

Chapter 9

eHealth Saskatchewan – Provincial Electronic Health Records

1.0 MAIN POINTS

Patients use health services at many different venues: doctors' offices, pharmacies, labs, hospitals, etc. In some cases, patients use these health services at different places and at different health regions in the province. Because of this, patient data is fragmented across venues and regions, and it is also often not standardized. Some patients take it upon themselves to collect all of their health information from their healthcare professionals because a comprehensive, standardized, readily-accessible record of their health information does not exist.

eHealth Saskatchewan (eHealth) is responsible for creating a system for comprehensive electronic health records for patients (called the provincial EHR) and providing healthcare professionals access to those records. eHealth is creating the provincial EHR by trying to compile and standardize patient data from different regions and healthcare providers into provincial data repositories. It is providing healthcare professionals access to the data in these repositories.

For the 11-month period ending February 28, 2014, eHealth had effective processes to share patient data among healthcare professionals except for the following. eHealth Saskatchewan needs to:

- › Obtain responsibility for managing and maintaining all provincial data repositories
- › Establish standard data requirements for all provincial data repositories
- › Define strategies to identify and collect data needed for the provincial EHR

Also, the Ministry of Health needs to allocate its capital funding for information technology based on a provincial strategy for electronic health records.

2.0 INTRODUCTION

2.1 eHealth's Responsibility for Provincial Electronic Health Records

Since 1997, Saskatchewan has been developing a provincial EHR to allow for the sharing of patient data among healthcare professionals.¹ Since 2010, eHealth has had the mandate to develop and implement the provincial EHR for Saskatchewan.

By March 31, 2013, eHealth management stated that \$502 million had been spent on a provincial EHR. Of this total, \$184 million was spent on development costs for

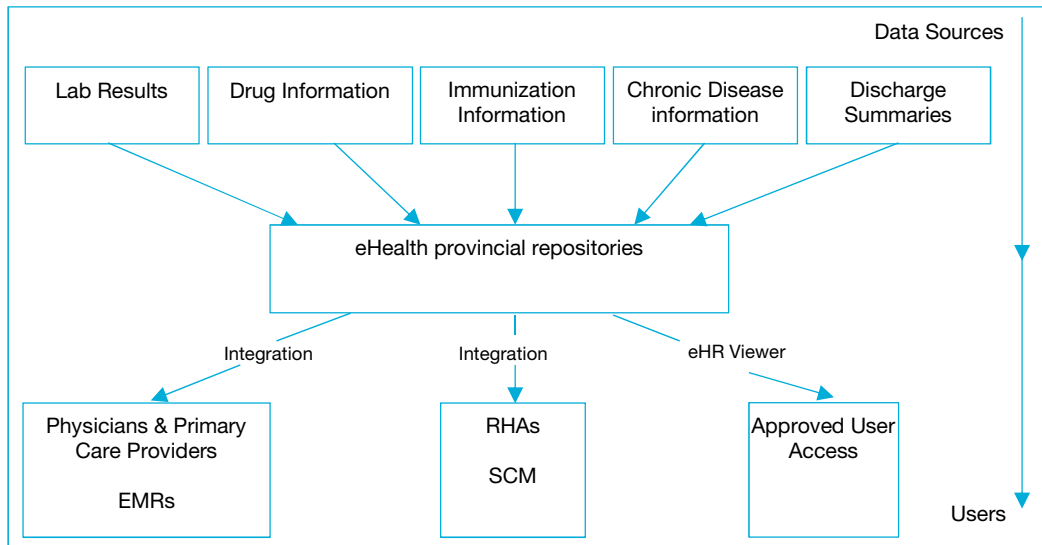
¹ Patient data is patient health information in electronic format. Healthcare professionals include physicians, pharmacists, nurses, and radiologists.



implementing new systems and \$318 million was spent on operating costs for ensuring the systems implemented are maintained and available. At March 2014, a provincial EHR was not yet complete.

The focus of eHealth’s EHR initiative is to compile patient data from various sources (e.g., pharmacies) into standardized and organized data collection systems. eHealth refers to the data collection systems as “provincial repositories.”

