Michigan Acute Care Surgery Collaborative

Ypsilanti, MI

December 8, 2022

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Disclosures

- Mark Hemmila Grants
  - Blue Cross Blue Shield of Michigan
  - Michigan Department of Health and Human Services

No Photos Please

Agenda

- Welcome/Updates
- Mark Hemmila
  - Data/Reports
- Jill Jakubus
  - Trend Graphs
  - Readmissions
- Lunch

Agenda

- Mark Hemmila
  - Opioids
  - CQI initiatives and maximizing value

Future Meetings

- 3 per year
- Wednesday April 26, 2023
- Wednesday September 7, 2023
- Thursday November 30, 2023

- Explore meeting on west side of state in April
- Let us know if you see problems with dates
- In-person if possible
  - Virtual – Weather, COVID

Recruitment

- Potentials
  - Bronson
    - Kalamazoo
    - Battle Creek
  - St. Mary's Saginaw
- Slow going
- Suggestions?

BCBSM 2023 and 2024

- SOW Deliverables
  - 3 Meetings/yr
  - Data validation program
  - Performance Index
    - Participation 2023 - Not being included by BCBSM
    - 2 metrics 2023 - No target date for P4P yet
    - MVC and EGS data > discussion with BCBSM

Meeting Goals

- New data and reporting
- Framework for future projects/initiatives
- Feedback from you

Data and Reports

Mark Hemmila, MD

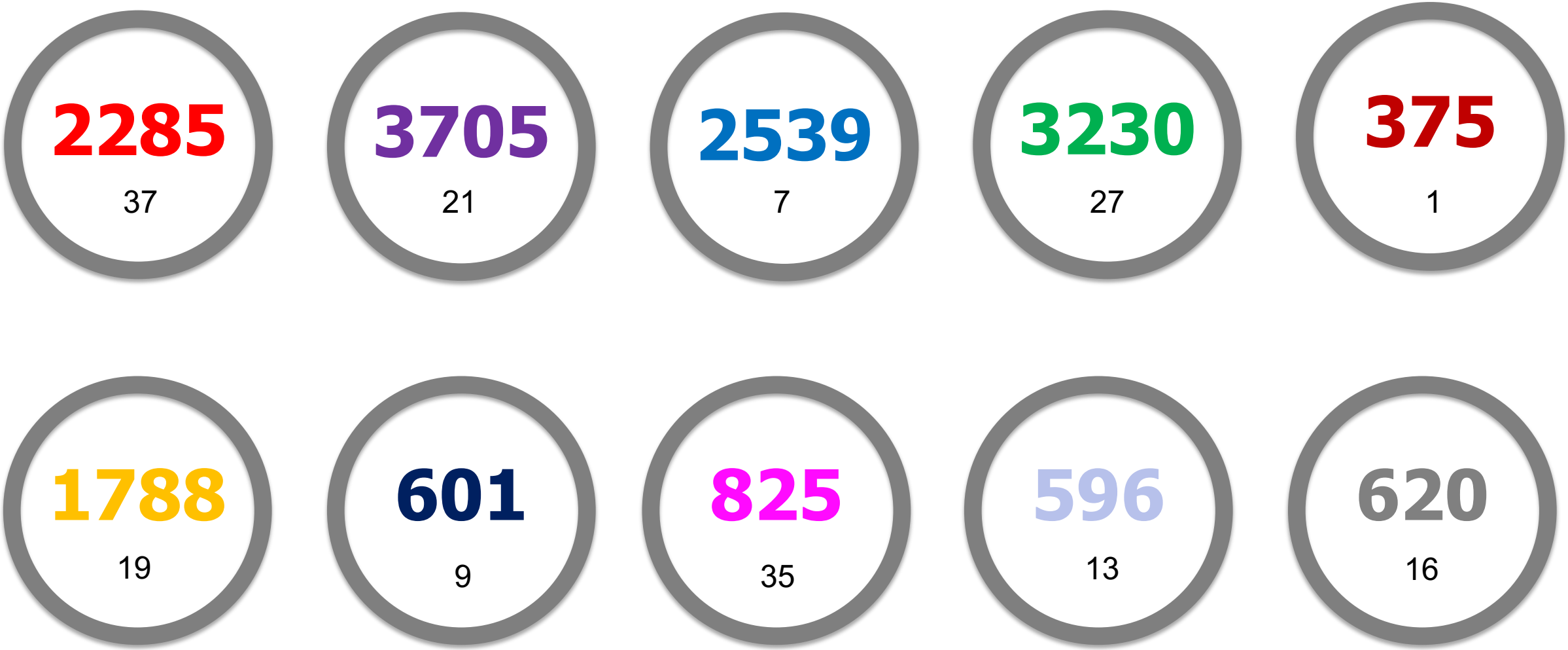
Overview of Data Capture

- Data pull November 4, 2022
- New data
  - Opioids
- New features in reports
  - Sepsis
  - Pregnancy
  - Interventional radiology
  - ERCP
  - Operation type

Reports

- Time frame
  - 9/1/2019 to 11/1/2022
  - 3 years
  - Power
- Unadjusted
- Risk-adjustment
- Tables
- Graphs
  - Risk-adjusted
  - Trends

Total = 16,564 Index, 19,179 w Readmits



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Michigan Acute Care Surgery Report
Summary • 27 • 9/1/2019-11/1/2022

Index Admission		Your Center N = 3230		Aggregate N = 16564	
Variable		**N**	**%**	**N**	**%**
Total Cases	Index Admissions	3230	19.5	16564	100.0
	Total Admissions (with Readmissions)	4126	21.5	19179	100.0
By Disease	Appendicitis	715	22.1	4250	25.7
	Gallbladder	1026	31.8	6846	41.3
	SBO	637	19.7	3103	18.7
	Exploratory Laparotomy	328	10.2	1642	9.9
	Other/None	524	16.2	723	4.4

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	SBO	637	19.7	3103	18.7
	Exploratory Laparotomy	328	10.2	1642	9.9
	Other/None	524	16.2	723	4.4
Operation	Appendicitis				
	Operative	512	71.6	3662	86.2
	Non-operative	203	28.4	588	13.8
	Gallbladder				
	Operative	760	74.1	5750	84.0
	Non-operative	266	25.9	1096	16.0
	SBO				
	Operative	176	27.6	1090	35.1
	Non-operative	461	72.4	2013	64.9
	Other/None				
	Operative	213	40.6	365	50.5
	Non-operative	311	59.4	358	49.5

Index Admission		Your Center N = 3230		Aggregate N = 16564	
Variable		**N**	**%**	**N**	**%**
Diagnosis (ICD-10) 15 most frequent	K35.80, Acute appendicitis, unspe	156	4.8	1248	7.5
	K56.609, Unspecified intestinal obs	248	7.7	1246	7.5
	K80.00, Calc of GB w/ acute chole	158	4.9	1170	7.1
	K35.30, Acute appendi, loc perit	34	1.1	1145	6.9
	K81.0, Acute cholecystitis	320	9.9	906	5.5
	K80.12, Calc of GB w/ acute & chr	16	0.5	712	4.3
	K85.10, Biliary acute pancrea	99	3.1	644	3.9
	K80.10, Chronic cholecystitis	9	0.3	616	3.7
	K35.32, Acute appendi, loc per	104	3.2	569	3.4
	K56.50, Intestinal adhes, with obs	88	2.7	458	2.8
	K35.89, Other acute appendi	334	10.3	434	2.6
	K56.60, Unspec intes obs	75	2.3	400	2.4
	K35.33, Acute appendi, loc perit	47	1.5	397	2.4
	K80.50, Calculus of bile duct w/o cholangitis or cholecyst w/o obst	124	3.8	299	1.8
	K80.20, Calc of GB w/o cholecys	46	1.4	263	1.6
	All other	1371	42.4	6051	36.5

Index Admission		Your Center N = 3230		Aggregate N = 16564	
Variable		**N**	**%**	**N**	**%**
CPT Code 15 most frequent	47562, Laparoscopic cholecystectomy	644	19.9	4680	28.3
	44970, Laparoscopic appendectomy	451	14.0	3400	20.5
	47563, Lap cholecystectomy w IOC	27	0.8	673	4.1
	44120, Resection of small intestine	95	2.9	498	3.0
	44005, Freeing of bowel adhesion	58	1.8	353	2.1
	47600, Open cholecystectomy	91	2.8	256	1.5
	49000, Exploration of abdomen	28	0.9	197	1.2
	44143, Partial colectomy w colostomy	41	1.3	184	1.1
	44140, Partial colectomy w anast	42	1.3	181	1.1
	43840, Gastorrhaphy, Graham patch	23	0.7	162	1.0
	44950, Open appendectomy	37	1.1	131	0.8
	44160, Partial colectomy with TI	27	0.8	121	0.7
	49561, Repair ventral/inc hernia	40	1.2	119	0.7
	49320, Laparoscopy, diagnostic	23	0.7	98	0.6
	49587, Repair umbilical hernia	23	0.7	81	0.5
	All other	336	10.4	1322	8.0

Summary-Risk Factors

- COVID 19
  - Confirmed positive (active or historic)
  - 330 patients (2%)
- Pregnancy
  - 46 patients
  - 89% operative

Summary-Outcome

- COVID 19
  - New diagnosis while admitted as inpatient
  - 71 patients (0.4%)

Sepsis

- Removed from Any Complications
- Separate sub-cohort
  - Comorbid = Sepsis
    - Severe sepsis/septic shock 6.7%
    - Sepsis 13.8%
  - Complication = Sepsis
  - 23.8% (complication or comorbid + sepsis)
  - Outcomes in patients with sepsis

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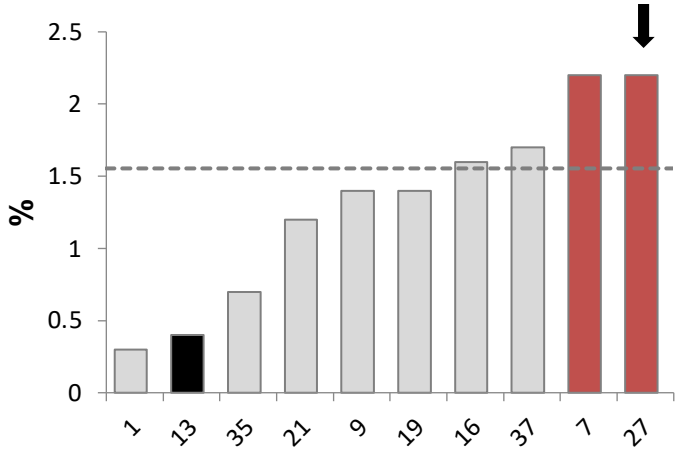
Sepsis Cohort
Risk Adjusted Outcomes
Index Admission with Readmissions

Variable		Your Center N = 770 N	Your Center %	Aggregate N = 3941 N	Aggregate %	P*	Outlier
Any complication	Overall, unadjusted	444	57.7	1875	47.6		
	Overall, risk-adjusted		49.0		47.5	0.460	
	With operation, unadjusted	330	58.6	1529	47.0		
	With operation, risk-adjusted		49.3		47.0	0.306	
	Without operation, unadjusted	114	55.1	346	50.3		
	Without operation, risk-adjusted		52.1		50.3	0.648	
Incisional SSI	With operation, unadjusted	20	3.6	84	2.6		
	With operation, risk-adjusted		2.9		2.6	0.669	
Organ space SSI	With operation, unadjusted	65	11.5	312	9.6		
	With operation, risk-adjusted		9.3		9.6	0.822	
Anastomotic leak	With operation, unadjusted	16	2.8	52	1.6		
	With operation, risk-adjusted		2.4		1.6	0.191	

Summary

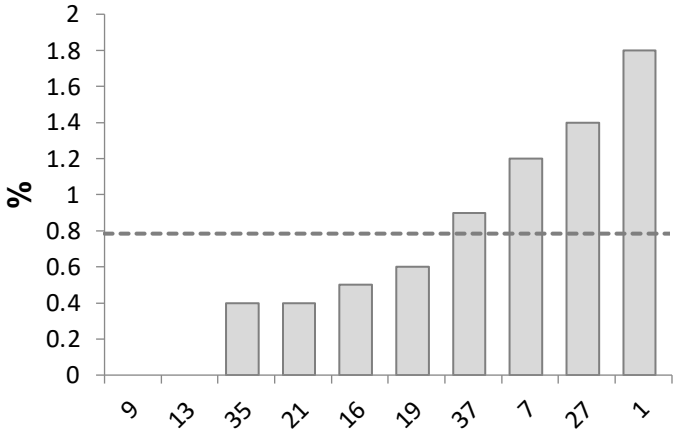
Incisional SSI
Operation



53 patients, 2.4%

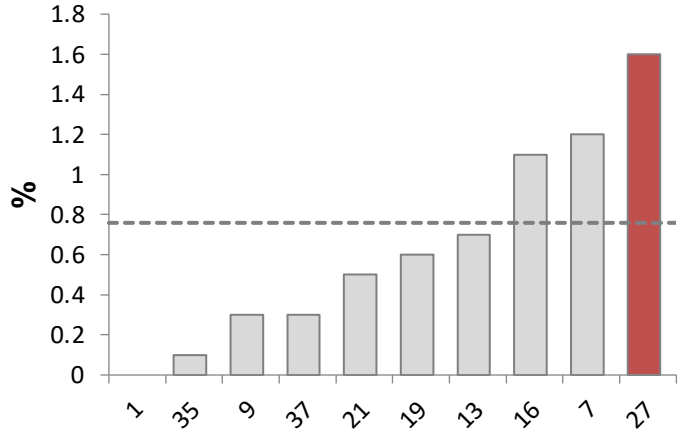
Appendicitis

Incisional SSI
Operation



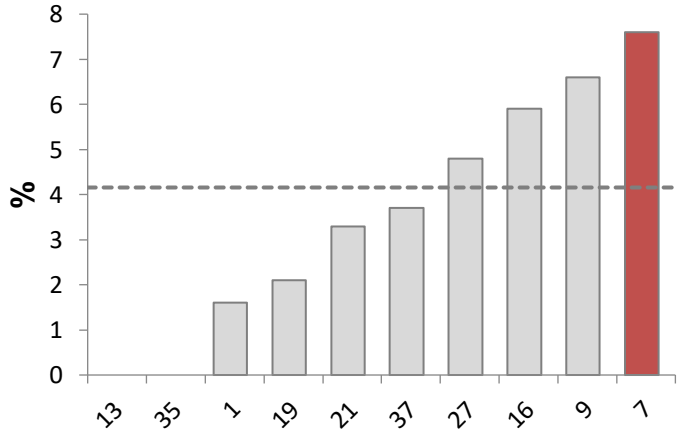
Gallbladder

Incisional SSI
Operation



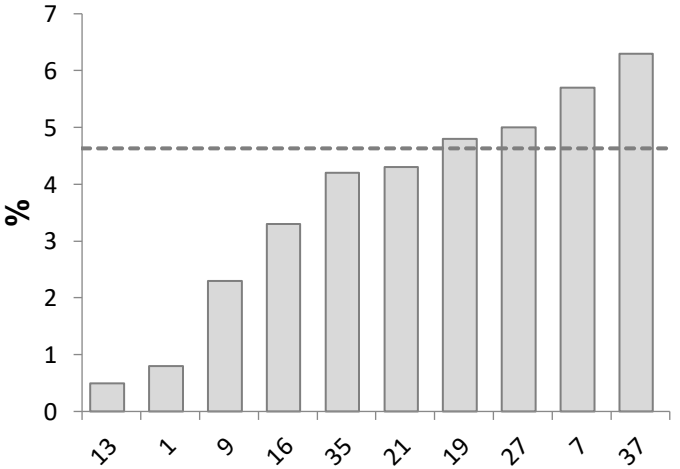
SBO

Incisional SSI
Operation



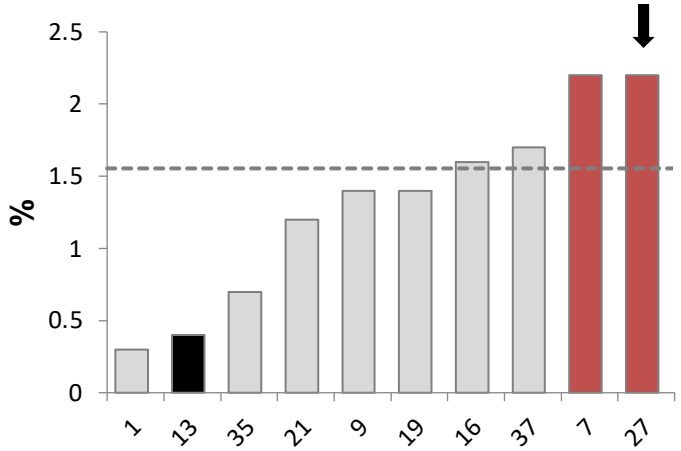
Ex. Laparotomy

Incisional SSI



Summary

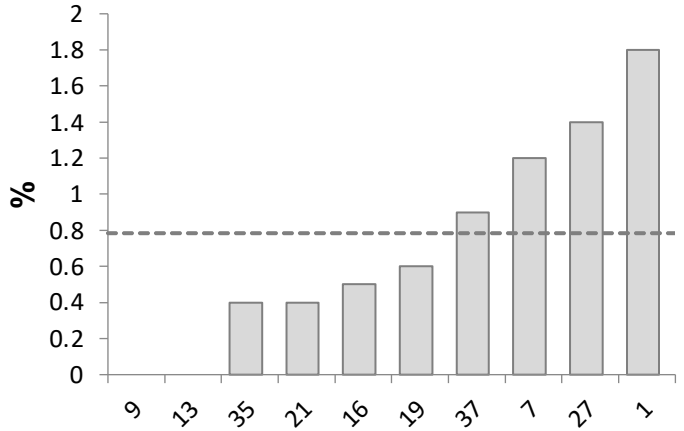
Incisional SSI
Operation



25% of MACS, 27 19-20% of cases

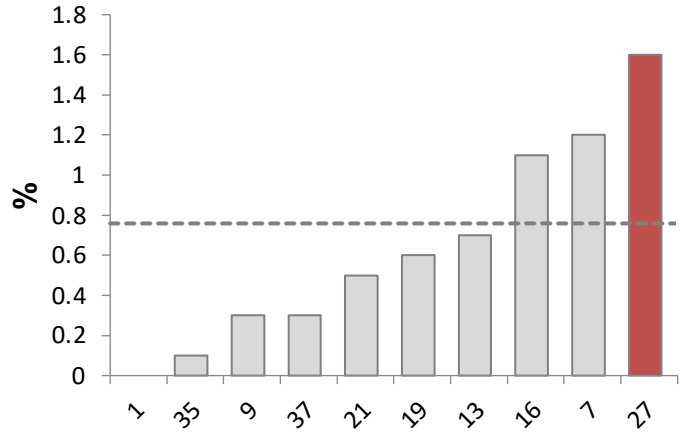
Appendicitis

Incisional SSI
Operation



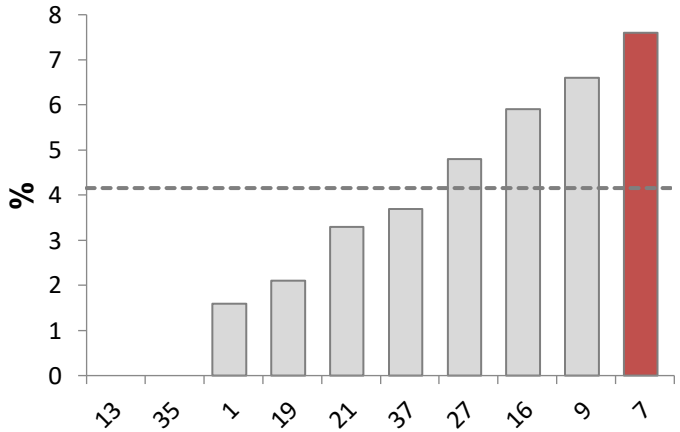
Gallbladder

Incisional SSI
Operation



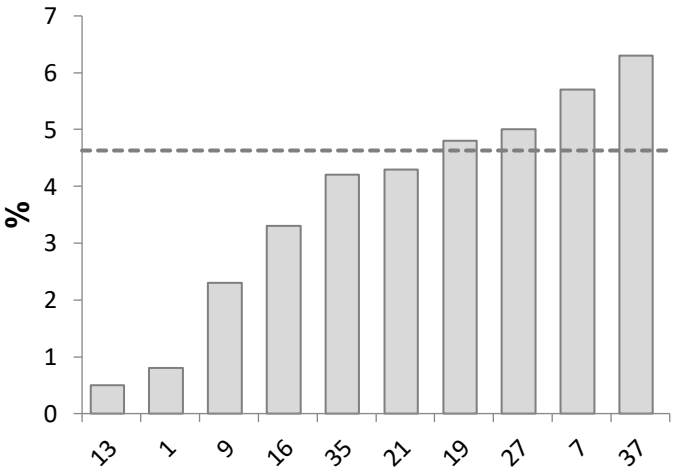
SBO

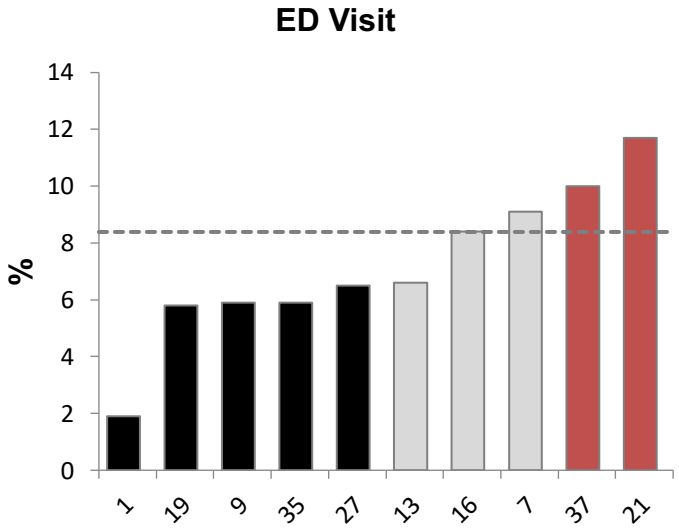
Incisional SSI
Operation



Ex. Laparotomy

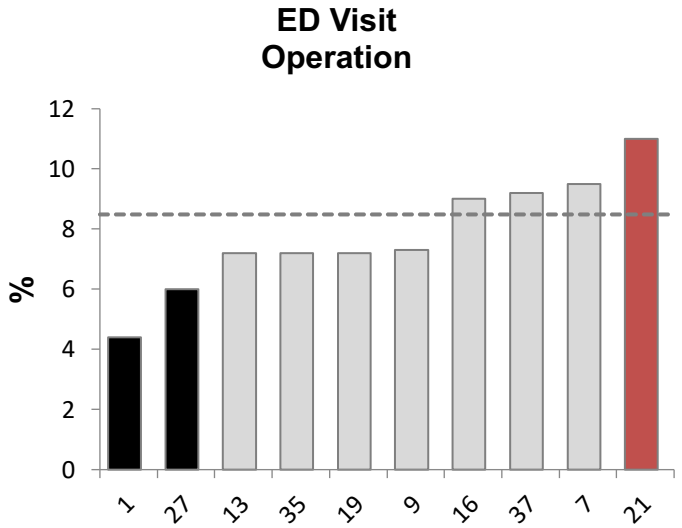
Incisional SSI

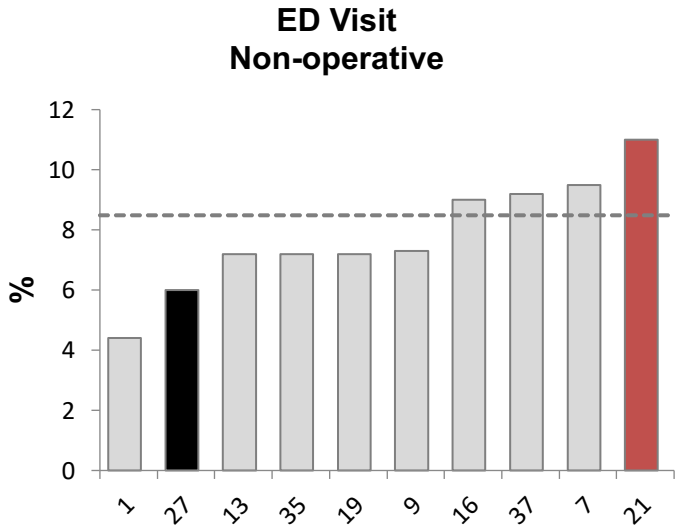


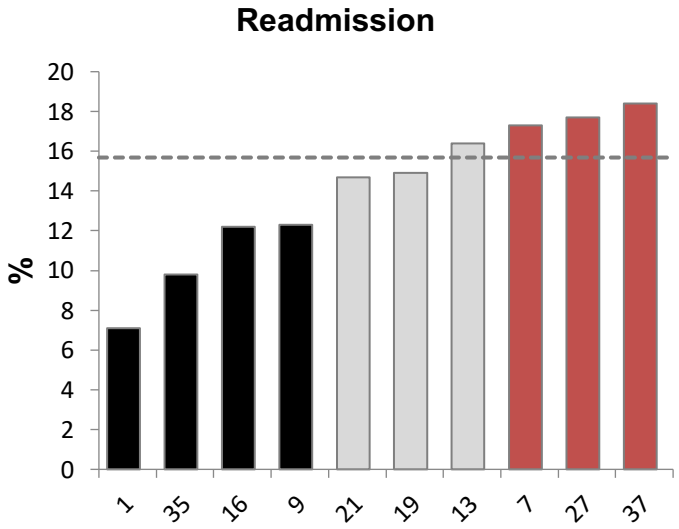


8.4% x 16,564 = 1,391 patients

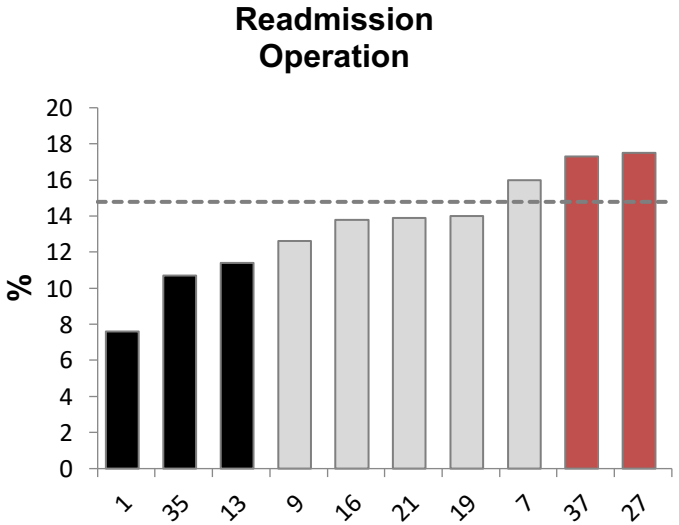
$1,273

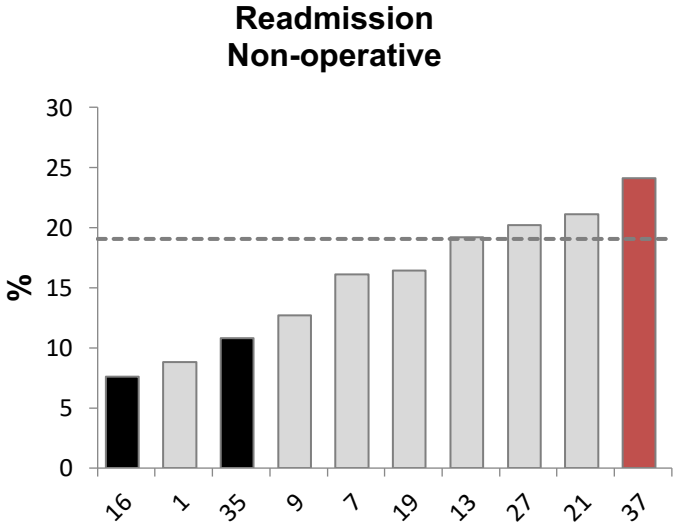






15.7% x 16,564 = 2,798 patients





Questions

Questions

Comments on sepsis cohort outcome reporting?

Is there an area in which you would like a list of your patients for drill down? Request mechanism.

