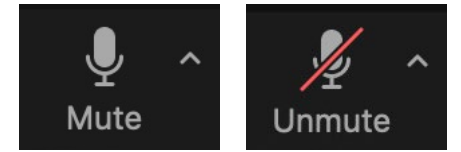


The Michigan Trauma Quality Improvement Program

**Virtual, MI
February 9, 2021**





Meeting Logistics

- **Join via computer and enter full name**
- **Mute all microphones**
- **Discussion opportunities at section ends**
- **Use chat to signal contribution**
- **You'll unmute your own microphone**

Disclosures

- ◆ Salary Support for MTQIP from BCBSM/BCN and MDHHS
 - Mark Hemmila
 - Judy Mikhail
 - Jill Jakubus
 - Anne Cain-Nielsen

Disclosures

- ◆ Mark Hemmila Grants
 - Blue Cross Blue Shield of Michigan
 - Michigan Department of Health and Human Services
 - Department of Defense
 - National Institutes of Health - NIGMS

No Photos Please



Evaluations

- ◆ Link will be emailed to you following meeting
- ◆ You have up to 7 days to submit
- ◆ Please answer the evaluation questions
- ◆ Physicians/Nurses/Advanced Practitioners:
 - E-mail certificate for 3.0 Category 1 CME

New MTQIP Trauma Center

- ◆ McLaren Northern Michigan Hospital
 - Michael Martin, MD, TMD
 - Jane Poquette, TPM
- ◆ 35 Level 1 or 2 Trauma Centers

Data Submission

- ◆ Data submitted December 4, 2020
 - This report
 - 3 week turnaround
- ◆ Data submitted February 5, 2021
 - Pending
- ◆ Next data submission
 - April 2, 2021

Future Meetings

- ◆ Spring (MCOT)
 - Wednesday May 12, 2021
 - Boyne Mountain, Boyne Falls ?
 - Virtual ?
- ◆ Spring (Registrars and MCR's)
 - Tuesday June 1, 2021
 - Ypsilanti, EMU Marriott
 - Level 3's

State of Michigan

◆ FY 2021

- State and region reporting (Level 1,2,3)
- 22 Level 3 Hospitals
- Level 3's risk-adjusted reporting
- Data validation - 12 Hospitals

◆ FY 2022

- Proposal submitted

BCBSM Guest

◆ Dr. James Grant

- Senior VP and Chief Medical Officer BCBSM
- Taking over for Tom Simmer, MD
- Cedars Sinai, former Chairman
- William Beaumont Hospital, former Chairman
- Past President of American Society of Anesthesiologists
- Past President Michigan State Medical Society

MTQIP Hospital Scoring Index Results

Mark Hemmila, MD



Metrics for MTQIP

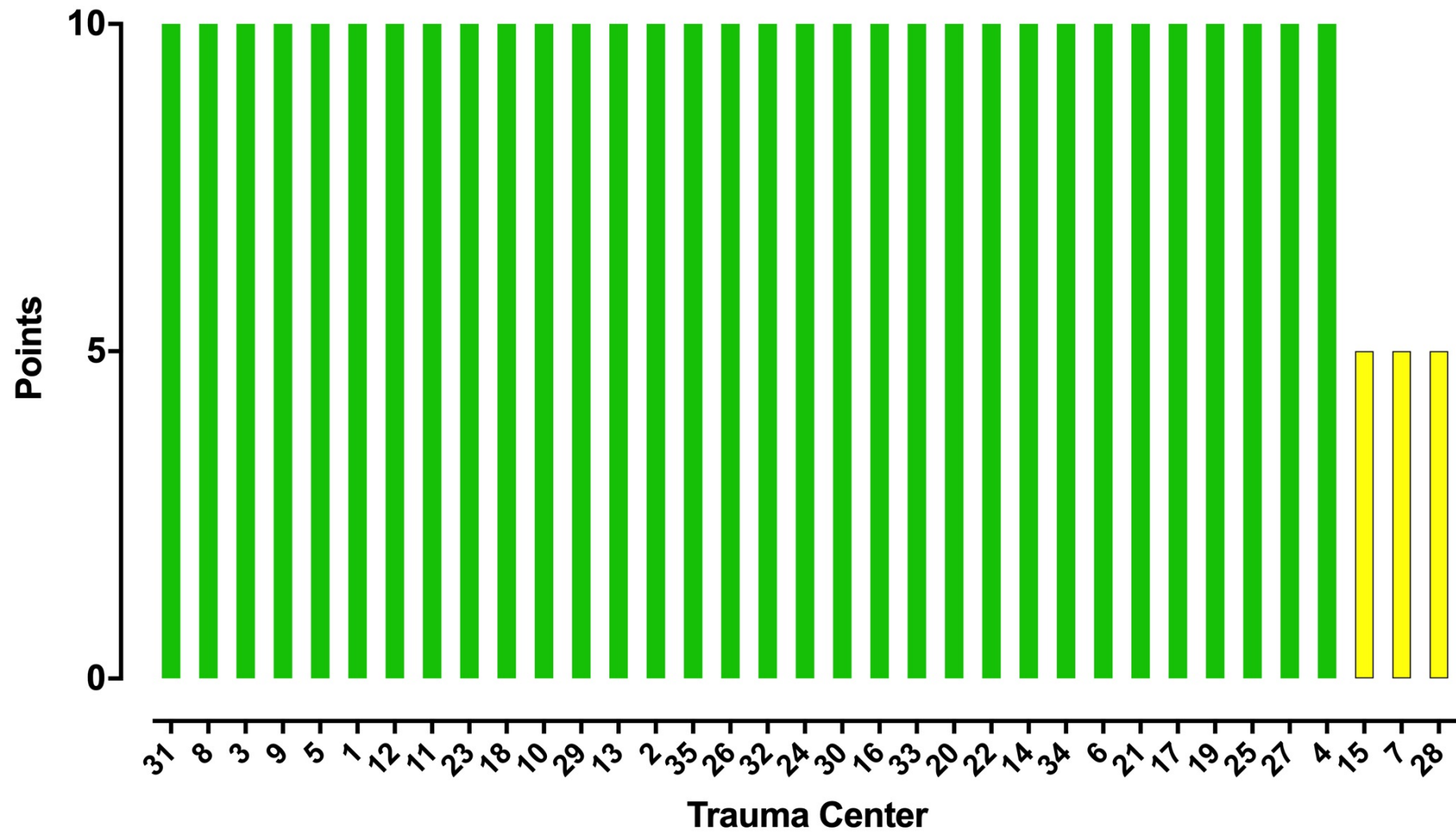
- ◆ Hospital = CQI Scoring Index
 - 10 Measures
 - End result: Hospital P4P
- ◆ Surgeon = VBR
 - 3 Measures (VTE LMWH Timing (G), IHF OR in <48hrs (G), Open femur/tibia fracture abx in 120 minutes (C))
 - Scoring as a group practice
 - End result: Surgeon VBR in 2021 (March)
 - BCBSM will notify

- Hospital Result
- Points
- Possible Points

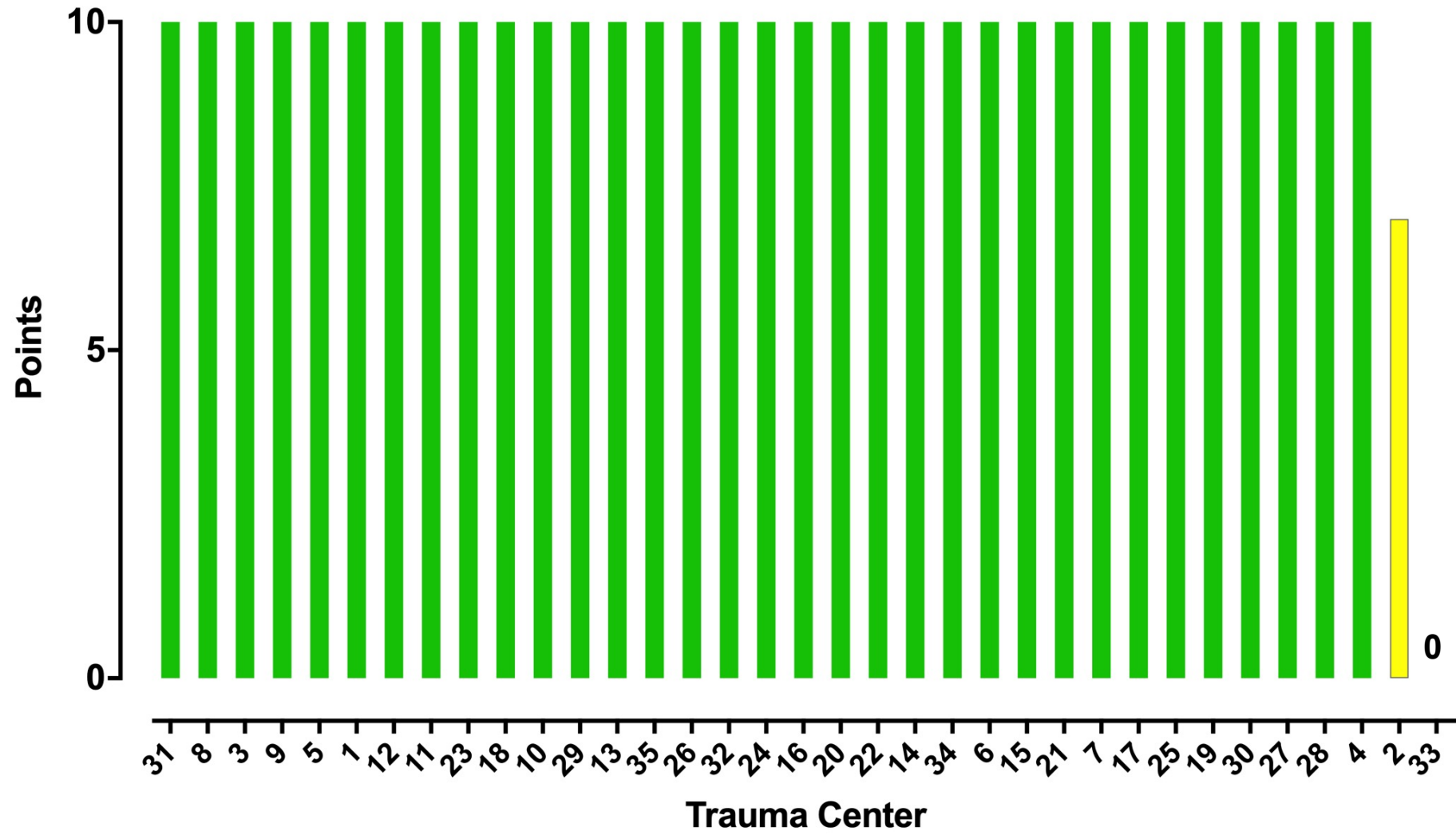
• Score =
Points/Possible Points x 100

Michigan Medicine Michigan Trauma Quality Improvement Program (MTQIP) 2020 Performance Index January 1, 2020 to December 31, 2020						
Measure	Weight	Measure Description	Result	Points	Possible	
#1	10	Data Submission On time and complete 3 of 3 times On time and complete 2 of 3 times On time and complete 1 of 3 times	3	10	10 5 0	PARTICIPATION (30%)
#2	10	Meeting Participation Surgeon, and (TPM and/or MCR) Participate in 3 of 3 Collaborative meetings (9 pts) Surgeon, and (TPM and/or MCR) Participate in 2 of 3 Collaborative meetings (6 pts) Surgeon, and (TPM and/or MCR) Participate in 1 of 3 Collaborative meetings (0 pts) Surgeon, and (TPM and/or MCR) Participate in 0 of 3 Collaborative meetings (0 pts) Registrar, and/or MCR Participate in the Data Abstractor Meeting (1 pt)	3 1	10	9 6 0 0 1	
#3	10	Data Validation Error Rate 0-4.0% 4.1-5.0% 5.1-6.0% 6.1-7.0% >7.0%	3.2	10	10 8 5 3 0	
#4	10	Timely LMWH VTE Prophylaxis in Trauma Service Admits (18 mo: 1/1/19-6/30/20) ≥ 50% of patients (≤ 48 hr) ≥ 45% of patients (≤ 48 hr) ≥ 40% of patients (≤ 48 hr) < 40% of patients (≤ 48 hr)	55	10	10 8 5 0	PERFORMANCE (70%)
#5	10	Timely Surgical Repair in Geriatric (Age ≥ 65) Isolated Hip Fxs (12 mo: 7/1/19-6/30/20) ≥ 90% of patients (≤ 48 hr) ≥ 85% of patients (≤ 48 hr) ≥ 80% of patients (≤ 48 hr) < 80% of patients (≤ 48 hr)	96	10	10 8 5 0	
#6	10	RBC to Plasma Ratio in Massive Transfusion (18 mo: 1/1/19-6/30/20) Weighted Mean Points in Patients Transfused with > 5 units 1st 4 hr	1.6	8.8	0-10	
#7	10	Serious Complication Z-Score Trend in Trauma Service Admits (3 years: 7/1/17-6/30/20) < -1 (major improvement) -1 to 1 or serious complications low-outlier (average or better rate) > 1 (rates of serious complications increased)	-1.00	7	10 7 5	
#8	10	Mortality Z-Score Trend in Trauma Service Admits (3 years: 7/1/17-6/30/20) < -1 (major improvement) -1 to 1 or mortality low-outlier (average or better rate) > 1 (rates of mortality increased)	0.25	7	10 7 5	
#9	10	Timely Head CT in TBI Patients on Anticoagulation Pre-Injury (12 mo: 7/1/19-6/30/20) ≥ 90% patients (≤ 120 min) ≥ 80% patients (< 120 min) ≥ 70% patients (< 120 min) < 70% patients (< 120 min)	91	10	10 7 5 0	
#10	10	Timely Antibiotic in Femur/Tibia Open Fractures - Collaborative Wide Measure (12 mo: 7/1/19-6/30/20) ≥ 85% patients (< 120 min) < 85% patients (< 120 min)	Center 94 MTQIP 87	 10	 10 0	
Total Points			92.8		100	
BCBSM Reported Score			92.8			

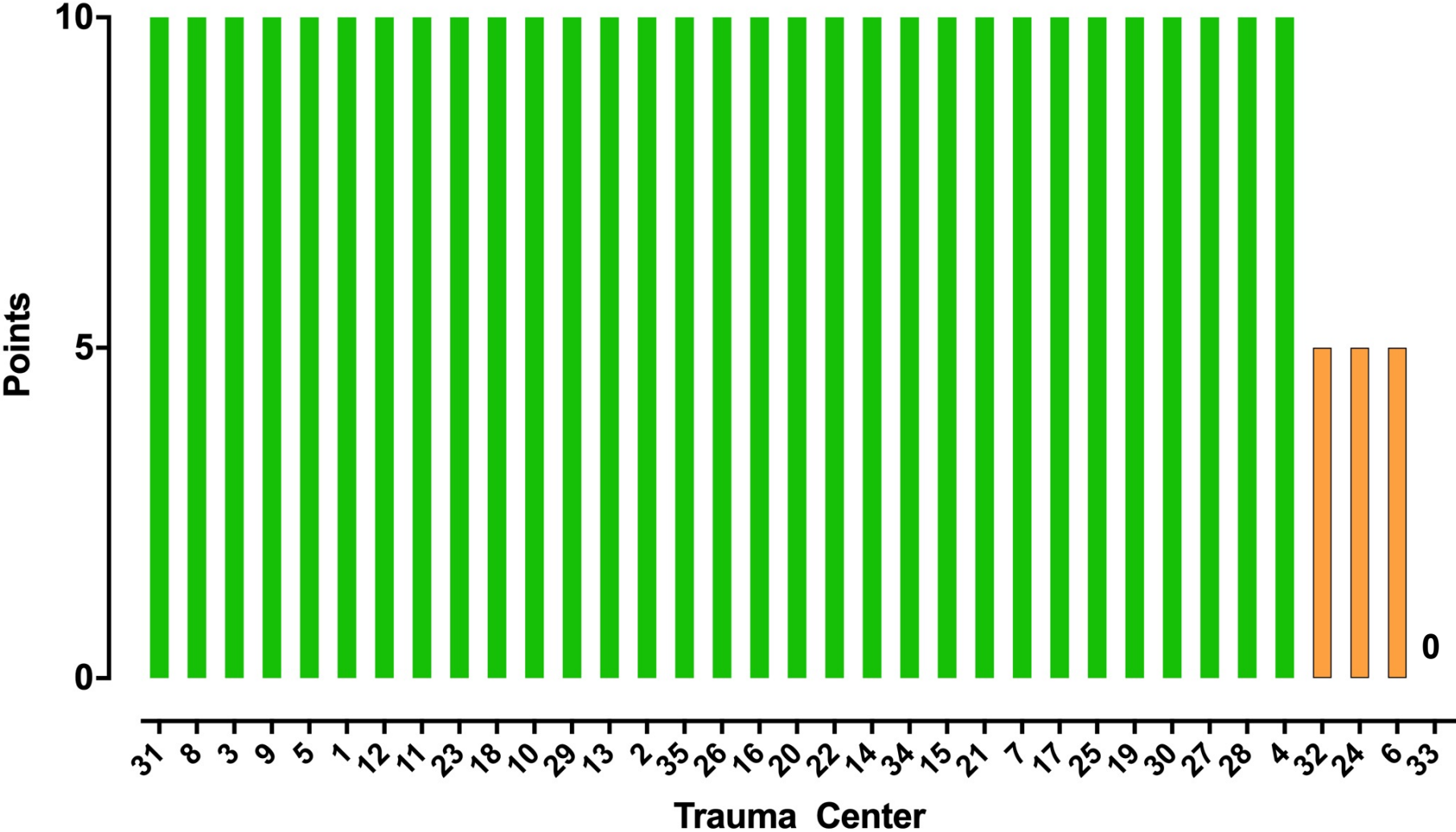
Data Submission



Meeting Participation



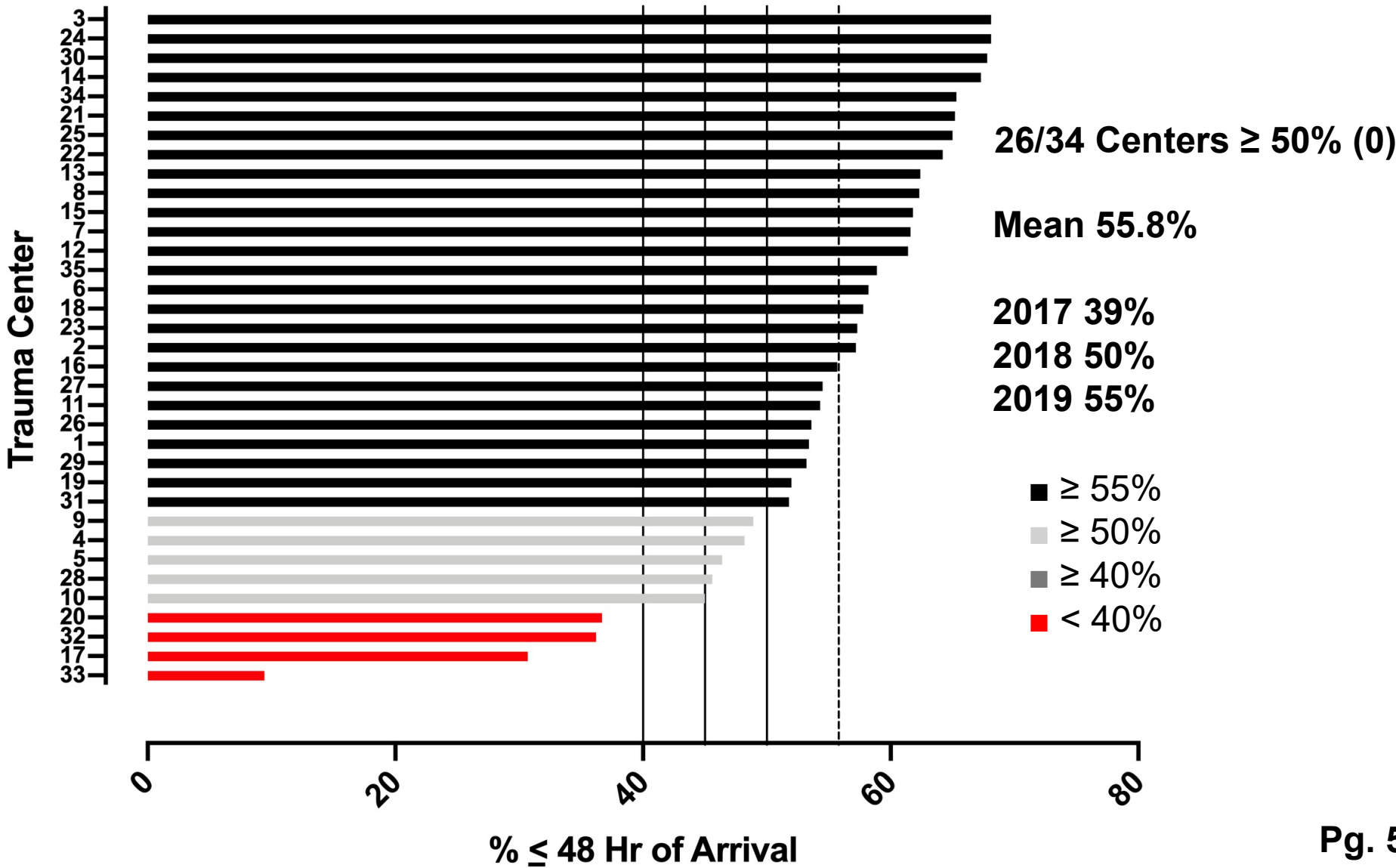
Accuracy of Data



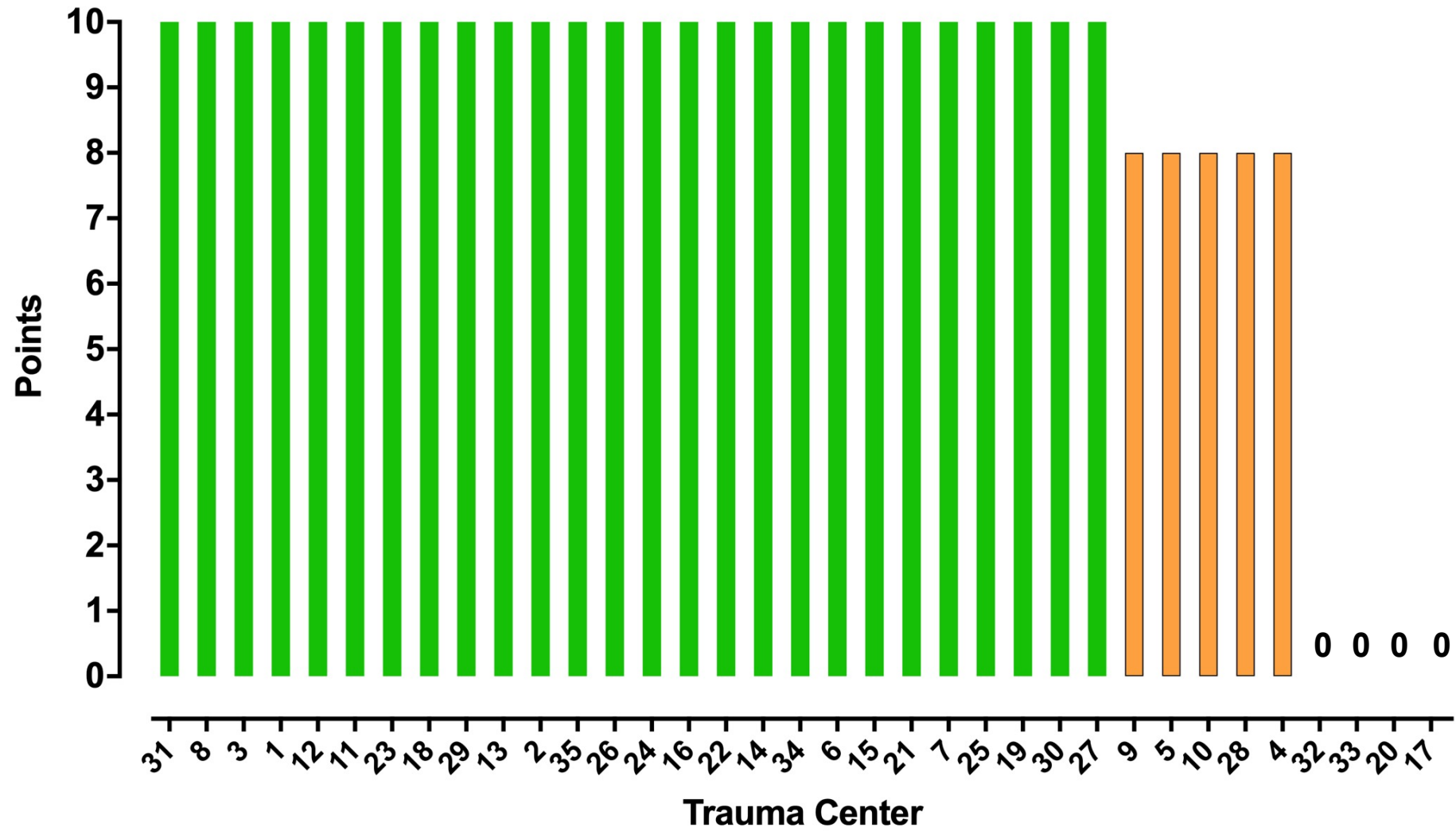
#4 Timely LMWH VTE Prophylaxis in Trauma Service Admits

- ◆ Venous Thromboembolism (VTE) Prophylaxis with LMWH Initiated Within 48 Hours of Arrival in Trauma Service Admits with > 2 Day Length of Stay (18 mo: 1/1/19-6/30/20)
 - $\geq 50\%$ of patients (≤ 48 hr)
 - $\geq 45\%$ of patients (≤ 48 hr)
 - $\geq 40\%$ of patients (≤ 48 hr)
 - $< 40\%$ of patients (≤ 48 hr)

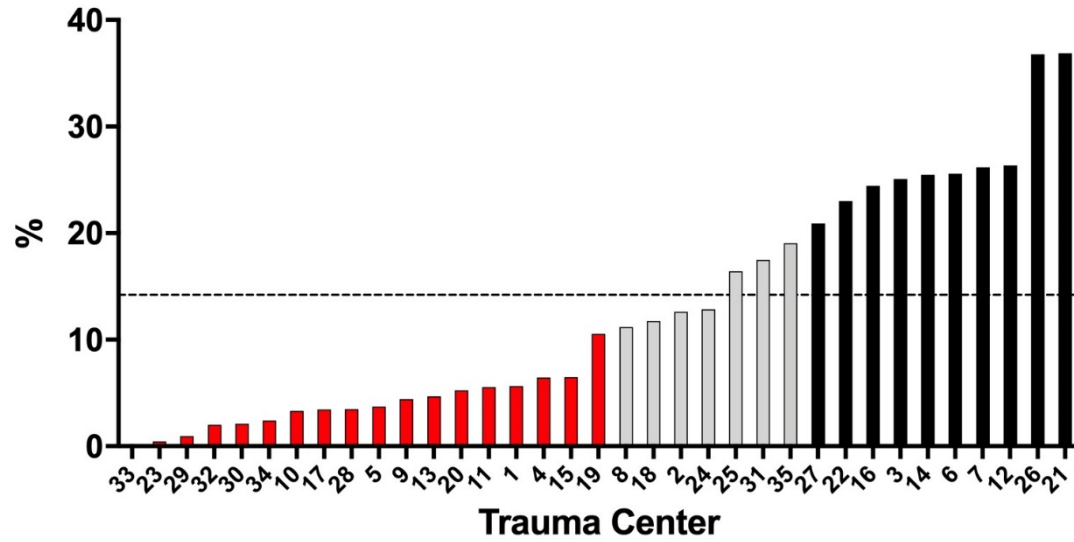
Metric #4 - VTE Prophylaxis LMWH Timeliness
Cohort 2 - Admit to Trauma
1/1/19 - 6/30/20



