Performance Improvement Techniques
&
Tips for Making Your Analysis Go Faster

2009 Spring Education Program
West TN

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May 8, 2009

Over-arching Objectives

Specific Agenda Items

- Develop objective performance measures

Measures – What, Why, How, Components, Examples

- Integrate results of data analysis into the performance improvement process

Data Analysis – Types, Examples, Efficiency tricks

- Integrate quality findings into governance and management

Findings – Sharing results, Deciding when it is or it not appropriate to integrate, Examples

What are Performance Measures?

- A system of parameters or ways of quantitative and periodic assessment of structures, processes, or outcomes that is to be measured, along with the procedures to carry out such measurement and the procedures for the interpretation of the assessment in the light of previous or comparable assessment

Why use Performance Measures?

- Provide information necessary to make informed decision about the quality of health care services
  - How are we doing?
  - Are we meeting our goals?
  - Are our customers satisfied?
  - Are our processes in control?
  - What or where do I need to make improvements?

Other Terms for Performance Measures

- Indicator
- Metric
- Criterion

Can all be considered a "statistic"

n.
The mathematics of the collection, organization, and interpretation of numerical data, especially the analysis of population characteristics by inference from sampling.

How do we express these statistics?

- Ratio: Amount of one quantity relative to another
  - Number of RNs per patient
- Rate: A special type of ratio measuring two quantities of different units
  - Can be expressed as a percentage (50%) or as rate per "X" (Newborn deaths per 1000)
- Continuous variable: Within the limit of the variable any value is possible
  - Length of stay

Metric	1Q06	2Q06	3Q06	4Q06
Coronary Artery Bypass Graft Mortality Rate	2.0%	1.9%	2.1%	2.0%

Measure Components

Element	Description
Metric	Name of the metric
Metric Description	Description of what is being measured
Measurement Procedure	How is the metric measured
Measurement Frequency	How often is the measurement taken
Thresholds Estimation	How are the thresholds calculated
Current Thresholds	Current range of values considered normal for the metric
Target Value	Best possible value of the metric
Units	Units of measurement

Developing Performance Measures

1. Select the process to be evaluated
2. Determine what you want to know about the process
3. Translate “What you want to know” into performance measures
4. Establish performance goals or standards
5. Design data collection strategies

1. Select the process to be evaluated

- Decide what to evaluate
  - Use accreditation/regulatory requirements
  - Look at topics of national and or local importance
  - Review the organizations strategic plan and performance improvement goals
  - Needs and expectations of customers

2. Determine what you want to know about the process

- Once you have identified the process or outcome to measure:
  - Consider those activities within the process that have a significant impact on efficiency, effectiveness, quality, timeliness, productivity or safety
    - Does the process meet accreditation and/or regulatory requirements?
    - Is the department meeting its performance improvement goals?
    - Are the needs and expectations of customers being met
    - Is the organization performing well on publicly reported measures?

3. Translate "What you want to know" into performance measures

- Construct performance measures for critical activities in the process to be evaluated
  - Begin by asking questions for which you want answers
  - Pain Management example

Post-Op Pain Management Critical Activities	Questions That Could be Asked of This Critical Activity
• Analgesia should be prescribed and administered regularly in sufficiently high doses to effectively manage the patient's postoperative pain.	• Are analgesics controlling the patient's pain? • Are patients adequately instructed in the use of self-administration devices? • Are patients being under- or over-dosed with pain medication?

3. Translate "What you want to know" into performance measures continued

- Once we have identified what we want to know or understand about the critical activities or a process we must translate it into a <u>quantitative value</u>.
  - "Say it with numbers"
  - Identify the data elements needed – few or many
- Performance measures can be reported in the negative or positive
  - Mortality rate (negative)
  - Survival rate (positive)

3. Translate "What you want to know" into performance measures continued

- Poorly defined measures cause misunderstandings during data collection and also when the results are analyzed
  - Develop clear data definitions
    - Specify the population to be included in the numerator and denominator
    - Aim for objectivity, not subjectivity
    - Specify exclusions
    - Avoid or clearly define ambiguous terms
      - Physical therapy
      - Evaluated
    - Test your measures!

Types of Performance Measures

- Structure – Used to judge adequacy of organizational resources for delivering care, such as worked FTEs per occupied hospital bed.
- Process – Used to judge peoples' completion of tasks, such as documentation.
- Outcome – Used to judge the outcome or results of patient care, such as mortality rates, charges for a procedure, or patient satisfaction.

