Canadian Institute for Health Information (CIHI)

Earning Trust – 3 Years Later

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BACKGROUND

Maintaining and enhancing *data quality* at CIHI is essential to ensuring that the organization can deliver on its mandate of providing timely, accurate and comparable information to inform health policies, support the effective delivery of health services and raise awareness among Canadians of the factors that contribute to good health. As the scope and magnitude of the decisions that are informed by health information expand, data quality requirements and challenges also grow accordingly. CIHI’s data quality program ensures that systematic improvements are made to the quality of the data found in its databases and registries – so as to meet the evolving needs of data users, both internally and externally.

In the fall of 2002, CIHI initiated a review of the organization’s strategies to promote data quality both internally and in the health care system more generally. The objective of the *Data Quality Strategies Study* was to develop a collaborative approach that promotes a culture of data quality within CIHI and in the broader health sector. The study proposed a six-point action plan to build on CIHI’s existing data quality initiatives. This action plan was articulated in a CIHI document entitled “Earning Trust” and was endorsed by the CIHI Board of Directors in June 2003.

More specifically, the action plan included short, medium and long-term strategies to:

- Foster a data quality culture within CIHI and in the broader health sector in general
- Strengthen CIHI’s data quality infrastructure and capacity
- Cultivate the data supply chain
- Enhance external collaboration
- Establish a dedicated fund for fast track priority data quality projects
- Communicate and consult on CIHI’s data quality strategies and action plans

This document provides an overview of the major accomplishments achieved in the last three years, in meeting the objectives set out in the six-point action plan.
Foster a data quality culture within CIHI and in the broader health sector

Leadership

- In addition to the establishment of a corporate data quality department and the appointment of a dedicated data quality manager in 1999/2000, CIHI appointed in 2003/2004, a Director responsible for providing leadership for the development and implementation of its corporate Data Quality Strategy.

Performance Management

- Since 2003/04, CIHI staff have been required to incorporate one or more quality related objectives in their annual performance management plan. An audit conducted of the 2003/04 performance management plans showed a high degree of adherence to the policy. A similar audit is planned for 2006/2007.

- Since 2003/04, CIHI has produced an annual Data Quality Operational plan, which highlights data quality initiatives to be undertaken for all database and relevant program areas. Starting with the 2005/06 operational plan, CIHI program managers also began to report progress achieved with respect to the previous year’s plan.

Information Sharing and Progress Monitoring

- The Data Quality Coordination Committee (DQCC) consisting of CIHI managers responsible for databases, support programs or data utilization meets approximately 10 times per year. Since 2003/2004, the mandate of the DQCC has been revitalised and is now sponsored and co-chaired by the Director, Data Quality & Classifications and a Program Area Director. Its primary mandate is to monitor the application of the CIHI Data Quality Framework and to serve as a focal point for the sharing of information and best practices relating to data quality across the organization. In addition to its regular meetings, the committee holds an off-site meeting once per year to review data quality achievements to-date and data quality plans for the following fiscal year. The committee also screens data quality fast track fund submissions and makes recommendations to CIHI’s Executive Committee on projects that should be considered for funding.

- Since 2004/2005, the application of the CIHI Data Quality Framework, including the production of a data quality assessment report and user documentation has been monitored through the CIHI production schedule.

- The Research and Analysis Division has established its own Quality Assurance Committee to review and share best practices within the Division related to analysis, data verification, fact checking and other approaches to ensure data quality in the reports produced by the Division.
**Strengthen CIHI’s data quality infrastructure and capacity**

**Human Resources**

- Since 2003/2004, CIHI has, through the addition of several new FTEs, substantially increased its capacity to effectively address data quality issues and implement plans to more proactively deal with these. These additional human resource allocations support a variety of activities including the annual application of the data quality framework, producing data quality documentation for external users and working with external data suppliers to improve the quality of incoming data.

**Tools**

- The initial version of CIHI’s Data Quality Framework was released in 2001. It was revised and a new version was published in the fall of 2003. It has since been reviewed on an annual basis. It was re-released in March 2005 to better reflect ongoing experiences in applying the tool. The next version of the Framework is scheduled to be published in the spring of 2007.

**Education and Support**

- The CIHI Data Quality department provides support and education to all CIHI program areas. This includes responding to queries arising from the application of the Data Quality Framework.

- In the spring of 2006, the Data Quality Department released 9 e-learning modules. These provide online education relating to the various dimensions of data quality and the concepts underlying the Data Quality Framework. These are intended to support CIHI analysts who are charged with the application of the Framework. More e-learning modules are scheduled to be developed and released in 2006/2007.

