



Hosted by the California Area Indian Health Service
and the California Rural Indian Health Board, Inc.



**CALIFORNIA PROVIDERS'
BEST PRACTICES & GPRA MEASURES
CONFERENCE** *with* **DIABETES DAY**

May 21-24, 2018

Understanding Variation

Key to More Effective Decision Making

By Clifford L. Norman

Associates in Process Improvement (API)

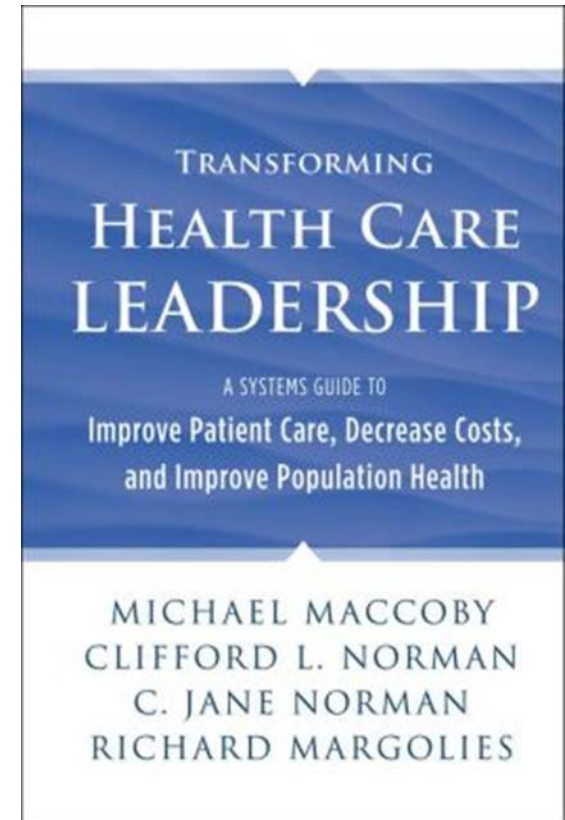
May 22, 2018

Becoming a More Effective Health Care Leader

Using the Theory of Variation

Learning Objectives (p. 15)

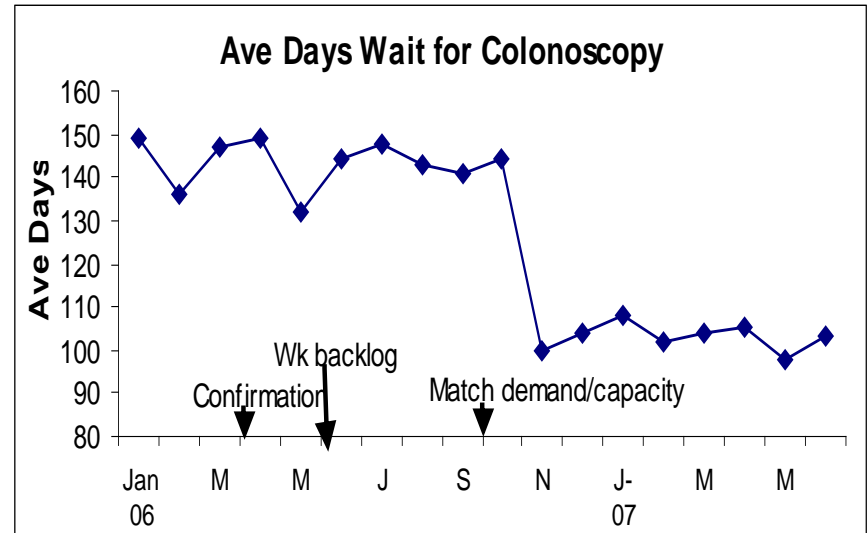
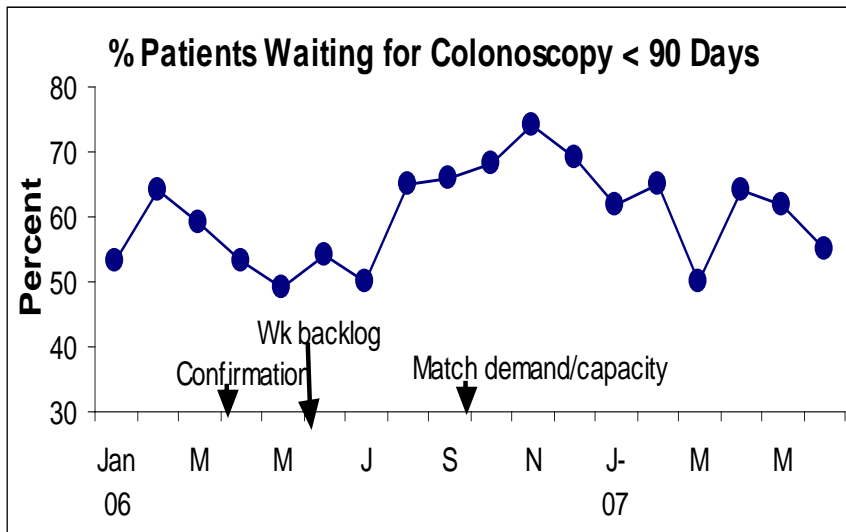
1. Identify the difference between special and common cause variation when viewing data on control charts.
2. Understand how the theory of variation minimizes the total cost of making mistakes 1 and 2; over reacting and under reacting.
3. Selecting an appropriate path as a health care leader to avoid making one or both mistakes results in waste, frustration, and the blame game (attribution theory) – most of us have no time for these wasteful activities – our day is already full.
4. Employing the theory of variation to ask good questions before reacting to data.



