Performance Report Overview

Wisconsin Surgical Society
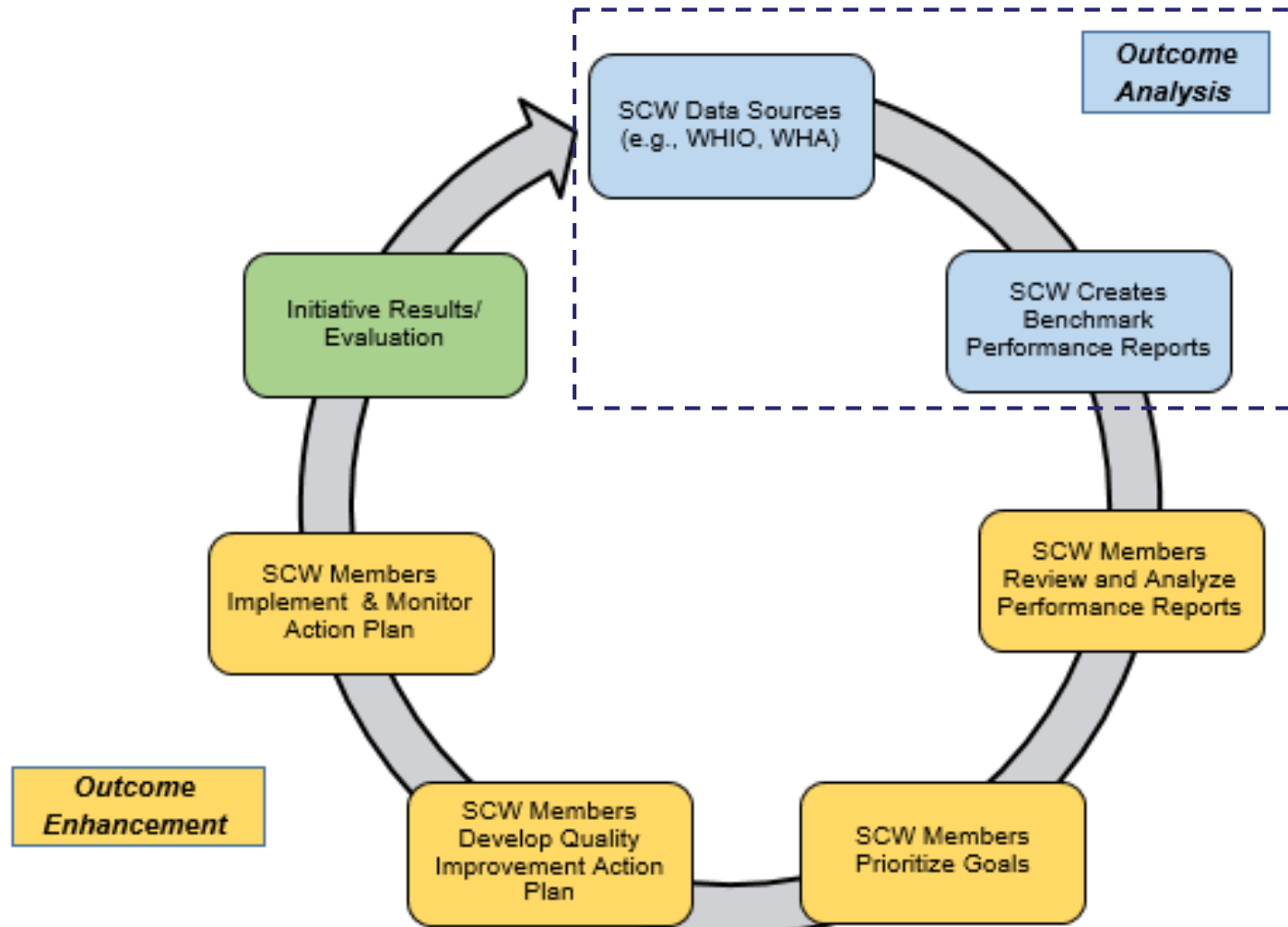
November 3, 2018

SURGICAL COLLABORATIVE

OF WISCONSIN

Overview

- Performance reports in context of outcome-based quality improvement
- Overview of data sources used for reports
- Review performance measures
- Review content of performance reports

Outcome-Based Quality Improvement

Outcome Analysis

Outcome Enhancement

- SCW Data Sources (e.g., WHIO, WHA)
- SCW Creates Benchmark Performance Reports
- SCW Members Review and Analyze Performance Reports
- SCW Members Prioritize Goals
- SCW Members Develop Quality Improvement Action Plan
- SCW Members Implement & Monitor Action Plan
- Initiative Results/ Evaluation

Adapted from Centers for Medicare and Medicaid Services. Outcome-Based Quality Improvement (OBQI) Manual. 2010.