- Internal education sessions to assist analysts in gaining familiarity with CIHI datasets (e.g. DAD, NACRS, Classifications) are also held on a regular basis.

**Supply Chain Management**

Since 2003/2004, CIHI has undertaken a number of activities to strengthen the data supply chain. Key achievements at the corporate level include:

- CIHI has continued to develop new education sessions for its clients and data users to respond to data quality issues and deliver education on an ongoing basis to ensure high quality information. CIHI also provides information sessions to a variety of data suppliers.

- In the fall of 2006, CIHI will be implementing a tool that will extend e-query services beyond Classifications to the following program areas: NRS, CCRS, DAD, NACRS, and Case Mix. This tool will allow clients to search our knowledge bases for frequently-asked questions and to submit questions and receive answers for new queries related to the coding and submission of data. This will provide another way for clients to access CIHI and obtain answers to questions.
Since 2003/04, there has been an ongoing effort to enhance edits for various databases including nursing databases, physician databases, HHR-DDP, HMHDB, NRS, CCRS, DAD, NPDUIS, OHMRS and NACRS. The goal of these edits is to prevent potential data quality issues and/or allow correction prior to final submission to CIHI.

CIHI also partners with software vendors by providing them with edit specifications. This allows edits to be implemented in vendor systems, so that corrections can be made directly on site at the time of data collection.

In 2004/2005, CIHI initiated Phase 2 of its corporate CIHI data dictionary development initiative. The goal of this project is to continue development of common standards for data elements contained in CIHI databases.

In 2005/2006, CIHI also initiated the development of an organizational index, which will provide a framework for tracking facilities across CIHI databases and over time. It will be used to support various CIHI initiatives, such as the eManagement reporting tool (to be implemented in 2006/2007). This eManagement reporting tool will provide information on the status of data submissions (timeliness, completeness, error rates) for relevant CIHI databases to facilities and Ministries of Health. This product will automate existing manual and ad-hoc processes and provide consolidated information to clients on submission activity over time. This product will also support and augment the Data Quality report cards submitted to Provincial/Territorial Deputy Ministers of Health.

Other key data quality initiatives related to specific databases include:

**Clinical Administrative Databases**

- Development of an Intranet page that coordinates and links all essential documents required by internal analysts for analysis of the DAD, HMDB and NACRS databases.
- Starting in 2003/2004, CIHI implemented a series of open-year data quality checks for the DAD and NACRS databases, with feedback to clients and provincial/territorial Ministries of Health.

**Discharge Abstract (DAD) & Hospital Morbidity Database (HMDB)**

- Since 2003/2004, CIHI has completed four re-abstraction studies of the Discharge Abstract Database, including the Ontario Audit study (2003), the Alberta Audit study (2004), the first year of ICD-10-CA/CCI implementation study (2004), and a major re-abstraction of Ontario Case Costing Facilities (2005). A multiyear DAD re-abstraction program is also under development, with the first year of the program to be implemented in the fall of 2006.
- In 2003/2004, completed and published an analysis of the impact of ICD-10-CA and CCI on the CMG and DPG grouping methodologies.
- In the fall of 2005/2006, CIHI began publishing Hospital Morbidity data without Quebec data to improve the timeliness of data for other jurisdictions.
- In 2005/2006, CIHI initiated a review of the standards for coding co-morbidities given the results of the Ontario Case Costing re-abstraction study.
• The Canadian Coding Standards for ICD-10-CA and CCI are released on an annual basis. The 2006 standards were released to coincide with the release of version 2006 of ICD-10-CA and CCI. A major redevelopment was done to enhance the usability of the standards.

• A redeveloped acute inpatient ICD-10-CA/CCI grouping methodology will be implemented in April 2007, the result of an extensive review and revision process using Canadian clinical activity and case-cost data. Its new co-morbidity methodology (replacing Plx) has been built using a co-morbidity list based on the quality of diagnosis coding and typing as measured by the Ontario Case Costing re-abstraction study. RIW and ELOS methodologies are being updated as well. This new grouping methodology was successfully pilot tested in the summer/fall of 2006.

• In 2006/2007, major refinements were made to the Day Procedure Groups (DPG) grouping methodology (and associated resource indicators), which is now based directly on CCI.

• Fiscal 2006/2007 marked a major milestone with the implementation of ICD-10-CA and CCI in Quebec. This will provide comparable information on a pan-Canadian basis for diagnoses and interventions contained in the Hospital Morbidity database.

• In 2005/2006, CIHI developed and delivered 2-day education sessions on DAD-HMDB to internal analysts. Similar sessions are planned later in 2006/2007 for external users such as the Canadian Public Health Agency.

