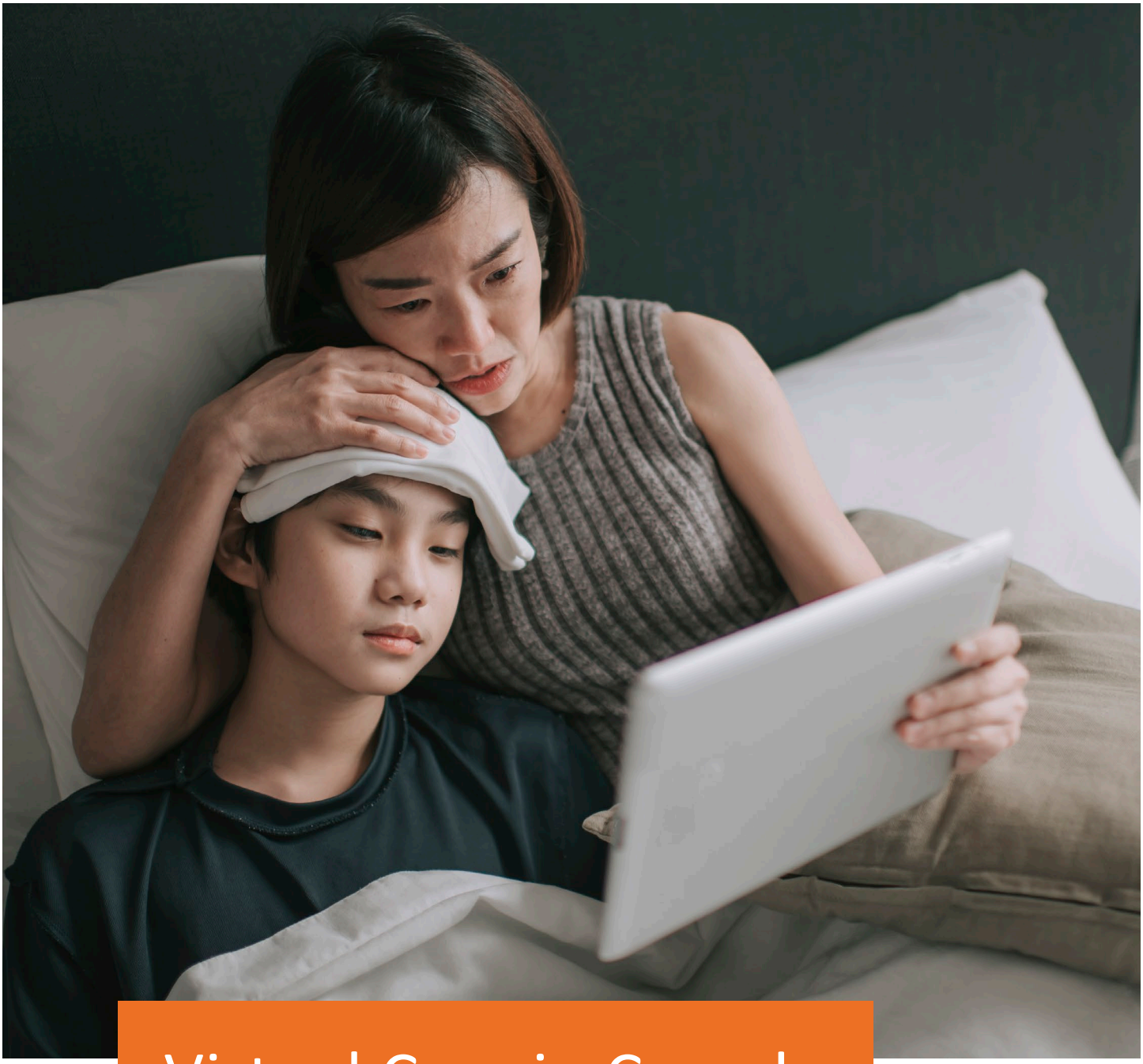

Virtual Care in Canada

Strengthening Data and Information

Canadian Institute for Health Information
Institut canadien d'information sur la santé

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The analyses and conclusions in the present document do not necessarily reflect those of the individuals or organizations mentioned above.

Executive summary

On the topic of virtual care, health system decision-makers have more questions than answers. This report explores the current landscape of Canadian virtual care data and information. It includes a snapshot of available virtual care data from the Canadian Institute for Health Information (CIHI), the provinces and territories, and pan-Canadian health care organizations. It also recommends new areas of pan-Canadian focus for measuring the quality and accessibility of virtual care.

Many jurisdictions delivered services virtually before the COVID-19 pandemic began, though the type and coverage of virtual care offerings depended on geography, population characteristics and investment priorities. In 2020–2021, provincial and territorial governments signed bilateral agreements with the Government of Canada to support new investments in virtual care. These agreements allowed the jurisdictions to apply new funds to local priorities, leading to a range of natural experiments across the country. Provincial and territorial governments have provided CIHI with baseline data to help describe the progress that will be made with these investments and to help lay the foundation of what we do and do not know about virtual care.

To help address these information gaps, CIHI conducted literature scans and consulted with patients, the public, clinicians and health system decision-makers to identify a small set of indicators to enable public reporting on the progress of virtual care implementation and broader health system outcomes. CIHI recommends the following indicators be tracked over time:

- Potentially Avoidable Visits to the Emergency Department;
- Appropriateness of the Modality (Patient-Reported and Provider-Reported);
- Wait Times for Community Mental Health Counselling; and
- Access to Virtual Care for Underserved Populations.

For jurisdictions with the capacity to collect or expand the collection of patient-reported experience measures (PREMs) for virtual care, CIHI also recommends the following measures:

- Communication With Provider;
- Respect and Cultural Safety;
- Patient Choice Regarding the Modality of Their Visit; and
- Patient Use of Virtual Care — Overall Experience.

Longer-term goals include having high-quality standardized data from across care settings and robust indicators to track progress over time. We still need more cross-sectoral data so health care can be examined as a process (that includes virtual modalities) rather than as a transaction at a single point in time. There is also a need to understand privately delivered virtual health care services. In the meantime, we can leverage new standards and early analytical work recently developed by CIHI and included in this report.

If we are to help ensure that virtual care is accessible to all Canadians, we need to think about the breadth and depth of data required — to better understand the appropriateness of care, patient experiences and value for money around virtual care implementation. CIHI would be pleased to continue working with health system planners, patients and providers to better grasp the state of virtual health care, and ultimately to design and manage more effective services and delivery models to meet the needs of Canadians.

Introduction

The COVID-19 pandemic has made virtual care a pervasive delivery mode in most sectors of care across Canada. While initially implemented to reduce the spread of the novel coronavirus through physical distancing, virtual care has implications beyond the pandemic. It has the potential to improve access to care for Canadians living in remote or rural locations, reduce costs for health systems and patients, and provide more timely access to health care. To ensure that this potential is realized and that virtual care is equitable, is used in appropriate situations and delivers a positive patient and health care provider experience, it is critical to examine and evaluate virtual care data.

Results from Canada Health Infoway's 2021 Digital Health Survey revealed that 73% of Canadians had at least one virtual health care interaction[i] in 2021; of those who had a virtual visit, 90% of respondents were satisfied with the care they received.[1] Changes to care delivery have been most prominent in the primary health care sector, as most virtual care services are used in this setting.[2, 3] A majority of Canadians are also interested in visiting health care providers virtually — by telephone (69%), video (56%) and secure messaging (57%).[1] A recent report from the Virtual Care Task Force also suggests that some physicians are reluctant to return to in-person care.[4] Given the interest from both patients and providers, it is expected that virtual care will continue to be a part of care delivery in the future.

