
**Maternal Mortality and Morbidity
Task Force and Department of State
Health Services**

Joint Biennial Report

**As Required By
Chapter 34, Texas Health and Safety Code
Section 34.015**

**Department of State Health Services
July, 2016**

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Executive Summary

Background

The Maternal Mortality and Morbidity Task Force (task force) and Department of State Health Services (DSHS) jointly submit the 2016 Biennial Report as required by [Chapter 34, Texas Health and Safety Code, Section 34.015](#). The Biennial Report contains the task force's findings and recommendations to help reduce the incidence of pregnancy-related deaths and severe maternal morbidity in Texas.

Summary of Findings

Based on analysis of maternal death data from calendar years 2011-2012, the task force found that 1) Black women bear the greatest risk for maternal death; 2) cardiac events, overdose by licit or illicit prescription drugs, and hypertensive disorders are the leading causes of maternal death; 3) a majority of maternal deaths occur more than 42 days after delivery; and 4) data quality issues related to the death certificate make it difficult to identify a maternal or “obstetric” death.

The task force reviewed cases of maternal death and observed that mental health and substance use disorders play a significant role in maternal death, and also found repeated missed opportunities to screen for and refer women to treatment for mental health and substance use disorders. Secondly, the task force found notable variation in how deaths are investigated depending on the investigating system involved, and that some deaths that should have been investigated by a medical examiner were not appropriately routed to the medical examiner system. Finally, the task force found that redaction of cases prior to nurse abstraction has prolonged the time to review maternal death cases.

In reviewing calendar year 2012 severe maternal morbidity (SMM) data, new methodologies of calculating severe maternal morbidity revealed a higher prevalence of SMM than previously found by past studies. Furthermore, the task force found that hemorrhage and blood transfusion cases largely drive severe maternal morbidity in Texas, and that racial/ethnic and geographic disparities exist in cases of hemorrhage and/or blood transfusion, with black women and women in south and east Texas bearing a disproportionate burden of SMM due to these causes. Lastly, the task force found that mental illness and substance use disorders contribute to severe maternal morbidity.

Summary of Recommendations

To address the above findings, the task force makes the following recommendations to help reduce the incidence of pregnancy-related deaths and severe maternal morbidity in this state:

1. Increase access to health services during the year after delivery and throughout the interconception period to improve continuity of care, enable effective care transitions, promote safe birth spacing, reduce maternal morbidity, and reduce the cost of care in the Medicaid program.
2. Increase provider and community awareness of health inequities and implement programs that increase the ability of women to self-advocate.

3. Increase screening for and referral to behavioral health services.
4. Increase staffing resources in support of the task force.
5. Promote best practices for improving the quality of maternal death reporting and investigation.
6. Improve the quality of death certificate data.

Introduction

[Senate Bill \(S.B.\) 495](#), 83rd Texas Legislature, Regular Session, 2013, amended [Chapter 34, Texas Health and Safety Code](#), to establish the Maternal Mortality and Morbidity Task Force (task force) to study maternal mortality and morbidity in Texas.

The task force is charged to:

- Study and review cases of pregnancy-related deaths, and trends in severe maternal morbidity
- Determine the feasibility of the task force studying cases of severe maternal morbidity
- Make recommendations to help reduce the incidence of pregnancy-related deaths and severe maternal morbidity in this state

Task force members serve staggered six-year terms, with the terms of four or five members, as appropriate, expiring February 1 of each odd-numbered year. The task force meets quarterly. Meetings are closed to the public, per statute, due to the confidential nature of the task force's work. On behalf of the task force, the Department of State Health Services (DSHS) and task force members may consult with relevant experts and stakeholders, and representatives of relevant state professional associations and organizations to perform the functions of the task force. All information pertaining to a pregnancy-related death or severe maternal morbidity are treated as confidential.

Statutory Requirement

Section 34.015 of the Health and Safety Code requires that the joint report include the task force's recommendations under Section 34.005(3) to help reduce the incidence of pregnancy-related deaths and severe maternal morbidity in Texas.

Unless continued in existence as provided by Chapter 325, Government Code (Texas Sunset Act), the task force is abolished and Chapter 34, Texas Health and Safety Code expires September 1, 2019.

Background

In December 2013, the DSHS Commissioner appointed the 15-member multidisciplinary task force. Dr. Lisa Hollier, Professor and Medical Director at Baylor College of Medicine in Houston and Maternal-Fetal Medicine Specialist, continues to serve as the Chair; and Dr. Gary Hankins, Professor of Maternal-Fetal Medicine and Chairman of the Obstetrics and Gynecology Department at the University of Texas Medical Branch in Galveston and Maternal-Fetal Medicine Specialist, continues to serve as Vice-Chair. See Appendix A for the full list of task force members.

DSHS determined that all cases of maternal death in Texas must be reviewed, with the exception of motor accidents and non-pregnancy-related cancers. The task force uses the Centers for Disease Control and Prevention (CDC) definition of **pregnancy-related death**, which is defined as the death of a woman while pregnant or within one year of termination of pregnancy,

irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by her pregnancy or its management, including from: (a) a pregnancy complication; (b) a chain of events initiated by pregnancy; or (c) the aggravation of an unrelated condition by the physiologic effects of pregnancy.

DSHS analyzed aggregate data of severe maternal morbidity and mortality to identify trends. DSHS is in the process of establishing and maintaining an electronic database to track cases of pregnancy-related deaths and severe maternal morbidity to assist DSHS and the task force in performing their required functions.

