McMaster Health Forum horizon-scanning panel
Briefing note for 4 April 2023 panel deliberations (panel #3)
(Last updated on 3 April 2023)

Current context

This briefing note is designed to inform horizon-scanning panel deliberations, which will focus on identifying, refining, and prioritizing innovations in health-system governance, financial and delivery arrangements that can be considered by federal, provincial and territorial health systems in Canada.

Potential health-system innovation options for consideration from the scan

Three priority areas for health-systems innovations were identified in the previous horizon-scanning panel that was convened on 4 January 2023. The priorities with examples for each are listed below.
- **Optimizing the use of virtual care and other forms of digitally enhanced service delivery**
  - o Using virtual hospitals to reach unattached patients and reduce admission to hospital and/or long-term care
  - o Optimizing existing virtual tools with AI
  - o Enabling system-wide use of remote-monitoring technologies (RMT)
- **Preparing for the future of technology-enabled healthcare work**
  - o Improving patient access (e.g., through lay health worker referrals)
  - o Increasing time that can be spent with patients
  - o Enhancing care provision (e.g., with more personalized care)
  - o Harness technologies to align HHR supply and demand
- **Strengthening and augmenting planning and early warning systems**
  - o Planning for chronic-disease management
  - o Identifying emerging priorities

In discussing these examples during the last panel, participants highlighted several important factors or enablers to innovation to take into account for the next set of deliberations in panel #3, which include:
- Prioritizing examples that relate to one or more of three high-priority current health-system issues: 1) supporting healthy aging and reducing demand on long-term care; 2) enhancing chronic-disease management; and 3) addressing the health human resources (HHR) crisis
- Prioritizing true innovations or accelerating health system transformation (i.e., doing things that other people are doing in other industries and doing things that no one else is doing)
- Considering the 'upstream' modernization investments required to enable piloting and scaling up of these innovations (e.g., system-wide interoperable electronic medical records are required to generate the comprehensive data required to feed into predictive AI analytics needed for many of the examples identified in Table 1)
- Working in a policy context of HHR scarcity (i.e., any innovation adopted that may require hiring more people will be challenging as result of current HHR supply issues)
- Prioritizing removing components of the system that are made redundant after the adoption of innovations (i.e., a balance of investment and disinvestment)
- Enabling flexibility to accommodate innovations (e.g., alignment of systems to support workforce redeployment through common/integrated HHR planning and payment systems across regions)
- Investing in building health literacy over time for the population through alignment between health systems, public health and the education system

To inform the deliberations in the third horizon-scanning panel about these three priority areas for health-system innovation, this briefing note includes detailed features of examples that incorporate insights from existing health-system innovations as well as from panel members. In some cases, examples are derived from conversations with panel members and therefore may not have been fully implemented and lack as much detail about features as other

examples. Such insights help to showcase the direction that innovations are trending, or broader health-system implications current innovations may have if scaled up and integrated effectively. We provide these insights in Tables 1-3 for each of the three priority areas for innovation, along with insights from relevant evidence. For each example, we highlight detailed features of examples related to chronic-disease management, those related to healthy aging, and those that are cross-cutting. Health human resource (HHR) insights are captured in the row for the priority focused on preparing for the future of technology-enabled healthcare work. In addition, we provide details about the methods used for this series of horizon-scanning panels in Appendix 1 and our search strategies for identifying evidence is provided in Appendix 2.

The goal of the deliberations in the third horizon-scanning panel that this briefing note is designed to inform is to prioritize specific examples to be considered for supporting spread and scale in provincial and territorial health systems.

