

Overview of the neonatal episodes of care

State of Ohio

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1. CLINICAL OVERVIEW AND RATIONALE FOR DEVELOPMENT OF THE NEONATAL EPISODES

1.1 Rationale for development of the neonatal episodes of care

Live birth is the most common cause of a hospital stay in the United States, accounting for 11 percent of stays.¹ There are generally agreed-upon clinical guidelines for the care of healthy newborns and for those with any one of many common neonatal conditions, such as respiratory distress syndrome or suspected early onset sepsis. Research has also shown that pediatric and adult outcomes may be influenced by newborn conditions.² Despite these clear guidelines, medical practices vary widely among providers.^{3,4} Unique patient needs sometimes necessitate variation in treatment; but practice variation due to reasons not related to the patient and not concordant with clinical guidelines may lead to sub-optimal patient outcomes, higher than necessary costs, or both.

In 2015, there were approximately 60,000 live births in the Ohio Medicaid program, which accounted for an estimated \$250 million in spend (1.2 percent of total Ohio Medicaid spend).⁵ There was substantial variation within this spend, with over \$10,000 separating the median spend for those at the 5th percentile from those at the 95th percentile. Spend for newborns is driven primarily by common diseases, such as neonatal jaundice, neonatal abstinence syndrome, respiratory distress syndrome, and

¹ Torio CM, Moore BJ. (2013). National inpatient hospital costs: The most expensive conditions by payer, 2013. Agency for Healthcare Research and Quality. Available at <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb204-Most-Expensive-Hospital-Conditions.jsp> Accessed June 15, 2016

² Hack, M, et al. (2002). Outcomes in young adulthood for very-low-birth-weight infants. *The New England Journal of Medicine*, 346: 149-157.

³ Eichenwald, EC, et al. (2001). Inter-neonatal intensive care unit variation in discharge timing: influence of apnea and feeding management. *Pediatrics*, 108 (4) 928-933.

⁴ Patrick, SW, et al. (2016). Improving Care for Neonatal Abstinence Syndrome. *Pediatrics*, e20153835.

⁵ Based on analysis of Ohio Medicaid claims data between 2014-10-01 and 2015-09-30. See section 2.3 for rationale for duration.

suspected early onset sepsis, accounting for approximately 70 percent of total newborn spend.⁶

Implementing the neonatal episodes will provide incentives evidence-based, guideline-concordant care through an outcomes-based payment model. The goals of the neonatal episodes are in line with the statewide effort of the Ohio Perinatal Quality Collaborative to improve birth outcomes through programs such as the Neonatal Abstinence Syndrome Project and the Decreasing Bloodstream Infections Project.⁷ Alongside other episodes of care, such as the perinatal episode, and patient centered medical homes, the neonatal episodes will contribute to a model of care delivery that benefits patients through improved care quality, improved clinical outcomes, and lower overall cost of care.

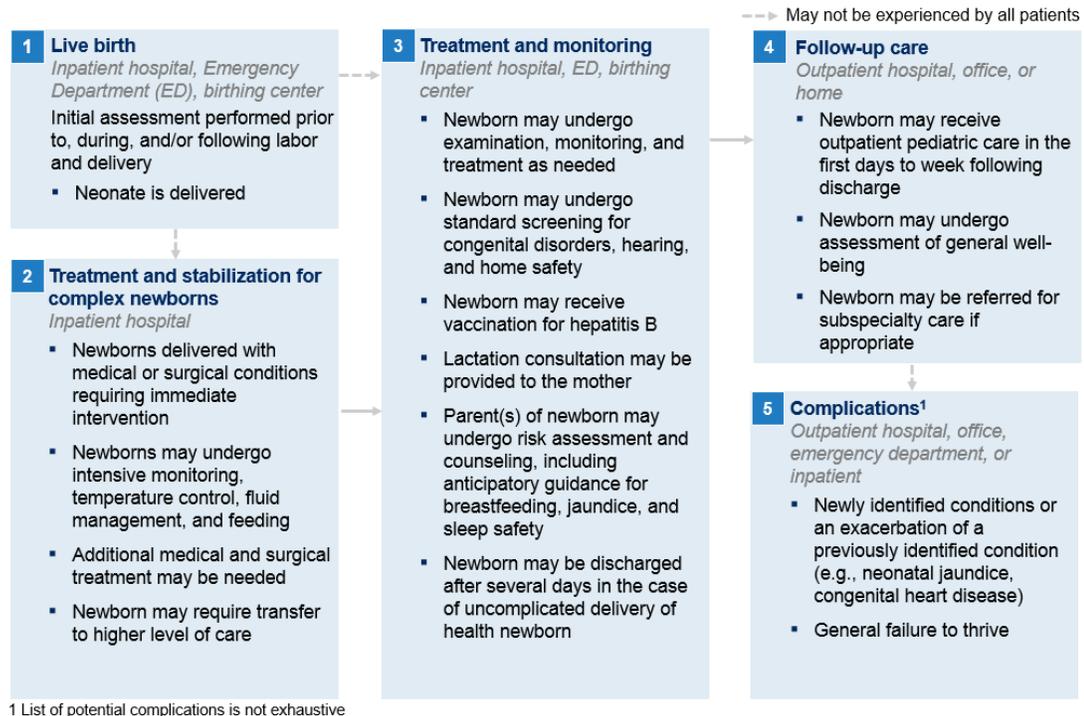
1.2 Clinical overview and typical patient journey for neonatal episodes

The patient journey for low-risk newborns is different from the patient journey for newborns that are at moderate or high risk (all are depicted in Exhibit 1). If the newborn is healthy and delivered at term (i.e., low-risk), he or she is assessed and provided initial care in the hospital's labor and delivery unit. He or she will typically be moved to a newborn nursery for examination, vaccination, and standard screenings for metabolic, genetic, and congenital disorders. Male newborns commonly receive a circumcision. The facility will also provide services to the mother to improve the care of the newborn, including counseling and lactation consultation. The newborn is typically discharged within two days after a vaginal delivery or three to five days after a Cesarean section.

⁶ *Ibid.*

⁷ Ohio Perinatal Quality Collaborative, 2012-2016. Available at <https://www.opqc.net>. For additional program details, see <https://www.opqc.net/projects/NAS> and <https://www.opqc.net/projects/BSI>. Accessed June 15, 2016

EXHIBIT 1 – NEONATAL PATIENT JOURNEY



Source: Stellwagen, Lisa, et al. “Care of the Well Newborn.” *Pediatrics in Review*. 27.3 (2006): 89-98.
Committee on Fetus and Newborn. “Levels of Neonatal Care.” *Pediatrics*. 130.3 (2012): 587-597.

The patient journey is different for newborns who are preterm or have a comorbidity requiring intervention, such as sepsis, respiratory distress syndrome, or neonatal abstinence syndrome. For these newborns, stabilization may be performed in labor and delivery. Then, the newborn is often triaged to a level II or higher neonatal intensive care unit (NICU) where intensive monitoring, respiratory support, temperature control, and medical interventions are performed as required. Some newborns may require surgical interventions such as the repair of an abdominal wall defect or the placement of a shunt to decrease intracranial pressure. After the newborn reaches physiologic maturity and is able to breathe and feed without assistance, he or she may be transferred to a less intensive level of care. For newborns who require complex care, inpatient stays may range from days to months.

Regardless of whether the newborn was healthy or not, he or she will have a first pediatric visit soon after discharge—typically within 2-5 days for normal newborns, with additional appointments and referrals to subspecialists as needed. Some newborns may require emergency department visits and inpatient stays if they develop new conditions, have an exacerbation of a previously identified condition (e.g., neonatal jaundice, respiratory complications in a newborn with respiratory

distress syndrome, late presenting congenital heart disease), or for general failure to thrive.

Three distinct episodes, segmented based on gestational age, are part of the neonatal episode group. The first, referred to as “low-risk,” includes newborns with a gestational age of 37 weeks or greater. The second episode, “moderate-risk,” includes newborns with a gestational age of 32-36 weeks. The third episode, “high-risk” includes newborns with a gestational age of 31 weeks or less.⁸

The rationale for separating newborns into three distinct episodes is that gestational age is a critical determinant of a newborn’s patient journey, and the treatments required differ substantially. Most newborns in the low-risk episode are healthy and have brief hospital stays. Those in the moderate-risk and high-risk episodes are more likely to require intensive care and longer hospital stays (see Exhibit 3 in the Appendix for summary data analysis on the three episodes).

The neonatal episode, perinatal episode, and patient centered medical homes will complement each other to cover a broad spectrum of care delivery for newborn Medicaid beneficiaries. The perinatal episode will focus on prenatal care to the mother up to and including the delivery, while the neonatal episode will focus on the immediate care of newborns during the initial birth stay and the following seven days. Patient centered medical homes will help to focus on coordinating care, providing follow-up examinations, screening, and education for both the mother and baby during the subsequent weeks, months, and years.

