

Quality Improvement Basics: Data Basics

Slide 1 Objectives

After completing this module, participants will be able to:

- Describe how data is used to show quality improvement.
- Differentiate between Qualitative vs. Quantitative data and why each is used.
- Distinguish between process measures and outcome measures and why each is used.

Slide 2 Valid and Reliable

Valid and reliable data is the key to understanding processes and outcomes. To be valuable, data should be both valid, meaning it is an accurate measure of what is intended, and reliable, indicating consistent results even when measured multiple times or by different individuals.

Slide 3 Using Data for Quality Improvement

A health care organization likely already has considerable amounts of data from various sources, such as clinical records, practice management systems, satisfaction surveys, external evaluations of the population's health, and others. Using this data in a disciplined and systematic way allows an organization to evaluate its current systems, measure performance against organizational goals, identify and prioritize opportunities for improvement, and monitor performance over time.

Data is a cornerstone of quality improvement that enables organizations to describe how well current systems work. Data helps quantify what happens when changes or modifications are made to a process and enables us to identify variations occurring in the process. In this way, data sheds light on hunches or guesswork, clarifying what is thought to be happening from what is really happening. Data helps us set a baseline to measure the changes we apply to our processes and systems and indicate whether our changes have led to improvements. By collecting and analyzing data over time, we gain further insights into our processes and systems and, ultimately, assess the impact of changes made on desired outcomes. Sometimes, in our efforts to make improvements, our changes can also lead to unintended or unanticipated results, and data will provide insights into these. If we do not achieve the intended results, the team then revisits if other changes could be made that might be more effective. Finally, when we successfully modify and improve our processes, it is not sufficient to have a 'one-time' success...rather, we want to ensure improvements are being sustained over time and our process and outcome metrics and underlying data help us monitor that progress.

Slide 4 Quantitative vs. Qualitative Data

Both quantitative and qualitative data are helpful in QI efforts. Let's discuss each.

Slide 5 Quantitative Data

Quantitative data involves the use of numbers expressed in measurable units. Quantitative data is often continuous, such as in height or length measurement. Quantitative data is objective and produced through verifiable, replicable processes and not subject to interpretation.



Quantitative data can be very helpful in looking for patterns and themes. They can be processed utilizing software such as Microsoft Excel, Tableau, and population health analytics packages, among many others. If you've ever recorded a blood pressure, looked at a hemoglobin A1C value, or other similar lab values, you've looked at and worked with quantitative data.

Here are a few other examples:

- Finding the average of a specific laboratory value
- Calculating the timeliness of patient access to care
- Calculating the percentages of patients that receive an appropriate health screening

Slide 6 Qualitative Data

Qualitative methods collect data with descriptive characteristics rather than numeric values. Qualitative data can also be categorical, placing observations in specific categories conveying attributes and properties. It provides important information about patterns and relationships between systems and is often used to provide context for needed improvements. Qualitative data would include data that is collected in:

- Patient and staff satisfaction surveys
- Focus group discussions.
- Independent observations
- Race, ethnicity, language (REL data), which is a set of qualitative data that is used to better understand patient populations and identify health inequities
- Qualitative data that can be used to better understand patient populations and identify health inequities include:
 - REL (Race, ethnicity, language) data
 - HRSN (Health-related social needs) data
 - SOGI (Sexual gender and orientation) data

... and could also be narrative observations such as an encounter note in a chart.

Slide 7 Quantitative and Qualitative Examples

A short-hand method to remember the difference between these two data types is that quantitative is generally a quantity, whereas qualitative describes the qualities about what you are collecting.

There is a deeper science within these types of categories of data, but we'll keep it at a higher level for our purposes.

Here are some additional examples of quantitative and qualitative data.

Quantitative data includes things like temperature, height, weight, time (like wait times or turnaround times), blood glucose level, and blood pressure.

Qualitative data can include information from meeting notes, documented discussions, or narratives, such as an encounter note, patient race, ethnicity, and language, or blood type.

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Qualitative data is typically non-numerical data collected through observations, interviews, or other means that allow for exploring opinions, experiences, and perceptions. On the other hand, quantitative data is always numerical data that can be objectively measured and analyzed statistically.

Quantifying qualitative data can involve assigning numerical values to certain qualitative attributes or characteristics to facilitate analysis and comparison. For example, a researcher might use a Likert scale to assign numerical values to responses on a survey, where one represents "strongly disagree" and five represents "strongly agree." While this process allows for numerical data analysis, it does not necessarily make the data quantitative.

It is important to note that there are distinct differences between qualitative and quantitative data; the two types of data are typically analyzed using different methods. Quantitative data is typically analyzed using statistical methods, while qualitative data is typically analyzed through thematic analysis, discourse analysis, or other qualitative methods.

Determining which type of data you are collecting is important as it will impact how you can analyze it and which data visualization tools you can use to tell your data story. We'll learn more about that later in the Data Collection and Measures Module.

Slide 8 Process vs. Outcome Measures

When deciding what to measure, there are two main types of measures: process measures and outcome measures. There are other types of measures, such as structural and balancing measures, but we will focus on process and outcome measures in this module.

Slide 9 Process Measures

Process measures examine the steps of the process or how things are done. Process measures indicate what our health care team or clinicians do to help patients improve or maintain health and typically reflect general health care recommendations. Examples may include the number of people assessed for a fall risk or those screened for diabetes.

Process measures aim to assess our processes: - are we doing the things as we intend to do them? If we see variation in our process measure results, we can seek to better understand and standardize our processes.

If a process or something in the system is changed as part of an improvement project or a corrective action, it is important to know if the change actually occurred as intended.

Consider how these process measure examples may help inform quality improvement work:

The number of patients that receive a second blood pressure check if the first measurement is elevated during an encounter.

The number of patients over 18 who are screened for prediabetes that are not already diagnosed with diabetes or gestational diabetes.

Slide 10 Outcome Measures

Outcome measures, on the other hand, reflect the result of the processes currently in place and, in health care, typically focus on how the patient's health has been impacted. While it is important to note that outcome measures can be influenced by factors beyond our control (such as the patient's

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physiology or environmental factors), these measures still have the potential to provide insights into health care quality.

If you want to establish that a change to a process ultimately had the desired effect on the overall health and care of those involved, some type of outcome measure will be needed. It is not enough to simply measure the process.

The purpose of outcome measures in quality improvement is to measure impact. Did the change made to a process or system have the desired result?

Thinking back to our process measure examples, consider these example outcome measures:

- The percentage of patients diagnosed with hypertension that have their BP under control.
- The percentage of patients diagnosed with prediabetes that have not progressed to a diabetes diagnosis within one year of the original diagnosis.

Slide 11 In Summary

- Effective use of data is a cornerstone of quality improvement and helps us measure how our organization is performing against goals, understand if our current systems are working and where the variations and opportunities for improvement are, and quantify success.
- Quantitative data deals with numbers and statistics, while qualitative data deals with words and meanings. Quantitative methods allow you to systematically measure variables and test hypotheses. Qualitative methods allow you to explore concepts and experiences in more detail.
- Outcome Measures assess impact, and Process Measures assess activities along the outcome pathway.