

Youth-developed Recommendations on Public Health Planning for Future Pandemics or Public Health Emergencies: A National Delphi Study

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Abstract

Background. In Canada, multiple studies reported an increase in youth-reported anxiety, depression, and substance use over the course of the COVID-19 pandemic. As the country has decreased restrictions, it is important to consider public health planning for future pandemics and emergencies, in light of the associated youth mental health and substance use burden. To prevent youth from falling further behind, we need to focus on public health planning recommendations to optimize Canada's future response. The objective of the study was to generate concrete, youth-derived recommendations for government, policymakers, and service planners to support public health planning for the next pandemic or public health emergency.

Methods. Using a virtual, modified Delphi, Youth Delphi Expert Panel Members rated recommendation items over three rounds, with the option to create their own recommendations items. "Consensus" was defined *a priori* if $\geq 70\%$ of the entire group, or subgroups of youth (e.g., age, race/ethnicity, gender and sexual identities), rated items at a 6 or 7 (on a 7-point Likert scale). Items that did not achieve consensus were dropped in subsequent rounds. Content analysis was used for qualitative responses in Rounds 1 and 2. Youth were engaged as members of an expert advisory committee throughout the design, implementation, and interpretation of findings.

Results. A total of $n=40$ youth participated in Round 1 with good retention ($>95\%$) in subsequent rounds. Youth endorsed eleven recommendations to support public health planning for the next pandemic or public health emergency. Youth prioritized easily accessible, clear, and understandable information about pandemics; and equitably and efficiently distributed vaccines. They also prioritized increased awareness of timely and accessible mental health and substance use services in schools, workplaces and communities; greater investment in free or inexpensive MHSU services; and health professionals and scientists leading pandemic-related policy decisions.

Conclusions. For Canada to move forward in a relevant, efficient, and ethically sound manner, decisions must be guided by the population that these decisions affect. These recommendations can be used to guide Canada's strategies and policies to prepare for future public health emergencies and pandemics, prioritizing the needs of youth, families/caregivers, and communities.

Background

The spread of the Coronavirus disease (COVID-19) has been associated with substantial mental health and substance use (MHSU) concerns globally (1, 2). Notwithstanding the impact that the COVID-19 pandemic has had on populations around the world, the burden and risks associated with MHSU concerns have not been equally experienced, with youth (12–25 years) among those disproportionately affected(1, 2).

In Canada, multiple studies showed an increase in youth-reported symptoms, including: anxiety, depression, loneliness, helplessness, and substance use over the pandemic period (3, 4, 5, 6, 7, 8, 9, 10,

11). Variations in MHSU outcomes were reported among subgroups of youth over the pandemic period. Previous longitudinal cohort research showed that younger youth (14–17 years); youth who identify as Trans, nonbinary or gender diverse; and those living in urban areas had greater mental health concerns compared to their counterparts (3, 5, 12, 13). At the same time, the exacerbation of MHSU concerns among youth were associated with service disruptions (5, 13, 14). The increased MHSU burden, coupled with gaps in the provision of MHSU services, have highlighted lessons learned for the country on planning, response, and adaptation for future public health emergencies and pandemics (15).

As public health restrictions have been reduced across the country, it is important to consider public health planning for future pandemics and emergencies. Given that the COVID-19 pandemic has demonstrated itself to be a contributing factor to poor MHSU among youth (3, 5, 12, 13), it is imperative to focus on public health planning recommendations to optimize Canada's future response (16). Understanding youth MHSU needs and concerns requires identifying how youth recommend preparing for future pandemics to develop tailored and relevant interventions and services that address their needs(17). These interventions and strategies are particularly important for subgroups of youth who experience poorer service access and quality. Indeed, a scoping review has shown that Black youth experience longer wait times, complex geographic and financial barriers, and Anti-Black Racism in MHSU services(18). Similarly, Indigenous youth are significantly impacted by health inequities, poor service access, unwelcoming environments and culturally-inappropriate care (19, 20). Further, transgender and gender diverse (TGD) youth have reported challenges to accessing quality MSHU services (21, 22, 23) and lower satisfaction with treatment compared to their cis-gender counterparts (24, 25). Importantly identifying public health strategies now will help reduce future health risks(16).

At the Margaret and Wallace McCain Centre for Child, Youth and Family Mental Health within the Centre for Addiction and Mental Health (CAMH) in Toronto, Canada, youth from the Youth Engagement Initiative (YEI) would like to support policy- and decision-makers to respond more effectively to the next pandemic or public health emergency. The YEI team want to use approaches that support and protect youth MHSU and wellness, building on the successes achieved during the COVID-19 pandemic while examining lessons learned. Amplifying youth voices in the creation of recommendations for system and service planning helps improve access, enhances engagement, better tailors the care to youth needs, and increases satisfaction with health services (26, 27, 28).