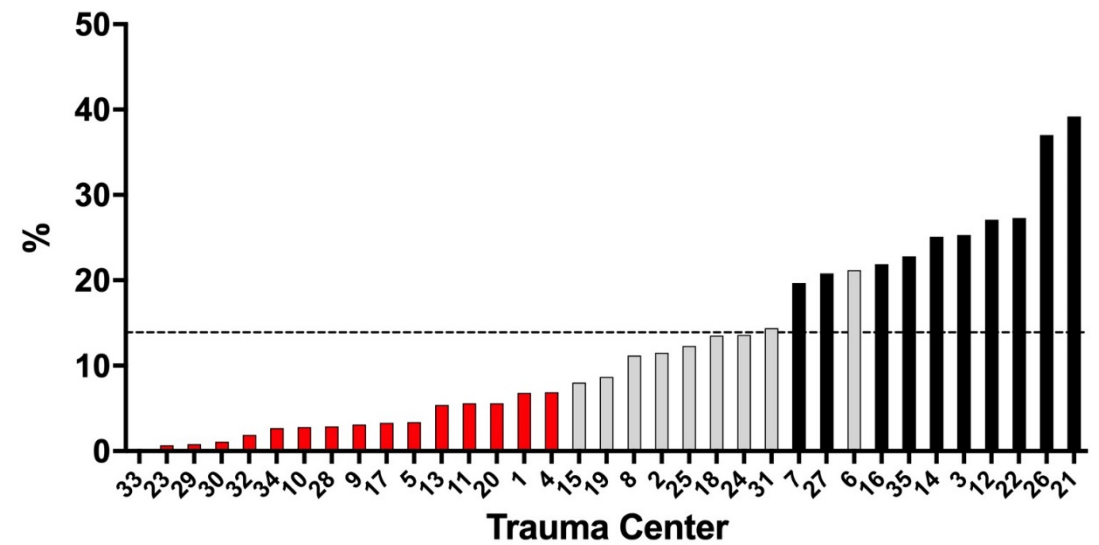
Timely VTE Prophylaxis



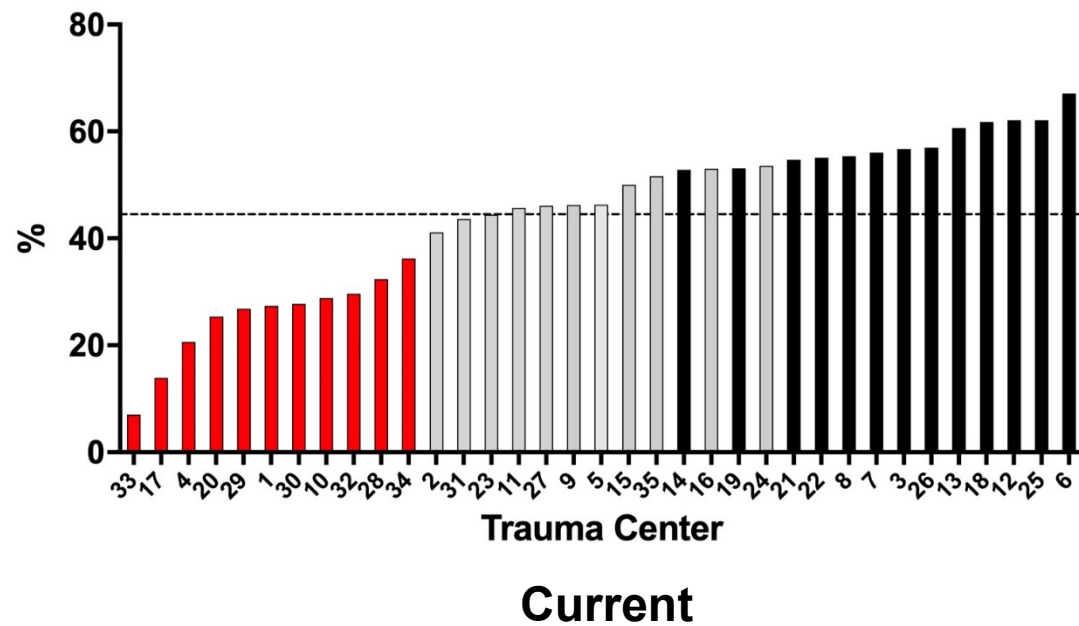
**VTE LMWH \leq 48 hours
Cohort - TBI**



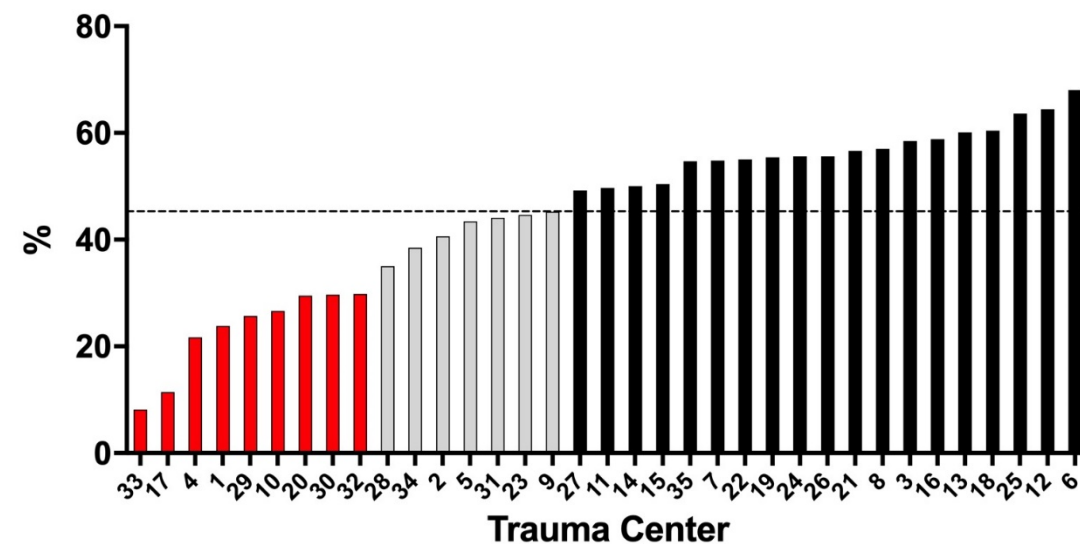
**VTE LMWH \leq 48 hours
Cohort - TBI**



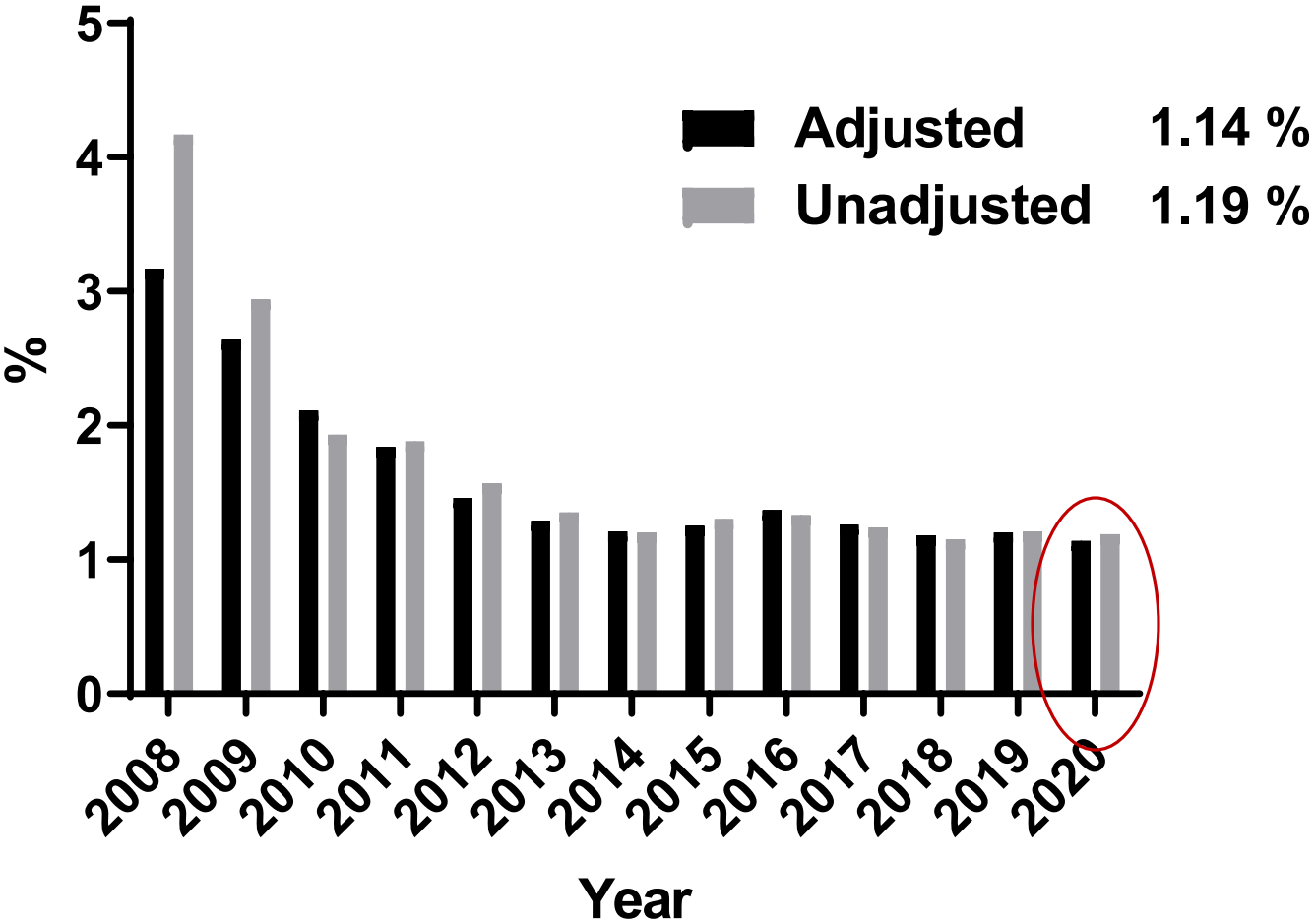
**VTE LMWH \leq 48 hours
Cohort - Spine Injury**



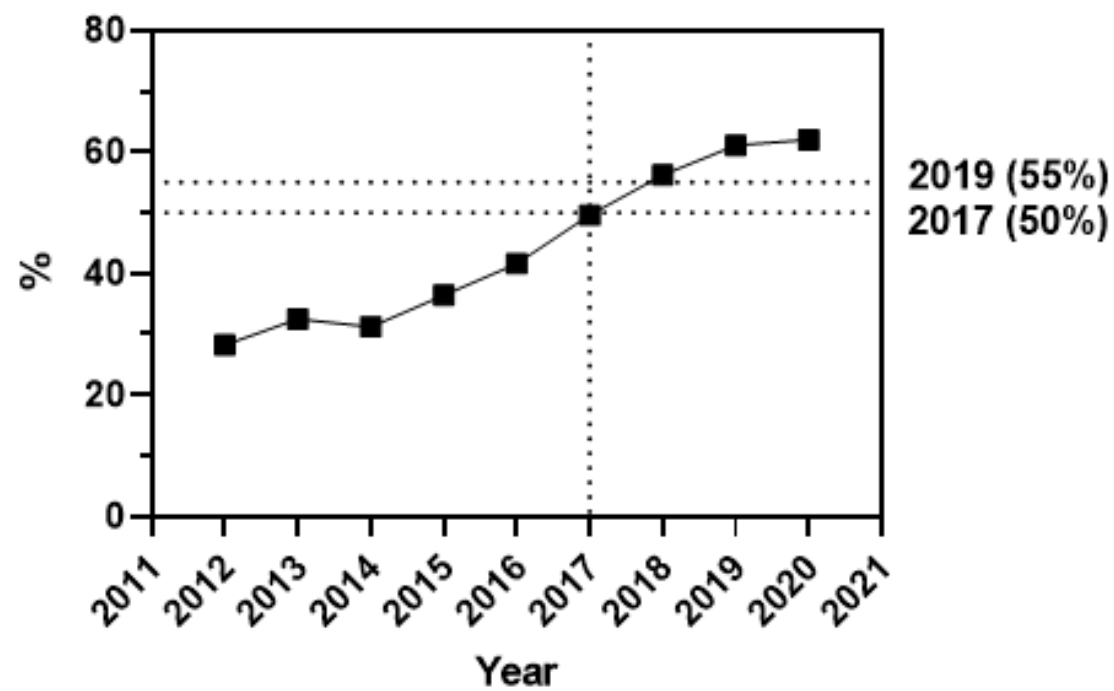
**VTE LMWH \leq 48 hours
Cohort - Spine Injury**



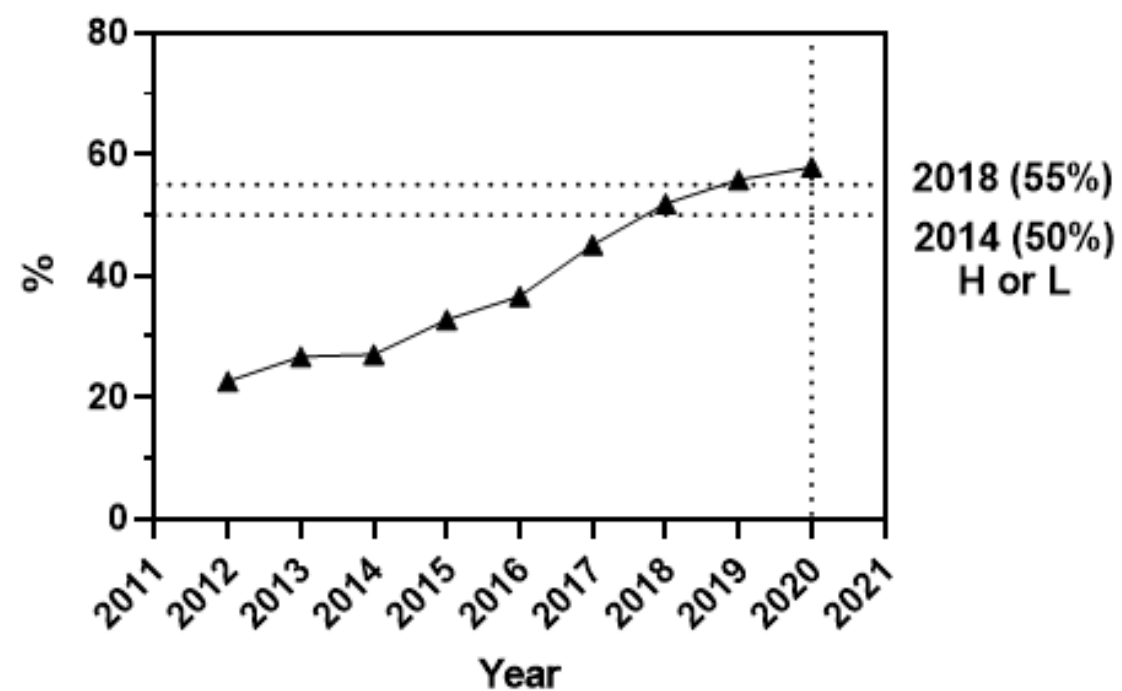
VTE Event



LMWH Type VTE Prophylaxis



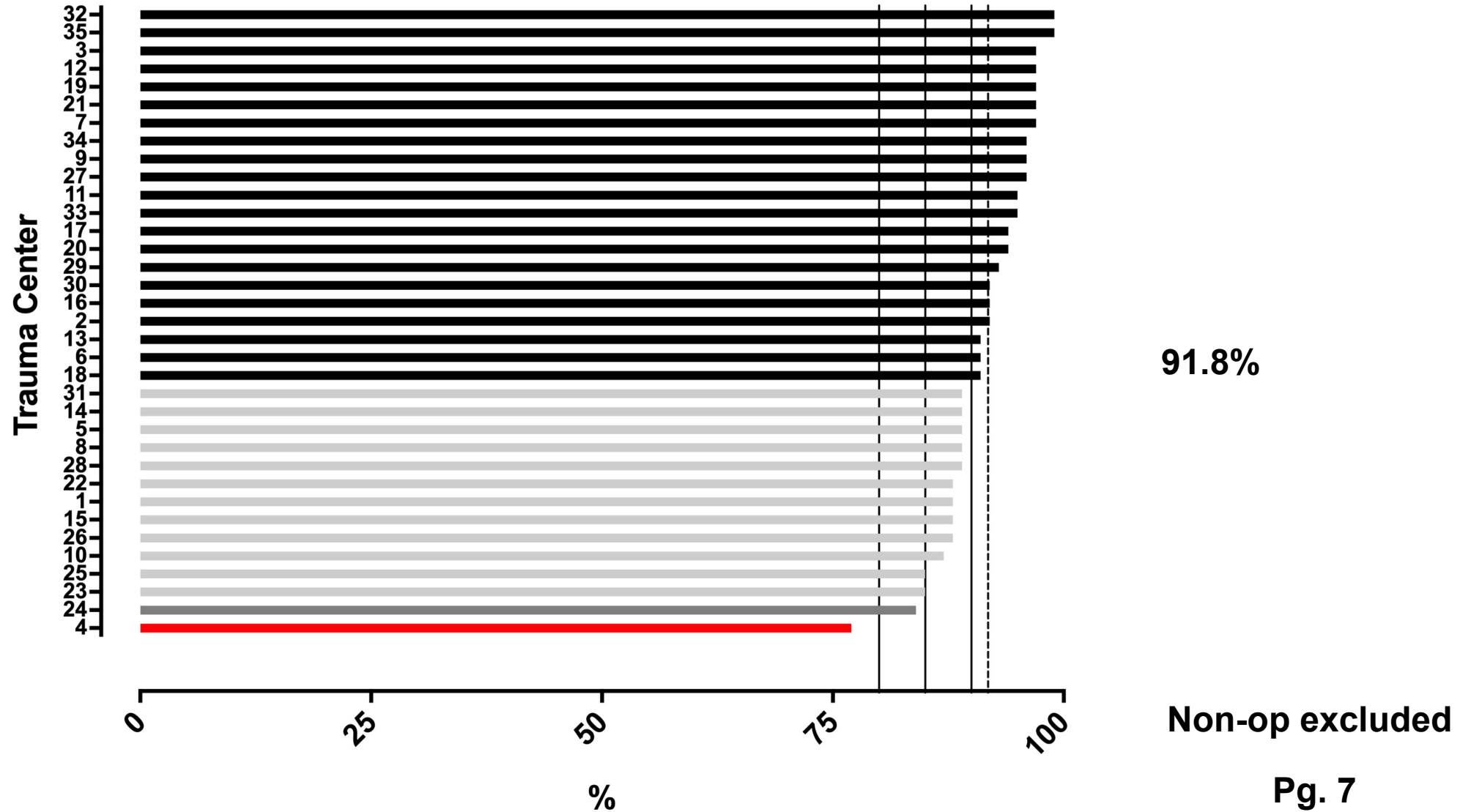
VTE Prophylaxis (LMWH, ≤ 48 hrs)



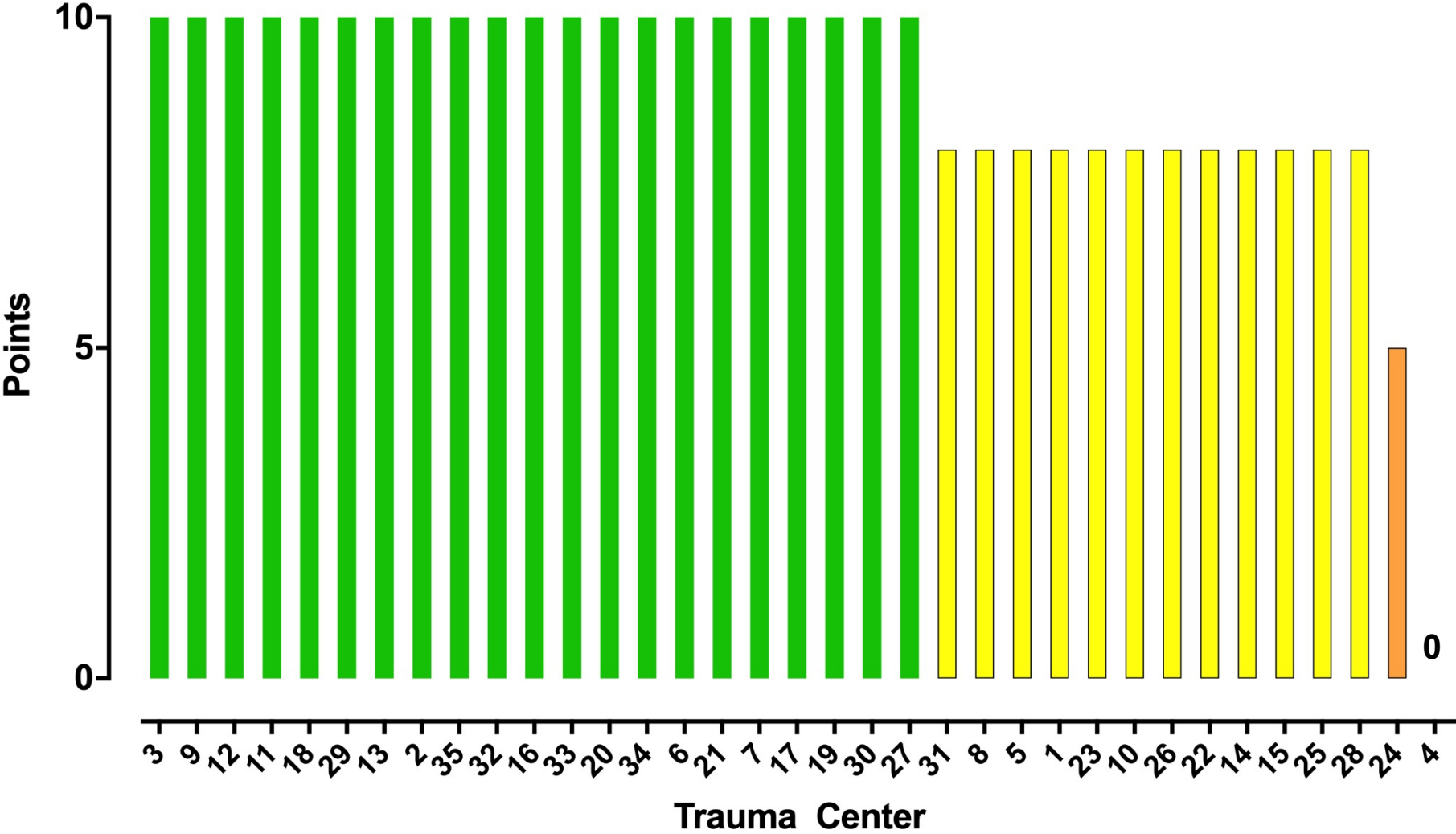
#5 Timely Surgical Repair in Geriatric (Age ≥ 65) Isolated Hip Fracture

- ◆ Time to surgical repair of isolated hip fracture in patients age 65 or older (12 mo: 7/1/19-6/30/20) who get an operation
 - $\geq 90\%$ of patients (≤ 48 hr)
 - $\geq 85\%$ of patients (≤ 48 hr)
 - $\geq 80\%$ of patients (≤ 48 hr)
 - $< 80\%$ of patients (≤ 48 hr)

Metric #5 - Timely Surgical Hip Repair \geq 65 years
Cohort 8 - Isolated Hip Fracture
7/1/19 - 6/30/20



Timely IHF Repair



Putting CQIs in Perspective and Communicating it Out Using that Perspective

- Per Agency for Healthcare Research and Quality (AHRQ), more than 14 million operating room (OR) procedures were performed during inpatient hospital stays in 2014—a rate of 4,453.1 OR procedures per 100,000 population.
- Of the Top 20 most frequent operating room (OR) procedures as defined by AHRQ, how many do the CQIs address?

CQI's Address 17 of the Top 20 Surgical Procedures Identified by AHRQ

Rank	Procedure	Number of OR Procedures	Percent of OR Procedures	CQI
1	Cesarean section	1,242,800	8.8	OBI
2	Circumcision	1,075,100	7.6	N/A
3	Arthroplasty of knee	752,900	5.3	MARCQI
4	Hip replacement, total and partial	522,800	3.7	MARCQI
5	Percutaneous coronary angioplasty (PTCA)	465,400	3.3	PCI
6	Spinal fusion	463,200	3.3	MSSIC
7	Laminectomy, excision of intervertebral disc	438,200	3.1	MSSIC
8	Cholecystectomy and common duct exploration	372,600	2.6	MSQC
9	Colorectal resection	302,400	2.5	MSQC
10	Treatment, fracture or dislocation of hip and femur	289,800	2.0	MTQIP
11	Ligation of fallopian tubes	254,500	1.8	N/A



CQI's Address 17 of the Top 20 Surgical Procedures Identified by AHRQ

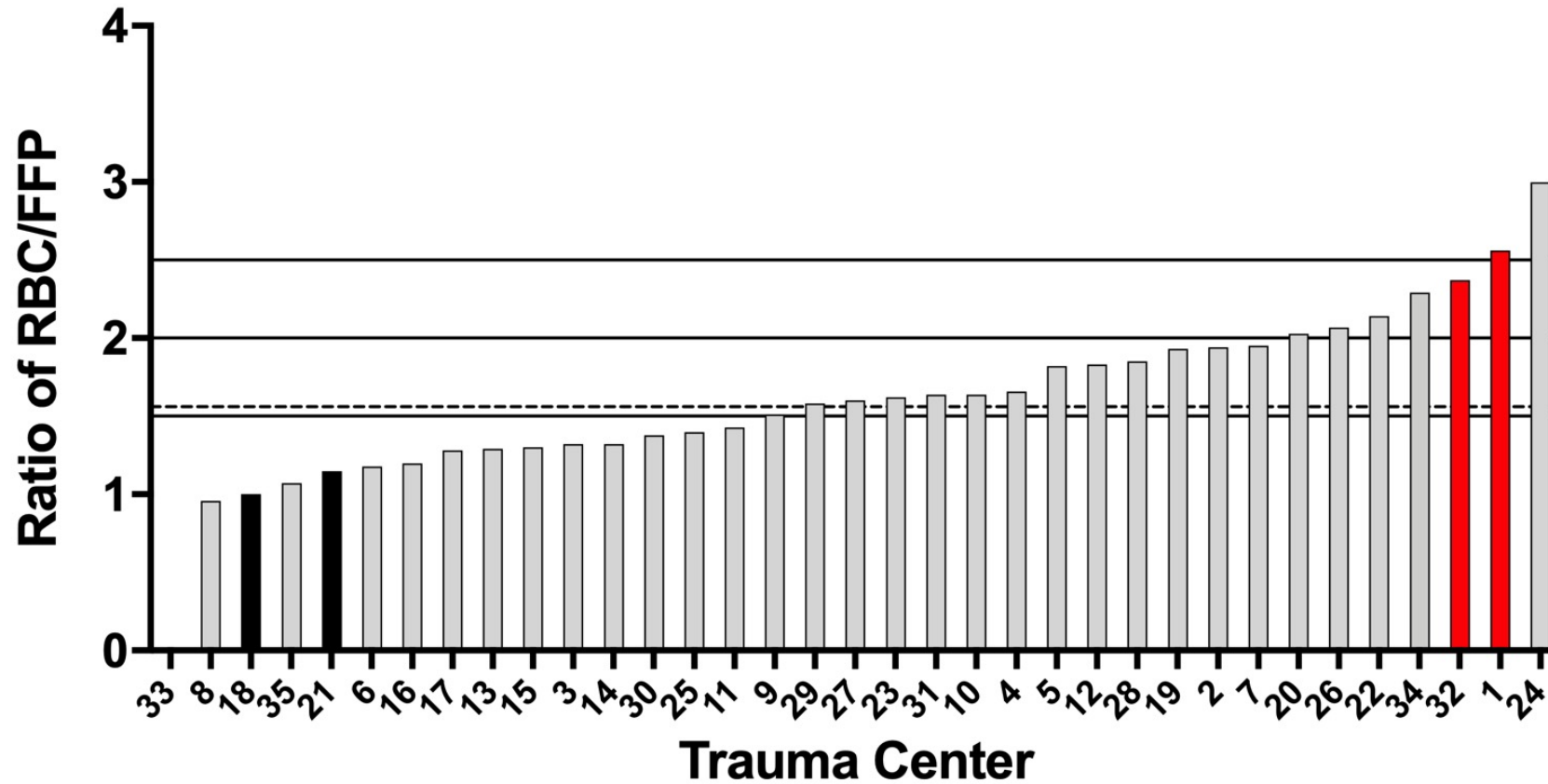
Rank	Procedure	Number of OR Procedures	Percent of OR Procedures	CQI
12	Appendectomy	238,800	1.7	MSQC
13	Hysterectomy, abdominal and vaginal	237,500	1.7	MSQC
14	Coronary artery bypass graft (CABG)	201,600	1.4	MSTCVS
15	Oophorectomy, unilateral and bilateral	182,400	1.3	MSQC
16	Treatment, fracture or dislocation of lower extremity (other than hip or femur)	181,900	1.3	MTQIP
17	Debridement of wound, infection or burn	160,400	1.1	MSQC
18	Amputation of lower extremity	146,500	1.0	BMC2 Vascular Surgery, MTQIP, MSQC
19	Heart valve procedures	143,600	1.0	MSTCVS, MI TAVR
20	Incision and excision of central nervous system (CNS)	120,800	0.9	N/A



#6 Red Blood Cell to Plasma Ratio

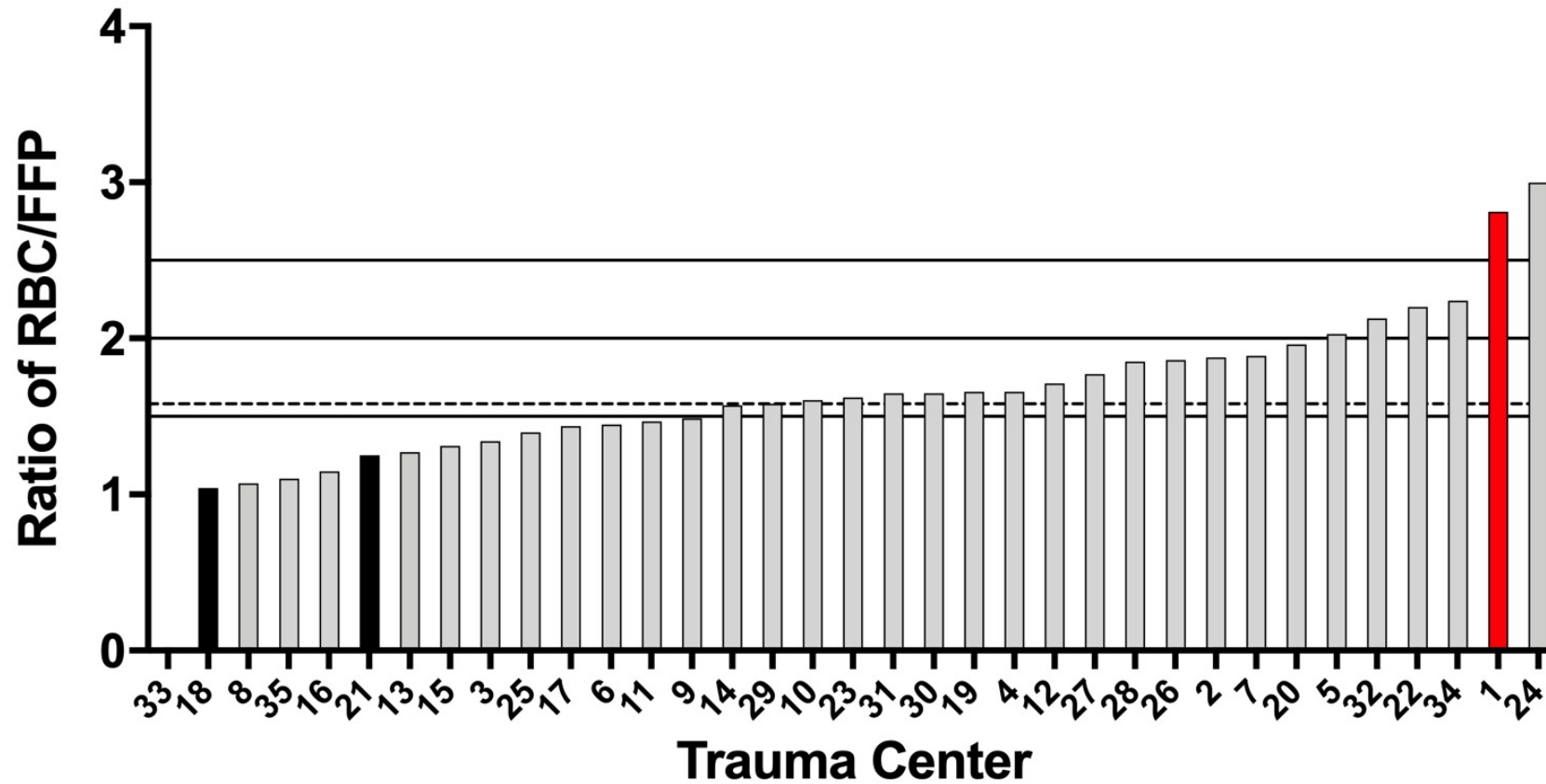
- ◆ Red blood cell to plasma ratio (weighted mean points) of patients transfused ≥ 5 units in first 4 hours (18 Mo's: 1/1/19-6/30/20)

