

HEALTH DISPARITY AND HEALTH INEQUITY

2019 Trends and Data Report

Houston/Harris County



SECTION 2:

MORBIDITY AND MORTALITY

DOWNSTREAM FACTORS



HOUSTON HEALTH
DEPARTMENT

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INTRODUCTION

Health disparities are the outcomes of underlying upstream factors that impact living conditions, economic and work environments, social conditions, and access to services, as reported extensively in Section 1 of this report. Section 2 describes the current status of health disparities in Houston/Harris County. The goal of this section is to present key health indicators using the most recently available data and assess changes over time and critical trends in the past decade (2008-2018) to better understand the health of the Houston community.

As defined by the Centers for Disease Control and Prevention (CDC), health disparities are preventable differences in the burden of disease, injury or violence, or in opportunities to achieve optimal health experienced by socially disadvantaged racial, ethnic, or other population groups and communities. These groups include populations such as those defined by sex/gender, sexual identity, age, disability, socioeconomic status, and geographic location.¹

Healthy People 2020 describes health disparity as a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage. Health disparities adversely affect groups of people who have systematically experienced greater obstacles to health based on their racial or ethnic group; religion; socioeconomic status; gender; age; mental health; cognitive, sensory, or physical disability; sexual orientation or gender identity; geographic location; or other characteristics historically linked to discrimination or exclusion.²

Over the years the public health sector has sought to understand the factors that lead to health disparities in order to implement appropriate evidence-based interventions to eliminate these health disparities. Among the many models developed to describe the causes of health disparities, the BARHII framework, described in Section 1 of this report, was chosen and has been modified for use as the context to describe and understand health disparities in our local area.

Public health agencies, such as the Houston Health Department (HHD), Harris County Public Health and Environmental Services (HCPHES), and the Centers for Disease Control and Prevention (CDC) were founded to protect the health and well-being of residents. In the early years, much focus was on communicable diseases and sanitation. Once antibiotics were discovered and clean food and water were common place, life expectancy increased and Americans began to face more difficulty with chronic diseases. Public health agencies have responded accordingly, with more attention toward prevention of chronic diseases, in addition to their traditional roles in prevention and control of communicable diseases.

A Glimpse of Health Disparities in the Nation

In the past 50 years, CDC reports significant progress in achieving their overarching goals to improve and protect the health of all Americans.³ CDC noted that people are living longer, healthier, and more

productive lives. Unfortunately, this improved trend in health is not rapid enough, nor is it experienced uniformly among all people in the United States, a nation that has become increasingly diverse in the last century. For example:

- Non-Hispanic black adults are 50% more likely to die of heart disease or stroke (two of the leading causes of death in the US) before age 75 years than their non-Hispanic white counterparts.
- Hispanics, non-Hispanic blacks, and those of other, or mixed races have a higher prevalence of adult diabetes than Asians and non-Hispanic whites.
- Adults without college degrees and adults with lower household incomes have higher percentages of adult diabetes.
- Non-Hispanic blacks have more than double the rate of infant mortality compared to non-Hispanic whites.
- Men are four times more likely to commit suicide than women regardless of race/ethnicity.
- American Indians/Alaskan Natives, and non-Hispanic whites for both genders are more likely to commit suicide than other races.⁴

Additionally,

- Each day, about 1,000 young people become daily cigarette smokers, while too many adults still use tobacco.
- About 40% of US households do not have easy access to large grocery stores and supermarkets, and fruits and vegetable consumption remains lower than the recommended levels.
- Obesity rates have leveled but not declined – one in three adults and one in six children are obese.
- About one in 25 hospitalized patients develops a healthcare-associated infection leading to 75,000 annual US deaths.
- Breastfeeding rates remain too low.
- Vaccination rates/immunization rates remain too low.
- Teen birth rates remain too high.⁵

According to the 2010 US Census, approximately 36% of the population belongs to a racial or ethnic minority group. Though health indicators such as life expectancy and infant mortality have improved for most Americans over the past 50 years, some minorities experience a disproportionate burden of preventable disease, death, and disability compared with non-minorities. Minority health determines the health of the nation since it affects all segments of the society.⁶

Upstream and Downstream Linkages of Health Disparities

Public health scientists have recognized group differences in health for more than a century, and many interventions have been designed to reduce these differences. However, there are gaps in the understanding how these differences develop. At this point, researchers agree that health disparities are determined by many factors, and that influences occur at both the group and individual levels. Additionally, a host of hereditary and individual behavioral factors are linked to health.

The current science in public health reports that social circumstances and environmental factors place minority groups at a distinct disadvantage in health and disease. These groups may be exposed to stressful conditions such as discrimination and unequal treatment in housing, employment, and medical care, more frequently than non-minority groups. For instance, in a study that linked upstream determinants to downstream health outcomes, researchers at the University of Chicago's Center for Interdisciplinary Health Disparities Research (CIHDR) developed a model that traced the development of disease, starting at the population or group level, and ending at disease in the individual. This approach identifies how specific social environments "*get under the skin*" to cause disease.

The researchers looked at disparities in death rates for aggressive premenopausal breast cancer suffered by black women. They identified each link in the downward chain of causes, from the population level of social environmental structures to the genetics that impact individual disease. At the population level are race, poverty, disruption, and neighborhood crime; at the individual level, they identified isolation, acquired vigilance, and depression; then, within the individual's body chemistry, there were stress-hormone dynamics; and finally, they found links to cell survival and tumor development. Thus the researchers found that the CIHDR Downward Causal Model could show that upstream determinants at the broad social and environment levels influence and regulate events at the lower levels which range from individual behavior and physiology, to the cellular and genetic interactions of health and disease.⁷

Although several characteristics affecting health and the determinants of health are modifiable, in most cases this has not been accomplished, in part because the determinants of health have been found to be complex. For example, increased mortality and poor health in the US is associated with area-level poverty even after the data are adjusted for individual behavior risk factors. An individual may live a healthy lifestyle, but still be impacted by poor access to healthcare, lack of awareness of public health interventions disseminated to the public, and barriers in their environment that inhibit their ability to access healthy food and physical activity.⁸

In a 2014 policy brief and video by Dr. Steven Woolf, Director of the Virginia Commonwealth University (VCU) Center on Society and Health, and the Robert Wood Johnson Foundation, Dr. Woolf stated that Americans without a high school diploma are living sicker, shorter lives than ever before, and so the links between education and health matter more now than ever before. Specifically, lower rates of education tend to translate into much higher rates of disease and disability, and place greater strains on mental health.⁹

Likewise, a Harvard School of Public Health special report in 2014 provided a follow-up five years after the Great Recession (*December 2007-June 2009*) and noted:

I don't think most Americans know that children with less education are destined to live sicker and die sooner.

Steven Woolf, MD, MPH, Director of the Center for Human Needs, Virginia Commonwealth University

- Losing a job when a business shuts its doors increases the odds of fair to poor health by 54% among workers with no preexisting health conditions while also increasing the risk of new health conditions by 83%. The stress of the situation heightens the odds of stress-related conditions such as stroke, hypertension, heart disease, arthritis, diabetes and psychiatric problems. In addition, the researchers found in 2010 that about 4 in 10 Americans had heart disease or diabetes, and psychiatric problems.
- One in five with cancer said the stress of the Great Recession made it more difficult to manage their illness.
- For many Americans the loss of a job also meant inability to pay for health care.
- Loss of a job can lead to loss of a home. More than 13 million American households were foreclosed between 2008 and 2013. This not only affected the people who lost their homes, it also impacted others nearby, through what the researchers called a “spillover” effect. For example, studies found that living near foreclosed homes may increase a person’s chances of being overweight.
- Weight gain in foreclosed communities are attributed to strong stress over declining property values; people simply not wanting to spend as much time outdoors in a community with rundown, boarded-up houses; or that they might not feel safe outside.

