Built Here, Bought Here: Strengthening Self-Reliance to Support "Canada First" Healthcare

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Abstract

Canada's health systems remain vulnerable to supply disruptions due to overreliance on globally sourced health products and limited visibility into domestic manufacturing capacity. This study presents an empirically tested, artificial intelligence–enabled search platform designed to automate the sourcing of health products from Canadian companies. The platform enables supply chain teams to efficiently identify Canadian suppliers for health products, overcoming the lack of awareness of Canadian manufacturers of health products, and builds a "Canada First" supply chain strategy. The platform has the potential to identify Canadian suppliers, reduce the burden of manual searches, support jurisdictions seeking to diversify Canadian sources and prioritize economic growth.

Introduction

In 2023, Canada reported over 3,000 active drug shortages, with an average duration of 93.5 days per shortage (Health Canada 2024b). Over 70% of the medical devices and pharmaceuticals used in Canada are imported, with significant dependencies on the US, China and India (Ernst and Young 2022; Government of Canada 2024). Canada's reliance on global markets for critical health products has exposed fragilities that limit the timely and equitable delivery of care to patients.

Supply chain vulnerability has substantive impacts on patients, who face delays in access to treatment. Clinicians whose ability to deliver care are constrained by unpredictable supply availability, and must manage supply disruptions and heightened operational risks to patients. Evolving geopolitical challenges, including export restrictions and protectionist trade policies, contribute additional risks for Canada's health supply chain. Recent tariffs imposed 25% duties on medical imports, threatening the availability and affordability of critical health products sourced from US companies (CBC News 2025; Department of Finance Canada 2025a).

Despite the presence of viable Canadian manufacturers, the lack of awareness of domestic supplier capacity remains a key barrier to advancing supply chain resilience in Canada (Office of the Auditor General of Ontario 2021; Snowdon et al. 2022). Healthcare procurement teams lack the tools needed to identify Canadian suppliers, limiting their ability to diversify sourcing and strengthen Canada's economic growth and self-reliance (Snowdon et al. 2021, 2022; Wright et al. 2023).

This paper examines the design, testing and impact of an artificial intelligence (AI)-enabled domestic supplier search platform developed by the Supply Chain Advancement Network in Health Community of Practice (SCANH CoP). The goal was to strengthen supply chain resilience by

co-designing a solution to enhance visibility of Canadian companies and the health products they manufacture to advance Canada's self-reliance and resilience of the health supply chain.

Literature Review

Many Canadian health systems rely on global suppliers for pharmaceuticals and medical products, due to limited production capacity in Canada, lower costs abroad and regulatory or licensing constraints (Daley and Gendron 2020). This reliance increases Canada's exposure to global pressures such as geopolitical conflict, distribution challenges and trade protectionism. Canada is a small population distributed across one of the largest land masses in the world, which challenges supply distribution, particularly for rural and remote communities. During disruptions, procurement teams must compete globally with limited market influence to successfully secure critical supplies needed to meet the demands for patient care (Health Canada 2024b; Snowdon et al. 2021).

These risks are particularly acute when products are sourced from a single supplier or jurisdiction. Over 60% of active pharmaceutical ingredients are imported from China and India, and 19 pharmaceutical products are supplied by three or fewer companies, making these products highly vulnerable to disruption (Ernst and Young 2022; Daley and Gendron 2020; Jiang 2020). Single-sourced drugs have a significantly higher likelihood of shortages and are prone to a long duration of supply disruption (Zhang et al. 2020). The 2019 shortage of vincristine, a chemotherapy agent for children with cancer, lasted over eight months and forced hospitals to ration cancer therapies, directly limiting treatment options for these children, while placing clinicians in ethically fraught positions (Brain Tumour Foundation of Canada 2020; Drug Shortages Canada 2020; Shuman and Unguru 2020).

Trade war: A tariff on the health of Canadians

Canada's reliance on global suppliers increases vulnerability due to geopolitical instability. Approximately 40% of medical devices used in Canadian health systems originate from the US, representing a $8.6 billion (CDN) annual import market (Medtech Canada 2025). Pharmaceutical supply chains are prone to disruption, as many finished drug products cross the Canada–US border daily (Aziz 2025; Ernst and Young 2022).

