose series (21 to 28 days apart) to people who work in long-term care and assisted living facilities in the lower mainland.

In the weeks of **December 21 and December 28, 2020**, Pfizer will deliver up to 29,250 doses (30 trays) each week to the same two sites in the lower mainland. Pfizer requires that half of these doses are set aside to complete the two-dose series with this shipment. These doses will also be administered to people who work in long-term care and assisted living facilities in the lower mainland.

January 1, 2021 onwards

Nine sites across the province have been identified as reception sites and will be prepared to receive vaccine by the end of January 2021. Some immunization clinics will be run through these sites, while others will be arranged via secondary distribution to other sites.

Areas in the province that are rural or remote, including some First Nations communities, will receive vaccine using the existing logistics capacities that move health supplies, human resources, and essential supplies every day. Residents of long-term care and assisted living facilities will be immunized in-house using immunization practices that are followed for the seasonal influenza vaccination program.

Communications

The province is assembling a comprehensive communications plan to:

- increase trust and uptake of COVID-19 vaccinations among all eligible groups;
- explain who is eligible for the vaccination and how, when and where they can get it;
- provide media with accurate and timely information throughout the immunization strategy;
- ensure active, timely, accessible, and effective public health and safety messaging along with outreach to key provincial and community partners and the public about COVID-19 vaccines; and
- provide guidance to local health authorities, clinicians, and other hosts of COVID-19 vaccination provider locations.

Monitoring

To ensure patient safety, BC will ensure each dose administered is captured in the Provincial Immunization Registry so that providers know who got which vaccine, and when. This is important for clinic operations (e.g. timing of second dose), after-market monitoring of vaccine safety and post-immunization care. Maintaining real-time situational awareness is essential to address emerging evidence related to vaccine effectiveness in specific populations, tracking unusual adverse events following immunization, and duration of protection. The registry also provides a picture of vaccine coverage in the province.

As immunization rolls-out throughout the province, epidemiologists will be able to determine the impacts it is having on BC's COVID-19 pandemic. This critical work will help to inform if and when public health measures, such as physical distancing and mask-wearing can be scaled back.

Reporting

A reporting plan is being developed and will include a suite of indicators to monitor areas such as vaccine inventory, vaccine distribution, vaccine administration, immunization coverage rates of specific groups, and adverse events following immunization. Each indicator will be broken down in different ways (e.g. vaccine administration by provider type and by geographical area, coverage rate for residents of LTC facilities). The plan will also include the various types of reporting that will be required (i.e. audiences), and their frequency.

Establishment of a national no-fault vaccine injury compensation program

Immunization is a very effective tool to reduce the spread of infectious diseases. Being immunized is a direct benefit to the person receiving the vaccine, but it also contributes to achieving community immunity (or herd immunity) – a level at which transmission of the virus is greatly reduced or stopped. To get the COVID-19 pandemic under control, it is estimated that we will require high immunization rates in the range of 60-70% to stop transmission of this virus. To get to that level, we not only need to immunize those at highest risk of severe disease, complications and death, but also immunize much broader

segments of the population. Not everyone can or will get immunized, but anyone who does contributes to get the pandemic under control. We, as a society, need their contribution to achieve our goal.

The challenge is that even with our current high standards for establishing vaccine safety, we may miss risks due to vaccines that fall below the detection level of vaccine clinical trials – even when tens of thousands of participants are enrolled in each of these trials (as it is the case with COVID-19 vaccine trials), they only represent a fraction of the population that our immunization program will cover. When we implement a program on a much larger scale, rare and severe reactions can become apparent. This means that there is always the rare possibility of serious harm resulting from adverse immunization events. And it is important to note that most of these are not due to negligence on the part of the immunization program.

It is then very important that individuals who suffer from significant harm as they contribute to achieving herd immunity and getting the pandemic under control be able to receive appropriate and fair compensation. This compensation, when indicated, should be part of a process that is accessible and easy to navigate, and that does not "re-victimize" the injured and put up delays, barriers and disincentives that would discourage victims from even reporting their injury and applying for fair compensation in the first place.

Canada is the only country in the G7 (or the only other country with Russia in the G8) that does not have a national no-fault vaccine injury compensation program. Québec has had such a program in place for many years, and recommendations to establish one nationally have been made many times over the years.

The current system is based on tort litigation (i.e. suing for damages), and this is inadequate on many levels in terms of meeting our goals of appropriate, predictable and fair compensation to the injured. Instead, it seeks punishment for harm done to others, and uses a costly, complex, and prolonged process without any assurance of a fair outcome for the injured. A no-fault program for victims of adverse events following immunization can provide more expeditious, efficient, consistent, predictable and fair compensation for unavoidable and unintended vaccine injuries. Having such a program in place is also reducing the risk of opposition to large-scale immunization programs, fueled by fear of injuries and harm that would be borne by individuals alone.

The cost and administrative burden of establishing a centralized program (i.e. national as opposed to PT-specific) is greatly reduced, and the cost of individual lawsuits can easily be $1M or more, often without getting the desired outcome. Practical experience in Québec, the U.S., the U.K., New Zealand and other jurisdictions has shown that the rate of claims is modest and the magnitude of compensation relatively low. The risks to governments, individuals, vaccine manufacturers and public perception of vaccines (i.e. increasing negative perception of vaccines' benefits and safety) can be greatly reduced with such a national program in place.

Also, the Government of Canada should be highly interested and engaged because it regulates vaccines, recommends them for P/T programs, actively promotes their importance and benefit, and administers them to federal populations.

In short, establishing a national no-fault vaccine injury compensation program is needed and justified, brings significant benefits while reducing various risks, and is therefore highly recommended.

A recent article in the Toronto Star is provided for information as a timely reminder that this is important.

Program ADM/Division: Bonnie Henry / Office of the Provincial Health Officer
Telephone:s.17; s.19
Program Contact (for content): Martin Lavoie
Drafter: Haley Miller
Date: December 10, 2020

It’s time Canada had a national vaccine injury compensation program

By **Kumanan Wilson**
Contributors: **Jennifer Keelan**
Wed., Nov. 25, 2020

Source: Toronto Star

Vaccine injury compensation

From: Henry, Bonnie HLTH:EX <s.15
s.15

To: Wanamaker, Lori PREM:EX, Brown, Stephen R HLTH:EX
Sent: December 11, 2020 6:53:58 AM PST
Attachments: 4. VIC SAC Deck_Dec 3 2020_EN.pptx

As discussed yesterday, this is the information we received on vaccine injury compensation from our Dec 3 SAC meeting. PHAC has subsequently confirmed that the compensation would start Dec 8, 2020 to cover anyone immunized with Health Canada approved covid vaccines.

My best,

Bonnie

Dr Bonnie Henry
Provincial Health Officer
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I gratefully acknowledge that I live and work on the traditional unceded territory of the Lekwungen Peoples, specifically the Songhees and Esquimalt First Nations. Hay'sxw'qu Si'em

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From: Davies, Stephanie (PHAC/ASPC) <stephanie.davies@canada.ca> **On Behalf Of** CCMOH SECRETARIAT / CMHC (PHAC/ASPC)
Sent: December 3, 2020 7:52 AM
To: CCMOH SECRETARIAT / CMHC (PHAC/ASPC) <phac.ccmoh.secretariat-cmhc.aspc@canada.ca>; Gaynor.Watson-Creed@novascotia.ca; Greg Haley <GREG.Haley@forces.gc.ca>; Jasmine Pawa <jpawa@gov.nu.ca>; Nadine Sicard <nadine.sicard@msss.gouv.qc.ca>; Sylvie Poirier <Sylvie.Poirier@msss.gouv.qc.ca>; Colleen Dudar <Colleen.Dudar@gov.mb.ca>; Emerson, Brian P HLTH:EX <Brian.Emerson@gov.bc.ca>; Sabapathy, David (Ext.) <dsabapathy@gov.pe.ca>; Romano, Anna (PHAC/ASPC) <anna.romano@canada.ca>; Avis Gray <avis.gray@gov.mb.ca>; Brent Roussin <brent.roussin@gov.mb.ca>; Catherine Elliott <catherine.elliott@gov.yk.ca>; Simms, Colleen (Ext.) <colleensimms@gov.nl.ca>; Dr. Barb Yaffe <barbara.yaffe@ontario.ca>; Henry, Bonnie HLTH:EX <Bonnie.Henry@gov.bc.ca>; XT:Hanley, Brendan HLTH:IN <Brendan.Hanley@gov.yk.ca>; Emerson, Brian P HLTH:EX <Brian.Emerson@gov.bc.ca>; Muecke, Cristin (Ext.) <dr.cristin.muecke@gnb.ca>; Dr. David Williams <dr.david.williams@ontario.ca>; Dr. Deena Hinshaw <deena.hinshaw@gov.ab.ca>; Dr. Denise Werker <denise.werker1@health.gov.sk.ca>; Dr. George Giovinazzo <george.giovinazzo@cic.gc.ca>; Morrison, Heather (Ext.) <hgmorrison@gov.pe.ca>; Njoo, Howard (PHAC/ASPC) <howard.njoo@canada.ca>; Dr. James Worthington <dr.james.worthington@csc-scc.gc.ca>; Dr. Janice Fitzgerald <janice.fitzgerald@gov.nl.ca>; Russell, Jennifer (Ext.) <jennifer.russell@gnb.ca>; Dr. Michael Patterson <mpatterson@gov.nu.ca>; Strang, Robert (Ext.) <robert.strang@gov.ns.ca>; Shahab, Saqib (Ext.) <saqib.shahab@health.gov.sk.ca>; Sharma, Supriya (HC/SC) <supriya.sharma@canada.ca>; Tam, Dr Theresa (PHAC/ASPC) <drtheresa.tam@canada.ca>; Wong, Tom (SAC/ISC) <tom.wong@canada.ca>; Cleary, Eilish (SAC/ISC) <eilish.cleary@canada.ca>; XT:Adams, Evan HLTH:IN

<evan.adams@fnha.ca>; Arruda, Horacio (Ext.) <horacio.arruda@msss.gouv.qc.ca>; Kandola, Kami (Ext.) <kami_kandola@gov.nt.ca>; Philip Christoff <philip.christoff@gov.yk.ca>; Reka Gustafson <reka.gustafson@phsa.ca>; SK CMOH Single Window <OCMHO@health.gov.sk.ca>; Suzanne Fedorowich <suzanne.fedorowich@health.gov.sk.ca>; Tami Denomie <tami.denomie@health.gov.sk.ca>; Thornton, Sally (PHAC/ASPC <sally.thornton@canada.ca>; Trish Merrithew <Trish.Merrithew-Mercredi@gov.ab.ca>; YK Surveillance <YCDCsurveillance@gov.yk.ca>; Yves Jalbert <yves.jalbert@msss.gouv.qc.ca>; Marcia Johnson <Marcia.Johnson@gov.ab.ca>
Subject: SAC Dec 3 - Meeting Materials

Dear CMOH and deputies,

Please find attached the following documents to support today's SAC discussion.

- SAC Agenda
- Agenda Item #2 Deck: Sequencing Discussion Continued: Focus on Indigenous Populations and Health Care Workers (**to follow and will be shared with core SAC members only)**
- Agenda Item #3 and 3a: Planning Guidance for COVID-10 Immunization Program, and Planning Guidance for Immunization Clinics for COVID-19.
- Agenda Items #4 and 4a Deck: No-fault Vaccine Injury Compensation in Canada (EN/FR) (**shared with core SAC members only)**

All documents have been added to the Public Health Network Council portal on CNPHI. https://www.cnphi-rcrsp.ca

Please do not hesitate to reach out should you have any questions.

Thank you,
SAC Secretariat

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

Canada

NO-FAULT VACCINE INJURY COMPENSATION IN CANADA

Special Advisory Committee – December 3, 2020

Purpose

- To discuss provincial and territorial interests in a federally-funded pan-Canadian no-fault Vaccine Injury Compensation (VIC) program covering all Health Canada authorized vaccines or immunoglobulins that protect Canadians from vaccine preventable diseases.

Overview of the Presentation

- Vaccine Injury Compensation Program Drivers
- Overview of Program Elements
- Overview of Program Design
- Key Considerations
- Communications Approach
- Proposed Next Steps

Vaccine Injury Compensation Program Drivers

Long-standing gap	• Establishing a national compensation program would leave a legacy of a strengthened immunization system in Canada. • Federal involvement in immunization activities and immunization safety through initiatives such as the National Immunization Strategy (2003).
Fairness and equity	• Currently, we indemnify pandemic vaccine manufacturers, but not injured Canadians. • Without a national program, only Quebec residents have access to a no-fault compensation program creating inequity across jurisdictions.
Securing supply	• As the only G7 country without a national vaccine injury compensation program, Canada could be at a competitive disadvantage as manufacturers assess local market conditions before deciding where to market new vaccines. • Removes barriers to market entry for smaller manufacturers.
Leadership and responsibility	• Demonstrates that Canada, like other countries, recognizes that in the rare instances of serious harm due to vaccination, it is a right that individuals receive compensation. • Quebec is the only province with an established program since the 1980s, a model of leadership in this area.

Overview of VIC Program Elements

A VIC Program would provide insurance in the event of a serious vaccine injury (e.g. permanent disability or death):

- Serves five key functions, including: receiving claims; validating claims; assessing claims to determine causality; recommending/rejecting compensation; paying claims.
- Allows fair compensation for all Canadians who are injured or harmed, not just those from one province.
- Awards compensation irrespective of fault or negligence or parties involved.
- Includes coverage for all vaccines approved by Health Canada.
- Expected to apply to measurable uninsured damages or costs.
- Causality, degree of disability and compensation to be determined by an appropriate expert body.

Overview of VIC Program Design

- Funded by the Government of Canada and administered by a Third Party. If no suitable Third Party is identified, program will be administered by Public Health Agency of Canada.

- Administration would cover all aspects of the program, including claims intake, assessments, all decisions, and payouts. Decisions to award compensation would be made by the Third Party, in accordance with the funding agreement.

- Intention is to use Quebec's VIC regime as the model for designing a pan-Canadian program to the extent possible, recognizing that it will not be feasible to duplicate every feature.

- Coverage will extend to all vaccines administered in Canadian territory **on or after January 1, 2021**:
  - Ensures that compensation coverage will be in place concurrently with the earliest possible date for the delivery of COVID-19 vaccine.
  - Formal program implementation, however, would follow by June 2021.

- P/Ts, including Quebec, will have the flexibility to opt out of the pan-Canadian program to administer an equivalent program, with federal funding provided if the program meets federal objectives.

Key Considerations

Current lack of alignment with other G7 countries

- Risk that vaccine suppliers will favour countries that have no-fault VIC programs.

Effect on vaccine confidence

- **Little data** available to assess if the introduction of no-fault VIC program is associated with an increase or decrease in immunization coverage rates, either immediately or over the longer term (see Annex 3).
- Transparency on vaccine communications overall supports vaccine confidence.

Timing

- Introducing a VIC program before COVID-19 vaccine roll-out could fuel sentiment that government doubts the safety of vaccines.
- Delaying the program until COVID-19 vaccine roll-out is underway could similarly trigger concerns that a safety risk has been identified.

Communications Approach

- Begin to introduce vaccine injury compensation into communications with Canadians now as part of updating them on COVID-19 vaccine roll-out plans.
  - Main message is the VIC puts Canada on an equal playing field with other countries and helps with Canada's competitiveness in accessing vaccines.

- Approach VIC communications by integrating it into overall vaccine roll-out planning information to Canadians (part of entire suite of efforts) rather than shining a light on it as a new program – correcting a gap in Canada's immunization policy.

- Liaise with FPT PHN communications table to assist with coordination of complementary messaging.

Proposed Next Steps

- Engagement at key F/P/T tables, including Canadian Deputy Ministers of Health and Health Ministers (Fall 2020).
- Decision required by each P/T whether to opt-out of pan-Canadian VIC and establish equivalent program (end of December 2020).
- Integrate VIC messaging and tactics into overall vaccine communications roll-out plan and develop evidence based messages designed to motivate the appropriate behaviour (underway).
- F/P/T engagement on program design and implementation (Winter 2021).
- Solicitation of interest and award of competitive process for a Third Party administrator (Spring 2021).
- Expected program launch, accepting claims for immunizations received on or after January 1, 2021 (June 2021).

Annexes

Annex 1 – Sample Key Messages

- We as Canadians pride ourselves on our commitment to each other. By immunizing, we protect one another and our way of life

- Establishing a vaccine injury compensation program is part of Canada's broader vaccine strategy and will help ensure we remain competitive in accessing new vaccines as they become available
  - We need Canada to be on an equal playing field with other countries
  - This VIC program brings Canada in line with its G7 counterparts that all provide VIC protection for a minimum of mandatory vaccines, with most covering all recommended vaccines

- All immunization programs are based on the principle of reciprocity. We therefore have a duty to help if someone should happen to fall ill from an adverse reaction to a vaccine
  - This is extremely rare – less than one in a million

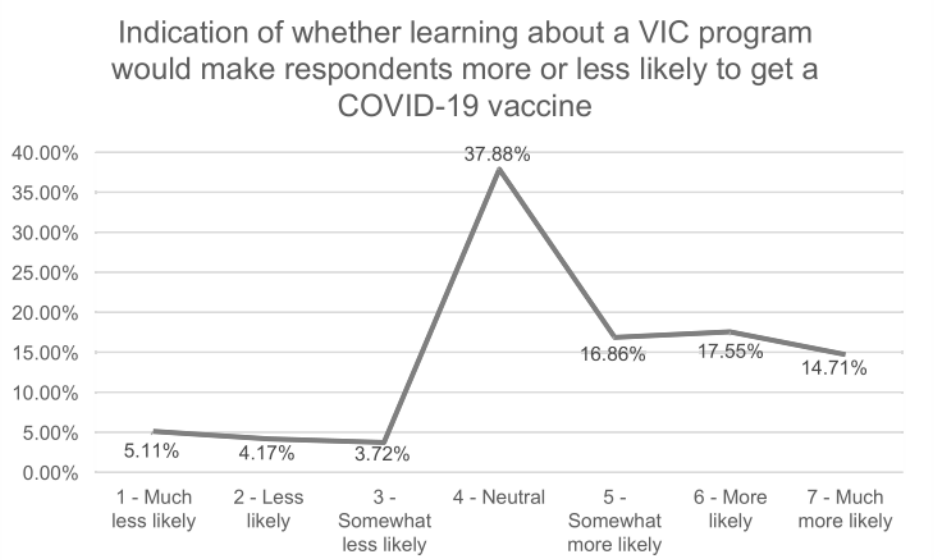
- In the rare event that a Canadian were to fall ill, they should not spend their time litigating in court for a settlement – they deserve fair compensation, which this program offers

Annex 2 – What we have learned from Quebec

- Quebec's successful no-fault VIC Program could provide the scope for a **pan-Canadian regime**.
- Since its creation by legislation, 284 cases (approx. 7 annually) have been filed with Quebec's no-fault vaccine injury compensation program; of these cases, 53 claims (close to 2 annually) were accepted and another 44 claims were not pursued.
- Over 32 years, Quebec's program has issued $6.5 million (approx. $250K annually) to successful claimants. Compensation has averaged $123K per successful claim.
- Under Quebec's model, applications must be filed within 3 years of when the vaccination occurred in Quebec. Quebec's program convenes an expert evaluation committee to review the cases and recommend compensation. The Minister of Health decides whether to award compensation. If the decision is in favour of the applicant, the government has a third-party agreement with Société de l'assurance automobile du Québec (which calculates and pays the compensation).
- Claims are heard by a three-person medical expert evaluation committee and decided by a 2/3 majority opinion. One member is nominated by the claimant, the other by the government, and the chair of the committee is chosen by the other two committee members.
- Unsuccessful claimants may file an appeal to the Administrative Tribunal of Quebec.

Annex 3 – Impact of VIC on Intention to Vaccinate

- Initial results from **research on the impact of learning about a national, no-fault VIC program on Canadians' intentions to be vaccinated against COVID-19*** conducted by PCO have revealed that:
  - Learning about a national VIC program **would either have no effect or a positive impact** on intentions to be vaccinated against COVID-19 for a large majority of Canadians, around 87%. Only 13% of survey participants reported that a VIC program would negatively impact their intentions to be vaccinated.



*Privy Council Office *Impact of a National, No-Fault Vaccine Injury Compensation Program on Intentions to be Vaccinated Against COVID-19: A Preliminary Analysis,* November 2, 2020. Sample size (n=1,580 Canadians).

Page 42 of 61 to/à Page 46 of 61

Withheld pursuant to/removed as

s.14

For Information--Summary of Vaccine-Related Discussion From Thurs., Dec. 17 FPT Health Ministers' Teleconference

From: Vandermolen, Chad HLTH:EX <Chad.Vandermolen@gov.bc.ca>

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Sent: December 18, 2020 11:59:06 AM PST

Good morning,
Please find below PT lead Ontario's summary for of the vaccine-related discussion on yesterday's FPT Heath Ministers' call, which BC IGR has reviewed and modestly edited.
Thanks,
Chad

Key Points

- **Preparations are underway to receive early shipments of the Moderna vaccine by end of month contingent on Health Canada regulatory approval.**
  - Early shipments will provide an opportunity to have dry-runs and mitigate issues before scaling up.
- **Using learnings from Quebec, a pan-Canadian, federally funded Vaccine Injury Support program will be implemented by June 2021. [Note: eligibility retroactive to Dec. 8, 2020]**
  - Canada will work with PTs on their decision to opt-in or opt-out with federal funding.

1. Update on COVID-19 Vaccine Rollout

- Public Health Agency of Canada (PHAC) provided updates on the rollout of initial doses of vaccines.
  - Early doses of Moderna could come before the end of the month contingent on Health Canada regulatory approval.
  - Canada is pulling forward on Q1 contracted amount by receiving early shipments; dry runs with the Moderna vaccine will take place, which is significant because the soft launch helped with mitigating issues on a small scale and preparing to increase to large scale dissemination for the Pfizer vaccine.
  - The National Advisory Council on Immunization (NACI) released its guidelines on the use of the Pfizer vaccine and will develop guidelines for all authorized COVID-19 vaccinations.
  - On Indigenous engagement: Indigenous Services Canada (ISC) and public health agencies are working with national Indigenous organizations on vaccine rollout.
  - To respond to Ontario's comment on availability of Pfizer doses: PHAC is working with the companies in real-time as they build out their supply chains for these novel vaccines. The Pfizer schedule was received this morning, 200,000 per week in December, and 125,000 per week in January.
- An update was provided by the National Operations Centre:
  - The first shipments of the Pfizer vaccine were delivered to all 14 points of use according to plan, with no incidents, by mid-day Tuesday, December 15.

- The bulk of the remaining Pfizer vaccines are expected next week, with residual doses expected the week of December 28.
- Additional (Pfizer, Moderna) delivery sites are being created as cold chain storage expands. This will also support scale-up in Q2 and Q3.
- NOC is waiting to hear from Pfizer on transportation of thawed doses.
- Delivery sites for the initial 168,000 doses of the Moderna vaccine have been confirmed with the PTs.
- Second doses of both vaccines should continue to be closely managed by PTs.

2. Vaccine Injury Support Program (VISP)

- Canada will establish a pan-Canadian, no-fault VISP to address a long-standing gap in the immunization program. Currently, Quebec is the only jurisdiction with such a program.
- PHAC provided an overview of the rationale for the program:
  - Canada is the only G7 country without a national, no-fault VISP.
  - It is important to note that serious vaccine-related injuries are very rare.
  - From a public health perspective, immunization is promoted as an effective way to prevent the spread of infectious diseases. If an individual is injured in the process of protecting themselves and their community, it is fair for the government to provide a mechanism to seek damages.
  - There is widespread support from the public health community, including Canada's Chief Medical Officers of Health.
  - Although evidence is limited, initial results show that the impact of VISP on COVID-19 vaccine confidence has no or a positive effect on the intention of Canadians to get vaccinated.
- PHAC provided an overview of the program's features:
  - It will be federally funded and administered by an arms-length third-party who will be responsible for all aspects, from receiving claims to awarding compensation.
  - PHAC will take this role on if a third-party cannot be identified.
  - Jurisdictions can opt-out and receive federal funding for administering their own program provided it meets certain federal objectives.
  - Coverage extends to all HC-authorized vaccines in Canada from December 8, 2020. Implementation will begin in June 2021.
  - PHAC will work with PTs to ensure common messaging about the VISP. Feds will reach out to PT officials to confirm participation or opt-out with compensation.

3. Discussion on the Current COVID-19 Situation, including Public Health Measures and Communications

- Dr. Tam noted the growth in cases among all ages, the complexity of the 2021 outlook, and the strains seen across the country on health systems and health human resources. There is a need to focus on scaling up testing, screening, contact tracing and isolation, and working with Canadians to ensure that a majority of the population is vaccinated.
- PHAC provided an update on the current situation:
  - There are 6,500 cases per day now, exceeding Wave 1. The key concern is the increase in hospitalization and ICU rates.

- The most troubling indicator is the impact on long-term care and seniors' congregate living settings, as epidemic rates are now highest in older age groups.
- Some Indigenous communities required support from the military.
- Forecasting models still show Canada is on a rapid growth trajectory, with a potential for 12,000 cases a day by early January. This is lower than previous forecasts, but much more work is required to flatten the curve.
- Vaccination levels required for herd immunity are not known, but it is prudent to assume 70% may be required.

Questions/Comments

- Quebec would like Pfizer to authorize PTs to separate the two doses as soon as possible so all received doses can be used immediately. As well, Quebec asks that federal VISP funding be passed on to the province as soon as possible (to compensate QC for it's existing program); the province is open to sharing all information on Quebec's current program.
    - PHAC (Iain Stewart): There is still uncertainty with shipment scheduling. PTs should continue to hold the second dose until regularity and predictability with shipments is well-established.
- Quebec: When will this occur?
    - PHAC (Iain Stewart): It is expected in the first half of January; discussions with Pfizer are ongoing.
- Canada: Some federal rapid/surge support is available for PTs and can be discussed bilaterally. It should be noted that federal resources were originally intended for outbreak suppression, and so there is limited capacity to assist with broader systemic issues.

No Fault Vaccine Injury Compensation Program Background - For EOC members only

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Sent:	December 24, 2020 10:01:48 AM PST
Attachments:	No Fault Vaccine Injury Compensation Background.pdf

Sent on behalf of Martin Lavoie

Dear IBCOC colleagues,

As promised a little while ago, here is some background info on No Fault Vaccine Injury Compensation that was developed a number of years ago.

Please do not circulate further, as this was part of a 2013 report that was never published after submission to PHAC.

Cheers,
Martin

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- *Explore means to support vaccine evaluation studies and vaccine readiness studies:* Vaccine evaluations have been identified as significant in influencing the development of vaccine improvements. Since Canada is an early adopter of many newer vaccines it might be in a position to provide a significant contribution in this area. Vaccine readiness studies would facilitate the introduction of new priority vaccines.

- *Address perceived conflict of interest issues with the regulator working with the industry early in the vaccine development stage and industry funding research, particularly socio-economic cost-benefit studies:* There are benefits to having the regulator be involved in the early stages of clinical studies so that these studies conform to regulatory requirements; however, the mechanism for such cooperation will need to guarantee real and perceptual regulatory independence and impartiality. Industry's funding of and/or participation in vaccine research often leads to a perception that the research findings are biased in favour of the funding industry. Agriculture and Agri-Food Canada has had some success in developing research approaches with industry that could be examined and possibly emulated.

J. No-Fault Vaccine Injury Compensation

SITUATION

To be effective in reducing the incidence and severity of vaccine-preventable diseases, immunization programs seek to achieve very high levels of vaccination on the part of populations at risk, including those who may pass the disease on to more vulnerable populations. High rates of vaccination are not only of direct benefit to those who are successfully inoculated but also of value to those who, for a variety of reasons, cannot be vaccinated, are ineffectively vaccinated, or refuse to be vaccinated. High levels of vaccination contribute to "herd immunity" by providing a kind of "firewall" (i.e., the large numbers of vaccinated individuals) between those who are infected and those who are susceptible.

The problem is that current high standards for establishing vaccine safety may miss risks that fall below a detection level, which at the population level can be significant. Thus, there is always the rare possibility of serious harm resulting from adverse immunization events. The achievement of high levels of vaccination constitutes a significant public good and a highly cost-effective method of achieving public health goals. It is therefore important that those who suffer serious harm from adverse events in the course of contributing to this public good receive appropriate compensation. It is also important that the processes by which their claims are handled are expedient and just and in particular do not "re-victimize" the injured by presenting bureaucratic and costly hurdles that might even discourage them from seeking the compensation they deserve.

Reliance on traditional tort ("civil wrong") litigation ("suing for damages") is generally inadequate and often counter-productive in addressing vaccine injuries, since adverse vaccine events most often relate to idiosyncratic *unavoidable* or *unintended* injuries arising from the administration of regulated vaccines that have been developed, approved and delivered in good faith and to high standards of risk management. Since the goal is the provision of appropriate, predictable and fair *compensation* to the injured rather than the *punishment* of wrong-doing or *deterrence* from doing harm to others, no-fault compensation is more appropriate.

As an alternative to tort litigation, a no-fault program for victims of adverse events following immunization can provide more expeditious, efficient, consistent, predictable and fair compensation for unavoidable and unintended vaccine injuries. As noted above, in providing such compensation—and doing so in a highly visible and transparent manner—one source of opposition to large-scale and/or mandatory vaccine programs can be removed, namely, fear of uncompensated injuries and burdens.

Key reasons for the establishment of no-fault vaccine injury compensation programs in Québec, the U.S. and other jurisdictions centre on the following:

1. *It's the right and fair thing to do for those who are injured from vaccines.*

    - Those who participate in vaccine programs should receive fair, prompt and convenient consideration, support and compensation for their injuries.
    - This is particularly true when vaccines are mandatory and when participation provides a broad public benefit beyond that for the individual being vaccinated.
    - A no-fault program provides the most direct, accessible, convenient, non-complicated and predictable support and compensation for those injured.
    - Since most injuries cannot be attributed to negligence on the part of anyone in the vaccine supply chain, a no-fault program is vital to ensure appropriate compensation for the rare cases of unexpected and unavoidable injuries.
    - Costs of the no-fault program can readily be shared by society at large, whether directly funded by governments or recovered from vaccine suppliers and shared equally and equitably across all relevant vaccine programs.

2. *A publicly managed no-fault injury compensation program reduces costs and burdens to individuals, governments, and industry alike.*

    - *Injured individuals* avoid the expenditure of personal time, effort and money that would otherwise be required to pursue civil suits (tort) to seek compensation; given the low likelihood of successful claims, this would largely be a waste, made all the worse by protracted processes whose outcomes are highly uncertain.
    - *Governments* avoid the legal defence costs, adverse publicity and distraction of being embroiled in lawsuits initiated by injured individuals, as governments would almost certainly be named in civil suits, given their roles in vaccine regulation, the making of vaccination mandatory, vaccine delivery and vaccine risk communication. (Note: Even if not named as respondents directly by the injured individuals, they would likely be named as third parties by vaccine manufacturers when they are sued.) While governments would in almost all cases be able to successfully defend claims, they would not likely be able to recover their costs, let alone overcome adverse publicity and distraction from their primary mission. (Note: Direct legal costs would be borne by the respective Health and Justice/Attorney General functions of the respective F/P/T jurisdictions. Moreover, the tendency would be for ALL relevant jurisdictions to be named, especially in class action suits.)
    - *Governments* also reduce the general administrative and procedural costs associated with hearing and overseeing civil claims in the courts, not all of which (and likely little of which) can be recovered through judgments on "costs" in unsuccessful claims. Since most cases would likely result in dismissal, this would be seen as a waste of public resources, especially if much less costly processes such as a no-fault program could otherwise be made available.

- *Vaccine suppliers* avoid the legal defence costs, adverse publicity and distraction of being embroiled in lawsuits initiated by injured individuals; while suppliers would in almost all cases be able to successfully defend claims, they would not likely be able to recover their costs, let alone overcome adverse publicity and distraction from their primary mission.
- *Society in general* avoids the general negative fall-out that would otherwise be associated with civil claims, especially high-profile class action suits, which are increasingly a possibility for consumer injuries in Canada. Even though it is likely that most cases would be successfully defended against negligence, there is a risk that the public will generally conjure the mistaken notion that vaccines are much riskier than they are.

3. *A no-fault injury compensation program is vital to maintaining the active participation of a suitably competitive number of drug manufacturers in the generally non-lucrative vaccine business.*

    - The avoidance of costly legal defence and adverse publicity associated with civil suits helps ensure that drug manufacturers can remain involved in vaccine supply, which they generally see as a non-lucrative aspect of their business, undertaken largely as a matter of public service. The chilling effect on industry of exposure to civil claims—even where such claims can be successfully defended—has been empirically demonstrated with the U.S. experience before the introduction of the U.S. no-fault program, compared to after.

4. *A no-fault injury compensation program helps remove one of the arguments against vaccination put forward by the anti-vaccine movement.*

    - While there is no evidence (thus far) to indicate whether the existence of no-fault vaccine injury compensation programs either enhances vaccine take-up (overcome fear that any injuries would go uncompensated or require costly and uncertain legal claims) or diminishes vaccine take-up (implicitly remind/signal that vaccines *do* have risks), the presence of a no-fault injury compensation program at least takes away one potential anti-vaccine argument.

5. *Waiting for a crisis related to potential AEFIs before instituting a no-fault compensation program can result in a problematic response to the handling of compensation demands.*

    - Reactive development of a no-fault compensation program in response to a crisis in confidence related to vaccines or an increase in vaccine-related injury litigation would likely result in a sub-optimal program. Increasingly complex immunization schedules, with the periodic introduction of new vaccines, add to the probability of AEFIs. At the same time, evolving changes in the legal environment also increase the likelihood of class action lawsuits. Pre-emptively designing a program to address anticipated increases in the risk of lawsuits related to AEFIs and the impact they would have on public confidence and vaccine manufacturers would allow for the careful development of such a program that takes into account all relevant considerations.

Government Sector Considerations

Provinces and territories have strong and direct interests in the issue of no-fault compensation for vaccine injury because they have primary responsibility for the design and implementation of vaccine programs for their respective populations. They have an interest in ensuring high levels of participation and high levels of public confidence in, and support for, immunization programs, and in avoiding costly and time-consuming legal actions in the event of injuries that may reasonably be attributed to vaccination.

At the same time, P/Ts generally wish to ensure that their handling of public concerns—such as injury compensation—in their own jurisdiction is reasonably consistent with the handling of such issues by their counterparts in other jurisdictions. They also wish to minimize the risk of dubious, let alone frivolous, claims, and to ensure that whatever compensation may be made available is reasonable and sustainable. A well-designed no-fault injury compensation program can achieve that by minimizing the need for tort litigation, setting well-prescribed and limited terms for compensation, and offering an accessible and efficient application process for claimants. Collaboration amongst the provinces and territories can help ensure reasonable consistency, sharing of best practices, and possibly even achievement of administrative efficiencies through some form of shared services or processes. The latter would be particularly important for smaller provinces, for which the establishment of their own administrative mechanisms would not be cost efficient.

As noted above, Québec already has a no-fault injury compensation program. Law reform commissions in Saskatchewan and Manitoba had also earlier concluded that some form of no-fault injury compensation scheme would be appropriate, although uncertainty at the time of the magnitude of financial and other implications prevented those jurisdictions from proceeding with programs. Since that time, however, the practical experience in Québec, the U.S., the U.K., New Zealand and other jurisdictions has shown that the rate of claims is modest and the magnitude of compensation relatively low. In Québec, for example, the number of cases between 1988 and 2009 averaged only 4.5 per year (99 cases in total in the time period, amounting to 0.7 cases per million population annually), with about one third resulting in compensation. Very few claimants had need for legal representation, with the greatest use being in appeals. Anecdotal evidence suggests that the program averted the need for civil litigation. Even in the U.S., where civil litigation is more prominent than in Canada, the number of claimants from 1988 to 2009 amounted to only 2.15 cases per million population.

While provinces and territories have responsibility for vaccination programs for their respective general populations, the Government of Canada is also interested and engaged because it regulates vaccines, recommends them for P/T programs, actively promotes their importance and benefit, and administers them to federal populations. (Indeed, with interests in and certain responsibilities for First Nations, Inuit, federal inmates, incoming immigrant and refugee populations, RCMP, forces personnel, veterans and others, the Government of Canada ranks fifth among Canadian jurisdictions in terms of the size of population for which it has immunization responsibilities.)

Like the provinces and territories, the federal government generally has an interest in minimizing the risks of civil suits, which can be costly and can serve as a deterrent to vaccine innovation. It also has an interest in seeing Canada enjoy high levels of participation and high levels of public confidence in, and support for, immunization programs, particularly those that are the subject of guidance under the federal-led NACI process. The federal government is also generally interested in encouraging P/T measures that support federal (and broader common F/P/T) objectives in the public health field, including reduction of vaccine-preventable diseases. To the extent that a system of P/T no-fault injury compensation programs might help sustain public participation and confidence and minimize public costs associated with immunization programs, the federal government has an interest in facilitating P/T collaboration on such programs, including sharing of best practices, promotion of consistent approaches, and facilitating efficient administrative procedures and mechanisms among P/Ts.

ASSESSMENT: NO-FAULT INJURY COMPENSATION

The problem is that, while Québec has a no-fault vaccine injury compensation program, the rest of Canada does not. Indeed, Canada and Russia are the only G8 nations without state-wide no-fault vaccine injury compensation programs.

Absence of a Canada-wide no-fault compensation program is problematic for several reasons:

- Residents of all provinces and territories other than Québec lack access to no-fault compensation and must rely on tort litigation, with all of the drawbacks, burdens and limitations noted above.
- Since many—if not most—of such uncovered individuals lack the knowledge, time or financial ability to pursue litigation if injured, or believed to be injured, they either bear the costs and burdens of injury themselves, or they refuse to participate in vaccine programs because of the risk of uncompensated injury. The latter results in reduced coverage of the population overall, thereby undermining the effectiveness of vaccine programs in protecting against vaccine-preventable diseases.
- Gaps and inconsistencies in the level of support—including injury compensation—for vaccine programs from one jurisdiction to another weakens overall cohesiveness and consistency of Canada-wide vaccine programs, and militates against the achievement of what could otherwise be mutually supporting programs and public messages.

For the reasons set out above, there is a need in Canada for a nation-wide no-fault compensation program (or system of programs) that would fairly and expeditiously compensate those likely injured from any vaccine that is recommended.

Considerations

To ensure objectivity, fairness and transparency, such (a) no-fault compensation programs should be administered by an arm's length agency(ies), and operate independently of the branches of government responsible for the promotion and safety of vaccines.

To ensure efficiency, pragmatism and expediency, a reasonably short statute of limitations for filing claims should be set (e.g., three years from injury onset), in addition to requiring sufficient documentation to substantiate the injury and its etiology.

To avoid costly redundancy or overlap with other sources of support for the injured, and to avoid frivolous or punitive claims, the injury itself must result in some measurable *uninsured* damages or costs. In the case of death, a death benefit should be paid out similar to an accidental death insurance benefit.

Needs and Costs

Experience in Québec and in other jurisdictions internationally has shown that the overall rate of applications for compensation is very low (fewer than three cases annually per million population in the U.S., the U.K. and New Zealand, and less than one third that rate in Québec). It has also shown that well-designed no-fault vaccine injury compensation programs are very low cost, especially in relation to the overall costs of the immunization programs to which they apply. Informal estimates for a nation-wide system of programs for Canada, based largely on the Québec experience, would amount to about $4

million to $5 million for compensation payouts and overall program administration. In comparison, a single legal case in 1988 resulted in legal costs alone in excess of $1 million.

Management of Claim Risks

As highlighted immediately below, an effective, responsible and sustainable no-fault injury compensation program requires suitable provisions to avoid dubious or frivolous claims, set realistic limits on eligibility and compensation terms, and ensure timely and efficient consideration of claims and handling of appeals. Practical experience in Québec and in other jurisdictions internationally has demonstrated that this can readily be achieved.

Potential Program Elements

Drawing upon the experience with the 13 jurisdictions around the world that have established no-fault compensation programs, there is considerable flexibility in how a program for Canada that would address domestic needs, values and priorities might be designed and implemented. This includes the following potential elements, approaches and options that reflect international practices and experiences:

- Administration by state ministries/agencies related to health, social welfare or labour or under legislation that governs an arm's length overseeing agency. (Note: Sweden is the only state whose no-fault program is covered under a *private* insurance compensation scheme.)
- Universal application to *all* populations experiencing adverse events OR, more restrictedly, to programs that target infants and school-age children, AND/OR to mandatory vaccinations required by state edict.
- A clearly articulated administrative review of the vaccine-related injury, in a manner similar to other accident insurance or disability schemes that do not require legal representation or the solicitation of expert representation of medical review (beyond the attending physician's report).
- Claims assessment overseen by a medical director taking into account administrative review of eligibility criteria and medical assessment by outside consultation from medical experts.
- Coverage of *uninsured* medical costs and, possibly, also special disability benefits, death benefits, economic damages (lost wages) and possibly even certain non-economic damages. This includes consideration of some threshold definition of eligible damages (e.g., serious injury or death, comparable to criteria for compensation applicable to accident or disability schemes).
- Funding of the program (typically modest in scale) from general government appropriations or possibly by a special vaccine excise tax paid by the purchaser or an injury premium paid by the manufacturers.
- Administration of the no-fault compensation program at arm's length from government branches or bureaus responsible for the approval, promotion and safety of vaccines and vaccine programs.

FW: For Action--Confirmation of PT Forum Representatives for BC;

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Sent: December 7, 2020 5:20 PM
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Cc: Samra, Kevin HLTH:EX <Kevin.Samra@gov.bc.ca>
Subject: RE: For Action--Confirmation of PT Forum Representatives for BC; FYI, some highlights from today's call; RE: Provincial-Territorial ADM Forum on COVID Immunization

Thanks Martin, it is reassuring to hear we are comparatively well informed and have good lines of communication with our federal counterparts. Thanks also for the education on monographs; that is good context to have.

From: Lavoie, Martin HLTH:EX
Sent: December 7, 2020 3:13 PM
To: Vandermolen, Chad HLTH:EX ; Hrycuik, Lorie HLTH:EX ; 'ross.brown@vch.ca'
Cc: Samra, Kevin HLTH:EX
Subject: RE: For Action--Confirmation of PT Forum Representatives for BC; FYI, some highlights from today's call; RE: Provincial-Territorial ADM Forum on COVID Immunization

Thanks, Chad. It is interesting (or sad) to see that a few jurisdictions don't seem to have all the information that they need – we seem to have better connections with the Feds on a number of these points.

And it is standard practice that the product monograph will not be available until the product is approved for use in Canada. They need to use the information they know about the vaccine (transport, thawing, dilution, IM injection, etc.) to get ready for this. We probably have all the key elements, and we are getting more details and clarifications from our bilateral meetings, emails and other contacts with the feds.

M

From: Vandermolen, Chad HLTH:EX <Chad.Vandermolen@gov.bc.ca>
Sent: December 7, 2020 2:47 PM
To: Hrycuik, Lorie HLTH:EX <Lorie.Hrycuik@gov.bc.ca>; Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>; 'ross.brown@vch.ca' <ross.brown@vch.ca>
Cc: Samra, Kevin HLTH:EX <Kevin.Samra@gov.bc.ca>
Subject: For Action--Confirmation of PT Forum Representatives for BC; FYI, some highlights from today's call; RE: Provincial-Territorial ADM Forum on COVID Immunization

Good afternoon,

Two things:

1. I look forward to confirmation of BC's leads on this PT Forum, that is, confirmation that Dr. Brown is replacing Lorie as co-lead alongside Dr. Lavoie.

2. ON will be circulating a more fulsome Record of Decision in the future, but I'm including some select call highlights, FYI, below:

    - All jurisdictions supported Forum chair ON continuing to produce Records of Decision (RoD) in relation to Forum meetings and also to continue produce the jurisdictional scan (all PTs are invited to contribute to the scan at any time). Given sensitivity and fluidity, RoDs will be drafted at a high-level.
    - Discussion focused on PM's announcement of Dec. distribution of first tranche of Pfizer vaccine and a jurisdictional roundtable
    - Numerous jurisdictions indicated surprise some vaccines would begin to be delivered in December (e.g., AB, MB).

