

CONFIDENTIAL

**Follow-up Adverse Outcome Report
Hospital Name and Quarters of Data**

A. Overview

This Analysis was developed by the National Perinatal Information Center/Quality Analytic Services (NPIC/QAS) in conjunction with Team Performance Plus (TPP)TM. The specific measures profiled in this Report were developed by a panel of experts from American College of Obstetrics and Gynecology (ACOG), the Association of Women’s Health, Obstetric and Neonatal Nurses (AWHONN), The Society for Obstetric Anesthesia and Perinatology (SOAP), Air Force Institute of Pathology (AFIP), Navy Bureau of Medicine (BUMed), DoD Tricare Management Activity and the hospitals selected for a team training study sponsored by the Department of Defense and the Harvard Risk Management Strategies Foundation Team Performance Plus (TPP)TM. The analysis is designed to measure the volume and magnitude of ten types of adverse events that occur during or around the delivery process and may expose an obstetrical team to malpractice liability. Events that were definable as well as potentially modifiable through improved teamwork were selected.

The ten types of adverse events are: in-hospital maternal death; in-hospital death of a neonate \geq 2500 grams and $>$ 37 weeks gestation (excluding cases with a congenital anomaly, fetal hydrops or dwarfism); uterine rupture during labor; unplanned admission to the ICU or external maternal transfer to an ICU for a postpartum complication; birth trauma (inborn only \geq 2000 grams); unanticipated operative procedure (previously: return to OR or labor and delivery); admission of inborn neonate \geq 2500 grams and \geq 37 weeks to NICU within one day of birth for $>$ 1 day (excluding cases with a congenital anomaly, fetal hydrops, dwarfism, or neonatal abstinence syndrome); APGAR 5 $<$ 7 (excluding cases with a congenital anomaly, fetal hydrops or dwarfism); maternal blood transfusion; and 3rd or 4th degree perineal laceration. ***This report reflects Version 2.2 of the AOI algorithm.*** (Specific codes and algorithm logic associated with each type of adverse event are included in the Glossary at the end of the Report.)

Each type of event has a severity weight associated with it and there are three indices that are calculated from the count and weight of the events occurring at your facility. The types of events – and the weights associated with each type of event - were developed by a panel of experts through a rigorous consensus process to determine appropriate “weights”. For example, it was agreed that “maternal death” should have the highest severity weight (750); the sum of the weights of all other events is equal to the severity weight for maternal death. The measures and their associated weights are listed below.

Weights for Adverse Outcomes

In-hospital Maternal death	750
In hospital Neonatal Death	400

Uterine Rupture During Labor	100
Unplanned Maternal Admission to ICU	65
Birth Trauma	60
Unanticipated Operative Procedure	40
Admission to NICU	35
APGAR 5 < 7	25
Maternal Blood Transfusion	20
3 rd and 4 th degree perineal laceration	5

The Adverse Outcome Index (AOI) is the number of patients with one or more of the identified adverse events as a proportion of total deliveries.

The Weighted Adverse Outcome Score (WAOS) is the total weights of all the adverse events divided by the total number of deliveries.

The Severity Index (SI) is the total weights of all the adverse events divided by the number of deliveries with an adverse event (each delivery is counted only once but each event is counted.)*

**Due to the limitations of using an administrative data set (the mother and the baby data are not linked), we can only determine the number of patients with an adverse event, not the number of deliveries with an adverse event. This may result in an overstatement in the number of deliveries with adverse events if there are cases where a mother and linked baby each had events.*

This Follow-up Report covers the period dates and reflects data submitted to the NPIC/QAS by your hospital.

This Report is divided into five sections:

- A. Overview of the AOI Indices, the coding for the numerator cases, calculation of the adverse outcome index, the weighted adverse outcome score and the severity index
- B. Data Submission and Validation Discussion
- C. AOI Indices by Quarter- Tables and Graphs
- D. Summary Comments
- E. Glossary

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B. Data Submission and Validation Discussion

Baseline Report dates

Files containing number of perinatal discharges for the period *dates* were submitted under the direction of *name and title of person submitting file*.

The original source file was submitted in the STATE DATABASE FORMAT IF THERE IS ONE for the above period. A supplemental file with (name fields) was also submitted. Mention problems if there are any. The file was programmed into the NPIC/QAS file structure and processed through our reporting system.