According to the Organisation for Economic Co-operation and Development (OECD 2020), single producers of raw materials required for manufacturing health products create structural bottlenecks and reduce the capacity of countries to respond to a surge in demand. For example, components such as electret melt-blown polypropylene, a key material in N95 respirators, are produced by only a handful of manufacturers worldwide, limiting their agility and responsiveness to meet surges in demand seen during emergencies such as pandemics or epidemics. While localized supply may appear costly, overdependence on international sources can result in far greater systemic costs during emergencies (OECD 2020).

Agility through domestic suppliers: Race against the clock to protect health system capacity to deliver patient care

Diversifying the supplier base has been identified as a strategic priority to strengthen supply chain agility, reduce the risk of shortages and safeguard access to care (Snowdon et al. 2022). Since the COVID-19 pandemic, Canadian jurisdictions have made targeted investments in domestic manufacturing of personal protective equipment (PPE) production, reducing dependence on overseas suppliers. Before 2020, more than 40% of Canada's PPE was sourced from China and more than 15% from the US (Office of the Auditor General of Ontario 2021). By 2023, 90% of PPE used in Ontario was domestically manufactured, demonstrating the capacity for localized production when supported by procurement reform (Supply Ontario 2023). Canada has expanded capacity in pharmaceutical manufacturing (Ernst and Young 2022), now producing approximately 2.3% of the world's medical devices, with exports growing from $3.8 billion in 2017 to $5.1 billion (CDN) by 2022 (Government of Canada 2024). Despite this growth in domestic manufacturing, Canadian companies struggle to get access to Canadian health systems to support market growth (Office of the Auditor General of Ontario 2021; Snowdon et al. 2021; Wright et al. 2023).

Digitally enabled supply chain management

Healthcare supply chains in Canada lack the digital infrastructure necessary to provide visibility into supplier networks and product availability, creating fundamental barriers to domestic procurement and risk management of supply disruptions (Snowdon et al. 2021, 2022). Limited transparency in supplier data and insufficient tracking capabilities are key barriers to resilient supply chain management (Health Canada 2024a; OECD 2020). The absence of digital infrastructure restricts procurement teams from identifying domestic suppliers, understanding their supply locations and tracking product movement across healthcare systems, described as "flying blind" (Snowdon and Forest 2021). While health systems globally are adopting AI-enabled procurement tools to improve sourcing speed, traceability and supplier diversity, such tools remain underdeveloped in Canada (Denecke et al. 2025; OECD 2020).

Domestic supply chain capacity can advance equity in access to care, as local production reduces dependence on globally scarce products and shortens lead times for underserved and remote communities (Adewumi et al. 2024). However, domestic supplier growth is reliant on health systems to support market access and procurement teams' ability to identify and procure products from local manufacturers to

mitigate risks to patients and support capacity to deliver quality care (Office of the Auditor General of Ontario 2021; Snowdon et al. 2022; Wright et al. 2023).

The role of policy in advancing supply resilience for health systems

Recent policy actions signal a growing shift towards prioritizing a "Canada First" strategy to strengthen market access and growth for Canadian suppliers of health products. In Ontario, the Building Ontario Businesses Initiative mandates preferential sourcing from Canadian manufacturers for health products to advance supply chain sovereignty (Supply Ontario 2024). Recent investments in domestic manufacturing capacity may contribute to a viable and scalable supply ecosystem in Canada (Office of the Auditor General of Ontario 2021; Supply Ontario 2023). While these initiatives are promising, success depends on enabling infrastructure and tools to identify and engage domestic suppliers to support access to Canadian health systems. Supply chain resilience depends not only on what Canada can produce, but also on Canadian suppliers getting their products into health systems in both Canada and globally.

