

## V.15.3 Special Report: Primary Cesarean Delivery Rate, Uncomplicated (IQI 33) and Unexpected Newborn Complications (NQF 716) – Linked Analysis

### I. Introduction

This V.15.3 Special Report is designed to look at the potential interaction between a hospital's Primary Cesarean Delivery Rate, Uncomplicated (IQI 33) and the hospital's Unexpected Newborn Complications (NQF 716), using a linked mother-baby analysis. Each of these topics was covered in previous special reports, as described below.

### II. Primary Cesarean Delivery Rate, Uncomplicated (IQI 33)

The NPIC/QAS V13.1 Special Report focused on the cesarean section rate of your low risk population. As described in that report, there are two similar low risk cesarean section metrics being reported by the perinatal community: The Joint Commission (TJC) PC 02 Cesarean Section measure and the Agency for Healthcare Research and Quality (AHRQ) Inpatient Quality Indicator (IQI) #33 Primary Cesarean Delivery Rate, Uncomplicated. They differ in one notable way: PC 02 looks ONLY at nulliparous women; IQI 33 does not. This is driven by the fact that the IQI 33 indicator relies on administrative data within which parity is generally not available. ***IQI 33 looks at term, live singleton, vertex presentation and excludes women with a prior cesarean section.*** As outlined in our prior report, there are other slight differences in the coding for these measures that do not have a major impact on variation in the PC 02 and IQI 33 rates.

### III. Unexpected Newborn Complications (NQF 716)

The NPIC/QAS V12.4 Special Report (and the revised version sent shortly thereafter) was based on the work of the California Maternal Quality Care Collaborative (CMQCC), the measure steward for National Quality Forum (NQF) measure #716: Healthy Term Newborn. CMQCC developed this measure in response to a need for a composite measure to identify the most important outcome for families having a birth -- taking home a healthy baby. While there are several measures looking at specific clinical practices and outcomes in preterm infants, there were no other measures for outcomes in term babies (who represent the majority of births).

Initially endorsed by NQF in January, 2011 the ***Healthy Term Newborn*** measure identified the percent of babies without preexisting conditions (no premature infants, multiple gestations, birth defects, or other fetal conditions) and who are normally grown and were not exposed to maternal drug use, that did **NOT** have any severe or moderate complications. Feedback to the measure developers initiated an update to reverse the numerator and measure "Unexpected Newborn Complications", those newborns without preexisting complications who do have a severe or moderate morbidity.

The source of the data for this measure is administrative claims data, using a combination of ICD-9 diagnosis and procedure codes and neonatal length of stay (LOS) to categorize

complications. This measure is a key balance to other NQF endorsed measures that examine obstetric care in this population such as cesarean section and episiotomy rates. Most families would value having a low chance of unexpected newborn complications and low to medium rates of these obstetric procedures.

#### **IV. Potential Interaction Between the Measures**

As noted above, women considered low risk deliveries would anticipate a vaginal birth, and would expect a newborn without severe or moderate morbidities. Potentially, a clinical decision to provide a primary cesarean section would minimize the chance of unexpected newborn complications. We have provided graphs which examine the interaction between these two measures using the database as a whole, as well as the variation in these measures within your facility.

#### **V. Description of the Tables and Graphs**

The tables and graphs in this special report provide data for IQI #33 Primary Cesarean Delivery Rate, Uncomplicated and NQF 716 Unexpected Newborn Complications (UNC). As described in more detail below, the graphs display data for a mother-baby linked analysis of these variables. The data period displayed includes calendar year data for 2010 – 2014, and the first three quarters of 2015 (1/1/15-9/30/15). Data are provided for your hospital across that time period (Graph 2) and for the last four quarters of data (Graph 1 and 3), with comparisons to the NPIC/QAS Trend Database, your NPIC/QAS Subgroup, and the NPIC/QAS Database.

