

## V15.2 NPIC/QAS Special Quarterly Report:

### Alliance for Innovation on Maternal Health (AIM) Outcome Metrics

#### I. Background

This Special Report focuses on selected outcome metrics that are designed to support the national QI project: the Alliance for Innovation on Maternal Health (AIM) initiative. It also describes the opportunities for NPIC/QAS members to participate in this project.

The United States now ranks 64th in the world for maternal mortality. The CDC reports that severe maternal morbidities (major birth complications) have risen 50% in the last decade. AIM is designed to address this and other major challenges in U.S. maternity care and to support national efforts by the Health Resources and Services Administration Maternal Child Health Bureau and more than 20 other national organizations to improve maternal outcomes. The AIM effort is being led by ACOG and its goal is to prevent 1,000 maternal deaths and 100,000 cases of severe maternal morbidity nationally by 2018.

#### II. AIM Approach

AIM will partner with states, major hospital systems, and NPIC/QAS members to:

- develop and strengthen partnerships,
- develop and implement maternal safety bundles,
- identify and enhance national resources,
- support state and national data infrastructure development, and
- provide intensive technical assistance.

At the highest level of participation (see next section), AIM will support the implementation of maternity safety practices (bundles) in hospitals for the 3 most preventable causes of maternal death: ***Obstetric Hemorrhage, Severe Hypertension, and Venous Thromboembolism*** (blood clots/pulmonary embolism). Additional bundles focus on safely reducing ***Low-risk Primary Cesarean Deliveries*** and improving postpartum care to enhance inter-conception care. These maternal safety bundles represent best practices for maternity care supported by national multidisciplinary organizations.

In an effort to document improvements resulting from this national effort, AIM participants will be asked to submit baseline and on-going quarterly outcome measures as well as one-time structure and quarterly process measures as they move through their selected bundle(s) implementation. AIM has set up a Data Portal for this data collection activity.

The AIM outcome measures, for the most part, are calculated from hospital administrative discharge data and include 2 universal outcome measures submitted regardless of bundle selection and 2 bundle specific outcomes.

Below is a table showing the universal outcome metrics and bundle metrics.

**Table 1: Outcome Metrics and Bundle Indicators**

<b>Universal Outcomes Measures</b>	<b>Severe Maternal Morbidity (SMM)</b>	<b>SMM excluding cases with transfusions</b>		
<b>Obstetric Hemorrhage Bundle</b>	X	X	SMM among cases with hemorrhage	SMM cases with hemorrhage excluding transfusion codes
<b>Severe Hypertension/Preeclampsia Bundle</b>	X	X	SMM among cases with preeclampsia	SMM among cases with preeclampsia excluding transfusions
<b>Prevention of Maternal VTE</b>	X	X	To be determined	To be determined
<b>Reduction of Primary C-Section (NTSV) *</b>	X	X	C/S Delivery Rate among NTSV	C/S Delivery Rate among NTSV after Induction

\*Requires parity data

The universal outcome metrics and metrics related to the Obstetric Hemorrhage and Severe Hypertension/Preeclampsia bundles are displayed in this report.

**Appendix A** provides the algorithm definition for each of the outcome metrics displayed in this report and **Appendix B** shows the ICD 9 codes that define SMM.

The NPIC/QAS **V14.3 Special Report: Severe Maternal Morbidity**, previously profiled the rate of severe maternal morbidity (SMM) as introduced by Callaghan, et. al, in November 2012<sup>1</sup>. As noted in that report, the rate of blood transfusion accounts for the largest impact on the overall SMM rate.

### III. NPIC/QAS Member Participation in AIM

On November 10, 2015 NPIC/QAS hosted an informational webinar with AIM leadership: Elliott Main, MD AIM Implementation Director and Jeanne Mahoney, RN AIM Program Director. The webinar outlined the goal of the AIM program as well as what are the options for NPIC/QAS members to participate. The audio and slides can be accessed from the link below:

[http://www.npic.org/Services/AIM\\_Participation.php](http://www.npic.org/Services/AIM_Participation.php)

The webinar identified the 6 states that are currently enrolling in AIM: Florida, Louisiana, Maryland, Michigan, Oklahoma, Illinois and South Carolina. We encourage you to participate in your state initiative (if that is an option). If your state is not an “AIM” state, you are invited to participate through NPIC/QAS and choose your level of engagement:

- Level 1 - **NPIC/QAS will submit anonymous** SMM outcome numerator and denominator counts to AIM Portal **on your behalf**. Baseline data includes 2011-2014, followed by quarterly submissions.