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Data Source
Wisconsin Health Information Organization (WHIO)

- All-payer claims database (Commercial, Medicaid, Medicare Advantage)

- Includes ~75% of WI population

- Inpatient/ Outpatient Use (diagnosis & procedure codes); Pharmacy
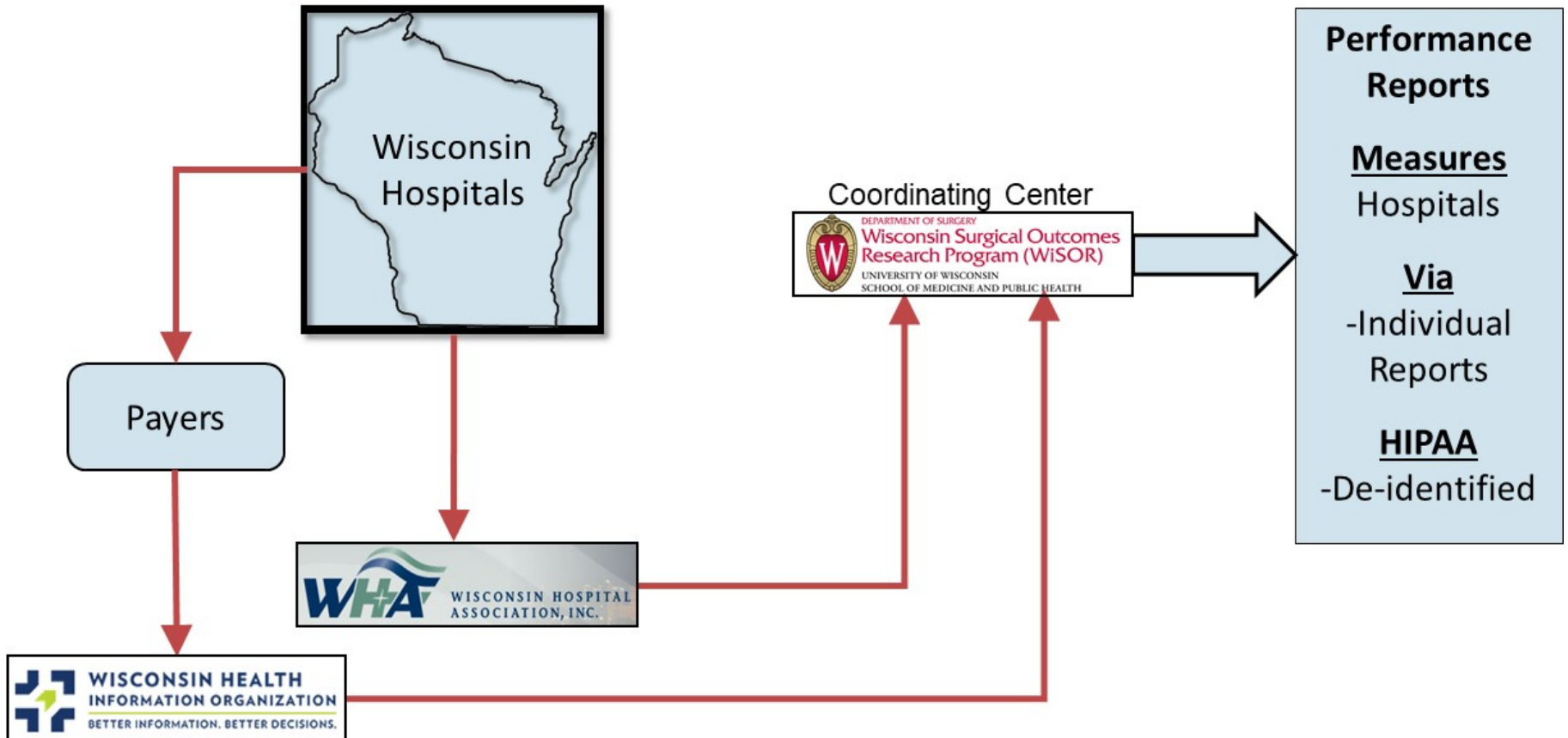 - Data source for the opioid performance report

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Data Source
Wisconsin Hospital Association (WHA)

- Inpatient and outpatient discharge data (quarterly)

- Identified Uses: Hospital Use Over Time (diagnosis & procedure codes)
  - Data source for colorectal and breast reoperation initiatives