Few empirical studies have examined solutions to support domestic supplier growth among Canadian health systems. Huebner et al. (2020) outlined procurement evaluation criteria for digital solutions, yet these criteria do not address supplier visibility or sourcing effectiveness. Many discussions on AI in Canadian healthcare rarely consider how AI can enable supply chain resilience or domestic sourcing strategies (Al-Haque et al. 2024). This study responds to that gap by empirically evaluating a digital platform specifically designed to inform procurement practices that optimize a "Canada First" strategy to advance supply chain resilience for Canadian healthcare systems.

Methods

Study design

This study used a qualitative Delphi design to evaluate the usability and face validity of an AI-driven platform with supply chain teams and organizations across Canada (Barrett and Heale 2020). Qualitative research methods are well-suited for research where the goal is to understand participant experiences and generate actionable, practice-relevant insights (Bradshaw et al. 2017; Neergaard et al. 2009). The study focused on pilot testing the AI-enabled domestic supplier search platform by supply chain stakeholders to support domestic supplier access to Canadian health systems.

Co-design and platform development

A co-design strategy was conceptualized by the SCANH CoP, funded by the Social Sciences and Humanities Research Council of Canada Partnership Grant No. 1154256. A workgroup was assembled to co-design a solution that would overcome the challenge of access to health systems by domestic manufacturers in Canada. Co-chairs of the workgroup included the chief executive officer of a national network of Canadian manufacturers and a senior executive of a provincial health system.

The domestic supplier solution was developed using a participatory co-design process involving 24 workgroup participants who represented diverse health system stakeholders, including federal and provincial governments, regional health authorities, distributors and manufacturers. Co-design is a method for ensuring that health innovation reflects a wide range of user priorities and system needs (Bate and Robert 2006; Denecke et al. 2025). The workgroup engaged in multiple structured design cycles over a 24-month period to design a solution to support domestic manufacturers' access to health systems. Challenges that health organizations experience when finding and contracting with Canadian companies were defined and informed by participant knowledge and expertise through this co-design process.

The workgroup highlighted the need for "a platform" to find and engage Canadian companies to improve Canadian market access for health products, including products with Health Canada approvals. Discussions prioritized company data that are publicly available, including Health Canada Data, Medical Devices Active Licence Listing and the Drug Product Database, to upload onto the platform.

Sample and data collection

A convenience sample of nine diverse stakeholders participated in the pilot testing, including two domestic manufacturers, two government agencies, three provincial supply chain agencies, one hospital and the military. The testing protocol (Appendix A, available online at longwoods.com/content/27678) guided procurement teams to use the platform to search for domestic companies that manufacture or supply a predefined list of products (e.g., fine sutures, urinary catheters, examination gloves). Semi-structured interviews were conducted to explore user experiences and perceptions regarding the functionality, usability and use cases for the platform (Kallio et al. 2016; Wosny et al. 2024). Interviews were conducted using Microsoft Teams, recorded with participant consent and transcribed for qualitative analysis. Ethics approval was obtained from the University of Windsor Research Ethics Board (REB no. 24-236).

Data analysis

Interview transcripts were analyzed using reflexive thematic analysis (Braun and Clarke 2006, 2020) to develop rich, thematic accounts of participant experiences. Transcripts were coded using an inductive approach. Coding frameworks were refined iteratively through team discussions and consensus,

enhancing the credibility and trustworthiness of the analysis (Nowell et al. 2017). Themes were finalized once saturation was achieved, and no new insights emerged.

Results

Three themes emerged from the analysis to reveal participant experience with the usability, functionality and use cases for the platform: (1) *discovery tool for domestic suppliers in Canada*; (2) *the lighthouse in the national darkness*; and (3) *the digital backbone for Canada's procurement infrastructure.*

Theme 1: Discovery tool for domestic suppliers in Canada

A common theme that emerged was the discovery of Canadian companies that were otherwise not found using search approaches most commonly used, such as Google search. The AI platform helped automate manual sourcing processes that supply chain teams use to identify suppliers:

