

CONFIDENTIAL

Baseline and Follow-up Adverse Outcome Report: SAMPLE

A. Overview

This Analysis was developed by the National Perinatal Information Center/Quality Analytic Services (NPIC/QAS). The specific measures profiled in this Report were developed by a panel of experts from American College of Obstetrics and Gynecology (ACOG), 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. 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 maternal death, intrapartum neonatal death of a neonate ≥ 2500 grams (excluding cases with a congenital anomaly or fetal hydrops), uterine rupture, unexpected internal or external maternal transfer to an ICU for a postpartum complication, birth trauma, return to OR or labor and delivery, admission of neonate ≥ 2500 grams and ≥ 37 weeks to NICU within one day of birth for > 24 hours (excluding cases with a congenital anomaly or fetal hydrops), APGAR 5 < 7 (excluding cases with a congenital anomaly or fetal hydrops), maternal blood transfusion and 3rd or 4th degree perineal laceration. This report reflects Version 2.1 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 the panel of experts (described above) 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

Maternal death	750
Intrapartum and Neonatal Death	400
Uterine Rupture	100
Maternal Admission to ICU	65
Birth Trauma	60
Return to OR/L&D	40
Admission to NICU	35
APGAR 5 <7	25
Blood Transfusions	20
3 rd and 4 th degree perineal laceration	5

The Adverse Outcome Index (AOI) is the number of deliveries 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.)*

This Follow-up Report covers the period **xxxxx** 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

Questions regarding this Report can be directed Janet H. Muri, President NPIC/QAS or Sandra Boyle, Director of Membership Services at 401-274-0650.

* The mother/baby data in this report is not linked therefore each inborn neonate with an event is counted once. This will result in a slight overstatement of the number of deliveries with events if there are cases where a mother and linked baby both had events. We have determined that this occurs very rarely.

B. Data Submission and Validation Discussion

Baseline Report (Discharge date range)

Files containing _____ perinatal discharges for the period _____ were submitted under the direction of _____ and merged into your baseline data set.

The original source file was submitted in the _____ format for the above period. A supplemental file containing gestational age data, birthweight, APGAR1 and 5 was also submitted.

The file was programmed into the NPIC/QAS file structure and processed through our reporting system.

Follow-up Report (Discharge date range)

Files containing _____ perinatal discharges for the period _____ were submitted under the direction of _____.

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 NPIC/QAS comparative rate and the target benchmark. **Please note:** the baseline comparison rate and the target benchmark now reflect data from eight hospitals prior to baseline then following target benchmark their participation in a team training initiative with Harvard Risk Management Strategies Foundation. Previously the target benchmark represented outcome data from one hospital, a level three perinatal center, which was in the original AOI study and which successfully implemented many quality improvement efforts following their team training initiative. Using the average outcome data from this larger sample of hospitals as a target benchmark should provide a clearer picture of what can be achieved as a result of implementing these types of process improvement strategies.

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 NPIC/QAS comparative rate. If the error bar crosses the horizontal lines representing the target benchmark and/or the NPIC/QAS 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 NPIC/QAS comparative rate.

The graphs also include a test of the statistical significance of the difference between the baseline average and the follow-up average for each of the three indices. If a statistically significant improvement was detected for one of the indices, this will be noted on Graphs 1, 2 and/or 3.

Table 1: Count of Adverse Events by Indicator AOI Version 2.1 - TPP™	Baseline								Follow-up Monitoring				
	Q1, 2004	Q2, 2004	Q3, 2004	Q4, 2004	Q1, 2005	Q2, 2005	Q3, 2005	Average For Period	Q3, 2006	Q4, 2006	Q1, 2007	Q2, 2007	Average For Period
Sample													
Total Deliveries													
Total Inborns													
Maternal Deaths	0	0	0	0	0	0	0	0	0	0	0	0	0
Intrapartum Neonatal Death >=2500 grams	0	0	0	0	0	0	0	0	0	0	0	0	0
Uterine Rupture	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
Return to OR/L&D	0	2	0	0	1	2	3	1	0	4	1	0	1
Admission to NICU of inborn neonate >= 2500 grams and >= 37 weeks Gestational Age	20	15	22	15	20	29	14	19	7	4	3	6	5
Inborn Neonate >= 2500 grams and APGAR 5 < 7	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	2	2
3rd or 4th degree perineal laceration	20	17	17	17	19	14	19	18	14	14	13	13	14
Total of Adverse Events	45	40	48	36	43	50	43	44	24	26	23	22	24
Total of Adverse Events Patients (duplicate patients removed)	45	40	47	36	42	49	40	43	23	25	22	22	23

