

Context for the brief

More than ever, health-system leaders are grappling with whether and how to use of a wide range of innovations (e.g., remote-monitoring technologies and innovations driven by artificial intelligence (AI)) to address complex system and policy challenges. Many of these innovations are promising and could strengthen our health systems and improve the health of the population.

However, we have a long history of struggling (and sometimes failing) to adopt health-system innovations in Canada.(1) Electronic medical records, virtual care and new interdisciplinary care models are just a few examples of innovations that health-system leaders have been struggling with for many years. The current financing structures for the adoption of new technologies (e.g., through charitable fundraising or one-time government funding) across provinces and territories poses a challenge to develop and evaluate permanent or scalable innovations.(2)

Between August 2022 and May 2023, the McMaster Health Forum convened a series of four horizon-scanning panels with health-system leaders from across Canada to identify and prioritize promising health-system innovations. The final panel convened in May 2023 identified several priorities that federal, provincial and territorial health systems could focus on for future innovations, including the spread and scale of: 1) remote monitoring technologies; 2) AI-driven patient intake platforms; and 3) early warning systems to identify policy needs.(3)

The final horizon-scanning panel also identified a cross-cutting priority that focuses on building structures and processes to create an integrated innovation system that is enabled by an ‘innovation backbone’ designed to better enable the adaptation and uptake of health-system innovations such as those prioritized above.(3) In particular, it was emphasized by participants that such an ‘innovation backbone’ would need to incorporate interoperable systems supporting the innovation, as well as governance, financial and delivery processes, that support uptake and spread of innovations. Building on this finding, this evidence brief aims to inform a stakeholder dialogue that is designed to spark action towards such an integrated health-innovation system in Canada (see Box 1). The brief draws on the best-available research evidence, insights from a series of four citizen panels that were convened in February 2024 on the same topic and informed by a plain-language version of this evidence brief, and a jurisdictional scan.

Evidence Brief

Creating an integrated innovation system to enable the adaptation and uptake of health-system innovations in Canada

26 March 2024

Box 1: Approach and supporting materials

This document was prepared to inform a stakeholder dialogue, which provides individuals – specifically those who will be involved in or affected by decisions about creating an integrated innovation system to enable the adaptation and uptake of health-system innovations – with an opportunity to deliberate about the problem and its causes, elements of an approach for addressing it, key implementation considerations, and next steps for different constituencies. A separate document contains six appendices:

- 1) background to and methods used to prepare evidence brief
- 2) jurisdictional scan of organizations in Canada and in other countries focused on supporting health-system innovation
- 3) evidence syntheses relevant to creating structures and processes to support the demand for innovation (element 1)
- 4) evidence syntheses relevant to supporting organizations that could serve as ‘innovation general contractors’ (element 2)
- 5) evidence syntheses relevant to creating structures and processes that could support the supply of innovation (element 3)
- 6) references.

Defining 'health-system innovation'

The World Health Organization (WHO) defines innovation as “a new or improved solution with the transformative ability to accelerate positive health impact.”(4) A health-system innovation can improve the efficiency, effectiveness, quality, sustainability, safety and/or affordability of health systems.

Health-system innovations are often thought of as new technologies relying on software and hardware. This can include:

- new devices to remotely monitor patients at home (e.g., sensors, cameras and wearable devices)
- new technologies to help patients and healthcare professionals make decisions about treatments
- new systems using artificial intelligence to collect and analyze patient information
- new early warning systems to monitor patients and warn healthcare professionals when patients are at risk.

However, health-system innovations can also mean, more broadly, new ways of doing things at a system level that may or may not involve new technologies. Such system-level innovations may include:

- new ways to govern health systems (e.g., how to more meaningfully engage patients and citizens in decision-making processes)
- new ways to deliver care (e.g., mobile outreach for enhancing access to primary care)
- new ways to fund health systems or to pay healthcare professionals (e.g., by using more flexible funding models that enable new and innovative ways of delivering care and adapting them to local contexts)
- new health policies to include equity, diversity and inclusion considerations
- new ways to better integrate health and social services.

In contrast to the WHO definition, not all innovation can bring transformative change in health systems. Some may simply help to modernize health systems (e.g., sending prescriptions by emails instead of fax machines). However, other innovations can be transformative, such as using AI to create patient intake platforms that can screen, recommend and triage patients.(5)

In addition, it's important to consider whether and how the nature of innovation needed may differ by sector or regions in a health system. For example, hospitals are more likely to be more focused on technology-based innovations given the complexity of care and support need for inpatient, outpatient and coordination/follow-up after discharge. In contrast, long-term care may be less dependent on technology, but may need to focus on innovations that enhance structures and processes to improve efficiency and quality (e.g., to help personal support workers spend more time with clients and less on administrative work).