- Level 2 – complete a Baseline Quality Improvement (QI) Assessment survey (which is submitted directly to ACOG via Survey Monkey) as well as Level 1 requirement to submit anonymous SMM outcome counts to AIM Portal.
- Level 3 – complete the baseline survey (Level 2), submit the outcome metrics (Level 1) **and** adopt one or two QI bundles to execute and report on structure and process measures to AIM portal directly.

***There is no fee to participate in AIM.*** You will be asked to sign an NPIC/QAS Addendum and an ACOG Data Sharing Agreement. We are hoping to have interested hospitals enrolled in NPIC/QAS AIM by January 31, 2016.

If you would like further information about this initiative, please visit the NPIC/QAS website and/or contact NPIC/QAS at: [AIM@npic.org](mailto:AIM@npic.org).

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

The tables and graphs in this special report provide the AIM universal outcome metrics and metrics related to the Obstetric Hemorrhage and Severe Hypertension/Preeclampsia bundles outcome indicators as described above. The data period displayed includes calendar year data for 2011 – 2014, and each of the first two quarters of 2015 (1/1/2015-6/30/2015). Data are provided for your hospital across that time period, with comparisons to your NPIC/QAS Subgroup and to the NPIC/QAS Trend Database.

***Because transfusions are a key component of these outcome measures, if your hospital does not provide transfusion data (or transfusion data for a particular time period) you will not have data in these sections. The graphs will not show a trend line if you do not have data for each time period. Please contact your Hospital Liaison if you would like to begin submitting these data to NPIC/QAS.***

#### **Table 1: AIM Outcome Metrics**

**Section A: Overview** displays total deliveries for your hospital, your Subgroup, and for the Trend Database.

***Please note: your Hospital’s delivery count on this report may differ slightly from that displayed on your V15.2 Quarterly Report. The AIM definition of deliveries uses diagnosis and procedure codes, which may result in a case with a delivery not grouping into a delivery DRG, the method used by NPIC/QAS for your standard Quarterly Report. From our investigation, the variance is usually very small.***

**Section B: Universal Metrics** displays the numerator, denominator and rate for your hospital for SMM with transfusions (O1) and then excluding transfusions (O2). For each metric, comparative data for your Subgroup and the Trend Database are also provided.

**Section C: Obstetric Hemorrhage Bundle** displays the numerator, denominator and rate for your hospital for SMM among Hemorrhage Cases with transfusions (O3) and then excluding transfusions (O4). For each metric, comparative data for your Subgroup and the Trend Database are also provided.

**Section D: Severe Hypertension/Preeclampsia Bundle** displays the numerator, denominator and rate for your hospital for SMM among Preeclampsia Cases with transfusions (O5) and then excluding transfusions (O6). For each metric, comparative data for your Subgroup and the Trend Database are also provided.

### **Graph 1: O1 - Severe Maternal Morbidity (SMM)**

This Graph displays the rate of SMM (*with transfusions*) for your hospital for the calendar years 2011 through 2014, then for each of the first two quarters of 2015. Analysis of these data indicate if your hospital's rate and the Trend Database rate is trending upward, downward, or is stable over time. The data table below the graph also displays the numerator and denominator for your hospital, the upper and lower confidence intervals for your hospital, and the trend rate for each time period.

### **Graph 2: O2 - Severe Maternal Morbidity (SMM) excluding transfusions**

This Graph displays the rate of SMM (*excluding transfusions*) for your hospital for the calendar years 2011 through 2014, then for each of the first two quarters of 2015. Analysis of these data indicate if your hospital's rate and the Trend Database rate is trending upward, downward, or is stable over time. The data table below the graph also displays the numerator and denominator for your hospital, the upper and lower confidence intervals for your hospital, and the trend rate for each time period.

### **Graph 3: O3 - Severe Maternal Morbidity (SMM) among Hemorrhage Cases**

This Graph displays the rate of SMM (with transfusions) among Hemorrhage Cases for your hospital for the calendar years 2011 through 2014, then for each of the first two quarters of 2015. Analysis of these data indicate if your hospital's rate and the Trend Database rate is trending upward, downward, or is stable over time. The data table below the graph also displays the numerator and denominator for your hospital, the upper and lower confidence intervals for your hospital, and the trend rate for each time period.

### **Graph 4: O5 - Severe Maternal Morbidity (SMM) among Preeclampsia Cases**

This Graph displays the rate of SMM (with transfusions) among Preeclampsia Cases for your hospital for the calendar years 2011 through 2014, then for each of the first two quarters of 2015. Analysis of these data indicate if your hospital's rate and the Trend Database rate is trending upward, downward, or is stable over time. The data table below the graph also displays the numerator and denominator for your hospital, the upper and lower confidence intervals for your hospital, and the trend rate for each time period.

