



Vermont Child Health Improvement Program
UNIVERSITY OF VERMONT LARNER COLLEGE OF MEDICINE

OB/GYN Webinar Series 2018-2019
Hot Topics in Obstetrical Care
Tuesday, June 11, 12:15pm- 1pm EST

Presented by:



The University of Vermont
LARNER COLLEGE OF MEDICINE

THE
University of Vermont
MEDICAL CENTER

VERMONT
DEPARTMENT OF HEALTH

VCHIP Webinars

Collaboration with UVMMMC, Vermont Dept. of Health, VCHIP

Today's Webinar:

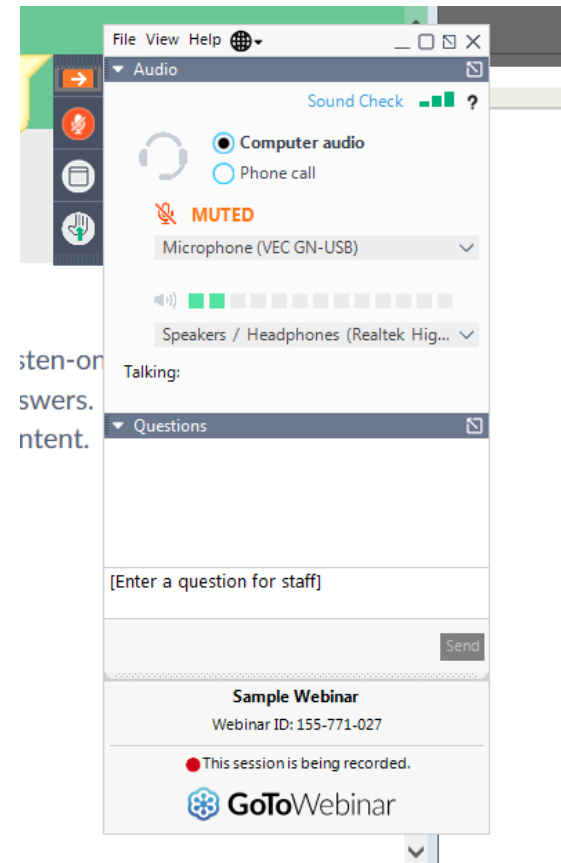
- Vermont Severe Maternal Morbidity
 - Marjorie Meyer, MD,—
Associate Professor OB/GYN & Reproductive Services, LCOM,
Maternal Fetal Medicine, UVMMMC
- Screening, Treatment & Access for Mothers and Perinatal Partners (STAMPP)
 - Laura Bernard, MPH Vermont Department of Health,
Div. of Maternal and Child Health

Recorded webinars and to register for upcoming webinars, visit vchipobstetrics.org



Questions/Comments During the Webinar

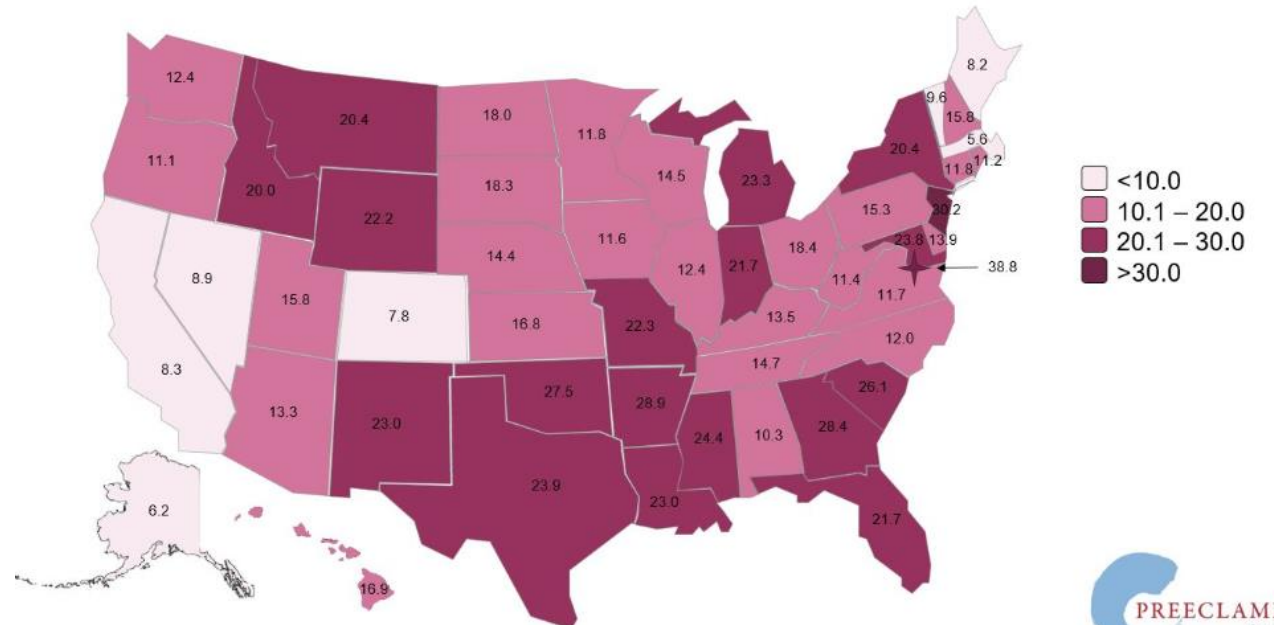
Use the Question or Chat box
in your webinar toolbar



Severe Maternal Morbidity (SMM): Vermont Statistics



Maternal Mortality Ratio per 100,000 Live Births, 2005-2014



Source: Moaddab, et al. "Health Care Disparity and State-Specific Pregnancy-Related Mortality in the United States, 2005–2014", *Obstet Gynecol* 2016;128:869–75.



The American College of
Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS



Society for
Maternal-Fetal
Medicine

- **What is severe maternal morbidity and why is it important?**
 - **Maternal mortality is a rare event; severe maternal morbidity can be considered the near miss of mortality**
 - **While there is no strict consensus on the definition of severe maternal morbidity, it can be considered unintended consequences of pregnancy, labor, and delivery that result in short term and long term morbidities**
 - **Reduction of severe maternal morbidity may impact maternal mortality**
- **How are the data collected?**

OBSTETRIC CARE CONSENSUS

Number 5 • September 2016

This document was developed by the American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine in collaboration with Sarah K. Kilpatrick, MD, PhD; Jeffrey L. Ecker, MD; and the Centers for Disease Control and Prevention's representative member William M. Callaghan, MD. The views do not necessarily represent those of the Centers for Disease Control and Prevention or the U.S. government.

*The information reflects
current clinical and scientific*

Severe Maternal Morbidity: Screening and Review

ABSTRACT: This document builds upon recommendations from peer organizations and outlines a process for identifying maternal cases that should be reviewed. Severe maternal morbidity is associated with a high rate of preventability, similar to that of maternal mortality. It also can be considered a near miss for maternal mortality because without identification and treatment, in some cases, these conditions would lead to maternal death. Identifying severe morbidity is, therefore, important for preventing such injuries that lead to mortality and for highlighting opportunities to avoid repeat injuries. The two-step screen and review process described in this document is intended to efficiently detect severe maternal morbidity in women and to ensure that each case undergoes a review to determine whether there were opportunities for improvement in care. Like cases of maternal mortality, cases of severe maternal morbidity merit quality review. In the absence of consensus on a comprehensive list of conditions that represent severe maternal morbidity, institutions and systems should either adopt an existing screening criteria or create their own list of outcomes that merit review.

Table 1. Example List of Diagnoses and Complications Constituting Severe Maternal Morbidity*