The problem

We have identified four facets of the problem, which are outlined in the visual below and discussed in the sections that follow. The framing and details of the problem were refined in collaboration with our project steering committee, and through key informant interviews that we conducted with policymakers, leaders of systems, organizations and professional organizations, industry representatives, citizen leaders and researchers.





Governments are lacking structures to support the ongoing identification, adaptation and uptake of innovations

Governments in Canada are good at supporting health researchers and ‘inventors.’ For example, governments have created business ‘incubators’ and ‘accelerators’ helping early-stage businesses navigate some of the most challenging aspects of running a business and developing novel ideas.

However, governments in Canada are not always as good at investing in structures that can turn novel ideas into concrete health-system transformations that everyone can benefit from. This can be explained in part by:

- the lack of structures embedded in governments that can help identify and prioritize health-system challenges that are being faced, and identify innovations that can address these challenges
- the Canadian innovation system being fragmented (for example, many different organizations from different sectors and from different levels of governments are involved, but are not fully aligned).

However, governments in Canada have established structures to support the evaluation and adoption of certain types of innovations, namely health products, drugs and devices. For example, several agencies evaluate and provide recommendations about these innovations, such as the [Canadian Agency for Drugs and Technologies in Health](#), the [Ontario Health Technology Advisory Committee](#) and the [Institut national d'excellence en santé et services sociaux](#). However, there are typically no such structures that are specific for health-system innovations and that can be used to support integration of innovations into health systems to address pressing challenges.

There are some notable examples of initiatives to support innovations at the national, provincial and local level in Canada, as well as in other countries that we have compiled in Appendix 2 from our jurisdictional scan. However, many of these examples are focused on particular components of a potential innovation system (e.g., on supporting suppliers of innovation), specific types of innovations (e.g., digital tools) or on specific sectors (e.g., primary care or specialty care) or conditions (e.g., mental health). Perhaps the most notable exception to this is the Alberta Innovation Pipeline, which has been created to provide a more formalized process to introduce innovations into the day-to-day operation of the health system in Alberta, rather than using ad hoc criteria to identify and choose which innovations to invest in.⁽⁶⁾ The pipeline uses a five-step process to test innovations and generate evidence from real-world settings to allow poor-performing innovations to fail fast and others to advance through the pipeline towards adaptation and implementation. The steps include: 1) idea generation (solution discovery); 2) proof of concept in the health system; 3) implementation testing in Alberta in different contexts; 4) implementation work to scale (adaptation/tailoring to optimize and/or support spread); and 5) implement for sustainment to maintain gains achieved.⁽⁶⁾



Some organizations are not welcoming to innovation from the ‘outside’

Health organizations in every sector can benefit from innovation: home and community care, primary care, specialty care, rehabilitation, long-term care and public health. However, some organizations are not welcoming to innovation from the ‘outside.’ In other words, these organizations may not look to outside innovators and prefer ‘locally grown’ innovations, or don’t foster an innovation incubator capability with their structures, policies, processes and incentives. As we heard from many key informants in developing this evidence brief, this could be explained, at least in part, by:

- a lack of capacity to identify, adapt and support the uptake of innovation to meet the specific needs of organizations
- using a ‘top-down’ approach to innovation where innovations are imposed externally rather than through a process informed by meaningful citizen and stakeholder engagement and with financial support for grassroots innovations ⁽⁷⁾
- limited budgets to support innovation (e.g., many healthcare organizations are able to allocate only a very small percentage of their annual budget to innovation as compared to private sector organizations)

- limited organizational readiness for change (e.g., some organizations have a mandate to protect people, which can be perceived as being contrary to the mandate of being innovative, which may carry some risk) (8)
- public scrutiny about whether and how local businesses or vendors are supported as part of innovation initiatives, which can lead to hesitancy in looking to innovation from the ‘outside.’

An important dimension of the first and second points above is that most small- to medium-sized healthcare organizations do not have the technical support to do evaluations of new technologies or innovations. A key part of supporting innovation is having the resources to conduct such evaluations on an ongoing basis. For example, some systems (e.g., through innovation hubs in Newfoundland and Labrador and Nova Scotia) (9; 10) have built capacity for this by supporting embedded scientists roles, such as those supported through Health System Impact Fellowships. Moreover, enabling organizations to engage in this type of rapid-learning and improvement cycle for innovations requires access to objective third-party evaluation. This can open opportunities to test different options, allowing some to fail fast and then pursue other promising approaches in ongoing rapid-learning and improvement. However, resource-constrained organizations cannot do this without broader system-level supports and resources that can also enable change management and acceleration innovation across a system.

