



New England Obstetrical and
Gynecological Society
Sturbridge, MA

Promoting Vaginal Birth

October 18, 2023

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Objectives

- Review the risks associated with unnecessary cesarean births
- Review the “optimal rate” of NTSV cesarean births
- Review the history of Promoting Vaginal Birth (PVB) work in the US
- Describe Dartmouth Hitchcock’s PVB project including outcomes

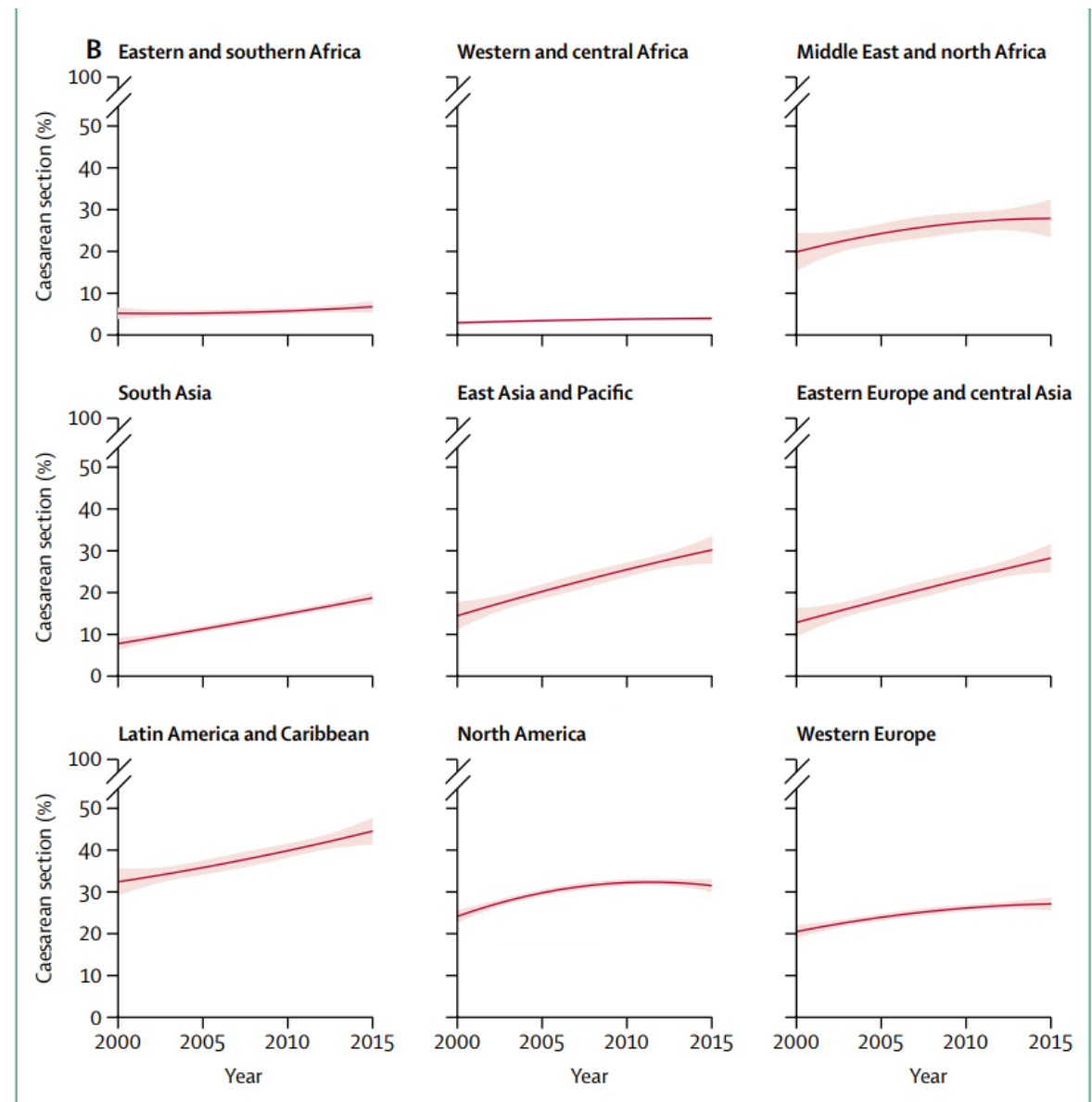
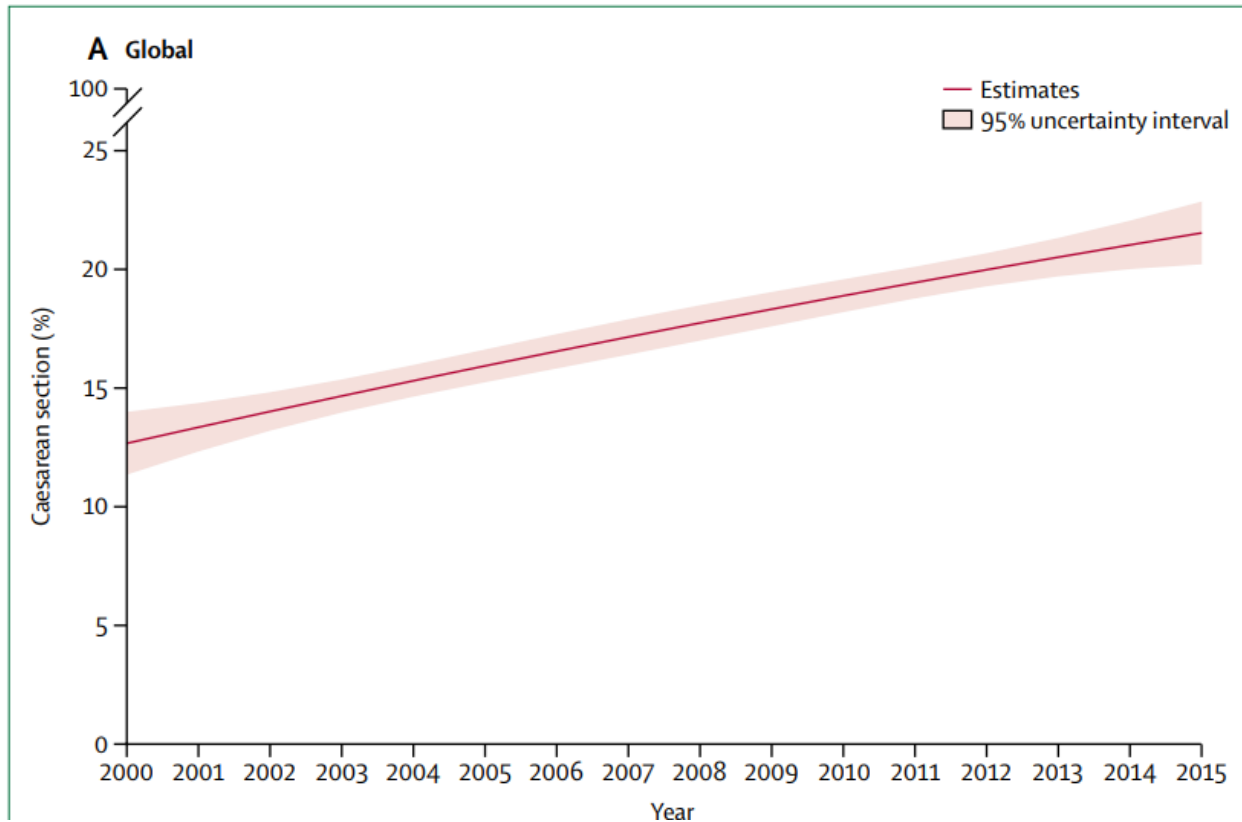
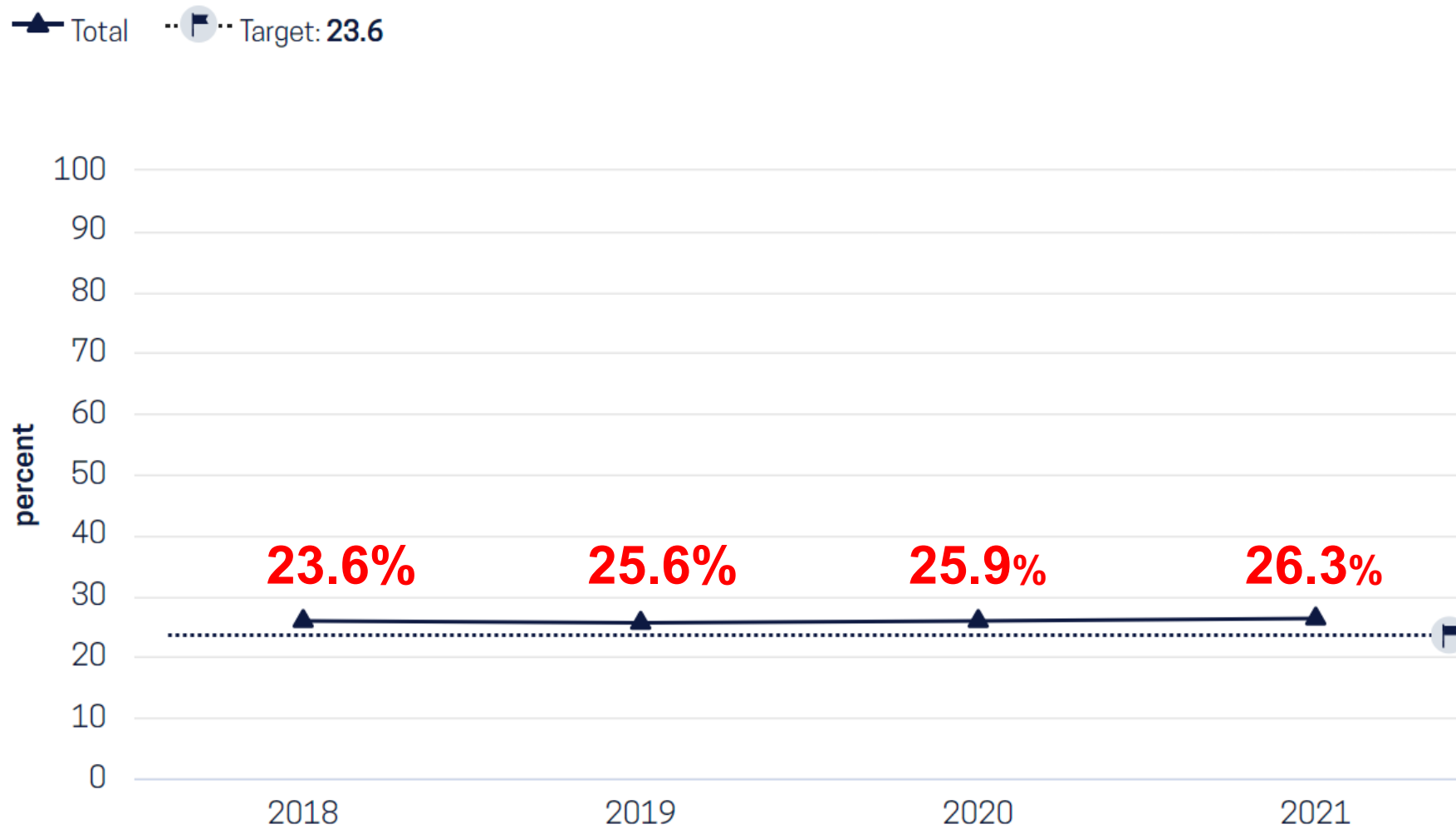


Figure 1: Estimated frequency of and trends in caesarean section use, as a proportion of livebirths between 2000 and 2015
 (A) Global data and (B) regional data.

Cesarean births among low-risk women with no prior births, 2018-2021

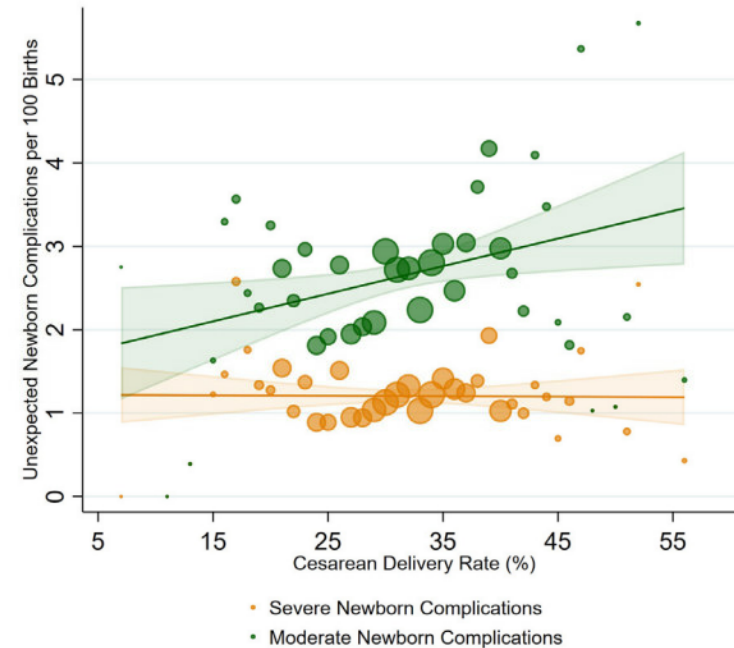
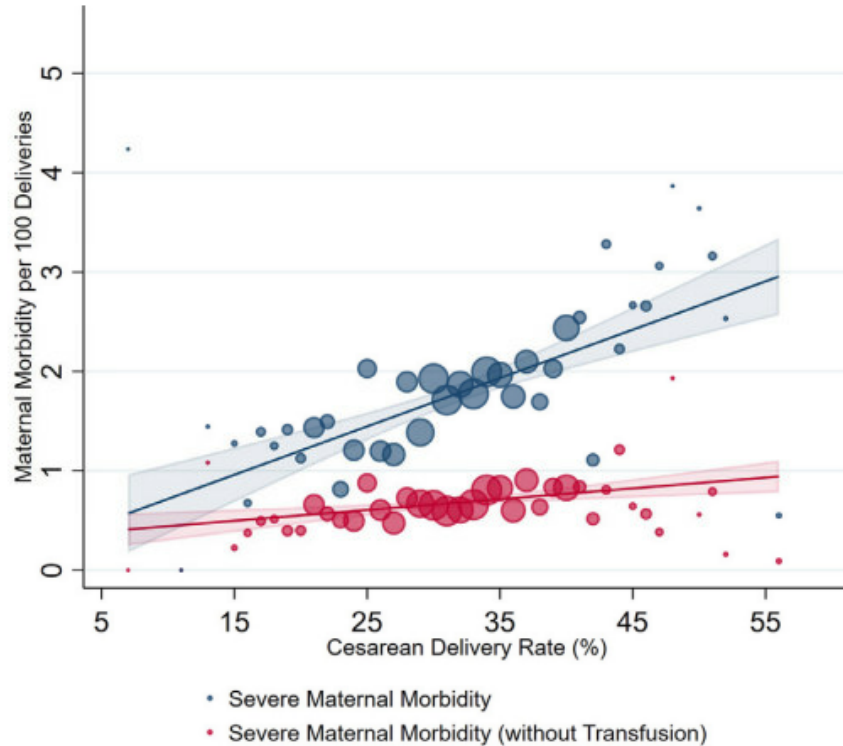


Why Promote Vaginal Birth?

Cesarean delivery is associated with increased maternal and neonatal morbidity

- PPH, blood transfusion
 - Bowel/bladder injury
 - Surgical site infection/wound complications
 - Urinary tract infections
 - VTE
 - Hysterectomy
 - Risk to future pregnancies including repeat cesarean and placenta accreta spectrum
 - Death
- Lower rates of breastfeeding
 - Greater likelihood of hospital readmission
 - Higher rates of respiratory morbidity for baby including need for ventilation and NICU admissions
 - Impact on neonatal microbiome and increased rates of asthma, allergic rhinitis, celiac, Type 1 DM and gastroenteritis

FIGURE 2
Relationship between of hospital CD rates and SMM and unexpected newborn complication rates



Cross sectional study from 2016
 831,111 deliveries from 621 hospitals
 Mean cesarean rate 30.5%
 Every % increase in a hospitals cesarean rate was associated with a 3.3% increase in severe maternal morbidity
 No association between cesarean delivery rates and unexpected newborn complications once adjusted

UNC: joint commission perinatal care performance measure-> cohort is term and nonanomalous, weight >2500g and no preexisting conditions (genetic abnormalities/maternal drug exposure)

Relationship between of hospital CD rates and (A) SMM and (B) unexpected newborn complication rates. The unadjusted rates are shown in comparison with the overall CD rates. Because there were over 600 hospitals included in the analysis, counties were grouped by their CD rate (to the nearest 0.5 percentage point) for graphical representation. The marker sizes are reflective of relative delivery volumes.

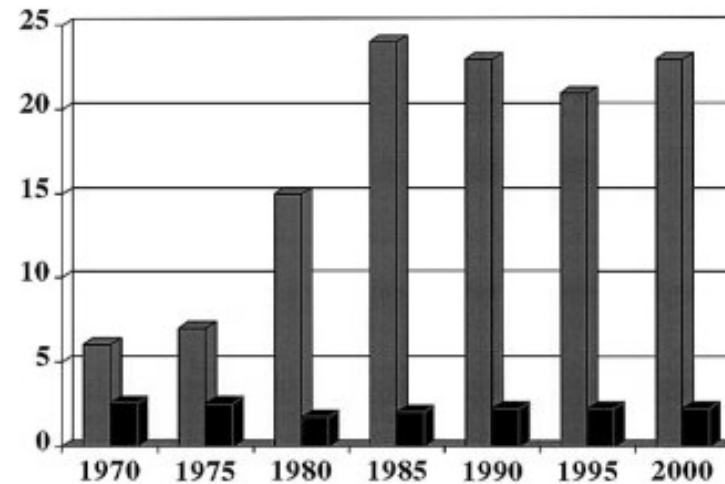
CD, cesarean delivery; SMM, severe maternal morbidity.

Clapp. Cesarean delivery rates and maternal and neonatal complications. *Am J Obstet Gynecol MFM* 2021.

Why Promote Vaginal Birth?