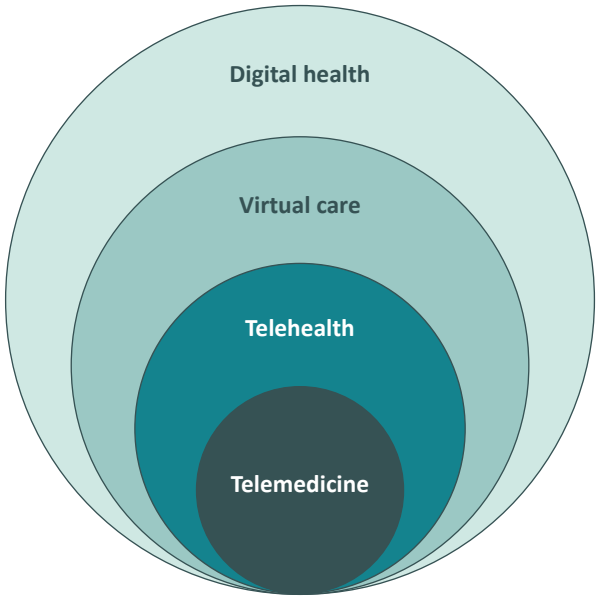
In some jurisdictions — rural and remote regions in particular — virtual service delivery has existed for decades, though it took the pandemic in early 2020 to spur substantial changes in the virtual care landscape across the country. For example, provinces and territories quickly implemented temporary billing codes to compensate physicians for virtual care, and many new virtual care tools were deployed to deliver publicly funded health services safely.[5] As jurisdictions continue to face health system challenges, the implementation and evaluation of virtual care provides new opportunities to understand how to best support different modalities of care provision in Canada's health systems and to ensure that these changes benefit all Canadians.

i. Health care interactions include visiting — both in person and virtually — a family physician, specialist physician, walk-in clinic or another type of health provider; obtaining a prescription; filling a prescription; completing an online health assessment; visiting an emergency department; and calling a teletriage or nurse call line.

Virtual care is part of digital health

Virtual care is defined as "any interaction between patients and/or members of their circle of care, occurring remotely, using any forms of communication or information technologies, with the aim of facilitating or maximizing the quality and effectiveness of patient care."[6] It includes services carried out using a variety of digital technologies, both synchronously and asynchronously, and includes telehealth and telemedicine. Digital health encompasses virtual care and more, such as devices, algorithms and apps that support decision-making and collaborative communication across the care continuum.[7] The focus of this report is virtual care, as opposed to the broader scope of digital health (Figure 1).

Figure 1 Digital health



Digital health: Broad umbrella term encompassing eHealth as well as developing areas such as the use of advanced computing sciences (e.g., in the fields of big data and artificial intelligence)

Virtual care: Any interaction between patients and/or members of their circle of care that occurs remotely, using any forms of communication or information technology, with the aim of facilitating or maximizing the quality and effectiveness of patient care

Telehealth: The use of digital technologies to deliver medical care, health education and public health services by connecting multiple users in separate locations

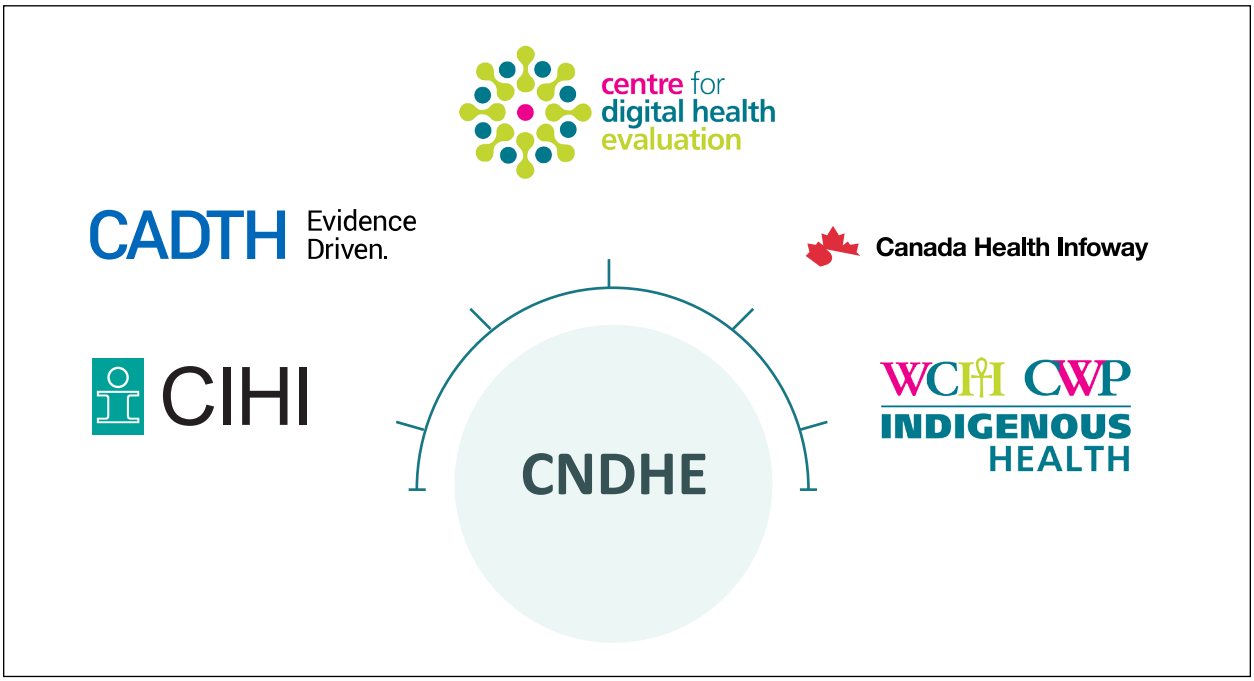
Telemedicine: A practice of medicine involving the use of information and communication technologies (ICT) by a health care provider to administer health care to patients

Note
Inspired by the American Association for Family Practice's construct. CIHI added digital health.
Sources
Digital health: World Health Organization. Digital health. Accessed March 1, 2022.
Virtual care: Women's College Hospital Institute for Health Systems Solutions and Virtual Care. *Virtual Care: A Framework for a Patient-Centric System*. 2015.
Telehealth: Telligen, Great Plains Telehealth Resource and Assistance Center. *Telehealth Start-Up and Resource Guide*. 2014.
Telemedicine: CHIEF Executive Forum. *Virtual Care in Canada: Lexicon*. No date.

Partnerships: Strength in combining expertise

CIHI works with a broad range of health organizations and partners, providing analyses and information to help support patients and their families, health system decision-makers and researchers across the country. Our partnerships related to virtual care help avoid duplication of effort and cost, while ensuring that the policies and decisions that influence health are based on accurate, comparable and unbiased information. On May 3, 2020, the Government of Canada announced an investment of $240.5 million to accelerate the use of virtual tools and digital approaches to support Canadians. Of this, $200 million is directed to provinces and territories to accelerate their efforts to meet their health care needs.[8] As part of the government's investment, it was recommended that a national strategy for digital health evaluation be established. From this recommendation, the Canadian Network for Digital Health Evaluation (CNDHE) was born.[9] The CNDHE is composed of several collaborating organizations: Canada Health Infoway (Infoway), the Canadian Agency for Drugs and Technologies in Health (CADTH), CIHI, the Centre for Digital Health Evaluation (CDHE) and the Centre for Wise Practices in Indigenous Health at Women's College Hospital (Figure 2). CIHI and the partner organizations at the CNDHE are combining their expertise to support a comprehensive approach to digital health evaluation for the country[9] that includes measurement and analyses of virtual care and virtual care technologies.[10]

Figure 2 Partnerships



CIHI is also consulting with Infoway and Healthcare Excellence Canada (HEC) to support their work on the Virtual Care Together design collaborative,[11] where community-based primary care practices and organizations from across Canada are preparing, implementing and evaluating virtual care tools and practices. CIHI's engagement with HEC and Infoway supports alignment on proposed measures and evaluations, and ensures information-sharing among leading pan-Canadian health care organizations that are committed to better data and improved health outcomes for Canadians.

