Innovation In Performance Improvement:

Use of External Benchmarks to Improve Performance

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What is PI?

- Many view it as a burden
  - An exercise they carry out to satisfy site visitors
  - Paperwork and meetings
  - Chasing down people to attend
  - Making sure minutes look good
  - Making sure sign-in sheets don’t get lost
  - Boring

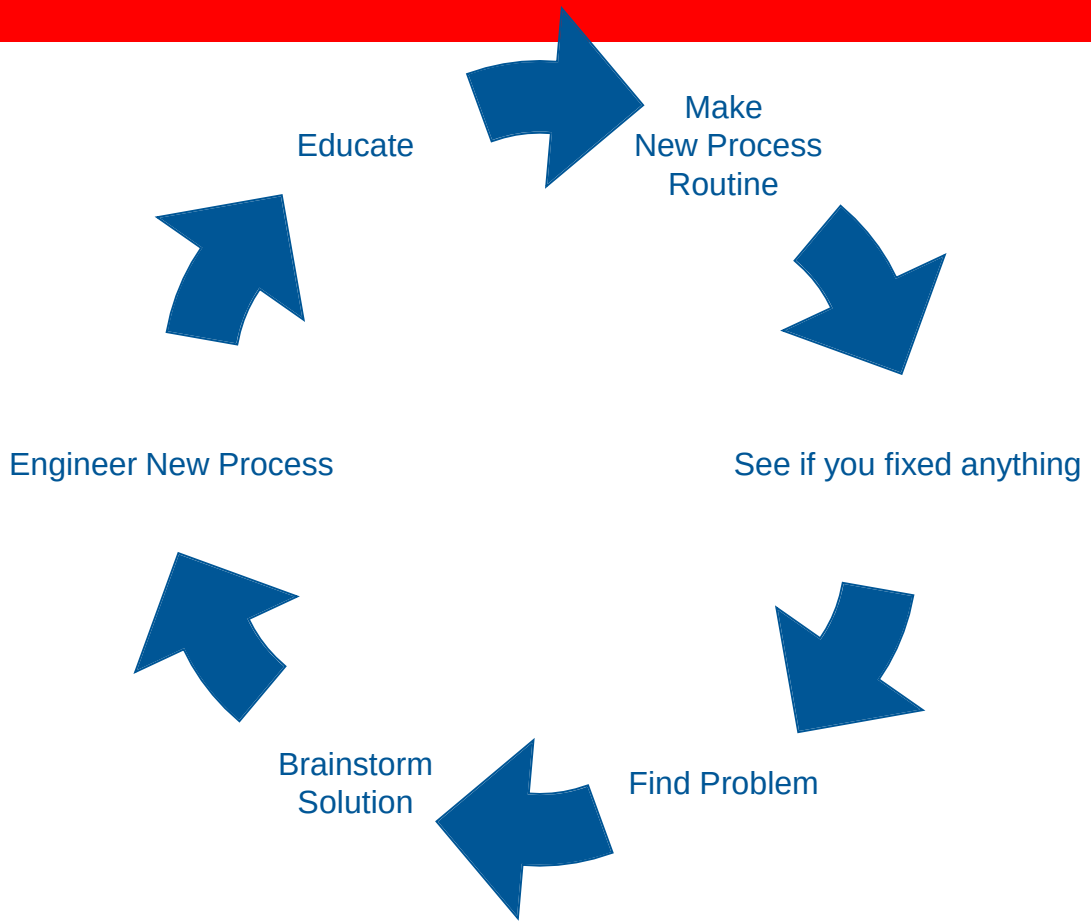
PI

- Much of this is our fault
  - We never really engaged people in what PI really should be or what it could be
  - Good PI is much more like engineering than medicine
    - Figuring out how things work
    - Looking for the key factors that affect performance
    - Discovering how to put the right part in the right place to make things work better

Mechanics of PI

- Leadership
  - Can and should be collective, not just one person
- Finding problems
  - People should feel comfortable to report problems
    - Need a mechanism to do this efficiently
  - Filters to look at frequent processes
  - Looking at potential system failures
    - Mortality is important but near misses could be more important
- Fixing problems and making sure they stay fixed

Mechanics of PI



Typical PI System

- Review your deaths
- Look at things when things blow up
  - Bad outcome
  - Near miss
  - Angry service
  - Angry TMD

Deaths and Preventability

- The way we have demanded that deaths be characterized may actually be harmful to PI
  - If there are people to be blamed then go ahead and blame them, but don't let that get in the way of learning lessons from cases
- Many programs spend time arguing about the preventability of a death, when it is usually irrelevant

Preventability

- Also our ability to determine preventability is VERY inexact
  - Usually a WAG
  - If its so inexact why make it such an essential part of the process?
- Much easier for people to accept opportunities for improvement
  - Though this can still be inexact

Preventability and Opportunities for Improvement

- Either a case has OFI's or it doesn't
  - It is often easier to accept that there is an OFI than it is to classify something as a preventable death
- Just saying something is preventable or non-preventable doesn't increase or decrease the burden of finding problems and fixing them

Examples

- 79 year old admitted to ED after fall, has large SDH with 1 cm midline shift, GCS 3, left pupil blown
  - Patient seen by neurosurgery, felt to be hopeless and care withdrawn
  - Simple, non-preventable death

Example

- But patient waited 55 minutes for initial CT
- FFP was ordered but not administered for 75 minutes
- Patient not intubated on arrival despite meeting indications for intubation
  - Intubated in scanner following sat drop
- ALL ARE OFI's, all could be glossed over if you only look at preventability

Example

- If this was a 20 year old with a smaller subdural would we have lost the patient?
- Unless everyone was dragging their feet from the beginning (which they shouldn't have been) the care was sub-par
- If this was your mother or father would you have been happy with the way their treatment unfolded?

Example

- Should use every case as an opportunity to find problems in your system
- This is why on site visits the first cases I look at are the non-preventable death file
  - It tells you how robust their PI system is
  - Tells you about their focus and desire to find problems

Fixing Problems:
Do you have a system?

PI System and Ability to Fix Problems

- A lot at this point depends on the organization of your system
  - If your care delivery is mostly random (EM attendings, surgery attendings, and residents do not handle the same situation similarly) you will spend a great deal of time looking at cases, because each case will be different
    - No two patients with splenic injury will be handled the same
  - Fixing the system in this situation is hard but not impossible

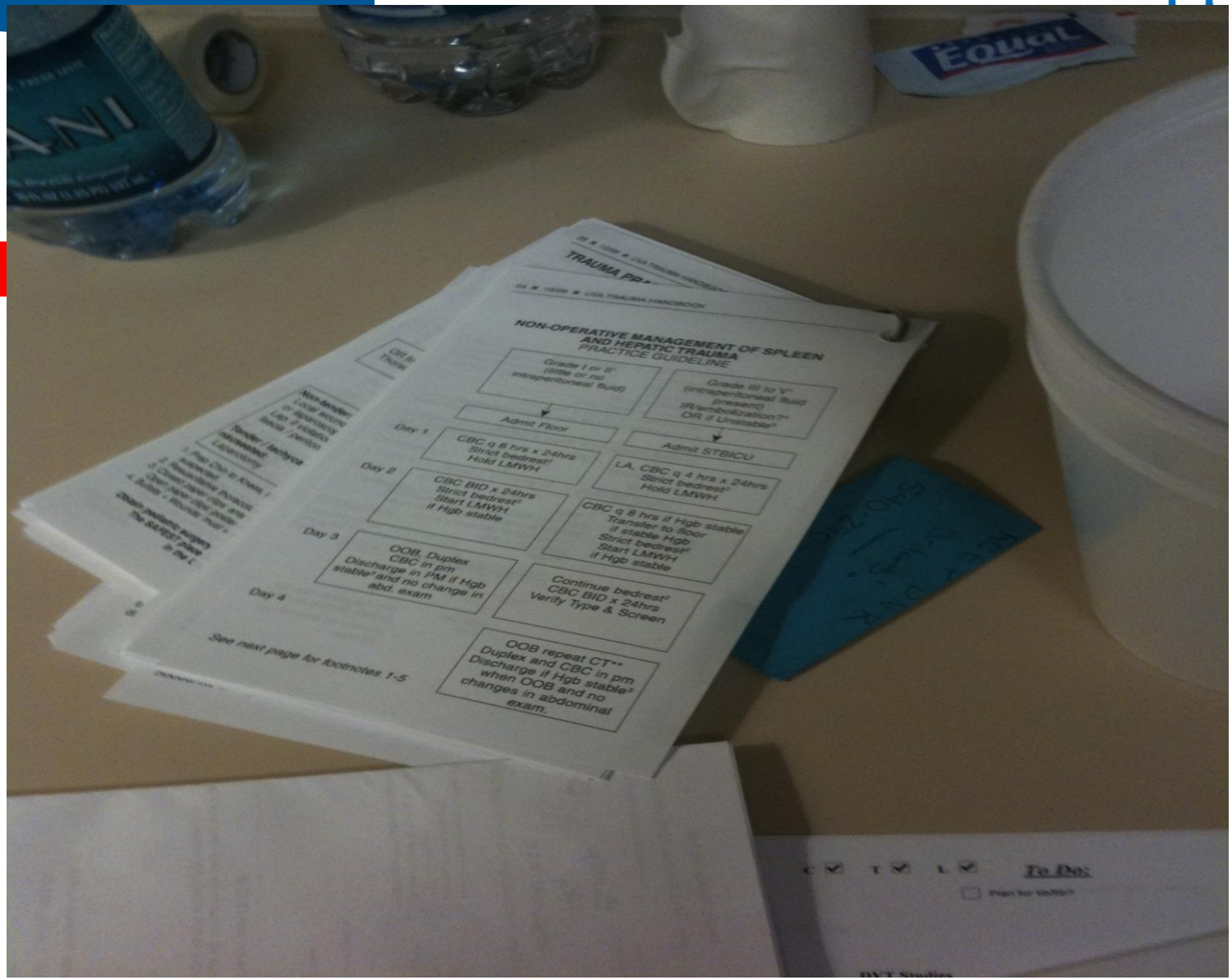
Typical PI Process

- Next level
  - Control of routine processes of your system
  - *A guideline is just a tool to measure variation*
    - *Brent James, MD*
  - So creation of guidelines helps you measure variation
    - Without that tool, you will have difficulty fixing things (since if you fix one type of case, you wont fix the next)
    - Only if cases are being handled in a consistent manner, can you carry out change that will affect groups of patients

Guidelines

- *"If three professors sitting in a room with coffee at 2pm cant figure out how to take care of a type of patient, how can a resident figure it out in the middle of the night?"*
- Does not mean you regiment every aspect of care
  - You control variation of those things that really don't need to vary (likely over 90% of decisions)
  - Leave *controlled* judgment for the other 10%
    - People can improvise within set parameters of escalation and good practice


STICU
Quality
Note-
book
FY
2004
STICU
Quality
Notebook
FY
2002-2003
Volume 1
CARLOS
227-1278


NON-OPERATIVE MANAGEMENT OF SPLEEN AND HEPATIC TRAUMA
PRACTICE GUIDELINE
Grade I or II
(little or no intraperitoneal fluid)
Grade III to V
(intraperitoneal fluid present)
IR embolization
OR if Unstable
Admit Floor
Admit STBICU
Day 1
CBC q 8 hrs x 24hrs
Strict bedrest
Hold LMWH
LA, CBC q 4 hrs x 24hrs
Strict bedrest
Hold LMWH
Day 2
CBC BID x 24hrs
Strict bedrest
Start LMWH
if Hgb stable
CBC q 8 hrs if Hgb stable
Transfer to floor
if stable Hgb
Strict bedrest
Start LMWH
if Hgb stable
Day 3
OOB, Duplex
CBC in pm
Discharge in PM if Hgb stable and no change in abd. exam
Continue bedrest
CBC BID x 24hrs
Verify Type & Screen
Day 4
OOB repeat CT
Duplex and CBC in pm
Discharge if Hgb stable when OOB and no changes in abdominal exam.
See next page for footnotes 1-5
To Do:

Controlling Variation

- Create guidelines that people accept
  - Consensus not unanimity
  - Sometimes you have to dictate, especially if no one will engage in the process
- Get it out and educate
  - Single email is useless
- Reinforce the guidelines every day
  - “When did the lactate clear?”
  - “Was the neck CTA normal?”
  - “Is Optho on board?”
  - “What did spine say?”

