Defining "Essential Digital Health for the Underserved"

INTRODUCTION

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ABSTRACT

The World Health Organization envisions achieving "Health for All," to strive for equitable access to important health information and services to attain wellness (WHO 2023a). The COVID-19 pandemic reshaped the Canadian health system toward increasing digital health services, which improved access for some but underserved others. Integrating digital health into holistic health services delivery deserves careful consideration. This paper introduces the concept of "essential digital health for the underserved," by first defining the terms "digital health," "essential" and "underserved." Then, we share a summary of a discussion at a May 2023 conference with stakeholders, including patients, caregivers, health professionals, health policy makers, private sectors and health researchers. A series of papers follow to explore

how digital health can help chart a responsible course for the future of essential digital health in Canada. In this post-pandemic era – with a health human resources shortage through attrition and retirement, an increased health service demand from patients and a greater strain on our recovering economy – innovative solutions need to be implemented to strengthen our Canadian health system.

Introduction

When the World Health Organization (WHO) was founded in 1948, it was firmly grounded on the enduring principle of "Health for All" (WHO 2023a). Halfdan Mahler, the director general of the WHO from 1973 to 1983, defined Health for All as "health (that) is to be brought within reach of everyone in a given country," and further defined health as a state that "enables a person to lead a socially and economically productive life" (Mahler 2016: 36). At 2023's World Health Day, which celebrated the 75th anniversary of the WHO, the annual theme was dedicated explicitly again to "Health for All" (WHO 2023a). *The Lancet* also chose to focus on universal health coverage (UHC) as a central tenet of improving the health of our global population ("Spotlight on Universal Health" n.d.). Analogous to an asymptote, achieving UHC toward Health for All is a worthwhile ideal that global and public health should always strive toward but never can quite completely attain. This endeavour is taking on more urgency due to the challenges we have been facing over the past decade (WHO 2019) and the fact that life expectancy globally has been dropping, including in Canada with a reduction three years in a row for the first time since it was recorded (Statistics Canada 2023).

Health for All Gaps and Essential Digital Health: The Canadian Context

Why does essential digital health matter in the context of Health for All (WHO 2023a)? The largest underserved population in Canada right now comprises the 6.5 million Canadians who do not have a family doctor, nurse practitioner or another regular provider (Duong and Vogel 2023). Canada is experiencing the worst crisis in access to primary care since the beginning of medicare. As of July 2023, there were 2,471 advertised positions for family physicians on government recruiting websites across Canada whereas only 1,550 family physicians newly graduated from Canadian training programs in 2022 (CMA 2023; Canadian Post-MD Education Registry 2023). Over the past four years, the average annual increase in the number of practising family physicians averaged less than 700 (CIHI 2023). While four new medical schools and campuses are in development, these graduates are years off and not a short-term solution. Governments clearly recognize this, and some are turning to virtual care and digital health as a *digital first* option. Nova Scotia, for example, offers publicly funded virtual care to patients who have registered to find a family doctor and has recently extended a limited offering to those who have one (Nova Scotia Health n.d.). Aside from these public programs, there are a number of privately funded virtual care offerings. Digital first holds potential implications for both relational and informational continuity of care. As noted by Haggerty et al. (2003), "information is the common thread linking care from one provider to another and from one healthcare event to another" (p. 1220). In a virtual care environment, the interoperability of the electronic records that are being captured during these encounters (which may extend over a long period of time) is a critical issue

(Forsyth et al. 2024). Interoperability is not just a virtual care issue as there are a number of nurse-practitioner and pharmacist clinics that offer in-person care. The Alberta Virtual Care Coordinating Body has just released a report with 18 recommendations on how interoperability can be enhanced, including a call for it to be mandated through legislation (Affleck et al. 2023). As Affleck et al. (2024) elaborated in their paper, human factors will play a key role in addressing the challenges in achieving seamless connected care.

We cannot lose sight of the remaining geographical and socio-economic inequalities in access to digital health technologies. A spring 2023 report of the auditor general of Canada reported that Internet access at target speeds of 50/10 Mbps reached 99.3% of households at the end of 2021, compared to just 59.5% of households in rural and remote areas and 42.9% in First Nations reserves (Office of the Auditor General of Canada 2023). The federal government has an ambitious target of 98% access to high-speed Internet by 2026 and 100% by 2030, supported by a Universal Broadband Fund of $3.225 billion that was launched in 2022 (Government of Canada 2022).