Follow-up Report dates

Files containing number of perinatal discharges for the period *dates* were submitted under the direction of (name and title of person submitting file) and merged into your baseline data set.

The original source file was submitted in the STATE DATABASE FORMAT IF THERE IS ONE for the above period. A supplemental file with (name fields) was also submitted. Mention problems if there are any. The file was programmed into the NPIC/QAS file structure and processed through our reporting system.

C. Tables and Graphs

Table 1 displays a quarter by quarter count of cases by adverse event along with the count of total deliveries, and the average counts for the baseline and follow-up monitoring periods.

Table 2 displays AOI, WAOS and SI rates by quarter for your hospital, as well as the average rates for the baseline and follow-up monitoring periods, the TPP™ comparative rate and the target benchmark. *Please note:* the TPP™ comparative rate reflects data from 20 hospitals, that have, to date, completed a team training initiative with Team Performance Plus(TPP)™. The target benchmark now reflects data from 6 of these 20 hospitals. These six hospitals were selected as their post-training data were in the top performance quartile for the AOI metric.

Graphs 1-3 show a graphic display of each index by quarter, as well as the average rate for your hospital for the baseline period and for the follow-up period. Each data point includes a vertical error bar that represents the margin of error (90% confidence interval). The graph includes a horizontal dashed line that represents the target benchmark value and a dashed dotted line that represents the TPP™ comparative rate. If the error bar crosses the horizontal lines representing the target benchmark and/or the TPP™ comparative rate, the data point is not significantly different from the line value it crosses. If the error bar does not cross the horizontal lines, the data point is significantly different (higher or lower) than the target benchmark and/or the TPP™ comparative rate.

Table 1: Count of Adverse Events by Indicator
AOI Version 2.2

SAMPLE	Baseline								Follow-Up Monitoring				
	Q1, 2008	Q2, 2008	Q3, 2008	Q4, 2008	Q1, 2009	Q2, 2009	Q3, 2009	Ave. For Period	Q3, 2010	Q4, 2010	Q1, 2011	Q2, 2011	Ave. For Period
Total Deliveries													
Total Inborns													
In-hospital Maternal Death	0	0	0	0	0	0	0	0	0	0	0	0	0
In-hospital Neonatal Death, >=2500 grams and >= 37 weeks gestation	0	0	0	0	0	0	0	0	0	0	0	0	0
Uterine Rupture During Labor	0	0	0	0	0	0	0	0	0	0	0	0	0
Unplanned Maternal admission to ICU	2	1	1	0	1	1	2	1	0	2	2	0	1
Birth Trauma	0	0	2	1	0	1	2	1	1	0	2	1	1
Unanticipated Operative Procedure	0	2	0	0	1	2	3	1	0	4	1	0	1
Admission to NICU of neonate >= 2500 grams and >= 37 weeks gestation, for > 1 day	22	17	25	16	19	30	14	20	8	4	3	6	5
APGAR 5 < 7, Inborn Neonate, >= 2500 grams and >= 37 weeks gestation	0	1	0	1	0	1	1	1	1	0	0	0	0
Maternal Blood Transfusion	3	4	6	2	2	2	2	3	1	2	2	1	2
3rd or 4th Degree Perineal Laceration	20	17	17	17	19	14	19	18	14	14	13	13	14
Total of Adverse Events	47	42	51	37	42	51	43	45	25	26	23	21	24
Total of Adverse Events Patients (duplicate patients removed)	47	42	50	36	41	50	40	44	24	25	22	21	23

Table 2: Indices by Quarter
AOI Version 2.2

SAMPLE	Baseline								TPP™ Comparative Rate*	Follow-Up Monitoring					
	Q1, 2008	Q2, 2008	Q3, 2008	Q4, 2008	Q1, 2009	Q2, 2009	Q3, 2009	Ave. for Period		Q3, 2010	Q4, 2010	Q1, 2011	Q2, 2011	Ave. for Period	Target Benchmark
Adverse Outcome Index (AOI)	0.082	0.061	0.072	0.065	0.080	0.073	0.066	0.071	0.076	0.038	0.048	0.040	0.037	0.041	0.039
Weighted Adverse Outcome Score (WAOS)	1.85	1.34	1.81	1.39	1.76	2.03	1.68	1.70	2.10	0.72	1.04	0.92	0.63	0.83	0.81
Severity Index (SI)	22.55	22.14	25.30	21.39	22.07	27.80	25.50	23.82	24.39	18.96	21.60	22.73	16.90	20.05	20.30