| Severe Maternal Morbidity | Not Severe Morbidity (insufficient evidence if this is the only criteria) |
|---|--|
| Hemorrhage | |
| Obstetric hemorrhage with ≥4 units of red blood cells transfused | Obstetric hemorrhage with 2–3 units of red blood cells transfused ALONE |
| Obstetric hemorrhage with 2 units of red blood cells and 2 units of fresh frozen plasma transfused (without other procedures or complications) if not judged to be overexuberant transfusion | Obstetric hemorrhage with 2 units of red blood cells and 2 units of fresh frozen plasma transfused AND judged to be "overexuberant" |
| Obstetric hemorrhage with <4 units of blood products transfused and evidence of pulmonary congestion that requires >1 dose of furosemide | Obstetric hemorrhage with <4 units of blood products transfused and evidence of pulmonary edema requiring only 1 dose of furosemide |
| Obstetric hemorrhage with return to operating room for any major procedure (excludes dilation) | |
| Any emergency/unplanned peripartum hysterectomy, regardless of number of units transfused (includes all placenta accretas) | Planned peripartum hysterectomy for cancer/neoplasia |
| Obstetric hemorrhage with uterine artery embolization, regardless of number of units transfused | |
| Obstetric hemorrhage with uterine balloon or uterine compression suture placed and 2–3 units of blood products transfused | Obstetric hemorrhage with uterine balloon or uterine compression suture placed and ≤1 unit of blood products transfused |
| Obstetric hemorrhage admitted to intensive care unit for invasive monitoring or treatment (either medication or procedure; not just observed overnight) | Any obstetric hemorrhage that went to the intensive care unit for observation only without further treatment |
| Hypertension/Neurologic | |
| Eclamptic seizure(s) or epileptic seizures that were "status" | |
| Continuous infusion (intravenous drip) of an antihypertensive medication | |
| Nonresponsiveness or loss of vision, permanent or temporary (but not momentary), documented in physician's progress notes | |
| Stroke, coma, intracranial hemorrhage | |
| Preeclampsia with difficult-to-control severe hypertension (>160 systolic blood pressure or >110 diastolic blood pressure) that requires multiple intravenous doses, persistent ≥48 hours after delivery, or both | Chronic hypertension that drifts up to severe range and needs postoperative medication dose alteration; preeclampsia blood pressure control with oral medications ≥48 hours after delivery |
| Liver or subcapsular hematoma or severe liver injury admitted to the intensive care unit (bilirubin >6 or liver enzymes >600) | Abnormal liver function requiring extra prolonged postpartum length of stay but not in the intensive care unit |
| Multiple coagulation abnormalities or severe hemolysis, elevated liver enzymes, and low platelet count (HELLP) syndrome | Severe thrombocytopenia (<50,000) alone that does not require a transfusion or intensive care unit admission |
| Renal | |
| Diagnosis of acute tubular necrosis or treatment with renal dialysis | Oliguria treated with intravenous fluids (no intensive care unit admission) |
| Oliguria treated with multiple doses of Lasix | Oliguria treated with 1 dose of intravenous fluids (no intensive care unit admission) |
| Creatinine ≥2.0 in a woman without preexisting renal disease OR a doubling of the baseline creatinine in a woman with preexisting renal disease | |

(continued)

Table 1. Example List of Diagnoses and Complications Constituting Severe Maternal Morbidity* (continued)

| Severe Maternal Morbidity | Not Severe Morbidity (insufficient evidence if this is the only criteria) |
|---|--|
| Sepsis | |
| Infection with hypotension with multiple liters of intravenous fluid or pressors used (septic shock) | Fever >38.5°C with elevated lactate alone without hypotension |
| Infection with pulmonary complications such as pulmonary edema or acute respiratory distress syndrome | Fever >38.5°C with presumed choriometritis/endometritis with elevated pulse but no other cardiovascular signs and normal lactate |
| | Positive blood culture without other evidence of significant systemic illness |
| Pulmonary | |
| Diagnosis of acute respiratory distress syndrome, pulmonary edema, or postoperative pneumonia | Administration of oxygen without a pulmonary diagnosis |
| Use of a ventilator (with either intubation or noninvasive technique) | |
| Deep vein thrombosis or pulmonary embolism | |
| Cardiac | |
| Preexisting cardiac disease (congenital or acquired) with intensive care unit admission for treatment | Preexisting cardiac disease (congenital or acquired) with intensive care unit admission for observation only |
| Peripartum cardiomyopathy | Preexisting cardiac disease (congenital or acquired) without intensive care unit admission for observation only |
| Arrhythmia requiring >1 dose of intravenous medication but not intensive care unit admission | Arrhythmia requiring 1 dose of intravenous medication but no intensive care unit admission |
| Arrhythmia that requires intensive care unit with further treatments | Arrhythmia that requires intensive care unit observation but no extra treatments |
| Intensive Care Unit/Invasive Monitoring | |
| Any intensive care unit admission that includes treatment or diagnostic or therapeutic procedure | Intensive care unit admission for observation of hypertension that does NOT require intravenous medications |
| Central line or pulmonary catheter used to monitor a complication | Intensive care unit admission for observation after general anesthesia |
| Surgical, Bladder, and Bowel Complications | |
| Bowel or bladder injury during surgery beyond minor serosal tear | |
| Small-bowel obstruction, with or without surgery during pregnancy/postpartum period | |
| Prolonged ileus for ≥4 days | Postoperative ileus that resolved without surgery in ≤3 days |
| Anesthesia Complications | |
| Total spinal anesthesia | Failed spinal anesthesia that requires general anesthesia |
| Aspiration pneumonia | Spinal headache treated with a blood patch |
| Epidural hematoma | |

Abbreviation: HELLP, hemolysis, elevated liver enzymes, and low platelet count.

*This list provides a series of examples that may help facilities and health care providers as they evaluate cases to determine if they represent severe maternal morbidity. The College and SMFM have not created or endorsed a single, comprehensive definition of severe maternal morbidity.

Reprinted from Main EK, Abreo A, McNally J, Gilbert W, McNally C, Poolter D, et al. Measuring severe maternal morbidity: validation of potential measures. *Am J Obstet Gynecol* 2016;214:643.e1–10.

- **What is severe maternal morbidity and why is it important?**
- **How are the data collected?**
 - **Each state collects data on discharge diagnoses**
 - **Deidentified and NOT linked to vital statistics or birth outcomes=no PHI**
 - **ICD-9, 10 based**
 - **Extracted by coders**

Uniform Hospital Discharge Data Set (UHDDS)

- 1969 Conference NCHS, National Center for health services and research and Development and John Hopkins University.
 - All short-term general hospitals in US must collect minimum set of patient data element UHDDS.
- 1974 Federal government adopted the UHDDS for Medicare and Medicaid programs.
- 1983 The UHDDS definitions were incorporated to the new prospective payment DRG.
- 1986 All federal health programs adopted the UHDDS

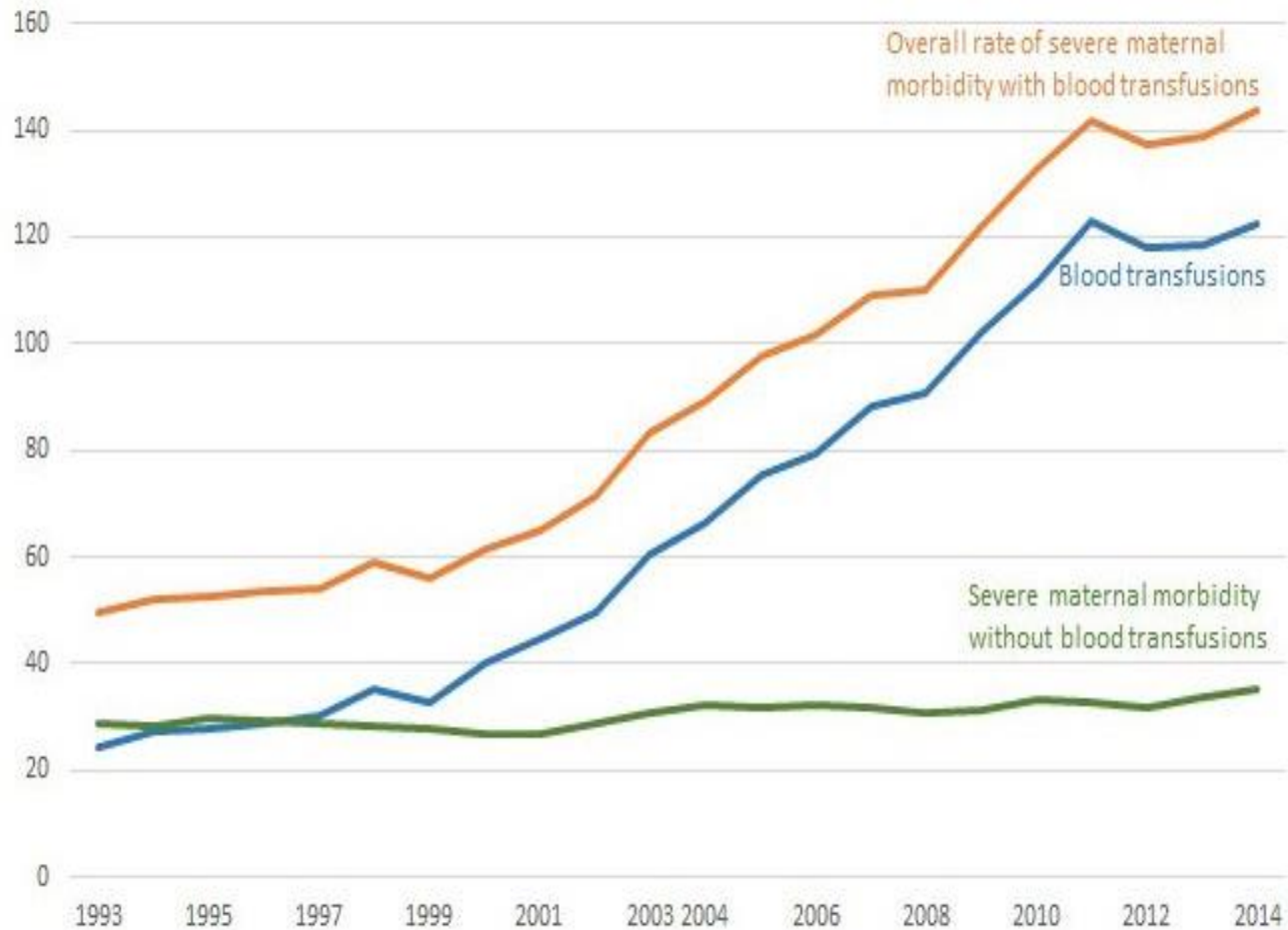
VERMONT UNIFORM HOSPITAL DISCHARGE DATA SYSTEM

The Vermont Uniform Hospital Discharge Data System consists of inpatient discharge data, outpatient procedures and services data, and emergency department data. Each data file includes:

- Case-specific diagnostic discharge data
- Some socio-demographic characteristics of the patient
- Medical reason for the admission
- Treatment and services provided to the patient
- Duration and status of the patient's stay in the hospital
- Full, undiscounted total and service-specific charges billed by the hospital

Vermont's rich hospital discharge data are available to state agencies, providers, payers and health care researchers seeking data for health research in the public interest. These de-identified patient-level data files support analyses of topics as hospital utilization patterns and market shares, the patient care continuum, comparative charges and outcomes in acute care hospitals, and preventable hospitalizations.