- NL remarked they had heard the Moderna vaccine may begin arriving earlier than previously anticipated.
- Numerous jurisdictions (e.g. MB) noted they are awaiting more detailed information and a green light regarding the ability for 'onward distribution' of Pfizer, i.e. from the initial drop-site, as this has significant implications for planning and logistics for this early roll-out phase.
- MB: noted they are still having to plan for multiple scenarios due to lack of specifics re vaccine #'s and precise timing of delivery, etc.
- QC: noted some on-going challenges confirming precise #'s and dates for vaccine delivery, which complicates planning and implementation logistics. Also noted they are keen for more details re Moderna as that vaccine will likely be key to protecting remote communities.
- ON: noted that it had issued a press release today about prioritization: https://news.ontario.ca/en/release/59508/ontario-identifies-key-groups-for-distribution-of-initial-covid-19-vaccines
- AB: one challenge noted is that they have not yet received the product monogram for Pfizer yet; training for staff who will be administering vaccines cannot be completed until the monograph has been received.
- Potential future Agenda topics for this Forum include:
    - Vaccine injury compensation program;
    - Indigenous engagement;
    - 'Vaccine hesitancy' and how to address it;
    - An HHR discussion—specifically, who will be administering vaccine;
    - Whether jurisdictions intent to request the assistance of the Canadian Armed Forces.

Many thanks,

Chad Vandermolen, LLB
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From: Hrycuik, Lorie HLTH:EX <Lorie.Hrycuik@gov.bc.ca>
Sent: December 7, 2020 9:23 AM
To: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>; 'ross.brown@vch.ca' <ross.brown@vch.ca>
Cc: Vandermolen, Chad HLTH:EX <Chad.Vandermolen@gov.bc.ca>
Subject: RE: Provincial-Territorial ADM Forum on COVID Immunization

Thanks Martin, PHEC and the FPT ADM overlap by 30 minutes every Monday.

Lorie

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Ministry of Health
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From: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>
Sent: December 7, 2020 9:22 AM
To: Hrycuik, Lorie HLTH:EX <Lorie.Hrycuik@gov.bc.ca>; 'ross.brown@vch.ca' <ross.brown@vch.ca>
Cc: Vandermolen, Chad HLTH:EX <Chad.Vandermolen@gov.bc.ca>
Subject: RE: Provincial-Territorial ADM Forum on COVID Immunization

Hi Lorie,

I mentioned this PT ADM working group to Ross last week, and we will chat some more about it.

For today, I had three meetings overlapping during this time slot: NACI, PHEC, and PT ADM meeting. I will be attending NACI from 10 to 12H15 today. We are finalizing the discussion on the first COVID-19 vaccine statement (the first vaccine statement with Pfizer as first vaccine to be included) after reviewing the draft this weekend and circulating feedback to committee members.

Cheers,

Martin

From: Hrycuik, Lorie HLTH:EX <Lorie.Hrycuik@gov.bc.ca>
Sent: December 7, 2020 9:16 AM
To: 'ross.brown@vch.ca' <ross.brown@vch.ca>
Cc: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>; Vandermolen, Chad HLTH:EX <Chad.Vandermolen@gov.bc.ca>
Subject: FW: Provincial-Territorial ADM Forum on COVID Immunization

Ross, in anticipation of the FPT meeting today.

Lorie

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From: Sotiropoulos, Evan (MOH) <Evan.Sotiropoulos@ontario.ca>
Sent: December 7, 2020 8:44 AM
To: Lavoie, Martin HLTH:EX <Martin.Lavoie@gov.bc.ca>; trish.merrithew-mercredi@gov.ab.ca; Philip.Christoff@gov.yk.ca; Szymczak, Marysia (MOH) <Marysia.Szymczak@ontario.ca>; Blair, Alison (MOH) <Alison.Blair@ontario.ca>; Debreuil, Corene (HSAL) <Corene.Debreuil@gov.mb.ca>; Gibson, Shelley (MOH) <Shelley.Gibson@ontario.ca>; Lerch, Robert (MOH) <Robert.Lerch@ontario.ca>; Arron, Nina (MOH) <Nina.Arron@ontario.ca>; Hartley, Justine (MOH) <Justine.Hartley@ontario.ca>; Hrycuik, Lorie HLTH:EX <Lorie.Hrycuik@gov.bc.ca>; Rebecca.Carter@health.gov.sk.ca; horacio.arruda@msss.gouv.qc.ca; eric.j.levesque@gnb.ca; Deidre_Falck@gov.nt.ca; jberry@gov.nu.ca; Jonathan.Veale@novascotia.ca; Benton.foster@gov.yk.ca; HGMORRISON@ihis.org; ebentley@ihis.org; McKibbin, Karen (MOH) <Karen.McKibbin@ontario.ca>; Williams, Robin Dr. (MOH) <Dr.Robin.Williams@ontario.ca>; Avis.Gray@gov.mb.ca; hgmorrison@gov.pe.ca
Cc: Osciak, Dawn (HSAL) <Dawn.Osciak@gov.mb.ca>; Shirley.Gebhardt@health.gov.sk.ca; kparadis@gov.nu.ca; LIngebrigtson@gov.nu.ca; mark.iocchelli@gov.ab.ca; Mark.Goossens@health.gov.sk.ca; Vandermolen, Chad HLTH:EX <Chad.Vandermolen@gov.bc.ca>; jennifer.white2@gov.mb.ca; jean-francois.melancon@msss.gouv.qc.ca; skylan.parker@novascotia.ca; dave.dell@gnb.ca; XT:HLTH Reddick, Vanessa <vanessareddick@gov.nl.ca>; XT:MacNeill, Shaun HLTH:IN <smacneill@gov.pe.ca>; annaclaire.ryan@gov.yk.ca; colette_perry@gov.nt.ca; DSouza, Laura (MOH) <Laura.DSouza@ontario.ca>; McManus, Valencia (MOH) <Valencia.McManus@ontario.ca>; Mesiano-Crookston, Jeremy (MOH) <Jeremy.Mesiano-Crookston@ontario.ca>; Muneswar, Ramona (MOH) <Ramona.Muneswar@ontario.ca>; Mehta, Tushna (MOH) <Tushna.Mehta@ontario.ca>; Fraser, Travis (MOH) <Travis.Fraser@ontario.ca>; Levesque, Eric J. (DH/MS) <Eric.Levesque2@gnb.ca>; Breen, Seamus <SeamusBreen@gov.nl.ca>; Heatley, Jennifer G <Jennifer.Heatley@novascotia.ca>; Potter, Lonnie (MOH) <Lonnie.Potter@ontario.ca>; D'Silva, Christabel (MOH) ; Dias, Kimberly (MOH) <Kimberly.Dias@ontario.ca>; MacKinnon, Marnie (MOH) <Marnie.MacKinnon@ontario.ca>; Barbrick, Tracey L <Tracey.Barbrick@novascotia.ca>
Subject: RE: Provincial-Territorial ADM Forum on COVID Immunization

Good morning,

We would like to share a few notes, below, before today's PT ADM Forum on COVID-19 immunization teleconference .

There will not be a formal agenda, instead today's call will focus on a debrief from this morning's Joint Health and IGA Deputies Ad-Hoc teleconference, followed by a roundtable discussion.

Please find attached the minutes from last Monday's meeting of the PT ADM Forum on COVID-19 Immunization. We have also attached a draft jurisdictional scan template on PT work on COVID immunization for your consideration and input.

Thank you and please feel free to connect with me if you have any questions.

Evan

-----Original Appointment-----
From: Fraser, Travis (MOH) **On Behalf Of** Sotiropoulos, Evan (MOH)
Sent: November-30-20 4:34 PM
To: Martin.Lavoie@gov.bc.ca; trish.merrithew-mercredi@gov.ab.ca; Philip.Christoff@gov.yk.ca; Marysia.Szymczak@ontario.ca; Blair, Alison (MOH); Debreuil, Corene (HSAL); Sotiropoulos, Evan (MOH); Gibson, Shelley (MOH); Lerch, Robert (MOH); Arron, Nina (MOH); Hartley, Justine (MOH); Lorie.Hrycuik@gov.bc.ca; Rebecca.Carter@health.gov.sk.ca; horacio.arruda@msss.gouv.qc.ca; eric.j.levesque@gnb.ca; Deidre_Falck@gov.nt.ca; jberry@gov.nu.ca; Jonathan.Veale@novascotia.ca; Benton.foster@gov.yk.ca; HGMORRISON@ihis.org; ebentley@ihis.org; karen.mckibbin@ontario.ca; dr.robin.williams@ontario.ca; Avis.Gray@gov.mb.ca; hgmorrison@gov.pe.ca
Cc: Osciak, Dawn (HSAL); Shirley.Gebhardt@health.gov.sk.ca; kparadis@gov.nu.ca; LIngebrigtson@gov.nu.ca; mark.iocchelli@gov.ab.ca; Mark.Goossens@health.gov.sk.ca; Chad.Vandermolen@gov.bc.ca; jennifer.white2@gov.mb.ca; jean-francois.melancon@msss.gouv.qc.ca; skylan.parker@novascotia.ca; dave.dell@gnb.ca; vanessareddick@gov.nl.ca; smacneill@gov.pe.ca; annaclaire.ryan@gov.yk.ca; colette_perry@gov.nt.ca; DSouza, Laura (MOH); McManus, Valencia (MOH); Mesiano-Crookston, Jeremy (MOH); Muneswar, Ramona (MOHLTC); Mehta, Tushna (MOHLTC) (Tushna.Mehta@ontario.ca); Travis Fraser; Levesque, Eric J. (DH/MS); Breen, Seamus; Heatley, Jennifer G; lonnie.potter@ontario.ca; christabel.d'silva@ontario.ca; Dias, Kimberly (MOH); MacKinnon, Marnie (MOH); Barbrick, Tracey L
Subject: Provincial-Territorial ADM Forum on COVID Immunization
When: December-07-20 2:00 PM-3:00 PM (UTC-05:00) Eastern Time (US & Canada).
Where: s.15

From:	van Gelderen, Courtney [PHSA] on behalf of IBCOC
To:	Brown, Stephen R HLTH:EX; Pokorny, Peter HLTH:EX; Henry, Bonnie HLTH:EX; Miller, Haley HLTH:EX; Brown, Ross Dr [VCH]; XT:Naus, Monika HLTH:IN; Reedijk, Jill [BCCDC]; Hassam, Noorjean [BCCDC]; "tim.byres@forces.gc.ca"; XT:HLTH Brown, Libby; Gustafson, Reka [BCCDC]; XT:Patrick, David HLTH:IN; "SHEA.BRAMLEY@forces.gc.ca"; "Patricia.Laing@forces.gc.ca"; Lavoie, Martin HLTH:EX; Lawrie, Hannah GCPE:EX; XT:McDonald, Shannon HLTH:IN; Hinde, Grace [PHSA]; Smith, Paula GCPE:EX; XT:Pope, Darcia HLTH:IN; Bru, Carolyn GCPE:EX; "Deborah.Lester@redcross.ca"; "Robert.Macquarrie2@ecn.forces.gc.ca"; Quirk, Ron EHS:IN; XT:Dawkins, Laurie GCPE:IN; Delorme, Gerry (PHSA) [VIHA]; Twyford, Philip HLTH:EX; Barclay, Corrie A HLTH:EX; Brach, Pader W EMBC:EX; XT:Palmer, Becky HLTH:IN; Virani, Alice [PHSA]; Thistle-Walker, Carlene HLTH:EX; Halicki, Ashley HLTH:EX; Galt, Jamie HLTH:EX; IBCOC; Thompson, Laurel HLTH:EX; Carroll, Jonathan C HLTH:EX; Greer, Shannon GCPE:EX; Achampong, Bernard HLTH:EX; Massey, Keren L HLTH:EX; Grieve, Chandler GCPE:EX; Youngs, Kirsten R GCPE:EX; Thompson, Laurel HLTH:EX; Aitken, Jeff HLTH:EX; Craig, Ken EMBC:EX; XT:Flatt, Alexandra HLTH:IN; CoastalSMD; XT:Lavery, John HLTH:IN
Subject:	No Fault Vaccine Injury Compensation Program Background - For EOC members only
Date:	December 24, 2020 10:02:11 AM
Attachments:	No Fault Vaccine Injury Compensation Background.pdf

Sent on behalf of Martin Lavoie

Dear IBCOC colleagues,

As promised a little while ago, here is some background info on No Fault Vaccine Injury Compensation that was developed a number of years ago.

Please do not circulate further, as this was part of a 2013 report that was never published after submission to PHAC.

Cheers,

Martin

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- *Explore means to support vaccine evaluation studies and vaccine readiness studies:* Vaccine evaluations have been identified as significant in influencing the development of vaccine improvements. Since Canada is an early adopter of many newer vaccines it might be in a position to provide a significant contribution in this area. Vaccine readiness studies would facilitate the introduction of new priority vaccines.

- *Address perceived conflict of interest issues with the regulator working with the industry early in the vaccine development stage and industry funding research, particularly socio-economic cost-benefit studies:* There are benefits to having the regulator be involved in the early stages of clinical studies so that these studies conform to regulatory requirements; however, the mechanism for such cooperation will need to guarantee real and perceptual regulatory independence and impartiality. Industry's funding of and/or participation in vaccine research often leads to a perception that the research findings are biased in favour of the funding industry. Agriculture and Agri-Food Canada has had some success in developing research approaches with industry that could be examined and possibly emulated.

J. No-Fault Vaccine Injury Compensation

SITUATION

To be effective in reducing the incidence and severity of vaccine-preventable diseases, immunization programs seek to achieve very high levels of vaccination on the part of populations at risk, including those who may pass the disease on to more vulnerable populations. High rates of vaccination are not only of direct benefit to those who are successfully inoculated but also of value to those who, for a variety of reasons, cannot be vaccinated, are ineffectively vaccinated, or refuse to be vaccinated. High levels of vaccination contribute to "herd immunity" by providing a kind of "firewall" (i.e., the large numbers of vaccinated individuals) between those who are infected and those who are susceptible.

The problem is that current high standards for establishing vaccine safety may miss risks that fall below a detection level, which at the population level can be significant. Thus, there is always the rare possibility of serious harm resulting from adverse immunization events. The achievement of high levels of vaccination constitutes a significant public good and a highly cost-effective method of achieving public health goals. It is therefore important that those who suffer serious harm from adverse events in the course of contributing to this public good receive appropriate compensation. It is also important that the processes by which their claims are handled are expedient and just and in particular do not "re-victimize" the injured by presenting bureaucratic and costly hurdles that might even discourage them from seeking the compensation they deserve.

Reliance on traditional tort ("civil wrong") litigation ("suing for damages") is generally inadequate and often counter-productive in addressing vaccine injuries, since adverse vaccine events most often relate to idiosyncratic *unavoidable* or *unintended* injuries arising from the administration of regulated vaccines that have been developed, approved and delivered in good faith and to high standards of risk management. Since the goal is the provision of appropriate, predictable and fair *compensation* to the injured rather than the *punishment* of wrong-doing or *deterrence* from doing harm to others, no-fault compensation is more appropriate.

As an alternative to tort litigation, a no-fault program for victims of adverse events following immunization can provide more expeditious, efficient, consistent, predictable and fair compensation for unavoidable and unintended vaccine injuries. As noted above, in providing such compensation—and doing so in a highly visible and transparent manner—one source of opposition to large-scale and/or mandatory vaccine programs can be removed, namely, fear of uncompensated injuries and burdens.

Key reasons for the establishment of no-fault vaccine injury compensation programs in Québec, the U.S. and other jurisdictions centre on the following:

1. *It's the right and fair thing to do for those who are injured from vaccines.*

    - Those who participate in vaccine programs should receive fair, prompt and convenient consideration, support and compensation for their injuries.
    - This is particularly true when vaccines are mandatory and when participation provides a broad public benefit beyond that for the individual being vaccinated.
    - A no-fault program provides the most direct, accessible, convenient, non-complicated and predictable support and compensation for those injured.
    - Since most injuries cannot be attributed to negligence on the part of anyone in the vaccine supply chain, a no-fault program is vital to ensure appropriate compensation for the rare cases of unexpected and unavoidable injuries.
    - Costs of the no-fault program can readily be shared by society at large, whether directly funded by governments or recovered from vaccine suppliers and shared equally and equitably across all relevant vaccine programs.

2. *A publicly managed no-fault injury compensation program reduces costs and burdens to individuals, governments, and industry alike.*

    - *Injured individuals* avoid the expenditure of personal time, effort and money that would otherwise be required to pursue civil suits (tort) to seek compensation; given the low likelihood of successful claims, this would largely be a waste, made all the worse by protracted processes whose outcomes are highly uncertain.
    - *Governments* avoid the legal defence costs, adverse publicity and distraction of being embroiled in lawsuits initiated by injured individuals, as governments would almost certainly be named in civil suits, given their roles in vaccine regulation, the making of vaccination mandatory, vaccine delivery and vaccine risk communication. (Note: Even if not named as respondents directly by the injured individuals, they would likely be named as third parties by vaccine manufacturers when they are sued.) While governments would in almost all cases be able to successfully defend claims, they would not likely be able to recover their costs, let alone overcome adverse publicity and distraction from their primary mission. (Note: Direct legal costs would be borne by the respective Health and Justice/Attorney General functions of the respective F/P/T jurisdictions. Moreover, the tendency would be for ALL relevant jurisdictions to be named, especially in class action suits.)
    - *Governments* also reduce the general administrative and procedural costs associated with hearing and overseeing civil claims in the courts, not all of which (and likely little of which) can be recovered through judgments on "costs" in unsuccessful claims. Since most cases would likely result in dismissal, this would be seen as a waste of public resources, especially if much less costly processes such as a no-fault program could otherwise be made available.

- *Vaccine suppliers* avoid the legal defence costs, adverse publicity and distraction of being embroiled in lawsuits initiated by injured individuals; while suppliers would in almost all cases be able to successfully defend claims, they would not likely be able to recover their costs, let alone overcome adverse publicity and distraction from their primary mission.
- *Society in general* avoids the general negative fall-out that would otherwise be associated with civil claims, especially high-profile class action suits, which are increasingly a possibility for consumer injuries in Canada. Even though it is likely that most cases would be successfully defended against negligence, there is a risk that the public will generally conjure the mistaken notion that vaccines are much riskier than they are.

3. *A no-fault injury compensation program is vital to maintaining the active participation of a suitably competitive number of drug manufacturers in the generally non-lucrative vaccine business.*

    - The avoidance of costly legal defence and adverse publicity associated with civil suits helps ensure that drug manufacturers can remain involved in vaccine supply, which they generally see as a non-lucrative aspect of their business, undertaken largely as a matter of public service. The chilling effect on industry of exposure to civil claims—even where such claims can be successfully defended—has been empirically demonstrated with the U.S. experience before the introduction of the U.S. no-fault program, compared to after.

4. *A no-fault injury compensation program helps remove one of the arguments against vaccination put forward by the anti-vaccine movement.*

    - While there is no evidence (thus far) to indicate whether the existence of no-fault vaccine injury compensation programs either enhances vaccine take-up (overcome fear that any injuries would go uncompensated or require costly and uncertain legal claims) or diminishes vaccine take-up (implicitly remind/signal that vaccines *do* have risks), the presence of a no-fault injury compensation program at least takes away one potential anti-vaccine argument.

5. *Waiting for a crisis related to potential AEFIs before instituting a no-fault compensation program can result in a problematic response to the handling of compensation demands.*

    - Reactive development of a no-fault compensation program in response to a crisis in confidence related to vaccines or an increase in vaccine-related injury litigation would likely result in a sub-optimal program. Increasingly complex immunization schedules, with the periodic introduction of new vaccines, add to the probability of AEFIs. At the same time, evolving changes in the legal environment also increase the likelihood of class action lawsuits. Pre-emptively designing a program to address anticipated increases in the risk of lawsuits related to AEFIs and the impact they would have on public confidence and vaccine manufacturers would allow for the careful development of such a program that takes into account all relevant considerations.

Government Sector Considerations

Provinces and territories have strong and direct interests in the issue of no-fault compensation for vaccine injury because they have primary responsibility for the design and implementation of vaccine programs for their respective populations. They have an interest in ensuring high levels of participation and high levels of public confidence in, and support for, immunization programs, and in avoiding costly and time-consuming legal actions in the event of injuries that may reasonably be attributed to vaccination.

At the same time, P/Ts generally wish to ensure that their handling of public concerns—such as injury compensation—in their own jurisdiction is reasonably consistent with the handling of such issues by their counterparts in other jurisdictions. They also wish to minimize the risk of dubious, let alone frivolous, claims, and to ensure that whatever compensation may be made available is reasonable and sustainable. A well-designed no-fault injury compensation program can achieve that by minimizing the need for tort litigation, setting well-prescribed and limited terms for compensation, and offering an accessible and efficient application process for claimants. Collaboration amongst the provinces and territories can help ensure reasonable consistency, sharing of best practices, and possibly even achievement of administrative efficiencies through some form of shared services or processes. The latter would be particularly important for smaller provinces, for which the establishment of their own administrative mechanisms would not be cost efficient.

As noted above, Québec already has a no-fault injury compensation program. Law reform commissions in Saskatchewan and Manitoba had also earlier concluded that some form of no-fault injury compensation scheme would be appropriate, although uncertainty at the time of the magnitude of financial and other implications prevented those jurisdictions from proceeding with programs. Since that time, however, the practical experience in Québec, the U.S., the U.K., New Zealand and other jurisdictions has shown that the rate of claims is modest and the magnitude of compensation relatively low. In Québec, for example, the number of cases between 1988 and 2009 averaged only 4.5 per year (99 cases in total in the time period, amounting to 0.7 cases per million population annually), with about one third resulting in compensation. Very few claimants had need for legal representation, with the greatest use being in appeals. Anecdotal evidence suggests that the program averted the need for civil litigation. Even in the U.S., where civil litigation is more prominent than in Canada, the number of claimants from 1988 to 2009 amounted to only 2.15 cases per million population.

While provinces and territories have responsibility for vaccination programs for their respective general populations, the Government of Canada is also interested and engaged because it regulates vaccines, recommends them for P/T programs, actively promotes their importance and benefit, and administers them to federal populations. (Indeed, with interests in and certain responsibilities for First Nations, Inuit, federal inmates, incoming immigrant and refugee populations, RCMP, forces personnel, veterans and others, the Government of Canada ranks fifth among Canadian jurisdictions in terms of the size of population for which it has immunization responsibilities.)

Like the provinces and territories, the federal government generally has an interest in minimizing the risks of civil suits, which can be costly and can serve as a deterrent to vaccine innovation. It also has an interest in seeing Canada enjoy high levels of participation and high levels of public confidence in, and support for, immunization programs, particularly those that are the subject of guidance under the federal-led NACI process. The federal government is also generally interested in encouraging P/T measures that support federal (and broader common F/P/T) objectives in the public health field, including reduction of vaccine-preventable diseases. To the extent that a system of P/T no-fault injury compensation programs might help sustain public participation and confidence and minimize public costs associated with immunization programs, the federal government has an interest in facilitating P/T collaboration on such programs, including sharing of best practices, promotion of consistent approaches, and facilitating efficient administrative procedures and mechanisms among P/Ts.

ASSESSMENT: NO-FAULT INJURY COMPENSATION

The problem is that, while Québec has a no-fault vaccine injury compensation program, the rest of Canada does not. Indeed, Canada and Russia are the only G8 nations without state-wide no-fault vaccine injury compensation programs.

Absence of a Canada-wide no-fault compensation program is problematic for several reasons:

- Residents of all provinces and territories other than Québec lack access to no-fault compensation and must rely on tort litigation, with all of the drawbacks, burdens and limitations noted above.
- Since many—if not most—of such uncovered individuals lack the knowledge, time or financial ability to pursue litigation if injured, or believed to be injured, they either bear the costs and burdens of injury themselves, or they refuse to participate in vaccine programs because of the risk of uncompensated injury. The latter results in reduced coverage of the population overall, thereby undermining the effectiveness of vaccine programs in protecting against vaccine-preventable diseases.
- Gaps and inconsistencies in the level of support—including injury compensation—for vaccine programs from one jurisdiction to another weakens overall cohesiveness and consistency of Canada-wide vaccine programs, and militates against the achievement of what could otherwise be mutually supporting programs and public messages.

For the reasons set out above, there is a need in Canada for a nation-wide no-fault compensation program (or system of programs) that would fairly and expeditiously compensate those likely injured from any vaccine that is recommended.

Considerations

To ensure objectivity, fairness and transparency, such (a) no-fault compensation programs should be administered by an arm's length agency(ies), and operate independently of the branches of government responsible for the promotion and safety of vaccines.

To ensure efficiency, pragmatism and expediency, a reasonably short statute of limitations for filing claims should be set (e.g., three years from injury onset), in addition to requiring sufficient documentation to substantiate the injury and its etiology.

To avoid costly redundancy or overlap with other sources of support for the injured, and to avoid frivolous or punitive claims, the injury itself must result in some measurable *uninsured* damages or costs. In the case of death, a death benefit should be paid out similar to an accidental death insurance benefit.

Needs and Costs

Experience in Québec and in other jurisdictions internationally has shown that the overall rate of applications for compensation is very low (fewer than three cases annually per million population in the U.S., the U.K. and New Zealand, and less than one third that rate in Québec). It has also shown that well-designed no-fault vaccine injury compensation programs are very low cost, especially in relation to the overall costs of the immunization programs to which they apply. Informal estimates for a nation-wide system of programs for Canada, based largely on the Québec experience, would amount to about $4

million to $5 million for compensation payouts and overall program administration. In comparison, a single legal case in 1988 resulted in legal costs alone in excess of $1 million.

Management of Claim Risks

As highlighted immediately below, an effective, responsible and sustainable no-fault injury compensation program requires suitable provisions to avoid dubious or frivolous claims, set realistic limits on eligibility and compensation terms, and ensure timely and efficient consideration of claims and handling of appeals. Practical experience in Québec and in other jurisdictions internationally has demonstrated that this can readily be achieved.

Potential Program Elements

Drawing upon the experience with the 13 jurisdictions around the world that have established no-fault compensation programs, there is considerable flexibility in how a program for Canada that would address domestic needs, values and priorities might be designed and implemented. This includes the following potential elements, approaches and options that reflect international practices and experiences:

- Administration by state ministries/agencies related to health, social welfare or labour or under legislation that governs an arm's length overseeing agency. (Note: Sweden is the only state whose no-fault program is covered under a *private* insurance compensation scheme.)
- Universal application to *all* populations experiencing adverse events OR, more restrictedly, to programs that target infants and school-age children, AND/OR to mandatory vaccinations required by state edict.
- A clearly articulated administrative review of the vaccine-related injury, in a manner similar to other accident insurance or disability schemes that do not require legal representation or the solicitation of expert representation of medical review (beyond the attending physician's report).
- Claims assessment overseen by a medical director taking into account administrative review of eligibility criteria and medical assessment by outside consultation from medical experts.
- Coverage of *uninsured* medical costs and, possibly, also special disability benefits, death benefits, economic damages (lost wages) and possibly even certain non-economic damages. This includes consideration of some threshold definition of eligible damages (e.g., serious injury or death, comparable to criteria for compensation applicable to accident or disability schemes).
- Funding of the program (typically modest in scale) from general government appropriations or possibly by a special vaccine excise tax paid by the purchaser or an injury premium paid by the manufacturers.
- Administration of the no-fault compensation program at arm's length from government branches or bureaus responsible for the approval, promotion and safety of vaccines and vaccine programs.

From:	Henderson, Marianne [BCCDC]
To:	Ashraf Amlani; Behn Smith, Daniele HLTH:EX; Bharmal, Aamir Dr. HLTH:IN; XT:HLTH Brodkin, Elizabeth; Clair, Veronic [BCCDC]; Corneil, Trevor [BCCDC]; Crabtree, Alexis [BCCDC]; Daly, Patty [VCH]; De Villiers, Albert; Elliott, Catherine [EXT]; Emerson, Brian P HLTH:EX; XT:Fumerton, Raina HLTH:IN; XT:HLTH Fyfe, Murray; XT:HLTH Galanis, Eleni; Gray, Andrew Dr. HLTH:IN; Grennan, Troy [BCCDC]; Gustafson, Reka [BCCDC]; XT:Hayden, Althea HLTH:IN; Henderson, Marianne [BCCDC]; Henry, Bonnie HLTH:EX; Hrycuik, Lorie HLTH:EX; Hyland, Ita [PHSA]; Rongve, Ian HLTH:EX; Kendall, Perry [EXT]; Massey, Keren L HLTH:EX; XT:Kim, Jong HLTH:IN; XT:Krajden, Mel HLTH:IN; Larder, Andrew [BCCDC]; XT:Lavery, John HLTH:IN; XT:Lysyshyn, Mark Dr. HLTH:IN; XT:McDonald, Shannon HLTH:IN; XT:Mema, Dr. Silvina HLTH:IN; Miller, Haley [BCCDC]; XT:Naus, Monika HLTH:IN; Sandhu, Jat [BCCDC]; Sherri Moore-Arbour; Skowronski, Danuta [BCCDC]; XT:Smolina, Kate HLTH:IN; XT:HLTH Stanwick, Richard; Brown, Stephen R HLTH:EX; XT:Swinkels, Helena HLTH:IN; Therrien, Darlene HLTH:EX; Tyler, Ingrid Dr. HLTH:IN; Wong, Jason [BCCDC]
Cc:	Carnegie, Lynn HLTH:EX; Patterson, Catherine M HLTH:EX; XT:Carpenter, Lori HLTH:IN; XT:Morimoto, Courtney HLTH:EX; XT:HLTH Stajduhar, Linda; Thom, Rachael [NHA]; Vivian Masigan; Walsh, Sara M HLTH:EX
Subject:	Agenda | PHLC | Wednesday Dec 16th
Date:	December 16, 2020 9:48:06 AM
Attachments:	Agenda Public Health Leadership Call Dec 16.docx 5. 007 UPDATE - dec 15 - PROTOCOL FOR COMMUNICATION AND TESTING RELATED TO COURT FACILITIES draft (CLEAN).docx 5. CourtProcessVisio _15dec2020.pdf 5. Guidance for Court Settings - Dec 14 2020.docx A. Cover Sheet- CRG 52-3 MIS-C Clinician Guidance.docx A. CRG 52-3 MIS-C Clinician Guidance Dec 8 2020 Changes Highlighted.docx B. Backgrounder - Safe Voluntary Isolation Sites Program (FINAL).pdf C. CRG Weekly Status Update 2020.12.11.pdf D. Weekly COVID-19 Evidence Review Tracker_07Dec2020.pdf

Good morning,

Please find attached the agenda and material for today's Public Health Leadership Committee meeting.

Kind regards,

Marianne Henderson

Operations Coordinator – Central Administration
Support to Dr. Réka Gustafson and Dr. Trevor Corneil
BC Centre for Disease Control
Provincial Health Services Authority
655 West 12th Avenue
Vancouver, BC, V5Z 4R4
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CONFIDENTIAL

COMMUNICATION AND INCIDENT RESPONSE PROTOCOL:

NOTIFICATION OF POTENTIAL COVID-19 INCIDENTS AND/OR TESTING

AT OR RELATED TO COURTHOUSES

December 15, 2020 DRAFT 007

BACKGROUND

Courthouses[1] occupy a unique and essential role in communities. They are a place where people come to access justice relating to a myriad of public and private legal matters that often engage public safety and individual liberty rights. People rely on the right to access courts to resolve their legal disputes s.13

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Commented [CB1]: I think this is important to set out as part of the purpose as questions about who has primary responsibility for communications arose around the Surrey testing and continue to arise in letters to the Chiefs.

[1] Courthouses is used in this Protocol to refer to all court locations, including circuit court locations.

COURTHOUSE AND REGIONAL HEALTH AUTHORITY CONTACTS

The Court of Appeal, Supreme Court, Provincial Court, and Court Services Branch list of contacts and their email addresses are in *Appendix A* ("Court Contacts").

Appendix B identifies the locations of the Court of Appeal, Supreme Court, Provincial Court and locations shared by more than one Court.

Contact information for the Provincial Health Officer, BC Centre for Disease Control (BCCDC) and the Regional Health Authorities is in an *Appendix C* ("Public Health Contacts").

Appendix D is a flowchart describing public health actions and anticipated communications by the Regional Health Authority in the event of a COVID-19 Incident in a courthouse.

For each COVID-19 Incident, the courts have identified a lead contact (see *Appendix A*) who will be the lead or will provide the name of a designate. Public health officials will each identify a lead contact who will facilitate communication between the court and the Regional Health Authority.

I. COVID-19 COURTHOUSE GUIDANCE DOCUMENT

The BCCDC in collaboration with BC Ministry of Health has prepared a Public Health Guidance document for the prevention of and response to COVID-19 in courthouses that will be publicly posted.

Commented [CB2]: Link to be added

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"COVID-19 Case" is a person with a confirmed COVID-19 laboratory test or is diagnosed as an epi-linked case by a public health official.

Commented [CB3]: Can this be defined

"COVID-19 Exposure" is a circumstance where a known COVID-19 Case has attended a courthouse while infectious and may have exposed others to COVID-19 and for which

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III. TARGETED ACCESS TO COVID-19 TESTING FOR COURT PARTICIPANTS IN RELATION TO ANTICIPATED OR ONGOING COURT PROCEEDINGS

Situations will arise where special measures to access a COVID-19 test are required for the purpose of facilitating court proceedings including but not limited to:

- A Court Participant experiencing COVID-19 like symptoms or with a high degree of real or perceived risk where a clinical assessment including COVID-19 testing is required in order to inform the determination of whether the court proceeding can continue as scheduled;
- A Court Participant will experience significant negative consequence should the court proceedings be adjourned in order to access COVID-19 testing;
- A matter is proceeding in a courthouse and there is concern that Court Participants may be experiencing symptoms associated with COVID-19.

In the event the court requires assistance obtaining targeted access to testing of a Court Participant, the appropriate Court Contact will reach out to the appropriate Public Health Contact or local medical health officer to discuss the specific circumstance requiring facilitated COVID-19 testing, and plan for testing accordingly if warranted.

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APPENDIX A

TABLE 1: PROVINCIAL COURT CONTACT LIST

	REGION	EMAIL
Mahar, Ryan *(Lead Court Contact)*	Executive Director of Organizational Services	RMahar@provincialcourt.bc.ca
Galbraith, Victor	Regional Administrative Judge (RAJ) Northern Region	s.17
Hamilton, Rob	RAJ Fraser Region	
Milne, John	RAJ Vancouver Region	
Rogers, Carmen	RAJ Vancouver Island Region	
Shaw, Meg	RAJ Interior Region	

TABLE 2: SUPERIOR COURTS CONTACT LIST

Bauman, Robert J.	Chief Justice of British Columbia	s.17
Hinkson, Christopher E.	Chief Justice of the Supreme Court	s.17
Holmes, Heather J.	Associate Chief Justice of the Supreme Court	s.17
McBride, Heidi *(Lead Court Contact)*	Executive Director and Senior Counsel	Heidi.McBride@bccourts.ca

TABLE 3: COURT SERVICES BRANCH CONTACT LIST

Jenny Manton *(Lead Court Contact)*	Assistant Deputy Minister	Jenny.Manton@gov.bc.ca
Paul Corrado	Chief Sheriff and Executive Director BC Sheriff Service	Paul.Corrado@gov.bc.ca
CSB Regional Management Team	Regional distribution list	CourthouseExposureNotifications@Victoria1.gov.bc.ca

APPENDIX B
COURTHOUSE LIST

Region	Court of Appeal	Supreme Court Only	Integrated Court Location (Supreme Court and Provincial Court)	Provincial Court Only
Vancouver Island Region	Victoria		Campbell River	Ganges
			Courtenay	Gold River
			Duncan	Port Hardy
			Nanaimo	Sidney
			Port Alberni	Tofino
			Powell River	Ucluelet
			Victoria	Western Communities
Vancouver Coastal Region	Vancouver Law Courts	Vancouver Law Courts		Downtown Community Court
				Justice Centre
				North Vancouver
				Pemberton
				Robson Square
				Sechelt
				Vancouver
				Bella Bella
				Bella Coola
				Klemtu
				Violation Ticket Centre - VTC
Fraser Region			Chilliwack	Abbotsford
			New Westminster	Port Coquitlam
			Abbotsford	Richmond
				Surrey
Interior Region	Kamloops		Cranbrook	Clearwater
	Kelowna		Golden	Nakusp
			Kamloops	Creston
			Kelowna	Fernie
			Nelson	Invermere
			Penticton	Sparwood
			Revelstoke	Lillooet
			Rossland	Merritt
			Salmon Arm	Castlegar
			Vernon	Princeton
				Grand Forks
				Ashcroft
				Chase
Northern Region	Yukon		Dawson Creek	Burns Lake
			Fort St John	Valemount
			Prince George	Mackenzie
			Prince Rupert	Chetwynd
			Quesnel	Tumbler Ridge
			Smithers	Atlin
			Terrace	Good Hope Lake (Cassiar)
			Williams Lake	Hudson's Hope

				Lower Post
				Queen Charlotte City
				Fort St James
				Fraser Lake
				Kwadacha (Fort Ware)
				Tsay Keh Dene
				Vanderhoof
				Hazelton
				Houston
				Dease Lake
				Kitimat Law Courts
				New Aiyansh
				Stewart
				McBride
				100 Mile House
				Masset
				Anahim Lake

APPENDIX C

Regional Health Authority contacts:

APPENDIX D

COMMUNICATION DIAGRAM

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Guidance for Court Proceedings During the COVID-19 Pandemic

This guidance is intended for The Court of Appeal, The Supreme Court, and The Provincial Court and is based on known evidence as of December 14, 2020.

Legal disclaimer:
The purpose of this guidance is to provide practical public health advice to reduce the transmission of COVID-19 in British Columbia. This guidance does not have legal authority; however, not following the guidance in this document may leave individuals or organizations open to legal action. This guidance does not supersede orders or direction under the *Public Health Act* or any other provincial or federal legislation. This guidance is subject to updates.

Introduction

Court proceedings are critical and essential services in the province of British Columbia. Courthouses are settings where people access justice relating to a myriad of public and private legal matters that often engage public safety and individual liberty rights. People rely on the right to access courts to resolve their legal disputes. Not all people who attend court choose to be there but are compelled to attend through the legal process.

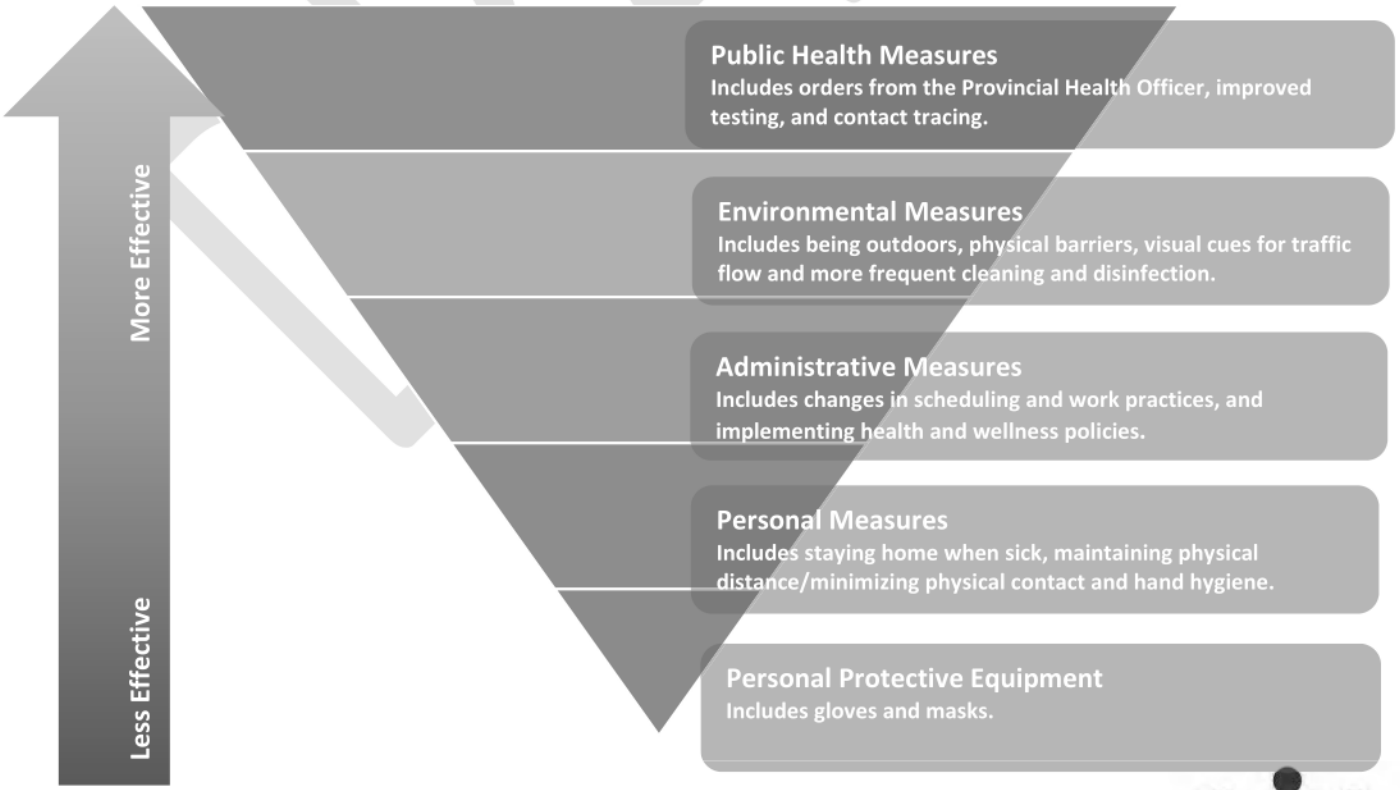
During the COVID-19 pandemic, concerns about individual safety and potential exposure risks have been highlighted by those who use the court system. This guidance document provides an explanation of infection prevention and control measures that can be implemented in court settings and includes thresholds for the ordering of COVID-19 testing for individuals who are scheduled to be present in the court house.

Infection Prevention and Exposure Control Measures

Infection prevention and exposure control measures help create safe environments by reducing the spread of communicable diseases like COVID-19. These are more effective in controlled environments where multiple measures of various effectiveness can be routinely and consistently implemented.

The Hierarchy for Infection Prevention and Exposure Control Measures for Communicable Disease describes measures that should be taken to reduce the transmission of COVID-19 in court settings. Control measures at the top are more effective and protective than those at the bottom. By implementing a combination of measures at each level, the risk of COVID-19 is substantially reduced.

The Hierarchy for Infection Prevention and Exposure Control Measures for Communicable Disease



Public Health Measures

Public health measures are actions taken across society at the population level to limit the spread and reduce the impact of the COVID-19, such as Provincial Health Officer Orders and case finding, contact tracing, and outbreak management.

Provincial Health Officer Orders

The Provincial Health Officer (PHO) has issued several Orders to protect public health. Orders are developed, amended, and rescinded based on the evolution of the pandemic. Please visit the PHO website regularly for updates.

The following PHO Orders are relevant to court settings as of December 14, 2020:

- Workplace Safety Plans, which requires all workplaces to develop a COVID-19 Safety Plan
- Gatherings and Events, which restricts the number of people who can gather for an event
- Travellers and Employers, which outlines restrictions on travellers who come to BC from outside of Canada

Case Finding, Contact Tracing and Outbreak Management

Case finding involves active testing of anyone with symptoms of COVID-19 to identify cases early in the course of the disease. Contact tracing is a process conducted by public health where close contacts of a positive case of a communicable disease are identified and followed up with. Not everyone who has been in contact with a confirmed case of COVID-19 is considered a close contact; public health makes this determination when conducting contact tracing. Outbreak management is overseen by public health and determines the scope of an outbreak or cluster of cases.