Increasing rates of cesarean **NOT** associated with improved neonatal morbidity or mortality

- No change in cerebral palsy rates over the last 3 decades despite a 5 fold increase in the rate of cesarean birth



[Download : Download high-res image \(36KB\)](#)

[Download : Download full-size image](#)

Continuous External
Fetal monitoring
introduced

Figure. Cerebral palsy prevalence (*black bars*) in developed countries and the United States. *Dark gray bars*, Cesarean section rate. (Based on pooled data from Sweden, Australia, Canada, Scotland, Denmark, England, United States, Norway, and Ireland.^{6, 7, 8, 9, 11, 12, 13, 14, 16, 17, 25, 27, 32, 37, 51})

Reproductive Health

CDC > Reproductive Health > Maternal and Infant Health

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- Infertility +

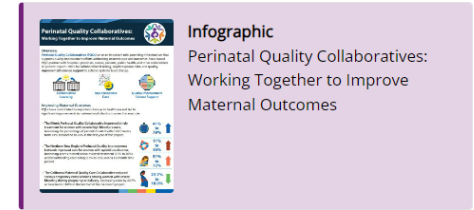
Perinatal Quality Collaboratives

[Print](#)

About Perinatal Quality Collaboratives

Perinatal Quality Collaboratives (PQCs) are state or multistate networks of teams working to improve the quality of care for mothers and babies. PQC members identify health care processes that need to be improved and use the best available methods to make changes as quickly as possible.

PQCs have contributed to important improvements in health care and outcomes for mothers and babies, including:



Reduce cesarean births among low-risk women with no prior births — MICH-06



ALLIANCE FOR INNOVATION ON MATERNAL HEALTH

A quality improvement initiative to support best practices that make birth safer, improve maternal health outcomes and save lives.

Objective Overview

Data

Data Methodology and Measurement

Evidence-Based Resources

Add to Custom List

Status: Getting worse ⊖ [Learn more about our data reliability](#)

Most Recent Data: **26.3** percent (2021)
 Target: **23.6** percent
 Desired Direction: **Decrease**

Baseline: **25.9** percent of low-risk females with no prior birth had a cesarean birth in 2018

See detailed data for this objective

Reduce cesarean births among low-risk women with no prior births

Target-Setting Method: Projection

Data Source: [National Vital Statistics System - Natality \(NVSS-N\)](#), CDC/NCHS

[Learn more about data measurement for this objective](#)



AIM PATIENT SAFETY BUNDLES

AIM develops multidisciplinary, clinical-condition specific patient safety bundles to support best practices that make birth safer. [LEARN MORE](#)

SAFE REDUCTION OF PRIMARY CESAREAN BIRTH

How do we measure performance?

- Use of nulliparous, term, singleton, vertex (NTSV) cesarean delivery rate
 - Excluded population: multiple gestation (including demise of one twin), placenta previa, fetal demise, malpresentation includes face/brow
 - Trying to define a “Low Risk” population
- Balancing measures from The Joint Commission Perinatal Care performance measures
 - PC06- Unexpected Complications in Term Newborns
 - Term and non-anomalous, weight >2500g and no preexisting conditions (genetic abnormalities/maternal drug exposure)
 - PC-07 Severe Obstetric Complications (new risk-adjusted measure)

These are TOTAL
Cesarean Births not
NTSV

How many is too many?
Not the right question. How do we reduce overall morbidity?

Healthy People 2030
NTSV goal 23.6%

Table 1. Summary of International Population-Level Studies Evaluating Optimal Cesarean Delivery Rate

Study	Population, Year(s)	Outcome	Optimal Rate
Molina et al ²²	194 WHO countries, 2012	Maternal mortality ratio, neonatal mortality rate	19%
Ye et al ²³	19 "high-income" countries, 1980–2010	Maternal, neonatal, and infant mortality rates	10–15%
Xie et al ²⁴	31 "high-income" countries, 2010	Infant mortality rate	None identified; higher cesarean delivery rate associated with higher infant mortality
Althabe et al ²⁵	119 medium-income or high-income countries, 1991–2003	Maternal and neonatal mortality rates	None identified; no association with cesarean delivery rate
Betran ⁸²	Systematic review including 8 ecological studies, 2000–2014	Maternal, neonatal, and infant mortality rates	9–16%

WHO, World Health Organization.

Office of Disease Prevention and Health Promotion. Healthy People 2030. Maternal, infant, and child health. Accessed October 2 2023. [Reduce cesarean births among low-risk women with no prior births — MICH-06 - Healthy People 2030 | health.gov](#)

Bruno AM, Metz TD, Grobman WA, Silver RM. Defining a Cesarean Delivery Rate for Optimizing Maternal and Neonatal Outcomes. *Obstet Gynecol.* 2022 Sep 1;140(3):399-407. doi: 10.1097/AOG.0000000000004876. Epub 2022 Aug 3. PMID: 35930389.

2009 data from 593 US hospitals nationwide, cesarean rates varied tenfold across hospitals, from 7.1 percent to 69.9 percent.

Even for women with lower-risk pregnancies, in which more limited variation might be expected, cesarean rates varied fifteen-fold, from 2.4 percent to 36.5 percent

HOSPITAL CULTURE IS THE VARIABLE

HOW DO WE CHANGE CULTURE??

ALL BIRTHS

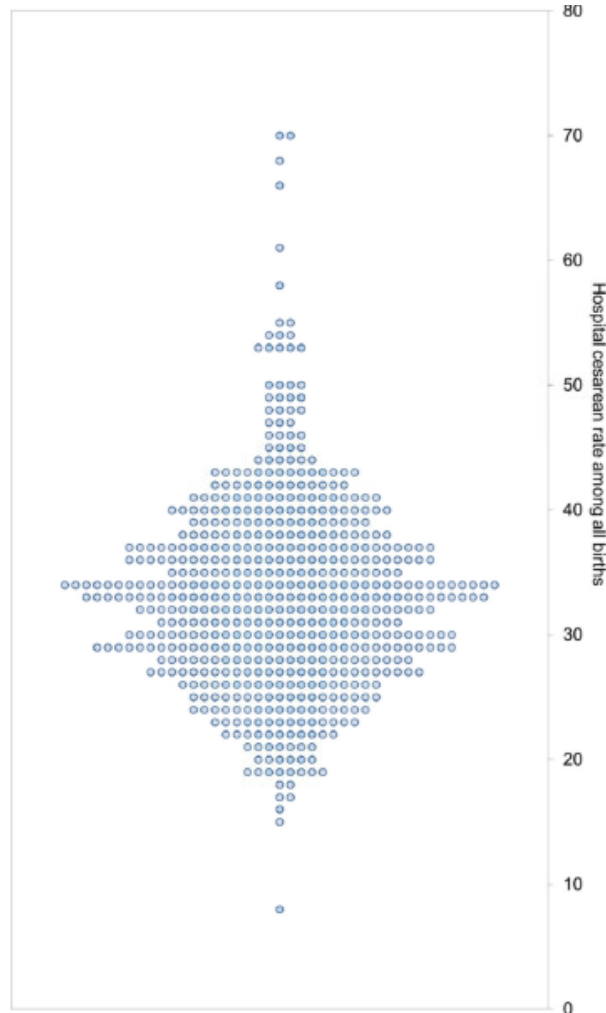


EXHIBIT 1.
Caption: Distribution Of Hospital Cesarean Rates In The United States, 2009
Source/Notes: SOURCE Authors' calculations based on data from the 2009 Nationwide Inpatient Sample of the Healthcare Cost and Utilization Project (HCUP). NOTES Distribution of cesarean delivery rates in a representative sample of US hospitals with at least 100 births in 2009 (N= 593). Hospital cesarean rates ranged from 7.1 percent to 69.9 percent--a tenfold variation across hospitals.

LOW RISK BIRTHS= NTSV

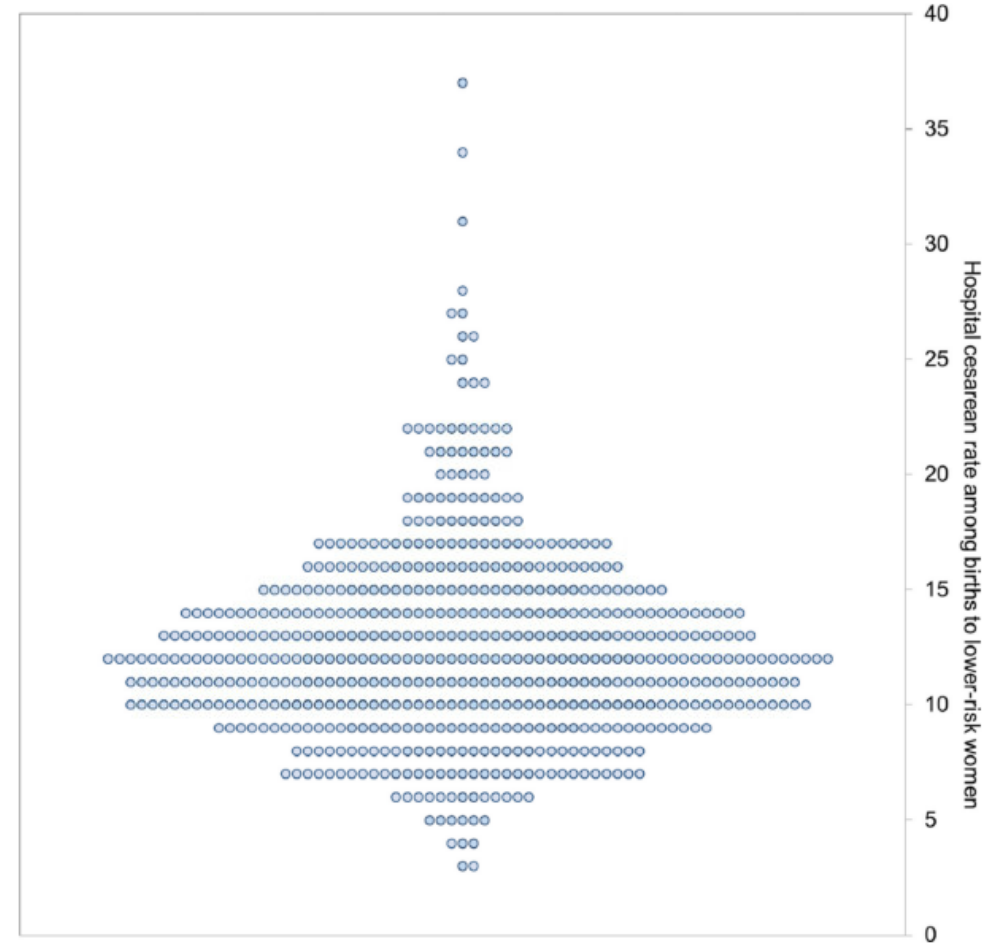
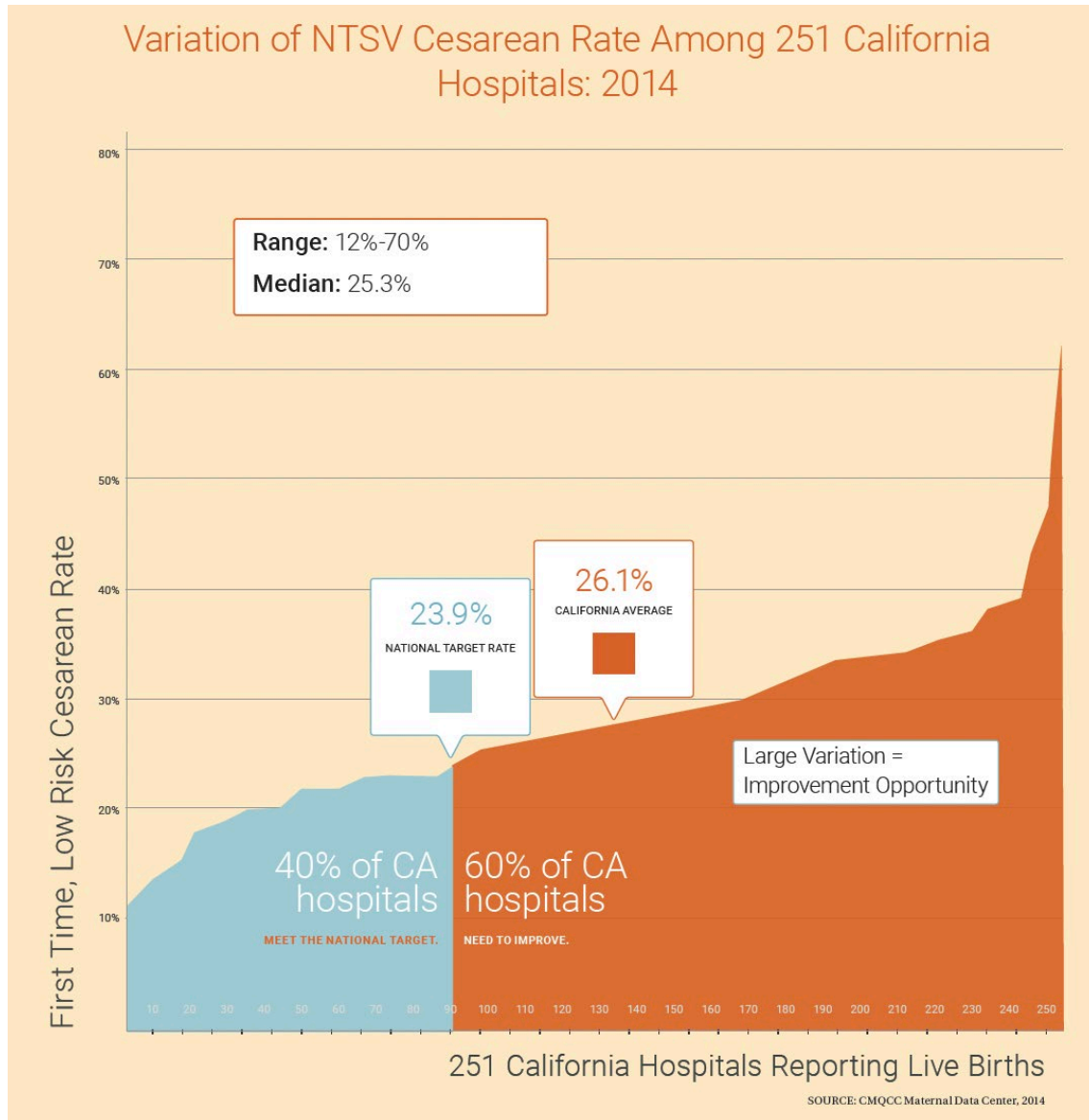
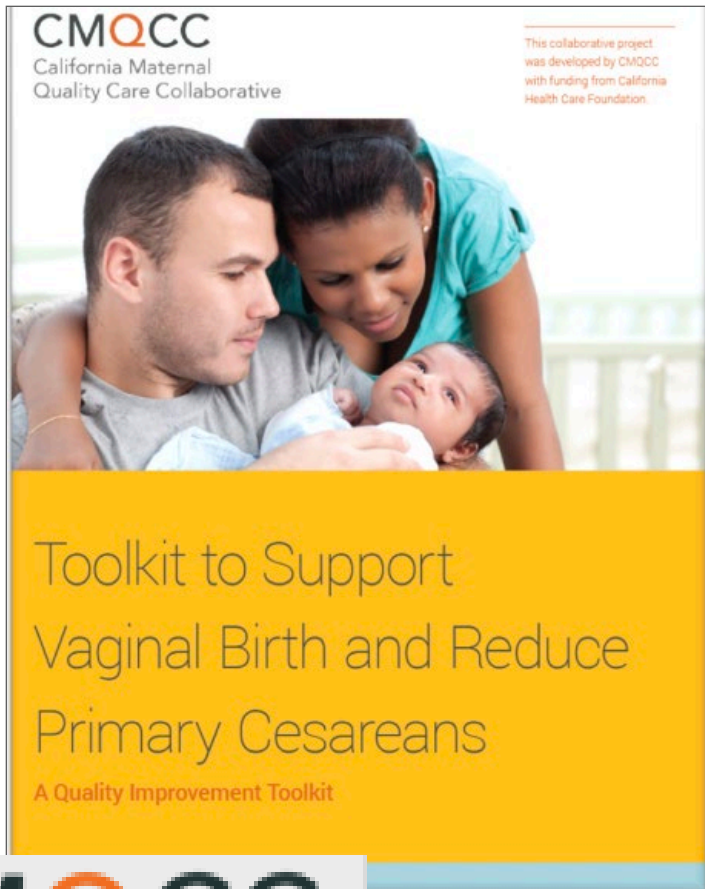


EXHIBIT 2.
Caption: Distribution Of Hospital Cesarean Rates In US Hospitals Among Lower-Risk Pregnancies, 2009
Source/Notes: SOURCE Authors' calculations based on data from the 2009 Nationwide Inpatient Sample of the Healthcare Cost and Utilization Project (HCUP). NOTES Distribution of lower-risk cesarean delivery rates in a representative sample of US hospitals with at least 100 births in 2009 (N= 593). "Lower-risk cesarean" is calculated as the percentage of cesareans among women with term, singleton, and vertex pregnancies with no prior cesarean deliveries. Hospital lower-risk cesarean rates ranged from 2.4 percent to 36.4 percent--a fifteenfold variation across hospitals.