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**

1. Callaghan, W.M., Creanga, A.A., Kuklina, E.V. Severe Maternal Morbidity Among Delivery and Postpartum Hospitalization in the United States. *Obstetrics and Gynecology* 2012; 120:5. 1029-1036.

**V15.2 Special Report**  
**Alliance for Innovation on Maternal Health (AIM) Outcome Metrics**  
**2011 - 2015 (Q2)**

NPIC ID: SAMPLE	2011	2012	2013	2014	2015 (Q1)	2015 (Q2)	Pct Change 2011-2015 (Q2)
<b>A. Overview: Total Deliveries</b>							
Hospital	3,065	2,965	2,354	2,625	668	667	
Subgroup Average	4,267	4,210	4,239	5,434	1,050	1,135	
Trend Data Base Average	4,640	4,619	4,561	4,624	1,105	1,146	
<b>B. Universal Metrics</b>							
<b>O1: Severe Maternal Morbidity (SMM)</b>							
Hospital Numerator	78	77	56	64	12	20	
Hospital Denominator	3,065	2,965	2,354	2,625	668	667	
Hospital Rate	2.5%	2.6%	2.4%	2.4%	1.8%	3.0%	18.1%
Subgroup Average	2.6%	2.7%	2.8%	3.9%	3.2%	2.9%	14.5%
Trend Data Base Average	2.1%	2.2%	2.3%	2.4%	2.5%	2.4%	12.8%
<b>O2: Severe Maternal Morbidity (excluding transfusions)</b>							
Hospital Numerator	30	36	17	13	6	3	
Hospital Denominator	3,065	2,965	2,354	2,625	668	667	
Hospital Rate	1.0%	1.2%	0.7%	0.5%	0.9%	0.5%	-54.1%
Subgroup Average	0.8%	1.0%	0.9%	1.4%	1.2%	0.9%	7.1%
Trend Data Base Average	0.8%	0.9%	0.8%	0.9%	0.9%	0.7%	-5.1%

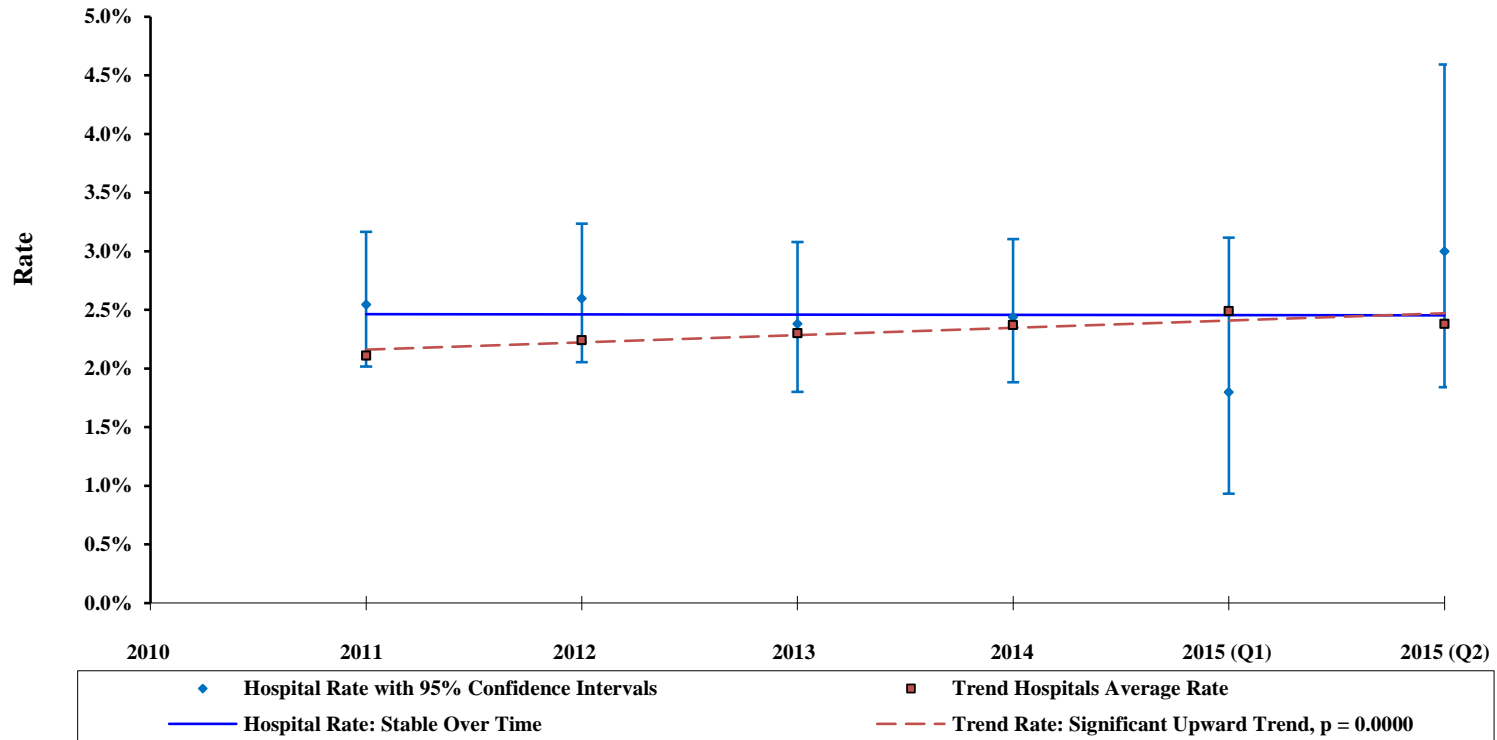
**V15.2 Special Report**  
**Alliance for Innovation on Maternal Health (AIM) Outcome Metrics**  
**2011 - 2015 (Q2)**

