

Enhancing Equitable Access to Assistive Technologies in Canada: Insights from Citizens and Stakeholders*

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RÉSUMÉ

Les besoins en technologies d'assistance augmentent au Canada, mais l'accès à ces technologies est inégal et fragmentaire, ce qui ferait en sorte que des besoins demeureraient non comblés. Cette étude visait à identifier les valeurs et préférences des citoyens concernant les moyens à utiliser pour favoriser un accès équitable aux technologies d'assistance. Elle visait également à impliquer les décideurs politiques, les parties prenantes et les chercheurs dans des discussions afin d'élaborer des actions dans ce domaine. Au printemps 2017, nous avons organisé trois panels de citoyens et un dialogue avec les parties prenantes. Les principales conclusions des panels ont été incluses dans une synthèse qui a été partagée avec les participants du dialogue. Trente-sept citoyens ont participé aux panels et ont souligné l'importance de l'accès à de l'information fiable, d'un accès équitable aux technologies d'assistance (et ce, quelle que soit la capacité de payer), et de la collaboration. Les vingt-deux participants au dialogue ont fait valoir la nécessité d'un cadre d'orientation pour appuyer l'évolution des pratiques dans l'ensemble au pays. Le cadre d'orientation proposé combinerait des politiques et programmes simplifiés incluant la collecte et l'évaluation de données robustes pour appuyer l'innovation et l'imputabilité à travers le pays.

ABSTRACT

The need for assistive technologies in Canada is increasing, but access is inconsistent and fragmented which can result in unmet needs. We aimed to identify citizens' values and preferences for how to enhance equitable access to assistive technologies and to engage policymakers, stakeholders, and researchers in deliberations to spark action. In spring 2017, we convened three citizen panels and a stakeholder dialogue. Key panel findings were included in an evidence brief that informed dialogue participants. Thirty-seven citizens participated in panels and emphasized the need for access to reliable information, equitable access to assistive technologies regardless of ability to pay, and the need for collaboration. Twenty-two dialogue participants focused on the need for a guiding framework that supports fundamental change across the country. The proposed policy framework can enhance access to assistive technologies through enabling simplified policies and programs, along with fostering robust data collection and evaluation to support countrywide innovation and accountability.

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Introduction

As the proportion of older adults in Canada continues to grow, assistive technologies will continue to play an important role in the promotion of active and healthy aging, independent living, and aging-in-place (Canadian Institute for Health Information, 2011; Ndegwa, 2011; Senate of Canada, 2009; Statistics Canada, 2017a). Although older adults today are healthier and participate more in society than previous generations at their age, evidence shows that as people age they are nonetheless more likely to experience disability (Canadian Institute for Health Information, 2011; Statistics Canada, 2014b, 2015). Assistive technologies are closely linked with both aging and disability, and 85 per cent of those aged 65 to 74 – and 90 per cent of those aged 75 and older – with disabilities reported using assistive technologies (Statistics Canada, 2015).

Those who are most in need of assistive technologies are people living with a disability (including cognitive impairments and mental health issues), older adults, people with non-communicable diseases, and people with gradual functional decline (World Health Organization, 2016a). The United Nations' Convention on the Rights of Persons with Disabilities promotes equal rights for persons with disabilities, and the role of assistive technologies is pervasive within the Convention's 50 articles (United Nations, 2006). Canada ratified the convention in 2010 and ratified the Optional Protocol in 2018 (United Nations Treaty Collection, 2019). The 2017 response from the Committee on the Rights of Persons with Disabilities on the initial report from Canada recognized the barriers related to accessibility and, in particular, the lack of information communication for persons with disabilities (article 9); however, the response from the committee did not outline a specific mechanism for any jurisdiction to take action on improving equitable access to assistive technologies (United Nations, 2017).

In 2014, the Government of Canada issued the first report on the Convention of the Rights of Persons with Disabilities, which outlines federal, provincial, and territorial policies and programs (including the provision of assistive technologies) to protect rights and support full participation of persons with disabilities (Government of Canada, 2014). Whereas most assistive technologies assist persons with disabilities to help them remain at home and live independently, some technologies (e.g., handrails and portable computers) are designed such that everyone may benefit from their use.

Although assistive technologies are increasingly essential to the home and community care sector, three main challenges limit equitable access to assistive technologies in Canada's health systems. First, there is variability within and between provinces and territories for the types of assistive technologies that are eligible for

funding through government programs. Each province and territory in Canada has different legislation and specifications for what assistive technologies are funded and for whom, which means that many who need assistive technologies are unable to access them. A second challenge is that there is no single program that fully funds the purchasing and provision of the full range of assistive technologies. The eligibility criteria for government-funded assistive technologies is highly variable and may not necessarily be the most suitable to meet the unique needs of individuals. Lastly, despite an increased market supply of assistive technologies, procurement policies and regulatory arrangements have lagged in responding to innovation and growing user demand (Center for Technology and Aging, 2014; Senate of Canada, 2009). For example, manufacturers/vendors/distributors interested in developing and introducing new assistive technologies must apply separately to each province and territory, each of which has different regulatory approval processes.

The result is a complex landscape for both those who need assistive technologies and those who support them (e.g., caregivers navigating the system and/or health care providers attempting to link their patients to services and supports they need as part of their care). These issues can result in the inability to provide for those who need assistance; to meet our society's responsibilities to ensure that services and opportunities are available in a fair manner; and/or to reduce health care costs.

The way in which assistive technologies are defined within jurisdictions also creates barriers as there are a range of terms used in the field (e.g., assistive device, assistive product, assistive technology device). There is no consensus internationally or nationally on a standard set of terms. For the purposes of our project, we defined assistive technologies in terms of those that maintain or improve the functioning of individuals of any age (Mattison, Wilson, Wang, & Waddell, 2017). The assistive technologies can be available commercially as "off-the-shelf" products (e.g., handrails, shower stools, and electronic/smart technologies); they can require personalized adjustments (e.g., height-adjustable two-wheeled walkers), or they can be customized and designed specifically to meet the needs of the individual (e.g., prostheses, orthoses, and some wheelchairs) (Mattison, Wilson, et al., 2017).

The aim of this project was to spark action towards enhancing equitable access to assistive technologies in Canada. Specifically, the project goals were to (a) identify citizens' views and experiences with, and their values and preferences for, addressing the issue; and (b) prepare action-oriented health-system leaders in Canada by supporting their efforts to enhance equitable access to assistive technologies.

Methods

To meet these objectives, we convened citizen panels in three Canadian provinces followed by a stakeholder dialogue with Canadian policymakers, stakeholders, and researchers. The project was guided by an interdisciplinary steering committee to ensure integrated knowledge translation. The committee consisted of a small number of policymakers, leaders of key stakeholder organizations, and Canadian and international researchers.

Effective citizen engagement and public deliberation can lead to improved outcomes for citizens, policymakers, and policymaking. Improvements include, for example, (a) *instrumental outcomes* by generating awareness of lived experience and improving the quality of policymaking by ensuring that policies, programs, and services align with the values and needs of citizens (Gauvin, Abelson, Giacomini, Eyles, & Lavis, 2010); (b) *developmental outcomes* by providing education and raising awareness about pressing health issues, which also develops citizens' capacity to take part in public policy matters (Gauvin et al., 2010); and (c) *democratic outcomes* by supporting transparency, accountability, trust, and empowerment (Abelson & Gauvin, 2006; Abelson, Montesanti, Li, Gauvin, & Martin, 2010; Gastil & Richards, 2013; OECD, 2005; Posner, 2011). To inform the deliberations during the panels and to support informed judgments by citizens, we sent a plain-language citizen brief to panellists two weeks prior to the panel (Mattison, Waddell, Wang, & Wilson, 2017).