Metric #6 - RBC to FFP Ratio - Mean
Cohort 1 - MTQIP All
1/1/19 - 6/30/20



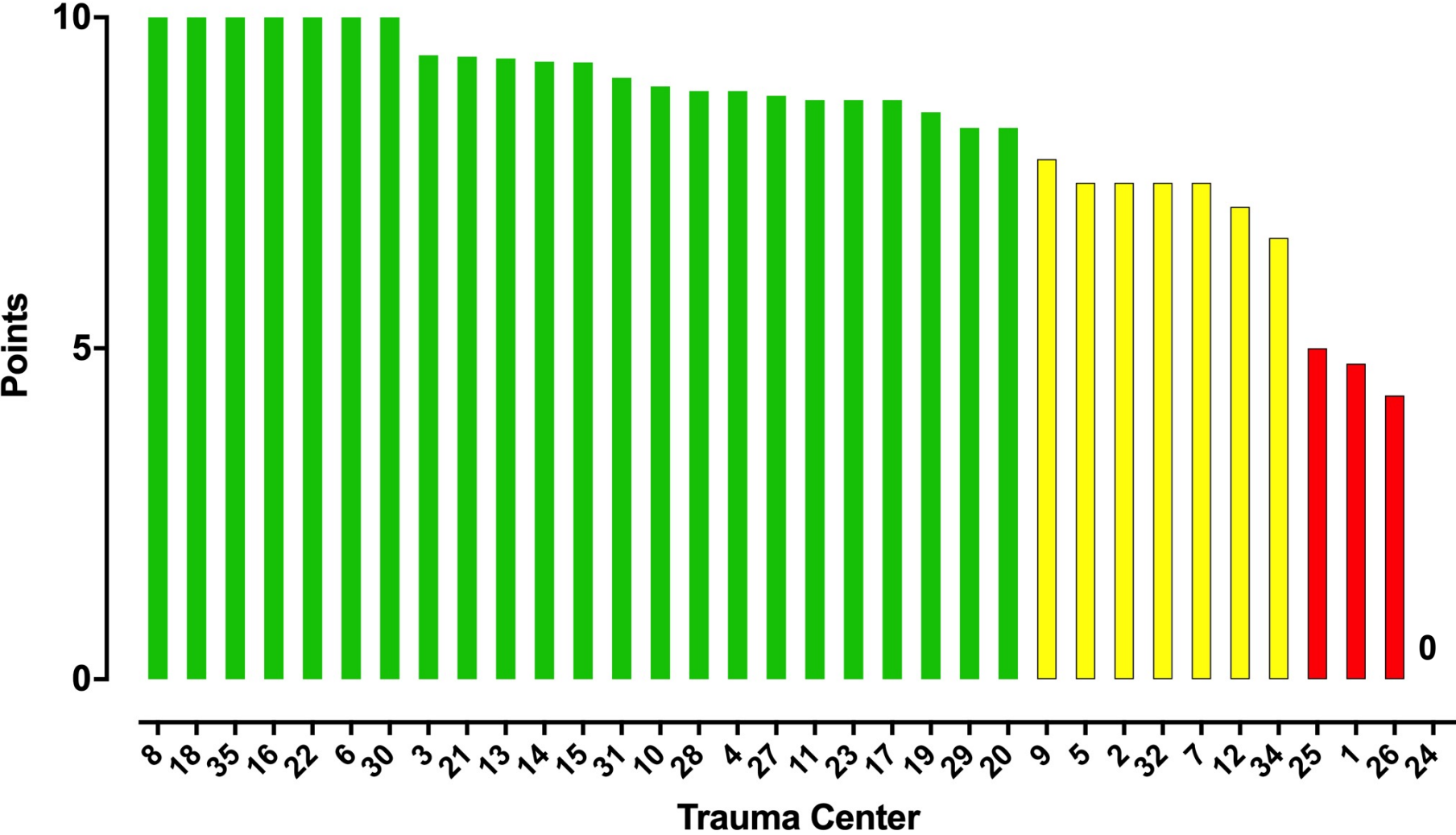
Mean 1.5

RBC to FFP Ratio - Mean
Cohort 1 - MTQIP All
7/1/18 - 9/30/20

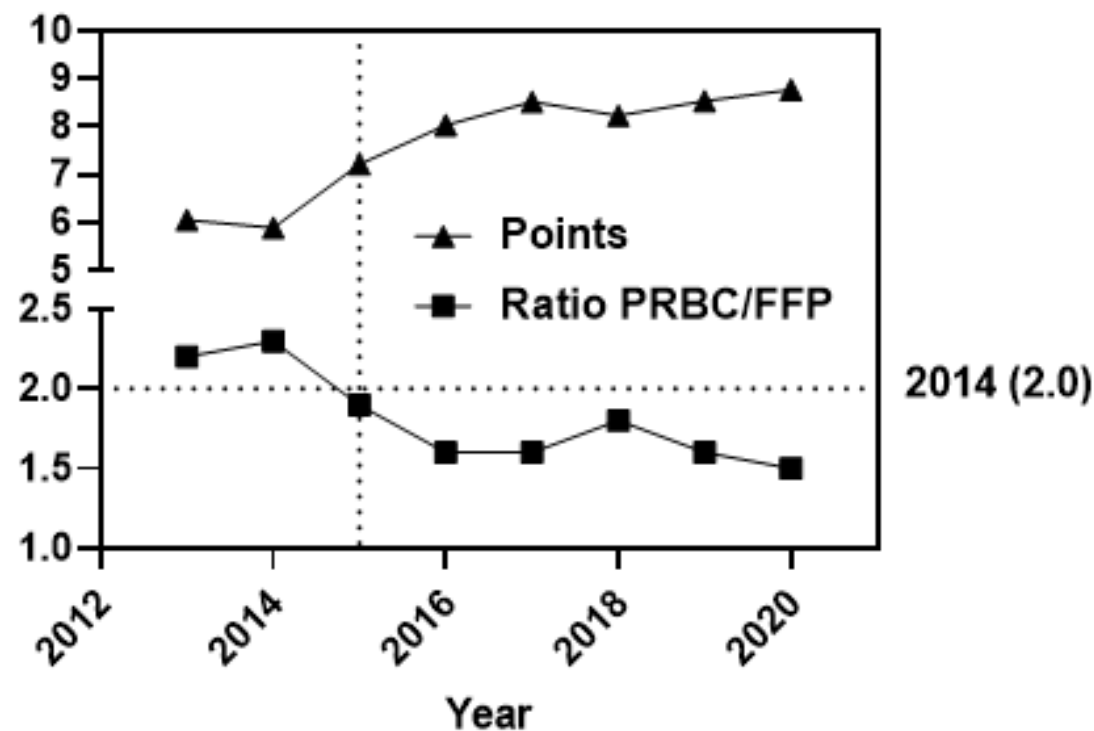


Mean 1.5

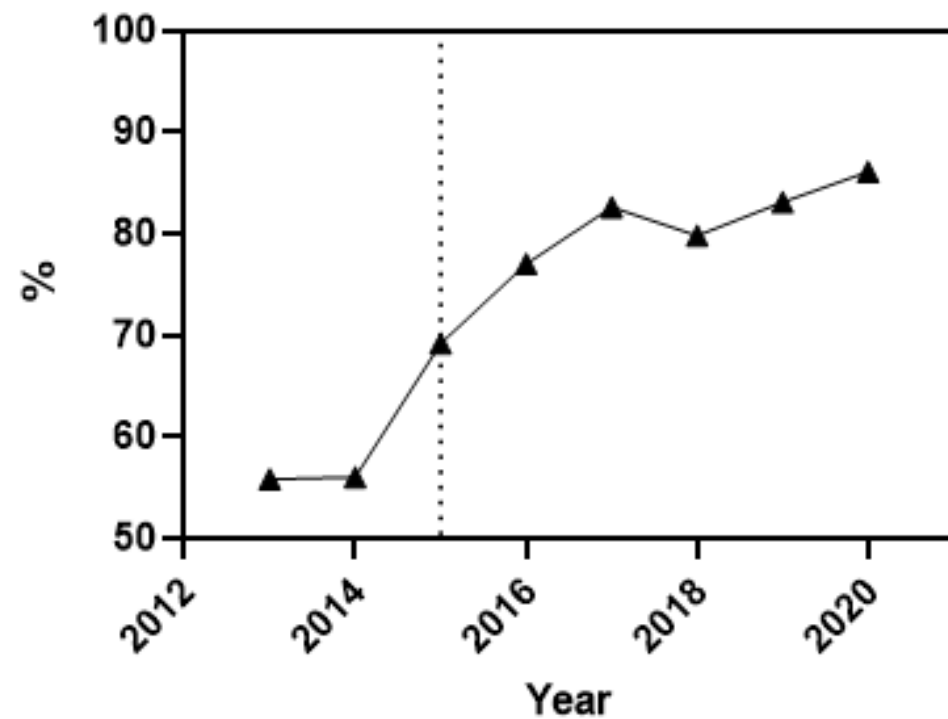
PRBC to Plasma Ratio



Blood Product Ratio in first 4 hrs



% Patients with Blood Product Ratio ≤ 2.0 in first 4 hrs



#7 Serious Complications

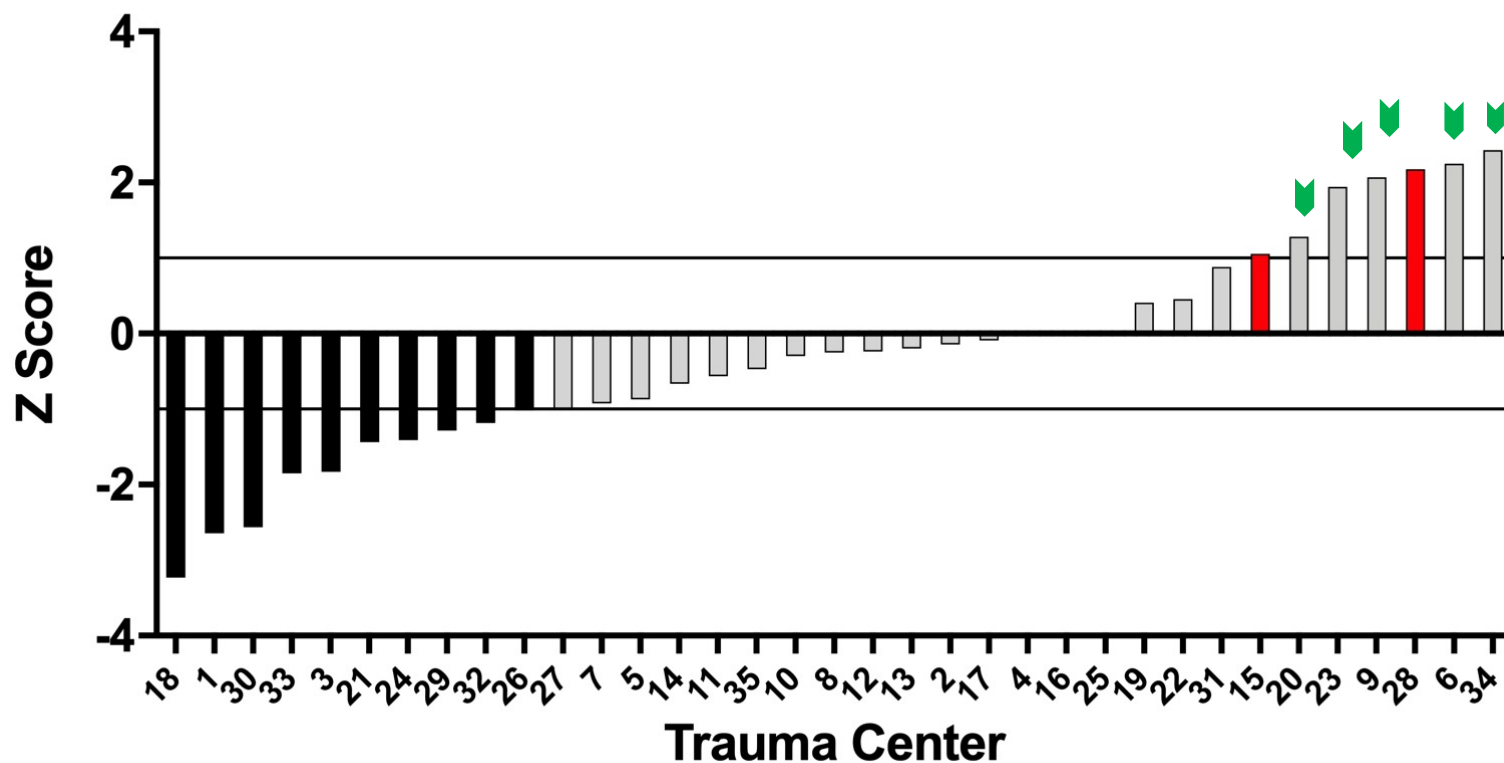
- ◆ Serious Complication Rate-Trauma Service Admits (3 years: 7/1/17-6/30/20)

Z-score

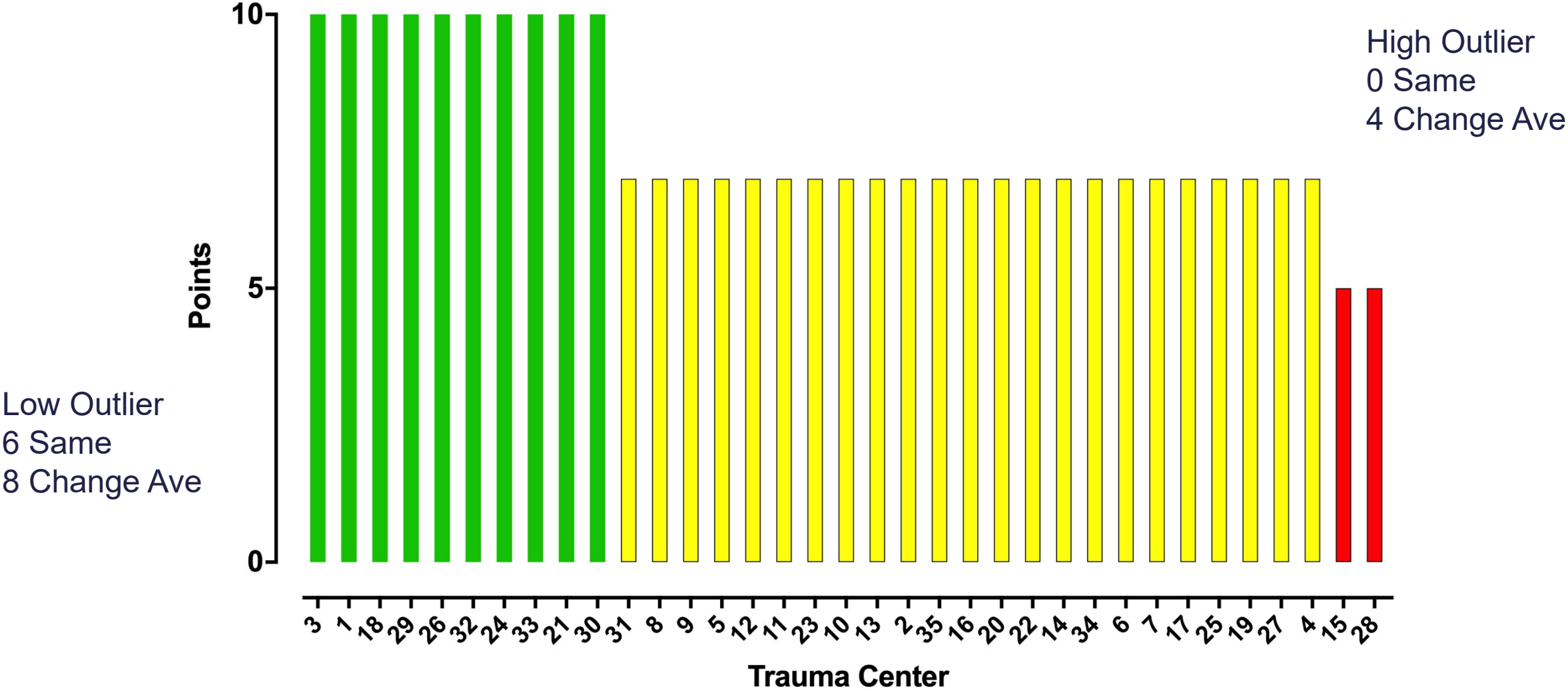
- ◆ Measure of trend in outcome over time
- ◆ Hospital specific
 - Compared to yourself
- ◆ Standard deviation
- ◆ > 1 getting worse
- ◆ 1 to -1 flat
- ◆ < -1 getting better

#7 Serious Complication Rate (Z-score)

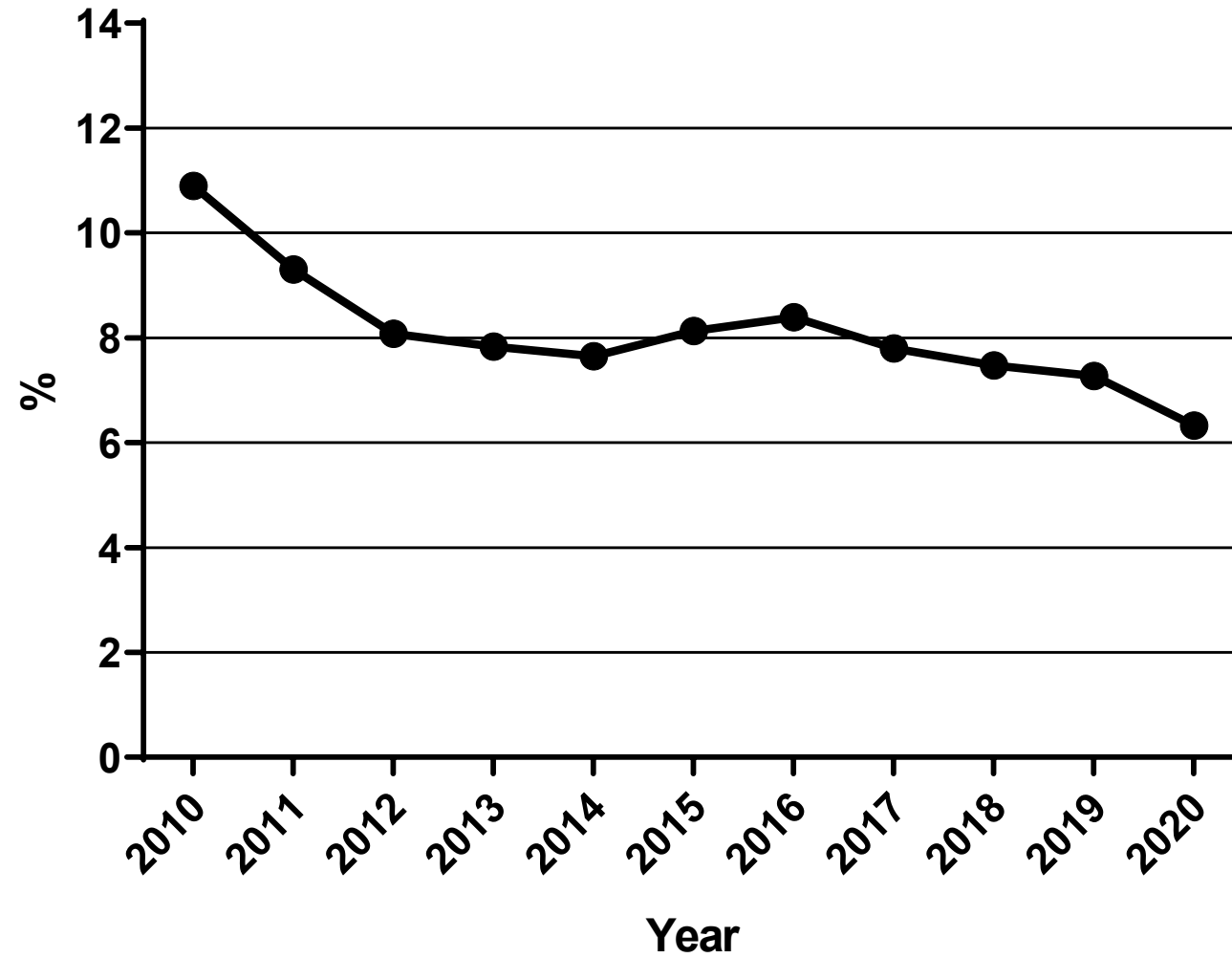
Metric #7 - Z Score - Serious Complication Rate
Cohort 2 - Admit to Trauma
7/1/17 - 6/30/20



Complication Rate: Z-score



Collaborative Outcome Overview - Serious Cx Cohort 2 - Admit to Trauma

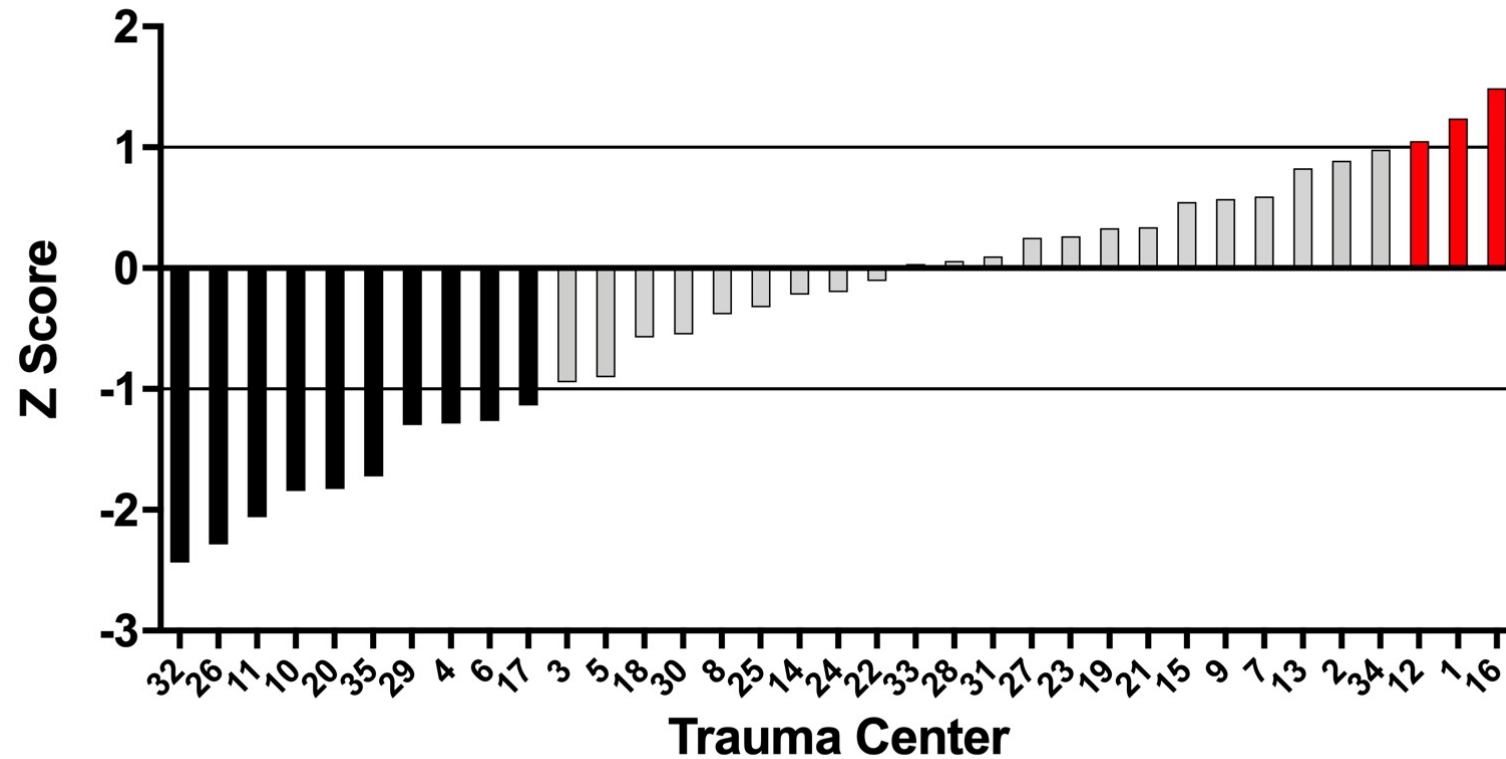


#8 Mortality

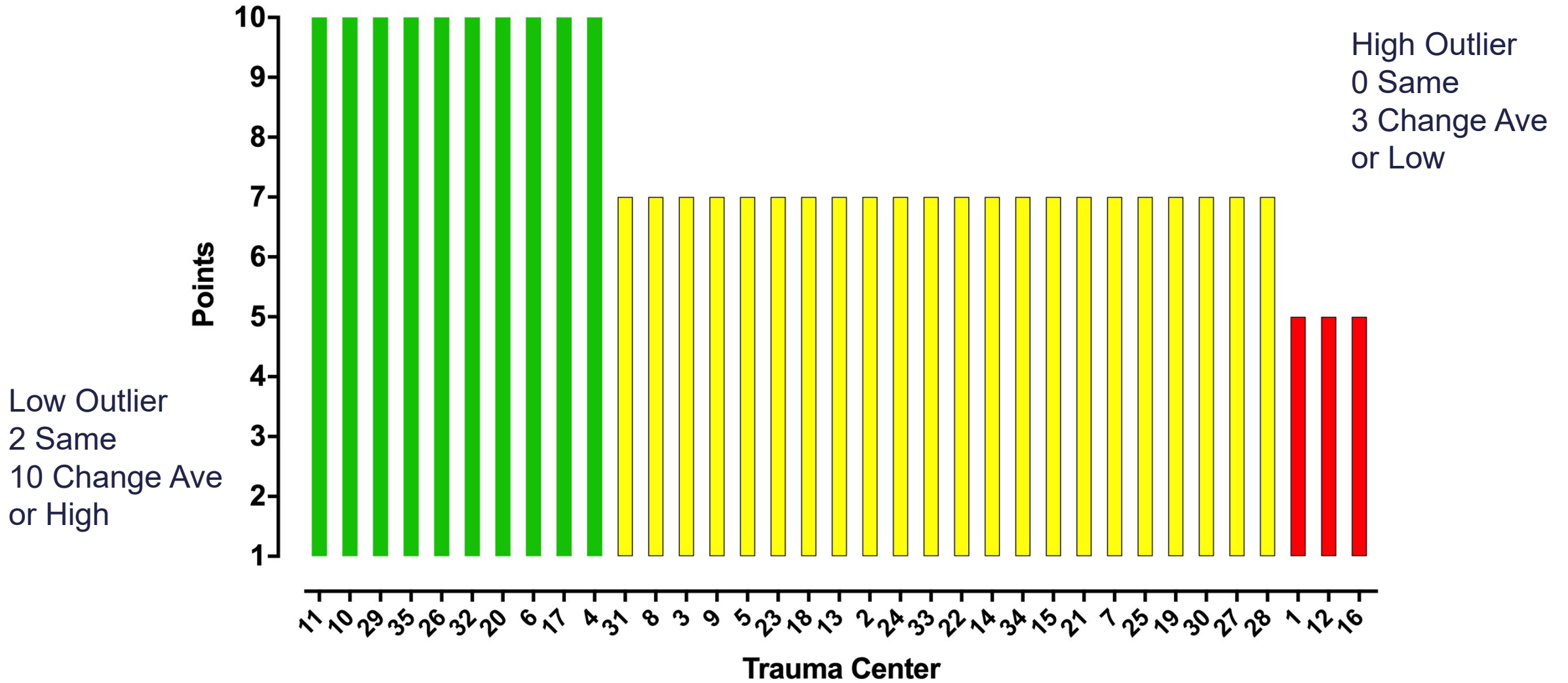
- ◆ Mortality Rate-Trauma Service Admits (3 years: 7/1/17-6/30/20)

#8 Mortality Rate (Z-score)

Metric #8 - Z Score - Mortality Rate
Cohort 2 - Admit to Trauma
7/1/17 - 6/30/20

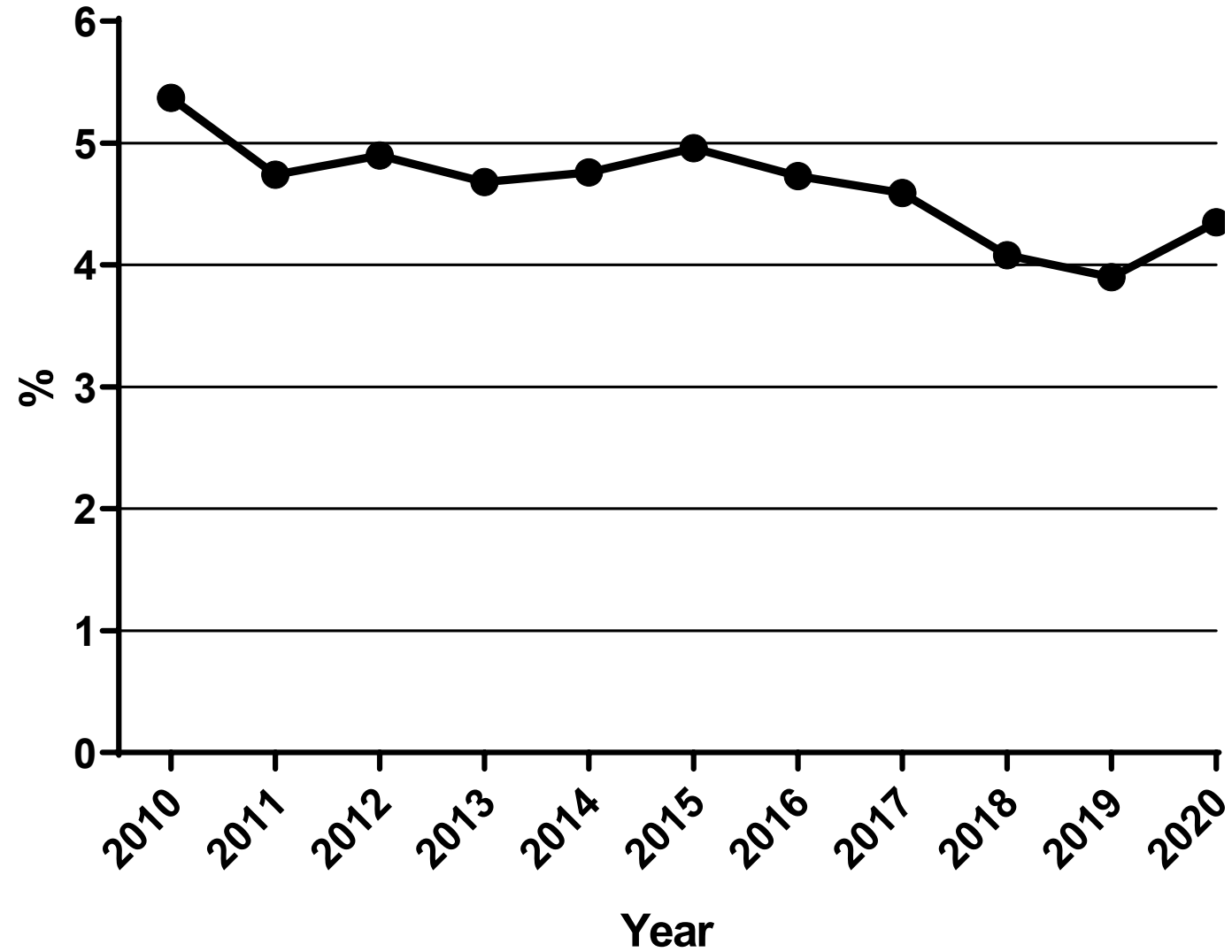


Mortality Rate: Z-Score



Collaborative Outcome Overview - Mortality

Cohort 2 - Admit to Trauma



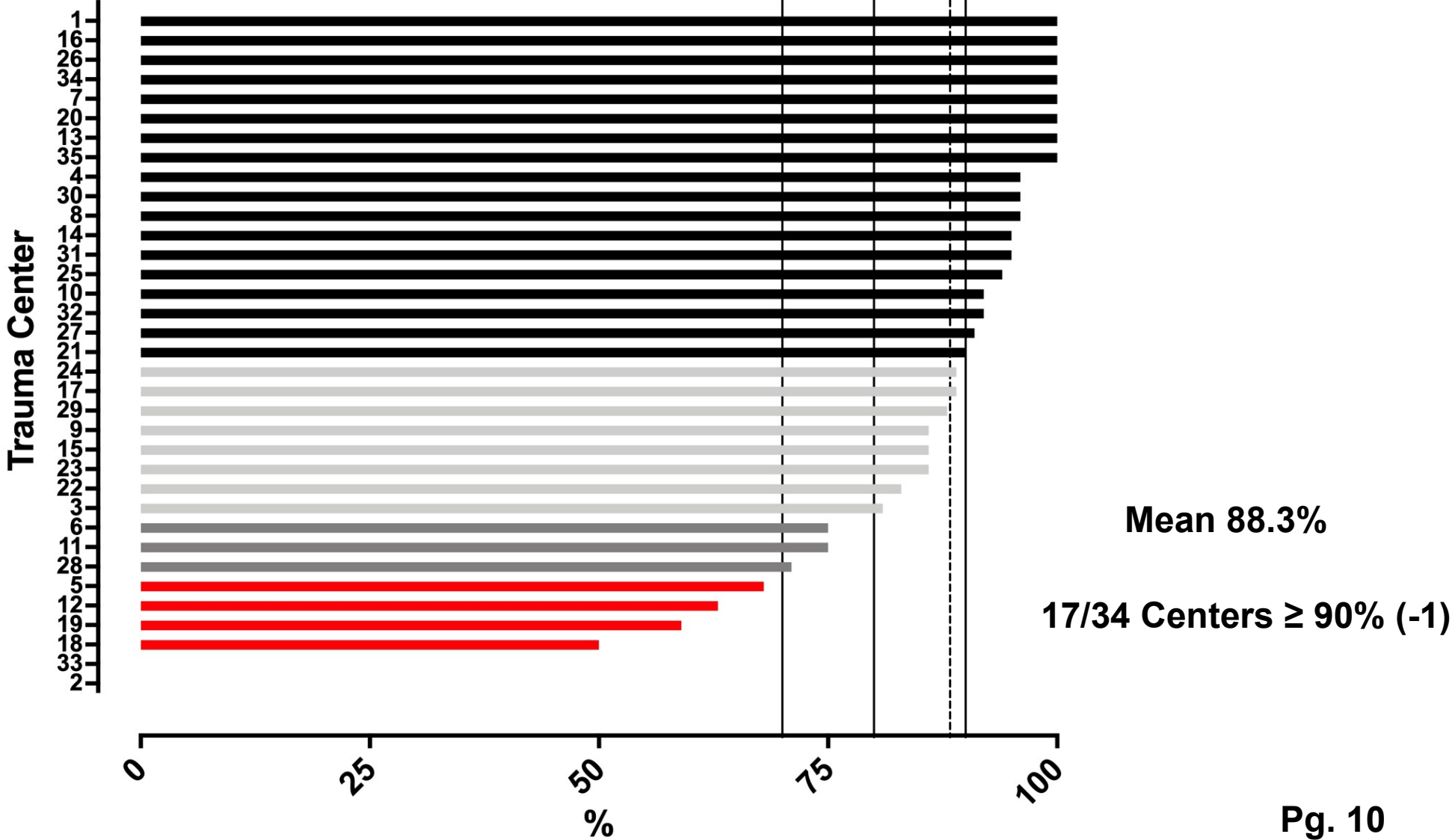
#9 Timely Head CT in TBI Patients on Anticoagulation Pre-Injury

- ◆ Head CT date and time from procedures
- ◆ Presence of prehospital anticoagulation
- ◆ TBI (AIS Head, excluding NFS, scalp, neck, hypoxia)
- ◆ Cohort1, Blunt mechanism
- ◆ Exclude direct admissions and transfer in
- ◆ No Signs of Life = Exclude DOAs
- ◆ Transfers Out = Include Transfers Out
- ◆ Time Period = 7/1/19 to 6/30/20

