Hello, my name is Amy Mullenix. I’m the Senior Collaboration Manager for the National MCH Workforce Development Center and I work with all the teams of the Center to ensure our services are relevant and timely for our audiences. I have 20 years of public health experience, both in clinical and public health settings, and I’m pleased to share this information about Quality Measurement with you today.

In the previous presentation, the Performance Management Cycle was discussed. One of the steps of that cycle is Reporting Progress. Today our focus will be on the use of data for tracking and monitoring progress.

Slide 2

Learning Objectives

- Terms and concepts
- Practical Measurement tips:
  - Preserving the context
  - Listening to the Voice of the Process
  - Bundling and unbundling data
  - Using a balanced set of measures
  - Differentiating types of measures and their uses
  - Implementing a measurement system
In this lesson we will cover: terms and concepts and the following Practical Measurement tips:

- Preserving the context
- Listening to the Voice of the Process
- Bundling and unbundling data
- Using a balanced set of measures
- Differentiating types of measures and their uses
- Implementing a measurement system

So, let’s begin with common terms and concepts.

Performance Measurement

“Performance measurement is the regular collection and reporting of data to track work produced and results achieved.”

- Uses performance measures
- Measures may be categorized in various ways
  - Quality performance measures
  - Cost performance measures
  - Patient experience performance measures

The Turning Point Guidebook to Performance Measurement
http://www.hrsa.gov/quality/toolbox/methodology/performancemanagement
In its simplest definition, “Performance measurement is the regular collection and reporting of data to track work produced and results achieved.”

In performance measurement, the data are usually referred to as a performance measure and are represented by computations such as counts, rates, and averages. As suggested in the definition, performance measurement is scalable by process, group, program, department, and organization. Performance measurement may be categorized in various ways based on the effort being measured. For example:
- Quality performance measures,
- Cost performance measures, or
- Patient experience performance measures.

Program Evaluation

“the systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments about the program, improve program effectiveness, and/or inform decisions.”

“A program evaluation has several components, one of which can be performance measurement.”

Performance measurement and program evaluation are different, but related. A Program Evaluation is “the systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments about the program, improve program effectiveness, and/or inform decisions.”

Performance measurement, on the other hand, may be one component of a more comprehensive program evaluation.
Because data used in performance measurement are referred to as measures, the term may be confusing to those who are used to using the word measure within the context of performance standards and measures.

This slide shows a copy of a page from the Public Health Accreditation Board: Standards and Measures, explaining the format in which the standards are written and presented. I want to bring your attention to the arrow pointing to a box labeled “measure.” It reads: “This section states the measure upon which the health department is being evaluated.”
This slide shows an excerpt from the Public Health Accreditation Board Standards and Measures. The measure labeled 1.4.1.A reads “Data used to recommend and inform public health policy, processes, programs and/or interventions.” In this context, the term “measure” refers to an action that should be done.

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“Measure”

- Public Health Accreditation Board
  - A measure: what is being done

- Performance measurement
  - A measure: measures something and represented by quantitative terms
  - Example: infant mortality rate; wait times; number of prenatal visits; average cost per visit; percentage of children immunized

So, within the context of Public Health Accreditation Standards, a ‘Measure’ refers to what is being done.

But within the context of performance measurement, a ‘Measure’ measures something, and can be represented in quantitative terms. For example, a measure in this context would be an infant mortality rate, or clinic wait times, or the number of prenatal visits, the average cost per visit, or the percentage of children on Medicaid with age appropriate immunization levels.

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Quality performance measures may be grouped into three areas: capacity measures; process measures; and outcome measures.

“**Capacity** means the ability of a work group, program, or organization to carry out the essential public health services, and in particular, to provide specific services; for example, disease surveillance, community education, or clinical screening. This ability is made possible by specific program resources as well as by maintenance of the basic infrastructure of the public health system [2]. Capacity means, for example, that you have sufficient staff, training, facilities, and finances, among other things.”

“**Process** means the things that are done by defined individuals or groups – or **to, for, or with** individuals or groups – as part of the provision of public health services. Process means all the things we do in public health practice; for example, conducting educational classes, performing a test or procedure, investigating a complaint, crunching data, or meeting with community groups.”