As a consensus-building technique, Delphi studies make the priorities of participants with expertise clear, engaging them fully in research (29, 30, 31). While there is some previous literature on recommendations for future pandemics and public health emergencies(15), information on consensus among a diverse group of youth about recommendations that are truly relevant to them is lacking. As such, we conducted a national Delphi study to determine youth's public health planning priorities and recommendations, based on their COVID-19 pandemic experiences. The objective of the study was to generate concrete, youth-derived recommendations for government, policymakers, and service planners to support public health planning for the next pandemic or public health emergency in youth-appropriate manners to maximize health and wellbeing, while minimizing harms.

Methods

To develop and rank recommendations, the study applied a virtual, modified Delphi technique⁽³²⁾. This approach is systematic method to establish consensus-based statements relevant to a topic of interest. In contrast to a focus group approach, the intent is to distribute influence from multiple representative perspectives. The first step involves generating initial candidate consensus statements from prior research (see below for details specific to this study). The next step involves assembling a panel whose members represent the desired perspectives. Subsequently, the research team presents candidate consensus statement to the panel members to rank on level of importance over consecutive rounds, where statements showing consensus are carried over to the next round. Panel members have the option to suggest new candidate consensus statements for future rounds. Each panel member's response is anonymous to other members and is intended to represent their own opinions and reasoning. The result is a list of actionable consensus-based statements. The Guidance on Conducting and Reporting Delphi Studies (CREDES) Checklist was followed (33) (Table 1). The Delphi studies were administered via REDCap, an online platform,⁽³⁴⁾ and approved by CAMH's Research Ethics Board in Toronto, Canada (144/2021).

Table 1
Guidance on Conducting and Reporting Delphi Studies (CREDES) Checklist

Rational for Delphi Technique		Page
1.	<i>Justification.</i> The choice of the Delphi technique as a method of systematically collating expert consultation and building consensus needs to be well justified. When selecting the method to answer a particular research question, it is important to keep in mind its constructivist nature	4–5
Planning and Design		
2.	<i>Planning and process.</i> The Delphi technique is a flexible method and can be adjusted to the respective research aims and purposes. Any modifications should be justified by a rationale and be applied systematically and rigorously	5
3.	<i>Definition of consensus.</i> Unless not reasonable due to the explorative nature of the study, an a priori criterion for consensus should be defined. This includes a clear and transparent guide for action on (a) how to proceed with certain items or topics in the next survey round, (b) the required threshold to terminate the Delphi process and (c) procedures to be followed when consensus is (not) reached after one or more iterations	10
Study Conduct		
4.	<i>Informational input.</i> All material provided to the expert panel at the outset of the project and throughout the Delphi process should be carefully reviewed and piloted in advance in order to examine the effect on experts' judgements and to prevent bias	6
5.	<i>Prevention of bias.</i> Researchers need to take measures to avoid directly or indirectly influencing the experts' judgements. If one or more members of the research team have a conflict of interest, entrusting an independent researcher with the main coordination of the Delphi study is advisable	No conflicts reported
6.	<i>Interpretation and processing of results.</i> Consensus does not necessarily imply the 'correct' answer or judgement; (non)consensus and stable disagreement provide informative insights and highlight differences in perspectives concerning the topic in question	10
7.	<i>External validation.</i> It is recommended to have the final draft of the resulting guidance reviewed and approved by an external board or authority before publication and dissemination	10
Reporting		
8.	<i>Purpose and rationale.</i> The purpose of the study should be clearly defined and demonstrate the appropriateness of the use of the Delphi technique as a method to achieve the research aim. A rationale for the choice of the Delphi technique as the most suitable method needs to be provided	4–5
9.	<i>Expert panel.</i> Criteria for the selection of experts and transparent information on recruitment of the expert panel, sociodemographic details including information on expertise regarding the topic in question, (non)response and response rates over the ongoing iterations should be reported	6
<p><i>Source:</i> Jünger S, Payne SA, Brine J, Radbruch L, Brearley SG. Guidance on Conducting and REporting DELphi Studies (CREDES) in palliative care: Recommendations based on a methodological systematic review. <i>Palliat Med.</i> 2017 Sep;31(8):684–706. doi: 10.1177/0269216317690685.</p>		

