children’s optimal health

travis county
birth outcomes
as related to the physical and social environment

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The majority of women living and giving birth in Travis County experience healthy birth outcomes, meaning that infants are carried to term and are born at a healthy birth weight. However, social and demographic factors are associated with health disparities and adverse birth outcomes (i.e. low birth weight and premature birth) that disproportionately impact certain race/ethnic groups as well as those with the least education and income.

The Texas Department of Health and Human Services (DSHS) and the Austin/Travis County Health and Human Services Department (A/TCHHSD) have published valuable information regarding maternal and infant health indicators, trends, and disparities for the region. Children’s Optimal Health (COH) has cited the work throughout this report. For this project it is the goal of COH to enhance existing analyses by providing a geographical perspective on birth outcomes and related social, economic, and environmental factors in Travis County.

Unique insight regarding root causes, intervention targeting, and resource allocation can be gained through a consideration of spatial patterns associated with social determinants of health (education, health care assets, etc.) and birth outcomes. Understanding the spatial distribution of maternal and child health factors is particularly important for Travis County and the Central Texas region due to a growing population and shifting demographic patterns. Although Travis County has lower rates of adverse birth outcomes compared to Texas as a whole, significant health disparities persist, particularly between African Americans and other ethnic groups in rates of babies born prematurely and low birth weight (A/TCHHSD, 2012). This report can inform efforts to improve birth outcomes, eliminate health disparities, and support the health of infants, women and families. For example, maps displaying premature births by census tract of residence allow viewers to identify neighborhoods within Travis County where mothers and infants are disproportionately impacted by premature births.

The majority of maps in this report display Travis County birth record data at the census tract level for mothers living in Travis County between 2007 and 2010 (See data sources page 47). For reference, the first maps display the geographic distribution of women of childbearing ages (ages 15-44) (US Census 2010).

Suggested Citation (APA)


Terminology

All references to African Americans, Whites, and Asians refer to the non-Hispanic components of those populations. Asian includes Pacific Islander. References to Hispanic ethnicity do not specify race.

Overview

**Demographic, Economic, and Social Factors**

Broadly, educational attainment, income level, race/ethnicity, presence of the potential father, and age at delivery are social, economic, and demographic factors that impact women throughout their reproductive years including pregnancy, and birth outcomes. These factors are also associated with patterns of health disparities that persist in Travis County.

According to the A/TCHHSD 2012 Critical Health Indicators Report, African American and Hispanic women experience insufficient pre-natal care and adverse birth outcomes at higher rates than White women. African Americans are at the greatest risk for preterm and low birth weight births and experience infant mortality at twice the rate of Hispanics and Whites (A/TCHHSD, 2012). Teen births also occur at higher rates among African American and Hispanic females than White females (A/TCHHSD, 2012).
Overview

Changing family types and household structures have important implications for family economic, social and physical well-being. In Travis County 16.3% of families with children under the age of five live below the poverty threshold. The percentage of families living below the poverty threshold increases to 43.3% among those with a female householder and no husband (American Community Survey [ACS], 2011). The highest poverty rates occur among female headed households with children compared to other household types. Compared by race and ethnicity nationally, the highest poverty rates are among African American, Hispanic and Native American female headed households (Snyder, McLaughlin, & Findeis, 2006). Recent Travis County data indicates there were 55,100 (25%) children under 18 that belonged to a female headed household with no husband present. For families earning less than $25,000 a year (26,724), female headed households with no husband present made up the greatest share in Travis County with 15,423 families (58%) (Travis County HHS/VS Research & Planning Division, 2013).

Maternal education is another important social determinant of health. Research has shown that mothers with comparatively lower education levels are more vulnerable to adverse birth outcomes (Luo, Wilkins, & Kramer, 2006). The percent of those 25+ with no high school diploma is 6.2% in Travis County compared to 9.8% for Texas and 8.5% nationally (American Community Survey, 2011b). Between 2007 and 2010 Travis County birth record data shows over 30% of births were to women with no high school diploma. The disparity in education level of new mothers by ethnicity is striking. According to the DSHS birth record data for the years 2007-2010, 58% of Hispanics and 20% of African American mothers had no high school diploma at the time of delivery, compared to approximately 5% for Whites and Asians. Travis County birth record data 2007-2010 showed that birth outcomes differ by the mother’s education attainment and ethnicity. For example, 3.2% of babies born to African American mothers without a high school diploma were born very low birth weight (≤1500g), compared to 2.3% among Whites and 1.0% among Hispanics.

Economic factors such as insurance status can be indicative of income level and may influence access to and/or utilization of healthcare services. Medicaid payment for delivery has been used as a proxy for socioeconomic status (Kingsley & Farag, 2010). In 2007 nearly half of all preterm births in the US were covered by Medicaid (Thomson Reuters & The March of Dimes Foundation, 2008). According to the 2002-2010 Texas Pregnancy Risk Assessment Monitoring System (PRAMS), 59% of surveyed respondents reported Medicaid coverage for their delivery (Kingsley & Farag, 2010). DSHS birth record data shows that between 2007 and 2010, 38% of the births to women living in Travis County were covered by Medicaid. Travis County ranks 7th among Texas counties in total Medicaid enrollment and enrollment of pregnant women (Texas Health and Human Services Commission, 2012).

Maternal age at delivery can increase the likelihood of low birth weight and preterm birth, especially mothers at far ends of the childbearing age range (generally 15-44). Although women aged 40+ only accounted for approximately 3% of all births in Travis County (DSHS), the rate of babies born very low birth weight (≤ 1500 grams) was highest among this age group than it was for all other age groups.

