Developing balanced quality indicators for monitoring virtual care in Ambulatory Care Environments: A Modified Delphi Panel Process

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Developing balanced quality indicators for monitoring virtual care in Ambulatory Care Environments: A Modified Delphi Panel Process

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Abstract

Background: While the volumes of virtual visits accelerating in uptake following the COVID-19 pandemic, less is understood regarding the quality of virtual visits. Furthermore, there is limited guidance for decision makers on how best to evaluate the quality of virtual care initiatives. There is a clear need for a comprehensive set of relevant quality indicators for implementation teams and organizations interested in either evaluating or implementing a virtual care initiative.

Objective: The objective of this study was to curate a set of ambulatory quality indicators grounded in the quintuple aim quality framework and National Academy of Medicine domains of quality, including sustainability to provide a broad view of quality for virtual care in ambulatory environments.

Methods: A three round modified Delphi panel process was conducted. Phase 1 involved curating a list of ambulatory virtual care quality indicators from published and grey literature along with stakeholder derived indicators generated through a pre-Delphi survey; these indicators were mapped and categorized to the Quintuple Aim and National Academy of Medicine (NAM) Quality Domains.. Phase 2 involved rating and ranking of the quality indicators. A 19-member pan-Canadian Delphi panel was convened. The panel included representation from patients, clinicians, policy-makers, academics, and administrators. Panelists rated indicators using the Agency for Healthcare Research and Quality measure attributes on 9-point Likert scale in round 1, followed by a virtual Delphi panel meeting to discuss indicators before round 2 of re-rating, before a final round 3 of ranking assessing importance of indicators within each quality domain and sub-domain. Novel quality indicators of virtual care to address gaps in literature were included through panel discussions, patient group consultations, and a pre-Delphi survey. For indicator advancement during rating exercises, 75% or more of panelist’s responses in the top tertile (between 7-9) with a median composite score of 7 or greater was required.

Results: 140 quality indicators were included and. progressed through the 3 Delphi rounds. There was minimal attrition among Delphi panel members (17/19 participated in all 3 rounds). After round 3, 27 indicators were compiled in the final scorecard. Aligned with the quintuple aim, these indicators include 14 centered on patient experience, 7 regarding provider experience, 2 focused on population health, 2 focused on health equity, and 2 focused on health system costs.

Conclusions: By creating set of comprehensive set of quality indicators of ambulatory virtual care relevant to stakeholders across the health system, comprehensive evaluations of virtual care programs can be conducted examining all relevant domains of quality. Using the balanced scorecard as a reference, organizations and institutions can compare projects across jurisdictions, and identify priority areas of quality to ensure their virtual care initiative is appropriate for the care being provided. Clinical Trial: This study was not registered

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Abstract

Background: While the volumes of virtual visits increased with the COVID-19 pandemic, little is still known regarding the quality of virtual visits. Furthermore, there is limited guidance on how best to evaluate the quality of virtual care initiatives.

Objective: The objective of this study was to curate a balanced set of quality indicators grounded in the Quintuple Aim quality framework and the National Academy of Medicine domains of quality, including sustainability, to monitor quality of virtual care in ambulatory environments.

Methods: A three-round modified Delphi panel process was conducted within two phases of work. Phase 1 involved curating a list of ambulatory virtual care quality indicators from published and grey literature along with stakeholder derived indicators generated through a pre-Delphi survey; these indicators were mapped and categorized to the Quintuple Aim and National Academy of Medicine (NAM) Quality Domains. In Phase 2, a 19-member pan-Canadian Delphi panel was convened to rate and rank the quality indicators. The panel included clinicians, individuals with lived experience with the healthcare system, policymakers, academics, and administrators. Panelists rated indicators using the Agency for Healthcare Research and Quality measure attributes on 9-point Likert scale in round 1, followed by a virtual Delphi panel meeting to discuss indicators before round 2 of re-rating, then a final round 3 of ranking to assess importance of indicators within each quality domain and sub-domain. To address gaps in the literature, novel quality indicators of virtual care were identified and discussed in panel discussions, patient group consultations, and a pre-Delphi survey. For indicator advancement during the rating exercises, 75% or more of panelist's responses in the top tertile (between 7-9) with a median composite score of 7 or greater was required.

Results: There were 140 quality indicators included in Phase 1 and progressed through the 3 Delphi panel rounds. There was minimal attrition among Delphi panel members (17/19 participated in all 3 rounds). After round 3, 25 indicators were included in the final scorecard. Aligned with the Quintuple Aim, there are 13 indictors on patient experience, 6 on provider experience, 2 on population health, 2 on health equity, and 2 on health system costs.

Conclusions: A balanced set of 25 quality indicators of ambulatory virtual care was developed based on literature and consensus building from knowledge users across the health system. This curated set of indicators will support more comprehensive evaluations of virtual care programs that examine all relevant domains of quality. Organizations can use the set of indicators as part of a scorecard to compare across jurisdictions, identify priority areas, and ensure their virtual care initiatives are delivering high quality care based on multiple domains of quality.