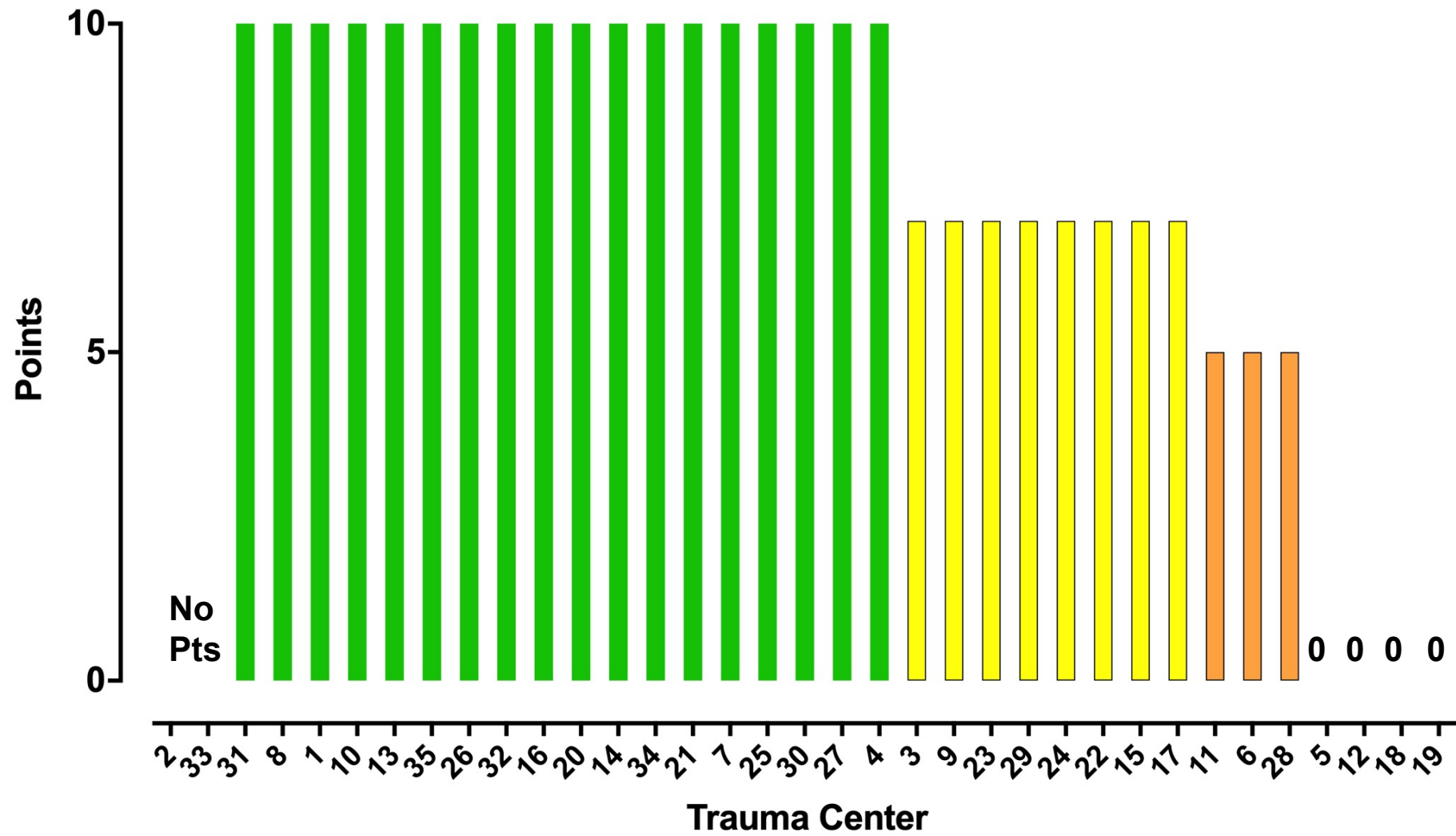
#9 Head CT

- ◆ Measure = % of patients with Head CT, date, and time
- ◆ Timing
 - $\geq 90\%$ patients (≤ 120 min)
 - $\geq 80\%$ patients (≤ 120 min)
 - $\geq 70\%$ patients (≤ 120 min)
 - $< 70\%$ patients (≤ 120 min)

Metric #9 - ED Head CT \leq 120 min
Cohort 1 - MTQIP All on Anticoagulant (Excluding ASA)
7/1/19 - 6/30/20



Head CT Time with Anticoagulant



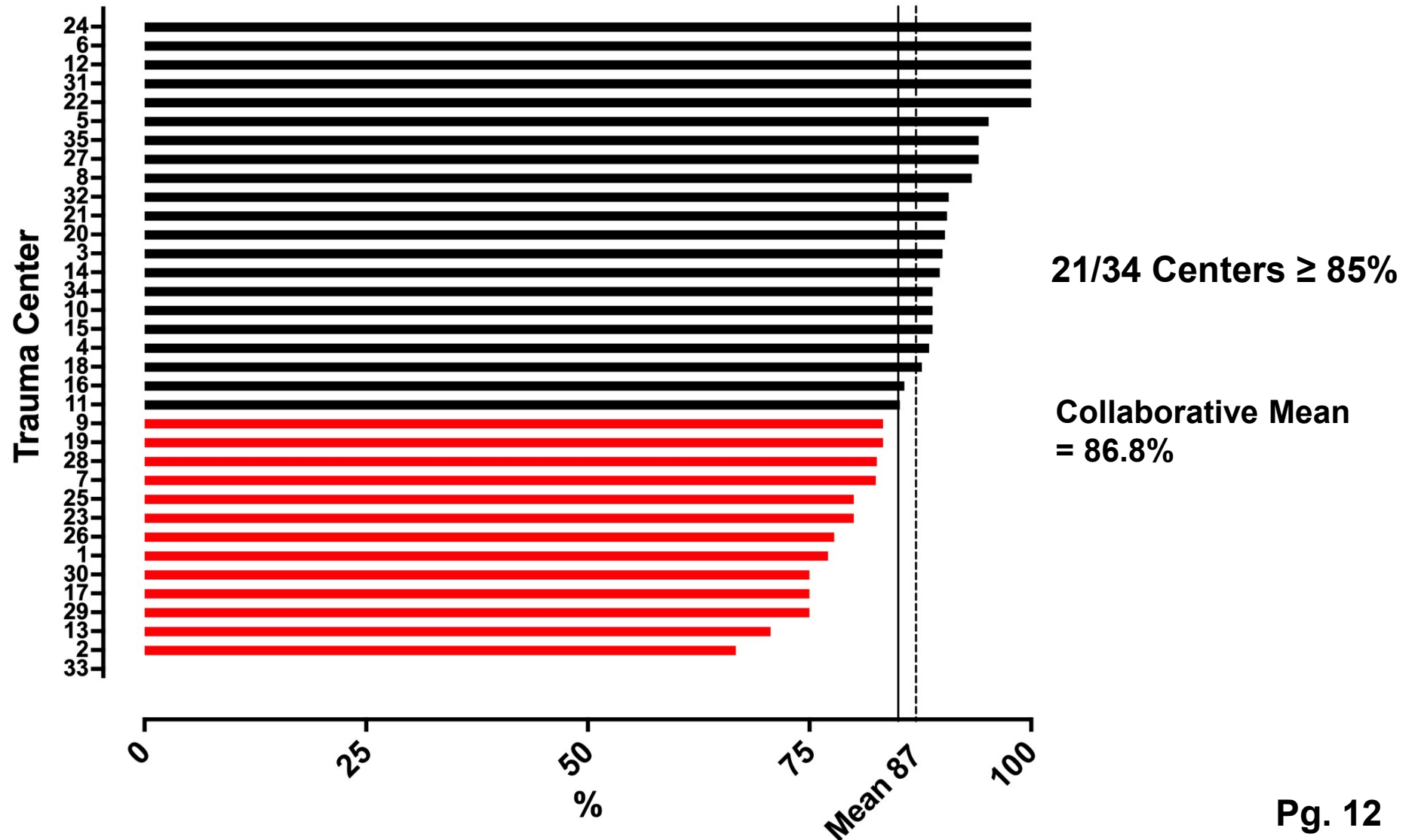
#10 Timely Antibiotic in Femur/Tibia Open Fractures - Collaborative Wide Measure

- ◆ Type of antibiotic administered along with date and time for open fracture of femur or tibia
- ◆ Presence of acute open femur or tibia fracture based on AIS or ICD10 codes (See list)
- ◆ Cohort = Cohort 1 (All)
- ◆ Exclude direct admissions and transfer in
- ◆ No Signs of Life = Exclude DOAs
- ◆ Transfers Out = Include Transfers Out
- ◆ Time Period = 7/1/19 to 6/30/20

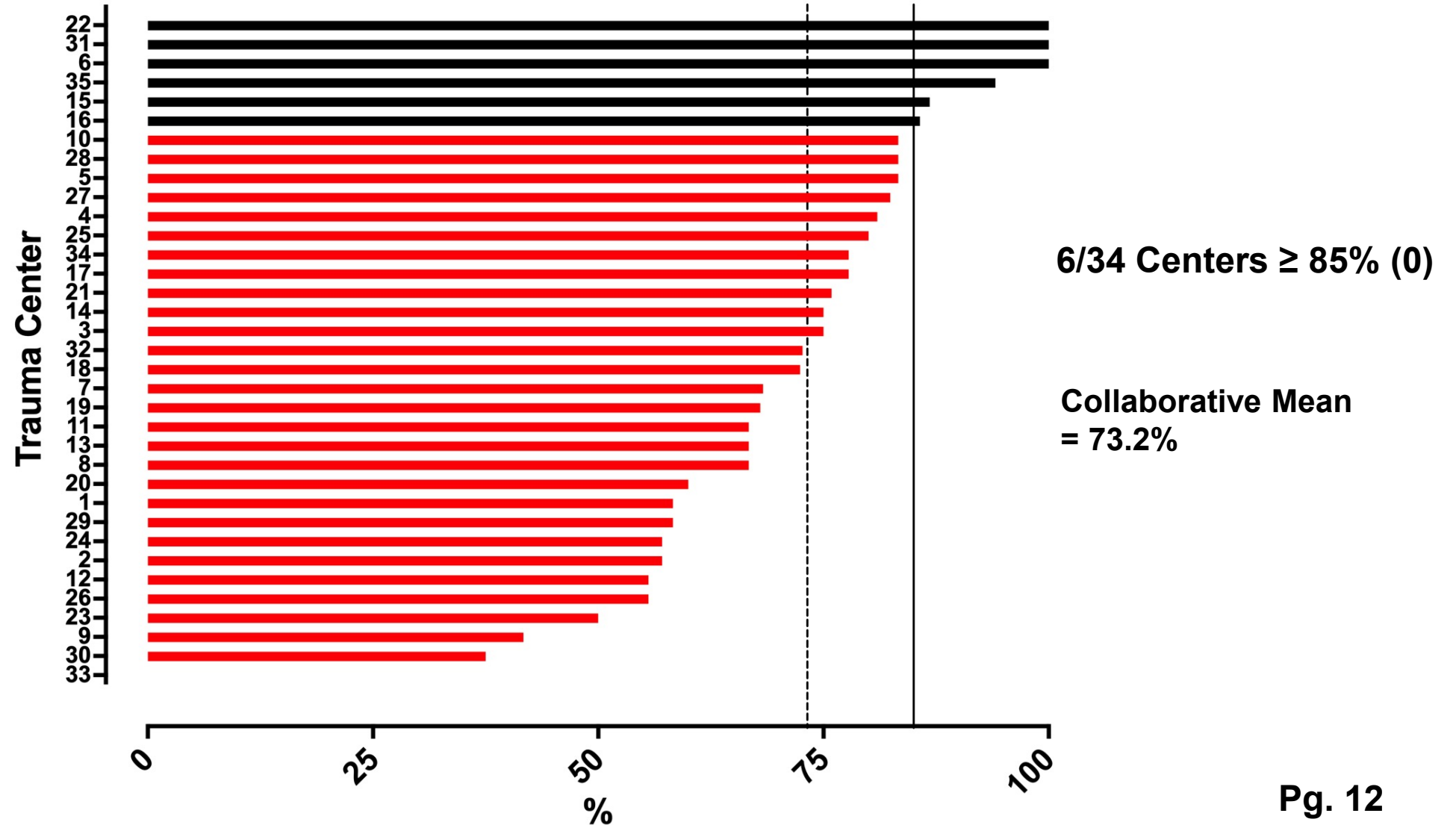
#10 Open Fracture Antibiotic Usage

- ◆ Measure = % of patients with antibiotic type, date, time recorded ≤ 120 minutes
 - $\geq 85\%$ patients (≤ 120 min) > 10 points
 - All or nothing
- ◆ ACS-COT Orange Book – VRC resources
 - Administration within 60 minutes
 - ◆ ACS OTA Ortho Update
 - ◆ ACS TQIP Best Practices Orthopedics

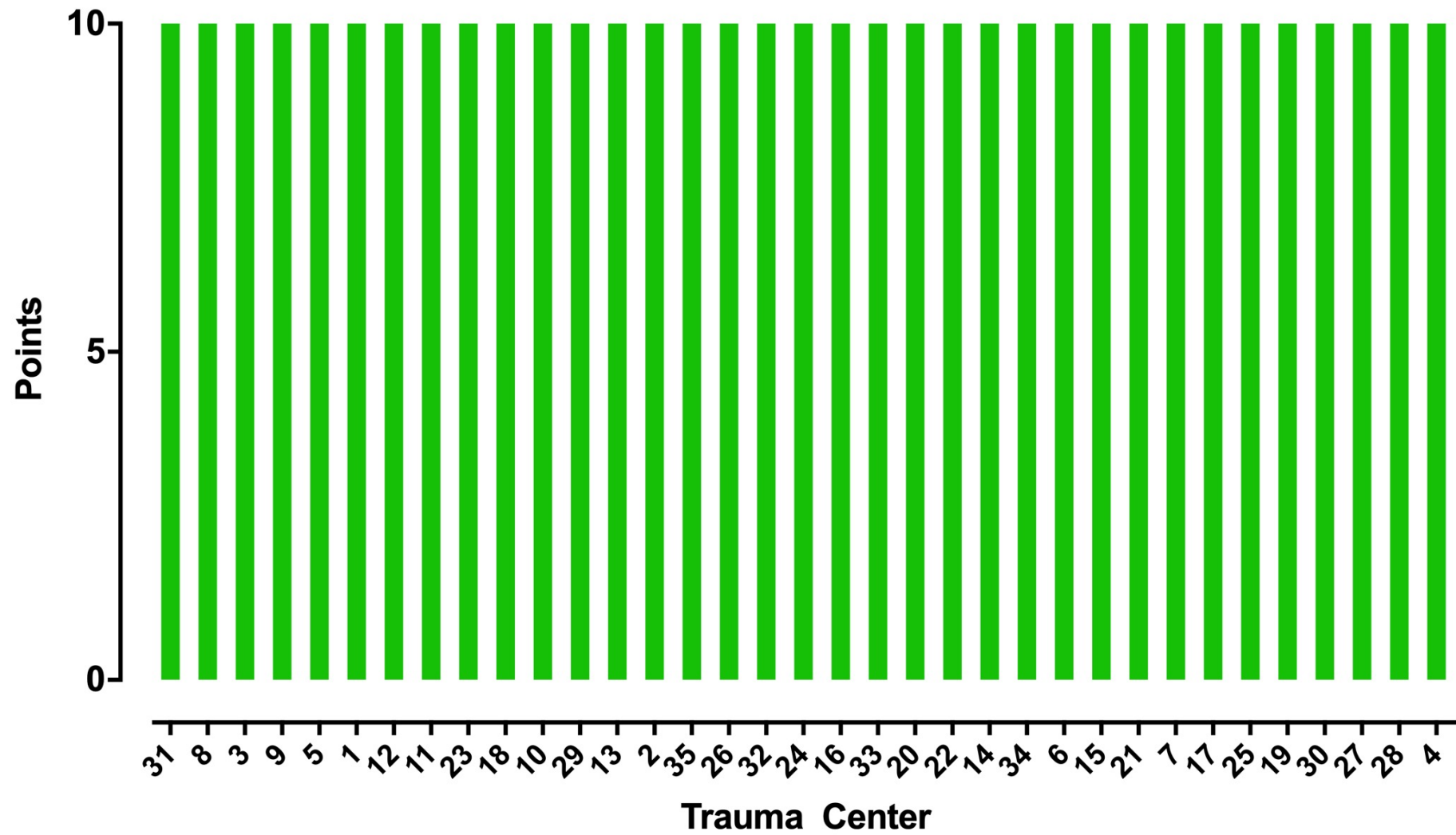
Metric #10 - Open Fracture - Time to Abx \leq 120 min
Cohort 1 - MTQIP All
7/1/19 - 6/30/20



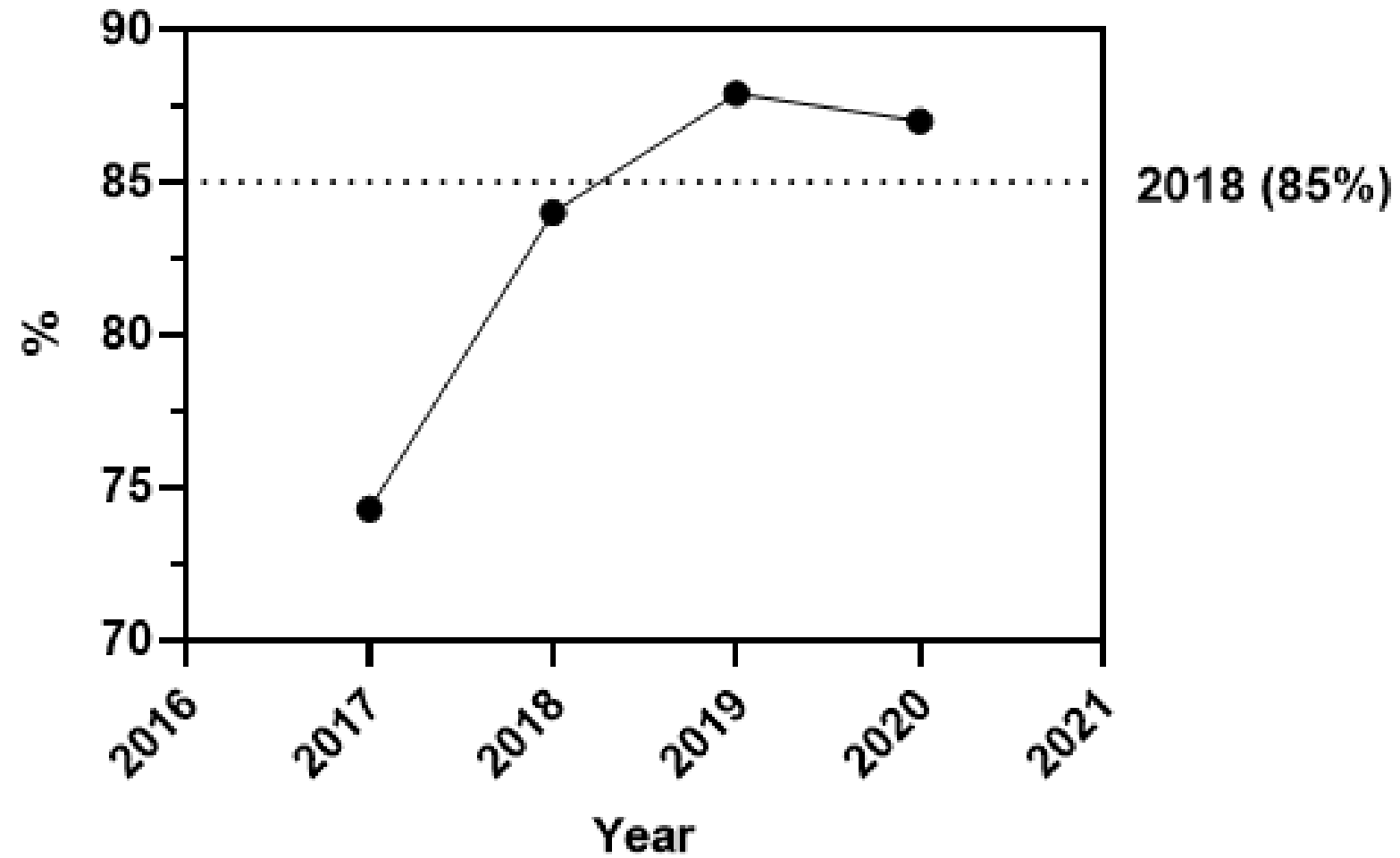
Open Fracture - Time to Abx \leq 60 min
Cohort 1 - MTQIP All
7/1/19 - 6/30/20



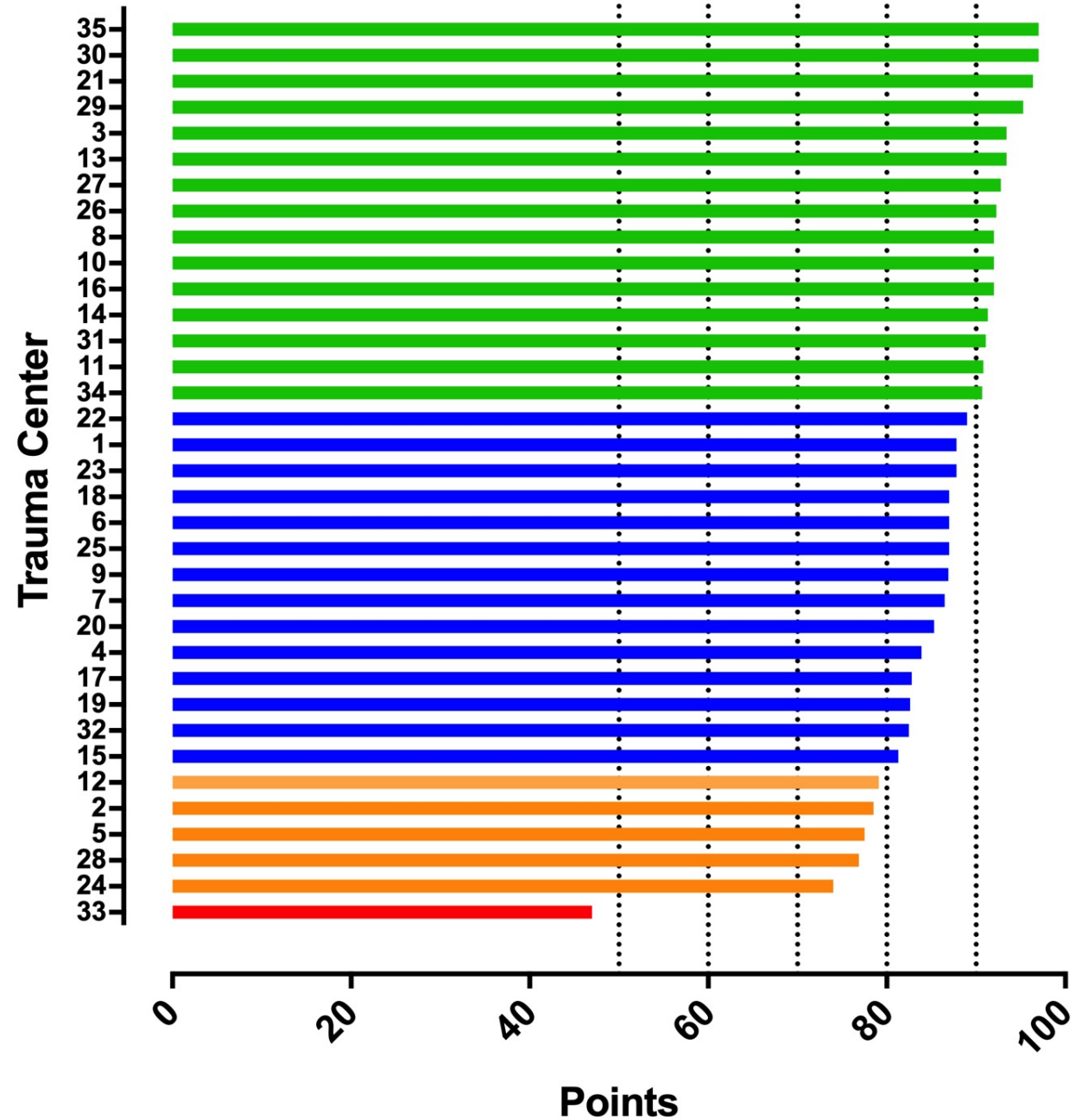
Open Fracture Antibiotic



Abx \leq 120 min Open Femur/Tibia Fracture



2020 CQI Score



2020

87.7%

97 – 74%

2019

89.2%

99 – 78%

2014 86%

2015 86%

2016 92%

2017 85%

2018 86%

2019 89%

2020 88%

CQI Index Changes for 2021

#3	10	Data Validation Error Rate 0.0-3.0% 3.1-4.0% 4.1-5.0% > 5.0%	10 8 5 0
#4	10	Timely LMWH VTE Prophylaxis in Trauma Admits (18 mo: 1/1/20-6/30/21) ≥ 52.5 % of patients (≤ 48 hr) ≥ 50.0 % of patients (≤ 48 hr) ≥ 45.0 % of patients (≤ 48 hr) < 45.0 % of patients (≤ 48 hr)	10 8 5 0
#5	10	Timely Surgical Repair in Geriatric (Age ≥ 65) Isolated Hip Fxs (12 mo: 7/1/20-6/30/21) ≥ 92.0 % of patients (≤ 48 hr) ≥ 87.0 % of patients (≤ 48 hr) ≥ 85.0 % of patients (≤ 48 hr) < 85.0 % of patients (≤ 48 hr)	10 8 5 0

Data Validation Error Rate 0-4.0% 4.1-5.0% 5.1-6.0% 6.1-7.0% > 7.0%
Timely LMWH VTE Prophylaxis ≥ 50% of patients (≤ 48 hr) ≥ 45% of patients (≤ 48 hr) ≥ 40% of patients (≤ 48 hr) < 40% of patients (≤ 48 hr)
Timely Surgical Repair in Geriatric ≥ 90% of patients (≤ 48 hr) ≥ 85% of patients (≤ 48 hr) ≥ 80% of patients (≤ 48 hr) < 80% of patients (≤ 48 hr)

ACS TQIP BENCHMARK REPORT:

TQIP Collaborative Fall 2020



AMERICAN COLLEGE OF SURGEONS
*Inspiring Quality:
Highest Standards, Better Outcomes*

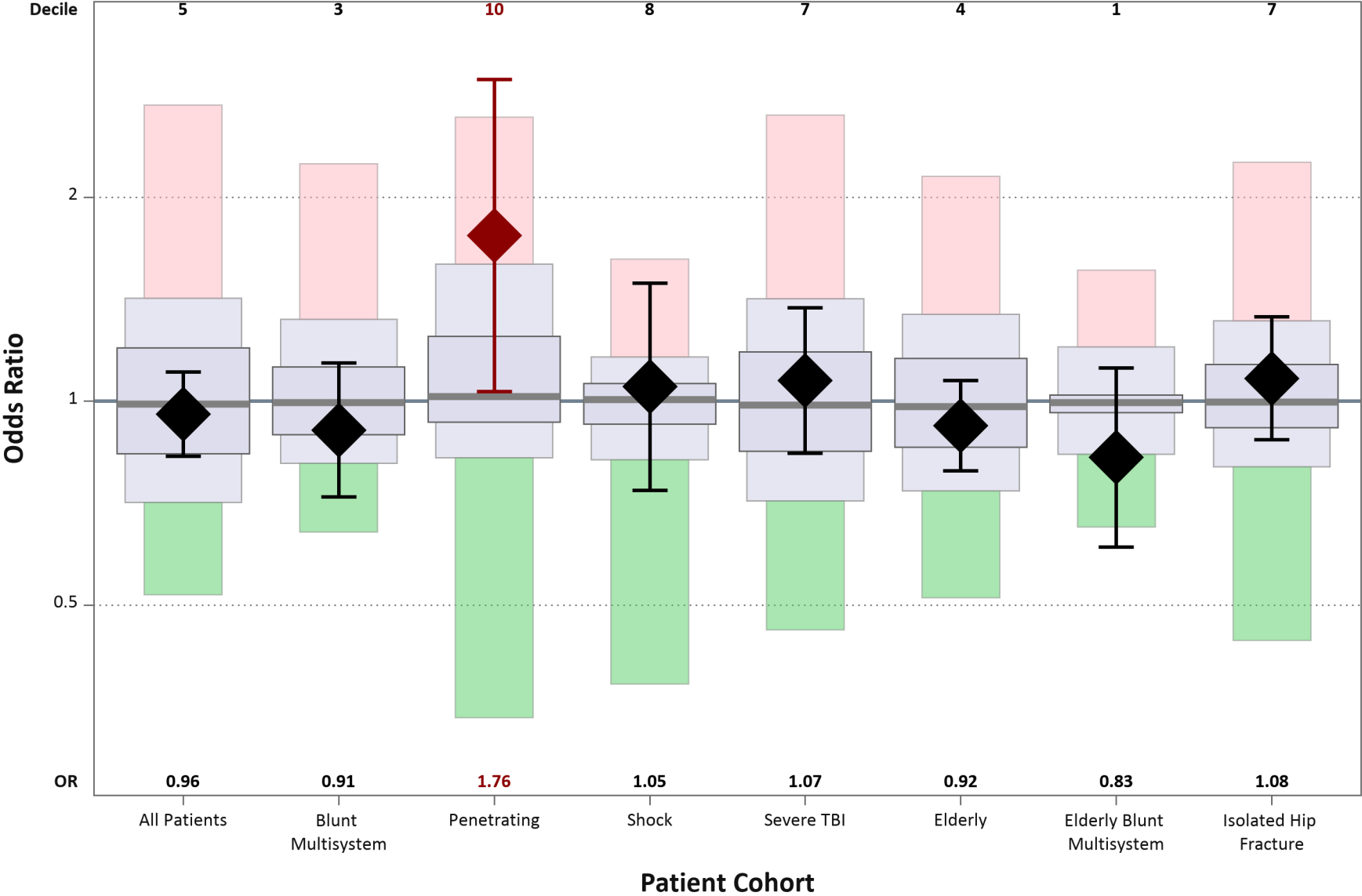


Release 1.0

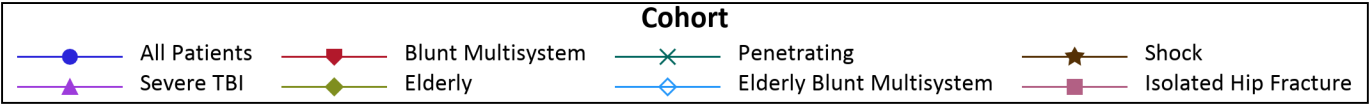
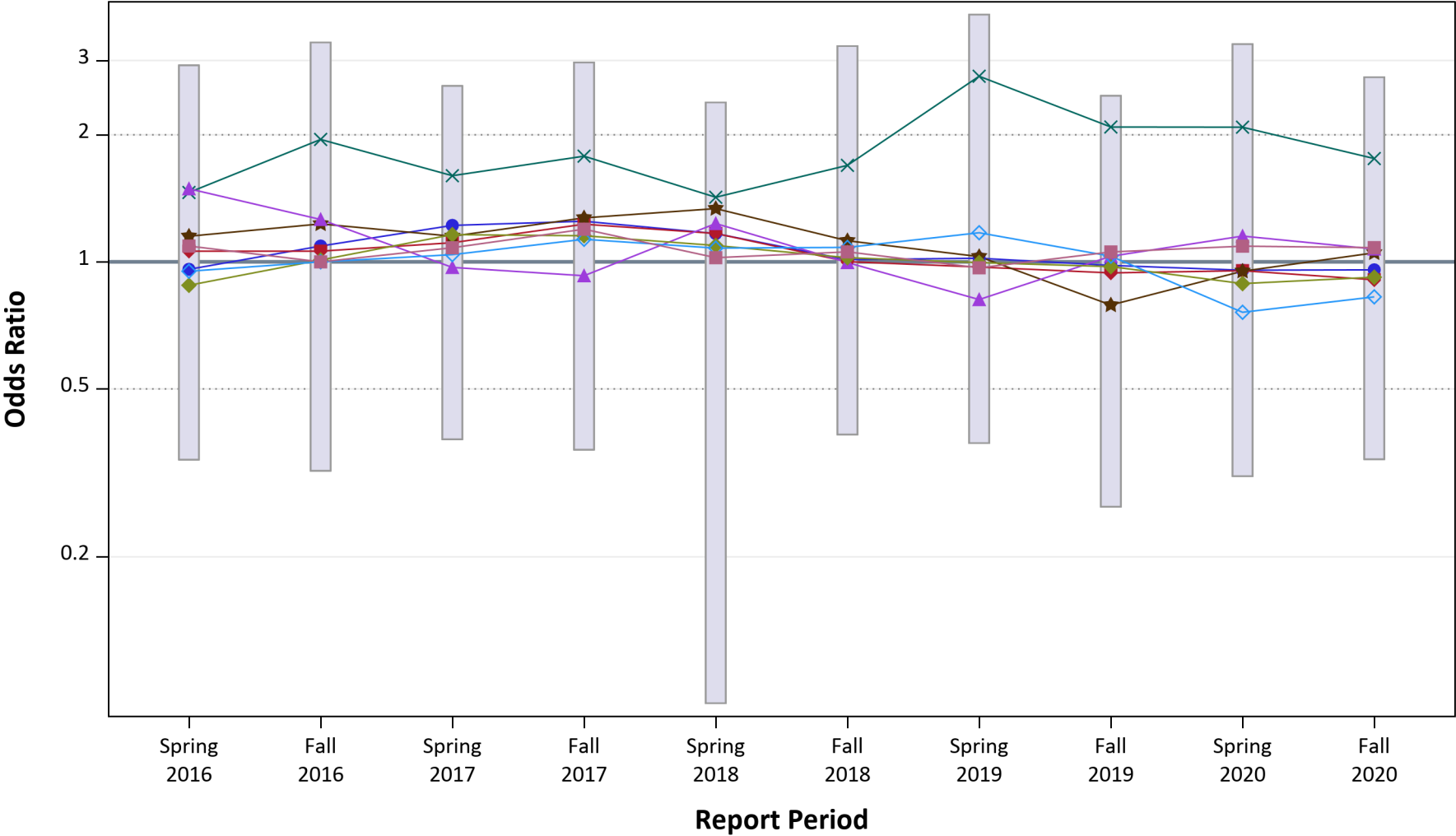
Inclusion/Exclusion

- ◆ AIS = 3 in at least one body region
- ◆ Exclude if pre-existing advanced directive
- ◆ Exclude if no signs-of-life
- ◆ Mortality includes discharge to hospice

