THE HEALTH STATUS OF NORTHEAST TEXAS

2021

UTTyler
THE UNIVERSITY OF TEXAS AT TYLER

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This report is accompanied by a data visualization tool that includes additional county-level and can be found at:

www.utsystem.edu/netx/

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A LETTER TO READERS

Dear Health Champions:

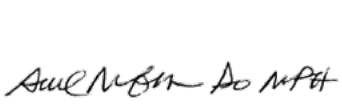
Northeast Texas is a growing and dynamic part of our state. With talented and hardworking people, picturesque beauty, and ample resources, the region is well poised for significant economic and population growth.

A community's quality of life and economic prosperity are both closely tied to the health status of its residents. This report reflects an effort to characterize the health status of Northeast Texas in an objective and comprehensive fashion. This 2021 edition provides an update to the Health Status of Northeast Texas, 2016 version released five years ago. That report revealed the area has many urgent challenges regarding health. Chief among them was the high rates of tobacco use, which contributes its excessively high rates of chronic respiratory disease, lung cancer, heart disease and stroke.

The 2016 report was used by businesses, health planners, educators, government agencies, and grant writers to facilitate health improvements throughout the region. Furthermore, the report was catalytic for the creation of the University of Texas at Tyler School of Community and Rural Health, whose mission is to transform the health of rural Texans and beyond through workforce development, research, scholarship, and other programs. The school's effort with community partners has been monumental in improving health in the region. Most recently, in addition to the College of Nursing and College of Pharmacy, a new medical school hopes to open its doors at the University of Texas at Tyler in 2023 with a chief aim of helping set a new trajectory for improved health in the region.

The Health Status of Northeast Texas, 2021 describes current population health challenges facing Northeast Texas, as well as areas of progress, and opportunities to target improvements. What the report does not describe are the numerous dedicated health professionals, community leaders, and engaged stakeholders who have taken on this challenge and committed their time and resources to improving health in their communities. Notably, Northeast Texas has succeeded in tackling one of the most critical drivers of poor health as mentioned above – cigarette smoking. The significant decline in cigarette use will pay dividends in improved quality of life in the near term, and improvements in mortality rates are certain to follow. Health advocates in Northeast Texas are committed to using data to drive improvements, and we hope this resource will be of great value in their continued work. Current and future generations of Northeast Texans are too valuable for us, collectively, not to act to improve everyone's health.

Sincerely,



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EXECUTIVE SUMMARY

INTRODUCTION

This report describes the health status of the population of Northeast Texas, the 35-county area also referred to as Health Service Region 4/5N by the Texas Department of State Health Services. The first edition of *The Health Status of Northeast Texas*, released in 2016, served as an important reference for stakeholders interested in promoting health in this area and in addressing geographic health disparities in Texas. The current report builds on the 2016 release with an additional five years of trend data, an expanded overview section that includes information on social and economic factors that impact health, and additional morbidity measures based on hospital discharge data. This report is accompanied by a data visualization tool that includes additional county-level data, and can be found at https://utsystem.edu/netx/

REGIONAL OVERVIEW AND SOCIAL DETERMINANTS OF HEALTH

Demographics. Northeast Texas is home to approximately 1.6 million people (5.4% of Texas population). Relative to Texas overall, the Northeast Texas population is slightly older and has a larger proportion of non-Hispanic White and non-Hispanic Black residents.

Healthcare Access. In Northeast Texas, nearly one-quarter of 19-64-year-olds are uninsured, a proportion similar to that in Texas overall and nearly double that of the U.S. Compared to Texas overall, Northeast Texas has fewer primary care and mental health providers per capita. Although approximately one-third of pregnant women did not access prenatal care in the first trimester, first trimester prenatal care access in the region has been trending upwards in recent years.

Social and Economic Factors. Compared to the overall Texas and U.S. populations, fewer Northeast Texas adults have earned a bachelor's degree, and a slightly higher proportion are unemployed or experiencing poverty. Compared to Texas overall and the U.S., a greater proportion of Northeast Texas employees work in the agriculture, forestry, fishing, and hunting sector, one of the most hazardous of the employment sectors. Computer and Internet access is lower in Northeast Texas, where one in four residents lack Internet access.

BEHAVIORAL RISK FACTORS

Cigarette Smoking. In 2019, 16.2% of adults in Northeast Texas reported daily cigarette smoking, compared to 14.7% in Texas overall. Compared to all Texas babies, a Northeast Texas baby was three times more likely to have been born to a woman who smoked during pregnancy. These differences have declined over time, indicating regional progress in reducing cigarette smoking.

Physical Inactivity. In 2019, one in four adults in Northeast Texas did not engage in any physical activity for exercise or recreation in the prior month, similar to the proportion in Texas overall. During the 2015-2016 school year in Northeast Texas, 28% of students met the U.S. physical activity guidelines, percentages similar to those in Texas students overall.

GEOGRAPHIC HEALTH DISPARITIES

For each of the five leading causes of death in the U.S. — heart disease, cancer, unintentional injury, chronic lower respiratory diseases (CLRD), and stroke — Northeast Texas experiences higher rates of mortality in 2019. If Northeast Texas were a state, in a lineup of the U.S. states it would have ranked 47th in heart disease mortality, 48th in cancer mortality, 50th in stroke mortality, and 51st in CLRD mortality. Northeast Texas as a state would have ranked 44th in overall (all-cause) mortality, while Texas ranked 24th.

In 2019, all-cause mortality rates in Northeast Texas were 20% higher for males, 22% higher for females, 17% higher for Whites, and 14% higher for Blacks than they were in Texas overall. For Hispanics, the mortality rate was 33% lower in Northeast Texas than in Texas overall. These rate differences were similar to those in 2014 reported in the first edition of The Health Status of Northeast Texas, with the exception of the rate difference for non-Hispanic Blacks, which was 7% higher among Northeast Texas Blacks in 2014.

In 2019, mortality rates were higher in Northeast Texas than in Texas and in the U.S. for all age groups. If Northeast Texas age-specific mortality rates were the same as those of the rest of Texas in 2019, 17% fewer deaths would have occurred (similar to the percentage found for 2014), representing 3022 fewer deaths. Within age groups, the largest differences in mortality rates between Northeast Texas and Texas overall were seen in those between 35-44 years of age.

Age-adjusted mortality rates in Northeast Texas for 2019 were higher than in Texas overall for the following causes of death:

- Heart disease and stroke
- Lung, colorectal, and cervical cancers
- Chronic obstructive pulmonary disease (COPD), the primary type of CLRD
- Kidney disease
- Injury due to motor vehicle crashes
- Diabetes
- Suicide
- Kidney disease

Age-adjusted mortality rates in Northeast Texas for 2019 were similar or lower than in Texas overall for the following causes of death:

- Breast, prostate, pancreatic, and liver cancers
- Alzheimer's disease
- Deaths due to alcohol or drug use

Mortality rates for heart disease, stroke, most cancers, and kidney disease were lower in 2019 than in 2014 (the focus of the first edition), while mortality rates for diabetes, COPD, Alzheimer's disease, suicide, alcohol/drug use, and unintentional injuries (motor vehicle crashes specifically) were higher.

RACIAL HEALTH DISPARITIES WITHIN NORTHEAST TEXAS

Within Northeast Texas, mortality rates due to heart disease, stroke, colorectal and breast cancer, diabetes, HIV/AIDS and kidney disease in 2019, and infant mortality in 2018, were higher among non-Hispanic Blacks than non-Hispanic Whites, while mortality due to COPD, Alzheimer's disease, suicide, and deaths related to alcohol and other drugs were higher among non-Hispanic Whites than non-Hispanic Blacks. Mortality rates among Hispanics were lower than among non-Hispanics for every cause of death included in this report for which there was sufficient data to analyze by ethnicity. These patterns are the same as those of five years prior, documented in the 2016 report.

COVID-19

This report was prepared during the worldwide COVID-19 pandemic. As of November 22, 2021, Northeast Texas residents aged 12 and older were 32% less likely to be fully vaccinated compared to the same age population in Texas overall. At 399 deaths per 100,000 population, the COVID-19 mortality rate for Northeast Texas through November 22, 2021 (approximately 21 months) was 60% higher than the Texas rate. If Northeast Texas were a state, it would rank worst of all U.S. states both in COVID-19 vaccination (with the lowest prevalence) and mortality rate (with the highest rate).

CONCLUSION

Northeast Texas continues to face many health challenges and health disparities. Further efforts towards prevention and education are needed to continue progress in areas of success such as declining cigarette use. Focused prevention work is also needed to address growing challenges facing the region such as increases in deaths due to diabetes and suicide. This report can serve as a resource to guide prevention efforts and additional investigations that can further inform population health practice in the region.

INTRODUCTION

This report describes the health status of the population of Northeast Texas, a 35-county area designated as Health Service Region 4/5N by the Texas Department of State Health Services (Figure 1).

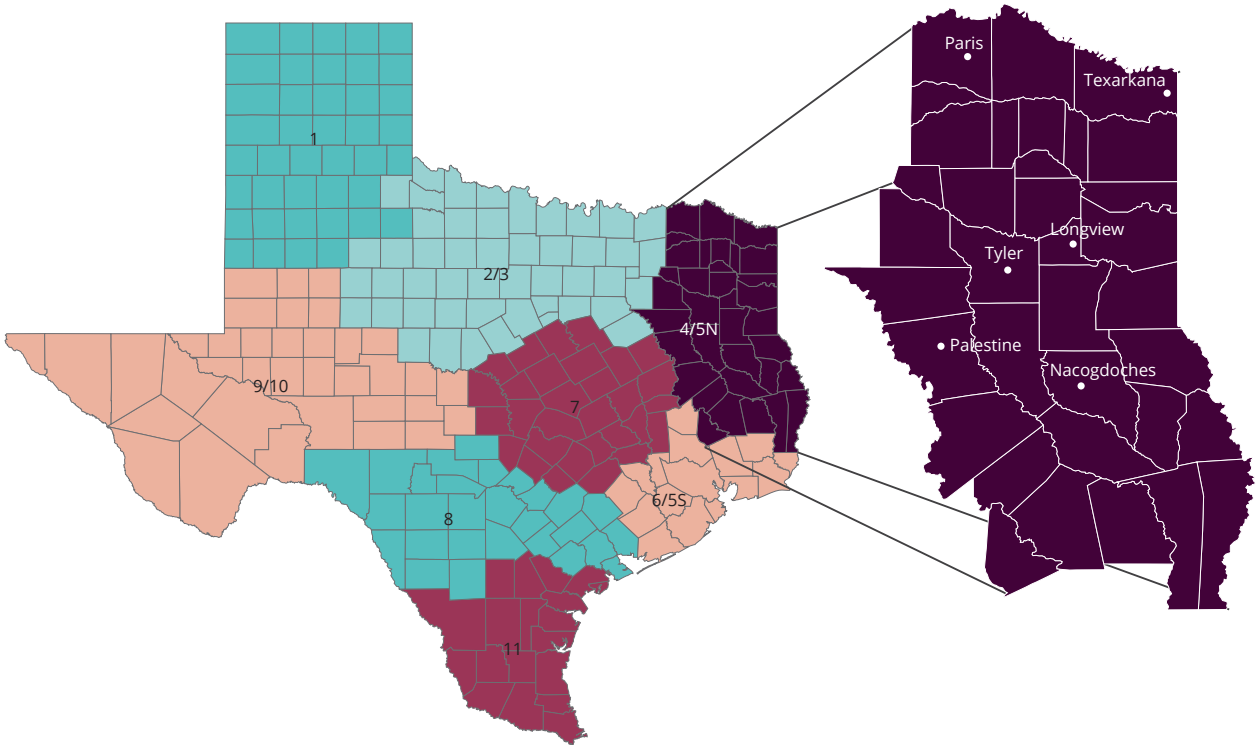
The health status of Northeast Texas is described using death (mortality) rates, measures of illness (morbidity) from sources such as the Texas cancer registry and hospital discharge records, measures of health care access such as the proportion of the population with health insurance, and social and economic indicators such as poverty prevalence and Internet access. Information on data sources, definitions of terms used in this document, and additional data tables are provided in the appendix.

Where possible population health indicators for Northeast Texas are compared:

- by years,
- to Texas and U.S. rates,
- to Healthy People 2020 targets (1),
- by sex, and
- by race or Hispanic ethnicity.

The first edition of *The Health Status of Northeast Texas*, released in 2016, served as an important reference for stakeholders interested in promoting health in this area and addressing geographic health disparities in Texas. The current report builds on the 2016 release with an additional five years of trend data, and expanded overview section that includes information on social and economic factors that impact health, and additional morbidity measures based on hospital discharge data. This 2021 edition is accompanied by a data visualization tool that includes additional county-level data, and can be found at https://utsystem.edu/netx/. As with the 2016 report, data in this 2021 release can be used to prioritize health issues in the region, identify populations at greatest risk, guide targeted public health action, and set and monitor measurable objectives to improve the health and well-being of the Northeast Texas population.

Figure 1. Health Service Regions in Texas, Highlighting Northeast Texas



REGIONAL OVERVIEW AND SOCIAL DETERMINANTS OF HEALTH

This section provides an overview of the Northeast Texas region, including characteristics of the population, access to health care, and social and economic factors impacting health.

Geographic and Demographic Characteristics

Northeast Texas spans just over 25,000 square miles and is home to approximately 1.6 million people (5.4% of Texas population) (Table 1).

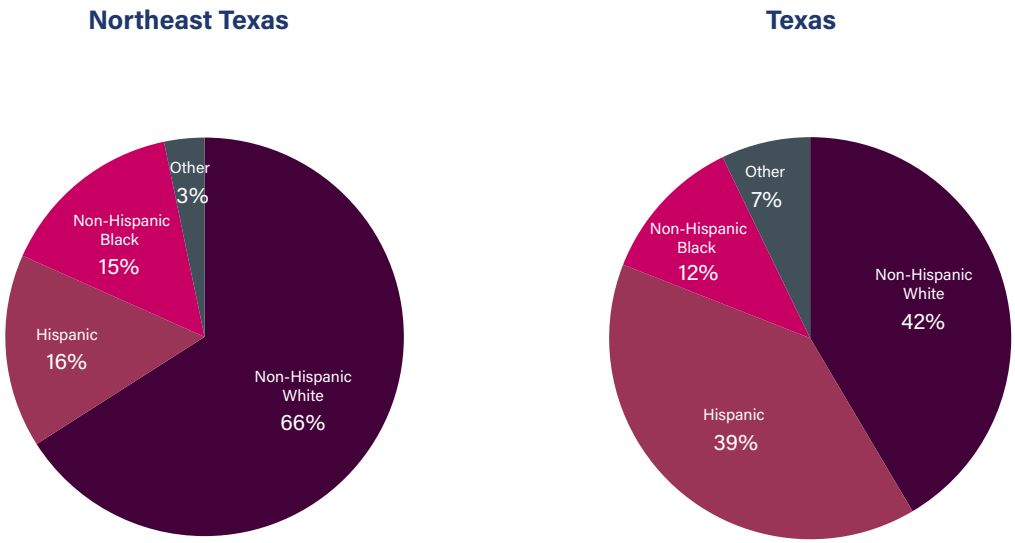
Table 1. Geographic and Demographic Characteristics of Northeast Texas and Texas (2019)

	Northeast Texas	Texas
Land area (sq. mi.)	25,328	261,232
Total population	1,556,174	29,001,602
Population density (people/sq mi)	61.4	111.0
Sex (% male)	50.0	49.7
Median age (years)	38.5	34.0

Data source: Land area - U.S. Census Bureau, 2010 Summary File 1. Total population, sex, and median age - The Texas Demographic Center. Population estimates are for July 1, 2019.

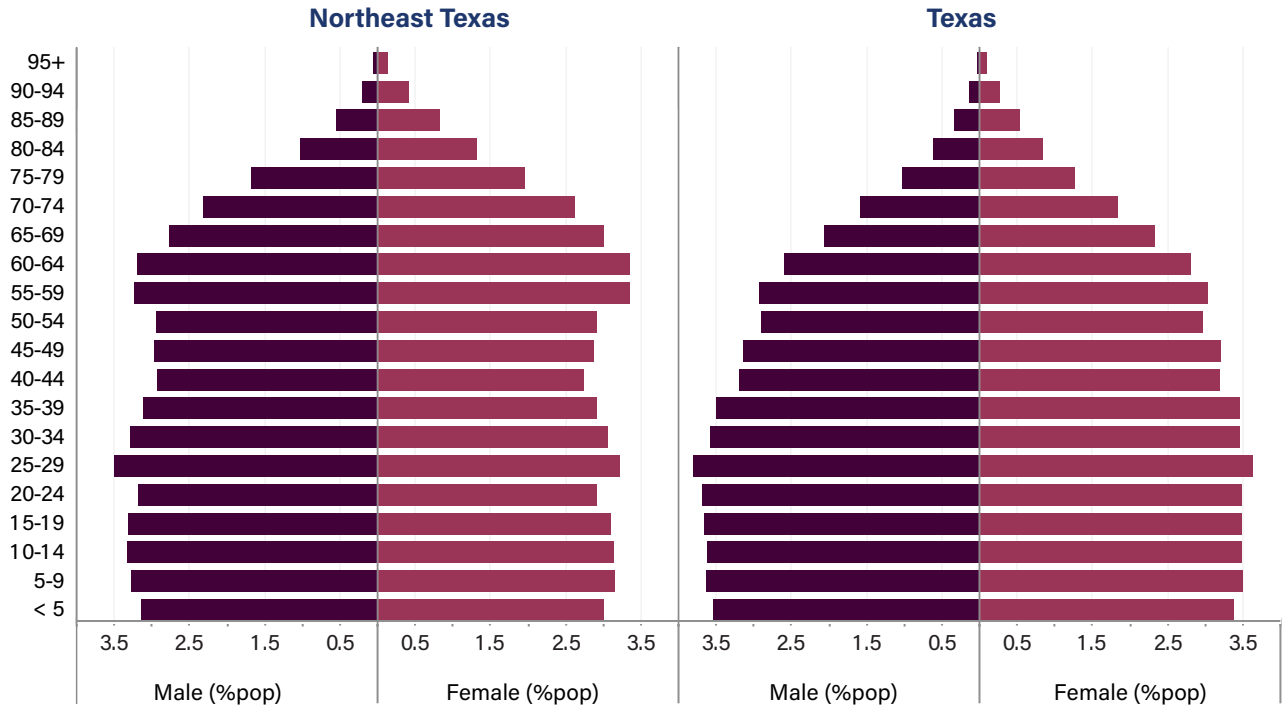
In contrast to Texas overall, where no single racial or ethnic group is in the majority, two-thirds of Northeast Texans are non-Hispanic White. The Northeast Texas region has a slightly larger percentage of non-Hispanic Black residents and a much smaller percentage of Hispanic residents compared to the state overall (Figure 2). The population of Northeast Texas is slightly older than the overall Texas population, with a median age of 38.5 in Northeast Texas and 34 in Texas (Table 1). The Northeast Texas population also has a relatively smaller population of young to early-middle-aged adults compared to Texas overall (Figure 3).

Figure 2. Northeast Texas and Texas Populations by Race or Hispanic Ethnicity (2019)



Data source: The Texas Demographic Center. Population estimates for July 1, 2019.

Figure 3. Population Distribution by Sex: Northeast Texas and Texas (2019)



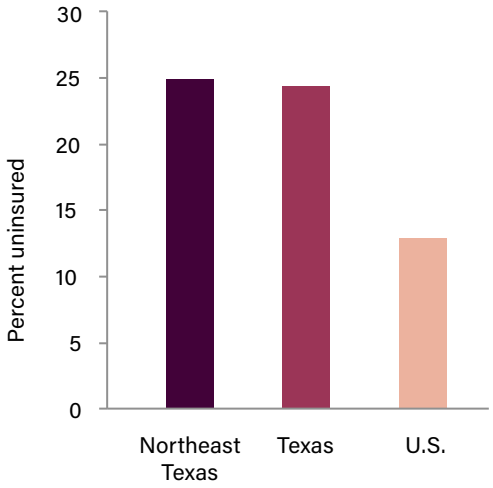
Data source: The Texas Demographic Center. Population estimates for July 1, 2019.

Access to Health Care

Access to health care is important for maintaining health and recovering from illness. One factor impacting access to health care is health insurance status. Those aged 19-64 years are most likely to be uninsured, as public insurance options are available for those in younger and older age groups (Medicaid/CHIP and Medicare, respectively). In Northeast Texas, nearly one-quarter of 19-64-year-olds are uninsured (24.9%). This proportion is similar to that in Texas overall (24.3%) yet nearly double that of the U.S. (12.9%) (Figure 4).

Lack of health insurance is a statewide problem that impacts Northeast Texas. Texas consistently and easily tops lists of states when ranked by the percent uninsured. A 2020 study by the Urban Institute on the characteristics of the uninsured in Texas found that a lack of insurance was highest among those in the construction, arts/entertainment/recreation, and agriculture sectors – at 43%, 42%, and 40% respectively (2). Those without a family member employed by a large company (defined as one with more than 50 employees) were more likely to be uninsured than those with a family member employed by a large company. These factors likely impact insurance coverage in Northeast Texas.

Figure 4. Civilian Non-institutionalized Adults 19-64 Years-old with no Health Insurance Coverage: Northeast Texas, Texas, and U.S. (2019)



Data source: U.S. Census Bureau, Model-based Small Area Health Insurance Estimates for Counties and States (2019); 2019 American Community Survey 1-Year Estimates: Table DP03

Availability of healthcare providers also impacts healthcare access. Compared to Texas overall, Northeast Texas has fewer primary care physicians and mental health professionals per capita (Table 2). This difference is most striking for mental health providers; the number of people per mental health provider in Northeast Texas is 47% higher than in Texas overall (1,081:1 vs. 736:1).

Table 2. Individuals per Healthcare Provider (2019)

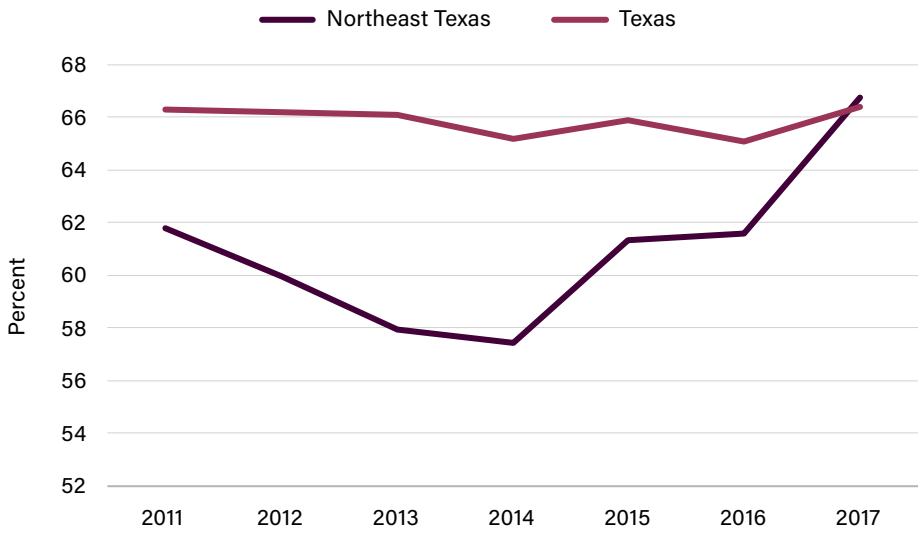
	Northeast Texas	Texas
Individuals per primary care physician (MD or DO)	1,433	1,320
Individuals per mental health provider	1,081	736
Individuals per Licensed Chemical Dependency Counselor	4,334	4,948

Mental health providers include Licensed Professional Counselors, Licensed Clinical Social Workers, psychologists, and psychiatrists. Data on psychologists are from 2018 (most recent year available for a non-duplicated count).
Data source: Health Professions Resource Center, Center for Health Statistics, Texas Department of State Health Services.

PRENATAL CARE ACCESS

Prenatal care is the main route for pregnant women to receive care and interact with the medical community. Adequate prenatal care includes both accessing care in the first trimester and having regular visits once care begins. Infants whose mother did not receive adequate care are at an increased risk of infant and fetal death. Such infants also have three times greater risk of being born preterm than infants of mothers receiving an adequate amount of prenatal care (3). While approximately one-third of pregnant women did not access prenatal care in the first trimester, first trimester prenatal care access in the region has been trending upwards (Figure 5).

Figure 5. Percent of Births to a Woman who Received Prenatal Care in the First Trimester: Northeast Texas and Texas (2011-2017)

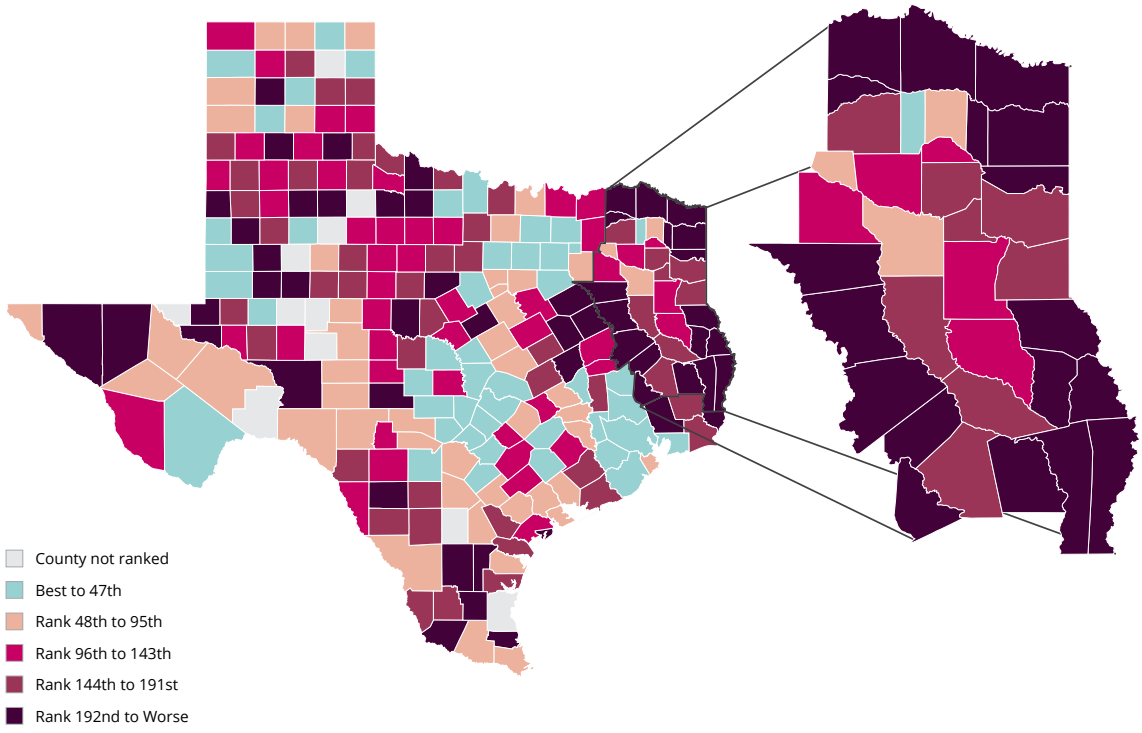


Data sources: Northeast Texas – DSHS Birth File, analysis by authors; Texas – Texas Department of State Health Services 2020 Healthy Texas Mothers and Babies Data Book.

Composite County Health Rankings

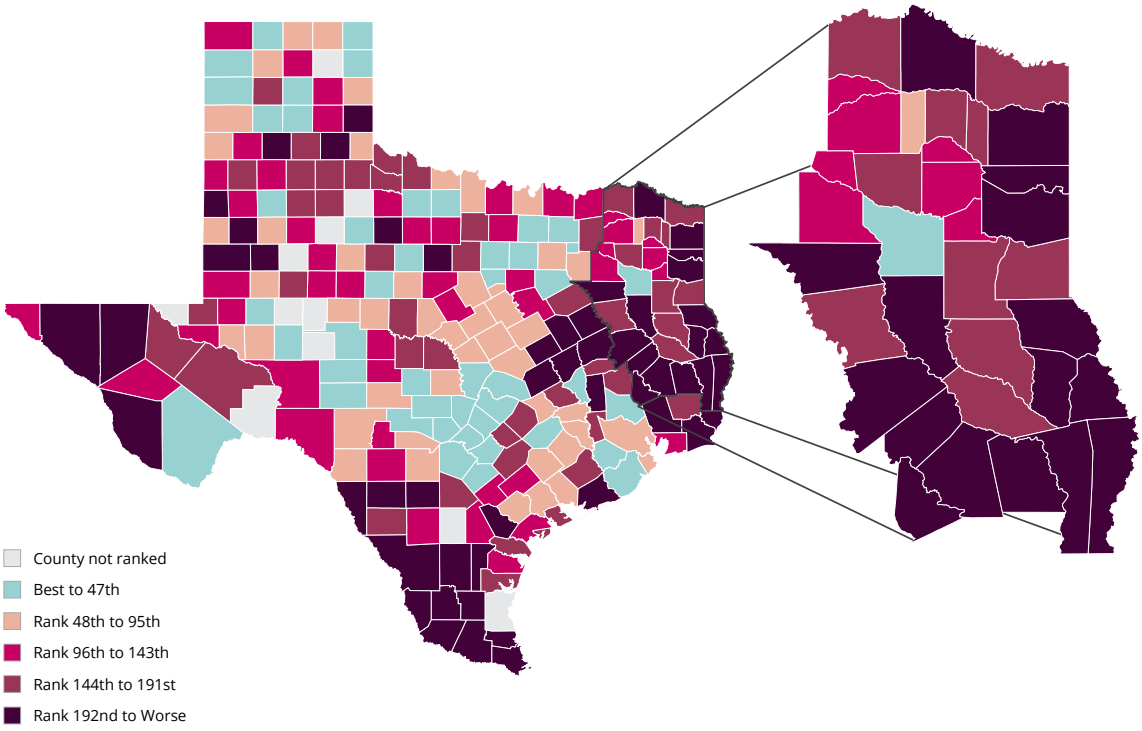
The County Health Rankings & Roadmaps project of the Robert Wood Johnson Foundation generates two county-level composite measures related to health. These measures are based on a model of community health that takes into account contributions of the many factors that influence health. The health outcomes measure incorporates both length and quality of life, while the health factors measure is a combination of measures of health behaviors, physical environment, and social and economic factors (4). Among all counties in Texas, 26 of the 35 counties in the Northeast Texas region ranked in the worst two quartiles on the health outcomes score (Figure 6) and 26 of the 35 ranked in the worst two quartiles on the health factors score (Figure 7). More details on these composite measures and their component measures can be found at the County Health Rankings & Roadmaps website: https://www.countyhealthrankings.org/.

Figure 6. County Health Outcome Rankings: Texas Highlighting Northeast Texas (2019)



Data source: County Health Rankings and Roadmaps. The University of Wisconsin Population Health Institute.

Figure 7. County Health Factors Rankings: Texas Highlighting Northeast Texas (2019)



Data source: County Health Rankings and Roadmaps. The University of Wisconsin Population Health Institute.

Social and Economic Factors

The majority of Texans recognize that access to good medical care is not enough for a person to live a healthy life (5). Decades of research demonstrate relationships between social, economic, and environmental factors (often called social determinants of health) and health outcomes (6). This section describes some of the non-healthcare factors that can impact health, including education, income, and access to the Internet.

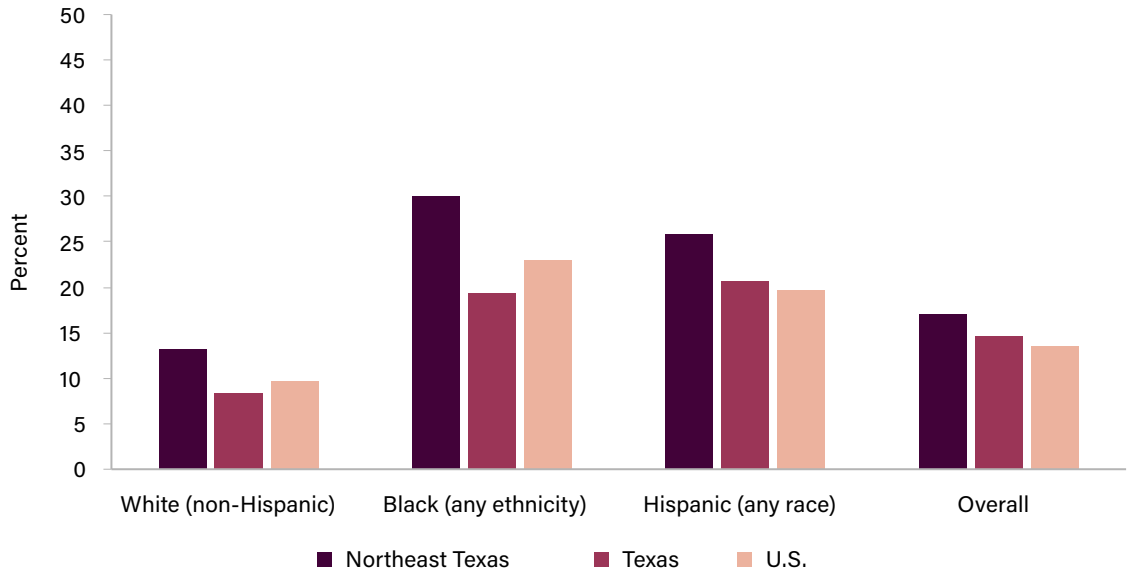
Compared to the overall Texas and U.S. populations, fewer Northeast Texas adults have earned a bachelor's degree, and a slightly higher proportion are unemployed or experiencing poverty (Table 3). In some respects these overall rates understate geographic differences, due to differences in the racial and ethnic makeup of Northeast Texas compared to Texas. Northeast Texas has a larger proportion of Non-Hispanic White residents, who as a group have lower poverty and more education than other racial and ethnic groups. The geographic disparities become more visible when the data are disaggregated by race and ethnicity. Although overall Northeast Texas residents are 15% more likely to experience poverty than are all Texans, poverty prevalence within Non-Hispanic White, Black, and Hispanic populations in Northeast Texas is 52%, 48%, and 18% higher, respectively, than within these populations throughout the state (Figure 8). Likewise, geographic disparities in education are more apparant when data are viewed within (dissagregated by) racial or ethnic groups (Figure 9).