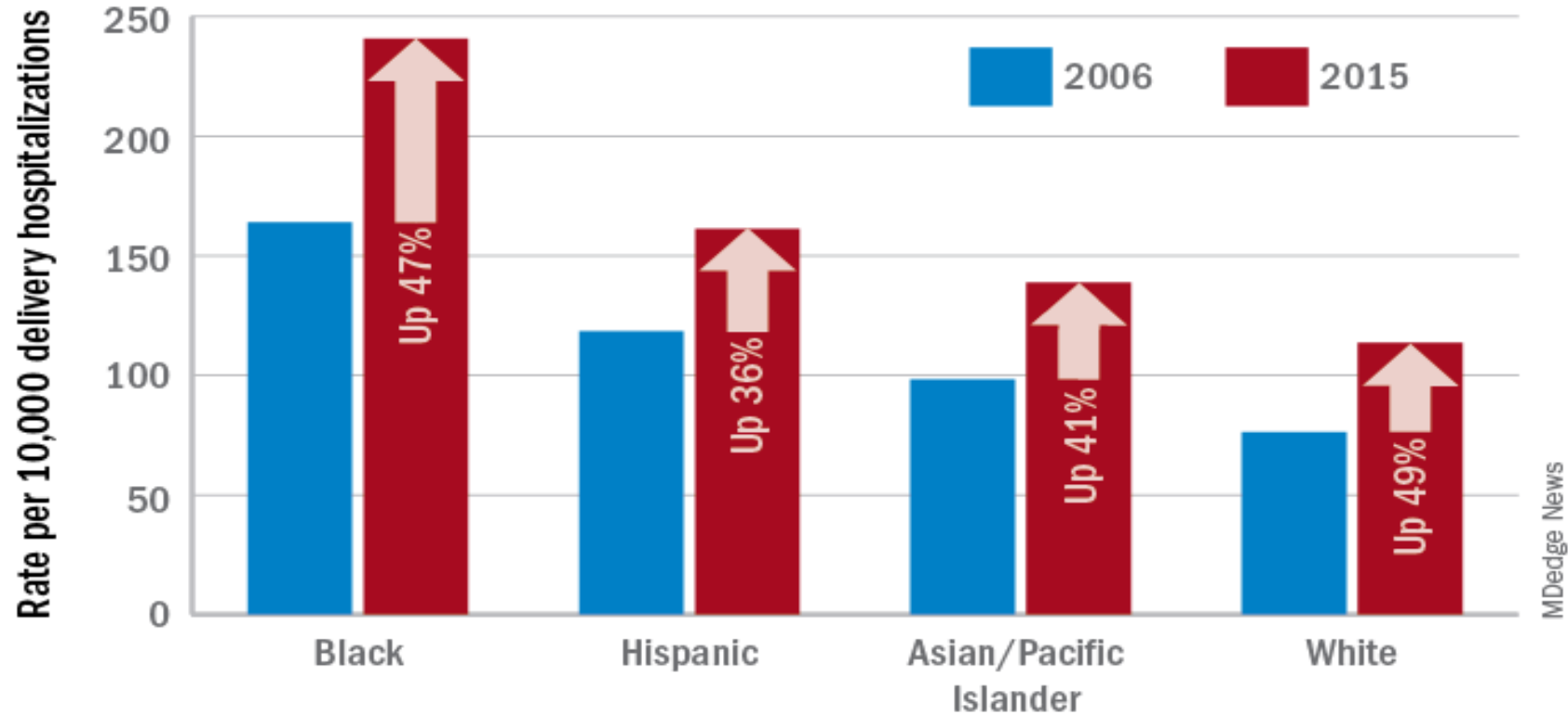
Rate of severe maternal morbidity per 10,000 delivery hospitalizations



- **Nationally, the rate of severe maternal morbidity is increasing (as is maternal mortality)**
- **Hemorrhage accounts for substantial morbidity nationally**

Racial disparities exist in severe maternal morbidity and mortality nationally:
almost certainly true in VT, although numbers are low

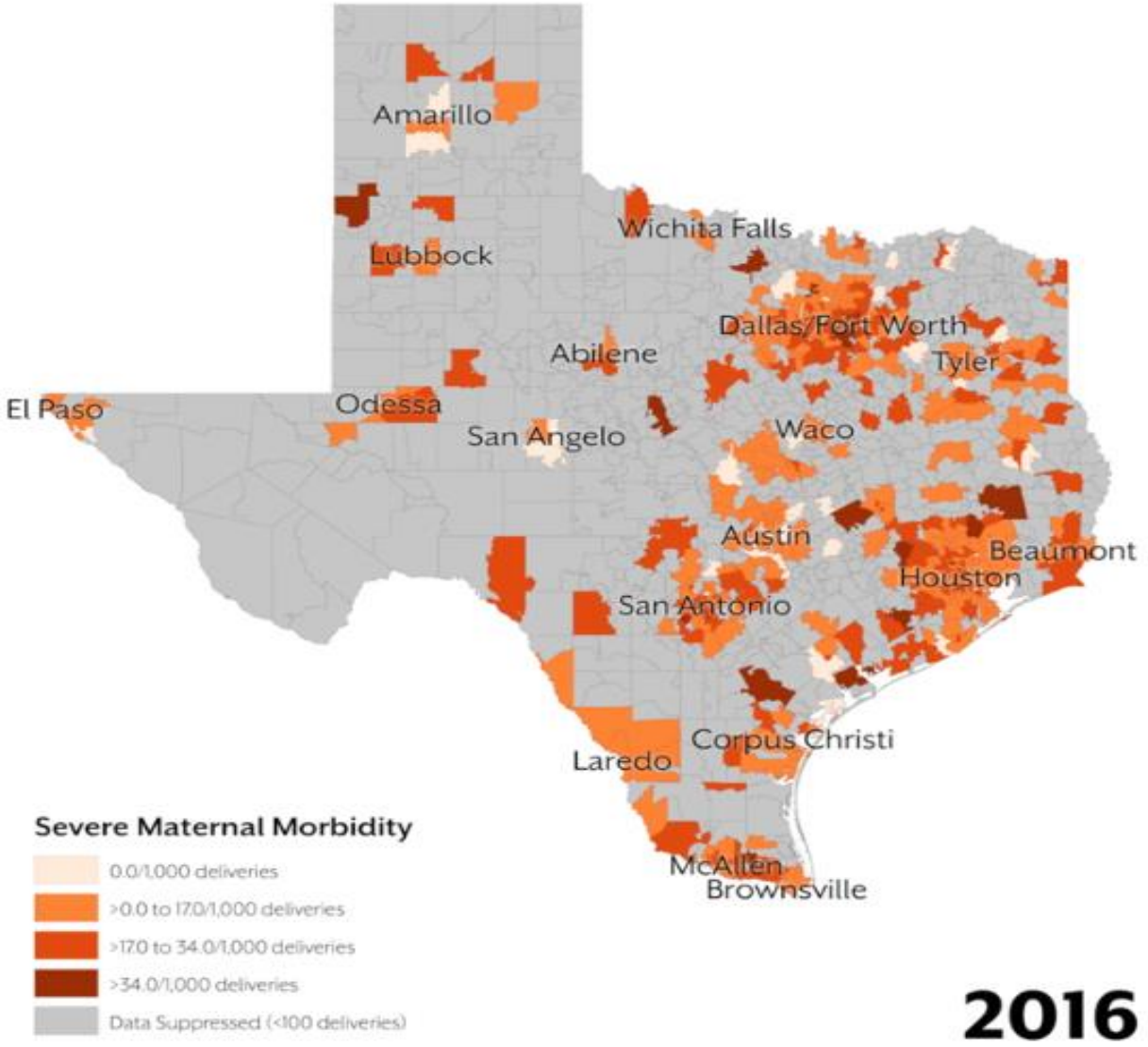
Deliveries involving severe maternal morbidity, 2006 and 2015



Note: Based on data from the State Inpatient Databases, weighted to provide national estimates.

