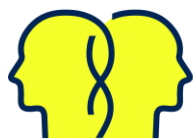




Health Workforce Modelling and Planning in Canada

October 29th Meeting Summary

Prepared by Health Workforce Canada | December 2024



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About This Report

This report summarizes input from discussions on health workforce modelling and planning held at a Health Workforce Canada (HWC) sponsored meeting in Montreal on October 29th, 2024. The meeting preceded HWC's inaugural Action Symposium on advancing health workforce solutions and was attended by over 50 Canadian health workforce experts from federal and provincial governments, professional associations, academia, and independent organizations (e.g., Canadian Institute for Health Information, Statistics Canada, Health Data Research Network, etc.).

Acknowledgements

Health Workforce Canada (HWC) extends its sincerest gratitude to the many health workforce leaders and experts who attended the HWC Pre-Symposium Meeting and contributed meaningful insights throughout the discussions. A full list of participants can be found in the appendix of this report.

A special thank you to Dr. Chantal Couris (Canadian Institute for Health Information), Dr. Vishva Danthurebandara (Health Canada) and Dr. Cory Neudorf (University of Saskatchewan) for presenting key lessons learned on developing pan-Canadian health workforce planning tools.

Understanding the context and use of evidence in HW decision-making

Context: We can all benefit from better understanding the range of ways HW planners make decisions based on the work of HW modelling teams. For HWC, this information will inform how data and evidence should be packaged to maximize utility and impact. In addition, it is also useful for all of us to identify the population and health care scenarios that our modelling efforts need to inform for better evidence-based decision making in the future.

Questions: How is the evidence developed by modelling and forecasting teams (i.e., models, forecasts, recommendations) currently being integrated in the decision-making process across the country?

- What works?
- What could be improved?
- Where can the greatest impacts in supporting HW planning and decision-making be made?

Successful Modelling and Forecasting Use Cases

Province	Stakeholders	Lessons Learned
Nova Scotia	Nova Scotia Government	Nursing School Seats: In response to projections of a nursing shortage for a new facility in Cape Breton, NS leveraged forecasting data to present a proposal to its Treasury Board for increased nursing school seats. This proposal succeeded, largely because NS had modeled multiple scenarios demonstrating alternative approaches would not sufficiently meet the need. Furthermore, there was buy-in from two government departments (Department of Health and Wellness and the Department of Advanced Education), Nova Scotia Health, and Cape Breton University. This joint support was key to obtaining approval.
Prince Edward Island	Société Santé en français (SSF) and the Government of PEI	Strengthening Bilingual Services: The integration of language preferences on PEI’s health cards has proven instrumental for planning bilingual services. This low-cost adjustment is now informing similar efforts in Manitoba, Nova Scotia, and NWT, and continued interest from BC. By capturing Francophone language of service needs directly, this initiative helped address specific workforce requirements for bilingual services.
Ontario	Ontario Health	Avoiding Ophthalmology Shortage: Ontario forecasted a shortage of ophthalmologists and discovered limitations in supporting resources, like operating rooms and post-surgical staff. By conducting a cost/benefit analysis, they presented a compelling case for funding, addressing not just workforce counts but resource allocation needs.

Province	Stakeholders	Lessons Learned
Manitoba	Shared Health Manitoba	Nursing Training Seat Revisions: Addressing an estimated 3,000 working vacancy challenge, Manitoba's team recommended an increase of 400 educational seats for licensed practitioners like LPNs, RNs, and RPNs. This data-driven approach helped secure approval for training programs that are now producing new cohorts.
Saskatchewan	Saskatoon Health Region	Modelling Patient Flow for Better Planning: The Chief Medical Officer led a modelling initiative to analyze patient flow in Saskatoon hospitals, pinpointing key areas where bottlenecks occurred. The model showed, for instance, that over-capacity issues were driven by patients awaiting transfers to other care settings, leading to investment in intake management units and support for primary care services to alleviate hospital pressure.
British Columbia	Government of BC, Workforce Planning Branch	Evidence-Informed Physician Resource Allocation: For a Treasury Board submission, BC's team provided physician forecasting data, contributing to workforce planning with a focus on specialty needs. Their physician planning branch regularly collaborates with health authorities, using demand projections to justify resource allocation which in turn, influences hiring practices.
Professional Associations	Canadian Physiotherapy Association, Nova Scotia Health, and IWK Health	Prioritizing Team-Based Care: In Nova Scotia, the team was able to collaborate with physicians to enable physiotherapists to order diagnostic images and refer patients to other specialists. This process minimized touch points by prioritizing team-based care and allows practitioners to work within their scope of practice.