Table 3. Socioeconomic Indicators for Northeast Texas, Texas, and the U.S. (2015-2019)

	Northeast Texas	Texas	U.S.
% Population 25 and older with a bachelor's degree or higher	18.4	29.9	32.1
% Civilian labor force ages 16 years and older who are unemployed	5.9	5.1	5.3
% Individuals with a disability	16.4	11.5	12.7
% Households receiving cash public assistance income, past 12 months	1.6	1.4	2.4
% Households receiving food stamps/SNAP, past 12 months	14.0	11.8	11.7
% Individuals with income below poverty level, past 12 months	17.0	14.7	13.4
% Families with children under 18 years below poverty level, past 12 months	20.5	16.6	15.1
% Children under 18 years below poverty level, past 12 months	24.1	20.9	18.5
% Individuals who are food insecure (2018)	17.1	15.0	11.5
% Children (under 18 years old) who are food insecure (2018)	25.8	21.6	15.2

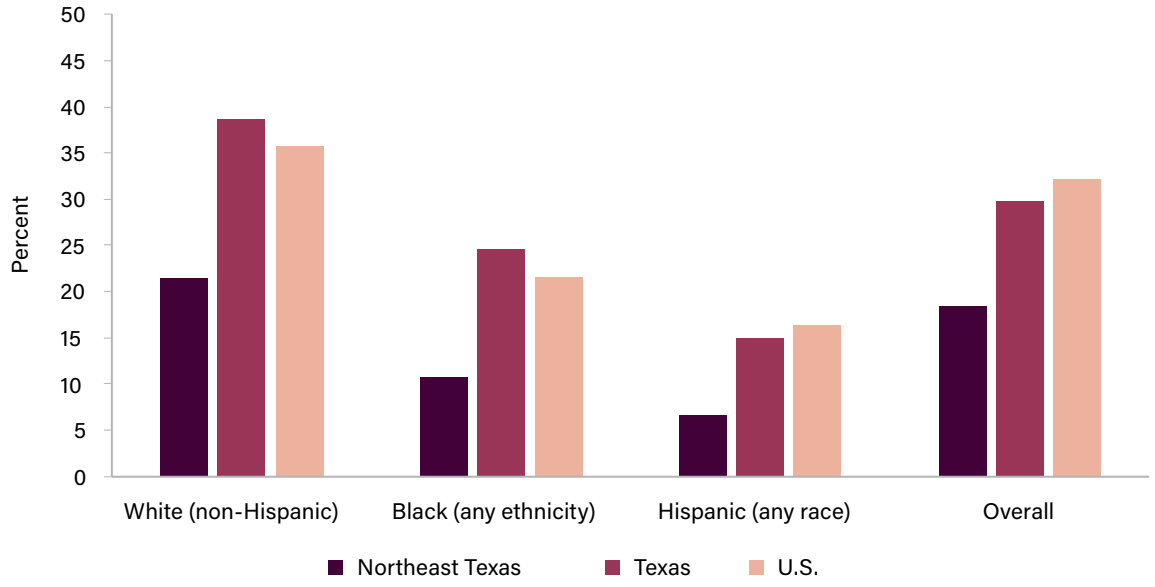
Data sources (except food insecurity): U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates. Educational attainment: Table S1501; Employment, cash assistance, SNAP, health insurance: DP03; Poverty S1701. Data source (food insecurity estimates): Gundersen CA, et al. Map the Meal Gap 2020: A Report on County and Congressional District Food Insecurity and County Food Cost in the United States in 2018. Feeding America, 2020. Note: Data from Map the Meal Gap 2020 are not directly comparable to data from any prior Map the Meal Gap study due to methodological changes made in 2020.

Figure 8. Individuals with Income Below Poverty Level, Past 12 Months, by Race or Hispanic Ethnicity: Northeast Texas, Texas, and U.S. (2015-2019)



Data source: U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates. Table S1701. Note that the racial and ethnic groupings used in this figure reflect the available categories in Table S1701, and differ from standard categories used the report, where the Black population only includes non-Hispanic Blacks.

Figure 9. Individuals Aged 25 Years and Older with a Bachelor's Degree, by Race or Hispanic Ethnicity: Northeast Texas, Texas, and U.S. (2015-2019)



Data source: U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates. Table S1501; note that the racial and ethnic groupings used in this figure reflect the available categories in Table S1501, and differ from standard categories used the report, where the Black population only includes non-Hispanic Blacks.

OCCUPATION

Occupation is one of the most important determinants of a person's health. Some occupations put workers at high risk of injury or illness. The percentage of Northeast Texas employees by industry sector is shown in Table 4.

Compared to Texas overall and the U.S., a greater proportion of Northeast Texas employees work in the agriculture, forestry, fishing, and hunting sector (AgFF). AgFF, which includes crop production, animal production, and aquaculture; logging operations; and commercial fishing operations (7), is one of the most hazardous of the employment sectors. AgFF workers experience the highest fatal occupation injury rate of any sector. In Texas, the fatal workplace injury rate among AgFF workers was 19.8 per 100,000, compared to an all-worker rate of 4.7 (8). AgFF workers are also high risk for nonfatal injury and illness. At the national level in 2019, 5.2 occupational injuries and illnesses requiring workers to miss at least one day of work were documented per 100 AgFF FTEs, compared to an all-worker rate of 3.0 per 100 AgFF FTEs (9).

Because Texas does not require workers' compensation insurance, estimates of Texas non-fatal workplace injuries and illnesses are underestimated (10). In 2019, the fatal occupational injury rate in Texas was higher than that of the U.S. (4.7 vs. 3.5 per 100,000) yet the reported rate of workplace injuries and illnesses was lower in Texas than in the U.S. (2.1 vs 2.8 per 100,000 within the private sector) (11-13).

Table 4. Percent of the Full-Time, Year-Round Civilian Employed Population 16 and Over by Industry Sector (2015-2019)

	Northeast Texas	Texas	U.S.
Agriculture, forestry, fishing and hunting, and mining:	5.9	3.4	1.9
Agriculture, forestry, fishing and hunting	2.0	0.8	1.2
Mining	3.9	2.6	0.6
Construction	9.0	9.3	7.1
Manufacturing	12.4	10.0	12.4
Wholesale trade	2.8	3.3	3.1
Retail trade	11.4	9.8	9.4
Transportation and warehousing, and utilities	5.9	6.4	5.9
Information	1.2	1.8	2.2
Finance and insurance, and real estate and rental and leasing	4.9	7.5	7.6
Professional, scientific, and management, and administrative and waste management services	7.2	11.8	12.1
Educational services, and health care and social assistance:	23.8	20.9	21.8
Educational services	9.3	9.0	8.1
Health care and social assistance	14.5	11.8	13.7
Arts, entertainment, and recreation, and accommodation and food services	5.4	6.4	6.6
Public administration	5.8	4.9	5.8
Other services, except public administration	4.4	4.4	4.2

Data source: U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates. Table S2404.

COMPUTER AND INTERNET ACCESS

Increasingly, broadband Internet access is being recognized as a basic need and a foundational social determinant of health. The Internet is a gateway to many other social determinants, including employment, housing, assistance programs, health care, and education (14). Computer and Internet access is lower in Northeast Texas than in Texas overall. According to the most recent data available, one in four residents of Northeast Texas did not have any type of Internet access, not even cellular data (Table 5).

Table 5. Computer and Internet Use for Northeast Texas, Texas, and the U.S. (2015-2019)

	Northeast Texas	Texas	U.S.
% Households without a computing device	14.2	9.0	9.7
% Households with a smartphone and no other computing device	12.5	9.5	7.0
% Households without an Internet subscription (including cellular data)	25.4	17.9	17.0
% Households with a cellular data plan and no other type of Internet subscription	19.5	12.9	10.0

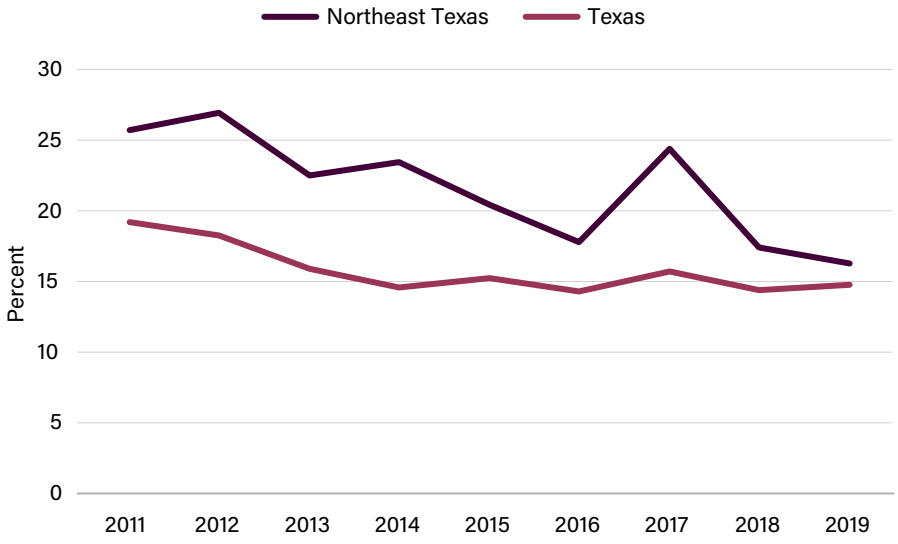
Data source: U.S. Census Bureau, 2015-2019 American Community Survey 5-Year Estimates. Table S2801

Behavioral Risk Factors

CIGARETTE SMOKING

Tobacco smoking is the leading cause of preventable death in the U.S. (15). Smoking is a major contributor to heart disease, stroke, lung cancer, colorectal cancer, and chronic obstructive pulmonary disease (COPD) – diseases for which mortality rates are higher in Northeast Texas than in Texas overall. In 2019, 16.2% of adults in Northeast Texas reported daily cigarette smoking, compared to 14.7% in Texas overall (Figure 10). This gap has declined over time, indicating regional progress in reducing cigarette smoking. However, because the health effects of smoking manifest over time, mortality rates for diseases associated with smoking will take years to decline.

Figure 10. Estimated Prevalence of Current Smoking among Adults (2011-2019)



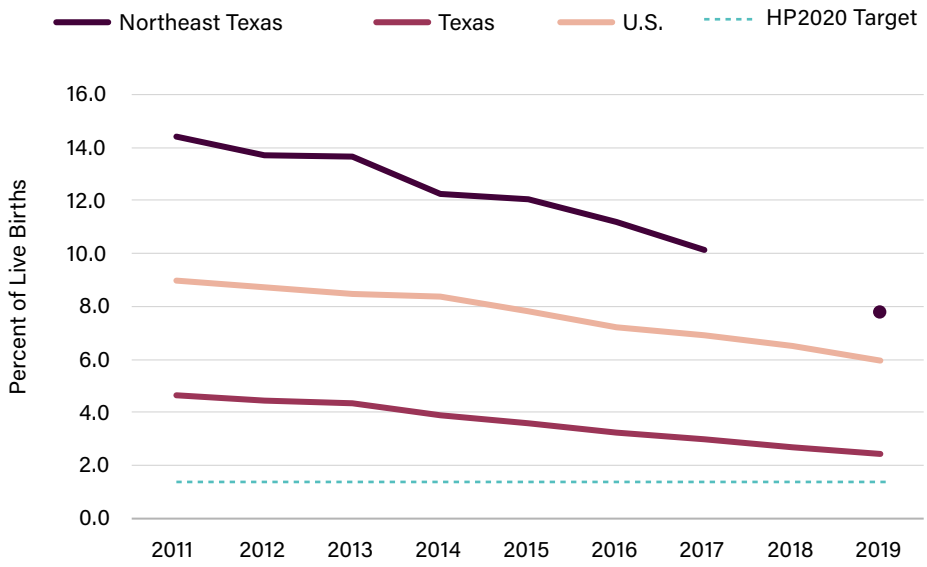
Data source: Behavioral Risk Factor Surveillance System (BRFSS), Center for Health Statistics, Texas Department of State Health Services.

Smoking during Pregnancy

Smoking prevalence in a community is reflected in the smoking prevalence among its pregnant population. Smoking during pregnancy is significantly associated with an increased risk for Sudden Infant Death Syndrome (SIDS) and other sleep related deaths (16). Among births in Texas, infants born to a woman who smoked during pregnancy were found to have more than three times the risk of a SIDS death than infants born to a woman who did not smoke (17). Furthermore, smoking during pregnancy has been shown to have a dose-dependent relationship with birth weight. Every cigarette a women smokes during pregnancy is proportionately related to a decrease in her fetus's birth weight (18, 19).

As in Texas and the U.S., Northeast Texas has seen a steady decline in the percentage of live births to a woman who smoked during pregnancy, from 14.1% in 2011 to 7.8% in 2019, which represents a 46% decrease over nine years (Figure 11). However, the gap between Northeast Texas and Texas overall has persisted. In 2019, compared to all Texas babies, a Northeast Texas baby was still three times more likely to have been born to a woman who smoked during pregnancy.

Figure 11. Percent of Births Where Mother Smoked During Pregnancy: Texas, Northeast Texas, and U.S. (2011-2019)



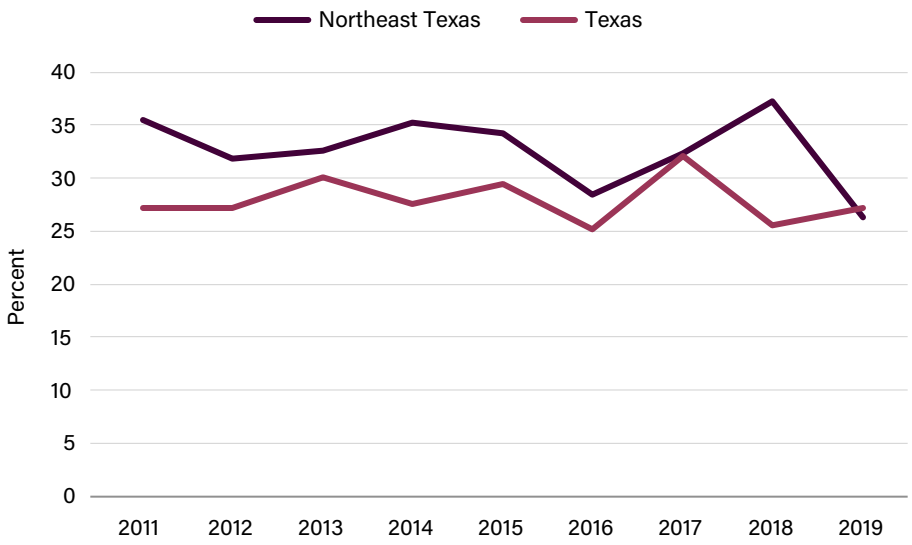
Data sources: Northeast Texas - 2011-2017 Birth File, analysis by authors; Texas – Texas Department of State Health Services 2020 Healthy Texas Mothers and Babies Data Book; U.S. - United States Department of Health and Human Services (US DHHS), Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Division of Vital Statistics.
Note: data not available for Northeast Texas in 2018.

PHYSICAL INACTIVITY

Regular physical activity decreases the risk of all-cause mortality as well as several chronic diseases for which mortality rates are higher in Northeast Texas than Texas overall, including coronary heart disease, stroke, and colorectal cancer (20). Physical activity also plays an important role in maintaining a healthy weight. In 2019, an estimated one in four adults in Northeast Texas did not engage in any physical activity for exercise or recreation in the month prior to the survey, a proportion similar to that in Texas overall and better than the HP2020 target (32.6%) (Figure 12). During the 2015-2016 school year in Northeast Texas, 28% of both 8th and 11th grade students

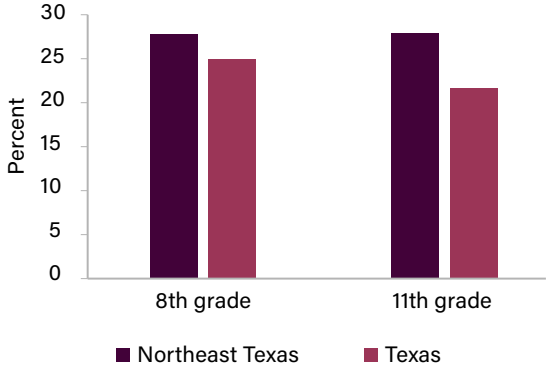
met the U.S. physical activity guidelines for aerobic physical activity (being physically active for a total of at least 60 minutes per day, every day). These percentages are as high or higher than the prevalence in Texas overall (Figure 13). Taken together, these data suggest that Northeast Texas residents are about as physically active as other Texas residents.

Figure 12. Percent of Adults Reporting no Physical Activity for Exercise or Recreation during the Prior Month: Northeast Texas and Texas (2011-2019)



Data source: Behavioral Risk Factor Surveillance System (BRFSS), Center for Health Statistics, Texas Department of State Health Services. Error bars represent 95% confidence intervals.

Figure 13. Percent of 8th and 11 Grade Students Meeting Physical Activity Guidelines: Northeast Texas and Texas (2015-2016)



Data source: School Physical Activity and Nutrition (SPAN) 2015-2016 survey, Michael & Susan Dell Center for Healthy Living with funding from the Texas Department of State Health Services.

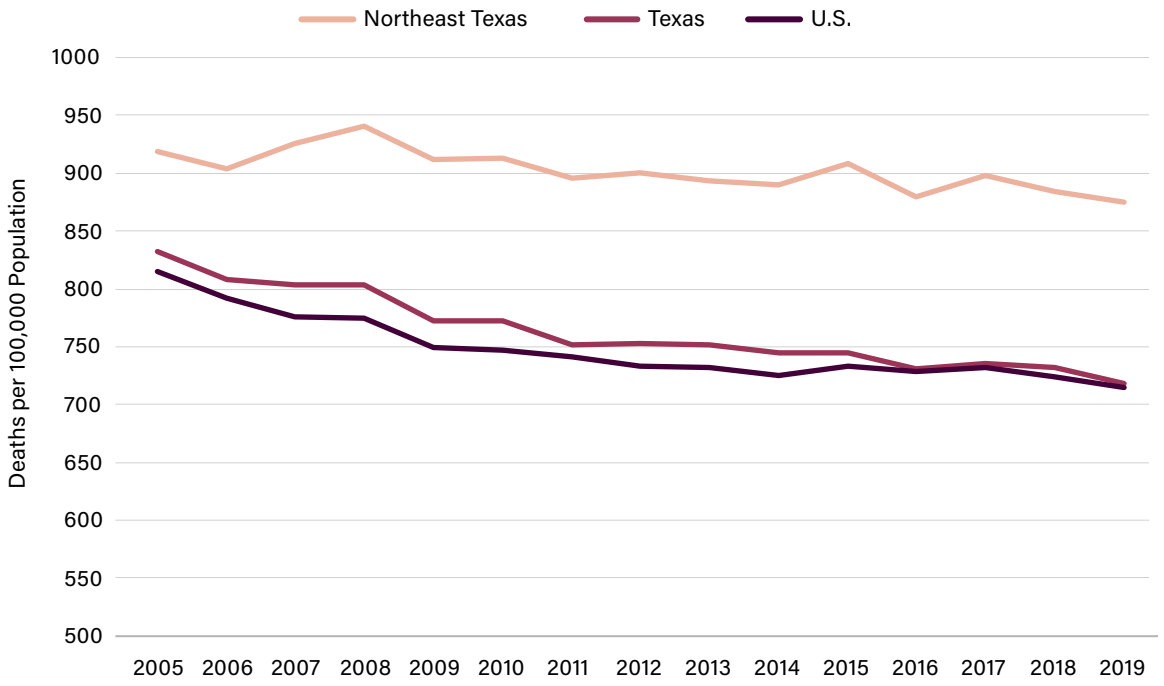
MORTALITY RATES AND LEADING CAUSES OF DEATH

All-Cause Mortality

Mortality rates[1] have been consistently higher in Northeast Texas when compared to Texas overall or the U.S., and this disparity appears to be growing. While mortality rates in Northeast Texas declined by 5% from 2005-2019, rates in Texas declined by 14% during the same time period (Figure 14). If in 2019 the Northeast Texas mortality rates had been the same as those in Texas overall by age group, 17.1% fewer deaths would have occurred, representing 3022 preventable deaths.

In 2019, within almost every subgroup, mortality rates were higher in Northeast Texas than Texas overall: 20% higher for males and 22% higher for females (Figure 15); 17% higher for Non-Hispanic Whites and 14% higher for Non-Hispanic Blacks (Figure 16). Notably, among Hispanics, the mortality rate was 33% lower in Northeast Texas than in Texas overall (Figure 16).

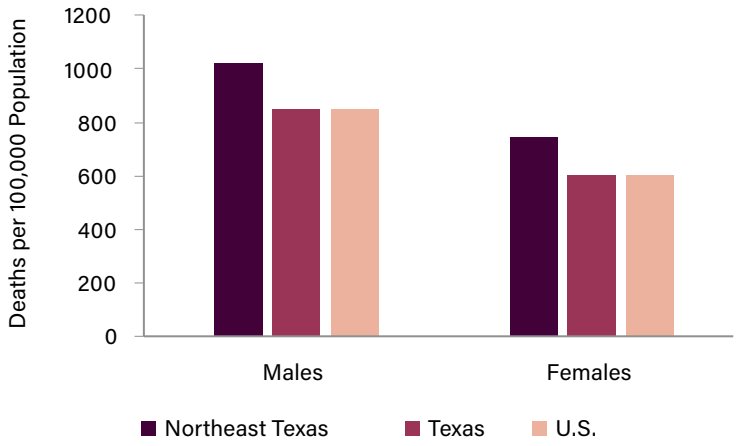
Figure 14. Age-Adjusted All-Cause Mortality Rates: Northeast Texas, Texas, and U.S. (2005-2019)



Data source: National Center for Health Statistics on CDC WONDER database.

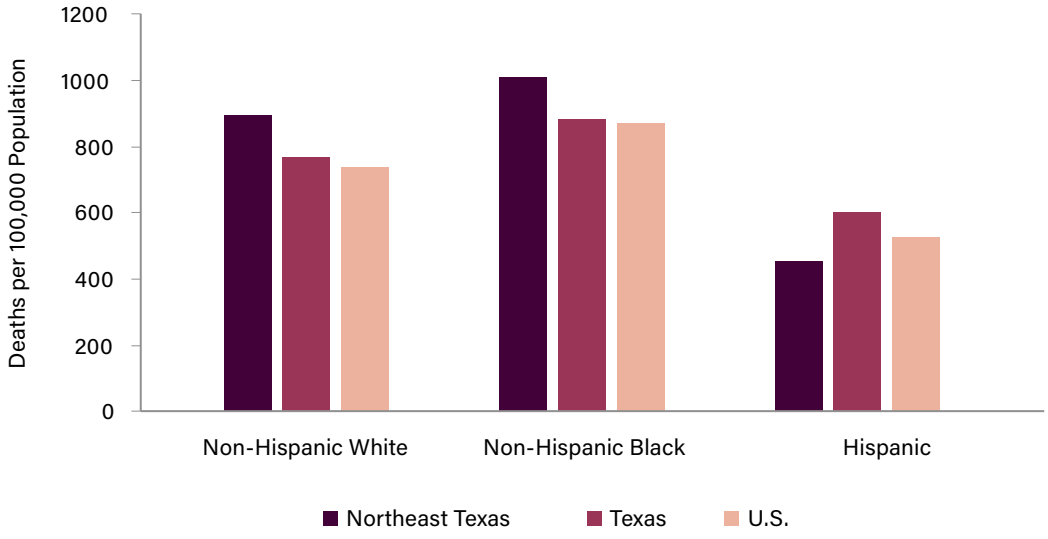
1. Unless otherwise noted, mortality rates are age-adjusted, using the 2000 U.S. Standard Population.

Figure 15. Age-Adjusted All-Cause Mortality Rates by Sex: Northeast Texas, Texas, and U.S. (2019)



Data source: National Center for Health Statistics on CDC WONDER database.

Figure 16. Age-Adjusted All-Cause Mortality Rates by Race or Hispanic Ethnicity: Northeast Texas, Texas, and U.S. (2019)

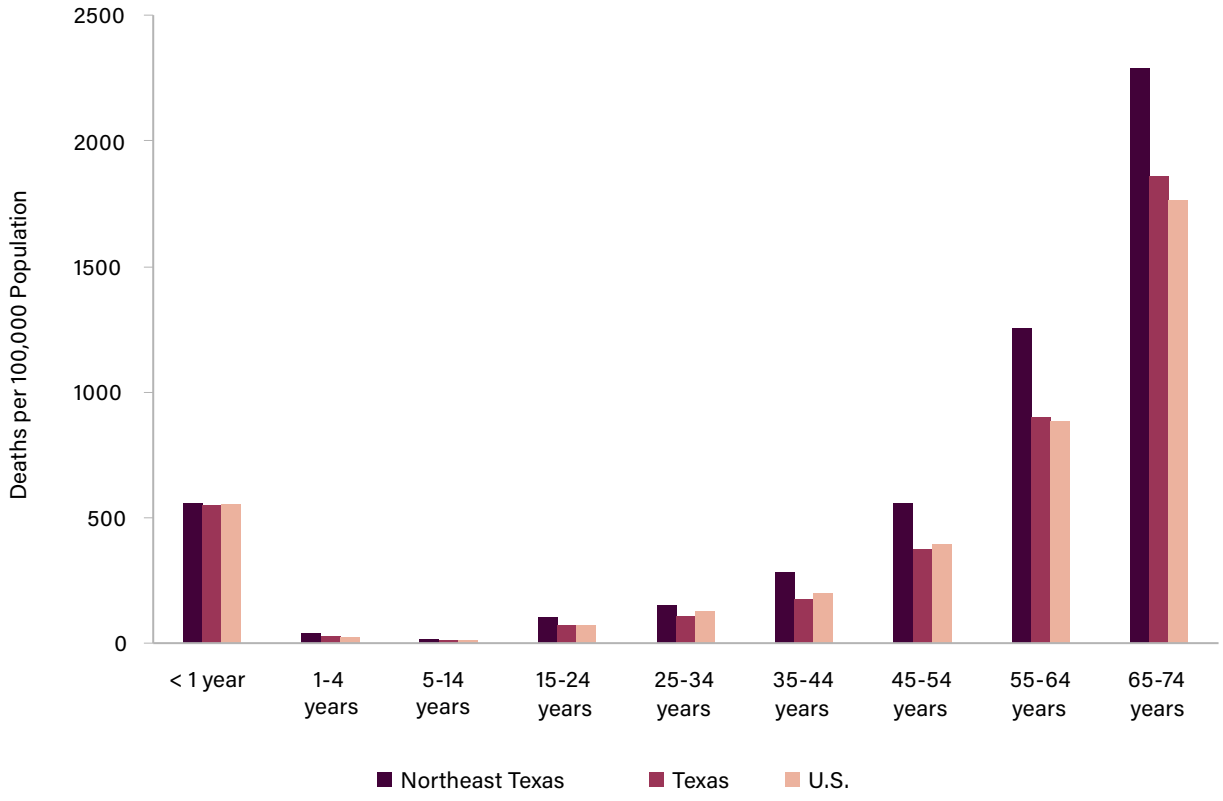


Data source: National Center for Health Statistics on CDC WONDER database.

The geographic disparity in mortality is also seen across age groups (Figure 17). Those with the largest elevated relative mortality risk in comparison to Texas overall were aged 35-44 years. In 2019, the mortality rate was 62% higher for 35-44-year-olds in Northeast Texas compared to Texas overall.

Geographic disparities were also evident in cause-specific mortality rates. Mortality rates for each of the top five leading causes of death were higher in Northeast Texas than in both Texas and U.S. (Figure 18). If Northeast Texas were a state, among states it would have ranked 47th in heart disease mortality, 48th in cancer mortality, 50th in stroke mortality, and 51st in chronic lower respiratory disease mortality, and 44th in deaths from all causes (Table 6).

Figure 17. All-Cause Mortality Rates by Age Group: Northeast Texas, Texas, and U.S. (2019)



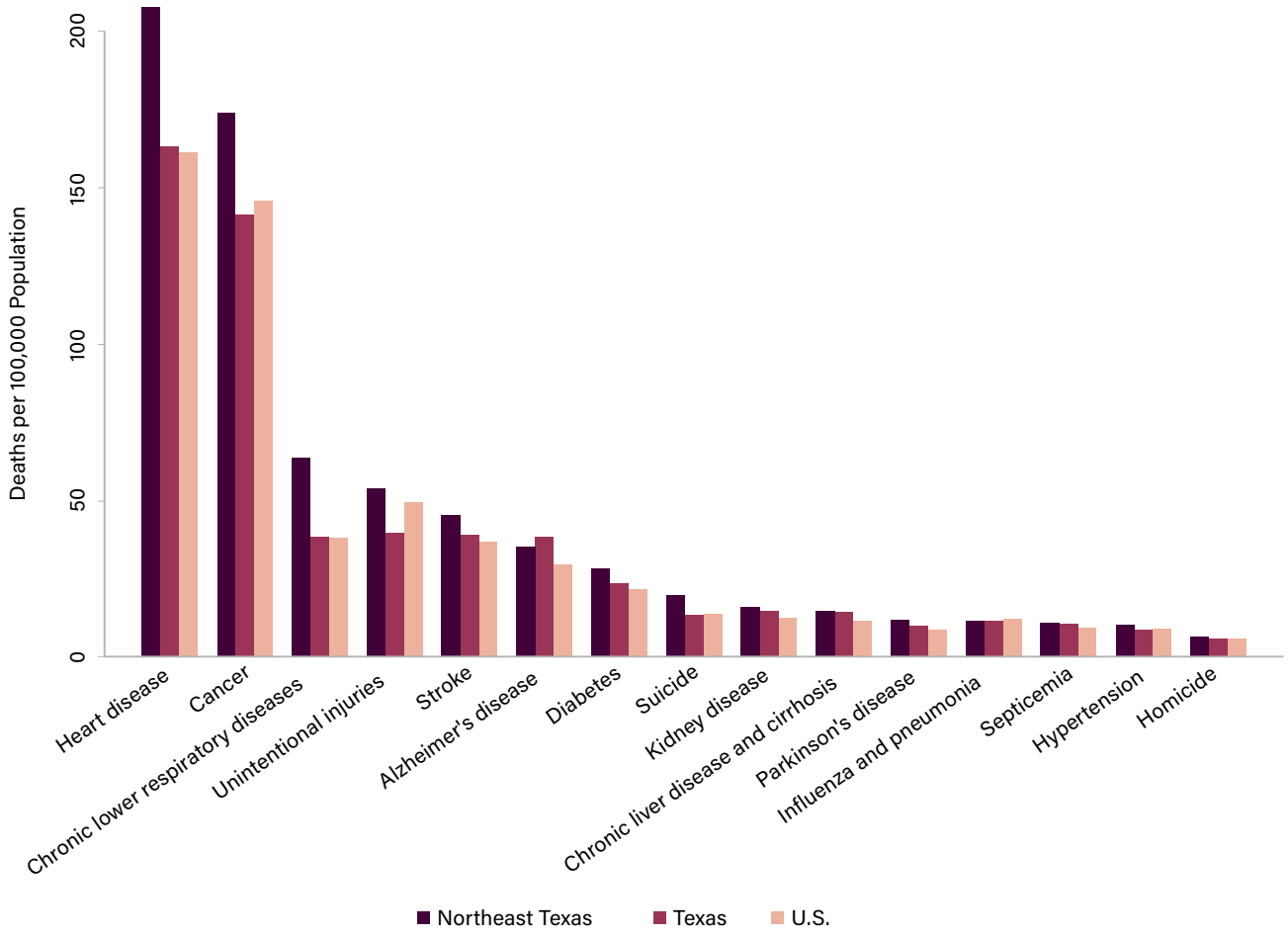
Data source: National Center for Health Statistics on CDC WONDER database.