Table 2: Indices by Quarter AOI Version 2.1 - TPP™	Baseline								Follow Up Monitoring						
	Q1, 2004	Q2, 2004	Q3, 2004	Q4, 2004	Q1, 2005	Q2, 2005	Q3, 2005	Average for Period	TPP™ Comparative Rate*	Q3, 2006	Q4, 2006	Q1, 2007	Q2, 2007	Average For Period	Target Benchmark
Adverse Outcome Index (AOI) # of patients with one or more adverse outcomes divided by number of deliveries	0.078	0.058	0.067	0.065	0.082	0.072	0.066	0.070	0.059	0.036	0.048	0.040	0.039	0.041	0.049
Weighted Adverse Outcome Score (WAOS) Adverse events times severity weight divided by total number of deliveries	1.72	1.24	1.66	1.32	1.83	1.98	1.68	1.64	1.27	0.66	1.04	0.92	0.66	0.82	0.99
Severity Index (SI) Total weights divided by number of patients with an adverse event	22.00	21.50	24.68	20.42	22.38	27.65	25.50	23.45	21.66	18.26	21.60	22.73	17.05	19.91	19.99

*TPP™ Comparative Rate Range:

AOI: 0.032 - 0.078

WAOS: 0.46 - 1.90

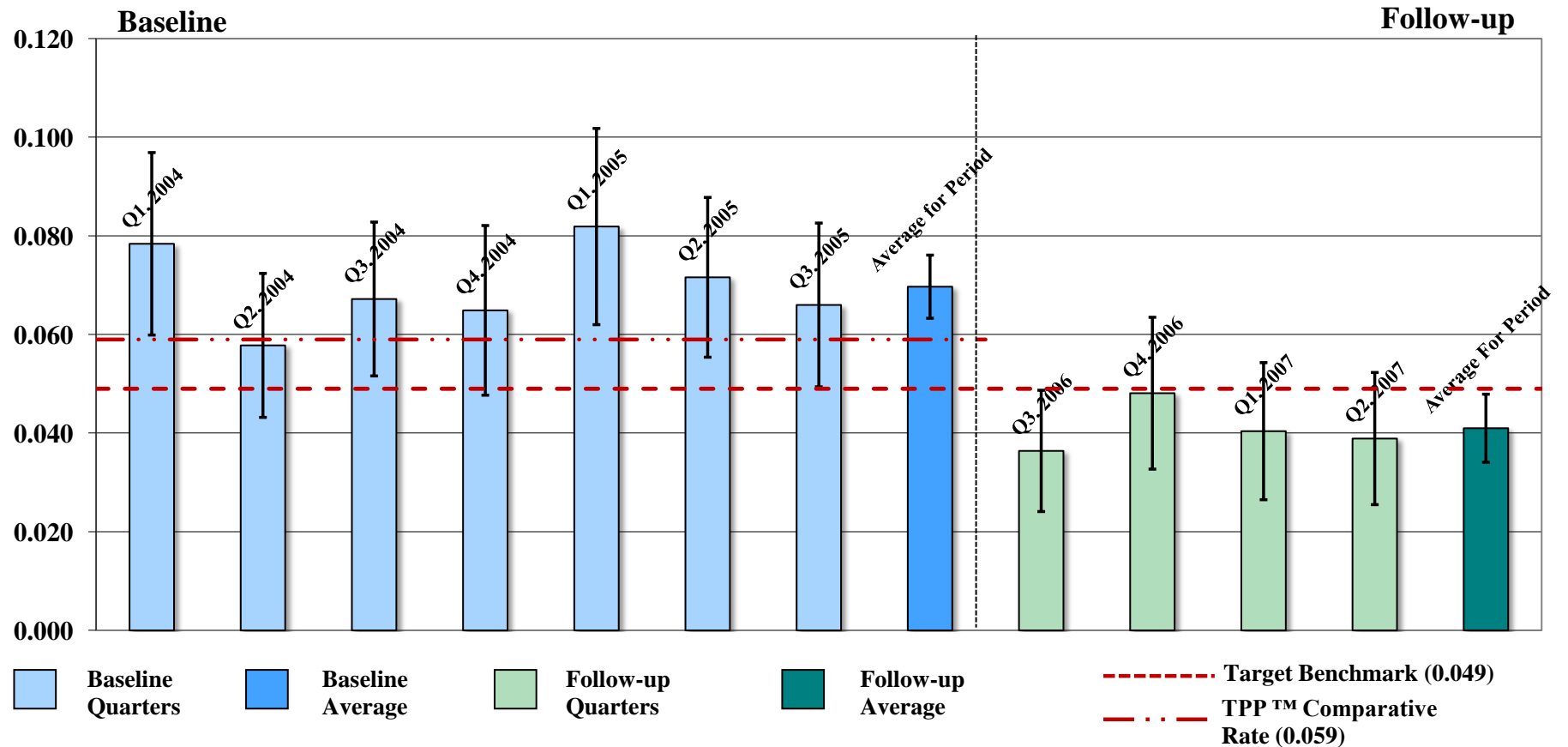
SI: 13.78 - 29.81

Sample

Adverse Outcome Index(AOI)

(Number of Patients with one or more adverse outcomes divided by the total number of deliveries)