Challenges and Opportunities in Health Workforce Data, Modelling and Forecasting

1. Building Data and Modelling Technical Capacity and Accessibility

- **Challenges:**

- Health workforce data silos and inconsistent sharing of information hinder comprehensive workforce planning.
- Definitions and standards for workforce roles vary across regions and settings, complicating data comparability (e.g., LTC, PSWs).
- Limited opportunities for relevant stakeholder to provide feedback during the development of model-based scenarios is a missed opportunity.
- Limited transparency, HW models are often black boxes and access to code, key methodological assumptions, and definitions are limited.

- **Opportunities:**

- Promote "data liberation" through interoperable systems, where data could flow across provincial boundaries to allow comprehensive tracking of workers and patient flows.

- Enhance transparency with open-source tools and clear communication on modelling assumptions and outcomes.
- Circumvent privacy concerns and data sharing limitations through the release of aggregated statistics and relevant proxies, along with detailed methodological notes.

2. Enhancing Modelling Literacy and Usability for Decision Making

- **Challenges:**

- Modelling outputs can be complex and challenging for non-technical stakeholders to interpret and act upon.
- Decision-makers often seek definitive answers, yet evidence derived from models nearly always needs to be nuanced by assumptions. There is a need for scenario planning models where assumptions can be adjusted to understand impacts of different policy decisions.

- **Opportunities:**

- Simplify modelling outputs into clear, actionable insights ("gems") tailored for policymakers.
- Invest in capacity-building initiatives for decision makers, such as training and resources (e.g., micro credentials, open-access textbooks), to improve model literacy.
- Strengthen communication (e.g., discussion opportunities) between modellers and decision-makers to align goals and foster trust across the system.

3. Aligning Data-Driven Insights with Real-World Impact

- **Challenges:**

- Workforce planning often faces real-world constraints, such as structural inertia or burnout among healthcare workers.
- Psychological safety and wellness are critical for retention but require systemic changes.
- Limited progress on interprofessional and team-based care initiatives.

- **Opportunities:**

- Bridge the gap between data and action by packaging recommendations with clear policy options, associated costs, and anticipated impacts.
- Leverage international best practices and develop long-term, visionary approaches to workforce planning (e.g., addressing rural/remote/equity deserving populations and Indigenous needs).
- Foster collaboration across sectors to align policy levers and implement sustainable solutions.

Imagining HWC’s Future Modelling Program of Work

Context:

- We heard there is support for a pan Canadian HW community through the establishment of a technical modelling working group(s) (TMWG) format to develop common approaches and solutions to existing methodological problems (standards, data, definitions, and methodologies).
- We have an opportunity to discuss the kinds of advanced analytical tools that are needed in the country.

1. Modelling and Forecasting

What are high-priority items that could be tackled by a technical working group?