Coaching the Guidelines

- Rex Ryan vs. Mike Shanahan
  - Is it better to be loved or feared?
    - Little of both
  - Is perfect care the goal?
    - Maybe
    - But you need to choose those things you think are ABSOLUTELY ESSENTIAL to safe care and have zero tolerance for missing those
    - As far as the others, I think you need to encourage and teach, but not everything has equal importance

Variation

- Until you control your variation, don’t even look at outside benchmarks
  - Other than to tell you your care is sub-par
  - If its shows your care is great, you are one lucky program
- If you cant deal with things in a consistent manner, you cant make changes
  - Must control variation first
  - Its just common sense

The Beauty of External Benchmarking

- Lots of people and programs think they are awesome
  - For no tangible reason other than that is what they think
- When you get to the bottom of a lot of quality problems, you find an inflated sense of performance at the center
  - That's why people don't listen to criticism
  - Its why they don't take a hard look at what they do
  - Its why they say all external data is "wrong"

Starting with Probability of Survival

- It introduces your program to the concept of *expected* outcomes
  - How are they derived?
  - What factors contribute to the metric?
  - Where do we stack up?
- Provides a useful entry into much more robust external benchmarking

External Benchmarking

- Where can you start?
  - NTDB
    - Not yet providing enough specific risk adjusted outcomes to benchmark
  - TQIP
  - The Literature

SMARTT

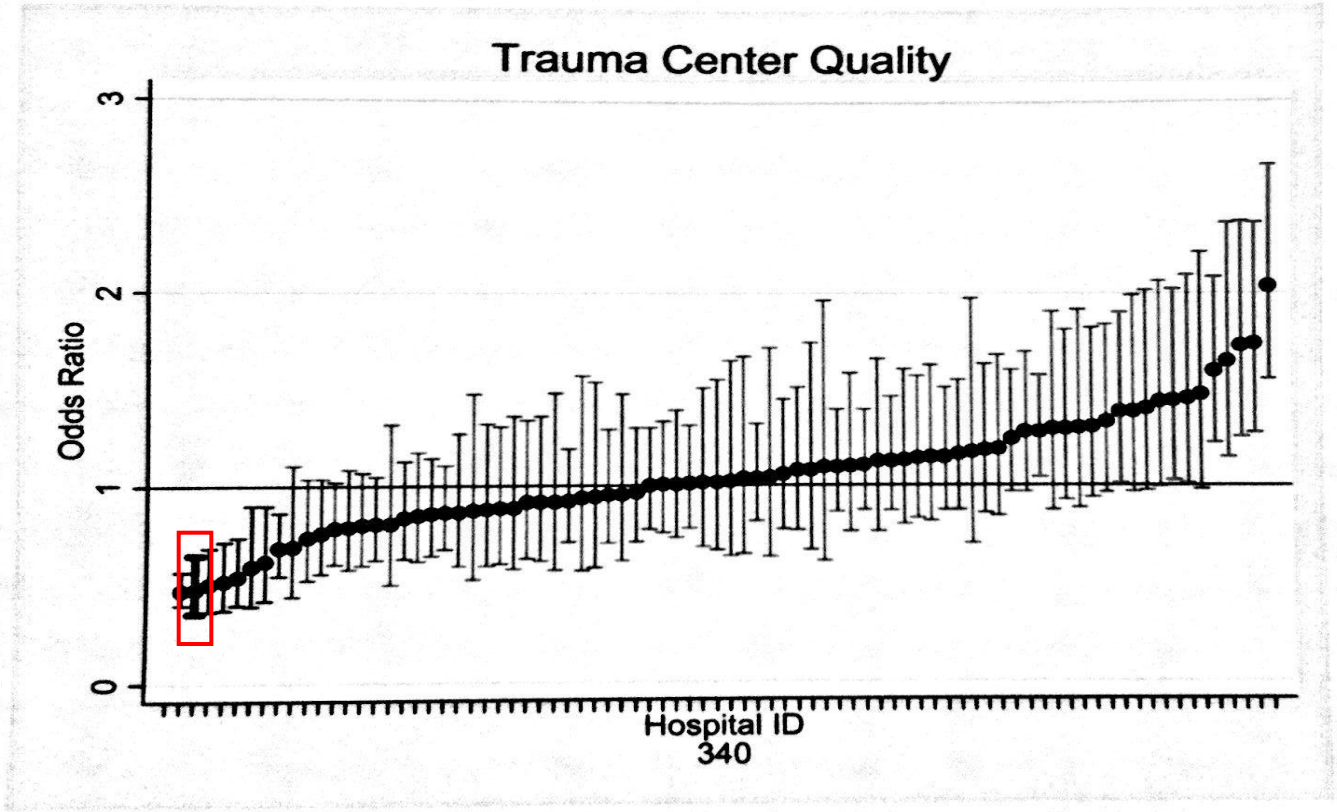
- The Survival Measurement and Reporting Trial for Trauma
  - Uses NTDB data
  - Includes 125 centers and provides annual report on risk-adjusted mortality
  - Results blinded
  - Excellent trauma mortality probability model
    - Developed by Turner Osler
    - Uses 5 most severe injuries augmented with age, gender, mechanism, motor GCS, SBP, and transfer status

SMARTT

- Provides data on
  - Overall trauma center quality
  - Blunt trauma
  - GSW trauma
  - MVC trauma
  - Pedestrian trauma
  - Very low risk patients
  - Very high risk patients

SMARTT 2006

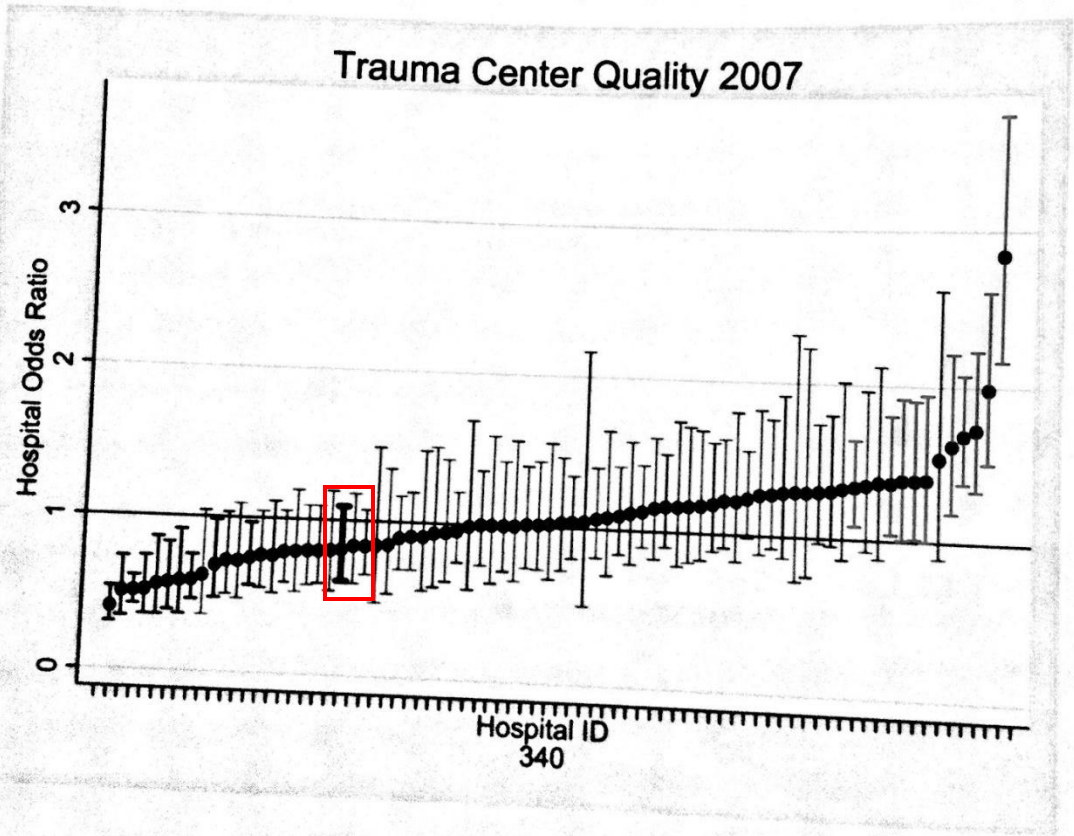
Figure 1. Hospital Odds Ratio based on all Trauma Cases.