Births to teen mothers have also been associated with adverse birth outcomes such as low birth weights, small for gestational age and increased risk of neonatal mortality (Chen et al., 2007). In 2008, 13.5% of births in Texas were to women under the age of 20 years old and 4.7% of births were to women aged 15 to 17 years old (A/TCHHSD, 2012). Percentages of teen births for the same period in Travis County were lower than the state percentages at 10.2% for those under 20 years and 3.7% for those from 15- to 17 years old. The teen birth rate in Travis County has been consistently declining downward since 1990 when rates were 36.7 births per 1,000 to 2009 with rates at 21.1 births per 1,000, a drop of 42.5% (A/TCHHSD, 2009). Even though the rate of teen births is declining there continue to be disparities by race/ethnicity. The average percent of teen births (15-17) in Travis County between 2006-2008 among African American births was 4.4% and 6.1% among Hispanic births and 0.8% for Whites (A/TCHHSD, 2012).
Birth Outcomes

Maternal and infant health is an important community criterion because it provides a glimpse of health outcomes for future generations, and can predict future public health challenges for families, communities and health care systems. Among the greatest disparities in Travis County are the disproportionate share of low birth weight and preterm births, particularly among African American women. Preterm infants and those with low birth weights are at higher risk for mortality in the first year of life and have higher rates of birth defects, neurodevelopmental problems, disabilities, and chronic health conditions (Fleischman, 2010). At the national and Texas state levels, ATCHHSD reports that the infant mortality rate for African Americans is twice that for Whites. However, in Travis County, at 12.6 deaths per 1000 live births, the African American infant mortality rate is 2.7 times that of Whites, and 2.5 times that of Hispanics, as the table below from the ATCHHSD 2012 Critical Health Indicators Report shows. The chart below the table reflects the persistence of this disparity over time.

<table>
<thead>
<tr>
<th>Infant Mortality Rates per 1,000 Live Births</th>
<th>Travis County</th>
<th>Texas</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2006</td>
<td>2007</td>
</tr>
<tr>
<td>Black non-Hispanic</td>
<td>13.5</td>
<td>9.3</td>
</tr>
<tr>
<td>White non-Hispanic</td>
<td>4.8</td>
<td>4.4</td>
</tr>
<tr>
<td>Hispanic All Races</td>
<td>5.7</td>
<td>4.2</td>
</tr>
<tr>
<td>Total</td>
<td>5.9</td>
<td>4.9</td>
</tr>
</tbody>
</table>

Adapted from ATCHHSD 2012. Data Source: Texas Department of State Health Services (DSHS), Center for Health Statistics, Texas Births 2006-2008. See also http://soupfin.tdh.state.tx.us/birth05.htm

Figures for the cost of births tell us that low weight and preterm births are vastly more expensive. The estimated cost of a full term newborn infant from birth through the first year of life is $4,500, whereas costs for a premature/low birth weight infant rise to $50,000 (Thomson Reuters & The March of Dimes Foundation, 2008). A large proportion of the increase in cost for premature births is attributable to the admission into the Neonatal Intensive Care Unit (NICU). The average cost in Texas for routine deliveries covered by Medicaid was $2,500. That cost increased to $45,000 for the average stay in NICU in Texas (Ramshaw, 2011).

Comparisons of premature and low birth weight for Travis County and Texas show similarities, yet in some cases Travis County continues to have higher adverse birth outcomes than state averages. A three year average (2006-2008) of premature births (< 37 weeks gestation) in Travis County was 11.7% compared to 13.4% for the rest of the state. However, the Travis County three year average for African Americans was 18.3% compared to 17.8% for the state (ATCHHSD, 2012). Within Travis County, African Americans had more premature births on average (17.5%) than Hispanics (11.5%) (A/TC HHSD, 2012).
Infants born with high birth weight (High BW) and those who are considered to be large for gestational age (LGA) are also at risk for adverse health outcomes including birth injury and low blood sugar after delivery (National Institutes of Health & U.S. National Library of Medicine [NIH & USNLM], 2011). Recent research has found associations between high BW or LGA with maternal obesity and obesity later in life for the infant (Cnattingius, Villamor, Lagerros, Wikström, & Granath, 2012). The primary risk factors for high BW are maternal diabetes, gestational diabetes, and prolonged pregnancy (NIH & USNLM, 2011).

Prenatal Care (PNC)

Prenatal Care (PNC) is medical care that is important to ensure that mother and growing fetus are on track for a healthy pregnancy and birth outcome. The American College of Obstetricians and Gynecologists (ACOG) guidelines for PNC for uncomplicated pregnancies call for initiation within the first trimester (6-12 weeks); visits once a month for the first 28 weeks and every 2-3 weeks up to 36 weeks; then weekly at 37 weeks until delivery. A Healthy People 2020 goal for PNC is that 77.9% of women in the U.S. will initiate PNC in the first trimester (US Department of Health and Human Services, 2013). Both the state of Texas and Travis County fall short of this benchmark. Approximately 60% of women in Travis County initiated PNC in their first trimester. Further, significant disparities by race/ethnicity exist for trimester of initiation of PNC in Texas (Healthy Texas Babies Expert Panel, 2010). In Travis County, over 40% of African American women and over 50% of Hispanic women received late or no PNC compared to 20% of White women between 2006-2008 (A/TCHHSD, 2012).

Adequacy of PNC is measured in different ways, including date of PNC initiation and the number of PNC visits during a pregnancy. The PRAMS conducted by the CDC and DSHS (also cited in the Austin/Travis County Community Health Assessment) uses trimester of initiation to measure PNC. The Adequacy of Prenatal Care Utilization Index (APNCU) adjusts for gestational age at PNC initiation and delivery providing a metric that reflects ACOG guidelines for initiation and subsequent visits. The maps and charts produced by Children’s Optimal Health display PNC using trimester of initiation as well as the APNCU Index. For a further explanation of how PNC was measured and represented in this report please see pages 27 and 46.

Recognition

Children’s Optimal Health would like to extend recognition and thanks to the Technical Advisory Committee (TAC) for the time and effort they have dedicated to ensure the integrity of this project. We would also like to give a special thank you to our Board of Directors without whom this project would not have been possible and to the RGK foundation whose generous grant helped support this project.

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- Kit Abney - Director of insure-a-kid.
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- Lindsey Ripley - Project Manager
- Nic Moe - Office Administrator

Public domain photos used in this report were obtained from: http://www.publicdomainpictures.net/.
Population Overview
Maps in this report display aggregate data at the 2000 census tract level. 2010 data and census tracts were used for initial maps displaying women of childbearing age. Census tracts in the urban core were largely unchanged from 2000 to 2010, however rural and semirural census tracts were subdivided for the 2010 census due to population growth.