Source: Agency for Healthcare Research and Quality

Severe Maternal Morbidity is Regional even within a state



Vermont background numbers:

About 1/3 of deliveries occur in hospitals that have <1000 deliveries/year

Small/rural hospitals have unique challenges

Over 2/3 of VT babies are born in relatively low volume hospitals

Hospital Delivery Volume Categories & Number of Deliveries by Hospital, VUHDDS, 2013-2015

| Delivery Volume Categories | Number (n=16,285) | Percent |
|--|-------------------|---------|
| Hospitals with <1,000 deliveries in 3 year period | 2,974 | 18.26 |
| Hospitals with 1,000 - 1,999 deliveries in 3 year period | 7,031 | 43.17 |
| Hospitals with 2,000 or more deliveries in 3 year period | 6,280 | 38.56 |

Closures by State

The map shows the number of rural hospitals that closed in each state between 2010 and 2017.



VT Severe Maternal Morbidity Categories, 2013-2015

- Hemorrhage in VT is a major contributor to SMM
- Cardiac disease is an important contributor
- We have weird coding re: eclampsia
- Anesthesia is difficult

| Conditions and Procedures | VT (n=16,285) | |
|---|---------------|-----------------|
| | Count | Rate per 10,000 |
| Cardiovascular Disease / Complications | | |
| Acute Myocardial Infarction | 1 | <0.1 |
| Aneurysm | 0 | 0.0 |
| Cardiac Arrest / V. Fib / General Heart Failure | 1 | <0.1 |
| Heart Failure during Procedure or Surgery | 24 | 14.7 |
| Conversion of Cardiac Rhythm | 1 | <0.1 |
| Hemorrhage | | |
| Disseminated Intravascular Coagulation | 35 | 21.5 |
| Hysterectomy | 12 | 7.4 |
| Transfusion | 208 | 127.7 |
| Organ failure | | |
| Acute Renal Failure | 10 | 6.1 |
| Shock | 6 | 3.7 |

| Other Conditions and Complications | | |
|--|----|------|
| Amniotic Fluid Embolism | 1 | <0.1 |
| Eclampsia | 21 | 12.9 |
| Puerperal Cerebrovascular Disorders / CVA / Stroke | 10 | 6.1 |
| Severe Anesthesia Complications | 17 | 10.4 |
| Septicemia and Sepsis | 9 | 5.5 |
| Sickle Cell Anemia with Crisis | 0 | 0.0 |
| Thrombotic Embolism | 4 | 2.5 |
| Pulmonary | | |
| Adult Respiratory Distress Syndrome | 7 | 4.3 |
| Pulmonary Edema | 1 | <0.1 |
| Mechanical Ventilation | | |
| Temporary Tracheostomy | 0 | 0.0 |
| Ventilation | 16 | 9.8 |

Overall Severe Maternal Morbidities (SMM) and AIM measures, 2013-2015

| | VT | |
|---|--------|-----------------|
| | Count | Rate per 10,000 |
| Total delivery discharges | 16,285 | N/A |
| Any SMM | | |
| Any severe maternal morbidity (21 conditions) | 322 | 197.7 |
| Any severe maternal morbidity (excluding transfusion) | 143 | 87.8 |
| Severe hypertension | | |
| Severe hypertension cases | 372 | 228.4 |
| SMM among severe hypertension cases | 54 | 1,451.6 |
| SMM (excluding transfusion) among severe hypertension cases | 36 | 967.7 |
| Severe hemorrhage | | |
| Severe hemorrhage cases | 1,144 | 702.5 |
| SMM among hemorrhage cases | 238 | 2,080.4 |
| SMM (excluding transfusion) among hemorrhage cases | 59 | 515.7 |

Focus on HTN and hemorrhage Account for 292/322 of SMM in VT



WHAT IS AIM?

The United States has the highest maternal mortality rate of any high resource country—and it is the only country outside of Afghanistan and Sudan where the rate is rising. The Alliance for Innovation on Maternal Health (AIM) is a **national data-driven maternal safety and quality improvement initiative** based on proven implementation approaches to improving maternal safety and outcomes in the U.S. Our end goal is to eliminate preventable maternal mortality and severe morbidity across the United States.

AIM works through state teams and health systems to align national, state, and hospital level quality improvement efforts to improve overall maternal health outcomes.

Any U.S. hospital in a participating AIM state or hospital system can join the **growing and engaged AIM community** of multidisciplinary healthcare providers, public health professionals, and cross-sector stakeholders who are committed to improving maternal outcomes in the U.S.

AIM is funded through a cooperative agreement with the Maternal and Child Health Bureau (MCHB)-Health Resource Services Administration through August 2018.

AIM Program

ALLIANCE FOR INNOVATION ON MATERNAL HEALTH

THE PROCESS OF AIM

AIM-SUPPORTED PATIENT SAFETY BUNDLES

THE ALLIANCE

AIM STATES & SYSTEMS

AIM eMODULES

AIM RESOURCES

AIM DATA

NATIONAL COLLABORATIVE ON MATERNAL OUTCOMES

SMM Count and Rate per 10,000, by Hospital Delivery Volume, 2013-2015

Abut 50% of overall SMM occurs in smaller hospitals

| Volume category for 3-year period | Total Delivery Discharges | Any severe maternal morbidity (All 21 conditions) | Any severe maternal morbidity (excluding transfusion) |
|--|---------------------------|---|---|
| | VT | VT | VT |
| Facilities with <1,000 deliveries | 2,974 | 31 | 15 |
| | | 104.2 | 50.4 |
| Facilities with 1,000-1,999 deliveries | 7,031 | 132 | 49 |
| | | 187.7 | 69.7 |
| Facilities with ≥2,000 deliveries | 6,280 | 159 | 79 |
| | | 253.2 | 125.8 |

SMM among Severe Hypertension Cases and Rate per 10,000, by Hospital Delivery Volume, 2013-2015

About 1/3 of SMM related to HTN occurs in smaller hospitals

| Volume category for 3-year period | Total Delivery Discharges | Total severe hypertension cases | Any SMM (All 21 conditions) among severe hypertension cases | Any SMM (excluding transfusion) among severe hypertension cases |
|--|---------------------------|---------------------------------|---|---|
| | VT | VT | VT | VT |
| Facilities with <1,000 deliveries | 2,974 | 26 | 3 | 3 |
| | | 87.4 | 1,153.8 | 1,153.8 |
| Facilities with 1,000-1,999 deliveries | 7,031 | 77 | 19 | 16 |
| | | 109.5 | 2,467.5 | 2,077.9 |
| Facilities with ≥2,000 deliveries | 6,280 | 269 | 32 | 17 |
| | | 428.3 | 1,189.6 | 632.0 |

SMM among Severe Hemorrhage Cases and Rate per 10,000, by Hospital Delivery Volume, 2013-2015

Over 50% of SMM related to hemorrhage occur in smaller hospitals (can be very difficult to predict)

| Volume category for 3-year period | Total Delivery Discharges | Total severe hemorrhage cases | Any SMM (All 21 conditions) among severe hemorrhage cases | SMM (excluding transfusion) among severe hemorrhage cases |
|--|---------------------------|-------------------------------|---|---|
| | VT | VT | VT | VT |
| Facilities with <1,000 deliveries | 2,974 | 191 | 21 | 5 |
| | | 642.2 | 1,099.5 | 261.8 |
| Facilities with 1,000-1,999 deliveries | 7,031 | 407 | 101 | 18 |
| | | 578.9 | 2,481.6 | 442.3 |
| Facilities with ≥2,000 deliveries | 6,280 | 546 | 116 | 36 |
| | | 869.4 | 2,124.5 | 659.3 |

Severe Maternal Morbidity, Major Categories and Conditions, Vermont Hospital Discharges, VUHDDS, 2013-2015 (n=16,285)

Cardiovascular Disease and Complications

| Condition / Procedure | Number of Discharges |
|---|----------------------|
| Acute Myocardial Infarction | 1 |
| Aneurysm | 0 |
| Cardiac Arrest / Ventricular Fibrillation / General Heart Failure | 1 |
| Heart Failure during Procedure or Surgery | 24 |
| Hypertension | 372 |
| Invasive Cardiac Monitoring | 1 |
| Conversion of Cardiac Rhythm | 1 |
| Cardiac Procedures (operations on heart and pericardium)§ | 10 |
| §Condition not carried into ICD-10 | |

Hemorrhage

| Condition / Procedure | Number of Discharges |
|--|----------------------|
| Disseminated Intravascular Coagulation | 35 |
| Transfusion | 208 |
| Hysterectomy | 12 |
| Hemorrhage | 1,144 |

Pulmonary Complications

| Condition | Number of Discharges |
|-------------------------------------|----------------------|
| Adult Respiratory Distress Syndrome | 7 |
| Pulmonary Edema | 1 |

