Data "Insanity": The Silent Improvement Killer

Part 3: Educating leadership ...and getting the respect you deserve

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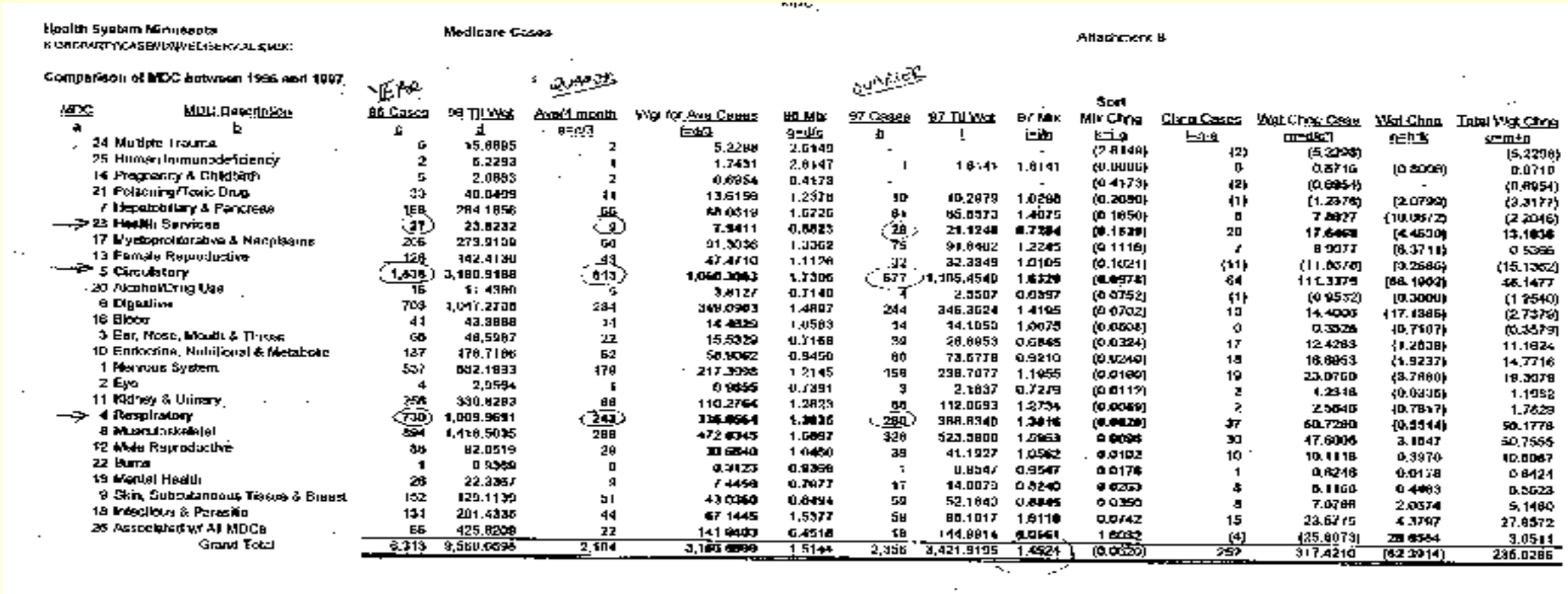
The Quality Colloquium Preconference Symposium

August 16, 2010

How many meetings? Pages & Pages



Health System Minnesota

Medicare Cases

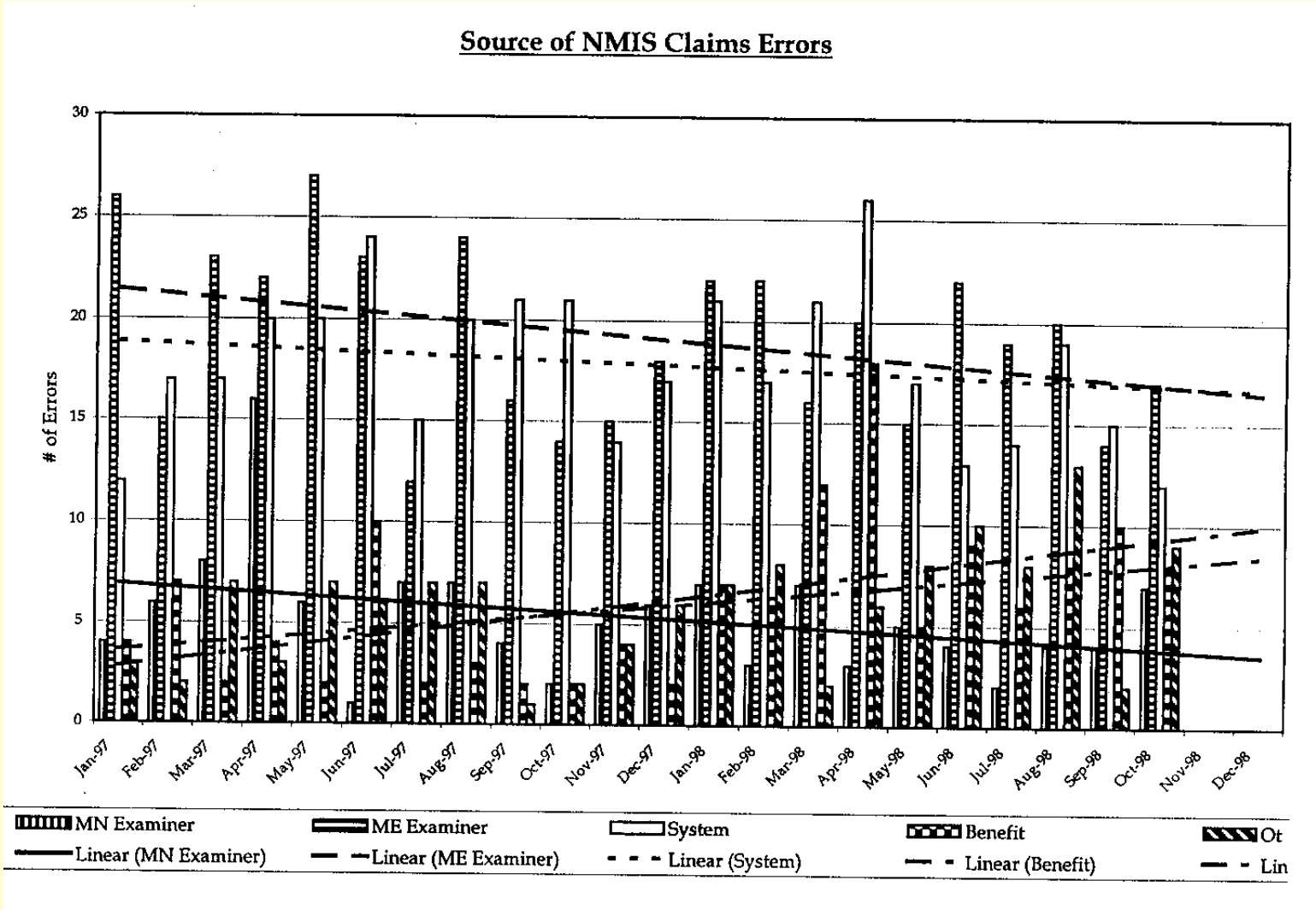
Attachment B

Comparison of MDC between 1996 and 1997

MDC	MDC Description	96 Cases	96 TI Wgt	Avg/1 month	Wgt for Avg Cases	96 Mix	97 Cases	97 TI Wgt	97 Mix	Mix Chng	Chng Cases	Wgt Chng Cases	Wgt Chng	Total Wgt Chng
a	b	c	d	e=c/3	f=d/c	g=c/Tot	h	i	j=i/h	k=j-g	l=k*c	m=l*f	n=m/Tot	o=m+n
24	Multiple Trauma	6	45.6885	2	5.2298	2.0149	-	-	-	(2.0149)	(12)	(5.2298)		(5.2298)
25	Human Immunodeficiency	2	6.2293	1	1.7451	2.0147	1	1.8141	1.8141	(0.2006)	0	0.3716	(0.8008)	0.0710
14	Pregnancy & Childbirth	5	2.0883	2	0.6954	0.4173	-	-	-	(0.4173)	(2)	(0.6954)	-	(0.8954)
21	Poisoning/Toxic Drug	33	40.0409	11	13.5159	1.2378	30	40.2879	1.0298	(0.2080)	(1)	(1.2378)	(2.0799)	(3.3177)
7	Hepatobiliary & Pancreas	168	284.1856	56	69.0619	1.0220	84	85.0573	1.4075	(0.1650)	8	7.8927	(10.0572)	(2.2046)
23	Health Services	27	23.8232	9	7.9411	0.8823	28	21.1248	0.7384	(0.1539)	20	17.6468	(4.4530)	13.1938
17	Myeloproliferative & Neoplasms	206	279.9139	69	91.3036	1.3362	75	99.6402	1.2245	(0.1116)	7	8.9077	(6.3711)	0.5366
13	Female Reproductive	126	142.4130	43	47.4710	1.1139	32	32.3849	1.0105	(0.1021)	(11)	(11.0570)	(3.2686)	(15.1362)
5	Circulatory	1,636	3,180.9188	613	1,060.3063	1.3306	677	1,105.4540	1.6329	(0.6978)	64	111.3379	(66.1902)	46.1477
20	Alcohol/Drug Use	16	51.4980	5	3.8127	0.7140	8	2.8507	0.0397	(0.0752)	(1)	(0.9552)	(0.3000)	(1.2540)
6	Digestive	703	1,017.2708	234	340.0903	1.4807	244	346.3624	1.4195	(0.0702)	10	14.4000	(17.4385)	(2.7379)
16	Blood	41	43.8888	14	14.4829	1.0563	14	14.1053	1.0075	(0.0508)	0	0.3526	(0.7107)	(0.3579)
3	Ear, Nose, Mouth & Throat	66	48.5987	22	15.5329	0.7168	39	26.0853	0.6845	(0.0324)	17	12.4283	(1.2638)	11.1624
10	Endocrine, Nutritional & Metabolic	127	176.7186	52	58.9062	0.9450	80	73.5778	0.9210	(0.0240)	18	16.8953	(1.9237)	14.7716
1	Nervous System	537	652.1833	179	217.3936	1.2145	158	238.7077	1.1955	(0.0190)	19	23.0760	(3.7880)	19.3078
2	Eye	4	2.0584	1	0.9855	0.7391	3	2.1837	0.7279	(0.0111)	2	1.2348	(0.0335)	1.1952
11	Kidney & Urinary	256	330.8283	88	110.2764	1.2823	85	112.0693	1.2734	(0.0089)	2	2.2048	(0.7857)	1.7629
4	Respiratory	730	1,009.9691	243	336.6564	1.3826	280	388.8340	1.3816	(0.0010)	37	50.7289	(0.5514)	50.1775
8	Musculoskeletal	594	1,418.5035	288	472.8345	1.5867	328	523.3800	1.5963	0.0096	30	47.6006	3.1647	50.7655
12	Male Reproductive	38	82.0519	20	30.6840	1.0460	38	41.1927	1.0862	0.0402	10	10.1118	0.3970	10.5087
22	Burns	1	0.9359	0	0.9123	0.9359	1	0.9547	0.9547	0.0176	1	0.9246	0.0178	0.9424
19	Mental Health	28	22.3957	9	7.4652	0.7677	17	14.0073	0.8240	0.0563	8	5.1160	0.4403	5.5563
9	Skin, Subcutaneous Tissue & Breast	152	129.1139	51	43.0380	0.8494	59	52.1840	0.8845	0.0350	8	7.0768	2.0374	9.1480
18	Infectious & Parasitic	131	201.4335	44	67.1445	1.5377	58	80.1017	1.3118	0.0742	15	23.6715	4.3797	27.8572
25	Associated w/ All MDCs	66	425.8208	22	141.9403	6.4518	18	144.8814	8.0501	1.5982	(4)	(25.8073)	28.8584	3.0511
	Grand Total	5,313	9,560.6695	2,104	3,186.8898	1.5144	2,356	3,421.9195	1.4521	(0.0620)	257	317.4210	(82.3914)	236.0286