1.3 Potential sources of value within the neonatal patient journeys

Within the neonatal episodes of care, providers have several opportunities to improve quality of care and reduce unnecessary spend associated with the episode (see Exhibit 2). For example, in the low-risk episode, the provider can ensure that appropriate screening and testing, risk assessment, and counseling are performed. Appropriate length of stay, access to a pediatrician, and efficient outpatient routine follow-up can be coordinated to limit preventable visits to the emergency department. For the moderate- and high-risk episodes, the provider can ensure that the newborn is delivered and triaged into the appropriate care setting according to anticipated or

⁸ On October 1, 2015, coding practices shifted from the ICD-9 to the ICD-10 classification system. The gestational age diagnosis codes have different levels of granularity in the two systems. When implemented, the episode group will utilize the gestational age codes in ICD-10 to build the appropriate segments. The analyses presented in this paper are based on data from before the coding change and use ICD-9 codes to approximate what the final episodes will be. For a list of the ICD-9 and ICD-10 gestational age codes, see Tables 1A and 1B, respectively, in the Appendix.

demonstrated intensity of needs. The provider can adhere to clinically appropriate care guidelines for medical and surgical interventions to reduce lengths of stay, limit complications, and decrease the number of post-discharge readmissions and visits to the emergency department. Providing these care improvements in the low-, moderate-, and high-risk episodes may influence long-term outcomes for the child and reduce future care needs.

EXHIBIT 2 – NEONATAL SOURCES OF VALUE



2. OVERVIEW OF THE NEONATAL EPISODE GROUP DESIGN

2.1 Episode Trigger

The three neonatal episodes are triggered by a live birth in the inpatient setting. Newborns are sorted based on gestational age into the low-, moderate-, or high-risk episodes as described in section 1.2. Newborns without a listed gestational age are placed in the low-risk episode, based on analyses that show that they tend to have a similar care and spend profile as other term newborns (see the Appendix for Tables 1A and 1B, which list the trigger diagnosis codes and gestational age codes used for segmentation, and Exhibit 3 for spend profiles).

2.2 Principal Accountable Provider

The principal accountable provider (PAP) is the person or entity best positioned to influence the patient journey and the clinical decisions made throughout the episode. For all three neonatal episodes, the PAP is the facility where the newborn is born. Given the importance of management decisions around setting of delivery (including level of care within a facility and transfers to higher-level facilities) which are a significant source of value influenced by facilities. Additionally, most of the care and spend for neonatal episodes happens during the initial hospitalization, and often requires coordinating multidisciplinary care during the admission. Hospital protocols and capabilities most significantly influence these decisions (see Exhibits 5A, 5B, and 5C in the Appendix for the distribution of average spend by PAP).

2.3 Episode Duration

For the purposes of spend accountability, the neonatal episodes begin at the time of birth and end seven days after the patient is discharged. A seven-day post-discharge period captures the majority of follow-up spend from the initial birth and is considered a standard period for the identification of complications related to the initial birth. Spend for care beyond seven days is considered outside of the PAP's responsibility. For informational purposes, the episode extends for a 30-day post-discharge period in order to provide transparency regarding certain indicators of quality, such as readmission rates, ED visit rates, and mortality rates (see section 2.6 for more detail on quality metrics).

2.4 Included Services

The episode model is designed to address the spend for care and services directly related to the patient journey. Each period of the patient journey, or episode "window," has a distinct claim inclusion logic derived from two major criteria: 1) that the type of included care and services must correspond to that period of the patient journey and 2) that the included care and services are understood to be directly or indirectly influenced by the PAP during that period.

The neonatal episodes are comprised of distinct trigger and post-trigger windows for the purpose of spend inclusions. During the trigger window—the initial hospital stay during which the patient is born—all spend is included, including medical, surgical/procedural, and drug spend. During the first post-trigger window, one through seven days following discharge, all spend is included, except for care related to unforeseen traumatic events. During the second post-trigger window, days eight through 30 following discharge, no spend is included in the episode (as described

above, this time period is used to provide transparency regarding certain indicators of quality).

The total episode spend is calculated by adding the amounts of all the individual claims included in the episode.

2.5 Episode Exclusions and Risk Factors

To ensure that episodes are comparable across patient panels, select risk factors and exclusions are applied before assessing PAP performance. In the context of episode design, risk factors are attributes or underlying clinical conditions likely to impact a patient's course of care and the spend associated with a given episode. Exclusions are attributes or clinical conditions that cannot be adequately risk adjusted and that indicate either a distinct patient journey or incomparably high or low episode spend.

Risk factors are selected via a standardized and iterative risk-adjustment process based on Ohio-specific regression analysis that gives due consideration to clinical relevance, statistical significance, and other contextual factors.⁹ Based on the selected risk factors, each episode is assigned a risk score. The total episode spend and the risk score are used to arrive at an adjusted episode spend, which is the spend on which providers are compared to each other. All three neonatal episodes used a similar list of initial risk factors for testing, but the risk factors were applied separately, given that the effect of clinical factors may vary depending on the prematurity of the newborn. Tables 2A, 2B, and 2C in the Appendix list the episode risk factors, and Exhibits 6A, 6B, and 6C present an analysis of these risk factors. Examples of risk factors include jaundice, neonatal abstinence syndrome, and respiratory distress syndrome. Note that the final list of risk factors was determined after feedback from providers and the application of the statistical process described above.

By contrast, an episode is excluded from a patient panel when the patient has clinical factors that suggest he or she has experienced a distinct or different journey and/or that drive very significant increases in spend relative to the average patient. These exclusions are selected independently for each of the three neonatal episodes. In addition, there are several "business-related" exclusions relating to reimbursement policy (e.g., whether a patient sought care out of state), the completeness of spend data for that patient (e.g., third-party liability or dual eligibility), and other topics

⁹ Garrett B, et al. (2014). Risk adjustment for retrospective episode-based payment: Guiding principles and proposed methodology. McKinsey Healthcare Systems and Services Practice. Available at <http://healthcare.mckinsey.com/risk-adjustment-retrospective-episode-based-payment> Accessed June 15, 2016

relating to episode design and implementation, such as overlapping episodes, during the comparison period. Episodes with no exclusions are known as “valid” and used for provider comparisons. Episodes that have one of any of the exclusions are known as “invalid” episodes.

For the neonatal episode group, both business and clinical exclusions apply. Several of the business and clinical exclusions are standard across most episodes, while others are specific to each neonatal episode. The episode specific clinical exclusions include severe congenital anomalies and other severe clinical presentations. The final list of clinical exclusions was determined after feedback from providers and the application of the risk-adjustment process for each of the three episodes. A list of business and clinical exclusions is in Table 3, and analysis of these exclusions is in Exhibits 7A, 7B, and 7C in the Appendix.

2.6 Quality Metrics

To ensure the episode model incentivizes quality care, the neonatal episodes have select quality metrics. These are calculated for each PAP meeting the minimum threshold for valid episodes for each of the three neonatal episodes independently.

The low-risk neonatal episode has six quality metrics, and the moderate- and high-risk neonatal episodes have five quality metrics. In each episode, one quality metric is linked to performance assessment, meaning that performance thresholds on this quality metric must be met in order for the PAP to be eligible for positive incentive payments within the episode model. The specific threshold amount will be determined during the informational reporting period. The metric tied to positive incentive payments for all three neonatal episodes is the percentage of episodes with a pediatric visit within five days of discharge. The remaining quality metrics are for informational purposes only.

Those shared across the three neonatal episodes include the percentage of episodes in which the neonate was born via Cesarean section, the percentage of episodes with a readmission within 30 days of discharge, the percentage of episodes with an emergency department visit within 30 days of discharge, and the mortality rate within 30 days of discharge. In the low-risk episode only, the final informational metric is the percentage of episodes with an inpatient hospitalization, observation visit, or ED visit for jaundice within 30 days of discharge. (A detailed description of all the quality metrics is in Table 4 in the Appendix and analysis of these quality metrics is in Exhibits 8A, 8B, and 8C.)

3. APPENDIX: SUPPORTING ANALYSES

Table 1A – Episode triggers: live birth diagnosis codes

Diagnosis code	Code type	Description
V3000	ICD-9 Dx	Sgl Liveborn No C-Section
V3001	ICD-9 Dx	Sgl Liveborn W C-Section
V3100	ICD-9 Dx	Twin Mate In Hospital
V3101	ICD-9 Dx	Twin Mate C-Section
V3200	ICD-9 Dx	Twin Mate Stillborn In Hosp
V3201	ICD-9 Dx	Twin Mate Stillborn C-Section
V3300	ICD-9 Dx	Twin Unsp In Hospital
V3301	ICD-9 Dx	Twin Unsp C-Section
V3400	ICD-9 Dx	Ot Multiple In Hospital
V3401	ICD-9 Dx	Ot Multiple C-Section
V3500	ICD-9 Dx	Ot Mult Stillborn In Hosp
V3501	ICD-9 Dx	Ot Mult Stillborn C-Section
V3600	ICD-9 Dx	Mult Lb/Sb In Hosptal Ot
V3601	ICD-9 Dx	Mult Lb/Sb By C-Section
V3700	ICD-9 Dx	Mult Nb Unsp In Hosp Ot
V3701	ICD-9 Dx	Mult Nb Unsp C-Section
V3900	ICD-9 Dx	Liveborn Unsp In Hosp
V3901	ICD-9 Dx	Liveborn Unsp C-Section
Z3800	ICD-10 Dx	Single liveborn infant, delivered vaginally
Z3801	ICD-10 Dx	Single liveborn infant, delivered by cesarean
Z382	ICD-10 Dx	Single liveborn infant, unspecified as to place of birth
Z3830	ICD-10 Dx	Twin liveborn infant, delivered vaginally
Z3831	ICD-10 Dx	Twin liveborn infant, delivered by cesarean
Z385	ICD-10 Dx	Twin liveborn infant, unspecified as to place of birth
Z3861	ICD-10 Dx	Triplet liveborn infant, delivered vaginally
Z3862	ICD-10 Dx	Triplet liveborn infant, delivered by cesarean
Z3863	ICD-10 Dx	Quadruplet liveborn infant, delivered vaginally
Z3864	ICD-10 Dx	Quadruplet liveborn infant, delivered by cesarean
Z3865	ICD-10 Dx	Quintuplet liveborn infant, delivered vaginally
Z3866	ICD-10 Dx	Quintuplet liveborn infant, delivered by cesarean
Z3868	ICD-10 Dx	Other multiple liveborn infant, delivered vaginally
Z3869	ICD-10 Dx	Other multiple liveborn infant, delivered by cesarean
Z388	ICD-10 Dx	Other multiple liveborn infant, unsp as to place of birth

