DEVELOPMENT OF A SCORING TOOL FOR VIRTUAL CARE PROGRAMS

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PRESENTED TO:
Ontario Health

Acknowledgements

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Acronyms

AI Artificial Intelligence

CDHE Centre for Digital Health Evaluation

HEIA Health Equity Impact Assessment

MOH Ministry of Health

OH Ontario Health

OHT Ontario Health Team(s)

PAN Patient Advisory Network

PPE Patient Partner Evaluator

WCH Women's College Hospital

WIHV Women's College Hospital Institute for Health System Solutions and Virtual Care

Operational Definitions

Health Equity: The fair opportunity for individuals and populations to reach their fullest health potential. Achieving health equity requires reducing unnecessary and avoidable differences that are unfair and unjust. Many causes of health inequities relate to social and environmental factors including income, social status, race, gender, education, and physical environment.[1,2]

An **Ontario Health Team (OHT)** is a practice model that supports the full and coordinated continuum of care within and across different providers and organizations in a certain geographic catchment area. The goal for OHTs is for patients to receive all their care from one team of providers so that patients can navigate the system and transition easily between different providers and health services.[3]

Quadruple Aim: An expansion of the Triple Aim, the Quadruple Aim was first described in 2014 and highlights four areas of focus for optimizing health system performance: (1) improving the patient experience of care, (2) improving the health of populations, (3) reducing the per capita cost of healthcare, and (4) improving the work life of clinicians and staff.[4]

Quintuple Aim: Framework that highlights five areas of focus for optimizing health system performance: (1) improving the patient experience of care, (2) improving the health of populations, (3) reducing the per capita cost of healthcare, (4) improving the work life of clinicians and staff, and (5) improving health equity.[5,6]

Sustainability: The ability to maintain programming and its benefits over time.[7,8]

Triple Aim: First described in 2008, the Triple Aim highlights three areas of focus for optimizing health system performance: (1) improving the patient experience of care, (2) improving the health of populations, and (3) reducing the per capita cost of healthcare.[9]

Virtual Care: Any interaction that occurs remotely between patients and/or members of their circle of care using communication or information technologies across the entire patient journey. This can refer to either an approach to care or a single interaction between a patient and healthcare provider.[10–12]

Virtual Care Modality: The specific type of technology or technological system that facilitates the delivery of virtual care.[13,14] For the purposes of this project, only videoconferencing and remote care modalities that incorporated a patient-facing component or enabled patient-provider interactions were considered.

Virtual Care Program: Set of formal organized activities offered by healthcare organization(s), which may occur at the local, regional, or national level and in a variety of settings. A virtual care

program is one that (1) uses one or more virtual care modality; (2) is offered to one or more patient populations; and (3) supports one or more models of care.[12] For the purposes of this project, only virtual care programs focused on videoconferencing and/or remote care that incorporated a patient-facing component or enabled patient-provider interactions were considered.

Executive Summary

Background

The Quintuple Aim—improving population health, enhancing the patient experience, enhancing the provider experience, reducing healthcare costs, and improving health equity—was first described in 2021 and is a guiding framework for optimizing health system performance.[5,6,9] Virtual care programs could enhance the Quintuple Aim but their impact on these aims is not measured in a systematic way in Ontario.

The use of scoring tools to inform or support program prioritization, selection, and funding decisions is common in healthcare and technology.[20–22] However, existing scoring tools typically do not consider the full range of elements that contribute to the success of a virtual care program. A scoring tool that can be applied to a variety of virtual care programs and measure the extent to which these programs align with the Quintuple Aim and have capacity for sustainability could support the programmatic decision-making process and optimize health system performance in Ontario.[19] Such a tool should also align with the strategic goals and priorities of Ontario Health and its partners.

Objectives

The purpose of the project was to develop a scoring tool to quantify alignment of current virtual care programs with the Quintuple Aim, by:

1) Identifying scoring tools used to quantify alignment elements of the Quintuple Aim.
2) Describe metrics used to assess program continuity, impact, and sustainability.
3) Develop a scoring tool that is aligned with the Quintuple Aim and measures sustainability of virtual care programs in Ontario.

Methods

The Centre for Digital Health Evaluation (CDHE) conducted a rapid review of peer-reviewed publications and grey literature; 4 semi-structured interviews with Ontario Health (OH), Ministry of Health (MOH), and Ontario Health Team (OHT) stakeholders; an end user utility assessment with 4 OH, MOH, and OHT stakeholders; and several consultations with Women's College Hospital Institute for Health System Solutions and Virtual Care (WIHV) Innovation Fellows, the WIHV Equity Committee, and Patient Partner Evaluators (PPEs).

Key Takeaways

EXISTING SCORING TOOLS

- Most tools included metrics to assess the patient experience (75%, n=18); some included metrics for population health (54%, n=13), the provider experience (46%, n=11), or healthcare costs (42%, n=10); and few included metrics for health equity (29%, n=7).

- No scoring tool covered all five of the Quintuple Aims along with measures of sustainability.

- The needs of OH can be served by a new scoring tool that combines and adapts key elements of existing tools and incorporates other elements relevant to sustainability.

IMPLICATIONS OF A SCORING TOOL FOR VIRTUAL CARE PROGRAMS

- Provide a framework to measure and compare the extent to which existing virtual care programs align with the Quintuple Aim and can be sustained.

- Highlight successes and opportunities for improvement within and across different virtual care programs.

- Contribute to the development of quality standards for all virtual care programs.

- Inspire continuous improvement and growth of virtual care programs.

- Lead to informed investments in virtual care programs that improve health system performance.

IMPLEMENTATION CONSIDERATIONS

Scoring tools with high adoption and uptake are characterized by simplicity and ease of use; clearly defined domains and indicators; a clear user guide; supportive leadership; and engaged program personnel to champion its use.

PROJECT HIGHLIGHTS

- The Quintuple Aim is a guiding framework for improving the delivery of care, optimizing health system performance, and promoting health equity.

- Currently, the extent to which virtual care programs in Ontario are aligned with the Quintuple Aim and have capacity to sustain their impact is not systematically measured.

- Informed by a rapid review and leveraging co-design methodology and stakeholder engagement, a scoring tool that is aligned with the Quintuple Aim and the strategic goals and priorities of Ontario Health and its partners was developed.

- Use of the scoring tool can standardize approaches to assess the impact virtual care programs have on the Quintuple Aim and contribute to the development of quality standards for all virtual care programs in Ontario.

Scoring Tool for Virtual Care Programs in Ontario

The new Scoring Tool for Virtual Care Programs is comprised of six focus areas: Population Health, Patient Experience, Provider Experience, Healthcare Costs, Health Equity, and Sustainability. Within each focus area, indicators are grouped thematically to a domain. The indicators are a combination of existing, adapted, and newly developed metrics, as informed by the rapid review, semi-structured interviews, end user utility assessment, and expert consultation panel. In addition, a user guide detailing the purposes and intended use of the tool, and instructions for conducting a scoring assessment, was developed.

The scoring tool and accompanying user guide aim to:

- Provide a framework that can be used to measure and compare the extent to which existing virtual care programs align with the Quintuple Aim and have capacity for sustainability.
- Highlight successes and opportunities for improvement within and across different virtual care programs in Ontario.
- Identify opportunities to design, adopt, implement, and maintain evidence-based virtual care programming to achieve the Quintuple Aim and build capacity for sustainability.
- Support and inspire continuous improvement and growth of virtual care programming in Ontario.

1.0   Introduction

1.1   Context

In 2019, Ontario launched its Digital First for Health Strategy to modernize the patient care experience and expand virtual care options.[11] Since then, the adoption of virtual care programs, which are the set of formal organized activities offered by healthcare organization(s) that (1) use one or more virtual care modality; (2) serve one or more patient populations; and (3) support one or more models of care, has significantly increased.[12,15] Funding for some of these virtual care programs is overseen by Ontario Health's Digital and Virtual Care Secretariat, and funding decisions are informed by a variety of factors, including the program's success criteria, impact, strategic fit, personnel, and sustainability plan. To continue to support a more equitable and patient-centred healthcare system, health system performance and equity should be key considerations that guide the design, adoption, implementation, and maintenance of virtual care programs.

The Quintuple Aim—improving population health, enhancing the patient experience, enhancing the provider experience, reducing healthcare costs, and improving health equity—was first described in 2021 and is a guiding framework for improving health care, optimizing health system performance, and promoting health equity.[5,6,9] Previous studies have shown that virtual care programs that do not align with the Quintuple Aim may have limited effects or unintentionally worsen health disparities.[16,17] In addition, the inclusion of health equity as an explicit goal of quality improvement may spur new efforts that may not otherwise be taken (e.g., design and adoption of virtual care programs in which the primary goal is intended to improve health equity).[18] Being able to systematically quantify the extent to which virtual care programs in Ontario align with the Quintuple Aim would be beneficial as this is not the current practice.[19]

The use of scoring tools to inform or support program prioritization, selection, and funding decisions is common in healthcare and technology.[20–22] Existing scoring tools typically focus on one focus area, such as program sustainability. However, the success of a virtual care program may be a result of a combination of factors, such the program's strategic fit, personnel, impact, and potential.[20] Therefore, a scoring tool that can assess a combination of factors and be applied across different virtual care programs may inform decision-making on which programs should be prioritized for continued support and investments.[19] Such a tool should also align with the strategic goals and priorities of Ontario Health and its partners.

1.2   Purpose and Objectives

The purpose of this project was to develop a scoring tool that enables Ontario Health and its partners to quantify the (potential) success of existing virtual care programs in alignment with the Quintuple Aim. The specific project objectives are:

1) To identify existing scoring tools used to quantify the success and/or sustainability of virtual care programs, with a focus on scoring tools that incorporate and assess some or all aspects of the Quintuple Aim.

