Achieving Impact Through Adoption of Innovative Health Technologies

ESTABLISHING *EARLY ADOPTER HEALTH ORGANIZATIONS* AS AN ACCELERATOR FOR ECONOMIC GROWTH IN ONTARIO

2019 OBIO REPORT

Ontario
Bioscience
Innovation Organization **BIO**

TABLE OF CONTENTS

Note to Readers: A complete version of this report including templates, case studies, budget and a governance model is available upon request at info@obio.ca

BACKGROUND

Our goal is to define a model and criteria that will qualify a network of Ontario healthcare organizations to become early engagers, collaborators, advisers, validators and ultimately adopters of innovative health technologies. We believe this will establish an integrated innovation-based healthcare economy across Ontario, which will both attract investment capital to the province, and retain our growing base of local companies producing innovative technologies for our local and global health systems.

A model to establish a network of Early Adopter Health Organizations (EAHN) in Ontario came as a direct recommendation from the *Tackling the Anchor Company Challenge – OBIO Leadership Summit (2017)*. Executives from Ontario industry and Ontario health organizations, along with stakeholders from government, identified EAHNs as the principal mechanism that would enable health organizations to work directly with Ontario companies to a) evaluate prospective health technologies b) adopt technologies that demonstrated a proven benefit to patients and resulted in efficiencies and cost savings to the health organization.

Ontario is well positioned to become a leader in health technology adoption. There are many institutions in Ontario that have already begun to engage with industry innovators and to establish best practices of an EAHN. A formalized network of EAHNs in Ontario will allow for sharing of those best practices, the standardization of criteria that define early adopter institutions and acceleration of deployment of new technology. As a single payer system, with a population of ~14 million, and a projected value of $59.4 billion in 2018, Ontario manages a health system that can both evaluate the effectiveness of novel technologies, and successfully deploy new technologies that achieve a net value within the system. Ontario is also home to a growing medical technologies industry that has emerged following decades of investment in R&D at our public institutions.

With a focus on building an integrated health economy, Ontario will further enhance its capacity in health technology assessment, clinical trials and testing and health outcomes evaluation, ensuring that the local Health Organization achieves maximal value for innovation spending. In addition, with the attraction of capital to support the growth of domestic technologies and companies, other global companies will also be attracted to Ontario, seeking to directly engage with end-users that can provide valuable feedback early in the development of their technologies; thus, establishing Ontario as a global test site and launching ground for leading innovative health technologies.

THE VISION: ESTABLISHING A MODEL FOR EARLY ADOPTER HEALTH ORGANIZATIONS IN ONTARIO

The model for an Early Adopter Health Organization Network (EAHN) in Ontario was developed based on several months of consultations and direct engagement with executive level stakeholders from Ontario health organizations and industry, as well as representatives from government and other affiliate organizations.

The EAHN will have a mandate to facilitate the evaluation and adoption of promising health science innovations that could benefit human health and wellbeing through their use in the Ontario healthcare system. Through our consultations, it was made clear by stakeholders from health organizations and industry that a EAHN in Ontario must be established through an open and transparent mechanism. Health organizations from across Ontario should have equal opportunity to engage as early adopter institutions. Therefore, the optimal model for establishing an EAHN should be through an open competition.

The initial model for the network would begin with a call for 5 institutions across Ontario, each with the mandate to assess a minimum of 20 Ontario-based health technologies over the next 5 years. These institutions would be designated as EAHNs, to take leadership in testing and adopting Ontario health technologies and disseminating proven technologies to Health Organization partners. These technologies must be deemed to provide benefits to the institution or Health Organization, e.g. increasing access, improving quality, delivering value for money.

All Ontario institutions would be invited to submit proposals outlining their plans for establishing an early adopter program at their institution. Successful institutions would be required to demonstrate:

- The strength of their clinical programs
- An established or emerging culture for innovation engagement at their institution
- A previous track record of engaging with external partners to assess novel innovative technologies
- An ability to provide either in-kind or other funding contributions towards assessment and adoption

EAHNs will be expected to engage other institutions through a hub-and-spoke model, to further build capacity for technology engagement and early adoption throughout the province. EAHNs will also be expected to develop and report on their technology adoption capabilities and practices, as well as to disseminate the technology evaluations within their own institution and to the other designated health organizations within their network to scale-up the adoption of proven technologies.