Regarding the last point, many leaders from across the country recognized the importance of increasing the risk tolerance of decision-makers.(3) This was viewed as important to allow for pilot testing of innovations. Such pilot testing will result in some innovations failing and some showing promise (e.g., as prioritized in the Alberta Innovation Pipeline). Those that show promise often require continued improvement cycles before being ready for testing innovations at a larger scale and adapting for use across systems.



We are lacking an infrastructure that can help bridge the demand and supply for innovation

There is a disconnect between the demand and supply for innovation. In other words, there is a disconnect between health-system leaders (on the demand side) and innovators (on the supply side). This can be explained, in part, by:

- most innovators pushing out their innovations with the hope of health-system leaders being receptive (as opposed to using health system and policy challenges as a starting point for innovators to respond to with opportunities to pilot in a coordinated way in the system)
- the market being fragmented with innovators (and some innovation hubs) at the local, provincial, national and international levels, and working on a wide range of innovations rather than in a formalized and coordinated approach at the system level
- a lack of pan-Canadian infrastructure for aligning and coordinating the demand for and the supply of innovations where both can be at the same table to identify what pressing problems are faced and how innovators can help (i.e., helping health-system leaders to identify the challenges they need solved with innovation, letting innovators move quickly to come up with potential innovations, and supporting the adaptation and uptake of innovations)
- few funding mechanisms to incentivize the adaptation and uptake of innovations that can contribute to enhancing equity-focused quadruple aim outcomes (patient experiences, population health, per capita costs and provider experiences) in provincial and territorial health systems.

A cross-cutting challenge for bridging demand and supply is the lack of interoperability of systems and processes within and between provincial and territorial health systems. This creates important challenges for sharing standards and processes, as well as data and evidence to enable rapid-learning and improvement cycles. Moreover, it can create lock-in to sub-optimal systems. For example, without policies, standards and guidelines to ensure innovation suppliers adhere to interoperability and ways to transfer data between technologies and the structures and processes that harness them, any approach to accelerate innovation prospectively is doomed. While this challenge is predominately relevant for technologies, there also needs to be interoperability between sectors within health systems to enable evaluation of outcomes and impact.



Citizens, patients and caregivers and their communities play a limited role in health-system innovations

Innovations typically go through different stages. This can generally be conceptualized in a process of identifying a problem, developing and testing solutions, adopting the innovation and diffusing the innovation across the health systems.

At each stage in the ‘innovation journey,’ different stakeholders are involved depending on what is needed to help the innovation progress. However, citizens, patients and caregivers and their communities currently play a limited role, despite being able to provide meaningful input at all stages. A recent evidence synthesis revealed that citizens are more commonly engaged in the earlier stages of innovation and mostly on service innovations (as opposed to clinical innovations or health-system innovations).(11) This points to a need to strengthen the engagement of citizens, patients, caregivers and their communities in all stages of the innovation journey. This is crucial for being able to leverage their lived experiences and ideas to co-produce health-system innovations that are responsive to the lived realities of those for whom health-system innovations are meant to benefit. The key findings from the series of citizen panels that we convened in February 2024 that are summarized below underscore this assertion. Without engagement that is coordinated between innovation demand and supply throughout the innovation cycle, there is a risk of not developing a complete picture of the landscape of system and policy challenges that could benefit from innovation and perpetuating an uncoordinated and fragmented innovation system.

Insights from citizen panels about the problem

We hosted a series of four citizen panels in February 2024 (with two panels on 2 February, one on 8 February and one on 9 February 2024) with a total of 48 citizens. The panel participants were socio-economically and ethnoculturally diverse, were from across Canada, balanced in ages ranging from 18 to 65+ and included people who were diverse in their perceptions of technology (e.g., from those who are ‘early adopters’ to those who typically wait much longer to adopt new technologies in their lives).

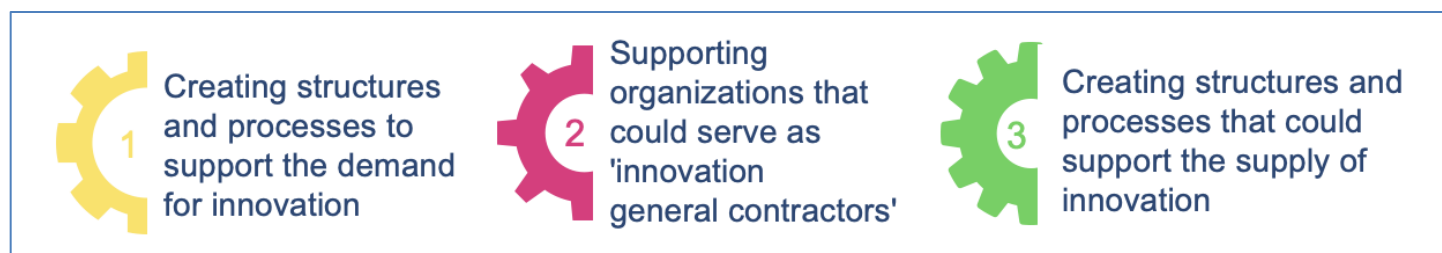
Participants generally agreed with the framing of the problem above, but also engaged in in-depth deliberation based on their views and experiences. We organized the key findings from these deliberations into seven themes, which are presented in the table below.

