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Case 14 : Development of an Electronic Health Record Strategy at the Glenburn Public Health Unit

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FACULTY CASE

CASE 14

Development of an Electronic Health Record Strategy at the Glenburn Public Health Unit

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BACKGROUND

In 2016, the management team met to review the state of client documentation and recordkeeping at the Glenburn Public Health Unit (GPHU).[1] This included reviewing a long list of complaints, issues, and requests from GPHU staff. GPHU teams that used paper forms to document client interactions reported that they were drowning in paper. These teams also reported that analyzing trends over time or across client groups was tedious work. Staff reported that clients were increasingly asking for self-serve access to personal health information such as immunization records. Clients noted that self-serve, online patient portals were becoming common in local family physician offices. These GPHU teams wanted to replace paper forms with an electronic system, either by purchasing existing software or by working with a software developer to create a customized system. The GPHU records manager echoed these concerns and projected that offsite storage costs would steadily rise if these teams continued using paper records. This was especially true since, by law, some GPHU records had to be retained forever. GPHU teams that already had electronic client documentation/recordkeeping systems also requested funding to modify or upgrade outdated systems. However, the Information Technology (IT) team said they faced challenges maintaining the many different electronic client recordkeeping systems already in place.

The management team reflected on these issues. Through their day-to-day interactions with health workers and clients, management team members were familiar with the issues raised by staff. As leaders within the health unit, the management team was also familiar with the limitations regarding privacy, analytics, client self-service, and cross-team collaboration presented by GPHU's current client documentation and recordkeeping practices. However, addressing all these issues would be expensive and difficult, if not impossible. The management team knew that other health units had replaced multiple electronic and paper systems with one or two robust electronic health record (EHR) systems that served multiple teams. The management team decided GPHU needed to explore the feasibility of using a robust EHR system. They identified this effort as one of GPHU's top strategic priorities and they created an interdisciplinary staff committee (the EHR Committee) to gather relevant information to help the management team develop a long-term EHR strategy for GPHU. The management team requested that the Manager of Strategic Projects, Sabrina Khan, and the IT Manager, Lee Golden, lead the EHR Committee and provide the team with periodic updates on the

[1]*This case is based on real events, but uses fictitious names for organizations, people, and software.*

Committee's progress. The management team asked the Committee to provide them with a report outlining:

- GPHU's current client document/recordkeeping systems and IT capacity (an internal scan)
- EHR systems in use at other health units and partner agencies, as well as possible funding sources to support EHR development and implementation (an external scan)
- EHR strategy options, including a recommended option

The overall goal was to develop an EHR strategy that would help the GPHU improve client documentation and recordkeeping practices, which, in turn, should improve client service delivery. Ideally, the use of an electronic solution would also support collaboration and communication across GPHU programs and services.

GLENBURN PUBLIC HEALTH UNIT

GPHU is one of more than 30 public health units in Ontario. GPHU staff provide a broad range of public health programs and services in accordance with Ontario's *Health Protection and Promotion Act* (Government of Ontario, 1990) and the *Ontario Public Health Standards* published by the Ministry of Health and Long Term Care (2018). GPHU serves people residing in the Town of Glenburn and throughout Hunt County. GPHU services include school health programs, a sexual health clinic, a needle exchange program, a dental clinic, home visits to new mothers, restaurant inspections, parenting classes, immunization clinics, and tobacco law enforcement. As one of the smallest health units in Ontario, GPHU serves a population of approximately 70,000, including one First Nations community.

A board of health oversees all GPHU activities. The GPHU Board of Health comprises five provincial representatives, three Hunt County representatives, and three Town of Glenburn representatives. GPHU receives funding from multiple sources, including all three levels of government. GPHU's funding is provided via a cost-sharing arrangement between the province of Ontario and municipalities within GPHU's district. This funding is to deliver mandatory programs specified in the *Health Protection and Promotion Act*. Other GPHU programs and services are funded by the provincial Ministry of Child and Youth Services, and the Ministry of Health and Long Term Care. GPHU has approximately 65 staff, 40 volunteers, and an operating budget of $14 million.

