

The Network of Scholars Strategy: A Case Study of Embedded Research Activities in Nova Scotia to Advance Health System Impact and Outcomes

La stratégie du Réseau de chercheurs : une
étude de cas d'activités de recherche intégrées
en Nouvelle-Écosse pour faire progresser
l'impact et les résultats du système de santé



COMMENTARY

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ABSTRACT

The Canadian Institutes of Health Research – Institute of Health Services and Policy Research’s (IHSPR’s) Strategic Plan 2021–2026 for accelerating health system transformation is well positioned to meet the strategic priorities being outlined by many health systems in Canada and internationally (CIHR IHSPR 2021). The IHSPR Health System Impact Fellow program has been a strong influence on the embedded research and scientist program in Nova Scotia, namely, the Network of Scholars Program, which was implemented just before the pandemic. The network includes scientists and scholars from diverse academic backgrounds and skill levels including alumni of the Health System Impact Fellow program. The Network of Scholars has over 30 scholars and approximately 100 academic partners and scientists supporting embedded activities such as rapid reviews, implementation science and rapid evaluation initiatives. These embedded activities are front facing to the needs and priorities of the health system. This commentary highlights the importance of IHSPR’s outlined strategic plan and direction, which are consistent with the experience and the needs for embedded supports within the Nova Scotia health system.

RÉSUMÉ

Le Plan stratégique 2021–2026 de l’Institut des services et des politiques de la santé (ISPS) des Instituts de recherche en santé du Canada pour accélérer la transformation du système de santé répond aux priorités stratégiques définies dans de nombreux

systemes de santé au Canada et à l'étranger (CIHR IHSPR 2021). Le programme des bourses d'apprentissage en matière d'impact sur le système de santé de l'ISPS a eu une grande influence sur le programme intégré de science et de recherche en Nouvelle-Écosse, à savoir le programme du Réseau de chercheurs, mis en œuvre juste avant la pandémie. Le Réseau comprend des scientifiques et des chercheurs de divers horizons universitaires et divers niveaux de compétence, notamment des anciens du programme des bourses d'apprentissage. Le Réseau compte plus de 30 chercheurs et environ 100 partenaires universitaires et scientifiques qui œuvrent à des activités intégrées telles que des examens rapides, la théorie de la mise en œuvre et des initiatives d'évaluation rapide. Ces activités intégrées font face aux besoins et aux priorités du système de santé. Ce commentaire souligne l'importance du Plan stratégique de l'ISPS, qui est conforme à l'expérience et aux besoins de soutiens intégrés au sein du système de santé de la Nouvelle-Écosse.

Background

The vision for a high performing health system is the integration of best possible evidence in planning, service design and delivery. These attributes are considered foundational enablers of a learning health system (LHS) leading to continuous quality improvements, impacts on the Quadruple Aim and innovative and sustainable solutions (Gould et al. 2020). In theory, this is the ideal state for how health systems need to operate and function – that is, being driven by best practice evidence and innovative solutions that guide planning, policy setting and service delivery. However, many health systems are often challenged in applying evidence and solutions in real time (Holmes et al. 2017). A major barrier for research evidence to translate to policy and decision making is the lack of structures or mechanisms for policy and decision makers to access relevant findings in a timely manner and to have the findings presented in a way to make them readily usable for planning, decision making and policy setting (Al Sabahi et al. 2020). Another issue, which has recently been highlighted during the COVID-19 pandemic, is the rapidness and the volume of evidence generated, making it difficult for distillation and interpretation by decision makers in real-time planning (Embrett et al.

2022a, 2022b; Ghaffar et al. 2017; Lavis et al. 2018; Moat et al. 2021; Nova Scotia Health 2021; Tomblin Murphy et al. 2021; Tricco et al. 2020). There are overall challenges to researchers and policy/decision makers to collaborate in a way that supports translation of research knowledge to practice. These challenges underscore the importance of the new strategic priorities from the Canadian Institute of Health Research (CIHR) – Institute of Health Policy Research (IHSPR) that will help guide the strengthening of relationships between researchers and decision makers to co-produce evidence that impacts decisions (CIHR IHSPR 2021).

In its “Strategic Priority 3,” IHSPR highlights the importance of integration of “evidence into health services and policy decisions for improved health care system performance and outcomes,” (CIHR IHSPR 2021: 17) and it has never been more important as health systems recover from the current pandemic and prepare for a possible next one. As outlined, this priority is not a new direction for healthcare systems but, rather, it reinforces the need for systems to accelerate the use of evidence in planning and decision making. The mission of an evidence-informed rapid LHS – initially described over a decade ago – is to be supported through

leadership that focuses on collaboration and co-learning enabled through integrated data delivery systems, national networks of rapid learning organized around populations and health-related conditions and research networks (Etheredge 2007, 2014). Despite an increasing emphasis on developing LHSs, challenges to integrating research evidence to inform system performance improvements continue to be so in the absence of viable structures embedded within systems to support this integration (Braithwaite et al. 2020).

