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Challenges and recommendations for COVID-19 public health messaging: a Canada-wide qualitative study using virtual focus groups

Madison M Fullerton,[1] Jamie Benham,[1,2] Addy Graves,[3] Sajjad Fazel,[4] Emily J Doucette,[5] Robert J Oxoby,[6] Mehdi Mourali,[7] Jean-Christophe Boucher,[8] Cora Constantinescu,[1,5] Jeanna Parsons Leigh ,[9] Theresa Tang,[1] Deborah A Marshall ,[1,2] Jia Hu ,[1] Raynell Lang[2]

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JH and RL are joint senior authors.

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For numbered affiliations see end of article.

Correspondence to
Raynell Lang;
Raynell.Lang@albertahealthservices.ca

ABSTRACT

Objectives To understand Canadian's attitudes and current behaviours towards COVID-19 public health measures (PHM), vaccination and current public health messaging, to provide recommendations for a public health intervention.

Design Ten focus groups were conducted with 2–7 participants/group in December 2020. Focus groups were transcribed verbatim and analysed using content and inductive thematic analysis. The capability opportunity motivation behaviour Model was used as our conceptual framework.

Setting Focus groups were conducted virtually across Canada.

Participants Participants were recruited from a pool of individuals who previously completed a Canada-wide survey conducted by our research team.

Main outcome measure Key barriers and facilitators towards COVID-19 PHM and vaccination, and recommendations for public health messaging.

Results Several themes were identified (1) participants' desire to protect family and friends was the main facilitator for adhering to PHM, while the main barrier was inconsistent PHM messaging and (2) participants were optimistic that the vaccine offers a return to normal, however, worries of vaccine efficacy and effectiveness were the main concerns. Participants felt that current public health messaging is inconsistent, lacks transparency and suggested that messaging should include scientific data presented by a trustworthy source.

Conclusions We suggest six public health messaging recommendations to increase adherence to PHM and vaccination (1) use an unbiased scientist as a spokesperson, (*2*) openly address any unknowns, (3) more is better when sharing data, (4) use personalised stories to reinforce PHM and vaccinations, (5) humanise the message by calling out contradictions and (6) focus on the data and keep politics out.

Strengths and limitations of this study

- This study was the first to conduct online focus groups across Canada to evaluate Canadian's attitudes and current behaviours towards COVID-19 public health measures and vaccination as well as provide an in-depth evaluation of current public health messaging.
- A limitation of this study was that focus group participants were recruited from an existing voluntary nationwide panel designed to be representative of the Canadian population.
- The COVID-19 pandemic is rapidly changing and therefore, the attitudes and behaviours expressed at the time of these focus groups may have changed.

INTRODUCTION

The COVID-19 pandemic is one of the greatest public health threats in history, with over 175 million infections and 3 million deaths worldwide as of June 2021.[1] In Canada, as of June 2021, there have been over 1.4 million cases of COVID-19 and over 25 000 deaths.[2] The health impacts of COVID-19 (SARS-CoV-2) extend beyond those that are infected. There are increased rates of depression, substance use disorder, post-traumatic stress disorder, anxiety and domestic abuse due to the pandemic itself and from public health measures (PHM) used to mitigate spread.[3 4]

The current public health framework encourages hand hygiene, physical distancing, wearing face masks, self-isolating when sick, prompt testing and contact tracing.[5] Given that SARS-CoV-2 can be transmitted either when persons have mild symptoms or are asymptomatic, these PHM can be effective at mitigating spread.[6–12] As society has reopened there have been significant challenges with maintaining PHM, including physical distancing in all settings.[13] With multiple variants of concern emerging and

spreading quickly[14] and with repeating waves of disease, we must rely on individuals to practice PHM.

Although PHM have been effective, controlling the spread of COVID-19 remains challenging and many experts believe broad and rapid immunisation is the only viable option to control this pandemic. A May 2021 national survey (n=1319) by the Angus Reid Institute indicated that of the 47% of Canadians who have not been vaccinated, 38% would not get a vaccine as soon as it becomes available.[15] This high degree of vaccine hesitancy threatens the success of the national vaccine programme and may result in further devastating health and economic impacts. Therefore, there is an urgent need for effective interventions to increase vaccine uptake and maintain PHM during the vaccine roll-out process.