Structure Performance Measures
Objective or Not?

- Number of surgeries cancelled due to unavailability of needed equipment
- Number of complaints received from patients/family about adequacy of parking accommodations
- Percent of patients that attend preoperative education classes

Process Performance Measures
Objective or Not?

- Percent of patients with complete admission assessment
- Percent of patient records containing accurate insurance information
- Percent of surgeries that begin within 15 minutes of scheduled start time
- Percent of records containing documentation of preoperative evaluation by anesthesiologist

Outcome Performance Measures

Objective or Not?

- Average length of stay (in hours)
- Percent of patients requiring inpatient admission following ambulatory surgery
- Percent of patients reportedly satisfied with the ambulatory surgery admission process
- Percent of patients who experience an adverse drug reaction
- Average charges for each of the top ten ambulatory procedures performed

4. Establish performance goals or standards

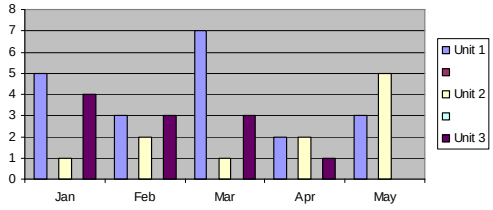
- Knowing your performance is not enough
- It may lead to the questions:
  - So is a rate of “X”% good enough?
  - What does it mean?
  - How do we compare to others?”
- Lack of a goal or target will cause inaction
- For each measure you need a goal or standard that is measurable
- Consideration should be given to:
  - Accreditation/regulatory requirements
  - The organization’s strategic goals
  - Professional guidelines/practice statements
  - Performance achieved by other organizations

5. Design data collection strategies

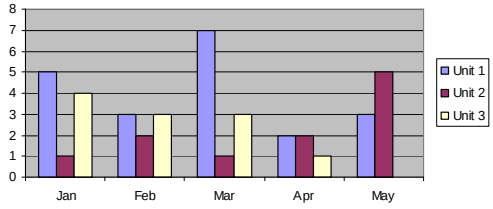
- Use advance planning to:
  - Locate the raw data
  - Identify the responsible people
  - Determine how often to take measurements
  - Agree on how to track/display the measurements
    - Tabular format
    - Graphic format (plot points)
    - Data sheet

Data Sheets in Excel

	Jan	Feb	Mar	Apr	May
Unit 1	5	3	7	2	3
Unit 2	1	2	1	2	5
Unit 3	4	3	3	1	0



	Jan	Feb	Mar	Apr	May
Unit 1	5	3	13	2	3
Unit 2	1	2	1	2	5
Unit 3	4	3	3	1	0



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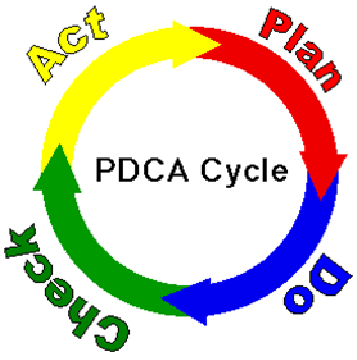
Performance Improvement Process



- Originally conceived by Walter Shewhart in 1930's, and later adopted by W. Edwards Deming.
- Provides a framework for the improvement of a process or system.
- Can be used to guide the entire improvement project or a targeted improvement area
- Designed to be used as a dynamic model. The completion of one turn of the cycle flows into the beginning of the next →*continuous* quality improvement

Healthcare PDCA Common Steps

1. Identify improvement opportunity
2. Organize a team
3. Gather information
4. Select actions
5. Test the effect
6. Adopt the change
7. Monitor performance *

