Scaling and Sustaining Cancer Control Innovations to Improve Access and Strengthening of Oncology Workforce: Pan-Canadian Considerations

Evidence Brief from
Health Services & Policy Research (HSPR)

June 1, 2026

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Acknowledgements

We acknowledge key members of our research team including Danielle Domm and Arezoo Mojbafan (Dalhousie University), and Drs. Diego Sanchez and Colene Bentley (Health Economist and Senior Methodologist – BC Cancer Population Health Sciences).

We extend our sincere appreciation to the initiative leads, policymakers, health system leaders, and research collaborators from across Canada and internationally who participated in surveys and interviews. Their contributions provided critical, real-world insights into implementation challenges, enabling conditions, and opportunities for spread and scale of innovations across jurisdictions.

We would like to extend our heartfelt thanks to the CAPCA Board members for their leadership, coordination, and guidance throughout the project.

PURPOSE

This evidence brief examines implemented innovations in cancer control across Canada and internationally. Specifically, it:

1. Reports on key findings from a comprehensive evidence review of innovations in cancer control;
2. Presents pan-Canadian scalability considerations, including workforce capacity, system readiness, equity, and sustainability conditions;
3. Outlines policy and system considerations emerging from the analysis; and
4. Provides recommendations for sustaining and scaling innovations at a pan-Canadian level.

This brief is intended to support provincial and territorial cancer agencies and programs, ministries of health, communities, and system partners in identifying high-value innovations that can strengthen access to high-quality care while supporting and sustaining the oncology workforce.

This brief was informed by the Health Services & Policy Research initiative led by the Canadian Association of Provincial Cancer Agencies (CAPCA), with financial support from the Canadian Partnership Against Cancer (CPAC) and Health Canada. The work was conducted by researchers from Dalhousie University, BC Cancer, Simon Fraser University, and CancerCare Manitoba with active engagement from provincial and territorial cancer agencies/programs and system leaders across Canada.

The views expressed herein do not necessarily represent the views of Health Canada or the Canadian Partnership Against Cancer.

INTRODUCTION

Cancer care systems in Canada are facing escalating pressures driven by rising incidence, an aging population, increasing clinical and social complexity, rapidly rising costs of new health technologies, and persistent inequities in access to specialized services. At the centre of these pressures is a growing strain on the oncology workforce, including shortages across key professions, uneven geographic distribution, high levels of burnout, and constrained education and training pipelines. These workforce challenges now represent the most significant threat to the sustainability of cancer care delivery in Canada.

Background and Rationale

The comprehensive review of implemented innovations in cancer control in Canada and internationally was undertaken in 2025. It was supported by pan-Canadian engagement from provincial and territorial cancer agencies/programs and system leaders, and was designed to

inform strategic, evidence-based approaches to sustaining and scaling cancer care delivery across Canada.

A central learning of this work is that innovation in cancer care cannot be considered independently of the workforce. Innovations need to be understood systematically through evidence and rigour to inform implementation and scaling of opportunities while understanding the capacity enhancement needs for the oncology workforce and the population in need of care.

Strain on the Oncology Workforce: A Central Driver of Equitable Access & System Sustainability

Among all system pressures, the oncology workforce represents the most significant constraint on sustaining and scaling cancer care equitably. While health workforce shortages constitute a global challenge, the issue is particularly acute in oncology due to the need for highly specialized professionals, long and resource-intensive training pathways, and the physical and psychological demands of delivering increasingly complex, multidisciplinary cancer care. Evidence suggests that cancer incidence and mortality in Canada will increase by approximately 40% and 44%, respectively, by 2040 due to population growth and aging. At the same time, Canada is experiencing critical shortages across nearly all oncology professions. Approximately 17% of radiation oncology full-time equivalent positions and 14% of oncology nursing positions remain vacant nationally, while 35% of medical radiation technologists report intentions to leave the profession permanently. Workforce departures are accelerating, including a 129% increase in medical physicist departures between 2021 and 2022 and a 14.8% increase among radiation oncologists between 2019 and 2022.

Although Canada maintains relatively high oncologist-to-population ratios compared to global averages, access challenges persist in rural and remote regions, where shortages, travel burden, and limited multidisciplinary capacity exacerbate inequities in timely diagnosis and treatment. These disparities have been further intensified by the COVID-19 pandemic.

