International Assistance in the Digital Age: Fostering Health Data-Technology Partnerships

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Issue

Canada's health international assistance portfolio is primarily focused on addressing basic health-care needs in developing countries, but few projects take a long-term approach to health care that capitalizes on Canada's unique expertise in health informatics and data management.

Background

Health Informatics

Health informatics describes the collection, manipulation and storage of health data, including all of the hardware and software used in these processes. The purpose of health informatics is to increase the efficiency and quality of health care. An electronic health record (EHR) stores health data and makes it accessible for multiple authorized users as a patient interacts with different aspects of the healthcare system over time (International Organization for Standardization 2005).

Countries facing health crises in the developing world are ill-prepared because they lack the ability to track health trends in real time and manage large amounts of information. Data collection can be performed on paper and aggregated centrally. However, this approach is time-consuming and inefficient. EHRs make it possible to back-up, access and share data at more than one site. Better accessibility of data means better management of chronic and infectious diseases, lower costs for health services, increased efficiencies and collaboration, and the facilitation of clinical research studies (Pantuvo, Naguib and Wickramasinghe 2011). EHRs improve patient outcomes by reducing medical errors and wait times, and improving utilization of lab results and drug ordering (Fraser et al. 2005).

A tangible example of how EHRs can save lives is the prevention, early screening and treatment of cervical cancer, aided by health informatics to track patient care and symptoms. In 2018, there were 570,000 new cases of cervical cancer around the world and 90 percent of resulting deaths occurred in low- and middle-income countries (World Health Organization n.d.). According to the World Health Organization, mortality rates associated with cervical cancer could be significantly lowered through screening, early detection and treatment.

Canada is a global leader in the development and implementation of successful EHR systems. Currently, Canada's most comprehensive EHR system is Alberta Netcare, a province-wide intranet system that tracks immunizations, lab test results and prescribed medications. A single record exists for every Albertan and an online identification system is used to verify and protect their identity (Graham 2018). Canada currently has 30 graduate-level university programs in Bioinformatics, 34 in Public Health and a plethora of existing health-r-elated

start-ups (Bioinformatics 2019). Canada Health Infoway, a Canadian non-profit that supports EHR implementation, has collected data indicating that currently, "100 percent of Canadians have at least one hospital clinical report or immunization record available in electronic form, and their authorized clinicians can access this information outside of a hospital" (Canada Health Infoway 2019). "93 percent of Canadian clinicians say that EHRs help them to improve their quality of care" (ibid.).

Canada is committed to improving the health and rights of women and children around the world in part by strengthening health systems to better respond to health challenges (Global Affairs Canada [GAC] 2019b). EHRs are a key element to ensure health systems are equipped with the information necessary to handle health crises and chronic health issues. At the Group of Seven Conference in June 2018, Canada adopted the Whistler Principles, reflecting Canada's commitment to "1) Promote inclusive innovation, 2) Take intelligent risks by experimenting and 3) Collect and use evidence, including disaggregated data to drive decision-making" (ibid. 2018).

Canadian International Assistance and Health

Almost CDN$15 billion has been spent on health-related international assistance projects since 2000, and approximately 50 percent of these projects have been conducted in Africa (ibid. 2019a). A large portion of Canada's international assistance portfolio is focused on addressing basic health-care needs, but few projects take a long-term approach to health care that capitalizes on Canada's unique expertise in health informatics and data management.

Canada has begun to recognize the wide-ranging impacts that health data systems can create for women and children in developing countries. In 2015, GAC committed CDN$3.5 billion over five years to further support Maternal, Newborn and Child Health (MNCH) international assistance, specifying the generation of health data and systems as a priority (ibid. 2017). An example of such a project is the Real Accountability: Data Analysis for Results (RADAR) project run by GAC in partnership with Johns Hopkins University. RADAR works with several developing countries to collect maternal and newborn health information, digitize the information and analyze it to create evidence-based international assistance decisions. Canadian IT professionals are trained to create the tools and conduct the data analysis and the data are stored in Canadian repositories to ensure data security and quality standards are upheld (ibid. 2019a).

The Data-driven Economy

Data is quickly becoming the world's most important resource. The global data economy is currently worth over US$3 trillion and is growing rapidly (Thirani and Gupta 2017). Canada is well placed to prosper in the global data economy due to its strong privacy laws, robust digital infrastructure, and growing technology and data analytics sector. However, growth in this sector is compromised by the ongoing "brain drain" — which describes the flow of home-grown data technology firms and professionals from Canada to the United States and other countries. For example, one in four Canadian graduates from tech-related undergraduate programs leave to work in the United States (Spicer, Olmstead and Goodman 2017). The San Francisco Bay Area hosts over 350,000 Canadians. Seventy-seven percent of Canadian tech companies expect to be acquired in the short term, mostly by foreign companies (Dasilva 2018). This "leakage" of firms and professionals has been catalyzed by recent trade agreements such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership and the Canada-United States-Mexico Agreement, which prohibit restrictions on cross-border data flows and prohibit data localization requirements. These new rules make it easier for data to flow between Canada and foreign countries, creating incentives for data technology firms to follow the data outside of Canada.