Key themes about the problem identified by citizen panel participants	Insights and examples from citizens
Reliance on ‘push’ (from suppliers) rather than ‘pull’ (demand from decision-makers and users) in driving the innovation agenda	This was highlighted as a key part of the problem, as panel participants noted it means that innovations are always attuned to the specific challenges being faced by those who are involved in or affected by decisions about provincial and territorial health systems
Lack of dialogue and coordination across governments, sectors and stakeholders (e.g., citizens, patients, providers)	- There needs to be some overarching leadership to promote coordination and share lessons learned - During the pandemic, a large amount of innovation occurred in a coordinated and fast-paced way due to a shared and urgent goal that is lacking during non-emergency times, and the resulting complacency and lack of urgency poses a barrier to a coordinated approach to innovation - Lack of continuity of care across providers was noted as a challenge for harnessing innovations in a way that is people centred because it creates inconsistent and fragmented approaches to adopting innovations

Key themes about the problem identified by citizen panel participants	Insights and examples from citizens
	The media was noted as needing to play a bigger role in highlighting ongoing challenges in health systems, encouraging input from citizens, and providing transparency about what is being said and how it is being acted on
Need to better manage risk and build trust to allow for innovation to take place	- Building trust with the public for how and why new innovations are important and can be used to strengthen health systems (e.g., about accommodating AI solutions or new roles for providers such as nurse practitioners, pharmacist prescribing, and remote monitoring) may help with acceptance of more risk-taking - Building trust among decision-makers, managers and providers increases willingness to take on risk associated with developing and implementing innovations (e.g., to assuage concerns about accountability and liability)
Human and financial resource constraints are a key barrier to innovation	Innovation cannot be a substitute for proper funding for people, equipment and supplies, and the availability of services needs to be scaled to accommodate population growth and increasing complexity of health issues
Lack of financial incentives to encourage the development, uptake, testing and scale-up of new innovations	People get stuck in old habits, and incentives can help encourage the accommodation of new innovations
Equity issues present a key barrier to the uptake of innovations	- The uptake in innovation is more challenging for some than others because of inequitable distribution of hospital infrastructure (e.g., better resourced hospitals in urban centres as compared to rural hospitals that lack the same technological infrastructure to take up new innovations) or user characteristics (e.g., providers uninterested in changing how they practice) - While panel participants generally noted that new innovations cannot be rolled out as a one-size-fits-all approach and that considerations for how to support all communities is important, some also noted that in some cases innovation will always have to start somewhere and eventually 'trickle down'
Regulatory and other challenges	- Lack of long-term data and evidence on new innovations makes policymakers hesitant to pursue them - Cyber security, systems compatibility and concerns about extra maintenance can inhibit new innovation - There are concerns about additional administrative responsibilities for family physicians to adapt their practice to innovation taking time away from seeing patients

Elements of a potentially comprehensive approach for addressing the problem

Three elements of a potentially comprehensive approach to address the problem were developed and refined through consultation with the Steering Committee and key informants who we interviewed during the development of this evidence brief.



These elements are designed to provide an initial way of thinking about how an integrated health-innovation system can be conceptualized. The elements should be considered as interdependent components of a larger innovation system. Such a system could be enabled by an 'innovation backbone' that provides an interface/coordination mechanism between demand and supply for innovation, which we present as being facilitated by an 'innovation general contractor.' Moreover, each of these elements should include processes to meaningfully engage citizens, patients, caregivers and their communities.

We present each of the three elements below with what each could include and insights from relevant evidence syntheses that we identified about them. We then supplement this information with insights from: 1) a jurisdictional scan of notable examples of initiatives to support innovations at the national, provincial and local level in Canada, as well as in other countries (additional details provided in Appendix 2); and 2) the citizen panels convened in February 2024.