Findings

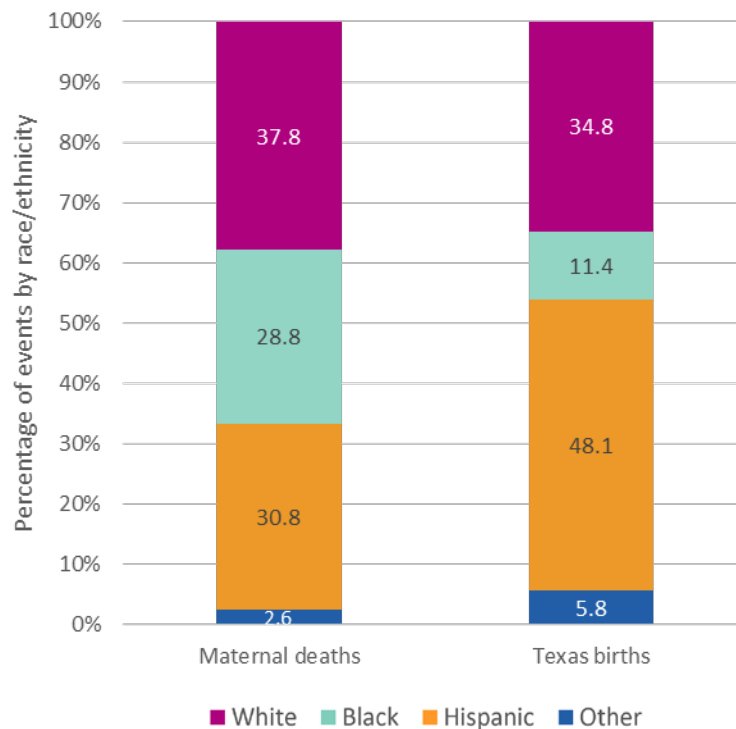
A. Statewide Trends of Maternal Deaths

Statewide trends of maternal deaths that occurred in calendar years 2011-2012 were analyzed. For the purposes of this analysis, any woman who died within 365 days of a birth or fetal death event was classified as a maternal death. Motor accidents and non-pregnancy-related cancers were excluded per protocol. There were 189 maternal deaths in 2011-2012.

Finding #1 — Black women bear the greatest risk for maternal death

Figure 1 shows the percentage of maternal deaths in 2011-2012, alongside the percentage of Texas births during the same time period, by mother's race/ethnicity. Though only 11.4 percent of all births in Texas were to Black women, they accounted for 28.8 percent of all maternal deaths. In contrast, White women accounted for similar proportions of total births and total maternal deaths, and Hispanic women and women of Other racial/ethnic groups accounted for a lower proportion of total maternal deaths than for total births. In other words, Black women made up a disproportionately large proportion of total maternal deaths in 2011-2012.

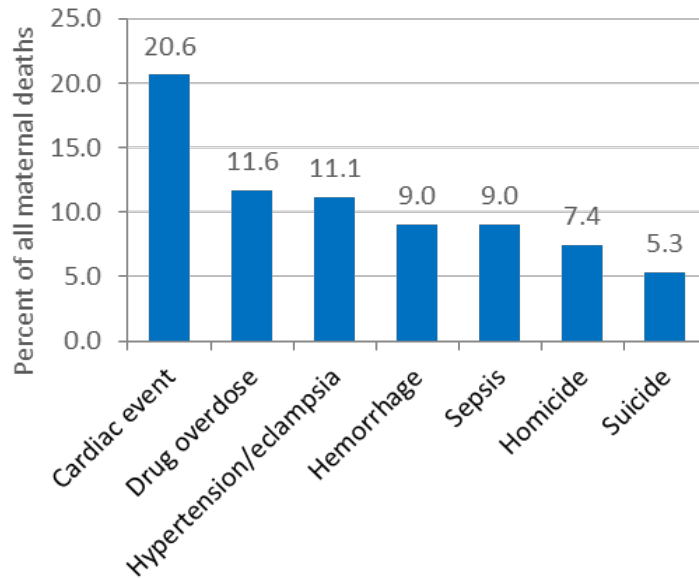
Figure 1. Percentage of Texas maternal deaths and births in 2011-2012 by mother's race/ethnicity.



Source: CHS Birth and Death Files, 2011-2012
Prepared by: Office of Program Decision Support, FCHS, DSHS, 2016

Finding #2 — Overdose by licit or illicit prescription drugs emerged as a leading cause of maternal death

Figure 2. Top causes of maternal death in Texas in 2011-2012.



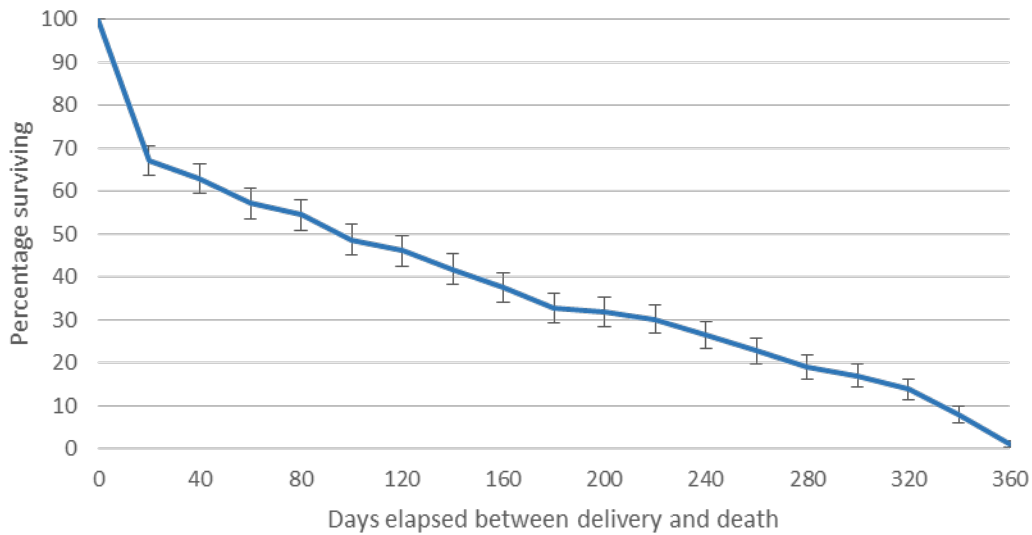
Source: CHS Death File, 2011-2012
Prepared by: Office of Program Decision Support, FCHS, DSHS, 2016

The top causes of maternal death in 2011-2012 are displayed in Figure 2. Cardiac events and hypertension/eclampsia were ranked first and third most common causes of maternal death, which is consistent with medical literature. However, overdose by ingestion of drugs emerged as the second leading cause of maternal death in 2011-2012 (11.6 percent). Review of actual case records (including postmortem toxicology and police reports) showed that the majority of these maternal deaths involved licit or illicit prescription opioids. This finding is alarming and may represent an ongoing shift in maternal causes of death. Indeed, prescription drug deaths are rising in the United States and have been identified as a major public health crisis (ASTHO, 2016).

Finding #3 — A majority of maternal deaths occur later than 42 days after delivery

Maternal deaths were confirmed by linking each mother’s information to a birth or fetal death event occurring up to 365 days prior. Time between the two events was calculated in days and a survival plot was generated to help visualize the relationship between maternal mortality and time. Figure 3 shows the percent of women in the 2011-2012 maternal death cohort who remained alive at particular points in time over the 365 days following their delivery.