Reference: Chapter 7

Use of Data in Health Care

Focus	Judgment & Accountability	Clinical Research	Improvement
Aim	Comparisons with others; Decide on certification	New knowledge	Improvement of Care



Scenario B: Could be Percentage of New Hires to Onboard by Goal Vs. Avg. Days to Onboard New Providers

Why Understand Variation?

Data – Information – Knowledge for Action

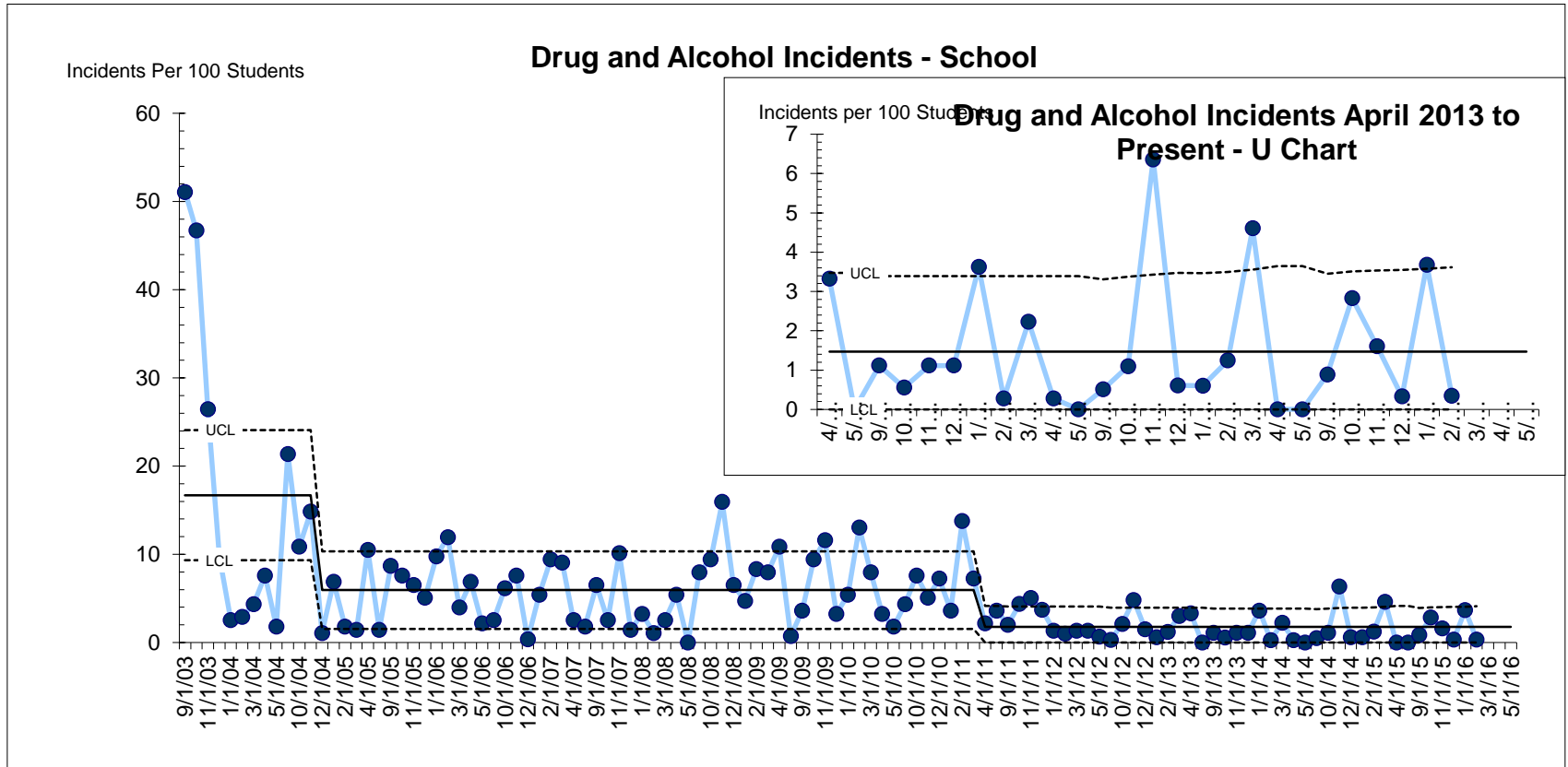
Scarce Resource: Time
DJ Vanas



The Data...Drug and Alcohol Incidents at the School – 9/2004 to 2015 – How are we doing?

DRUG AND ALCOHOL 2003-2016													
YEAR	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16
SEPTEMBER	141	59	24	7	18	22	10	12	6	1 (2)	4(7)	2 (6)	3(6)
OCTOBER	129	30	21	17	7	26	26	21	13(21)	7 (14)	2(4)	4(4)	9(13)
NOVEMBER	73	41	18	21	28	44	32	14	15(17)	16 (32)	4(4)	22(34)	5(9)
DECEMBER	27	3	14	1	4	18	9	20	11(20)	5 (7)	4(5)	2 (3)	1(3)
JANUARY	7	19	27	15	9	13	15	10	4(5)	2	13(16)	2 (2)	11(14)
FEBRUARY	8	5	33	26	3	23	36	38	3(5)	4	1(1)	4 (7)	1(1)
MARCH	12	4	11	25	7	22	22	20	4(5)	10 (27)	8(12)	14(24)	
APRIL	21	29	19	7	15	30	9	6	4	11(25)	1 (1)	0	
MAY	5	4	6	5	0	2	5	10	2	0	0	0	
TOTAL	423	194	173	124	91	200	164	151	62(85)	56(113)	36(83)	50(80)	30(46)

Drug and Alcohol Incidents – 2003 to 2016



Deming: “What I am getting ready to show you will haunt you for the rest of your life...”