Theme	High Priority Items	What could be tackled?
Community Building and Trust	<ul style="list-style-type: none"> • Establishing a foundation where participants know each other and build trust is essential. • This approach can foster spontaneous collaboration and open communication before diving into technical issues. 	<ul style="list-style-type: none"> • Develop and implement relationship-building activities, such as forums, workshops, or regular meetings, to build trust and encourage open communication.
Standardization and Data Practices	<ul style="list-style-type: none"> • Developing consistent definitions and methodologies, especially for key metrics such as vacancy rates, unmet needs, and full-time equivalents (FTEs), or at least making the range of existing definitions available and transparent. • Improving data sharing and data linkage across different regions and healthcare settings, with an emphasis on "data liberation" to support workforce mobility and patient care continuity. • Ensuring health equity by focusing on data for underserved or equity-deserving populations, mindful of disparities in healthcare access and representation in workforce planning models. • Convening discussions about a mechanism to move forward with a system for national unique identifiers for health professions. Facilitating access to data, and sharing data in open-source tool, including exploring models where initial costs are shared among interested parties. 	<ul style="list-style-type: none"> • Identify mechanisms and promote consistent definitions and methodologies for priority metrics amongst the leading authorities responsible for implementation • Focus early work on practical 'task and finish' groups that would find solutions to priority 'pain points' across all modelling teams (e.g. FTE definitions, demand modelling, unmet need, etc.). • Develop a TMWG structure that allows for inclusivity, equity, openness, transparency and sharing • Start small and focused, and learn and grow over time as trust is enhanced and early lessons learned are incorporated into future work.

Theme	High Priority Items	What could be tackled?
Innovation in Tools and Methods	<ul style="list-style-type: none"> Documenting various modelling approaches, including their pros and cons and suitable contexts, and creating training materials for knowledge transfer. Identifying and potentially incorporating advanced analytical tools like machine learning and AI in modelling to address specific forecasting and planning challenges. Clearly defining roles and scope within healthcare teams as part of forecasting needs accurately while considering alternative models like interprofessional care. This may also involve rethinking professional scopes of practice to address workforce shortages. Focus on practical needs of government decision makers for the modelling to be relevant and meet their needs. 	<ul style="list-style-type: none"> Establish an open-source repository of modelling methodologies and training materials for capacity building. Pilot the use of advanced analytical tools such as machine learning and AI for innovative forecasting solutions. Explore proposed refinements to role clarity and scopes of practice definitions to better inform workforce planning and address shortages. Validate the user needs of government decision makers prior to initiating the development of new models and datasets.

How can we innovate? What advanced analytical tools (e.g., microsimulation, machine learning, etc.) beyond or complementing existing supply and demand models should we be investigating?

Theme	Key Strategies to Innovate
Leverage Advanced Analytical Tools	<ul style="list-style-type: none"> Use advanced tools like machine learning, AI, and microsimulation to create more dynamic models that handle complex data and improve predictions. Use AI to make models easier to understand for decision-makers by simplifying outputs into accessible narratives. Combine quantitative data with qualitative community insights to ensure models address broader social factors and healthcare needs.
Build Infrastructure to Promote Collaboration and Trust	<ul style="list-style-type: none"> Develop or promote existing platforms for sharing standardized data across regions; near or real-time workforce planning tools through better data integration. Promote national unique identifier systems across healthcare professions to improve workforce tracking and data quality, starting with small-scale pilots. Create a cross-disciplinary community to share knowledge, case studies, and innovative methods. Build relationships focused on solving common problems to increase trust within the modelling community

Theme	Key Strategies to Innovate
Promote Inclusive and Preventive Models	<ul style="list-style-type: none"> • Work with partners to expand data collection/availability to include underserved populations. Use equity-focused metrics to ensure models reflect everyone's needs. • Explore team-based models that allow healthcare roles to adapt and share tasks for greater flexibility. • Enable models to account and measure the impacts of preventive care and public health strategies to reduce demand and build a more sustainable system.

2. Policy and Planning

What are the HW policy and scenario considerations that should be on our radar as we think about the future decisions that we will have to make about our healthcare workforce and system?

1. Interprofessional Collaboration/Team-based Care

- Look to future scenarios where workforce capacity is optimized by fostering interprofessional collaboration, role flexibility, and teams working at optimized scopes of practice.

