2017 Healthy Texas Babies Data Book

Prepared by: Texas Department of State Health Services, Maternal & Child Health Epidemiology Unit

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Contents

Purpose

The 2017 Healthy Texas Babies Data Book provides an overview of infant health in Texas, as well as maternal health before and during pregnancy, which directly impacts infant health. It is hoped that the trends and disparities in infant health outcomes highlighted in this report can help programs and policymakers make data-driven decisions about how to improve these outcomes in Texas. This data book is not meant to repeat results found in other places; rather, it is meant to bring different data sources together to be analyzed and reported in a way that creates a cohesive view of the status of both infant health and maternal health during pregnancy in Texas.

Data Sources & Terms

Data Sources Used

Vital records data (information from Texas birth, death, fetal death, and linked birth-death files), as well as results from the Texas Pregnancy Risk Assessment Monitoring System (PRAMS) survey, were used in this report.

The Texas Department of State Health Services (DSHS) Vital Statistics Section collects demographic data on all (or the vast majority of) births and deaths in Texas, as well as information on fetal deaths weighing 350 grams or more or, if weight is unknown, occurring at 20 weeks of gestation or more. Vital records files are a rich and comprehensive source of data; however, the quality of birth certificate data is dependent on how accurately birth records are completed by hospital staff or providers. It is also thought that the birth file likely underreports the prevalence of several maternal health indicators, such as diabetes, preeclampsia, and anemia [1, 2]. In addition, 2016 Texas birth and death file data are preliminary (are available for analysis before these datasets have been thoroughly 'cleaned' and finalized), and as such, certain 2016 data elements were not presented due to potential data quality concerns. In this report, no geographic information was analyzed or reported using preliminary 2016 data, and outcomes by race/ethnicity were not presented for preliminary 2016 death data. All other years of data used in this report are final.

Data were suppressed in maps when there were fewer than 15 cases, to prevent identification of affected individuals that could be possible with such small numbers, thereby protecting the confidentiality and privacy of these individuals and their families.

In Texas, the PRAMS survey provides the most comprehensive population-based data on maternal health before, during, and after pregnancy. Conducted in partnership with the Centers for Disease Control and Prevention (CDC), DSHS has been implementing PRAMS annually since 2002. The PRAMS survey asks questions (via mail or telephone) of mothers who have recently given birth on topics such as prenatal care, pregnancy intention, alcohol use, smoking, intimate partner violence, postpartum depression, breastfeeding, infant sleep position, and infant secondhand smoke exposure. Unlike vital records data, which include information on almost all births and deaths in Texas, PRAMS data are obtained from a sample of women who are residents of Texas and gave birth to a live infant.

CDC provides Texas with a survey data file that includes survey weights, and CDC ensures that analyses are representative of women who have given birth to a live infant and are residents of Texas. For example, the 1,322 women who completed the survey in 2015 were representative of all 396,093 Texas residents who had a live birth. PRAMS data/results are generalizable to *women* who are Texas residents with at least one live birth within a specific year, whereas the birth file represents all *live births* in Texas. Because of this, along with potential sampling and reporting differences, PRAMS findings may differ from results obtained from vital statistics data. PRAMS results are reported along with confidence intervals, and the width of the confidence interval – in other words, the distance between its upper and lower limits – is an indicator of the variability, and thus the reliability, of the results. Texas PRAMS data are presented as estimated percentages or prevalence estimates to account for complex sampling and weighting. As with any self-reported survey, possibility of recall bias exists; that is, women may not answer the question correctly or leave it blank because they may not remember the event. However, the schedule of survey mailings begins 61 to 183 days after the birth of the infant in order to minimize this risk.

Despite the few limitations described above, Texas vital records are invaluable sources of data on the status of infant and maternal health, and PRAMS provides much-needed information about maternal risk and health pre-pregnancy, during pregnancy, and post-pregnancy that is not available elsewhere. Both Texas vital records and PRAMS data are used by DSHS and other state agencies and stakeholders to inform, develop, and drive policies and programs to improve the health of mothers and babies, and to understand their emerging health needs. These sources provide a rich understanding of both infant and maternal health, and serve as an important resource for risk factor analysis and for identification of possible avenues for prevention.

Data Terms

Baby-Friendly Hospital: A designation given to birthing facilities that offer an optimal level of care for infant feeding (breastfeeding) and for mother/baby bonding. To achieve accreditation as a Baby-Friendly Hospital, a facility must demonstrate a 75 percent exclusive breastfeeding rate or higher among mothers at discharge, must adhere to the International Code of Marketing Breastmilk Substitutes, and must successfully implement the Ten Steps to Successful Breastfeeding [3].

Body Mass Index: Body mass index (BMI) is a measure of weight-for-height that is often used to classify adults as being underweight, of normal weight, overweight, or obese [4]. In this report, maternal BMI is calculated using the mother's pre-pregnancy weight and height. BMI categories are defined using the standard cutoffs for adults, even if the mother is younger than 22 years of age.

Causes of Infant Death: Cause of death categories from the National Center for Health Statistics Instruction Manual are used to calculate information regarding the leading causes of infant death in this report [5]. Not all infant deaths in Texas are due to the leading causes shown in the report. Causes of infant death are reported as the number of deaths per 10,000 live births.

Communities: In this report the term "communities" refers to combined statistical areas (CSAs) and select large Metropolitan Statistical Areas (MSAs). CSAs and MSAs are defined by the U.S. Office of Management and Budget (OMB). CSAs are composed of adjacent metropolitan areas (containing an urban core of 50,000 or more population) and micropolitan areas (containing an urban core of at least 10,000 but less than 50,000 population), and consist of the county containing the urban core area, as well as adjacent counties with a high degree of social and economic integration with the urban core. To be consistent with recent past Healthy Texas Babies Data Books (from 2013-2016), this report uses the U.S. OMB CSA and MSA definitions released in 2013, with two exceptions. First, the traditional CSA of Dallas-Fort Worth was divided into three separate areas: Fort Worth-Arlington, Dallas-Plano, and the remaining outlying counties of the metropolitan area. Second, the county of Galveston was removed from the Houston-The Woodlands CBSA so that this county could be analyzed separately.

Gestational Age: Gestational age is used to calculate whether or not a birth is preterm, as well as to calculate when in pregnancy the mother first received prenatal care. However, exact gestational age is often unknown and must be estimated. Beginning with final 2014 data, the National Center for Health Statistics has changed the variable used to estimate gestation [6]. The current standard, starting in 2014, uses the obstetric estimate of gestation on the birth certificate, and not a combination of last menstrual period and the obstetric estimate, as had been done in the past. This current standard for calculating gestational age is used throughout the report.

Infant Mortality: Infant mortality rate (IMR) is defined as the number of infants who died in a given year divided by the number of live births in that same year. This number is then multiplied by 1,000 to calculate the IMR. All of the births that comprise this rate are restricted to those women with Texas listed as their state of residence.

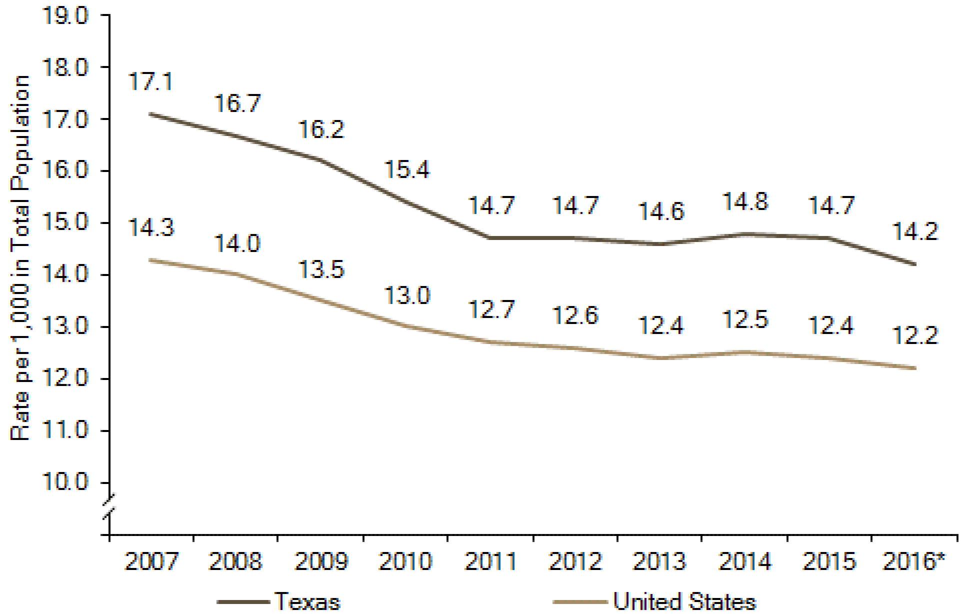
Perinatal Periods of Risk: A comprehensive approach designed to help communities use data to improve infant and maternal health outcomes. In addition to infant deaths, fetal deaths are also included in the perinatal periods of risk (PPOR) analysis to provide more information. The PPOR analysis divides fetal and infant deaths into four risk periods (maternal health/prematurity, maternal care, newborn care, and infant health), based on birth weight and age of death. An excess feto-infant mortality rate (F-IMR) is then calculated for each of these periods, both for the state as a whole and for specific demographic study populations. The reference group for each of these calculations is a state-level reference population of mothers with near-optimal birth outcomes [7, 8].

Race/Ethnicity: For information obtained from birth records, fetal death records, or from PRAMS, race/ethnicity information shown throughout this report refers to the mother, not the infant. However, infant death data are classified according to infant's race/ethnicity. Women who identified themselves as only White or Black and who did not indicate that they were Hispanic were classified as White or Black, respectively. Women who identified themselves as Hispanic were classified as Hispanic, regardless of their race designation. Women of all other races, including multiracial women, were classified as "Other", as long as the woman did not self-identify as Hispanic. The "Other" category is not homogeneous, and there have been shifts in the demographics of women within this category. Since 2004, there has been an increase in the number of women identifying themselves as multiracial.

Birth Demographics

The birth rate in Texas decreased slightly in 2016, after remaining fairly stable from 2011 to 2015 (see Figure 1). Texas has the fourth highest birth rate in the United States [9]. In 2016, more than 400,000 babies were born in the state, and there were more than 390,000 births to mothers that live in Texas.

Figure 1
Birth Rate in Texas and The United States, 2007-2016



*2016 Texas and United States data are preliminary
Source: National Center for Health Statistics
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

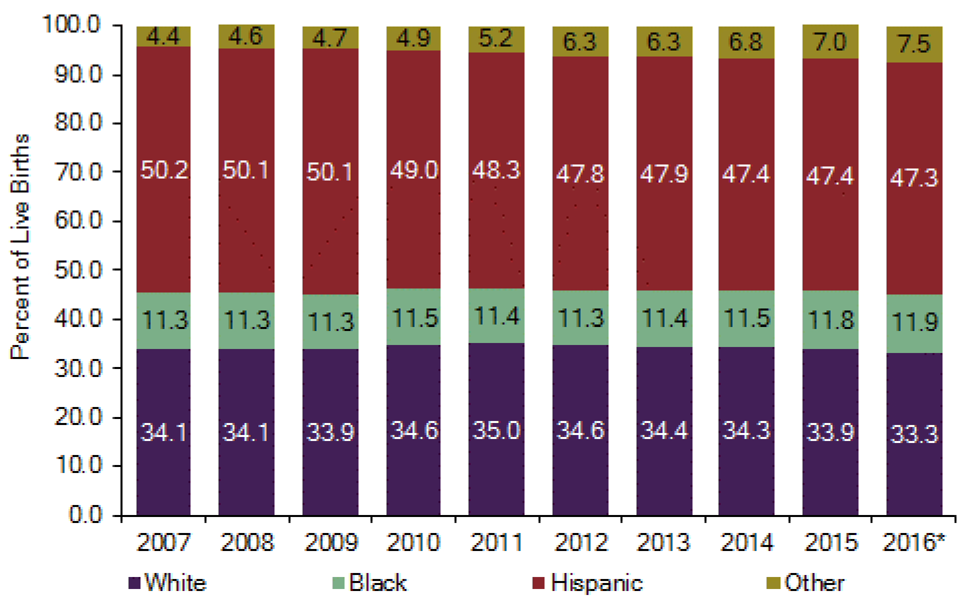
Maternal Race/Ethnicity

Births to Hispanic women make up the largest percentage of all births in Texas, followed by births to White women, Black women, and women classified as 'Other' race/ethnicity (see Figure 2).

Although women who are classified as being of 'Other' race/ethnicity make up a small proportion of the total number of Texas births, this race/ethnic group has had the largest increase in the percent of total live births over the past decade in Texas (see Figure 2). Over 29,000 births in 2016 were to mothers who classified themselves as Asian, multiracial, or other race/ethnic designations. However, it is important to keep in mind that this group is quite heterogeneous (encompassing many different races/ethnicities), which often limits the interpretability of results for this particular race/ethnic category.

Figure 2

Distribution of Race/Ethnic Groups Among All Live Births, 2007-2016



*2016 Texas data are preliminary
Source: 2007-2016 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
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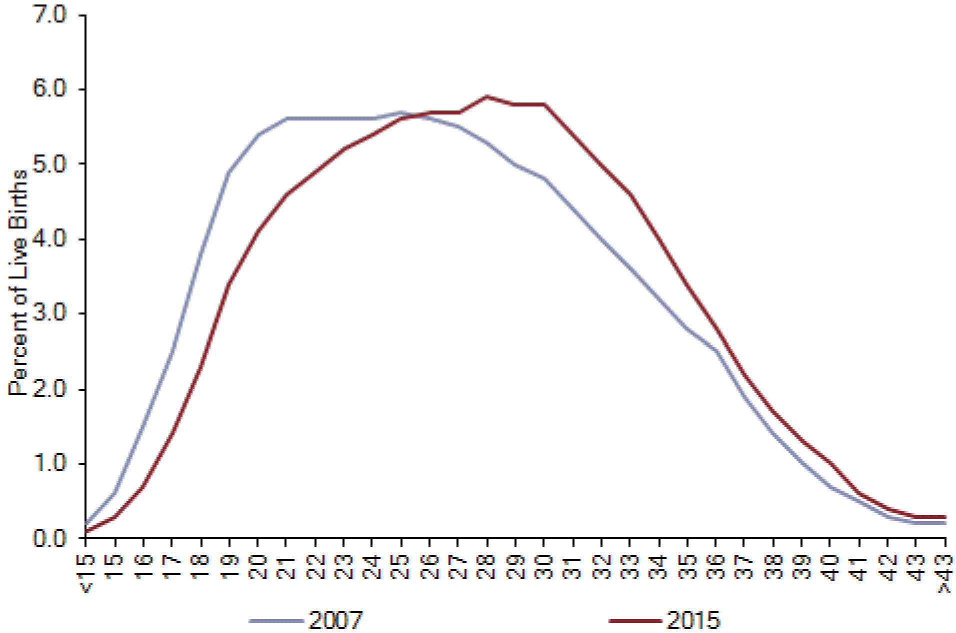
Maternal Age

As in the United States as a whole, Texas has seen a shift in the maternal age of women giving birth over time (see Figure 3) [10]. The average maternal age at birth in 2015 was 27.7 years of age, a significant increase from an average age of 26.5 years in 2007.

Figure 3

Maternal Age Distribution in 2007 and 2015



Source: 2007 & 2015 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
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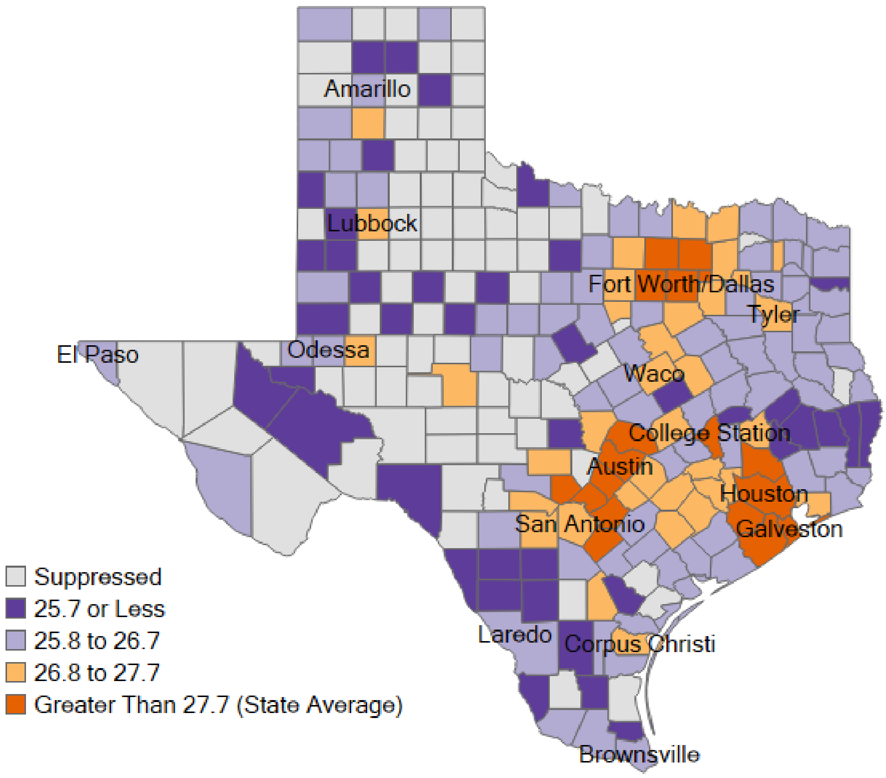
The average age for women with a live birth in 2015 differed by region (see Figure 4). Counties with major urban centers tended to have older average maternal ages.