There is also a socio-economic gradient in access to digital health technology. The latest published data are from 2019. Virtually all persons in the highest income quartile (99.6%) had access to Internet at home, compared with four out of five (80.9%) in the lowest quartile. Similarly, more than nine out of 10 in the highest quartile had a smartphone for personal use, compared to four out of five (79.8%) in the lowest quartile (Statistics Canada 2019). Moreover, homeless persons and those living in precarious housing may not be captured in Statistics Canada's survey sampling methods. Aside from access to the technology, digital literacy is likely also an issue.

Defining digital health

The COVID-19 pandemic has led to a rapid health system adoption of digital health and virtual care in health services delivery. This accelerated adoption resulted in uneven digital health implementation across the spectrum of health services. With the emergence from the pandemic toward the new normal, it is important for our health systems to examine how we can integrate digital health into holistic health services delivery and ensure that essential health services can be optimally accessed by all.

Digital health can be simply defined as "... the use of information and communication technologies in medicine and other health professions to manage illnesses and health risks and to promote wellness" (Ronquillo et al. 2023: 1). From the perspective of health services delivery, digital health can take on many forms to improve patient care, streamline administrative processes for better health system efficiency and strengthen documentation to promote better communication between health professionals and patients. Examples of digital health that concentrate primarily on service delivery include but are not limited to:

- *telemedicine or virtual care* (Beheshti et al. 2022): technologies facilitating remote consultations and care delivery through video or audio calls, text messages or e-mails for health professionals to diagnose, treat and monitor patients at a distance;
- *mobile health* (Gromisch et al. 2021): applications for mobile and smartphones or tablets to support patients by tracking health and symptoms and for communication with health professionals;
- *remote patient monitoring* (de Farias et al. 2020): wearable technologies and devices that patients can use at home to capture

and transmit physiologic data such as vital signs and facilitate monitoring by health professionals at a distance;
- *electronic health records and patient portals* (Carini et al. 2021): digital platforms to store and manage patient information and records accessible by health professionals, patients or both to promote longitudinal documentation and communication;
- *virtual and augmented reality* (Yeung et al. 2021): technologies to support digital therapies such as mental health applications, pain management or alleviation of delirium;
- *data analytics for population health management* (Batko and Ślęzak 2022): the processing of large amounts of health data to support trend analysis, risk stratification and targeted interventions to improve overall population health; and
- *machine learning/artificial intelligence (ML/AI) driven clinical decision support* (Secinaro et al. 2021): the use of AI algorithms for diagnosis of conditions, selection of treatment and making clinical decisions based on patient data combined with medical literature.

There is good evidence to suggest that these digital health applications can be beneficial to support patient care and improve equity of access to healthcare for those traditionally underserved (Ho 2021; Kuziemsky et al. 2022; Ronquillo et al. 2023). Yet, paradoxically, digital health can further marginalize groups that are lacking in access to digital tools or compromised in digital health literacy, commonly referred to as the digital divide (Saeed and Masters 2021). Therefore, it is imperative that digital health technologies are chosen wisely to be applied in healthcare systems for good (Ho 2019).

Defining essential

What constitutes essential digital health services? Considering first the concept of *medically necessary*, there is no widely accepted definition of essential health services. Oxford defines "essential" as "completely necessary; extremely important in a particular situation or a particular activity" (Oxford Learner's Dictionaries n.d.). The WHO has been a pioneer in developing the concept of essential as it relates to health services. It created the first list of essential medicines in 1977, and the list is updated every two years. In the initial launch, "essential drugs" were defined as being "of the utmost importance, and are basic, indispensable and necessary for the health needs of the population" (WHO 1977). The 2023 version of the list includes 502 medicines (WHO 2023b). Numerous countries have adopted their own versions of an essential medicines list (Persaud et al. 2019).

More broadly, the WHO (1978) established primary care as essential healthcare in the *Declaration of Alma-Ata*. It included two important qualifiers: (1) universal access to individuals and families in the community and (2) at a cost that the community and country can afford to maintain at every stage of development. It specified a range of activities to be included, such as health education, public health measures, disease prevention, treatment and control and the provision of essential drugs (WHO 1978).