Rational for Delphi Technique	Page
10. <i>Description of the methods.</i> The methods employed need to be comprehensible; this includes information on preparatory steps (How was available evidence on the topic in question synthesised?), piloting of material and survey instruments, design of the survey instrument(s), the number and design of survey rounds, methods of data analysis, processing and synthesis of experts' responses to inform the subsequent survey round and methodological decisions taken by the research team throughout the process	5–10
11. <i>Procedure.</i> Flow chart to illustrate the stages of the Delphi process, including a preparatory phase, the actual 'Delphi rounds', interim steps of data processing and analysis, and concluding steps	6–8
12. <i>Definition and attainment of consensus.</i> It needs to be comprehensible to the reader how consensus was achieved throughout the process, including strategies to deal with non-consensus	10
13. <i>Results.</i> Reporting of results for each round separately is highly advisable in order to make the evolving of consensus over the rounds transparent. This includes figures showing the average group response, changes between rounds, as well as any modifications of the survey instrument such as deletion, addition or modification of survey items based on previous rounds	10–13
14. <i>Discussion of limitations.</i> Reporting should include a critical reflection of potential limitations and their impact of the resulting guidance.	17
15. <i>Adequacy of conclusions.</i> The conclusions should adequately reflect the outcomes of the Delphi study with a view to the scope and applicability of the resulting practice guidance	18
16. <i>Publication and dissemination.</i> The resulting guidance should be clearly identifiable from the publication, including recommendations for transfer into practice and implementation.	17 + this publication
<p><i>Source:</i> Jünger S, Payne SA, Brine J, Radbruch L, Brearley SG. Guidance on Conducting and REporting DElphi Studies (CREDES) in palliative care: Recommendations based on a methodological systematic review. <i>Palliat Med.</i> 2017 Sep;31(8):684–706. doi: 10.1177/0269216317690685.</p>	

Table 1. Guidance on Conducting and Reporting Delphi Studies (CREDES) Checklist

Youth Expert Advisory Committee

Following principles outlined by the Canadian Institutes of Health Research Strategy for Patient-Oriented Research (SPOR)(35) and the McCain Model of Youth Engagement(36, 37), a Youth Expert Advisory Committee was established with support from the Youth Engagement Initiative team. The Committee included two youth engagement specialists (CAMH youth employees who support the implementation of youth engagement activities and facilitate the relationship between research teams and youth advisors) and three youth advisors (youth who consult and collaborate on project activities) 12 to 25 years of age, each with lived/living MHSU-related experiences. This Committee met every 3 to 4 months. The Committee advised on study design, starting recommendations, implementation, interpretation and

language of Delphi findings, and knowledge translation products. The Committee members received honoraria for their time.

Youth Delphi Expert Panel Members

Youth Delphi Expert Panel Members were recruited from two pre-existing CAMH studies in Ontario (3, 12, 13, 38), Canada and through internal CAMH networks. Youth were eligible to participate if they were: 12–25 years of age; lived in Canada; and had lived/living experience of MHSU concerns at the time of the study. Members of the Expert Advisory Committee were ineligible to participate on the panel. The study aimed to recruit n = 40 youth, which is within the recommended Delphi panel size range(39). Youth were provided \$35 honorarium for their participation in each round of the study.

Survey Development

Initial candidate recommendations were derived from qualitative responses from participants in a pre-existing longitudinal, cohort CAMH-based study (13) in August 2021. Youth participants in this study provided open-ended responses to 12 questions on planning for a future pandemic or public health emergency (Table 2). Members of the research team analyzed responses to these questions, following the process as recommended by Fereday et al (2006)(40). A total of nine starting recommendations were generated for Round 1. These recommendations were presented to Youth Delphi Expert Panel Members.

Table 2
Open-ended questions used to formulate Delphi Round 1 starting recommendations.

Questions
What do you think was done well during the COVID-19 pandemic in terms of the public health response? (i.e., public health response includes the restrictions that were put into place, the information provided to the public, etc.)
What do you think should be done differently next time in terms of the public health response?
How should government and policy makers be preparing now for the next pandemic or public health emergency?
How should schools be preparing now for the next pandemic or public health emergency?
How should employers be preparing now for the next pandemic or public health emergency?
How should health service organizations be preparing now for the next pandemic or public health emergency?
How should government and policy makers respond differently to the next pandemic or public health emergency?
How should schools respond differently to the next pandemic or public health emergency?
How should employers respond differently to the next pandemic or public health emergency?
How should health service organizations respond differently to the next pandemic or public health emergency?
Please specify: How should they respond differently to the next pandemic or public health emergency?
Who should be involved in making decisions about public health responses to the next pandemic or public health emergency? How should they be involved?

Delphi Procedure

The study took place over three rounds, between July 2022 and April 2023. Participants were invited via email at the beginning of each round, with a link to the Delphi survey. Completion of each round required Panel Members to rate each recommendation item using a 7-point Likert scale (1 'one of the least important' to 7 'one of the most important'), indicating the importance of the item. Panel Members were invited to provide comments and/or edits on the recommendation item using an open-ended response field in each round. In Rounds 1 and 2, participants were provided the opportunity to create their own recommendations. Demographic characteristics (age, gender identity, race/ethnicity, province/territory) were obtained in round 1.

Delphi rounds were kept open for 3–4 weeks, with completion reminder emails sent every week. De-identified quantitative and qualitative findings from Round 1 were included in Rounds 2 and 3 (Fig. 1). Results of each round were presented to the Youth Expert Advisory Committee to review the items that

achieved consensus and the language of each item. Edits from the Panel Members and suggestions from the Youth Expert Advisory Committee were taken forward to the next round (see Table 3).