Table 6. Age-Adjusted Mortality Rates for Top 5 Causes of Death: Northeast Texas Compared to Texas (2019)

	Texas Rate	Northeast Texas Rate	Rate Difference	% Higher Rate in Northeast TX	TX State Rank*	Northeast TX "State" Rank*
Heart disease	163.4	207.9	44.5	27%	31st	47th
Cancer	141.4	173.9	32.5	23%	16th	48th
Chronic Lower Respiratory Diseases	38.6	63.5	24.9	65%	24th	51st
Unintentional Injuries	39.7	53.7	14.0	35%	5th	25th
Stroke	39.0	45.5	6.5	17%	34th	50th
All causes	717.8	874.6	156.8	22%	24th	44th

*A rank of 1=best (lowest) rate, 51=worst (highest) rate, with Northeast Texas included as a U.S. "state."Data source: National Center for Health Statistics on CDC WONDER database. Rates are per 100,000 population.

Figure 18. Age-Adjusted Mortality Rates for Top 15 Causes of Death: Northeast Texas, Texas, and U.S. (2019)



Data source: National Center for Health Statistics on CDC WONDER database. Rates are per 100,000 population.

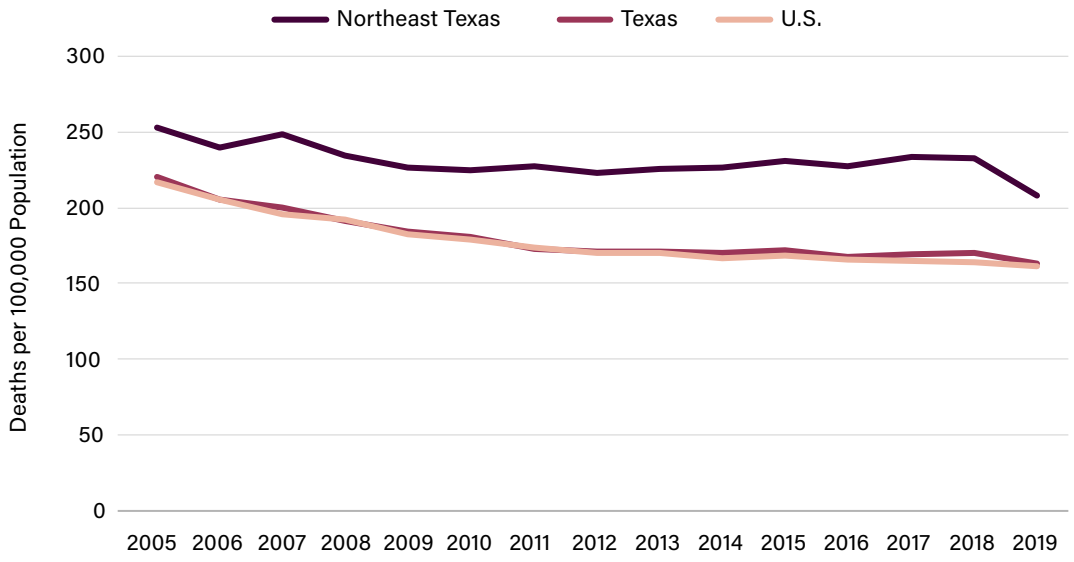
LEADING CAUSES OF DEATH IN NORTHEAST TEXAS

The following section describes the top five causes of death in Northeast Texas over time, by sex, by race and ethnicity, and in comparison to Texas and the U.S..

1. Heart Disease

As in 2014, in 2019 the leading cause of death in Northeast Texas, Texas and the U.S. was heart disease, which includes a variety of diseases that affect the heart. The rate of heart disease in Northeast Texas has been consistently higher than the rates in Texas and the U.S. (Figure 19). In 2019, the age-adjusted heart disease mortality rate was 27% higher in Northeast Texas than in Texas overall (Table 6). If Northeast Texas were a state, it would rank 47th in heart disease mortality.

Figure 19. Age-Adjusted Heart Disease Mortality Rates: Northeast Texas, Texas, and U.S. (2005-2019)

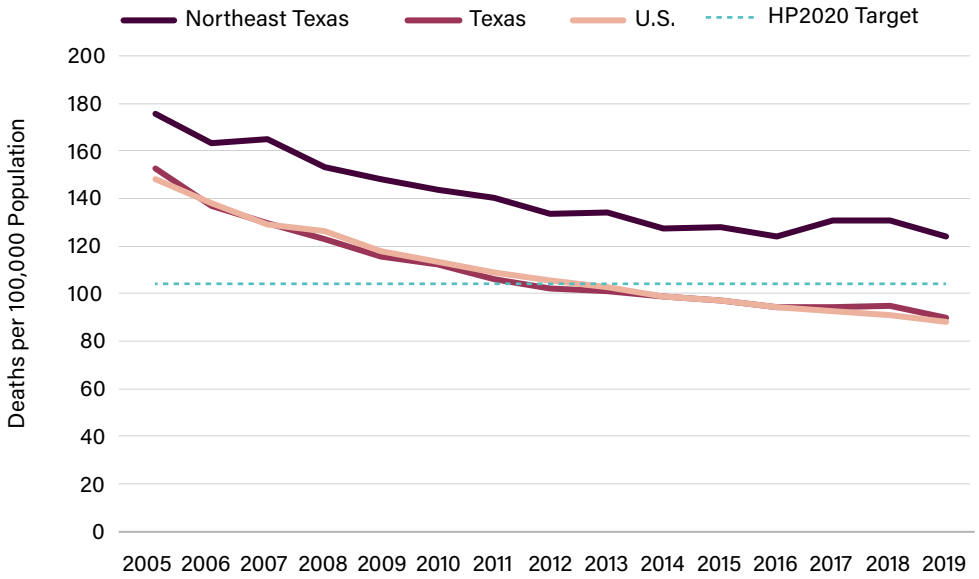


Data source: National Center for Health Statistics on CDC WONDER database. ICD10 codes I00-I09,I11,I13,I20-I51.

CORONARY HEART DISEASE

The most common type of heart disease in the U.S. is coronary heart disease (CHD), caused by plaque build-up in the walls of the arteries, restricting blood flow (21). When part of the heart muscle does not receive enough blood flow, a heart attack (myocardial infarction) can occur. Modifiable risk factors for coronary heart disease include high blood pressure, high blood cholesterol, cigarette smoking, physical inactivity and obesity (21).

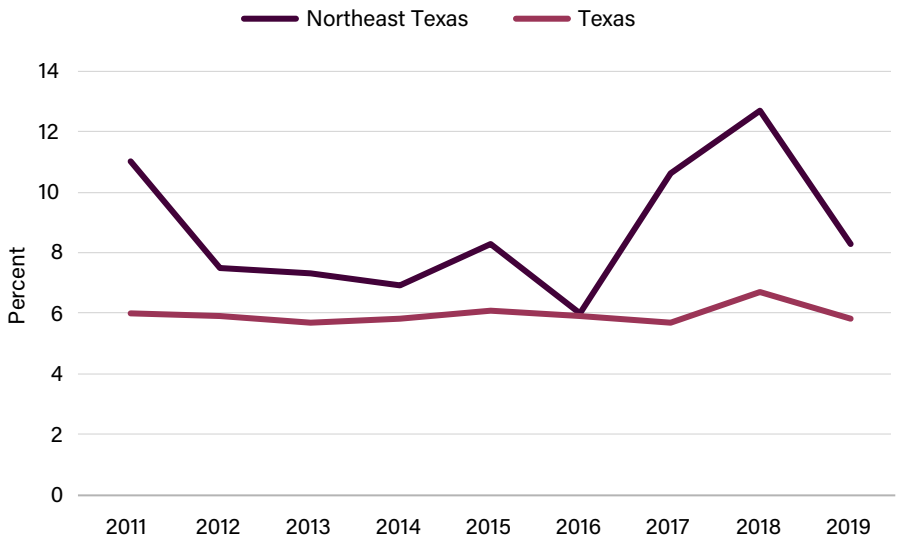
Figure 20. Age-Adjusted Coronary Heart Disease Mortality Rates: Northeast Texas, Texas, and U.S. (2005-2019)



Data source: National Center for Health Statistics on CDC WONDER database. ICD10 codes: I20-I25

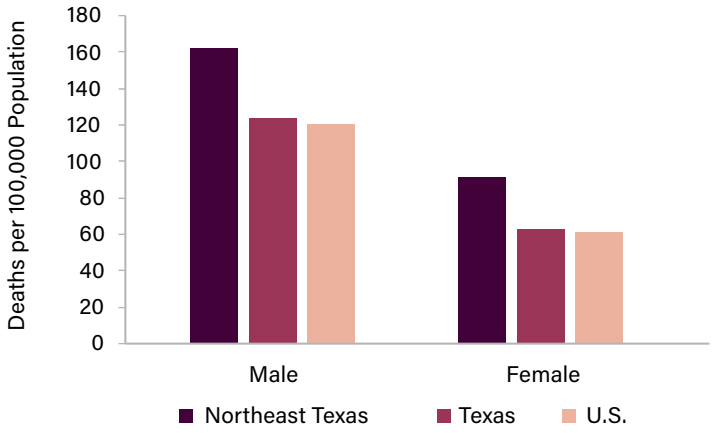
As with heart disease overall, CHD mortality rates have been declining, yet the rate in Northeast Texas has remained above that of Texas and the U.S. (Figure 20). The estimated prevalence of Northeast Texas adults who had coronary heart disease, angina, or had ever had a heart attack – 8.3% in 2019 – was higher than for Texas overall almost every year since 2011 (Figure 21). Compared to Texas overall and the U.S., CHD mortality rates were higher in Northeast Texas for males and females (Figure 22), and for Non-Hispanic Whites and Non-Hispanic Blacks, while rates for Hispanics were lower (Figure 23). At all geographic levels, males are at a greater risk for CHD mortality than females (Figure 22), and Non-Hispanic Blacks are at higher CHD mortality risk than Non-Hispanic Whites and Hispanics (Figure 23).

Figure 21. Estimated Prevalence of Heart Disease among Adults: Northeast Texas and Texas (2011-2019)



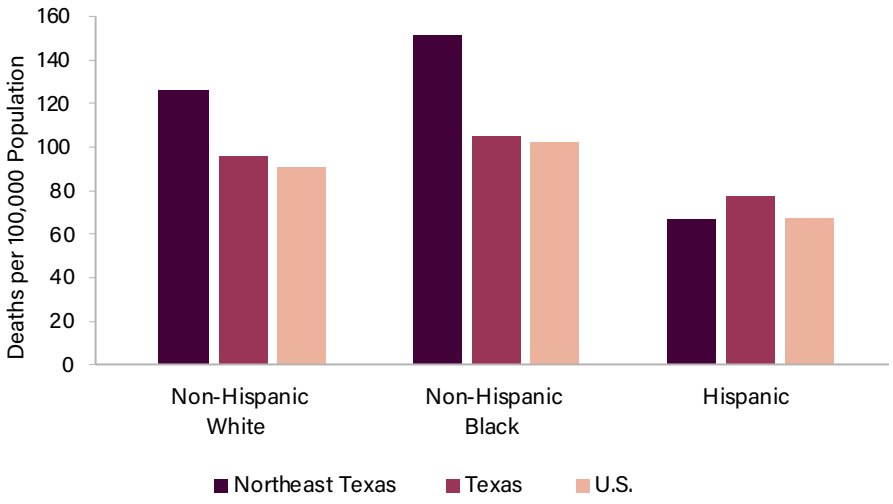
Data source: Behavioral Risk Factor Surveillance System (BRFSS), Center for Health Statistics, Texas Department of State Health Services.

Figure 22. Age-Adjusted Coronary Heart Disease Mortality Rates by Sex: Northeast Texas, Texas, and U.S. (2019)



Data source: National Center for Health Statistics on CDC WONDER database. ICD10 codes: I20-I25

Figure 23. Age-Adjusted Coronary Heart Disease Mortality Rates by Race or Hispanic Ethnicity: Northeast Texas, Texas, and U.S. (2019)

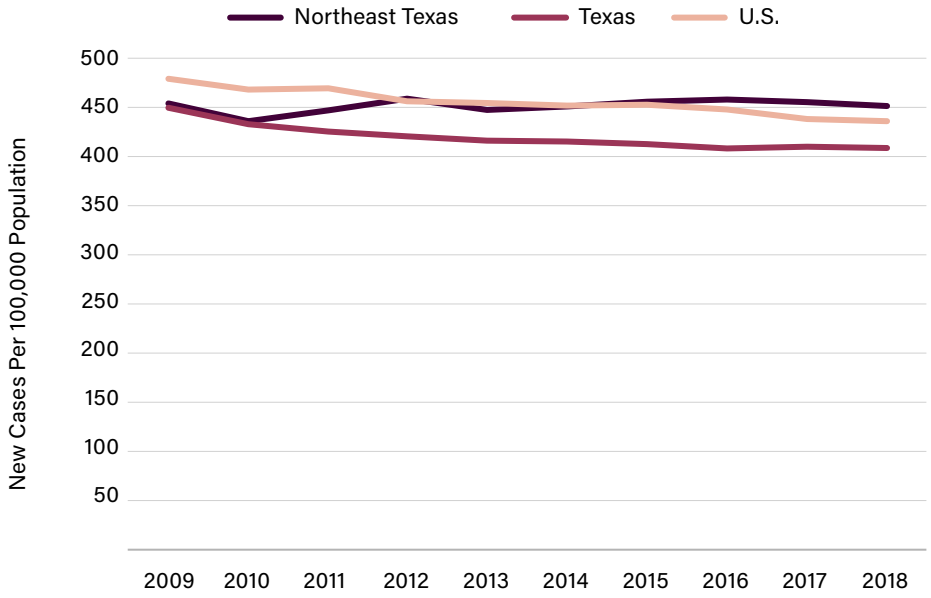


Data source: National Center for Health Statistics on CDC WONDER database. ICD10 codes: I20-I25

2. Cancer

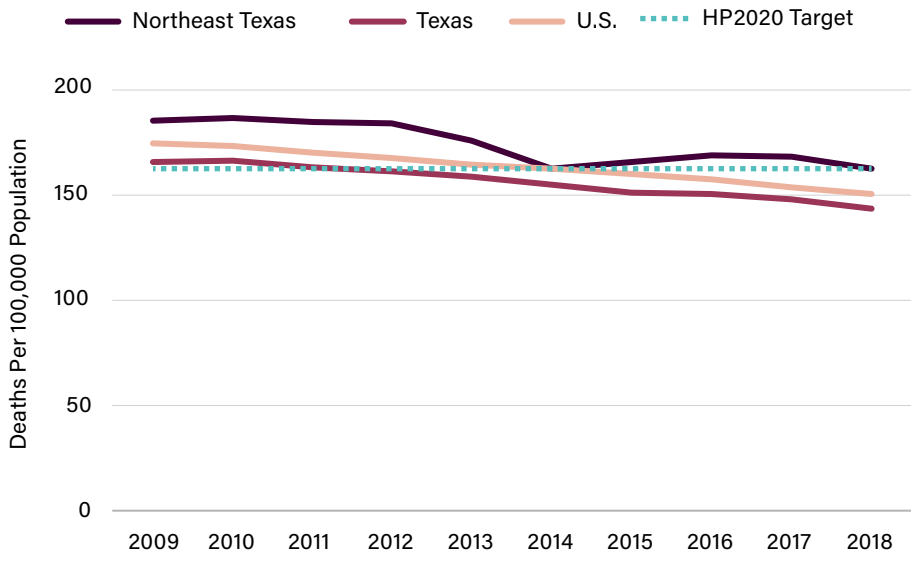
The second leading cause of death in Northeast Texas, Texas, and the U.S. was cancer, a collection of diseases characterized by uncontrolled growth of abnormal cells. In recent years, while both cancer incidence and mortality rates have been slowly declining in Texas and the U.S., rates in Northeast Texas have leveled off or risen slightly (Figure 24 & Figure 25). In 2018, cancer incidence rates were 10% higher in Northeast Texas than in Texas overall, while mortality rates were 13% higher.

Figure 24. Age-Adjusted Cancer Incidence Rates: Northeast Texas, Texas, and U.S. (2009-2018)



Data source: Northeast Texas - Texas Cancer Registry, Department of State Health Services. Texas and National - U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database.

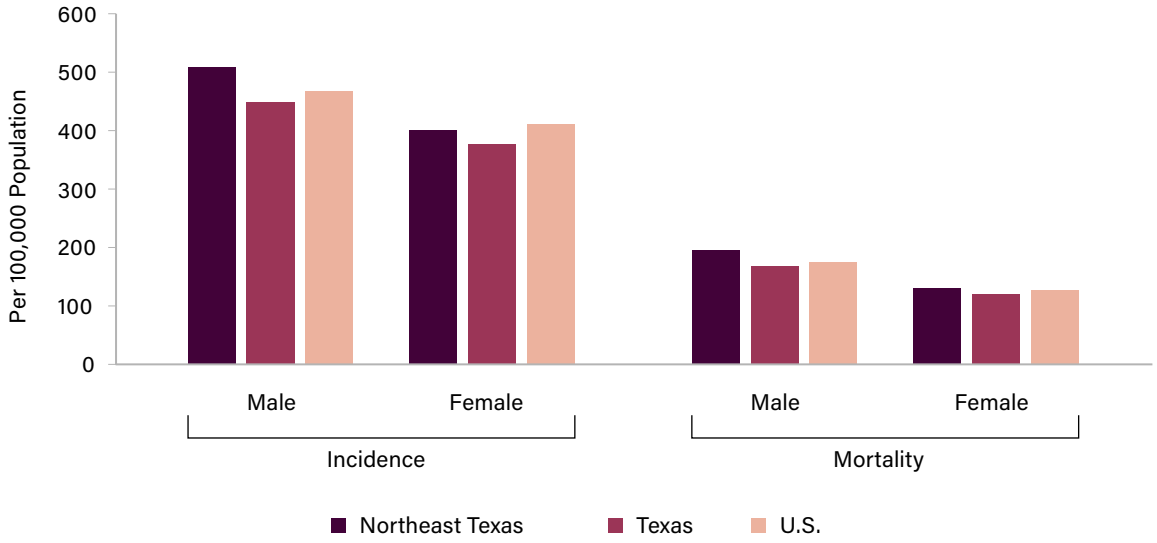
Figure 25. Age-Adjusted Cancer Mortality Rates: Northeast Texas, Texas, and U.S. (2009-2018)



Data source: Northeast Texas - Texas Cancer Registry, Department of State Health Services. Texas and National - U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database.

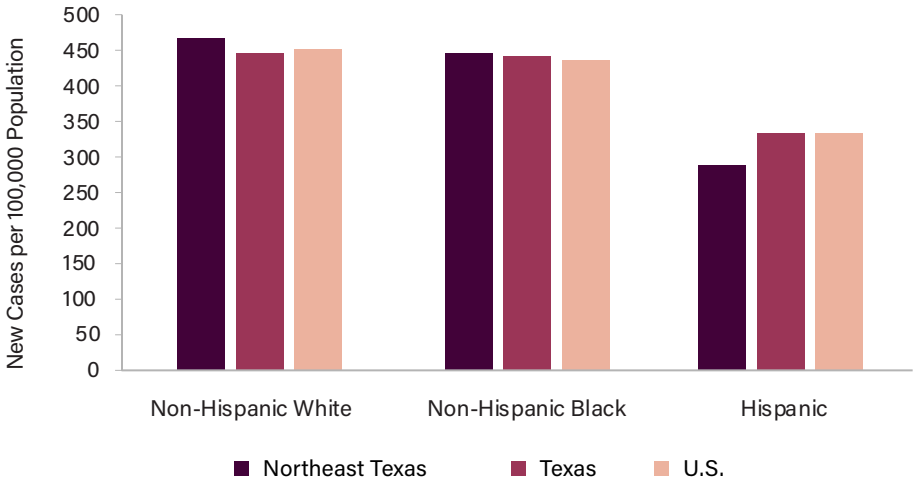
Compared to Texas overall, both males and females in Northeast Texas experienced higher rates of cancer incidence and mortality in 2018 (Figure 26). Hispanics in Northeast Texas had slightly lower cancer incidence and mortality rates than Hispanics in Texas overall, while the rates for Non-Hispanic Blacks and Non-Hispanic Whites were slightly higher in Northeast Texas than in Texas overall (Figure 27 & Figure 28).

Figure 26. Age-Adjusted Cancer Incidence and Mortality Rates by Sex: Northeast Texas, Texas, and U.S. (2018)



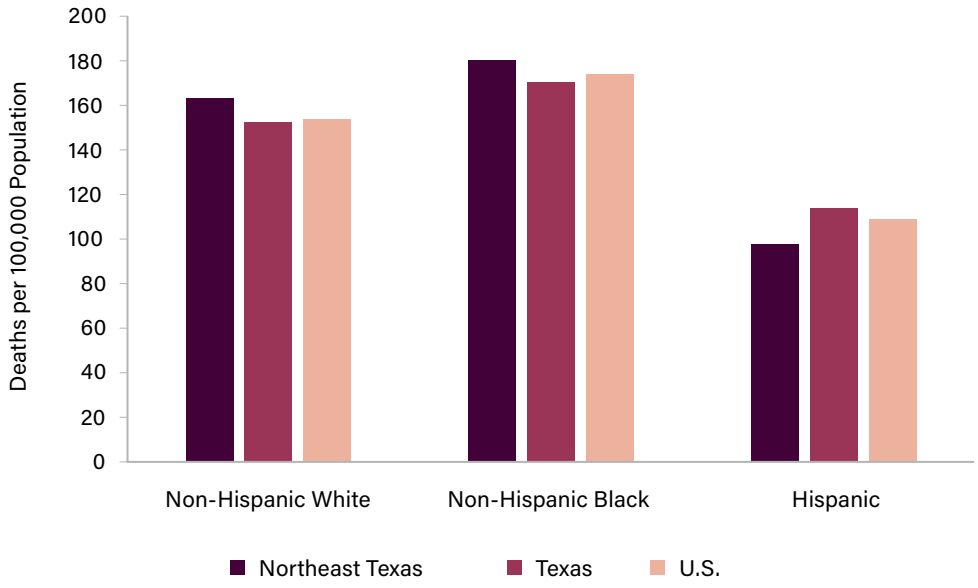
Data source: Northeast Texas - Texas Cancer Registry, Department of State Health Services. Texas and National - U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database.

Figure 27. Age-Adjusted Cancer Incidence by Race or Hispanic Ethnicity: Northeast Texas, Texas and U.S. (2018)



Data source: Northeast Texas - Texas Cancer Registry, Department of State Health Services. Texas and National - U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database.

Figure 28. Age-Adjusted Cancer Mortality Rates by Race or Hispanic Ethnicity: Northeast Texas, Texas, and U.S. (2018)

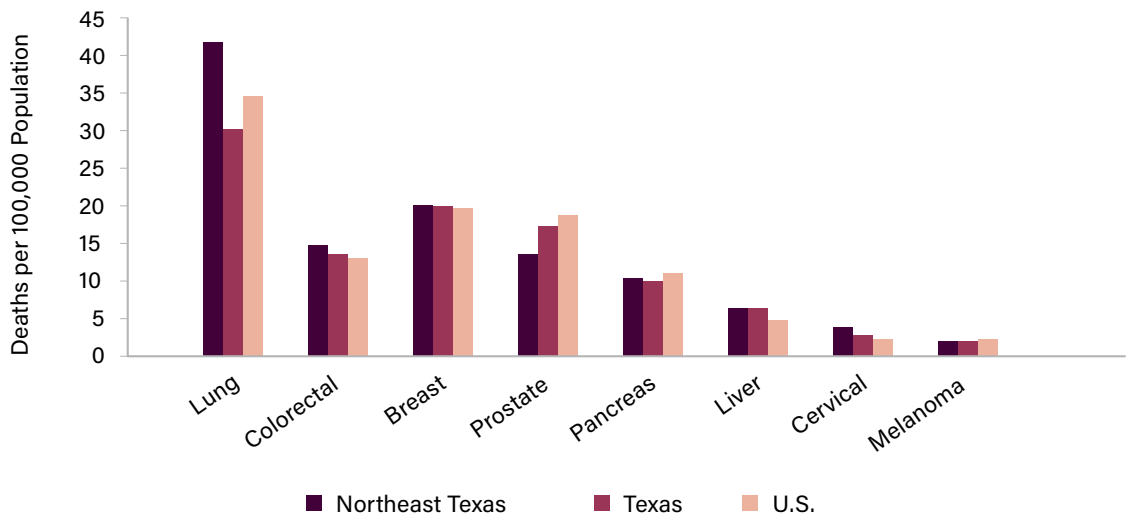


Data source: Northeast Texas - Texas Cancer Registry, Department of State Health Services. Texas and National - U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database.

SITE-SPECIFIC CANCERS

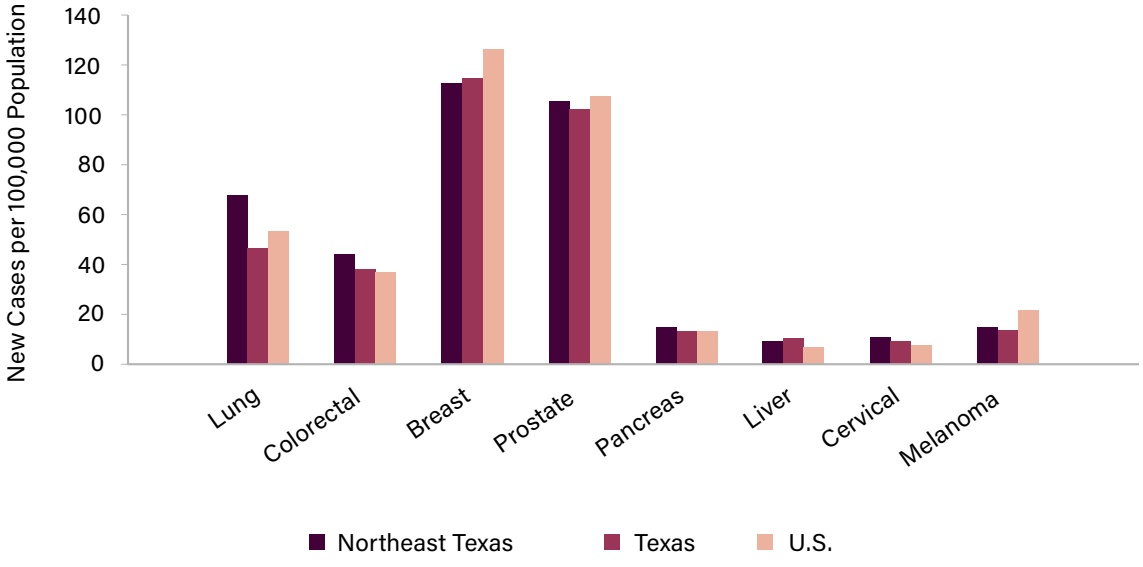
Cancer is not just one disease; there are more than one hundred kinds of cancer (22). The 2018 mortality and incidence rates for the most common cancers are shown in Figure 29 and Figure 30. Note that incidence and mortality rates for sex-specific cancers (i.e., female breast cancer, prostate cancer, and cervical cancer) are typically calculated using either the number of males or the number of females in the population as the denominator, rather than the population as a whole. As a result, although breast cancer and prostate cancer have higher incidence rates than lung cancer (Figure 30), the largest percentage of new cancer cases in Northeast Texas are lung cancers (Figure 31). Among males and females, the most common cancers are prostate and breast cancers, respectively, yet the most common cause of cancer deaths in both males and females is lung cancer (Figure 32 & Figure 33).

Figure 29. Age-Adjusted Cancer Mortality Rates by Type of Cancer: Northeast Texas, Texas, and U.S. (2018)



Data source: Northeast Texas - Texas Cancer Registry, Texas Department of State Health Services. Texas and National – U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database.

Figure 30. Age-Adjusted Cancer Incidence Rates by Type of Cancer: Northeast Texas, Texas, and U.S. (2018)



Data source: Northeast Texas - Texas Cancer Registry, Texas Department of State Health Services. Texas and National – U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database.

Figure 31. Cancer Incidence and Mortality by Cancer Site: Northeast Texas (2018)

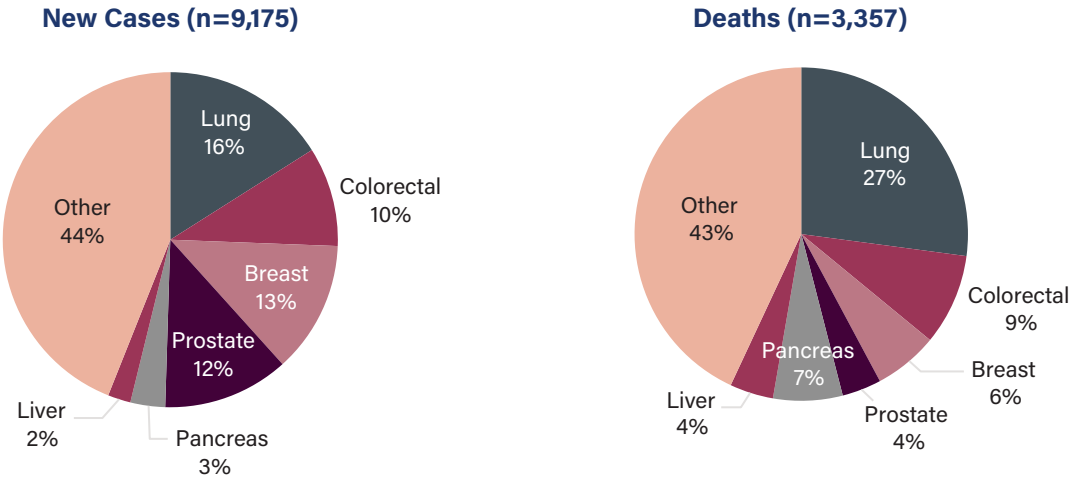


Figure 32. Male Cancer Incidence and Mortality by Cancer Site: Northeast Texas (2018)

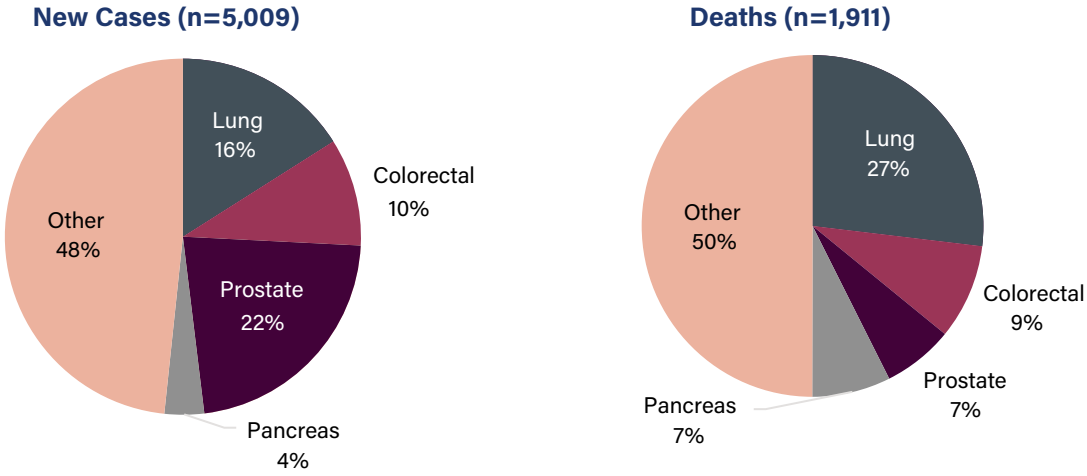
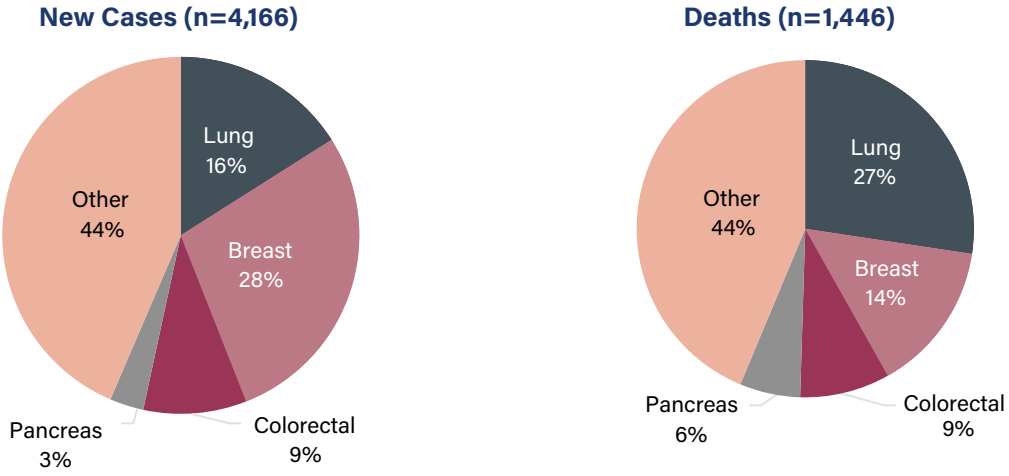


Figure 33. Female Cancer Incidence and Mortality by Cancer Site: Northeast Texas (2018)



Data source (all figures): Northeast Texas - Texas Cancer Registry, Department of State Health Services.

