"Just-In-Time" Self-Study Modules and Data Analytics for Quality Improvement

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Rationale

Statistical computation for quality improvement is a "learn-by-doing" activity
Flipped Classroom

Common Themes

Content delivery and assimilation outside of the classroom

Technology enabled

- Course management software
- Video lessons

Reinforcement of learning in-class
Video Repository

My Vision

Lessons delivered repeatedly should be

- Captured on video
- Stored in a common repository
- Shared within the Division of Health Sciences
Self-Study Modules for Quality Improvement

"Just-in-Time"

HOME    CHAPTER 1    CHAPTER 2    CHAPTER 3    CHAPTER 4    CHAPTER 5    CHAPTER 6

CHAPTER 10    CHAPTER 11    CHAPTER 12    CHAPTER 13    CHAPTER 14    CHAPTER 15

Home

This blog contains videos for teaching quality improvement in health care.

Video Repository

Proof of Concept
“Just-in-Time” Training

Supply Chain Management
◦ JIT Inventory Management

Education
◦ JIT Content Delivery
“Just-in-Time” Training
Let the Data Speak

HANDS-ON CASE STUDY
Rationale/Need

Crosby (1979) defined quality as “conformance to requirements”.

The problem is what is the requirement and what do we know about performance?

The data that will be examined is AHRQ’s estimates of inpatient deaths.
Crosby’s Management Maturity Stages

Quality Management Maturity Stages

Cost as % of Sales

Uncertainty  Awakening  Enlightenment  Wisdom  Certainty

No Data

reported  actual
<table>
<thead>
<tr>
<th>Year</th>
<th>In-Hospital Deaths</th>
<th>% Discharges</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>907,423</td>
<td>2.69%</td>
</tr>
<tr>
<td>1994</td>
<td>863,843</td>
<td>2.61%</td>
</tr>
<tr>
<td>1995</td>
<td>867,816</td>
<td>2.58%</td>
</tr>
<tr>
<td>1996</td>
<td>840,960</td>
<td>2.52%</td>
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<tr>
<td>1997</td>
<td>813,707</td>
<td>2.45%</td>
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<tr>
<td>1998</td>
<td>849,846</td>
<td>2.51%</td>
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<tr>
<td>1999</td>
<td>848,258</td>
<td>2.46%</td>
</tr>
<tr>
<td>2000</td>
<td>834,802</td>
<td>2.36%</td>
</tr>
<tr>
<td>2001</td>
<td>835,392</td>
<td>2.31%</td>
</tr>
<tr>
<td>2002</td>
<td>815,218</td>
<td>2.23%</td>
</tr>
<tr>
<td>2003</td>
<td>814,082</td>
<td>2.20%</td>
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<tr>
<td>2004</td>
<td>785,553</td>
<td>2.09%</td>
</tr>
<tr>
<td>2005</td>
<td>772,896</td>
<td>2.04%</td>
</tr>
<tr>
<td>2006</td>
<td>768,120</td>
<td>2.02%</td>
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<tr>
<td>2007</td>
<td>731,011</td>
<td>1.92%</td>
</tr>
<tr>
<td>2008</td>
<td>768,935</td>
<td>2.01%</td>
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<tr>
<td>2009</td>
<td>768,935</td>
<td>2.01%</td>
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<tr>
<td>2010</td>
<td>694,901</td>
<td>1.86%</td>
</tr>
<tr>
<td>2011</td>
<td>691,041</td>
<td>1.87%</td>
</tr>
<tr>
<td>2012</td>
<td>673,050</td>
<td>1.84%</td>
</tr>
</tbody>
</table>
Creating the Run Chart

- Highlight data
- Select INSERT
- Select Insert Line Chart
- Select 2D or 3D line

EXCEL DEMOS
A Different View of the Data

Total In-Hospital Deaths

A Third View of the Data

In-hospital Deaths as a % Discharges

% of Discharges

1.50% 1.70% 1.90% 2.10% 2.30% 2.50% 2.70% 2.90%

Questions about the Data

Why don’t we know the number of inpatient deaths?

How do we know the number of inpatient deaths with an adverse event?

How do we know the percentage of adverse events that were preventable?
Health Care Quality Myths

44,000 – 98,000 Americans die every year as result of medical error (IOM, 1999, 1)

The 100,000 lives campaign saved 122,300 lives (Berwick, Hackbarth, & McCannon, 2006, 628)

440,000 lives are lost to preventable medical error every year (James, 2013, 127)
## The IOM Estimate

<table>
<thead>
<tr>
<th>State</th>
<th>Error Rate</th>
<th>Lethality</th>
<th>Preventable %</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO/UT</td>
<td>2.9%</td>
<td>6.6%</td>
<td>68.4%</td>
</tr>
<tr>
<td>NY</td>
<td>3.7%</td>
<td>13.6%</td>
<td>59.0%</td>
</tr>
</tbody>
</table>
Critique of the IOM Estimate
McDonald et al. (2000)

13.8% of high severity patients died in NY
13.6% of patients with adverse events died

Therefore the proportion of deaths in groups with and without adverse events must be similar.

Joint Commission Sentinel events 2004 – 2014; 4,984 or 498 per year
The 100,000 Lives Campaign

The campaign promoted the use of: 1) rapid response teams, 2) medication reconciliation, prevention of 3) central line infections, 4) surgical site infections and 5) ventilator–associated pneumonia, and 6) evidence based myocardial infarction care.

Critique:
* weak effectiveness evidence for 1 & 2, strong evidence for 3-6.
* all but rapid response teams were already promoted and in use
* “extremely difficult to estimate the marginal impact of the campaign on the implementation of these six practices.”

AHRQ data: Reduction in inpatient deaths
* 2004 – 2005: 12,658
* 2005 – 2006: 4,775
James’ New Evidence Based Estimate
Deaths Due to Preventable Harm

James’ math: total admissions * % preventable AE * lethality

\[34,400,000 \times 69\% \times 0.89\% = 210,000\]

“although it is probably an understatement, a minimum estimate of a 2-fold increase...”, James, 2013, 127 (+ 20,000).

Eureka! 440,000

Variability in lethality: 5.3% - 21.4%

Variability in % preventable: 44% - 100%
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Quality Management Maturity Stages

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References


Institute of Medicine, 1999, *To Error is Human*, National Academy Press, Washington DC.


McDonald CJ, Weiner M, and Hui S, 2000, Deaths Due to Medical Error are Exaggerated in Institute of Medicine Report, JAMA, 284 (1), 93-95.


Acknowledgements

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