Keywords: Virtual care, Quality, Quintuple Aim, Delphi panel, Quality indicators, Performance Assessment,

Introduction

The rapid adoption of virtual care across all levels of the health system was driven by the COVID-19 pandemic (1). Virtual care is defined as any interaction between patients and/or caregivers and their healthcare providers (or 'circle of care') that occurs remotely and is facilitated through digital communication or other information technologies (2). In Ontario, Canada, virtual visits rose from 146, 014 in 2016 to 4, 927, 830, in 2020. Furthermore, virtual visits in rural regions increased over 1000%, from 27 145 in 2016 to 290 401 in 2020 (3). As COVID-19 pandemic measures have subsided, many temporary virtual service programs became integrated into standard of care as part of hybrid-models of care delivery (4). In part, the adoption of this hybrid model has been supported by the ease of access, renumeration models and preference of many patients and healthcare professionals (5–7).

Despite the extensive uptake of virtual care, there is limited guidance on how best to evaluate of the *quality* of virtual care visits. Virtual care evaluations conducted during the pandemic largely focused on narrow domains of quality such as patient satisfaction, with limited assessment on other relevant quality domains including the impact on equity and/or population health (8–10). While virtual encounters can be beneficial with increasing access, and respecting the preference of patients and/or providers, they might not always be appropriate (11). There is still some hesitation around virtual care modalities, as this method of care delivery is seen to limit the comprehensiveness of care, such as the inability to perform a physical exam

(12). Patients have also reported negative experiences, such as receiving ‘bad news’ through virtual meetings, or accessing test results before they have been reviewed or interpreted by their provider (13). Assessing quality of virtual care is integral to ascertain, as it can influence effectiveness of treatment and adherence to provider recommended care plans (14). However, there is limited guidance for healthcare organizations about how to comprehensively evaluate quality of virtual care initiatives, examining all relevant quality domains and extending beyond narrow disease states (9).

To address this gap, a balanced scorecard for virtual care could provide a set of quality indicators to guide performance assessments and quality improvement (QI) projects related to virtual care (15,16). Quality indicators are standardized, evidence-based measures that can be used to track and compare health outcomes and performance over time and across different organizations (17). A balanced scorecard (BSC) is a tool used by organizations to strategize about meeting their mandates and goals and have been used in healthcare (18).

Our objective was to develop a set of broad quality indicators that could be used as part of a balanced scorecard across the Quintuple Aim to evaluate the quality of virtual care.

By grounding the set of quality indicators on the Quintuple Aim framework of improving the 1) patient experience, 2) provider experience, 3) population health, 4) health equity, 5) and health system costs (19), a prospective BSC for quality of virtual care allows for a nuanced understanding of these intersecting aspects that impact quality of care. To achieve this aim, we conducted a scoping review to identify quality indicators from the literature (20), then followed a modified Delphi panel process to achieve expert consensus on the proposed indicators. This manuscript reports the results of the pan-Canadian Delphi panel recommendations for quality indicators based on diverse perspectives that can form a balanced scorecard for virtual care.

Methods

A literature review (Phase 1) and modified Delphi-panel (Phase 2) were used to curate a set of quality indicators for ambulatory virtual care. The literature review developed a candidate list of quality indicators, which was validated using a modified Delphi-panel process. The ACrutate COnsensus Reporting Document

(ACCORD) checklist (21) was used to report the findings of the modified Delphi (**Supplementary Material Table S2).** The study was not registered. A steering committee of researchers, clinicians, a project manager, and a person with lived experience (PWLE) oversaw the administration and execution of the scoping review and Delphi process.

Ethics approval and Funding

This study was reviewed and approved through the Assessment Process for Quality Improvement Projects (APQIP) process at Women's College Hospital (APQIP # 2021-0131-P). Funding for this project was provided by the Innovation Fund of the Alternative Funding Plan for the Academic Health Sciences Centres of Ontario (WCH-22-004).

Phase 1: Generating Candidate List of Virtual Care Indicators

A rigorous scoping review guided by the Joanna Briggs Institute (JBI) Manual for Evidence Synthesis (23) was used to generate the candidate list of quality indicators of virtual care. Scoping review results are described elsewhere (20). In brief, extracted indicators from the published and grey literature were aligned to two quality frameworks: the Quintuple Aim, and the National Academies of Medicine (NAM) domains of quality of care. Extracted indicators within the provider and patient experience of the Quintuple Aim were further subdivided into the NAM quality domains which includes safety, effectiveness, efficiency, patient-centeredness, timeliness and equity (24). The steering committee reviewed the frameworks and added the domain of sustainability to the structured extraction, to ensure consideration of long-term quality was included. The codebook used to map the extracted indicators is described elsewhere (20). All modalities of virtual care were included such as video conferencing, remote monitoring and patient portals.

Following the extraction and mapping exercises, the steering committee reviewed indicators for completeness and redundancy. Any indicator which did not stand alone as a quality measure, was irrelevant, difficult to interpret, or duplicate, was removed. The remaining indicators were categorized to each quality domain for rating by the Delphi panel.