Using the McMaster Health Forum's established methods, we prepared a citizen brief that mobilized the relevant research evidence about the problem and its causes, elements of a potentially comprehensive approach for addressing it, and key implementation considerations. The brief was informed by feedback from 19 key informants (i.e., policymakers, leaders of key stakeholder organizations, and researchers) and consultation with the steering committee (Mattison, Waddell et al., 2017). Similarly, each dialogue participant was sent an evidence brief prior to the event, which was a more detailed version of the citizen brief and also included key findings from the three citizen panels (Mattison, Wilson, et al., 2017). The McMaster Health Forum's formative and summative evaluations of the citizen panels and stakeholder dialogues it convened found that participants consistently rated the briefs, panels, and dialogues very highly in terms of how they achieve their purposes. Figure 1 gives an overview of the methods used to prepare the evidence brief.

Citizen Panels

Citizen panels provide the opportunity for citizens to make informed judgments about enhancing equitable

access to assistive technologies. Specifically, we used a deliberative approach to uncover citizens' unique understandings of the issue in Canada and to spark insights about viable solutions that are aligned with their values and preferences (McMaster Health Forum, 2019). We convened three citizen panels in spring 2017 in three Canadian provinces (Ontario, Alberta, and New Brunswick).

We identified a purposive sample of participants for each of the panels from AskingCanadians (<http://www.delvinia.com/companies/askingcanadians/>), which is a full-service data collection firm with an online research community of approximately 600,000 Canadians. The pool of panellists maintained by the company is demographically representative of the Canadian population and continuously monitored against Statistics Canada population and demography data to gauge statistical representation. Their database provides more than 50 personal attributes of panellists (such as gender, age, level of education, employment, languages, etc.), tens of medical condition attributes, digital and social media behaviours, and other dimensions that cannot be found through mail list providers (such as Canada Post). The criteria for recruitment for this project specified that each panel should include a mix of people with and without lived experiences (including identified need for assistive technologies) and be balanced in terms of gender, age, socioeconomic status, ethnocultural background, and individuals living in different regions of the province in which the panel is hosted (e.g., urban, rural, and northern) (Table 1). The panels excluded (a) health care professionals or employees of health care organizations; (b) elected officials; (c) individuals working for market research, advertising, public media or public relations firms; and (d) individuals who had taken part in two or more previous citizen panels convened by our team. A thematic analysis of deliberations arising from the citizen panels was conducted by study-team members (CAM, MGW, and KW) based on notes from the facilitator, secretariat, and audio recordings from each panel.

Stakeholder Dialogue

Stakeholder dialogues are an approach to collective problem-solving and consist of off-the-record deliberations with policymakers, stakeholders, and researchers (Boyko, Lavis, Abelson, Dobbins, & Carter, 2012). The steering committee identified dialogue participants on the basis of their ability to bring unique insights about enhancing equitable access to assistive technologies in Canada, as well as on their ability to champion change following the dialogue. The dialogue was convened on June 8, 2017 in Hamilton, Ontario. The facilitator (MGW) engaged participants in deliberations about the problem, three elements of a potentially compre-

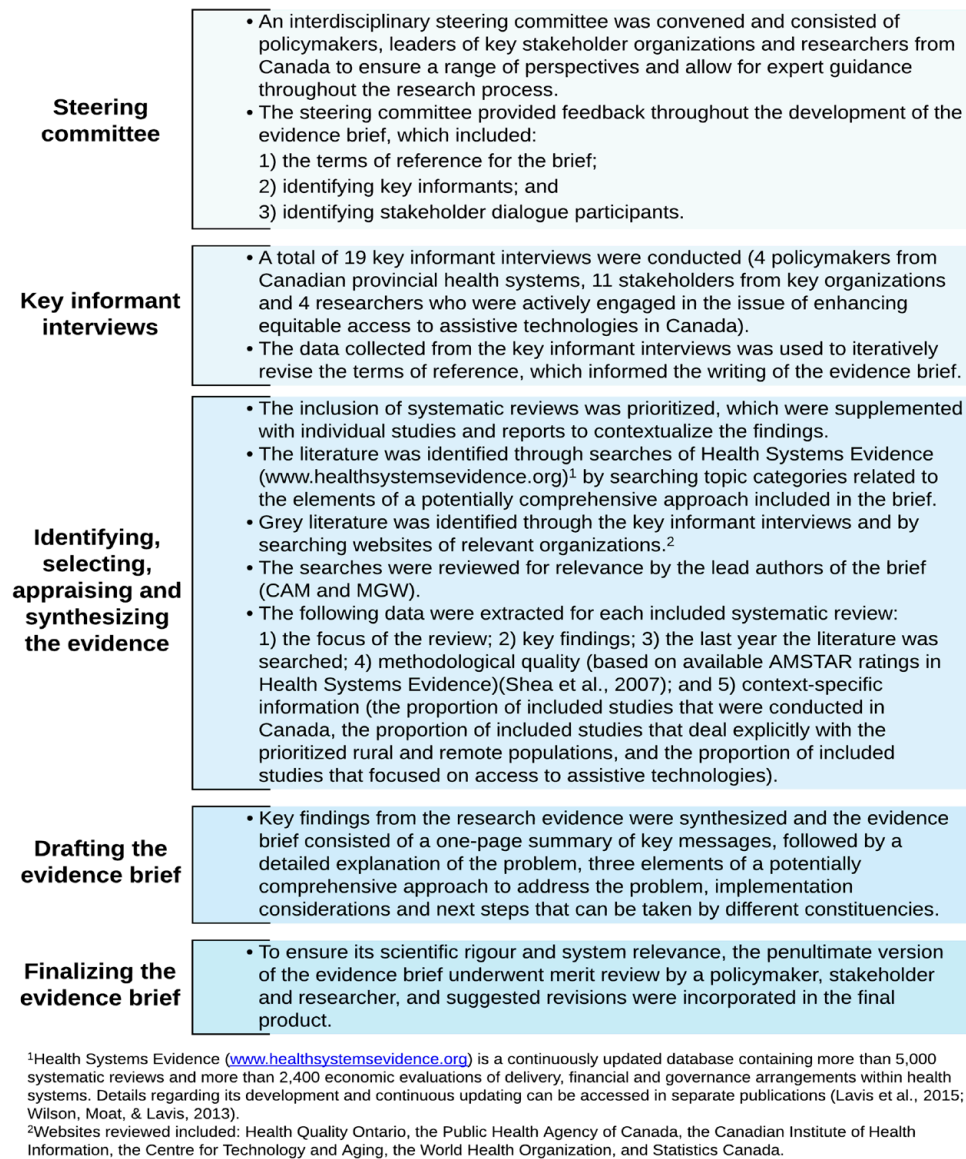


Figure 1: Overview of the stages of evidence brief development (adapted from Denburg et al., 2017; Wilson, Lavis, Moat, & Guta, 2016)

hensive approach to addressing the problem, implementation considerations, and next steps that could be taken by different constituencies. Similar to the citizen panels, study-team members (CAM, MGW, and KW) used notes from the facilitator and secretariat to develop a thematic analysis of the deliberations.

