Author(s): Darrell A. Campbell, Jr. MD, FACS

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The Power of Collaboration

In a real world setting

Health Informatics
Darrell A. Campbell, Jr. MD, FACS
Professor of Surgery, UM

- “Managing Clinical Knowledge for Clinical Improvement” Balas and Boren
- Yearbook of Medical Informatics 2000

The problem: Slow diffusion of knowledge

- New technology 4-6 yrs to reach 25 citations
- Thrombolytic drugs for AMI 13 years before experts recommended
- 6.3 yrs for evidence to reach reviews, papers and texts
- Increase rate of use for 9 landmark findings was 3.2% per year
- 15.6 years from 0% to 50% use

Diffusion of knowledge in surgery

Reputation based

Word of mouth referrals

Outcomes assumed to be good

"I am called eccentric for saying in public that hospitals, if they wish to be sure of improvement, must find out what their results are. Must analyze their results to find their strong and weak points. Must compare their results with those of other hospitals... Such opinions will not be eccentric a few years hence."

E. A. Codman, MD
(1869 - 1940)

The Present

Hospital based

Outcomes increasingly important

Diffusion of knowledge still a problem

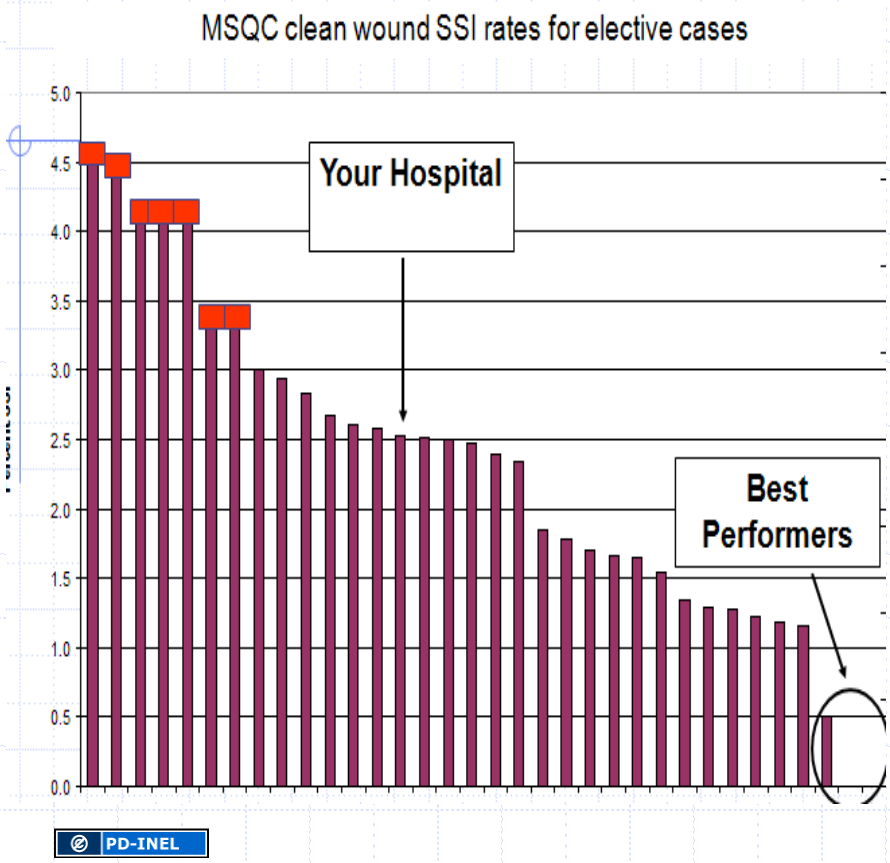
What is a better approach?

- BCBSM pays for every penny of this initiative
- BCBSM sees only aggregate data
- A pay for participation model

How to improve surgical quality

- Develop a surgical registry
- Use the registry to examine variation in quality
- Identify best performing hospitals
- Identify “best practices” in the best performing hospitals
- Distribute the information

The importance of the site visit



Culture is important

FRIENDLY

- Collegial
- Non-competitive
- Evidence-based

The MSQC "Blood Oath"

- We will not use the data for competitive advantage (no billboards)
- Information shared at working group meetings is confidential
- There are no secrets among our group

Success factors for the MSQC

STRUCTURE

- Financial support
- Payer agnostic to results
- “Pay for participation”
- Reliable data, (doctors believe it), regular feedback
- Regional rather than national organization
- Multidisciplinary (doctors, nurses, administration)

CULTURE

- High quality workers
- Non threatening
- Non competitive
- Engagement
- Site visits welcomed
- Interest in discovery and innovation

Evidence based medicine

Made easily available to the sites

Antibiotics within 60 min of incision (SCIP1)

82% overall compliant

57% for emergent

Appropriate antibiotics(SCIP2)

80% overall compliant

53% emergent

Antibiotic dose adjustment based on weight

- 55% compliant

Redosing of antibiotic after 3 hours of surgery

7% compliant!!

Oral non absorbable antibiotics after mechanical bowel prep

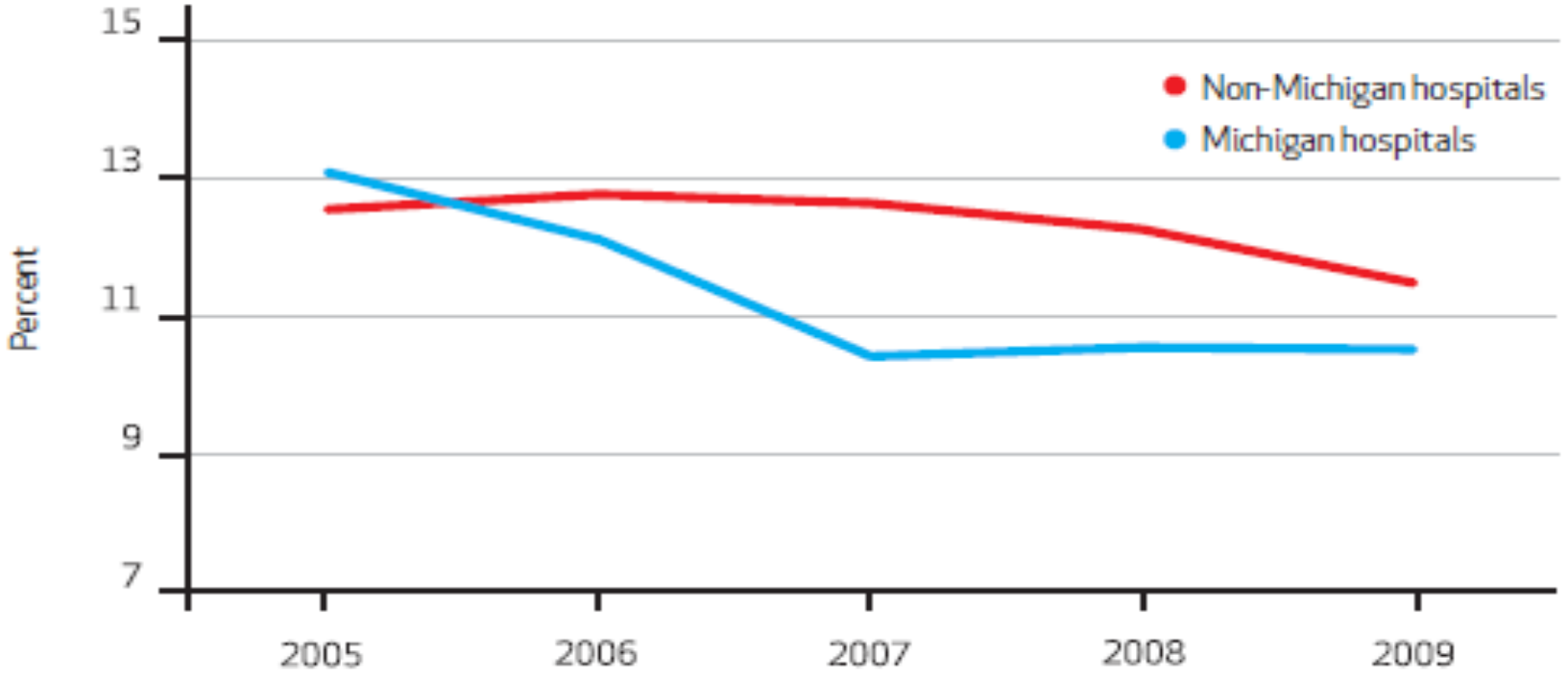
39% compliant

Does this approach work?

Yes

EXHIBIT 2

Risk-Adjusted Morbidity With General And Vascular Surgery: Hospitals In Michigan Versus Hospitals Outside Of Michigan, 2005–09



SOURCE Michigan Surgical Quality Collaborative and National Surgical Quality Improvement Program registries, 2005–09. **NOTES** Morbidity rates declined faster in Michigan hospitals ($p < 0.001$) and, by 2009, were lower than in other hospitals participating in the National Surgical Quality Improvement Program ($p < 0.001$).

2009-2011

BCBSM estimated it had saved 85.9 million dollars in avoidable costs via MSQC

The Future

Of Surgical Quality Improvement

The national approach to hospital based QI

Is fundamentally flawed

Hospital bears all of the cost for QI

Financial penalties sometimes apply (never events, VBP)

Surgical complications are expensive

Reducing the incidence of expensive complications benefits the patients

Saves money-but whose money?

Who pays for poor surgical quality? Building a business case for quality improvement

JACS 2006 202:933

Justin B. Dimick, MD, MPH; Raj J. Karia, MPH; Smita Das, MPH; William B. Weeks, MD, MBA, Darrell A. Campbell, Jr., M.D.

Overall hospital costs and revenues for surgical patients with and without complications.