Figure 1 – Simplified EHR Data Sources and Users (Data Paths²) at February 28, 2014



Source: Adapted from eHealth Information Advisory Committee Terms of Reference
Note: Data sources can include data from repositories at regional health authorities, pharmacies or data entered directly into provincial repositories.

eHealth stores patient data such as lab results and drug information in provincial repositories. **Figure 1** provides an overview of EHR data paths.

eHealth provides approved users (healthcare agencies and professionals) with access to data collected in provincial repositories. Healthcare agencies and professionals use the data to provide patient care. eHealth provides them with access to data in two main ways:

- **Electronic Medical Records (EMRs)³** – EMRs enable physicians to record relevant patient information in a centralized system (e.g., add their own notes and observations to the repository information). These EMRs are located:
 - At physician and primary care clinics.
 - In some regional health authorities (RHAs), which refer to their EMR as the Sunrise Clinical Manager (SCM).
- **Web-Based Viewer (eHR Viewer)** – This website has operated since the end of 2011. eHR Viewer allows authorized users to view data over the Internet. As of March 2014, about 2,000 authorized users had access to the eHR Viewer.

² Data path is the flow of information electronically between various sources and users.
³ EMRs are digital versions of paper charts that contain all of a patient’s medical history from one practice, e.g., they contain patient data generated from visits to a physicians’ office. eHealth supports provincial repository access only for two approved EMR systems. To encourage physicians to use EMRs that are compatible with the provincial repositories, eHealth provides the Saskatchewan Medical Association (SMA) with a list of approved EMRs. Despite this, about 40% of physicians in Saskatchewan either do not use an EMR, or use a different, unapproved EMR.

By compiling complete patient data electronically and sharing it with healthcare professionals through a provincial EHR, eHealth is striving for the following benefits:

- › For patients – Improved and timely health care and decreased risks (such as fewer adverse drug reactions), and lower chance of having duplicate or unnecessary tests.
- › For healthcare professionals – An integrated view of patient data and information for making more timely and informed decisions using accessible, up-to-date patient data.
- › For taxpayers – A more efficient and effective system (e.g., fewer duplicate tests⁴ needed to provide patient care).

2.2 Healthcare Agencies with Patient Data

Numerous agencies play a role in identifying, collecting, and providing patient data. The key agencies include:

- › eHealth – The development of Saskatchewan’s EHR began with the Saskatchewan Health Information Network (SHIN), which was a part of the Ministry of Health. In 2010, SHIN evolved into eHealth, a Treasury Board Crown corporation with the responsibility for developing and implementing the provincial EHR.
- › Twelve Saskatchewan regional health authorities – RHAs⁵ provide the majority of health services in Saskatchewan, either directly or indirectly through healthcare agencies.
- › Saskatchewan Cancer Agency (SCA) – Created in 2007, the SCA provides cancer care for Saskatchewan patients.
- › The Ministry of Health (Ministry) – The Ministry oversees and coordinates the network of healthcare authorities and agencies (i.e., RHAs, SCA, and other healthcare agencies).
- › Professional Agencies – Various professional agencies play an important role in communicating patient and healthcare provider needs to the Ministry and eHealth. As well, they are important in the development and implementation of Saskatchewan’s EHR. These agencies do not have access to electronic health records. The agencies include several self-regulating professional healthcare agencies (e.g., the College of Physicians and Surgeons of Saskatchewan, the Saskatchewan College of Pharmacists, and the Saskatchewan Registered Nurses Association), and the Saskatchewan Medical Association (SMA), a voluntary professional association for physicians, medical students, and medical residents.
- › Canada Health Infoway (Infoway) – Infoway is a federal not-for-profit corporation that works with provinces and territories to accelerate the development and use of compatible EHRs across Canada. Infoway is a source of funding for the provincial EHR and does not have access to electronic health records. In general, through

⁴ Auditor General of Canada. *Fall 2009 Report*.

⁵ RHAs in Saskatchewan are: Cypress, Five Hills, Heartland, Keewatin Yatthé, Kelsey Trail, Mamawetan Churchill River, Prairie North, Prince Alberta Parkland, Regina Qu’Appelle, Saskatoon, Sun Country, and Sunrise.



funding provided by the federal government, Infoway pays 75% of eligible costs for specified EHR projects and the province or territory pays the remainder. As a condition of funding, Infoway requires provincial or territorial projects to comply with design standards for a compatible EHR.

