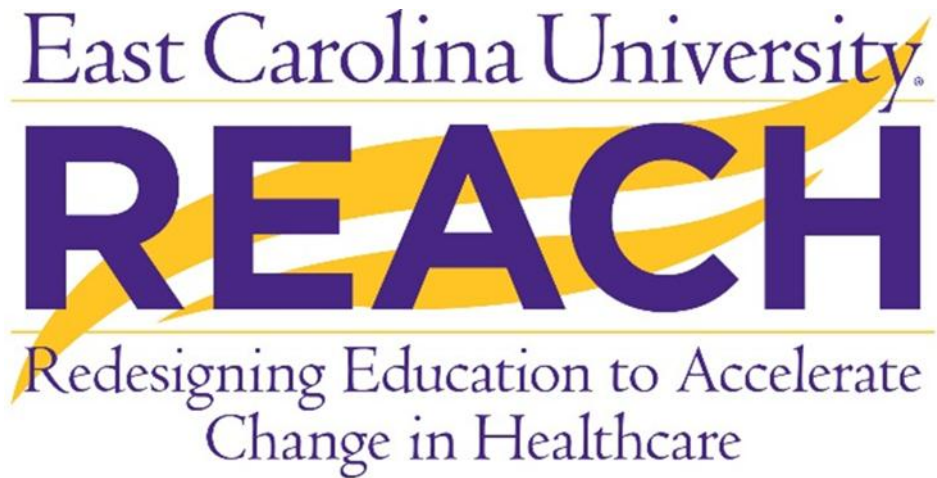# "Just-In-Time" Self-Study Modules and Data Analytics for Quality Improvement