##### **Table 1: Data Overview**

**Section A: Overview** displays total deliveries, total cesarean sections (count and percent of total deliveries), total inborns, and the percent of total inborns with valid APGAR 5 data (relevant for the UNC analysis) for your hospital, your Subgroup, and for the NPIC/QAS Database as a whole.

*The remaining data displayed in this Table are counts and rates derived from a linked mother-baby analysis. If your hospital does not have a valid ( $\geq 70\%$ ) mother-baby linking rate, data will not be displayed for your facility. Please contact your hospital liaison if you would like to explore improving your hospital's mother-baby link.*

##### **Section B: IQI 33 Primary Cesarean Delivery Rate, Uncomplicated and NQF 716 Unexpected Newborn Complications (UNC) data**

**Section B1: IQI 33** provides the starting denominator for this variable for the linked analysis (count and percent of total deliveries), then the final denominator once the exclusions for this metric are applied. The numerator is displayed as well as the IQI 33 rate. All metrics are provided for your hospital, your Subgroup and the Database.

**Section B2: NQF 716 (UNC)** includes the total inborns (count and percent) linked to a mother in the IQI 33 denominator, the UNC final denominator and UNC numerator for the linked analysis, and the UNC rate. These inborns are further divided into those delivered by

cesarean section and those delivered vaginally, with the UNC rates for those two subsets. All metrics are provided for your hospital, your Subgroup and the Database.

### **Graph 1: Linked Mother/Baby Analysis of NPIC/QAS Database, Rate of Unexpected Newborn Complication Cases Delivered Vaginally vs. IQI 33 Primary Cesarean Delivery Rate, Uncomplicated**

This scattergram illustrates, for the 69 hospitals within the NPIC/QAS member database with a valid ( $\geq 70\%$ ) linking rate, the relationship of the hospital's IQI 33 rate to their NQF 716 (UNC) rate of linked inborns delivered vaginally. The line placed on the scattergram is a statistically computed least-squares-regression line which represents the overall trend ("line of best fit"). The legend includes the interpretation of the graph. IQI rates and UNC rates in the NPIC/QAS Database are negatively and weakly correlated ( $r = -.0798$ ). A negative correlation indicates that as one value increases, the other decreases; a correlation less than 0.5 is generally described as *weak*.  $R^2$ , the *coefficient of determination*, represents the percent of the data that is closest to the line of best fit. Little of the variation in Total UNC rates can be explained by the linear relationship between the 2 variables ( $r^2 = .0064$ ).

### **Graph 2: Linked Mother/Baby IQI 33 and UNC Trend Analysis, 2010 – 2015 (Q1-Q3) with Trendlines**

This graph displays, using linked mother-baby data, the trend rates for your hospital for IQI 33 and NQF 716 (UNC) rates for calendar years 2010 – 2014 and the first three quarters of 2015 (1/1/15-9/30/15). The legend indicates if each of these rates is stable over time or trending upwards or downwards. The Table below provides the rates for your hospital, your subgroup, and for the trend database for each time point. An analysis of the trends for the subgroup and trend database is also included in the table below the graph.

### **Graph 3: Linked Mother/Baby Analysis, Rate of Linked Inborns with Unexpected Newborn Complications (UNC) by Type of Delivery**

This graph displays a comparison of the Total UNC rate for linked inborns delivered vaginally and linked inborns delivered by cesarean section for your hospital and the hospitals in your Subgroup.

*Please request case lists if any of these rates do not appear to be accurate (remembering this is a linked analysis, so the rates will not match those in your Quarterly Report).* Questions regarding this analysis should be directed to Sandra Boyle, Director of Data Services ([sboyle@npic.org](mailto:sboyle@npic.org)) or Janet Muri, President ([jmuri@npic.org](mailto:jmuri@npic.org)) at 401-274-0650.

## **REFERENCES**

Specifications Manual for Joint Commission National Quality Measures - PC (v2013B)  
[www.jointcommission.org](http://www.jointcommission.org)

California Maternal Quality Care Collaborative (CMQCC) document; shared by Elliott Main, MD with NPIC/QAS, Jan. 2013.