The maps on the following pages display births by counts and percentage per census tract for the four year time period of 2007-2010. Maps displaying counts of births can be used to determine areas with the greatest numbers of births with a particular characteristic. Maps displaying percent of births with a particular characteristic for a census tract are not influenced by the population size or density. These maps help identify areas affected by health disparities. Together, maps presenting counts and percentages provide a visual representation of the distribution of social, demographic, and health factors across the county.
Women of Child Bearing Age (15-44) by Race/Ethnicity in Travis County
2010 Census

- African American: 21,114
- Hispanic: 85,737
- Asian: 21,869
- White: 120,070

The maps of women of childbearing age are provided as a reference population for women who gave birth.
White women of childbearing age are predominantly located in the western half of Travis County whereas African American and Hispanic women of childbearing age are predominantly located in the eastern half of Travis County.
Birth Record data from DSHS was determined to be the most appropriate data source for the investigation of birth patterns in Travis County. Data from hospital systems or smaller municipalities is limited by differences in definitions (for example, definitions of prenatal care adequacy), technical challenges, and timing issues. For this report, birth records from a four year period between 2007 and 2010 for Travis County serves as the primary dataset. Maps display aggregate data at the census tract level and charts display percentages and rates at the county level. For further information on the birth record dataset and/or our mapping methodology see page 47.

For this report, it is important to distinguish between all births occurring in Travis County (place of birth) and births to mothers residing in Travis County. Between 2007 and 2010, 78,047 births occurred in Travis County (A.1). For the same period, 65,400 births occurred to mothers whose address was within Travis County (A.2). This means that over 10,000 births to mothers residing outside of Travis County occurred in Travis County; and, out of the 65,400 births to women living in Travis County approximately 5% gave birth elsewhere. Unless otherwise noted the maps, charts, and tables in this report will display data on births occurring to women living in Travis County.

The following maps in this report are based on 64,324 births in Travis County with known Census tract IDs. However, charts display the full dataset of 65,400 births to Travis-resident mothers since Census tract residence is not needed for county-wide aggregates.
Population Overview: Births to Women Residing in Travis County

- The map below and following maps display the geographic distribution of births occurring to women living in Travis County between 2007 and 2010.
- Because more rural census tracts have a less dense population, they cover a larger geography and appear larger on the map.
- The five groups in the map are based on patterns in the data. These are not evenly divided categories such as quintiles, but they maximize differences between groups.
- Women in eastern and south-western Travis County contributed a disproportionately larger number of births when compared to other tracts whereas the women in north-western Travis County contributed a relatively smaller number of births.

Total Births by Race/Ethnicity
2007-2010 Travis County Birth Record Data

- African American
- Hispanic
- Asian
- White

Counts of Births by mother’s race/ethnicity 2007 –2010:
- African American - 5,085
- Hispanic - 31,796
- Asian - 4,429
- White - 24,092

Maps produced by Children’s Optimal Health display visual correlations among multiple layered datasets. They do not represent cause and effect relationships.

Data Sources:
- DHHS 2007 - 2010, TNRS 2013,
- Census 2000, CAFCOG 2013

Osdin Ullas
4/5/2013
• The map below reflects the geographic distribution of births to African American women.
• Red census tracts are those with the highest count of births to African American women.
• African American women accounted for 8% of all births in Travis County between 2007-2010.

The map below reflects the percent of all births per census tract that were to African American women.
• Births to African American mothers occur largely along the eastern third of Travis County rather than the urban core.
• In red census tracts below, African American women made up more than 20% of the births in those census tracts.
The map below reflects the geographic distribution of births to Hispanic women.

- Red census tracts are those of the highest count of births to Hispanic women.
- Hispanic women accounted for 48% of all births in Travis County between 2007-2010.

Births to Hispanic women span the dense urban tracts of north and south Austin to the semirural tracts of eastern Travis County.

In red census tracts below, Hispanic women made up more than 70% of the births in those census tracts.
• The map below reflects the geographic distribution of births to White women.
• Red census tracts are those with the highest count of births to White women.
• White women accounted for 37% of all births in Travis County between 2007-2010.

• The map below reflects the percent of all births per census tract that were to White women.
• Births to White women span the dense urban tracts of west and central Austin to the semi-rural western and northern tracts of Travis County.
• In red census tracts below, White women made up more than 69% of the births in those census tracts.
The map below reflects the geographic distribution of births to Asian women.
- Red census tracts are those with the highest count of births to Asian women.
- Asian women accounted for 7% of all births in Travis County between 2007-2010.

The map below reflects the percent of all births per census tract that were to Asian women.
- Births to Asian women occur largely along the urban corridor of central Travis County.
- In red census tracts below, Asian women made up more than 27% of the births in those census tracts.
Healthcare assets were compiled from the Central Texas Literacy Coalition’s Central Texas Healthcare Resource Directory, published in 2012. The maps below display healthcare assets that serve uninsured and low income populations.

- The main concentration of healthcare assets are within the beltway formed by highway 183 in the east and north, 360 to the west, and 71 to the south.
The concentration of clinics with women’s health services are within the beltway formed by highway 183 in the east and north, 360 to the west, and 71 to the south.
Social and Economic Factors
Economic Factors: Insurance Coverage

Broadly, educational attainment, income level, race/ethnicity, presence of the potential father, and age at delivery are social, economic, and demographic factors that impact women throughout their reproductive years including pregnancy, and birth outcomes. These factors are also associated with patterns of health disparities that persist in Travis County.