	Costs: Resources used by the Hospital	**Reimbursement: Amount Paid to the Hospital**	**Hospital Profit (Revenues less Costs)**
No complications	$10,978	$14,266	$3,288
With complications	$21,156	$21,911	$755
Change in Reimbursement:		$7,645	

	Costs: Resources used by the Hospital	Reimbursement: Amount Paid to the Hospital	Hospital Profit (Revenues less Costs)
Colon resection for benign or malignant disease			
No complications (n=40)	$15,464	$22,353	$6,889
With complications (n=11)	$35,950	$34,490	($1,460)
Change in Reimbursement:		$12,137	

The stakeholder who bears the largest burden of additional costs from surgical complications would have a strong incentive to support quality improvement activities.

What are the options?

States have no money

CMS ? (never events, VBP)

Third party payers (BCBS)

BCBSM has a lot of skin in the game

Voluntary Employee Benefits Agreement

850,000 UAW member health benefits

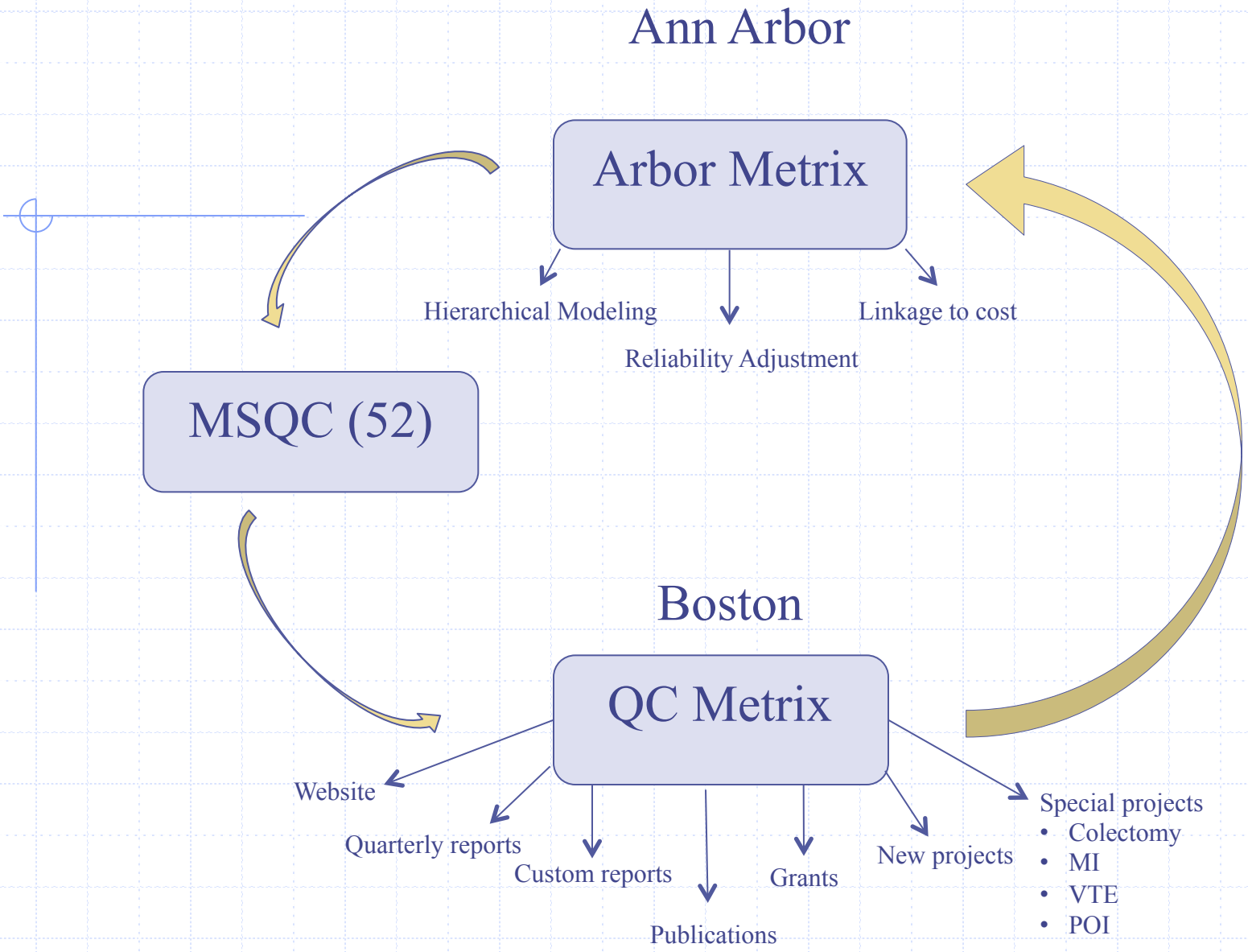
BCBSM administers the VEBA

Responsible to UAW for improving quality

QI efforts should be facilitated

By modern information technology

Get the information to the hospital, but also the individual surgeon

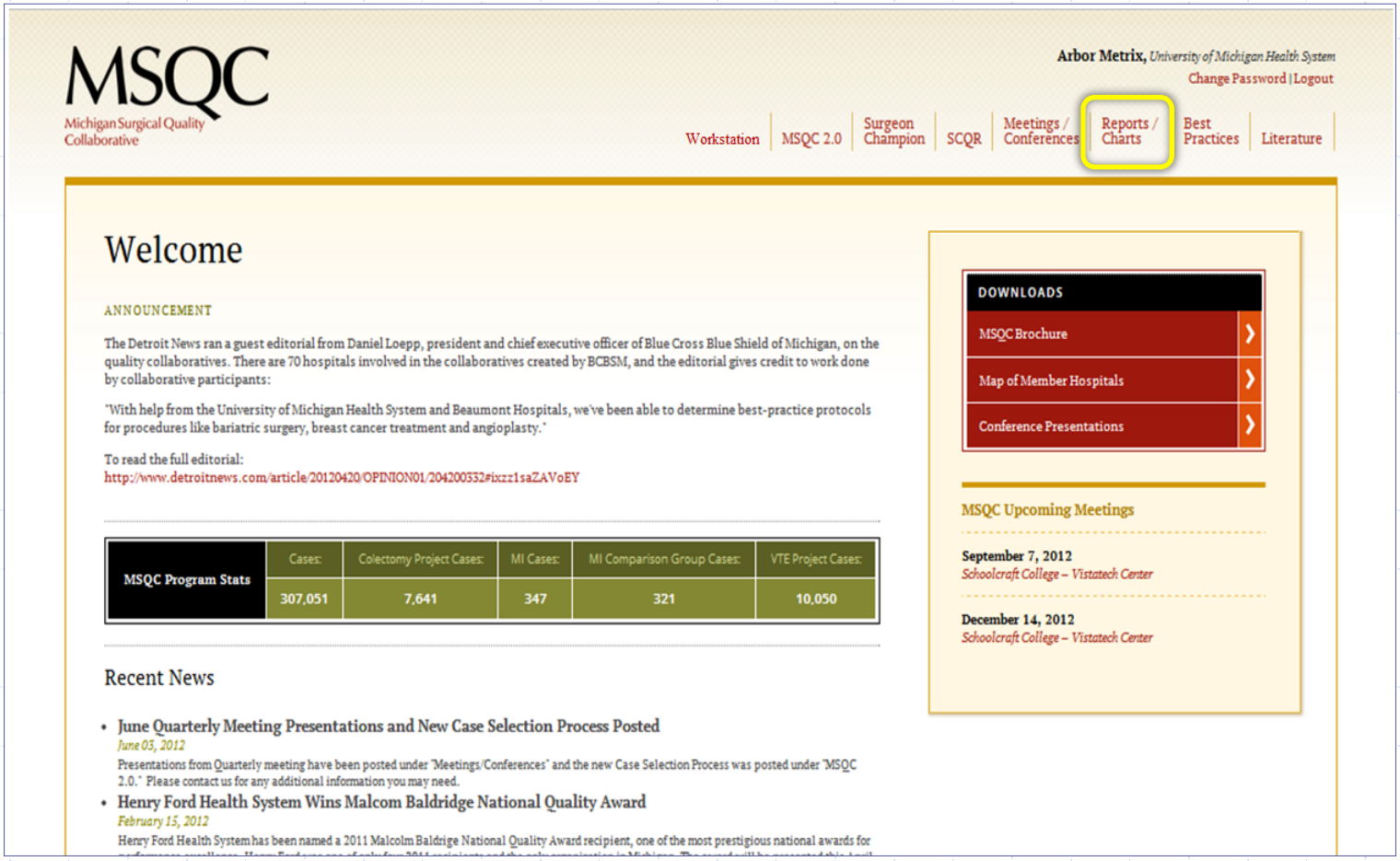

Ann Arbor
Arbor Metrix
Hierarchical Modeling
Reliability Adjustment
Linkage to cost
MSQC (52)
Boston
QC Metrix
Website
Quarterly reports
Custom reports
Publications
Grants
New projects
Special projects
• Colectomy
• MI
• VTE
• POI