2.3 Electronic Health Records—Potential Impact on Delivery of Health Care

In Saskatchewan, each day thousands of patients and healthcare professionals interact. Most of these interactions generate or require information (e.g., prescriptions, lab test results). Healthcare professionals collect and store this information in different locations (e.g., doctor offices, pharmacies, private labs) and in different ways (e.g., paper files, various computer systems). Today, some patients take it upon themselves to collect their health information from each of their healthcare professionals because a comprehensive, readily-accessible record of their health information does not exist.

Putting the onus on patients to collect their health information and storing patient data in various locations and formats does not allow for ready sharing of patient data, creates inefficiencies, and can limit the ability of a health professional to best treat a patient.

Patients need quality care. Patients expect healthcare professionals to have ready access to relevant data including data generated by other healthcare professionals, and use that data to provide them with quality care.

A complete provincial EHR in Saskatchewan would allow healthcare professionals to effectively share patients' data. Patient health information in electronic form is more likely to be legible, and more easily and quickly accessible no matter where an individual seeks medical attention. Ultimately, a provincial EHR that effectively shares key patient data would improve the delivery of health care by making the right data available at the right time to the right healthcare professionals.

3.0 AUDIT OBJECTIVE, SCOPE, CRITERIA, AND CONCLUSION

The objective of this audit was to assess whether eHealth had effective processes to share patient data among healthcare professionals. We assessed eHealth's processes for the eleven-month period of April 1, 2013 to February 28, 2014.

We did not assess EMRs in use at physician's offices or RHAs; we examined eHealth's policies, procedures, minutes, and agreements and interviewed eHealth staff. We also viewed a demonstration of the data presentation and tools within the eHR Viewer and observed training tools.

To conduct this audit, we followed the standards for assurance engagements published in the *CPA Canada Handbook – Assurance*. To evaluate eHealth's processes, we used criteria based on our related work, literature including reports of other auditors, and consultations with management. eHealth's management agreed with the criteria (see **Figure 2**).

Figure 2—Audit Criteria

To have effective processes to share patient data among healthcare professionals, eHealth should:

- 1. Specify key patient data to share**
 - 1.1 Evaluate data needs
 - 1.2 Identify data paths (i.e., who generates and who requires key data)
 - 1.3 Identify gaps between needs and availability of data (data gaps)
 - 1.4 Monitor and address data gaps
- 2. Build commitment for patient data sharing**
 - 2.1 Confirm data needs and sharing requirements with key stakeholders
 - 2.2 Establish agreements for collecting and sharing data with authorized users
 - 2.3 Coordinate with key stakeholders to collect needed data not readily available
- 3. Determine viable patient data sharing methods**
 - 3.1 Implement systems that enable efficient data collection and sharing to authorized users
 - 3.2 Check validity and completeness of data collection

We concluded that, for the period of April 1, 2013 to February 28, 2014, eHealth had effective processes to share patient data among healthcare professionals except that eHealth needs to:

- › **Establish standard data requirements for all provincial data repositories**
- › **Define strategies to identify and collect data required for the provincial EHR**
- › **Obtain responsibility for managing and maintaining all provincial data repositories**

As first identified in our *2009 Report – Volume 3*, Chapter 10C, eHealth needs an operational plan to guide the development and implementation of the provincial EHR.

Also, the Ministry of Health needs to allocate IT capital funding based on a provincial strategy for electronic health records.

4.0 KEY FINDINGS AND RECOMMENDATIONS

In this section, we describe our key findings and recommendations related to the audit criteria in **Figure 2**.

4.1 Need Standard Data Requirements and to Monitor and Address Data Gaps

4.1.1 Standardized Data Requirements Needed

eHealth has determined its data repository needs for a provincial EHR through direction from Infoway Canada and the Ministry of Health (Ministry), along with the participation of healthcare professionals and their related agencies.

Overall, eHealth has decided the key data repositories needed and is building the corresponding provincial repositories as part of a provincial EHR to include patient data related to:



- › Lab results
- › Drug information
- › Diagnostic imaging/reports
- › Clinical records (discharge summaries)⁶
- › Immunization information
- › Chronic disease information
- › Synoptic reporting⁷

As the Ministry of Health continues to develop strategic health objectives and eHealth further consults with patients and providers,⁸ eHealth noted it must continue to evaluate data needs and expand the capabilities of Saskatchewan's provincial EHR.