Table 1B – Episode triggers: diagnosis codes for gestational age

Episode	Diagnosis code	Code type	Description
Low-risk	76529	ICD-9	37 Or More Completed Weeks Of Gestation
	76621	ICD-9	Post-Term Infant
	P0821	ICD-10	Post-term newborn
	P0822	ICD-10	Prolonged gestation of newborn
Moderate-risk	76527	ICD-9	33-34 Completed Weeks Of Gestation
	76528	ICD-9	35-36 Completed Weeks Of Gestation
	P0730	ICD-10	Preterm newborn, unspecified weeks of gestation
	P0735	ICD-10	Preterm newborn, gestational age 32 completed weeks
	P0736	ICD-10	Preterm newborn, gestational age 33 completed weeks
	P0737	ICD-10	Preterm newborn, gestational age 34 completed weeks
	P0738	ICD-10	Preterm newborn, gestational age 35 completed weeks
	P0739	ICD-10	Preterm newborn, gestational age 36 completed weeks
High-risk	76521	ICD-9	Less Than 24 Completed Weeks Of Gestation
	76522	ICD-9	24 Completed Weeks Of Gestation
	76523	ICD-9	25-26 Completed Weeks Of Gestation
	76524	ICD-9	27-28 Completed Weeks Of Gestation
	76525	ICD-9	29-30 Completed Weeks Of Gestation
	76526	ICD-9	31-32 Completed Weeks Of Gestation
	P0720	ICD-10	Extreme immaturity of newborn, unsp weeks of gestation
	P0721	ICD-10	Extreme immaturity of newborn, gestational age less than 23 completed weeks
	P0722	ICD-10	Extreme immaturity of newborn, gestational age 23 completed weeks
	P0723	ICD-10	Extreme immaturity of newborn, gestational age 24 completed weeks
	P0724	ICD-10	Extreme immaturity of newborn, gestational age 25 completed weeks
	P0725	ICD-10	Extreme immaturity of newborn, gestational age 26 completed weeks
	P0726	ICD-10	Extreme immaturity of newborn, gestational age 27 completed weeks

Episode	Diagnosis code	Code type	Description
	P0731	ICD-10	Preterm newborn, gestational age 28 completed weeks
	P0732	ICD-10	Preterm newborn, gestational age 29 completed weeks
	P0733	ICD-10	Preterm newborn, gestational age 30 completed weeks
	P0734	ICD-10	Preterm newborn, gestational age 31 completed weeks

Table 2A – Low-risk neonatal episode risk factors

Risk factor	Relevant time period
Anemia	During the episode window
Apnea	During the episode window
Atrial septal defect	During the episode window
Birth trauma	During the episode window
Birth weight 1,500-1,999 Grams	During the trigger window
Birth weight 2,000-2,499 Grams	During the trigger window
Cardiac dysrhythmias	During the episode window
Cesarean delivery	During the episode window
Chorioamnionitis	During the episode window
Complicated pregnancy, NOS	During the episode window
Congenital tongue anomalies	During the episode window
Conjunctivitis	During the episode window
Disorders of thermoregulation	During the episode window
Fetal exposure to other drugs or medications	During the episode window
Gastrointestinal bleeding	During the episode window
HIV	During the episode window
Hydronephrosis	During the episode window
Hypoglycemia	During the episode window
Inguinal hernia	During the episode window
Jaundice	During the episode window
Meconium staining or aspiration	During the episode window
Neonatal abstinence syndrome	During the episode window
Omphalitis	During the episode window
Other congenitally acquired infections	During the episode window
Other respiratory disease	During the episode window
Patent ductus arteriosus	During the episode window
Pneumonia	During the episode window

Risk factor	Relevant time period
Pneumothorax and pulmonary collapse	During the episode window
Respiratory distress syndrome	During the episode window
Respiratory Failure	During the episode window
Seizure	During the episode window
Sepsis or rule out sepsis	During the episode window
Skin and soft tissue infections	During the episode window
Small for gestational age	During the trigger window
Syndactyly or polydactyly	During the episode window
Thrombocytopenia	During the episode window
Transient tachypnea of the newborn	During the episode window
Umbilical hernia	During the episode window
Ventricular septal defect	During the episode window

Table 2B – Moderate-risk neonatal episode risk factors

Risk factor	Relevant time period
Anemia	During the episode window
Apnea	During the episode window
Birth weight 1,000-1,499 grams	During the trigger window
Birth weight 1,500-1,999 grams	During the trigger window
Birth weight 2,000-2,499 grams	During the trigger window
Cesarean delivery	During the episode window
Gastrointestinal bleeding	During the episode window
Gestational age 33-34 weeks	During the trigger window
Inguinal hernia	During the episode window
Intraventricular hemorrhage grade I-II	During the episode window
Jaundice	During the episode window
Neonatal abstinence syndrome	During the episode window
Patent ductus arteriosus	During the episode window
Pleural effusion	During the episode window
Pneumonia	During the episode window
Respiratory distress syndrome	During the episode window
Sepsis or rule out sepsis	During the episode window
Small for gestational age	During the trigger window
Thrombocytopenia	During the episode window

Table 2C – High-risk neonatal episode risk factors

Risk factor	Relevant time period
Anemia	During the episode window
Birth weight 500-999 grams	During the trigger window
Birth weight 1,000-1,499 grams	During the trigger window
Gestational age 25-26 weeks	During the trigger window
Gestational age 27-28 weeks	During the trigger window
Gestational age 29-30 weeks	During the trigger window
Inguinal hernia	During the episode window
Other respiratory disease	During the episode window
Patent ductus arteriosus	During the episode window
Respiratory distress syndrome	During the episode window

Table 3 – Episode exclusions

Exclusion type	Episode exclusion	Description	Relevant time period
	Dual	An episode is excluded if the patient had dual coverage by Medicare and Medicaid	During the episode window
	FQHC/RHC	An episode is excluded if the PAP is classified as a federally qualified health center or rural health clinic	During the episode window
	Incomplete episodes	An episode is incomplete if the total episode spend is less than the spend from the minimum services required to treat an episode	During the episode window
	Inconsistent enrollment	An episode is excluded if the patient has gaps in full Medicaid coverage	During the episode window
	Long Admission (Low-risk neonatal episode only)	An episode is excluded if the patient has one or more hospital admissions for a duration greater than 30 days	During the episode window
	Long Term Care	An episode is excluded if the patient has one or more long-term care claim detail lines which overlap the episode window	During the episode window
	No DRG	An episode is excluded if a DRG-paid inpatient claim is missing the APR-DRG and severity of illness	During the episode window
	Multi Payer	An episode is excluded if a patient changes enrollment between FFS and an MCP or between MCPs	During the episode window

Exclusion type	Episode exclusion	Description	Relevant time period
Business exclusion	No PAP	An episode is excluded if the PAP cannot be identified	During the episode window
	Out of state	An episode is excluded if the PAP operates out of state	N/A
	Third party liability	An episode is excluded if third-party liability charges are present on any claim or claim detail line or if the patient has relevant third-party coverage at any time	During the episode window
Standard clinical exclusion	Cardiac arrest	An episode is excluded if the patient has a diagnosis of cardiac arrest	During the episode window
	Coma	An episode is excluded if the patient has a diagnosis of coma	During the episode
	Death	An episode is excluded if the patient has a discharge status of “expired” on any inpatient or outpatient claim	During the episode window
	Left Against Medical Advice	An episode is excluded if the patient has a discharge status of “left against medical advice”	During the episode window
	Meningitis and encephalitis	An episode is excluded if the patient has a diagnosis of meningitis or encephalitis	During the episode window
	Tuberculosis	An episode is excluded if the patient has a diagnosis of tuberculosis	During the episode window
Episode-specific clinical exclusion	Bilious emesis	An episode is excluded if the patient has a diagnosis of bilious emesis	During the episode window
	Birth weight less than 500 grams (High-risk neonatal episode only)	An episode is excluded if the patient has a diagnosis of a birth weight less than 500 grams	During the trigger window
	Birth weight less than 1,000 grams (Moderate-risk neonatal episode only)	An episode is excluded if the patient has a diagnosis of a birth weight less than 1,000 grams	During the trigger window
	Birth weight less than 1,500 grams (Low-risk neonatal episode only)	An episode is excluded if the patient has a diagnosis of a birth weight less than 1,500 grams	During the trigger window