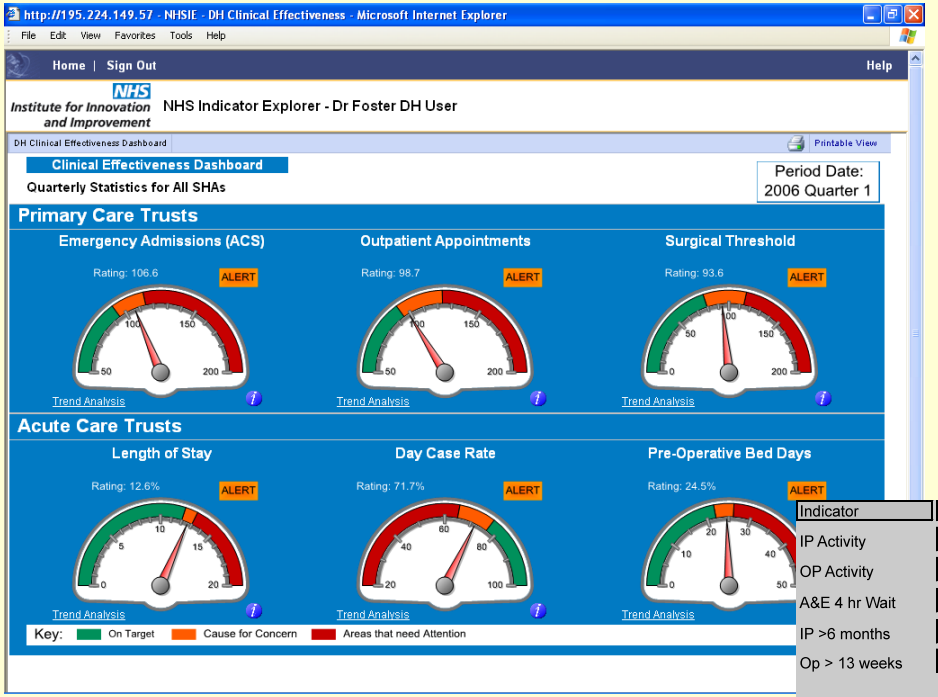
- ***THIS IS STATISTICS***: **You are reacting to variation!**
- **"MBLC": HALF of this time is WASTE**

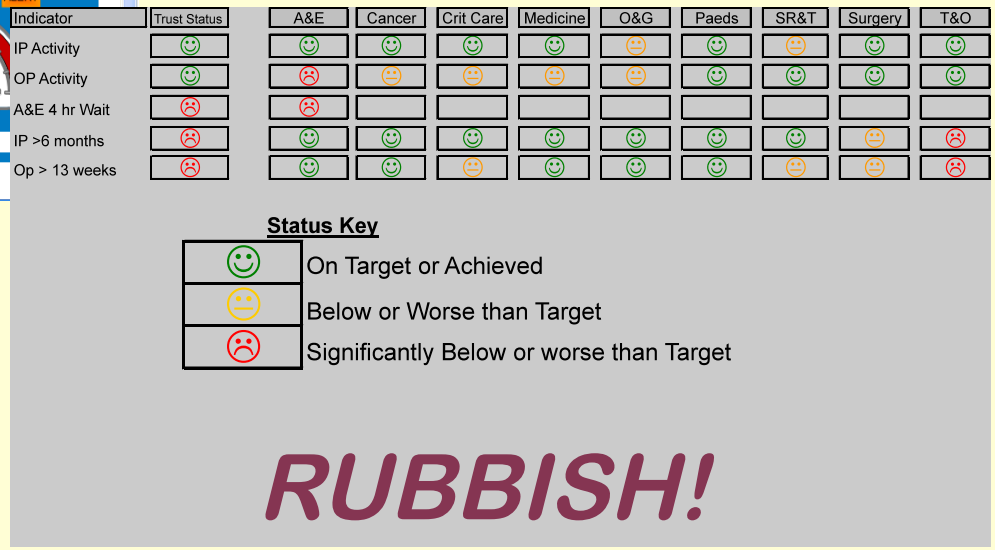
What numbers make you perspire?



Challenge:

1. **Whenever possible, AVOID bar graphs!**
2. **Trend lines? Easy…NEVER!**





"WAG"

RUBBISH!

Traffic lights are a special cause strategy – "PLOT THE DOTS!" instead

"SWAG": GREAT Article

Mills, "Data Torturing"

NEJM October 14, 1993

Like it or not…

Vague data responding to…

Vague problems

will yield…

Vague meetings,

yielding…

Vague questions

yielding…

Vague solutions,

yielding…

Vague results.

WHAT IF…

- 50% reduction in monthly senior management meeting time
- Eliminating up to one hour each day of managerial review and attempts to interpret unimportant performance data
- 60% reduction in daily pounds of published performance reports
  - "Backup data"
- 80% reduction in monthly corporate financial reports

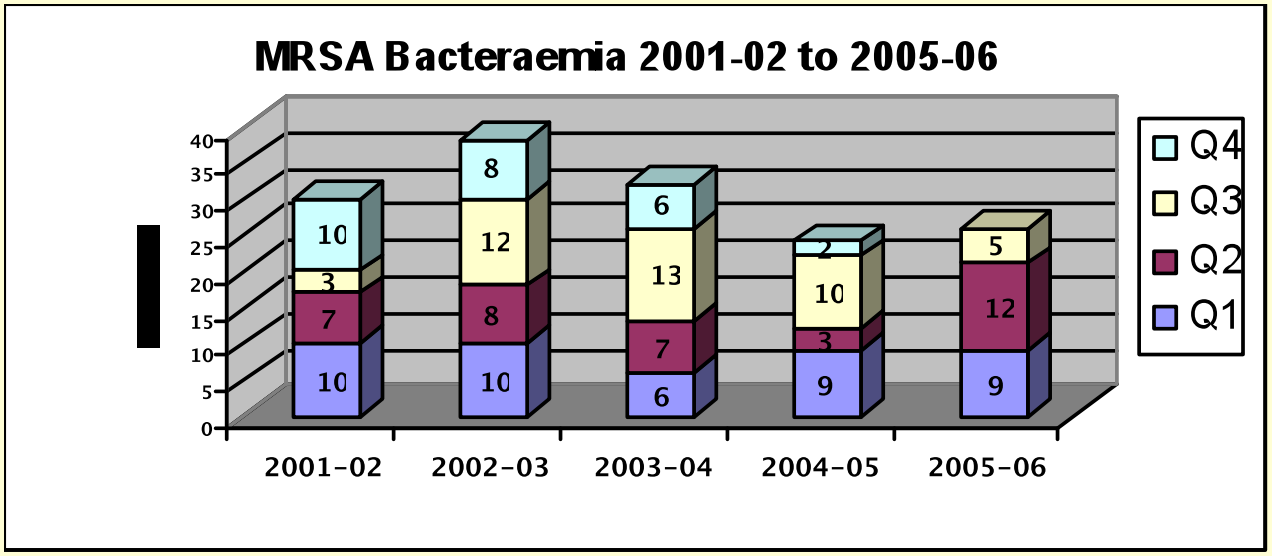
Would this help your improvement efforts?

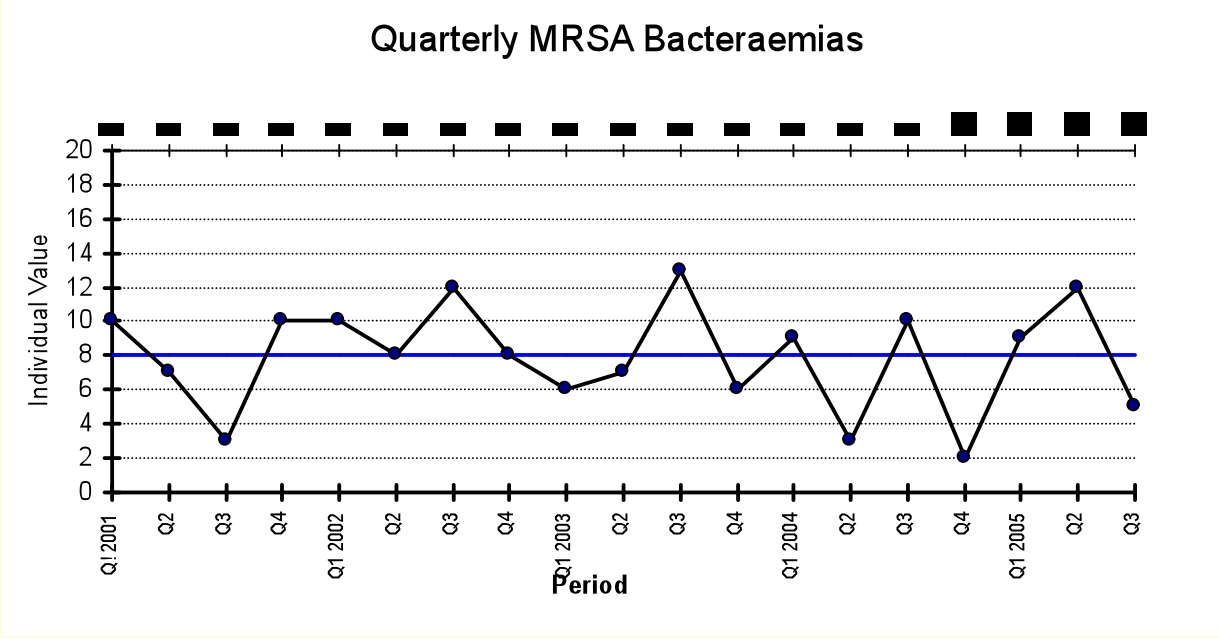
“When I die, let it be in a meeting. The transition from life to death will be barely perceptible.” --Anon

Transition to More "Advanced" Skills

- From:
  - Colors & Faces & Drawing circles
  - "This number is different from that one… which is different from the goal…and *I DON'T LIKE IT – Make it so!"*
- To:
  - Counting up to "8"
  - Subtracting two numbers
  - Sorting a list of numbers
  - ***Asking better questions!***
  - ***"Plotting the dots!"***
  - ***"Special" vs. "Common" cause strategy***

NO MORE BORING MEETINGS!





