Achieving Data Quality: How Data from a Pediatric Health Information System Earns the Trust of Its Users

by Donna M. Fletcher, MPA, RHIA

Having confidence in your decisions begins with having confidence in your data. Here's how a network of pediatric hospitals maintains data quality with a four-point program.

When making plans and reviewing performance, we need more than data—we need data we can trust. Confidence in data is due in large part to its quality. This can become especially challenging to achieve when data is submitted from multiple facilities and different organizations. Data quality programs provide a rigorous means of routinely monitoring and improving the trustworthiness of the numbers that inform your decisions.

One such program exists at the Child Health Corporation of America (CHCA), a business alliance of 41 of the largest not-for-profit children's hospitals and healthcare systems in the US and Canada. The alliance represents more than 20,000 physicians, 98,000 employees, and $11 billion in revenue. CHCA provides its member organizations group purchasing and supply chain management, pediatric data management, performance improvement and patient safety initiatives, Web-based training programs, and strategic planning. One of the alliance's major resources is a comparative pediatric database.

CHCA member hospitals pool clinical and financial data to form the Pediatric Health Information System (PHIS). (All member hospitals may submit data to PHIS; to date, 34 of 41 have opted to do so.) The collaboration allows members to base their improvement efforts on more than just their own performance—PHIS users can analyze what they know about themselves plus 33 of their peers. PHIS is the most comprehensive comparative pediatric database in the nation and includes clinical and financial details of more than seven million patient cases.

PHIS data is warehoused by a third-party vendor, which loads and processes data submitted by the hospitals. The warehouse partner then applies 175 audits to each patient record. Submissions that do not meet the error thresholds are rejected. The hospital must correct the errors, resubmit the data, and meet the threshold before the data is loaded into PHIS. Data are loaded and made available to hospitals quarterly. Hospitals access PHIS data via a virtual private network or modem.

The PHIS Data Quality Program

Confidence in the database is due in part to CHCA's commitment to ensure the quality of PHIS data. In short, CHCA's objective is to prevent poor data quality that would lead to incorrect analysis and inappropriate decisions. To accomplish this, CHCA developed an extensive data quality program to identify and resolve data quality issues, routinely monitor and assess quality, provide preventive maintenance, and support data users by facilitating good data management.

Over the five years since its inception, the data quality program developed four distinct components:

- **Triage:** investigation and resolution of data quality issues through ad-hoc assessment
- **Routine check-ups:** monitoring and assessing data quality with report cards, table consistency checks, classification system coding verification (e.g., ICD-9, charge code mapping), and data submission timeliness
- **Preventive maintenance:** provision of tools and processes to better ensure consistent practice and data collection, such as data submission standards, coding guidelines, and reference information
- **Member support:** Facilitation of decision making by establishing standards and guidelines, providing feedback on topics such as improvements, concerns, trends, hospital successes, implementing changes, resolving issues, and managing priorities

Triage: Issue Resolution

Suspected quality issues are generally reported by data users, because most issues are identified when data are analyzed; for instance, when analysis reveals unexpected trends or significant variance between a single hospital and the rest of the alliance members.

Members also report issues when preparing data to submit to the database. In these instances, issues are identified during internal hospital presubmission data quality reviews, comparison of data submission reports to internal hospital data, submission reports of data warehouse partners, coding practice and consistency reviews (e.g., ICD-9 diagnoses and procedures codes, charge codes), and from the PHIS data quality and completeness report card (a monitoring tool that provides snapshots of key data elements by hospital).

The identification of any issues starts the triage process. Examples of issues resolved during the triage process include:

- The case mix for asthma patients was significantly higher at one hospital than for all other hospitals. Upon conducting a coding practice review and discussing the issue, a code assignment difference was identified and communicated to members.
- Upon conducting a coding practice review, the case mix for asthma patients was significantly lower at one hospital than for all other hospitals. An investigation revealed that physicians did not document "with status asthmaticus," resulting in an unspecified code assignment. The physicians were informed and began appropriately documenting more specific code assignments, and subsequently, a higher asthma patient case mix.
- Utilization of a high-cost drug was not consistent among the hospitals. A review revealed that the drug was charged from the pharmacy, respiratory therapy, or a combination of the two departments. This resulted in assignment of different classification numbers for the same drug. To resolve this issue, one classification number was assigned regardless of which department administered the drug, and this information was communicated to members.
- Upon review of its data quality report, one hospital had not submitted ICD-9 procedure codes for the period. The hospital corrected its files and resubmitted them

The steps of the investigation and resolution process are described in "Data Quality Triage,". The success of the triage component is measured by the number of issues reported and communicated to members and the resolution of issues as verified in PHIS data review.