Data Flow for Performance Reports

Data Accuracy & Reliability

Type of Measure (Examples)	Hospital Discharge Data (WHA)	Insurance Claims (WHIO)	Primary Data Collection
Surgery	X	X	
Hospital Use (ED; Readmission; Length of Stay)	X	X	
Outpatient Services, including Pharmacy		X	
Complications; SSI; VTE			X
Labs			X

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Re-Excision Performance Report Methods
Data Source

- Wisconsin Hospital Association Data, CY 2017

- Inclusion Criteria:
  – Women received a partial mastectomy (lumpectomy) or mastectomy in 2017

- Exclusions:
  – Patients under age 18 at time of procedure.
  – Women with breast procedure within 12 months of performance year procedure
  – Women without a primary diagnosis of breast cancer at the time of the performance year procedure

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Re-Excision Performance Report Methods
Performance Measures

- <u>Hospital Level Mastectomy Rate</u>: Total number of patients who underwent an index mastectomy procedure at a given hospital divided by the total number of patients who underwent any breast procedure (BCS or mastectomy).

- <u>Hospital Level Re-excision Rate</u>: Total number of patients who underwent a second breast procedure (either mastectomy or breast conserving surgery) within 60 days of their index breast conserving surgery at a given hospital divided by the total number of patients who underwent a breast conserving procedure at that same hospital.

Re-Excision Performance Report Methods
Covariates for Risk Adjustment

- **Age**
- **Payer** (Medicare/Other government, Private, Medical assistance/Badgercare/Self pay)

Performance Report Common Elements

- Tables
  - Patient sociodemographic and clinical characteristics
  - Hospital-level performance year case volume
  - Unadjusted and adjusted performance metrics
- Figures
  - Distribution of hospital-level performance, either risk and reliability adjusted or unadjusted depending on initiative goals
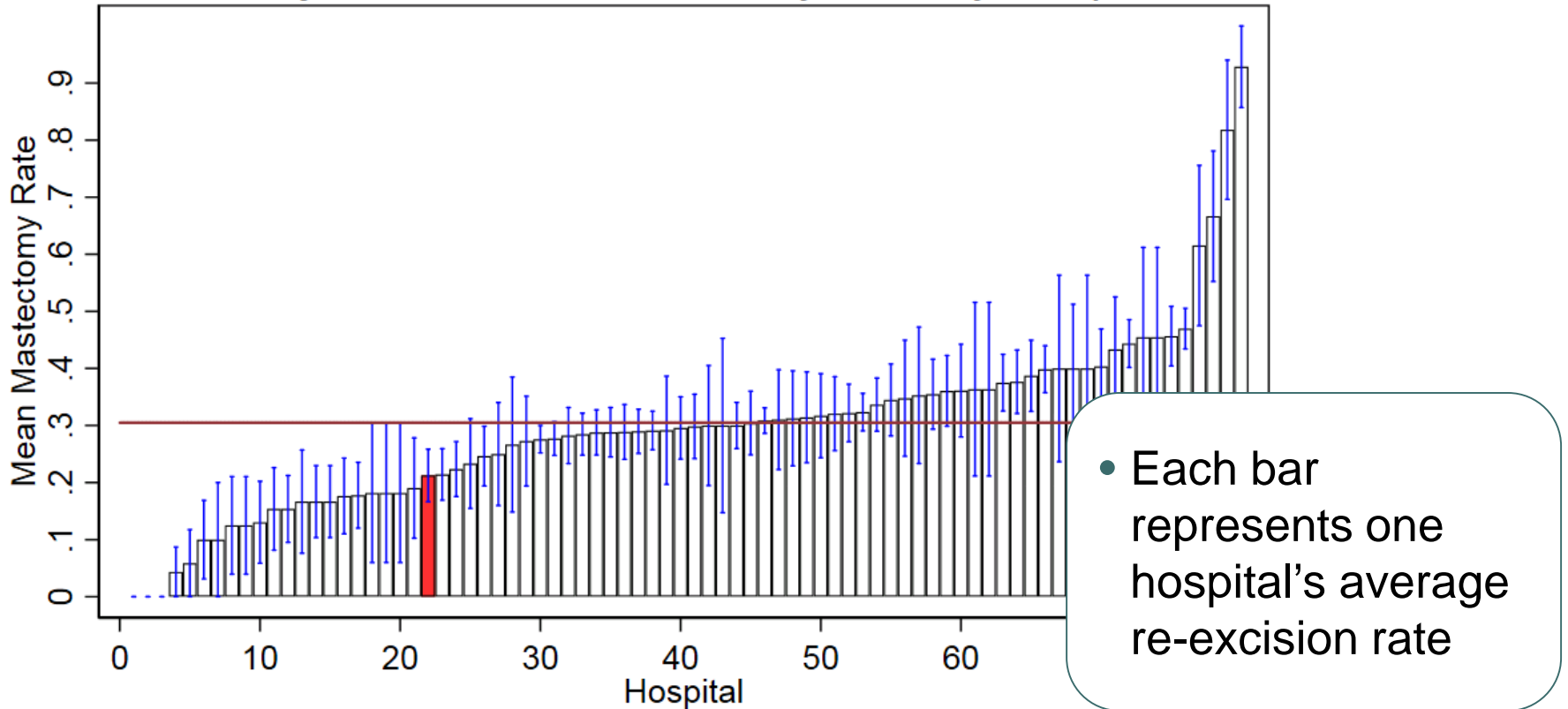
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Example