Prior to our 1st Ami training in 2016, I was uncomfortable using charts vs tables. To me, charts were just dots and lines, and tables had data that I could more easily understand. However, when you created run charts using Micah's data, it was as if a light bulb went off. I already had seen his data , but seeing it in a run chart or control chart with explanations for the peaks and dips suddenly made sense. And, when you teased out portions of the chart so the data points weren't so compressed, it was even more powerful. I have learned that charts can be very useful tools and they are easy to create.

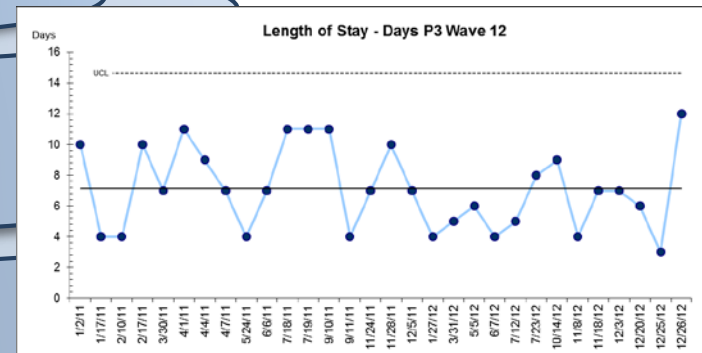
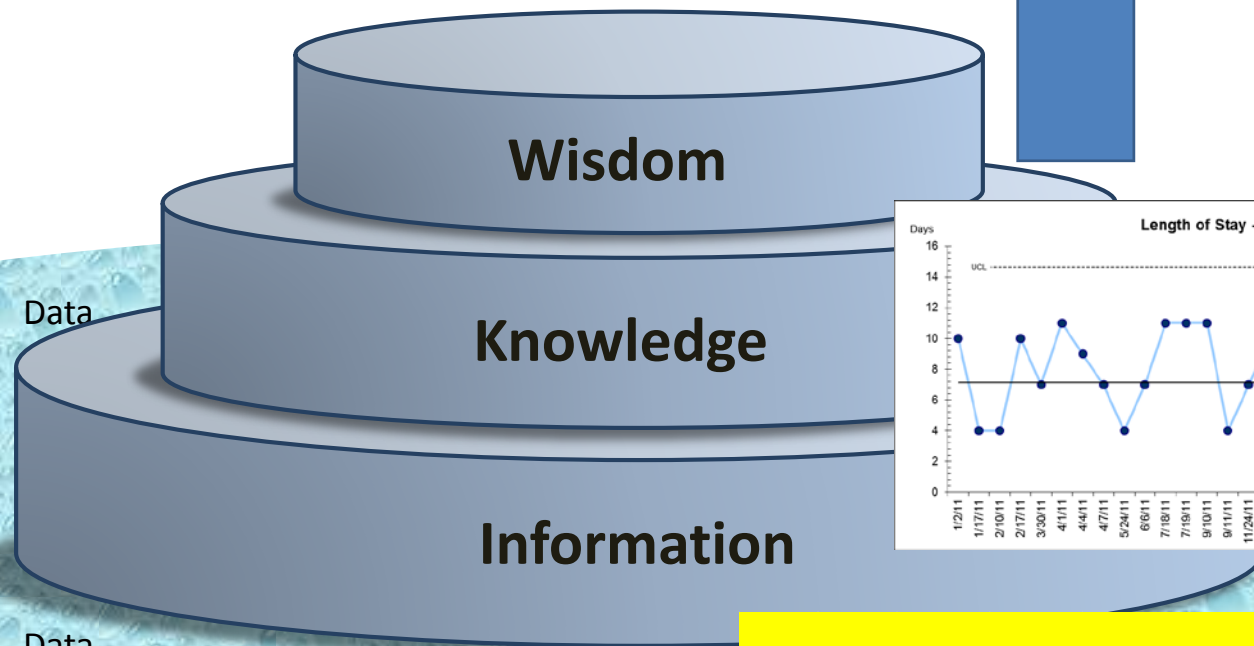
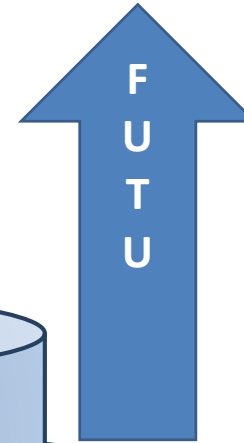
Beth Finnon, MPH
Chemawa Indian Health Center



Dr. Ackoff's Hierarchy of Intelligence

Data – Information – Knowledge for Action

Deming
The problem is prediction!