2. Workforce Retention and Burnout

- Explore models where the focus is on psychological health and safety to reduce burnout and attrition, with an eye to developing long-term strategies to enhance workforce sustainability.

3. Immigration Policy Impact

- Explore models that analyze the influence of emerging immigration policies on workforce supply, and consider how they inform international recruitment strategies, particularly for rural and underserved regions.

4. Equity-Oriented Care Access

- Develop models that examine how underserved populations have sufficient workforce support, incorporating principles of cultural safety, equity, diversity and inclusion, and multilingual services to address diverse needs.

5. Preventive and Primary Care

- Investigate models focused on preventive and primary (upstream) care to lower demand for intensive acute (downstream) healthcare services.

6. Social Determinants of Health

- Consider models that reflect impacts of socioeconomic and community-specific health factors on healthcare demand by integrating social determinants of health into workforce planning.

7. Specialized Care Needs

- Explore how modelling can be used to better understand health workforce distribution supporting rare diseases and other specialized care areas at national and regional levels

What are the leading practices or governance structures for integrating HW estimates into planning and decision making?

1. Strategic Workforce Planning

- **Proactive Data-Driven Scenario-Based Planning:** Use scenario-driven forecasts to highlight potential workforce shortages/surpluses and demonstrate the value of proposed training or hiring changes by considering a range of policy scenarios and planning assumptions.

2. Targeted Operational Adjustments

- **Capturing Service Needs Through Administrative Data Enhancements:** Simple adjustments, like tracking individual care preferences and needs (e.g., language or other special requirements) help identify specific workforce requirements and improve allocation efficiency.
- **Operational Adjustments Informed by System Flow Analysis:** Analyze system bottlenecks using a combination of workforce data and service utilization data to implement solutions to address issues such as ED wait times, inpatient intake flows, expanded home care options in community, reducing congestion and enhancing efficiency.

3. Collaborative and Holistic Resource Management

- **Ongoing Collaboration with Decision-Makers:** Maintain regular communication with decision-makers to meet their forecasting information needs related to resource allocation, budget requests, and planning.
- **Comprehensive Resource Analysis Beyond Workforce Counts:** Consider workforce numbers alongside supporting resources (e.g., facility constraints, post-care support, funding) for a holistic understanding of capacity needs.
- **Build in efficiency and economic analysis to support planning:** Use cost/benefit analyses and other economic methods to study health workforce investments, policy impacts, and to justify investments in full-service capability.

What is the value of developing pan-Canadian models and where could we go as country?

Key Considerations	Pros	Cons
Standardization and Consistency	Provides a unified approach to workforce data collection, analysis, and reporting across Canada, supporting reliable and comparable insights nationwide.	May require significant investment and coordination to align diverse provincial systems, adding complexity and cost.
Pan Canadian-level Insights	Highlights trends and challenges at a national level, enabling responses to broader issues like overall workforce distribution, inter-provincial migration, opportunities for national or regional licensure approaches.	Depending on model design, data availability, and approach, pan Canadian models could create estimates that are inconsistent with provincial level models
Full transparency in modelling assumptions and outputs	Pan Canadian models that are fully accessible and transparent would create harmonization across the country and significantly reduce duplication of effort	Fully transparent models may make politically sensitive information available that could comprise/challenge PT negotiations. Models based on record-level and/or sensitive data may not be replicable even if transparent.
Resource Optimization	Supports efficient planning for rare diseases and specialized services by leveraging national-level data when lower-level estimates are not possible or optimal.	Some regions may hesitate to share data due to privacy or resource availability concerns.
Data Sharing and Collaboration	Encourages interjurisdictional collaboration and data sharing, fostering a comprehensive workforce view.	Privacy, ownership, and governance concerns may limit data sharing, reducing the model's comprehensiveness. Data interoperability may not be possible.
Equity Improvements	Helps identify and produce estimates for underserved populations, enabling targeted interventions to reduce health disparities nationwide.	Gaining buy-in from all regions can be challenging, especially if the model and/or its assumptions does not fully reflect local priorities and contexts.
Model Interpretation	Model interpretation and improving literacy will assist the modelling community and governments best understand how to leverage modelling estimates as part of policy development and decision making.	Decision-makers may struggle with complex outputs and ask for a single and/or precise estimate that are beyond the capabilities of the model.