What if EVERYONE did this and…

"Assignment" before Part 3

1. Calculate the moving ranges (19 data points produce 18 moving ranges):

   Bacteraemia Data: 10, 7, 3, 10, 10, 8, 12, 8, 6, 7, 13, 6, 9, 3, 10, 2, 9, 12, 5

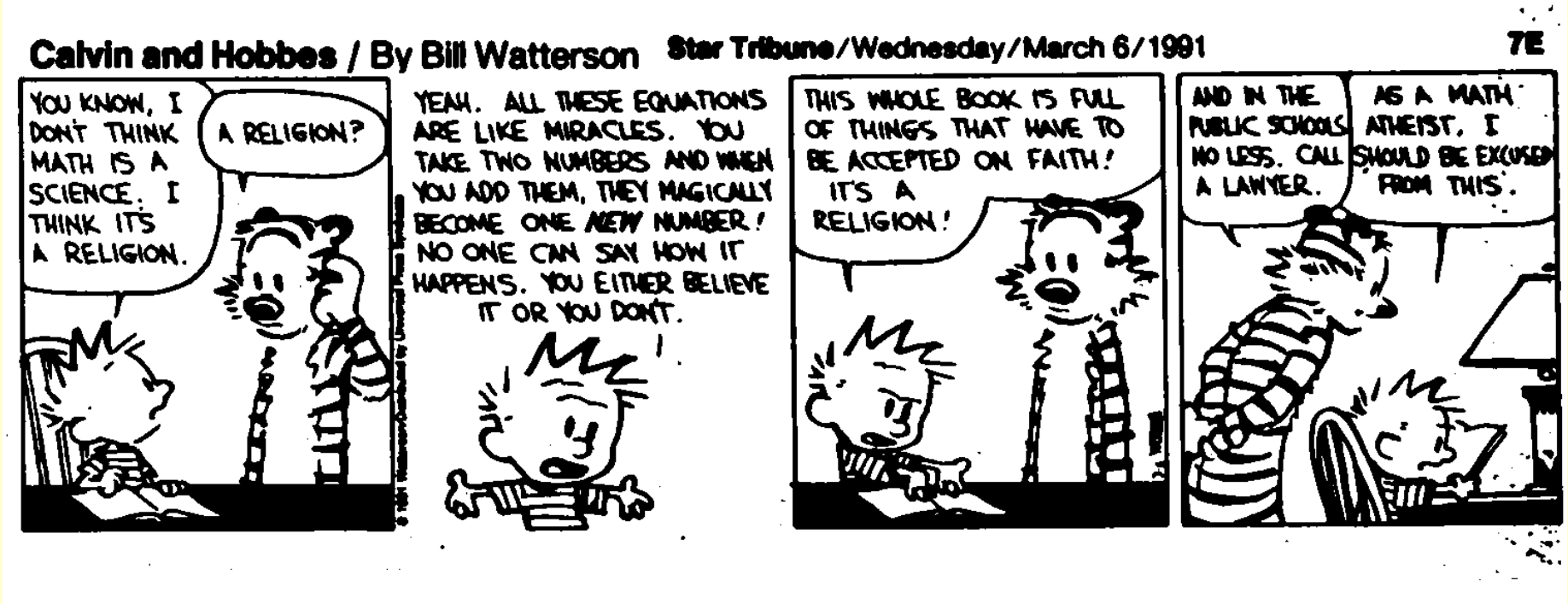
   ***Absolute values*: (7-10), (3-7), (10-3), (10-10), (8-10)…(5-12)**

2. Determine MR_{Med} : Sort them from smallest to largest
   Average the 9^{th} & 10^{th} in this SORTED sequence

3. Multiply MR_{Med} by 3.865 (round it)

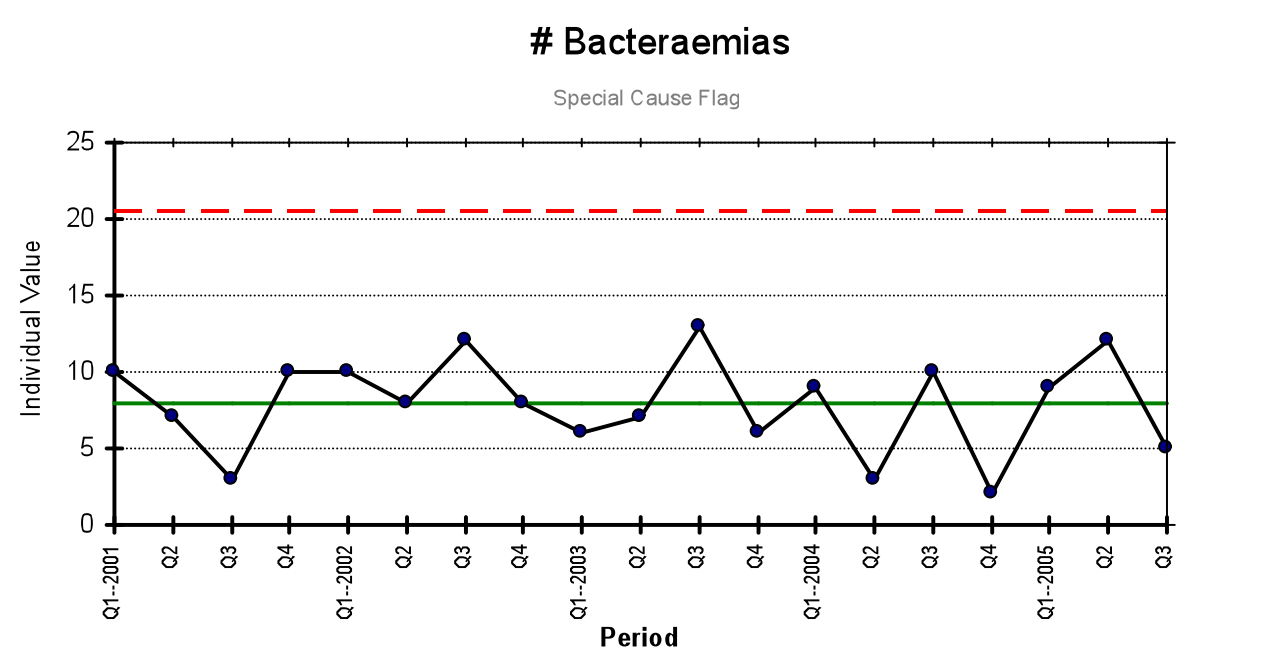
4. The average of the 19 data point is 7.9, let's call it ~8
   Calculate $8 \pm [3.14 \times MR_{Med}]$

Bacteraemias	Moving Range	Sorted Moving Ranges	
10	*	0	
7	3	1	
3	4	2	
10	7	2	
10	0	3	
8	2	3	
12	4	3	
8	4	4	
6	2	4	9TH
7	1	4	10TH
13	6	6	
6	7	6	
9	3	7	
3	6	7	
10	7	7	
2	8	7	
9	7	7	
12	3	8	
5	7		



No more math atheism!!

YIKES – PERFECTLY designed!



Med MR = 4

MR_{max} = 4 x 3.865* ~ 15

8 ± (4 x 3.14*) ~ [0 – 20]

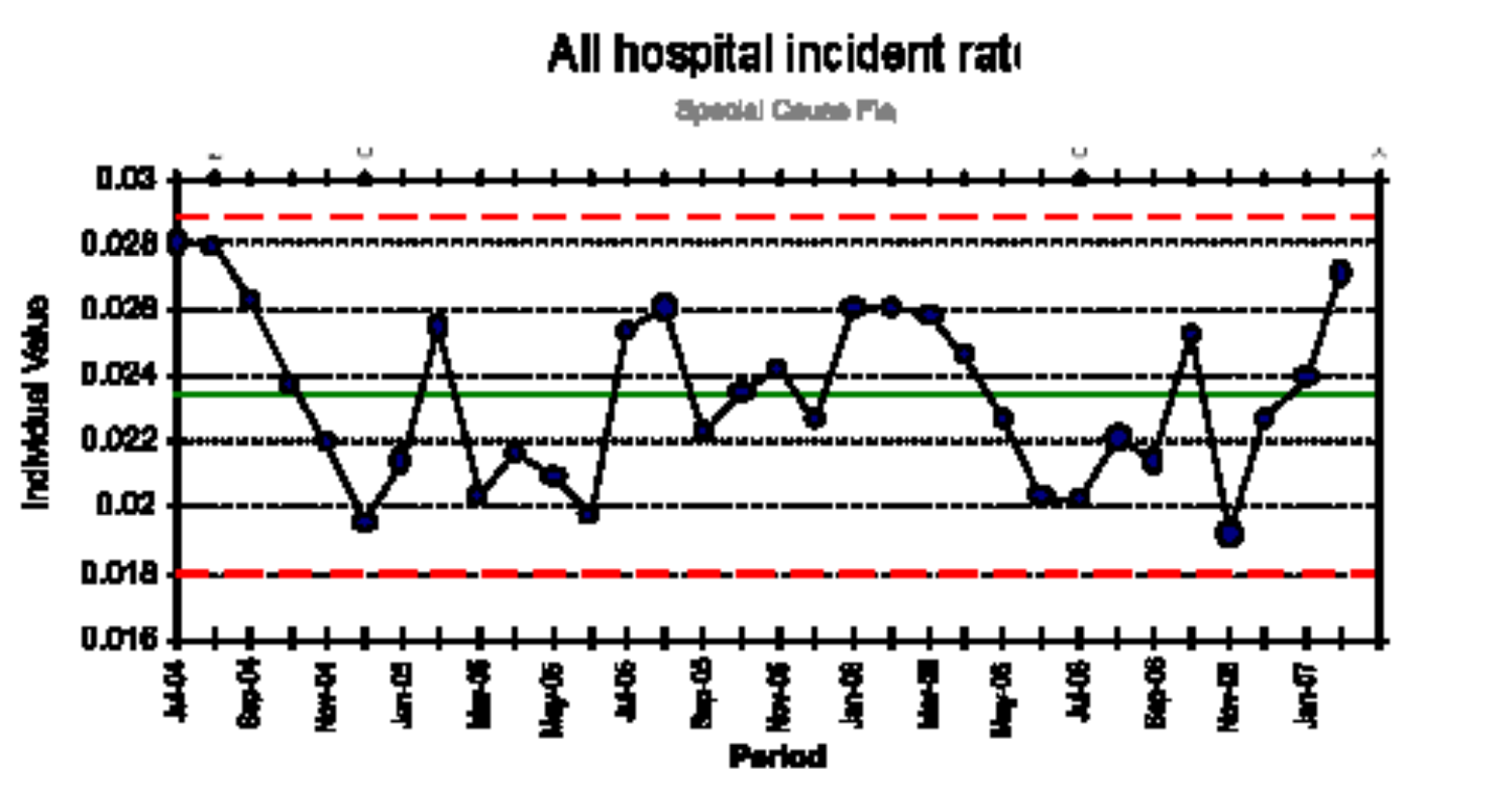
- **From theory:**
  Doesn't change

"Matrix" 150 bacteraemias?

