

## EVIDENCE BRIEF

# Barriers and Strategies to Equity in Digital Health Programs and Services

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## Key Messages

- During the COVID-19 pandemic, digital health services were rapidly deployed across Canada as an adaptable and low-barrier means to improve access to health services and reduce inequities.
- Despite digital health being cited as a convenient, flexible, and efficient means for providing health services, notable lessons have been learned during its recent implementation and scale-up. Evidence highlights that it may not be suitable for all populations and as a result, may consequently widen health inequities for populations who have been historically and systemically excluded from the health system.
- Barriers to addressing equity in digital health services were mapped against four levels of the *Framework for Digital Health Equity* (individual, interpersonal, community, and societal), which highlights that access to virtual care is strongly facilitated or limited by access to technology, infrastructure, and equity-informed design factors.
- Recommendations for reducing equity barriers to digital health services span multiple levels but were centred on the community and societal levels. These include: creating inclusive mechanisms to engage community members and partners in the design of culturally-safe digital health services, strengthening health providers' competencies for equitable virtual service provision, using technology navigators who are already engaged with communities facing marginalization to address barriers of mistrust, and developing policies and strategies to enable equitable access to low-cost broadband and digital health infrastructure.
- Given that access to digital health services is informed by multiple domains, health system planners, providers, and leaders should consider the impacts of both external and contextual factors, such as availability and affordability of digital health infrastructure, alongside embedding equity considerations when designing and implementing digital health services.

## Issue and Research Question

The implementation of digital health programs and services has grown rapidly across Canada, expedited by the transition to utilizing alternative models of care during the Coronavirus Disease 2019 (COVID-19) pandemic.<sup>1</sup> In 2019, virtual care accounted for between 2% and 11% of the services that individuals received across Canada. A year later, this number increased substantially, with Canadians receiving between 24% and 42% of their health services virtually.<sup>2</sup>

The proliferation of technology-based health services and information is reflected in federal, provincial and regional investments in digital health, some of which were identified prior to the COVID-19 pandemic. In 2019, Ontario announced its *Digital First for Health Strategy* to “support a more modern, patient-centered health system, which prominently features virtual care”.<sup>3</sup> Through the publically funded Ontario Virtual Care program, 1.4 million visits were completed in 2019/2020. By the end of 2022, more than 81 million virtual care services were completed for over 10.9 million patients since the pandemic started, with visits facilitated by provincial funding and OHIP insured temporary virtual care fee codes.<sup>4</sup>

Digital health has been positioned to provide timely, safe, and cost-effective access to information and care, particularly during the COVID-19 pandemic, when in-person services were not feasible.<sup>5</sup> The use of digital technologies has extended to various domains of public health programming<sup>6</sup> and has even sparked a new field of “digitized health promotion”.<sup>7</sup> The shift to digital services has provided positive impacts for populations living in rural or remote settings, individuals facing challenges with travel costs and reliable transportation, and individuals in precarious work environments.<sup>8</sup> Despite its intent, the implementation of digital health services has also shed light on new and existing health inequities across many jurisdictions, including Ontario, which continue to have implications beyond the pandemic.<sup>9</sup>

Empirical research indicates a deepening divide in relation to who has access to and benefits from virtual health services.<sup>10</sup> For communities that have been historically marginalized and under-served by the health system, including individuals living in poverty, individuals who are unhoused, and Indigenous, and racialized communities, digital solutions may further deepen known barriers to care.<sup>11</sup> This has led to growing concerns for systemically excluded groups, emphasizing the urgency of reducing the digital divide in Canada.<sup>12</sup> The digital divide refers to the “gap between demographics and regions that have access to modern information and technology and those that do not or have restricted technology”.<sup>13</sup>

The inequities in access to technology and the Internet have led international organizations such as the United Nations to position Internet access as a critical enabler of human rights.<sup>14</sup> Access to digital tools and Internet connectivity have increasingly been recognized as a social determinant of health (SDoH), as they have broad ranging impacts on access to health, social, and economic services. Some have identified digital literacy and Internet connectivity as “super SDOH”, as they address all other determinants of health. For example, applications for housing, employment and other social services (each of which in turn influence health), are increasingly only available online.<sup>15</sup>

With the public health sector continuing to learn about and recover from the COVID-19 pandemic, this evidence brief aims to identify challenges and recommendations to support the equitable planning and implementation of digital health interventions. To this end, this brief explores the following research question: *What are barriers and strategies to address equity in digital health services based on lessons learned from the COVID-19 pandemic?*

## Note on Terminology

In this brief, we examine the equity impacts of digital health, which is a “discrete functionality of digital technology that is applied to achieve health objectives and is implemented within digital health applications and information communication technology systems, including communication channels such as text messages”.<sup>16</sup> Digital health includes the spectrum of virtual care, which is “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”, including telemedicine and telehealth.<sup>2</sup>

Health equity is created when all people (individuals, groups, and communities) have a fair opportunity 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, economic, and environmental conditions, including socially constructed factors such as social status, gender, sexuality, and racialization.<sup>17</sup> As such, digital health equity is recognized as a fair and just opportunity for all people to benefit from the information, knowledge, and practices related to the development and use of digital technologies to improve health.<sup>18</sup>

## Methods

To explore the evidence base, Public Health Ontario (PHO) Library Services supported with the development of specific search terms and strategies for both peer-reviewed and grey literature. The search for peer-reviewed literature was conducted on May 15, 2023 by Library Services for articles published 2020-2023 in five bibliographic databases including Ovid MEDLINE, PsychINFO, Global Health, CINAHL, and SocINDEX.

