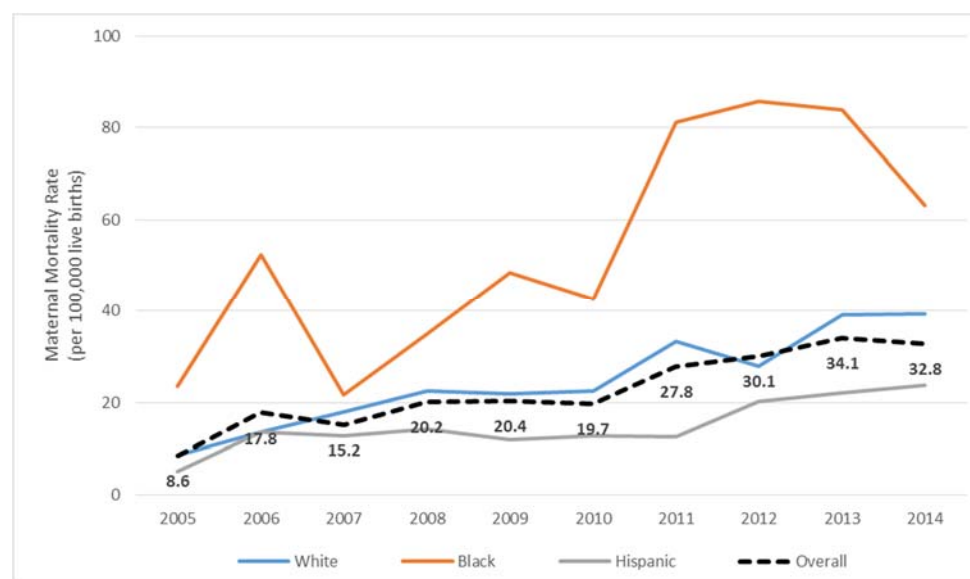


MATERNAL MORTALITY IN TEXAS

Using Precision Public Health to Improve Maternal Outcomes

- In an article by MacDorman et al. appearing in the 2016 September issue of *Obstetrics and Gynecology*, MacDorman's data analysis purports to show a dramatic increase in maternal mortality in Texas between 2010 and 2011. (see MacDorman article attached)
- The TDSHS analysis of the Maternal Mortality Rate (MMR) in Texas does document a sharp increase from 2010 to 2011. However, the percent change or the magnitude of the increase in MMR from 2010 to 2011 in Texas differs depending on the statistical methods used to compute and display it, ranging from an increase of 77% to 25% depending on the method. (see Appendix)
- Both MacDorman and TDSHS analysis of MMR in Texas demonstrate a decrease from 2013 to 2014. However, as with the increase, the statistically calculated percent change or the magnitude of the decrease in MMR from 2013 to 2014 in Texas differs depending on the method used to compute it, ranging from a decrease of 1% (MacDorman) to 12% (TDSHS - Method 4 in the Appendix).
- It is important to note that maternal mortality has increased throughout the United States over the past decade. The trends seen in Texas are similar to those national trends. Steady and pervasive increases in chronic diseases are to blame, especially comorbid conditions that complicate pregnancy, such as obesity, Type II diabetes, and hypertension.
- The risk for maternal death in Texas is highest among Black women. (Figure 1)