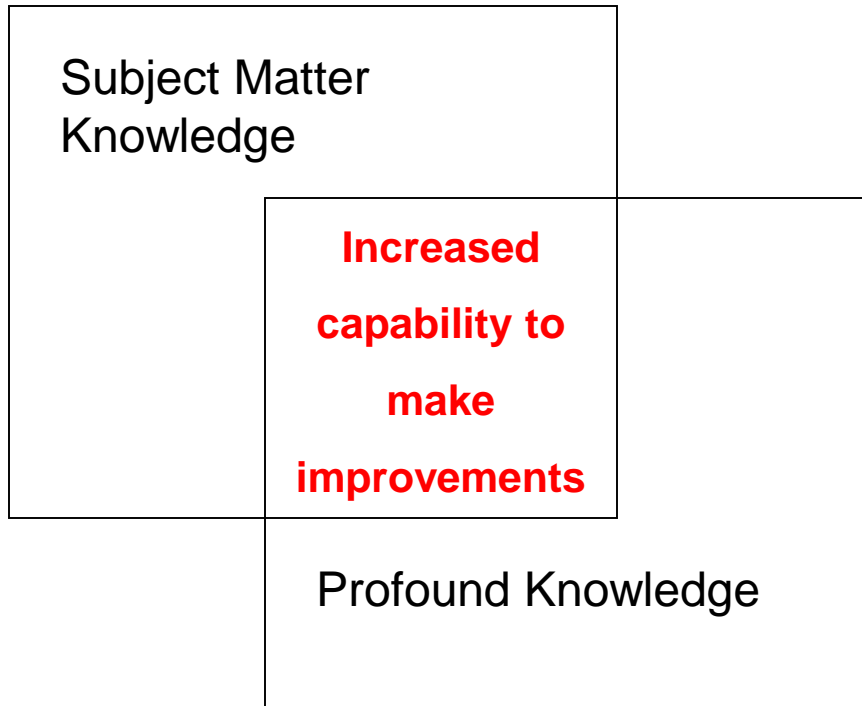


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Patient number	Gender (1: male, 2: female)	Date of birth	age	admission date	discharge date	Length of stay (days)	Hospital bill	Treatment start date
30	1	5/29/2007	4	1/2/2011	1/12/2011	10		1/2/2011
29	1	8/26/2005	6	1/17/2011	1/21/2011	4		1/18/2011
25	1	8/21/2009	2	2/10/2011	2/14/2011	4		2/11/2011
28	1	1/10/2005	6	2/17/2011	2/28/2011	10		2/18/2011

Knowledge for Improvement

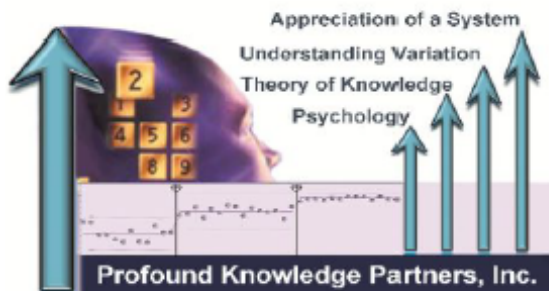
Data Mining without Subject Matter Knowledge...



- Vodka + Tonic = Drunk
- Gin + Tonic = Drunk
- Whiskey + Tonic = Drunk

Sources of Variation

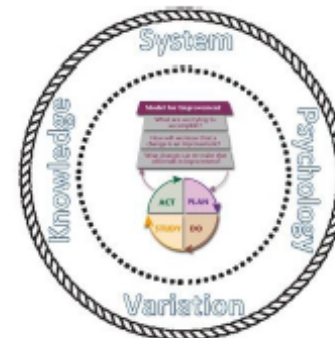
- **Common Causes (expected)**—those causes inherent in the process over time, affect everyone working in the process, and affect all outcomes of the process
 - Common cause of variation
 - Chance cause
 - Stable process
 - Process in statistical control
- **Special Causes (unexpected)**—those causes *not* part of the process all the time or not affecting everyone, but arising because of specific circumstances
 - Special cause of variation
 - Assignable cause
 - Unstable process
 - Process not in statistical control



Profound Knowledge Partners, Inc.

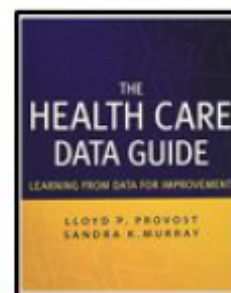
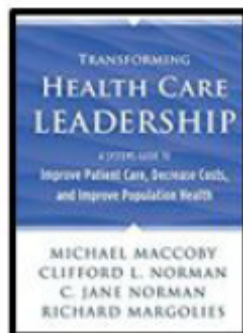
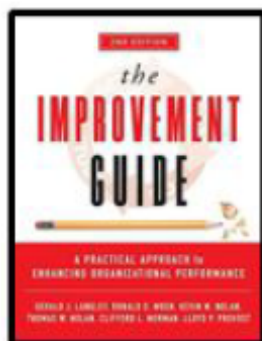
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Purpose:

Rapid change in global markets is driving the need for organizations to accelerate learning and adapt to changes quickly to be successful. PKP Inc. assists Leaders by engaging stakeholders effectively to transform their organization into a collaborative, learning, results-oriented system.