Acute Appendicitis - New

Index Admission		Your Center N = 718		Aggregate N = 4265	
Variable		**N**	**%**	**N**	**%**
IR Procedure (Index)	Yes	26	3.6	199	4.7
	Drain	18	69.2	161	80.9
	Aspiration	8	30.8	35	17.6
	Angiogram	0	0.0	1	0.5
	Embolization		0.0		0.0
	PTC tube		0.0		0.0
	Cholecystostomy tube - insertion	0	0.0	1	0.5
	TIPS		0.0		0.0
	Paracentesis	0	0.0	1	0.5
	Thoracentesis		0.0		0.0
	Biopsy	1	3.8	1	0.5
	IVC filter		0.0		0.0
	Cholecystostomy tube - exchange		0.0		0.0
	Cholecystostomy tube - removal		0.0		0.0
	Gallbladder ablation		0.0		0.0
	Gallstone extraction		0.0		0.0

Acute Appendicitis - New

Index Admission		Your Center N = 718		Aggregate N = 4265	
Variable		**N**	**%**	**N**	**%**
IR Procedure (Index w/operation)	Yes	3	0.4	51	1.2
	Drain	2	66.7	36	70.6
	Aspiration	0	0.0	11	21.6
	Angiogram	0	0.0	1	2.0
	Embolization		0.0		0.0
	PTC tube		0.0		0.0
	Cholecystostomy tube - insertion	0	0.0	1	2.0
	TIPS		0.0		0.0
	Paracentesis	0	0.0	1	2.0
	Thoracentesis		0.0		0.0
	Biopsy	1	33.3	1	2.0
	IVC filter		0.0		0.0
	Cholecystostomy tube - exchange		0.0		0.0
	Cholecystostomy tube - removal		0.0		0.0
	Gallbladder ablation		0.0		0.0
	Gallstone extraction		0.0		0.0

Acute Appendicitis - New

Index Admission with Readmissions		Your Center N = 718		Aggregate N = 4265	
Variable		**N**	**%**	**N**	**%**
IR Procedure (Readmits)	Yes	8	7.3	89	20.4
	Drain	6	75.0	70	78.7
	Aspiration	2	25.0	15	16.9
	Angiogram		0.0		0.0
	Embolization	0	0.0	1	1.1
	PTC tube		0.0		0.0
	Cholecystostomy tube - insertion		0.0		0.0
	TIPS		0.0		0.0
	Paracentesis		0.0		0.0
	Thoracentesis	0	0.0	2	2.2
	Biopsy		0.0		0.0
	IVC filter		0.0		0.0
	Cholecystostomy tube - exchange		0.0		0.0
	Cholecystostomy tube - removal		0.0		0.0
	Gallbladder ablation		0.0		0.0
	Gallstone extraction		0.0		0.0

4701- 4265=436 89/436=20.4%

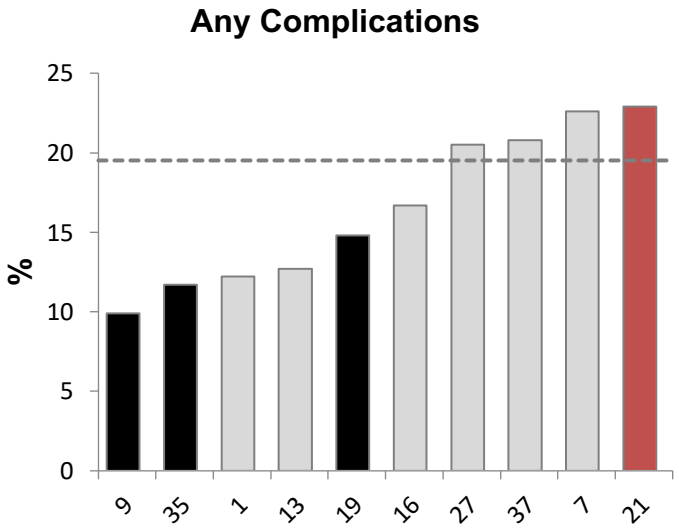
Acute Appendicitis - New

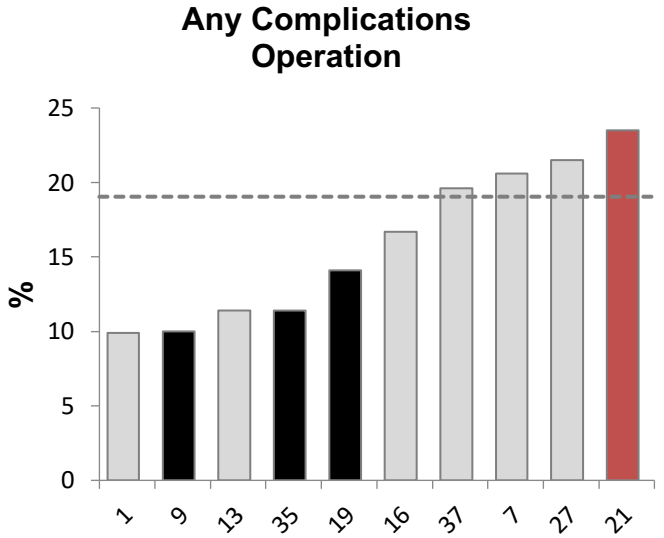
Index Admission with Readmissions		Your Center N = 718		Aggregate N = 4265	
Variable		**N**	**%**	**N**	**%**
IR Procedure (Perforated, index & readmit)	Yes	28	3.4	206	4.4
	Drain	19	67.9	164	79.6
	Aspiration	8	28.6	36	17.5
	Angiogram	0	0.0	1	0.5
	Embolization		0.0		0.0
	PTC tube		0.0		0.0
	Cholecystostomy tube - insertion		0.0		0.0
	TIPS		0.0		0.0
	Paracentesis	0	0.0	1	0.5
	Thoracentesis		0.0		0.0
	Biopsy	1	3.6	1	0.5
	IVC filter		0.0		0.0
	Cholecystostomy tube - exchange		0.0		0.0
	Cholecystostomy tube - removal		0.0		0.0
	Gallbladder ablation		0.0		0.0
	Gallstone extraction		0.0		0.0

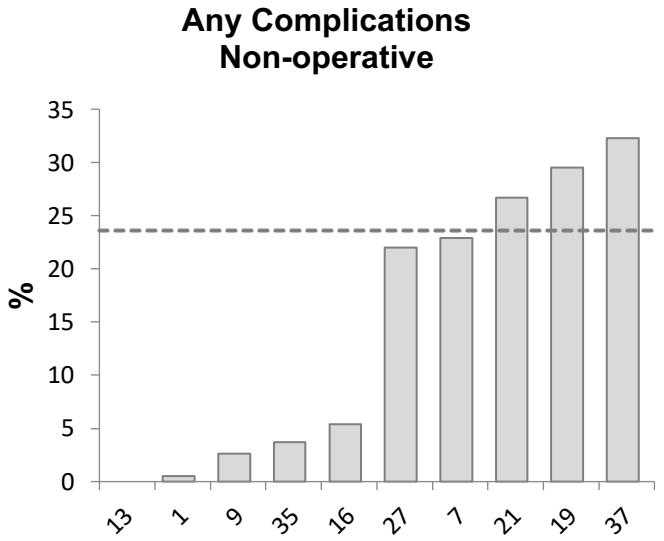
Acute Appendicitis - New

Index Admission with Readmissions		Your Center N = 718		Aggregate N = 4265	
Variable		**N**	**%**	**N**	**%**
Pregnancy	Yes	8	0.0	17	0.0
	Operative	6	75.0	15	88.2
	Non-operative	2	25.0	2	11.8
Medical Management	Medical management	205	28.6	594	13.9
	Medical manage fail with operation (index)	5	2.4	22	3.7

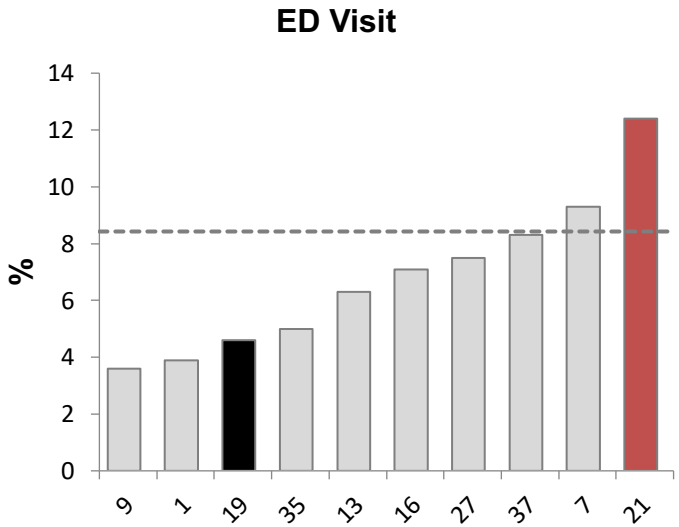
Risk-Adjusted Outcomes

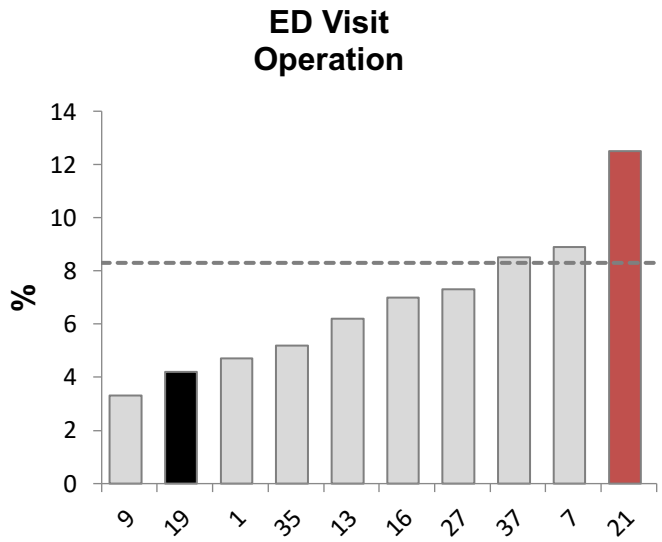


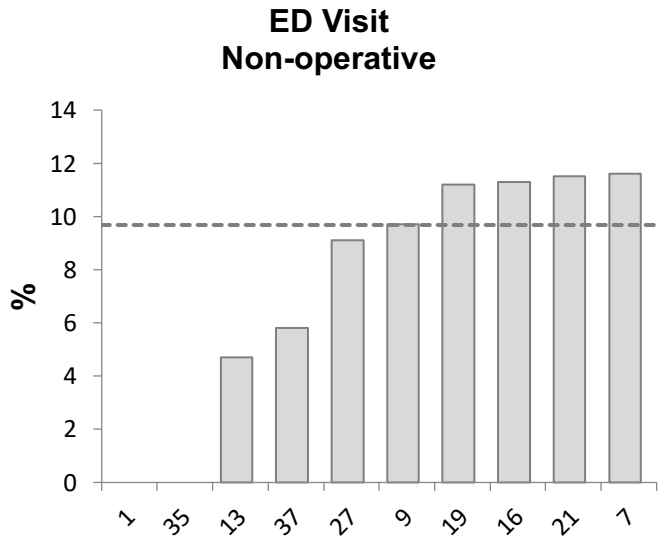




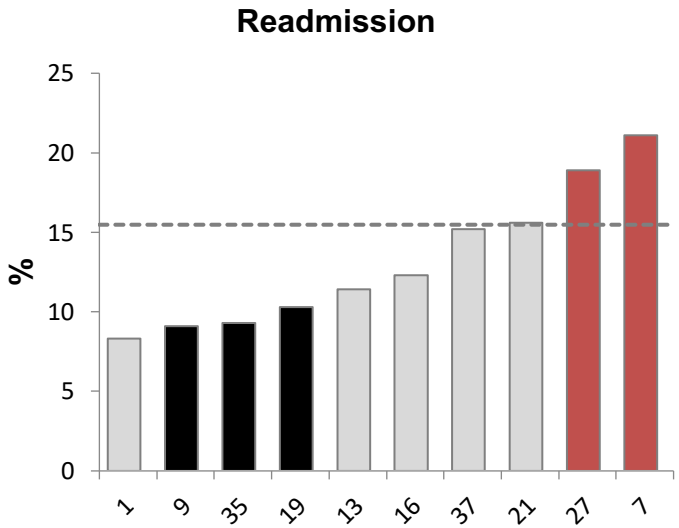
Risk-Adjusted Outcomes

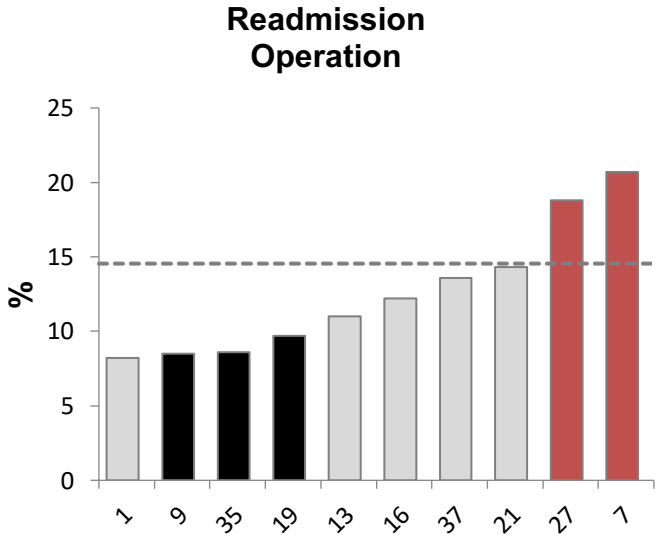


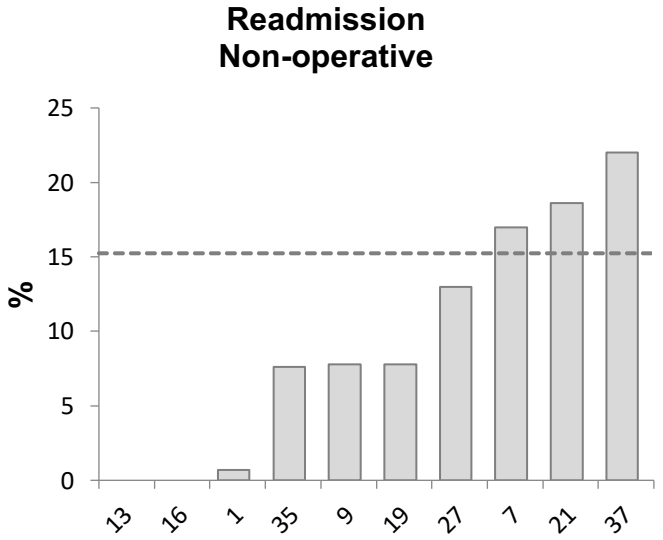




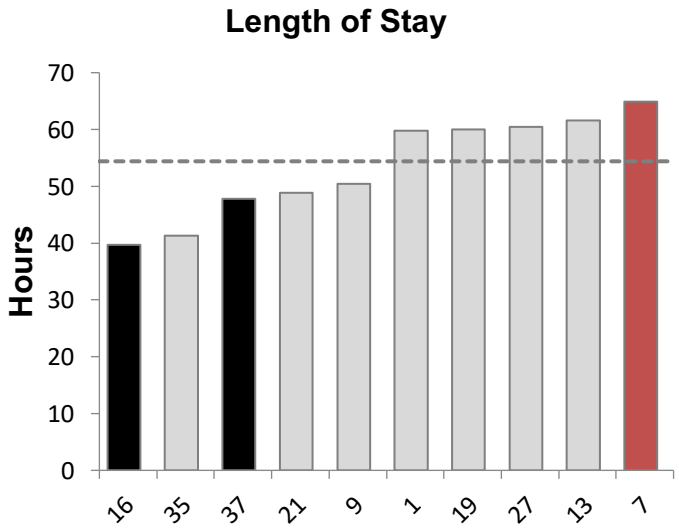
Risk-Adjusted Outcomes

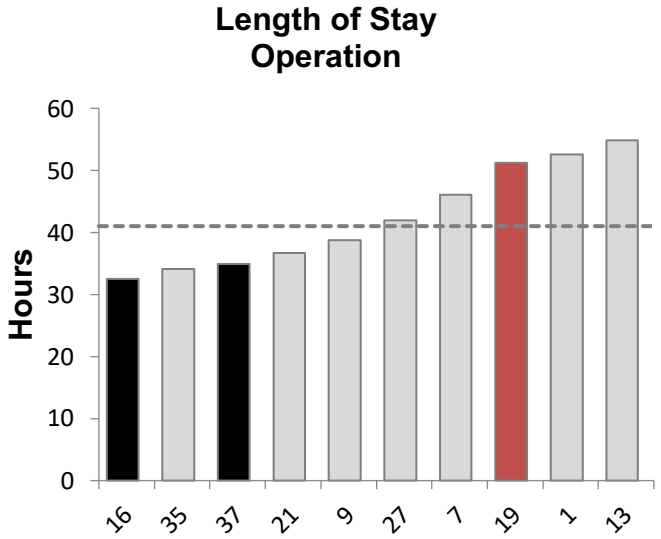


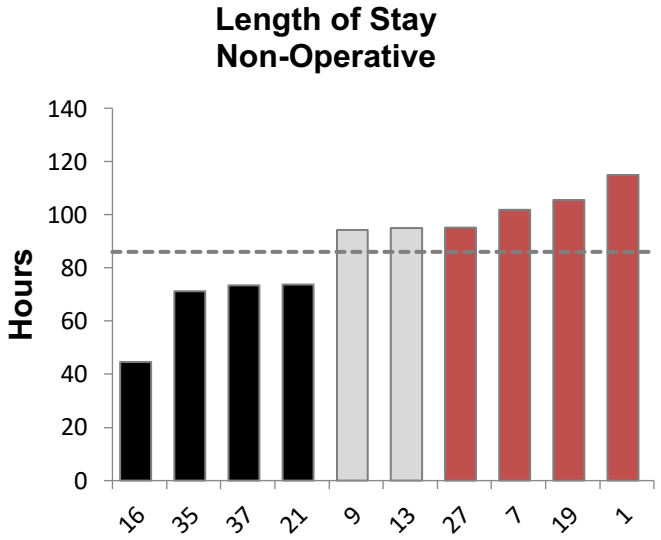




Risk-Adjusted Outcomes







Acute Appendicitis – MVC Data

- MACS acute appendicitis patients
- 7/1/2019 to 5/31/21 (leave 1 year for PD, +3 months for claim to be submitted)
- Index
  - 1st or 2nd ICD10 matches a MACS Acute Appendicitis code
- Post-discharge
  - Not index
  - Up to 1 year after index
  - 1st or 2nd ICD10 matches a MACS Acute Appendicitis code

Acute Appendicitis – MVC Data

- Index
  - 290 patients w/match
- Post-discharge
  - 87 patients w/match
- 85% operation
- 13% readmit
- Lots of missing data

Acute Appendicitis – QI Project

- Uncomplicated
  - 114 patients non-op
  - LOS = 3 days
  - 342 bed days
- CODA data
- Uncomplicated
  - Fecalith > OR
  - Non-op
    - IV then oral abx, antibiotic choice
    - Discharge from ED
    - Follow-up program
    - Interval appendectomy > No

Questions

Questions

Combine ED visit and Readmit ? Z-score trend ?

- Readmission = 11% (482 pts)
- Post-discharge ED visit = 8% (360 pts)
- Qualitative analysis

Guidance on uncomplicated ?

Antibiotic choice IV, po

Fecalith > OR

No admit

Who gets an interval appendectomy ?

Gallbladder - New

Index Admission		Your Center N = 1055		Aggregate N = 6901	
Variable		**N**	**%**	**N**	**%**
Cholecystectomy Technique (All diagnosis)	Total excision	518	93.0	4632	96.7
	Sub-total w/Fenestration	16	2.9	69	1.4
	Sub-total w/Reconstruction	19	3.4	34	0.7
	Sub-total Other/Not Specified	4	0.7	55	1.1
Cholecystectomy Technique (Acute cholecystitis)	Total excision	361	91.2	3743	96.4
	Sub-total w/Fenestration	16	4.0	65	1.7
	Sub-total w/Reconstruction	16	4.0	29	0.7
	Sub-total Other/Not Specified	3	0.8	45	1.2

Gallbladder - New

Index Admission		Your Center N = 1055		Aggregate N = 6901	
Variable		**N**	**%**	**N**	**%**
Gallbladder ERCP (Index, Diagnosis)	Yes	278	26.4	1428	20.7
	Common bile duct stent	11	4.0	69	4.8
	Cystic duct stent	5	1.8	5	0.4
	Pancreatic duct stent	8	2.9	10	0.7
	Other stent	6	2.2	18	1.3
	Removal CBD stones/sludge	54	19.4	323	22.6
	Sphincterotomy	49	17.6	346	24.2
Gallbladder ERCP (Index, Secondary)	Yes	67	8.6	388	6.7
	Common bile duct stent	6	9.0	28	7.2
	Cystic duct stent	0	0.0	3	0.8
	Pancreatic duct stent	1	1.5	1	0.3
	Other stent	0	0.0	6	1.5
	Removal CBD stones/sludge	13	19.4	79	20.4
	Sphincterotomy	12	17.9	88	22.7

Gallbladder - New

Index Admission		Your Center N = 1055		Aggregate N = 6901	
Variable		**N**	**%**	**N**	**%**
IR Procedure (Index)	Yes	131	12.4	515	7.5
	Drain	8	6.1	65	12.6
	Aspiration	3	2.3	8	1.6
	Angiogram	3	2.3	8	1.6
	Embolization	0	0.0	6	1.2
	PTC tube	8	6.1	21	4.1
	Cholecystostomy tube - insertion	101	77.1	367	71.3
	TIPS		0.0		0.0
	Paracentesis	3	2.3	13	2.5
	Thoracentesis	2	1.5	19	3.7
	Biopsy	5	3.8	18	3.5
	IVC filter	0	0.0	1	0.2
	Cholecystostomy tube - exchange	2	1.5	14	2.7
	Cholecystostomy tube - removal	1	0.8	1	0.2
	Gallbladder ablation		0.0		0.0
	Gallstone extraction		0.0		0.0

Gallbladder - New

Index Admission		Your Center N = 1055		Aggregate N = 6901	
Variable		**N**	**%**	**N**	**%**
IR Procedure (Index, w/Operation)	Yes	16	2.0	80	1.4
	Drain	2	12.5	37	46.3
	Aspiration	2	12.5	6	7.5
	Angiogram	3	18.8	6	7.5
	Embolization	0	0.0	4	5.0
	PTC tube	3	18.8	6	7.5
	Cholecystostomy tube - insertion	3	18.8	6	7.5
	TIPS		0.0		0.0
	Paracentesis	1	6.3	2	2.5
	Thoracentesis	1	6.3	10	12.5
	Biopsy	1	6.3	4	5.0
	IVC filter	0	0.0	1	1.3
	Cholecystostomy tube - exchange	0	0.0	1	1.3
	Cholecystostomy tube - removal	1	6.3	1	1.3
	Gallbladder ablation		0.0		0.0
	Gallstone extraction		0.0		0.0

Gallbladder - New

Index Admission		Your Center N = 1055		Aggregate N = 6901	
Variable		**N**	**%**	**N**	**%**
IR Procedure (Index, Non-operative cases)	IR Procedure, No OR	115	43.9	435	40.4
	Drain	6	5.2	28	6.4
	Aspiration	1	0.9	2	0.5
	Angiogram	0	0.0	2	0.5
	Embolization	0	0.0	2	0.5
	PTC tube	5	4.3	15	3.4
	Cholecystostomy tube - insertion	98	85.2	361	83.0
	TIPS		0.0		0.0
	Paracentesis	2	1.7	11	2.5
	Thoracentesis	1	0.9	9	2.1
	Biopsy	4	3.5	14	3.2
	IVC filter		0.0		0.0
	Cholecystostomy tube - exchange	2	1.7	13	3.0
	Cholecystostomy tube - removal		0.0		0.0
	Gallbladder ablation		0.0		0.0
	Gallstone extraction		0.0		0.0

Gallbladder - New

Index Admission		Your Center N = 1055		Aggregate N = 6901	
Variable		**N**	**%**	**N**	**%**
Lap vs Open	Open	27	3.5	91	1.6
	Laparoscopic	670	86.3	5258	91.0
	Laparoscopic to Open	78	10.1	242	4.2
	Robotic	0	0.0	157	2.7
Pregnancy	Yes	3	0.3	29	0.4
	Operative	1	33.3	26	89.7
	Non-operative	2	66.7	3	10.3

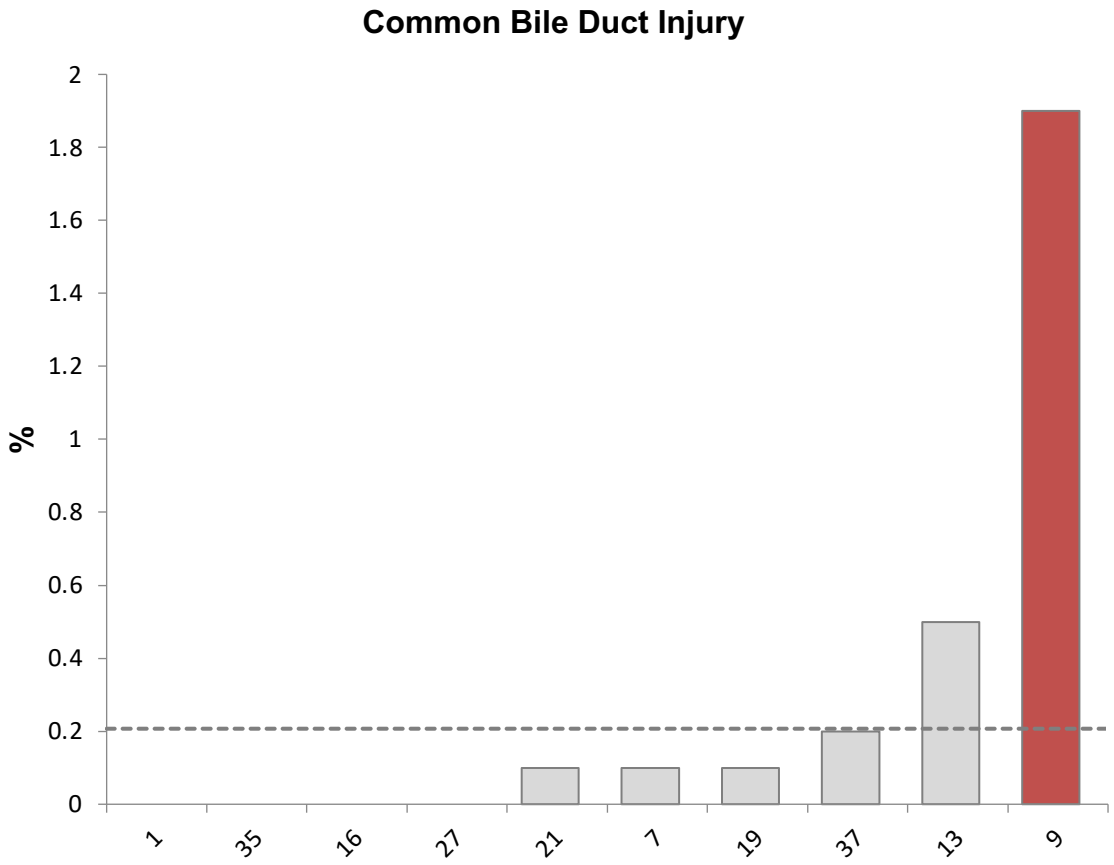
Gallbladder - New

Index Admission		Your Center N = 1055		Aggregate N = 6901	
Variable		**N**	**%**	**N**	**%**
ERCP Diagnosis (Readmit)	Yes	28	16.4	81	12.1
	Common bile duct stent	3	10.7	9	11.1
	Cystic duct stent	1	3.6	1	1.2
	Pancreatic duct stent		0.0		0.0
	Other stent	0	0.0	1	1.2
	Removal CBD stones/sludge	6	21.4	16	19.8
	Sphincterotomy	3	10.7	15	18.5
ECRP Secondary (Readmit)	Yes	10	5.8	31	4.6
	Common bile duct stent	0	0.0	3	9.7
	Cystic duct stent		0.0		0.0
	Pancreatic duct stent		0.0		0.0
	Other stent	0	0.0	3	9.7
	Removal CBD stones/sludge	1	10.0	7	22.6
	Sphincterotomy	0	0.0	6	19.4

Gallbladder - Fenestrated, Cystic duct stump leak

```
. tab Q269 cystic_duct_leak
```

Cholecystectomy Technique	cystic_duct_leak 0	1	Total
Total Excision	4,789	34	4,823
Sub-Total Excision w/Fenestration	64	11	75
Sub-Total Excision w/Reconstitution	35	1	36
Sub-Total Excision Other/Not Specified	51	7	58
Total	4,939	53	4,992



12 patients out of 6,008 operations = 0.20%

0.25 to 0.2% Flum, JAMA Surgery

Questions

Questions

Criteria for cholecystostomy tube placement?

- Appropriateness
- Secondary plan?

Combine ED visit and Readmit ? Z-score trend ?

What to focus on ? Studies, lots but not really in our control.