Figure 1. Flow Diagram of Delphi Rounds on Planning for Future Pandemics or Public Health Emergencies

Table 3

Initial and Final Recommendation Items Ranked by Youth Delphi Expert Panel Members

	Initial Recommendation	Final Recommendation
B.	Ensure that clear pandemic policies are in place.	Ensure that pandemic policies are clear to the public.
E.	Provide information about a pandemic as clearly as possible.	Provide information about a pandemic that is clear, easy to understand and accessible in written and spoken languages.
F.	Include scientists and health professionals in making decisions on pandemic policies (e.g., physicians, mental health practitioners, public health experts and researchers).	Prioritize scientists and health professionals as the leads on decisions related to pandemic policies (e.g., physicians, mental health practitioners, public health experts and researchers).
H.	Ensure vaccines are made available and distributed efficiently.	Ensure that vaccines are easy to access, distributed efficiently, and equitably available to individuals in different communities (prioritizing those at-risk, lower-income individuals, racialized populations etc.).
J.	Ensure governments and other decision-makers prepare in advance for a future pandemic and implement policies and practice plans that are supported by science.	Ensure governments and other decision-makers prepare in advance for a future pandemic and implement policies and practice plans that are supported by science.
K.	Implement financial aid programs and ensure they are accessible for youth who need them.	Implement financial aid programs and ensure they are accessible for youth who need them.
L.	Ensure mental health and substance use services are easily accessible, timely, and well-known to youth in their schools, workplaces and communities.	Ensure mental health and substance use services are easily accessible, timely, and well-known to youth in their schools, workplaces and communities.
M.	Fund mental health and substance use services, hire more mental health professionals, and ensure services are free or inexpensive.	Fund mental health and substance use services, hire more mental health professionals, and ensure services are free or inexpensive.
N.	Ensure schools, workplaces and mental health and substance use services offer a variety in-person and virtual options (e.g., individual or group support) for youth to choose from.	Ensure schools, workplaces, communities and mental health and substance use services offer a variety of in-person and virtual options for youth to choose from.
P.	Ensure schools and workplaces continue to prioritize the health, safety and well-being of their students and employees.	Ensure schools and workplaces continue to prioritize the health, safety and well-being of their students and employees.
Q.	Provide employees with paid sick days and mental health days.	Provide employees with paid sick days, mental health days and holidays.

Data Analysis

Statistical analyses were performed using Stata 16.1(41). Demographic data were analyzed using descriptive statistics. The percentage of participants who highly endorsed (i.e., ranking a 6 or 7 on a 7-point Likert scale) recommendations was calculated for importance in each round. Following previous literature (39, 42, 43), *a priori* consensus was considered achieved if $\geq 70\%$ of the entire group rated items at a 6 or 7 (on a 7-point Likert scale). If $\geq 70\%$ of the entire group did not rate items at a 6 or 7, we considered consensus achieved if $\geq 70\%$ of subgroups of youth (e.g., age, race/ethnicity, gender and sexual identities, and urban/rural location) rated items at a 6 or 7. Items that did not achieve consensus were dropped in subsequent rounds. In Rounds 2 and 3, Youth Panel Members were presented with their individual and group mean score of each recommendation item in the prior round and asked to re-rate the items. Content analysis (44, 45) was used for qualitative responses in Rounds 1 and 2. New recommendation items were created if statements and areas were relevant and re-occurring. The recommendations that achieved consensus in Round 3 were presented to the Youth Expert Advisory Committee in a final meeting to ensure cohesion and relevancy of the recommendations.

Results

A total of $n = 40$ youth participated in Round 1. Participation rates between Round 1 to Round 2 was 95% ($n = 38$ youth) and from Round 2 to Round 3 100% ($n = 38$ youth). Youth primarily identified as a girl/woman (cis, Trans) (50%), from Central Canada (Ontario, Quebec) (47.5%), and living in urban areas (65.0%) (Table 4).

Table 4
 Select Demographic Characteristics of Youth Delphi Expert Panel Members, Round 1 (n = 40)

Category		mean (range)
Age (years)		20.0 (14–25)
		n (%)
Age category (years)	14–16	7 (17.5)
	17–21	17 (42.5)
	22–25	16 (40.0)
Gender Identity	Boy/man (cis, trans)	12 (30.0)
	Girl/woman (cis, trans)	20 (50.0)
	Nonbinary and Gender-diverse	8 (20.0)
Ethnicity	Indigenous (in Canada)	1 (2.6)
	Asian	11 (28.2)
	Black	1 (2.6)
	Middle Eastern	1 (2.6)
	Mixed Race	8 (20.5)
	White	17 (43.6)
Sexual Identity	Straight	19 (47.5)
	2SLGBQ+	21 (52.5)
Born in Canada	Yes	29 (72.5)
	No	11 (27.5)
Region*	Prairies	9 (22.5)
	Western Canada	9 (22.5)
	Eastern Canada	3 (7.5)
	Central Canada	19 (47.5)
Area of Residence	Large city or suburbs	26 (65.0)
	Small city, town, rural	14 (35.0)
*Provinces represented in each region: Prairies = Alberta; Western = British Columbia; Eastern Canada = New Brunswick, Nova Scotia; Central Canada = Ontario, Quebec		

Round One

Youth Delphi Expert Panel Members in Round 1 ranked nine starting recommendations on level of importance (Table 5). Round 1 indicated that level of agreement was highest for Recommendations E (85.0%), F (85.0%), and H (82.5%). Nonbinary and gender diverse youth (75.0%) and those 14–16 years of age (71.4%) prioritized Recommendation B. Recommendation C was prioritized by youth 14–16 years of age (71.4%) (Table 5).