Control Charts

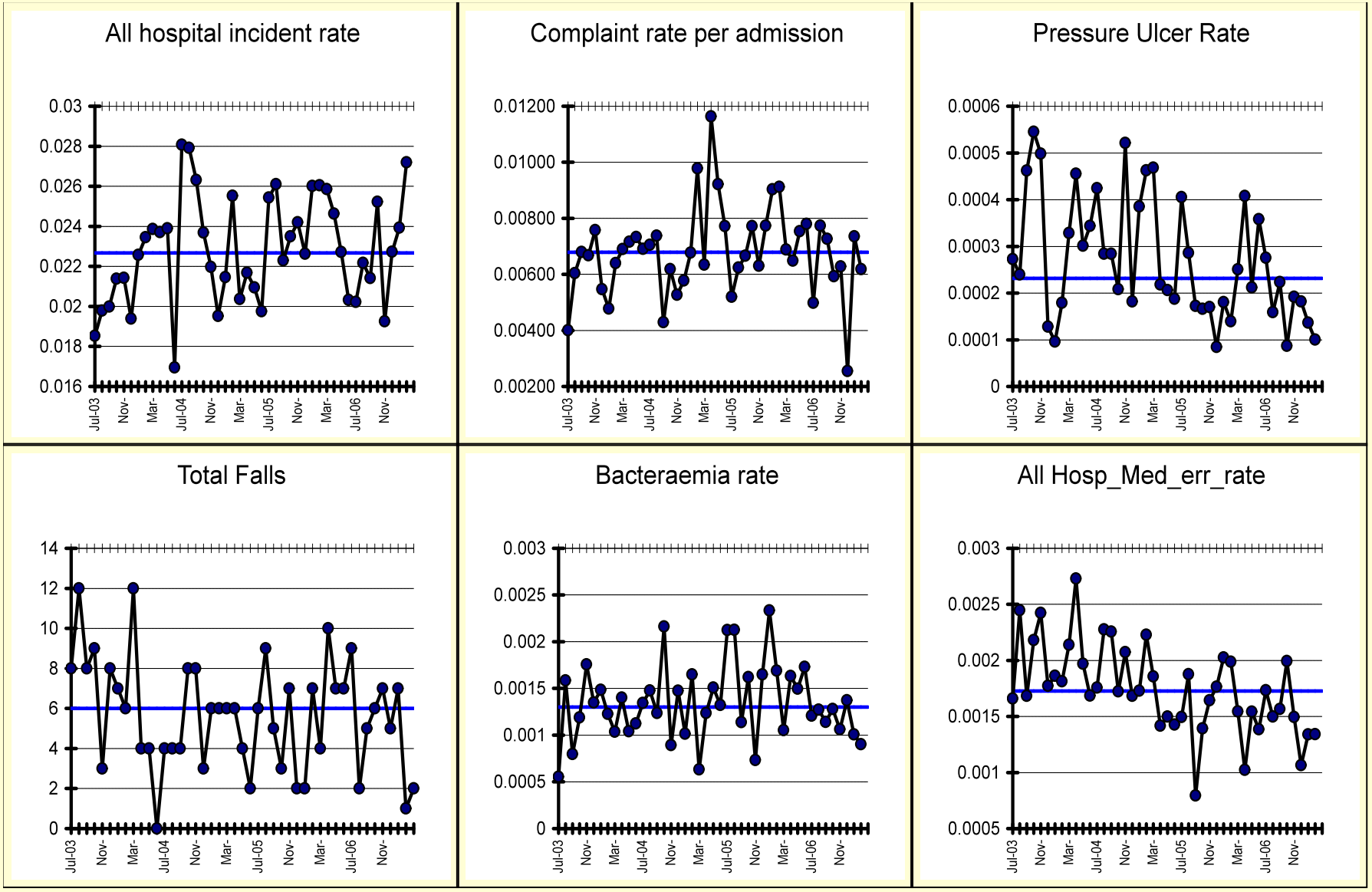
- You DO NOT have to accept this level of performance!
- ANY numbers between 0 and 20 are indistinguishable from each other AND the average of 8.
- KEY: Any "infection" isn't necessarily a special cause just because it isn't "supposed" to happen…or the fact that you can explain it after it occurs

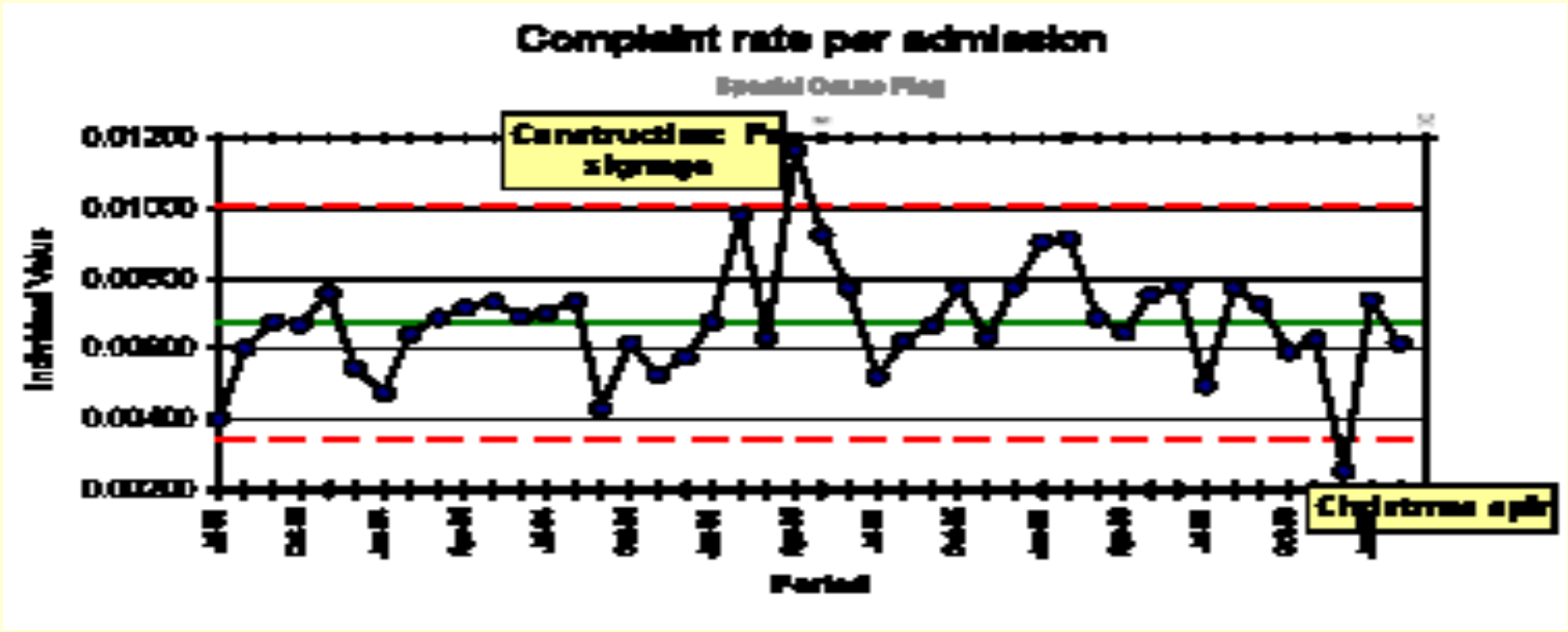
Balanced Scorecard?
"Own" the "Learning & Growth" sub-business – Invent a "Safety" Metric