	X	Participating Hospitals (n=35)	All WI Hospitals (n=80)
60-Day Re-Excision Rate			
Unadjusted		15.1%	16.3%
Risk- and Reliability-Adjusted		15.7%	N/A
Mastectomy as First Operation			
Unadjusted		31.2%	30.5%
Risk- and Reliability Adjusted		31.3%	N/A

	X	Participating Hospitals (n=35)	All WI Hospitals (n=80)
Number of Index Lumpectomy Procedures		2735	3,646
Number of Mastectomy Procedures (as First Operation)		872	1,600
Number of Repeat Procedures		281	593
Mean age (SD)		62.2 (12.6)	62.7 (12.7)
Payer (%)			
Medicare		45.8	47.8
Medical assistance/Badgercare		4.9	4.9
Other Government		1.2	0.9
Private Insurance		47.2	46.2
Self Pay		0.6	0.32
Other/Unknown		0.3	0.15

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Example

Unadjusted Mean Mastectomy Rate by Hospital

- Each bar represents one hospital's average re-excision rate

ERAS Performance Report Methods
Data Source

- Wisconsin Hospital Association Data, 2017

- Inclusion Criteria:
  - Patients who underwent colectomy or procectomy as part of an inpatient stay in 2017

- Exclusions:
  - Patients under age 18 at the time of their performance year procedure.
  - Patients admitted to trauma centers
  - Patients who were not admitted from home, including patients transferred from hospital, skilled nursing facility, same facility, another health care facility, court/law enforcement, ambulatory surgery center, and hospice
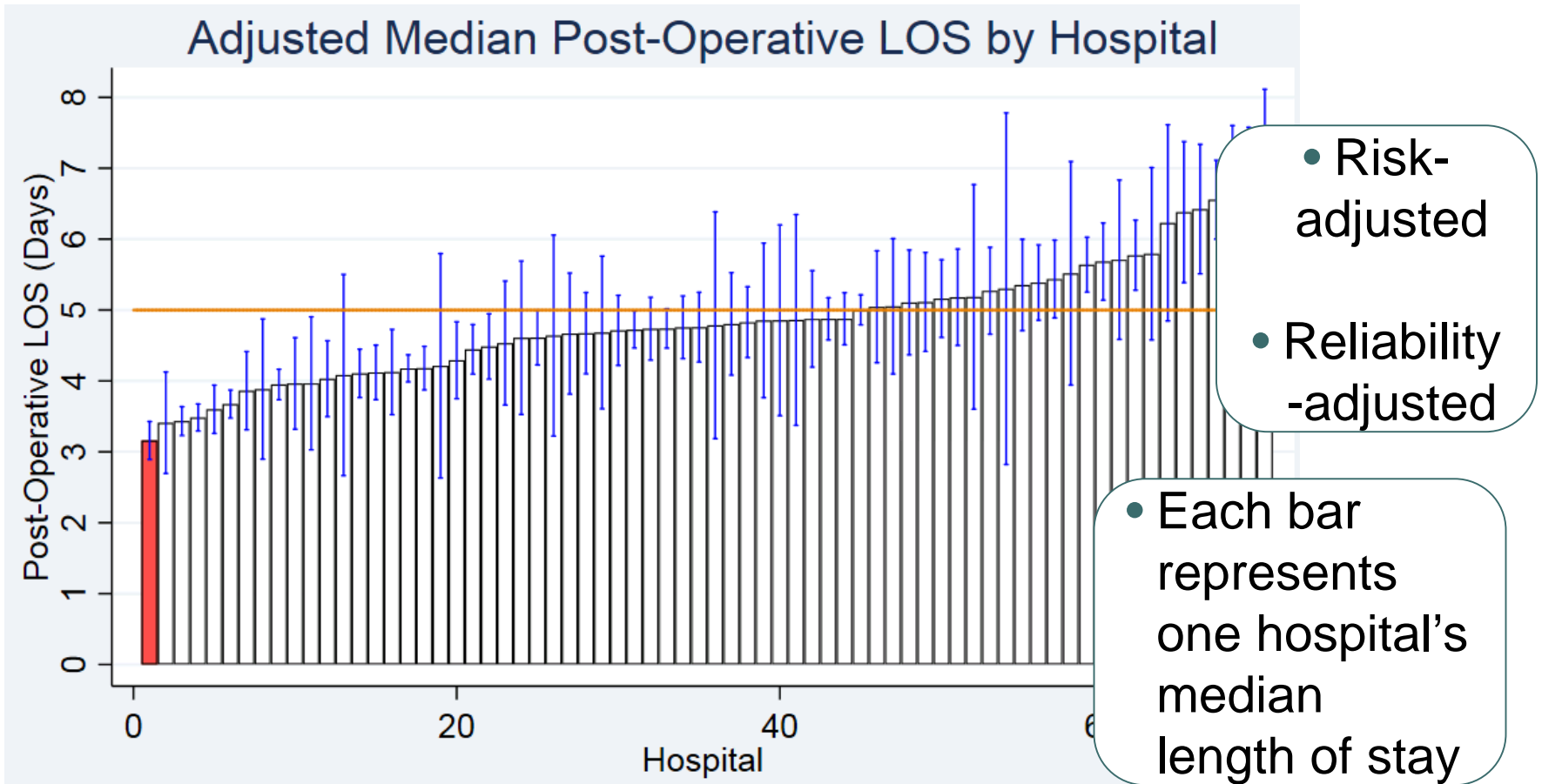
Covariates for Risk Adjustment