Table 1: Examples, features and insights from evidence about innovation priority area 1 - Optimizing the use of virtual acre and other forms of digitally enhanced service delivery

Areas for innovation	Detailed features of examples (chronic disease management, healthy aging and cross-cutting)	Insights from evidence

Using virtual hospitals to reach unattached patients and reduce admission to hospital and/or long-term care	*Chronic-disease management and healthy aging*
	
	• Edmonton Zone Virtual Hospital program provides hospital-level care to patients at home
	  o The program works to avoid hospital admission for people with chronic disease or on the verge of being admitted to hospital
	  o It connects patients with the physician responsible for their care and provides a team for in-home care
	  o It allows for remote monitoring and provides connection to paramedics and/or other who can be engaged if/when needed
	  o The program is enabled and optimized with use of remote-monitoring technologies which, in combination with homecare supports, can lead to scaling up in rural communities
	• The Calgary Complex Care Hub provides home monitoring, health assessments, and home-based acute care as well as medication management and self-management support
	  o Includes similar features to the Edmonton Zone Virtual Hospital described above, along with in-person care visits in outpatient settings
	  o The virtual hospital model targets high system users to avoid emergency department visits and inpatient admissions, which are the biggest drivers of cost
	• The Salvation Army Toronto Grace Health Centre (TGHC) Alternate Level of Care (ALC) pilot project provides in-home support and care as an alternative to admission to an in-hospital setting for patients requiring services from TGHC's Complex Continuing Care, Post Acute Care Rehabilitation, RECOVER, and Palliative Care programs
	  o The program uses an integrated service delivery model involving Ontario Health-Home and Community Services and community caregivers, and leverages remote monitoring technology to monitor vital signs, patient weight and movement, and even automate medications dispensing
		Healthy aging (n= 1)
		
		• A review of 28 evidence syntheses concluded that there is clinical effectiveness of 'hospital at home' (face-to-face care at home as an alternative to inpatient care) among older adults but there is less evidence for virtual wards due to limited reporting on team characteristics, outcome selection, and data protection (5/9 AMSTAR rating; literature last searched March 2022)
		
		Other conditions and treatment (n= 1)
		
		• A post-discharge virtual ward compared to usual community-based care reduced all-cause mortality and heart failure-related hospital admissions among patients with heart failure (8/11 AMSTAR rating; literature last searched 31 January 2017)

Optimizing existing virtual tools with AI	*Cross-cutting*	*Chronic-disease management (n= 6)* • Smartphone-based AI programs demonstrate high diagnostic accuracy for detecting diabetic

Areas for innovation	Detailed features of examples (chronic disease management, healthy aging and cross-cutting)	Insights from evidence

	• AI-enabled virtual triaging systems such as Clearstep leverage AI chatbots to allow patients to triage and schedule appropriate care appointments online
	  o Clearstep allows patients to type their symptoms in free-text and follows up with 10-15 of the most clinically relevant follow-up questions (similar to what a doctor or triage nurse would ask), analyzes patient's symptoms, and provides clear next steps for their health care, along with information on how to care for themselves at home (e.g., when to seek immediate care and over-the-counter medications)
	  o Clearstep is a white-labeled software, which allows organizations to tailor the care options presented to users to the care resources available, such as urgent care, telemedicine visits, and various types of specialty care
	  o Virtual tools such as chatbots, symptom checkers, virtual triage and diagnostic assessments are being used in some jurisdictions, but they are not optimized with AI, which allows for more accurate and personalized information for patients
	  o Overall, AI chatbots have the potential provide information, refer patients to care options, schedule appointments, or provide various forms of health coaching and behaviour-change support
	  o To better coordinate across providers and further deepen the accuracy and sophistication of AI-enabled approaches, such tools require system-wide interoperable electronic medical records that would generate the comprehensive data required to feed into predictive AI analytics
	• The University of Waterloo and Grand River Hospital partnered to implement an artificial intelligence virtual triaging system for spine disorders
	  o The team used a deep learning approach that can locate relevant anatomical landmarks on 750 lateral spine X-ray images and 250 X-ray images of the lumbar spine and pelvis
	  o The model's average accuracy was 85% compared to manual measurements, which is the same level of agreement between two different radiologists
		retinopathy and referable disease, suggesting their potential as substitutes for conventional screening, though further high-quality trials are needed to establish their effectiveness in different populations (7/11 AMSTAR rating; literature last searched 2020)
		• Artificial intelligence (AI) used to diagnose gastric cancer, chronic atrophic gastritis, and Hp infection were overall found to perform well across accuracy, sensitivity, and specificity indicators (3/9 AMSTAR rating; literature last searched 2021)
		• Despite advances in machine and deep learning-based techniques that have improved cancer prediction, cancer mortality has not been reduced (3/9 AMSTAR rating; literature last searched 2021)
		• AI-based models show promise in detecting early esophageal adenocarcinoma, but more prospective studies are required (7/11 AMSTAR rating; literature last searched 2020)
		• AI-based diagnostic systems show promise in diagnosing and monitoring esophagogastric cancers, but further development is needed for greater accuracy and consideration of clinical workflows (4/11 AMSTAR rating; literature last searched 2021)
		• The convolutional neural network model, a type of AI-diagnostic system, exhibited comparable performance to endoscopists in the diagnosis of early gastric cancer using digital endoscopy images, suggesting that it could enhance the performance of endoscopists and reduce workload (7/11 AMSTAR rating; literature last searched 2021)
		