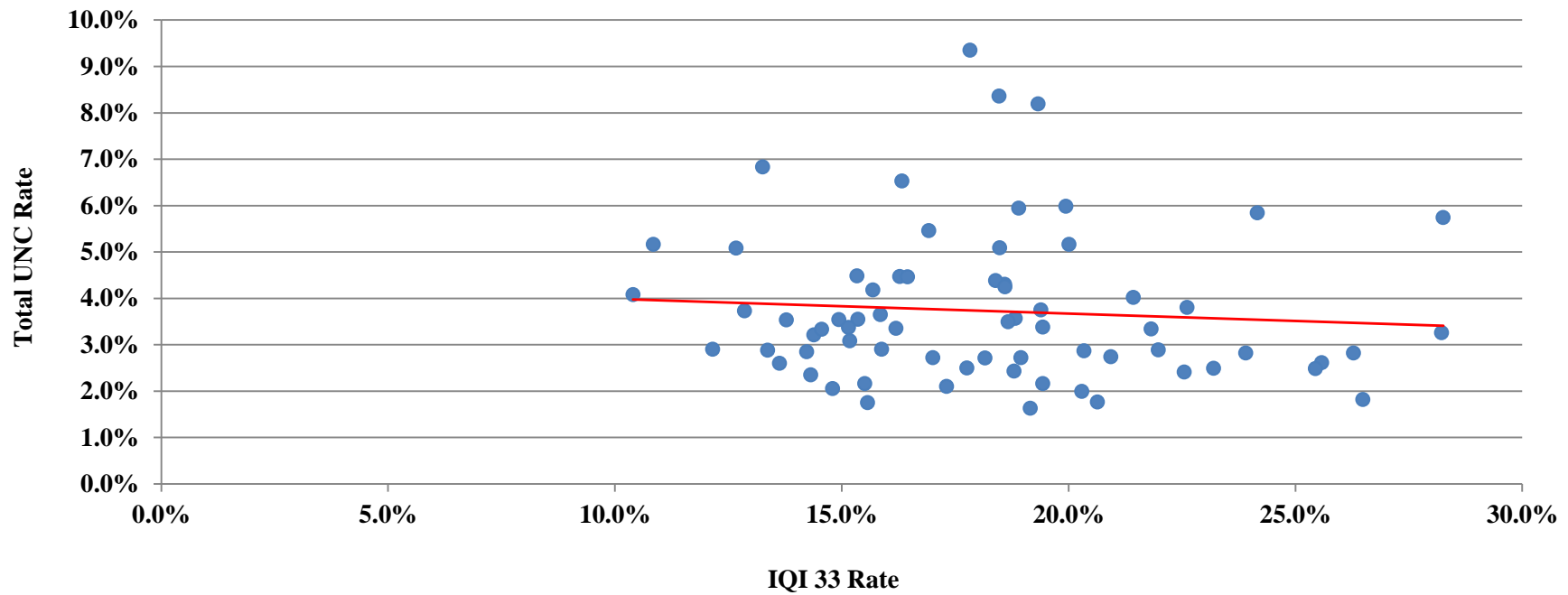
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**Table 1: Data Overview**