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THOMAS K. ROSS, PHD

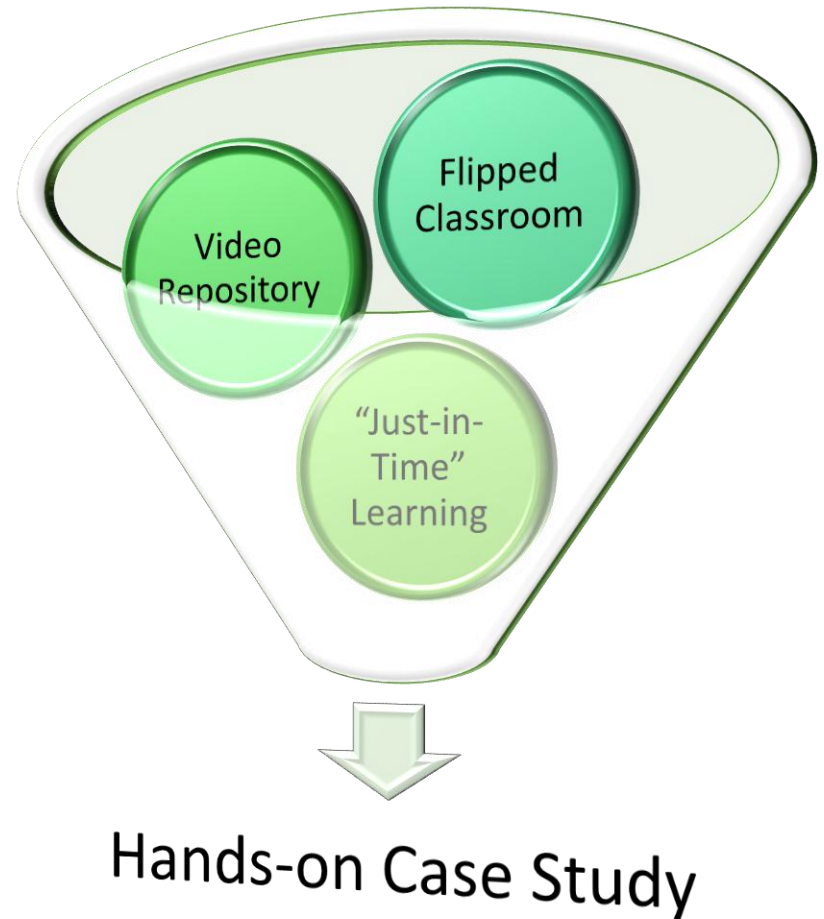# TEACHERS OF QUALITY ACADEMY
MEDICAL EDUCATION DAY
APRIL 22, 2015

Rationale

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

Hands-on Case Study

Flipped Classroom
Common Themes

Content delivery and assimilation outside of the classroom

Technology enabled
- Course management software
- Video lessons
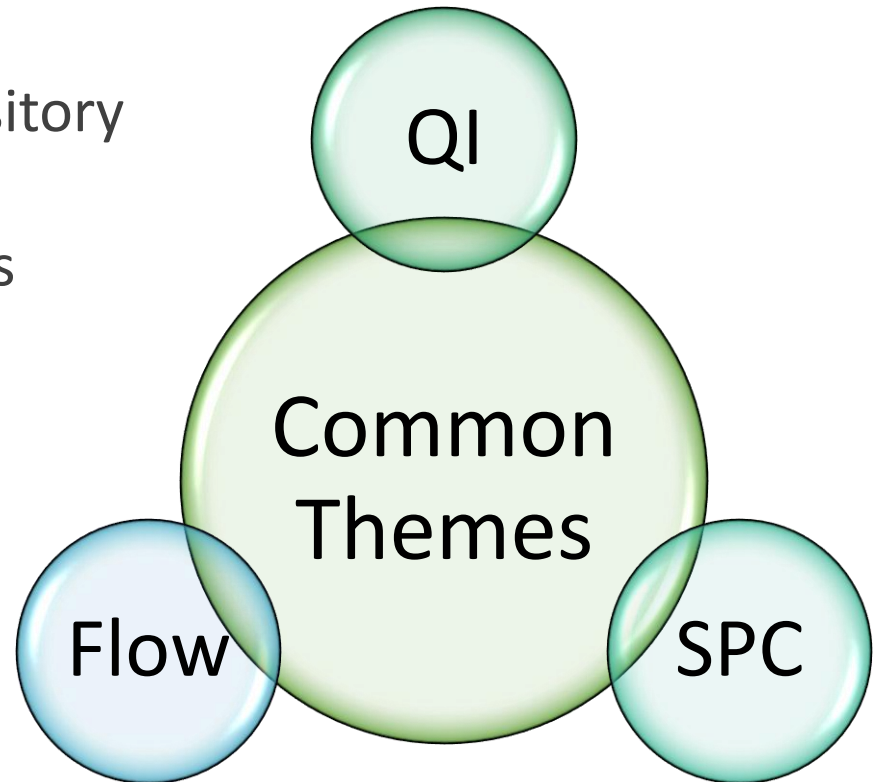
Reinforcement of learning in-class

Video Repository
My Vision

Lessons delivered repeatedly should be
- Captured on video
- Stored in a common repository
- Shared within the
  Division of Health Sciences