Figure 4

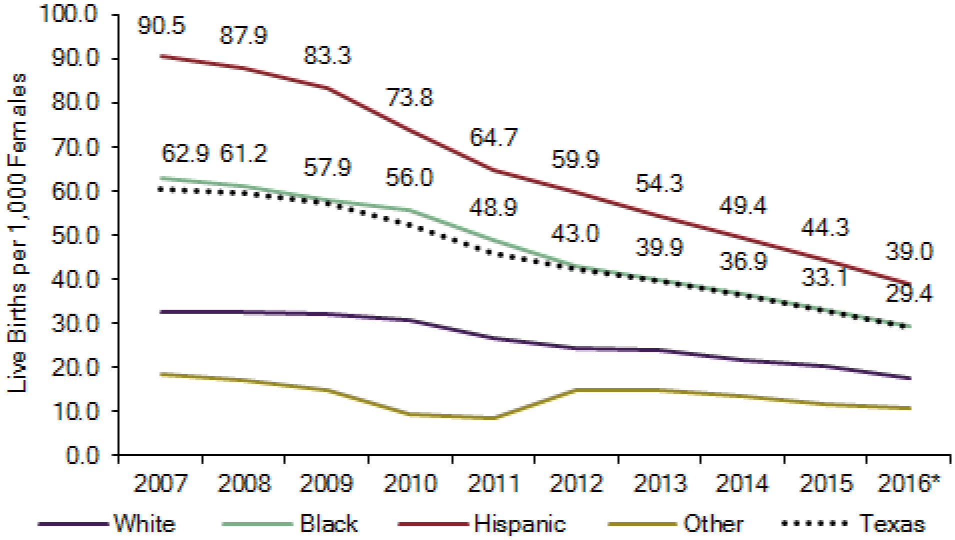
Average Age of a Woman with a Live Birth, 2015



Source: 2015 Birth File
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Figure 5

Teen (15 - 19 year old) Birth Rate per 1,000 Females by Race/Ethnicity, 2007-2016



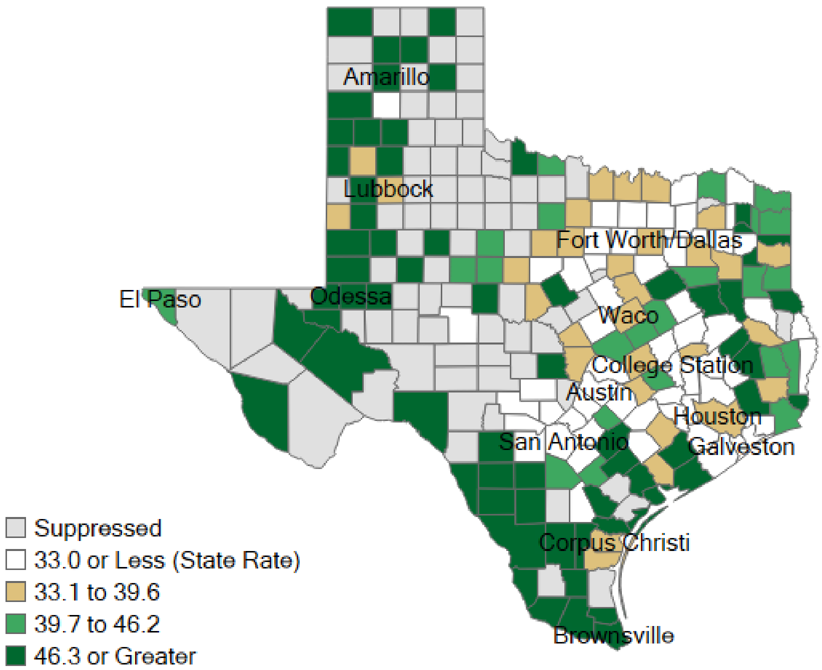
*2016 Texas data are preliminary
Source: 2007-2016 Birth Files
2007-2015 population estimates
2016 population projections
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

The increase in average maternal age observed over the past decade is likely due in part to a marked decrease in the teen birth rate. Texas, like the rest of the country, has reported dramatic decreases in the teen birth rate since 2007 [11]. This drop has been particularly steep for Hispanic and Black youth (see Figure 5). Over the past 10 years, the teen birth rate has declined by 56.9 percent among Hispanic youth and has declined by 53.2 percent among Black youth.

Although Texas has experienced a steady decrease in the teen birth rate over the past decade, as of 2015, Texas was tied with New Mexico for the fourth highest teen birth rate in the United States (among females 15-19 years old) [9].

Figure 6

Teen Birth Rate per 1,000 Females Age 15-19 Years Old, 2015



Source: 2015 Birth File
Texas Demographic Center 2015 Population Estimates
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Additionally, several areas in Texas have high teen birth rates when compared to the rest of the state (see Figure 6). Many counties in the border regions of the state and in the Texas Panhandle have high teen birth rates.

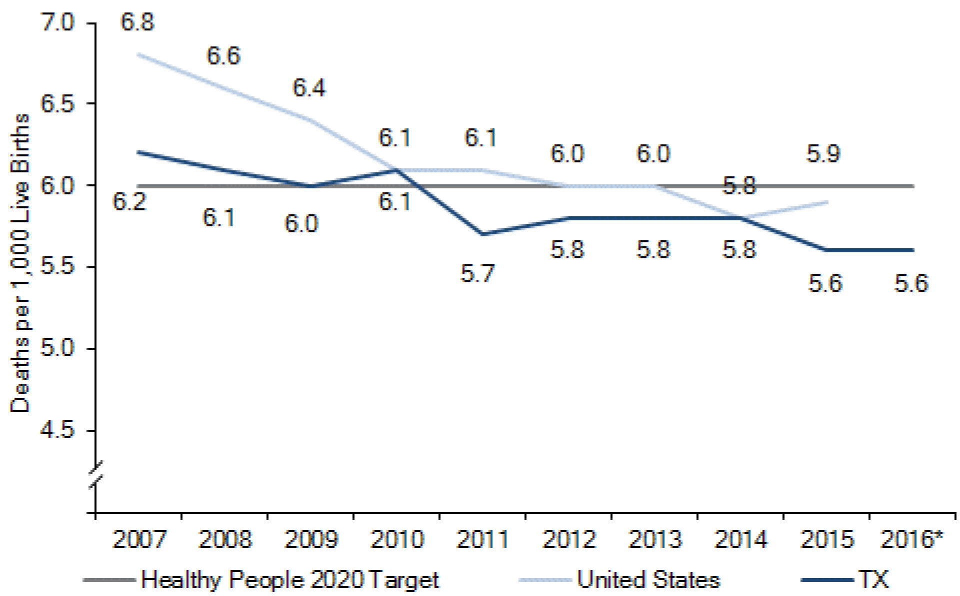
Infant Mortality & Morbidity

Infant Mortality Rate

In 2015, the Texas infant mortality rate (IMR) reached a historic low of 5.6 deaths per 1,000 live births. According to provisional 2016 data, the IMR stayed at 5.6 deaths per 1,000 live births in 2016. The IMR in Texas has been at or below the national rate for the past 10 years (see Figure 7). Moreover, since 2011, the state has consistently been below (exceeded) the Healthy People 2020 (HP2020) target of 6.0 deaths per 1,000 live births.

Figure 7

Infant Mortality Rate in Texas and the US, 2007-2016

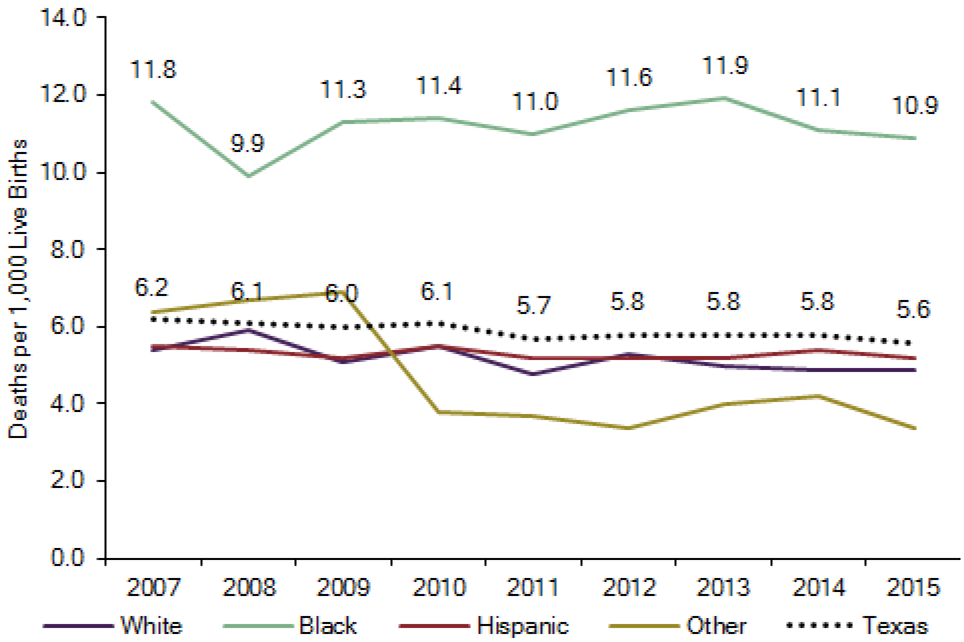


*2016 Texas data are preliminary
Source: 2007-2016 Texas Birth and Death Files, National Center for Health Statistics
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

However, racial/ethnic disparities in IMR have persisted in Texas, and it is clear that the overall decrease in IMR observed in Texas over the past decade was not equally distributed across all race/ethnic groups (see Figure 8). IMRs for Black mothers have been twice as high as IMRs for White and Hispanic mothers over much of this timeframe.

Figure 8

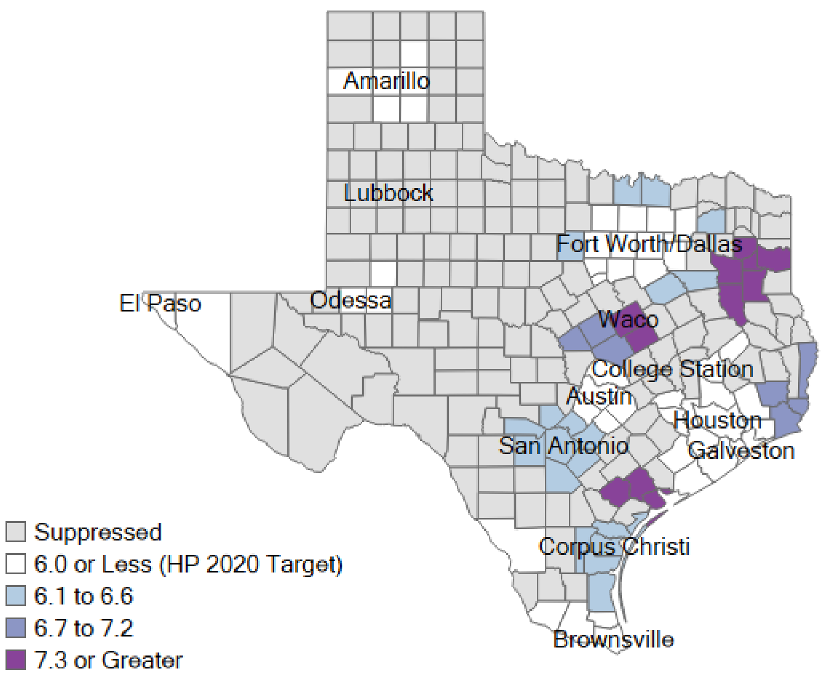
Infant Mortality Rate in Texas by Race/Ethnicity, 2007-2015



Source: 2007-2015 Texas Birth and Death Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

In addition to race/ethnic disparities, substantial regional differences in IMR persist within the state. In 2015, eleven of Texas' large communities met the HP2020 target of 6 or fewer infant deaths per 1,000 live births (see Figure 9). The Austin-Round Rock and El Paso communities had the lowest IMRs, with these communities both having fewer than 4.3 deaths per 1,000 live births. In contrast, four large Texas communities (Longview-Marshall, Tyler-Jacksonville, Victoria-Port Lavaca, and Waco) had IMRs higher than 7.3 deaths per 1,000 live births in 2015.

Figure 9
Infant Mortality Rate per 1,000 Live Births by Select Communities, 2015



Source: 2015 Birth File
2015 Death File
Prepared by: Maternal & Child Health Epidemiology Unit
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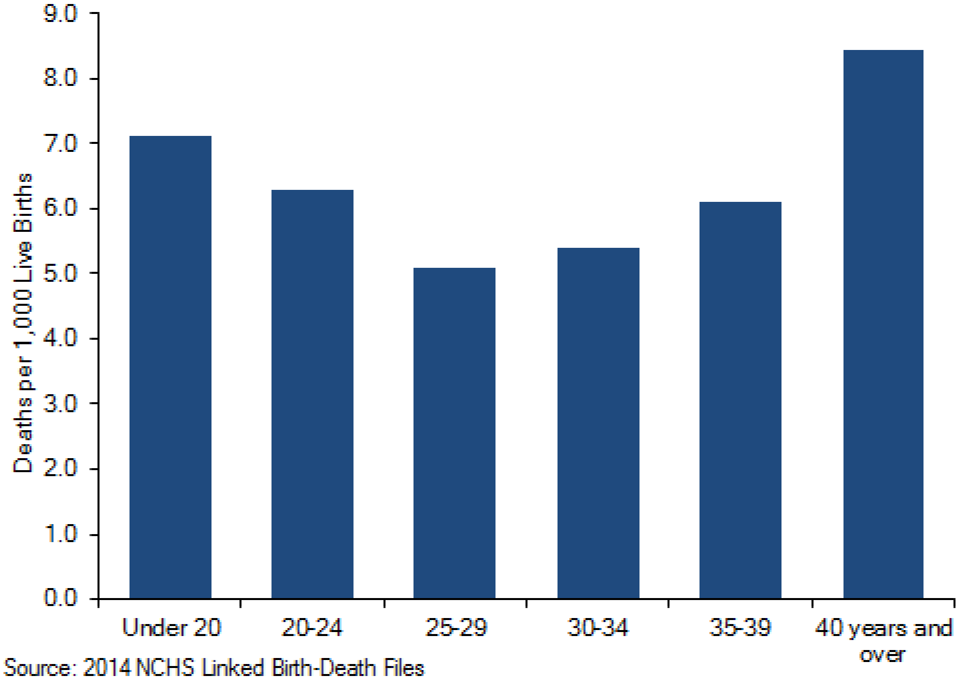
Differences in IMR also exist by maternal age. In 2014, mothers age 40 or older had a higher IMR than mothers of any other age group, followed by young mothers less than 20 years of age (see Figure 10). Mothers in these two age groups comprised 11.4 percent of resident births in 2014.

Figure 10

Infant Mortality Rate by Age Group, 2014



Source: 2014 NCHS Linked Birth-Death Files
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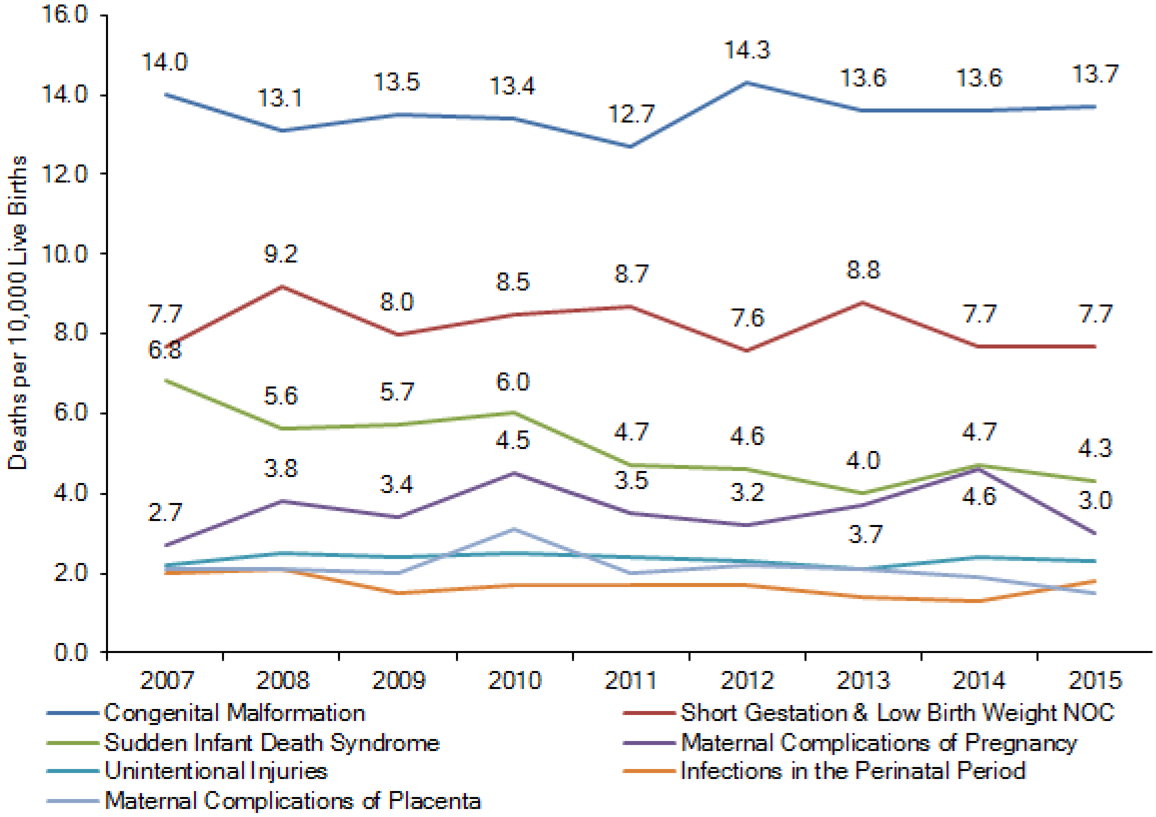
Causes of Infant Death

Overall, the leading cause of death for infants younger than one year in Texas is congenital malformation (birth defects; see Figure 11). However, among infants older than 28 days, Sudden Infant Death Syndrome (SIDS) is the leading cause of death.