Phase 2: Modified Delphi Panel Process

The modified Delphi process is a well-established, consensus building practice wherein content experts rate and rank specific indicators across 2 or more rounds according to their relevance to the issue in question (25). It is an iterative, multistage process designed to combine individual opinion into group consensus and are most appropriate where there is little agreement regarding the method of appropriate action (26), such as with virtual care which may have different meaning to different individuals, (e.g. patients or providers, and rural or urban populations (27)). In addition, anonymity in voting allows for equal weighting of all perspectives (decreasing power differentials, such as between policy decision makers and PWLEs), the feedback sessions allowed for discussion, clarification, and justification for decisions (28,29). This pan-Canadian Delphi process was conducted between June 2023 and February 2024.

Pre-Delphi Survey: A pre-Delphi survey was conducted via email using RedCap© to assess the completeness of extracted indicators and appropriateness of coding the indicators into the Quintuple Aim and NAM quality frameworks. Feedback on the candidate list of indicators generated from the scoping review was collected, perceived gaps were identified, new indicators could be suggested, and potential panel members could be nominated. This survey was sent to all Canadian Network for Digital Health Evaluation (CNDHE) members. Survey responses were reviewed by the steering committee and used to inform the inclusion of novel indicators prior to round 1 rating.

Co-Design with Persons with Lived Experience: The PWLE perspective was critical in creating a scorecard that reflects the priorities and needs of patients when accessing care virtually. One of our co-investigators and steering committee members is a PWLE who informed the study design including the scoping review and Delphi process. The project was also presented to a patient partner group at Women's College Hospital (the Community Liaison Advisory Committee; CLAC) to solicit feedback on our overall approach and our plans for seeking PWLE input on the Delphi panel. The list of indicators was shared with the CLAC to gather feedback on potential gaps in the list and new indicators.

Pre-Delphi Training with Panelists: Before the first round of the Delphi, panelists were invited to an online training workshop where steering committee members explained the methodology and rationale for the project. The Agency for Healthcare Research and Quality (AHRQ) quality measures (see below) were described, as well as their functional meaning when rating and ranking. This level-setting exercise ensured all panel members were comfortable with the rating and ranking process and any questions about the project or process could be addressed. This workshop also encouraged respectful collaboration given the power differentials within the panel. All participants, particularly PWLEs, were provide the opportunity for further support if requested.

Delphi Round 1: For Round 1, the list of candidate indicators was sent to panel members through RedCap®(30), a secure survey software used in all rounds. Indicators were categorized to align with the quintuple aim (31) as the primary tree (i.e. indicators measuring patient experience, provider experience, population health outcomes, health equity, and health system costs). For the patient and provider experience quintuple aims, these were further subdivided according to the NAM quality domains (effective, efficient, equitable, safety, timeliness, patient centered, and safety). Composite indicators (indicators which addressed 1 or more of the NAM subdomains) were also included in the patient and provider experience trees. Panelists were asked to rate each indicator against the four AHRQ quality measures attributes on a 9-point Likert scale where 1 indicates strong disagreement and 9 indicates strong agreement. Panelists' ratings were equally weighted across the AHRQ's 4 qualities:

- Scientific Soundness: Clinical Logic
- Scientific Soundness: Measurement Properties
- Feasibility
- Importance of the Measure

Indicator inclusion criteria after ranking was ≥75% of panelists responses within the top tertile (7-9) for a given indicator. Indicator exclusion criteria was ≥75% of panelists responses in the bottom tertile (1-3). Indicators meeting the inclusion criteria advanced to round 3 (ranking). Indicators meeting the exclusion criteria were automatically excluded and not re-ranked. Where there was no consensus, indicators were included for re-rating in round 2. Reminder e-mails were sent to panelists 2 weeks after the initial survey was sent in Rounds 1, 2, and 3.

Delphi Round 2: Between the first and second rating rounds, a three-hour structured virtual Delphi panel meeting was conducted to discuss the results of Round 1, moderated by steering committee members. Prior to the meeting, each panel member received their rating scores for the indicators, along with median and interquartile ranges of ratings of quality indicators based on Round 1 results. During the meeting, novel indicators were also solicited based on perceived gaps from Round 1. During the Delphi panel meeting, breakout groups were conducted for focused discussion on the novel indicators, indicators where there were no consensus, and to allow for more direct feedback from panelists regarding the indicators' fidelity to quality of virtual care. Round 2 re-rating then progressed through the same approach as Round 1.

Delphi Round 3: In Round 3, panel members ranked remaining indicators based on their importance in measuring quality of virtual care in ambulatory care environments. Due to the number of indicators with no consensus by Round 3 of ranking, the modified Delphi approach was refined further to decrease the burden of Delphi panel members and minimize loss to follow up of panelists. In Round 3, panel members were to rank indicators from 1- *n* with 1 being most important to measuring quality within each domain of quality and *n* being least important within the specific Quintuple Aim domain. *N* represents the number of indicators within that specific quality domain. For example, if there were 11 indicators within patient experience, panel members ranked remaining indicators 1 to 11, based on their perceived importance to measuring quality of virtual care.