Grey literature searches were conducted May 24, 2023 via the following search engines: Ontario’s Public Health Unit Search Engine, Canadian Health Departments and Agencies Search Agencies Search Engine, International Public Health Resources Search Engine, and Google Canada. Based on recommendations from Library Services, the first 100 results were reviewed (for each search string), given that relevance decreases after the first 50-100 results. The detailed search strategy, including specific search terms for both peer-reviewed and grey literature, is available upon request.

Articles were eligible for inclusion if they examined digital health during the COVID-19 pandemic, took place in public health settings, included implications for COVID-19 recovery, were published in English and to increase relevance and applicability of findings, were published in Canada and US jurisdictions. Two reviewers independently screened titles and abstracts of the peer-reviewed results. Reviewers met to discuss any discrepancies and to achieve consensus. Strong agreement (>80%) was achieved between both reviewers during title and abstract screening. Full text articles were retrieved, reviewed, and their data extracted by one reviewer. Given resource and time limitations, quality appraisal of the final included papers was not conducted.

Studies that were unrelated to public health practice (e.g., clinical, primary care, home/community care, care management, etc.) and articles or reports that provided reflections or theoretical discussions without applicable or actionable strategies (e.g., commentaries) were excluded.

Barriers and strategies for improving equitable access to digital health services were categorized according to the *Framework for Digital Health Equity* ('FDHE') four levels of influence: individual, interpersonal, community and societal.<sup>19</sup> The Framework highlights that determinants of digital health are not meant to be exhaustive and do not exist in isolation, functioning in ways that are cumulative or interactive. The FDHE positions the digital environment as one of six domains that impacts health outcomes, in addition to biological mechanisms, behavioral factors, physical/built environment, sociocultural environment, and the healthcare system.<sup>19</sup>

## Main Findings

### Search Results

The search identified 661 articles, from which 133 articles were included after title and abstract screening. Following full text screening, 16 peer-reviewed records were included in this evidence brief (fourteen records were identified through the peer-reviewed search and two additional peer-reviewed records were uncovered during the grey literature search). Of the 16 included records, one was a systematic review<sup>5</sup>, two were narrative reviews<sup>20,21</sup>, two were exploratory case studies<sup>22,23</sup>, two were evaluations<sup>24,25</sup>, and nine were primary studies.<sup>26-35</sup>

The grey literature search results included digital health strategy guidelines, standards, and evaluations which were produced by government organizations at various levels, as well as public health agencies. Notably, most grey literature had greater applicability to primary care environments, with limited relevance to the public health sector. A total of 11 grey literature records that have translatable findings to public health are included in this review. These records are comprised of one evaluation<sup>36</sup>, two program updates<sup>37,38</sup>, six reports<sup>8,39-42</sup>, one policy framework<sup>43</sup>, and one science brief.<sup>44</sup>

Findings are presented by three main categories: 1) lessons learned on the equity impacts of digital health services, 2) barriers to accessing digital health services, and 3) strategies to accessing digital health services. The evidence on barriers and strategies is further categorized by the four levels of the FDHE to describe individual, interpersonal, community, and societal influences.

## Lessons Learned: Equity Impacts of Digital Health Services

A prevalent theme in the literature was around the health equity impacts of utilizing digital health programs and services during the COVID-19 pandemic and the potential implications of its use during pandemic recovery.<sup>5,8,23-26,29,32,33,44</sup>

### Positive Impacts on Health Equity

Six records highlighted the shift to digital services provided positive impacts for those who typically experienced barriers to accessing care.<sup>22,24,28,32,33,42</sup> This includes individuals who face transportation challenges, including low-income populations,<sup>42</sup> rural populations,<sup>28</sup> older adults living far from in-person sites who are homebound due to physical limitations,<sup>24</sup> individuals with mobility challenges or chronic health conditions that make travelling difficult and costly,<sup>33</sup> and newcomers who may face challenges with reliable transportation, long commutes, lack of a driver's license, and travel costs.<sup>22,32</sup>

An exploratory study which sought to understand perceptions of refugees who accessed virtual mental health services found they saved time, resources and the inconvenience of having to travel long distances to get to their appointments, especially for those residing far from services who rely on public transportation and face higher costs.<sup>22</sup> This was consistent with Weith and colleagues' cross-sectional study with refugee providers, of whom 69% indicated that transportation access was "better" or "much better" for telemental health services than in-person.<sup>32</sup>

Records also identified how virtual health helped to overcome financial challenges associated with accessing in-person care.<sup>33,42</sup> For example, a cross-sectional study of community health centres in Ontario found that virtual visits provided cost-saving benefits to patients, in particular for those who needed to pay for transportation, parking, arranging childcare or for those with fixed work schedules who are required to take time off for visits.<sup>33</sup> Virtual modalities were cited by one study as a particular advantage for caregivers of young children who may otherwise be concerned about child care.<sup>22</sup>