Figure 11

Leading Causes of Infant Death, 2007-2015

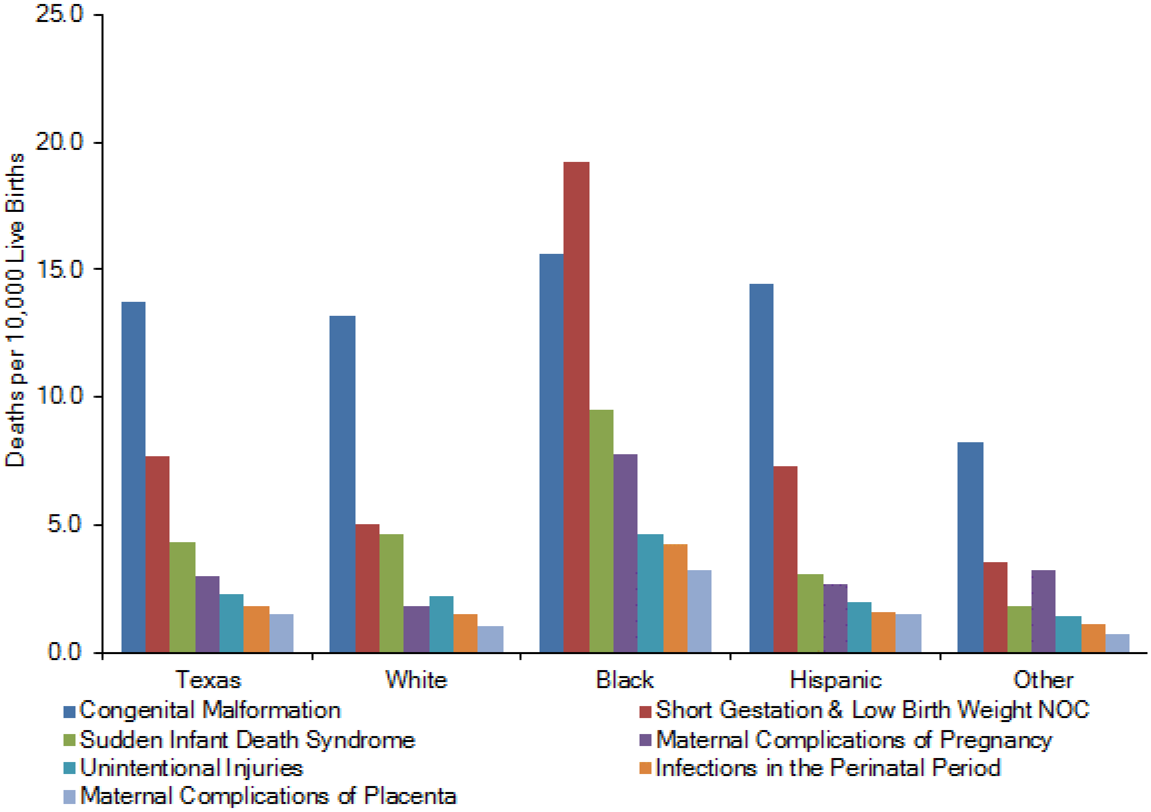


NOC: Not otherwise classified
Source: 2007-2015 Death & Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Leading causes of infant death also differ by race/ethnicity. In 2015, the leading cause of death among Black infants was short gestation and low birth weight, whereas congenital malformation was the leading cause of death among infants of all other race/ethnic groups (see Figure 12).

Figure 12

Leading Causes of Death by Race/Ethnicity, 2015



NOC: Not otherwise classified
Source: 2015 Death & Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
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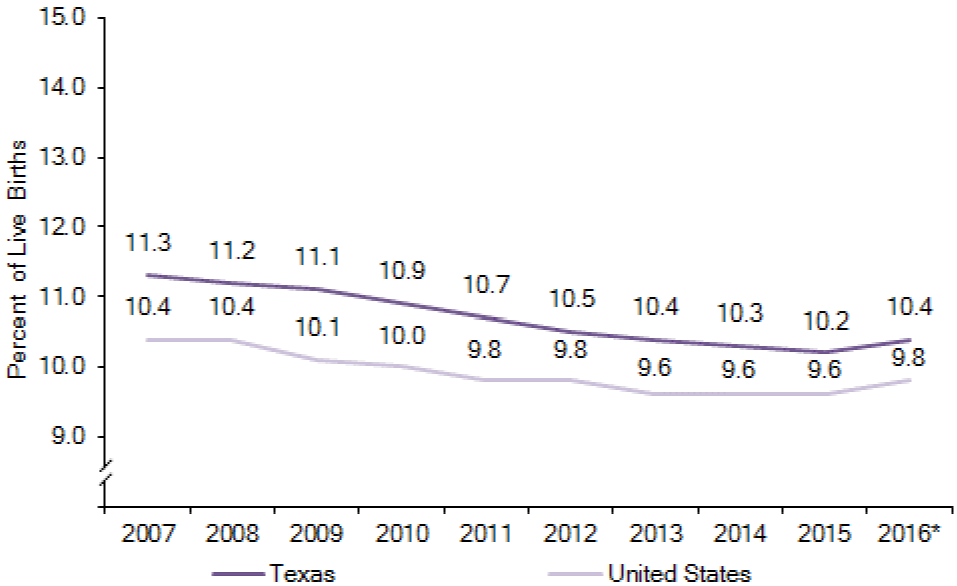
Preterm Birth

Preterm births are those that occur prior to 37 weeks of gestation. Preterm birth rates in both Texas and the nation have decreased over the past decade. However, in 2016, the Texas preterm birth rate increased for the first time since 2007, as did the national rate of preterm birth. The preterm birth rate in Texas has consistently been higher than the national average over the past 10 years (see Figure 13).

Figure 13

Percent of Live Births Born Preterm (less than 37 weeks) in Texas and United States Using Obstetric Estimate of Gestation, 2007-2016



*2016 Texas and United States data are preliminary
Source: National Center for Health Statistics
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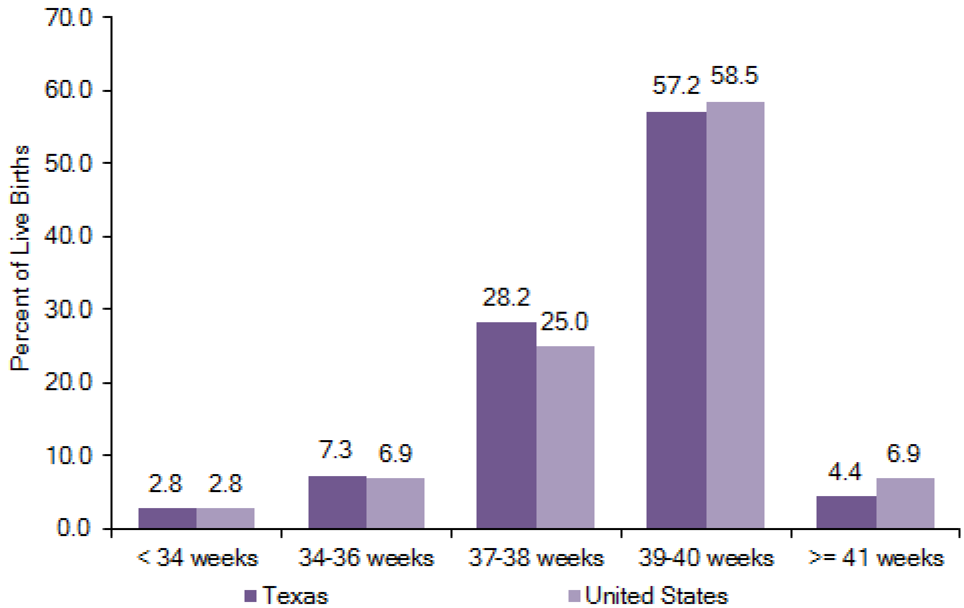
When further dividing gestational age into several different categories (including early preterm (<34 weeks), late preterm (34-36 weeks), early term (37-38 weeks), term (39-40 weeks), and late term (41 weeks or more)), a slightly higher percentage of late preterm (34-36 weeks) and early term (37-38 weeks) births were observed in Texas compared to the United States as a whole (see Figure 14).

Figure 14

Percent of Births Across Gestation Categories in Texas and United States Using Obstetric Estimate of Gestation, 2015

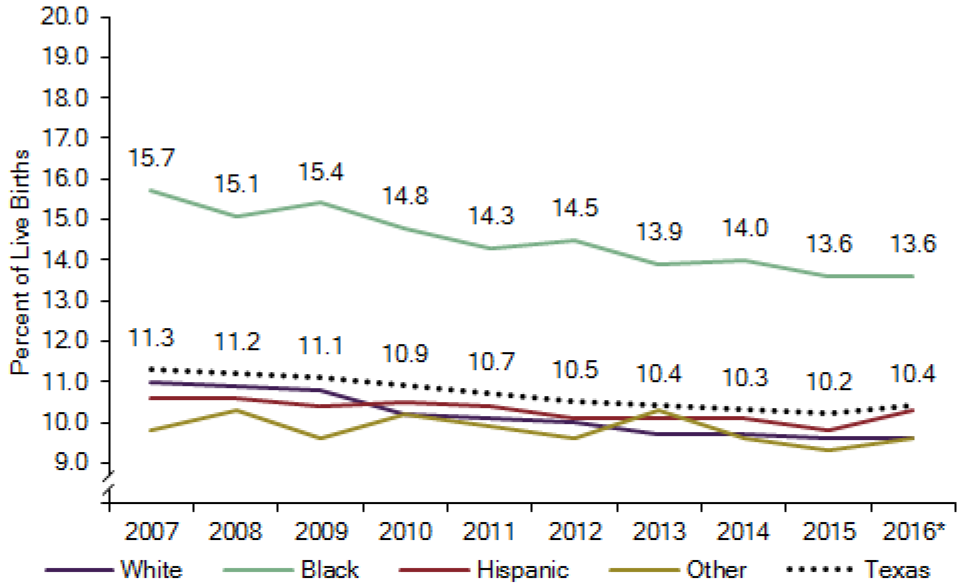


Source: National Center for Health Statistics
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

As with IMR, there are substantial racial/ethnic disparities in the preterm birth rate (see Figure 15). Black infants have a higher preterm birth rate than do infants of any other race/ethnic group. However, in the past decade, the preterm birth rate has decreased most rapidly among infants born to Black mothers, which has slightly narrowed this gap in preterm birth rates.

Figure 15

Percent of Live Births Born Preterm (less than 37 weeks) in Texas by Race/Ethnicity Using Obstetric Estimate of Gestation, 2007-2016



*2016 Texas data are preliminary
Source: 2007-2016 Texas Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
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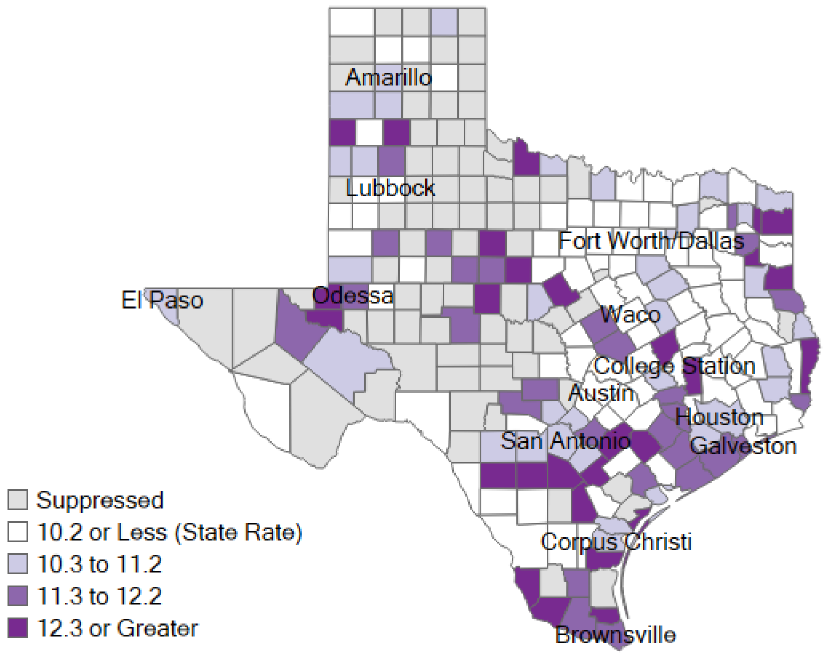
Figure 16 shows the percentage of preterm births by county in Texas. Regional differences were observed; many counties in central and south Texas had higher rates of preterm birth than the state as a whole.

Figure 16

Percent of Births That Were Preterm (Less Than 37 Weeks) Using Obstetric Estimate of Gestation, 2015



Source: 2015 Birth File
Prepared by: Maternal & Child Health Epidemiology Unit
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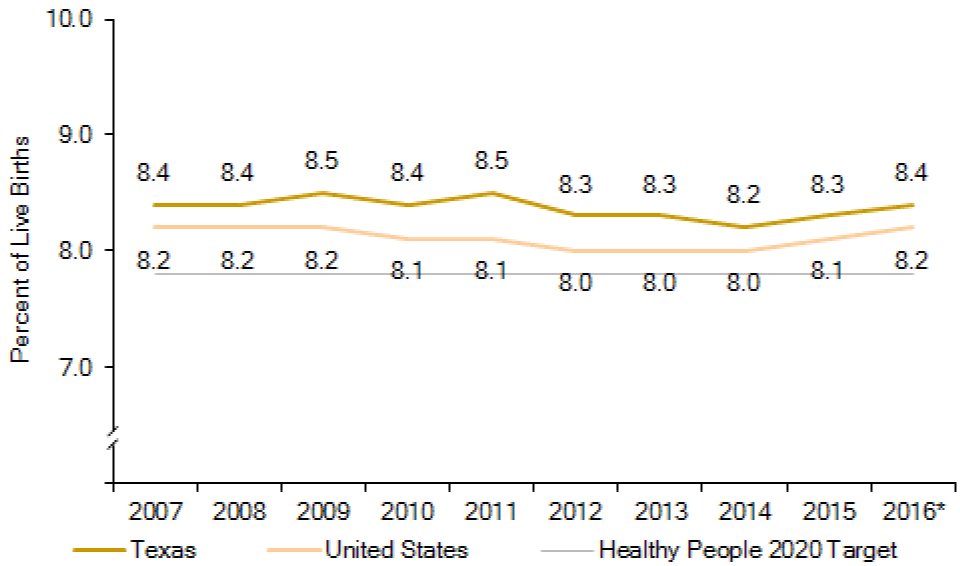
Low Birth Weight

The percentage of babies born with a low birth weight (weighing less than 2500 grams) increased slightly from 2014 to 2016, both in Texas and in the nation. The rate of low birth weight infants in Texas is slightly higher than the national rate, and Texas is currently not meeting the HP2020 target of 7.8 percent or fewer of all live births weighing less than 2500 grams (see Figure 17).