Considerations for pan-Canadian scaling and sustaining of innovations

The evidence underscores that workforce constraints are not a peripheral issue but a global issue, and one that is a central determinant of whether cancer care innovations can be sustained and scaled. Innovations that fail to address workforce capacity, role design, education and training, reimagining workforce capacity and distribution, and provider/team well-being, risk increasing system strain rather than alleviating it. Conversely, innovations that deliberately integrate workforce redesign, such as navigation, team-based care, optimized scopes of practice, digital health and Artificial Intelligence (AI), and community-based models, offer the greatest potential to stabilize capacity, improve equity, and support long-term system resilience.

This evidence brief provides high-level findings of the comprehensive review that was undertaken to understand the landscape of innovations within cancer care, specifically with a

lens of implementation science, Quintuple Aim outcomes, operationalization, and scale-up considerations. It synthesizes these findings into a concise, policy-relevant narrative that supports decision-makers in identifying high-value innovations and enabling reforms that are ready for pan-Canadian implementation, with a focus on equity, sustainability of oncology workforce and innovations, and system resilience.

METHODS

Evidence review

A comprehensive evidence synthesis was conducted using established scoping review and environmental scanning methods (Arksey & O'Malley, 2005). Peer-reviewed systematic reviews published between 2020 and 2025 were prioritized to capture post-pandemic implementation experience in cancer care and, where relevant, primary and community-based care. This approach ensured inclusion of models relevant to sustainability beyond hospital-based oncology settings.

Grey literature searches followed the Godin et al. (2015) methodology and prioritized federal, provincial and territorial, and international government and health authority publications. This ensured that real-world implementation experience, policy adaptations, and system-level enablers were captured alongside academic evidence.

Screening and synthesis were guided by the Quintuple Aim (Nundy et al., 2022) and the Consolidated Framework for Implementation Research (CFIR) (Damschroder et al., 2009). Through this process the following documents were identified for in-depth review:

- 42 systematic reviews
- 32 Canadian policy/system documents
- 20 international implementation reports

Pan-Canadian stakeholder engagement

A bilingual, pan-Canadian survey was administered to cancer system leaders, implementers, and policymakers, followed by semi-structured key informant interviews with national and international experts. Engagement spanned all provinces and territories and included clinical, operational, and policy perspectives. Qualitative thematic analysis focused on implementation barriers, enablers, and workforce implications. This included:

- 72 pan-Canadian survey respondents
- 24 key informant interviews

Structured feasibility–impact prioritization

Implemented innovations were assessed using a structured feasibility–impact matrix drawing on implementation science and health policy methods (Bowen et al., 2009; Brownson et al., 2021).

- Each initiative was evaluated across dimensions, including implementation maturity, scalability, economic feasibility, workforce capacity, equity, digital readiness, infrastructure, policy alignment, and Quintuple Aim outcomes.

The preliminary phases of this research have been reviewed and approved by Dalhousie University Ethics Board.

SYNTHESIS OF MAJOR FINDINGS

The major findings fall into three groups:

- Identified priorities;
- Application of the matrix/criteria leading to the top five innovations; and
- Policy implications.

IDENTIFIED PRIORITIES:

Across all evidence streams, five innovation domains consistently emerged as priorities for improving access, patient/community and provider/team experience, and sustainability:

1. **Virtual care and digital health**
   - Virtual oncology consultations, electronic patient-reported outcomes (ePROs), and remote symptom monitoring are now implemented to varying degrees across most provinces and territories, with strongest uptake in follow-up care, symptom management, and treatment monitoring.
   - Evidence demonstrates that ePRO and remote monitoring-enabled care reduce unnecessary in-person visits, emergency department use, and hospitalizations, while improving symptom control, patient experience, and access for rural and remote populations.
   - Digital standards and infrastructure, interoperability, and consistency in integration protocols, such as stable funding, reimbursement and training, have been shown to be key enablers in realizing the benefits from virtual and remote monitoring models.

2. **Artificial Intelligence (AI)**
   - AI implementations have been more common in diagnostics, treatment planning, and clinic operations.
   - The majority of AI implementations remain at pilot or early operational stages, with limited integration into routine workflows.
   - Based on the findings from the review, pan-Canadian readiness to implement and scale AI innovations remains uneven including governance, ethical and equity guardrails and guidelines, workforce readiness competency and capacity, risk assessment and management strategies, change management and more.