1 Creating structures and processes to support the demand for innovation

This first element focuses on the structures and processes that could better support all the demands for health-system innovations from those working in health systems, citizens, patients and caregivers. More specifically, this element could include:

- identifying common challenges that could be solved by innovations (e.g., addressing the health human resources crisis in the health systems across Canada)
- prioritizing these challenges and determining which ones are the most important to address (e.g., reducing administrative burden on family physicians to give them more time with patients and to reduce burnout)
- identifying and prioritizing promising innovations to address these challenges, and building business cases that evaluate their potential system-level benefits, costs and risks in a way that helps system decision-makers identify which ones to further pilot, evaluate and adapt for local contexts
- supporting and investing in an innovation 'backbone' that allows suppliers to 'plug into' the system to evaluate innovations to address prioritized challenges by ensuring:
 - interoperable systems are in place to support testing, refinement and adaptation of innovations
 - governance, financial and delivery processes that support uptake and spread of innovations
- implementing decision-making processes about the adoption of innovations based on evidence-informed business cases (e.g., that make explicit the benefits, harms, costs, views and experiences of citizens/patients, providers and others stakeholders and adaptations that may be needed to support system-level uptake), in the same or similar way that we do for products, drugs and devices (e.g., making decisions about which innovations will be publicly covered or not, for whom and under what circumstances)
- supporting the diffusion and uptake of innovations across health systems.

We identified four evidence syntheses that addressed this element (see Appendix 3), which revealed the following key insights:

- One medium-quality synthesis about a process called ‘horizon scanning’ highlighted that it is being adopted globally to identify, assess and prioritize innovations and trends at an early stage of their development (12)
 - This process can help health-system decision-makers to be proactive and prepare for change
 - Various methods are being used to conduct horizon scanning, which can include examining the available evidence, and soliciting feedback from industry, experts, policymakers and other stakeholders
 - However, the authors of the evidence synthesis indicated that incorporating additional tools may be required to understand the weighting of the available evidence and/or to support the generation of complex scenarios
- One low-quality synthesis focused on how health technology assessment agencies choose which topics to address (13)
 - Typically, these agencies use multiple steps to select their topics, notably: 1) developing a framework with specific criteria to choose topics; 2) identifying potential topics; 3) short-listing those topics; 4) scoping of potential topics; 5) scoring and ranking of potential topics; and 6) deliberation and decision on final topics.
 - In Ontario, a framework was developed for assessing health technologies that is focused on identifying potential benefits and harm, assessing costs and cost-effectiveness, and patient-centredness (e.g., whether they are aligned with patient values and preferences; consistent with commitments to autonomy, privacy and confidentiality; enhance equity in access or outcomes; and improve the coordination of care) (14)
- One medium-quality synthesis examined how community members and stakeholders are involved in decisions to determine publicly funded services, and various methods are being used, including consultation approaches (e.g., surveys, focus groups, public dialogues, citizens’ juries), participation in decision-making committees, advisory councils, local planning meetings and appeals mechanisms (15)
- Another medium-quality synthesis found that frameworks to support the adoption and uptake of health-system innovations typically focus on five components:(16)
 - the innovation (e.g., highlighting the importance of it being evidence-based, developed from a credible source, superior to existing approaches, simple to understand, easy to modify or tailor and aligned to existing culture)
 - the spread or scale-up process (e.g., moving from a single pilot to small-scale evaluations in different contexts to systematic efforts to replicate in other settings by using rapid-cycle tests of change)
 - the resource team supporting the implementation (e.g., having credible and committed change agents, providing enough resources to support the innovation and defining who has responsibility to implement)
 - the innovation user (or organization) who would ensure that implementing the innovation is important compared to other priorities, and who then provides leadership, infrastructure and incentive systems to support implementation
 - broader environmental factors (e.g., considering how socio-cultural values and beliefs, local conditions, priorities, available financing and external pressures can either drive innovation or hinder implementation).(16)



Supporting organizations that could serve as ‘innovation general contractors’

The second element focuses on supporting organizations that could serve as ‘innovation general contractors,’ where they work closely with decision-makers to build an in-depth understanding of their challenge(s) and coordinate with health-system innovators to develop and test a solution. This requires an innovation contractor to have an in-depth understanding of the demand for innovations (e.g., about how health-systems work, decision-making processes and what decision-makers need to inform decisions about whether and how to adopt innovations) and on the supply of innovations (e.g., trusted vendors to turn to, how to engage researchers and other stakeholders to enable rapid-learning and improvement cycles to evaluate innovations, identify the ones with promise and help build a business case that meets the needs of decision-makers).