Figure 17

Percent of Births that are Low Birth Weight (less than 2500 g) in Texas and the United States, 2007-2016

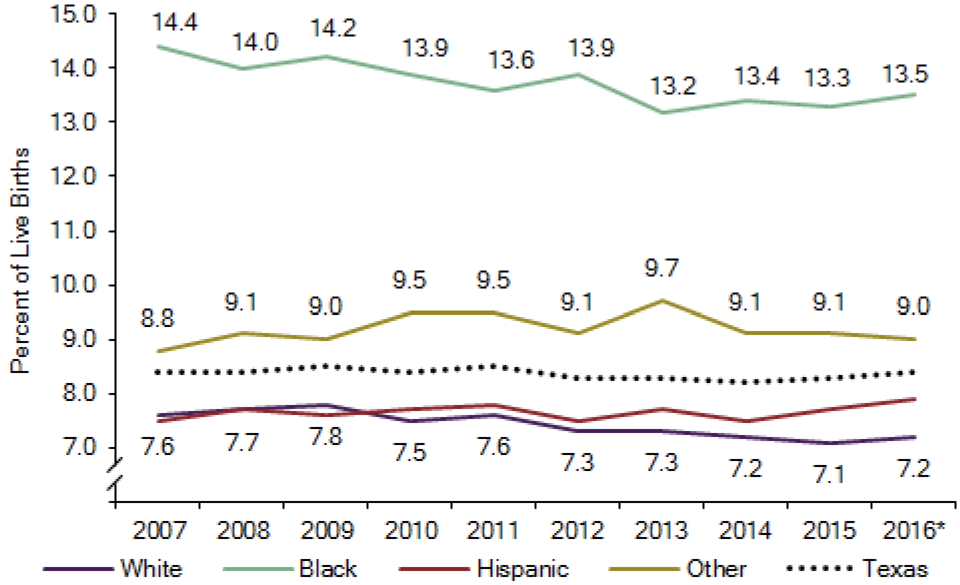


*2016 Texas and United States data are preliminary
Source: 2007-2016 Texas Birth & Death Files, National Center for Health Statistics
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

As with IMR and preterm births, Black mothers have a disproportionately high percentage of low birth weight infants (see Figure 18).The rate of low birth weight infants is also higher among mothers in the 'Other' race/ethnic category than among White or Hispanic mothers.

Figure 18

Percent of Births that are Low Birth Weight (less than 2500 g) in Texas by Race/Ethnicity, 2007-2016



*2016 Texas data are preliminary
Source: 2007-2016 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
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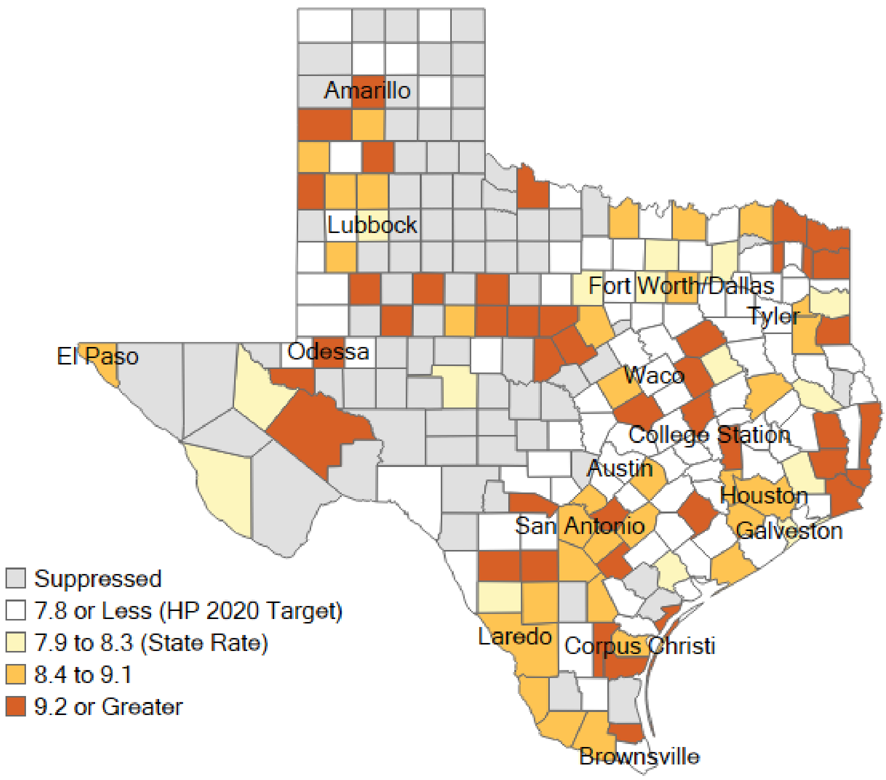
Although some counties in Texas met the HP2020 target for percentage of low birth weight infants in 2015, many counties did not (see Figure 19). There were no clear geographic patterns or regional disparities for low birth weight rates within the state.

Figure 19

Percent of Infants Born Low Birth Weight (Less Than 2,500g), 2015



Source: 2015 Birth File
Prepared by: Maternal & Child Health Epidemiology Unit
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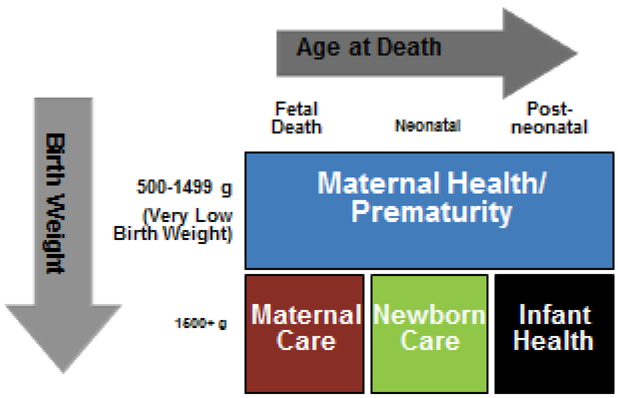
Perinatal Periods of Risk

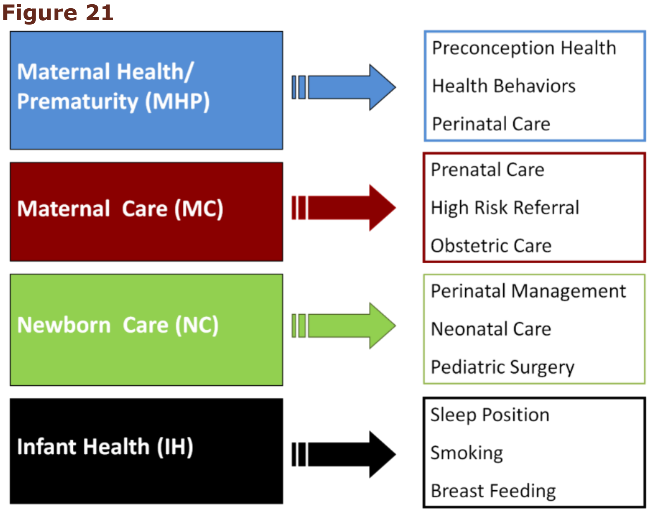
Although Texas has made significant progress in reducing infant mortality, data show continued disparities in infant mortality and feto-infant mortality among different racial/ethnic groups, especially between Black and White women. To better understand these disparities, a perinatal periods of risk analysis (PPOR) was undertaken, which examines the risk of feto-infant mortality during different perinatal periods. Based on birth weight and age at death, fetal and infant deaths were partitioned into four corresponding risk periods (see Figure 20).

Figure 20



Each of these periods has different risk factors and causes of death, and hence, different opportunities for prevention; therefore, the four risk periods represent distinct points of intervention in the health care continuum (see Figure 21) [7].

Figure 21

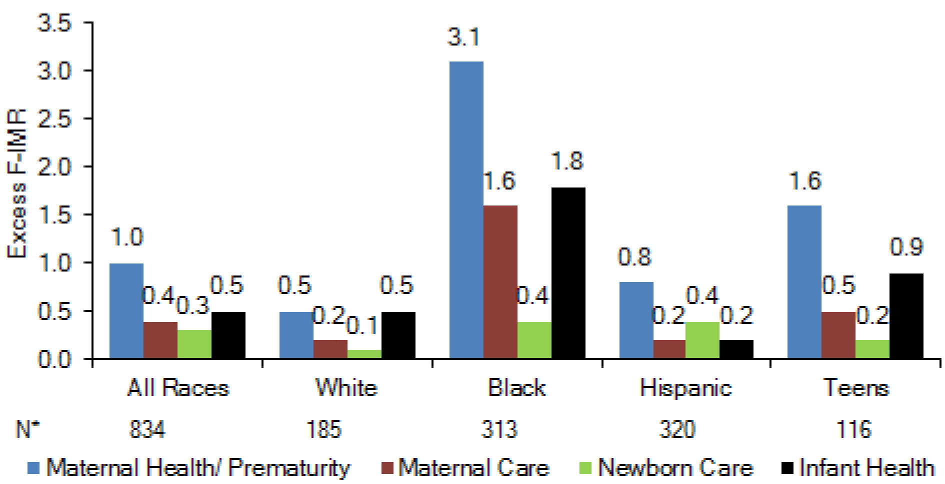


From: Peck, M. G., Sappenfield, W. M., & Skala, J. (2010). Perinatal periods of risk: A community approach for using data to improve women and infants' health. *Maternal & Child Health Journal, 14*(6), 864-874. doi:10.1007/s10995-010-0626-3

Texas and specific study populations (i.e., Black, White, Hispanic, or teens) were compared to a state-level reference group generally known to have better feto-infant mortality outcomes (i.e., non-Hispanic White women who are at least 20 years of age and have 13+ years of education). In the following analysis, these study populations are not mutually exclusive. The feto-infant mortality rate (F-IMR) is calculated as the number of fetal and infant deaths per 1,000 live births and fetal deaths. The 2014 F-IMRs were 6.6 per 1,000 for White mothers, 12.1 per 1,000 for Black mothers, 6.9 per 1,000 for Hispanic mothers, and 8.5 per 1,000 for teen mothers. The excess F-IMR is the difference in F-IMR between the study population and the reference group. In 2014, Black mothers experienced a total of 6.8 excess fetal and infant deaths per 1,000 live births and fetal deaths. Total excess F-IMRs for White mothers, Hispanic mothers, and teen mothers were 1.4 per 1,000, 1.7 per 1,000, and 3.3 per 1,000, respectively (see Figure 22).

Figure 22

Excess Feto-Infant Mortality Rates (F-IMR), Texas, 2014



*N is the number of excess fetal and infant deaths for each of the groups shown.
Source: 2014 Birth Cohort Linked Birth Infant Death Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

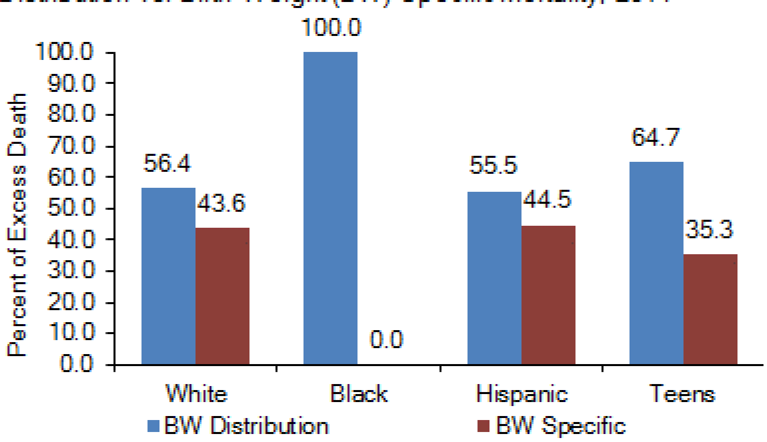
Black women had the highest excess F-IMR for all four risk periods (see Figure 22), with 57 percent of all Black fetal and infant deaths being potentially preventable deaths (i.e. excess fetal and infant deaths). Moreover, 45 percent of the overall excess Black fetal and infant deaths occurred in the Maternal Health/Prematurity risk period. For teen mothers, 78 percent of excess feto-infant deaths occurred in the Maternal Health and Infant Health risk periods.

Phase II Analysis

For fetal and infant deaths in the Maternal Health/Prematurity risk period, a Kitagawa analysis was conducted for each study population, to examine whether excess feto-infant mortality was primarily due to a greater number of very low birth weight (VLBW) births in the study population compared to the reference population (a difference in *birth weight distribution*), or to a higher mortality rate among VLBW infants than seen in the reference population (a difference in *birth weight specific mortality*) [12]. In other words, did the excess feto-infant mortality emerge because of the greater number of VLBW infants in the study population compared to the reference group, or because VLBW infants died at higher rates compared to the reference group? The percentage of excess deaths attributable to a difference in birth weight distribution compared with the percentage attributable to a difference in birth weight specific mortality rates are shown in Figure 23 for each study population.

Figure 23

Percent of Excess Death Attributable to Birth Weight (BW) Distribution vs. Birth Weight (BW) Specific Mortality, 2014



Source: 2014 Linked Birth Infant Death Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

For all subpopulations examined, the majority of excess Maternal Health/Prematurity risk period deaths were attributable to a greater number of VLBW births in these groups when compared to the reference population. Notably, Black infants (0%) had lower mortality rates among VLBW births than the reference population; for this subgroup, all excess deaths (100%) were potentially attributable to a greater number of VLBW births (see Figure 23). For all of these study populations, and especially for infants born to Black mothers, interventions aimed at reducing the number of VLBW births are likely to be most effective at closing the gap in feto-infant mortality.

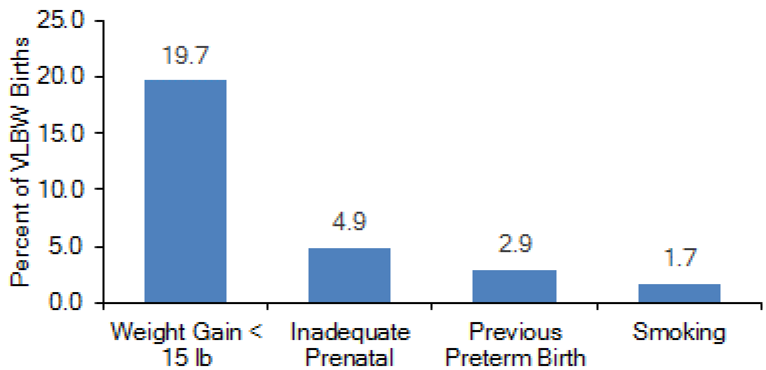
For infants born to White mothers, Hispanic mothers, and teen mothers, some proportion of excess feto-infant death was also attributable to a higher mortality rate among VLBW births than the reference population.

To examine differences in *birth weight distribution* during the Maternal Health/Prematurity risk period, a multivariable logistic regression analysis was conducted to identify factors associated with risk of delivering a VLBW baby. Factors examined included maternal demographic factors (race/ethnicity, age, and education), multiple gestations, smoking during pregnancy, high parity, previous preterm birth, maternal weight gain during pregnancy, adequacy of prenatal care, trimester prenatal care began, and payment source for the delivery.

Factors that contributed the most to risk of a VLBW birth included weight gain less than 15 pounds, inadequate prenatal care, and previous preterm birth (see Figure 24). Approximately 20 percent of all VLBW births were attributable to weight gain less than 15 pounds. Five percent and 3 percent of all VLBW births could be attributed to inadequate prenatal care and previous preterm birth, respectively. Black mothers and teens were more likely to gain less than 15 pounds or receive inadequate prenatal care compared to the reference population, and Black mothers had increased prevalence of having a previous preterm birth.

Figure 24

Percent of VLBW Births Attributable to Select Risk Factors, 2014



Source: 2014 Linked Birth Infant Death Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

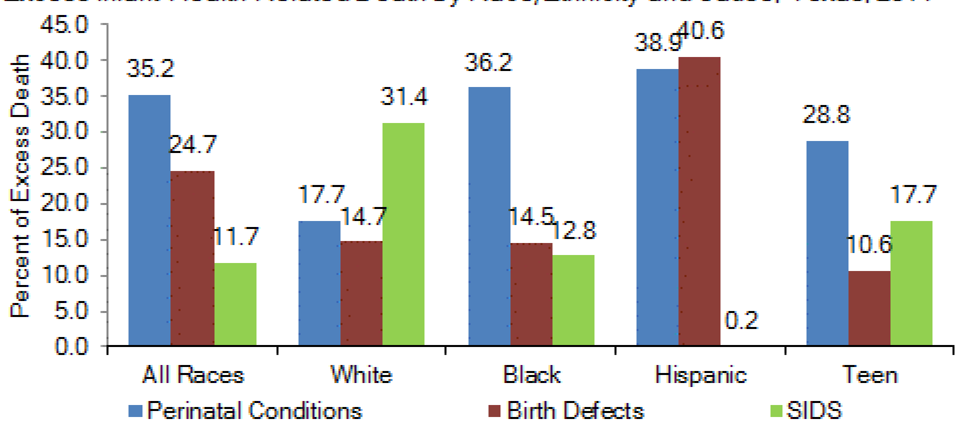
To identify factors related to *birth weight specific mortality* in the Maternal Health/Prematurity risk period, an analysis was also performed to assess risk of infant death among VLBW births. Factors examined in this analysis included maternal demographics, congenital anomalies, inadequate prenatal care, maternal diabetes, maternal hypertension, infant transfer, maternal transfer, respiratory care, ruptured membranes, and prenatal steroids.

Congenital anomalies contributed the most to infant mortality among VLBW births. Specifically, 4 percent of infant deaths to this group were attributable to congenital anomalies. Among VLBW births, infants whose mothers received prenatal steroids had a 60 percent *reduced* risk of infant death. Compared to the reference population, teen mothers were more likely to deliver an infant with congenital anomalies and were less likely to receive prenatal steroids.