Trend Graphs
Readmissions

Jill Jakubus, PA-C

MACS Trend Graphs
Feedback Session

Jill Jakubus, PA-C

M·ACS

Trend Graphs

- Available now in Dropbox
- Appendicitis cohort
- Risk-adjusted
- 6 periods each 6 months in length
- Plan to expand over time

Outcomes

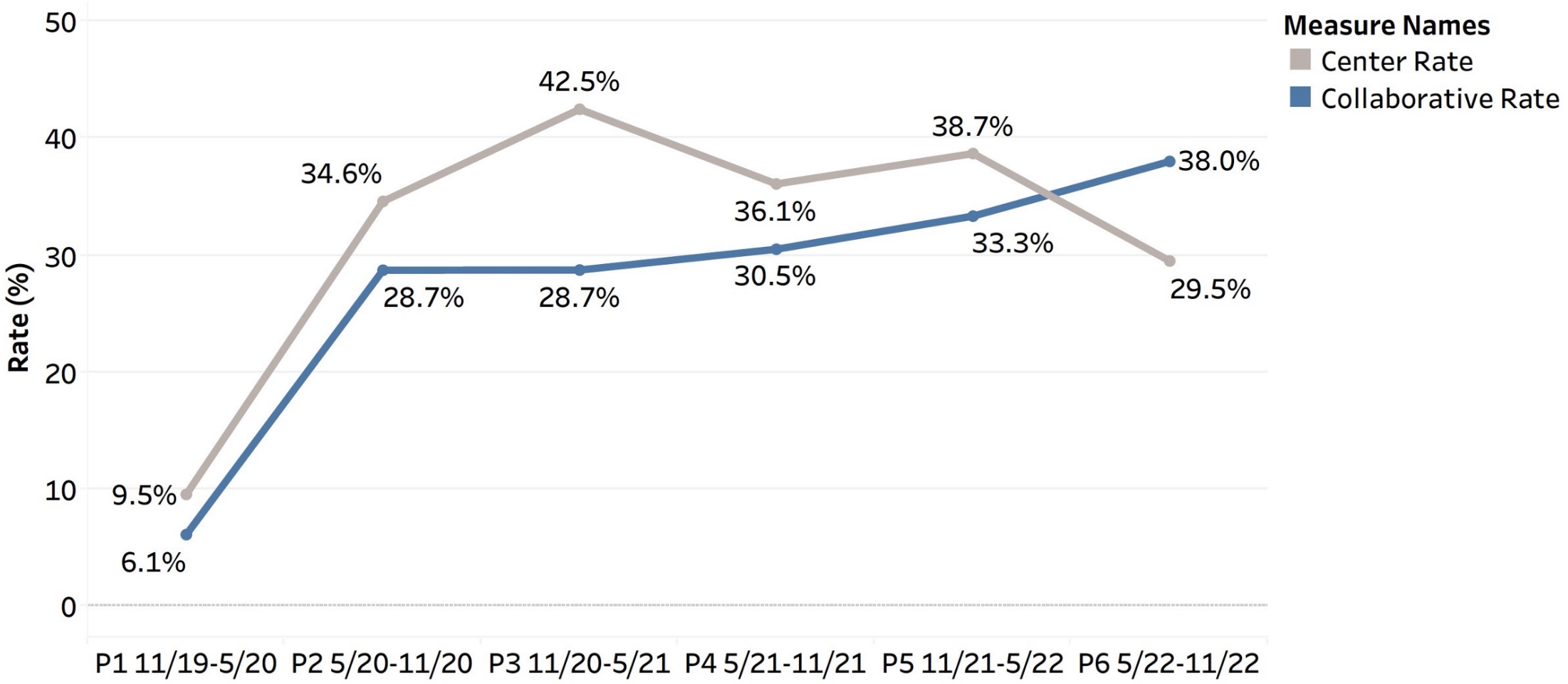
- Any complication
- ED visit
- Organ space SSI
- Readmission

Encounters

- Up to 30 days post discharge
- All visits

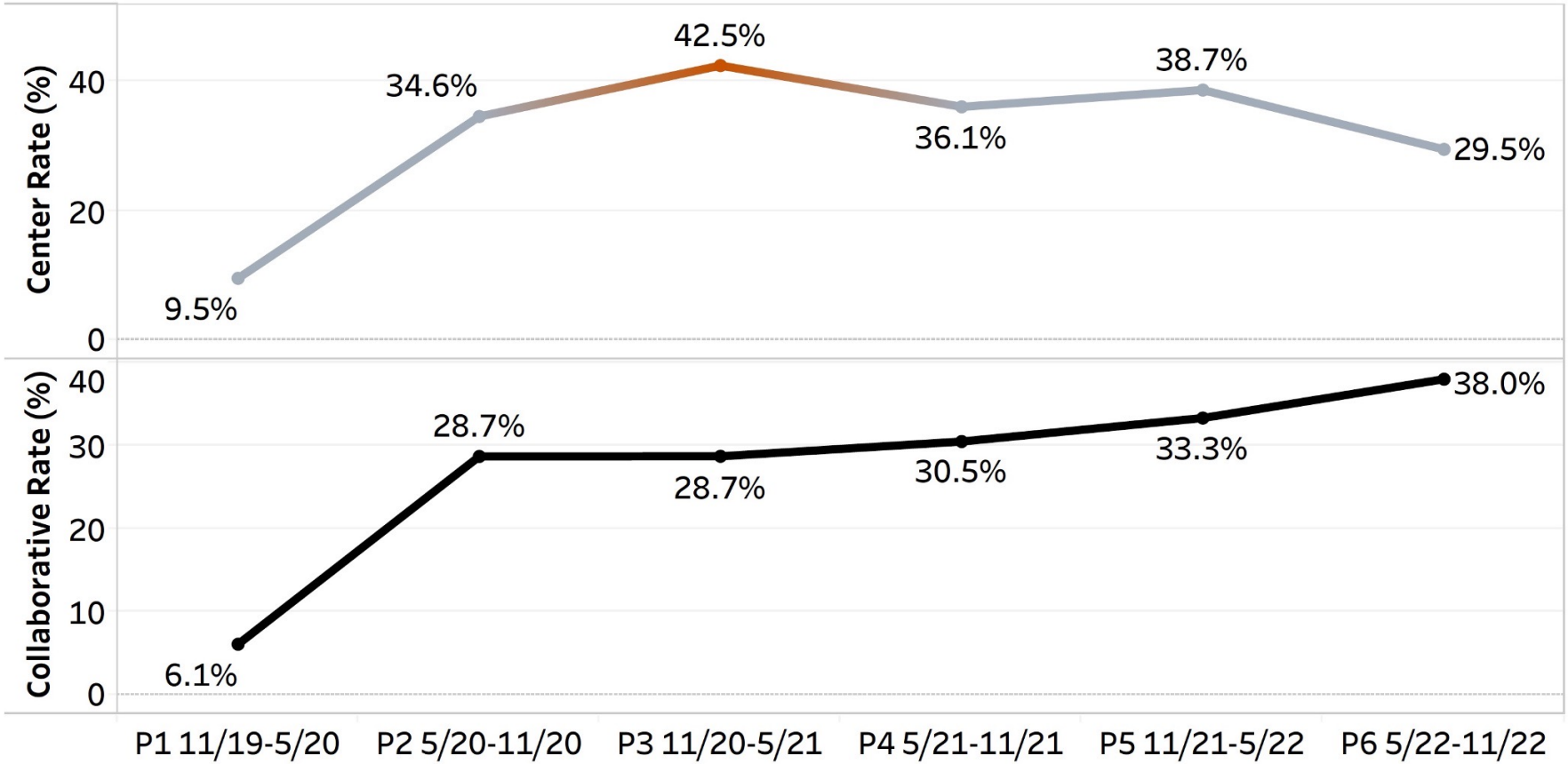
Format 1

XX Appendicitis | Any Complication All Visits
Risk-Adjusted Values



Format 2

XX Appendicitis | Any Complication All Visits
Risk-Adjusted with Outlier Status



Outlier Status
Blue = Low-outlier status (better performance)
Gray = Non-outier status (average performance)
Red = High-outlier status (worse performance)

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#MACS

Open text poll

Trend Graphs (1/3)

0 1 1

What outcome(s) would you most like to see on the next distribution of trend graphs?

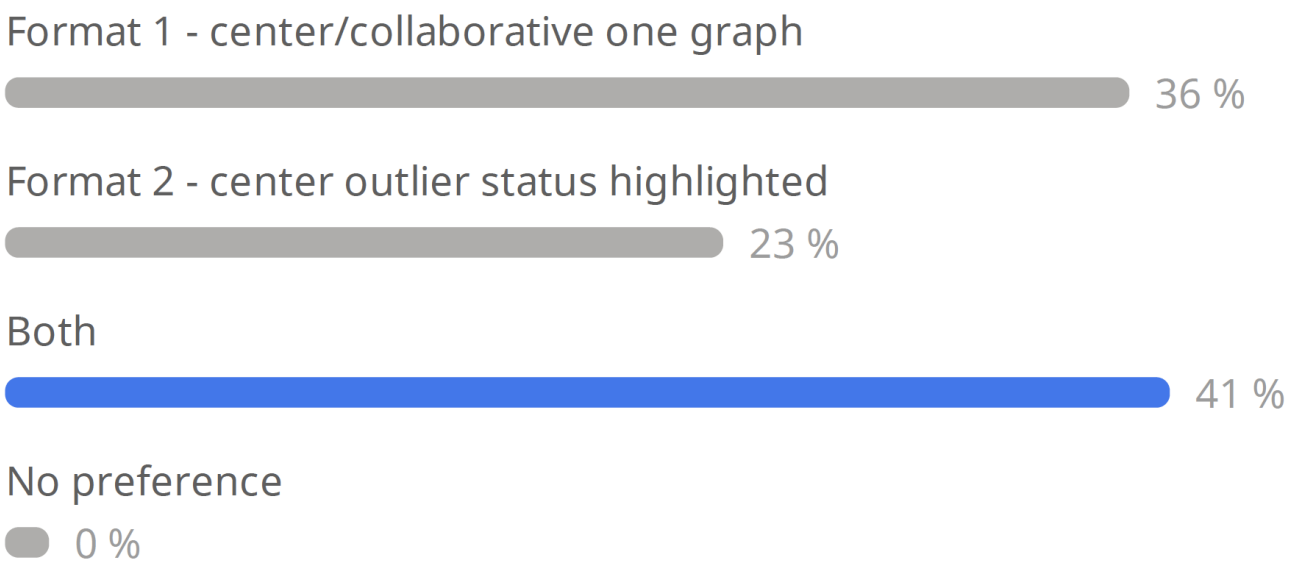
- No opinion
- Complications 30 day
- LOS
- Perhaps more specific complications- I.e SSI or DVT more specific data
- Length of stay index amd readmits
- The ones you chose are adequate
- Appendicitis readmission for complicated appendicitis
- Appendicitis, perforated - readmission rates
- Comparing two graph
- Infections and readmission
- LOS

Multiple-choice poll

Trend Graphs (2/3)

0 2 2

Which risk-adjusted trend graph format do you prefer?



Open text poll

Trend Graphs (3/3)

0 1 0

Are there any graph formatting changes would you like us to make?

- No
- We jumped in mid cycle, so we need more data points
- No
- No
- Format 1 with the outlier colors.
- No
- N/a
- I like the ranking graphs arbor metrics provides.
- No
- Not at this time


Thank you

MACS Readmissions

Improving care and measuring what matters

Jill Jakubus, PA-C

M·ACS

How do we reduce hospital readmissions?

Hospital Readmissions Reduction Program (HRRP)

- Beginning 2012, reduced payments for “excess” 30-day risk-standardized readmissions for specific conditions and procedures
- Goal reduction avoidable readmissions

HRRP 30-day risk standardized readmission rates for:

- **AMI**
- **COPD**
- **Heart failure**
- **Pneumonia**
- **CABG surgery**
- **Elective THA/TKA**

- **The HRRP effectively decreased readmissions for targeted procedures. There were no associated spillover effects for common nontargeted procedures.**

  Borza T, Oreline MK, Skolarus TA, et al. Association of the Hospital Readmissions Reduction Program With Surgical Readmissions. JAMA Surg. 2018;153(3):243-250. doi:10.1001/jamasurg.2017.4585

- **This study's findings suggest that racial disparities may have widened substantially after the implementation of the HRRP for discharges within safety-net hospitals among nontargeted conditions.**

  Chaiyachati KH, Qi M, Werner RM. Changes to Racial Disparities in Readmission Rates After Medicare's Hospital Readmissions Reduction Program Within Safety-Net and Non-Safety-Net Hospitals. JAMA Netw Open. 2018;1(7):e184154. Published 2018 Nov 2. doi:10.1001/jamanetworkopen.2018.4154

- **There was a statistically significant association with implementation of the HRRP and increased post-discharge mortality for patients hospitalized for heart failure and pneumonia, but whether this finding is a result of the policy requires further research.**

  Wadhera RK, Joynt Maddox KE, Wasfy JH, Haneuse S, Shen C, Yeh RW. Association of the Hospital Readmissions Reduction Program With Mortality Among Medicare Beneficiaries Hospitalized for Heart Failure, Acute Myocardial Infarction, and Pneumonia. JAMA. 2018;320(24):2542-2552. doi:10.1001/jama.2018.19232

- **The findings of this study suggest that the reduction of readmissions associated with the implementation of the HRRP was smaller than originally reported.**

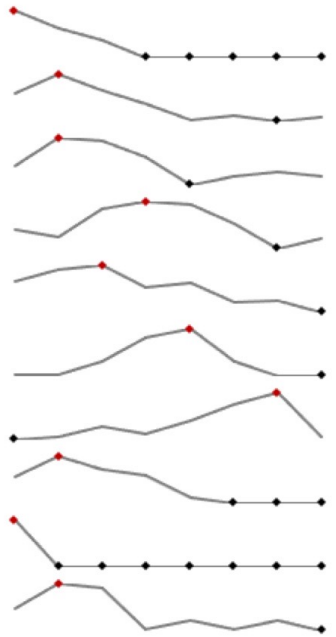
  Sabbatini AK, Joynt-Maddox KE, Liao J, et al. Accounting for the Growth of Observation Stays in the Assessment of Medicare's Hospital Readmissions Reduction Program. *JAMA Netw Open*. 2022;5(11):e2242587. Published 2022 Nov 1. doi:10.1001/jamanetworkopen.2022.42587

How did your hospital do following HRRP implementation?

Source: KHN analysis of hospital data from Centers for Medicare & Medicaid Services

Percentage by which payments are reduced because of excess rehospitalizations.

2016	2017	2018	2019	2020	2021	2022	2023	Delta
0.34	0.21	0.13						-0.34
0.85	1.23	0.92	0.64	0.33	0.41	0.31	0.38	-0.47
0.52	1.27	1.21	0.75	0.02	0.24	0.36	0.25	-0.27
0.87	0.71	1.3	1.45	1.39	1	0.49	0.69	-0.18
1.11	1.43	1.53	0.94	1.07	0.57	0.6	0.32	-0.79
0.02	0.04	0.32	0.8	1	0.3	0.01		-0.02
	0.04	0.15	0.07	0.21	0.4	0.53	0.03	0.03
0.47	0.84	0.61	0.5	0.1				-0.47
0.05								-0.05
0.18	0.37	0.34	0.03	0.09	0.03	0.09	0.02	-0.16
0.44 1.11	0.61 1.43	0.65 1.53	0.52 1.45	0.42 1.39	0.30 1	0.24 0.6	0.17 0.69	-0.27 -0.79



Penalty (collaborative high)
Penalty
No penalty

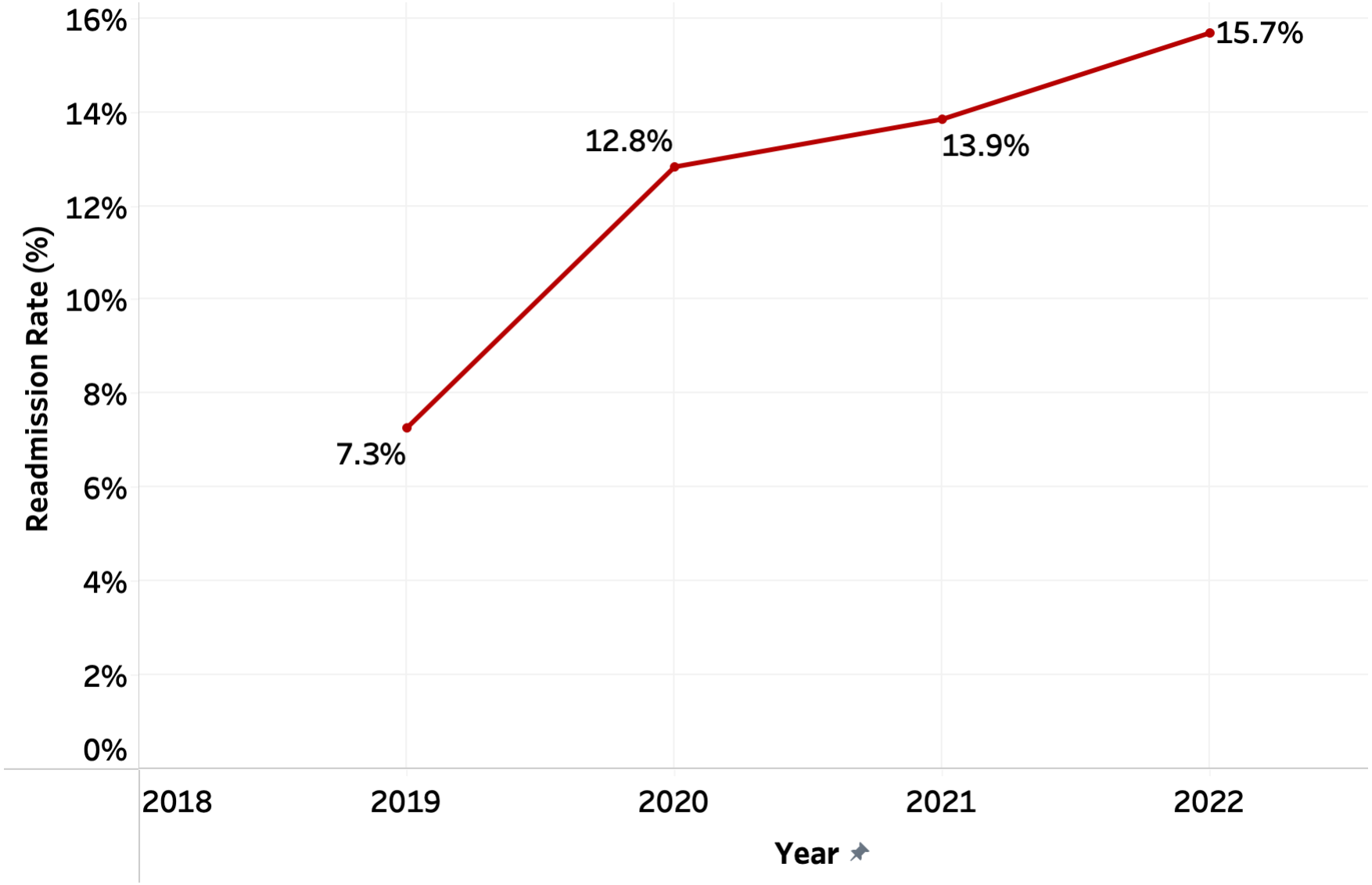
How do we ~~reduce hospital readmissions~~?
understand why patients return?

MACS Data Questions

- Who is getting readmitted?
- Where is their point of entry?
- Why are they coming back?
- When are they coming back?
- Where were patients discharged to initially?
- Are there opportunities for improvement?
- Other questions?

All Cohorts | Collaborative Readmission Rates

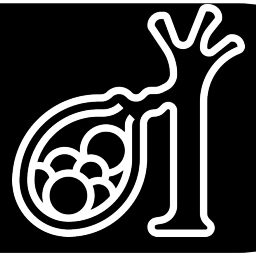
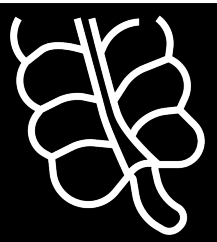
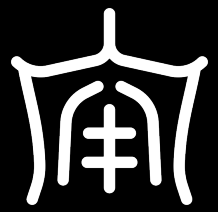
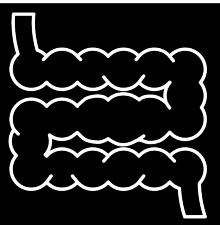
Which cohort should we drill into?



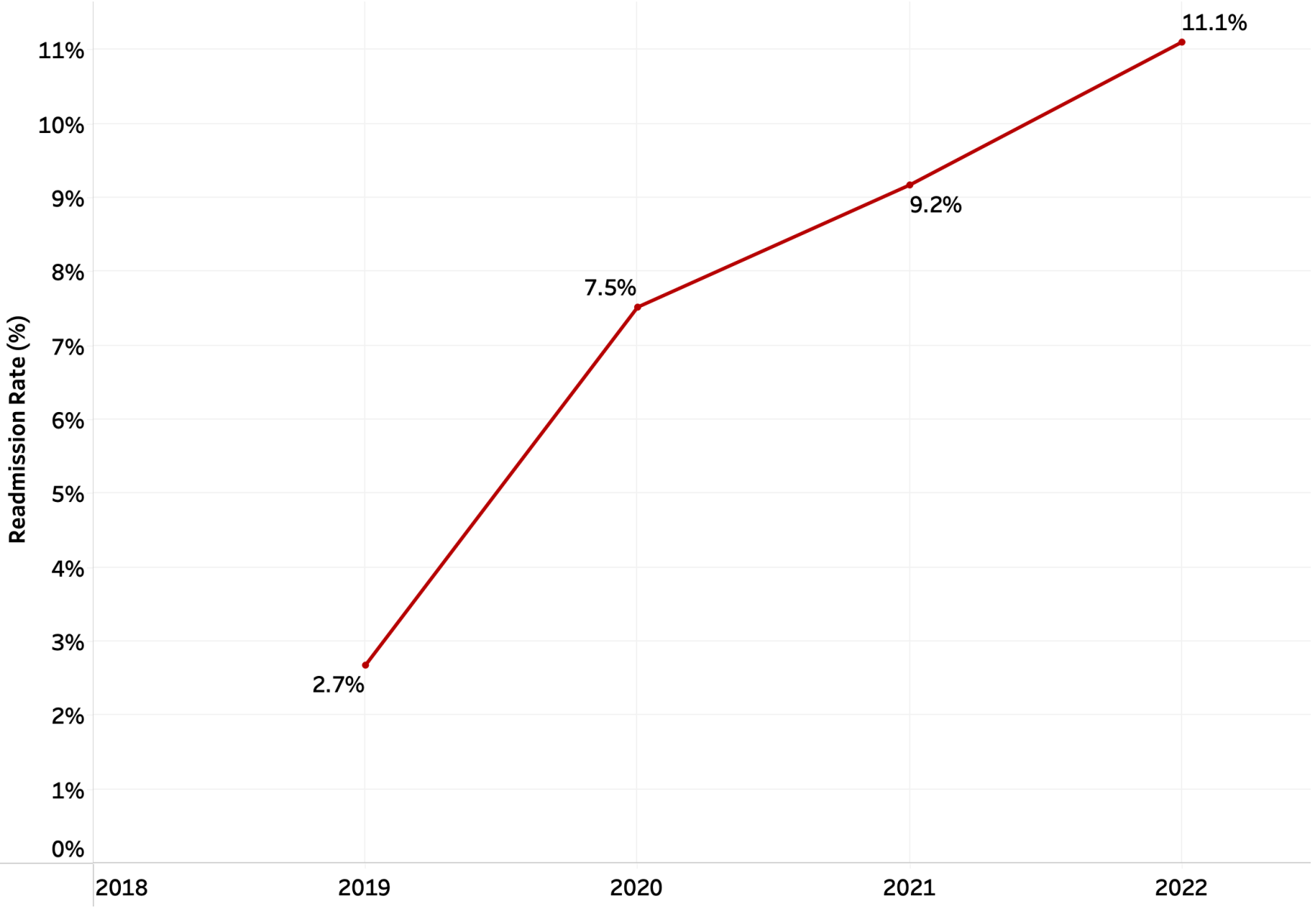
13.3%
Avg. Rate

All Cohorts | Collaborative Readmission Rates

Which cohort should we drill into?

Gallbladder		8.7% N = 679
Appy		9.0% N = 441
Ex Lap		20.0% N = 435
SBO		21.2% N = 906

Acute Gallbladder Disease | Collaborative Readmission Rates



8.7%
Avg. Rate

Collaborative

Cohort: Gallbladder readmission
Encounter: Index or subsequent
Time: All

Demographics **Comorbidities** **Complications** **Hospital Dispo**

Time to Readmit **Point of Reentry** **Readmit Rate** **Diagnosis** **Complications**

Collaborative

Cohort: Gallbladder readmission
Encounter: Index
Time: All

Age

54 (18.9)
mean (SD), y

Female

58% (N = 324)

Race

W 83% (N = 467)
B 9% (N = 50)

Demographics | Comorbidities | Complications | Hospital Dispo | Time to Readmit | Point of Reentry | Readmit Rate | Diagnosis | Complications

Collaborative

Cohort: Gallbladder readmission
Encounter: Index
Time: All

Comorbidities Highest Incidence

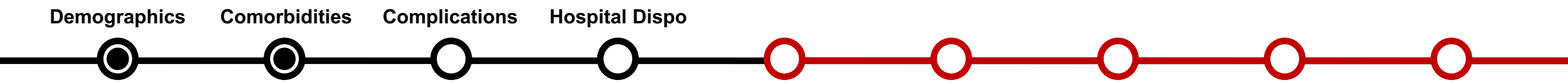
- 41% Hypertension (n = 229)
- 23% Sleep apnea (n = 127)
- 13% Sepsis (n = 75)
- 13% Tobacco use (n = 70)
- 9% IDDM (n = 52)

Collaborative

Cohort: Gallbladder readmission
Encounter: Index
Time: All

Model Comorbidities Incidence

- 13% Tobacco use (n = 70)
- 9% History DVT/PE (n = 50)
- 6% COPD (n = 36)
- 2% Renal failure (n = 10)



> J Trauma Acute Care Surg. 2022 Oct 12. doi: 10.1097/TA.0000000000003804.
Online ahead of print.

A COMPREHENSIVE ANALYSIS OF 30-DAY READMISSIONS AFTER EGS PROCEDURES. ARE RISK FACTORS MODIFIABLE?

Raul Coimbra, Timothy Allison-Aipa, Bishoy Zachary [1], Matthew Firek [1], Sara Edwards

Affiliations + expand

PMID: 36221175 DOI: 10.1097/TA.0000000000003804

Abstract

Background: Modifiable risk factors associated with procedure-related 30-day readmission after emergency general surgery (EGS) have not been comprehensively studied. We set out to determine risk factors associated with EGS procedure-related 30-d unplanned readmissions.

Methods: A
included 9 s
an urgent/e
appendecto
laparoscopi
and explora
hospital len
regression.

Conclusions: We identified several unmodifiable patients and EGS disease-related factors associated with 30-day unplanned readmissions. Readmissions could be potentially reduced by the implementation of a post-discharge surveillance systems between hospitals and post-discharge destination facilities, leveraging telehealth and outpatient care.

Level of evidence: III, Prognostic and Epidemiological.