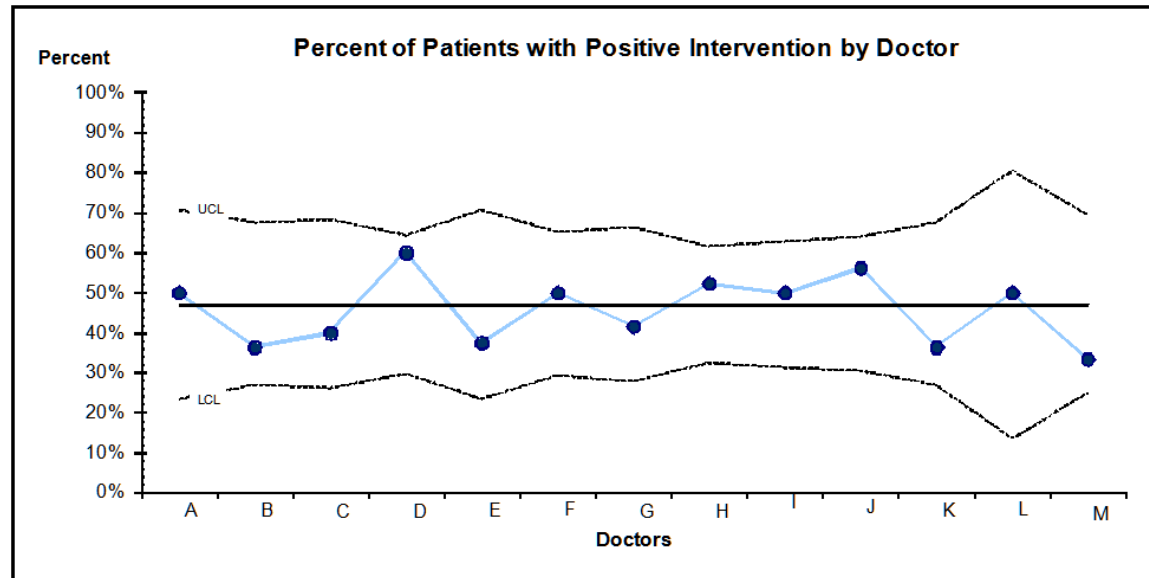


2/3 THOR (Special Cause Patterns)

	Name	Pattern	# Consecutive Data Points	Description
2/3	Two of Three		2 out of 3	Two out of three consecutive points near (in the outer third) of the control limit
T	Trend		6	Six consecutive points increasing (trend up) or decreasing (trend down).
H	Hugging the Centerline		15	Fifteen consecutive points close (in the inner one-third) to the centerline.
O	Outside		1	A single point outside the control limits.
R	Run		8	A run of eight or more points in a row above (or below) the centerline.

Using Data without Theory Allowed us to make which mistake? 1 or 2

Doctor	Num	Total	Percent
A	20	40	0.50
B	20	55	0.36
C	20	50	0.40
D	45	75	0.60
E	15	40	0.38
F	35	70	0.50
G	25	60	0.42
H	55	105	0.52
I	45	90	0.50
J	45	80	0.56
K	20	55	0.36
L	10	20	0.50
M	15	45	0.33
Total	370	785	0.47



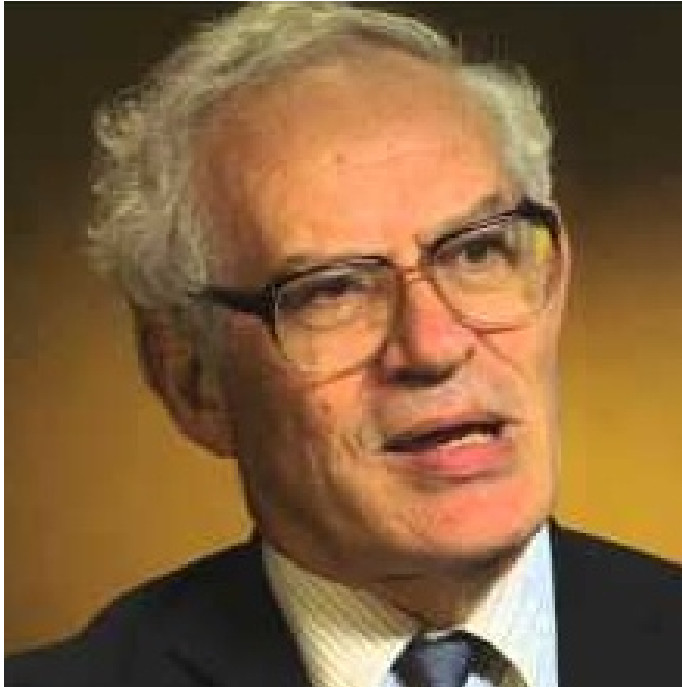
ACTION	ACTUAL SITUATION OF SYSTEM	
	NO CHANGE	CHANGE
Take action on individual outcome; Treat as a <i>special cause variation</i> .	- \$ Mistake 1	+ \$ Correct Decision (A)
Treat outcome as part of system; work on changing the system-Treat as <i>common cause variation</i>	+ \$ Correct Decision (B)	- \$ Mistake 2

