

Transforming Healthcare through Better Use of Data: A Canadian Context

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Rhoads and Ferrara are to be commended for their understanding of the increasing need for healthcare organizations operating in a competitive environment in the United States (US) to seize the opportunities offered by technological advances in access to data and advanced analytics. Their White Paper, “Transforming Health Care through Better Use of Data,” postulates that in an increasingly competitive environment, hospitals and health systems in the US that will be able to leverage their data to improve patient care, drive innovation and improve organizational performance will generate an ongoing competitive advantage. This argument is not new and had already been put forward by Davenport for the private industry in 2006 (Davenport 2006). In addition, the authors propose that most organizations have the data they need but lack the foundational practices and capabilities to get the most out of these data assets. They propose that in order to leverage their data, organizations should assess their capacity to assess their organizational capacity in six areas: data governance; data acquisition; data sharing; data standardization; data integration; and analytics. Finally, they make the point that the next generation of data will be bigger, less structured and less easily integrated.

The first question arising from this analysis relates to its relevance to Canada. Many would argue that the Canadian context is vastly different from that of the US and that competition does not play the same role in Canada as in the US. In reality, Canada offers a contrasted picture with intense competition in a few large urban areas for fundraising and govern-

ment attention, and little or no competition in rural and remote parts of the country. Today, 60% of the 600 Canadian hospitals are small community hospitals with little to do with the situation described by Rhoads and Ferrara. However, the introduction of Activity-Based Funding mechanisms in Alberta, British Columbia, Ontario and other provinces will create a more competitive environment for healthcare providers. The level of

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analysis referred to by the authors (hospitals) is also not necessarily the most relevant to a country where many provinces have regionalized the management of their health systems and integrated healthcare delivery to various extents. Finally, we would argue that with a publically funded and managed healthcare system, the main incentive in Canada is not generating profit but maximizing public good and ensuring public accountability. The conclusions of the authors about the existence of strong incentives to leverage data available to improve care and deliver services more efficiently are still pertinent to Canada; however, the incentives driving this *impetus* for change differ in Canada.

A second question relates to the data the authors refer to as available in hospitals or local health systems. If a lot of data is available at hospital level, there are issues about the depth and

the breadth of use of this data. The authors correctly mention the possibilities offered by the expansion of clinical data, for example through the primary or secondary use of electronic medical records, in addition to existing or expanded administrative data. The availability of expanded clinical and administrative data for primary and secondary use, coupled with easier access to warehousing and innovative analytics, offers larger opportunities to use data and indicators for performance management. This is also true for Canada. One of the main differences between the US and the Canadian context is the degree of integration of the healthcare system. In Canada, the provinces and territories are responsible for the entire health system, while in the US, a more hospital-centric or local healthcare delivery system limits integration. Isolated performance measurement activities do little to improve overall system performance, and various organizations in Canada have been calling lately for a more organized approach to performance measurement (Health Council of Canada 2012a, 2012b; Standing Senate Committee on Social Affairs, Science and Technology 2012). Some of the requirements highlighted for performance improvement are the alignment of performance indicators within a common national framework that is aligned with strategic goals of provinces and territories, and an inclusion of these indicators in accountability agreements with healthcare service providers and regional health authorities. In addition, there are still important data gaps in Canada (some of them relate to the measurement of access to care, quality of care and patient safety, primary care, efficiency and productivity measurement, and patient-reported outcomes) and challenges in bridging patient-level performance information with population-level information. The absence of an overall organizing framework, together with data gaps, makes it a more challenging task to drive performance improvement at a system level.

Although far from perfect, Canada's health information system is the envy of many countries. Beyond having detailed data available at the hospital level, many provinces have an integrated information system that brings together data for the entire system, with strong analytical capabilities. This is the case of the Institute for Clinical Evaluative Sciences in Ontario, the Newfoundland and Labrador Centre for Health Information, the Manitoba Centre for Health Policy and British Columbia's Population Data BC initiative, to mention a few. Those centres have access to patient-level linkable data, including primary, ambulatory, acute, home and residential care. Analytics from those centres support the development of evidence-informed policies and health system performance monitoring. Furthermore, Canada is one of the most advanced countries in the standardized collection of high-quality data. The Canadian Institute for Health Information (CIHI) was established by the Conference of Deputy Ministers of Health in the early 1990s to play this role and has since defined data content and collection standards for the entire country for key data holdings. For

example, it has standards for in-patient discharge abstracts, financial information, electronic medical records in physician offices, and long-term care services.