> During COVID, it was all kinds of manual processes. You are emailing your main suppliers … and then you are cold calling and messaging yourself. If we had a resource tool that we can go ahead and [search] … who is selling facemasks, and [this tool] gives you that. A list of vendors or a list of resources near your hospital. (Hospital leader)

> Otherwise, it is doing the research more slowly, like going to websites and talking to the companies themselves or going into product monographs and trying to find pieces of information in there ... . (Federal government organization leader)

Procurement teams emphasized that the platform successfully identified smaller, lesser known Canadian suppliers that were not discoverable through conventional methods (e.g., Google), which was especially valuable when alternative sources of product needed to be located quickly:

> I noticed there were suppliers that were local that we never even heard of before. ... There were some recalls that we were actively looking for alternative products and we got some names from your engine, so we learned some new things. (Regional health authority leader)

> I saw it as an adjunct to Google because I did the same search in Google versus right in the [platform]. … in the app, it gave me more of the smaller suppliers. … we have never heard of this supplier. … I send it to our coordinator and I am like, "Did you guys see this in Google?" And they are like, "Nope." I think that is interesting. We found smaller suppliers versus when you go on Google, they give you the bigger suppliers. … in a critical disruption, I think it is important that every single product is found. … If a critical disruption was happening or maybe could happen, you can use it to look for a domestic alternative. (Regional health authority leader)

For the majority of participants, procurement teams conducted manual searches using Google, with no way to identify Canadian suppliers. The platform centralized supplier discovery, which participants linked to improved supply chain agility and resilience.

Theme 2: The lighthouse in the national darkness

This theme focused on the operational utility of the platform that enabled jurisdictional assessments aimed at reducing Canada's reliance on global suppliers and US-based contracts in particular. The platform enabled jurisdictional procurement reviews, enabling teams to identify Canadian-based suppliers as alternatives to existing contracts with global suppliers:

> What we have been doing … [is] trying to migrate away [from the US] where possible … trying to filter out all of the [US] contracts that we have … we know we have about 150 right now that are probably going to expire this year, so we are going to get two or three new resources. … do some market sounding. … we have this [domestic supplier platform] database … that we can use to help with this analysis, and I appreciate this is focused on Canada. (Regional health authority leader)

> … some jurisdictions [and] some provinces are looking at their contracts with US suppliers. … In British Columbia, and I think in Ontario now too, we are now having to look at existing contracts with US suppliers and make a determination whether or not we can cancel them now and go to someone else. I think [the platform] will be super useful to at least [use] as a starting point to look for alternatives. (Regional health authority leader)

The platform was also viewed as a tool able to contribute to Canada's goal of building a more locally integrated supply chain, informed by experiences during the COVID-19 pandemic:

> I definitely think that it is [the platform] moving us in a direction that we did not have before. If we had this

> during COVID-19, I think it would have made a ton of difference … definitely any navigation in the dark is the lighthouse in the national darkness. … I would never have known about any of these companies unless we had this database. (Regional health authority leader)

Participants described the use of the platform to reduce dependency on foreign suppliers and enable market intelligence to identify and secure procurement contracts with Canadian companies to advance a "Canada First" policy mandate.

Theme 3: Advancing security of supply – the digital backbone for Canada's procurement infrastructure

A dominant theme was the future state of domestic procurement, with stronger domestic supplier engagement informed by structured product data, inventory availability and supplier attributes such as location. Participants identified opportunities to enhance the platform by expanding the supplier data and information, including distinction between manufacturers and distributors, manufacturing locations and defined product origin (e.g., "Product of Canada" vs. "Made in Canada"), as described in the following:

> The manufacturing sites are also really important, like knowing where companies and manufacturers specifically [are] located. I think that is very important too. (Federal government organization leader)

> … if you are looking at security of supply, knowing who manufactures in Canada as opposed to who imports it [and] distributes would be a very crucial question. (Federal government organization leader)

> Product of Canada is #1. … Most things are not product of Canada because all of the global trade and parts are coming from everywhere, but product of Canada would be the number one priority. You need a way to prioritize and have a separate category for "Product of Canada" and then you need "Made in Canada." (Manufacturer)