Consider, for example, a general contractor coordinating a home renovation for a client. A good general contractor would need to work with the client (i.e., the demand side for the work) to understand the challenges they face in their home that have led them to want to change its functionality. Such challenges could be due to changing needs,

such as growing older and facing mobility challenges, having more people living in the home (e.g., from a growing family with more children) that puts pressure on the existing layout (e.g., limited space) and how everyone uses the house and/or on the need to incorporate more technology to adapt and integrate with how they technology in other parts their lives. The general contractor would then work with a variety of specialty services (e.g., architects and structural engineers) that can collectively incorporate these innovations to co-create a plan with the client with iterative revisions to ensure it meets functionality requirements and to determine what changes to the existing infrastructure are needed. The general contractor then coordinates with the trades (e.g., electricians, carpenters, plumbers) in the sequence needed to implement the plan, but with adaptations to the plan as additional challenges or barriers to implementation are encountered.

Therefore, in the context of health-system innovation, such a contractor role could follow the same type of approach, such as by:

- establishing partnerships between those on the demand side (i.e., decision-makers who face pressing and complex health-system challenges that need to be addressed), the supply side (i.e., innovators) for innovation and with citizens, patients, caregivers and their communities
- harnessing these partnerships to:
 - document the needs of and challenges faced by those working in health systems, as well as the needs of citizens, patients and caregivers
 - identify and refine priorities that can be used to line up investment and support
 - co-design testing and evaluation where innovators on the supply side are able to ‘hook-up’ to the innovation-system ‘backbone’ to: a) do beta testing in the product development phase to adapt to local context; and b) test prioritized innovations at scale system backbone
 - support innovation refinement and adaptation (e.g., in specific settings or with specific types of professionals and patients) to further test and refine
 - build a business case development with those on the supply side that meets the needs of those on the demand side
 - use a learning health system approach (such as the [learning health system action framework](#) produced by the Institute for Better Health, Trillium Health Partners) to advance adaptation and implementation support for the most promising innovations.

We identified four evidence syntheses that provide some insight about this element (see Appendix 4), which revealed the following key insights:

- A growing body of evidence about ‘living labs’, which are designed to work as intermediaries among citizens, government agencies, research organizations, industry and other stakeholders
 - These living labs are open innovation ecosystems in real-life contexts using iterative feedback processes throughout a lifecycle approach of an innovation to create sustainable impact
 - They focus on co-producing innovations, rapidly co-creating prototypes, testing them, and helping the adoption and uptake of innovations
 - One evidence synthesis found that the level of user engagement is still low in living labs and that living labs are predominantly used in developing clinical innovations, as opposed to broader health-system innovations (17)
 - However, one low-quality synthesis revealed that living labs are often used to co-produce innovations with vulnerable populations, such as adults with dementia living in the community or nursing homes (18)
 - One medium-quality synthesis found few studies about approaches or frameworks for evaluating the impact of living labs (19)
- One low-quality synthesis identified strategies that policymakers have used to increase interaction and partnerships for innovation, which included innovation vouchers (e.g., to help small and medium-sized companies access expertise within post-secondary institutions and to form business partnerships), developing coordinated research consortia for evaluation of innovations, marketing support, and/or larger clusters that bring these types of activities together in a region, province/state or country (20)



3 Creating structures and processes that could support the supply of innovation

The third element focuses on structures and processes to better support those producing innovations to address health-system challenges. More specifically, this element could include:

- responding to decision-maker needs by developing new solutions or adapting existing solutions to meet emerging health-system challenges
- supporting the co-production of innovations (meaning that decision-makers, innovators, citizens and other stakeholders work together in a meaningful way to co-produce innovations)
- refining innovations based on testing in real-world contexts by being able to ‘plug into’ an innovation-system backbone
- providing evidence needed for a business case for innovations, and helping those making decisions about the adoption and uptake of innovations.

We identified seven evidence syntheses that addressed this element (see Appendix 5), which revealed the following key insights:

- Citizens, patients and caregivers have been found to play a limited role in the innovation process
 - A low-quality synthesis revealed that they are more commonly engaged in the earlier stages of innovation (through workshops, interviews, focus group discussions and early prototype testing) and mostly on service innovations (as opposed to clinical innovations or health-system innovations) (11)
- While these syntheses highlight the capacity of the general public to be involved in the co-production of innovation, they also highlight that vulnerable populations can be meaningfully engaged as well (e.g., older adults in long-term care homes, older adults with dementia, community-dwelling older adults and patients in acute-care settings)
- Most syntheses found benefits for using co-design processes for innovations, especially at the idea-generation stage and at the user-testing stage

Insights from jurisdictional scan of organizations in Canada and in other countries focused on supporting health-system innovation