Among all infant deaths in the Infant Health risk period, perinatal conditions were the primary cause of death, accounting for 35 percent of excess deaths (see Figure 25). Of the subgroups examined, Blacks and teens had the greatest excess infant mortality in this risk period, with perinatal conditions accounting for a large proportion of excess infant deaths. Birth defects contributed to 41 percent of excess mortality among Hispanic infants, and SIDS accounted for 31 percent of excess deaths among infants born to white mothers.

Figure 25

Excess Infant Health-Related Death by Race/Ethnicity and Cause, Texas, 2014



Source: 2014 Linked Birth Infant Death Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

To further examine excess mortality in the Infant Health risk period, an analysis was conducted to determine risk factors associated with infant death among infants 28 days and older. Maternal demographic factors, smoking during pregnancy, adequacy of prenatal care, breastfeeding status at hospital discharge, and trimester prenatal care began were all examined. Breastfeeding at hospital discharge and smoking had the greatest impact on overall risk of infant death during this time period. Among infants 28 days and older, infants who were breastfed at hospital discharge had a 38 percent *reduced* risk of infant death, and 5 percent of infant deaths were attributable to maternal smoking during pregnancy.

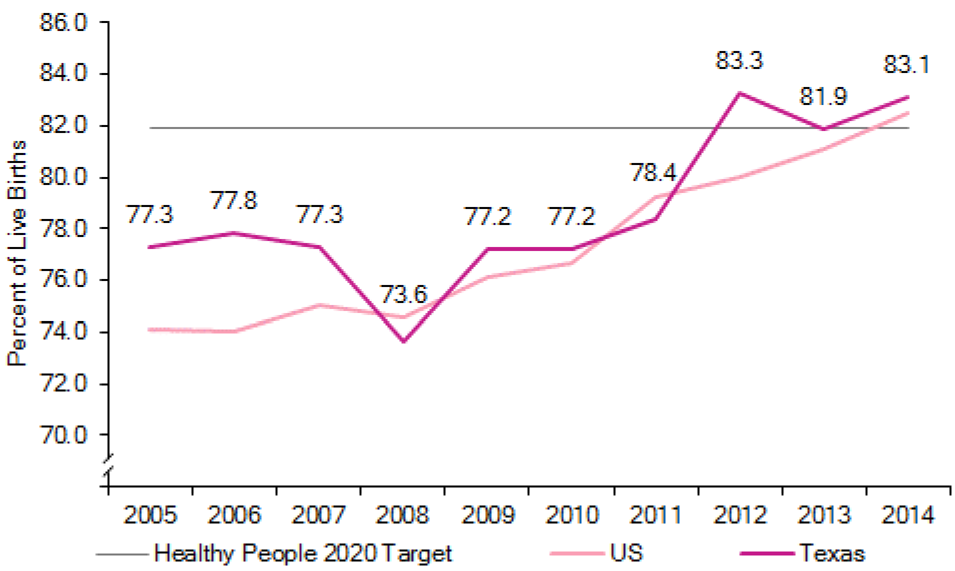
Infant Health Practices

Breastfeeding

Breast milk is the best source of nutrition for infants, as it contains essential nutrients and antibodies necessary to best nourish infants and protect them from disease. Formula-fed babies are at higher risk of several adverse outcomes, including necrotizing enterocolitis (a condition that affects the gastrointestinal tract of preterm infants), lower respiratory infections, and chronic diseases such as asthma, obesity, and type 2 diabetes [13]. Exclusive breastfeeding has also been shown to be protective against infant mortality due to SIDS, as well as deaths from childhood illnesses [14, 15].

According to the National Immunization Survey, 83.1 percent (CI: 79.9-86.3) of infants born in Texas in 2014 were ever breastfed (see Figure 26) [16]. This rate was very similar to the 2014 national rate (82.5 percent; CI: 81.4-83.6). Since 2012, Texas has met or exceeded the HP2020 target for proportion of infants having ever breastfed (81.9 percent).

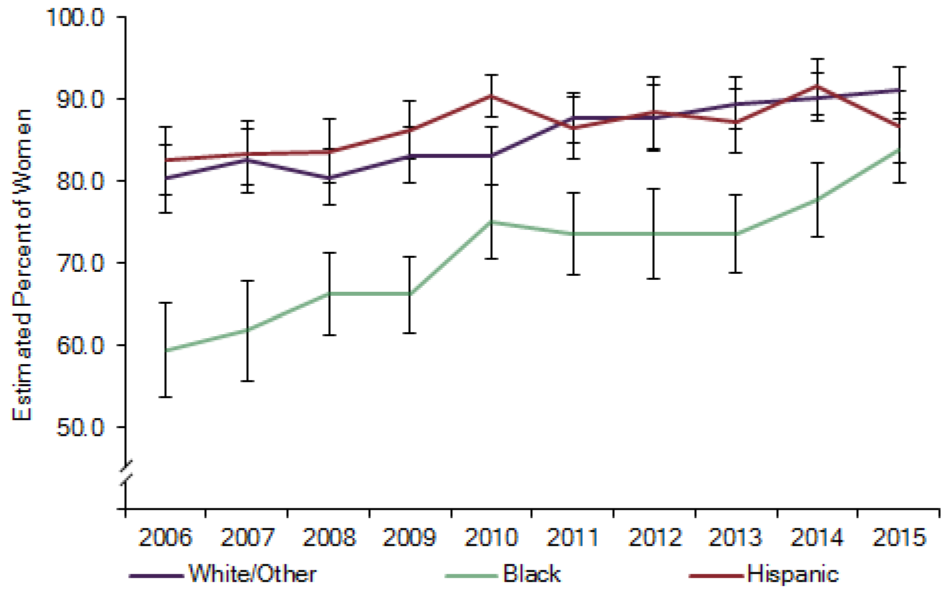
Figure 26
Percent of Infants Who Were Ever Breastfed in Texas and the United States, 2005-2014



Breastfeeding rates through 2008 births are based on the landline sampling frame. Starting with 2009 births, rates are based on a dual-frame sample.
Source: National Immunization Survey
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

However, significant race/ethnic disparities exist in the rate of women who have ever breastfed their infant. Black mothers report lower rates of ever breastfeeding than White mothers (see Figure 27).

Figure 27
Women Who Ever Breastfed Their Baby by Race/Ethnicity, Texas PRAMS 2006-2015



Error Bars: 95% Confidence Interval
Source: 2006-2015 Texas PRAMS
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Among the Women, Infants, and Children (WIC) population in Texas, 84.8 percent of clients surveyed in the 2013 Infant Feeding Practices Survey reported ever breastfeeding, and in 2016, 86.0 percent reported ever breastfeeding [17].

While a relatively large proportion of Texas mothers report having ever breastfed, rates of exclusive breastfeeding are significantly lower. Research has shown that the benefits of breastfeeding are greatest when the baby is exclusively fed breast milk for the first 6 months after birth. According to the National Immunization Survey, 24.6 percent (C.I.: 21.5-27.7) of Texas mothers reported breastfeeding exclusively at 6 months in 2014 [16]. Among mothers enrolled in Texas WIC in 2016, only 6.0 percent reported exclusively breastfeeding at 6 months of age [17].

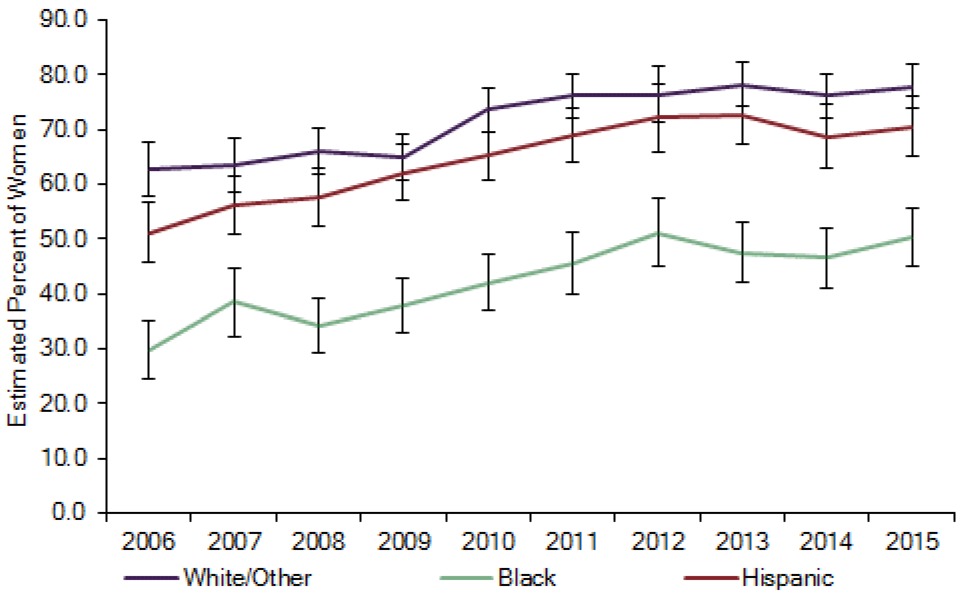
It has been shown that initiating breastfeeding in the hospital is an important first step towards exclusive breastfeeding. In Texas, only 17.0 percent of births in 2017 occurred in a Baby-Friendly Hospital, according to 2017 Baby-Friendly USA [18].

Placing Infants on their Back to Sleep

Placing an infant on his/her back to sleep, rather than on the stomach or side, is an important strategy to reduce sleep-related deaths [19]. According to Texas PRAMS data, the percent of mothers reporting placing their infant on their back to sleep has increased by over 30 percent since 2006. Despite this significant increase, substantial race/ethnic differences still exist. In particular, although the proportion of Black mothers placing their infant on their back to sleep increased by 68 percent between 2006 and 2015, this proportion was still significantly lower among Black mothers than among both White and Hispanic mothers in 2015 (see Figure 28).

Figure 28

Women Who Reported Placing Infant on Back to Sleep by Race/Ethnicity, Texas PRAMS 2006-2015



Error Bars: 95% Confidence Interval
Source: 2006-2015 Texas PRAMS
Prepared by: Maternal & Child Health Epidemiology Unit
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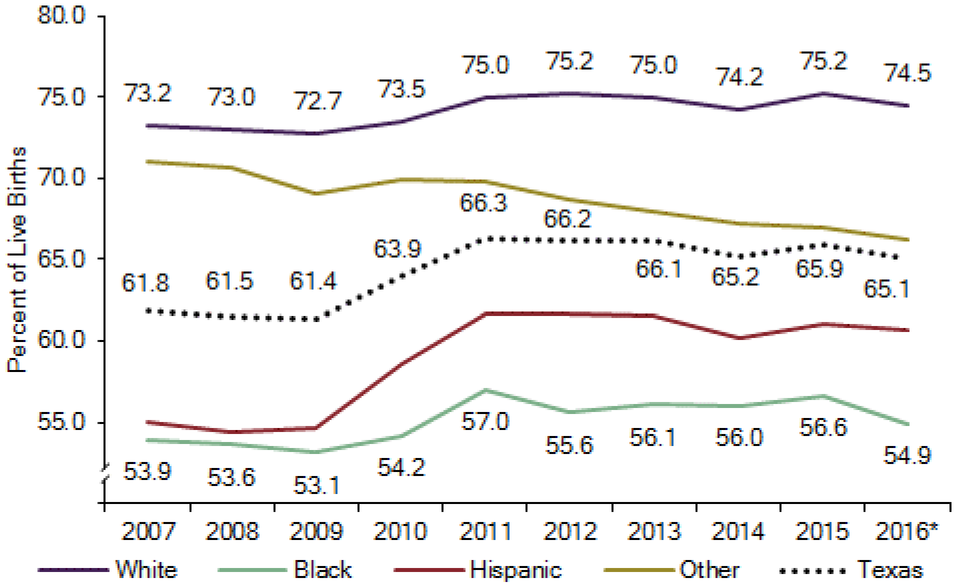
Prenatal Care

The HP2020 target is to increase the proportion of pregnant women who begin prenatal care in the first trimester of pregnancy to 77.9 percent. Texas, as a whole, is not meeting this target percentage; in 2016, 65.1 percent of mothers entered prenatal care within the first trimester (see Figure 29).

Figure 29
Percent of Live Births Where Mother Received Prenatal Care in the First Trimester, 2007-2016



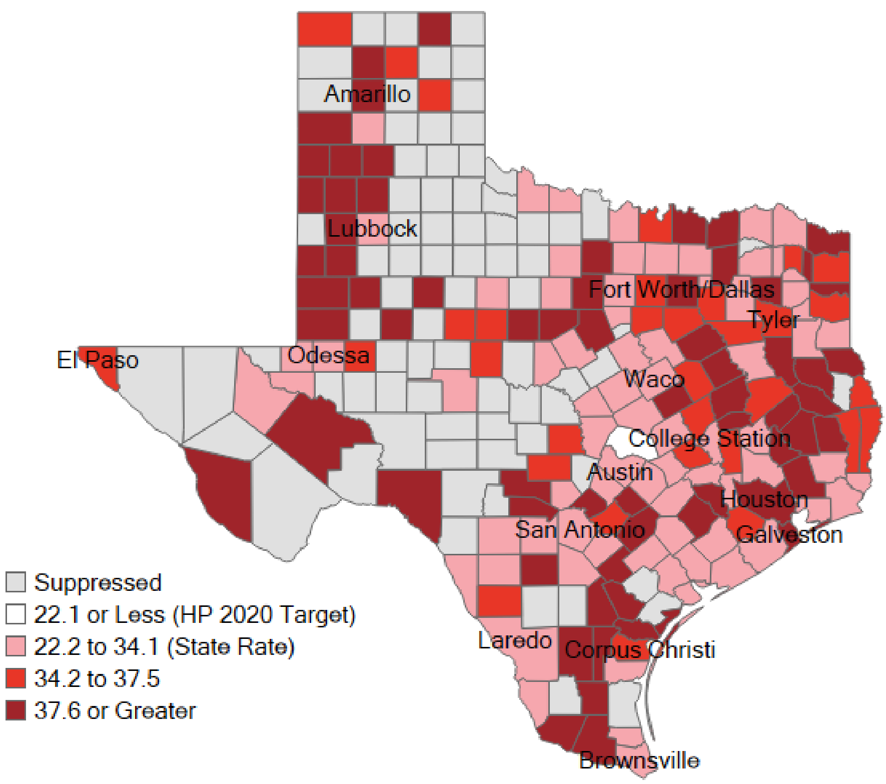
*2016 Texas data are preliminary
Source: 2007-2016 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Timely access to prenatal care increased in Texas from 2009-2011 (largely driven by a sharp increase in the percentage of Hispanic women receiving prenatal care in the first trimester during this timeframe), but appears to have decreased slightly since 2011. Disparities in timely prenatal care access exist between different race/ethnic groups. A larger proportion of White women begin receiving prenatal care in the first trimester of pregnancy, compared to all other race/ethnic groups. Conversely, a smaller proportion of Black women receive prenatal care in the first trimester than any other race/ethnic group. Only a little more than half of Black mothers begin prenatal care in the first trimester of pregnancy. While a relatively high proportion of women of 'Other' race/ethnicity receive timely access to prenatal care, the proportion of women in this race/ethnic group who receive prenatal care in the first trimester has steadily decreased over the past decade.

Late entry into prenatal care is a statewide problem. In 2015, only one urban Texas county (Williamson County, in central Texas) met the HP2020 target percentage of women entering prenatal care in the first trimester (see Figure 30).

Figure 30

Percent of Live Births Not Receiving Prenatal Care in the First Trimester, 2015



Source: 2015 Birth File
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Using PRAMS 2015 survey data, among mothers who reported that they did not receive care in the first trimester of their pregnancy, 51.5 percent still reported that they had received prenatal care as early as they had wanted. These findings indicate a need for increased education and awareness of the importance of obtaining prenatal care starting in the first trimester.

Maternal Health

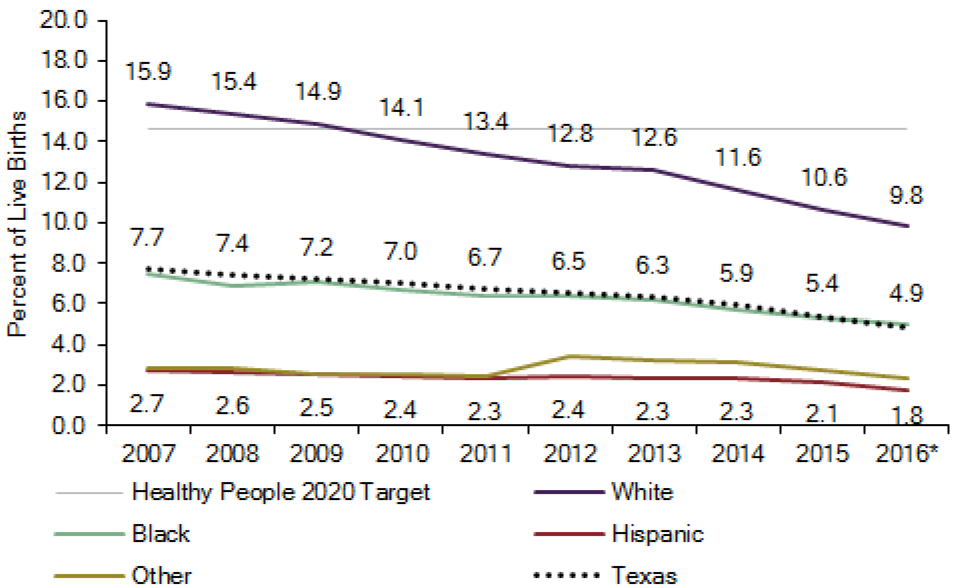
Smoking

Texas is one of the better performing states when it comes to smoking during pregnancy [20]. This is due, in large part, to the high number of births to Hispanic women in the state (47 percent of all births in Texas were to Hispanic women in 2016).