To design an evidence-based intervention to encourage behavioural change, we must first understand current attitudes and behaviours as well as identify key barriers and facilitators that influence adherence to PHM and vaccination.[16] In behavioural change research, the capability opportunity motivation behaviour (COM-B) model is a well-established framework that sits at the centre of behaviour diagnosis as it is used to effectively identify gaps in generating a desired behaviour.[16] The COM-B model tells us that behavioural change and maintenance is a result of the interaction between individual capability (ie, knowledge), opportunity (ie, access) and motivation (ie, goals).[17] By understanding people's capability, opportunity and motivation, we can identify what needs to change (ie, underlying conditions) and provide recommendations around how to change it.

The primary objectives of the study were to: (1) understand the motivations, capabilities and opportunities of Canadians who participate or do not participate in PHM to mitigate COVID-19, and (2) identify barriers and facilitators that influence COVID-19 vaccination among Canadians and the factors that would increase their willingness to take a COVID-19 vaccine. Secondary objectives were to: (1) identify Canadians' sources of COVID-19 information and (2) identify themes and messaging that resonates with Canadians to inform an evidence-based campaign aimed at increasing uptake of PHM and vaccine confidence.

METHODS

Study design

We conducted focus groups with Canadians from provinces across Canada (figure 1, online supplemental material A) between 8 December 2020 and 14 December 2020. Focus groups were used over other qualitative methods in efforts to create discussion among the participants and identify as many themes as possible. In addition, evidence shows that sensitive themes are more likely to emerge in a focus group setting than during one-on-one interviews.[18]

Participant recruitment

Participants were recruited from the Angus Reid Forum[19] and had previously participated in a Canada-wide survey in November 2020 conducted by the research team (n=4498).[20] At the end of the survey,[20] participants were asked if they would be interested in partaking in a future online focus group to further understand their attitudes