<b>Hospital: SAMPLE</b>	<b>Hospital</b>	<b>Subgroup Average</b>	<b>Database Average</b>
<b>A. Overview</b>			
<b>Total Deliveries</b>	<b>2,598</b>	<b>4,344</b>	<b>3,934</b>
Total C-Sections	919	1,394	1,341
Percent of total deliveries	35.4%	32.1%	33.7%
<b>Total Inborns</b>	<b>2,665</b>	<b>4,365</b>	<b>3,993</b>
Percent of total Inborns with valid APGAR 5	99.7%	89.7%	88.6%
<b>B. Linked Analysis*</b>			
<b>B1. IQI 33: Primary Cesarean Delivery Rate, Uncomplicated</b>			
IQI 33 Starting Denominator	2,523	4,198	4,024
Percent of total deliveries	97.1%	97.5%	97.4%
IQI 33 Denominator exclusions	776	1,177	1,099
IQI 33 Final Denominator	1,747	3,021	2,924
IQI 33 Numerator	318	519	531
<i>Rate of Uncomplicated Primary C-sections: IQI 33</i>	18.2%	17.6%	18.2%
<b>B2. NQF 716: Unexpected Newborn Complications</b>			
Total Inborns linked to a mother in <b>IQI 33</b> denominator population	1,748	3,021	2,922
Linked inborns as a percent of total mothers in <b>IQI 33</b> denominator population	100.1%	100.0%	100.0%
UNC Final Denominator: Linked IQI 33 Inborns in UNC denominator population (without preexisting complications)	1,505	2,599	2,546
UNC Numerator: Linked IQI 33 Inborns with unexpected complications	64	108	94
<i>Total Unexpected Newborn Complication Rate for inborns of IQI 33 denominator population</i>	4.3%	4.2%	3.7%
Linked UNC Inborns delivered by c-section	22	33	27
UNC Rate of Linked Inborns delivered by c-section	1.5%	1.3%	1.1%
Linked UNC Inborns delivered vaginally	42	75	67
UNC Rate of Linked Inborns delivered vaginally	2.8%	2.9%	2.7%

\* Subgroup and Database Averages are calculated from hospitals with a valid ( $\geq 70\%$ ) mother/baby linking rate.

**Graph 1: Linked Mother/Baby Analysis of NPIC/QAS Database \***  
**IQI 33: Primary Cesarean Delivery Rate, Uncomplicated vs.**  
**Total Unexpected Newborn Complications (UNC) Rate of Linked IQI 33 Inborns**