GPHU is required to maintain high-quality records about its operations and the interactions its staff have with its patients/clients (including individuals, groups, and private businesses). This is accomplished using proper documentation and recordkeeping practices that ensure information accuracy, security, privacy, and access. Furthermore, many GPHU staff are regulated health professionals (such as nurses, physicians, and dietitians) that have discipline-specific requirements regarding client documentation and recordkeeping.

THE MINISTRY OF HEALTH AND LONG TERM CARE

As noted, the Ministry funds the majority of public health and general health care services in Ontario. In this way, the Ministry acts as *the* leader of Ontario's health system, providing overall direction on the system's goals, and then allocating resources and establishing standards to achieve those goals. The Ministry funds, regulates, and evaluates health units across Ontario, including GPHU, to provide local public health services. The Ministry also funds public health laboratories and a provincial public health agency (Public Health Ontario) and contributes to various national and international public health initiatives. Ontario also has a provincial Medical

Officer of Health and a Division of Public Health within the Ministry that oversee most of the provincial public health system.

ELECTRONIC HEALTH RECORDS

An EHR is a software or web-based documentation and recordkeeping platform that records and describes an individual's health and care history (Naylor et al., 2015). EHRs aim to keep a record of the health information and "events" a person experiences throughout their life, such as visits to their family physician, surgeries, test results, medical diagnoses, and family health history. There are countless formats and types of EHRs, most created by private IT companies. Although EHRs can exist within a single organization such as a hospital, many EHRs provide a secure connection for access to patient health information between authorized organizations and health service providers, such as hospitals, private laboratories, and family physician offices (Canada Health Infoway, 2019). Some EHRs offer self-serve access to information so people can monitor and contribute to their own record (often referred to as a "patient portal"). Given that public health represents only approximately 5% of government health system spending in developed countries, the vast majority of EHRs focus on *medical* experiences, not interactions with public health. This means most EHRs are best equipped to capture information from hospitals, doctors, pharmacies, and laboratories, but not from public health practitioners such as public health nurses or public health inspectors. The term EHR is often used synonymously with the term electronic medical record, given the focus on medical experiences (Gheorghiu & Hagens, 2016). However, EHR is generally accepted to be a broader term than electronic medical record, capturing both health status information and medical treatment experiences.

Implementing an EHR is complex and challenging work for a health service provider. Technically, a health service provider can either purchase an EHR from a company or create a new one by hiring software developers. However, providers rarely hire developers to create new EHRs given the complexity of EHR software and the number of cost-effective EHR options already available. Organizations such as hospitals and health units collect massive amounts of sensitive client information every day. Provinical laws dictate that organizations take great care in how this information is collected, stored, used, accessed, shared, analyzed, and destroyed. This affects all levels of the health organization and, when an EHR is implemented, this can present barriers to all stakeholders, including frontline clinicians, management, executive leaders, and governance bodies. Key barriers include limitations on which software can be selected, tight controls on what and how information is shared, and staffing requirements to ensure proper data storage and system auditing.

There are many valid reasons that health service providers seek to replace their paper systems with EHRs. If successfully adopted, a wide range of benefits can be realized by health providers, patients, and the health system (Canada Health Infoway, 2013). EHRs have the potential to decrease errors in medication administration, improve patient privacy, increase equitable access to health care services, improve the quality and safety of health service delivery, and, overall, contribute to a more efficient health care system (Canada Health Infoway, 2013; Cavoukian, 2010; Naylor et al., 2015; Office of the Chief Coroner, 2011). Similarly, the management team identified a number of specific benefits it sought from an EHR for GPHU:

- Improved services by facilitating collection and synthesis of more accurate and complete information among GPHU staff
- Reduced wait times for access to records
- Reduced data entry duplications

- Allowance for process improvement and automated workflows (e.g., online appointment scheduling)
- Reduced paper usage and paper storage costs
- Improved security of confidential health information through modern, encrypted data protection systems
- Ability to provide GPHU staff with immediate, accurate, and secure access to client/premise information, even when staff are working in the community
- Reduced potential for errors and uncoordinated service provision

The management team also wanted to explore the ability of the system to facilitate information sharing among local organizations when appropriate (e.g., between children's services and local hospitals) and to contribute to enhancing public health across the province by improving communication with public health laboratories and provincial agencies.

