

# Health City: Transforming health and driving economic development

Reg Joseph, MBA<sup>1</sup> ; Antonio Bruni, PhD<sup>1</sup>; and Chris Carvalho, PMP<sup>1</sup>

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## Abstract

Health City was established in the fall of 2018 as a Canadian not-for-profit corporation that works with numerous stakeholders to develop new pathways of care that can drive better health outcomes and economic development in the health sector. Data, artificial intelligence, and extended reality are technology platforms in healthcare that are highlighted in the context of Health City Initiatives presented here. Health City's future area of focus in addressing challenges in procurement for health innovations is also discussed as a new approach that connects the health industry to healthcare. Health City has been an active stakeholder in health innovation in Edmonton and will continue to focus on developing a global niche and owning that space through meaningful partnerships and impactful projects. This will drive improved health outcomes and economic development for the Edmonton region and Canada that can be scaled globally.

## Introduction

In the summer of 2017, the mayor of Edmonton, Don Iveson, with leadership from a steering committee,<sup>1</sup> launched Health City.<sup>2</sup> The intent stemmed from a confluence of factors that included the need to diversify our regional resource-based economy, increasing cost pressures on our health system while relative healthcare performance in Canada continued to decline,<sup>3</sup> and the Edmonton Region's potential to participate in the global disruption of the health sector.<sup>4</sup> These factors also apply broadly to the rest of Canada where provincial healthcare costs are approaching 50% of annual budgets in several Canadian jurisdictions.<sup>5</sup>

What is also clear is the opportunity for the municipality to play a role in health. Health is impacted by all levels of government. Typically, municipal governments do not play a substantive role in health planning or investment decisions. However, municipal investments often have direct impact on social indicators of health. If municipalities better understand these indicators and make investments that are coordinated, they unlock the ability to influence the entire health value chain. This enables the health system to act strategically and proactively in concert with the municipality to make an impact on both health costs and outcomes. Although a complex task, other global jurisdictions have accomplished this<sup>6</sup> and Edmonton must try as well.

## The formation of Health City

Health City was officially established in the fall of 2018. Health City is a Canadian not-for-profit corporation that works with clinicians, innovators, philanthropic organizations, and companies to develop new pathways of care that can drive better outcomes and economic development in the health sector. Health City is Edmonton-championed with a national scope.

Health City develops and executes transformational projects that leverage innovation and talent to increase patient access and to foster effectiveness within care teams. In doing so, Health City creates an innovative “living lab” environment that promotes the development of regional innovation. In turn, regional innovation retains and attracts companies to scale regionally and export globally. By bridging non-traditional partnerships and deconstructing silos, Health City can achieve its mandate to diversify our economy, drive cultural change and policy adoption, and provide validation opportunities for regional health-based companies.

## Health City initiatives: Responding to trends and needs in healthcare

The digitization of healthcare has been a complex discussion over the last decade, but it has now arrived. To win in digital health—in the same way Netflix won in media streaming—organizations need to rethink their business models to meet goals related to cost, quality, patient engagement, and customer experience. To proactively embrace digital health, it is important to take note of other industries where digital convergence is a way of life. The pressure is on the health sector to catch up and keep up. As other industries have learned, disruption through digital innovations is full of threats and opportunities.<sup>7</sup>

There are many innovators from industry who are looking at the big picture and developing novel solutions to well-established healthcare challenges. Health City embraces these innovators and includes them as part of the team for health innovation. This collaborative effort enables Health City to

<sup>1</sup> Health City, Edmonton, Alberta, Canada.

### Corresponding author:

Reg Joseph, Health City, Edmonton, Alberta, Canada.

E-mail: reg@edmontonhealthcity.ca

impact health transformation and, of equal importance, to drive economic development. Thus far, the initiatives that Health City has been involved in are mainly related to digital health. As such, data, artificial intelligence, virtual care, and extended reality are trending areas of influence in healthcare that will be highlighted in the context of Health City Initiatives presented in the next sections.

### *The data opportunity*

The use of data in healthcare has been bantered about for some time. The opportunity is not about “monetizing” the data; the real opportunity around data is to effectively track and use the right data to drive better health outcomes. Like in other industries, there is no reason why health companies should not play a defined role to join forces with health systems to address key public health or operational challenges in a transparent manner.

Industry consultation and participation is often done in sectors such as energy, agriculture, and the auto industry. It is key to find a way to do the same in the health sector. Adopting policies for proper use of healthcare data enable nations to both nurture a domestic healthcare industry and to reshape interactions with multinational companies that provide healthcare goods and services. The underlying motivation is clear: publicly funded healthcare is invariably a valued social program but can also contribute to economic development.<sup>8</sup> In relation to data use, Health City has important initiatives underway.