3. **Team-based care**

- Team-based oncology care and multidisciplinary models are implemented in multiple jurisdictions.
- Survey and interview data consistently identified improved throughput, reduced physician burden, and better coordination of care.
- Scale is limited by lack of standardized team competencies and protected time for collaboration and communities of learning.

4. **Expanded scopes of practice**
   - Expanded roles for nurse practitioners, advanced practice radiation therapists, pharmacists, and general practitioners in oncology are implemented in over half of jurisdictions reviewed.
   - These models show strong workforce stabilization potential, but are constrained by regulatory and remuneration variation, enhanced capacity for education and training, career development opportunities, and embedded evaluation and communities of learning.

5. **Home- and community-based care**
   - Navigation and community screening and support programs were among the most frequently implemented and scaled innovations identified.
   - Evidence shows improved timeliness of diagnosis, care coordination, and patient experience, particularly for Indigenous communities, rural, remote and other equity denied populations.
   - Home infusion and community-based oncology services, including navigation and screening, demonstrate feasibility but require standardized safety and supervision models in addition to stable funding and training for community workers.

PRIORITIZATION OF INNOVATIONS

Initiatives were prioritized across implementation maturity, multi-jurisdiction scalability, economic feasibility, workforce stabilization, equity impact, digital readiness/interoperability, and policy alignment.

The resulting “top 5” innovations reflect the strongest balance of near-term feasibility and system-level transformation potential for pan-Canadian scale.

- **Navigation** emerged as the most equity-oriented and implementation-ready model, with evidence of strengthening more upstream care, including screening, reducing diagnostic and treatment delays, and improving access for equity denied populations.
- **Team-based oncology models enabled by scope-of-practice optimization** ranked highly for addressing workforce shortages through role redesign, task redistribution, and throughput gains.
- **Home infusion** was identified as a high-value model for shifting appropriate treatments closer to home, relieving infusion-unit capacity, and improving patient experience,

provided that standardized eligibility criteria, safety protocols, escalation pathways, and sustainable funding models are in place.

- **AI** was prioritized as high-potential enabler to strengthen flow, reliability, and coordination, contingent on robust standards for governance, risk management, change management, interoperability, and workforce capacity.
- Finally, **equity-oriented diagnostic pathways for unhoused and people without access to primary care** were prioritized as a strategic, high-equity payoff model despite earlier maturity, requiring inter-sectoral coordination and targeted equity investments to achieve sustained impact at scale.

POLICY IMPLICATIONS FOR PAN-CANADIAN IMPLEMENTATION AND SCALE-UP

The matrix analysis demonstrates that Canada has moved beyond the question of *whether* innovation works in cancer care to the more pressing policy challenge of *how to scale what already works*.

Three overarching policy implications emerge from the findings:

First, **oncology workforce capacity is a key enabler to scale innovations**. The highest-scoring initiatives, namely, navigation, team-based clinics with optimized scopes, home infusion, and AI-implementations, derive their value primarily from how they redesign and redistribute work, stabilize staffing, and increase capacity across teams.

Second, **variation of adoption across jurisdictions is now a more significant consideration than a lack of innovation**. Differences in scope-of-practice regulations, privileging, remuneration, digital and AI standards, and equitable and ethical data-sharing agreements are potential risks that may fragment implementation and undermine the portability of effective innovations as a pan-Canadian opportunity. An emphasis on implementation and evaluation integrated to support ongoing learning and communities of practice is critical, along with infrastructure needs.

Third, **equity must be embedded by design at scale**. Navigation and equity-oriented diagnostic pathways for Indigenous, rural/remote, unhoused, and people without access to primary care scored highly because they directly highlight the need to address systemic and structural barriers.

POLICY RECOMMENDATIONS

1. Anchor around a small set of pan-Canadian initiatives that serve as scalable models and system enablers

Focus on scaling a limited number of high-readiness initiatives, rather than dispersing effort across multiple pilots. Based on the matrix analysis, these should include:

- Patient and community navigation at scale
- Team-based oncology clinics enabled by scope-of-practice optimization
- Home infusion to bring care closer to home
- AI-enabled applications
- Equity-oriented care pathways for unhoused and people without access to primary care

2. Treat health workforce redesign and capacity as the primary implementation levers
Position innovation as a strategy for workforce retention and for capacity enhancement. Deliberate workforce redesign is essential to scaling innovations while investing in workforce capacity.