In general, Hispanic women have a lower prevalence of smoking than women of all other races/ethnicities in Texas. A smaller proportion of both Hispanic women and women of 'Other' race/ethnicity smoked three months prior to becoming pregnant, compared to all other race/ethnic groups (see Figure 31).

Figure 31

Percent of Live Births Where Mother Smoked Cigarettes 3 Months Before Pregnancy, 2007-2016

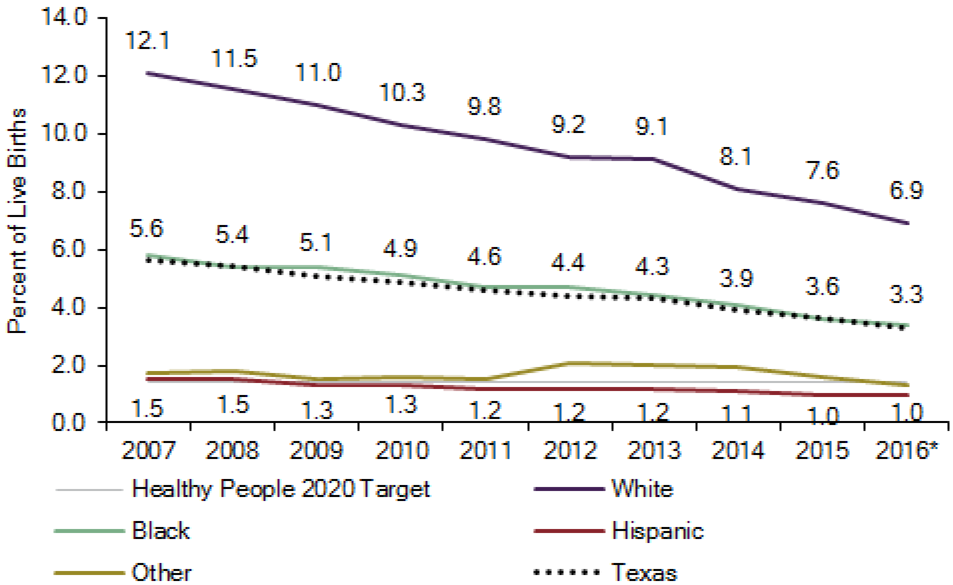


*2016 Texas data are preliminary
Source: 2007-2016 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Women of these race/ethnic groups also have the lowest prevalence of smoking during pregnancy, both in Texas and in the nation [21]. Currently, only Hispanic women and women of 'Other' race/ethnicity are meeting the Healthy People 2020 target of at least 98.6 percent abstinence from smoking during pregnancy in Texas. While the overall proportion of women who smoke during pregnancy has decreased 42.1 percent in Texas over the past decade, there is still room for improvement, especially among White women (see Figure 32).

Figure 32

Percent of Live Births Where Mother Smoked Cigarettes During Pregnancy, 2007-2016

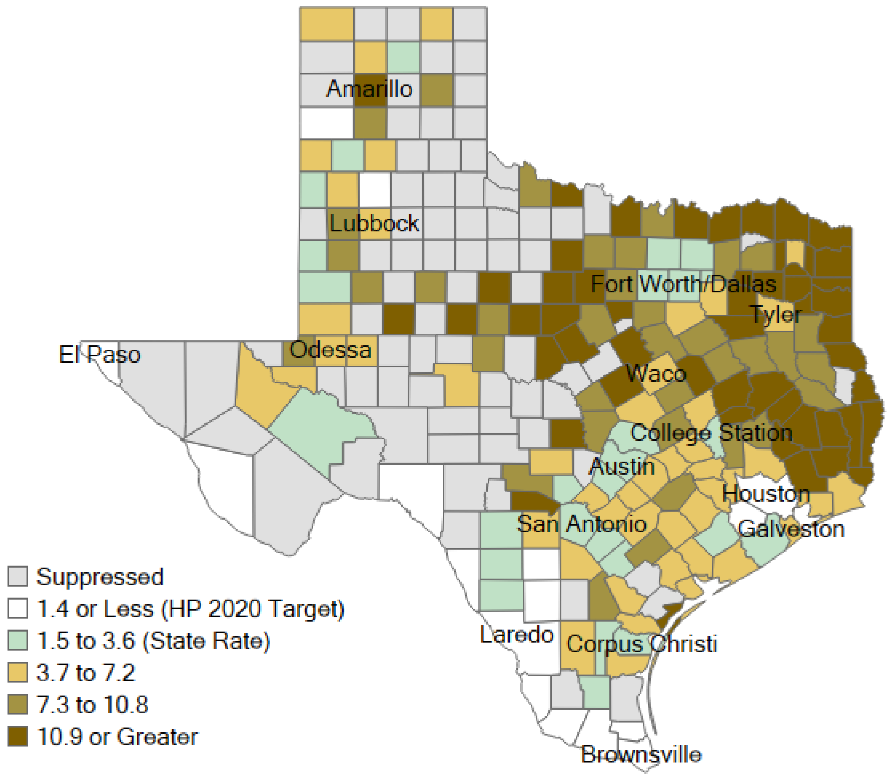


*2016 Texas data are preliminary
Source: 2007-2016 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

In 2007, 29.2 percent of women who smoked 3 months prior to pregnancy abstained from smoking (did not smoke at all) once becoming pregnant. In 2015, this rate of total abstinence from smoking during pregnancy among previous smokers had risen to 35.2 percent.

Regional differences in the prevalence of smoking during pregnancy exist throughout Texas (see Figure 33). In 2015, counties near the Texas-Mexico border generally had lower rates of smoking during pregnancy, whereas higher rates of smoking during pregnancy were observed in many counties in north and east Texas.

Figure 33
Percent of Live Births Where the Mother Smoked During Pregnancy, 2015



Source: 2015 Birth File
Prepared by: Maternal & Child Health Epidemiology Unit
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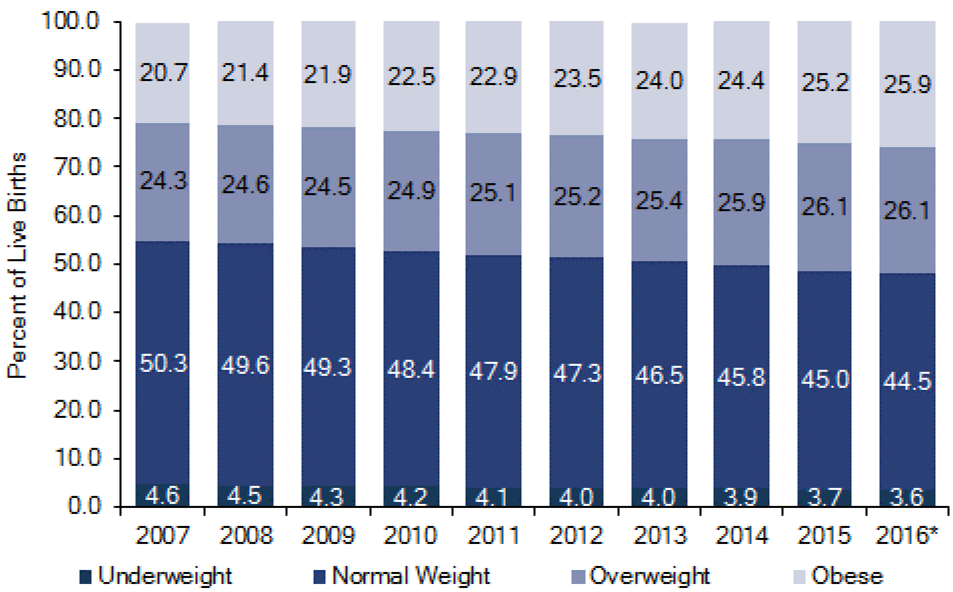
Pre-Pregnancy Obesity

Obesity is a well-known risk factor for developing hypertension, diabetes, and a variety of other medical problems during pregnancy [22, 23, 24]. Obese women are at higher risk for having a preterm birth or experiencing infant death than are non-obese women [25, 26, 27].

A rise in pre-pregnancy obesity has been observed over the past decade, both in Texas and in other states [28]. The proportion of mothers with a pre-pregnancy body mass index (BMI) in the obese range has increased 25.0 percent in Texas since 2007 (see Figure 34).

Figure 34

Maternal Pre-pregnancy Body Mass Index Distribution for All Live Births, 2007-2016

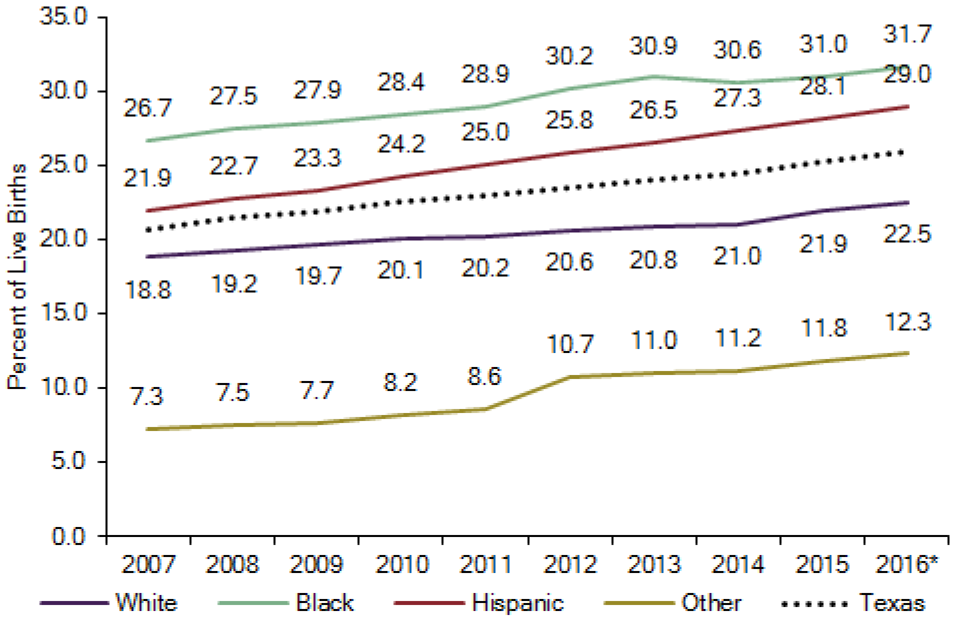


*2016 Texas data are preliminary
Source: 2007-2016 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Pre-pregnancy obesity is more prevalent among Black and Hispanic mothers than among White mothers or mothers of 'Other' race/ethnicity (see Figure 35). However, over the past decade, the rate of pre-pregnancy obesity has risen most steeply among mothers of 'Other' race/ethnicity; a 68.8 percent increase in pre-pregnancy obesity has been observed among mothers of this group since 2007. Hispanic mothers have also seen a relatively large increase in pre-pregnancy obesity between 2007 and 2016 (a 32.4 percent increase among Hispanic mothers, compared with increases of 18.7 and 19.8 percent among Black and White mothers, respectively).

Figure 35

Maternal Pre-pregnancy Obesity by Race/Ethnicity, 2007-2016

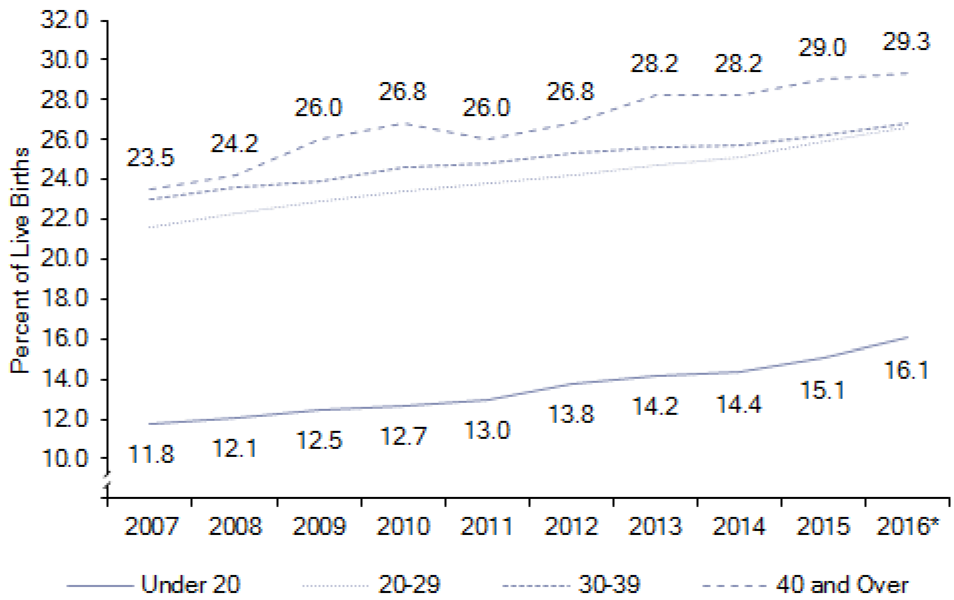


*2016 Texas data are preliminary
Source: 2007-2016 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Prevalence of pre-pregnancy obesity also differs by maternal age. In 2016, a much lower proportion of mothers younger than 20 years old were obese prior to pregnancy, compared with all older age groups. Mothers 40 years or older had the highest proportion of pre-pregnancy obesity. The rise in obesity rates over time has also differed by maternal age. Over the past decade, the largest percent increase in the prevalence of pre-pregnancy obesity has been observed for mothers younger than 20 years old, followed by mothers 40 years or older (see Figure 36).

Figure 36

Maternal Pre-pregnancy Obesity by Age Group, 2007-2016

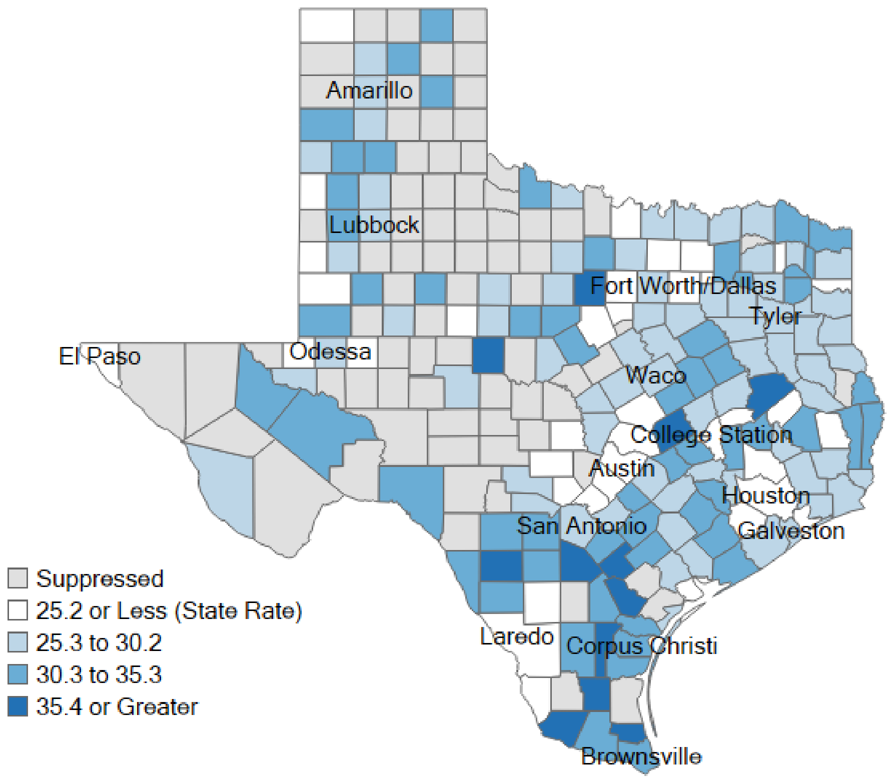


*2016 Texas data are preliminary
Source: 2007-2016 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Many rural and suburban counties in Texas have higher pre-pregnancy obesity rates than the state as a whole (see Figure 37). In addition to pre-pregnancy obesity rate differences observed between Texas counties, it is likely that within-county differences could also exist, since neighborhood environments (walkability, access to parks/sidewalks, access to healthy food choices) can vary widely even within the same county [29, 30].