User Flow

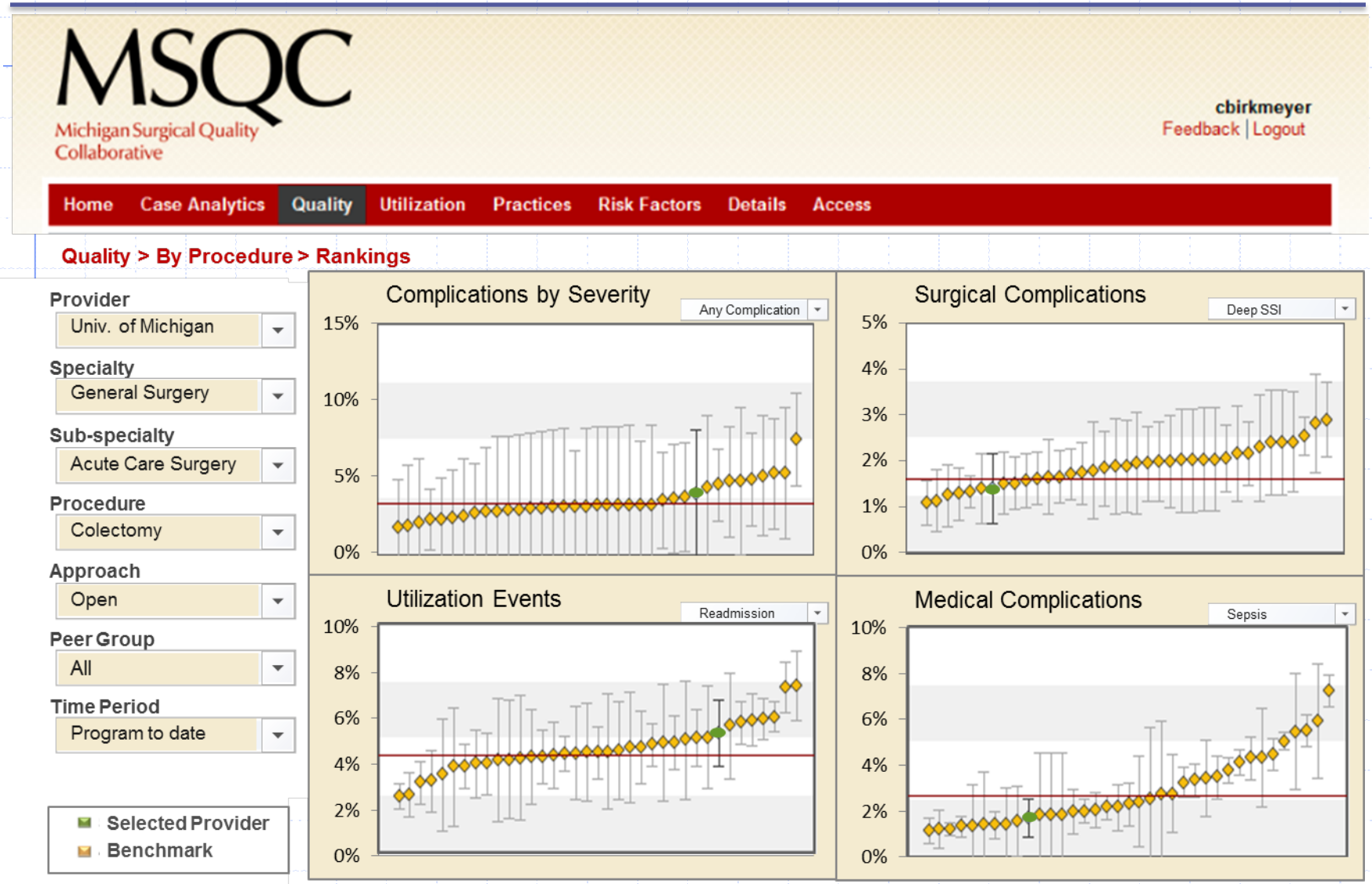
Log-in as usual

User Flow

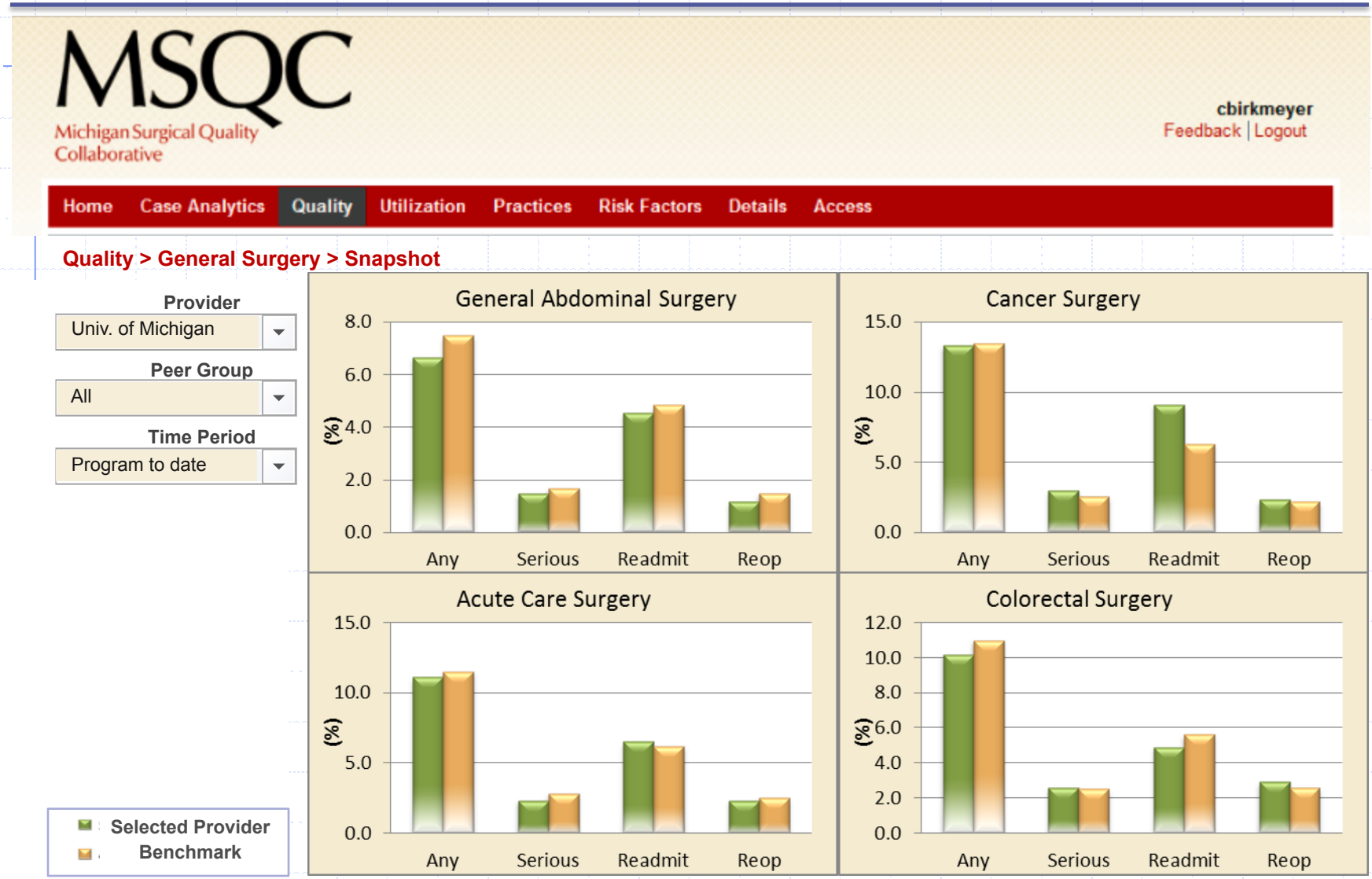
Click on Reports/Charts



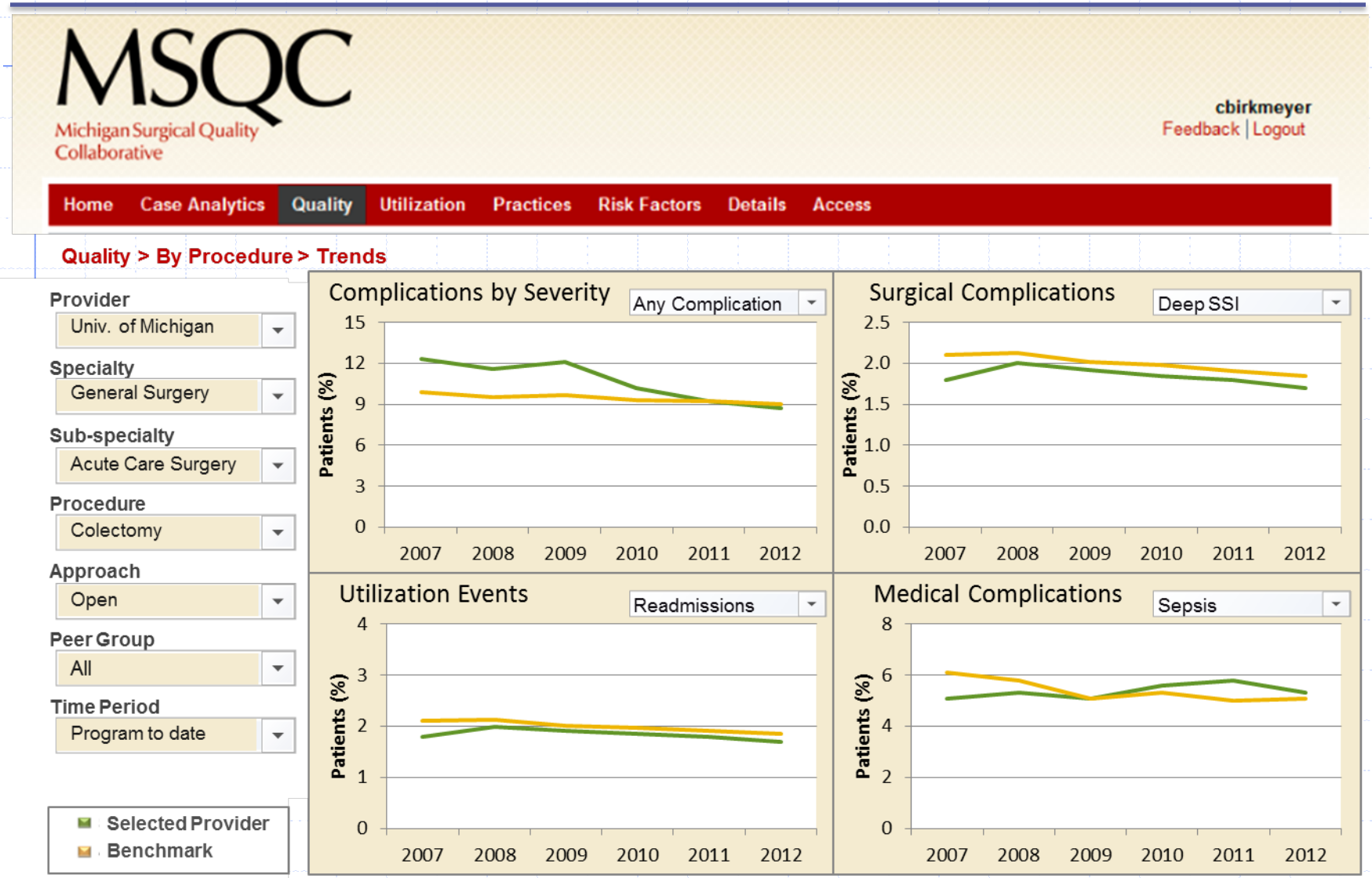
Reporting: Quality



Reporting: Quality



Reporting: Quality



Reporting: Quality

MSQC
Michigan Surgical Quality Collaborative

cbirkmeyer
Feedback | Logout

Home | Case Analytics | Quality | Utilization | Practices | Risk Factors | Details | Access

Quality > By Procedure > Complications Drill-down

Provider
Univ. of Michigan

Specialty
General Surgery

Sub-specialty
Acute Care Surgery

Procedure
Colectomy

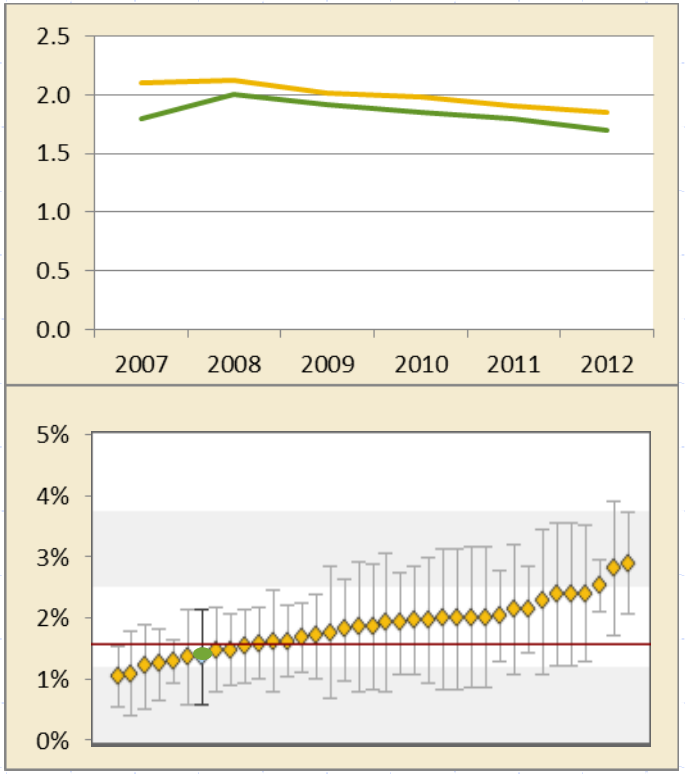
Approach
Open

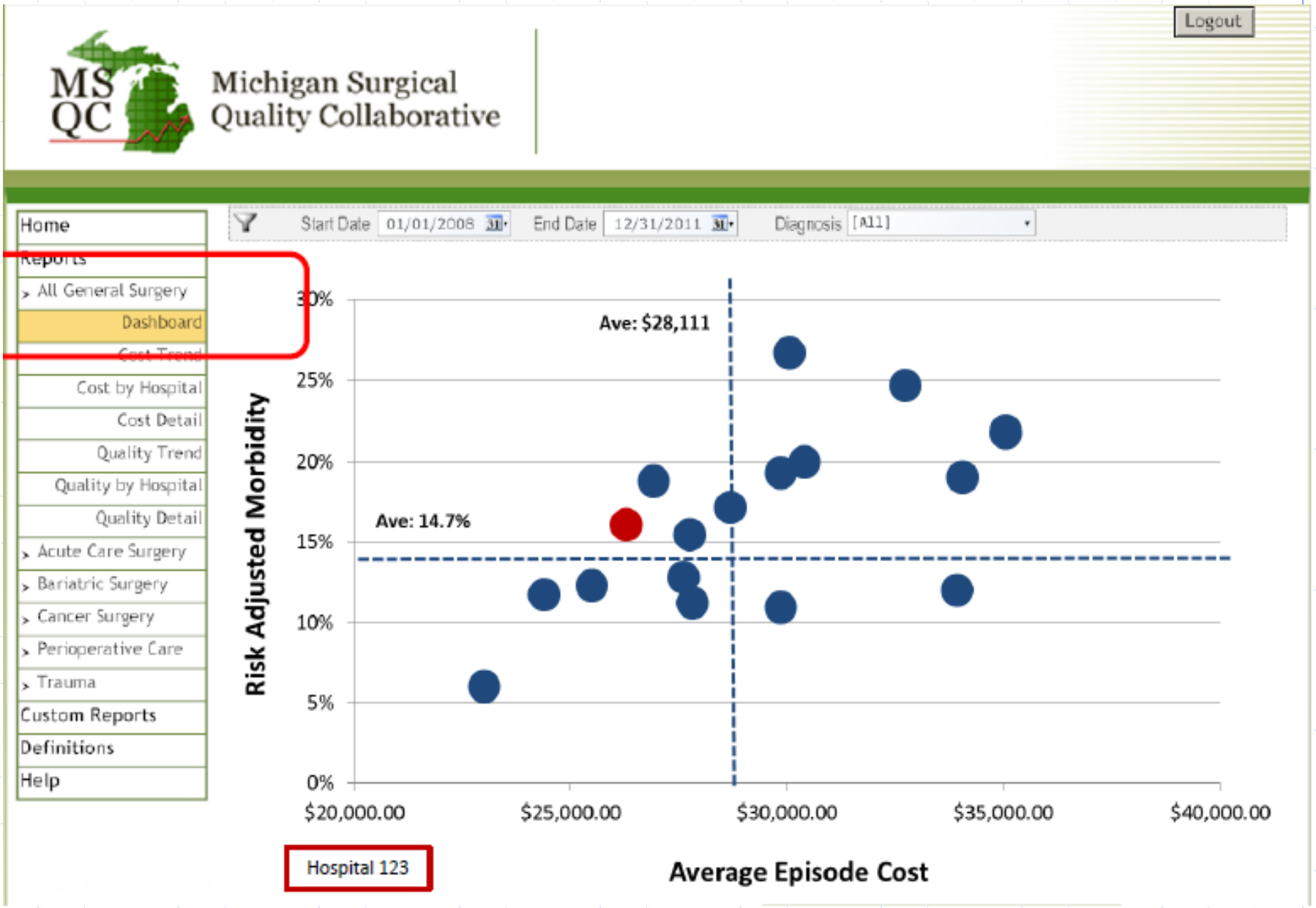
Peer Group
All

Time Period
Program to date

Selected Provider
Benchmark

Complications (%)	Selected	Benchmark	P-Value
Any complication	7.2%	8.9%	0.03
Grade I	4.6%	6.0%	0.02
Grade II	1.9%	2.0%	0.58
Grade III	0.7%	0.9%	0.19