3. Establish "standards before scale" for consistency
Prioritize the development and adoption of pan-Canadian standards that reduce implementation barriers, including:

- Guiding standards and regulations on community/navigator roles, including performance metrics
- AI governance frameworks and standards
- Regulatory and education/competency standards for role optimization in oncology
- Roadmap for home infusion implementation and scaling
- Evidence-based standards and guidelines for equitable models of care for the unhoused / people without access to primary care.

These standards should enable portability across jurisdictions while allowing local adaptation.

4. Embed equity into scaling efforts
Ensure that scaling closes, rather than widens, gaps in access and outcomes through co-design, integration of equity metrics, and strengthening inter-sectoral partnerships. Equity should be treated as a core performance objective, not a secondary outcome.

5. Strengthen pan-Canadian learning
Move beyond project-based evaluation to **embedded learning systems** by:

- Defining a small set of shared implementation and outcome indicators across jurisdictions
- Using rapid-cycle evaluation and audit-and-feedback mechanisms to support adaptation
- Linking evaluation findings directly to funding, policy refinement, and scale decisions

This will ensure that scaling remains evidence-informed and responsive to system realities.

6. Strengthen pan-Canadian coordination and learning communities
Sustained coordination and learning communities across cancer agencies/programs, governments, and partners are key enablers. This should include:

- Identifying and mobilizing pan-Canadian and cross-jurisdictional learning opportunities to accelerate knowledge exchange and the spread of effective practices.
- Using CAPCA's presence across provincial and territorial agencies and programs as a central mechanism for pan-Canadian learning and scaling.

CONCLUSION

This evidence brief demonstrates that strengthening cancer care across Canada requires workforce-centred innovation supported by coordinated, pan-Canadian implementation strategies. Sustained progress will depend on aligning policy, workforce capacity, and evidence-informed scaling of innovations that improve access, equity, and long-term system sustainability.

NEXT STEPS

The findings from this work will inform the next phase of planning considerations for implementation and scale up of innovations across Canada. Success factors for equitable scaling and sustaining identified in this review will inform the design of policies, workforce capacity, and sustained governance. Next steps from this work will involve translating evidence into actionable policy roadmaps, implementation toolkits, and governance guidance to support sustainable, equitable cancer care transformation across Canada.

Key References

1. Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology, 8*(1), 19–32.
2. Bowen, D. J., et al. (2009). How we design feasibility studies. *American Journal of Preventive Medicine, 36*(5), 452–457.
3. Brownson, R. C., et al. (2021). *Dissemination and implementation research in health*. Oxford University Press.
4. Damschroder, L. J., et al. (2009). Fostering implementation of health services research findings. *Implementation Science, 4*, 50.
5. Buajitti, E., & Watson, T. (2020). Insights into health equity in Canada. *Canadian Medical Association Journal, 192*(33), E952–E957. https://doi.org/10.1503/cmaj.200085
6. CADTH. (2024). *Artificial intelligence for patient flow (HTIS)*. Ottawa: Canadian Agency for Drugs and Technologies in Health.
7. Canada Health Infoway. (2023). *Shared Pan-Canadian Interoperability Roadmap*. Toronto: Infoway.
8. Canadian Partnership Against Cancer (CPAC). (2017). *Models of care for cancer survivorship*. Toronto, ON: CPAC. https://www.partnershipagainstcancer.ca
9. CAPCA, "Pan-Canadian Strategic Oncology Workforce Report," 2025. [Online]. Available: https://capca.ca/wp-content/uploads/2025/05/CAPCA-Strategic-Oncology-Workforce-FINAL-2025-05-05.pdf
10. CAPCA. (2025). *Enhancing access, and health outcomes and addressing health workforce challenges in cancer care using innovative models of care.*
11. CancerCare Manitoba. (2022). *Cancer Navigation Program: Evaluation and outcomes report*. Winnipeg: Manitoba Health.