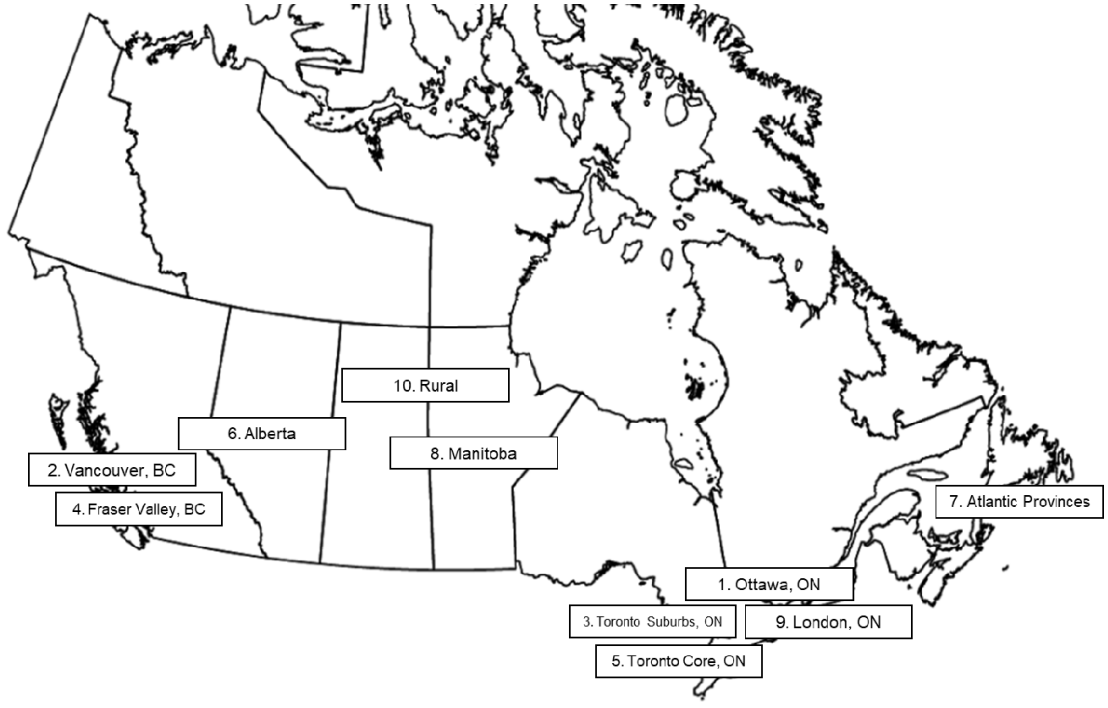

Figure 1 Locations of 10 virtual focus groups conducted across Canada from 8 December 2020 to 14 December 2020. 3. Toronto Suburbs, ON: Refer to online supplemental material A. 5. Toronto Core, ON: Refer to online supplemental material A. 7. Atlantic Provinces: New Brunswick, Newfoundland and Labrador, Nova Scotia, Prince Edward Island. 10. Rural Canada: Living outside of Saskatoon and Regina, Saskatchewan and outside Winnipeg, Manitoba.

and current behaviours towards COVID-19 PHM and vaccination. Components of the survey[20] were related to individuals' overall COVID-19 concern, which we used to identify individuals to invite to a focus group, in addition to the province/region they resided in to ensure equal representation across the country. We recruited slightly or moderately hesitant individuals (those that ranked within the middle 50% of willingness to vaccinate and willingness to follow PHM) as this population is thought to represent the 'movable middle' for whom we were most interested in understanding motivations and barriers.

Eligibility was defined as (1) slightly to moderately concerned individuals identified in our Canada-wide survey,[20] (2) aged 18 years or older, (3) live in a Canadian province, (4) speak English and (5) have access to the internet. From the 4498 survey participants, 530 were excluded as they responded in French. Of the 3968 potential participants, 52% (2070) indicated that they were interested in participating in an online focus group. We contacted 89 interested participants to ensure equal representation of the Canadian provinces. Individuals who met the criteria were invited to complete an online consent form and a small incentive was offered for participation. Participation was voluntary and informed consent was obtained.

Patient and public involvement

No patient involved.

Focus group guide development

Using the COM-B Model as our conceptual framework,[17] the focus group guide (online supplemental material B) was informed by the questions and results of our Canada-wide survey[20] and previous COVID-19 qualitative research conducted by our research team.[21] The focus group focused on the following areas: overall attitudes towards the COVID-19 pandemic, effectiveness of PHM, willingness to take the vaccine, sources of COVID-19 information and opportunities for improvements to public messaging. The content was presented in the form of a semistructured interview guide and was validated by a team of subject matter experts from the areas of public health, behavioural change research and qualitative methods.

Focus group guide moderation

Focus groups were conducted to the point of saturation (ie, the addition of participants did not result in the generation of new themes),[22] by Critical Mass,[23] a market research and digital experience design agency. Due to the COVID-19 restrictions and geographical scope of the study, focus groups were conducted online using Zoom (Zoom Video Communication, San Jose, California, USA). Focus groups were 1.5 hours in length and were moderated by one skilled female Market Researcher, while three facilitators (not seen by the participants) observed and took notes. Once each focus group was completed, the moderator and facilitators debriefed and shared their field notes. There were no repeat interviews.

Qualitative analysis

Focus groups were audiorecorded and videorecorded and transcribed verbatim to support rigorous data analysis. Content analysis was conducted to identify themes followed by inductive thematic analysis to identify common perceptions and opinions.[24] A preliminary analytical template, aligned with the focus group guide, was developed as a starting point for analysis. Two experienced qualitative data analysts did the initial coding of the transcripts, with the analytic template continuing to evolve throughout the course of the data analysis. Regular communication between the two analysts ensured that ongoing changes to the template were discussed and agreed on. Triangulation of themes and codes was also done by reviewing field notes recorded during each focus group and reviewing findings with the focus group facilitators to ensure no key themes were missed. Key themes on barriers and facilitators towards COVID-19 PHM and vaccination were mapped to the COM-B Model to develop recommendations for future public health messaging. Participants did not provide feedback nor review transcripts. The Consolidated criteria for Reporting Qualitative research checklist[22] was used to report our findings.

RESULTS

Of the 89 potential participants, 47 participated in one of ten focus groups consisting of 2–7 participants. Overall, the focus groups included 23 (49%) men and 24 (51%) women. The ages of the participants were distributed as follows: 15 (32%) age 18–34 years, 19 (40%) age 35–54 years and 13 (28%) 55 years or older.