The Harvard researchers noted that the effects of the foreclosure crisis will continue to be felt for a long time.¹⁰

Health is not something that can be miraculously revived overnight. Even if foreclosures go down, even if people manage to regain a foothold in mainstream society, the consequences will be long-lasting.

Kasisomayajula Viswanath. Harvard T.H. Chan School of Public Health

Much research has focused on the link between stress and physical and mental problems. The biological effects of stress include:

- Higher risk of heart disease and hypertension.
- Acute sleep deprivation, which alters the body’s immune and hormone-secreting systems.
- Depressed mood or anxiety.
- Unhealthy behaviors such as overeating, smoking, and alcohol use.
- Increased frequency and severity of upper respiratory infections.
- Decreased response to vaccines.
- Accelerated aging and early death.¹¹

While chronic levels of stress impact everyone, there is an unequal distribution of stress among racial and ethnic groups. In their report ***Stress and Health Disparities***, the American Psychological Association noted significant disparities in the US by socioeconomic status, and also by race/ethnicity.¹² Black individuals reported more stress exposure overall, including exposure to discrimination, compared to white individuals. US-born Hispanic adults also report more stress than white adults. The report added that there are significant race and class disparities in access to a wide range of personal, social,

educational, and material resources across the lifespan. Black, Hispanic, and Native American individuals are more likely to experience poverty and other neighborhood disadvantages across their lifespans. Without sufficient resources, even minor demands are more stressful. Racial and ethnic discrimination compound these effects by increasing exposure to threats and stresses, and by creating barriers that make it difficult for individuals to develop the resources needed to respond to these stressors.

The Modified BARHII

As described in Part 1, the Bay Area Regional Health Inequities Initiative (BARHII) framework has been modified and adopted for this report, and describes upstream and downstream factors.¹³ The upstream factors, the determinants of health, are beyond the control of individuals. These factors are generally system oriented (social inequities, structural inequities, institutional power, and most living conditions), generating responses in individuals as well as populations. The responses are the individual risk behaviors that link most of these upstream factors or health determinants to the downstream or health outcomes of disease and injury, and finally to mortality. This linkage is complex, so responses, such as the risk behavior of smoking, may have multiple health outcomes, such as cancer, respiratory disease, tooth loss, or heart disease. In the Houston Health Department's adapted BARHII framework, risk behaviors which are modifiable at the individual level, such as smoking, poor nutrition, low physical activity, violence, alcohol/drug abuse, and sexual behavior, act as the link between the upstream factors and the health outcomes downstream. The determinants of health combine with the individual's behavior to impact health disparities.

“Stress” is such a simple word. It rolls off the tongue – The challenge is to pin down its biological consequences.

*Michelle Williams,
Harvard T.H. Chan
School of Public Health*

The 2008 and 2019 Houston/Harris County Health Disparities Reports

The Houston Health Department has studied health disparities in the local community for decades. The 2008 **City of Houston Health Disparities Data Report**¹⁴ focused on some factors related to the health of racial/ethnic groups in Houston and their potential underlying causes. The highlights of the 2008 report include:

- Houston is a diverse city with a large, growing minority population. Over 60% of the population was made up of Hispanic or Latino, Black or African American, and Asian residents.
- Socio-economic status affects health, especially of minority groups. The Hispanic or Latino population in Houston had lower levels of educational attainment and experienced greater poverty than other racial/ethnic groups.
- Access to health care services affected health outcomes. Hispanics or Latinos, and Asians in Houston experienced the greatest obstacles to health care access. A larger percentage of Hispanics or Latinos lacked health insurance or a regular source of care and were unable to afford health services. They also had lower levels of health care access for preventive services.

- The black or African American population in Houston experienced worse health for a wide-range of health indicators than any other racial/ethnic groups in Houston. These included greater rates of overweight/obesity, infant mortality, diabetes, HIV/AIDS and other sexually transmitted diseases; and mortality for numerous conditions including heart disease, cancer, stroke, and diabetes.
- The Hispanic or Latino population in Houston experienced worse outcomes for some health indicators than the non-Hispanic white population. These included higher mortality rates from diabetes, obesity, tuberculosis, and kidney diseases.
- The white population (non-Hispanic or Latino) in Houston had worse outcomes for some health indicators compared to other racial/ethnic groups. These included higher rates of mortality from chronic lower respiratory disease, Alzheimer's Disease, and suicide, as well as higher rates of breast cancer and heart disease.
- There was lack of adequate information and data on the health status of the Asian population in Houston. However, the available information indicated that Asians had less access to cancer screening, experienced higher rates of tuberculosis and hepatitis B, and engaged in lower rates of physical activity.
- The need for improved data collection and standardization to correctly identify all high-risk populations was also highlighted.

A decade later, this 2019 ***Houston Health Department Health Disparity and Health Inequity – Trends and Data Report, Houston/Harris County*** examines trends in these health indicators and their outcomes over time and whether improvements can be seen in the health outcomes experienced by the different racial/ethnic groups.

HEALTH BEHAVIORS

Health is strongly impacted by how we live our lives, including health risk and health promoting behaviors. Health behaviors are often established during childhood and early adolescence, and frequently cluster within populations.¹⁵

Health risk behaviors are activities that increase the risk for illness or injury. Among the risk behaviors are smoking, use of drugs and alcohol, poor diet, and risky sexual behavior. These activities can lead to negative health consequences such as illness, unintended pregnancy and sexually transmitted diseases, and increased likelihood of developing obesity. Behaviors can also promote health, such as immunizations, prenatal care, and cancer screening, and these are included later in this section.

A 2014 CDC National Health report showed that in 2011, chronic diseases accounted for 7 of the 10 leading causes of death and approximately 75% of all deaths in the United States.¹⁶ Chronic diseases are strongly impacted by risk factors. Deaths from other causes, such as injuries, violence, and infectious diseases, are also frequently preventable.

This report tracks the health behaviors of residents of Houston/Harris County over the past 10 years and the prevalence of health behaviors among different populations. The HHD 2008 Health Disparities report tracked risk behaviors across race/ethnicity groups for smoking, physical activity, alcohol, and sexual behavior with outcomes such as STDs and teen pregnancy. This current report introduces an additional topic of illicit drug use including opioids, marijuana, and cocaine. One of the most important trends since 2008 is a decrease in smoking. In 2005, 17.3% of Houston area adults reported smoking, and rates were similar among the racial/ethnic groups: whites (17.9%), black (16.3%) and Hispanic (17.5%). By 2016, the overall rate for those who currently smoke declined to 12.1%. The greatest decline was among Hispanics (8.4%), while whites (16.8%) and blacks (16.1%) had smaller decreases.