## Health Equity Impacts Across Populations

Despite digital health being cited as a convenient, flexible, and efficient means for providing health services<sup>5</sup>, ten records highlighted the wide ranging impacts of virtual health services on equity-deserving populations.<sup>5,8,23-26,29,32,33,44</sup> Several records highlighted that that in particular, virtual health services may not be suitable for all populations as a result of barriers to access, such as limited or no access to technology and/or financial barriers. This includes older adults, individuals living in poverty or low-income<sup>5,8,23,33,44</sup>, racialized groups<sup>8,23,24,26,29,32,33,44</sup>, newcomers<sup>24,25,33</sup>, and individuals who were precariously housed or unhoused.<sup>23,33</sup> For groups facing marginalization, these barriers stem from broader, structural determinants of health, including unjust historical and ongoing policies, practices, and structures.

A systematic review by Hatef et al. (2023) highlighted that individuals using telehealth during the COVID-19 pandemic were more likely to be young to middle-aged, female, White, higher socioeconomic status and living in urban settings, suggesting that telehealth may only improve access to care for those who already have access.<sup>5</sup> The unintended equity impacts of solely depending on virtual health services for older, racialized, and low socio-economics status populations could possibly result in missed or delayed diagnoses owing to a lack of in-person visits during the pandemic.<sup>5</sup>

## Racialized and Indigenous Populations

Ten records highlighted racialized inequities in accessing virtual health services<sup>23,24,26,29,32,33,30,8,38,44</sup> particularly among Black,<sup>26,30,38,44</sup> Indigenous,<sup>23,44</sup> and other racialized populations,<sup>23,33,44</sup> signalling the need for deliberate consideration of specific contexts, needs and preferences of individuals and communities when designing digital health services.<sup>44</sup> The Mapping Toronto's Digital Divide study conducted in 2021 revealed that 42 percent of Black families worry about the affordability of internet services, with neighbourhoods with higher proportions of Black populations reporting lower internet connectivity rates than other Toronto neighbourhoods.<sup>38</sup> An evidence brief on virtual mental health services during the pandemic reinforced that Black and other racialized populations are disproportionately impacted by social and structural determinants of health, including systemic racism, and food and housing insecurity, which further impacts access to virtual services.<sup>44</sup>

For Indigenous populations, barriers to accessing virtual services are linked to historical and longstanding effects of ongoing colonialism and racism, including the impacts of harmful historical practices.<sup>41</sup> Shahid and colleagues' (2023) cross-sectional study examined whether and how health equity was considered by health and social services while implementing virtual care during the pandemic and found cultural beliefs about wellness and care did not often translate to virtual settings. This suggests that a lack of in-person visits during the pandemic reduced the potential for culturally safe healing encounters.<sup>23</sup>

## Rural and Remote Populations

Four records highlighted inequities among access to virtual health services among rural and remote communities,<sup>26,28,33,36</sup> finding that virtual health service utilization was higher among urban than rural populations during the pandemic.<sup>26,28,33,36</sup> A cross-sectional study found that more urban than rural clinics used virtual health services for contraceptive care, including contraceptive counseling, emergency contraception, and sexually transmitted infection treatment.<sup>28</sup> Further, an evaluation of a digital health equity program for low-income families and older adults in Northern Ontario, noted a discrepancy in those who have access to information and communication technologies, which was driven by high costs for technology and limited Internet connectivity in the region.<sup>36</sup>

## Newcomer and Refugee Populations

Five records described that newcomer and refugee populations faced challenges with using virtual services during the pandemic,<sup>5,22,23,32,33</sup> resulting in interrupted care or shortened visits. These inequitable impacts on access to virtual care were further amplified among individuals whose first language was not English.<sup>5,23,25,29,34</sup> A cross-sectional study which sought to understand practitioners' perspectives on barriers and benefits of virtual mental health services on refugees and asylum seekers in the US found they face complex and multilayered barriers to accessing virtual mental health services, including technological challenges, privacy limitations, cross-cultural communication challenges, and a lack of interpreter services.<sup>32</sup> Approximately, 24% of refugee providers reported that language barriers were “worse” or “much worse” via virtual delivery than in-person.<sup>32</sup>

## Older Adults

Considered a vulnerable population, older adults were positioned as facing access-related barriers to virtual health services due to discomfort with technology use and lower levels of digital health literacy.<sup>5,23,24,26,41,42</sup> A cross-sectional study which examined trends in accessing virtual services pre-COVID and post-COVID in rural communities in Alabama found that while an increase in telehealth access was observed across all age groups after the pandemic, there were greater increases across younger age groups.<sup>26</sup> Inequities in accessing virtual services intersected across groups of older adults. An evaluation of a virtual fall prevention program found that remote programming did not adequately reach older newcomer and racialized communities, individuals whose primary language is other than English and individuals with disabilities, such as sensory disabilities, including vision impairments.<sup>24</sup>

## A Note on Intersectionality

Individuals and communities are complex and heterogenous, rather than one dimensional. As such, an intersectional approach is required to understand inequities in accessing and using virtual health services.<sup>21,44</sup> Coined by critical legal theorist, Kimberlé Williams Crenshaw, an intersectional approach acknowledges that identities and forms of oppression intersect to produce unique and often unpredictable experiences, as one form of oppression can be shaped and can influence another.<sup>45</sup>