Risk-Adjusted Mortality by Cohort - Fall 2020
TQIP Report ID: Michigan

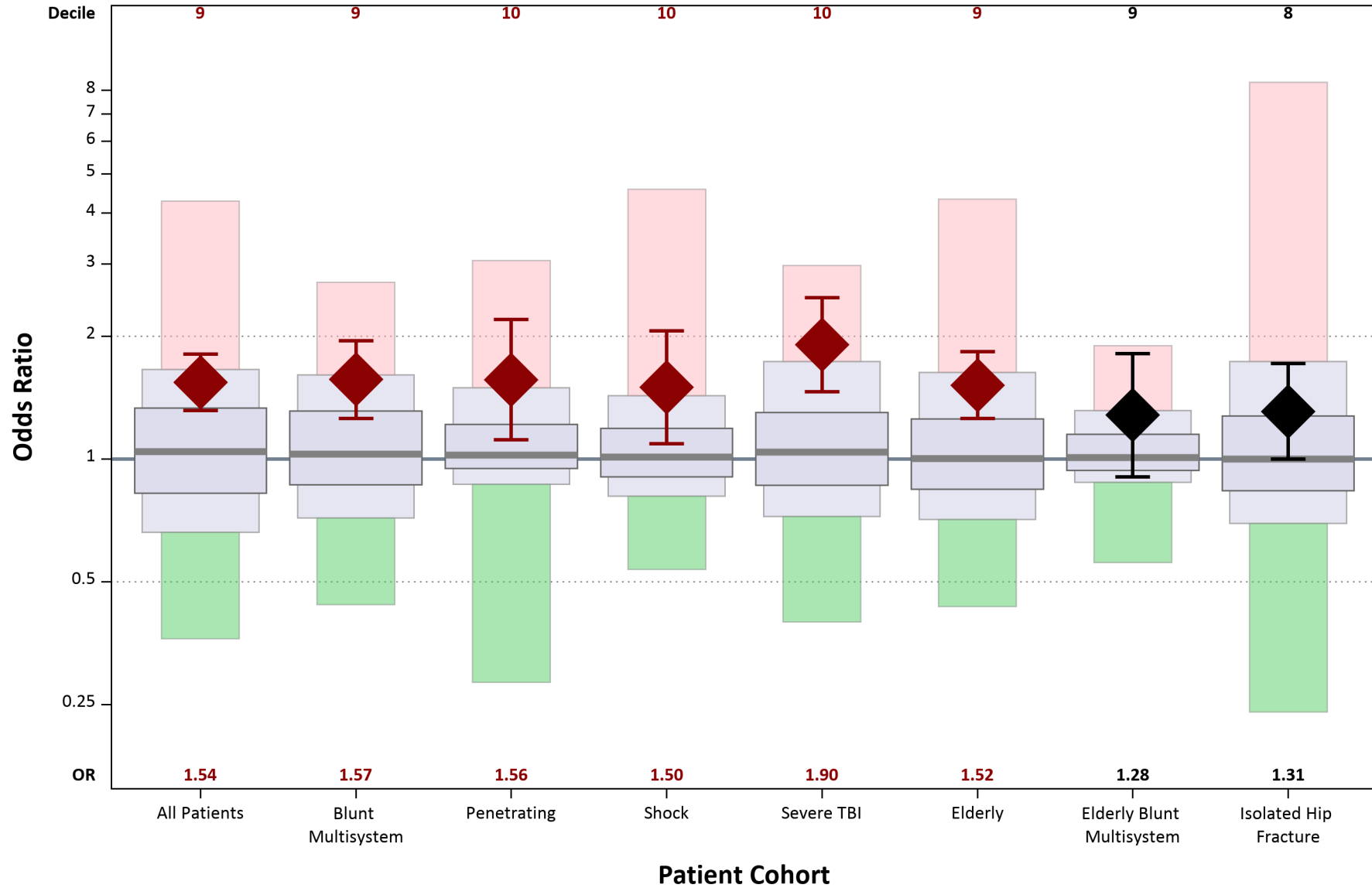


Risk-Adjusted Mortality by Cohort - Fall 2020
TQIP Report ID: Michigan



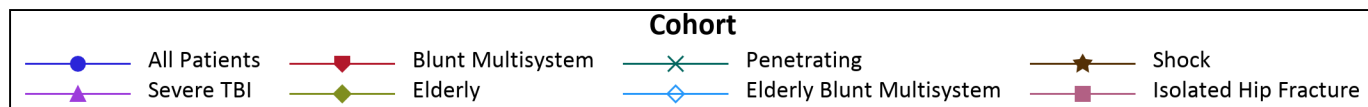
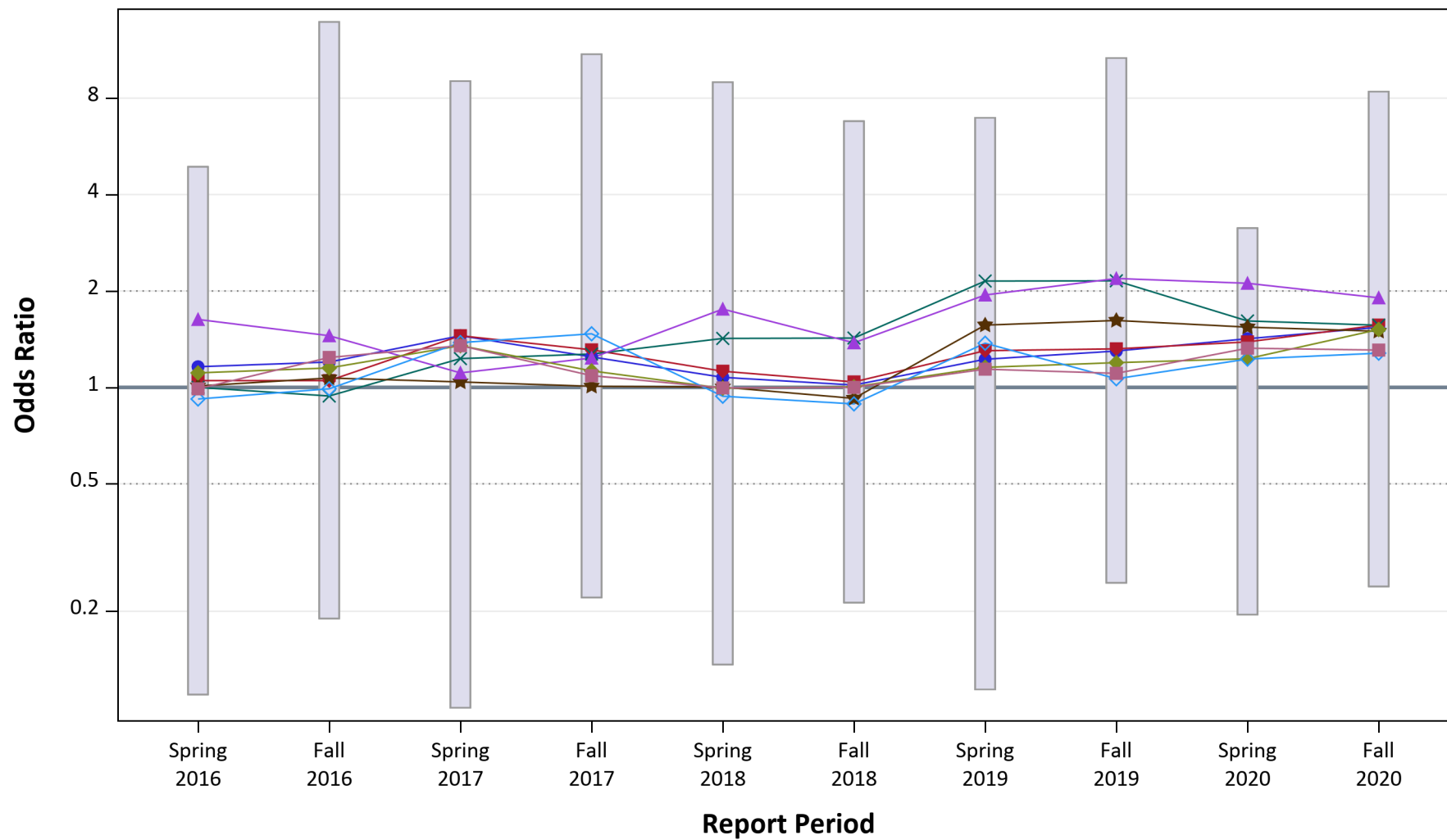
Risk-Adjusted Major Hospital Events by Cohort - Fall 2020

TQIP Report ID: Michigan

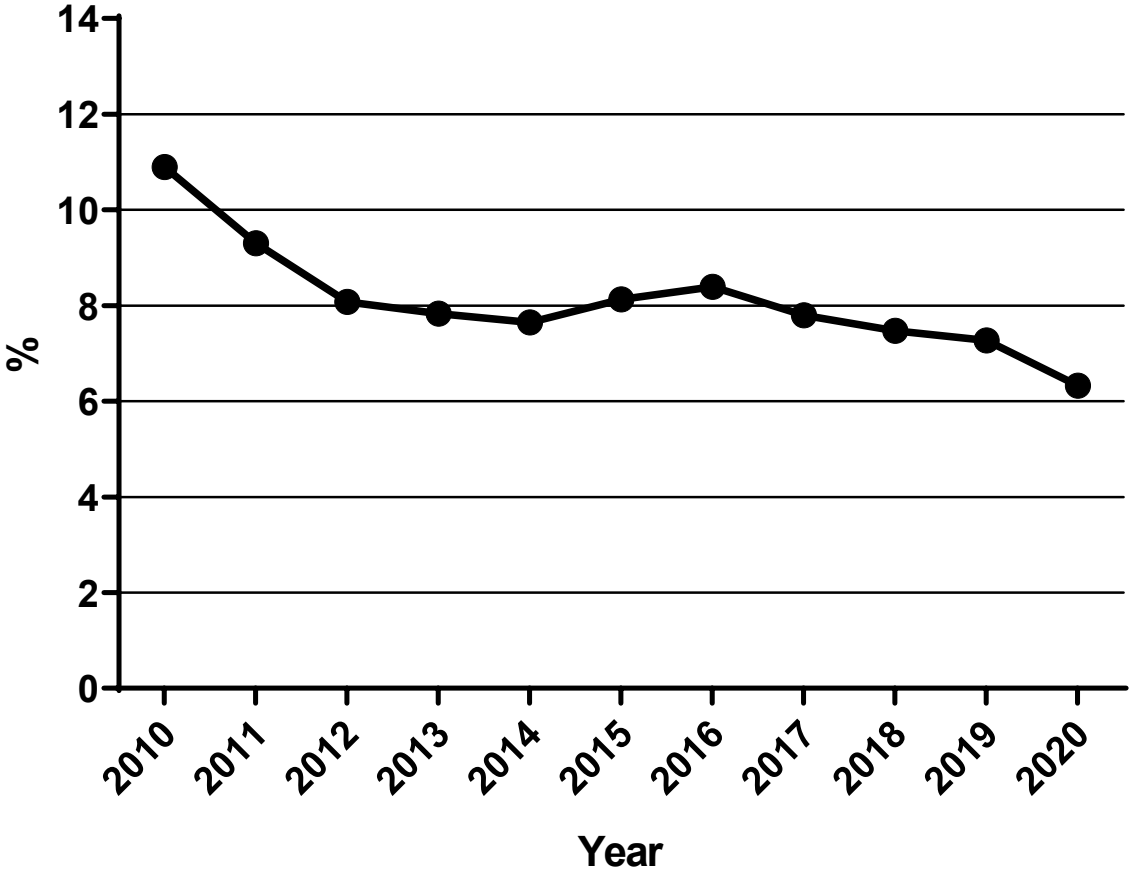


Risk-Adjusted Major Hospital Events by Cohort - Fall 2020

TQIP Report ID: Michigan



Collaborative Outcome Overview - Serious Cx
Cohort 2 - Admit to Trauma



IX. Processes of Care: Orthopedic Trauma Care

Table 15: First Operative Internal or External Fixation in Elderly Patients with Isolated Hip Fracture

	Isolated Hip Fracture	Operative Fixation		Time to Operative Fixation (hours)	Operative Fixation more than 48 Hours		Missing Time to Operative Fixation	
Group	N	N	%	Median (IQR)	N	%	N	%
All Others	40,504	36,453	90.0	21.07 (15.3-28.55)	2,804	7.7	141	0.4
Collaborative	3,800	3,510	92.4	23.05 (17.03-31.45)	304	8.7	2	0.1

Table 16: First Operative Internal or External Fixation in Patients with Mid-Shaft Femur Fracture

	Mid-Shaft Femur Fracture	Operative Fixation		Time to Operative Fixation (hours)	Operative Fixation more than 24 Hours		Missing Time to Operative Fixation	
Group	N	N	%	Median (IQR)	N	%	N	%
All Others	18,846	17,037	90.4	15.85 (7.65-23.5)	4,061	23.9	59	0.3
Collaborative	906	790	87.2	17.84 (10.63-27.65)	251	31.9	2	0.3

Table 17: First Operative Internal or External Fixation in Patients with Open Tibia Shaft Fracture

	Open Tibia Shaft Fracture	Operative Fixation		Time to Operative Fixation (hours)	Operative Fixation more than 24 Hours		Missing Time to Operative Fixation	
Group	N	N	%	Median (IQR)	N	%	N	%
All Others	6,037	5,609	92.9	6.97 (3.08-14.88)	495	8.9	24	0.4
Collaborative	236	216	91.5	5.35 (3.13-14.23)	8	3.7	0	0.0

IX. Processes of Care: Orthopedic Trauma Care

Table 18: Operative Irrigation and Debridement in Patients with Open Tibia Shaft Fracture

	Open Tibia Shaft Fracture	Irrigation and Debridement		Time to First Irrigation and Debridement (hours)	Irrigation and Debridement within 24 Hours		Missing Time to Irrigation and Debridement	
Group	N	N	%	Median (IQR)	N	%	N	%
All Others	6,037	5,751	95.3	8.98 (4.08-16.75)	3,196	87.3	2,089	36.3
Collaborative	236	220	93.2	7.15 (3.39-16.13)	195	88.6	0	0.0

Table 19: Flap in Patients with Open Tibia Shaft Fracture

	Open Tibia Shaft Fracture	Flap		Time to Flap (days)	Flap within 7 Days		Missing Time to Flap	
Group	N	N	%	Median (IQR)	N	%	N	%
All Others	6,037	260	4.3	7 (5-12)	137	52.7	0	0.0
Collaborative	236	11	4.7	7 (5-16)	6	54.5	0	0.0

Table 20: Fasciotomy in Patients with Open or Closed Tibia Shaft Fracture

	Open or Closed Tibia Shaft Fracture	Fasciotomy	
Group	N	N	%
All Others	8,355	348	4.2
Collaborative	310	18	5.8

IX. Processes of Care: Spleen

Table 21: Procedures for Patients with Blunt Splenic Injuries by Cohort

		Patients	Operative Management		Splenic Preservation		Angiography		Time to Operative Management (hours)	Missing Time to Operative Management	
Cohort	Group	N	N	%	N	%	N	%	Median (IQR)	N	%
Blunt Splenic Injury (BSI)	All Others	14,303	2,794	19.5	11,509	80.5	2,505	17.5	1.67 (0.92-3.83)	33	1.2
	Collaborative	441	68	15.4	373	84.6	65	14.7	1.65 (1.22-3.84)	0	0.0
Isolated BSI	All Others	1,215	222	18.3	993	81.7	347	28.6	2.43 (1.05-6.33)	2	0.9
	Collaborative	47	6	12.8	41	87.2	10	21.3	1.37 (0.82-2.57)	0	0.0

Table 22: Hospital and ICU LOS for Patients with Non-Operative Isolated Blunt Splenic Injuries

	Patients	Hospital Length of Stay (days)	ICU Admission		ICU Length of Stay (days)	Missing LOS (%)	
Group	N	Median (IQR)	N	%	Median (IQR)	Hospital	ICU
All Others	993	4 (3-5)	610	61.7	3 (2-3)	0.5	0.5
Collaborative	41	4 (3-5)	27	67.5	3 (2-4)	2.4	2.4

Table 23: Pharmacologic VTE Prophylaxis by Cohort

		Patients ¹	VTE Prophylaxis				Time to VTE Prophylaxis (days)	Missing Time to VTE Prophylaxis	
Cohort	Group	N	N	%	No Prophylaxis (%)	Status Unknown (%)	Median (IQR)	N	%
All Patients	All Others	299,638	207,729	69.4	30.6	0.2	2 (2-3)	141	0.1
	Collaborative	13,083	10,065	76.9	23.1	0.0	2 (2-3)	2	0.0
Blunt Multisystem	All Others	42,156	34,762	82.6	17.4	0.1	3 (2-4)	10	0.0
	Collaborative	1,341	1,160	86.5	13.5	0.0	3 (2-4)	0	0.0
Penetrating	All Others	13,570	11,439	84.4	15.6	0.1	2 (2-3)	4	0.0
	Collaborative	418	387	92.6	7.4	0.0	2 (2-3)	0	0.0
Shock	All Others	11,042	9,027	81.8	18.2	0.1	3 (2-4)	3	0.0
	Collaborative	358	306	85.5	14.5	0.0	2 (2-3)	0	0.0
Severe TBI	All Others	17,366	11,725	67.7	32.3	0.2	4 (3-6)	6	0.1
	Collaborative	521	387	74.3	25.7	0.0	4 (3-5)	0	0.0
Elderly	All Others	112,115	72,615	64.9	35.1	0.2	2 (2-3)	57	0.1
	Collaborative	5,888	4,419	75.1	24.9	0.0	2 (2-3)	1	0.0
Elderly Blunt Multisystem	All Others	11,060	8,623	78.1	21.9	0.2	3 (2-4)	2	0.0
	Collaborative	412	338	82.0	18.0	0.0	3 (2-4)	0	0.0
Isolated Hip Fracture	All Others	40,000	34,515	86.4	13.6	0.1	2 (2-3)	21	0.1
	Collaborative	3,781	3,600	95.2	4.8	0.0	2 (1-3)	0	0.0

¹ Excluding deaths in the ED, deaths within the first 48 hours of arrival, and deaths with unknown time to death

Table 24: Pharmacologic VTE Prophylaxis Type by Cohort

		VTE Prophylaxis ¹	Unfractionated Heparin		Low Molecular Weight Heparin		Direct Thrombin or Xa Inhibitor		Other	
Cohort	Group	N	N	%	N	%	N	%	N	%
All Patients	All Others	207,729	41,735	20.1	157,315	75.7	3,141	1.5	5,538	2.7
	Collaborative	10,065	2,135	21.2	7,382	73.3	229	2.3	319	3.2
Blunt Multisystem	All Others	34,762	7,530	21.7	26,525	76.3	214	0.6	493	1.4
	Collaborative	1,160	262	22.6	889	76.6	5	0.4	4	0.3
Penetrating	All Others	11,439	1,409	12.3	9,888	86.4	32	0.3	110	1.0
	Collaborative	387	46	11.9	339	87.6	1	0.3	1	0.3
Shock	All Others	9,027	2,026	22.4	6,762	74.9	70	0.8	169	1.9
	Collaborative	306	58	19.0	236	77.1	3	1.0	9	2.9
Severe TBI	All Others	11,725	4,175	35.6	7,360	62.8	50	0.4	140	1.2
	Collaborative	387	174	45.0	213	55.0	0	0.0	0	0.0
Elderly	All Others	72,615	20,646	28.4	47,121	64.9	2,003	2.8	2,845	3.9
	Collaborative	4,419	1,196	27.1	2,877	65.1	171	3.9	175	4.0
Elderly Blunt Multisystem	All Others	8,623	2,580	29.9	5,763	66.8	99	1.1	181	2.1
	Collaborative	338	99	29.3	233	68.9	4	1.2	2	0.6
Isolated Hip Fracture	All Others	34,515	6,082	17.6	22,931	66.4	2,184	6.3	3,318	9.6
	Collaborative	3,600	598	16.6	2,485	69.0	216	6.0	301	8.4

¹ Excluding deaths in the ED, deaths within the first 48 hours of arrival, and deaths with unknown time to death

IX. Processes of Care: Severe Traumatic Brain Injury

Table 25: Cerebral Monitoring for Severe TBI Patients

	Patients	Cerebral Monitoring		Time to Cerebral Monitoring (hours)	Missing Time to Cerebral Monitoring	
Group	N	N	%	Median (IQR)	N	%
All Others	22,865	5,362	23.5	3.83 (2.18-9.15)	56	1.0
Collaborative	736	174	23.6	4.13 (2.37-8.7)	9	5.2

Table 26: Cerebral Monitoring Method for Severe TBI Patients

	Cerebral Monitoring	External Ventricular Drain		Intraparenchymal Oxygen Monitor		Jugular Venous Bulb		Other Pressure Monitoring Device	
Group	N	N	%	N	%	N	%	N	%
All Others	5,362	2,793	52.1	334	6.2	27	0.5	3,164	59.0
Collaborative	174	76	43.7	1	0.6	0	0.0	110	63.2

Note: Multiple methods are possible for an individual patient

Table 27: Tracheostomy Management for Severe TBI Patients

	Patients	Tracheostomy		Time to Tracheostomy (days)	Tracheostomy within 7 days of Admission		Missing Time to Tracheostomy	
Group	N	N	%	Median (IQR)	N	%	N	%
All Others	22,976	3,984	17.3	10 (7-13)	1,248	31.3	3	0.1
Collaborative	736	137	18.6	8 (5-12)	59	43.1	0	0.0

IX. Processes of Care: Hemorrhagic Shock Management within First 24 Hours

Table 28: Hemorrhagic Shock Management

	Patients	Surgery for Hemorrhage Control		Angiography		Neither Surgery for Hemorrhage Control or Angiography	
Group	N	N	%	N	%	N	%
All Others	7,551	3,955	52.5	1,307	17.4	2,905	38.6
Collaborative	215	111	51.6	20	9.3	93	43.3
Note: Patients may have both surgery for hemorrhage control and angiography							

Table 29: Angiography for Hemorrhagic Shock Patients

	Patients	Angiography		Time to Angiography (hours)	Missing Time to Angiography	
Group	N	N	%	Median (IQR)	N	%
All Others	7,551	1,307	17.4	2.78 (1.5-4.52)	92	7.0
Collaborative	215	20	9.3	4.83 (1.5-7.52)	1	5.0

IX. Processes of Care: Hemorrhagic Shock Management within First 24 Hours

Table 30: Angiographic Interventions for Hemorrhagic Shock Patients

							Embolization Site											
	Patients	Angiography	Angiography with Stenting		Angiography with Embolization		Liver		Spleen		Kidney		Pelvis/ Retroperi- toneum		Peripheral Vascular		Other	
Group	N	N	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
All Others	7,551	1,307	61	4.7	746	57.1	137	18.4	127	17.0	33	4.4	381	51.1	58	7.0	43	5.8
Collaborative	215	20	1	5.0	13	65.0	2	18.2	4	36.4	0	0.0	4	36.4	0	0.0	1	9.1

Note: Multiple sites are possible for an individual patient

Table 31: Surgery for Hemorrhage Control for Hemorrhagic Shock Patients

	Patients	Surgery for Hemorrhage Control		Time to Surgery for Hemorrhage Control (hours)	Missing Time to Surgery for Hemorrhage Control	
Group	N	N	%	Median (IQR)	N	%
All Others	7,551	3,955	52.5	0.92 (0.55-1.87)	38	1.0
Collaborative	215	111	51.6	1.21 (0.67-2.17)	1	0.9

Table 32: Surgery for Hemorrhage Control Type for Hemorrhagic Shock Patients

			Surgery for Hemorrhage Control Type															
	Patients	Surgery for Hemorrhage Control	Laparotomy		Thoracotomy		Sternotomy		Extremity		Neck		Mangled Extremity/Traumatic Amputation		Extraperitoneal Pelvic Packing		Other Skin/Soft Tissue	
Group	N	N	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
All Others	7,551	3,955	2,396	60.6	508	12.8	91	2.3	503	12.7	113	2.9	157	4.0	44	1.1	143	3.6
Collaborative	215	111	66	59.5	15	13.5	4	3.6	13	11.7	4	3.6	5	4.5	0	0.0	4	3.6

Table 33: Transfusion Volume for Hemorrhagic Shock Patients

		Patients Receiving Product	Volume Transfused In 4 Hours (units) ¹
Transfusion Product	Group	N	Median (IQR)
Whole Blood ²	All Others	216	2 (1-4)
	Collaborative	0	NA
Packed Red Blood Cells	All Others	7,485	4 (2-8)
	Collaborative	215	4 (2-8)
Plasma	All Others	5,411	4 (2-8)
	Collaborative	160	4 (2-8.5)
Platelets	All Others	3,208	1 (1-3)
	Collaborative	114	5 (4-10)
Cryoprecipitate	All Others	1,014	2 (1-3)
	Collaborative	24	5 (2-11)

¹ When submitted in mLs, transfusion volume is converted to units based upon the process defined in the References
² Only collected for patients admitted after 2019

Table 34: Massive Transfusion Protocol: Plasma to Packed Red Blood Cells (PRBC) Ratios for Hemorrhagic Shock Patients

Patients ¹		Plasma:PRBC Transfused Ratio between 1:1 and 1:2 ²		Patients with Unknown Plasma:PRBC Ratio	
Group	N	N	% ³	N	%
All Others	2,274	1,546	73.5	172	7.6
Collaborative	61	42	72.4	3	4.9

¹ Hemorrhagic shock patients receiving more than 6 units of PRBCs and/or Whole Blood within 4 hours from ED/Hospital arrival
² Whole Blood was treated as a 1:1 ratio of Plasma:PRBC and, if applicable, added to Plasma:PRBC volumes as described in the References
³ Patients with unknown ratio of Plasma:PRBC are not included in the denominator

**Patient-Reported Outcomes
Complication Grade Changes
Research in Progress
Triage**

Jill Jakubus, PA-C



Topics

- **Patient-Reported Outcomes**
Complication Grade Changes
Research in Progress
Triage

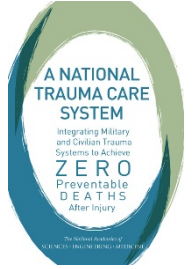
Concept

**Measuring
what matters
to the patient**



**Measured by
the patient**

The Ask



Review

A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths

Committee on Military Trauma
Sector;

Board on Health Sciences Policy
Health and Medicine Division; I
Donald Berwick, Autumn Down

Washington (DC): National Aca

PMID: 27748086 Bookshelf ID

Recommendation 5: The Secretary of Health and Human Services and the Secretary of Defense, together with their governmental, private, and academic partners, should work jointly to ensure that military and civilian trauma systems collect and share common data spanning the entire continuum of care. Within that integrated data network, measures related to prevention, mortality, disability, mental health, patient experience, and other intermediate and final clinical and cost outcomes should be made readily accessible and useful to all relevant providers and agencies.

To implement this recommendation, the following specific actions should be taken:

- Existing trauma registries should develop mechanisms for incorporating long-term outcomes (e.g., patient-centered functional outcomes, mortality data at 1 year, cost data).

Future Ask



SPECIAL ARTICLE

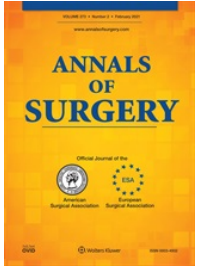
Proceedings from the Consensus Conference on Trauma Patient-Reported Outcome Measures



Joseph V Sakran, MD, MPH, MPA, FACS, Hiba Ezzeddine, MD, C William Schwab, MD, FACS, Stephanie Bonne, MD, FACS, Karen J Brasel, MD, MPH, FACS, Randall S Burd, MD, PhD, FACS, Joseph Cuschieri, MD, FACS, James Ficke, MD, FACS, Barbara A Gaines, MD, FACS, Joseph T Giacino, PhD, Nicole S Gibran, MD, FACS, Adil Haider, MD, MPH, FACS, Erin C Hall, MD, FACS, Juan P Herrera-Escobar, MD, MPH, Bellal Joseph, MD, FACS, Lillian Kao, MD, FACS, Brad G Kurowski, MD, MS, FACS, David A Lippert, MD, FACS, Deepika Nehra, MD, FACS, Babak Sarani, MD, FACS, Ben Zarzaur, MD, MPH, FACS, Ronald S. B. Nathens, MD, MPH, PhD, FACS,

Our goal was to identify a limited number of measures to incorporate into the ACS National Trauma Data Standard.²² The National Trauma Data Standard specifies field definitions for data to be captured by trauma centers to evaluate their quality of care. Most trauma centers have limited capacity to take on additional large-scale data

Literature



ORIGINAL ARTICLE

Patient-reported Outcomes at 6 to 12 Months Among Survivors of Firearm Injury in the United States

Juan Pablo Herrera-Escobar, MD, MPH,✉ Elzerie de Jager, MBBS(Hons),*
Justin Conrad McCarty, DO, MPH,* Stuart Lipsitz, ScD,* Adil H. Haider, MD, MPH,*
Ali Salim, MD,† and Deepika Nehra, MD†*

Objective: Assess outcomes in survivors of firearm injuries after 6 to 12 months and compared them with a similarly injured trauma population.

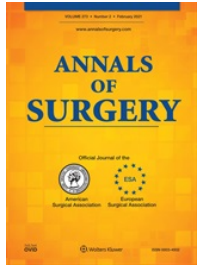
Background: For injury in 2017, there were 39,000 firearm deaths in the United States, while neglecting the

largely focuses on mortality and short-term health outcomes,^{5,6} while neglecting the long-term consequences.⁷

Survivors of injury as a whole commonly suffer from reduced

Conclusions: This study highlights the need for targeted long-term follow-up care, physical rehabilitation, mental health screening, and interventions for survivors of firearm violence.

Literature



ORIGINAL ARTICLE

Factors Associated With Long-term Outcomes After Injury *Results of the Functional Outcomes and Recovery After Trauma Emergencies (FORTE) Multicenter Cohort Study*

Adil H. Haider, MD, MPH,*† Juan P. Herrera-Escobar, MD, MPH,* Syeda S. Al Rafai, MD,*
Alyssa F. Harlow, MPH,* Michel Apoj, BS,‡ Deepika Nehra, MD,† George Kasotakis, MD, MPH,‡
Karen Brasel, MD, MPH,§ Haytham M. A. Kaaifarani, MD, MPH,|| George Velmahos, MD, PhD,||
and Ali Salim, MD†

Objective: The aim of this study was to determine factors associated with patient-reported outcomes, 6 to 12 months after moderate to severe injury.

Summary of Background Data: Trauma patients often have an incomplete understanding of their injury and recovery. Reported outcomes are often inconsistent across several entities in the literature.

This suggests that social support systems are potentially at the core of recovery rather than traditional measures of injury severity.

Conclusion: The long-term sequelae of trauma are more significant than previously expected. Collection of postdischarge outcomes identified patient factors, such as female sex and low education, associated with worse recovery.

Literature



BRIEF REPORT

Pain across traumatic injury groups: A National Institute on Disability, Independent Living, and Rehabilitation Research model systems study

Dagmar Amtmann, PhD, Alyssa M. Bamer, MPH, Kara McMullen, MPH, Nicole S. Gibran, MD, Jeanne M. Hoffman, PhD, Charles H. Bombardier, PhD, and Gretchen J. Carrougner, MN, RN, Seattle, Washington

BACKGROUND: Pain is a common problem after traumatic injury. We describe pain intensity and interference at baseline and 1 year postinjury in burn, traumatic brain injury (TBI), and spinal cord injury (SCI) survivors and compare them with the general population (GP). We tested a custom Patient Reported Outcomes Measurement Information System (PROMIS) pain interference short form developed for use in trauma populations.