NPIC ID: SAMPLE	2011	2012	2013	2014	2015 (Q1)	2015 (Q2)	Pct Change 2011-2015 (Q2)
<b>C: Obstetric Hemorrhage Bundle</b>							
<b>O3: SMM among Hemorrhage Cases</b>							
Hospital Numerator	58	46	42	54	7	17	
Hospital Denominator	144	114	136	145	29	51	
Hospital Rate	40.3%	40.4%	30.9%	37.2%	24.1%	33.3%	-17.3%
Subgroup Average	28.1%	27.4%	29.0%	37.6%	27.9%	28.2%	0.3%
Trend Data Base Average	26.1%	27.5%	28.3%	27.1%	28.8%	27.9%	6.8%
<b>O4: SMM (excluding transfusions) among Hemorrhage Cases</b>							
Hospital Numerator	10	5	4	3	1	0	
Hospital Denominator	144	114	136	145	29	51	
Hospital Rate	6.9%	4.4%	2.9%	2.1%	3.5%	0.0%	--
Subgroup Average	5.0%	4.1%	4.5%	6.6%	5.6%	3.2%	-35.9%
Trend Data Base Average	5.1%	5.4%	4.9%	4.4%	4.5%	2.9%	-44.2%

**V15.2 Special Report**  
**Alliance for Innovation on Maternal Health (AIM) Outcome Metrics**  
**2011 - 2015 (Q2)**

NPIC ID: SAMPLE	2011	2012	2013	2014	2015 (Q1)	2015 (Q2)	Pct Change 2011-2015 (Q2)
<b>D: Severe Hypertension/Preeclampsia Bundle</b>							
<b>O5: SMM among Preeclampsia Cases</b>							
Hospital Numerator	15	14	10	14	2	3	
Hospital Denominator	95	109	98	113	36	32	
Hospital Rate	15.8%	12.8%	10.2%	12.4%	5.6%	9.4%	-40.6%
Subgroup Average	11.3%	12.7%	11.2%	16.0%	10.9%	11.0%	-2.4%
Trend Data Base Average	11.7%	11.8%	11.5%	11.7%	10.8%	10.7%	-8.7%
<b>O6: SMM (excluding transfusions) among Preeclampsia Cases</b>							
Hospital Numerator	7	7	6	4	1	1	
Hospital Denominator	95	109	98	113	36	32	
Hospital Rate	7.4%	6.4%	6.1%	3.5%	2.8%	3.1%	-57.5%
Subgroup Average	4.9%	5.0%	5.3%	7.4%	5.2%	4.4%	-11.2%
Trend Data Base Average	5.2%	4.9%	4.3%	5.2%	4.9%	4.0%	-23.3%