Figure 37

Percent of Births to an Obese Mother, 2015

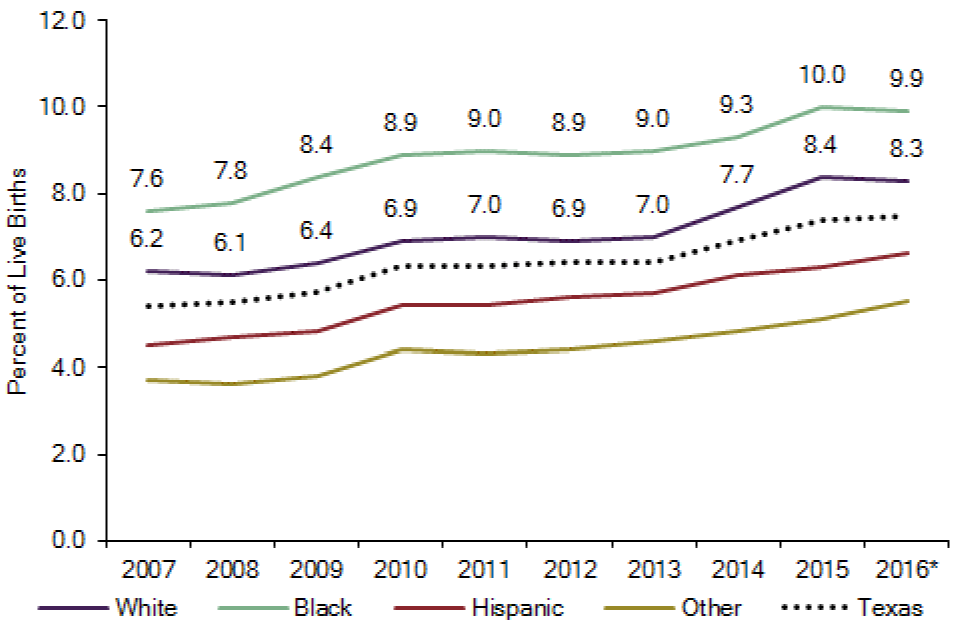


Source: 2015 Birth File
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Hypertension & Diabetes

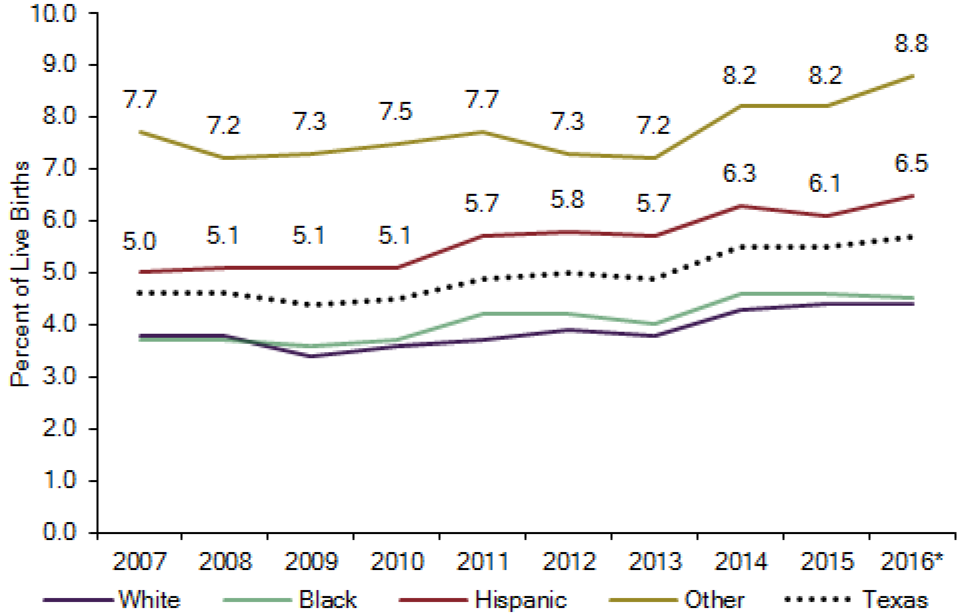
According to 2016 birth certificate data, 7.5 percent of all live births were to mothers with some form of hypertension, and 5.7 percent of all live births were to mothers who had diabetes (these mothers either had diabetes or hypertension pre-pregnancy, or developed the condition over the course of the pregnancy). Rates of both hypertension and diabetes among mothers are slowly rising in Texas (see Figure 38 & Figure 39). As with many health outcomes, both hypertension and diabetes rates differ by race/ethnicity. Of all race/ethnic groups, Black and White women have the highest percentages of maternal hypertension (see Figure 38), while women in the 'Other' race/ethnicity category and Hispanic women have the highest percentages of maternal diabetes (see Figure 39).

Figure 38
Rates of Maternal Hypertension by Race/Ethnicity, 2007-2016



*2016 Texas data are preliminary
Source: 2007-2016 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Figure 39
Rates of Maternal Diabetes by Race/Ethnicity, 2007-2016



*2016 Texas data are preliminary
Source: 2007-2016 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Pre-pregnancy obesity is associated with both hypertension and diabetes in the Texas data, as is seen in the literature [22, 23]. In 2016, 20.7 percent of all mothers with pre-pregnancy obesity also had hypertension, diabetes, or both conditions. In contrast, only 7.4 percent of mothers with normal pre-pregnancy BMI were hypertensive, diabetic, or had both conditions.

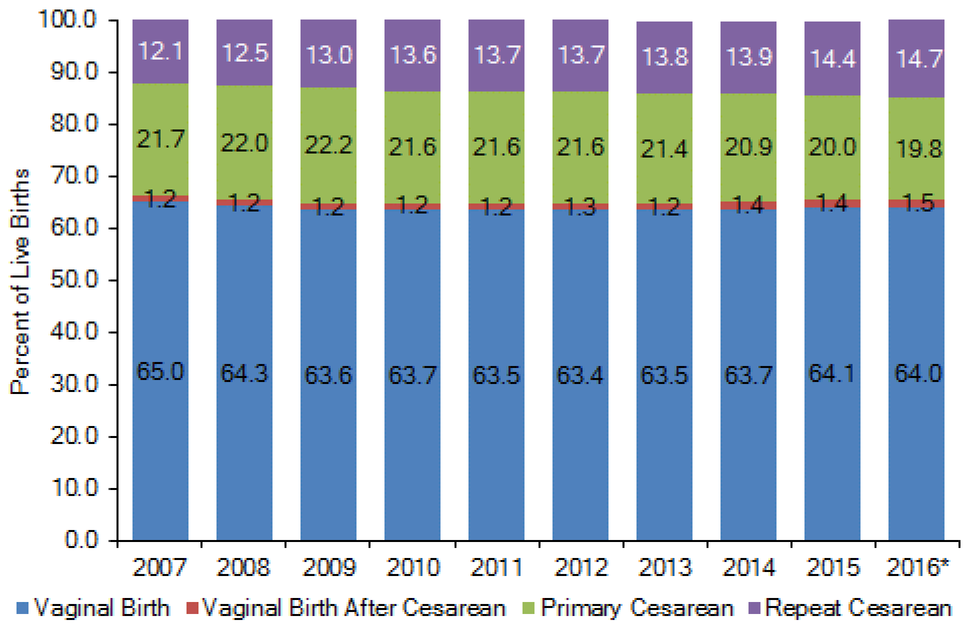
Women with diabetes and their infants are at increased risk for a variety of complications, including infant or fetal death. While a relatively small proportion (fewer than eight percent) of women who deliver each year have some form of hypertension, these women experience about 10 percent of all fetal and infant deaths. Additionally, these women experience a high rate of severe maternal morbidity. Hypertension/eclampsia is both a leading diagnosis of severe maternal morbidity and a leading cause of maternal death for Black women [31].

Delivery

The method of delivery for live births in Texas has remained relatively stable from 2007 to 2016 (see Figure 40). Over this time period, the percentage of vaginal births has decreased slightly, and the percent of women having a repeat cesarean section has increased slightly. The percent of infants born via primary cesarean section (cesarean section in a woman who has not previously had a cesarean section) has shown modest decreases since 2009. In 2016, 34.4 percent of all Texas deliveries were delivered by cesarean section.

Figure 40

Percent of All Births by Delivery Method, 2007-2016



*2016 Texas data are preliminary
Source: 2007-2016 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
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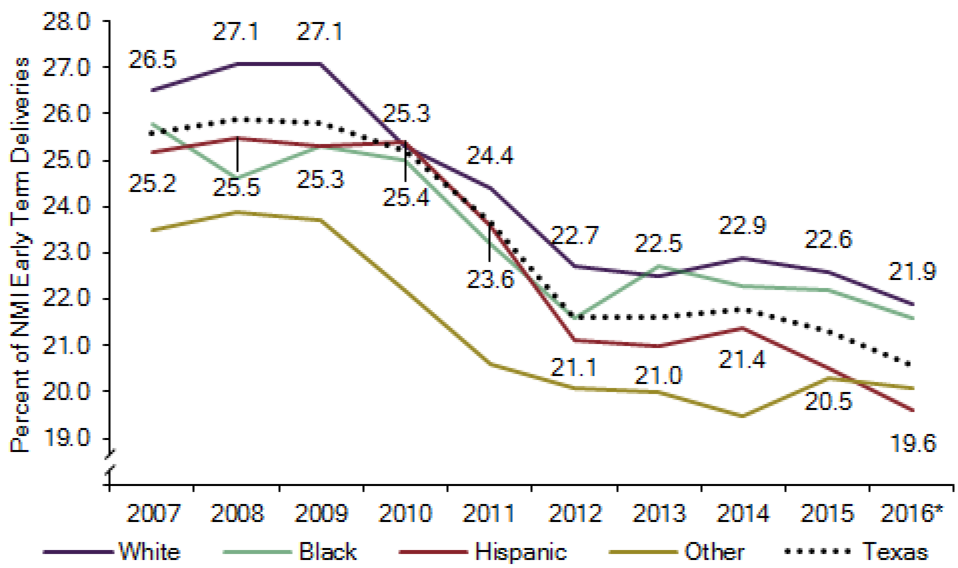
Early Non-medically Indicated Elective Cesarean Delivery Rates

The cesarean section rates mentioned above are overall rates that reflect both medically necessary and elective cesarean deliveries. Whether or not a cesarean section is elective is difficult to assess using the Texas birth file. Criteria that would identify a cesarean delivery as medically necessary are not well documented on the birth certificate [1, 2]. However, early non-medically indicated (NMI) elective cesarean delivery rates were estimated, based on a method developed for The Collaborative Improvement and Innovation Network to Reduce Infant Mortality (IM CoIIN) using data available from the birth certificate [32].

Approximately 20.6 percent of all NMI early term deliveries in Texas occurred via elective cesarean section in 2016. Overall, the percent of NMI early term deliveries by elective cesarean section in Texas has declined since 2009. Notably, among Hispanic mothers, the early NMI elective cesarean section rate has decreased 22 percent from 2007 to 2016. Consequently, Hispanic mothers have a lower early NMI elective cesarean section rate in 2016 than do all other race/ethnic groups (see Figure 41). White mothers and Black mothers have higher early NMI elective cesarean section rates than the state average.

Figure 41

Early Non-medically Indicated (NMI) Elective Cesarean Delivery Rate by Race/Ethnicity, 2007-2016

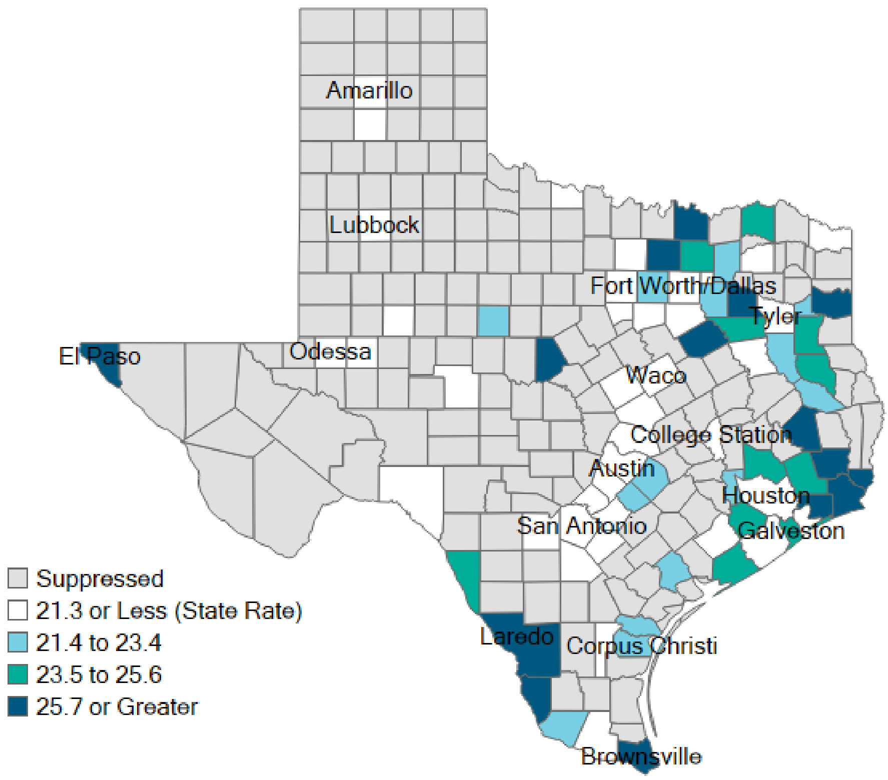


*2016 Texas data are preliminary
The IM CoIIN method was used to identify early NMI elective cesarean deliveries.
Source: 2007-2016 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Regional differences in early NMI elective cesarean section rates are also observed in Texas. The majority of counties with high early NMI elective cesarean section rates (compared to the state rate) are located in south and southeast Texas (see Figure 42).

Figure 42

Early Non-medically Indicated Elective Cesarean Section Rate, 2015

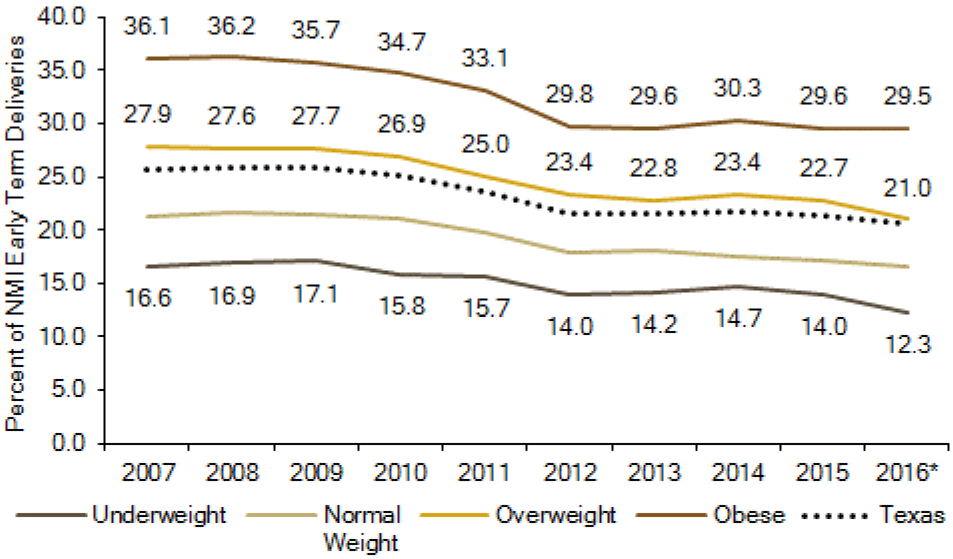


Source: 2015 Birth File
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Early NMI elective cesarean section rates also differ by mothers' weight category (based on pre-pregnancy BMI). Mothers with pre-pregnancy obesity have a higher early NMI elective cesarean section rate than mothers of all other pre-pregnancy weight categories (see Figure 43).

Figure 43

Early Non-medically Indicated (NMI) Elective Cesarean Delivery Rate by BMI Category, 2007-2016



*2016 Texas data are preliminary
The IM CoIIN method was used to identify early NMI elective cesarean deliveries.
Source: 2007-2016 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

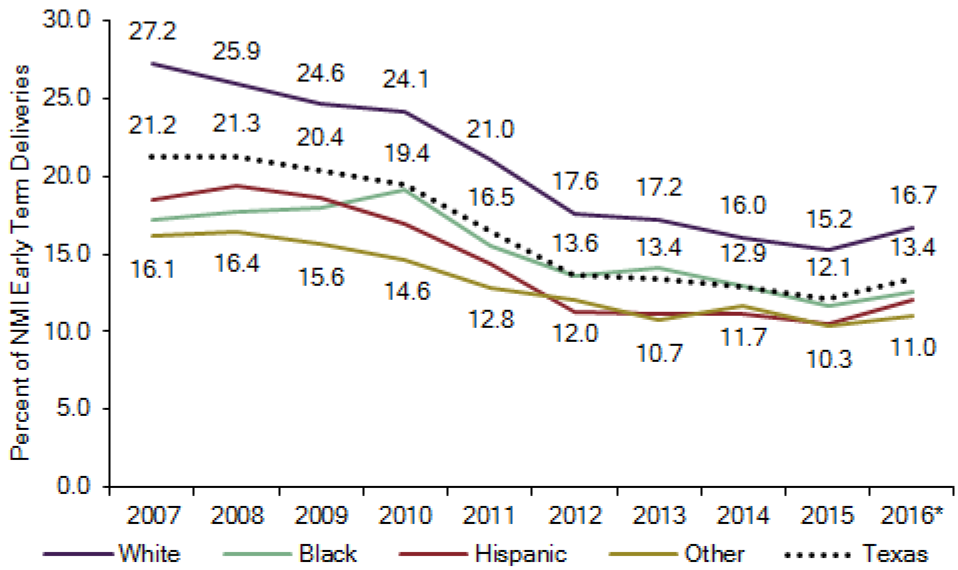
Early Non-medically Indicated Elective Labor Induction Rates

In this subsection, elective labor induction rates and patterns are examined among early term deliveries without medical conditions that could possibly justify an early term delivery. Again, the IM CoIIN method was used to identify early NMI elective labor inductions.