While paths to implementing an LHS are varied, some consistency is found in experience, such as identification of barriers and enablers. Enablers include a skilled workforce and capacity building (Enticott et al. 2020; Zurynski et al. 2020); embedded scholarship that focuses on maximizing learning for all stakeholders (Damschroder et al. 2021); a continuous culture of learning (Enticott et al. 2020; Platt et al. 2020) fostered through the commitment of organizational leadership and alignment of goals (Damschroder et al. 2021); infrastructure to evaluate investments in evidence-based innovations (Damschroder et al. 2021; Enticott et al. 2020), including data infrastructure (Enticott et al. 2020; Platt et al. 2020; Zurynski et al. 2020); open stakeholder partnerships (Zurynski et al. 2020); and true horizontal and vertical system integration (Damschroder et al. 2021; Enticott et al. 2020).

Gaps continue to be identified (Platt et al. 2020), including the involvement of stakeholders and data integration and the need for a better understanding of the implications of an LHS from a policy and practice perspective. A top challenge to successful integration of LHS is also aligning evidence to the health system priorities or needs (Damschroder et al. 2021).

In today's healthcare context, we view the third strategic priority as a *reaffirmation* of

how critical an LHS is (and its related, supportive elements, such as embedded scholarship) to advancing health system priorities toward improved health outcomes for all. We describe throughout this commentary how Nova Scotia is an exemplar of a rapid LHS in both development and action, with a deliberate attendance to the role and positioning of embedded scholarship within the provincial health authority.

IHSPR's strategic priorities and vision for embedded research concur with Nova Scotia Health's (NSH) journey of integrating embedded researchers and scientists within the health system driven by the strategic priorities of the research, innovation and discovery (RID) portfolio (Nova Scotia Health 2020). NSH is the provincial health system and provides health services to Nova Scotians and some specialized services to all Atlantic Canadians. NSH includes employees, physicians and healthcare professionals, teams, volunteers, patient and family advisors, researchers and learners. NSH operates hospitals, health centres and community-based programs across the province. This commentary highlights a key strategy in Nova Scotia and NSH for establishing embedded researchers and scientists, the early impacts of the strategy and the alignment with IHSPR's outlined strategic priorities (CIHR IHSPR 2021).

Embedded Researchers and Role within Health Systems

Embedded research engages individuals working in the healthcare system to highlight implementation barriers and related healthcare system shortcomings through scientific inquiry; it is contextually relevant, focuses on addressing local issues and aligns with organizational priorities, objectives and culture (WHO 2018). The embedding of early- to mid-career researchers of policy,

practice and implementation is considered a crucial and innovative next step to strengthening health systems (Ghaffar et al. 2017) and is recognized for its ability to help improve health system performance (Vindrola-Padros et al. 2017).

There have been several attempts made to define the role and characteristics of an embedded researcher (Kanani et al. 2017) partly because the specifics of the role and definitions may differ between organizations. Several key characteristics, however, have emerged, including that the embedded researcher or scholar (1) is affiliated to an academic institution as well as an organization outside of academia, (2) is seen as part of the team, (3) generates knowledge addressing the needs of the host organization and (4) builds research capacity in the host organization.

Establishing tangible outcomes of embedded scholars directly linked or measured to system or patient outcomes can be challenging. However, the need for and the evidence of embedded scholarly activities within health systems, including emerging strategies and visible structures, are measurable, especially since the onset of the pandemic across Canada and globally. During the pandemic, many health systems have renewed their commitment to work with embedded scientists and academic partners and fund priority research to inform policy and planning. There has been an increasing trend in the conduct of rapid reviews linked to jurisdictions across Canada, although it is not clear how many are linked to sustainable strategies post pandemic (Blanchette et al. 2019). There is also emerging evidence that embedded researchers help build internal capacity for conducting and incorporating research into practice (Kanani et al. 2017). Finally, it has been shown that the integration of researchers working with decision makers and policy makers, providers and teams can help improve uptake of health

systems research (Ghaffar et al. 2017; Langlois et al. 2019).