SCOPE OF TECHNOLOGIES

The technologies assessed by the Early Adopter Health Organization Networks (EAHNs) need to address challenges ranging from healthcare operations, disease/patient management, or improvements in diagnosis or treatment. Technologies must also be at a point in their development, where if proven, they could then be adopted and scaled within the Ontario health system. These areas of focus were selected based on those in which government and industry have been investing directly, and for which individual health organizations could have a direct impact on assessing and validating the prospective solutions.

Relevant sub-sectors and levels of technology readiness include:

1) ***Digital Health Technologies / Applications:*** Digital health technologies or applications may fit into, enhance or run independently of existing technology platforms within the institution. They would facilitate efficiencies for healthcare operations, as well as broader engagement and proper monitoring of end-users that is critical to delivering effective care. Digital health technologies should also be highly adaptable ensuring that the specific needs of the end-users are met.
2) ***Medical Devices / Therapeutic Devices / Diagnostics:*** Medical technologies related to diagnostics, imaging, monitoring, therapeutic intervention, and training are all examples of innovations that address real needs in the Health Organization. Clinical testing and feedback for ongoing development are essential to this category of innovative technology. Any technology in this category needs to have achieved a Technology Readiness Level (TRL) of 7 or higher.

THE RESEARCH:

ONTARIO HEALTH ORGANIZATIONS PERSPECTIVE ON ENGAGING INNOVATIVE TECHNOLOGIES

The development and assessment of innovative health technologies is not a new concept for Ontario health organizations. The Ontario landscape is saturated with a variety of initiatives that support innovation in health technology, including provincial programs, many of which have been around for several years. Individual health organizations themselves have been self-initiating their own programs focused on engaging with companies to assess, refine, and validate novel technologies for their own institutions. The challenge, however, is that each of these institutions has been navigating a pathway for technology assessment and adoption on their own, and most have been highly constrained in the number of technologies they can identify and evaluate.

Despite the challenges that result from engaging in the assessment of novel technologies, our consultations with Ontario health organizations have identified several institutions that have moved forward to implement their own programs for health technology assessment. They offer several reasons for prioritizing health technology assessment:

a) Technology as a solution to real clinical challenges
b) Improving efficiencies
c) Impacts on patient outcomes
d) Building expertise and delivering leading clinical care

Working with Ontario institutions involved in early technology assessment and adoption over the past several months, we have compiled a 'Best Practice Check List'. These best practices were further vetted and refined by Ontario companies who have worked with both Ontario institutions and institutions from other jurisdictions in the assessment of their technologies. By sharing best practices, institutions are now able to self-assess and determine what practices they already have in place, and what practices require further development at their institution to become an effective early adopter of health technologies.

BARRIERS FACED BY ONTARIO HEALTH ORGANIZATIONS THAT HAVE PRIORITIZED INNOVATIVE TECHNOLOGIES

Our consultations with Ontario health organizations have identified several key challenges and barriers for institutions that have prioritized a mandate to engage and assess prospective technology solutions from industry. These challenges have been summarized as follows:

1) ***No clear mandate or government policy for the adoption of innovative technologies within the Ontario Health Organization.*** Ontario Health Organization executives are mandated in the effective delivery of health services to Ontarians, however, many of these executives have cited that the Ontario health system has not established a clear pathway to accelerate the adoption of innovative technologies that would improve the overall efficiency and effectiveness of the health services being delivered.

2) ***Ontario Health Organizations are impeded from engaging with Ontario companies that are developing novel technologies, due to the absence of dedicated funding for technology assessment.*** The health funding reforms including the Health-Based Allocation Model (HBAM) or the Quality-Based Procedures (QBP) are structured specifically to address the costs of delivering care to the patient and are explicitly or implicitly based on the costs associated with legacy approaches and technologies. The costs associated with assessing novel technologies are not included in the funding provided to healthcare institutions. Therefore, under the formula, institutions can currently be penalized for the costs associated with health technology assessment.

3) ***Individual institutions are bridging the gap in the funding provided for developing novel technologies.*** For institutions that have still chosen to prioritize health technology assessment, they often rely on funding support from other government programs or from their own hospital foundations and internal budgets. While these programs and hospital foundations provide some support for piloting novel technologies within the institution, the full costs associated with technology assessment and adoption are often not covered and are borne in some part by the institutions themselves, typically through in-kind contributions of time and overhead.

4) ***The costs and benefits associated with technology adoption are misaligned, penalizing individual institutions for costs benefits that occur elsewhere in the system.*** This misalignment of costs and benefits doesn't account for the future benefits of adopting the proven technologies for health organizations across the health system. For example, while one hospital is incurring the upfront cost for the assessment activities, the future benefit of adopting these proven technologies is shared by many health organizations and/or other healthcare providers (e.g. home care) across the province. Some health organizations have stated that they will only engage with technologies that have a perceived direct benefit for their institution. This results in the prioritization of health technologies that have the potential to improve efficiencies and cost savings at their own institutions, but not the ones that can achieve a cost savings for the health system overall.

