

Innovation Strategy Consultation Session: Health, Bioscience, Digital and High-Tech Sectors

Introduction

The Canadian Science Policy Centre (CSPC) hosted an industry consultation session with the health and bioscience, digital and high-tech sectors as part of its National Conversation on Canada's Innovation Strategy initiative. The consultation aimed to gather insights for shaping a flexible and adaptive innovation strategy that addresses both current and future needs of the sector. The discussion focused on three core topics:

- Emerging trends and challenges in the sectors
- Designing an innovation strategy to adapt to the emerging trends and challenges
- Priorities for a national innovation strategy

Emerging Trends and Challenges

Shift in Research Prioritization: Health research funding is increasingly moving toward short-term, government-prioritized projects, shifting away from investigator-driven and discovery-based research. This shift presents challenges in adopting long-term, high-impact innovations, as the lack of alignment in funding timelines can stifle breakthrough developments in biotech and health sciences.

Data Accessibility and Digital Health: Digital health technologies, such as virtual care and telemedicine, have rapidly expanded, especially post-COVID-19. However, limitations in health data accessibility and cybersecurity pose significant challenges, affecting the effectiveness of healthcare delivery and innovation potential in the sector.

AI and Digital technologies: Cybersecurity, artificial intelligence (AI), and big data are seen as key trends. AI has the potential to revitalize productivity in IT and Health sectors (e.g., in biopharma, particularly in drug development). Yet, obstacles like restricted data access and privacy concerns hinder its adoption. There are concerns that Bill C-27 and its AI regulations could stifle Canadian AI research. Supporting AI research, enhancing privacy-preserving technologies, and funding human-AI collaboration initiatives are key to realizing the full potential of AI in health and technology sectors.

Capital and Talent Gaps: Both health and digital sectors are affected by limited venture capital and talent shortages, which hinder growth and scalability. High tax rates and restrictive regulatory environments exacerbate these issues, reducing incentives for private sector investment and talent retention in Canada.

Sector-Specific Infrastructure Needs: The life sciences sector lacks critical infrastructure, such as wet labs and advanced manufacturing facilities, to support R&D and commercialization. Insufficient infrastructure funding limits Canada's competitiveness in areas like clinical trials and scaling of advanced therapeutics.

Commercialization and Adoption Gaps: Although COVID raised awareness of biotech's importance, Canada still struggles with commercialization. Canadian companies are facing difficulties in scaling manufacturing due to revenue-based eligibility criteria in support programs, a significant hurdle for life sciences companies needing inventory for regulatory compliance.

Designing an Innovation Strategy to Address Challenges

Building a Flexible, Adaptive Innovation Strategy

Alignment Across Government and Private Sectors: An effective innovation strategy requires coordination among federal, provincial, and private stakeholders. Aligning strategies with clear role definitions for the government as funders and the private sector as implementers could help establish a sustainable and impactful innovation framework.

Human-Centered, Mission-Driven Design: A system-thinking approach that incorporates human-centered, mission-oriented principles is crucial to ensuring innovation benefits society broadly. Addressing health, economic, and social inequities through a holistic policy approach could allow Canada's innovation ecosystem to be more inclusive and socially impactful.

Fostering AI and Open Access: Promoting open-access policies for AI and supporting foundational AI research can drive Canadian innovation. This approach encourages collaboration across sectors, particularly in health and biotech, by creating an ecosystem where resources and knowledge are shared to advance sectoral goals.

Addressing Structural Barriers to Commercialization and Scaling

Procurement and Market Access: Government procurement policies are critical to supporting domestic innovation. Many Canadian-developed products are primarily

marketed in the U.S. due to limited domestic support, highlighting the need for policies that prioritize Canadian products and provide clearer commercialization pathways.

Infrastructure for scaling and manufacturing: Canadian life sciences face limitations due to inadequate wet labs and manufacturing facilities for advanced therapeutic production (e.g., cell and gene therapies), therefore there is a need for the targeted infrastructure funding. In addition, there is a need for dedicated commercialization facilities and infrastructure to support local biotech start-ups and enable them to compete on an international scale.

Developing a Talent Pipeline: The health and biotech sectors require targeted programs to build and retain skilled talent, particularly in clinical research and spin-off companies. Strengthening the talent pipeline could improve Canada's capacity to innovate, especially in sectors where highly specialized skills are essential.

Learning from International Models: Examining international models in countries like Australia (tax incentives) and the UK (centralized healthcare system) offers valuable insights into addressing Canada's structural barriers. Adapting elements from these systems could help Canada attract more clinical trials and foster a more competitive environment for life sciences and health tech.

Priorities for a National Innovation Strategy

Industry-Government Collaboration: Enhanced partnerships among industry, government, and academia are essential for addressing sector-specific needs and accelerating commercialization. Regional strategies, such as Ontario's life sciences pathway, demonstrate the value of streamlined adoption and commercialization processes that could be applied nationally.

Long-Term Investment and Planning: Recognizing the lengthy timelines inherent in health and life sciences R&D is critical. Long-term planning, sustained funding, and a commitment to understanding the structural requirements of these sectors would enable Canadian innovations to reach their full potential and strengthen the overall ecosystem.

Conclusions and Recommendations

Sectoral Challenges: Health sector challenges are limited data accessibility, funding gaps for clinical trials, talent shortages, and the need for patient-centric innovations. In digital and high-tech, concerns focused on cybersecurity, AI, venture capital shortages, and a risk-averse mindset in Canada's private sector.

Commercialization and Regulatory Needs: The biotechnology and life sciences sectors face challenges in scaling and commercializing innovations. Harmonized regulatory frameworks and economic incentives are needed to support commercialization and maintain global competitiveness.

Infrastructure and Human Resource Gaps: A key barrier is the shortage of infrastructure and skilled human capital. Investments in infrastructure such as wet labs for advanced therapies and dedicated commercialization facilities, are critical. Additionally, integrating specialized AI and digital skills into workforce development is an important aspect to build a highly specialized talent pool.