		Aging at home (n = 2)

Areas for innovation	Detailed features of examples (chronic disease management, healthy aging and cross-cutting)	Insights from evidence
		• [In-home monitoring and smart technologies, supported by intelligent algorithms, have the potential to improve health outcomes and increase independence for aging populations, according to a review of 91 publications](#) (3/9 AMSTAR rating; literature last searched 2019) • [While AI-enhanced interventions show promise for improving long-term care services for older people, a systematic review of 31 studies found mixed evidence for their effectiveness and high risk of bias, highlighting the need for more high-quality trials to support their widespread implementation](#) (7/10 AMSTAR rating; literature last searched 2021) *Other conditions and treatment (n= 6)* • [AI has promising applications in surgical education, especially in assessing surgical competencies](#) (8/10 AMSTAR rating; literature last searched 2021) • [AI systems or AI-supported human readings show less performance variability and may support the differentiation of COVID-19 pneumonia from other forms of pneumonia in high-prevalence and symptomatic populations](#) (7/10 AMSTAR rating; literature last searched 2021) • [AI-aided polyp detection systems significantly increase lesion detection rate compared to routine colonoscopy](#) (6/11 AMSTAR rating; literature last searched 2021) • [Machine learning algorithms show promise as an initial triage tool for ruling out acute coronary syndromes, due to their excellent sensitivity, negative likelihood ratio, and negative predictive values](#) (9/11 AMSTAR rating; literature last searched 2019)

Areas for innovation	Detailed features of examples (chronic disease management, healthy aging and cross-cutting)	Insights from evidence
		• This systematic review highlights the potential applications of artificial intelligence in kidney stone disease, including diagnosis, predicting treatment outcomes, and recurrence rates, but notes that wider clinical implementation is limited by data infrastructure, complexity, and cost (4/9 AMSTAR rating; literature last searched 2020) • Machine learning and intelligent systems have shown successful applications in various areas of midwifery and obstetrics, including but not limited to diagnosis of bladder tumor, pregnancy risk assessment, and fetal monitoring (3/9 AMSTAR rating; literature last searched 2021)

Enabling system-wide use of remote-monitoring technologies (RMT)	*Chronic-disease management*
	• In Australia, CareMonitor uses a real-time, multidisciplinary remote monitoring and telehealth platform to allow healthcare providers to better plan and manage patient care remotely
	  o The platform includes remote health monitoring of vital signs through Bluetooth-enabled devices, decision-support tools for care pathways, workflow tools, and health-assessment tools and educational content for patients
	  o It aims to streamline processes related to patient care to help prevent and manage complex and chronic diseases and avoid hospitalizations
	  o Such tools can drive modernized proactive approaches in care teams and pathways by enabling clinicians, inter-professional teams and organizations to better assess and support functions that are important to the client, rather than focusing on pathology and dysfunction
	
	Healthy aging
	• CarePredict is an AI-powered digital health platform used to monitor senior living community residents' vital signs and behaviour to predict and respond to potential emergencies before they occur
	  o The system uses precise sensors, wearables, advanced kinematics and deep-learning algorithms to observe each individual during
		Cross-cutting (n= 1)
		• Remote-monitoring technologies (RMTs) provide advantages for patients, such as increased comfort and access to health information, but also face challenges such as privacy breaches and limited internet access. Financial support and policy work are underway globally to facilitate implementing RMT programs, which may include increased access to technologies, cost-effectiveness, and patient convenience (McMaster Health Forum rapid synthesis, published 6 July 2022)