Vertical bars represent the 95% confidence interval. Hospitals whose quality is below

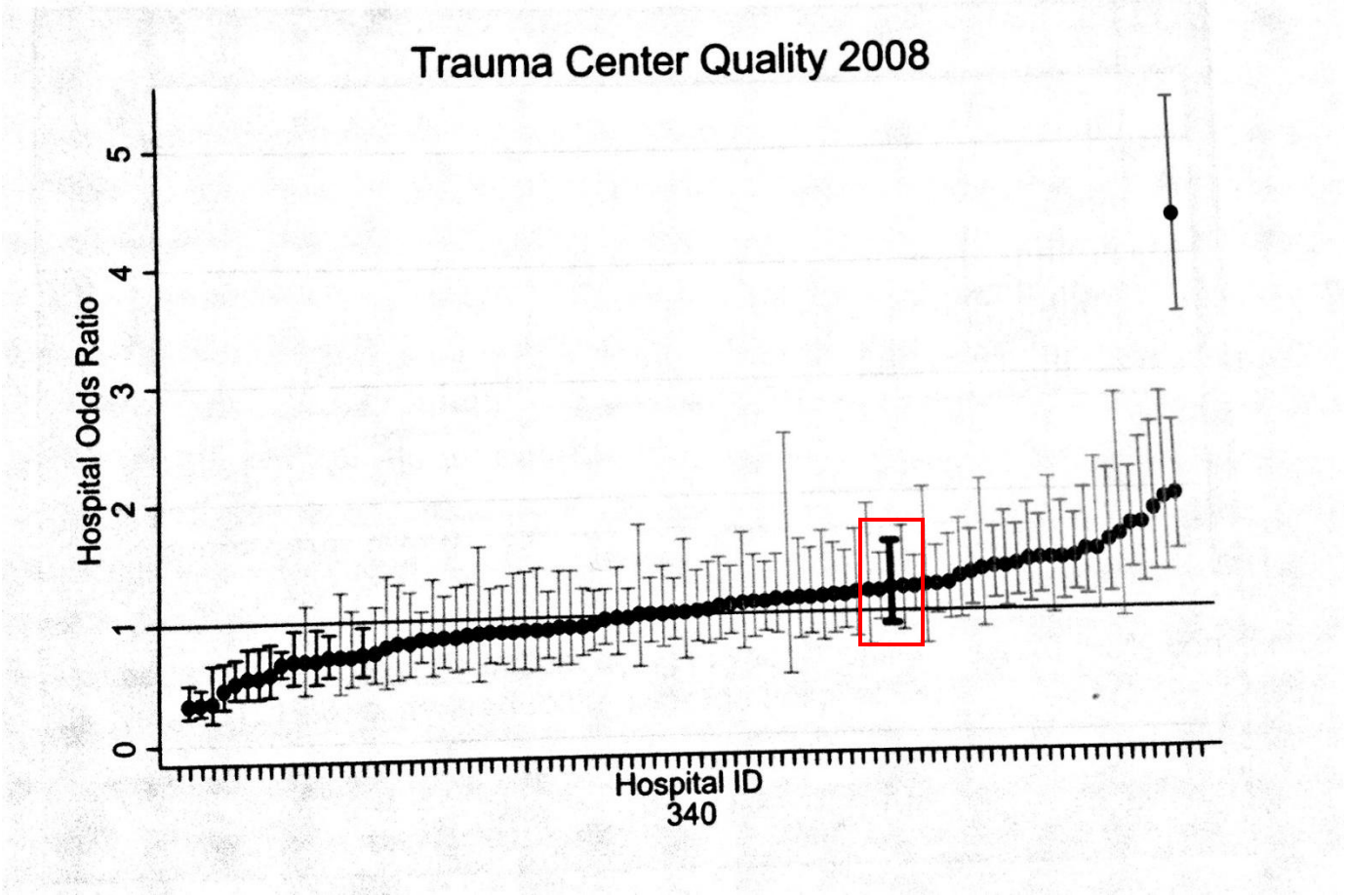
SMARTT 2007

Figure 1. Hospital Odds Ratio based on all Trauma Cases.



Vertical bars represent the 95% confidence

SMARTT 2008


Trauma Center Quality 2008
Hospital Odds Ratio
0
1
2
3
4
5
Hospital ID
340

External Benchmark - SMARTT

Happy initially, grew less happy

Changes in program over time period

- 2006 – Program had been under one surgeons direction and 95% of all trauma critical care provided by same person for 12 years
- July, 2007
  - Second trauma surgeon joins program

University Health System Consortium

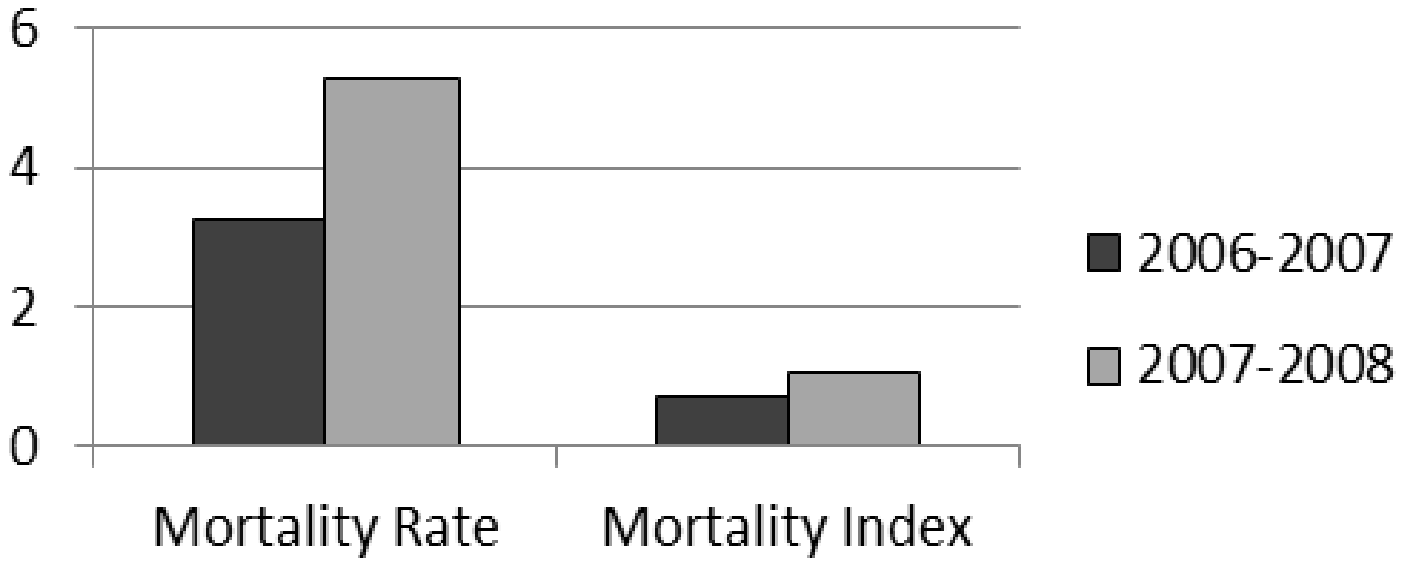
- Group of teaching hospitals associated with medical schools
- Robust risk adjustment system based on the patients in their database
- Robust query system
- Can see what other places are doing and can drill down to individual physician and patient

Analysis

We examined nationally benchmarked outcomes from the 24 months elapsed since the arrival of the second surgeon and compared trauma registry data from June, 1999 - June, 2007 (time period #1) to data from July, 2007- June, 2009 (time period #2). Our hypothesis was that outcomes in time period #2 would improve compared to time period #1.

What Happened

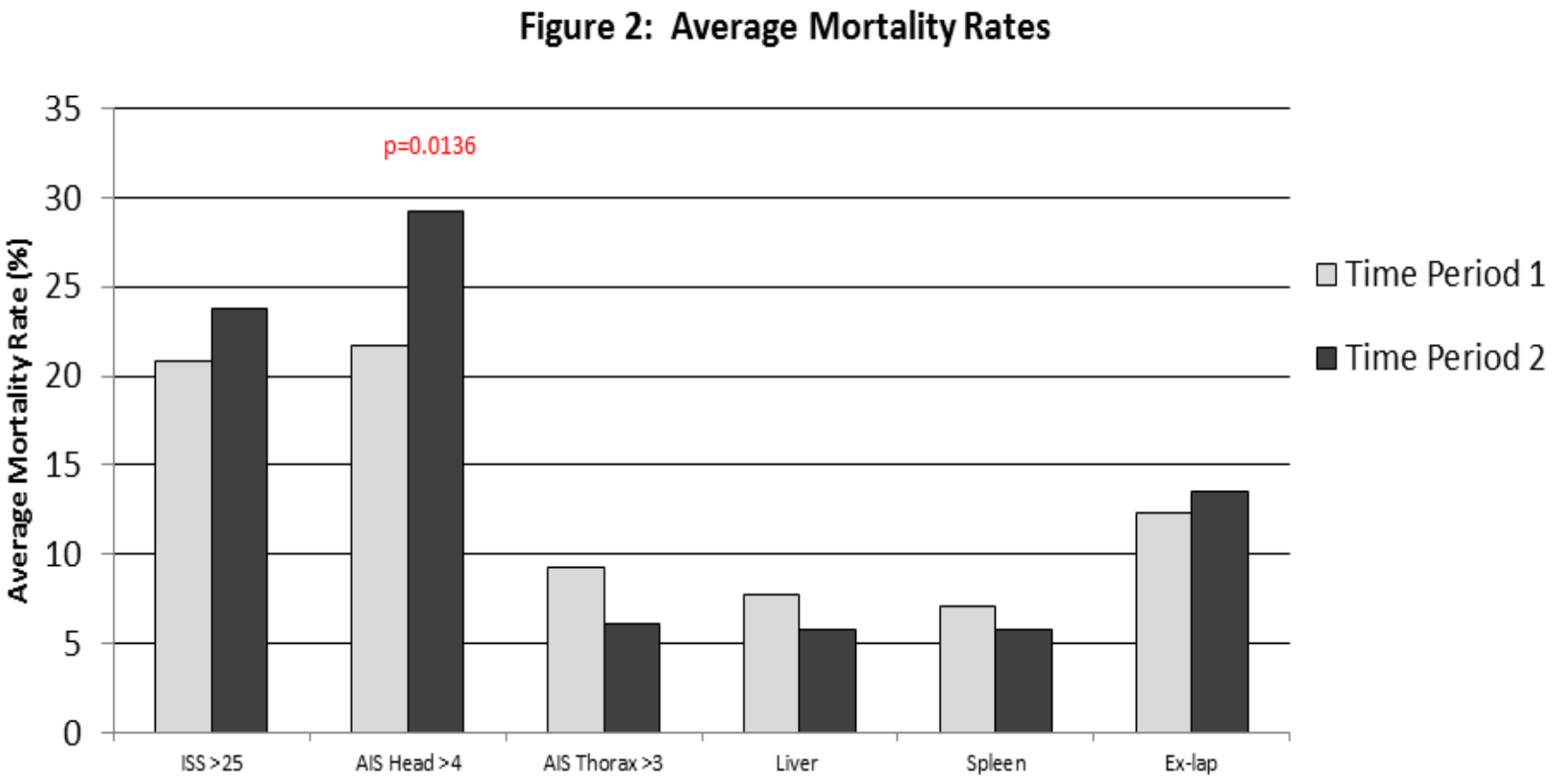
Figure 1: Mortality Rate and Mortality Index 2006-2007 Compared With 2007-2008