Acute Renal Problems	1.2%	1.4%	0.14
Cardiac Arrest /CPR	0.3%	0.3%	0.51
Cardiac Arrhythmias	1.7%	1.6%	0.74
Deep Incisional SSI	1.1%	1.3%	0.23
DVT req. Therapy	3.4%	3.5%	0.89
Myocardial Infarction	0.1%	0.1%	0.74
Pneumonia	4.1%	4.0%	0.52
Pulmonary Embolism	0.7%	0.6%	0.51
Sepsis	5.1%	4.9%	0.42
Stroke/CVA	0.4%	0.5%	0.09
Superficial Incisional SSI	3.2%	3.1%	0.77
Transfusions w/i 72	2.6%	3.1%	0.02




Logout
MS QC
Michigan Surgical Quality Collaborative
Home
Reports
All General Surgery
Dashboard
Cost Trend
Cost by Hospital
Cost Detail
Quality Trend
Quality by Hospital
Quality Detail
Acute Care Surgery
Bariatric Surgery
Cancer Surgery
Perioperative Care
Trauma
Custom Reports
Definitions
Help
Start Date 01/01/2008
End Date 12/31/2011
Diagnosis [All]
Ave: $28,111
Ave: 14.7%
Risk Adjusted Morbidity
30%
25%
20%
15%
10%
5%
0%
$20,000.00
$25,000.00
$30,000.00
$35,000.00
$40,000.00
Average Episode Cost
Hospital 123