- **Risk factors 30-d unplanned readmissions**
- **NSQIP 13-19 (6 years)**
- **9 procedures**
- **16K pts (5.2%)**
- **Risk Factors: age > 40, ASA >= 3, BMI < 18 or >= 40, high-risk OR, LOS >=4 d, d/c except home**

Collaborative

Cohort: Gallbladder readmission
Encounter: Index
Time: All

Complications Highest Incidence

- 4% Retained CBD stone (n = 25)
- 4% Sepsis (n = 20)
- 3% Septic shock (n = 15)
- 3% SSI organ/space (n = 15)
- 3% Cystic duct leak (n = 14)

Collaborative

Cohort: Gallbladder readmission
Encounter: Index
Time: All

Discharge Disposition	Frequency	Percent
Home or Self-Care	460	82.1
Home Care for Skilled Care	59	10.5
Skilled Nursing Facility (SNF)	26	4.6
Left AMA	7	1.3
Inpatient Rehab	3	0.5
Long Term Care Hospital	2	0.4
Short-Term Hospital for Inpatient Care	2	0.4
Hospice-Home	1	0.2

Collaborative

Cohort: Gallbladder readmission
Encounter: Index
Time: All

Statistic	Time to First Readmit (d)	Time to First Readmit (mos)
Mean	53.6	1.8
SD	111.2	3.7
Min	0.5	0.0
Max	942.0	31.4
N	548	548
Missing/Invalid Data	12	12

Collaborative

Cohort: Gallbladder readmission
Encounter: Index
Time: All

Operative Index

Statistic	Time to First Readmit (d)	Time to First Readmit (mos)
Mean	42.2	1.4
SD	107.1	3.6
Min	0.7	0.0
Max	928.2	30.9
N	267	267

Non-Operative Index

Statistic	Time to First Readmit (d)	Time to First Readmit (mos)
Mean	64.5	2.2
SD	114.0	3.8
Min	0.5	0.0
Max	942.0	31.4
N	281	281

Missing/Invalid Data	12	12

POP QUIZ

Collaborative

Cohort: Gallbladder readmission
Encounter: Subsequent
Time: All

Point of Entry	Frequency	Percent
ED	438	64.5
Home/Direct Admit	171	25.2
Transfer from Outside Hospital ED	42	6.2
Emergency Department Only/Not Admitted	18	2.7
Direct from Skilled Care	4	0.6
Transfer from Outside Hospital	3	0.4
Other	2	0.3
Transfer Other	1	0.2

Collaborative

Cohort: Gallbladder readmission
Encounter: Index
Time: All

Operative Management	Non-Op Management
43%	57%
n = 239	n = 321

Demographics — Comorbidities — Complications — Hospital Dispo — Time to Readmit — Point of Reentry — Readmit Rate — Diagnosis — Complications

Collaborative

Cohort: Gallbladder readmission
Encounter: Subsequent
Time: All

ICD-10 Code	Description	Frequency	Percent
K80.10	Calculus of gallbladder with other cholecystitis Without mention of obstruction of biliary tract.	53	7.8
K85.10	Biliary acute pancreatitis Without mention of organ complication.	43	6.4
K81.0	Acute cholecystitis	30	4.4
K80.50	Calculus of bile duct without cholangitis or cholecystitis Without mention of obstruction of biliary tract.	29	4.3
K80.00	Calculus of gallbladder with acute cholecystitis Without mention of obstruction of biliary tract.	24	3.6

Collaborative

Cohort: Gallbladder readmission
Encounter: Subsequent
Time: All

Readmit Complications Highest Incidence

- 5% SSI organ/space (n = 37)
- 4% Sepsis (n = 30)
- 4% Retained CBD stone (n = 27)
- 3% Septic shock (n = 18)
- 3% Cystic duct leak (n = 18)

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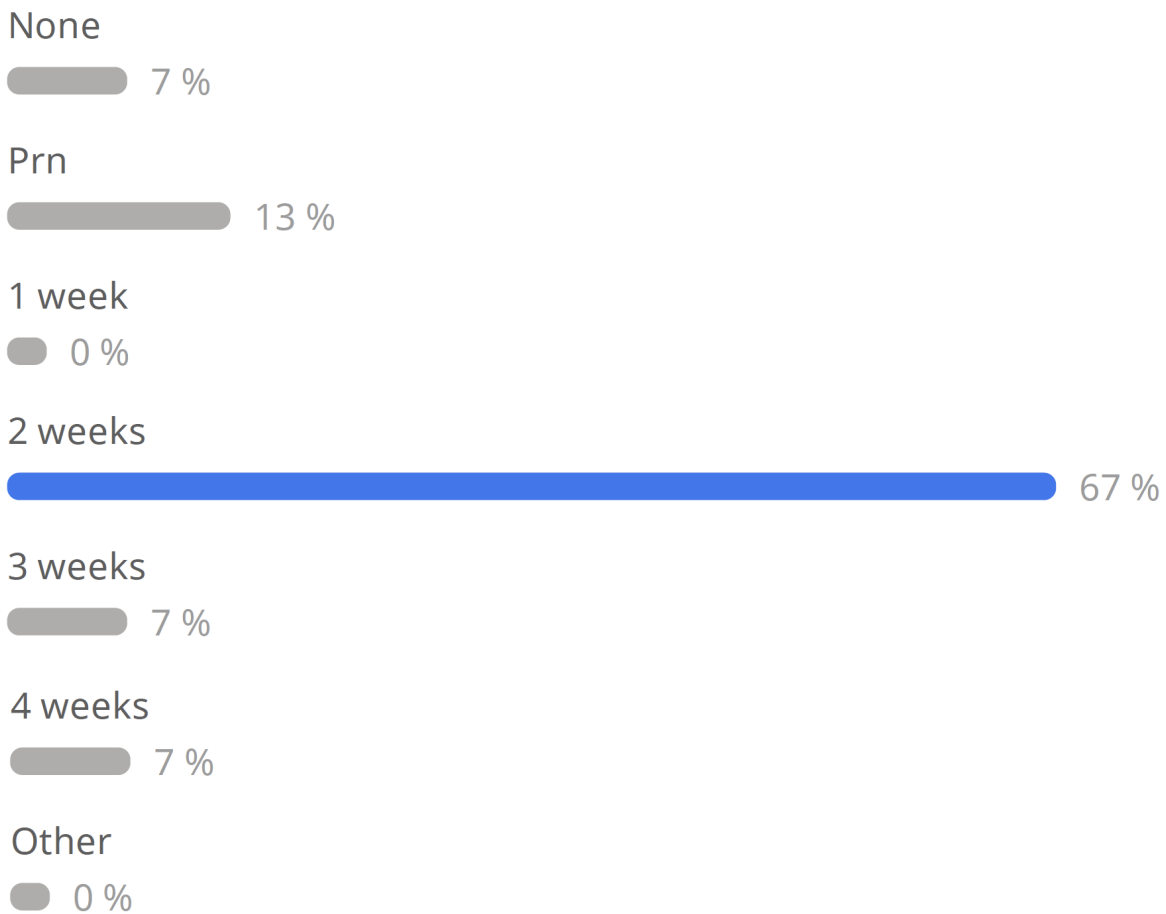
Multiple-choice poll

Readmissions (1/13)

0 1 5

1. How many weeks post-discharge do you see patients admitted for acute UNCOMPLICATED gallbladder disease?

(1/2)



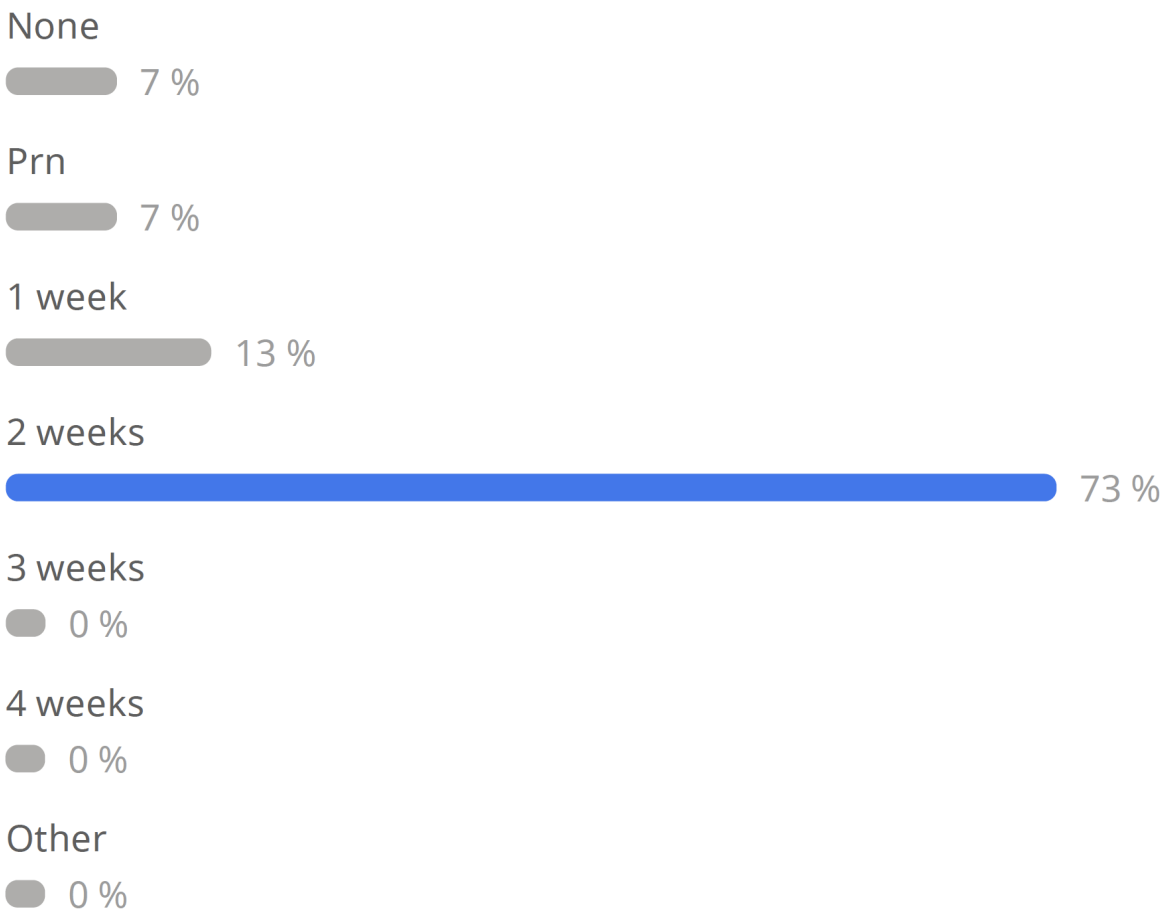
Multiple-choice poll

Readmissions (2/13)

0 1 5

2. How many weeks post-discharge do you see patients admitted for acute COMPLICATED gallbladder disease?

(1/2)



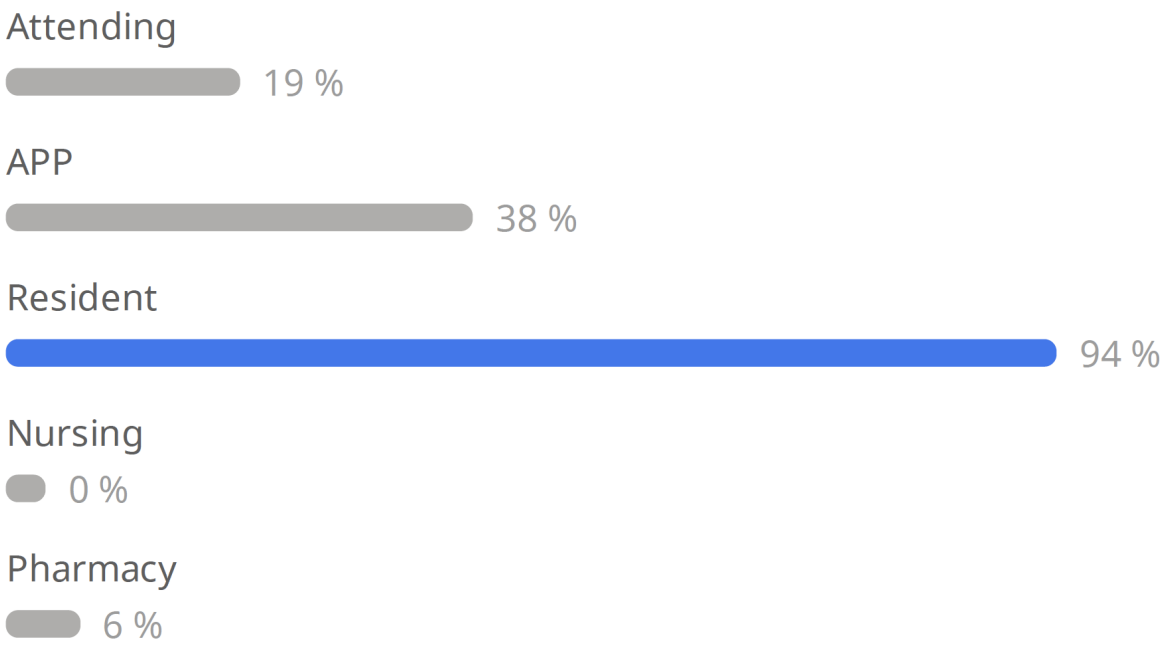
Multiple-choice poll (Multiple answers)

Readmissions (3/13)

0 1 6

3. Who primarily reconciles medication agreement for the discharge summary? (Mark all that apply)

(1/2)

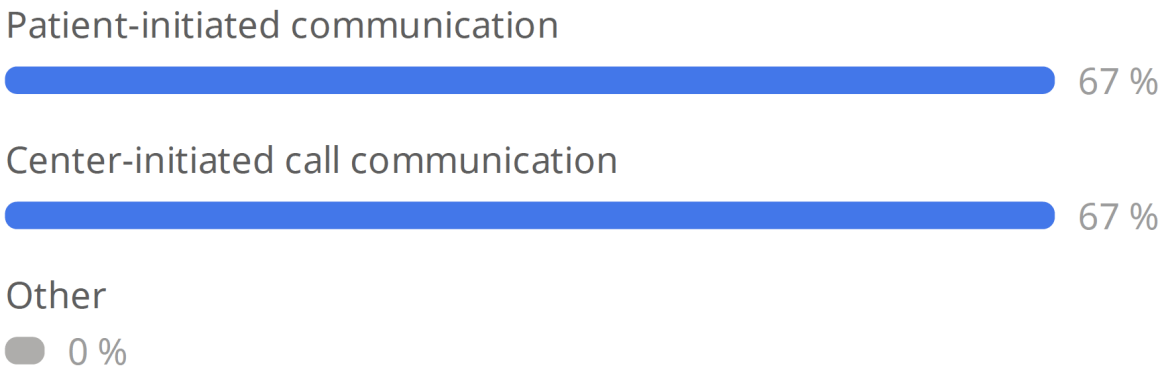


Multiple-choice poll (Multiple answers)

Readmissions (4/13)

0 1 5

4. How is outpatient surgical follow-up primarily scheduled? (Mark all that apply)

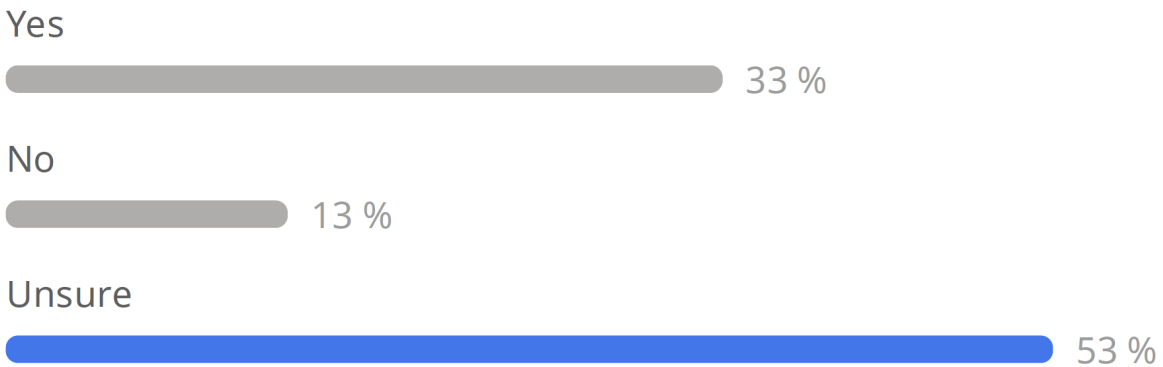


Multiple-choice poll

Readmissions (5/13)

0 1 5

5. Does your hospital have a readmission automated risk stratification tool?



Open text poll

Readmissions (6/13)

004

6. If your center uses an automated risk stratification tool, what tool are you using?

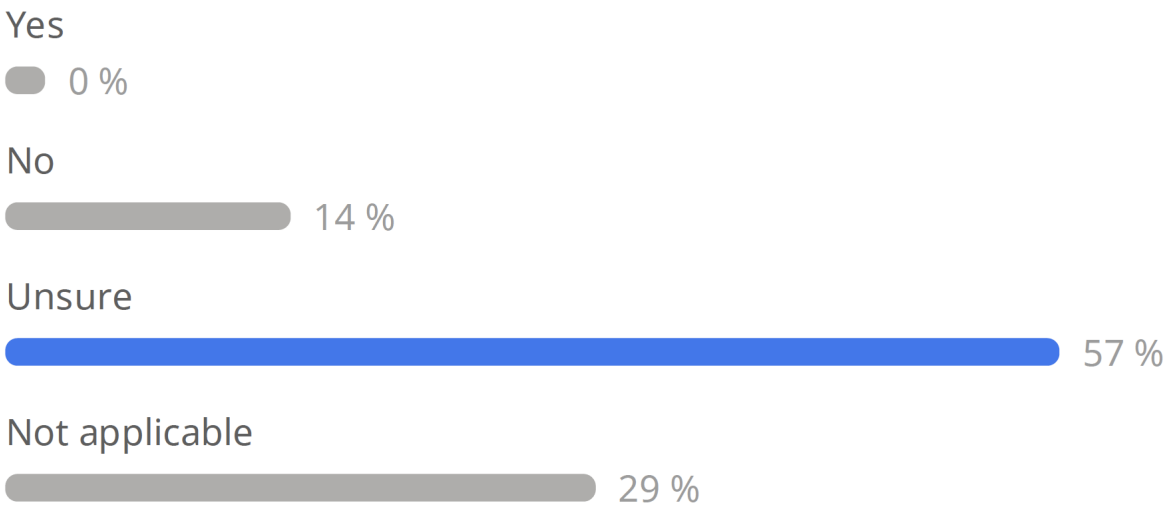
- Not sure
- Lace
- Cerner
- LACE

Multiple-choice poll

Readmissions (7/13)

0 1 4

7. If your center uses an automated risk stratification tool, does this transmit the results to the outpatient provider(s)?

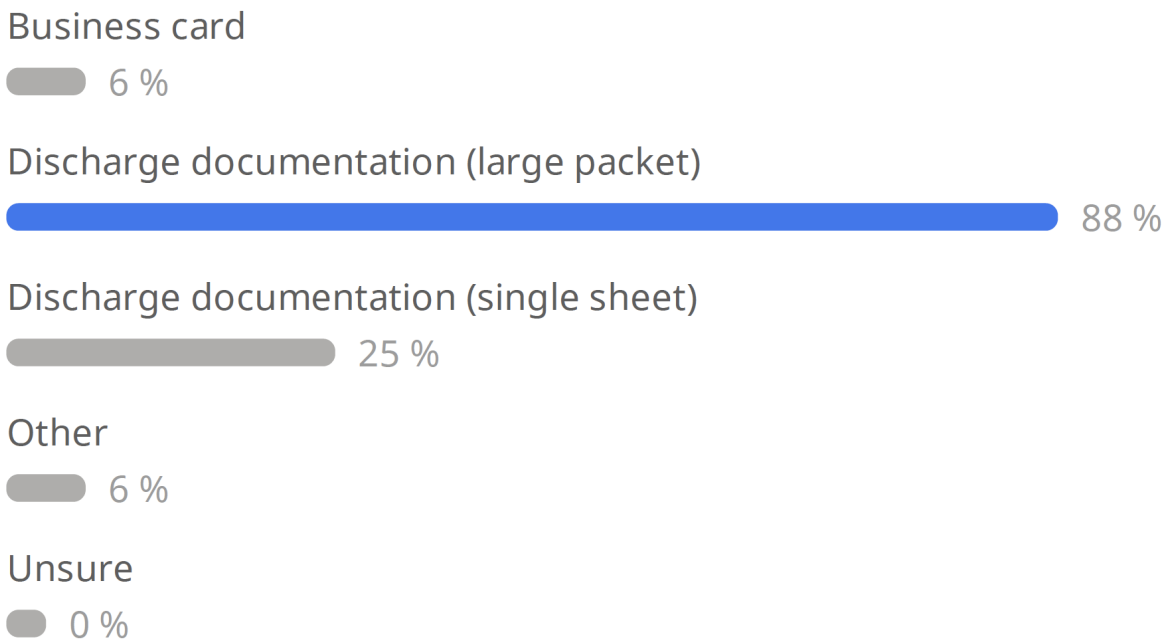


Multiple-choice poll (Multiple answers)

Readmissions (8/13)

0 1 6

8. How is contact information provided to the patients at discharge? (Mark all that apply)



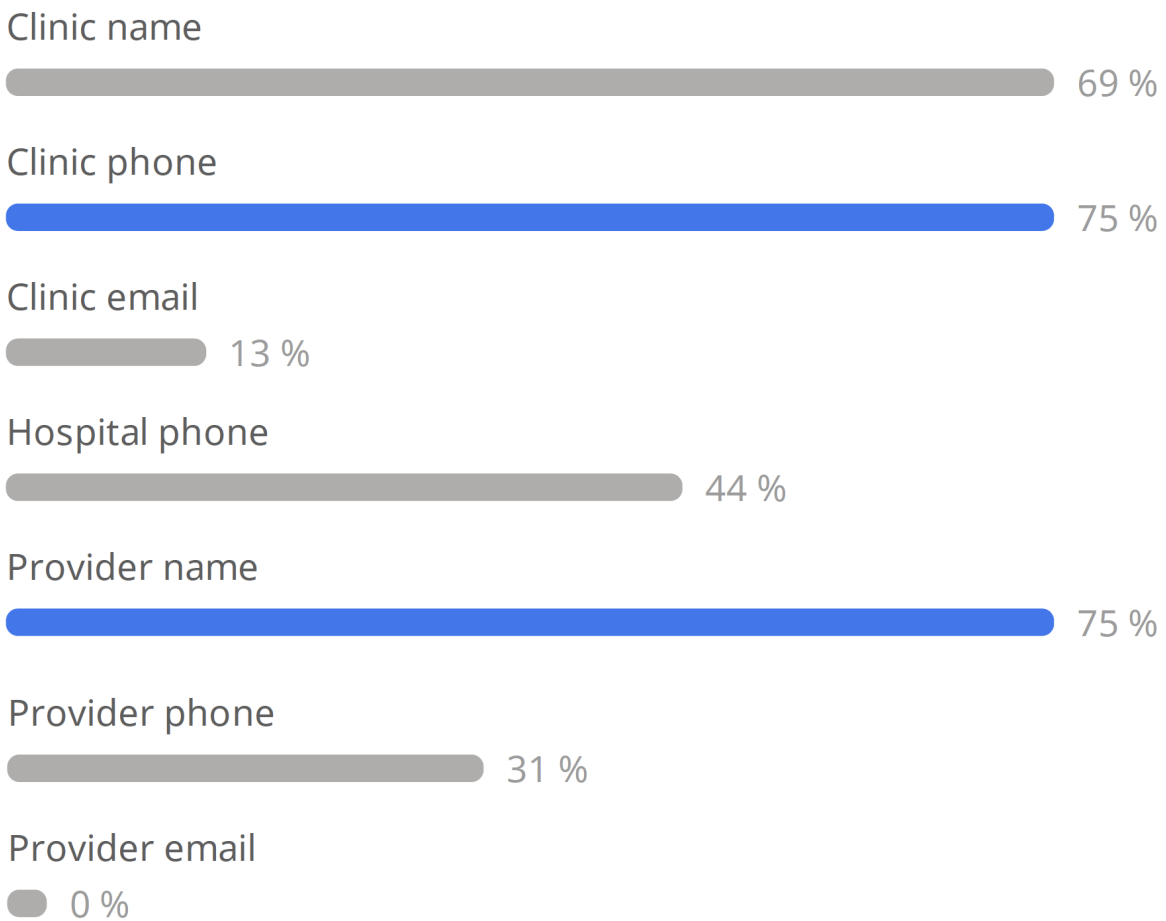
Multiple-choice poll (Multiple answers)

Readmissions (9/13)

0 1 6

9. What direct contact information is provided to patients at discharge? (Mark all that apply)

(1/2)

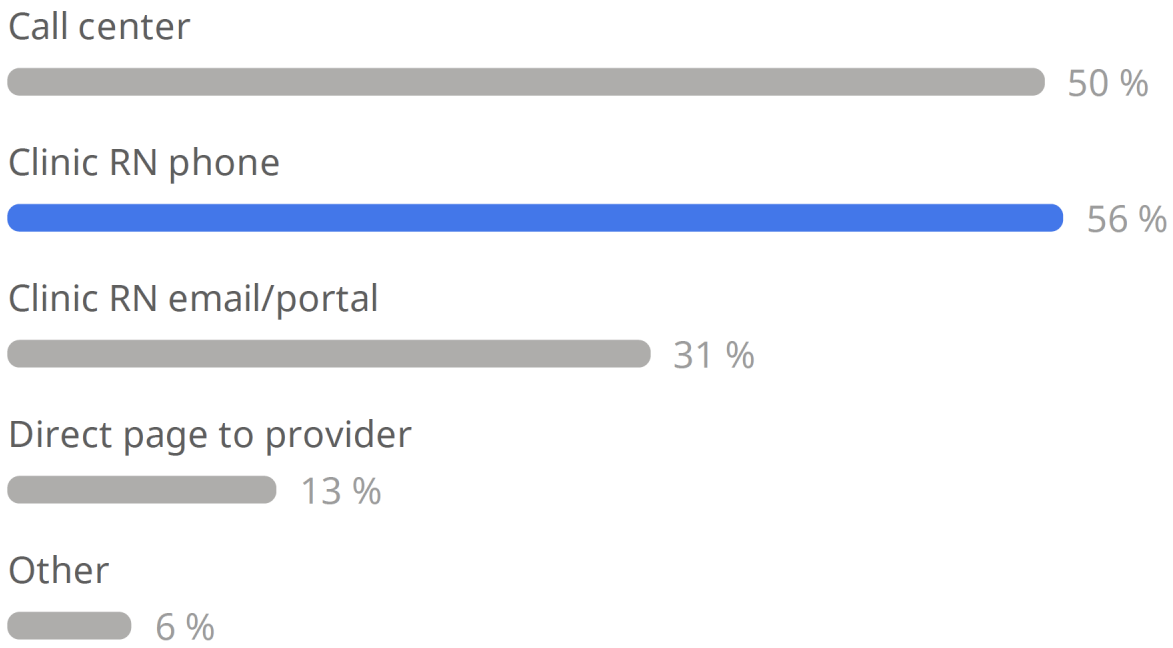


Multiple-choice poll (Multiple answers)

Readmissions (10/13)

0 1 6

10. How can patients contact your practice if they have an issue during a weekday? (Mark all that apply)

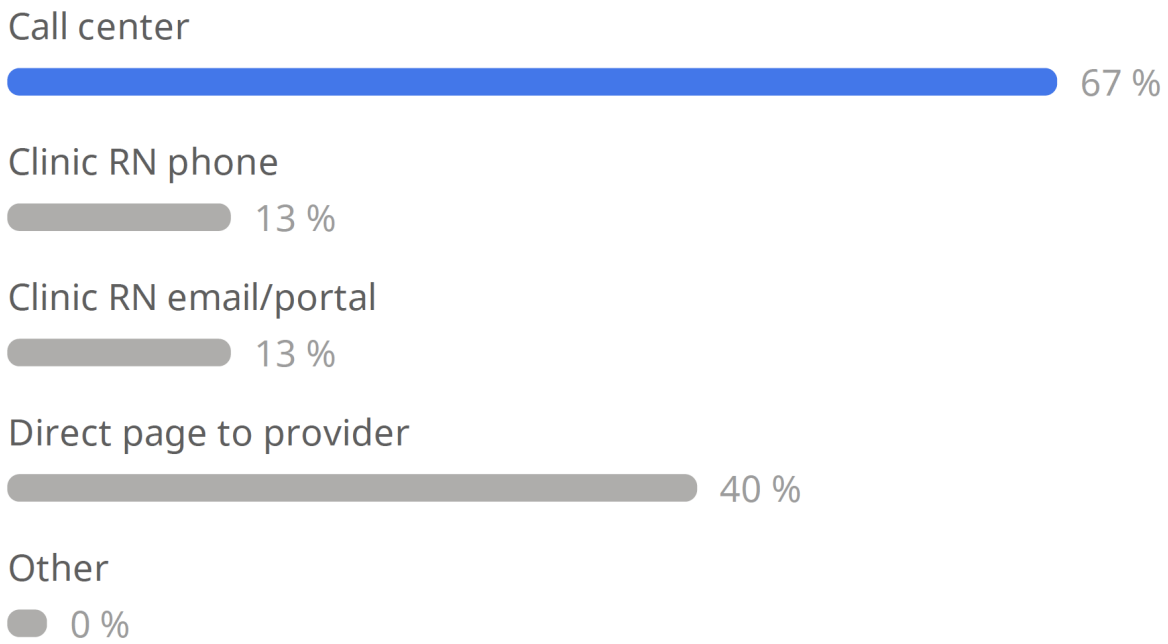


Multiple-choice poll (Multiple answers)

Readmissions (11/13)

0 1 5

11. How can patients contact your practice if they have an issue during a weekend? (Mark all that apply)

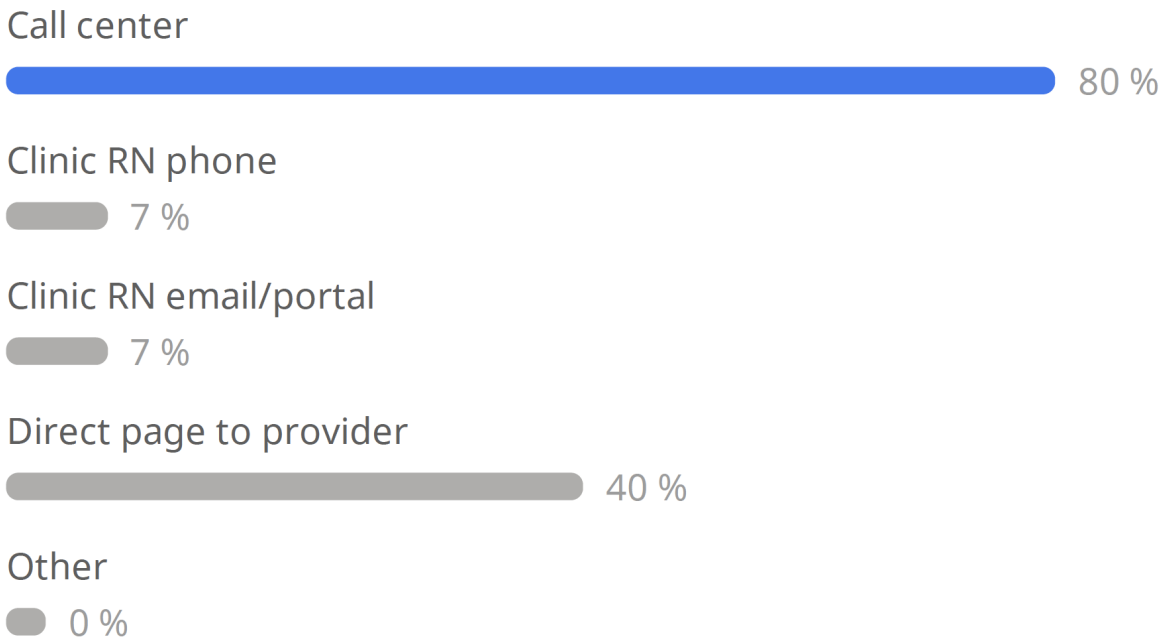


Multiple-choice poll (Multiple answers)

Readmissions (12/13)

0 1 5

12. How can patients contact your practice if they have an issue overnight? (Mark all that apply)



Multiple-choice poll

Readmissions (13/13)

