

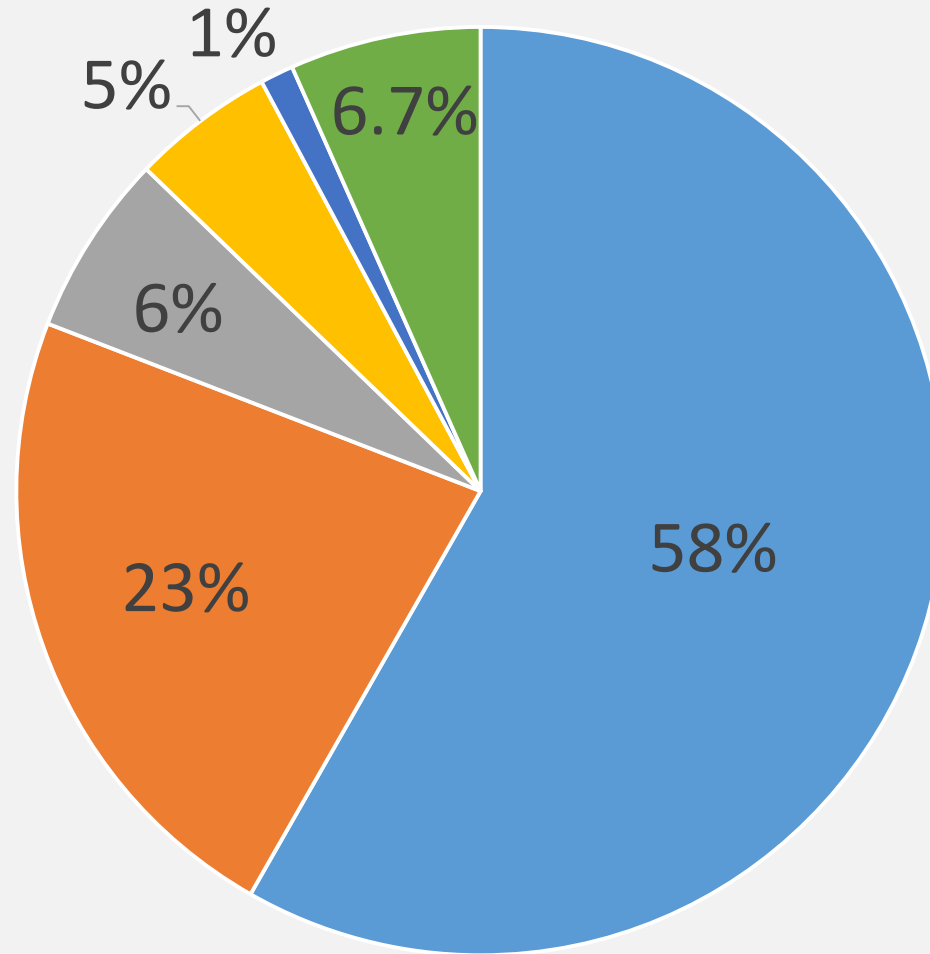


Colorado Perinatal Care Quality Collaborative

October 29, 2020

Colorado Births 2019

Total Live Births: 62,875



■ White Non-Hispanic

■ White Hispanic

■ Black/African American

■ Asian/Pacific Islander

■ American Indian/Native Alaskan

■ Other/Unknown

Selected birth characteristics by race/ethnicity of mother: Colorado residents, 2019

Characteristic	White Non-Hispanic		White Hispanic		Black		Asian American/Pacific Islander		American Indian/Native Alaskan	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total Live Births	36,628	100.0	14,223	100.0	3,977	100.0	3,132	100.0	729	100.0
Age of Mother										
10-17	165	0.5	341	2.4	45	1.1	9	0.3	15	2.1
18-19	570	1.6	776	5.5	152	3.8	35	1.1	50	6.9
20-29	13,857	37.8	7,928	55.7	2,097	52.7	1,096	35.0	389	53.4
30+	22,031	60.1	5,175	36.4	1,683	42.3	1,992	63.6	275	37.7
Low Weight Births (<2,500 Grams)	3,161	8.6	1,345	9.5	565	14.3	356	11.4	64	8.8
Very Low Weight Births (<1,500 Grams)	364	1.0	153	1.1	101	2.5	44	1.4	6	0.8
Prenatal Care Later than 1st Trimester/No Care	4,738	13.6	3,082	22.9	899	24.6	505	17.1	212	31.1
No Prenatal Care	313	0.9	376	2.8	87	2.4	41	1.4	31	4.5
Preterm Births (<37 Weeks)	3,266	8.9	1,409	9.9	497	12.5	331	10.6	69	9.5
Education of Mother <High School Diploma/GED	1,505	4.1	3,358	23.9	502	12.9	256	8.3	129	17.9
Live Births to Unmarried Women	6,238	17.0	4,715	33.2	1,572	39.5	370	11.8	339	46.5
Smoking During Pregnancy	2,074	5.7	534	3.8	284	7.2	57	1.8	73	10.2



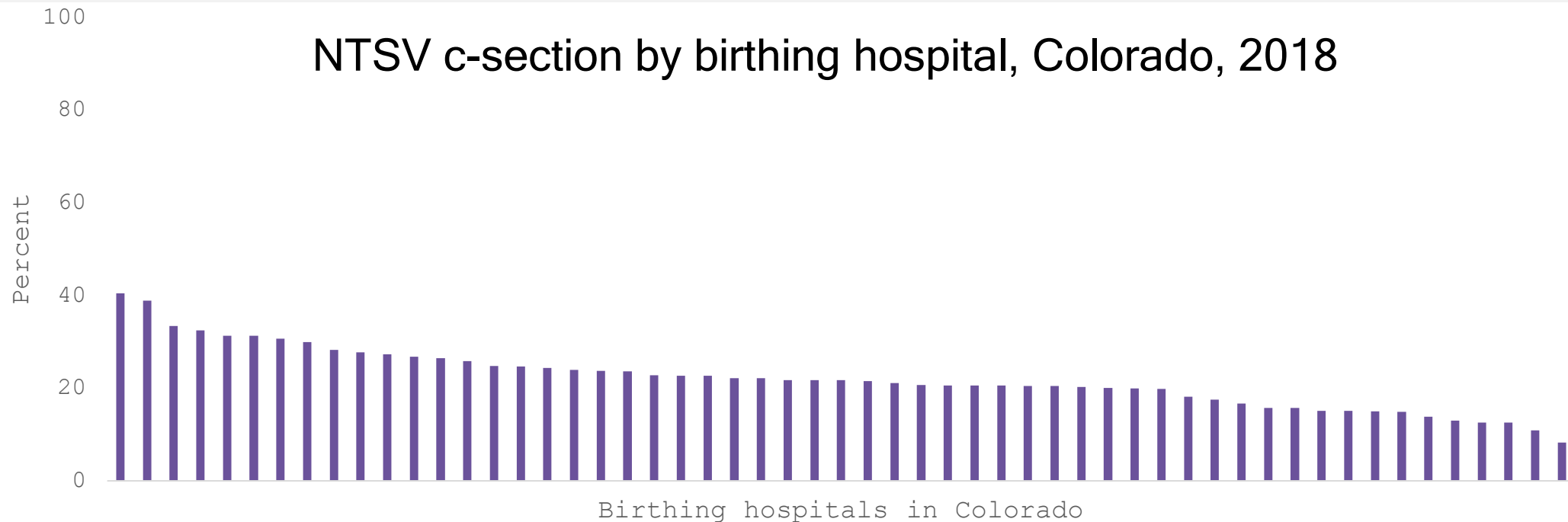
SOAR

SuppOrting vAginal delivery for
low-Risk mothers

Overview

- High degree of variability in NTSV cesarean birth rate across CO
- While lifesaving in many cases, unnecessary cesarean births:
 - Increase maternal morbidity and mortality
 - Increase risks for infants

NTSV c-section by birthing hospital, Colorado, 2018



Intervention aligned with ACOG/SMFM Consensus Statement & the AIM Patient Safety Bundle

- Readiness
- Recognition & Prevention
- Response to Every Labor Challenge

**COUNCIL ON PATIENT SAFETY
IN WOMEN'S HEALTH CARE**
safe health care for every woman

SAFE REDUCTION OF PRIMARY CESAREAN BIRTHS: SUPPORTING INTENDED VAGINAL BIRTHS

READINESS

Every Patient, Provider and Facility

- Build a provider and maternity unit culture that values, promotes, and supports spontaneous onset and progress of labor and vaginal birth and understands the risks for current and future pregnancies of cesarean birth without medical indication.
- Optimize patient and family engagement in education, informed consent, and shared decision making about normal healthy labor and birth throughout the maternity care cycle.
- Adopt provider education and training techniques that develop knowledge and skills on approaches which maximize the likelihood of vaginal birth, including assessment of labor, methods to promote labor progress, labor support, pain management (both pharmacologic and non-pharmacologic), and shared decision making.

RECOGNITION AND PREVENTION

Every patient

- Implement standardized admission criteria, triage management, education, and support for women presenting in spontaneous labor.
- Offer standardized techniques of pain management and comfort measures that promote labor progress and prevent dysfunctional labor.
- Use standardized methods in the assessment of the fetal heart rate status, including interpretation, documentation using NICHD terminology, and encourage methods that promote freedom of movement.
- Adopt protocols for timely identification of specific problems, such as herpes and breech presentation, for patients who can benefit from proactive intervention before labor to reduce the risk for cesarean birth.

PATIENT SAFETY BUNDLE
Safe Reduction of Primary Cesarean Births

OBSTETRICS & GYNECOLOGY

Volume 116, Number 5, November 2016

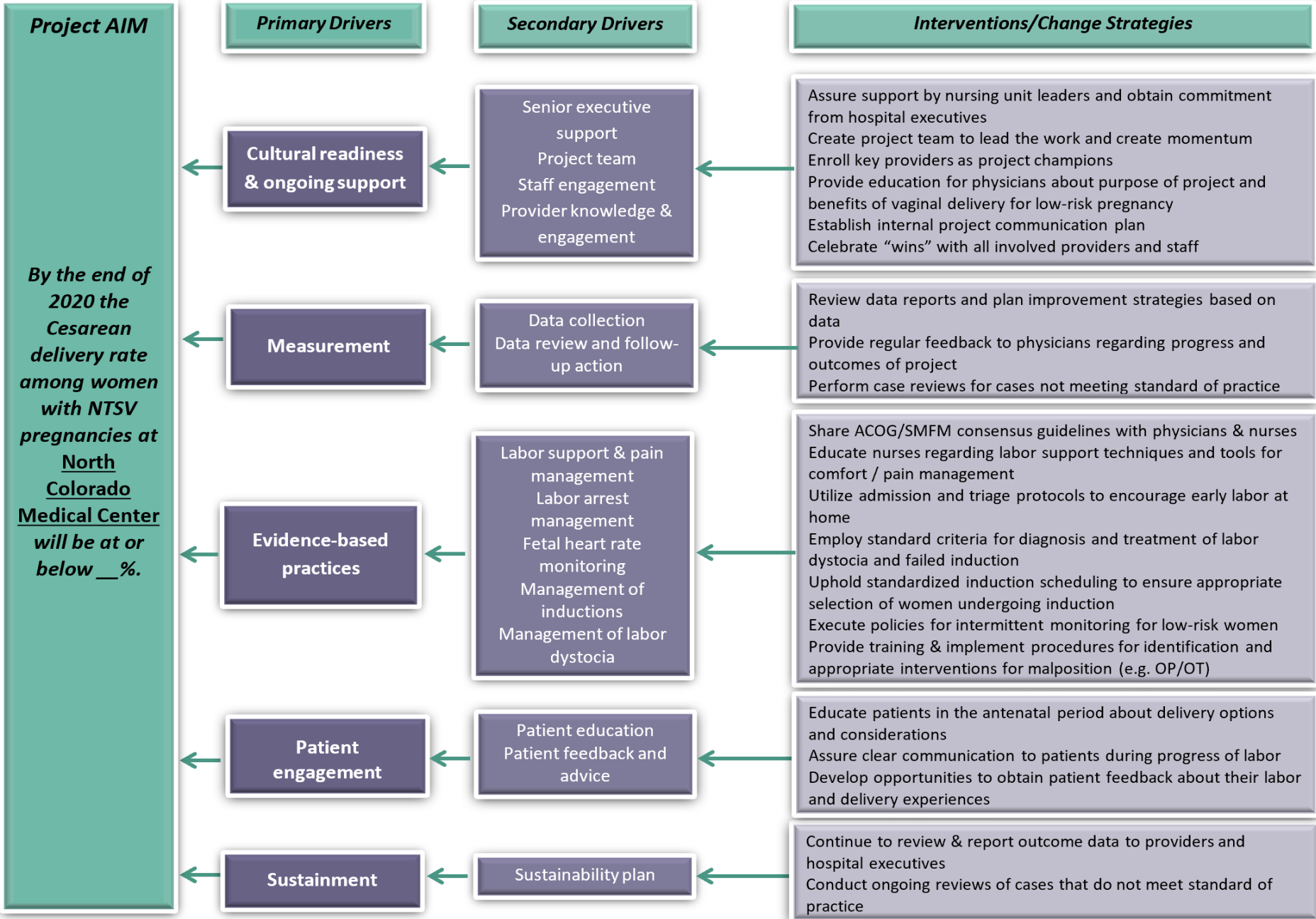
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Submit Manuscripts: <http://mc.manuscriptcentral.com/obgyn>