All Births by Payment Source
2007-2010 Travis County Birth Record Data

- Medicaid
- Other*
- Private Insurance
- Self-Pay

*Other may include CHIP, CHIP Perinate, and Tricare (veteran's coverage)

Counts of Births by Payment Source by Race/Ethnicity
2007-2010 Travis County Birth Record Data

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Medicaid</th>
<th>Other*</th>
<th>Private Insurance</th>
<th>Self-Pay</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>3,303 (65%)</td>
<td>96 (1.9%)</td>
<td>1,613 (31.7%)</td>
<td>70 (1.4%)</td>
<td>5,082</td>
</tr>
<tr>
<td>Hispanic</td>
<td>16,686 (52.5%)</td>
<td>6,131 (19.3%)</td>
<td>6,826 (21.5%)</td>
<td>2,116 (6.7%)</td>
<td>31,759</td>
</tr>
<tr>
<td>Asian</td>
<td>653 (14.8%)</td>
<td>102 (2.3%)</td>
<td>3,532 (80%)</td>
<td>131 (3.1%)</td>
<td>4,418</td>
</tr>
<tr>
<td>White</td>
<td>4,218 (17.5%)</td>
<td>113 (0.5%)</td>
<td>18,646 (77.5%)</td>
<td>1,095 (4.5%)</td>
<td>24,072</td>
</tr>
<tr>
<td>Total</td>
<td>24,860</td>
<td>6,442</td>
<td>30,617</td>
<td>3,412</td>
<td>65,331</td>
</tr>
</tbody>
</table>

*Other may include CHIP, CHIP Perinate, and Tricare (veteran's coverage)

- Derived from the counts in the table above, the chart below shows rates of births by payment source and race/ethnicity.
- 77% of births to White women were covered by private insurance (18,646 / 24,072).
- Births covered by Medicaid were disproportionately high for African American (65%) and Hispanic (53%) women, which indicates income level disparities.

Rates of Births by Payment Source and Race/Ethnicity
2007-2010 Travis County Birth Record Data

- African American
- Hispanic
- Asian
- White

*Other may include CHIP, CHIP Perinate, and Tricare (veteran's coverage)
The map below reflects relative counts of births to mothers with no private insurance, by census tract. These maps collapse payer source categories "Medicaid", "Self-pay" and "Other" into those with no private insurance. These categories were collapsed to distinguish economic access to private and non-private insurance. 52% of mothers giving birth had no private insurance, and of those 73% were covered by Medicaid.

- The map below reflects the percent of births per census tract to mothers with no private insurance.
- In red areas below, over 70% of births were covered by Medicaid, self-pay, or other type of insurance in those census tracts.
The map below reflects relative counts of births to mothers with no high school diploma, by census tract.

Over 30% of mothers giving birth did not have a high school diploma at time of delivery.

The map below reflects the percent of births per census tract to mothers with no high school diploma.

In red areas below, over 55% of mothers did not have a high school diploma at time of delivery in those census tracts.
Social Factors: Maternal Age & Education

- The chart below displays birth rates to mothers without a high school diploma within each race/ethnicity.
- For every 1,000 Hispanic births, 578 were to Hispanic mothers without a high school diploma.
- For every 1,000 African American births, 205 were to African American mothers without a high school diploma.
- For every 1,000 White births, 45 were to White mothers without a high school diploma.

![Rates of Births by Race/Ethnicity to Mothers with No High School Diploma](chart)

![Mother's Age at Delivery by Race/Ethnicity](chart)

- The chart below displays maternal age at time of delivery.
- Maternal age peaks at an earlier age for African American and Hispanic women than it does for White or Asian women.

![Rates of Teen Birth (<18) by Race/Ethnicity](chart)

- The chart below displays rates of teen birth within each race/ethnicity.
- African American and Hispanics females have the highest rates of teen birth (<18 years of age).
- The map below reflects relative counts of births to mothers under the age of 18, by census tract.
- 3.6% of births occurred to females under 18.

- The map below reflects the percent of births per census tract to mothers younger than 18.
- In red areas below, 7.8-12% of births occurred to females under 18 in those census tracts.
• The map below reflects relative counts of births where father’s address was unknown or different than mother’s, by census tract.
• Over 18% of the birth records indicated that the father’s address was unknown or different than the mother’s.

• The map below reflects the percent of births per census tract where father’s address was unknown or different than mother’s.
• In red areas below, over 30% of births had potential father’s at an unknown or different address than the mother’s in those census tracts.
Prenatal Care
Prenatal Care (PNC) is medical care that is important to ensure that mother and growing fetus are on track for a healthy pregnancy and birth outcome. Two distinct measures of PNC are employed to determine the adequacy of care:

- The date of the first PNC visit. Any initiation beyond the 1st trimester is considered “inadequate.”

- Kotelchuck Index, also known as the Adequacy of Prenatal Care Utilization (APNCU) Index. The index has four levels ranging from Inadequate to Adequate Plus. Levels are determined using three elements: date of first PNC visit, total number of PNC visits, and initiation of PNC in terms of gestational age. The Adequate Plus category can be used to identify pregnancies that received more than the typically recommended number of prenatal care visits identifying a potential high-risk group.

### Adequacy of Prenatal Utilization Index Matrix

<table>
<thead>
<tr>
<th>Timing of PNC initiation by month</th>
<th>Under 50%</th>
<th>50-79%</th>
<th>80-109%</th>
<th>110+%</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-9 Month</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-6 Month</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-4 Month</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-2 Month</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Summary Index

- Inadequate
- Intermediate
- Adequate
- Adequate Plus

### Count of Births by Prenatal Adequacy and Payment Source

2007-2010 Travis County Birth Record Data

<table>
<thead>
<tr>
<th>Description</th>
<th>Adequate</th>
<th>Adequate Plus</th>
<th>Inadequate</th>
<th>Intermediate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicaid</td>
<td>9,629</td>
<td>4,394</td>
<td>6,921</td>
<td>3,860</td>
<td>24,804</td>
</tr>
<tr>
<td>Other*</td>
<td>2,514</td>
<td>484</td>
<td>2,227</td>
<td>1,200</td>
<td>6,425</td>
</tr>
<tr>
<td>Private Insurance</td>
<td>17,055</td>
<td>7,562</td>
<td>1,775</td>
<td>4,177</td>
<td>30,569</td>
</tr>
<tr>
<td>Self-Pay</td>
<td>1,376</td>
<td>310</td>
<td>1,071</td>
<td>639</td>
<td>3,396</td>
</tr>
</tbody>
</table>

*Other may include CHIP, CHIP Perinate, and Tricare (veteran's coverage)

- Derived from the counts in the table above, the chart below displays the birth rate by adequacy of care and payment source.
- Although many women received adequate prenatal care through multiple payment sources the rate of those that received inadequate prenatal care were significantly higher for those under Other, Medicaid, and no insurance (self-pay).