Cesarean Birth in California (2014)

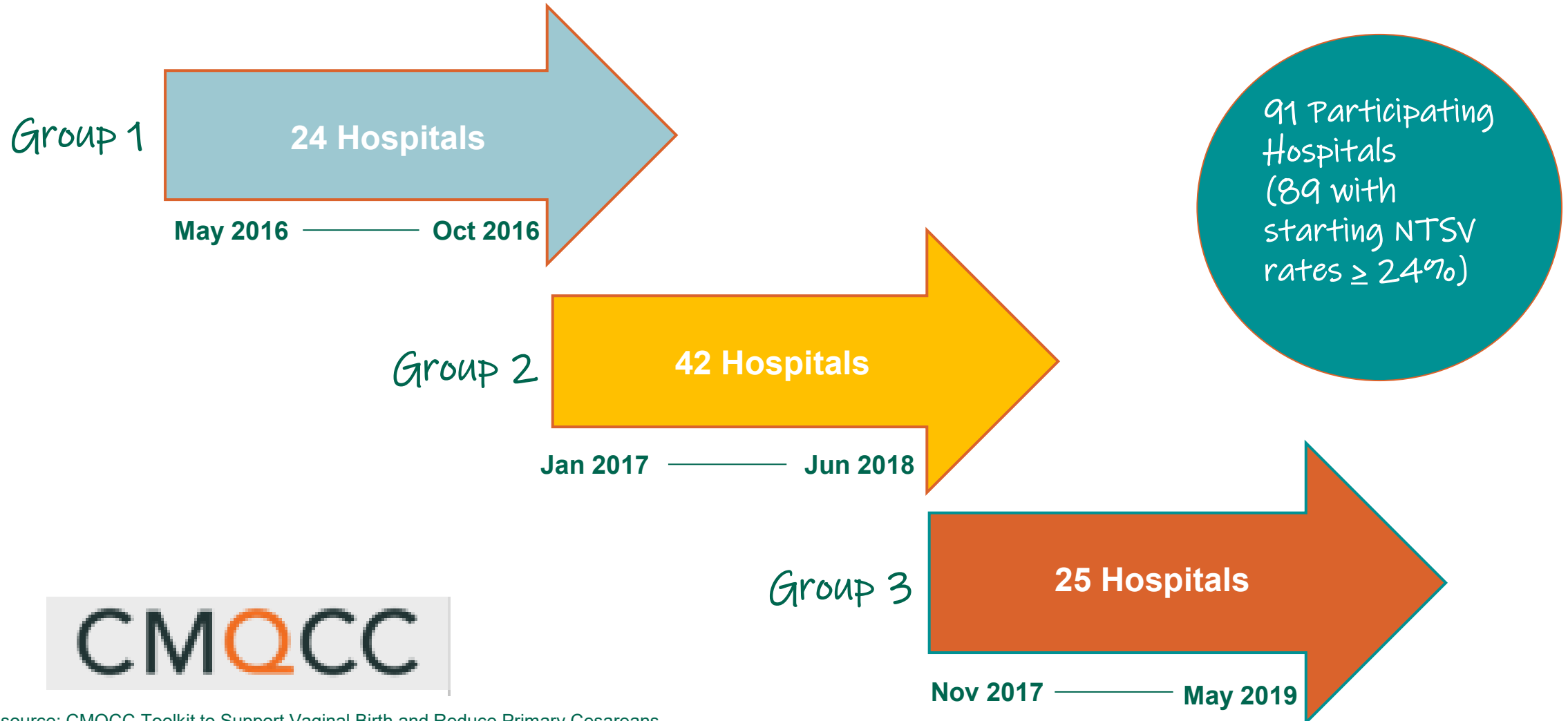


Toolkit to Support Vaginal Birth and Reduce Primary Cesareans – Published in 2016



- I. Key Strategies for Improving the Culture of Care, Awareness, & Education for Cesarean Reduction (*Readiness*)
- II. Key Strategies for Supporting Intended Vaginal Birth (*Recognition & Prevention*)
- III. Key Strategies to Manage Labor Abnormalities & Safely Reduce Cesarean Births (*Response*)
- IV. Key Strategies for Using Data to Drive Reduction in Cesareans (*Reporting*)

Statewide Hospital Collaborative to Support Vaginal Birth



-238 hospitals
-statewide rate of severe
unexpected newborn
complications decreased
from 2.1% to 1.5% between
January 2015 and June
2019.

Original Investigation

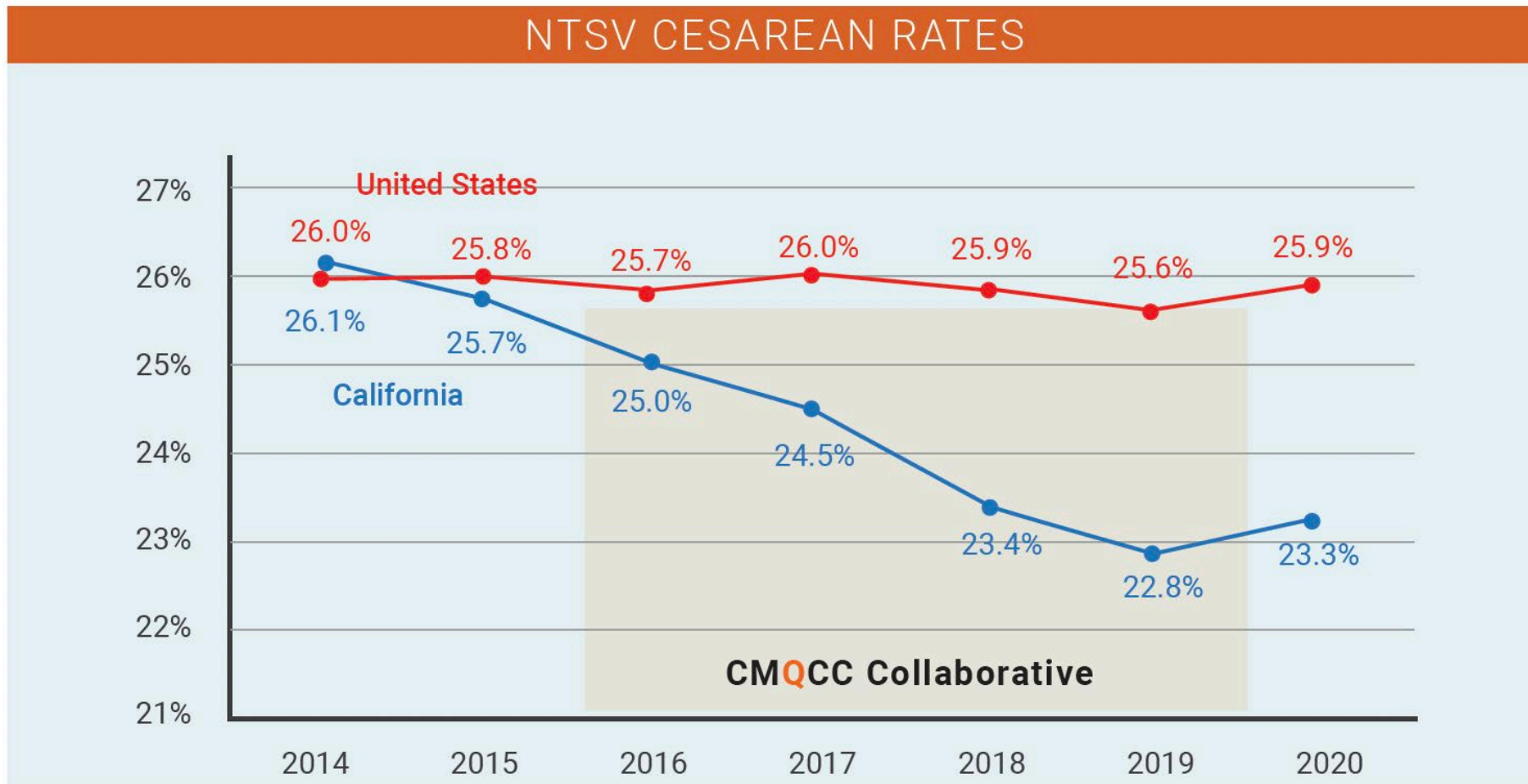
April 27, 2021

**Hospital Quality Improvement Interventions,
Statewide Policy Initiatives, and Rates of Cesare-
an Delivery for Nulliparous, Term, Singleton,
Vertex Births in California**Melissa G. Rosenstein, MD, MAS^{1,2}; Shen-Chih Chang, MS, PhD^{1,3}; Christa Sakowski, MSN¹; [et al](#)[» Author Affiliations](#)

JAMA. 2021;325(16):1631-1639. doi:10.1001/jama.2021.3816

- **Findings** In this observational study of 7 574 889 NTSV births that compared the rates of cesarean delivery between 2014 and 2019, **the rates in California had a statistically significant decrease from 26.0% to 22.8%** (relative risk, 0.88). The cesarean delivery rate for NTSV births in the US (excluding California) was 26.0% in both 2014 and 2019.

Landscape of Cesarean Birth in California (compared to United States, pre- and post- collaborative)



Source of US Data: National Vital Statistics System – Natality (NVSS-N), CDC/NCHS

Source of CA Data: CMQCC Maternal Data Center based on linked patient discharge and birth certificate data

What is happening at your institution?





Reporting Period for 2023 Surveys - CY2022

Inclusions: nulliparous, term singleton, vertex

Exclusions: placenta previa, fetal demise

Dartmouth-Hitchcock Medical Center

1 Medical Center Drive
 Lebanon, New Hampshire 03756-0001
 Survey Submission Date: June 30, 2023
[Facility info, location, and more](#)

+ Show all

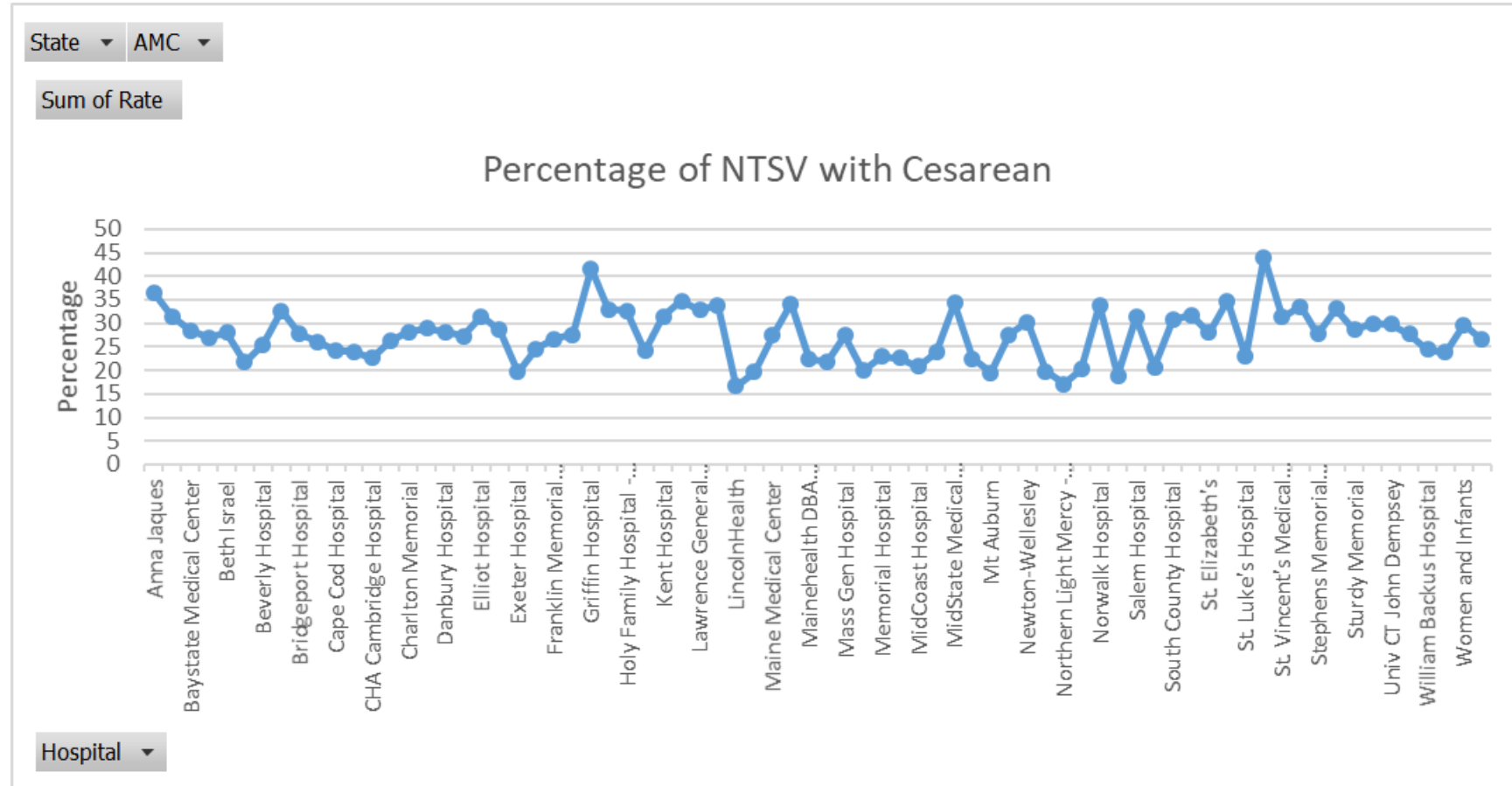
Maternity Care

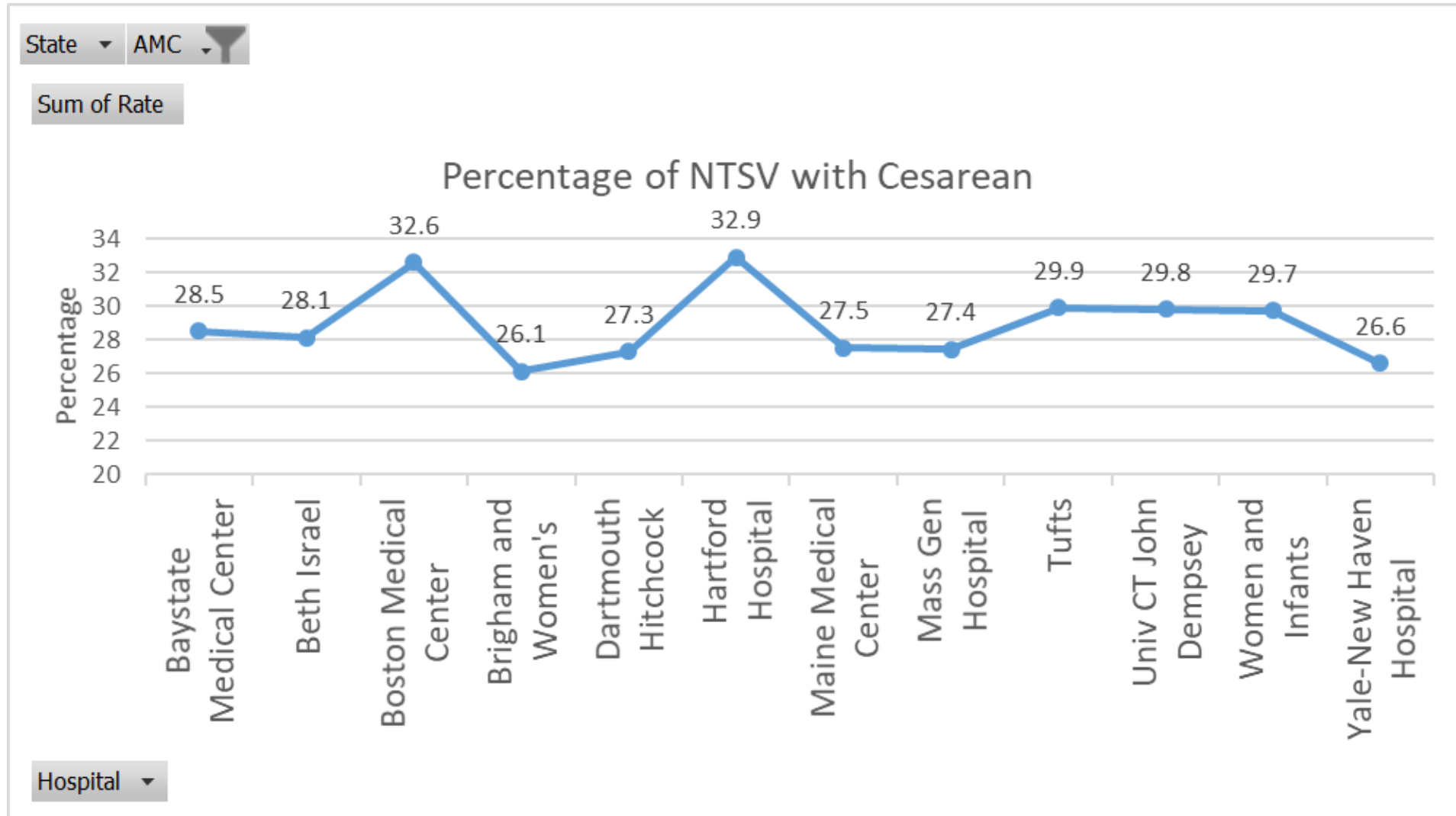
Measure name	Leapfrog's Standard	Hospital's Progress
High-Risk Deliveries	Hospitals should deliver at least 50 very-low birth weight babies per year OR the hospital must maintain a lower-than-average morbidity/mortality rate for very-low birth weight babies.	 CONSIDERABLE ACHIEVEMENT
Cesarean Sections	This is defined as first-time mothers giving birth to a single baby, at full-term, in the head-down position who deliver their babies through a C-section. Hospitals should have a rate of C-sections of 23.6% or less.	 SOME ACHIEVEMENT
▲ SHOW LESS ▲		
Early Elective Deliveries	This is defined as mothers being scheduled for cesarean sections or medication inductions prior to 39 weeks gestation without a medical reason. Hospitals should have a rate of early elective deliveries of 5% or less.	 ACHIEVED THE STANDARD
▼ SHOW MORE ON THIS HOSPITAL'S PERFORMANCE ▼		
Episiotomies	This is defined as mothers having an incision made in the perineum (the birth canal) during childbirth. Hospitals should have a rate of episiotomies of 5% or less.	 ACHIEVED THE STANDARD