QI

Common Themes

Flow

SPC

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
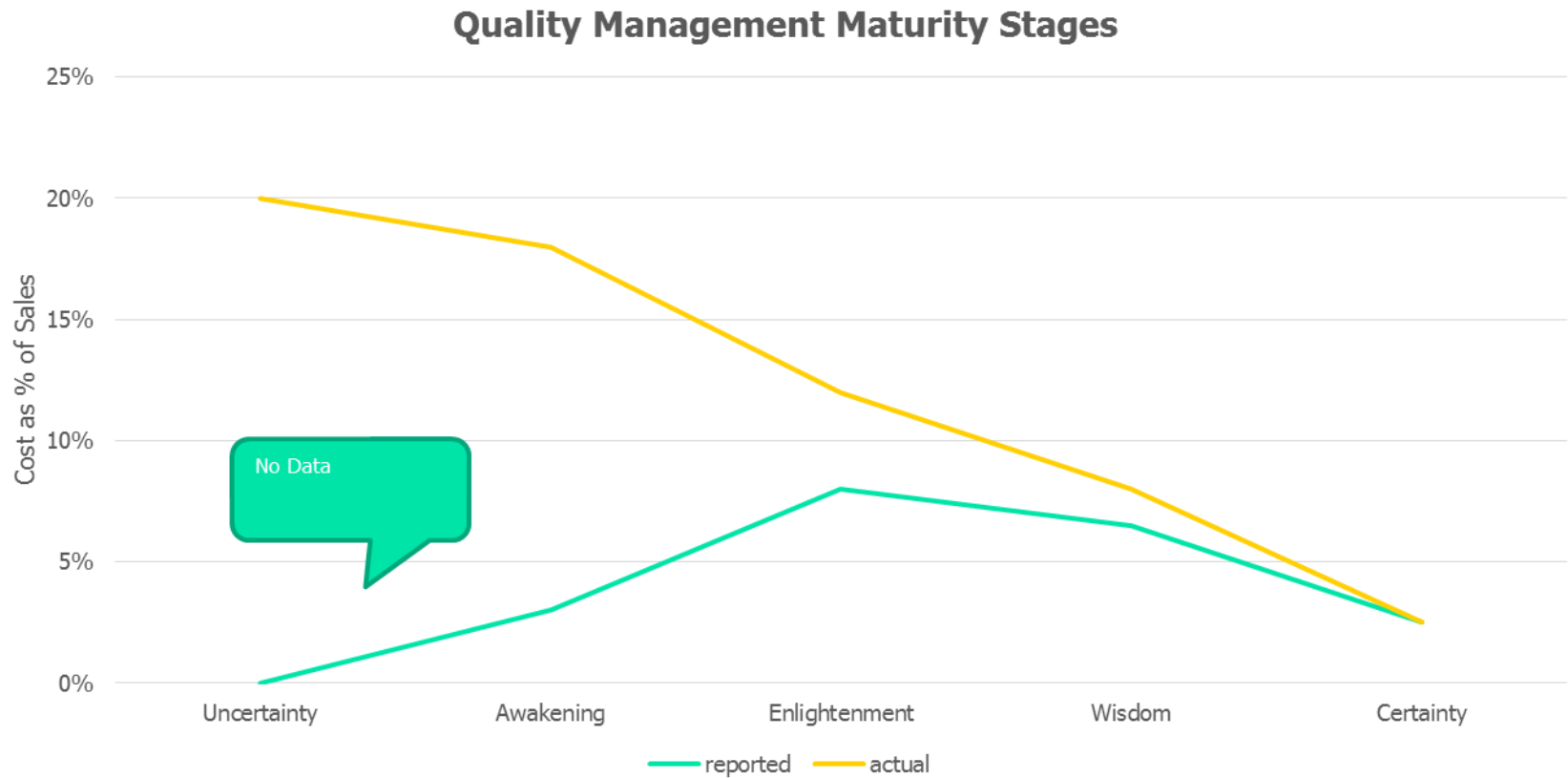
Let the Data Speak