From the evidence we've been collecting for years, we know virtual care can improve access to care, provide help to patients so they can better manage their care, and can save them time and money. Over the past year in particular, pan-Canadian partnerships have enabled the advancement of virtual care change management to help ensure that providers, patients and their essential care partners are well-equipped to help transform care — so more people can benefit from equitable, safe and high-quality virtual care.

— Shelagh Maloney
Executive Vice President, Engagement and Marketing, Canada Health Infoway

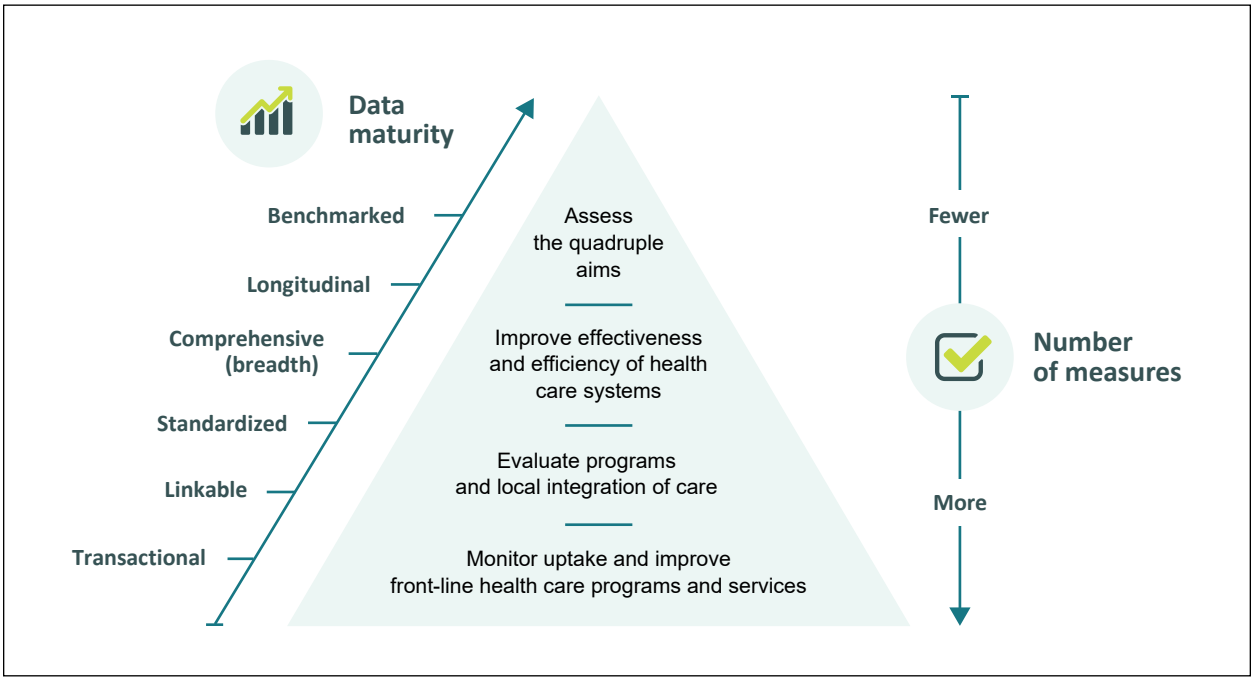
Virtual care measurement

As we plan for the growth of virtual care data in Canada and the rich information and insights it can provide, it is important to evaluate the data that is available and identify new data sources that can help address the priority information needs of health system decision-makers, patients and their families. These data and standards are the foundation of measures and indicators that provide comparable and actionable information and that allow decision-makers to track progress over time.

> We have a record of supporting pan-Canadian measurement and achieving consensus around comparable data and public transparency. A recent example includes CIHI's leadership on the development of a focused set of 12 pan-Canadian indicators, now publicly reported, to support the federal, provincial and territorial (FPT) governments' Common Statement of Principles on Shared Health Priorities.

As depicted in the pyramid in Figure 3, there are multiple types of and uses for measures and indicators within health care systems. At the bottom of the pyramid are measures that leverage transactional data, such as the number of patients using certain technologies or the number of e-visits. These measures provide important information to establish the uptake and use of health services. To address complex questions about the effectiveness of health care models, quality and safety of care, and the value of health system investments (higher up in the pyramid), more mature data is required.

Figure 3 Health system measurement



In 2020–2021, provincial and territorial governments entered into bilateral agreements with the Government of Canada to advance virtual care priorities in response to COVID-19.[8, ii] As part of these commitments, CIHI worked with provincial and territorial partners to identify a small set of pan-Canadian virtual care indicators that align with our Health System Performance Measurement Framework[12] and the quadruple aim domains of the CNDHE's pan-Canadian digital health evaluation framework. These recommended indicators for the future aim to

- Support decision-makers' understanding of the effectiveness of care delivered virtually;
- Identify opportunities to improve virtual care delivery;
- Promote transparency and accountability;
- Facilitate sharing of best practices; and
- Amplify the voice of patients and providers within health systems.

ii. The federal and Quebec governments have agreed to a distinct asymmetrical arrangement.

To derive this small set of indicators, we gathered input from ministry representatives and measurement experts through multi-jurisdictional discussions, CIHI-led meetings with clinicians and patients, and surveys of provincial and territorial stakeholders. CIHI also undertook literature reviews and environmental scans to examine the current state of virtual care measurement in Canada and internationally. To inform the specific recommendations for PREMs, CIHI commissioned an environmental scan from the Person-Centred Care Team at the University of Calgary to explore the current state of virtual care patient experience survey tools in Canada and internationally.[iii] This work revealed that while common measures are used in academic literature to evaluate patient experience, no consistent measures of virtual care for patients have been validated for use across Canada.

As a result of this work, information gaps were identified and categorized into the following key themes. Many of the topics could be categorized under multiple themes, and some jurisdictions have performance measurement frameworks that organize these topics in different ways. For example, some stakeholders categorized some topics within the quality and safety theme while others grouped similar topics within the appropriateness theme. Equity was considered a critical cross-cutting theme across all topics and was not categorized separately.

Value for money

- Impacts of virtual care on medical travel and interprovincial billing
- Overuse of services and/or low-value care

Quality and safety

- Communication with provider
- Cultural safety, respect and dignity; person-centred approach to service provision
- Impact of virtual care on post-surgical monitoring, care and outcomes

Appropriateness

- Appropriate prescribing
- Appropriateness of the modality from the perspective of patients and providers

Access

- Access to care for underserved populations
- Time and cost savings for patients and providers
- Comfort with technology (patients and providers)
- Access to mental health services

iii. To request a copy of the environmental scan, email virtualcare@cihi.ca.

To further narrow the information gaps into a small set of measurement recommendations, we were careful to ensure that the proposed set offers decision-makers a balanced view of complex health care transformation. Criteria used to prioritize the indicators included the following:

- Indicators should align with at least two Health System Performance Measurement Framework domains.
- At least one indicator will leverage an existing data source.
- At least one indicator will be patient-reported.
- At least one indicator will be care sector–specific.

In February 2022, indicators were presented to the public via a survey and pan-Canadian focus groups, as well as to the FPT Virtual Care and Digital Health Table. The following short-list of indicators emerged following this process.

Recommended indicators

Potentially Avoidable Visits to the Emergency Department

If virtual care is successful in increasing patient access to primary care, emergency department (ED) visits for family practice–sensitive conditions should decrease over time. This indicator would help track whether access to primary care has improved by measuring ED visits for family practice–sensitive conditions that could have been avoided through appropriate virtual care. The data source for this indicator is the National Ambulatory Care Reporting System at CIHI; indicator development will build on existing work led by CIHI[13] and other organizations such as Alberta Health[14] on family practice–sensitive conditions.