How We Figured Things Out

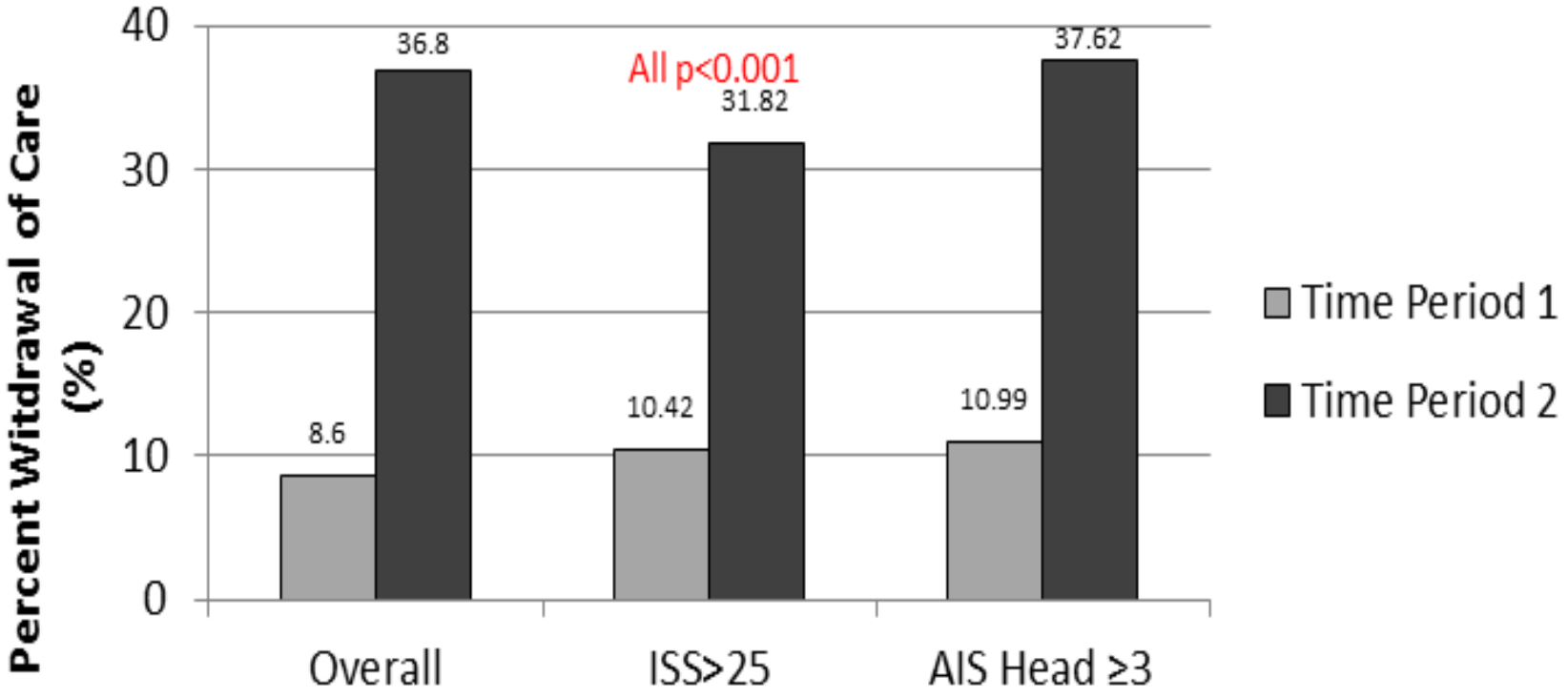
- Used the registry, TQIP, and chart review
- Looked at all factors
  - Presence in ED for resuscitations
  - Age of deaths, overall age of population
  - Average ISS, ICU days, hospital days
  - ISS>25
  - Age >65
  - Spleen and Liver injuries
  - Thoracic AIS >=3
  - Head AIS 4 or 5
  - Emergency abdominal or chest procedures
  - Penetrating and blunt

What we found



Analysis

Figure 3: Withdrawal of Care Comparison Between Time Period 1 and Time Period 2

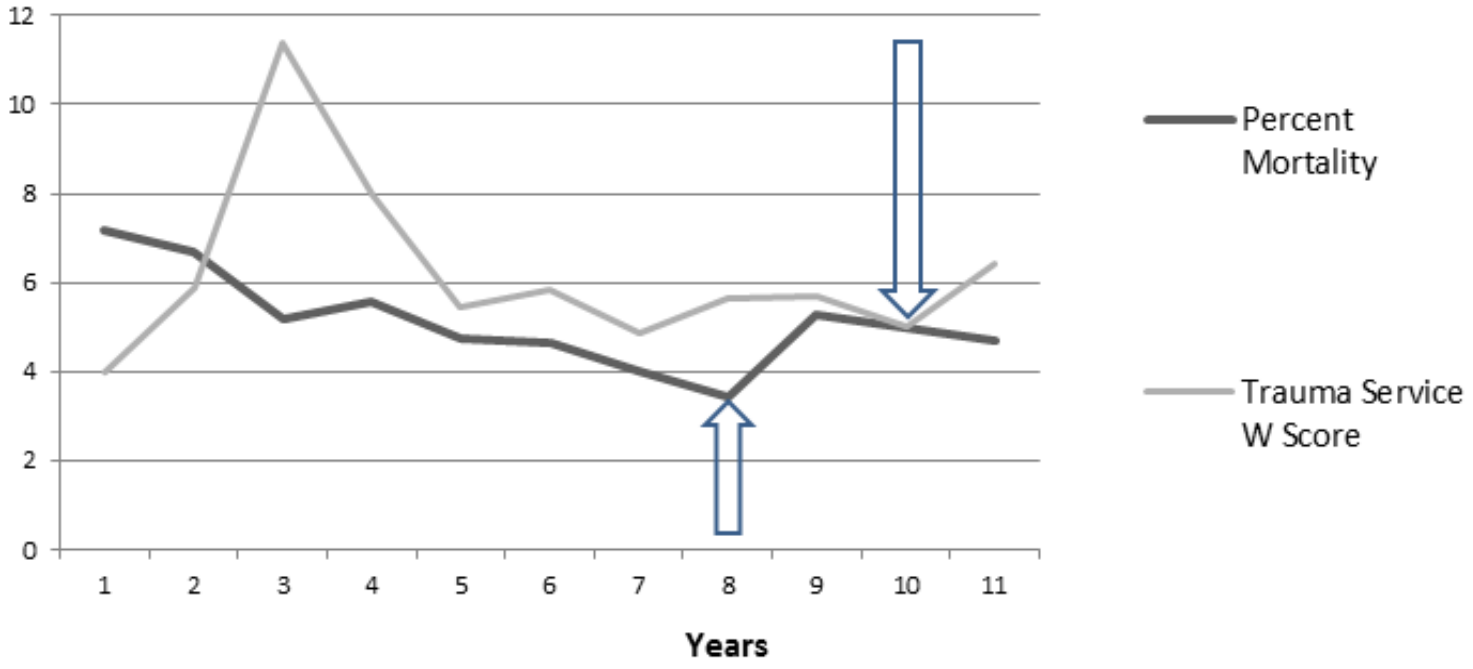


What we found

- In the 8 years prior to 2007, 22 trauma service patients had care withdrawn, in 2007 and 2008 – 27 patients had care withdrawn
- No change in protocols or guidelines
- New surgeon handled family meetings himself, Surgeon #1 allowed residents to do it
  - Residents are less comfortable asking for withdrawal of care
  - More families chose to withdraw care after family meetings with Surgeon #2
- No other real changes found

Withdrawal of Care

Figure 4: Percent Mortality and Trauma Service W-Score During 11 Years From 1999 to 2010



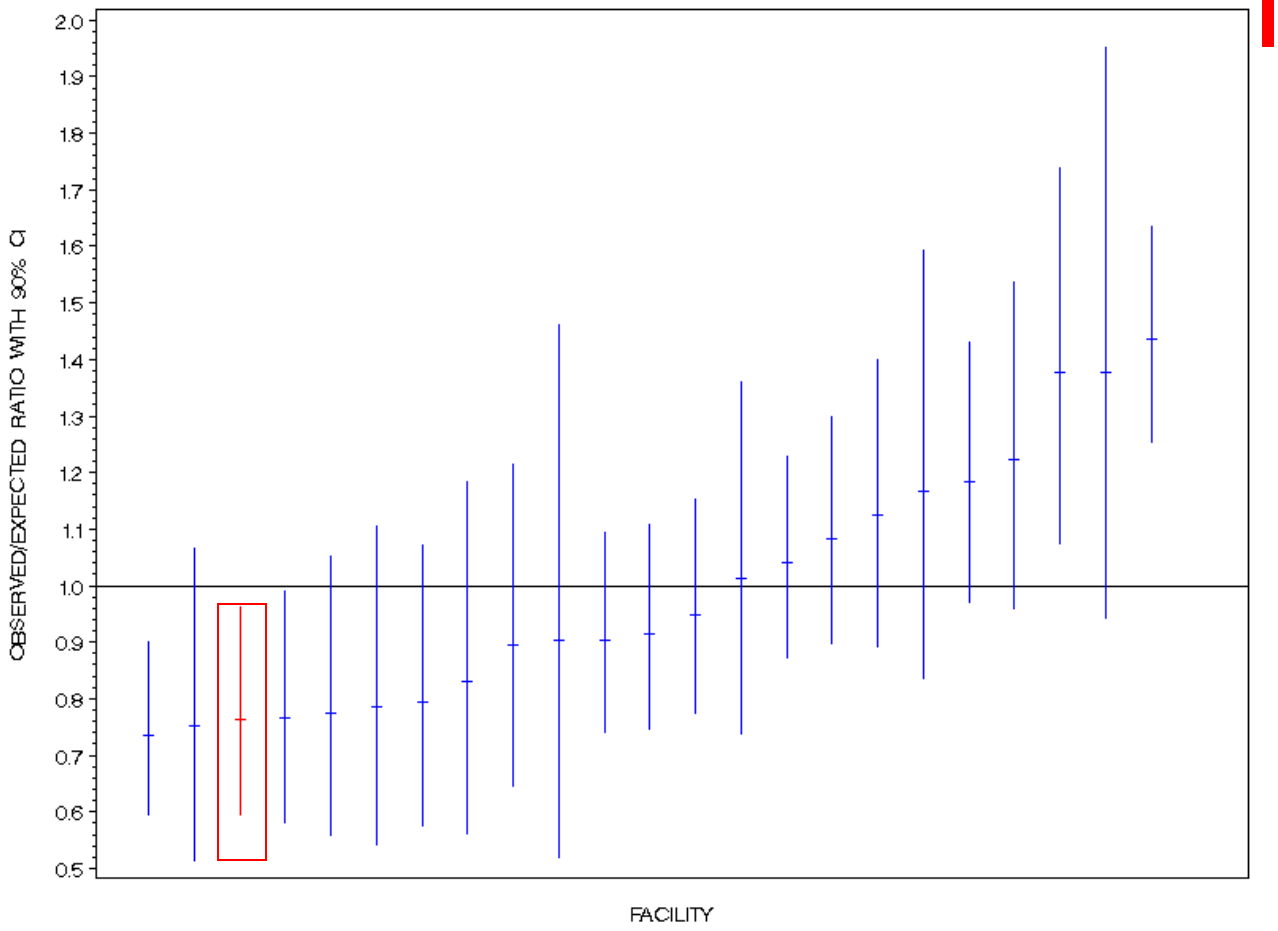
Meaning

- Cause of increase in MI complex
  - Which process is more appropriate?
  - Not associated with bad care or bad decision making
  - Without external benchmarking, could have over-reacted and made changes that would have had additional consequences
  - Just by bringing this cause to programs attention, MI returned to previous values (0.6-0.8)