Exclusion type	Episode exclusion	Description	Relevant time period
	Chromosomal anomalies and genetic disorders	An episode is excluded if the patient has a diagnosis of a chromosomal anomaly or genetic disorder	During the episode window
	Coagulation factor deficiencies	An episode is excluded if the patient has a diagnosis of a coagulation factor deficiency	During the episode window
	Congenital cardiovascular anomalies	An episode is excluded if the patient has a diagnosis of a congenital cardiovascular anomaly	During the episode window
	Congenital face and neck anomalies	An episode is excluded if the patient has a diagnosis of a congenital face or neck anomaly	During the episode window
	Congenital gastrointestinal anomalies	An episode is excluded if the patient has a diagnosis of a congenital gastrointestinal anomaly	During the episode window
	Congenital genitourinary anomalies	An episode is excluded if the patient has a diagnosis of a congenital genitourinary anomaly	During the episode window
	Congenital immunodeficiency	An episode is excluded if the patient has a diagnosis of congenital immunodeficiency	During the episode window
	Congenital musculoskeletal anomalies	An episode is excluded if the patient has a diagnosis of a congenital musculoskeletal anomaly	During the episode window
	Congenital nervous system anomalies	An episode is excluded if the patient has a diagnosis of a congenital nervous system anomaly	During the episode window
	Congenital respiratory anomalies	An episode is excluded if the patient has a diagnosis of a congenital respiratory anomaly	During the episode window
	Conjoined twins	An episode is excluded if the patient has a diagnosis of conjoined twins	During the episode window
	Gestational age less than 25 weeks (High-risk neonatal episode only)	An episode is excluded if the patient has a diagnosis of a gestational age less than 25 weeks	During the trigger window
	Gestational age less than 32 weeks (Moderate-risk neonatal episode only)	An episode is excluded if the patient has a diagnosis of a gestational age less than 32 weeks	During the trigger window

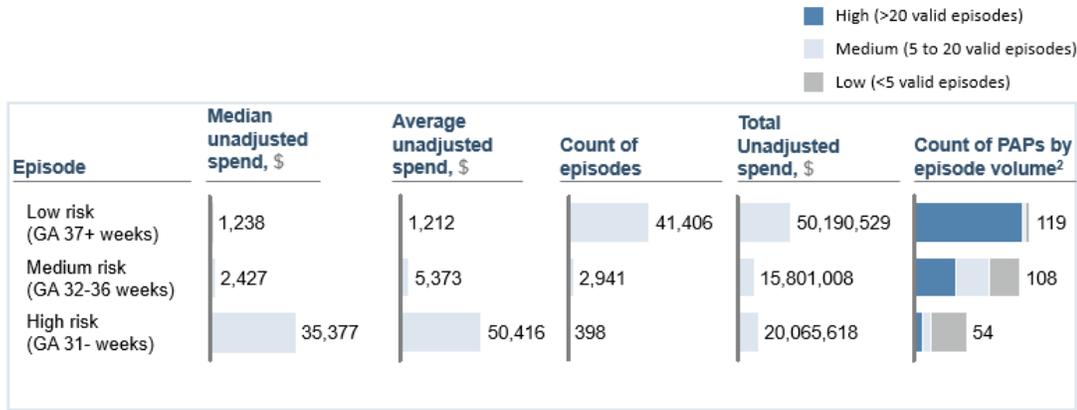
Exclusion type	Episode exclusion	Description	Relevant time period
	Gestational age less than 37 weeks (Low-risk neonatal episode only)	An episode is excluded if the patient has a diagnosis of a gestational age less than 37 weeks	During the trigger window
	Hepatitis	An episode is excluded if the patient has a diagnosis of hepatitis	During the episode window
	Hydrops fetalis	An episode is excluded if the patient has a diagnosis of hydrops fetalis	During the episode window
	Inborn errors of metabolism	An episode is excluded if the patient has a diagnosis of an inborn error of metabolism	During the episode window
	Intrauterine hypoxia and birth asphyxia	An episode is excluded if the patient has a diagnosis of intrauterine hypoxia	During the episode window
	Intraventricular hemorrhage grade I-II (Low-risk neonatal episode only)	An episode is excluded if the patient has a diagnosis of an intraventricular hemorrhage grade I-II	During the episode window
	Intraventricular hemorrhage grade III-IV	An episode is excluded if the patient has diagnosis of an intraventricular hemorrhage grade III-IV	During the episode window
	Major cardiovascular disorders	An episode is excluded if the patient has a diagnosis of a major cardiovascular disorder	During the episode window
	Maternal death	An episode is excluded if the patient has a diagnosis of maternal death	During the episode window
	Necrotizing enterocolitis (Low-risk neonatal episode only)	An episode is excluded if the patient has a diagnosis of necrotizing enterocolitis	During the episode window
	Other hemorrhage (excluding gastrointestinal bleed)	An episode is excluded if the patient has a diagnosis of hemorrhage, other than a gastrointestinal bleed	During the episode window
	Other major congenital anomalies	An episode is excluded if the patient has a diagnosis of another major congenital anomaly	During the episode window
	Post-term newborn (Low-risk neonatal episode only)	An episode is excluded if the patient has diagnosis of being a post-term newborn	During the trigger window

Exclusion type	Episode exclusion	Description	Relevant time period
	Renal failure	An episode is excluded if the patient has a diagnosis of renal failure	During the episode window
	Retinoblastoma	An episode is excluded if the patient has a diagnosis of retinoblastoma	During the episode window
	Stroke	An episode is excluded if the patient has a diagnosis of a stroke	During the episode window
	Triplets or greater	An episode is excluded if the patient has a diagnosis of being a multiple of triplets or greater	During the episode window

Table 4 – Episode quality metrics (PAP level)

Metric type	Quality metric	Description	Relevant time period
Tied to incentive payments	Pediatric visit	Percent of valid episodes with a pediatric visit within five days of discharge	Five days after the trigger window
Informational (low-risk episode only)	Non-office visit for jaundice	Percent of valid episodes with a visit for jaundice in a non-office setting (i.e., in an inpatient hospital, ED, or observation unit) after discharge	30 days after the trigger window
Informational	Readmission	Percent of valid episodes with a readmission after the initial hospitalization	30 days after the trigger window
Informational	ED visit	Percent of valid episodes with an emergency department visit after the initial hospitalization	30 days after the trigger window
Informational	C-section deliveries	Percent of valid episodes with a Cesarean section delivery	During the trigger window
Informational	Mortality	Percent of all episodes where the neonate had a patient discharge status of “expired”	During the episode window

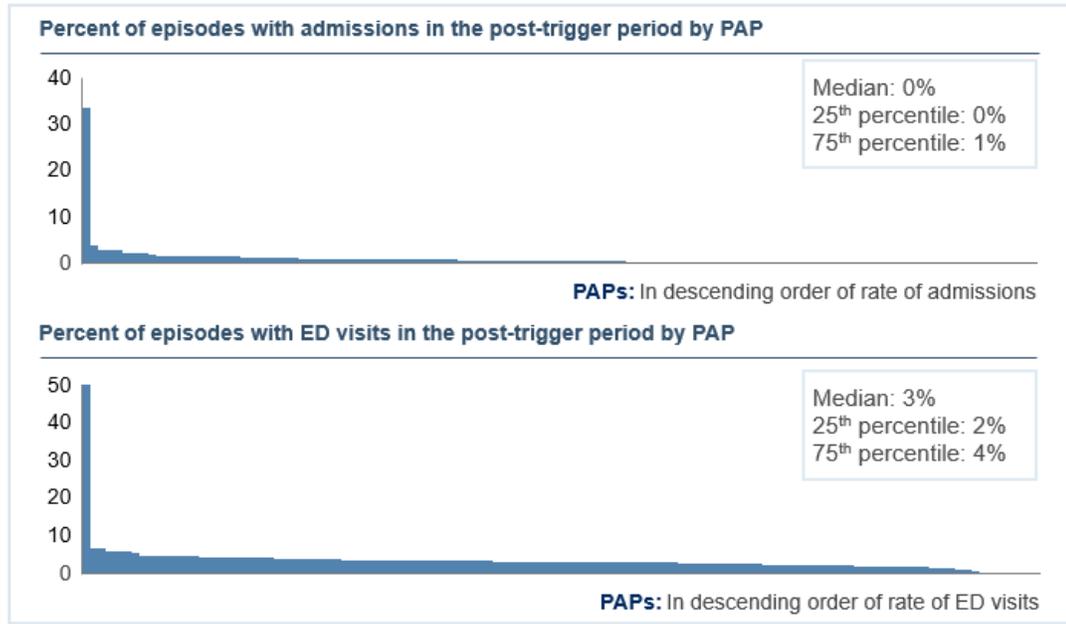
EXHIBIT 3 – SPEND AND VOLUME ACROSS THE NEONATAL EPISODES¹



¹ For valid episodes across all PAPs; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death)