The standard collection of data is obviously a condition for benchmarking and performance improvement. One recent example is the Canadian Hospital Reporting Project (CHRP) released by the CIHI in April 2012 and publically available (www.cihi.ca). CHRP reports on a core set of evidence-based performance indicators organized within a balanced scorecard framework. It supports benchmarking by providing healthcare professionals with the capacity to compare performance indicators across hospitals within peer groups and by offering them a

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complementary analytical environment in which they can drill down on the underlying data to lower-level clinical information supporting performance improvement. Releasing tools like CHRP publicly also increases the public accountability of the healthcare system, a critical feature of a publicly funded healthcare system. Beyond CHRP, CIHI regularly produces a series of electronic reports available to system managers for management and performance improvement purposes.

With the increasing implementation of electronic health records (EHR) and electronic medical records (EMR), more and more data is available electronically. EHRs and EMRs were initially implemented in Canada to support direct care to patients. In addition to the primary use of EHRs and EMRs, attention is progressively shifting to the secondary use (or health system use [HSU] in the Canadian context). The Conference of Deputy Ministers of Health has developed and released a shared vision of HSU: *Better Information for Improved Health*. The vision is aligned with that proposed by Rhoads and Ferrara in their White Paper. It promotes use of data from electronic records for clinical program management, health system management, public health and health research. Having such a vision is critical to maximize the benefits of the investments in electronic records. The vision calls for the collection of standardized and structured data at the point of care to enable HSU. CIHI and Canada Health Infoway have been tasked by the Conference of Deputy Ministers of Health to refine the vision and to conduct demonstration projects showcasing its potential to improve the performance of the Canadian healthcare system. The Conference of Deputy Ministers of Health is a mechanism that enables the coordination of a pan-Canadian data infrastructure and provides a forum to address issues related to the building blocks identified by Rhoads and Ferrara.

Finally, Canada has a strong tradition of allowing researchers

One great HSU example happened in the Winnipeg Health Region. Data collected at the point of care to establish and monitor the care plan of long-term care residents has been used to produce comparable quality indicators. It showed high variation in the rate of antipsychotic use across the 38 personal care homes in the region, suggesting opportunities for improvement. In response, a regional quality improvement project was developed and implemented. In just six months, Middlechurch Home in Winnipeg, a 197-bed facility dedicated to the care of the elderly, achieved a reduction of more than 20% in antipsychotic medication use among residents who were on the medication when the project began. This was achieved without any increase in behavioural symptoms or physical restraint use among this group of residents. These results represent a remarkable improvement, with significant implications for resident safety, quality of life and cost. (The full case study is available at: http://www.cihi.ca/CIHI-ext-portal/pdf/internet/hsu_clinic_cab_pdf_en.)

access to data in a privacy-sensitive manner. This is the case not just for provincial data centres like the Institute for Clinical Evaluative Sciences in Ontario and others mentioned in this paper, but also for national-level data sources such as those from Statistics Canada and CIHI. As an example, Statistics Canada facilitates access to its health survey data through a network of research data centres across the country, while CIHI

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provides researchers directly, on a cost-recovery basis, with access to de-identified patient-level data for research purposes. In addition, CIHI is considering posting some of its key data holdings in the research data centres managed by Statistics Canada and is piloting the development of Research Analytical Files easily accessible to researchers and offering aggregate-level data for a number of key data holdings.

Rhoads and Ferrara make a compelling argument for the increased use of data and analytics in transforming the US healthcare system and improving hospital performance dramatically. We argue that if the incentives structure is different in Canada, the incentives for healthcare organizations and regional health authorities to be data-driven are equally strong, but on a different ground. In Canada, the need for creating a high-performing

system is critical to maintain citizen trust in a publicly funded healthcare system. The challenge is to find a balance between the need to strengthen public reporting and accountability and in the meantime promote development of a non-blaming, learning health system oriented toward continuous performance improvement and supported by stronger analytical capabilities, instruments and environments. We believe that Canada is well positioned to meet this challenge. **EH**

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