Rapid Synthesis

Establishing Supports for Evidence-informed Health-system Transformation in Nova Scotia

9 June 2021

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Rapid Synthesis:
Establishing Supports for Evidence-informed Health-system Transformation in Nova Scotia
90-day response

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McMaster Health Forum

The McMaster Health Forum's goal is to generate action on the pressing health-system issues of our time, based on the best available research evidence and systematically elicited citizen values and stakeholder insights. We aim to strengthen health systems – locally, nationally, and internationally – and get the right programs, services and drugs to the people who need them.

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Timeline

Rapid syntheses can be requested in a three-, 10-, 30-, 60- or 90-business-day timeframe. This synthesis was prepared over a 90-business-day timeframe. An overview of what can be provided and what cannot be provided in each of the different timelines is provided on the Forum's Rapid Response program webpage (www.mcmasterforum.org/find-evidence/rapid-response).

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Conflict of interest

The authors declare that they have no professional or commercial interests relevant to the rapid synthesis. The funder played no role in the identification, selection, assessment, synthesis or presentation of the research evidence profiled in the rapid synthesis.

Merit review

The rapid synthesis was reviewed by a small number of policymakers, stakeholders and researchers in order to ensure its scientific rigour and system relevance.

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KEY MESSAGES

Questions

This rapid synthesis aimed to answer two main questions:

- What can we learn from the best-available research evidence and from the experiences in other jurisdictions about supporting evidence-informed health-system transformation through timely, demand-driven dynamic responses to priority policy questions (e.g., contextually relevant evidence syntheses prepared in short timeframes), structural reforms that support the institutionalization of evidence-informed inputs in decision-making processes (e.g., commissions and expert panels), and operational support (e.g., evidence-informed technical support) during the implementation of system-transformation initiatives?
- What can we learn from the experience of key policymakers, stakeholders and researchers in Nova Scotia about the assets in place, and those that would need to be created or strengthened, to support evidence-informed health-system transformation in the province, with a particular emphasis on:
  - access to dynamic responses among decision-makers and those supporting them;
  - the structure of decision-making processes and whether there is routine consideration of inputs from the best-available research evidence and stakeholder insights; and
  - the availability of operational supports during the implementation of system-transformation initiatives through evidence-informed, technical support for rapid learning and improvement?

Why the issue is important

- The Government of Nova Scotia has introduced two significant health-system transformation initiatives in the last six years, creating fundamental changes in how the system ensures cost-effective programs and services get to the Nova Scotians who need them: 1) the centralization of nine District Health Authorities into the Nova Scotia Health Authority (NSHA) in 2015; and 2) the introduction of population- and service-based networks to coordinate service planning and delivery across the province in 2021. Alongside these initiatives, the Nova Scotia Health Research, Innovation & Discovery portfolio has established key strategic priorities to better engage with and address priority needs for the NSHA and for Nova Scotians more broadly, with a key area of focus on enabling the use of the best-available evidence through rapid reviews.
- The COVID-19 pandemic has created additional momentum for creating sustained demand for the best-available data and research evidence to inform decision-making in the province.
- Within this context, there has been remarkable progress in moving forward to support evidence-informed decision-making within the NSHA, however, new reforms and opportunities created by the pandemic make this an opportune moment to address ongoing challenges and build on existing initiatives that can contribute to evidence-informed health-system transformation in Nova Scotia, including efforts to create a 'rapid-learning' health system.

Key takeaways and next steps based on what we found

- Takeaways include: 1) there are no definitive answers from research evidence or experiences in other jurisdictions on 'what works best' to support dynamic responses, structural reforms and operational supports; 2) rapid reviews were instrumental in supporting dynamic COVID-19 responses in Nova Scotia and are set to continue as an important input into decision-making well beyond the pandemic; and 3) there are opportunities to increase the extent to which key structural reforms and operational supports are in place for supporting decision-making across the province.
- Next steps to be considered include: 1) document and build on lessons learned from COVID-19 about how to support the routine use of evidence in decision-making; 2) enable existing platforms to provide broader coordination and administrative support for evidence-informed decision-making efforts across the province; 3) articulate clear roles for different levels of leadership and for existing provincial assets; 4) review, adapt and implement promising models of rapid-learning and improvement from other jurisdictions; 5) build capacity in areas where assets are not well developed; and 6) identify ways to optimize points of intersection between the key structures within NSHA and among external partners to facilitate rapid learning and improvement.

QUESTIONS

Support for evidence-informed decision-making in Nova Scotia continues to gain traction and widespread acceptance, particularly in the wake of the province's increased reliance on data and evidence in response to the COVID-19 pandemic. A number of important opportunities exist to help routinize the use of evidence in decision-making at all levels of the health system, which can help to achieve the quadruple aim of improving care experiences and health outcomes at manageable per capita costs and with positive provider experiences.

Stronger supports for evidence-informed decision-making can also create a strong foundation in the province for adopting a rapid-learning and improvement approach to health-system transformation initiatives now and in the future. This rapid synthesis aims to addresses two inter-related questions that can provide insights for decision-makers and other health-system stakeholders about what is currently being done, and what opportunities exist for expanding evidence-informed decision-making across Nova Scotia:

1) What can we learn from the best-available research evidence and from the experiences in other jurisdictions about supporting evidence-informed health-system transformation through timely, demand-driven **dynamic responses** to priority policy questions (e.g., contextually relevant evidence syntheses prepared in short timeframes), **structural reforms** that support the institutionalization of evidence-informed inputs in decision-making processes (e.g., commissions and expert panels), and **operational support** (e.g., evidence-informed technical support) during the implementation of system-transformation initiatives?
2) What can we learn from the experience of key policymakers, stakeholders and researchers in Nova Scotia about the assets in place, and those that would need to be created or strengthened, to support evidence-informed health-system transformation in the province, with a particular emphasis on understanding:
    - access to dynamic responses among decision-makers and those supporting them;
    - the structure of decision-making processes and whether there is routine consideration of inputs from the best-available research evidence and stakeholder insights; and
    - the availability of operational supports during the implementation of system-transformation initiatives through evidence-informed, technical support for rapid learning and improvement?

Box 1: Background to the rapid synthesis

This rapid synthesis mobilizes both global and local research evidence about a question submitted to the Forum's Rapid Response program. Whenever possible, the rapid synthesis summarizes research evidence drawn from systematic reviews of the research literature and occasionally from single research studies. A systematic review is a summary of studies addressing a clearly formulated question that uses systematic and explicit methods to identify, select and appraise research studies, and to synthesize data from the included studies. The rapid synthesis does not contain recommendations, which would have required the authors to make judgments based on their personal values and preferences.

Rapid syntheses can be requested in a three-, 10-, 30-, 60- or 90-business-day timeframe. An overview of what can be provided and what cannot be provided in each of these timelines is provided on the McMaster Health Forum's Rapid Response program webpage (www.mcmasterforum.org/find-evidence/rapid-response).

This rapid synthesis was prepared over a 90-business-day timeframe and involved five steps:

1) submission of a question from a policymaker or stakeholder (in this case, the Nova Scotia Health Authority);
2) identifying, selecting, appraising and synthesizing relevant research evidence about the question;
3) conducting a jurisdictional scan and key informant interviews;
4) drafting the rapid synthesis in such a way as to present concisely and in accessible language the research evidence, and insights from other jurisdictions and key informants; and
5) finalizing the rapid synthesis based on the input of at least two merit reviewers.

For this rapid synthesis, we also worked collaboratively with a steering committee that included individuals from the Nova Scotia Health Authority Research, Innovation and Discovery team.

To answer question 1, we conducted searches (see Box 2) for the best-available global evidence from systematic reviews (as well as any directly relevant single studies and grey literature) and synthesized the evidence identified about dynamic responses, structural reforms and operational supports. We also undertook a jurisdictional scan (drawing on insights from government websites, reports and other publications) to

understand the experience in other provinces with these same types of activities, focusing on three western provinces (British Columbia, Albert and Saskatchewan) one central province (Ontario) and one maritime province (New Brunswick).

To answer question 2, we worked closely with senior leaders from the Implementation Science Team conducting rapid reviews in the NSHA, and key members of the Nova Scotia Health Research, Innovation and Discovery (NSHRID) team to purposively sample and conduct key informant interviews with 29 policymakers, stakeholders (including patient advisors) and researchers from across Nova Scotia. We focused on engaging key informants with a range of experience in decision-making processes (or supporting decision-making processes) across sectors (e.g., primary care to specialty care), for select conditions and/or using select treatments or approaches to care (e.g., cancer, mental health and addictions, virtual care), and focused on particular populations (e.g., women and children).

In the sections that follow, we first provide an overview of why the issues addressed in this syntheses are of particular importance in Nova Scotia right now, and then summarize our findings in relation to the two questions and their sub-components. We then provide a number of key takeaway messages, including potential next steps, based on these findings in the final section.

WHY THE ISSUE IS IMPORTANT

The issues addressed in this synthesis are important to consider now, as ongoing transformation initiatives in Nova Scotia present opportunities to continually enhance the use of data and evidence in decision-making in the province, and to move towards a system that rapidly learns and improves. In particular, in the last six years, the Government of Nova Scotia has introduced two significant health-system transformation initiatives, which have created (or will create) fundamental changes in how the system is arranged to get the right mix of cost-effective programs and services to all Nova Scotians who need them. The first major transformation occurred in 2015, when the government consolidated nine District Health Authorities into a single centralized delivery system with the Nova Scotia Health Authority (NSHA) at the centre. The reform also established a continued role of key partners in providing targeted programs and services for maritime youth, children and women, while also leading research initiatives that focus on these populations. The overall goals of transforming into a centralized delivery system in the province were to reduce administrative costs, promote flexibility, improve system-wide coordination, and facilitate the standardization of services and care across the province.(1)

One area of remarkable progress in Nova Scotia as a result of this first transformation relates to the ways in which the NSHA continues to put in place mechanisms for supporting the use of evidence in decision-making. In particular, senior NSHA leaders with a strong commitment to the use of data and evidence in efforts to drive health-system strengthening efforts created the NSHRID branch. This branch has a mandate to, and increased activity focused on, developing capacity for research and evaluation across the health system. Leadership within the branch has also established a growing team, namely the Rapid Review Team, as part of the Implementation Science Team, to provide decision-makers and key stakeholders in the health system (including patient advisors, providers, and those delivering community programs and services) with context-specific and evidence-informed supports on demand (e.g., through the development of rapid reviews). Additionally, in order to support these important NSHRID activities, a Network of Scholars (NoS) was created that consists of more than 80 emerging and established health researchers from across the province who work as part of the NSHRID team on priority research projects. Members of the network assist with data collection and analysis for NSHRID rapid reviews. Ultimately, the NoS facilitates collaboration among local experts and trainees to increase NSHRID capacity to develop on-demand synthesis products and other decision-relevant outputs in a timely way.

Collectively, these internal changes have created a strong culture in support of evidence-informed decision-making more generally, while creating a foundation for establishing a rapid-learning health system in Nova Scotia. Additionally, the COVID-19 pandemic has forced profound changes in how decision-makers in Nova

Scotia respond to societal needs, with timely access to data and evidence now more important than ever. As such, the pandemic has added additional momentum to the efforts already underway, creating sustained demand for the best-available data and research evidence to inform decision-making, planning and policy-setting in the province.

The second and more recent transformation was announced in early 2021, when the government introduced a new networked approach to healthcare service planning and delivery, based on population- and service-based networks, including:

- population-based networks focused on primary healthcare, chronic disease management/disease prevention and management, and the elderly and frailty (including areas of focus for seniors health, frailty and dementia, and complex patients); and
- service-based networks focused on perioperative care, episodic/integrated acute care, emergency medicine, acute medicine, critical care and women and children, quaternary/specialty services, pain management and ambulatory care, access and flow, diagnostic and therapeutic services, labs and pharmacies, and COVID-19 response (as needed).

The introduction of these networks provides a unique window of opportunity to consider how the key components of a rapid-learning health system can be adapted and introduced in Nova Scotia. A rapid-learning health system involves "the combination of a health system and a research system that at all levels – self-management, clinical encounter, program, organization, regional (or provincial) health authority and government – is: 1) anchored on patient needs, perspectives and aspirations (and focused on improving their care experiences and health at manageable per capita costs and with positive provider experiences); 2) driven by timely data and evidence; 3) supported by appropriate decision supports and aligned governance, financial and delivery arrangements; and 4) enabled with a culture of and competencies for rapid learning and improvement." The approach finds its roots in incrementalism, and couples small policy, organizational, and clinical changes that focus on improving quadruple-aim metrics with small-scale and tightly focused evaluations, that identify which changes improved outcomes and warrant keeping.(2)

To take advantage of existing opportunities and to support widespread rapid-learning and improvement in Nova Scotia, leaders in each population- and service-based network in Nova Scotia will need to consider how they:

1) engage patients (e.g., in defining the targets for improvement in each area and in co-designing the care that will be required to achieve them);
2) leverage data and evidence (e.g., to understand the most pressing problems and how they can be addressed) to establish or enhance decision supports to enable their rapid use in real time by decision-makers at all levels of the system (e.g., interoperable data systems);
3) work with government to ensure governance, financial and delivery arrangements are aligned to support rapid learning and improvement at the level of each network (e.g., aligning provider remuneration to facilitate necessary changes); and
4) create a culture that embraces rapid learning and improvement, while helping to build competencies in the provinces to support it within and across the networks.