2) Describe metrics used to assess program continuity, impact, and sustainability.

3) Develop a scoring tool or virtual care programs that is aligned with the Quintuple Aim; quantifies leading practices; measures factors related to impact, sustainability, and potential; and that can be applied across different virtual care programs.

2.0   Methodology

2.1   Overview of Data Collection Activities

To address the objectives described above, the Centre for Digital Health Evaluation (CDHE) conducted the following research activities:

- Rapid review of peer-reviewed publications and grey literature sources
- Semi-structured interviews with the intended end users and other relevant stakeholders
- End user utility assessment with the intended end users and other relevant stakeholders
- Consultations with an expert panel of WIHV Innovation Fellows and clinicians, the WIHV Equity Committee, and the Patient Partner Evaluators (PPEs)

The rapid review and semi-structured interviews informed the development of the draft scoring tool (Phase 1). Once the scoring tool was developed, the end user utility assessment and expert panel consultations were used to refine the scoring tool and ensure its utility (Phase 2). Further details about each activity are provided below.

2.2   Rapid Review

ACADEMIC LITERATURE SEARCH APPROACH

The World Health Organization's methodologically rigorous approach to conducting a rapid review[23] was adopted to identify existing scoring tools and metrics that assess some or all aspects of the Quintuple Aim and sustainability. Rapid reviews are a form of knowledge synthesis in which

components of the systematic review process, including a clear statement of review objectives, predefinition of eligibility criteria, assessment of the validity of findings (e.g., through assessing risk of bias), and systematic presentation and synthesis of results, are simplified to produce information in a timely manner.[23]

MEDLINE and SCOPUS databases were searched from 2015 to January 31, 2023 for existing scoring tools, measurement tools, or frameworks that measured achievement of the Quintuple Aim and/or capacity for sustainability. The search strategy was developed in consultation with an Information Specialist and experienced Librarian. Search terms included subject heads and free text. Covidence, a systematic review software, was used to remove duplicate references. Supplemental searches were conducted through reference lists of included studies and related systematic reviews. A two-level screening process (titles/abstracts, full-text screening) was used to select eligible studies. Information on the search strategy, study eligibility, and flow diagram is provided in Appendix A.

GREY LITERATURE SEARCH APPROACH

A broad and rapid review of grey literature on existing scoring tools, relevant frameworks, and other types of measurement tools was conducted. A keyword search of concepts related to "virtual care" and "scoring tools" or "frameworks" or "measurement" was undertaken in 1) Google and 2) the websites of agencies or organizations that are involved in the design and/or delivery of virtual care. See Appendix A for further details on the grey literature search.

2.3   Semi-structured Interviews

Semi-structured interviews were conducted to supplement the rapid review and to identify 1) usage and awareness of existing scoring tools; 2) expectations of the proposed scoring tool for virtual care programs in Ontario; 3) metrics of interest to include in the proposed scoring tool for virtual care programs in Ontario; and 4) potential drivers and barriers for engagement and sustained use of the proposed scoring tool. See Appendix B for the interview guide.

A purposive sampling strategy that leveraged existing OH and CDHE networks was used. Semi-structured interviews were conducted with the intended end users of the scoring tool, who were identified by OH. The participants were recruited by the CDHE via email. All interviews were audio recorded, transcribed, and analyzed.

Following the conclusion of all semi-structured interviews, findings from the rapid review and interviews were synthesized. Key themes and relevant indicators were identified, and the initial draft of the Scoring Tool for Virtual Care Programs in Ontario was developed.

2.4   End User Utility Assessment

An end user utility assessment was conducted to receive feedback on the draft scoring tool, including feedback on the metrics developed and their interpretation; the utility, workflow, and ease of use of the scoring tool; and whether the scoring tool aligned with the Quintuple Aim could inform the design, adoption, implementation, and maintenance of virtual care programs in Ontario to improve overall health system performance.

A purposive sampling strategy that leveraged existing OH and CDHE networks was used. The utility assessment was conducted with the intended end users of the scoring tool, who were identified by OH. The participants were recruited by CDHE via email. Half (50%) of all recruited participants also participated in the semi-structured interviews.

To participate in the utility assessment, the participants were asked to imitate the user experience by evaluating a virtual care program that they oversaw using the scoring tool. Participants were also asked to provide feedback on the time it took to complete the assessment and suggest improvements to facilitate uptake and usability of the scoring tool.

2.5   Expert Consultation Panel

The expert consultation panel comprised of three distinct groups: (1) WIHV Innovation Fellows and Clinicians, (2) WIHV Equity Committee, and (3) PPEs. The various groups were recruited and engaged differently at intervals throughout development of the scoring tool. A purposive sampling strategy that leveraged existing CDHE networks was used. All members of the expert panel were identified and recruited by the CDHE, in consultation with OH.

Three WIHV Innovation Fellows and Clinicians with expertise in virtual care delivery, health system planning, equity, and leading practices in virtual care programs were engaged. They were consulted to review the draft scoring tool and provide feedback on utility, workflow, interpretation, measurement, and alignment with the Quintuple Aim.

Similarly, a focus group was conducted with the WIHV Equity Committee, a multidisciplinary team of researchers with expertise in health access and policy, equity, implementation science, and

health services research. They were consulted to: (1) review and solicit feedback on the draft scoring tool, (2) specifically identify gaps and considerations for domains and indicators in the health equity and patient experience sections, (3) share equity considerations for the implementation of the scoring tool.

The CDHE also engaged with the PPEs from the Patient Advisory Network (PAN) at regular intervals, starting at project kick-off. The PPEs were consulted to provide their insight and expertise, which included: (1) sharing relevant sources for the rapid review; (2) sharing key considerations when selecting themes and indicators during the scoring tool design; and (3) co-designing, reviewing, and providing feedback on the draft scoring tool and report.

Findings from the utility assessment and expert consultation panel informed the revision of the draft scoring tool and provided considerations for implementation of the scoring tool.

3.0   Results

3.1   Phase 1: Rapid Review and Semi-Structured Interviews

Given the broad scope and variety of virtual care programs that exist, and the differences in virtual care modalities used across existing virtual care programs, for the purposes of this project, only virtual care programs focused on videoconferencing and remote care that involved patient-facing component(s) and/or enabled patient-provider interaction were considered (see Operational Definitions).

RAPID REVIEW CHARACTERISTICS

A total of 48 resources were identified (30 peer-reviewed articles and 18 grey literature sources), representing 24 unique scoring tools or frameworks that could be used to measure at least one of the Quintuple Aims or sustainability (Appendix A, Figure A1).

In Canada, relevant scoring tools or frameworks were identified in Ontario (n=5) and British Columbia (n=1). National entities, including Accreditation Canada, Canada Health Infoway, Healthcare Excellence Canada, and the Heart and Stroke Foundation of Canada have also developed scoring tools or relevant frameworks (n=4).

Several countries and global organizations, including the United States (n=7), the United Kingdom (n=3), Australia (n=2), Netherlands (n=1), and the Pan American Health Organization (n=1), have also developed relevant scoring tools or frameworks to guide the development,

adoption, implementation, and maintenance of virtual care programs or more broadly, healthcare programs. In Appendix A, Figure A2 presents the geographic distribution of existing scoring tools, frameworks, or metrics that were used to inform the development of a Scoring Tool for Virtual Care Programs in Ontario.

CHARACTERISTICS OF SEMI-STRUCTURED INTERVIEWEES

A total of 4 interviews were conducted (response rate: 67%). Table 1 provides an overview of the characteristics of the interviewees.

Table 1. Characteristics of Semi-Structured Interviewees

Organization	Position	Experience and Expertise	OHT Region
Ontario Health	Senior Advisor, Virtual Care	• Development and implementation of virtual care programs • Health equity • Funding envelope lead	N/A
Ontario Health	Consultant, Digital Health	• Implementation of virtual care programs for priority population groups • Public policy and health equity	North
Ontario Health Team	Virtual Care Coordinator	• Information Services Leader and Chief Information Officer • Implementation of virtual care programs • Procurement of virtual care platforms	East
Ontario Health Team	Operational Lead	• Administration, corporate governance, healthcare leadership, and strategic planning • Implementation and operations of virtual care programs	Toronto

GENERAL OVERVIEW OF EXISTING SCORING TOOLS

APPLICATIONS OF EXISTING SCORING TOOLS

Nearly all identified scoring tools could be applied to any virtual care program (83%, n=20). For example, Ontario's Health Equity Impact Assessment (HEIA) Digital Health Supplement is a scoring tool that can be applied to any virtual care program to measure achievement of health equity and quality of care.[24] However, there was minimal evidence of a scoring tool being used by decision-makers to inform program selection, prioritization, and funding of multiple virtual care programs across a jurisdiction. Commonly, scoring tools were adopted by individual healthcare organizations to evaluate a single virtual care program. For instance, a hospital using a scoring tool to evaluate the implementation of a new virtual care program.[25]

SCORING ASSESSMENTS USING AN EXISTING SCORING TOOL

The majority of the identified scoring tools (75%, n=18) were presented as a template, table, or checklist embedded within a Word document, Excel worksheet, or fillable PDF. Notably, all scoring tools provided users with step-by-step instructions on how to conduct the scoring assessment via an additional workbook or instruction guide. In addition, nearly all scoring tools were self-assessments (96%, n=23), often completed by individuals or groups involved in the design or delivery of care (e.g., clinicians, healthcare organization leads).