To provide examples of organizations that may use some of the components of the elements outlined above, we identified 21 organizations in Canada (at the national, provincial/territorial and local levels), Australia, United States, United Kingdom and Israel that support the spread and scale of health-system innovations at the level of professionals, organizations and systems. See Appendix 2 for features of each organization and reported impact. Examples of the identified organizations included:

- national organizations in Canada such as CAN Health Network, Canada Health Infoway, Centre for Collaboration, Motivation and Innovation, an Healthcare Excellence Canada, which use a range of approaches and processes for identifying market-ready needs; connecting health-innovation companies with healthcare organizations to develop, pilot, and evaluate innovations; supporting professionals with tools and training to transform care; and building leadership capacity to implement change
- organizations in Canadian provinces such as the Centre for Technology Adoption for Aging in the North (CTAAN) in British Columbia, CAMH’s Provincial System Support Program, Ontario Centre for Effective Practice, Centre for Digital Health Evaluation, the Nova Scotia Health Innovation Hub and the Health Innovation Acceleration Centre in Eastern Health (Newfoundland and Labrador) that support implementation and evaluation of health-innovations
- organizations in other countries such as the Agency for Clinical Evaluation (Australia), CMS Innovation (United States), Kaiser Permanente Health Innovation (United States) and NHS Transformation Directorate (United Kingdom) that support the development and testing of health-innovations and partnerships with innovators, individuals working in the health system, and patients.

However, we found limited publicly available information on the impact of these organizations (e.g., documented performance measures). Some examples of measures that we found included the number of new technologies, tools, implementation settings and partnerships, quadruple aim outcomes, financial savings and investments. For example, CAN Health Network reported that they have supported 48 companies, launched 54 commercialization projects, and purchased or procured 17 new technologies.

Insights from citizen panels about the elements of a potentially comprehensive approach

During the panels, participants raised several issues when discussing each element. The figure below summarizes the major themes that emerged in relation to each element.



1 Creating structures and processes to support the demand for innovation

- Citizens called for innovation development to 'start with those using it' by gaining insights from users and front-line providers
 - This was noted as requiring more outreach and feedback processes with citizens to shape innovations based on priorities, preferences and concerns
- Create opportunities for shared learning and best-practice dissemination across the country to create dialogue and share insights
 - Create a 'bulletin board' of priority challenges to help focus innovator's efforts
 - Look to other countries (e.g., Germany and France) to see what business cases or other information is available about innovations that have been rolled out to help us plan
- Embed innovation into medical education to help a new generation of medical professionals advance innovation efforts
- Encourage, empower and expect managers and other health workers to innovate (i.e., innovation does not always need to be a top-down process)
- Promote an acceptance of risk and clearly define who is accountable for taking risk and course correcting innovations, so that decision-makers are not hesitant to take risks that are needed to strengthen health systems in Canada
 - Participants often emphasized the need to 'just get on with it' and 'try something'



2 Supporting organizations that could serve as 'innovation general contractors'

- In general, citizens supported the idea of an 'innovation general contractor,' but stressed the importance of ensuring that they are free from conflict of interest (e.g., shaping priorities and then engaging innovators from whom they may benefit financially from)
 - The process of involving a general contractor needs to be equity sensitive by avoiding one-size-fits-all approaches
 - Some concerns were raised about adding another layer of bureaucracy to an already inefficient and fragmented system
 - Some participants noted the need to understand if we need a 'contractor' to renovate a house, or a systems architect to build a new one, and how this would affect the nature of the general contractor's/intermediary's work
- Town halls or panels could allow citizens to be updated about the process and provide feedback, with some participants noting that social media/apps should be leveraged to allow for more citizen input
- Having a roster or list of individuals/organizations that can be contracted to advance certain innovations based on fit and prior performance could reduce costs by creating competition and avoid conflict of interest