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

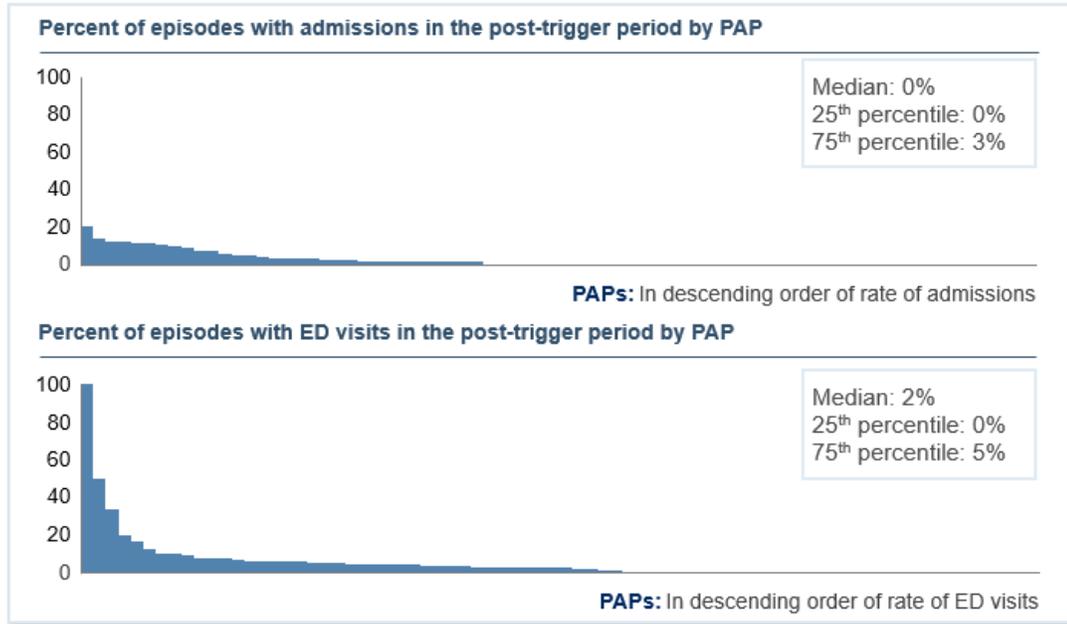
EXHIBIT 4A – LOW-RISK EPISODE: VARIATION IN POST-TRIGGER ADMISSION RATES AND ED VISIT RATES BY PAP¹



¹ For valid episodes (41,406) across PAPs with 5 or more valid episodes (114); valid episodes with PAPs with 4 or fewer episodes are not included in this analysis; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death); Top 3 PAPs by average episode spend removed for improved visualization

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

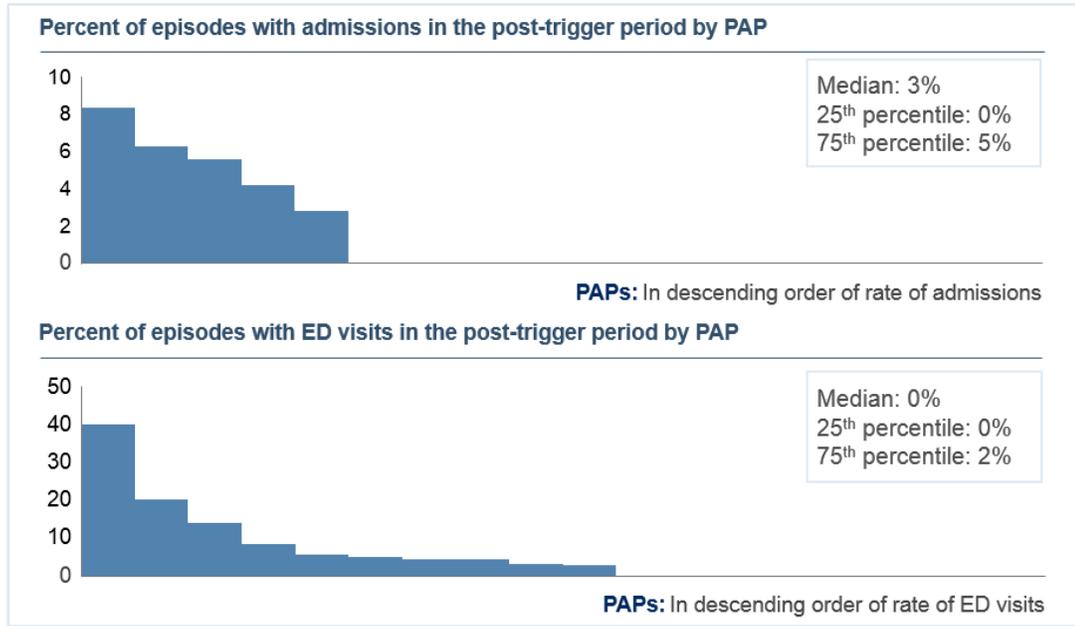
EXHIBIT 4B – MODERATE-RISK EPISODE: VARIATION IN POST-TRIGGER ADMISSION RATES AND ED VISIT RATES BY PAP¹



¹ For valid episodes (2,941) across PAPs with 5 or more valid episodes (76); valid episodes with PAPs with 4 or fewer episodes are not included in this analysis; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death)

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

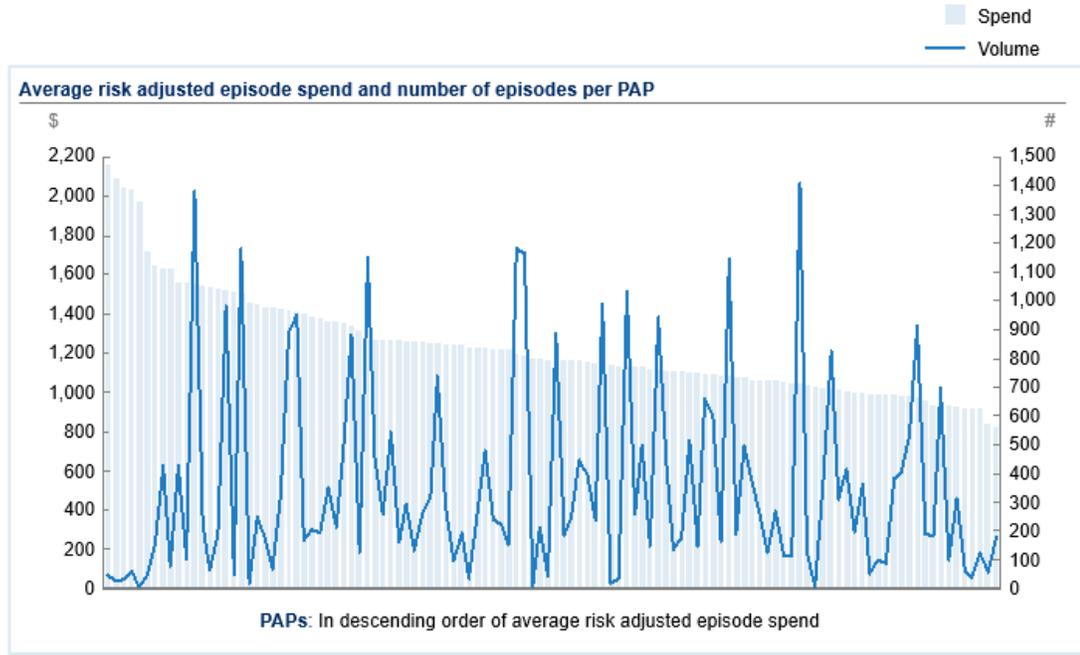
EXHIBIT 4C – HIGH-RISK EPISODE: VARIATION IN POST-TRIGGER ADMISSION RATES AND ED VISIT RATES BY PAP¹



¹ For valid episodes (398) across PAPs with 5 or more valid episodes (14); valid episodes with PAPs with 4 or fewer episodes are not included in this analysis; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death)

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

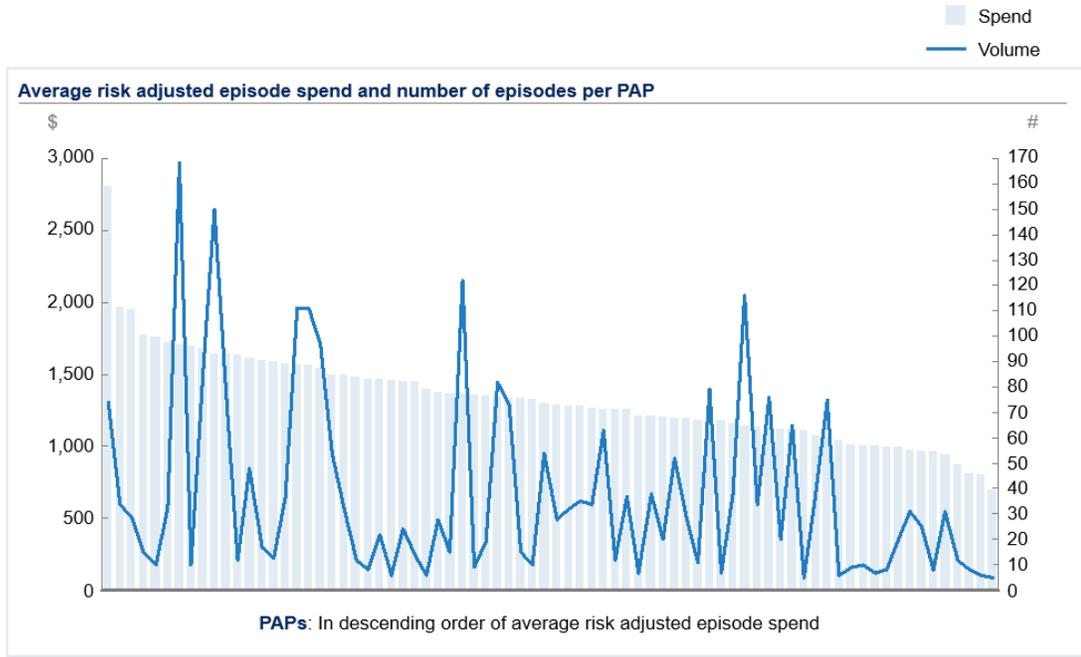
EXHIBIT 5A – LOW-RISK EPISODE: DISTRIBUTION OF RISK-ADJUSTED AVERAGE EPISODE SPEND AND COUNT BY PAP¹