AOI Version 2.1 - TPP™

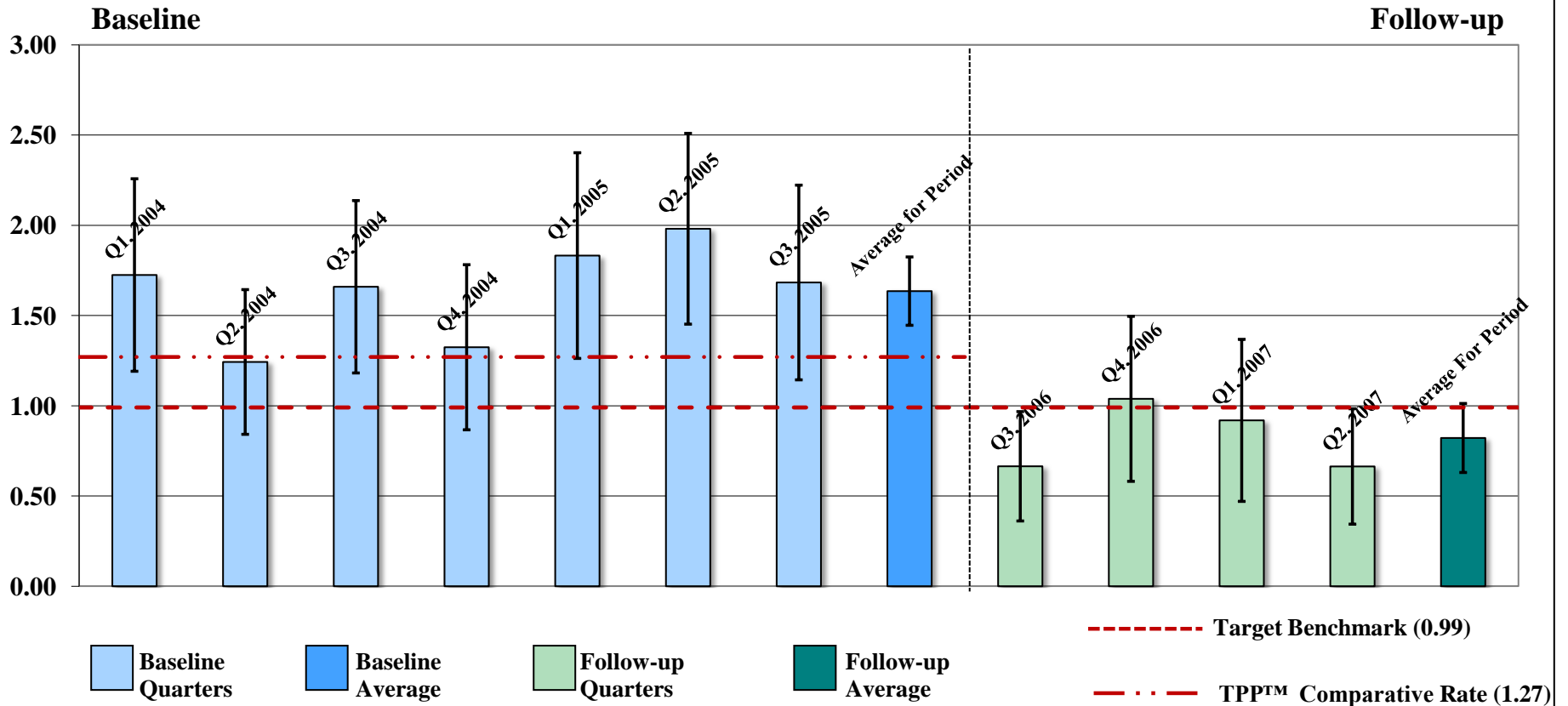


Error Bars represent Margin of Error (90% Confidence Interval).

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

Sample