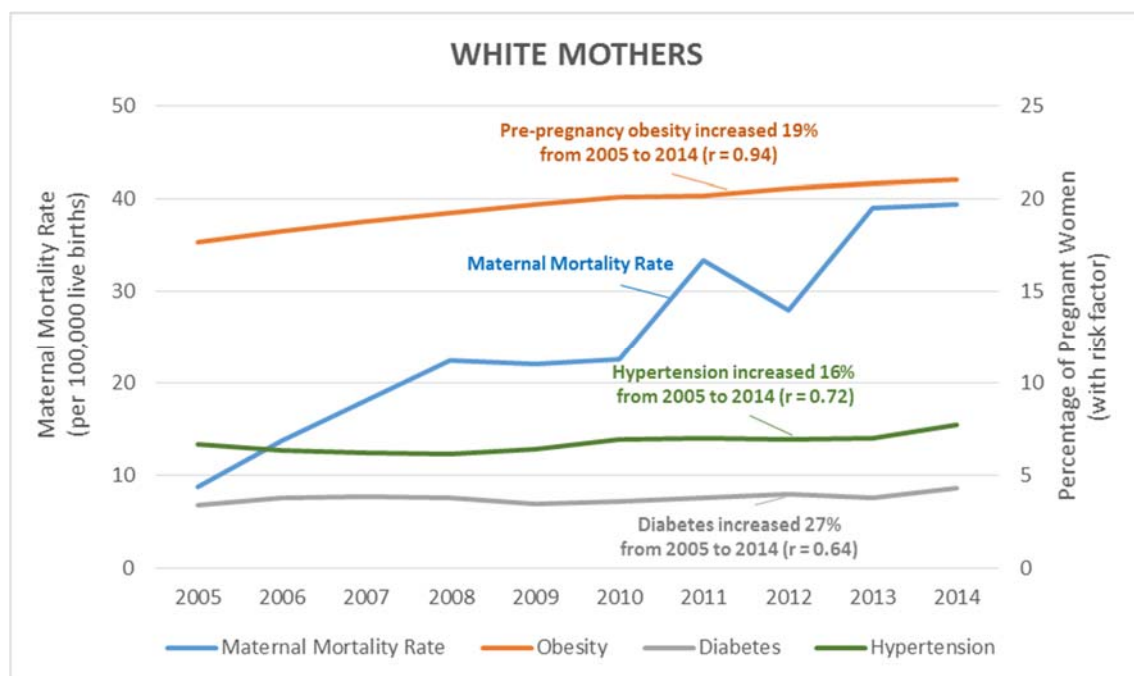
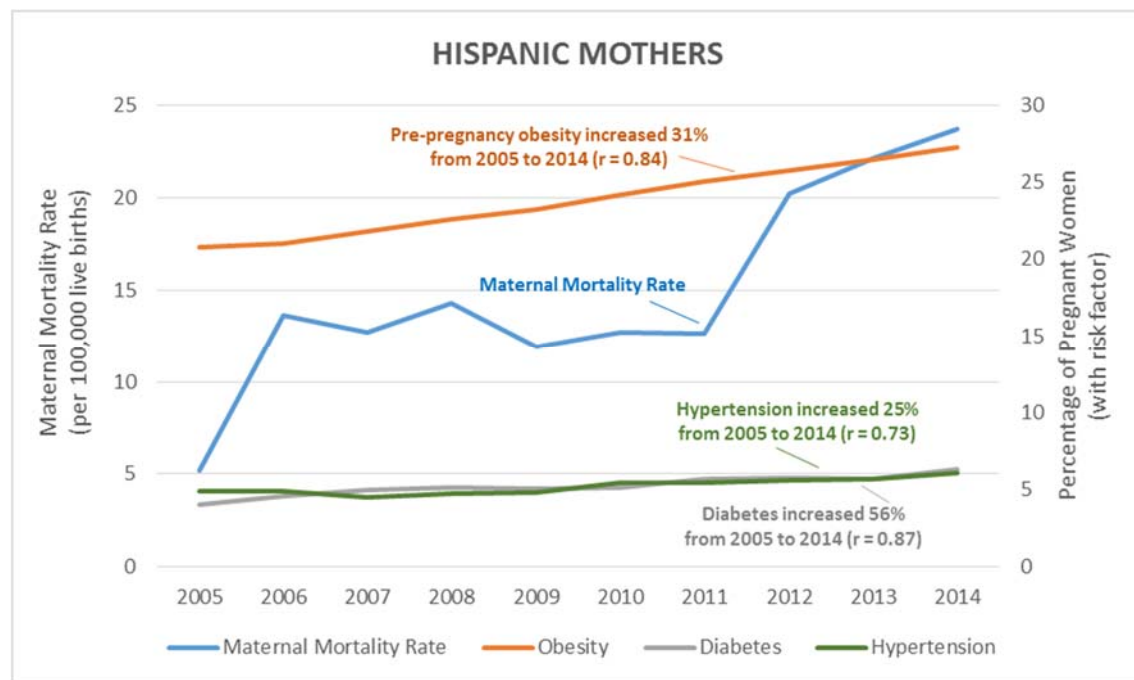
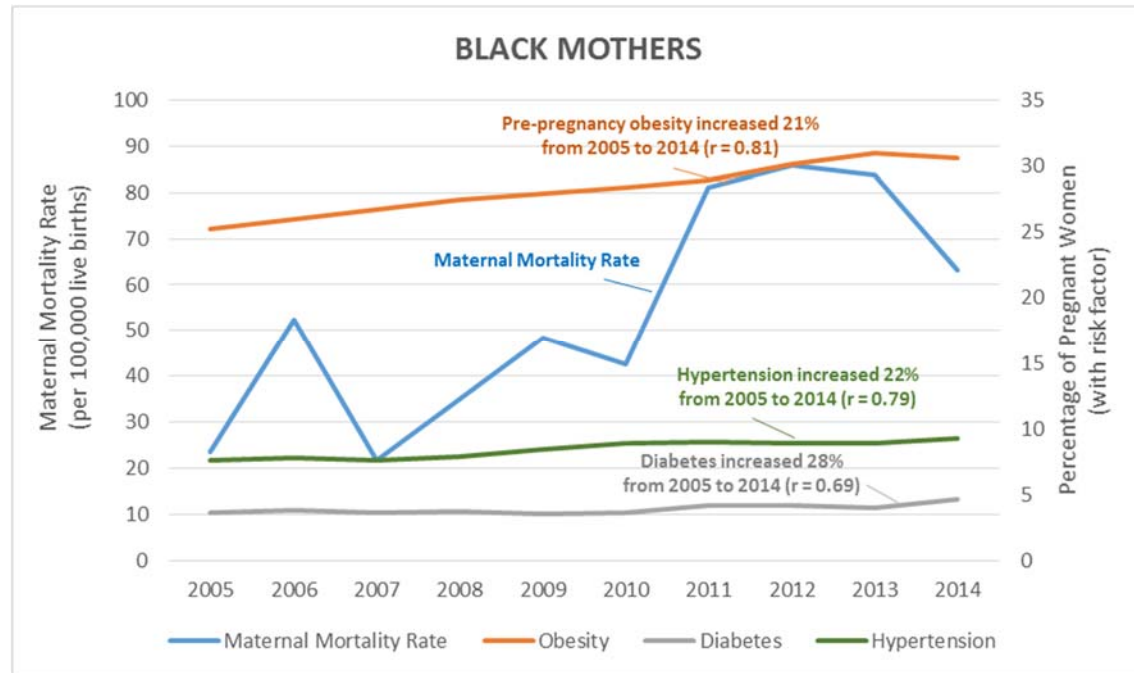