SMM Major Categories and Conditions, continued

Other Conditions

| Condition | Number of Discharges |
|--|----------------------|
| Cerebrovascular Accidents / Stroke / Puerperal Cerebrovascular Disorders | 10 |
| Thrombotic Embolism | 4 |
| Eclampsia | 21 |
| Septicemia and Sepsis | 9 |
| Amniotic Fluid Embolism | 1 |
| Severe Anesthesia Complications | 17 |
| Sickle Cell Anemia with Crisis | 0 |

Mechanical Ventilation

| Procedure | Number of Discharges |
|------------------------|----------------------|
| Temporary Tracheostomy | 0 |
| Ventilation | 16 |

Other Organ Failure

| Condition | Number of Discharges |
|---|----------------------|
| Renal Failure | 14* / 10* |
| Shock | 6 |
| *ICD-9 definition; **ICD-10 and back translation of ICD-9 | |

Trauma

| Condition | Number of Discharges |
|---|----------------------|
| Internal Injuries of Thorax, Abdomen, and Pelvis§ | 0 |
| Intracranial Injuries§ | 0 |
| §Condition not carried into ICD-10 | |

Number of Deliveries & SMM Events / Rates per
10,000 Vermont Hospital Delivery Discharges, 2013-
2015 (n=16,285)

Hypertension and hemorrhage seem to coexist

| SMM Events | With Transfusion | | | | Without Transfusion | | | |
|--|------------------|--------|--------|-----------|---------------------|--------|-------|-----------|
| | 2013 | 2014 | 2015 | 2013-2015 | 2013 | 2014 | 2015 | 2013-2015 |
| Total Number of Deliveries | 5,315 | 5,517 | 5,453 | 16,285 | 5,315 | 5,517 | 5,453 | 16,285 |
| Overall SMM Events | 90 | 135 | 97 | 322 | 37 | 56 | 50 | 143 |
| Overall SMM Rates | 169.3 | 244.7 | 177.9 | 197.7 | 69.6 | 101.5 | 91.7 | 87.8 |
| | | | | | | | | |
| Number of Severe Hypertension Cases | 100 | 147 | 125 | 372 | 100 | 147 | 125 | 372 |
| Any SMM among Severe Hypertension Cases | 12 | 27 | 15 | 54 | 7 | 18 | 11 | 36 |
| SMM Rate among Severe Hypertension Cases | 1200.0 | 1836.7 | 1200.0 | 1451.6 | 700.0 | 1224.5 | 880.0 | 967.7 |
| | | | | | | | | |
| Number of Severe Hemorrhage Cases | 340 | 400 | 404 | 1,144 | 340 | 400 | 404 | 1,144 |
| Any SMM among Severe Hemorrhage Cases | 70 | 98 | 70 | 238 | 17 | 19 | 23 | 59 |
| SMM Rate among Severe Hemorrhage Cases | 2058.8 | 2450.0 | 1732.7 | 2080.4 | 500.0 | 475.0 | 569.3 | 515.7 |

Number of Deliveries & SMM Events / Rates per 10,000
 Vermont Hospital Delivery Discharges, by Hospital
 Delivery Volume, 2013-2015 (n=16,285)

- SMM related to Severe HTN, but not hemorrhage, is higher in smaller hospitals
- Hemorrhage is pretty similar

| SMM Events | With Transfusion | | | | Without Transfusion | | | |
|---|------------------|--------|--------|-----------|---------------------|--------|-------|-----------|
| | 2013 | 2014 | 2015 | 2013-2015 | 2013 | 2014 | 2015 | 2013-2015 |
| Hospitals with <2,000 Deliveries in a 3-year Period | | | | | | | | |
| Total Number of Deliveries | 3,283 | 3,390 | 3,332 | 10,005 | 3,283 | 3,390 | 3,332 | 10,005 |
| Overall SMM Rate | 143.2 | 203.5 | 141.1 | 162.9 | 36.6 | 85.5 | 69.0 | 64.0 |
| SMM Rate among Severe Hypertension Cases | 2000.0 | 3170.7 | 937.5 | 2135.9 | 1666.7 | 2682.9 | 937.5 | 1844.7 |
| SMM Rate among Severe Hemorrhage Cases | 1969.7 | 2462.3 | 1691.5 | 2040.1 | 202.0 | 452.3 | 497.5 | 384.6 |
| Hospitals with 2,000 or More Deliveries in a 3-year Period | | | | | | | | |
| Total Number of Deliveries | 2,032 | 2,217 | 2,121 | 6,280 | 2,032 | 2,217 | 2,121 | 6,280 |
| Overall SMM Rate | 211.6 | 310.3 | 235.7 | 253.2 | 123.0 | 126.9 | 127.3 | 125.8 |
| SMM Rate among Severe Hypertension Cases | 857.1 | 1320.8 | 1290.3 | 1189.6 | 285.7 | 660.4 | 860.2 | 632.0 |
| SMM Rate among Severe Hemorrhage Cases | 2183.1 | 2437.8 | 1773.4 | 2124.5 | 915.5 | 497.5 | 640.4 | 659.3 |

Data by Hospital Delivery Volume

Severe Maternal Morbidity, Major Categories and Conditions, Vermont Hospital Discharges, among Hospitals with <1,000 Deliveries in 3-Year Period, VUHDDS, 2013-2015 (n=2,974)

| Conditions / Procedures | # Discharges | Conditions / Procedures | # Discharges |
|--|--------------|--|--------------|
| Acute Myocardial Infarction | 0 | Adult Respiratory Distress Syndrome | 0 |
| Aneurysm | 0 | Pulmonary Edema | 0 |
| Cardiac Arrest / V Fib / General Heart Failure | 0 | Cerebrovascular Accidents / Stroke / Puerperal Cerebrovascular Disorders | 0 |
| Heart Failure during Procedure or Surgery | 1 | Thrombotic Embolism | 0 |
| Hypertension | 26 | Eclampsia | 3 |
| Invasive Cardiac Monitoring | 0 | Septicemia and Sepsis | 0 |
| Conversion of Cardiac Rhythm | 0 | Amniotic Fluid Embolism | 0 |
| Disseminated Intravascular Coagulation | 3 | Severe Anesthesia Complications | 0 |
| Transfusion | 17 | Sickle Cell Anemia with Crisis | 0 |
| Hysterectomy | 1 | Temporary Tracheostomy | 0 |
| Hemorrhage | 191 | Ventilation | 7 |
| Renal Failure* | 0 | *ICD-10 and back translation of ICD-9 | |
| Shock | 0 | | |

Number of Deliveries & SMM Cases / Rates per 10,000 Vermont Hospital Delivery Discharges, among Hospitals with <1,000 Deliveries in 3-Year Period, 2013-2015 (n=2,974)

| SMM | With Transfusion | | | | Without Transfusion | | | |
|--|------------------|--------|-------|-----------|---------------------|-------|-------|-----------|
| | 2013 | 2014 | 2015 | 2013-2015 | 2013 | 2014 | 2015 | 2013-2015 |
| Total Number of Deliveries | 991 | 1,004 | 979 | 2,974 | 991 | 1,004 | 979 | 2,974 |
| Overall SMM Cases | 11 | 13 | 7 | 31 | 4 | 6 | 5 | 15 |
| Overall SMM Rate | 111.0 | 129.5 | 71.5 | 104.2 | 40.4 | 59.8 | 51.1 | 50.4 |
| | | | | | | | | |
| Number of Severe Hypertension Cases | 10 | 8 | 8 | 26 | 10 | 8 | 8 | 26 |
| Any SMM among Severe Hypertension Cases | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| SMM Rate among Severe Hypertension Cases | 3000.0 | | | 1153.8 | 3000.0 | | | 1153.8 |
| | | | | | | | | |
| Number of Severe Hemorrhage Cases | 67 | 60 | 64 | 191 | 67 | 60 | 64 | 191 |
| Any SMM among Severe Hemorrhage Cases | 8 | 10 | 3 | 21 | 1 | 3 | 1 | 5 |
| SMM Rate among Severe Hemorrhage Cases | 1194.0 | 1666.7 | 468.8 | 1099.5 | 149.3 | 500.0 | 156.3 | 261.8 |

Severe Maternal Morbidity, Major Categories and Conditions, Vermont Hospital Discharges, among Hospitals with 1,000-1,999 Deliveries in 3-Year Period, VUHDDS, 2013-2015 (n=7,031)

| Conditions / Procedures | # Discharges | Conditions / Procedures | # Discharges |
|--|--------------|--|--------------|
| Acute Myocardial Infarction | 1 | Adult Respiratory Distress Syndrome | 1 |
| Aneurysm | 0 | Pulmonary Edema | 0 |
| Cardiac Arrest / V Fib / General Heart Failure | 0 | Cerebrovascular Accidents / Stroke / Puerperal Cerebrovascular Disorders | 4 |
| Heart Failure during Procedure or Surgery | 9 | Thrombotic Embolism | 0 |
| Hypertension | 77 | Eclampsia | 15 |
| Invasive Cardiac Monitoring | 0 | Septicemia and Sepsis | 2 |
| Conversion of Cardiac Rhythm | 0 | Amniotic Fluid Embolism | 0 |
| Disseminated Intravascular Coagulation | 11 | Severe Anesthesia Complications | 3 |
| Transfusion | 89 | Sickle Cell Anemia with Crisis | 0 |
| Hysterectomy | 0 | Temporary Tracheostomy | 0 |
| Hemorrhage | 407 | Ventilation | 5 |
| Renal Failure* | 3 | | |
| Shock | 1 | *ICD-10 and back translation of ICD-9 | |