Just two records explored an intersectional perspective when describing equity barriers to accessing virtual health services.<sup>21,44</sup> Husain and colleagues' (2022) narrative review sought to understand how multiple forms of disadvantage, specifically older age, lower socio-economic status, and limited English proficiency has been conceptualized in the literature. Rooted in intersectionality theory, authors noted "each individual's identity and lived experience is unique and multifaceted and that individuals will use (or will not use) digital services based on their own unique identity and circumstances—rather than as members of a single category such as asylum seeker, Black individuals, or older adults." They found that most studies (93%) identified specific digital inequities but solutions generally overlooked the pervasive impact of multiple layers of disadvantage that combine to affect digital health inequities.<sup>21</sup>

## Barriers to Accessing Digital Health Services

The FDHE positions equity barriers to accessing digital health services across four distinct levels outlined below. Inequities are a product of complex social, economic, and structural factors and as such, the barriers below do not exist in isolation and can be experienced at multiple, mutually reinforcing levels.<sup>19</sup>

### Individual-Level Barriers

According to the FDHE, determinants of using digital health services at the individual level include digital literacy, digital self-efficacy, technology access, and attitudes towards use.<sup>19</sup> A total of nine records highlighted barriers to accessing digital health programs and services at the individual level.<sup>5,20,23,25,29,32-34</sup>

Digital literacy refers to the skills and abilities necessary for digital access, including an understanding of the language, software, and hardware required to successfully navigate technology.<sup>19</sup> Low levels of digital literacy were cited as a barrier to accessing digital health services across a number of records,<sup>20,23,25,29,33</sup> with an emphasis on system-level solutions to address these barriers. Findings from a digital health consultation conducted by Government of Canada suggest that 46% of Canadians report not having the digital literacy skills to take full advantage of digital health services.<sup>8</sup> This includes limited awareness of digital health tools and resources available, limited technical skills to use available technology and/or limited access to tools to understand the health information being shared.<sup>8</sup>

Technology access describes the necessary technological equipment available to an individual. Eight records identified access to and financial costs of devices, plans, and reliable internet served as a major barrier to accessing digital health services.<sup>5,20,22,24,25,32,34,42</sup> This was particularly challenging for individuals living in poverty or low-income<sup>42</sup>, individuals experiencing precarious employment, newcomer and refugee populations<sup>32</sup>, and/or unhoused individuals.<sup>22</sup>

Attitudes towards use refers to an individual's desire and willingness to use, trust in, and beliefs about their ability to use digital tools.<sup>46</sup> Across a number of records, privacy was cited as a major concern for accessing digital health services, leading to a hesitancy to participate in virtual sessions or care.<sup>24,29,33,34</sup> This was particularly relevant for people living in overcrowded homes or among unhoused populations.<sup>29</sup> In one study, virtual care posed even greater privacy and confidentiality limitations for those at risk of domestic violence and living in shared homes.<sup>33</sup> Another found that privacy due to lack of space, the number of people in the home, and/or associations with mental health stigma were reported as significantly more prevalent for refugee clients than non-refugee clients.<sup>24</sup>



Trust, including concerns about privacy, security, and surveillance, is a key determinant to accessing virtual care, particularly for individuals and populations who have experienced historical and ongoing harms caused by the health system.<sup>19</sup> This includes but is not limited to Indigenous, Black and other racialized communities, as a result of the longstanding impacts of colonialism and systemic racism.<sup>44</sup> Mistrust was identified as a barrier to accessing digital health interventions among ‘undocumented’ populations, who cited a fear that any information collected through digital health platforms could be collected by the application and put individuals at risk for deportation.<sup>25</sup>

This extends beyond virtual care to mobile applications. An evaluation of Washington State’s COVID-19 digital exposure notification tool, ‘WA Notify’ noted security, privacy and misinformation as a concern among individuals with disproportionately high rates of COVID-19. This, along with mistrust of the government (82% of participants), technology companies (59%), and public health organizations (53%), was cited as barriers to adoption in underrepresented communities.<sup>25</sup> Fear of adoption was informed by historical context between communities and governments and public health organizations.<sup>25</sup>

Digital self-efficacy, an individual’s belief in one’s own performance as it relates to the effective and effortless utilization of information technology, predicts proficiency and access.<sup>19</sup> This was cited by four records<sup>24,26,25,34</sup>, including the evaluation of ‘WA Notify’, which found that one of the top two barriers that influenced access, adoption, and use among marginalized groups was a lack of confidence to use a digital tool for health communication purposes.<sup>25</sup> Digital self-efficacy was cited as more challenging for older populations, who may not be as familiar with technology.<sup>24,26</sup>

## Interpersonal-Level Barriers

Interpersonal determinants of digital health equity describe relational factors that connect individuals to digital health technologies and one another and include patient-provider relationships, implicit technology bias, and interdependence.<sup>19</sup>