Monekosso (1984) used the WHO definition as the basis for a framework for the definition and implementation of essential healthcare. His basic classification followed the *Declaration of Alma-Ata* (WHO 1978) and included individual, family and community healthcare. Individual and family healthcare would be delivered by multi-disciplinary family health teams based at a health centre. Community healthcare could involve the

collaboration of health and other professional disciplines from other sectors and would be organized by the principal health team in the district. Critical to the implementation would be a community health profile constructed by a district health development committee. Since the origins of the term essential services, under the leadership of a British Columbia native, the late S. William Gunn, the WHO has also applied the concept of *essential* to surgery in disaster situations and developing countries, defining it to include surgical procedures that can be carried out in rural and remote hospitals mainly in developing countries by trained paramedical and nursing staff or physicians experienced in such situations (Gunn 2014).

The 2018 WHO *Declaration of Astana*, following a global conference on primary care, reaffirmed the importance of primary healthcare and acknowledged the role of digital and other technologies in helping individuals and communities to manage their health and healthcare (WHO 2018). The WHO's 2020–2025 global strategy on digital health states that "digital technologies are an essential component and an enabler of sustainable health systems and universal health coverage" (WHO 2021: 15).

In summary, essential health services should be universally available to a population and those who stand to receive them should have a say in what is on offer. Applying this principle to virtual care, Canada faces two challenges. First, while all Canadian jurisdictions enabled access to virtual care during the pandemic, thus far only Ontario and British Columbia have classified video and telephone consultations as an insured service in the provincial health insurance plan. Second, Canadian patients generally do not have choices in the publicly funded digital health services available to them. A recent editorial on essential digital health in cancer care has stressed the importance of integrating the needs and expectations of professional caregivers, patients and relatives, as well as the perspectives of other disciplines in taking a holistic approach to cancer care (Scotte et al. 2021).

It follows that to define essential services an examination of who is currently being underserved would be critical.

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Defining underserved

In general, an underserved population is understood as a population that does not have sufficient access to resources and health services to promote optimal well-being (Arya and Piggott 2018). The term "underserved" is often used interchangeably with the terms "vulnerable" (experiencing increased burden of illness and/or harms) and "marginalized" (isolated/other-ized/overlooked) in the literature (Arya and Piggott 2018). We will argue that these two terms are not synonymous and that using the term underserved must always be prefaced with the word "structurally" so that it is read as "structurally underserved."

Health inequities are unjust and systematic and have avoidable differences in health outcomes between groups of individuals (Braveman and Gruskin 2003). They occur because of social, political and economic policies that create social inequalities (Sayani 2019) and influence the distribution of the social determinants of health (SDH) (Raphael 2003). When health inequities are exacerbated because of unequal access to and utilization of healthcare, inequities become further entrenched in society, leading to structural

inequities (Sayani 2019). Structural inequities manifest in various forms, including but not limited to socio-economic inequality, racial discrimination, gender biases and ableism. For example, the COVID-19 pandemic forced a rapid shift to remote healthcare delivery using digital tools such as telehealth. Individuals without access to the necessary technology, Internet connectivity or digital literacy faced inequities in their ability to receive medical care. Thus, unequal access to telehealth services can exacerbate health inequities for groups already experiencing socio-economic inequalities, resulting in unjust and avoidable differences in health outcomes. These systemic, social and structural issues are inherent to the functioning of established power structures.

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By using the term *structurally underserved*, we are reminded that:

- underpinning differences in health risk are based on the avoidable and unequal distribution of the SDH;
- access (opportunity to have individual healthcare needs met) is multi-faceted and to increase utilization, care must be approachable, acceptable, available, affordable and appropriate (Khanassov et al. 2016; Sayani et al. 2023);
- the responsibility to improve the quality and distribution of the SDH and to ensure equitable utilization of care lies with the system and not with individuals who are being structurally underserved; and
- a gradient of inequity exists within underserved populations based on factors such as geographical location, socio-economic status, cultural diversity, historical injustices and cultural practices, resulting in a spectrum of structured disadvantage across populations that require tailored and targeted interventions to address these varying degrees of inequity.

Using terms to describe the attributes of a population is considered labelling – and we need to be thoughtful about our choice of words because language creates meaning and shapes lived realities. Foucault (1994) describes discourse as a way of viewing the self and the social world that is legitimized by the texts and contexts produced by the knowledge bearers. Thus, discourse becomes both a way of exerting power (by legitimation via texts) and an instrument of control (through influencing ideology and beliefs). As knowledge producers interested in improving health inequities, we must further challenge normative assumptions about who is *invisible*, *hard-to-reach* and *seldom-heard* within structurally underserved populations.