*TPP™ Comparative Rate Range:

AOI: 0.030 - 0.288

WAOS: 0.63 - 9.12

SI: 13.27 - 49.19

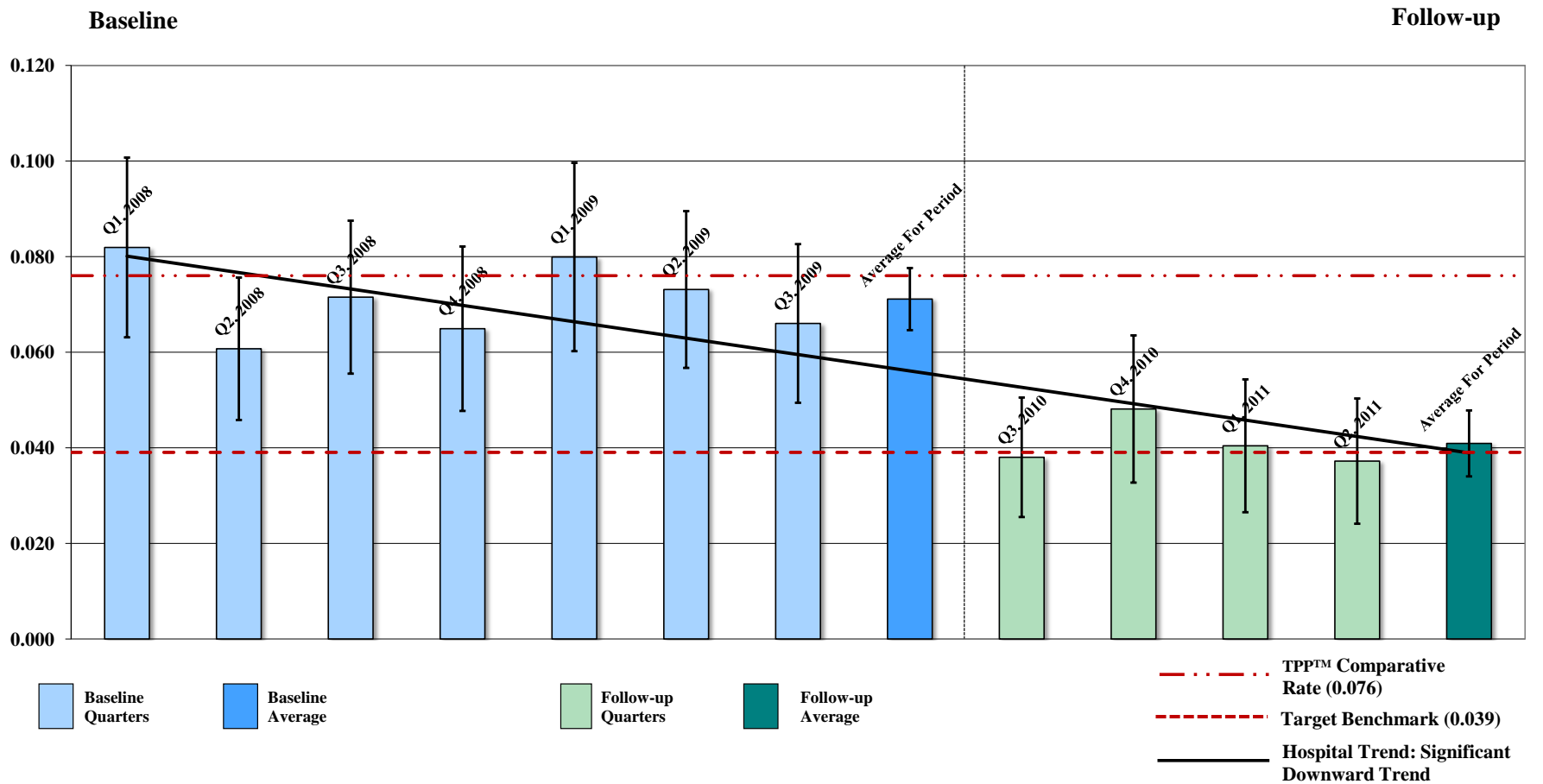
Adverse Outcome Index (AOI) -- # of patients with one or more adverse outcomes divided by number of deliveries