Figure 3. Survival plot of time elapsed between delivery and death, 2011-2012 maternal deaths



Source: CHS Birth, Fetal Death, and Death Files, 2011-2012
 Prepared by: Office of Program Decision Support, FCHS, DSHS, 2016

The World Health Organization defines all maternal deaths within 42 days of termination of pregnancy as pregnancy-related deaths, irrespective of the cause of death (WHO, 2016). However, close to 60 percent of maternal deaths in 2011-2012 occurred after 42 days post-delivery (Figure 3). Case review of these deaths will determine whether they were pregnancy-related, -associated, or neither. Nevertheless, it is clear that women remain at-risk for the first year after their pregnancy has ended. It is possible that lack of continuity of care plays a role in these later maternal death outcomes. Regular comprehensive postpartum care during the first year after giving birth is necessary to ensure that health issues are appropriately diagnosed, managed, and treated, thereby reducing the risk for maternal mortality.

Finding #4 — Data quality issues related to the death certificate make it difficult to identify a maternal or “obstetric” death

A number of maternal death cases identified in 2011-2012 were found to have incorrect ICD-10 coding for cause of death. Death certificates are completed by physicians, medical examiners, or justices of the peace. Causes of death are recorded in designated spaces as immediate or underlying. These cause of death “narratives” are then coded using software from the National Center for Health Statistics (NCHS). Upon review of ICD-10 codes and cause of death narratives, many inconsistencies were found.

The national standard for identification of maternal deaths involves using ICD-10 codes O00-O99 (“obstetric” or “O-codes”). The Task Force has found this method to be unreliable because it results in too many non-obstetric deaths being miscoded as “obstetric” and too few maternal deaths being coded as “obstetric” despite occurring within 365 days of pregnancy termination. For 2011-2012, there were 189 maternal deaths identified, of which only 79 had “obstetric” coded as the cause of death. Conversely, 181 total deaths in 2011-2012 were coded as “obstetric”, when the narrative on the death certificate did not indicate pregnancy. Further

examination of the coding mechanism used by NCHS is necessary, and a death certificate quality improvement initiative is recommended.

For this examination of the statewide trends, maternal deaths were identified by linking the mothers' information from their birth/fetal death record with information from their own death record occurring within one year of pregnancy termination, regardless of the ICD-10 code assigned. Some alternative methodologies do begin by identifying all obstetric deaths, labeled with an "O-code" (ICD-10 code O00-O99). However, this approach likely fails to identify maternal deaths with non-natural causes, such as overdose, suicide, and homicide.

B. Review of Maternal Death Cases

After the necessary formative work of developing governance structures, researching methodologies and best practices in maternal mortality and morbidity review, and developing processes, instruments, and standards for maternal death review, the task force began reviewing cases of maternal death occurring in 2012. A total of 11 of the 89 maternal death cases that occurred in calendar year 2012 have been reviewed to date by the task force. In general, cases with smaller case records were prioritized for review first to test the review instruments and to allow task force members the opportunity to gain knowledge and experience while providing feedback on the review process.

Finding #1 — Opportunities exist to screen and refer women with mental health and substance use needs

In a number of the cases reviewed by the task force, mental health and substance use disorders played a significant role in the maternal death. In reviewing these cases, teams discovered repeated missed opportunities to screen women for mental and behavioral health issues and to refer them to treatment.

Finding #2 — Notable variation in how maternal deaths are investigated

Texas has a mixed system of county-based death investigation where inquests into the death of a person are performed within a medical examiner system or a justice of the peace system. The task force found notable variation in how maternal death investigations are conducted, as well as inconsistencies in the quality of the investigations. The task force also found a lack of standardization in how maternal deaths are reported to the proper authority (be it medical examiner or justice of the peace), leading to some maternal deaths being routed to the inappropriate system — a maternal death that should have been investigated by a medical examiner or justice of the peace was either not reported or was incorrectly reported to the investigating agency, leading to a missed opportunity to perform the needed laboratory tests.

Lastly, case reviews revealed a lack of standardization in the laboratory tests, specifically toxicologic testing, ordered by maternal death investigators. In several instances, the pertinent laboratory tests were not performed at the time of investigation, which hindered the task force's ability to assess pregnancy-relatedness and/or preventability of death.

Finding #3 — Redaction of cases prior to nurse abstraction has prolonged the time to review maternal death cases

A DSHS nurse has supported the task force by abstracting, consolidating, synthesizing, and summarizing relevant medical information from across all case records for a given case into a single de-identified case report so that the task force can then review each case in detail to ascertain the cause(s) and underlying contributors of maternal death, including identification of issues that could potentially be remediated or altogether prevented through health system improvements.

According to the Nursing Practice Act (NPA), it is a nurse's duty to report another nurse, health care practitioner, agency or facility (provider) that the reporting nurse has reasonable cause to believe has exposed a patient to substantial risk or harm by failing to provide care in conformity with minimum practice standards or statutory, regulatory, or accreditation standards. This requirement is consistent with the American Nursing Association's *Nursing Code of Ethics* to which all nurses are bound. In the course of record review, the DSHS nurse encounters information that could contribute to the nurse's judgement for the need to report. However, Texas Health and Safety Code Chapter 34, *Maternal Mortality and Morbidity Task Force* specifies that confidential information acquired by the department, including identifying information of an individual or a health care provider, is privileged and may not be disclosed to any person or to members of the task force.

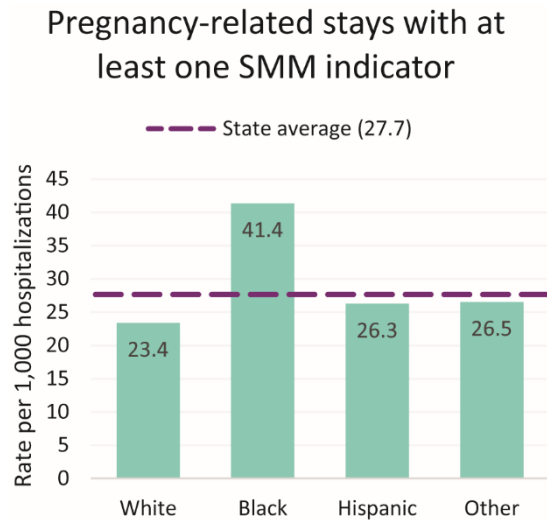
To protect the integrity of both the nurse and the case review process, all provider-identifying information is redacted from case records by a non-licensed DSHS staff prior to the nurse's review and abstraction of the records. This process allows for the DSHS redactors to capture the provider-identifying information needed to obtain additional case records while avoiding the potential need for a nurse abstractor to file a report in accordance with nursing practice ethical and legal standards but in conflict with Texas Health and Safety Code Chapter 34. Although de-identification of all case information prepared for and provided to the task force members was anticipated, redaction of case records prior to the DSHS nurse abstractor's review has considerably increased the number of staff hours and resources that would otherwise be required for the case review process, and has therefore lengthened the time required to prepare a case for the task force's review.