Appendix A: List of Meeting Attendees

Affiliation	Attendees
Association of Faculties of Medicine of Canada	<ul style="list-style-type: none"> • Geoff Barnum
Association of Faculties of Pharmacy of Canada	<ul style="list-style-type: none"> • Janet Cooper
British Columbia Ministry of Health	<ul style="list-style-type: none"> • Cindy Cui
Canadian Association Long Term Care (CALTC)	<ul style="list-style-type: none"> • Jodi Hall
Canadian Association of Optometrists (CAO)	<ul style="list-style-type: none"> • François Couillard
Canadian Association of Occupational Therapists (CAOT)	<ul style="list-style-type: none"> • Irving Gold
Canadian Association of Provincial Cancer Agencies (CAPCA)	<ul style="list-style-type: none"> • Kristi MacKenzie
Canadian Association of Schools of Nursing (CASN)	<ul style="list-style-type: none"> • Jessica Pearce Lamothe
Canadian Health Workforce Network (CHWN), University of Ottawa	<ul style="list-style-type: none"> • Ivy Bourgeault • Sarah Simkin
Canadian Medical Association (CMA)	<ul style="list-style-type: none"> • Ashley Chisholm
Canadian Partnership Against Cancer (CPAC)	<ul style="list-style-type: none"> • Sara Urowitz • Jean Yong
Canadian Physiotherapy Association (CPA)	<ul style="list-style-type: none"> • Krissy Bell
Canadian Institute of Health Information	<ul style="list-style-type: none"> • Chantal Couris • Natalie Damiano
College of Family Practice of Canada (CFPC)	<ul style="list-style-type: none"> • Steve Slade
Employment and Social Development Canada (ESDC)	<ul style="list-style-type: none"> • Martin Charron
Government of Newfoundland & Labrador	<ul style="list-style-type: none"> • Karen Dickson
Government of Nova Scotia	<ul style="list-style-type: none"> • Adrian MacKenzie • Kathleen DeCoste
Government of Prince Edward Island	<ul style="list-style-type: none"> • Nadine MacLean
Health Canada	<ul style="list-style-type: none"> • Geneviève Moineau • Susan Weston • Vishva Danthurebandara
Health Prince Edward Island	<ul style="list-style-type: none"> • Kari Barnes
Manitoba Data Center, Shared Health Manitoba	<ul style="list-style-type: none"> • Jide Babalola
McGill University	<ul style="list-style-type: none"> • Priyanka Saksena
McMaster University	<ul style="list-style-type: none"> • Arthur Sweetman
Mental Health Commission of Canada (MHCC)	<ul style="list-style-type: none"> • Kamlesh Tello
Ontario Health	<ul style="list-style-type: none"> • Stephanie Akers
Queen's University	<ul style="list-style-type: none"> • Michael Green

Affiliation	Attendees
Société Santé en français	<ul style="list-style-type: none"> • Antoine Désilets
Statistics Canada	<ul style="list-style-type: none"> • Aimé Ntwari • Dafna Kohen • Deirdre Hennessy
University of Alberta	<ul style="list-style-type: none"> • Bei Jiang
University of British Columbia	<ul style="list-style-type: none"> • Kimberlyn McGrail
University of Manitoba	<ul style="list-style-type: none"> • Marcia Anderson
University of Saskatchewan	<ul style="list-style-type: none"> • Cory Neudorf
University of Toronto	<ul style="list-style-type: none"> • Linda McGillis Hall