INTERNAL SCAN

The EHR Committee began the scan by meeting with staff from each GPHU team. Committee members collected relevant documents on the current state of client documentation and recordkeeping. They found GPHU's approach to this was best described as decentralized. This meant that GPHU program teams had autonomy as to how they created and kept records. All software design/purchase and implemention decisions were left to individual teams. IT staff were then tasked with maintaining these systems. While many teams used paper-based systems, more than half of the teams had also used a "basic" client record software solution (such as a Microsoft Excel or Microsoft Access database). A few teams had purchased more advanced software tailored to their specific needs. The end result was that many different electronic client systems were in use. For example, the Department of Occupational and Sexual Health was using 27 different electronic client systems. Each was a standalone system that was not connected to other systems. The scan also revealed that a few teams were required to maintain Ministry software so client information could be shared provincially. Overall, there were 65 unique electronic client recordkeeping systems in use at GPHU (Exhibit 1). While the scan results identified the broad range of services provided by GPHU, there were several constraints with having many different systems, such as challenges ensuring privacy and security as well as system maintenance.

The internal scan also showed that GPHU had foundational IT issues. GPHU lacked suitable IT infrastructure to implement an EHR across its programs. For example, there was no capacity for staff to have offsite access to GPHU's IT network. However, it was determined that GPHU could address these deficits by continuing to strengthen its IT department. GPHU had made significant investments in IT in recent years, but additional investment was required. Golden had been hired as IT Manager 6 months earlier and the IT department had expanded from four to seven staff. The IT department had also begun updating all GPHU servers, software, and hardware. With this augmented IT team and technology, GPHU was better equipped to implement an EHR, but there were still some foundational issues to be addressed.

EXTERNAL SCAN

The EHR Committee then conducted its external scan. The Committee found that the Ministry would fund EHR implementation in health care settings, but not in public health units (including the GPHU). However, the Ministry's strategic plan (2013) for the Ontario public health sector stated that developing a sector-wide IT and EHR strategy was a priority over the next three years. Despite the Ministry's plan, there was no guarantee that this goal would be realized in a

timely manner or that sufficient investments would be made to cover all EHR implementation costs.

The Ministry's current budget guidelines required any health unit that wanted to procure an EHR system to select one that was "provincially certified." The term provincially certified referred to software that has been evaluated and approved by OntarioMD, which is a joint venture between the Ministry and the Ontario Medical Association created to advance EHR adoption in Ontario. OntarioMD had approved 17 types of EHR software from 10 vendors (2017). However, Ministry budget guidelines also reported that it would not fund EHRs in health units at the time. Through conversations with colleagues at other health units, Ms. Khan found that before these budget guidelines had been determined, some health units had received one-time funding from the Ministry to implement an EHR.

The external scan revealed that, generally, most other health units in Ontario used a mix of Ministry-mandated and program-specific client record software solutions, similar to GPHU. EHRs were most commonly used to support sexual health clinics. The Committee also found that while some health units had complied with the Ministry requirement to purchase a provincially certified EHR, other health units had not. Two health units already used the non-approved IntraHealth software and another health unit was in the process of implementing the IntraHealth program. Two other health units were using the approved docSAFE software for some of their services. One health unit used docSAFE for mental health services and influenza clinics. It also planned to implement docSAFE in its sexual health clinic. The other health unit planned to start using docSAFE in its sexual health clinic soon. The Associate Medical Officer of Health at one of the health units using docSAFE was a vocal advocate of the software, hoping to establish it as the EHR system for many, if not all, Ontario health units. The scan also showed that health units using EHRs had made personnel investments while implementing docSAFE, such as hiring project managers, business analysts, and software developers.

The Committee also connected with its community partners. GPHU partners with many organizations across multiple sectors to deliver its broad range of programs and services. The Committee contacted some of GPHU's key local partners as part of the external scan to assess their experience with EHRs. The scan revealed that GPHU's partners did not use a consistent approach and instead had used multiple strategies and approaches to electronic client documentation and recordkeeping (Exhibit 2). However, two initiatives stood out to the Committee: the *Connecting South West Ontario* (cSWO) initiative and the Association of Ontario Health Centres' (AOHC) sector-wide approach to implementing an EHR.