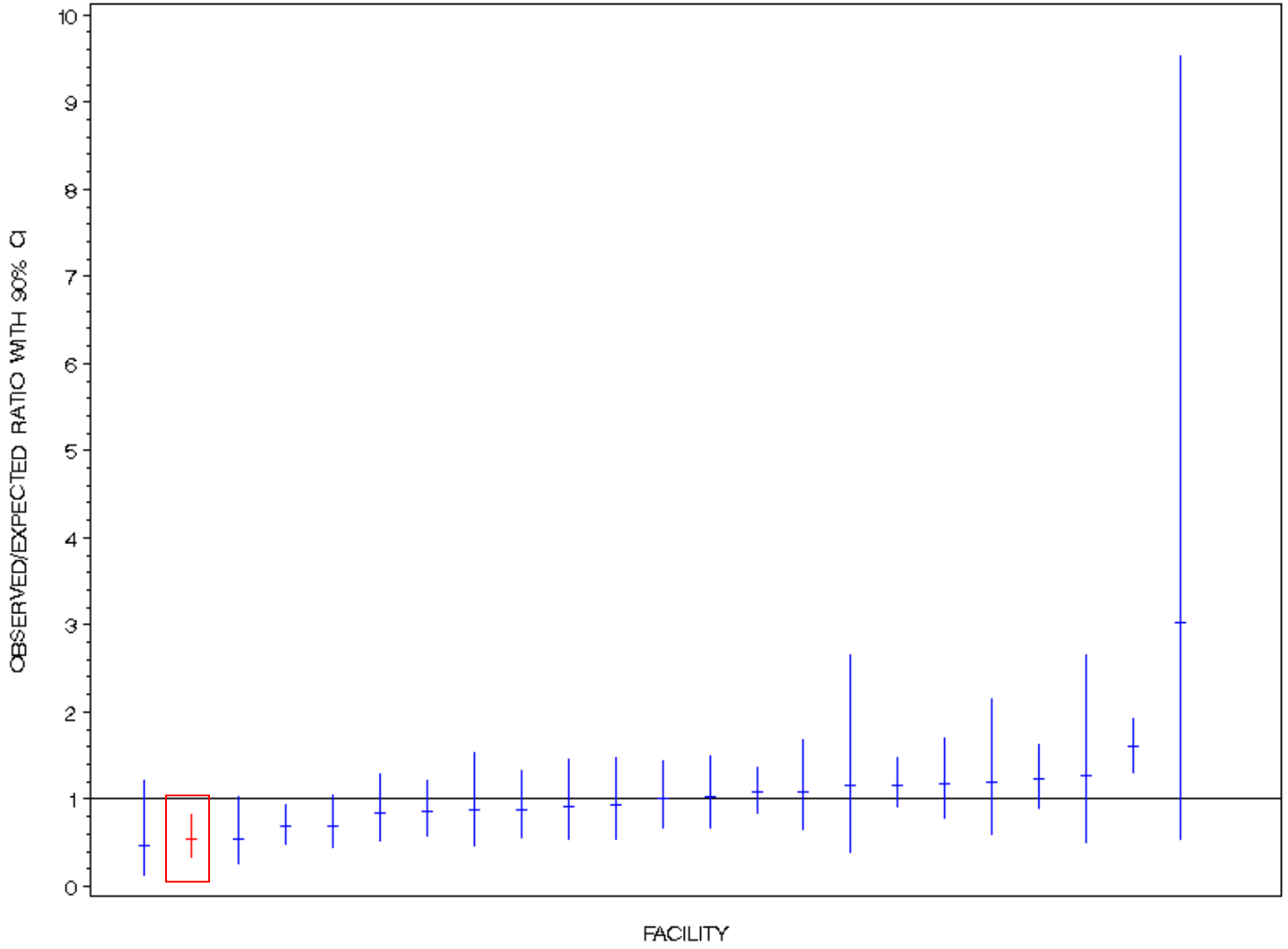
TQIP

- We are part of the initial TQIP group of institutions
- Received a yearly report benchmarking our performance against the group of top US level 1 trauma centers
- Also requested several specific queries

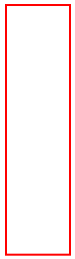
Risk Adjusted Mortality All Patients Admitted 2007



Blunt Multisystem Injury 2007



Blunt Single System Injuries



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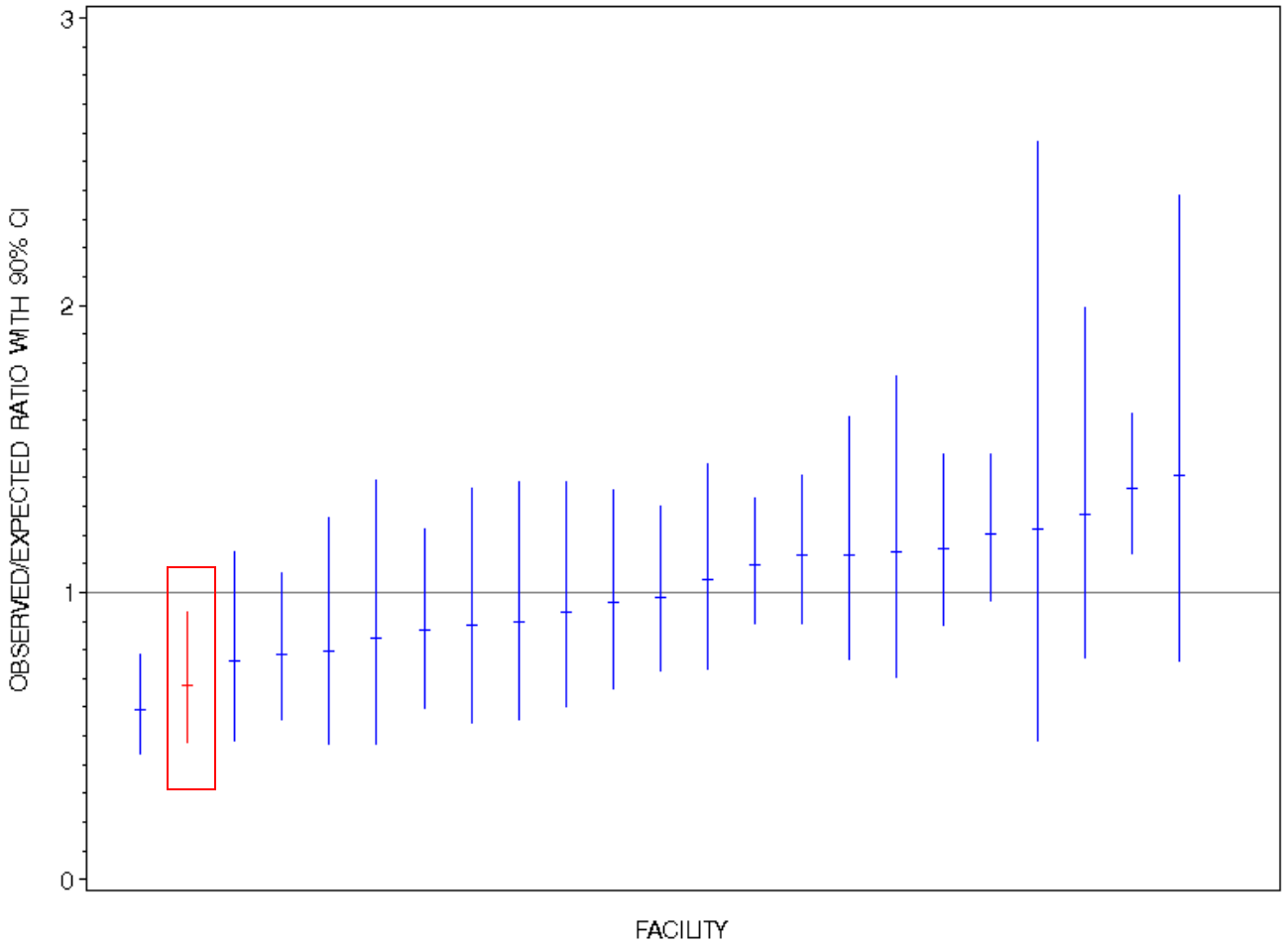
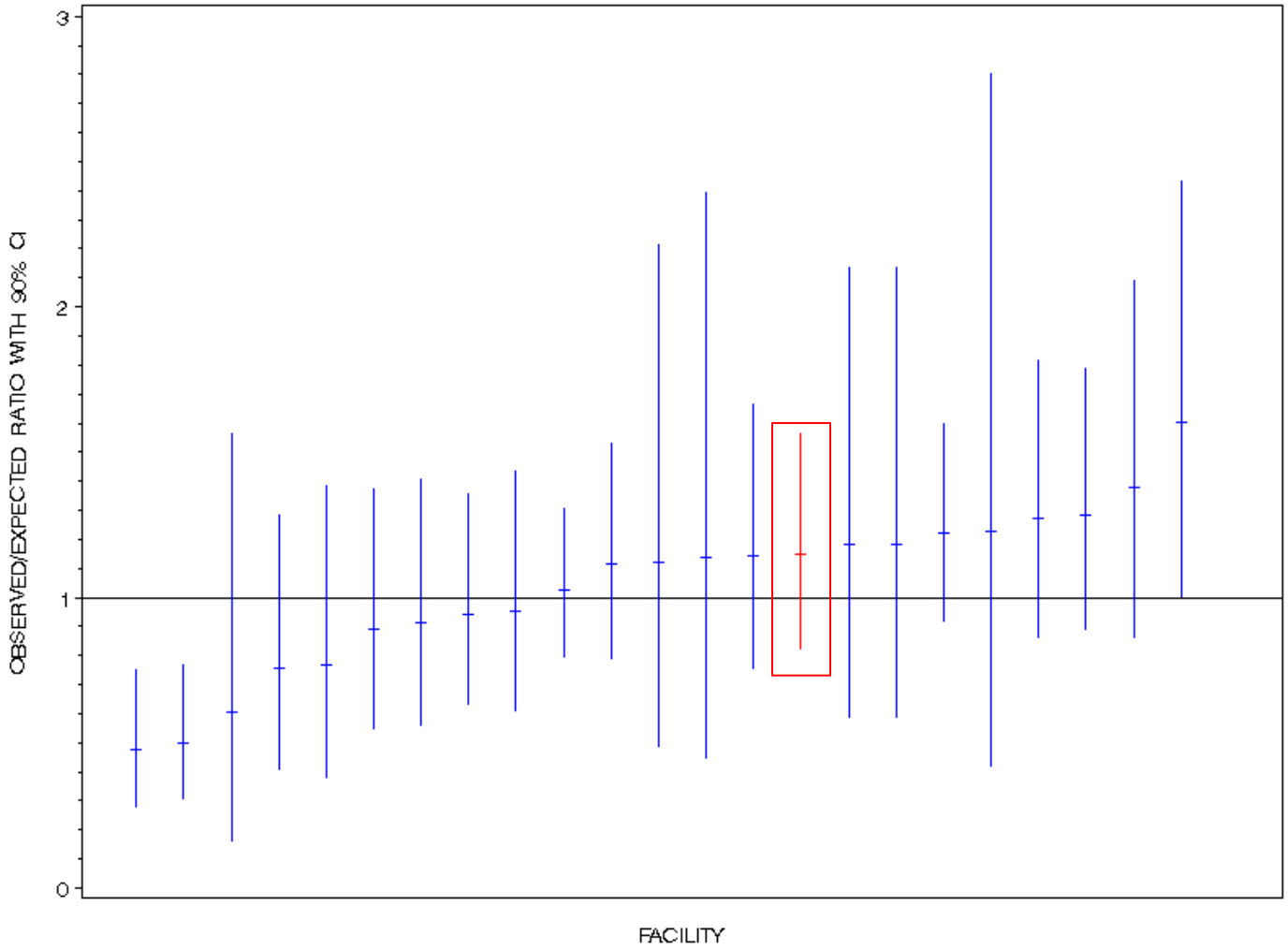
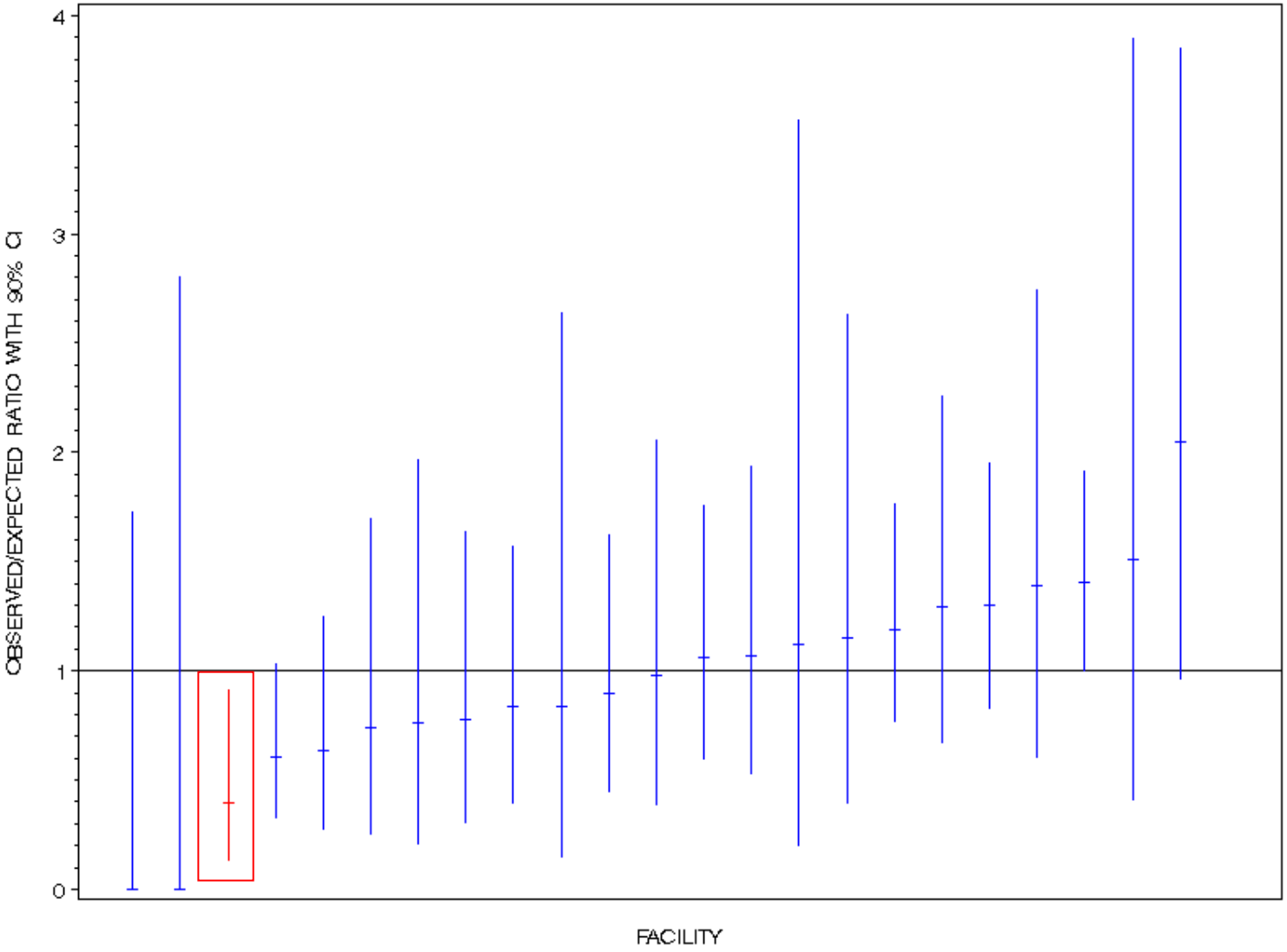