Results

Following is our summary of the main findings from the evidence brief and the major themes that emerged from the deliberations in the citizen panels and the stakeholder dialogue. Additional information is available on the McMaster Health Forum's website (www.mcmasterhealthforum.org), which includes the full citizen and evidence briefs as well as panel and dialogue summaries (Mattison, Waddell, Wang, et al., 2017;

Mattison, Waddell, & Wilson, 2017; Mattison, Wilson, et al., 2017; Waddell, Wilson, & Mattison, 2017). A high-level synthesis of the main themes are (a) the factors contributing to the problem identified in the evidence brief (Table 2); (b) additional factors contributing to the problem identified by citizen panel and stakeholder dialogue participants (Table 3); (c) key findings of the three elements of an approach to address the problem (Table 4); and (d) a summary of the implementation considerations, windows of opportunities, and next steps prioritized by dialogue participants (Figure 2).

Main Findings from the Evidence Brief

The main factors contributing to the challenges of enhancing equitable access to assistive technologies in Canada included (a) the many different definitions for

Table 1: Citizen panel characteristics

Characteristic	n	%
Edmonton, Alberta	15	41
Moncton (New Brunswick <i>n</i> = 11, Nova Scotia <i>n</i> = 1)	12	32
Hamilton, Ontario	10	27
Sex		
Women	18	49
Men	19	51
Age		
24–34	3	8
35–49	4	11
50–64	7	19
65–75	14	38
75 and older	8	22
Community size		
Rural	8	22
Urban	20	54
Suburban	9	24
Income		
Less than \$20,000	4	11
\$20,000 – \$34,999	4	11
\$35,000 – \$49,999	11	30
\$50,000 – \$79,999	10	27
More than \$80,000	7	19
Did not answer	1	3
How many have used assistive technologies?		
Sought or are currently using assistive technologies	21	55
Currently providing care to a family member or friend who has sought or is currently using assistive technologies	14	38
Have never sought or used assistive technologies	16	43

assistive technologies that can lead to confusion about what they are and what is covered by government-funded programs; (b) the increasing need for assistive technologies; (c) inconsistent access to assistive technologies, which in some cases results in unmet needs; and (d) system-level factors that can complicate access to assistive technologies.

We could select from many approaches to choose a starting point for deliberations about an approach for enhancing equitable access to assistive technologies in Canada. To promote discussion about the pros and cons of potentially viable approaches, our evidence brief outlined three elements of a potentially comprehensive approach, which we developed and refined through consultation with the Steering Committee and key informants. The elements focused on activities related to (a) informing citizens, caregivers, and health care providers to help them make decisions about which assistive technologies they need and how to access them; (b) helping citizens get the most out of government-funded programs; and (c) supporting citizens to access needed assistive technologies not covered by government-funded programs.

A range of barriers may hinder implementation of the three elements, each of which needs to be factored into any decision about whether and how to pursue any given element. The main barriers that we identified in the brief were as follows: (a) The expectations of individuals in need of assistive technologies and their caregivers in terms of what can be publicly financed may not align with the realities of government budgets; (b) the increased demands placed on health care providers in terms of supporting informed decision-making and system navigation (including determining program eligibility and coverage) may not be feasible given existing time constraints; and (c) streamlining government approaches for regulatory approval processes for assistive technologies requires significant involvement of and collaboration between federal- and provincial-level policymakers, which is often hard to achieve.

At the individual level, some patients, caregivers, and others may be unaware of existing or new supports available to them. At the care provider level, health care providers may not be equipped to be responsible for keeping up with which assistive technologies are eligible for public funding as well as who is eligible to receive them. At the organizational level, organizations that offer assistive technologies programs may find such programs difficult to coordinate; they may also lack the infrastructure needed to support system navigation and a streamlined approach to regulatory approval processes. At the system level, continuous innovation means that technologies are rapidly changing, and the criteria for identifying publicly financed technologies will need to be flexible and also require significant collaboration from a broad range of stakeholders (e.g., federal and provincial government ministries, private insurers, non-profit and charitable organizations, and manufacturers/vendors/distributors), which may be challenging. Potential windows of opportunity that could be capitalized upon include (a) demographic shifts in the population necessitating system change; (b) the alignment of provincial and territorial health-system policy priorities and strategic goals of the federal government on enhancing access to the home and community care sector; and (c) resource constraints, which can often support the creation of innovative approaches to health care problems.

Main Findings from the Citizen Panels

A total of 37 ethnoculturally and socio-economically diverse citizens participated in three panels (*n* = 15 Edmonton, *n* = 12 Moncton, *n* = 10 Hamilton) (Table 1). Panellists were from Alberta, Ontario, Nova Scotia, and New Brunswick. Of those who had lived experience, individuals had participated in a variety of programs and services offering assistive technologies, including federal programs (e.g., Veterans Affairs Canada), publicly funded provincial programs, municipal

Table 2: Summary of the main factors contributing to the problem outlined in the evidence brief

Issue	Factors Contributing to the Problem
<p>Evidence Brief (Mattison, Wilson, et al., 2017)</p> <p>The many different definitions for assistive technologies can lead to confusion about what they are and what is covered by government-funded programs.</p>	<ul style="list-style-type: none"> • As there is no common definition for assistive technologies, provinces and territories use different terms to refer to them, which results in government-funded programs often having narrow definitions in order to be clear about what is and is not eligible for public coverage (Alberta Health, 2016; Ministry of Health and Long-Term Care, 2016; Social Development, 2017). • The different terms used to refer to assistive technologies by federal, provincial, and territorial programs can be confusing for citizens, caregivers, and health care providers. • Identifying what assistive technologies are covered and the eligibility criteria for them can be challenging, especially when one needs to access and navigate multiple programs in different health and social systems to receive the needed assistive technologies.
<p>The need for assistive technologies is increasing.</p>	<p>Aging population</p> <ul style="list-style-type: none"> • For the first time in census history, there are more persons aged 65 years and older in Canada than children under age 15 (Statistics Canada, 2017a, 2017b). • The number of Canadians aged 65 or older is expected to double within the next two decades (Canadian Institute for Health Information, 2011; Public Health Agency of Canada, 2010). <p>Prevalence of disability</p> <ul style="list-style-type: none"> • The likelihood of disability rises with age, which is driving an increase in the prevalence of disability (Canadian Institute for Health Information, 2011; Statistics Canada, 2014b, 2015). • Of those aged 65 to 74 years, 33% reported some form of disability, and 43% of those aged 75 and older reported a disability (Statistics Canada, 2014b, 2015). <p>Burden of chronic disease</p> <ul style="list-style-type: none"> • The likelihood of having multiple chronic conditions also increases with age with 74% of Canadians aged 65 years and older reporting having at least one chronic condition (Canadian Institute for Health Information, 2011). • Medical advances and shifts in behaviours have changed the burden of disease, with many previously life-threatening conditions now appearing as chronic disease. <p>Caregiver burden</p> <ul style="list-style-type: none"> • Almost a quarter of Canadians (23%) are playing a role in providing care for family and friends with a long-term illness, disability, or aging-related needs. The role of caregivers will continue to grow as the shifts in demographics and the prevalence of disability and chronic conditions described above continue (Statistics Canada, 2014a, 2016).
<p>Access to assistive technologies is inconsistent, which in some cases results in unmet needs.</p>	<ul style="list-style-type: none"> • The World Health Organization's (WHO) Global Cooperation on Assistive Technology Initiative has identified 50 priority assistive technologies based on their ability to address population-level needs and to have a large impact on an individual's life (World Health Organization, 2016b). • A jurisdictional scan conducted as part of the AGE-WELL NCE project mapped the 50 priority assistive technologies according to those that are publicly financed by the federal or provincial and territorial governments in Canada. Findings from the programs surveyed include the following: <ul style="list-style-type: none"> ○ none of the 50 priority assistive technologies are available across all federal, provincial, and territorial programs; ○ several do not receive any public funding (e.g., time management products, portable travel aids, adaptive tricycles, and talking/touch-enabled watches); and ○ others receive public funding but only in a small number of provinces and territories (e.g., alarm signalers with light, sound or vibration, deaf-blind communicators, gesture-to-voice technology, global positioning system (GPS) locators, pill organizers, video communication devices) (Mattison, Wilson, et al., 2017; Schreiber et al., 2017).