A More Expansive Approach

To surgical quality improvement

MSQC

Optimal Preparation for Surgery

Prevention of Complications

Rescue after Complications

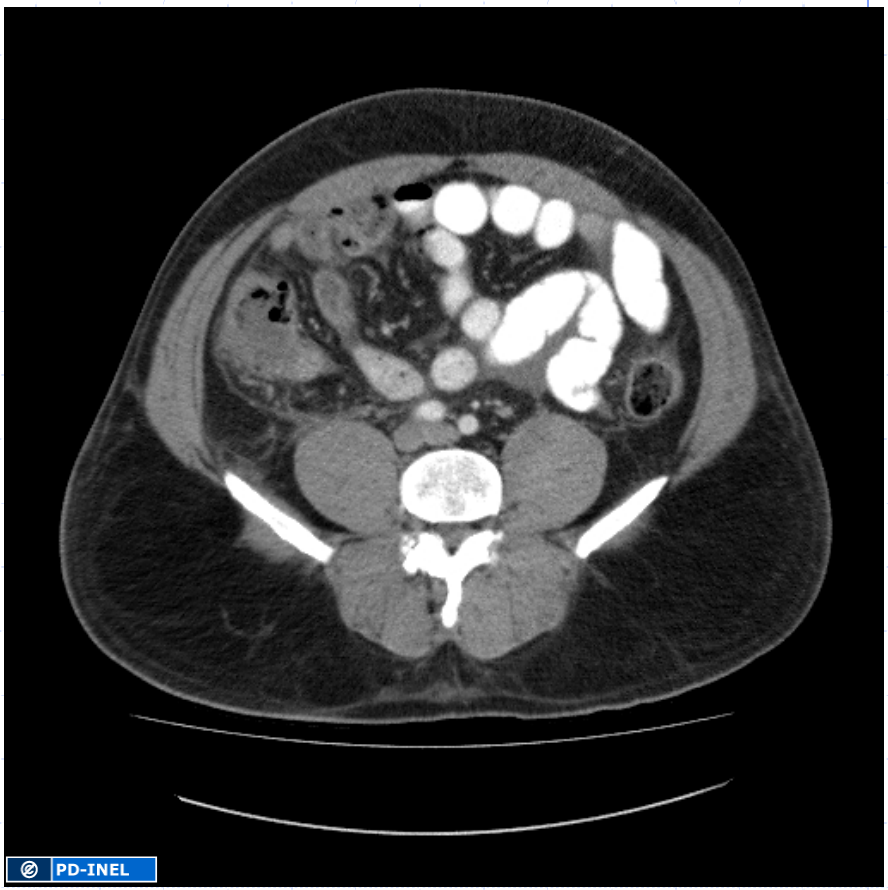
“Pre-hab” checklist-30 days prior to OR

- Stop smoking
- Incentive spirometer
- Walk 2-3 miles/day
- HgbA1c for diabetics, glycemic control
- Correct anemia (hct <30%)
- Nasal culture for Staph
- Antibacterial soap X 3 days pre op
- Consider starting a Beta blocker
- Consider starting a statin

Use the power of the group

To think differently about common problems

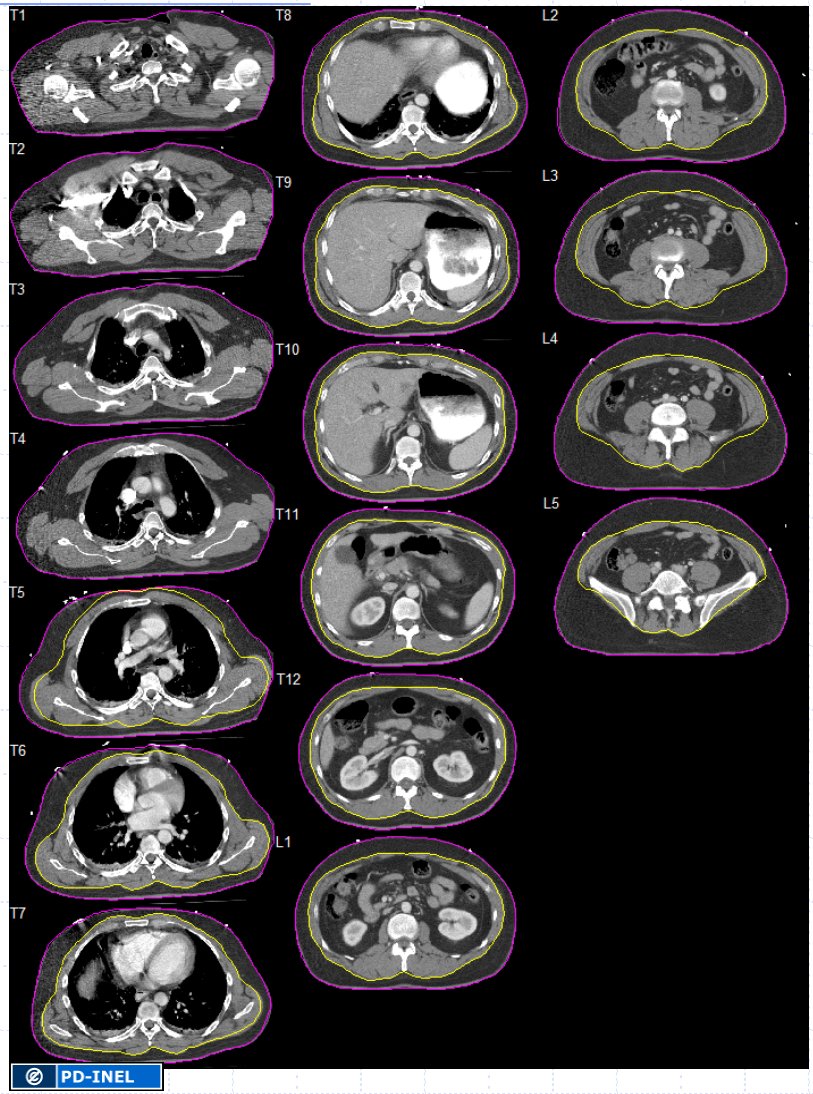
58 year old male with diabetes, previous myocardial infarction, and COPD who is pre-operative for a colectomy

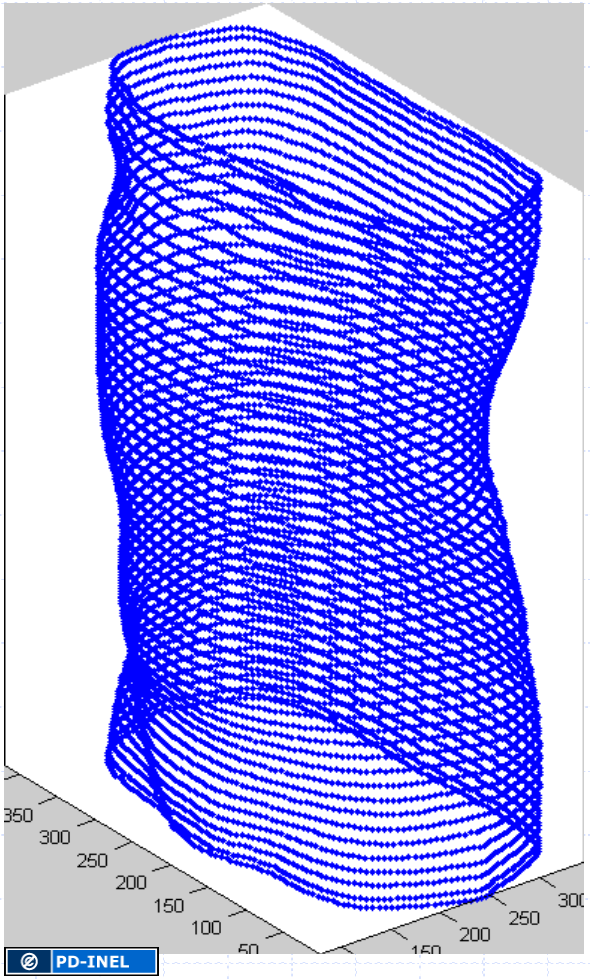


58 year old male with diabetes, previous myocardial infarction, and COPD who is pre-operative for a colectomy

Analytic Morphomics

Body Composition





Analytic Morphomics

Core Muscle Size

Adjusted Complication Rates following Elective General and Vascular Surgery Stratified by terciles of Core Muscle Size