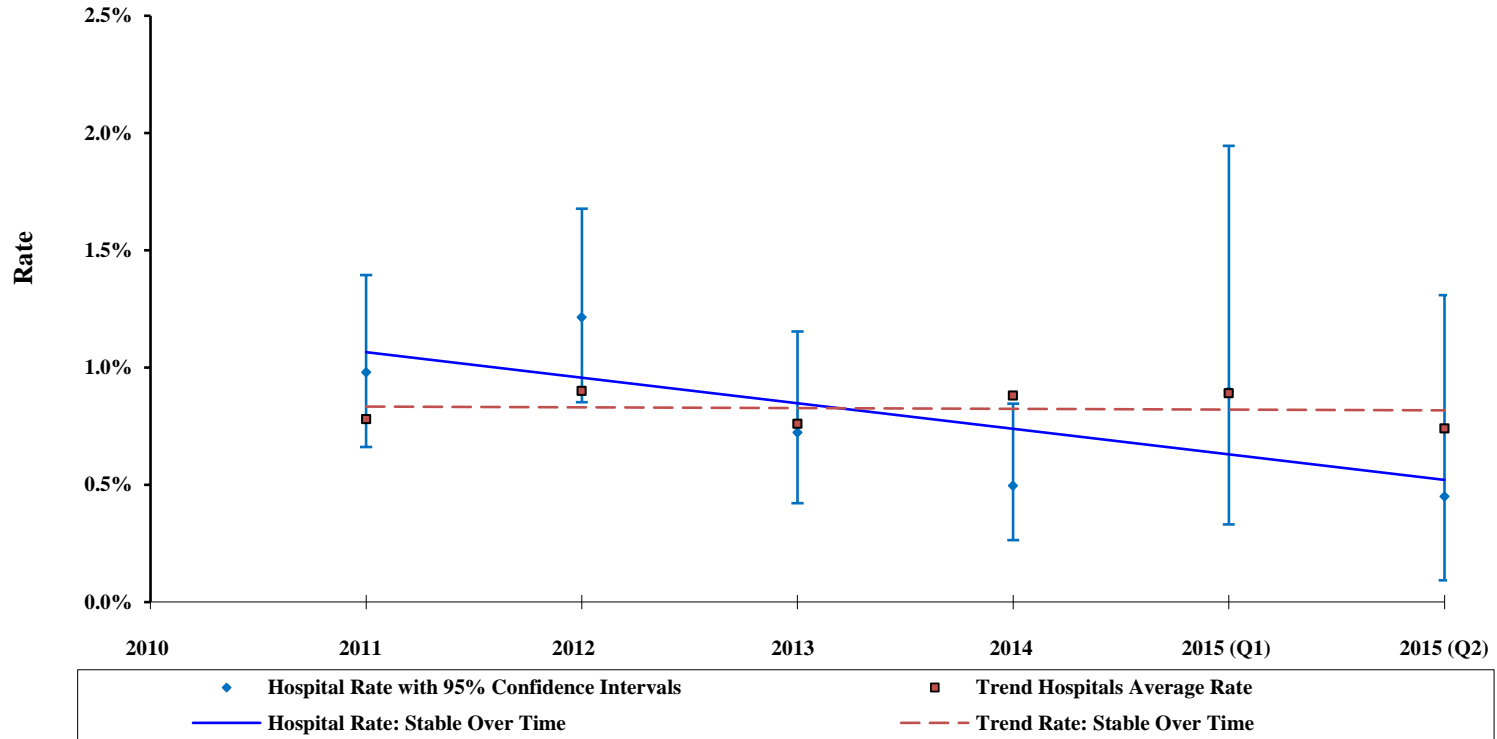
**Graph 1: O1 - Severe Maternal Morbidity (SMM)  
2011 - 2015 (Q2) with Trendlines  
NPIC ID: SAMPLE**



	2011	2012	2013	2014	2015 (Q1)	2015 (Q2)
Trend Rate	2.1%	2.2%	2.3%	2.4%	2.5%	2.4%
Hospital Rate	2.5%	2.6%	2.4%	2.4%	1.8%	3.0%
Hospital Numerator	78	77	56	64	12	20
Hospital Denominator	3065	2965	2354	2625	668	667
Lower CI	2.0%	2.1%	1.8%	1.9%	0.9%	1.8%
Upper CI	3.2%	3.2%	3.1%	3.1%	3.1%	4.6%