Health System Impact Fellows: Integrating Capacity for Embedded Research into Health Systems Operations

One example of an embedded research initiative in Canada is the CIHR Health System Impact Fellowship (HSIF) (McMahon et al. 2019). The program was created, in part, to address the need to improve skilled research capacity within healthcare organizations. An increase in skilled research capacity will help health systems adopt an LHS approach by enabling evidence-informed system transformation (Sim et al. 2019). A key objective of the program is to provide healthcare organizations with opportunities to integrate academically trained researchers by bringing their scientific expertise and rigour to address real-world challenges and priorities presented within health system settings (McMahon et al. 2019; Sim et al. 2019). The HSIF model is based on a long-standing program called Delivery System Science Fellowship (<https://academyhealth.org/dssf>) by AcademyHealth based in the US (Kanani et al. 2017), and this program recognizes that embedded researchers are essential to supporting an LHS. AcademyHealth defines LHS as a system “where applied, operationally relevant research is systematically designed, generated, and translated into high-quality care delivery” (Kanani et al. 2017: 570).

NSH’s Embedded Research Strategy: A Journey toward Becoming an LHS

The value of embedded research and implementation science in supporting health system transformation and optimal performance for NSH was initially identified in the blueprint for strategic direction for NSH’s RID portfolio (Nova Scotia Health 2020). Before the

launch of the Implementation Science Team in RID, an NSH-wide organizational strategy for implementation science was non-existent. The report presented a clear opportunity and a need for an implementation science unit or team to support the integration of best practice evidence and translation into practice and the need for a strategy for an LHS. The report also identified leveraging key enabling structures within the organization, such as the culture for research and quality, capabilities for advanced analytics and the structures for quality improvement. Strong enablers for an enhanced research environment and partnerships include (1) the Research Methods Unit and affiliate scientists program, (2) key structures and partnerships to promote working relationships with academic community and organizations, including grants that supported partnerships such as the QE II Health Sciences Foundation's Translating Research into Care grants and (3) the involvement of patients and families and community advisors in quality improvement and research activities (Nova Scotia Health n.d.a., n.d.b., 2020). The formation of new strategies for the NSH RID portfolio in 2018, including the vision of a health innovation hub, is seen as being instrumental in mobilizing the vision for an embedded research strategy that includes the Network of Scholars and the Implementation Science Team (Brooks 2022; Nova Scotia Health 2020). This team of scholars, referred to as the "Network of Scholars" (NoS), supports the need for evidence aligned with the healthcare system and patient priorities, encourages meaningful participation of all stakeholders and applies principles of integrated knowledge translation. Alumni of the HSIF program play a key role within the NoS as mentors and supervisors for new scholars who are recruited to support the needs and key priorities of the system.

The key strategic priorities of the RID portfolio, namely, to improve priority needs of

Nova Scotians through the use of best practice and cutting-edge evidence are aligned with IHSPR's third strategic goal, which is related to enhancing the embedded researcher's role to support the integration of timely evidence into priority health services and policy decisions and to improve health care system performance and outcomes (CIHR IHSPR 2021).

The RID strategy in NSH, implemented in early 2020, calls for teams of embedded scholars; innovators; scientists and clinical and health system champions; and patients and community advisors from across the province to come together in new ways to build a better healthcare system (Nova Scotia Health 2020). The NoS' design is based on the well-established HSIF and other relevant models with its key activities being front-facing to the priorities of the system, including support to conduct rapid reviews, implementation science initiatives and rapid evaluation of implementations (Brooks 2022). These activities are targeted toward strengthening capacity for solution-oriented research and evaluation that drives evidence-informed healthcare system transformation, policy and planning and the creation of learnings for future implementations. This strategic direction reflects IHSPR's "Strategic Priority 4" (CIHR IHSPR 2021: 20) by engaging more than 80 emerging and seasoned health researchers from across the province to facilitate collaboration among local experts, trainees and emerging scholars to increase capacity to develop on-demand synthesis products and other health system-related outputs in a timely manner.

Embedded Fellows and NoS Strategies in NSH

Since 2017, there are six HSI fellows who have been awarded the fellowship to work within NSH. Fellows are fully integrated within RID's broader strategy of embedded scholarship and are developing a nimble

LHS that has similar goals as IHSPR’s “Strategic Priority 1” (CIHR IHSPR 2021: 11). Through the structures created by the transformation of the RID portfolio – the development of RID’s strategic priorities, the implementation of the Blueprint recommendations and NoS – the HSI fellows have helped accelerate the adoption of embedded scholarly activities within the NSH system. The COVID-19 pandemic has been a catalyst in demonstrating the need for applying rapidly emerging evidence to inform key policies and planning decisions including surge capacity and health human resource planning strategies (Moat et al. 2021; Tomblin Murphy et al. 2021). Other evidence needs addressed by the NoS strategy to inform priority planning and policies include access to care strategies, implementation of service frameworks, rural health planning, virtual care implementations and digital health solutions. These strategic activities are also observed as key activities to achieve IHSPR’s “Strategic Priority 2” (CIHR IHSPR 2021: 14) and aim to achieve the Quadruple Aim and health equity for all.