### Rates of Prenatal Care Adequacy by Payment Source

2007-2010 Travis County Birth Record Data

- Medicaid
- Other*
- Private Insurance
- Self-Pay

*Other may include CHIP, CHIP Perinate, and Tricare (veteran's coverage)
Prenatal Care: Adequacy

- The graphs below display prenatal adequacy as defined by the APNCU Index.
- 18% of women received inadequate prenatal care.
- Of those women that received inadequate prenatal care, 58% were Medicaid recipients.

All Births by Prenatal Care Adequacy
(Adequacy of Prenatal Care Utilization Index)
2007-2010 Travis County Birth Record Data

- The charts below display prenatal care adequacy by race/ethnicity.
- When looking at adequate and adequate plus prenatal care together, 78% of White women, 62% of African American women, and 56% of Hispanic women received either adequate or adequate plus prenatal care.
- The percent of inadequate prenatal care was roughly three times greater for African American and Hispanic women than for Whites.

African American Prenatal Care Adequacy
2007-2010 Travis County Birth Record Data

Hispanic Prenatal Care Adequacy
2007-2010 Travis County Birth Record Data

White Prenatal Care Adequacy
2007-2010 Travis County Birth Record Data
The map below reflects relative counts of births to mothers that lacked adequate prenatal care, by census tract.

- 18% of births to mothers in Travis County lacked adequate prenatal care.

The map below reflects percent of births per census tracts of mothers that lacked adequate prenatal care.

- Over 26% of births to mothers had inadequate prenatal care in those census tracts.
- Orange and red areas together reflect census tracts where the percent of women receiving inadequate prenatal care exceeds the overall average for Travis County.
The map below reflects relative counts of births to mothers that received adequate plus prenatal care. Nearly 20% of mothers in Travis County received adequate-plus prenatal care, meaning more than recommended prenatal care visits were utilized given time of initiation and gestational age at birth. Adequate Plus category can be used to identify pregnancies that received more than the typically recommended number of prenatal care visits identifying a potential high-risk group (e.g. women with twins/triplets, previous preterm pregnancies).

The map below reflects percent of births per census tract of mothers that received adequate plus prenatal care. In red areas below, over 25% of births to mothers had adequate plus PNC in those census tracts.
66% of women in Travis County initiated PNC in their first trimester, but significant disparities by race/ethnicity exist for adequacy of PNC.

Although Hispanic women comprise 48% of all births, 70% of all women who did not initiate prenatal care in first trimester were Hispanic.

The chart below indicates that women with private insurance are much more likely than those with Medicaid, other insurance, or no insurance (self-pay) to receive prenatal care in the first trimester.

Those who lacked private insurance were approximately equivalent in their delayed access to prenatal care.

Mothers with Medicaid, other, or self-pay were approximately five times more likely to not receive prenatal care in first trimester.

The chart below indicates that women with private insurance are much more likely than those with Medicaid, other insurance, or no insurance (self-pay) to receive prenatal care in the first trimester.

Those who lacked private insurance were approximately equivalent in their delayed access to prenatal care.

Mothers with Medicaid, other, or self-pay were approximately five times more likely to not receive prenatal care in first trimester.
- The map below reflects relative counts of births to women who did not receive PNC in the 1st trimester, by census tract.
- 34% of mothers did not initiate prenatal care in the first trimester.

- The map below reflects the percent of births per census tract to women that did not receive PNC in 1st trimester.
- In red areas below, over 45% of births were to mothers with no PNC in 1st trimester.
Birth Outcomes
Birth Outcomes: Prematurity

Maternal and infant health is an important community criterion because it provides a glimpse of health outcomes for future generations, and can predict future public health challenges for families, communities and health care systems. Among the greatest disparities in Travis County are the disproportionate share of low birth weight and preterm births, particularly among African American women.

- Both multiples and singleton births are represented in the pie chart below, however only singleton births are represented in the bar chart below.
- 90% of births in Travis County are full term (≥37 weeks gestation), however there are significant disparities in birth outcomes by race/ethnicity.

Total Births by Race/Ethnicity
2007-2010 Travis County Birth Record Data

- Although African American women comprise 8% of all births during this time period, they accounted for 16% of all births ≤ 32 weeks gestation.
- African American women were three times more likely than White women to give birth ≤32 weeks.

Percent of Total Births by Gestational Age
2007-2010 Travis County Birth Record Data

- Rates of Gestational Age at Birth by Race/Ethnicity
Singleton Births Only
2007-2010 Travis County Birth Record Data

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The map below reflects relative counts of preterm births (<37 weeks), by census tract.

- The rate of preterm births (< 37 weeks) is 96 per 1,000 births.

The map below reflects the percent of births per census tract that were preterm births (< 37 weeks).

- In Travis County 10% of births were preterm.
- In red areas below, over 12% of births were born preterm in those census tracts.
- Both higher and lower income census tracts are represented in preterm and very preterm proportions.
The map below reflects relative counts of preterm births (≤32 weeks), by census tract. The rate of premature births (≤32 weeks) is 18 per 1,000 births or 1.8%.

- The map below reflects the percent of births per census tract that were preterm births (≤32 weeks).
- In red areas below, 3.7-6.7% of births were born before 33 weeks gestation in those census tracts.
- Both higher and lower income census tracts are represented in preterm and very preterm birth proportions.
- Yellow, orange and red tracts in the map below indicate tracts that met or exceeded the Travis County rate of 1.8% of births ≤32 weeks.

Map produced by Children's Optimal Health display visual correlations among multiple layered datasets. They do not represent cause and effect relationships.
Although 81% of infants are born at a healthy weight, there are significant disparities in low birth weight by race/ethnicity. Both multiples and singleton births are represented in the charts below.