Finally, “**Outcome** means a change, or lack of change, in the health of a defined population that is related to a public health intervention – such as the tests, investigations, or educational services you offered as part of your process, above.”
Example: Immunizations

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Process</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Number / location of pediatric clinics</td>
<td>Immunization rates (e.g., MMR)</td>
<td>Measles rates</td>
</tr>
<tr>
<td>• Available vaccines (i.e. inventory)</td>
<td></td>
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</tbody>
</table>

Now let’s apply this to a specific example. Using childhood immunizations, capacity measures would include the number and location of clinics as well as the supply or inventory of vaccine; process measures would include how many children in the population are being given or receive appropriate immunizations; and, the outcome measures would include actual measles rates in the population.

These measures work sequentially: capacity enables processes to be carried out to improve outcomes. A process measure may be used as a proxy for an outcome measure only if a scientific link has been established between the process and the outcome. It is important to note that process measures are more sensitive to quality than outcome measures, meaning that breakdowns or omissions in the process do not always lead to negative outcomes. Comprehensive performance measurement should include quality measures in all 3 areas: capacity, process and outcome.
This next section covers helpful measurement tips to consider as described by Diane Kelly in her text, “Applying Quality Management in Healthcare: A Systems Approach (3rd edition, 2013) Slide 12

**Preserving the Context**

What do these numbers mean?

656, 1087, 1049

The first measurement tip is to preserve the context of the data — without context, the data have no meaning.

“In regard to measurement, the term context refers to “the interrelated conditions in which something exists or occurs” (Merriam-Webster Dictionary Online 2010a). To illustrate, consider the three numbers 656, 1087, and 1049.
Say these three numbers are each associated with a month of the year: January = 656; March = 1,087; and June = 1,049. What do the numbers mean now?

What if we add the descriptor: number of visits to an outpatient mammography center. What do the numbers mean now? This is the question faced by the mammography center manager. For several months the center’s staff had been complaining about being busy. The manager needed to determine if the increase in visits was a permanent change or if it was a passing phenomenon.” The answer to this question would help him determine whether or not to hire another person.

The monthly reports he had received from the finance department presented the center’s volume statistics in a spreadsheet according to the current month, previous month, year to date, and the same month in the previous year. He used those reports to generate a run chart (or a line graph) and was then able to determine the answer to his question.
Here’s the run chart – what does it look like now?
A large snowstorm had hit the city the previous January and shut down business for four days. The center’s current busyness was a reflection of the need to reschedule appointments that had been cancelled as a result of the snowstorm. The overall volumes for the year were still on track, while the monthly distribution of visits had been affected by this unusual and explainable event. The manager decided to continue to watch the visits to see if they stayed at this higher volume level or dropped back down before making a decision about hiring additional staff.

Let’s look at two principles related to preserving the context:

• First, graphs reveal interesting structures present in the data; and
• Second, graphs make data more accessible to the human mind than do tables.

Let’s move on to Kelly’s next measurement tip, which is to listen to the voice of the process.

Process performance is based on several concepts and principles. The “Voice of the Process”, also referred to as process capability, is what the process can deliver; process measurement quantifies the voice of the process.

The “voice of the customer”, also referred to as process requirements, defines what is needed from the process. Process behavior charts illustrate the difference between the voice of the customer and the Voice of the Process; and process improvement helps align process capability with process requirements.

Determining the voice of the process starts with an understanding of a normal distribution curve, mean, and variance.
Remember that the two goals of quality improvement are to improve performance (as measured by the mean) and to decrease variability (as measured by the width of the curve).

Turning the normal distribution on its side forms the basic process behavior chart, with the increments of time on the x-axis and the units of performance on the y-axis.
One may then plot the values over time to track and monitor the voice of the process. The level of performance is indicated by the mean line and the variability of the process is indicated by the range of how far away the data points are from the mean.

Removing the bell curve leaves a simple run chart; just imagine the bell chart behind the data points and you can tentatively identify the one outlier seen.
Compared to the previous graph, the points in this graph are “tighter” around the mean, indicating a more stable process with little variability from month to month.