As these changes continue to shape how decisions are made in the province, it is an opportune time to stand back and take stock of what is known from the literature, from other jurisdictions and from key health-system stakeholders in Nova Scotia about supporting evidence-informed decision-making. This rapid synthesis seeks to build on the numerous efforts such as rapid reviews and implementation-science initiatives already underway in the province to identify: 1) existing assets to support timely, demand-driven and evidence-informed dynamic responses to policy questions; 2) existing decision-making processes informed by best-available research evidence and opportunities to pursue structural reforms; and 3) opportunities to strengthen the operational support during the implementation of system-transformation initiatives (i.e., to support rapid learning and improvement).

WHAT WE FOUND

In this section we present findings in two main sub-sections. The first sub-section focuses on what was learned from a review of the best-available research evidence, and from a jurisdictional scan of experiences in select provinces about dynamic responses, structural reforms and operational supports (answering the first overarching question posed in this synthesis). The second sub-section then provides a summary of what was learned from the experiences of key policymakers, stakeholders and researchers in Nova Scotia about the assets in place and those that need to be created or strengthened to support evidence-informed health-system transformation in the province (answering the second overarching question posed in this synthesis).

What was learned from research evidence and from other jurisdictions

The first overarching question posed in this rapid synthesis was what can we learn from the best-available research evidence and from the experiences in other jurisdictions about supporting evidence-informed health-system transformation through timely, demand-driven dynamic responses to priority policy questions (e.g., contextually relevant evidence syntheses prepared in short timeframes), structural reforms that support the institutionalization of evidence-informed inputs in decision-making process (e.g., commissions and expert panels), and operational support (e.g., evidence-informed technical support) during the implementation of system-transformation initiatives?

Findings from the best-available research evidence

We identified 32 documents that were relevant to one or more components of the question including seven systematic reviews, three scoping reviews, 18 single studies, and four other types of documents. Detailed document descriptions are provided in Appendices 1 and 2.

Box 2: Identification, selection and synthesis of research evidence

We identified research evidence (systematic reviews and primary studies) by searching Health Systems Evidence (www.healthsystemsevidence.org) and PubMed (in April 2020 and an updated search on 24 March 2021). In Health Systems Evidence, we searched for evidence AND (policymakers or policy makers) in the open search with filters for governance arrangements in addition to an open search with health system AND evidence AND inform AND decision-making. In PubMed, we searched for similar research evidence based on articles provided by experts in the field. We identified jurisdictional experiences by hand searching government and stakeholder websites. We selected British Columbia, Alberta, Saskatchewan, Ontario, and New Brunswick that are advanced in their thinking and/or experiences with evidence-informed health-system transformation.

The results from the searches were assessed by one reviewer for inclusion. A document was included if it fit within the scope of the questions posed for the rapid synthesis.

For each systematic review we included in the synthesis, we documented the focus of the review, key findings, last year the literature was searched (as an indicator of how recently it was conducted), methodological quality using the AMSTAR quality appraisal tool (see the Appendix for more detail), and the proportion of the included studies that were conducted in Canada. For primary research (if included), we documented the focus of the study, methods used, a description of the sample, the jurisdiction(s) studied, key features of the intervention, and key findings. We then used this extracted information to develop a synthesis of the key findings from the included reviews and primary studies.

Overall, the research evidence about dynamic responses, structural reforms and operational supports was found to be largely descriptive, focused on identifying promising models. Several of the studies identified focused on documenting the key features of each type of approach, and details related to how they have been implemented in various contexts, highlighting the main barriers and facilitators that need to be considered by those interested in adopting them in their own context, and examples of operational supports.

The research evidence about **dynamic responses** suggests these efforts can be categorized into three general models:

1) rapid-response services (i.e., preparing rapid evidence profiles, rapid-response syntheses, living evidence profiles and other types of syntheses on demand);
2) demand-driven systematic reviews (i.e., rapid reviews, full systematic reviews, living rapid and systematic reviews that respond directly to requests from decision-makers); and

3) general supports to decision-makers accessing relevant evidence (i.e., evidence summaries, one-stop shops, and other research evidence databases to avoid duplication of efforts).

Rapid-response services involve the generation of rapid evidence profiles, syntheses, and/or living evidence profiles and syntheses that directly address requests from decision-makers within a timeframe that is shorter than a traditional systematic review (e.g., ½ day to 90 business days). The rapid syntheses prepared in this model include contextualized summaries and/or syntheses of the best-available evidence, and there is no attempt to generate new knowledge.

Demand-driven systematic reviews (including rapid reviews, full systematic reviews, and living rapid and systematic reviews) use rigorous, systematic, and transparent methods to identify, select and appraise relevant studies, and generate new research evidence to answer clearly defined research question(s). These types of reviews typically take an average of five weeks (rapid reviews) to one year (full systematic reviews) to complete, thus have the flexibility to address research questions from decision-makers within a range of timelines. Living rapid and systematic reviews are emerging as invaluable products for policymakers and researchers. A recent mixed-methods evaluation study reported that living systematic reviews appear to be an acceptable and feasible approach to continually update research evidence that address specific research questions.(7) Specifically, the use of machine learning (e.g., automation tools such as RCT Classifier) and citizen science (e.g., crowd sourcing) to support the developing of living systematic reviews appear to be valuable assets. Additionally, existing research organizations and groups experienced in living systematic reviews (e.g., Cochrane Living Systematic Review support team) were reported to be a significant enabler to the success in the conduct of the living systematic reviews.

Finally, there are general supports that facilitate decision-makers' timely access to relevant evidence (and evidence-derived products) such as evidence summaries, online one-stop shops, and searchable databases. There are many examples of databases (e.g., McMasterPLUS, Cochrane Library, Health Evidence, Health Systems Evidence, Social Systems Evidence, Evidence Aid, U.S. Veterans' Affairs Evidence Synthesis Program, and others), that point to existing research evidence and decision-relevant products prepared based on the best-available evidence (e.g., evidence summaries) that can be utilized for specific types of questions (e.g., clinical, public health, health and social systems arrangements). Additionally, there are existing databases that help identify reviews that are currently ongoing or have been proposed for further research (e.g., PROSPERO, International Platform of Registered Systematic Reviews and Meta-Analysis Protocols).

Additional details about each model and considerations that need to be made when developing and implementing them can be found in Table 1.

Table 1: Key findings and considerations for different types of dynamic, demand-driven and evidence-informed response supports

Models of demand-driven and evidence-informed dynamic response and related supports	Descriptions of demand-driven and evidence-informed dynamic responses	Considerations when developing and implementing the model
Rapid-response services • Rapid evidence profiles • Rapid-response syntheses • Living evidence profiles and syntheses	• Rapid-response services generally involve summarizing available evidence in a synthesized and contextualized manner to respond directly to decision-makers' questions • This type of model does not generate new knowledge, but uses existing evidence from systematic reviews • Living evidence profiles and syntheses are continually updated to summarize new emerging evidence particularly when it is changing frequently • The time frame for preparing syntheses in this model ranges from ½ day to a 90-day response	• Key things to consider when developing and implementing a rapid-response program include: the creation of partnerships and collaborations with health system decision-makers, networks and/or organization (to help build demand), the identification of sources of external and sustainable funding, and planning to ensure management and staffing capacity • Examples of types of complementary analyses that can be adopted to prepare syntheses include policy, political and systems analyses (utilizing policy documents) supplemented with key informant interviews • Jurisdictional scans are also often considered • Evaluation of this type of model could involve the completion of surveys by requestors on the key features of outputs • The workload and time frame of rapid-response services is dependent on the complexity of the topic, availability of staff, the amount of literature available, and depth of analysis
Demand-driven systematic reviews • Rapid reviews • Full systematic reviews • Living rapid and systematic reviews	• Systematic reviews use reproducible and transparent methods to identify, select, appraise, and analyze relevant research evidence to answer a clearly defined research question • Many different types of questions can be addressed (e.g., effectiveness of interventions, diagnostic test accuracy, prognosis, risk factors, etc.) • Rapid reviews use streamlined methods to produce evidence in a shorter timeframe than traditional systematic reviews (the latter which can take years) • Living rapid and systematic reviews are continually updated, incorporating relevant new evidence when available • Timeframes could range from five weeks (rapid reviews) to one year or longer (full systematic review)	• Key aspects of successfully conducting rapid reviews include: 1) identifying the scope and outputs, and determining the timeline which may involve fewer or more stakeholders; 2) defining and measuring success (e.g., program organization, final product, and influence and use of findings through surveys to the requestor; engaging transdisciplinary teams throughout the process to help address complex issues) • Factors that may increase the uptake of systematic reviews include: perceived usefulness, relevance and applicability of systematic reviews to policy issues; policymakers' ability to find, assess, and interpret the findings; collaboration between policymakers and researchers during the development of the systematic review; and synthesis of findings with actionable next steps, implementation considerations, interpreting the evidence related to policies of interest, and intervention descriptions (4-6) • Barriers limiting the use of systematic reviews included: 1) lack of agreement with the usefulness of the results; 2) lack of skills to access, evaluate and interpret the results; 3) difficulty to discern the key messages; and 4) lack of resources or receptive policy climate (4;6) • Policymakers and health care managers preferred a one-page plain-language summary of the review including clear key messages of relevance, impact and applicability to policies and audience of interest

Models of demand-driven and evidence-informed dynamic response and related supports	Descriptions of demand-driven and evidence-informed dynamic responses	Considerations when developing and implementing the model
		• Living systematic reviews appear to be an acceptable and feasible approach to continually be up-to-date on new research evidence while utilizing machine learning (e.g., automation of screening) and citizen science (e.g., crowd sourcing) approaches to manage workflow • The workload of rapid reviews and systematic reviews are dependent on a few factors such as complexity of the topic, availability of research staff, the amount of literature available, and depth of analysis • Rapid reviews generally omit or streamline specific methods (e.g., fewer research bibliographic databases identified, one reviewer during screening and abstraction process), which may limit the interpretation of research evidence and related conclusions • Living systematic reviews can be time-sensitive and resource-intensive as high levels of organization, motivation, team commitment and responsiveness were reported as beneficial (7) • Existing research organizations and groups experienced in living systematic reviews (e.g., Cochrane Living Systematic Review support team) were reported as a significant enabler to the success in the conduct of living systematic reviews • Current challenges to conducting living systematic reviews include: 1) clarifying roles and processes; 2) providing resources and incentive to increase motivation; 3) using technology to reduce human investment; 4) providing specific criteria to determine when a living systematic review is most useful; and 5) improving publication processes
General supports for decision-makers to access relevant evidence • Evidence summaries • One-stop shops • Other supports (e.g., avoid duplication of effort and reduce research waste)	• Online repositories or 'one-stop shops' that enable timely access to the best-available syntheses and synthesis-derived products (e.g., evidence summaries), targeted to the needs of decision-makers	• There are already several one-stop shops available to address the full range of clinical, public health, health- and social-system questions, so efforts to help users navigate and access the right one-stop shop at the right time could be more useful than establishing a new one • Developing user guides on how a particular target audience (e.g., citizens, clinicians, managers, policymakers) can use a one-stop shop may be important, as well as the functionality to facilitate automatic research evidence retrievals (e.g., through a monthly evidence service of new reviews) • Evidence summaries are likely easier to understand than systematic reviews, but it is unclear if the use of evidence summaries improve the uptake of research findings from systematic reviews by policymakers and health-system managers (8) • Evidence summaries likely require additional dissemination strategies that involve the collaboration of policymakers and health-system managers • One-stop shops are helpful when they use relevant health-systems taxonomy, help address the policy problem (e.g., stakeholders' views and experiences), features of policy options (e.g., how and why an option works) and implementation considerations (e.g., barriers to implementing particular option), and provide rapid results of relevant information in a user-friendly summary (9)

The research evidence related to **structural reforms** (which were more often framed generally as structural and operational factors) focused on what could potentially affect the routine use of best-available evidence and stakeholder insights in decision-making processes. Overall, a number of barriers and facilitators were identified across four domains, which are described in greater detail in Table 2:

1) procedures and processes (e.g., optimizes the use of best-available research evidence and stakeholder insights in decision-making processes);
2) competencies (e.g., strategies and processes related to improving competencies in the use of research evidence and stakeholder insights in decision-making processes);
3) culture (e.g., processes to develop a culture of values and principles related to the use of research evidence and stakeholder insights in decision-making processes); and
4) engagement and exchange efforts (e.g., processes anchored in the involvement and collaboration of relevant stakeholders).