**National Ambulatory Care Reporting System (NACRS)**

• In 2006/2007, major refinements were made to the Comprehensive Ambulatory Classification System (CACS) grouping methodology (and associated resource indicators), which is now based directly on ICD-10-CA and CCI.

• In 2006/07, the first ever re-abstraction study of the NACRS data set was undertaken.

**National Rehabilitation Reporting System (NRS)**

• In 2003-2004, CIHI developed and implemented quarterly data quality summaries to accompany the release of the quarterly NRS comparative reports provided to clients.

• In 2004/2005, CIHI launched a web-based re-certification tool for use by data providers to assess competency in completing the NRS clinical assessment instrument.

• In 2005/2006, CIHI initiated statistical analysis of coding patterns to identify facility variation and to assess the validity of additional cognitive data elements in the data set.

**Continuing Care Reporting System (CCRS)**

• In 2006/2007, CIHI initiated an inter-rater reliability study in Ontario Complex Continuing Care facilities and the testing of a new DQ tool - the interRAI Plausibility Index™. These initiatives are being conducted in collaboration with interRAI.

• In 2006/2007, CIHI collaborated with interRAI on a research project to enhance the quality and comparability of indicators for pan-Canadian reporting.

• In 2006/2007, a CCRS FAQ process was developed, with links to interRAI for difficult clinical coding queries, quarterly releases of FAQs and the CCRS Education program.
In 2005/2006, CIHI implemented two new types of data quality audits. One supports the completeness of the individual’s longitudinal record by flagging missing expected assessments and the other supports accuracy by flagging suspicious records based on clinical logic.

Since 2005/2006, a number of improvements have been made in the process and documentation for annual testing of revised system specifications. Furthermore, reports with historical trending of RUGS Weighted Patient Days (RWPD) support monitoring and identification of potential coding issues.

Home Care Reporting System (HCRS)

As part of the development of this new reporting system, a Data Quality Accountability Framework was introduced to identify all key stakeholders, as well as their roles and responsibilities for data quality throughout the cycle from collection through analysis and reporting. Data quality principles were also implemented into the design and development of the database.

Provincial technical and clinical implementation working groups were also established to support implementation and data quality issues.

With the launch of this new system in 2006/2007, a HCRS FAQ process was developed, with links to interRAI for difficult clinical coding queries, quarterly releases of FAQs and the HCRS Education program.

Canadian MIS Database (CMDB) and MIS Standards

In 2005/2006, CIHI began converting the name MIS Guidelines to MIS Standards to reinforce the expectation of compliance.

In 2006/2007, CIHI developed an automated MIS Compliance Tool to assess compliance and launched e-MIS reports that provide comparative information across the country on MIS data.

In 2006/2007, CIHI implemented a plan to improve mapping between the MIS Standards and the standard used in the Province of Québec.

Health Human Resource Databases

Data quality principles were incorporated into the re-engineering of the National Physician Database, the Health Personnel Database and the nursing databases, as well as into the design and development of new HHR databases (OT and Pharmacists).

A comprehensive data quality review (and associated documentation) of the new National Physician Survey data set was undertaken.

In 2004/2005, CIHI implemented methodological improvements to the Scott’s Medical Database to address the issue of Certified versus non-Certified Physicians. As well, similar improvements were made to the Regulated Nursing Databases to address the issue of tracing Regulatory Data to CIHI data.

In 2005/2006, CIHI conducted a comprehensive review of historical RNDB, LPNDB, RPNDB data and developed historical codebooks for analysis.
Registries (CORR, NTR, OTR, CJRR)

- In 2006/2007, CIHI will complete the implementation of an ICD-10-CA collection module for NTR and OTR.
- In 2006/2007, CIHI successfully resolved an outstanding data quality issue relating to the coding of hip/knee procedures in Québec.
- In 2005/2006, CIHI launched new internal data entry applications for CJRR and CORR that will enhance data quality checks on paper entries.

Pharmaceutical Databases (NPDUIS & CMIRPS)

- Data quality principles were incorporated into the design and development of these new databases. Furthermore, CIHI developed data quality agreements for its data suppliers.

Enhance external collaboration

Many stakeholders have the ability to influence the quality of the data held by CIHI. Their active involvement is critical to the long-term success of strategies for improved data quality. The following highlights areas some of the partnerships and initiatives undertaken since 2003/2004.