Environmental Measures

Environmental measures are changes to the physical environment that reduce the risk of exposure, such as choosing outdoor spaces where possible, using visual cues for maintaining physical distance, erecting physical barriers where appropriate, and frequent cleaning and disinfection.

Cleaning and Disinfection

Regular cleaning and disinfection are essential to preventing the transmission of COVID-19 from contaminated objects and surfaces. The premises should be cleaned and disinfected in accordance with the BCCDC's Cleaning and Disinfectants for Public Settings document.

Clean and disinfect the premises at least once every 24 hours, and clean and disinfect frequently touched surfaces (e.g., door knobs, toilet handles, light switches, desks, chairs) at least twice every 24 hours.

Support Physical Distancing

Use floor markings and posters to encourage physical distancing. This may include designated entrance and exit doors. Do not reduce the number of exits. Ensure any alterations to the premises adheres to the fire code. Reduce the number of seats in waiting areas, and limit or reduce the number of seats in court rooms.

Physical Barriers

Barriers can be installed in places where physical distance cannot regularly be maintained, such as reception areas.

Administrative Measures

Administrative measures are policies, procedures, training and education that reduce the risk of exposure.

Supportive Sick Leave Policies

Anyone who is experiencing symptoms of COVID-19 should be supported to stay home through the implementation of sick leave policies that do not negatively impact employment. Work from home policies are an option when or if a person does not feel well.

Ordering COVID-19 Tests for Individuals Scheduled to be in Court Settings

Testing for COVID-19 is available for people with symptoms that are indicative of the infection. If an individual has no symptoms, testing is not required. Testing is generally not available through the provincial health care system for people without symptoms, including routine screening for employment, travel, school, before surgery or other settings.

The rationale for this stance is the low numbers of confirmed active cases in BC and that the majority of identified cases have a known source of exposure. Resources to expand screening for asymptomatic individuals are high in relation to the expected low yield of detecting new cases; a significant amount of resources would be required to test asymptomatic individuals, and would impact laboratory testing costs, health system costs, and personal protective equipment. Asymptomatic individuals are also more likely to receive a false positive test, which has implications for the individual (e.g., unnecessary restriction of individuals) and the public health system (i.e., to conduct contact tracing).

This being said, a court may wish to test an individual for a variety of reasons, including:

- A court participant who is experiencing COVID-19 like symptoms or has a high degree of real or perceived risk where a clinical assessment including COVID-19 testing is required in order to inform the determination of whether the court proceeding can continue as scheduled;
- A court participant who will experience significant negative consequence should the court proceedings be adjourned in order to access COVID-19 testing.
- A matter is proceeding in court and there is concern that one or more participants may be experience symptoms associated with COVID-19.

In any of these events, court administration will connect with the local medical health officer to discuss the specific circumstance that requires facilitated COVID-19 testing and arrange for testing if warranted.

Personal Measures

Personal measures are actions individuals can take to protect themselves and others such as maintaining physical distance/minimizing physical contact, frequent hand washing, practicing respiratory etiquette and staying home if sick.

Stay Home When Sick

Anyone with cold, influenza, or COVID-19 symptoms should self-isolate and seek assessment by a health care provider or use the BC COVID-19 Self Assessment Tool. People who experience seasonal allergies or other COVID-19-like symptoms that are related to an existing condition can continue to attend court as long as they are experiencing these symptoms as normal. People whose household has a person with cold, influenza, or COVID-19 symptoms may attend court, provided they are asymptomatic and have not been directed by public health to self-isolate.

Screening others for symptoms, checking temperatures, or COVID-19 testing should be reserved for health-care professionals.

Hand Hygiene

Rigorous hand washing with plain soap and water is the most effective way to reduce the spread of illness. Everyone should practice diligent hand hygiene often. To learn about how to perform hand hygiene using soap and water or using alcohol-based hand sanitizer, please refer to the BCCDC's hand washing poster.

Respiratory Etiquette

Everyone should:

- Cough or sneeze into their elbow or a tissue. Throw away used tissues and immediately perform hand hygiene.
- Refrain from touching their eyes, nose or mouth with unwashed hands.
- Refrain from sharing any food, drinks, unwashed utensils, cigarettes, or vaping devices.

Personal Protective Equipment (PPE)

Personal protective equipment (PPE) is the last and least effective of the infection prevention and exposure control measures and should only be considered after applying all other measures. PPE is not effective as a stand-alone preventive measure, should be suited to the task, and must be worn and disposed of properly. Outside of health care settings, the effectiveness of PPE is generally limited to protecting others from your droplets.

PPE, such as masks and gloves, is not needed for most staff beyond that used as part of routine practices for the hazards normally encountered in their regular course of work.

Non-Medical Masks

Non-medical masks or face coverings must be worn inside indoor public places by Order of the Minister of Public Safety and Solicitor General. However, masks do not have to be worn inside of the courtroom.

Appendix A: Notification Process for Court Participants

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COVER SHEET- CRG 52-3

Title: Multisystem Inflammatory Syndrome in Children (MIS-C) Temporally Associated with COVID-19: Guidance for Clinicians in B.C.	
New or revised?	
Revised	
Is this replacing an existing document? Yes/No (If Yes, the name of/link to the document being replaced is provided in the space below)	
Yes http://www.bccdc.ca/Health-Professionals-Site/Documents/COVID19_MIS-C_ClinicianGuidance.pdf	
Content owner(s) for revisions /groups involved in creating original content	
Primary author: Catherine Biggs Reviewed by: Pediatrics Subcommittee, MIS-C Working Group	
Do the revision /new content in this document have implications for changes that may need to make in other documents? Yes/No If yes, please list documents	
Yes, content on the Pediatrics webpage http://www.bccdc.ca/health-professionals/clinical-resources/covid-19-care/clinical-care/pediatrics under Multisystem Inflammatory Syndrome in Children may need to be updated.	
Target audience(s)	
Health care providers	
Target publication date	
As soon as possible	
Subject matter of new documents OR high-level summary of changes to revised document	
• Addition of questions within copy to help with organization of information • Update to content (changes highlighted in yellow) • Addition of workflow sheet (now referred to as Appendix B) as requested by stakeholders from the community, with incorporation of lab tests table as part of the flow chart and addition of table on patient presentation with clinical suspicion of Covid MIS-C • Update to resource list	
Type of Document? (e.g., PDF, web content, social media post, flow sheet, FAQ)	
PDF	
Where is the information from? Select all that applies.	
☐ **PHAC** ☐ **Jurisdictional scan** ☐ **Worksafe BC** ☐ **SOWG**	☒ **New content/other (Please briefly describe):** Pediatrics subcommittee, primary literature, guidance from the American College of Rheumatology
Is there an approval body that should discuss this as an early draft? Once reviewed, insert name/email of most responsible representative for the reviewing group. (e.g. IPC, SOWG, MoH etc.)	
No	

PHRG Guideline (#)	Target Pub Date	Guideline quality dimension: Scale: 1 (v poor) – 5 (excellent) or (n/a)	Rating:	Comments:
		Knowledge synthesis: Does it summarize all pertinent evidence? Does it draw from a diverse body of literature? Are there gaps?		
		Knowledge translation: Has a jurisdictional scan been completed? Is the guidance and messages in the document accurate and reflect the evidence?		
		Policy alignment: Does it align with regulations, orders, and policies already in place in BC?		
		Guidance alignment: Is the guidance consistent with other public health and clinical guidelines and protocols in BC?		
		Pragmatism: Is the guidance practical for providers and/or the target population to implement?		
		Editorial standard: Is the document well written and appropriate for the intended audience (s)?		
		User testing: Has the guideline been tested for user acceptability in messages?		

Reviewers. Once review by a group is complete, check the box and insert name/email of most responsible representative for the reviewing group.		
☐	**KTSOC**	**Name/email:**
☐	**PHRG**	**Name/email:**
☐	**BC COVID Oversight**	**Name/email:**
☐	**PHL**	**Name/email:**
☐	**CHREM**	**Name/email:**
☐	**THRIVE**	**Name/email:**
☐	**8-1-1**	**Name/email:**
Dissemination Suggestions (e.g. BCCDC Website, Social Media, Targeted Distribution)		
BCCDC website Sharing via Pediatrics subcommittee members' networks		

DRAFT EDITED VERSION

Multisystem Inflammatory Syndrome in Children (MIS-C) Temporally Associated with COVID-19: Guidance for Clinicians in B.C.

Updated: December 8, 2020

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December 8, 2020
Preliminary guidance for clinicians in British Columbia about:
Multisystem inflammatory syndrome in children (MIS-C) temporally associated with COVID-19

BACKGROUNDER
Safe Voluntary Isolation Sites Program (SVISP) for COVID-19

Context

Canada remains focused on efforts to delay and slow the spread of COVID-19. Federal efforts have sought to address underlying issues faced by vulnerable people at higher risk of transmission during the pandemic. However, evidence indicates that individuals from lower-income and densely populated neighbourhoods are disproportionately affected by COVID-19. Individuals from these neighbourhoods may have more difficulty safely isolating at home due to factors such as overcrowding and/or resource constraints.

Program Objectives

The Safe Voluntary Isolation Sites Program (SVISP) for COVID-19 is being offered as part of the Government of Canada's rapid response tools for COVID-19, and helps to address the needs of the most vulnerable populations and the efforts of provincial and territorial public health partners in response to the COVID-19 pandemic. In this regard, the SVISP aims to decrease community transmission of COVID-19 by addressing gaps identified for individuals who are unable to safely self-isolate due to housing conditions.

Specifically, the goals of this Program are to:

1) Increase the availability and accessibility of voluntary isolation site(s),
2) Ensure the safety of individuals making use of voluntary isolation site(s), and
3) Support integration of voluntary isolation site(s) into relevant COVID-19 prevention and control efforts, as necessary.

As outlined in the *"Safe Voluntary Isolation Site Program" Program Guide*, the eligible recipients should take into account the three (3) guiding principles:

1) Be informed by local Public Health authority's knowledge of their community, including, epidemiological trends, local data and broader COVID-19 infection prevention and control plans;
2) Contribute to reducing community transmission of COVID-19; and,
3) Consider the socio-demographic, cultural, and other diversity factors of the individuals using voluntary isolation site(s).

Eligible Activities/Services

Each safe voluntary isolation site represents a location where Canadian residents can safely self-isolate for the required period, based on the guidance from local public health officials.

For each approved project, federal funding would cover the following services: transportation, safe lodging, meals and incidentals, as well as on-site security and cleaning personnel for the facility. It is also understood that related activities may be required, such as those performed by public health professionals in the context of infection prevention and control.

Eligible Recipients

The SVISP aims to support the needs identified by local public health authorities. As such, eligible recipients include provincial, territorial, local governments and their agencies, organizations and institutions supported by provincial and territorial governments (e.g., regional health authorities, etc.).

Funding Amount and Duration

The Government of Canada has identified $100 million for the SVISP as part of the efforts to address the COVID-19 pandemic. Selected projects will represent different scales for both larger and smaller sites, based on the needs identified by eligible recipients. Funding will be determined based on assessment of applications by eligible recipients for eligible projects and activities. All projects will be completed by March 31, 2022.

Proposals deemed eligible for financial assistance must demonstrate that they will further the objectives and principles identified in the *"Safe Voluntary Isolation Site Program" Program Guide*.

Application Requirements

As outlined in the *"Safe Voluntary Isolation Site Program" Program Guide*, proposals must establish eligibility and the relationship of proposed projects or activities to program objectives and priorities, and contain the following elements:

1) **Organizational information:** A description of the potential eligible recipient. In cases where the recipient is not another order of government or its entity, the organizational information should include details of ownership, management, governance structure, experience, financial results, etc., as applicable.

2) **Rationale:** This section should illustrate the risk of increased COVID-19 community transmission related to an inability of individuals to self-isolate in their usual place of residence, and should make specific reference to the guiding principles of the Program.

3) **Budget:** The budget should include a financial plan that includes planned expenditures, a forecast of cost of the project and details on its financing (including other sources of proposed funding), and the amount of any federal, provincial, territorial or municipal assistance or tax credit, received or likely to be received for the project. The budget should also include the cost per room per night.

4) **Implementation/Workplan:** This section should include relevant timelines and/or milestones for the operation of the safe voluntary isolation site, and where applicable, related public health functions.

5) **Monitoring/evaluation and reporting plan:** This section should indicate the details for how the use and effectiveness of the voluntary isolation site will be measured, evaluated, and reported. A reporting plan should include firm requirements (deliverables and dates) which must be adhere to for the duration of the project.

Application and Assessment Process

The SVISP is being established as a time-limited, targeted program in response to the continued evolution of the COVID-19 pandemic. As such, there is no deadline for submissions.

In support of the broader goal of COVID-19 prevention and control, selected recipient sites/projects are those that directly address the goals, objectives and principles of the Program. Within the context of SVISP objectives, applications will be evaluated against their ability to contribute to reductions in COVID-19 community transmission, the project's feasibility of scope and time frame, relevance to PHAC core responsibilities for infectious disease prevention and control, and relevance to the directions and objectives of PHAC in light of COVID-19.

As required, PHAC may request additional information from applicants where it deems necessary to:

- Assess the eligibility of the potential recipient and of the initiative,
- Determine how the initiative would contribute to attaining the goals of the SVISP, and/or
- Determine the impact of the proposed initiative on the community transmission of COVID-19.

Please refer to the *"Safe Voluntary Isolation Site Program" Program Guide* for a detailed outline of the application process and assessment criteria.

Language Requirements

The Government of Canada is committed to enhancing the vitality of the English and French linguistic minority communities in Canada (Francophones living outside the province of Quebec and Anglophones living in the province of Quebec), supporting and assisting their development, and fostering the full recognition and use of both official languages in Canadian society. Applicants must ensure that project activities are accessible in one or both official languages depending on the reach and needs to the target audience. For additional information, refer to the Official Languages Act website.

Gender-Based Analysis

The Government of Canada is committed to conducting Gender-based Analysis Plus ("GBA+") on all legislation, policies and programs. GBA+ incorporates consideration of sex and gender, as well as other identity factors such as age, education, language, geography, culture and income. Applicants are expected to incorporate these considerations into their proposals and site operation. For additional information refer to the GBA+ website, and the Key Health Inequalities in Canada: A National Portrait.

Lobbying Act

Recent amendments to the *Lobbying Act* have broadened the definition of lobbying. We encourage applicants to review the revised Act and Regulations to ensure compliance. For more information, refer to the Office of the Commissioner of Lobbying of Canada website.

Contact us

To obtain additional information about this Program, please contact: phac.cgc.solicitations-csc.aspc@canada.ca; and the COVID-19 support inbox: PHAC.COVID.support.ASPC@canada.ca.

CRG Weekly Status Update- December 11, 2020

CRG Subcommittee(s)	CRG Document Status
Pediatrics	**IN DEVELOPMENT** - CRG 72: Considerations for Children in Foster Care: Minimizing Trauma and Maximizing Resilience in the Context of Covid-19 **PENDING UPDATE:** - CRG 32: COVID-19: Management of Severe Respiratory Illness in Pediatric Patients during COVID-19 Pandemic - CRG 41-2: Infection Prevention and Control (IPAC) Protocol for Surgical Procedures During COVID-19: Pediatrics **PENDING REVIEW BY PHRG:** - CRG 52-3: Multisystem Inflammatory Syndrome in Children (MIS-C) Temporally Associated with COVID-19: Guidance for Clinicians in BC **PENDING APPROVAL:** - CRG 70: Caring for Families of Immunocompromised Children: Guidance for family physicians, primary care providers and general pediatricians— Sent to Ministry Nov 24 - CRG 50-3: Guidance for Families of Immunocompromised Children in School and Group Gatherings — Sent to Ministry Dec 4
Perinatal Care	**PENDING UPDATE:** - CRG 16: Antenatal Visits during COVID-19 Pandemic - CRG 33-1: Infection Prevention and Control Protocol for Obstetrical Procedures During COVID-19 **PENDING APPROVAL:** - CRG 22: Guideline for Lactation for Women/Individuals Who Are Confirmed or Suspect Cases of COVID-19— Sent to Ministry Nov 24 - CRG 62: Maternal and Newborn Discharge Planning and continued care in community settings during the COVID-19 pandemic— Sent to Ministry Nov 6
Critical Care/ Emergency Medicine	**BEING FINALIZED:** - CRG 56: Protocol for Code Blue During COVID 19 Pandemic Recovery
IPC/Perioperative	PENDING UPDATE: - CRG 49-2: Infection Prevention and Control Protocol for Surgical Procedures During COVID-19 Adult
Emergency Medicine	**PENDING UPDATE** - CRG 43-2: COVID-19: PPE Recommendations for Endotracheal Intubation of Suspected or Confirmed COVID-19 Patients in Critical Care and Emergency Departments **POSTED:** - CRG 57-3: Oxygenation & Intubation Threshold Guidance for Adults with Suspected Covid-19 in Rural Settings

Weekly COVID-19 Evidence Review – December 7th, 2020

Version 30

1. New Evidence Reviews and Findings[1]

Title of review	Overview of the evidence	Key Findings	Conducted by:

Evidence Brief of COVID-19 quarantine length reduction strategies and effectiveness, Update 1	The review identified and summarized twenty published and pre-published studies. The limited research focused on quarantine to reduce transmission among case contacts in the community and by traveller introduction of COVID-19.
	
	Seventeen quantitative models and risk assessments were included. These do not identify actual outcomes of strategies that have been tested, but rather present a range of plausible outcomes within theoretical scenarios being studied. Their results are useful to compare different options as part of a decision-making process, however the results should be interpreted with caution as the models will vary on their assumptions, input values based on the epidemic period and region specific parameters used.
	
	Two epidemiological investigations, related to contact tracing or quarantine and surveillance of passengers arriving at the airport were identified. These observational studies have a moderate to high risk of bias due to selection, reporting and follow-up biases.
	
	A single rapid review was conducted, it is considered of moderate quality by AMSTAR because only on person assessed and extracted data from each study. Within this review six additional epidemiological investigations and one model were identified for SARS-CoV-2 with similar biases as noted above.
	
	Important knowledge gaps were identified. The knowledge base on quarantine scenarios is largely supported by models, thus there is a lack of empirical evidence on the impact quarantine has on the epidemic, particularly in a local context. Additional information on adherence to quarantine could help with future decision making on this issue. It was also noted that little performance
		• Since the first version of this evidence brief, one pre-published model was updated, and one rapid review and thirteen models have been released, eleven of which are prepublications that have not completed a peer review process. The rapid review confirms that there was very little research prior to June 26 on the efficacy of quarantine for SARS-CoV-2 as well as SARS-CoV-1 and MERS. The publications in Table 1 and 2 have been issued since the review was conducted and include eight studies that focus on effective quarantine period strategies in the community for contacts of cases and fourteen studies focus on quarantine strategies for travellers to reduce the risk of importation of SARS-CoV-2.
		• Two epidemiological studies and the rapid review describe observed data about the effectiveness of the 14-day quarantine period for both case contacts and travellers. These studies indicate that the 14-day quarantine was effective and the addition of an RT-PCR improved the effectiveness of the quarantine strategy.
		• Quantitative models (n=17) concur the 14-day quarantine strategy is effective and explore several alternative scenarios for quarantine and test strategies in the community and for travellers.
		  ○ Shorter quarantines (seven or more days) with at least one test completed near the end of the quarantine were fairly equivalent to 14 days with no test. Scenarios where quarantine was less than seven days were consistently less effective compared to longer quarantine.
		  ○ Without the addition of a test, effectiveness increased over time from seven days (50-60% median range) to ten days (68-84%) compared to fourteen days.
		  ○ Testing travellers on arrival and not quarantining those with a negative result was significantly less effective (~40%) than quarantine strategies of one week or longer with various testing strategies.
		  ○ Testing close to the end of the quarantine period was the most effective time point in most scenarios, because individuals initially in the incubation period have a longer time for virus load to increase and thus be detected. This was particularly true to all quarantine
			PHAC-ESG

[1] Findings presented in this tracker are subject to PHAC's final review before publication

Title of review	Overview of the evidence	Key Findings	Conducted by:
	data exists for new diagnostic tools such as RADTs, thus testing and quarantine scenarios for RADTs may change as data becomes available.	scenarios less than seven days. For quarantines seven days and longer, a test at seven days was just as effective as a test performed later. ○ Testing multiple times during the quarantine period resulted in minimal reduction in the risk of releasing an infectious person into the community compared to testing one time close to the end of quarantine. • Evidence from quantitative models suggests that testing and quarantine strategies for community contacts and travellers are similar when considering testing at quarantine lengths greater than one week. For strategies less than one week, test and quarantine strategies are less effective in the community because case contacts may be early in their incubation period and test results would have a high false negative rate. This is less of an issue for travellers that may be at any point in their infection, but there is still a risk of releasing travellers early in their incubation period. • For both community contacts and travellers, the models captured have started to look at quarantine strategies that use RT-PCR or RADTs. The RADT sensitivity is predicted in most of the models to lag behind the RT-PCR, which translated to optimal test and quarantine model results suggesting that doing an RT-PCR on day five of quarantine or the RADT on day six was equivalent. However, depending on the turn around time for the RT-PCR test (reported to be 24 to 96 hours), the RADT would shorten the quarantine period because results would be obtained on day six assuming there is minimal wait for RADT results. • Adherence to quarantine was also discussed and modelled in several studies. All studies concluded that adherence is higher with shorter quarantines and the impact of quarantine in real life is likely much lower than reflected in the models due to a lack of compliance.	
Rapid Review: What is the evidence for COVID-19 transmission in acute care settings?	The designs of the included studies are observational (primarily cross-sectional and case-control designs which are high risk of bias) and do not control for the level of virus circulating in community settings. The majority of studies examined univariate relationships between transmission or risk factors and COVID-19 infection, without control for other confounding factors and other sources of exposure. The majority of identified studies include data collected in the early phases of the COVID-19 pandemic, during which lack of access to proper PPE was noted in some jurisdictions. As the understanding of the route of transmission and effective IPAC measures has evolved considerably, the applicability of these data to the current context may be limited. For example, several studies note that data were collected prior to widespread mask use in the hospital setting.	Introduction and Transmission of COVID-19 • Contact tracing in acute care settings is often unable to identify the source of infection (the index case), particularly for cases among health care workers (HCW). The nature of the work in acute care means that HCW cases have multiple contacts, with patients, staff and community/family members, making definitive contact tracing difficult. As a result, conclusions drawn from the available evidence about the transmission of COVID-19 in health care settings must be considered with caution. • There are reports of transmission in acute care settings, but the frequency is not known and is dependent on factors in the setting including IPAC measures, levels of community transmission, among other variables. • The available evidence related to transmission of COVID-19 in acute care settings shows a low risk of HCW transmitting infection to HCW or patients when PPE is used (e.g., masks, gloves, gowns, eye protection). When PPE is routinely in use in the setting, HCW are more likely to be infected by HCW than by patients, and patients are more likely to be infected by patients than by HCW. The	**NCCMT**

Title of review	Overview of the evidence	Key Findings	Conducted by:

	There are few recent syntheses directly relevant to these questions and included studies were primarily completed during the first wave of the pandemic. Although not done as part of this review, it may be valuable to conduct a jurisdictional scan of current rates of COVID-19 among HCW, and patients in hospital, given that implementation of robust IPAC measures appears to coincide with reduced transmission within health care settings in comparison to community settings, where PPE is not generally worn.
	
	The majority of studies explore transmission to and spread among HCW. Fewer studies investigate transmission of COVID-19 to patients already in hospital for non-COVID-19 reasons.
	
	There are imprecise and variable definitions of "health care worker" and "staff" in the available studies. Included participants often hold roles without direct patient contact, but in which contact with other hospital personnel is frequent (e.g., cleaning, food service, administration). Greater specificity in the use of these terms would improve the ability to identify specific risk pathways in acute care settings.
	
	Prevalence of confirmed COVID-19 infection and seroprevalence using antibody tests was highly variable across included studies. This suggests that a number of contextual factors (such as what IPAC measures are in place within and outside of hospital settings, rates of community transmission, etc.) are likely very important. As these factors were not controlled for in analyses, it is very hard to compare findings from different jurisdictions, and findings from other countries may not be applicable to the Canadian context.
	
	Introduction and Transmission of COVID-19
	In 6 studies of forward contact tracing (in which a case is identified and subsequent infections among their contacts are traced) of infected HCW, a total of 69 index HCW cases were linked to 18 HCW cases and 12 patient cases. Three of these studies identified no or inadequate use of PPE and accounted for 9 HCW infections and 2 patient infections. In the remaining 3 studies, a Canadian study reported 5 HCW cases with no forward transmission to staff or patients; a Chinese study reported 1 index HCW case linked to 4 HCW cases; a Polish study
		overall certainty of this evidence is very low and findings are very likely to change as more evidence accumulates.
		
		Risk Factors
		• In studies that explored HCW with known exposures, close contact with an infected colleague or in a shared workplace appeared to increase risk of infection compared to exposure to an infected patient. The overall certainty of this evidence is very low, and findings are very likely to change as more evidence becomes available.
		• Lack of access to or improper use of PPE is associated with increased risk of infection. The overall certainty of the evidence is moderate, so while the direction of effect is less likely to change as more evidence becomes available, the size, or magnitude, of effect may change.
		• There is no clear association between demographic characteristics, a specific role in an acute care setting (e.g., physician, nurse, administrative staff, etc.) or work in a specific department or location in a hospital (e.g., emergency department, surgical ward, etc.) and risk of COVID-19 infection in HCW in acute care settings. The overall certainty of the evidence is low, and findings may change as more evidence accumulates.
		
		Protective Strategies
		• Demonstrated strategies to control the spread of infection include:
		  ○ Use of PPE (masks, gloves, gowns, eye protection)
		  ○ Universal workplace HCW testing
		  ○ Distancing of 1m or more
		  ○ Triaging areas are associated with low levels of infection, although no specific comparisons are available.
		• The overall certainty of this evidence is very low and findings are very likely to change as more evidence accumulates.	

Title of review	Overview of the evidence	Key Findings	Conducted by:
	reported on an outbreak with 1 index HCW case linked to 5 HCW and 10 patient cases. In 1 study of forward contact tracing of infected patients, 28 infected patients in a respiratory ward were linked to no HCW infections and possibly to 1 patient infection in a patient with other exposures. Two studies of HCW infections identify the source of infection through viral sequencing studies of the strain of COVID-19, and both of these studies conclude that the HCW infections were community-acquired. In 12 studies reporting on backward contact tracing (in which a case is identified, and their prior exposures are examined) of HCW infections, 5 were in settings with no or inadequate PPE use. Of the remaining 7 studies, specific sources of infection were identified in 4. In these 4 studies, there were 291 HCW cases, 85 of which were traced to HCW sources and 94 of which were traced to patient sources, with 179 having no identified source. Transmission from patient to HCW is infrequent in settings in which PPE is used. In a review of secondary attack rates (SAR) of COVID-19 in health care settings where the index case was an infected patient, the pooled SAR was 0.7% (95% CI: 0.4%-1.0%), with most individual studies reporting a SAR of < 2%. In 2 studies reporting on backward contact tracing of a total of 111 patient infections, 5 infections were traced to HCW and 85 were traced to patients, with the remaining 21 cases having no identified source. HCW infections are frequently identified among staff working in roles with no patient contact. This finding suggests that transmission to these staff is happening through HCW or community contacts. Studies of HCW beliefs about the source of their infection show that they most often consider the source of their infection to be patients.		

Title of review	Overview of the evidence	Key Findings	Conducted by:
	A low quality review shows no clear evidence to date of transmission of COVID-19 associated with HVAC systems in health care facilities, based on 4 COVID-19-specific included studies with unknown risk of bias. Risk Factors The risk factors for transmission explored within individual studies were highly variable, making cross-study comparisons difficult. Similarly, when the same variable was measured in different studies (e.g., type of HCW sometimes including staff not responsible for patient care such as administrative staff, laboratory workers, custodians, porters; physicians and nurses sometimes divided by department or specialty, etc.) the categories were quite different. Findings that inadequate access to and improper use of PPE are risk factors are in line with findings from studies on protective strategies, highlighting the importance of proper PPE in reducing transmission. Protective Strategies Several reviews of protective strategies included studies of infections other than COVID19 (e.g., SARS, MERS, H1N1). It was not always possible to separate out the findings from COVID-19-specific studies. Several studies of protective strategies do not include comparative data, so the specific effectiveness of the strategy relative to other measures is unknown. Demonstrated strategies to control the spread of infection include: • Use of PPE (masks, gloves, gowns, eye protection), although one moderate quality study found that FFP2 PPE was not superior to FFP1 PPE (e.g., surgical masks) at preventing COVID-19 infections. • Universal workplace HCW testing • Distancing of 1m or more • Triaging areas are associated with low levels of infection, although no specific comparisons are available. • Modelling studies show that:		

Title of review	Overview of the evidence	Key Findings	Conducted by:
	○ Early testing of suspected cases (with results within 8 hours) and a quarantine unit for new patients were the most effective measures. ○ Front-door screening was moderately effective. ○ PPE (even less effective PPE) reduced infections, compared to no PPE. ○ Masking is superior to distancing. ○ Weekly testing of patients and HCW reduced infections. Weekly testing of HCW reduced transmission by 24%, and daily testing by 64%. ○ Smaller cohorts of suspected cases reduced infections, compared to larger cohorts. ○ Isolating suspected cases in single rooms reduced transmission compared to quarantine wards. Strategies with no evidence of control of the spread of infection include: • Aerosol boxes do not protect HCW from aerosolized particles. • Barrier enclosures may create additional risk. • Powered air purifying respirators (PAPRs) are not superior to other protective respiratory equipment when performing airway procedures. • Prophylactic hydroxychloroquine among HCW has no demonstrated effect.		
Rapid Review Update 1: What risk factors are associated with COVID-19 outbreaks and mortality in long-term care facilities and what strategies mitigate risk?	What risk factors are associated with COVID-19 outbreaks and mortality in LTC facilities? In several studies, adjusting for levels of community transmission in multivariate models reduced or eliminated the estimated associations between organization-level factors and risk of outbreaks or mortality. This is an important confounding factor that should be accounted for in future studies. Within studies that did not adjust for community transmission, large variations were observed between geographic regions which could be explained by variations in community transmission. Across studies, there was a large variation in the potential confounders controlled for in the analyses and the way various risk factors and confounding factors were measured, making it difficult to compare the strength of the relationship across studies.	What risk factors are associated with COVID-19 outbreaks and mortality in LTC facilities? • Across studies, incidence in the surrounding community was found to have the strongest association with COVID-19 infections and/or outbreaks in LTC settings. The certainty of the evidence is moderate (GRADE). • Several resident-level factors including, racial/ethnic minority status, older age, male sex, receipt of Medicaid or Medicare were associated with risk of COVID-19 infections, outbreaks and mortality; severity of impairment was associated with infections and outbreaks, but not mortality. The certainty of the evidence is low (GRADE) and may change as more data become available. • At the organizational level, increased staffing, particularly Registered Nurse (RN) staffing was consistently associated with reduced risk of COVID-19 infections, outbreaks and mortality while for-profit status, facility size/density and movement of staff between facilities was consistently associated with increased risk of COVID-19 infections, outbreaks and mortality. The certainty of the evidence is low (GRADE) and may change as more data become available.	**NCCMT**

Title of review	Overview of the evidence	Key Findings	Conducted by:
	Resident-level risk factors for infection were often measured at the group level and may not correspond to individual-level risk of contracting or dying from COVID-19. Several studies from the US compared five-star facility ratings between sites with and without COVID-19 infections and outbreaks; several studies found that lower overall facility quality, history of fines/complaints, substandard cleaning practices, and having external staff brought in were associated with increased risk of COVID-19 cases, outbreaks and mortality within the facility. Facility size (reported as number of residents or beds) was consistently positively associated with increased risk of infections and mortality; however, several studies suggest that facility crowding, or the ratio of residents to staff may be the key drivers of transmission. What strategies mitigate risk of outbreaks and mortality within LTC? Findings from low and high quality syntheses report a variety of interventions to decrease infection transmission in LTC. Common interventions across syntheses were promotion of hand hygiene and regular/enhanced environmental cleaning. Two syntheses included studies conducted in the context of COVID-19, as well as other respiratory infections. Notably, the quality of included evidence in syntheses was very low or not reported. Further evidence is needed on the effect of restricting staff movement between multiple long-term care facilities. Single studies consisted primarily of cohort or quasi-experimental designs. A number of interventions were described with the potential to decrease COVID-19 transmission: • Proactive facility-wide active screening and testing of residents and staff • Infection control audits • Compliance with proper use of masks and other personal protective equipment • Cohorting • Technological tools (i.e., digital contact tracing, COVID-19 app tool) • Social distancing	What strategies mitigate risk of outbreaks and mortality within LTC? • Most guideline recommendations include surveillance, monitoring and evaluation of staff and resident symptoms, and use of personal protective equipment (PPE). The certainty of the evidence is low (GRADE) and may change as more data become available. Other interventions demonstrating some effect on decreased infection rates within syntheses and a small number of single studies include promotion of hand hygiene, enhanced cleaning measures, social distancing, and cohorting. The certainty of the evidence is low (GRADE) and may change as more data become available. • Technological platforms and tools (e.g., digital contact tracing, apps, heat maps) are being developed and show potential for decreased transmission through efficient case and/or contact identification that further informs infection control planning strategies. The certainty of the evidence is very low (GRADE) and may change as more data become available.	

Title of review	Overview of the evidence	Key Findings	Conducted by:
	• Enforcement of maximum occupancy in small areas • Voluntary staff self-confinement in facilities (i.e., spending ≥ 7 days a week and 24 hours a day in the facility; sleeping in unused areas While several case reports describe implementing visitor restriction policies, no studies that include a comparator group were identified to explore the efficacy of this measure. Most studies did not address potential confounding factors at the resident, organizational, or community level that may influence measured outcomes of implemented infection control interventions.		

2. Previous Reviews

Title of review	Key Findings	Review conducted by:	Date released:
Evidence to support safe return to clinical practice by oral health professionals in Canada during the COVID-19 pandemic: A report prepared for the Office of the Chief Dental Officer of Canada.	• We identified a large number of new systematic reviews and meta-analyses concerning the symptoms of people diagnosed with COVID-19 and the risk factors for serious consequences such as hospitalization, ventilation and death among those patients. Many of these reviews and analyses confirmed data presented in the previous report. • The evidence is strong that the most common signs and symptoms experienced by people diagnosed with COVID-19 are fever, cough, fatigue and muscle aches, shortness of breath, sputum, headache, sore throat and gastrointestinal symptoms, including diarrhea. New strong evidence has emerged reporting loss of sense of smell and altered sense of taste as common symptoms. With respect to risk factors for serious consequences of COVID-19, the evidence is strong for increased risk among people with cardiovascular diseases, hypertension, diabetes, chronic respiratory diseases, liver and kidney diseases, obesity and smokers. Newly added risk factors are people with cancer and cerebrovascular conditions. In terms of sociodemographic factors, the evidence is strong that increased age augments the risk of serious consequences, with this increased risk beginning to emerge particularly for those 60 years and older. There is now good evidence in the international literature indicating men being at increased risk for COVID-19 and its consequences, although it is not clear why – is it biological or because of their work, socializing habits and/or smoking and alcohol consumption? However, it is important to note that in Canada, the incidence of COVID-19 is higher in women. There is also some evidence to indicate that when studies control for socioeconomic factors, there are no racial differences in serious consequences for COVID-19. • While the evidence concerning the disease itself is increasingly strong, the evidence supporting different interventions pertinent to oral health care remains minimal and weak and relatively little work has been published in the period since the first report. In terms of clarifying guidance for oral health professionals, one systematic review highlights the categories of actions in pre-treatment, during treatment and post-treatment phases of care that organizations around the world have concentrated on, although this does not mean the relevant actions are based on evidence, rather that these are common areas to consider. Another review of guidelines for dental care during the pandemic noticed an increasing focus on preventive and non-Aerosol Generating Procedures (AGPs) and another highlighted the need to develop an evidence-based classification of AGPs and non-AGPs in dentistry rather than the theoretical approaches used thus far. • In terms of PPE, the picture remains unclear in terms of evidence directly related to oral health care, although the evidence does suggest using combined forms of facial covering (e.g. face visor and N95 mask) is better than just one, as no single interventions are fully effective in preventing transmission. There is emerging evidence that	**McGill University on behalf of the PHAC Chief Dental Officer of Canada**	**30NOV2020**

	N95 masks can be microwaved and re-used at least once without loss of function but there remains no evidence supporting various mitigating approaches such as use of pre-treatment mouthwash, rubber dam and high-volume evacuation. There is evidence that chlorhexidine mouthwash reduces bacterial colony-forming units but none on this or other mouthwashes concerning viruses or disease transmission. • There is emerging evidence concerning the risk factors for Health Care Workers (HCWs) being infected with COVID-19, plus the impacts of the disease on them, which are both relevant in terms of considering how to mitigate risks and impacts. Suggestions have been made for HCWs concerning reducing hours and increasing mental support services.		
Face shields in public: better than nothing, but not good enough	• The evidence on whether or not face shields alone are effective against respiratory diseases is sparse, and further complicated by our uncertainty as to the role of aerosols in COVID-19 transmission. A previous rapid review conducted by Public Health Ontario looked at face shields in health care settings and determined that there was insufficient evidence to determine whether face shields can be relied upon for either source control or PPE. More recently, Verma et al. (2020) used two perpendicular laser light sheets to visualize the flow of respiratory droplets in and out of a standard face shield, as well as several other devices (two surgical masks, an N95, and an N95 with an exhalation valve). They found that although the face shield blocked the forward expiratory jet of a simulated sneeze, it did not prevent droplets from diffusing outward from the bottom of the mask and spreading several feet in front of and behind the source over about 10 s. The N95 performed best in terms of blocking escaping droplets, the valved mask released a stream of droplets, and two surgical masks tested varied greatly in their effectiveness, perhaps reflecting differences in the quality of materials used. These results suggest that face shields may be one of the less desirable options for source control. In contrast, in a non-peer-reviewed pre-print, Ronen et al. found that placing a face shield on a cough simulator was as effective as a surgical mask in blocking particles from reaching an unmasked "breathing" mannikin placed 60 cm straight ahead, although they did not measure other points in space around the cough simulator. • To examine the value of masks as personal protection, Ronen et al. 2020 placed a full face shield on a "breathing" mannikin and measured the size and concentration of droplets that were able to reach the mannikin's airway when exposed to a simulated cough from the front and the sides. Although the simulation found that the face shield was quite effective in blocking droplets and aerosols after being coughed in the face, it provided less protection when the cough originated from the sides or from 30 cm above or below the wearer's face, depending on the dimensions of the shield. Similarly, Lindsley et al. (2014) found that wearing a face shield blocked 96% of the larger particles that would have otherwise been immediately inhaled. However, the shield was less effective against smaller particles, and grew less effective overall as minutes passed and the remaining smaller particles diffused throughout the space and were drawn behind the shield. • Thus, although face shields seem to provide some benefit in blocking the initial jet of particles expelled during a cough or a sneeze, they may not be a good option for prolonged interactions or when continuously occupying a space where aerosols might be accumulating. In addition, because face shields are less effective at blocking smaller particles, they may be particularly problematic if aerosol transmission is a more important route than currently believed. Because particles were able to flow both into and out of face shields, this research emphasizes the importance of having some sort of filtration apparatus to trap or remove particles, or at minimum to close the gap between the shield and face as much as possible.	**NCCEH**	**04DEC2020**
Evergreen Rapid Review on COVID-19 Vaccine Knowledge, Attitudes, and Behaviors	• Research on COVID-19 vaccine KABs (n=67) was conducted in healthcare workers (HCWs), post-secondary students, high-risk populations, expert stakeholders, and the general public and mainly focus on intention to vaccinate as a vaccine for COVID-19 is not available. • Six studies were from Canada, one engaging expert opinion on who to vaccinate initially and five on the general public. Intention to vaccinate varied between 65-73%. The Atlantic had the highest intentions to vaccinate and Saskatchewan/Manitoba had the lowest. • Globally, countries with the highest intent to vaccinate in the general population include India, China, South Korea, Brazil, and South Africa. The countries with the lowest intentions include Nigeria, Poland, France, and Russia. • Intention to vaccinate has declined in multiple countries including China, Australia, Spain, Canada, and Brazil. • The most common factors positively associated with intention to vaccinate were male gender, older age, higher education, adequate knowledge or health literacy, higher socioeconomic status, and heightened worry or concern about COVID-19.	**PHAC-ESG**	**10DEC2020**

	• Partisanship and race were also associated with intention to vaccinate. Those who voted liberal/democrat expressed intention to vaccinate at higher rates than other parties. The intention to vaccinate varied widely by race/ethnicity with White individuals more likely to vaccinate compared to other ethnic groups such as Black, Asian, and Hispanic in studies from the USA and UK. • Concerns about vaccine safety and effectiveness were the two most cited reasons for vaccine refusal. Other commonly cited reasons include newness of the vaccine, and the belief that a COVID-19 vaccine is unnecessary. • Four studies assessed intention to vaccinate comparing those employed in the healthcare sector with the general public. Two studies demonstrated that being a healthcare worker was associated with a higher intention for getting vaccinated and the other two found there was no difference. • Compared to nurses and other healthcare professionals, doctors were significantly more likely to accept a COVID-19 vaccine.		

Evidence Brief on the Risk of COVID-19 Transmission in Flight, Update 1	Seventeen flight investigations (contact tracing or cohorts) were identified, of these five reported no secondary cases (two on repatriation and three commercial flights) and twelve reported in-flight exposure. Whole genome sequencing results were available for three investigations and aided in linking cases to an on-flight single exposure.
	• No transmission to crew has been reported on repatriation flights.
	• Most in-flight transmission events occurred on flights without mandatory face masks. On flights with mandatory mask use, some transmission events occurred either due to incorrect mask use (e.g. not covering the nose) or perhaps due to removal of mask to eat or drink.
	• Symptom and temperature checks were conducted on some flights. Lack of adherence by passengers to self-reporting symptoms lead to a transmission event in at least one flight.
	• Proximity to an index case was a risk factor in investigations where seating charts were available.
	• One survey of passengers and crew after implementation of enhanced safety measures to curb transmission indicated that both the passengers and crew felt safer and with the exception of inflight physical distancing, most enhanced public health measures were implemented e.g. enhanced cleaning, universal face mask, hand hygiene, physical distancing on embarkation and disembarkation and designated crew only areas as well as quarantine areas for unwell passengers or crew.
	