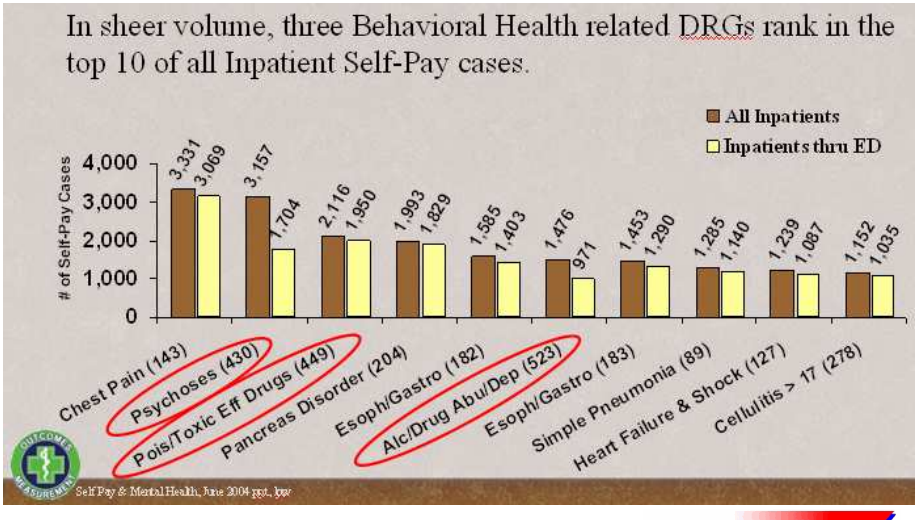
* A word about monitoring performance …

- Individuals and teams must be able to say, “That was a job well done.”
- A project is complete when there is objective evidence that the goal has been met or the problem no longer exists and the process changes have been incorporated into routine practices

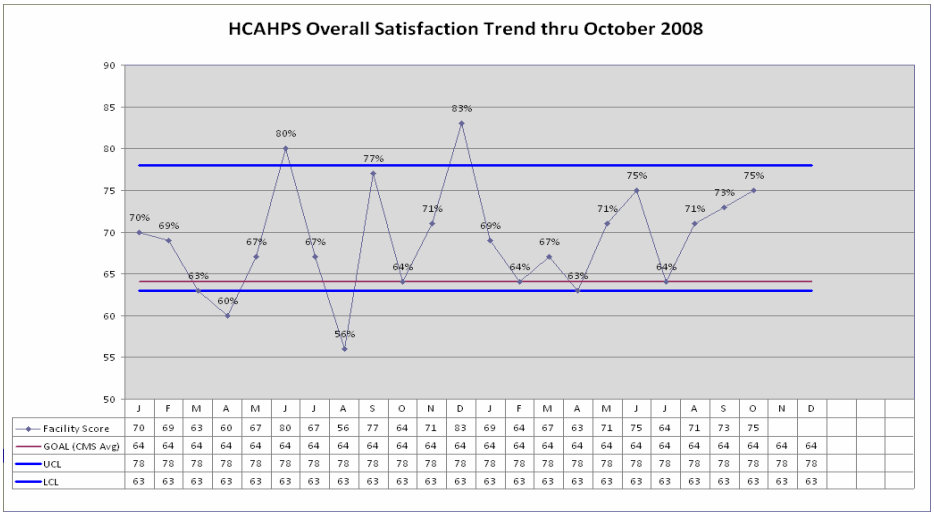
Types of Data Analysis

- Measures of Central Tendency and Variability
- Run charts and Control Charts
- Rank ordering
- Comparison to benchmarks
- Comparison to expected values
- Hypothesis Testing & analysis of variance
- Significance testing
- Correlation analysis
- Linear regression