The cSWO program was a large regional initiative funded by eHealth Ontario (an agency of the Ministry). cSWO aimed to deploy robust, integrated EHR services for health care providers across Southwestern Ontario—namely to hospitals, laboratories, and primary care offices. cSWO enabled access to hospital data for partner organizations and an online portal for clinicians to access hospital and community-based treatment information about their patients. A related component, called Southwest Physicians Interface with Regional EMR's (SPIRE) enabled family physicians to download patient hospital data. Through these services, cSWO allowed health care providers to securely access health information far more quickly than they could using slower methods such as fax, telephone, or mail. Since GPHU is located within Southwestern Ontario, the cSWO leadership team was keen to connect with GPHU about its interest in pursuing an EHR.

The scan also showed that more than 100 community health centres in Ontario had collectively purchased and implemented an EHR. This effort was coordinated by their provincial

association, the AOHC. The Association had a comprehensive IT team that gathered resources and requirements from its member health centres. The AOHC then launched a request-for-proposals process to invite submissions from EHR vendors. The provincially OntarioMD certified Nightingale system was selected and is now being implemented across Ontario. The local health centre that GPHU partnered with reported that participating in a sector-wide implementation was effective because each centre alone lacked the IT skills to purchase/develop and maintain an EHR. However, they reported that it took time for over 100 centres to accept that a sector-wide approach meant every centre may not get its unique EHR needs met.

The Committee also commissioned Dr. Molly Vollmer, a local health system evaluation consultant, to review the literature on EHRs in public health. This was undertaken to ensure the strategy determined by the management team aligned with the best evidence presented and allowed GPHU to benefit from the experience of other health units that have reported their experience with EHR implementation.

PROGRESS UPDATE

After reviewing the results of the internal and external scans, Ms. Khan and the EHR Committee identified two potentially promising opportunities for GPHU to pursue an EHR as part of a partnership:

1. **Public Health Sector Partnership.** The health units using docSAFE expressed interest in partnering with GPHU to implement docSAFE and share the significant costs associated with software licensing, maintenance, and development. Although this partnership could support data-sharing within the public health sector, it might constrain GPHU's ability to implement and modify docSAFE according to its specific needs.

2. **Southwestern Ontario Partnership.** cSWO leadership expressed interest in having GPHU join their initiative. This partnership would focus on local and regional information sharing between GPHU and its health care partners, and it could coincide with the docSAFE partnership since docSAFE was a Ministry-approved system.

Ms. Khan provided the management team with a progress report, including the two partnership opportunities identified. The management team was pleased with the Committee's progress, and they were interested in learning more about the partnership opportunities, especially with the knowledge that the Ministry would not fund an EHR at this time. The team made it clear that funding an EHR implementation initiative would be a significant challenge since it would restrict funding available for other GPHU projects. The management team asked the Committee to engage GPHU staff about the potential of an EHR to assess staff perceptions about the benefits and challenges of implementing an EHR, as well as the service areas of highest need.

STAFF ENGAGEMENT

Ms. Khan and the Committee organized a staff engagement event to obtain staff input on the EHR strategy. A representative from each of the management, administrative support, and front-line teams was invited to participate. The event included staff rotating through four different activity stations where they were asked specific questions about EHR implementation. This format was chosen to ensure the event was engaging and that information was collected from all attendees on many different topics. The different station formats also allowed staff with different preferences to fully participate (i.e. feedback could be provided at stations via anonymous feedback forms or through the participation in group discussion stations). An online survey was also conducted with participants afterwards.

Nearly all participants reported a strong interest in having GPHU use an EHR system. Overall, staff felt an EHR would improve GPHU's productivity. They reported a desire to implement an EHR that was fast, reliable, user-friendly, and allowed for remote/offsite access. Participants also stated the importance of having adequate training to accompany the implementation of a new EHR. The participants perceived the benefits of potential EHRs included the following: improved service delivery through facilitating better communication among clients, staff, and GPHU teams; improved tracking of client progress and interactions; improved accuracy in documentation; and improved reporting to support planning and decision-making. Participants additionally perceived some potential negative effects associated with using an EHR system. Some of these consequences included the introduction of new issues (e.g. relating to privacy, data security), the extensive transition period, the creation of rigid client interactions (caused by staff having to type their personal information instead of write on paper forms), and the duplication of data entered into the EHR and Ministry systems.

