Better Quality Through Better Measurement Worksheets

Asia Pacific Forum on Quality Improvement in Health Care

Robert Lloyd, PhD, Mary Seddon, MD and Richard Hamblin

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Faculty

Robert Lloyd, PhD
Executive Director Performance Improvement
Institute for Healthcare Improvement
Boston, Massachusetts, USA

Mary Seddon, MD
Clinical Director
Centre for Quality Improvement, Ko Awatea
Counties Manukau DHB, Auckland, NZ

Richard Hamblin,
Director of Health Quality Evaluation
Health Quality & Safety Commission, Wellington, NZ
Exercise

Quality Measurement Journey Self-Assessment

This self-assessment is designed to help quality facilitators gain a better understanding of where they personally stand with respect to the milestones in the Quality Measurement Journey (QMJ). What would your reaction be if you had to explain why using a run or control chart is preferable to computing only the mean, the standard deviation or calculating a p-value? Can you construct a run chart or help a team decide which control is most appropriate for their data?

You may not be asked to do all of the things listed below today or even next week. But, if you are facilitating a QI team or advising a manager on how to evaluate a process improvement effort, sooner or later these questions will be posed. How will you deal with them?

The place to start is to be honest with yourself and see how much you know about the QMJ. Once you have had this period of self-reflection, you will be ready to develop a learning plan for self-improvement and advancement.

Use the following Response Scale. Select the one response which best captures your opinion.

1 I could teach this topic to others!
2 I could do this by myself right now but would not want to teach it!
3 I could do this but I would have to study first!
4 I could do this with a little help from my friends!
5 I'm not sure I could do this!
6 I'd have to call in an outside expert!

## Quality Measurement Journey Self-Assessment


<table>
<thead>
<tr>
<th>Measurement Topic or Skill</th>
<th>Response Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moving a team from concepts to set of specific quantifiable measures</td>
<td></td>
</tr>
<tr>
<td>Building clear and unambiguous operational definitions</td>
<td></td>
</tr>
<tr>
<td>Developing data collection plans (including frequency and duration of data collection)</td>
<td></td>
</tr>
<tr>
<td>Helping a team figure out stratification strategies</td>
<td></td>
</tr>
<tr>
<td>Explain and design probability and nonprobability sampling options</td>
<td></td>
</tr>
<tr>
<td>Explain why plotting data over time is preferable to using aggregated data and summary statistics</td>
<td></td>
</tr>
<tr>
<td>Describe the differences between common and special causes of variation</td>
<td></td>
</tr>
<tr>
<td>Construct and interpret run charts (including the run chart rules)</td>
<td></td>
</tr>
<tr>
<td>Decide which control chart is most appropriate for a particular measure</td>
<td></td>
</tr>
<tr>
<td>Construct and interpret control charts (including the control chart rules)</td>
<td></td>
</tr>
<tr>
<td>Link measurement efforts to PDSA cycles</td>
<td></td>
</tr>
<tr>
<td>Build measurement plans into implementation and spread activities</td>
<td></td>
</tr>
</tbody>
</table>
### The Three Faces of Performance Measurement

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Improvement</th>
<th>Accountability</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aim</strong></td>
<td>Improvement of care (efficiency &amp; effectiveness)</td>
<td>Comparison, choice, reassurance, motivation for change</td>
<td>New knowledge (efficacy)</td>
</tr>
<tr>
<td><strong>Methods:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Test Observability</td>
<td>Test observable</td>
<td>No test, evaluate current performance</td>
<td>Test blinded or controlled</td>
</tr>
<tr>
<td>• Bias</td>
<td>Accept consistent bias</td>
<td>Measure and adjust to reduce bias</td>
<td>Design to eliminate bias</td>
</tr>
<tr>
<td>• Sample Size</td>
<td>“Just enough” data, small sequential samples</td>
<td>Obtain 100% of available, relevant data</td>
<td>“Just in case” data</td>
</tr>
<tr>
<td>• Flexibility of Hypothesis</td>
<td>Flexible hypotheses, changes as learning takes place</td>
<td>No hypothesis</td>
<td>Fixed hypothesis (null hypothesis)</td>
</tr>
<tr>
<td>• Testing Strategy</td>
<td>Sequential tests</td>
<td>No tests</td>
<td>One large test</td>
</tr>
<tr>
<td>• Determining if a change is an</td>
<td>Run charts or Shewhart control charts (statistical process</td>
<td>No change focus (maybe compute a percent change or rank order the results)</td>
<td>Hypothesis, statistical tests (t-test, F-test, chi square), p-values</td>
</tr>
<tr>
<td>improvement</td>
<td>control charts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Confidentiality of the data</td>
<td>Data used only by those involved with improvement</td>
<td>Data available for public consumption and review</td>
<td>Research subjects’ identities protected</td>
</tr>
</tbody>
</table>
Dialogue #1

Why are you measuring?