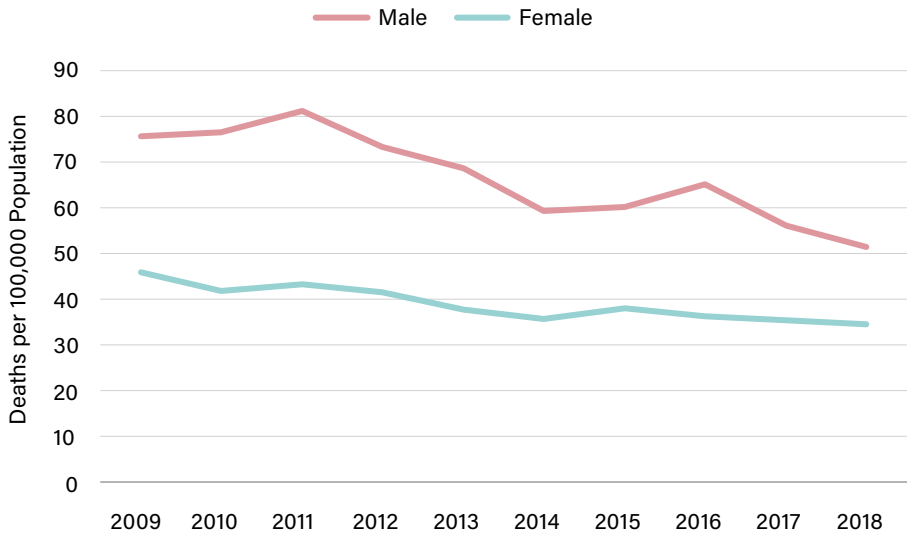
Lung Cancer

The biggest killer among cancers is lung cancer. In Northeast Texas in 2018, lung cancer accounted for 16% of new cancer cases and 27% of deaths from cancer (Figure 31). In 2018, the mortality rate for lung cancer was 38% higher and the lung cancer incidence rate was 46% higher in Northeast Texas compared to Texas overall (Figure 29 & Figure 30).

Lung cancer mortality rates have been declining among both men and women and among Non-Hispanic Blacks and Non-Hispanic Whites, although the rates have plateaued among women and non-Hispanic Blacks in recent years (Figure 34 & Figure 35). Counties in Northeast Texas experiencing the greatest burden of lung cancer mortality include Lamar, Polk, and Shelby (Figure 36).

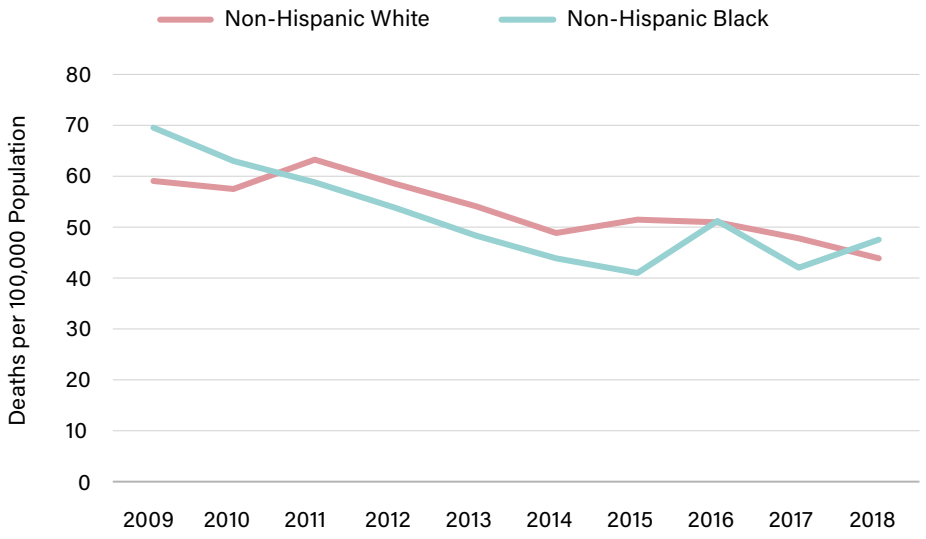
Given the relatively low five-year survival rate (21.7%) for lung cancer (five-year survival rates for colon and breast cancers are 64.7% and 90.2%, respectively) (23), prevention is paramount. In high-income countries such as the U.S., researchers have estimated that lung cancer deaths would drop by 86% if tobacco smoking ceased (24). The U.S. Preventive Services Task Force recommends yearly lung cancer screening with low-dose computed tomography (LDCT) in adults aged 50-80 years who have a 20 pack-year or more smoking history and smoke now or have quit within the past 15 years.

Figure 34. Age-Adjusted Lung Cancer Mortality Rates by Sex: Northeast Texas (2009-2018)



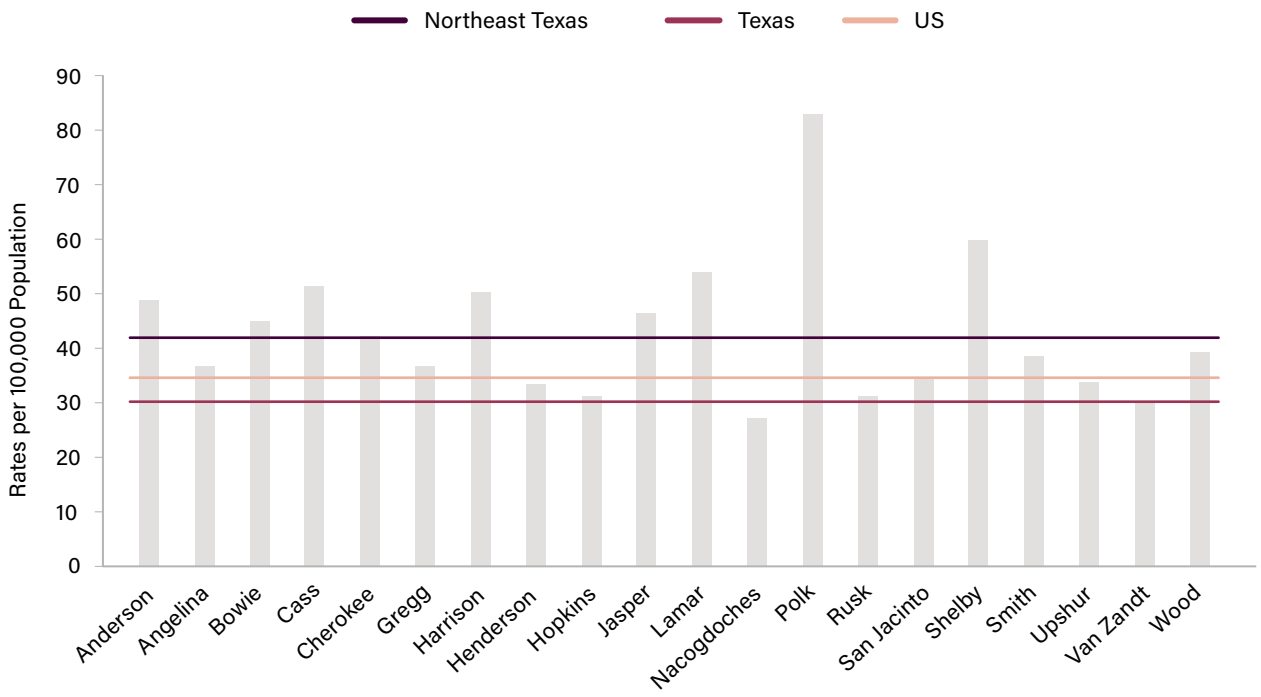
Data source: Texas Cancer Registry, Department of State Health Services

Figure 35. Age-Adjusted Lung Cancer Mortality Rates by Race: Northeast Texas (2009-2018)



Data source: Texas Cancer Registry, Department of State Health Services

Figure 36. Age-Adjusted Lung Cancer Mortality Rates for Northeast Texas Counties (2018)



Data source: Texas - Texas Cancer Registry, Department of State Health Services. Texas and National – U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database.

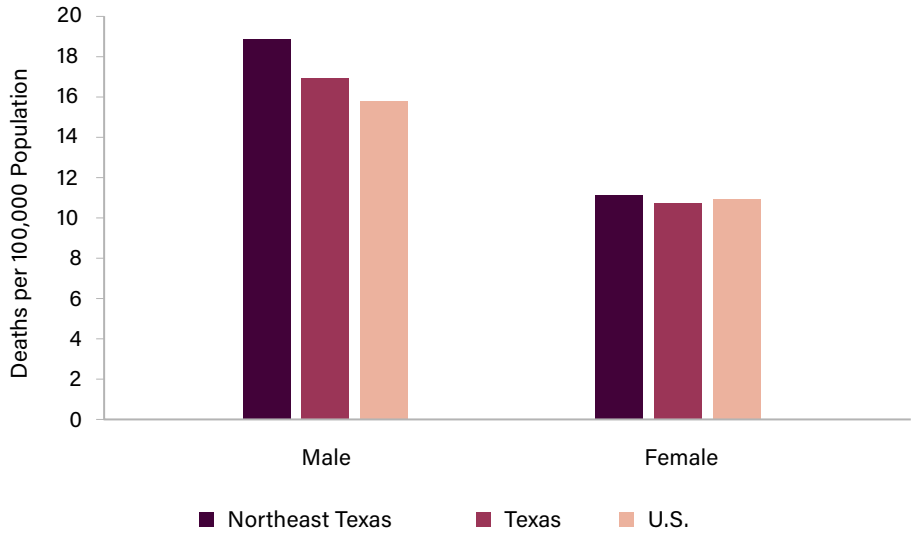
Colorectal Cancer

Colorectal cancer starts in either the colon or rectum. Risk factors include diets high in red meat and processed meats, physical inactivity, smoking, and obesity (25). Colorectal cancer accounts for a smaller proportion of cancer cases than either breast or prostate cancer, but a greater proportion of cancer deaths (Figure 31).

Colorectal cancer mortality rates were higher in Northeast Texas than in Texas and the U.S. (Figure 29). In 2018, the colorectal cancer incidence rate was 16% higher and the mortality rate was 8% higher in Northeast Texas than in Texas overall. Colorectal cancer rates were higher in Northeast Texas than in the U.S. for males (Figure 37), and Non-Hispanic Whites and Non-Hispanic Blacks (Figure 38). In Northeast Texas, rates were 74% higher among males compared to females (Figure 37), and 34% higher among Non-Hispanic Blacks compared to Non-Hispanic Whites (Figure 38).

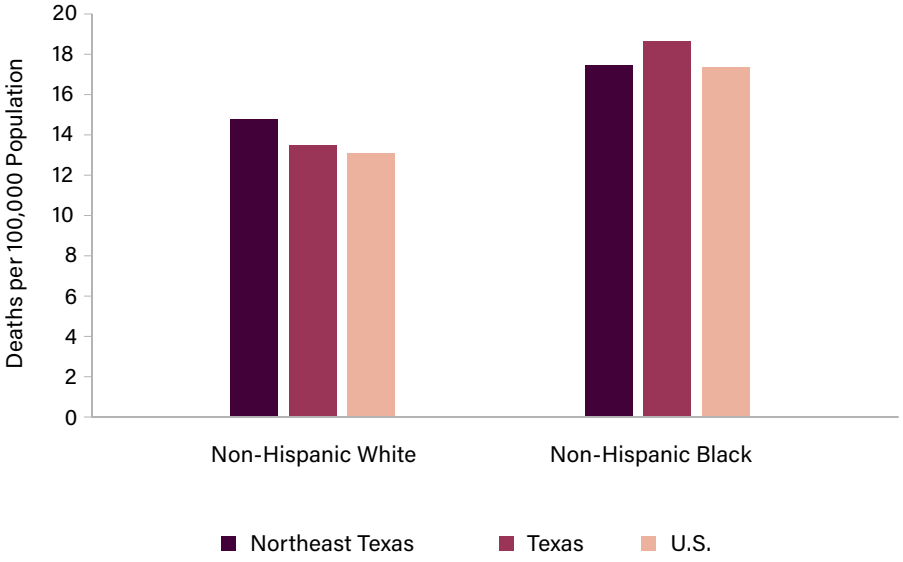
Early detection through screening is effective at preventing colorectal cancer deaths (26). National data indicate that Non-Hispanic Blacks are less likely than Non-Hispanic Whites to undergo colorectal cancer screening (27), and this is likely the case in Northeast Texas. Nationally, 19% of the racial disparity in colorectal cancer mortality has been attributed to lower screening rates among Non-Hispanic Blacks (28).

Figure 37. Age-Adjusted Colorectal Cancer Mortality Rates by Sex: Northeast Texas, Texas, and U.S. (2018)



Data source: Northeast Texas - Texas Cancer Registry, Texas Department of State Health Services. Texas and National – U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database.

Figure 38. Age-Adjusted Colorectal Cancer Mortality Rates by Race: Northeast Texas, Texas, and U.S. (2018)



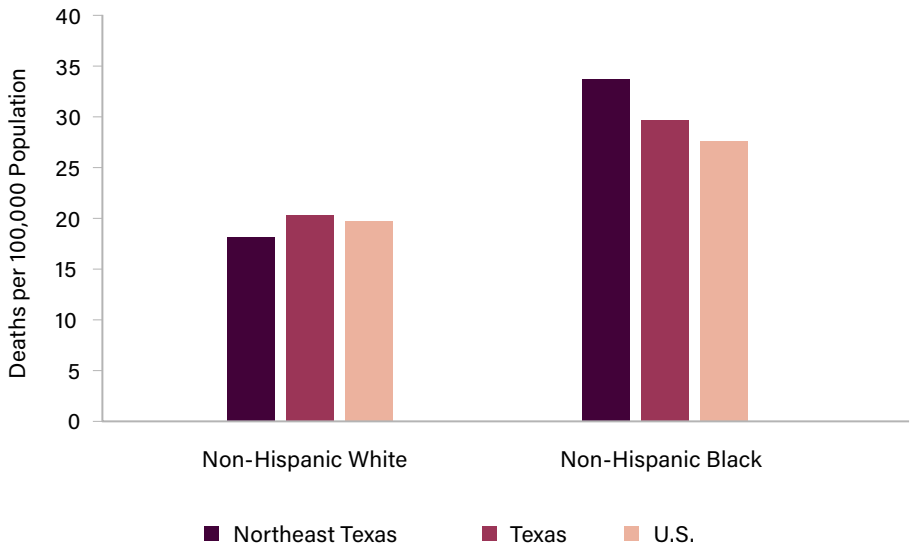
Data source: Northeast Texas - Texas Cancer Registry, Texas Department of State Health Services. Texas and National – U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database.

Female Breast Cancer

Breast cancer is the most common type of cancer for women in Northeast Texas and the second most common cause of cancer deaths among women (Figure 33). Modifiable risk factors include heavy alcohol use, obesity, and physical inactivity (24).

The breast cancer mortality rates in Northeast Texas in 2018 were similar to those in Texas overall (Figure 29). In Northeast Texas, as in Texas and the U.S., the breast cancer mortality rate in 2018 was higher among Non-Hispanic Black women than Non-Hispanic White women (Figure 39).

Figure 39. Age-Adjusted Female Breast Cancer Mortality Rates by Race: Northeast Texas, Texas, and U.S. (2018)



Data source: National Center for Health Statistics on CDC WONDER database.

3. Chronic Lower Respiratory Disease

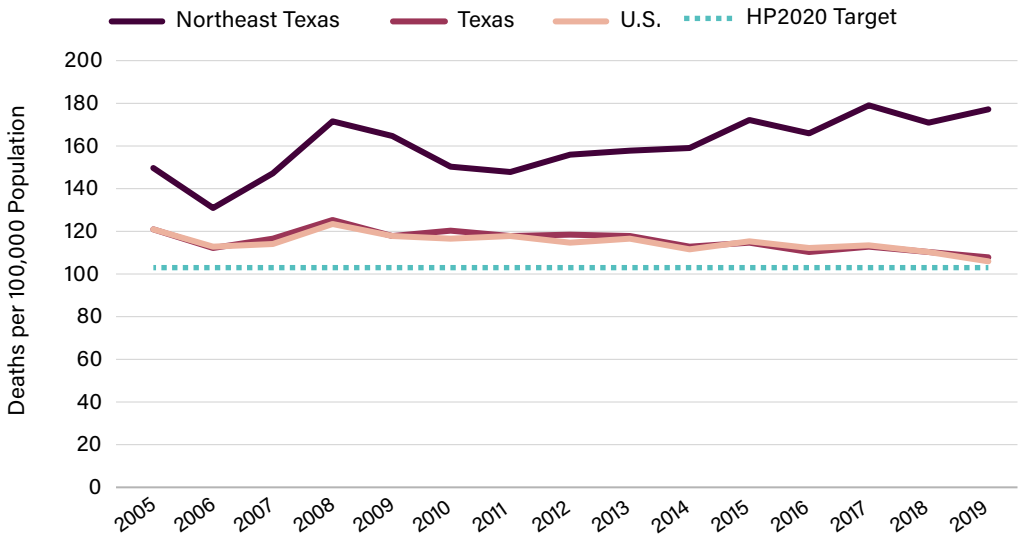
The third leading cause of death in Northeast Texas was chronic lower respiratory disease (CLRD), which includes both chronic obstructive pulmonary disease and asthma. If Northeast Texas were a state, it would rank 47th in terms of CLRD mortality (Table 6).

CHRONIC OBSTRUCTIVE PULMONARY DISEASE

The principal component of CLRD is chronic obstructive pulmonary disease (COPD). COPD is a lung disease that makes breathing difficult due to lung damage that restricts air flow. The disease grows progressively worse over time. The dominant risk factor for COPD is cigarette smoking, which has been estimated to contribute to about 80% of deaths from COPD (29).

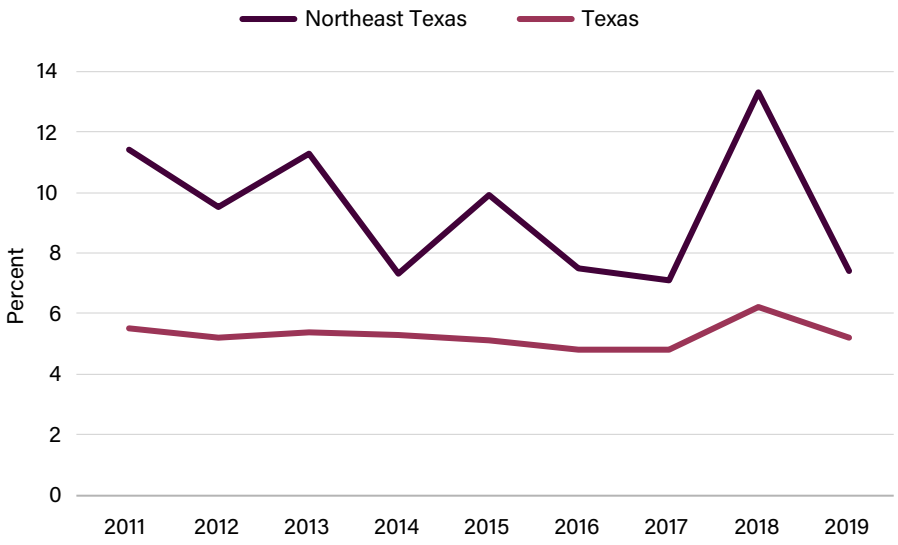
From 2005-2019 COPD mortality rates were higher in Northeast Texas than in Texas overall and in the U.S., and the disparity has widened over time (Figure 40). In 2019, the COPD mortality rate in Northeast Texas was 64% higher than the rate in Texas overall. The estimated prevalence of COPD among Northeast Texas adults - 7.4% in 2019 - has been higher than for Texas overall since at least 2011 (Figure 41).

Figure 40. Age-Adjusted Mortality Rates for COPD in Adults ≥45 Years-Old: Northeast Texas, Texas, and U.S. (2005-2019)



Data source: National Center for Health Statistics, CDC. Chronic Obstructive Pulmonary Disease (COPD) includes ICD-10 codes J40-J44, and excludes asthma.

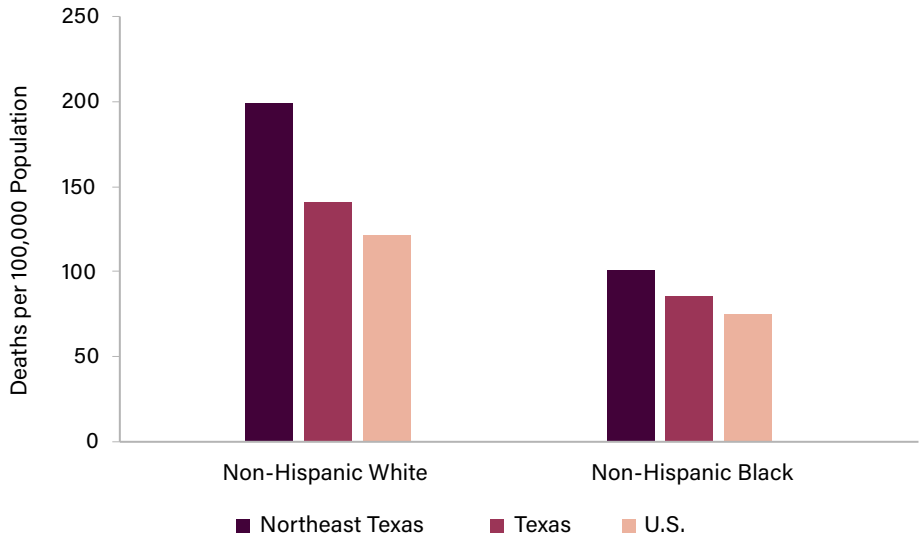
Figure 41. Estimated Prevalence of COPD among Adults: Northeast Texas and Texas (2011-2019)



Data source: Behavioral Risk Factor Surveillance System (BRFSS), Center for Health Statistics, Texas Department of State Health Services.

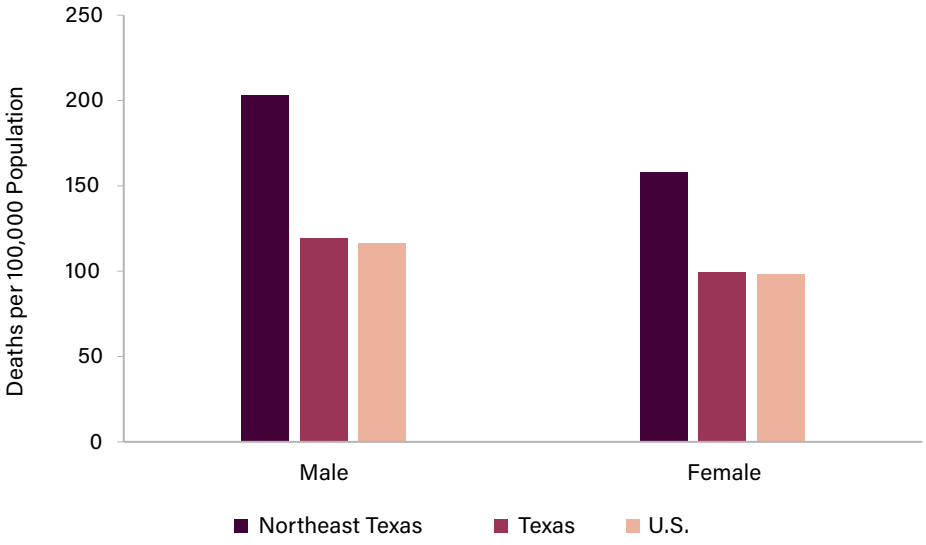
COPD rates were higher in Northeast Texas than in Texas overall for both Non-Hispanic Whites and Non-Hispanic Blacks, but especially for Non-Hispanic Whites (Figure 42). At all geographic levels, COPD mortality rates were higher for males (Figure 43).

Figure 42. Age-Adjusted Mortality Rates for COPD in Adults ≥45 Years-Old by Race or Hispanic Ethnicity (2019)



Data source: National Center for Health Statistics, CDC. Chronic Obstructive Pulmonary Disease (COPD) includes ICD-10 codes J40-J44, and excludes asthma.

Figure 43. Age-Adjusted Mortality Rates for COPD in Adults ≥45 Years Old by Sex (2019)



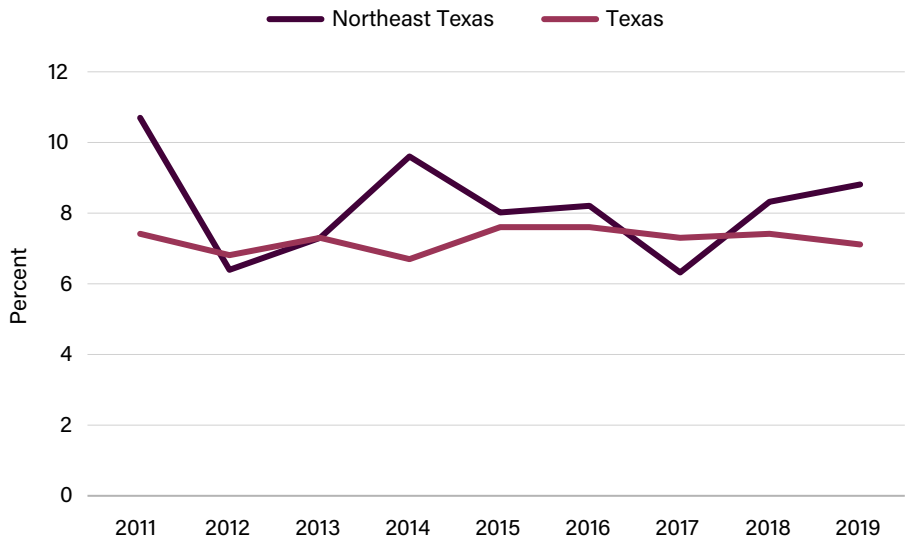
Data Source: Texas: National Center for Health Statistics, CDC. Chronic Obstructive Pulmonary Disease (COPD) includes ICD-10 codes J40-J44, and excludes asthma.

ASTHMA

Asthma is a chronic lung disease characterized by inflammation and narrowing or blocking of the airways, which leads to episodes of coughing and shortness of breath (30). Modifiable risk factors include exposure to cigarette smoke, air pollution, microbes, or allergens; and workplace hazards such as chemical irritants or dusts (30). In Texas in 2012, asthma was estimated to result in a 1.66 lost days of school or work per capita, and an estimated 2.17 lost days of school for those aged 0-17 years (31).

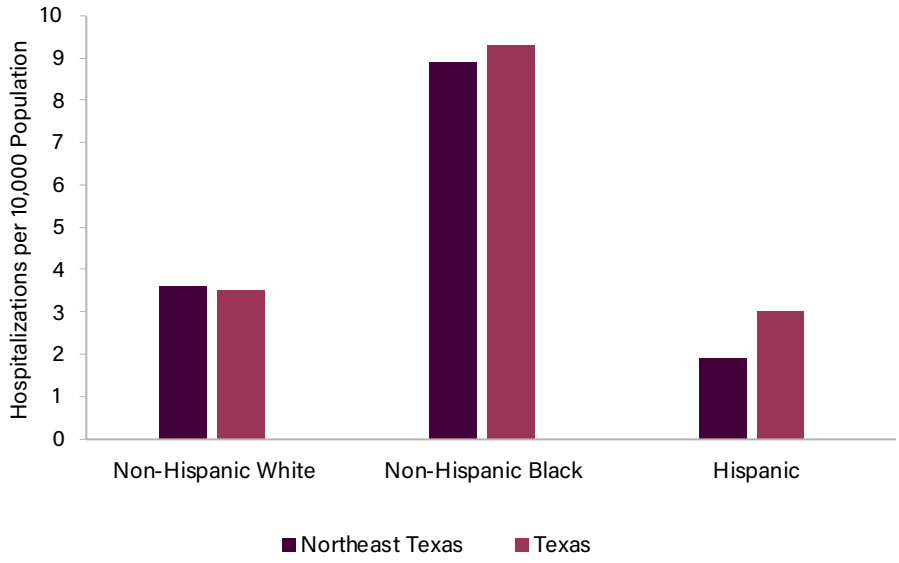
The estimated prevalence of asthma among Northeast Texas adults was 9% in 2019 and has been higher than the Texas estimate for most years since 2011 (Figure 44). Asthma hospitalization rates indicate that asthma disproportionately impacts the Non-Hispanic Black population. In Northeast Texas, as in Texas overall, Non-Hispanic Blacks were approximately 2.5 times more likely to be hospitalized for asthma in 2019 compared to Non-Hispanic Whites (Figure 45). (Hospitalization rates do not include emergency department visits that do not result in a hospital admission of more than 23 hours). Females were significantly more likely than males to be hospitalized (Figure 46). Asthma hospitalization rates were higher among those aged 18-54 years-old in Northeast Texas compared to Texas overall (Figure 47).

Figure 44. Estimated Prevalence of Asthma among Adults: Northeast Texas and Texas (2011-2019)



Data source: Behavioral Risk Factor Surveillance System (BRFSS), Center for Health Statistics, Texas Department of State Health Services.

Figure 45. Age-Adjusted Asthma Hospitalization Rates by Race or Hispanic Ethnicity: Northeast Texas and Texas (2019)

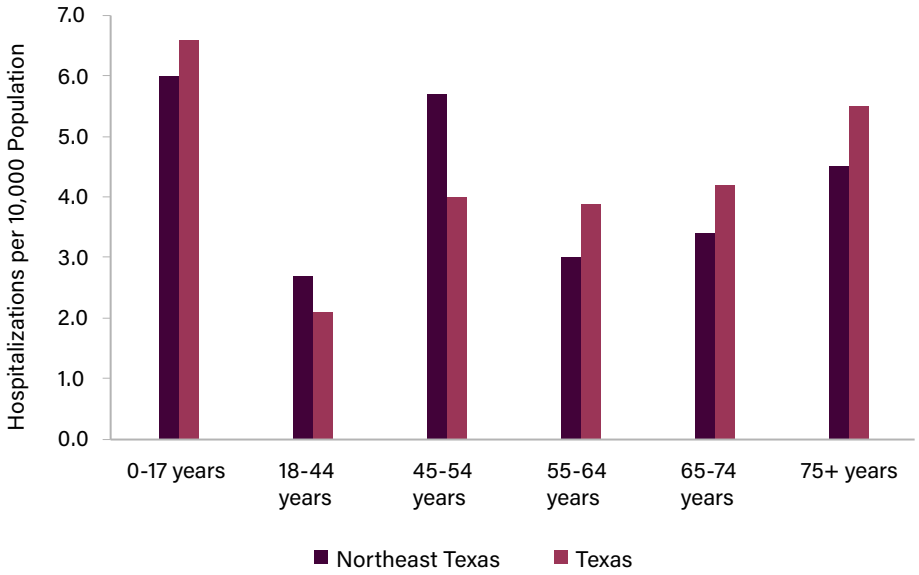


Data source: Texas Hospital Inpatient Discharge Public Use Data Files, 2019. Texas Department of State Health Services, Center for Health Statistics, Austin, Texas. Based on hospital records listing ICD-10 code J45 as the principal diagnosis.

Figure 46. Age-Adjusted Asthma Hospitalization Rates by Sex: Northeast Texas and Texas (2019)

Data source: Texas Hospital Inpatient Discharge Public Use Data Files, 2019. Texas Department of State Health Services, Center for Health Statistics, Austin, Texas. Based on hospital records listing ICD-10 code J45 as the principal diagnosis.

Figure 47. Asthma Hospitalization Rates by Age Group: Northeast Texas and Texas (2019)



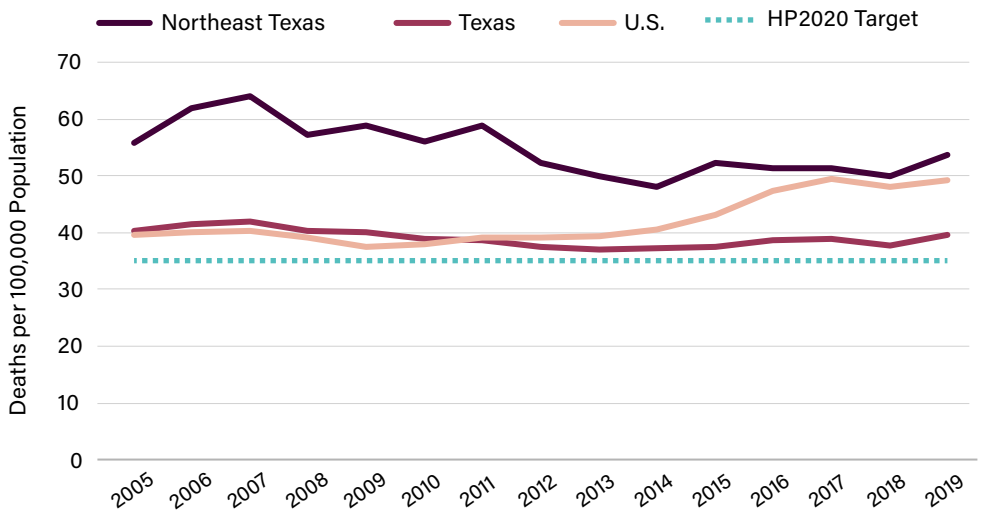
Data source: Texas Hospital Inpatient Discharge Public Use Data Files, 2019. Texas Department of State Health Services, Center for Health Statistics, Austin, Texas. Based on hospital records listing ICD-10 code J45 as the principal diagnosis.

4. Unintentional Injury

Unintentional injury was the fourth leading cause of death in Northeast Texas. Although often referred to as accidents, unintentional injuries are both predictable and preventable (32). For at least fifteen years, unintentional injury mortality rates in Northeast Texas have exceeded those for Texas and the U.S. (Figure 48).