Overall attitudes towards the COVID-19 pandemic

In general, focus groups participants felt optimistic about the outlook/future of the COVID-19 pandemic, particularly considering the news around COVID-19 vaccines becoming available.

> I feel pretty exhausted from it. With recent news of the vaccine, I think we can get through it. Seems like a light at the end of the tunnel. (Participant 43, age 35–54, London, Ontario)

> Cautiously optimistic—with the next six months, vaccine roll-out, we'll gradually get normalcy back. (Participant 15, age 35–54, Toronto Suburbs, Ontario)

Others experienced optimism paired with frustration because of how long they have been forced to work from home, unable to see family and friends, out of work, or living in generally undesirable circumstances. However, some participants experienced scepticism and anger due to a lack of (1) consistency from Canadian public figures, (2) trust with pharmaceutical companies and (3) transparency when it comes to missteps by public health authorities and government representatives.

> Lack of control—all of these decisions are being made for us. The public's best interests are not in

mind. I just want it to make sense. In Manitoba we have this insane lockdown going on, it's not as necessary." (Participant 44, age 35–54, Rural Canada)

There were a few participants who felt their feelings towards the pandemic remained unchanged, acknowledging they felt more uncertain about the future early in the pandemic.

Personally, I'm not too worried, I go about [my] normal day. It seems like most people are following public health recommendations, wearing masks and social distancing so I feel comfortable going about my daily tasks. (Participant 35, age 35–54, Atlantic Provinces)

Effectiveness of PHM

Overall, most participants believed that PHM such as physical distancing and wearing a mask were effective in limiting the spread of COVID-19. Many mentioned parallels to influenza and how there have been significantly less cases since the implementation of COVID-19 PHM.

It just makes sense to me. It's just like any other virus. When cold and flu season comes around its always - don't get too close to people, don't shake hands, wash your hands more often. So I think the recommendations for mask wearing, social distancing and hand washing just make sense to me. (Participant 35, age 35–54, Atlantic Provinces)

A dominant theme was that people believe they are consistently following PHM. Even among those that were more sceptical, participants indicated compliance with basic recommendations when out in public, especially masking. However, many felt that the restrictions lacked consistency, unity, and clarity, resulting in feelings of confusion and frustration.

Because other people decide to lock down, we lock down, without dealing with population density or cases. It's reactionary, not proactive. (Participant 40, age 35–54, Manitoba)

I get frustrated when we lose our freedoms to get together with family and friends. Enough is enough. Things are a little bit blown out of proportion. A little bit frustrated with everything. When health measures override personal charter of freedoms, who is to say who you can't see or your ability to go to a place or a business to be open. There is a lot of livelihood/make a living, where things are shut down, things are determining a lot of people's lives. (Participant 32, age 35–54, Alberta)

Another dominant theme was that participants were more worried about infecting others than contracting COVID-19 themselves. Many expressed a strong desire to protect their family from COVID-19 and as a result they were more careful about following PHM.

It's more that I don't want to give it to someone else, not worried about my own health. Seems like it's a lot better here than other places so I'm lucky. (Participant 36, age 18–34, Atlantic Provinces)

Attitudes towards COVID-19 vaccines

Four main themes emerged when participants were asked to share their attitudes and perceptions towards COVID-19 vaccines and whether they would take a vaccine should one be made available to them. Dominant themes were (1) vaccine was viewed as a solution to the challenges of the pandemic, (2) parallels were drawn to past diseases, (3) while optimistic, some intend to do more research and wait to get the vaccine and (4) the vaccine offers a return to 'normal' (table 1). Although some participants had reservations towards a vaccine, most participants felt optimistic and indicated that they would take a vaccine when they were eligible.

…from our perspective the vaccine is the glimmer of hope on the horizon. (Participant 20, age 18–35, Fraser Valley, British Columbia)

COVID-19 information sources

When it comes to forming opinions on the COVID-19 pandemic, most participants indicated that they were not afraid to use several sources of information. A dominant theme was participants' willingness to do their own research, such as reading articles, watching the news, talking directly with experts or reading others' perspectives online.