This hospital's rate of Cesarean sections is 27.3%

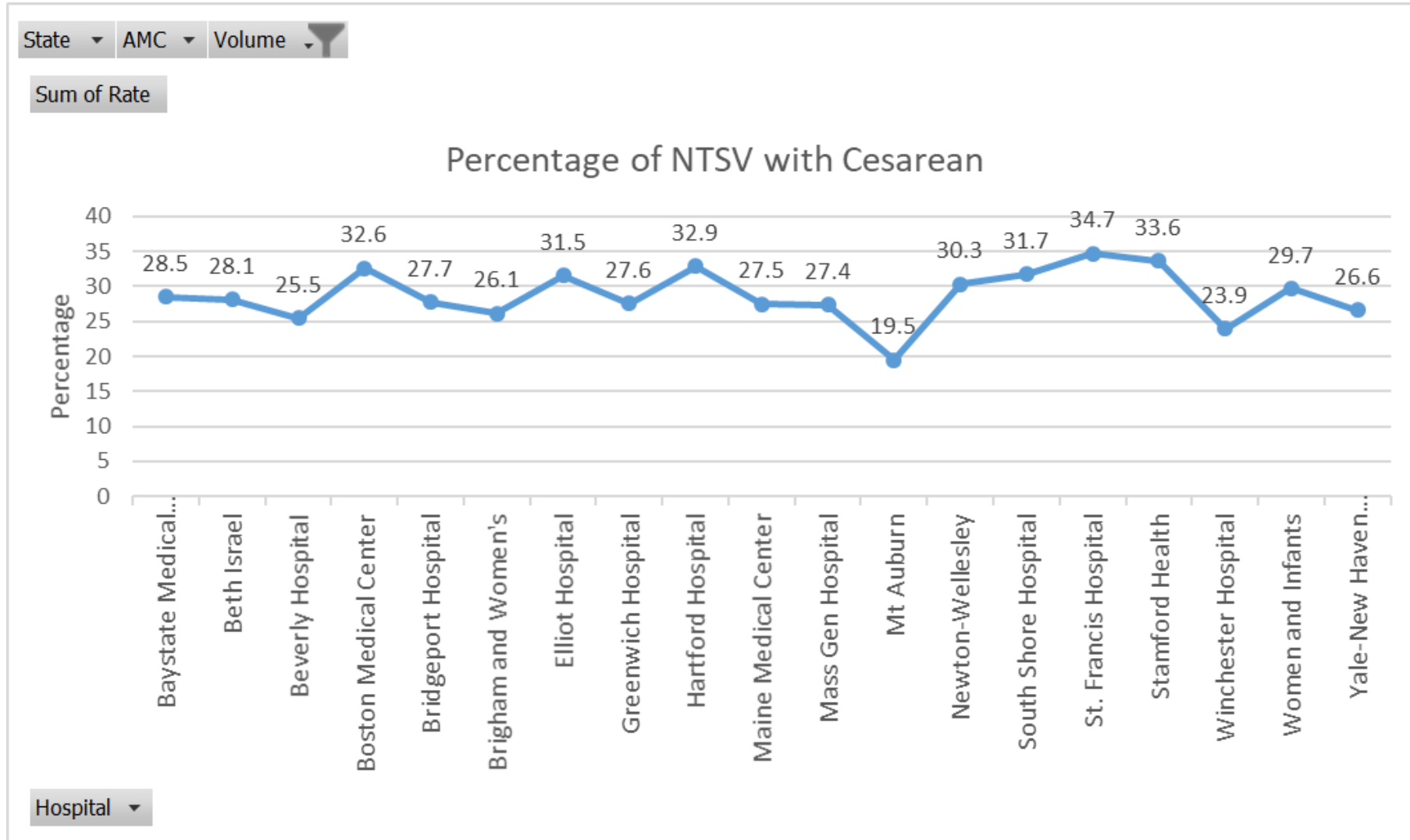
Variation Across New England -

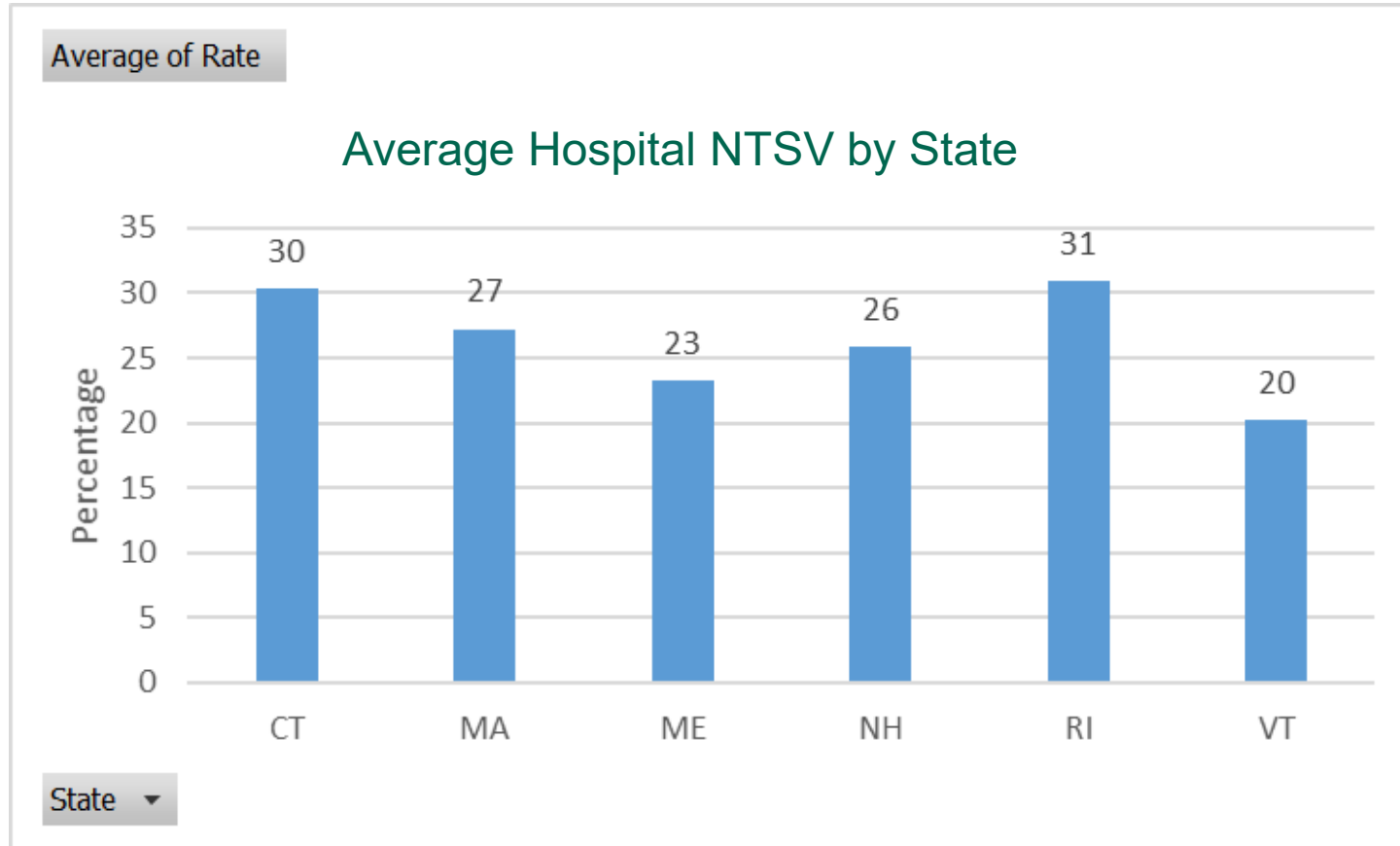
- 74 hospitals
 - Connecticut: 19
 - Massachusetts: 33
 - Maine: 11
 - New Hampshire: 5
 - Rhode Island: 5
 - Vermont: 1
- Range: 16.7% to 44.1%





Hospitals with volume >2000 deliveries per year Range 19.5% – 34.7%










Average Hospital NTSV (not by patient volume) reporting to Leapfrog

VT: only one hospital reported

Safety Story

“[The patient] is very despondent after the cervical check. She was really hoping that she was going to have some change in the cervix, and is able to express a lot of anger towards the process of her labor induction. She feels that she was given mixed messages from the staff, the induction started and stopped twice, she hasn't slept and is exhausted. She would like to think about her options for moving forward and is asking about a primary elective cesarean”



X		DEFINE	Define the business problem, identify key stakeholders, and capture customer feedback
X		MEASURE	Measure the current state of the process through data collection and process-mapping
X		ANALYZE	Analyze the problem to determine root causes
X		IMPROVE	Improve the process by testing solutions aimed at eliminating the root causes
□		CONTROL	Control the process to sustain the gains and practice continuous improvement

Define

Problem Statement	Project Scope		Resource Plan	
<p>Vaginal delivery is the safest mode of delivery for most birthing people and newborns, compared to cesarean birth. The goal is to build a culture that supports vaginal delivery. The decision for cesarean birth is complex and involves a multidisciplinary team including obstetrics, anesthesia, midwifery, and nursing across multiple settings, including prenatal care and intrapartum. For 2021 and 2022, our NTSV rate was 25.6 and 26.8%, however, the HealthyPeople 2023 goal is 23.6%. Our goal is to decrease the rate of cesarean birth for low-risk patients without increasing morbidity to the pregnant person or newborn.</p>	<p>In Scope: Births at Birthing Pavilion at DHMC, term, singleton and vertex presenting Scope Exclusions: Scheduled repeat cesarean deliveries</p>		<p>Project Lead(s): Ella Damiano Emily Donelan</p>	<p>Project Sponsor(s): Ilana Cass</p>
	Goal	Metric	Team Members	
Provider and RN specific NTSV rates	Yes/No on dashboard	<p>Emily Brayton Petrice DiDominic Kate Stokes Caroline Stroup Nora Workman Heather Bonneau Ellen Joyce Robyn Puleo Chelsea Whitney Holly Old Kristen Murphy Elizabeth Kinsley Kristen Murphy Kathy Wohlfort</p>		<p>Emily Bearse Emma Hyde Allie Morgan Emily Osborne Jessica Densmore Karen Schabot Kelsey Murray Jenn Martin Jennie Marchant Amy Lee Colleen Whatley Anna Childs Join us!</p>
Intermittent auscultation use	Percent of NTSV patients			
Standardized patient education	Rate of use			
Business Case	Appropriate indication for cesarean is present	Documented using ACOG/SMFM criteria (goal of 100%)	Milestones	
<p>Vaginal birth is a safest mode of delivery for most pregnancies and is less expensive to the healthcare system compared to cesarean birth. Benefits to the birthing person include improving patient experience, decreased length of stay, increased success with breastfeeding, decreased blood loss, avoidance of surgical risks, and decreased surgical risk for future pregnancies or gynecologic procedures. For the healthcare system, decreased length of stay would help allow additional acute transfers and focus resources on other high-risk patients.</p>	Operative vaginal delivery rate	Track percentages	February 2023	Charter / Define
	Unexpected complications to term newborns	Track total number, days between	June 2023	Measure / Analyze
	NTSV and TSV rates	Tracking on dashboard	July 2023	Improve
	Postpartum hemorrhage	Percentage of NTSV with QBL >1000mL	December 2023	Control

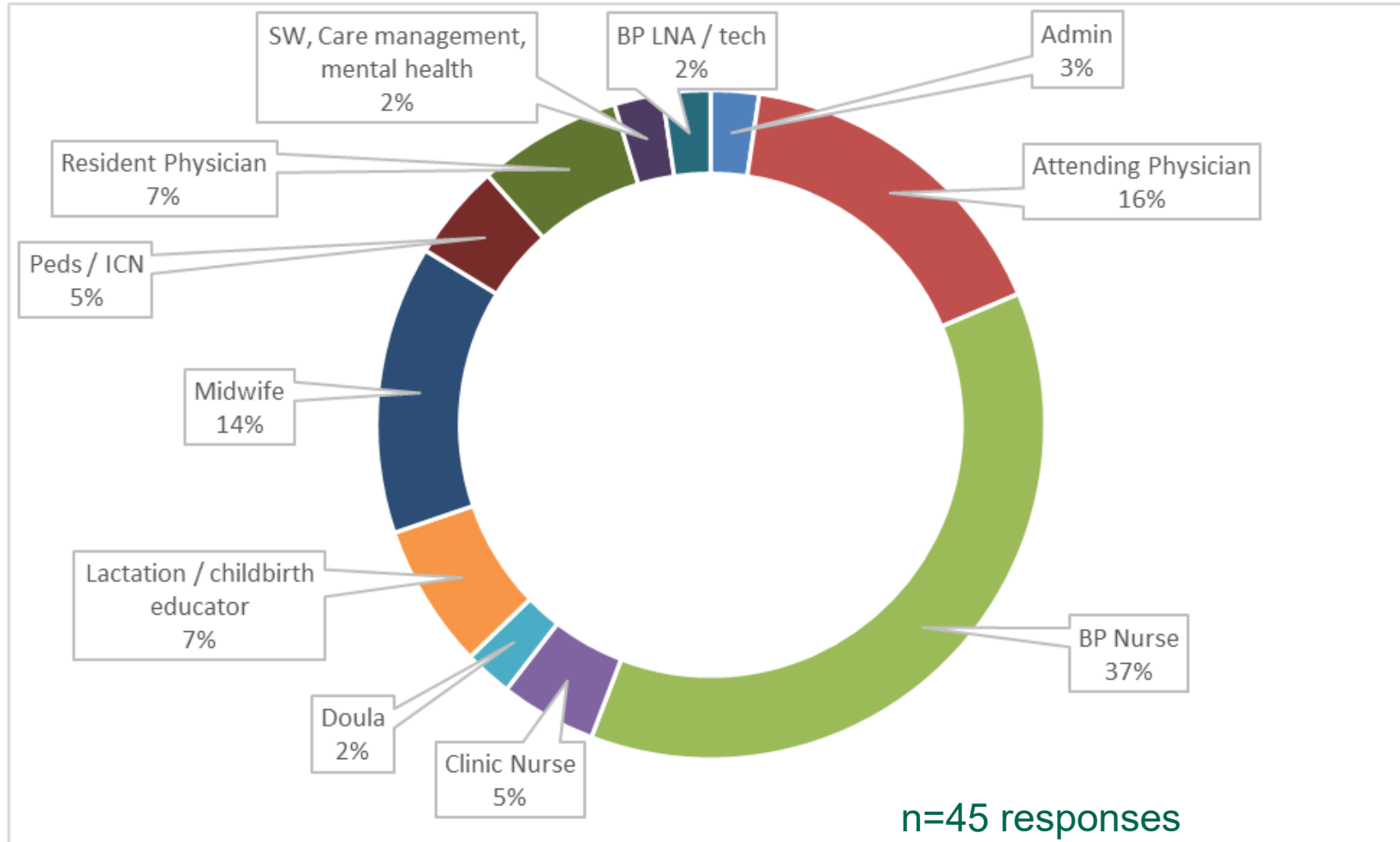
Project Launch

- Grand Rounds in December 2022
- Chartered workgroup in January 2023
- Nursing Staff Meetings in February 2023

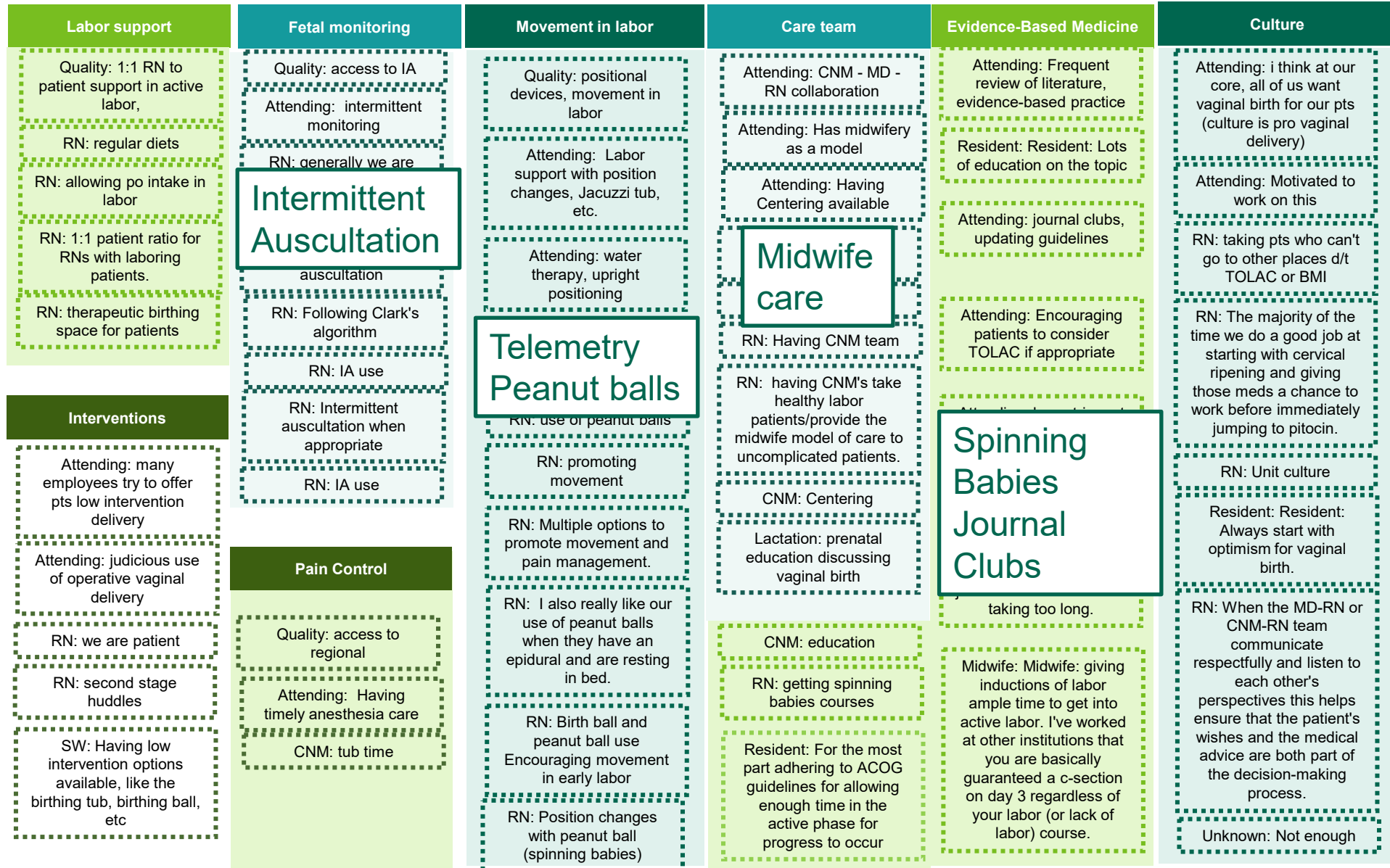
Staff Survey – “Voice of Customer”

- What is your role on the Birthing Pavilion?
- Years of experience / Shifts per month