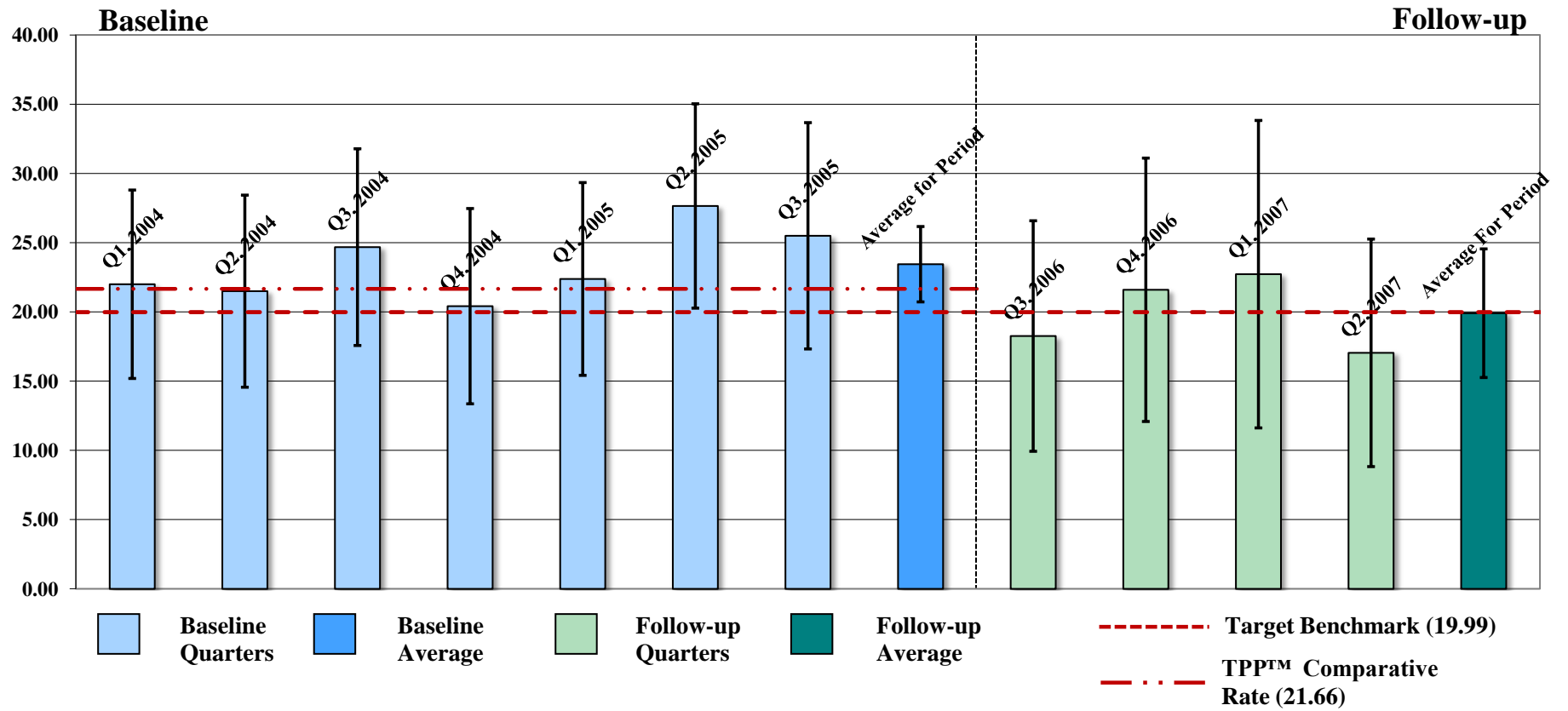
Weighted Adverse Outcome Score (WAOS)
 (All adverse events times severity weight divided by total number of deliveries.)
 AOI Version 2.1 - TPP™