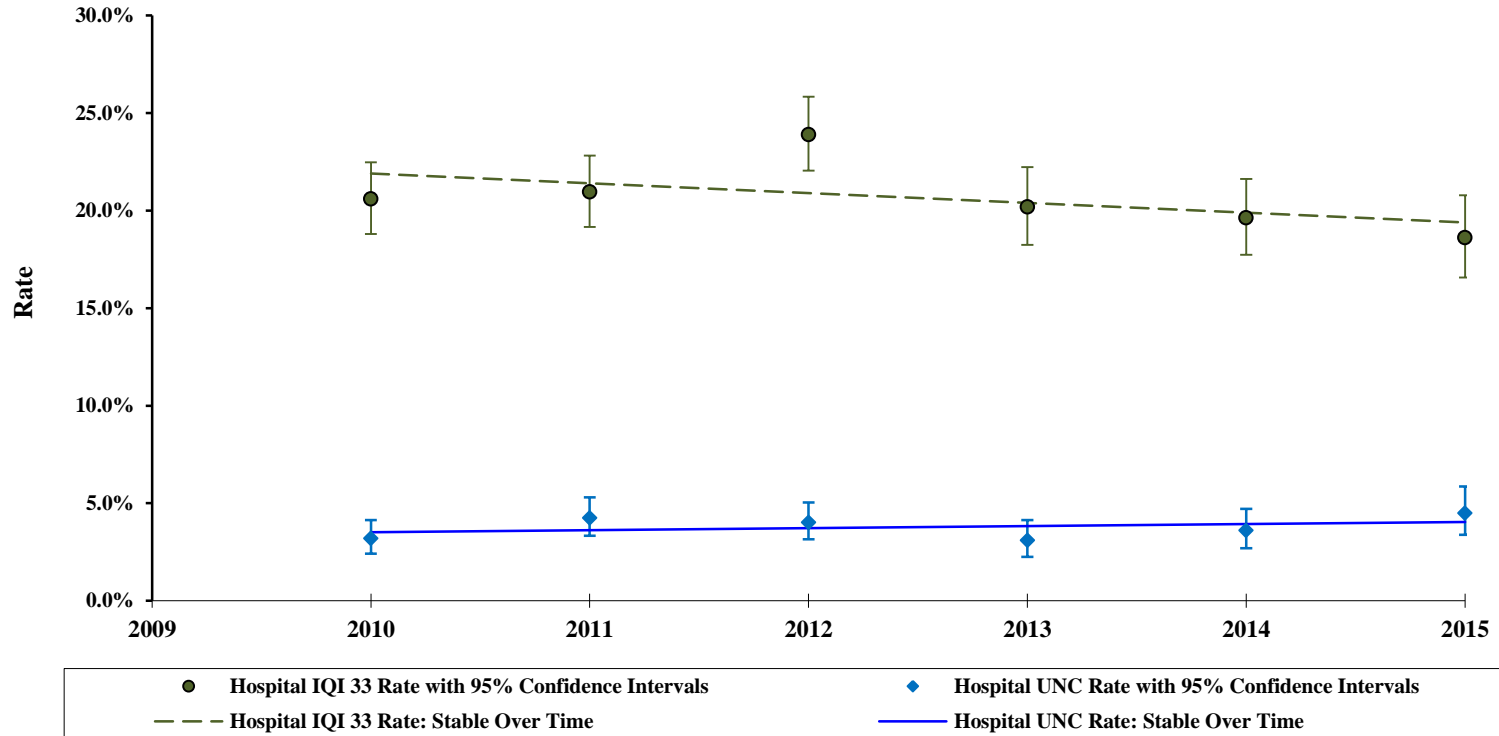


$r = -0.0798$	$t \text{ value} = -0.66$
$r^2 = 0.0064$	$p \text{ value} = 0.51$

**Interpretation:**  
 IQI rates and UNC rates in the NPIC/QAS Database are negatively and only weakly correlated ( $r = -.08$ ). Little of the variation in UNC rates can be explained by the linear relationship between the 2 variables ( $r^2 = .006$ ).

\* Hospitals with a valid ( $\geq 70\%$ ) mother/baby link rate,  $n = 69$   
 Date Range of Comparison Data: 10/1/2014 - 9/30/2015