	Mitigating the risk of SARS-CoV-2 transmission during air travel was discussed directly in five reviews and risk assessments and indirectly in thirteen reviews, risk assessments, simulation experiments and in silico studies.
	• The key findings of the SARS-CoV-2 literature on transmission during flights is that multiple interventions are needed to maximally reduce the risk of transmission as no single intervention was protective, this is summarized well in the Appendix figure from the Aviation Public Health Initiative report lead by Harvard.
	  ○ Public health measures to maintain physical distancing during boarding, disembarkation and in-flight, enhanced cleaning, hand hygiene and universal mask use implemented in a layered approach significantly reduce the risk of transmission.
	  ○ Airplane ventilation systems are designed to quickly refresh cabin air and this level of ventilation substantially reduces the time particles remain in the cabin compared to other indoor environments and thus opportunity for transmission, particularly when coupled with other public health measures.
	  ○ Adherence by passengers and crew are a critical factor to the success of the public health measures to reduce the risk of transmission. This includes adherence to symptom screening guidelines and on-board procedures.
	• The indirect literature investigates the aerodynamics of droplets and aerosols to characterize high risk situations, or simulates boarding and inflight movements to suggest strategies for minimizing interaction of people and maximizing the distance between people in flight.
	  ○ Passengers who sneeze or cough while standing or moving about the cabin spread their respiratory droplets considerably further than those seated.
	  ○ Wearing a face mask significantly decreased the spread of droplets (>90%) and was less disruptive to the ventilation flow.
	  ○ Boarding an airplane by groups of related individuals, those seated in window seats first as well as other more complicated algorithms were shown to reduce the interaction with other people and decrease the time to board the plane.
		PHAC-ESG	**28OCT2020**

	• Grouping families and strategically spacing passengers on flights that are not at capacity improves physical distance between passengers. Algorithms developed by researchers were presented to maximize this concept and demonstrated the potential performance of these algorithms compared to middle seat empty or aisle seat empty strategies. Across all of these strategies, their effectiveness decreased on fuller airplanes.		
Environmental Surface and Air Sampling in the Context of the COVID-19 Pandemic	• SARS-CoV-2 RNA is consistently found in environmental surface samples in hospital rooms, healthcare settings, and residential quarantine rooms. Studies seem to differ on the presence of airborne SARS-CoV-2 RNA in patient care areas, likely due to study design, air exchange, ventilation, occupancy, patient characteristics, patient shedding, and air samplers and protocols used. Some studies have attempted to isolate viable SARS-CoV-2 from environmental surfaces and air samples using cell culture, but were either unsuccessful or found weak evidence of viable virus. • While analytical methods such as RT-PCR can provide information about the presence and quantity of SARS-CoV-2 RNA in surface and air samples, the infectiousness of the viruses in the sample is unknown without culturing the virus in live cells. • Environmental sampling may be more useful for specific purposes, such as in epidemiological investigations in outbreaks or case clusters, food safety assurance in food processing plants, to validate the effectiveness of a new cleaning and disinfection protocol, to protect vulnerable populations such as seniors in long-term care facilities, or as periodic surveillance of the effectiveness of control measures.	**NCCEH**	**16NOV2020**
Outdoor Winter Dining during the COVID-19 Pandemic	• Dining out heightens COVID-19 transmission risk because it requires unmasked, face-to-face interaction, and this risk exists both indoors and outdoors. The most effective way to reduce transmission risk while visiting any public space is to avoid close contact with those outside one's own "bubble"; in this case, restricting dining parties to members of one's own household. • Single-party structures appear to be a popular and nearly ubiquitous option to prevent between-party transmission. Although use of single-party structures effectively eliminates this risk, it does not mitigate (and may slightly accentuate) the risk from those seated at the same table. Ventilating single-party structures is unlikely to eliminate the risk of close-contact transmission if one member of the party is infected, but may lessen the risk for subsequent diners by helping to clear accumulated respiratory particles. • Devices that generate heat via combustion should never be used in enclosed spaces. Operators should familiarize themselves with the risks of CO poisoning and ensure that outdoor heating devices are used safely. • Operators may also wish to consider a mix of heating strategies, including some of the personalized options like bring-your-own-blanket (which reduces the risk of fomite transmission), as well as enhancing communication with patrons to ensure that they can dress for the weather.	**NCCEH**	**18NOV2020**
What is known about whether vaccine injury-compensation programs and program elements affect vaccine acceptance and uptake and, where evaluations have been planned or conducted, how	• All the studies were based on the evaluation of the U.S. National Vaccine Injury Compensation Program (VICP). Regarding vaccine acceptance, two studies (one published in 2013, and another in 2006) reported that the program's ability to address liability were associated with improved confidence among the public-health workforce and improvement environment for vaccine research and development. There were mixed findings related to the impact of vaccine uptake. The previously mentioned study from 2006 reported an association between increased immunization rates among the general population since the inception of VICP. However, an older study from 1998 reported that there was no evidence related to an increase of vaccination uptake if VICP were to include two vaccines (influenza and pneumococcal vaccines) targeting adults.	**COVID-END**	**29OCT2020**

these programs are complemented by and timed in relation to other strategies to increase vaccine acceptance and uptake?			
What is known about anticipated COVID-19 vaccine-delivery program elements, and whether and how federated states are harmonizing these elements across constituent units of federations?	Supply • Most countries reported securing agreements for COVID-19 vaccines through a variety of mechanisms, including international alliances such as the COVAX Facility, local public-private partnerships, and country agreements with vaccine producers. • In Canada, there are signed agreements with Sanofi and GlaxoSmithKline to secure 72 million doses of COVID-19 vaccine candidates. In addition, Canada is a contributing participant of the COVAX Facility. Allocation, ordering, distribution, and inventory management within a country • Four jurisdictions (Germany, New Zealand, U.K., and U.S.) described similar vaccine-allocation rules related to their COVID-19 vaccine-delivery programs. These countries identified priority populations groups as older adults, health and social care front-line workers, essential workers from other sectors, and individuals at risk due to underlying chronic conditions. • One jurisdiction (U.S.) reported information on ordering procedures. The government developed the Vaccine Tracking System (VTrckS) as part of their comprehensive vaccine-delivery program, and the system will be used to order and distribute vaccines to jurisdictions, private partners (e.g., pharmacy chains), and other federal agencies (e.g., The Indian Health Service). • Two jurisdictions (U.S. and Germany) described distribution procedures in their vaccine-delivery program plans. The U.S. will be utilizing a federally contracted distributor (McKesson) to centrally manage and deliver vaccines. The contractor can maintain vaccine doses that require refrigeration or be kept frozen. In contrast, Germany plans to identify 60 facilities throughout the country that will be used as delivery centres. • Jurisdictions within the U.S. will be responsible for developing strategies to ensure proper inventory management and approve orders from enrolled providers within different settings in their jurisdictions (e.g., public-health clinics or federally qualified health centres, hospitals, physician clinics, mobile and/or mass-vaccination events). • In Canada, the federal government will prioritize similar population groups, including those at high risk of severe illness and death from COVID-19 and essential workers maintaining the COVID-19 response and other services. However, it diverges from other countries as it plans to include individuals with poor working or living conditions that put them at greater risk of infection. There was limited to no information about provincial and territorial plans for ordering, distributing, and managing COVID-19 inventories. Administration within sub-national units of health systems • Limited information was available about when a vaccine-delivery program will be developed or administered. In Australia, the government is preparing for vaccine distribution, with the intent to develop an immunization program once there is a safe and effective vaccine.	**COVID-END**	**05NOV2020**

	• In terms of vaccine administration sites, Germany plans to utilize vaccination centres with mobile teams for its first phase of vaccine distribution, with a second phase including physician clinics. The U.S. will prioritize settings that meet storage and handling requirements and can reach prioritized populations within health systems (e.g., hospitals, pharmacies, long-term care, and federal agencies such as Indian Health services). • New Zealand reported their commitment to engage different stakeholders, including government and related entities. The U.K. government has stated that there are no initial plans to co-administer the COVID-19 vaccine with the flu vaccine. The European Centre for Disease Prevention and Control developed guidance for the U.K. (along with other European Union countries) about the safety monitoring of adverse events following immunization at the regional-level and for specific population groups. • The U.S. Centers for Disease Control and Prevention's Vaccination Program Interim Playbook outlines detailed information about the administration of their vaccine-delivery program, including: o expanding the scope-of-practice of pharmacists to give them the ability to administer vaccines; o developing a vaccination campaign called 'Vaccinate with Confidence' as part of their vaccine communication for COVID-19; o engaging different stakeholders in government, public-private partnerships, and related entities; o developing reporting requirements to include information on administration (facility, type, address, date) and vaccine (product, dose number, lot number, expiration, series completion, route of administration), recipient characteristics (race, ethnicity, IIS ID number, event ID, address, date of birth, name, sex, comorbidity status, missed appointment, serology results, vaccination refusal), and vaccine administration (provider, site); o constructing an immunization-information system to be used by jurisdictions; and o ensuring vaccine-injury compensation for recipients and liability immunity for distributers. • Limited information was available about administering vaccine-delivery programs within provinces and territories in Canada. Performance indicators Limited information was available about performance indicators across the countries reviewed and in Canadian provinces and territories. The only example identified was from European Centre for Disease Prevention and Control, which released a comprehensive guide related to COVID-19 vaccine-delivery program elements for the EU and the U.K. The guide includes the development of performance indicators such as assessing impact, safety, effectiveness, coverage, dose type, and vaccine product.		
Rapid Review: What is the effect of the COVID-19 pandemic on the use and cessation of tobacco and vaping products?	• There was no clear direction of effect of the COVID-19 pandemic on use of tobacco or vaping products. Most cross-sectional studies reported a mixed result; that some smokers increased their use during the pandemic, some decreased their use, and others did not change their use. The factors associated with an increase versus a decrease in smoking were not clearly identified in the research. The overall certainty of this evidence is very low (GRADE), and findings are very likely to change as more evidence accumulates. • There was no clear effect of the COVID-19 pandemic on cessation or cessation attempts. Studies reported cessation rates of 8-21% among smokers since the pre-pandemic period, with 36-40% of smokers making a cessation attempt. However, the comparison of these cessation and attempt rates to pre-pandemic rates is generally not reported, so it is not possible to determine whether this was an increased rate. The overall certainty of this evidence is very low (GRADE), and findings are very likely to change as more evidence accumulates.	**NCCMT**	**09NOV2020**
Living Rapid Review Update 10: What is the specific role of daycares and schools in COVID-19 transmission?	• Based on the published reports to date from both prior to COVID-19 lockdown and following re-opening, the risk of transmission from children to children and children to adults in primary school and daycare settings appears low, when infection control measures are in place. The certainty of the evidence is low (GRADE), and findings may change as new data become available. • Within clusters and outbreaks, adult to adult transmission seems to be more common than child to adult or adult to child. Certainty of the evidence is very low (GRADE), and findings are very likely to change as new data become available.	**NCCMT**	**12NOV2020**

	• Implementation of infection control measures appear to be important to limiting spread as evidenced by several outbreaks where limited or no measures were in place. Across jurisdictions reviewed, there is wide variability in policies in place limiting the ability to evaluate the impact of specific infection prevention and control measures or make best practice recommendations for daycare or school settings due to variability in measures implemented.		
Rapid Review: What is known about the risk of COVID-19 transmission across different indoor settings in the community such as restaurants and gyms?	What is known about the risk of COVID-19 transmission across different indoor settings in the community? • Based on the limited available evidence, it is not possible to compare an individual's risk of infection across community settings or compare the risk of outbreaks or infection clusters across settings. Certainty of evidence is very low, and findings are very likely to change as more evidence becomes available. • Since the beginning of the pandemic, household and shared accommodation settings appear to be the most prevalent settings for clusters of infections or outbreaks to occur. • Certainty of evidence is low, and findings are likely to change as more evidence becomes available. What is known about the risk of COVID-19 transmission in indoor dining settings, such as restaurants and bars/nightclubs? • Reported attack rates in indoor restaurants, bars and nightclub settings are highly variable, ranging from 1.74%-45%. Certainty of evidence is very low, and findings are very likely to change as more evidence becomes available. • Reduced/poor ventilation and lack of physical distancing have been suggested as critical drivers of transmission risk in restaurant settings, however further evidence is needed to understand how infection prevention and control (IPAC) measures (e.g., mask wearing by patrons and staff) impact risk in these settings. Certainty of evidence is very low, and findings are very likely to change as more evidence becomes available. What is known about the risk of COVID-19 transmission in indoor physical activity settings, such as gyms and fitness centres? • Attack rates, reported only in few instances of outbreaks involving indoor fitness classes, are highly variable and range from 7.3%-26.3%. Transmission appears to occur more commonly from fitness instructors to participants. Certainty of evidence is very low, and findings are very likely to change as more evidence becomes available. • Factors that have been suggested to influence transmission risk in gym exposures include number of individuals within the facility, room size, length of exposure time, ventilation type, type of fitness activity, and viral load of infected source. Certainty of evidence is very low, and findings are very likely to change as more evidence becomes available.	**NCCMT**	**04NOV2020**
Evidence Brief of Potential Health Risks of Hard-Surface Disinfectants in Environments Shared by School-aged Children	There is limited evidence on the health risks of hard surface disinfectant use in school-aged children, this review demonstrates that: • Compared with previous years, reports on calls to poison control centres in both the United States (USA) and Canada have documented an increase in calls during the COVID-19 pandemic related to disinfectants and cleaners, with exposures frequently involving children. • Based on a consumer survey in the US, people using disinfectants may lack knowledge of their safe use and potential harms. • Studies of children that reside in homes with high disinfectant use have a higher frequency of skin and respiratory effects as well as sensitization to disinfectants. • Some cross-sectional studies have shown an association between the frequency of disinfectant use around children and health effects such as asthma and wheezing in young children. • Chloroform - one of the volatile organic compounds (VOCs) that can form when bleach comes into contact with other products or organic matter - has been found at unacceptable concentrations in several early childhood education centres; most of these centres reported using bleach regularly. • Overall, there remains considerable knowledge gaps in the literature on both the short- and long-term effects that may be experienced by children as a result of the increased use of hard-surface disinfectants.	**PHAC-ESG**	**08OCT2020**
A Rapid Review of Disinfectant Chemical Exposures and	• Surface disinfection is one of the interventions that is frequently recommended to reduce the risk of SARS-CoV-2 transmission. However, reports of acute health effects due to misuse and overexposure to disinfectants have been on the rise since early 2020. While businesses and facilities strive to implement more stringent cleaning and disinfection policies, some public health practitioners have raised concerns about the potential of disinfectants to increase the risk of asthma and wheezing. As such, there is merit for public health practitioners to provide clear recommendations about appropriate and safe cleaning and disinfection practices that would protect people from potentially harmful disinfectants while reducing the transmission risk of SARS-CoV-2.	**NCCEH**	**26OCT2020**

Health Effects During COVID-19 Pandemic			
Rapid Review Update 9: What is the specific role of daycares and schools in COVID-19 transmission?	• Based on the published reports to date from both prior to COVID-19 lockdown and following re-opening, the risk of transmission from children to children and children to adults in primary school and daycare settings appears low, particularly when infection control measures are in place. The certainty of the evidence is low (GRADE), and findings may change as new data become available. • Within clusters and outbreaks, adult to adult transmission seems to be more common than child to adult or adult to child. Certainty of the evidence is very low (GRADE), and findings are very likely to change as new data become available. • Implementation of infection control measures appear to be important to limiting spread as evidenced by several outbreaks where limited or no measures were in place. Across jurisdictions reviewed, there is wide variability in policies in place limiting the ability to evaluate the impact of specific infection prevention and control measures or make best practice recommendations for daycare or school settings due to variability in measures implemented.	**NCCMT**	**22OCT2020**
Evidence Brief on SARS-CoV-2 antibodies in patients that retest RT-PCR positive	• The rate of retesting positive (prevalence of RP) varied from 1.87% of discharged patients to 52.7% for an average of 16.5% from all studies (397/2412 patients). No study found a difference is sex distribution, but four of the nine studies found RP patients to be significantly younger than NRP patients. A wider review would be needed to explore this further. • Of six studies that reported on the positivity rate of patients for IgG or IgM antibodies, RP patients exhibited positivity rates that did not differ from the positivity rates of NRP patients. This indicates that the presence of IgG or IgM antibodies is unlikely to be predictive of retesting positive. • Of the four studies that reported on the level of IgG or IgM antibodies in serum, the results are mixed. One study found that the levels of IgM and IgG antibodies were significantly lower in RP patients than NRP patients. A second found no difference. The third found IgG to be significantly lower in RP patients but no difference in IgM levels. The fourth found no difference in IgG, but that IgM levels varied over time – initially RP patients had higher IgM titers (week 3 post discharge), but the levels of IgM antibodies eventually became significantly lower for RP patients compared to NRP patients (week 6-8 post discharge). This suggests that lower antibody levels might play a role in retesting positive after discharge, but the evidence is not conclusive at this point. • It is still unclear why patients retest positive. All nine studies took place in China, which enforced a mandatory 14-day quarantine following hospital discharge at separate facilities with individual rooms. Three studies that only followed patients during this period found up to 52.7% of patients retested positive. One plausible explanation for retesting positive within the two-week quarantine period is a 'reactivation' of the initial infection, following incomplete clearing of the virus. It is also possible that concentration of viral RNA in samples fluctuate during clearance of the virus resulting in two false negative results leading to discharge. In Zou et al., 2020, patients retested positive less often when required to have three negative PCR tests prior to hospital discharge, instead of the usual two. • One study demonstrated that some patients will retest positive more than once. Upon retesting positive, patients were re-hospitalized until discharged again following two consecutive negative RT-PCR tests, only to retest positive a second, third and even fourth time. Another study found that requiring three consecutive negative tests prior to discharge significantly reduced the chance of retesting positive. This indicates that false-negatives may play a role in retesting positive after discharge, although an additional review would need to uncover any additional literature on this topic.	**PHAC-ESG**	**09SEPT2020**
High-humidity Environments and the Risk of COVID-19 Transmission	This rapid review did not identify an elevated transmission risk for showers, steam rooms, or hot tubs as a result of high temperature (>30°C) and/or high humidity (>80% relative humidity). Based on the available data, high relative humidity and high temperature appear to increase airborne mass deposition and decrease the viability of virus in both airborne particles and on surfaces. However, there is uncertainty as to whether SARS-CoV-2 aerosolized in human secretions may remain viable longer than those generated artificial media. In addition, any decrease in viability does not alleviate the need to maintain physical distancing, as well as adequate cleaning, disinfection, and ventilation (where appropriate).	**NCCEH**	**16OCT2020**
Rapid Review: What risk factors	What risk factors are associated with COVID-19 outbreaks and mortality in LTC facilities?	**NCCMT**	**16OCT2020**

are associated with COVID-19 outbreaks and mortality in long-term care facilities and what strategies mitigate risk?	• Across studies, incidence in the surrounding community was found to have the strongest association with COVID-19 infections and/or outbreaks in LTC settings. The certainty of the evidence is moderate. • Several resident-level factors including, racial/ethnic minority status, older age, male sex, receipt of Medicaid or Medicare were associated with risk of COVID-19 infections, outbreaks and mortality; severity of impairment was associated with infections and outbreaks, but not mortality. The certainty of the evidence is low (GRADE) and may change as more data become available. • At the organizational level, increased staffing, particularly Registered Nurse (RN) staffing was consistently associated with reduced risk of COVID-19 infections, outbreaks and mortality while for-profit status, and facility size/density was consistently associated with increased risk of COVID-19 infections, outbreaks and mortality. The certainty of the evidence is low and may change as more data become available. What strategies mitigate risk of outbreaks and mortality within LTC? • Most guideline recommendations include surveillance, monitoring and evaluation of staff and resident symptoms, and use of personal protective equipment (PPE). The certainty of the evidence is low and may change as more data become available. Other interventions demonstrating some effect on decreased infection rates within syntheses and a small number of single studies include promotion of hand hygiene, enhanced cleaning measures, social distancing, and cohorting. The certainty of the evidence is low and may change as more data become available. • Technological platforms and tools (e.g., digital contact tracing, apps, heat maps) are being developed and show potential for decreased transmission through efficient case and/or contact identification that further informs infection control planning strategies. The certainty of the evidence is very low and may change as more data become available.		
Rapid Review: What factors may help protect Indigenous peoples and communities in Canada and internationally from the COVID-19 pandemic and its impacts?	• Indigenous peoples and communities have experience with pandemics and disease outbreaks and have learned effective ways of responding and protecting family and community members, despite socio-economic challenges and pervasive inequities resulting from historic and ongoing colonization. • Indigenous peoples and communities in Canada and internationally draw on community strengths and protective factors to reduce the risk of COVID-19 outbreaks and impacts. Indigenous community resilience in the face of the COVID-19 pandemic is exemplified through many factors, most of which can be found across evidence from Canada and the USA, Australia, New Zealand and other international jurisdictions. Prominent protective factors include: o Community strengths o Indigenous knowledges and practices o Caring for family and community members o Community-centred communication • Community-driven and controlled public health measures	**NCCMT**	**16OCT2020**
Rapid Review: What are best practices for risk communication and strategies to mitigate risk behaviours?	• The risk communication literature from a variety of topic areas emphasizes the importance of clear, repeated action-oriented messaging by a trusted leader (e.g., community leader, trusted public health professional, etc.). The certainty of the evidence is moderate. • Trust in both the message and the person delivering the message can be built by addressing uncertainty and acknowledging changing recommendations and information or previous errors. The certainty of the evidence is low and may change as more data become available. • Communications should be tailored to target audiences by both message and medium; stakeholder engagement is important to identify the most appropriate message framing and medium of the message. The certainty of evidence is moderate. • Positively framed messages emphasizing a collective vs. individual approach may be more effective. The certainty of the evidence is low and may change as new data become available.	**NCCMT**	**08OCT2020**

Evidence Brief on Ethnicity and COVID-19	• Regarding ethnicity and COVID-19, two systematic reviews with literature up to May 15 and June 15, sixty-seven individual studies published since May 15 and four of five Canadian studies or reports were identified in the grey literature and are included in this review. There were 34 studies that assessed COVID-19 risk of infection, 31 on severity of disease and 22 studies on mortality. Most of the research came from the USA and UK. There were two studies from France and one study from Brazil. Studies from Canada included a prepublication of an ecological study and two cross-sectional surveys and two relevant surveillance reports were identified in the grey literature. • This is the second version of this review. The first included a systematic review that summarized studies to May 15 and primary research published May 15 -30. This update added studies published between June 1 and Sept 7 including an additional systematic review with studies up to June 15. Analysis of studies captured in the tables and the new systematic review identified 15 studies which are marked with an asterisk. • Risk of Infection o One systematic review included risk of infection and concluded across studies Blacks, Asians and Hispanics were more likely to test positive for COVID-19 compared to Whites (D. Pan, 2020). o Twenty-nine studies examined risk of infection among different ethnic groups from people tested by RT-PCR for active infection and four seroprevalence studies measured risk of exposure. Multivariable analyses with age, sex, comorbidities and socioeconomic variables attenuated associations with specific ethnicities, but in many studies the association was still significant: ▪ Among twenty studies from the USA, compared to Whites, a higher risk of infection among Blacks (six adjusted and three univariate results) and Hispanics (six adjusted and six univariate results) were reported and conflicting data on Asians (two adjusted, and one univariate association and two no association results). One USA study reported a higher risk of infection among American Indians and Alaskan natives (Hatcher, 2020). ▪ Fourteen studies from the UK, compared to Whites, consistently identify Black (nine adjusted results), South Asian (four adjusted results), Asian (three adjusted results) and more generally BAME groups (one adjusted and two univariate and one no association result) at higher risk of infection, whereas the results for other ethnicities were rarely reported. • COVID-19 Severity Outcomes o Outcomes of COVID-19 severity (hospitalization, ICU admission and mechanical ventilation) were reported in two systematic reviews and thirty one studies reported associations for different ethnicities compared to Whites. ▪ For hospitalization: The systematic review reports meta-analyses of univariate associations compared to Whites for Blacks (overall countries) and for Asians (UK only), with a significantly higher magnitude association from UK studies and the adjusted analyses (age, sex and comorbidities) reported no association. Across individual studies from the USA, Blacks were found to have higher risk of hospitalization; for Asians and Hispanics there were mixed results. Mixed results from two USA studies reported on the proportion of American Indians, Alaskan Natives hospitalized (Alvarez Retamales, 2020; Karaca-Mandic, 2020). No association with Pacific Islander hospitalizations was reported in two studies (Alvarez Retamales, 2020; McPadden, 2020). In the UK, Blacks and South Asians had a higher risk of hospitalization; for Asians, mixed ethnicity or BAME groups the findings were inconsistent. ▪ For ICU admission: The systematic review findings reported Asian and BAME ethnicities in UK studies were over-represented in the ICU, however the meta-analyses reported no association in adjusted analysis for Blacks, Hispanics and Asians (USA only). New studies in the USA had conflicting results for Blacks and Hispanics. In the UK, Blacks, South Asians and BAME had higher risk of admission. ▪ For mechanical ventilation: Eighteen studies in the systematic review reported no association for Blacks and Hispanics, however Asians (four studies) had an association with ventilation that persisted with age and sex adjusted analysis. Few recent studies looked at the risk of ventilation by ethnicity; one from the USA reported no association for Blacks and Hispanics and a study from the UK indicated Blacks and Asians were at increased risk compared to Whites. o Multisystem Inflammatory Syndrome in Children (MIS-C) and ethnicity was reported in three studies one prospective cohort (ISARIC study, (Swann, 2020)) and two small case series from the UK and France (Riphagen, 2020; Toubiana, 2020). Across these studies a disproportionate number of MIS-C cases occurred in non-White ethnicities. No further analysis was conducted in these studies.	**PHAC-ESG**	**22SEPT2020**

	• COVID-19 Mortality
	  ○ The systematic reviews reported no association with Blacks or Asians, and a protective association identified for Hispanics in univariate analyses, however the association did not persist in models adjusted for age, sex and comorbidities. An association with Asians who required mechanical ventilation due to COVID-19 was reported (4 studies). It is important to note there was high heterogeneity across studies and both reviews describe approximately 50% of studies reporting an association and the others report no association.
	  ○ In the USA and the UK twenty-two studies analysed mortality among hospitalized patients and did not report an association with ethnicity. However, when considering a population level denominator, certain ethnic groups were more likely to acquire COVID-19 disease, so proportionally they represent a higher than expected number of COVID-19 deaths. In UK studies that identified an association across all COVID-19 cases, there was an increased risk of mortality among BAME, Blacks, South Asians and Asians compared to Whites.
	• Canadian studies
	• Despite an additional grey literature search, limited Canadian evidence was identified. Available Canadian data suggest non-White ethnicities, with the exception of East Asians, are disproportionately infected with COVID-19. The analyses largely did not adjust for comorbidities or socio-economic factors that attenuated results in other studies in this review. No Canadian data on ethnicity and hospitalizations, severity or mortality was identified.
	  ○ A cross-sectional survey designed to compare COVID-19 impacts on Black Canadians to a representative "national" sample reported a higher likelihood of COVID-19 among Black Canadians individually and among people they know. Black Canadians had a higher frequency of risk factors such as taking public transportation and having a job that requires face-to-face interactions with people. They also had a higher frequency of severe financial impacts associated with the pandemic. These data are consistent with similar studies published in the USA.
	  ○ Toronto Public Health dashboard shows that a higher proportion of COVID-19 cases than the representation in the community was seen for Black, Hispanic, Southeast Asian, South Asian/ Indo-Caribbean and Middle Eastern ethnic groups.
	  ○ The ecological study analysed population data on number of COVID-19 cases and deaths in Canada by population level demographic information including proportion Black, proportion foreign-born, proportion over 65 years, population density and median income. Findings from their multivariable analysis include:
	  ▪ A 1% increase in the proportion Black in a health unit was associated with double the case count. A 1% increase in the proportion foreign-born residents was associated with a 3% increase in the case count.
	• A 1% increase in the proportion of Black residents in the health region was associated with 2.1x increase in COVID-19 death rates.		

Rapid Review Update 8: What is the specific role of daycares and schools in COVID-19 transmission?	• Based on the published reports to date from both prior to COVID-19 lockdown and following re-opening, the risk of transmission from children to children and children to adults in primary school and daycare settings appears low, particularly when infection control measures are in place. The certainty of the evidence is low (GRADE), and findings may change as new data become available. • Within clusters and outbreaks, adult to adult transmission seems to be more common than child to adult or adult to child. Certainty of the evidence is very low (GRADE), and findings are very likely to change as new data become available. • Implementation of infection control measures appear to be important to limiting spread as evidenced by several outbreaks where limited or no measures were in place. Across jurisdictions reviewed, there is wide variability in policies in place limiting the ability to evaluate the impact of specific infection prevention and control measures or make best practice recommendations for daycare or school settings due to variability in measures implemented.	**NCCMT**	**05OCT2020**
Rapid Review: Food security: What is the impact of COVID-19 and related	• In a limited number of studies that provided comparisons to pre-pandemic levels, increases in food insecurity during COVID-19 lockdown measures were reported. Three studies, in Bangladesh, the USA, and the UK, self-reported changes in rates of food insecurity from pre-pandemic to the early months of the pandemic: levels grew from 5.6% to 36.5%; 18.8% to 24.8%; and 7.6% to 16.2% in these three studies respectively. Prevalence varied across populations and settings. Two studies from the USA examined rates among populations who were food secure prior to the pandemic and reported rates of 30% having low or very low food security during the pandemic. The overall certainty of this evidence is very low (GRADE), and findings are very likely to change as more evidence accumulates.	**NCCMT**	**25SEPT2020**

public health measures?			
Rapid Review Update 3: What is known on the potential for COVID-19 re-infection, including new transmission after recovery?	• Across studies, the rates of re-detection following a previous negative test range from 3% to 30%, with one meta-analysis calculating the mean rate of re-detection as 14.8% and another at 16%, based on included studies that were generally low or moderate quality. The overall certainty of this evidence is very low (GRADE), and findings are very likely to change as more evidence accumulates. • Despite evidence of cases testing positive after having recovered, most syntheses and studies find no evidence of actual COVID-19 re-infection. The detection of re-positive cases is thought to be due to ongoing virus shedding or testing inaccuracies (such as false positives at the initial or follow-up test, or false negatives indicating that the virus had cleared). The Azam meta-analysis reported the pooled estimate of the interval from negative test to repeat positive test to be 9.76 days, and Osman reported an interval of 12 days. The overall certainty of this evidence is very low (GRADE), and findings are very likely to change as more evidence accumulates. • To date there is no evidence in the included syntheses and studies that re-positive cases can transmit the infection to contacts. Evidence that the virus is viable for a median of 9 days is in line with current isolation periods. The RT-PCR test detects the presence of viral nucleic acid, but the test does not differentiate between live (or viable) and non-infective virus. The overall certainty of this evidence is very low (GRADE), meaning that the findings are very likely to change as more evidence accumulates.	**NCCMT**	**28SEPT2020**
Rapid Review Update 1: What is the effect of the COVID-19 pandemic on opioid and substance use and related harms?	• Minimal cohort, cross-sectional and surveillance evidence is available on the effects of the COVID-19 pandemic on opioid and substance use, including overdoses and deaths, and these findings show increases during the COVID-19 pandemic in some jurisdictions, and decreases or steady levels in others. • Very limited research evidence exists related to the effect of the COVID-19 pandemic on opioid and substance use and related harms. The overall certainty of this evidence is very low (GRADE), and findings are very likely to change as more evidence accumulates. • To date, most of the available evidence is based on previous experiences during pandemics and similar events: o People who use substances may have reduced access to harm-reduction and treatment services. o There may be a disruption to the supply of illicit drugs in Canada, affecting availability and cost, and increasing the risk of drug adulteration. • Surveillance data within Canada were identified from several jurisdictions (provincial and regional). No clear pattern of change was observed. Opioid-related overdoses and deaths are influenced by many factors, and it is not certain that changes in these outcomes that occurred during the COVID-19 pandemic are a result of public health measures to reduce the spread of the virus. The variety of indicators (e.g., naloxone administration, emergency calls for overdose, hospitalization for overdose), and the inconsistency in measurement periods and relevant comparators mean that observed trends may not be reliable. • Preliminary research and expert opinion are providing some direction to service providers and people who use illicit drugs, and this direction is summarized in this review. The uptake, feasibility and effectiveness of these strategies is not known. Some models exist aimed at modifying harm reduction or treatment strategies for implementation during the COVID-19 pandemic, as well as strategies to minimize the risk of COVID-19 infection among people who use substances. The overall certainty of this evidence is very low (GRADE), and findings are very likely to change as more evidence accumulates.	**NCCMT**	**21SEPT2020**
Rapid Review Update 7: What is the specific role of daycares and schools in COVID-19 transmission?	• Based on the published reports to date from both prior to COVID-19 lockdown and following re-opening, the risk of transmission from children to children and children to adults in primary school and daycare settings appears low, particularly when infection control measures are in place. The certainty of the evidence is low (GRADE), and findings may change as new data become available. • Within clusters and outbreaks, adult to adult transmission seems to be more common than child to adult or adult to child. Certainty of the evidence is very low (GRADE), and findings are very likely to change as new data become available. • Implementation of infection control measures appear to be important to limiting spread as evidenced by several outbreaks where limited or no measures were in place. Across jurisdictions reviewed, there is wide variability in policies in place limiting the ability to evaluate the impact of specific infection prevention and control measures or make best practice recommendations for daycare or school settings due to variability in measures implemented.	**NCCMT**	**23SEPT2020**

Evidence Brief of COVID-19 quarantine length reduction strategies and effectiveness	• A very limited number of publications were identified in this review (n=6). Two studies provide epidemiological data in the community (n=1) and for travellers (n=2); and four quantitative models compare alternative quarantine strategies in the community (n=1) and for travellers (n=3).
	• Two epidemiological studies have documented that the 14-day quarantine period for both case contacts and travellers was successful in preventing community transmission.
	• Quantitative models (n=4) concur that the 14 day quarantine strategy is effective and explore several alternative scenarios for quarantine and test strategies.
	  ○ Longer strategies and the addition of an RT-PCR test are more effective. For travellers, this equated to a 0.1% risk that a person was infectious when released from quarantine (Steyn, et al., 2020).
	  ○ Shorter quarantines (over eight days) with at least one test completed near the end of the quarantine were fairly equivalent to 14 days with no test (Quilty et al, 2020; Steyn, et al., 2020), scenarios with less than eight days showed effectiveness decrease as quarantine length decreases (5-8 days).
	  ○ Testing travellers on arrival and not quarantining those with a negative result were variable, 55-90% effective, across studies.
	  ○ Testing close to the end of the quarantine period was the most effective time point in most scenarios, because individuals initially in the incubation period have a longer time for virus load to increase and thus be detected.
	  ○ Testing multiple times during the quarantine period resulted in minimal reduction in the risk of releasing an infectious person into the community compared to testing one time close to the end of quarantine.
	• Evidence from quantitative models suggests strategies of testing to reduce quarantine length are not equally effective when used for community contacts and travellers.
	  ○ For example, testing travellers on arrival may identify a large proportion of infected cases, whereas testing case contacts immediately is much less effective as they are still early in their incubation period.
		PHAC-ESG	**14SEPT2020**

Rapid Review of Infectious Period	• Overall, the best available evidence indicates infectious period for most symptomatic cases is considered to start on average 2.5 days before developing symptoms, peak around day 4 of symptoms and decrease to low levels within 8-10 days after the start of symptoms for a total of 10-13 days. The asymptomatic infectious period has been found to be similar. Longer infectious periods have been documented in more severe or immunocompromised cases (18-32 days post symptom onset).
	• Pre-symptomatic Infectious Period, N=25 studies
	  ○ Viable virus has been cultured from respiratory samples of pre-symptomatic cases 1-6 days before symptom onset as determined by medical observation (Table 1). Viable virus has also been cultured from gastrointestinal samples; for example a rectal sample showed evidence of active SARS-CoV-2 viral replication three days prior to symptom onset (Qian et al., 2020).
	  ○ Studies utilizing RT-PCR to detect viral RNA from respiratory samples also suggest that shedding occurs on average 2.5 days (1-7 range) prior to symptom onset.
	• Asymptomatic Infectious Period, N=25 studies
	  ○ Viable virus and viral RNA detected in a cohort of asymptomatic cases was highest during the first week of infection and declined in subsequent weeks (Quicke et al., 2020). Infectious virus was not detected by plaque assay in nasopharyngeal swabs from individuals with less than 100,000 RNA copies/swab.
	  ○ There has been little consensus about whether asymptomatic and mildly symptomatic infections differ in viral shedding time (Table 2). Based on the current evidence, the total infectious period of asymptomatic cases appears to be similar or shorter than that of mildly symptomatic cases. Across studies, similar viral loads have been reported for asymptomatic, pre-symptomatic, and symptomatic cases.
	• Symptomatic Infectious Period, N=107 studies
	  ○ Viable virus, culture results, N=18 primary research studies and 2 systematic reviews:
	  ▪ For mild cases, the best estimate for the infectious period, measured from self-reported symptom onset using virus culture from respiratory samples, is 8-10 days with a peak in viral load during the first week of illness (Table 3).
		PHAC-ESG	**14SEPT2020**

	▪ Cases of prolonged viable viral shedding (18-32 days) have been documented using virus culture in a few studies. Many of these studies are still in preprints and include single cases or small sample sizes (Table 3). These cases are typically individuals with severe infection, who are either immunocompromised, or have multiple chronic underlying health conditions. ▪ There are a few studies that have cultured SARS-CoV-2 from the fecal/rectal samples of a confirmed case (Table 3). A recent study of inoculated ferrets has confirmed the presence of infectious SARS-CoV-2 in fecal and urine specimens from days 11, 13 and 15 of illness (Jeong et al., 2020). o Viral RNA detection, RT-PCR results, N=88 primary research studies and 6 systematic reviews: ▪ Most studies report time from self-reported symptom onset or test positive diagnosis to time viral infection has been cleared, determined via RT-PCR. Positive RT-PCR results are not proof of infectiousness. ▪ Viral RNA presence varies widely by sample type. Respiratory swabs typically become negative within 14-20 days of self-reported symptom onset, while stool samples remain positive a few days to four weeks longer than respiratory samples. Evidence of SARS-CoV-2 RNA has also been identified in eye swabs up to 22 days post onset of self-reported symptoms. ▪ Extended periods of viral RNA shedding have been reported (up to 83 days) in respiratory samples, with shedding frequently outlasting the duration of symptoms. However, concentrations of viral RNA measured in upper respiratory samples has been shown to decline after symptom onset and there has been no evidence of transmission in clinically recovered individuals with persistent detection of viral RNA nor has there been viable virus isolated from such cases. ▪ Prolonged viral RNA shedding has been shown to be positively associated with severity of COVID-19 and older age in multiple studies (Table 3). However, a recent meta-regression identified that the reported average of four days longer duration of viral RNA shedding in severe cases was not statistically significant (Byrne et al., 2020). The length of viral RNA shedding does not significantly differ between male and female. • Recurrence of Viral Shedding in Convalescent Period, N=55 studies o Recurrence of viral RNA shedding in the convalescent period after meeting discharge criteria (defined at the time as two consecutive negative RT-PCR tests) has been reported in multiple case reports and observational studies (Table 4). These cases are not thought to be re-infection with a new strain of the virus, instead are considered to have not fully cleared the original SARS-CoV-2 infection. ▪ Recurrence typically occurs within seven days of discharge. ▪ Following recurrence, patients remained viral RNA positive for approximately 1-8 days and typically remained asymptomatic. ▪ Although this is an active area of study and numerous new studies have been published, to date, only one study has provided evidence of viable virus in a recurrent case (Quicke et al., 2020). No evidence of transmission during the recurrence of viral RNA detection has been reported. o Additional research is needed to improve our understanding of RT-PCR results and how to interpret those results with respect to infectious period and risk of transmission. Particularly in cases with prolonged RT-PCR positive test results. As a result, the CDC has stopped recommending two consecutive negative RT-PCR tests to determine when to end isolation and precautions for COVID cases. • Reinfection, N=2 studies o Since August 25, 2020, good evidence that reinfection can occur has been reported (Table 5): ▪ A patient from Hong Kong was reinfected 142 days after initial infection and this was documented with compelling epidemiological, clinical, serological evidence as well as genomic analyses. (To, Hung, et al., 2020). ▪ There is also strong evidence for a case of re-infection in the United States (Tillet et al., 2020). o At this time, knowledge gaps exist on whether clinical course and epidemiological characteristics including infectious period of re-infection cases are different from the initial infection. • Additional research is needed to understand the role of immunity in protection against SARS-CoV-2 post infection.		

Rapid Review on the Risk of COVID-19 Outbreaks in the Workplace	• Outbreaks have been associated with many types of workplaces and occupations.
	  ○ In addition to the known risk to healthcare professionals, the occupations most at risk of SARS-CoV-2 infection include drivers and transport workers, service and sales workers, food industry, personal care occupations, food production workers, preschool occupations, community and social services occupations (e.g. social workers, counselors), construction and related trades occupations, and public safety workers (e.g. correction officers, police, firefighters).
	  ○ The majority of these require workers to have frequent contact with clients, work on customers' premises, or in public spaces. Many of these occupations do not allow employees to work from home.
	• Workplace clusters have occurred across a wide range of workplaces and circumstances that resulted in transmission.
	  ○ Most of the workplace clusters were traced to an asymptomatic or very mild symptomatic index case.
	  ○ Thirty-seven publications describe one or more transmission events considered to have occurred in a workplace involving workers broadly captured under the categories: office environment, meat processing facilities, other factories, migrant work, fitness centers, ships, other service related occupation, and transportation.
	  ○ Eight COVID-19 clusters in workplaces with employer-provided accommodations were identified. Shared accommodation results in close contact of workers for long durations of time.
	  ○ There is limited evidence on COVID-19 clusters resulting from transportation or commuting to the workplace. Shared transportation to and from the workplace was determined as a risk factor for exposure to SARS-CoV-2 in outbreaks at meat processing facilities.
	  ○ COVID-19 clusters resulting from work-related travel were identified in five publications. Risk factors identified related to the proximity and length of time secondary cases spent with the primary cases (e.g. sitting at the same table during a meal or meeting).
	  ○ Three COVID-19 clusters resulting from social gatherings of co-workers outside of the workplace were identified. In all three scenarios, the infections acquired during the social gathering of co-workers resulted in additional infections in the workplace.
	• Risk factors for SARS-CoV-2 infection identified in the workplace include difficulties adhering to physical distancing, lack of hand hygiene, poor ventilation/air circulation design, and crowded working, transportation and/or accommodation conditions.
	  ○ The main facilitators for SARS-CoV-2 transmission in an office setting include close contact, duration of interaction, shared common areas, and work-related travel.
	  ○ Socio-demographic factors and occupation were examined to explore determinants of SARS-CoV-2 exposure. Being female, a visible minority, and being in a low-income bracket were associated with employment in occupations associated with significantly higher risk of exposure to COVID-19 which typically do not allow working from home and involves working in close proximity to other people. Conversely, increasing age and higher education was associated with lower risk of exposure occupations.
	  ○ The risk factors for infection in meat processing facilities were identified as difficulties with physical distancing, prolonged close contact with coworkers for long periods of time, hand hygiene, shared accommodation, shared transportation to and from work, and frequent community contact with fellow workers. These risk factors were also identified for outbreaks on ships.
	  ○ In addition to SARS-CoV-2 activity in the community, the activities a worker engages in outside of the workplace will determine the individual risk that a person brings to the organization.
	  ○ Several studies report increased risk of exposure to SARS-CoV-2 proportional to the number of contacts related to the workers job. For example grocery store employees with direct customer exposure were five times more likely to test positive for SARS-CoV-2 (OR 4.7; 95% CI: 1.2-32.0). A similar finding was reported for firefighters and paramedics in a second study.
	  ○ Shared accommodation or facilities (e.g. bathroom) and a lack of preventative measures (e.g. face mask) have been suggested to contribute to several outbreaks in shopping malls, retail stores, bars, nightclubs, restaurants, concerts, and overnight camps.
	  ○ Outbreaks are more likely to occur in an indoor environment OR 18.7 (95%CI 6.0-57.9).
		PHAC-ESG	**14SEPT2020**

	• Two risk assessments explored the attributes of workplaces for their potential for SARS-CoV-2 transmission.
	  ○ In a risk assessment a 1% increase in the density of super spreading businesses (SSB - based on the frequency, duration, and square footage of businesses pre-pandemic) equated to a 5% increase in cases. The most common SSBs were full service restaurants, limited service restaurants, and hotels/motels.
	  ○ The potential health risks of SARS-CoV-2 in sewage to wastewater treatment plant workers (WWTPs) was investigated using a quantitative microbial risk assessment (QMRA). Duties close to sewage tanks were considered high risk of exposure and protection such as face mask, eye protection, and/or face shields were recommended.
	• Strategies to reduce the risk of SARS-CoV-2 transmission in the workplace were identified in 21 publications (Table 7).
	  ○ Successful prevention strategies included limiting social contact (restricting activities in the workplace, cohorting or staggering employees, and telework), policies on exclusion of sick workers from the work environment, providing workplace guidelines, and provision of personal protective equipment.
	  ○ Monitoring strategies explored the mode (worker or environmental sampling) and frequency of sampling for effective identification of transmission or circulating SARS-CoV-2 in the workplace and how the level of SARS-CoV-2 in the community impact sampling strategies.
	  ○ Lifting public health measures were explored to minimize a resurgence, while allowing the economy to slowly re-open.
	• Management of migrant workers, particularly their movement from place to place was discussed in three publications from China and India. Strategies included screening and quarantine protocols to limit the importation of SARS-CoV-2 into an unaffected area.		