— How much of your organization’s energy is aimed at improvement, accountability and/or research?

— Does one form of performance measurement dominate your journey?

— Does your organization approach measurement from an enumerative or an analytic perspective?
Exercise: Developing a Set of Measures and Operational Definitions

• Identify a project you are currently working on or plan to address in the near future.

• Select 1-2 Process, 1-2 Outcome and 1 Balancing measure and develop a clear operational definition for each measure.

• Use the Measurement Plan and Operational Definitions Worksheet to record your work.
# Measurement Plan Worksheet

<table>
<thead>
<tr>
<th>Measure Name</th>
<th>Type (Process, Outcome or Balancing)</th>
<th>Operational Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>B</td>
<td></td>
</tr>
</tbody>
</table>

Source: Lloyd & Scoville 2010
Operational Definition Worksheet©

Team name: _____________________________________________________________________________

Date: ___________________ Contact person: ________________________________________________

WHAT PROCESS DID YOU SELECT?

WHAT SPECIFIC MEASURE DID YOU SELECT FOR THIS PROCESS?

OPERATIONAL DEFINITION

Define the specific components of this measure. Specify the numerator and denominator if it is a percent or a rate. If it is an average, identify the calculation for deriving the average. Include any special equipment needed to capture the data. If it is a score (such as a patient satisfaction score) describe how the score is derived. When a measure reflects concepts such as accuracy, complete, timely, or an error, describe the criteria to be used to determine “accuracy.”

Operational Definition Worksheet© (cont’d)

DATA COLLECTION PLAN
Who is responsible for actually collecting the data?
How often will the data be collected? (e.g., hourly, daily, weekly or monthly?)
What are the data sources (be specific)?
What is to be included or excluded (e.g., only inpatients are to be included in this measure or only stat lab requests should be tracked).
How will these data be collected?
   Manually ______  From a log ______  From an automated system

BASELINE MEASUREMENT
What is the actual baseline number? __________________________________________________________
What time period was used to collect the baseline? _____________________________________________

TARGET(S) OR GOAL(S) FOR THIS MEASURE
Do you have target(s) or goal(s) for this measure?
Yes ___  No ___

Specify the External target(s) or Goal(s) (specify the number, rate or volume, etc., as well as the source of the target/goal.)

Specify the Internal target(s) or Goal(s) (specify the number, rate or volume, etc., as well as the source of the target/goal.)
# Dashboard Worksheet©

**Name of team:** ________________________________  **Date:** ______________

| **Measure Name** (Provide a specific name such as medication error rate) | **Operational Definition** (Define the measure in very specific terms. Provide the numerator and the denominator if a percentage or rate. Indicate what is to be included and excluded. Be as clear and unambiguous as possible) | **Data Source(s)** (Indicate the sources of the data. These could include medical records, logs, surveys, etc.) | **Data Collection:**  
  • **Schedule** (daily, weekly, monthly or quarterly)  
  • **Method** (automated systems, manual, telephone, etc.) | **Baseline**  
  • Period  
  • Value | **Goals**  
  • Short term  
  • Long term |

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## NON-SPECIFIC CHEST PAIN PATHWAY MEASUREMENT PLAN

<table>
<thead>
<tr>
<th>Measure Name</th>
<th>Operational Definition</th>
<th>Data Source(s)</th>
<th>Data Collection:</th>
<th>Baseline</th>
<th>Goals</th>
</tr>
</thead>
</table>
| Percent of patients who have MI or Unstable Angina as diagnosis | **Numerator** = Patients entered into the NSCP path who have Acute MI or Unstable Angina as the discharge diagnosis  
**Denominator** = All patients entered into the NSCP path | 1. Medical Records  
2. Midas  
3. Variance Tracking Form | 1. Discharge diagnosis will be identified for all patients entered into the NSCP pathway  
2. QA-UR will retrospectively review charts of all patients entered into the NSCP pathway. Data will be entered into MIDAS system | 1. Currently collecting baseline data.  
2. Baseline will be completed by end of 1st Q 2010 | Since this is essentially a descriptive indicator of process volume, goals are not appropriate. |
| Number of patients who are admitted to the hospital or seen in an ED due to chest pain within one week of when we discharged them | Operational Definition: A patient that we saw in our ED reports during the call-back interview that they have been admitted or seen in an ED (ours or some other ED) for chest pain during the past week | All patients who have been managed within the NSCP protocol throughout their hospital stay | 1. Patients will be contacted by phone one week after discharge  
2. Call-back interview will be the method | 1. Currently collecting baseline data.  
2. Baseline will be completed by end of 1st Q 2010 | Ultimately the goal is to have no patients admitted or seen in the ED within a week after discharge. The baseline will be used to help establish initial goals. |
| Total hospital costs per one cardiac diagnosis | **Numerator** = Total costs per quarter for hospital care of NSCP pathway patients  
**Denominator** = Number of patients per quarter entered into the NSCP pathway with a discharge diagnosis of MI or Unstable Angina | 1. Finance  
2. Chart Review | Can be calculated every three months from financial and clinical data already being collected | 1. Calendar year 2010  
2. Will be computed in June 2010 | The initial goal will be to reduce the baseline by 5% within the first six months of initiating the project. |
Exercise: Data Collection Strategies
(frequency, duration and sampling)