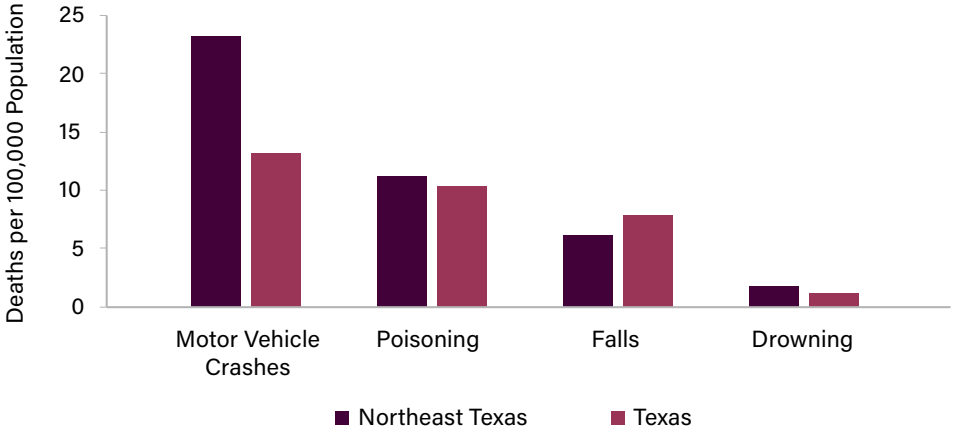
The top cause of unintentional injury mortality is motor vehicle crashes (Figure 49). In 2019, the motor vehicle crash mortality rate was 77% higher in Northeast Texas than in Texas overall in 2019 (Figure 49). While Northeast Texas rates had been trending downward, they have plateaued in recent years and remain higher than the Texas and U.S. rates (Figure 50).

Figure 48. Age-Adjusted Unintentional Injury Mortality Rates: Northeast Texas, Texas, and U.S. (2005-2019)



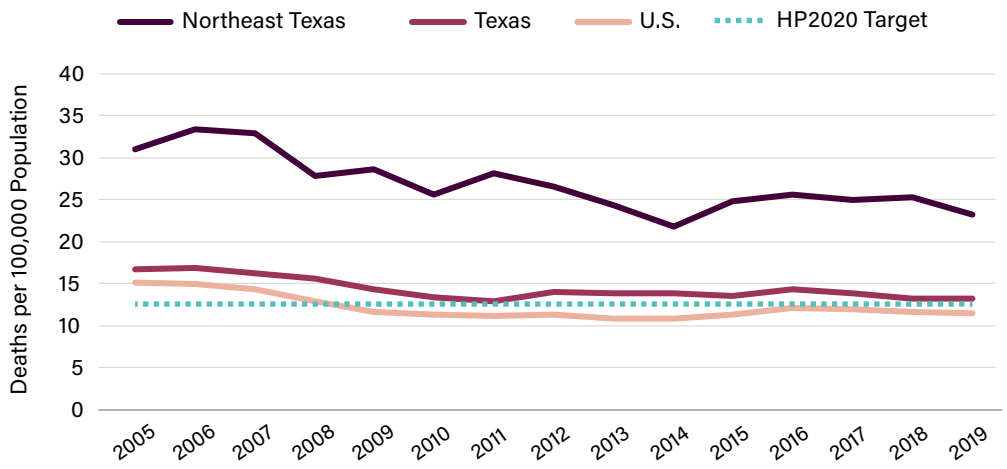
Data source: National Center for Health Statistics on CDC WONDER database. ICD10 codes: V01-X59,Y85-Y86.

Figure 49. Age-Adjusted Unintentional Injury Mortality Rates by Cause of Injury: Northeast Texas and Texas (2019)



Data source: National Center for Health Statistics on CDC WONDER database.

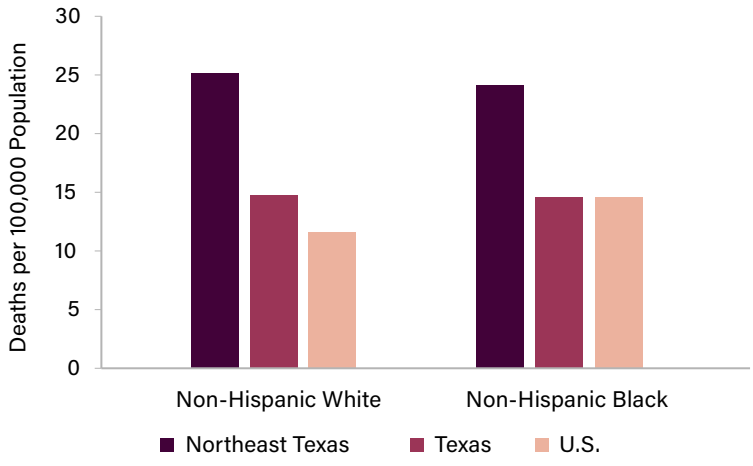
Figure 50. Age-Adjusted Motor Vehicle Injury Mortality Rates: Northeast Texas, Texas, and U.S. (2005-2019)



Data source: National Center for Health Statistics on CDC WONDER database.

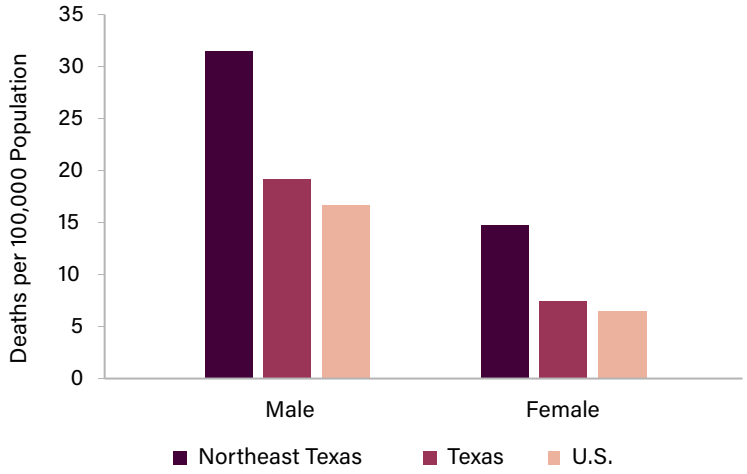
Compared to Texas overall and the U.S., motor vehicle injury mortality rates are higher in Northeast Texas for Non-Hispanic Blacks and Non-Hispanic Whites (Figure 51) and males and females (Figure 52). At all geographic levels, rates among males are more than double the rates among females (Figure 52). Although the total number of crashes per person in Texas has exceeded that of Northeast Texas since 2013, the percentage of crashes resulting in a fatality or severe injury has been consistently higher in Northeast Texas compared to the state overall (Figure 53).

Figure 51. Age-Adjusted Motor Vehicle Injury Mortality Rates by Race: Northeast Texas and Texas (2019)



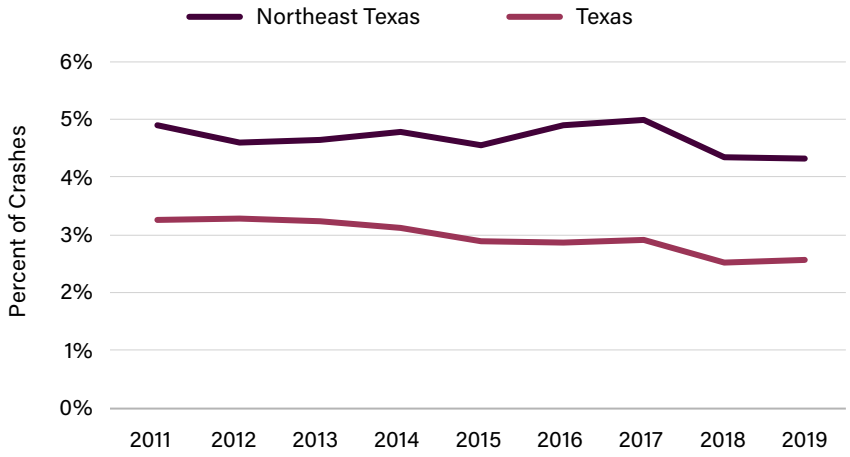
Data source: National Center for Health Statistics on CDC WONDER database.

Figure 52. Age-Adjusted Motor Vehicle Injury Mortality Rates by Sex: Northeast Texas and Texas (2019)



Data source: National Center for Health Statistics on CDC WONDER database.

Figure 53. Percent of Crashes Resulting in a Fatality or Severe Injury: Texas and Northeast Texas (2011-2019)



Data source: Texas Department of Motor Vehicles

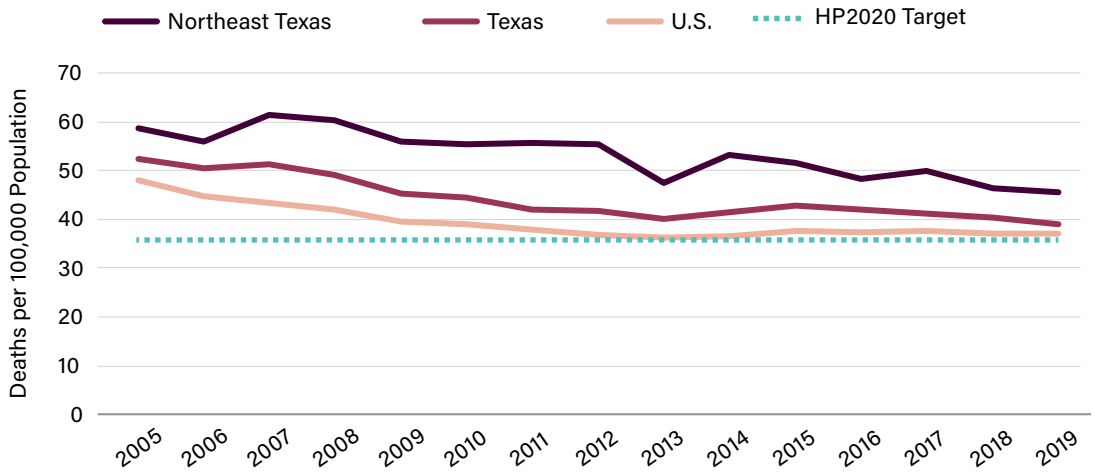
5. Stroke

The fifth leading cause of death in Northeast Texas was stroke. Stroke (cerebrovascular disease) results when a blood vessel to the brain is blocked or bursts. Modifiable risk factors for stroke include high fat diets, physical inactivity, obesity, heavy alcohol consumption, and tobacco use (33).

The stroke mortality rate was higher in Northeast Texas than in Texas overall and the U.S. (Figure 54). In 2019, the stroke mortality rate was 17% higher in Northeast Texas than in Texas overall (Table 6). If Northeast Texas were a state, it would rank 50th in terms of stroke mortality (Table 6). In 2019, an estimated 5% of Northeast Texas residents had ever had a stroke (Figure 55).

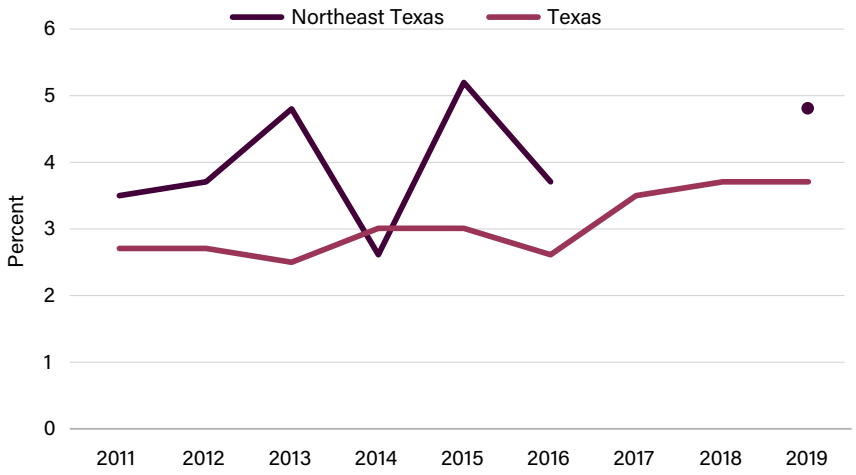
Compared to Texas overall, in Northeast Texas the stroke mortality rate was 16% higher for Non-Hispanic Whites and 12% higher for Non-Hispanic Blacks (Figure 56), and 6% higher for males and 25% higher for females (Figure 57). At all geographic levels, Non-Hispanic Blacks were at higher risk for stroke mortality than were Non-Hispanic Whites (Figure 56).

Figure 54. Age-Adjusted Stroke Mortality Rates: Northeast Texas, Texas, and U.S. (2005-2019)



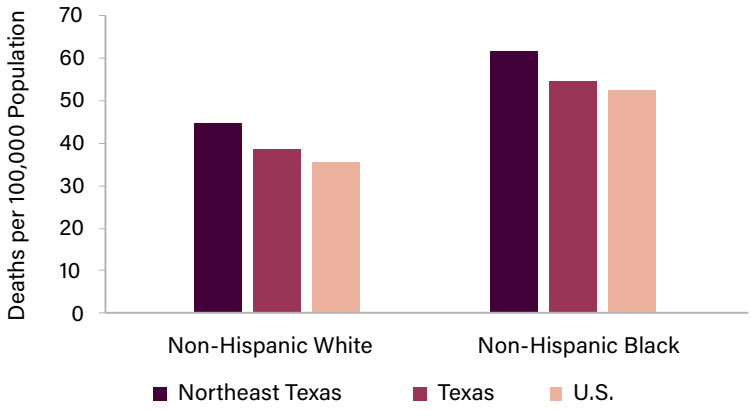
Data source: National Center for Health Statistics on CDC WONDER database.

Figure 55. Estimated Prevalence of Past Stroke: Northeast Texas and Texas (2011-2019)



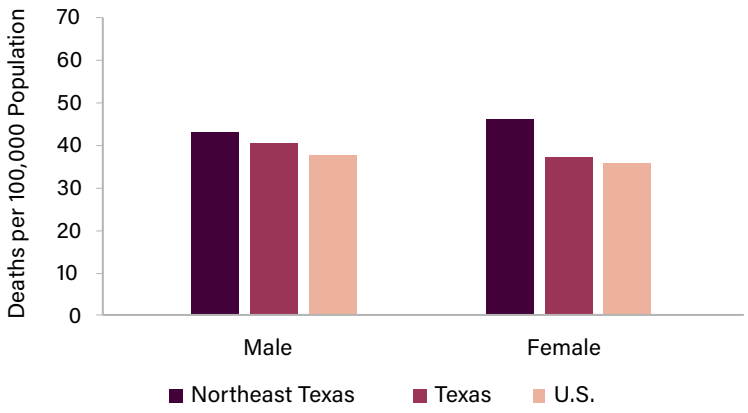
Data source: Behavioral Risk Factor Surveillance System (BRFSS), Center for Health Statistics, Texas Department of State Health Services.
Note: 2017 & 2018 data are unavailable for Northeast Texas.

Figure 56. Age-Adjusted Stroke Mortality Rates by Race: Northeast Texas, Texas, and U.S. (2019)



Data source: National Center for Health Statistics on CDC WONDER database.

Figure 57. Age-Adjusted Stroke Mortality Rates by Sex: Northeast Texas, Texas, and U.S. (2019)



Data source: National Center for Health Statistics on CDC WONDER database.

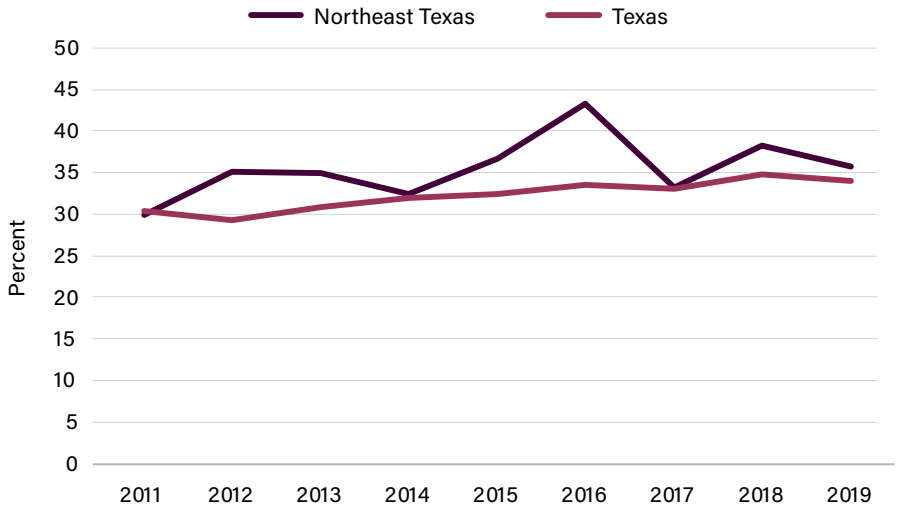
OTHER CHRONIC DISEASES AND CONDITIONS

Overweight and Obesity

Body Mass Index (BMI) is used as an approximation of a person's body fat. BMI is the weight of a person in kilograms divided by their height in meters. A high BMI is indicative of high body fat. Obesity is a risk factor in many chronic diseases, including heart disease, stroke, diabetes, and some forms of cancer.

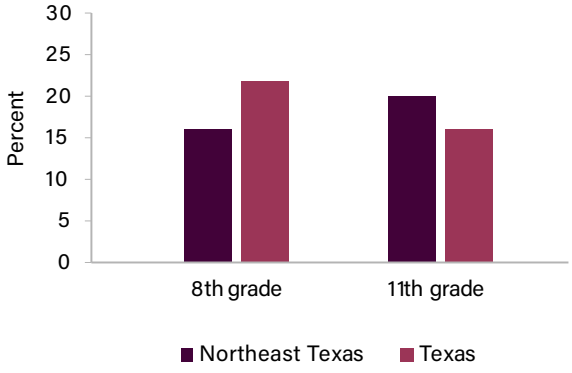
For adults, the CDC defines a person as obese if their BMI is 30.0 or greater. The estimated percent of Northeast Texas adults who were obese in 2019 was 35.8% (Figure 58). Estimated obesity prevalence among 8th and 11th grade students in Northeast Texas during the 2015-2016 school year was 20% and 23%, respectively (Figure 59).

Figure 58. Estimated Prevalence of Obesity among Adults: Northeast Texas and Texas (2011-2019)



Data source: Behavioral Risk Factor Surveillance System (BRFSS), Center for Health Statistics, Texas Department of State Health Services.

Figure 59. Prevalence of Obesity among 8th and 11th Grade Students: Northeast Texas and Texas (2015-2016)

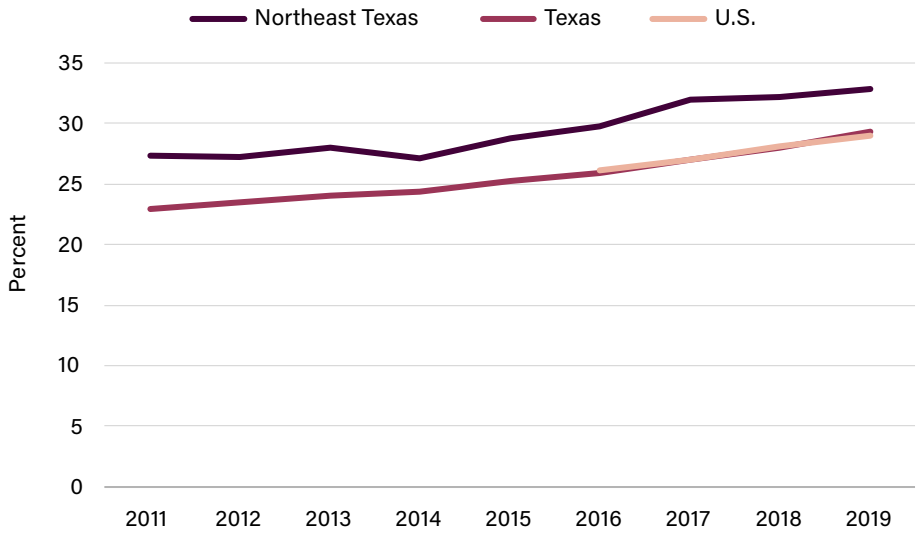


Data source: Texas: School Physical Activity and Nutrition (SPAN) survey, Michael & Susan Dell Center for Healthy Living and Department of State Health Services, Office of Title V.

MATERNAL OBESITY

Pre-pregnancy obesity is a risk for both the mother and fetus. Pre-pregnancy obesity is associated with the development of diabetes and hypertension during pregnancy (34, 35). Obese women are at higher risk than non-obese women of having a cesarean delivery (36). Additionally, maternal obesity has been shown to be associated with higher infant mortality and stillbirth rates (37, 38). Unfortunately, both Northeast Texas and Texas overall has seen an upward trend in pre-pregnancy obesity. In 2019, nearly one-third of all births in Northeast Texas were to a woman who began her pregnancy obese, a 20% increase since 2011 (Figure 60).

Figure 60. Percent of Births to a Woman Who Was Obese Pre-Pregnancy: Northeast Texas, Texas, and U.S. (2011-2019)



Data sources: Texas & Northeast Texas - 2011-2017 Birth File, analyzed by authors; U.S. - United States Department of Health and Human Services (US DHHS), Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Division of Vital Statistics, Natality public-use data 2007-2019, on CDC WONDER Online Database.

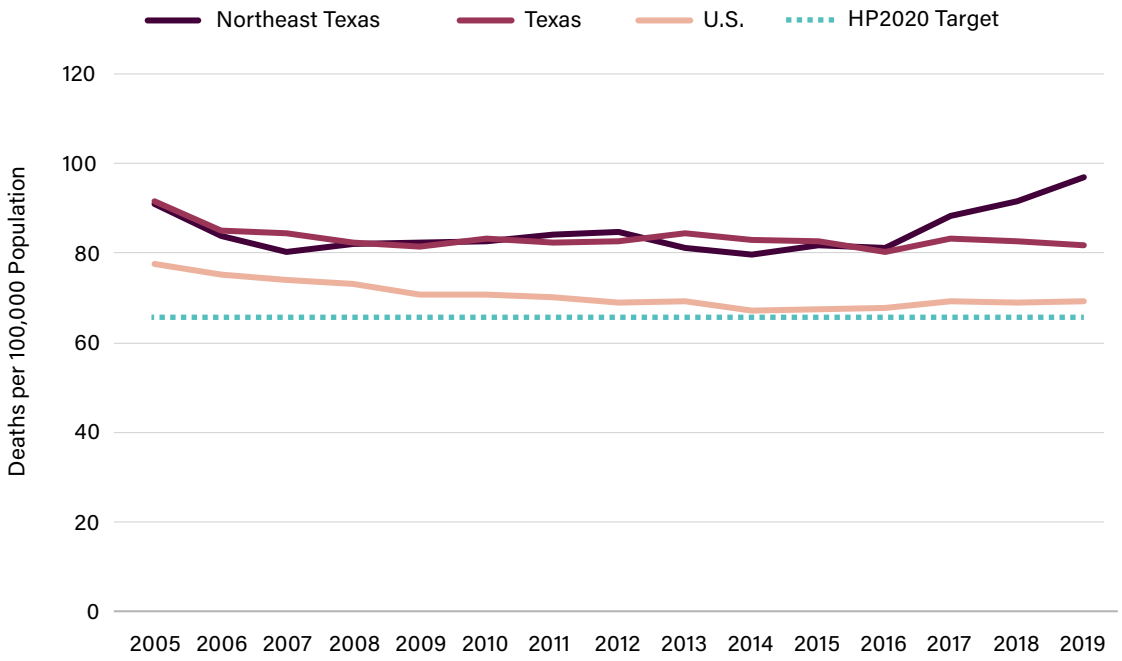
Diabetes

Diabetes is a group of diseases characterized by elevated blood glucose levels due to deficiency in insulin, a hormone that regulates sugar metabolism. Health consequences of diabetes include heart disease, blindness, kidney failure, leg and foot amputations, and premature death (39). The two main types of diabetes are type 1, which typically develops during childhood, is thought to be caused by an autoimmune reaction, and has no known modifiable risk factors; and type 2, which develops over many years and can be prevented or delayed with a healthy diet, healthy weight, and physical activity. (39).

Diabetes is three times more likely to be listed as a multiple (contributing) cause of death rather than as the underlying cause of death; therefore, diabetes-related mortality data presented here come from the multiple cause of death files, which include all mentions of diabetes on the death certificate. This approach to measuring diabetes mortality rates is the same as that used in setting the HP2020 target (40).

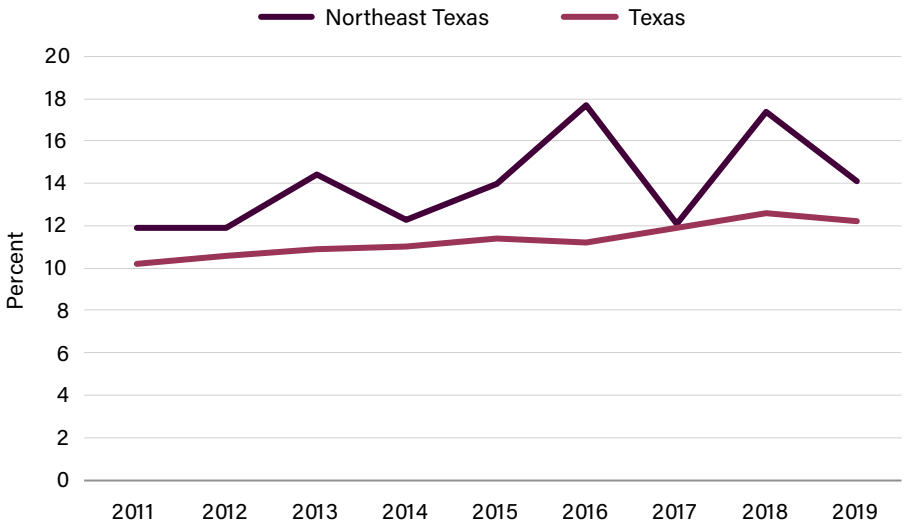
From 2005-2016 Northeast Texas diabetes mortality rates had been trending with overall Texas rates, but in recent years rates in Northeast Texas have risen sharply (Figure 61). Higher diabetes mortality rates in Northeast Texas compared to Texas overall were seen in both Non-Hispanic Whites and Non-Hispanic Blacks (but not Hispanics) (Figure 65), in both males and females (Figure 66), and in all age groups except those over 75 years (Figure 67).

Figure 61. Age-Adjusted Mortality Rates for Diabetes as Underlying or Multiple Cause: Northeast Texas, Texas, and U.S. (2005-2019)



Data source: National Center for Health Statistics on CDC WONDER database.

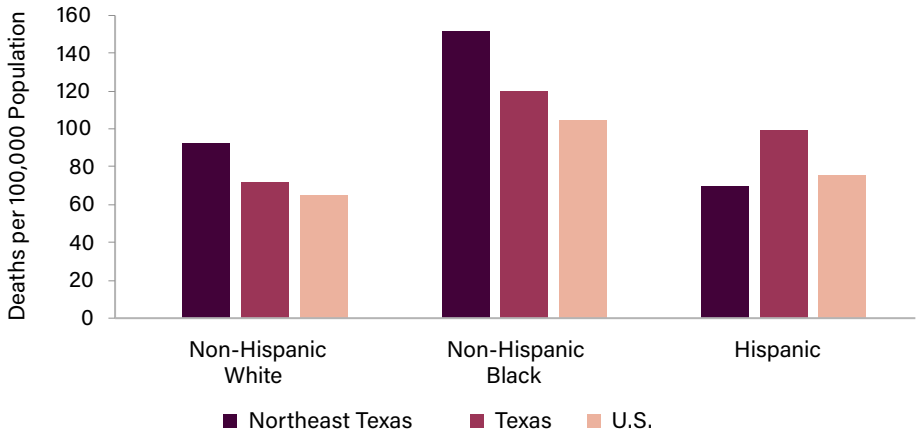
Figure 62. Estimated Prevalence of Adults Ever Diagnosed with Diabetes by a Doctor: Northeast Texas and Texas (2011-2019)



Data source: Behavioral Risk Factor Surveillance System (BRFSS), Center for Health Statistics, Texas Department of State Health Services. Estimate does not include gestational diabetes diagnoses.

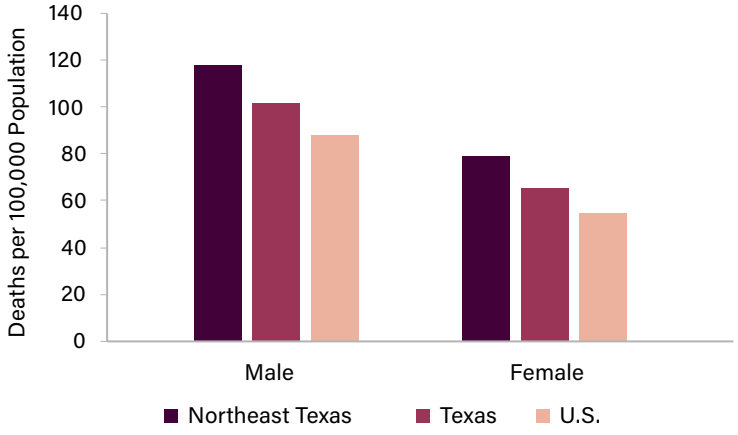
At all geographic levels, Non-Hispanic Blacks are at higher risk for diabetes compared to Non-Hispanic Whites and Hispanics, and this disparity is larger in Northeast Texas than in Texas (Figure 63). In 2019, the mortality rate for diabetes as an underlying or multiple cause was over 64% higher in Non-Hispanic Blacks than Non-Hispanic Whites in Northeast Texas, and 27% greater than Non-Hispanic Blacks in Texas overall (Figure 63). The disproportionate burden of diabetes on the Non-Hispanic Black population and the larger racial disparity in Northeast Texas compared to Texas and the U.S. is also evident in diabetes hospitalization rates. Non-Hispanic Blacks in Northeast Texas were more than twice as likely to be hospitalized for diabetes than Non-Hispanic Whites in Northeast Texas, and 63% more likely to be hospitalized for diabetes than Non-Hispanic Blacks in Texas overall (Figure 65). (Hospitalization rates do not include emergency department visits that do not result in a hospital admission of more than 23 hours).

Figure 63. Age-Adjusted Mortality Rates for Diabetes as Underlying or Multiple Cause by Race or Hispanic Ethnicity: Northeast Texas, Texas, and U.S. (2019)



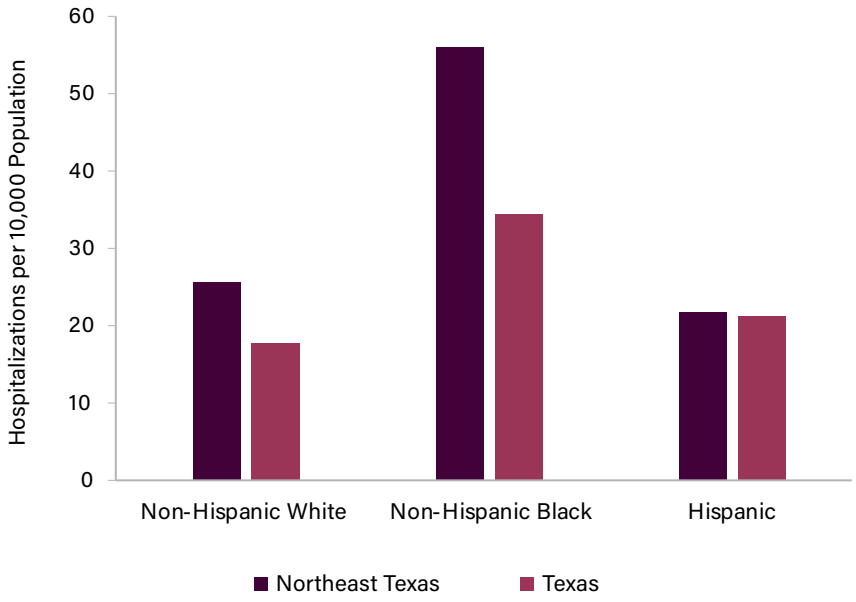
Data source: National Center for Health Statistics on CDC WONDER database.

Figure 64. Age-Adjusted Mortality Rates for Diabetes as Underlying or Multiple Cause by Sex: Northeast Texas, Texas, and U.S. (2019)



Data source: National Center for Health Statistics on CDC WONDER database.

Figure 65. Age-Adjusted Diabetes Hospitalization Rates by Race or Hispanic Ethnicity: Northeast Texas and Texas (2019)

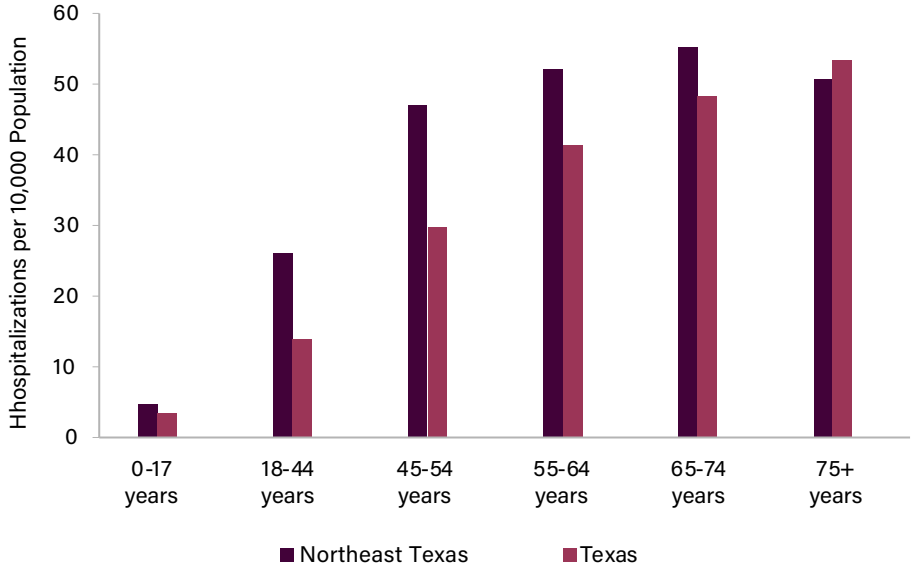


Data source: Texas Hospital Inpatient Discharge Public Use Data Files, 2019. Texas Department of State Health Services, Center for Health Statistics, Austin, Texas. Based on hospital records listing ICD-10 code E10, E11, E13 as the principal diagnosis.