12. Davidson, P., Hickman, L., Graham, B., Halcomb, E., & Phillips, J. (2006). Beyond the rhetoric: What do we mean by a 'model of care'? *Australian Journal of Advanced Nursing, 23*(3), 47–55.
13. Fan, Q., Wehby, G., & Munguti, K. (2022). Housing and cancer care and outcomes: a systematic review. Cancer Medicine, 11(18), 3426–3435. https://doi.org/10.1002/cam4.5066
14. Gaglio, B., Shoup, J. A., & Glasgow, R. E. (2013). The RE-AIM framework: A systematic review of use over time. *American Journal of Public Health, 103*(6), e38–e46. https://doi.org/10.2105/AJPH.2013.301299
15. Glasgow, R. E., Vogt, T. M., & Boles, S. M. (1999). Evaluating the public health impact of health promotion interventions: The RE-AIM framework. *American Journal of Public Health, 89*(9), 1322–1327. https://doi.org/10.2105/AJPH.89.9.1322
16. Holtrop, J. S., Estabrooks, P. A., Gaglio, B., Harden, S. M., Kessler, R. S., King, D. K., Kwan, B. M., Ory, M. G., Rabin, B. A., Shelton, R. C., & Glasgow, R. E. (2021). Understanding and applying the RE-AIM framework: Clarifications and resources. *Journal of Clinical and Translational Science, 5*, e126. https://doi.org/10.1017/cts.2021.789
17. Kiran, T., Kopp, A., Moineddin, R., et al. (2020). Cancer diagnosis and care among the homeless: Equity considerations for policy and practice. *Canadian Family Physician, 66*(3), 181–187.
18. Meadows, D. H. (2008). *Thinking in systems: A primer*. Chelsea Green Publishing.
19. Ming, X., Zhang, L., & NRG Oncology AI Working Group. (2022). Benchmarking artificial intelligence tools for radiation oncology: A framework for evaluation and quality assurance. International Journal of Radiation Oncology, Biology, Physics, 112(3), 569–577. https://doi.org/10.1016/j.ijrobp.2021.11.012
20. National Home Infusion Association (NHIA). (2023). *Infusing safety: Comparing oncology infusion outcomes at home infusion services vs. hospital-based outpatient infusion centers*. Alexandria, VA: NHIA.
21. Okoli, C., & Pawlowski, S. D. (2004). The Delphi method as a research tool: An example, design considerations and applications. *Information & Management, 42*(1), 15–29. https://doi.org/10.1016/j.im.2003.11.002
22. Pereira, R., Dykstra, B., & Stinnett-Donnelly, J. (2021). Systematic literature review to identify the current state of knowledge regarding home infusion vs. medical-setting infusion. *Value in Health, 24*(Suppl 2), S18. https://doi.org/10.1016/j.jval.2021.04.093
23. Schiffler, T., Jeleff, M., Gil-Salmerón, A., Yang, L., Haider, S., Schuch, F. B., Grabovac, I., & others. (2023). Cancer risk factors and access to cancer prevention services for people experiencing homelessness: a scoping review protocol. BMJ Open, 13(8), e074710. https://doi.org/10.1136/bmjopen-2023-074710
24. Strøm, H. H., Andersen, M. H., Jørgensen, M., et al. (2022). "It's a part of the patient": The experiences of patients with cancer undergoing home-based chemotherapy from patients' and nurses' perspectives. *European Journal of Oncology Nursing, 56*, 102086. https://doi.org/10.1016/j.ejon.2022.102086
25. Wells, K. J., Battaglia, T. A., Dudley, D. J., et al. (2018). Patient navigation in cancer care: A systematic review. *Cancer Epidemiology, Biomarkers & Prevention, 27*(11), 1447–1455. https://doi.org/10.1158/1055-9965.EPI-18-0506

26. Zhu, X., Ge, Y., Fakhry, C., & Wu, Q. J. (2021). Artificial intelligence in adaptive radiotherapy: A systematic review of clinical evidence and emerging applications. Radiotherapy and Oncology, 161, 211–219. https://doi.org/10.1016/j.radonc.2021.06.019
27. Nundy, S., Cooper, L. A., & Mate, K. S. (2022). The Quintuple Aim. *Health Affairs, 41*(2), 226–234.
28. Tomblin Murphy, G., Sampalli, T., Domm, D., Peacock, S., Navaratnam, S., Mackenzie, K. (2025). *Sustaining Canada's cancer workforce: A pan-Canadian review of innovations in the rising needs for equitable care*. Manuscript submitted for publication.