Lessons from measuring provider performance in clinical medicine

Rachel M. Werner, MD, PhD
Professor of Medicine
University of Pennsylvania
Qualities of good performance metrics

• Performance metrics should be correlated with meaningful outcomes
  • Are surrogate measures correlated with outcomes we really care about?
  • Do measured outcomes reflect provider quality?
• Performance on metrics should be under the control of providers
  • A provider should be able to improve his/her performance over time
• Performance metrics should not unintentionally harm clinical care
Process-based performance measures

• Is the right care delivered?

• Advantages of process-based measurement
  • Under direct control of providers
  • Less sensitive to clinical and sociodemographic risk of patients
  • Measured over the short term
  • Directly informs whether medicine is being properly practiced

• Process measures have been widely adopted in measuring provider performance

• BUT, need to ensure that process-based performance is related to patient outcomes
Effect of Hospital Compare on mortality

- Aspirin on admission
- Beta-blocker on admission
- Aspirin on discharge
- Beta-blocker on discharge
- ACE for LV dysfunction

Risk-Adjusted Thirty-Day Mortality For Heart Attack, 2000-08
Effect of pay-for-performance on hospital quality

EXHIBIT 1

Average Overall Performance In Pay-For-Performance And Control Hospitals, Fiscal Years 2004–08

Werner et al. (2011) Health Affairs
Effect of pay-for-performance on hospital quality

EXHIBIT 1

Average Overall Performance In Pay-For-Performance And Control Hospitals, Fiscal Years 2004–08

Werner et al. (2011) *Health Affairs*

Jha et al. (2012) *NEJM*

Werner et al. (2011) *Health Affairs*

Figure 1. Mortality at 30 Days among All Hospitals, According to Pay-for-Performance Status, 2002–2009.
Outcome-based performance measures

• Is the right result achieved?

• Advantages of outcome measures
  • Clinically meaningful endpoints
  • Strong face validity
  • Policy appeal

• Need to ensure that a provider-level outcomes are valid measures
  • Many factors influence outcome. Do outcome-based performance measures reflect provider quality?
  • Or are they simply measures of patient risk?
    • Patient effects versus provider effects

• Need to be under the provider’s control
Measuring providers’ past outcomes tells us something about expected future outcomes

- Historical hip fracture 30-day mortality measured at each hospital
- Current patient outcomes followed over 180 days
- Hospitals with the lowest historic mortality rates had significantly better patient outcomes

Neuman et al. (2016) *Healthcare*
Providers’ past outcomes predict future outcomes, even after controlling for patient risk

Table 2. Difference in Observed 30-Day Readmission Rates, with 95% Confidence Intervals, and Numbers of Admissions in Each Quartile Pair.*

<table>
<thead>
<tr>
<th>Quartile Pair</th>
<th>No. of Admission Pairs</th>
<th>Observed 30-Day Readmission Rate</th>
<th>Difference in Readmission Rate (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lower-Rate Quartile</td>
<td>Higher-Rate Quartile</td>
</tr>
<tr>
<td>Q1 vs. Q2</td>
<td>5649</td>
<td>21.3</td>
<td>21.7</td>
</tr>
<tr>
<td>Q2 vs. Q3</td>
<td>3472</td>
<td>23.1</td>
<td>23.9</td>
</tr>
<tr>
<td>Q3 vs. Q4</td>
<td>8049</td>
<td>25.8</td>
<td>26.0</td>
</tr>
<tr>
<td>Q1 vs. Q3</td>
<td>5781</td>
<td>23.1</td>
<td>23.5</td>
</tr>
<tr>
<td>Q2 vs. Q4</td>
<td>6035</td>
<td>24.1</td>
<td>25.3</td>
</tr>
<tr>
<td>Q1 vs. Q4</td>
<td>9355</td>
<td>23.1</td>
<td>25.1</td>
</tr>
</tbody>
</table>

Krumholz et al. (2017) *NEJM*
Focusing on outcomes can improving outcomes: Change in readmission rates after HRRP

Zuckerman et al. (2016) NEJM
Unintended effects of measuring outcomes

• Cream-skimming
  • Healthier patients receiving treatment
  • Appearance of improved outcomes without true quality improvements

• Reduced access to care
Translating lessons from clinical quality measurement to GME

- Patient outcomes can be used to evaluate GME training programs
  - Data and methods to do so are available
- Do outcomes occur over a short enough time period to make outcome-based GME metrics a feasible strategy to measure and improve GME quality?
- Do outcomes reflect true differences in GME programs? Or differences in the trainees?
  - Selection effects versus training effects
- Monitor for unintended effects
- Leverage opportunities to advance research on measurement of GME outcomes (e.g. funding opportunities, policy priorities)