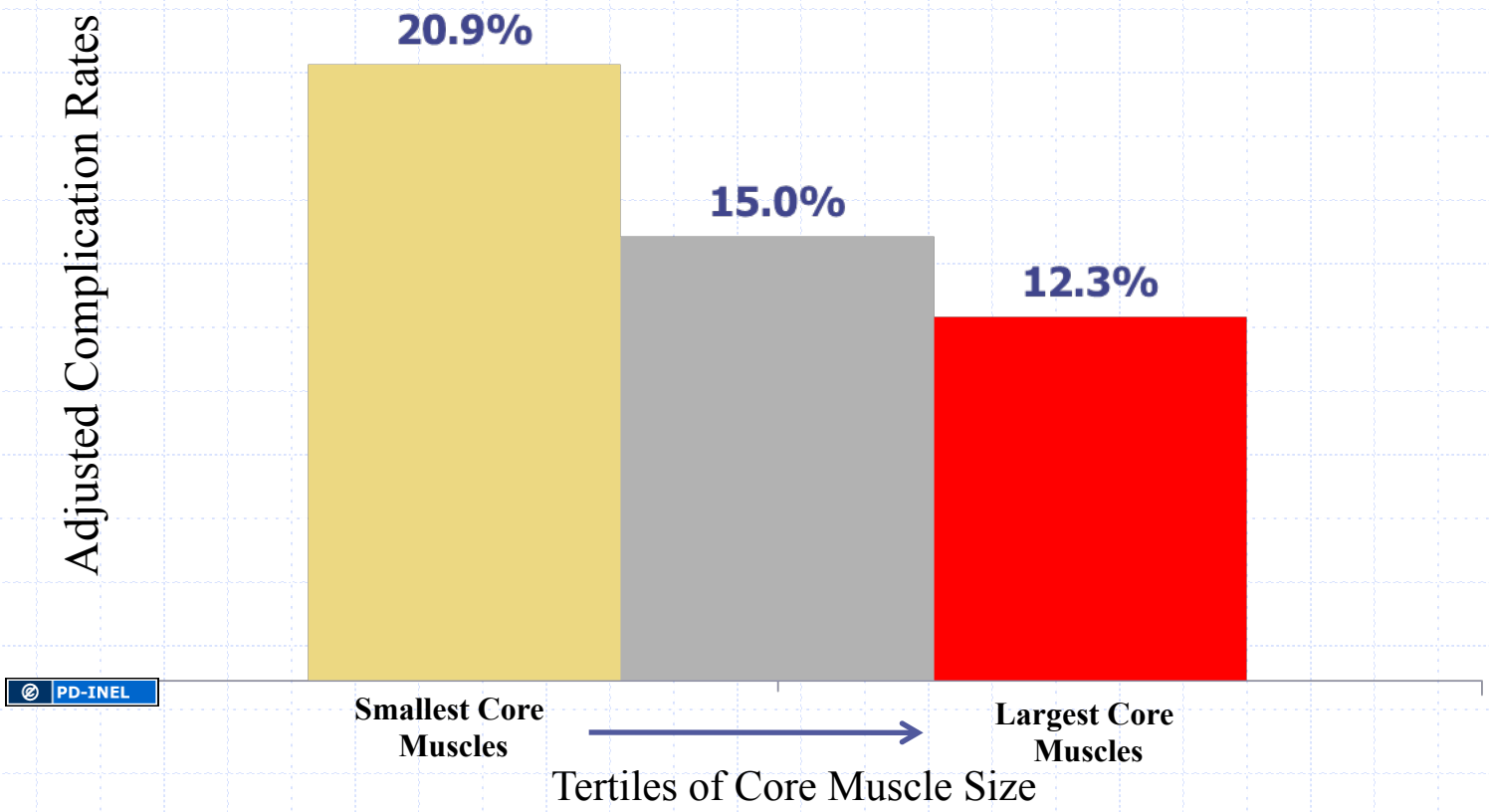
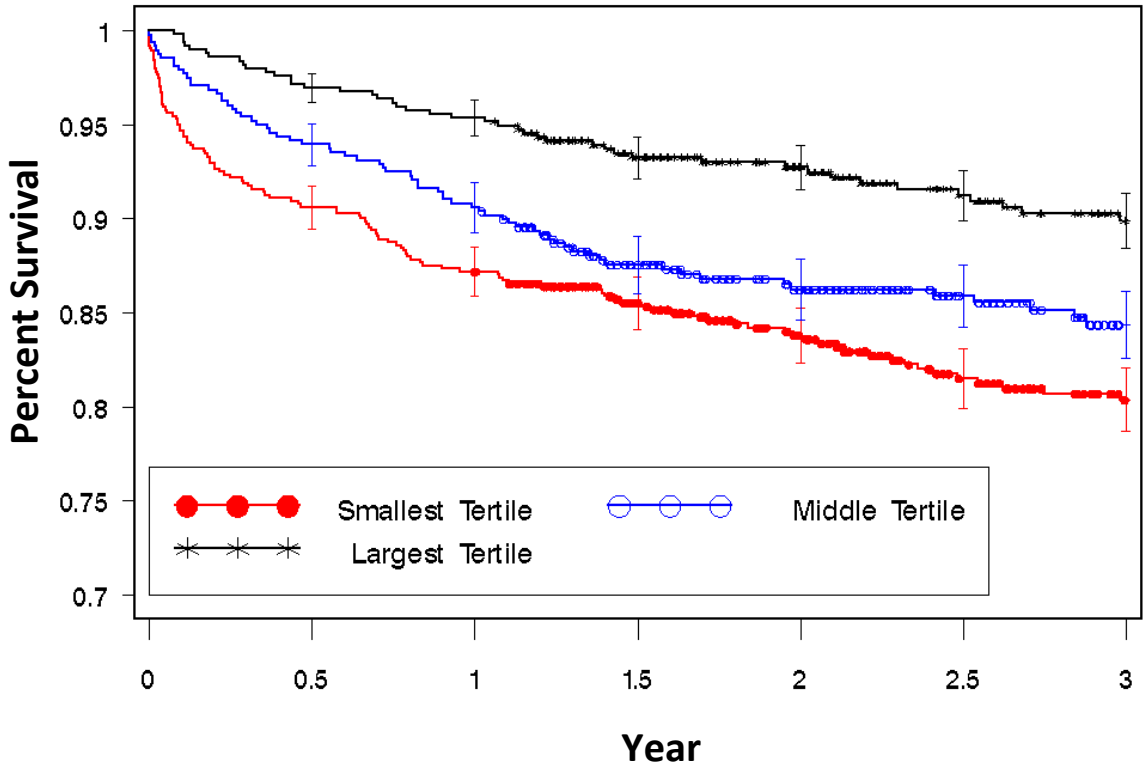


Figure 5

Survival (Kaplan-Meier) following major surgery

Stratified I



Time 0: n=586 for tertile 1, 450 for tertile 2, 449 for tertile 3
Time 1 year : n=505 for tertile 1, 406 for tertile 2, 426 for tertile 3
Time 3 years: n=223 for tertile 1, 170 for tertile 2, 207 for tertile 3

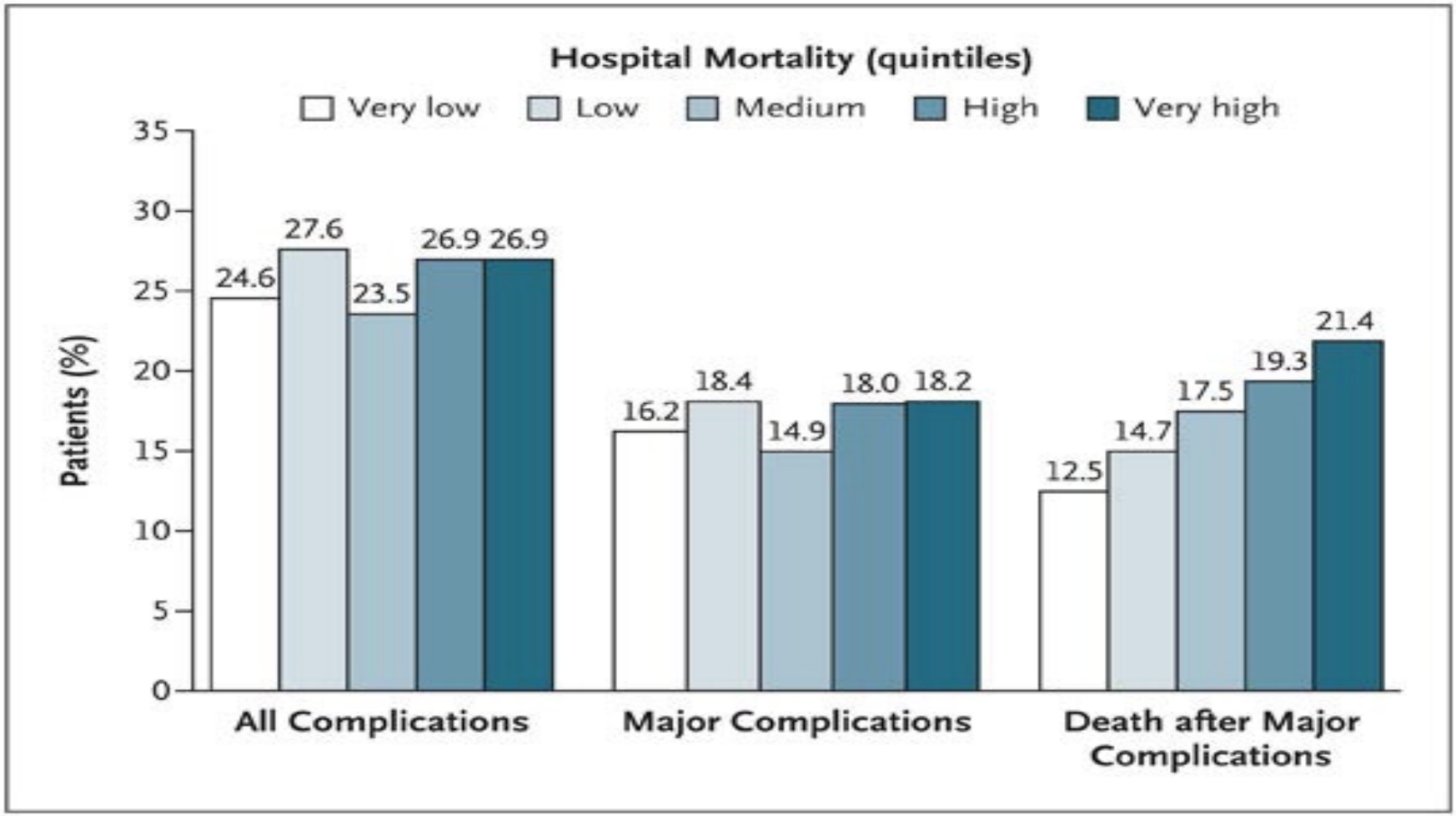
The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

Variation in Hospital Mortality Associated with Inpatient Surgery

Amir A. Ghaferi, M.D., John D. Birkmeyer, M.D., and Justin B. Dimick, M.D., M.P.H.