Despite the obstacles that Canada faces in its transition to a data-driven economy, developing countries face a far more daunting series of challenges. Many developing countries do not have the infrastructure necessary to collect and manage data such as a reliable power supply, WiFi systems, the requisite software and adequate data storage. Moreover, many developing countries do not have the training or expertise required to improve their infrastructure and data systems (Odedra et al., n.d.). The regulatory environments in many countries are not conducive to participation in the global data economy, as many lack the data privacy and security regulations necessary for the safe handling of data. Improving data-related infrastructure in developing countries is crucial for their participation in the digital economy, as well as the ability of governments to harness data to create positive impacts for their citizens.

Feminist International Assistance Policy for the Digital Age

One of the "action areas" of Canada's Feminist International Assistance Policy (FIAP) is human dignity, which focuses on a number of key outcomes for women's health and nutrition. The FIAP seeks to maximize the effectiveness of Canada's international assistance by providing more integrated and responsive assistance; investing in innovation and research; delivering better reporting on results; and developing more effective partnerships (GAC 2019a). All four of these goals can be achieved by building health data-technology partnerships with developing countries where Canada uses its expertise in health informatics to bolster data and health systems in partner countries. These partnerships would foster evidence-based decisions in Canada's international assistance portfolio and partner countries' health sector, improve long-term health outcomes in partner countries, promote innovation in Canadian and partner countries' data and health systems sectors, and deepen relationships between Canada and partner countries.

Potential Partner Countries: South Africa, Oman and Tanzania

This section identifies three countries that may be suitable partners for health data-technology partnerships. Partner countries should have the following characteristics:

- Existing international assistance ties with Canada;
- Existing proposal for a national EHR system;
- Stable national government; and
- Existing track record of ethical data usage.

South Africa (SA): In 2013, SA began to implement a nationwide plan to standardize both its private and public health-care systems by 2027. SA's Office of Health Standards Compliance has been mandated to assess all 4010 health-care centres every four years to ensure that quality of care and medication prescription is standardized (Braithwaite et al. 2018). Currently, SA is in the process of developing a National Health Insurance scheme that requires the creation of a national EHR system (Katurura and Cilliers 2018). Canada has existing international assistance projects in SA's health sector, as well as 33 historical health-related projects since 2001 with a total budget of CDN$392 million (GAC 2019c). Enhancing EHR systems in SA would ensure that all aid dollars are being used efficiently, and more citizens' medical needs are being met.

Oman: Oman began its transition to EHRs in 2008 with the Al Shifa 3Plus system designed to connect Oman's health-care networks as part of Oman's national *Health Vision 2050*. However, the system has been plagued by numerous issues such as poor information and communications technology infrastructure, a lack of skilled IT professionals and data security issues (Al-Badi et al. 2015). Currently, Canada and Oman do not have strong international assistance ties, but they are both partners in several global health initiatives and could both benefit from health data-technology partnerships.

Tanzania: In 2017, the government of Tanzania published a road map for improving health-care data utilization by 2023 (PATH n.d.). It intends to strengthen and harmonize its EHRs and data usage by increasing investment in health systems and collaborating with development partners. Canada currently has 20 active international assistance projects in Tanzania in the health sector, with a budget of CDN$489 million (GAC 2019c).

Recommendations

1. **Place a larger emphasis on international assistance projects that develop data and health systems, focusing on EHR systems.** EHR systems are critical to improving health outcomes in developing countries and these projects address Canada's FIAP goals. To accomplish this, data and health systems should be added as a separate priority in GAC's global health international assistance portfolio. A strategic plan outlining Canada's goals for international assistance in this area should be created. MNCH data and health systems funding should be renewed in 2020 when the current funding program is set to end. International assistance funding for data and health systems in general should be expanded, moving beyond only MNCH.
2. **Partner with developing countries to develop and implement EHR systems.** As part of this new data and health systems portfolio, Canada should work with national governments of developing countries to develop their EHR system frameworks and provide

some financial assistance for the implementation of these systems. These health data-technology partnerships would leverage Canadian expertise in health informatics and EHR systems, and would help create long-term positive health outcomes in partner countries.

3. **Enlist Canadian companies to help with system creation and implementation.** As many potential partner countries have limited information technology and data analysis capacity, Canadian firms should be involved in the creation of hardware and software tools for these EHR international assistance projects. The involvement of Canadian firms is a "win" for both the partner countries and Canada. Partner countries will benefit from Canada's expertise in health systems and information technology, and Canada will benefit from creating more opportunities for Canadian IT and health professionals. More generally, Canada will benefit by becoming a global leader in EHR systems and health informatics, and by increasing Canada's role in the global data economy.

4. **Encourage the creation of ethics and gender equality agreements with partner countries.** These agreements would create a framework for the ethical and gender-sensitive treatment of the data collected and stored through these projects, as well as a framework for the secure treatment of data. For example, the agreements may include provisions to ensure that data collected is proportionate to each gender and cannot be disaggregated in a way that would allow for discriminatory actions. These agreements would be in line with Canada's FIAP.

Implementing these recommendations would leverage Canada's unique expertise in health informatics to increase the effectiveness of current health-based international assistance, improving health outcomes in partner countries and providing benefits to Canadian firms.

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