We first reported in our *2009 Report – Volume 3*, Chapter 10C, the need for eHealth to develop an operational plan that would guide the development and implementation of electronic health records. By February 2014, eHealth had developed a strategic plan that includes provincial EHR initiatives to March 31, 2017. However, eHealth still did not have a multi-year operational plan. eHealth noted that it has not developed a complete operational plan for the provincial EHR because its funding is decided on an annual basis.

eHealth gathers data requirements for repositories through consultations with relevant stakeholders. For example, the chronic disease repository includes diabetes and coronary artery disease data. When deciding on data requirements for these diseases, eHealth consults with physicians to determine the relevant indicators to adequately treat patients with these diseases.

We found eHealth did not always establish standard data requirements (i.e., complete and consistent information required) before implementing provincial repositories. For example, eHealth's discharge summary repository, compiled from various RHA data repositories, does not have standard data requirements. Without standardized data compiled into the discharge summary repository, physicians may not have the necessary information to make the best decisions.

For example, if an RHA does not include hospital drug information in its discharge summary, a healthcare professional in another location later treating the same patient may prescribe a conflicting drug potentially with adverse health consequences.⁹ In an

⁶ eHealth is currently working on this repository to share discharge summaries from hospitals. eHealth plans for more information to be included in clinical records in the future.

⁷ Synoptic reporting captures data items in a structured, standardized format, and contains information critical for understanding a disease, the technical details of a procedure, and the subsequent impacts on patient care. eHealth plans on including synoptic reporting for breast cancer surgery in the next eHR Viewer release.

⁸ In 2013, eHealth formed an eHealth Information Advisory Committee (eHIAC). eHIAC is comprised of a wide variety of health professionals, including representatives from the Saskatchewan Medical Association, the Saskatchewan College of Pharmacists, the Saskatchewan Registered Nurses Association, RHAs, the Ministry of Health, and eHealth. eHIAC's responsibilities include reviewing new sources and consumers for the Saskatchewan EHR and providing input on eHealth services. eHealth has also formed a Citizen Advisory Panel to obtain feedback on the eHR Viewer from patients. This committee first met in March 2014.

⁹ As discussed in **Section 4.1.3**, hospital drug information is not included in the drug information repository. Thus, if hospital drug information is not included in a discharge summary, it will not be available on the eHR Viewer.

emergency situation, the timeliness of the physician having access to this type of patient data is critical.

Establishing standardized data requirements in electronic format for all repositories would ensure relevant and timely information is readily available for patient care.

1. **We recommend that eHealth Saskatchewan establish standard data requirements for all provincial repositories.**

4.1.2 Identifying Data Paths

Provincial repositories allow key patient data to be readily transferred and received from anywhere a patient receives healthcare services. eHealth documents the data paths between the sources and users of patient data.

eHealth amalgamates patient data into provincial repositories from existing individual RHA repositories. RHAs continue to input and maintain the data in their individual repositories. We found eHealth uses this approach for lab results and discharge summaries. For provincial repositories under the control of the Ministry (i.e. drug information and immunization information), eHealth uses the eHR Viewer to access patient data. Also, eHealth has built repositories of key data where nothing previously existed (i.e., chronic disease repository).

The eHR Viewer enables access to patient data stored in provincial repositories. eHealth requires healthcare professional agencies (e.g., an RHA, a pharmacy, a physician office) to sign a user-access policy prior to granting access to the eHR Viewer. Once agencies have signed the user-access policy, healthcare professionals can apply through their agencies to eHealth for individual access to the eHR Viewer. We observed that a user identification and password are required for access to the eHR Viewer.

At February 2014, eHealth did not provide patients with direct access to their electronic health record. According to eHealth, providing patients with access to electronic patient data is being considered.

4.1.3 Identifying Data Required for a Provincial EHR

eHealth recognizes that the completeness of its provincial repositories is contingent upon the completeness of the sources of its information and willingness of those with patient data to share it. **Figure 3** summarizes the availability (through the eHR Viewer¹⁰) and completeness of patient data at February 2014. It shows gaps in availability of certain data and incompleteness of others.

¹⁰ Given that EMRs reside at physician offices and healthcare clinics, we did not look at the availability of data in those systems.