In other words, the process is more dependable and consistent. This is desirable when tracking volume, as stable and somewhat predictable volumes make it easier to manage human and other resources. The outlier in January stands out and warrants investigation as previously described.
The width of the normal distribution curve or the range of values above and below the mean in the run chart indicate random variation associated with the process. Because the voice of the process represents what the process is capable of producing, the only way to change the amount of random variation is to improve the underlying process.

The outlier in the graph in the previous slide is special cause or assignable variation. As the name indicates, this type of variation is not inherent to the process and is caused by a special circumstance. Special cause variation should be investigated, explained, and removed if possible. Do not try to improve a process based on special cause variation because you will be tampering with the process and risk reducing its capability.

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<table>
<thead>
<tr>
<th>Bundling/Unbundling Data</th>
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<tbody>
<tr>
<td><strong>Original Measure</strong></td>
</tr>
<tr>
<td>• Terminations within the department</td>
</tr>
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<td></td>
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<td></td>
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</tbody>
</table>

Kelly’s next measurement tip is to consider when to bundle (or aggregate) data and when to unbundle data into smaller parts.

“When different levels of the organization are telling different stories about the operating environment, unbundling or disaggregating the indicators can be useful.

For example, administrators of a large, metro health department tracked staff turnover rates as one of the their performance indicators. Turnover for the nursing department was 25 percent, which the administrators considered to be reasonable given the local employment and economic environments. However, the nurse managers and nurses consistently voiced their concerns about understaffing and turnover.

The aggregate turnover figures reflected the combined turnover of registered nurses, licensed practical nurses, certified nurse assistants, and unit secretaries. Unbundling the data revealed that although the departmental turnover was 25 percent, the registered nurse turnover was 15
percent and the certified nurse assistant turnover was 43 percent. While studying the departmental turnover data, the human resources department realized that internal staff transfers were not included in the turnover calculations; only terminations were included. When staff movement within the organization was also taken into account, it became apparent that the original turnover figures significantly underestimated the impact of staff changes on the nurse managers and the frontline nursing staffs. Once these flaws in the performance indicators were identified, the human resources department redesigned its performance indicators and reporting mechanisms to account for changing activity at the unit level in addition to aggregate turnover at the departmental or organizational level.

The “distinction between data and information does not lie in the content of a given string of characters. It lies more in its relationship to required decisions. [Data are] measurements that enable us to judge the impact of a local decision on the company’s goal” (Goldratt 1990, 4, 10). Although the health department clinical services administrators were receiving data, originally they were not receiving information to best understand the relationship between their decisions and the organization’s goals.”

Here are two principles related to bundling and unbundling data:

- As data are aggregated they lose their context and usefulness.
- Aggregated data may be used as a report card, but they will not pinpoint what needs to be fixed.
The example in this slide depicts a deeper dive into data from 4 outpatient clinics. It examines patients’ perceptions about nurse courtesy and respect. When these data were bundled, or aggregated, the graph suggested a relatively stable, consistent process. But when unbundled and presented by clinic, as you see here, the graph suggests much more variation within and between clinics, which can help to guide improvement efforts.

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Using a Balanced Set of Measures

<table>
<thead>
<tr>
<th>Customer</th>
<th>Internal</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Patient / family satisfaction</td>
<td>• Transfer capacity</td>
</tr>
<tr>
<td>• Market share</td>
<td>• Complication rates</td>
</tr>
<tr>
<td>• Referral rates</td>
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<table>
<thead>
<tr>
<th>Financial</th>
<th>Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Cost per delivery</td>
<td>• Staff credentials and</td>
</tr>
<tr>
<td>• Supply costs</td>
<td>certifications</td>
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</tbody>
</table>

Kelly’s next measurement tip is to Use a Balanced Set of Measures. On this slide you see an example of a balanced scorecard.
The Balanced Scorecard is
A “set of measures that gives top managers a fast but comprehensive view of the business (or organization). The balanced scorecard includes financial measures and it complements the financial measures with operational measures on customer satisfaction, internal processes, and the organization’s innovation and improvement activities—operational measures that are the drivers of future financial performance.” (Kaplan and Norton 2005, 174)

The balanced scorecard you see here is from a birthing center using the 4 scorecard categories. Using a Balanced Scorecard can help managers ensure that one area of performance is not unintentionally excelling at the expense of another.