Data Quality Triage

The PHIS triage procedure uses the following process to investigate and resolve data quality issues:

1. Identify issue
2. Replicate or confirm issue
3. Identify the source of the issue (e.g., hospital, data warehouse partner)
4. Determine extent of issue (e.g., number of hospitals involved, time period)
5. Notify source of the issue to correct issue
6. Follow-up
    a. Coordinate correction process with source
    b. Reassess issue as needed
    c. Provide progress reports to interested parties
7. Communicate issue and correction to users via PHIS data quality alerts and the data quality and completeness report card. Both documents are sent to members via e-mail and are posted on the Web site.
    a. Provide description of the issue
    b. Indicate change or correction made
    c. Provide affected time periods

d. If available, provide a method to circumvent the data quality issue for previously submitted data

Routine Check-Ups: Monitoring and Assessment

To assess PHIS data quality and maintain user confidence, CHCA routinely monitors data and communicates the results to users. The success of the check-up component is measured by improvements from one review to the next.

Power users and the PHIS advisory group identify potential data quality monitors; tools and procedures are then developed and deployed. Three monitors are currently in place. The **data quality and completeness report card** provides a snapshot of key data elements within the PHIS database. This snapshot, organized by hospital and by data element, provides information that users should consider when analyzing PHIS data. Hospitals use the report cards to:

- Circumvent known data quality issues and avoid faulty analysis and resulting misinformed decision making
- Identify areas of excellence and, conversely, areas of concern
- Monitor data quality improvement efforts
- Identify similar hospitals

A second monitor is **data submission timeliness**, which coordinates data submission processes between hospitals and the data warehouse partner. Monitoring timeliness ensures that data are available for users and for transmission to the Joint Commission for ORYX indicators.

The **data submission data quality report** includes error rates and summaries of data submitted to the data warehouse. Reviewing quality reports from the data warehouse partner provides hospitals the opportunity to make corrections before the submission deadline and to confirm that all appropriate cases are loaded into the PHIS database.

Preventive Maintenance: Promoting Consistent Data Practice

Preventive maintenance improves data quality by learning from the past. When inconsistent data elements are identified during triage and routine check-ups, tools and processes are developed to address the issues and ensure future consistent practice and data collection. Preventive maintenance resources include data submission standards, coding guidelines, and other reference information. CHCA measures the success of the component by the number of tools and processes available and the evidence of their use.

Coding consistency tools include coding practice and consistency review procedures, APR-DRG severity of illness assignment guidelines, pediatric coding guidelines, and coding consensus. These tools result in improved ICD-9-CM coding consistency in the database, coding consistency and accuracy education for coders, increased and more appropriate case mix, and improved medical record documentation. CHCA documents with coding information do not supercede official coding guidelines.

Data quality management guidelines assist users in the development and planning stages of projects that use data. The guidelines establish good process for using standardized data, assessing the quality of test data collected, establishing data definitions, standardizing the data collection process, and assessing the quality of testing data collected. Managing data quality streamlines projects and saves time by eliminating the collection of unnecessary or duplicate data. It helps users avoid inconsistent data collection and confusion due to unclear or misinterpreted data definitions.

The **data quality and completeness report card** used in routine monitoring is also helpful as a preventive maintenance tool. The information contained in the report can answer questions that arise when analyzing PHIS data. For instance, users considering data on birth weight can use the report card to identify which hospitals have reasonable birth weight values entered. And as discussed earlier, report cards alert users to known issues in the database.

Accurately mapped charge codes reflect the treatment of the patient and account for expenses incurred to treat patients. To enhance the integrity of PHIS data and for more accurate comparisons, the mapping of these codes must be accurate. Consequently, when inconsistencies are identified, the **mapping change form** is completed. This ensures that the

inconsistencies are known and allows hospitals the opportunity to make corrections. Most issues are identified as significant variances from other hospitals, such as utilization of tests or administration of pharmaceuticals.

Users experiencing programming and data submission issues can also check a **technology database** to identify other member hospitals using systems similar to their own. Networking with counterparts can help expedite solutions.