Areas for innovation	Detailed features of examples (chronic disease management, healthy aging and cross-cutting)	Insights from evidence
	their daily activities to detect deviations relative to their individual patterns o The system is designed to alert caregivers when there is still time to intervene o The system can also be used for those living at home o Platforms like CarePredict can allow inter-professional teams and organizations to integrate updates to audit older adults' capacity, function and goals over time and then adjust care plans and the types of RMT deployed to support and inform the care plan *Cross-cutting* • In New Brunswick, the Drug Information System (DIS) displays patients' medication histories of all prescriptions filled in real-time and the Prescription Monitoring Program (PMP) allows authorized healthcare providers to monitor drugs such as Opioids, Ritalin and Ativan o The program allows for providers to prevent harm by identifying patients who may be at risk, such as for those with potentially high doses, multiple prescriptions for similar monitored drugs, different pharmacies where prescriptions have been filled, and possible risky combinations of monitored drugs o Additional PMP functionality are being developed with stakeholders, including alerts for prescribers and pharmacists o This example highlights the potential for embedding RMT in community-based settings such as pharmacies with trusted and available providers (e.g., pharmacists and nurse practitioners providing clinical care in pharmacies) to reach people who may not otherwise be connected to care • CMS has begun to pay physical and occupational therapists for RMT to monitor HEP compliance, therapy response and pain levels o This change opens up greater potential to allocate monitoring functions to most appropriate care providers on a care team and/or regional authority/population-based model, rather than rely exclusively on physicians o For example, occupational therapists and physiotherapists are often best positioned to assess functions, and could be 'the boots in the ground' for the care team with an 'escalation pathway' that	

Areas for innovation	Detailed features of examples (chronic disease management, healthy aging and cross-cutting)	Insights from evidence
	engages other clinicians as needed and based on the nature of the challenges faced by a client	

Table 2: Examples, features and insights from evidence about innovation priority area 2 - Preparing for the future of technology-enabled healthcare work

Areas for innovation	Detailed features of examples (chronic disease management, healthy aging and cross-cutting)	Insights from evidence

Improving patient access (e.g., through lay health worker referrals)	*Cross-cutting*
	• Patient self-scheduling tools such as Mend, Relatient and Keona health, that can facilitate in-person, virtual, phone, messaging or home appointments as well as facilitate triage scheduling
	  o Despite the growing appeal and demonstrable benefits of automated self scheduling, barriers to uptake may include health care providers' concerns about cost, flexibility, safety, and integrity, and some patients' prior experience with technology and communication preferences
	  o Self-scheduling tools can help optimize booking and enable data collection and triage that informs booking
	  o Although isolated examples of self-scheduling tools to help patients book visits exist, very few attempts have been made to integrate these tools with AI-powered technologies that can help better understand patient needs and direct patients to appropriate care pathways
	• Autonomous transportation has the potential to improve the efficiency and reduce costs related to the delivery of drugs, devices, and other products to those who need them
		Cross-cutting (n= 1)
		• There are limited evidence syntheses about establishing appropriate referral networks to ensure continuity of care; however, there is some evidence to suggest that the use of digital-care enhanced referral coordination may improve the quality and continuity of care (McMaster Health Forum evidence brief, published 8 March 2023)

Increasing time that can be spent with patients	*Cross-cutting* • New digital clinical supports are increasingly being integrated into clinical practice to help reduce administrative burden • AI/machine learning platforms can enable automation through services such as NewDawn, which can enable intelligent document processing, conversational automation, analyzing organizational log data to identify opportunities for	*Cross-cutting (n= 1)* • The Intelligent System for Unified Management of Tasks in Organizations (ISUMO) is a framework that describes an AI-enhanced system for managing administrative tasks in healthcare organizations that includes data collection and analysis, task prioritization and assignment, task completion and feedback, and continuous