My husband actually has a big spreadsheet. He likes to do some modelling and examine things, we're both math people. But also staying up to date with local news sources, to understand what might impact me day to day. (Participant 41, age 35–54, London, Ontario)

The most common sources for COVID-19 information were found to be CBC Television, CTV Television network, and Global News. Many participants also indicated that they turn to organisations such as the Centers for Disease Control and Prevention as well as provincial public health authorities or government websites for information.

I put a lot of stock in WorkSafe BC. They intend to protect employees and the relationship between employer and employee. I think they have put a lot of effort into their thinking. You've seen evidence of it all over the place. Being on the ground, [people being] the appropriate distance away. I think they've done a very good job. (Participant 8, age 55+, Vancouver, British Columbia)

While some participants gravitated towards social media, the consensus was that social media created more issues than solutions as it was believed that people were only sharing their subjective opinions or referring to sources that support their arguments.

Table 1 Canadians' attitudes towards the COVID-19 vaccine

Themes	Findings	Quotes
Vaccine viewed as a solution to the challenges of the pandemic	► People expressed feelings of optimism and positivity ► People would take the vaccine – As soon as it becomes available to them, – as the benefits outweigh the risks	"Potential side effects vs death, uh, I'll take the vaccine and the side effects." (Participant 30, age 18–34, Alberta) "I'm a big believer in vaccines, uh, I get the flu shot every year." (Participant 1, age 55+, Ottawa, Ontario) "I saw the picture of the first person getting it today. And I … a little cry, you know, thinking like, maybe this is the light at the end of the tunnel, that we've all been kind of waiting for." (Participant 46, age 18–34, Rural Canada)
Parallels drawn to past diseases	► The benefits and successes of past vaccines to reduce diseases, such as poliomyelitis, measles, and smallpox, speaks volumes	"Just like the measles vaccine. Just like the polio vaccine. Just like all those other things that we get inoculated from." (Participant 31, age 55+, Alberta) "…there's been vaccines that have saved polio, did a fantastic job. And without it, a lot of people wouldn't be around…" (Participant 22, age 55+, Fraser Valley, British Columbia)
While optimistic, some intend to do more research and wait	► Need to better understand if the benefits of the vaccine outweigh the side effects ► Would not be among the first individuals to receive the vaccine, – Wait and see what the long-term side effects are – Low perceived risk of being infected with COVID-19	"I think I would have to definitely do a little bit more research and definitely know that the pros of taking the vaccine are gonna outweigh any sort of side effects or any sort of, um, uh, fallout that can come from the vaccine." (Participant 32, age 35–54, Alberta) "I am thankful that I actually have that opportunity to maybe see how the vaccine plays out before I have to receive it." (Participant 42, age 18–34, London, Ontario) "I have a 99.9% chance of recovery for my age and my health. And so, it doesn't necessarily make the most sense for me to get the vaccine for something that I have a 99.9% chance of recovery." (Participant 32, age 35–54, Alberta)
"The vaccine offers a return to normal"	► The vaccine enables us to get back to normal life, use public services comfortably, and travel safely ► Although, the vaccine may create a false sense of security and worry that those vaccinated wouldn't adhere to public health recommendations	"I'd say as more and more people get vaccinated, especially around here, I think you'll see the cases drop off down to zero." (Participant 36, age 18–34, Atlantic Provinces) "For me, it's just getting things back to kind of normal again, where you can travel and you can see people and we can just put an end to the pandemic, hopefully." (Participant 36, age 18–34, Atlantic Provinces) "Now normally, I treat myself medically naturally … But, if that's what I need to do to live a life, then I'll figure out a way to do that. And I'll get that (vaccine), so that I can have a social life and go out, go travel and get on a plane and go to a concert or a sporting event…" (Participant 15, age 35–54, Toronto Suburbs, Ontario)
Other key concerns	► Concerned about the efficacy and effectiveness of the vaccine ► Concerned about how quickly the vaccine was developed ► Concerned about the lack of long-term data surrounding side effects	"What kind of tests did they do after the vaccine was administered (Clinical Trials)? What were the common side effects? And how are all those people now?" (Participant 35, age 35–54, Atlantic Provinces) "I guess I'd be concerned that maybe it wasn't tested as thoroughly as it could have been, or the fact that they've been rushed up so quickly means there's side effects that they might not know about until years in the future after more exhaustive studies are done." (Participant 20, age 18–34, Fraser Valley, British Columbia)

> For me, [I get my information about COVID-19 from] social media mostly. And I know that a lot of the stuff on social media isn't always true and reliable. (Participant 13, age 18–34, Vancouver, British Columbia)

A few participants expressed that they try to avoid being overwhelmed with COVID-19 information. Explanations included tiredness of repeatedly hearing about COVID-19 and frustration with inconsistencies in information and messaging.