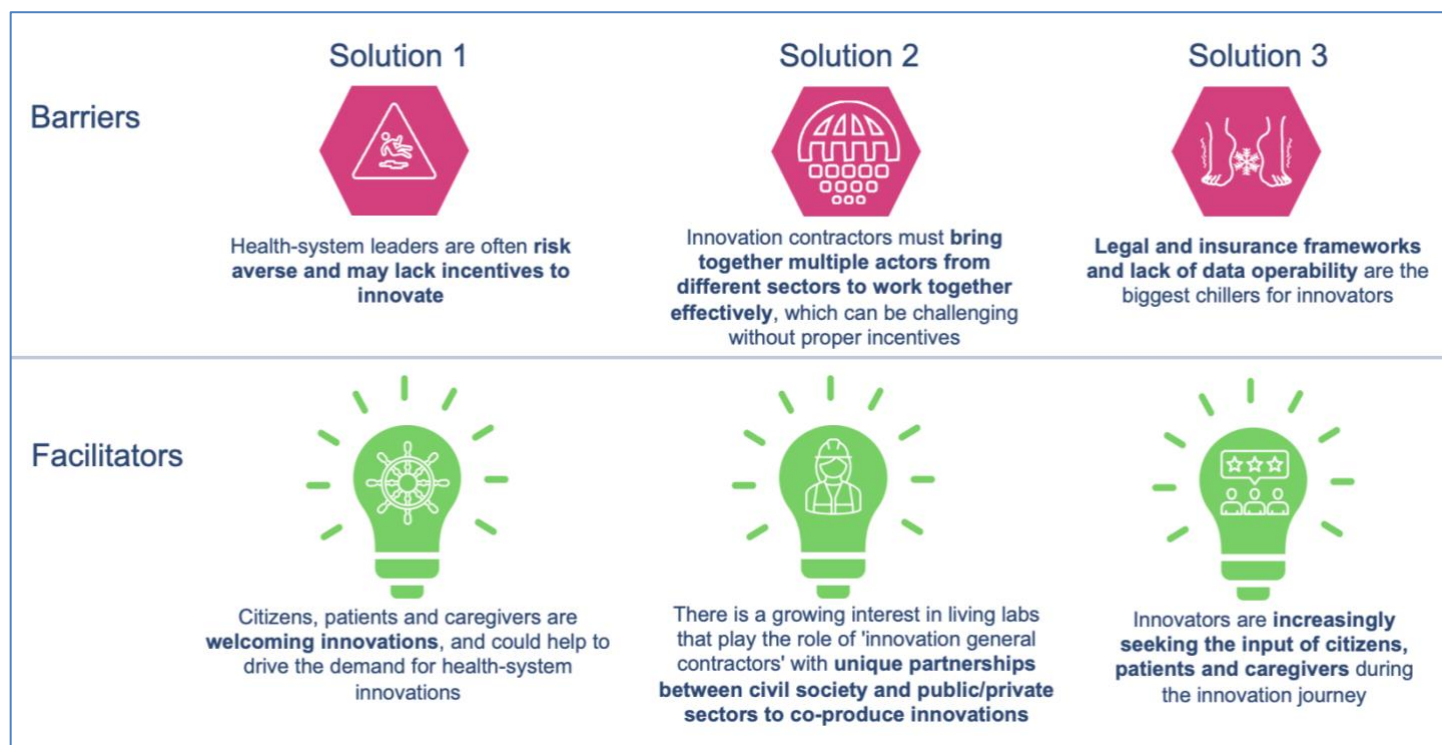


3 Creating structures and processes that could support the supply of innovation

- Many panel participants noted that even if innovations 'fail' the work is not necessarily a waste because others might adapt and reuse certain elements of the innovation
- Given this, participants emphasized the need to be receptive to the possibility of failing, and be able to build on failure through a commitment to an iterative progress (e.g., through rapid-learning and improvement cycles)
- It is important to leverage other health workers in developing and refining innovations, such as nurse practitioners and pharmacists, to address simple issues that do not require a physician
- Innovators need to more consistently prioritize input from frontline workers, families, patients and caregivers throughout all stages of the innovation process

Implementation considerations

In the figure below we identify some barriers that may make it difficult to proceed with the elements, as well as facilitators that could create a window of opportunity for advancing them. One low-quality evidence synthesis found potential barriers to meaningful engagement, such as not involving patients early in the process, lack of trust among those involved, and potential data privacy and security concerns related to the innovation itself.(14)



Insights from panel participants about implementation barriers and facilitators

During the panel, participants identified several barriers that they viewed as important to consider towards the goal of creating an integrated health-innovation system, including:

- legal/insurance frameworks that focus on worst case scenarios can make us risk-adverse and inhibit innovation
- lack of targeted funding for innovation, as well as processes to support adaptation to local contexts, uptake in systems and sustainability
- difficult to change perceptions to better accommodate innovation (e.g., to become more accepting of risk in decision-making about health systems)
- conflicts of interest between those acting as a 'general contractor' and the groups they work with to supply innovations
- health human resource limitations
- lack of digital literacy and acceptance and new technologies
- certain 'general contractor' models like living labs can be resource intensive and funding is always a barrier

Participants also noted several facilitators during the panel, including:

- involvement of citizens, families, caregivers and front-line workers with all three elements and stages of innovation
- living labs that are positioned to facilitate learning and improvement cycles for innovations
- transitioning out the 'old-guard' of health-system decision-makers (in terms of perceptions, not age) to help facilitate new ways of thinking and doing things
- establishing a body to help coordinate innovation efforts across the country

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