Approach

SOAR (Supporting vaginal delivery for low-Risk mothers)

Hospital:

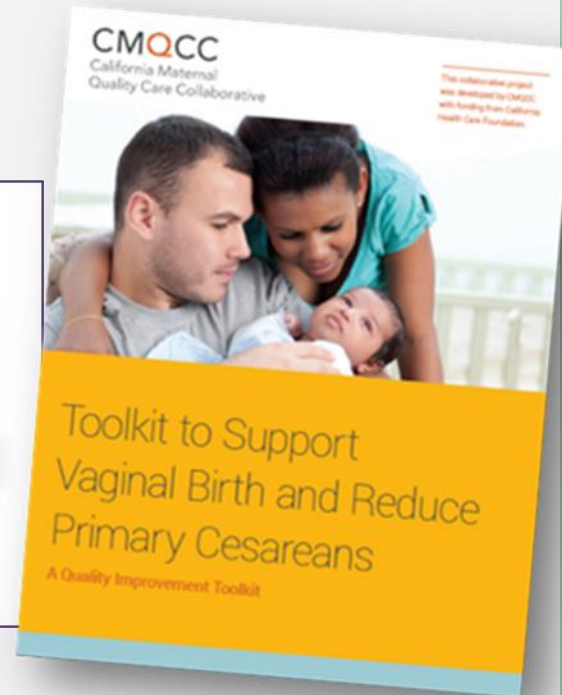
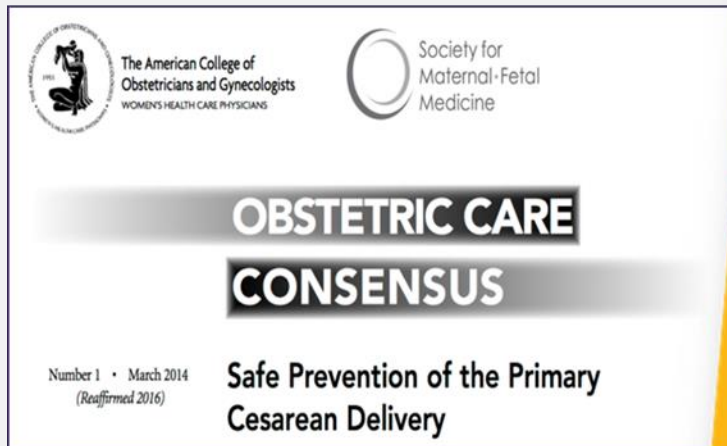


Key Drivers

1st Test of Change

Use of labor dystocia checklist

*Adopted & adapted from CMQCC Toolkit



2nd Test of Change

Individualized by hospital

- Pitocin protocol
- Scheduling of inductions
- Deep dive into cases not meeting dystocia criteria
- Use of intermittent auscultation
- Outpatient cervical ripening protocol

Labor Dystocia Checklist



SUPPORTING VAGINAL BIRTH FOR LOW-RISK MOTHERS (SOAR)
Pre-Cesarean Checklist for Labor Dystocia or Failed Induction

Is the provider unable to augment labor with Pitocin or AROM due to non-reassuring fetal heart rate?

Yes, infant has non-reassuring heart rate

Has the provider tried intrauterine resuscitative measures such as intraamniotic infusion and position changes?

If Yes, do not complete this checklist

No, fetal heart rate does not prohibit augmentation of labor

If No, continue with this checklist

Patient Info/Sticker
(optional)

MR#:
Date of C-section:

Failed Induction in the case of an unfavorable cervix

Bishop Score <8, **AND**

Cervical ripening was used (ripening agent: _____), **AND**

Unable to generate regular contractions (every 3 minutes) and cervical change after oxytocin administered for at least 12-18 hours after membrane rupture.

If all of the above are checked, consider cesarean delivery. Note that ≥24 hrs of oxytocin administration after membrane rupture is preferable if maternal & fetal statuses permit.

Latent Phase Arrest

<6 cm Dilation, **AND**

Moderate or strong contractions palpated for > 12 hours without cervical change, **OR**

IUPC reads ≥ 200 MVU for > 12 hours without cervical change

If both of the above are checked, consider cesarean delivery. Note that as long as fetal and maternal statuses remain reassuring and cervical progress is being made, a slow but progressive latent phase (e.g., >20 hours in nulliparous women or >14 hours in multiparous) is not an indication for cesarean delivery. Use caution when diagnosing latent phase arrest and allow for sufficient time to enter the active phase.

Active Phase Arrest

≥6 cm Dilation, **AND**

Membranes ruptured, **AND**

No cervical change after at least 4 hours of adequate uterine activity (e.g. strong to palpation or MVUs ≥ 200), **OR**

At least 6 hours of oxytocin administration with inadequate uterine activity

If all of the above are checked, consider cesarean delivery

Second Stage Arrest

Nullipara with epidural pushing for at least 4 hours, **OR**

Nullipara without epidural pushing for at least 3 hours, **OR**

Nullipara with epidural with total second stage of at least 4 hours

If any of the above apply, consider cesarean delivery

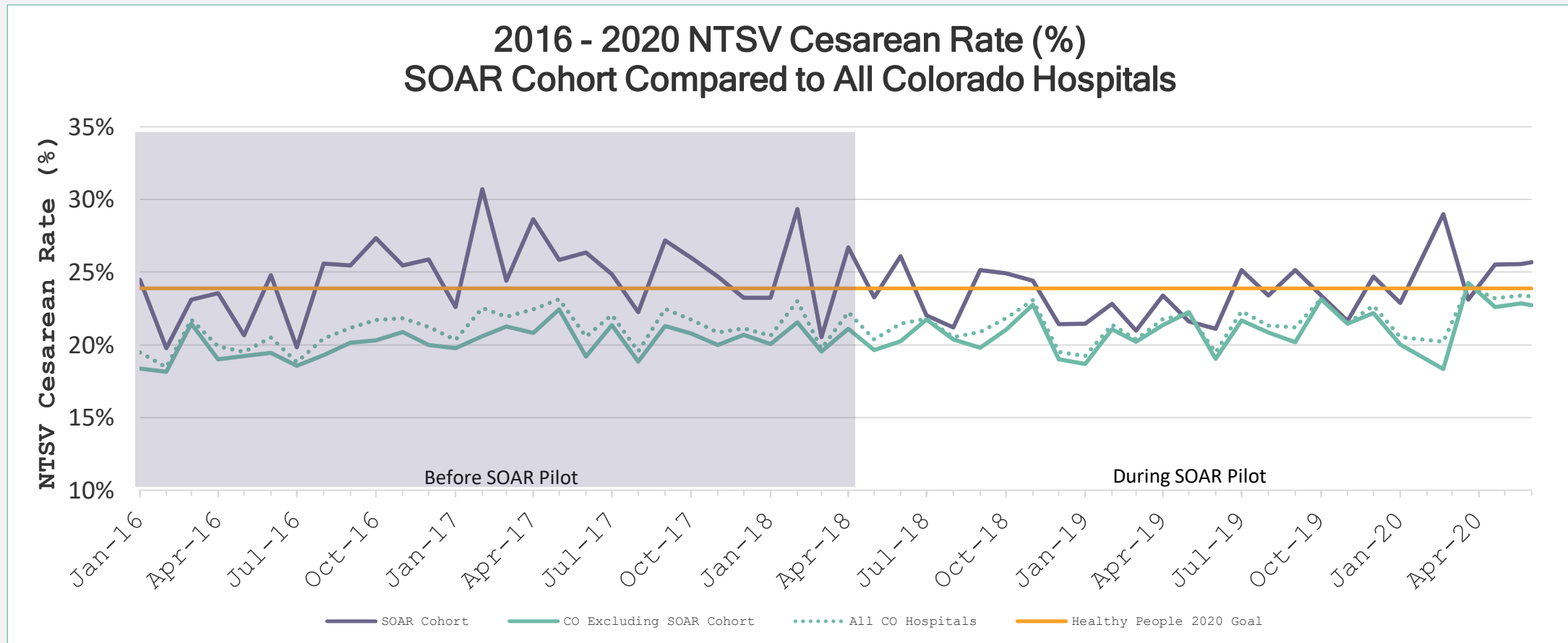
Comments: _____

This checklist was developed based on California Maternal Quality Care Collaborative's Labor Dystocia Checklist, which was adapted with permission from a toolkit created by Miller Children's and Women's Hospital



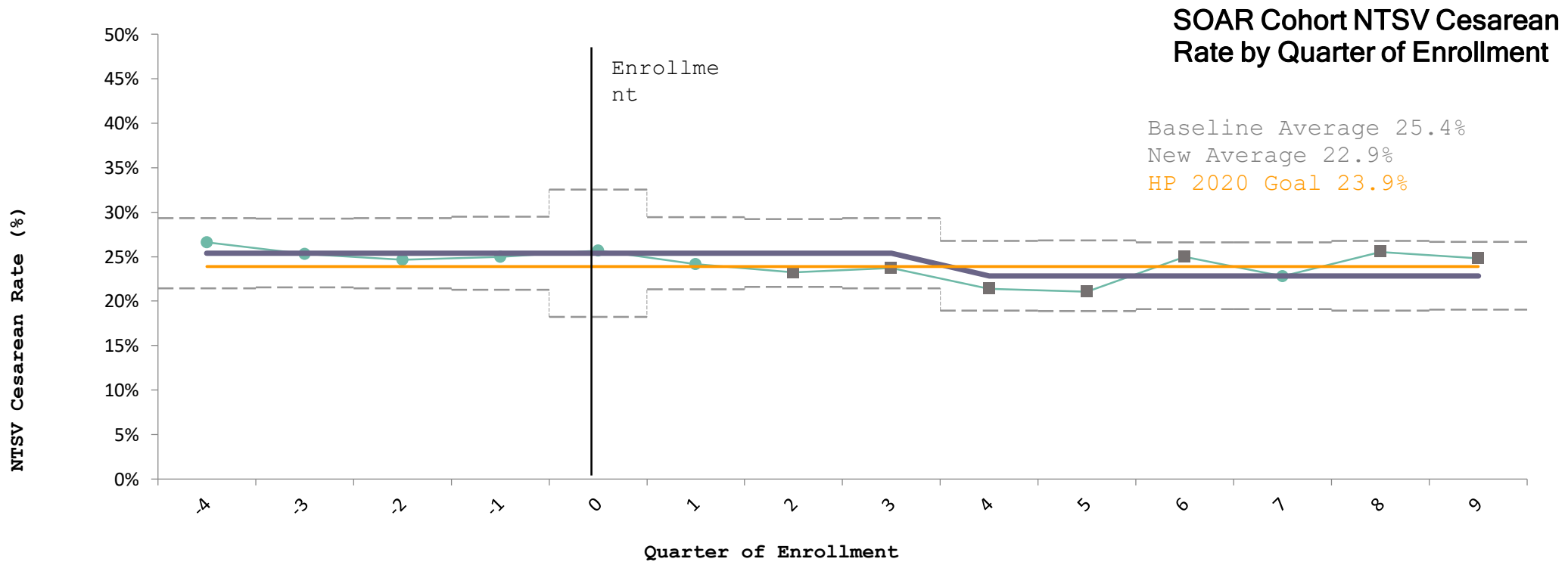
Outcomes

- Participating hospital teams recorded 52% (1,272/2,448) of NTSV cesarean births in REDCap
- SOAR hospitals started with more variability and a higher average NTSV cesarean rate than the rest of CO