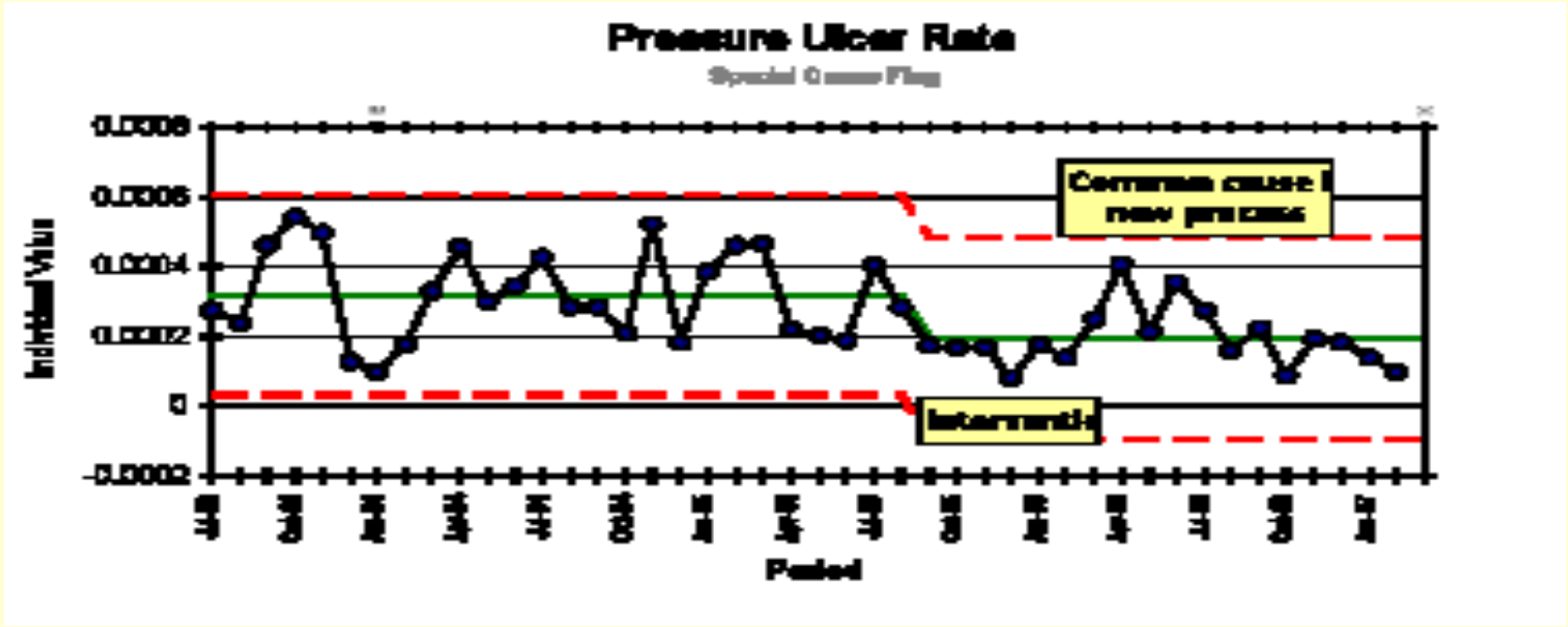


"Big dot": Safety Analytic

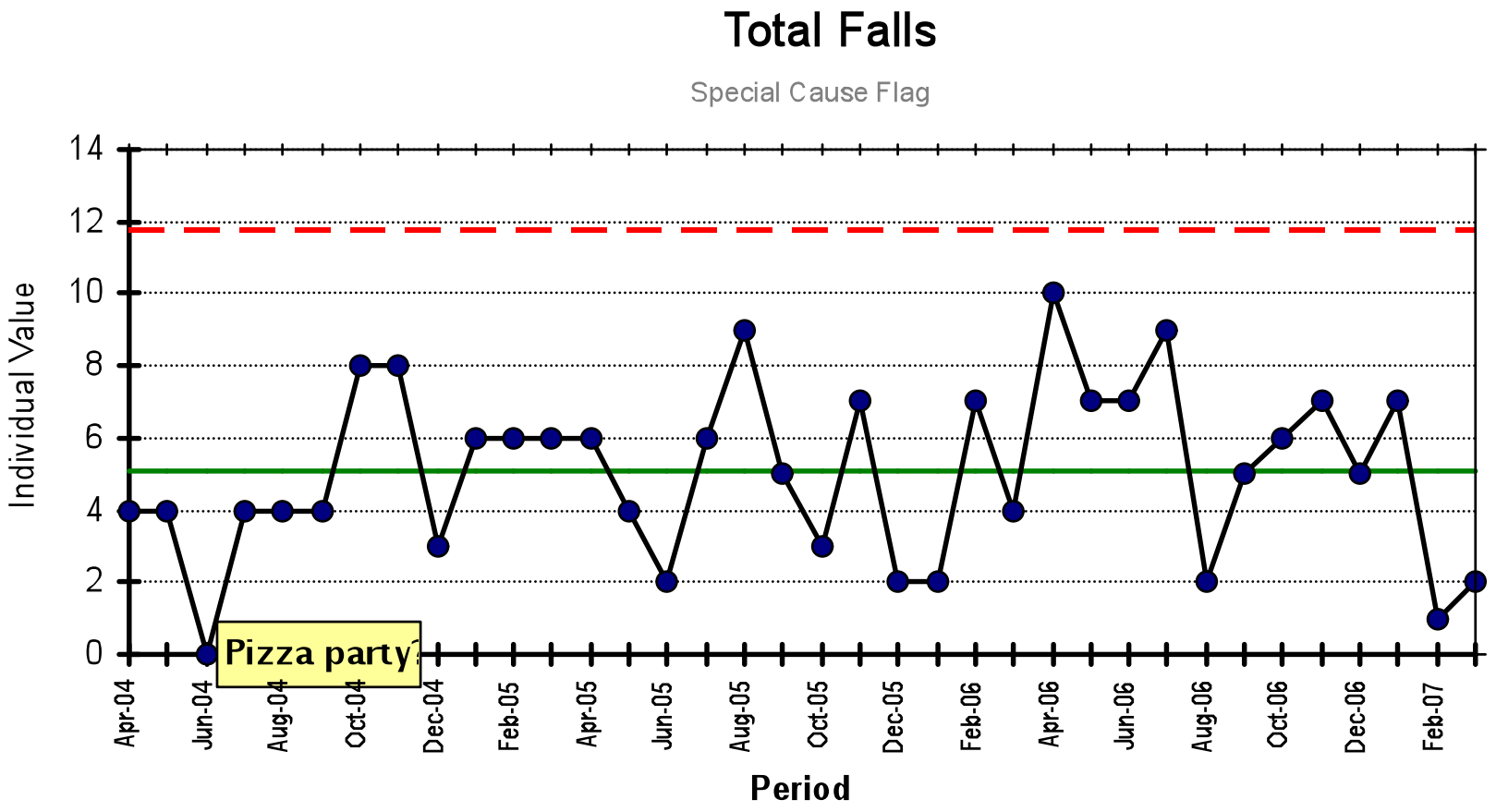
"Peeled" "Incidents"



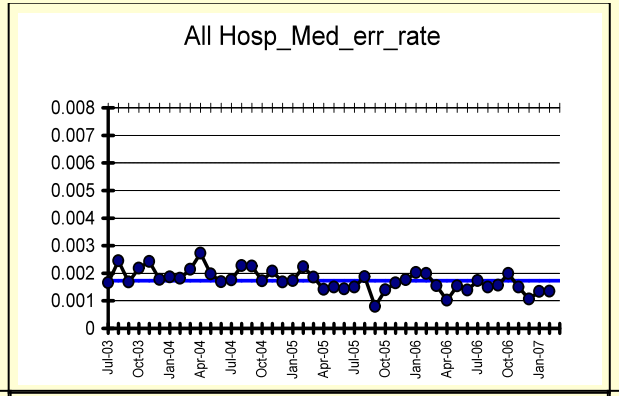

Complaint rate per admission
Special Cause Flag
0.01200
0.01000
0.00800
0.00600
0.00400
0.00200
Individual Value
Period

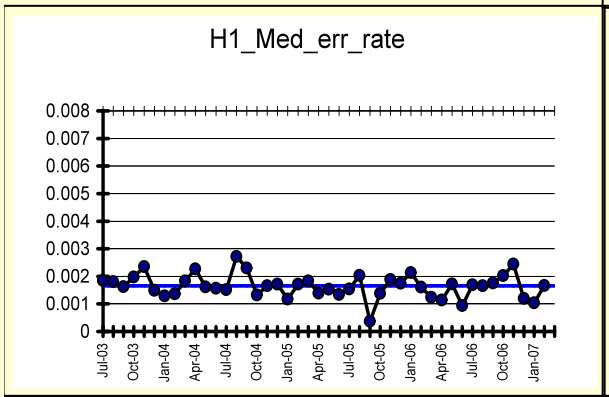

Pressure Ulcer Rate
Special Cause Flag
0.0008
0.0006
0.0004
0.0002
0
-0.0002
Individual Value
Period

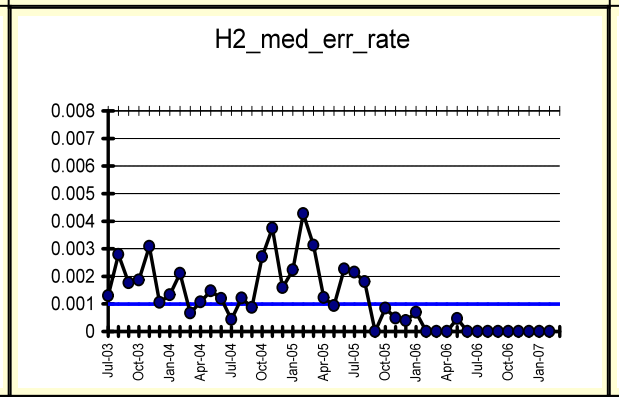
"Perfectly designed" for Falls

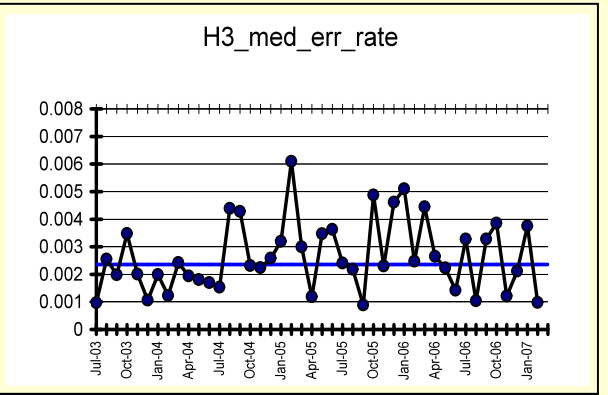


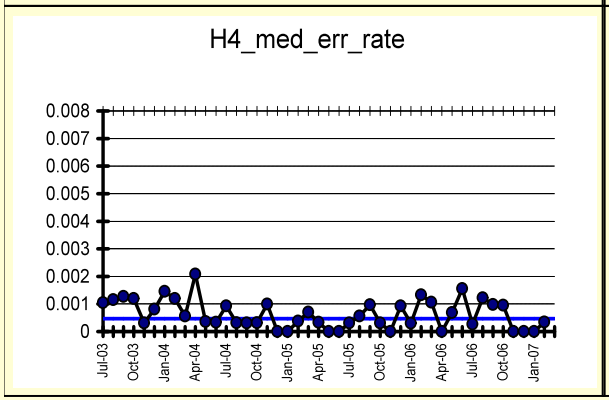
Med Error Rate Comparison

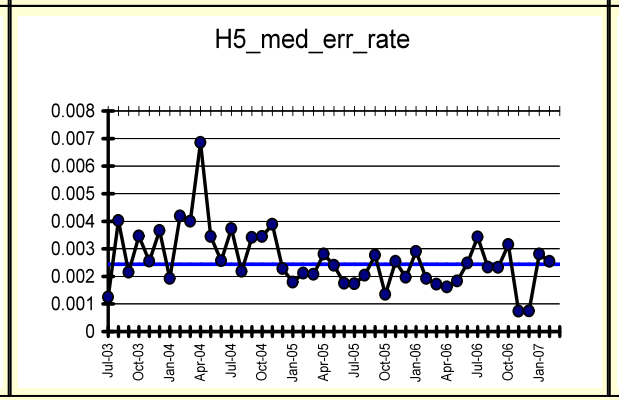


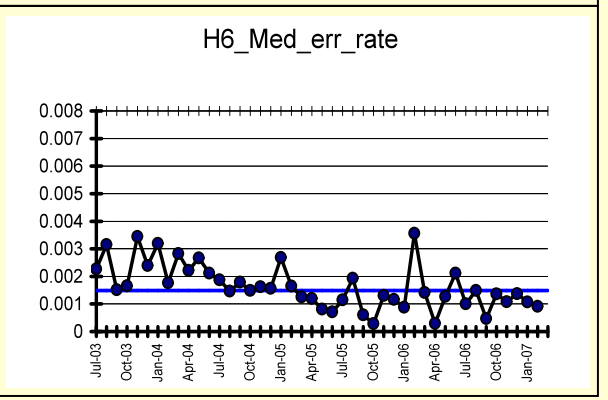












I have an Excel macro that will do this

- E-mail me and I would *delighted* to send you a copy with a tutorial
- Pour a glass of wine and spend 2-1/2 hours!
- davis@dbharmony.com