Weighted Adverse Outcome Score (WAOS) -- Adverse events times severity weight divided by total number of deliveries

Severity Index (SI) -- Total weights divided by number of patients with an adverse event

SAMPLE

Adverse Outcome Index(AOI)
 (Number of Patients with one or more adverse outcomes divided by the total number of deliveries)
 AOI Version 2.2

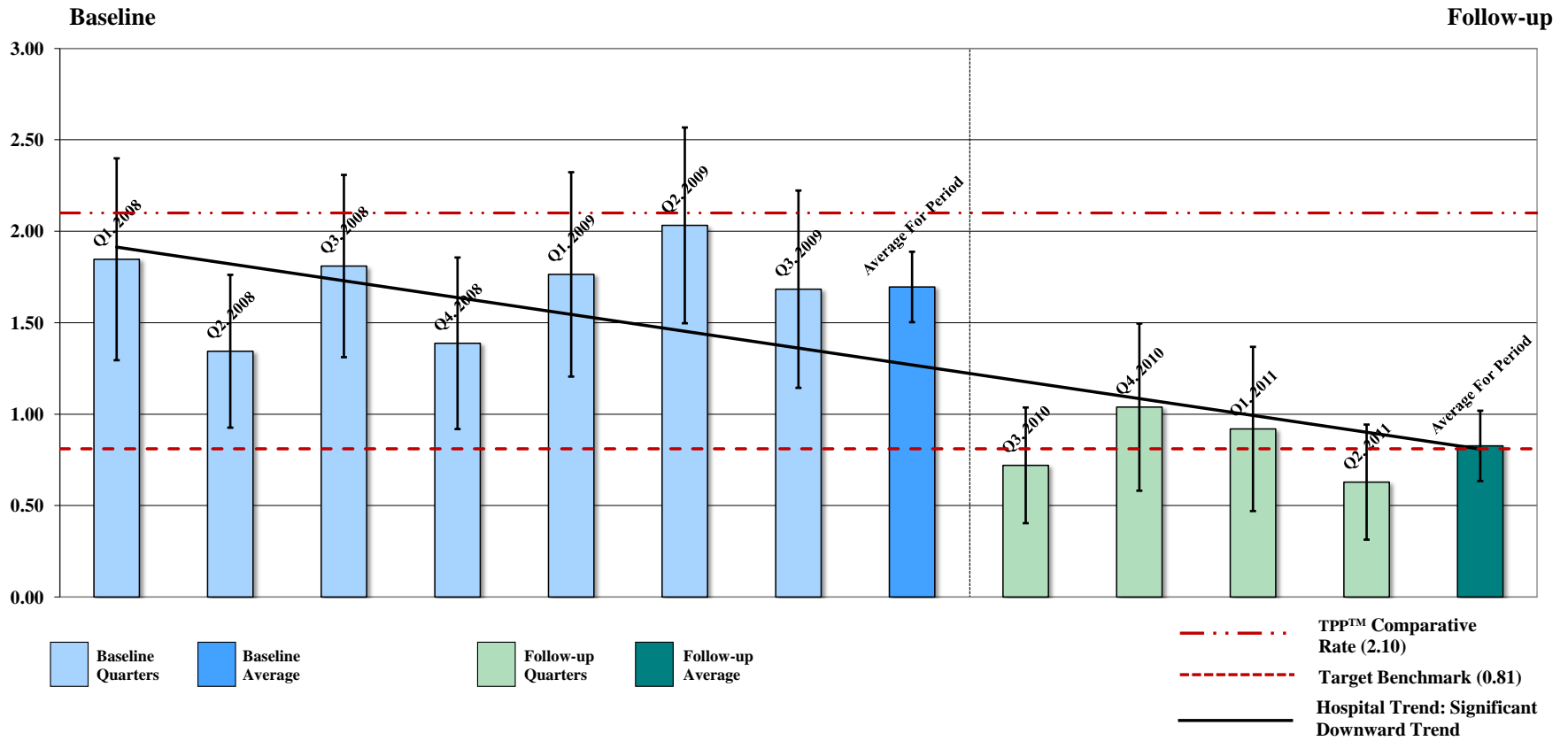


Error Bars represent Margin of Error (90% Confidence Interval).