Seven records<sup>5,23,24,27,29,33,42</sup> noted the impact of patient-provider relationships, which describe complex interpersonal transformations that occur through digital technologies, that can address or exacerbate power imbalances in relationships.<sup>19</sup> For marginalized populations, the patient-provider relationship can impact other dimensions of quality of care, including mistrust and poor quality communication.<sup>19</sup> A systematic review found a major long-term barrier to telehealth included insufficient communication between providers and patients.<sup>5</sup> Further, phone or video services did not provide the same level of quality as in-person services due to challenges with building relationships and the relative lack of other forms of communication, including body language or self-expression.<sup>23,27,29,33</sup>

In particular, a study among low-income people of colour in New Jersey found it difficult to explain their symptoms and connect emotionally through telehealth, which decreased their trust in the accuracy of the diagnoses and treatment received. Some noted the lack of empathy or emotional connection with receiving a diagnosis over telehealth.<sup>29</sup> These challenges were amplified with newcomers, when the individual and provider did not speak the same language, despite an interpreter being present.<sup>29</sup> In community health centres settings in Ontario, this gap was owed to the inability to observe patient reactions to information being discussed and solely relying on the descriptions that patients provided.<sup>33</sup>



Interdependence is used to describe the dependence of two or more people (e.g., family members, caregivers or friends) on each other for the digital skills, access, and equipment necessary to use digital tools.<sup>19</sup> An evaluation highlighted a technology divide based on age and gender in newcomer and refugee communities, noting that mobile phones were typically owned by men or household primary income earners in the family. While interdependence can be considered a positive adaptive mechanism and facilitate positive social capital in many contexts,<sup>46</sup> it may also have power implications on access to digital health tools and services among newcomer women.<sup>25</sup>

## Community-Level Barriers

Community level determinants to accessing digital health services include community infrastructure, health system infrastructure, community tech norms, and community partners.<sup>19</sup> Five records described community level barriers to virtual care.<sup>23,24,29,32,41</sup>

Community infrastructure includes cellular wireless and broadband access, quality, and affordability<sup>19</sup> and was cited by four records as a barrier.<sup>23,24,29,32</sup> An exploratory study with health and social service providers in Ontario found that meaningful virtual care was strongly related to infrastructure and access to devices and network. This was a challenge faced by service users who lacked access to Internet, cellular service and/or digital devices with sufficient minutes or data.<sup>23</sup> This access gap was most apparent for individuals living in rural and remote communities,<sup>24</sup> individuals with low-income, including older adults on a fixed income, and individuals who were unhoused.<sup>23</sup> Providers serving refugee populations reported that challenges with technology (92%), and internet connectivity (90%) were either “somewhat” or “a lot” of a problem for their clients.<sup>32</sup>

Health system infrastructure includes community access to health systems with advanced digital capabilities, including electronic health record systems, portals, and other telehealth tools.<sup>19</sup> Limited electronic infrastructure and the integration of telehealth software into EMRs were cited as a barrier for organizations providing virtual services.<sup>28</sup> The differential resources and technologies across health systems can lead to a misalignment of digital health efforts, resulting in inequities for individuals living in locations where resources are limited.<sup>41</sup> Additionally, connectivity issues were not limited to patients; providers also faced challenges accessing the Internet and connectivity for virtual appointments and programs during the pandemic.<sup>23,24</sup>

During the pandemic, many organizations faced competing priorities, including ongoing challenges with human health resources (e.g. staffing shortages, redeployment), which impacted the ability to ensure equitable approaches to virtual care.<sup>23,28</sup> Resource intensity was highlighted in an evaluation of a remote falls prevention program, which noted extra time and resources required to send participant materials, new technology needs, remote platform licenses, and additional staff to be on standby in the event an emergency occurred with participants during the remote session.<sup>24</sup>

Lastly, the role of community technology norms, including community preferences for particular tools or high versus low-tech solutions and community partners is vital in informing access and uptake of digital health services.<sup>19</sup> Lack of promotion of virtual services and programs was cited as a barrier to reaching end users, particularly for newcomers or those who were not already connected to health, social or settlement services.<sup>22,23</sup> Overall, most records did not include community technology norms or community partners as barriers to virtual care but rather positioned them as recommendations.

## Societal-Level Barriers

Societal-level determinants include technology policy, data and design standards, social norms and ideologies and algorithmic bias. Technology policy refers to federal, provincial and local policies supporting health technology options, development and innovation, and security. Data standards are created and maintained by professional organization, whereas design standards reflect accessibility for individuals with disabilities and those with low digital health literacy.<sup>19</sup>

Four records cited legislation, policy, and regulation as barriers to accessing digital health services.<sup>21,23,28,41</sup> *The Report of the Canadian Virtual Task Team on Equitable Access to Virtual Care* (2021) noted that regulatory standards that support virtual care services are jurisdiction specific and not aligned or up to date. Policy inconsistency leads to variation in how services are provided and how providers are compensated in jurisdictions across Canada and can lead to inequitable distribution of service delivery.<sup>41</sup> For example, a study on contraceptive care via telehealth at rural and urban health centres during the pandemic found challenges with funding for telehealth as policy barrier to implementing services.<sup>28</sup>

## Strategies for Embedding Equity into Digital Health

Several studies highlighted strategies for promoting health equity through digital health programs and services<sup>20,21,29</sup>, which have been mapped against the four levels of the FDHE and outlined below.