N Engl J Med 2009; 361:1368-1375 | October 1, 2009


Hospital Mortality (quintiles)
Very low
Low
Medium
High
Very high
Patients (%)
35
30
25
20
15
10
5
0
24.6
27.6
23.5
26.9
26.9
16.2
18.4
14.9
18.0
18.2
12.5
14.7
17.5
19.3
21.4
All Complications
Major Complications
Death after Major Complications

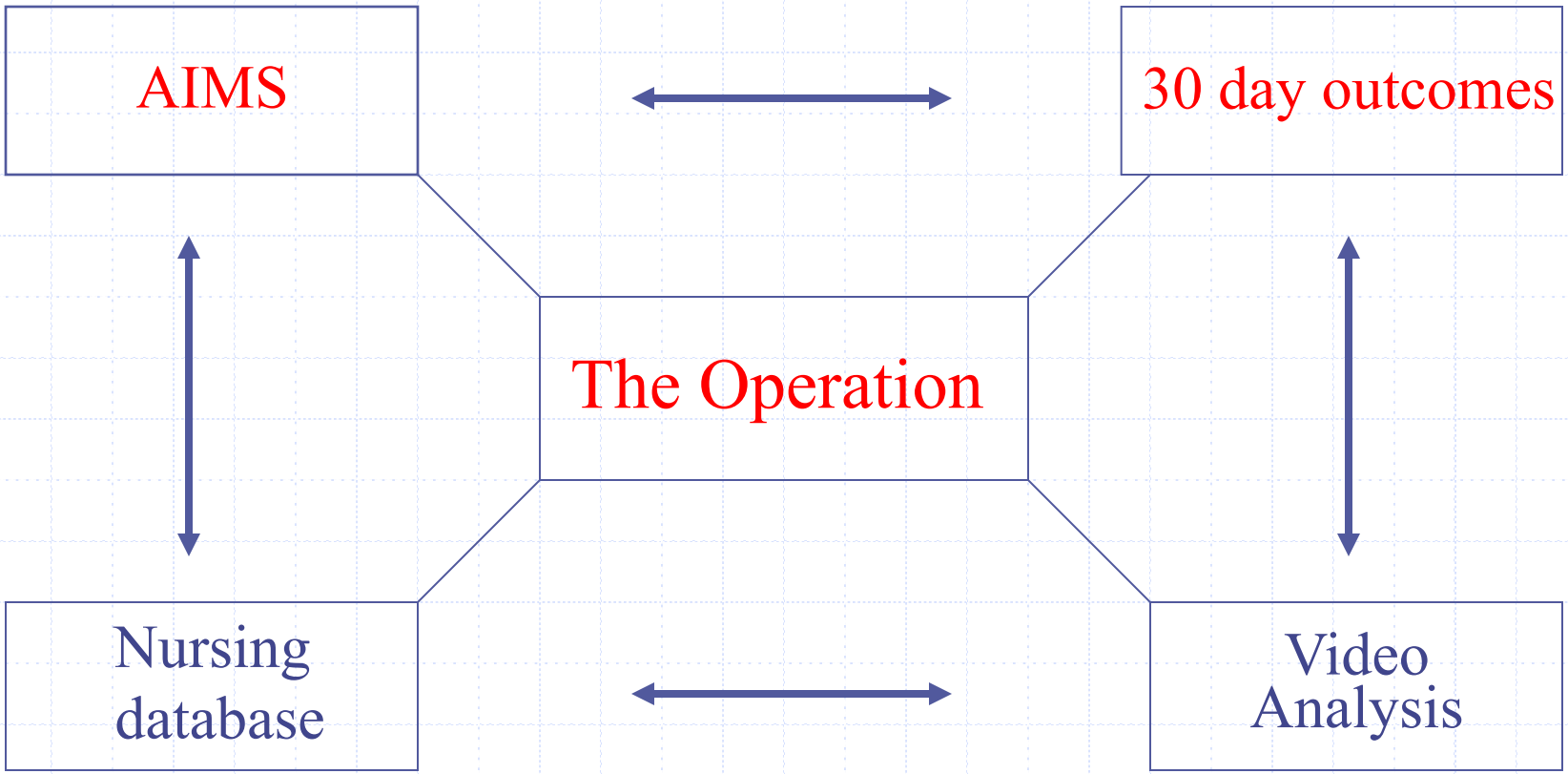
“Rescue” after a complication

- Large variation among MSQC hospitals
- ICU staffing “closed” or not
- Academic vs community
- Nurse staffing
- Weekend coverage
- Rapid Response Team
- Sepsis identification protocol

Linkage with anesthesia

Complications after surgery are more closely associated with anesthetic management than we have ever imagined

The OR of the Future



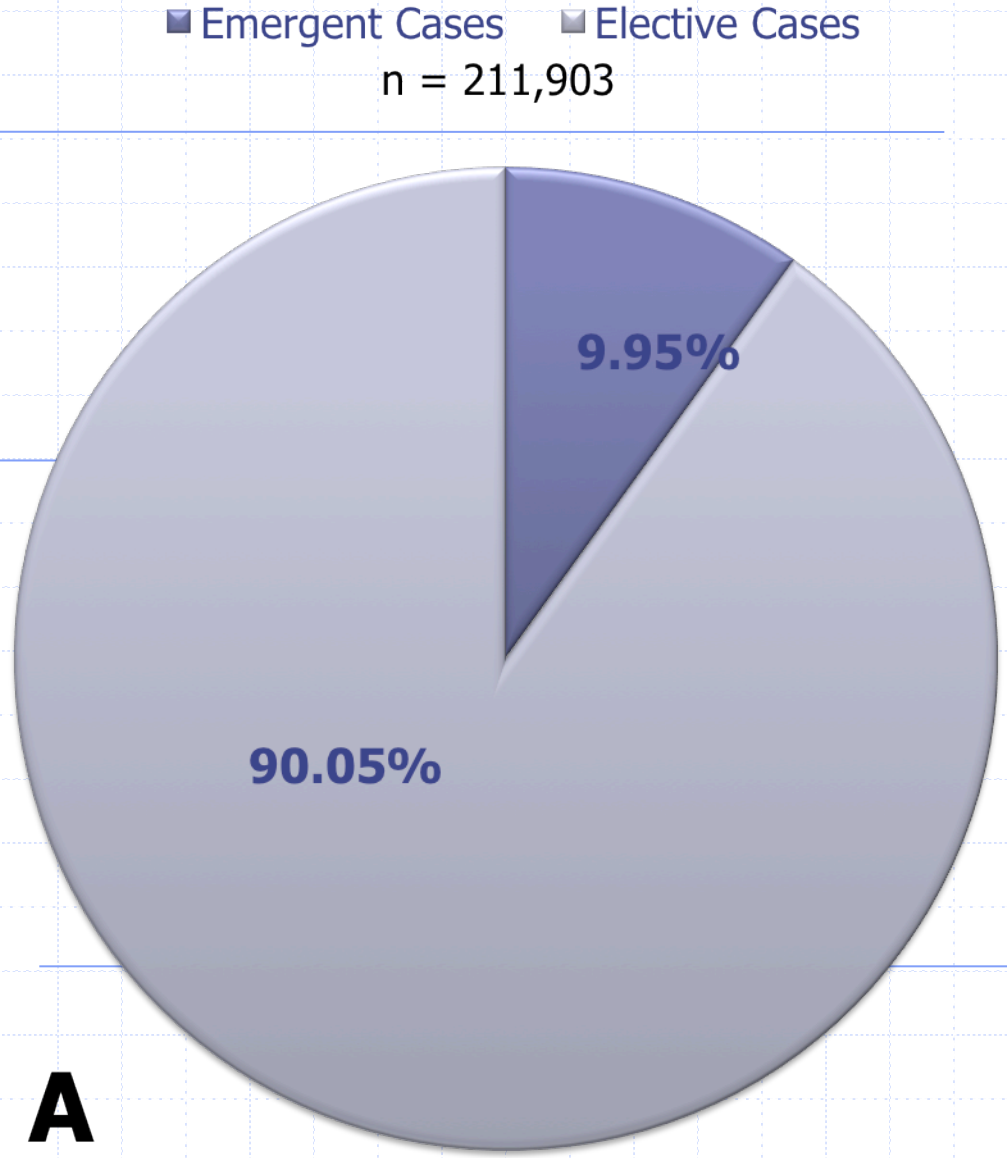
Anesthetic variables added to MSQC

- Total fluid given, and type, total out
- Blood product replacement
- Temp, glycemic control
- Anesthetic technique, agent
- Neosynephrine, hypotension
- Epidural placement, level
- Art line, CO monitoring
- BIS monitoring