**Figure 3—Gaps in Saskatchewan’s Provincial Repositories at February 2014**

| Patient Data | Available? | Complete? |
|-----------------------------|------------|--|
| Lab Results | Yes | No – Missing lab information from Heartland RHA and Keewatin-Yatthé RHA |
| Drug Information | Yes | No – Missing hospital drug information and oncology drugs |
| Immunization Information | Yes | Yes |
| Diagnostic Imaging/Reports | No* | No |
| Discharge Summaries | Yes | No – Only includes Saskatoon RHA |
| Chronic Disease Information | Yes | No – eHealth plans to add four additional chronic diseases to the repository. About 250 physicians are currently participating in the chronic disease program. |
| Synoptic Reporting Tool | No** | No – Voluntary program for surgeons |

Source: eHealth Saskatchewan documentation and interviews

* While eHealth has obtained access to the majority of public clinic diagnostic images and reports, access to these images and reports is not yet available through the eHR Viewer/EMRs. eHealth hopes to provide eHR Viewer/EMR access to public clinic diagnostic images and reports in the next release in September 2014. eHealth does not have an agreement in place to secure images and reports from private clinics (about 30% of images/reports in the province).

** eHealth plans on including synoptic reporting in the next release of the eHR Viewer planned for spring 2014.

eHealth cited a variety of reasons for missing data sources. These included:

- › Completeness of repository information: Where eHealth amalgamates patient data from existing individual RHA repositories (e.g., lab results), the resulting provincial repository is only as complete as the RHA repositories. For example, if a Saskatoon lab’s results are not contributed to Saskatoon RHA’s lab repository, those lab results are not included in the provincial repository.
- › Absence of electronic repositories: RHAs such as Heartland RHA do not have an electronic RHA lab repository.
- › Use of voluntary programs to obtain data: For example, for chronic disease information, eHealth obtains data from physicians who agree to enter this data on a voluntary basis; not all do.

We further discuss the need to address gaps in data in **Section 4.1.4**.

4.1.4 Need to Monitor and Address Data Gaps

eHealth has identified the data it needs to collect for existing provincial repositories with the exception of the discharge summary repository (as described in **Section 4.1.1**). It also maintains a list of source providers (e.g., Saskatchewan Cancer Agency) for the additional data (e.g., oncology data) required. However, eHealth has not documented priorities, strategies, or timelines for obtaining required data that it has not yet collected.

RHA EMRs include detailed information regarding patient care (e.g., critical patient observations). eHealth has never required much of this EMR information to be stored in

the provincial repositories. Therefore, key patient data needed by physicians may not be available as part of the provincial EHR.

eHealth needs to document its data requirements for the provincial EHR and define strategies to address data gaps. Without a complete and summarized gap analysis, the provincial EHR may not contain key patient data that healthcare professionals need to deliver timely and effective care.

2. **We recommend that eHealth Saskatchewan define strategies to identify and collect key patient data required for provincial electronic health records.**

4.2 Improve Patient Data Agreements

4.2.1 Communicating Data Sharing Requirements With Key Stakeholders

eHealth uses a variety of committees and supports to confirm sharing requirements with key stakeholders. For example, eHealth uses eHIAC (see footnote 8) to provide advice and guidance on data-sharing agreements, service and access policies, and security and privacy concerns.

eHealth recognizes that it must make healthcare agencies and professionals aware of how they can access patient data (i.e., through the eHR Viewer and EMRs). We found that eHealth used the following means to build awareness and understanding of the role and use of eHR Viewer and EMRs, and encourage sharing of patient data. eHealth:

- › Created a Transition and Change Management Team. This team, through annual presentations at the University of Saskatchewan's Colleges of Medicine and Pharmacy, introduces the eHR Viewer and EMRs to upcoming healthcare professionals.
- › Runs a Peer Program for practicing healthcare professionals. Using networks of healthcare professionals, the program provides demonstrations of the eHR Viewer and EMRs, assists in the use of these technologies, and shares best practices.

4.2.2 Establish Better Agreements for the Collection and Sharing of Data

The Health Information Protection Act (HIPA) specifies that eHealth, RHAs, and the Ministry of Health (Ministry), among others, are trustees¹¹ for electronic health information. eHealth enters into agreements with the Ministry and RHAs to collect and share data, or obtain access to their repositories.

¹¹ HIPA defines a trustee as a person or organization who has custody or control of personal health information (i.e., patient data).