C. Statewide Trends in Maternal Morbidity

Statewide trends of severe maternal morbidity that occurred in calendar year 2012 were analyzed.

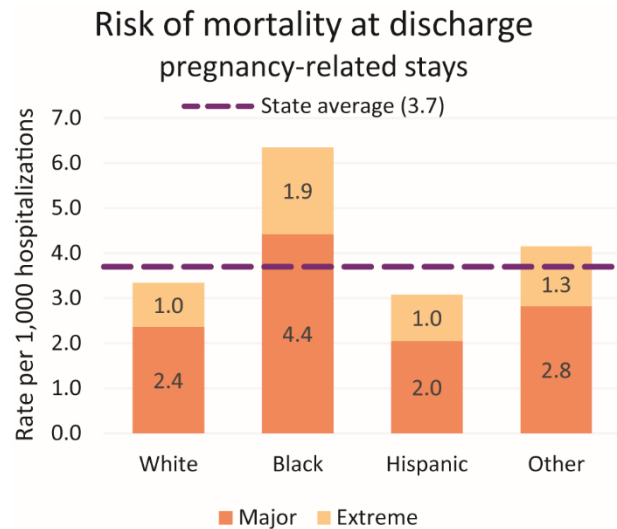
Finding #1 — Prevalence estimates of severe maternal morbidity (SMM) differ greatly by methodology

Figure 4. SMM during pregnancy-related hospitalization by race/ethnicity, 2012.



Source: CHS Hospital Inpatient Discharge File, 2012
Prepared by: Office of Program Decision Support, FCHS, DSHS, 2016

Figure 5. Mortality risk at discharge from pregnancy-related hospitalization by race/ethnicity, 2012.



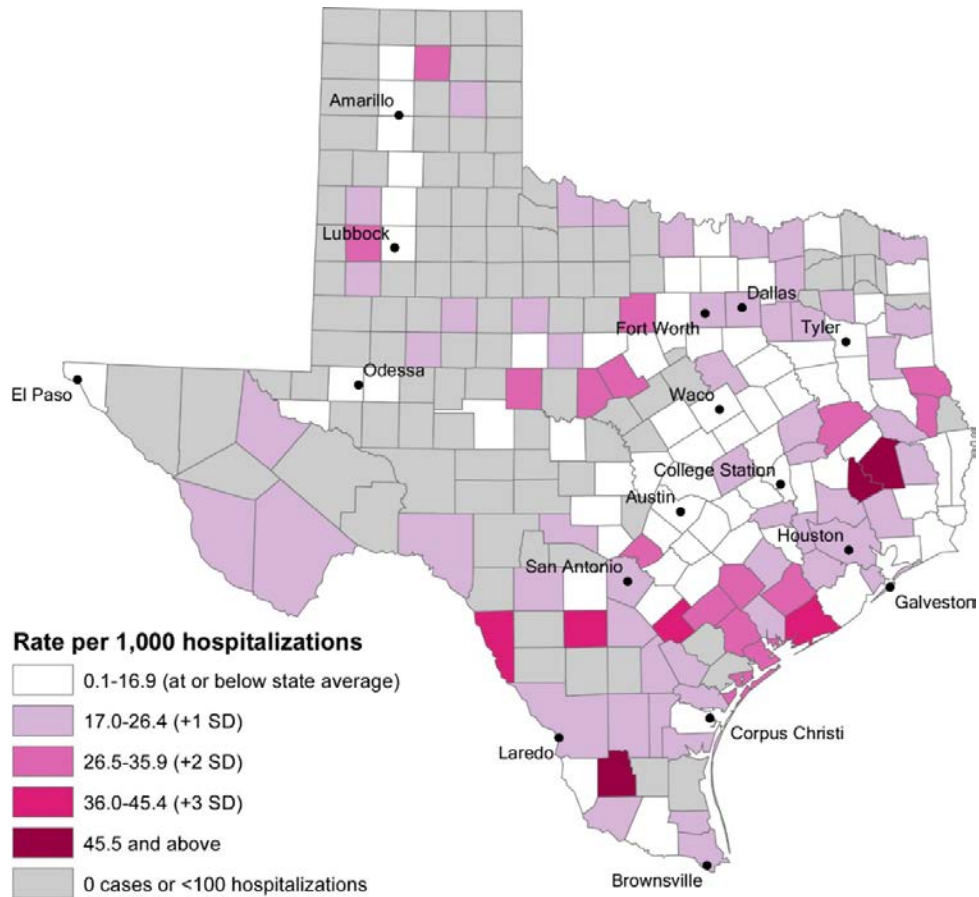
Source: CHS Hospital Inpatient Discharge File, 2012
Prepared by: Office of Program Decision Support, FCHS, DSHS, 2016

A previously reported analysis conducted in 2014 calculated rates of severe maternal morbidity (SMM) using a risk of mortality (ROM) classification code as a proxy measure. ROM estimates the likelihood of a hospitalized patient dying, regardless of illness severity. In an effort to align Texas SMM measurement to federal standards, a change in methodology was made. For this report, SMM was identified using ICD-9-CM diagnosis and procedure codes (Appendix B) provided by the Centers for Disease Control and Prevention (CDC, 2015; Callaghan et al., 2012). All obstetric hospitalizations with at least one SMM indicator were counted. Figures 4 and 5 demonstrate differences in the estimation of SMM prevalence when using the CDC algorithm (Figure 4) compared to the previously reported ROM method (Figure 5). Using the CDC methodology, SMM rates varied from 23.4 to 41.4 per 1,000 hospitalizations, compared with much smaller rates of 3.0 to 6.3 per 1,000 hospitalizations obtained using the ROM method. These differing results were to be expected, since these two methods are not analogous. It is evident that the CDC approach was not only a more precise SMM measure by defining specific conditions that contribute to SMM, but also more accurate as a measure for SMM by identifying nearly eight times more cases than the ROM method. One trend remained obvious regardless of methodology – Black women were much more likely to experience SMM during a pregnancy-related hospitalization compared to women of other races and ethnicities. Further, the risk of mortality at discharge from a pregnancy-related hospital stay was almost twice as high for Black women as it was for women in all other race/ethnic groups.

Finding #2 — Geographic and racial/ethnic disparities emerged in cases of hemorrhage and/or blood transfusion

Hemorrhage and blood transfusion cases largely drive severe maternal morbidity in Texas, with 16.9 per 1,000 obstetric hospitalizations involving hemorrhage or blood transfusion in calendar year 2012.