0 1 6

13. Does your practice use virtual visits?

All patients

6 %

Select patients

63 %

No patients

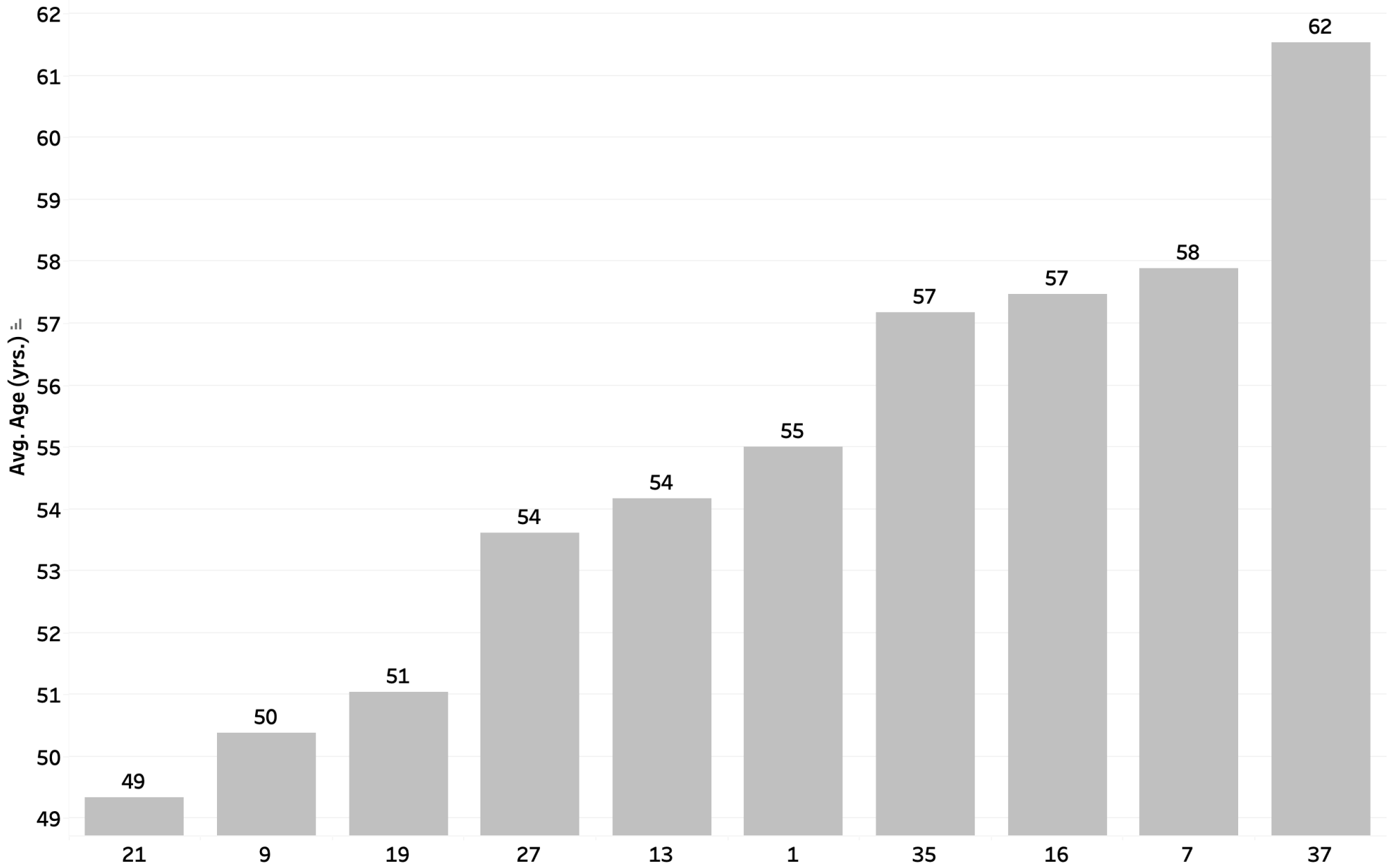
31 %

Other

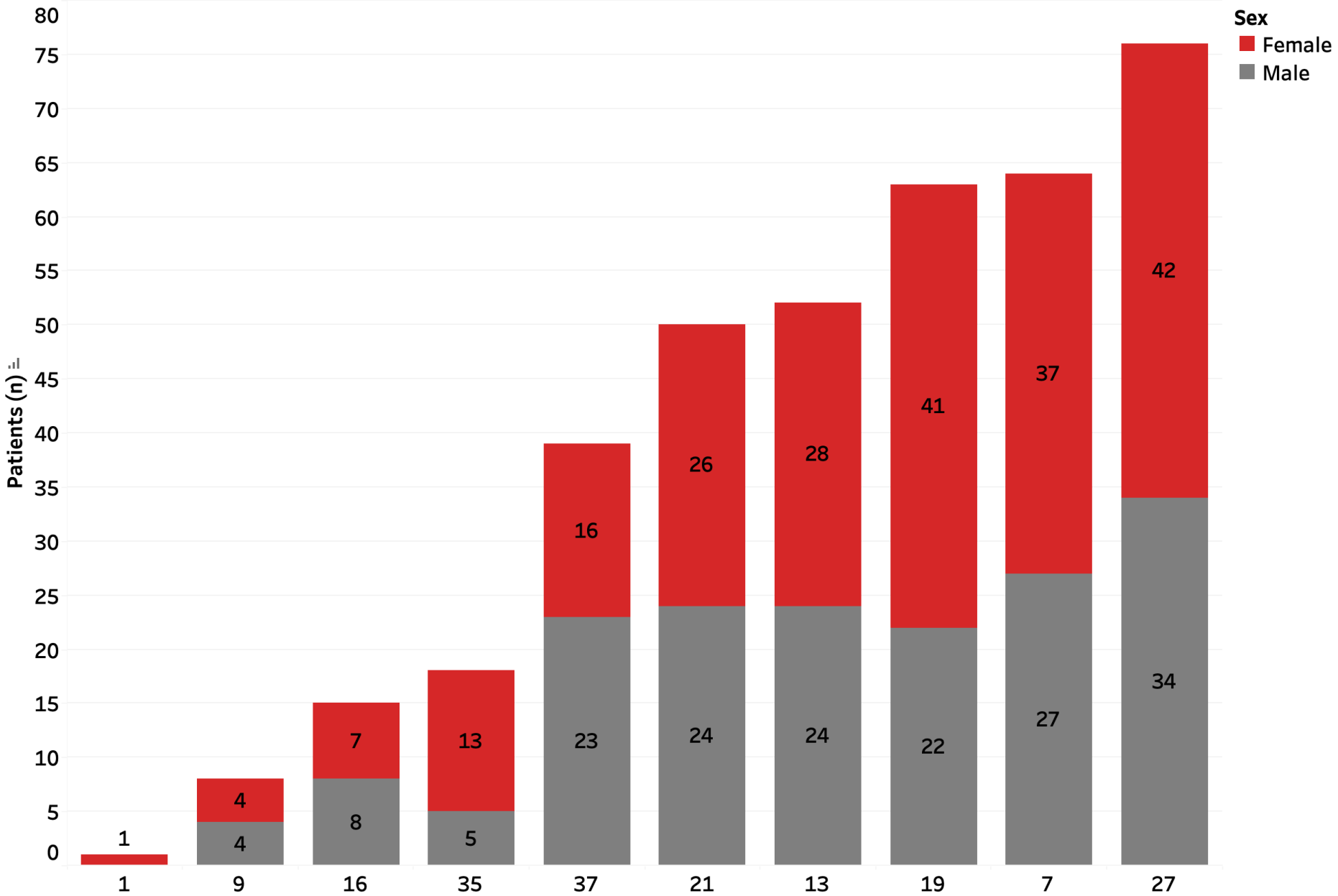
0 %

Acute Gallbladder Disease | Readmission Average Age

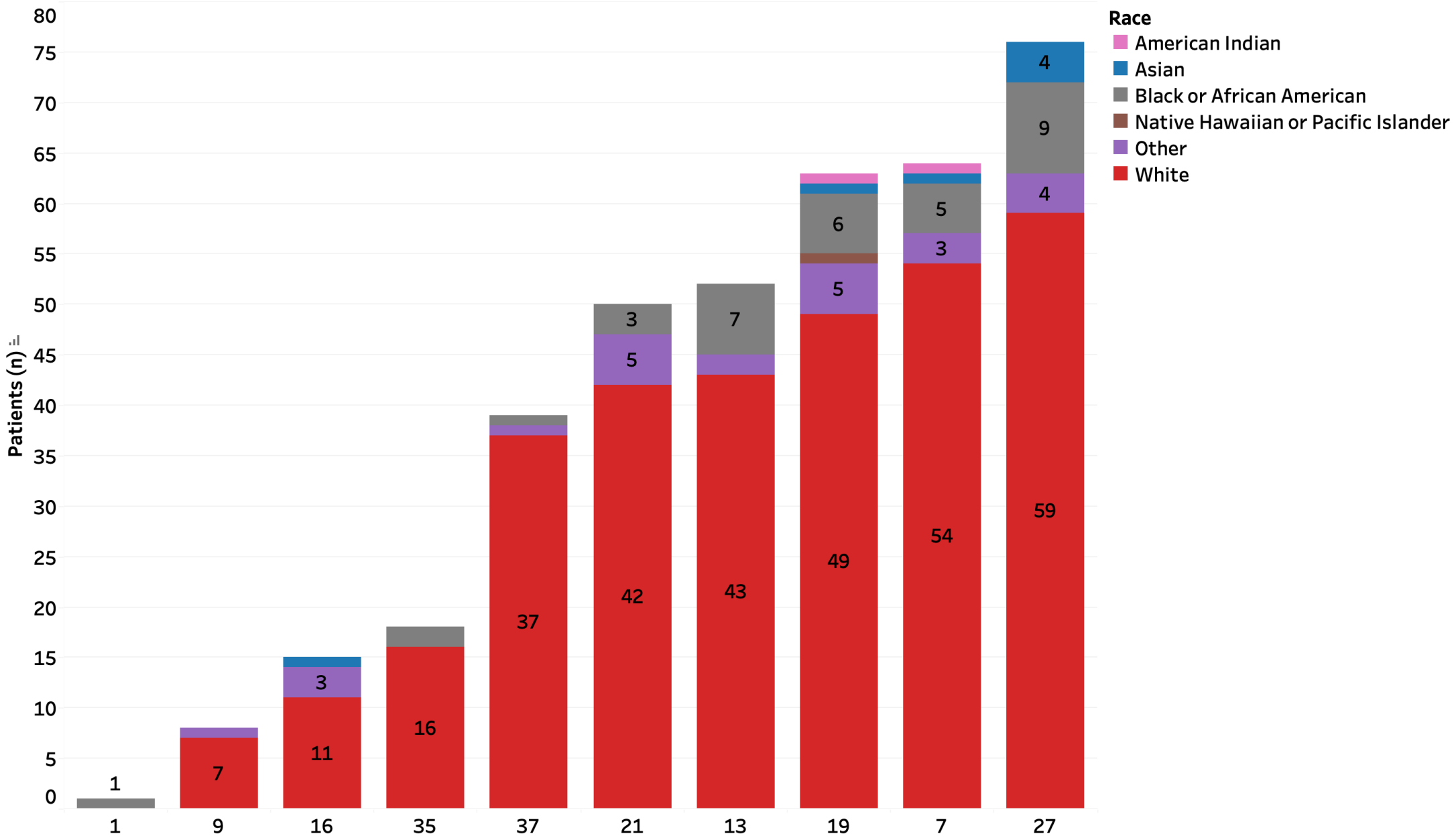
2021 to 2022



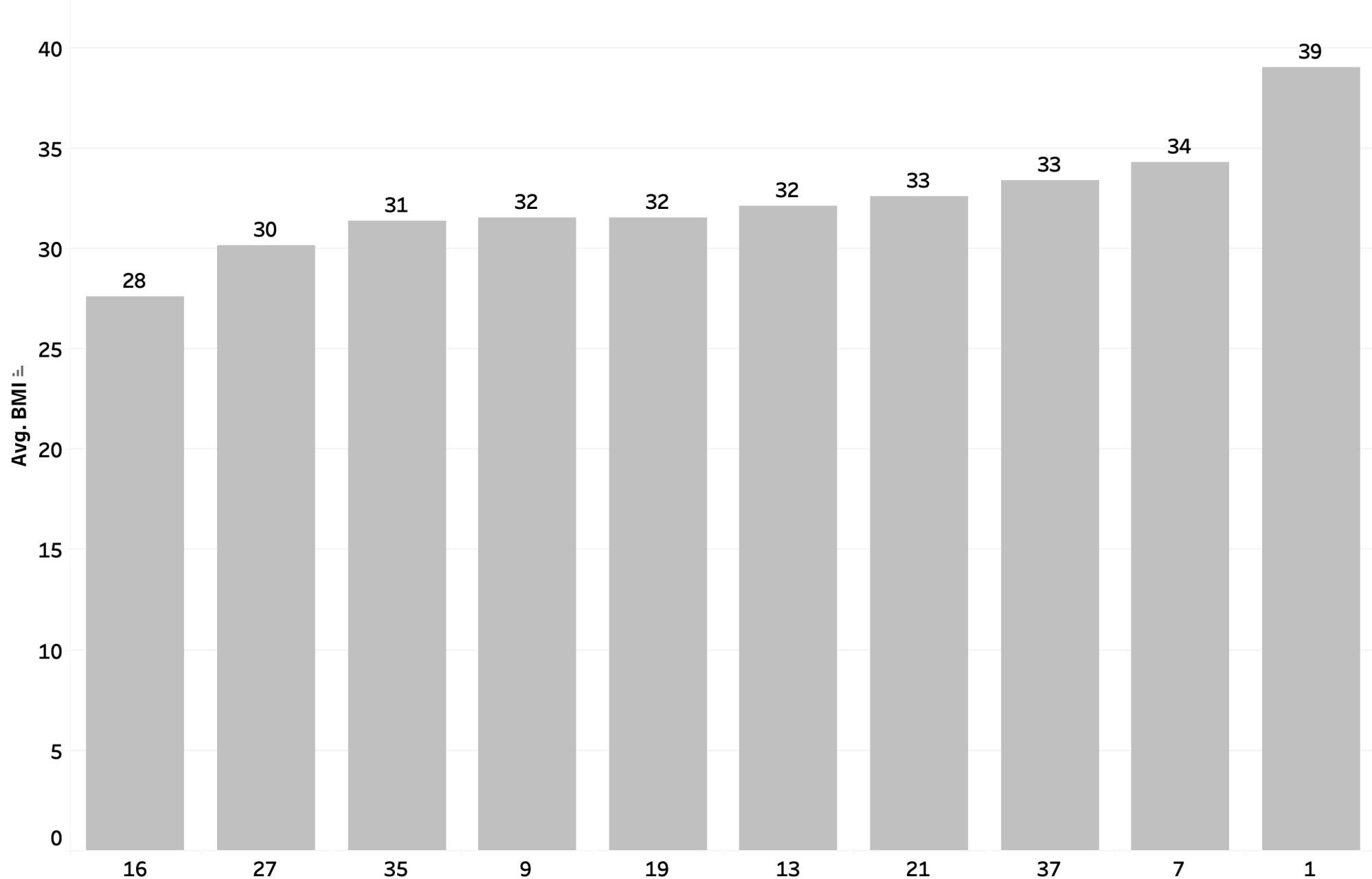
Acute Gallbladder Disease | Readmission Sex
2021 to 2022



Acute Gallbladder Disease | Readmission Race
2021 to 2022



Acute Gallbladder Disease | Readmission Average BMI
2021 to 2022



Acute Gallbladder Disease | Readmission ASA
2021 to 2022

ASA Score	1	7	9	13	16	19	21	27	35	37
1		2				1				
2		16	3	6	3	10	16	13	2	7
3	1	21	2	4	3	13	18	13	7	11
4		2				1				

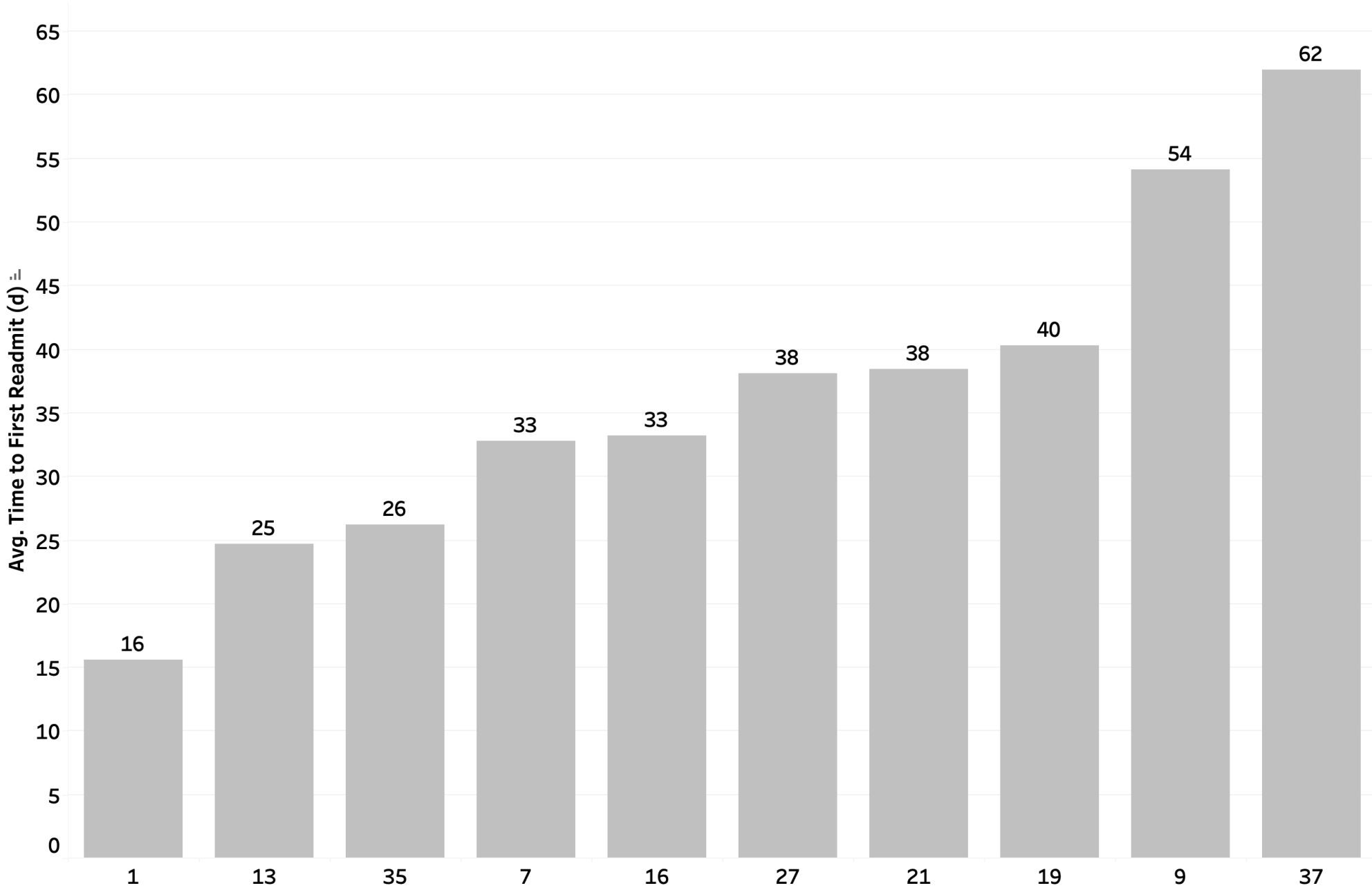
Count of ASA Score broken down by Center ID vs. ASA Score. The data is filtered on Year, which ranges from 2021 to 2022. The view is filtered on ASA Score, which excludes Null.

Acute Gallbladder Disease | Readmission Index Discharge Disposition
2021 to 2022

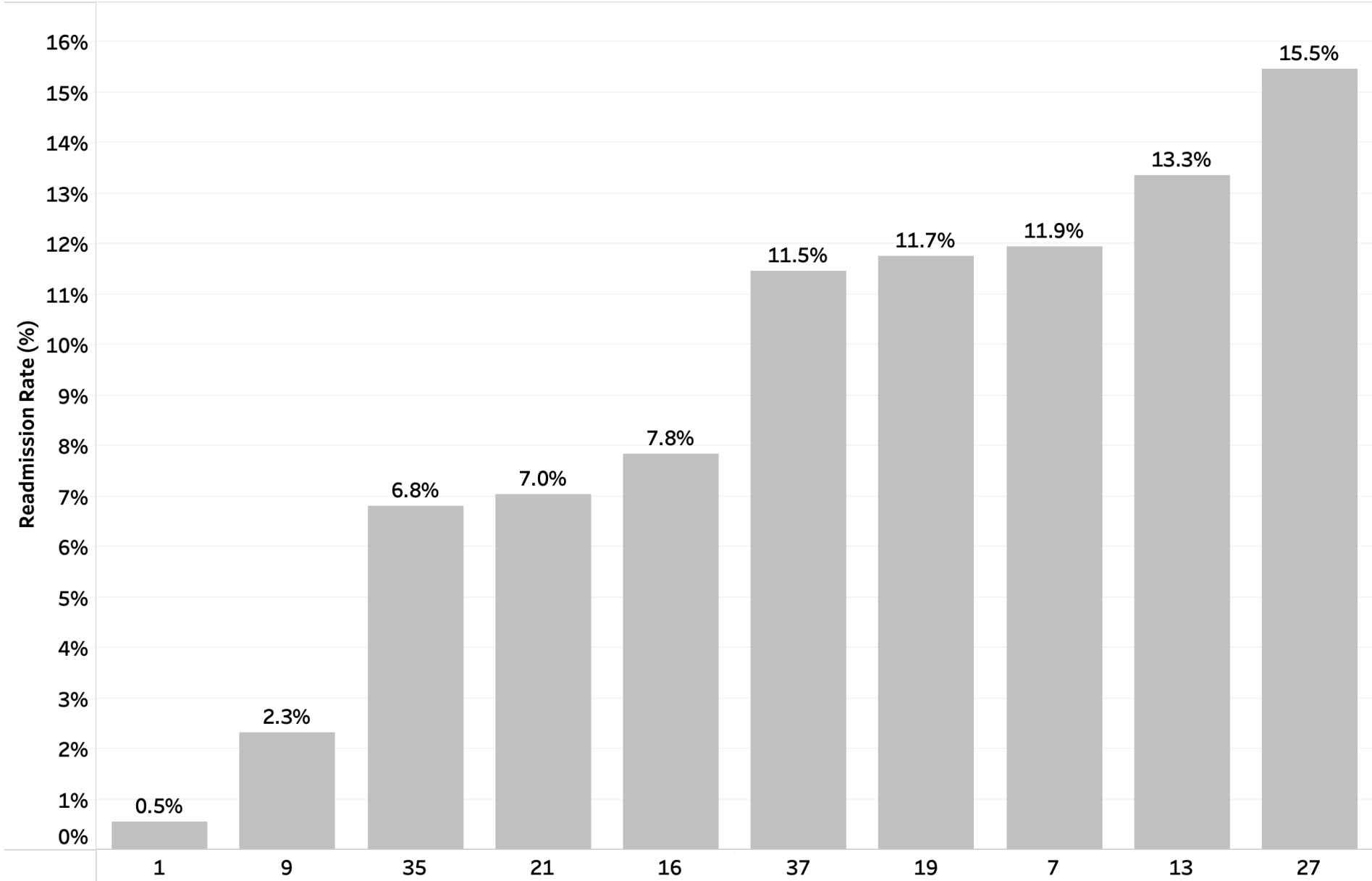
Discharge Disposition	1	7	9	13	16	19	21	27	35	37
Home Care for Skilled Care		6		1	1	6	6	8		7
Home or Self-Care	1	50	7	48	13	51	42	67	18	27
Inpatient Rehab				1		1				
Left AMA		1				4				
Long Term Care Hospital						1				1
Short-Term Hospital for Inpatient Care		2								
Skilled Nursing Facility (SNF)		5	1	2	1		2	1		4

Count of Index GB broken down by Center ID vs. Discharge Disposition. The data is filtered on Year, which ranges from 2021 to 2022.

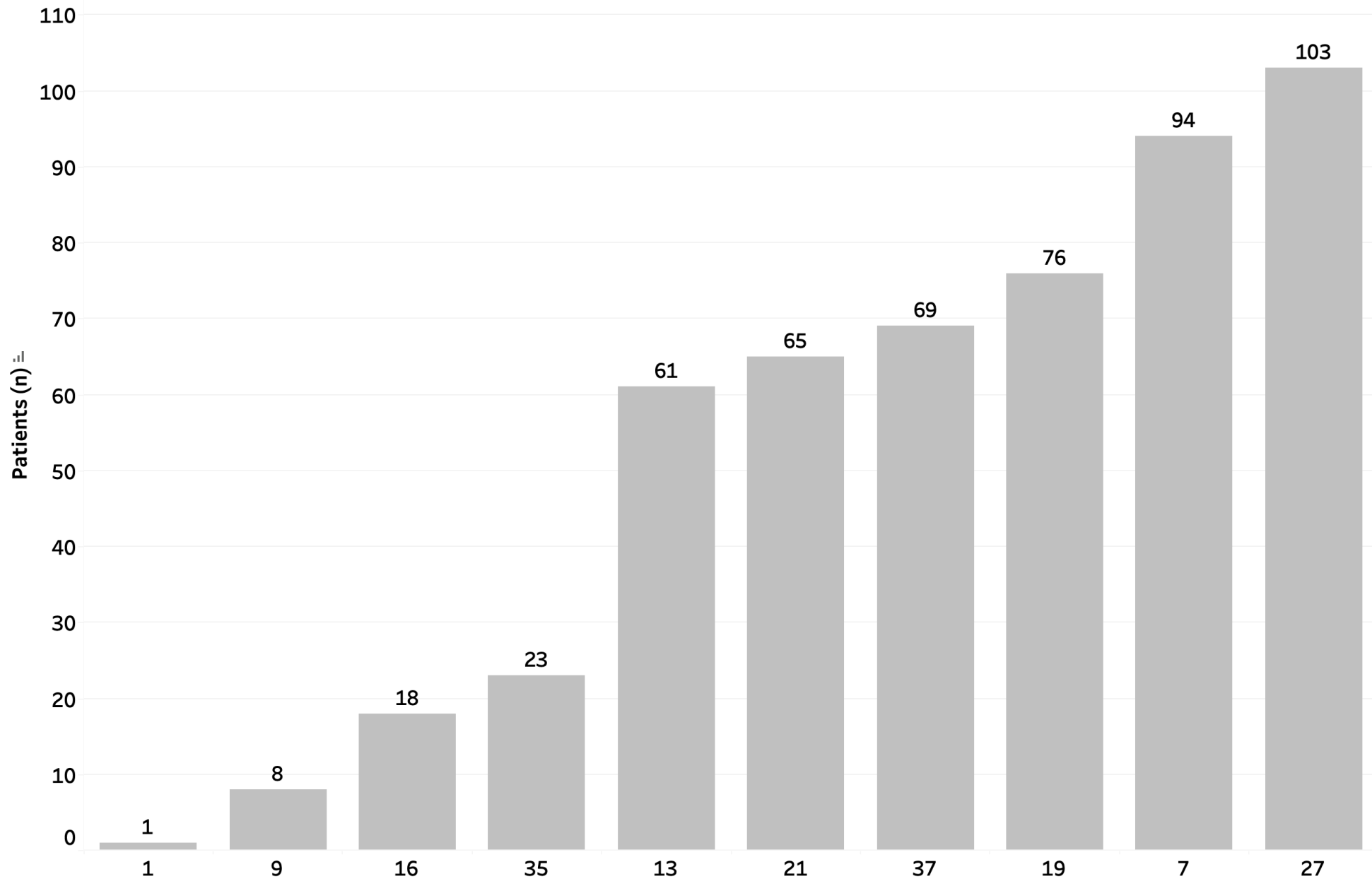
Acute Gallbladder Disease | Time to First Readmit
2021 to 2022



Acute Gallbladder Disease | Readmission Rate
2021 to 2022



Acute Gallbladder Disease | Readmission Patients
2021 to 2022



Acute Gallbladder Disease | Readmission Point of Entry
2021 to 2022

Point of Entry	1	7	9	13	16	19	21	27	35	37
Direct from Skilled Care				1			1			2
ED	1	60	4	23	15	42	51	68	17	41
Emergency Department Only/Not Admitted		9		3		1				
Home/Direct Admit		17	3	32	3	31	2	32	6	18
Transfer from Outside Hospital										1
Transfer from Outside Hospital ED		8	1	2		2	11	3		6
Transfer Other										1

MACS Data Answers

- Who is getting readmitted?
- Where is their point of entry?
- Why are they coming back?
- When are they coming back?
- Where were patients discharged to initially?
- **Are there opportunities for improvement?**
- Other questions?

