Measurement and Data Quality for QI/KT

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15 April 2019
Measurement

- Specific to the process and outcome of interest
- Are the desired results being achieved?
- Are the interventions being implemented correctly?
Measures of healthcare quality

- Outcome Measures
- Process Measures
- Balancing Measures
Types of measurement

- Qualitative data are exploratory
  - Hypothesis generating: gain an understanding of processes
  - Focus groups, structured interviews, observation, key informant interviews

- Quantitative data are expressed/measured numerically
  - Hypothesis confirming: uncover patterns/relationships
  - Survey, number of occurrences, record review,
Nature of Quality Measurement

Structure + Process = Outcome

Donabedian 1996 Millbank Q
Measures

Structure
- Equipment
- Supplies
- Environment
- Training
- Technology

Process
- MD Orders
- Treatment
- Preventive Care

Outcome
- Clinical outcomes
- Functional status
- Satisfaction
- Cost
# Process vs. Outcome Measures

<table>
<thead>
<tr>
<th>Need for...</th>
<th>Process</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Updating &amp; maintenance</td>
<td>+++ (changes in treatment)</td>
<td>+ (risk adjustment models)</td>
</tr>
<tr>
<td>Collect and model risk adjustment data</td>
<td>- (not usually required)</td>
<td>+++ (model for each outcome)</td>
</tr>
<tr>
<td>Time to measure &amp; large sample size</td>
<td>+ (shorter time/smaller sample)</td>
<td>++ (large sample, outcomes require long period of obs.)</td>
</tr>
<tr>
<td>Follow-up for data collection</td>
<td>- (concurrent with care)</td>
<td>++ (collection of outcomes)</td>
</tr>
<tr>
<td>Use of routine data</td>
<td>- (use routinely collected data)</td>
<td>++ (risk adjustment data)</td>
</tr>
</tbody>
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### Process vs Outcome Continued

<table>
<thead>
<tr>
<th>Need for…</th>
<th>Process</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced statistics</td>
<td>- (descriptive statistics)</td>
<td>+++ (risk adjustment models)</td>
</tr>
<tr>
<td>What patients care about</td>
<td>Patients often don’t understand the importance of care processes.</td>
<td>Patients care about outcomes, e.g., survival, health &amp; well-being</td>
</tr>
<tr>
<td>What providers care about</td>
<td>High face validity; relates directly to what they do.</td>
<td>Wary of outcome measures due to influence by things beyond their control.</td>
</tr>
</tbody>
</table>
## Developing a Measure

<table>
<thead>
<tr>
<th>Steps</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Define audience/purpose</td>
<td>Clinicians, administrators, patients QI, regulation, selection of provider</td>
</tr>
<tr>
<td>2. Choose clinical area to evaluate</td>
<td>ICU, Primary or Specialty Clinic Care, Hospital Floor, Home Health</td>
</tr>
<tr>
<td>3. Organize assessment team</td>
<td>Expertise in: measurement, clinical area, project administration/management</td>
</tr>
<tr>
<td>4. Select process</td>
<td>Requires strong evidence Feasible, reliable, valid Under control of providers/stakeholders Variability in performance/care exists</td>
</tr>
<tr>
<td>5. Write specifications</td>
<td>Target population &amp; sample Numerator &amp; denominator Risk adjustment strategy Data source &amp; collection methods</td>
</tr>
</tbody>
</table>
### Continued

<table>
<thead>
<tr>
<th>Steps</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Pilot test</td>
<td>Feasibility of measure</td>
</tr>
<tr>
<td></td>
<td>Feasibility of data collection</td>
</tr>
<tr>
<td></td>
<td>Test reliability &amp; validity</td>
</tr>
<tr>
<td>7. Write scoring/analytic specifications</td>
<td>How will measures be scored</td>
</tr>
<tr>
<td></td>
<td>Define acceptable performance</td>
</tr>
<tr>
<td></td>
<td>Determine analytical plan</td>
</tr>
<tr>
<td></td>
<td>Write it down</td>
</tr>
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Validity of Outcome Measures

- How is the outcome defined?
- Are all cases reported in the system?
- What is the potential for misclassification?
## Advantages and disadvantages of types of data

<table>
<thead>
<tr>
<th>Type of data</th>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary data</td>
<td>Readily available</td>
<td>Lacks specificity and detail</td>
</tr>
<tr>
<td></td>
<td>Inexpensive</td>
<td></td>
</tr>
<tr>
<td>Medical record data</td>
<td>Available</td>
<td>May be expensive to obtain</td>
</tr>
<tr>
<td></td>
<td>Richer in detail</td>
<td>May have insufficient detail</td>
</tr>
<tr>
<td></td>
<td>Reduces burden of data collection</td>
<td></td>
</tr>
<tr>
<td>Prospectively collected clinical data</td>
<td>Most specific; can define exactly what data are required</td>
<td>Not readily available</td>
</tr>
<tr>
<td></td>
<td>Quality control of data collection</td>
<td>High data collection burden</td>
</tr>
<tr>
<td>Survey data</td>
<td>Can collect what is important to patients</td>
<td>Not readily available</td>
</tr>
<tr>
<td></td>
<td>Collects data not otherwise available</td>
<td>Expensive to collect</td>
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<tr>
<td></td>
<td></td>
<td>Requires a valid instrument</td>
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Data Quality Control
Why is This Important?

• QI/KT results are becoming more widely publicized

• Increasing disclosure of quality of care indicators by hospitals

• Stakeholders assume data are accurate; but is this really true?
Project Phases

- Project Design
- Data Collection
- Data Management
- Data Analysis
Project Design

• Clear aims drive data collected
• Challenges in selecting measures
  – Reliable and valid
  – Sensitive to change
  – Acceptable and feasible
  – Simple and communicable
Data Collection

- Data items clearly defined & each item operationalized in writing
- Standardized data collection forms
- Staff trained to collect data
- QA review completed on a regular basis
- Electronic database (not Excel) for data management
- Database controls in place to identify errors
- Database regularly backed up
Data Management

• Staff trained to manage data
• Evaluate using simple statistics
• Methods to minimize missing data
• Comprehensive review for missing data
Data analysis

• Missing data reported & appropriate methods used to account for it.
• Potential outliers identified & evaluated
• Appropriate methods used to identify summary measures of the results
• Measures of precision reported
• Appropriate measures used to evaluate confounding factors
Conclusion

• Data quality control methods required to assure validity of QI project results
• Simple, yet effective, strategies employed at all stages of the QI project
• QI project leaders and stakeholders need a critical eye regarding data quality issues
Summary

• Structure + Process = Outcome
• Measures need to be specific to process and outcome
• Process and outcome measures have positive & negative attributes
• Data quality is important & should be implemented across the life of a project
• Stakeholders/Users need to consider data quality when assessing KT/QI project reports
References