Figure 66. Age-Adjusted Diabetes Hospitalization Rates by Sex: Northeast Texas and Texas (2019)

Data source: Texas Hospital Inpatient Discharge Public Use Data Files, 2019. Texas Department of State Health Services, Center for Health Statistics, Austin, Texas. Based on hospital records listing ICD-10 code E10, E11, E13 as the principal diagnosis.

Figure 67. Diabetes Hospitalization Rates by Age Group: Northeast Texas and Texas (2019)



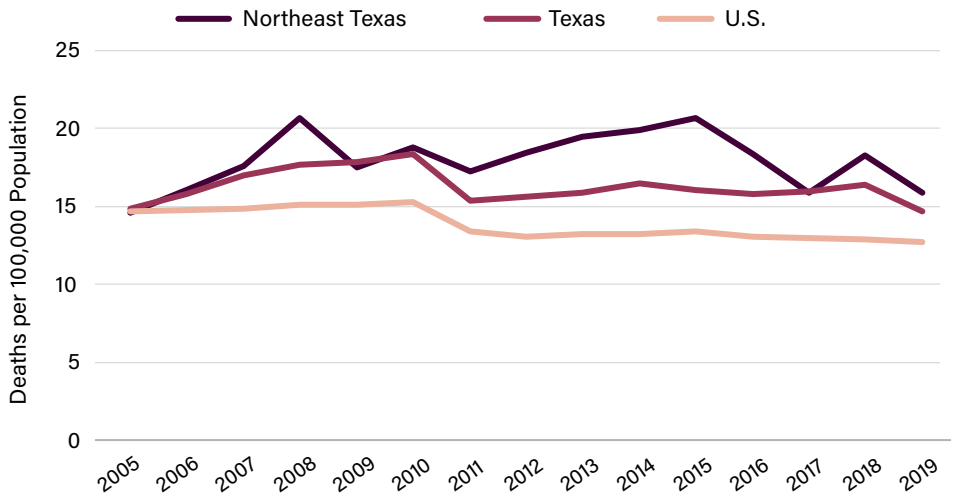
Data source: Texas Hospital Inpatient Discharge Public Use Data Files, 2019. Texas Department of State Health Services, Center for Health Statistics, Austin, Texas. Based on hospital records listing ICD-10 code E10, E11, E13 as the principal diagnosis.

Kidney Disease

Kidney disease is a chronic condition resulting from damage to the kidneys that affects their ability to filter blood, leading to an accumulation of wastes in the body. In most cases, the kidney damage occurs over many years, often in people with diabetes or high blood pressure, the two most common causes of kidney disease. Cardiovascular disease is also a risk factor for kidney disease (41).

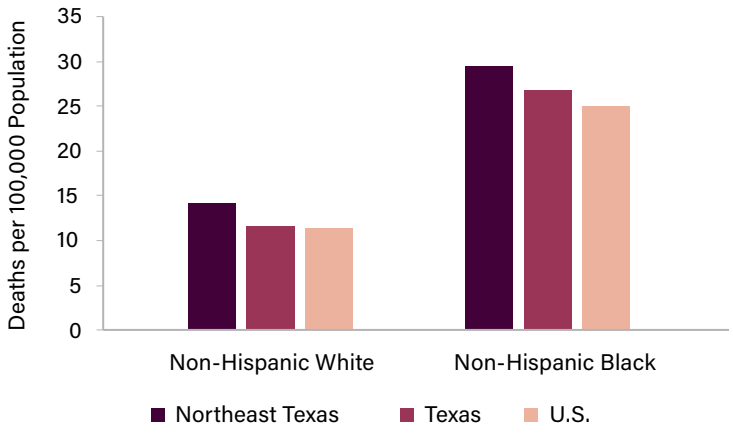
In 2019, the mortality rate for kidney disease was 8% higher in Northeast Texas than in Texas overall and 25% higher than in the U.S. (Figure 68). This excess burden is seen in both Non-Hispanic Blacks and Non-Hispanic Whites (Figure 69), and males and females (Figure 70). In Northeast Texas in 2019, the kidney disease mortality rate for Non-Hispanic Blacks was double that of Non-Hispanic Whites (Figure 69), and 29% higher in males than in females (Figure 70).

Figure 68. Age-Adjusted Mortality Rates for Kidney Disease: Northeast Texas, Texas, and U.S. (2005-2019)



Data source: National Center for Health Statistics on CDC WONDER database.

Figure 69. Age-Adjusted Mortality Rates for Kidney Disease by Race: Northeast Texas, Texas, and U.S. (2019)



Data source: National Center for Health Statistics on CDC WONDER database.

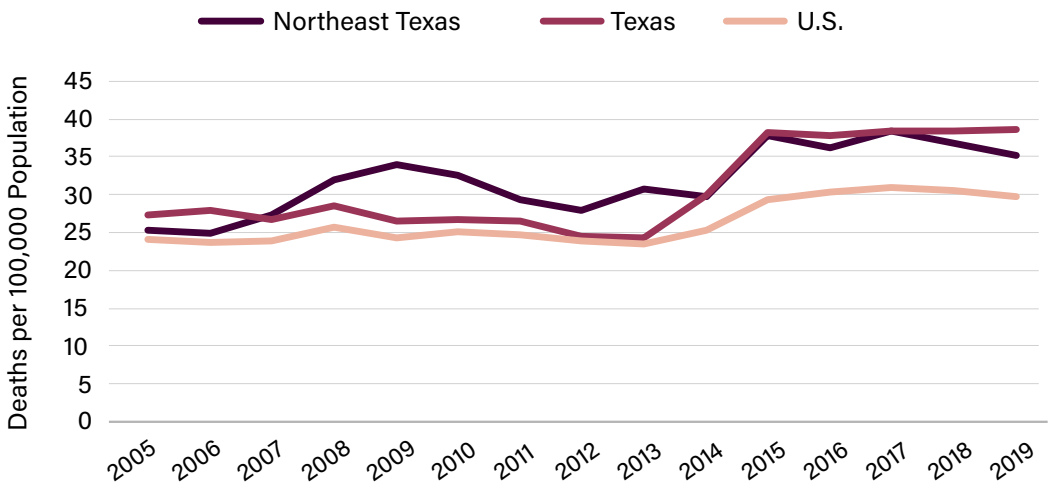
Figure 70. Age-Adjusted Mortality Rates for Kidney Disease by Sex: Northeast Texas, Texas, and U.S. (2019)

Data source: National Center for Health Statistics on CDC WONDER database.

Alzheimer's Disease

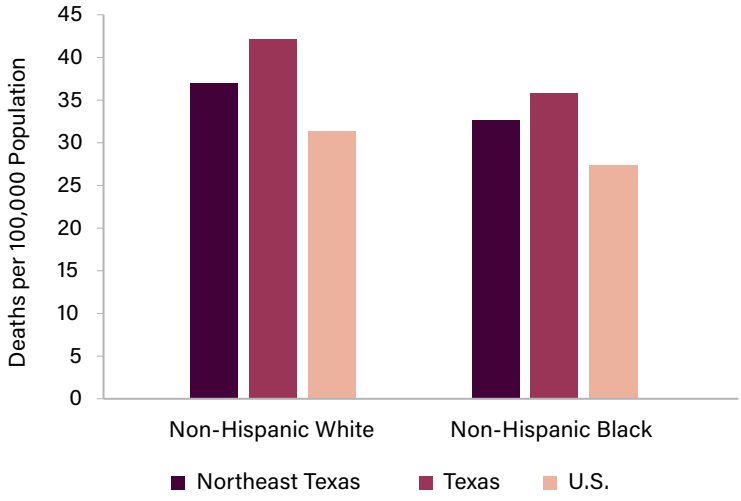
Alzheimer's disease is a progressive and irreversible loss of brain function that affects memory, thinking skills, and behavior (42). Mortality rates for Alzheimer's disease in Northeast Texas have been consistently higher than in the U.S. but have recently trended lower than in Texas overall (Figure 71). As in Texas overall and the U.S., mortality rates for Alzheimer's disease in Northeast Texas in 2019 were higher in Non-Hispanic Whites than in Non-Hispanic Blacks (Figure 72), and higher in women than in men (Figure 73).

Figure 71. Age-Adjusted Mortality Rates for Alzheimer's Disease: Northeast Texas, Texas, and U.S. (2005-2019)



Data source: National Center for Health Statistics on CDC WONDER database.

Figure 72. Age-Adjusted Mortality Rates for Alzheimer's Disease by Race: Northeast Texas, Texas, and U.S. (2019)



Data source: National Center for Health Statistics on CDC WONDER database.

Figure 73. Age-Adjusted Mortality Rates for Alzheimer's Disease by Sex: Northeast Texas, Texas, and U.S. (2019)

Data source: National Center for Health Statistics on CDC WONDER database.

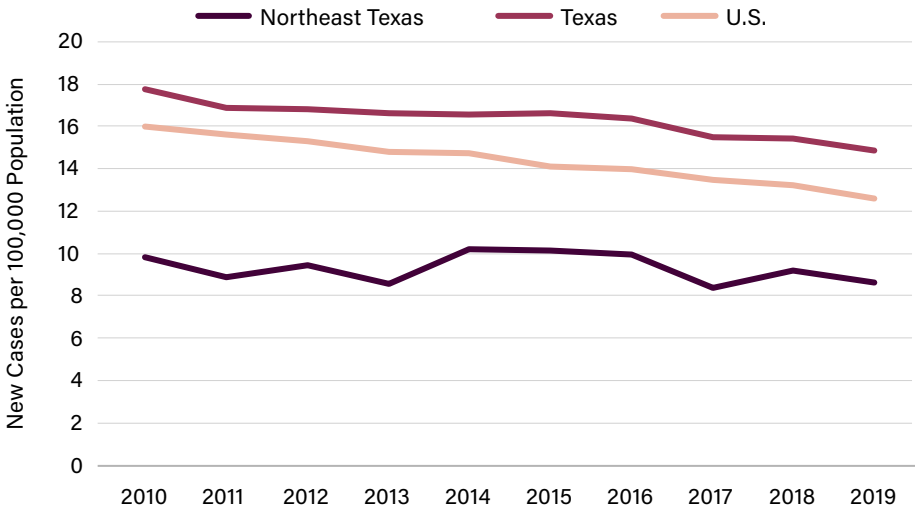
INFECTIOUS DISEASE

HIV

Human Immunodeficiency Virus (HIV) is a virus that attacks the immune system and reduces its ability to fight infection. HIV can be managed as a chronic condition through medications. Untreated, HIV can lead to AIDS (Acquired Immunodeficiency Syndrome), whereby the immune system is so weak that opportunistic infections can quickly spread and cause death. HIV is primarily transmitted through sexual contact, and to a lesser extent through sharing syringes for intravenous drug use (43).

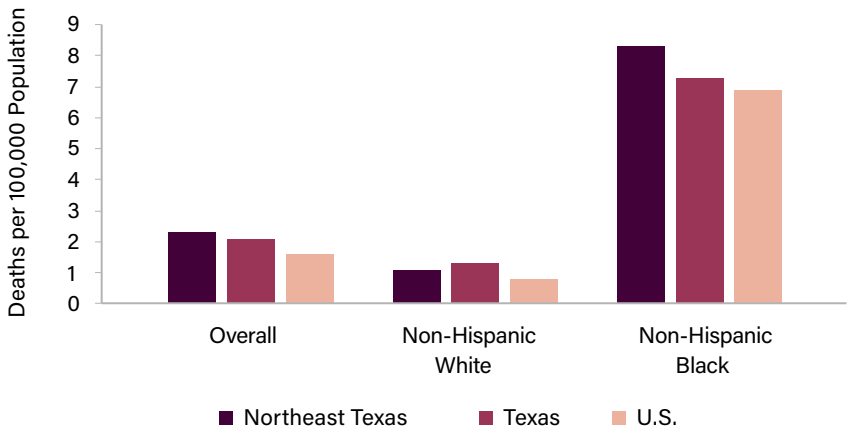
Although over the past decade new cases of HIV have been lower in Northeast Texas compared to Texas overall (Figure 74), age-adjusted HIV mortality rates from 2015-2019 were similar or higher in Northeast Texas (Figure 75). HIV mortality rates in Northeast Texas were 7.5 times greater among Non-Hispanic Blacks than Non-Hispanic Whites (Figure 75), and over twice as high among males than females (Figure 76).

Figure 74. HIV Incidence Rates: Northeast Texas, Texas, and U.S. (2010-2019)



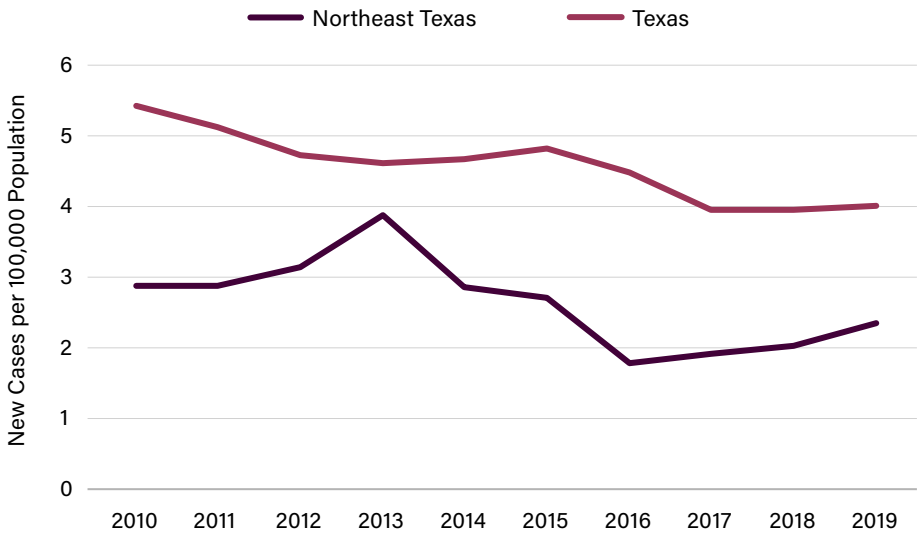
Source: HIV/STD Surveillance Branch, Texas Department of State Health Services. U.S. data source: Centers for Disease Control and Prevention. HIV Surveillance Report, 2021; vol.26. Incidence rates include all HIV cases regardless of disease status (HIV-only or AIDS) at diagnosis.

Figure 75. Age-Adjusted HIV Mortality Rates by Race: Northeast Texas, Texas, and U.S. (2015-2019)



Data source: National Center for Health Statistics on CDC WONDER database.

Figure 76. Age-Adjusted HIV Mortality Rates by Sex: Northeast Texas, Texas, and U.S. (2015-2019)

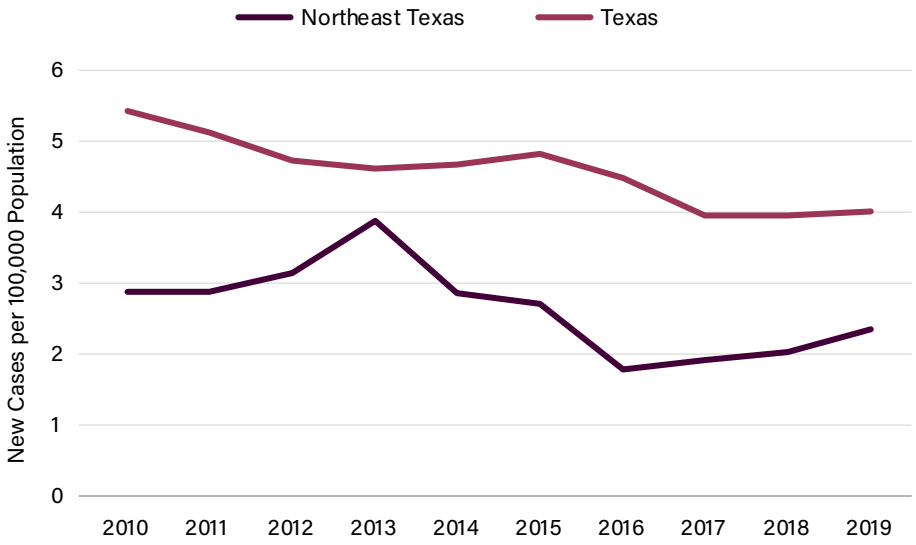


Data source: National Center for Health Statistics on CDC WONDER database.

Tuberculosis

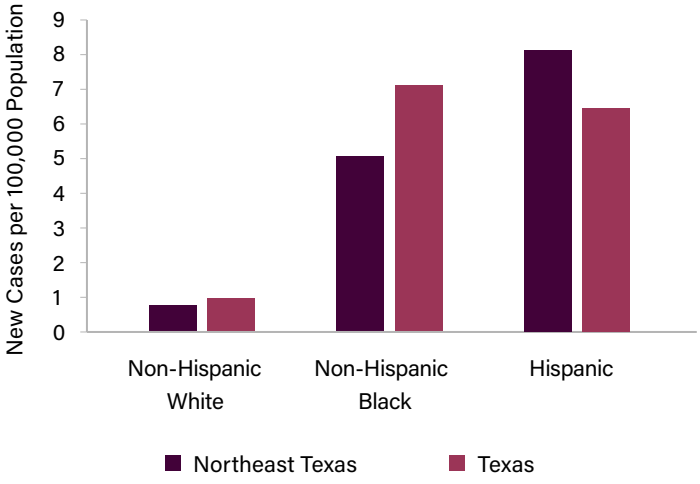
Tuberculosis (TB) is caused by a bacterial infection that typically occurs in the lungs (44). The TB incidence rate has been lower in Northeast Texas than Texas since at least 2010 (Figure 77). In Northeast Texas and Texas, TB disproportionately impacts Non-Hispanic Black and Hispanic populations (Figure 78).

Figure 77. Tuberculosis Incidence Rates: Northeast Texas and Texas (2010-2019)



Data source: Tuberculosis Service Branch, Texas Department of State Health Services.

Figure 78. Tuberculosis Incidence Rates: Northeast Texas and Texas (2019)



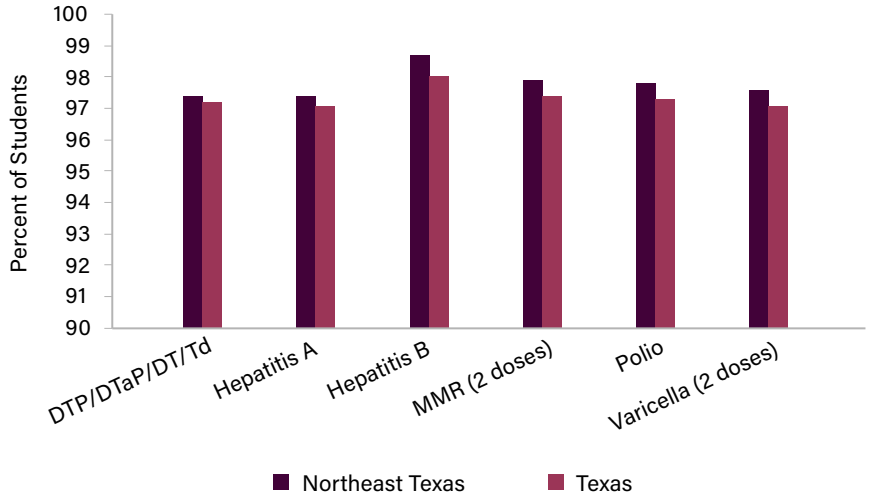
Data source: Tuberculosis Service Branch, Texas Department of State Health Services.

Vaccine-Preventable Infectious Diseases

Widespread vaccination against infectious diseases is foundational to population health. Vaccinations introduce a killed or weakened form, or specific proteins, of a disease-causing organism (such as a virus) into a person's body. The vaccinated person's immune system then produces antibodies against the disease, without causing the person to become ill with the disease itself. The resulting immunity protects that individual from developing the disease if exposed to a fully-functional version of the organism (45).

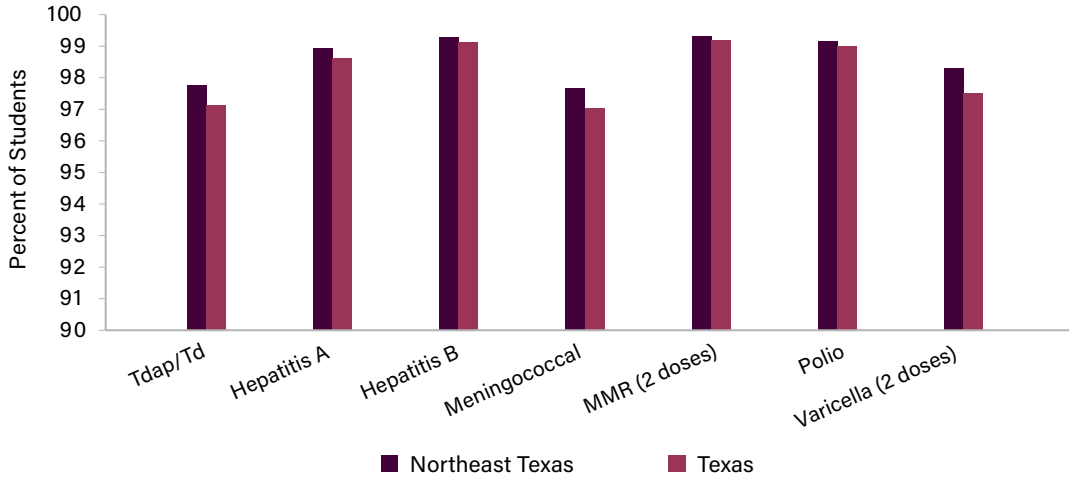
Importantly, when a large enough proportion of a population is immune, even the non-immune are protected. This protection for all – known as herd immunity – happens because the pathogen cannot spread far in a community in which most people are immune, reducing the chance that any individual within that community will come in contact with the virus. Therefore, high rates of vaccination help protect everyone.

Figure 79. Immunization Rates for Kindergarten Students: Northeast Texas and Texas (2018-2019)



Data source: Texas Department of State Health Services Immunization Branch.

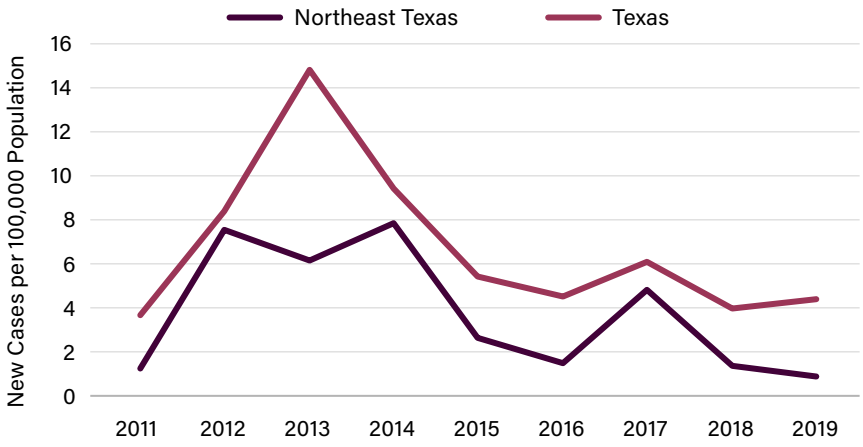
Figure 80. Immunization Rates for 7th Grade Students: Northeast Texas and Texas (2018-2019)



Data source: Texas Department of State Health Services Immunization Branch.

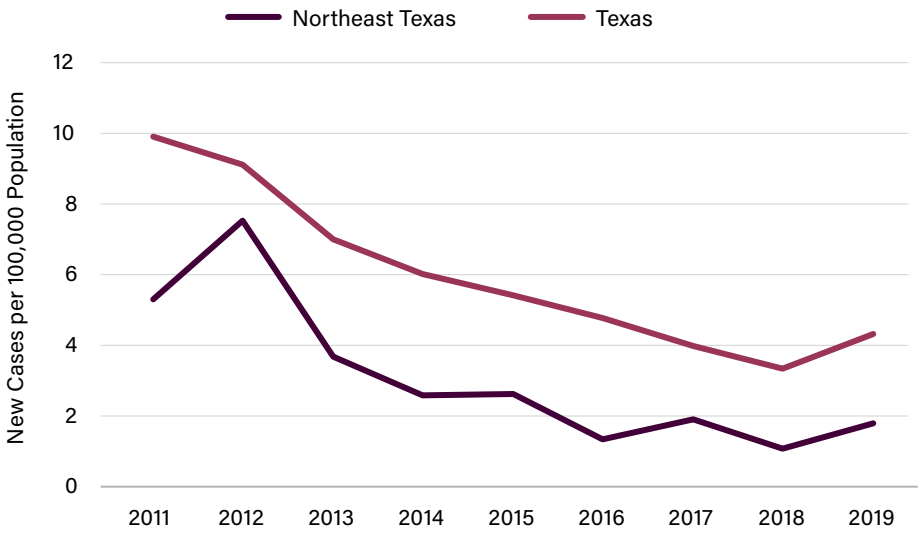
As in Texas overall, immunization rates in Northeast Texas for Kindergarten and 7th grade students during the 2018-2019 school year were high - exceeding 96% for each recommended vaccine (Figure 79 & Figure 80). Extremely low incidence rates for the two most common vaccine-preventable diseases seen in Texas in recent years - pertussis (whooping cough) and varicella (chicken pox) – reflect the widespread uptake of vaccines in Northeast Texas and elsewhere in the state (Figure 81 & Figure 82).

Figure 81. Pertussis Incidence Rates: Northeast Texas and Texas (2011-2019)



Data source: Texas Department of State Health Services Immunization Branch.

Figure 82. Varicella Incidence Rates: Northeast Texas and Texas (2011-2019)



Data source: Texas Department of State Health Services Immunization Branch.

MENTAL/BEHAVIORAL HEALTH

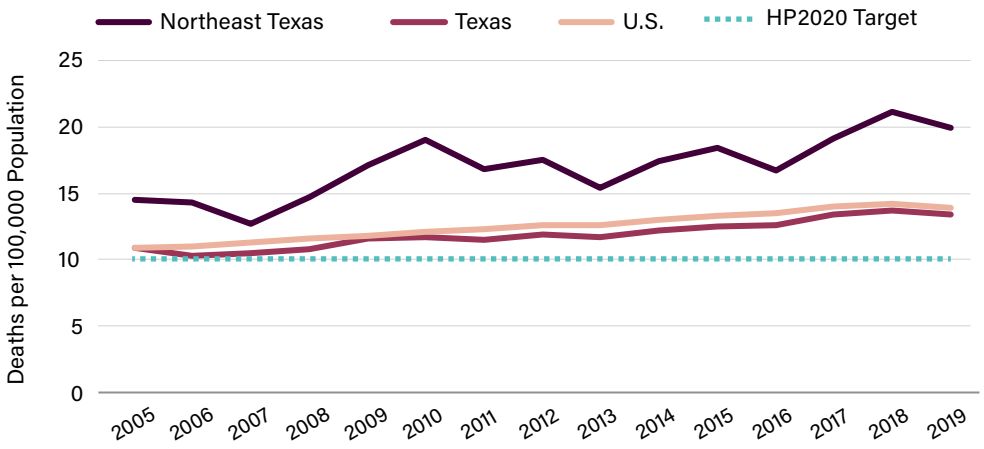
Suicide

Typically, suicide is an outcome of a mental health condition such as a mood, personality, or substance use disorder (46). Since 2005, suicide rates in Northeast Texas have been consistently higher than those in Texas overall and in the U.S. and have been trending upwards (Figure 83). In 2019, the suicide rate in Northeast Texas was 49% higher than in Texas overall.

Suicide rates in Northeast Texas were 2.5 times higher for Non-Hispanic Whites than Non-Hispanic Blacks (Figure 84). However, data on hospitalizations suggest cause for concern regarding suicide among the Non-Hispanic Black population in Northeast Texas. The hospitalization rate for suicide-related injury among Non-Hispanic Blacks in Northeast Texas was nearly double the rate among Non-Hispanic Blacks in Texas overall (Figure 86).

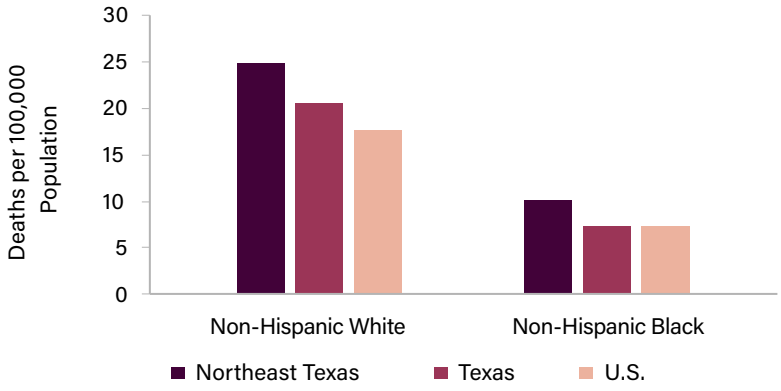
Looking at rates by sex, Northeast Texas males were 3.5 times more likely to die by suicide than females (Figure 85), and unlike in the state as a whole, were also more likely to be hospitalized for a suicide-related injury (Figure 87).

Figure 83. Age-Adjusted Suicide Rates: Northeast Texas, Texas, and U.S. (2005-2019)



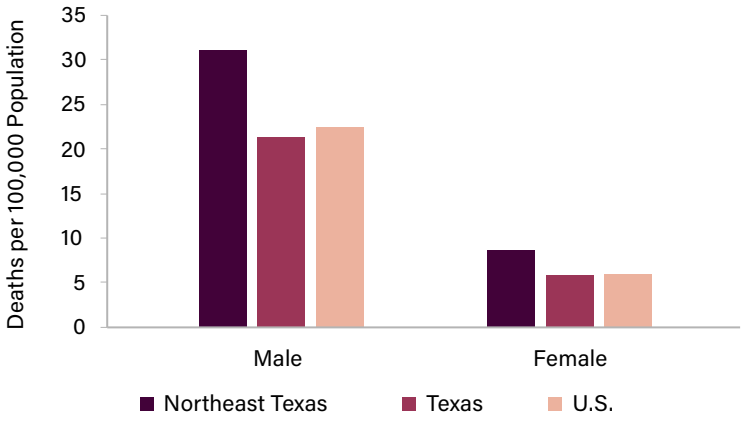
Data source: National Center for Health Statistics on CDC WONDER database.

Figure 84. Age-Adjusted Suicide Mortality Rates by Race: Northeast Texas, Texas, and U.S. (2019)



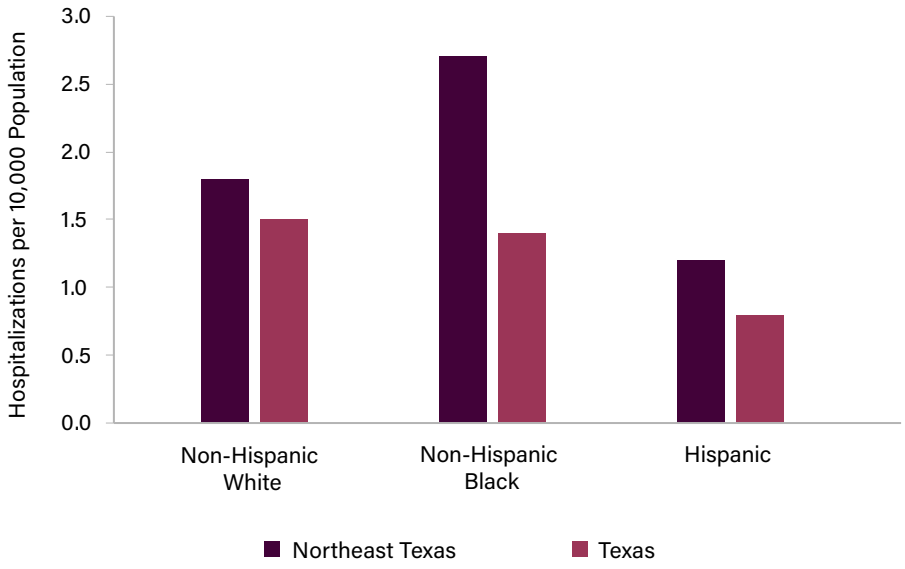
Data source: National Center for Health Statistics on CDC WONDER database.