Areas for innovation	Detailed features of examples (chronic disease management, healthy aging and cross-cutting)	Insights from evidence

	automation, and deploying "virtual assistants" that emulate human actions when interacting with digital systems
	• Veradigm (formally AllScripts), offers services such as eCHART COURIER to automate patient chart retrieval processes, integrated medical billing to verify eligibility automatically and record information directly to EHRs, and platforms to help automate and optimize EHR management to streamline work processes and better inform patient care
	• AutoScribe uses hands-free speech recognition and artificial intelligence to help streamline clinical documentation and provide suggested outputs for the clinician to verify and subsequently automatically record specific user tasks on electronic medical records such as printing an order or prescription
	• A commercially available AI tool, Smarturgences developed by Milvue, has been trained on datasets of almost 1 million chest and bone X-rays and taught to identify seven key problems such as broken bones and abnormalities in the lungs
	  o When presented with images it was trained on, the tool was able to pass half the number of mock examinations that radiologists could pass, and errors were usually false-positives rather than missing problems
	  o It correctly identified 90.5% of all the X-rays that most radiologists also got correct
	  o Smarturgences showcases one example of how work in clinical-care pathways can be automated
		improvement and optimization, with a flexible and adaptable approach to task management using natural language processing and machine learning algorithms (The New England Journal of Medicine commentary, published 3 March 2022)

Enhancing care provision (e.g., with more personalized care)	*Cross-cutting* • Merative provides AI-powered clinical decision-support solutions Micromedex and DynaMedex that can be integrated into electronic health records to provide clinicians with point-of-care, evidence-based clinical decision support to help improve patient care and efficiency o AI and machine-learning processes can help enable more personalized medicine by referencing electronic health records to help inform clinical decision support responses	*Cross-cutting (n= 1)* • Enhancing care provision with technology (e.g., electronic health records, predictive analytics, precision medicine) has the potential to improve health outcomes and patient satisfaction, but will require ongoing attention and investment in technology, training, and collaborative approaches to care delivery (McMaster Health Forum evidence brief, published 8 March 2023)
Harness technologies to align HHR supply and demand	*Cross-cutting*	*Cross-cutting (n= 2)*

Areas for innovation	Detailed features of examples (chronic disease management, healthy aging and cross-cutting)	Insights from evidence
	• AI can play a role in planning for hospital bed capacity and usage, such as Alberta's predictive model and planning tool that can help inform HHR and equipment planning o On a systems level, AI (informed from system-wide datasets) has the potential to similarly model HHR supply and demand in real time and using a flexible approach to support workforce redeployment through integrated HHR planning and payment systems across regions	• [The use of technology among healthcare workforce and HHR planning will require new skills and roles, education, and training](#) (McMaster Health Forum evidence brief, published 8 March 2023) • [Technology can support health workforce planning efforts, but it requires a balanced approach that considers the human element of healthcare delivery](#) (McMaster Health Forum rapid synthesis, published 19 July 2019)

Table 3: Examples, features and insights from evidence about innovation priority area 3 - Strengthening and augmenting planning and early warning systems

Areas for innovation	Detailed features of examples (chronic disease management, healthy aging and cross-cutting)	Insights from evidence

Planning for chronic-disease management	*Chronic-disease management*
	• A [pilot lifestyle intervention](#) to proactively prevent, slow and reverse Type 2 diabetes burden in Newfoundland and Labrador through a value-based approach was successful in decreasing body weight by 3.5% at six months and 6.4% at 10 months
	  o A1c declined by an average of 0.5, and 1.1 for those with an initial A1c of 9 or above
	  o Engagement levels among participants were 81%
	  o The pilot leverages genetic, social and behavioural insights to create individualized prevention programs that combine virtual care, digital tools, and connected devices
	  o AI-powered population health management efforts can help to align systems to more effectively manage a suite of chronic diseases and assess compliance with best practices and better inform targeted prevention and management efforts in high-priority communities through electronic mapping software
	• [Southwestern Health Resources (SWHR)](#) uses [clinical data and predictive analytics](#) to help identify rising and high-risk
		Chronic-disease management (n= 4)
		• [AI chatbots show promise in increasing physical activity, but the efficacy of interventions for improving diet and weight management remains inconclusive](#) (6/10 AMSTAR rating; literature last searched 2020)
		• [Internet of Things technology and AI-based machine learning models can support Parkinson's disease patients and caregivers by predicting disease-related aspects from data acquired via smart devices and sensors](#) (AMSTAR rating not available; published 24 February 2022)
		• [Virtual coach systems have been applied in clinical settings to manage physical activity, overweight or nutritional issues, and to facilitate interactions with patients suffering from different chronic conditions, but rehabilitation is still an area that requires further research](#) (5/10 AMSTAR rating; literature last searched 2019)
		• [Chatbots in cancer care have the potential for clinical integration, but require further research](#)