- **Age**
- **Gender**
- **Admission type** (Elective, Emergency, Urgent)
- **Admission source** (Non-health care facility, Clinic or Physician office)
- **Payer** (Medicare/Other government, Private, Medical assistance/Badgercare/Self pay)
- **Primary diagnosis category** (GI malignancy, Diverticulitis, Benign neoplasm, Obstruction/perforation, Inflammatory bowel disease, Others)
- **Principal procedure category** (Left colectomy, Right colectomy, Total colectomy, Proctectomy)
- **Surgical approach** (Open, Laparoscopic)
- **Underwent ostomy**
- Elixhauser comorbidities in year prior to index procedure (variables with an overall prevalence of 5% or more were used in the adjusted model):
    - Cardiac arrhythmia , Hypertension , Chronic pulmonary disease , Diabetes without chronic complications, Diabetes with chronic complications, Hypothyroidism, Renal failure , Solid Tumor without metastasis, Obesity, Fluid and electrolyte disorders, Deficiency anemias, Depression

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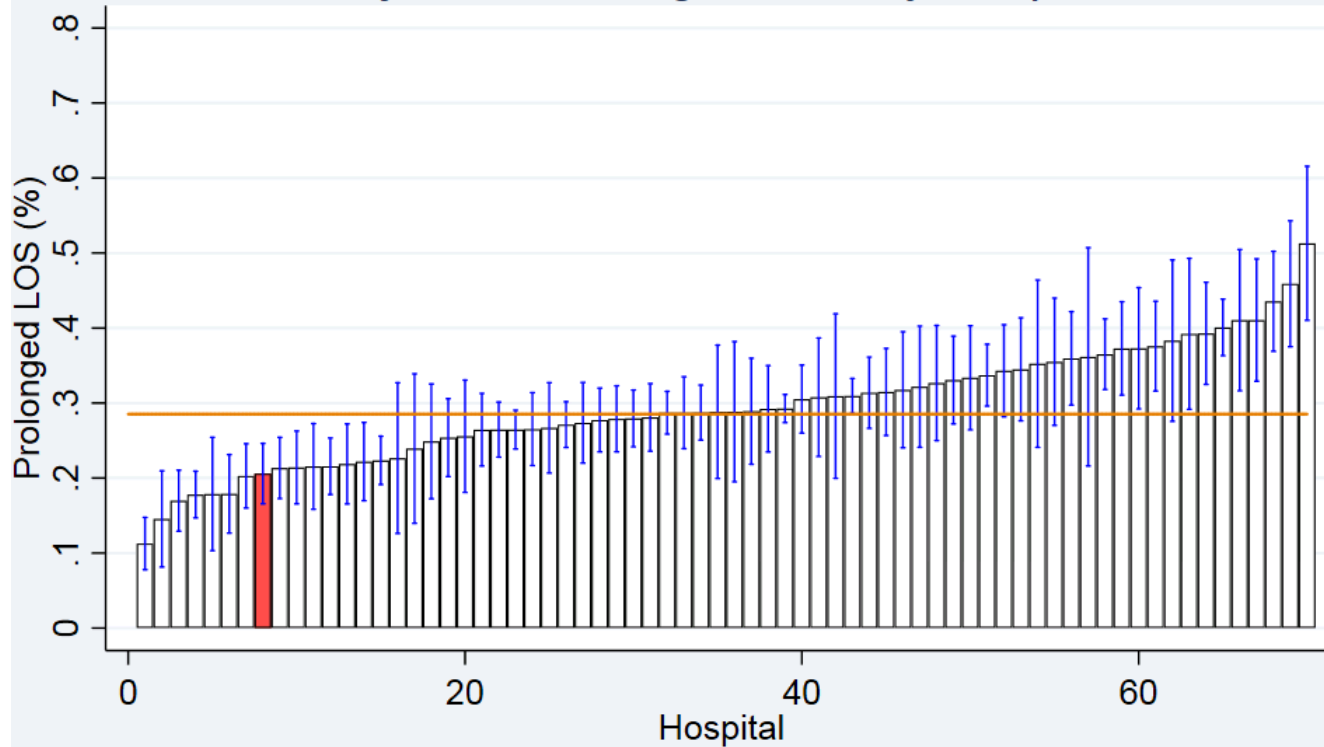OF WISCONSIN