The early NMI elective labor induction rate increased slightly from 2015 to 2016. Among NMI early term deliveries, White mothers had the highest prevalence of elective labor induction (see Figure 44).

Figure 44

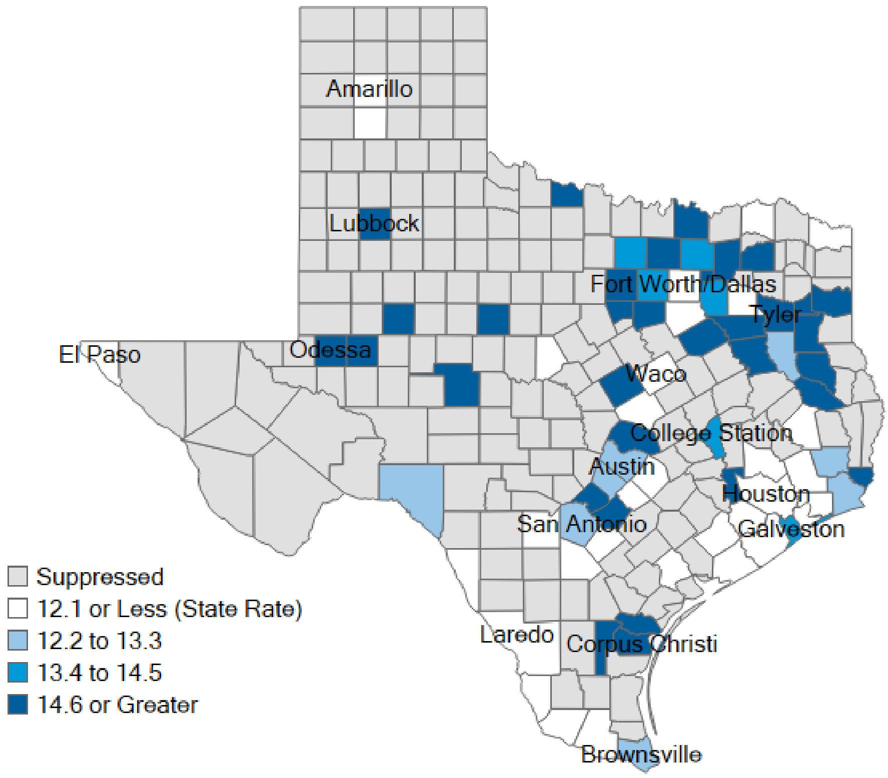
Early Non-medically Indicated (NMI) Elective Labor Induction Rate by Race/Ethnicity, 2007-2016



*2016 Texas data are preliminary
The IM CoIIN method was used to identify early NMI elective labor inductions.
Source: 2007-2016 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Many counties in north and northeast Texas have higher percentages of NMI early term deliveries occurring via elective labor induction than the state rate (see Figure 45).

Figure 45
Early Non-medically Indicated Elective Labor Induction Rate, 2015



Source: 2015 Birth File
Prepared by: Maternal & Child Health Epidemiology Unit
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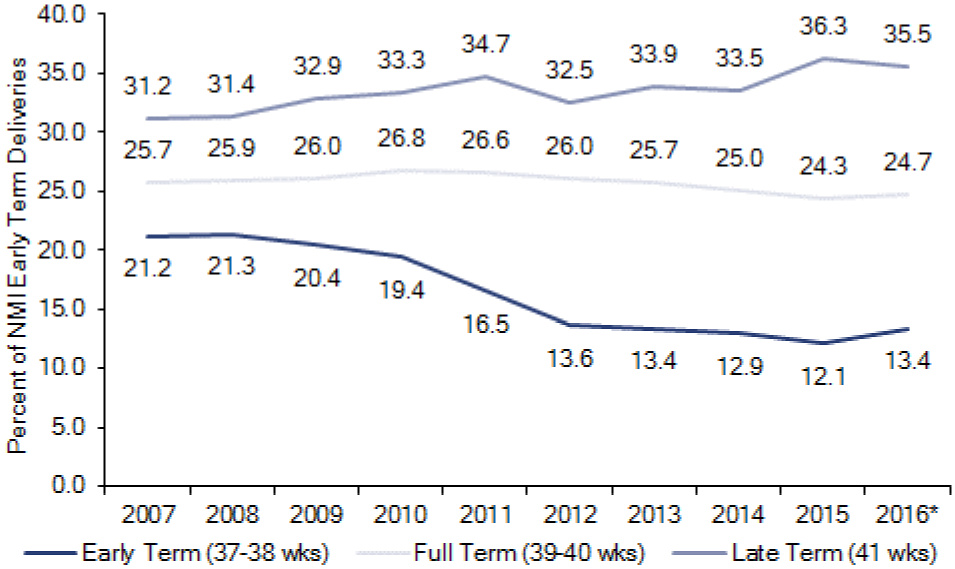
Elective induction rates were also analyzed by gestational age category for all births without medical conditions, potentially justifying delivery prior to 39 weeks gestation. In 2016, the NMI elective induction rate was 36 percent among late-term births (41 weeks of gestation and later) in Texas, compared with 25 percent among full-term births (39-40 weeks gestation) and 13 percent among early term births (37-38 weeks gestation) (see Figure 46). The proportion of NMI early term deliveries occurring via elective labor induction has decreased substantially since 2010, likely due, in part, to Medicaid policy changes in October 2011 (Texas House Bill 1983), which denies payment by Medicaid for elective deliveries (either via induction of labor or by cesarean section) that take place prior to 39 weeks gestation [33].

Figure 46

Non-medically Indicated (NMI) Elective Induction Rate by Gestational Age Category, 2007-2016



*2016 Texas data are preliminary
The IM CoIIN method was used to identify early NMI elective labor inductions.
Source: 2007-2016 Birth Files
Prepared by: Maternal & Child Health Epidemiology Unit
Oct 2017

Conclusion

This report provides an overview of a variety of infant health indicators, as well as several indicators of maternal health during pregnancy. Over the past decade, Texas has seen a reduction in the infant mortality rate, the preterm birth rate, and the percentage of women who smoke during pregnancy. However, during this same time period, the state has experienced an increase in pre-pregnancy obesity, maternal diabetes, and maternal hypertension.

Preliminary 2016 data are presented in this report before they have been finalized by the DSHS Center for Health Statistics. After remaining relatively stable for five years, the Texas birth rate decreased in 2016. Also in 2016, the percent of births born preterm in Texas increased for the first time in the past ten years. However, this increase in the preterm birth rate was not reflected in the preliminary 2016 infant mortality rate, which remained at a historic low.

Substantial race/ethnic disparities exist for infant health indicators, including rates of infant mortality, preterm birth, and low birth weight births. Infants born to Black mothers have significantly higher rates of each of these adverse infant health outcomes than do infants born to mothers of other races/ethnicities. Infant health practices and maternal health indicators also differ by race/ethnicity in Texas. Geographic and regional differences were also observed throughout Texas, especially for infant mortality rates, prevalence of smoking during pregnancy, and the proportion of NMI early term deliveries occurring via elective cesarean section.

It is hoped that the information presented in this report can help public health workers, researchers, and policymakers identify trends and disparities in infant and maternal health outcomes in Texas, so that they are better able to make data-driven decisions on where best to allocate resources and efforts to improve these outcomes.

More Information on Infant & Maternal Health in Texas

[Gestational Diabetes in Medicaid: Prevalence, Outcomes, and Costs]

Report released in 2014 focusing on the rates and costs of gestational diabetes in the Texas Medicaid population. This study shows that the rate of diabetes among pregnant women enrolled in Medicaid is underestimated on the birth certificate and provides a clearer estimate of the impact of gestational diabetes on this population.

[Center for Health Statistics: Direct links to health-related data]

Contains vital statistics tables and reports providing basic health-related data at the state and county level.

[Texas Health Data]

This online query tool from DSHS allows you to create tables of basic birth statistics at the state or county level. The tool can be used to compare race/ethnicities, education level, marital status, and a variety of other demographics across major birth outcome indicators.

[Maternal & Child Health]

Contains the PRAMS annual reports as well as links to other information about maternal and child health and community-based initiatives.

[March of Dimes PeriStats]

Online query tool from the March of Dimes that covers a variety of infant health indicators that can be compared across different states in the country or across years for single regions/states.

[Someday Starts Now]

Website containing information for men and women of childbearing age, parents, providers and community stakeholders. There are toolkits for outreach, life and birth planning tools, social media tools and a page devoted to the Texas Collaborative for Healthy Mothers and Babies.

For information on maternal mortality and morbidity in Texas, please see:

- *Scientific Analysis of the Current State and Needs of the Maternal and Child Population in Texas*;
- Maternal Mortality and Morbidity Task Force and DSHS *2014 Joint Biennial Report for the Legislature*;
- Maternal Mortality and Morbidity Task Force and DSHS *2016 Joint Biennial Report for the Legislature*;
- The Maternal Mortality Rate (MMR) in Texas as computed by the DSHS Center for Health Statistics; and
- Baeva S, Archer NP, Ruggiero K, et al. Maternal mortality in Texas. *American Journal of Perinatology* 2017; 34:614-620.

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Figure 5. Teen (15-19 year old) Birth Rate by Race/Ethnicity

Year	White	Black	Hispanic	Other	Texas
2007	32.8	62.9	90.5	18.8	60.6
2008	32.8	61.2	87.9	17.2	59.7
2009	32.0	57.9	83.3	15.1	57.4
2010	30.7	56.0	73.8	9.6	52.2
2011	26.9	48.9	64.7	8.5	45.9
2012	24.4	43.0	59.9	14.9	42.3
2013	23.9	39.9	54.3	15.0	39.7
2014	21.8	36.9	49.4	13.4	36.3
2015	20.5	33.1	44.3	12.0	33.0
2016*	17.5	29.4	39.0	10.8	29.1

Rate per 1,000 in the population
2007-2016 Texas Birth files; *2016 data are preliminary

Figure 8. Infant Mortality Rate in Texas by Race/Ethnicity

Year	White	Black	Hispanic	Other	Texas
2007	5.4	11.8	5.5	6.4	6.2
2008	5.9	9.9	5.4	6.7	6.1
2009	5.1	11.3	5.2	6.9	6.0
2010	5.5	11.4	5.5	3.8	6.1
2011	4.8	11.0	5.2	3.7	5.7
2012	5.3	11.6	5.2	3.4	5.8
2013	5.0	11.9	5.2	4.0	5.8
2014	4.9	11.1	5.4	4.2	5.8
2015	4.9	10.9	5.2	3.4	5.6

Rate per 1,000 live births
2007-2015 Texas Birth and Death files

Figure 15. Percent of Live Births Born Preterm (less than 37 Weeks) by Race/Ethnicity

Year	White	Black	Hispanic	Other	Texas
2007	11.0	15.7	10.6	9.8	11.3
2008	10.9	15.1	10.6	10.3	11.2
2009	10.8	15.4	10.4	9.6	11.1
2010	10.2	14.8	10.5	10.2	10.9
2011	10.1	14.3	10.4	9.9	10.7
2012	10.0	14.5	10.1	9.6	10.5
2013	9.7	13.9	10.1	10.3	10.4
2014	9.7	14.0	10.1	9.6	10.3
2015	9.6	13.6	9.8	9.3	10.2
2016*	9.6	13.6	10.3	9.6	10.4

Computed using the obstetric estimate of gestation
2007-2016 Texas Birth and Death files; *2016 data are preliminary

Figure 18. Percent of Births that are Low Birth Weight by Race/Ethnicity

Year	White	Black	Hispanic	Other	Texas
2007	7.6	14.4	7.5	8.8	8.4
2008	7.7	14.0	7.7	9.1	8.4
2009	7.8	14.2	7.6	9.0	8.5
2010	7.5	13.9	7.7	9.5	8.4
2011	7.6	13.6	7.8	9.5	8.5
2012	7.3	13.9	7.5	9.1	8.3
2013	7.3	13.2	7.7	9.7	8.3
2014	7.2	13.4	7.5	9.1	8.2
2015	7.1	13.3	7.7	9.1	8.3
2016*	7.2	13.5	7.9	9.0	8.4

2007-2016 Texas Birth and Death files; *2016 data are preliminary

Figure 29. Percent of Live Births Where Mother Received Prenatal Care in the First Trimester

Year	White	Black	Hispanic	Other	Texas
2007	73.2	53.9	55.0	71.0	61.8
2008	73.0	53.6	54.4	70.6	61.5
2009	72.7	53.1	54.6	69.1	61.4
2010	73.5	54.2	58.6	69.9	63.9
2011	75.0	57.0	61.6	69.8	66.3
2012	75.2	55.6	61.6	68.7	66.2
2013	75.0	56.1	61.5	67.9	66.1
2014	74.2	56.0	60.2	67.2	65.2
2015	75.2	56.6	61.1	67.0	65.9
2016*	74.5	54.9	60.7	66.2	65.1

Computed using the obstetric estimate of gestation
2007-2016 Texas Birth files; *2016 data are preliminary

Figure 32. Percent of Live Births Where Mother Smoked During Pregnancy

Year	White	Black	Hispanic	Other	Texas
2007	12.1	5.8	1.5	1.7	5.6
2008	11.5	5.4	1.5	1.8	5.4
2009	11.0	5.4	1.3	1.5	5.1
2010	10.3	5.1	1.3	1.6	4.9
2011	9.8	4.7	1.2	1.5	4.6
2012	9.2	4.7	1.2	2.1	4.4
2013	9.1	4.4	1.2	2.0	4.3
2014	8.1	4.1	1.1	1.9	3.9
2015	7.6	3.6	1.0	1.6	3.6
2016*	6.9	3.4	1.0	1.3	3.3

2007-2016 Texas Birth files; *2016 data are preliminary

Figure 38. Maternal Hypertension by Race/Ethnicity

Year	White	Black	Hispanic	Other	Texas
2007	6.2	7.6	4.5	3.7	5.4
2008	6.1	7.8	4.7	3.6	5.5
2009	6.4	8.4	4.8	3.8	5.7
2010	6.9	8.9	5.4	4.4	6.3
2011	7.0	9.0	5.4	4.3	6.3
2012	6.9	8.9	5.6	4.4	6.4
2013	7.0	9.0	5.7	4.6	6.4
2014	7.7	9.3	6.1	4.8	6.9
2015	8.4	10.0	6.3	5.1	7.4
2016*	8.3	9.9	6.6	5.5	7.5

2007-2016 Texas Birth files; *2016 data are preliminary

Figure 39. Maternal Diabetes by Race/Ethnicity

Year	White	Black	Hispanic	Other	Texas
2007	3.8	3.7	5.0	7.7	4.6
2008	3.8	3.7	5.1	7.2	4.6
2009	3.4	3.6	5.1	7.3	4.4
2010	3.6	3.7	5.1	7.5	4.5
2011	3.7	4.2	5.7	7.7	4.9
2012	3.9	4.2	5.8	7.3	5.0
2013	3.8	4.0	5.7	7.2	4.9
2014	4.3	4.6	6.3	8.2	5.5
2015	4.4	4.6	6.1	8.2	5.5
2016*	4.4	4.5	6.5	8.8	5.7

2006-2015 Texas Birth files; 2015 data are preliminary

Figure 41. Early Non-medically Indicated (NMI) Elective Cesarean Delivery Rate by Race/Ethnicity

Year	White	Black	Hispanic	Other	Texas
2007	26.5	25.8	25.2	23.5	25.6
2008	27.1	24.6	25.5	23.9	25.9
2009	27.1	25.3	25.3	23.7	25.8
2010	25.3	25.0	25.4	22.2	25.2
2011	24.4	23.2	23.6	20.6	23.7
2012	22.7	21.6	21.1	20.1	21.6
2013	22.5	22.7	21.0	20.0	21.6
2014	22.9	22.3	21.4	19.5	21.8
2015	22.6	22.2	20.5	20.3	21.3
2016*	21.9	21.6	19.6	20.1	20.6

The IM CoIIN method was used to identify early NMI elective cesarean deliveries.
2007-2016 Texas Birth files; *2016 data are preliminary

Figure 44. Early Non-medically Indicated (NMI) Elective Labor Induction Rate by Race/Ethnicity

Year	White	Black	Hispanic	Other	Texas
2007	27.2	17.2	18.5	16.1	21.2
2008	25.9	17.7	19.4	16.4	21.3
2009	24.6	18.0	18.6	15.6	20.4
2010	24.1	19.1	16.9	14.6	19.4
2011	21.0	15.5	14.3	12.8	16.5
2012	17.6	13.6	11.3	12.0	13.6
2013	17.2	14.1	11.2	10.7	13.4
2014	16.0	12.9	11.1	11.7	12.9
2015	15.2	11.6	10.5	10.3	12.1
2016*	16.7	12.5	12.1	11.0	13.4

The IM CoIIN method was used to identify early NMI elective labor inductions.
2007-2016 Texas Birth files; *2016 data are preliminary