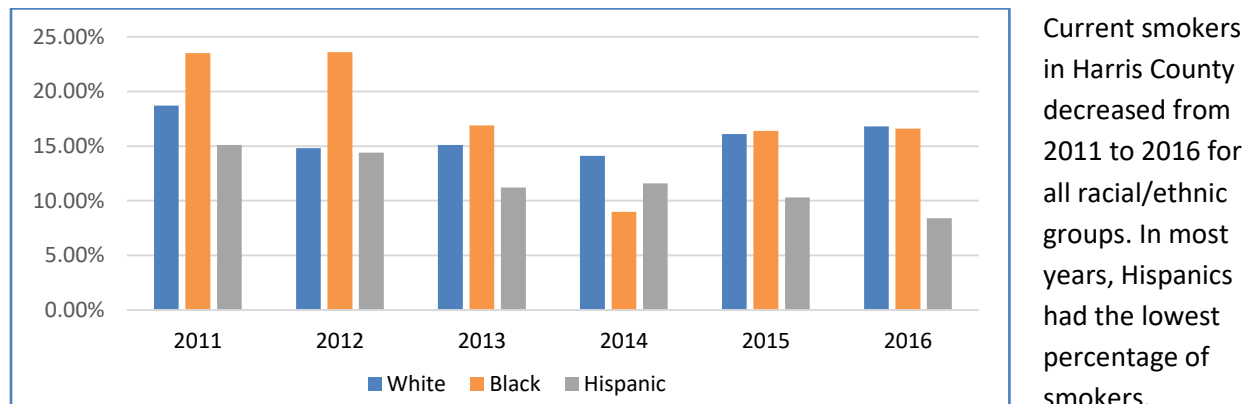
SMOKING

Tobacco is the agent most responsible for avoidable illness and death in America today. According to the Centers for Disease Control and Prevention, tobacco use brings premature death to almost half a million Americans each year, and it contributes to profound disability and pain in many others. The World Health Organization states that approximately one-third of all tobacco users in this country will die prematurely because of their dependence on tobacco. Areas with a high smoking prevalence also have greater exposure to secondhand smoke for non-smokers, which can cause or exacerbate a wide range of adverse health effects such as cancer, respiratory infections, and asthma.¹⁷

In 2002, over 22% of persons in the Houston area reported that they smoked. That percentage dropped to 12% in 2016.¹⁸ Even though rates are dropping, smoking still leads to the deaths of 28,000 adults in Texas each year.¹⁹

Between 2011 and 2016, the proportion of current smokers in Harris County decreased from 18.2% to 12.1% respectively, while current smokers in Texas declined from 19.2% to 14.3%. Overall, a lower percentage of Harris County residents were smokers compared to Texas residents during these years.²⁰ Many disparities exist among Harris County smokers. Figure 1 shows the differences in percentages of smokers between racial/ethnic groups among respondents to the Texas BRFSS survey.

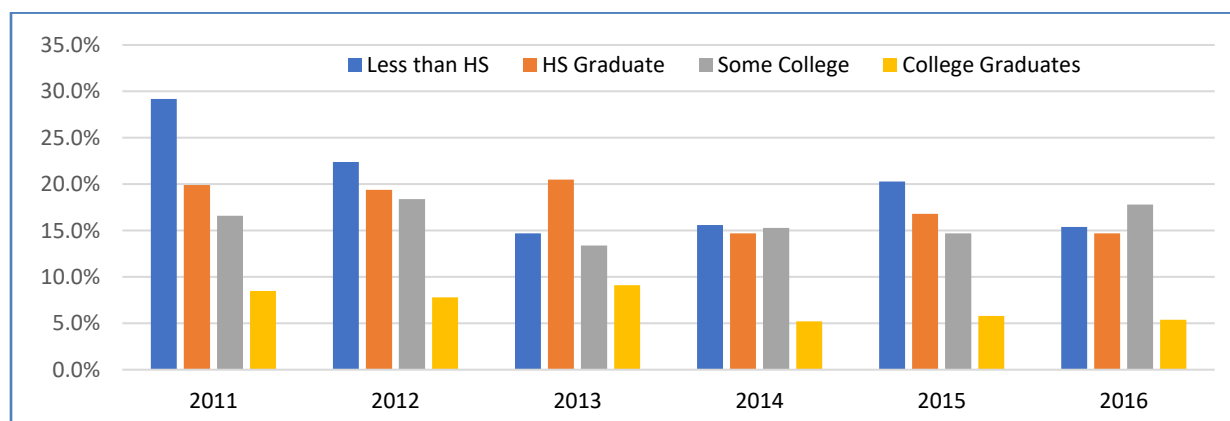
Figure 1: Percentage of Adults Currently Smoking by Race/Ethnicity, Harris County TX 2011-2016



Data Source: Texas Department of State Health Services, Behavioral Risk Factor Surveillance Survey (BRFSS)

Other disparities were apparent between men and women smokers; in Harris County, more males smoked (16.1%) than females (8.1%) in 2016. Differences were also seen based on level of education. Figure 2 shows how smoking percentages have a general pattern of decreasing from 2011 among all education levels. College graduates were consistently the group least likely to smoke.

Figure 2: Percentage of Adults Currently Smoking by Education, Harris County TX 2011-2016

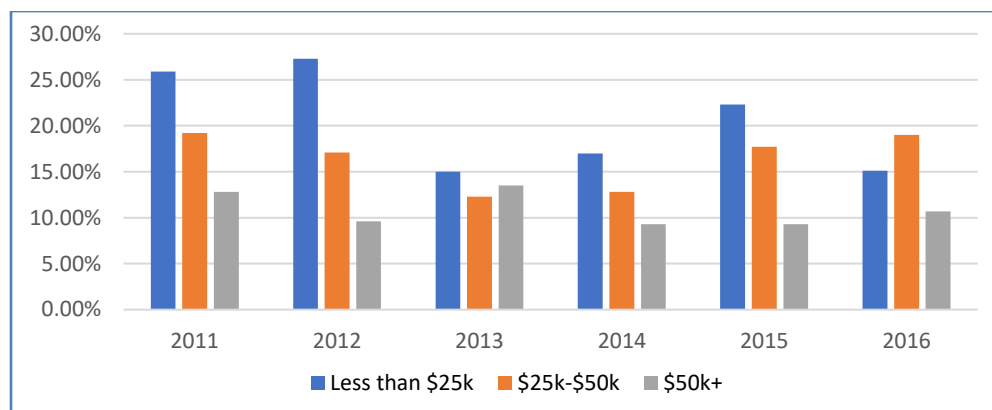


Data Source: Texas BRFSS

Income is another variable with notable differences among groups. Among those who responded to the survey, persons with lower incomes were generally more likely to smoke. This is a pattern consistent

with the overall US population. In general, lower income people are more likely to smoke, despite the cost of cigarettes, now approximately \$6 to \$13 per pack, depending on the state. This cost is a proportionately higher percentage of total income for lower income persons compared to those in higher income groups.

Figure 3: Percentage of Adults Currently Smoking by Income, Harris County TX 2011-2016



Among Harris County BRFSS survey respondents, lower income residents are more likely to smoke, a pattern that is true in the US as well.