OVERVIEW OF EXISTING SCORING TOOLS TO MEASURE THE QUINTUPLE AIM

A single scoring tool that measured the extent to which a virtual care program aligned with all the Quintuple Aims was not identified from the rapid review or interviews. However, 19 scoring tools, frameworks, or other types of measurement tools that could be used to assess at least one of the Quintuple Aims were identified. In addition, a few peer-reviewed articles that presented case studies on the extent to which a local virtual care program aligned with the Triple Aim or Quadruple Aim were identified.

Among all scoring tools, the majority included metrics to assess the patient experience (75%, n=18) and population health (54%, n=13); some included metrics for the provider experience (46%, n=11) or healthcare costs (42%, n=10); and few included metrics for health equity (29%, n=7). Figure A3 in Appendix A displays the degree to which each identified scoring tool, framework, or other type of measurement tool aligned with each of the Quintuple Aims.

COMMON THEMES MEASURED IN SCORING TOOLS THAT ALIGN WITH A QUINTUPLE AIM

For each of the Quintuple Aims, relevant metrics from existing scoring tools and those mentioned by the interview participants were identified and grouped into the following themes:

1. **Population Health:** (1) Data-driven Care and (2) Integrated Care
2. **Patient Experience:** (1) Patient-Centred Care and Engagement; (2) Patient Reported Measures; (3) Patient Safety and Accessibility; and (4) Privacy and Security
3. **Provider Experience:** (1) Provider and Staff Engagement; (2) Delivery of Care; (3) Provider and Staff Satisfaction; and (4) Professional Development
4. **Healthcare Costs:** (1) Efficient Processes and Resource Utilization; (2) Financial Impact and Costs; and (3) Analytics
5. **Health Equity:** (1) Data on Social Determinants of Health; (2) Digital Determinants of Health; (3) Person- and Community-Centred Care; and (4) Community and Stakeholder Engagement

These themes outline the key concepts that could be measured by a scoring tool that is aligned with the Quintuple Aim. A description of each theme is provided in the Scoring Tool for Virtual Care Programs (macros-enabled Microsoft Excel document).

OVERVIEW OF EXISTING SCORING TOOLS TO MEASURE SUSTAINABILITY

Five scoring tools that could inform the measurement of the sustainability of a virtual care program were identified. These were the Program Sustainability Measurement Tool (PSAT)[26,27]; the Clinical Sustainability Assessment Tool (CSAT)[28,29]; the National Health Service (NHS) Sustainability Model[30,31]; the Long-Term Success Tool adapted by Healthcare Excellence Canada[32]; and the Intervention Scalability Assessment Tool.[33,34] Each of these tools used an iterative design process and engaged with stakeholders to develop the sustainability factors and guide tool design. Notably, no scoring tools measured both the Quintuple Aim and sustainability (Figure A3 in Appendix A).

COMMON THEMES MEASURED IN SUSTAINABILITY SCORING TOOLS

Eight commonly measured themes were identified from the review of sustainability assessment tools and as informed by interview participants:

1. **Environmental Support:** Having a supportive internal and external environment.
2. **Partnerships:** Cultivating connections between the virtual care program, its stakeholders, and the community.
3. **Program Evaluation:** Assessing the virtual care program to inform planning and outcomes.
4. **Communications:** Strategic dissemination of the activities and outcomes of the virtual care program with stakeholders, decision makers, and the community and public.
5. **Resource and Funding Stability:** Establishing a consistent resource and financial base for the virtual care program.
6. **Organizational Capacity:** Having support and resources to effectively manage and grow the virtual care program and its initiatives.
7. **Program Adaptability:** Taking actions to adapt the virtual care program to ensure ongoing effectiveness.
8. **Strategic Planning:** Creating processes to guide the long-term directions, goals, and strategies of the virtual care program.

A description of each theme is provided in the Scoring Tool for Virtual Care Programs.

SCORING TOOL DESIGN CONSIDERATIONS

Literature on the implementation of assessment tools for virtual care programs and the semi-structured interviews highlighted three factors that were valuable to stakeholders and may encourage adoption of the scoring tool:

1. The scoring tool should be clear with simple design elements and characteristics.
2. The scoring tool should have clearly defined terminology that is consistent with other resources developed by the organization (e.g., standard lexicon and taxonomy), which would also serve as a starting point to ensure virtual care programs can be compared.
3. The scoring tool should be accompanied with clear and easy to understand instructions to complete the scoring tool assessment.

DEVELOPING A SCORING TOOL FOR VIRTUAL CARE PROGRAMS IN ONTARIO

As noted earlier, existing scoring tools, frameworks, or other types of measurement tools were not sufficiently broad in scope to assess the extent to which a virtual care program aligned with the Quintuple Aim and had capacity for sustainability. As such, a scoring tool that contains a comprehensive yet meaningful set of metrics related to the Quintuple Aim and sustainability, and that is responsive to the strategic goals and priorities of Ontario Health and its partners, was developed. Each of the identified themes listed above outline the key domains that should be measured by a scoring tool that can assess the extent to which a virtual care program aligns with the Quintuple Aim and has capacity for sustainability. Each domain is comprised of existing, adapted, and newly developed indicators based on those identified by the rapid review and interviewees. In response to the design considerations described above, a user guide was also developed alongside the scoring tool to provide users with instructions and a common terminology to conduct the scoring assessment.

3.2 Phase 2: End User Utility Assessment and Expert Panel Consultation

The scoring tool was shared with OH and MOH stakeholders and an expert panel comprised of WIHV Innovation Fellows and Clinicians, the WIHV Equity Committee, and PPEs. Participants provided feedback on the developed metrics and their interpretation, utility and workflow, and measurement and alignment with the Quintuple Aim and sustainability. Feedback from these groups was synthesized and is presented in further detail below.

END USER UTILITY ASSESSMENT PARTICIPANT CHARACTERISTICS

A total of 4 individuals participated in the end user utility assessment (response rate: 50%). Participants were organizational leaders and health system leaders who oversee the funding and/or operations of several virtual care programs across different healthcare settings. Table 2 provides a brief description of the participants characteristics.

Table 2. Characteristics of End User Utility Assessment Participants

Organization	Position	Experience and Expertise	OHT Region
Ontario Health	Senior Advisor, Virtual Care	• Development and implementation of virtual care programs • Health equity • Funding envelope lead	N/A
Ontario Health	Consultant, Digital Health	• Implementation of virtual care programs for priority population groups • Public policy and health equity	North
Ontario Health	Manager, Digital Health	• Digital Health and Innovation • Virtual care program funding lead	East
Ministry of Health	Senior Program Consultant	• Health system improvement • Evaluation and knowledge mobilization • Sustainable Development	N/A

EXPERT CONSULTATION PANEL PARTICIPANT CHARACTERISTICS

A total of 10 participants were engaged in the expert consultation panel. Table 3 provides an overview of the characteristics of the panel participants.

Table 3. Characteristics of Expert Consultation Panel

Panel Members	Positions	N= 10
WIHV Innovation Fellows and Clinicians	Physician and Chief Medical Informatics Officer; Physician and Health System Leader; Senior Fellow at several research institutes, Strategist and Advisor for several innovative enterprises on digital health, and health system leader	3
Patient Advisory Network Members	Patient Partners	2
Equity Committee Members	Equity Specialist; Equity Committee Co-Chair; Policy Research Coordinator; Implementation Scientist and Health Services Researcher; Program Manager for Access and Policy	5

GENERAL FEEDBACK ON THE SCORING TOOL

ALIGNMENT OF DOMAINS AND INDICATORS WITH THE QUINTUPLE AIM AND SUSTAINABILITY

All participants agreed that the domains and indicators in the scoring tool captured important aspects of the Quintuple Aim and sustainability, and that the stated aims of the scoring tool were clear. In addition, participants expressed that being able to quantify the extent to which a virtual care program aligns with the Quintuple Aim will allow decision makers to "manage the trade-offs that are inherent in any virtual care program." Specifically, some participants from the end user utility assessment noted that a virtual care program may not have equal impact on all aspects of the Quintuple Aim while being sustainable. For example, a virtual care program that improves quality of care might not reduce healthcare costs. However, by complete the scoring tool assessment, users can make informed funding decisions that consider the various organizational and contextual factors of the virtual care program.

SCORING SCALE

Following common practices identified in existing scoring tools, a 5-point Likert scale was adopted for the Scoring Tool for Virtual Care Programs. All end users and the expert panel agreed that the scale was suitable. However, some participants reported that the definition of the scale (i.e., Never or seldom to Always) only speaks to the frequency and not the level of achievement of the indicator. For some indicators, a 5-point Likert scaled defined as "Little or No Extent" to "To a Great Extent" would work better.

During the end user utility assessment, participants noted that some indicators were not relevant to the virtual care program they were scoring and therefore, having a not applicable (N/A) option in the scoring tool was appropriate. In these scenarios, participants recommended that the comment section should be leveraged to allow users to provide further context for why the N/A option was selected. In addition, some expert panelists noted that the N/A option should not be available for indicators that should be considered fundamental or standard to healthcare. For example, "Patients and healthcare providers collaborate on care decisions" is an indicator used to measure the Patient Experience focus area. It was noted that in all instances of care, patients and healthcare providers should be collaborating on care decisions and if a virtual care program is not able to achieve this indicator, then a lower score should be selected, which would in turn, signal this as an area for improvement.

INTERPRETATION OF SCORING TOOL RESULTS

All participants from the end user utility assessment and expert panel opined that funding decisions should not be solely based on the results of the scoring tool assessment, as the scoring

tool only provides a quantitative metric. Rather, results from the scoring tool should be used alongside other data, including qualitative data, that can provide contextual information about the scores. For example, a virtual care program that serves a small rural population may improve the patient experience of care despite being more costly. If a scoring assessment was completed, the program may receive very low scores for the Healthcare Costs focus area despite meeting its desired goals and health outcomes. Therefore, having contextual information that supplements scores would be crucial.