Judgment and Learning

Legend for Status of Goals (Based on Annual Goal)		FY 2009 Hospital System-Level Measures					
Goal Met (GREEN)							
Goal 75% Met (YELLOW)							
Goal Not Met (RED)							
	Goals	FY 2007	FY 2008	FY 2009 Q1	FY 2009 Q2	FY 2009 Q3	
	FY 09 Goal	Long Term Goal					
Patient Perspective							
1.Overall Satisfaction Rating: Percent Who Would Recommend (Includes inpatient, outpatient, ED, and Home Health)	□ 60%	80%	37.98%	48.98%	57.19%	56.25%	51.69%
2.Wait for 3rd Next Available Appointment: Percent of Areas with appointment available in less than or equal to 7 business days (n=43)	□ 65%	100%	53.5%	51.2%	54.3%	61.20%	65.1%
Patient Safety							
1.Safety Events per 10,000 Adjusted Patient Days	□ 0.28	0.20	0.35	0.31	0.31	0.30	0.28
1.Percent Mortality	□ 3.50	3.00	4.00	4.00	3.48	3.50	3.42
5.Total Infections per 1000 Patient Days	□ 2	0	3.37	4.33	4.39	2.56	1.95
Clinical							
6.Percent Unplanned Readmissions	□ 3.5%	1.5%	6.1%	4.8%	4.6%	4.1%	3.5%
1.Percent of Eligible Patients Receiving Perfect Care--Evidence Based Care (Inpatient and ED)	□ 95%	100%	46%	74.1%	88.0%	91.7%	88.7%
Employee Perspective							
1.Percent Voluntary Employee Turnover	□ 5.80%	5.20%	5.20%	6.38%	6.10%	6.33%	6.30%
1.Employee Satisfaction: Average Rating Using 1-5 Scale (5 Best Possible)	□ 4.00	4.25	3.90	3.80	3.96	3.95	3.95
Operational Performance							
1.Percent Occupancy	□ 88.0%	90.0%	81.3%	84.0%	91.3%	85.6%	87.2%
1.Average Length of Stay	□ 4.30	3.80	5.20	4.90	4.60	4.70	4.30
1.Physician Satisfaction: Average Rating Using 1-5 Scale (5 Best Possible)	□ 4.00	4.25	3.80	3.84	3.96	3.80	3.87
Community Perspective							
1.Percent of Budget Allocated to Non-recompensed Care	7.00%	7.00%	5.91	7.00%	6.90%	6.93%	7.00%
1.Percent of Budget Spent on Community Health Promotion Programs	0.30%	0.30%	0.32%	0.29%	0.28%	0.31%	0.29%
Financial Perspective							
1.Operating Margin-Percent	□ 1.2%	1.5%	-0.5%	0.7%	0.9%	0.4%	0.7%
1.Monthly Revenue (Million)-change so shows red-but sp cause good related to occupancy	□ 20.0	20.6	17.6	16.9	17.5	18.3	19.2

Goodhart's Law

Unintended Consequences of Targets



Charles Goodhart
London School of Economics

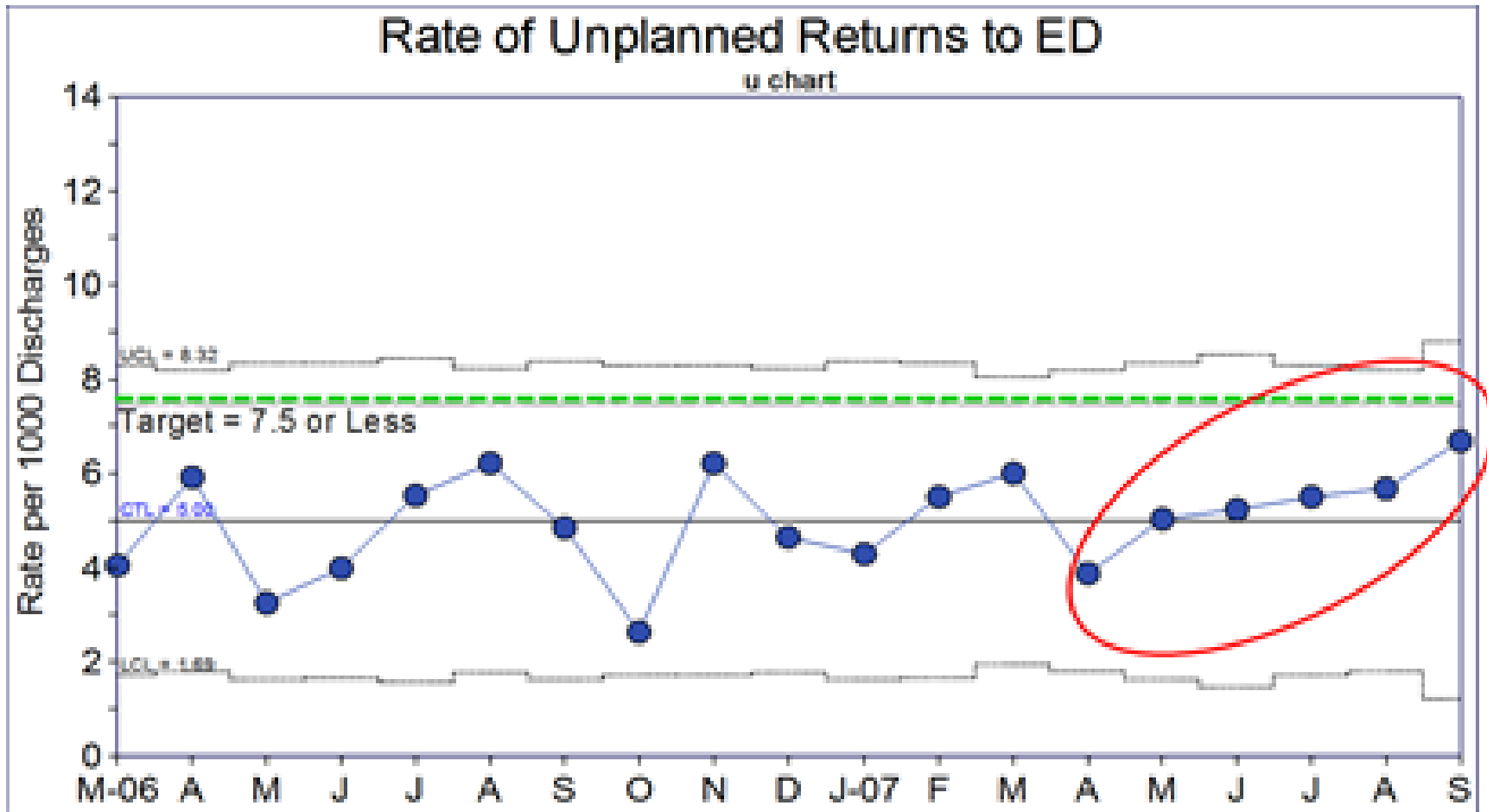
"When a measure becomes a target, it ceases to be a good measure."