Continued

Table 2: Continued

Issue	Factors Contributing to the Problem
System-level factors can make it complicated to access assistive technologies.	<p data-bbox="272 1411 293 1680">Governance arrangements</p> <ul data-bbox="302 184 407 1680" style="list-style-type: none"> • There is no clear stewardship for the provision of assistive technologies across the country, much like for the provision of prescription drug programs. • There is jurisdictional variability in regulatory approvals of assistive technologies that can create barriers to innovation. Key informants that we spoke to in developing the evidence brief indicated that manufacturers/vendors/distributors interested in developing and introducing new assistive technologies must apply separately to each province and territory, yet each has different approval processes. <p data-bbox="415 1444 436 1680">Financial arrangements</p> <ul data-bbox="444 199 518 1680" style="list-style-type: none"> • Funding and services for assistive technologies are provided through a complicated array of publicly and privately financed programs. • Sources of funding for assistive technologies include government programs (federal, provincial, and territorial agencies), non-profit and charity programs, private insurance, public insurance, and out-of-pocket payments. <p data-bbox="526 1453 547 1680">Delivery arrangements</p> <ul data-bbox="555 199 740 1680" style="list-style-type: none"> • Assistive technologies are delivered through a patchwork of programs that are highly fragmented, overlapping, and poorly coordinated within provinces and territories. • As a result of this patchwork of programs, system navigation becomes a challenge for those in need of assistive technologies and/or for their caregivers. • Equitable access extends beyond the assistive technologies themselves and includes the associated services required for them (i.e., trained personnel for fitting, user training, follow-up, and maintenance) (World Health Organization, 2016a). Many experience difficulties in accessing services associated with assistive technologies due to lack of funding and/or inequitable availability of services within provinces and territories. • Those living in rural and remote communities often face additional barriers, as programs and services are not distributed equitably across geographic areas in Canada (Government of Canada, 2011; Mattison & Lavis, 2016).

programs, charitable organizations, private insurance, and employment-based benefits.

During the problem deliberation process, citizens were asked to share what they perceived to be the main challenges related to accessing assistive technologies or the services and supports needed to allow their use, on the basis of their experiences or those of a family member or someone to whom they provide care. Panellists identified the following seven additional factors related to enhancing equitable access to assistive technologies in Canada: (a) assistive technologies do not seem to be fairly allocated; (b) access to assistive technologies is complicated and often not focused on needs of the individual; (c) many face challenges in paying for needed assistive technologies and/or engaging with the private sector to identify and purchase what they need; (d) there is a lack of an integrated approach to the delivery of assistive technologies as part of larger care pathways and packages of care; (e) stigma associated with needing an assistive technology; (f) caregiver burden and challenges in getting appropriate supports; and (g) the lack of integration of assistive technologies into infrastructure (Tables 2 and 3) (Mattison, Waddell, & Wilson, 2017).

During the deliberations about the elements of an approach to address the problem of access, panellists identified eight components that they viewed as being important to underpin any future actions (Table 4) (Mattison, Waddell, & Wilson, 2017), as follows:

- (1) empowered patients and caregivers who can make evidence-informed decisions through access to reliable information about programs and services offering assistive technologies;
- (2) collaboration among patients, providers, and organizations within the health system and other sectors to ensure more coordinated access to needed assistive technologies (and to care more generally);
- (3) trusting relationships between patients and their primary-care providers;
- (4) equity and fairness in access to assistive technologies;
- (5) manageable per capita costs for the system (as an outcome to prioritize);
- (6) a focus on excellent health outcomes through prevention of additional health issues;
- (7) flexibility and adaptability of services; and
- (8) accountability to ensure that pricing of assistive technologies is kept affordable.

When discussing the potential barriers and facilitators to moving forward, panellists identified collaboration between the health system and other sectors as a challenge, yet also as being central to supporting streamlined access to programs and services offering assistive technologies across Canada. Nonetheless, panellists thought there was an opportunity for coordination and collaboration given the potential for cost savings to the

Table 3: Summary of additional factors contributing to the problem identified by citizen panel and stakeholder dialogue participants

Issue	Factors Contributing to the Problem
Citizen Panel Participants (Mattison, Waddell, & Wilson, 2017)	
Assistive technologies do not seem to be fairly allocated.	<ul style="list-style-type: none"> • Most agreed that differences in assistive technologies programs and services within and between provinces meant that Canadians are treated differently based on where they live, especially those in remote communities, which they identified as being unfair. • Many described the variability in publicly funded lists and that some assistive technologies are central to living but are not publicly funded or only partially funded, which results in those with limited financial means often being unable to access needed assistive technologies. • Many agreed, across all three panels, that the focus of eligibility for assistive technologies is often only on older adults and those living with a physical disability, but that there are many in need of assistive technologies such as those with invisible disabilities (particularly mental health conditions) who are not able to access needed assistive technologies because they are not accounted for in eligibility criteria.
Access to assistive technologies is complicated and often not focused on needs of the individual.	<ul style="list-style-type: none"> • Expressing frustration with the complicated process of accessing assistive technologies, many participants agreed with the sentiment expressed by one participant that “a lot of people don’t know where to go, so they go without.” • Many participants also noted that: <ul style="list-style-type: none"> ◦ access to assistive technologies is unnecessarily complicated, and often does not focus on the needs of the individual; ◦ there is a lack of information to support navigation across this complicated landscape; ◦ there is a rigid classification of disability into “boxes” and allocation does not take into account the spectrum of need within these boxes, and many people do not fit well into just one box or any box at all; ◦ the assessment for eligibility is fragmented, as are access points, which make it hard to navigate the system, particularly for those with complex and/or multiple conditions (i.e., those fitting in multiple eligibility “boxes”); ◦ access is often bureaucratic, and many participants have to routinely “prove” disability to qualify for supports, even though they have a permanent disability (e.g., congenital amputation and a permanent colostomy); <ul style="list-style-type: none"> ▪ expressing frustration about this situation, one participant questioned “how many times do I have to prove that I have a disability to someone at the government?”; and ◦ there is a lack of coordination between agencies and inconsistencies between them in terms of what and how much is covered.
Many face challenges in paying for needed assistive technologies and/or engaging with the private sector to identify and purchase what they need.	<ul style="list-style-type: none"> • Many participants experience high out-of-pocket costs for assistive technologies, which was identified as a barrier to access for those with limited means to pay for them. • Some expressed frustrations with the lack of choice in vendors and challenges with approved vendors not supplying the specific technology that they required. • Several participants were concerned with the sustainability of charitable organizations providing assistive technologies in areas they thought should be the government’s responsibility.
There is a lack of an integrated approach to delivering assistive technologies as part of larger care pathways and packages of care.	<ul style="list-style-type: none"> • Most participants indicated that the challenges seem to extend beyond accessing assistive technologies and are embedded in broader health- and social-system challenges, such as: <ul style="list-style-type: none"> ◦ the role of the family physician as the gatekeeper to programs and services offering assistive technologies, which many noted as a challenge for those without a primary-care provider and/or those who cannot access one in a timely manner; ◦ lack of timely access to specialty care (with wait times for orthopedic surgeons as the main example cited) given that access to some technologies is contingent on assessments from specialists, and because it creates a lack of sensitivity in the system to addressing urgent issues; and ◦ health-system inefficiencies (e.g., duplication of laboratory work and lack of sharing information between health care providers) that often results in fragmented care, which many thought could be addressed through better sharing of medical information using technology.