• This exercise has been designed to test your knowledge of and skill with developing a data collection plan.

• In the table on the next page is a list of eight measures.

• For each measure identify:
  – The frequency and duration of data collection.
  – Whether you would pull a sample or collect all the data on each measure.
  – If you would pull a sample of data, indicate what specific type of sample you would pull.

• Spend a few minutes working on your own then compare your ideas with others at your table.
Exercise: Data Collection Strategies  
(frequency, duration and sampling)

The need to know, the criticality of the measure and the amount of data required to make a conclusion should drive the frequency, duration and whether you need to sample decisions.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Frequency and Duration</th>
<th>Pull a sampling or take every occurrence?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vital signs for a patient connected to full telemetry in the ICU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood pressure (systolic and diastolic) to determine if the newly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>prescribed medication and dosage are having the desired impact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent compliance with a hand hygiene protocol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholesterol levels (LDL, HDL, triglycerides) in a patient recently</td>
<td></td>
<td></td>
</tr>
<tr>
<td>placed on new statin medication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient satisfaction scores on the inpatient units</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central line blood stream infection rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of inpatients readmitted within 30 days for the same diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of surgical patients given prophylactic antibiotics within 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hour prior to surgical incision</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dialogue #2
Common and Special Causes of Variation

1. Select several measures your organization tracks on a regular basis.

2. Do you and the leaders of your organization evaluate these measures according the criteria for common and special causes of variation?

3. If not, what criteria do you use to determine if data are improving or getting worse?
Run Chart Exercise

Now it is your turn!
- Interpret the following run charts
- Is the median in the correct location?
- What do you learn by applying the run chart rules?

1. % of patients with Length of Stay shorter than six days

2. Average Length of Stay DRG373

3. Number of Acute Surgical Procedures

Source: Peter Kammerlind, (Peter.Kammerlind@lj.se), Project Leader Jönköping County Council, Jonkoping, Sweden.
% of patients with Length of Stay shorter than six days

Source: Peter Kammerlind, (Peter.Kammerlind@lj.se), Project Leader
Jönköping County Council, Jonkoping, Sweden.
Average Length of Stay DRG 373

Source: Peter Kammerlind, (Peter.Kammerlind@lj.se), Project Leader Jönköping County Council, Jonkoping, Sweden.

Grundläggande statistik och analys

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Number of Acute Surgical Procedures

Source: Peter Kammerlind, (Peter.Kammerlind@lj.se), Project Leader
Jönköping County Council, Jonkoping, Sweden.

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The Control Chart Decision Tree

Variables Data

- More than one observation per subgroup?
  - Yes: X bar & R
  - No: X bar & S

- < than 10 observations per subgroup?
  - Yes: XmR
  - No: Decide on the type of data

Attributes Data

- Occurrences & Non-occurrences?
  - Yes: np-chart
  - No: Decide on the type of data

- Is there an equal area of opportunity?
  - Yes: c-chart
  - No: u-chart

- Are the subgroups of equal size?
  - Yes: p-chart
  - No: np-chart


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## How prepared is your Organization?

### Key Components*

- Will (to change)
- Ideas
- Execution

### Self-Assessment

- Low
- Medium
- High

*All three components MUST be viewed together. Focusing on one or even two of the components will guarantee suboptimized performance. Systems thinking lies at the heart of CQI!
The Sequence of Improvement

Developing a change

Testing a change

Make part of routine operations

Implementing a change

Sustaining and improvements and Spreading a changes to other locations

Theory and Prediction

Test under a variety of conditions

Act

Plan

Study

Do

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Thanks for joining us!

Please contact us if you have any questions:

Robert Lloyd
rlloyd@ihi.org

Mary Seddon
mary.seddon@middlemore.co.nz

Richard Hamblin
richard.hamblin@hqsc.govt.nz