The notion of populations being *invisible* is a mischaracterization that serves to perpetuate marginalization. Populations have been made invisible by systems and processes that benefit from their exclusion. Similarly, referring to communities as *hard-to-reach* suggests that they are inherently difficult to find or engage with, which can lead to a sense of hopelessness in addressing their needs. Often, such communities are under-resourced – lacking the social/cultural support and infrastructure required to facilitate meaningful engagement. The concept of *seldom-heard* implies a passive silence on the part of populations when, in fact, their perspectives have been silenced by systems that do not value their experiences. To create meaningful change, we must reframe the conversation,

partner with diverse communities, co-create meaningful ways to safely centre all perspectives (Sayani et al. 2021, 2022) and dismantle the structures that perpetuate the reasons why they are structurally underserved.

Exploring "Essential Digital Health for the Underserved": TEC 2023

On May 12 and 13, 2023, the UBC Digital Emergency Medicine unit, Vancouver Coastal Health and VGH & UBC Hospital Foundation jointly hosted the Technologies in Emergency Care (TEC) conference. It received planning participation and/or support from (1) national partners, including Canada Health Infoway, Canadian Institute for Health Information, Canadian Institutes of Health Research, CMA Foundation, Canadian Medical Protective Association, First Nations Health Authority BC, Health Canada and Healthcare Excellence Canada; (2) BC provincial partners, including First Nations Health Authority, Ministry of Health, Provincial Health Services Authority and Rural Coordination Centre of BC; and (3) private sector partners, including Royal Bank, Teladoc, CGI, Deloitte, KPMG, Amazon Web Services, Boehringer Ingelheim, Braebon Medical Corporation, GalenMedical, Petal Health and Thrive Health. TEC 2023 brought together over 250 participants across Canada – including patient partners, innovators, health professionals and policy makers – to focus on the theme "Essential Digital Health for the Underserved," sparking discussion and illuminating on advancing digital health innovation, access and equity in Canada. Some key summary points discussed at the conference are captured as follows (unpublished data):

- When asked about who they believed were the underserved patient populations in Canada, Indigenous communities were the most mentioned. This sentiment was congruent with some of the well recognized but inadequately addressed structural barriers that Indigenous communities face when accessing healthcare in Canada. These barriers are predominantly structural and rooted in systemic racism, structural violence and colonialism in healthcare (Wylie et al. 2019). In addition, the audience also identified the elderly, rural populations, racialized communities and women as underserved populations. Some further argued that, if access to care is not timely, we are all underserved. This idea was particularly pertinent in discussions surrounding rural and remote healthcare.
- Audience members and panel speakers also commented that healthcare providers are an underserved population. It was discussed that healthcare providers who lack the resources and support to provide timely, quality care to patients are indeed an underserved population. For example, many rural providers may not have access to digital technology, technical literacy and peer-to-peer support to perform their services. Structural barriers experienced by rural healthcare providers include infrastructural inequities, lack of access to an Internet connection and lack of collegial support (Novak Lauscher et al. 2023). Audience members resonated with this theme and posed reflection questions such as:

  Providers may need [support with digital literacy]. How do we support the healthcare team to obtain this?

  What do providers want from digital health? How can we ease their burden?

These questions highlighted not only the gaps experienced by health providers but also the sentiment of shared responsibility among all stakeholder groups in advancing digital health equity, which was pervasive throughout the conference. Eighty-three percent of the respondents indicated that they were more inclined to advocate for equity in digital health compared with before the event.

Conclusion

Following the intent of TEC 2023 to elucidate "Essential Digital Health for the Underserved" more fully, a group of authors produced the series of papers in this issue through three foundational guiding lenses:

1. How can digital health address current gaps in healthcare delivery?
2. How can digital health offer innovative services that conventionally would not have been achievable before?
3. How can digital health not create new challenges or further marginalize groups in the future?

We hope that these papers in this issue are helpful and provocative enough to further dissect the core principles, values and possible road maps pertaining to how digital health services can augment and improve healthcare delivery so that a responsible course can be charted for the future of essential digital health in Canada for the underserved.

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