Participants proposed expanding the platform's capability to include identification of substitute products made in Canada:

> Honestly, being able to identify different substitute items would be a big help. Internally, we have a team, and they have a lot of information in their brains that they use, but for someone like myself, I do not have a ton of clinical expertise on specific things. For me to be able to ask this tool for a list of potential substitute items, then you can at least go to that clinical team and say, "Hey, here is a list, do any of these work?" and proactively provide that. (Regional health authority leader)

Integration of product information into a more dynamic, multi-layered product catalogue, could serve as a digital backbone for Canada's procurement infrastructure:

> … knowing which items are available (i.e., for sale, inventory ready to ship), and which vendor I can purchase them from … the basic idea would be to take some kind of primary identifier (manufacturer's part number), search these databases, and return information like a product description, GMDN [global medical device nomenclature] code, etc. If we can do that consistently, we can build up a catalogue of products with standardized nomenclature … that would let us understand which items are similar to each other when we need to make substitutions. (Federal government organization leader)

> I think that the tool is really on the right track and the potential to me is very, very clear. I think, with a couple of tweaks and adjustments, I think it can provide [what] we need. (Federal government organization leader)

Participant insights were valuable for future platform design features as well as advancing supply chain digital health infrastructure planning.

Discussion

The findings revealed multiple uses for the domestic supplier platform and functional features that could advance a "Canada First" strategy, by automating supplier discovery that is currently fragmented and time-intensive in identifying Canadian manufacturers. The ability to identify domestic suppliers addresses a fundamental challenge that has constrained sourcing strategies for Canadian companies. This discovery function is particularly critical given Canada's urgency of identifying new sources of products manufactured in Canada. Limitations of digital infrastructure result in supply chain teams having to rely on basic internet searches and "cold calling" companies to identify product availability during critical shortages. Canadian companies struggle to access healthcare markets, which limits their growth and the sustainability of Canada's manufacturing base. The platform was found to address both procurement automation and enhanced visibility of Canadian manufacturers.

Participants viewed the platform as a "lighthouse," enabling strategic navigation away from dependence on foreign suppliers. The lighthouse metaphor captures the illumination

of domestic suppliers, to ensure procurement teams no longer rely on international suppliers even when viable Canadian alternatives exist. Findings reveal that the platform may overcome the dependency on foreign suppliers by identifying domestic companies that strengthen Canada's ability to advance resilient, locally anchored supply chains.

This strategic use of the domestic supplier platform responds to the heightened urgency of geopolitical events, such as tariffs. The platform's ability to identify Canadian alternatives takes on national economic significance when 40% of medical devices used in Canadian health systems originate from the US (Department of Finance Canada 2025a; Medtech Canada 2025). This tool also offers a strategic resource for teams to comply with legislative mandates for preferential sourcing from Canadian manufacturers for designated health products (Supply Ontario 2024).

Study results have documented that the need for greater automation in the discovery of Canadian companies and access to product data is an important first step in operationalizing a "Canada First" strategy for health systems. For procurement and supply chain professionals, the study findings underscore the need to advance strategic procurement focused on prioritizing Canadian suppliers to ensure the security of health products, while also supporting Canadian companies to supply products to Canadian health systems.

A number of opportunities for further expanding the platform emerged that can strengthen sourcing and procurement of products from Canadian companies. The distinction between "Product of Canada" and "Made in Canada" classification is highly relevant to strengthening Canada's supply chain vulnerability and security to advance a "Canada First" strategy (Government of Canada 2025).

Conclusion

Canada's healthcare system remains structurally exposed to global supply chain disruptions, illustrated by the growing number and duration of supply disruptions. While Canadian suppliers exist, procurement teams lack the tools to identify and engage Canadian companies, which further limits the capacity to advance supply chain resilience. These findings point to the broader imperative, a "Canada First" strategy that incentivizes domestic manufacturing, accelerates economic growth and advances sustainable sources of critical products to ensure health systems have the capacity to deliver care in a timely manner to Canadians. HQ

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