**Graph 2: Hospital Linked Mother/Baby IQI 33 and Total UNC Trend Analysis  
2010 - 2015 (Q1-Q3)  
NPIC ID: SAMPLE**

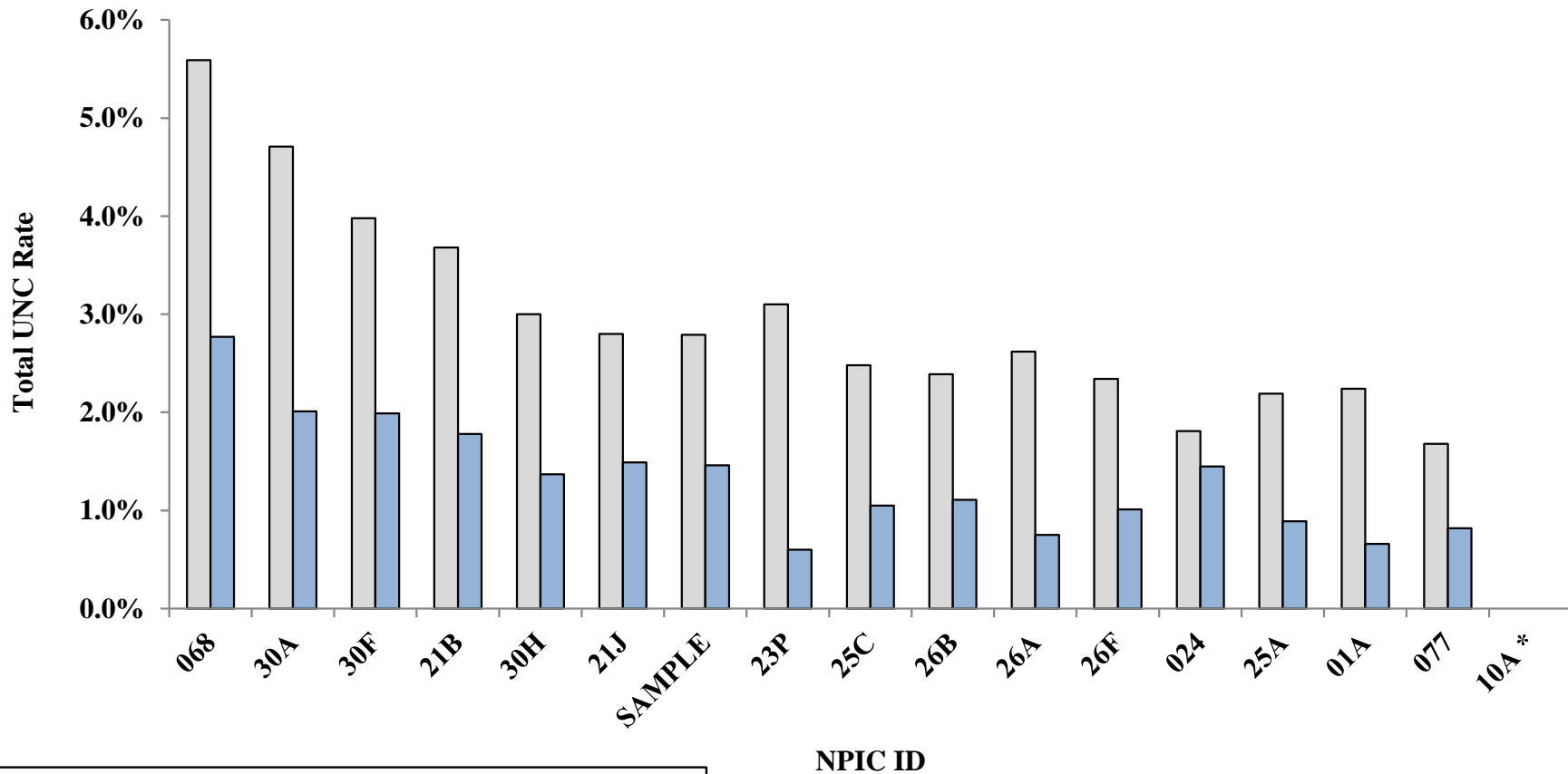


	2010	2011	2012	2013	2014	2015 (Q1-Q3)
Hospital IQI 33 Rate	20.6%	21.0%	23.9%	20.2%	19.6%	18.6%
Hospital UNC Rate	3.2%	4.2%	4.0%	3.1%	3.6%	4.5%

**Trend AR Subgroup and Trend NPIC Database Average Rates (not displayed on graph):**

Trend AR Subgroup IQI 33 Rate	16.3%	16.8%	18.8%	18.3%	17.5%	17.5%
(Significant Downward Trend, p = 0.0000)						
Trend AR Subgroup UNC Rate	3.0%	3.1%	3.1%	3.2%	3.4%	3.6%
(Significant Upward Trend, p = 0.0000)						
Trend NPIC DB IQI 33 Rate	19.5%	18.8%	19.1%	19.2%	18.6%	17.9%
(Significant Downward Trend, p = 0.0000)						
Trend NPIC DB UNC Rate	3.3%	3.1%	3.4%	3.3%	3.4%	3.5%
(Significant Upward Trend, p = 0.0000)						

**Graph 3: Comparative Linked Mother/Baby Analysis**  
**Rate of Linked IQI 33 Inborns with Unexpected Newborn Complications (UNC) by type of delivery**  
**NPIC ID: SAMPLE**



**Total UNC Rate for inborns of IQI 33 denominator population: 4.3%**

- UNC Linked Inborns delivered vaginally (2.8%)**
- UNC Linked Inborns delivered by c-section (1.5%)**

\* Hospital did not provide a valid ( $\geq 70\%$ ) mother/baby link