Appropriateness of the Modality (Patient-Reported)

The intention of this indicator is to measure whether a patient's experience with a virtual visit was helpful to them and met their needs. Care is care. Canadians need to feel confident that they are receiving the care they need, regardless of the mode of delivery. This indicator would track over time whether the care offered to patients and their families leverages the appropriate modalities to meet individual patient needs. There is an opportunity to take advantage of survey tools to support this indicator, including Infoway's Canadian Digital Health Survey[iv] and Statistics Canada's Canadian Community Health Survey or other Statistics Canada surveys.

iv. This survey may include data from health services that are outside of the public-sector bundle of services.

Appropriateness of the Modality (Provider-Reported)

As long as virtual care remains an option available to patients, providers will need to strive for an appropriate mix of in-person and virtual services to meet their patients' needs. The intention of this indicator is to capture the provider's perspective on the appropriateness of modality and could help to better understand whether tools are being leveraged effectively. This indicator would help track over time whether clinician change management programs and supports for use of technologies are having their intended impacts. There is an opportunity to work with existing survey tools, such as by collaborating with Infoway and other health care professional associations, to capture data for this indicator.

Wait Times for Community Mental Health Counselling

The intention of this indicator is to measure the median number of days that a client waited for ongoing counselling services.[15, v] Wait times could be stratified by whether services were received virtually or in person.

The data source is aggregate-level provincial and territorial data submitted to CIHI according to an agreed-upon definition. This indicator would help track over time whether clients wait less for a virtual counselling appointment than for an in-person appointment. This is particularly relevant as provincial and territorial governments are focused on expanding virtual mental health services, especially as the pandemic has highlighted the need to focus on mental health.

Access to Virtual Care for Underserved Populations

The intention of this indicator is to measure access to care provided virtually to patients in underserved or remote populations. When considering underserved populations, it is critical to further explore the concept of access for patients who are unattached to a primary health care provider. Work on the topic of patient–provider attachment has recently been prioritized by the FPT Virtual Care and Digital Health Table. Statistics Canada's Canadian Community Health Survey is a potential data source to support this indicator, as are provincial and territorial registries for unattached individuals. This indicator would help track over time whether unattached patients and other underserved populations are receiving care sooner and more frequently through virtual modalities, and may reveal if virtual care can improve continuity of care for underserved or remote patients.

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v. Virtual counselling includes any synchronous counselling provided by phone or online (videoconference and chat). In-person counselling refers to the client and provider being in the same physical location. Counselling services include only publicly funded services primarily provided, coordinated or overseen by the government. Stand-alone substance use services and crisis or walk-in services are among some of the services excluded from the indicator.

Recommended patient-reported experience measures

Beyond the small set of pan-Canadian indicators above, CIHI is also recommending the following PREMs for uptake by those who want to evaluate their own services and are seeking alignment with other jurisdictions. Public consultations reiterated the importance of capturing the patient voice in measurement work, emphasizing the importance of respect for and trust in providers, and continuity of care.

Communication With Provider

- A measure of the patient's experience of engaging with their health care provider during the virtual visit

Respect and Cultural Safety

- A measure of the patient's experience of respect and cultural safety during the virtual visit

Patient Choice Regarding the Modality of Their Visit

- A measure of the patient's experience in being able to choose the modality of their visit, whether in person or virtual (e.g., telephone, video)

Patient Use of Virtual Care — Overall Experience

- A measure of the patient's overall virtual care experience

One of the recommended PREMs addresses cultural safety and respect during the health care visit. CIHI recognizes that no single measure can capture whether the care provided is culturally safe; however, this measure can begin to provide important information on the experience of groups such as racialized individuals and Indigenous Peoples. For more information, please see *Measuring Cultural Safety in Health Systems*.[16]

Virtual care depends a lot on the patient, on their ability to describe their symptoms. If a patient can't express themself or describe their symptoms, can we really provide good care?

— Focus group participant, February 2022

Measuring provider experience

CIHI's stakeholder consultations reiterated how patient choices and experiences are influenced by the options made available to them by health care providers. CIHI recommends that efforts to collect providers' perspectives continue, particularly as they relate to virtual care.

- Canada Health Infoway regularly surveys physicians, in collaboration with the Canadian Medical Association, to better understand their use of digital health and information technology, including their perceptions and experience of virtual care. The 2021 National Survey of Canadian Physicians found that while physicians saw the benefits of virtual care for patients as well as themselves, they also reported that their greatest challenge was examining patients virtually.[17]
- The Commonwealth Fund's International Health Policy surveys poll patients and providers in 11 developed countries and include questions on use of and experience with virtual care. The 2019 survey of primary care physicians found that while electronic medical record (EMR) use had increased in Canada since the previous survey, the percentage of Canadian primary care practices that offered patients the option to electronically view their patient visit summaries online and request prescription renewals online was below the Commonwealth Fund average.[18]

The landscape of virtual care delivery in Canada is changing. While most jurisdictions delivered services virtually before the pandemic,[19] the adoption of virtual care has accelerated. Currently, data collection on virtual care across Canada is fragmented — timeliness, cost and collection burdens have always been challenges for data collection, and they are even more pronounced in the pandemic era. Leveraging existing data sources and identifying opportunities for new standardized data collection remain fundamental goals for better supporting health systems, patients and their families.

Standards and data governance

Data standards are the foundation of each of CIHI's 30 data holdings and are critical components of accurate, reliable and comparable health system information. Common data standards ensure that systems use the same language and approach to collecting, organizing, sharing, storing and interpreting health information. CIHI's Discharge Abstract Database (DAD), for example, is the pan-Canadian[vi] repository for acute care hospital inpatient discharges. It relies on mature data content standards to support the creation of critical information for stakeholders. Standardized data from the DAD has been crucial to helping decision-makers understand the impact of COVID-19 on Canada's health systems,[20] including impacts on hospital stays, surgeries and intensive care unit admissions,[21] and for providing critical information, including that specifically related to harms caused by substance use.[22]

While standards and tools to support data collection in acute care settings are well established, the rapid deployment of virtual care during the pandemic has been a great catalyst for identifying how and where standards need to be implemented or enhanced to help measure the impacts of virtual care on health care systems, and to assess equity of access and patient outcomes. As a result, CIHI has undertaken a number of standards-related activities, including

- Creating analytical standards to identify delivery of virtual services as captured in physician billing data;
- Enhancing primary health care data standards and collaborating with Infoway on interoperable data standards;
- Developing and enhancing standards to capture relevant virtual care information in CIHI's data holdings; and
- Recommending a standardized set of PREMs.

vi. Quebec reports its acute care data to CIHI's Hospital Morbidity Database.

Physician billing information

As the pandemic emerged, provincial and territorial ministries of health worked with medical associations to incorporate virtual care into physician services. New physician billing codes were created, billing rules for existing codes were modified and guidance on permitted technologies for virtual service delivery was developed.[23] With these enhancements, ministries of health have been able to identify virtual care provided by physicians in physician claims data. Although each jurisdiction maintains its own standard for physician billing information, CIHI collects this information and brings the various standards into a common framework, our National Grouping System (NGS).[24] The NGS is used to organize physician billing codes into comparable categories of service. It is updated and improved regularly to reflect changes in physician billing codes, including the introduction of new virtual care billing codes. CIHI's ongoing maintenance of the NGS allows for comparable pan-Canadian reporting of physician services, including those provided virtually.

Primary health care data standards

CIHI also provides leadership in advancing primary health care data standards so that virtual services may be better identified and captured.[25] Standardized, comparable primary health care data is essential for clinical care, patient safety and quality improvement. Recent changes to the *Pan-Canadian Primary Health Care EMR Minimum Data Set for Performance Measurement, Version 1.1* include updates to 2 data elements:

- Visit Modality, which allows virtual care to be identified; and
- Provider Type, which identifies who provided care based on profession/designation (see the sidebar Data standards supporting virtual care).

Common data standards for interoperability, including data exchange and content, are the backbone of health data in the health sector and need to be consistently defined, adopted, evolved and sustained.