Isolated TBI



Hypotension

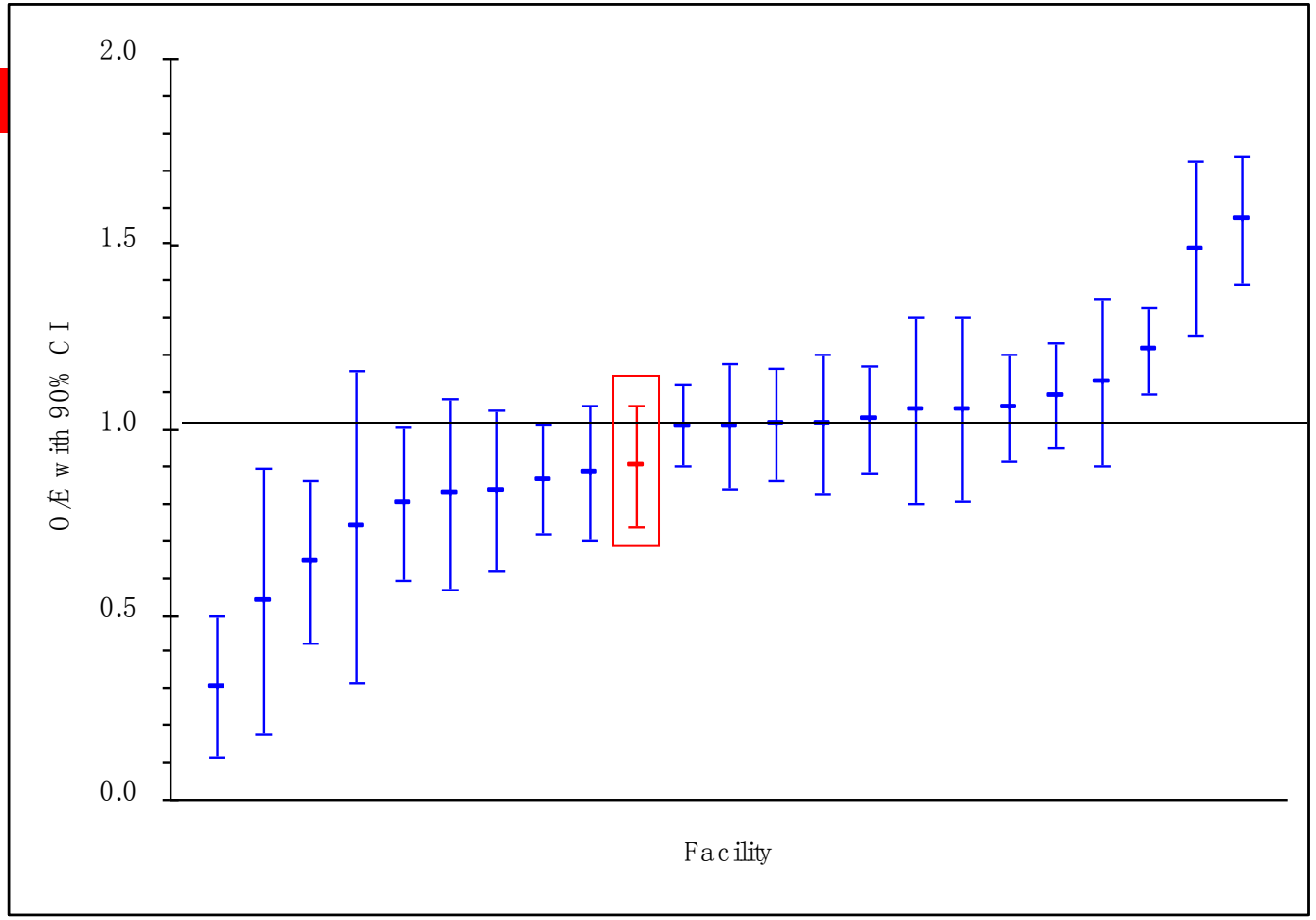


Analysis

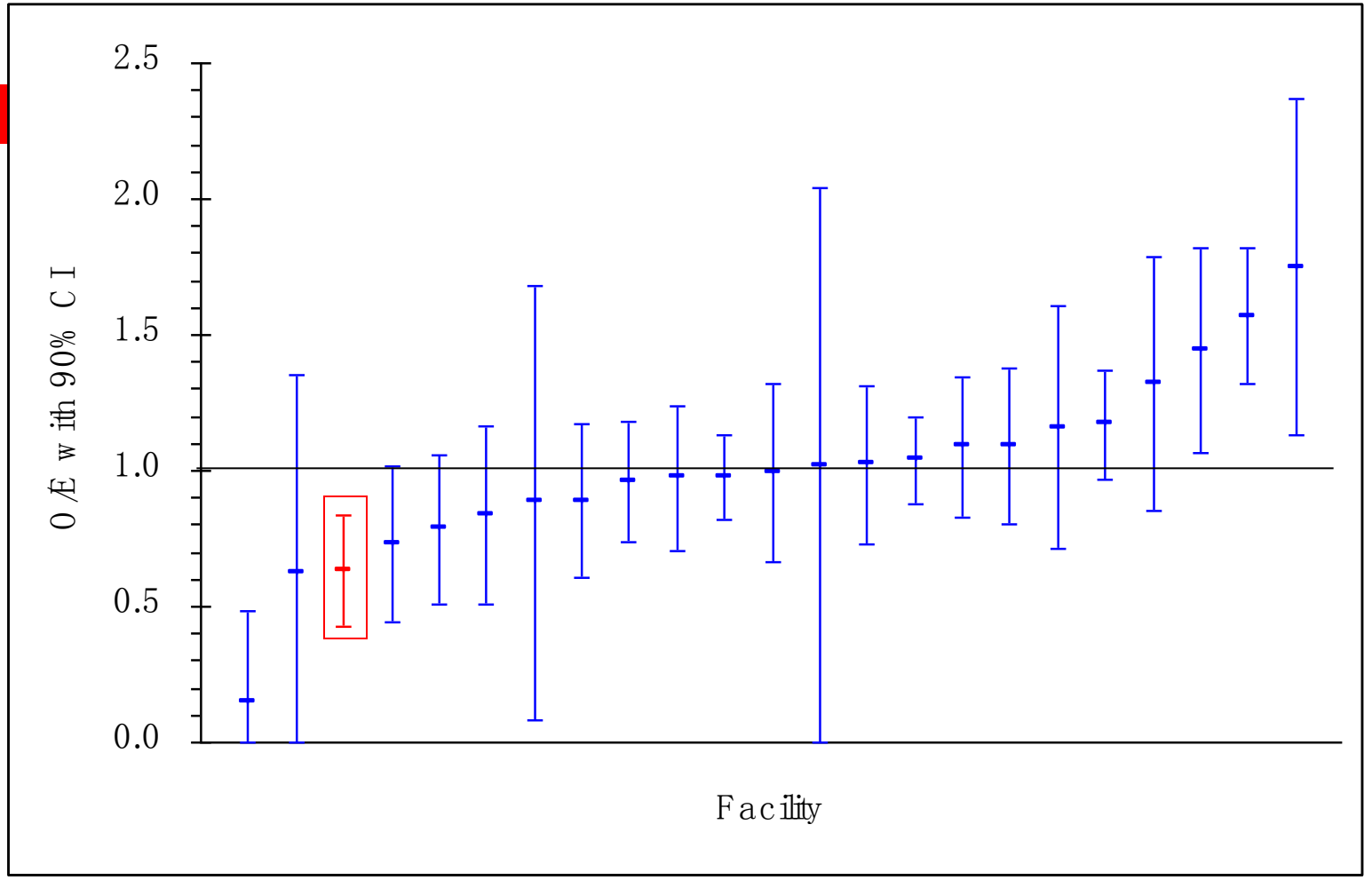
- Felt pretty good about things
- Opportunities for improvement in TBI
- Didn’t know what to make about lower rank in blunt single system injuries, but did not make any changes based on this.

Next TQIP Report
2008 Patients

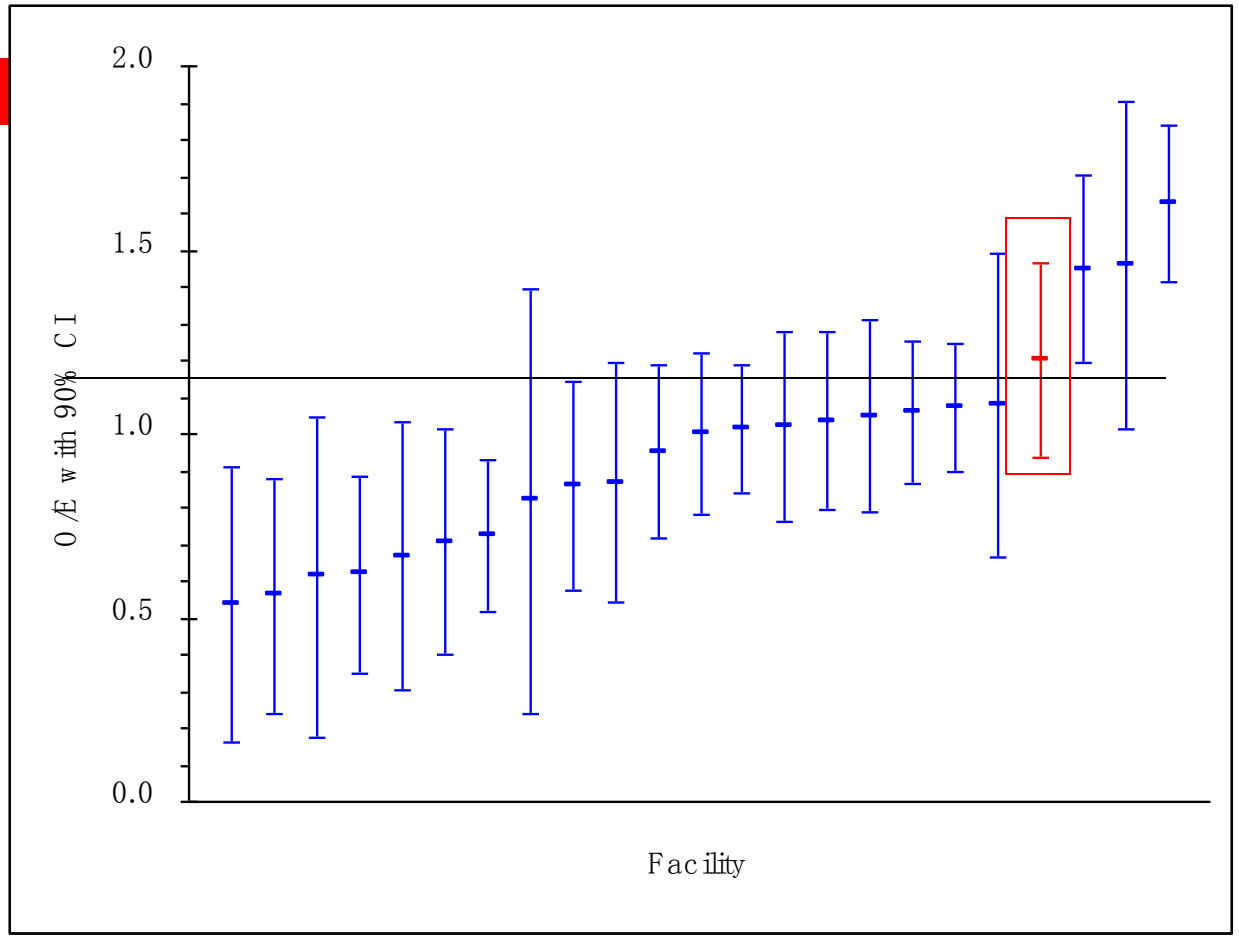
Overall Mortality



Blunt Multisystem Injuries



Blunt Single System Injuries



Not where we want to be

Analysis

- Had maintained ranking in most areas EXCEPT blunt single system injuries
- Undertook massive PI in investigation
  - Asked TQIP to help us identify which patients were in this group
  - Reviewed all of these patients charts
  - Presented at service PI meetings

What We Found

- Who are they?
  - Elderly patients with head and facial injuries from ground level falls or low speed MVC's
  - Not usually trauma alerted
  - Often admitted without trauma surgery involvement
    - Seen by neurosurgery and either admitted to neurosurgery or medicine
  - Care often withdrawn in first 72 hours

Further Examination