Rapid Review Update 6: What is the specific role of daycares and schools in COVID-19 transmission? (Update)	• Based on the published reports to date from both prior to COVID-19 lockdown and following re-opening, the risk of transmission from children to children and children to adults in primary school and daycare settings appears low, particularly when infection control measures are in place. The certainty of the evidence is low (GRADE), and findings may change as new data become available. • Within clusters and outbreaks, adult to adult transmission seems to be more common than child to adult or adult to child. Certainty of the evidence is very low (GRADE), and findings are very likely to change as new data become available. • Implementation of infection control measures appear to be important to limiting spread as evidenced by several outbreaks where limited or no measures were in place. Across jurisdictions reviewed, there is wide variability in policies in place limiting the ability to evaluate the impact of specific infection prevention and control measures or make best practice recommendations for daycare or school settings due to variability in measures implemented.	**NCCMT**	**14SEPT2020**

Rapid Review of COVID-19 hospitalizations and length of stay (Update)	• The average percentage of hospitalization of COVID-19 cases varied 11%-77% over the study population. Older age groups had increasing proportion hospitalized.
	• The percentage of admission to Intensive Care Unit (ICU) of COVID-19 cases varied from:
	  ○ 1% to 32% among infected patients
	  ○ 12% to 40% among hospitalized patients
	• The percentage of patients requiring ventilation varied from:
	  ○ 1% to 13% among infected patients
	  ○ 5% to 19% among hospitalized (including ICU) patients
	  ○ 28% to 94% among patients in ICU; the two recent studies were 92% and 94%
	• The length of stay (LOS) for hospitalization (including ICU) of COVID-19 cases median days across studies was 4-19 days with an interquartile range (IQR) of 3 to 27 days:
	  ○ Among survivors median LOS for hospitalization varied from 5 to 9 days with a IQR of 3 to 13
	  ○ Among non-survivors median LOS for hospitalization varied from 4 to10 with a IQR of 3 to 16
	• The median length of stay in ICU varied from 4 to 23 days with a IQR of 2 to 32 days among all patients in ICU
	  ○ Among survivors, median LOS in ICU varied from 8 to 26 days with a IQR of 5 to 46 days
	  ○ Among non-survivors, median LOS in ICU varied from 6 to 12 days with a range of 2 to 26 days
		PHAC-ESG	**11SEPT2020**

	• Median duration of ventilation for patients who required mechanical ventilation was 6 to 13 days with a range of 5 to 22 days. • In August 2020, MMWR published an analysis of pediatric COVID-19 hospitalization data from 14 states (L. Kim et al., 2020a). It found that although the cumulative rate of COVID-19–associated hospitalization among children (8.0 per 100,000 population) was low compared with that in adults (164.5), the hospitalization rates among Hispanic was eight times higher, and among black children was five times higher, than the rate in white children. An underlying medical condition was present in 42% of the children; obesity was the most prevalent underlying medical condition. o Hospitalization rate was highest for those under 2 years of age (24.8 per 100,000 population). o One third of hospitalized patients were admitted to the ICU (33.2%) o The proportion of hospitalized patients requiring invasive mechanical ventilation was 5.8% o The median LOS in hospital overall was 2.5 days with a range of 1 to 5 days • The median LOS in ICU was 2 days with a range of 1 to 5 days		
Rapid Review Update 5: What is the specific role of daycares and schools in COVID-19 transmission? (Update)	• Based on the published reports to date from both prior to COVID-19 lockdown and following re-opening, the risk of transmission from children to children and children to adults in primary school and daycare settings appears low, particularly when infection control measures are in place. The certainty of the evidence is low (GRADE), and findings may change as new data become available. • Within clusters and outbreaks, adult to adult transmission seems to be more common than child to adult or adult to child. Certainty of the evidence is very low (GRADE), and findings are very likely to change as new data become available. • Implementation of infection control measures appear to be important to limiting spread as evidenced by several outbreaks where limited or no measures were in place. Across jurisdictions reviewed, there is wide variability in policies in place limiting the ability to evaluate the impact of specific infection prevention and control measures or make best practice recommendations for daycare or school settings due to variability in measures implemented.	**NCCMT**	**08SEPT2020**
Rapid Review Update 1: Is there an increased risk of adverse maternal or fetal outcomes in women infected with COVID-19 during pregnancy?	• Maternal outcomes: Overall, the available evidence shows a low risk of adverse maternal outcomes associated with COVID-19 infection, although most studies do not compare rates to those of non-infected women. The overall certainty of this evidence related to maternal outcomes is very low (GRADE), and findings are very likely to change as more evidence accumulates. • Labour and delivery outcomes: A meta-analysis showed no difference in the rate of preterm birth among women infected with COVID-19 infection compared to non-infected women. Syntheses report rates of pre-term birth between 20-39% of cases, and a rate for cesarean deliveries among women with COVID-19 of between 48-96% (although the clinical indications for cesarean in these cases are not well described), and the limited available evidence suggests that vaginal delivery can be safe. The overall certainty of this evidence related to labour and delivery outcomes is very low (GRADE), and findings are very likely to change as more evidence accumulates. • Fetal and neonatal outcomes: A meta-analysis found no difference in rates of low birthweight for infected versus non-infected pregnant women. Rates of fetal death and stillbirth are between <1-10%. In syntheses reporting on neonatal COVID-19 infection, between 0-7% of neonates were infected, although it is not known if they were infected before or during delivery, or after delivery through exposure to infected health care workers. There is no definitive evidence of vertical transmission. The overall certainty of this evidence related to fetal and neonatal outcomes is very low (GRADE), and findings are very likely to change as more evidence accumulates.	**NCCMT**	**03SEPT2020**
Rapid Review Update 2: What is known on the potential for COVID-19 re-infection, including new	• Across studies, the rates of re-detection following a previous negative test range from 3% to 30% with one meta-analysis calculating the mean rate of re-detection as 14.8%; the overall certainty of this evidence is very low (GRADE), and findings are very likely to change as more evidence accumulates. • Despite evidence of cases testing positive after having recovered, most syntheses and studies find no evidence of actual COVID-19 re-infection. The detection of re-positive cases is thought to be due to ongoing virus shedding or testing inaccuracies (such as false positives at the initial or follow-up test, or false negatives indicating that the virus had cleared). The Azam meta-analysis reported the pooled estimate of the interval from negative test to repeat positive test to be 9.76 days. The overall certainty of this evidence is very low (GRADE), and findings are very likely to change as more evidence accumulates.	**NCCMT**	**28AUG2020**

transmission after recovery?	• To date there is no evidence in the included syntheses and studies that re-positive cases can transmit the infection to contacts. Evidence that the virus is viable for a median of 9 days is in line with current isolation periods. The RT-PCR test detects the presence of viral nucleic acid, but the test does not differentiate between live (or viable) and non-infective virus. The overall certainty of this evidence is very low (GRADE), meaning that the findings are very likely to change as more evidence accumulates.		
Evidence to support safe return to clinical practice by oral health professionals in Canada during the COVID-19 pandemic: A report prepared for the Office of the Chief Dental Officer of Canada	• The searches identified strong evidence for a number of conditions that increase the risk of individuals diagnosed with COVID-19 having potentially serious consequences such as hospitalization, ventilation and mortality. These conditions are hypertension, diabetes, cardiovascular and coronary artery disease, chronic respiratory diseases, kidney disease and liver disease. There is also strong evidence that people aged 65 years or older are at similar risk. The evidence concerning sex-related risk is however equivocal. Strong evidence also exists concerning the most common signs and symptoms of COVID-19, which are fever, cough, fatigue and muscle aches and shortness of breath. All these factors and others listed in the summaries below should be considered as part of the pre-treatment screening strategies used by oral health professionals. In reviewing evidence for non-treatment management of in-person care episodes during the pandemic, there was little evidence directly related to the topic in dental care settings. However, we identified evidence regarding aerosolization in health care settings, supporting the use of N95 respirators, surgical masks and eye protection by staff and showing that influenza virus is the most commonly transmitted disease in long term care facilities so good infection control measures need to be in place to prevent transmission of this and similar viruses. We also identified research raising questions concerning infection control measures in place in dental laboratories and work identifying the need for training of professionals and compliance with infection control protocols. We also highlight the possibility of using tele-dentistry for certain forms of health care as an alternative to in-person care. • With respect to the use of PPE by professionals providing care, the available evidence is of limited strength but shows that N95 respirators and surgical masks are equivalent at least in the provision of non-aerosol generating procedures and that training personnel in the donning and doffing of PPE is important in reducing contamination. The discomfort of various forms of PPE, including N95 respirators, is mentioned as contributing to them being less effective than perhaps expected. We identified good evidence that N95 respirators can be disinfected with vaporized hydrogen peroxide for one re-use but no evidence to support re-use of surgical masks. • With respect to the use of aerosol-generating procedures (AGPs), the evidence was not strong. We identified one study reporting a large increase in bioaerosol in dental clinics during the work period and a subsequent fall once that work had finished, plus other work confirming a broad range of pathogens in bioaerosols in health care settings, including dental offices. No evidence was available concerning the risk of transmission or contamination with dental AGPs. • With respect to mitigating strategies during dental procedures, the strongest evidence was identified supporting the use of chlorhexidine as a pre-procedural mouth rinse to reduce bacteria in bioaerosols prior to dental procedures. This was supported by oral chlorhexidine preventing pneumonia and other respiratory morbidity in ventilated and cardiac surgery patients. It is interesting to note that a very recently published Cochrane rapid review of international guidelines concerning AGPs and their mitigation in dental care stated: "There is a lack of evidence provided to support the majority of recommendations in the documents." • Our review of ventilation systems found that sophisticated systems used in hospitals reduce bioaerosol levels and that ventilation systems can reduce the transmission of infectious diseases, although it is not clear what specific ventilation strategies are effective in different settings. And our review of the disinfection of inanimate surfaces demonstrated that many pathogens including viruses can remain viable on such surfaces for days if disinfection strategies are not used. Our search identified chlorine-based disinfectants as effective, although it is not clear what concentrations are required for different surface types. • Finally, as a general observation, we identified several studies that highlighted the importance and the need for training in a variety of elements of infection control. Given the provision of oral health care in Canada is concentrated in thousands of small offices with small staff numbers, and given the significant changes already incorporated, plus those that will be necessary as more research emerges, oral health professions across Canada need to give careful and urgent consideration of revised and on-going infection control training for their members and trainees.	**McGill University on behalf of the PHAC Chief Dental Officer of Canada**	**28AUG2020**
Evidence Brief on the Risk of COVID-19 and	• Two published investigations of SARS-CoV-2 outbreaks associated with recreational physical activity appear in the literature (Table 1). These transmission events were linked to indoor fitness facility settings and aerobic activities (one a Zumba class, the other playing squash) and occurred in March 2020. • An additional 10 transmission events related to sports or exercise were identified in a COVID-19 Superspreading Events database (Swinkles, 2020).	**PHAC-ESG**	**21AUG2020**

Non-Professional Sports	○ Several transmission events have been reported in gyms associated with indoor classes, bonspiels, square dancing, and football. Many of these are considered high contact activities within the reporting news articles. ○ The actual sources of infection and transmission within these clusters arising from team sports events have not been identified. For example, in two curling bonspiels and one road hockey game, social activities also occurred before and/or after the game. Similarly, the source of an outbreak in a soccer team in Japan that is on-going has not been identified. ○ Activities such as running do no appear to be at high risk of transmission, a single cluster between running partners was identified. • Computer simulations of SARS-CoV-2 aerodynamics concluded that respiratory droplets will ride a runner's slip steam and thus, one should avoid running or walking directly behind another person (Blocken, Malizia, van Druenen, & Marchal, 2020). • Wong et al., report findings from two independent investigations applicable to participation in sports and SARS-CoV-2 transmission (Wong et al., 2020). ○ Analysis of professional soccer game video footage estimates a semi-professional soccer player spends on average 20% of the game within close contact of another player. ○ Experimental simulations of physical activity among athletes found individuals who wore a face mask recorded higher heartrates and perceived exertion compared to those not wearing a face mask. • Helpful strategies to reduce the risk of SARS-CoV-2 transmission during sports can be found in World Health Organization (WHO) guidance documents, risk assessment tools, and published commentaries (Table 2). ○ WHO guidance outlines key considerations, risks, and mitigation based on the type of sport (i.e. the level of contact among players), size of the event, indoor/outdoor locations, venue facilities, demographics of competitors and spectators, and risk communication, and provides guidance on managing SARS-CoV-2 cases that may be identified at a sporting event (WHO, 2020a). The document is to be used in conjunction with the Key Planning Recommendations for Mass Gatherings in the Context of the Current COVID-19 Outbreak (WHO, 2020b), and Mass Gathering COVID-19 Risk Assessment Tool – Sports Events (WHO, 2020c). ○ Commentary by Carmody et al. proposes a risk assessment matrix to support decision makers on restarting sports events that is based on WHO guidance and consideration of local community transmission of SARS-CoV-2 (Carmody, Murray, Borodina, Gouttebarge, & Massey, 2020). ○ A technical note by Blocken et al. considers the process of reopening indoor exercise facilities while minimizing SARS-CoV-2 transmission. Based on the application of limited indirect evidence, the authors conclude deep exhalation and inhalation from exercise can increase respiratory aerosol emission and inhalation. As such, they advocate for the use of displacement (vs. mixing) ventilation systems, HEPA filters, and limited occupancy within indoor facilities where physical exercise is frequent (B. Blocken et al., 2020). Guidance for physical educators at Chinese schools reinitiating after the COVID-19 lockdown, proposes various strategies, such as the use of drills and staggered physical activity periods, that can be adopted by non-professional sports teams to mitigate transmission risks.		
Evidence Brief on Size of Gatherings and Characteristics of High Risk Transmission Events (Update)	• Fifty-five studies were identified, including modelling studies, risk assessments, ecological and epidemiologic studies and outbreak reports. • The studies showed a clear relationship between increased gathering size and risk, but there was not a consistent assessment of different gathering size thresholds (Table 1). ○ An ecological study estimated a 36% reduction in Ro if the cut-off for gathering size was 10 people, compared to 21% if it was 100 people, and a 2% reduction in Ro if the cut-off for gathering size was 1000 people (Brauner et al., 2020). Another study estimated overall 10% reduction in infections associated with gathering size restrictions (Esra et al., 2020). ○ Two models explored thresholds for epidemic collapse, one identified a gathering cut off of 23 people (St-Onge , 2020) and another identified limiting contacts to seven people per 5-day period (Zhao, 2020). • Several predictive models that employ a network structure were developed to explore the impact of different sizes, types of gatherings and whether they included people that knew each other or did not know each other (Table 1).	**PHAC-ESG**	**21AUG2020**

	○ Small closed community networks (e.g., where groups of people only interact with a chosen group of other people and there is limited interaction outside of that network) were identified as having a low risk of virus introduction. The risk increased with increasing bridges to other networks (e.g., commuting to work in another place, attending a sporting event) (Scott et al., 2020; Sneppen et al., 2020). ○ Random mixing events such as public transit, restaurants/bars and sporting events were high-risk events because people from many small networks mixed and, if transmission occurred could then take the virus back to their network (Scott et al., 2020). • There were a number of studies that evaluated the risk associated with certain activities: ○ One assessment estimated the relative risk of going to a nightclub was 200-fold higher than eating at a restaurant (Dalton et al., 2020). This was consistent with another study that found >50% attack rate in direct contacts at night clubs (Prakash et al., 2020), a qualitative risk assessment that identified nightclubs, karaoke, restaurant, gymnasiums, ski resorts and cruise ships as high risk gathering settings (Dalton et al., 2020) and a study in Hong Kong found that 30.4% of cases were linked to exposure to bars and bands (Adam et al., 2020). ○ Large gatherings are associated with the largest outbreaks. A carnival in Germany, for example, was associated with 1,700 cases (Walker et al., 2020). Sporting events were associated with approximately 50-100 cases (Leclerc et al., 2020). Small gatherings, such as interactions among household members, had the majority of documented transmission events but usually result in a small number of secondary cases (<5). ○ Other common gathering settings where transmission events were documented included family gatherings (birthday parties, meals etc.), religious gatherings, weddings, social settings, gyms, shopping facilities, shared accommodations and a variety of workplaces from office environments to factory type settings (such as food processing plants). • Non-pharmaceutical interventions, such as individual hand hygiene practices and community mask wearing and limiting the number of individual contacts, can reduce the risk of a transmission event occurring during gatherings, particularly gatherings of random individuals (Scott et al., 2020). • Super spreading events (SSEs) have been associated with large gatherings and the following characteristics (Table 3): ○ The index case is often asymptomatic or mildly symptomatic. ○ Several studies have estimated that 10-20% of COVID-19 cases cause ~80% of new infections (Adam et al., 2020; Pozderac et al., 2020, James et al., 2020, Laxminara et al., 2020). ○ The risk of transmission in closed environments is higher than in open-air environments (OR 18.7 (6.0-57.9) (Nishiura et al., 2020). ○ Most transmission events were attributed to the number of close and sustained contact; loud talking, shouting and singing have all been associated with high attack rates. These findings need to be considered in light of other individual factors that can affect transmission, such as viral load (Pfefferle et al., 2020) and that some people may have a higher Ro than others e.g., women had a higher Ro than men in Korean clusters (Kim & Jiang, 2020).		
Rapid Review: What is known about using wastewater surveillance to monitor the COVID-19 pandemic in the community? (Update)	• The virus that causes COVID-19 has been detected in untreated wastewater in a number of jurisdictions worldwide, including the USA, the Netherlands, Spain, Italy, Turkey, Chile, Brazil, Ecuador, Pakistan, India, Japan, Australia and Israel. Viral RNA has been found in wastewater treatment plants and in rivers with direct flow of sewage. In some cases, retrospective analyses of wastewater showed that the presence of the virus could be detected before community transmission had been identified. Variations in methodology may contribute to variability in findings. The quality of the evidence should be confirmed through consultation with a content-area expert. • In some studies, the concentration of viral RNA was correlated with the known number of cases in the area. Findings are consistent in the most recent studies. The quality of the evidence should be confirmed through consultation with a content-area expert. • To date, all published studies have demonstrated that wastewater-based surveillance is possible; however, there are no reports of the effectiveness or cost-effectiveness of this method for ongoing surveillance.	**NCCMT**	**14AUG2020**

Evidence brief on the use of face masks to prevent COVID-19 in community settings	• Evidence on the effectiveness of face masks to protect against COVID-19 in community settings were investigated in 12 studies, none of which were conducted in Canada (Table 1). The type of mask worn was not explored in these studies. • Five studies estimated a significant impact on the number of COVID-19 cases and fatalities due to mandatory face mask policies. • Six retrospective epidemiological studies and one case control study based on contact tracing concluded that wearing a face mask by the index case or susceptible individuals was protective. • Literature reviews and systematic reviews on community face mask wearing (Table 2) mainly include evidence published prior to the COVID-19 pandemic with the exception of two reviews. General public masking research prior to the COVID-19 pandemic primarily used surgical masks. o Randomized controlled trials (not on SARS-CoV-2) on surgical face mask use in the community have not shown protective results possibly due to small sample size and variation in the implementation and adherence to the intervention. o Observational studies of the protective effects of face masks against influenza like illness (ILI) were more significant. o Studies on healthcare workers wearing non-medical masks (cotton or paper) demonstrated protection compared to no mask. This was the only field based evidence on non-medical masks. o Experimental studies have been conducted on different non-medical fabrics to examine the filterability of fabric combinations for optimal homemade masks (The Royal Society, 2020). Studies conducted in the community to determine how effective different types of non-medical masks are, have not been conducted. o Knowledge, beliefs, attitudes, and motivation have been shown to impact adherence to protective behaviours such as wearing a face mask. • There is no scientific evidence on any medical condition that would prohibit a person from wearing a non-medical face mask. The impact of prolonged use of an N95 mask was studied for COPD, pregnant women and healthcare workers in four studies (Table 3). No evaluations of other mask types were identified. • The Centers for Disease Control and Prevention (CDC) recommend that that face masks should not be worn by children under the age of two years old, anyone who has trouble breathing, and anyone who is unconscious, incapacitated, or unable to remove their mask without assistance (Centers for Disease Control and Prevention, 2020).	**PHAC**	**31JUL2020**
COVID-19 summary of Heating, Ventilation, Air Conditioning (HVAC) systems and transmission of SARS-CoV-2	• SARS-CoV-2 RNA contamination in air samples and HVAC system surfaces (e.g. air grates and filters) from healthcare settings indicate it may be possible for SARS-CoV-2 to spread through the HVAC system (Table 1). The viability of isolated viral RNA has not been confirmed by cell culture in the majority of studies, with the exception of two studies that collected viable virus from air samples in COVID-19 patients' rooms. o Lednicky and colleagues demonstrate viable SARS-CoV-2 can be found in air 2 to 4.8 meters away from patients in hospital care settings, using virus culture (RT-qPCR) (Lednicky et al., 2020). Moreover, the authors suggest virus particles becoming inactivated during sample collection to be the reason for studies failing to culture viable SARS-CoV-2 in air samples. o Air samples from a hospital setting treating SARS-CoV-2 patients were contaminated with viral RNA. Minor indications of cytopathic effects and viral replication were observed in an air and surface sample (Santarpia et al., 2020). • A single study reports on the presence of SARS-CoV-2 RNA downstream of air filters in a hospital ventilation system, however the viability of the isolated virus was not evaluated (Table 1). As such, the potential for SARS-CoV-2 infection from air circulated through a ventilation system remains unestablished. • A small number of SARS-CoV-2 clusters has been attributed to air conditioning units and air recirculation (Table 2) at a dine-in restaurant (Lu et al., 2020), bus ride to a worship event, and a professional workshop (Shen et al., 2020). Strong air jets created by air conditioning units and the recirculation of indoor air are considered likely modes transmitting infectious respiratory particles from the index case to other susceptible individuals nearby (Yuguo Li et al., 2020).	**PHAC**	**31JUL2020**

	Other investigations into SARS-CoV-2 outbreak in a cruise ship have failed to implicate the HVAC system in infection transmission (Almilaji & Thomas, 2020; Xu et al., 2020). • Transmission of other coronavirus infections (i.e. MERS and SARS) predating SARS-CoV-2 point to an association between poor ventilation (i.e. insufficient movement and clearance of contaminated indoor air) and infection transmission, this association likely extends to SARS-CoV-2 (Table 4). • Expert statements and guidance documents advocate for HVAC testing and certification to ensure properly functioning systems to minimize air contaminants in indoor settings based on local standards. • Commentaries and reviews that consider the body of evidence on the topic, and mathematical models, consistently report that increasing the flow of outside fresh air into built environments (e.g. open windows) and reducing occupancy within enclosed indoor settings, where feasible and appropriate, to be simple strategies that can mitigate SARS-CoV-2 transmission in indoor settings (Dai & Zhao, 2020; Dietz et al., 2020; Morawska & Cao, 2020).		
Rapid Review: What is known about how long the virus can survive with potential for infection on surfaces?	• There is no conclusive evidence on the length of time SARS-CoV-2 can be detected on different surfaces, and the likelihood of infectivity when the virus is detected. Study quality is moderate, and findings are inconsistent. • Findings from laboratory-based studies indicate SARS-CoV-2 can remain viable longer on smoother surfaces such as plastic or steel than cardboard or cotton. There is wide variation in the length of times reported and study quality was not assessed.	**NCCMT**	**31JUL2020**
Rapid Review: What factors increase the risk of COVID-19 outbreaks in congregate living settings? How do outcomes compare to outbreaks in community settings? (Update)	• No evidence was found to directly address the question of specific factors in congregate living settings that may increase or reduce risk of a COVID-19 outbreak. The impact of factors such as crowding and shared facilities (e.g., washrooms, dining, communal space) is assumed in the studies, based on expert opinion, but has yet to be demonstrated in evidence. • Prevalence studies show higher rates of infection in congregate settings, although many do not provide comparative rates for community settings. • Higher infection rates were reported in four studies that provided comparative rates for outcomes (i.e., cases, hospitalizations, fatalities) for congregate-living residents of shelters, prisons and group homes versus community-dwelling residents. Two Canadian prevalence studies that reported a comparator found a higher rate of COVID-19 infection in congregate settings (shelter and prison) than in the general population (2 to 18 times higher). US prevalence studies also reported higher rates for residents of prisons and a group home than for the general population. Given that many congregate settings are testing universally, the testing rate is also likely higher in these congregate settings than in the general population, potentially leading to a higher prevalence rate. Quality is high; findings are consistent. • A systematic review identified factors in prison settings that contribute to the spread of infections other than COVID-19. Recommended mitigation strategies, with relevance for COVID-19, include: health communication; reduction of overcrowding; and limiting shared spaces when possible. Recommended public health measures such as hand hygiene, screening, testing, contact tracing, and isolation are challenging to implement in a prison context. Quality is moderate; findings are consistent. • Mitigation strategies focus on infection prevention and control measures tailored to prison and shelter settings, and include: limiting visitors; limiting movement of staff and residents between locations; screening, testing, and isolating; providing on-site healthcare; enhanced sanitation; physical distancing and reduction of crowding when possible; cohorting of positive cases; and PPE and hand hygiene measures. The effectiveness of these interventions has not been studied in these contexts; implemented practices are moderately consistent.	**NCCMT**	**31JUL2020**
Evidence Brief on Age-	• Empirical evidence suggests that a low proportion of SARS-CoV-2 cases occur in children <19, a large proportion of infections may be asymptomatic, and that they can transmit the virus (Table 1).	**PHAC-ESG**	**24JUL2020**

Dependent Transmission	• Few contact tracing, or outbreak studies have reported children <19 years old as the index case (Table 1). However, there are instances where an infected child has passed SARS-CoV-2 to an adult or another child. Most studies conclude that children have not been the main drivers of t transmission of SARS-CoV-2 to date. • One study estimated the relative infectivity of children to adults to be 85% (65-110%). However, few children were the index case in the household outbreaks investigated, which resulted in the study being underpowered (Dattner et al., 2020). In a systematic review, pooled odds ratio of being an infected contact in children compared with adults for all contact tracing studies, was reported as 0.44 (0.29, 0.69) (Viner et al., 2020). • Viral load in symptomatic children was shown to be the same as adults in three studies of symptomatic COVID-19 cases (Table 2). • Six publications use mathematical models to investigate the impact of relaxing intervention measures by targeting different age groups on the epidemic (Table 1). • Re-opening schools: the most recent model examines the risk of opening schools in a low transmission vs. high community transmission scenario, indicating opening schools in low transmission scenarios along side other public health interventions did not result in a large spike in cases. Two other mathematical models demonstrate that allowing younger children (pre-school and primary school aged) to return to school would have the smaller impact on the basic reproduction number (R0) , whereas the return of secondary school grades will have the greatest impact (Di Domenico, Pullano, Sabbatini, Boëlle, & Colizza, 2020; Keeling et al., 2020). • Of the three models that analyzed lifting interventions by age groups, results suggest that relaxing measures by age group could reduce the impact of COVID-19. Specifically, releasing younger individuals (0-19) from strict lockdown can lead to lower overall fatality rates compared to the simultaneous release of all individuals after a lockdown (Castilho, Gondim, & Marchesin, 2020; Zhao & Feng, 2020).		
Evidence Brief on the Determinants of Individual Adherence to Public Health Interventions for COVID-19	• 80 studies conducted in many countries evaluated the individual adherence to protective measures against COVID-19 infection in various populations including adults, young adults, university students, children and adolescents, healthcare workers (HCWs), pregnant women, employees, and visitors to hospitals (Tables 1-5). • Most of these studies were conducted in the initial stages of the epidemic and represent initial adoption of protective behaviours. Many studies (n=28) report better compliance among females compared to males in all age groups. There were few studies on children and adolescents, and many of these noted high compliance in these age groups with a lower compliance among children of high school age. • Compliance varied across studies, sociodemographic factors and type of protective measure, and was frequently associated with individual knowledge and beliefs. • Adults > 30 years old were more likely to be compliant with recommended protective behaviors in 13 studies. Other factors positively correlated to adherence in adults include: risk perception (n=7 studies), higher COVID-19 knowledge (n=5), trust in science and government (n=4), increased anxiety levels (n=3), perceived self-efficacy to adopt protective measures (n=3) and Black or Asian ethnicity (n=3). • Non-adherence in adults was associated with psychological issues such as depression, conspiracy mentality and narcissism (n=5), as well as being a current smoker (n=3). • In children and adolescents, factors correlated with improved adherence include father's occupation, mother's educational background, location of residence and those with an immigrant background (Chen et al., 2020; Soest, Pedersen, Bakken, & Sletten, 2020). • Three rapid synthesis reviews were identified that included pre-pandemic literature on adherence to quarantine and individual preventative behaviors (IPC) by HCWS (Table 6).	**PHAC-ESG**	**24JUL2020**
Evidence Brief of Pregnancy and Severity of COVID-19	• Studies looking at severity of COVID-19 disease among pregnant women compared to non-infected pregnant women or non-pregnant COVID-19 cases present variable results that are not comparable from one study to the next due to their study design. • Prospective studies of pregnant women in the population find a low proportion of women were infected with COVID-19 during the initial stage of the epidemic (note this was not compared to infection in the general population). Many COVID-19 positive pregnant women were asymptomatic at the time of enrollment, which ranged from first trimester visits to delivery. Many of these studies report close to zero hospitalizations or severe outcomes (Table 1). • Prospective and retrospective case series report on a spectrum of COVID-19 disease severity outcomes in pregnant women, with significant heterogeneity across estimates between studies and within the systematic review meta-analyses (Table 2 & 3). Most of these studies did not indicate that the proportions reported were higher or different from the general population. A summary of the range in proportions reported across studies for each outcome is listed below: ○ Severe COVID-19 disease: 5.3% - 26.1%	**PHAC-ESG**	**17JUL2020**

	○ Critical COVID-19 disease: 1.4% - 5% ○ Mortality: 0 – 2.0% / ICU mortality: 15.4% ○ Hospitalized for COVID-19: 0% - 28% ○ Oxygen therapy among hospitalized COVID-19 cases: 7% - 32% ○ ICU overall COVID-19 cases: 2% -10% ○ Mechanical Ventilation overall COVID-19 cases: 2 - 3.4% / ICU: 11 - 61.5% ○ ECMO overall COVID-19 cases: 0.03% - 2.3% ○ Induction of delivery due to COVID-19 disease: 9% - 19.0% • One study based on USA surveillance data reported that the adjusted risk ratio for hospitalizations among pregnant women during the beginning of the epidemic was 5.4 times that of non-pregnant women of reproductive age (Ellington et al., 2020). This study also reported higher adjusted relative risk of ICU admission 1.5 times and mechanical ventilation 1.7 times, but no difference in the adjusted relative risk of mortality. This data could not distinguish hospitalizations for COVID-19 from other reasons for hospital admission (e.g., pregnancy-related treatment, or labor and delivery, which are common during pregnancy), thus it is unknown what proportion of the risk of hospitalization between pregnant and non-pregnant women can be attributed to pregnancy versus a possible increased risk due to COVID-19 during pregnancy. • Another large hospital dataset from New York, USA compared the hospitalization rates of weeks one and four of the epidemic between pregnant women [RR 14.81 (95%CI 2.07-107.38) N=3064] and total hospitalizations [RR 46.99 (95% CI, 36.72-60.15) N=21980] (Tekbali et al., 2020). The study concludes that the increase in risk of the general population being hospitalized was more than for pregnant women in the first month of the epidemic. However, without a measure of excess hospitalizations due to COVID-19, these results are difficult to interpret. • A study from China, documented that pregnant women were more likely to be admitted to the hospital sooner and with more mild symptoms compared to non-pregnant COVID-19 cases, which may bias outcomes such as hospitalization when comparing pregnant women to non-pregnant populations (Wang, Wang, & Xiong, 2020). • There was no association with COVID-19 status and spontaneous abortion in the first trimester (S. Cosma et al., 2020b). • There was some indication that women in the third trimester are more likely to have clinical symptoms and be diagnosed with pneumonia related to SARS-CoV-2 infection compared to those in the first trimester (Crovetto et al., 2020). • Risk factors for severe COVID-19 disease among pregnant women included age>35, comorbidities and/or obesity (Table 2 & 3) (Cohen, Vignaux, & Jacquemard, 2020; Khalil et al.; Vivanti et al., 2020).		
COVID-19 Summary of Face Shields to Prevent Transmission of SARS-CoV-2	• Face shields are a form of personal protective equipment that has been used in healthcare settings (e.g., surgical/medical, dental, veterinary) to cover the face and mucosal membranes (eyes, nose, mouth) and prevent infectious particle exposure from aerosols and body fluid spatter. A face shield is often used when performing medical procedures that increase the risk of aerosols or patient body fluid splashes, sprays or splatter and is worn with other personal protective equipment (e.g., medical masks, respirators, medical gowns) (Roberge, 2016). • All studies included in this review are experiments conducted under controlled conditions. With the exception of one study which used influenza (Lindsley et al., 2014), the studies in this review did not use virus contaminated fluids. • Studies on face shield use by healthcare workers report a protective effect particularly from patient generated splatter during specific medical procedures when used in combination with other protective equipment such as a surgical mask (Table 1 and Table 2) (Mansour et al., 2009; Mostaghimi et al., 2020; Shoham et al., 2016). Face shields have also been designed for the patient to wear when undergoing an aerosol generating procedure to contain the aerosols and protect the health care workers doing the procedure from exposure (Anon, Denne, & Rees, 2020;) • Two simulation studies reported on droplet inhalation and exposure when wearing face shields as the only protective equipment (Table 1). Both studies report 90% of the large droplets were blocked by a cough aimed at the middle of the face shield (Lindsley et al., 2014; Ronen et al., 2020), however the protective effects decreased when	**PHAC-ESG**	**10JULY2020**

	the direction of the cough was varied (higher/lower/side). Over time (30 minutes) inhalation of small droplets was only reduced by 23% by the face shield (Lindsley et al., 2014). • Three studies simulated coughing in an individual wearing the face shield and reported the level of contamination resulting from respiratory particles released (Table 1 and Table 2). Two studies report the release of droplets and aerosols from around the openings in the face shield (Anon et al., 2020; Viola et al., 2020), while the third reports that the face shield provided a good forward barrier as no droplets reached a simulator 60 cm away (Ronen et al., 2020). • The design of the face mask is reported to be important. Face shields that wrap further around the face, fully shielding the cheek area, wrap under the chin and any enhancements that minimize bioaerosol leakage/entry around the edges of the mask were more protective (Viola et al., 2020; Anon et al., 2020; Mostaghimi et al., 2020).		
Aerosolization of SARS-CoV-2	• A quantitative risk analysis using two COVID-19 clusters attributed to a restaurant and a choir practice, concludes the high attack rates observed in both outbreaks can only be possible if airborne transmission is the assumed primary mode of transmission (Buonanno, Morawska, & Stabile, 2020). • There are no studies that estimate SARS-CoV-2 infection transmission risk based on varied distance from an infectious source, or evaluate factors impacting airborne transmission on the virus. There is limited evidence on virus viability in expelled particles or the infectious dose. • van Doremalen provides experimental evidence to support the viability of SARS-CoV-2 virus particles in aerosols. The study reports SARS-CoV-2 virus can remain viable within aerosols for longer than three hours (van Doremalen et al., 2020). • Mathematical models informed by the laws of particle physics and aerodynamics predict airborne particles can remain suspended in air for long enough to be inhaled and have the potential to be dispersed some distance away from the infectious source (Feng, Marchal, Sperry, & Yi, 2020; Guerrero, Brito, & Cornejo, 2020; Vuorinen et al., 2020; Zhao, Qi, Luzzatto-Fegiz, Cui, & Zhu, 2020). • According to mathematical models, droplet size, humidity, temperature, air flow, and air turbulence all impact the travel distance and decay of virus containing airborne particles. Key findings from individual studies (Table 1). • Simulation studies find thousands of minute respiratory droplets and aerosols are generated when speaking, and these particles can remain suspended in air for periods longer than eight minutes (Anfinrud, Bax, Stadnytskyi, & Bax, 2020; Stadnytskyi, Bax, Bax, & Anfinrud, 2020). • Multiple researchers have investigated the presence of SARS-CoV-2 laden aerosols in air sampled from various healthcare environments managing COVID-19 patients (Table 2).	**PHAC-ESG**	**10JULY2020**
COVID-19 Summary of SARS-CoV-2 Transmission and Singing/Wind Instruments	• The available evidence suggests the activity of singing in indoor settings can contribute to amplified infection transmission of SARS-CoV-2 if an infected person is participating. Epidemiological reports of COVID-19 clusters with high attack rates linked to choir practice in the US, Singapore, and the Netherlands, as well as a karaoke bar in South Korea provide evidence that transmission has occurred during activities that involve singing (Tables 2 and 3). • Primary evidence on wind and brass instrument use and SARS-CoV-2 transmission could not be identified. However, one descriptive risk assessment and one grey literature study of wind instruments indicate more research should be done on the risk of SARS-CoV-2 transmission from wind instrument aerosols (Table 3). One protocol to study wind instruments and safe playing was identified (Miller, Vance, Hertzberg, & Toohey, 2020). • No evidence on mitigation strategies for musicians was identified. • Experimental evidence and modelled scenarios on droplet dispersion and aerosolization of SARS-CoV-2: • Infectious particles are commonly expelled into the surrounding air by an infected person (e.g., breathing, speaking, sneezing, singing and coughing) and these particles may transmit SARS-CoV-2 to another person when inhaled (Table 1). • Airborne SARS-CoV-2 particles can exist in the form of aerosols, droplets, droplet nuclei or other small particles containing viral RNA. One study reports SARS-CoV-2 virus can remain viable within aerosols for longer than three hours (van Doremalen et al., 2020). • No simulation studies have examined particle generation during singing or wind instrument use, but studies do report on speaking and coughing. For example, 1000s of virus containing particles are estimated to be produced during a minute of loud speaking and remain airborne for longer than eight minutes (Table 1) (Stadnytskyi, Bax, Bax, & Anfinrud, 2020).	**PHAC-ESG**	**03JULY2020**

	• Mathematical models informed by particle physics and aerodynamics predict respiratory and saliva particles can remain suspended in air for long enough to be inhaled by another individual, and has the potential to be dispersed some distance away from the infectious source (Vuorinen et al., 2020) (Guerrero, Brito, & Cornejo, 2020; Zhao, Qi, Luzzatto-Fegiz, Cui, & Zhu, 2020) (Feng, Marchal, Sperry, & Yi, 2020). According to mathematical models, droplet size, humidity, temperature, airflow and air turbulence all impact the movement and decay of virus containing airborne particles (Table 1).		
Evidence brief on age-dependent transmission	• No study estimated the transmission rate in children <19 years old or by age groups between zero and 19 years. • One study estimated the relative infectivity of children to adults to be 85% (65-110%). However, few children were the index case in the household outbreaks investigated, which resulted in the study being underpowered (Dattner et al., 2020). In a systematic review, pooled odds ratio of being an infected contact in children compared with adults for all contact tracing studies was reported as 0.44 (0.29, 0.69) (Viner et al., 2020). • The epidemiological research shows that children are a small fraction of cases. • Data on viral load was reported in one study and re-analysed in one review (Jones et al., 2020; Ludvigsson, 2020a). They show that viral load in children was lower than adults. o Viral load estimates by age group: 1-10 yo= 43k, 11-20 yo= 63k, 21-30 yo=183k, 31-40 yo=164k. p=0.008. • Household transmission studies show that children are rarely the index case; however, there are instances where an infected child has passed SARS-CoV-2 to an adult. Thus, transmission can occur, but may be less frequent than with adults. • Five publications use mathematical models to investigate the impact of relaxing intervention measures by targeting different age groups on the epidemic (Table 1). o Re-opening schools: two mathematical models demonstrate that allowing younger children (pre-school and primary school aged) to return to school would have the smaller impact on R, whereas the return of secondary school grades will have the greatest impact (Di Domenico, Pullano, Sabbatini, Boëlle, & Colizza, 2020; Keeling et al., 2020). o Of the three models that analyzed lifting interventions by age groups, results suggest that relaxing measures by age group could reduce the impact of COVID-19. Specifically, releasing younger individuals (0-19) from strict lockdown can lead to lower overall fatality rates compared to the simultaneous release of all individuals after a lockdown (Castilho, Gondim, & Marchesin, 2020; Zhao, Feng, Castillo-Chavez, & Levin, 2020).	**PHAC-ESG**	**26JUNE2020**
Evidence brief on SARS-CoV-2 virus dispersion distance	• The body of evidence suggest particle speed, evaporation, air flow, humidity, temperature, all play a role in the distances virus laden respiratory particles can travel after being released by an infectious individual. As such, the protective effects of physical distancing at different distances also depend on the conditions in which they are practiced. • The available empirical and modeled evidence suggests in some circumstances respiratory droplets and aerosols expelled from infectious individuals may travel distances greater than 2 meters (Table 1), but face coverings are effective at limiting dispersion distances to less than 0.5 meters (Table 2). • According to mathematical models and fluid dynamic analysis, droplet size, humidity, temperature, air flow, and air turbulence all impact the movement and decay of virus containing airborne particles (Table1). o Some models predict small droplets and aerosols can travel distances as far as ten meters when generated by coughs or sneezes, and frequently conclude social distance of two meters is not always sufficient to negate airborne SARS-CoV-2 transmission (Feng, Marchal, Sperry, & Yi, 2020; Guerrero, Brito, & Cornejo, 2020; Zhao, Qi, Luzzatto-Fegiz, Cui, & Zhu, 2020). o Low temperature and high humidity are found to facilitate respiratory droplet transmission and dispersion. High temperature and low humidity are found to promote the rapid loss of respiratory droplet mass (from evaporation) thereby reducing droplet travel distance (Feng et al., 2020; Zhao et al., 2020). o A multidisciplinary research consortium applied evidence based Monte-Carlo models and 3D simulations to investigate the physics of SARS-CoV-2 aerosol dispersion (Vuorinen et al., 2020). The investigators use computer simulations to demonstrate SARS-CoV-2 aerosols can travel distances up to ten meters, and the inhalation of	**PHAC-ESG**	**26JUNE2020**

	sufficient concentrations of aerosols (100 virus laden particles was assumed to be infectious) is possible within one second to one hour depending on the surrounding conditions. ○ Results from an agent based model reported a decreasing risk of a transmission event within indoor settings (e.g. supermarket) when the distance between individuals are increased from 30 cm to 2 meters (Hernandez Mejia & Hernandez-Vargas, 2020). ○ Speed of movement also impacts droplet travel distance. Computer fluid dynamic simulations find, distances greater than 1.5 meters are necessary when two individuals are running or moving fast as inertia of expelled droplets also impacts droplet spread although a distance of 1.5 meters may be sufficient when standing still (Blocken, Malizia, van Druenen, & Marchal, 2020). • Laboratory simulation studies report human and manikin generated cough droplets can travel distances between one to two meters, and a maximum of four meters in some simulations (Loh et al., 2020; Rodriguez-Palacios, Cominelli, Basson, Pizarro, & Ilic, 2020; Viola et al., 2020). • Two simulation studies investigated the effects of face covers on expelled particle dispersion distance. Both studies find the inclusion of face covers, such as face shields, filtering face piece respirators, surgical face masks, and homemade masks, reduced the dispersion of expelled droplets to less than 0.5 meter, even when coughing. • A recent systematic review by Chu et al., quantifies the relative risk of beta-corona virus infection based on distance (Chu et al., 2020). The authors report transmission of viruses to be lower with physical distancing of 1 m or more, compared with a distance of less than 1 m (n=10 736, pooled adjusted odds ratio [aOR] 0·18, 95% CI 0·09 to 0·38; risk difference [RD] −10·2%, 95% CI −11·5 to −7·5; moderate certainty); protection was increased as distance was lengthened (change in relative risk [RR] 2·02 per m; *p* interaction=0·041; moderate certainty). There appears to be some ambiguity in the measurement of physical distance for some of the evidence included in this review. Therefore, it may be premature to quantify the relative risk of SARS-CoV-2 infection based on incremental differences in physical distance, due to the lack of sufficient evidence. • Presently there are no observational studies that estimate SARS-CoV-2 infection transmission risk based on varied distance from an infectious source.		
What is known about best practices for infection prevention and control in inpatient psychiatric facilities?	• There is very little evidence on effective infection control practices specific to inpatient psychiatric facilities and no evidence-informed guidelines are available. Quality of available studies is low, and recommendations are very likely to change as more evidence becomes available. • In response to COVID-19, several organizations have produced interim guidance documents with recommendations specific to inpatient psychiatric facilities. Recommendations (based on expert opinion) generally suggest following established guidelines for other inpatient hospital settings (not included in data tables), and several factors specific to inpatient psychiatric facilities were identified: ○ There are complex ethical considerations surrounding enforcement of physical distancing measures if patients are non-compliant (e.g., use of restraints). ○ There is a need to adapt rather than suspend activities (for example, group therapy, family visits, etc.) to ensure adequate mental health care support. ○ There is the potential for certain conditions (e.g., anxiety, paranoia, obsessive compulsive disorder) to be worsened by the experience of the pandemic. • Many patients have other medical comorbidities that may place them at increased risk of more serious COVID-19 complications.	**NCCMT**	**26JUNE2020**
What factors increase the risk of COVID-19 outbreaks in congregate living settings? How do outcomes compare to outbreaks in	• No evidence was found to directly address the question of specific factors in congregate living settings that may increase or reduce risk of a COVID-19 outbreak. The impact of factors such as crowding and shared facilities (e.g., washrooms, dining, communal space) is assumed in the studies, based on expert opinion, but has yet to be demonstrated in evidence. • Very limited evidence was found that compared outcomes (i.e., cases, hospitalizations, fatalities) for congregate-living residents to community-dwelling residents. Two Canadian prevalence studies that reported a comparator found a higher rate of COVID-19 infection in congregate settings (shelter and prison) than in the general population (2 to 18 times higher). Given that many congregate settings are testing universally, the testing rate is also likely higher in these congregate settings than in the general population, potentially leading to a higher prevalence rate. Quality is high; findings are consistent. • Prevalence studies appear to show higher rates of infection in congregate settings, although most do not provide comparative rates for community settings.	**NCCMT**	**26JUNE2020**

community settings?	• A systematic review identified factors in prison settings that contribute to the spread of infections other than COVID-19. Recommended mitigation strategies, with relevance for COVID-19, include: health communication; reduction of overcrowding; limiting shared spaces when possible. Recommended public health measures such as hand hygiene, screening, testing, contact tracing, and isolation are challenging to implement in a prison context. Quality is moderate; findings are consistent. • Mitigation strategies focus on infection prevention and control measures tailored to prison and shelter settings, and include: limiting visitors; limiting movement of staff and residents between locations; screening, testing, and isolating; providing on-site healthcare; enhanced sanitation; physical distancing and reduction of crowding when possible; cohorting of positive cases; PPE and hand hygiene measures. The effectiveness of these interventions has not been studied in these contexts; implemented practices are moderately consistent.		
Evidence brief of size of gatherings and characteristics of high risk transmission events.	• The agent-based model developed by V. Ng at the Public Health Agency of Canada is being adapted to explore the impact of gathering size restrictions. Results will be available soon. • The evidence largely does not provide estimates of the size or threshold size for high-risk gathering. o One Canadian model suggested under one scenario that gatherings of 23 people and below was a threshold under which the epidemic would collapse. • Several predictive models that employ a network structure were developed to explore the impact of gatherings and different types of gatherings. These are generally divided by gatherings, with various sizes, of random people that do not know each other and gatherings of people that do know each other (Block et al., 2020; Scott et al., 2020; P. J. Zhao, 2020). o Small closed community networks (e.g. where groups of people only interact with a chosen group of other people and there is limited interaction outside of that network) are considered in these models to be relatively protective and have a low risk of virus introduction into the closed network. The risk increases with increasing bridges to other networks (e.g. commuting to work in another place, attending a sporting event). o Random mixing events e.g. public transit, restaurants/bars and sporting events were high-risk events because people from many small networks mix and risk taking the virus back to their network (Scott et al., 2020). • A quantitative risk assessment developed in the US estimated the median probability of COVID-19 infection transmission is one infection per 3836 (Range: 626 to 31,800) unprotected community-level contacts (e.g., without social distancing, wearing of masks, hand hygiene, etc.) (Bhatia & Klausner, 2020). • Several studies demonstrate the impact on the epidemic of decreasing or restricting individual's contacts. As well as studies that measured the normal vs. restricted number of contacts per individual. • Other non-pharmaceutical interventions e.g. individual hand hygiene practices and community mask wearing can augment the risk of a transmission event occurring during gatherings, particularly gatherings of random individuals (Scott et al., 2020). • Transmission dynamics and risk associated with social gatherings is not well documented and there is likely a lot of under-reporting. Several cluster investigations were analysed for common characteristics (Table 3). o Many transmission events occur when the index case is asymptomatic or mildly symptomatic. o Most transmission events are small clusters, however, the occasional larger cluster (>10 people) have been reported. The likelihood of observing transmission at a gathering event is context dependant (meaning it depends on situation, population density, cultural practices etc.). For COVID-19, a study looking at clusters in Hong Kong, Japan and Singapore early in the epidemic estimated the risk of a transmission event occurrence with >4 secondary cases was 0.106 to 0.215 (On Kwok et al., 2020). Similarly, in Hong Kong, it was estimated that 20% of the cases caused 80% of the infections early in the epidemic (Adam, Wu, Wong, & et al., 2020).	**PHAC-ESG**	**22JUNE2020**