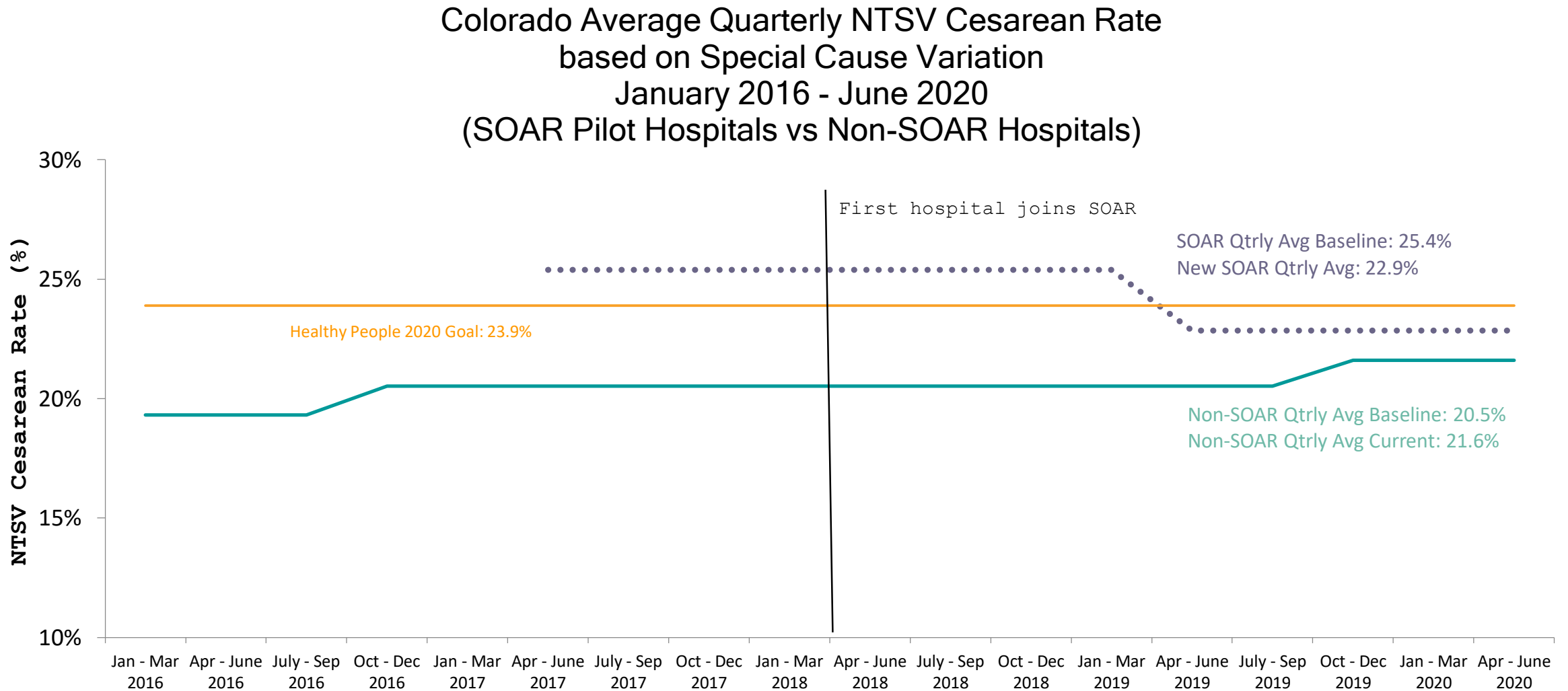
Outcomes

- Control charts demonstrate a decrease in the NTSV cesarean birth rate
 - Baseline = 25.4%, current = 22.9%



Outcomes

- The CO average NTSV cesarean birth rate increased over the same time period



Outcomes

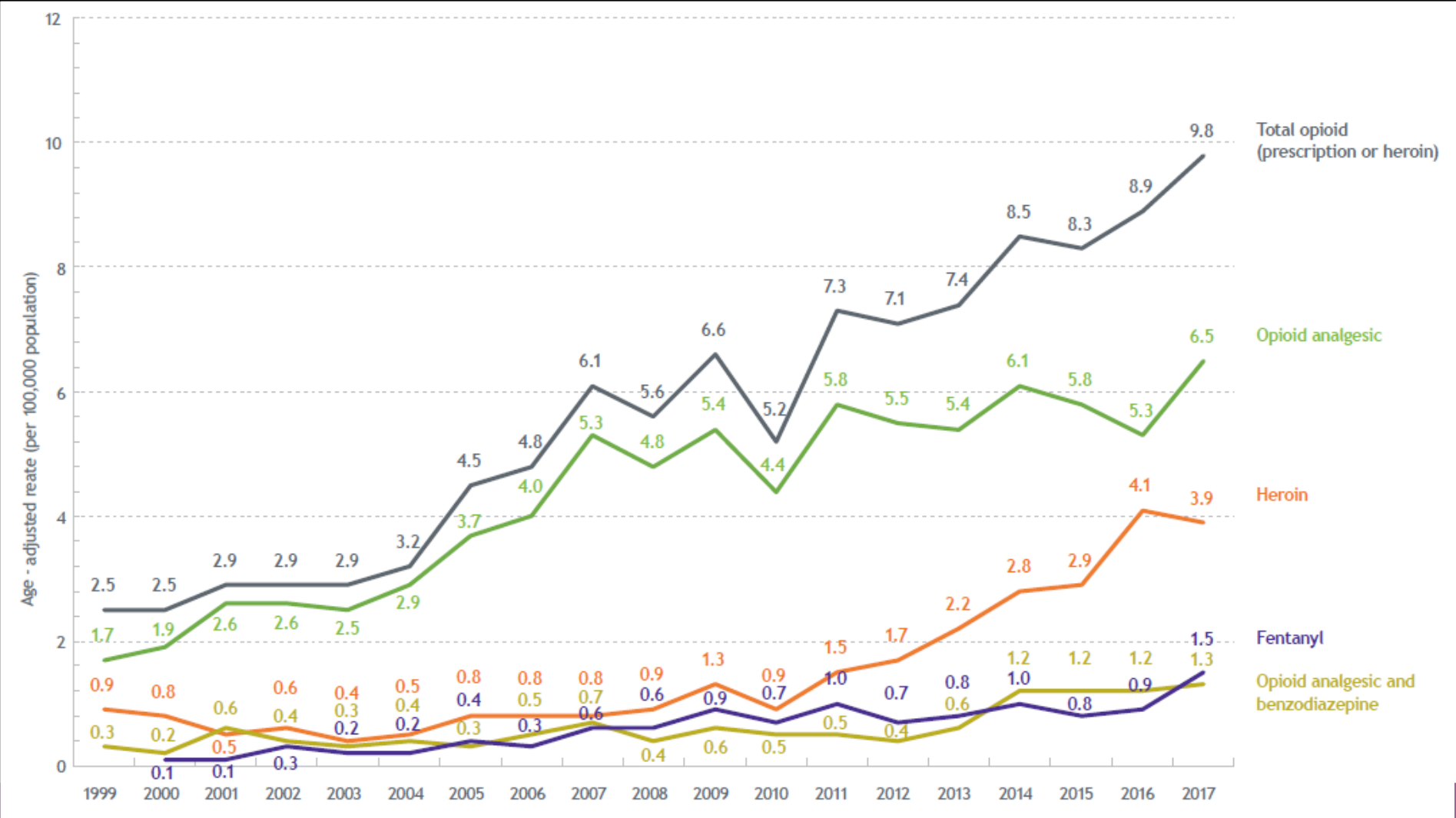
- 10% of NTSV cesareans were for Failed Induction
 - Nearly ¼ of inductions are elective
- Labor Dystocia, Fetal Distress and Failed Induction remain the leading indications
- Lack of adherence to best practice criteria indicates further

Indication	# Indicated	# Criteria Met	% Criteria Met
Failed Induction	129	62	48%
Advanced Maternal Age	74	15	20%
LD: Latent Arrest	78	29	37%
LD: Active Arrest	180	155	86%
LD: Arrest of Descent	274	80	63%



Colorado Hospital Substance Exposed Newborns Collaborative

Age-adjusted drug overdose rates from opioids: Colorado residents, 1999-2017



MATERNAL MORTALITY IN COLORADO, 2014-2016

July 2020

Colorado Department of Public Health and Environment (2020). *Colorado Maternal Mortality Prevention Program Legislative Report 2014–2016*.

Cause of death	Number of pregnancy-associated deaths	Percentage of pregnancy-associated deaths
Suicide	16	17.0%
Drug overdose	13	13.8%
Injury (including motor vehicle crash)	10	10.6%
Homicide	8	8.5%
Cardiac conditions	7	7.4%
All other obstetric complications (hypertensive disorders of pregnancy, ruptured ectopic pregnancy, uterine rupture, amniotic fluid embolism)	7	7.4%
Sepsis/infection	6	6.4%
Cerebrovascular accident (stroke)	5	5.3%
Thrombotic pulmonary embolism	5	5.3%
All other non-obstetric medical causes of death (e.g. cancer, respiratory conditions)	17	18.1%

Variability Across Colorado Hospitals in Care of Opioid-Exposed Newborns

- Maternal and infant drug screening
- Infant assessment for withdrawal
- Location of care for opioid exposed newborns
- Degree of engagement of mothers
- Pharmacologic treatment modalities
 - Initiation and weaning protocols
- Criteria for discharge
- On and on and on.....



Initiative Goal

- To develop a collaborative quality improvement initiative of Colorado hospitals that uses structured **quality improvement methods and sharing of data and practices** to further support hospital-based improvement efforts to achieve measurable improvements in the care of substance-exposed newborns and their families.

September 2017

<u>Hospital</u>	<u>Team Lead Identified</u>	<u>Team Roster Completed</u>	<u>IRB Review Completed</u>	<u>Data Audit Begun</u>	<u>Interventions Implemented</u>	<u>Data Sharing Begun</u>
Denver Health	Y					
Lutheran	Y					
Parker	Y					
Platte Valley	Y					
Poudre Valley	Y					
University Hospital	Y					

CHoSEN

COLLABORATION

The CHoSEN Collaborative

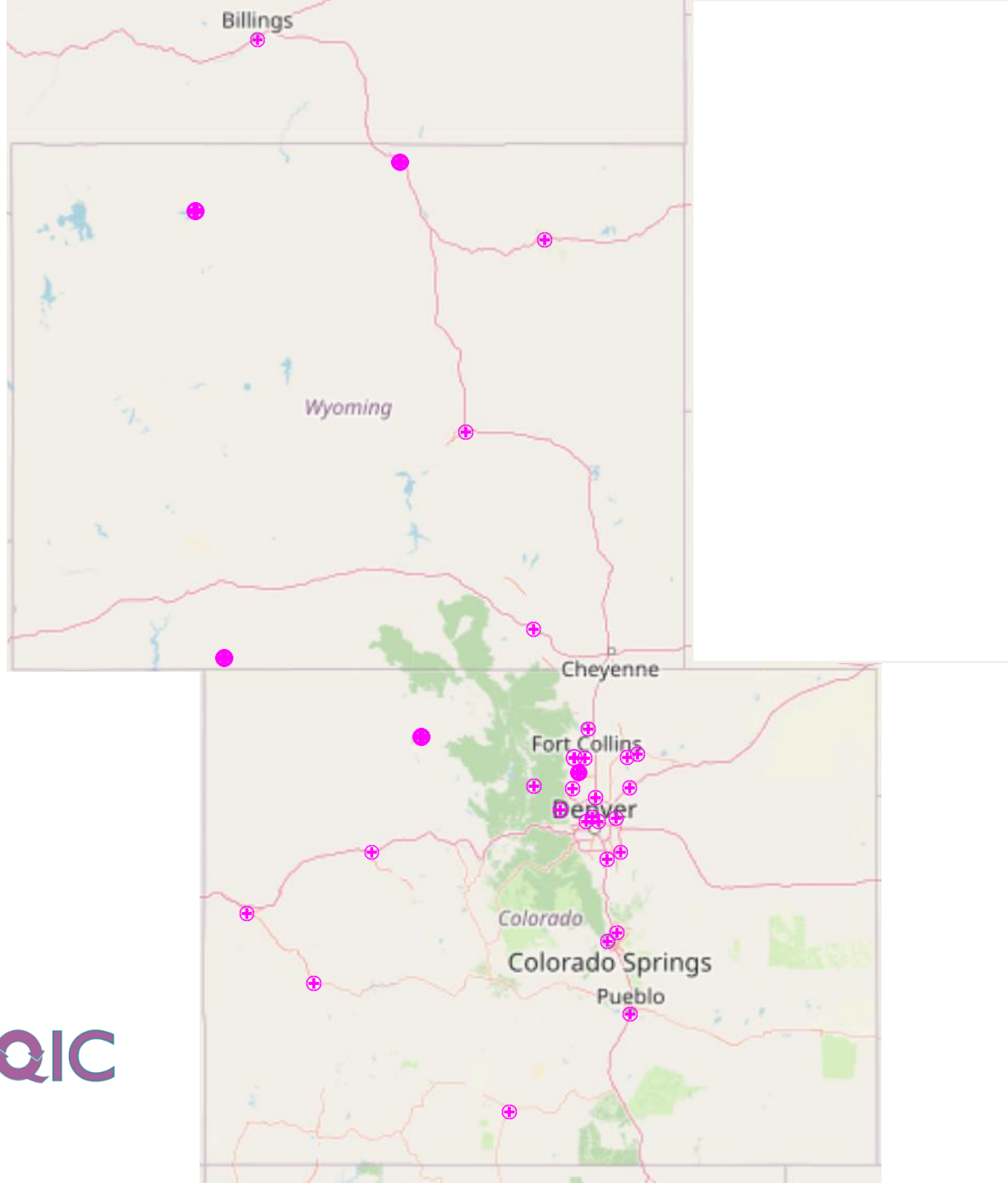
Led In Partnership By



SCHOOL OF MEDICINE
Department of Pediatrics
UNIVERSITY OF COLORADO ANSCHUTZ MEDICAL CAMPUS