> *"In the North, we might have a tool that perhaps costs a lot more because we have a very small population and it is more expensive to deliver service. Does that necessarily mean that it is not effective? No. I think you got those other domains with respect to the Quintuple Aim that can help evaluate whether or not it has efficacy. So cost is certainly a factor, but it is not the only one. And you can't have an exec looking at that and saying 'oh well this is too costly and we're just going to scrap it' when actually it might be showing significant amount of increase for support relative to some of the chronic conditions that exist within the North."*
> – Health System Leader and Potential End User of the Scoring Tool

FEEDBACK ON THE UTILITY AND WORKFLOW OF THE SCORING TOOL
PERCEIVED VALUE AND UTILITY OF THE SCORING TOOL
In general, all participants reported that a scoring tool for virtual care programs in Ontario would be valuable for benchmarking, growth, and strategic planning. Moreover, participants from the end user utility assessment reported that being able to visualize the results for each focus area and having a list of indicators that were aligned with the strategic goals and priorities of OH was informative for both adapting current virtual care programs and developing future programs. Expert panel participants also noted that the scoring tool described "key success factors" and "quality indicators" for any virtual care program in Ontario. Furthermore, expert panel participants expressed that some of the indicators in the tool may equally serve as standards for any interaction or model of care and were not specific to only virtual care.

Similar to the design considerations identified in Phase 1 by the semi-structured interviewees, some participants from the end user utility assessment expressed that the use of the scoring tool may only be appropriate and the benefits of the scoring tool may only be realized if virtual care programs can be organized according to a classification system (e.g., classification taxonomy) to

ensure that similar programs are being compared to one another. A good starting point is ensuring a common definition for virtual care programs as it relates to the project.

> *"The tool could be helpful in understanding programs, at least how they see themselves, and promoting indicator or domain elements – which could lead to improvement in these domains and inform decision-making around the programs. Though if you are comparing programs using this there will need to be an upfront classification of the programs so you are comparing like programs."*
> – Health System Leader and Potential End User of the Scoring Tool

WORKFLOW AND CONDUCTING AN ASSESSMENT USING THE SCORING TOOL

All participants noted that completing the scoring tool assessment required intimate and overarching knowledge of the virtual care program because it includes indicators at the patient-, provider-, and health system-level. All participants from the end user utility assessment also expressed that internal stakeholder collaboration would be required to collect all the information needed to properly conduct an assessment. In particular, participants mentioned that the domains and focus areas that aligned with their area(s) of expertise were perhaps the easier domains and focus areas to measure, whereas other domains and focus areas required collaboration with other personnel involved in the operation or oversight of the program. As such, the scoring tool should be completed by multiple individuals or groups to ensure the scores are backed by consensus and quality information. Moreover, participants from the end user utility assessment emphasized that prior to conducting the scoring tool assessment, infrastructure to develop robust data collection mechanisms and to ensure scores are backed by quality data was needed.

> *"Given the detailed nature of the questions I'm assuming individuals intimately familiar with the program would need to fill in the tool, rather than funders or such, like OH. Thus there would be different people filling it out for each program… I think there needs to be [not optional] information to support the score that could help with assessment of the quality of information/evidence to support and highlight where there are difference of interpretation of what would support a score under each indicator between programs and those filling in the tool.*
> – Health System Leader and Potential End User of the Scoring Tool

> *"A general observation that I found is that before this could be a scoring tool, there would be significant planning that a health service provider would have to undertake to make sure that they could utilize the tool and that they have sufficient data to inform quality information."*
> – Health System Leader and Potential End User of the Scoring Tool

End user utility assessment participants also advised that the scoring would need to undergo periodic review and adaptations in response to a dynamic health system, changing workflows, and the development of new and innovative virtual care programs.

FACILITATORS AND BARRIERS TO IMPLEMENTATION

Complementing the implementation considerations identified in Phase 1, Table 4 presents an overview of the facilitators and barriers of adoption and implementation of the scoring tool. Implementation considerations, facilitators, and barriers were informed by the end user utility assessment and expert consultation panel (Phase 2).

Table 4. Facilitators and Barriers to the Adoption and Implementation of a Scoring Tool for Virtual Care Programs

Considerations	Facilitators	Barriers
Design Complexity and Compatibility	A practical, simple, and easy to use scoring tool that aligns with the values of its end users and stakeholders.	Overly complex scoring tools that lack compatibility with the values of its end users and relevant stakeholders.
Motivation and Justification	Leadership and program personnel champion use and there is a strong culture of accountability.	Absence of a clear vision and purpose of a scoring tool to support program selection, prioritization, and funding decisions.
Processes and Workflow	Investments and resources are available to socialize tool and support its use.	Implementation of a scoring tool that impedes current processes and workflows or is too onerous to fill out.

"I can't articulate enough how it needs to be easy, really understand what the intent of the program is and what they expect to achieve, what the benefits are for themselves as well for the patients."
– Health System Leader and Potential End User

"So, one of the things we found, say last year, especially in the midst of the pandemic and the overall mood, let's say [sic] healthcare providers [were] highly stressed. So asking people to fill out one more survey or provide more information maybe wasn't what they saw as the optimal use of their time."
– Health System Leader and Potential End User

3.3 Summary of Key Findings and Process to Develop the Scoring Tool

In summary, Phase 1 (rapid review and semi-structured interviews) highlighted the following gaps and considerations:

- Most scoring tools aligned with some but not all aspects of the Quintuple Aim, and no scoring tools measured both the Quintuple Aim and capacity for sustainability.
- Majority of the identified scoring tools included metrics to assess the patient experience and population health; some included metrics to measure the provider experience and healthcare costs; and very few included metrics to measure health equity.
- Minimal evidence of a scoring tool used to inform decision making on multiple different virtual care programs across a jurisdiction was found.
- Very few standardized scoring tools were identified and used by OHTs to assess alignment with aspects of the Quintuple Aim or Sustainability.
- Success and achievement of some or all aspects of the Quintuple Aim may look different across regions and across different virtual care programs.
- The needs of OH can be served by a new scoring tool that combines and adapts key elements of existing tools and leverages co-design methodology and stakeholder engagement.

Based on the findings from Phase 1, a draft scoring tool was developed and shared with the expert consultation panel and end users for the utility assessment (Phase 2).

In Phase 2, we found that a scoring tool relevant for OH virtual care programs should include or address the following characteristics and implementation considerations:

- Simple and practical design and language
- Clear vision and purpose of scoring tool among leadership and program personnel
- Sufficiently socialized among end users and stakeholders
- Clearly defined comment section in the scoring tool to supplement a program's score
- Guidance and transparency on who is filling out the scoring tool
- Explicit definition of virtual care and virtual care programs
- Directly acting and engaging with stakeholders in the process to develop a scoring tool may encourage adoption and sustainability

In consultation with WIHV Innovation Fellows and clinicians, elements of the draft scoring tool were adapted to improve its functionality and utility. In general, participants believed that the scoring tool can support the design, adoption, implementation, and maintenance of virtual care programs in Ontario.

The WIHV Equity Committee also highlighted key considerations for the patient experience and health equity focus areas. Feedback included expanding some indicators to include items such as alternative forms of care, alternative therapies, and social services, as well as considerations around the purpose/use/application of personal health information. In addition, they provided insights on the scoring system of the tool including tailoring the comments section.

Overall, all participants agreed that the key focus areas within the draft scoring tool captured important indicators and aligned with the objectives of the tool. End users felt that the scoring tool was appropriate, and that the indicators were meaningful and relevant to the virtual care programs in their portfolio. End users also provided additional comments on its design and utility. The final scoring tool addresses the gaps identified in Phase 1 and incorporates feedback received in Phase 2.

4.0   Final Product: Scoring Tool for Virtual Care Programs

4.1   Scoring Tool for Virtual Care Programs in Ontario

The Scoring Tool for Virtual Care Programs is comprised of six focus areas (Population Health, Patient Experience, Provider Experience, Healthcare Costs, Health Equity, and Sustainability). Within each focus area, indicators are grouped thematically into a domain. The indicators are a combination of existing, adapted, or newly developed metrics, as informed by the rapid review, semi-structured interviews, end user utility assessment, and expert consultation panel. A brief description for each focus area is provided below.

SCORING TOOL FOCUS AREAS

IMPROVING POPULATION HEALTH
This focus area assesses the impact a virtual care program has on population health outcomes and encompasses the use of a data-driven approach to inform service delivery as well as integrated models of care. To improve population health, a virtual care program should collect

and mobilize data to advance population health and assess its effectiveness for continuous improvement. The program should enable collaboration and coordination of care across healthcare providers and institutions. Operational data should also be captured to track outcomes and progress towards integrated workflows with a high degree of collaboration and communication across healthcare providers, staff, and patients/caregivers.

ENHANCING THE PATIENT EXPERIENCE

This focus area assesses the impact a virtual care program has on patient-centred care; patient engagement; patient-reported measures; and patient safety, accessibility, privacy, and safety. To enhance the patient experience, a virtual care program should enable accurate and timely care that is respectful and responsive to the patients' preferences, needs, and values while protecting the patients' privacy and security. In addition, the virtual care program should facilitate meaningful connections between patients and healthcare providers and staff.