Examples of Data Analysis



Examples of Data Analysis continued



TAHQ

Examples of Data Analysis continued

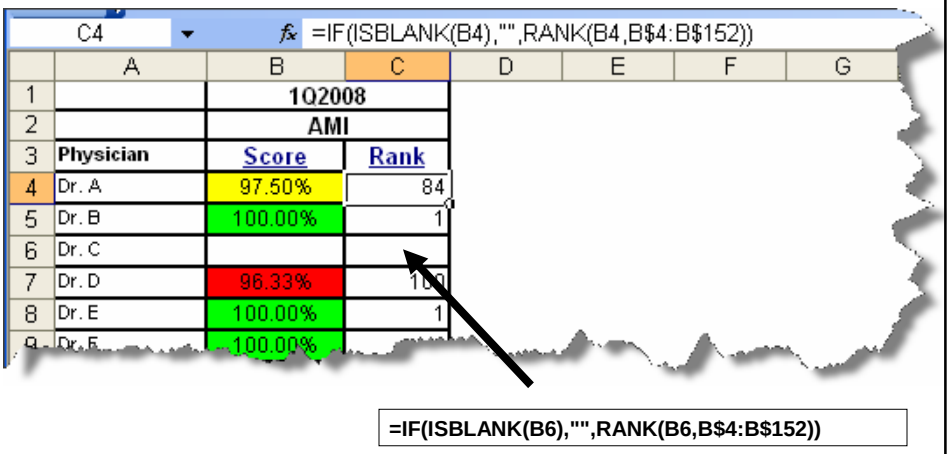
CMS/HQA Executive Summary Report

Composite Score by Measure Set

Facility	Internal Data (Source: COMET) Current Quarter 1Q2008 AMI Score	Rank	%tile	Most Recent 12 Months 2Q2007 - 1Q2008 AMI Score	Rank	%tile
ALASKA REGIONAL HOSPITAL	97.50%	84	Bottom 40%	96.88%	74	Bottom 50%
ALLEGHANY REGIONAL HOSPITAL	100.00%	1	Top 10%	100.00%	1	Top 10%
ALLEN COUNTY HOSPITAL				62.50%	143	Bottom 10%
AVENTURA HOSPITAL & MEDICAL CENTER	96.33%	100	Bottom 30%	95.48%	102	Bottom 30%
AVOYELLES HOSPITAL	100.00%	1	Top 10%	91.30%	130	Bottom 10%
BAYSHORE MEDICAL CENTER	100.00%	1	Top 10%	99.66%	17	Top 20%
BLAKE MEDICAL CENTER	99.65%	41	Top 30%	99.21%	22	Top 20%
BRANDON REGIONAL HOSPITAL	97.84%	78	Bottom 50%	94.91%	110	Bottom 30%
BRIGHAM CITY COMMUNITY HOSPITAL				100.00%	1	Top 10%

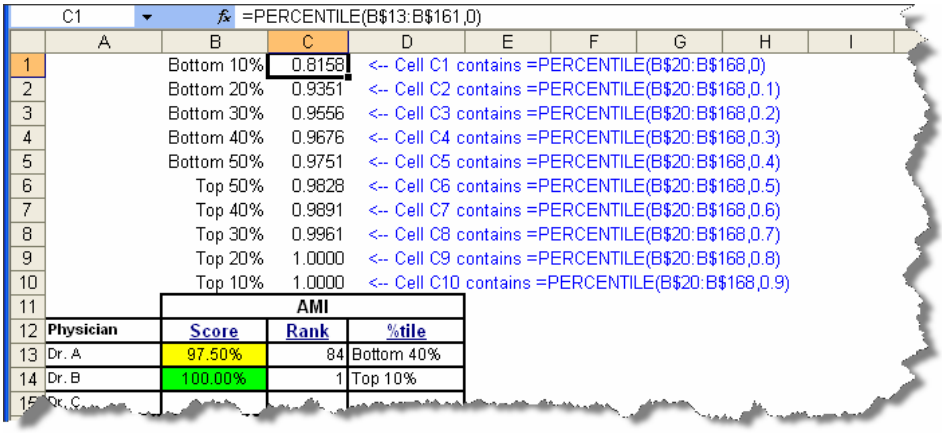
TAHQ

IsBlank and Rank




```
=IF(ISBLANK(B6),"",RANK(B6,B$4:B$152))
```


Percentile



Lookup

D13 =IF(ISBLANK(B13),"",LOOKUP(B13,C$1:C$10,B$1:B$10))

	A	B	C	D	E	F	G	H
1		Bottom 10%	0.8158					
2		Bottom 20%	0.9351					
3		Bottom 30%	0.9556					
4		Bottom 40%	0.9676					
5		Bottom 50%	0.9751					
6		Top 50%	0.9828					
7		Top 40%	0.9891					
8		Top 30%	0.9961					
9		Top 20%	1.0000					
10		Top 10%	1.0000					
11		AMI						
12	**Physician**	**Score**	**Rank**	**%tile**				
13	Dr. A	97.50%	84	Bottom 40%				
14	Dr. B	100.00%	1	Top 10%				
15	Dr. C							
16	Dr. D	96.33%	100	Bottom 30%				