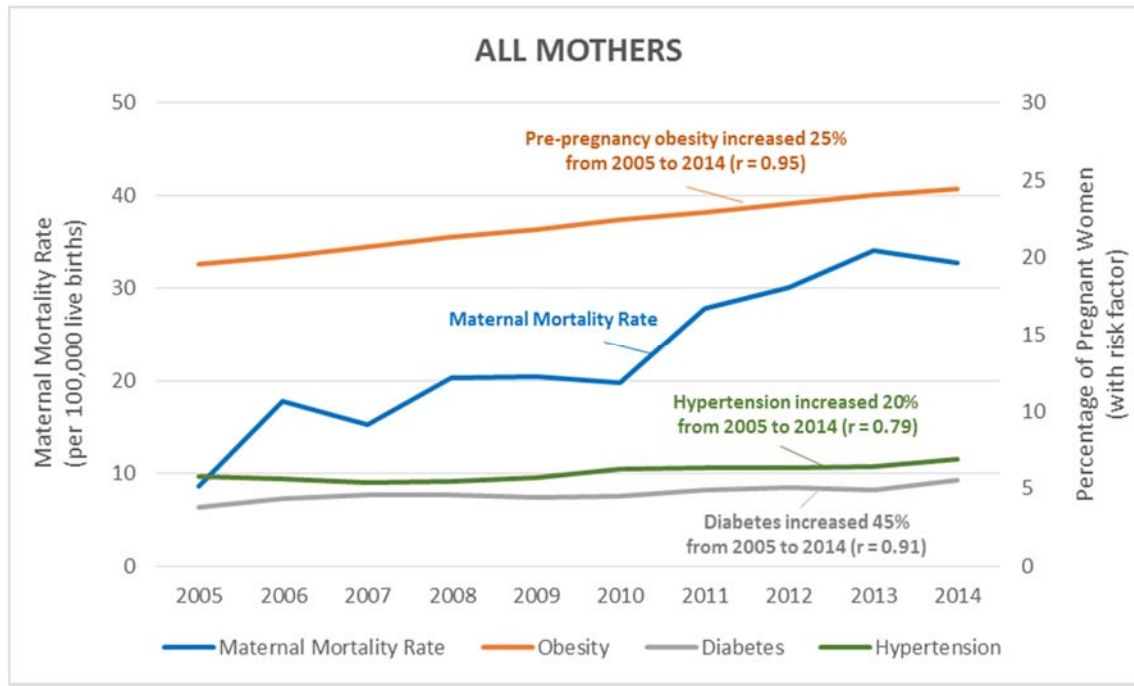
Figure 1. Maternal mortality rate by racial/ethnic group, 2005-2014.