Data Source: Texas BRFSS

NUTRITION

A fresh, healthy and balanced diet is essential to maintain a healthy weight and prevent chronic disease. Many studies have linked the amount and variety of fruits and vegetables consumed to the rates of chronic diseases, especially cancer. According to the World Cancer Research Fund International, about one third of all cancers can be prevented through a nutritious diet that includes fruits and vegetables, physical activity, and maintaining a healthy weight.²¹

According to CDC, just 1 in 10 adults meet the federal fruit or vegetable consumption recommendations. Depending on one's age and sex, federal guidelines recommend that adults eat at least 1½ to 2 cups per day of fruit and 2 to 3 cups per day of vegetables. Consumption of fruits and vegetables is lower among men, young adults, and adults living in poverty. In Texas, the median intake was 1.0 fruit and 1.7 vegetables each day; 12.1% met the guidelines for fruit, and 10.9% for vegetables.²²

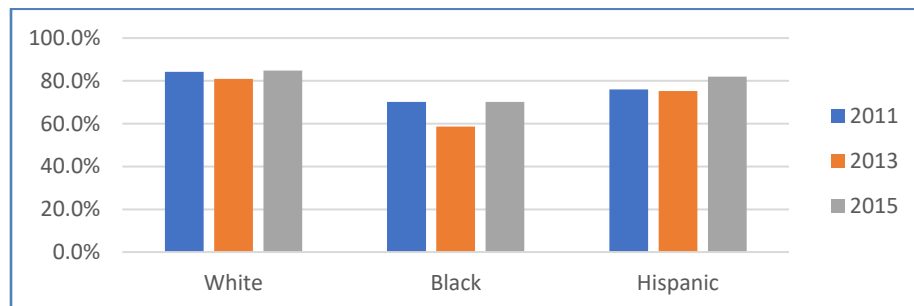
In Harris County, 18.7% of adults reported that they eat fruits and vegetables five or more times per day in 2015. This was an increase from 12.2% in 2013.²³

Vegetable Consumption

Americans are encouraged to eat a variety of vegetables to obtain good nutrition. However, many typically eat just a few types of vegetables. According to the United States Department of Agriculture, the most frequently consumed vegetable in the US is the potato (29% of all vegetables consumed), often

eaten in the form of french fries. The second most frequently consumed vegetable is the tomato (23% of all vegetables consumed), often in tomato/pizza sauce or ketchup.²⁴

Figure 4: Percentage of Adults Who Consumed Vegetables One or More Times Each Day by Racial/Ethnic Group, Harris County TX 2011-2015



In Harris County, whites were slightly more likely to have eaten at least one vegetable each day, followed by Hispanics and blacks.

Data Source: Texas BRFSS

Harris County residents with a college degree (83.0%) were somewhat more likely to eat vegetables at least once a day compared to those with less education (76.6% to 81.6%) in 2015. Females (83.2%) were more likely to have eaten at least one vegetable daily compared to males (77.4%).

Small differences in vegetable intake were seen in different income groups. In general, those with higher incomes are more likely to eat at least one vegetable each day. Among all groups, however, an average of approximately three-fourths report eating at least one vegetable a day.

Fruit Consumption

Fruit are relatively low in calories and high in nutrients. Oranges were the most popular fruit in 2014, followed by apples. Both were most frequently consumed as juice, which lacks the fiber content of the whole fruit. The next most frequently eaten fruits were bananas, followed by grapes and pineapples. Americans, on average, consumed 0.9 cup-equivalents of fresh and processed fruit per person per day in 2014, less than the recommended 1½ to 2 cups.²⁵

Table 5: Percent of Adults Who Consumed Fruit Once or More Times Each Day by Gender, Harris County TX, 2011-2015

Year	2011	2013	2015
Male	58.2%	59.9%	49.2%
Female	64.7%	55.7%	66.8%

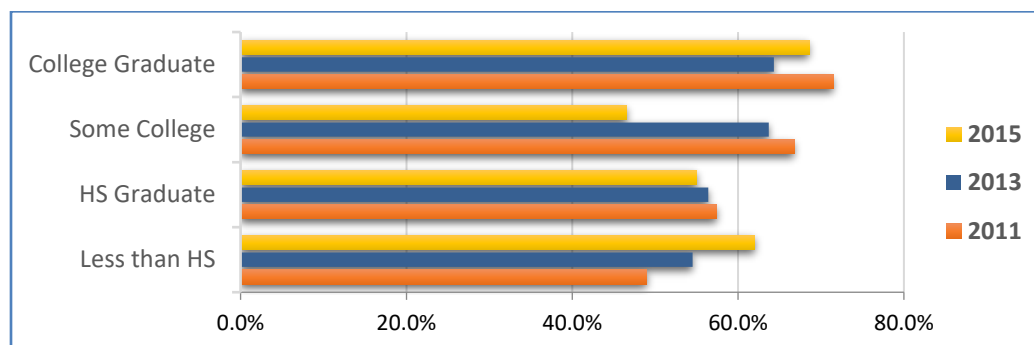
Data Source: Texas BRFSS

In general, consumption of fruits by gender followed similar patterns to those of vegetables. Women were generally more likely to eat fruit each day compared to men.

Among the racial/ethnic groups, the percent of adults who ate at least one fruit daily remained consistent, at about 60%, among the white and Hispanic populations. The black population showed a decreasing trend, however, from 59% in 2011, to 52% in 2013, and to 47% in 2015.

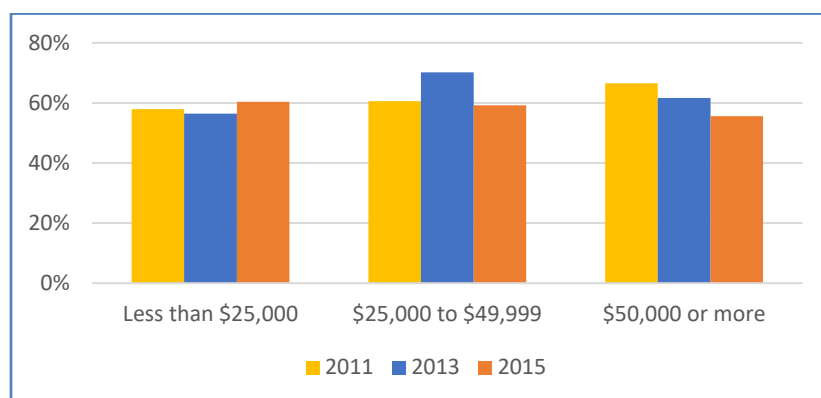
Fruit consumption increases, in general, with education. More college graduates consumed fruit one or more times per day than those with less than a high school diploma. Those with less than high school increased their fruit consumption, however, from 49% in 2011 to 62% in 2015.

Figure 6: Percentage of Adults Who Consumed Fruit Once or More Times Each Day by Education, Harris County TX 2011-2015



Data Source: Texas BRFSS

Figure 7: Percentage of Adults Who Consumed Fruit One of More Times Each Day by Income, Harris County TX 2011-2015



Fruit consumption did not show a consistent pattern by income in Harris County. In all groups, approximately 60% to 70% ate at least one fruit per day. However, the lowest income group, under \$25,000 annual household income, did show a pattern of increasing fruit intake, across the years.

Data Source: Texas BRFSS

PHYSICAL ACTIVITY

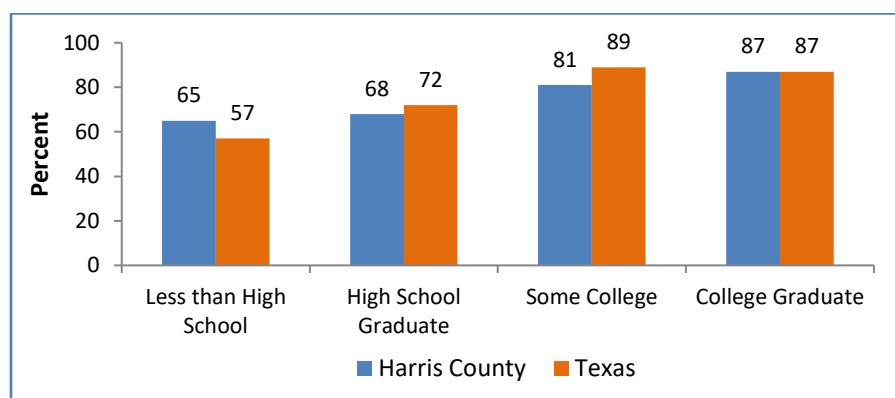
Active adults reduce their risk of many serious health conditions including obesity, heart disease, diabetes, colon cancer, and high blood pressure. In addition, physical activity reduces the symptoms of anxiety and depression, improves mood and feelings of well-being, and promotes healthy sleep patterns. More than 60% of adults in the United States do not engage in the recommended amount of activity, and about 25% of adults are not active at all. In addition to reducing the risk of multiple chronic diseases, physical activity helps maintain healthy bones, muscles, joints, and helps to control weight, develop lean muscle, and reduce body fat.²⁶