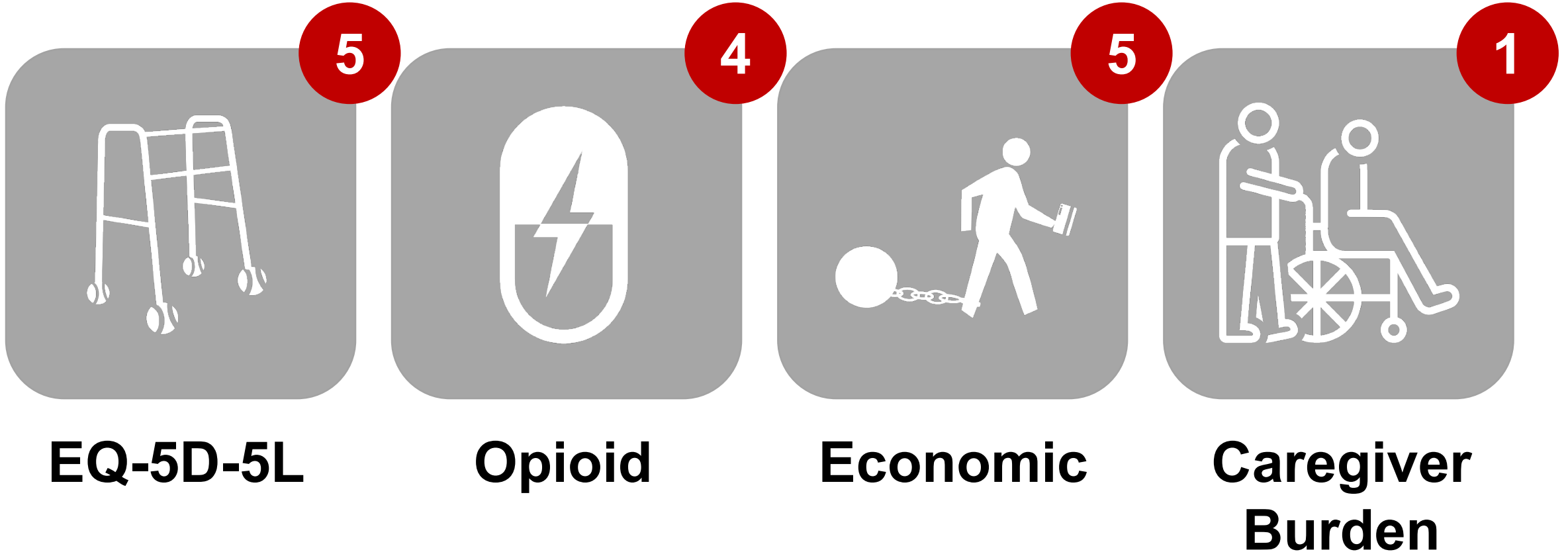
METHODS: We administered a pain intensity numerical rating scale and custom PROMIS pain interference short forms at baseline and/or 1 year

CONCLUSION: The custom pain interference short forms functioned well and demonstrated the utility of the custom PROMIS pain interference short forms in traumatic injury. Results indicate that, for many people with burn, TBI and SCI, pain remains an ongoing concern long after the acute injury phase is over. This suggests a need to continue to assess pain months or years after injury to provide better pain management for those with traumatic injuries. (*J Trauma Acute Care Surg.* 2020;89: 829–833. Copyright © 2020

Progress



Protocol



Reporting

 MICHIGAN MEDICINE
UNIVERSITY OF MICHIGAN

Are you still taking opioid pain medication?

☐ Yes

☐ No

☐ N/A



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PRO Opportunity

- Offer MTQIP staff to perform your PRO reporting
 - Contact on your behalf
 - PRO data available to center
 - PRO collaborative feedback
 - Guide clinical care
 - Verification resource
-
- Email: jjakubus@umich.edu
 - Amendment may be required





Discussion Opportunity

Topics

- ✓ **Patient-Reported Outcomes**
 - **Complication Grade Changes**
- Research in Progress**
- Triage**

Complication Group Changes

1

Non-Life-Threatening

- CRBSI 1 → 2
- Deep SSI
- Alcohol Withdrawal
- Organ/Space SSI
- Superficial SSI
- CAUTI
- Wound Disruption
- Delirium 0 → 1

2

Potentially-Life-Threatening

- DVT
- ECF
- Extremity Compartment Syndrome 2 → 1
- PE
- Pressure Ulcer
- Unplanned OR
- Unplanned ICU
- VAP 2 → 3

3

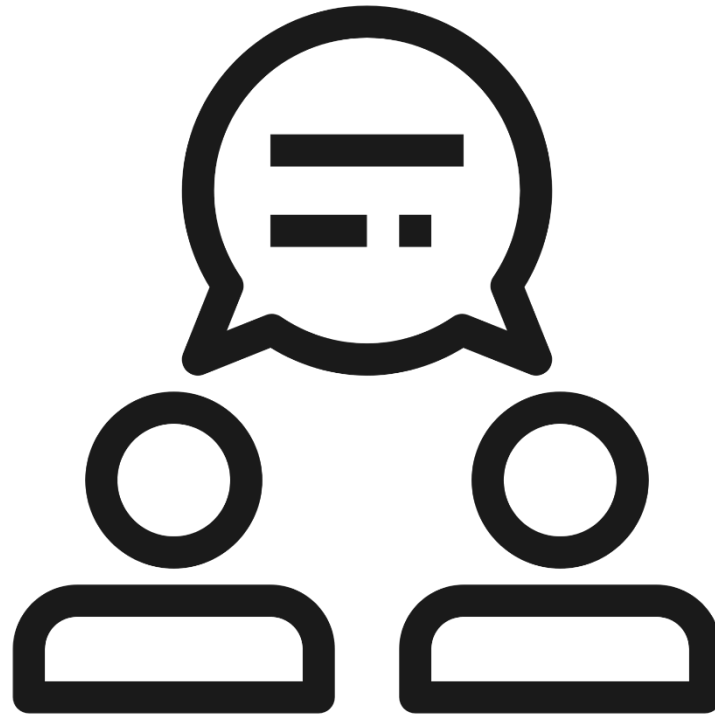
Life-Threatening

- ARDS
- AKI
- Cardiac Arrest
- C. difficile Colitis 3 → 2
- CVA
- MI
- Renal Insufficiency
- Sepsis
- Unplanned Intubation

Target: Feb 15

	Complication	N died w Comp	N Comp	Mortality	N	Comp Rate	MTQIP Revised	MTQIP Serious	MTQIP Any	ACSTQIP	Change from
	Cardiac arrest	534	950	56.2%	140,776	0.67%	3	Serious	Any	Major	
	Acute renal failure (dialysis)	228	620	36.8%	140,776	0.44%	3	Serious	Any	Major	
	Unplanned intubation	617	2127	29.0%	140,776	1.51%	3	Serious	Any		
	Systemic sepsis	174	640	27.2%	140,776	0.45%	3	Serious	Any	Major	
	ARDS	151	564	26.8%	140,776	0.40%	3	Serious	Any	Major	
	MI	136	607	22.4%	140,776	0.43%	3	Serious	Any	Major	
	Stroke/CVA	99	461	21.5%	140,776	0.33%	3	Serious	Any	Major	
	Renal insufficiency	37	183	20.2%	140,776	0.13%	3	Serious	Any		
●	VAP	184	1170	15.7%	140,776	0.83%	3	Serious	Any	Major	2
	Return to ICU	463	3070	15.1%	140,776	2.18%	2	Serious	Any		
	Pneumonia	487	3322	14.7%	140,776	2.36%	2	Serious	Any		
	Decubitus ulcer	92	803	11.5%	140,776	0.57%	2	Serious	Any	Major	
●	CRBSI/CLABSI	6	63	9.5%	140,776	0.04%	2	Serious	Any	Major	1
●	C. diff colitis	48	519	9.2%	140,776	0.37%	2	Serious	Any		3
	Return to OR	59	748	7.9%	140,776	0.53%	2	Serious	Any	Major	
	EC fistula	3	40	7.5%	140,776	0.03%	2	Serious	Any		
	Pulmonary embolism	44	599	7.3%	140,776	0.43%	2	Serious	Any	Major	
	DVT LE	87	1241	7.0%	140,776	0.88%	2	Serious	Any		
	UTI	68	1060	6.4%	140,776	0.75%	1		Any		
	Wound disruption	4	68	5.9%	140,776	0.05%	1		Any		
	Deep ssi	11	202	5.4%	140,776	0.14%	1		Any	Major	
	Osteomyelitis	1	19	5.3%	140,776	0.01%	1		Any		
	Organ space ssi	9	201	4.5%	140,776	0.14%	1		Any	Major	
●	Extremity compartment syndrome	7	160	4.4%	140,776	0.11%	1		Any		2
	Superficial ssi	8	193	4.1%	140,776	0.14%	1		Any		
	Alcohol or drug withdrawal	63	1564	4.0%	140,776	1.11%	1		Any		
●	Delirium						1		Any		0

Discussion Opportunity



Topics

- ✓ **Patient-Reported Outcomes**
 - ✓ **Complication Grade Changes**
 - **Research in Progress**
- Triage**

Research in Progress

Update	Center	PI	Topic	Phase*
	Detroit Receiving	Oliphant	The accuracy of orthopedic data in a trauma registry	Data collection and analysis
	Henry Ford	Johnson	EMS vs. private car effect on outcomes	
	Michigan Medicine	Oliphant	Timeliness of antibiotic administration	Abstract being submitted Central/Midwest Surgical
	Michigan Medicine	Hemmila	Pedestrian protection	Analysis
	Michigan Medicine	Wang	Injury prevention in vulnerable populations	Analysis
	Michigan Medicine	Ward	Clinical decision support tools	
	Spectrum Health	Chapman	Outcomes in operative fixation of rib fractures	
	Spectrum Health	Little	Traumatic frontal sinus fractures	Abstract being submitted American Society of Plastic Surgery
	Spectrum Health	Miller	Outcomes in IMN of long bone fractures	Abstract being submitted Orthopedic Trauma Association
	St Joseph Mercy Ann Arbor	Hecht	Time to anticoagulant reversal	Analysis
	St. Joseph Mercy Ann Arbor	Hoesel	Rib fractures in the elderly	Analysis
	St. Joseph Mercy Ann Arbor	Keyes	Impact of COVID-19 on trauma in the ED	New collaborator
	University of Minnesota	Parr	Effects of novel coronavirus on neurotrauma	New collaborator
	University of Minnesota	Tignanelli	NEI-6 modeling prospective validation	Abstract being submitted Journal of Surgical Research

**Blank Phase indicates update requested but response pending*








Topics

- ✓ **Patient-Reported Outcomes**
- ✓ **Complication Grade Changes**
- ✓ **Research in Progress**
- **Triage**

Triage

What online analytic would you find most valuable?

Top

4		Triage
2		PRQ
1		Triage
0		Prq
0		PRQ
0		NIFTI
0		Triage

New

1	Triage
0	Prq
0	PRQ
0	NIFTI
2	PRQ
0	Triage
4	Triage

Cribari

- Major Trauma = ISS>15
- Exclude direct admit
- Exclude no signs of life

NFTI

- Transfusion of packed red blood cells within 4 hrs of arrival
- Discharge from ED to OR within 90 minutes of arrival
- Discharge from ED to interventional radiology
- Discharge from ED to ICU with a stay \geq 3 days (72 hrs)
- Mechanical ventilation within 3 days, not including OR or procedures
- Death within 60 hrs of arrival
- Exclude direct admit
- Exclude no signs of life

NEI-6

- Receive \geq 5 units of packed red blood cells within the first 4 hrs of arrival
- Any operation within 6 hrs of arrival
- Any angiography within 6 hrs of arrival
- Chest tube within 6 hrs of arrival
- Central line placement within 6 hrs of arrival
- Emergent intubation
- Placement of ICP monitor or intracranial OR within the first 24 hrs of arrival
- Exclude direct admit
- Exclude no signs of life

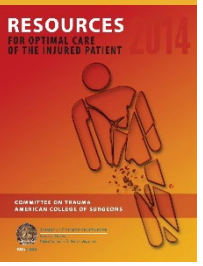
	Not Major Trauma	Major Trauma	Total
Highest Level TTA	A	B	C
Midlevel TTA	D	E	F
No TTA	G	H	I

	No Intervention	Intervention	Total
Highest Level TTA	A	B	C
Midlevel TTA	D	E	F
No TTA	G	H	I

	No Intervention	Intervention	Total
Highest Level TTA	A	B	C
Midlevel TTA	D	E	F
No TTA	G	H	I

Overtriage	$A/C \times 100$	25-35%
Undertriage	$(E+H)/(F+I) \times 100$	$\leq 5\%$

Triage Calculation



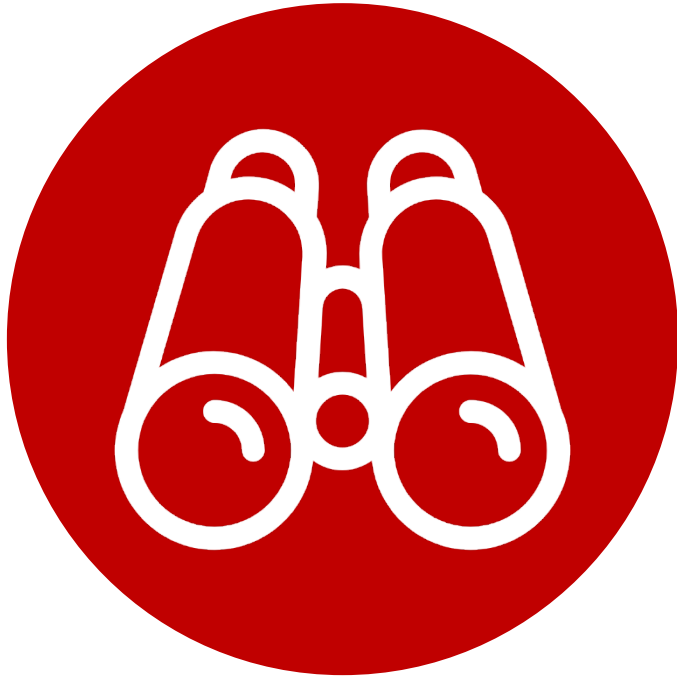
Another method is to determine how many major trauma patients were transported incorrectly to a non-trauma center. If an Injury Severity Score of 16 or more is used to define major trauma patients, undertriaged patients would be patients with an Injury Severity Score of 16 or more who were taken to a non-trauma center hospital. By using this method, an acceptable undertriage rate could be as high as 5 percent.

Page 25

Overtriage is a decision that incorrectly classifies a patient as needing trauma center care, although retrospective analysis suggests that such care was not needed. Overtriage results in overutilization of finite resources (financial and human) and, as such, is also important to monitor. Overtriage commonly is calculated by classifying major trauma patients by using standard registry criteria. One example, as originally introduced with the Major Trauma Outcome Study, would be patients who died or who were admitted to the hospital for more than 48 hours, admitted to an intensive care unit, or taken to the operating room. The patients triaged to the trauma center who did not meet these criteria become the numerator. The total number of patients triaged to the trauma center would be the denominator. Most agree that an acceptable percentage of overtriage is in the range of 25 to 35 percent.

Page 28

ISS Controversy



Retrospective



Anatomically Based



Physiologic Omission

Literature



Redefining the Trauma Triage Matrix: The Role of Emergent Interventions

Rachel S. Morris, MD,^{a,*} Nicholas J. Davis, MD,^b Amy Koestner, MSN,^c
Lena M. Napolitano, MD,^d Mark R. Hemmila, MD,^d
and Christopher J. Tignanelli, MD^{a,b,e}

^a Department of Surgery, University of Minnesota, Minneapolis, Minnesota

^b Department of Surgery, North Memorial Medical Center, Robbinsdale, Minnesota

^c Department of Surgery, Spectrum Health - Butterworth Hospital, Grand Rapids, Michigan

^d Department of Surgery, University of Michigan, Ann Arbor, Michigan

^e Institute for Health Informatics, University of Minnesota, Minneapolis, Minnesota

ARTICLE INFO

ABSTRACT

Article history:
Received 10 Jul

Conclusions: NEI-6 performs better than TTM, NFTI, and STAT in terms of undertriage, mortality and need for resource utilization. Other methods resulted in significantly more full TTAs than NEI-6 without identifying patients at risk for early mortality. NEI-6 represents a novel tool to determine trauma activation appropriateness.

Compare Triage Calculation Methods

PRQ > Over/Under Triage

Over/Under Triage	Cases Numerator	Cases Demoninator	Hospital - Unadj	MTQIP All - Unadj	P Value - Unadj
Overtriage Cribari	N	N	#	#	
Overtriage NEI-6	N	N	#	#	
Overtriage NFTI	N	N	#	#	
Undertriage Cribari	N	N	#	#	
Undertriage NEI-6	N	N	#	#	
Undertriage NFTI	N	N	#	#	

Transparent Matrix Calculation

PRQ > Triage Matrix Drill Down

Triage Matrix Drill Down	Cases Numerator	Cases Demoninator	Hospital - Unadj	MTQIP All - Unadj	P Value - Unadj
Missing Activation Level					
Cribari A - Highest Level TTA + Not Major Trauma					
Cribari B - Highest Level TTA + Major Trauma					
Cribari D - Midlevel TTA + Not Major Trauma					
Cribari E - Midlevel TTA + Major Trauma					
Cribari G - No TTA + Not Major Trauma					
Cribari H - No TTA + Major Trauma					
NEI-6 A - Highest Level TTA + No Intervention					
NEI-6 B - Highest Level TTA + Intervention					
NEI-6 D - Midlevel TTA + No Intervention					
NEI-6 E - Midlevel TTA + Intervention					
NEI-6 G - No TTA + No Intervention					
NEI-6 H - No TTA + Intervention					
NFTI A - Highest Level TTA + No Intervention					
NFTI B - Highest Level TTA + Intervention					
NFTI D - Midlevel TTA + No Intervention					
NFTI E - Midlevel TTA + Intervention					
NFTI G - No TTA + No Intervention					
NFTI H - No TTA + Intervention					

	Not Major Trauma	Major Trauma	Total
Highest Level TTA	A	B	C
Midlevel TTA	D	E	F
No TTA	G	H	I

	No Intervention	Intervention	Total
Highest Level TTA	A	B	C
Midlevel TTA	D	E	F
No TTA	G	H	I

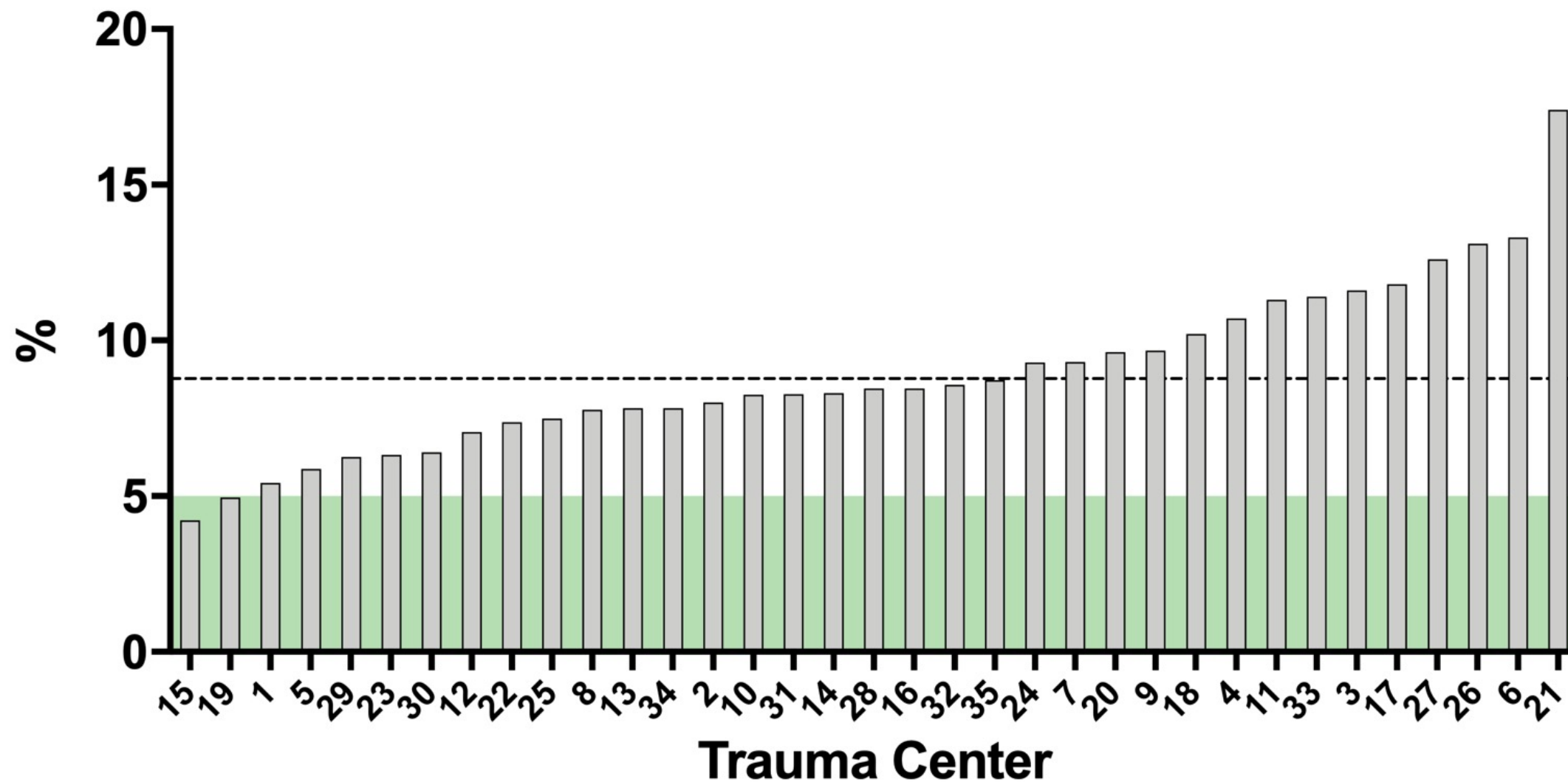
Interventions Driving Triage Rates

PRQ > Interventions

Interventions Drill Down	Cases Numerator	Cases Demoninator	Hospital - Unadj	MTQIP All - Unadj	P Value - Unadj
NEI-6 - Transfusion ≥ 5 units of packed RBC 0-4 hours of arrival					
NEI-6 - Any operation 0-6 hours of arrival					
NEI-6 - Any angiography 0-6 hours of arrival					
NEI-6 - Chest tube 0-6 hours of arrival					
NEI-6 - Central line placement 0-6 hours of arrival					
NEI-6 - Emergent intubation					
NEI-6 - ICP placement or intracranial operation 0-24 hours of arrival					
NFTI - Transfusion packed RBC within 0-4 hours of arrival					
NFTI - Discharge from ED to OR within 90 minutes of arrival					
NFTI - Discharge from ED to interventional radiology					
NFTI - Discharge from ED to ICU with a stay ≥ 3 days (72 hours)					
NFTI - Mechanical ventilation within 3 days, excluding OR or procedures					
NFTI - Death within 60 hours of arrival					