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

The Data

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

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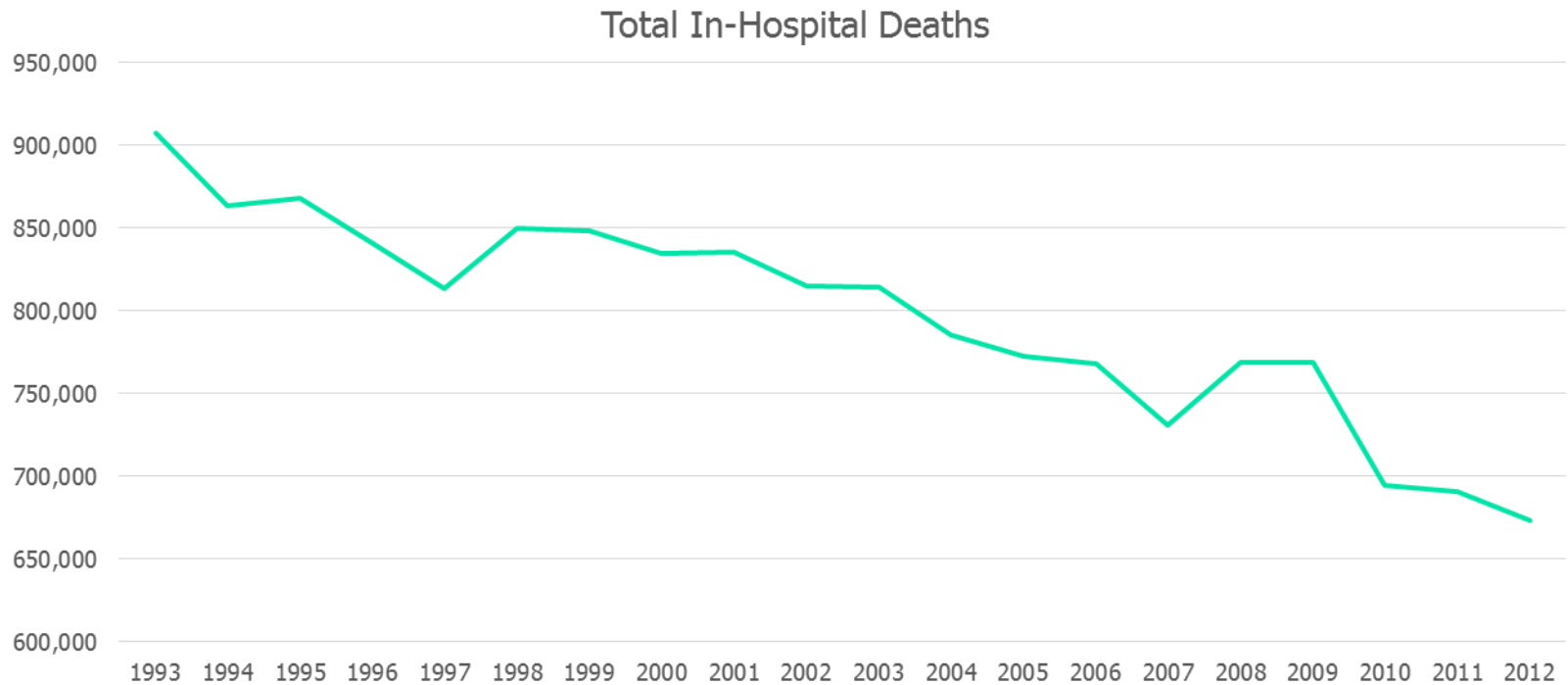
- Highlight data
- Select INSERT
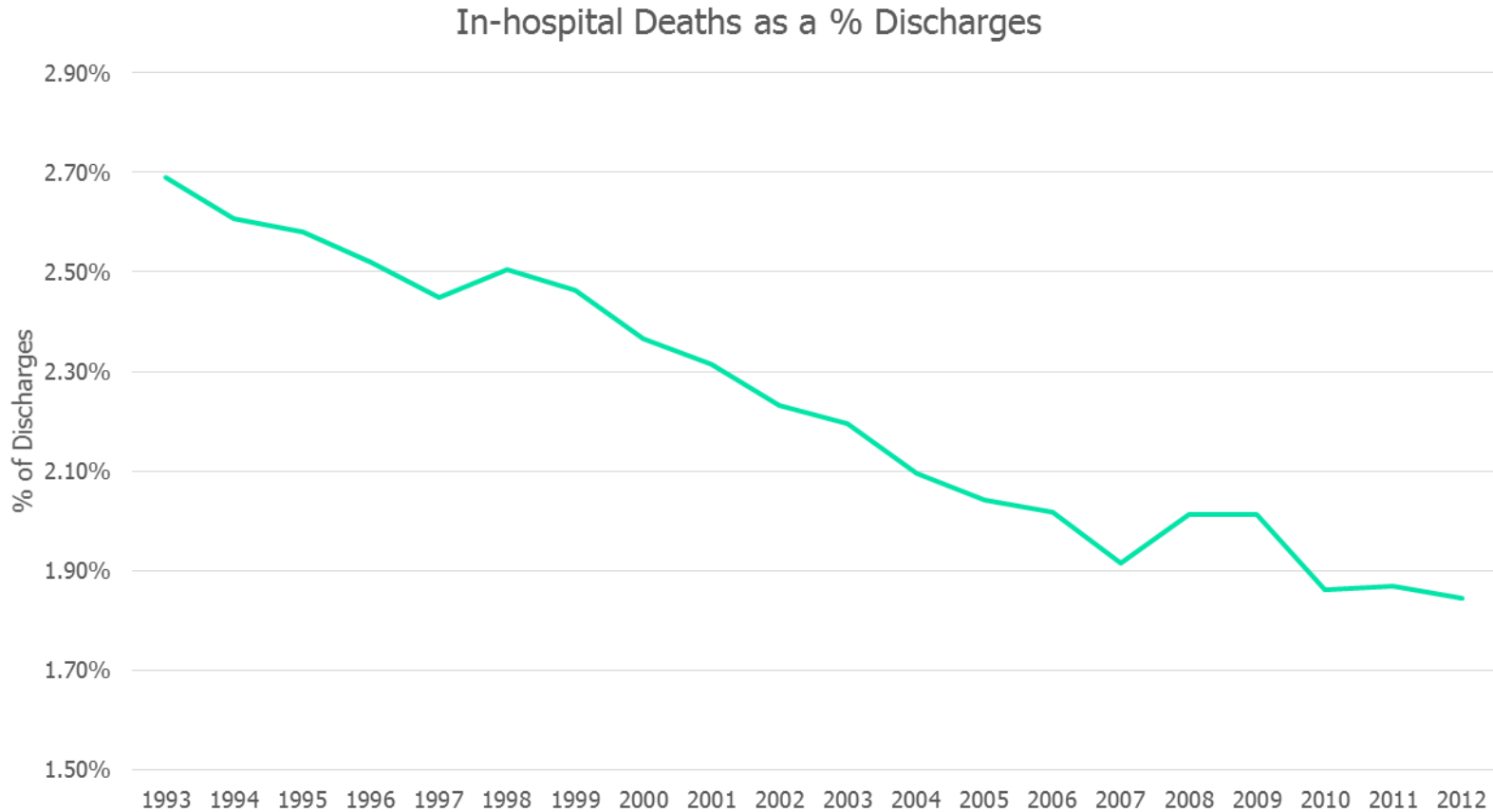- Select Insert Line Chart
- Select 2D or 3D line