- www.dbharmony.com

  Sign up for my FREE bi-weekly e-newsletter on the home page

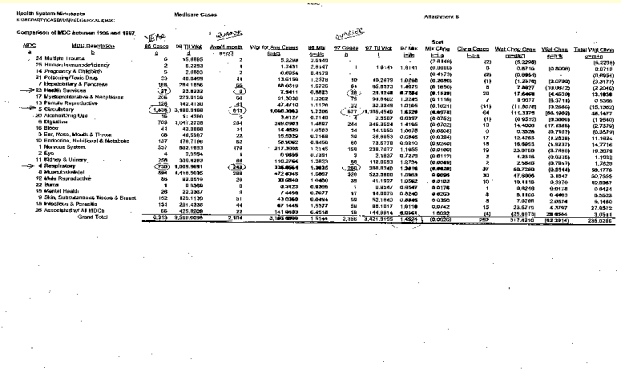
Statistics for Improvement

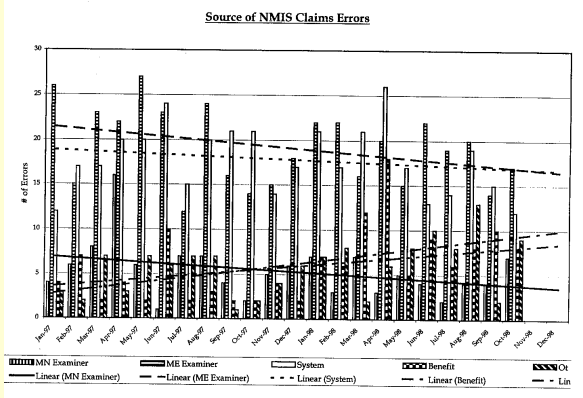
- Choose / define an issue in a process context
- Design & manage *a series of* simple, efficient data collections
- Use simple analysis / display methods understood by all organizational levels
  - Virtually 99.9+% graphical
- Assess a situation
  - The current state
  - Identify major opportunities—inappropriate & unintended variation
  - The effects of interventions
- Hold gains

Five "Everyday" Statistical Traps

- **Treating all observed variation in a time series data sequence as special cause.**
- **Fitting inappropriate "trend" lines to a time series data sequence. (*NEVER!*)**
- **Obsession with Normal distribution and "summary stats." [Note: *Never* mentioned]**
- **Choosing *arbitrary* cutoffs for "above" average and "below" average.**
- **Improving processes merely through the use of *arbitrary* numerical goals and standards.**
  - **"Is the 'gap' from the goal common or special cause?"**

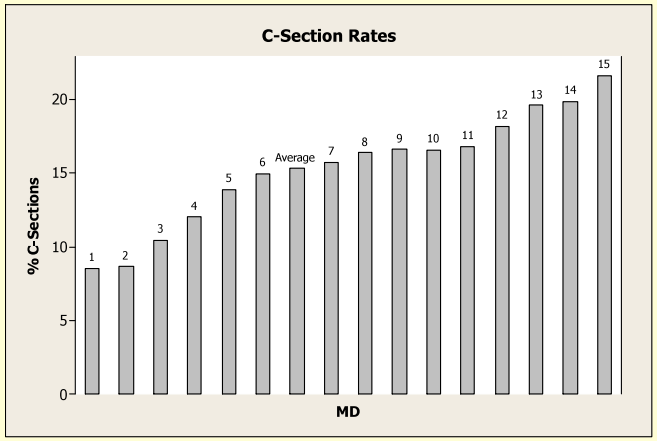
This…?



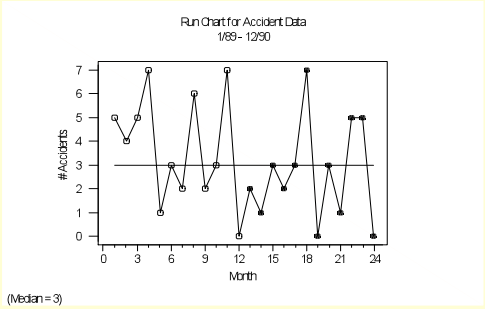


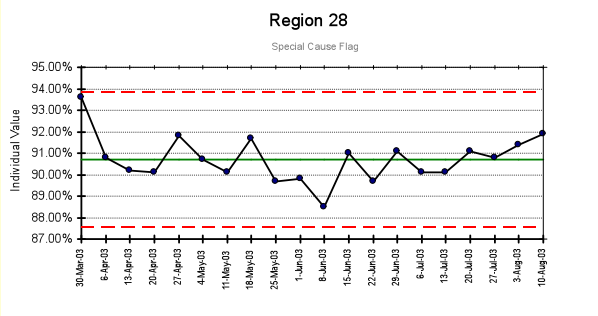
Indicator	Trust Status	A&E	Cancer	Crit Care	Medicine	O&G	Paeds	SR&T	Surgery	T&O
IP Activity	☺	☺	☺	☺	☺	😐	☺	😐	☺	☺
OP Activity	☺	☹	😐	😐	😐	😐	☺	☺	☺	☺
A&E 4 hr Wait	☹	☹								
IP >6 months	☹	☺	☺	☺	☺	☺	☺	☺	😐	☹
Op > 13 weeks	☹	☺	☺	😐	☺	☺	☺	😐	😐	☹

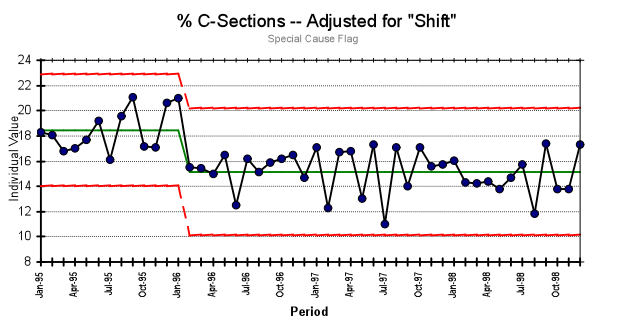
Kent and Medway	K&M	98.4%	96.7%	98.4%	97.3%	96.9%	96.4%
County Durham & Tees Valley	CDTV	96.7%	95.6%	96.5%	96.3%	94.7%	96.4%
Trent	Trent	96.7%	95.3%	96.7%	95.5%	94.0%	96.6%
Shropshire & Staffordshire	SASHA	97.9%	97.1%	98.1%	97.3%	97.5%	96.6%
Hampshire & the Isle of Wight	H&IOW	96.6%	95.9%	96.0%	96.7%	95.1%	96.7%
West Midlands South	WMS	97.0%	96.4%	97.6%	97.4%	96.1%	96.7%
Bedfordshire & Hertfordshire	Beds&Herts	96.6%	96.0%	96.7%	96.4%	95.2%	96.8%
Leicestershire. Northamptonshire & Rutlan	LNR	96.3%	96.2%	97.3%	96.9%	95.6%	96.8%
Birmingham & the Black Country	BBC	96.8%	95.8%	96.4%	96.6%	94.7%	96.9%
Surrey & Sussex	Sy&Sx	96.7%	96.7%	96.7%	97.0%	95.9%	97.5%
Greater Manchester	GM	96.7%	96.7%	96.5%	96.6%	95.9%	97.6%
Cumbria & Lancashire	C&L	98.0%	97.7%	98.1%	97.9%	97.7%	97.8%
South West Peninsula	SWP	97.2%	97.8%	97.2%	98.0%	97.8%	97.8%
Avon. Gloucestershire & Wiltshire	AG&W	96.8%	97.0%	96.4%	97.2%	96.2%	97.8%
Norfolk. Suffolk & Cambridgeshire	NSC	97.2%	97.7%	97.6%	98.0%	97.4%	98.1%

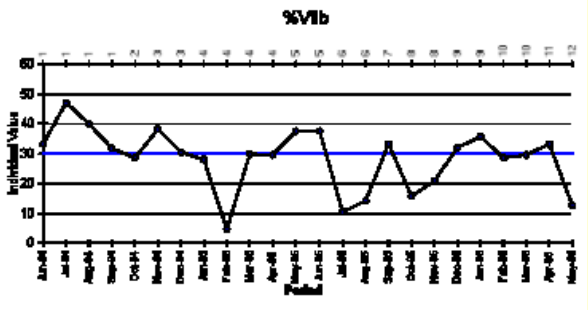


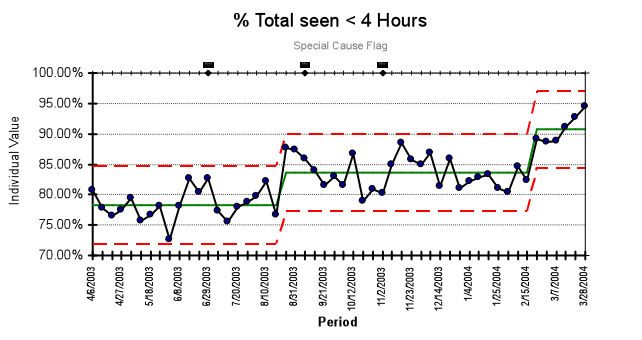
...or this?