- Even though there were patients with severe intracranial injuries that were unsurvivable from the beginning, there was a fair percentage of patients with initially reasonable CCT, that went on to decompensate over 48 hours
- Often classified as non-preventable death on review
  - 80 year old patient on Coumadin with large SDH who goes on to withdrawal of care

Examination

These patients often had opportunities for improvement

- Slow workup
  - Not activations, 3 hours to get head CT, etc.
- Inadequate resuscitation
- Delayed intubation
- Delayed administration of blood products and correction of coagulopathy
- Unaggressive neurosurgical response

Conclusion was the 15-20% of these deaths were potentially preventable with aggressive focus

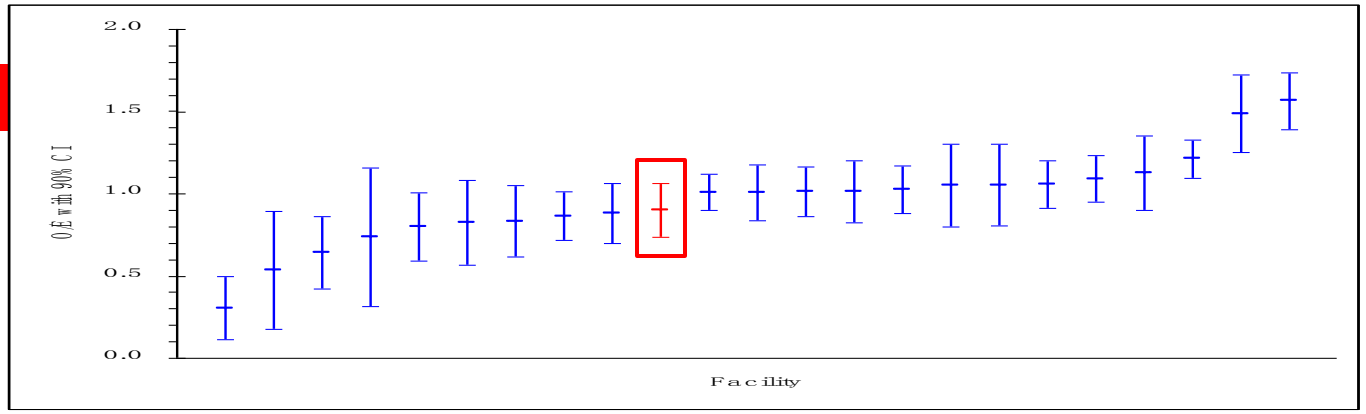
Actions

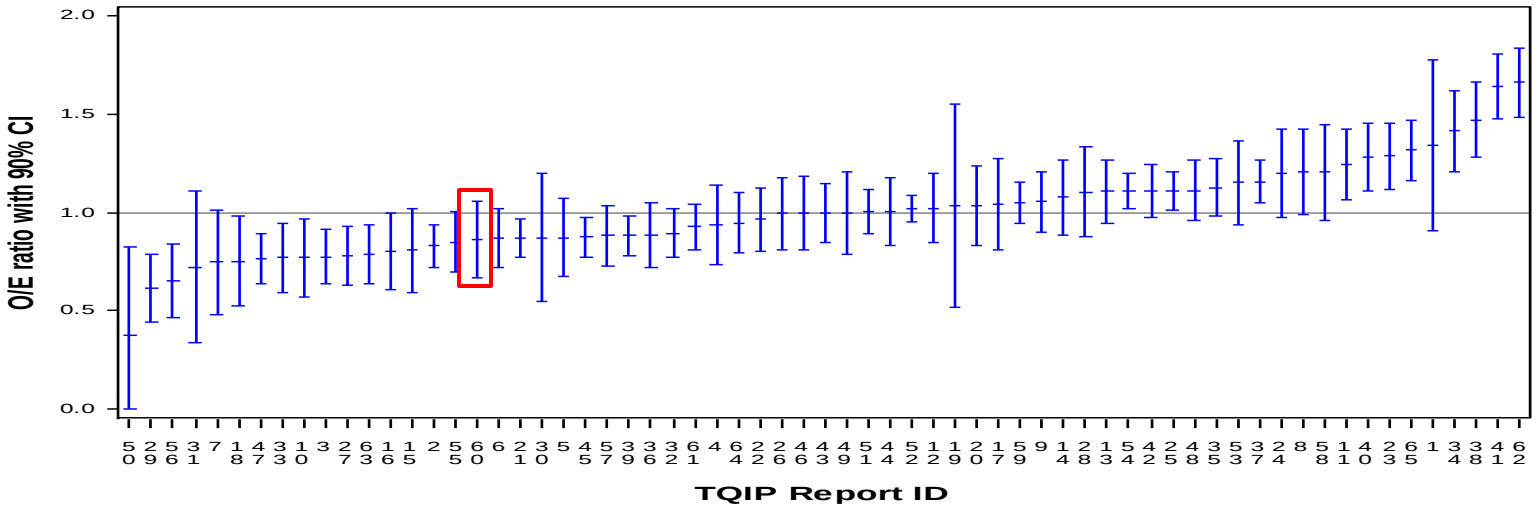
- Need to activate these patients to get system involved
- Need to get trauma service involved early
  - Neurosurgery and medicine were not terribly interested in this population
- Need to do what we can in first 24-48 hours, if after that neuro exam does not improve, then withdrawal can be broached with family