### Birth Weight Categories
- **Very Low Birth Weight (VLBW)** ≤1500 g (3.3lbs)
- **Low Birth Weight (LBW)** >1500 g and ≤2500 g (>3.3lbs and ≤5.5lbs)
- **Healthy Birth Weight (Healthy BW)** > 2500 g and ≤ 4000 g (>5.5 lbs and ≤ 8.8 lbs)
- **High Birth Weight (High BW)** > 4000 g (8.8 lbs)

#### Percent of Total Births by Birth Weight Category
**2007-2010 Travis County Birth Record Data**

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>VLBW</th>
<th>LBW</th>
<th>Healthy BW</th>
<th>High BW</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>176</td>
<td>581</td>
<td>4,135</td>
<td>193</td>
<td>5,085</td>
</tr>
<tr>
<td>Hispanic</td>
<td>374</td>
<td>1,829</td>
<td>27,064</td>
<td>2,529</td>
<td>31,796</td>
</tr>
<tr>
<td>Asian</td>
<td>49</td>
<td>340</td>
<td>3,825</td>
<td>208</td>
<td>4,422</td>
</tr>
<tr>
<td>White</td>
<td>282</td>
<td>1,373</td>
<td>20,177</td>
<td>2,253</td>
<td>24,085</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>881</td>
<td>4,123</td>
<td>55,201</td>
<td>5,183</td>
<td>65,388</td>
</tr>
</tbody>
</table>

- Derived from the counts in the table above, the chart below shows rates of births by weight category and race/ethnicity.
- African American women comprise 8% of all births, however 20% of VLBW births were to African American women (176 / 881).
- The map below reflects relative counts of low birth weight births (≤2500 grams), by census tract.
- 7.7% of all infants born in Travis County were ≤2500 grams.

- The map below reflects the percent of births per census tract that were ≤ 2500 grams.
- In red areas below, over 10% of births had low birth weights in those Census tracts.
- Both higher and lower income census tracts are represented in high-LBW and high-VLBW proportions.
• The map below reflects relative counts of very low birth weight births (≤1500 grams), by census tract.
• The rate of very low birth weight births (≤1500 grams) is 13.5 per 1,000 births, or 1.35%.

$count$ of Very Low Birth Weights ≤1500 Grams

Counts per Census Tract:
- 18 - 30
- 12 - 17
- 6 - 11
- 6 - 7
- ≤6

Maps produced by Children's Optimal Health display visual correlations among multiple layered datasets. They do not represent cause and effect relationships.

Data Sources:
- DSHS 2007 - 2010, TNRS 2013,
- Census 2000, CAPCOG 2013

• The map below reflects the percent of births per census tract with very low birth weights (≤1500 grams).
• 1.35% of births had very low birth weights (≤1500 grams).
• In red areas below, 2.4-5% of births had very low birth weights in those census tracts.
• Red and orange areas together identify areas where the percent of very low birth weight births exceed the county’s overall rate.

Percent of Very Low Birth Weights ≤1500 Grams

Percents per Census Tract:
- 24 - 5.0%
- 17 - 2.4%
- 13 - 1.7%
- ≤1.3%
- (count <6, not visible)

Maps produced by Children’s Optimal Health display visual correlations among multiple layered datasets. They do not represent cause and effect relationships.

Data Sources:
- DSHS 2007 - 2010, TNRS 2013,
- Census 2000, CAPCOG 2013
The map below reflects relative counts of high birth weights (>4000 grams) by census tract. The rate of high birth weight births (>4000 grams) is 79 per 1,000 births. In red areas below, over 10% of births had high birth weights in those census tracts.
Although 81% of infants born in Travis County are born at healthy birth weights, there are significant disparities in low birth weight by race/ethnicity and age.

Birth Weight Categories

Very Low Birth Weight (VLBW) ≤1500 g (3.3lbs)

- The rate of very low birth weights to women age 20-39 were 13 births per 1,000. The corresponding rates for women 40 years and older was 20, and for women 19 years and younger the rate was 15.

Rates of Very Low Birth Weight (≤1500g) Births by Age
2007-2010 Travis County Birth Record Data

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>≤19</th>
<th>20-39</th>
<th>≥40</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>30</td>
<td>140</td>
<td>6</td>
<td>176</td>
</tr>
<tr>
<td>Hispanic</td>
<td>50</td>
<td>312</td>
<td>12</td>
<td>374</td>
</tr>
<tr>
<td>Asian</td>
<td>&lt;6</td>
<td>44</td>
<td>&lt;6</td>
<td>56</td>
</tr>
<tr>
<td>White</td>
<td>14</td>
<td>250</td>
<td>18</td>
<td>282</td>
</tr>
<tr>
<td>Total</td>
<td>94</td>
<td>746</td>
<td>42</td>
<td>888</td>
</tr>
</tbody>
</table>

*Ranges are used due to counts <6

Count of VLBW (≤1500g) Births by Age and Ethnicity

- Derived from the counts in the tables above, the chart below shows rates of VLBW by age and race/ethnicity.
- African American women comprise 8% of all births, 12% of births to mother ≤19 (739 / 6273), yet they exceed 30% of all VLBW deliveries to mother ≤19 years of age (30 / 94).
- In contrast Hispanic adolescents comprise 76% (4794 / 6273) of births ≤19, but only about 50% (50 / 94) of VLBW deliveries to mothers ≤19 years of age.
- The rate of VLBW (≤1500g) for African American women far exceeds that of other ethnic groups, for each age range.
Birth Outcomes: Neonatal Intensive Care Unit (NICU) Admissions

96.5% of births in Travis County from 2007-2010 were singleton births. 33% of multiple births were admitted to the NICU. The corresponding number for singleton births is 4.5%. In the following analysis we focus on singleton births due to their much higher numbers and to remove any bias introduced by a disproportionate number of multiple births. Similar to prematurity and low birth weight, there are differences in NICU admission rates due to several factors including multiple-singleton births, maternal race/ethnicity, maternal age and others.

- 5.6% of all births to mothers living in Travis County were admitted to the NICU.
- 53% of all births were to women without private insurance.
- 57% of singleton birth NICU admits did not have private insurance.
- 34% of multiple birth NICU admits did not have private insurance.