	○ The majority of documented transmission events are among household members. Other common gathering settings where transmission events were documented included family gatherings (birthday parties, meals etc.), religious gatherings, weddings, social settings, gyms, shopping facilities, long-term care facilities and a variety of workplaces from office environments to factory type settings (Table 3). ○ Most transmission events were attributed to the number of close contacts and duration of contact during the gathering event. ○ Type of contact is likely important although this has not been formally evaluated and characterized. Outbreaks in social settings where there is a lot of talking or singing have resulted in high attack rates (Prakash, 2020). The risk may be different in non-social crowds (e.g. public transportation), however this has not been studied. • The available data indicates that large transmission events associated with gatherings have not been the primary driver of transmission during this epidemic; although there is evidence they occur and can spark a long transmission event. They often occur when the index case is asymptomatic or mildly symptomatic, which makes them more difficult to prevent. Additional interventions, such as hand hygiene and community facemask use are predicted in some of the models (Table 1) to augment some of the risk of transmission during gatherings.		
Evidence brief of de-escalation of social bubbles	• One preprint was identified that directly models social bubbles and real world options using the UK as the case study. The study reports that single family bubbles are estimated to have reduced the number of cases by 17%. In their model they explore relaxing the single household bubble to different scenarios of multiple households using three different secondary attack rates and Ro as the outcome. Ro is shown to increase as restrictions are relaxed, but some of the limited options appear to have minimal increase in risk. • Three social network models also provide some evidence to support that larger, but still closed and segmented networks offer a protective effect against introduction of SARS-CoV-2. The larger a segmented network and the more contacts outside of that network, the higher the risk of virus introduction. • There are many studies that look at the impact of social distancing more generally and in combination with other interventions. They have not been summarized in this evidence brief, but are available upon request as they are collected within the Public Health Intervention evergreen review. • One protocol for a systematic review on physical distancing interventions was also identified, but it will not be conducted until October 2020.	**PHAC-ESG**	**22JUNE2020**
Evidence brief of aerosol generating procedures in dental care settings	• No published reports of COVID-19 transmission, clusters, or outbreaks in dental care settings could be identified. • SARS-COV-2 aerosolization: ○ Air samples collected from hospital care settings treating COVID-19 cases have demonstrated SARS-COV-2 RNA contamination, likely from aerosols and small respiratory droplets (Guo et al., 2020; Liu et al., 2020; Santarpia et al., 2020). SARS-CoV-2 is found to remain viable in aerosols for up to 4 hours, but neither the infectiousness or the infectious dose of these particles has been established (van Doremalen et al., 2020). ○ Dental procedures can induce gag reflexes leading to increased saliva secretion and coughing in patients. High speed dental instruments can create high volumes of aerosols containing water, saliva, blood, microorganisms and other debris (Ather, Patel, Ruparel, Diogenes, & Hargreaves, 2020; Jamal et al., 2020; Sales, Sales, & Da Hora Sales, 2020). ○ A recent publication by Workman et al., reports on cadaver simulations where aerosolization risks linked to endonasal procedures were assessed (Workman et al., 2020). The study concludes high-speed surgical drill procedures resulted in substantial aerosol contamination in all tested conditions. These findings may be extended to dental drills and procedures that are considered aerosol generating. • Guidance Documents: ○ Published guidance indicates confirmed and suspected COVID-19 patients should NOT be treated in routine dental practice settings, and only be managed in negative-pressure infection isolation rooms (AIIR). (Ather et al., 2020; Jamal et al., 2020)	**PHAC-ESG**	**12JUN2020**

	○ Reviews of multiple COVID-19 dental guidance documents indicate that some procedures and equipment used are associated with increased risk of aerosol generation and should be either avoided or modified during the COVID-19 pandemic (Table 1). Specific guidance linked to aerosol generating procedures and instruments from these publications are summarized below. ▪ Intraoral Radiographs should be avoided and replaced with extraoral imaging such as panoramic radiography or cone-beam computed tomographic imaging when intraoral imaging is unavoidable (Ather et al., 2020; Jamal et al., 2020; Meng, Hua, & Bian, 2020). ▪ Use of a rubber dam to minimize splatter generation is the standard of care for nonsurgical endodontic treatment. Recommendations suggest it may be advantageous to place the rubber dam so that it covers the nose (Ather et al., 2020; Jamal et al., 2020; Sales, Sales, & Da Hora Sales, 220). Also, when the rubber dam is applied, extra high-volume suction for aerosol and spatter is recommended along with regular suction (Peng et al., 2020). ▪ Ultrasonic instruments such as triplex syringes, high-speed hand pieces, ultrasonic scalers, air abrasion devices, and intra-oral sandblasters are identified to be associated with increased aerosolization risk that should be avoided or the use minimized (Ather et al., 2020; Jamal et al., 2020; Meng et al., 2020; Sales et al., 220). If the use of such equipment is unavoidable, the application of high volume saliva ejectors are recommended alongside applicable instruments (Ather et al., 2020; Jamal et al., 2020; Meng et al., 2020). ▪ To minimize the risk of dental aerosols, it is recommended that hand instruments, low-speed hand pieces, instruments without water spray and hand piece with an anti-retraction valve or other anti-reflex technology are used where possible (Ather et al., 2020; Jamal et al., 2020). ▪ Peng et al., suggest the use of dental hand pieces without anti-retraction function should be prohibited during the epidemic period of COVID-19. Instead, anti-retraction dental hand piece with specially designed anti-retractive valves or other anti-reflux designs are strongly recommended as an extra preventive measure for cross-infection. It is important to note these recommendations are based on previous evidence from Hepatitis B infection transmission in dental care settings (Peng et al., 2020). **Available at: https://drive.google.com/file/d/1QyiGqwqeOGYJcvAks6tRRN7seIC9-n8m/view?usp=sharing** •		
Evidence brief on the risk of COVID-19 outbreaks in the workplace	• Risk factors for SARS-CoV-2 infection identified in the workplace include difficulties adhering to physical distancing, lack of hygiene, poor ventilation, and crowded working and transportation conditions (Table 1 & 2). ○ Overall, close contact with others was the main risk factor identified in the workplace. Examples of close contact situations that lead to transmission include business meetings, interactions with colleagues or clients, or close proximity to others for long durations. • Strategies to reduce the risk of SARS-CoV-2 transmission in the workplace were identified in 12 publications (Table 3). These include limiting social contact (restricting activities in the workplace, scheduling or staggering employees, and telework), quarantining sick workers, providing workplace guidelines, and screening employees and migrant workers. • Outbreaks have been associated with many types of work places and several key studies highlight the findings in the literature to date: ○ The occupations most at risk of SARS-CoV-2 infection include healthcare professionals, drivers and transport workers, service and sales workers, cleaning and domestic workers, production workers, education occupations, community and social services occupations (e.g. social workers, counselors), construction and extraction occupations, and public safety workers (e.g. police, firefighters) (Baker, Peckham, & Seixas, 2020; Lan, Wei, Hsu, Christiani, & Kales, 2020). ▪ The majority of these are low or middle-skilled occupations that require workers to have frequent contact with clients, work on customers' premises or public spaces. Many of these occupations do not allow employees to work from home. ▪ A study in the UK found that of 817 individuals tested for SARS-CoV-2 infection, 206 had a positive test in a hospital setting. Compared to non-essential workers (occupations other than healthcare workers, social and education workers, and police and protective service), healthcare workers (RR 7.59, 95% CI: 5.43-10.62) and social and education workers (RR 2.17, 95% CI: 1.37-3.46) had a higher risk of testing positive for SARS-CoV-2 in the hospital (Mutambudzi et al., 2020).	**PHAC-ESG**	**12JUN2020**

	• A risk assessment scored businesses for their potential to be super-spreading business (SSBs) based on the frequency, duration, and square footage of businesses pre-pandemic across 8 US states (O'Donoghue et al., 2020). A positive association between SSBs and the cumulative weekly cases of COVID-19 was reported where a 1% increase in SSB equated to a 5% increase in cases. The most common SSBs were full service restaurants, limited service restaurants, and hotels/motels. • Workplace clusters have been identified in healthcare settings, long term care facilities, cruise ships, retail, tourism industry, transportation (taxi, bus, trains and planes), factories, and to a lesser extent restaurants/food establishments (Table 2). o Most of the workplace clusters were traced to an asymptomatic or very mild symptomatic index case. o A few clusters were identified in an office or factory setting and all cases had close contact with infected individuals. The common element across these outbreaks were time spent in close contact in an enclosed environment (e.g. a meeting room, processing facility etc.) • Poor ventilation, individual air conditioners and fans, have been instrumental in increasing the dispersion of SARS-COV-2 from infected to susceptible individuals in several outbreaks (Koh, 2020; Lan et al., 2020; Qian et al., 2020; Shen et al., 2020; Yang et al., 2020). **Available at: https://drive.google.com/file/d/19YPSZ0pUXVo29Pr4kJZmNXS5yvSddRN3/view?usp=sharing**		
Rapid review: what is known about the efficacy and cost-effectiveness of copper materials to reduce transmission of viruses?	• A comprehensive search of the literature found no evidence on the efficacy or cost-effectiveness of copper-treated PPE in hospital or public settings to reduce transmission of any viruses, and no reports were found of hospitals using copper-treated PPE to protect against COVID-19 or other viruses. • One high quality synthesis of seven randomized controlled trials found that use of copper-treated surfaces and textiles resulted in a 6-43% reduction in risk of hospital-acquired infections (which included both bacterial and viral infections). • Among the studies that compared several viruses, responses differed by the type of virus tested. This suggests that findings from the most commonly studied viruses (HIV, influenza, norovirus) may not be applicable to the virus causing COVID-19. • One moderate quality study found no difference in the risk of viral infections during an outbreak in two long-term care wings that did and did not have high-touch surfaces treated with copper. • Several laboratory-based studies suggested that viral infectivity over time decreases faster after exposure to a copper-treated textile or surface compared to a control. • Study quality is low; findings are consistent. It is very likely the results will change with more evidence. • This question should be reexamined as more information becomes available. **Available at: https://www.nccmt.ca/uploads/media/media/0001/02/b4c91fef9983c643188fce24796fb547b40f0841.pdf**	**NCCMT**	**12JUN2020**
Rapid review: what is the effectiveness of cohorting virus-positive residents to shared rooms in care facilities?	• No research evidence was identified related to the effectiveness of cohorting COVID-19 virus-positive residents to shared rooms in long-term care facilities. • Guidance documents are consistent in recommending isolation of positive cases in single rooms, and cohorting when single rooms are not available, based on past practice, recommendations related to control of other infections, and expert opinion. **Available at: https://www.nccmt.ca/uploads/media/media/0001/02/d95f846845fea8022e1d9704ef1a9db909c4f8fd.pdf**	**NCCMT**	**12JUN2020**
Evidence brief on infection risk from eye exposures to inform contact	• No studies to date have specifically investigated or reported COVID-19 infection due to SARS-CoV-2 exposure of ocular surfaces due to interactions with asymptomatic and pre symptomatic cases. Key evidence that support the use of eye protection by healthcare workers to minimize infection transmission of coronaviruses is outlined below (and in Table 1) o A systematic review and meta-analysis by Chu et al., examine the available evidence from observational studies on coronavirus (SARS-CoV-2, MERS-CoV, SARS) transmission risk from physical distancing, facemask and eye protection.[13] Based on the pooling of primary study data on SARS and MERS the reviewers conclude	**PHAC-ESG**	**8JUN2020**

and droplet precautions	eye protection used in conjunction with surgical mask/ respirator further mitigates coronavirus infection transmission risk compared to face protection alone (risk difference and adjusted odds ratio between eye protection vs. no eye protection is estimated to be -10.6% 95% CI -12.5 to -7.7 and aOR 0·22, 95% CI 0·12 to 0·39 respectively). The summary of findings on eye protection are reported to be of low certainty based on the application of GRADE. ○ ACE-2 receptors, a cellular receptor for SARS-CoV-2 virus attachment are found in human eye tissue. Numerous studies, including a systematic review, provide molecular biological evidence that SARS-CoV-2 can use optical tissues (i.e. the eye) as a portal of entry to infect human hosts.[14-18] ○ SARS-CoV-2 viral RNA has been identified from ocular swabs and during autopsy of COVID-19 cases with and without ocular manifestations.[19] ○ Exposure data from multiple hospitals during the SARS outbreak in Ontario, Canada provide observational data that reported eye protection reduced the incidence of SARS infections among responding healthcare workers.[20] • Available guidance for healthcare worker precautions indicate: ○ Infection prevention and control (IPAC) guidance recommend the use of contact AND droplet precautions (i.e. use of gloves, masks, face shields, and goggles) when healthcare workers 1) interact with symptomatic COVID-19 patients, or 2) are in proximity to any aerosol generating procedure - regardless of acute respiratory infection symptom presentation in the patient.[6-8] ○ IPAC best practices specific to COVID-19 also recommend a point of care risk assessment be applied (based on the patient, the interaction, and the task) to determine additional precautions necessary for ALL patient and visitor at this time.[6] • Emerging evidence suggests the absolute risk of exposure of healthcare worker contact with a SARS-CoV-2 infected person increases with the prevalence in the community. ○ Serological testing of hospital workers in Italy revealed healthcare IgG positivity to be associated with the geographical prevalence of COVID-19 infections in the region.[11] • COVID-19 Outbreak data from Ontario's nursing homes also find associations between outbreaks and the incidence of COVID-19 infections in the surrounding health regions and nursing home bed-size.[12] **Available at: https://drive.google.com/file/d/14Za-h2epWrXSe9zFMsTPrOuq7Mz_rQIT/view?usp=sharing**		
Evidence brief on infectiousness and symptom onset	• Literature from healthcare settings highlight that transmission of COVID-19 is complex and related to the situation, duration of exposure, and individual factors ○ Potential asymptomatic transmission has been documented in healthcare settings among facility residents healthcare workers, and visitors (9,10). One outbreak in a skilled nursing facility in Washington State found that over half of residents who had positive results were asymptomatic at time of testing and that viable virus was cultured from pre-symptomatic cases up to 6 days prior to symptom development (9). ○ Another study was unable to demonstrate that asymptomatic transmission occurred among close contacts and in healthcare settings (8). This study had low power, which may not have been sufficient to estimate a risk of transmission. • Asymptomatic transmission has been shown to occur and may be linked to time spent in close contact with an infected person and other attributes of the scenario under which transmission occurred. ○ In a meta-analysis of mild (n=8) and asymptomatic cases (n=36), high rates of transmission were observed in situations of close quarters such as meals/family events, talking while travelling in car, private meetings, and prayer service (1). It is likely that in such situations, asymptomatic spread is facilitated via contact (contamination of hands and fomites) as well as droplet generation via talking and singing. • The estimated viral load in aerosols emitted by patients while breathing normally was on average 0.34-11.5 copies/cm^3 while the corresponding numbers for patients exhibiting respiratory symptoms were much higher at 10,900-366,00 copies/cm^3 per cough (2). An individual spending time in a room with a person breathing normally (i.e. not exhibiting respiratory symptoms) was still likely to inhale tens to hundreds of copies of the virus. • The proportion of transmission events from pre- and asymptomatic individuals in epidemiological investigations are highly variable (range <10-73%), Table 1. Predictive models estimate 40-80% of transmission events occur from pre- and asymptomatic individuals (3-5).	**PHAC-ESG**	**8JUN2020**

	• Transmission probabilities for symptomatic and asymptomatic cases may be very similar: ○ An analysis reported no significant difference in transmission rates between symptomatic and asymptomatic patients (6.3/100 and 4.1/100, respectively) (6). • Similar SARS-CoV-2 upper respiratory viral loads have been reported among asymptomatic and symptomatic patients (7). **Available at: https://drive.google.com/file/d/14Za-h2epWrXSe9zFMsTPrOuq7Mz_rQIT/view?usp=sharing**		

Summary of the evidence on asymptomatic infections and transmission of SARS-CoV-2	• The median proportion of cases who were asymptomatic was 45% (range 23% to 89%) amongst cases identified in population-based/screening studies. This summary estimate was lower in case series 15.5% (range 1% to 56%) and in outbreak/cluster investigations 20.0% (range 0% to 100%).
	• The median estimate of the fraction of asymptomatic cases who remain persistently asymptomatic through infection 50% (range 4% to 92%). There is a lot of variation across studies due to variable follow-up time, intensity of follow-up and symptoms considered.
	• The median prevalence estimates depends on SARS-COV-2 in circulation within the community, the range across studies 0% to 15.5%.
	• Evidence of transmission by asymptomatic cases:
	  ○ The limited evidence to date demonstrates that asymptomatic cases do transmit the infection. The proportion of asymptomatic cases that produce secondary cases is heterogeneous across studies, however the majority of cases do not result in onward transmission and a minority of asymptomatic cases produce many secondary cases. Super spreading events have occurred in many settings, secondary cases from asymptomatic transmission accounted for 64-69% of cases on a long term care facility and a cruise ship respectively[64, 95]. Evidence from active case findings and contact tracing indicates that the secondary attack rates are similar, although slightly lower for asymptomatic vs symptomatic cases[70, 96].
	  ○ Most studies on asymptomatic transmission are descriptive evidence from case studies and outbreak investigations.
	  ○ Asymptomatic transmission has occurred in a variety of settings (communities, households, nursing homes, hospital inpatients).
	  ○ Viral loads and dynamics (Ct values on qRT-PCR) are similar between asymptomatic and symptomatic cases.
	  ○ Viable virus has been retrieved from a large portion of specimens from asymptomatic cases.
	• Asymptomatic cases show large variation in viral dynamics [6]. The duration of the infectious period has been estimated by RT-PCR only. Few studies estimated the time from exposure through to clearance of the virus. Typically, the included studies estimated the time from RT-PCR testing positive/diagnosis to the first of two consecutive negative test; and some estimated the time from exposure to testing positive.
	  ○ Median and min-max infectious period estimated by presence of viral RNA from RT-PCR results among asymptomatic cases across the studies was 22 (10-32) days.
	  ○ Median and min-max time from exposure to detection among asymptomatic cases across the studies was 10 (1-29) days.
	  ○ Median and min-max time from detection to clearance among asymptomatic cases across the studies was 13.5(2-<63 days) days.
	• Long periods of viral RNA detection have been recorded in asymptomatic cases. Although there is evidence of viable virus in the samples from asymptomatic cases, infectious period using virus culture has not been undertaken. The virus viability in individuals with persistent positive RT-PCR tests requires more investigation to parameterize the relationship between infectiousness and RT-PCR positive results.
	
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Are any jurisdictions using isolation periods other than 14 days in	• The majority of jurisdictions recommended or required a 14-day quarantine for people exposed, or thought to have been exposed, to COVID-19. • Among jurisdictions with a 14-day quarantine or self-isolation period, the number of cases ranges from 58 to 6125 per million. • Three jurisdictions have quarantine guidance other than for a 14-day period: Switzerland and Norway require a 10-day quarantine period; Sweden does not recommend a period of quarantine for people who may have been exposed to COVID-19. Two of these jurisdictions have a higher total number of cases per million than Canada (for 3 June 2020, Canada: 2448 cases/million; Norway: 1557 cases/million; Switzerland: 3557 cases/million; Sweden: 3820 cases/million.) In addition to different quarantine or self-	**NCCMT**	**8JUN2020**

response to COVID-19? If yes, what is their rate of COVID-19 cases?	isolation periods, jurisdictions vary in their application of other public health measures and the timing of the implementation of public health measures relative to the occurrence of cases. • There is variability in the prescribed self-isolation period for people who are infected and able to self-isolate at home, ranging from 5-14 days post-symptom onset and/or 1-7 days after the end of fever or other symptoms. Available at:		
What is known about the duration from exposure to symptoms or diagnosis for COVID-19?	• Across studies, estimates of mean or median incubation period were typically between 4 and 6 days. The quality of the evidence is moderate, findings are consistent. • Within included studies, the range of incubation periods for individuals varied widely from 1 to 14 days; in one study researchers estimated that 1% of cases may have an incubation period more than 14 days however the precise number is not known. • Little is known about factors that may contribute to variation in incubation periods. One study found those 64-86 years old had a longer incubation period than those 18-64 years; another study found that younger adults had a longer incubation period than older adults. Study quality is low, findings are inconsistent. • Precise calculation of the incubation period was more feasible early in the pandemic, when cases were limited, and a precise exposure time was known. With widespread community transmission, accurate identification of exposure is difficult if not impossible. Given this, new evidence is unlikely to change these estimates.	**NCCMT**	**8JUN2020**

Evidence brief of SARS-CoV-2 super spreading events	• Individuals who have been identified as the index case in superspreading events (SSEs) do not have any unique attributes.
	  ○ Many of the SSEs occurred while the index case was still asymptomatic or had very mild symptoms. (This is different than SARS where all superspreaders were symptomatic.)
	  ○ Children have not been the index case in any SSE.
	• There have been several SSEs reported for SARS-COV-2, many of which occurred in the early phase of the epidemic within the country of occurrence.
	  ○ Most SSEs were small clusters, however the occasional larger cluster (>10 people) have been reported.
	  ○ The majority of SSEs occurred in closed environments as opposed to open-air environments.
	  ○ SSEs were attributed to gathering and close contact. The size of the SSE depends on the number of close contacts and duration of contact.
	  ○ Type of contact may also be important although this has not been formally evaluated. SSEs in social settings where there is a lot of talking or singing have resulted in high attack rates. The risk may be different in non-social crowds' (e.g. public transportation), however this has not been studied.
	  ○ The likelihood of observing an SSE is context dependant (meaning it depends on situation, population density, cultural practices etc.). For COVID-19, a study looking at clusters in Hong Kong, Japan and Singapore early in the epidemic estimated the risk of SSE occurrence with >4 secondary cases was 0.106 to 0.215. Similarly in Hong Kong it was estimated that 20% of the cases caused 80% of the infections early in the epidemic.
	  ○ More SSEs in general public settings (e.g. work, recreational, religious, cruise ship) and private setting (e.g. family gatherings) have been reported than in healthcare settings.
	• Prevention and Control of SSEs for SARS-COV-2.
	  ○ Strict cleaning protocols for fomites in public places is recommended. Although there are no SSEs unequivocally related to transmission from fomites, shared bathrooms were a likely point of transmission.
	  ○ Behavioural factors are likely the most important driver of SSEs at the moment. Thus, individual hygienic practices, their health seeking behaviour and attitude towards self isolation. Ultimately their adherence to public health guidance (e.g. staying home, avoidance of public gatherings and community mask wearing) has significant impact on prevention of an SSE.
	  ○ Non-pharmaceutical Interventions implemented within the community have a large impact on reducing the risk of an SSE. This may be particularly true for COVID-19 where many SSEs have occurred prior to the index case developing symptoms. Social distancing interventions and reductions in the number of contacts per person prevent SSE occurrence.
		PHAC-ESG	**29MAY2020**

	▪ Interventions related to timely testing of cases, contact tracing and quarantine are also crucial in the identification and containment of an SSE. ▪ *Additional information on Public Health Interventions is compiled in an evergreen review maintained by the Emerging Sciences team.* o The predictive models captured in this review largely look at the role that SSEs play in the epidemic and the likelihood that they occur under varying levels of non-pharmaceutical interventions. SSEs have large impact on the trajectory of the epidemic initially and under all scenarios where interventions to control the epidemic have been implemented.		
Evidence brief on potential COVID-19 resurgence and its impact on influenza season	• No research has been identified on the interaction between COVID-19 and influenza for the current 2020 influenza season in the southern hemisphere. • Researchers at PHAC and in academia have predicted that under the current scenario in Canada, a second peak is predicted to occur in the fall of 2020 (October-November). Public health interventions will determine the magnitude and timing of this peak. o Canada remains vulnerable to resurgences as long as a critical fraction of the population remains susceptible to disease. o With stronger public health interventions, the peak of the second wave will be pushed back to winter/spring and will be smaller. • Based on the end of the 2019/2020 influenza season, which over lapped with the beginning of the pandemic, public health interventions implemented to control COVID-19 were also effective at also reducing the burden of influenza. o 8 studies demonstrated large reductions in influenza cases in the 2019/2020 influenza season in China, Taiwan, Hong Kong, Singapore, Japan, US, and Italy. • Co-infections between SARS-CoV-2 and influenza A and B have been document in 26 cases. However, it is likely that co-infections are infrequently detected due to the indistinct early manifestations of COVID-19 and influenza. • The association between coinfections of SARS-CoV-2 and influenza and disease severity and mortality is currently unclear. There is almost no evidence on this topic. o Multiple case reports describe the clinical course of the co-infection and conclude that they are similar to COVID-19 disease. o A comparison between COVID-19 and co-infected cases was conducted in one study, a retrospective cohort in Wuhan of 273 patients with SARS-CoV-2 and influenza IgM test results, 151 (55.3%) were considered co-infected with influenza. Patients with co-infection had a significant reduction in fatality when compared to those with only SARS-CoV-2 infection (OR 0.470, 95% CI: 0.239-0.923) and decreased risk of severe disease. • A protective association with influenza vaccination status and COVID-19 infections, severity, and mortality was reported in three studies, two of which were ecological studies. These studies overall present very low quality research, but they indicate the potential protective effects of the flu vaccine warrant further investigation. o A Canadian predictive model explores the impact of a mass influenza vaccination strategy implemented prior to the start of influenza season combined with moderate quarantine to effectively control the COVID-19 outbreak and minimize influenza cases. • To prepare for the potential overlap between COVID-19 and influenza season, Australia has recently implemented a massive influenza vaccination strategy. Over a 3 week period in late March-early April, ~66% of their population received the vaccine.	**PHAC-ESG**	**29MAY2020**
Evidence brief on aerodynamic analysis of SARS-CoV-2 virus	• In this evidence brief SARS-CoV-2 aerosols refer to either an aerosol particle or suspension of liquid droplets, droplet nuclei or particles in the air. Aerosol particles can remain in ambient air for long enough to be inhaled and has the potential to be dispersed over long distances by air flow.[1] Infectious aerosols can be exhaled into the air by an infected person (e.g. breathing, speaking, sneezing, singing, and coughing) and these particles may transmit an infection to another person when inhaled. • van Doremalen provides primary evidence to support the viability of SARS-CoV-2 virus particles in aerosols. The study confirms SARS-CoV-2 virus can remain viable within aerosols for longer than 4hrs.[2] • A recent publication by a multidisciplinary research consortium apply evidence based Monte-Carlo models and 3D simulations to investigate the physics of aerosol dispersion of SARS-CoV-2. The investigators use simulations to demonstrate SARS-CoV-2 aerosol transmission over long distances (up to 10 meters), and inhalation of sufficient concentrations of aerosols (100) are possible within 1 second to 1 hour in public indoor spaces.[1] • A number of researchers have investigated the presence of SARS-CoV-2 laden aerosols in air sampled from various healthcare environments treating COVID-19 patients. This evidence is variable. The majority of air samples are SARS-CoV-2 negative, suggesting air ventilation and filtration strategies employed by hospitals to maintain high air quality effectively reduce airborne transmission risk in healthcare settings. Relevant findings from these studies are outlined in Table 1.	**PHAC-ESG**	**29MAY2020**

	• Epidemiological investigations of COVID-19 clusters in public settings, including department stores, airplanes, buses and restaurants have attributed infections, at least partially, to airborne transmission of COVID-19 seems likely. A number of these clusters are described in Table 2. • In the commentaries by Anderson and colleagues, Morawska and Cao, Setti and colleagues the authors discuss the potential rationale and existing evidence on aerosol/airborne transmission of SARS-CoV-2.[3-5] These authors generally conclude airborne transmission of infection is possible and the topic warrants immediate attention and research.		
What is known on the potential for COVID-19 re-infection, including new transmission after recovery?	• There is very limited evidence on the occurrence of COVID-19 re-infection. Evidence quality is low; findings are inconsistent. • Two recent syntheses found the percentage of patients discharged from hospital following a negative RT-PCR test who subsequently tested positive during routine follow-up, usually in self-isolation or quarantine, to range from 2-21%; study quality is low and findings are inconsistent. • Most patients who test positive following a previous negative test are asymptomatic; study quality is low and findings are consistent. • A variety of tests have been used, which raises the question as to whether any noted re-infections are false positives at the initial or follow-up test, or a false negative indicated that the virus had cleared, study quality is low and findings are inconsistent. • There is no evidence to date that addresses the question as to whether those who may have been re-infected may be able to transmit the virus.	**NCCMT**	**29MAY2020**
How have affected jurisdictions handled previously positive cases in the context of re-exposure/re-infection?	• Very few jurisdictions have described policy approaches related to previously positive cases who are considered recovered and subsequently test positive. • Evidence from South Korea shows that 're-positive' cases resulted in no transmitted infections. They suggest that these cases do not reflect a 're-positive' status, but only that a previous negative result was in error. As policy, they do not treat 're-positive' cases as re-infections, and consider these cases to be discharged from isolation. • Other jurisdictions note that there is currently no evidence of re-infection and have not developed policy to address the management of potential re-infection in previously positive cases. • The concept of an 'immunity passport', which could certify previous infection and current immunity, is being considered, but no jurisdictions have developed policy to move in this direction. Given that there is currently no evidence that people who have recovered from COVID-19 and have antibodies are protected from a second infection, the assumption behind an immunity passport is not supported.	**NCCMT**	**29MAY2020**
What serological tests are available, and what are the sensitivities and specificities?	• There are many serological tests available from many different manufacturers for the detection of antibodies to the virus that causes COVID-19. • Overall, the sensitivity of these tests is highly variable, with a wide range of estimates from as low as 18.4% to as high at 100.0%. Results were inconsistent; quality of evidence was low-moderate. • The reported specificity of tests is higher, ranging from 84.3% to 100.0%. Results were consistent; quality of evidence was low-moderate.	**NCCMT**	**29MAY2020**

Evidence brief on gastrointestinal symptoms associated with COVID-19	• GI symptoms occur in 15% (10–21; range: 2–57; I^2=96%) of cases. The frequency is similar in pediatric cases. (*Results are from a recent meta-analysis, others are available below and are comparable*.)
	  ○ diarrhea 9% (95% CI 6–12; range 1–34; I^2=89%),
	  ○ nausea or vomiting 7% (5–9; range 1–22; I^2=88%),
	  ○ loss of appetite 21% (9–44; range 1–79; I^2=98), and
	  ○ abdominal pain 3% (2–5; range 1–4; I^2=31%)
	• GI symptoms are the presenting symptom in 10% (95% CI 4–19; range 3–23; I^2=97%) of COVID-19 cases.
	• SARS-COV-2 is readily identified and has been isolated from feces. Fecal RT-PCR positive results has NOT been associated with GI symptoms (p=0.45) or disease severity (p=0.6), but was positively associated with antiviral treatment (p=0.025).
		PHAC-ESG	**22MAY2020**

	○ High frequency of fecal RT-PCR positive tests 54% (95% CI 44–64; I2=28%) may persist after symptoms resolve and nasophayngeal swabs are negative (range 1-33 days) or 27.9 days (SD 10.7) after symptom on set in a single study. ○ SARS-COV-2 has been cultured from feces in two studies, 1 case report and 2/44 viral RNA positive samples had detectable live virus. • Severe COVID-19 cases had higher odds of GI symptoms (diarrhea, vomiting, anorexia, abdominal symptoms) OR=1·60 [95% CI 1·09–2·36; p=0·0020; I2=44%] compared to mild cases. This association is strongest when only abdominal pain is considered (7·10 [1·93–26·07]; p=0·010; I^2=0). ○ A single study (preprint) from England indicates GI symptoms may indicate a significantly higher risk of hospitalization [adjusted OR 4.84 95% CI: 1.68-13.94] ▪ Diarrhea was associated with a seven-fold higher likelihood for hospitalization [adjusted OR=7.58, 95% CI: 2.49-20.02, P <0.001] ▪ nausea or vomiting had a four times higher odds [adjusted OR 4.39, 95% CI: 1.61-11.4, P = 0.005] • In the past couple weeks abdominal pain has been one of the main presenting symptoms along with prolonged fever for children presenting with a multi inflammatory syndrome in children (MIS-C) that appears to be temporally related to SARS-COV-2 exposure. This syndrome has been noted in pediatric centers in many countries and while there are few publications to date, CDC hosted an informative webinar this week. • One autopsy was identified: GI results showed segmental dilation and stenosis in the small intestine.		
Evidence brief of smell or taste disorders	• The average prevalence of COVID-19 cases presenting symptoms of smell/taste disorders across the included studies is approximately 50%, with a large range of 13%-80%. ○ Systematic review meta-analyses support the reported average prevalence calculated in this evidence brief, specifically reporting a prevalence range between 30%-80%, and pooled values of 55.2% and 52.7%. • There was no consistent evidence that there are demographic differences between those who experience smell/taste disorders and those who do not. ○ The association between smell/taste disorders and severity of COVID-19 infection was inconsistent. Two studies found that anosmia was not predictive of severe COVID-19 manifestation and a large study reported it predicted less severe COVID-19 infection. This difference may be attributed to the differing populations and the larger sample size, further research is needed. ○ The association between COVID-19 related smell/taste disorders and age is inconsistent. Of four studies, one study compared individuals <18 years versus 18 years or older, finding no significant differences in reporting smell/taste dysfunction symptoms. In contrast, one study that used higher age cut offs (<60 years versus 60 years or older) reported that experiences of smell/taste disorders were significantly higher in those <60 years. Two other studies agreed with this finding, concluding that those who reported smell/taste disorders were significantly younger than those who did not. This difference may be attributed to a difference in age used to create two subgroups. ○ The association of smell/taste disorders and gender of the COVID-19 case was reported in one study as no association and in another that this symptom was significantly more common amongst females. As these are both observational studies, additional research is required to confirm this association. • The literature is conflicting on the magnitude and direction of self-reported loss of taste and smell compared to using a validated test or instrument. One study reported a large overestimation (36.64% versus 86.60%) using a non-validated instrument. • Multiple studies reported on the predictive capacity of loss of taste/smell disorders in identifying COVID-19 cases. ○ The average reported positive predictive value in the literature was approximately 80% (range 77%-88.1%). ○ The average sensitivity and specificity were found to be approximately 53.5% and 92% respectively. ○ Several studies vaguely reported the presence of smell/taste disorders as a strong predictor of COVID-19. ○ This symptom may serve as an early indicator of COVID-19 in some cases, with three studies reporting the presence of smell/taste dysfunctions as the first symptom in approximately 20% (range 10%-26.6%) of cases. • One study reported the presence of smell/taste disorders was higher in COVID-19 patients (39.2%) compared to influenza (12.5%). • Suggested underlying mechanisms of the manifestation of smell/taste disorders in COVID-19 patients is not well-established. Presently, some studies support that the SARS-CoV-2 virus is neurotropic, while other argue that the expression of key elements in non-neuronal regions suggest interaction with other sites.	**PHAC-ESG**	**22MAY2020**

Evidence brief on cutaneous manifestations associated with COVID-19	• This brief only contained articles that reported findings from confirmed COVID-19 cases.
	Epidemiology:
	• One article estimated the prevalence of cutaneous manifestation at 4.9%, among 103 cases of COVID-19
	  ○ There is no age preference for the cutaneous manifestations; it can occur in the elderly and pediatric patients
	  ○ There is no clear gender preference, as the cutaneous manifestations can occur in both males and females.
	Types of lesions:
	• Skin rash were identified in patients with confirmed COVID-19, with maculopapular rash being the most common presentation (~50% of cutaneous manifestations).
	• There is evidence of skin vascular involvement.
	Location of lesions:
	• Cutaneous lesions can affect all parts of the body: face, trunk and limbs. Many reports indicated that the lesions eventually disseminate in a craniocaudal pattern (i.e. vertically, staring from the top and going down)
	Onset:
	• The cutaneous manifestations can occur before, simultaneously with, or after the onset of the systemic manifestations of COVID-19.
	• There is no agreement on whether cutaneous manifestations are linked to the severity of the underlying COVID-19.
	• There are reports of skin rash developed in patients treated with hydroxychloroquine and azithromycin.
	• More research is needed to understand the cutaneous manifestations of COVID-19 better.
		PAHC-ESG	**22MAY2020**

Evidence brief on the association of COVID-19 with stroke among young cases	• Only three case reports and case series have examined the association of COVID-19 disease and risk of cerebrovascular disease among young people (defined as people <50 years old). There is insufficient data to address the question of whether cerebrovascular disease is occurring at a higher rate in this age group.
	• Across all age groups the only systematic review on CVD reported 2.55-fold increased odds of CVD in severe COVID-19 [OR: 2.55 (95% CI: 1.18 to 5.51), I^2 = 29%] across 4 studies.
	• Among all cases reported, those with acute cerebrovascular disease were more likely to be older (> 50 years old), and more likely to have cardiovascular risk factors.
	• Several literature review and primary studies have examined the mechanisms of SARS-COV-2 and biochemical profiles of COVID-19 cases to better understand and identify those at higher risk of CVD.
	  ○ Strokes and other cerebrovascular diseases such as pulmonary embolisms (PE), and deep vein thrombosis (DVT) are being reported as a complication of COVID-19. The pathophysiology is not clear, however evidence suggests possibility of hypercoagulation state, platelet activation, and artery vasoconstriction promoting clotting changes and resulting stroke.
	  ○ Elevated D-dimer laboratory findings are consistently found to be present among patients with severe COVID-19 disease. Elevated fibrin degeneration products, prothrombin time elongation, and activated partial thromboplastin time are also suggestive characteristics of severe COVID-19 disease.
	  ○ Viral infiltration of vascular tissue via ACE2 is also suspected to result in endothelial dysfunction and potentially causing thromboembolic complications. Additionally, activation of the complement system is also suspected to play a role in the high rates of thrombotic complications observed in COVID-19 patients. Further research is needed to understand how COVID-19 infection leads to the various disturbances on coagulation.
		PHAC-ESG	**22MAY2020**

Impact of COVID-19 on Indigenous communities in Canada	Indigenous communities and populations around the world are vulnerable to the effects of COVID-19 pandemic in a variety of ways, including poverty, migration, current health status, and lack of access to information, resources, and health care services. The certainty of the evidence is moderate, given that most sources are expert opinion. The findings are consistent, with some variability that reflects local context.	**NCCMT**	**22MAY2020**