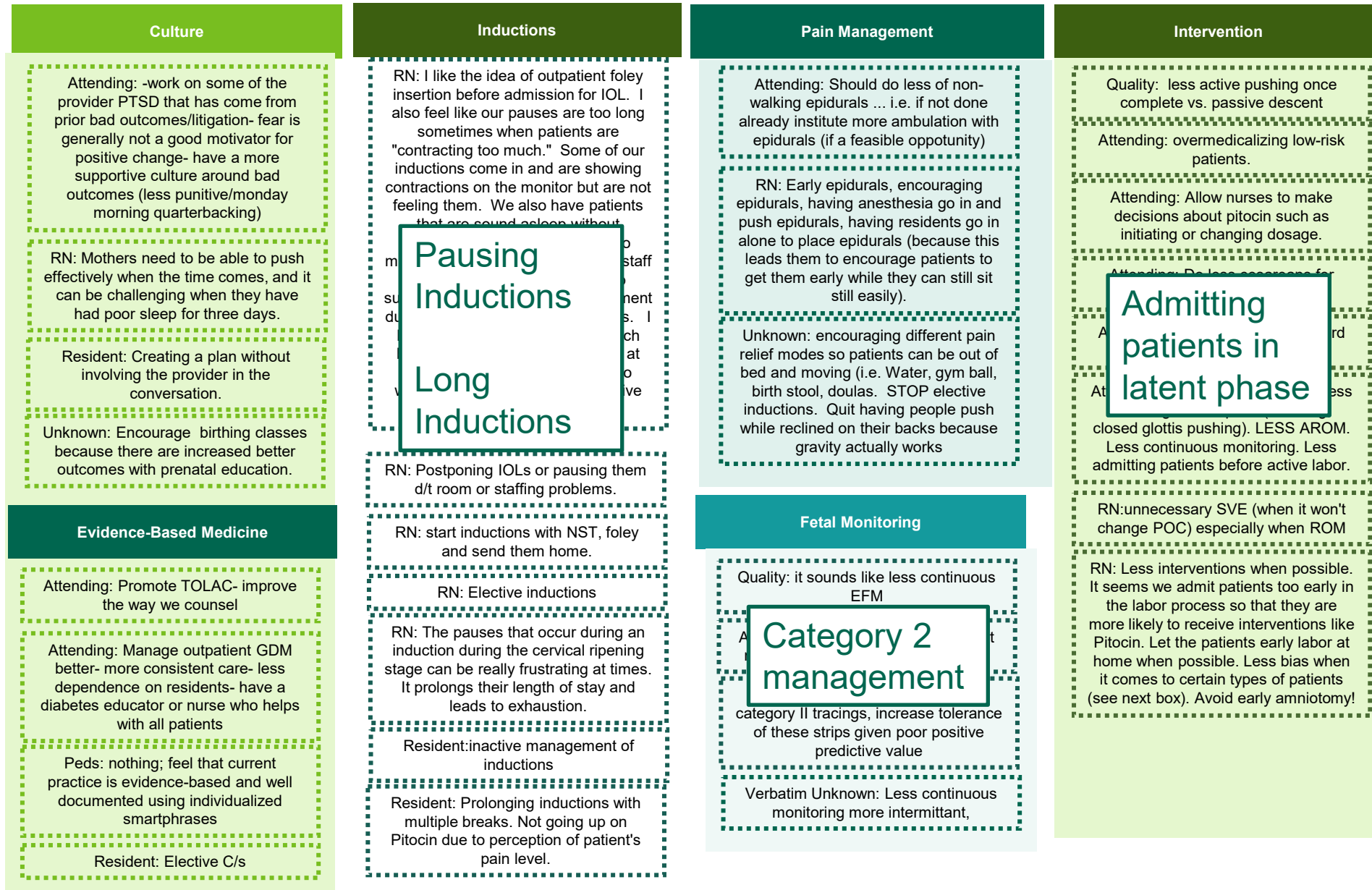
- What do you think our unit is doing well for promoting vaginal birth?
- What do you think DHMC should do less of in order to promote vaginal birth?
- What do you wish DHMC did better or more of to support vaginal birth?



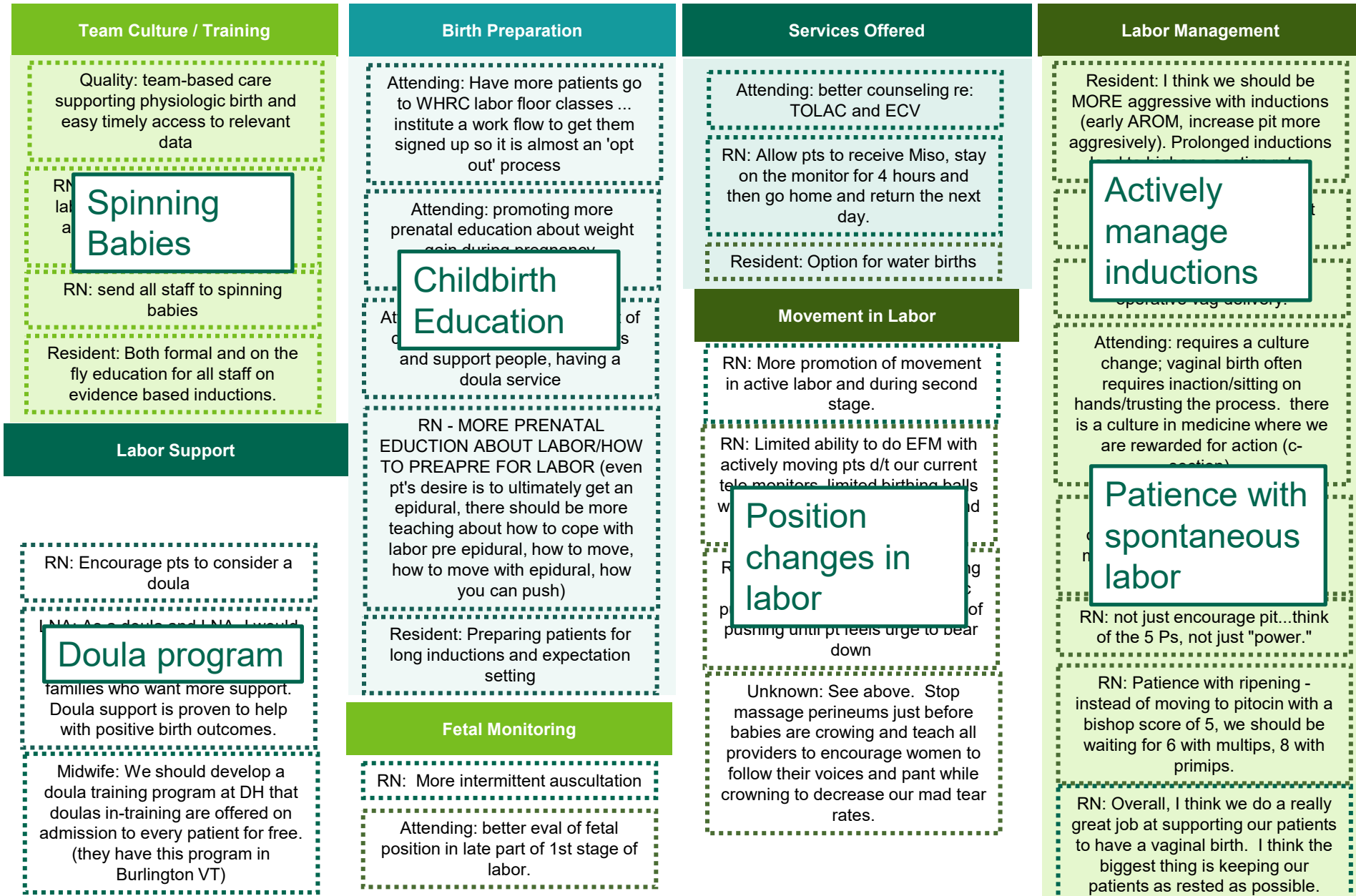
Affinity Diagram – Answers to what we are already “doing well”



Affinity Diagram – Answers to what we should “do less”



Affinity Diagram – Answers to what we should “do more”



Methodology for data analysis

- Review NTSV cases per The Joint Commission definition
- All manual chart review
- ACOG / SMFM criteria for cesarean delivery

- Challenges with automating data analysis:
 - Missing fields
 - Incorrect indications for surgery

Historical DHMC NTSV Data

Year	Percentage
2020	27.3%
2021	27.5%
2022	27.3%

- Dartmouth Hitchcock Medical Center –
 - Rural academic medical center
 - Tertiary care center
 - Approx. 1200-1300 deliveries per year

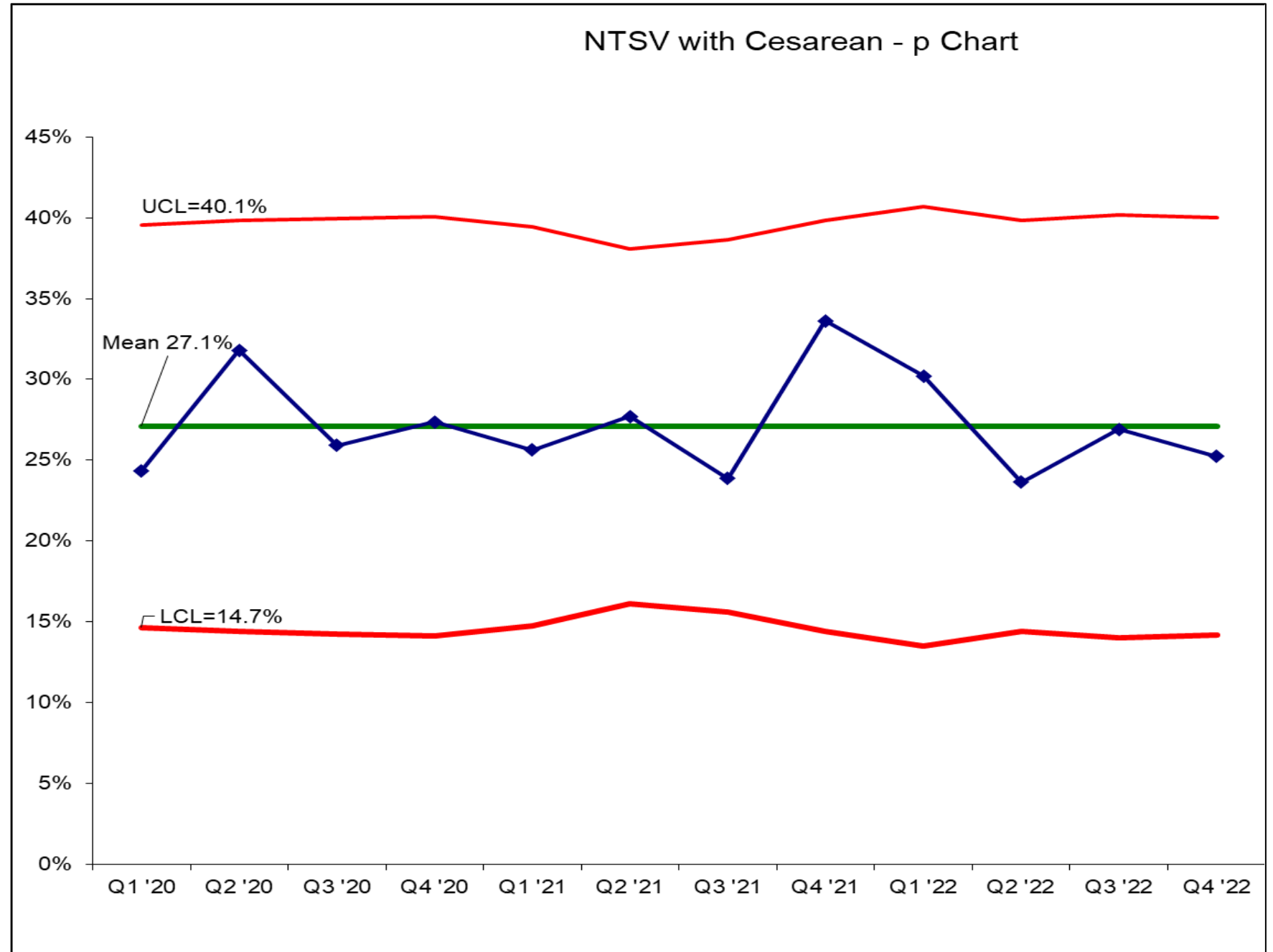
Project start after December 2022



All Team NTSV by Quarter

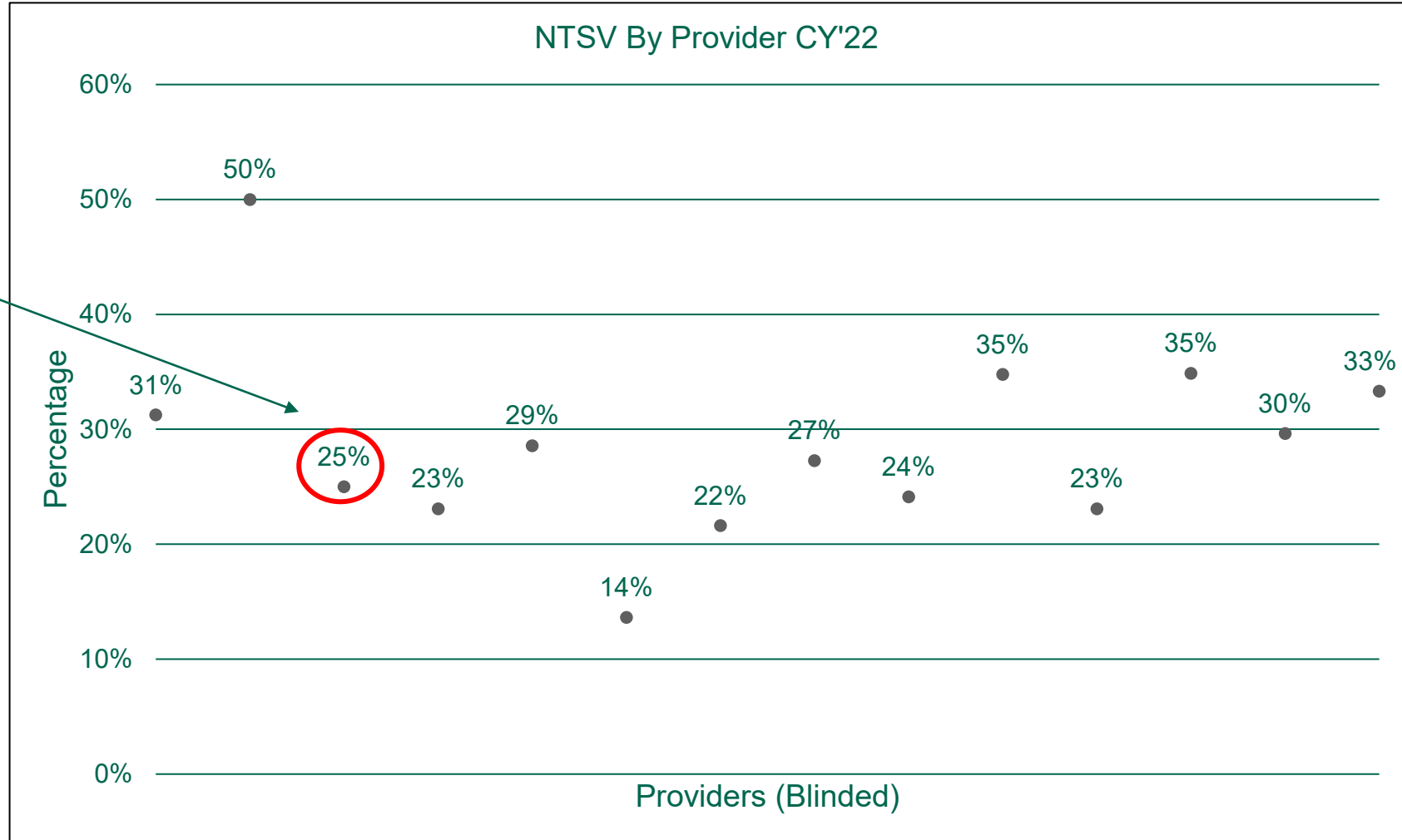
Jan 2020 - Dec 2022

Mean 27.1%

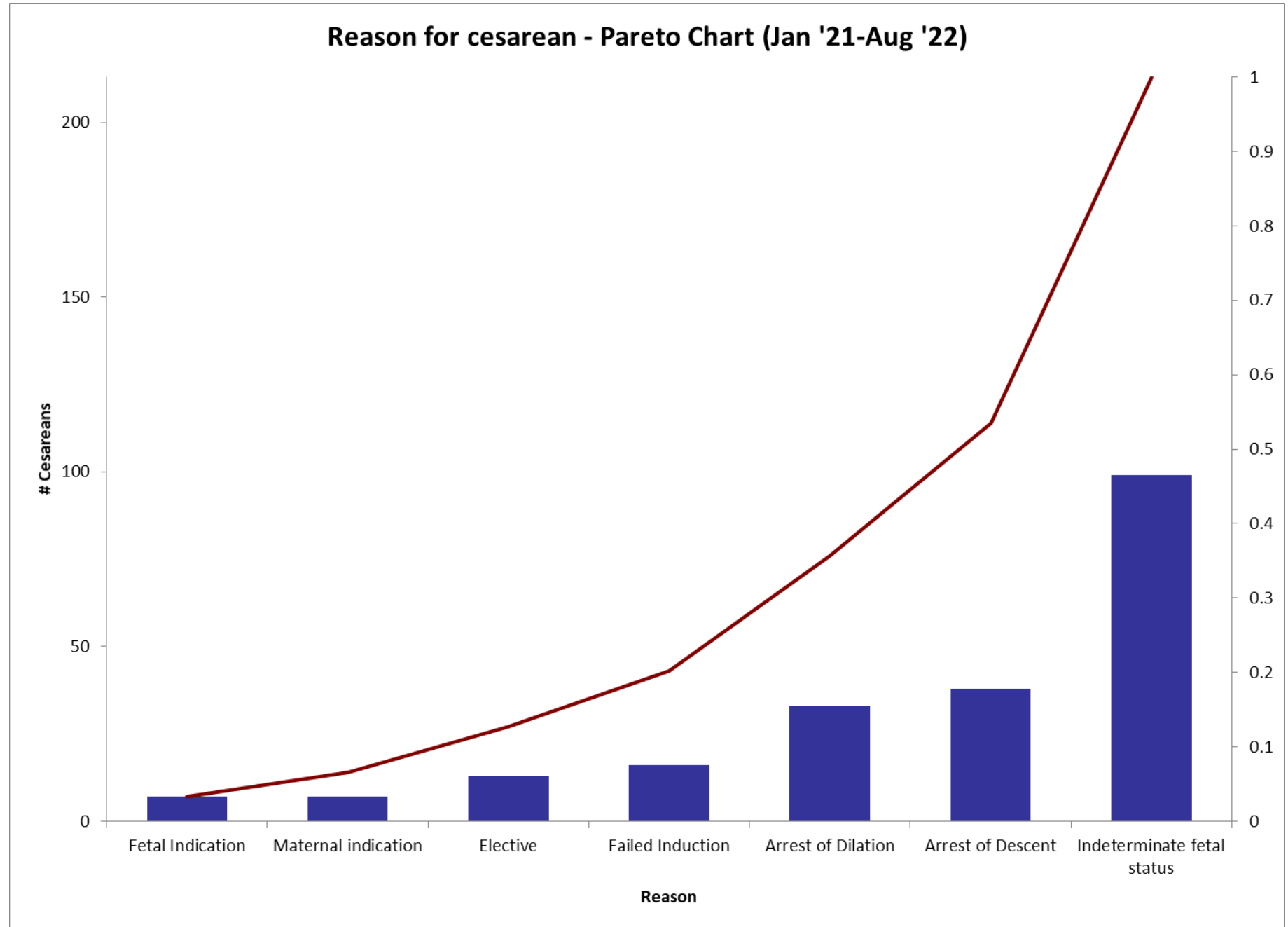


- Unblinded preferred
- Sample Size per Provider

Me



Primary indication for NTSV cesarean deliveries



Safe Prevention of the Primary Cesarean Delivery

Obstetric Care Consensus **i** | Number 1 | March 2014

Not specific to NTSV

Data from Yale New Haven
from 2003-2009 (n=32,443)