EXCEL DEMOS

A Different View of the Data

Total In-Hospital Deaths

A Third View of the Data

In-hospital Deaths as a % Discharges

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

State	Error Rate	Lethality	% Preventable
CO/UT	2.9%	6.6%	68.4%
NY	3.7%	13.6%	59.0%

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."
                    Wachter and Provonost, 2006, 622-3.

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

$$34,400,000 \ * \ 69\% \ * \ 0.89\% \ = \ 210,000$$

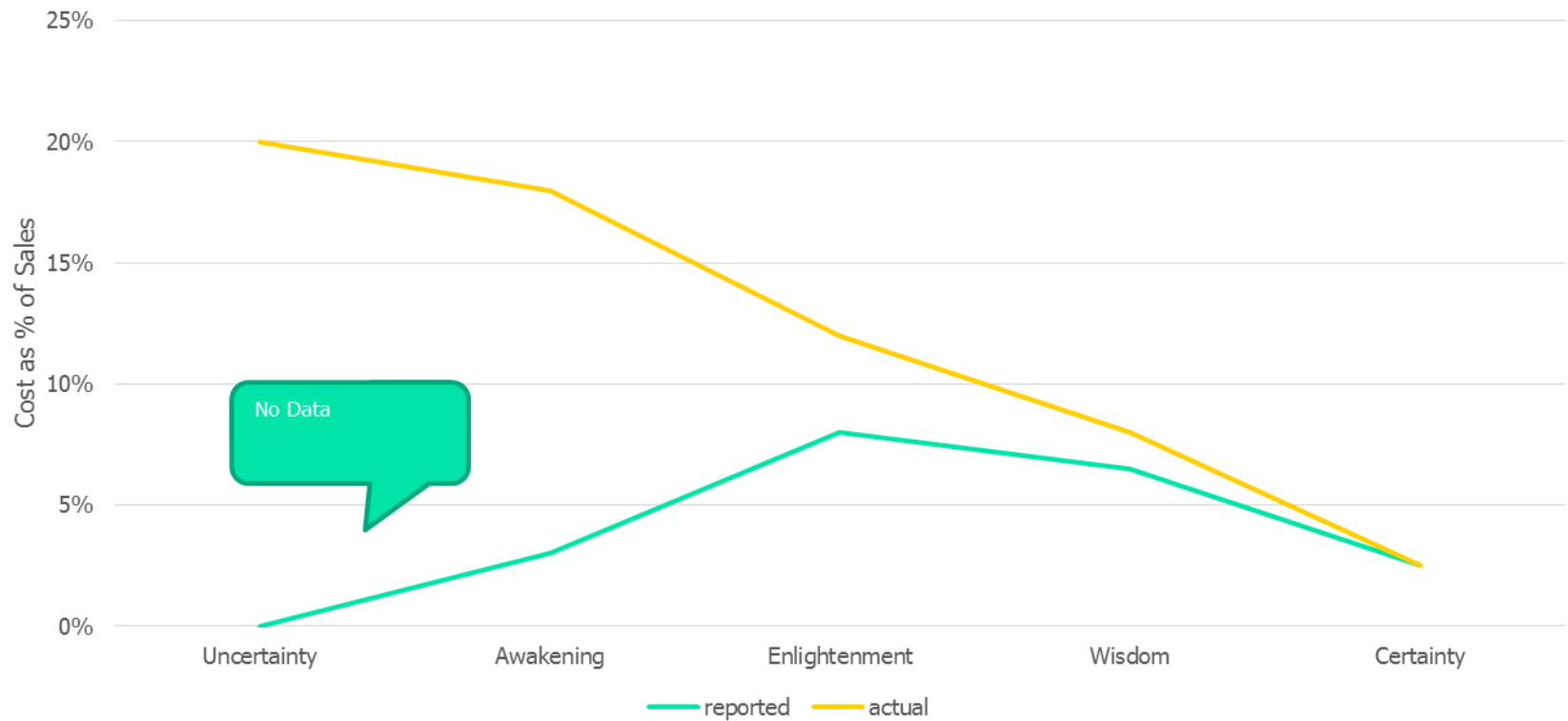"although it is probably an understatement, a minimum estimate of a 2-fold increase...", James, 2013, 127 (+ 20,000).

Eureka! 440,000

Variability in lethality: 5.3% - 21.4%

Variability in % preventable: 44% - 100%

Crosby's Management Maturity Stages

References

Crosby P, 1979, *Quality is Free*, McGraw-Hill Book Company, New York, NY.

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

Berwick D , Hackbarth A, & McCannon CJ, 2006, IHI Replies to "The 100,000 Lives Campaign: A Scientific and Policy Review", Journal on Quality and Patient Safety, 32 (11), 628-633.

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.

Wachter R and Provonost P, 2006, The 100,000 Lives Campaign: A Scientific and Policy Review, Journal on Quality and Patient Safety, 32 (11), 621-627.

James J, 2013, A New, Evidence-base Estimate of Patient Harms Associated with Hospital Care, Journal of Patient Safety, 9 (3), 122-128.

Acknowledgements