— *Pan-Canadian Health Data Strategy: Building Canada's Health Data Foundation — Expert Advisory Group — Report 2*[26]

This year, the new data elements Race and Indigenous Identity have also been added to the standards, which are important for better understanding and addressing health inequalities in primary care, including virtual care. Future work is planned to improve the standardized capture of the reason for a primary care visit (or health concern) and for standards related to prescribed medication in primary health care.

These standards provide a breadth of opportunity to support clinical and health system decision-making. This includes supporting the study of potentially avoidable ED visits or hospital admissions associated with a specific chronic disease cohort in primary care and other benefits as demonstrated though joint analysis conducted by CIHI and the Alliance for Healthier Communities.[27]

Data standards supporting virtual care

The following information standards have been developed and implemented within CIHI's databases to ensure consistent capture and reporting of virtual care data:

Visit Modality: Defines the mode of encounter used for health service encounters between a client and a health care provider (e.g., in person, email, telephone, messaging). Using this information in combination with other data elements currently collected in CIHI's databases can provide insight on the appropriate use of technology for various care models, the effect of encounter modes on the quality of care, the relationship between health equity and health outcomes, and best practices of care.

Provider Type: Describes who provided care based on profession/designation. Consultations have indicated that decision-makers are interested in which kinds of health care professionals are providing virtual care services and are prioritizing these policy questions in their jurisdictions. Standardized capture of Provider Type can help to support key questions related to costs, workflows and continuity of care. It can also support workforce planning for the future.

Equity considerations for virtual care

Improved access, continuity of care, cost effectiveness, and patient and provider satisfaction have all been identified as potential benefits of virtual care. For example, telephone has been the predominant modality for virtual care delivery during the pandemic[28] and can help to support equitable access, particularly for those in areas where broadband access for video visits may be a barrier.[29] 2020 data from Ontario shows growth in virtual care use across age groups and across income quintiles during the pandemic.[30]

While these findings may indicate that patients are indeed able to access telephone-based virtual care equitably, there are concerns that virtual care could also exacerbate inequities in access and outcomes for patients living in northern, rural and remote locations,[31] for those who lack cellphone data or minutes, or for those with limited access to private spaces for virtual visits.[32] Focus group participants noted that regardless of the modality through which care is provided, inequities that exist in in-person care will be replicated in virtual care unless there are deliberate efforts to address root causes.

The burden of care for virtual has to be so much higher. We need to ensure we're still decent human beings to one another when there's that distance separating us.

— Focus group participant, February 2022

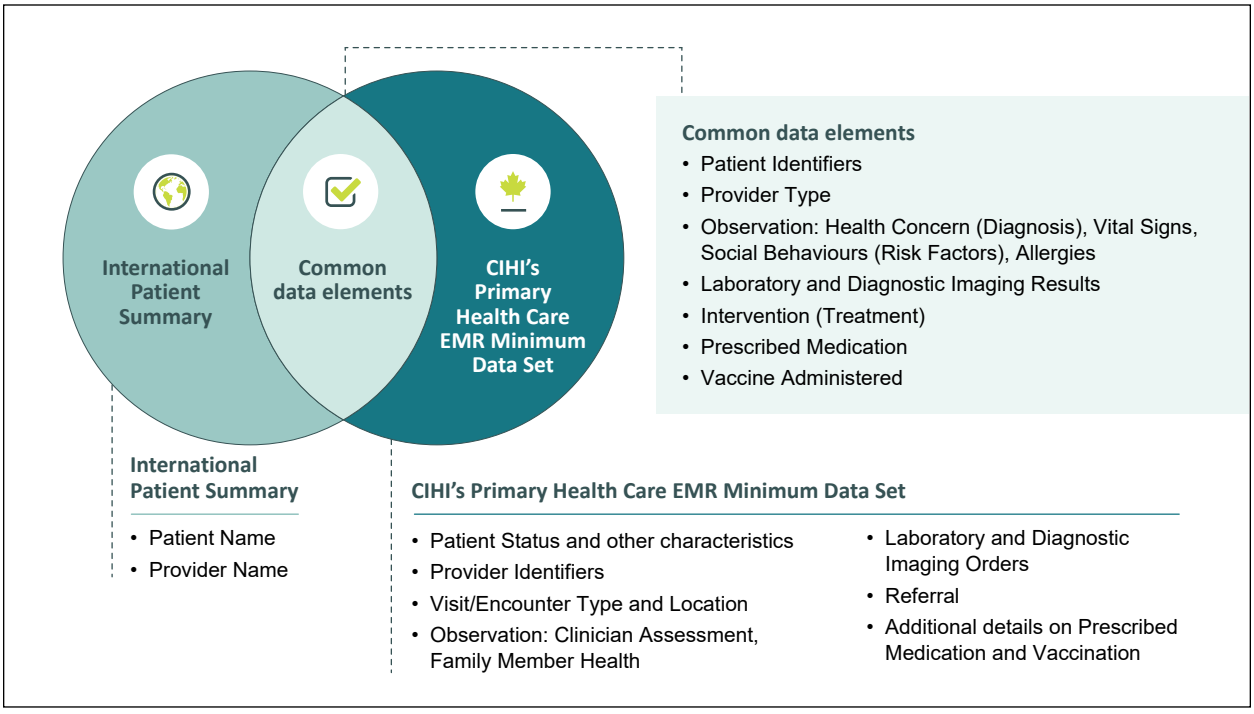
Whether accessing care virtually or in person, Indigenous Peoples and members of other racialized groups experience discrimination and barriers in health systems across Canada that can lead to significant harms.[33, 34] Measuring and reporting on cultural safety provides an important opportunity to help ensure that health systems and health care providers remain accountable for providing equitable and culturally safe care.

To harmonize collection and ensure high-quality data across data holdings, CIHI released *Guidance on the Use of Standards for Race-Based and Indigenous Identity Data Collection and Health Reporting in Canada*[35] and has also provided guidance through a health inequalities toolkit.[36] These standards and tools support the consistent capture of socio-demographic data and permit an exploration of health inequity, which is critical to ensuring that virtual care is accessible to all groups. For example, information on race and Indigenous identity and on education is part of the Canadian Patient Experiences Reporting System[37] as well as the revised primary health care EMR minimum data set noted above.

Advancing data to support virtual care

As provincial and territorial health systems consider the future of primary health care, there are calls for better data access and improved standardization to support this transformation. Interoperability is a critical component of digital health information–sharing across sources, standards and jurisdictions. Interoperability requires standardization so data, such as patient summaries, can seamlessly flow as a patient moves throughout health care systems. A patient summary portrays a snapshot of a person's critical health information, such as allergies and prescribed medication. It supports continuity of care for a patient by travelling with them through various care settings. The International Patient Summary is an international standard that defines the essential data required to create a patient summary. While patient summaries enable clinical exchange of a person's essential health information, complementary source data standards (such as primary health care data standards) are required to ensure data is suitable both for clinical use and for understanding health system performance. The *Pan-Canadian Primary Health Care EMR Minimum Data Set for Performance Measurement*[25] provides a strong foundation for creating patient summaries (Figure 4) — a particular area of focus related to virtual care — in addition to creating a comparable data set to better understand virtual care use. With Infoway's leadership, CIHI and the provinces and territories have been collaborating to develop a patient summary for use within Canada.

Figure 4 High-level summary of key commonalities between the International Patient Summary and CIHI's Primary Health Care EMR Minimum Data Set



Note
CIHI reviewed only core data elements in the International Patient Summary, not optional data elements. Code sets were excluded.

What do we know about virtual care data in Canada today?

Virtual care provided by physicians increased dramatically at the onset of the pandemic, with the proportion of services fluctuating with local COVID-19 case counts and changes in public health restrictions.[38] While guidelines are emerging on the appropriate use of virtual care in some specialties,[39] and some regulatory, public health and government authorities have given directives to resume in-person care,[40] it remains unclear what an appropriate balance of in-person and virtual care looks like. The availability of virtual care data will continue to be crucial to monitor changing trends and the ongoing implementation of virtual health services.