Homework

MACS Team

- Readmit patient list 1/13/23
- Master slide deck 1/13/23
- Support

Center Team

- Drill into patient list
- Max patients #25
- Populate slide deck
- Due in Dropbox 3/13/23
- Present findings 4/26/23

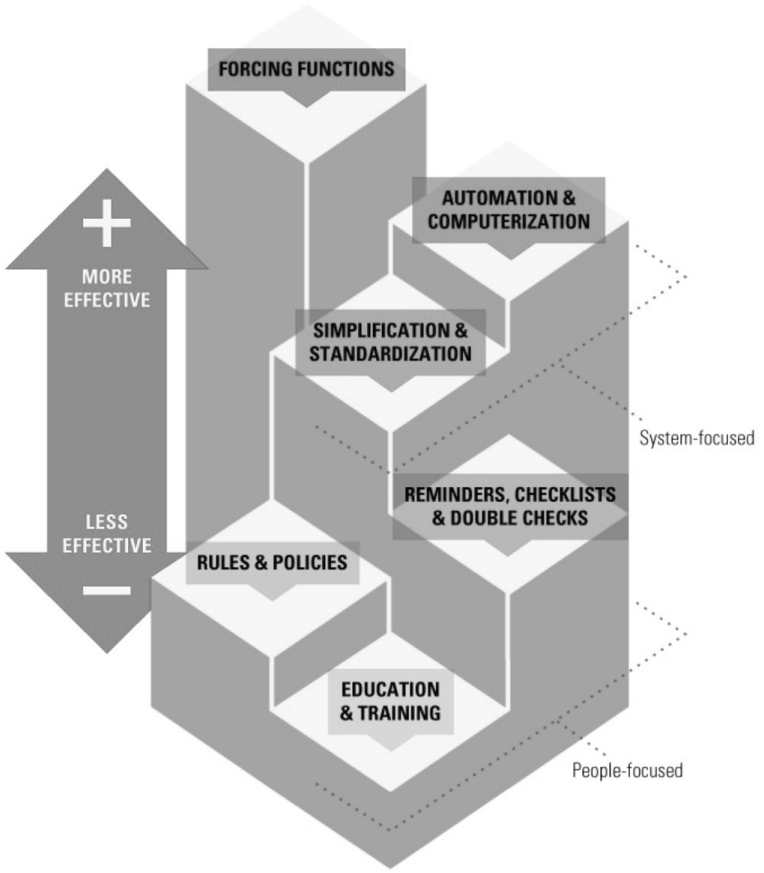
Readmit Patient List Variables

- Cohort
- Name
- MRN
- MACS number
- Age
- Sex
- Readmit date(s)/time(s)
- Comorbidities
- Complications

Uploaded to Dropbox

Master Slide Deck

- Demographics center, service, and staff
- Patient readmit drill down
- Systems and practices that work well
- Areas for improvement
- Barriers to improvement
- Lessons learned
- Moving forward



Hierarchy of Intervention Effectiveness


Thank you

Opioids

Mark Hemmila, MD

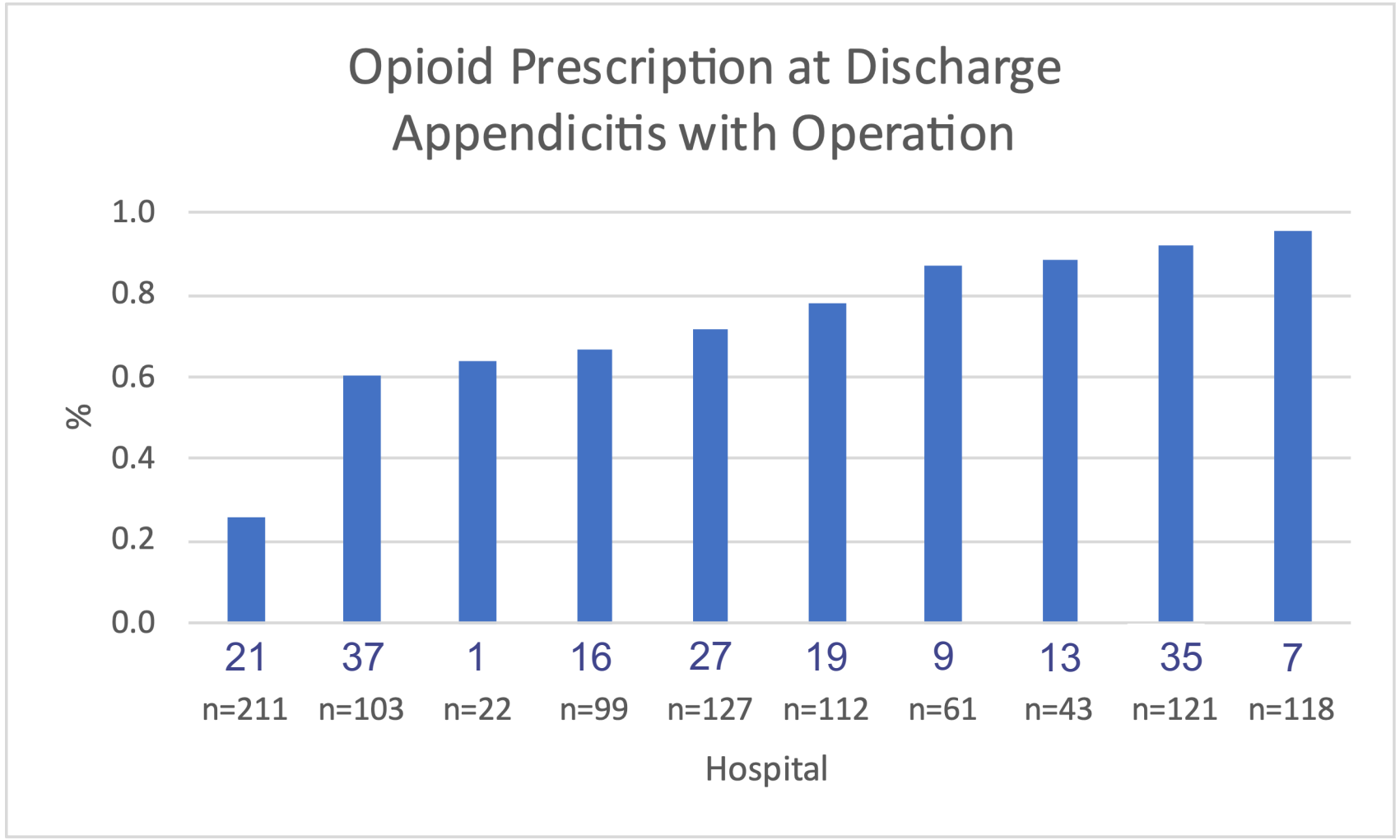
Framework

- Pain is real
- Subjectivity
- Excess pills are a problem
- Undertreatment is a problem
- Discussion

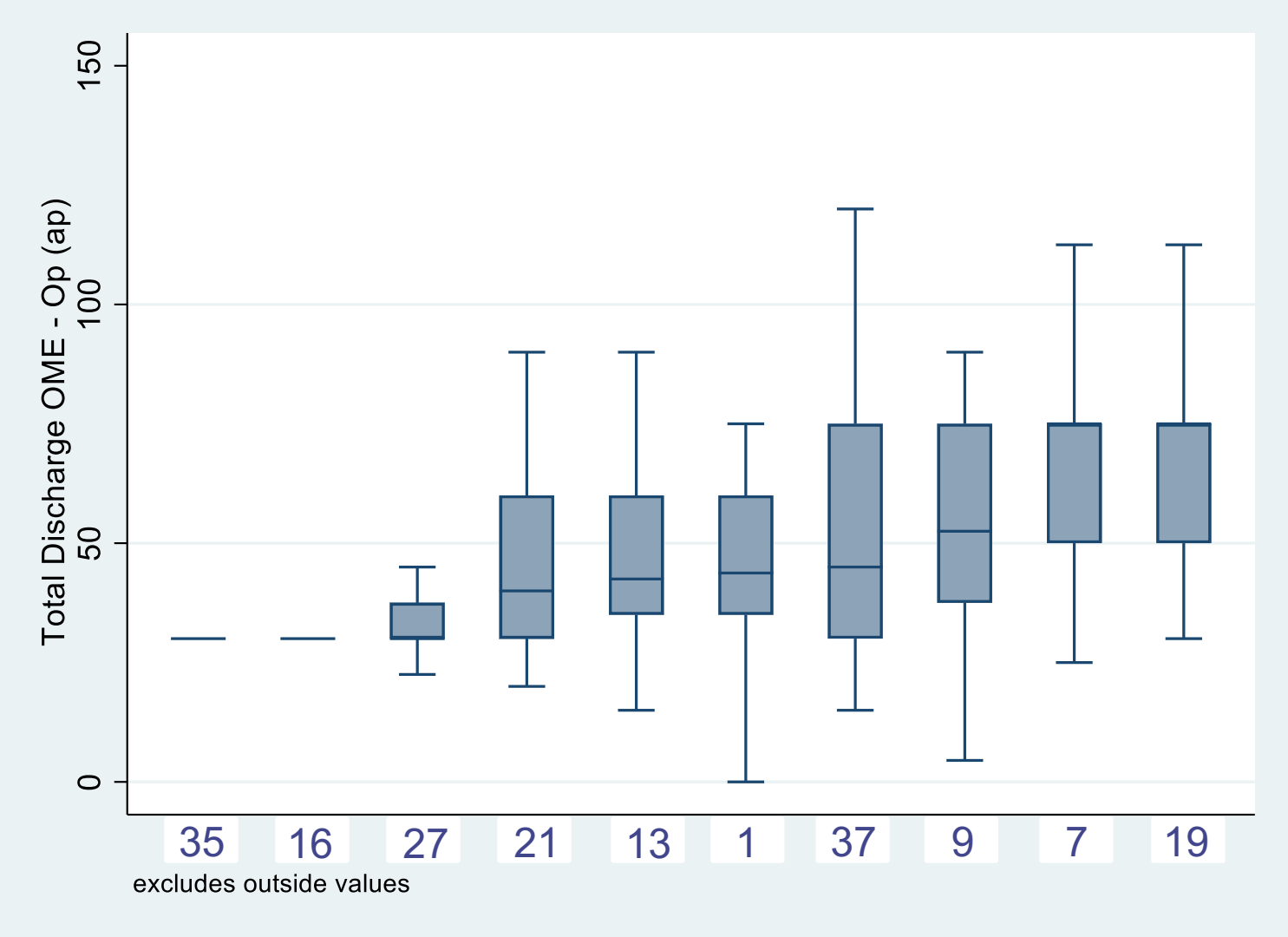
Appendectomy

- Michigan Open
- 5 mg Oxycodone pills
  - 1 mg oxycodone = 1.5 OME
  - 50th percentile (median) = 3 pills
    - 22.5 OME
  - 75th percentile = 7-8 pills
    - 52.5 OME
  - Maximum recommended = 10 pills
    - 75 OME

Acute Appendicitis w Operation



Acute Appendicitis w Operation



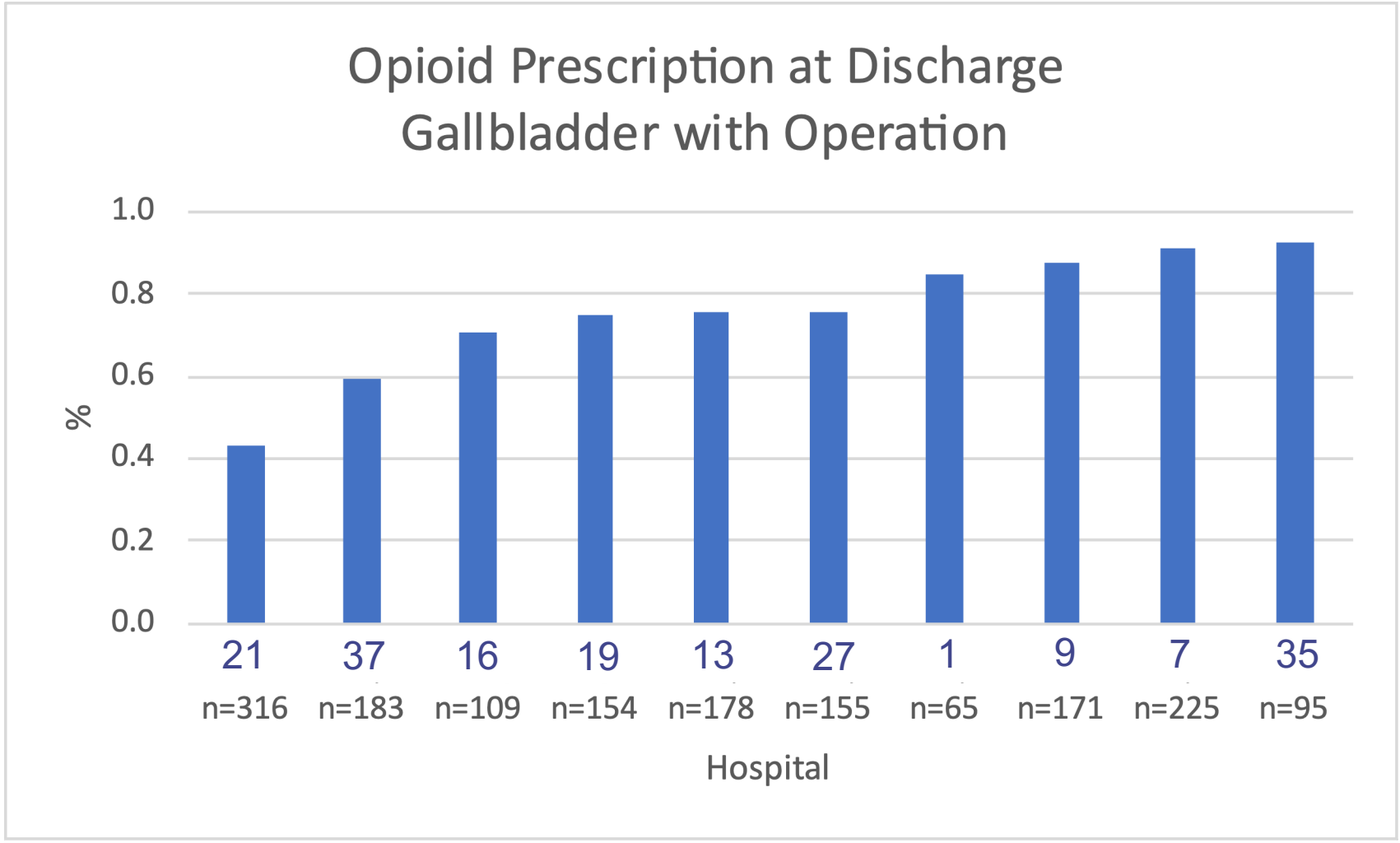
Acute Appendicitis w Operation

Operation: Appendectomy (Index only, operation=1, pre admission use of opioid medication=0)								
	Any Prescribed OME	Prescribed OME > 50th percentile		Prescribed OME > 75th percentile		Prescribed OME > Max		
Hospital	N	N	%	N	%	N	%	
9	52	48	92%	26	50%	7	13%	
1	14	13	93%	4	29%	0	0%	
13	37	36	97%	11	30%	4	11%	
35	108	106	98%	3	3%	3	3%	
16	61	52	85%	6	10%	3	5%	
37	61	57	93%	23	38%	12	20%	
21	54	49	91%	16	30%	9	17%	
7	112	112	100%	80	71%	10	9%	
19	86	86	100%	59	69%	13	15%	
27	87	83	95%	10	11%	2	2%	

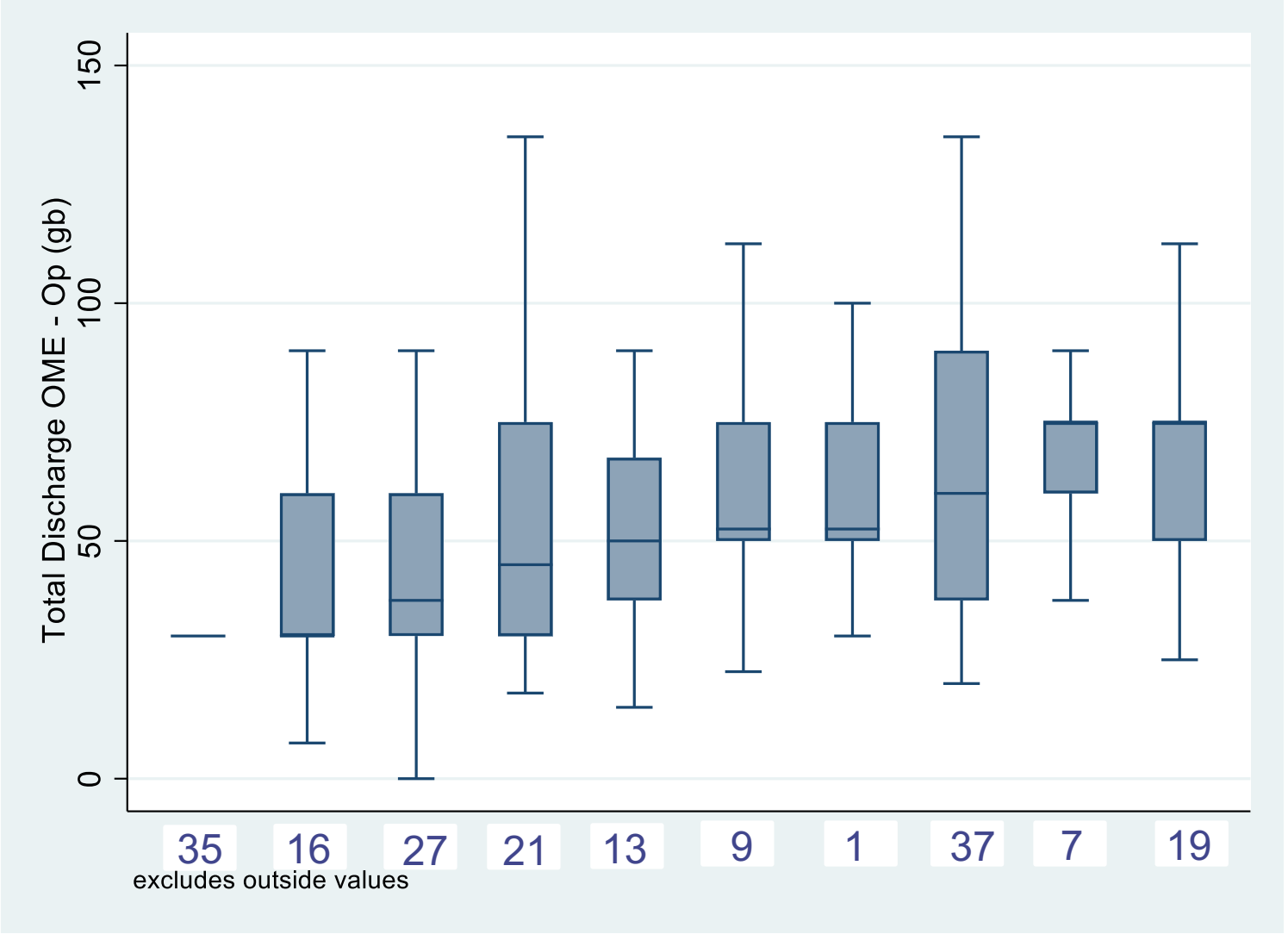
Cholecystectomy

- Michigan Open
- 5 mg Oxycodone pills
  - 1 mg oxycodone = 1.5 OME
  - 50th percentile (median) = 3 pills (Lap), 4 pills (Open)
    - 22.5 OME, 30 OME
  - 75th percentile = 6 pills (Lap), 10 pills (Open)
    - 45 OME, 75 OME
  - Maximum recommended = 10 pills
    - 75 OME

Cholecystectomy - All



Cholecystectomy - All



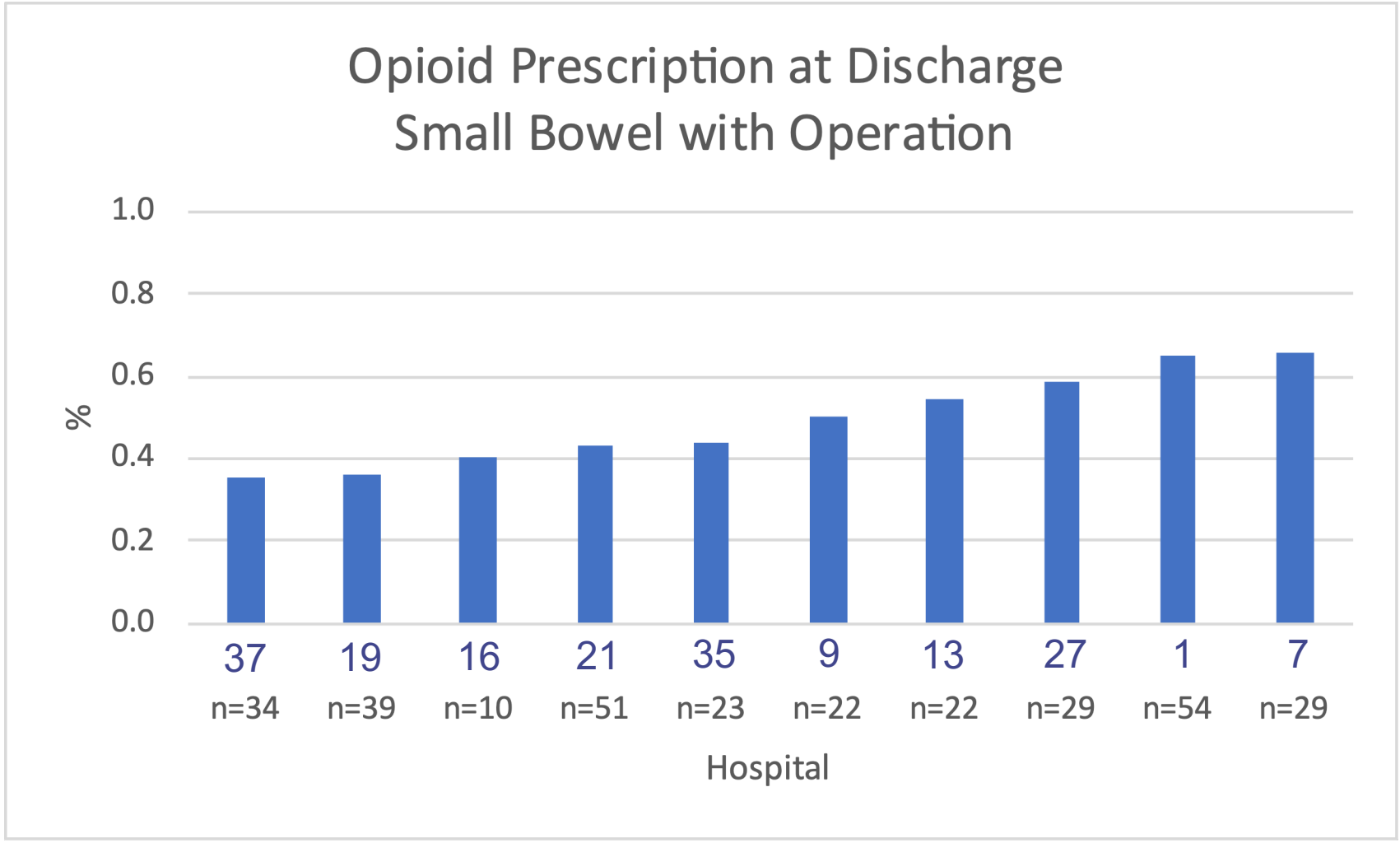
Cholecystectomy - All

Operation: Laparoscopic cholescystecomy (Index only, operation=1, type operation=lap, pre admission u								
	Any Prescribed OME	Prescribed OME > 50th percentile		Prescribed OME > 75th percentile		Prescribed OME > Max		
Hospital	N	N	%	N	%	N	%	
9	115	112	97%	97	84%	18	16%	
1	30	27	90%	24	80%	7	23%	
13	72	71	99%	45	63%	6	8%	
35	79	78	99%	6	8%	3	4%	
16	70	65	93%	16	23%	9	13%	
37	101	100	99%	58	57%	29	29%	
21	128	127	99%	54	42%	29	23%	
7	147	147	100%	124	84%	12	8%	
19	107	107	100%	89	83%	24	22%	
27	93	88	95%	18	19%	4	4%	

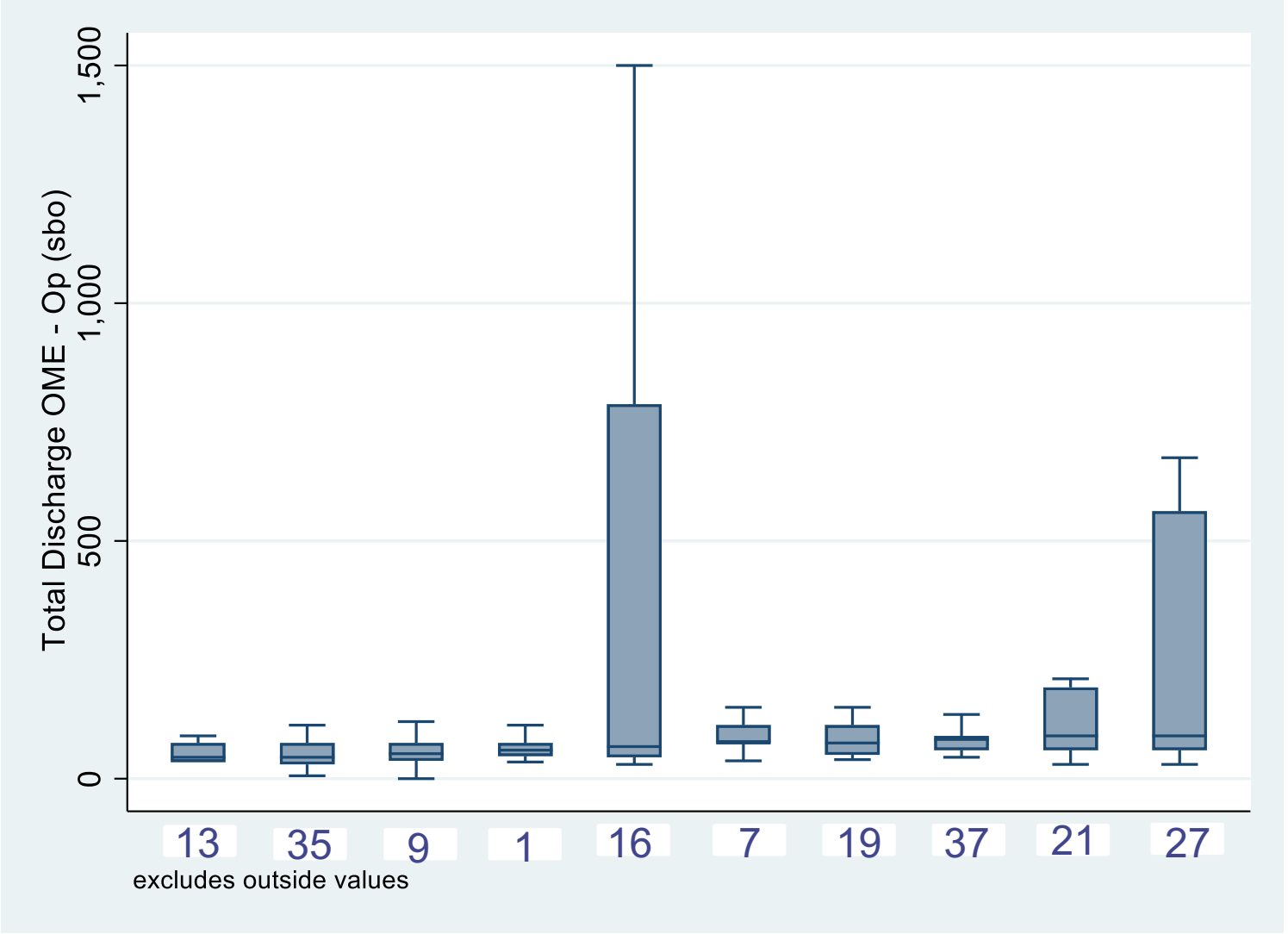
SBO

- Michigan Open (Lysis of adhesions)
- 5 mg Oxycodone pills
  - 1 mg oxycodone = 1.5 OME
  - 50th percentile (median) = 2 pills
    - 15 OME
  - 75th percentile = 8 pills
    - 60 OME
  - Maximum recommended = 10 pills
    - 75 OME