Table 2: Structural and operational factors affecting the routine use of best-available evidence and stakeholder insights in decision-making processes

Structural and operational factors	Facilitators associated with the factor	Barriers associated with the factor
Procedures and processes: Procedures and processes that optimize the use of best-available research evidence and stakeholder insights in decision-making processes	• Decision-making processes such as an advisory committee, or collaborative relationships that facilitate the generation of relevant evidence (10) • Resources and infrastructure with dedicated research support, including strategies to promote knowledge sharing and capacity to train staff within the organization (11-14) • Strategies and collaborative models that promote engagement among relevant stakeholders including organizations, policymakers, and researchers (12; 13; 15) • Investment and funding to support research databases that automatically retrieve findings and aid in decision support when needed (16)	• Organizational leaders may find it difficult to incorporate research evidence within their decision-making (11) • Organizational leaders may be hesitant due to limited time and capacity to institutionalize evidence-based decision-making (10; 17) • Organizations may only focus on one aspect of research evidence (e.g., cost-effectiveness) instead of including other contextual aspects such as the policy problem (e.g., stakeholders' views and experiences), features of policy options (e.g., how and why an option works), implementation considerations (e.g., barriers to implementing particular option), and research evidence on cost-effectiveness (17) • Advisory committees may not have access or support to relevant and up-to-date decision-making criteria processes (17) • External environmental factors (e.g., system restructuring, meeting policy targets, and budgetary constraints) may have an impact on how evidence is used in decision-making (17)
Competencies: Strategies and processes related to improving competencies in the use of research evidence and stakeholder insights in decision-making processes	• Training programs and resources that promote the use of research evidence (e.g., 'policy buddies' partners policymakers with researchers to support the use of research evidence, or 'communities of practice' (CoPs) that bring together stakeholders) (10; 11; 18) • In-house capacity among staff on research literacy skills or long-term collaborations with external expertise (19) • Sub-specialty committees to address targeted issues that require additional expertise (6)	• Organizations may lack experience, awareness and familiarity in the use of research evidence (including how to address conflicting information or to apply research evidence to local needs and contexts) (5; 6; 11) • Organizations may have poor access to research evidence databases, or limited time to consult information (19) • Organizations may lack training and workshops dedicated to research use (5) • Organizations may have a culture to rely on expert opinion instead of additionally using rigorous research (20)

	• Engagement and learning opportunities from research organizations with strong research use (12)	
Culture: Processes to develop a culture of values and principles related to the use of research evidence and stakeholder insights in decision-making processes	• Strong leadership to exemplify the use of research findings and its value (11; 14; 16; 17) • Strong political and community support in the value of research evidence and stakeholder engagement to address local needs and contexts (12) • Reputation of advisors and trust in the processes (21) • Transparency on systematic methods and processes (15) • Quality and quantity of connections between researchers, decision-makers and health-system organizations (21) • Conflict-management strategies to address and mitigate issues among research staff involved in research evidence and stakeholder engagement (15)	• Lack of shared understanding between researchers and decision-makers on local needs and problems (11) • Power dynamics between different professional groups on the use of research evidence and experiential or clinical knowledge (17) • Lack of leadership to create a culture of learning and openness (17) • Lack of motivation and perceived usefulness of research evidence (5) • Competing priorities and perspectives of research evidence may reduce motivation and trust in the process (10)
Engagement and exchange efforts: Processes anchored in the involvement and collaboration of relevant stakeholders	• The use of key stakeholders to identify policy issues and research questions, and to disseminate key findings (e.g., medical officers or local champions in smaller systems, policy leaders) (6; 11; 14; 15; 21) • The use of knowledge brokers to operationalize the conduct of research evidence and stakeholder engagement with certain qualities such as: 1) at arm's length from policymakers and researchers; 2) high credibility and trust; and 3) support the conduct of research (e.g., set agendas, clarify needs, commission research syntheses, communicate opportunities, and monitor gaps) (22) • The use of effective communication and 'non-hierarchical' platforms among stakeholders during the processes (17) • The use of tailored dissemination strategies for research findings (e.g., using an automated system (such as a listserv) to alert stakeholders when evidence becomes available) (6)	• Limited available evidence on the impact of stakeholder engagement in the uptake of research use (19)

The research evidence related to **operational supports** generally focused on three areas of technical implementation support:

1) supporting rapid learning and improvement (e.g., 'on-the-ground' supports for teams implementing system-transformation initiatives);
2) developing and delivering activities and products (e.g., preparing rapid syntheses to address priority questions, and convening stakeholder dialogues and citizen panels to provide 'ways in' to evidence- and values-informed decision-making); and
3) sharing tools and resources in various modalities (e.g., creating one-stop shops for key tools and resources that can support those implementing system-transformation initiatives, with 'ways in' that align with their key areas of focus, such as priority populations or sectors).

In Table 3, we organize the key findings from the literature according to these areas and highlight some examples of the key concepts associated with each (to inform planning and development of relevant initiatives), as well as how they can be used to support rapid learning and improvement.

Table 3: Concepts and uses of operational supports to strengthen rapid learning and improvement

Type of operational support	Details of key concepts (to inform planning) and how the supports can be used
Supporting rapid learning and improvement	• The rapid-learning health-system framework and related concepts are gaining traction across Canada, including among supporting bodies, such as through CIHR's Institute of Health Services and Policy Research (IHSPR), and the Canadian Health Services and Policy Research Alliance, (as well as provincially in Ontario through the SPOR SUPPORT network and in B.C. through the B.C. Academic Health Sciences Network) • The rapid-learning and improvement cycle process can be used to: 1) identify a problem; 2) design a solution based on data and evidence; 3) implement a plan (pilot and control settings); 4) evaluate to identify what works and does not work; 5) adjust based on what was learned; and 6) disseminate the results • Assets and gaps can be identified based on the seven characteristics of rapid-learning health systems: 1) engaged patients; 2) digital capture, linkage, and timely sharing of relevant data; 3) timely production of research evidence; 4) appropriate decision supports; 5) aligned governance, financial and delivery arrangements; 6) culture of rapid learning and improvement; and 7) competencies for rapid learning and improvement • The planned SPOR national data platform would permit benchmarking, the evaluation of natural experiments, as well as other national SPOR assets that could be aligned with a rapid-learning approach • Existing training programs and resources that promote the use of research evidence (e.g., 'policy buddies' partners policymakers with researchers) (10; 11; 14; 18)
Developing and delivering activities and products	• Stakeholders can help identify policy issues and research questions and to disseminate key findings (e.g., medical officers or local champions in smaller systems, policy leaders) (6; 11; 14; 15; 21; 22) • Knowledge brokers and research organizations can help operationalize the conduct of research evidence and stakeholder engagement (22) • Existing dynamic, demand-driven and evidence-informed response models (e.g., rapid-response services, systematic reviews, one-stop shops) can be used to develop relevant activities and products
Sharing tools and resources in different modalities	• Searchable research databases can help avoid duplication of effort and reduce research waste by identifying existing systematic reviews and any that are currently ongoing or have been proposed (e.g., Evidence Aid, Cochrane Reviews, U.S. Veterans' Affairs Evidence Synthesis Program, AHRQ EPC program, PROSPERO, International Platform of Registered Systematic Reviews and Meta-Analysis Protocols) • There are existing digital applications and crowd-sourcing resources that can be used to make systematic reviews more accessible and usable (e.g., RCT classifier, Covidence) (23)

	• The use of tailored dissemination strategies for research findings can be helpful when sharing tools and resources (e.g., using an automated system (such as a listserv) to alert stakeholders when evidence becomes available) (6) • One-stop shops support efforts to optimize evidence-informed decisions for health-system improvement, especially when they include intervention descriptions, up-to-date interpretations, guidelines to use the one-stop shop, and the ability to conduct automatic research evidence retrievals • Other types of modalities include the use of learning collaboratives (or communities of practice)(24), webinars to connect with relevant experts and stakeholders, one-on-one coaching, working sessions, and use of a dashboard to benchmark progress

Findings from other jurisdictions

Below we provide a summary of select provinces (British Columbia, Alberta, Saskatchewan, Ontario and New Brunswick) in Canada in terms of what they are doing to create dynamic responses, to provide 'ways in' for data and evidence in decision-making processes through structural reforms, and ensure the availability of operational supports for evidence-informed implementation and rapid learning and improvement. These are also summarized in Table 4. These select provincial efforts are further detailed in Appendix 3.

In summary, our jurisdictional scan found that there are numerous and remarkable efforts that are underway in the select provinces that:

- support evidence-informed dynamic responses by policymakers and decision-makers (e.g., mostly related to demand-driven systematic reviews and use of other general supports within research organizations and government);
- routinize the use of evidence and stakeholder insights in decision-making through supportive structures (e.g., mostly related to developing a collaborative culture across sub-national health authorities, patient groups, provider associations, and organizations); and
- support rapid learning and improvement through operational supports (e.g., mostly related to the use of integrated health data systems, and research groups/networks that provide technical support and training opportunities to build research capacity).

Table 4: Examples of dynamic responses, decision-making structures, and operational supports across provinces in Canada

Jurisdiction	Dynamic responses	Decision-making structures	Operational supports
British Columbia	• Yes, but mainly focused on demand-driven systematic reviews, with less focus on rapid responses and other general supports	• Province-wide collaborative research is supported by the B.C. Academic Health Sciences Network, Michael Smith Foundation for Health Research, and Provincial Health Services Authority • A collaborative culture is being built through the coordination efforts noted above and through the Joint Collaborative Committees to engage physicians and policymakers in improvement • Several organizations help to coordinate efforts on evidence-informed decision-making and for rapid learning and improvement (e.g., Provincial Health Services Authority, First Nations Health Authority, B.C. Patient Safety and Quality Council, and B.C. Academic Health Sciences Network)	• Resources to support evidence-informed decision-making are available for patients (e.g., HealthLinkBC), providers (e.g., BC guidelines) and health-system leaders (e.g., BC Health Technology Assessment) • B.C. Academic Health Sciences Network is assisting to build research skills and competencies on rapid learning and improvement (including evidence-informed decision-making) • Many access points and supports are in place for linked health- and social-systems data (e.g., Populations Data BC) and a tripartite data-sharing agreement in ethical use of First Nations data

Jurisdiction	Dynamic responses	Decision-making structures	Operational supports
Alberta	• Yes, but mainly focused on demand-driven systematic reviews and other general supports, with less focus on rapid responses	• Several organizations help to coordinate and support efforts on evidence-informed decision-making and rapid learning and improvement (e.g., Alberta Strategic Clinical Networks, Alberta SPOR, Health Quality Council of Alberta, Health Research Ethics Board of Alberta)	• Supports are in place for linked health-systems data (e.g., Alberta SPOR data platform, Provincial Health Analytics Network Data Integration and Management Repository)
Saskatchewan	• Yes, but mainly focused on demand-driven systematic reviews and other general supports, with less focus on rapid responses	• A collaborative culture is being built through the establishment of guiding frameworks (e.g., First Nations and Métis Policy Consultation Policy Framework)	• Supports are in place for linked health- and social-systems data (e.g., eHealth Saskatchewan, Health Data and Analytics portal, administrative information management systems, Health Quality Council, Strategic Health Information and Performance support) • Training opportunities exist for building research capacity and quality-improvement measurement design for organizations and system leaders (e.g., LEAN's improvement leader training program, Saskatchewan Health Quality Council)
Ontario	• Yes, with several efforts for demand-driven rapid responses, systematic reviews, and other general supports	• Several organizations help to coordinate and support efforts on evidence-informed decision-making and rapid-learning (e.g., Institute for Clinical Evaluative Sciences (ICES), Ontario Health, Ontario SPOR) • There are initiatives directly addressing emerging research requests by decision-makers (Innovations Strengthening Primary Healthcare through Research (INSPIRE) and Better Access and Care for Complex Needs (BeACCoN)) • New financial arrangements are beginning to or have the potential to incentivize rapid learning and improvement (e.g., quality-based procedures, bundled care models, interprofessional team-based primary-care organizations) • Many groups use rigorous and participatory approaches to make recommendations to providers and healthcare institutions about optimal care	• Supports are in place for linked health-systems data (e.g., MyChart and patient portals, Health Ontario, ICES, Centre for Excellence in Digital Health Evaluation) • Supports are in place for rapid learning and improvement (OHT program of supports, RISE) • Research groups and networks have the capacity to produce demand-driven evidence-informed products (e.g., McMaster Health Forum, Knowledge Translation Program at the Li Ka Shing Knowledge Institute, Public Health Ontario, Ontario SPOR Unit) • Organizations in the acute-care sector have business intelligence, clinical informatics, decision support, and quality-improvement staff
New Brunswick	• Yes, but mainly focused on demand-driven systematic reviews and other general supports, with less focus on rapid responses	• Several organizations collaborate to coordinate and support efforts on evidence-informed decision-making and rapid learning (e.g., New Brunswick Health Council, Horizon Health Network and Vitalité Health Network) • Programs exist to increase research capacity (e.g., Support Opportunities and Assistance for Research (SOAR) program)	• Supports are in place for linked health- and social-systems data (e.g., New Brunswick Health Council, provincial electronic medical record system, New Brunswick Institute for Research, Data and Training)

What was learned from key informants

We conducted 29 key informant interviews with policymakers, stakeholders and researchers across Nova Scotia to learn about the assets in place, and those that would need to be created or strengthened, to support evidence-informed health-system transformation in the province. Additionally, we complemented the interviews with insights from NSHRID's efforts to engage key stakeholders across the province to understand the impact of the support being offered by the Rapid Review team and to review gaps and improvements. Interviews placed a particular emphasis on understanding the three areas that are the focus of this document:

- access to **dynamic responses** among decision-makers and those supporting them;
- the **structure** of decision-making processes regarding the routine consideration of inputs from the best-available research evidence and stakeholder insights; and
- the availability of **operational supports** during the implementation of system-transformation initiatives through evidence-informed, technical support for rapid learning and improvement.

In addition to answering the second overarching question in this synthesis and gaining insights about the dimensions listed above, interviews were also used to:

- interpret the totality of findings from the evidence synthesis, jurisdictional scan and other key informant interviews to identify opportunities and next steps;
- identify barriers and facilitators to making progress; and
- gain insights about how to effectively frame the issues in ways that will resonate with policymakers, stakeholders and researchers in the province in order to gain traction.

Below, we provide an overview of findings from key informants about access to dynamic responses, structure of decision-making processes and availability of operational supports in Nova Scotia, as well as barriers and facilitators to making progress. In the next section, we provide some of the key takeaway messages and proposed next steps that consider all of the inputs into this rapid synthesis (evidence review, jurisdictional scan and key informant interviews) and that were framed based on the insights gained from key informants.