> If I'm not consuming that all day every day, like I was earlier in the pandemic, I find – I do it a couple days a week and pretend life is normal in between. Emotionally, I feel a lot better. (Participant 15, age 35–54, Toronto Suburbs, Ontario)

Public health messaging evaluation

When participants were asked to recall COVID-19 public health messages that resonated with them, most had difficulty thinking of specific examples of messages that have

Table 2 Evaluation and recommendations of public health messaging across Canada

Themes	Findings	Quotes
Need for detail	Data and information are key ► Data demonstrating counts of those who are at risk, hospitalised, etc. ► Evidence of testing and analysis that has been conducted ► Visuals in the format of charts or graphs that clearly communicate the message	"Sounds a bit geeky but I like numbers, and there's also the John Hopkins map that is really good." (Participant 24, age 55+, Toronto Core, Ontario) "Relating to an outbreak at Western University and they shared the contact tracing chart to show how one single party crossed four different resident houses and how those people contracted it from each other. When you see an actual image of something that has actually happening and their tracing of it. That was very impactful. (Participant 43, age 35–54, London, Ontario) "A graph is always good because we are all visual people. We are so inundated with information. A quick graph gives us a good idea." (Participant 11, age 35–54, Vancouver, British Columbia)
Science trumps all	► People are more likely to take information coming from an unbiased (unaffiliated with politics) and truly scientific source, at face value ► People want to hear from public health experts that they feel confident about a COVID-19 vaccine and would take it themselves	"They're just administrators. I'd rather hear from an actual front-line doctor who's actually dealing with this." (Participant 40, age 35–54, Manitoba) "I'm 100% confident in Health Canada approving medicines and giving them to all of the population of Canada. I don't know what any government would have to gain by harming their own citizens." (Participant 39, age 35–54, Manitoba)
Transparency drives trust	► Personal stories resonate best ► Relatability is key in driving action ► Acknowledging unknowns or missteps is appreciated and helps build trust	"Trudeau did a video to the kids across the country telling them that he has kids and they would like to have sleepovers, but they can't. Very specifically speaking to the children. I think that finally hit it home for them. That was impactful for dealing with the pandemic and helping children through the situation." (Participant 43, age 35–54, London, Ontario) "Initially Teresa Tam said masks weren't effective but I knew that was a lie. In a culture where people respect each other, masks are used and they do work." (Participant 11, age 35–54, Vancouver, British Columbia)
Consistency is key	► There can't be confusing or contradictory rules and recommendations (keeping some business closed while other similar business can operate) ► The lack of uniformity across jurisdictions and public figures affects behaviour	"John Tory will tell me to stay home, but also say have you seen my latest ice rink (to go skating)? Governments are going to lose people if you keep doing that." (Participant 23, age 18–34, Toronto Core, Ontario) "Completely on board with the rules but some things I don't personally understand. Maybe it's just me, like how haircuts affect everybody if it's just one person at a time" (Participant 25, age 18–34, Toronto Core, Ontario)

impacted their behaviour or had a lasting effect; however, they did express that personal stories resonated best. When asked to evaluate regional and national COVID-19 messaging the following themes emerged (1) the importance of data and information, (2) unbiased science is universally accepted, (3) acknowledging unknowns helps foster trust and (4) finding unity is important to inspire action (table 2). Although most participants understood how challenging the pandemic has been for everyone, including decision-makers, participants emphasised the need for consistent messaging provincially and nationally.