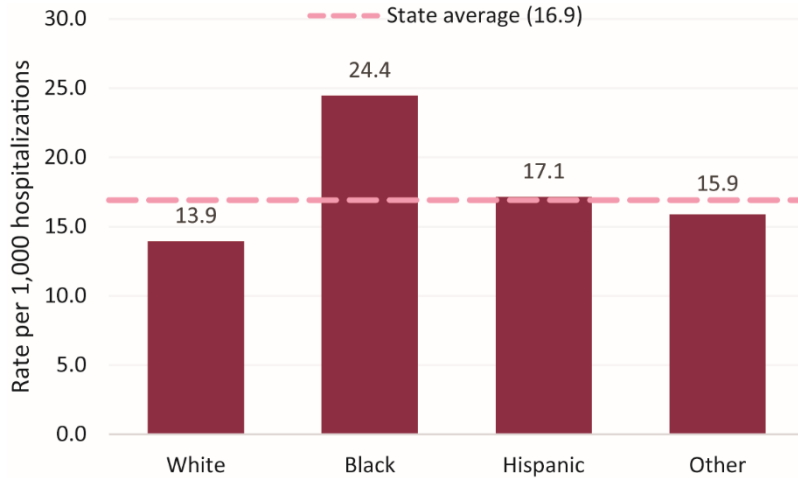
Figure 6. Rates of hemorrhage and/or blood transfusion by county, 2012.



Source: CHS Hospital Inpatient Discharge File, 2012
Prepared by: Office of Program Decision Support, FCHS, DSHS, 2016

Figure 6 shows rates of hemorrhage and/or blood transfusion per 1,000 (pregnancy-related) hospitalizations by county in 2012. The highest rates were observed in Jim Hogg County in South Texas, and in Polk and San Jacinto Counties in East Texas.

Figure 7. Rates of hemorrhage and/or blood transfusion by race/ethnicity, 2012.



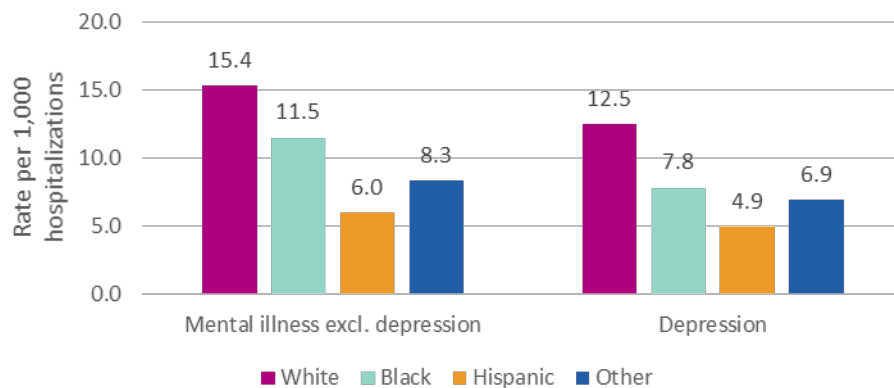
Source: CHS Hospital Inpatient Discharge File, 2012
Prepared by: Office of Program Decision Support, FCHS, DSHS, 2016

Figure 7 shows rates of hemorrhage and/or blood transfusion per 1,000 (pregnancy-related) hospitalizations in 2012, by race/ethnicity. Black women had the highest rate of being hospitalized for hemorrhage and blood transfusion (24.4 per 1,000 hospitalizations), whereas the rate for Hispanic women (17.1 per 1,000 hospitalizations) was only slightly above the state average, and the rates for White and Other women were below the state average (13.9 and 15.9 per 1,000 hospitalizations, respectively).

Finding #3 — Mental and behavioral health issues contribute to severe maternal morbidity

Mental illness and substance use disorders contribute to maternal morbidity and mortality. Depression can lead individuals to attempt or commit suicide. In addition, depression and chronic disease frequently co-occur as individuals with chronic illness are at increased risk for depression. According to the National Institute of Mental Health, people with depression have an increased risk of developing many chronic illnesses—including diabetes, cardiovascular disease and stroke. Mental illness can also contribute to, or be exacerbated by, substance use. While the CDC does not currently include psychosocial factors such as mental illness or substance use disorders in their measure of severe maternal morbidity, trends in both morbidity and mortality in Texas show that these conditions are impacting maternal health outcomes.

Figure 8. Mental health diagnoses during pregnancy-related hospitalizations by race/ethnicity, 2012

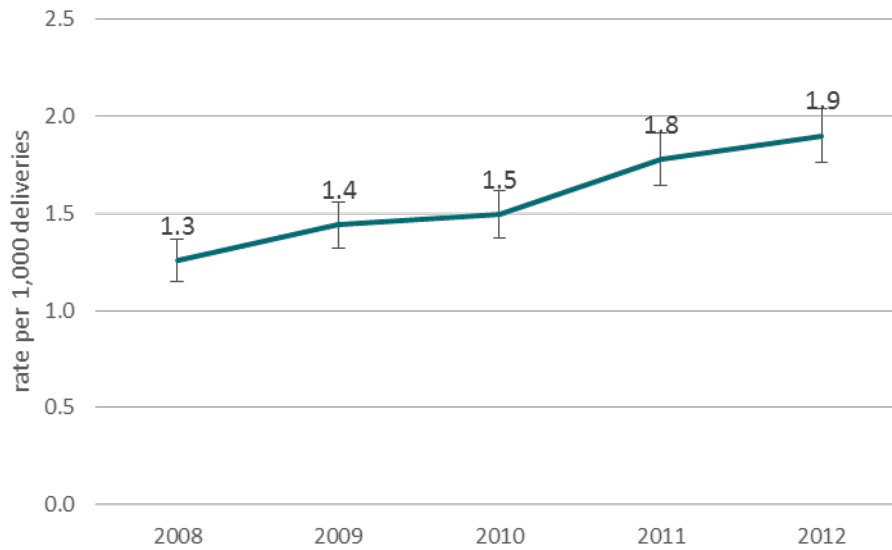


Source: CHS Hospital Inpatient Discharge File, 2012
 Prepared by: Office of Program Decision Support, FCHS, DSHS, 2016

Figure 8 displays the rate of diagnosed mental illness (excluding depression) and the rate of diagnosed depression per 1,000 (pregnancy-related) hospitalizations in 2012. White women had the highest rates of diagnosed mental illness of any kind (depression as well as other psychological illnesses) during pregnancy and the puerperium; Black women had the second highest rates. Hispanic women had the lowest rates of diagnosed mental illness during pregnancy, although the highest proportion of maternal deaths by suicide was observed among this race/ethnic group in 2011-2012. It is important to note that these data reflect only diagnoses and may not reflect actual prevalence of mental illness, including depression. Factors effecting likelihood of diagnosis, such as access to care, access to medical home, provider or health care system factors, care seeking behaviors, or other issues may contribute to lower prevalence of diagnosis among non-Whites.