¹ For valid episodes (41,406) across PAPs with 5 or more valid episodes (114); valid episodes with PAPs with 4 or fewer episodes are not included in this analysis; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death)

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

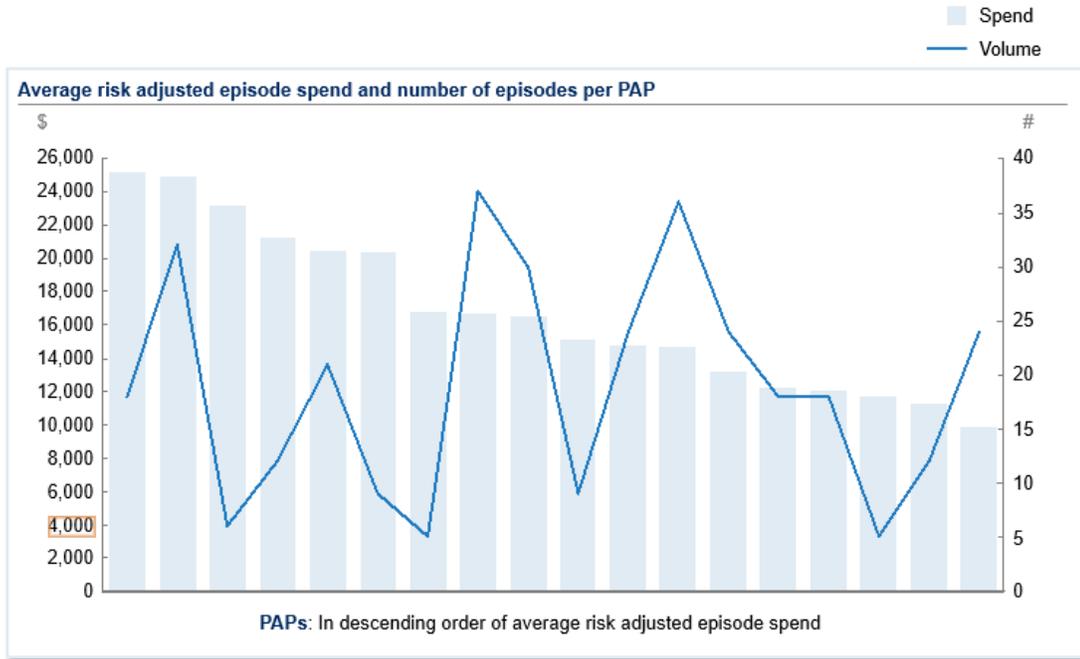
EXHIBIT 5B – MODERATE-RISK EPISODE: DISTRIBUTION OF RISK-ADJUSTED AVERAGE EPISODE SPEND AND COUNT BY PAP¹



¹ For valid episodes (2,941) across PAPs with 5 or more valid episodes (76); valid episodes with PAPs with 4 or fewer episodes are not included in this analysis; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death)

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

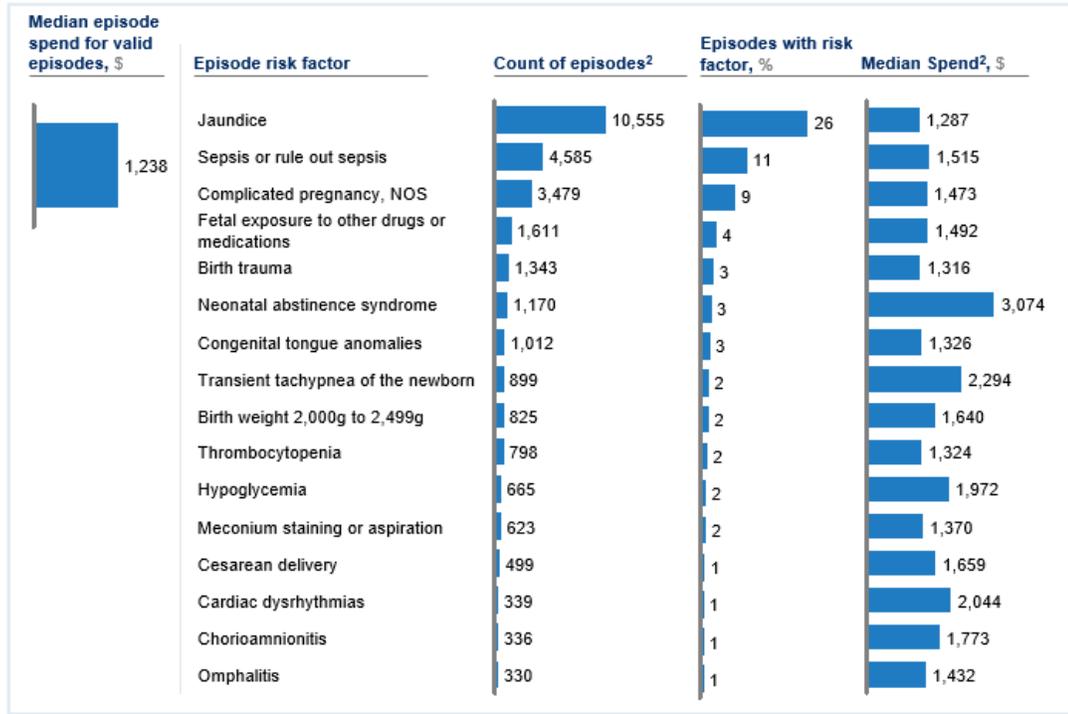
EXHIBIT 5C – HIGH-RISK EPISODE: DISTRIBUTION OF RISK-ADJUSTED AVERAGE EPISODE SPEND AND COUNT BY PAP¹



¹ For valid episodes (398) across PAPs with 5 or more valid episodes (14); valid episodes with PAPs with 4 or fewer episodes are not included in this analysis; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death)

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

EXHIBIT 6A – LOW-RISK EPISODE: EPISODE COUNT AND SPEND BY EPISODE RISK FACTOR¹

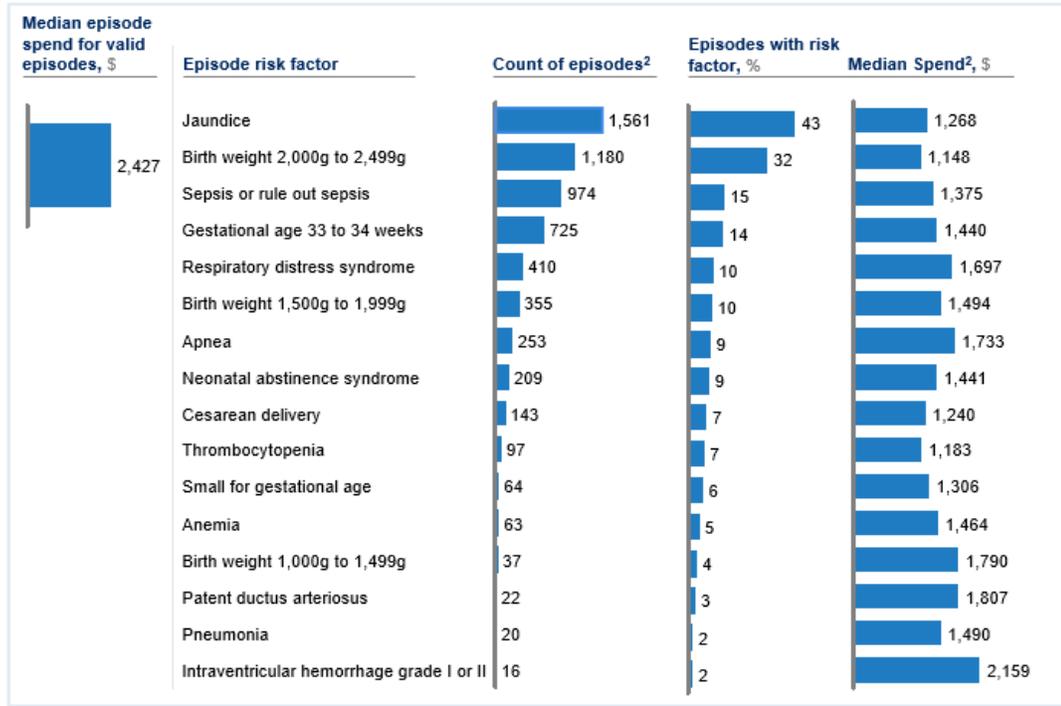


1 Only showing 16 selected risk factors; for valid episodes (41,406) across all PAPs (114); valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death)