Continued

Table 3: Continued

Issue	Factors Contributing to the Problem
Stigma is associated with needing an assistive technology.	<ul style="list-style-type: none"> • Some participants discussed the stigma associated with assistive technologies, either as users or as caregivers trying to encourage someone to use assistive technologies. • Examples of stigmatization associated with assistive technologies included wearing hearing aids, using a continuous positive airway pressure machine (CPAP) for sleep apnea, and a range of mobility devices (e.g., walkers and wheelchairs). • In describing their experience with using a CPAP machine, one participant shared that “the long-term effects are dramatic, but I travel for work. I don’t take it with me because of the stigma. I feel terrible by the end of the week because I don’t have it. There’s a mouth device but it’s not covered, and this clunky machine is a hassle. The assistive technologies have advanced, but it’s not readily available [in my province].”
Caregiver burden and challenges impinge on obtaining appropriate supports.	<ul style="list-style-type: none"> • Several participants mentioned the lack of supports available for caregivers, which mean their needs are often not addressed. • A few participants discussed the restrictions to their employment, either only working part-time or not able to work at all because of the responsibility for caregiving was too much. • Some participants expressed difficulties with finding and maintaining appropriate supports in the home.
There is a lack of integration of assistive technologies into environmental infrastructure.	<ul style="list-style-type: none"> • Many participants were frustrated with the variability of accessibility standards and the inaccessible public spaces (e.g., building codes and accessibility requirements) that pose challenges even when they have been able to access needed assistive technologies. • Some participants also identified challenges with using assistive technologies outside, citing frustration with maintenance of sidewalks and ramps, which leaves people housebound. • One participant summarized the challenge as “my own independence is limited by inaccessible environments.”
Stakeholder Dialogue Participants (Waddell et al., 2017)	
The root causes drive many of the challenges that individuals face in accessing assistive technologies.	<p>Participants identified four root causes that contribute to the challenges individuals face in accessing needed assistive technologies as follows:</p> <ul style="list-style-type: none"> • the lack of a consistent definition for assistive technology; • entrenched policies that have not been developed with unique client needs in mind; • theory not being used to drive the development of long-term policy goals; and • inconsistent or nonexistent data that can be used to identify the use and cost of assistive technologies.
Complex patient journeys are not often accommodated in the current system.	<ul style="list-style-type: none"> • Participants emphasized the lack of awareness of assistive technologies in the health system in terms of what is funded, among health professionals in terms of knowing what supports and technologies exist; and by the public in knowing where to go to gain access to needed assistive technologies. • Participants discussed the limited focus that is spent on assessing an individual’s needs and pairing them with one or more assistive technologies, despite there being significant evidence to support the use of assessments in determining suitable assistive technologies. • There are groups who face complex challenges, which are often neglected (e.g., women with disabilities and those with intellectual disabilities).
Financial challenges persist as a critical barrier to achieving equitable access to assistive technologies.	<ul style="list-style-type: none"> • Participants explained that individuals continue to face financial burden from having to pay out-of-pocket for their assistive technologies that they require to meet basic needs. • Participants spoke to the limited coordination that exists between what is covered publicly under government programs and what private health plans set as their scope of coverage. • Participants linked a lack of action on enhancing equitable access to assistive technologies to broader sustainability concerns for health and social systems. • Without a substantial evidence base on the impact of assistive technologies, many participants highlighted how it will be challenging for policymakers to know where to invest. Similar to pharmaceuticals and medical technologies, one participant described that there is “always the latest thing but that we have no idea if it works.” They further clarified that a systematic method of evaluating what to fund and what not to fund with regards to assistive technologies is needed in Canada.

Table 4: Summary of key findings related to three elements of an approach to address the problem

Sub-elements	Summary of Key Findings from Systematic Reviews* (Mattison, Wilson, et al., 2017)	Summary of Key Findings from the Citizen Panels (Mattison, Waddell, & Wilson, 2017)	Summary of Key Findings from the Stakeholder Dialogue (Waddell et al., 2017)
Element 1: Informing citizens, caregivers, and health care providers to help them make decisions about which assistive technologies they need and how to access them			
Information or education provision from logical community points of contact (e.g., primary-care providers, home- and community-care coordinators or providers) and/or through a reliable and trusted online source to those who can make direct use of assistive technologies (including families and caregivers)	<ul style="list-style-type: none"> Two medium-quality reviews and one high-quality review examined the provision of education in decision-making and found that it increased knowledge and reduced levels of uncertainty among patients but had no effect on patients' final decision-making (Dugas et al., 2012; Durand et al., 2014; Stacey et al., 2014). Other findings suggest continued uncertainty regarding levels of effectiveness between different participatory models of decision-making, between different types of decision aids, and the relationship between health literacy and the effectiveness of communication of risks for treatment decision-making (Legare et al., 2012; Malloy-Weir, Charles, Gafni, & Entwistle, 2015; Sarrami-Foroushani, Travaglia, Debono, & Braithwaite, 2014). 	<ul style="list-style-type: none"> Participants emphasized the need for empowerment to be able to make evidence-informed decisions through access to reliable information on programs and services offering assistive technologies, which included having a central point of contact to help with system navigation (with information presented in accessible language). Implementing these components focused on: <ul style="list-style-type: none"> collaboration among patients, providers, and organizations within health and social systems to ensure more coordinated access to needed assistive technologies which could be facilitated through better information sharing (e.g., electronic health records and patient-held records) and information and educational supports for providers; the need to build trusting relationships between patients and their primary-care provider given the importance of this relationship for identifying a need for technologies and facilitating access to them; and collaboration between the health system and other sectors in terms of enhancing awareness of and access to the full range of programs that provide access to assistive technologies. 	<ul style="list-style-type: none"> Participants focused on two approaches that could be pursued to inform citizens, caregivers, and health care providers to help them make decisions about which assistive technologies they need and how to access them: <ol style="list-style-type: none"> enhance access to information and streamline the consumer experience through simplifying the process for gaining access to assistive technologies and creating a dedicated role for navigators to help individuals to access the right services; and support client-driven approaches to individualized assessments and solutions to ensure that the right set of assistive technologies are bundled based on what clients need and through the use of multi-purpose assistive technologies whenever possible.
Questions/prompts about the need for assistive technologies included in decision aids that support care planning and purchasing of assistive technologies (either through government or private sources) based on the best available evidence, and the values and preferences of those living with disabilities and their caregivers	<ul style="list-style-type: none"> None identified. 		
Providing system navigators for those with complex needs and equipping them with the knowledge and skills needed to identify and support access to assistive technologies for those who could benefit from them	<ul style="list-style-type: none"> One recent low-quality review found that system-navigator interventions significantly improved outcomes related to chronic-disease management, and reduced barriers to accessing primary care that new immigrants or ethnic minorities often face (Shommu et al., 2016). One recent medium-quality review found limited evidence for the use of system navigators, but their use for individuals with complex conditions appeared beneficial (Manderson, McMurray, Piraino, & Stolee, 2012). One recent medium-quality review found mixed evidence on the potential for decision-support interventions, including health coaching and telephone outreach; to generate savings, however, a number of factors may differ between interventions and affect the ability to generate savings (Walsh et al., 2014). 		