Figure 85. Age-Adjusted Suicide Mortality Rates by Sex: Northeast Texas, Texas, and U.S. (2019)



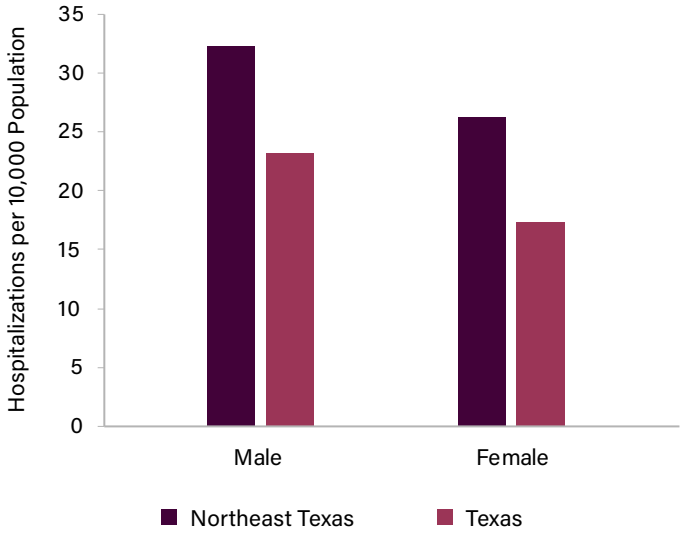
Data source: National Center for Health Statistics on CDC WONDER database.

Figure 86. Hospital Discharge Rates for Suicide-Related Injury by Race or Hispanic Ethnicity: Northeast Texas and Texas (2019)



Data source: Texas Outpatient Services Public Use Data File, 2019. Texas Department of State Health Services, Center for Health Statistics, Austin, Texas. Based on hospital records listing ICD-10 code T14.91, Z91.5, X71, X72, X73, X74, X75, X76, X77, X78, X79, X80, X81, X82, X83 as the reason for visit or any diagnosis codes.

Figure 87. Hospital Discharge Rates for Suicide-Related Injury by Sex: Northeast Texas, Texas, and U.S. (2019)

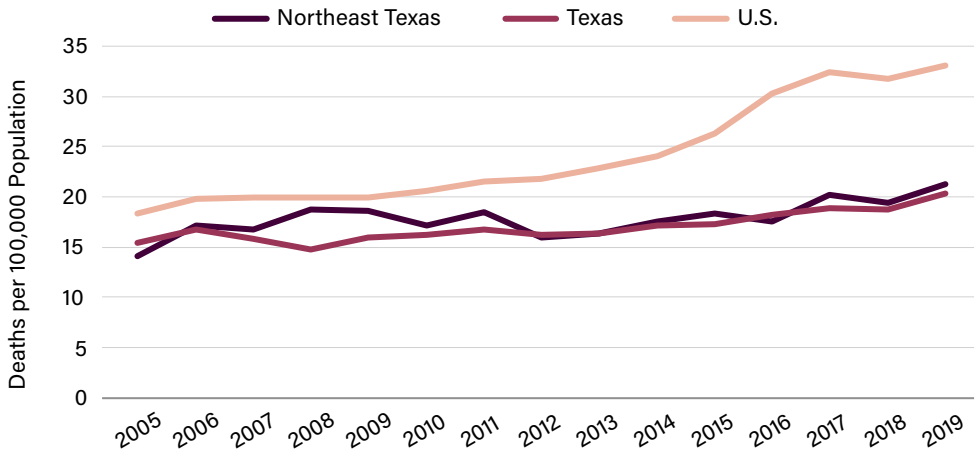


Data source: Texas Outpatient Services Public Use Data File, 2019. Texas Department of State Health Services, Center for Health Statistics, Austin, Texas. Based on hospital records listing ICD-10 code T14.91, Z91.5, X71, X72, X73, X74, X75, X76, X77, X78, X79, X80, X81, X82, X83 as the reason for visit or any diagnosis codes.

Alcohol and Drug Abuse

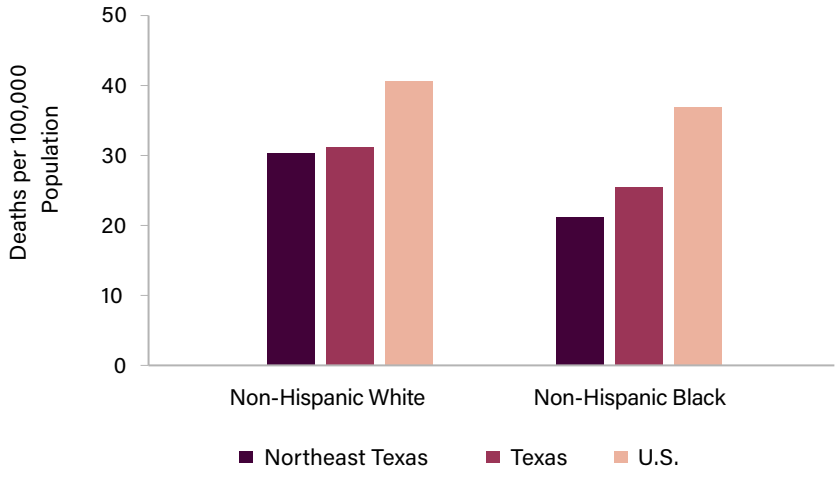
Heavy use of alcohol can contribute to unintentional injuries (such as those resulting from motor vehicle crashes), intentional injuries (such as sexual assault, homicide and suicide), and the development of several chronic diseases (47). Mortality rates related to alcohol or drug use in Northeast Texas have been similar to those seen in Texas overall, and lower than those of the U.S. (Figure 88). Rates are higher for Non-Hispanic Whites than for Non-Hispanic Blacks (Figure 89), and higher for men than for women (Figure 90). The percent of adults who reported past month binge drinking in Northeast Texas has consistenly been lower than in Texas overall (Figure 91).

Figure 88. Age-Adjusted Mortality Rates Due to Alcohol/Drug Use: Northeast Texas, Texas, and U.S. (2005-2019)



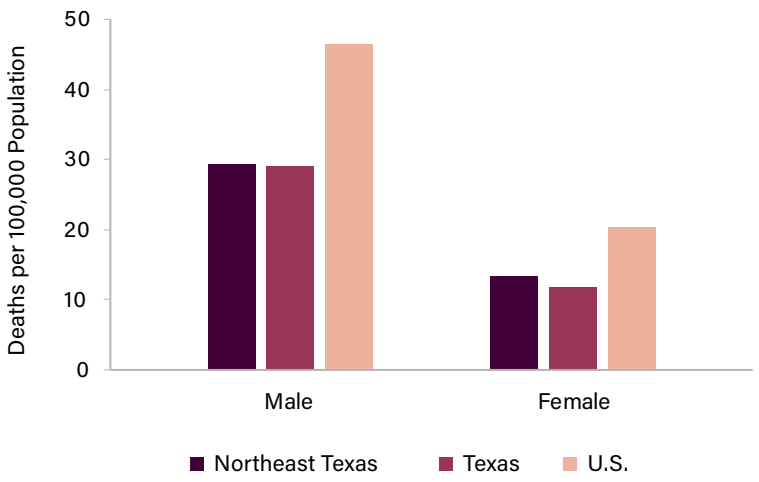
Data source: National Center for Health Statistics on CDC WONDER database.

Figure 89. Age-Adjusted Mortality Rates Due to Alcohol/Drug Use by Race: Northeast Texas, Texas, and U.S. (2019)



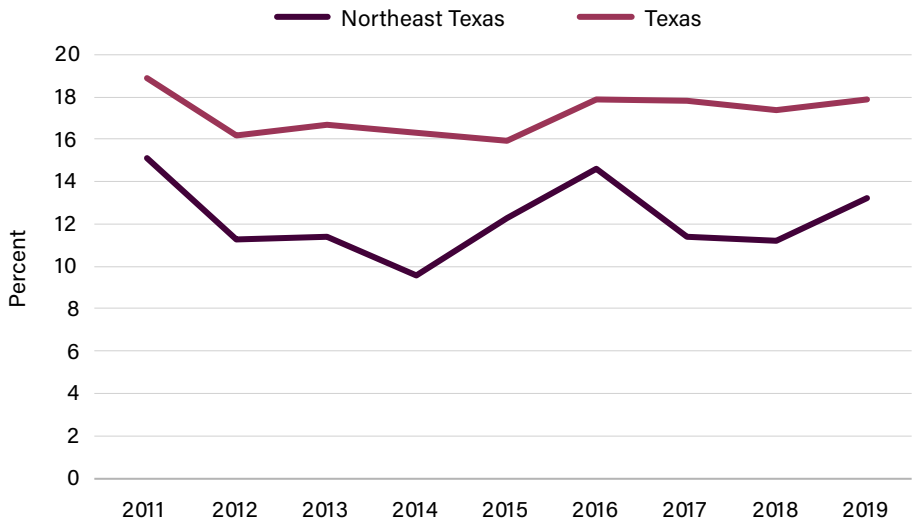
Data source: National Center for Health Statistics on CDC WONDER database.

Figure 90. Age-Adjusted Mortality Rates Due to Alcohol/Drug Use by Sex: Northeast Texas, Texas, and U.S. (2019)



Data source: National Center for Health Statistics on CDC WONDER database.

Figure 91. Estimated Percentage of Adults who Engaged in Binge Drinking in Past Month: Northeast Texas and Texas (2011-2019)



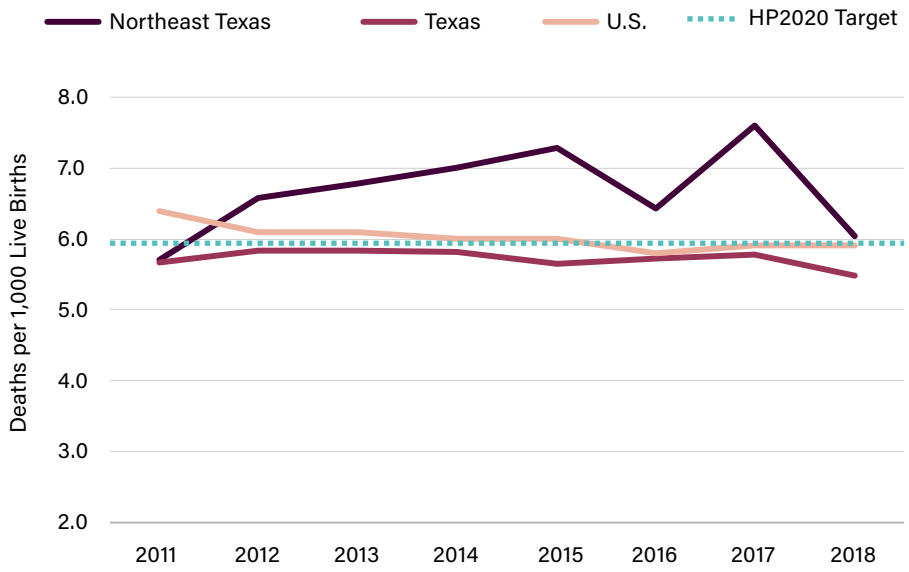
Data source: Behavioral Risk Factor Surveillance System (BRFSS), Center for Health Statistics, Texas Department of State Health Services.

BIRTH OUTCOMES & INFANT HEALTH

Infant Mortality

Infant mortality is defined as death to an infant in the first year of life. A key population health indicator, the infant mortality rate reflects not only the health and well-being of infants, but also the community at large. The HP2020 objective for this health outcome is to reduce the infant mortality rate to 6.0 per 1,000 live births, which the U.S. reached in 2013 (48). In Northeast Texas, the infant mortality rate in 2018 was 6.0 infant deaths per 1,000 live births, compared with 5.5 in Texas overall (Figure 92).

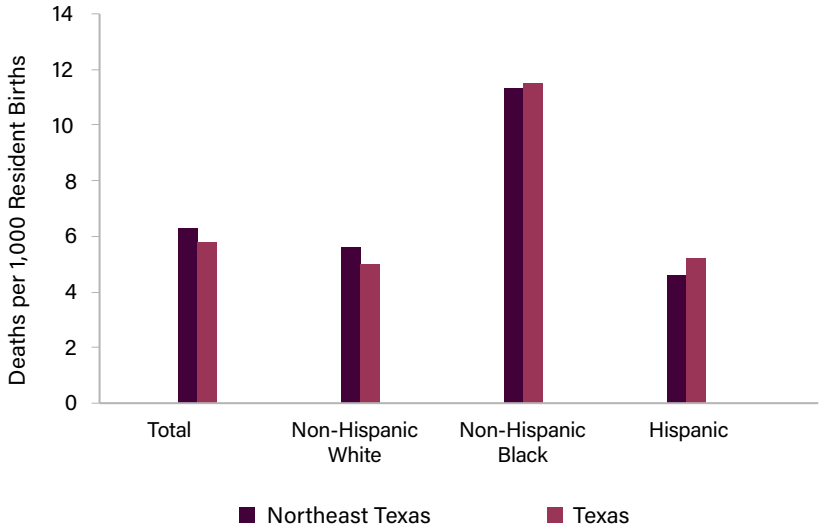
Figure 92. Infant Mortality Rates: Northeast Texas and Texas (2011-2018)



Data source: Texas & Northeast Texas – 2011-2018 Birth & Death File, analysis by authors; U.S.- Texas Department of State Health Services 2020 Healthy Texas Mothers and Babies Data Book

One of the most tragic of racial health disparities in the U.S. is that found in infant mortality rates. The higher rates of Non-Hispanic Black infant mortality in the U.S. overall are reflected in both Texas and Northeast Texas (Figure 93). In 2018 infant mortality rate for Non-Hispanic Blacks was 60% greater than for Non-Hispanic Whites and 88% greater than for Hispanics (Figure 93).

Figure 93. Infant Mortality Rates by Race or Hispanic Ethnicity: Northeast Texas and Texas (2018)

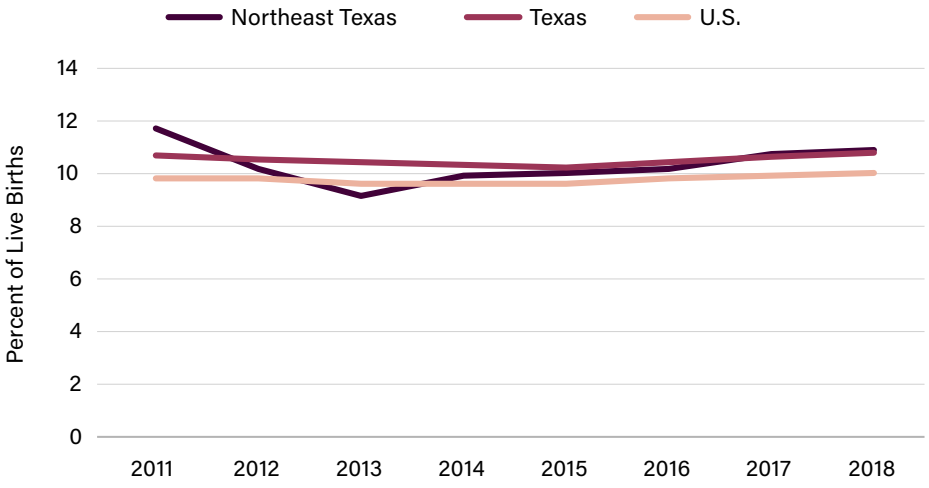


Data source: 2011-2018 Birth & Death File, analysis by authors

Preterm Birth

Being born prematurely is the leading cause of infant death, and increases the risk of a number of conditions, including long-term neurological disabilities, developmental delays, and problems with breathing, feeding, vision and hearing (49). Preterm birth is defined as less than 37 completed weeks of gestation. The data presented here uses the obstetric estimation of gestation. In 2018, approximately 11% of babies in Northeast Texas were born premature, a percentage similar to that in the state overall, and greater than in the U.S. (Figure 94).

Figure 94. Preterm Births: Northeast Texas, Texas, and U.S. (2011-2018)

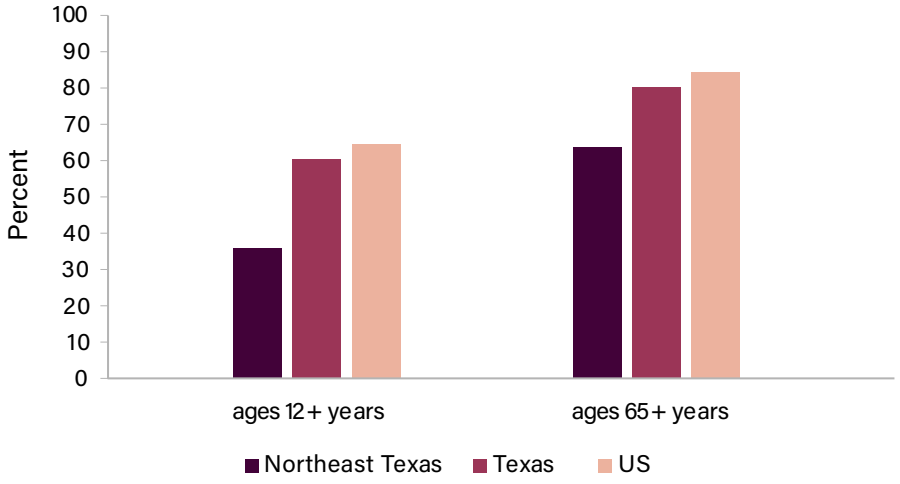


Data sources: Northeast Texas - 2011-2018 Birth File, analyzed by authors; Texas & U.S. – Texas Department of State Health Services 2020 Healthy Texas Mothers and Babies Data Book.

COVID-19

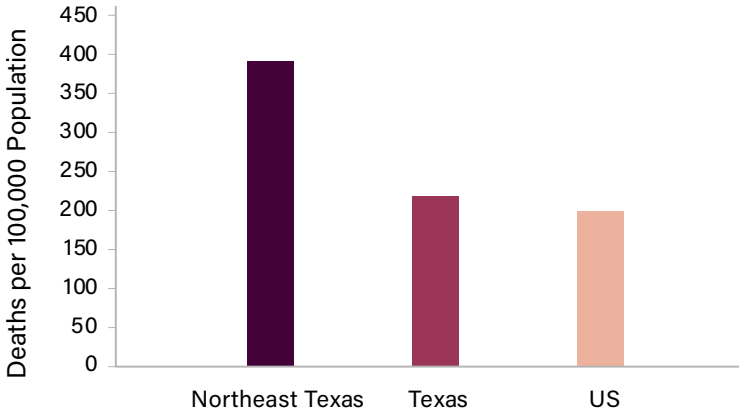
This report was prepared during the worldwide COVID-19 pandemic. A wide range of epidemiological measures are used to monitor the disease spread, impact and control. This report includes measures of vaccination prevalence and the COVID mortality rate through November 22, 2021. At that time, Northeast Texas residents aged 12 and older were 32% less likely to be fully vaccinated compared to the same age population in Texas overall (44.4% vs. 65.4%) (Figure 95). Among those 65 years and older, Northeast Texas residents were 17% less likely than same-aged Texans to be fully vaccinated (Figure 95). At 399 deaths per 100,000 population, the COVID-19 mortality rate for Northeast Texas through November 22, 2021 (approximately 21 months) was 60% higher than the Texas rate (249 per 100,000) (Figure 96). If Northeast Texas were a state, it would rank worst of all U.S. states both in COVID-19 vaccination (with the lowest prevalence) and mortality rate (with the highest rate).

Figure 95. COVID-19 Vaccination Prevalence: Northeast Texas, Texas, and U.S. (through 11/22/2021)



Data Sources: Texas: DSHS Center for Health Statistics COVID-19 Vaccine Administration Data (Updated: 9/30/2021) National: The U.S. Centers for Disease Control and Prevention. https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-total-admin-rate-total

Figure 96. COVID-19 Mortality Rates: Northeast Texas, Texas, and U.S. (through 11/22/2021)



Data Source: Texas: DSHS Center for Health Statistics COVID-19 Vaccine Administration Data (Updated: 9/30/2021) National: The U.S. Centers for Disease Control and Prevention. https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-total-admin-rate-total

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APPENDIX

Data Sources

Cancer Registry Data

The Texas Cancer Registry (TCR) is a statewide population-based registry that serves as the foundation for measuring the Texas cancer burden, comprehensive cancer control efforts, health disparities, progress in prevention, diagnosis, treatment, and survivorship, as well as supports a wide variety of cancer-related research. http://www.cancer-rates.info/tx/index.php

The United States Cancer Statistics (USCS) are the official federal statistics on cancer incidence from registries having high-quality data and cancer mortality statistics for 50 states and the District of Columbia. USCS are produced by the Centers for Disease Control and Prevention (CDC) and the National Cancer Institute (NCI). http://wonder.cdc.gov/cancer.html.

County Health Rankings and Roadmaps

The County Health Rankings & Roadmaps project generates two county-level composite measures related to health. These measures are based on a model of community health that takes into account contributions of the many factors that influence health. The project is supported by the Robert Wood Johnson Foundation and is implemented by the University of Wisconsin Population Health Institute. https://www.countyhealthrankings.org/app/texas/2021/downloads

COVID Data

Texas and Northeast Texas COVID-19 data were sourced from DSHS Center for Health Statistics. Fatality data are based on death certificates. A fatality is counted as a COVID-19 fatality when the medical certifier attests on the death certificate that COVID-19 is a cause of death. Vaccination data are based on data entered into ImmTrac2, the Texas Immunization Registry, which requires health care providers enter COVID vaccination information within 24 hours after a dose is administered. https://dshs.texas.gov/coronavirus/AdditionalData.aspx

US COVID-19 death rate and immunization rate was sourced from the U.S. Centers for Disease Control and Prevention COVID Data Tracker. https://covid.cdc.gov/covid-data-tracker/#datatracker-home

Demographic and Socioeconomic Data

The Texas Demographic Center produces and disseminates population estimates and projections for Texas and its counties and places. https://demographics.texas.gov/

The United States Census Bureau is a principal agency of the U.S. Federal Statistical System, responsible for producing data about the American people and economy. The Decennial Census of Population and Housing counts every resident in the United States and takes place every 10 years. The American Community Survey (ACS) is a mandatory, ongoing statistical survey that samples a small percentage of the population every year. The ACS collects information such as age, race, income, employment status, disability status, use of federal public assistance benefits, occupation, computer and Internet access, and health insurance coverage. https://data.census.gov/cedsci/

Feeding America produces modeled estimates of food insecurity at the county level. The relationship between food insecurity and its closely linked indicators (poverty, unemployment, homeownership, disability prevalence, etc.) are first analyzed at the state level. Then, the coefficient estimates from this analysis are used in conjunction with the same variables for every county and congressional district. Together, these variables are used to generate estimated food insecurity rates for individuals and children at the local level. https://map.feedingamerica.org/

Health Behavior Data

The Behavior Health Risk Factor Surveillance System (BRFSS) is a federally supported landline and cellular telephone survey that collects data from Texas residents about their health-related risk behaviors, chronic health conditions, and use of preventive services. https://healthdata.dshs.texas.gov/dashboard/surveys-and-profiles/behavioral-risk-factor-surveillance-system

The School Physical Activity and Nutrition (SPAN) Project is a Texas-wide surveillance system which monitors school-aged children. Funded by the Texas Department of State Health Services, and conducted by the Michael & Susan Dell Center for Healthy Living at The University of Texas Health Science Center at Houston (UTHealth) School of Public Health in Austin, SPAN survey data was collected using a cross-sectional questionnaire. https://span-interactive.sph.uth.edu/

Health Professions Data

The Health Professions Resource Center was established in 1989 and was transferred from the Texas Department of Health to the Statewide Health Coordinating Council in 1997. Administrative oversight is provided by the Center for Health Statistics, Texas Department of State Health Services. It is the mission of the Health Professions Resource Center to be the primary source of health workforce information in the State of Texas. https://www.dshs.texas.gov/chs/hprc/

Hospital Discharge Data

The Texas Health Care Information Council (THCIC) collects hospital discharge data from all state licensed hospitals except those that are statutorily exempt from the reporting requirement. Exempt hospitals include those located in a county with a population less than 35,000, or those located in a county with a population more than 35,000 and with fewer than 100 licensed hospital beds and not located in an area that is delineated as an urbanized area by the United States Bureau of the Census. Exempt hospitals also include hospitals that do not seek insurance payment or government reimbursement. THCIC is part of the Texas Department of State Health Services (DSHS). https://www.dshs.texas.gov/thcic/hospitals/Inpatientpudf.shtm

Infectious Disease Data

The Infectious Disease Prevention Section (IDPS) of the Texas Department of State Health Services (DSHS) is responsible for assisting local or regional public health officials in investigating outbreaks of acute infectious disease. The program conducts routine and special morbidity surveillange of diseases designated by the Board of Health as reportable including HIV and Tuberculosis.

The Texas Department of State Health Services Immunization Branch collects the immunization status of children and the number of conscientious exemption affidavit forms filed at the private school and ISD level via a mailed survey to approximately 1,300 independent school districts and 800 accredited private schools in Texas. The data is self-reported and although the Annual Report of Immunization Status is mandated by law not all schools participate each year.

Maternal and Infant Health Data

The following population health indictors are derived from the Texas Birth File: 1) percentage of births to a woman who received prenatal care in the first trimester; 2) percentage of births where mother smoked during pregnancy; 3) Percent of births to a woman who was obese pre-pregnancy. Infant mortality rates are derived from the Texas Birth & Death File. For Northeast Texas, these measures were analyzed by the authors. For Texas, these measures were obtained from the Texas Department of State Health Services 2020 Healthy Texas Mothers and Babies Data Book, available at: https://www.dshs.texas.gov/healthytexasbabies/data.aspx. For the U.S., these measures were obtained from CDC WONDER online database. https://wonder.cdc.gov/natality.html

Mortality Data

Mortality data are based on information from all death certificates filed in the fifty states and the District of Columbia. Deaths of nonresidents (e.g. nonresident aliens, nationals living abroad, residents of Puerto Rico, Guam, the Virgin Islands, and other territories of the U.S.) and fetal deaths are excluded. Mortality data from the death certificates are coded by the states and provided to the National Center for Health Statistics (NCHS) through the Vital Statistics Cooperative Program or coded by NCHS from copies of the original death certificates provided to NCHS by the State registration offices. http://wonder.cdc.gov/ucd-icd10.html

Motor Vehicle Crash Data

Texas Department of Motor Vehicles maintains a database of all reportable motor vehicle traffic crashed in Texas collected from Texas Peace Officer's Crash Reports (CR-3). A reportable motor vehicle crash is any crash involving a motor vehicle in transport that occurs or originates on a traffic way, results in injury to or death of any person, or damage to the property of any on person to the apparent extent of $1,000. https://cris.dot.state.tx.us/public/Query/app/home

Definitions

Age adjustment (age standardization)
The rates of almost all causes of disease, injury, and death vary by age. Age adjustment is a technique to minimize the effects of differences in age composition when comparing rates for different populations, or for one population at different points in time. Age-adjusted rates are calculated by applying age-specific rates in a population of interest to a standard age distribution, to eliminate differences in observed rates that result from age differences in population composition. The standard age distribution in current use is the projected year 2000 U.S. resident population. Age-adjusted rates should be viewed as relative indexes rather than actual measures of risk.

Age-specific rate
Rate obtained for specific age groups. The numerator and denominator refer to the same age group.

Cause of death
Any condition which leads to or contributes to death and is classifiable according to the tenth revision of The International Classification of Diseases (ICD-10).

Count
The number of health events, such as a death or a reported disease incident, that occurred within a specified time period.

Healthy People 2020
Healthy People provides science-based, 10-year objectives for improving the health of all Americans. Healthy People is managed by the Office of Disease Prevention and Health Promotion (ODPHP) within the U.S. Department of Health and Human Services (HHS).

Incidence rate
The rate at which new events occur in a population. The numerator is the number of new events that occur in a defined period of time. The denominator is the population at risk of experiencing the event during this time period.

International Classification of Diseases (ICD)
The purpose of the ICD is to promote international comparability in the collection, classification, processing, and presentation of health statistics. The ICD is used to code and classify cause-of-death data. The ICD is developed collaboratively by the World Health Organization and 10 international centers, one of which is housed at the National Center for Health Statistics. ICD-10 is the 10th edition of the International Classification of Diseases, which has been in use since January 1, 1999.

Infant death
Death of an individual less than one year of age.

Live birth
The complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which after such separation, breathes or shows any other evidence of life such as beating of the heart, pulsation of umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached.

Modifiable risk factor

A risk factor is an attribute, characteristic or exposure of an individual that increases the likelihood of developing a disease or injury. Modifiable risk factors are those that can be changed to reduce a person's disease or injury risk.

Mortality rate

The frequency of occurrence of death in a defined population during a specified interval. Mortality rates are typically calculated as the number of deaths in one year, divided by an estimate of the population size at mid-year, multiplied by 100,000. Throughout this report, age-adjusted mortality rates are used (see age adjustment).

Obesity

Abnormal or excessive fat accumulation that may impair health, commonly defined as having a Body Mass Index (BMI) equal to or more than 30.

Prevalence

The total number of people in a population who have an attribute or disease at a point in time or during a given time period, divided by the population at risk of having the attribute or disease at that time or midway through the period. Prevalence estimates are typically used to describe the frequency of a health behavior or the burden of a disease in a population.

Underlying cause of death

The disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury.

Data tables

Table A-1. Age-Adjusted All-Cause Mortality Rates: Northeast Texas, Texas and U.S. (2005-2019)

Year	Northeast Texas	Texas	U.S.
2005	918.7	832.1	815.0
2006	904.1	807.7	791.8
2007	925.6	803.1	775.3
2008	941.2	803.6	774.9
2009	911.9	772.1	749.6
2010	913.5	772.3	747.0
2011	895.8	751.6	741.3
2012	900.2	753.3	732.8
2013	893.1	751.6	731.9
2014	889.7	745.3	724.6
2015	908.0	745.0	733.1
2016	879.3	730.6	728.8
2017	898.2	735.7	731.9
2018	883.7	731.8	723.6
2019	874.6	717.8	715.2

Data source: National Center for Health Statistics on CDC WONDER database. Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

Table A-2. Age-Adjusted All-Cause Mortality Rates by Sex, Race, and Ethnicity: Northeast Texas, Texas and U.S. (2019)

	Northeast Texas	Texas	U.S.	% difference: Northeast Texas vs. Texas
Male	1020.0	848.0	846.7	20.3
Female	741.1	605.8	602.7	22.3
Non-Hispanic White	895.6	765.8	736.8	16.9
Non-Hispanic Black	1006.0	881.3	870.7	14.1
Hispanic	453.4	602.8	523.8	-24.8

Data source: National Center for Health Statistics on CDC WONDER database. Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

Table A-3. All-Cause Mortality Rates by Age: Northeast Texas, Texas and U.S. (2019)

	Northeast Texas	Texas	U.S.	% difference: Northeast Texas vs. Texas
1-4 years	36.6	26.0	23.3	40.8
5-14 years	18.8	13.8	13.4	36.2
15-24 years	101.0	70.8	69.7	42.7
25-34 years	149.6	106.1	128.8	41.0
35-44 years	283.0	174.7	199.2	62.0
45-54 years	556.7	374.6	392.4	48.6
55-64 years	1254.5	897.7	883.3	39.7
65-74 years	2288.4	1856.5	1764.6	23.3
75-84 years	5203.7	4472.6	4308.3	16.3
85+ years	13725.1	13038.8	13228.6	5.3

Data source: National Center for Health Statistics on CDC WONDER database. Rates are per 100,000 population.