ENHANCING THE PROVIDER EXPERIENCE

This focus area assesses the impact a virtual care program has on healthcare provider and staff engagement, satisfaction, and professional development, and its ability to support healthcare providers and staff to deliver timely and accurate care. To enhance the provider experience, a virtual care program should meaningfully collaborate with healthcare providers and staff to ensure its adoption and implementation considers existing workflows to avoid undue burden and tool-related burnout, support the delivery of timely and accurate care, and support educational activities and opportunities that enhance competencies and skills.

REDUCING HEALTHCARE COSTS

This focus area assesses the ability of a virtual care program to achieve its desired health outcomes for the populations served using a data-driven approach and via efficient allocation and use of resources. To reduce per capita healthcare costs, a virtual care program should consider both costs and benefits and its ability to incorporate processes that make efficient use of available resources to achieve the desired outcomes of the populations served, as informed by data on operational performance and per capita total system costs.

IMPROVING HEALTH EQUITY

This focus area assesses the extent to which a virtual care program offers services that are accessible, available, acceptable, appropriate, and culturally safe for individuals and populations. To improve health equity, a virtual care program should collect and mobilize data on social determinants of health to inform care strategies; address or mitigate potential inequities in health status due to access to health services; and have culturally based adaptations. In general, the

virtual care program should enable patients to have a fair opportunity to reach their fullest health potential.

SUSTAINABILITY

This focus area assesses whether a virtual care program can maintain its programming over time to achieve its desired goal(s), benefit(s), and associated outcomes. To maintain these benefits to society, stakeholders must understand all of the factors that contribute to program sustainability. With knowledge of these critical factors, stakeholders can build program capacity for sustainability and position their efforts for long term success. For a virtual care program to be sustainable, several conditions must be met, including having environmental support, funding stability, partnerships, and organizational capacity. In addition, given the dynamic nature of the health system, a virtual care program should undergo periodic evaluation to adapt processes, communications, and strategic planning to ensure ongoing effectiveness.

SCORING SYSTEM

Each indicator can be scored on a 5-point Likert scale. Once all indicators have been scored, an average score per domain and for the overall focus area is automatically calculated. In general, lower average scores indicate areas where there are opportunities for improvement whereas higher average scores indicate areas of success and strong alignment with the Quintuple Aim or sustainability.

INTENDED USERS

The Scoring Tool for Virtual Care Programs is intended to be used by individuals in senior-level positions who oversee the funding and/or operation of one or several virtual care programs in Ontario. Intended users of the scoring tool may include Managers, Project or Operational Leads, Senior Advisors, or healthcare providers. For example, a Senior Advisor who leads a funding envelope at Ontario Health may fill out the scoring tool to assess the extent to which a funded virtual care program is aligned with the Quintuple Aim and is sustainable. Alternatively, a Nurse Practitioner who oversees the operation of a virtual care program in a rural or remote community may also complete the scoring tool for the same reason.

While the scoring tool is targeted towards senior-level individuals who oversee the funding and operations of virtual care programs, the scoring tool and corresponding user guide may also be useful to other personnel responsible for planning and supporting virtual care program service delivery (e.g., Medical Office Assistants).

CONSIDERATIONS WHEN COMPLETING THE SCORING TOOL ASSESSMENT

Virtual care programs in Ontario likely vary in their patient population, staff capacity, and availability and capabilities of technological resources. To be applicable to the different types of videoconferencing and remote care programs in Ontario, the domains and indicators were designed to be high-level and non-prescriptive. Thus, when completing the scoring tool assessment, users should also consider the specific context, challenges, and resource capacity of the virtual care program in its current state.

Moreover, since the scoring tool assesses both patient- and provider-level factors in addition to system-level factors, the process to complete a scoring tool assessment may require overarching and intimate knowledge of the virtual care program and will require internal stakeholder collaboration. For example, to determine if and the extent to which a virtual program provides help desk services and technical support to patients (indicator from the Patient Safety and Accessibility domain of the Patient Experience focus area), the intended user of the scoring tool may need to collaborate with the virtual care program's Manager to gather the information needed. Therefore, it is advisable that the scoring tool be completed by multiple individuals or groups with knowledge of the virtual care program to ensure the scores are backed by consensus and quality information.

CURRENT IMPLICATIONS FOR POLICY AND PRACTICE

By completing the scoring tool assessment, users will have a current-state snapshot of the extent to which a virtual care program aligns with the Quintuple Aim and has capacity for sustainability. In its current state, the scoring tool can:

- Provide a framework that can be used to quantify and compare the extent to which existing virtual care programs align with the Quintuple Aim and have capacity for sustainability.
- Highlight successes and opportunities for improvement within and across different virtual care programs in Ontario.
- Identify opportunities to design, adopt, implement, and maintain evidence-based virtual care programming to achieve the Quintuple Aim and build capacity for sustainability.
- Support and inspire continuous improvement and growth of virtual care programming in Ontario.

4.2 Limitations

Although methodologically rigorous data collection and synthesis activities were used, the scoring tool is not without limitations. First, this scoring tool was designed to be applicable to virtual care programs focused on videoconferencing and remote care virtual programs that involved patient-facing component(s) and/or enabled patient-provider interactions. As such, the scoring tool may require adaptation for virtual care programs that solely rely on other types of virtual care modalities, such as artificial intelligence (AI) screening platforms.

Second, although the scoring tool was developed following extensive stakeholder engagement and consultations with experts, the scoring tool has not been formally pilot tested or validated due to the short project timeline. Therefore, although the end user utility assessment provided an opportunity for the intended end users of the scoring tool to mimic a real-life scoring exercise and provide feedback on the metrics, utility, and workflow of the scoring tool, further testing and validation studies are needed.

Third, while feedback was gathered from a diverse set of OH and MOH stakeholders who oversee the funding and operation of virtual care programs across jurisdictions, in addition to three OHT regions (i.e., North, East, and Toronto region), engagement with other OHT regions (e.g., Central) would have been beneficial to ensure representativeness. Personnel from all six OHT regions were contacted to participate, but only 50% responded and agreed to participate.

Lastly, indicators and domains across all focus areas are equally weighted. While the contents of the scoring tool were informed using evidence-based best practices, few programs ever equally impact the Quintuple aim, so the differential impact should be considered in instances where programs have a specific purpose. For example, a virtual care program whose primary goal is to improve access to care in a small rural or remote population may have high per capita operating costs. However, if the intended goal of the program is to improve health equity, and the benefits outweigh the costs associated with the program, then indicators associated with Health Equity should be given greater weight than indicators associated with Healthcare Costs.

4.3 Implications and Future Opportunities

NEXT STEPS

It is recommended that the scoring tool undergo further pilot-testing and validation with its intended users prior to wide-spread implementation and scaling. Pilot testing should involve additional OHT stakeholders to improve representativeness and ensure feedback from all OHT regions is incorporated into the scoring tool. In addition, to increase likelihood of uptake and adoption, the scoring tool should be socialized in a phased approach, starting with immediate users, such as the Clinical Transformation team and Virtual Care team at OH, before widespread spread and scale.

FUTURE OPPORTUNITIES TO ADAPT THE SCORING TOOL

As the health system continues to evolve and innovative virtual care programs are developed, the scoring tool should also be adapted. Future versions of the scoring tool can consider the following adaptations:

- Recognizing that virtual care programs may vary greatly in patient population, staff capacity, and availability and capabilities of technological resources, **the scoring tool can be adapted into a weighted score model** that weighs the cost-benefit ratio for all indicators.
- To reduce undue burden with completing the scoring tool assessment and to improve workflows, **the scoring tool can be integrated into existing data collection platforms available to internal personnel at OH**. For example, the scoring tool can be transformed into a dashboard on the Ontario Health internal website, where users can easily input scores and receive a summary report.
- As new and innovative virtual care programs are developed, **the scoring tool can be adapted to be applicable to a wider range of virtual care programs and modalities**, such as AI screening platforms.

LONG-TERM IMPLICATIONS FOR POLICY AND PRACTICE

Long-term and consistent use of this scoring tool can:

- Enable **longitudinal and repeated measure analysis** to inform benchmarking, growth, and strategic planning of within and across virtual care programs
- **Standardize approaches to assess the impact virtual care programs** have on the Quintuple Aim
- Guide the creation of **sustainable** virtual care programs

- Contribute to the **development of quality standards** for all virtual care programs in Ontario
- Create **alignment, direction, and decision-support** for in-development, new, and mature virtual care programs across Ontario
- Lead to **more consistent investments in virtual care programs** that improve health system performance
- Enable **greater information and resource sharing** across virtual care programs
- Encourage **cross-organization collaboration**
- Support **cost reduction and containment**

5.0   Conclusion

Scoring tools are commonly used in healthcare and technology to inform prioritization, selection, and funding decisions. However, existing scoring tools assess a narrow scope of factors that do not consider broader issues, such as improving health equity or optimizing health system performance. A scoring tool that enables Ontario Health and its partners to quantify the impact of virtual care programs on the Quintuple Aim–improving population health, improving the patient care experience, enhancing the work life of providers, reducing per capita healthcare costs, and improving health equity–could direct future investments towards enhancing health system performance. Though many tools have been published, none cover all of these elements along with sustainability.

Therefore, informed by a rapid review and semi-structured interviews, and in collaboration with health system leaders, healthcare providers, patient partners, and equity specialists, a scoring tool that can measure the extent to which virtual care programs in Ontario are aligned with the Quintuple Aim and have capacity for sustainability was developed. The Scoring Tool for Virtual Care Programs outlines 6 focus areas: 1 for each of the Quintuple Aims in addition to Sustainability. It provides a current-state snapshot of successes and areas for improvement for virtual care programs and is accompanied by a comprehensive user guide. Standardizing the assessment of the (potential) impact of virtual care programs could lead to more consistent investments in programs that can improve health system performance and health equity. However, in its current state, the scoring tool requires further testing to ensure its utility. As it evolves, companion documents should be developed in the future to support newer versions of the scoring tool.