Substance use can often be difficult to diagnose during delivery, hence women may be hospitalized for substance use only in extreme cases involving overdose, or if they had previously entered the facility for substance use treatment. Since opioids are the most commonly abused substances both in Texas and nationwide, a way to estimate the prevalence of substance use as a contributing factor to severe maternal morbidity may be to examine the rate of Neonatal Abstinence Syndrome (NAS) in newborns. We acknowledge that NAS is a result of prenatal opioid use, therefore the following analyses are limited to opioids only. However, in the wake of our nation’s opioid epidemic, we believe that these analyses are highly relevant and serve to represent a large proportion of prenatal substance use cases.

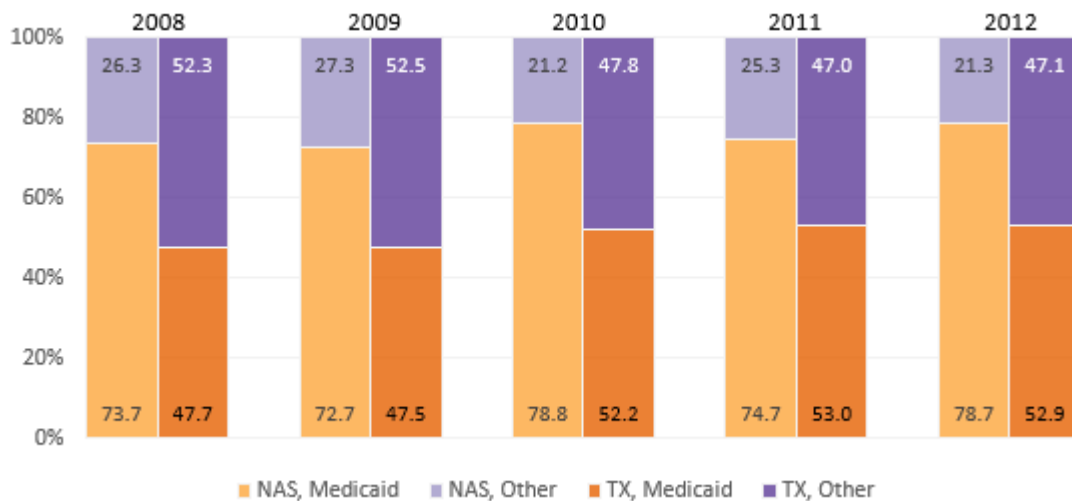
Figure 9. Five year trend of Neonatal Abstinence Syndrome hospitalizations, 2008-2012



Source: CHS Hospital Inpatient Discharge Public Use Data Files, 2008-2012
 Prepared by: Office of Program Decision Support, FCHS, DSHS, 2016

Figure 9 shows rates of NAS in Texas per 1,000 deliveries from 2008 to 2012. Rates of NAS have steadily increased during this time period, which suggests that more pregnant women are using opioids.

Figure 10. Neonatal Abstinence Syndrome cases and all Texas resident births by payer source, 2008-2012



Source: CHS Birth and Hospital Inpatient Discharge Public Use Data Files, 2008-2012
 Prepared by: Office of Program Decision Support, FCHS, DSHS, 2016

Figure 10 compares the percentage of NAS cases according to payer source (Medicaid vs. Other) with the percentage of all births in Texas according to payer (Medicaid vs. Other) in each

calendar year from 2008 to 2012. Whereas the majority of NAS cases occurred among patients with Medicaid (75.7 percent), only approximately half of all births in Texas were paid by Medicaid (50.7 percent). Postpartum substance abuse was also observed for several maternal deaths in 2011-2012. Among the 19 women with Medicaid insurance during pregnancy who later died of drug overdose, 14 (73.7 percent) died after the 60 day post-delivery mark, after Medicaid coverage typically expires.

Recommendations

Recommendation #1 — Increase access to health services during the year after delivery and throughout the interconception period to improve continuity of care, enable effective care transitions, promote safe birth spacing, reduce maternal morbidity, and reduce the cost of care in the Medicaid program

Preconception/interconception health refers to the health of women during their reproductive years. Optimal health during these years is essential to improve pregnancy and birth outcomes, and preconception/interconception care has been recognized as a critical component of a comprehensive health package to improve pregnancy- and birth-related outcomes as well as women's health overall. The postpartum period is an important component of interconception care, offering an opportunity to provide risk assessment, management and counseling on adverse pregnancy outcomes, and maternal complications in order to improve the mother's health and reduce risks in future pregnancies. This includes assessment of weight status; screening for chronic conditions, mental health issues, substance use, and interpersonal violence and issuing referrals as needed; and counseling on safe pregnancy spacing and family planning to prevent short inter-pregnancy intervals (defined as less than 18 months between pregnancies), which are associated with adverse and costly pregnancy and birth outcomes including maternal morbidity and mortality, and preterm birth and low birth weight.

Some of the health issues identified in the postpartum period may require continued management to ameliorate—or to altogether prevent—escalation of risk. Other pregnancy-related morbidities may emerge or worsen only after the early postpartum period, and after the time a mother's access to health care coverage typically ends. Strengthening continuity of care from obstetric to primary care is critical to ensure risks continue to be assessed and managed so that women can enter pregnancy in optimal health, subsequently increasing likelihood of positive pregnancy and birth outcomes. The task force found from examination of statewide trends of maternal deaths (Figure 3) that nearly 60 percent (117 out of 189 women) of 2011-2012 maternal deaths occurred in the period from six weeks (after 42 postpartum days) to 52 weeks after delivery when, for many women, access to health care is limited.

The task force recommends increasing access to postpartum/interconception health care through the first year after delivery to enable care transitions that will improve continuity of care, promote safe birth spacing, and reduce maternal morbidity. Over half of all Texas births are paid by Medicaid, totaling over \$2.2 billion per year in birth and delivery-related services for mothers and infants. The average amount spent in the first year of life for a preterm birth *with* major complications (excluding extreme prematurity) is \$19,059, and \$4,019 for a preterm birth *without* major complications compared to \$410 for an uncomplicated, term birth. Increasing access to care throughout the first postpartum year would improve interconception health while also reducing cost in the Medicaid program by decreasing the rate of unintended pregnancy, and by preventing, detecting and managing chronic conditions and other risk factors, such as obesity, hypertension, smoking, and mental and behavioral health issues, that increase risk for maternal morbidity and mortality and lead to costly adverse pregnancy and birth outcomes including severe maternal morbidity, preterm birth, and low birth weight.