The physical activity requirements for adults, according to the US Department of Health and Human Services, include a weekly minimum of 150 minutes of moderate-intensity aerobic activity and muscle strengthening activities involving all major muscle groups on at least two days a week. An alternative recommendation is a minimum of 75 minutes of vigorous-intensity aerobic activity per week and the aforementioned muscle strengthening activities.²⁷

The Texas Behavioral Risk Factor Surveillance System (BRFSS) asked respondents, "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?" The most recent data available from the Texas (BRFSS) showed that 76.6% of Harris County residents in 2016 reported that they participated in leisure time physical activity, compared to 74.8% in Texas.²⁸

Whites (80.3%) and blacks (79.1%) were more likely to say that they did physical activities outside of work compared to Hispanics (68.7%). Males (77.3%) and females (75.9%) had similar levels of physical activity outside work.

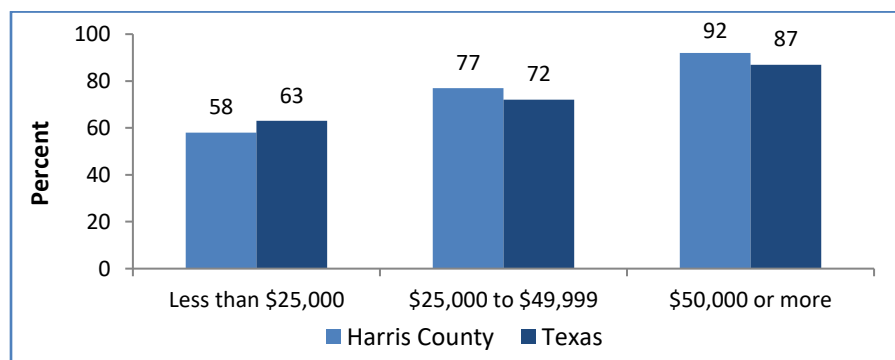
Figure 8: Percentage Who Participated in Leisure Time Physical Activity in the Past Month by Education, Harris County and Texas, 2016



Disparities were apparent in levels of physical activity by education. In both Harris County and in Texas, those with more education were more likely to participate in leisure time physical activities.

Data Source: Texas BRFSS, 2016

Figure 9: Percentage Who Participated in Leisure Time Physical Activity in the Past Month by Income, Harris County and Texas, 2016

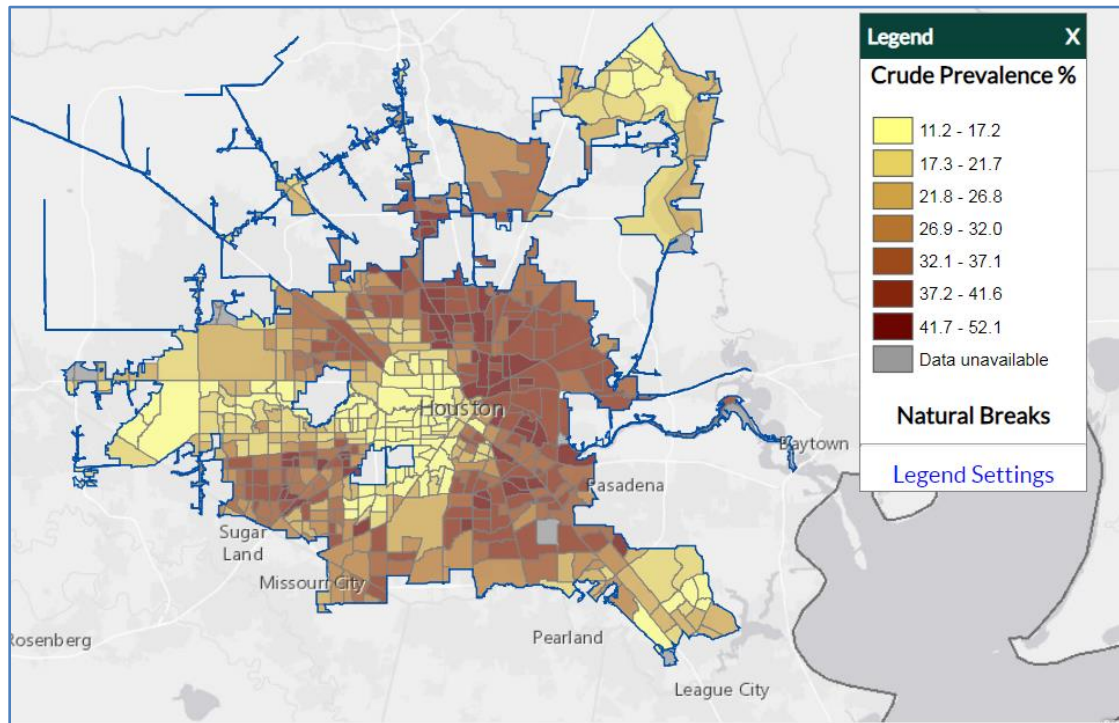


Data from Texas BRFSS also revealed significant disparities by income level. The percentages of those who reported that they had participated in leisure time physical activity rose as income levels rose, in both Harris County and Texas.

Data Source: Texas BRFSS

People in low income areas often face barriers to participation in leisure-time physical activities. Some of these include lack of nearby recreational facilities and parks, lack of transportation, neighborhoods that are unsafe for outdoor activities, and streets and sidewalks in need of repair. The **CDC 500 Cities Project** map in Figure 10 depicts the areas in Houston with the least participation in leisure time physical activity in 2016, shown in the darkest colors. These areas were mostly located in the eastern and southern regions of Houston, and are more likely to encompass low income neighborhoods.²⁹

Figure 10: No Leisure-Time Physical Activity Among Adults Aged 18+ years, Houston TX 2016



Data Source and Map: CDC 500 Cities Project

VIOLENCE

Gunshot Wound Injuries/Deaths

Gun violence in the US is among the highest in the world. In 2016, an estimated 251,000 people died worldwide from firearm injuries. Six countries, with less than 10% of the world's population, accounted for 50.5% of this total. The countries and the total deaths in each are:

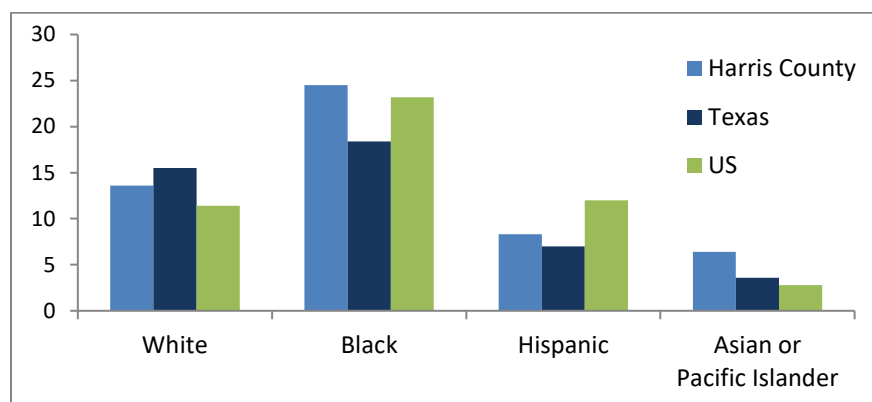
- Brazil: 43,200
- United States: 37,200
- Mexico: 15,400
- Colombia: 13,300
- Venezuela: 12,800
- Guatemala: 5,090³⁰

Deaths due to firearms include assault, Intentional self-harm (suicide), unintentional shooting (accidents), firearm discharge of undetermined intent, justifiable shooting (legal intervention), or firearm injury related to war or terrorism.