Performance Metrics

- Hospital-level postoperative length of stay (LOS)
  - Number of days from operative end to discharge from the hospital (includes date of the index procedure)

- Hospital-level prolonged postoperative LOS (%)
  - Percent of cases with a postoperative LOS longer than the 75th percentile across Wisconsin hospitals.

- Hospital level all-cause 30-day readmission (%)

Example

Adjusted Median Post-Operative LOS by Hospital

Risk-adjusted

Reliability-adjusted

Each bar represents one hospital's median length of stay

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Example

Adjusted Prolonged LOS by Hospital

- Risk-adjusted

- Reliability-adjusted
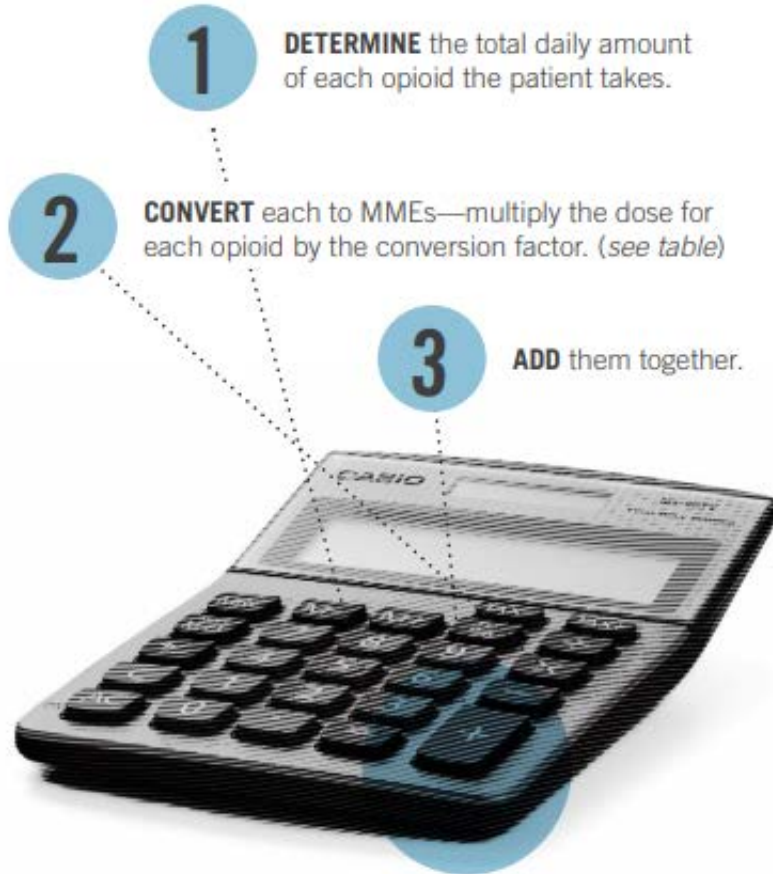
Each bar represents one hospital's <u>percentage of patients with a prolonged LOS</u> (NSQIP definition)

Opioid Prescribing Performance Report Methods
Data Source

- Wisconsin Health Information Organization (WHIO) administrative claims data, July 1 2016-June 30 2017

- CDC algorithm (2018) to convert NDC drug codes to morphine equivalents

- Inclusion Criteria:
  - Patients who underwent laparoscopic cholecystectomy between 6/1/2016-6/1/2017 (n=9,348)
  - Continuous insurance coverage with insurance carrier within month of surgery, including prescription drug coverage (n=6,167)

- Exclusions:
  - Patients with additional procedures at the time of their laparascopic cholecystectomy based on provider review (n=5,679)

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Calculating Morphine Equivalents

1 **DETERMINE** the total daily amount of each opioid the patient takes.