Prepared by: Office of Program Decision Support, Division for Family and Community Health Services, Texas Department of State Health Services, 08/24/2016.
Data Sources: Death and Birth Files, Center for Health Statistics, Texas Department of State Health Services.
MMR — computed within 42 days following the end of pregnancy, using ICD-10 codes A34, O00-095, O98-099.

- In response to the steadily increasing maternal mortality rate from 2000 to 2009, Texas House Bill 1133, establishing a Maternal Mortality and Morbidity Review Board, failed to pass in 2011.
- In 2013, Senate Bill 495 did pass, and established the multi-disciplinary Maternal Mortality and Morbidity Task Force to:
 1. Study statewide trends in maternal mortality and severe maternal morbidity;
 2. Review individual cases of maternal deaths; and
 3. Make recommendations with the goal of reducing the incidence of maternal mortality and morbidity in the future.
- Maternal mortality is a complex issue and the increase is likely due to a multitude of factors.
- The scientific literature clearly shows that pre-pregnancy obesity, hypertension, and diabetes place women at much greater risk for maternal death.
- Indeed, an analysis of Texas data for all mothers and for each racial/ethnic group shows that these chronic disease risk factors are highly related with maternal mortality, such that increased pre-pregnancy obesity, diabetes, and hypertension are each significantly correlated with an increased maternal mortality rate. (Figures 2-5)

Figures 2-5. Maternal mortality and risk factors, 2005-2014.



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MMR — computed within 42 days following the end of pregnancy, using ICD-10 codes A34, O00-095, O98-099.

Pre-pregnancy obesity; diabetes before and/or during pregnancy (including diabetes mellitus and gestational diabetes); and hypertension before and/or during pregnancy (including chronic hypertension, pre-eclampsia, and eclampsia) — Birth file.

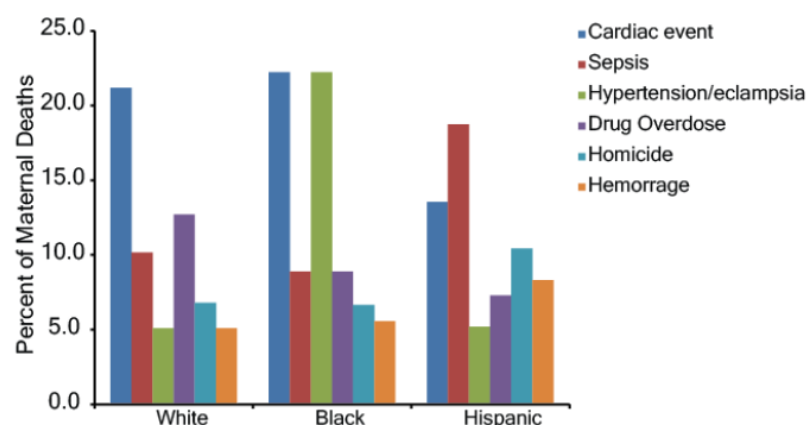
Note: r = correlation coefficient between MMR and each risk factor.