Go where the money is

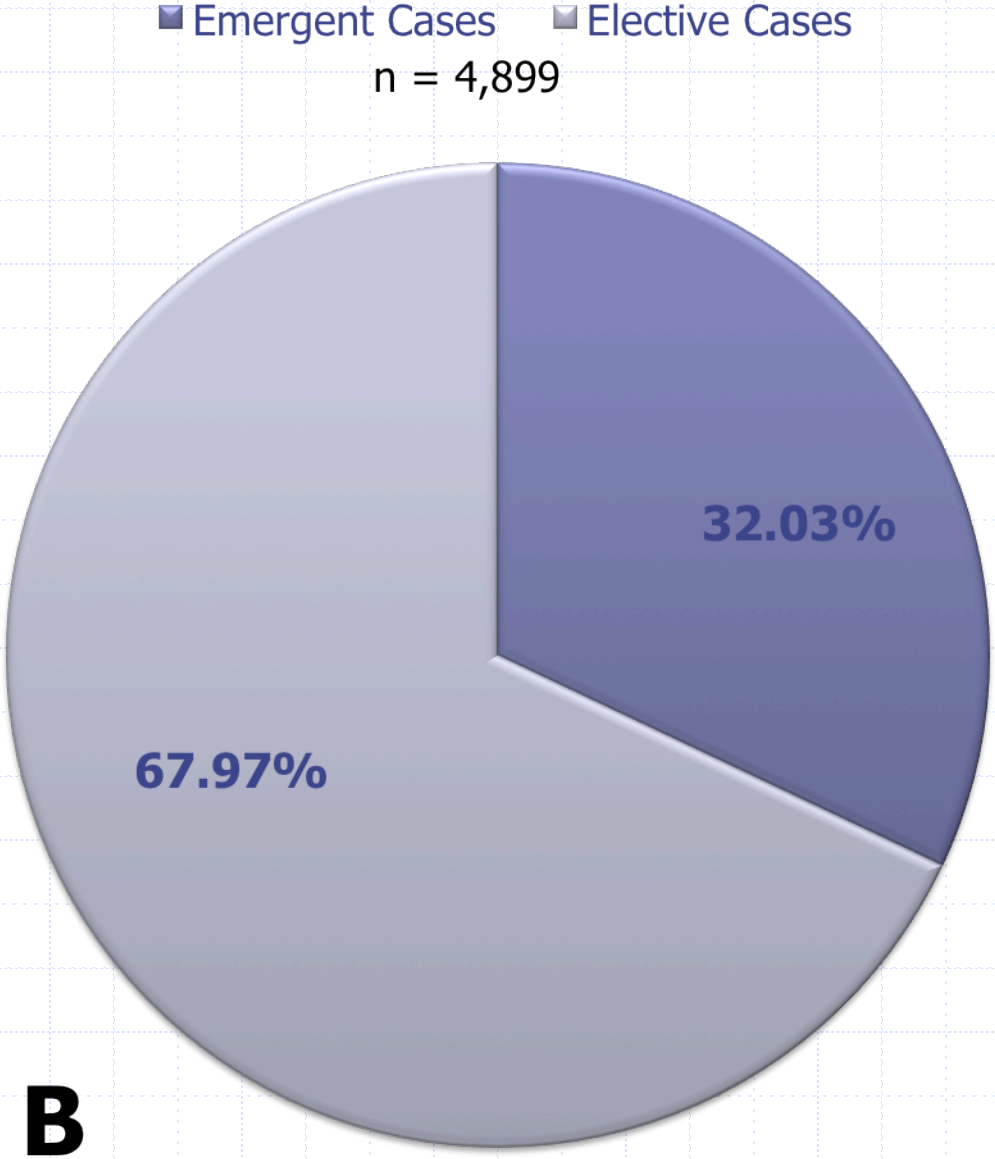
- Emergency surgery

Case Breakdown



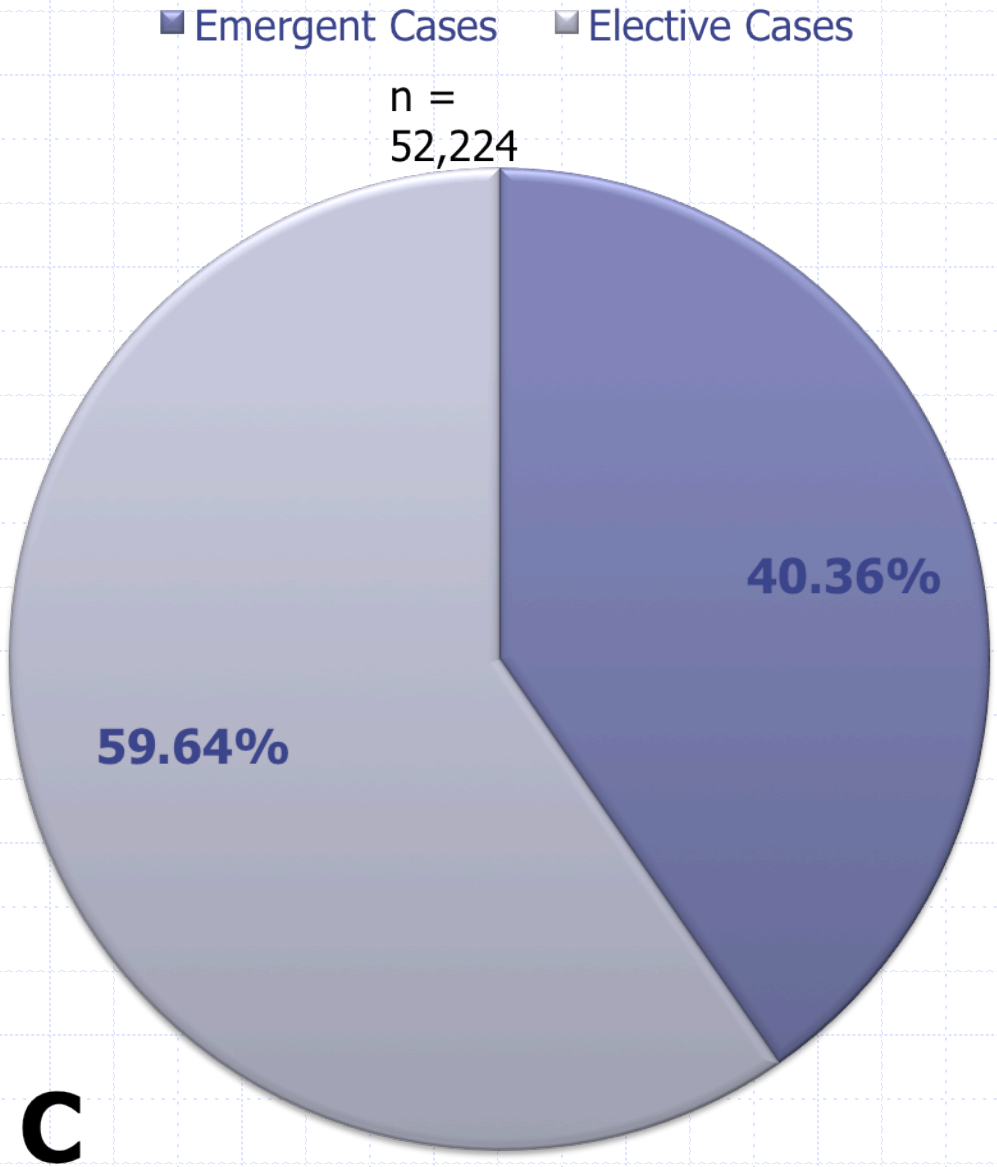
A

Mortality



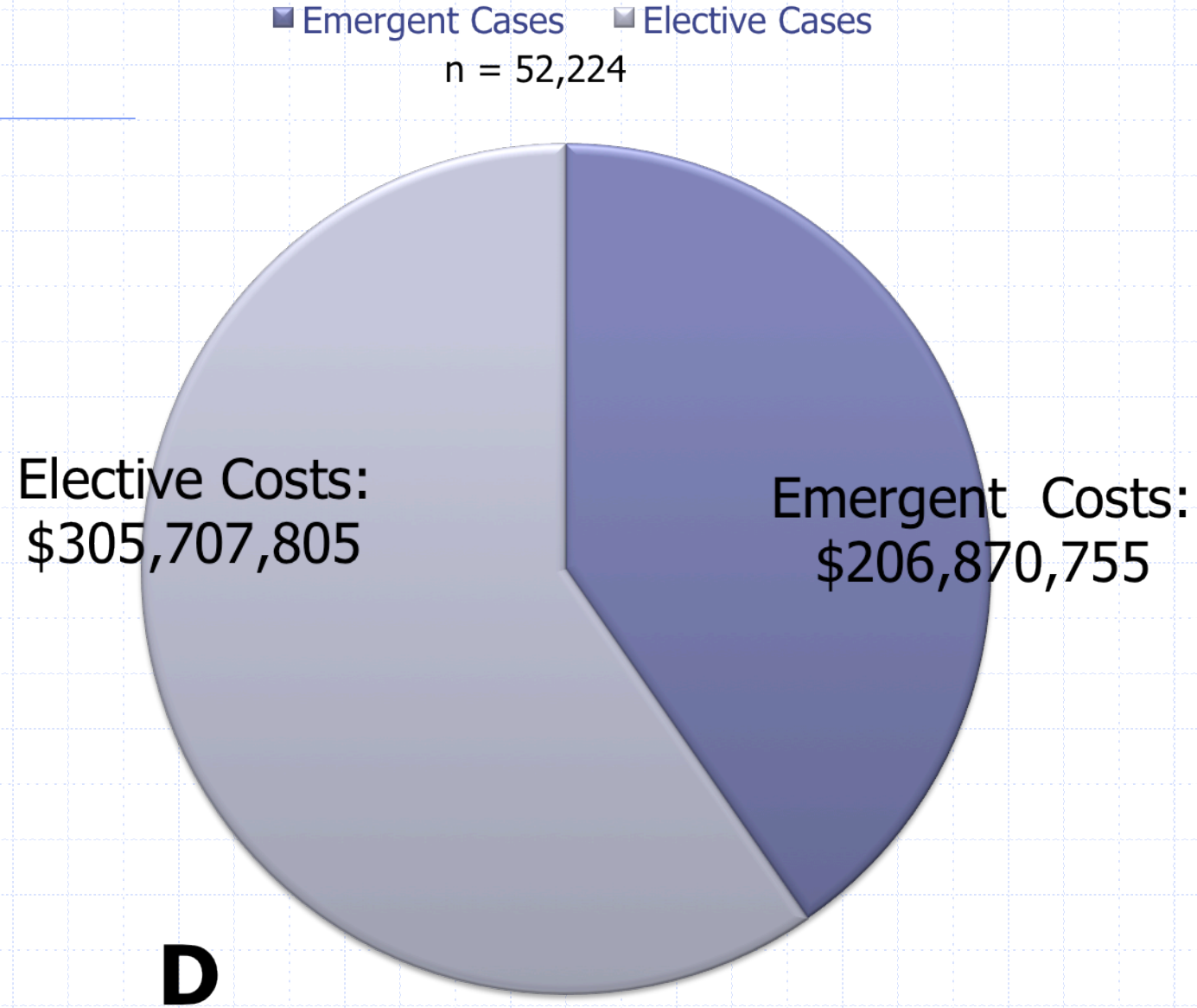
B

Complications



C

Costs from Complications



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