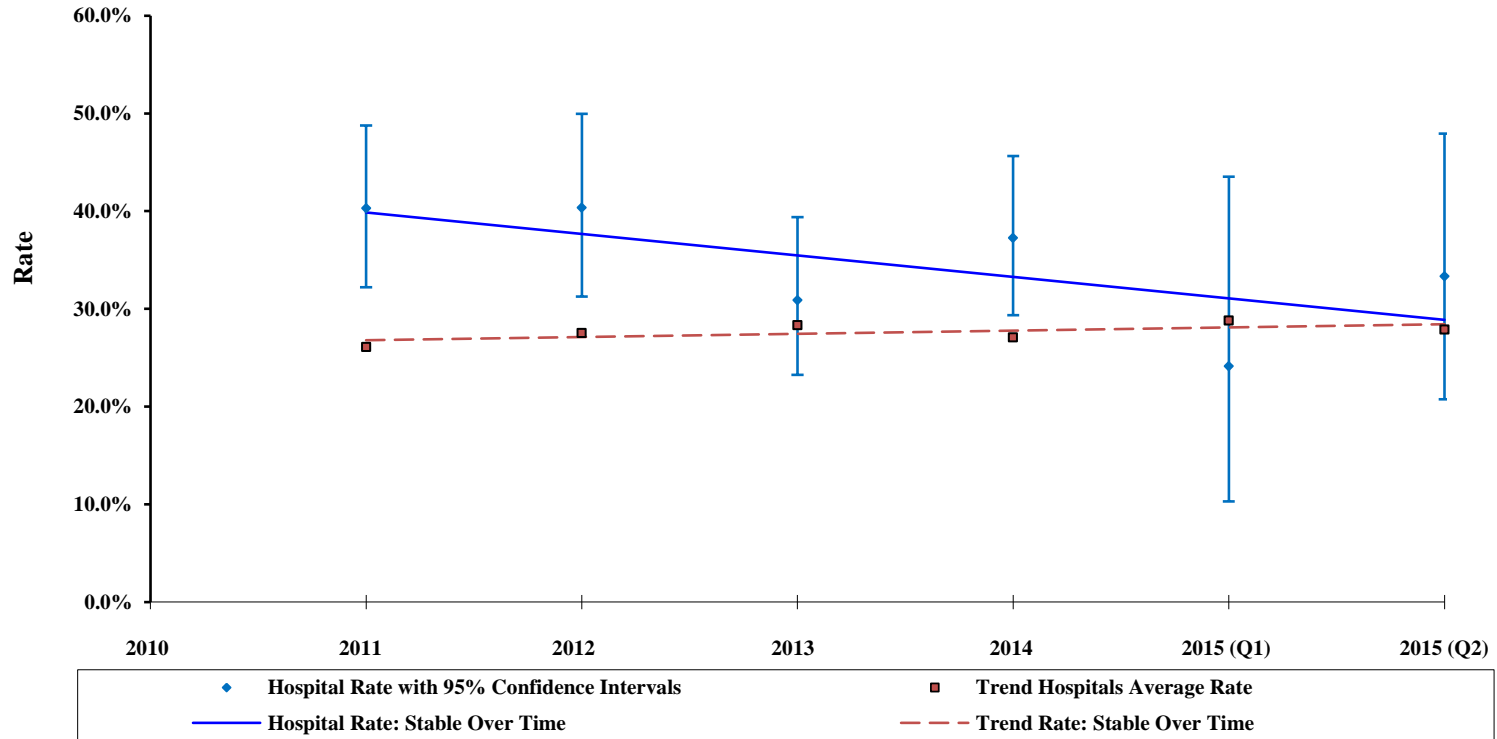


**Graph 2: O2 - Severe Maternal Morbidity (SMM) excluding transfusions  
2011 - 2015 (Q2) with Trendlines  
NPIC ID: SAMPLE**