- While the recent downward trend in maternal mortality among Black mothers since 2013 is welcome, we are concerned that maternal mortality among Hispanic mothers has increased over the same span of time, in parallel with the increasing prevalence of pre-pregnancy obesity, diabetes, and hypertension among Hispanic mothers.
- Smoking further increases the risk for maternal death, although consistent underreporting of smoking during pregnancy by women limits the ability to examine statewide trends of maternal smoking and their relation to maternal mortality. However, only Hispanic women in Texas meet the Healthy People 2020 target of abstaining from smoking during pregnancy.
- As described in the newly released 2016 Joint Biennial Report for the Legislature by TDSHS and the Task Force, the top five causes of death among a cohort of women (N = 189) confirmed to have experienced a maternal death in 2011 and 2012 (by linking their death record with a live birth or fetal death) are as follows:
 1. Cardiac event
 2. Drug overdose
 3. Hypertension/Eclampsia
 4. Hemorrhage
 5. Sepsis

(see attached Legislative report)

- When the cohort of women is expanded to also include unconfirmed maternal deaths in 2011 and 2012 (per *Scientific Analysis of the Current State and Needs of the Maternal and Child Health Population in Texas*, Office of Program Decision Support, TDSHS, 2015, p. 62), drug overdose remains the second leading cause of death only among White women, and becomes the third leading cause of death overall. Among Black women, cardiac events and hypertension/eclampsia are the leading causes of death. (Figure 6)

Figure 6. Maternal death (confirmed and unconfirmed) cohort, 2011 and 2012, six most prevalent causes of Death



Source: Vital Statistics Birth Matched Death Files
Prepared by: Office of Program Decision Support

- Per the 2016 Legislative report by TDSHS and the Task Force, a review of individual cases of maternal deaths that occurred in 2012 (including detailed case abstraction of patient records) also uncovered substance use as an explanatory factor for maternal mortality, in addition to prenatal and post-partum depression. Increased screening and treatment are recommended to address each of these risk factors. Regarding substance use, opioids are the most commonly abused substances both in Texas and nationwide. One way to estimate the prevalence of substance use as a contributing factor to poor maternal health outcomes is to examine the rate of Neonatal Abstinence Syndrome in newborns, which is the result of prenatal opioid use. Funding was provided through an exceptional item over the course of the 2016-2017 biennium to fund services to reduce the incidence, severity, and cost associated with NAS. Through this NAS Prevention Pilot, which includes enhanced screening and outreach, increased access to intervention and treatment, and specialized programs to reduce the severity of NAS, improved health outcomes are anticipated. TDSHS will continue working with THHSC regarding mental health and substance abuse services.