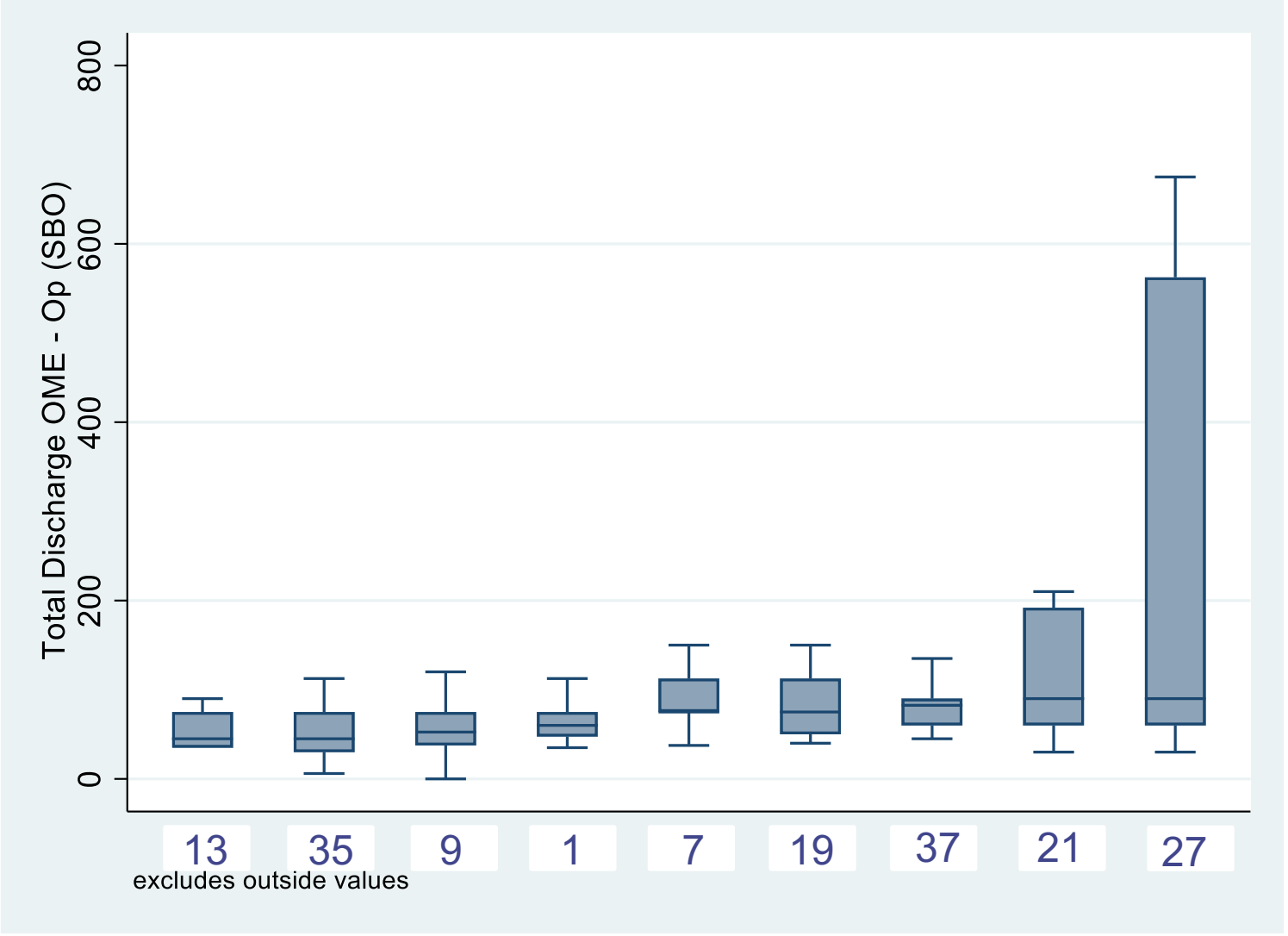
SBO - Operation



SBO - Operation



SBO - Operation



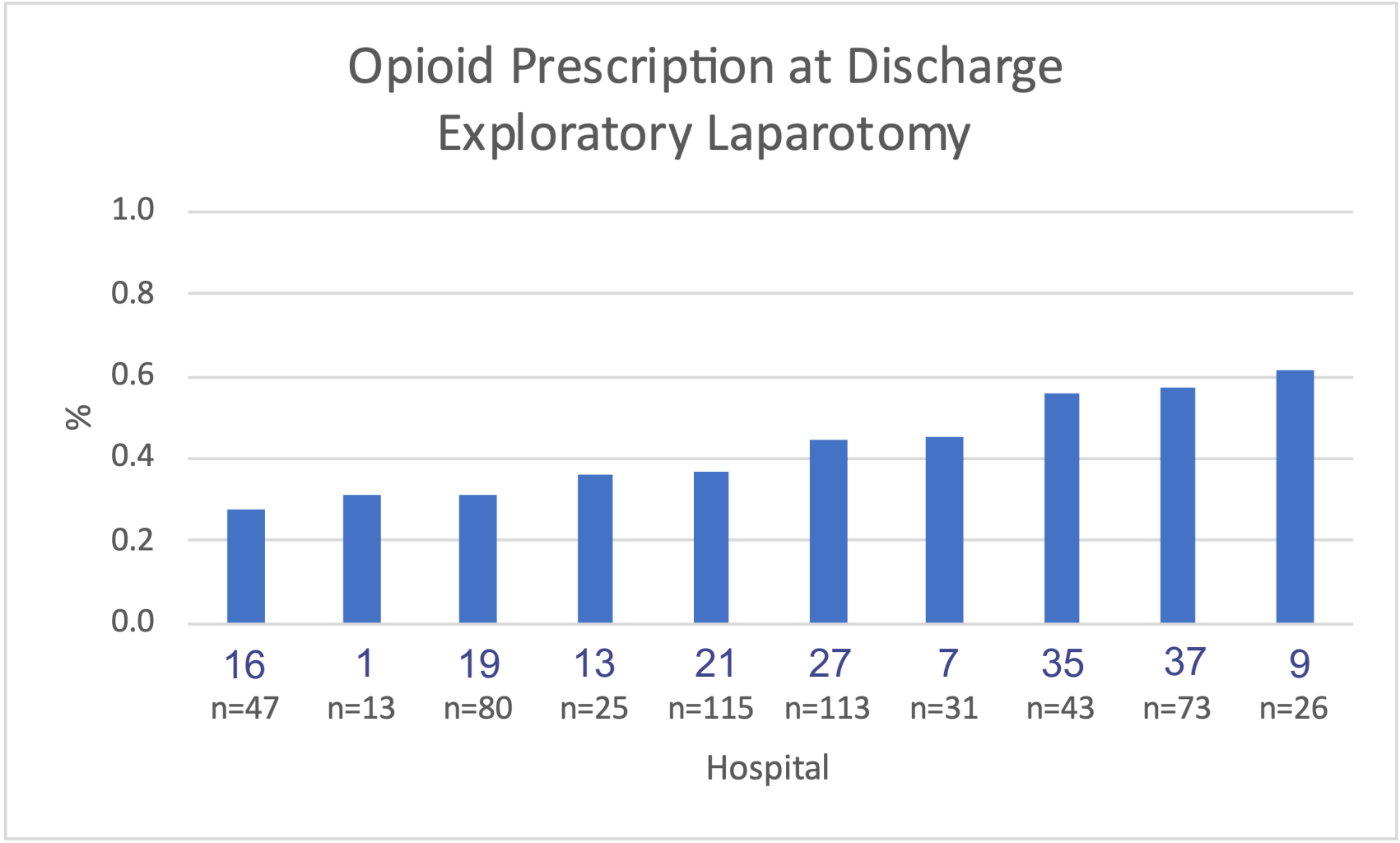
SBO - Operation

Operation: SBO w operation (Index only, operation=1, pre admission use of opioid medication=0)								
	Any Prescribed OME	Prescribed OME > 50th percentile		Prescribed OME > 75th percentile		Prescribed OME > Max		
Hospital	N	N	%	N	%	N	%	
9	9	8	89%	4	44%	2	22%	
1	30	28	93%	14	47%	5	17%	
13	10	10	100%	5	50%	3	30%	
35	10	9	90%	3	30%	2	20%	
16	4	4	100%	2	50%	1	25%	
37	11	11	100%	7	64%	5	45%	
21	20	20	100%	14	70%	11	55%	
7	17	17	100%	13	76%	5	29%	
19	14	14	100%	8	57%	4	29%	
27	11	11	100%	7	64%	5	45%	

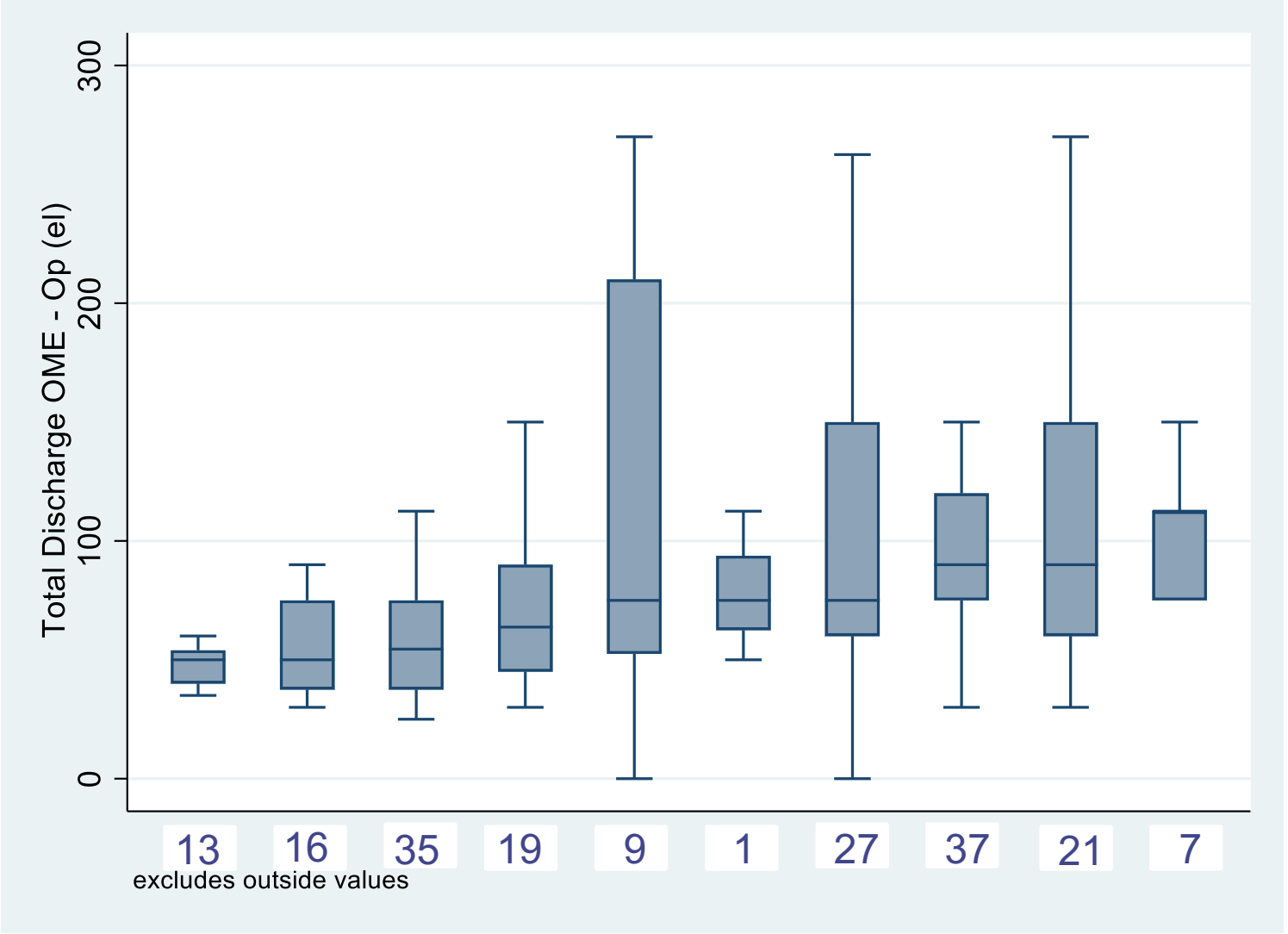
Exploratory Laparotomy

- Michigan Open (Colectomy)
- 5 mg Oxycodone pills
  - 1 mg oxycodone = 1.5 OME
  - 50th percentile (median) = 3 pills
    - 22.5 OME
  - 75th percentile = 10 pills
    - 75 OME
  - Maximum recommended = 10 pills
    - 75 OME

Exp. Laparotomy



Exp. Laparotomy



Exp. Laparotomy

Operation: Exploratory laparotomy (Index only, pre admission use of opioid medication=0)								
	Any Prescribed OME	Prescribed OME > 50th percentile		Prescribed OME > 75th percentile		Prescribed OME > Max		
Hospital	N	N	%	N	%	N	%	
9	13	13	100%	7	54%	7	54%	
1	2	2	100%	1	50%	1	50%	
13	8	8	100%	1	13%	1	13%	
35	21	21	100%	5	24%	5	24%	
16	13	13	100%	1	8%	1	8%	
37	35	35	100%	19	54%	19	54%	
21	37	37	100%	24	65%	24	65%	
7	11	11	100%	5	45%	5	45%	
19	17	17	100%	3	18%	3	18%	
27	37	34	92%	15	41%	15	41%	

Questions

Questions

Are you aware of these prescribing guidelines?

How to make into a process measure?

Focus on 75th percentile

All patients or specific diseases?

Exclude SBO

Hospital CQI Index - Initiatives

Mark Hemmila MD

Status

- 2023
  - Does not count in P4P
  - Goal is to develop measures and provide scoring
    - Preseason
  - Share MACS data and economic data with BCBSM
- 2024
  - TBD

CQI Index

- 2022
  - Attendance
  - Data Submission
  - Validation visit

Michigan Acute Care Surgery (MACS)
2022 Performance Index
January 1 to December 31, 2022

Measure	Weight	Measure Description	Points	
#1	30	**Data Submission**		PARTICIPATION (100%)
		On time and complete 3 of 3 times	30	
		On time and complete 2 of 3 times	5	
		On time and complete 1 of 3 times	0	
#2	25	**Meeting Participation-Surgeon**		
		Participated in 3 of 3 meetings	25	
		Participated in 2 of 3 meetings	10	
		Participated in 1 of 3 meetings	5	
		Participated in 0 of 3 meetings	0	
#3	25	**Meeting Participation-Program Manager or Data Abstractor**		
		Participated in 3 of 3 meetings	25	
		Participated in 2 of 3 meetings	10	
		Participated in 1 of 3 meetings	5	
		Participated in 0 of 3 meetings	0	
#4	20	**Data Validation**		
		Completed	20	
		Not completed	0	
		Total (Max Points) =	100	

Additional Information

Measure 1: Data Submission: Partial/incomplete submissions receive no points. Complete data submission is defined as all cases submitted for the requested interval.

Measure 2: Meeting Participation: Surgeon represents one center only; alternate must be an attending level equivalent.

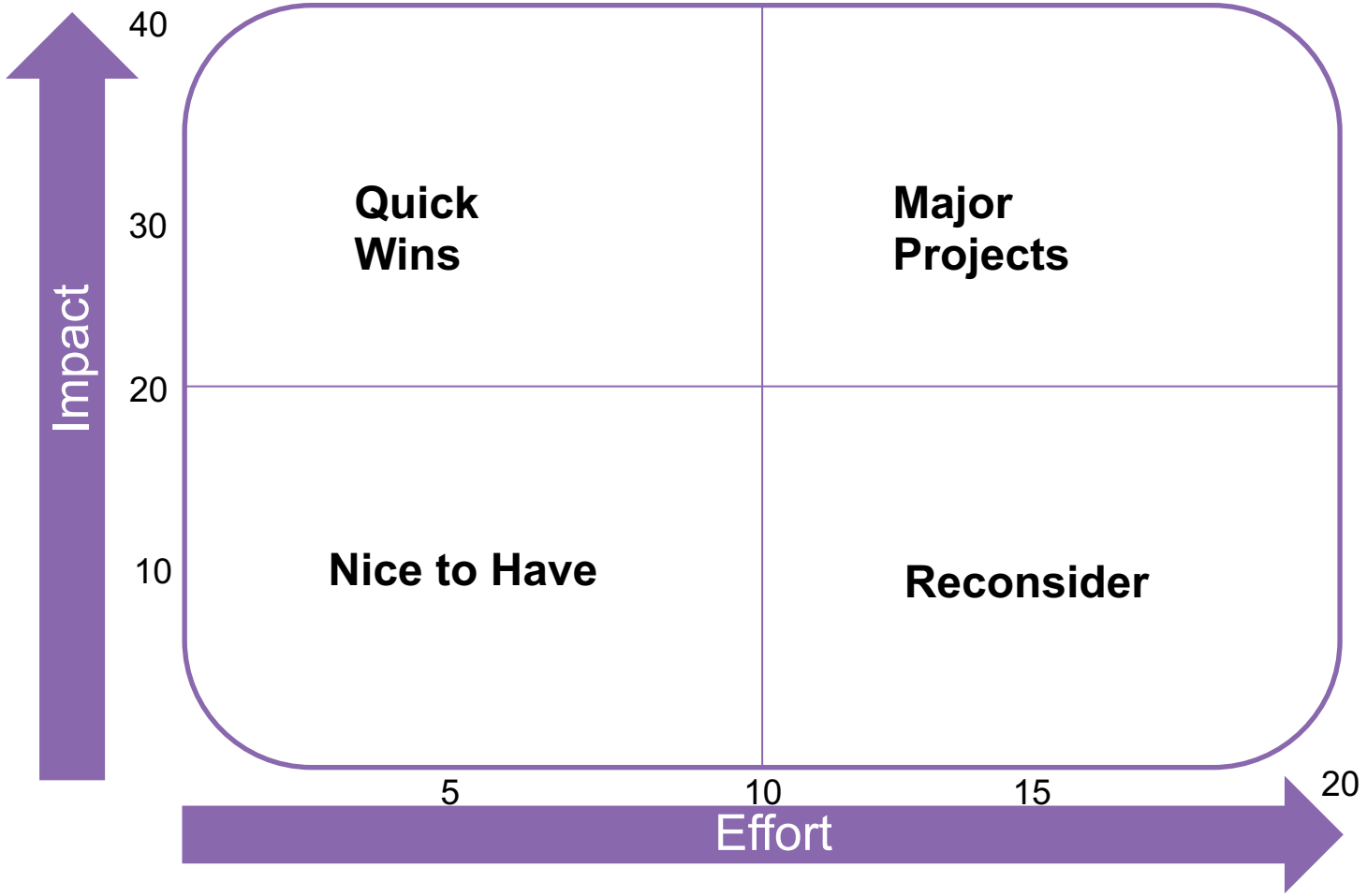
Maximizing Value

Impact-Effort Matrix & Rubric for Selection of Initiatives

Jennifer J. Griggs, MD, MPH

Keli K. DeVries, LMSW

Impact-Effort Matrix



Rubric

Impact Scored 1 - 5	
BCBSM priority	
Population impact	
Impact on health equity	
Patient & caregiver priority	
Practice engagement/priority	
Time to impact (reverse score)	
Collaboration with other CQIs	
External funding (grants)	
Total possible	**40**

Effort Scored 1 - 5	
Barriers to success (feasibility)	
Additional FTE requirement(s)	
Additional expertise required	
Training & other costs	
Total possible	**20**

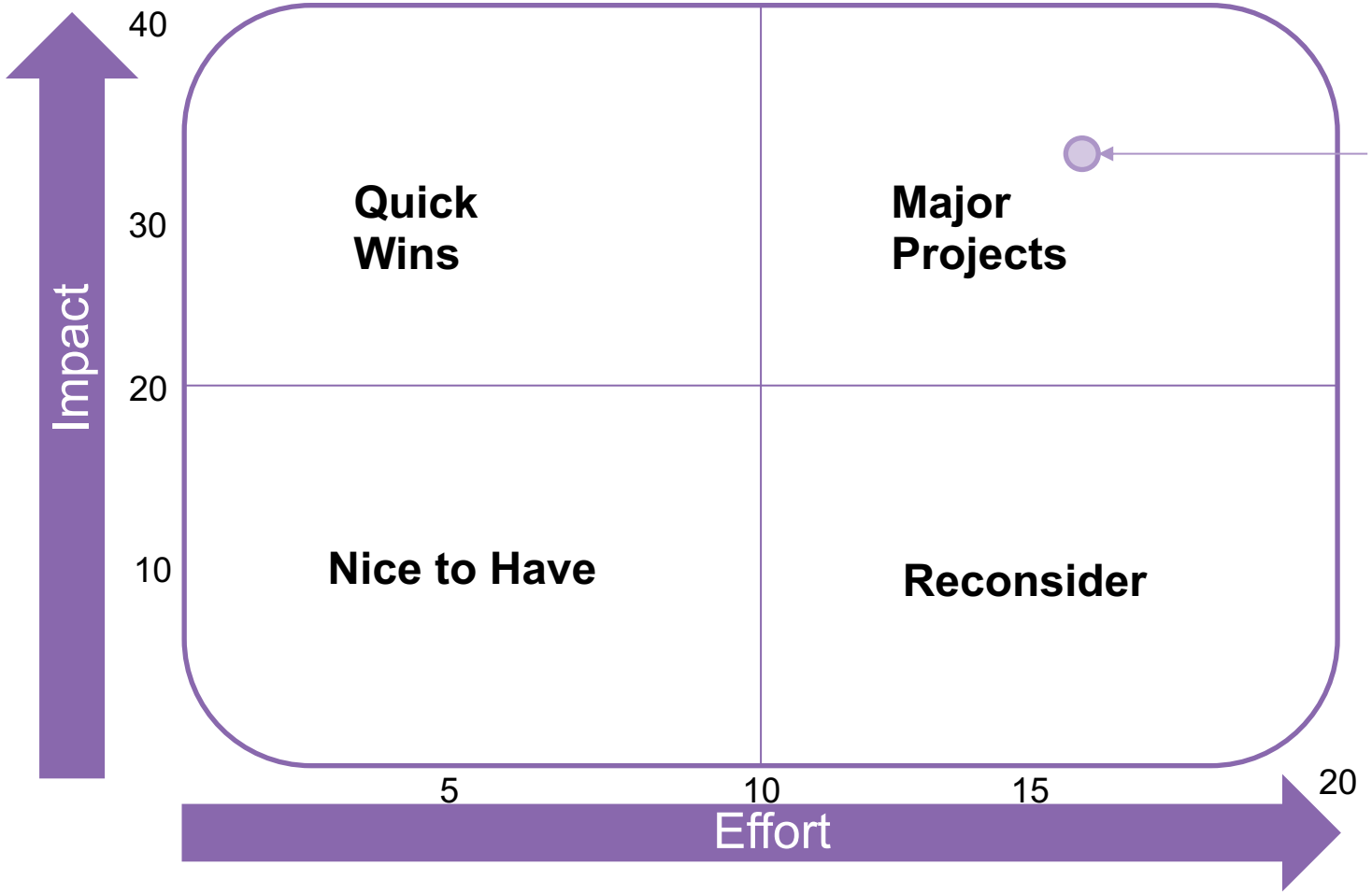
Examples

Clinician & Team Training in Important Conversations

Impact Scored 1 – 5	
BCBSM priority	3
Population impact	5
Impact on health equity	5
Patient & caregiver priority	5
Practice engagement/priority	4
Time to impact (reverse score)	4
Collaboration with other CQIs	4
External funding (grants)	3
Total	**33**

Effort Scored 1 - 5	
Barriers to success (feasibility)	4
Additional FTE requirement(s)	4
Additional expertise required	4
Training & other costs	4
Total	**16**

Clinician & Team Training in Important Conversations



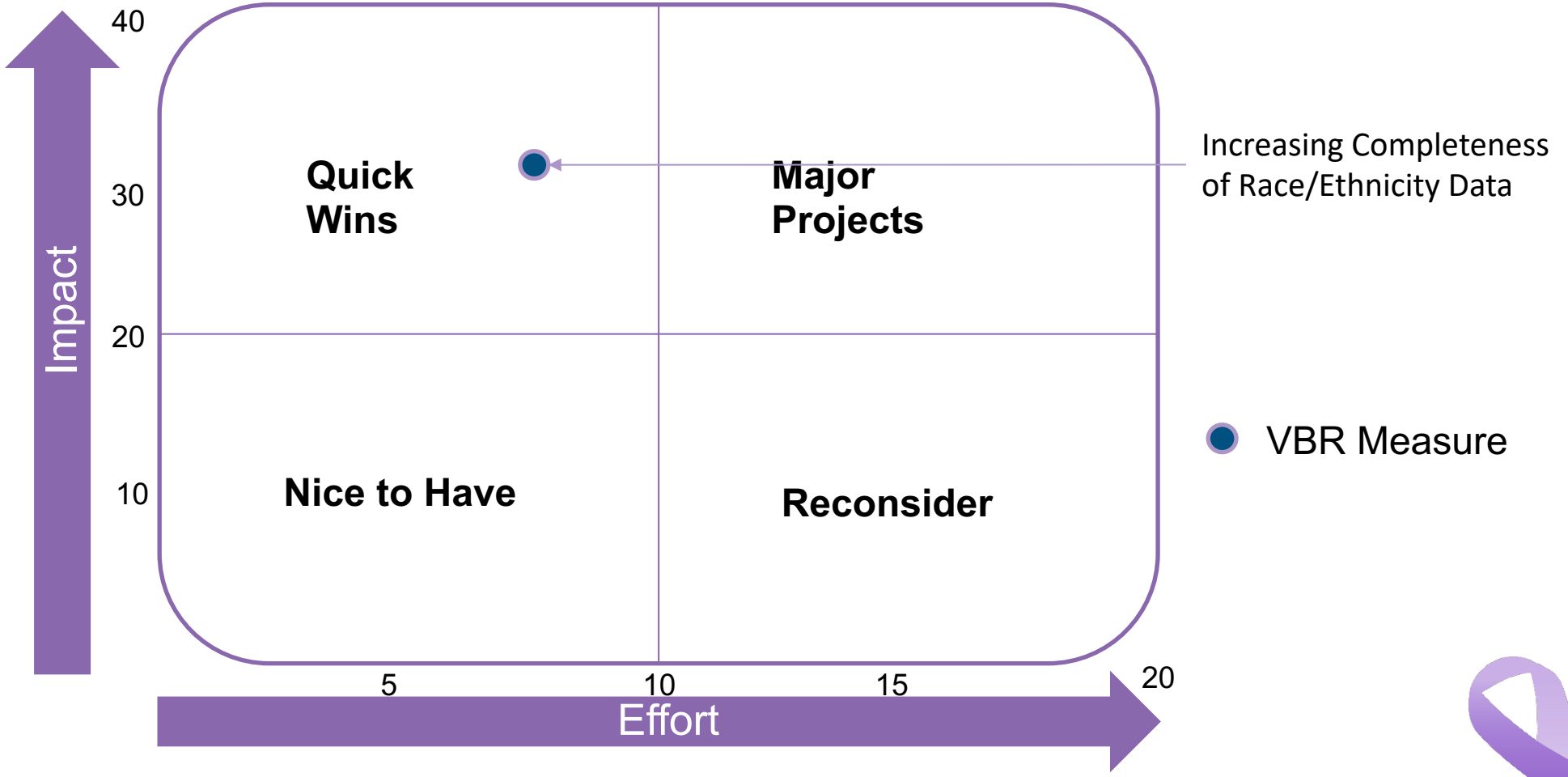
MOQC
MICHIGAN ONCOLOGY QUALITY CONSORTIUM

Increasing Completeness of Race/Ethnicity Data

Impact Scored 1 – 5	
BCBSM priority	5
Population impact	5
Impact on health equity	5
Patient & caregiver priority	3
Practice engagement/priority	4
Time to impact (reverse score)	4
Collaboration with other CQIs	4
External funding (grants)	1
Total	**31**

Effort Scored 1 - 5	
Barriers to success (feasibility)	2
Additional FTE requirement(s)	2
Additional expertise required	2
Training & other costs	2
Total	**8**

Increasing Completeness of Race/Ethnicity Data

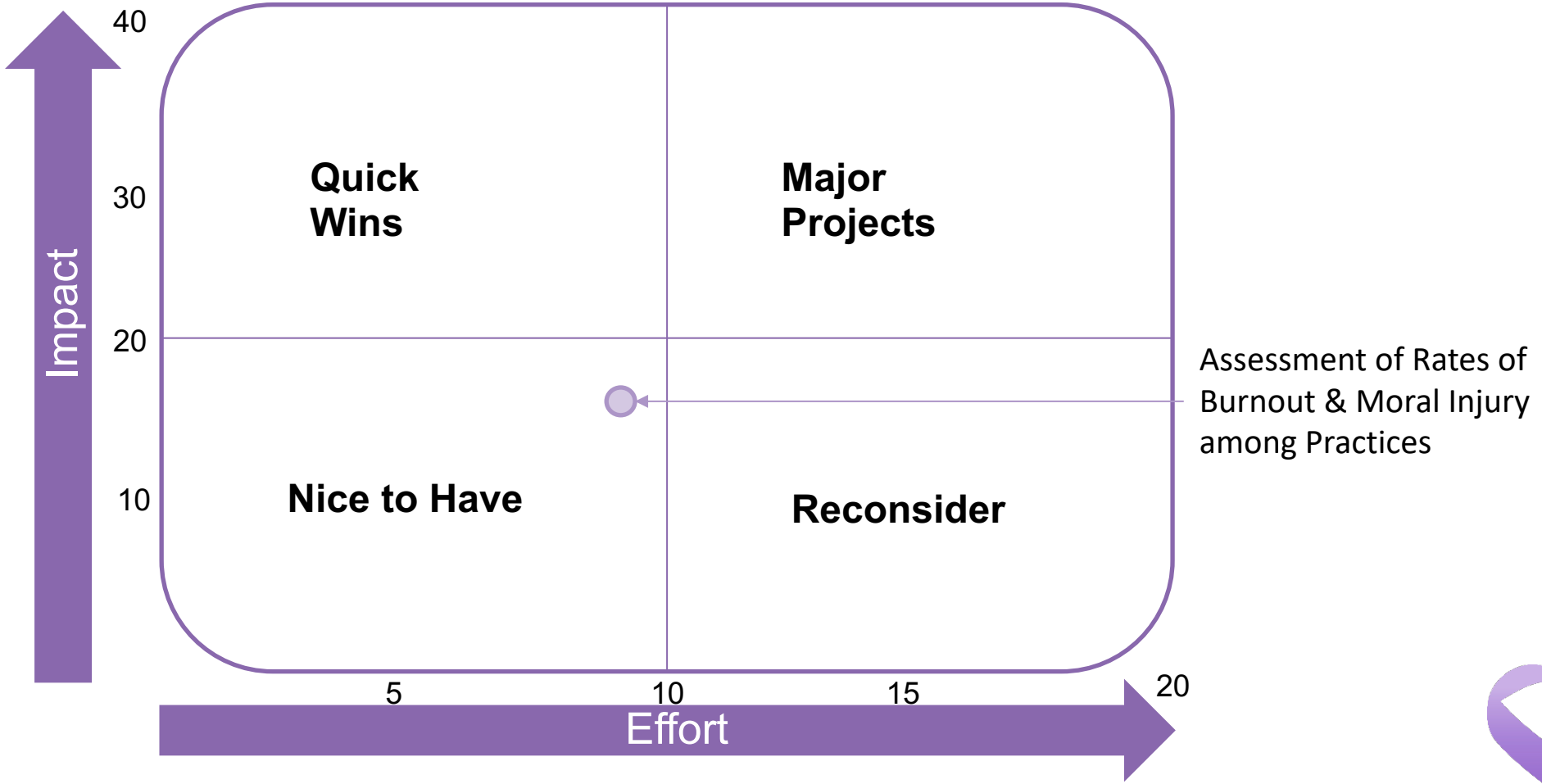


Assessment of Rates of Burnout & Moral Injury among Clinicians

Impact Scored 1 – 5	
BCBSM priority	1
Population impact	3
Impact on health equity	4
Patient & caregiver engagement	2
Practice engagement	4
Time to impact (reverse score)	2
Collaboration with other CQIs	1
External funding (grants)	1
Total	**18**