2 For episodes with this risk factor; one episode can have multiple risk factors

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

EXHIBIT 6B – MODERATE-RISK EPISODE: EPISODE COUNT AND SPEND BY EPISODE RISK FACTOR¹

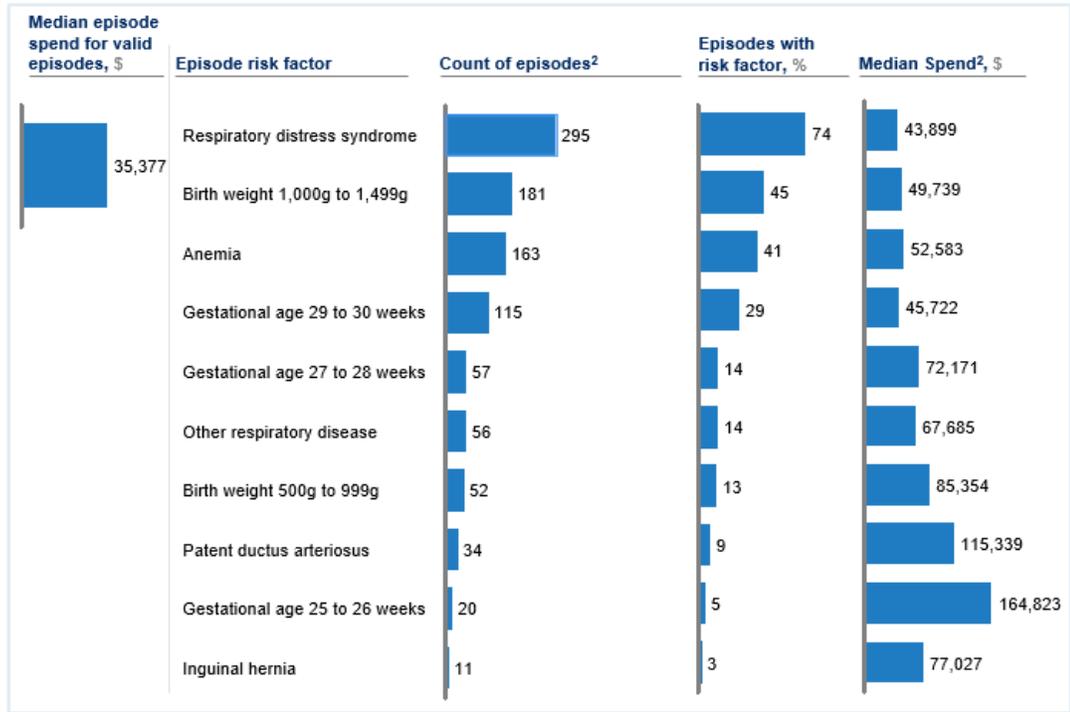


¹ Only showing 16 selected risk factors; for valid episodes (2,941) across all PAPs (76); valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death)

² For episodes with this risk factor; one episode can have multiple risk factors

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

EXHIBIT 6C – HIGH-RISK EPISODE: EPISODE COUNT AND SPEND BY EPISODE RISK FACTOR¹

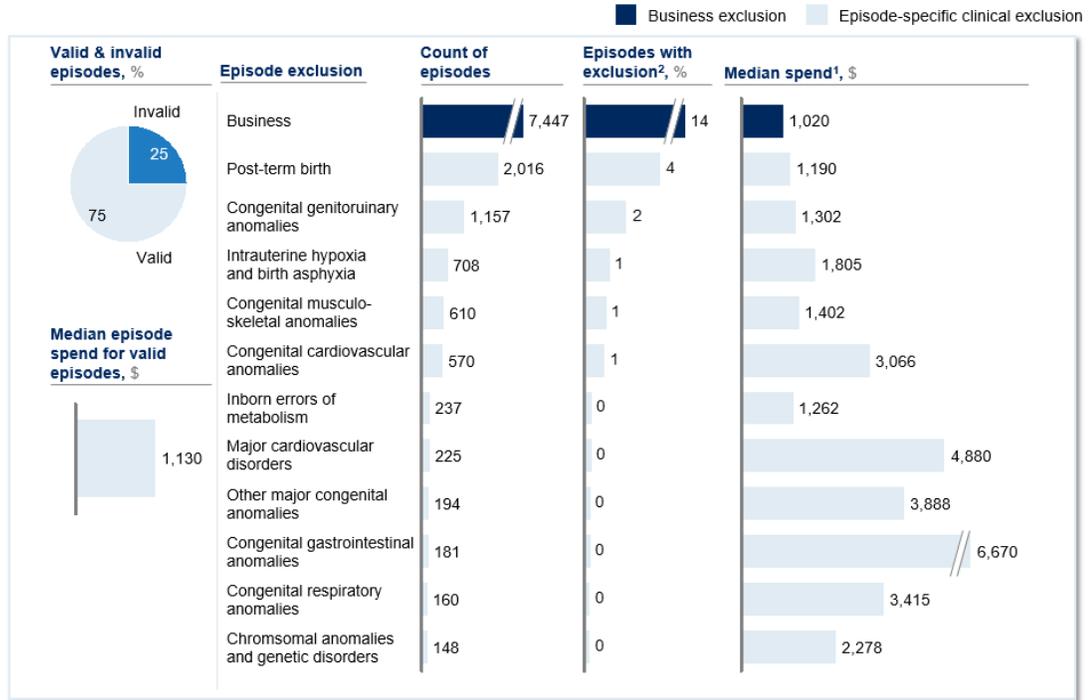


¹ Only showing 16 selected risk factors; for valid episodes (398) across all PAPs (14); valid episodes do not include episodes with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death)

² For episodes with this risk factor; one episode can have multiple risk factors

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

EXHIBIT 7A – LOW-RISK EPISODE: EPISODE COUNT AND SPEND BY EPISODE EXCLUSION ACROSS THE NEONATAL EPISODES¹

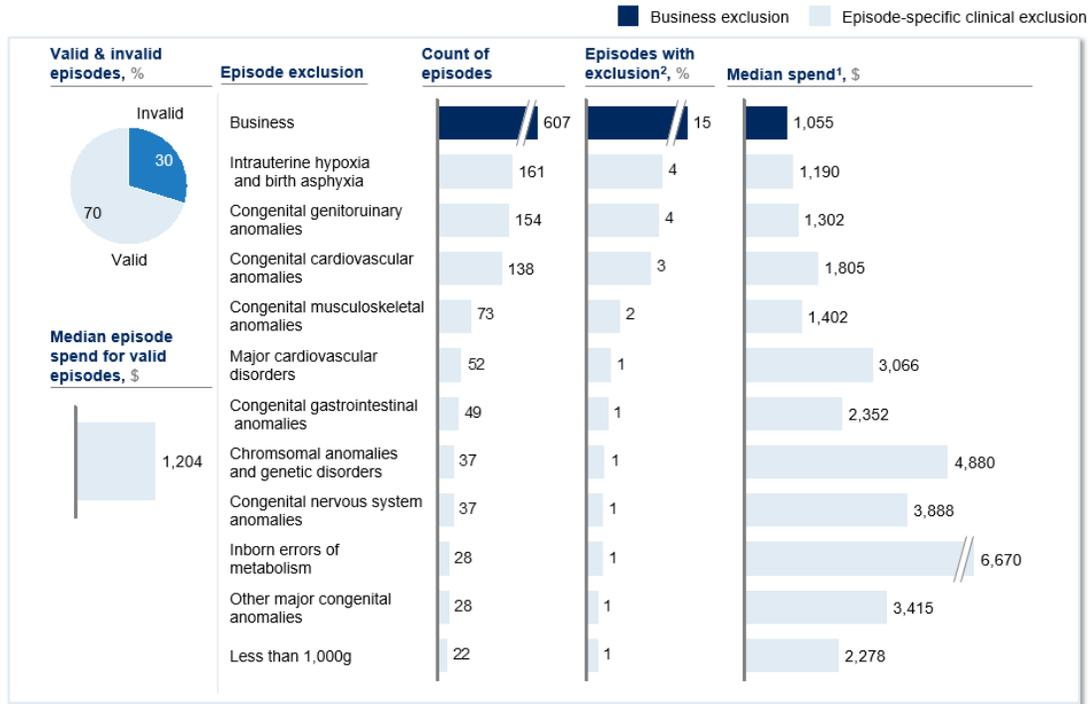


¹ Only showing select episode exclusions; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death)