CHoSENCollaborative.org



Timeline

Q1 2018

Q2 2018

Q3 2018

Q4 2018

Q1 2019

Q2 2019

Q3 2019

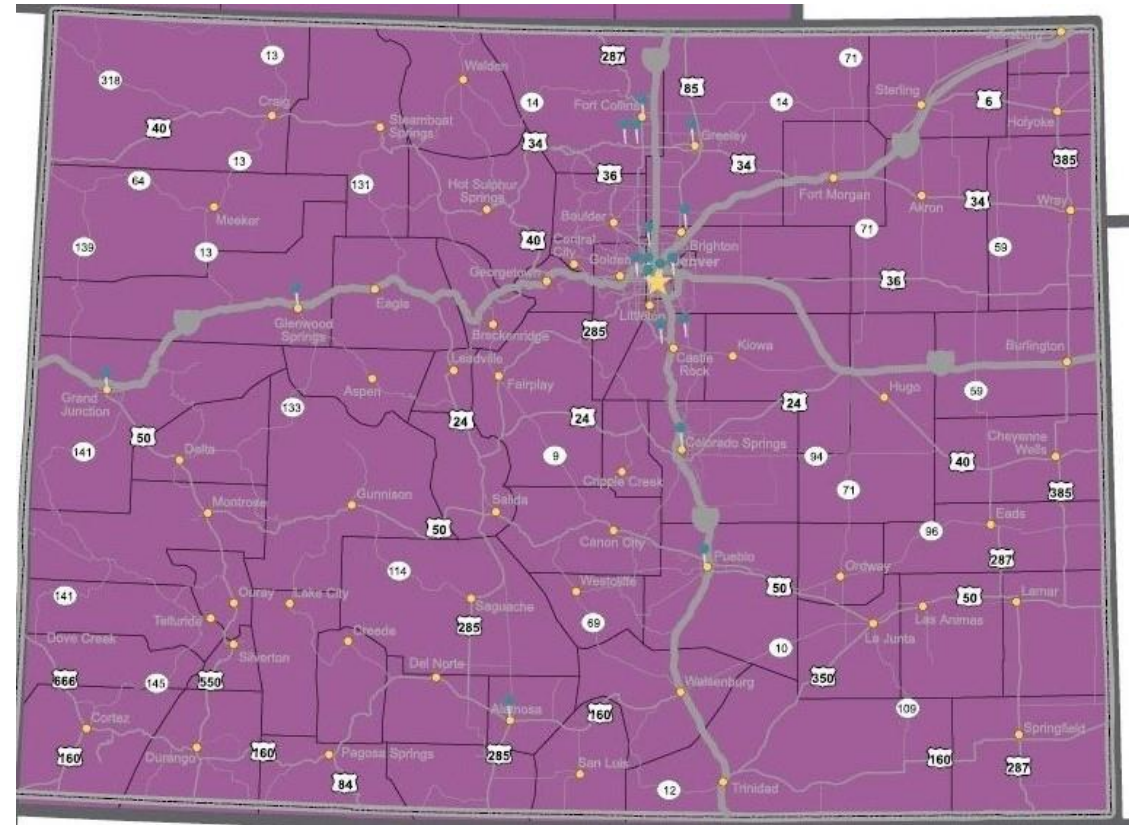
Q4 2019

Q1 2020

Q2 2020

CHoSEN QIC

- Over 50 percent of Colorado births occur in a hospital participating in CHoSEN QIC.



Primary Aims

Primary Drivers

Secondary Drivers

Potential Change Concepts

Overall Project Goal
 Improve the care and outcomes of SENs.

- 1. Improve the hospital-based care of SENs.
- 2. Improve the safe discharge of SENs.

Increase and improve participation of CO hospitals in improvement project
Measure: % of CO birth hospitals engaged in project

Reduce post-natal exposure to opiates
Outcome Measure: % of SENs at risk for NAS needing pharmacologic Rx
Outcome Measure: 1. total days of postnatal opioid therapy; 2. length of birth hospitalization

Increase family involvement in care

Improve discharge process for SENs

Increase number of hospitals that have structured and effective care guidelines of the SEN
Measure: % of hospitals in project with active SEN QI project by end of 2018
Measure: % of hospitals in project reporting data to collaborative database by 2018

Improve non-pharmacologic care
Process Measure: % of SEN receiving non-pharmacologic care

Increase use of human milk
Process Measure: % of participating hospitals with a policy on use of mother's own milk

Implement ESC assessment tool
Process Measure: % of participating hospitals utilizing the ESC assessment tool

Increase antenatal consults for families with SEN
Measure: % of hospitals with protocol/guidelines for prenatal consultation

Standardize the discharge process for SENs
Measure: % of hospitals with a guideline for safe discharge of SENs

- 1) Outreach to CO hospitals
- 2) QI education and project facilitation
- 3) Database development including completion of Data Use Agreements

- 1) Development of local protocols
 - 2) Staff education
 - 3) Family education
- Process Measure:* % of participating hospitals with appropriate local policies or guidelines

- 1) Development of local protocols
- 2) Staff education

- 1) Development of local protocols
- 2) Inpatient and outpatient provider education
- 3) Family education



The CHoSEN Collaboration Led In Partnership By



CHoSENCollaborative.org

RESEARCH ARTICLE

The Colorado Hospitals Substance Exposed Newborn Quality Improvement Collaborative: Standardization of Care for Opioid-Exposed Newborns Shortens Length of Stay and Reduces Number of Infants Requiring Opiate Therapy

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ABSTRACT

OBJECTIVES: To decrease the average length of stay (LOS) of opioid-exposed newborns (OENs) by 20% from baseline from April 2017 to December 2019.

METHODS: The Colorado Hospitals Substance Exposed Newborn Quality Improvement Collaborative is a consortium of neonatal providers, public health experts, and legislative experts that provides infrastructure and resources for Colorado birthing hospitals to undertake initiatives focused on improving the care of OENs. The Colorado Hospitals Substance Exposed Newborn Quality Improvement Collaborative was started in September 2017 and includes 19 birthing hospitals in Colorado, with 12 contributing data to the centralized database. The interventions were focused on (1) hospital engagement and (2) increasing nonpharmacologic care (by using the Eat, Sleep, Console assessment tool; developing guidelines for breastfeeding eligibility; employing comfort measures before pharmacologic therapy; and administering opiate therapy on an as-needed basis).

RESULTS: From April 2017 to December 2019, 787 OENs were identified. Among infants ≥ 35 weeks' gestational age without other medical diagnoses ($n = 647$), statistical process control charts revealed significant reduction in the primary outcome of interest, average hospital LOS, from 14.8 to 5.9 days. For all OENs, receipt of pharmacologic therapy declined from 61% to 23%. Among OENs who received pharmacologic therapy (and were ≥ 35 weeks' gestational age without other medical diagnoses), average LOS also declined from 21.9 to 8.0 days.

CONCLUSIONS: Through standardization of OEN care focused on family engagement and nonpharmacologic care, this statewide collaborative reduced average LOS, the percentage of OENs requiring opiate therapy, and average LOS for OENs requiring opiate therapy.



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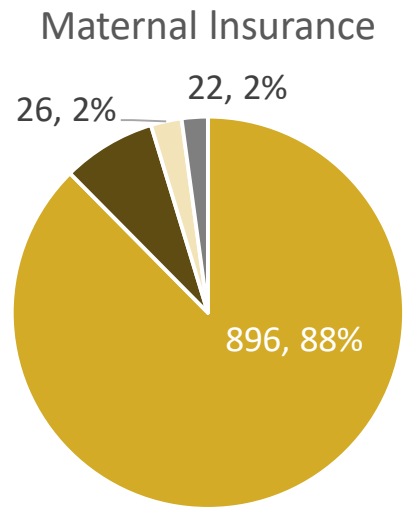
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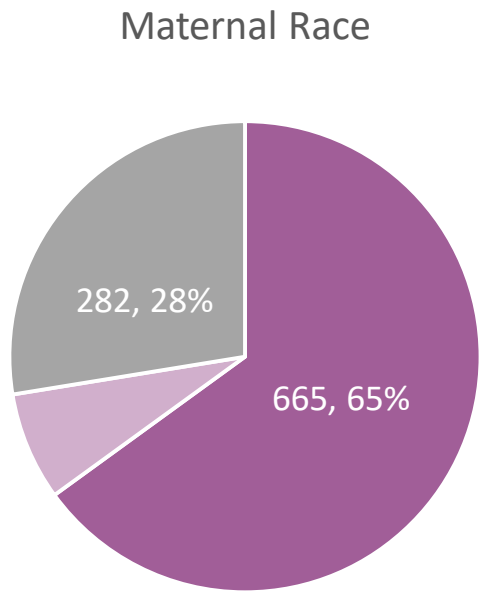
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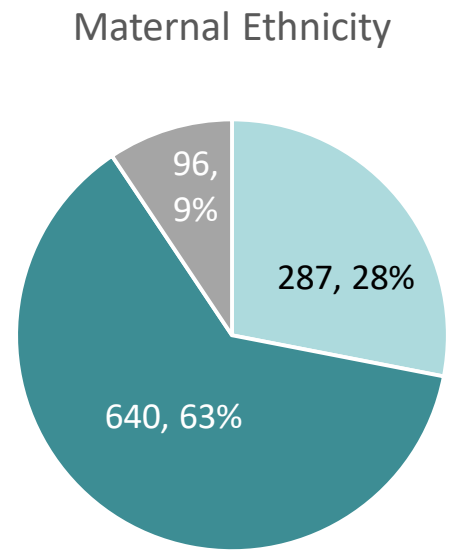


Total SEN: 1,234
Total OEN: 1,023

Public Private Other Missing/Unknown



White Other Missing/Unknown



Hispanic Non-Hispanic Missing/Unknown

Maternal Substance Use

Maternal Substance Exposures	N (%)
MAT	581 (57%)
MAT <i>Only</i>	143 (25%)
MAT + Rx/Legal Substances	35 (6%)
MAT + Illicit Substances	403 (69%)
No MAT	442 (43%)
Rx Opiates <i>Only</i>	54 (12%)
Rx Opiates + Rx/Legal Substances	37 (8%)
Illicit Opiates <i>Only</i>	46 (10%)
Illicit Opiates + Other Substances	305 (69%)

*MAT = Prescribed Buprenorphine/Methadone
 Rx = SSRI, Benzodiazepines
 Legal = Marijuana, Alcohol, Nicotine
 Illicit Substances = Meth/amphetamines, cocaine, MDMA