- Also, since the majority of the confirmed maternal deaths in 2011 and 2012 occurred more than 42 days after delivery, the Task Force is recommending extending the period in which women can access health services to a full year after delivery, which the new Healthy Texas Women program (launched July 1st, 2016) has since done, via a robust benefit package, streamlined Medicaid enrollment, and extensive outreach. The Healthy Texas Women program, administered by the Texas Health and Human Services Commission (THHSC), provides access to family planning services as well as certain health care services, such as screening for and treatment of hypertension and diabetes. Screening and referral for postpartum depression is also available. Women can access services through www.healthytexaswomen.org. With the funding provided by the Texas Legislature for the inception of this program, improved preconception and interconception outcomes for Texas women are anticipated.
- The Task Force also recommends increased provider and community awareness of health inequities and to implement programs that increase the ability of women to self-advocate. TDSHS will continue to leverage funding (\$2.5 million in FY2017) for the five public health components of the Title V-funded Healthy Texas Babies (HTB) program to increase provider and community awareness related to disparities in maternal and infant mortality:
 - 1) **The Texas Collaborative for Healthy Mothers and Babies (TCHMB)** — a multi-disciplinary perinatal quality collaborative whose mission is to advance health care quality and patient safety for all Texas mothers and babies through the collaboration of health and community stakeholders in the development of joint quality improvement initiatives, the advancement of data-driven best practices, and the promotion of education and training.
 - 2) **Provider Education** — through TDSHS Grand Rounds, the Preconception and Prenatal Health suite of Texas Health Steps Online Provider Education modules, and the annual HTB conference (November 15-16, 2016, in Austin).
 - 3) **Someday Starts Now** — a bilingual public awareness campaign to increase awareness of the modifiable risk factors that impact infant mortality and preterm birth among the general public, with particular attention focused on men and women of childbearing age.
 - 4) **Preconception Peer Education** — a national Office of Minority Health initiative to reduce infant mortality in the Black community. Young men and women are trained on a peer-educator model to educate peers and members of their community on the importance of preconception health, seeking regular preventive care, having a reproductive life plan, and the impact of social determinants of health on their wellbeing.
 - 5) **HTB Community Coalitions** — supporting the creation and strengthening of 6 local perinatal coalitions in the state through funding and programmatic technical assistance. HTB coalitions are responsible for implementing evidence-based interventions based on Perinatal Periods of Risk analysis conducted by TDSHS. Focusing on Black and Hispanic women of childbearing age, these interventions promote integration of preconception and inter-conception care into routine primary care, using evidence-based tools including the Someday Starts Now Life Planning Tool.
- Furthermore, through the work of Title V (approximately \$1 million in FY2017), TDSHS will build upon prior successes in programming designed to increase initiation and continuation of breastfeeding, a protective factor for maternal mortality. TDSHS implements a multi-component breastfeeding support program to increase breastfeeding initiation, continuation, and exclusivity. Current breastfeeding support initiatives include efforts to:
 - Educate and support families (e.g., Breastmilk: Every Ounce Counts campaign; Statewide Lactation Support Hot Line);
 - Educate health care professionals about breastfeeding management and support (e.g., continuing education trainings; Health Care Provider Guide to Breastfeeding app);
 - Support improvement in maternity care practices for lactating mothers and their babies (e.g., Texas Ten Step Program; Star Achiever Breastfeeding Learning Collaborative);
 - Reduce employment-related barriers to breastfeeding (e.g., the Texas Mother-Friendly Worksite Program; child care provider training); and
 - Improve coordination and planning for breastfeeding support (e.g., the TDSHS Infant Feeding Workgroup, TDSHS/Medicaid Lactation Support Workgroup; Texas WIC Infant Feeding Practices Survey).

- Better quality/more accurate death certificate data and greater staff resources are also needed to assist in requesting patient records, patient record redaction, case abstraction, and case synthesis, as TDSHS and the Task Force continue to examine and strive to reduce maternal mortality and morbidity in Texas. In terms of staff resources, options to increase infrastructure include contracting with a public university and the addition of one Program Specialist to redact and abstract patient records for all cases. Estimated cost is approximately \$902K annually — an amount that may change based on itemized costs detailed in contract proposals during procurement. Another option is to increase staff resources through 8 additional FTEs, including nurses, program specialists, and an epidemiologist, at an estimated cost of \$1.2 million annually.
- In addition, the Vital Statistics Unit (VSU) at TDSHS, together with the Center for Health Statistics (CHS), are in the process of replacing the existing electronic system for registering and collecting birth, death, fetal death, marriage, and divorce records in Texas (i.e., Texas Electronic Registrar or TER) with a new electronic system (i.e., Texas Electronic Vital Events Registrar or TxEVER; \$16.5 million budgeted for this effort). This new electronic vital events registration system (to be launched on January 1, 2018) will allow for additional data quality checks (by VSU, CHS, and a third-party vendor), as well as improved and more efficient receipt and recording of out-of-state deaths of Texas residents.

By ensuring that programming is data driven and utilization of evidence-based/ evidence-informed strategies, Texas has the ability to measure the impact of programming and to demonstrate “moving the needle in Maternal and Child Health (MCH) outcomes” related to the Maternal & Women’s Health and the Perinatal & Infant Health Domains. Within the Maternal & Women’s Health Domain, work focuses on the preventative visit looking at the pre-conception and inter-conception time periods to impact the effects of chronic disease. The programming within the Perinatal & Infant Health Domain supports performance measures related to breastfeeding, safe sleep, and infant mortality disparities. The Title V MCH Section has identified the opportunity to engage key stakeholders to participate in a newly developed Maternal, Women, Perinatal, and Infant Health Strategic Workgroup that will focus in participating in strategic planning process to implement strategies to address maternal morbidity and mortality and other key public health priorities.