Areas for innovation	Detailed features of examples (chronic disease management, healthy aging and cross-cutting)	Insights from evidence

	patients and subsequently work towards closing gaps in chronic care management
	   o Such predictive AI-powered data analytics are especially useful in the context of population health management
	• The U.S. Health and Human Services roundtable report highlights that AI can be leveraged to inform population health management
	   o For example, through the identification of populations at risk for opioid abuse or overdose using data on social determinants of health and pharmacy claims
		and interdisciplinary collaboration to address concerns regarding ethical, moral, security, technical, and regulatory standards (3/9 AMSTAR rating; literature last searched 2020)

Identifying emerging priorities	*Cross-cutting* • Bluedot's intelligence platform leverages machine intelligence to scan scientific, public health, travel, and client data as well as global media to monitor for global biothreats and provide contextualized interpretation of disease surveillance and threat assessment information to help inform response efforts • The electronic-Canadian triage and acuity scale support tool standardizes the Canadian Triage and Acuity Scale (CTAS) guidelines to help promote consistency and accountability while improving patient safety and quality of care; providing more timely collection, analysis and reporting of clinical triage data; and supporting more informed policy and funding decision-making o Moving forward, the tool brings opportunities to incorporate AI to better predict real-time emergency department wait times, provide real-time connections to Emergency Management Services, and rapidly detect regional outbreaks while providing live updates to front-line nurses to support infection prevention	*Cross-cutting (n= 7)* • Artificial intelligence was applied in COVID-19 for forecasting infectious disease dynamics and effects of interventions, surveillance and outbreak detection, and timely diagnosis of infections to inform clinical and public health decision-making (AMSTAR rating not available; literature last searched 2020) • Implementing early warning track and trigger tools improved mortality, series adverse events, hospital admissions, observation frequency, and intensive care unit admission, but further research is needed to determine the impact on hospital length of stay and cardiopulmonary arrests (8/9 AMSTAR rating; literature last searched 2018) • A 'whole system' approach using aggregate weighted scoring systems (AWSS) led by a clinician with critical care skills, is more effective than single parameter systems and emergency response teams for improving hospital survival of adult inpatients, although the poor quality of evidence highlights the need for further research (5/11 AMSTAR rating; literature last searched not available) • Implementation of early warning systems had a positive effect on nurses' clinical performance in documenting vital signs and was associated with

Areas for innovation	Detailed features of examples (chronic disease management, healthy aging and cross-cutting)	Insights from evidence
		preventing adverse events among deteriorating patients in general wards, but further high-quality evidence is needed to evaluate the full effects of EWSs on these outcomes (9/11 AMSTAR rating; literature last searched 2017) • There is poor methodological quality and diversity in studies investigating outreach and early warning systems, and the results of the two included studies showed either no evidence of effectiveness or a reduction in overall mortality in patients receiving outreach (10/10 AMSTAR rating; literature last searched 2006) • There is low-level quantitative evidence and strong anecdotal evidence supporting the use of early warning systems (EWS) to improve patient outcomes and augment clinical staff's ability to recognize and respond to patient decline; however, the authors caution that EWS charts alone cannot replace good clinical judgment due to the contribution of human factors to the decision-making process (3/9 AMSTAR rating; literature last searched not available) • There is low to very low certainty evidence for all outcomes, with no strong recommendations being made regarding their effectiveness of early warning systems and rapid response systems for the prevention of patient deterioration on acute adult hospital wards (11/11 AMSTAR rating; literature last searched 2020)

Wilson MG, Bhuiya AR, DeMaio P, Lavis JN. Horizon scanning: Health-system innovations for Canadian health systems (version 3). Hamilton, Canada: McMaster Health Forum; 4 April 2023.