The engagement event results validated the importance of developing an EHR strategy at GPHU. Teams using paper-based systems reported that they had waited for this opportunity for a long time. Teams using electronic systems were similarly frustrated with the limited capacity of their systems, which hindered service delivery and constrained service improvements. The engagement event also highlighted some important technical considerations of implementing an EHR. Each team had specific needs that a potential EHR system would have to address. Ideally, each team wanted a system that best suited their specific needs; however, this might not be possible if one EHR was implemented across teams. Golden, the IT Manager, noted that the ability to collaborate between teams and analyze data would potentially be gained at the expense of team customization. During the engagement event, the Committee had informed participants that having many systems posed potential challenges for the IT department. This was not known to some staff, who were primarily focused on their team's documentation and recordkeeping needs. Some participants had even suggested implementing more than one EHR system to prevent these IT challenges.

STRATEGIES

Ms. Khan and the Committee reflected on the information they had gathered. Rather than revealing one clear direction or recommendation, the information revealed three key questions for the management team to consider. Each question had important implications for GPHU's budget, programs, and services over the next few years:

1. **Should GPHU wait for a provincial strategy or begin down the path towards EHR implementation right now?**

   Although implementing an EHR in all health units was a Ministry priority, it was unclear how long the provincial EHR strategy would take to develop, and whether it would support EHR implementation and maintainence costs. Considering this uncertainty, and the impact of the potential delay (i.e., suboptimal service delivery, collaboration, and recordkeeping), was it acceptable for GPHU to wait? On the other hand, self-funding an EHR system would likely mean reductions to funding for other programs and services.

2. **If GPHU decides to implement an EHR now, should it use one EHR for all teams, several different EHR systems, or as many different EHRs as required to meet specific team needs?**

   All teams want an EHR, but they want a system that best suits their unique needs. One EHR system would be ideal for the IT group, but it would not meet the needs of all other teams. Conversely, having many different EHRs would be ideal for some teams but would be more difficult for IT to support.

3. **If GPHU decides to use one or more EHR systems, should it implement an EHR on its own to meet its specific needs or undertake the endeavor as part of a partnership?**

   Independent implementation of an EHR would provide GPHU with total flexibility, but it would limit the ability for cost sharing and local/sector integration. Conversely, if GPHU established a partnership, there would be financial benefits but less flexibilty and ability for customization.

PRESENTATION TO THE MANAGEMENT TEAM

Ms. Khan and Mr. Golden presented their report, including the key questions, to the management team. There was no clear path forward since no funding sources were identified. While GPHU staff supported EHR adoption, staff were divided over whether one system or many systems should be pursued. The management team discussed the information presented by the Committee. The team was discouraged that the Ministry was no longer supporting EHR costs, but they were pleased to learn that GPHU had options, both in terms of EHR system type and implementation approach (i.e., alone or via a partnership). The management team was also pleased to learn that some health units had progressed further than GPHU on EHR implementation and GPHU could learn from their experiences. It was now time for the management team to determine an EHR strategy for GPHU.

CONCLUSION

As of August 2017, months had passed, and GPHU had still not implemented an EHR system. The management team decided to wait for either the provincial strategy to be developed or for another funding source to be identified. Unfortunately, the Ministry has not yet announced its EHR strategy for Ontario health units and it appears many units are in a similar position to GPHU. The cSWO initiative has continued to develop and now includes 74 local hospitals and 44,241 health care providers (2018). Similarly, the docSAFE EHR system continues to be promoted by some health units as the best option for client documentation and recordkeeping.

EXHIBIT 1
Results of an Internal Scan of Glenburn Public Health Unit Electronic Documentation/Recordkeeping Systems

GPHU Department	Documentation/ Recordkeeping System	Type	Number of Electronic Systems
Occupational and Sexual Health	Client/Server	Vendor Product	9
	MS Access	Custom (GPHU created)	7
	MS Excel	Custom (GPHU created)	2
	Online	Custom (developer created)	5
	Online	Ministry Mandated	4
Disease and Disaster Prevention	Client/Server	Ministry Mandated	1
	MS Access	Custom (developer created)	1
	MS Access	Custom (GPHU created)	2
	Other Database	Vendor Product	3
	MS Excel	Custom (GPHU created)	4
	MS Word	Custom (GPHU created)	2
	Online	Custom (developer created)	3
Epidemiology, Children's Services and Healthy Public Policy	Client/Server	Custom (developer created)	2
	Client/Server	Ministry Mandated	1
	Client/Server	Vendor Product	2
	MS Access	Custom (developer created)	3
	Other Database	Ministry Mandated	3
	Other Database	Vendor Product	8
	Online	Custom (developer created)	2
	Online	Ministry Mandated	1
		Total	**65**