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 2.1 - TPPTM



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

No Significant Change from Baseline to Follow-up. $p = 0.059$

D. Summary Comments

Baseline (Discharge date range) and Follow-up (Discharge date range)

This section includes a description of the findings from testing the statistical significance of the change from baseline to follow-up, as explained in Section “C”. The results of the analysis of each average in comparison to the target benchmark are also included.

The AOI reflects the overall rate of cases with an adverse event. The HOSPITAL’s follow-up average rate is _____ than the baseline average rate; however, there *was or was not* a statistically significant change from baseline to follow-up. The AOI baseline average rate and the AOI follow-up average rate are each _____ than the target benchmark rate. The confidence interval for the baseline average is _____ the target benchmark, indicating that there *was or was not* a significant difference between this average and the target benchmark. The confidence interval for the follow-up average is _____ the target benchmark, indicating that there *was or was not* a significant difference between this average and the target benchmark.

The WAOS is a reflection of the severity of adverse events relative to all deliveries. The HOSPITAL’s follow-up average rate is _____ than the baseline average rate. There *was or was not* a statistically significant change from baseline to follow-up. The WAOS baseline average rate and the WAOS follow-up average rate are each _____ than the target benchmark. The confidence interval for the baseline average is _____ the target benchmark, indicating that there *was or was not* a significant difference between this average and the target benchmark. The confidence interval for the follow-up average is _____ the target benchmark, indicating that there *was or was not* a significant difference between this average and the target benchmark.

The SI is a reflection of the severity of the events relative to all cases with an adverse event. The HOSPITAL’s follow-up average rate is _____ than the baseline average rate. There *was or was not* a statistically significant change from baseline to follow-up. The SI baseline average rate and the SI follow-up average rate are _____ than the target benchmark. The confidence interval for the baseline average is _____ the target benchmark, indicating that there *was or was not* a significant difference between this average and the target benchmark. The confidence interval for the follow-up average is _____ the target benchmark, indicating that there *was or was not* a significant difference between this average and the target benchmark.

E. GLOSSARY

AOI ALGORITHM DEFINITIONS VERSION 2.1 *

Maternal Deaths - DRG 370-375 or MS DRG 765-768 and 774-775 and discharge disposition = died *Case Weight 750*

Intrapartum Neonatal Death ≥ 2500 grams - Inborns only; neonate ≥ 2500 grams with discharge disposition of died within 7 days of birth and excluding cases with congenital anomalies (DX codes 740-759.9) or fetal hydrops (DX code 778.0)
Case Weight 400

Uterine Rupture - 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 an ICU day or charge and with a DX code 5th digit = 2 (delivered with mention of postpartum condition) on any DX code 640-677

OR

if the hospital does not provide ICU services the algorithm is modified to identify women transferred out: (DRG 370-375 or MS DRG 765-768 and 774-775, PDX 5th digit =2 and discharged to another hospital (UB92/UB04 disp=02).
Case Weight 65

Birth Trauma - Inborns only; 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)
Case Weight 60

Return to OR/L&D - 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 ≥ 2500 grams and ≥ 37 weeks gestational age (GA) for >1 day** Inborns only BW ≥ 2500 grams, GA ≥ 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) and fetal hydrops (DX code 778.0)

OR

if the hospital does not provide NICU services the algorithm is modified to identify inborns transferred out:

(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) or fetal hydrops (DX code 778.0)

Case Weight 35

APGAR 5 <7 Inborns only, Birthweight \geq 2500 grams and APGAR 5 <7 Excludes cases with congenital anomalies (DX codes 740-759.9) or fetal hydrops (DX code 778.0)

Case Weight 25

Maternal Blood Transfusion DRG 370-375 or MS DRG 765-768 and 774-775 with procedure code 99.0 (transfusion of blood and blood components) or Blood Transfusion Indicator = 1 ***Case Weight 20***

3rd or 4th degree perineal laceration DRG 370 – 375 with diagnosis codes 664.2 – 3rd degree perineal laceration or 664.3 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**