Results of the round 3 ranking exercise included recording medians and interquartile ranges of rankings. A Friedman test for statistical significance was conducted to assess if differences in ranking were statistically significant. Where the *n* of indicators was robust enough, statistical significance of ranking differences was noted. Indicators were then reviewed in order of highest to lowest median ranking by an expert Steering committee to enable final selection of ranked indicators for inclusion.

Results

Curating Candidate Indicators

A scoping review was completed to assess existing quality indicators in the literature. Results are described in detail elsewhere (20). In brief, 66 manuscripts were included for review to identify quality indicators in virtual care. Following the initial extraction, 245 indicators were reviewed and coded. After the removal of duplicates, incomplete, or incohesive indicators (n=105), 140 quality indicators were then included for presentation to the Delphi panel. Nine novel quality indicators were developed through the pre-Delphi survey, PWLE consultation, introductory meeting, and panel discussion.

Pre-Delphi Survey

Beginning in June 2023, the pre-Delphi survey was sent to 189 members of CNDHE. Thirty-three members completed the survey (17.5% response rate). Results of the survey recommended adding cultural safety indicators when considering patient experience (n=3), digital literacy for providers (n=3), and equitable access to virtual care based on geographic status (n=2). The recommendations were referenced in Delphi panel meetings and informed the generation of novel indicators between Round 1 and Round 2. The novel indicators were not included in the Round 1 survey, as they had not been reviewed or commented on by Delphi panel members. Once the Delphi panel was selected, these suggested indicators were then discussed.

Delphi Panelists: Thirty-five people were invited to the Delphi introductory meeting, and 19 panelists contributed to all three rounds (54% response rate). Panelists were from Ontario (n=10), British Columbia (n=4); Saskatchewan (n=3); Albertan (n=1); and Newfoundland (n=1), and represented different organizations and backgrounds. Details on panelists are provided in Figure 1.

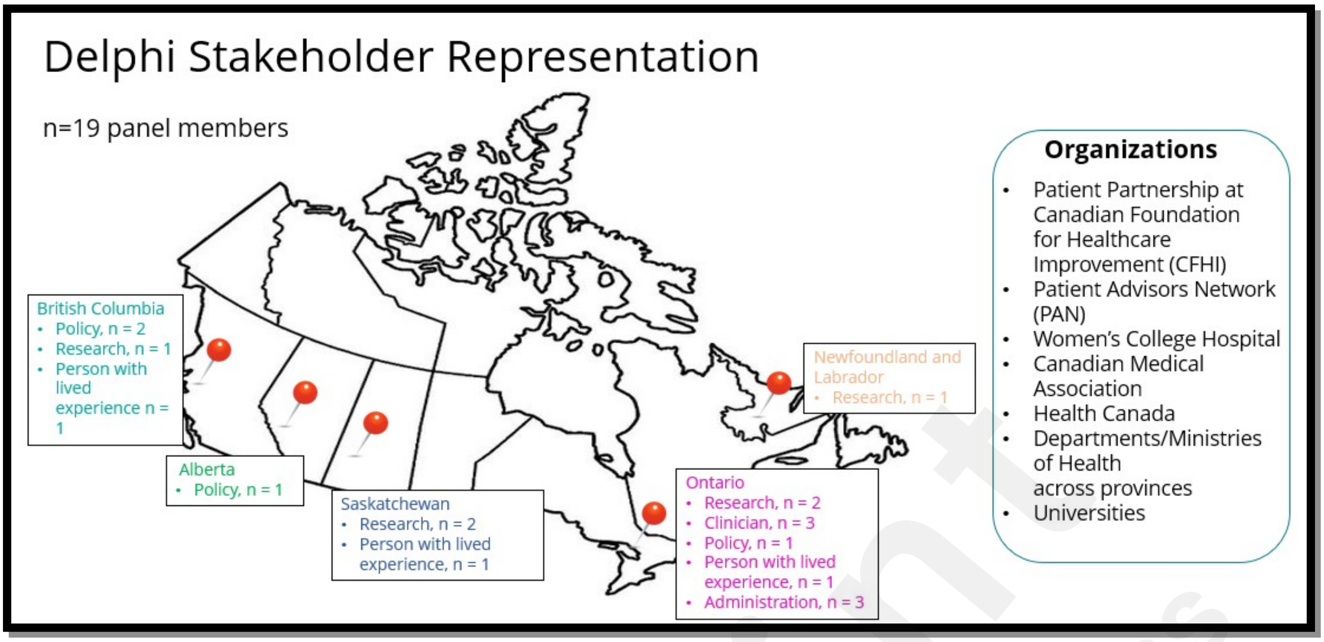

Figure 1: *A map of modified Delphi panel member locations, as well as their primary affiliations. The panel was a diverse group of clinicians, researchers, and patients from across Canada and urban/rural communities.*

Delphi Round 1: Table 1 describes the round-by-round process of the Delphi process of the indicators of virtual care, eventually leading to the final list of 25. In Round 1, 19 surveys were completed. There were 69 indicators included for Round 3 ranking. 0 were excluded, and 71 indicators had no consensus and required re-rating in Round 2. A panel discussion at the conclusion of Round 1 with 12 of the panel members yielded 9 novel indicators to be included in Round 2 rating. **Supplementary Material Table S3** shows the results after Round 1 of rating.