Co-Exposures

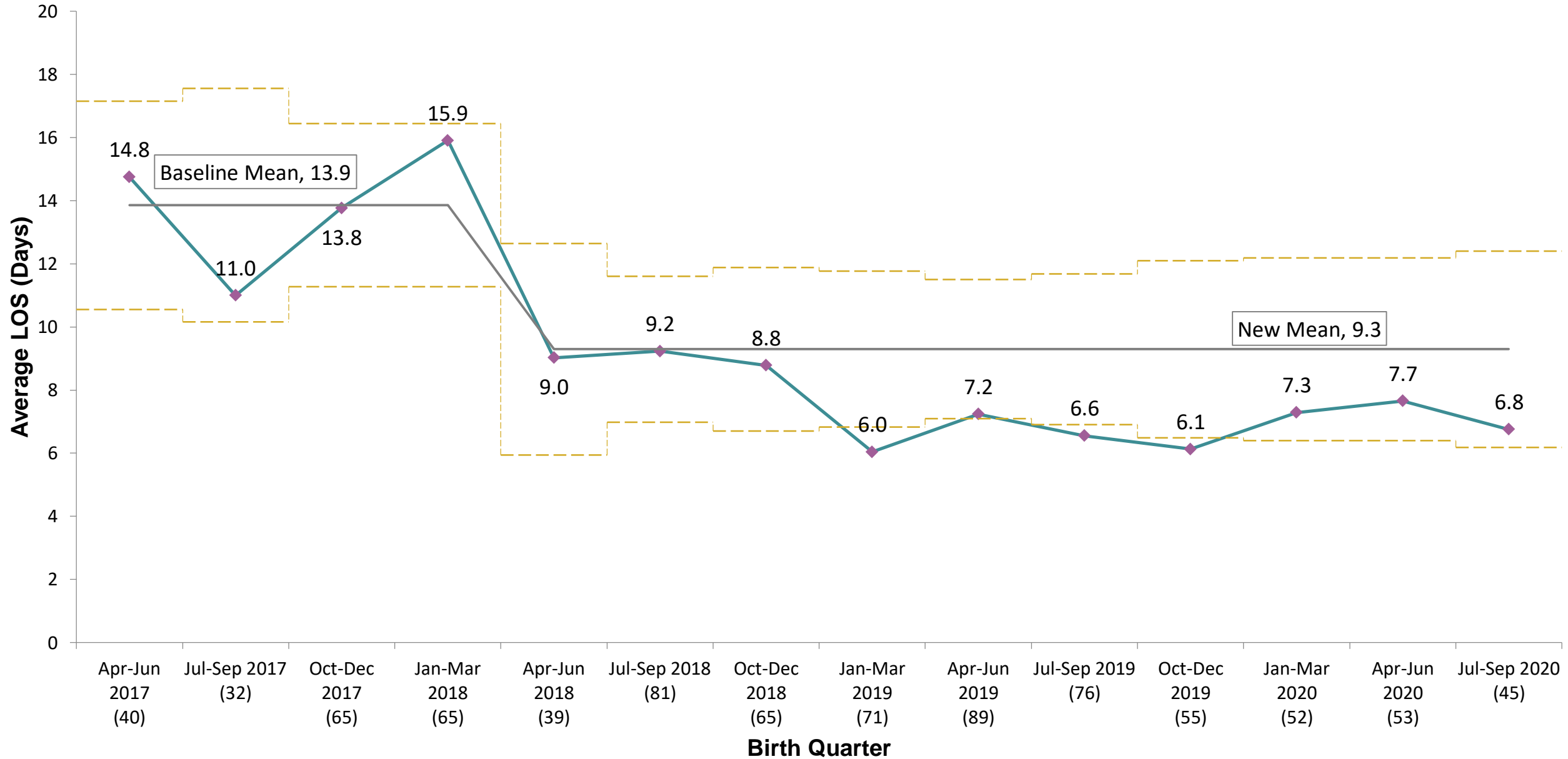
Frequency of Opiate Exposures (not mutually exclusive)

Heroin	417 (41%)
Prescription Methadone	298 (29%)
Prescription Buprenorphine	287 (28%)
Illicit Opioids	157 (15%)
Rx Opioids	149 (15%)
Opioids, Unknown Source	90 (9%)

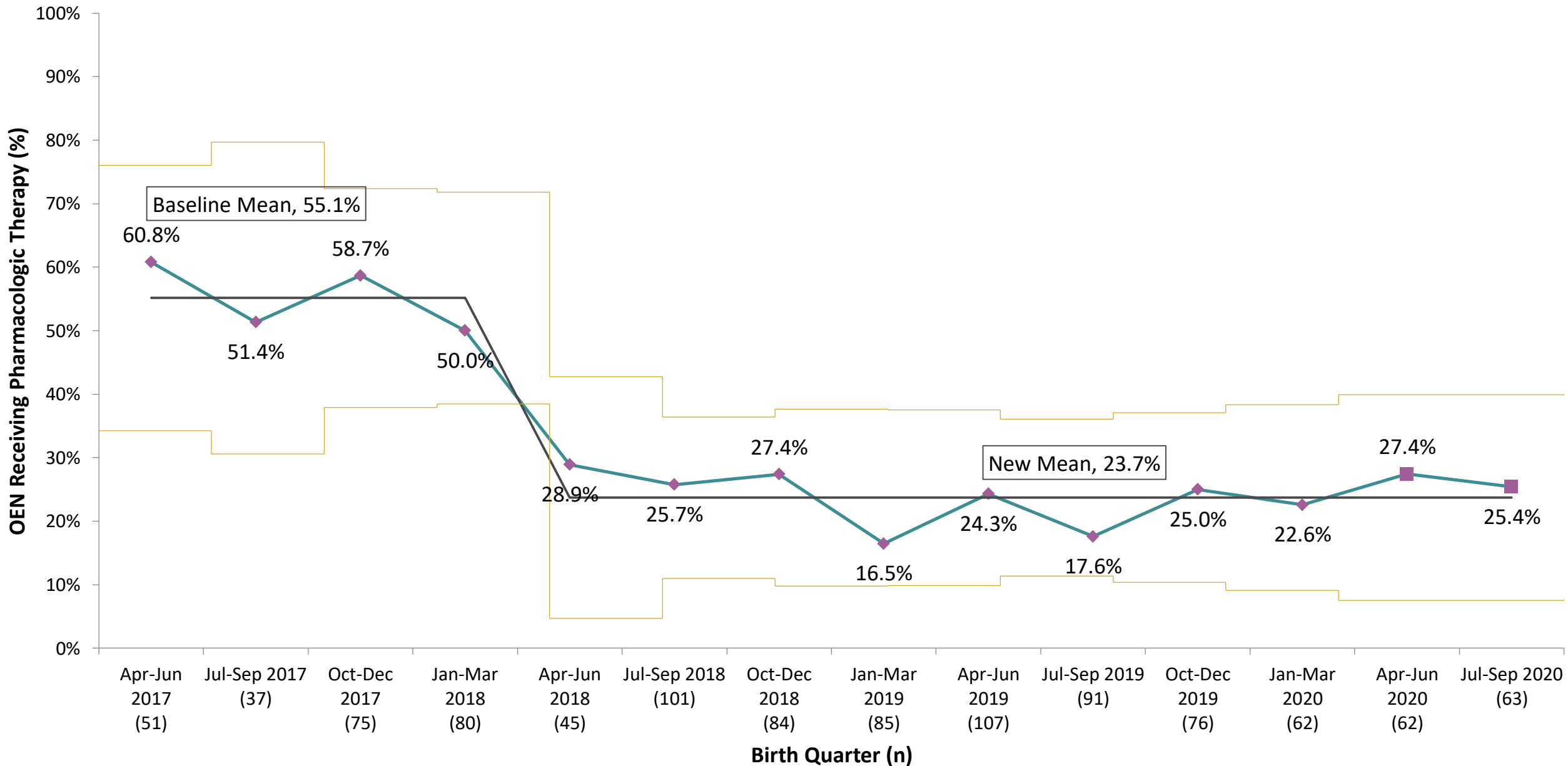
Frequency of Non-Opiate Co-Exposures

Meth/amphetamines	359 (35%)
Nicotine	285 (28%)
Marijuana	266 (26%)
Cocaine	76 (7%)
Benzodiazepines	73 (7%)
Other	40 (4%)
Alcohol	33 (3%)

CHoSEN QIC Cohort: Average Length-of-Stay for OEN, $n = 826$ (GA ≥ 35 weeks, LOS not affected by other diagnosis)

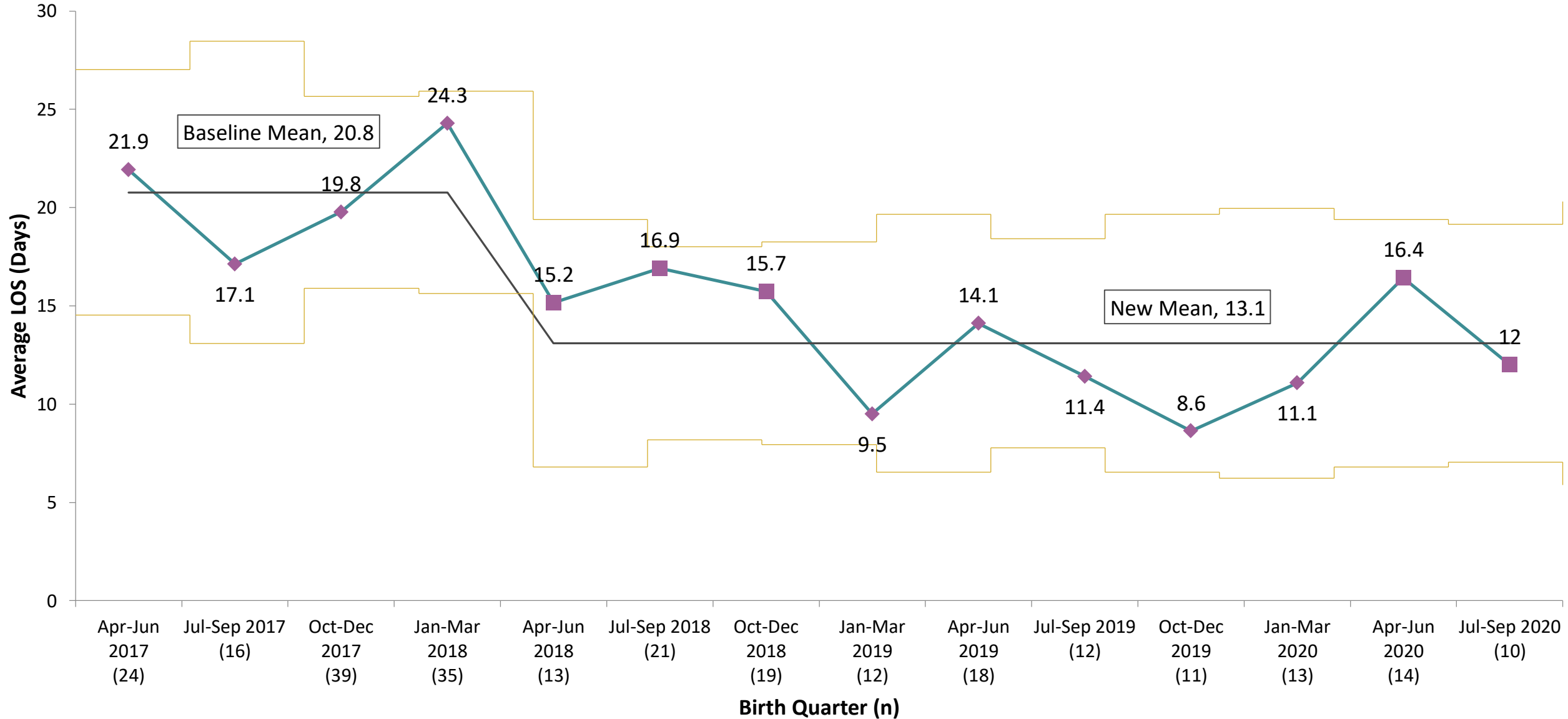


CHoSEN QIC Cohort: Percentage of OEN who Received Pharmacologic Therapy, $n= 1019$