1975

Judgment and Learning

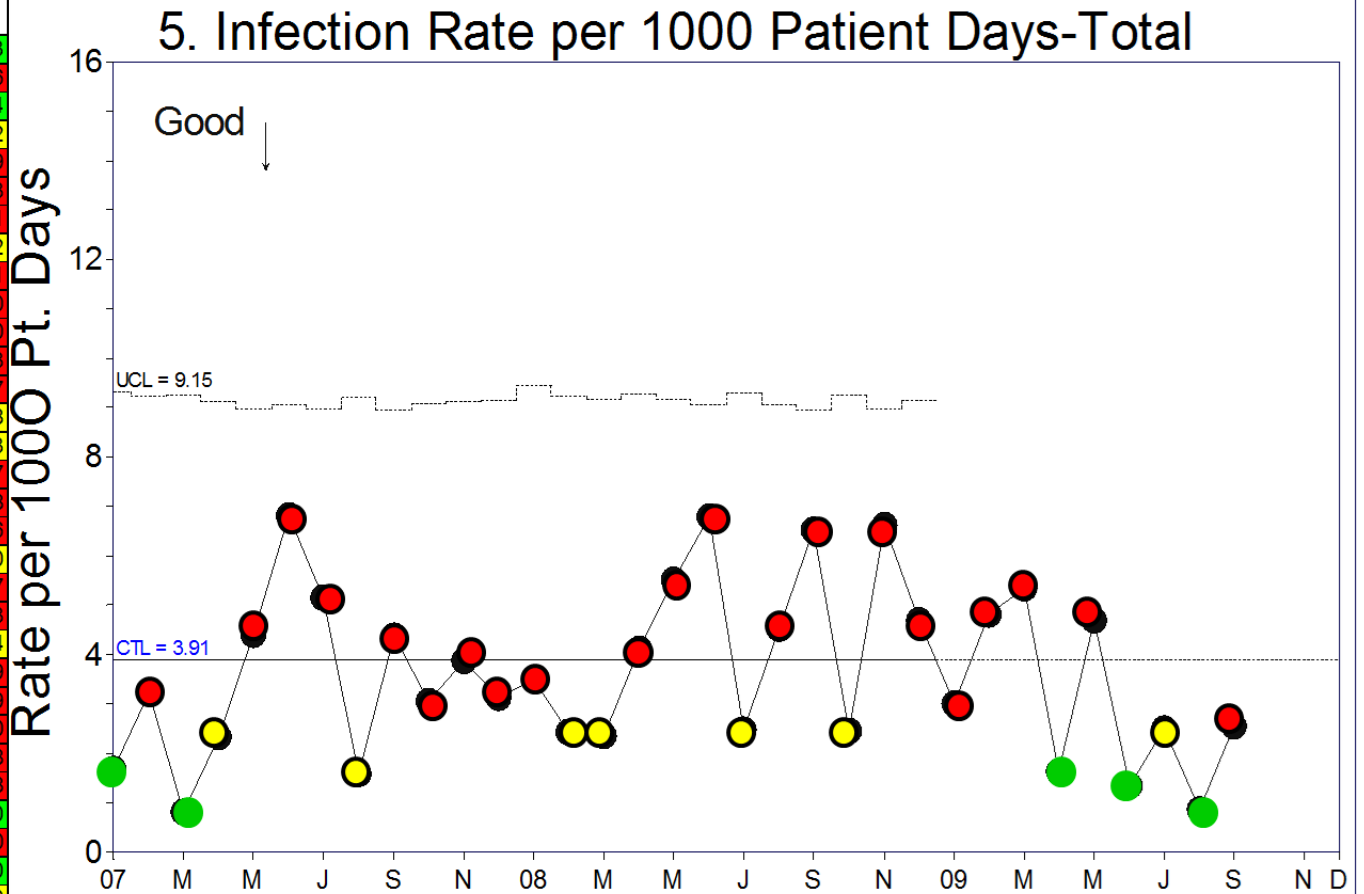
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What color is the light?



Stable or Unstable?

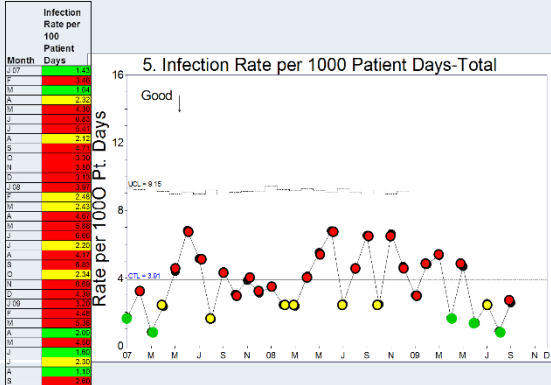
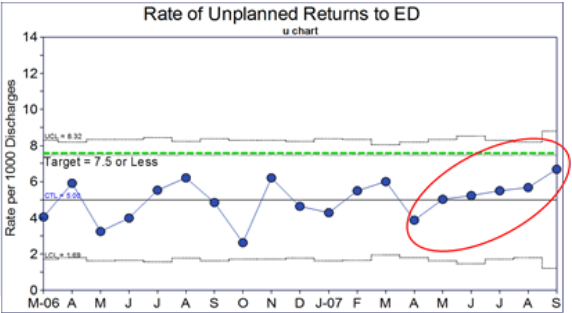
Month	Infection Rate per 100 Patient Days
J 07	1.43
F	3.46
M	1.04
A	2.32
M	4.39
J	6.83
J	5.41
A	2.12
S	4.71
O	3.30
N	3.50
D	3.13
J 08	3.97
F	2.48
M	2.43
A	4.67
M	5.88
J	6.66
J	2.20
A	4.17
S	6.83
O	2.34
N	6.69
D	4.39
J 09	3.20
F	4.48
M	5.38
A	2.00
M	4.50
J	1.60
J	2.30
A	1.10
S	2.60



Minimizing the Two Mistakes

MISTAKE 1: React to an outcome as if it came from a special cause, when actually it came from common causes of variation.