	Proposed plans to address the impact of COVID-19 emphasize the importance of collaborative responses that are culturally appropriate and locally sensitive. Many Indigenous communities have cultural and traditional practices that involve collective living, enclosed spaces, and shared foods and medicines, which are impacted by physical distancing and other standard infection control practices. An emphasis on prevention before cases are identified, followed by proactive case management, is suggested. Mental health concerns may be exacerbated given COVID-19 restrictions and stresses. The isolation of some Indigenous communities can be an asset if movement into and out of the community can be limited, and supports to maintain isolation are provided. Addressing the larger context of inequity is also considered to be paramount in responding to the COVID-19 pandemic and other health concerns. Learning from responses to tuberculosis among the Inuit population may hold promise for addressing COVID-19.		
What is known about stigmatization related to COVID-19 in Canada	No studies conducted in Canada specifically related to stigma were found. Discrimination and stigma associated with COVID-19 infection is a concern for those infected and those with infected family members. However, the certainty of the evidence is very low, and further evidence may change and enhance the current understanding. One study of Asian medical students in Poland reported discrimination in public and professional settings, especially while wearing facemasks. One study of health care workers in Italy found that those with discriminatory attitudes and fear about COVID-19 patients had lower satisfaction with their ability to provide care, higher burnout, and higher compassion fatigue, potentially affecting patient care. The use of discriminatory terms related to COVID-19 on Twitter increased when used by a prominent US figure, with the potential to increase stigma for Asian Americans.	**NCCMT**	**22MAY2020**
Rapid review of symptom-based screening, including temperature as screening tool	• Airport symptom-based screening estimates <50% of SARS-CoV-2 infected travelers would be detected. Traveller sensitization aims to trigger rapid self-isolation and reporting of symptom onset resulting in SARS-CoV-2, which would initiate contact tracing to contain the virus. This intervention delayed the outbreak by ~1 day. • Symptom-based screening in targeted or high risk of COVID-19 situations have been shown to be ineffective for epidemic control. o Evacuees from Wuhan to Germany were screened (n=126) and 7 symptomatic passengers were SARS-COV-2 negative. Two passengers without symptoms tested positive by RT-PCR. o Three studies of a single long term care facility in WA, USA analyzed the adequacy of symptom-based screening to identify infections in residents or staff during a COVID-19 outbreak. Results indicate that the symptom-based identification and control strategies in this facility were not sufficient to prevent transmission. • Community symptom-based screening can be more effective if a high proportion of symptomatic individuals are tested. These interventions rely on symptomatic people self identifying and gaining access to testing or intense contact tracing and testing programs. o Results from a model conclude that the most effective and feasible strategy involves exhaustive testing of patients presenting with fever and cough in primary care. To do this, ~2,000 tests/million population per week using 1/16 pooling of samples would be required to screen all fever and cough primary patients. o A mathematical model demonstrated that Contact Tracing (CT) was more effective than Random Symptomatic Testing (RST) in reducing the maximum number of cases. A Location Based Testing Policy (LBT), which gives priority for testing to symptomatic individuals belonging to localities and workplaces with higher infection was shown to be comparable to CT and is operationally less intensive. o In a COVID-19 DriveThrough Test Site (DTTS) in Alabama, 70/2216 patients self-reporting symptoms suggestive of SARS-CoV-2 infection tested positive. The number of cases identified by the DTTS represented 33% of the statewide cases reported to the Alabama Department of Public Health as of March 21, 2020. • The type of instruments used to measure temperature (eg. handheld infra-red thermometers, tympanic or oral thermometers, and thermal scanners) were not reported in these studies. There is limited evidence on the efficacy of non-contact thermometers for detecting fever such as handheld infra-red thermometers and thermal scanners. Likely compliance to a zero tolerance policy on entering gathering places if symptomatic has not been directly studied for SARS-COV-2. Borrowing from compliance to social distancing and self-isolation interventions, results in some areas were very high and much lower in others for a variety of reasons. Generally compliance has been lower in certain age groups populations and has been impacted by religion, personal beliefs, and risk-taking behaviors	**PHAC-ESG**	**15MAY2020**

Evidence brief on virus stability on currency	According to information from the Royal Canadian Mint, the majority of coins currently in circulation in Canada are composed of steel, whereas two-dollar coins are mainly comprised of a nickel outer ring and a copper middle. Bank of Canada banknotes in circulation are printed on a synthetic substrate polypropylene, a thermoplastic. Through the application of in-vitro experiments van Doremalen and colleagues, confirm novel SARSCoV-2 virus can remain viable and infectious up to 48 hrs on plastic surfaces, 24 hrs on cardboard and stainless steel surfaces, and up to 8hrs on copper surfaces. To our knowledge, this is the only primary evidence to date on SARS-CoV-2 virus stability on inanimate surfaces. Two recent literature reviews summarize the available evidence on coronavirus survival on various surfaces. All reviewed studies were conducted before 2019, when novel SARS-CoV-2 was first identified. Although somewhat variable, evidence from multiple studies suggests high concentrations of SARS-CoV virus can remain infectious on plastic surfaces up to 5 days, 1-2 days on stainless steel surfaces, and 1-4 days on paper surfaces. A single study investigating coronavirus inactivation by different metals found nickel and stainless steel do NOT possess viral inactivation properties and the virus could remain infectious for up to 5 days upon these surfaces. While copper alloys containing 70% or more copper could permanently inactivate the virus within one hour. No peer-reviewed literature on coronavirus stability on paper or synthetic currency could be identified. However, a study reporting on Influenza virus viability on Swiss banknotes (composed of paper and a middle polymer layer) reports some Influenza subtypes can remain infectious on banknote surfaces up to 1-3 days. Furthermore, the study found respiratory secretions (e.g. mucous) greatly increased infectiousness duration of viruses contaminating paper currency to as long as 2 days under natural conditions.	**PHAC-ESG**	**15MAY2020**
Asymptomatic infections and transmission of SARS-CoV-2 (Updated bi-weekly)	Small or individual case studies; larger case series, contact and cluster investigations and population studies continue to demonstrate that asymptomatic cases occur; that the asymptomatic population is large, and the range between studies continues to vary widely. ○ Small (<10 cases) or individual case studies this week demonstrated the presence of asymptomatic cases in small familial clusters; returning travellers; pediatric, including newborn patients; and patients presenting for medical care for other indications such as oncology appointments. ○ Larger case series this week of hospitalized SARS-CoV-2 positive patients, fatal cases, and hospitalized special populations (e.g., pregnant, pediatric) who are SARS-CoV-2 positive reported proportion asymptomatic ranging from 0.6% (amongst fatal cases) to 65% (pregnant cases). ○ Population-based studies this week reported asymptomatic proportions of 18.1% (returning travellers) to 87.9% (pregnant women attending for delivery to New York hospitals). In the latter study, 13.7% of all admissions for delivery were asymptomatic SARS-CoV positive patients indicating that where community circulation is observed to be high, so is the number of asymptomatic cases. ○ Follow-up studies of asymptomatic cases reported this week that often the large majority of asymptomatic cases (two-thirds to three quarters) remain so. Tanaka in a study this week using branching processes in Japan estimate that before and after the emergency declaration, the ratio of undiagnosed symptomatic: undiagnosed asymptomatic patients: diagnosed patients was 1.9: 4.7:1.0 (pre-declaration) and 0.77: 2.4:1.0 (post-declaration). Thus even with the improved case finding and testing post declaration for every 100 diagnosed cases there are an estimated 240 undiagnosed asymptomatic cases and a further 77 undiagnosed symptomatic cases. Transmission studies provide estimates of transmission probabilities in asymptomatic and symptomatic – these are roughly the same. A reanalysis this week reported no significant difference in transmission rates between symptomatic and asymptomatic patients (6.3/100 and 4.1/100, respectively). Several cluster investigations this week estimated much higher attack rates in close contacts of asymptomatic index cases of 33% to 75%. Similarly, studies of exposure history of cases continued to indicate large proportions reporting no known exposure to ill individuals. Finally, investigations of transmission chains with asymptomatic/pre-symptomatic cases point to transmission 2-9 days into the incubation period. • As more convalescent/recovered cases accumulate, studies are emerging that examine recurrent intermittent detection of viral RNA in these asymptomatic/post-symptomatic patients. It will be important to monitor emerging research on the transmissibility within the recovered/convalescent population still testing positive, persistent viral shedding and the size of the infectious convalescent population. One case study this week reported on the intermittent recurrence of viral RNA detection in an asymptomatic/post-symptomatic patient through post-discharge/recovery quarantine, re-hospitalization and re-discharge/recovery.	**PHAC – ESG**	**15MAY2020**

Rapid Review of vitamins and other micronutrients in relation to outcomes of COVID-19	VITAMIN D • Vitamin D has been widely studied for its role as a secosteroid that has a wide spectrum of immunomodulatory, anti-inflammatory anti-fibrotic, and antioxidant actions. Many of the publications that have currently completed a journal peer-review are reviews, letters and editorials. All primary research on COVID-19 and vitamin D is still in preprint form. • Retrospective observational studies done in the USA (n=3), Southeast Asia (n=1) and the UK (n=1) analysed data to determine if vitamin D deficiency indicated a higher risk of COVID-19 positive test (n=2) or higher risk of more severe COVID-19 outcomes (n=3). o Conflicting evidence on whether people are more likely to COVID-19 if vitamin D deficient. The preprint study from Chicago was more convincing as their data represented individuals with vitamin D status in the previous year and the vitamin D supplementation they had followed, those that were not treating their deficiency with sufficient supplementation were at higher risk of becoming infected with COVID-19. o The other three studies were in agreement that vitamin D deficiency is associated with COVID-19 disease severity, risk of ICU and mortality. • There was consistency across the eight ecological studies presenting relationships between latitude, UV exposure, vitamin D index and even C-reactive protein indexes and the number of cases, mortalities and recoveries in various COVID-19 affected countries. • General population supplementation with vitamin D was widely discussed across papers and is considered the reason that many northern European countries do not have a lot of vitamin D deficiency. • Vitamin D as a therapy for COVID-19 has not been directly studied. Within the vitamin D literature there are studies where high doses of vitamin D (250 000-500 000 IU) were safe, decreased hospital stay and resulted in improved hemoglobin levels on mechanically ventilated patients. VITAMIN C • Vitamin C (L-ascorbic acid) has been evaluated for its protective effects (high dose IV therapy) as a treatment for acute respiratory distress syndrome ARDS. • Despite there being a systematic review protocol registered, studies on COVID-19 cases and vitamin C have not been completed. We identified one RCT trials registered to evaluate the clinical efficacy of vitamin C to improve the prognosis of severe COVID-19 cases. One *in silico* study that indicated vitamin C may be part of a promising therapy. ZINC • One retrospective observational study at hospitals in New York compared the addition of zinc sulphate (220 mg capsule containing 50 mg elemental zinc twice daily for five days) to hydroxychloroquine (400 mg load followed by 200 mg twice daily for five days) and azithromycin (500 mg once daily). The cases that received zinc had a significantly higher discharge to home and the non-ICU cases had a lower odds of mortality of discharge to hospice compared to the other non-ICU cases. Supplementation is not addressed. SELENIUM • There is one review article and one ecological study on selenium and COVID-19. Together these articles propose a role in the human immune response for selenium, where deficiency results in higher susceptibility. OTHER MICRONURTIENTS Reviews and letters published on micronutrient research related to viral diseases indicated there is evidence for protective effects from vitamin A, B and E, selenium, zinc, iodine, iron. omega3s and supplementation in deficient populations may be beneficial.	**PHAC-ESG**	**15MAY2020**

Review of hospitalization and length of stay	The average percentage of hospitalisation of Covid-19 cases varied 26-77% over the population. Older age groups had increasing proportion hospitalized. The percentage of admission to Intensive Care Unit (ICU) of covid-19 cases varied from ○ 4% to 11% among infected patients ○ 12% to 33% among hospitalized patients ○ The percentage of patients in ICU requiring ventilation varied from 17% to 78% The length of stay (LOS) for hospitalisation (including ICU) of Covid-19 cases median days across studies was 6-7 days with a range of 3 to 23 days ○ Among survivors the median LOS in ICU varied from 8 to 17 days with a range of 4 to 44 days ○ Among non-survivors the median LOS in ICU varied from 7 to 12 days with a range of 5 to 17 days Median duration of ventilation for patients who required mechanical ventilation was 5 to 13 days with a range of 7 to 19 days.	**PHAC-ESG**	**15MAY2020**
Role of indirect transmission in the pandemic	Based on the current data, there is insufficient evidence to support the role of facemasks on their own to reduce indirect/community transmission of COVID-19. As of 11 May, 2020, only one modelling study has been conducted specific to COVID-19 to address the question of whether facemasks reduce the spread of the virus in the community. This study suggests that mask wearing may reduce disease transmission; however, the certainty of the evidence is very low and further evidence may very likely change these estimates. Several reviews and studies have explored the role of facemasks to reduce community spread of other influenza-like illnesses and there is little to no evidence to suggest that mask wearing on its own reduces community spread. The quality of the evidence is low to moderate, findings are consistent. There is some suggestion that mask wearing may be more effective if initiated early in a pandemic, and mask wearing must be combined with other infection-control procedures such as hand hygiene.	**NCCMT**	**15MAY2020**
Evidence on potential for COVID re-infection	There is very limited evidence on the occurrence of COVID-19 reinfection. Evidence quality is low; findings are inconsistent. A small study suggested that a proportion of recovered COVID-19 patients could reactivate; a modelling study using data up to March 27, 2020 found no evidence to suggest recovered patients become re-infected with COVID-19. Evidence from two human studies of people infected with SARS-CoV show that initial high levels of IgG among those infected were not maintained beyond 1-2 years following infection. Evidence quality is low; findings are consistent.	**NCCMT**	**15MAY2020**
Adverse maternal or fetal outcomes and COVID-19	There is little to no evidence of adverse outcomes associated with pregnancy among women with COVID-19. Evidence quality is low to moderate; findings are consistent. Several reviews and studies report a high rate of cesarean deliveries among women with COVID-19, although the clinical indications for cesarean in these cases are not well described, and the limited available evidence suggests that vaginal delivery can be safe. Evidence quality is low to moderate; findings are consistent. Some reviews report rates of pre-term birth between 21-39% of cases. The extent to which this rate is elevated compared to non-COVID-19 rates is not reported. Evidence quality is low to moderate; findings are consistent. There is no evidence of vertical transmission. Evidence quality is low to moderate; findings are consistent.	**NCCMT**	**15MAY2020**
Role of daycares, primary schools in COVID-19 transmission	The effect of school closures to prevent the spread of COVID-19 is not known as it has not been possible to separate the effect of school closures from other physical distancing and quarantine measures. The quality of evidence is low, findings are consistent across reviews. Analysis of infection clusters in China prior to school closures revealed that for children who were infected, transmission was traced back to community and home settings rather than daycares or schools. The quality of this evidence is low, findings are consistent across reviews. Overall, low quality evidence suggests that children are not significant vectors for transmission. This evidence is based on limited case series and should be interpreted with caution. There is some evidence suggesting that transmission from children to caregivers is possible and the virus may be transmitted through fecal matter, although this evidence is low quality and further research is needed to confirm	**NCCMT**	**15MAY2020**

Impact of physical distancing on mental health	Outbreaks prior to COVID-19 show an association between adverse mental health effects and quarantine. Evidence quality is low to moderate; findings are consistent. One review of moderate quality found that the negative effects of quarantine were exacerbated by longer quarantine duration, infection fears, frustration, boredom, inadequate supplies, inadequate information, financial loss, and stigma. Evidence quality is low to moderate. One review of moderate quality recommended that to mitigate the negative effects of physical distancing, quarantine should be implemented for no longer than required, clear rationale and information should be provided and sufficient supplies should be ensured. Appealing to altruism by emphasizing the benefits of quarantine rather than legislating quarantine may also be favourable. Evidence quality is low to moderate.	**NCCMT**	**15MAY2020**
What is the evidence on the role of children in the transmission of COVID-19?	As of April 20, 2020 there is little evidence about the role children play in transmission of SARS-COV-2. Most evidence is related to household cluster investigations. Children were not the index case in most of these investigations (<10%). COVID-19 cases <19 years old were typically exposed by a close relative or family member. This is opposite to what we typically see with influenza, for example among H5N1 avian influenza household clusters the index case was children >50% of the time (Zhu et al., 2020). Evidence that supports children do not play a important role in SARS-COV-2 include: ○ Probability of infection from a contact was lower in children than adults in one study (Hua et al., 2020) and was lower for children of an infected parent compared to the spouse in one study (W. W. Sun et al., 2020). ○ The proportion of cases that are <19 years old is 1.2-6.3% across studies, which is significantly less than the proportion of older age groups. ○ One study captured from Iceland reported "healthy population screening" using RT-PCR and they did not detect any SARS-COV-2 RNA among children <10 years, whereas among adults the prevalence was 0.8%. ○ Cohort studies that followed up on children with long periods of detecting viral RNA by RT-PCR in feces after recovery did not identify any COVID-19 cases among their family contacts. This is weak evidence that there is little transmission risk from convalescent stage cases despite detection of vial RNA. Predictive models show school closures have an impact on the size and speed of the epidemic, although this is not as effective as for influenza given that children appear to play less of a role in transmission. Epidemiologically children <19 have a lower incident risk and mortality across studies and clinically are consistently reported be at lower risk of severe outcomes compared to adults.	**PHAC-ESG**	**20APR2020**
What evidence exists on the occurrence of SARS-CoV-2 transmission in the workplace (indoor settings)	Workplace clusters have been identified in healthcare settings, long term care facilities, cruise ships, retail, the tourism industry, transportation (taxi, bus, trains and planes) and to a lesser extent restaurants/food establishments. There were a few clusters identified in an office setting and all cases had close contact with the infected individuals. Similar to other indoor outbreaks, there was time spent in an enclosed environment (e.g. a meeting room). Most of the professions identified in clusters have a high rate of contact with people and were also ranked as being at higher risk of exposure. Most of the workplace clusters were traced to a symptomatic index case.	**PHAC-ESG**	**20APR2020**
What evidence exists on the occurrence of SARS-CoV-2 transmission in outside settings	There is weak evidence of outdoor transmission, the frequency or importance of outdoor transmission has not been assessed. Among cluster investigations in two studies, 1/138 clusters were attributed to an outdoor conversation and the other concluded that COVID-19 was 18.7 times (RR 95%CI: 6.0-57.9) more likely to be transmitted in closed environments compared to open air environments. SARS-COV-2 RNA has been found in particulate matter for 3 weeks at an industrial site in Italy. Detection of RNA does not mean viable virus, but further research is needed to characterize what these results mean for public health. The research that examined potential impacts of UV on SARS-COV-2 and the COVID-19 epidemic were weak studies and the conclusion are likely to change with further research	**PHAC-ESG**	**20APR2020**

Rapid literature review and international scan of practices on the topic of "Immunity post-infection"	Distinguishing people in the population that are immune to SARS-COV-2 is being considered as a part of risk-based de-escalation plans in several countries according to the recent news and there are some predictive models looking at this as a strategy. Post exposure immunity has not been demonstrated in humans. Several studies provide evidence of antibody response and immune response in COVID-19 cases during infection and in convalescent phases. The assumption that the antibodies developed during infection may provide protection is reasonable based on current early evidence. This will need to be confirmed with evolving state of knowledge on this particular topic. ○ SARS-COV-2 was used in a non-human primate challenge trial that demonstrated the reinfection challenge, 2 weeks after symptoms resolved, was unsuccessful (Bao et al., 2020). ○ Sera from convalescent COVID cases were able to neutralize SARS-CoV-2 in an in vitro plaque assay, suggesting a possible successful mounting of the humoral responses (Zhou et al., 2020). ○ Studies of SARS cases detected IgG antibodies for approximately 3 years (Wu LP, 2007). Currently, most nations are initiating serological surveys to start evaluating and understanding who in the population has been exposed. There is a lot of work being done on developing serological tests, however validation of these tests is lagging behind as it takes time to develop serological panels for validation of the serological tests.	**PHAC-ESG**	**06APR2020**
Prevalence of GI symptoms and fecal shedding	Diarrhea in cases range from 2%- 31% across studies. Larger studies and the meta-analyses place the proportion of cases reporting diarrhea between 5-10%. Vomiting was less frequently reported, but had a similar proportion to diarrhea. The proportion of cases that have a fecal positive RT-PCR were highly variable ranging form 17% - 100% of cases in the study. Fewer studies with less observations have been able to investigate viral persistence in feces and frequently fecal samples were taken days after the first respiratory positive test. Of note, several studies report a long duration of fecal shedding, this continues past the resolution of symptoms and past when respiratory samples start to test negative.	**PHAC-ESG**	**20MAR2020**

Public Health Leadership Call
Meeting Agenda

Wednesday, December 16th, 2020 ~ 11:30 AM – 12:30 PM
Zoom Coordinates in Calendar Invite

Attendees:

	Aamir Bharmal (FHA)		Haley Miller (BCCDC)		Patty Daly (VCH)
	Albert De Villiers (IHA)		Ian Rongve (ADM, MoH)		Perry Kendall (BCCSU)
	Alexis Crabtree (GOV)		Ingrid Tyler (FHA)		Raina Fumerton (NHA)
	Althea Hayden (VCH)		Ita Hyland (HEMBC)		Rakel Kling (NHA)
	Andrew Gray (NHA)		Jason Wong (BCCDC)		Réka Gustafson (BCCDC)
	Andrew Larder (BCCDC) *(Chair)*		Jat Sandhu (BCCDC)		Richard Stanwick (VIHA)
	Ashraf Amlani (Bunyaad)		John Lavery (HEMBC)		Shannon McDonald (FNHA)
	Bonnie Henry (PHO Office)		Jong Kim (NHA)		Sherri Moore-Arbour (Bunyaad)
	Brian Emerson (PHO Office)		Kate Smolina (BCCDC)		Silvina Mema (IHA)
	Catherine Elliott (YK)		Keren Massey (MoH)		Siu-Kae Yeong (BCCDC)
	Daniele Behn Smith (PHO Office)		Lorie Hrycuik (MoH)		Stephen Brown (D MoH)
	David Patrick (BCCDC)		Marianne Henderson *(Secretariat)*		Trevor Corneil (BCCDC)
	Dee Hoyano (VIHA)		Mark Lysyshyn (VCH)		Troy Grennan (BCCDC)
	Dennis Cleaver (NHA)		Mel Krajden (BCCDC)		Veronic Clair (BCCDC)
	Eleni Galanis (BCCDC)		Monika Naus (BCCDC)		
	Elizabeth Brodkin (FHA)		Murray Fyfe (VIHA)		

AGENDA

ITEM	TIMING	DESCRIPTION	LEAD/ACTION
1	11:30	Welcome and roll call	Andrew
2	11:32	Approval of agenda / addition of other items	Andrew
3	11:33	Follow up on action items from previous meeting – in action plan	Andrew
		NEW BUSINESS	
4		Continued conversation from Monday's PHEC meeting	Lorie
5		Court Protocol	Trevor
6		Social outings/daypasses LTC	Ingrid
		STANDING ITEMS	
7	12:25	Media Briefings	Bonnie
8	12:30	Adjournment	

Documents for consent (48 hours):

A. CRG 52-3: Multisystem Inflammatory Syndrome in Children (MIS-C) Temporally Associated with COVID-19: Guidance for Clinicians in B.C. *[Revision, with main changes noted in cover sheet and highlighted in yellow in the attached Word document]*

Informational Items:

B. Backgrounder - Safe Voluntary Isolation Sites Program (FINAL)
C. CRG Weekly Status Update 2020.12.11
D. Weekly COVID-19 Evidence Review
E. Archive of CTS Meeting Minutes (Testing Subcommittee meeting minutes)

From:	van Gelderen, Courtney [PHSA] on behalf of IBCOC
To:	Brown, Stephen R HLTH:EX; Henry, Bonnie HLTH:EX; Miller, Haley HLTH:EX; Brown, Ross Dr [VCH]; XT:Naus, Monika HLTH:IN; Reedijk, Jill [BCCDC]; Lavoie, Martin HLTH:EX; Lawrie, Hannah GCPE:EX; XT:McDonald, Shannon HLTH:IN; XT:Dawkins, Laurie GCPE:IN; Delorme, Gerry (PHSA) [VIHA]; Prevost, Jean-Marc GCPE:EX; VPOEOC [PHSA]; Halicki, Ashley HLTH:EX; Galt, Jamie HLTH:EX; Pokorny, Peter HLTH:EX; Hassam, Noorjean [BCCDC]; "tim.byres@forces.gc.ca"; XT:HLTH Brown, Libby; Gustafson, Reka [BCCDC]; XT:Patrick, David HLTH:IN; "SHEA.BRAMLEY@forces.gc.ca"; "Patricia.Laing@forces.gc.ca"; Hinde, Grace [PHSA]; Smith, Paula GCPE:EX; XT:Pope, Darcia HLTH:IN; Bru, Carolyn GCPE:EX; "Deborah.Lester@redcross.ca"; "Robert.Macquarrie2@ecn.forces.gc.ca"; Quirk, Ron EHS:IN; Twyford, Philip HLTH:EX; Barclay, Corrie A HLTH:EX; Brach, Pader W EMBC:EX; XT:Palmer, Becky HLTH:IN; Virani, Alice [PHSA]; Thistle-Walker, Carlene HLTH:EX; IBCOC; Carroll, Jonathan C HLTH:EX; Greer, Shannon GCPE:EX; Achampong, Bernard HLTH:EX; Massey, Keren L HLTH:EX; Grieve, Chandler GCPE:EX; Youngs, Kirsten R GCPE:EX; Thompson, Laurel HLTH:EX; Forge, Kathryn EMBC:EX; XT:Lavery, John HLTH:IN; CoastalSMD; IBCOC
Subject:	IBCOC Meeting Documents - December 18, 2020
Date:	December 18, 2020 4:01:11 PM
Attachments:	Agenda-IBCOC-2020-12-18.docx Minutes-IBCOC-2020-12-17.docx Action-plan-IBCOC-2020-12-18.xlsm SBAR 009 - COVID-19 Vaccine Sequencing December 18 2020 224pm.docx SBAR-010-Vaccine Delivery Sites-FNHA nursing stations Dec 17 2020.docx

Good afternoon,

Please find attached the documents for today's Immunize BC Operations Centre meeting as received thus far:

- Agenda IBCOC 2020-12-18
- Minutes IBCOC 2020-12-17
- Action Plan IBCOC 2020-12-18
- SBAR-009-Vaccine Sequencing December 18 2020
- SBAR-010-Vaccine Delivery Sites-FNHA Nursing Stations Dec 17 2020

Thanks,

Courtney

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#	Relates to	Action	Priority	Assigned to	Date assigned	Due date	Status	Comments
A-044	Logitstics and Planning	Monika to take issue of allocation and sequencing of Moderna vaccine, particiuarly to First Nations communities, to BCIC for input. An aollcation algorithm will be proposed and brought to the IBCOC command as an SBAR.	High	Monika Naus	16-Dec-20	18-Dec-20	**Open**	Gerry Delorme, to provide list of communities with specific logistical concers (seasonal and weather related travel restrictions). Becky Palmer to take concerns related to this topic to the FHNA Immunization Steerign Committee for input.
A-045	Planning	Monika N to take issue of LTC staff vaccination reporting to BCIC for input, to find potential solutions to current reporting issues.	High	Monika Naus	17-Dec-20	18-Dec-20	**Open**	
A-046	Public Health and Planning and Logististics	Reka to take issue of Jan 4 Pfizer allocation decision to public health leadership group for reccomendation. SBAR to be generated based off PHL decsision, and brought to IBCOC command	high	Reka Gustafson	17-Dec-20	18-Dec-20	**Open**	
A-047	Logitistics	Noorjean to create an SBAR based on the approved proposal to deliver moderna vaccine to 10 remote FN communites	high	Noorjean Hassam	17-Dec-20	18-Dec-20	**Open**	
A-048	Planning	All IBCOC command to review research priroties document circulated by David Patrick by end of day Dec 18.	high	David Patrick	17-Dec-20	18-Dec-20	**Open**	
A-037	Planning	Monica to provide VPO-EOC with update re: vaccine safety surveillance	Medium	Monica Naus	8-Dec-20	21-Dec-20	**Open**	Dec 10 - working on hiring nurses/clinical resources. December 14 - conversations today about AEFI reporting - plan in development.
A-041	Logistics	Noorjean will provide VPO-EOC with details as to which sites and health authorities are ready to receive -20 ° C vaccine.	Medium	Noorjean Hassam	8-Dec-20	18-Dec-20	**In progress**	Update 12/9/2020: List of sites across the province; request to circulate to the group so planning for distribution to secondary sites is supported. There are 85 sites that can accept -20C vaccine; 65 are able to move it at -20C. 12/10/2020 - will update at future meeting. Date TBD.

A-017	First Nations Health Authority	Determine who makes decisions (federal, provincial, etc.) regarding COVID-19 immunization for First Nations, and identify the impact on communities	High	Bonnie Henry; Shannon McDonald	3-Dec-20	21-Dec-20	**In progress**	Update 12/4/2020: Will engage with First Nations Leadership Council Update 12/6/2020: Indigenous Services Canada have requested number of HCWs working in First Nations Communities. Understanding that doses will come from provincial allocation. Update 12/7/2020: Shannon and Bonnie attended Special Advisory Committee today- lots of discussion around remote and isolated communities and federal definition; will be meeting again to talk about poverty, social determinents of health, weather-related barriers to delivery etc. First Nation Health Council is meeting on Friday. The first Internal Steering Committee took place today. Update 12/9/2020: Meeting deferred to Tuesday at 9am. Update 12/15/2020: PHO has met with FN community members, good engagement. FNHA developing communications stream. This will be an ongoing action item.
A-016	Planning	Bonnie to share a presentation on the national decisions re: vaccine roll-out	High	Bonnie Henry	3-Dec-20	4-Dec-20	**Closed**	
A-006	Documentation	HEMBC to organize for a Teamsite to be created for VPO-EOC documents	High	HEMBC/John Lavery	2-Dec-20	5-Dec-20	**Closed**	Update 12/3/2020: HEMBC will provide access to VPO-EOC membership; requires HA email for access (will be exploring workaround)
A-011	Planning	Monika to take prioritization criteria to PHEC for discussion and recommendations to bring back to VPO-EOC	Medium	Monika Naus	3-Dec-20	7-Dec-20	**Closed**	Update 12/4/2020: Had meeting today with BC Immunization Committee and discussed the more detailed sequencing in respect to roll-out; will be taken to PHEC meeting on Monday Update 12/6/2020: Reviewed this morning at PHEC, for early doses VCH plans are LTC; FH are having a meeting this week (similiar approach is likely)
A-029	Planning	Monika to verify through which committee Public Health Agency Canada are connected to the UK and ensure access to the emerging information	Medium	Monika Naus	6-Dec-20	7-Dec-20	**Closed**	Update 12/7/2020: Connected with PHAC, Health Canada, CAF; Monika doesn't have names of who they are connected in with but confirmed that they are connected
A-010	Planning	Monika to explore whether 2cc saline product can be acquired	Medium	Noorjean Hassam; Todd Cooper	3-Dec-20	7-Dec-20	**Closed**	Update 12/4/2020: Reassigned to Supply Chain for consideration Update 12/6/2020: Noorjean is following up item with Supply Chain; Reassigned to Noorjean and Todd Update 12/7/2020: Confirmation that there is no 2cc available. Action closed.
A-027	First Nations Health Authority; VPO-EOC structure	Becky Palmer to be added FNHA box	High	HEMBC	6-Dec-20	7-Dec-20	**Closed**	Added 12/6/2020
A-028	Logistics; VPO-EOC structure	Remove Todd Cooper from Logistics box; Noorjean to put forward recommendation	Medium	HEMBC; Noorjean Hassam	6-Dec-20	7-Dec-20	**Closed**	Added 12/6/2020
A-030	Ethics	David to invite Alice Virani to provide ethics support to VPO-EOC	High	David Patrick	6-Dec-20	7-Dec-20	**Closed**	Added 12/6/2020
A-009	Logistics	Noorjean to share vaccination roll-out deadline dates with John for tracking	Medium	Noorjean Hassam	3-Dec-20	7-Dec-20	**Closed**	Update 12/4/2020: First draft to John on 12/7/2020 Update 12/6/2020: Mapping exercise will provide these dates
A-021	Planning	Monika and Peter to connect regarding licensing of retired nurses	High	Monika Naus; Peter Pokorny	4-Dec-20	8-Dec-20	**Closed**	Update 12/6/2020: Peter and Monika to connect tomorrow; Monika to send over details. Becky Palmer to be linked in. Update 12/8/2020: Monika is connected with Mark Armitage; nursing policy secretariat involved - there is a specifiifc process for retired nurses
A-007	Logistics	Peter Pokorny and Philip Twyford to take forward -20°C Freezer Procurement Briefing Note for financial decision	High	Peter Pokorny; Philip Twyford	3-Dec-20	8-Dec-20	**Closed**	Update 12/4/2020: Noorjean has revised and sent through. Philip supportive will bring back tomorrow Update 12/7/2020: Peter confirmed that this has been approved
A-014	Provincial Immunization Registry and Digital Solutions	VPO-EOC to draft document outlining the recommendation of one provincial recording system for sign off by Dr. Henry and the Minister	Medium	Jill Reedijk; Corrie Barclay	3-Dec-20	9-Dec-20	**Closed**	Update 12/4/2020: Needs a VPO-EOC lead assigned Update 12/6/2020: Corrie to provide update on this in a couple of weeks. Update 12/8/2020: Date is currently set to Dec 21, will need to bring forward

A-003	Communication	Decision as to where detailed information on vaccination program for the public will be hosted	Medium	Jean Marc Prevost	2-Dec-20	9-Dec-20	**Closed**	Update 12/3/2020: Gerry to connect with Jean Marc Update 12/4/2020: Gerry and Jean Marc have connected; Ross also to connect with Jean Marc Update 12/7/2020: Meeting this morning with Jean Marc; no conclusion yet. Jean Marc is working with Catherine on a process for the triaging - good plan in place for approvasl of products for Wednesday's event.
A-013	Provincial Immunization Registry and Digital Solutions	Jill to present draft COVID-19 vaccinations workflow based on engagements with BC Immunization Committee	High	Jill Reedijk	3-Dec-20	10-Dec-20	**Closed**	12/11/2020 - closing item, and rolling into items A-042 and A-043
A-020	Reporting	VPO-EOC to assemble a group that can advise on real time reporting for vaccination program	Medium	Corrie Barclay; Jill Reedijk; Ron Quirk	4-Dec-20	10-Dec-20	**Closed**	12/4/2020: Need to assign a sponsor from VPO-EOC Update 12/6/2020: Inventory Management Team (Rachel is lead) is responsible for this; need to identify whether they need to be connected with any members/teams from VPO-EOC. Arrange to
A-023	Planning	Monika to consider who could represent Data, Safety and Monitoring planning section	Medium	Monika Naus	4-Dec-20	10-Dec-20	**Closed**	Update 12/6/2020: Box to be removed; will be reported on under Planning
A-043	Non-clinical Immunization Reporting	Reporting requirements for non-clinical data must be established (sites, dosage shipments, etc.). Data for those requirements must be sourced. The processes by which that data will be reported must be identified. New IT support systems must be implemented were appropriate.	High	HEMBC, Noorjean Hassam, Peter Pokorny	11-Dec-20	11-Dec-20	**Closed**	12/11/2020: Item closed. Report out to occur under Health System Operations on the agenda.
A-042	Immunization and Clinical Data Reporting	Reporting Requirements for clinical vaccination information must be defined. Data for those requirements must be sourced. The processes by which that data will be reported must be identified. New IT support systems must be implemented were appropriate.	High	Peter Pokorny, Jill Reedijk, Corrie Barclay, Martin Lavoie	11-Dec-20	11-Dec-20	**Closed**	12/11/2020: Action item closed. Plan is being led by Martin Lavoie, report out to occur on agenda under Health System Operations
A-038	Planning	Monika and Bonnie to meet with CMHOs re: vaccination preparation in the other health authorities	Medium	Monika Naus; Bonnie Henry	8-Dec-20	14-Dec-20	**Closed**	Update 12/9/2020: All HAs prepared to receive vaccine and rollout; template with level of detail sought vs trusting HAs to know their regions; Reka suggested asking HAs if they have plans and then synthesize that information to avoid adding additional burden.
A-026	First Nations Health Authority; Logistics; Planning	Noorjean, Becky and Robert to connect regarding commercial resources and planning	Medium	Noorjean Hassam, Robert Macquarrie; Becky Palmer	4-Dec-20	16-Dec-20	**Closed**	
A-024	Logistics; Planning	Deb, Noorjean and Monika to connect regarding possible provision of Red Cross clinical and non-clinical volunteers	Medium	Noorjean Hassam; Deb Lester; Monika Naus	4-Dec-20	16-Dec-20	**Closed**	Update 12/6/2020: Deb has details; will be connecting with Noorjean and Monika. Need to add additional groups.
A-034	Health System Operations	Budget documents to be drafted and shared at VPO-EOC	High	Peter Pokorny; Philip Twyford	7-Dec-20	21-Dec-20	**Closed**	Update 12/8/2020: Working with colleagues at PHSA to pull together. Budget itself will be due first week of January, needs to go through approval process. Target to have final draft in two weeks. Focus required for period up to 03/31/2021, followed by April 2021 onwards. Update 12/14/2020 - item closed. Will be a regular update going forward.
A-031	Red Cross Logistics	Deb to provide a comprehensive list of what CRC can provide in a document for sharing at VPO-EOC tomorrow	Medium	Deb Lester	6-Dec-20	23-Dec-20	**Closed**	
A-002	VPO-EOC	Define the roles and responsibilities of the different sections within the VPO-EOC	Medium	All Members	2-Dec-20	Mondays	**Closed**	Update 12/3/2020: VPO-EOC will continue to develop this Update 12/11/2020: Closed - this is ongoing work of HEMBC
A-005	VPO-EOC structure	Members to direct any amendments to the VPO-EOC structure or names to be added to John and Haley	Medium	All Members	2-Dec-20	Mondays	**Closed**	Update 12/3/2020: Ongoing, will do a check on this every day
A-040	Public Health Operations	Peter to provide directive on the need for vaccination records to be inputted into system immediately	Medium	Peter Pokorny	8-Dec-20		**Closed**	12/11/2020 - closing item, and rolling into items A-042 and A-043
A-039	IMIT	Corrie and Jill to follow up with MHOs on whether the identified nine sites across the province are ready to vaccinate, and as to how they are going to enter the information into the Provincial Immunization Registry	Medium	Corrie Barclay; Jill Reedijk	8-Dec-20		**Closed**	Update 12/9/2020: Remove as tracking item

A-025	Logistics; Planning	HEMBC will be asking external groups represented at VPO-EOC what capabilities they have for the different phases of vaccine roll-out	Medium	Gerry Delorme; HEMBC	4-Dec-20		**Closed**	Update 12/6/2020: Gerry to connect in with Deb etc. A-024 Update 12/8/2020: Three meetings today: CAF, CRC, RCMP. Finalizing documents on how to activate capabilities on the ground etc. Gerry to share document when complete.
A-032	First Nations Health Authority; Public Health Operations	Ross and Shannon to connect with Joint Standing Committee on Rural Issues regarding definition of rural and remote communities in BC	Medium	Ross Brown; Shannon McDonald	7-Dec-20		**Closed**	Update 12/8/2020: Connection today with JSC- provided a list from that describes each of the communities in RSA and their level- anyone on the A list should be considered rural and remote. HEMBC to email to all VPO-EOC members. Further work needs to be done as to where these communities fit in sequence - item will be returning to PHEC on Monday.
A-033	Health System Operations	HEMBC to send Peter early version of Op Immunize	Medium	HEMBC	7-Dec-20		**Closed**	Update 12/8/2020: This is the outward facing version, when the more tactical information has been developed this will be shared with Peter
A-035	Planning	Identify appropriate support (administration, project management and nursing) for planning section (Monika)	High	HEMBC	7-Dec-20		**Closed**	Update 12/8/2020: John has made connections at PHSA; Monika to send John email outlining exact need
A-036	Communication	Noorjean to provide Jean Marc with VCH and FH contacts for the recording of vaccine arrival	Medium	Noorjean Hassam	7-Dec-20		**Closed**	
A-018	Provincial Immunization Registry and Digital Solutions	Corrie/Jill/Ron to consider where digital solutions fits best within EOC structure; return to VPO-EOC with a recommendation	Medium	Corrie Barclay; Jill Reedijk; Ron Quirk	4-Dec-20		**Closed**	
A-019	Logistics	Gerry will connect with Noorjean over the weekend for input on the preliminary product to be used for VPO-EOC tabletop exercise	High	Gerry Delorme; Noorjean Hassam	4-Dec-20		**Closed**	Update 12/4/2020: Met today to discussion planning TTX- date TBD. Initial plan is to have exercise with Noorjean's team; will feedback to VPO-EOC.
A-022	Logistics	Noorjean to remove locations from BCCDC infographic	High	Noorjean Hassam	4-Dec-20		**Closed**	Update 12/6/2020: Noorjean has asked to team to remove
A-008	Logistics	Noorjean to bring SBAR regarding procurement of -80°C shippers to VPO-EOC	High	Noorjean Hassam	3-Dec-20		**Closed**	
A-015	Logistics	Gerry to support Noorjean in mapping process for vaccination roll-out	Medium	Gerry Delorme; Noorjean Hassam	3-Dec-20		**Closed**	Update 12/4/2020: Updates to follow; discussed under agenda item 3 Update 12/6/2020: Information will be shared with VPO-EOC and risks identified flagged with appropriate leads
A-001	Public Health Operations	VPO-EOC to make a decision as to whether to contract with Vaccination Evaluation Centre	Medium	Reka Gustafson	2-Dec-20		**Closed**	Update 12/3/2020: David has been in touch with people that might be able to help with the research piece; Manish Sadarangani is interested in participating so will be added to the research subgroup - David will approach about being his alternate Update 12/4/2020: Manish confirmed as David's alternate
A-004	VPO-EOC structure	John to organize for EMBC and Red Cross representation at VPO-EOC	High	John Lavery	2-Dec-20		**Closed**	Update 12/3/2020: Red Cross said they would get back to us today; John to follow up Update 12/4/2020: Deb Lester has joined the VPO-EOC from Red Cross, Pader Brach from EMBC
A-012	Research	David to connect with John re: identifying where research group fits within EOC structure	Medium	David Patrick	3-Dec-20		**Closed**	
A-049								
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2020-12-17		
#	Responsible Party	Action
1	Peter Pokorny and Ross Brown	Peter P and Ross B to determine placement for Bernard Achampong on IBCOC org. chart
2	All	Notify IBCOC@phsa.ca if you will be away for holidays, and who is covering for you.
3	Peter Pokorny	Peter P to locate, and share with command, the letter that was sent to regional health authorities about the use of the e-form, and other data reporting requirements.

2020-12-16		
#	Responsible Party	Action
1	Noorjean Hassam	Noorjean H to connect with Becky P and Robert M regarding commercial resources and planning
2	Gerry Delorme	Gerry D to connect with Reka G regarding planning approach to expanding vaccine delivery to practitioners outside of public health staff.
3	Noorjean Hassam	Noorjean H to work with Gerry D to develop weekly logistics work plan.