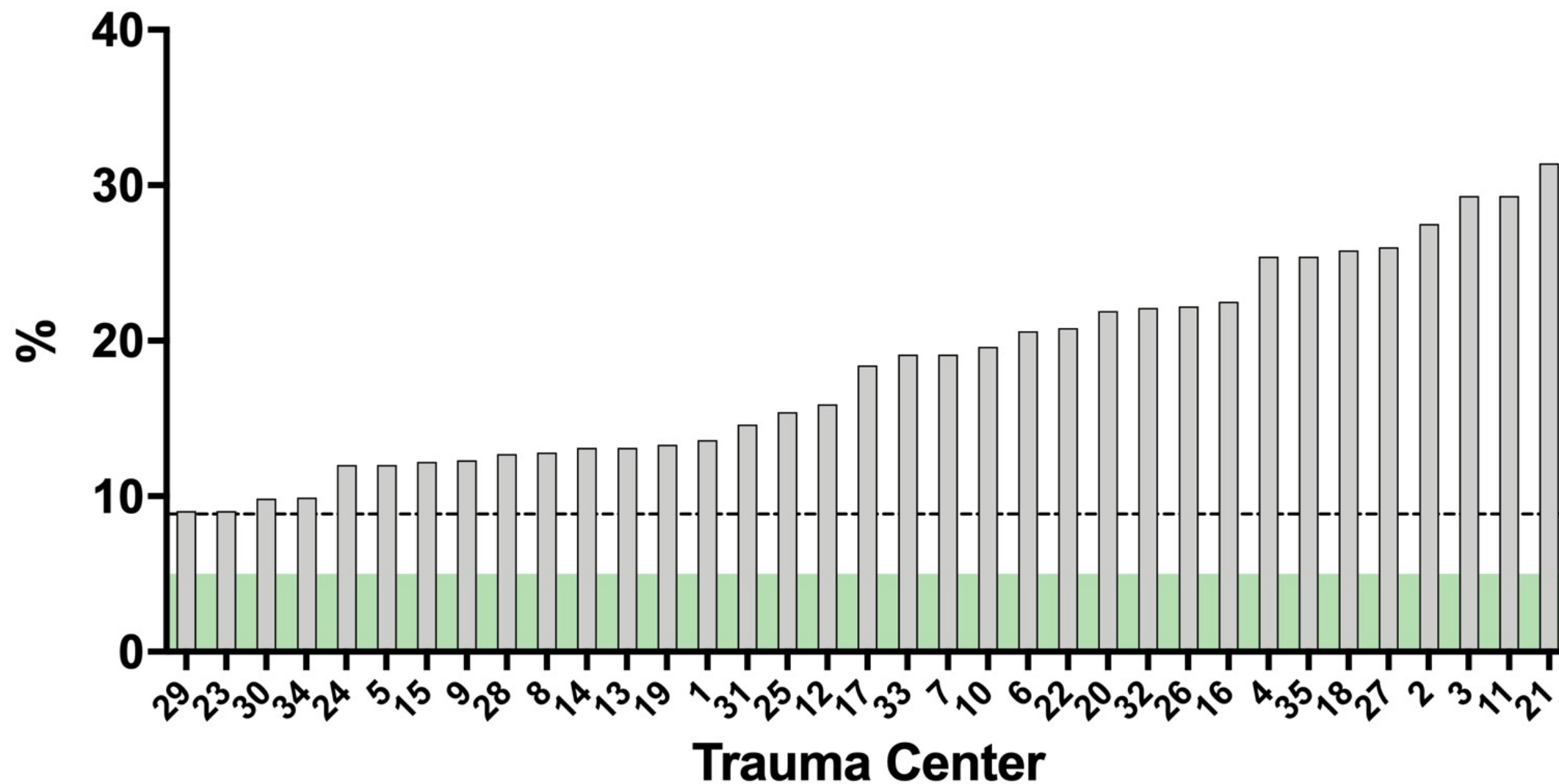
Cribari Undertriage w/o DOA, Age ≥ 16

Cohort 0 - Registry All



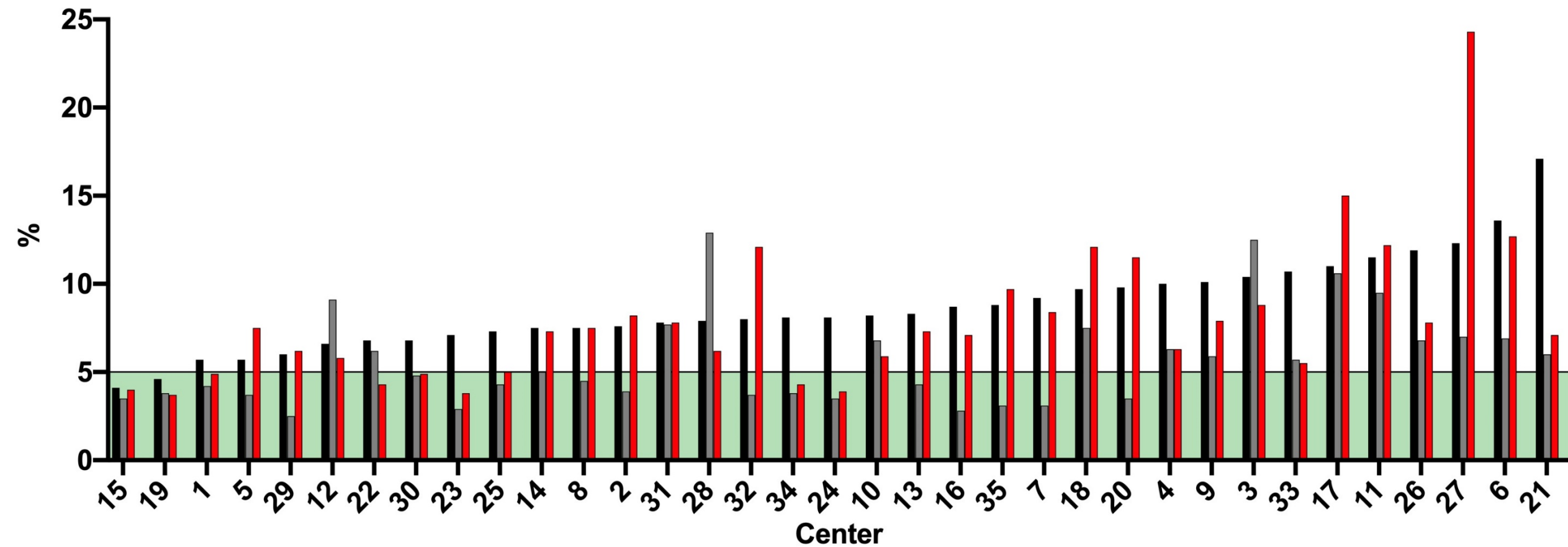
Cribari Undertriage w/o DOA, Age ≥ 16

Cohort 2 - Admit to Trauma

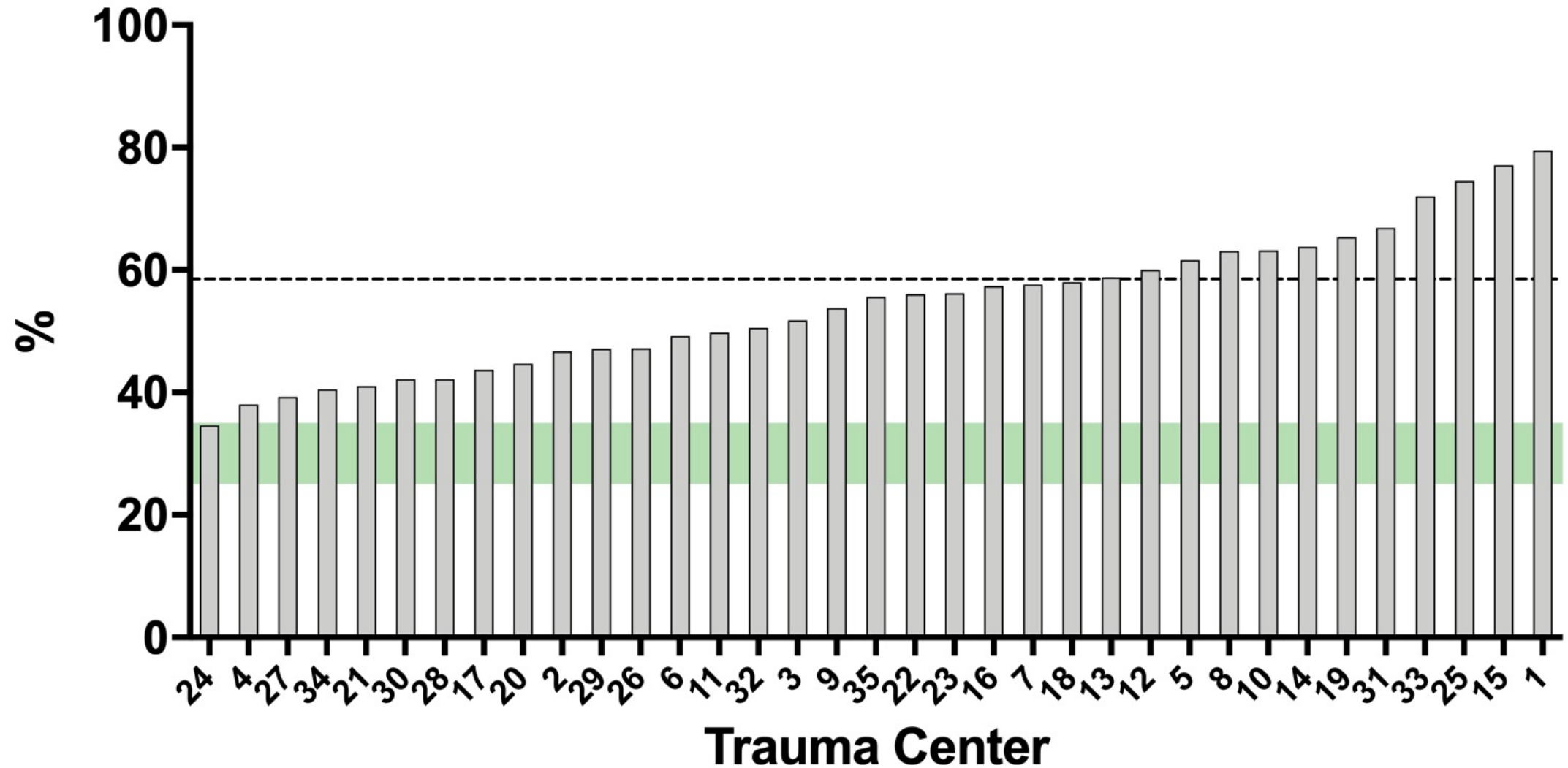


**Undertriage w/o DOA
Cohort 0 - Registry All
1/1/19 - 10/31/20**

■ Cribari
■ NFTI
■ NEI-6

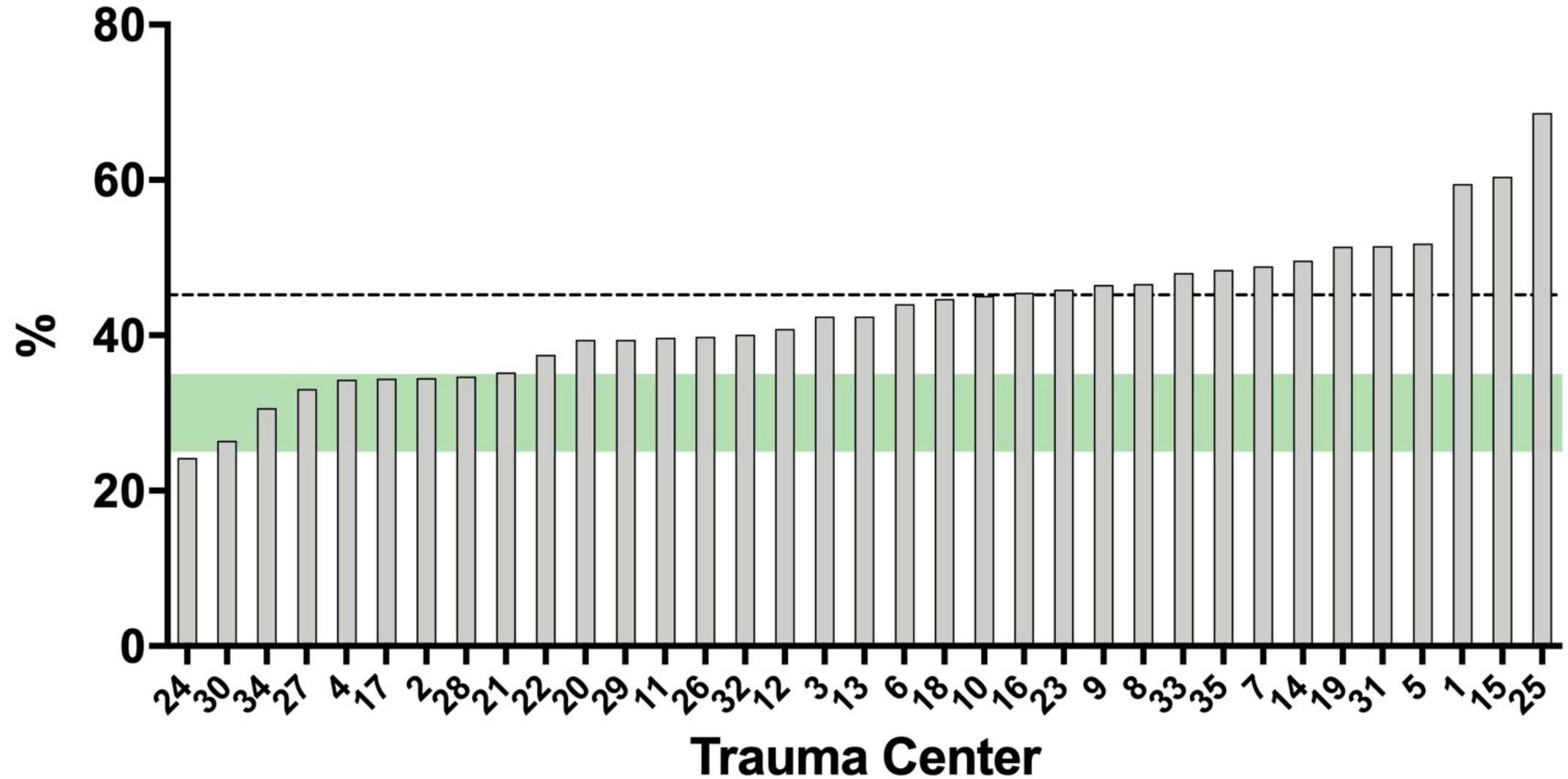


Cribari Overtriage w/o DOA, Age ≥ 16 Cohort 0 - Registry All



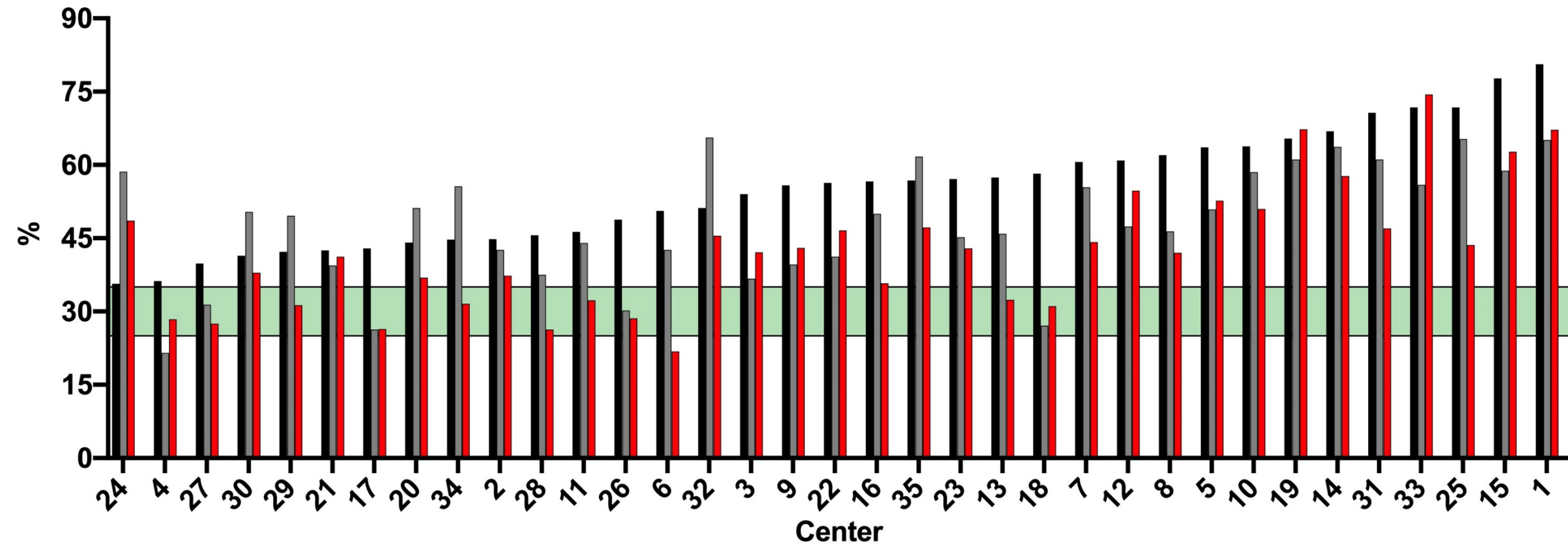
Cribari Overtriage w/o DOA, Age ≥ 16

Cohort 2 - Admit to Trauma



**Overtriage w/o DOA
Cohort 0 - Registry All
1/1/19 - 10/31/20**

■ Cribari
■ NFTI
■ NEI-6



Questions

- **Do the proposed analytics allow you to answer your questions about care delivery?**
- **Are the new triage graphs in the report meaningful?**
- **Additional feedback?**

Topics

- ✓ **Patient-Reported Outcomes**
- ✓ **Complication Grade Changes**
- ✓ **Research in Progress**
- ✓ **Triage**

Summary

- **Email MTQIP to participate in PRO's**
- **Complication grade changes coming this month**
- **New triage analytics coming MTQIP May meeting**

**Interested in Patient-
Reported Outcomes?**



Break

15 min (return 12:15)

Email: mhemmila@umich.edu

Email: jjakubus@umich.edu

MTQIP Program Manager Update

Judy Mikhail, PhD MBA RN



MTQIP and COVID-19

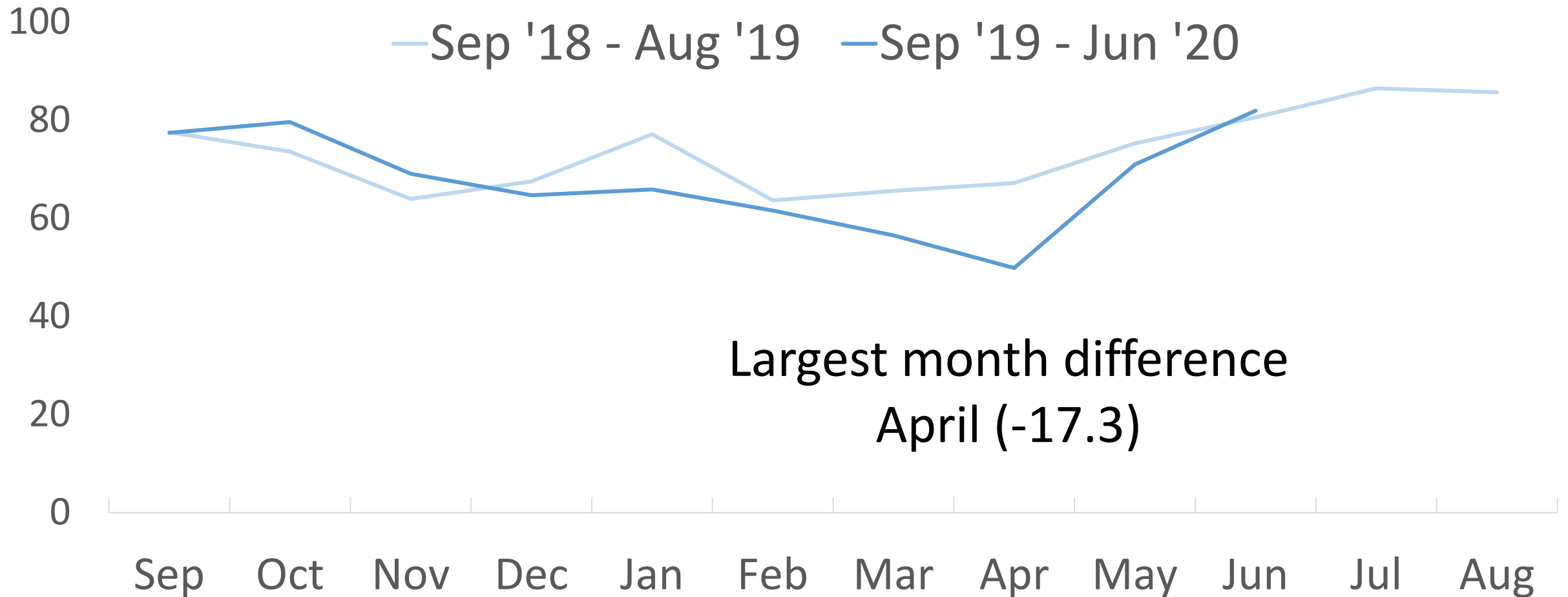
Acknowledgment

Anne Cain-Nielsen

MTQIP Lead Statistician

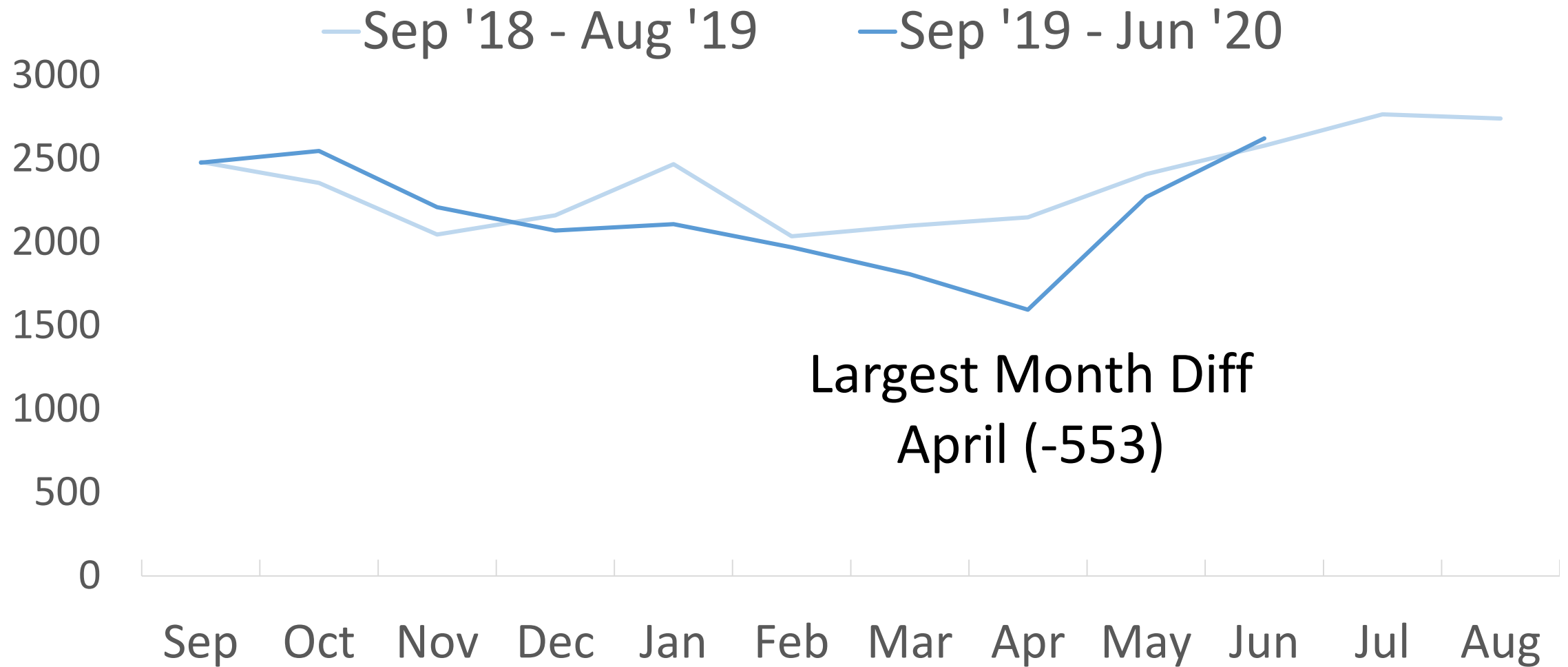
Mean Monthly MTQIP Center Volume

Year 1: 73.7 Year 2: 69.4 (-4.3)

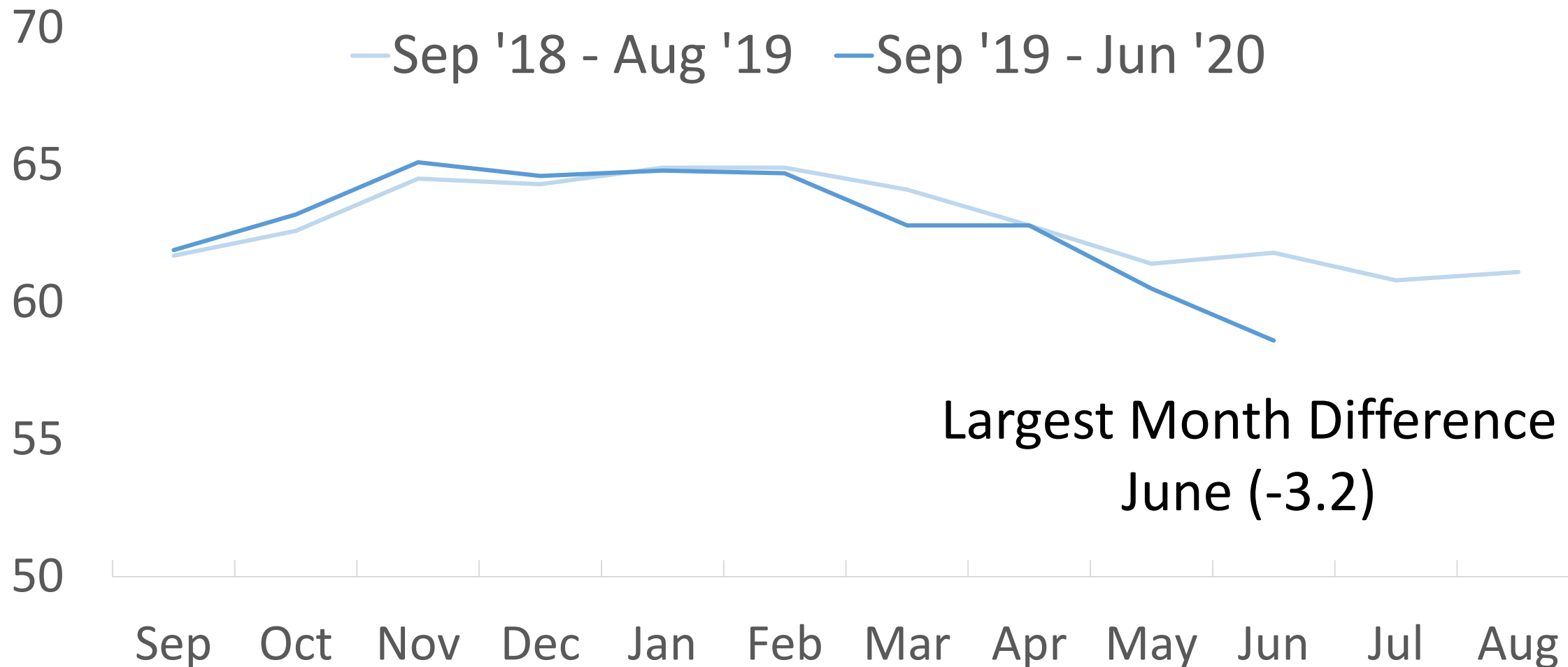


Mean Monthly Michigan-Wide Volume

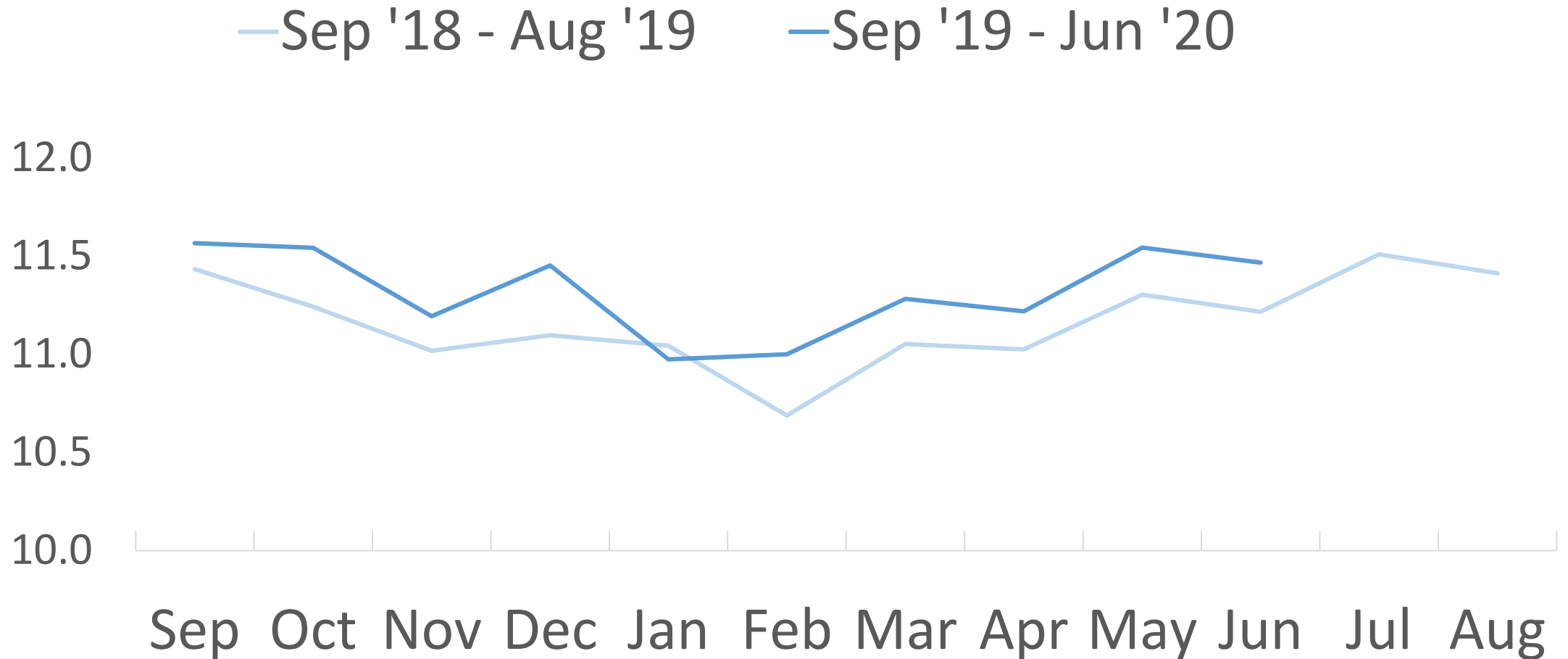
Year 1: 2358; Year 2: 2168 (-190)



Mean Age Per Month

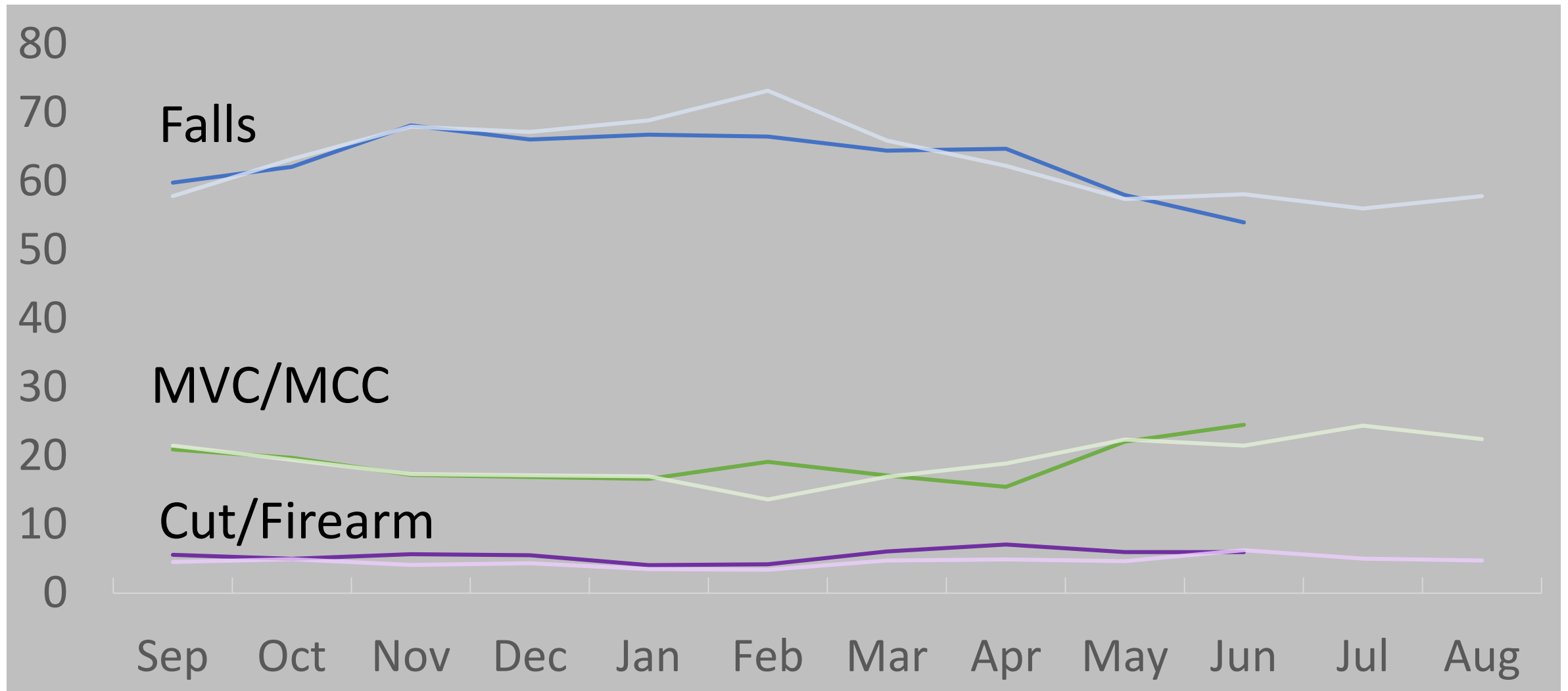


Mean ISS Pre Month



MOI as Percent of All Injuries Per Month

September 2018-August 2019 (Year 1) vs September 2019-June 2020 (Year 2)

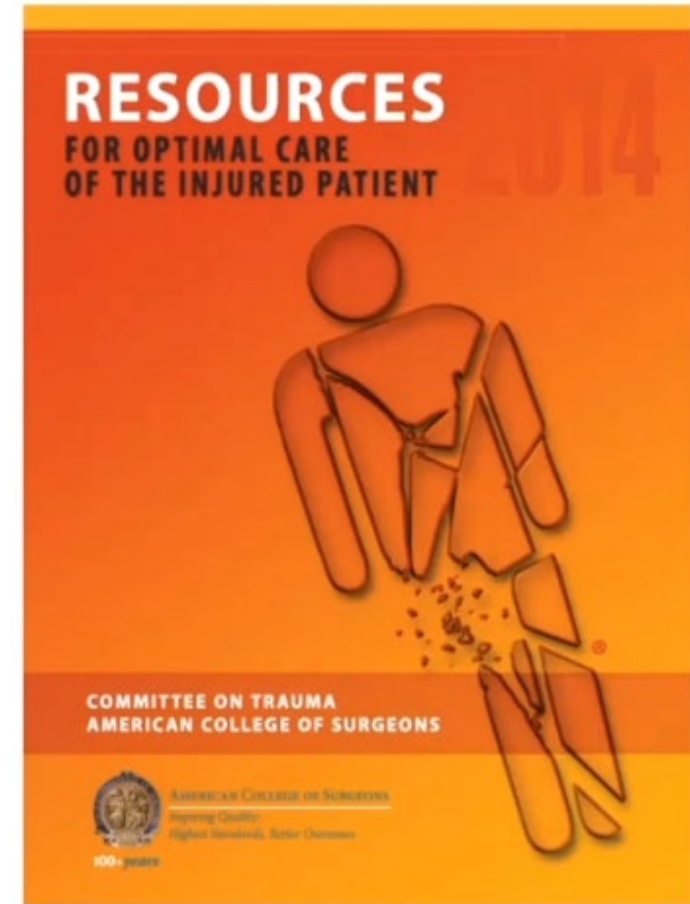


TQIP Meeting
Dec 2020

Verification Changes

How Can MTQIP Help?

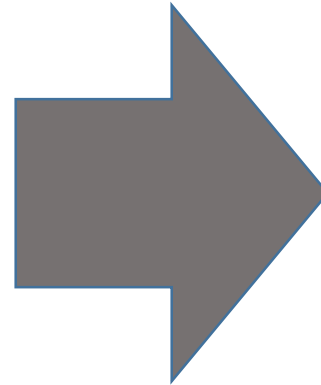
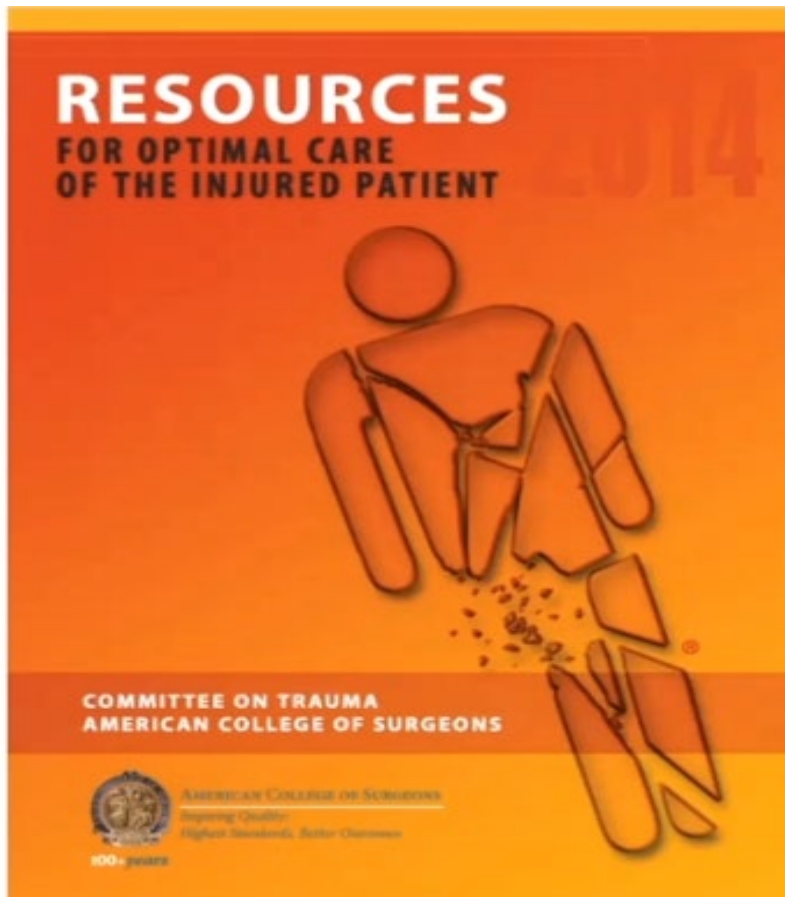
Standards Update



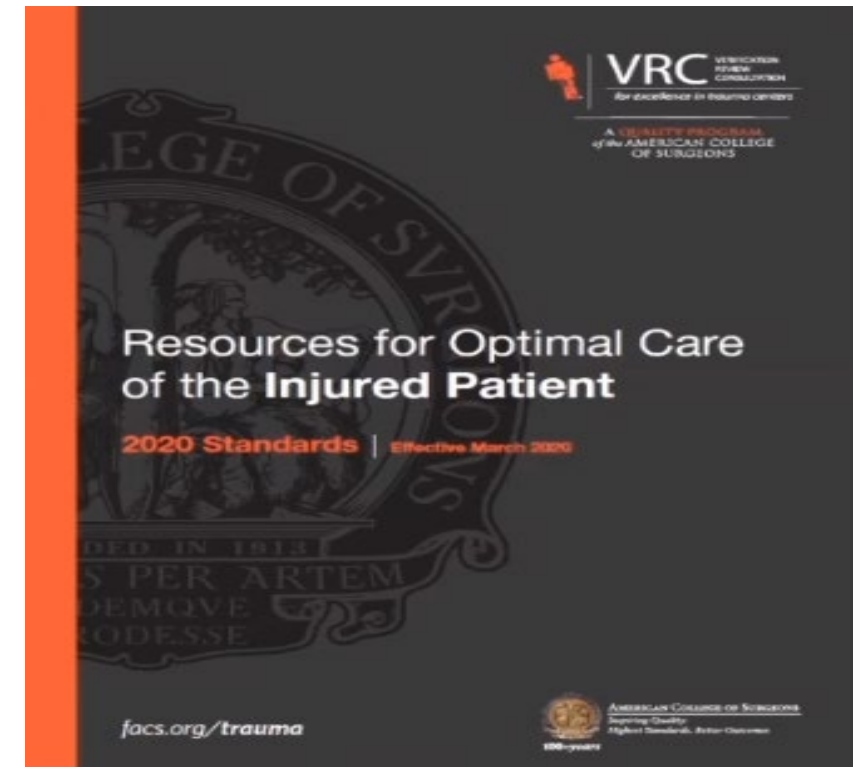
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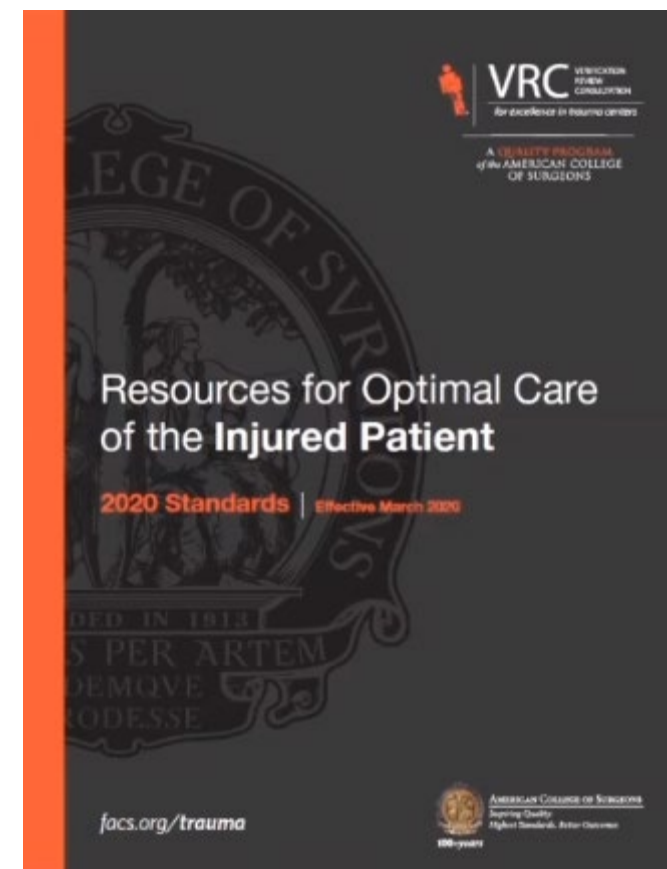
Standards Comparison

387 Standards



141 Standards





PI Personnel

PI Coordinator

In all trauma centers, there must be at least 0.5 FTE dedicated PI personnel (separate from TPM or registrar duties) where the volume exceeds 500 patients meeting NTDS inclusion criteria annually. For trauma centers where the volume exceeds 1,000 patients annually, there must be at least 1 FTE PI personnel. (LI, LII, LIII, PTCI, PTCII)