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Table 4: Continued

Sub-elements	Summary of Key Findings from Systematic Reviews* (Mattison, Wilson, et al., 2017)	Summary of Key Findings from the Citizen Panels (Mattison, Waddell, & Wilson, 2017)	Summary of Key Findings from the Stakeholder Dialogue (Waddell et al., 2017)
Element 2: Helping citizens get the most out of government-funded programs			
Providing public financing (e.g., through needs-based allocations and/or controlled budgets by the individual that allow them to purchase the products they need) based on need for different types of assistive technologies, such as those that aim to improve physical and mental health, mobility, social connectedness, safety, leisure, and activities of daily living	<ul style="list-style-type: none"> • The four systematic reviews on universal public health insurance found that increasing coverage to include prescription medicines resulted in a reduced likelihood of paying for medications, reduced out-of-pocket payments, increased utilization of medications and services, and increased adherence to prescriptions (Freeman, Kadiyala, Bell, & Martin, 2008; Meng et al., 2011; Salmi et al., 2015; Skinner et al., 2014). • One economic evaluation on health budgets for chronic disease (based in the U.K.) found no difference in clinical outcomes; however, those with personal health budgets reported a higher quality of life at lower cost and greater psychological well-being than those in the control group (Jones et al., 2013). • One medium-quality review found the following strategies for expanding insurance coverage: <ul style="list-style-type: none"> • modifying eligibility criteria; • using targeted awareness campaigns to draw attention to changes in coverage, or to encourage individuals to enroll; • offering subsidies to low-income people; and • modifying enrollment approaches (e.g., simplifying procedures or integrating sources of enrollment (Meng et al., 2011). 	<ul style="list-style-type: none"> • Participants consistently emphasized equity and the need to ensure that all of those in need of assistive technologies have access regardless of ability to pay. • Preferences for how to implement equitable access centred on: <ul style="list-style-type: none"> ◦ ensuring access to assistive technologies that help people meet basic needs for daily living; ◦ enhancing access to all of the 50 priority assistive technologies listed by the World Health Organization; and ◦ addressing the persistent inequitable access to assistive technologies that several groups seem to consistently face (e.g., people with disabilities, mental health conditions, and chronic disease, as well as those who are homeless or marginally housed). • In implementing the other components of this element, participants focused on managing per capita costs through efficiency (e.g., the role of assistive technologies in prevention of additional health issues), flexibility (e.g., to address the unique needs of individuals), and collaboration between the health and other sectors (e.g., streamlining access to programs). 	<ul style="list-style-type: none"> • Participants agreed that more could be done to help citizens get the most out of government-funded programs, and focused their discussions both on the role of the government facilitating access to assistive technologies and on changes that could be made to existing programs. • Participants highlighted four approaches for achieving this: <ol style="list-style-type: none"> 1) designing government programs with the aim of maximizing participation (e.g., to support basic independence and instrumental activities of daily living) through developing a list of essential assistive technologies as well as developing a subsidy or entitlement to be spent on the assistive technologies; 2) leveraging the efforts of existing organizations and actors across Canada by developing an evidence base that could support decision-making on what to fund; 3) integrating universal design into public policy (e.g., through municipal building codes); and 4) investing in and scaling up initiatives that have been shown to be successful.
Streamlining existing government approaches to publicly financing assistive technologies (e.g., tax deductions)	<ul style="list-style-type: none"> • None identified. 		

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Table 4: Continued

Sub-elements	Summary of Key Findings from Systematic Reviews* (Mattison, Wilson, et al., 2017)	Summary of Key Findings from the Citizen Panels (Mattison, Waddell, & Wilson, 2017)	Summary of Key Findings from the Stakeholder Dialogue (Waddell et al., 2017)
Establishing transparent and flexible criteria to define what technologies will be covered	<ul style="list-style-type: none"> • One recent medium-quality systematic review identified program budgeting and marginal analysis and multi-criteria decision analysis as two common models for decision-making. (Cromwell, Peacock, & Mitton, 2015). • Two recent medium-quality reviews and one older-quality review identified criteria that are frequently used to evaluate options for resource allocation, which included: <ul style="list-style-type: none"> ◦ effectiveness of intervention; ◦ budgetary impact or affordability; ◦ equity or effect on health inequalities; ◦ burden of disease that the intervention is targeted towards or number of people likely to benefit; ◦ ability to (or ease of) access to the intervention; ◦ cost-effectiveness; ◦ quality or uncertainty of available evidence; and ◦ ease with which the intervention can be implemented (Guindo et al., 2012; Huber & Mielck, 2010; Mitton, Smith, Peacock, Evoy, & Abelson, 2009). 		

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Table 4: Continued

Sub-elements	Summary of Key Findings from Systematic Reviews* (Mattison, Wilson, et al., 2017)	Summary of Key Findings from the Citizen Panels (Mattison, Waddell, & Wilson, 2017)	Summary of Key Findings from the Stakeholder Dialogue (Waddell et al., 2017)
Element 3: Supporting citizens to access needed assistive technologies that are not covered by government-funded programs			
<p>Cost-sharing mechanisms, which could involve one or more of the following:</p> <ul style="list-style-type: none"> • sliding-scale payments with the amount paid privately (e.g., through insurance or out-of-pocket) and publicly determined by an individual's ability to pay, • flat-rate user fees, or • full private payment (either from insurance coverage or out-of-pocket payment). 	<ul style="list-style-type: none"> • One recent medium-quality review found that reference pricing schemes led to an increase in switching from more expensive drugs to generic drugs, or to those drugs that had dropped their prices as a result of the reference policies and resulted in a significant reduction (11.5%) in the overall price of targeted drug classes (Lee, Fischer, Shrank, Polinski, & Choudhry, 2012). • Two high-quality reviews and one low-quality review assessed other cost-sharing mechanisms including the introduction of co-payments and found that they led to a reduction in medication adherence and resulted in potentially adverse health effects, which may require later treatment and have an impact on emergency department admissions, nursing home admissions, and outpatient care (Gemmill, Thomson, & Mossialos, 2008; Luiza et al., 2015; Sinnott, Buckley, O'Riordan, Bradley, & Whelton, 2013). • One medium-quality review assessed possible roles for the private sector in the procurement and distribution of pharmaceuticals, finding that well-funded, private, disease-specific programs could improve the stock management of pharmaceuticals (Nunan & Duke, 2011). • Two reviews examined the use of social franchising for the delivery of services or products and found that they were able to effectively deliver services and products to local communities and resulted in an overall increase in the utilization of services (Beyeler, York De La Cruz, & Montagu, 2013; Nachtnebel, O'Mahony, Pillai, & Hort, 2015). 	<ul style="list-style-type: none"> • Participants identified the following values-related themes: <ol style="list-style-type: none"> 1) collaboration between the health system and other sectors, with a focus on the private sector (e.g., insurance companies) and voluntary sector (e.g., charities): <ul style="list-style-type: none"> • information sharing across these sectors was identified as central to streamlining access to assistive technologies; • participants suggested that organizations within these sectors could undergo an approval process with approved organizations being able to access patient information and share information; 2) accountability to ensure that pricing of assistive technologies is kept affordable: <ul style="list-style-type: none"> • for example, participants indicated that holding vendors accountable for the pricing of assistive technologies and maintaining reasonable expectations for profit would help to lower insurance premiums; 3) equity and fairness in terms of the cost-sharing mechanisms used: <ul style="list-style-type: none"> • for example, to prevent those in need from not accessing technologies because of inability to pay. 	<ul style="list-style-type: none"> • Participants differed in the role they thought that the private sector should play in providing access to assistive technologies. • Participants generally agreed that the private sector should be more complementary to the services that are publicly funded. To do so, participants emphasized the importance of two approaches: <ol style="list-style-type: none"> 1) coordinate public and private coverage through cost-sharing models; and 2) de-medicalize some assistive technologies to decrease their cost.