Access to dynamic responses, structure of decision-making processes and availability of operational supports

The detailed findings from interviews in relation to access to dynamic responses, structure of decision-making processes and availability of operational supports are presented in Table 5. Overall, key informant interviews suggested that while there are important assets in place across the province to support evidence-informed health-system transformation (e.g., culture conducive to evidence-informed decision-making, organizations and structures in place to support it), things are not perfect, and several areas of need remain. In particular, the following themes were identified with respect to each area of focus:

1) access to **dynamic responses** can be improved by placing greater emphasis on creating decentralized capacity and coordinating the preparation of timely evidence syntheses to support decision-makers at all levels of the health system (e.g., zones and in local settings), and to identify and clarify the roles that can be played by existing provincial assets that have been underutilized in dynamic responses (e.g., university-based academics and research units);
2) **the structure of decision-making processes** can be improved by establishing processes and structures that routinize the systematic and transparent use of evidence and stakeholder insights (e.g., mandating an evidence synthesis alongside evidence-informed deliberations in each provincial expert panel established to inform priority policy decisions), and that strengthen the connections across levels of decision-making (e.g., government, NSHA, zone and local levels); and
3) **operational supports** can be strengthened through clearer linkages between strategic decision-making and operational decision-making, greater emphasis on data- and evidence-informed implementation supports underpinned by appropriate decision-support infrastructure, and a widespread commitment to rapid learning and improvement at all levels of decision-making.

Key informants described opportunities that could be taken advantage of in efforts to support evidence-informed system transformation and the adoption of a rapid-learning and improvement approach, such as:

- enhanced demand for data and evidence created by the COVID-19 pandemic;
- system restructuring with the recent establishment of population- and service-based networks;
- existing capacity in the province for supporting evidence-informed decision-making (e.g., rapid reviews prepared by the Implementation Science Team in NSHRID), and centres of gravity that could coordinate broader province-wide efforts; and
- experience from previous initiatives that can be used to inform scaling up key aspects of rapid learning and improvement (e.g., citizen-engagement efforts in chronic-disease management and evidence-informed reforms in virtual care).

Contextual facilitators and barriers

Key informants also identified a number of important contextual factors that may act as barriers to the adoption of a rapid-learning and improvement approach, and others that may facilitate supports for evidence-informed decision-making. The contextual factors identified as potential barriers include:

1) a number of system-level factors, such as:
    - separation of decision-making processes between key health-system stakeholders means there isn't always a clear pathway to adjust strategic policy directions based on what is being learned 'on the ground',
    - inconsistent emphasis on, and capacity to support, evidence-informed decision-making across different sectors (e.g., primary care versus specialty care), conditions (e.g., chronic conditions versus cancer care) and populations (e.g., women and children versus frail seniors),
    - lack of clarity in the support roles played by key stakeholders within a rapid-learning health system (e.g., key partners and research units have capacity for preparing evidence syntheses, but members are not routinely relied upon for dynamic responses), and
    - data sharing across all levels of decision-making, within and outside of government, is still in development stage, with trust among stakeholders currently being relied on to help facilitate data sharing;
2) organizational-level factors, such as varying administrative capacity for supporting evidence-informed decision-making and rapid-learning and improvement efforts across the province (e.g., individuals based at universities may not have HR support to coordinate and execute rapid syntheses in short timeframes, particularly if not aligned with other career milestones at the university); and
3) professional-level factors, including the fact that there has been little support for developing physician-leadership skills across the province in ways that are conducive to systems thinking and the adoption of a rapid-learning and improvement lens (e.g., developing capacities at the clinical level for engaging in monitoring and evaluation), and a predominant 'go it alone' culture that prioritizes personal experience and tacit knowledge over data- and evidence-informed decision-making.

The major contextual factors identified as facilitators include:

1) Nova Scotia is a small province with well-established channels of communication and collaboration in healthcare, with relatively few levels of bureaucracy in comparison to larger jurisdictions (e.g., researchers and decision-makers feel comfortable picking up the phone and calling each other);
2) actions by health-system leaders indicate a willingness to change (e.g., a number of structural and leadership changes across the system in recent years that continue to open up the door for evidence-informed decision-making); and
3) experience and capacity have been developed in supporting evidence-informed health-system transformation in recent years, with the pandemic accelerating progress in several key areas (e.g., 124 rapid reviews completed by the Implementation Science Team in NSHRID and renewed expectations of the role data and evidence plays in decision-making).

Table 5: Insights from key informant interviews about provincial assets, areas of need and opportunities to support evidence-informed health-system transformation in Nova Scotia

Areas of focus	Assets	Areas of need	Opportunities
Dynamic responses	• Established culture of drawing on researchers and evidence synthesis for priority issues (e.g., 'best brains' meetings on chronic disease, virtual care reforms) • NSHRID branch established with an Implementation Science Team to prepare rapid reviews in a timely way • Strong 'centres of gravity' at provincial universities to provide methodological and content expertise across a range of priority health issues • Research network of researchers who can provide policy-relevant research evidence when engaged	• Decentralized capacity to conduct timely evidence syntheses in direct response to decision-makers as a way to complement strong assets in place at NSHA • Improved access to dynamic responses for decision-makers outside of NSHA (e.g., in provincial government and in local settings within zones) • Role clarification for key assets in the province (e.g., academics and research organizations) to inform how they can routinely support dynamic-response efforts to a range of decision-makers	• Heightened demand for timely research syntheses initiated by COVID-19 pandemic
Decision-making structures	• NSHRID now established as a hub for data and evidence decision-making supports including access to rapid reviews that can be drawn on as needed by a range of decision-makers across the province • Research Nova Scotia structured to support research on priority topics as they emerge	• Systematic and transparent stakeholder-engagement efforts to ensure the right views and experiences are represented in decision-making processes • Focused efforts to identify routine 'ways in' for data and evidence into provincial decision-making processes about priority issues, and on expert advisory panels (with virtual-care reform providing a 'blueprint' for potential ways in for evidence synthesis) • Stronger connections at all levels (e.g., province, zones, and local) between decision-makers, data and evidence assets, and those involved in day-to-day operations in the health system	• Population- and service-based networks can create explicit 'ways in' for data and evidence while ensuring broader stakeholder engagement in decision-making processes from across the system • Clear signals across government and NSHA that there is a willingness to make routine use of data and research evidence alongside tacit knowledge and public input
Operational supports	• Capacity for engaging citizens and patients in key transformation initiatives (e.g., virtual care) and in implementation supports (e.g., chronic-disease management) • Clear mandate for NSHA to oversee implementation, monitoring and evaluation of system-wide policy decisions made by government, with business-planning cycles providing regular opportunities to relay lessons learned into decision-making • Technical supports in place to assist local implementers within zones (e.g., key partners in NS Health and other partners in the province that are	• Clearer linkages between system-wide strategic decision-making processes and operationalization within zones, and in local clinical settings • Greater emphasis on data- and evidence-informed technical supports for those operationalizing strategic decisions within the zones • Enhanced data infrastructure and analytics capacity, alongside tailored supports that account for local context • Stronger commitment to embracing a 'rapid-learning and	• Population- and service-based networks provide a way to target operational supports and rapid-learning and improvement efforts • Previous citizen- and patient-engagement efforts (e.g., in virtual care and in chronic-disease management) and existing technical supports (e.g., data dashboards and evaluation teams) provide a template with

	available to support capacity building across the system) • Strong willingness among research community to support 'day-to-day' decision-making processes in the province, and establishment of Translating Research into Care (TRIC) grants to fund collaborative research that can identify and scale up promising innovations across the province	improvement' cycle at all levels of the system, where things that aren't working are discontinued, and adaptations to policy practice are constantly driven by what is being learned across the province	opportunities to scale up across multiple areas of focus • Centralized coordination capacity at NSHA can be leveraged to support broader organizational supports

KEY TAKEAWAYS AND NEXT STEPS BASED ON WHAT WE FOUND

When considering the insights from the best-available evidence, experiences in other jurisdictions and key-informant interviews as an integrated whole, there are three high-level takeaway messages.

1) **There are no definitive answers from research evidence or experiences in other jurisdictions on 'what works best' to support dynamic responses, structural reforms and operational supports**. Specifically, while the best-available research evidence and jurisdictional scans provide helpful illustrations of models that have been adopted to support evidence-informed health-system transformation, these sources do not provide estimates of whether, how and why they are effective. At present, most of the literature is descriptive, with a focus on identifying promising models, documenting their key features and providing details related to how they have been implemented in various contexts, as well as highlighting the main barriers and facilitators that need to be considered by those interested in adopting them in their own context. Furthermore, jurisdictional scans indicate that the kinds of efforts adopted across Canada have rarely been subject to rigorous evaluations that can provide insights about whether, how and why the approaches have been successful.

2) **Rapid reviews were instrumental in supporting dynamic COVID-19 responses in Nova Scotia and are set to continue as an important input into decision-making well beyond the pandemic**. One of the clearest and most consistent messages from key informants was related to dynamic response in Nova Scotia. In particular, the Implementation Science Team within the NSHRID, which was created in 2018, was identified as an important provincial asset by most stakeholders across the province. Prior to the pandemic, this team and the newly established NoS (mentioned earlier in this document) began to address the rapid evidence synthesis, implementation and evaluation needs of the system through the preparation of rapid reviews as well as support for other decision-making processes and structures. With the preparation of more than190 rapid reviews between March 2020 and August 2021 (on COVID-19, and non-COVID topics), it is clear that the COVID-19 pandemic bolstered existing demand for and reliance on these dynamic responses, which will likely continue well beyond the pandemic. Several key informants also noted that this increased demand helped to further validate these structures while creating opportunities to both establish other supportive mechanisms (e.g., onboarding and mentoring within the NoS), and to engage key decision-makers and decision-making structures proactively on the need for evidence. Finally, with respect to the other types of dynamic response mechanisms, it appears as though there are opportunities to expand beyond rapid reviews, should additional types of decision-relevant evidence products be identified as being valuable outputs. Specifically, there is capacity for, but less coordination of, demand-driven systematic reviews and living-evidence products, which could be leveraged to inform decision-making about priority issues that may have a longer time horizon, or that would require regular updating given a rapidly changing evidence base.

3) **There are opportunities to increase the extent to which key structural reforms and operational supports are in place for supporting decision-making across the province.** It is clear that there are key strengths in Nova Scotia for supporting evidence-informed decision-making and the establishment of a

rapid-learning health system, but many existing supports for evidence use are linked to informal networks and personal relationships, and pursuing structural reforms and expanding operational supports are clear opportunities. While there are examples of provincial decision-making processes systematically and transparently leveraging the best-available research evidence and stakeholder insights (e.g., through policy deliberations informed by the best-available evidence), these types of efforts have yet to be routinized through structural reforms (e.g., through mandates for evidence syntheses and evidence-informed deliberations as part of expert panels and commissions). With respect to operational supports in Nova Scotia, to date these efforts mostly have been adopted to achieve sector- or condition-specific goals, rather than to orient the entire health system towards a rapid-learning and improvement approach. Other provinces provide illustrative models for these kinds of operational supports (e.g., Strategic Clinical Networks in Alberta and Rapid Improvement Support and Exchange in Ontario) that may be useful points of reference. Efforts are now underway across the province to operationalize a consistent approach for engaging with evidence at all levels of the health system, through zone operational structures and through the population- and service-based network structures which were implemented during the pandemic. Both of these provide clear pathways forward for pursuing structural reforms and establishing operational supports in the near future.

In the context of the transformations already underway in Nova Scotia (e.g., establishment of new structures such as population- and service-based networks) and initiatives planned for leveraging provincial assets to strengthen Nova Scotia's learning health system (e.g., building on the work of the NSHRID, NoS, and other key partners within NS Health), **there are six next steps that decision-makers in Nova Scotia may consider**:

1) document and build on lessons learned from COVID-19 about how to support the routine use of evidence in decision-making;
2) enable existing platforms (e.g., NSHRID and the Implementation Science Team, with support from the NoS) to provide broader coordination and administrative support for evidence-informed decision-making efforts across the province (e.g., dynamic responses, structural reforms and operational supports);
3) articulate clear roles for different levels of leadership and for provincial assets in supporting widespread evidence-informed decision-making (including other key partners within NS Health);
4) review, adapt and implement promising models of rapid-learning and improvement from other jurisdictions;
5) build capacity in areas where assets are not well developed; and
6) identify ways to optimize points of intersection between the key structures within NSHA and among external partners to facilitate rapid learning and improvement.

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APPENDICES

The following tables provide detailed information about the systematic reviews and primary studies identified in the rapid synthesis. The ensuing information was extracted from the following sources:

- systematic reviews - the focus of the review, key findings, last year the literature was searched, and the proportion of studies conducted in Canada;
- primary studies - the focus of the study, methods used, study sample, jurisdiction studied, key features of the intervention and the study findings (based on the outcomes reported in the study); and
- websites - details of programs and tools were extracted from websites.

For the appendix table providing details about the systematic reviews, the fourth column presents a rating of the overall quality of each review. The quality of each review has been assessed using AMSTAR (A MeaSurement Tool to Assess Reviews), which rates overall quality on a scale of 0 to 11, where 11/11 represents a review of the highest quality. 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 delivery, financial or governance arrangements within health systems. 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).

All of the information provided in the appendix tables was taken into account by the authors in describing the findings in the rapid synthesis.