Member Support: Facilitating and Managing Change

Providing support to users of PHIS data feeds the triage, routine check-ups, and preventive maintenance activities. Support to members may include facilitating decision making by establishing standards and guidelines; providing feedback and updates on data quality improvements, concerns, trends, and issue resolution; and implementing changes requested by members. Improvements to the database are also considered member support functions.
CHCA provides support through annual meetings, conference calls, a Web site, e-mail and an electronic discussion list, and online surveys. Member feedback and compliance with standards and guidelines are useful measures to gauge the success of the component.

Skills for Data Quality Managers

Successfully implementing a data quality program requires a mix of analytical and project management skills. As the PHIS program developed, a core set of competencies emerged. HIM professionals establishing data quality programs should posses strong leadership abilities, and they should have knowledge of data sets and coding and classification systems and experience in data and process analysis. Further, data quality managers must develop their personal effectiveness—the facilitation skills and relationship management skills necessary for working with the diverse stakeholder groups that design and develop the tools and processes that make up the program. The table lists the identified skills and their uses in managing data quality programs.

Skills Needed to Establish a Data Quality Program	Components of How the Skill Was Demonstrated	Examples of How the Skill Was Used
Leadership	• Possess ability to facilitate expertise	• Ensure that the appropriate people are involved to resolve data quality issues or to test the data submission process, such as those with extensive knowledge of databases, technology, diagnoses and procedures coding, charge description masters, and data users
	• Possess ability to train and educate • Recognize differences in learning and social styles and provide processes to meet those needs • Possess knowledge transfer skills • Communicate well in writing, verbally, and on an interpersonal level • Conduct group presentations • Write reports effectively	• Write report cards, tools, and processes • Communicate via e-mail to members and coworkers • Conduct presentations to instruct and inform members • Conduct brainstorming sessions, fact-finding teleconferences; facilitate reaching consensus
	• Manage multiple priorities and projects	• Coordinate efforts on behalf of multiple user groups, such as ORYX, HIM, coding, and data users • Ensure that projects are completed and delivered on time
Operations management	• Possess knowledge of data sets, classification, and coding systems	• Determine data definitions • Assess reliability and validity of coded data • Determine the source of selected data elements

Outcomes analysis	• Possess ability to analyze data • Display data effectively • Ensure data quality and integrity characteristics • Think analytically	• Develop queries to assess the completeness and validity of data • Learn the origin of suspected data quality issues
	• Use success indicators	• Know when a change has been an improvement • Know whether tools and processes meet member needs
Personal effectiveness	• Possess facilitation skills • Maintain and foster diverse work relationships • Manage relationships—relate to clinicians, diverse teams, finance, administration	• Work with member groups developing tools and processes and prioritizing improvement efforts. Groups include HIM professionals and data users from all healthcare disciplines
	• Pursue lifelong learning and take responsibility for self-development	• Stay abreast of technology and knowledge that affects data quality management

Results of Successful Data Quality Management

Successful data quality management returns tremendous benefits. Since CHCA hospitals began using PHIS, they have improved clinical outcomes, enhanced revenue, decreased utilization of unnecessary procedures and drugs, and reduced variation in care. PHIS data allows members to:

- Reduce variation and standardize care
- Improve care for high-cost, high-volume patient populations that need to be proactively managed
- Reduce costs by comparing resource utilization in pharmacy, lab, and imaging
- Improve managed care contracting
- Identify trends for clinical quality improvement initiatives and strategic planning
- Analyze high-cost drugs
- Report as needed for hospital committees
- Review ICD-9 coding practices
- Enhance and improve medical record documentation
- Transmit ORYX indicators
- Analyze physician practice
- Conduct research

All of this is made possible because of the strength and quality of the data.

References

AHIMA. *Evolving HIM Careers: Seven Roles for the Future*. Chicago: AHIMA, 1999. Available online at www.ahima.org.

AHIMA Data Quality Management Task Force. "A Checklist to Assess Data Quality Management Efforts." *Journal of AHIMA* 69, no. 3 (1998). Available online at www.ahima.org.

AHIMA Data Quality Management Task Force. "Data Quality Management Model." *Journal of AHIMA* 69, no. 6 (1998). Available online at www.ahima.org

Fuller, Sandra. "Designing a Data Collection Process." *Journal of AHIMA* 69, no. 5 (1998). Available online at www.ahima.org.

Donna M. Fletcher *(donna.fletcher@chca.com) is data quality manager at Child Health Corporation of America, Shawnee Mission, KS.*

Article citation:
Fletcher, Donna M. "Achieving Data Quality: New Data from a Pediatric Health Information System Earns the Trust of Its Users." *Journal of AHIMA* 75, no.10 (Nov-Dec 2004): 22-26.