Table 5
Percentage of Delphi Experts Rating Recommendations at 6 or 7, All Rounds

Recommendations	Round 1 (n = 40) n (%)	Round 2 (n = 38) n (%)	Round 3 (n = 38) n (%)
A. Implement lockdowns and public health measures immediately.	Did not achieve consensus		
B. Ensure that pandemic policies are clear to the public.	6 (75.0%) Nonbinary and Gender-diverse 5 (71.4%) 14–16 years	14 (70.0%) 2SLGBQ+ 12 (80.0%) 22–25 years 17 (80.9%) Indigenous, Asian, Black 15 (78.9%) girls/women 18 (72.0%) urban	28 (73.7%) all youth
C. Enforce public health measures strictly and consistently.	5 (71.4%) 14–16 years	Did not achieve consensus	
D. Implement lockdowns for one long stretch instead of many short periods.	Did not achieve consensus		
E. Provide information about a pandemic that is clear, easy to understand and accessible in written and spoken languages.	34 (85.0%) all youth**	32 (86.5%) all youth**	33 (86.8%) all youth**
F. Prioritize scientists and health professionals as the leads on decisions related to pandemic policies (e.g., physicians, mental health practitioners, public health experts and researchers).	34 (85.0%) all youth**	30 (81.1%) all youth**	29 (76.3%) all youth
G. Include the public in making decisions on pandemic policies.	Did not achieve consensus		
H. Ensure that vaccines are easy to access, distributed efficiently and equitably available to individuals in different communities (e.g., prioritizing those at high risk, lower-income individuals, racialized populations etc.).	33 (82.5%) all youth**	30 (81.1%) all youth**	28 (73.7%) all youth

**Denotes top recommendations in each round based on percentage highly endorsed on importance

Recommendations	Round 1 (n = 40) n (%)	Round 2 (n = 38) n (%)	Round 3 (n = 38) n (%)
I. Include youth in making decisions on pandemic policies.	Did not achieve consensus		
J. Ensure governments and other decision-makers prepare in advance for a future pandemic and implement policies and practice plans that are supported by science.		12 (70.6%) White youth 9 (75.0%) boys/men 13 (86.7%) 22–25 years	12 (70.6%) White 14 (73.7%) girls/women 14 (70.0%) 2SLGBQ+ 12 (80.0%) 22–25 years
K. Implement financial aid programs and ensure they are accessible for youth who need them.		5 (71.4%) Nonbinary and Gender-diverse	13 (76.5%) White 6 (85.7%) Nonbinary and gender diverse 13 (72.2%) Straight 5 (71.4%) 14–16 years
L. Ensure mental health and substance use services are easily accessible, timely and well-known to youth in their schools, workplaces and communities.		29 (75.3%) all youth	32 (84.2%) all youth**
M. Fund mental health and substance use services, hire more mental health professionals, and ensure services are free or inexpensive.		29 (75.7%) all youth	31 (81.6%) all youth**

**Denotes top recommendations in each round based on percentage highly endorsed on importance

Recommendations	Round 1 (n = 40) n (%)	Round 2 (n = 38) n (%)	Round 3 (n = 38) n (%)
N. Ensure schools, workplaces, communities and mental health and substance use services offer a variety of in-person and virtual options for youth to choose from.		15 (78.9%) girls/women	16 (76.2%) Indigenous, Asian, Black 14 (73.7%) girls/women 18 (72.0%) urban 13 (72.2%) straight 6 (85.7%) 14– 16 years 12 (75.0%) 17–21 years
O. Support vital learning by providing students with technology and academic supports (e.g., laptops, accessible Wi-Fi, homework help, etc.)		Did not achieve consensus	
P. Ensure schools and workplaces prioritize the health, safety and well-being of their students and employees.		5 (71.4%) Nonbinary and Gender- diverse 5 (71.4%) 14–16 years	5 (71.4%) Nonbinary and gender diverse 18(72%) urban 14 (70.0%) 2SLGBQ+ 6 (85.7%) 14–16 years
Q. Provide employees with paid sick days, mental health days and other days off as needed.		12 (70.1%) White 14 (73.7%) Girl/women 18 (72.0%) Urban	29 (76.3%) all youth
R. Consider the impact of pandemic-related decisions on people from all age groups and communities and listen to their perspectives.		Did not achieve consensus	

**Denotes top recommendations in each round based on percentage highly endorsed on importance

Recommendations	Round 1 (n = 40) n (%)	Round 2 (n = 38) n (%)	Round 3 (n = 38) n (%)
S. Ensure all youth are provided with the opportunity to voice their opinion on pandemic planning strategies through different platforms (e.g., surveys, online forums, advisory boards, discussion groups, etc.)		Did not achieve consensus	
**Denotes top recommendations in each round based on percentage highly endorsed on importance			

Table 5. Percentage of Delphi Experts Rating Recommendations at 6 or 7, All Rounds

Four recommendations did not achieve consensus and were dropped (Recommendations A, D, G, and I). These recommendations focused on lockdowns and inclusion of communities in making pandemic-related policies.