Appendix 1: Summary of findings of systematic reviews

Type of review	Focus of systematic review	Key findings	Year of last search/ publication date	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada
Systematic review	Examining the factors affecting the use of evidence in policymaking (25)	The review included 145 studies, including 13 systematic reviews. The 'evidence' discussed in the studies was most often research evidence, primarily systematic reviews. However, 59 studies looked at the use of informal evidence, including personal experience and local data. While studies were predominately conducted within the health sector, they were also from other domains, such as criminal justice and environmental conservation. All studies reported barriers, facilitators, or both, of the use of evidence in policy. Barriers and facilitators were classified into themes: 'organizations and resources', 'contact and collaboration', 'research and researcher characteristics,', 'policymaker characteristics', 'policy characteristics', and 'other'. Organizational factors, including a lack of access to research, costs, and poor dissemination posed barriers to the use of research. Professional bodies were also a barrier where useful guidelines were unavailable, or where they were seen as political or biased. Leadership was a facilitator, specifically community leadership and policy entrepreneurialism. Other facilitators within the 'organizations and resources' theme included availability and access. Over two-thirds of studies reported contact and collaboration as facilitators of evidence use. Relationships, trust, and shared respect between researchers was the single most mentioned facilitator. Characteristics of research evidence affected uptake of research, with clarity, relevance, quality, and authoritativeness identified as facilitators. Researchers who understood the policy process and policy priorities benefited research uptake. However, researchers could also act as a barrier when they had different priorities from policymakers. Policymaker characteristics also affected evidence uptake, as their lack of research skills and awareness was found to be a barrier in 34 studies. Within the theme of policy characteristics, competing pressures, such as economic and political factors, were found to be barriers to evidence-based policy. Most studies focused on perceptions about factors affecting the research-policy 'gap', instead of documented proof or observational results about evidence use. Most studies also lacked an exploration of the content of facilitators and barriers, resulting in a lack of knowledge on when,	2012	5/10 (AMSTAR rating from McMaster Health Forum)	27/145

		why, and how these factors influence evidence uptake. Future research should identify the content and relative importance of these factors in different contexts.			
Systematic review	Identifying barriers to decision-makers' use of evidence from systematic reviews and meta-analyses (5)	A prominent finding within health research is that research knowledge is incorporated into clinical practice with limited success. Although systematic reviews synthesize discrete studies to facilitate the uptake of evidence into policy and practice, actual usage remains inconsistent. This review examined 27 studies describing obstacles to the use of evidence from systematic reviews and meta-analyses by decision-makers, which included 25 surveys and two qualitative studies. The review found 28 potential barriers, which were grouped into three themes: 'knowledge', 'attitudes', and 'behaviour'. Under 'knowledge', 11 studies looked at lack of awareness as a possible barrier, with a median of 55% of respondents citing it as an obstacle. Seven studies measured lack of familiarity as a barrier, and a median of 70% of respondents identified it as such. Under 'attitude', four studies investigated lack of motivation as a possible barrier, and a median of 3.6% participants cited it as an obstacle. In addition, a median of 16.5% of participants from seven surveys felt that lack of perceived usefulness posed a barrier. As for 'behaviour', a median of 55% of participants from 11 studies cited lack of access as a barrier. Five studies measured 10 external barriers to research uptake. Over 10% of respondents identified lack of resources and lack of a receptive policy climate, lack of workshop attendance, and lack of training as an obstacle. Finally, 14 surveys measured lack of use of systematic reviews, with a median of 78% of respondents reporting lack of use. Of the two qualitative studies, important barriers emphasized include lack of accessibility, lack of training, and weaknesses of the Cochrane Library, such as a limited range of topic coverage. Content issues such as lack of implications for practice and limited implementation strategies were also mentioned. Few studies looked at the entire variety of obstacles that must be overcome to reach improved uptake of evidence. Thus, future research should address a greater range of barriers to evidence use, and practical challenges must be documented by researchers through 'user testing'.	2010	7/10 (AMSTAR rating from McMaster Health Forum)	5/27
Scoping review	Reviewing factors influencing the use of systematic reviews by policymakers and healthcare managers (4)	Evidence suggests that systematic reviews are not routinely used by healthcare managers and policymakers. This review, which included 19 studies, aimed to identify barriers and facilitators to uptake of systematic reviews, with the goal of developing recommendations to improve the usability of systematic reviews. Barriers limiting the use of systematic reviews included lack of agreement with the usefulness of systematic reviews and lack of agreement with results of systematic reviews. In addition, lack of awareness or lack of familiarity impeded uptake. Lack of skills to locate, evaluate, interpret, and use systematic reviews also presented a barrier. Finally, patient and clinician resistance to	2014	7/9 (AMSTAR rating from McMaster Health Forum)	10/30

		implementing evidence from systematic reviews, as well as difficulty identifying key messages quickly obstructed evidence uptake. Facilitators to uptake of systematic reviews included positive attitudes towards the usefulness and applicability of systematic reviews to policy. Importantly, the provision of valuable and relevant reviews to policymakers at significant points in decision-making was influential in their use. Knowledge of the importance of systematic reviews, as well as skills in finding, assessing and interpreting reviews enhanced their use. In addition, collaborations between policymakers and researchers, such as assistance with evidence interpretation, benefited evidence uptake. With regards to format features of a systematic review, policymakers and healthcare managers recommended a one-page summary of the review including clear key messages in plain language. The summary should describe relevance, impact and applicability for decision-making. The summary could also be targeted to the specific audience, such as policymakers versus healthcare managers. As for content features, it was suggested that the evidence should be framed with regard to policy application, with implications of implementation and possible outcomes.			
Systematic review	Identifying factors influencing evidence uptake in program management within healthcare organizations (11)	Program managers within healthcare organizations oversee the design and execution of specific health services. Despite the promotion of evidence-based decision-making within healthcare, processes to achieve this at the program management level are not well-developed. Thus, this review included 14 studies to investigate possible barriers and facilitators of evidence uptake by program managers. Barriers to evidence use experienced by managers were most frequently informational, such as a lack of availability of relevant research. In particular, respondents perceived that research that could support decision-making at the local level was unavailable. Negative views of the impact of research and difficulty accessing relevant evidence were also prominent barriers. Organizational structure and process-related barriers were also cited, such as challenges related to incorporating research evidence within the complicated nature of organizational decision-making. Finally, organizational culture, a lack of experience of decision-makers in research usage, and a lack of shared understanding between researchers and decision-makers also posed potential challenges. Facilitators of evidence uptake were mainly informational, such as access to information and tailored dissemination of research to decision-makers. Organizational structure and processes could also facilitate evidence use, such as linkages within an organization that promote knowledge sharing. An organization's culture could also be a facilitator by providing the necessary supports and by exemplifying that the use of research findings is valuable. Developing individual skills in research literacy and dialogue between researchers and decision-makers were also cited as possible facilitators. A major difference between program managers and both clinicians and policymakers was the importance of organizational processes for the incorporation of evidence into decision-making.	2011	6/9 (AMSTAR rating from McMaster Health Forum)	10/14

		Strategies should work towards developing an evidence-informed culture, and towards increasing interaction between researchers and decision-makers.			
Systematic review	Evaluating the effectiveness of evidence summaries on the uptake of evidence in health decision-making (8)	Many organizations are beginning to develop evidence summaries of systematic reviews. These summaries have been found to be more useful than systematic reviews alone for decision-making about local applicability of research findings. However, there is minimal evidence on the usefulness of systematic review derivative products. This review aimed to evaluate the effectiveness of evidence summaries on policymakers' evidence uptake, as well as to ascertain the most effective aspects of a summary for improving evidence uptake. The review included six studies and protocols from two ongoing studies. The primary outcomes were the use of systematic review derivatives in decision-making, understanding knowledge, and/or beliefs. The review found that generally, evidence summaries are likely easier to understand than systematic reviews. However, it is unclear as to whether these summaries improve the use of evidence from systematic reviews in policymaking. For the primary outcomes, two studies evaluated self-reported usage of summaries in decision-making and found little to no difference in effect. For decision-making, understanding knowledge, or beliefs, four studies found little to no effect. In addition, two studies assessed which aspects of a summary could improve use of evidence. For tables summarizing findings, features such as including study event rates and absolute differences was reported to be helpful. Participants also favoured avoiding the use of footnotes. The review mentions that the primary outcome, the uptake of evidence from systematic reviews, is difficult to measure. Many factors influence decision-making, and studies assessed self-reported use of research rather than the actual use of research. It should also be noted that only two of the studies compared the evidence summary to a full systematic review or access to a database of systematic reviews. The other four studies compared various versions of evidence summaries. If these students used systematic reviews as a control, results may have differed. Further research is necessary to investigate whether evidence summaries can enhance the use of systematic reviews in policymaking.	2016	8/10 (AMSTAR rating from McMaster Health Forum)	1/6
Systematic review	Exploring how mental health policy can increase the use of evidence (14)	There is a widely recognized gap between evidence and practice in mental health, as well as a lack of knowledge of factors that enhance the development of evidence-informed mental health policy. This review identified nine studies investigating interventions with an aspect aiming to improve evidence use in mental health policy. Of these nine studies, two were randomized controlled trials, one used a rolling cohort design, and six employed a case study approach. The review employed the SPIRIT action framework to categorize the interventions being studied. The strategies to increase evidence use were categorized into three SPIRIT domains: policy influences, capacity, and research-engagement actions. The domain of policy influences includes media, public opinion or stakeholder interests. Three studies emphasized policy influences as a major strategy to increase evidence use in mental health	2013	4/9 (AMSTAR rating from McMaster Health Forum)	2/17

		policy. These strategies largely involved organizing community support for the uptake of a specific evidence-based practice. Five studies also identified collaboration among stakeholders as a strategy to improve evidence use. The domain of capacity involves increasing the extent to which the organization and its staff value research, the organization has resources and infrastructure to support research use, and the staff have the skills to incorporate research. Increasing the organization and staff value of evidence was indirectly included in all nine studies. In addition, five studies included supporting research use on the organizational level. Finally, eight studies aimed to improve staff research literacy. Under the domain of research-engagement actions, seven studies employed the strategy of increasing access to research evidence related to a specific evidence-based treatment. Other less popular strategies within this domain include increasing skills to assess research evidence, and increasing interaction between decision-makers and researchers. Each study employed multiple strategies to increase evidence use in mental health decision-making and reported on these strategies altogether. Thus, it is not possible to identify which strategies were more or less effective. Furthermore, most included studies did not offer outcome data.			
Systematic review	Evaluating interventions that can help to increase the use of systematic reviews by health-system managers, policymakers, and clinicians in decision-making processes (26)	The primary aim of this systematic review was focused on examining interventions that can be implemented to increase the use of evidence from systematic reviews by health-system managers, policymakers, and clinicians in decision-making processes. A total of eight studies were identified for this review, which included randomized controlled trials, interrupted time-series, and controlled before-after study designs. The findings from the interrupted time series studies found significant reductions in glue ear surgery rates for children in the following two ages groups: 1) under 10 years old, and 2) under 15 years old. Further, prescribing medication for the treatment of depression was found to be significantly reduced upon the distribution of bulletins to general practitioners. Overall, the authors of this paper recommend the adoption of Effect Health Care bulletins that summarize evidence from systematic reviews as a means of improving evidence-based practices given the following conditions: 1) a clear and specific message; 2) requires a marginal change; and 3) increasing awareness that a change needs to be made.	2011	9/10 (AMSTAR rating from McMaster Health Forum)	1/9

Non-systematic review	Exploring examples of embedded health policy and systems research used in decision-making in low- and middle-income countries (21)	This study examines the "embeddedness" of health policy and systems research in decision-making processes in the health sector. "Embeddedness" describes an organization and/or an individual's connection and structural position within a social network. The literature review included 92 articles and organized findings by health-system functions under the WHO Health Systems Framework. The six health systems building blocks are: service delivery, medical products, health information systems, health workforce, financing, and governance/leadership. Fourteen studies looked at the stakeholders involved in making decisions about service delivery. Lobby groups, champions and the leadership of policy networks were essential in incorporating research into the policy process. Nine studies examined decision-making around medical products. This building block was found to have some of the clearest pathways for health policy systems research to influence policy. Several low- and middle-income countries had large federal bodies responsible for creating evidence to inform policy decisions. There was sparse data under health information systems, and many low- and middle-income countries will need to develop basic data collection facilities. As for health workforce, no studies matched criteria for this building block. Next, health systems and policy research were used in five studies to support health financing decision-making. Finally, nine articles under governance/leadership demonstrated the successful use of health policy and systems research created by organizations with heavy political connections. Integrating health policy and systems research into decision-making involves many actors and is a context-dependent process. To embed an organization into the decision-making network, four qualities need to be developed: reputation, capacity, quality and quantity of connections to decision-makers and other health system organizations.	2015	4/9 (AMSTAR rating from McMaster Health Forum)	0/92
Systematic scoping review	Identifying and evaluating knowledge translation products utilized in healthcare decision-making processes (27)	The primary aim of this systematic scoping review was to identify and assess knowledge translation products utilized in decision-making processes in healthcare settings. A total of 20 knowledge-translation resources were identified, of which summaries of systematic reviews were the most common (n=11), followed by overviews of systematic reviews (n=6) and policy briefs (n=3). Summaries were from Evidence Update, Health Evidence, and policymakers' summaries by the Agency for Healthcare Research and Quality. Summaries of systematic reviews identified within the paper included, but were not limited to, Evidence Essentials and SUPPORT summaries. Lastly, with respect to the policy briefs identified within the review, these were McMaster Health Forum evidence briefs. The most frequently found features in summaries of systematic reviews were the assessment of methodological quality and generalizability of the conclusions reached. It is worth noting that overviews of systematic reviews were found to encompass a larger number of features and exhibit a greater likelihood to describe methods.	2009	6/9 (AMSTAR rating from McMaster Health Forum)	4/20