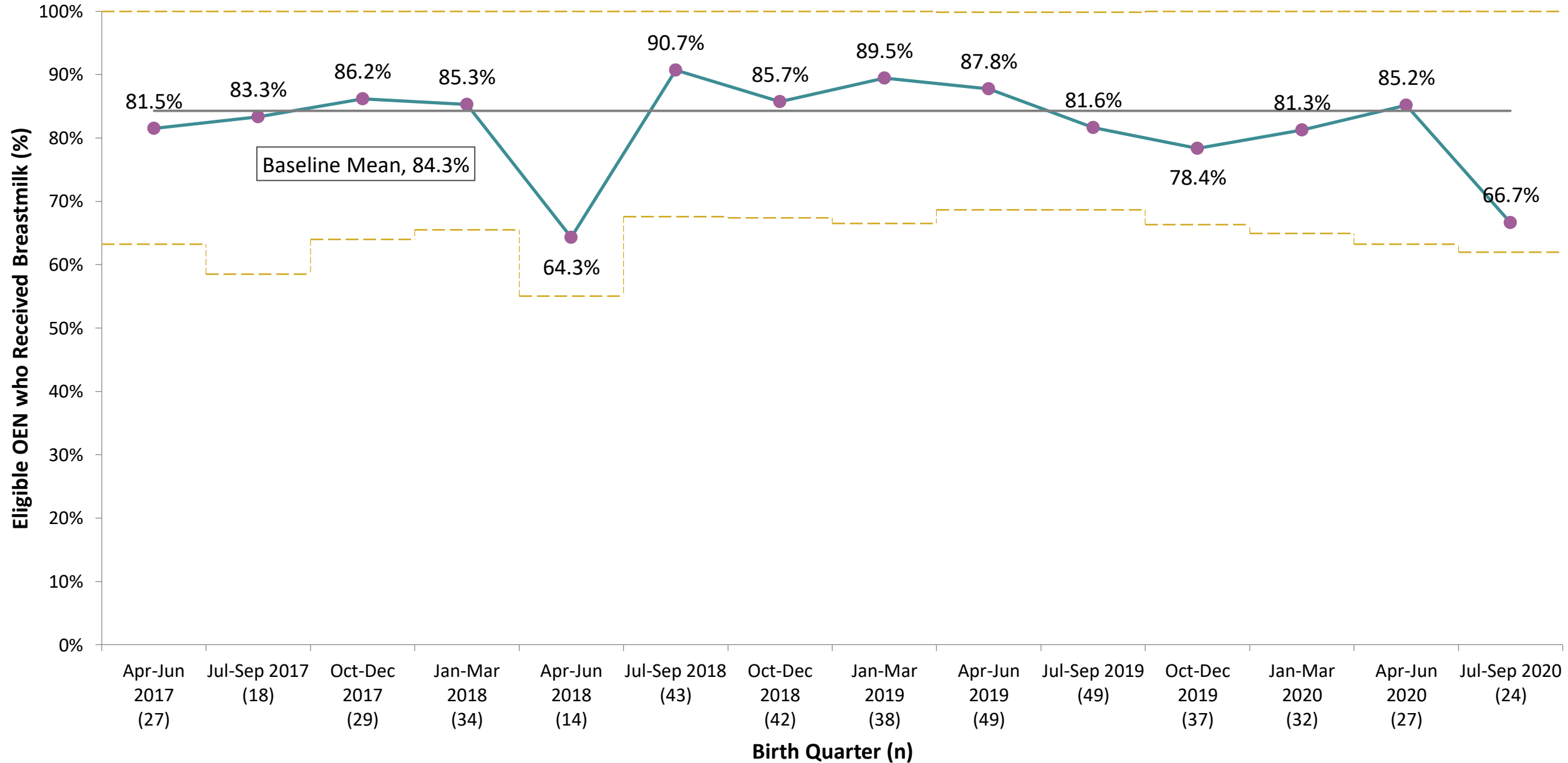


CHoSEN QIC Cohort: Average Length-of-Stay for OEN who Received Pharmacologic Therapy, $n = 257$

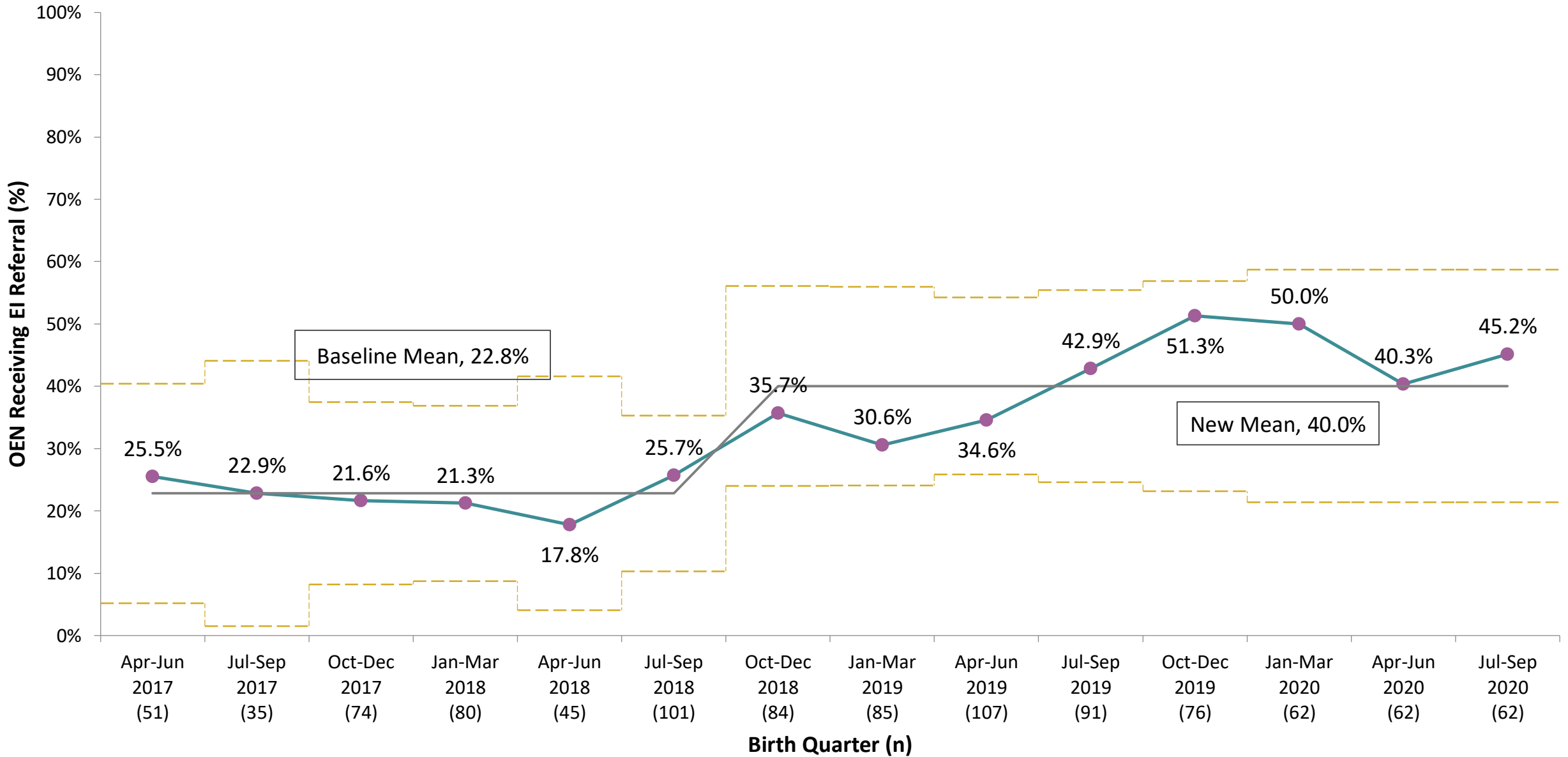
(GA ≥ 35 weeks, LOS not affected by other diagnosis)



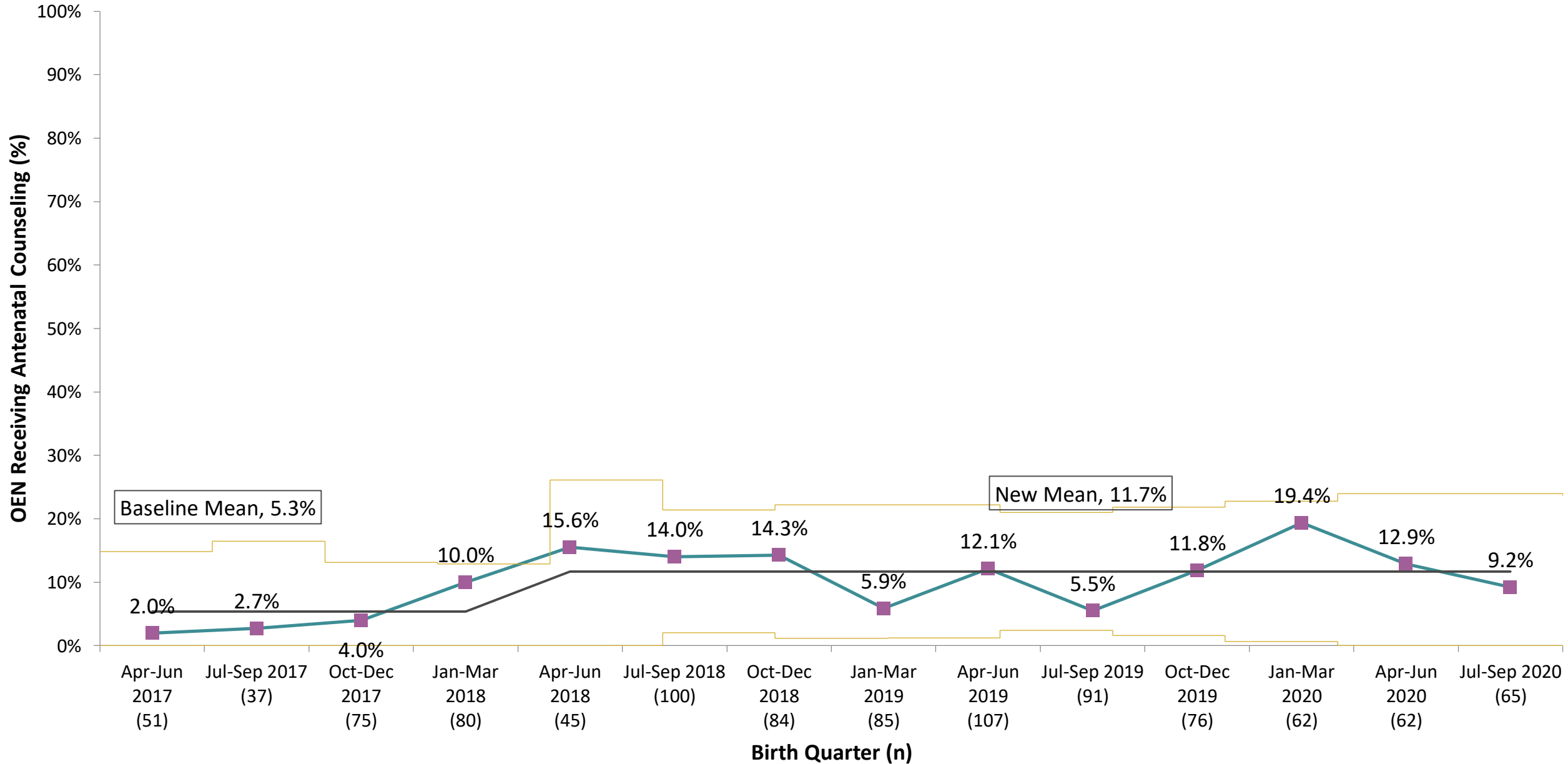
CHoSEN QIC Cohort: Percentage of Eligible OEN who Received Mother's Breastmilk, $n = 463$