ONTARIO INDUSTRY PERSPECTIVE ON BARRIERS TO ADOPTION

Ontario health technology companies are impeded from engaging in the Ontario health system due to a variety of barriers that either delay or prevent their novel products from being adopted. While the underlying technology has been developed and even tested within Ontario's current innovation environment, the delays and barriers to adopting the resulting technology products are pushing Ontario companies to seek-out easier paths to adoption in other markets.

To fully illustrate the barriers being faced by Ontario companies, we profiled the experiences of four diverse Ontario based health technology companies. All four companies are established businesses in the province, and through the clinical application of their technology products they have demonstrated the value of the technology on health outcomes and the cost benefits for adopting them. The most commonly referenced barriers to adoption include:

1) *Research Investment with No Consideration for Adoption or ROI*

    Ontario companies are recognized and even celebrated for the novel technologies they develop, but once tested and validated, they are not being adopted. Ontario is not benefiting from any return on the research investment, nor are we realizing the full value of the technology through the adoption and deployment into the health organization.

2) *No Clear Path to Access Capital Budgets for Large Equipment Purchases*

    Ontario institutions have not been able to fully engage with companies developing higher cost capital equipment, despite the novelty of the technology platforms they are developing. There is a perception that Canadian institutions are struggling with limited budgets and have no flexibility to finance new capital equipment.

3) *No Clear Path to Engaging Operating Budgets for Lower Cost Technologies*

    Even when technologies are relatively low cost (in the thousands of dollars per month) and can demonstrate direct cost savings to the departments that adopt them, companies find that one of the main challenges to working with Canadian healthcare institutions is navigating the pathway to engage operating budget decision makers. This is a critical pain point for companies that have limited capacity to invest the significant time required to navigate the pathway to adoption at Canadian institutions. This has led to the preferential engagement of other markets over Ontario.

4) *Canadian Institutions Require More Data to Justify Adoption*

    Companies receiving unrealistic requests from Canadian institutions for more data has resulted in our missing out on the opportunity to become early adopters of novel healthcare technologies. Companies report that Canadian institutions require significant information on the clinical validation of the technology before it is adopted and are often unwilling to trial the technology based on the evidence provided from studies already undertaken.

5) *Missing the Greater Opportunity for Improved Health and Economic Growth*

Ontario companies prefer to work with local institutions whenever possible. However, if the pathway to adoption is too difficult or time-consuming, then they favour easier pathways to adoption in other regions. The result is that Canada misses out on the opportunity to use innovation adoption as a tool to attract, retain, and build expertise in our local healthcare institutions. We miss out on the opportunity to engage with innovative technologies to build global leadership in healthcare delivery.

THE PATH FORWARD

IMPLEMENTING AN INSTITUTIONAL MANDATE TO BE AN EARLY ADOPTER HEALTH ORGANIZATION

Through our consultations with Ontario healthcare institutions and Ontario health technology companies, we have been able to describe the expectations in terms of operational criteria and financial requirements to operate an EAHN institution according to best practices. While the specifics for operationalizing an EAHN mandate will likely vary among institutions across the province, these overall criteria provide a benchmark for what would be expected for an EAHN institution in Ontario.

1) *Executive level leadership to champion the EAHN mandate throughout the institution*

There must be an individual on the executive management team of the health organization who will be responsible for championing and overseeing the innovation and technology adoption mandate for the health organization. This individual must be able to work directly with the health organization leadership to ensure that innovation and adoption are integrated into day-to-day culture and operations of the health organization, as well as the budgeting and annual planning.

2) *Dedicated office for innovation assessment and adoption*

Each EAHN must have a dedicated office that acts as the central point of entry and coordination for prospective technology partners. Responsibilities include: engaging with industry partners and assessing prospective technology solutions; engaging with the health organization's operational and clinical teams to understand their challenges and opportunities; building health organization project teams to assess and test prospective technology solutions; seeking funding to support priority projects; managing project contracts for technology assessment; managing procurement of proven technologies; and managing engagements with other health organization partners to support deployment of proven technologies.

3) *Gating process to prioritize the most relevant and most innovative technologies*

Each of the individual EAHN's will need to clearly define their institutional needs and have a strategy in place to finance the adoption of a proven technology solution. This includes procurement of the technology and operational and change management implications for its

adoption. By identifying the areas seeking to engage novel technology solutions, prospective vendors and solution providers can be prioritized, and direct engagements with the EAHN can focus only on those vendors that are aligned with the EAHN's defined priorities.