		The findings from this review noted that knowledge-translation resources hold great benefit as they can help to interpret findings and/or inconsistencies within the literature, and evaluate the quality and conclusions reached by systematic reviews. However, the extent to which these resources are currently adopted by policymakers is currently unclear and further research is required.			
Scoping review	Reviewing the health literature on innovations within acute and primary care and map processes at the professional, organizational and local system levels which have an impact on how evidence informs decision-making on innovation (17)	The review included 24 studies that highlighted innovations within acute and primary care and described processes at the professional, organizational, and local system levels which influence how evidence informs decision-making on innovation. Evidence use in decision-making is affected by multi-level processes within professional, organizational, and local systems, as well as interactions across these systems. At the professional level, preferences for evidence were different across professional groups and healthcare sectors. Service payers preferred a wide variety of evidence sources, such as patient stories, and prioritized local need for innovation over research evidence. Nurses working in the acute sector preferred to integrate practical and scientific principles, while physicians preferred the latter. Some evidence also highlighted that decisions to develop and adopt innovations reflect professional interests. For example, in a study of surgical innovation, surgeons 'spoke for' patients by introducing novel techniques that would 'make sense' for them, even though supporting research evidence was lacking. Furthermore, power dynamics between different professional groups had an impact on evidence use, with an example being managers who elevated scientific evidence, while attempting to marginalize general practitioners' clinical and experiential knowledge. At the organizational level, organizations assessed non-clinical aspects of innovation. For example, financial issues were considered alongside clinical need or effectiveness. Organizations allowed stakeholder engagement in decision-making processes and quality-improvement projects, such as staff, as well as patients and the public. Such engagement was supported by effective communication channels and a 'non-hierarchical' platform for decision-making. Several organizational facilitators to evidence use in decision-making about innovation were also found, including collaboration, strong leadership, a culture of openness and learning, and a commitment to being driven by research and data. Organizational barriers to implementing innovations included a lack of time and resources, and pressures, and a lack of leadership to make changes. Organizational politics also influenced the type of evidence accessed and how it was interpreted. For instance, the use of economic evaluation by committees making technology coverage decisions was limited by unclear relationships with resource providers, a politicized decision-making process, and poorly defined decision-making criteria.	2016	8/9 (AMSTAR rating from McMaster Health Forum)	5/24

		At the local system level, external pressures, such as system restructuring, meeting policy targets, and budgetary constraints, had an impact on how evidence was used in decision-making about innovation. Furthermore, pan-regional organizations influenced how evidence was integrated into decision-making about innovation. On the one hand, pan-regional organizations down-regulated the uptake of evidence in local decision-making; however, certain pan-regional organizations also helped institutionalize local innovations or supported disinvestment. Finally, engagement in external systems allowed a more diverse range of potential stakeholders to inform decision-making on innovation. However, taking into account a range of external stakeholders' views could deter implementing innovations based on formal research evidence as a standalone driver. This review examines how processes at multiple levels (professional, organizational, local system) impact evidence uptake in decision-making processes on innovation. While the review found that research evidence was the most widely cited form of information, other forms of evidence such as local data and professional expertise was also described, thereby elucidating the importance of integrating informal information into decision-making processes.			
Systematic Review	Reviewing the barriers to the uptake of research evidence from systematic reviews by decision-makers (5)	This review included 27 unique studies that described at least one barrier to the uptake of evidence from systematic reviews. The identified barriers were then grouped in accordance with the knowledge/attitude/behavioural framework. In terms of knowledge-related barriers, lack of awareness was highlighted in 11 studies. Seven surveys also measured lack of familiarity as a possible barrier, with at least 10% of survey respondents citing lack of familiarity as a barrier. For attitude-related barriers, lack of motivation and lack of perceived usefulness were also cited as possible barriers by survey respondents. Finally, behaviour-related barriers include lack of access, as well as external environmental barriers such as lack of resources and lack of positive policy climate, lack of workshop attendance, lack of use of systematic reviews, and lack of training in the Cochrane Library. Lack of time was cited by less than 10% of participants, and limited range of topics mentioned by the Cochrane Library also served as a barrier. Two qualitative studies described key barriers to evidence use from systematic reviews such as the lack of accessibility, lack of training in the purpose and methodology of systematic reviews, content issues, and an insufficient understanding of the information needs of the target audience of systematic reviews. Lastly, one study assessed the perceived weaknesses of the Cochrane Library, suggesting that poor access, the narrow focus on randomized controlled trials and meta-analysis, difficulty of use, lack of regular update, inadequate promotion, and the time needed to use and search the database. The review suggests that methods to improve the use of evidence from reviews and meta-analyses will need to overcome various obstacles, while highlighting the barriers that prevent knowledge users from using such evidence.	2010	8/9 (AMSTAR rating from McMaster Health Forum)	5/27

Appendix 2: Summary of findings from primary studies

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
Examining strategies to develop and implement a rapid-response program for health-system decision-makers (3)	*Publication date:* 2014 *Jurisdiction studied:* Canada *Methods used:* Issue brief	Systematic reviews were identified by searching for organization-targeted implementation strategies in Health Systems Evidence (www.healthsystemsevidence.org) and an existing analytical framework was drawn on.	This paper aimed to describe the best available evidence related to the problem, while proposing three broad features of a program that would address the problem and implementation considerations. A stakeholder dialogue was subsequently conducted to examine rapid-response programs for health-system decision-makers in Canada.	Health-system decision-makers continue to face difficulties in finding and using research evidence. These challenges include a lack of access to relevant and high-quality evidence, a lack of sustained interaction between policy researchers and decision-makers, and uncertainty regarding the measurement of success. To address these difficulties, this issue brief provided three potential features of a rapid-response program to offer timely access to evidence for health-system decision-makers in Canada, as well as implementation considerations for executing such a program. The first program feature involves organizing a rapid-response program. This can emphasize four types of organizational features: governance, management and staffing, resources, and collaboration. The second program feature involves deciding on the timelines in which a rapid synthesis may be conducted and identifying the scope of activities and products that can be completed during each timeline. The issue brief establishes three timelines for the completion of a rapid response: three, 10 or 30 business days. The third program feature involves defining and measuring success. The four areas of success are: program organization, final product, influence on behavioural intention, and whether and how the synthesis was used. The issue brief identifies possible approaches to measuring success in each area. For example, the success of the final product could be measured by conducting a survey asking the requestor to evaluate key features of the rapid synthesis. With regards to implementation considerations, there are possible barriers to the development of a rapid-response program for health-system decision-makers. These barriers exist at the level of individuals, service providers, organizations and systems. In addition, potential opportunities for implementing the program features include emphasizing the creation of partnerships with health-system decision-makers, networks and/or organizations, and on seeking external funding.
Examining SUPPORT tools as a means of finding and using research evidence to support evidence-informed health policymaking (28)	*Publication date:* 2009 *Jurisdiction studied:* Multiple *Methods used:* Review	n/a	The series describes a set of tools that have been developed by the SUPporting POlicy relevant Reviews and Trials (SUPPORT) project to help policymakers ensure that their decisions are well-informed by the	This article proposes a tool that can be used by those involved in finding and using research evidence to support evidence-informed health policymaking. Four broad areas are proposed: 1) supporting evidence-informed policymaking, which is often dependent on organizational arrangements to support the use of evidence, including processes for priority making; 2) identifying needs for research evidence, which relates to the ability to clarify the problem, frame the options and plan for implementation; 3) finding and assessing evidence, which relates to the systematic approaches decision-makers use to find and assess available evidence; and 4) going from research evidence to decisions, which relates to the approaches decision-makers take in

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
			best available research evidence	order to engage and inform relevant stakeholders in order to use evidence to inform policy choices. The article suggests that inappropriate use of evidence can lead to issues such as inefficient processes, delays in programming, misleading information about problems and options, and distortion of research agendas. Using processes that are systematic and transparent can help ensure research evidence is used appropriately to help guide decision-making.
Synthesizing information for Decision-makers by utilizing prior evidence and frameworks to help deal with complexity (29)	*Publication date:* 2017 *Jurisdiction studied:* Multiple *Methods used:* Book chapter	n/a	n/a	This chapter considers the options for synthesizing knowledge for decision-makers by building on prior evidence and using frameworks to help deal with complexity. The choice of methods for delivering a rapid review is intertwined with how projects are managed, the workload, and the knowledge currently available. Regarding project management, the size of the team that can be employed to work on a project is an important consideration. Regarding the workload, it is not always obvious how much work a project will take. The complexity of the problem question, the amount of literature available and the depth of analysis may not be known until the project is started. Transdisciplinary working across different disciplines and policy sectors is likely to occur when addressing complex issues. Touchpoints with stakeholders along the entire research process will be important to determine methodological decisions for the rapid-review product. Overall, this chapter summarizes that reviews done quickly often involve fewer stakeholders, less discussion and greater use of prior work, whereas longer reviews allow for increased stakeholder involvement with more in-depth learning from the literature.
Addressing organizational efforts to support the use of research evidence to inform health-policy decisions (13)	*Publication date:* 2009 *Jurisdiction studied:* Multiple *Methods used:* Mixed methods	Evidence drawn from a survey of 176 organizations, followed by telephone interviews with 25 of these, and site visits to eight.	Lessons learned from the experience of organizations engaged in activities to support evidence-informed health policymaking.	This article suggests five questions that organizations can ask when considering how to improve support for the use of research evidence to inform health-policy decisions. The questions suggested are outlined below. Each question is accompanied by a list of suggestions on how to approach the question. (1)"What is the capacity of your organization to use research evidence to inform decision-making?" This can be assessed by an organizational self-assessment that examines areas of organizational culture and values, priority setting, ability to obtain research evidence, quality assessments and interpretation, recommendation and decision-making, monitoring and evaluation, and professional development. (2) "What strategies should be used to ensure collaboration between decision-makers, researchers and stakeholders?" These include a set of primary and secondary strategies that can be adapted based on context. (3) "What strategies should be used to ensure independence as well as the effective management of conflicts of interest?" These strategies include the use of disclosure forms, criteria for decision-

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
				making, standard polices and standing committees, as well as financial arrangements, management arrangements, and transparency in decision-making. (4) "What strategies should be used to ensure the use of systematic and transparent methods for accessing, appraising and using research evidence?" These often include easily accessible manuals that describe these methods. (5) "What strategies should be used to ensure adequate capacity to employ these methods?" Three key messages that relate to ensuring capacity are: collaboration with other organizations to avoid unnecessary duplication; build capacity among those in the organization through training and availability; and start small, have a clear scope and ensure resources are in place where they are needed most. The article concludes that there is limited evidence regarding different strategies to improve how to support evidence-informed health policymaking, but that organizations should tailor their arrangements to specific aims and circumstances reflecting on key lessons drawn from other organizational experiences.
Examining how research evidence helps to inform the development of recommendations by international organizations (30)	*Publication date:* 2009 *Jurisdiction studied:* Multiple *Methods used:* Review of recommendations	World Health Organization (WHO) and World Bank recommendations on five topics (contracting, healthcare financing, health human resources, tuberculosis control and tobacco control)	Recommendations were identified and their relevant systematic reviews were catalogued. Recommendations were assessed to determine their consistency with the systematic reviews used for their formulation.	This article aimed to examine the extent to which research evidence informs the development of recommendations by two international organizations. The article found that only two of the eight publications examined cited systematic reviews, and only five of 14 WHO and two of seven World Bank recommendations were consistent with the claims of the systematic reviews. Based on these findings the article recommends that decision-makers and organizations should critically evaluate the quality and local applicability of any recommendations from any source, including international organizations, prior to their implementation.
Examining the evidence of effects in recommendations developed by the World Health Organization (20)	*Publication date:* 2007 *Jurisdiction studied:* Multiple *Methods used:* Mixed methods (interviews and review of	Department detectors at the WHO headquarters and a sample of recommendation-containing reports.	Interviews and key features of the reports were individually examined by two individuals.	The article aimed to examine the use of evidence, specifically the evidence of effects, in recommendations developed by the WHO. The article found that processes used by the WHO relied heavily on the use of expert knowledge from the topic specialty, and often did not use those who will be affected by the recommendations or methodological experts. In addition, systematic reviews, and concise summaries of the findings of these reviews, were rarely used in the development of recommendations. The article concluded that in order for progress to be made in recommendation development and implementation, organizations such as the WHO will need leadership,

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
	recommendations)			targeted resources, transparent processes, and close attention to current and emerging research.
Reviewing contributions that help support finding and using research evidence in a timely manner (16)	*Publication date:* 2012 *Jurisdiction studied:* Canada *Methods used:* Review of five Canadian contributions to support evidence informed decision-making	EvidenceUpdates, Rx for Change, Health-Evidence.ca, Health Systems Evidence, and the McMaster Health Forum	Review and profile five Canadian contributions that allow stakeholders to find and use research evidence in a timely matter.	The article aimed to review and profile five Canadian contributions that allow stakeholders to find and use research evidence in a timely matter. The article found that "one-stop shopping" resources for research evidence and dialogues are essential for supporting efforts to optimize evidence-informed decisions for health-system improvement. While systematic reviews are an important tool for knowledge translation activities, the inclusion of intervention descriptions and up-to-date interpretations are important for use by system stakeholders. Diversifying knowledge translation by including support systems that automatically retrieve findings, interventions that aid rapid decision support when research is needed, and the recognition of the utility of general guidelines to support evidence-informed decision-making in health systems is also needed. The article concluded that in addition to the above, training system stakeholders for the use of knowledge translation activities is important.
Examining how health-systems identify and use evidence, and how "Evidence-based Practice Centre" can support future decision-making processes (6)	*Publication date:* 2017 *Jurisdiction studied:* Multiple *Methods used:* Qualitative interviews	Nine individuals with leadership roles in enhancing health-system quality, safety and process improvements	Evidence Based Practice Centre working group members reviewed interview notes	This article aimed to examine how health systems identify and use evidence, and how "Evidence-based Practice Centre" may aid future decision-making. The article found that health systems have several processes for finding and using evidence for decision-making. Evidence and improvement practices could arise from the top down (from leadership to local level) or from the bottom up (local to leadership). One common process to identify these practices was for the health systems to conduct searches from the literature themselves, although there was considerable variability in obtaining this information. Systems with more capacity used medical librarians and centralized committees to gather and disseminate findings, while smaller systems relied on champions or local medical officers to obtain information. Internal data was often used to benchmark performance across the system and identify relevant improvements. Sub-specialty committees were often put into place for more targeted issues. Challenges in the process of finding and using evidence related to how to resolve conflicting information, applying the information to local needs and keeping information up to date. Synthesized data from systematic reviews and guidelines, with a focus on actionable next steps, was preferable. It was also important to have a system (such as a listserv) to alert stakeholders throughout the health system when evidence became available. Prolonged turnaround time for evidence synthesis may be a barrier to health systems partnering with agencies or working groups. A focus on predictive