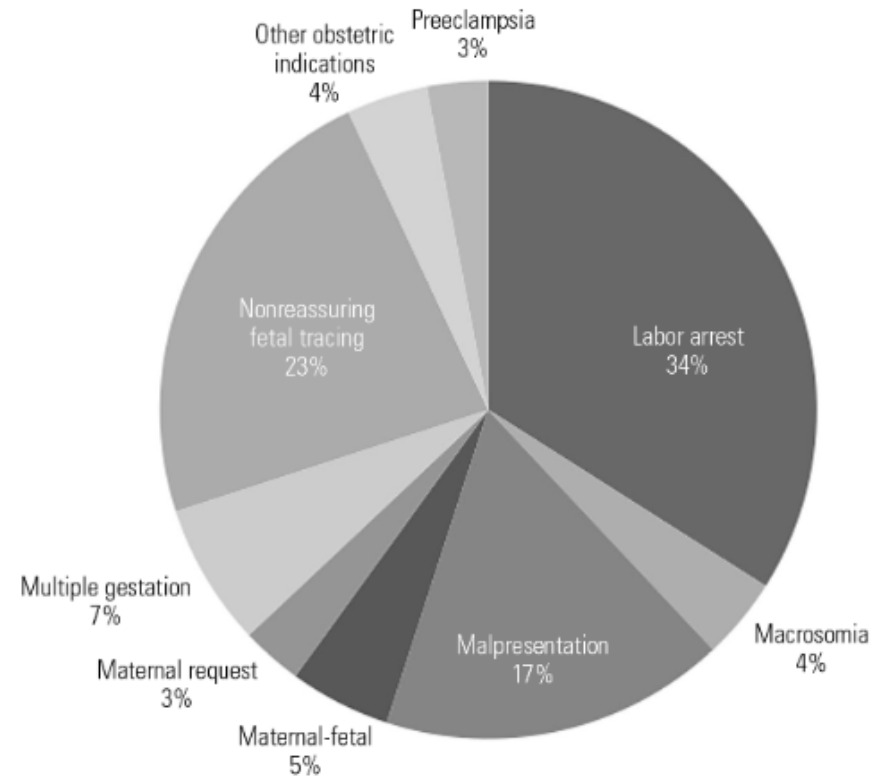
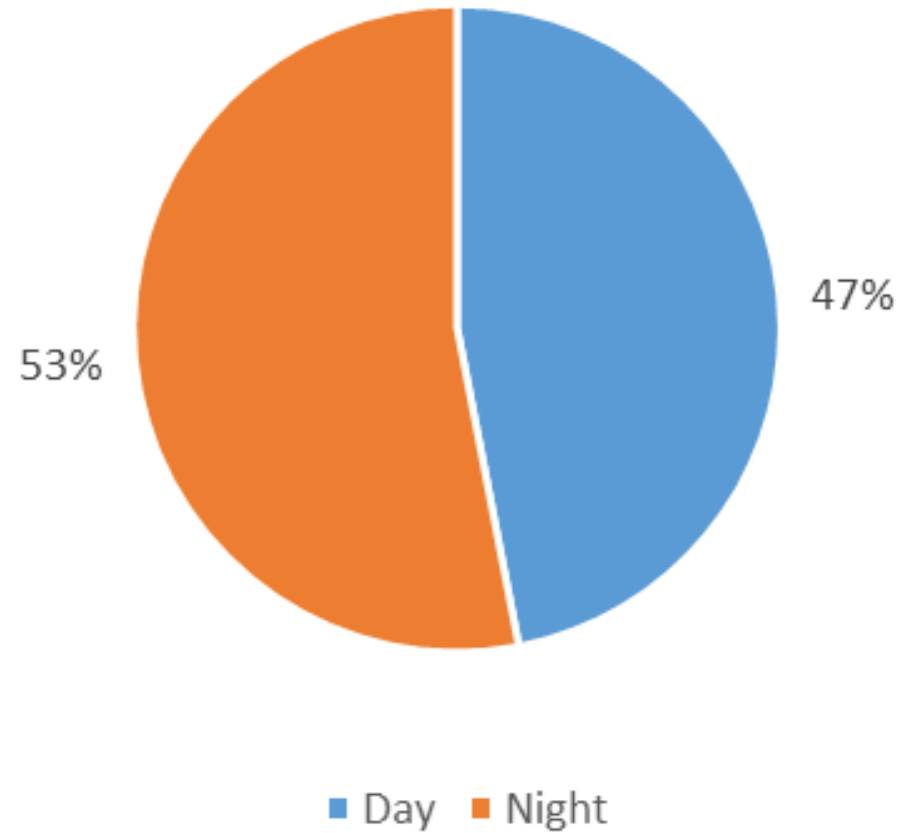


Fig. 3. Indications for primary cesarean delivery. (Data from Barber EL, Lundsberg LS, Belanger K, Pettker CM, Funai EF, Illuzzi JL. Indications contributing to the increasing cesarean delivery rate. *Obstet Gynecol* 2011;118:29–36.) ←

NTSV Cesarean based on Shift (Jan '21 - Aug '22)



ACOG / SMFM Criteria for Cesarean Delivery in Labor

Criteria for Failed Induction/Augmentation in Latent Labor

All three must be met:

- Cervix < 6cm dilation (latent labor)
- Membranes ruptured
- Oxytocin administered a minimum of 12 hours (up to 24 hours) after membrane rupture without achieving active labor

Criteria for Arrest of Dilation in Active Labor

All three must be met:

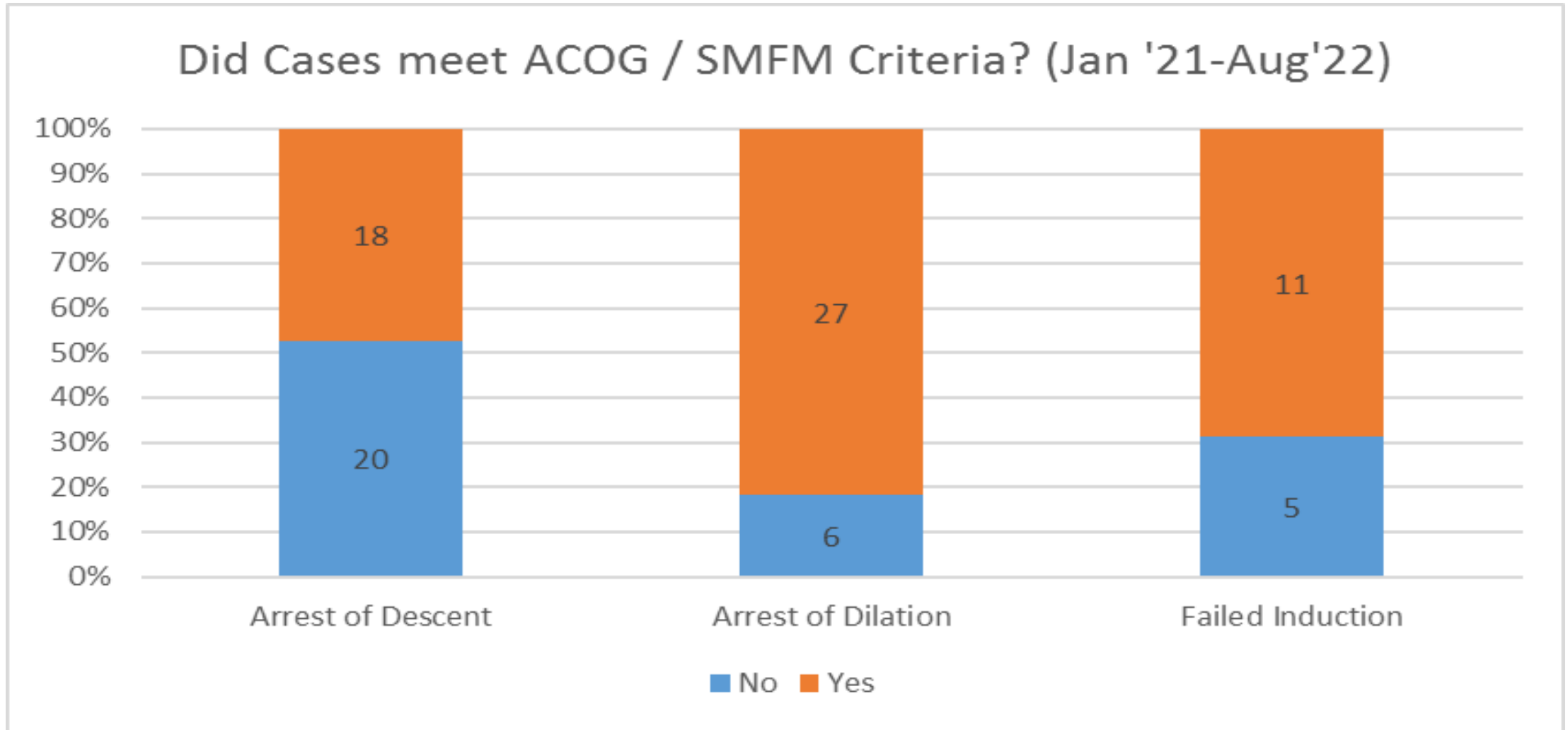
- Cervix ≥ 6cm dilation (active labor)
- Membranes ruptured
- No cervical change after:
 - At least 4 hours of adequate uterine activity defined as MVU ≥ 200 with an IUPC in place
 - At least 6 hours of oxytocin administration with inadequate uterine activity

Criteria for Arrest of Descent

- At least 4 hours of pushing in nulliparous patient with epidural
- At least 3 hours of pushing in nulliparous patient without epidural
- At least 3 hours of pushing in multiparous patient with epidural
- At least 2 hours of pushing in multiparous patient without epidural
- Failed trial of operative vaginal delivery

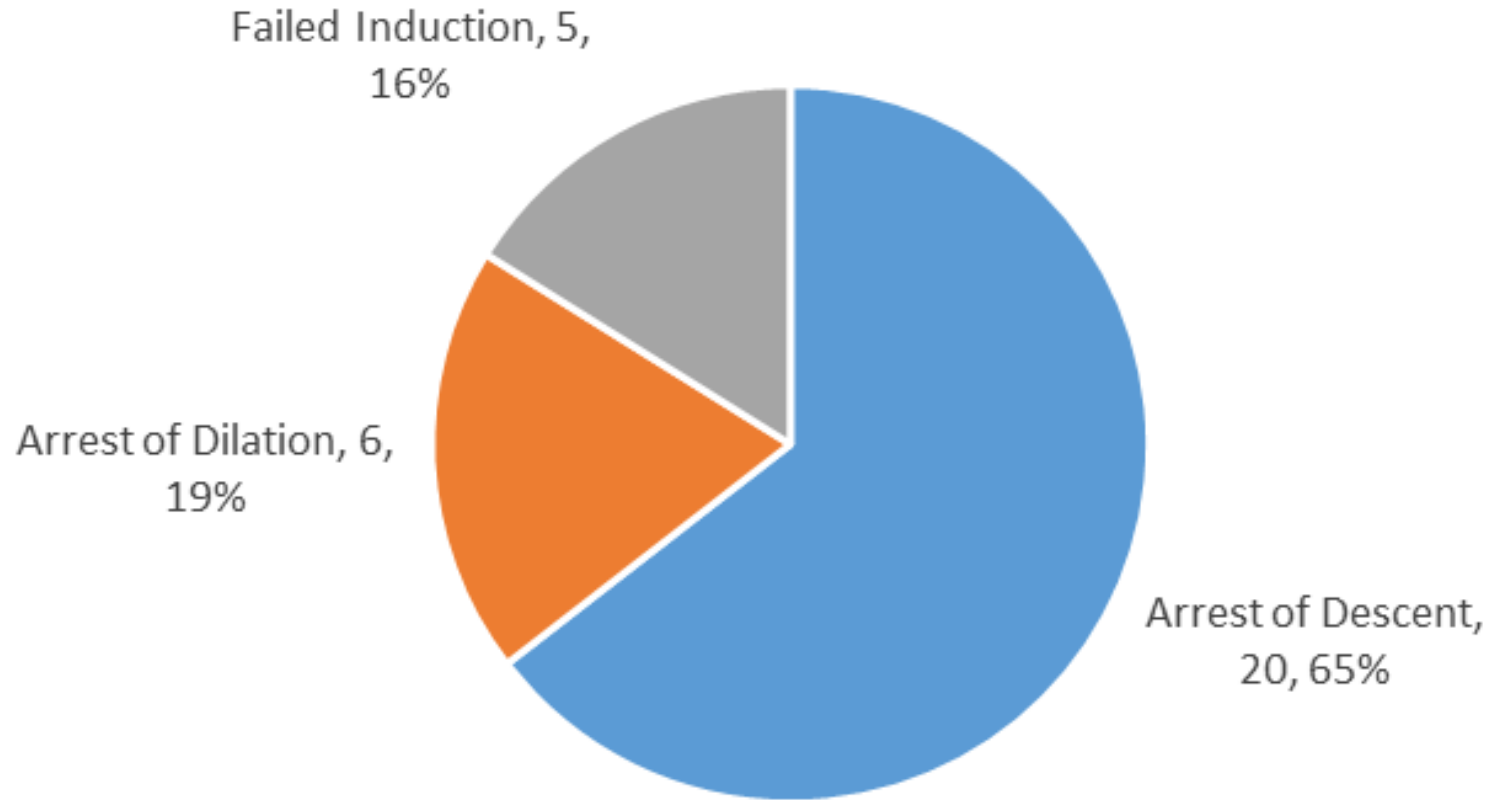
Criteria for Indeterminate Fetal Status

- Category III FHR
 - Category II FHR remote from delivery that is not responsive to resuscitation efforts such as: maternal repositioning, fluid administration, maternal blood pressure support if hypotensive, scalp stimulation, correction of uterine tachysystole, amnioinfusion if repetitive variable decelerations
- *provider discretion regarding which category II tracings require delivery vs observation



Pushing \geq 3 hours

Cases That Did not Meet ACOG/SMFM Criteria Jan '21-Aug '22



Improve

- Education to Providers and Nurses
 - Quarterly Grand Rounds and nursing staff meetings
 - Twice monthly PVB team meetings (open invitation)
- Adherence to SMFM / ACOG criteria for labor dystocia
 - EPIC dot phrase
- Induction of labor standardization
 - Dual Ripening

Decision for Cesarean Delivery:

I discussed with @NAME@ my recommendation that we proceed with cesarean section at this time. She meets sMFM/ACOG criteria for:

{Decision for cesarean:37788}

We discussed the risks of cesarean delivery, including the need for antibiotic prophylaxis. Surgical

@ME@

- Arrest of dilation based on the fact that she is dilated ≥ 6 cm with ruptured membranes and no cervical change for at least either 4 hours with adequate uterine activity (MVU = 200) or 6 hours of oxytocin administration with inadequate uterine activity
- Failed induction or augmentation based on the fact that she is < 6 cm dilated (latent labor) with oxytocin administration for ≥ 12 hours after membrane rupture without achieving active labor
- Second stage arrest based on the fact that she has been pushing for: {2nd stage arrest criteria:37955}
- Indeterminant fetal status based on: {Indeterminate fetal status:38245}
- The patient does not currently meet criteria sMFM/ACOG criteria for *** however my clinical judgement deems this cesarean delivery indicated given the presence of ***

DECISIONFORCESAREAN

Description [Populate](#)

SMFM/ACOG criteria for cesarean delivery during labor.

[Watch Template Formatting](#) [Keep SmartLink Formatting](#)

[Synonyms](#)

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Decision for Cesarean Delivery:

I discussed with @NAME@ my recommendation that we proceed with cesarean section at this time. She meets sMFM/ACOG criteria for:

Second stage arrest based on the fact that she has been pushing for: {2nd stage arrest criteria:37955}

We discussed the risks of cesarean delivery, including the need for antibiotic prophylaxis.

@ME@

- 4 hours and is a nulliparous patient with an epidural
- 3 hours and is a nulliparous patient without an epidural
- 3 hours and is a multiparous patient with an epidural
- 2 hours and is a multiparous patient without an epidural
- Pushing for *** hours with no descent past *** station. Although this does not technically meet criteria for arrest of descent, given the low likelihood of vaginal delivery it is my clinical opinion that the risk/morbidity associated with continued pushing outweighs any potential benefit.