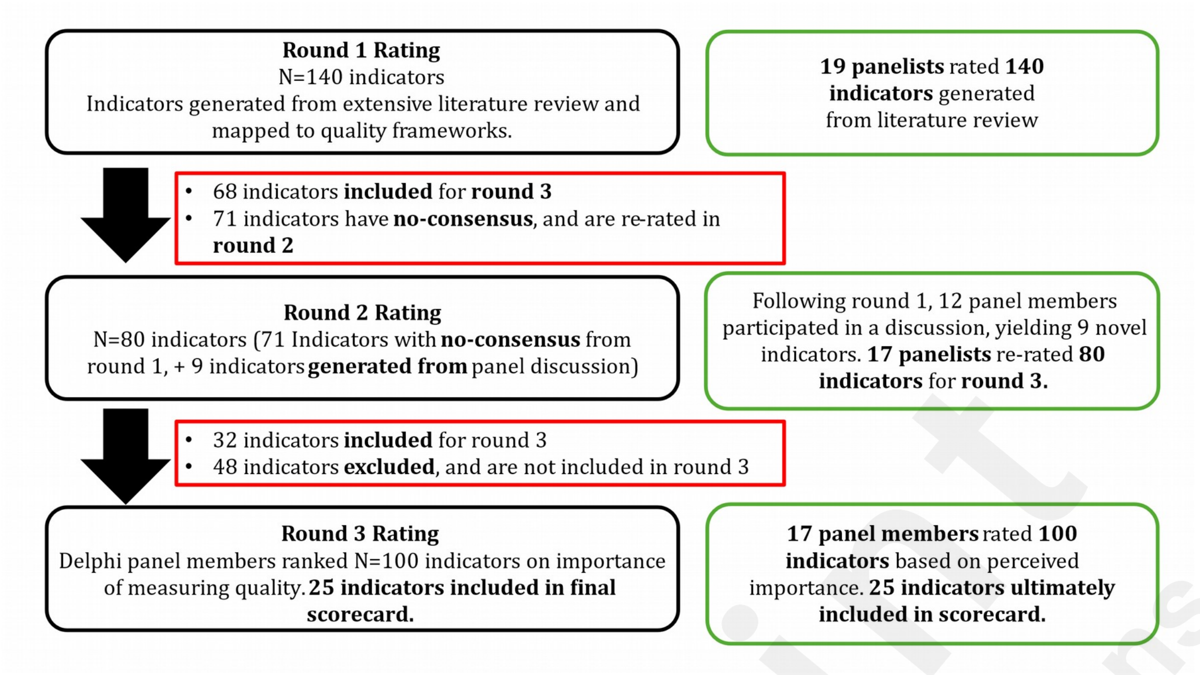

Figure 2: Summary of the Delphi process to select indicators of virtual care, across 3 rounds of rating, eventually leading to the final list balanced score card for virtual care which included 25 quality indicators.

Delphi Round 2: Between Round 1 and 2 rating exercises a virtual Delphi panel meeting was held to discuss indicators that had not yet reached consensus (to either include or exclude), and to suggest novel indicators based on perceived gaps in current indicators. The meeting was attended by Delphi panel members who had completed Round 1 (n=12; 63% attendance rate). The meeting featured discussions on health equity and sustainability indicators, sub-coded under patient experience and provider experience. Further discussion was also held regarding health system costs and patient-centered care, and breakout groups were used to discuss current and proposed indicators. The largest gaps identified included a limited focus on sustainability as well as health equity, which were addressed through the creation of novel indicators to be included in round 3.

Following the meeting, 19 surveys were distributed for re-rating the indicators without consensus with 17 responses (89% response rate). 32 indicators were included for Round 3 ranking with 48 excluded after Round 2.

Delphi Round 3: In Round 3 ranking, 17 surveys were sent to panel members to rank 100 indicators (68 indicators included from round 1, and 32 from round 2, 100% Delphi panel response rate). The two panelists who did not complete round 2 ranking were not contacted for round 3 (considered lost to follow-up). **Supplementary Material Table S4** includes the results of Round 3. Indicators included in the final scorecard were based on their median ranking and inter quartile range. Where applicable, the Friedman test was used to assess statistically significant differences in ranking between indicators within specific quality domains.