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
				analytics, high-value care, advance care planning, and care coordination would be of great interest. For the Evidence-based Practice Centre, they concluded that they could improve their own reports in the following ways: 1) disseminate emails that include key research messages; 2) construct a newsletter with concise research summaries; 3) ensure reports are accessible through Google and other common search engines; 4) consider making targeted reports for specific topics 5) make reports more actionable; and 6) focus on outreach and branding.
Developing and evaluating alternative formats for augmenting access to and usability of systematic review data for health-systems guideline development (23)	*Publication date:* 2019 *Jurisdiction studied:* Multiple *Methods used:* Mixed (interviews, literature search)	Interviews with a department director and four health-system experts. Literature was on the core functionalities of evidence summaries. Subsequent reactions on examples were elicited from participants.	n/a	The article aimed to develop and test alternative formats for improving access to and usability of systematic review data for health-systems guideline development. The article found that there was a need for two core functionalities for evidence summaries and systematic reviews: the ability to elicit concise and specific information from reviews, and the ability to select subsets of evidence from larger reviews. Two tools that are able to provide these functions are MAGICapp and Tableau. In order to use these tools, a certain level of expertise will be required. The additional staff time and expertise to prepare, import and manage data will have to be taken into consideration. There are existing tools that can be used to make systematic reviews more accessible and usable, however, using these tools requires considerable investments.
Investigating knowledge-brokering approach experiences to support evidence-based policymaking (22)	*Publication date:* 2006 *Jurisdiction studied:* The Netherlands *Methods used:* Case study	This study uses a recent successful experience with knowledge brokering to foster greater use of research evidence in policymaking in the Netherlands	n/a	This article describes that knowledge brokering is not about transferring the results of research, but rather organizing an iterative process between researchers and policymakers to co-produce feasible and evidence-informed policy. Knowledge brokering requires organizing forums between policymakers and researchers, building trust, setting agendas, highlighting mutual opportunities, clarifying needs, commissioning research syntheses, packaging research syntheses, communicating and sharing information, and monitoring gaps. The study describes a successful example of knowledge brokering for informing policy in the Netherlands. In the Netherlands, a steering committee was established to provide quality control by bringing together various stakeholders to achieve well-informed decision-making on cost-effectiveness approaches in the areas of assisted reproduction. The Netherlands Organization for Health Research and Development (ZonMw) first commissioned a synthesis from clinical researchers to reach an agreement about key messages from the evidence-based literature. Then ZonMw helped facilitate an iterative process to map out the policy context and what the key messages would mean in context. Finally, the results

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
				from the research synthesis and policy mapping were packaged together to form scenarios that could be presented to stakeholders. Policymakers were then able to agree on recommendations for action. The key to success in this process was identified as the researchers leading the research extraction and ZonMw leading the translation of key messages into the policy context. From this case study, it was concluded that having a professional institutional broker at arm's length from policymakers and researchers, but with high credibility, would be an essential support structure to carry out such mandates.
Investigating facilitators and barriers to evidence-informed decision-making (10)	*Publication date:* 2008 *Jurisdiction studied:* U.S. *Methods used:* Qualitative	Twenty-eight state-level legislators and administrators who incorporate evidence into decision-making	Interviews were coded inductively to highlight important issues with evidence-based decision-making, the types of information that were used and the facilitators and barriers to this process	This study examines the contexts in which policymakers are situated when making decisions which may be evidence informed. The key barriers to evidence-informed policymaking included: 1) institutional features that prevented legislators and administrators from being amenable to change, such as limited capacity, time and understanding; 2) characteristics of the evidence supply, such as research quantity, quality, accessibility and usability; and 3) competing sources of influence, including the power of anecdotes and 'rights talk' to sway opinions, the power of interest groups and political values, and attacks on the evidence-based approach that degrade trust. Key facilitators included: 1) linking research to concrete impacts, costs and benefits; 2) reframing policy issues to fit the existing evidence by highlighting what *is* known; 3) training to use evidence-based skills; and 4) developing research venues whose core task is to collect and evaluate evidence, such as an advisory committee, or establishing collaborative relationships that will facilitate the generation of relevant evidence.
Examining the characteristics of 131 policy documents (19)	*Publication date:* 2019 *Jurisdiction studied:* Sydney, Australia *Methods used:* Qualitative	Six health policy and program development agencies based in Sydney, Australia	Interviews covered whether and how research was engaged with and used in the development of 131 policy products, and any barriers or facilitators related to this.	This paper aimed to describe the characteristics of 131 policy documents, the ways in which research was engaged with and used in the development of these policy documents, and to identify the common barriers and facilitators. The paper found that access to consultants and relationships with researchers were both associated with increased research engagement (i.e., whether research was searched for, appraised or generated), but were not associated with increased research use (i.e., to clarify current understandings, persuade decision-making or inform policy). The agencies in which evidence use was the strongest had some notable characteristics; they all included monitoring and surveillance of relevant health data and funded their own research. The top barriers to evidence use were not having enough time to adequately consider available research evidence and poor access to literature. In contrast, having internal research use expertise or contracting external expertise in the form of consultants were two of the most common facilitators.

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
				Findings suggest that increasing access to consultants and relationships with researchers may be a promising intervention for agencies who wish to increase the quality of the evidence used.
Investigating case descriptions of organizations that produce research evidence and support its use (12)	*Publication date:* 2008 *Jurisdiction studied:* Multiple *Methods used:* Mixed methods	Fifty-one interviews were conducted as a part of eight site visits to organizations that support the use of research evidence	n/a	This paper aimed to provide case descriptions of organizations that produce research evidence and support its use. Two organizational strengths that were highlighted by participants were their use of an evidence-based approach and the strong relationships built between researchers and decision-makers. Although these were strengths, participants noted that these commitments can be time consuming and may lead to challenges with conflict of interest. Two main weaknesses of organizations were their lack of resources and problematic conflicts of interest. Two key suggestions for similar organizations were to first learn from other organizations and to develop capacity and retain staff and collaborators. Other advice included working on supporting policymakers and researchers to work together, focusing on processes from the beginning, obtaining a strong political commitment, and considering equity.
Synthesizing findings from organizations that support research evidence use (15)	*Publication date:* 2008 *Jurisdiction studied:* Multiple *Methods used:* Mixed methods	This study used surveys, interviews and case descriptions during site visits to organizations that support the use of research evidence by producing clinical guidelines, health technology assessments or directly developing policy	n/a	This study aimed to synthesize findings from multiple organizations that support the use of research evidence. The study identified seven key recommendations regarding organizations that support the use of research evidence in developing health policy: 1) collaborating with organizations and being open to different forms of organizations and collaborative models; 2) establishing strong links with policymakers and involve stakeholders throughout the process; 3) manage conflict of interest among those involved in the work; 4) focus on building capacity within your organization; 5) be transparent in your work and rely on systematic methods and processes; 6) start with a concisely defined audience and scope; and 7) always consider implementation considerations.
Examining multi-site collaborative approaches in low-resource settings (18)	*Publication date:* 2016 *Jurisdiction studied:* Multiple	This study included a review of implementation research facilitated by communities of practice (CoPs) in Mexico and	n/a	This study aimed to examine the implementation and impact of multi-site approaches to translate evidence into policy in lower-resource settings. Using CoPs (a group of stakeholders who share a common concern or passion for a topic) to implement research was found to trigger data monitoring by local health organizations and lead to improved capacities to identify and use evidence in solving implementation problems. The use of Policy Buddies (a program where a 'buddying'

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
	Methods used: Case studies	Nicaragua as will as Policy Buddies in South Africa		process enhanced the demand and use of systematic reviews by policymakers through supporting the clarification of research questions, search strategies, appraisal methods, evidence summaries and feedback) helped inform a policy framework for medication adherence in South Africa, and those engaged in the program reported an enhanced recognition for the value of research and a greater demand for policy-related knowledge. The study concluded that when developing evidence-to-policy approaches, consideration should be given to 'fit for purpose' interventions where embedding the use of research directly into policymaking can help guide decision-making in complex contexts.
Assessing the feasibility and acceptability of living systematic reviews (7)	*Publication date:* 2019 *Jurisdiction studied:* N/A *Methods used:* Mixed methods	Six living systematic review (LSR) teams (three Cochrane, three non-Cochrane) were included in the study	Information regarding individual experiences conducting and contributing to the LSRs were gathered through online surveys and semi-structured interviews. Surveys were administered between October 2017 and July 2018, once a month, to key members of each LSR team following the publication of their first LSR	This study aimed to assess the feasibility and acceptability of living systematic reviews (LSRs) as an effective means of keeping evidence syntheses up to date with the most recent research evidence. The authors investigated various methods in which LSRs are currently being conducted, facilitators and barriers to executing LSRs, and opportunities for scale-up and improvement. The structure of the LSR team varied between Cochrane and non-Cochrane review teams. Cochrane review teams consisted of an information specialist who collaborated with the LSR editors to develop and run monthly searches. Additionally, Cochrane teams used machine learning and Cochrane Crowd to screen records. This is in contrast to non-Cochrane review teams in which members were required to run their own searches. Reported time commitments among study participants varied widely. The following key pieces of information were gleaned through semi-structured interviews with participants. To begin, individuals were overall enthusiastic to be contributing to LSRs, recognizing them to be an effective and reliable way of ensuring reviews reflect the most recent research evidence. When asked about their expectations and motivations for joining an LSR team, participants commonly believed that LSRs would be a more time-efficient approach to providing an update on the current status of the literature, as compared to the "traditional one-off task of updating a systematic review". Participants also stressed the importance of employing dedicated and experienced team members, as well as the importance of constant communication between members, to effectively meet the deadlines and requirements of the LSR. Strict timelines, clearly defined roles, and high levels of support were essential to executing successful updates. Challenges regarding the LSR process were also identified by participants, including, but not limited to: 1) the ongoing workload; 2) securing peer reviews that were adherent to the strict timeline of each LSR; 3) barriers in the publication process; 4) managing the

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
				constant flow of new citations; and 5) limitations of existing screening technologies. Several opportunities for improvement and scale-up were also noted, including more comprehensive guidance to clarify individual responsibilities and LSR methods, changes to the current publishing process to include a clear versioning system for updates, the need for better "integration of technology within existing workflows" to assist with managing searches and screening, as well as the need for continual funding, resources, and promotion of LSRs. Overall, LSRs were identified to be an acceptable and feasible approach to ensuring evidence syntheses are kept up to date and policymakers are provided with the newest available evidence to inform decision-making.
Methods to develop and refine a comprehensive 'one-stop shop' for research evidence about health systems for policymakers, researchers and key stakeholders (9)	*Publication date:* 2015 *Jurisdiction studied:* N/A *Methods used:* Descriptive	n/a	This article highlights the process followed to develop a comprehensive 'one-stop shop' for policymakers, key stakeholders and researchers to attain research evidence on health systems. The following four stages of development were defined and followed by the study authors: 1) developing a taxonomy of health systems topics; 2) build content and add value to that content; 3) expand the types of content; and 4) continuously update and maintain the 'one-stop shop'.	The purpose of this study was to "define and refine the methods" for developing a comprehensive 'one-stop shop' for policymakers, researchers and key stakeholders to identify decision-relevant sources of information regarding health systems. The authors identified the following three challenges faced by researchers, key stakeholders and policymakers, to be used as a means of informing the development of their 'one-stop shop': 1) policymakers must be able to find research evidence using a clear taxonomy of topics; 2) policymakers must know that they have conducted a comprehensive search of the research evidence relevant to their question; and 3) policymakers must be able to quickly identify decision-relevant sources of information as a result of their search. Proceeding through three pre-defined stages of development, the authors created Health Systems Evidence, a 'one-stop shop' for policymakers, researchers and key stakeholders to attain decision-relevant sources of information about health systems. A description of the platform, as well as the way in which it addresses the three previously mentioned challenges is summarized in the study's *Results* and *Conclusion* sections. To begin, an easily understandable taxonomy was developed to address the first challenge. This taxonomy is organized by governance, financial and delivery arrangements, and by implementation strategies. To address the second challenge, Health Systems Evidence includes a variety of different types of research evidence, including "evidence briefs, overviews of systematic reviews, systematic reviews, systematic review protocols, registered systematic review titles, economic evaluations and costing studies, health reform descriptions and health system descriptions." Finally, to address the third challenge, Health Systems Evidence is continuously updated, and content is translated to seven different languages (Arabic, Chinese, English, French, Portuguese, Russian and Spanish). Furthermore, the authors "developed an approach to providing added value to existing content" (i.e., assessments of methodological quality for systematic reviews).