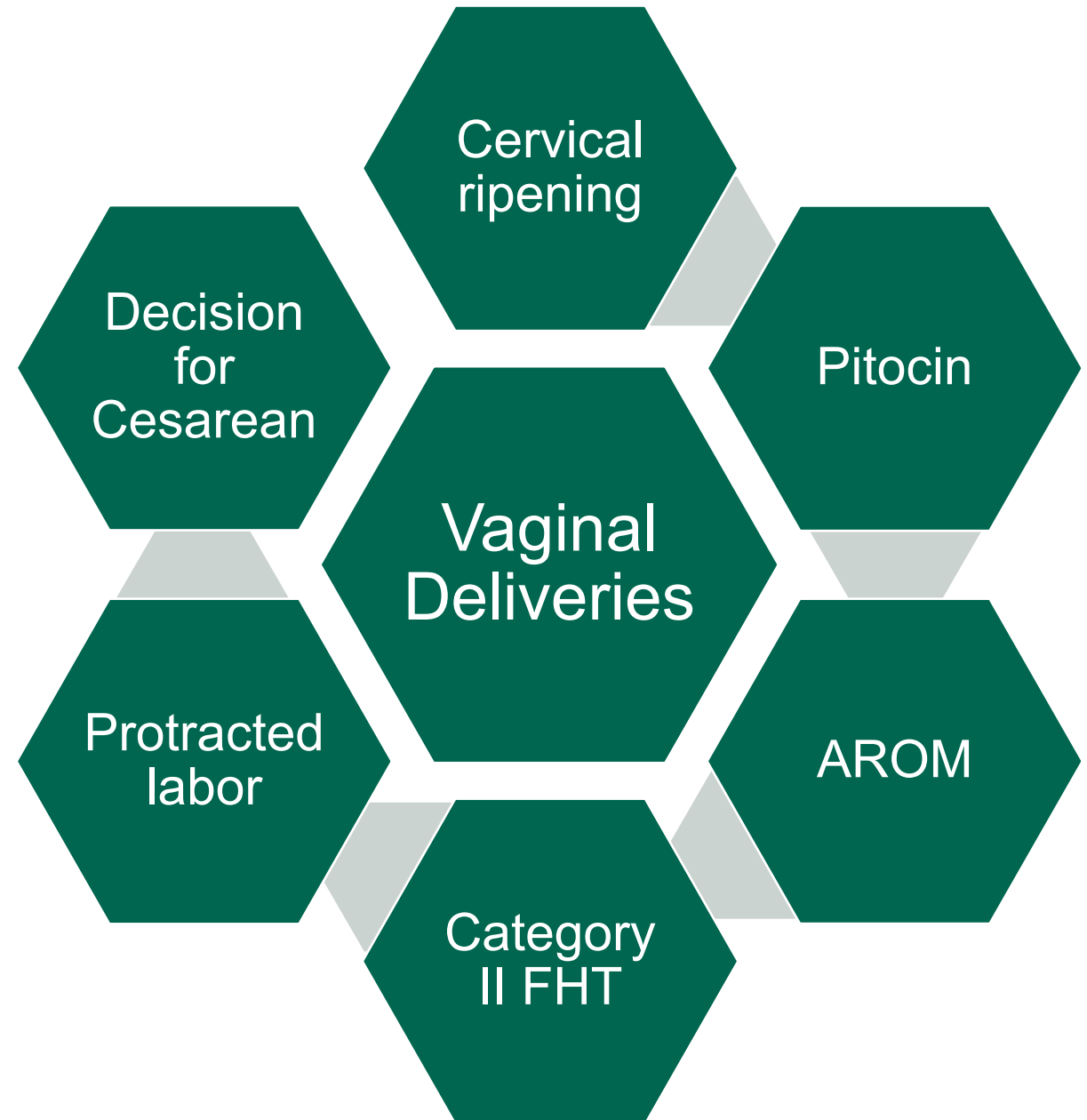
DECISIONFORCESAREAN

Description [Populate from Text](#)

SMFM/ACOG criteria for cesarean delivery during labor.

[Watch Template Formatting](#) [Keep SmartLink Formatting](#)

Additional Considerations for Promoting Vaginal Birth: Induction of Labor Process and Outcomes



Step One: Analyze Current IOL Data

Induction of Labor Sample: June-December 2022

	All Patients (n=50)	Nulliparous (n=18)
Median time from first agent to delivery (hours)	29	40.5
Rate of Cesarean Section (%)	22%	39%

- Average time from start of induction to 6cm: 24 hours, (IQR 13-30)
- Average time from 6cm to delivery: 4 hours (IQR 2-6)



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Systematic Review

Maternal and neonatal outcomes with
mechanical cervical dilation plus
misoprostol compared to misoprostol
alone for cervical ripening; a systematic
review of literature and metaanalysis

Dimitrios Nasioudis MD^a  , Sun Woo Kim MD^a, Corina Schoen MD^b,
Lisa D. Levine MD, MSCE^a

Shorter time to vaginal delivery
(mean difference, -4.53 hours;
95% CI, $-5.79, -3.27$)

**40% reduction in the incidence
of meconium passage**
(RR, 0.62; 95% CI, 0.43–0.90)

**30% Reduction in risk of NICU
admission**
(RR, 0.71; 95% CI, 0.53–0.96)



American Journal of Obstetrics and Gynecology

Available online 16 July 2023

In Press, Corrected Proof [?](#) What's this? [↗](#)



Systematic Review

Single-balloon catheter with concomitant vaginal misoprostol is the most effective strategy for labor induction: a meta-review with network meta-analysis

Luis Sanchez-Ramos MD^a [👤](#) [✉](#), Lifeng Lin PhD^b, Gustavo Vilchez-Lagos MD^c,
Jose Duncan MD^d, Niamh Condon DO^a, Jason Wheatley DO^a,
Andrew M. Kaunitz MD^a

- **Reduced odds of a prolonged induction** compared to:
 - Slow-release PGE2 (ie Cervidil) (OR, 0.08; 95% CI, 0.01-0.61)
 - Low dose oral misoprostol (OR, 0.36; 95% CI, 0.13-0.96)
- **Reduced odds of NICU admission** compared to:
 - PV misoprostol (OR, 0.68; 95% CI, 0.52–0.88)
 - PGE2 slow release (OR, 0.65; 95% CI, 0.43–0.97)
- **Reduced rate of cesarean delivery** compared to:
 - Oxytocin alone (OR, 0.60; 95% CI, 0.44-0.83)
 - Single-balloon catheter (OR, 0.75; 95% CI, 0.57-0.96)

Quality Improvement Process

Policy Changes

- Cervical Ripening balloon volume
- Timing of Misoprostol doses

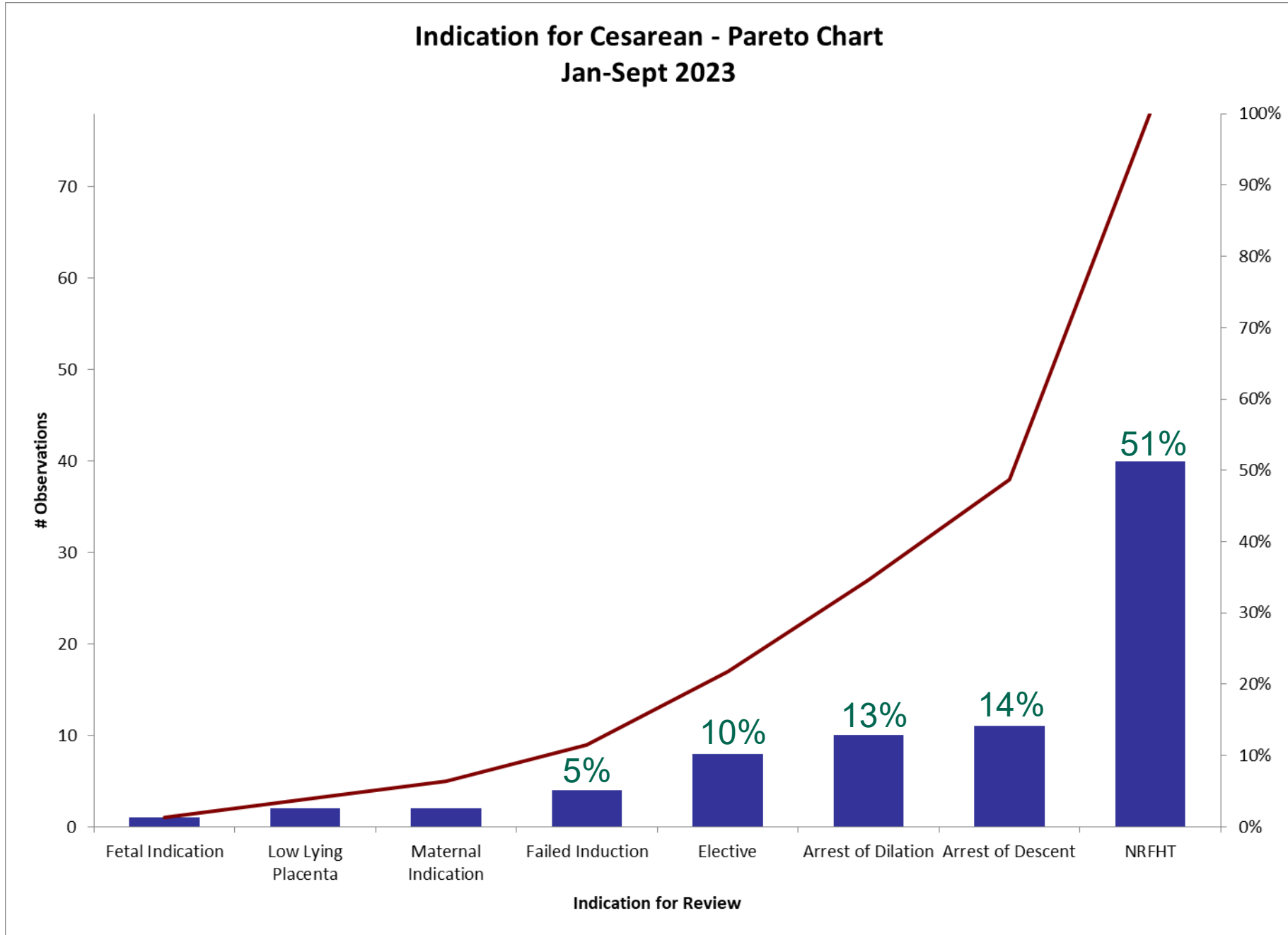
Staff Education

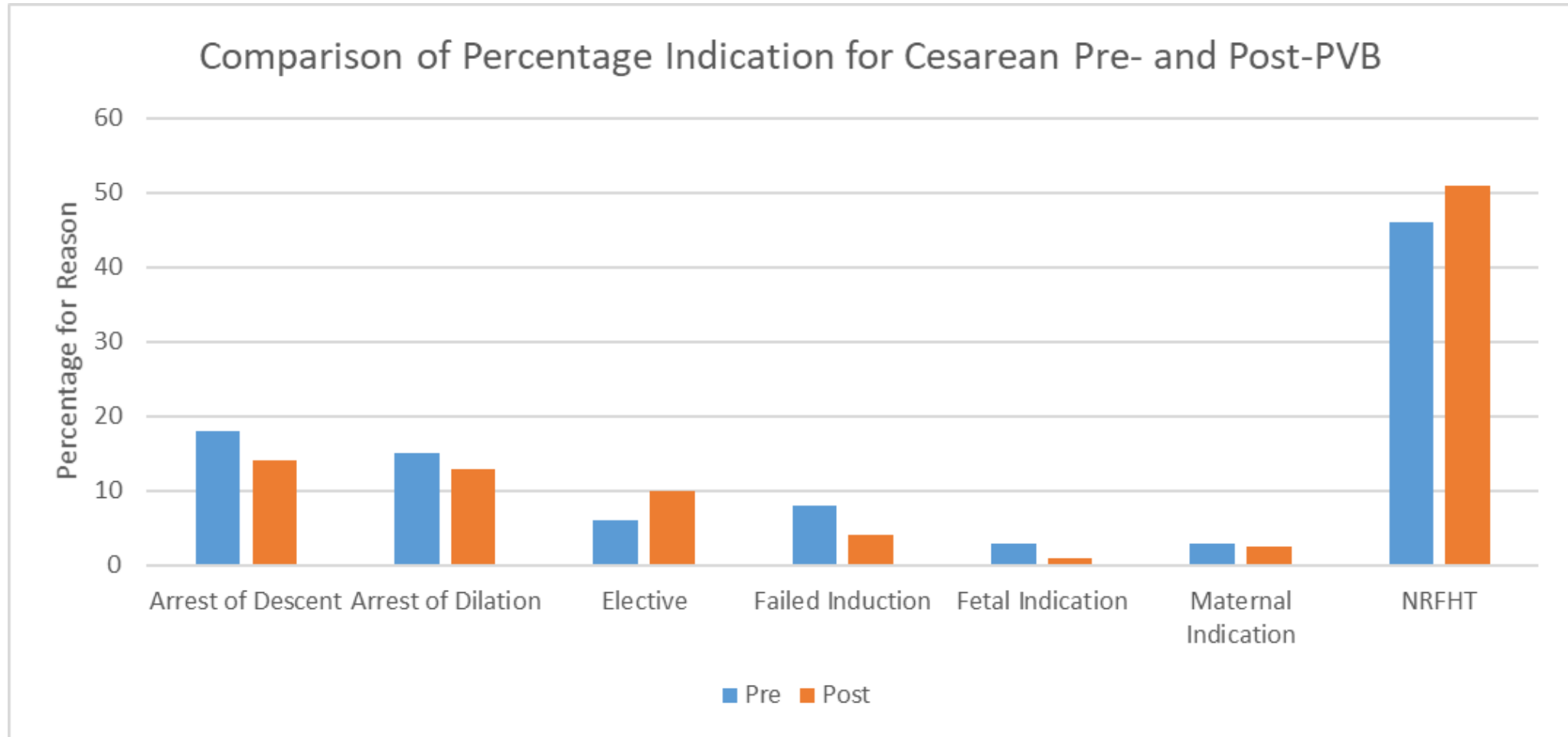
- Staff Meetings
- Grand Rounds
- Journal club
- Resident Didactics

Outcomes

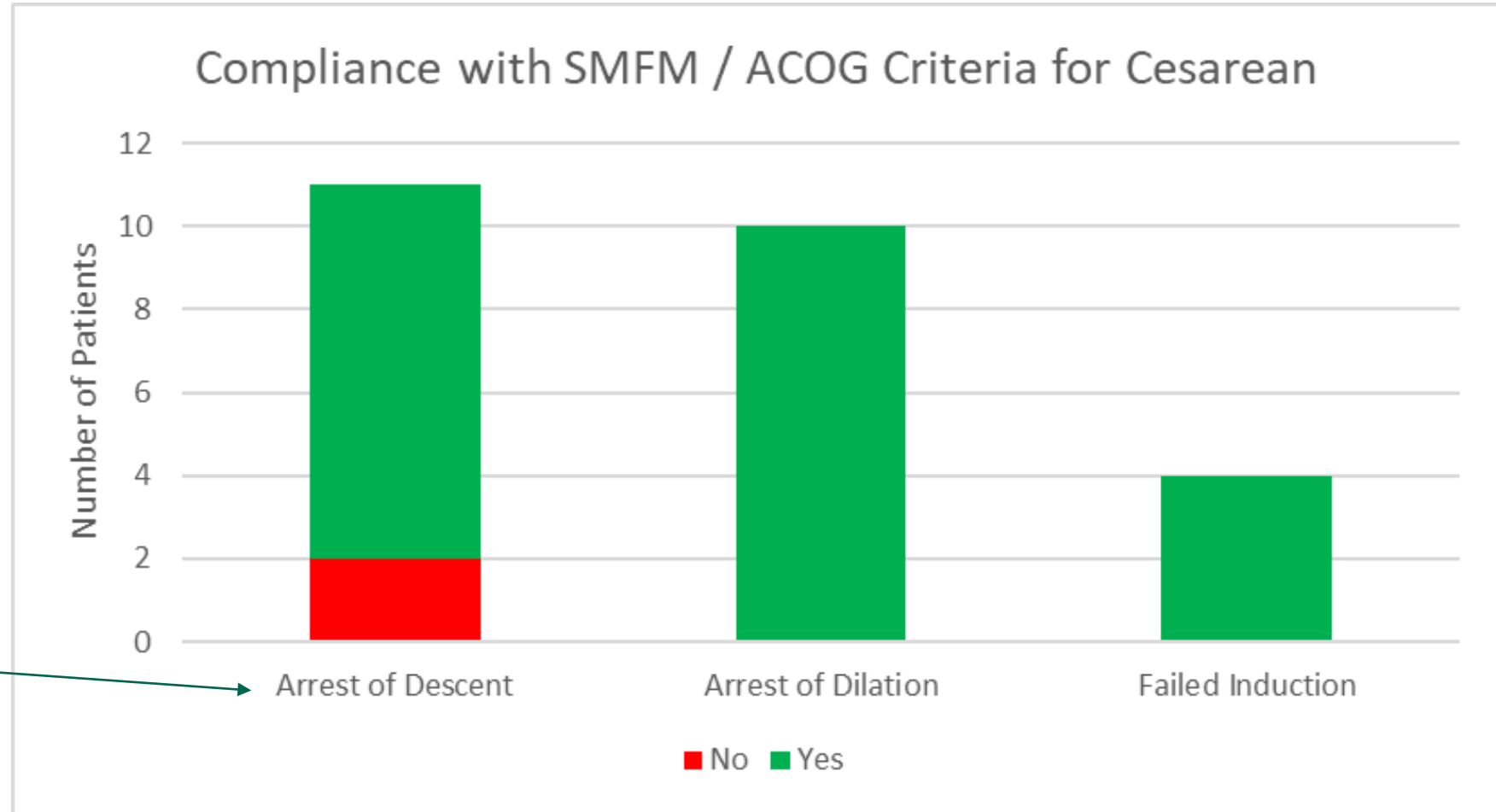
- Process Measures
 - Compliance with SMFM / ACOG criteria
 - Duration of induction of labor
 - Dual Ripening Rate
- Outcomes Measure
 - NTSV Cesarean Rate
- Balancing Measures
 - TJC PC-06: Unexpected Complications to Term Newborns
 - TJC PC-07: Severe Obstetric Complications (future work)

Indication	Number	Percentage
Fetal Indication	1	1.3%
Low Lying Placenta	2	2.6%
Maternal Indication	2	2.6%
Failed Induction	4	5.1%
Elective	8	10.3%
Arrest of Dilation	10	12.8%
Arrest of Descent	11	14.1%
NRFHT	40	51.3%