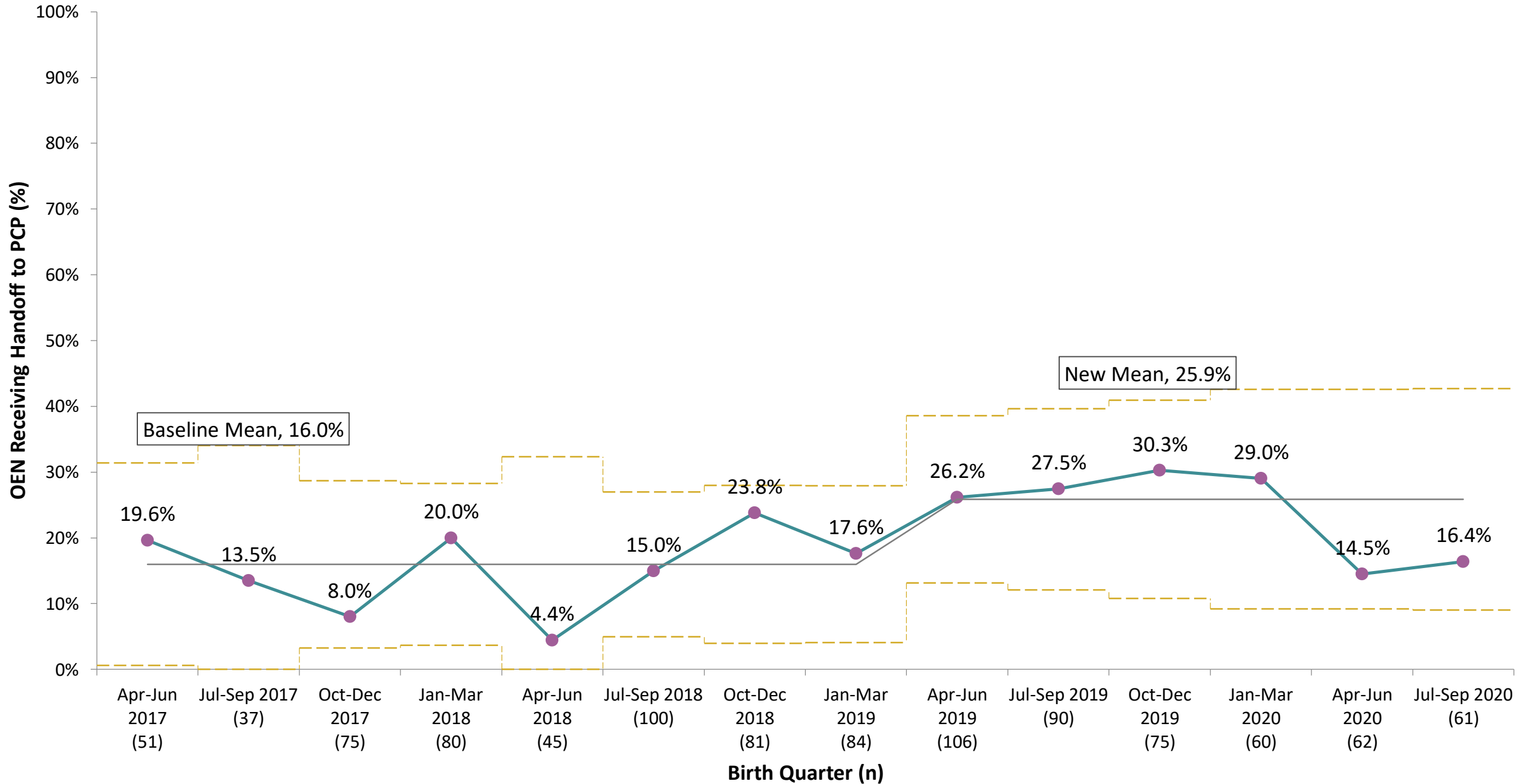
CHoSEN QIC Cohort: Percentage of OEN who Received a Referral to Early Intervention, $n= 1015$



CHoSEN QIC Cohort: Percentage of OEN whose Parent Received Antenatal Counseling, $n= 1020$

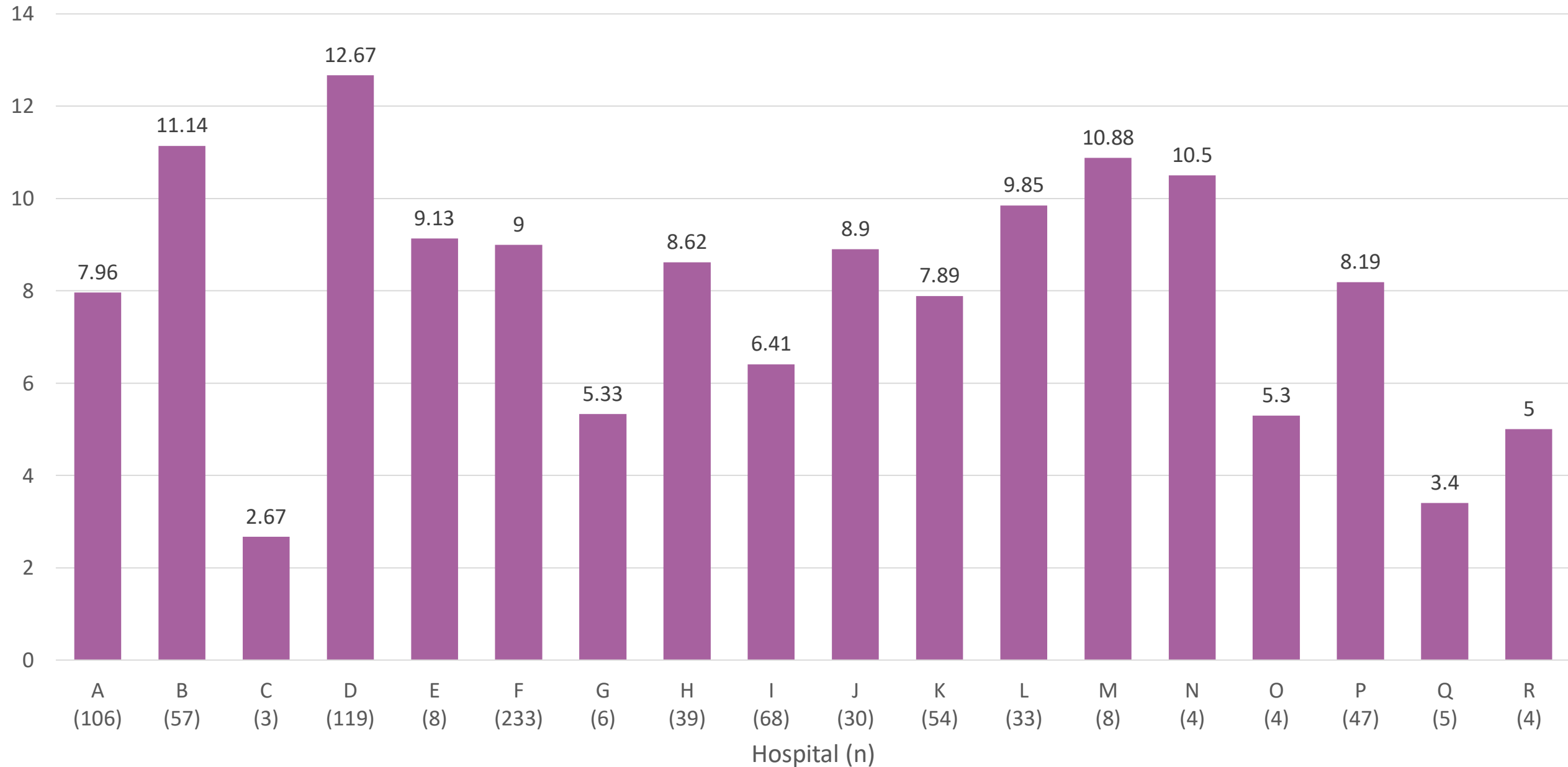


CHoSEN QIC Cohort: Percentage of OEN Received Handoff to a Physician, $n= 1016$



Average Length-of-Stay of OEN by Hospital

(GA \geq 35 weeks, LOS not affected by other diagnosis)





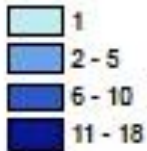
Next Steps

- Resume site visits
- Moving beyond OEN care to care of SENs and their families
- Key-Driver focused efforts
- Engagement with MAT centers and providers
- Engagement and education of outpatient pediatric providers
- Data linkage project
- Qualitative study: Lived experience of birthing individuals with SUD

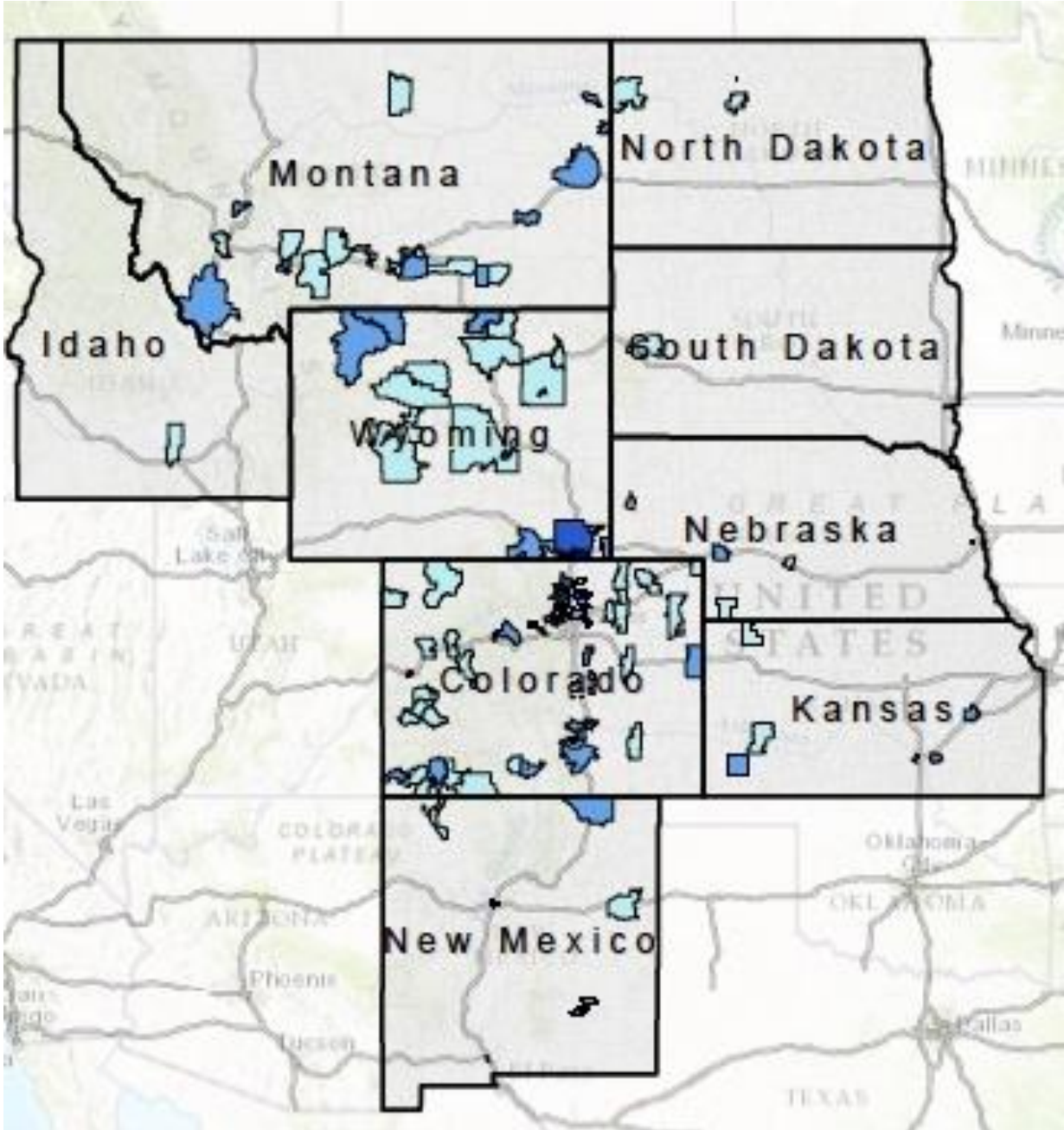
Family Integration into Neonatal Care

**Data-driven Engagement of Families to Improve the
NICU Experience in Colorado
(DEFINE Colorado)**

CHCO NICU Admissions by Zip Code



Matthew J. Nalty
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Stephanie Bourque, MD
Childrens Hospital Colorado