### Individual-Level Strategies

Six records provided strategies to address individual-level factors which impact digital health uptake and access, including digital health literacy, digital self-efficacy, technology access, and attitudes towards technology use.<sup>20-22,28,29,34</sup> The FDHE highlights that interventions to address digital health inequities often suffer from ‘Fundamental Attribution Error’, that is, overweighing the impact of individual factors and placing less emphasis on contextual and situational factors.<sup>19</sup> To truly address the root causes of inequities and to be most effective for communities facing marginalization, interventions must target upstream determinants at community and societal levels.<sup>19</sup>

Creating inclusive mechanisms to engage community members with limited access to digital services to provide input into planning and delivering virtual care, was cited as a means to address digital health literacy, digital self-efficacy and the needs of communities who are under-invested.<sup>20,29,34</sup> Shaw et al.’s narrative review (2022) recommended establishing community advisory committees that represent the views and diversity of underrepresented populations, collaborating with trusted partners who provide leadership to racialized communities, and/or establishing community-based participatory research to facilitate meaningful engagement.<sup>20</sup> Another narrative review recommended not only involving individuals facing marginalization in co-design but also in data stewardship.<sup>21</sup>

Additional considerations include offering tailored capacity strengthening and education programs to communities who are historically underserved by digital health programs to improve their awareness of digital health services and health technology.<sup>21,28,29</sup> One means to increase access is by offering technology classes to patients and making telehealth applications user-friendly and affordable.<sup>29</sup>

To address barriers associated with access to technological equipment, the importance of assessing needs and implementing person-centred virtual care was highlighted.<sup>20-22</sup> Health service providers should assess the suitable delivery of virtual services depending on the individual accessing care, given differences across experiences.<sup>18,33</sup> This includes planning a mix of in-person and virtual visits and using telephone-based visits (over video visits) for individuals who have access to a phone but not a device or Internet connectivity that would enable a video visit.<sup>8,20</sup> Further considerations included providing different options, such as high- and low-technology forms and exploring technologies that supplement or simulate face-to-face interactions during web-based consultations.<sup>21</sup> Identifying relevant devices and equipment that suit the needs of specific individuals is another means to enhance their access.<sup>23</sup>

The provision of financial and resource support, including devices, device loan schemes, and subsidies to those who would benefit from digital health but do not have access to equipment or data plans was also recommended.<sup>21,22,29,36</sup> Local agencies and community partners were identified as a means to provide these supports and build access.<sup>22</sup> For example, the *Closing the Digital Divide in Timiskaming* project by Timiskaming Public Health Unit sought to address inequity through the provision of technology and Internet to low income families and older adults experiencing access barriers in Northeast Ontario. The program was successful in addressing the digital divide and reducing severity of the access issue during the COVID-19 pandemic. According to users and referral partners, devices supported clients with accessing online health and well-being information and online learning. Despite this, access to and affordability of quality Internet services remain an ongoing challenge in rural and remote communities.<sup>36</sup>

## Interpersonal-Level Strategies

Interpersonal determinants include the relationship between the health service provider and the individual accessing care and implicit technology bias, which is held by health service providers and health systems on individuals' willingness to access care.<sup>19</sup> Five records highlighted the importance of social connectedness and interpersonal relationships to improve awareness and access to virtual services.<sup>21,22,25,33</sup> For example, in an exploratory study of virtual mental health services for newcomers and refugees, both newcomers and their providers highlighted how informal and formal networks were pivotal to ensuring awareness of virtual services. This includes reliance on friends, family, sponsors, and health service providers for information on where and how to access virtual services.<sup>22</sup>

Having established relationships prior to participating in a virtual visit was a key consideration for increasing trust and thereby improving uptake of digital health services, with individuals preferring virtual visits with providers with whom they already had a trusting relationship.<sup>21,25,33,38</sup> In a cross-sectional study, over two-thirds of patients highlighted the importance of a historical relationship in contributing to their willingness and comfort in receiving care virtually.<sup>33</sup>

Findings from an evaluation of a digital notification tool recommend using technology navigators and trusted messengers including community leaders, who are known, credible and already engaged with communities facing marginalization to address barriers of mistrust and aversion.<sup>25</sup> Engaging community health workers was also cited as a means to better connect with individuals experiencing inequities.<sup>21</sup> To support virtual patient-provider communication, developing and evaluating evidence-based health communication protocols for telehealth may enhance and/or create a patient-centred experience.<sup>21</sup>

Additionally, records identified developing culturally and linguistically tailored services that meet the needs, preferences, and values of communities facing marginalization, including context, language, and addressing stigma, as a method to improve trust and relevancy of digital health services.<sup>20-22,34,44,8,23,30</sup> Efforts to support sustainability of virtual services requires a deep understanding of the potential consequences for members of structurally marginalized communities, including racialized and Indigenous communities, whose access to virtual care has been and continues to be precarious.