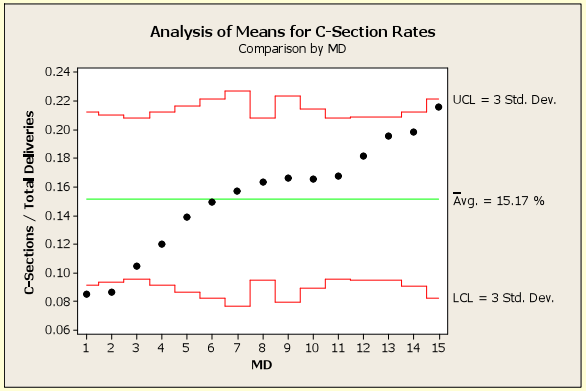

Run Chart for Accident Data
1/89 - 12/90
#Accidents
Month
(Median = 3)


Region 28
Special Cause Flag
Individual Value

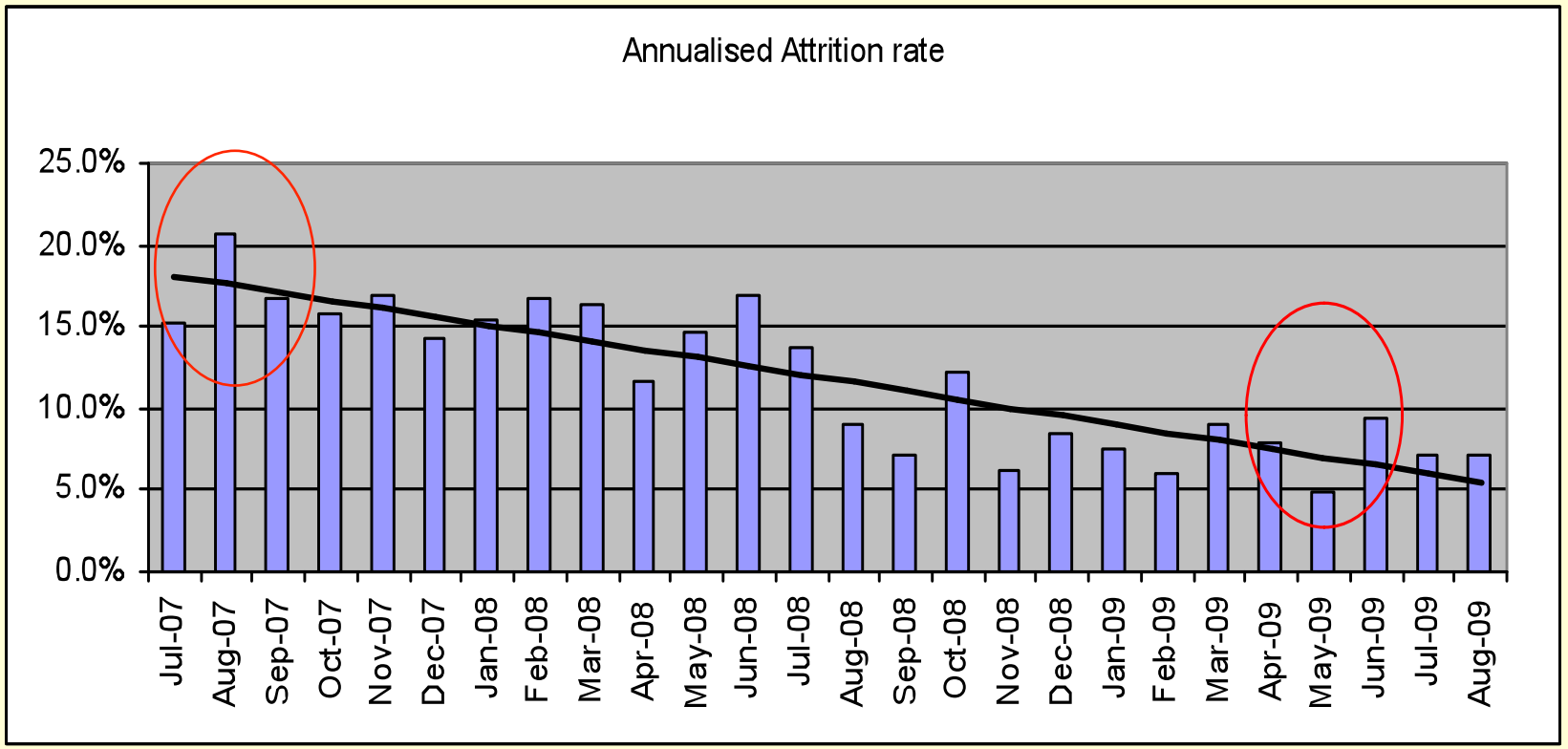

% C-Sections -- Adjusted for "Shift"
Special Cause Flag
Individual Value
Period


%Vlb
Individual Value

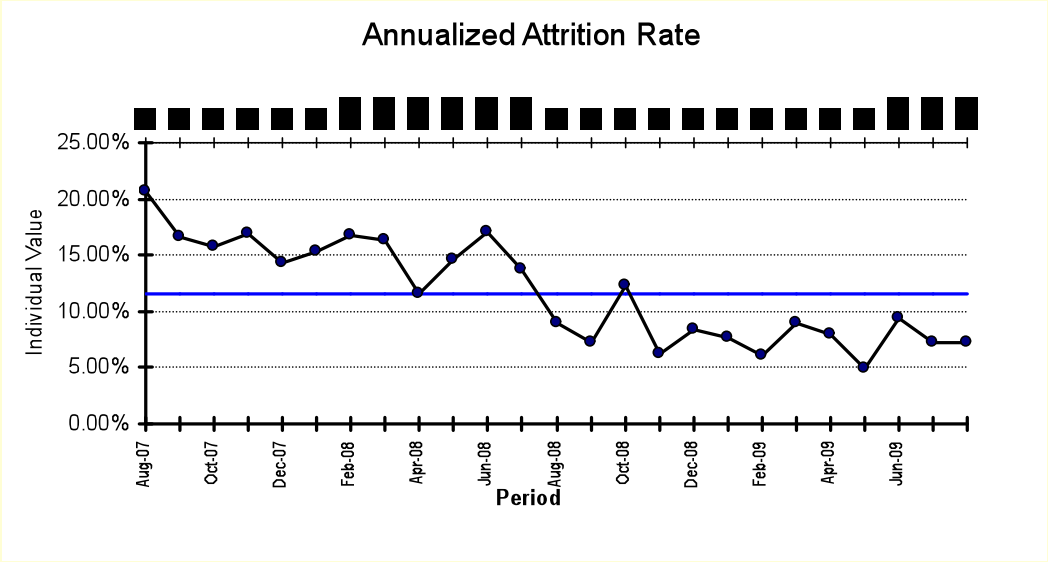

% Total seen < 4 Hours
Special Cause Flag
Individual Value
Period

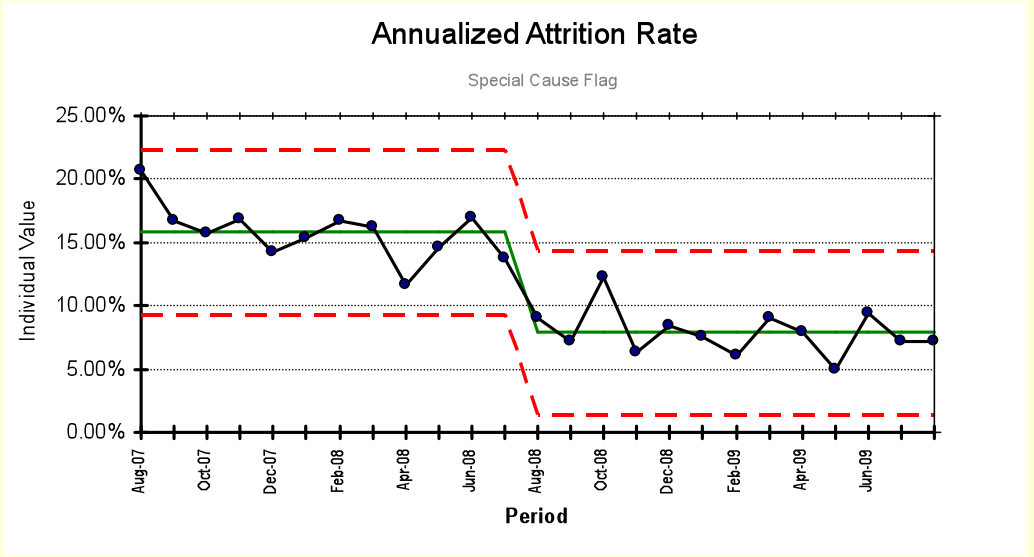

Analysis of Means for C-Section Rates
Comparison by MD
C-Sections / Total Deliveries
UCL = 3 Std. Dev.
Avg. = 15.17 %
LCL = 3 Std. Dev.
MD