- In 2004/2005, CIHI, in collaboration with Statistics Canada, developed jurisdictional data quality reports for the DAD and CMDB. In 2005/2006, similar reports were added for NPDB and NRS.
- Since 2003/2004, CIHI has increased its support to Ministries of Health in establishing data quality strategies. Furthermore, presentations have been made on the Data Quality Framework to a number of jurisdictions including B.C., Saskatchewan and facilities within Ontario.
- Since 2003/2004, CIHI has also provided increased support to provincial data quality committees across the country, through either regular participation/attendance at meetings or in response to ad hoc requests.
- Since 2005/2006, CIHI program areas (DAD, NACRS, NRS, CCRS, Classifications, Data Quality, Case Mix and Hospital Reports) have supported Data Quality Blitzes in Ontario.
- In 2006/2007, CIHI initiated processes to increase interaction with researchers on the issue of data quality – so that data quality issues uncovered by researchers are brought to CIHI’s attention.
- In partnership with the Canadian Council on Health Services Accreditation (CCHSA), the MIS Standards and the standards pertaining to the DAD (ICD-10-CA/CCI, Coding Standards and Abstracting Standards) were incorporated into the CCHSA accreditation guidelines, as of 2006.
- Since 2003/2004, CIHI has been working in partnership with the Canadian Health Information Management Association to improve data quality. This has resulted in joint ventures relating to a number of re-abstraction studies carried out by CIHI, as well as the validation of e-learning modules for coders.
CIHI has also been working in partnership with ICES and the University of Toronto to review SAS code, analysis techniques and methods used to create indicators that are publicly reported through the Hospital Report series. CIHI has also implemented data verification processes with hospitals to provide the opportunity to verify data reported by Hospital Reports and Health Indicators.

**Fast Track Priority Projects**

In 2003/2004, a data quality fast-track fund was established to support high priority targeted data quality projects. Projects are selected on an annual basis based on proposals put forward by program managers. Approximately $640,000 has been invested to-date.

The following provides a list of completed and/or approved projects to-date:

- A review of the Hospital Mental Health Database Frame (completed in 2003/04)
- Development of an approach to assess compliance with MIS Standards (completed in 2005/2006)
- Development of E-MIS reports (completed in 2006/2007)
- Cardiac Revascularization Rates Project (initiated in 2006/2007)
- Evaluation of Continuing Care Quality Measures in Canada – a collaboration with interRAI to enhance the quality and comparability of indicators for pan-Canadian reporting (initiated in 2006/2007)

**Communications and Consultations**

Upon the initial release of the CIHI data quality strategy, all staff were provided with an overview of the strategy. Data quality is covered in the corporate and program specific orientation process for new staff. In addition, CIHI’s data quality initiatives have been highlighted through various media including the CIHI Lights, CIHI intranet, CIHI web-site, bulletins, internal and external presentations, conferences, etc.

In 2006/07, the development of a corporate communications strategy for Data Quality has been initiated with the aim of continuing to enhance internal and external communication on data quality.

**SUMMARY**

Implementation of CIHI’s data quality strategy has served to build heightened awareness of data quality both internally and externally. CIHI staff and management view data quality as critical to the organization’s credibility and long-term success and have embraced data quality principles and practices in their day-to-day activities.

This heightened awareness has allowed CIHI to shift from being reactive to being proactive in addressing data quality issues – and data quality is now built right into new system design and development, resulting in higher quality edits and specifications – and thus better overall quality of data.
Particular attention has been paid to enhancing current data standards – across data holdings – resulting in important improvements to analytical products – and the production of more comparable indicators. Data verification is being done in a more timely fashion – often as data gets received, instead of waiting for year-end closes, and enhanced tools have been implemented to more effectively manage data submissions and address client coding queries – resulting in timelier and more comprehensive data submissions, with reduced error rates.

CIHI has also significantly improved its data quality documentation for both internal and external users of the data, and is now producing more regular/timely data quality reports for its data providers. Significant investments have also been made in providing increased education and client support activities – to both internal and external stakeholders – resulting in improved data submissions.

In addition to increasing our interactions with the research community – to identify and address data quality issues – CIHI has also participated in yearly data quality blitzes, organized by the Ontario MOHLTC, that promote a common, shared approach to data quality. The last few years have also seen a growing number of provincial data quality committees being established – with most of them being actively supported by CIHI staff.

In 2004, CIHI produced its first-ever set of jurisdictional data quality reports (provided to deputy ministers of health). These reports have attracted much attention from ministries of health, and are being used to effect changes and improve the quality of data submitted to CIHI. This was further demonstrated by a recent request from the Ontario MOHLTC to produce facility-specific data quality indicators for participating NRS facilities – following the release of the inaugural set of jurisdictional NRS data quality reports.

Data quality continues to be mission critical for CIHI – and while much has been accomplished in the last three years – much remains to be done. Over the coming years, CIHI will continue to work closely with its stakeholders and data providers, to produce the best quality data possible.