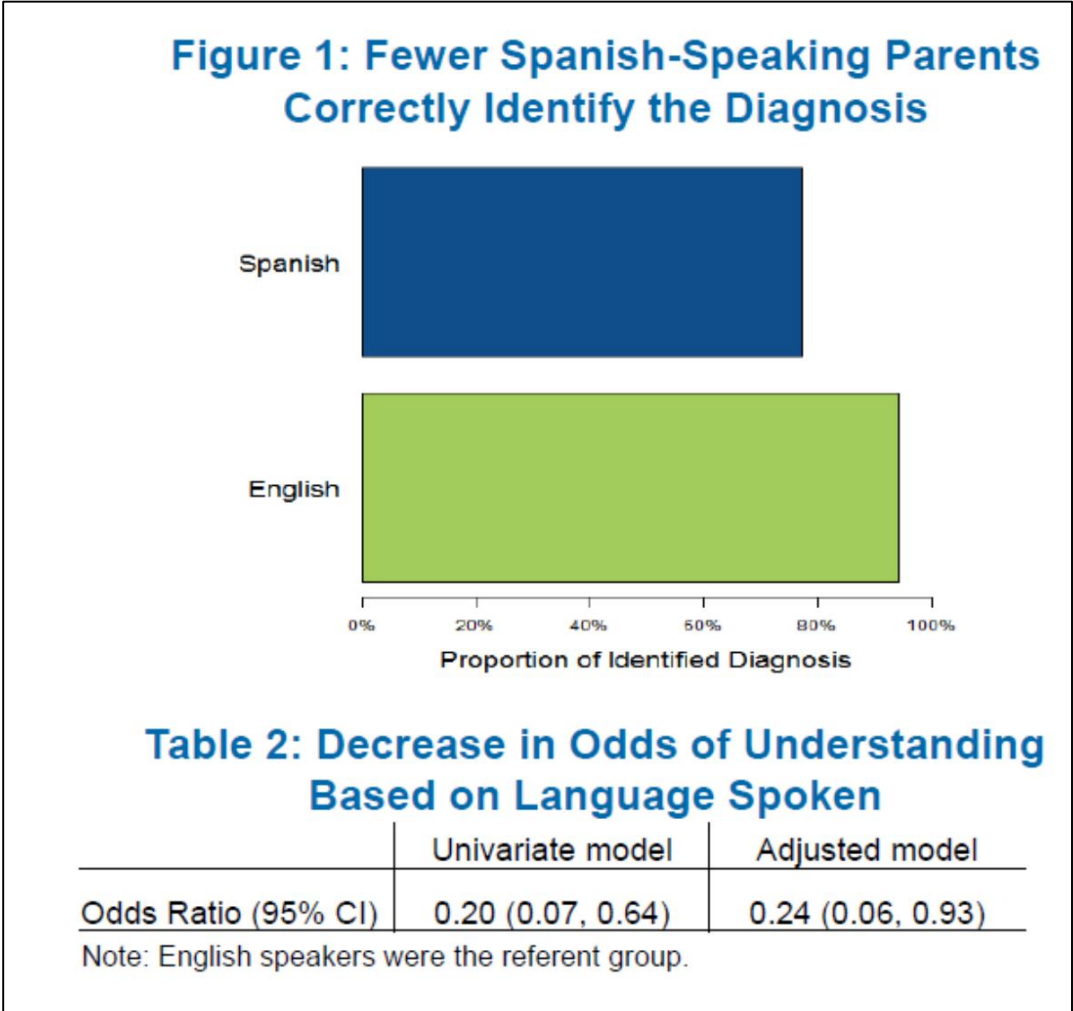


LENGTH OF STAY BEYOND CLINICAL STABILITY

Median LOS in Level IV NICU for infants not back-transported was **28.5 days** beyond being on LFNC and full enteral feedings

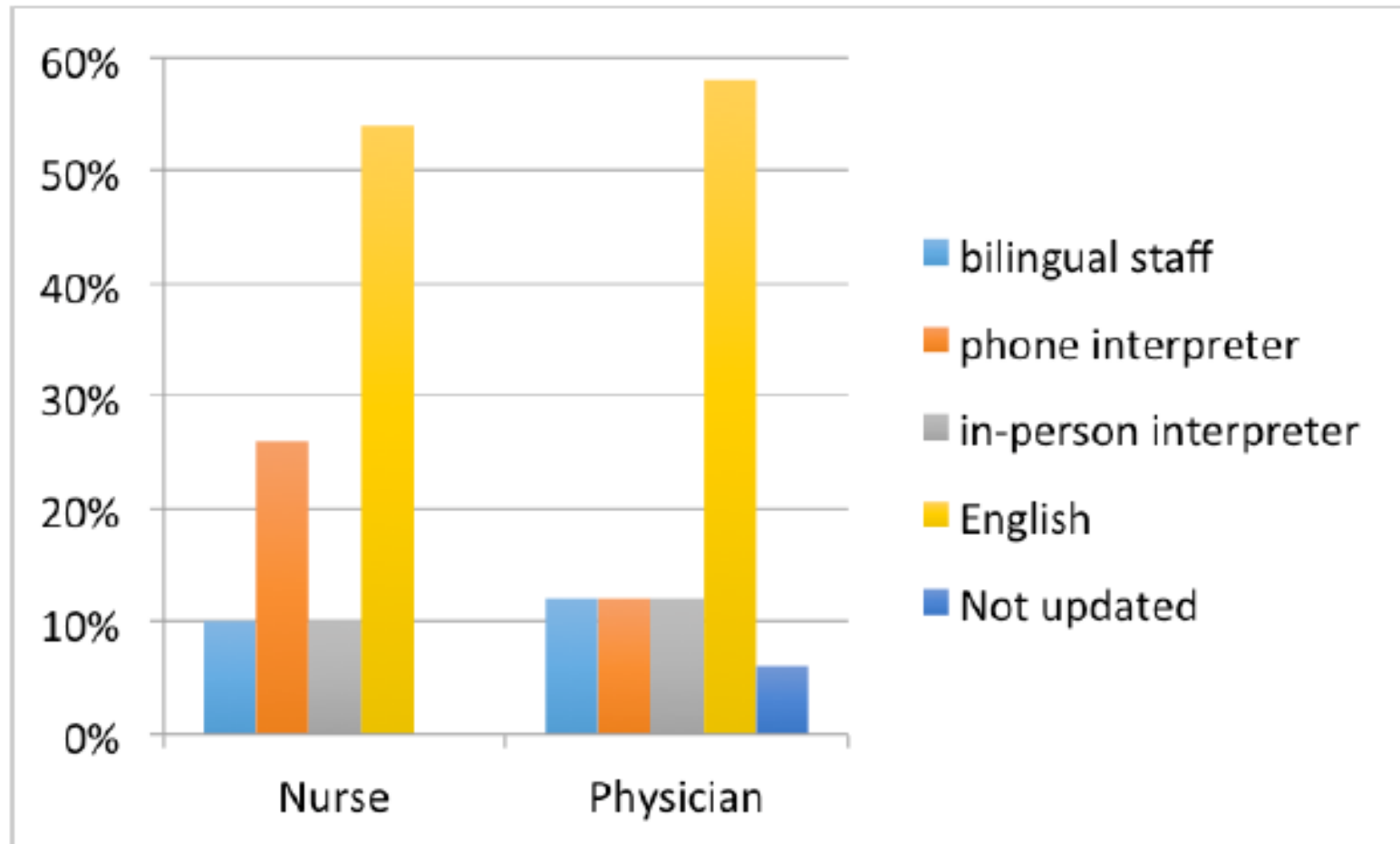
The impact of parental primary language on communication in the neonatal intensive care unit

Mauricio A. Palau¹ • Maxene R. Meier² • John T. Brinton² • Sunah S. Hwang¹ • Genie E. Roosevelt³ • Thomas A. Parker¹



Palau MA, Meier MR, Brinton JT, Hwang SS, Roosevelt GE, Parker TP. J Perinatol 2018.

Figure 3. Proportion and Method of Updates to Spanish-speakers by Care Provider



Palau MA, Meier MR, Brinton JT, Hwang SS, Roosevelt GE, Parker TP. J Perinatol 2018.

DEFINE Colorado QIC Key Driver Diagram

Aim Statement

Primary Drivers

Secondary Drivers

Potential Change Concepts

By **December 2022**, hospitals will improve family engagement in NICUs by:

1. Improving parental report of engagement in infant health and development during NICU hospitalization by 20%

2. Reduce disparities in parental report of engagement by race/ethnicity, primary language, and distance from hospital by 20%

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services often and early

Content of first family meeting after admission

Provide public transportation vouchers; 3) Minimize wait time; 4) On site childcare for siblings; 5) Overnight care; 6) Provide meals as needed

Communication among medical consultants and primary team; 2) Communication among primary team and nurses

Communication tool; 2) establish referral service

Support groups

services often and early

Screening for parental depression/anxiety; 2) Provide mental health support during hospitalization

Provide public transportation vouchers; 3) Minimize wait time; 4) On site childcare for siblings; 5) Overnight care; 6) Provide meals as needed

Options of care they can participate in; 2) Development of standardized family participation in infant's care (FiCare)

services often and early

Education and support during prenatal period; 2) Early pumping and skin to skin; 4) Address lactation issues by

Options of care they can participate in; 2) Development of standardized family participation in infant's care (FiCare)

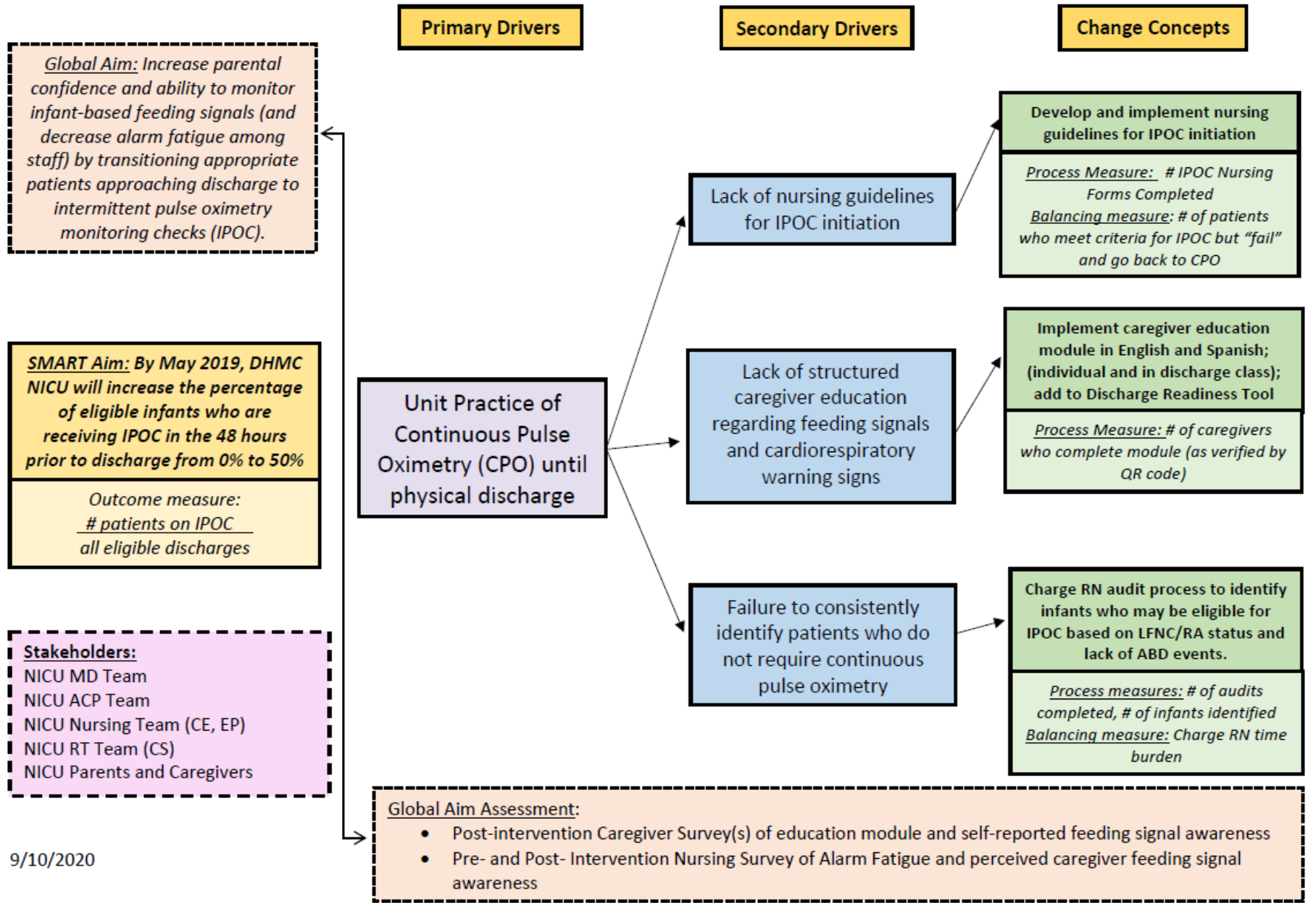
services often and early

Provide public transportation vouchers; 3) Minimize wait time; 4) On site childcare for siblings; 5) Overnight care; 6) Provide meals as needed

1) Standardize infant sleep practices and environment for all NICU infants

Discontinuation of Pulse Oximetry Checks (DPOC)

Improving Parental Confidence for Infants Nearing Discharge: Key Driver Diagram



PARTICIPATION IS GROWING

46% of Colorado birthing hospitals are participating in at least one QI initiative

60% of Colorado births take place in a collaborative member hospital

22% of participating hospitals are rural

78% of participating hospitals are urban

THANK YOU



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