EXHIBIT 2
Key Glenburn Public Health Unit Partner–Client Documentation/Recordkeeping Systems

Partner	Description
Ontario Community Health Centres	Recently completed a sector-wide electronic health record (EHR) procurement process coordinated by their association (which included approximately 100 member organizations such as Community Health Centres, Aboriginal Health Access Centres, and Community Family Health Teams) (n.d.). This resulted in a contract to use OntarioMD-approved Nightingale software.
Family Physicians	Incentivized to purchase an OntarioMD-approved EHR using OntarioMD funding. More than 6,000 physician offices are being funded. Health units are not eligible for this funding.
Nurse Practitioner Clinics	Incentivized similar to family physicians, but the program is administered by the Ministry.
Local Hospitals	Have moved toward EHRs, but also use paper records. Hospitals in Southwestern Ontario connect with laboratory and other provincial systems via the regional *Connecting South West Ontario* program (2015) funded by eHealth Ontario, as part of *Ontario's eHealth Blueprint* strategy (2014).
Community Care Access Centres	Have a robust electronic documentation and recordkeeping system that monitors payments to contracted service providers and monitors key client outcomes, not client health status.
Glenburn Police	Have a robust electronic documentation and recordkeeping system that is developed specifically for policing purposes (including remote access, personnel identification, and risk assessment supports).
Local Children's Aid Society	Use both electronic and paper recordkeeping (practitioners can choose preferred documentation method). Their software was developed specifically for Children's Aid Societies, but does not communicate between organizations. Their current focus is digitally scanning paper records.

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INSTRUCTOR GUIDANCE

Development of an Electronic Health Record Strategy at the Glenburn Public Health Unit

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BACKGROUND

Medical or electronic health records (EHR) are electronic databases that capture an individual's health and care history throughout their life. EHRs are often used as a single repository of patient information that is shared among multiple health care providers (such as hospitals, laboratories, and family physicians). The Ontario Ministry of Health and Long-Term Care requires all EHR systems in public health units be provincially certified; however, their budget does not provide units with the necessary funding for EHR implementation. The Glenburn Public Health Unit (GPHU) is conducting a review of their recordkeeping practices and has identified a need to streamline their methods for client documentation. There are currently inconsistencies across the unit's many health teams that result in communication, logistical, and technical issues with respect to document storage and delivery. To address these issues, GPHU must develop an EHR strategy that seeks to improve current recordkeeping practices and, as a result, improves client service delivery.

OBJECTIVES

1. Define key goals and/or objectives for an EHR strategy.
2. Analyze the benefits and challenges of EHR implementation in regard to partnerships and the use of single or multiple EHR systems.
3. Recommend the most effective EHR strategy in this case using the information provided and course tools and theories.
4. Document the complexities, challenges, and implementation considerations senior leaders should understand about EHR systems.

DISCUSSION QUESTIONS

1. What are some benefits associated with EHRs?
   a. Which stakeholders benefit the most? Does anyone suffer from EHR use?
   b. Are there any risks associated with EHRs for public health units?
2. What are the benefits and challenges associated with implementing a single EHR system versus multiple EHR systems in a public health unit?
   a. How can the challenges associated with the use of single and/or multiple EHR systems be overcome?
   b. Which stakeholders benefit the most from which approach? Why?
   c. Do clients have different perspectives about the benefits and challenges of EHR use? If so, how?

3. Compare and contrast the advantages and disadvantages associated with implementing EHRs as part of a partnership versus a lone venture.
   a. Which stakeholders benefit the most from which approach? Why?
   b. Do the benefits and challenges differ from the perspective of a client? If so, how?
4. What theories or models may be applied to develop an effective EHR strategy?
5. How might EHRs enhance collaboration within a single health unit and across networks of multiple public health units?
   a. How may this further benefit overall population health and client care?
   b. Are there associated risks? Why or why not?

KEYWORDS
Electronic health record; electronic medical record; environmental scan; patient documentation; public health; strategy; information technology