One of the ways to address privacy with healthcare data is through the concept known as synthetic data. Synthetic health data sets are generated from real data sets that contain actual patient information. Statistical methods are used to maintain the quantitative properties of the original data set, yet importantly do not correspond to identifiable individuals from the original data set (the data set contains fictitious patient data). Thus, synthetic data maintains patient confidentiality. Since synthetic data contains no protected health information, the data sets can be shared freely among health investigators or those in industry, without raising patient privacy concerns or contravening the Alberta Health Information Act.

Health City is exploring the value of synthetic data in a collaboration with the Institute of Health Economics, Alberta Innovates, the University of Alberta, and an Ottawa-based start-up—Replica Analytics—as an innovation that can address existing reservations around de-identifying data, and the ability “re-identify” individuals’ personal data.<sup>9</sup> This project is focused on achieving four key objectives, which are critical to the future scale and spread of a larger synthetic data initiative. These objectives are establishing a process for generating synthetic data that are representative of an existing Alberta Health database; identifying, documenting, and addressing the privacy and security concerns of key groups in Alberta (eg, Canadian Intellectual Property Office, data custodians, ethics boards) for future use and distribution of

the generated synthetic data set; analyzing and validating the synthetic data set to ensure their future utility; and presenting the results and outcomes to key government stakeholders that may assist in the development of required policy changes in data access, as well as acceptance of analyses conducted with synthetic data.

The initial stages of this work are expected to be completed by the fall of 2020. The anticipated outcomes could lay the foundation for future scale. Additionally, community and industry researchers may have increased opportunities for data accessibility and consequently, increased collaboration with the health system in a safe way that allows for the exploration of innovative solutions in various areas of healthcare.

### *Artificial intelligence to drive health outcomes*

Remote and rural communities can be burdened with a lack of infrastructure and resources to ensure the delivery of adequate healthcare as compared to major centers. Equitable access to healthcare services is still a considerable barrier that must be addressed to meet the needs of these communities. Such barriers can lead to undiagnosed conditions that can result in long-term complications, straining an over-burdened acute care system. With rapid advancements in technology, closing the gap to equitable access is becoming a real possibility with solutions being developed within the Edmonton region. As an example, MEDO.ai, an Edmonton-based start-up, has developed technology which is being used in rural communities to aide in disease diagnosis and timely intervention. Through a partnership with Health City, WestView Primary Care Network (PCN), and Alberta Innovates, MEDO.ai has been able to deploy ultrasonography in remote and rural communities to diagnose hip dysplasia in newborns.<sup>10</sup> Harnessing the power of artificial intelligence, the technology aims to better diagnose hip dysplasia in patients, with the anticipation of leading to timely intervention for improved health outcomes at the point of care in community care settings.

Another Health City initiative began with a collaborative partnership with Boehringer Ingelheim (Canada) Ltd (BI). The goal is to leverage artificial intelligence to examine patient data, with a focus on the social determinants of health, to better address health issues (including seniors’ health and chronic diseases). The project uses natural language processing on unstructured physician notes in patients’ electronic medical records where information on the patients’ social indicators of health often resides. Using such data, BI can develop risk prediction models that will support clinicians in augmenting and customizing care pathways for their patients.<sup>11</sup> The Health City partnership with BI is expected to drive innovation in the Edmonton region while yielding improved patient outcomes. The partnership, while in its infancy, has already created multiple collaborations with local innovators in the private sector, including Okaki Health Intelligence and AltaML, as well as partnerships with

the University of Alberta and SAGE Seniors' Association. At the heart of using artificial intelligence is the development of tools that can facilitate frontline providers to identify patients' needs, optimize care pathways, and focus on prevention.

### *Virtual care*

Digital-based technologies not only address efficiency and improved tracking and measurement, but also enable basic tenets that Canadians hold dear, such as access to high-quality healthcare. While Alberta has slowly adopted virtual care, the COVID-19 pandemic has accelerated these changes thus creating opportunities to leverage gains and we are encouraged will likely to continue post-pandemic. Health City is currently involved in two key multiparty projects that demonstrate emerging models in virtual care delivery. The first is the Alberta Central Zone PCN Home Health Monitoring project (HHM). This initiative—a collaborative effort between Health City, Alberta Central Zone PCNs, Telus Health, BI, Alberta Innovates and Alberta Health Services—aims to deploy a community-based HHM solution for individuals with chronic conditions.

Patients across three PCNs in central Alberta will soon be participating in an HHM technology trial. The aim is to implement and rapidly scale proven remote monitoring digital technologies. This will alleviate stress on the health system while serving as a national model for ongoing stability of care. By reducing the risk of infection, enhancing patient recovery at home, and promoting self-management, it may be possible to shorten the time necessary for (post-pandemic) economic resurgence in Canada.