Recommendation #2 — Increase provider and community awareness of health disparities and implement programs that increase the ability of women to self-advocate

The task force found pervasive racial and ethnic disparities in their review of maternal mortality cases and of state morbidity and mortality trends. The task force recommends to increase provider education on the impact of health disparities in health outcomes to promote equity in the access to and quality of services provided to all patients. The task force also recommends development and implementation of programs to enhance a woman's ability to advocate for herself. These programs should include community outreach to increase community engagement and individual understanding of health disparities.

Recommendation #3 — Increase screening for, and referral to, behavioral health services

To help address the shortage of behavioral health services in some areas of the state and allow medical providers to make appropriate referrals to services that are accessible for their patients, the task force recommends that:

- the Medicaid program ensure that managed care organizations providing Medicaid-funded substance use disorder services ensure that rural areas are adequately covered as required
- pregnant women are prioritized for admission into all substance use disorder programs funded by Medicaid so that access issues may be lessened or avoided
- pregnant women are immediately admitted or admitted as soon as capacity is available.

The task force identified multiple opportunities for identification and treatment for women with mental health and substance use disorders, and recommends that health care providers implement strategies to increase evidence-based screening and referral practices. The task force recommends health care providers follow the [American College of Obstetricians and Gynecologists \(ACOG\) Committee on Ethics recommendations](#) on screening and referral for alcohol abuse and other substance use disorders and the [ACOG Committee on Obstetric Practice](#) and [United States Preventive Services Task Force](#) recommendations on screening and referral for depression among pregnant and postpartum women.

The task force recommends these screenings before pregnancy, in early pregnancy, and during the postpartum period, given the recommendations of professional organizations and the findings of case review and data analysis conducted by this task force. The task force also recommends that social workers and other professional and paraprofessionals be trained on use of validated screening tools and referral protocols.

As substance use disorders have been confirmed as a “brain disease” with psychologic and physiologic manifestations by the National Institute on Drug Abuse, ACOG stresses the importance of diagnosing and treating substance use disorders with the same evidence-based approach applied to other chronic illnesses to ensure patient access to health care services and resources; and highlights the ethical responsibility to treat patients with substance use disorders with dignity and respect and to avoid stigmatization or punishment. ACOG recommends routine

screening for alcohol and other substance use disorders be applied equally to every patient, regardless of age, sex, race, ethnicity or socioeconomic status, and brief intervention and treatment referral be offered to patients with positive screening results. Routine screening can be accomplished by using validated screening tools or having conversations with women about their use of alcohol and drugs, including prescription opioids and other medications used for nonmedical reasons; routine laboratory testing of biological samples is not required. ACOG encourages physicians to learn and appropriately use routine screening techniques, clinical laboratory tests, brief interventions, and to familiarize themselves with resources available via their local hospitals, community and state organizations in order to appropriately and effectively refer patients for treatment. Furthermore, ACOG recommends using a team approach, where non-physician members of the health care team are involved in screening and assisting women who have positive screening results.

ACOG recommends that clinicians use a standardized, validated tool to screen all patients for depression and anxiety symptoms at least once during the perinatal period, and to closely monitor, evaluate and assess women with risk factors including current depression or anxiety or a history of perinatal mood disorders. ACOG further recommends that routine screening for perinatal mood disorders by itself is insufficient to improve clinical outcomes and must be accompanied, when indicated, with appropriate diagnostic testing, treatment and referral, and to have systems in place to ensure follow-up for diagnosis and treatment. The United States Preventive Services Task Force recommends screening all adults, including pregnant and postpartum women, for depression regardless of risk factors and outlines factors associated with increased risk for depression.

Recommendation #4 — Increase staffing resources in support of the task force

The task force has reviewed 11 of the 89 cases of maternal death identified from calendar year 2012, with the key findings presented in previous sections of this report. Additionally, statewide trends in both maternal mortality and severe maternal morbidity for the years 2011-2012 and 2008-2012 have been studied, the findings from which have also been considered by the task force and presented here. The infrastructure and systems needed to support this work are still in progress, including refining case abstraction and report forms, and developing a database to collect and analyze these data.

Although meaningful progress has been made, capacity issues have limited the number of cases the task force has been able to review to date. Additional resources are needed to support record requests, record redaction, case abstraction and case synthesis processes. The task force recommends increasing staffing resources to support the task force in fulfilling the task force's responsibility to review cases of pregnancy-related deaths and to identify and make recommendations on opportunities for improvement to reduce the incidence of pregnancy-related deaths and severe maternal morbidity in Texas.

Recommendation #5 — Promote best practices for improving the quality of maternal death reporting and investigation

Adequate reporting and investigation of maternal death cases is essential to this task force's work of determining cause and preventability of maternal deaths. The task force recommends developing and disseminating a maternal death bundle to promote best practices on maternal death reporting to the proper official (medical examiner or justice of the peace), and on a systematic protocol for maternal death investigation. A component of the protocol for maternal death investigation would be guidelines for comprehensive toxicology screening when indicated.

During the course of case review, the task force found that thorough toxicology screens were not always conducted when indicated, which hindered the task force's capacity to determine pregnancy-relatedness and preventability of death of several cases. The task force recommends that when toxicology testing is indicated in the investigation of a maternal death, such as in cases which may involve intoxicating substances, comprehensive toxicology screening be performed and include, at minimum:

- Alcohols and related compounds;
- Illicit drugs (e.g., methamphetamine, cocaine, and heroin metabolites);
- Opiate/opioid medications (e.g., methadone, hydrocodone, codeine, and morphine);
- Benzodiazepines (e.g., alprazolam and clonazepam);
- Other prescription medications (e.g., antidepressants, antipsychotics, anticonvulsants, and cardiac medicines); and
- Common over-the-counter medications (e.g., nonsteroidal anti-inflammatory drugs, acetaminophen, diphenhydramine, and dextromethorphan).

In addition, if there is a possibility that an intoxicating substance may have caused or contributed to death, these deaths should be investigated by a Medical Examiner/ Justice of Peace as outlined in TCCP Chapter 49.

Recommendation #6 — Improve the quality of death certificate data

Death certificate data serve as the main source of maternal death information for maternal mortality reporting. Specifically, two pieces of information from the death certificate are used: underlying cause of death (a single ICD-10-CM code) and a pregnancy status value assigned by the certifier. Through examination of maternal death data, it has been discovered that both of these values are frequently incorrect. For example, in 2011-2012, of 249 deaths coded as being of a direct obstetric cause, 2.8 percent were due to a non-natural, non-obstetric cause such as drug overdose, suicide, or homicide; 16.9 percent died from non-pregnancy-associated cancer causes; 7.6 percent had an inconsistent pregnancy status (death certificate indicated that the woman was not pregnant within one year of death); and 13.3 percent of women were over 50 years of age, and thus, unlikely to die of a direct obstetric cause. These errors have necessitated the linkage of women's deaths with recent live birth and fetal death records to confirm pregnancy. Since it is likely that these inaccuracies will lead to incorrect estimations of the state's maternal mortality rate, a maternal death coding quality improvement initiative is recommended.