DISCUSSION

To understand Canadian's attitudes and current behaviours towards COVID-19 PHM and vaccination we conducted focus groups virtually across Canada. Additionally, we wanted to learn what public health messaging is most effective. In a diverse group of 47 participants we found that the main facilitator for adhering to PHM was the desire to protect one's family and friends from contracting COVID-19. In contrast, the main barrier was inconsistent messaging around why PHM were being implemented and the lack of synchronised messaging from government representatives and public health authorities. The main reason participants were willing to get vaccinated was optimism that the vaccine would offer a return to normal, whereas vaccine efficacy and effectiveness were the main barriers for vaccination. Overall, participants felt that current public health messaging was inconsistent, lacking in transparency and detail, and suggested that messaging should include valid scientific data and be presented by a trustworthy source.

Barriers and facilitators for adhering to PHM

Physical distancing and wearing a mask were viewed as appropriate and effective measures for reducing the transmission of COVID-19. Most participants indicated a strong desire to protect those around them from contracting and spreading COVID-19. However, participants were less concerned about their individual safety. A study evaluating barriers and facilitators of adherence to physical distancing, found that wanting to protect oneself, others and the community were the strongest motivators associated with compliance.[25] These facilitators have also been reported in several other studies,[26–28] suggesting that PHM messaging should encourage individuals to do their part for the health and safety of their family and friends as well as the broader community and place less emphasis on the individual.

Although participants believed PHM are effective, they expressed frustration towards the lack of consistency, unity and clarity in PHM messaging. Prior studies have identified that people are less likely to follow PHM if there is inconsistent messaging from government representatives and public health authorities as it leads to confusion and lack of trust in institutions.[21 29–32] We found that transparency drives trust, and that people want to be shown the scientific reasoning behind PHM, such as presenting data that highlights effectiveness. Recent studies demonstrated that people are more likely to comply with COVID-19 PHM if there is open communication around why specific PHM are being implemented[31] and the efficacy of these measures are well understood.[33] Therefore, public health messaging needs to target increasing an individual's capability and motivation to adhere to PHM, by presenting information to the public in a way that helps build trust and strengthen one's knowledge, such as providing accurate, scientifically backed and consistent information on a regular basis.

Barriers and facilitators for COVID-19 vaccination

We identified key facilitators for uptake of a COVID-19 vaccine including trust in government and public health, belief that the benefits of vaccination outweigh the risks (ie, side effects), success of past vaccination programmes (ie, poliomyelitis) and the hope to regain some form of normalcy (ie, use public services comfortably, travel). It has also been shown that belief in vaccine effectiveness,[16] vaccine recommendations from a trusted healthcare provider[34–37] and feelings of fear, worry and vulnerability,[38] also contribute to people's willingness to vaccinate.

The main barrier to COVID-19 vaccination were concerns around vaccine efficacy and effectiveness; specifically motivated by how quickly the vaccine was developed and uncertainty over long-term effects. However, for a few participants that were vaccine willing, their biggest barrier to receiving a COVID-19 vaccine was not having the time off work to get vaccinated. Lastly, we found that inconsistent COVID-19 vaccine messaging from a variety of sources resulted in government and institutional mistrust, ultimately leading to worry and vaccine hesitancy among participants. Several studies reported mistrust in government as one of the main drivers of vaccine hesitancy.[35 36 39–41] Studies conducted during the H1N1 pandemic demonstrated that as peoples trust in government shifted positively so did their intent to vaccinate.[38 42] Collectively, these findings emphasise the importance of building and maintaining trust in government, especially during a pandemic when everyone is experiencing the same unknown and is seeking reliable and trustworthy information. With the goal of increasing vaccine confidence, government representatives need to be transparent when presenting information to the public and use scientific data to support their decisions. When implementing an evidence-based intervention to promote PHM and vaccination, who is presenting the material may have just as big of an impact as the material itself. For example, based on our research findings and the work of others,[34 35] messages from a trusted healthcare provider may be more effective at increasing PHM adherence and vaccine confidence compared with the same message coming from a government representative.