Examples of Data Analysis continued

Inter-rater Reliability Results, Nov 2003

	JCAHO N	JCAHO	HCA N	HCA	Z score, Numerator	Z, Denominator	Z	Significant @ 95 % LOC
ASA at Arrival	227	0.84	564	0.96	-12%	0.02063167	-5.82	YES
ASA at Discharge	227	0.82	564	0.96	-14%	0.02134582	-6.56	YES
ACEI for Patients with LVSD	227	0.94	564	0.9	4%	0.02232708	1.79	YES
Adult Smoking Cessation	227	0.97	564	0.9	7%	0.02131352	3.28	YES
Beta Blockers at Discharge	227	0.9	564	0.97	-7%	0.01714535	-4.08	YES
Beta Blockers at Arrival	227	0.8	564	1	-20%	0.01828269	-10.94	YES
Time to Thrombolitics	227	0.91	564	0.84	7%	0.02726679	2.57	YES
Time to PTCA	227	0.9	564	0.75	15%	0.03184353	4.71	YES
Inpatient Mortality	227	0.96	564	0.98	-2%	0.01244727	-1.61	
Discharge Instructions	217	0.88	775	0.94	-6%	0.01999487	-3.00	YES
LVF Assessment	217	0.88	775	0.93	-5%	0.02094703	-2.39	YES
ACEI for LVSD	217	0.89	775	0.94	-5%	0.01971676	-2.54	YES
Adult Smoking Cessation Counseling	217	0.94	775	0.94	0%	0.01823957	0.00	
O2 Assessment	202	0.83	676	0.96	-13%	0.02044689	-6.36	YES
Pneumococcal Screening or vaccination	202	0.92	676	0.98	-6%	0.01449157	-4.14	YES
Blood Cultures	202	0.77	676	0.85	-8%	0.03000766	-2.67	YES
Adult Smoking Cessation Counseling	202	0.91	676	0.96	-5%	0.01772287	-2.82	YES
Ped Smoking Cessation Counseling	202	0.99	676	1	-1%	0.00384173	-2.60	YES
Time to Antibiotics	202	0.78	676	0.86	-8%	0.02927755	-2.73	YES

Test for Comparing Two Proportions:

$Z = (Proportion_1 - Proportion_2 - Hypothesized\ Difference) / (Square\ Root\ of ((Pie\ Hat * (1 - Pie\ Hat)) * (1 / Sample\ Size_1 + 1 / Sample\ Size_2)))$

where $Pie\ Hat = (Number\ of\ Successes_1 + Number\ of\ Successes_2) / (Sample\ Size_1 + Sample\ Size_2)$

t Tests & z Tests

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Test for Comparing Two Proportions

- Statistics: Overview
- Statistics: Graphic Displays
- Statistics: Numerical Measures
- Statistics: Probability
- Statistics: Sampling
- Statistics: Principles of Testing
- Statistics: Univariate Inferential Tests
  - One-Sample z-Test
  - One-Sample t-Test
  - Two-Sample z-Test: Comparing Two Means
  - Two-Sample t-Test: Comparing Two Means
  - Paired Difference t-Test
  - Test for a Single Population Proportion

Email AIM

Test for Comparing Two Proportions

Requirements: two binomial populations, $n_0 \geq 5$ and $n(1-n) \geq 5$ (for each sample), where n_0 is the hypothesized proportion of successes in the population.

Difference test

Hypothesis test

Formula:

$$z = \frac{\hat{\pi}_1 - \hat{\pi}_2 - \Delta}{\sqrt{\hat{\pi}(1-\hat{\pi})\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

where

$$\hat{\pi} = \frac{x_1 + x_2}{n_1 + n_2}$$

Examples of Data Analysis continued

Hand Washing/Hygiene: The single most important thing we could do to manage infections.

This indicator will measure the frequency and appropriateness of the staff's compliance to hand hygiene. Currently this is a manual process with a designated number of required observations per each nursing unit. The Formula used for measurement is:

The number of staff observations that were done correctly
The total number of observations
The quotient is then multiplied by 100 to derive the compliance percentage.

The method for the observation is defined as the start of a patient encounter to the end of that patient encounter, what should be observed is the staff washing their hands upon entrance to the room and washing their hands when exiting the room.

RandBetween

D2 =RANDBETWEEN(1,10000)

	A	B	C	D	E
1	Pat Num	Admit Date	Pat Type Pos1	RANDOM	
2	705925999	09/11/2008	I	9955	
3	705927727	09/12/2008	I	3870	
4	705929517	09/13/2008	I	4700	
5	705929834	09/13/2008	I	3720	
6	705932324	09/15/2008	I	8087	
7	705932932	09/15/2008	I	9328	
8	705949228	09/25/2008	I	7825	
9	705954089	09/27/2008	I	9027	
10	705955550	09/28/2008	I	7553	
11	400431264	09/03/2008	I	7151	

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Sharing Your Findings

- Words of advice
  - Footnote everything!
  - Name and date all of your documents
  - Never know who may get cc'd
  - If appropriate, provide a summary statement – or an Executive Summary

When is it appropriate to integrate findings?

- When you and everyone involved trusts the findings
- When you are certain that if the study was repeated, the results would be the same
- Enough time has passed & enough data has been collected – what's enough?
- Integration may mean starting a new project

Examples

- Hardwiring process so that Flu vaccines are not missed
- Goals as part of Mgmt Incentive Plan
- Share your examples

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