2020-12-15		
#	Responsible Party	Action
1	Bonnie Henry	Bonnie H discuss the distribution of Moderna Vaccines with Monika N and Reka G
2	Peter Pokorny	Peter P to share Regional Health Authority Clinic and Immunization plans with this group as they are received.
3	Corrie Barclay	Corrie B to connect with Monika N regarding AEFI reporting requirements.
4	Peter Pokorny	Peter P to connect with Reka G and Corrie B regarding reporting requirements and way to avoid reporting duplication, as well as streamlining data entry processes.
5	Corrie Barclay	Corrie B to connect with Noorjean H and Monika N regarding regional representatives to discuss monitoring and reporting on vaccine inventory.
6	Monika Naus	Monika N to connect with Becky P regarding BC's AEFI surveillance
7	Corrie Barclay	Corrie B to connect with Becky P and Shannon M regarding FN data collection
8	Bonnie Henry	Bonnie H to provide ethnicity standards for disaggregated data for case report forms to Jill R.
9	David Patrick	David P to develop a plan for research ramp-up.
10	Peter Pokorny	Peter P to locate information on federal cost recovery and coverage, and provide to Philip T
11	Shannon Greer	Shannon G to connect with Monika N regarding public vaccine safety messaging

2020-12-14		
#	Responsible Party	Action
1	HEMBC	SitRep template to be developed and distributed
2	Noorjean Hassam	SBAR-005 approved, to be actioned by Noorjean H
3	Monika Naus and Peter Pokorny	Monika to follow up with Meghan Will and Kiersten Fischer regarding LTC staff numbers. Peter P to provide assistance in the event of delayed information.
4	Corrie Barclay	Corrie B to connect with Lexie Flatt regarding the streamlining of data input processes
5	Peter Pokorny	Peter P to work with Pandemic VPs to create immunization clinic plans, which will be shared with this table upon completion.
6	Corrie Barclay and Peter Pokorny	Corrie B and Peter P to work with Shannon M to ensure that indigenous status data is being collected, and clarify associated processes.
7	Shannon MacDonald	Shannon to seek clarification on how immunizations will be getting to remote and FN communities. Issue to be addressed Dec 15 in conversation with PHO and FNHA.
8	Noorjean Hassam	Noorjean H to ensure that FNHA is included in logistical planning activities, such as the RHA tabletops.
9	Peter Pokorny	Peter P to connect Corrie B and David P regarding information flows.
10	Robert Macquarrie	Robert M to connect with Gerry and HEMBC regarding additional support capacity.

2020-12-13		
#	Responsible Party	Action
1	Reka Gustafson	Reka G to provide Peter P with contact names and information for the VCH immunization clinic.
2	Corrie Barclay	Corrie B to connect with Shannon M regarding adding indigenous status information collection in e-form
3	Corrie Barclay	Corrie B to connect with Monika N regarding AEFI reporting process
4	John Lavery	John L to report to Ross B on situation reporting process
5	Robert Macquarrie	Rob M to connect with Gerry D and Jonathan C regarding updates to possible support offered by CAF
6	Shannon Greer	Shannon G to advise Ross B on when GCPE will be able to provide push updates on information to the EOC.
7	Bonnie Henry and Ross Brown	Bonnie H and Ross B to determine if/when/how GCPE will be present at the vaccine rollout on Dec 15
8	Bonnie Henry	Bonnie H to connect with Ross B regarding op-ed or media availability re: safety of Pfizer vaccine and mRNA vaccine technology.
9	Noorjean Hassam	Noorjean H to confirm with John L that FH and VCH have security planned overnight in case of early vaccine delivery.

2020-12-11		
#	Responsible Party	Action
1	Noorjean Hassam	Provide a list of all the sites with a -80C freezer, that are getting vaccine in December
2	Monika Naus	Monika N to share the prioritization matrix for selection of LTC sites receiving vaccines with Bonnie H.
3	Noorjean Hassam	Noorjean H to move forward with the SBAR presented today, as it was approved.
4	Gerry Delorme	Gerry D to send preparedness materials to Peter P, Ross B, and Bonnie H, following validation on Dec 12.
5	HEMBC	Create central site where "intel" can be saved for awareness of all. Note: information sharing site in Microsoft Teams is available, and information on access was sent to all members of this committee.
6	Reka Gustafson and Ross Brown	Reka G and Ross B to determine solution for ensuring effective connection between existing public health structures and the IBCOC
7	Reka Gustafson	Reka G to set up a call with Elizabeth Brodkin and Patty Daly and Bonnie H over the weekend
8	Monika Naus	Monika N to send VCH and FH immunization clinic plans to this group

2020-12-10		
#	Responsible Party	Action
1	All	All command staff must identify alternates for their own and other key positions, to ensure continuity of operations.
2	John Lavery	John L to connect with Corrie B regarding consolidating action tracker items related to data and reporting.
3	David Patrick	David P to share updated modeling with the command group on December 11th.
4	All	This table will revisit the topic of the ethical considerations regarding holding back Pfizer dose withholding, on Sunday December 13th.
5	All	This table to decide, by Dec. 15, to what extent future Pfizer shipments in December will be concentrated in the lower mainland.
6	Monika Naus	Monika and the BCCDC will distribute clinical information materials once the ethical considerations from Item #5 are addressed.

7	John Lavery	HEMBC team to produce a plan and progress update for Ross B that can be used for briefing purposes.
8	Bonnie Henry	Bonnie H, Becky P, and Shannon M to discuss whether nursing staff in FN communities should be prioritised for vaccination over the December holiday timeframe.
9	Jill Reedijk and Corrie Barclay	Jill R and Corrie B to validate FH/VCH solutions required for entering immunization data, and produce one-page summary outlining current situation and needs by This weekend (Dec. 12-13)
10	Martin Lavoie	Martin L to facilitate meeting on the topic of reporting requirements with necessary stakeholder groups.
11	Monika Naus	Monika N to provide Martin L with examples of existing reporting templates
12	Jill Reedijk	Jill R to create summary of data flow within, and in to, the Provincial Immunization Registry.
13	Gerry Delorme and Robert Macquarie	Gerry and Robert to connect regarding information sharing and organizational practices.

HEMBC Health Emergency Management

Novel Coronavirus (COVID-19)
Immunize BC Operations Centre

Agenda: Immunize BC Operations Centre

Zoom Meeting Information			
Join meeting on a **computer** → Join meeting by **phone** →		Click on the Zoom link Dial s.15	**Meeting ID** s.15 **Password** s.15
Date (mm/dd/yyyy)	**Time** (24 hr)	**Chair**	**Recorder**
12/18/2020	16:30-17:30	Ross Brown	HEMBC

Item	Lead	Notes
1. Welcome & Introductions • Land Acknowledgement • Opening comments from Bonnie • Minutes • Membership updates	Ross Brown	
2. **Situation Updates**	Ross Brown Noorjean Hassam	
3. New Business • SBAR 009-Sequencing of COVID-19 Vaccines in BC • SBAR 010-Vaccine Delivery Sites – FNHA Nursing Stations	Ross Brown Noorjean Hassam	
4. Action Log	Ross Brown	
5. Logistics	Noorjean Hassam	
6. Public Health Operations	Reka Gustafson	
7. Health System Operations **7a. Reporting** **7b. IMIT** **7c. Human Resources**	Peter Pokorny Corrie Barclay, Jill Reedijk, Martin Lavoie Corrie Barclay, Ron Quirk TBD	
8. Planning **8a. Research**	Monika Naus David Patrick, VEC	
9. Finance and Procurement	Philip Twyford	
10. First Nations Health Authority	Shannon McDonald	
11. HEMBC	John Lavery	
12. EMBC Liaison	Kathryn Forge	
13. Canadian Armed Forces	Robert Macquarrie	

14. Communication	Shannon Greer Kirsten Youngs	
15. Red Cross Logistics	Deborah Lester	
16. Priorities for Operational Period	Ross Brown	
17. Closing/Next Meeting	Ross Brown	

Minutes: Immunize BC Operations Centre

Zoom Meeting Information			
Join meeting on a **computer** → Click on the Zoom link Join meeting by **phone** → Dial s.15			**Meeting ID** s.15 **Password** s.15
Date (mm/dd/yyyy)	**Time** (24 hr)	**Chair**	**Recorder**
12/17/2020	16:30-17:30	Ross Brown	HEMBC

Item	Lead	Notes
1. Welcome & Introductions • Land Acknowledgement • Opening comments from Bonnie • Minutes • Membership updates	Ross Brown	Opening comments from Ross B and Martin L Membership update • Kirsten Youngs, Director of COVID communications with GCPE.
2. **Situation Updates** • IBCOC Internal SitRep	Ross Brown Noorjean Hassam	Pfizer and Moderna • December arrival dates confirmed • Decisions on where to allocate December and January doses needed before Dec 20. Vaccinations • As of 16:23, 930 doses were administered today, for a new provincial total of 2141. • We have confirmation that people are getting 6 doses per vail of the Pfizer vaccine, sometimes, rather than 5 (as on the label). Confirmed with Pfizer that that is fine. ○ These extra doses are available roughly 60% of the time, but all planning will occur assuming 5 doses per vial.

3. New Business
• Holiday Coverage
• First Nations Allocation Proposal
• SBAR 008 - Vaccine Ethical Decision Making Framework Dec 17 2020
	Ross Brown
	
	Noorjean Hassam
	
	Alice Virani
		Holiday Coverage
		• Notify the s.17 if you will not be available and who is covering for you.
		• IBCOC members will be considered to be available unless stated otherwise
		SBAR 008 –
		• Seeking to approve the use of the new ethics framework put together by the provincial health ethics advisory team. Intended to ensure consistency by ethics groups across the province when answering HA questions, as well as providing a framework for decision making generally
		• If approved, this document would be distributed to the health authorities to provide decision making support
		• **SBAR Approved**
		  ○ A NACI briefing on ethics occurred today
		  ○ Martin L would like to have this document presented at SAC.
		First Nations Allocation Proposal
		• Proposal brought forward by Noorjean H.
		• Proposal: distribute Moderna Vaccine to 10 remote first nations when first allocation received.
		• Proposal was developed in consultation with FNHA and ethics experts, and is in line with the provincial ethics framework.
		• Significant discussion undertaken.

		• **Proposal APPROVED**
		  ○ Four further decision points sought:
		  1. Should it be sent to all of these communities, or just some?
		  ▪ **Decision:** All
		  2. What segment of the population should vaccines be supplied for?
		  ▪ **Decision:** All adults
		  3. What percentage of vaccination uptake (vaccine acceptance) should be assumed for the communities?
		  ▪ **Decision:** Assume 100% uptake
		  4. Should supplies be sent for first doses, or for both doses?
		  ▪ **Decision:** Vaccines should be supplied in sufficient quantity to administer both doses.
		• The Proposal shall be submitted to this group as an SBAR for further approval.
		• Decision must be finalized at next IBCOC Command meeting, in order to ensure that delivery sites can be confirmed in time for Dec. 20 deadline.
		• Note: receiving sites do not have -20 freezers, and so vaccine will be stored in standard refrigeration.
		  ○ Moderna vaccine can be kept in standard refrigeration for 30 days.
		  ○ Minimum time between doses is 21 days.
		  ○ This may cause some strain with communities in making sure that the second dose is delivered in time.
		  ○ Work underway to see if it is possible to alter distribution plan to create additional time for second dose.

4. Action Log	Ross Brown	No Updates
5. Logistics	Noorjean Hassam	Question: The Pfizer delivery of 16,575 doses on Jan 4, will we allocate that according to population across the HAs? • Reka G to take the issue of Pfizer allocation for first week of January, to Dec 18 Public Health Leadership call for decision. • Monika N to send information regarding planning for Pfizer sequencing, in order to inform public health decision making. • An SBAR will then be generated based on the recommendations of the Public Health Leadership group, and brought to the IBCOC command call for approval. • Once SBAR is approved, Bonnie H and Steve B will take the recommendations to the Minister. • This is only for the shipment in the first week of Jan, the future decisions will go to BCIC first, then to PHEC, then IBCOC Command.
6. Public Health Operations	Reka Gustafson	No Updates
7. Health System Operations **7a. Reporting** **7b. IMIT**	Peter Pokorny Corrie Barclay, Jill Reedijk, Martin Lavoie Corrie Barclay, Ron Quirk	HA Clinic Plans • All HA Clinic Plans have been completed, and will be updated as the roll-out continues. Several Decision points needed for planning purposes: • What is the final plan for sequencing of the Pfizer vaccine?

7c. Human Resources	TBD	• What are the details of our second-dose scheduling plans? • Supply forecasts (in so much as we have, for planning purposes) • Information on the limitations on moving the vaccine • Documented decision on the provision and use of the Provincial Immunization Registry • Clear reporting requirements IMIT • Work continues on refinement of the e-form and associated workflows. • Peter to connect with Ian and Darlene ensuring that the data requirements for reporting to the minister are clear, and that connections are made so that all data requests are coming through a singular channel. Reach-out to physicians and other providers • Messaging being developed to send out to docs etc. to ensure that they know that their assistance will be needed for vaccination, but isn't yet.

8. Planning
8a. Research
	Monika Naus
	David Patrick, VEC
		Data Reporting
		• A letter has apparently been sent to regions regarding expectations for reporting into the registry
		  ○ Peter will find the letter and clarify the information, bringing it back to this group
		Adverse event reporting
		• Need for clarification: what is our role in this, and what the roles of the other people who are becoming involved from across the ministry and health sector?
		• Peter to report back with clarification on this matter
		Vaccine injury compensation scheme
		• Presentation came out today from the federal government (to be shared with this group)
		• Will be retroactive to Dec 8
		• Will be up and running in June, but not before.
		• Will cover all vaccines approved by Health Canada
		• This was discussed at SAC, and that information was sent to cabinet
		  ○ A decision must be made to either opt in or opt out
		  ○ We are likely to opt in
		Research
		• First draft of knowledge gap analysis has been sent to IBCOC group for input, particularly looking for public health feedback
		• Want to start sitting down with funders on Monday to get this work moving
		• IBCOC members asked to submit feedback within 24 hours, if possible

9. Finance and Procurement	Philip Twyford	No updates
10. First Nations Health Authority	Shannon McDonald	No updates
11. HEMBC	John Lavery	No updates
12. EMBC Liaison	Katheryn Forge	No updates
13. Canadian Armed Forces	Robert Macquarrie	No updates
14. Communication	Shannon Greer	Kirstin Young • New director of COVID communications with GCPE • will have a dedicated COVID team working under her.

		Healthcare workers are currently lined up outside the clinic in VCH • Location of vaccine clinic is now public Marketing meeting • Government marketing vaccine comms plan will launch in Jan. • Work ongoing to put together a template HAs when communicating about their clinics
15. Red Cross Logistics	Deborah Lester	Available to support rural and remote communities with Moderna deliveries.
16. Priorities for Operational Period	Ross Brown	
17. Closing/Next Meeting	Ross Brown	December 18

#	Responsible Party	Action
1	Peter Pokorny and Ross Brown	Peter P and Ross B to determine placement for Bernard Achampong on IBCOC org. chart
2	All	Notify s.17 if you will be away for holidays, and who is covering for you.
3	Peter Pokorny	Peter P to locate, and share with command, the letter that was sent to regional health authorities about the use of the e-form, and other data reporting requirements.

HEMBC Health Emergency Management

SBAR 009
COVID-19: IBCOC

Administrative Information				
EOC Lead/Sponsor	Ross Brown	**Date**	**12/18/2020**	
SBAR developed by	Haley Miller	**Key stream**	☒ Operations ☐ Planning ☐ Logistics	☐ Information ☐ Finance ☐ Other
Please list anyone consulted in the development this SBAR	Public Health Executive Committee	**Item is for**	☐ Discussion ☐ Information ☒ Decision	
Please list any SBARs related to this decision	006: Allocation of Initial Doses (Approved)			
Cost associated *(*see Step 2 in SBAR process)*	☒ No ☐ Yes; Finance representative has reviewed the Financial Considerations section: Name of representative consulted.	**To be discussed at**	☒ IBCOC ☐ Public Health Leadership ☐ Public Health Executive ☐ Other (specify)	
FTE/staffing impact	☒ No ☐ Yes	**Priority**	☐ Low ☐ Medium ☒ High	

Title: Sequencing of COVID-19 Vaccines in British Columbia

Situation
A limited supply of COVID-19 vaccine has been delivered to BC to begin immunizing high risk priority populations. This limited supply is anticipated to continue into early January 2021, with increases in doses received weekly. Using recommendations from the National Advisory Committee on Immunization, public health leadership has identified sequencing of priority populations in British Columbia for whom vaccine will be offered.

Background
The nature of the COVID-19 immunization program, with multiple vaccine products, extreme storage and handling requirements, two-dose schedules, and uncertain timelines for vaccine availability means that equitable allocation of COVID-19 vaccines will be challenging. Initial doses provided by Pfizer will be in limited quantities for December 2020 and are expected to increase in January 2021 and beyond. Additional manufacturers will bolster BC's allocation of COVID-19 vaccines; however, due to the initial scarcity of doses, vaccines will not (and cannot) be made available to all people in BC at once.

Allocating vaccine as it arrives in limited quantity requires a fair and transparent process until enough vaccine arrives to offer it to the general population. A prevailing principle in the allocation of scarce resources is to seek to maximize benefit, that is, to prioritize people with the highest needs and greatest likelihood to benefit in order to maximize health benefits for the population overall. Therefore, the ethical approach to vaccine distribution is to offer vaccine to people with both the highest need and the greatest likelihood of benefiting and prioritize access that does not exacerbate the impact of COVID-19 to maximize the health benefits of the population. This approach is outlined in the recently IBCOC-approved COVID-19 Vaccine Allocation Ethical Decision-Making Framework.

The National Advisory Committee on Immunization (NACI) makes recommendations for the use of vaccines in Canada and identifies groups at risk for vaccine-preventable diseases for whom vaccination should be targeted. NACI recommends the following populations be offered COVID-19 vaccine:

- Residents and staff of congregate living settings that provide care for seniors;
- Adults 70 years of age and older, beginning with adults 80 years of age and older, then decreasing the age limit by 5-year increments to age 70 years as supply becomes available;
- Health care workers (including all those who work in health care settings and personal support workers whose work involves direct contact with patients); and
- Adults in Indigenous communities where infection can have disproportionate consequences.

In BC, public health leadership, in collaboration with the Provincial Health Officer, the First Nations Health Authority, and Indigenous leaders have adapted and refined the NACI recommendations to identify priority populations to receive the initial offer of protection. These priority populations have been identified in consideration of multiple and novel vaccine products, the complexity of cold-chain management, minimizing vaccine wastage, vaccine safety, areas with a high concentration of COVID-19 cases, and equitable geographical distribution.

INITIAL PHASE	QUARTER ONE	QUARTER TWO	QUARTER THREE	QUARTER FOUR
December 2020	**January 1 – March 31, 2021**	**April 1 – June 30, 2021**	**July 1 – September 30, 2021**	**October 1 – December 2021**
Doses expected: 33,150	**Doses expected: 736,650**	**Doses expected: 5 million**	**Doses expected: TBD**	**Doses expected: TBD**
• Planning and exercises to prepare for safe arrival and distribution • Initial doses received December 14, 2020 • First doses administered December 15, 2021 to workers in long-term care and assisted living facilities in the lower mainland • Additional December doses to continue to be offered to staff of LTC and Assisted Living Residences and to residents of these settings as transport/ cold chain requirements allow	• **First priority group**: staff and residents of long-term care and assisted living facilities; home care recipients and staff; HCWs working in ER/ICU/Medicine caring for COVID-19 patients and managing the COVID-19 response including testing and assessment sites, on site outbreak response teams and COVID-19 immunization clinics; essential visitors to long-term care and assisted living facilities; indigenous people living in rural and remote locations; residents, clients and workers in select congregate settings; people over 80 years old	• **Second priority group**: older people under age 80; indigenous people living on and off reserve; key frontline workers including remaining health care workers; police; fire and first responders; teachers; people working in transportation; people working in manufacturing and production facilities	• General population	• General population

Assessment

The first delivery of vaccine was received on **December 14, 2020.** Four trays with 975 doses per tray were delivered to two locations in the lower mainland and are stored in ultra-low temperature freezers. All 3,900 doses are being administered as the first dose in a two-dose series to people who work in long-term care and assisted living facilities in the lower mainland beginning at 1pm on **December 15, 2020**. Pfizer has restricted secondary transport of their vaccine for the month of December while the province familiarizes itself with the safe storage and administration of this novel, ultra-low temperature vaccine. Pfizer are expected to provide updated information on vaccine stability that may allow for transport of thawed vaccine; this would allow for vaccine use in non-mobile populations including residents of long-term care who require immunization services in their

residential setting. Further allocations for the Moderna vaccine, once approved, are forthcoming in a future SBAR.

The following proposed sequencing and recommended timing will be dependent on the ability for the province to receive a sufficient supply of doses. The sequencing and timing will be continued to be monitored with recommendations coming forth if the situation changes significantly.

Priority populations for this initial rollout include:

- Residents and staff of long-term care facilities;
- Residents and staff of assisted living residences;
- Essential visitors to residents of long-term care facilities and assisted living residences;
- Home care recipients and staff who provide care to these individuals; and
- Health care providers most essential to providing front line care to patients with COVID-19 and in managing the COVID-19 response, including:
    - Those working on-site at outbreak response teams in senior's residences;
    - Those working in emergency rooms, intensive care units and medical wards;
    - Those working at COVID-19 testing sites; and
    - Those working in COVID-19 immunization clinics.

In **January 2021**, vaccine will begin to be distributed to additional sites throughout the province in all health authorities. Nine sites will receive vaccine, with some to run clinics directly from those locations, while others will arrange for distribution to secondary sites. Regional health authority planning for this phase of the vaccine rollout is rapidly underway.

In **February and March 2021,** vaccine will continue to be offered to the priority groups listed in the initial rollout, and will be expanded to include:

- Indigenous people (First Nations, Metis, Inuit, and other Indigenous people) on and off reserve;
- Other people aged 80 years and older;
- Residents / clients and workers in select congregate settings with demonstrated higher morbidity or where infection prevention measures not readily applied, such as:
    - People experiencing homelessness;
    - Shelters;
    - Correctional facilities;
    - Group homes;
    - Mental health residential care; and
    - Migrant farm workers.
- Additional health care workers[1], including:
    - Paramedics and other medical first responders, including fire fighters who respond to overdose calls;
    - Staff of acute care hospitals with priority given to those who may be exposed to aerosol generating medical procedures;
    - Community primary care providers, some specialists who see patients in person, and office staff in these settings;
    - Public and private laboratory staff;
    - Midwives;

[1] Health care workers are defined as including hospital employees, other staff who work or study in hospitals (e.g., students in health care disciplines, contract workers, volunteers) and other health care personnel (e.g., those working in clinical laboratories, nursing homes, home care agencies and community settings). Among workers in a healthcare setting, those whose work puts them at increased risk due to direct contact with patients (e.g., physical contact with patients, sustained time in patients' room), particularly those who are in direct contact with COVID-19 patients, should be prioritized during the initial vaccine availability. This can be expanded to other health care workers based on subsequent vaccine supply availability.

  - Pharmacists and pharmacy staff;
  - Public health staff who work in front line care settings;
  - Community radiology / imaging staff;
  - Those who work with vulnerable populations; and
  - Those who work in patient care settings.
- Residents of remote / isolated communities.

Sequencing decisions at the regional level may be adjusted to account for:

- Recognized risk in specific settings and populations;
- Geographic transmission patterns and incidence of COVID-19;
- Mitigating impacts of outbreaks;
- Potential impact of outbreaks in rural and remote communities due to their geographical distance from care;
- The size of the priority population(s) within the community, along with minimum doses allocated for use; and
- Consideration of vaccine tolerability (i.e., the degree to which adverse events can be tolerated) the and potential impact on staffing.

In April 2021, logistics are dependent on the vaccine that is delivered to BC. However, the second priority group will begin to receive immunizations during this quarter, including:

- Older people under age 80 in descending five-year-age groups, with a focus on the oldest people first;
- Key frontline workers including:
  - Health care workers;
  - Police;
  - Fire and first responders;
  - Teachers;
  - People working in transportation; and
  - People working in manufacturing and production facilities.

In July 2021, it is expected that the remainder of the general population that is eligible for vaccination will be offered it. It is anticipated that all people in BC who are eligible to receive the COVID-19 vaccine will be offered it by the fall of 2021.

Recommendation

Endorse the priority populations recommended by NACI and adapted by public health leadership using an ethical COVID-19 vaccine allocation framework for the sequencing of COVID-19 vaccine in BC. Support the ability for health regions to make operational decisions to opportunistically deliver vaccine doses within the priority population categories to reduce vaccine wastage, expected to be a very small amount.

Completed by HEMBC		
Outcome	☐ Approved	☐ On hold
	☐ Not approved	☐ Revision required
	☐ Withdrawn	☐ Endorsed
	☐ Pending	

Approving body	☐ IBCOC ☐ PHSA ☐ Ministry of Health ☐ Other:			**Authorized by**	Head of approving body
SBAR #	XXX	**Version**	-XX	**Date**	Click here to enter a date.

HEMBC Health Emergency Management

SBAR 010

COVID-19: Immunize BC Operations Centre

Administrative Information				
EOC Lead/Sponsor	Noorjean Hassam, Logistics Chief	**Date**	**12/17/2020**	
SBAR developed by	Noorjean Hassam	**Key stream**	☐ Operations ☐ Planning ☒ Logistics	☐ Information ☐ Finance ☐ Other
Please list anyone consulted in the development this SBAR	Shannon McDonald, CMHO FNHA Becky Palmer, CNO FNHA Chuck Wilmink, FNHA FNHA Vaccine Planning Team Lauren Mathany, Provincial Operations Logistics co-Chair	**Item is for**	☐ Discussion ☐ Information ☒ Decision	
Please list any SBARs related to this decision				
Cost associated *(*see Step 2 in SBAR process)*	☒ No ☐ Yes	**To be discussed at**	☒ IBCOC ☐ Public Health Leadership ☐ Public Health Executive ☐ Other (specify) BCIC	
FTE/staffing impact	☒ No ☐ Yes; Human Resource/WorkforcePlanning representative has been consulted: Name of representative consulted.	**Priority**	☐ Low ☐ Medium ☒ High	

Title: Allocation of Moderna vaccine delivery sites to FNHA remote nursing stations

Situation

The BC COVID-19 Ethical Decision-Making Framework (EDMF) for vaccine allocation supports the just allocation of vaccines to remote sites, and particularly remote sites with a higher risk populations. Moderna is more suitable to deliver to remote sites than the Pfizer vaccine, as Moderna vaccine can be stored at -20C long term or at 2-8C for 30 days. The first shipment of Moderna vaccine to BC is anticipated to arrive December 28-31, 2020. Moderna is therefore being considered for delivery to the 10 remote nursing stations in BC that each have a percentage of people who are over 65.

Background

The BC COVID-19 Ethical Decision-Making Framework (EDMF) for vaccine allocation supports the just allocation of vaccines to remote sites, and particularly remote sites with higher risk populations. The Moderna vaccine is more suitable for use in remote regions since it does not require a -80 freezer for transportation and storage, has a longer fridge life, and does not need to be diluted for administration. Moderna vaccine can be stored at -20C long term or at 2-8C for 30 days, and the 2 dose schedule includes a second dose after 21-35 days. The first shipment of Moderna vaccine to BC will arrive December 28-31, 2020. Only Moderna and Pfizer vaccine will arrive in BC in Q1 of 2020. The delivery of this vaccine is through a contract with FedEx, to anywhere in the province with no limit on the number of delivery sites. Given the first shipment of Moderna is to arrive around December 28, the only eligible remote FNHA sites are the 10 nursing stations, mostly in northern BC. The rest of the health

centres in FN communities are closed during this time period and have no staffing available. Moderna is therefore being considered for delivery to the 10 remote nursing stations in BC, each serving a town with a small percentage of people who are over 65.

These 10 communities have little access to health care services locally, and are considered living in a "high risk environment". Given that there are elders over 65 in each of these communities, they fall under the highest prioritization group for the allocation of vaccines, as described in the British Columbia COVID-19 Vaccine Implementation: An Ethical Decision Making Framework. *Getting vaccines to these elders is a priority.* Alongside this, there are practical and ethical considerations that suggest it is better to send vaccines to the *entire* adult population, rather than only the elders. These considerations include:

- Elders in the community tend to live in multi-generational homes; immunizing all people in the home increases the protection for the elders
- The population of elders in these communities is very low, and sending the minimum dose would result in needing to vaccinate others in the community to avoid waste. This could result in inequitable immunization in the community, and the need for a second or third delivery.
- The weather impacts the ability of these communities to get deliveries. The weather is more favorable now, than it will be at the end of January and February when the next Moderna deliveries are anticipated
- The population of the communities is low, and has a relatively small impact on overall distribution of vaccines across BC
- Health Canada is sending all Territories the full allocation of Moderna vaccine to immunize the adult population, rather than providing vaccine in multiple shipments and sequencing the population
- Providing vaccines in a timely way to remote FN communities is an important act of reconciliation and equity

Assessment

Given the multiple factors that make Moderna the vaccine of choice for remote communities, and the timing of Moderna deliveries in Q1, and the ethical considerations for ensuring that these communities receive vaccines early in the sequencing we assess that sending the full two dose adult allocation of Moderna to these 10 nursing stations via the Dec 28 delivery is the favored option.

Recommendation:

Approve the allocation of 8800 doses of Moderna vaccine across the 10 FNHA remote nursing stations from the December 28, 2020 delivery.

Completed by HEMBC					
Outcome	☐ Approved ☐ Not approved ☐ Withdrawn ☐ Pending		☐ On hold ☐ Revision required ☐ Endorsed		
Approving body	☐ IBCOC ☐ PHSA ☐ Ministry of Health ☐ Other:			**Authorized by**	Head of approving body
SBAR #	XXX	**Version**	-XX	**Date**	Click here to enter a date.

From:	van Gelderen, Courtney [PHSA] on behalf of IBCOC
To:	Brown, Stephen R HLTH:EX; Henry, Bonnie HLTH:EX; Miller, Haley HLTH:EX; Brown, Ross Dr [VCH]; XT:Naus, Monika HLTH:IN; Reedijk, Jill [BCCDC]; Lavoie, Martin HLTH:EX; Lawrie, Hannah GCPE:EX; XT:McDonald, Shannon HLTH:IN; XT:Dawkins, Laurie GCPE:IN; Delorme, Gerry (PHSA) [VIHA]; Prevost, Jean-Marc GCPE:EX; VPOEOC [PHSA]; Halicki, Ashley HLTH:EX; Galt, Jamie HLTH:EX; Pokorny, Peter HLTH:EX; Hassam, Noorjean [BCCDC]; "tim.byres@forces.gc.ca"; XT:HLTH Brown, Libby; Gustafson, Reka [BCCDC]; XT:Patrick, David HLTH:IN; "SHEA.BRAMLEY@forces.gc.ca"; "Patricia.Laing@forces.gc.ca"; Hinde, Grace [PHSA]; Smith, Paula GCPE:EX; XT:Pope, Darcia HLTH:IN; Bru, Carolyn GCPE:EX; "Deborah.Lester@redcross.ca"; "Robert.Macquarrie2@ecn.forces.gc.ca"; Quirk, Ron EHS:IN; Twyford, Philip HLTH:EX; Barclay, Corrie A HLTH:EX; Brach, Pader W EMBC:EX; XT:Palmer, Becky HLTH:IN; Virani, Alice [PHSA]; Thistle-Walker, Carlene HLTH:EX; IBCOC; Carroll, Jonathan C HLTH:EX; Greer, Shannon GCPE:EX; Achampong, Bernard HLTH:EX; Massey, Keren L HLTH:EX; Grieve, Chandler GCPE:EX; Youngs, Kirsten R GCPE:EX; Thompson, Laurel HLTH:EX; Forge, Kathryn EMBC:EX; XT:Lavery, John HLTH:IN; CoastalSMD; IBCOC
Subject:	IBCOC Internal SitRep 2020-12-18
Date:	December 18, 2020 4:33:35 PM
Attachments:	IBCOC_Internal_SitRep_2020-12-18.docx

Good afternoon,

Please find **IBCOC Internal SitRep 2020-12-18** attached.

Many thanks,
Courtney

Courtney van Gelderen
Executive Assistant to John Lavery, Executive Director HEMBC
Provincial Health Services Authority

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HEMBC Health Emergency Management

Situation Report #01
Immunize BC Operations Centre

Internal Situation Report # 002

Region: British Columbia – Provincial

Overview: The Immunize BC Operations Centre (IBCOC) is activated to coordinate management of the COVID-19 vaccination rollout. This report provides a strategic overview on the status of deliveries, inventory, planned and actual administration, and logistics status (i.e. shipment status/location and status of Health Authorities receiving initial batches). This report represents a "snapshot in time" and the information within is subject to change.

Situation Reports will be released daily based on information from the previous day.

New information will be posted in red.

Date issued: 2020-12-18

Next report: 2020-19-19

Prepared by: HEMBC IBCOC Support

Contact: Jonathan.Carroll@gov.bc.ca

Report Sections:

1. Strategic Priorities

1. Ensure safe and efficient implementation of the Provincial COVID-19 Vaccination Plan
2. Ensure that deliveries of the Pfizer Vaccine are received and administered to members of the public in a safe, fair, and scientifically-base way, in accordance with the Provincial COVID-19 Vaccination Plan
3. Ensure that the health system is prepared for the arrival and implementation of the Moderna vaccine.

2. Situation Overview (as of 2020-12-17)

Last 24 hours			
Health Authority	Population Vaccinated (at least one dose)	Vaccine Doses Received	
		Pfizer	Moderna
FHA	360	-	-
VCHA	1,016	-	-
VIHA	-	-	-
IHA	-	-	-
NHA	-	-	-
TOTAL	**1,376**	**-**	**-**

*Data not available for this report

Total To-Date					
Health Authority	Population Vaccinated (at least one dose)	Vaccine Doses Received		Vaccine Receival Sites	Vaccine Clinics sites active to date
		Pfizer	Moderna		
FHA	633	1,950	-	1	1
VCHA	1,959	1,950	-	1	1
VIHA	-	-	-	-	-
IHA	-	-	-	-	-
NHA	-	-	-	-	-
TOTAL	**2,592**	**3,900**	**-**	**-**	

*Data not available for this report

Significant Updates:

- Vancouver Coastal Health is reported to have used all of their stock of Vaccine. This means that they are finished vaccination for the time being.
- Pfizer has confirmed that doses arriving in January will be less than previously anticipated.
- Some vials of Pfizer vaccine have been found to contain 6 doses after reconstitution, instead of the expected 5. Pfizer has confirmed that this is normal, and that additional dose may be used.
- Vaccination Clinic continues operation in Fraser Health.
- The first Shipment of Moderna Vaccine could be expected to arrive as early as December 21, with shipment likely to arrive closer to the end of December.

3. Upcoming Events

- December 18: Health authority readiness exercise for vaccination clinics
- December 21: Shipment of Pfizer Vaccine, 20,475 doses
- December 23: After Action Review for Dec. 21 shipment arrivals
- December 28: Shipment of Pfizer Vaccine, 8,775 doses
- December 28 – January 1: Possible range for arrival of Moderna Vaccine

4. Key Updates by Section

Command	• Primary focus of activities is around preparing for Dec. 21 deliveries, and the consequent vaccinations.
Logistics	• January allocations of Pfizer vaccine are confirmed to be lower than previously anticipated, but will arrive weekly. • Planning underway to delivery Moderna vaccine to 10 specific remote First Nations communities, when first shipment arrives.
Public Health Operations	• Work ongoing to collect data on vaccination coverage/progress at long-term-care facilities. • Planning underway for scaling-up of vaccination efforts, and expansion of vaccination from just public health staff, to other doctors, nurses, and pharmacists.
Health System Operations	• Regional Health Authorities plans for clinics and vaccine roll-out have been submitted. • Messaging being developed for Physicians and other providers to inform them that their assistance will be required for vaccinations, but not until larger mass-immunization efforts are underway. • Work to refine workflow associated with the new e-form is underway. • Daily reporting on inventory for sites administering vaccines is in development. • Efforts underway to register individuals receiving vaccines for the Health Gateway system, so that they can access digital records of their vaccination.
Planning	• Clarification regarding roles and responsibilities around adverse event reporting is underway. • Federal government announced its new Vaccine Injury Compensation Scheme. • Rapid assessment of research needs is now complete, funding talks to commence on Monday Dec. 21.

	• Work ongoing with the BC Immunization Committee, FNHA, and others to determine which communities and which populations will be prioritized for vaccination. • Advanced Planning around the rollout of large-scale immunization clinics is underway.
Finance and Procurement	• No updates at this time.
Communications	• A new director of COVID Communications has been added to the IBCOC structure, Kirsten Youngs • Government Vaccine Marketing/Comms plan will launch in Jan. • Work is ongoing to develop a template for regional health authorities, to assist in communicating about their vaccine clinics.
Liaison Updates	• No new updates.

5. Health Authority Updates

FH	• Vaccinations continue at clinic site, planning underway for receiving additional vaccine on Dec 21. • Planning underway for receiving and administering Moderna Vaccine, once it is approved.
VCH	• Vaccinations continue at clinic site, planning underway for receiving additional vaccine on Dec 21. • Planning underway for receiving and administering Moderna Vaccine, once it is approved.
VIHA	• Preparations underway to prepare for Dec. 21 vaccine delivery, and subsequent immunization. • Planning underway for receiving and administering Moderna Vaccine, once it is approved.
IH	• Preparations underway to prepare for Dec. 21 vaccine delivery, and subsequent immunization. • Planning underway for receiving and administering Moderna Vaccine, once it is approved.
NH	• Preparations underway to prepare for Dec. 21 vaccine delivery, and subsequent immunization. • Planning underway for receiving and administering Moderna Vaccine, once it is approved.
FNHA	• Preparations underway to prepare for Dec. 21 vaccine delivery, and subsequent immunization. • Planning underway for receiving and administering Moderna Vaccine, once it is approved.

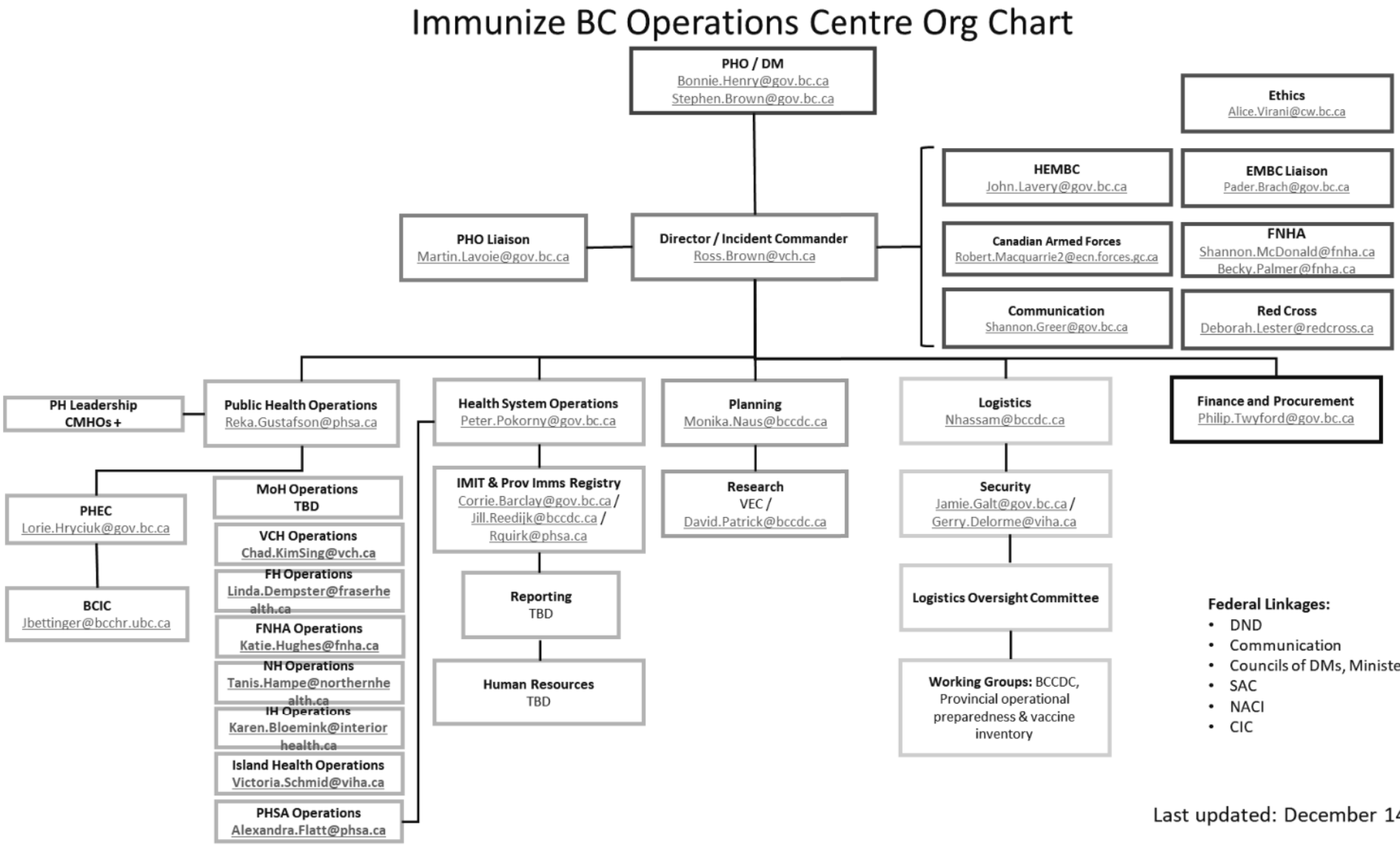
6. NOC updates

- Efforts are underway to streamline communications between NOC and health system response by utilizing IBCOC communications processes.

7. SBARS

Number	Title	Contact	Outcome(s)
SBAR – 001	Freezer Procurement for COVID-19 Vaccine	Noorjean Hassam	Approved
SBAR – 002	Ultralow temperature thermal shippers and data loggers for Pfizer vaccine	Noorjean Hassam	Approved
SBAR – 003	Dry Ice PPE Kits final	Noorjean Hassam	Approved
SBAR – 004	BC COVID-19 Vaccine Second Dose Deferral Strategy	Reka Gustafson	
SBAR – 005	Dry Ice Contract	Noorjean Hassam	Approved
SBAR – 006	Allocation of initial COVID-19 vaccine doses in December 2020 and early January 2021	Ross Brown	Approved
SBAR – 007	Immunization Record Card for COVID Vaccine recipients	Noorjean Hassam	Approved, for uncoated option.
SBAR - 008	Ethical Decision-Making Framework	Alice Virani	Approved
SBAR – 009	Allocation of Moderna vaccine delivery sites to FNHA remote nursing stations	Noorjean Hassam	Pending

8. Organizational Chart



Last updated: December 14, 2020, 14:20

9. Detailed Site Information

Pfizer Sites

Health Authority	Community	Site	Storage Type	Shipment Receiving Site	Clinic Site	Vaccine Received To date	Vaccine Administered to date	Vaccine on-hand (doses)	Doses Unusable	Ancillary Supplies (Days on hand)	Next Shipment
FHA	s.15; s.19		UTL	Yes	Yes	1950	633	*	0	-	Dec 21 * doses
FHA			UTL	Yes	Yes	-	-	-	-	-	Dec 21 * doses
FHA			UTL	Yes	Yes	-	-	-	-	-	Dec 21 * doses
VCHA			UTL	Yes	Yes	1950	1,959	*	0	-	Dec 21 * doses
VCHA			Thermal Shipper	Yes	Yes	-		-	-	-	Dec 21 * doses
VCHA			Thermal Shipper	Yes	Yes	-	-	-	-	-	Dec 21 * doses
VIHA			UTL	Yes	Yes	-	-	-	-	-	Dec 21 * doses
VIHA			UTL	Yes	Yes	-	-	-	-	-	Dec 21 * doses
VIHA			UTL	Yes	Yes	-	-	-	-	-	Dec 21 * doses
VIHA			UTL	Yes	Yes	-	-	-	-	-	Dec 21 * doses
IHA			UTL	Yes	Yes	-	-	-	-	-	Dec 21 * doses
IHA			UTL	Yes	Yes	-	-	-	-	-	Dec 21 * doses
NHA			UTL	Yes	Yes	-	-	-	-	-	Dec 21 * doses

* Information not available for this report

Moderna Sites (TBD)

Health Authority	Community	Site	-20 Freezer on site?	Shipment Receiving Site	Clinic Site	Vaccine Received To date	Vaccine Administered to date	Vaccine on-hand	Doses Unusable	Ancillary Supplies (Days on hand)	Next Shipment
FHA											
FHA											
FHA											
VCHA											
VCHA											
VCHA											
VIHA											
VIHA											
VIHA											
VIHA											
IHA											
IHA											
NHA											

10. Appendixes

None at this time.