Slide 27

<table>
<thead>
<tr>
<th>Differentiating Measures and Uses</th>
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<tbody>
<tr>
<td>• Research – new knowledge</td>
</tr>
<tr>
<td>• Improvement – improve processes and systems</td>
</tr>
<tr>
<td>• Accountability – public disclosure</td>
</tr>
<tr>
<td>• Performance management – monitor system feedback</td>
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</tbody>
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Practitioners, employees, and stakeholders coming from a research background may find fault with improvement, performance, and accountability measures as these lack the rigor of research studies; however, the characteristics of the data must be matched with its planned use – another important measurement tip from Kelly. As a quick overview:

• Data in a research study are rigorously controlled to test hypotheses and generate new knowledge using defined groups of subjects.

• But, improvement data are used to identify opportunities for improvement and evaluate those improvements. While improvement may take place in any setting, it has historically been within the context of an organizational system.

• Censuses generated over history may be thought of as the earliest accountability data. Public health also has historical roots in accountability data, for example, when John Snow used data to establish a case for removing the Broad St. pump. Population data from the WHO,
the CDC, and state and local health departments provide additional examples of accountability data that inform the public.

• And finally, it is important to remember the purpose of performance management data - which is to provide and monitor feedback about system behavior.

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<table>
<thead>
<tr>
<th>Timeframes</th>
</tr>
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<tbody>
<tr>
<td>• Research – pre and post intervention</td>
</tr>
<tr>
<td>• Improvement – continuous until process is stable, then intermittent checks</td>
</tr>
<tr>
<td>• Accountability – longer time frames</td>
</tr>
<tr>
<td>• Performance management – continuous and intermittent; very short to longer timeframes</td>
</tr>
</tbody>
</table>

• Research data are usually compared before and after an intervention to determine if the intervention has made a change according to the research question.

• As discussed earlier, process and system improvement is best seen by using a run chart over time. Once a process has stabilized, intermittent spot checks can be done.

• Accountability data are typically reported annually, quarterly, and over time ranges such as a 5- or 10-year period.

Because the purpose of performance management data is to provide system feedback, the timeframes will vary depending on the user’s purpose and the type of data. For example, a community health assessment may be performed every three years; financial data may be reviewed daily, weekly, monthly, quarterly and annually.

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And last but not least Kelly shares that: “When creating a performance management system:

• Include a varied set of measures that are vertically and horizontally aligned, combined with a systematic way of analyzing and communicating information gleaned from the measures. These aid in identifying patterns across parts of the system, provide clues about system structures, and help ensure that one area of performance is not unintentionally excelling at the expense of another.

• Performance measures throughout the organization should reflect the common direction and priorities defined by the organization’s mission, vision, and business strategy. A comprehensive performance management measurement system should also ensure coordination of activities to minimize the duplication of collecting, reporting, and analyzing efforts.”

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Finally, without careful consideration and coordination of measures, it is easy to become “data rich and information poor” while trying to fulfill internal and external reporting needs. “Organizations must purposefully select performance measures that are linked to and aligned with their organizations’ goals, business strategy, and customer and stakeholder requirements.”

Consider the relationship between internal and external measurement requirements like a Venn diagram. In this slide, one circle represents internally driven performance measures, while the other circle represents externally driven performance measures. To leverage time, effort, and resources, managers should strategically select measures that allow for the largest area of overlap between the circles. In this way, performance measures may be used for multiple purposes internally and externally.”

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Summary

• Terms and concepts
• Practical Measurement tips
  – Preserving the context
  – Listening to the Voice of the Process
  – Bundling and unbundling data
  – Using a balanced set of measures
  – Differentiating types of measures and their uses
  – Implementing a Performance Measurement System
In this presentation, we have reviewed:

Terms and concepts related to measurement and

Practical tips for using Quality and Performance Measurement effectively:
  • Preserving the context
  • Listening to the Voice of the Process
  • Bundling and unbundling data
  • Using a balanced set of measures
  • Differentiating types of measures and their uses, and
  • Implementing a Performance Measurement System

I have enjoyed sharing this information with you today, and I hope it’s been helpful in illuminating the role of quality improvement in public health.