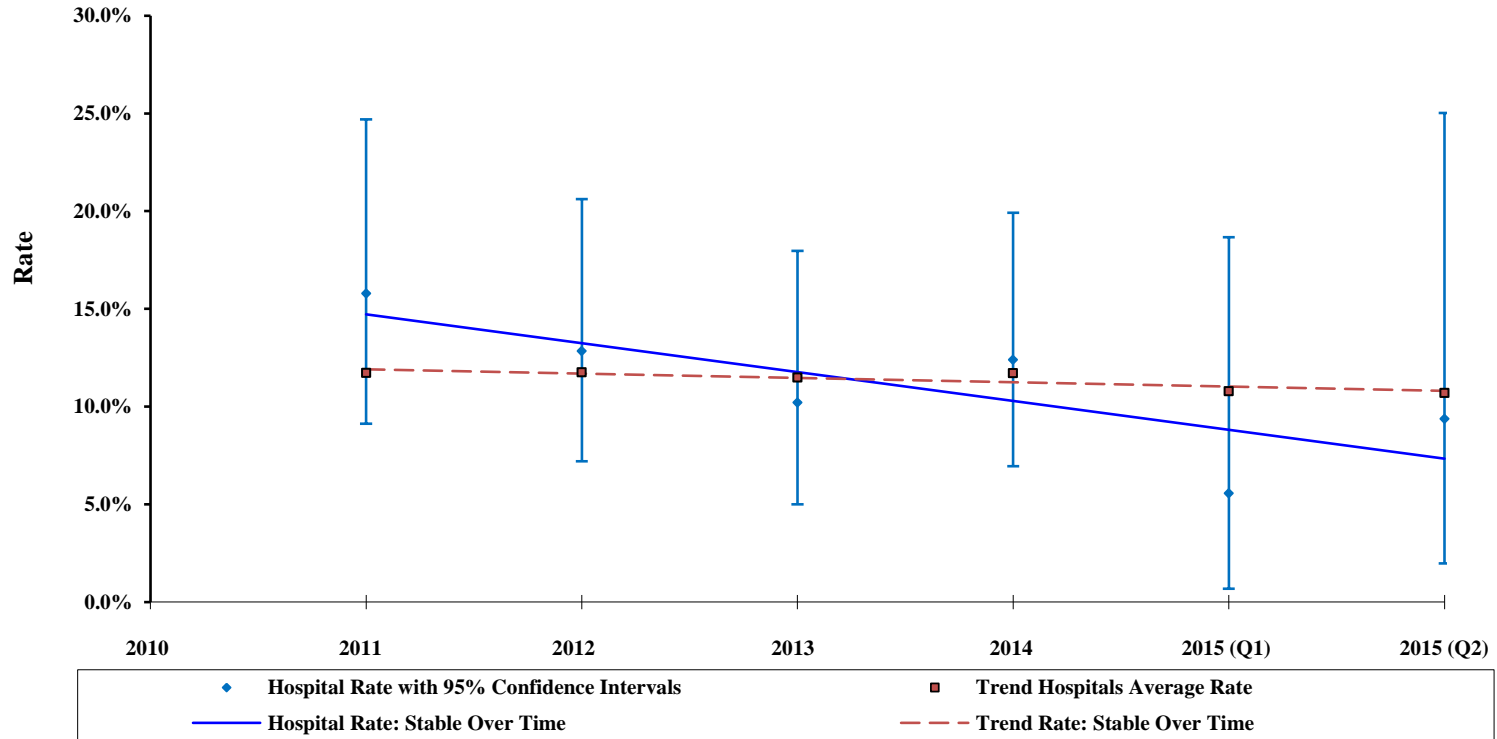
	2011	2012	2013	2014	2015 (Q1)	2015 (Q2)
Trend Rate	0.8%	0.9%	0.8%	0.9%	0.9%	0.7%
Hospital Rate	1.0%	1.2%	0.7%	0.5%	0.9%	0.4%
Hospital Numerator	30	36	17	13	6	3
Hospital Denominator	3065	2965	2354	2625	668	667
Lower CI	0.7%	0.9%	0.4%	0.3%	0.3%	0.1%
Upper CI	1.4%	1.7%	1.2%	0.8%	1.9%	1.3%

**Graph 3: O3 - Severe Maternal Morbidity (SMM) among Hemorrhage Cases  
2011 - 2015 (Q2) with Trendlines  
NPIC ID: SAMPLE**



	2011	2012	2013	2014	2015 (Q1)	2015 (Q2)
Trend Rate	26.1%	27.5%	28.3%	27.1%	28.8%	27.9%
Hospital Rate	40.3%	40.4%	30.9%	37.2%	24.1%	33.3%
Hospital Numerator	58	46	42	54	7	17
Hospital Denominator	144	114	136	145	29	51
Lower CI	32.2%	31.3%	23.2%	29.4%	10.3%	20.8%
Upper CI	48.8%	49.9%	39.4%	45.7%	43.5%	47.9%

**Graph 4: O5 - Severe Maternal Morbidity (SMM) among Preeclampsia Cases  
2011 - 2015 (Q2) with Trendlines  
NPIC ID: SAMPLE**



	2011	2012	2013	2014	2015 (Q1)	2015 (Q2)
Trend Rate	11.7%	11.8%	11.5%	11.7%	10.8%	10.7%
Hospital Rate	15.8%	12.8%	10.2%	12.4%	5.6%	9.4%
Hospital Numerator	15	14	10	14	2	3
Hospital Denominator	95	109	98	113	36	32
Lower CI	9.1%	7.2%	5.0%	6.9%	0.7%	2.0%
Upper CI	24.7%	20.6%	18.0%	19.9%	18.7%	25.0%

## Appendix A: SMM Outcome Metrics Algorithm

### DELIVERY - Defined by any one of the following methods:

- Dx codes: V27, V650
- DRGs: 765-768, 774, 775
- Delivery Procedures: 720-7254, 7271, 7279, 728, 729, 7322, 7359, 736, 740, 741, 742, 744, 7499

### EXCLUDED CASES:

- Ectopic or Molar Pregnancy: 630, 631, 632, 633, 634, 635, 636, 637, 638, 639
- Abortion: 6901, 6951, 7491, 750