In 2017, the overall rate of firearm deaths in Harris County was 13.4 per 100,000 population, higher than the Texas rate (12.4 per 100,000) and the US rate (12.0 per 100,000). In the past 20 years, Harris County deaths from firearms have fluctuated between 11.5 per 100,000 and 14.7 per 100,000, with no clear trend.^{31,32}

As shown in Figure 11, firearm deaths show distinct disparities locally and nationwide. The highest rates were among the black population, followed by whites, then Hispanics, and finally Asians.

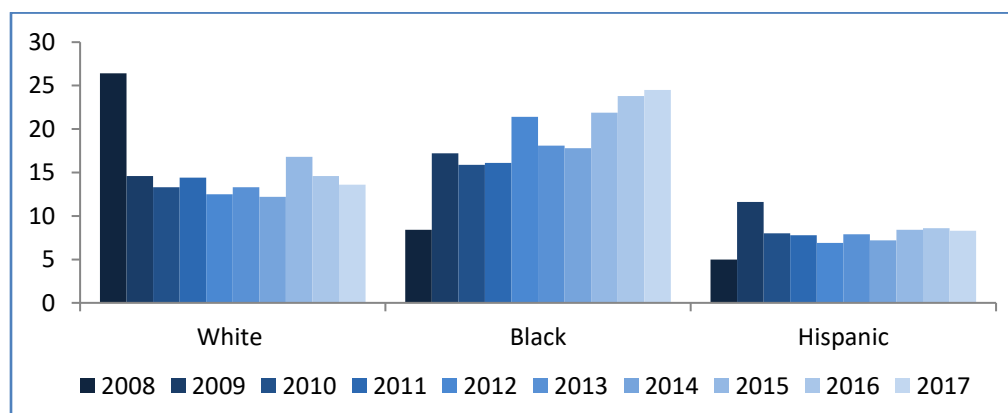
Figure 11: Deaths per 100,000 Due to Firearms by Racial/Ethnic Group, Harris County and Texas 2017
Age-Adjusted Rates



Firearm deaths in Harris County were highest among blacks (24.5 per 100,000) followed by whites (13.6 per 100,000), and then Hispanics (8.3 per 100,000) in 2017. Rates were lowest among Asian/Pacific Islanders (6.4 per 100,000).

Data Source: CDC WONDER website, 2018³³

Figure 12: Deaths per 100,000 Due to Firearms by Racial Ethnic Group, Harris County 2008-2017
Age-Adjusted Rates



Firearm deaths in Harris County were highest among blacks in most of the years from 2008-2017. Rates were lowest among Hispanics.

Data Source: CDC WONDER website, 2018

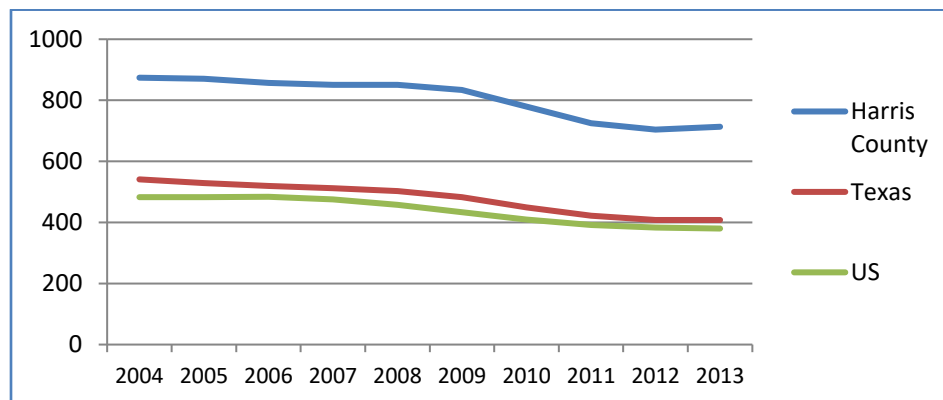
In the case of suicide, whites (7.1 per 100,000) were more likely to die by firearm in Harris County in 2017, compared to blacks (3.9 per 100,000) or Hispanics (2.8 per 100,000). Gender differences were also

apparent. Males (22.9 per 100,000) were much more likely to die from firearms than females (4.2 per 100,000).³⁴

Violent Crime

Violent crime is a concern in Harris County. As shown in Figure 13, rates of violent crimes in Harris County have consistently exceeded both the Texas and US rates.³⁵

Figure 13: Violent Crime Rate in Harris County, Texas and the US 2004-2013
3-Year Averages, Rate per 100,000 Population



Violent crime in Harris County has decreased from 874 per 100,000 in 2004 to 714 per 100,000 in 2013. Violent crime has also decreased at the state and national levels.

Data Source: County Health Rankings, 2018

ALCOHOL

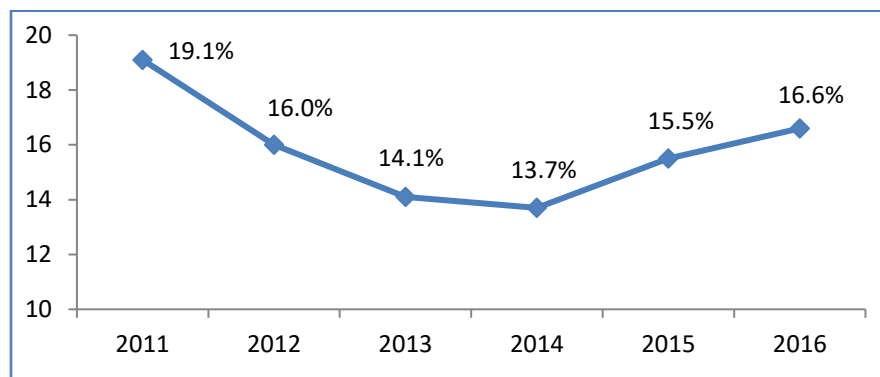
Alcohol is the most commonly used substance in the United States. A national survey by the Substance Abuse and Mental Health Services Administration (SAMHSA) stated that about half of Americans aged 12 or older reported use of alcohol in the past month. According to research by the National Institute on Alcohol Abuse and Alcoholism, adolescents who begin drinking at a young age are more likely to develop alcohol dependence than those who begin drinking at age 21. Alcohol use also impairs judgment and can lead to other high-risk behaviors such as drunk driving and irresponsible sexual activity.³⁶

Binge Drinking

Binge drinking is a pattern of drinking that brings a person's blood alcohol concentration (BAC) to the legal limit of 0.08% or above. This typically happens when men consume five or more drinks or women consume four or more drinks in about two hours.³⁷

Binge drinking can be dangerous and may result in vomiting, loss of sensory perception, and blackouts. Binge drinkers are 14 times more likely to report alcohol-impaired driving than non-binge drinkers. Alcohol abuse is associated with a variety of negative health and safety outcomes including alcohol-related traffic accidents and other injuries, health problems, employment problems, legal difficulties, financial loss, family disputes and other interpersonal problems. The prevalence of binge drinking among men is twice that of women.³⁸