This…

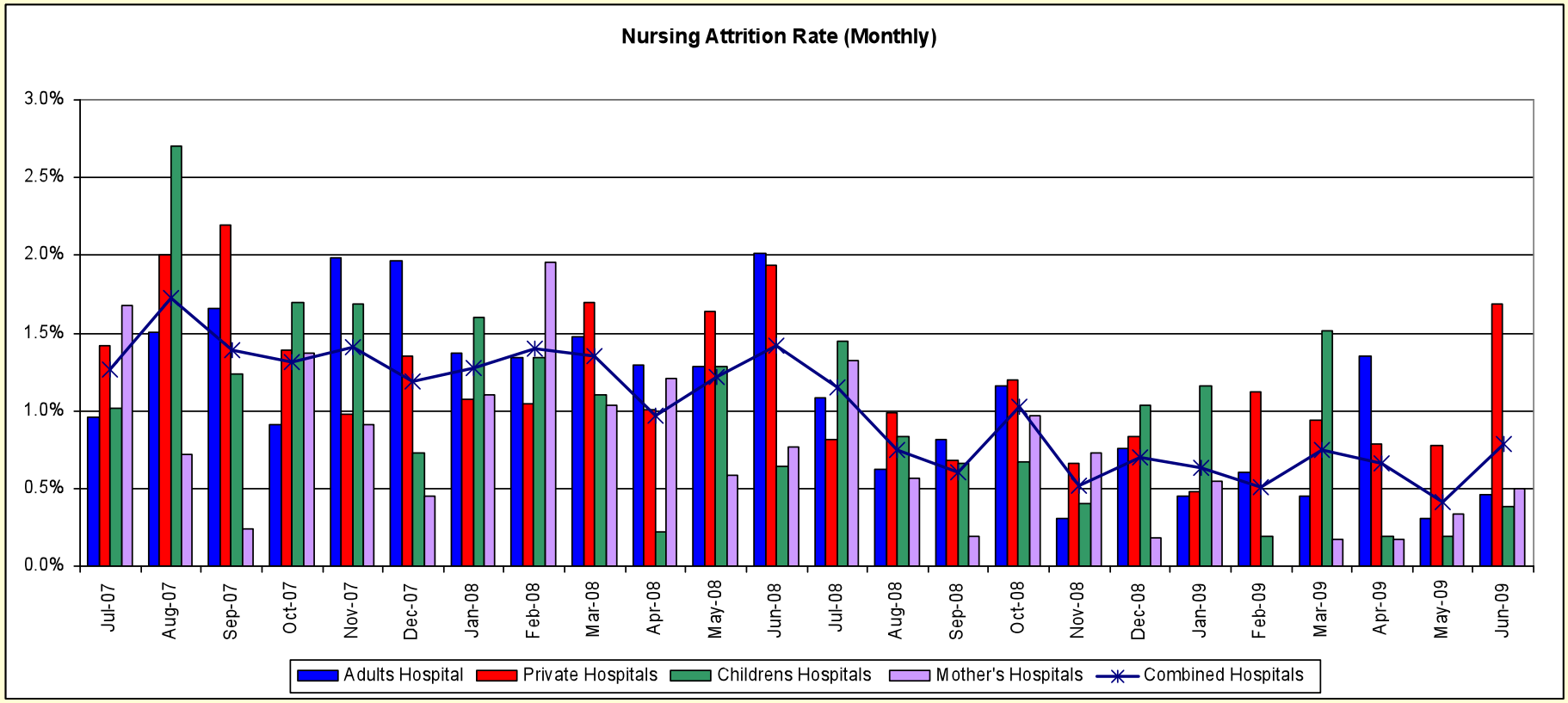

Annualised Attrition rate
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Feb-08
Mar-08
Apr-08
May-08
Jun-08
Jul-08
Aug-08
Sep-08
Oct-08
Nov-08
Dec-08
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09

…or this?

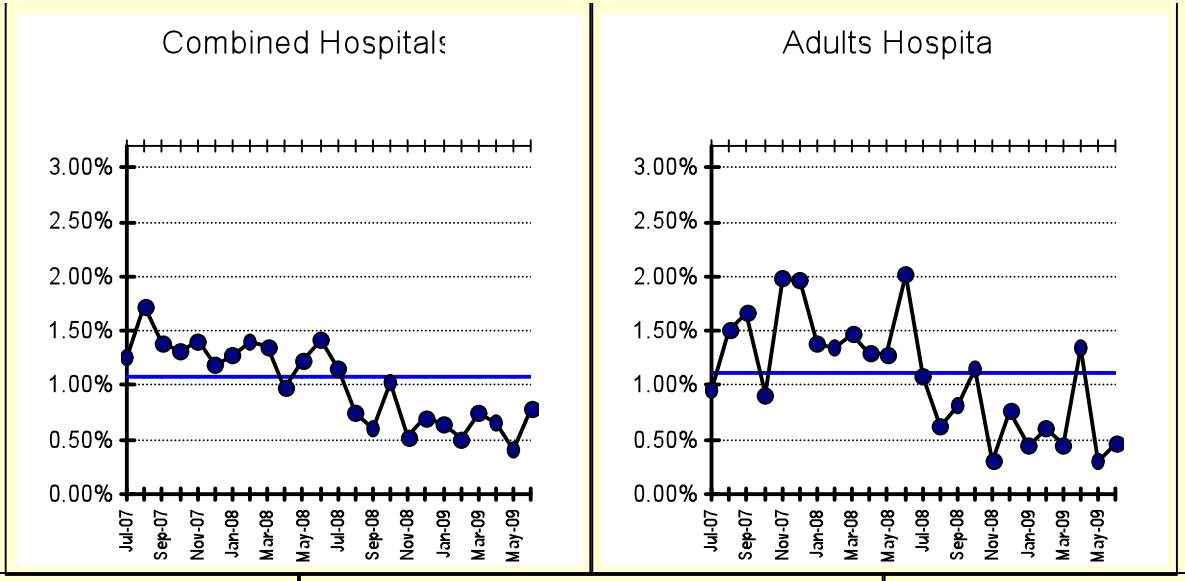

Annualized Attrition Rate
Individual Value
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
Aug-07
Oct-07
Dec-07
Feb-08
Apr-08
Jun-08
Aug-08
Oct-08
Dec-08
Feb-09
Apr-09
Jun-09
Period


Annualized Attrition Rate
Special Cause Flag
Individual Value
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
Aug-07
Oct-07
Dec-07
Feb-08
Apr-08
Jun-08
Aug-08
Oct-08
Dec-08
Feb-09
Apr-09
Jun-09
Period

This…


Nursing Attrition Rate (Monthly)
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
Jul-07
Aug-07
Sep-07
Oct-07
Nov-07
Dec-07
Jan-08
Feb-08
Mar-08
Apr-08
May-08
Jun-08
Jul-08
Aug-08
Sep-08
Oct-08
Nov-08
Dec-08
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Adults Hospital
Private Hospitals
Childrens Hospitals
Mother's Hospitals
Combined Hospitals

...or this?


Combined Hospitals
Adults Hospita
Private Hospitals
Childrens Hospitals
Mother's Hospitals
3.00%
2.50%
2.00%
1.50%
1.00%
0.50%
0.00%
Jul-07
Sep-07
Nov-07
Jan-08
Mar-08
May-08
Jul-08
Sep-08
Nov-08
Jan-09
Mar-09
May-09

Suggestions when you go back

- Individual run charts of various "incidents"
- Run chart of "total number of RCA, 'sentinel event,' and 'near miss' incidents"
  - IF COMMON CAUSE: Pareto matrix?
- Run chart of "time between *any* RCA, sentinel event, or 'near miss' event"

Are you "perfectly designed" to have "incidents?"

GOOD LUCK…

- …and PLEASE keep in touch!
- I have an all-day Data Sanity seminar that includes the Excel macro
- davis@dbharmony.com
- Please check out my book (Amazon):

  Data Sanity: A Quantum Leap to Unprecedented Results

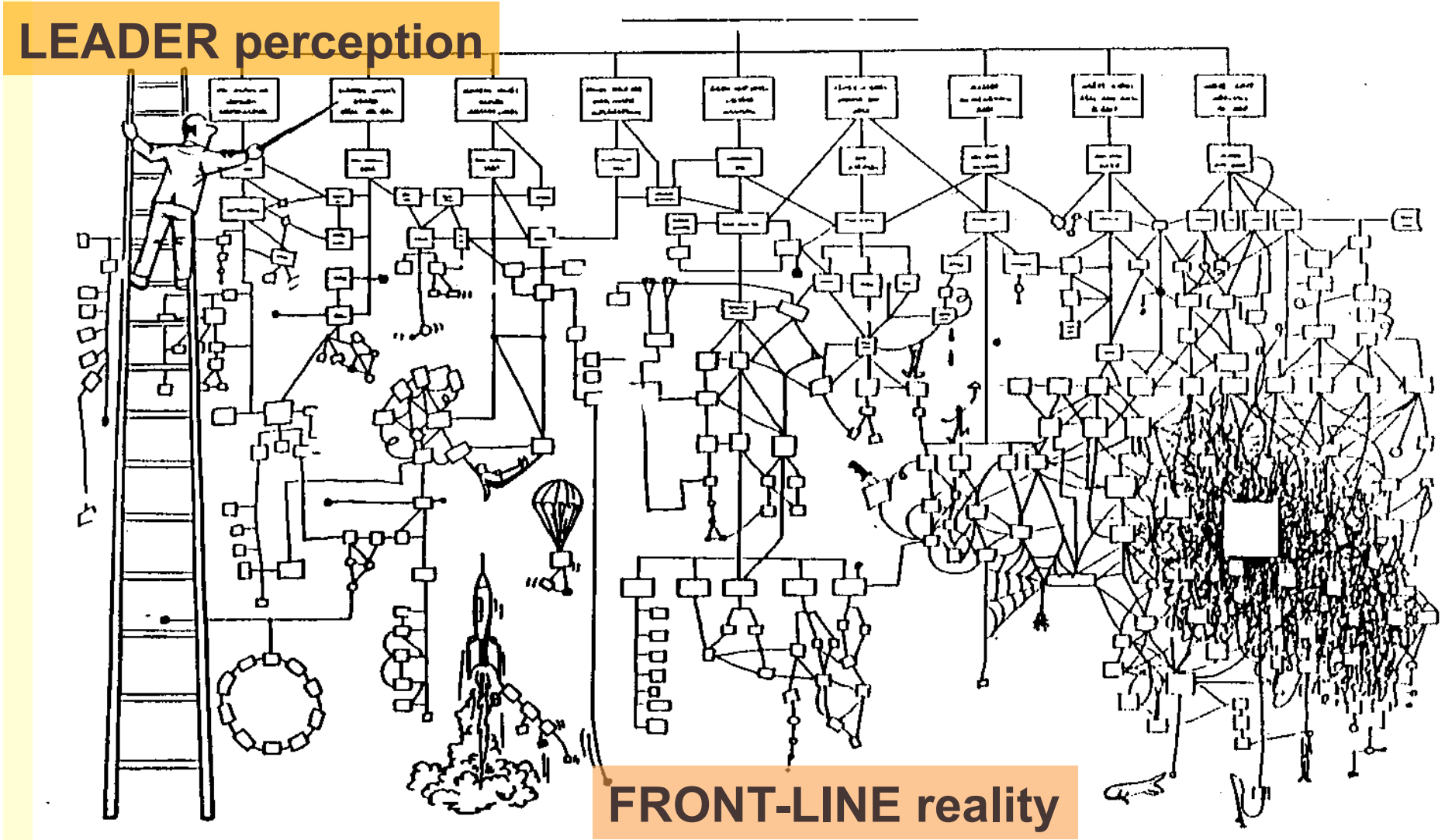
  - Email me for Preface or Chapter summaries

  Don Berwick wrote the Foreword

Don Berwick: 1995 Forum Plenary

"Plotting measurements over time turns out, in my view, to be one of the most powerful devices we have for systemic learning... Several important things happen when you plot data over time. First, you have to ask what data to plot. In the exploration of the answer you begin to clarify aims, and also to see the system from a wider viewpoint. Where are the data? What do they mean? To whom? Who should see them? Why? These are questions that integrate and clarify aims and systems all at once…When important indicators are continuously monitored, it becomes easier and easier to study the effects of innovation in real time...Pick a measurement you care about and begin to plot it regularly over time. You won't be sorry."

Your culture awaits…



Your culture awaits…