Panel members provided open-ended responses to create new recommendations in Round 1. Similar statements were grouped into areas, including the following: (i) financial aid; (ii) virtual and in-person health and social services; (iii) investment in MHSU services; (iv) perspectives' and voices in pandemic-related decisions and strategies; and (v) student and employee health and safety. Ten new recommendations were added (Recommendations J–S) based on open-ended responses during this round.

Round Two

Youth Delphi Expert Panel Members ranked 15 recommendations in Round 2 on importance (Table 5). Round 2 indicated that level of agreement was highest for Recommendations E (86.5%), F (81.1%), and H (81.1%). Recommendation B was prioritized by Indigenous, Asian, and Black youth (80.9%); 22–25 year olds (80.0%); girls/women (78.9%); those living in urban areas (72%), and 2SLGBQ+ youth (70.0%). Recommendation J was prioritized by 22–25 year old youth (86.7%); boys/men (75.0%); and White youth (70.6%). Recommendation K was prioritized by nonbinary and gender diverse youth (71.4%). Recommendation N was prioritized by youth who identify as girls/women (78.9%). Recommendation P was prioritized by nonbinary and gender diverse youth (71.4%) and those 14–16 years of age (71.4%). Recommendation Q was prioritized by girls/women (73.7%); those living in large cities (72.0%); and White youth (70.1%) (Table 5).

Four recommendations did not achieve consensus and were therefore dropped from the next round (Recommendations C, O, R, and S). These recommendations focused on enforcing public health measures; supporting virtual learning for students; and giving communities the opportunity to voice their perspectives on planning strategies and pandemic-related decisions. No new recommendations were added.

Round Three

A total of eleven recommendations were presented in Round 3 and eleven recommendations achieved consensus (Table 5). Recommendations E (86.8%), L (84.2%) and M (81.6%) had highest percentage of agreement in Round 3. Percentage of agreement on recommendations F and H were 76.3% and 73.7%, respectively. Subgroups of youth rated specific recommendations as important: Recommendation J was prioritized by 22–25 year old youth (80.0%), girls/women (73.7%), White youth (70.6%), and 2SLGBQ + youth (70.0%). Recommendation K was prioritized by nonbinary and gender diverse youth (85.7%), White youth (76.5%), youth who identify as straight (72.2%), and 14–16 year old youth (71.4%). Recommendation N was prioritized by 14–16 year old youth (85.7%), Indigenous, Black and Asian youth (76.2%); 17–21 year old youth (75.0%); girls/women (73.7%); youth who identify as straight (72.2%); and urban youth (72.0%). Recommendation P was prioritized by 14–16 year old youth (85.7%); nonbinary and gender diverse youth (71.4%); and 2SLGBQ + youth (70.0%) (Table 5).

Discussion

To our knowledge, this national study is the first to define youth-developed recommendations on planning for future pandemics and public health emergencies in Canada. Youth achieved consensus on eleven recommendations in support of preparedness for the next pandemic or public health emergency. These recommendations focused on the provision of easily accessible, clear, and understandable information about pandemics; the efficient and equitable distribution of vaccines; awareness of accessible MHSU services in schools, workplaces and communities; investment in free or inexpensive MHSU services; pandemic-related policy decisions led by health professionals and scientists; clear pandemic policies available to the public; evidence-informed pandemic preparedness; implementation of financial aid programs; the provision of in-person and virtual MHSU service options to youth, families, and the community; prioritization of the health, safety, and wellbeing of students and workplaces; and the provision of paid sick- and mental health- days.

The recommendations generated in this study align with previously published pandemic preparedness responses. For example, the American College of Physicians⁽¹⁵⁾ support similar recommendations, including an evidence-based comprehensive pandemic preparedness plan; clear communication on pandemic-related information; the promotion of physical and mental wellbeing among populations; universal access to paid sick leave and time off; and the efficient and equitable distribution of vaccines. Similar recommendations were drafted for the Quebec government to inform planning of the next pandemic (46). These recommendations included improving communication between the public and the government; strengthening the role of knowledge-based agencies in making decisions; supporting digital health strategies and telehealth; and establishing reliable health information systems that can be shared with the public.