Recommendations for public health messaging

Participants want COVID-19 public health messaging that is transparent and consistent, including government representatives and public health authorities acknowledging unknowns about the pandemic and addressing any missteps. Additional suggestions included, presenting data and visuals, using personal stories, and creating unity in messages across jurisdictions. Other studies have also suggested that COVID-19 vaccine messaging should be transparent when discussing the safety of the vaccine without causing fear,[35 41] provide information on how vaccines work and how they were developed,[39] emphasise the importance of reaching herd immunity,[39] be credible and culturally informed,[40] and use clear communication.[33] In keeping with other studies, we found that participants were more likely to listen to information coming from an unbiased (unaffiliated with politics), scientific source.[34 35]

Through mapping the key findings identified in this study to the COM-B Model, we determined that future public health messaging should focus on targeting an individuals' motivation and capability for promoting adherence to COVID-19 PHM and vaccination. We suggest the following six recommendations for creating transparent, effective, and trustworthy public health messaging. To increase an individual's capability,(1) openly address any unknowns (ie, mask effectiveness at the beginning of the pandemic), (2) more is always better when it comes to sharing data, (3) humanise the message by calling out contradictions that may exist and (4) focus on the data and keep politics out of the conversation wherever possible. To increase an individual's motivation (1) use an unbiased scientist with relevant expertise as a spokesperson, and (2) use personalised stories according to the audience to reinforce PHM and vaccine uptake.

These recommendations may help rebuild public trust by promoting belief and understanding in the efficacy and effectiveness of PHM and vaccination as well as encourage voluntary compliance. However, depending on what phase of behavioural change someone is in, the most effective messaging technique may vary.[17 34] For example, Reiter *et al*[34] suggested that messaging for someone who is vaccine willing should focus on efficacy and healthcare provider recommendation, whereas messaging for someone who is vaccine hesitant should address concerns surrounding side effects of the vaccine. This work also re-emphasises the importance of using behavioural change frameworks such as the COM-B Model to identify and address individual barriers and facilitators for behavioural change.[34] As the vaccine continues to roll-out across Canada, we need an evidence-based intervention to shift public perception and help combat vaccine hesitancy, such as a targeted marketing campaign.[34 39] These six recommendations may also lay the groundwork for future public health messaging to address other key public health concerns, such as uptake of the human papillomavirus vaccine.

Limitations

The limitation of this study was that focus group participants were recruited from an existing voluntary nationwide panel designed to be representative of the Canadian population. When recruiting from a panel there will be selection bias as participants have volunteered to participate and access to electronic devices. Additionally, participants had previously taken part in a survey conducted by our research team so there is a possibility that individuals who participated in a focus group may have been more adherent to PHM and vaccination than those who chose not to participate. There is also a chance of social desirability bias as participants may have said what they felt the moderator wanted to hear, or if their views differed from other participants, they may have been less willing to speak openly. Lastly, the COVID-19 pandemic is rapidly changing, and therefore, the attitudes and behaviours expressed at the time of these focus groups may have changed.

CONCLUSION

Using the COM-B Model as our framework, we identified key drivers for the lack of adherence to PHM and vaccination and provided six recommendations for public health messaging. These recommendations may be used by government representatives and public health authorities to create a more transparent line of communication with the public by tailoring what they present and how they present it. Our research findings could also be used to shape the narrative for any upcoming COVID-19 marketing campaigns such as those directed at combatting COVID-19 vaccine hesitancy and encouraging adherence to PHM. By tailoring the narrative to focus on the needs of Canadians, we can work towards shifting public perception around COVID-19 PHM and vaccinations, and ultimately increase the number of Canadians who get vaccinated.

Author affiliations
[1]Department of Community Health Sciences, University of Calgary, Calgary, Alberta, Canada
[2]Department of Medicine, University of Calgary, Calgary, Alberta, Canada
[3]Critical Mass Inc, Calgary, Alberta, Canada
[4]Cancer Epidemiology and Prevention Research, Alberta Health Services, Calgary, Alberta, Canada
[5]Department of Pediatrics, University of Calgary, Calgary, Alberta, Canada
[6]Department of Economics, University of Calgary, Calgary, Alberta, Canada
[7]Haskayne School of Business, University of Calgary, Calgary, Alberta, Canada
[8]Department of Political Science, University of Calgary, Calgary, Alberta, Canada
[9]Health Administration, Dalhousie University, Halifax, Nova Scotia, Canada

Twitter Sajjad Fazel @sajjadfazel

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ORCID iDs
Jeanna Parsons Leigh http://orcid.org/0000-0002-8408-674X
Deborah A Marshall http://orcid.org/0000-0002-8467-8008

Jia Hu http://orcid.org/0000-0002-6548-3985

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