![Singleton Births Only](image1)

![Multiple Births Only](image2)

### Count of Singleton Births by Race/Ethnicity and those admitted and not admitted to NICU

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>NICU Yes</th>
<th>NICU No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>374</td>
<td>4,506</td>
<td>4,880</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1,360</td>
<td>29,762</td>
<td>31,122</td>
</tr>
<tr>
<td>Asian</td>
<td>165</td>
<td>4069</td>
<td>4,234</td>
</tr>
<tr>
<td>White</td>
<td>953</td>
<td>21,914</td>
<td>22,867</td>
</tr>
<tr>
<td>Total</td>
<td>2,852</td>
<td>60,251</td>
<td>63,103</td>
</tr>
</tbody>
</table>

### Count of Singleton Births by Payment Source and those admitted and not admitted to NICU

<table>
<thead>
<tr>
<th>Payment Source</th>
<th>NICU Yes</th>
<th>NICU No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicaid</td>
<td>1325</td>
<td>22,893</td>
<td>24,218</td>
</tr>
<tr>
<td>Other</td>
<td>139</td>
<td>6,201</td>
<td>6,340</td>
</tr>
<tr>
<td>Private Insurance</td>
<td>1,215</td>
<td>27,896</td>
<td>29,111</td>
</tr>
<tr>
<td>Self-Pay</td>
<td>170</td>
<td>3,197</td>
<td>3,367</td>
</tr>
<tr>
<td>Total</td>
<td>2,849</td>
<td>60,187</td>
<td>63,036</td>
</tr>
</tbody>
</table>

- Derived from the counts in the table above, the chart below shows rates of singleton births by race/ethnicity admitted to NICU.
- African American women comprise 8% of all births but 13% of Singleton NICU admissions for their infants.
- The rate of NICU admits for African American infants is 77 per 1,000 births, compared to 44 for Hispanics, 39 for Asians and 42 for White.

### Rates of Singleton Births Admitted to NICU by Race/Ethnicity

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Rate per 1,000 singleton births</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>76.6</td>
</tr>
<tr>
<td>Hispanic</td>
<td>43.7</td>
</tr>
<tr>
<td>Asian</td>
<td>39.0</td>
</tr>
<tr>
<td>White</td>
<td>41.7</td>
</tr>
</tbody>
</table>
The maps below display Neonatal Intensive Care Unit Admission (NICU) births for Travis County. The density map (left) shows high concentrations of NICU births in the northeast around Manor and Pflugerville and another concentration in the south framed by 290 and I-35. The proportion map (right) shows the tracts become more dispersed throughout the county with several tracts West of I-35 and along 360.

- The map below reflects relative counts of NICU admissions, by census tract.
- 5.6% of births were admitted to NICU.

- The map below reflects the percent of all births per census tract admitted to NICU.
- In red areas below, over 8% of births were admitted to NICU in those Census tracts.
This analysis, based on birth record data, reflects live births that resulted in infant death prior to hospital discharge. This does NOT represent the neonatal or perinatal death rate (first 27 days), nor does it represent infant mortality, which is calculated based on the first 12 months of life. The following data only reflects the subset of neonatal deaths that occurred before hospital discharge.

- African American women comprise 8% of all births and 12% (49 / 402) of infant deaths.
- Hispanic women comprise 48% of all births and 50% (203 / 402) of infant deaths.
- Asian women comprise 7% of all births and 5% (19 / 402) of infant deaths.
- White women comprise 37% of all births and 32% (131 / 402) of infant deaths.
- Rates of infant death between 2007-2010 show that nearly 10 African American infants per 1,000 births did not leave the hospital alive.
About this Project
Measurement of Adequacy of Prenatal Care

A common measure of prenatal care (PNC) is simply the date of the first prenatal care visit in which initiation in the 1st trimester is the standard recommendation. The Pregnancy Risk Assessment Monitoring System (PRAMS) conducted by the CDC and Texas Department of State Health Services uses this method to survey prenatal care adequacy. However, more complicated indexes may be used to account for PNC initiation and number of subsequent visits. Both the Kessner Index and the Kotelchuck Index include the timing of prenatal care initiation and the number of subsequent visits in order to determine adequacy of PNC (Kotelchuck, 1994). It is important to note that both of these indices were developed for the purpose of analyzing birth record data, and neither assesses the content nor quality of PNC, only utilization.

The Kessner Index divides PNC adequacy into: adequate (initiation in the 1st trimester), intermediate (initiation in the 2nd trimester), and inadequate (initiation in the 3nd trimester) (Kotelchuck, 1994). For a normal length pregnancy, adequate prenatal care requires initiation in the first trimester as well as a total of nine prenatal care visits (Kotelchuck, 1994). One of the limitations of the Kessner Index is that the number of visits can only lower the rating, and it has been found that only about 14% of ratings are lowered due to the number of visits. Few differences are found when comparing results using Kessner Index versus only using the timing of PNC initiation (the latter being much less labor intensive) (Kotelchuck, 1994). The total number of visits for adequacy is 9 for a pregnancy normal in length. However, this number was found to be somewhat arbitrary (it was the result of a limitation in the birth record database that was used during the development of the Kessner Index: the 1986 NYC birth file which was limited to a single digit space for capturing the number of visits) (Kotelchuck, 1994). This limitation results in the misclassification of normal and post-term births, artificially making full-term babies more likely to be categorized as having adequate PNC (Kotelchuck, 1994).

The Kotelchuck Index (Adequacy of Prenatal Care Utilization Index, APNCU) measures prenatal care utilization with two separate factors. The first dimension is the timing of PNC initiation by month to match standard birth records (months: 1-2, 3-4, 5-6, 7-9). The second is the number of prenatal care visits received (based on the American College and Obstetricians and Gynecologists [ACOG] recommendations for uncomplicated pregnancies which can be found on the following page). The APNCU adjusts for gestational age at initiation of PNC and delivery by converting the number of observed/reported PNC visits and the number of expected PNC visits for a given pregnancy length into a ratio (Kotelchuck, 1994). A significant strength of the APNCU is that it is an adjusted metric that more closely reflects ACOG guidelines (Kotelchuck, 1994). For example, the addition of the Adequate Plus category can be used to identify pregnancies that received more than the typically recommended number of prenatal care visits identifying a potential high-risk group unaccounted for by the Kessner Index. The figure below displays how the two dimensions are combined to categorize births into Inadequate, Intermediate, Adequate or Adequate Plus PNC.
APNCU Index Procedure

Utilization is determined by the gestational age of the first prenatal visit, the gestation period of the pregnancy, and the number of prenatal visits. DSHS does not provide a baby’s date of birth due to privacy concerns. Only the birth month and year are provided. When calculating gestational ages we assume all babies were born on the 15th of their birth month.