Effort Scored 1 - 5	
Barriers to success (feasibility)	2
Additional FTE requirement(s)	2
Additional expertise required	2
Training & other costs	3
Total	**9**

Assessment of Rates of Burnout & Moral Injury among Practices

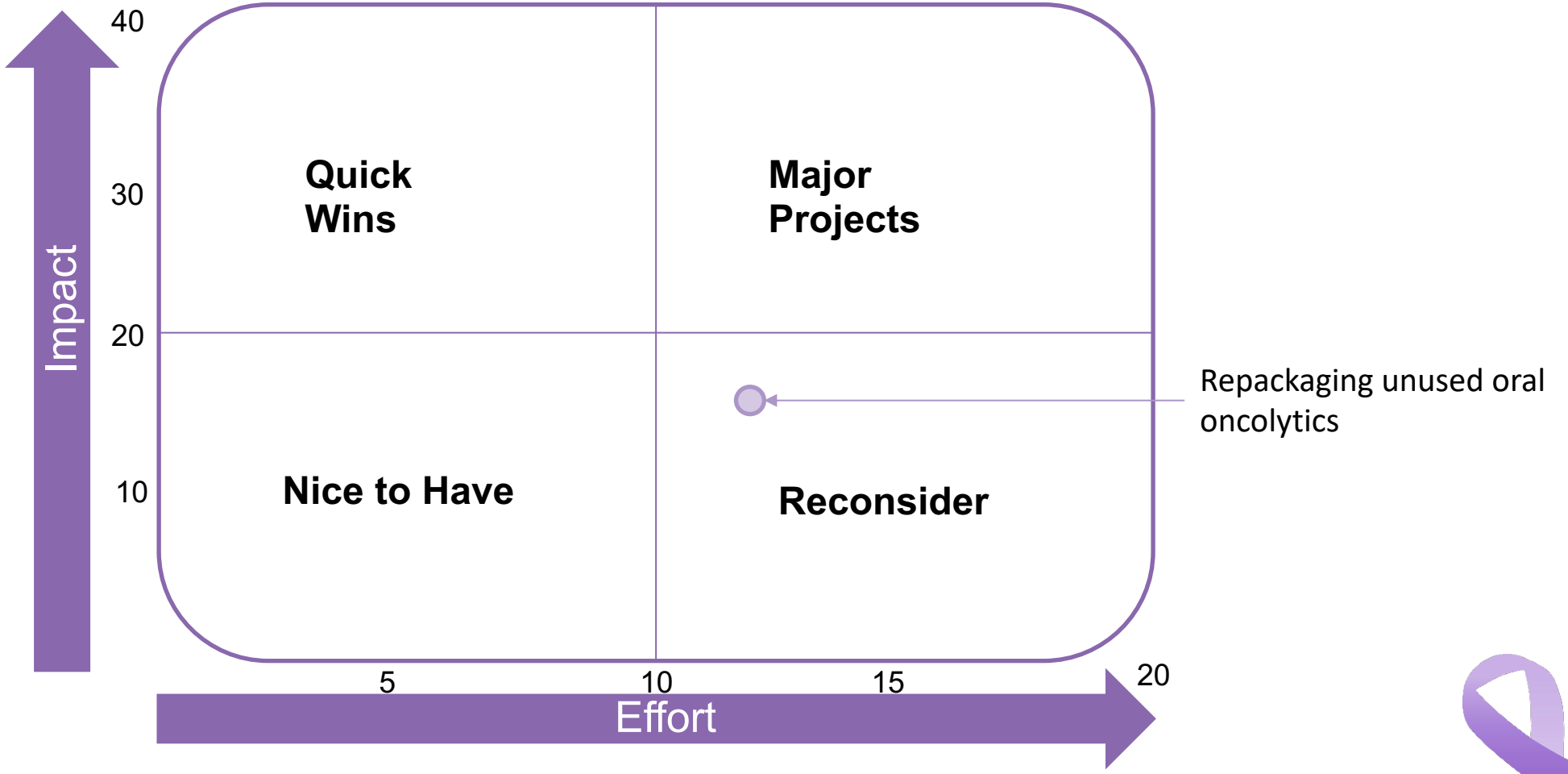


“Rescuing” & Repackaging Unused Oral Oncolytics

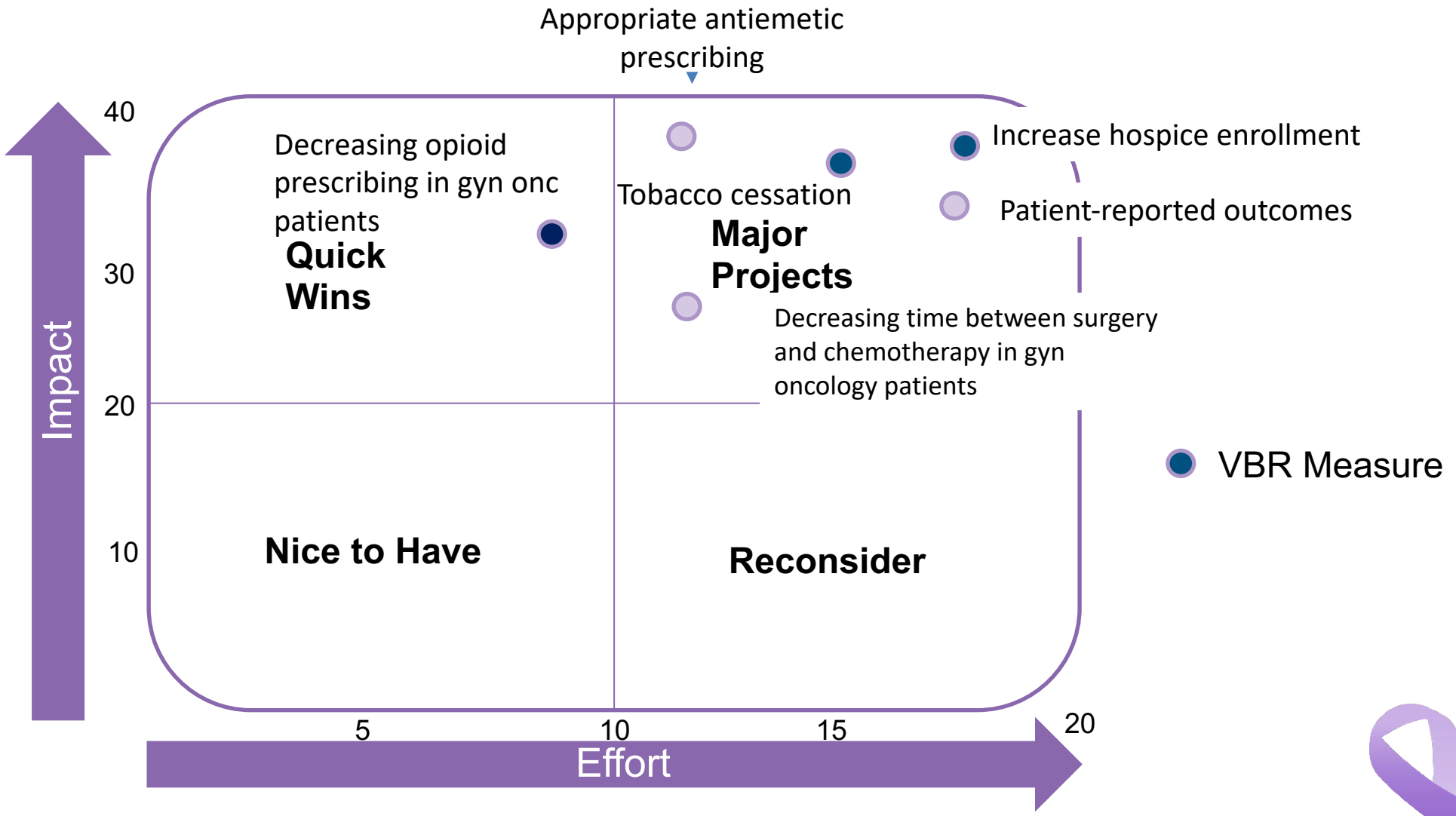
Impact Scored 1 – 5	
BCBSM priority	1
Population impact	2
Impact on health equity	3
Patient & caregiver priority	3
Practice engagement/priority	3
Time to impact (reverse score)	2
Collaboration with other CQIs	2
External funding (grants)	1
Total	**17**

Effort Scored 1 - 5	
Barriers to success (feasibility)	4
Additional FTE requirement(s)	1
Additional expertise required	4
Training & other costs	4
Total	**13**

“Rescuing” and repackaging unused oral oncolytics



Other MOQC Initiatives



Challenges

- Ratings are subjective
- Multiple stakeholders and the role of the “elder”
- BCBSM priorities shift
- Costs not always known a prior
- FTE requirements assume engaged, curious, and stable team
- Sustainability not easily assessed
- Disadvantages smaller, less well-resourced practices

Possible CQI Initiatives

- Data Validation Scoring
  - Easy
  - Should do
- Z-scores
  - Acute appendicitis
  - Gallbladder
  - Readmissions, ED visits
    - Independent
    - Combo

Z-Scores Explained

Anne Cain-Nielsen

Performance index measure

Michigan Trauma Quality Improvement Program (MTQIP) 2019 Performance Index January 1, 2019 to December 31, 2019			
Measure	**Weight**	**Measure Description**	**Points**
#7	10	**Serious Complication Rate-Trauma Service Admits (3 yr: 7/1/16-6/30/19)** Z-score: < -1 (major improvement) Z-score: -1 to 1 or serious complications low-outlier (average or better rate) Z-score: > 1 (rates of serious complications increased)	 10 7 5
#8	10	**Mortality Rate-Trauma Service Admits (3 yr: 7/1/16-6/30/19)** Z-score: < -1 (major improvement) Z-score: -1 to 1 or mortality low-outlier (average or better rate) Z-score: > 1 (rates of mortality increased)	 10 7 5

Goal

We want to answer the (important!) question:

Is my hospital improving over time?

Goal

We want to answer the (important!) question:

Is my hospital improving over time?

How would you answer this question?

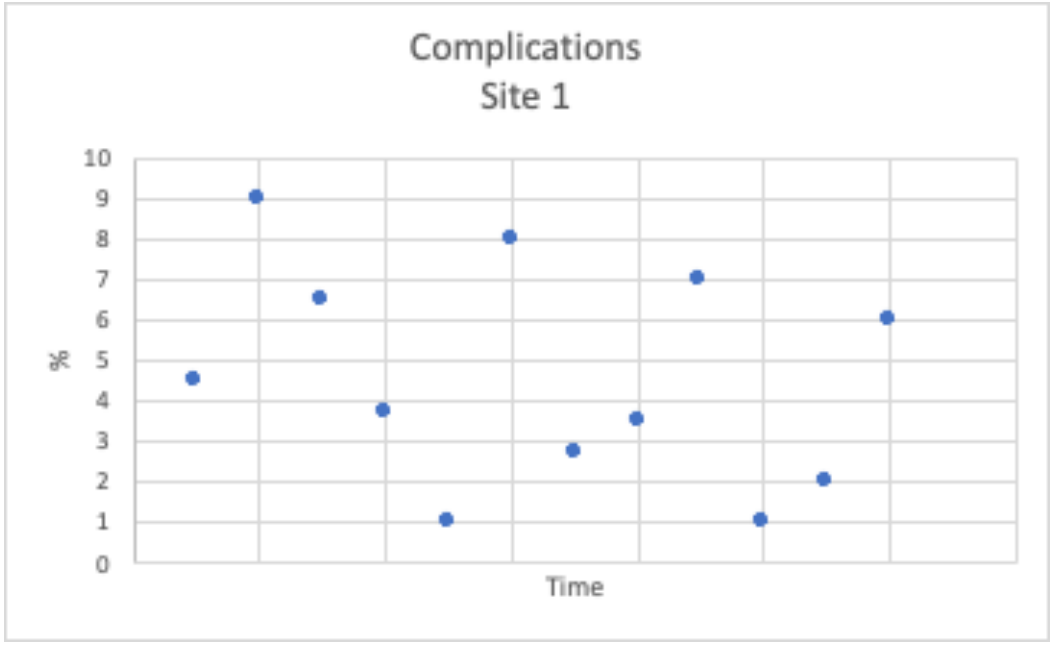
We are interested in *trends*.
The z-score tests whether a trend exists.

What does my trend look like?

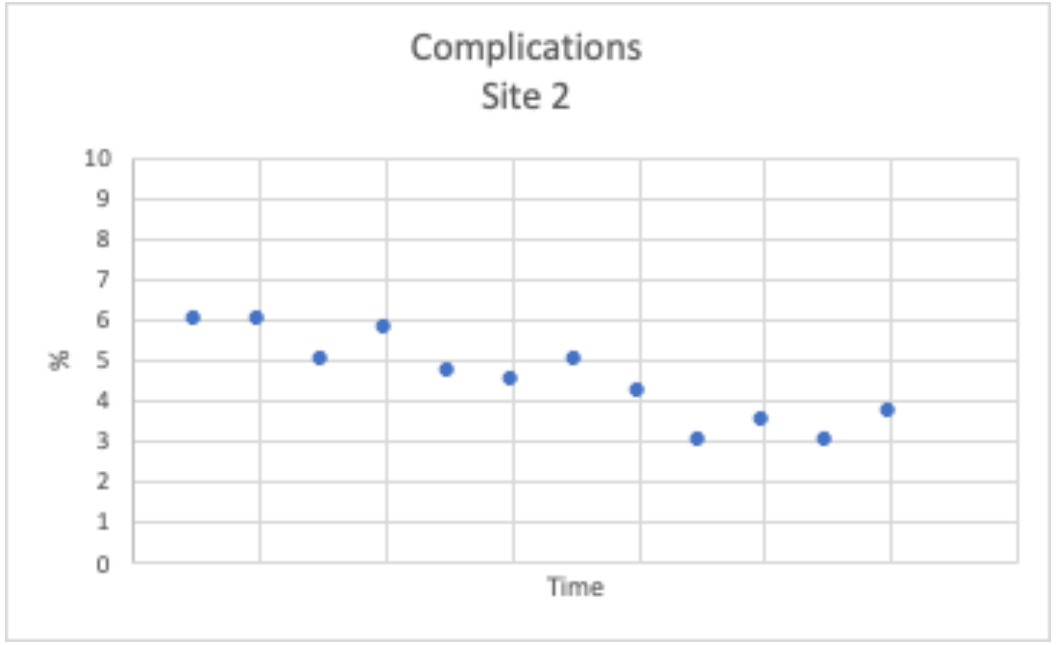
- Am I trending upwards, downwards, or flat?
- How do we know?
- Let’s try just looking at the data first.

Who is improving more?

Site #1



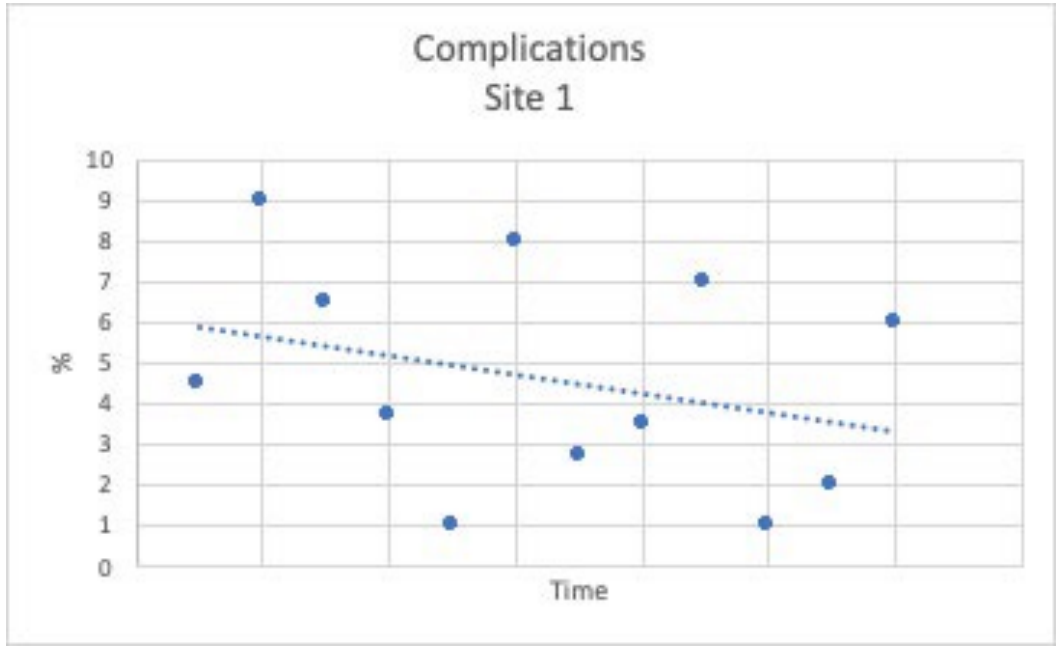
Site #2



Same slope, different variability

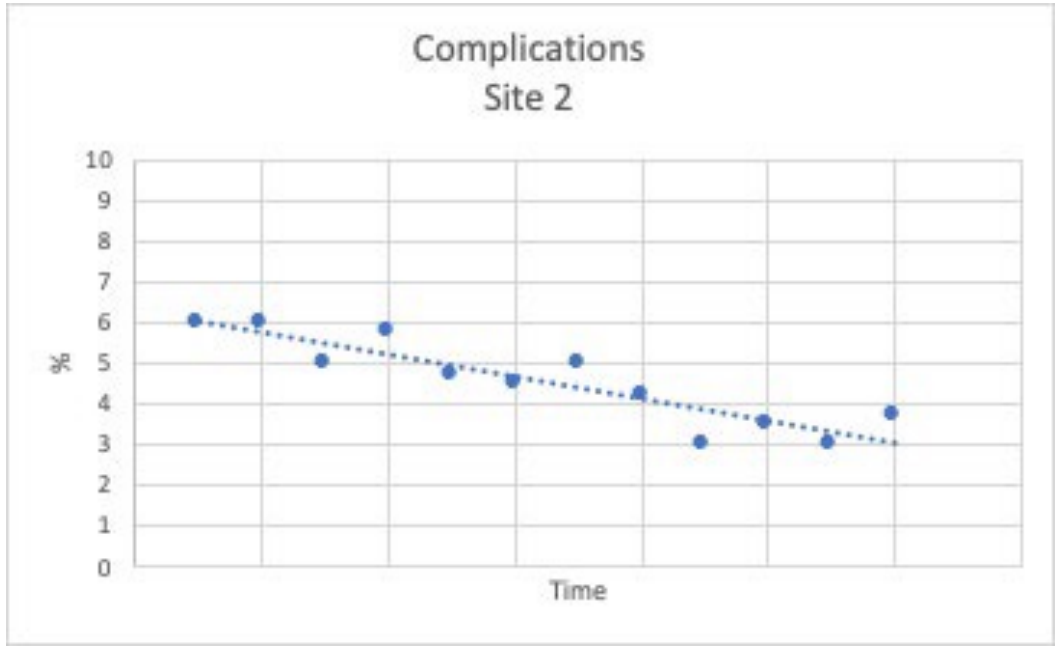
Site #1

High variability



Site #2

Low variability



Testing for trend

- Visual inspection only gets us so far.
- We can *test* whether our trend is actually going downwards (or upwards).
- We need:
  - Slope of the trend line
  - Measure of the variability around that trend line

Calculation

- Test for whether trend *over time* is flat.
- (Whether the slope of the line for time = 0).

Z = Slope / Variability around slope

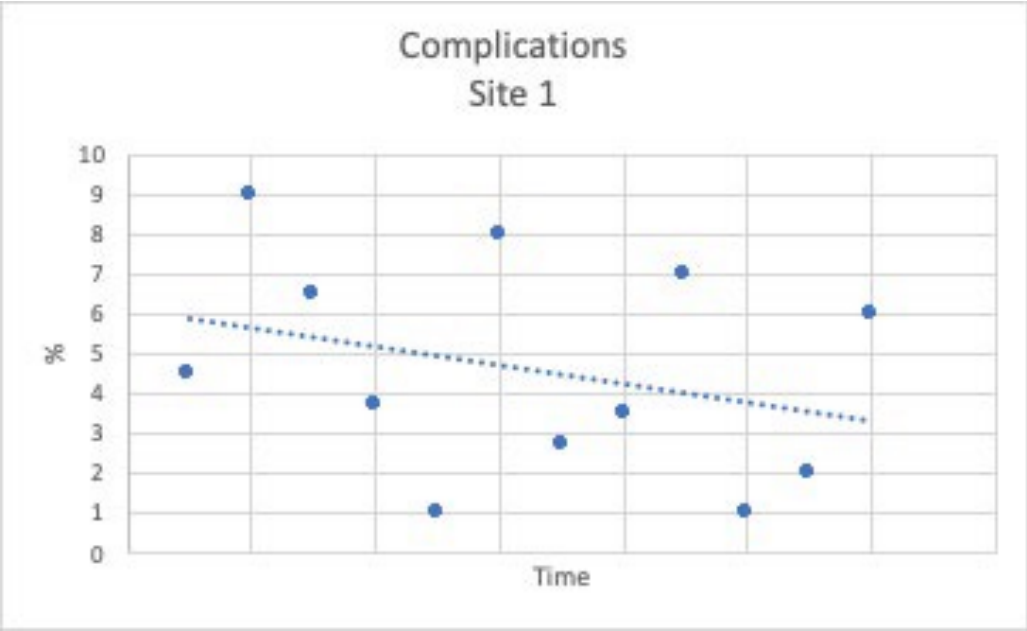
$Z = \beta_{time} \ / \ se(\beta_{time})$

*Note: Slope will be negative for downwards trends

*Note: Z will be bigger (farther from 0) if variability is small

Site #1

High variability



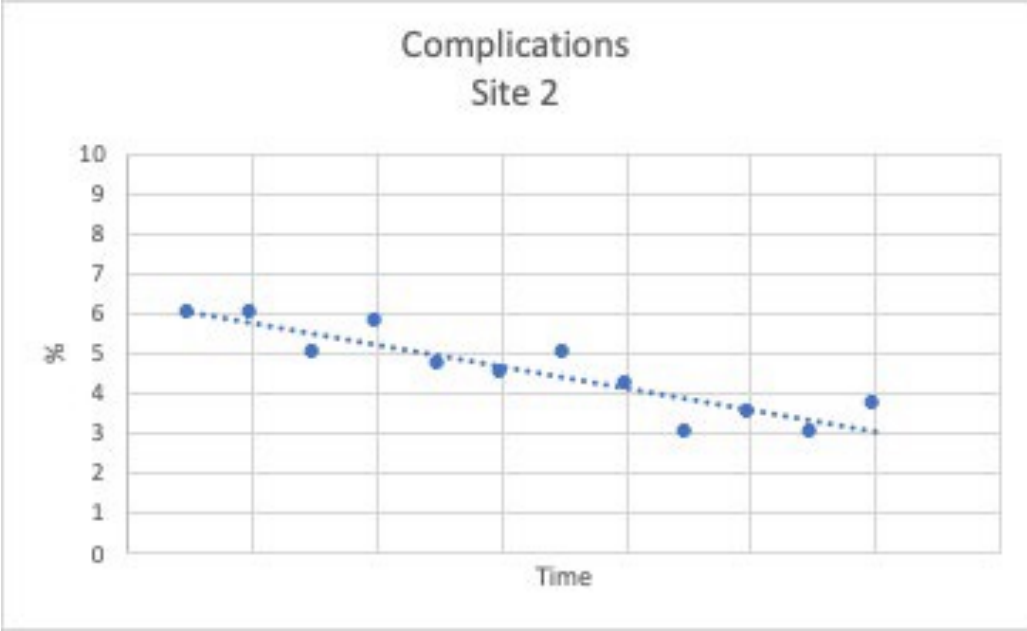
Z = slope / standard error of slope

Z= -0.25 / 0.3

Z = -0.83

Site #2

Low variability

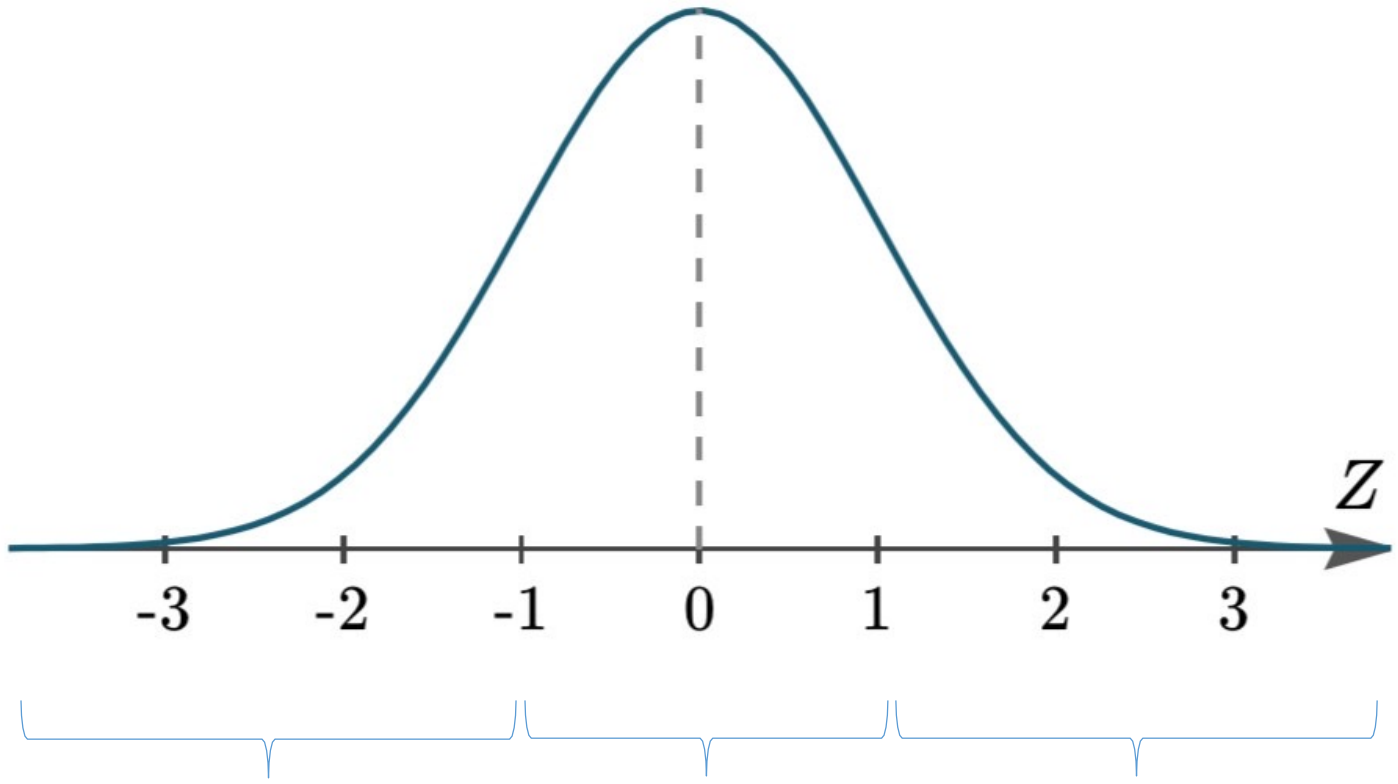


Z = slope / standard error of slope

Z= -0.25 / 0.05

Z = -5.0

Z-score follows a normal distribution



Me vs Me

- Calculations use ***your hospital's data only***
- Adjusts for ***your patients'*** injury severity, ED vitals, comorbidity burden, demographics

Possible CQI Initiatives

- Opioid Prescribing
  - Adjunct medication prescribing
  - % of opioid naive patients >75th percentile
    - Acute appendicitis (operation)
    - Gallbladder (operation)
    - Emergent Ex. Lap. (operation)
- Medical Rx of uncomplicated appendicitis
  - Home from ED
  - Antibiotic recommendations?

Possible CQI Initiatives

- Uncomplicated appendicitis
  - If fecalith present > operative intervention
- Emergent Ex. Lap bundle
  - Obtain and calculate NEWS2 score
  - Timing of antibiotic administration

Work on menu of initiatives between meetings and at meetings.

Feedback (mhemmila@umich.edu)

- Reports
  - Questions
  - Problems/Mistakes
  - Improvements
- Homework
- Speakers, Topics, Information

- See you in April