MISTAKE 2: Treat an outcome as if it came from common causes of variation, when actually it came from a special cause.

ACTION	NO CHANGE	CHANGE
Take action on individual outcome; Treat as a special cause variation.		<p>+ \$</p> <p>Correct Decision (A)</p>
Treat outcome as part of system; work on changing the system-Treat as common cause variation	<p>+ \$</p> <p>Correct Decision (B)</p>	

Using Traffic Signals on a Dashboard with Understanding Variation

Meets Targets/Customer Specifications?

Yes

No

Yes

Ideal State

Threshold State

Stable?

**Brink of
Chaos**

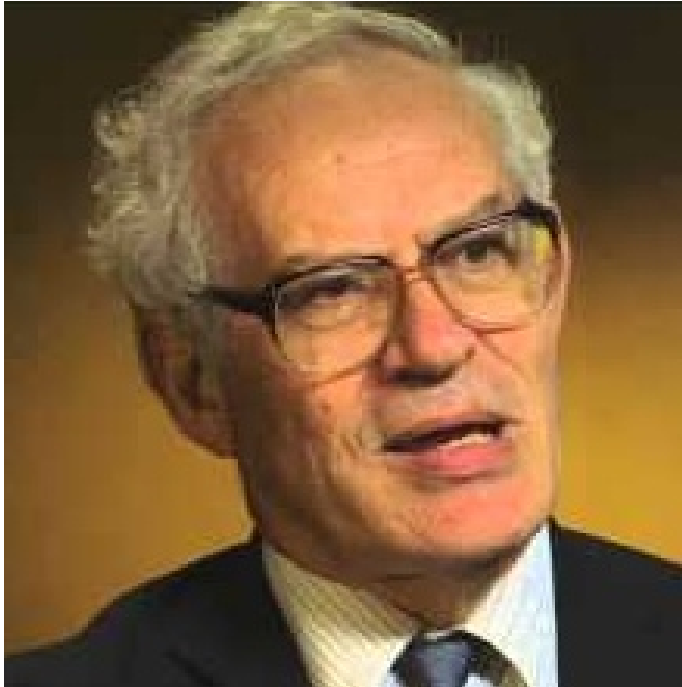
Chaos

No

Changes are being tested to impact the measure

Goodhart's Law

Unintended Consequences of Targets



Charles Goodhart
London School of Economics

"When a measure becomes a target, it ceases to be a good measure."

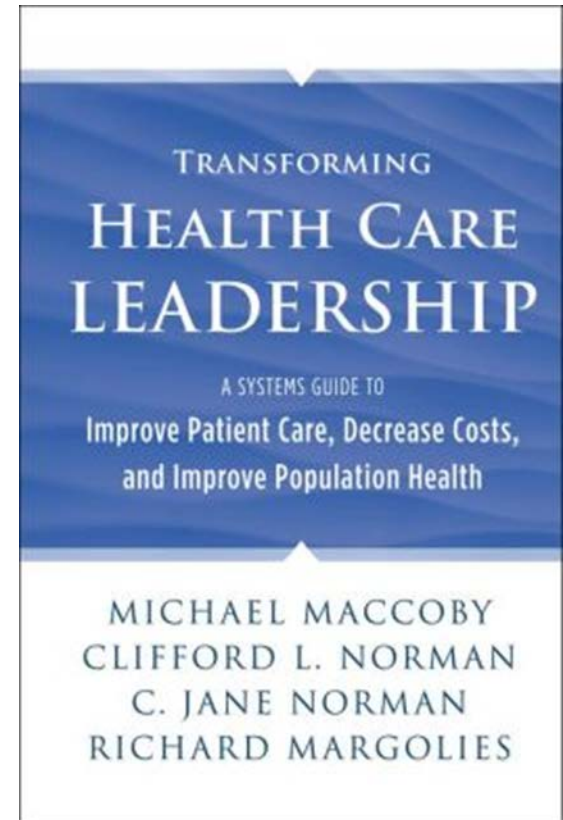
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Becoming a More Effective Health Care Leader

Using the Theory of Variation

Summary

1. Identify the difference between special and common cause variation when viewing data on control charts.
2. Understand how the theory of variation minimizes the total cost of making mistakes 1 and 2; over reacting and under reacting.
3. Selecting an appropriate path as a health care leader to avoid making one or both mistakes results in waste, frustration, and the blame game (attribution theory) – most of us have no time for these wasteful activities – our day is already full.
4. Employing the theory of variation to ask good questions before reacting to data.



Reference: Chapter 7

Breakout Session for this Afternoon

- Moving data from data bases to information and knowledge for action.
 - Introduction to Software owned by IHS to produce useful displays of data – *QI Charts*.
- Explore the use and application of run charts and control charts in the health care setting.
- Appreciate the power and usefulness of using analytic methods for decision making and improvement.

What to do if the data does not give you the answer you want...