HEART DISEASE DATA TABLES

Table A-4. Age-Adjusted Heart Disease Mortality Rates: Northeast Texas, Texas and U.S. (2005-2019)

Year	Northeast Texas	Texas	U.S.
2005	253.2	220.4	216.8
2006	239.7	205.2	205.5
2007	248.7	200.1	196.1
2008	234.3	191.7	192.1
2009	226.4	184.1	182.8
2010	224.4	181.1	179.1
2011	227.5	172.5	173.7
2012	222.6	171.3	170.5
2013	226.0	170.7	169.8
2014	226.4	169.9	167.0
2015	230.8	171.6	168.5
2016	227.8	167.7	165.5
2017	233.9	169.2	165.0
2018	233.1	170.0	163.6
2019	207.9	163.4	161.5

Data source: National Center for Health Statistics on CDC WONDER database. ICD10 codes I00-I09,I11,I13,I20-I51.
Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

Table A-5. Age-Adjusted Coronary Heart Disease Mortality Rates: Northeast Texas, Texas and U.S. (2005-2019)

Year	Northeast Texas	Texas	U.S.
2005	175.8	152.6	148.2
2006	163.2	136.9	138.3
2007	164.7	129.9	129.2
2008	153.4	122.9	126.1
2009	148.3	115.7	117.7
2010	143.7	112.5	113.6
2011	140.3	105.9	109.2
2012	133.7	102.2	105.4
2013	133.9	101.3	102.6
2014	127.2	98.7	98.8
2015	128.2	96.9	97.2
2016	124.1	94.4	94.3
2017	130.8	94.6	92.9
2018	130.9	94.7	90.9
2019	124.3	89.9	88.0

Table A-6. Age-Adjusted Coronary Heart Disease Mortality Rates by Sex, Race, and Ethnicity: Northeast Texas, Texas and U.S. (2019)

	Northeast Texas	Texas	U.S.
Male	162.2	123.3	120.4
Female	91.7	62.6	61.5
Non-Hispanic White	126.6	96.0	90.6
Non-Hispanic Black	151.3	104.7	102.5
Hispanic	67.1	77.3	67.8

Data source: National Center for Health Statistics on CDC WONDER database. ICD10 codes I00-I09,I11,I13,I20-I51.
Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

CANCER DATA TABLES

Table A-7. Age-Adjusted Invasive Cancer Incidence Rates: Northeast Texas, Texas and U.S. (2009-2018)

Year	Northeast Texas	Texas	U.S.
2009	454.0	449.4	479.1
2010	435.8	432.6	468.0
2011	446.8	425.1	469.1
2012	458.8	420.3	456.0
2013	447.1	416.2	454.5
2014	450.6	415.1	451.5
2015	455.6	412.3	452.6
2016	457.7	408.0	447.8
2017	455.0	409.8	437.8
2018	451.1	408.6	435.8

Table A-8. Age-Adjusted Invasive Cancer Incidence Rates by Sex, Race, and Ethnicity: Northeast Texas, Texas and U.S. (2018)

	Northeast Texas	Texas	U.S.
Male	510.3	451.6	469.9
Female	403.6	378.2	413.2
Non-Hispanic White	468.4	446.8	452.6
Non-Hispanic Black	447.9	442.9	437.1
Hispanic	289.0	335.1	335.2

Data source (Both tables): Northeast Texas - Texas Cancer Registry, Texas Department of State Health Services. Texas and National – U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database.
Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

Table A-9. Age-Adjusted Cancer Mortality Rates: Northeast Texas, Texas and U.S. (2009-2018)

Year	Northeast Texas	Texas	U.S.
2009	183.6	164.6	173.4
2010	185.2	164.8	171.8
2011	183.0	161.7	168.8
2012	182.7	159.7	166.4
2013	174.3	157.2	163.3
2014	161.1	153.6	161.4
2015	164.5	150.1	158.9
2016	167.5	149.1	156
2017	166.6	146.6	152.6
2018	161.0	142.3	149.2

Table A-10. Age-Adjusted Invasive Cancer Mortality Rates by Sex, Race, and Ethnicity: Northeast Texas, Texas and U.S. (2018)

	Northeast Texas	Texas	U.S.
Male	197.3	170.9	177.2
Female	131.8	121.0	128.6
Non-Hispanic White	170.9	155.9	157.5
Non-Hispanic Black	178.1	176.7	178.9
Hispanic	95.6	118.1	109.5

Data source (Both tables): Northeast Texas - Texas Cancer Registry, Texas Department of State Health Services. Texas and National – U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database.
Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

Table A-11. Age-Adjusted Invasive Cancer Incidence Rates by Site: Northeast Texas, Texas and U.S. (2018)

Site	Northeast Texas	Texas	U.S.
All Sites	451.1	408.6	435.8
Lung	66.5	48.7	55.2
Colorectal	42.0	37.6	36.8
Female Breast	113.6	114.2	125.1
Prostate	104.5	102.6	106.5
Pancreas	13.1	12.8	12.9
Liver	9.0	10.6	6.8
Cervical	11.8	9.1	7.5
Melanoma	13.6	13.6	22.7

Table A-12. Age-Adjusted Cancer Mortality Rates by Site: Northeast Texas, Texas and U.S. (2018)

Site	Northeast Texas	Texas	U.S.
All Sites	161.0	142.3	149.2
Lung	42.1	30.4	34.8
Colorectal	14.7	13.6	13.1
Female Breast	20.1	19.9	19.8
Prostate	13.6	17.4	18.9
Pancreas	10.4	10.0	11.1
Liver	6.5	6.5	4.8
Cervical	3.9	2.7	2.2
Melanoma	1.9	1.9	2.1

Data source (Both tables): Northeast Texas - Texas Cancer Registry, Texas Department of State Health Services. Texas and National – U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database. Rates are age-adjusted to the 2000 U.S. Standard Population.

Table A-13. Age-Adjusted Lung Cancer Mortality Rates by County: Northeast Texas (2018)

County	Incidence Rate
Anderson	49.1
Angelina	36.9
Bowie	45.2
Camp	*
Cass	51.5
Cherokee	42.4
Delta	*
Franklin	*
Gregg	36.8
Harrison	50.5
Henderson	33.7
Hopkins	31.4
Houston	47.6
Jasper	46.7
Lamar	54.2
Marion	*
Morris	*
Nacogdoches	27.2
Newton	78.6
Panola	*
Polk	83.2
Rains	*
Red River	*
Rusk	31.5
Sabine	*
San Augustine	*
San Jacinto	34.6
Shelby	60.0
Smith	38.7
Titus	*
Trinity	71.2
Tyler	48.7
Upshur	33.9
Van Zandt	30.3
Wood	39.4
Northeast Texas	42.1
Texas	30.4
U.S.	34.8

Data sources: Northeast Texas - Texas Cancer Registry, Texas Department of State Health Services. Texas and National – U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database.

Rates are per 100,000 population.

Rates are age-adjusted to the 2000 U.S. Standard Population.

*County level data is unavailable.

Table A-14. Age-Adjusted Lung Cancer Mortality Rates by Sex, Race, and Ethnicity: Northeast Texas (2009-2018)

Year	Non-Hispanic White	Non-Hispanic Black	Male	Female
2009	59.1	69.6	75.5	46.0
2010	57.5	63.0	76.4	42.0
2011	63.2	58.8	81.0	43.5
2012	58.6	53.8	73.3	41.6
2013	54.1	48.3	68.6	37.8
2014	48.9	43.9	59.4	35.9
2015	51.6	41.0	60.2	38.3
2016	51.0	51.3	65.1	36.5
2017	47.9	42.1	56.1	35.5
2018	43.9	47.6	51.6	34.6

Data source: Texas Cancer Registry, Texas Department of State Health Services.
Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

Table A-15. Age-Adjusted Colorectal Cancer Mortality Rates by Sex, Race, and Ethnicity: Northeast Texas, Texas and U.S. (2018)

	Northeast Texas	Texas	U.S.
Male	18.8	16.9	15.8
Female	11.1	10.7	10.9
Non-Hispanic White	14.7	13.5	13.1
Non-Hispanic Black	17.4	18.6	17.3

Data source: Northeast Texas - Texas Cancer Registry, Texas Department of State Health Services. Texas and National – U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database.
Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

Table A-16. Age-Adjusted Female Breast Cancer Mortality Rates by Race: Northeast Texas, Texas and U.S. (2018)

	Northeast Texas	Texas	U.S.
Non-Hispanic White	18.2	20.5	19.8
Non-Hispanic Black	33.9	29.8	27.7

Data source: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute on CDC WONDER database.
Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

CHRONIC LOWER RESPIRATORY DISEASE DATA TABLES

Table A-17. Age-Adjusted Mortality Rates for COPD in Adults ≥45 Years-Old: Northeast Texas, Texas and U.S. (2005-2019)

Year	Northeast Texas	Texas	U.S.
2005	149.2	121.2	120.6
2006	131.2	112.3	112.7
2007	147.4	116.7	113.9
2008	171.7	125.2	123.5
2009	164.5	118.0	117.9
2010	150.0	120.0	116.6
2011	147.5	117.8	117.7
2012	156.2	118.6	114.8
2013	157.5	117.9	116.5
2014	159.2	112.7	111.7
2015	171.9	114.9	115.1
2016	166.2	110.3	112.3
2017	178.9	112.7	113.4
2018	170.8	110.5	110.0
2019	177.1	108.0	105.6

Table A-18. Age-Adjusted Mortality Rates for COPD in Adults ≥45 Years-Old by Sex and Race: Northeast Texas, Texas and U.S. (2019)

	Northeast Texas	Texas	U.S.
Male	203.4	119.7	116.2
Female	157.9	99.5	98.0
Non-Hispanic White	199.0	141.1	121.5
Non-Hispanic Black	101.4	85.0	75.1

Data source: National Center for Health Statistics on CDC WONDER database.

COPD: Chronic Obstructive Pulmonary Disease (ICD10 codes: J40-J44). Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

Table A-19. Asthma Hospitalization Rates by Age Group: Northeast Texas and Texas (2019)

Age Group (years)	Northeast Texas	Texas
0-17	6.0	6.6
18-44	2.7	2.1
45-54	5.7	4.0
55-64	3.0	3.9
65-74	3.4	4.2
75+	4.5	5.5

Data source: Texas Hospital Inpatient Discharge Public Use Data Files. Center for Health Statistics, Texas Department of State Health Services. Hospital discharges were based on ICD-9 codes for asthma listed as the primary diagnosis (493).

Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

STROKE DATA TABLES

Table A-20. Age-Adjusted Stroke Mortality Rates: Northeast Texas, Texas and U.S. (2005-2019)

Year	Northeast Texas	Texas	U.S.
2005	58.8	52.4	48.0
2006	55.9	50.4	44.8
2007	61.5	51.4	43.5
2008	60.2	49.2	42.1
2009	56.0	45.2	39.6
2010	55.5	44.4	39.1
2011	55.6	41.9	37.9
2012	55.5	41.8	36.9
2013	47.5	40.2	36.2
2014	53.2	41.6	36.5
2015	51.6	42.7	37.6
2016	48.4	42.0	37.3
2017	49.9	41.3	37.6
2018	46.4	40.3	37.1
2019	45.5	39.0	37.0

Table A-21. Age-Adjusted Stroke Mortality Rates by Sex, Race, and Ethnicity: Northeast Texas, Texas and U.S. (2019)

	Northeast Texas	Texas	U.S.
Male	43.2	40.6	37.6
Female	46.3	37.1	35.8
Non-Hispanic White	44.7	38.7	35.6
Non-Hispanic Black	61.4	54.6	52.5
Hispanic	27.5	34.5	32.8

Data source: National Center for Health Statistics on CDC WONDER database.
Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

UNINTENTIONAL INJURY DATA TABLES

Table A-22. Age-Adjusted Unintentional Injury Mortality Rates: Northeast Texas, Texas and U.S. (2005-2019)

Year	Northeast Texas	Texas	U.S.
2005	55.8	40.4	39.5
2006	61.9	41.6	40.2
2007	64.0	42.0	40.4
2008	57.1	40.4	39.2
2009	58.8	40.2	37.5
2010	56.1	39.0	38.0
2011	58.9	38.7	39.1
2012	52.2	37.4	39.1
2013	50.0	37.0	39.4
2014	48.0	37.3	40.5
2015	52.2	37.4	43.2
2016	51.4	38.6	47.4
2017	51.3	38.8	49.4
2018	49.9	37.7	48.0
2019	53.7	39.7	49.3

Table A-23. Unintentional Injury Mortality Rates by Cause of Injury: Northeast Texas and Texas (2019)

	Northeast Texas	Texas
Motor Vehicle Crashes	23.2	13.2
Poisoning	11.2	10.4
Falls	6.1	7.9
Drowning	1.8	1.2

Data source: National Center for Health Statistics on CDC WONDER database.
Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

Table A-24. Age-Adjusted Motor Vehicle Injury Mortality Rate: Northeast Texas, Texas and U.S. (2005-2019)

Year	Northeast Texas	Texas	U.S.
2005	31.1	16.8	15.2
2006	33.4	16.9	15.0
2007	32.9	16.2	14.4
2008	27.8	15.7	12.9
2009	28.7	14.3	11.6
2010	25.7	13.4	11.3
2011	28.2	13.0	11.1
2012	26.6	14.0	11.4
2013	24.3	13.8	10.9
2014	21.8	13.8	10.8
2015	24.9	13.6	11.4
2016	25.7	14.4	12.1
2017	25.0	13.8	12.0
2018	25.3	13.2	11.7
2019	23.2	13.2	11.5

Table A-24. Age-Adjusted Motor Vehicle Injury Mortality Rates by Sex and Race: Northeast Texas, Texas and U.S. (2005-2019)

	Northeast Texas	Texas	U.S.
Male	31.6	19.2	16.7
Female	14.7	7.4	6.5
Non-Hispanic White	25.1	14.8	11.6
Non-Hispanic Black	24.1	14.5	14.5

Data source: National Center for Health Statistics on CDC WONDER database.
Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

Table A-26. Motor Vehicle Crash Rates: Texas and Northeast Texas (2011-2019)

Year	Northeast Texas	Texas
2011	1918	1777
2012	1930	1903
2013	1901	1972
2014	1904	2060
2015	1992	2189
2016	2012	2269
2017	1919	2193
2018	1957	2192
2019	1903	2238

Data source: Texas Department of Motor Vehicles
Rates are per 100,000 population.

Table A-27. Percent of Crashes Resulting in a Fatality or Severe Injury: Texas and Northeast Texas (2011-2019)

Year	Northeast Texas	Texas
2011	4.9	3.2
2012	4.6	3.3
2013	4.6	3.2
2014	4.8	3.1
2015	4.5	2.9
2016	4.9	2.9
2017	5.0	2.9
2018	4.3	2.5
2019	4.3	2.6

Data source: Texas Department of Motor Vehicles.

MENTAL AND BEHAVIORAL HEALTH DATA TABLES

Table A-28. Age-Adjusted Suicide Rates: Northeast Texas, Texas and U.S. (2005-2019)

Year	Northeast Texas	Texas	U.S.
2005	14.5	10.9	10.9
2006	14.3	10.3	11.0
2007	12.7	10.5	11.3
2008	14.7	10.8	11.6
2009	17.1	11.6	11.8
2010	19.0	11.7	12.1
2011	16.8	11.5	12.3
2012	17.5	11.9	12.6
2013	15.4	11.7	12.6
2014	17.4	12.2	13.0
2015	18.4	12.5	13.3
2016	16.7	12.6	13.5
2017	19.1	13.4	14.0
2018	21.1	13.7	14.2
2019	19.9	13.4	13.9

Table A-29. Age-Adjusted Suicide Rates by Sex, Race, and Ethnicity: Northeast Texas, Texas and U.S. (2019)

	Northeast Texas	Texas	U.S.
Male	31.1	21.4	22.4
Female	8.7	5.8	6.0
Non-Hispanic White	24.8	20.6	17.6
Non-Hispanic Black	10.1	7.3	7.4
Hispanic	7.7	7.7	7.3

Data source: National Center for Health Statistics on CDC WONDER database.
Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

Table A-30. Age-Adjusted Mortality Rates due to Alcohol/Drug Use: Northeast Texas, Texas and U.S. (2005-2019)

Year	Northeast Texas	Texas	U.S.
2005	14.1	15.5	18.3
2006	17.2	16.8	19.8
2007	16.7	15.8	19.9
2008	18.8	14.8	20.0
2009	18.6	16.0	20.0
2010	17.2	16.2	20.6
2011	18.5	16.7	21.6
2012	16.0	16.2	21.8
2013	16.4	16.4	22.8
2014	17.5	17.1	24.1
2015	18.3	17.3	26.3
2016	17.5	18.2	30.3
2017	20.2	18.9	32.4
2018	19.4	18.7	31.7
2019	21.3	20.3	33.1

Table A-31. Age-Adjusted Mortality Rates due to Alcohol/Drug Use by Sex and Race: Northeast Texas, Texas and U.S. (2019)

	Northeast Texas	Texas	U.S.
Male	29.2	29.0	46.3
Female	13.3	11.8	20.4
Non-Hispanic White	25.5	26.4	38.4
Non-Hispanic Black	13.9	19.1	33.4

Data source: National Center for Health Statistics on CDC WONDER database.
Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

DIABETES DATA TABLES

Table A-32. Age-Adjusted Mortality Rates for Diabetes as Underlying or Multiple Cause: Northeast Texas, Texas and U.S. (2005-2019)

Year	Northeast Texas	Texas	U.S.
2005	91.0	91.6	77.7
2006	83.9	85.0	75.3
2007	80.3	84.3	74.0
2008	82.2	82.3	73.2
2009	82.5	81.4	70.8
2010	82.8	83.3	70.7
2011	84.1	82.4	70.3
2012	84.8	82.7	69.1
2013	81.2	84.3	69.2
2014	79.6	82.9	67.1
2015	81.8	82.6	67.6
2016	81.1	80.4	67.8
2017	88.2	83.2	69.2
2018	91.5	82.8	69.1
2019	96.9	81.8	69.3

Table A-33. Age-Adjusted Mortality Rates for Diabetes as Underlying or Multiple Cause by Sex, Race, and Ethnicity: Northeast Texas, Texas and U.S. (2019)

	Northeast Texas	Texas	U.S.
Male	117.9	101.9	87.9
Female	78.9	65.5	54.4
Non-Hispanic White	92.2	72.0	64.6
Non-Hispanic Black	151.6	119.6	104.4
Hispanic	70.0	99.1	75.4

Data source: National Center for Health Statistics on CDC WONDER database.
Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

KIDNEY DISEASE DATA TABLES

Table A-34. Age-Adjusted Mortality Rates for Kidney Disease: Northeast Texas, Texas and U.S. (2005-2019)

Year	Northeast Texas	Texas	U.S.
2005	14.6	14.9	14.7
2006	16.1	15.8	14.8
2007	17.6	17	14.9
2008	20.7	17.7	15.1
2009	17.5	17.9	15.1
2010	18.8	18.4	15.3
2011	17.3	15.4	13.4
2012	18.5	15.6	13.1
2013	19.5	15.9	13.2
2014	19.9	16.5	13.2
2015	20.7	16.1	13.4
2016	18.4	15.8	13.1
2017	15.9	16.0	13.0
2018	18.3	16.4	12.9
2019	15.9	14.7	12.7

Table A-35. Age-Adjusted Mortality Rates for Kidney Disease by Sex and Race: Northeast Texas, Texas and U.S. (2019)

	Northeast Texas	Texas	U.S.
Male	18.0	17.6	15.4
Female	13.9	12.4	10.7
Non-Hispanic White	14.2	11.7	11.3
Non-Hispanic Black	29.5	26.8	25.0

Data source: National Center for Health Statistics on CDC WONDER database.
Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

Table A-36. Age-Adjusted Mortality Rates for Alzheimer's Disease: Northeast Texas, Texas and U.S. (2005-2019)

Year	Northeast Texas	Texas	U.S.
2005	25.4	27.4	24.0
2006	25.0	27.9	23.7
2007	27.3	26.8	23.8
2008	32.0	28.6	25.8
2009	34.0	26.6	24.2
2010	32.6	26.8	25.1
2011	29.3	26.6	24.7
2012	27.9	24.6	23.8
2013	30.8	24.3	23.5
2014	29.7	30.0	25.4
2015	37.7	38.2	29.4
2016	36.2	37.8	30.3
2017	38.5	38.5	31.0
2018	36.8	38.4	30.5
2019	35.2	38.6	29.8

Table A-37. Age-Adjusted Mortality Rates for Alzheimer's Disease by Sex and Race: Northeast Texas, Texas and U.S. (2019)

	Northeast Texas	Texas	U.S.
Male	25.4	30.8	23.9
Female	41.8	43.6	33.6
Non-Hispanic White	37.0	42.2	31.4
Non-Hispanic Black	32.7	35.8	27.4

Data source: National Center for Health Statistics on CDC WONDER database.
Rates are per 100,000 population. Rates are age-adjusted to the 2000 U.S. Standard Population.

INFECTIOUS DISEASE DATA TABLES

Table A-38. Tuberculosis Incidence Rates per 100,000 by Race and Ethnicity: Northeast Texas and Texas (2019)

	Northeast Texas	Texas
Overall	2.3	4.0
Non-Hispanic White	1.2	1.0
Non-Hispanic Black	4.8	5.5
Hispanic	2.9	5.3

Data source: Tuberculosis Service Branch, Texas Department of State Health Services.
Rates are per 100,000 population.

Table A-39. HIV Incidence Rates: Northeast Texas, Texas and U.S. (2010-2019)

Year	Northeast Texas	Texas	U.S.
2010	9.8	17.8	16.0
2011	8.9	16.9	15.6
2012	9.5	16.8	15.3
2013	8.5	16.6	14.8
2014	10.2	16.6	14.7
2015	10.1	16.6	14.1
2016	9.9	16.3	14.0
2017	8.4	15.5	13.5
2018	9.2	15.4	13.2
2019	8.6	14.8	12.6

Source: Texas HIV Surveillance Reports, Department of State Health Services. U.S. data source: Centers for Disease Control and Prevention. HIV Surveillance Report, 2019; vol. 26.
Rates are per 100,000 population.

Table A-40. Age-Adjusted HIV Mortality Rates Overall and by Sex and Race: Northeast Texas, Texas and U.S. (2015-2019)

	Northeast Texas	Texas	U.S.
Overall	2.3	2.1	1.6
Male	3.2	3.2	2.5
Female	1.4	1.0	0.9
Non-Hispanic White	1.1	1.3	0.8
Non-Hispanic Black	8.3	7.3	6.9

Rates are per 100,000 population.

Table A-41. Pertussis Incidence Rates: Northeast Texas and Texas (2011-2019)

Year	Northeast Texas	Texas
2011	1.3	3.7
2012	7.6	8.4
2013	6.2	14.8
2014	7.8	9.4
2015	2.7	5.4
2016	1.5	4.6
2017	4.9	6.1
2018	1.4	4.0
2019	0.9	4.4

Table A-42. Varicella Incidence Rates: Northeast Texas and Texas (2011-2019)

Year	Northeast Texas	Texas
2011	5.3	9.9
2012	7.5	9.1
2013	3.7	7.0
2014	2.6	6.0
2015	2.6	5.4
2016	1.3	4.8
2017	1.9	4.0
2018	1.1	3.3
2019	1.8	4.3

Rates are per 100,000 population.

Table A-43. Kindergarten Immunization Rates: Northeast Texas and Texas (2018-2019)

Vaccine	Northeast Texas	Texas
DTP/DTaP/DT/Td	96.5%	96.7%
Hepatitis A	96.5%	96.6%
Hepatitis B	97.7%	97.6%
MMR (2 doses)	96.9%	96.9%
Polio	96.8%	96.9%
Varicella (2 doses)	96.5%	96.3%

Table A-44. 7th Grade Immunization Rates: Northeast Texas and Texas (2018-2019)

Vaccine	Northeast Texas	Texas
Hepatitis B	97.6%	97.0%
Meningococcal	98.6%	98.3%
MMR (2 doses)	99.0%	98.8%
Polio	97.5%	96.9%
Tdap/Td	99.0%	98.9%
Varicella (2 doses)	98.8%	98.7%

MATERNAL AND INFANT HEALTH DATA TABLES

Table A-45. Birth Outcomes and Prenatal Risk Factor Prevalence: Northeast Texas and Texas (2011-2019)

Measure	Year	Northeast Texas	Texas	U.S.
Infant mortality rates	2011	5.7	5.7	6.4
	2012	6.6	5.8	6.1
	2013	6.8	5.8	6.1
	2014	7.0	5.8	6.0
	2015	7.3	5.6	6.0
	2016	6.4	5.7	5.8
	2017	7.6	5.8	5.9
	2018	6.0	5.5	5.9
	2019	5.5	5.5	5.8
Percent of preterm live births*	2011	11.7	10.7	9.8
	2012	10.2	10.5	9.8
	2013	9.1	10.4	9.6
	2014	9.9	10.3	9.6
	2015	10.0	10.1	9.6
	2016	10.2	10.4	9.8
	2017	10.7	10.6	9.9
	2018	10.9	10.8	10.0

Percent of live births to women who received prenatal care in first trimester**	2011	61.8	66.3	-
	2012	60.0	66.2	-
	2013	58.0	66.1	-
	2014	57.4	65.2	-
	2015	61.3	65.9	-
	2016	61.6	65.1	-
	2017	66.7	66.4	-
Percent of live births to women who were obese pre-pregnancy**	2011	27.3	22.9	-
	2012	27.2	23.5	-
	2013	28.0	24.0	-
	2014	27.2	24.4	-
	2015	28.8	25.2	-
	2016	29.8	25.9	-
	2017	32.0	27.0	-
	2018	32.2	28.0	-
	2019	32.8	29.3	-
Percent of live births to women who smoked during pregnancy	2011	14.4	4.6	9.0
	2012	13.7	4.4	8.7
	2013	13.7	4.3	8.5
	2014	12.2	3.9	8.4
	2015	12.1	3.6	7.8
	2016	11.2	3.3	7.2
	2017	10.1	3.0	6.9
	2018	Unavailable	2.7	6.5
	2019	7.8	2.4	6.0

Data source: Texas & Northeast Texas – 2011-2018 Birth & Death File, analysis by authors; U.S.- Texas Department of State Health Services 2020 Healthy Texas Mothers and Babies Data Book

*Preterm birth is determined using the procedure outlined by Healthy People 2020.

**U.S. Data unavailable for measure.

Table A-46. Infant Mortality Rates by Race and Ethnicity: Northeast Texas and Texas (2018)

	Northeast Texas	Texas
Total	6.0	5.5
Non-Hispanic White	5.8	4.6
Non-Hispanic Black	9.4	10.9
Hispanic	5.0	5.0

Data source: Texas & Northeast Texas – 2011-2018 Birth & Death File, analysis by authors; U.S.- Texas Department of State Health Services 2020 Healthy Texas Mothers and Babies Data Book

COVID-19 DATA TABLES

Table A-47. COVID-19 Vaccination Prevalence: Northeast Texas, Texas and U.S. (through 11/22/2021)

	Northeast Texas	Texas	U.S.
Ages 12+ years	44.4	65.4	69.2
Ages 65+ years	68.5	82.8	86.4

Table A-48. COVID-19 Mortality Rates: Northeast Texas, Texas and U.S. (through 11/22/2021)

	Northeast Texas	Texas	U.S.
Mortality Rate	399.4	249.0	232.0

BEHAVIORAL RISK FACTOR SURVEILLANCE SURVEY (BRFSS) AND SCHOOL PHYSICAL ACTIVITY AND NUTRITION (SPAN) DATA

Table A-49. Unadjusted Prevalence Measures Assessed via Behavioral Risk Factor Surveillance Survey (BRFSS): Northeast Texas and Texas (2011-2019)

Measure	Year	Northeast Texas	Texas
Been told by health care provider: have heart disease	2011	11.0	6.0
	2012	7.5	5.9
	2013	7.3	5.7
	2014	6.9	5.8
	2015	8.3	6.1
	2016	6.0	5.9
	2017	10.6	5.7
	2018	12.7	6.7
	2019	8.3	5.8
Been told by health care provider: had a stroke	2011	3.5	2.7
	2012	3.7	2.7
	2013	4.8	2.5
	2014	2.6	3.0
	2015	5.2	3.0
	2016	3.7	2.6
	2017	Unavailable	3.5
	2018	Unavailable	3.7
	2019	4.8	3.7
Been told by health care provider: have COPD	2011	11.4	5.5
	2012	9.5	5.2
	2013	11.3	5.4
	2014	7.3	5.3
	2015	9.9	5.1
	2016	7.5	4.8
	2017	7.1	4.8
	2018	13.3	6.2
	2019	7.4	5.2

Been told by health care provider: have asthma (current)	2011	10.7	7.4
	2012	6.4	6.8
	2013	7.3	7.3
	2014	9.6	6.7
	2015	8.0	7.6
	2016	8.2	7.6
	2017	6.3	7.3
	2018	8.3	7.4
	2019	8.8	7.1
Been told by health care provider: have diabetes	2011	11.9	10.2
	2012	11.9	10.6
	2013	14.4	10.9
	2014	12.3	11.0
	2015	14.0	11.4
	2016	17.7	11.2
	2017	12.1	11.9
	2018	17.4	12.6
	2019	14.1	12.2
Binge drinking in past 30 days	2011	15.1	18.9
	2012	11.3	16.2
	2013	11.4	16.7
	2014	9.6	16.3
	2015	12.3	15.9
	2016	14.6	17.9
	2017	11.4	17.8
	2018	11.2	17.4
	2019	13.2	17.9
Obese	2011	29.9	30.4
	2012	35.1	29.2
	2013	34.9	30.9
	2014	32.4	31.9
	2015	36.7	32.4
	2016	43.3	33.6
	2017	33.2	33.0
	2018	38.2	34.8
	2019	35.8	34.0

Current smoker	2011	25.7	19.2
	2012	26.9	18.2
	2013	22.5	15.9
	2014	23.4	14.5
	2015	20.4	15.2
	2016	17.8	14.3
	2017	24.4	15.7
	2018	17.4	14.4
	2019	16.2	14.7
No past-month leisure-time physical activity	2011	35.5	27.2
	2012	31.9	27.2
	2013	32.6	30.1
	2014	35.3	27.6
	2015	34.3	29.5
	2016	28.4	25.2
	2017	32.3	32.1
	2018	37.3	25.6
	2019	26.3	27.2

Data source: Behavioral Risk Factor Surveillance System (BRFSS), Center for Health Statistics, Texas Department of State Health Services.

Table A-50. Definitions of Prevalence Measures Assessed via Behavioral Risk Factor Surveillance Survey (BRFSS)

Measure	Question/Definition
Been told by health care provider: have heart disease	"Has a doctor, nurse, or other health professional ever told you that you had a heart attack, also called a myocardial infarction?" or "Has a doctor, nurse, or other health professional ever told you that you had angina or coronary heart disease?" (Yes to either question)
Been told by health care provider: had a stroke	"Has a doctor, nurse, or other health professional ever told you that you had a stroke?"
Been told by health care provider: have COPD	"Has a doctor, nurse, or other health professional ever told you that you have COPD (chronic obstructive pulmonary disease), emphysema, or chronic bronchitis?"
Been told by health care provider: have asthma (current)	"Have you ever been told by a doctor, nurse, or other health professional that you had asthma" and "do you still have asthma?" (Yes to both questions)
Been told by health care provider: have diabetes	"Have you ever been told by a doctor, nurse, or other health professional that you have diabetes?" (Does not include gestational diabetes)
Binge drinking in past 30 days	> 5 drinks on one occasion for males or >4 drinks on one occasion for females during past 30 days.
Obese	BMI ≥30, calculated using self-reported height and weight measurements.
Current smoker	Smoke at least 100 cigarettes in his/her entire life and smoke cigarettes every day.
No past-month leisure-time physical activity	"During the past month, other than your regular job, did you participate in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?"

Table A-51. Prevalence Measures Assessed via School Physical Activity and Nutrition (SPAN) Survey: Northeast Texas and Texas (2019)

Measure	Grade	Northeast Texas	Texas
Prevalence of meeting physical activity guidelines	8th	27.5	24.3
	11th	27.7	20.5
Obesity prevalence	8th	20.2	24.2
	11th	23.0	20.2

Data source: School Physical Activity and Nutrition (SPAN) survey, Michael & Susan Dell Center for Healthy Living and Department of State Health Services, Office of Title V.

Meeting physical activity guidelines is defined as being physically active for a total of at least 60 minutes per day on each of the past seven days, assessed via student self-report. Obesity is defined as having a BMI ≥30, calculated using investigator-measured height and weight.

Prevalence proportions are percentages.

HEALTHY PEOPLE 2020 OBJECTIVES

Table A-52. Northeast Texas, Texas and U.S.: Comparisons to Select Healthy People 2020 Targets

HP2020 Topics/Objectives	Measure	Target	Northeast Texas Value	Texas Value	U.S. Value
Cancer					
Decrease overall cancer mortality rate	Deaths per 100,000	161.4	161.0	142.3	149.2
Decrease lung cancer mortality rate	Deaths per 100,000	45.5	42.1	30.4	34.8
Decrease female breast cancer mortality rate	Deaths per 100,000	20.7	20.1	19.9	19.8
Decrease colorectal cancer incidence rate	New cases per 100,000	39.9	44.2	38.0	36.5
Decrease colorectal cancer mortality rate	Deaths per 100,000	14.5	14.7	13.6	13.1
Decrease melanoma cancer mortality rate	Deaths per 100,000	2.4	1.9	1.9	2.1
Decrease cervical cancer incidence rate	New cases per 100,000	7.2	10.9	9.2	7.5
Decrease cervical cancer mortality rate	Deaths per 100,000	2.2	3.9	2.7	2.2
Decrease prostate cancer mortality rate	Deaths per 100,000	21.8	13.6	17.4	18.9
Diabetes					
Reduce the diabetes death rate	Deaths per 100,000	66.6	96.9	81.8	69.3
Heart Disease and Stroke					
Reduce coronary heart disease deaths	Deaths per 100,000	103.4	124.3	89.9	88.0
Reduce stroke deaths	Deaths per 100,000	34.8	45.5	39.0	37.0
Injury and Violence Prevention					
Reduce unintentional injury deaths	Deaths per 100,000	36.4	53.7	39.7	49.3
Reduce motor vehicle crash-related deaths	Deaths per 100,000	12.4	23.2	13.2	11.5
Reduce the suicide rate	Deaths per 100,000	10.2	19.9	13.4	13.9

Maternal, Infant and Child Health					
Reduce the rate of all infant deaths (within 1 year)	Deaths per 1,000 live births	6.0	5.5	5.5	5.8
Physical Activity					
Reduce the proportion of adults who engage in no-leisure time physical activity	Percent	32.6%	26.3%	27.2%	*
Respiratory Diseases					
Reduce deaths from COPD among adults ≥45 years-old	Deaths per 100,000	102.6	177.1	108.0	105.6

*Data not available.

Health advocates in Northeast Texas are committed to using data to drive improvements, and we hope this resource will be of great value in their continued work. Current and future generations of Northeast Texans are too valuable for us, collectively, not to act to improve everyone's health.

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THIRTEEN INSTITUTIONS. UNLIMITED POSSIBILITIES.