Number of Deliveries & SMM Cases / Rates per 10,000 Vermont Hospital Delivery Discharges, among Hospitals with 1,000-1,999 Deliveries in 3-Year Period, 2013-2015 (n=7,031)

| SMM | With Transfusion | | | | Without Transfusion | | | |
|--|------------------|--------|--------|-----------|---------------------|--------|--------|-----------|
| | 2013 | 2014 | 2015 | 2013-2015 | 2013 | 2014 | 2015 | 2013-2015 |
| Total Number of Deliveries | 2292 | 2386 | 2353 | 7,031 | 2292 | 2386 | 2353 | 7,031 |
| Overall SMM Cases | 36 | 56 | 40 | 132 | 8 | 23 | 18 | 49 |
| Overall SMM Rate | 157.1 | 234.7 | 170.0 | 187.7 | 34.9 | 96.4 | 76.5 | 69.7 |
| | | | | | | | | |
| Number of Severe Hypertension Cases | 20 | 33 | 24 | 77 | 20 | 33 | 24 | 77 |
| Any SMM among Severe Hypertension Cases | 3 | 13 | 3 | 19 | 2 | 11 | 3 | 16 |
| SMM Rate among Severe Hypertension Cases | 1500.0 | 3939.4 | 1250.0 | 2467.5 | 1000.0 | 3333.3 | 1250.0 | 2077.9 |
| | | | | | | | | |
| Number of Severe Hemorrhage Cases | 131 | 139 | 137 | 407 | 131 | 139 | 137 | 407 |
| Any SMM among Severe Hemorrhage Cases | 31 | 39 | 31 | 101 | 3 | 6 | 9 | 18 |
| SMM Rate among Severe Hemorrhage Cases | 2366.4 | 2805.8 | 2262.8 | 2481.6 | 229.0 | 431.7 | 656.9 | 442.3 |

Severe Maternal Morbidity, Major Categories and Conditions, Vermont Hospital Discharges, among Hospitals with ≥2,000 Deliveries in 3-Year Period, VUHDDS, 2013-2015 (n=6,280)

| Conditions / Procedures | # Discharges | Conditions / Procedures | # Discharges |
|--|--------------|--|--------------|
| Acute Myocardial Infarction | 0 | Adult Respiratory Distress Syndrome | 6 |
| Aneurysm | 0 | Pulmonary Edema | 1 |
| Cardiac Arrest / V Fib / General Heart Failure | 1 | Cerebrovascular Accidents / Stroke / Puerperal Cerebrovascular Disorders | 6 |
| Heart Failure during Procedure or Surgery | 14 | Thrombotic Embolism | 4 |
| Hypertension | 269 | Eclampsia | 3 |
| Invasive Cardiac Monitoring | 1 | Septicemia and Sepsis | 7 |
| Conversion of Cardiac Rhythm | 1 | Amniotic Fluid Embolism | 1 |
| Disseminated Intravascular Coagulation | 21 | Severe Anesthesia Complications | 14 |
| Transfusion | 102 | Sickle Cell Anemia with Crisis | 0 |
| Hysterectomy | 11 | Temporary Tracheostomy | 0 |
| Hemorrhage | 546 | Ventilation | 4 |
| Renal Failure* | 7 | *ICD-10 and back translation of ICD-9 | |
| Shock | 5 | | |

Number of Deliveries & SMM Cases / Rates per 10,000 Vermont Hospital Delivery Discharges, among Hospitals with ≥2,000 Deliveries in 3-Year Period, 2013-2015 (n=6,280)

| SMM | With Transfusion | | | | Without Transfusion | | | |
|--|------------------|--------|--------|-----------|---------------------|-------|-------|-----------|
| | 2013 | 2014 | 2015 | 2013-2015 | 2013 | 2014 | 2015 | 2013-2015 |
| Total Number of Deliveries | 2,032 | 2,127 | 2,121 | 6,280 | 2,032 | 2,127 | 2,121 | 6,280 |
| Overall SMM Cases | 43 | 66 | 50 | 159 | 25 | 27 | 27 | 79 |
| Overall SMM Rate | 211.6 | 310.3 | 235.7 | 253.2 | 123.0 | 126.9 | 127.3 | 125.8 |
| | | | | | | | | |
| Number of Severe Hypertension Cases | 70 | 106 | 93 | 269 | 70 | 106 | 93 | 269 |
| Any SMM among Severe Hypertension Cases | 6 | 14 | 12 | 32 | 2 | 7 | 8 | 17 |
| SMM Rate among Severe Hypertension Cases | 857.1 | 1320.8 | 1290.3 | 1189.6 | 285.7 | 660.4 | 860.2 | 632.0 |
| | | | | | | | | |
| Number of Severe Hemorrhage Cases | 142 | 201 | 203 | 546 | 142 | 201 | 203 | 546 |
| Any SMM among Severe Hemorrhage Cases | 31 | 49 | 36 | 116 | 13 | 10 | 13 | 36 |
| SMM Rate among Severe Hemorrhage Cases | 2183.1 | 2437.8 | 1773.4 | 2124.5 | 915.5 | 497.5 | 640.4 | 659.3 |

Number of Deliveries & SMM Cases / Rates per 10,000 Vermont Hospital Delivery Discharges, by Delivery Volume for 3-Year Period, 2013-2015 (n=16,285)

| Hospital Delivery Volume | SMM | With Transfusion | | | | Without Transfusion | | | |
|--------------------------|------------------------------|------------------|--------|--------|-----------|---------------------|--------|--------|-----------|
| | | 2013 | 2014 | 2015 | 2013-2015 | 2013 | 2014 | 2015 | 2013-2015 |
| <1,000 | Total Number of Deliveries | 991 | 1,004 | 979 | 2,974 | 991 | 1,004 | 979 | 2,974 |
| | Overall SMM Rate | 111.0 | 129.5 | 71.5 | 104.2 | 40.4 | 59.8 | 51.1 | 50.4 |
| | SMM Rate/Severe Hypertension | 3000.0 | | | 1153.8 | 3000.0 | | | 1153.8 |
| | SMM Rate/Severe Hemorrhage | 1194.0 | 1666.7 | 468.8 | 1099.5 | 149.3 | 500.0 | 156.3 | 261.8 |
| 1,000 – 1,999 | Total Number of Deliveries | 2292 | 2386 | 2353 | 7,031 | 2292 | 2386 | 2353 | 7,031 |
| | Overall SMM Rate | 157.1 | 234.7 | 170.0 | 187.7 | 34.9 | 96.4 | 76.5 | 69.7 |
| | SMM Rate/Severe Hypertension | 1500.0 | 3939.4 | 1250.0 | 2467.5 | 1000.0 | 3333.3 | 1250.0 | 2077.9 |
| | SMM Rate/Severe Hemorrhage | 2366.4 | 2805.8 | 2262.8 | 2481.6 | 229.0 | 431.7 | 656.9 | 442.3 |
| ≥2,000 | Total Number of Deliveries | 2,032 | 2,217 | 2,121 | 6,280 | 2,032 | 2,217 | 2,121 | 6,280 |
| | Overall SMM Rate | 211.6 | 310.3 | 235.7 | 253.2 | 123.0 | 126.9 | 127.3 | 125.8 |
| | SMM Rate/Severe Hypertension | 857.1 | 1320.8 | 1290.3 | 1189.6 | 285.7 | 660.4 | 860.2 | 632.0 |
| | SMM Rate/Severe Hemorrhage | 2183.1 | 2437.8 | 1773.4 | 2124.5 | 915.5 | 497.5 | 640.4 | 659.3 |

Table 1. Socio-demographic and Comorbidities by Country, 2007-2013. Socio-demographic information and medical comorbidities for each country. Numbers shown are the % of the study population, unless otherwise stated. All significant at $p < 0.05$ using Pearson's Chi-squared test.