<b>O1: Severe Maternal Morbidity</b>	<b>Denominator:</b> All mothers during their birth admission, exclude ectopics and miscarriages <b>Numerator:</b> Cases with any SMM code (see Appendix B)
<b>O2: Severe Maternal Morbidity (excluding transfusions)</b>	<b>Denominator:</b> All mothers during their birth admission, exclude ectopics and miscarriages <b>Numerator:</b> Cases with any SMM code, excluding cases with a transfusion code 99.0x (see Appendix B)
<b>O3: Severe Maternal Morbidity among Hemorrhage Cases</b>	<b>Denominator:</b> All mothers during their birth admission, exclude ectopics and miscarriages, with one of the following codes: <ul style="list-style-type: none"> <li>• Abruptio, Placenta Previa or Antepartum hemorrhage: 641.xx</li> <li>• Transfusion: 99.0x (excluding transfusion codes for women with sickle cell disease - 282.6x)</li> <li>• Postpartum hemorrhage: 666.xx</li> </ul> <b>Numerator:</b> Cases with any SMM code (see Appendix B)
<b>O4: Severe Maternal Morbidity among Hemorrhage Cases (excluding transfusion)</b>	<b>Denominator:</b> All mothers during their birth admission, exclude ectopics and miscarriages, with one of the following codes: <ul style="list-style-type: none"> <li>• Abruptio, Placenta Previa or Antepartum hemorrhage: 641.xx</li> <li>• Transfusion: 99.0x (excluding transfusion codes for women with sickle cell disease - 282.6x)</li> <li>• Postpartum hemorrhage: 666.xx</li> </ul> <b>Numerator:</b> Cases with any SMM code, excluding cases with a transfusion code 99.0x (see Appendix B)

<b>O5: Severe Maternal Morbidity among Preeclampsia Cases</b>	<p><b>Denominator:</b> All mothers during their birth admission, exclude ectopics and miscarriages, with one of the following codes:</p> <ul style="list-style-type: none"> <li>• Severe Preeclampsia 642.5x</li> <li>• Eclampsia 642.6x</li> <li>• Preeclampsia superimposed on pre-existing hypertension 642.7x</li> </ul> <p><b>Numerator:</b> Cases with any SMM code (see Appendix B)</p>
<b>O6: Severe Maternal Morbidity among Preeclampsia Cases (excluding transfusion)</b>	<p><b>Denominator:</b> All mothers during their birth admission, exclude ectopics and miscarriages, with one of the following codes:</p> <ul style="list-style-type: none"> <li>• Severe Preeclampsia 642.5x</li> <li>• Eclampsia 642.6x</li> <li>• Preeclampsia superimposed on pre-existing hypertension 642.7x</li> </ul> <p><b>Numerator:</b> Cases with any SMM code, excluding cases with a transfusion code 99.0x (see Appendix B)</p>

**Appendix B: SMM with ICD-9 Codes (ICD-10 Codes are under review by AIM Data Workgroup and the CDC)**

Comorbidity	ICD-9 Code(s)
Renal Failure	584, 669.3
Cardiac arrest or ventricular fibrillation	427.41, 427.42, 427.5
Heart Failure during procedure or surgery	669.4x, 997.1
Shock	669.1, 785.5x, 995.0, 995.4, 998.0
Sepsis	038.0-038.9, 995.91, 995.92
Disseminated intravascular coagulation	286.6, 286.9, 666.3
Amniotic fluid embolism	673.1
Thrombotic embolism	415.1x, 673.0, 673.2, 673.3, 673.8
Puerperal cerebrovascular disorders	430, 431, 432.x, 433.x, 434.x, 436, 437.x, 671.5, 674.0, 997.2, 999.2
Severe anesthesia complications	668.0, 668.1, 668.2
Pulmonary edema	428.1, 518.4
Adult respiratory distress syndrome	518.5, 518.81, 518.82, 518.84, 799.1
Acute myocardial infarction	410.xx
Eclampsia	642.6x

<b>Comorbidity</b>	<b>ICD-9 Code(s)</b>
Blood transfusion	99.00-99.09
Ventilation	93.90, 96.01-96.05, 96.7x
Hysterectomy	68.3-68.9
Sickle cell anemia with crisis	282.62, 282.64, 282.69
Intracranial injuries	800.xx, 801.xx, 803.xx, 804.xx, 851.xx-854.xx
Internal injuries of thorax, abdomen & pelvis	860.xx-869.xx
Aneurysm	441.x
Operations on heart and pericardium	35.xx, 36.xx, 37.xx, 39.xx
Cardio monitoring	89.6x
Temporary tracheostomy	31.1
Conversion of cardiac rhythm	99.6x

SAMPLE