To finalize the set of quality indicators, the steering committee reviewed the list to ensure there was minimal repetition between ranked indicators, that each one could be interpretable as an individual measures, and that gaps in indicators were addressed by Delphi panel derived indicators. Ultimately, three novel indicators from the Delphi panel were included. These include 1) cultural safety and competency, 2) language preference, and 3) acknowledgement of a patient's identity. The final list was further enhanced through review by content experts, including clinicians and leadership, who were external to the steering committee and not a Delphi panelist. Aligned with the Quintuple Aim, there are 13 indictors on patient experience, 6 on provider experience, 2 on population health, 2 on health equity, and 2 on health system costs. The final list of indicators is presented in **Supplementary Material Table S1.**

Discussion

Through a structured and rigorous modified Delphi panel process, using broad knowledge user engagement that included PWLEs in the co-design, a set of 25 quality indicators were curated to support organizations to evaluate the quality of ambulatory virtual care. The final set of indicators align with the Quintuple Aim framework, as well as the NAM quality domains of care, with the addition of sustainability to ensure a broad view of quality. Utilization of the set of indicators as part of a balanced scorecard can provide institutions with guidance on what measures to broadly assess performance of virtual care within programs, with the aim to improve the quality of care provided.

There have been calls for a more uniform approach to understanding quality of care – particularly in the context of virtual encounters (32,33). Quality indicators of care vary, sometimes significantly, between hospitals and institutions (17). By providing organizations with a balanced list of indicators across all relevant domains of quality within established frameworks, indicators will be relevant to knowledge users, helping to standardize approaches to measuring quality of virtual care. This, in turn, can identify gaps in care delivery, and inform rapid plan-do-study-act cycles of quality improvement, foundational to a learning health system

(LHS) (34) (35). The aim is for the set of virtual quality indicators generated through this modified Delphi process can form the foundation for organizations across a health system to evaluate virtual care programs and as part of hybrid models of care.

Based on our previously completed literature review, and extraction from quality indicators therein (20), there were several gaps identified by the Delphi panel in existing virtual care indicators. In response to this, the Delphi panel generated novel indicators – particularly centered on assessing equity and measuring costs of virtual care. Lowering the barrier of entry for equitable virtual care, as well as ensuring virtual care programs are cost-effective, is a key next step in facilitating that transition from pilot models to standards of care.

This study has several strengths. The modified Delphi panel approach employed in this study leveraged expertise from across Canada and from a diverse range of backgrounds, locations and perspectives. There was minimal attrition of panel members through the three rounds of the modified Delphi process, with only 2 panel members being lost between rounds 1 and 2. There was strong involvement of people with lived experience in all phases of the project, from the steering committee to broad engagement in our Delphi panel process. Involving a PWLE in our steering committee helped shape and inform the study from its inception to analyzing and interpreting results, to being part of the decision-making process regarding the finalized list of quality indicators. Involving PWLEs in research has multiple positive effects, including making end products relevant and pragmatic to implement (36). Lastly, the rigorous methodology used throughout the modified Delphi process utilizing the AHRQ rating process the alignment of indicators to existing quality frameworks (Quintuple Aim and NAM domains of quality), contributes to the relevance of using the scorecard to measure all relevant domains of quality of virtual care moving forward.

Systemic and consistent measurements of quality-of-care support more reliable comparisons of quality indicators across domains, jurisdictions, and contexts. This set of quality indicators aims to support institutions to align their goals and priorities and help diverse knowledge users communicate effectively regarding quality of virtual care. For measurements to be perfected, they must first be implemented. Our next step is to test the feasibility and acceptability of this set of virtual care in practice and to support organizations to incorporate these indicators as part of existing balanced quality scorecards.

Limitations

There are limitations with the study to note. First, the heterogeneity of published quality indicators required transformation by the study team as they were extracted to ensure each indicator addressed a discrete quality consideration and could be measurable. This adaptation process was done diligently, ensuring that fidelity to the quality indicator as it was reported in the literature was maintained. There were also changes to how the indicator was reported to Delphi panel members compared to how it was originally reported before its extraction to support clarity of the indicator.

Quality of care is complex and institutions can have challenges in effectively measuring certain domains particularly for equity and system costs (37–41)(42). Although we have presented a comprehensive list, some measures will be easier to feasibly measure than others, and further revisions may be required once the set is tested in practice. While the set of indicators provide guidance on what to measure, teams should ensure that the indicators reflect the needs of their individual setting and context. Each organization is unique, with its own intricacies and complexities and consideration need to be made to see what may be feasible in each setting and capacity level (43). Some quality indicators are more technical than others (for example, indicators measuring system costs). To use these indicators, administrative personnel may be required, which may not be feasible at all organizations – particularly smaller, community clinics. Wherever possible, the steering committee tried to make the quality indicators accessible, while maintaining fidelity to the extracted indicator and the Delphi rating and ranking process, and further streamlining is anticipated based on the learnings from our implementation process. In addition, there were 100 indicators that were included for ranking for round 3, but the steering committee needed to be judicious to ensure a set of indicators that could be comprehensive to measure virtual care, while balancing the number of indicators to include. Through the process, there were a number of quality indicators that may have not been included, in order to make the set of indicators more practical.

Future Directions

Our next steps will focus on testing, implementing and sharing the set of indicators. While our quality indicators have been rigorously curated, feedback from this implementation and dissemination phase will be essential to inform feasibility and viability of the quality indicators in practice. One future direction is to understand how to embed the set of metrics within existing hospital scorecards as part of hybrid models of care. Next steps may include establishing benchmarks, and continuously refining the scorecard through a learning health system approach (37, 38). The set of indicators will be a living document, constantly changing and updating to reflect best practice and the dynamic nature of digital health interventions.