| Variable | Australia | England | US |
|--|---------------|-----------------|----------------|
| Total deliveries n(%) | 95,107 (18.4) | 294,409 (57.0) | 127,265 (24.6) |
| | n (%) | n (%) | n (%) |
| Multiple Birth | | | |
| Multiple | 1647 (1.7) | 5519 (1.9) | 3754 (3) |
| Single | 93,460 (98.3) | 288,890 (98.1) | 123, 511 (97) |
| Intrauterine death | | | |
| Live birth | 94,434 (99.3) | 292,634 (99.4) | 126,076 (99.1) |
| Still birth | 673 (0.7) | 1766 (0.6) | 1189 (0.9) |
| Maternal age | | | |
| <20 | 2,513 (2.6) | 11,218 (3.8) | 10,647 (8.4) |
| 20-29 | 42,412 (44.6) | 115, 757 (39.3) | 54,948 (43.2) |
| 30-39 | 46,491 (48.9) | 151,697 (51.5) | 55,972 (43.2) |
| 40-59 | 3,691 (3.9) | 15,737 (5.3) | 5,698 (4.5) |
| Comorbidity | | | |
| 1 or more of the following comorbidities | 1,491 (1.6) | 11,524 (3.9) | 14,888 (11.7) |
| Obesity | 578 (0.6) | 10,2000 (3.5) | 8,824 (6.9) |
| Hypertension | 49 (0.1) | 122 (0.0) | 1,905 (1.5) |
| Diabetes | 322 (0.3) | 46 (0.0) | 2,011 (1.6) |
| Drugs and alcohol abuse | 597 (0.6) | 1,215 (0.4) | 3,663 (2.9) |
| Calendar year | | | |
| 2008 | 15,903 (16.7) | 46,606 (15.8) | 21,857 (17.2) |
| 2009 | 16,793 (17.7) | 48,540 (16.5) | 20,856 (16.4) |
| 2010 | 16,979 (17.9) | 49,946 (17.0) | 20,856 (16.4) |
| 2011 | 16,810 (17.7) | 50,363 (17.1) | 20,843 (16.4) |
| 2012 | 15,551 (16.4) | 50,337 (17.1) | 21,445 (16.9) |
| 2013 | 13,071 (13.7) | 48,617 (16.5) | 21,408 (16.8) |

Study comparing SMM in Australia, England, and US

US:

<20 yo: 8.4% vs 2.6 or 3.8%

40-59: similar

Obesity: 7% vs 1.6 or 3.9%

HTN: 1.5% vs 0%

Diabetes: 1.6% vs 0%

Drug use: 3% vs 0%

Table 2. Severe morbidity during delivery Hospitalizations, according to severe morbidity Category, 2008-2013. Severe maternal morbidity using the CDC-SMM criteria during delivery hospitalization.

| Country | Australia | | England | | United States | | Total | |
|---|-----------|---------------------------|---------|---------------------------|---------------|---------------------------|---------|---------------------------|
| | n | Rate per 1,000 deliveries | n | Rate per 1,000 deliveries | n | Rate per 1,000 deliveries | n | Rate per 1,000 deliveries |
| Deliveries | 95,107 | | 294,409 | | 127,265 | | 516,781 | |
| Total CDC-SMM (excluding transfusion, but including overlap between transfusion and other categories) | 785 | 8.3 | 1531 | 5.2 | 2017 | 15.8 | 4333 | 8.4 |
| Acute renal failure | 126 | 1.3 | 89 | 0.3 | 358 | 2.8 | 573 | 1.1 |
| Liver failure | 9 | 0.1 | 2 | 0.0 | 21 | 0.2 | 32 | 0.1 |
| Adult respiratory distress | 37 | 0.4 | 90 | 0.3 | 204 | 1.6 | 331 | 0.6 |
| Shock | 40 | 0.4 | 58 | 0.2 | 110 | 0.9 | 208 | 0.4 |
| Cerebrovascular accident | 19 | 0.2 | 37 | 0.1 | 95 | 0.7 | 151 | 0.3 |
| Thrombotic embolism | 51 | 0.5 | 60 | 0.2 | 52 | 0.4 | 163 | 0.3 |
| Amniotic fluid embolism | 3 | 0.0 | 1 | 0.0 | 11 | 0.1 | 15 | 0.0 |
| Eclampsia | 53 | 0.6 | 107 | 0.4 | 169 | 1.3 | 329 | 0.6 |
| Sepsis | 55 | 0.6 | 45 | 0.2 | 61 | 0.5 | 161 | 0.3 |
| Complications of an anesthesia | 10 | 0.1 | 29 | 0.1 | 37 | 0.3 | 76 | 0.1 |
| Cardiac events/procedures | 79 | 0.8 | 142 | 0.5 | 298 | 2.3 | 519 | 1.0 |
| Cardiomyopathy or heart failure | 73 | 0.8 | 127 | 0.4 | 247 | 1.9 | 447 | 0.9 |
| AMI | 1 | 0.0 | 2 | 0.0 | 30 | 0.2 | 33 | 0.1 |
| Cardiac arrest and ventricular fibrillation | 8 | 0.1 | 9 | 0.0 | 25 | 0.2 | 42 | 0.1 |
| Conversion of cardiac rhythm | 3 | 0.0 | 5 | 0.0 | 18 | 0.1 | 26 | 0.1 |
| Disseminated intravascular coagulation | 208 | 2.2 | 637 | 2.2 | 662 | 5.2 | 1507 | 2.9 |
| Sickle cell anemia with crisis | 0 | 0.0 | 26 | 0.1 | 57 | 0.4 | 83 | 0.2 |
| Intracranial injuries | 12 | 0.1 | 1 | 0.0 | 7 | 0.1 | 20 | 0.0 |
| Internal injuries thorax/abdomen/pelvis | 94 | 1.0 | 7 | 0.0 | 15 | 0.1 | 116 | 0.2 |
| Aortic aneurysm | 2 | 0.0 | 6 | 0.0 | 0 | 0.0 | 8 | 0.0 |
| Ventilation | 100 | 1.1 | 236 | 0.8 | 170 | 1.3 | 506 | 1.0 |
| Transfusion | 2340 | 24.6 | 214 | 0.7 | 2817 | 22.1 | 5371 | 10.4 |
| Hysterectomy | 89 | 0.9 | 89 | 0.3 | 282 | 2.2 | 460 | 0.9 |
| Invasive hemodynamic monitoring | 3 | 0.0 | 5 | 0.0 | 55 | 0.4 | 63 | 0.1 |
| Temporary tracheostomy | 1 | 0.0 | 7 | 0.0 | 20 | 0.2 | 28 | 0.1 |

VT

8.8/1000

0.6/1000

97/1000

Severe HTN

208/1000

PPH

OBSTETRIC CARE

CONSENSUS

Number 2 • February 2015
Reaffirmed 2016

This document was developed jointly by the American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine with the assistance of M. Kathryn Menard, MD, MPH; Sarah Kilpatrick, MD, PhD; George Saade, MD; Lisa M. Hollier, MD, MPH; Gerald F. Joseph Jr, MD; Wanda Barfield, MD; William Callaghan, MD; John Jennings, MD; and Inanna Coover, MD.

Levels of Maternal Care

Abstract: In the 1970s, studies demonstrated that timely access to risk-appropriate neonatal and obstetric care could reduce perinatal mortality. Since the publication of the *Toward Improving the Outcome of Pregnancy* report, more than three decades ago, the conceptual framework of regionalization of care of the woman and the newborn has been gradually separated with recent focus almost entirely on the newborn. In this current document, maternal care refers to all aspects of antepartum, intrapartum, and postpartum care of the pregnant woman. The proposed classification system for levels of maternal care pertains to birth centers, basic care (level I), specialty care (level II), subspecialty care (level III), and regional perinatal health care centers (level IV). The goal of regionalized maternal care is for pregnant women at high risk to receive care in facilities that are prepared to provide the required level of specialized care, thereby reducing maternal morbidity and mortality in the United States.

CDC Levels of Care Assessment Tool (CDC LOCATe)

On This Page

[Risk-Appropriate Care](#)

[How CDC LOCATe Data Are Used](#)

[CDC Levels of Care Assessment Tool](#)

[Learn More about CDC LOCATe and Levels of Care](#)

[The CDC LOCATe Process](#)

Next year VCHIP:

- Interview each VT hospital for LOCATE
- Become AIM state
- Explore what VT can do to reduce Severe Maternal Morbidity
- How tertiary care center can help
- Recognize importance of smaller hospitals in VT for numerous reasons: how can local hospitals be supported
- (Discharge coding is important. The Discharge Data Set will be used nationally for benchmarking more and more)

CDC Levels of Care Assessment Tool (CDC LOCATe)

On This Page

[Risk-Appropriate Care](#)

[How CDC LOCATe Data Are Used](#)

[CDC Levels of Care Assessment Tool](#)

[Learn More about CDC LOCATe and Levels of Care](#)

[The CDC LOCATe Process](#)



[About Us](#) [Patient Safety Bundles](#) [Patient Safety Tools](#) [Get Involved](#) [Safety Action Series](#) [Voices of Impact](#) [AIM Program](#)

ALLIANCE FOR INNOVATION ON MATERNAL HEALTH PROGRAM

[Home](#) // [Alliance for Innovation on Maternal Health Program](#)



ALLIANCE FOR INNOVATION ON MATERNAL HEALTH **A I M**

WHAT IS AIM?