This entails incorporating and addressing Indigenous perspectives of health and wellbeing in virtual services and co-designing and co-implementing culturally-safe practices to respond to unique challenges for Indigenous peoples, including mistrust, which present as a result of historical and ongoing impacts of colonization.<sup>23</sup> Outside of Indigenous health, an example that addresses cultural safety is DREAM, a virtual community-health worker model for diabetes prevention among South Asian immigrants, which found that including virtual healthy eating sessions during the month of Ramadan and culturally tailored dance routines to encourage exercise, were reported to be successful by program leaders.<sup>34</sup>

Additional recommendations in the literature included enhancing translation and communication for individuals whose first language is not English, including providing interpretation services, translating relevant documents and tailored text and, developing information and guidance that is inclusive and relevant to those living in vulnerable circumstances to encourage access.<sup>8,21,25</sup> To promote readability and understanding of public health outreach materials and graphics, simplified materials which are culturally competent and easily accessible should be developed to be appropriate for all communities.<sup>23</sup>

## Community-Level Strategies

Six records identified community level recommendations including addressing community infrastructure, health service infrastructure, community technology norms, and community partners. Engaging community partners and developing relationships with community-based organizations better facilitates the design of virtual health service delivery and ensures more deliberate involvement of diverse users, including groups facing marginalization.<sup>20,21,23,32,44</sup>

Community partners contribute greatly to the local digital equity system and other social systems that seek to increase access, including libraries, digital literacy training programs, and community health workers.<sup>19</sup> One such example entails developing partnerships with local organizations to create spaces with publically available Internet and/or no-cost devices in communities who are facing socio-economic marginalization or unable to access services privately.<sup>20,21,32</sup> Husain and colleagues' (2022) review recommends installing free, bookable, soundproofed video booths in community centres, libraries, or physicians' offices to create privacy, and identifying available staff to support with using technology.<sup>21</sup> Further, forming partnerships with local communities when developing and implementing processes and policies can ensure virtual health decisions are in alignment with community needs and perspectives.<sup>44</sup>

Community partners were also identified to improve the promotion of virtual health services to better reach those who have been historically and systematically excluded.<sup>22</sup> A cross-sectional study which aimed to understand health equity related challenges and experiences during the implementation of virtual care during COVID-19 in Ontario noted that while many organizations translated materials for non-English speaking individuals, translation did not necessarily guarantee equitable access to virtual resources, if individuals were unaware that translated resources exist.<sup>23</sup> Engaging community health workers could be one means to increase awareness and reach of virtual services.<sup>21</sup>

Providing technology support, including assistance for individuals navigating virtual care was a strategy to ensure equitable uptake of services and increase quality of care across three records.<sup>20,27,47</sup> To support individuals who are engaging with virtual care for the first time, integrating supportive intermediaries or care navigators within virtual programs to support users was proposed. This model was successfully used at Women's College Hospital in Toronto, Canada, whereby existing staff with knowledge in technology and/or equity were deployed to support with virtual service uptake.<sup>20</sup> Organizations can also hire new staff for this intermediary role and to assist with building equity partnerships with community organizations, public libraries and others to establish support programs.<sup>20</sup>

Lastly, investment in competency strengthening for health providers was cited as an effective means to ensure that virtual service delivery is underpinned by principles of health equity, anti-oppression, and anti-racism and to ensure that health equity is recognized as a long-term priority.<sup>20</sup> Seven records highlighted the importance of providing professional development trainings to enhance providers' and organizations' understanding of virtual platforms, barriers to accessing virtual care, tailoring services to focus on communities facing marginalization and/or strategies for addressing inequity.<sup>20,21,23,28,32,33,44</sup>

It was noted that this capacity strengthening should not be limited to navigating virtual platforms and adapting to virtual care<sup>33</sup> but should be specific to the role equity plays in relation to accessing care<sup>21,23</sup>, and promoting cultural humility.<sup>32</sup> Training for mental health providers can help ensure that providers deliver virtual care that mirrors in-person care.<sup>44</sup> This includes developing curricula and assessments that can be embedded into current training of health providers and recognizing inequities in virtual service provision.<sup>44</sup> Further, simplifying the complexity of digital care processes, including processes and work flows, was a strategy highlighted in three records.<sup>20,25,28</sup>

## Societal-Level Strategies

Beyond individual providers and organizations' roles in addressing inequities in virtual care provision, societal and structural level recommendations were identified across the included records. Societal determinants include policies for technology adoption, data and design standards, and broadband internet policies. From an accessibility standpoint three records highlighted the need for organizations to develop inclusive design standards, which are centred on accessibility and patient experience, to understand how virtual health services and applications are interoperable with critical assistive technologies (e.g., text-to-speech systems or screen readers), and to identify strategies to ensure information and resources are accessible in a variety of formats.<sup>20,21,25</sup>

Recommendations were made to simplify the use of digital health services, particularly for individuals who are unhoused or underhoused, experiencing poverty, have precarious income, and have lower levels of education. Following design guidelines which acknowledge a wide range of literacy levels, such as the *UNESCO Guidelines on Designing Inclusive Solutions and Developing Digital Skills*, can serve as a starting point for enhancing usability of virtual health services.<sup>20</sup>