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Table 4: Continued

Sub-elements	Summary of Key Findings from Systematic Reviews* (Mattison, Wilson, et al., 2017)	Summary of Key Findings from the Citizen Panels (Mattison, Waddell, & Wilson, 2017)	Summary of Key Findings from the Stakeholder Dialogue (Waddell et al., 2017)
Enhancing access to employment-based benefits programs by supporting workforce participation	<ul style="list-style-type: none"> • Two recent reviews (one high-quality and one medium-quality) identified the following interventions that helped individuals successfully return to work following injury: 1) involving a workplace component; 2) care from an interprofessional team; 3) begin intervention within six weeks of the injury; 4) psychological interventions as part of a multi-component intervention; and 5) rehabilitative interventions (Cancelliere et al., 2016; Hoefsmit, Houkes, & Nijhuis, 2012). • One older medium-quality systematic review suggested that the most important determinant of a successful return to work was the goodwill of both the employee and employer (MacEachen, Clarke, Franche, & Irvin, 2006). • One recent high-quality review identified a number of personal factors (e.g., being younger, having high levels of education, having a higher income, and having positive social support from friends and family) that were found to improve the likelihood of a successful return to work (Islam et al., 2014). 		
Streamlining regulatory approval processes for technologies to be brought to markets across the country	<ul style="list-style-type: none"> • None identified. 		

Note. * Medicines are used as an analogue to assistive technologies as they provide some indication of how individuals may use and demand products as a result of changes to financial mechanisms.

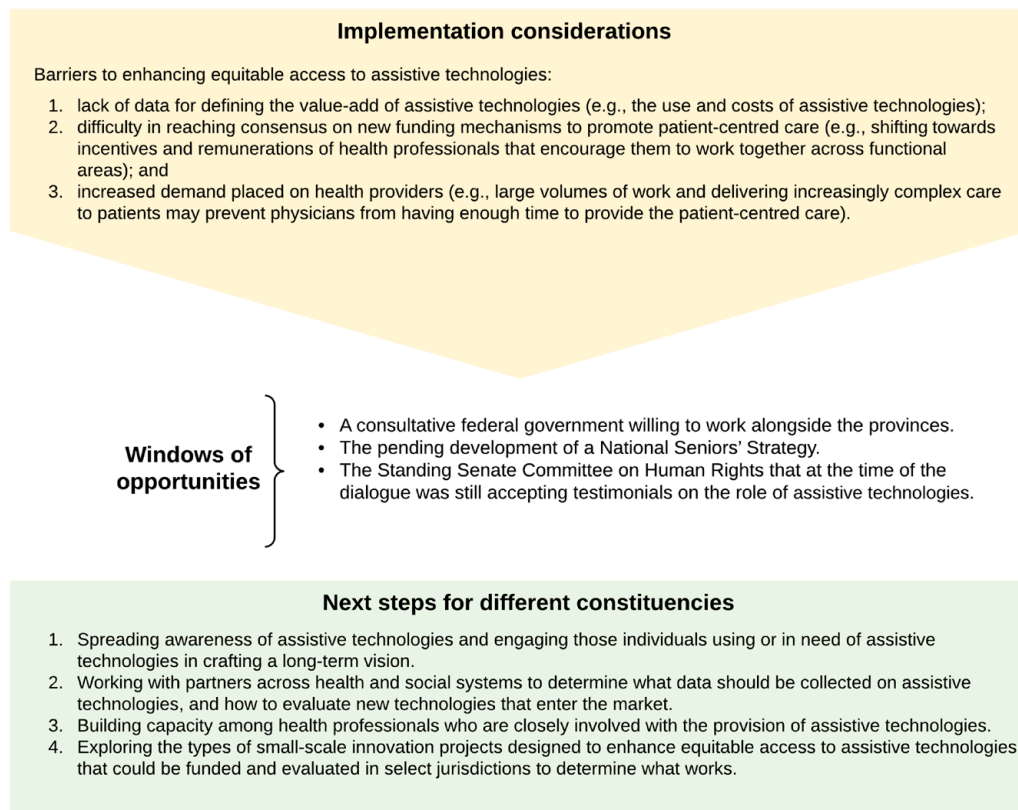


Figure 2: Summary of the implementation considerations, windows of opportunities and next steps involved in enhancing equitable access to assistive technologies prioritized by dialogue participants (Waddell et al., 2017)

health system through greater efficiency. Within the health system and delivery of health care services, panellists identified having occupational therapists work within primary-care teams as key to supporting system navigation.

Main Findings from the Stakeholder Dialogue

The dialogue convened 22 participants, which included six policymakers, two managers of community-based organizations, one member of a health care professional organization, three representatives from citizen groups, seven individuals from stakeholder organizations, and three researchers. Twenty-one of the participants were from Canada; one of the researchers was from another country but with expertise in the Canadian policy context. Of those from Canada, 13 brought a national perspective to the issue. This included two federal policymakers and 11 representatives of national stakeholder organizations (e.g., community-based organizations, professional associations, patient groups, and/or groups with a direct interest in the topic). The remaining eight participants were from British Columbia (*n* = 2), Alberta (*n* = 1), Ontario (*n* = 4), and Nova Scotia (*n* = 1), which included three policymakers, two from stakeholder organizations and two researchers (who, although from universities based in a specific

province, also brought a broader national and international perspective to bear on the issue).

During the deliberation about the problem of access to assistive technologies, participants agreed with the features of the problem outlined in the evidence brief and identified four additional challenges: (a) a small number of root causes (e.g., lack of consistent definition of assistive technologies, client-focused policies, long-term policy goals, and data that can be used to identify use and cost of assistive technologies) that drive many of the challenges that individuals face in accessing assistive technologies; (b) complex patient journeys not often being accommodated in the current system; (c) financial challenges that are a critical barrier to achieving equitable access to assistive technologies; and (d) difficulty in achieving innovation and ensuring that high-quality products come to market. Table 3 provides the key messages, with examples, related to the problem identified by dialogue participants.