Conclusions

A balanced set of 25 quality indicators were rigorously developed through a modified Delphi panel process to assess virtual care with extensive knowledge user engagement that incorporated persons with lived experience in the co-design. With inconsistencies in measuring quality of virtual care across institutions, this set of indicators offers an evidence-informed approach to addressing this gap. This set of 25 quality indicators can be used as part of a structured approach aligned with the Quintuple Aim and the NAM domains of quality of care to ensure a comprehensive evaluation of quality of virtual care. As virtual care becomes increasingly integrated into standard forms of hybrid-modalities of care delivery ensuring quality and appropriateness of virtual encounters should be a key goal of health organizations and systems.

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Conflicts of Interest

The authors have no conflicts of interest to declare.

Abbreviations

JMIR: Journal of Medical Internet Research
RCT: randomized controlled trial
PWLE: Persons with Lived Experience
NAM: National Academies of Medicine
APQIP: Assessment Process for Quality Improvement Projects
QI: Quality Improvement
ACCORD: The ACrutate COnsensus Reporting Document
LHS: Learning Health System
CNDHE: Network for Digital Health Evaluation
CLAC: Community Liaison Advisory Committee
WCH: Women’s College Hospital
AHRQ: The Agency for Healthcare Research and Quality

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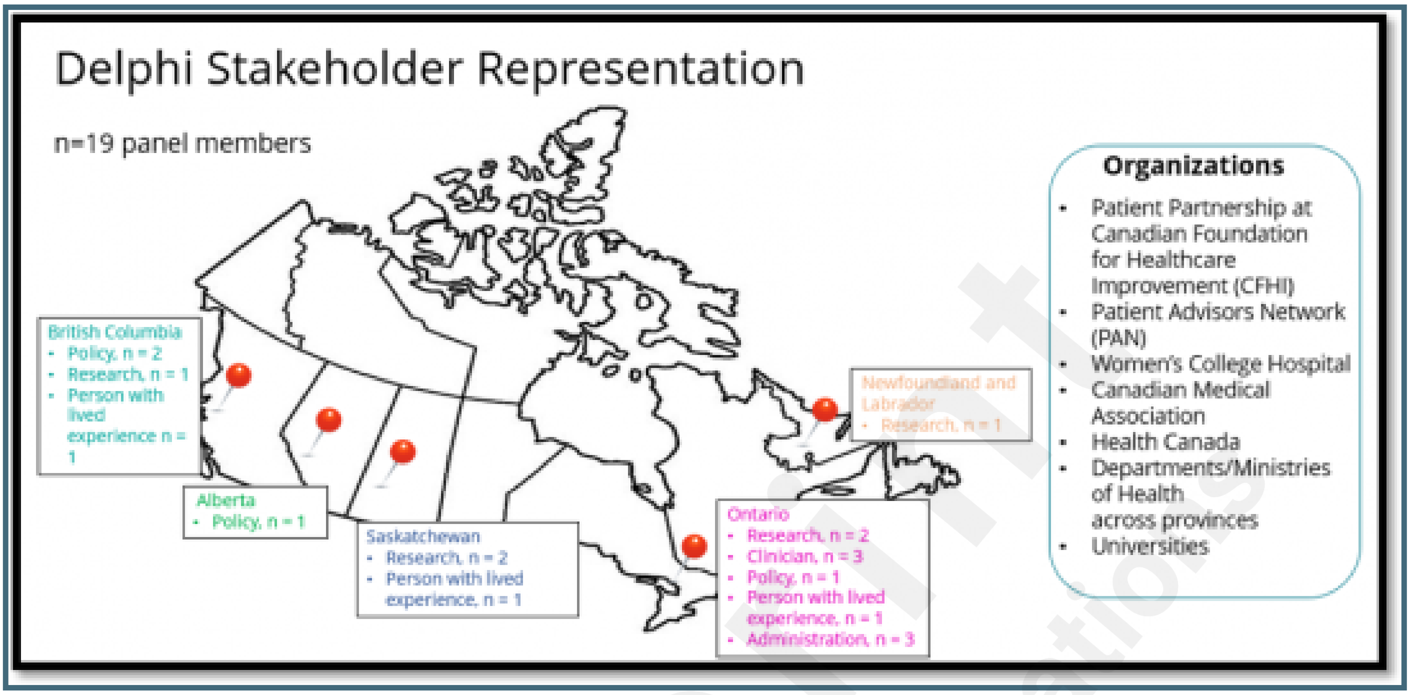
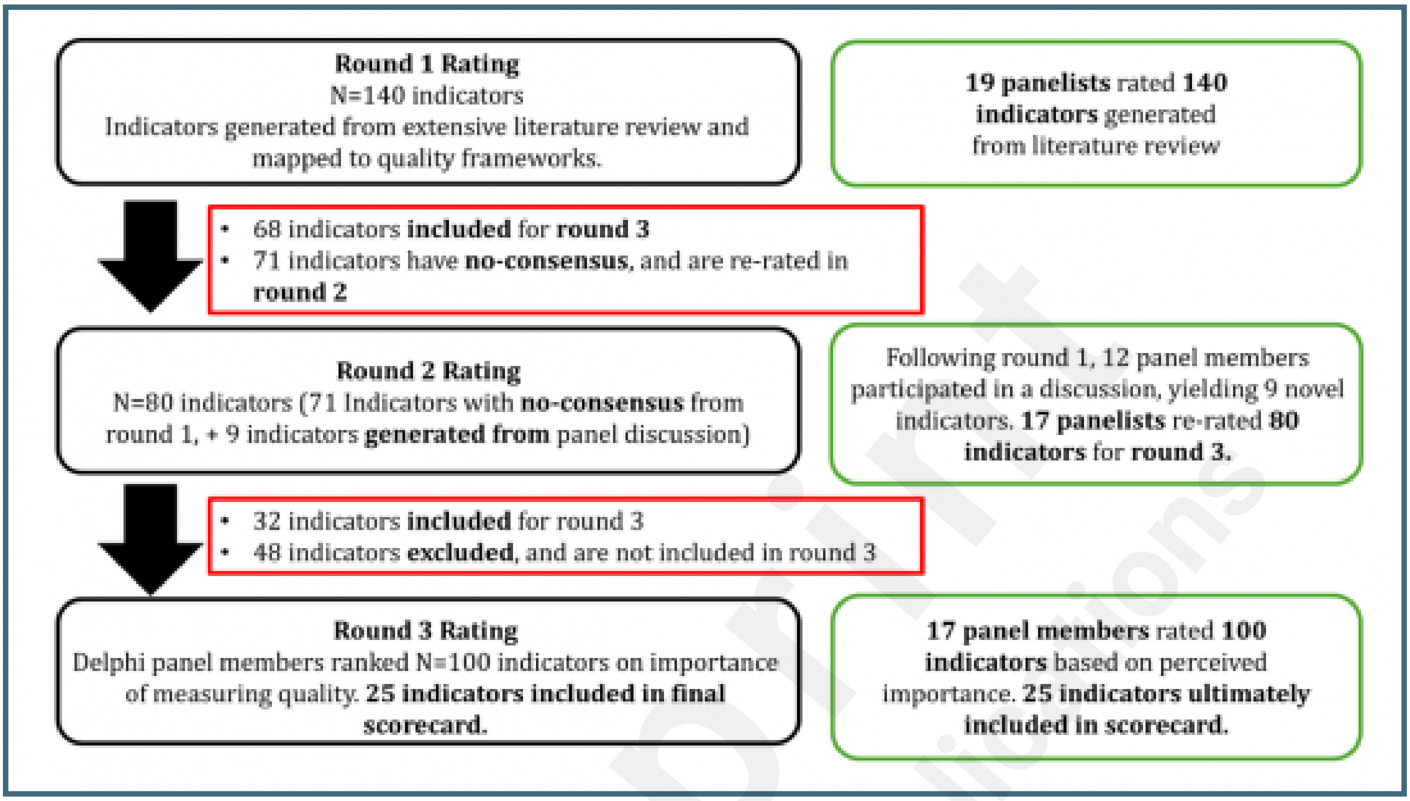
Supplementary Files