We found that eHealth uses two main types of agreements to collect and share data: information-management service provider agreements (IMSP agreements) and data-sharing agreements.

eHealth has an IMSP agreement with the Ministry for the drug and immunization repositories. The Ministry remains responsible for these repositories. Because eHealth is not responsible for these repositories, it does not have the ability to further develop them (e.g., obtain missing data).

eHealth has entered into data-sharing agreements with each RHA for the diagnostic imaging/reporting repository. Because eHealth is not the only party responsible for this repository, when it needs to make changes to the diagnostic imaging/reporting repository, it must consult with and obtain the agreement of all contributing RHAs.

Without eHealth having lead responsibility for provincial data repositories, developing the provincial EHR is an inefficient, time-consuming process. Because eHealth is charged with the development of the provincial EHR, it should control and manage all provincial data repositories.

3. We recommend that eHealth Saskatchewan obtain responsibility from the Ministry of Health for the drug and immunization repositories to facilitate developing the provincial electronic health records.

4. We recommend that eHealth Saskatchewan obtain responsibility from regional health authorities for the diagnostic images and reporting repository to facilitate developing the provincial electronic health records.

eHealth has also entered into data-sharing agreements with each RHA, and the Ministry for the lab results and discharge summaries. We found these data-sharing agreements were adequate. These agreements included important clauses that outline responsibilities of the different parties, collection policies, confidentiality requirements, and data protection requirements.

As discussed in **Section 4.1.2**, eHealth requires healthcare agencies to sign the user access policy to obtain access to provincial repository data. All healthcare professionals within agencies must also agree to the user access policy before eHealth grants them access. Whenever changes are made to this policy, eHealth appropriately requires all healthcare agencies and professionals accessing the eHR Viewer to re-acknowledge the policy. We found the policy adequately outlines party responsibilities, data trusteeship, and data use.

4.2.3 Coordinating with Stakeholders to Collect Data

eHealth regularly consults with relevant healthcare agencies and professionals before collecting data. For example, to obtain data for the drug information repository, eHealth met with the Saskatchewan Cancer Agency to discuss eHealth's data requirements for oncology drugs. eHealth also consulted with stakeholders to determine data requirements for its chronic disease repository.

4.3 Need Provincial Perspective for IT Capital Funding

4.3.1 Analyze the Benefits of IT Capital Funding on a Health Sector-Wide Basis

As noted in **Section 2.1**, eHealth is responsible for leading the planning and strategy for the provincial EHR. This includes the responsibility for procuring, implementing, owning, operating and managing the provincial EHR and the associated provincial components and infrastructure. Where data sources are included, eHealth makes data available through the eHR Viewer. eHealth's systems that are used to share the data are compatible, and allow data to be transferred between various sources and users noted in **Figure 1**.

Prior to the creation of eHealth, RHAs developed their own IT solutions (e.g., lab result repositories). Some RHAs continue to develop their own IT solutions for expanding electronic health records within their regions and for sharing records between regions. The Ministry funds these projects. The Ministry does not require the RHAs that it funds to coordinate their development with eHealth.

In our *2013 Report – Volume 2*, Chapter 11 we reported that the Ministry does not have a capital asset plan. A long-term capital asset plan would help ensure that the healthcare system has the resources it requires to deliver patient services.

Providing money to other healthcare agencies for electronic health record development without central coordination could result in unnecessary delays in completing the provincial EHR. It could also result in inefficient use of public resources, as some RHA development is not necessarily compatible with eHealth's vision or technologies and could result in managing and maintaining multiple separate systems – those by RHAs and one by eHealth.

As noted in **Section 4.1.1**, in 2009, we recommended that eHealth develop an operational plan to guide the development and implementation of EHR. Such a plan would outline coordination of the provincial EHR with its associated components (systems at RHAs and other healthcare agencies).

5. We recommend that the Ministry of Health allocate IT capital funding based on a provincial strategy for electronic health records.



4.3.2 Checking Validity of Data Collected

We found that eHealth has adequate policies to regularly perform data reconciliations to find errors. We also found that with new repositories such as the chronic disease repository, eHealth uses edit checks and defined data fields to prevent data errors. Data is not included in a provincial repository until it passes required validation checks.

eHealth staff follow up on identified errors by contacting the original data source. eHealth makes the source (e.g., RHA) responsible for correcting the error directly in the provincial repository or in their RHA repository (e.g., lab repositories).

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