Actions

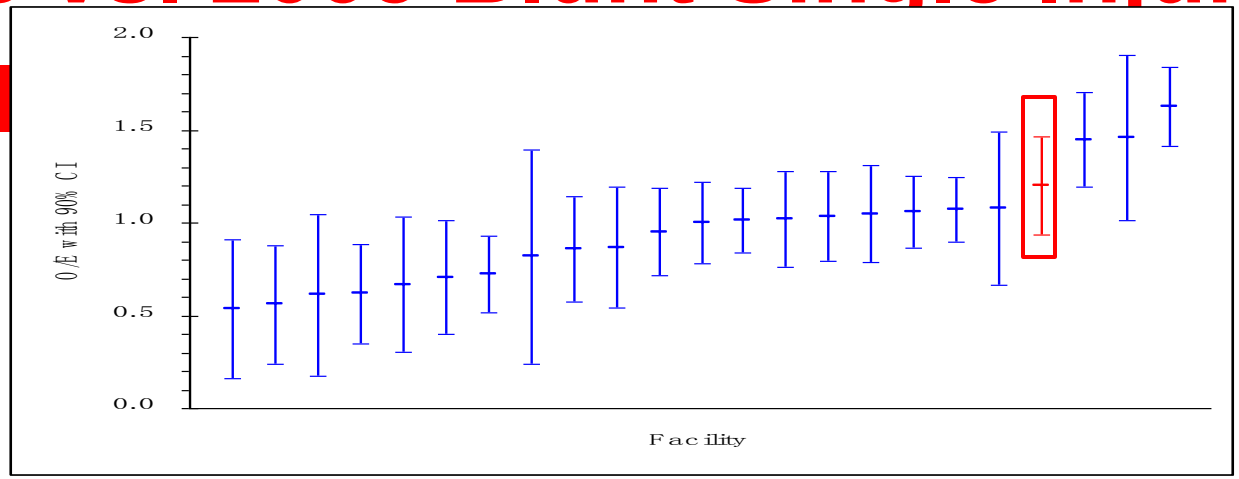
- “Gamma” alert
  - ED response with trauma chief resident
  - Alert moniker insures they will be pushed through radiology
  - Trauma service involved from beginning
  - Includes these patients, and patients with severe mechanism but no physiologic derangement

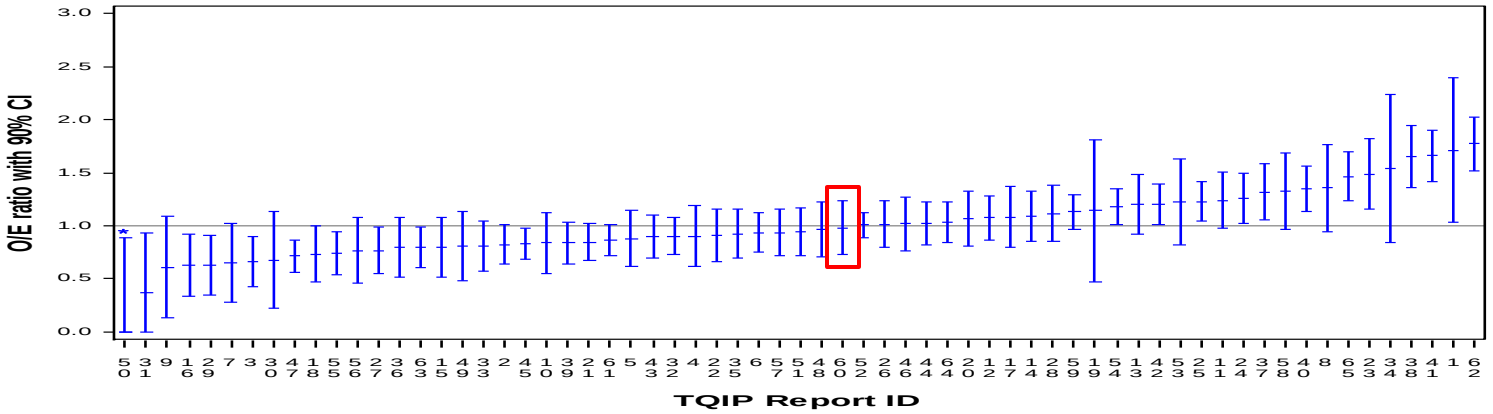
2008 vs. 2009 Overall Mortality



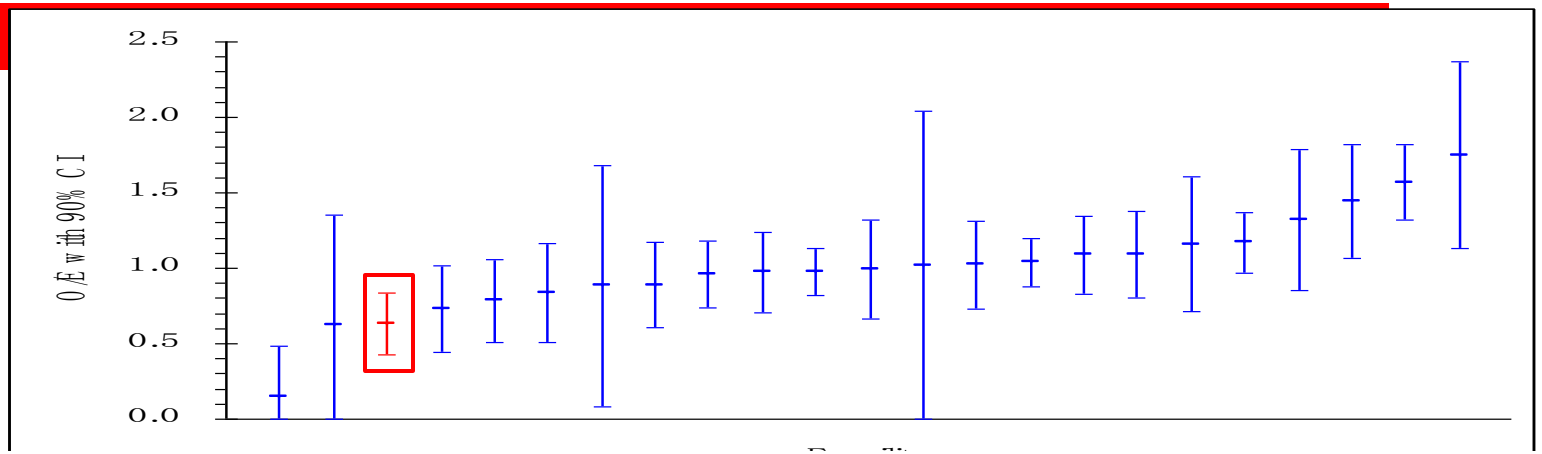


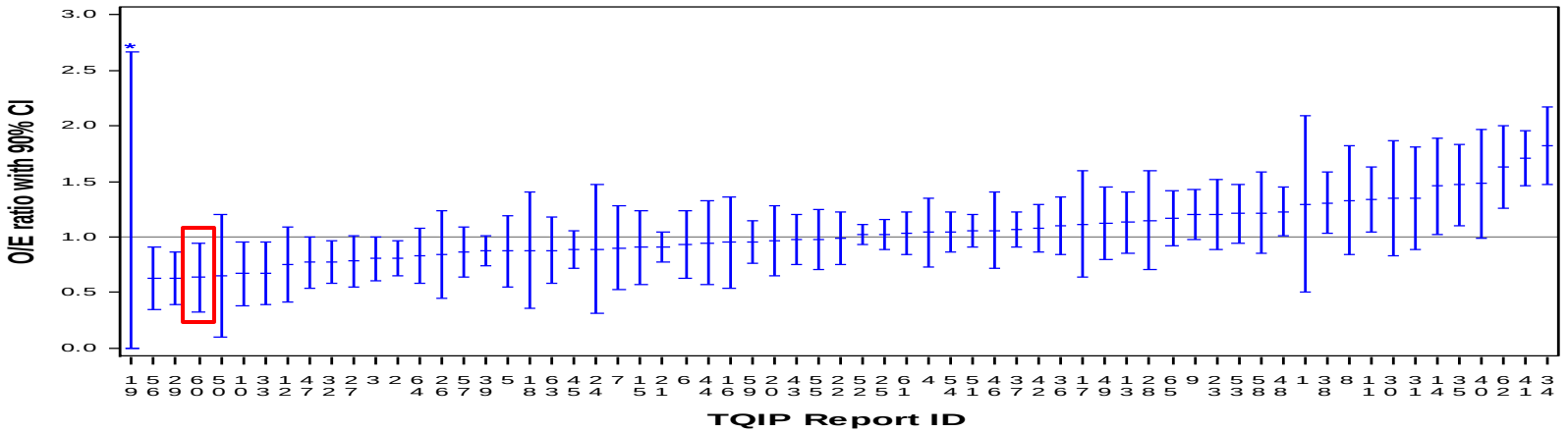
2008 vs. 2009 Blunt Single Injury





2008 vs. 2009 Blunt Multisystem





Moral of the Story

- You cant reliably make positive change without control of the variability in your practice
- Once you've controlled variability, how do you know your are performing at a high level? – Using external benchmarking
  - But even without external benchmarking, you can compare yourself to yourself over time

Moral of the Story

- Once you've identified an opportunity for improvement, you need to understand data well enough to know what factors you need to look at
- Once you've found a problem, and cleared the noise from the signal, you can really begin performance improvement, and know that you've done something that will positively impact outcomes.

External Benchmarking

- Few of these changes would have been possible with only internal examination
  - You just cant know where the state of the art is moving without looking outside
- External benchmarking is essential, once your house is for the most part in order
- These were very interesting PI projects that engaged our entire program