Figures

A map of modified Delphi panel member locations, as well as their primary affiliations. The panel was a diverse group of clinicians, researchers, and patients from across Canada and urban/rural communities.



Summary of the Delphi process to select indicators of virtual care, across 3 rounds of rating, eventually leading to the final list balanced score card for virtual care which included 25 quality indicators.



Round 1 Rating
N=140 indicators
Indicators generated from extensive literature review and mapped to quality frameworks.

19 panelists rated **140 indicators** generated from literature review

- 68 indicators **included** for **round 3**
- 71 indicators have **no-consensus**, and are re-rated in **round 2**

Round 2 Rating
N=80 indicators (71 Indicators with **no-consensus** from round 1, + 9 indicators **generated from** panel discussion)

Following round 1, 12 panel members participated in a discussion, yielding 9 novel indicators. **17 panelists** re-rated **80 indicators** for **round 3.**

- 32 indicators **included** for round 3
- 48 indicators **excluded**, and are not included in round 3

Round 3 Rating
Delphi panel members ranked N=100 indicators on importance of measuring quality. **25 indicators included in final scorecard.**

17 panel members rated **100 indicators** based on perceived importance. **25 indicators ultimately included in scorecard.**

Multimedia Appendixes

Balanced Scorecard for Virtual Care. 25 quality indicators were included from the Delphi process.
URL: http://asset.jmir.pub/assets/1039940a105cf64d54f51723eb9527a8.pdf

CONSORT (or other) checklists

ACCORD checklist for Delphi reporting.
URL: http://asset.jmir.pub/assets/e1bf4a70e01e7541ffa6fac90745efe9.pdf