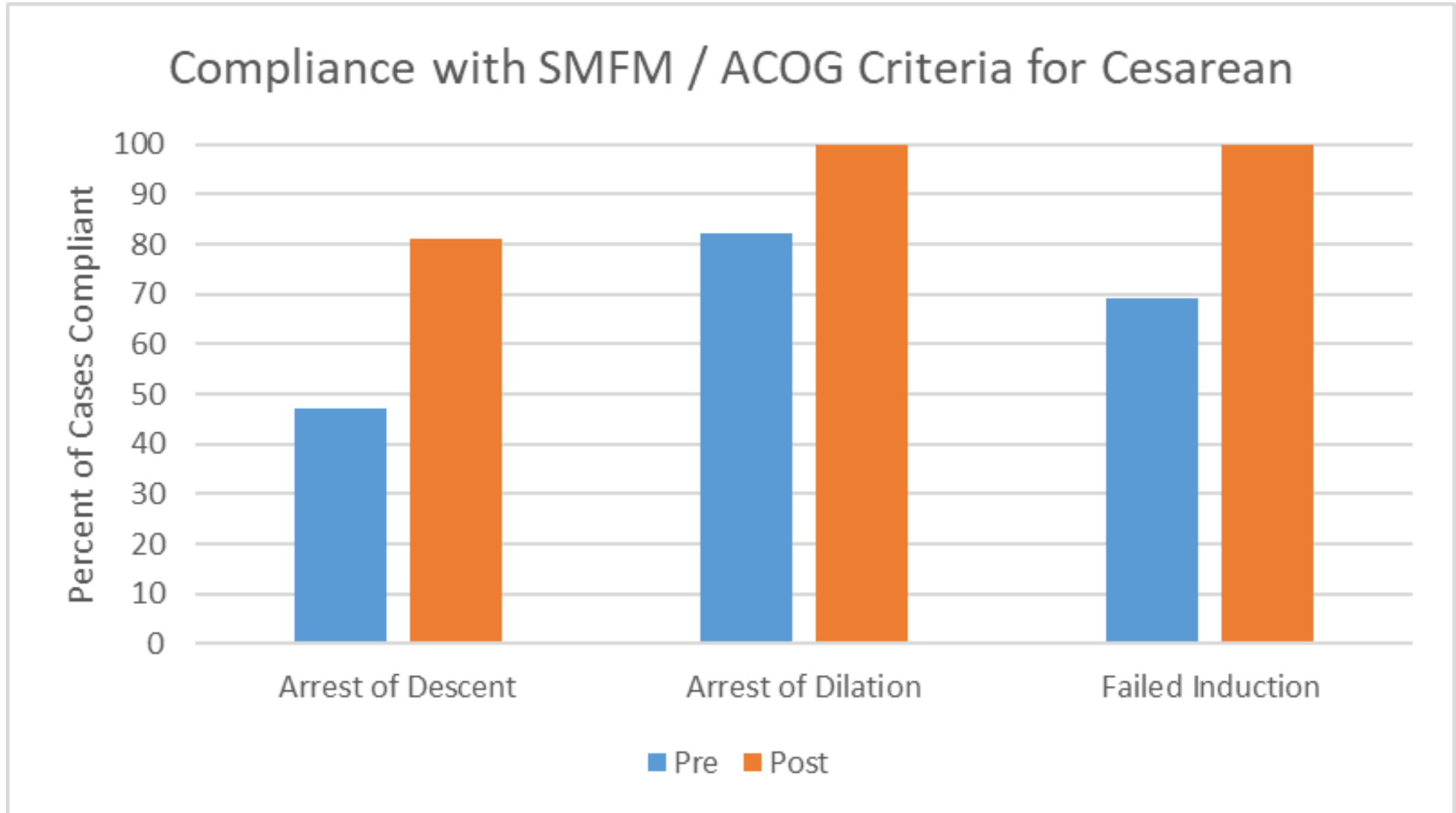


January-September 2023



Two patients pushed 2.5 hours without progress





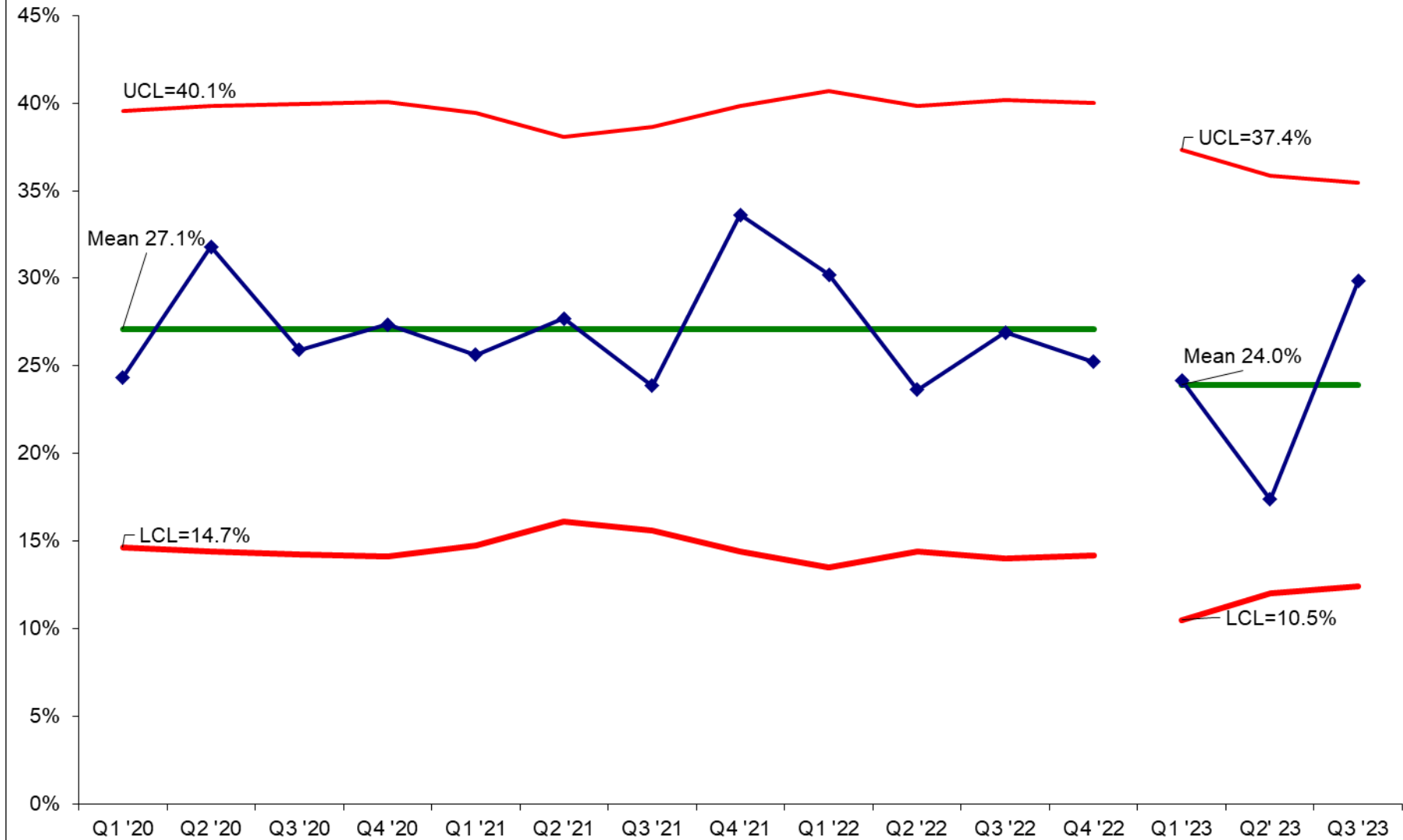
IOI Outcomes following Dual Ripening Policy Changes and Education

	June-Dec 2022 (n=127)	March-August 2023 (n=197)	P-Value
Median Length of Induction in hours (Q1-Q3)	27 (17-38)	19 (11-26)	<0.00001
Dual ripening (%)	20.5%	52.8%	<0.00001
Rate of CS (%)	23.8%	17.4%	0.05
Rate of CS for patients with initial SVE <3cm (%)	26.7%	22.1%	0.2

Outcomes for Nulliparous Patients

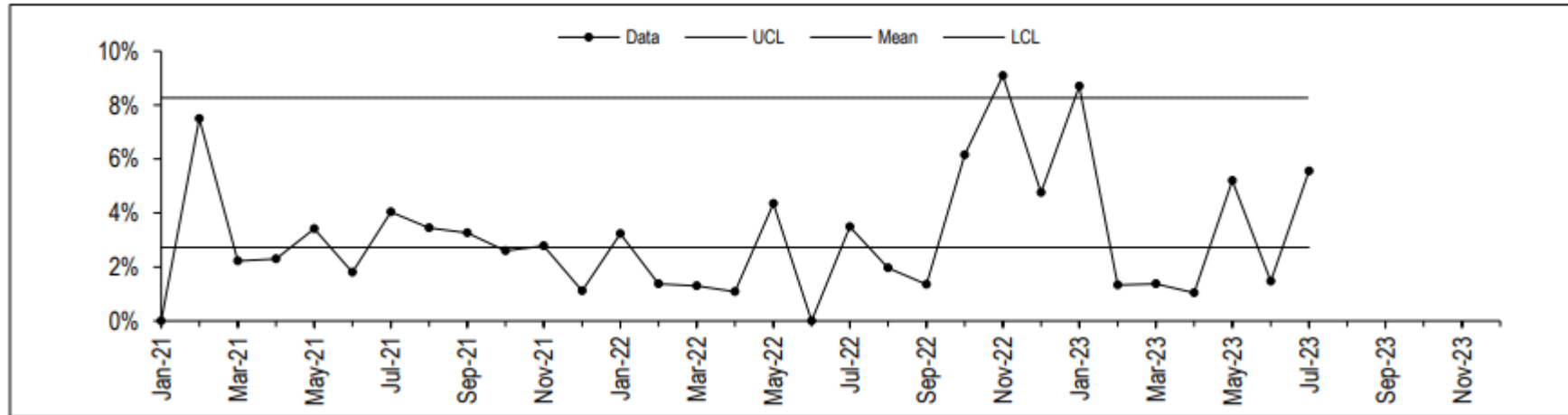
	June-Dec 2022 (n=54)	March-August 2023 (n=94)	P-Value
Median Length of Induction in hours (Q1-Q3)	35 (25-46)	24 (17-31)	0.0001
Rate of CS (%)	35.2%	26.6%	0.18
Rate of CS for patients with initial SVE <3cm (%)	40.9%	30.1%	0.11

NTSV with Cesarean - p Chart

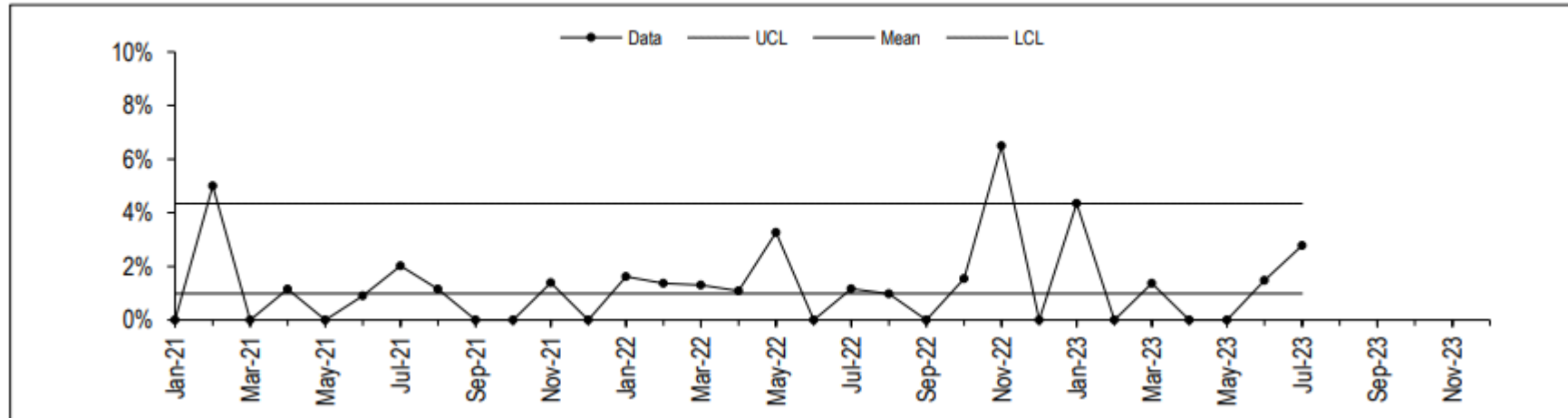


Balancing Measures – Unexpected Complications to Term Newborns

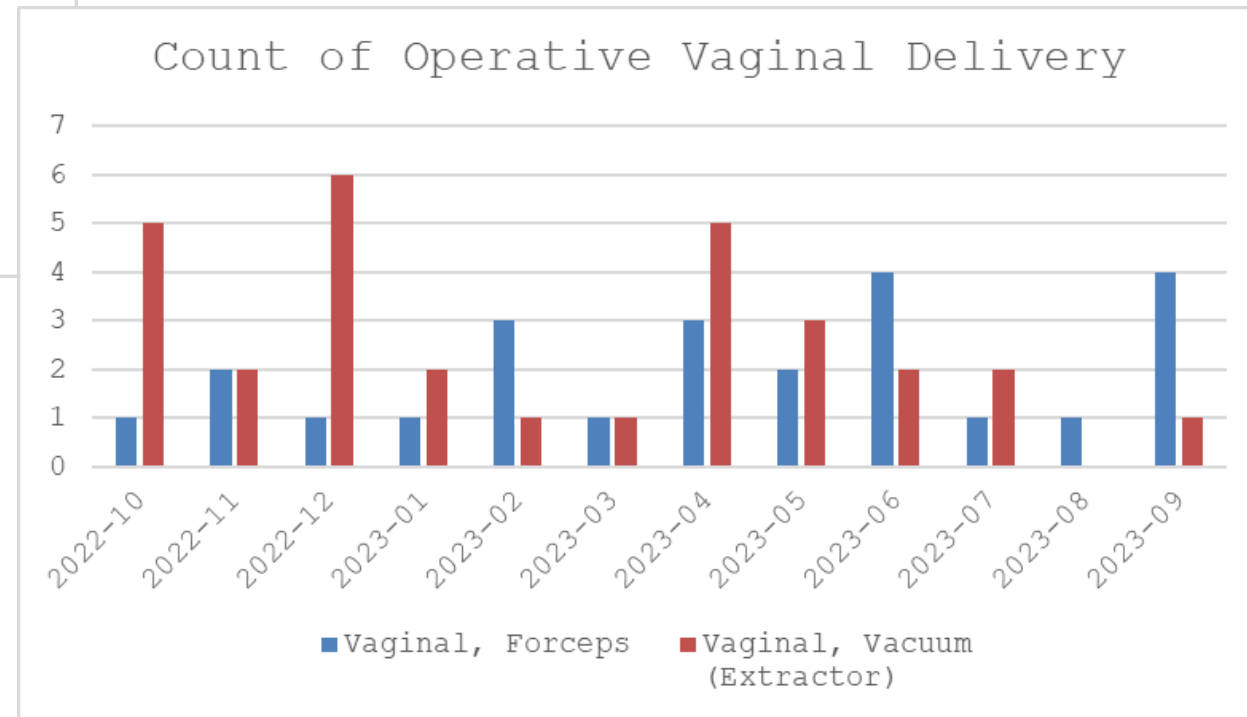
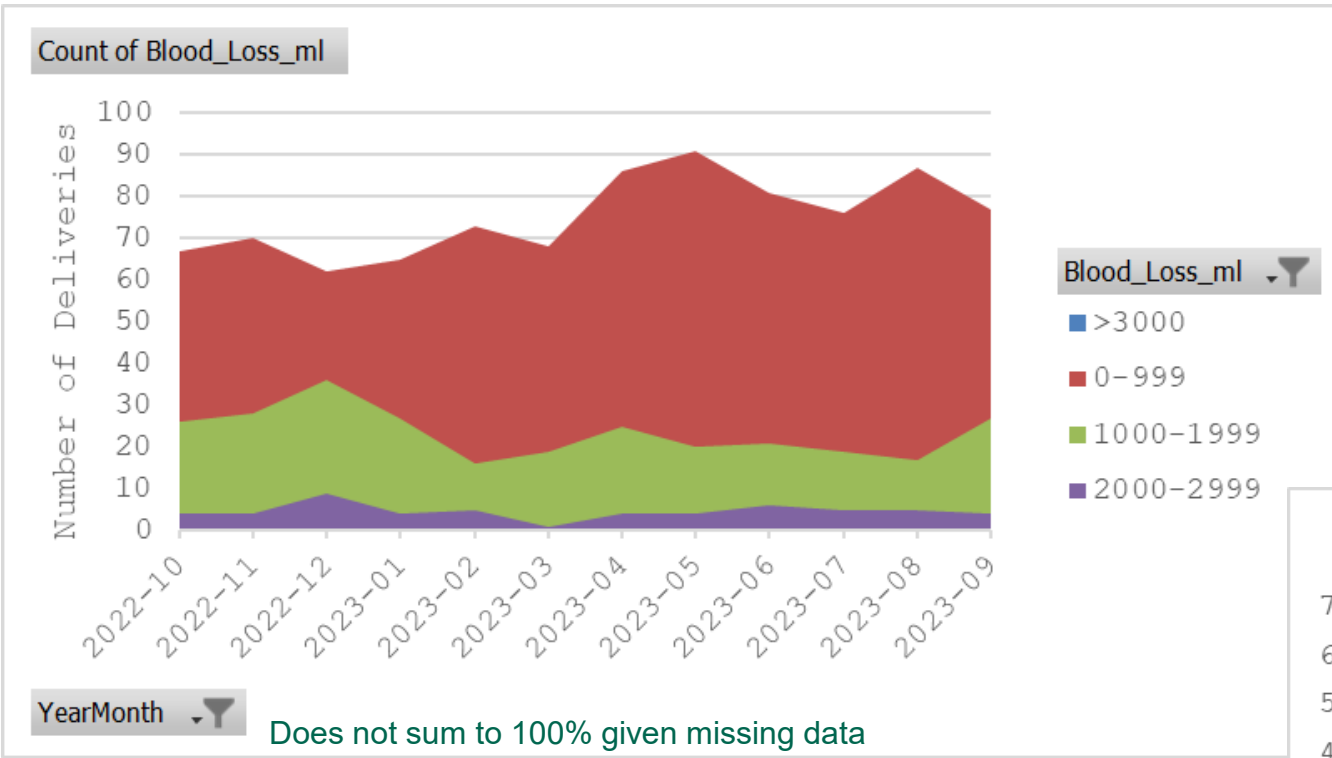
PC-06: Unexpected Complications in Term Newborns, Overall Rate
Lower rate is better



PC-06: Unexpected Complications in Term Newborns, Severe Rate
Lower rate is better



Additional Balancing Measures



Future Directions

- Doula program
- Category 2 management
- Operative vaginal delivery and reverse breech extraction workshops
- NTSV nursing-specific data



Discussion and Questions