Significant Decrease from Baseline to Follow-up. p = 0.000

SAMPLE

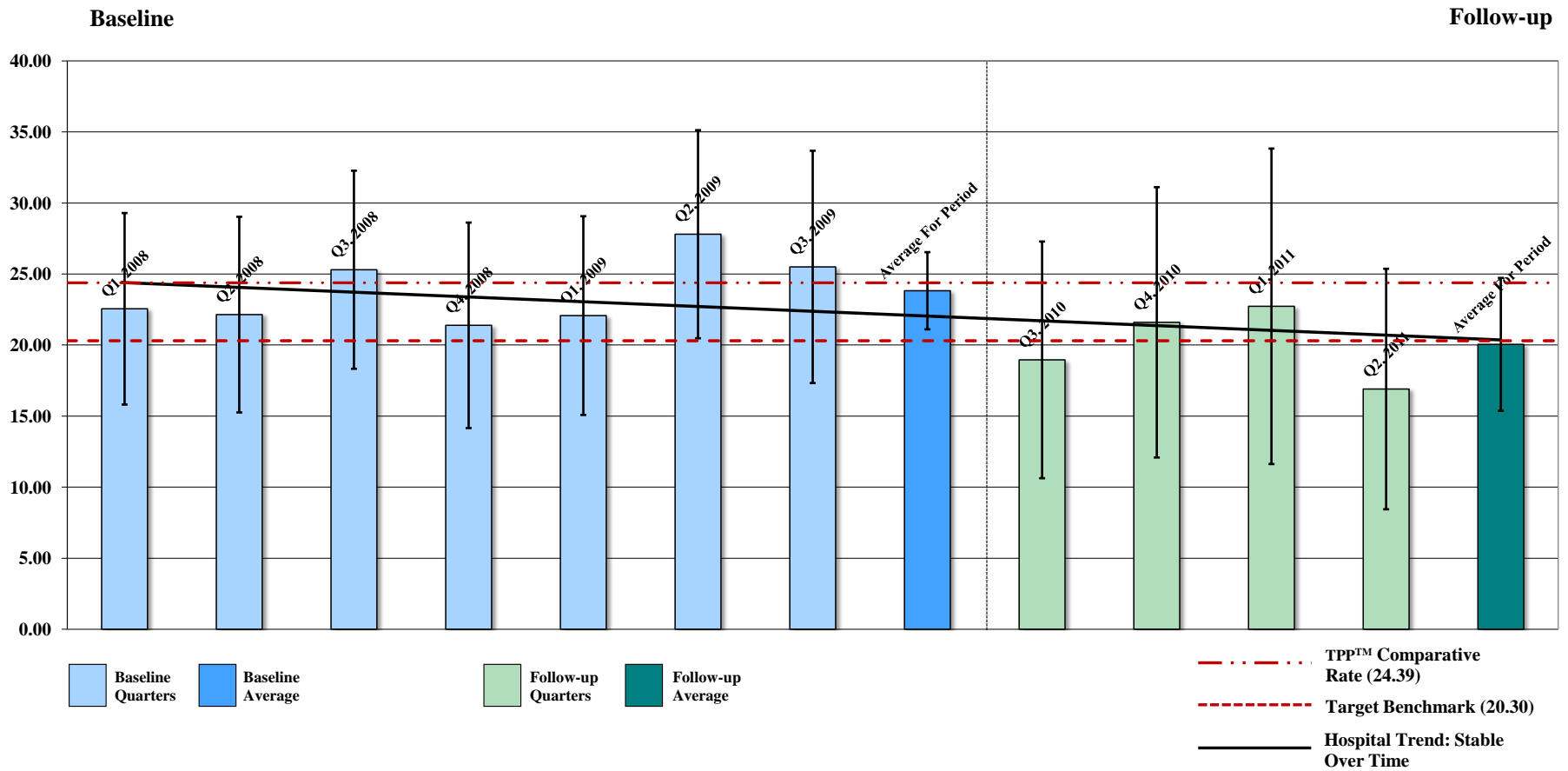
Weighted Adverse Outcome Score (WAOS)
 (All adverse events times severity weight divided by total number of deliveries.)
 AOI Version 2.2



Error Bars represent Margin of Error (90% Confidence Interval).