CIHI's data can help begin to fill the data and measurement gaps. We host extensive linkable, comparable, pan-Canadian data across the health care continuum from many sources. In recent months, we have released several products focused on virtual care to address the information needs of our stakeholders. Drawing on CIHI's data holdings — including those for physician billing data, health workforce data, and hospital and survey data — we have begun to explore the impacts of virtual care on Canada's health systems and patients. Visit CIHI's Virtual care in Canada web page for more information on our analytical work in this area.

> CIHI reports on more than 100 health indicators that provide information across different geographic, organizational or administrative boundaries and/or that can track progress over time. Our stakeholders use our broad range of health system databases, measurements and standards, together with our evidence-based reports and analyses, in their decision-making processes.

Available virtual care baseline data: Focus on access

To support the FPT bilateral agreements, CIHI is committed to working with jurisdictions across Canada to gather available baseline data to better understand the impacts of implementing virtual care, including those resulting from the Government of Canada's investments in virtual care.[8] While much of the preliminary virtual care data provided to CIHI by provinces and territories to date is non-standardized and reports on local projects and activities, when it is coupled with data from CIHI and other pan-Canadian organizations the theme of access clearly emerges. For example, CIHI worked with partners at Infoway to leverage the Rapid Response utilization metrics (as of March 31, 2021) submitted as part of its Rapid Response virtual care projects.[41, 42] This data provides a glimpse into the implementation of virtual care solutions (including e-visits and home monitoring) and online mental health services[41] reported at the provincial and territorial level. The Infoway data also provides a provincial/territorial total of the number of patients accessing COVID-19 results virtually.[vii]

Access: E-visits, secure videoconferencing, messaging and mail accounts

Data shows that in Ontario, Manitoba, Saskatchewan, Alberta and British Columbia, the proportion of family physician consults and visits provided virtually between March 2020 and June 2021 averaged between 27% and 57%.[43]

Preliminary data also suggests that investments in secure videoconferencing, messaging and mail accounts are leading to increased use of these virtual tools at a time when regular care providers have been unavailable for in-person visits. Early data in Nova Scotia, Ontario and B.C. has shown that the number of health care provider accounts, use of the technology by both providers and patients, and number of support calls have increased. Early point-in-time data submitted by Saskatchewan to CIHI reflects similar reporting metrics. In Alberta, current systems are also able to report on the uptake of services such as secure mail accounts and secure mail messages (2-way between provider and patient). Data from May 2021 to January 2022 from Alberta that was provided to CIHI indicates that the average number of messages sent to Alberta patients per month is 37,800 and the average number of messages sent from Alberta patients per month is 9,500.

Rapid Response[42] data reported to Infoway from Newfoundland and Labrador, Prince Edward Island, New Brunswick, Yukon and the Northwest Territories also indicates a willingness among providers, patients and citizens to use available technologies and virtual delivery of services to gain timely access to information and care across the country.

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vii. It is important to note that the number of e-visits reported in the Rapid Response data does not include telephone visits.

Spotlight: Impact of COVID-19 on Canada's health care systems

The COVID-19 pandemic has seen Canadians accessing health care in a new way: virtual care has become a tool that EDs, primary care physicians and specialists are using as they treat patients. Family physician activity remained below pre-pandemic levels for the first 13 months of the pandemic.[38] The biggest decrease occurred for children and youth age 0 to 17, while patients age 65 and older (who typically make up about a third of physician activities) showed the smallest drop in most jurisdictions (1 province saw a small increase). This suggests that older adults with chronic conditions were still accessing their family physicians for care.[38]

Chronic disease management, and mental health and substance use

Chronic diseases, including mental health concerns and substance use, have been health system priorities both prior to and during the pandemic. In 2020–2021, the most common reasons for hospitalization (beyond giving birth) were acute myocardial infarction (heart attack) and heart failure, followed by substance use disorders.[44]

For many Canadians, accessing care for chronic diseases has depended on accessing virtual care. For example, preliminary data from Nova Scotia from March to December 2020 that was provided to CIHI shows that while virtual care was used across many specialties, patients who received the most virtual care in that province were those with chronic issues (625,000 virtual services) and those with intermittent illness (almost 500,000 virtual services).

Spotlight: The Commonwealth Fund's International Health Policy Survey

CIHI reports regularly on the Canadian results of the Commonwealth Fund's International Health Policy surveys, which poll patients and providers in 11 developed countries on their health care experiences and interactions.

The 2021 survey collected information from seniors age 65 and older and reveals valuable information about their use of virtual care during the pandemic. In 2021, more Canadian seniors had a virtual appointment than seniors in other countries (71% versus 39%).[45] However, more Canadian seniors also had an appointment cancelled or postponed compared with the Commonwealth Fund average (29% versus 19%). Almost a quarter of Canadian seniors were monitoring their health using a digital device (23%). Canadian seniors with higher numbers of chronic conditions and higher household income were more likely to have had virtual appointments and to have used digital devices to monitor their health.

In Nunavut, the Virtual Nurse Practitioner Chronic Disease Program was launched in fall 2021 to improve patients' access to care through virtual care. The program features a dedicated nurse practitioner workforce and aims to increase early detection of disease through up-to-date screening guidelines, and to support continuity of care by ensuring that all patients involved in this program are rostered. Not only can this initiative improve overall health outcomes and ensure more timely care, but it also hopes to reduce costs to the system by mitigating the number of patients requiring costly transfers via medivac to larger facilities for urgent treatment of progressed disease.

The first report submitted to CIHI shows more than 100 new referrals currently rostered to the program. Of those who have participated in the program, more than 90% agreed or strongly agreed that the virtual appointment with the nurse practitioner increased their confidence in managing their chronic disease. Ongoing data collection through patient-reported experience and outcome measure surveys administered by the care teams, and through administrative data captured on site, will continue to support evaluation of this program.

The pandemic has also demonstrated the need to focus on mental health in the same way we do on physical well-being,[46] and there has been an increased emphasis by provincial and territorial governments on expanding virtual mental health services. A 2021 survey by Infoway found that 81% of respondents said the virtual visit helped them with their mental health concern.[1] It is important to note, however, that virtual care is not always appropriate to address mental health concerns. In particular, those with serious mental illnesses, including eating disorders, may not benefit as much from virtual care as they do from in-person care, and barriers are compounded for those experiencing inequities.[47] More work is needed to better understand the breadth of available data related to virtual mental health services delivery, as is better guidance on the appropriate use of virtual mental health services for specific conditions and populations.

Spotlight: Canadian Centre on Substance Use and Addiction's survey

The Canadian Centre on Substance Use and Addiction, in partnership with other organizations, studied both patient and practitioner perceptions of and experiences with virtual services and supports for substance use, substance use disorders and concurrent disorders. Patients using these virtual services and supports noted that the biggest barriers included the cost of private services, the belief that a client is unable to build a relationship with a health care provider during virtual appointments and the lack of a private space from which to access care.[32] Practitioners reported the main challenge for themselves and for clients was a steep technology learning curve. Equitable access to services will require flexible service provision options, as more barriers exist for those with lower incomes or those without a phone or internet, for example. Age and gender were also found to impact access to and comfort with virtual services.[32]

Patient experience

There are multiple sources of patient-reported experience data, assessing patients' uptake of and satisfaction with virtual care. Ontario's Health Care Experience Survey[48] asked patients if they'd had a virtual visit in the previous 12 months. Based on survey results provided to CIHI, the uptake of virtual care in Ontario increased substantially from the first reference period (May 2019 to March 2020) to the second (June to July 2021), from 9.5% to 72.1%. Patient experience data was also collected through the Virtual Nurse Practitioner Chronic Disease Program in Nunavut; the results were overwhelmingly positive and demonstrated that patients felt a high degree of satisfaction with their experience.