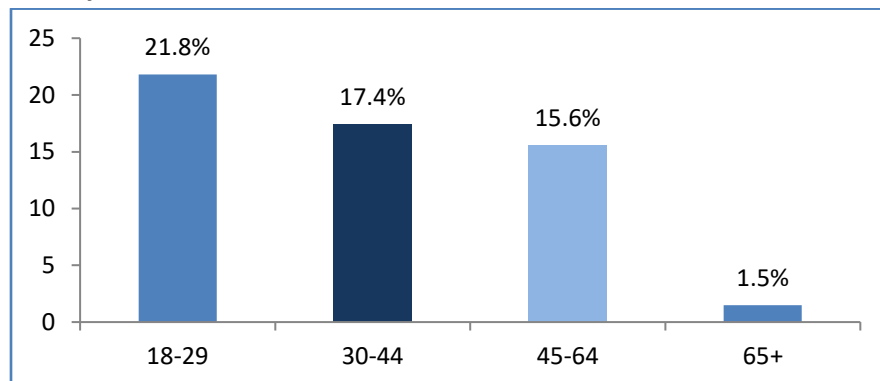
Figure 14: Percentage of Adults Reporting Binge Drinking in the Past 30 Days, Harris County TX 2013-2016



Data Source: Texas BRFSS

Binge drinking has been a consistent problem in Harris County where approximately one in seven adults binge drink each month. The percentage of those reporting binge drinking appears to have decreased until 2014, when it began to rise again.

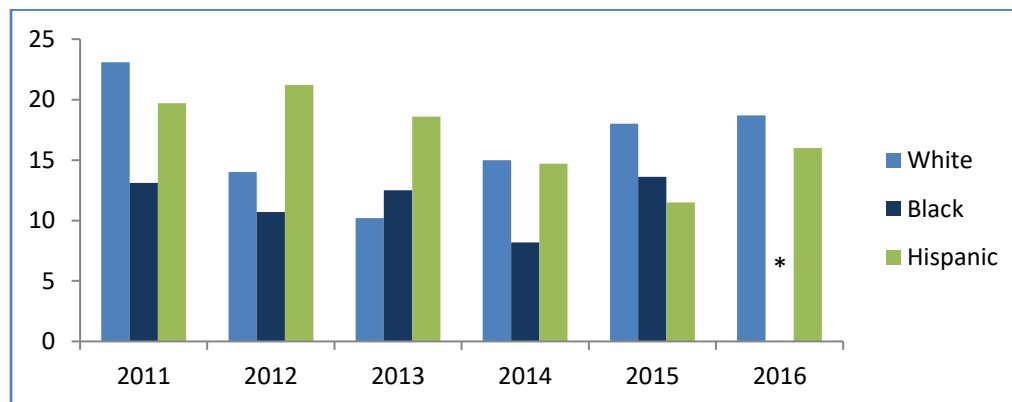
Figure 15: Percentage of Adults Who Reported Binge Drinking in the Past 30 Days by Age, Harris County TX 2015*



Data Source: Texas BRFSS, *Data for all age groups not available for 2016

Binge drinking is a much larger problem among young adults. Those aged 18-29 years (21.8%) are much more likely to binge drink than older adults. By age 65 and older, only 1.5% are binge drinkers.

Figure 16: Percentage of Adults Who Reported Binge Drinking in the Past 30 Days by Racial/Ethnic Group, Harris County TX 2011-2016



Data Source: Texas BRFSS, *Data not available

Harris County whites and Hispanics were generally more likely to report binge drinking compared to the black population.

In 2015, Harris County residents with higher levels of education and also higher incomes were more likely to report binge drinking in the past 30 days. This is consistent with the Texas and US patterns, in

which binge drinking was found to be higher among those who earn \$75,000 and more annually, compared to those earning \$25,000 or less.³⁹

Figure 17: Percentage of Adults Reporting Binge Drinking by Education, Harris County TX 2015*

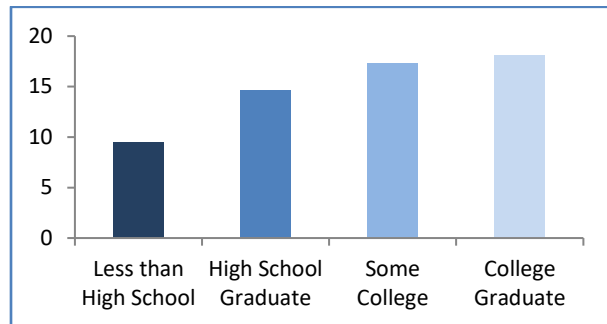
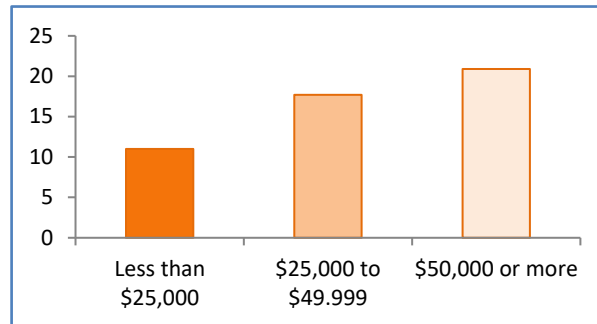


Figure 18: Percentage of Adults Reporting Binge Drinking by Income, Harris County TX 2015*



Data Source: Texas BRFSS

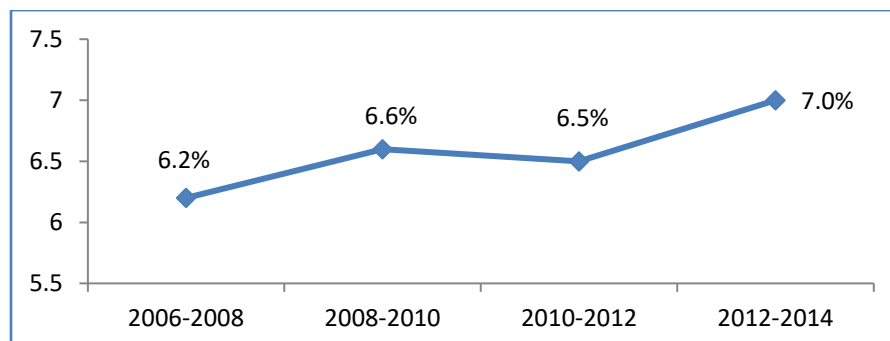
*Year 2015 was used as the data was incomplete for 2016

ILLCIT DRUGS

Illicit drug use refers to the use of marijuana, cocaine/crack, methamphetamine, heroin, hallucinogens, inhalants, and nonmedical use of prescription psychotherapeutics. Psychotherapeutic drugs impact brain functioning, and include pain relievers, tranquilizers, stimulants, and sedatives. These substances are known to be highly addictive and in most cases are illegal substances.⁴⁰ Use of illicit drugs is highest among young people aged 15-25 years.⁴¹

Illicit drug usage can cause severe long- or short-term physical damage, such as heart attack, stroke, psychosis, overdose, and death. It also can lead to drug-related incidences such as burglary or driving while intoxicated.⁴² In 2004, 18% of federal inmates said they committed their current offense to obtain money for drugs.⁴³

Figure 19: Percentage of People Aged 12 or Older Who Reported Using an Illicit Drug in the Prior Month, Texas Region 6a (Harris County and Surrounding Counties), 2006-2014