Appendix 1: Approach to developing the briefing note

The first briefing note was developed and refined to inform a horizon-scanning panel on 24 August 2022. For the first version of the briefing note, we included health-system innovations identified from the project steering team, document and website reviews, and key informants. For the document and website review, we reviewed policy documents and websites of governments focusing on strategic foresight and innovation, published from 2019 to 6 June 2022 to identify examples of system-level reforms that are being piloted or implemented (see Appendix 2 in this for the list of sources reviewed). We summarized our findings in a table that outlines: 1) innovations based on whether they relate to governance, financial and delivery arrangements (or a combination of these categories); 2) examples of each innovation; 3) the state of innovation (e.g., pilot or being scaled up and whether an evaluation is underway or completed); and 4) the sources for each innovation identified. The project team reviewed all innovations identified from the website and document review and prioritized including innovations relevant to provincial and territorial health systems in Canada and that had specific examples of innovations (e.g., overview of features of the innovation and/or insight about the State of innovation through a pilot program or evaluation) that federal, provincial and territorial health systems could consider. We excluded any innovations identified that were mentioned in a broad sense or briefly and without examples or description of specific features.

We then approached six key informants and secured interviews with four who are actively involved in work related to health-system innovations provincially, nationally or globally. The draft summary table was shared with each key informant who were asked to: 1) identify any other innovations that should be considered in the briefing note; 2) describe the key features of each innovation, including its state of innovation; and 3) provide any resources about the innovations (e.g., policy documents, websites and/or research evidence). The tables were iteratively updated based on this input.

In this version, the briefing note was revised with a list of innovations prioritized during the second panel and through follow-up discussions with provincial policymakers. The innovations included in the briefing note will be rank ordered after the panels based on participants' assessments of their potential for high impact.

Assessing quality of evidence

For the second version of this briefing note that includes systematic reviews about high priority innovations, two reviewers will independently appraise the methodological quality of systematic reviews. Disagreements are resolved by consensus with a third reviewer if needed. AMSTAR rates overall methodological quality on a scale of 0 to 11, where 11/11 represents a review of the highest quality. High-quality reviews are those with scores of eight or higher out of a possible 11, medium-quality reviews are those with scores between four and seven, and low-quality reviews are those with scores less than four. It is important to note that the AMSTAR tool was developed to assess reviews focused on clinical interventions, so not all criteria apply to systematic reviews pertaining to health-system arrangements or to economic and social responses. Where the denominator is not 11, an aspect of the tool was considered not relevant by the raters. In comparing ratings, it is therefore important to keep both parts of the score (i.e., the numerator and denominator) in mind. For example, a review that scores 8/8 is generally of comparable quality to a review scoring 11/11; both ratings are considered 'high scores.' A high score signals that readers of the review can have a high level of confidence in its findings. A low score, on the other hand, does not mean that the review should be discarded, merely that less confidence can be placed in its findings and that the review needs to be examined closely to identify its limitations. (Lewin S, Oxman AD, Lavis JN, Fretheim A. SUPPORT Tools for evidence-informed health Policymaking (STP): 8. Deciding how much confidence to place in a systematic review. *Health Research Policy and Systems* 2009; 7 (Suppl1):S8.

Appendix 2: Search strategy for identifying evidence sources

We identified research evidence (systematic reviews and other types of knowledge syntheses) by searching Health Systems Evidence (www.healthsystemsevidence.org) on 14 March 2023. In Health Systems evidence, a combination of the following search terms was used with relevant search filters and Boolean operators: "virtual", "hospital", "artificial intelligence", "AI", "chronic disease", "plan OR map", "early warning system". Additionally, we identified other relevant syntheses from reference lists and from experts in the field. A full search strategy is available upon request.

The results from the searches were assessed by two reviewers for inclusion. A systematic review was included if it fit within the scope of the identified priority areas for innovation. We documented the methodological quality using the AMSTAR quality appraisal and literature last searched (as an indicator of how recently it was conducted), and developed declarative titles based on the results and conclusions of each systematic review.