Infoway regularly surveys Canadians about their experiences with virtual care. In its Canadian Digital Health Survey, Infoway found that Canadians generally reported positive experiences with virtual care. 71% of respondents said the personal connection with the health care provider was the same as at an in-person visit.[1]

While CIHI has reported on positive patient experiences in acute care settings during the pandemic,[49] experience data from both patients and providers will help us to better understand whether virtual encounters are leading to positive patient experiences.

Spotlight: Virtual care — A major shift for Canadians receiving physician services

Since the pandemic began in 2020, Canadians have received more care services virtually than ever before, accounting for between 24% and 42% of the services patients received, depending on the province.[50] Income disparities were found to be modest, with more notable differences found between age groups: adults age 18 to 64 had the highest proportion of virtual services (35%), with younger and older patients receiving fewer services virtually (both at 29%).

Emergency departments and virtual care

With the uptake of virtual care, one of the key questions being explored is its impact on the use of EDs. Findings from CIHI's release on the impacts of COVID-19 on Canada's health care systems show that, compared with 2019, there were approximately 9,300 fewer ED visits per day across Canada on average between March 2020 and June 2021.[51] However, it is not known whether ED volumes during the first year of the pandemic were lower because of patient hesitancy to seek care in a hospital-based setting, limited physician capacity or reduced health care needs. Preliminary research in Ontario between February and July 2021 also showed lower ED visit volumes compared with 2019 and found no "crude ecological association" between the percentage of care delivered virtually by family doctors and ED visit volumes.[52] CIHI is committed to leveraging available data on physician services and ED visits to further explore the relationship between virtual care and the potential shift or displacement of health service encounters from primary to emergency care.

I just called my family doctor and discussed the issue over the telephone as opposed to going to our ER, where we'll have to wait for hours just to see a doctor. So, over the phone worked in that situation for me.

— Focus group participant, February 2022

Spotlight: Virtual care — A major shift for physicians in Canada

More physicians provided care virtually during the first year of the pandemic (between 79% and 90%, depending on the province)[53] than the year before. Virtual care delivery varied across physician specialty, with family doctors providing the highest proportion of their services virtually (42%), compared with medical specialists (23%) and surgical specialists (12%). Among family physicians, female physicians provided a higher proportion of virtual care than male physicians. These variations across specialties and between sexes are likely due, in part, to differences in practice patterns between the groups.

Rural and remote communities

Virtual care may benefit patients who access care in rural or remote communities. B.C.'s Real-Time Virtual Support (RTVS) pathways enhance health equity in rural, remote and First Nations communities across B.C. by connecting rural health care providers and patients to RTVS virtual physicians via Zoom or telephone. Data from May 2020 to June 2021 provided to CIHI shows a dramatic increase in the number of physicians (more than doubling) and patients (increasing to more than 80 times the initial volume) using the pathways each month, suggesting improved access to care for patients in these rural and remote communities.

While such data is encouraging, it is important to mention that patients living in remote locations may have difficulty accessing care virtually due to lack of internet bandwidth or access to an appropriate modality. Studies have found that people living in northern areas may be living in crowded places and not have the privacy to discuss their health.[31] Patients with chronic disease might also struggle with accessing virtual care.[54] Preliminary data provided to CIHI from Nova Scotia found that rural patients had more physician services, regardless of whether they were in person or virtual, than patients in small or large population centres, in both 2019 and 2020. The population in rural areas is also greater than the population in large urban centres in Nova Scotia. Interestingly, however, it was urban patients who received the largest proportion of their physician services virtually. Barriers may exist for rural patients who wish to access virtual care.

Virtual care can improve things in rural communities in many ways. It's an opportunity to really make yourself more available for people that you're already serving. A big part of rural medicine is feeling supported; you can't be an expert in everything. Virtual care can help with that. It's being able to bring experts into the exam room with me. Care suddenly becomes much more holistic when we're working in teams.

— Dr. Katharine Smart
Pediatrician; President, Canadian Medical Association

Conclusion

Emerging data from provincial and territorial governments, as well as from robust consultation on information priorities, helps us to better understand the current state and potential future exploration of virtual care in Canada. By focusing on priority areas of measurement identified through consultation — including use of EDs, access to mental health services, access for underserved populations and the appropriateness of virtual services to meet patient needs — we can develop an information baseline that helps decision-makers leverage the tools available to support a patient-centred approach to delivering high-quality care.

Finding the right balance of virtual and in-person care will be challenging and will depend on several factors, including patients' health care needs, access to technologies and infrastructure, funding and regulations to support delivery of virtual services, and provider training. New analytical work on topics including virtual care physician costs will support the ongoing understanding of the implications of virtual health services and the factors that impact the balance of virtual and in-person health care.

Another important topic that warrants further exploration is the private delivery of publicly and privately funded health care via the use of virtual care platforms. This is a fast-emerging area that may have significant implications for the health care sector, particularly in the areas of primary care and community-based mental health and substance use services. Better data will be required to understand the patterns and impacts of these new care delivery approaches.

The pandemic has strained health system resources and led to a shift in the way health care services are provided. Understanding and supporting these shifts and emerging paradigms in health care provision requires ongoing analysis and dialogue between health system partners. CIHI is well positioned to facilitate these conversations, and to support researchers and health system partners who want to address the quality and health system implications of virtual health services. Over the longer term, indicator development and reporting will allow health system planners and providers to understand what is working well and where improvements are still needed, to learn from best practices and each other's successes, and to design and manage more effective services to meet the needs of Canadians.

Appendix

Text alternatives for figures

Text alternative for Figure 1: Digital health

Digital health encompasses virtual care, telehealth and telemedicine, including devices, algorithms and apps that support decision-making and collaborative communication across the care continuum.

- **Digital health:** Broad umbrella term encompassing eHealth as well as developing areas such as the use of advanced computing sciences (e.g., in the fields of big data and artificial intelligence)
- **Virtual care:** Any interaction between patients and/or members of their circle of care that occurs remotely, using any forms of communication or information technology, with the aim of facilitating or maximizing the quality and effectiveness of patient care
- **Telehealth:** The use of digital technologies to deliver medical care, health education and public health services by connecting multiple users in separate locations
- **Telemedicine:** A practice of medicine involving the use of information and communication technologies (ICT) by a health care provider to administer health care to patients

Note
Inspired by the American Association for Family Practice's construct. CIHI added digital health.
Sources
Digital health: World Health Organization. Digital health. Accessed March 1, 2022.
Virtual care: Women's College Hospital Institute for Health Systems Solutions and Virtual Care. *Virtual Care: A Framework for a Patient-Centric System*. 2015.
Telehealth: Telligen, Great Plains Telehealth Resource and Assistance Center. *Telehealth Start-Up and Resource Guide*. 2014.
Telemedicine: CHIEF Executive Forum. *Virtual Care in Canada: Lexicon*. No date.

Text alternative for Figure 3: Health system measurement

There are multiple types of measures and indicators within health care systems, and they have various uses. These can be organized into a pyramid structure with 4 levels.

1. At the bottom of the pyramid are measures that leverage transactional data. These measures focus on monitoring uptake and improving front-line health care programs and services.
2. The next layer of measures and associated data help to evaluate programs and local integration of care.
3. In the third layer of the pyramid, we typically see indicators focused on improving effectiveness and efficiency of health care systems.
4. At the top of the pyramid, we find measures that are focused on assessing the quadruple aims, where the data provides the ability to develop benchmarks to support more robust evaluation.

Data maturity moves along a continuum (from less mature to more mature): transactional, linkable, standardized, comprehensive (breadth), longitudinal and benchmarked.

The higher up in the pyramid, the more mature the data needs to be.

There are more measures in the lower layers of the pyramid than in the higher layers.