² For episodes with this exclusion; one episode can have multiple exclusions

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

EXHIBIT 7B – MODERATE-RISK EPISODE: EPISODE COUNT AND SPEND BY EPISODE EXCLUSION ACROSS THE NEONATAL EPISODES¹

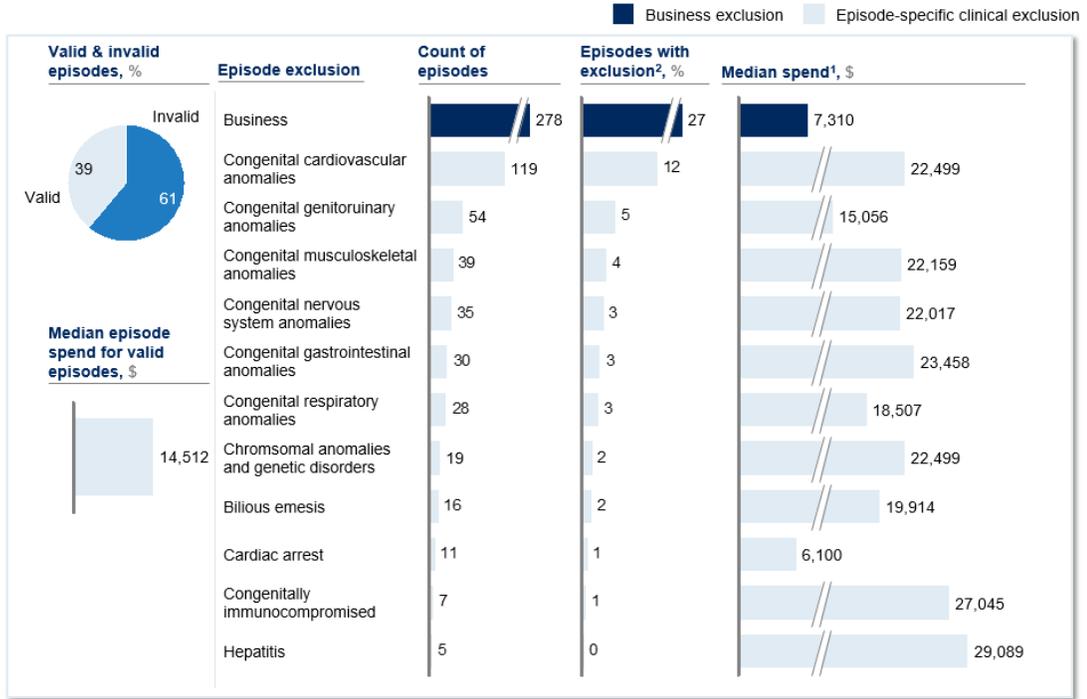


1 Only showing select episode exclusions; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death)

2 For episodes with this exclusion; one episode can have multiple exclusions

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

EXHIBIT 7C – HIGH-RISK EPISODE: EPISODE COUNT AND SPEND BY EPISODE EXCLUSION ACROSS THE NEONATAL EPISODES¹

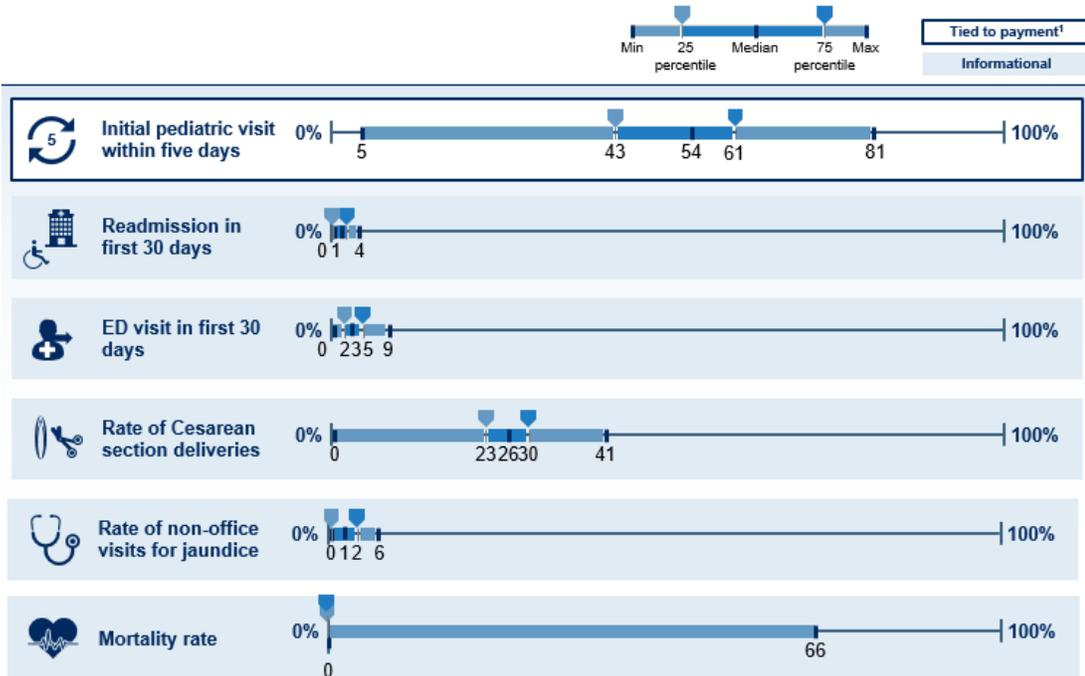


1 Only showing select episode exclusions; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death)

2 For episodes with this exclusion; one episode can have multiple exclusions

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

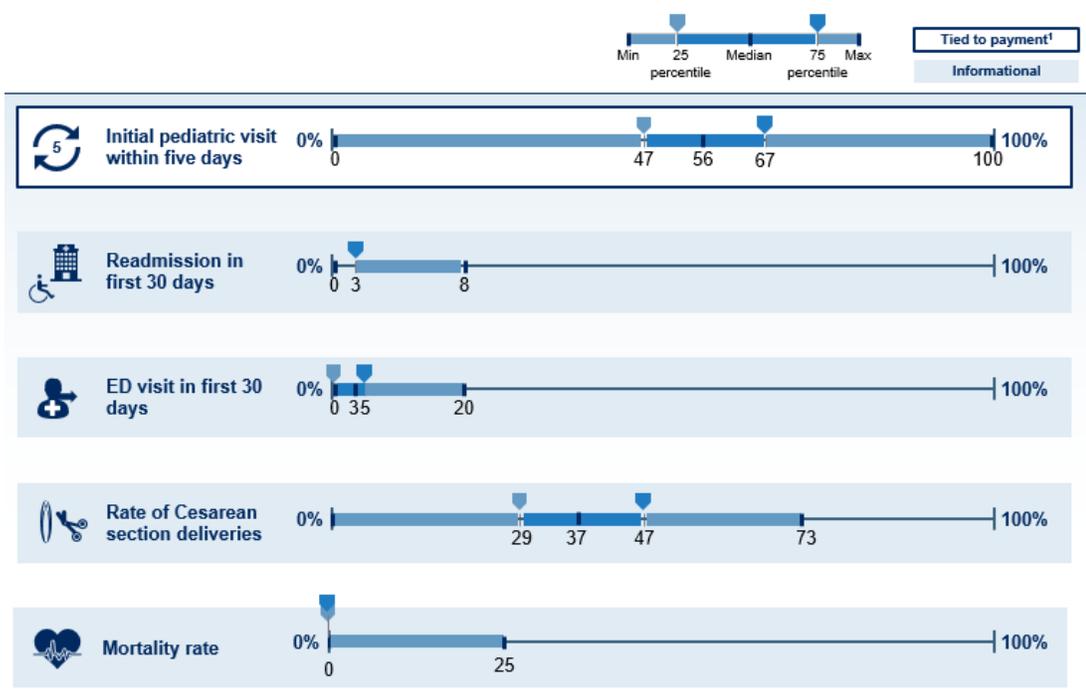
EXHIBIT 8A – LOW-RISK EPISODE: PAP PERFORMANCE ON EPISODE QUALITY METRICS¹



¹ For valid episodes (41,406) across PAPs with 5 or more valid episodes (114); valid episodes with PAPs with 4 or fewer episodes are not included in this analysis; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death)

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

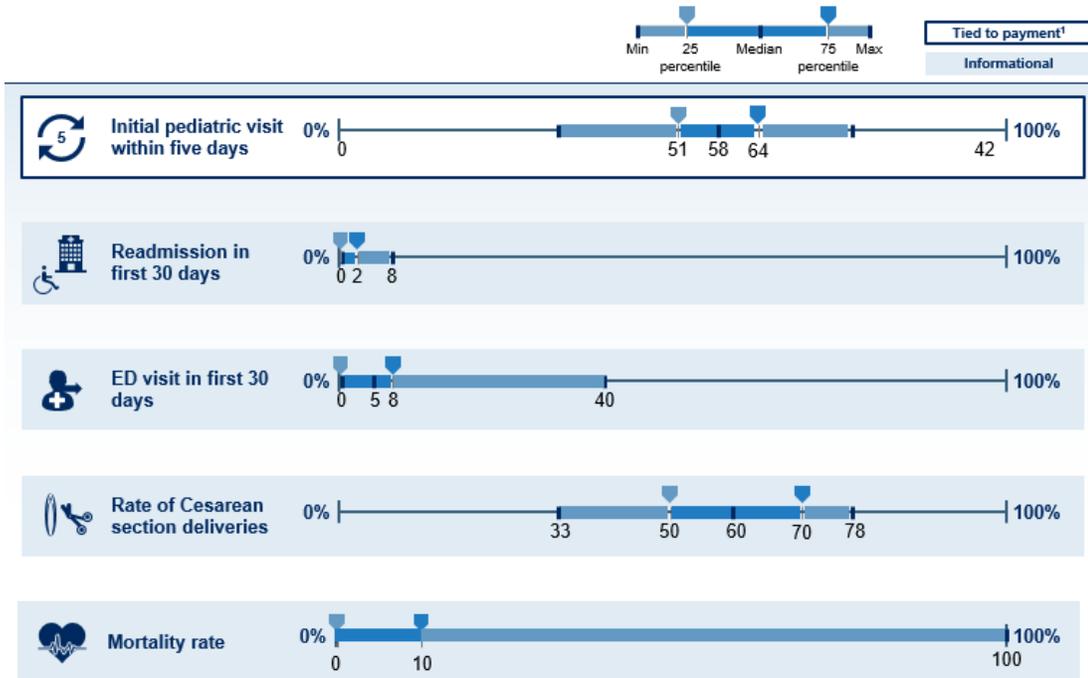
EXHIBIT 8B – MODERATE-RISK EPISODE: PAP PERFORMANCE ON EPISODE QUALITY METRICS¹



¹ For valid episodes (2,941) across PAPs with 5 or more valid episodes (76); valid episodes with PAPs with 4 or fewer episodes are not included in this analysis; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death)

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015

EXHIBIT 8C – HIGH-RISK EPISODE: PAP PERFORMANCE ON EPISODE QUALITY METRICS¹



¹ For valid episodes (398) across PAPs with 5 or more valid episodes (14); valid episodes with PAPs with 4 or fewer episodes are not included in this analysis; valid episodes do not include those with business (e.g., third-party liability, dual eligibility) or clinical exclusion (e.g., maternal death)

SOURCE: OH claims data with episodes ending between 10/01/2014 and 09/30/2015