Significant Decrease from Baseline to Follow-up. $p = 0.000$

SAMPLE
Severity Index (SI)
 (Total weights divided by number of patients with an adverse event.)
 AOI Version 2.2



Error Bars represent Margin of Error (90% Confidence Interval).

Significant Decrease from Baseline to Follow-up. $p = 0.037$

D. Summary Comments

Baseline (dates) and Follow-up (dates)
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This section describes the results of the analysis of each average in comparison to the target benchmark. A description of the findings from testing the statistical significance of the change from baseline to follow-up, as explained in Section “C”, is also included, as is the trend analysis.

The AOI reflects the overall rate of cases with an adverse event. HOSPITAL’s follow-up average rate is (lower than, higher than, the same as) the baseline average rate; there (was or was not) a statistically significant change (increase or decrease) from baseline to follow-up. The AOI baseline average rate is (lower than, higher than, the same as) the target benchmark rate; the AOI follow-up average rate is (lower than, higher than, the same as) the target benchmark rate. The confidence interval for the baseline average (is above, below or includes) the target benchmark, indicating that there (was or was not) a statistically significant difference between this average and the target benchmark. The confidence interval for the follow-up average (is above, below or includes) the target benchmark, indicating that there (was or was not) a statistically significant difference between this average and the target benchmark. The trend analysis indicates (no significant change over time, a significant upward or downward trend).

The WAOS is a reflection of the severity of adverse events relative to all deliveries. HOSPITAL’s follow-up average rate is (lower than, higher than, the same as) the baseline average rate; there (was or was not) a statistically significant change (increase or decrease) from baseline to follow-up. The WAOS baseline average rate is (lower than, higher than, the same as) the target benchmark rate; the WAOS follow-up average rate is (lower than, higher than, the same as) the target benchmark rate. The confidence interval for the baseline average (is above, below or includes) the target benchmark, indicating that there (was or was not) a statistically significant difference between this average and the target benchmark. The confidence interval for the follow-up average (is above, below or includes) the target benchmark, indicating that there (was or was not) a statistically significant difference between this average and the target benchmark. The trend analysis indicates (no significant change over time, a significant upward or downward trend).

The SI is a reflection of the severity of the events relative to all cases with an adverse event. HOSPITAL’s follow-up average rate is (lower than, higher than, the same as) the baseline average rate; there (was or was not) a statistically significant change (increase or decrease) from baseline to follow-up. The SI baseline average rate is (lower than, higher than, the same as) the target benchmark rate; the SI follow-up average rate is (lower than, higher than, the same as) the target benchmark rate. The confidence interval for the baseline average (is above, below or includes) the target benchmark, indicating that there (was or was not) a statistically significant difference between this average and the target benchmark. The confidence interval for the follow-up average (is above, below or includes) the target benchmark, indicating that there (was or was not) a statistically significant difference between this average and the target benchmark. The trend analysis indicates (no significant change over time, a significant upward or downward trend).

E. GLOSSARY

AOI ALGORITHM DEFINITIONS VERSION 2.2 (Updates highlighted in yellow)

In-hospital Maternal Death – DRG 370-375 or MS DRG* 765-768 and 774-775 and discharge disposition = died.
{Case Weight: 750}

In-hospital Neonatal Death ≥ 2500 grams and ≥ 37 weeks gestation– Inborns only; neonate ≥ 2500 grams and ≥ 37 weeks gestation with discharge disposition of died within 7 days of birth and excluding cases with congenital anomalies (DX codes 740-759.9), fetal hydrops (778.0), or dwarfism (259.4).
{Case Weight: 400}

Uterine Rupture During Labor – DRG 370-375 or MS DRG 765-768 and 774-775 with DX code 665.1 (rupture of uterus during labor) in the primary, first or second diagnosis code positions only.
{Case Weight: 100}

Unplanned Maternal Admission to the ICU – DRG 370-375 or MS DRG 765-768 and 774-775 with DX code 5th digit = 2 (delivered with mention of postpartum condition) on any DX code 640-677 and with an ICU day or charge.