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Appendix A

Rapid Review

SEARCH STRATEGY

1. exp telemedicine/
2. exp internet-based intervention/
3. (remot* adj2 (consult* or interact* or diagnos* or monitor* or treat* or therap* or care)).tw,kf.
4. (telemonitor* or telemedicine* or telecommunication* or telehealth*).tw,kf.
5. (((remote or online or video* or text message* or telephone* or phone or phones or email* or virtual* or technolog* or iphone* or smartphone* or mobile application* or mobile app* or teleconferenc* or messenger or whatsapp or skype or zoom or instant messag* or tablet* or e-mail* or asynchronous messag* or synchronous messag* or Videoconferenc* or hotline* or helpline* or call center*) adj3 (communicat* or engag* or discuss* or care or interact* or clinical guidance)) and patient*).tw,kf.
6. (((remote or online or electronic* or video* or text message* or telephone* or phone* or email* or technolog* or virtual* or iphone* or smartphone* or mobile application* or mobile app* or teleconferenc* or messenger or whatsapp or skype or zoom or instant messag* or tablet* or e-mail* or asynchronous messag* or synchronous messag* or Videoconferenc* or hotline* or helpline* or call center*) adj3 (consult* or appointment* or meet or meeting* or visit*)) or virtual tool*).tw,kf.
7. ((virtual* or digital*) adj3 (healthcare or health care or health strategy)).tw,kw,kf. or (virtual care or virtual health).tw,kf. or (rapid* adj3 virtual*).tw,kf.
8. ((online or digital* or virtual*) adj3 (doctor* or physician* or clinic or clinics or nurse or nurses or nursing or medicine or medical)).tw,kf.
9. (digital health or digital first).tw,kf.
10. ("e health*" or ehealth* or evisit* or "e-visit*").tw,kf.
11. (online adj3 (healthcare or health care)).tw,kf.
12. ((virtual* or digital*) adj3 (healthcare or health care or health strategy)).tw,kf.
13. (teleassist* or "tele-assist*" or teleaudiolog* or "tele-audiolog*" or telebased or "tele-based" or telecancer or "tele-cancer" or "tele-cardiolo*" or telecardiolog* or teleconsult* or "tele-consult*" or telecounselling or "tele-counselling" or telecounseling or "tele-

counseling" or teledental or "tele-dental" or telederm* or "tele-derm*" or telediagnos* or "tele-diagnos*" or teledialysis or "tele-dialysis" or teleecho* or "tele-echo*" or teleemerg* or "tele-emerg*" or teleepileps* or "tele-epileps*" or telefollow* or "tele-follow*" or teleguidance or "tele-guidance" or "tele-health*" or telehome* or "tele-home*" or teleICU or "tele-ICU" or teleintervention* or "tele-intervention*" or telemanag* or "tele-manag*" or telemedicine or "tele-medicine" or telemental* or "tele-mental*" or telemonitor* or "tele-monitor*" or telenurs* or "tele-nurs*" or teleoncolo* or "tele-oncolo*" or teleopthalm* or "tele-opthalm*" or telepalliat* or "tele-palliat*" or "tele-patholog*" or teleprocedu* or "tele-procedu*" or telepsych* or "tele-psych*" or teleradiol* or "tele-radiol*" or telerefer* or "tele-refer*" or telerehab* or "tele-rehab*" or telesurger* or "tele-surger*" or telesurgic* or "tele-surgic*" or teletherap* or "tele-therap*" or teletreat* or "tele-treat*" or teletriage or "tele-triage").tw,kf.

14. (tele adj (care or counselling or counseling or diagnos* or health* or intervention* or manag* or therap* or treat* or medicine or medical or nursing)).tw,kf.

15. ("e-care" or ecare or "e-consult*" or econsult* or "e-diagnos*" or ediagnosis* or "e-medicine" or emedicine or "e-nurse*" or enurse* or "e-nursing" or enursing or "e-physician*" or ephysician* or "e-psych*" or epsych* or "e-therapy" or etherapy or mhEALTH or "M-HEALTH").tw,kf.

16. ((online or video* or text message* or telephone* or phon* or email* or virtual* or technolog* or iphone* or smartphone* or mobile application* or mobile app* or teleconferenc* or messenger or instant messag* or whatsapp or skype or zoom or tablet* or e-mail* or asynchronous messag* or synchronous messag* or Videoconferenc* or hotline* or helpline* or call center*) adj2 (care or counselling or Counseling or diagnos* or health* or intervention* or manag* or therap* or treat* or medicine or medical or nursing)).tw,kf.

17. (virtual* adj3 monitor*).tw,kf.

18. ((implant* sensor* or body sensor*) adj4 (diagnost* or monitor* or report*)).tw,kf.

19. mobile health monitor*.tw,kf.

20. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19

21. "Quintuple Aim"/

22. "Quadruple Aim"/

23. "Triple Aim"/

24. "Outcome and Process Assessment, Health Care"/

25. Quality Assurance, Health Care/

26. Benchmarking/

27. Total Quality Management/

28. Quality Improvement/

29. Quality Indicators, Health Care/

30. "Utilization Review"/

31. Patient Outcome Assessment/

32. (quality indicat* or quality metric or quality standard* or quality measure* or quality report* or performance measure* or metric or performance metric or usability or care evaluation or benchmark* or scorecard or balanced scorecard or logic model).tw,kf.

33. (quality adj3 (indicat* or metric* or standard* or measure*)).tw,kf.