Early Impacts

Nova Scotia is well under way to leveraging on the success and presence of HSIFs leading and supporting key embedded research activities within NSH (Brooks 2022; Moat et al. 2021; Nova Scotia Health 2020; Tomblin Murphy et al. 2021). There are currently over 30 part-time to full-time scholars and scientists working with the network including six HSIFs. There are over 100 affiliate scientists and academic partners working in the network or supporting network activities, including patient advisors, system leaders and providers in various capacities. Key activities of the network are aligned with supporting scholars and scientists to achieve health system competencies and skills that have been developed based on leading practices such as the HSIF program.

Early impacts of embedded activities conducted by NoS and the Implementation Science Team, with key partners, are shown in Table 1.

Globally, the strategic directions in health systems are geared toward a focus on innovation, digital solutions, enhanced and

Table 1. Early impacts of the embedded scientists program in Nova Scotia (as of May 2022)

Embedded activities	Numbers since January 2020
Total rapid reviews	320
Topics related to COVID-19	145
Topics not related to COVID-19	175
Total implementation science support initiatives	45+
Total evaluation science support initiatives	50+
Rapid review by priority topics to inform planning and policy decisions	
<p>Related to COVID-19: Public health strategies, personal protective equipment conversation/innovation/management/distribution, drive-through and mobile clinics, virtual care solutions, acute care/long-term care, primary care and home care, COVID-19 management strategies, pulse oximeter and at-home care for COVID-19, long COVID, pregnancy and COVID-19 care, surge capacity planning, health and wellness strategies for healthcare workers, vaccine efficacy and hesitancy, service re-opening frameworks.</p> <p>Not related to COVID-19: Access to care, health human resource strategies, collaborative models of care and innovative models, virtual and digital solutions to enhance access and planning across program areas – including primary healthcare, acute care, long-term care and care in community.</p>	

strengthened integration of evidence and research in driving key policy and planning decisions, especially the post-pandemic recovery and plans for strengthening the health system (Agency for Clinical Innovation 2019; Alderwick et al. 2021; CFPC 2020; Department of Health and Social Care 2021; The King's Fund 2021). IHSPR's strategic directions are well positioned to support the directions being taken by jurisdictions across Canada. These priorities have been highly evident in the embedded research activities supported by NoS and the Implementation Science Team in Nova Scotia. Some examples of key activities aligned with IHSPR's strategic directions include the following:

Innovations, data and digital solutions to modernize healthcare:

- multiple rapid reviews conducted to support innovative solutions in service delivery, including virtual care; team models of care to improve access to care in emergency departments and acute, primary and long-term care settings; care at home and in community solutions; and service delivery frameworks
- rapid reviews related to command centres for integration of data and accountability structures to enhance access and flow, use of drones in healthcare and digital and virtual care-related first access to primary care
- implementation science and evaluation initiatives: implementation of innovative virtual care solutions for unattached and attached patients in primary care, chronic disease management and emergency departments and enhancement of nursing and healthcare workforce initiatives

Integration of research and evidence in policy and planning and service delivery (Moat et al. 2021; Tomblin Murphy et al. 2021):

- multiple examples on how rapid reviews, implementation science and evaluation initiatives are shaping informed policy, planning and practice improvement decisions in Nova Scotia as highlighted in Table 1.

Conclusion

Health system transformation into an LHS requires that all stakeholders (e.g., leaders, managers, healthcare providers) rely on effective strategies to integrate evidence into health services and policy decisions. IHSPR's strategic priorities will help guide future research that aims to support this direction. Specifically, in the context of the third strategic priority, the role of embedded scholars, as well as experts outside the health system (i.e., NoS), have a critical role in creating and communicating evidence that has the potential to accelerate brave new directions in healthcare and health system innovations that improve health system performance to achieve the Quadruple Aim. As described in this commentary, NSH's journey has resulted in the successful adoption of embedded research and implementation science strategies for becoming a strong LHS. The alignment of NSH's RID strategy and IHSPR's strategic priorities will only enhance NSH's capacity to ensure that real-time decision making within the organization is evidence informed.

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Toward a World-Class Health Data System



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