Conclusions

The task force's findings and recommendations center on several core issues.

Improving the processes for maternal death investigation is critical to maternal mortality case reviews. When toxicology reports are needed for review, but are not available; or if the death was investigated by an inappropriate entity, the task force review teams are at a disadvantage in their work. Addressing these recommendations will result in more thorough case reviews, as the information needed for review will be consistent and available.

Data challenges particularly on the death certificate, combined with a lack of staffing resources for redaction and abstraction of maternal mortality cases, complicates and slows the work of the task force review teams. Addressing these recommendations will result in more accurate identification of cases for review as well as more cases available for the task force review teams to consider.

Finally, mental and behavioral health issues, lack of continuity in access to services, and geographic, racial and ethnic health disparities permeate the findings of the task force.

- Increasing mental and behavioral health screening and referral during the preconception and prenatal periods can potentially reduce the number of deaths involving mental health and substance use or overdose.
- Improving access to health services during the first postpartum year would increase opportunities for health care providers to detect, monitor, manage, and treat both active and latent health risks and morbidities, promote birth spacing and provide assistance with care transition, thus enhancing continuity of care.
- Creating programs that increase provider and community awareness of health disparities and that provide women – particularly those women most at-risk of maternal death and morbidity – with information about their health risks and tools for self-advocacy will allow women, their families, their providers, and their communities the opportunity to communicate effectively and beneficially about health disparities, ideally leading to a reduction in these disparities.

Appendix A: Task Force Members as of May 1, 2015

<p>Dr. Lisa Hollier <u>Chair, Physician specializing in Obstetrics, Maternal Fetal Medicine specialist</u> Professor and Medical Director, Baylor College of Medicine, Houston</p>	<p>Dr. Gary Hankins <u>Vice-Chair, Physician specializing in Obstetrics, Maternal Fetal Medicine specialist</u> Professor and chairman, University of Texas Medical Branch, Galveston</p>
<p>Evelyn Delgado <u>DSHS representative - Family and Community Health Services</u> Assistant Commissioner, Family and Community Health Services Division, DSHS, Austin</p>	<p>Dr. Meitra Doty <u>Physician specializing in Psychiatry</u> Faculty physician, UT Southwestern Department of Psychiatry/Medical Center and Parkland Hospital, Dallas</p>
<p>Dr. Linda Gaul <u>State Epidemiologist</u> State Epidemiologist, DSHS, Austin</p>	<p>Pamala Gessling <u>Registered Nurse</u> Director of Nursing, Methodist Dallas Medical Center, Dallas</p>
<p>Dr. Kidada Gilbert-Lewis <u>Physician specializing in Pathology</u> Associate Pathologist, Mangini, Lakhia, Delahoussaya and Associates, Houston</p>	<p>June Hanke <u>Community advocate</u> Registered Nurse and Strategic Analyst/Planner, Health Systems Strategy - Harris Health System, Houston</p>
<p>Dr. James Maher <u>Physician specializing in Obstetrics, maternal fetal medicine specialist</u> Associate professor, Department of Obstetrics and Gynecology - Texas Tech University Health Sciences Center and Director of Maternal Fetal Medicine, Medical Center Hospital, Odessa</p>	<p>Dr. D. Kimberley Molina <u>Medical Examiner</u> Deputy Chief Medical Examiner, Bexar County Medical Examiner's Office, San Antonio</p>
<p>Dr. Carla Ortique <u>Physician specializing in Obstetrics</u> Obstetrician/gynecologist, Texas Children's Hospital, Houston</p>	<p>Dr. Ronald Peron <u>Physician specializing in Family Medicine</u> Chief Medical Officer, Community Health Service Agency, Inc., Greenville</p>
<p>Dr. Amy Raines Milenkov <u>Researcher of pregnancy-related deaths</u> Assistant professor, University of North Texas Health Science Center, Fort Worth</p>	<p>Nancy Jo Reedy <u>Certified Nurse-Midwife</u> Registered Nurse, Instructor and Clinical Faculty Advisor, Georgetown University, Arlington</p>
<p>Nancy Sheppard <u>Licensed Clinical Social Worker</u> Network Perinatal Outreach Coordinator, Seton Healthcare Network, Austin</p>	

Appendix B: CDC Severe Maternal Morbidity Indicators/Corresponding ICD-9-CM Codes

Severe Maternal Morbidity Indicator	ICD-9-CM Codes	ICD-9-CM Diagnosis Code	ICD-9-CM Procedure Code
1. Acute myocardial infarction	410.xx	x	
2. Acute renal failure	584.x, 669.3x	x	
3. Adult respiratory distress syndrome	518.5, 518.81, 518.82, 518.84, 799.1	x	
4. Amniotic fluid embolism	673.1x	x	
5. Aneurysm	441.xx	x	
6. Cardiac arrest/ventricular fibrillation	427.41, 427.42, 427.5	x	
7. Disseminated intravascular coagulation	286.6, 286.9, 666.3x	x	
8. Eclampsia	642.6x	x	
9. Heart failure during procedure or surgery	669.4x, 997.1	x	
10. Internal injuries of thorax, abdomen, and pelvis	860.xx—869.xx	x	
11. Intracranial injuries	800.xx, 801.xx, 803.xx, 804.xx, 851.xx-854.xx	x	
12. Puerperal cerebrovascular disorders	430, 431, 432.x, 433.xx, 434.xx, 436, 437.x, 671.5x, 674.0x, 997.2, 999.2	x	
13. Pulmonary edema	428.1, 518.4	x	
14. Severe anesthesia complications	668.0x, 668.1x, 668.2x	x	
15. Sepsis	038.xx, 995.91, 995.92	x	
16. Shock	669.1x, 785.5x, 995.0, 995.4, 998.0	x	
17. Sickle cell anemia with crisis	282.62, 282.64, 282.69	x	
18. Thrombotic embolism	415.1x, 673.0x, 673.2x, 673.3x, 673.8x	x	
19. Blood transfusion	99.0x		x
20. Cardio monitoring	89.6x		x
21. Conversion of cardiac rhythm	99.6x		x
22. Hysterectomy	68.3x-68.9		x
23. Operations on heart and pericardium	35.xx, 36.xx, 37.xx, 39.xx		x
24. Temporary tracheostomy	31.1		x
25. Ventilation	93.90, 96.01-96.05, 96.7x		x