2 **CONVERT** each to MMEs—multiply the dose for each opioid by the conversion factor. (*see table*)

3 **ADD** them together.

Calculating morphine milligram equivalents (MME)

OPIOID (doses in mg/day except where noted)	CONVERSION FACTOR
Codeine	0.15
Fentanyl transdermal (in mcg/hr)	2.4
Hydrocodone	1
Hydromorphone	4
Methadone	
1-20 mg/day	4
21-40 mg/day	8
41-60 mg/day	10
≥ 61-80 mg/day	12
Morphine	1
Oxycodone	1.5
Oxymorphone	3

These dose conversions are estimated and cannot account for all individual differences in genetics and pharmacokinetics.

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Performance Report
Project: Reducing Opioid Prescribing

- Measures
  - Mean total morphine equivalent (MME) filled by patients within 7 days of laparoscopic procedure
  - Mean number of hydrocodone, codeine, tramadol, oxycodone, hydromorphone tablets filled postoperatively by procedure
- Data not risk or reliability adjusted. Emphasis on number of tablets by type.

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Example

	Opioid Prescribing Recommendation*	Hospital X	Participating Hospitals (n= 32)	All WI Hospitals (n=134)
Number of Cases	n/a		1,693	3,986
Hydrocodone (Norco) 5 mg Tablets (Median, IQR)	15		30 (20-40)	30 (20-30)
Codeine (Tylenol #3) 30 mg Tablets (Median, IQR)	15		30 (15-30)	25 (20-30)
Tramadol 50 mg Tablets (Median, IQR)	15		30 (20-40)	30 (20-35)
Oxycodone 5 mg Tablets (Median, IQR)	10		30 (20-40)	30 (20-40)
Hydromorphone (Dilaudid) 2 mg Tablets (Median, IQR)	10		70 (20-120)	25 (18-60)

* Prescribing recommendation taken from the Michigan Opioid Prescribing Engagement Network (OPEN)

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Example

Each bar represents one hospital's median total morphine equivalent – error bars are IQR


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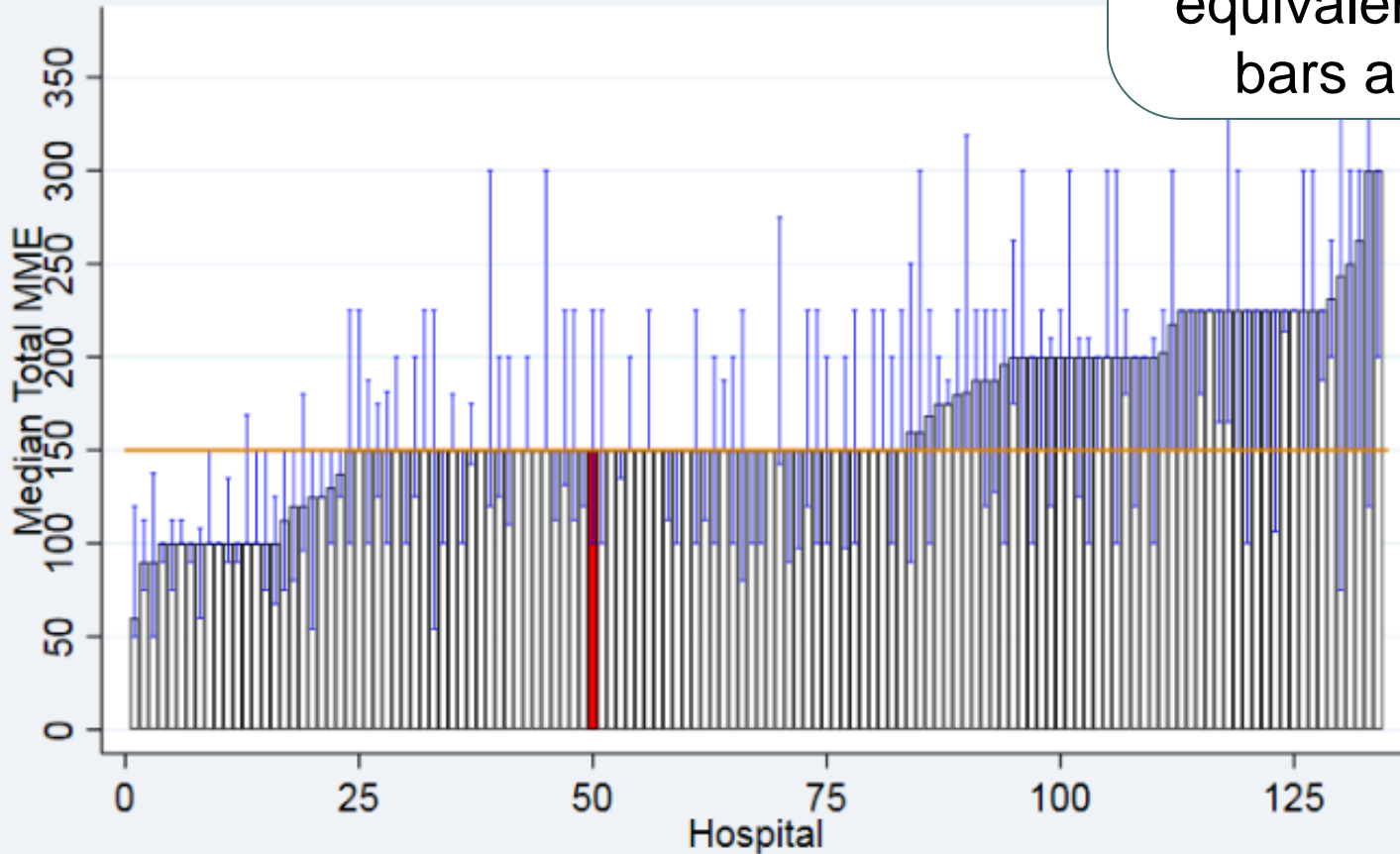
Risk & Reliability Adjustment