Results of this study indicate that youth recommend clear and accessible information about the pandemic. In order to follow through on this recommendation, Canada needs to strengthen its public

health system and handling of misinformation (47)-(48). Indeed, one of the most pressing public health challenges experienced over the pandemic period was the extensive amount of misinformation circulated online about the pandemic, public health measures and policies (17, 49, 50, 51). This misinformation was particularly acute for youth (52, 53, 54), who may not have had the capacity to discern and filter reliable and accurate information from misinformation (51, 55). For example, a systematic review and secondary data analysis reported that the frequency and consumption of COVID-19 related news was adversely associated with youth mental health concerns (51, 53). To counter the spread of misinformation, clear, accurate, and transparent information about public health policies and measures must be shared and widely accessible. This information needs to be delivered early on through communication methods tailored to youth and involve diverse youth in the co-design of messaging. A recent systematic review on communication interventions to combat COVID-19 vaccine misinformation (56) reported that the most effective strategies included adding misinformation warnings; using humour to convey messages; and highlighting that the evidence was generated through scientific consensus. In addition, a systematic review highlighted that information be developed by reliable and credible sources and tailored to different communities' lived experiences, needs, and concerns (17, 49, 50).

Youth recommend that health professionals and scientists inform and lead pandemic and public health emergency related decisions. While all youth in this study agreed that science plays a critical role in public health preparedness, a qualitative study of COVID-19 policy advisors reported the challenges that scientific advisors experienced over the COVID-19 period.(57) These challenges included the inability to stay up-to-date on the evidence given the overwhelming, rapid generation of evolving and sometimes conflicting evidence; scientific uncertainty about different pandemic-related scenarios; the misinterpretation and misapplication of evidence; concerns about research integrity; and the lack of clarity on the integration of multi-sectoral evidence. At the same time, scientific advisors reported that they experienced a lack of transparency with governmental decision-makers on how pandemic-related decisions were made (57). Further, a qualitative study and repeated-measures cohort study reported that scientific and technical jargon can be alienating for the public, pointing to a need for better knowledge translation.(58, 59)

To overcome these challenges youth also recommended that scientists and health professionals lead pandemic-related decisions. This recommendation could be achieved by establishing a diverse, multidisciplinary, and integrated group of scientific experts, in collaboration with a youth advisory group. To inform and support these decisions, establishing and promoting tools based on open science principles and responsible data sharing, guided by Ownership, Control, Access and Possession (OCAP®) principles(60) and Engagement Governance, Access and Protection (EGAP) framework(61) is critical. Further, there is a need to establish a rigorous review system that ensures rapid access to clear and reliable evidence, as well as decision-support frameworks to support scientific integrity and transparency to communities (57).

A recommendation endorsed among subgroups of youth (e.g., Nonbinary and gender diverse, White, straight, and 14–16 years) identified a need for financial aid programs; specifically, the implementation of

accessible financial aid programs in the context of public health emergencies and future pandemics. The COVID-19 pandemic period was associated with far-reaching negative economic consequences, including recession, unemployment, business closures, and followed by inflation and rising prices for consumers (62, 63, 64). Two previous reviews(64, 65) suggested that focusing on social protection measures, including promoting social welfare, targeted measures for vulnerable populations, and establishing a minimum standard of living (e.g., food, shelter, clothing, finances) could help buffer the shock of the next pandemic or public health emergency.

We would like to acknowledge some of the strengths and limitations of this study. Strengths include the authentic engagement of youth; recommendations that reflect youth's lived experiences and needs; robust participation rates in each round; and recommendations that can inform public health planning for future pandemics and public health emergencies. Limitations are as follows: Fifty percent of the study sample identified as a girl/woman. The recommendations generated may not be representative of the perspectives of boys/men and nonbinary or gender diverse youth. Participants resided mainly in Central Canada (Ontario and Quebec) and may not represent youth perspectives from other provinces and territories. It is important to obtain these perspectives. Further, the Canadian health system is decentralized at the provincial/territorial level, therefore, implementation of these recommendations will vary by province and territory.

Recognizing that these recommendations reflect youth needs and priorities for the next pandemic or public health emergency, future work is needed to support the translation of these recommendations into policy action. The Youth Expert Advisory Committee in this study recommended that youth collaborate with scientists and health professionals to support decision-making. As part of a knowledge dissemination strategy, a prior literature review has highlighted the important role of training researchers about engaging policy-makers, learning about the policy-making process and how to convey evidence to policy-makers(66). Other strategies include the identification of knowledge brokers, or an individual who moves the knowledge from knowledge creators (e.g., youth and the research team) to knowledge users (e.g., policy- and decision-makers)(67, 68, 69, 70, 71); face-to-face contact; and communication through various media platforms(71).

Conclusions

These recommendations can be used to guide Canada's preparedness and response strategies and policies, supporting youth, families, and communities. The COVID-19 pandemic has provided us an opportunity to strengthen our public health system and prevent future pandemics and emergencies.