Four records identified developing internal quality improvement initiatives, such as collecting socio-demographic data on virtual care service users to provide insight onto equity-related access and outcomes.<sup>8,20,21,40</sup> A brief by Canadian Institute for Health Information, (2022) highlighted that collecting information on groups experiencing discrimination and barriers in virtual health systems, including Indigenous Peoples and members of racialized groups, is important to understand who is accessing virtual care and who is not being reached.<sup>40</sup> Further, measuring and reporting on cultural safety provides an opportunity to ensure health system and provider accountability for providing equitable and culturally safe virtual care.<sup>40</sup> Health systems and governments also have a role in investing in educational training and advocating for the comprehensive inclusion of equity, inclusion, diversity and anti-racism practices into the formative training of health providers and managers.<sup>23</sup>

Four records recommended governments develop policies and strategies to enable better access to infrastructure that is required for all populations to equitably participate in virtual care.<sup>8,20,21,28</sup> This includes but is not limited to improving investments in broadband internet and availability of digital devices for those who do not have access. A narrative review recommended governments secure funding for projects that address equitable access to telehealth and develop targeted payment mechanisms to reimburse providers for helping clients to adapt to video-enabled telehealth.<sup>21</sup> Ensuring necessary infrastructure for racialized populations in urban settings, and in rural, remote, and Northern regions, including in First Nations communities, was cited as an important opportunity for governments to ensure marginalized groups have access to affordable and accessible infrastructure.<sup>44</sup>

In response to calls to enhance access to broadband Internet and improve digital equity, many local and provincial jurisdictions have launched programs to close the digital divide<sup>4,5,6,39</sup>, including the Government of Ontario, which committed to investing \$4 billion to connect homes in every region across Ontario with access to high-speed internet. This is the largest single investment in high-speed internet in any province, by any government.<sup>39</sup> At the local level, examples in the grey literature include City of Toronto's ConnectTO program which aims to actively expand access to free public Wi-Fi across Toronto neighbourhoods at community centres, arenas, Toronto Public Library branches, subway stations, and residents living in 22 apartment towers across select priority neighbourhoods.<sup>36</sup> Further, City of Toronto is in the process of developing a *Digital Equity Policy* which will outline a vision to address inequities in access to technology and internet.<sup>12</sup>

Federally, a *Virtual Care Policy Framework* by Health Canada, identified five policy pillars to enable the long-term adoption of virtual care. These pillars included patient and community-centred approaches, equity in access to virtual care services, remuneration/compensation, change management, and appropriateness, safety, and quality of services. Key areas of work related to equity were identifying barriers to access for marginalized groups, including rural and remote populations, Indigenous Peoples, and other racialized populations; developing pan-Canadian approaches to address barriers; considering affordable broadband access; and enhancing the publicly funded system so users do not face charges.

## Limitations

When interpreting the findings of this evidence brief, there are several limitations to consider. First, many of the studies were cross-sectional in nature, which does not allow for measurement of access over time. Another limitation described in many of the studies was a small sample size, which may impact generalizability of their results. Many studies consulted with providers, health system administrators, and program leaders rather than individuals who are users of health services. It is possible that findings could differ if these studies assessed challenges and recommendations directly from individuals accessing services. Additionally, the protocols and restrictions imposed on jurisdictions related to accessing virtual services were not the same, and as such, could impact results and findings.

Other confounding factors relate to the challenges experienced with virtual care during the pandemic, including limited health human resources across health organizations, which could impact interpersonal and organizational level findings. Despite these limitations, the available data provide insight on the possible challenges and suggestions to improve equitable access to digital health services.



## Discussion and Conclusions

The COVID-19 pandemic was an important opportunity to understand the equity implications of using digital means to implement public health programs and services. The studies reviewed in this evidence brief examined the equity impacts of virtual health programs and services, barriers to accessing virtual care, and highlighted key recommendations to address equity in virtual health across multiple levels.

There are abundant findings on the inequities in access to and utilization of digital health programs and services that were highlighted in this review. These findings suggest that many groups are at risk of being systematically excluded from digital health programs and services, especially if these services are not planned with diverse needs at the forefront.<sup>23</sup> This has the potential to widen health inequities among groups who already face challenges to accessing care.<sup>5</sup> There is also a notable gap in the literature on how best to incorporate the intersectoral needs of populations in virtual care. This urges the need to move away from a one-size-fits-all approach to delivery and provides the opportunity for practitioners and researchers to consider intersectionality when designing virtual services.<sup>21</sup>

While most barriers to digital health equity were noted at the individual and interpersonal levels, most recommendations were found at community and societal levels. These findings signal that while action to address digital health inequities can take place at individual and interpersonal levels, targeted and deliberate action is required at the community and societal levels in order to facilitate broader change within systems and policies in order to have larger impacts on the upstream and structural factors that impact access to digital health.<sup>19</sup>

As recovery activities of the pandemic are implemented, it will be important to continue to assess whether digital health services are the most appropriate means to deliver programs and services and more generally, to continue assessing and mitigating the equity impacts of these services. As new digital health innovations are introduced in the public health space, the barriers and strategies identified in this review offer providers, leaders, and organizations several recommendations to consider when planning and designing equitable, person-centred virtual care.

With technology continuously and rapidly evolving, virtual care is an inevitable part of the health landscape. In the absence of gold-standard roadmaps to delivering low-barrier virtual care, continued learning through implementation and evaluation will be crucial to developing equity-informed solutions. Public health practitioners and health systems, more broadly, must continue to critically reflect on ensuring the benefits of virtual care are adapted towards improving health equity.



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