Prenatal Care Utilization falls into four categories:

- "Inadequate" due to late initiation of prenatal visits (after 4 months), or less than 50% of expected number of visits.
- "Intermediate" if initiation of visits started in the first four months and the visit count was >= 50% and < 80% of the expected number of visits.
- "Adequate" if initiation of visits started in the first four months and the visit count was >= 80% and < 110% of the expected number of visits.
- "Adequate Plus" if initiation of visits started in the first four months and the visit count was >= 110% of the expected number of visits.

The expected number of visits is based on ACOGs recommended schedule:

- Every four weeks for the first 28 weeks of pregnancy
- Subsequently, every two to three weeks through 36 weeks
- Weekly at 37 weeks and thereafter
- If the first prenatal visit began after the second month (i.e., 3rd or 4th month) then the expected number of visits is one less than if the visits had begun in the first two months).
**Project Data Sources**

**DSHS Birth Record Data 2007-2010**

Birth record data obtained by Children’s Optimal Health (COH) from the Texas Department of State Health Services (DSHS) includes years 2007-2010 for Travis, Williamson, and Hays County. Non-sensitive data fields for individual birth records were aggregated to the 2000 Census tract level for map representation. For this report only data for Travis County was used.

**Healthcare Assets**

This data set was compiled drawing from the 4th Edition of the Central Texas Healthcare Resource Directory, published in 2012 by the Literacy Coalition of Central Texas. We include both hospitals, listed as such, and clinics, defined as primary care providers. Prenatal care providers include those which offer prenatal or maternity care. Women’s healthcare providers include those which offer women’s health, healthcare, or services; gynecological care; OB/GYN services; or “well-women exams.” The original resource can be found at [https://www.willread.org/healthcare-resource-directory](https://www.willread.org/healthcare-resource-directory).

**2010 Census Data**

Data for the population maps of women of childbearing age (15-44) come from 2010 Census data for Travis County. Classifications were compiled using Census categories sex by age; White alone not Hispanic or Latino, Black or African American alone, and Hispanic or Latino. The counts of all women of childbearing age were calculated and totaled and mapped by Census tract.

**Mapping Methodology**

Births to mothers residing in Travis County within the 2007-2010 four year period are the focus of this report. Approximately 5% of these mothers gave birth outside of the county. There were also approximately 5% of births that occurred within Travis County, but the mother’s residence was outside of Travis county.

**U.S. Census Tract Mapping Methodology**

A choropleth map shows the geographic distribution of a population by basing the color of a predefined area to the count of the population being mapped. A common choropleth example is a map where countries with large populations are shown in darker shades than countries with small populations. COH uses choropleth maps to show the distribution of birthing mothers’ residences as recorded by DSHS. The U.S. Census Tracts are the maps’ predefined areas.

The U.S. Census defines tracts as a geographic area “designed to be relatively homogenous units with respect to population characteristics, economic status, and living conditions. Census tracts average about 4,000 inhabitants,” (US Census Bureau, 2010). Although tracts average about 4,000 inhabitants, tract populations can vary widely from 1,000 to 8,000. The geographic extent of tracts can also vary widely from less than a mile to well over 10 miles across.

COH employs the Natural Breaks classification scheme for the choropleth maps. This classification method seeks to minimize variance within classes and maximize variance between classes. In other words, Natural Breaks attempts to maximize the value differences among the different census tract groupings represented in a map.

In this report two varieties of choropleth maps are shown. One type shows the count of individuals that reside within a census tract and the other type shows the percentage (or proportion) of a base population that the mapped individuals represent. The base population is context-dependent and is spelled out in each proportion map. The counts of population for a tract can range from zero to the hundreds or more.

Following accepted cartographic principles, we allow the top value of a percentage category to touch the bottom value of the next higher category. In contrast, there are no value overlaps in the legends showing counts of individuals. Note that percentages are continuous values and counts of individuals are discrete values.
When the count for a particular tract is very low, any characterization of the area’s population can potentially compromise the privacy of the individuals within the geographic unit. As an extreme example, suppose a map shows that there was a single birth within a census tract. This information immediately allows for assigning any birth characteristics, such as birth weight, that is known for that census tract to a single newborn. Although less severe, the same problem applies for tracts with two or three births. The low count problem applies to count and proportion maps. Even though counts are not displayed in proportion maps, the counts can still be obtained through other means. To ensure privacy, COH maps that show protected personal health information do not display count or percentage values for tracts that have fewer than six individuals. All tracts with fewer than six individuals are grouped into a single 0-to-5 category and are colored gray.

**Project Limitations**

The data for this report come from DSHS birth records from the years 2007-2010 for Travis, Williamson, and Hays counties. The DSHS dataset includes births from all hospitals and registered birthing facilities. Home births are not included. Birth data for mothers who reside in Travis, Williamson, and Hays but gave birth outside of Texas are not included. The focus of this report is on birth outcomes of mothers with residences in Travis County.

To protect confidentiality, maps were based on the census tract of residence of the mother. Because census tract geography reflects population density, more rural areas with lower density are represented by larger geographies, while persons living in densely populated urban areas are represented by comparatively smaller geographies. This can create a visual imbalance in a map that includes both rural and urban areas, such as those Travis County encompasses. Census tracts are roughly comparable in population despite differences in their geographic appearance. For this study, Census 2000 tract boundaries were used. Data pulls for 2011 and later will have Census 2010 tract boundaries.

Of the 65,400 births recorded during the four year period, 1,076 births could not be geocoded (i.e., assigned a census tract) and were excluded from the maps. They were however included in the tabular analyses.
References


Travis County Health and Human Services & Veterans Services, R. & P. D. (2013). Focus on Children in Travis County.


travis county

birth outcomes
as related to the physical and social environment

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