MTQIP MCRs

Standards Update

CD's "not changed that much" but regrouped into these 9 categories



Daniel Margulies

Nine ACS Categories *How does MTQIP help with verification?*

Category	
Institutional Administrative Commitment	Resource allocation, commitment to patient safety, focus on continuous PI
Program Scope and Governance	Trauma center levels and the functions of key trauma personnel
Facilities and Equipment Resources	Required facilities, personnel, and equipment for care of the injured patient
Personnel and Services Resources	Onsite and consultative services, including the availability of personnel
Patient Care: Expectations and Protocols	Use of comprehensive clinical pathways
Data Surveillance & Systems	Collection and use of trauma registry data
Quality Improvement	Problem identification, resolution, outcomes improvement, and assurances of patient safety
Education: Professional and Community Outreach	Programs designed to improve outcomes from trauma and prevent injury
Research: Basic and Clinical Trials	Research activities for Level I

M
T
Q
I
P

MCRs
Best Practices
Data Validation
QI Measures
MTQIP Mtgs
Regions/Level IIIs
MTQIP Data for Research

Question

My centers next reverification review is now expected to occur in:

- a. 2021
- b. 2022
- c. 2023
- d. 2024

Question

Rate your confidence in interpreting TQIP reports:

- a. Not confident
- b. Slightly confident
- c. Somewhat confident
- d. Fairly confident
- e. Completely confident

Using TQIP at your site visit



Interpreting your data

8:30 am – 9:00 am	TQIP Report	Trauma team will provide their most recent TQIP report, discuss areas for improvement, and present their specific efforts (e.g., data drill down, PI projects) to address any issues.
		<ul style="list-style-type: none">• Provide a navigator that is familiar with the trauma patients,

- A new approach
 - Reviewers to receive report
 - Insights into potential challenges
 - New item on the site visit agenda
 - Centers to show how they used their results

Starts with virtual visits in 2021

TQIP Reports Ad Hoc Committee

- Goal: To help you with your TQIP report at reverification visit
- Who: Volunteer TPMs/MCRs/REGs facilitate interpreting TQIP reports
- What: Share Best Practices---Learn from each other
 - How to drill down into TQIP Report
 - How to identify your “issues”
 - How to discuss if MTQIP and TQIP data don’t match
- When: Present at next meeting

VBR Update

BCBSM Value Based Reimbursement (VBR)



Surgeon Eligibility

- Surgeon enrolled in PGIP and nominated by PO
- 75% MTQIP surgeons eligible
- Restricted to one trauma center only
- Surgeon rewarded for trauma center results
 - Scored as a group
- Depending on surgeons individual situation:
 - Money comes back to surgeon/group/hospital

VBR Concept

- 3 Metrics chosen from Hospital Perf Index
- Must meet target in 2 of 3
- Reward: 3% increase in BCBSM payments for specialty
 - Operations
 - E&M
 - General Surgery

2021 VBR Metrics

2022 VBR Metrics

1. Timely (48 hr) LMWH VTE Prophylaxis $\geq 50\%$
2. Timely (48 hr) Operative Repair Geriatric Hip Fx $\geq 90\%$
3. Timely (120 min) Abx Open Fx $\geq 85\%$ [[Collaborative Wide](#)]

3% Reward: Meet 2 of 3

New BCBSM 2022 VBR Opportunity

Earn an **additional** 2% for **extra** measures

Successfully Piloted in Other CQIs

Option A

- Develop 3 more measures
- 2% Meet 2 of 3

Surgeons may be eligible for 2%, 3% or 5%

Option B

- Keep same measures
- But meet 3 of 3

All or nothing 5%

➤ MTQIP decision due to BCBSM by Friday-Feb 12th

MACS Data

Mark Hemmila, MD



Emergency General Surgery

- ◆ 2019

- 7/1/2019
- 4 Hospitals (SJ, OW, SH, UM)

- ◆ 2020

- Approval for 2 additional hospitals
- Recruitment
- COVID
- Sparrow

Emergency General Surgery

◆ 2021

- Recruit 4 Hospitals (MetroHealth, DRH, OSU)
- Develop formal onboarding program
- 3 collaborative meetings
- On-line reporting platform
- Data validation program

◆ 2022

- Recruit 4 Hospitals (Total 12)
- Develop 2 performance metrics

Overview of Data Capture

- ◆ Diseases

- Acute Appendicitis*
- Acute Gallbladder disease*
 - ◆ Cholecystitis
 - ◆ Choledocholithiasis/Cholangitis
 - ◆ Gallstone pancreatitis
- SBO*
 - ◆ Hernia (if present)
- Emergent Exploratory Laparotomy
- * Operative and non-operative cases

- ◆ All Qualtrics - May 2020

Reports

- ◆ Time frame
 - 7/1/2019 to 9/30/20
- ◆ Data Source
 - Qualtrics
 - Outcomes from 5/2020 onward
 - Outcomes may be artificially low
- ◆ Unmasked
- ◆ No risk adjustment yet

Reports

- ◆ Summary
- ◆ Acute Appendicitis
- ◆ Acute Gallbladder Disease
- ◆ Small Bowel Obstruction
 - Hernia if present
- ◆ Emergent Exploratory Laparotomy

Total Patients = 6,388

480

14

2582

21

954

7

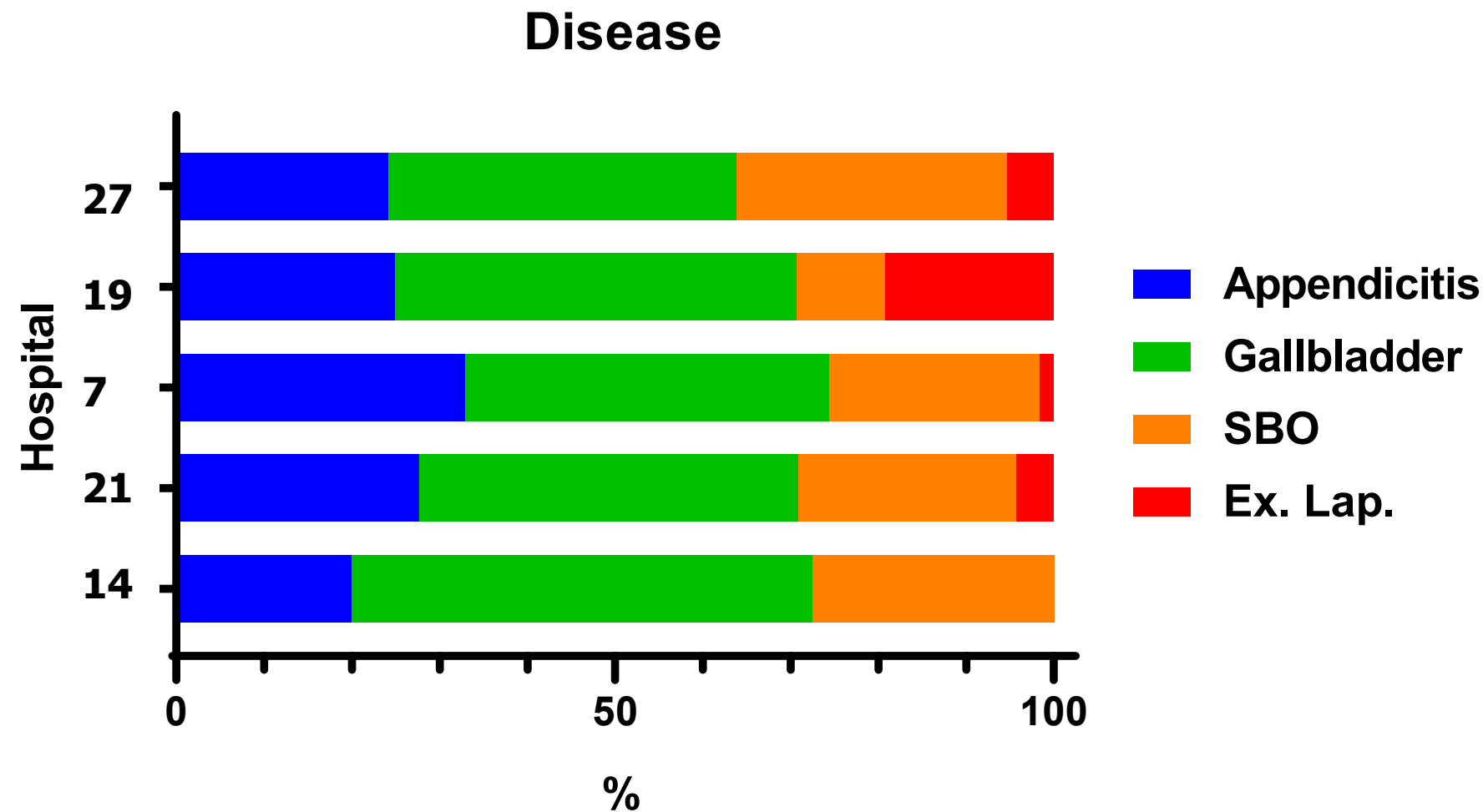
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27

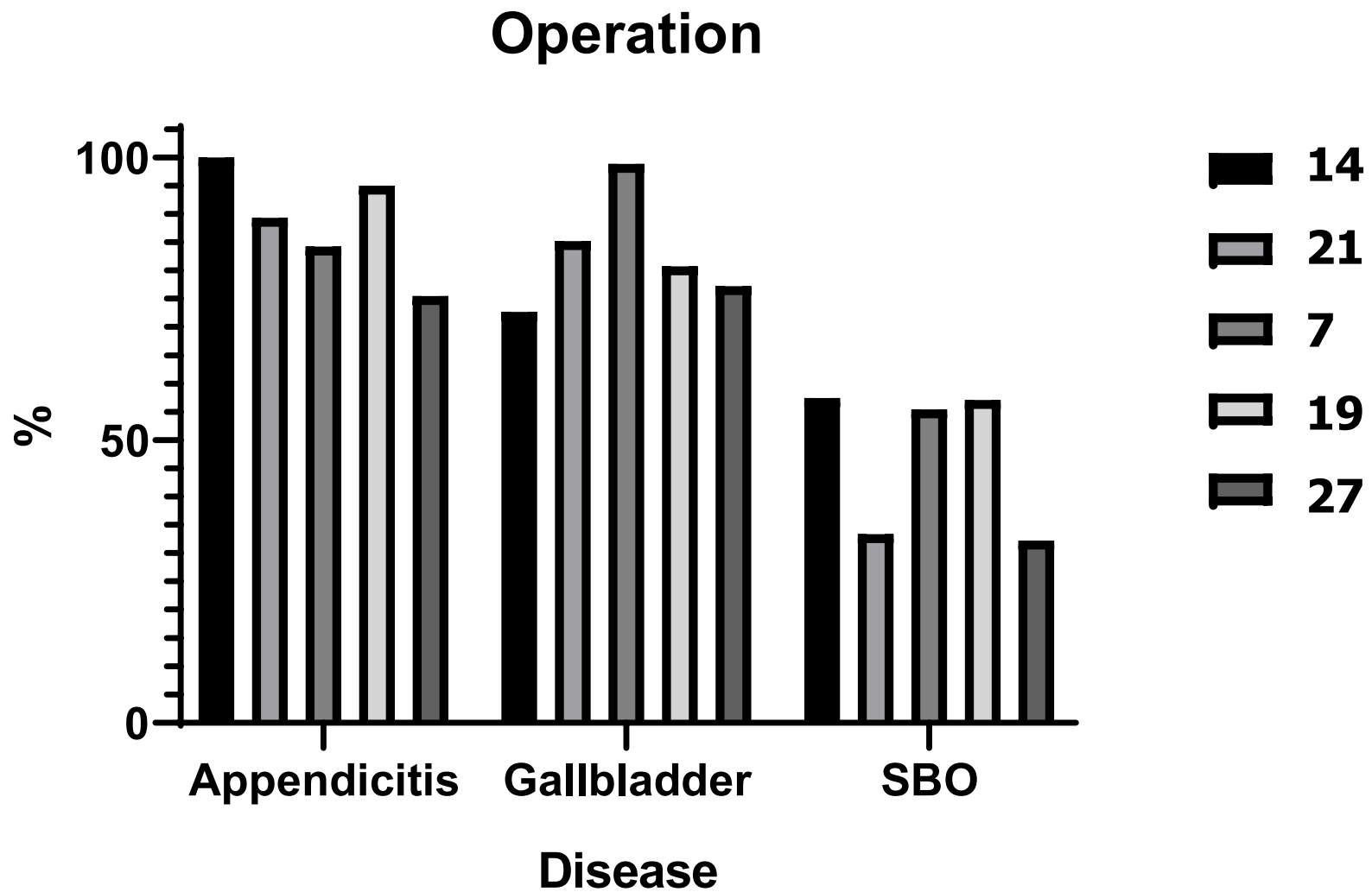
233

19

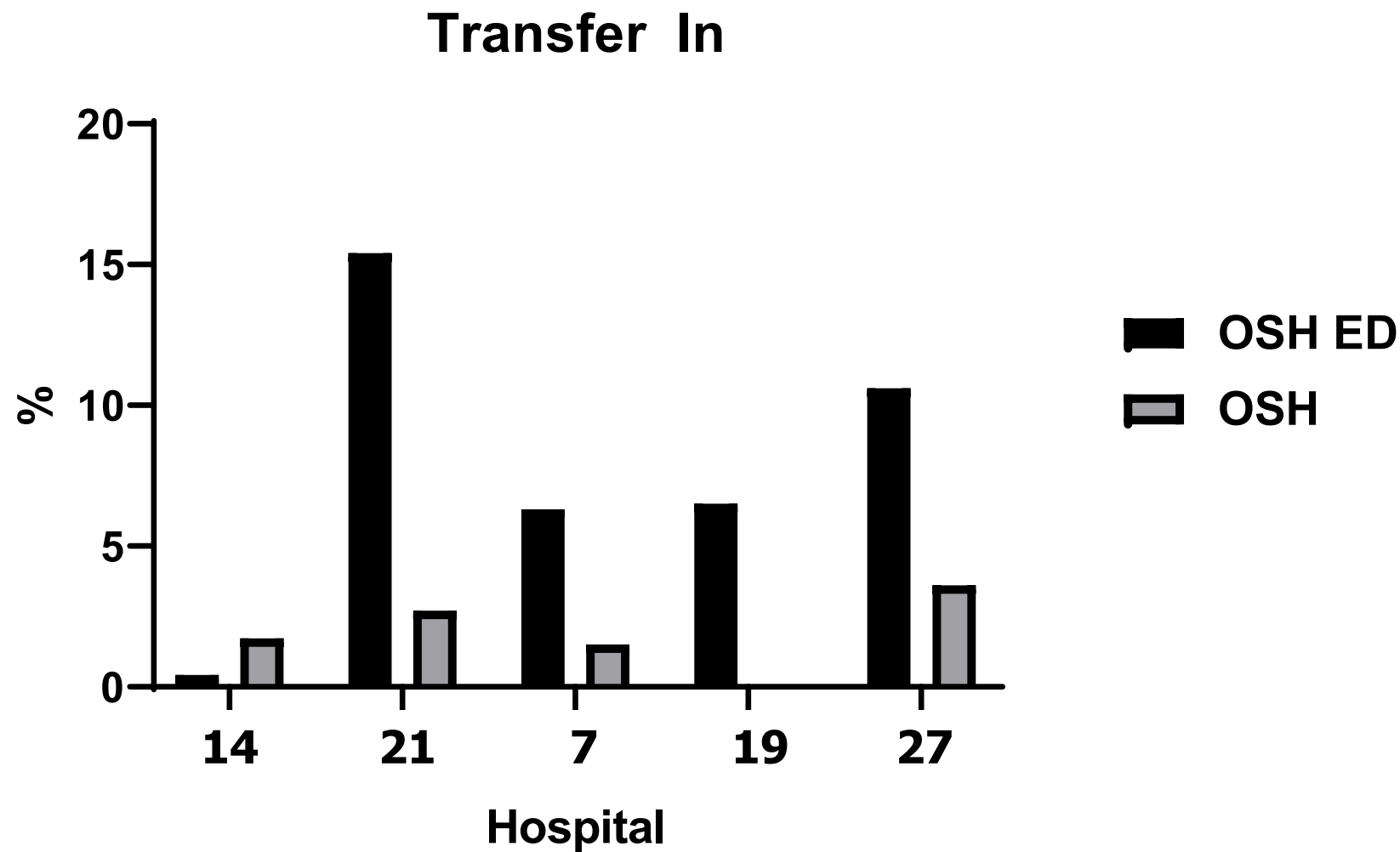
Total Patients = 6,388



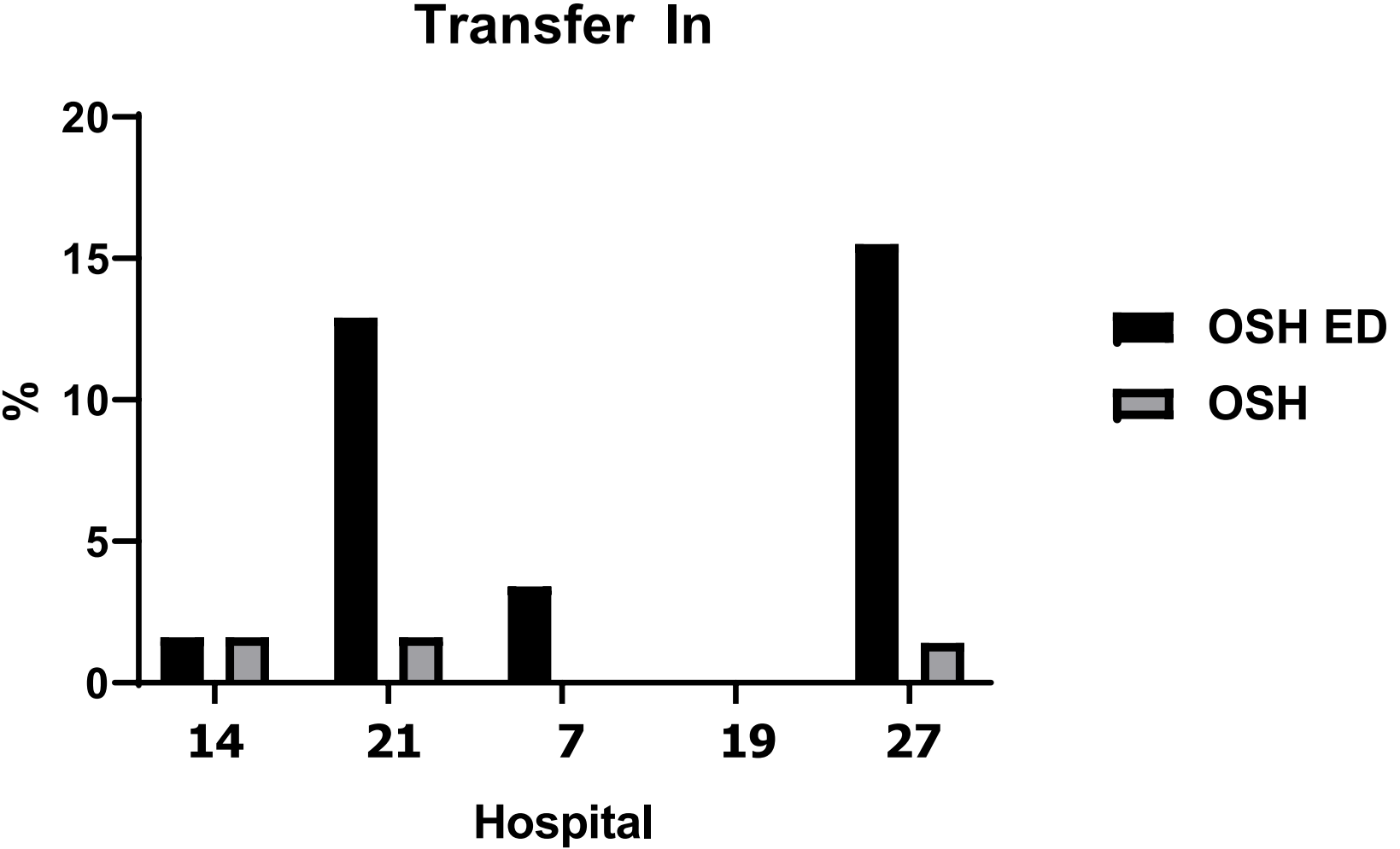
Operative Intervention



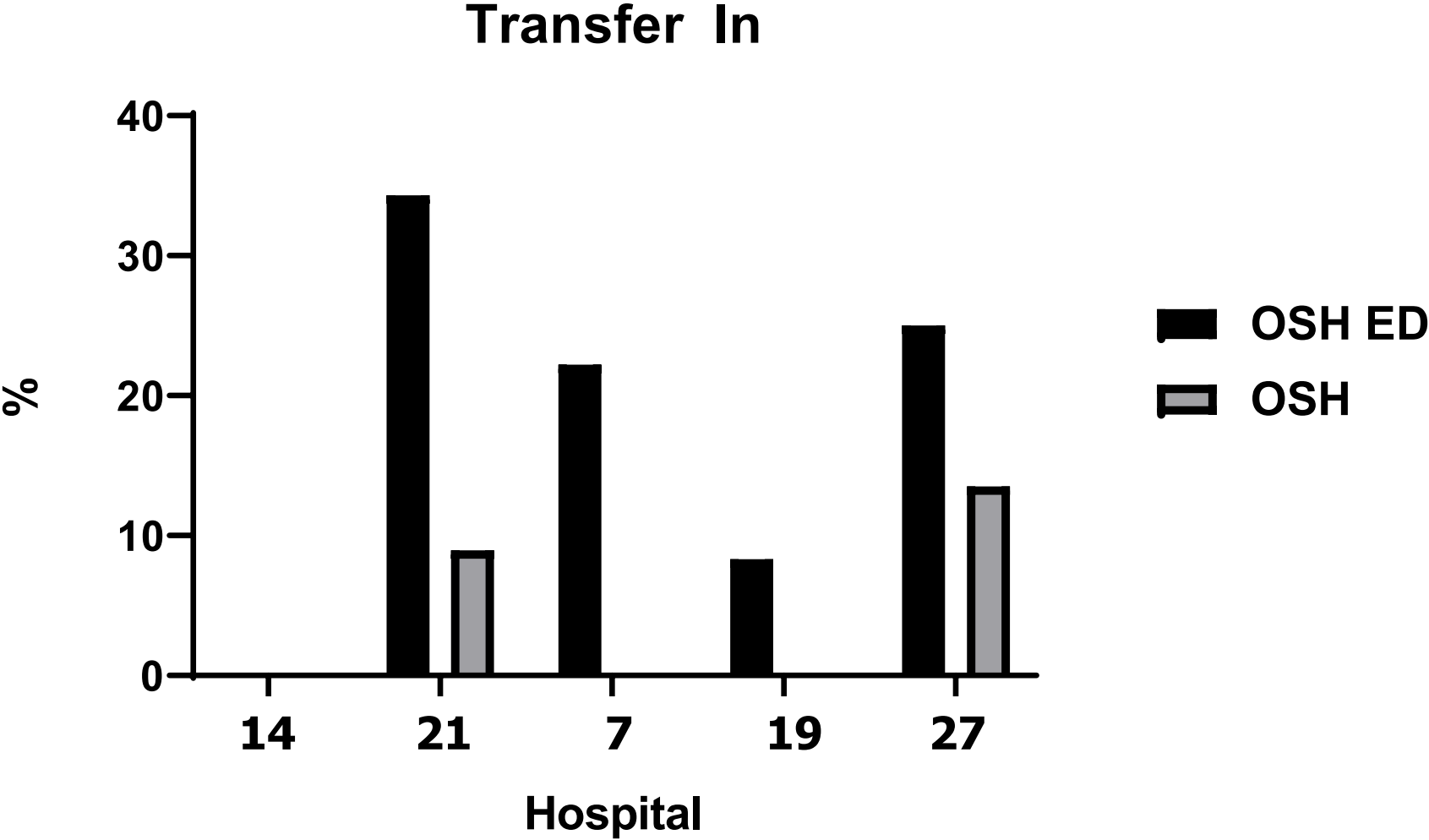
Gallbladder



SBO



Emergent Exploratory Laparotomy

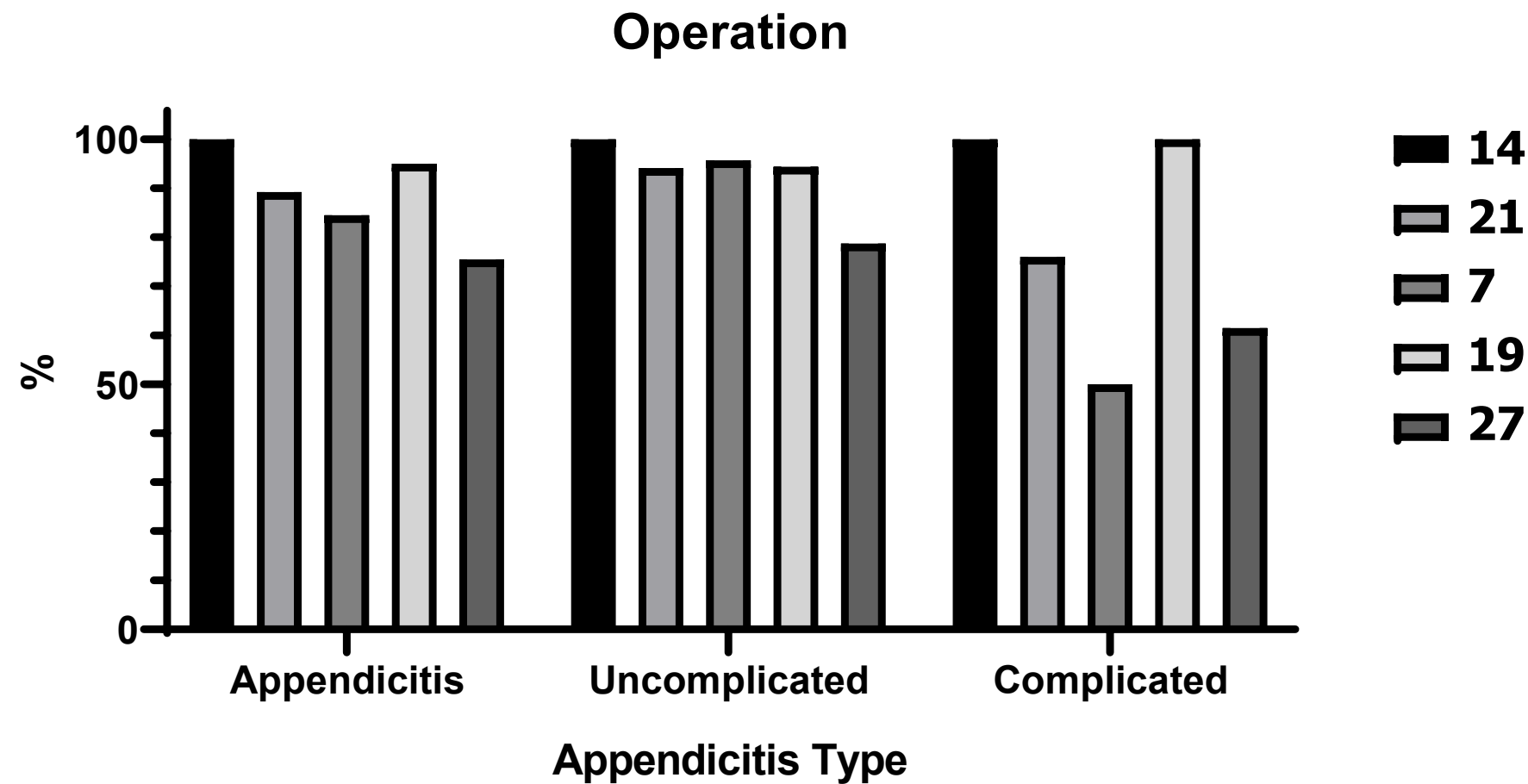


CPT – Operation, 15 most frequent

	N	%
47562, Laparoscopic cholecystectomy	1456	25.6
44970, Laparoscopic appendectomy	1013	17.8
44120, Resection of small intestine	171	3.0
44005, Freeing of bowel adhesion	133	2.3
47563, Lap cholecystectomy w IOC	113	2.0
47600, Open cholecystectomy	102	1.8
44160, Partial colectomy w TI	51	0.9
44143, Partial colectomy w colostomy	49	0.9
44140, Partial colectomy w anast	47	0.8
49561, Repair ventral/inc hernia	44	0.8
43840, Gastrorrhaphy, Graham patch	40	0.7
44950, Open appendectomy	31	0.5
49000, Exploration of abdomen	31	0.5
49587, Repair umbilical hernia	25	0.4
44050, Reduction volvulus, intussusception	24	0.4
All other	2361	41.5

Questions

Acute Appendicitis



Acute Appendicitis

CT Result	Ultrasound Result			Total
	Positive	Negative	Equivocal	
Positive	32 27.83	34 29.57	49 42.61	115 100.00
Negative	1 33.33	1 33.33	1 33.33	3 100.00
Equivocal	0 0.00	4 30.77	9 69.23	13 100.00
Total	33 25.19	39 29.77	59 45.04	131 100.00

USN Sensitivity = $32/(32+83) = 28\%$ USN Specificity = $15/(15+1) = 94\%$

Positive USN may be helpful, negative USN useless

Acute Appendicitis - Medical Management

- ◆ IV Abx Mean 3.1, Median 3 days
- ◆ po Home Abx Mean 9.6, Median 10 days
- ◆ Subsequent appendectomy
 - Emergent 7 patients, 4%
 - Interval 2 patients, 1%

Acute Appendicitis - Times

- ◆ Hospital LOS
 - Overall: Mean 53, Median 27 hrs
 - Operation: Mean 47, Median 24 hrs
 - No operation: Mean 88, Median 65 hrs
- ◆ Time to operation
 - Mean 12.6 hrs
 - Median 8.3 hrs

Emergent Exp. Laparotomy

- ◆ 139 Patients since May
- ◆ Point of Entry
 - Home: 7%
 - ED: 55%
 - OSH ED Transfer: 27%
 - OSH Transfer: 9%

	N	%
Perforation	40	28.8
Colon	24	17.3
Small bowel	1	0.7
Stomach/Duodenum	15	10.8
Obstruction	69	49.6
Hernia	31	22.3
Malignancy	11	7.9
Other (Volvuluous, Intussusception)	27	19.4
Ischemia	10	7.2
Other	19	13.7

Operation

- ◆ Ostomy - 23%
 - Colostomy = 14.4%
 - Ileostomy = 8.6%
- ◆ Associated hernia repair - 21%
- ◆ Anastomosis
 - None: 60%
 - Stapled: 36%
 - Hand Sewn: 4%

Emergency Ex. Lap – Outcomes

	N	%
Any Complication	76	54.7
Incisional SSI	9	6.5
Organ space SSI	16	11.5
Sepsis	23	16.5
Post-discharge ED visit	19	13.7
Readmission within 30 days	11	7.9
Mortality	15	10.8

Care Bundle - ELPQuic

- ◆ Identification
- ◆ Timely consult (Surgeon)
- ◆ Timely antibiotics
- ◆ Prompt diagnosis (CT scan)
- ◆ Goal directed resuscitation
- ◆ Early operation (6 hrs from decision to operate)
- ◆ ICU care

Cholecystostomy Tube (Non-op)

center	IR Procedure					Total	
	Drain	Embolizat	PTC	Cholecyst	Paracente		
21	5 11.36	0 0.00	2 4.55	28 63.64	2 4.55	44 100.00	60
19	1 25.00	0 0.00	0 0.00	2 50.00	1 25.00	4 100.00	
27	2 4.65	1 2.33	1 2.33	36 83.72	1 2.33	43 100.00	63
Total	8 8.79	1 1.10	3 3.30	66 72.53	4 4.40	91 100.00	

Gallbladder – Outcomes

	N	%
Any Complication	71	3.5
Incisional SSI	2	0.1
Organ space SSI	4	0.2
Sepsis	8	0.4
Post-discharge ED visit	29	1.4
Readmission within 30 days	86	4.3
Mortality	16	0.8
Cystic duct stump leak	2	0.1
Retained CBD stone	5	0.2
CBD injury	2 7	0.1

Questions

MTQIP

- ◆ 10 years
- ◆ We have done a lot
- ◆ It is going to get harder
- ◆ Think about
 - Challenges
 - Who are our patients?
 - What are their problems?

Future Directions

- ◆ Patient Report Outcomes
- ◆ Long Term Outcomes
- ◆ Specialty Interaction
 - Orthopedic Surgery
 - General Surgery
 - Anesthesia
 - Emergency Medicine
- ◆ Acute Care Surgery
 - Emergency General Surgery
 - ICU

Discussion

Advisory

Tackle harder issues
VAP, TEG/ROTEM
ICU

Wrap Up

Jill Jakubus, PA-C



Conclusion

- ◆ Thank you for attending
- ◆ Evaluations
 - Fill out and turn in
- ◆ Questions?
- ◆ See you in May