OR

DRG 370-375 or MS DRG 765-768 and 774-775 with DX code 5th digit = 2 (delivered with mention of postpartum condition) on any DX code 640-677 and discharged to another hospital (UB92/UB04 disp=02).

OR

DRG 370-375 or MS DRG 765-768 and 774-775 with DX code 5th digit = 2 (delivered with mention of postpartum condition) on any DX code 640-677 and one of the following procedure codes: 96.04 (Insertion of endotracheal tube), 96.05 (Other intubation of respiratory tract), 96.06 (Insertion of Sengstaken tube), 96.7 (Other continuous invasive mechanical ventilation), 93.90 (Non-invasive mechanical ventilation), 93.91 (Intermittent positive pressure breathing, IPPB), or 93.93 (Nonmechanical methods of resuscitation). {Case Weight: 65}

Birth Trauma – Inborns only ≥ 2000 grams; dx codes 767.0, (subdural and cerebral hemorrhage), 767.11 (epicranial subaponeurotic hemorrhage - massive), 767.3 (other injuries to skeleton), 767.4 (injury to spine and spinal cord), 767.5 (facial nerve injury), 767.6 (injury to brachial plexus), or 767.7 (other cranial and peripheral nerve injuries) and exclude (756.51 osteogenesis imperfecta).
{Case Weight: 60}

Unanticipated Operative Procedure – DRG 370-375 or MS DRG 765-768 and 774-775 with one of the following procedure codes in **first** or **second procedure** field: 75.92 (evacuation of other hematoma of vulva or vagina) or 69.02 (D&C following delivery), 54.61 (reclosure of postoperative disruption of abdominal wall), 38.86 (other surgical occlusion of abdominal vessels), 39.98 (control of hemorrhage), 69.52 (aspiration curettage following delivery).
{Case Weight: 40}

Admission to NICU of neonate birthweight \geq 2500 grams and \geq 37 weeks gestational age (GA) for >1 day** Inborns only BW \geq 2500 grams, GA \geq 37 weeks, and NICU admission (day or charge) within one day of birth for greater than a day. Excludes cases with congenital anomalies (DX codes 740-759.9) fetal hydrops (778.0), dwarfism (259.4), or neonatal abstinence syndrome (779.5)

OR

Inborns with BW \geq 2500 grams and GA \geq 37 weeks and transferred to another hospital (UB92/UB04 disp=02 or =05) within 1 day of birth and excluding cases with congenital anomalies (DX codes 740-759.9), fetal hydrops (778.0), dwarfism (259.4) or neonatal abstinence syndrome (779.5)
{Case Weight: 35}

APGAR 5 < 7 - Inborns only, Birthweight \geq 2500 grams and \geq 37 weeks completed gestation and APGAR 5 < 7, excludes cases with congenital anomalies (DX codes 740-759.9) or fetal hydrops (DX code 778.0) or dwarfism (DX Code 259.4).
{Case Weight: 25}

Maternal Blood Transfusion – DRG 370-375 or MS DRG 765-768 and 774-775 with procedure code 99.03 (Other transfusion of whole blood), 99.04 (Transfusion of packed cells), 99.05 (Transfusion of platelets), 99.07 (Transfusion of other serum), 99.08 (Transfusion of blood expander) or Blood Transfusion Indicator = 1
{Case Weight: 20}

3rd or 4th Degree Perineal Laceration - DRG 370-375 with diagnosis codes 664.2x – 3rd degree perineal laceration or 664.3x- 4th degree perineal laceration.
{Case Weight: 5}

* MS DRGs effective beginning with 10/1/07 discharges

**** Gestational age is determined by the numeric value or ICD-9-CM coding. Cases missing gestational age information default to \geq 37 weeks if birthweight is \geq 1250 grams or, if birthweight is missing, cases with a DX code of V300, V310, V320 or V330 (Inborn singleton or twin) will default to gestational age \geq 37 weeks**