34. 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33

35. 20 and 35

SCREENING ELIGIBILITY CRITERIA

Table A1. Rapid Review Inclusion and Exclusion Criteria

| INCLUSION	EXCLUSION
- English language full-text publications - Published after January 1, 2015 - Development or description of a scoring tool for virtual care programs, with a focus on videoconferencing and remote care programs that incorporated a patient-facing component or enabled patient-provider interactions were considered - Development or description of a scoring tool, framework, or other type of measurement tool that included metrics to measure sustainability or the Quintuple Aims - Development or description of metrics used to measure sustainability or the Quintuple Aims	- Scoring tools, frameworks, or measurement tools not suitable for virtual care programs - Scoring tools, frameworks, or other measurement tools that did not include metrics to measure sustainability or the Quintuple Aims
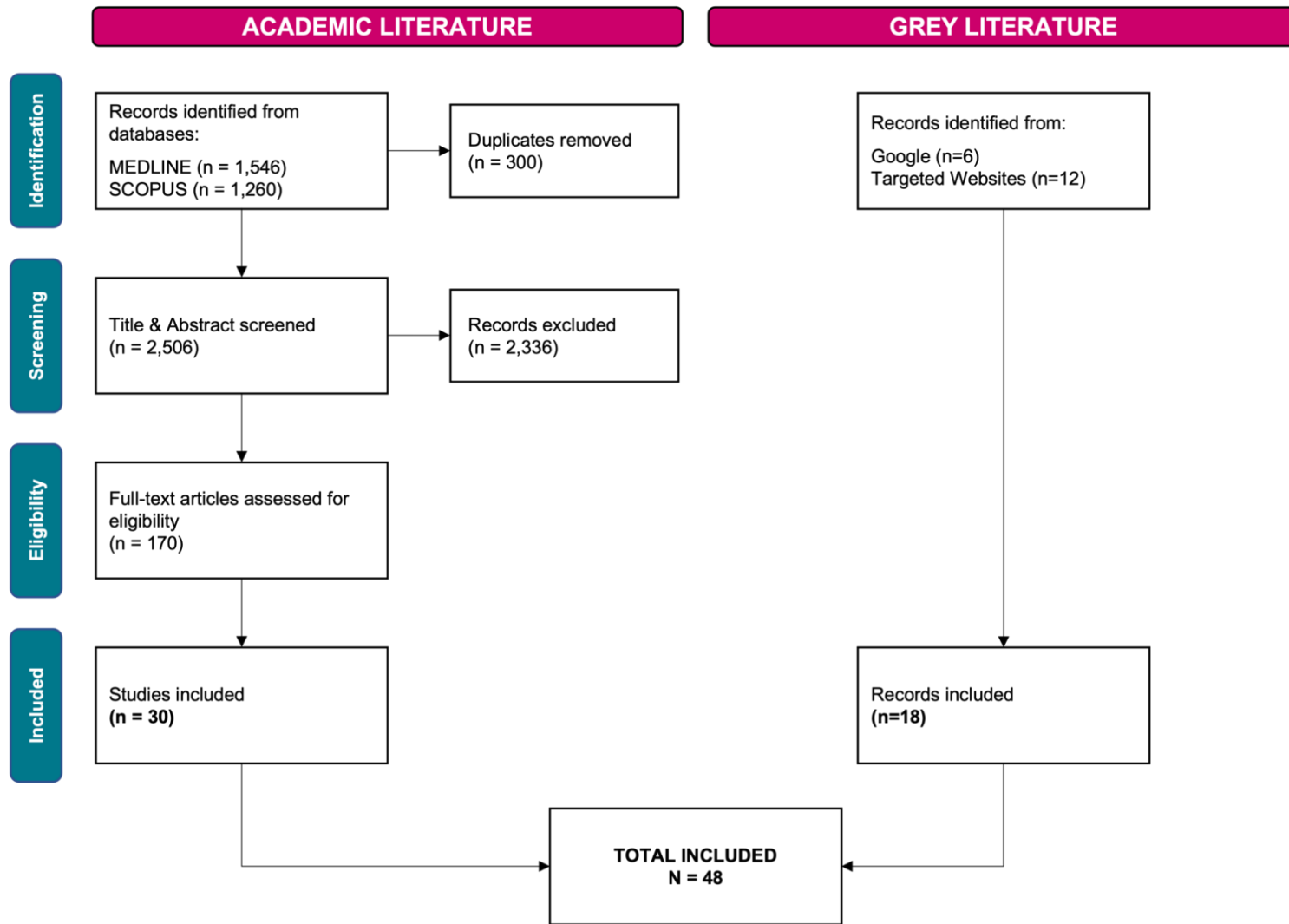
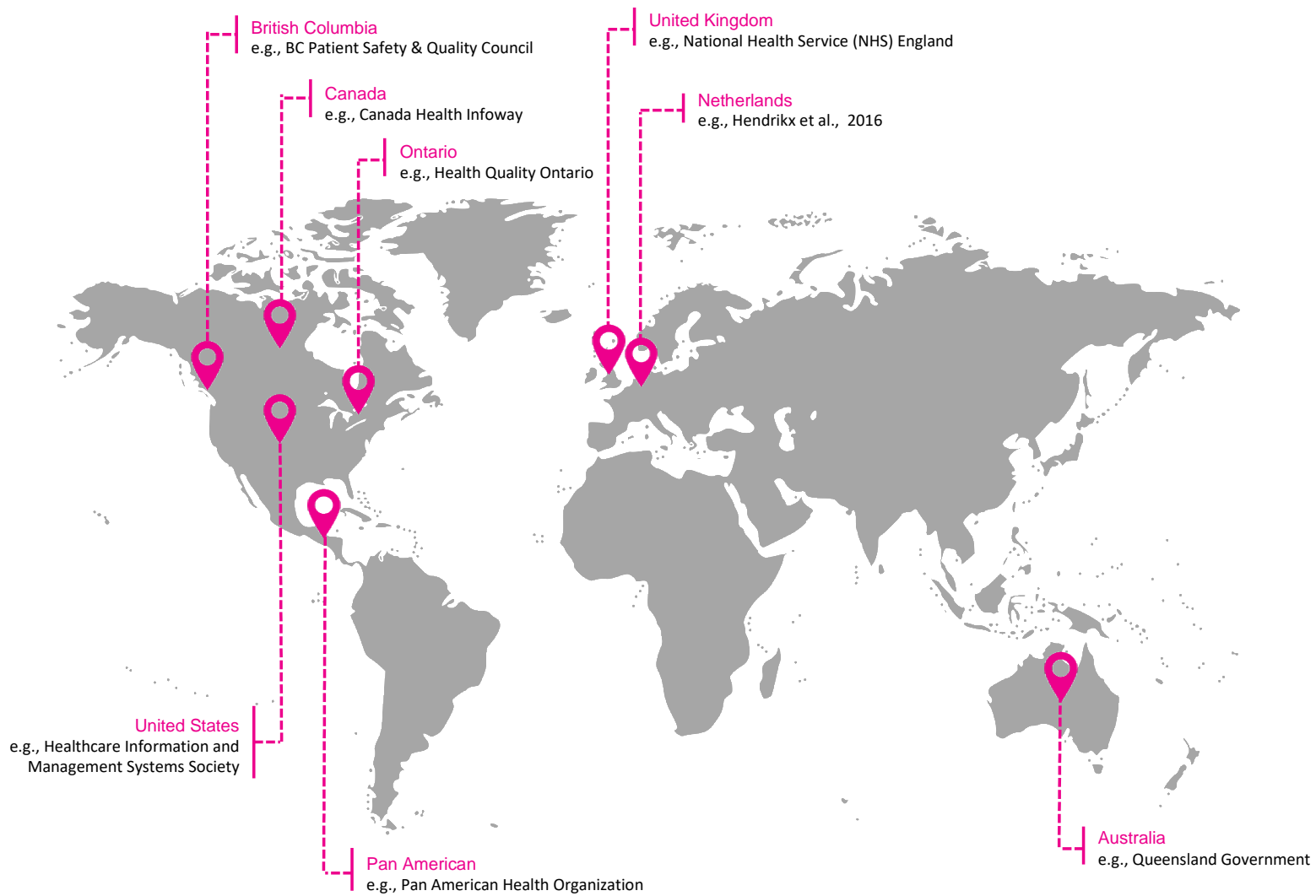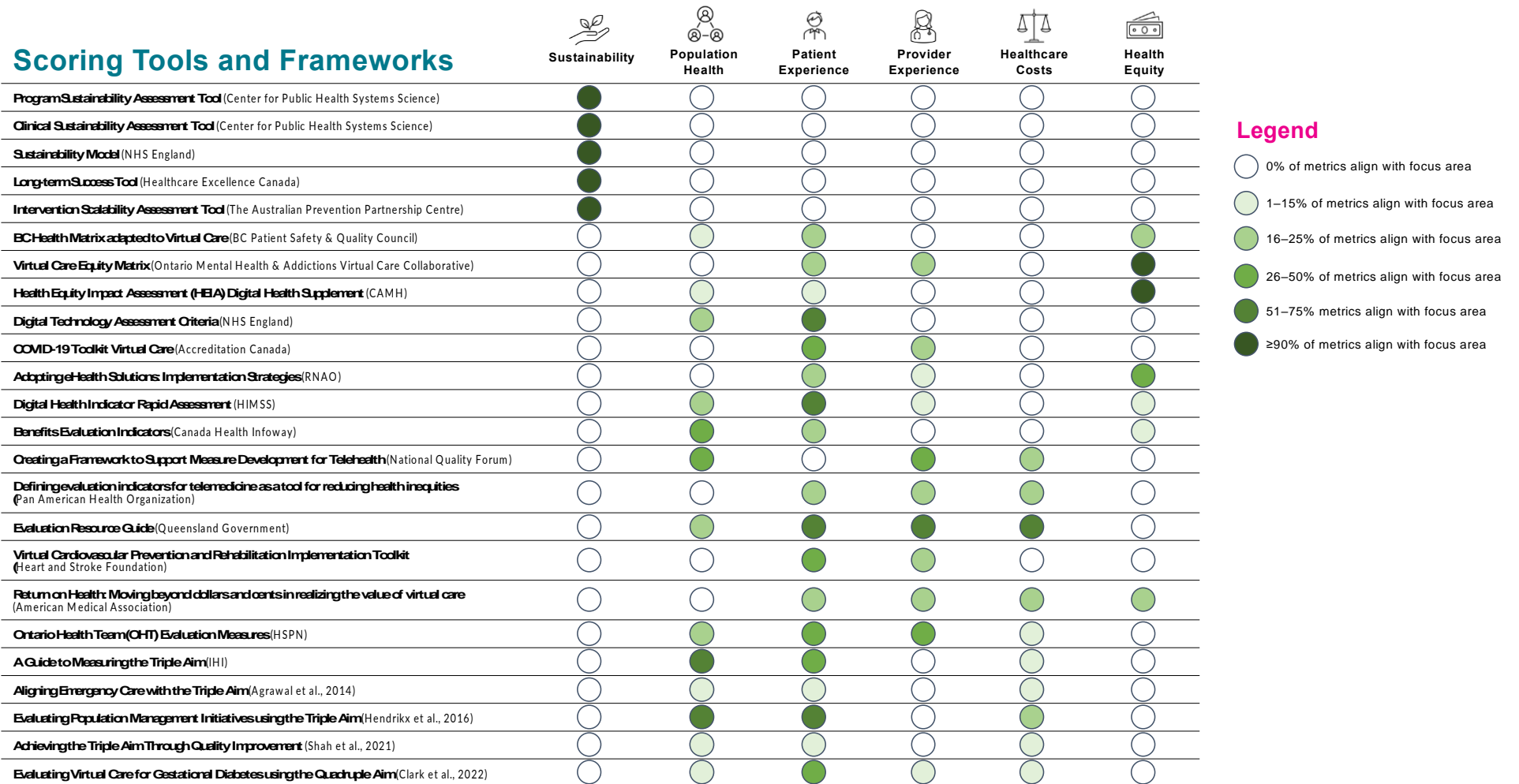Figure A1. Flow chart of included academic and grey literature in the rapid review

Figure A2. Regions that developed relevant scoring tools, frameworks, or metrics to assess at least one of the Quintuple Aims or sustainability of a virtual care program