Text alternative for Figure 4: High-level summary of key commonalities between the International Patient Summary and CIHI's Primary Health Care EMR Minimum Data Set

In the International Patient Summary, we find the following data elements:

- Patient Name
- Provider Name

In CIHI's Primary Health Care EMR Minimum Data Set, we find the following data elements:

- Patient Status and other characteristics
- Provider Identifiers
- Visit/Encounter Type and Location
- Observation: Clinician Assessment, Family Member Health
- Laboratory and Diagnostic Imaging Orders
- Referral
- Additional details on Prescribed Medication and Vaccination

In both the International Patient Summary and CIHI's Primary Health Care EMR Minimum Data Set, we find the following data elements:

- Patient Identifiers
- Provider Type
- Observation: Health Concern (Diagnosis), Vital Signs, Social Behaviours (Risk Factors), Allergies
- Laboratory and Diagnostic Imaging Results
- Intervention (Treatment)
- Prescribed Medication
- Vaccine Administered

Note
CIHI reviewed only core data elements in the International Patient Summary, not optional data elements. Code sets were excluded.

References

1. Canada Health Infoway. *Canadian Digital Health Survey 2021: What Canadians Think*. 2021.
2. Canada Health Infoway. Canadian Digital Health Survey: Virtual Visits. Accessed March 2, 2022.
3. Glazier RH, Green ME, Wu FC, et al. Shifts in office and virtual primary care during the early COVID-19 pandemic in Ontario, Canada. *CMAJ*. 2021.
4. Virtual Care Task Force. *Virtual Care in Canada: Progress and Potential*. 2022.
5. Health Canada. *Summary Report of the Federal–Provincial–Territorial Virtual Care Summit*. 2021.
6. Jamieson T, Wallace R, Armstrong K, et al. *Virtual Care: A Framework for a Patient-Centric System*. 2015.
7. Qure4u. Digital health vs. virtual care: What's the difference?. Accessed April 8, 2022.
8. Government of Canada. Pan-Canadian virtual care priorities in response to COVID-19. Accessed March 2, 2022.
9. Centre for Digital Health Evaluation. The Canadian Network for Digital Health Evaluation. Accessed March 2, 2022.
10. Canadian Agency for Drugs and Technologies in Health. *Approaches to Evaluations of Virtual Care in Primary Care*. 2022.
11. Healthcare Excellence Canada. Virtual care together. Accessed March 2, 2022.
12. Canadian Institute for Health Information. *A Performance Measurement Framework for the Canadian Health System*. 2013.
13. Canadian Institute for Health Information. *Continuity of Care With Family Medicine Physicians: Why It Matters*. 2015.
14. Alberta Health, Planning, Measuring and Reporting Branch. *Family Practice Sensitive Conditions*. 2014.
15. Canadian Institute for Health Information. Your Health System: In Brief > Wait Times for Community Mental Health Counselling. Accessed March 2, 2022.

16. Canadian Institute for Health Information. *Measuring Cultural Safety in Health Systems*. 2021.

17. Canadian Medical Association, Canada Health Infoway. *2021 National Survey of Canadian Physicians: Quantitative Market Research Report*. 2021.

18. Canadian Institute for Health Information. Commonwealth Fund survey, 2019. Accessed March 2, 2022.

19. Praxia Information Intelligence, Gartner, Inc. *Telehealth Benefits and Adoption: Connecting People and Providers Across Canada*. 2011.

20. Canadian Institute for Health Information. Impact of COVID-19 on Canada's health care systems. Accessed March 2, 2022.

21. Canadian Institute for Health Information. COVID-19's impact on hospital services. Accessed March 2, 2022.

22. Canadian Institute for Health Information. Your Health System: In Brief > Hospital Stays for Harm Caused by Substance Use. Accessed March 2, 2022.

23. Canadian Institute for Health Information. Physician billing codes in response to COVID-19. Accessed March 2, 2022.

24. Canadian Institute for Health Information. *National Grouping System (NGS)*. 2016.

25. Canadian Institute for Health Information. *Pan-Canadian Primary Health Care EMR Minimum Data Set for Performance Measurement, Version 1.1*. 2022.

26. Public Health Agency of Canada. *Pan-Canadian Health Data Strategy: Building Canada's Health Data Foundation — Expert Advisory Group — Report 2*. 2021.

27. Rayner J, Khan T, Chan C, Wu C. Illustrating the patient journey through the care continuum: Leveraging structured primary care electronic medical record (EMR) data in Ontario, Canada using chronic obstructive pulmonary disease as a case study. *International Journal of Medical Informatics*. 2020.

28. Canada Health Infoway. *Canadians' Health Care Experiences During COVID-19: Uptake of Virtual Care*. 2022.

29. Jaklevic MC. Telephone visits surge during the pandemic, but will they last?. *JAMA*. 2020.

30. Bhatia RS, Chu C, Pang A, et al. Virtual care use before and during the COVID-19 pandemic: A repeated cross-sectional study. *CMAJ Open*. 2021.

31. Li J, Roerig M, Saragosa M, et al. *Rapid Review: Virtual Primary Care in Northern, Rural and Remote Canada*. 2020.

32. Goodman A, Cragg S, Corace K, et al. *Client and Practitioner Experiences and Perceptions of Virtual Services and Supports for Substance Use or Concurrent Disorders During the COVID-19 Pandemic*. 2022.

33. Turpel-Lafond ME. *In Plain Sight: Addressing Indigenous-Specific Racism and Discrimination in B.C. Health Care*. 2020.

34. Western University Centre for Research & Education on Violence Against Women & Children Learning Network. *"More Exposed and Less Protected" in Canada: Systemic Racism and COVID-19*. 2020.

35. Canadian Institute for Health Information. *Guidance on the Use of Standards for Race-Based and Indigenous Identity Data Collection and Health Reporting in Canada*. 2022.

36. Canadian Institute for Health Information. Measuring Health Inequalities: A Toolkit. Accessed March 2, 2022.

37. Canadian Institute for Health Information. Canadian Patient Experiences Reporting System metadata. Accessed March 2, 2022.

38. Canadian Institute for Health Information. COVID-19's impact on physician services. Accessed March 2, 2022.

39. Dermer M. *Virtual Care Playbook*. 2021.

40. Canadian Institute for Health Information. *COVID-19 Intervention Scan — Data Tables*. January 13, 2022.

41. Canada Health Infoway. Rapid response to COVID-19: Working with provinces and territories to fund virtual care solutions. Accessed March 2, 2022.

42. Canada Health Infoway. *2020–2021 Annual Report: Celebrating 20 Years of Progress*. 2021.

43. Canadian Institute for Health Information. Overview: COVID-19's impact on health care systems. Accessed March 2, 2022.

44. Canadian Institute for Health Information. Hospital stays in Canada. Accessed March 2, 2022.

45. Canadian Institute for Health Information. Commonwealth Fund survey, 2021. Accessed March 24, 2022.

46. Government of Canada, Governor General of Canada. *Building a Resilient Economy: A Cleaner and Healthier Future for Our Kids — Speech From the Throne to Open the First Session of the 44th Parliament of Canada*. 2021.

47. Mental Health Commission of Canada. *COVID-19 and People Living With Serious Mental Illness: Policy Brief*. 2021.

48. Ontario Ministry of Health. The Health Care Experience Survey. Accessed March 2, 2022.

49. Canadian Institute for Health Information. Impact of COVID-19 on patient experience in acute care hospitals. Accessed March 2, 2022.

50. Canadian Institute for Health Information. Virtual care: A major shift for Canadians receiving physician services. Accessed March 24, 2022.

51. Canadian Institute for Health Information. COVID-19's impact on emergency departments. Accessed March 2, 2022.

52. Kiran T, Glazier R. *Association Between Virtual Primary Care and Emergency Department Use: Preliminary Results*. 2021.

53. Canadian Institute for Health Information. Virtual care: A major shift for physicians in Canada. Accessed March 24, 2022.

54. Seixas AA, Olaye IM, Wall SP, Dunn P. Optimizing healthcare through digital health and wellness solutions to meet the needs of patients with chronic disease during the COVID-19 era. *Frontiers in Public Health*. 2021.

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