The second project pertains to virtual care delivery in Long-Term Care (LTC) facilities. Health City has partnered with Centric Health and BI to implement an initiative that will provide access to remote treatment to senior residents in LTC facilities in rural communities. In view of the scope of practice of Alberta Pharmacists, the Centric Health team will work closely with the selected LTC sites to establish a process whereby the pharmacist will send a daily schedule to the on-site staff member with a list of patients to be seen virtually. This project will be able to provide essential services to seniors while offering a proof of concept for how virtual services can be scaled across Centric Health and other organizations.

The overarching goal of virtual care Health City initiatives is to develop both operational and outcomes data around community-based models of care that can inform policy-makers as they consider virtual care solutions as part of the healthcare delivery toolset.

### *Extended reality*

The extended reality market is also a key area of focus for Health City. In particular, *Enhanced Learning Incorporating eXtended Reality* (ELIXR) has the ability to

bring Edmonton-based post-secondary institutions together under one umbrella, building critical mass for such an important health subsector. Educators and practice experts will have the ability to create virtual and augmented reality simulations, training, and learning experiences. Using agile strategies, content can be distributed collaboratively through ELIXR's network of publishers to ensure that high-quality, extended reality learning experiences are made widely available to benefit students' and practicing professionals' continuing education and development.

Health City's mandate is to help pave the way for the transformation of our health economy through connecting ELIXR to companies and organizations in Health City's network. This will enable a marketplace for both Business-to-Business and Business-to-Consumer transactions that will serve as an economic driver for extended reality in the health sector.

### **Health City's future areas of focus**

One of the challenges to innovation is procurement. In most Canadian jurisdictions, when innovators initiate the process of demonstrating an application's utility on a broad scale, procurement presents a hurdle. This is true whether innovation is developed internal or external to the health system. Health City—through its collaborations with various stakeholders in government, private sector, and health systems—expects to facilitate the adoption of healthcare innovations by addressing barriers in procurement. These barriers include inadequate early warning, lack of engagement between procurers and suppliers, overly prescriptive and burdensome procurement processes, risk aversion, and procurement capability shortfalls.<sup>12</sup> Procurement teams often focus almost exclusively on the lowest up-front prices for products and services not fully considering the potential greater return on investment in a total cost of ownership model.

Health City's strategic initiatives and collaborations have the potential to facilitate embedding innovation in procurement policies and procedures while maintaining transparency, integrity, economy, openness, fairness, competition, and accountability as core fundamental principles of public procurement. A new approach that connects the health industry to healthcare, going beyond the traditional purchaser-vendor relationship that currently exists, is much needed. There is also an imminent need to address increasing healthcare costs while improving health outcomes that are stagnant at best.

### **Canadian innovation is not wishful thinking: It is already happening**

Canadian innovation is already happening and Health City has been an active stakeholder. A tangible and exciting example is Edmonton's representation in the Canada-Chicago Mentoring

Program (C2MP). C2MP was formed as a partnership between the Canadian Trade Commissioner Service and the Chicago Innovation Mentors at MATTER.health. C2MP delivers tailor-made mentorship focused on life sciences and healthcare innovators working in pharmaceuticals, health IT, and medical devices to Canadian companies. The competitive application process saw the admission of three Edmonton-based companies (RUNWITHIT Synthetics, UMay Care, and Health Gauge) in the 2019 six-month program, emphasizing the strength of the Edmonton region's med-tech companies.<sup>13</sup>

As an opportunity to celebrate these companies, but also create opportunities of collision with C2MP and other local innovators, Health City hosted a unique forum to showcase the Program as part of its 2019 Breakfast Series. The panel-centric breakfast featured a participating C2MP mentor, regional innovators excelling within the C2MP, and the Canada Trade Commissioner Service. The anticipation is that more regional-based companies will apply to future C2MP cohorts, gaining access to expertise from mentors in the Chicago area while excelling and growing their companies locally. For those interested in following Health City's initiatives and exciting news, the web site <https://edmontonhealthcity.ca/> and the Twitter account @Yeghealthcity are the places where the most current information can be found.

## Conclusion

Canada's estimated spending is \$264 billion in 2019, representing 11.4% of its gross domestic product. While many jurisdictions boast about their clinical and academic excellence globally, or innovations they have developed that are having global impact, most view the Canadian health systems through a single lens—a “cost centre” that needs to be managed. The progress and success achieved by Health City come in part from the organization's ability to host a table to explore projects that are informed by many stakeholders. Health City has an opportunity to drive innovation in the health system while simultaneously building a sector that can play a role in Alberta's economy. This combination will be even more vital in Alberta's post-pandemic recovery.

Overall, the emerging health economy is being disrupted by trends in healthcare, including digital health, virtual care, artificial intelligence, and extended reality. If the Edmonton region is to compete in these high-growth markets, Health City needs to continue to focus on developing a global niche and owning that space through meaningful partnerships and impactful projects. This will drive improved health outcomes and economic development for both the Edmonton region and Canada which can be scaled globally.

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## ORCID iD

Reg Joseph  <https://orcid.org/0000-0002-5843-6638>

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