- Risk-adjustment performed using clinical factors identified from the literature
  - Risk factors combined into a single risk score before conducting hierarchical model
  - Risk score calculated based on logistic regression model, using postestimation commands to predict log(odds) of the dichotomous outcomes

- Risk score added as single independent variable in subsequent two-level hierarchical logistic regression models for each dependent variable
  - Hospital ID used as the only second level variable
  - Using postestimation commands, produced empirical Bayes estimates of each hospital's random effect
  - Random effect represents the risk-adjusted and reliability-adjusted quality estimate that then gets added to the average patient risk

Impact of Reliability Adjustment on Performance Measures

- Reduces variation in rates relative to estimates that are risk adjusted alone
  - Hospitals with large N: Outcomes measured reliably and do not shrink much to average.
  - Hospitals with small N: Outcomes less reliable and shrink more
- Rare outcomes tend to be impacted more by this approach than outcomes that are more common.

Dimick, 2012
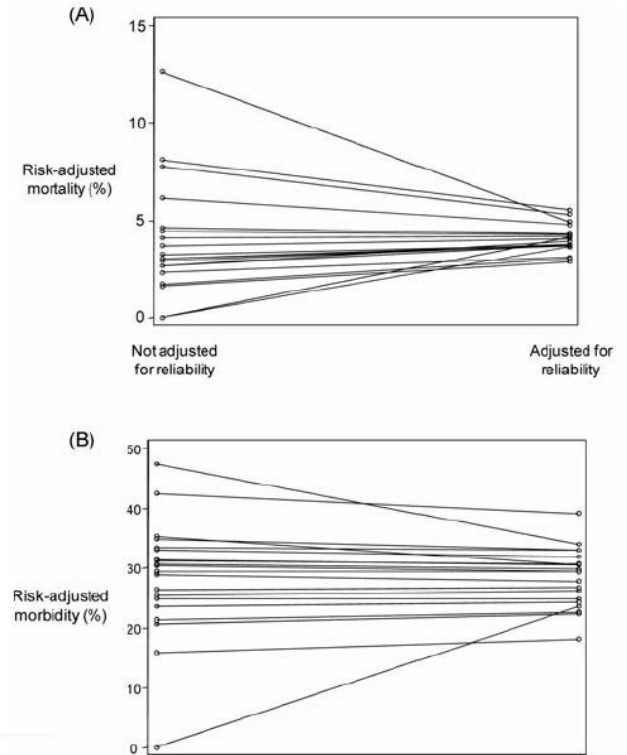
Strengths & Limitations

- Strengths
  - Data reliably collected using validated claims-based algorithms
  - Consistency of data over time to assess change

- Limitations
  - Misspecification is always a concern
  - Less of a concern when assessing change over time
  - Data isn't perfect

- Important to remember primary use of these data
  - Benchmark for current performance
  - Opportunity to identify variation
  - Reliable measurement approach to assess changes over time

We Welcome Your Feedback!

- What elements of the report are most helpful?
- Additional information that would be useful?
  - Technical appendix & FAQ will be made available

- Please provide feedback in your initiative groups!

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