When a hospital publishes data on clinical outcomes, patient safety, or other areas, or in other ways makes data public, such as on the hospital's website, the hospital has an ethical obligation to provide the public with accurate information. Hospital leaders are accountable for ensuring that the data are valid. Data should be validated using an evidence-based process appropriate for data collection (for example, electronic health records with automated processing vs. paper records that require manual data mining). Reliability and validity of measurement and quality of data can be established through the hospital's internal data validation process or, alternatively, can be judged by an independent third party, such as an external company contracted by the hospital. Resources such as the World Health Organization's *Data Quality Assurance* toolkit is an example of a tool to assist with data validation. The process can consist of simple measures to validate data, such as a two-person review process to ensure inter-rater reliability.

Measurable Elements of QPS.03.01

1. The hospital validates data when any of the following conditions are noted, at minimum:
   - A new measure is implemented (in particular, those clinical measures that are intended to help a hospital evaluate and improve an important clinical process or outcome).
   - Data will be made public on the hospital's website or in other ways.
   - A change has been made to an existing measure, such as the data collection methods have changed, or the data abstraction process or abstractor has changed.
   - The data resulting from an existing measure have changed in an unexplainable way.
   - The data source has changed, such as when part of the patient health care record has been turned into an electronic format and thus the data source is now both electronic and paper.
   - The subject of the data collection has changed, such as changes in average age of patients, comorbidities, research protocol alterations, new practice guidelines implemented, or new technologies and treatment methodologies introduced.
   - When the data collection method is manual, and data collection staff have changed mid-cycle.
2. The hospital uses an evidence-based methodology for data validation.
3. Hospital leaders assume accountability for the validity of the quality and outcome data made public.

Standard QPS.03.02

Individuals with specialized experience, knowledge, and skills systematically aggregate, validate, and analyze data in the hospital.

Intent of QPS.03.02

Specialized expertise is required to accurately aggregate, analyze, and transform data into useful information. Data aggregation and analysis requires qualified individuals who meet the following criteria:

- Understand information management.
- Have skills in data aggregation methods.
- Know how to use various statistical tools to analyze data.

Results of data analysis must be transformed into reports that are easily understood by those individuals responsible for the process or outcome being measured and who can act on the results. These individuals may be clinical, managerial, or a combination. Data analysis provides continuous feedback of continuous quality improvement information to help those individuals make decisions and continuously improve clinical and managerial processes.

Understanding statistical techniques is critical in data analysis, particularly in interpreting variation and deciding where improvement needs to occur. Run charts, control charts, histograms, and Pareto charts are examples of statistical tools useful in understanding trends and variation in health care.

The quality and patient safety program participates in the determination of how often data are aggregated and analyzed. The frequency of this process depends on the activity or area being measured and the frequency of the measurement, in accordance with laws and regulations and national health care industry standards. For example, clinical laboratory quality control data may be aggregated and analyzed weekly to meet local regulations, and patient fall data may be aggregated and analyzed quarterly if falls are infrequent. Aggregation and analysis of data at points in time enables the hospital to judge the stability of a particular process or the predictability of a particular outcome in relation to expectations.

The goal of data analysis is to be able to compare a hospital in the following ways:

- With itself over time, such as month to month, or one year to the next
- With other similar hospitals, such as through reference databases
- With standards, such as those set by accrediting and professional bodies or those set by laws or regulations
- With recognized desirable practices identified in the literature as best or better practices or practice guidelines

These comparisons help the hospital understand the source and nature of undesirable change and help focus improvement efforts.

Measurable Elements of QPS.03.02

1. The hospital aggregates, analyzes, and transforms data into useful information to identify opportunities for improvement. (*See also* QPS.03.00, ME 2)
2. The hospital defines and approves appropriate qualifications for individuals who participate in data collection, aggregation, validation, and analysis.
3. The hospital uses established statistical tools and techniques in the analysis process.
4. Hospital leaders determine the frequency of reporting the results of analysis to those accountable for action, in accordance with laws and regulations and national health care industry standards.
5. Data analysis supports comparisons internally and externally over time, including comparisons with databases of like hospitals, with best practices, and with objective scientific professional sources.

Standard QPS.03.03

The data analysis process includes at least one evaluation of the clinical, financial, and operational impact of hospitalwide improvement priorities per year.

Intent of QPS.03.03

The analysis provides useful information on which improvements positively impact clinical outcomes and efficiency to justify resource allocation. The quality and patient safety program includes an analysis of the clinical, financial, and operational impact of priority improvements as supported by leaders. For example, the analysis shows that there is evidence to support that the use of clinical practice guidelines to standardize care, treatment, and services has a significant impact on efficiency and a reduction in the length of stay, which ultimately reduces costs. Therefore, hospital leaders can make informed decisions about allocating resources for performance improvement initiatives.

The quality and patient safety program team must use appropriate tools to evaluate the use of resources for the existing process and then reevaluate the use of resources for the improved process. The resources may be human (for example, time devoted to each step in a process) or may involve the use of technology or other resources. The evaluation is then reported to leaders and others who are responsible for making decisions.