4) *Identification of systemic benefits*

It is expected that technologies demonstrating value for money to the institution will be prioritized for adoption. However, processes must be developed for technologies that demonstrate a savings and benefit to the health organization overall but do not necessarily have a direct cost benefit for the individual EAHN institution. These may require an alternate funding strategy in partnership with the province before they are prioritized for adoption.

5) *Assessment of prospective innovative health technologies*

Each EAHN should have in place a mechanism to contract with potential vendors to conduct assessments of their prospective technology. For specific studies or specialized expertise, external partners may also be engaged and built into the overall project plan. Agreements for the assessment (and prospective procurement) of any new technology should ensure that outcome-based specifications (OBS) are defined as part of the technology assessment process. In addition, the assessment project should include: a description of the need within the institution; evidence of the positive clinical benefit; an assessment of the feasibility for implementation; and an assessment of the budget impact for the institution.

Technology assessments often require multiple stages of studies based on the valuable feedback provided by the end users and the further refinements of the technology by the company that ensues. What the EAHN model provides is a symbiotic relationship between the health organization and industry partner that allows them to collaboratively evolve and develop the best technology solution over the course of the technology assessment. EAHN institutions must be willing to contribute in-kind expertise to ensure the robust assessments required to validate the technology.

6) *Procurement and adoption of proven innovative health technologies*

Procurement of products or services valued at >$100K require broader public sector institutions to engage in an open competitive process. Therefore, at the stage of defining the health organization's priority challenges and technology needs, an open call must be issued to invite prospective technology partners to offer solutions to the defined problem area. By inviting multiple technology partners to propose prospective solutions and signalling that procurement may follow the proof of concept phase, institutions will be operating within the bounds of the legislative framework. Procurement requirements should be outcome-based with corresponding value-based evaluation criteria.

7) *Dissemination of proven innovative health technologies*

EAHN institutions must be positioned to manage the adoption and dissemination of proven technologies. New proven technologies will impact operations and executive champions must

lead the change required to integrate them into new standards of practice. Change management within the institution will be a critical success factor for the adoption of new technologies.

The EAHN's network of health organization partners will be important in achieving scaled adoption of proven technologies. Using a hub and spoke model, they will be able to participate in early testing and adoption. The EAHN (and its partners) will ultimately become the showcase site for any proven technologies that are adopted by the institution.

GOVERNANCE MODEL

The EAHN will be governed by a Board of Directors. Their primary responsibility will be to recommend for each health science innovation for which an EAHN-sponsored evaluation has been completed:

a) public funding by the Ontario Ministry of Health and Long-term Care, or
b) procurement by agencies who procure health science innovations on behalf of Ontario health organizations

The EAHN Board will play four central roles in fulfilling its mandate:

a) Establishing and maintaining a roster of Early Adopter Health Organizations;

EAHN will establish a network of no fewer than five Early Adopter Health Organizations to participate in field evaluations of medical devices, digital health solutions and therapeutics developed by Ontario-based start-ups (collectively, "health science innovations") funded by EAHN.

Membership in the network will be established by a competitive process to be administered by the Early Adopter Health Organization Network Board of Directors.

b) Facilitating primary field evaluations of promising domestic health science innovations;

EAHN will direct health organizations to conduct primary field evaluations of health science innovations within the boundaries of their own institutions, individually or collectively, using grant funding EAHN distributes to health organizations for this purpose on a yearly basis ("EAHN-sponsored evaluations").

c) Facilitating the adoption of domestic health science innovations proven in field evaluations;

The EAHN Board of Directors will vote on whether to recommend public funding by the Ontario Ministry of Health and Long-term Care, or procurement by agencies who procure health science innovations on behalf of Ontario health organizations, for each health science innovation for which an EAHN-sponsored evaluation has been completed.

d) Reporting on the outcomes for all aspects of its mandate;

EAHN will prepare for its financial sponsors a report on the key performance indicators at years three (3) and five (5).

FUNDING

The health system funding reform that has been underway in Ontario has not accounted for the assessment and adoption of novel health technologies that will result in efficiencies, improved health outcomes and cost savings to the health organization. Health organizations that engage in health technology assessment are perceived as less efficient under the current funding formula as the expected increase in efficiencies and patient volumes are not immediately recognized.