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
				Overall, Health Systems Evidence, a 'one-stop shop' for policymakers, researchers and stakeholders, reflects a comprehensive body of evidence that can be used as an effective means of informing evidence-based decision-making.
Considerations for implementing rapid-learning health systems in Canada (2)	*Publication date:* 2018 *Jurisdiction studied:* Canadian jurisdictions (one federal, 10 provincial and three territorial) *Methods used:* Rapid Synthesis	n/a	Searches were conducted using several databases such as Health Systems Evidence and PubMed. Search terms included "learning health" and "system." Fifty key informant interviews were also conducted with individuals from each of the 13 Canadian jurisdictions.	This rapid synthesis addressed five key questions to the implementation of rapid-learning health systems across Canadian jurisdictions. Questions ranged from identifying assets and gaps across Canadian jurisdictions to creating rapid-learning health systems, as well as identifying possible windows of opportunity to stimulate their implementation. Through a comprehensive search of the literature, the authors proposed a definition of a rapid-learning health system, summarized by the seven characteristics discussed below. The seven characteristics of a rapid-learning health system, as defined by the authors of this evidence-synthesis, are: 1) engaged patients; 2) digital capture, linkage and timely sharing of relevant data; 3) timely production of research evidence; 4) appropriate decision supports; 5) allied governance, financial and delivery arrangements; 6) culture of rapid learning and improvement; and 7) competencies for rapid learning and improvement. The timely production of research evidence involves ensuring that research regarding "problems, improvement options, and implementation considerations" is produced, synthesized, and shared efficiently and effectively among stakeholders at all levels. Key insights from the literature demonstrated that simply implementing a means of sharing data and research evidence (i.e., through electronic health records) is not likely to be sufficient in supporting a rapid-learning health system. Several barriers to sharing research evidence and data through electronic health records were noted, including: 1) inconsistencies between different electronic health record systems with respect to the means of recording clinical data; 2) limited incentives for providers to maintain good quality data for the sole purpose of research; 3) possible ethical and legal constraints regarding the use of recorded data without consent; and 4) lack of awareness about the benefits of these systems to promoting research. Possible solutions include but are not limited to: 1) adopting a series of information-exchange standards to facilitate the exchanges of data between electronic health record systems; 2) establishing times when data can be linked without consent as well as systems to manage consent and extraction; and 3) encouraging detailed record keeping. Specific jurisdictional assets to support the timely sharing of research evidence can be found on pages 14 and 15 of the synthesis. With respect to the fourth characteristic, appropriate decision supports, there is a need for strong supports in place at all levels to assist with decision-making through having

Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
				access to appropriate data, evidence and decision-making frameworks. Specific jurisdictional assets to assist with this characteristic can be found on page 15 of the synthesis. Finally, a "culture of rapid learning and improvement" is required to support a rapid-learning health system. Committed leaders at all levels are required to instil a culture of teamwork and collaboration necessary to recognize, learn from, and move past previous failures. This is also essential to fostering trusted relationships with partners to support the process of learning and improvement. The authors note that such culture is not yet widely recognized across all levels and jurisdictions, but has been recognized by several previous case studies and documents as an essential component of a rapid-learning health system. Specific jurisdictional assets to support a culture of rapid learning and improvement can be found on page 16 of the synthesis.

Appendix 3: Examples of dynamic responses, decision-making structures, and operational supports across provinces in Canada

Jurisdiction	Dynamic responses	Decision-making structures	Operational structures
British Columbia	• The Institute for Health System Transformation and Sustainability (IHSTS) gathers, develops and shares evidence about the B.C. health system • BC Academic Health Sciences Network focuses on sharing the capacity to produce evidence with activities from: BC SUPPORT Unit, Clinical Trials BC, and Research Ethics BC • Center for Health Evaluation and Outcome Sciences designs and conducts assessments of programs and systems at all levels of the healthcare sector • Health Research Institute at the University of Northern British Columbia supports collaborative health-related decision-making • In addition to internal evidence-synthesis supports, the B.C. MOH provides funding to research groups to respond to pressing policy priorities with synthesized evidence • BC Health Technology Assessment is a joint process between the MOH and the health authorities that is used to make evidence-informed decisions about which health technologies (devices, diagnostics and clinical procedures) should receive public funding	• BC Academic Health Sciences Network fosters partnerships and collaborations to connect provincial resources and expertise • The First Nations Health Authority is creating a shared forum for decision-making (e.g., through the creation of partnership accords and joint health and wellness plans) and, through its integration with the MOH and as a funder of First Nations communities, can rapidly redistribute resources to implement changes in response to sub-optimal outcomes • Putting Our Minds Together: Research and Knowledge Management Strategy affirms the MOH's "commitment to use research evidence in health care policy development, implementation and evaluation. It recognizes that research evidence, increasingly and where appropriate, will be developed by and with researchers in partnership with clinicians, policy makers and patients" • The Research and Knowledge Management Strategy also identified 10 research-related gaps in the province for supporting evidence-informed decision-making, along with strategies for addressing them • The BC Patient Safety and Quality Council supports a culture for rapid learning and improvement (e.g., through the Release Time to Care program, which supports teams to take actions to improve outcomes related to improving patient safety and reliability of care, patient experience, staff well-being and efficiency of care) • Joint Collaborative Committees are comprised of equal representation from Doctors of BC and the B.C. government, and contribute to a rapid-learning and improvement culture	• Population Data BC manages 21 data sets from two federal and six provincial sources (linkable to other external data sets across many health and social sectors), and provides training to support access and use of the data • Health Data Platform Initiative is supported by BC Academic Health Sciences Network, and provides an environment to share health data for collaborative research and analytics • In addition to their focus on data and analytics, the BC Academic Health Sciences Network is an example of centralized coordinated efforts to adopt a rapid-learning health-system approach through its focus on efforts targeted at health-system improvement in five priority areas (team-based primary care, strengthened services for seniors, rural and remote care, mental health and addictions, and surgery) • Michael Smith Foundation for Health Research (focusing on knowledge translation)

Jurisdiction	Dynamic responses	Decision-making structures	Operational structures
		through their focus on improving the health system and the quality of care	
Alberta	• Strategic clinical networks work with AHS knowledge management staff to synthesize data and evidence about clinical problems and options for improvement • Alberta Innovates funds research and innovation in health • Alberta SPOR SUPPORT Unit supports patient-oriented research • Alberta Partnership for Research and Innovation in the Health System supports research to improve health-system performance • Institute of Health Economics prepared health technology assessments, decision analytic modelling and health-economics research • Research groups at the University of Alberta and University of Calgary also conduct health technology assessments • Alberta Health's Health Evidence and Policy Unit conducts health technology assessments (called Alberta Health Evidence Reviews) to determine which technologies, services and models of care to adopt across the health system	• AHS strategic clinical networks include clinicians with strong connections to guideline-producing national professional societies, which are developing a standardized approach to care pathways • The 16 strategic clinical networks bring together communities of interest among front-line providers (many of whom have strong connections to academic departments, the Alberta Medical Association, and national professional societies, among others) and support improvement for select sectors, select categories of conditions, select categories of treatment, and for select populations • AHS supports quality-management frameworks at multiple levels and has initiatives such as 'Improving Health Outcomes Together' to improve care in measurable ways • AHS supports many groups – Innovation, Evidence and Impact team, Evidence Decision Support Program, and Health Systems Evaluation and Evidence team – to support decision-making • Health Quality Council of Alberta monitors and publicly reports on healthcare quality (as an independent voice in the health system) and supports front-line rapid learning and improvement • Alberta Clinical Research Consortium supports clinical research • Health Research Ethics Board of Alberta (HREBA) supports three committees (cancer, clinical trials and community health) that work together as one research ethics board (albeit not with a single-entry model for province-wide research ethics board approval), and that	• Alberta SPOR data platform provides access to administrative data (except for physician billings) and related database, methods and statistical services • Provincial Health Analytics Network provides a single-entry point to health data • Data Integration and Management Repository (DIMR) maintains a rich variety of data assets, analytic tools and dashboards that can be accessed by AHS employees (and seeks to acquire and link new data assets each year)

Jurisdiction	Dynamic responses	Decision-making structures	Operational structures
		forward approved requests for access to administrative data • Research ethics boards at the University of Alberta (Health Research Ethics Board) and University of Calgary (Conjoint Health Research Ethics Board) are working with HREBA to harmonize research-ethics processes across the province	
Saskatchewan	• Saskatchewan Centre for Patient-Oriented Research (SCPOR) provides training to patients/caregivers, researchers, health professionals, and decision-makers who wish to become involved in patient-oriented research • Saskatchewan's "Continuous quality-improvement initiative" with a focus on the patient-first health system, using **LEAN methodology**, includes 1,500 continuous-improvement projects	• LEAN's Improvement Leader Training Program (created by Health Quality Council) is now offered throughout organizations in the health system • Government of Saskatchewan's First Nation and Métis Policy Consultation Policy Framework is a guiding framework for ministries, agencies and Crown corporations for decisions that may have an impact on Treaty or Indigenous rights • Saskatchewan Health Quality Council co-designs training programs with system partners for building quality-improvement competency, including quality-improvement measurement design (i.e., understanding variation)	• eHealth Saskatchewan supports and coordinates projects about the province's electronic health records • eHealth Saskatchewan's Health Data and Analytics portal facilitates the secondary use of data related to electronic health records • The administrative information management system (AIMS) launched in October 2018 creates a single operating system for the province (originally 82 different non-integrated data systems) • Saskatchewan Health Quality Council supports the health system in surveying patients about their healthcare experiences • Strategic Health Information and Performance Support within the Saskatchewan Health Authority has the capacity to link data about health and the social determinants of health
Ontario	• Ontario SPOR SUPPORT Unit (OSSU) has supported three masterclasses on the conduct and use of patient-oriented research (for patients as well as providers, decision-makers and researchers), as well as smaller patient-engagement projects and patient-partnership training workshops	• The Ontario Health Teams (OHT) Building Blocks require teams to make strategic choices in 58 domains, with some of these decisions needing to be made in year 1 and others coming later. Building blocks include: identified patient population; in-scope services; patient partnership and community engagement; patient care and experience; digital health; leadership, accountability and governance; funding and incentive structure;	• MyChart and other patient portals provide patients with access to their health information (if they receive care at participating organizations), and 'my results' provides patients with diagnostic test data (if they receive laboratory services through LifeLabs) • Many organizations collect patient-experience data and these data are often then aggregated and reported on by Health Quality Ontario

Jurisdiction	Dynamic responses	Decision-making structures	Operational structures
	• IDEAS provides training in quality improvement to large cohorts of providers and managers • INSPIRE (Innovations Strengthening Primary Healthcare through Research) and BeACCoN (Better Access and Care for Complex Needs), both funded by the ministry, conduct research in primary care and use 25% of their funds to respond to emerging research requests by decision-makers (called Applied Health Research Questions)	performance measurement, quality improvement, and continuous learning. • For OHT approval, a common observation was that a leadership infrastructure was needed to support new ways of working together as system partners. An executive leadership group comprised of CEOs and executive directors of partner organizations can engage their respective boards of directors and commit their organizations accordingly. This is in addition to an integrated operational management group comprised of vice-presidents of operations and directors of programs who can develop and execute work plans. Three types of work plans can assist leaders and their staff with harnessing the building blocks to achieve specific targets: 1) understanding who the OHT serves and what matters to these people; 2) co-designing care that meets these needs, which includes brokering discussions among partner organizations; and 3) supporting learning and improvement in delivering this care. • Ministry commissions periodic, large-scale patient surveys (e.g., Primary Care Access Survey, which is undertaken by York University's Institute for Social Research) • There are initiatives that directly address emerging research requests by decision-makers (Innovations Strengthening Primary Healthcare through Research (INSPIRE) and Better Access and Care for Complex Needs (BeACCoN))	• Ministry funds Institute for Clinical Evaluative Sciences (ICES) to provide a data management and analytics platform, and ICES and other groups are laying the groundwork for more comprehensive datasets • OSSU has funded the ICES Data and Analytic Services to respond to data requests, including for data linkage, by decision-makers • Ministry funds Centre of Excellence in Digital Health Evaluation to evaluate digital solutions • Some research groups have experience in designing and conducting surveys or other types of studies to capture patient experiences • OHT program of supports includes resources on the application process, decision-making agreements, Rapid-Improvement Support and Exchange (RISE), digital health playbook
New Brunswick	• Maritime SPOR SUPPORT Unit engages volunteers as patient advisors for research into priority health-system issues (e.g., unnecessarily long hospital stays), and provides support for	• Maritime SPOR SUPPORT Unit runs a weekly Lunch & Learn series focused on using information to support research and decision- making	• Community Health Needs Assessments (CHNA) produced in collaboration between Horizon Health Network, Vitalité Health Network, New Brunswick Health Council and community members (process being

Jurisdiction	Dynamic responses	Decision-making structures	Operational structures
	researchers looking to engage patients by connecting them with other patients, providing resources and tools for patient engagement, and providing training in patient engagement • Canadian Agency for Drugs and Technologies in Health's rapid-response service sometimes used by managers and decision-makers in New Brunswick • Horizon Health Network and Vitalité Health Network have initiatives to foster a culture of rapid learning and improvement (e.g., establishment of clinical learning networks on aging, cancer, mental health)	• New Brunswick Health Council offers useful data and information to support decisions at the regional and provincial level • Infrastructures are in place to build research capacity with Horizon's Research Services Team and Vitalité's Research Support Office • Government has identified a priority-delivery unit (to drive and increase accountability for improvement) and created strategic learning units and networks (to support improvement)	standardized in collaboration with the Department of Health) • Unités et réseaux cliniques apprenants ('clinical learning units and networks') proposed by Vitalité Health Network and Horizon Health Network to support the optimization and continuous improvement of health services through the sharing and systematic analysis of relevant data throughout the patient's care path • Support Opportunities and Assistance for Research (SOAR) program at Horizon aims to improve patient care through: research that will produce the highest level of evidence for development and testing of care guidelines; accurate and timely diagnoses; and best treatment options and rapid recovery • New Brunswick Health Council has systems in place to capture, link and share data, including: Primary Health Surveys; Community Profiles; Hospital Patient Care Experience; New Brunswick Health System Report Card; • New partnership in 2018 between the provincial government and the New Brunswick Medical Society to support and accelerate the adoption of the Provincial Electronic Medical Record system by doctors • Brunswick Institute for Research, Data and Training offer administrative data-access services for qualified researchers

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