Abbreviations

Centre for Addiction and Mental Health	CAMH
Coronavirus disease	COVID-19
Conducting and Reporting Delphi Studies	CREDES
Engagement Governance, Access and Protection	EGAP
Mental Health and Substance Use	MHSU
Ownership, Control, Access and Possession	OCAP®
Strategy for Patient-Oriented Research	SPOR
Transgender and Gender Diverse	TGD
Two-Spirit, Lesbian, Gay, Bisexual, Queer, and additional people who identify as sexual diverse communities	2SLGBQ+
Youth Engagement Initiative	YEI

Declarations

Ethics approval and consent to participate. The study was approved by the Research Ethics Board of the Centre for Addiction and Mental Health (144/2021). Informed consent was obtained from all participants in this study.

Consent for publication. Consent was obtained directly from participants.

Availability of data and materials. The data used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests. The authors declare that they have no competing interests.

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Authors' contributions. MQD contributed to the designing the research question and conducted the analysis, interpretation of the data, and drafted the manuscript. All co-authors reviewed the manuscript. JH contributed to designing the research, oversaw the conduct of the study, interpreted the data, reviewed the manuscript and provided study leadership; JH is the overall guarantor of the work.

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Figures

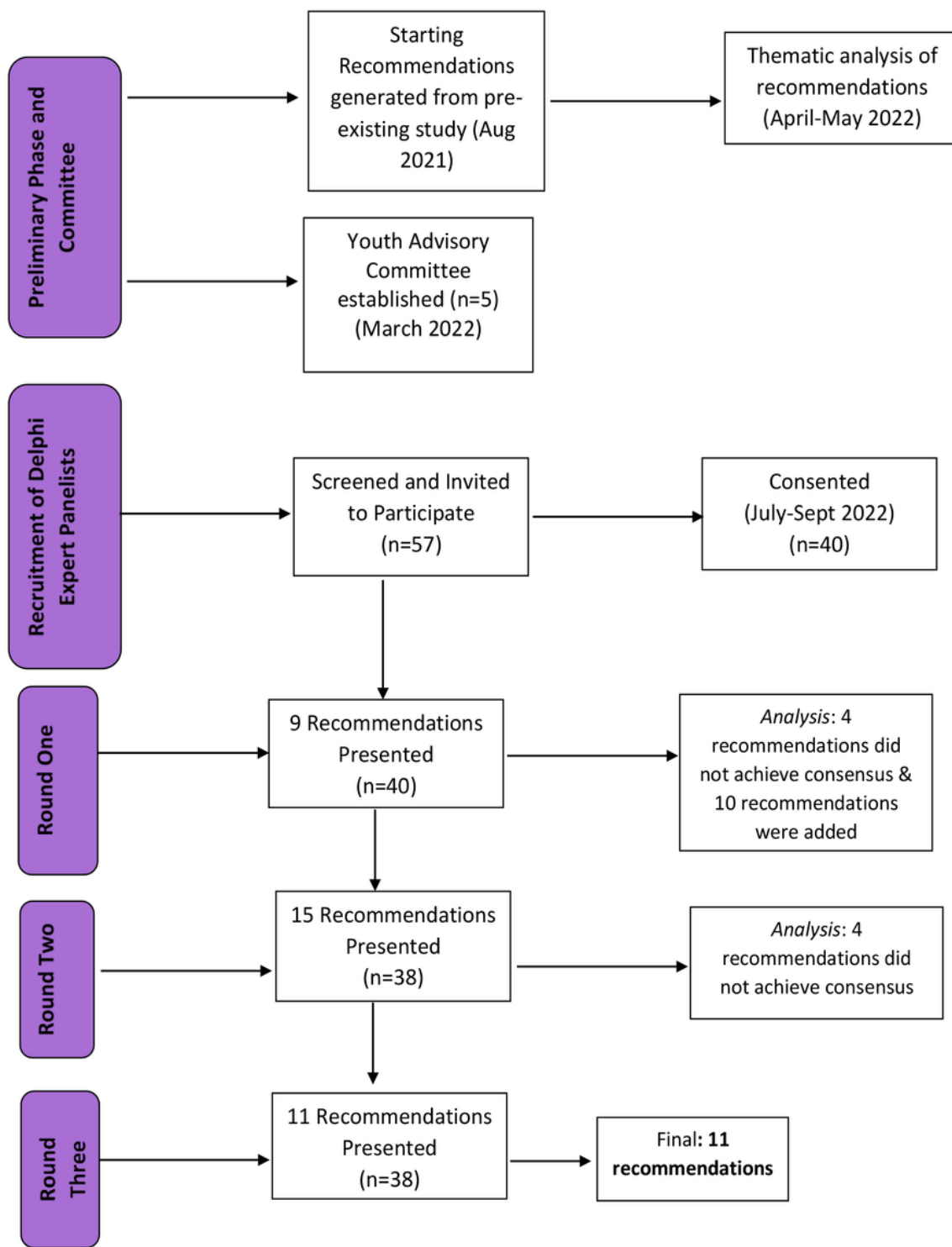


Figure 1

Flow Diagram of Delphi Rounds on Planning for Future Pandemics or Public Health Emergencies