DEGREE TO WHICH EXISTING SCORING TOOLS MEASURE SUSTAINABILITY OR THE QUINTUPLE AIM

Scoring Tools and Frameworks	Sustainability	Population Health	Patient Experience	Provider Experience	Healthcare Costs	Health Equity
Program Sustainability Assessment Tool (Center for Public Health Systems Science)	≥90%	0%	0%	0%	0%	0%
Clinical Sustainability Assessment Tool (Center for Public Health Systems Science)	≥90%	0%	0%	0%	0%	0%
Sustainability Model (NHS England)	≥90%	0%	0%	0%	0%	0%
Long-term Success Tool (Healthcare Excellence Canada)	≥90%	0%	0%	0%	0%	0%
Intervention Scalability Assessment Tool (The Australian Prevention Partnership Centre)	≥90%	0%	0%	0%	0%	0%
BC Health Matrix adapted to Virtual Care (BC Patient Safety & Quality Council)	0%	1–15%	26–50%	0%	0%	26–50%
Virtual Care Equity Matrix (Ontario Mental Health & Addictions Virtual Care Collaborative)	0%	0%	26–50%	26–50%	0%	≥90%
Health Equity Impact Assessment (HEIA) Digital Health Supplement (CAMH)	0%	1–15%	1–15%	0%	0%	≥90%
Digital Technology Assessment Criteria (NHS England)	0%	26–50%	51–75%	0%	0%	0%
COVID-19 Toolkit Virtual Care (Accreditation Canada)	0%	0%	51–75%	26–50%	0%	0%
Adopting eHealth Solutions: Implementation Strategies (RNAO)	0%	0%	26–50%	1–15%	0%	26–50%
Digital Health Indicator Rapid Assessment (HIMSS)	0%	16–25%	26–50%	0%	0%	0%
Benefits Evaluation Indicators (Canada Health Infoway)	0%	26–50%	26–50%	0%	0%	1–15%
Creating a Framework to Support Measure Development for Telehealth (National Quality Forum)	0%	26–50%	0%	26–50%	26–50%	0%
Defining evaluation indicators for telemedicine as a tool for reducing health inequities (Pan American Health Organization)	0%	0%	16–25%	16–25%	16–25%	0%
Evaluation Resource Guide (Queensland Government)	0%	16–25%	51–75%	51–75%	51–75%	0%
Virtual Cardiovascular Prevention and Rehabilitation Implementation Toolkit (Heart and Stroke Foundation)	0%	0%	26–50%	16–25%	0%	0%
Return on Health: Moving beyond dollars and cents in realizing the value of virtual care (American Medical Association)	0%	0%	16–25%	26–50%	26–50%	16–25%
Ontario Health Team (OHT) Evaluation Measures (HSPN)	0%	26–50%	26–50%	26–50%	0%	0%
A Guide to Measuring the Triple Aim (IHI)	0%	51–75%	26–50%	0%	1–15%	0%
Aligning Emergency Care with the Triple Aim (Agrawal et al., 2014)	0%	16–25%	16–25%	0%	16–25%	0%
Evaluating Population Management Initiatives using the Triple Aim (Hendrikx et al., 2016)	0%	51–75%	51–75%	0%	26–50%	0%
Achieving the Triple Aim Through Quality Improvement (Shah et al., 2021)	0%	16–25%	16–25%	0%	1–15%	0%
Evaluating Virtual Care for Gestational Diabetes using the Quadruple Aim (Clark et al., 2022)	0%	1–15%	26–50%	1–15%	1–15%	0%

Legend

- ○ 0% of metrics align with focus area
- 1–15% of metrics align with focus area
- 16–25% of metrics align with focus area
- 26–50% of metrics align with focus area
- 51–75% metrics align with focus area
- ≥90% of metrics align with focus area

Figure A3. The degree to which each identified scoring tool, framework, or other type of measurement tool measures sustainability or aligns with one or more of the Quintuple Aims (i.e., focus areas). A white dot denotes that the scoring tool or framework does not include any metrics that align with the focus area. In contrast, the darkest green dot denotes a scoring tool or framework where nearly all metrics align with the focus area. Metrics may align with one or more of the Quintuple Aims.

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Appendix B

Semi-Structured Interviews

SEMI-STRUCTURED INTERVIEW GUIDE

Setting the Stage

- Confirm respondent is still available for the 45-minute interview
- Introduce self (and note taker, if applicable)
- Emphasize confidentiality
- Request/confirm that interview can be recorded

Thank you for agreeing to speak with us.

Our team at the Centre for Digital Health Evaluation was engaged by Ontario Health to develop a Scoring Tool for Virtual Care Programs that is in alignment with the Quintuple Aim. In the context of this project, the Quintuple Aim refers to improving population health, enhancing the care experience for patients and providers, reducing per capita healthcare costs, and improving health equity.

Thus far, we have conducted a rapid review for existing scoring tools. We've discovered that a single tool that can measure all aspects of the Quintuple Aim does not exist. However, we've identified relevant metrics and envision that the developed scoring tool will pull together information from various sources, including this interview.

During this discussion, we are going to ask you questions about your knowledge and experience with existing assessment tools, gaps or areas for improvement of these tools, and lastly, implementation and utility considerations. These questions are voluntary, and you can choose to skip any question.

Do you have any questions before we begin?

Questions

1. Could you briefly describe your current role with [Ontario Health, the Ministry of Health, Ontario Health Teams]?

2. Could you briefly describe some of the virtual care programs that you have direct experience working with?

   a. *Cues: Virtual care program refers to the set of organized activities offered by healthcare organizations, which may occur at the local, regional, or national level and in a variety of settings. For the purposes of this project, we are focusing on a videoconferencing and remote care programs that incorporate a patient-facing component or enabled patient-provider interactions.*

Scoring Tool Content

3. Are you aware of any assessment tools that are currently used by Ontario Health, the Ministry of Health, or Ontario Health Teams to either evaluate a virtual care program's alignment with the Quintuple Aim or measure its sustainability?

   a. *Cues: Consider types of reporting at the end of fiscal year to demonstrate success, metrics used and reported upon and what they mean*

   b. Which of these do you have experience testing or using?

4. For [name of tool(s) or metrics mentioned by participant], can you highlight some of its major merits/advantages?

   c. *Cues: Easy to understand and implement, already socialized/incentivized/validated*

5. For [name of tool(s) or metrics mentioned by participant], can you highlight some of its gaps/areas that require improvement?

   d. *Cues: No patient-centric indicators; not developed collaboratively; sector-specific; cost/time intensive; requires 3rd party implementation, adjudication or input; difficult to measure; poor operationalization or definition of constructs; disconnect between local reporting and provincial analysis*

6. From your perspective, what are some of the gaps that exist in the [funding process], [operational process] for virtual care programs?

   a. *Cues: lack of guidance; lack of transparency in funding process, etc.*

7. What are some constructs or domains you feel should always be included in a scoring tool to evaluate virtual care programs?

     a. *Cues: How can we measure population health, healthcare costs, health equity,*
     the provider experience, or the patient experience?

Implementation Considerations

8. In your opinion, what are some of the main challenges to uptake of assessment tools, such as scoring tools?
     a. *Cues:*
          i. *Institutional/organizational factors*
          ii. *Personnel-related factors*
          iii. *Instrumental or metrics*

9. In your opinion, what are some of the main facilitators to uptake of assessment tools?
     a. *Cues: What would encourage high uptake and adoption of the scoring tool? Ease of use, approachable, compatibility with workflows, champions, etc.*

10. If you had to complete an evaluation of a virtual care program…
     a. What resources would you envision you'd need to complete the assessment?
     b. What is the maximum length of time you think it should take to complete the scoring tool assessment?

Perceived Value and Utility of a Scoring Tool

11. What do you feel is the added value of having a scoring tool?

Wrap-up

12. Is there anything that we didn't ask yet which you would like to speak to, to help inform this process?

Conclude interview. Thank the participant again and confirm next steps (e.g., development of scoring tool, consultations with expert panel, and end user utility assessment).

Appendix C

The following sections present the material that was used during the End User Utility Assessment and consultations with the Expert Panel to gather feedback on the draft scoring tool and facilitate discussion related to the implementation of the scoring tool.

End User Utility Assessment

SMALL GROUP SESSION AGENDA

Ahead of the end user utility assessment, the draft scoring tool was presented to participants.

Objectives:

- To receive feedback on the metrics developed and their interpretation, the utility of the tool, and whether the tool aligns with the Quintuple Aim and can help guide decision-making to improve overall health system performance
- To replicate a real-life scoring tool assessment using a virtual care program that they work with
- To identify considerations, facilitators, and barriers to implementation and adoption of the scoring tool

Questions and Prompts

Virtual Care Program

1. Describe the virtual care program you are assessing using the scoring tool.
2. What are the main objectives of the virtual care program? What are the short- and long-term goals of the virtual care program?
3. How does the scoring tool align with the goals of the virtual care program? How does the scoring tool not align with the goals of the virtual care program?
4. What does success look like for a virtual care program that is aligned with the Quintuple Aim and has capacity for sustainability?
5. How should the scoring tool help the virtual care program achieve its objectives and goals?

Implementation Strategy

1. What is required for you to complete the scoring tool assessment?
    a. Prompts: resources may relate to people, culture, process, or technology
2. What risks or barriers to use do you foresee?
3. What supports are required to use the scoring tool?

Expert Consultation Panel

WIHV EQUITY COMMITTEE FOCUS GROUP AGENDA

Objectives:

- To receive feedback on the draft Scoring Tool for Virtual Care Programs
- To define success with respect to improving health equity and enhancing the patient care experience
- To identify equity considerations for the implementation of the scoring tool

Agenda

10:10am – 10:30am	**Welcome & Opening Remarks** • Project Background and Purpose • Scoring Tool Overview • Today's Objective • Agenda Overview
10:30am – 10:50am	**Open Discussion: Feedback on the Draft Scoring Tool** • Are the focus areas, domains, and indicators clear? • In your opinion, is anything missing? • Did anything surprise you? • Do the levels (0-5) feel appropriate?
10:50am – 11:10am	**Defining Success** • What does it mean to improve health equity with respect to virtual care programs? • What does it mean to enhance the patient experience with respect to virtual care programs?
11:10am – 11:20am	**Implementation Strategy** • What equity considerations need to be made prior to and during the implementation of the scoring tool?
11:20am – 11:30am	**Closing Remarks & Next Steps**

PATIENT ADVISORY NETWORK CONSULTATION AGENDA

Objectives:

- To receive feedback on the draft Scoring Tool for Virtual Care Programs
- To define success with respect to improving health equity and enhancing the patient care experience
- To identify equity considerations for the implementation of the scoring tool

Agenda

1. Update on project progress and findings to date
2. Open discussion: Feedback on the draft scoring tool
3. Defining success: From the perspective of a patient/caregiver, what does it mean to improve health equity and enhance the patient experience with respect to virtual care programs?
4. Implementation: From the perspective of a patient/caregiver, what equity considerations need to guide implementation and adoption of the scoring tool?