The EAHN provides a model that will facilitate health organization engagement in technology assessment and adoption, for improved delivery of care. The dedicated funding recommended for this model would allow the institution to commit resources to the early adoption mandate, without having to pull existing resources from their current focus of health services delivery. Institutions would be supported to both continue delivering the current best practices for health services to their patients, while also assessing novel technologies to improve on current best practices, or to address other challenges within the health organization. By leveraging the existing funding programs from government and the additional commitments from health organizations and industry, the initial investment to launch the EAHN will be further multiplied. Funding will be scalable based on the number of technologies evaluated each year.

This model also creates a mechanism for validating the model itself through a five-year trial period, before scaling up the model to other institutions across the province and developing a more permanent approach to funding. With five years of funding there will be sufficient time to demonstrate the impacts of the early adoption model, however, long-term success will depend on ongoing funding renewal to achieve a fully integrated health economy. Without a long-term commitment to the assessment and adoption of novel health technologies, we will be missing the vital bridge from investments in health technologies to our commitment for health spending that delivers the most efficient, outcomes-based health services.

BEYOND ONTARIO – IMPLEMENTING A NATIONAL VISION FOR HEALTH TECHNOLOGY ADOPTION

Adoption of proven health technologies is a priority for all Canadians. In addition to maintaining a cost-effective and sustainable health system, Canadians are seeking the best technology solutions that deliver the best healthcare to be made available not only to Canadians, but to be exported globally.

Canada needs a model for the early testing and adoption of novel health technologies to ensure that we are both benefiting from our own investments and showcasing our leading health technologies to the world. A model for Early Adopter Health Organizations is applicable to all regions of Canada.

Common Challenges Across Canada that Would be Addressed with an Early Adopter Health Organization Network

When looking at other provinces, common themes that are impeding the adoption of health technologies emerge. The missing element in these cases is simply having the ability for a select group of end-users to address these issues to prove the effectiveness of the technology before it is deployed throughout the whole system.

Examples of common challenges include:
- Cost containment
- A clear path for innovation adoption
- Concerns over privacy and security

Many of the challenges that have led to the development of an EAHN model for Ontario, are applicable across Canada and can be addressed with the same model.

CONCLUSION: WHY AN EARLY ADOPTER HEALTH ORGANIZATION NETWORK IS ESSENTIAL IN ONTARIO

There are countless benefits to be realized by facilitating a collaborative ecosystem whereby industry and health organization end-users can work together to develop, test, refine, adopt, and deploy novel technologies for the health sector. The key impacts are summarized as follows:

1. ***A clear pathway to technology assessment and adoption.***

    An EAHN establishes a formal mechanism for evaluating novel technologies and provides the evidence on efficiencies, health outcomes, and cost savings that all stakeholders (companies, health organizations, government) are seeking to facilitate their adoption into the health system. A dedicated network of EAHN institutions will ensure that technologies with no impact will fail fast, and that only the best and proven technologies that have demonstrated benefit can be deployed throughout the health system. This EAHN will bridge the gap for engaging companies with clinical end users and ensure that only the proven technologies are deployed for the benefit of all health organizations and the health system overall.

2. ***Anchoring a growing health sciences industry across Canada.***

    In order to anchor Canadian companies here and prevent them from being enticed to relocate to the US, it will be essential to have them directly engage with health organizations and end-users within the health organization. This engagement will allow them to continue to innovate and assess the local market before they expand their sales to a larger global market. The alternative is that these companies will leave to work with health centres in other global regions and Canada will need to wait before it can access (often at a higher cost) new technology products that originated from our own country.

3. ***An integrated technology-based health sciences economy that benefits patients and taxpayers.***

    Designated early adopter health organizations will be incentivized to seek out novel health technologies that will address real burdens that currently exist within the health system. By

directly engaging with industry to help address these problems, the end-users and ultimate consumers can work directly with local innovators to provide the critical feedback that will further enhance and refine technology solutions to optimally benefit the patient. By engaging in the health system early on, companies and end-users can also monitor the true economic benefit of the technologies, ensuring that only those that achieve a net benefit are fully deployed throughout the health system.

4. *Attracting global health sciences industry and investment to Canada.*

By showcasing the success of integrated health economies across Canada, global investment will become easier to attract to the region. Investors evaluate the opportunity for partnering with Canadian companies primarily based on their success in the local market. To an outside investor, the local market is essentially a proxy for how the company will succeed in the global marketplace. Investments in Canadian companies will become more attractive due to strong ties with the local market. In addition, foreign companies and MNEs will be attracted to the Canadian health economy to preferentially test other leading health technologies (developed in other jurisdictions), given the favourable environment for innovation adoption in Canada.