Participants collectively agreed that there is a need to focus on a policy framework that includes guidance for both short- and long-term change; Table 4 presents a summary of the main findings from systematic reviews related to the three elements of a potentially comprehensive approach to addressing the problem, along with key messages from the deliberations about each of

these elements. Dialogue participants identified the following principles to underpin such a policy framework:

- (1) Using a client-driven approach (i.e., engaging those affected by the issues in the change process and client centredness as a principle in enhancing equity);
- (2) Fostering agreement on a definition of assistive technologies and/or bill of rights for those with disability;
- (3) Ensuring universal access for technologies that support basic and instrumental activities of daily living (and thereby helping people lead independent lives without costly intervention from the health sector);
- (4) Ensuring a simplified approach to accessing assistive technologies coupled with the flexibility needed to address an individual's unique needs;
- (5) Moving beyond a medical model to either a social or rights-based model (which was seen as helping to address many issues, including reducing assistive technology prices and adopting a holistic needs assessment approach);
- (6) Fostering national leadership related to assistive technologies, as well as partnerships with industry to achieve common goals; and
- (7) Fostering innovation not only for new technologies, but also for policy approaches that could be used to enhance equitable access (which could involve drawing on lessons learned from similar areas of policy such as prescription drugs, but with the caveats that not all examples will be applicable and that there is potential risk of continuing in a medical model depending on the analogy used).

In considering how to move forward with the elements and a long-term policy framework, participants identified several implementation considerations (see Figure 2). This included the identification of key barriers to implementation that must be overcome. These include (a) the lack of data and evidence for crafting a compelling narrative that is needed to politically prioritize efforts to enhance equitable access to assistive technologies and ultimately spark change; (b) difficulty in reaching consensus on new funding mechanisms to promote patient-centred care; and (c) the increased demand placed on health care providers (e.g., from large volumes of work and delivering increasingly complex care to patients) which may limit their time to provide the patient-centred care that is needed. Participants also identified several opportunities for moving the policy agenda forward, which included a consultative federal government willing to work alongside the provinces, the pending development of a National Seniors' Strategy, and a senate committee on robotics, artificial intelligence, and 3D printing technologies that at the time of the dialogue was still accepting input.

Building on this, participants identified important next steps that they (either individually or collectively) thought were needed (see Figure 2). These included (a) spreading awareness of assistive technologies and engaging those individuals using or in need of assistive technologies in crafting a long-term vision; (b) working

with partners across health and social systems to determine what data should be collected on assistive technologies, and how to evaluate new technologies that enter the market; (c) building capacity among health professionals who are closely involved with the provision of assistive technologies; and (d) exploring the types of small-scale innovation projects designed to enhance equitable access to assistive technologies that could be funded and evaluated in select jurisdictions to determine what works.

Discussion

Principal Findings

To enhance equitable access to assistive technologies in Canada, our findings point to a need to foster buy-in from policymakers, stakeholders, and researchers across the country. In considering the full array of elements, there was a general agreement that a focus on both short-(incremental) and long-term (aspirational) change is needed. Participants noted that despite the many changes they wanted to make as to how individuals access and use assistive technologies, they understood that these changes would take time, and that there was a need to make small improvements to the system in its current form. Participants highlighted incremental changes across all three elements that should be pursued, as Table 4 illustrates. In element 1, this included adopting a common language, improving service navigation and enhancing access to individualized assessments and solutions. For elements 2 and 3, participants focused on the need to better align government programs with the needs of those requiring assistive technologies, as well as to coordinate public- and private-insurance coverage to minimize gaps.

Throughout the deliberations, participants also emphasized that to move forward with any of the proposed solutions, there is a need for an organization or a close network of groups to "own" the area of assistive technologies. There was, however, some disagreement about whether this should be taken up by an existing organization or whether the development of a new agency that is able to straddle the medical-social divide might be a better fit.

Strengths and Limitations

The main strength of our approach was the use of best-available research evidence combined with citizens' values and preferences to inform the evidence brief used to stimulate deliberations in the stakeholder dialogue. We considered systematic reviews along with an appraisal of their methodological quality in order to understand what is known about the elements that might contribute to addressing the problem of access.

We integrated findings from the thematic analysis of the citizen panels into the evidence brief and informed the deliberation of the problem as well as the individual elements in the stakeholder dialogue. One main limitation of our approach is that, potentially, not all stakeholders were represented at the dialogue. However, we were able to ensure geographical representation with participants who brought a national perspective and from seven provinces (British Columbia, Alberta, Manitoba, Ontario, Quebec, Nova Scotia, and Prince Edward Island). In addition, the Steering Committee ensured representation from the range of key stakeholders involved in the provision of assistive technologies at both federal and provincial levels and across organizations. Similarly, within the citizen panels there was also a potential limitation related to representation. The three panels were held in locations to draw from a wide range of citizens across Canada; however, no panel was conducted in French. Although the Moncton panel was conducted in English, the facilitator also spoke French and many of the participants were Francophone.

Implications for Policy and Practice

As we highlighted in the introduction, priorities in provincial and territorial health systems in Canada are focused on expanding the home and community care sector and supporting older adults at home to live at home as long as possible. However, programs that provide access to assistive technologies, which can enhance care and independence at home, vary greatly, and the approach to delivery is highly fragmented. Enhancing equitable access to assistive technologies in Canada therefore provides an opportunity to address important policy priorities and aligns with the United Nations' Convention of the Rights of Persons with Disabilities, inasmuch as the use of assistive technologies spans health and social services sectors, care settings, and health conditions. Equitable access to assistive technologies is a key resource that, along with environmental design (universal), has the potential to improve citizens' abilities.

The deliberations highlighted the need to develop a list of essential technologies for which those in need could receive coverage. Participants cited pharmaceutical advances in Canada as an example and discussed the possibility of creating a pan-Canadian alliance for assistive technologies to mirror the pan-Canadian pharmaceutical alliance, which could support collective purchasing power and more efficient procurement systems. Another feasible opportunity for policy development, identified by participants, was the integration of environmental design (universal) and considerations for those who may need assistive technologies when crafting public policy.

Implications for Future Research

In keeping with the aforementioned implications for policy, future research is needed to identify and develop the list of essential assistive technologies for public financing in Canadian health systems. As part of the evidence brief we prepared, we mapped the 50 priority assistive technologies identified by the World Health Organization's Global Cooperation on Assistive Technology (GATE) initiative according to those that are fully or partially publicly financed by the federal government or provincial and territorial governments in Canada (World Health Organization, 2017). None of the 50 priority assistive technologies were available across all federal, provincial, and territorial programs, and several did not receive any public funding (e.g., time management products, portable travel aids, adaptive tricycles, and talking/touch-enabled watches) (Mattison, Wilson, et al., 2017; Schreiber, Wang, Durocher, & Wilson, 2017). Moreover, only a few of the items on the list are designed to address cognitive or mental health concerns, even though cognitive changes (e.g., related to dementia) or mental health concerns (e.g., depression, social isolation, and loneliness) often occur as people age. Given this identified gap, there is a need for future research to create a list of essential assistive technologies that support basic independence and instrumental activities of daily living.

Other areas for future research that we identified in this project include (a) identification of the needed outcomes to support processes for the provision of assistive technologies (e.g., is an individualized model economically viable in terms of decreased waste, improved satisfaction, and improved quality of community participation?); (b) identification of the core indicators for improved system navigation; and (c) identification of the outcomes of improved system navigation in terms of quality of care and system performance.

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