The United States has the highest maternal mortality rate of any high resource country—and it is the only country outside of Afghanistan and Sudan where the rate is rising. The Alliance for Innovation on Maternal Health (AIM) is a **national data-driven maternal safety and quality improvement initiative** based on proven implementation approaches to improving maternal safety and outcomes in the U.S. Our end goal is to eliminate preventable maternal mortality and severe morbidity across the United States.

AIM works through state teams and health systems to align national, state, and hospital level quality improvement efforts to improve overall maternal health outcomes.

Any U.S. hospital in a participating AIM state or hospital system can join the **growing and engaged AIM community** of multidisciplinary healthcare providers, public health professionals, and cross-sector stakeholders who are committed to improving maternal outcomes in the U.S.

AIM is funded through a cooperative agreement with the Maternal and Child Health Bureau (MCHB)-Health Resource Services Administration through August 2018.

AIM Program

ALLIANCE FOR INNOVATION ON MATERNAL HEALTH

THE PROCESS OF AIM

AIM-SUPPORTED PATIENT SAFETY BUNDLES

THE ALLIANCE

AIM STATES & SYSTEMS

AIM eMODULES

AIM RESOURCES

AIM DATA

NATIONAL COLLABORATIVE ON MATERNAL OUID



The American College of
Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS



Society for
Maternal-Fetal
Medicine

OBSTETRIC CARE CONSENSUS

Number 5 • September 2016

This document was developed by the American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine in collaboration with Sarah K. Kilpatrick, MD, PhD; Jeffrey L. Ecker, MD; and the Centers for Disease Control and Prevention's representative member William M. Callaghan, MD. The views do not necessarily represent those of the Centers for Disease Control and Prevention or the U.S. government.

*The information reflects
emerging clinical and scientific*

Severe Maternal Morbidity: Screening and Review

ABSTRACT: This document builds upon recommendations from peer organizations and outlines a process for identifying maternal cases that should be reviewed. Severe maternal morbidity is associated with a high rate of preventability, similar to that of maternal mortality. It also can be considered a near miss for maternal mortality because without identification and treatment, in some cases, these conditions would lead to maternal death. Identifying severe morbidity is, therefore, important for preventing such injuries that lead to mortality and for highlighting opportunities to avoid repeat injuries. The two-step screen and review process described in this document is intended to efficiently detect severe maternal morbidity in women and to ensure that each case undergoes a review to determine whether there were opportunities for improvement in care. Like cases of maternal mortality, cases of severe maternal morbidity merit quality review. In the absence of consensus on a comprehensive list of conditions that represent severe maternal morbidity, institutions and systems should either adopt an existing screening criteria or create their own list of outcomes that merit review.

ALLIANCE FOR INNOVATION ON MATERNAL HEALTH PROGRAM

[Home](#) // [Alliance for Innovation on Maternal Health Program](#)



ALLIANCE FOR INNOVATION ON MATERNAL HEALTH **AIM**

WHAT IS AIM?

The United States has the highest maternal mortality rate of any high resource country—and it is the only country outside of Afghanistan and Sudan where the rate is rising. The Alliance for Innovation on Maternal Health (AIM) is a **national data-driven maternal safety and quality improvement initiative** based on proven implementation approaches to improving maternal safety and outcomes in the U.S. Our end goal is to eliminate preventable maternal mortality and severe morbidity across the United States.

AIM works through state teams and health systems to align national, state, and hospital level quality improvement efforts to improve overall maternal health outcomes.

Any U.S. hospital in a participating AIM state or hospital system can join the **growing and engaged AIM community** of multidisciplinary healthcare providers, public health professionals, and cross-sector stakeholders who are committed to improving maternal outcomes in the U.S.

AIM is funded through a cooperative agreement with the Maternal and Child Health Bureau (MCHB)-Health Resource Services Administration through August 2018.

AIM Program

ALLIANCE FOR INNOVATION ON MATERNAL HEALTH

THE PROCESS OF AIM

AIM-SUPPORTED PATIENT SAFETY BUNDLES

THE ALLIANCE

AIM STATES & SYSTEMS

AIM eMODULES

AIM RESOURCES

AIM DATA

NATIONAL COLLABORATIVE ON MATERNAL OUI

Table 3. Adjusted OR and 95% CI of Severe Maternal Morbidity. Adjusted OR and 95% CI of SMM by maternal risk factor and country of delivery from 2007-2013. Adjusted for year of delivery and all other variables in the model.

| | United States | Australia | England |
|--------------------------|-----------------------|-----------------------|-----------------------|
| | Adjusted OR (95 % CI) | Adjusted OR (95 % CI) | Adjusted OR (95 % CI) |
| Maternal Age | | | |
| <=19 | 1.1 [0.93 - 1.3] | 1.24 [0.81 - 1.92] | 0.8 [0.58 - 1.11] |
| 20-29 (referent) | | | |
| 30-<40 | 1.02 [0.93 - 1.12] | 1.23 [1.06 - 1.43] | 1.32 [1.18 - 1.47] |
| >=40 | 1.56 (1.30-1.87) | 2.18 (1.65-2.89) | 2.01 (1.66-2.43) |
| Obesity | 1.15 (1.0-1.35) | 3.07 (1.84-5.11) | 1.35 (1.06-1.72) |
| Hypertension | 4.62 (3.85-5.56) | 6.63 (2.38-18.51) | 12.56 (6.16-25.62) |
| Diabetes | 1.83 (1.44-2.33) | 2.72 (1.39-5.33) | 10.95 (2.57-33.55) |
| Drugs and Alcohol | 1.71 (1.39-2.10) | 3.03 (1.77-5.17) | 2.19 (1.26-3.79) |
| Year of delivery | | | |
| 2013 is referent | | | |
| 2008 | 0.83 [0.71 - 0.97] | 0.81 [0.63 - 1.05] | 0.93 [0.75 - 1.15] |
| 2009 | 0.95 [0.81 - 1.11] | 0.76 [0.59 - 0.98] | 1.61 [1.33 - 1.93] |
| 2010 | 1.01 [0.86 - 1.17] | 1.02 [0.8 - 1.29] | 1.99 [1.67 - 2.38] |
| 2011 | 1.16 [1 - 1.35] | 0.8 [0.62 - 1.03] | 1.64 [1.37 - 1.97] |
| 2012 | 1.03 [0.88 - 1.19] | 0.93 [0.72 - 1.19] | 1.18 [0.97 - 1.43] |

Diabetes and HTN are BAD
Especially in Engla

VERMONT

Screening, Treatment & Access for Mothers and Perinatal Partners (**STAMPP**)

Goal: To improve the mental health and well-being of pregnant and postpartum women and their children and families by developing and sustaining a coordinated system of mental health supports for pregnant and postpartum women

Objectives

- ▶ Assess **resources, gaps and opportunities** in our existing system of care
- ▶ Increase capacity of Vermont's **health care providers** to educate, screen, diagnose, prevent, and treat
- ▶ Increase capacity of Vermont's **mental health system** to diagnose and treat
- ▶ Increase capacity of the **human service workforce** to screen and support
- ▶ Identify and support innovative **financing options**
- ▶ Access to comprehensive maternal depression and **educational information** and support and treatment options
- ▶ Develop up-to-date, **real-time referral resources at the community level**
- ▶ Conduct a **comprehensive evaluation**

Work Plan: Health Care Provider Capacity

Quality improvement in primary care (pediatrics, family medicine, internal medicine)

```
graph TD; A[Quality improvement in primary care (pediatrics, family medicine, internal medicine)] --> B[Quality improvement in OB settings and Family Wellness Coaching and care coordination]; B --> C[Psychiatric consultation in primary care and OB];
```

Quality improvement in OB settings and Family Wellness Coaching and care coordination

Psychiatric consultation in primary care and OB

Work Plan: Mental Health Capacity

Psychiatric consultation to mental health providers and psychiatrists

Telehealth to increase psychiatric access in rural communities

Designated mental health agencies pilot innovative strategies to provide treatment

Support groups of women and families with lived experience

Work Plan: Human Service Workforce

Provide ongoing training and professional development on maternal depression and related topics



Provide seed funding to community service agencies to develop and implement evidence-based support groups and wellness strategies

Work Plan: Increase Consumer Awareness

Conduct formative research to assess current provider practices, educational materials and modes, and communication methods



Create new, high impact materials/ website/ social media for target audiences



Use Vermont Help Me Grow/2-1-1 and other public venues or opportunities to provide clear instruction for women and families

Questions?

This webinar was recorded and will be available to view within 5 days at vchipobstetrics.org



OB/GYN Webinar Series 2018-2019

Upcoming Webinar:

Vermont OB/GYN Educational Webinars

Presented by Vermont Department of Health and the University of Vermont Medical Center's Obstetrics, Gynecology & Reproductive Sciences

[Home](#) [About](#) [Webinars](#) [Contact](#)



**Stay Tuned for 2019-2020 Webinar Dates!
We will email you!**

Topic ideas!!???? Let us know!

Visit: vchipobstetrics.org

Contact: Amanda.slater@uvmhealth.org



The University of Vermont
LARNER COLLEGE OF MEDICINE



Thank you!