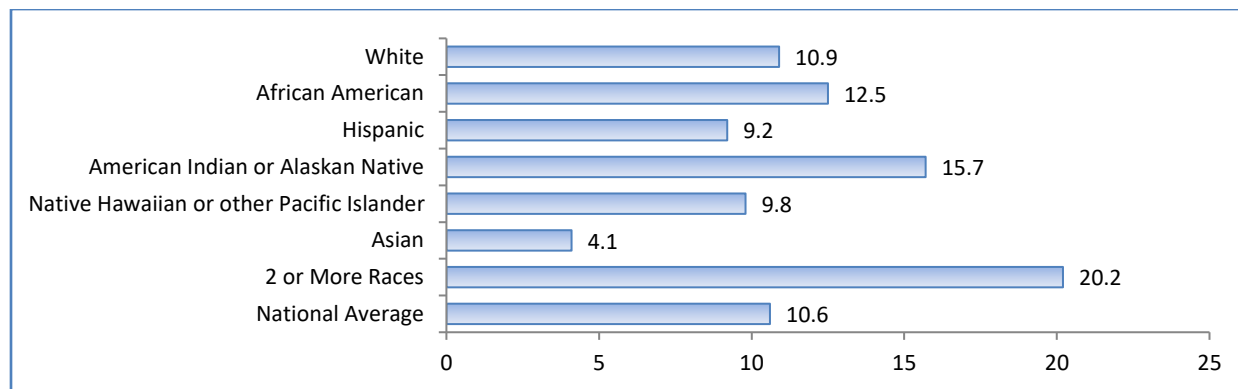


In Texas Region 6a, which includes Harris County, the use of illicit drugs by those aged 12 and older has been rising since the 2006-2008 period.

Data Source: Houston State of Health website

Illicit drug use varies among gender; more males (12.5%) reported illicit drug use compared to females (7.9%) in 2016 in the US. Racial/ethnic groups also vary in use of illicit drugs. As shown in Figure 20, those of mixed race (two or more races), and American Indians or Alaskan Natives were the groups most likely to report use of illicit drugs.⁴⁴

Figure 20: Percentage Aged 12 and Older Reporting Illicit Drug Use in the Last Month, US 2016

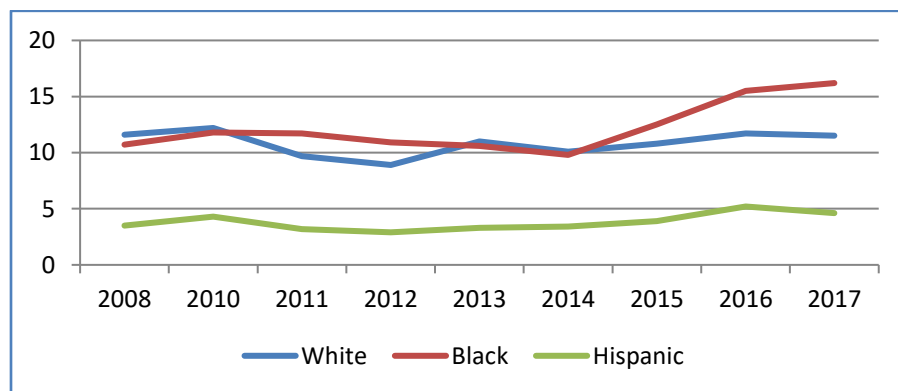


Data Source: CDC, 2017⁴⁵

Drug poisoning caused 549 deaths in Harris County in 2017. This number includes drug poisonings from overdose, suicide, homicide, and undetermined incidents.⁴⁶

Figure 21: Drug Induced Causes of Death by Race/Ethnicity, Harris County TX 2009-2017

Age Adjusted, Rate per 100,000 population



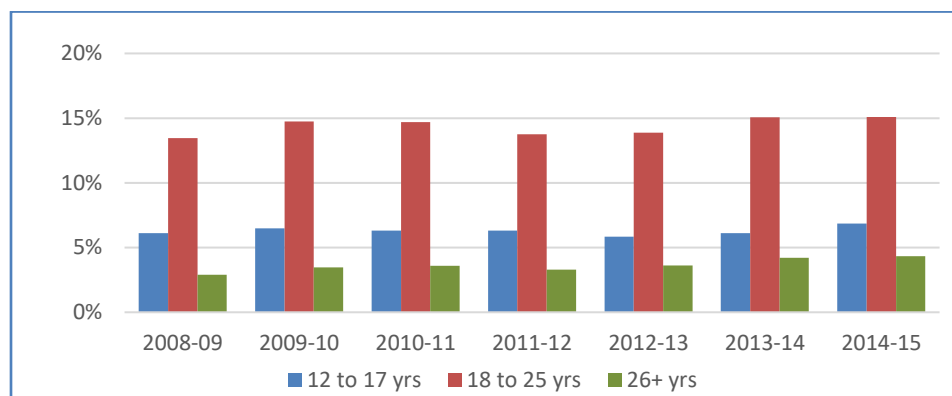
Drug induced deaths were highest in Harris County among whites and blacks, more than double the rate per 100,000 of Hispanics during the years 2008-2017. The rate has risen among the black population since 2014.

Data Source: CDC WONDER website, 2018

Marijuana

According to the Substance Abuse and Mental Health Services Administration (SAMHSA), marijuana is the most commonly used illicit drug, with the highest rates of use among young adults aged 18 to 25. Marijuana intoxication can cause distorted perceptions, impaired coordination, difficulty thinking and problem solving, and problems with learning and memory. Chronic marijuana use can lead to impaired lung function, reduced sperm count, interference with prenatal development, impaired immune response, and addiction.⁴⁷

Figure 22: Percentage Who Used Marijuana in the Past Month, by Age Group, Texas 2008-2015



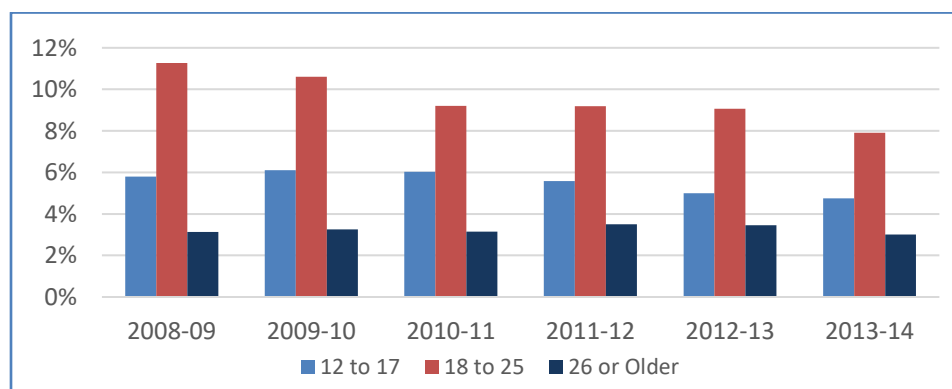
The use of marijuana in Texas was twice as high among those aged 18-25 years compared to those in the 12-17 year-old and 26+ year-old groups during years 2008 to 2015.

Data Source: SAMHSA, 2017⁴⁸

Non-medical Use of Pain Killers

Non-medical use of pain killers is defined as the use of prescription drugs which have not been prescribed by a physician, are used in a manner or dosage other than what was prescribed, or are used only for the experience or feeling they cause. Non-medical use does not include over-the-counter drugs. When prescription pain relievers are abused they can produce serious adverse health effects, including drug dependence and addiction. Among illicit drugs, the number of people abusing prescription pain relievers is second only to the number of people using marijuana.⁴⁹

Figure 23: Percentage Who Reported Non-medical Use of Prescription Pain Relievers in the Past Year by Age Group, Texas 2008-2014



The percentage of those using non-medical pain relievers has dropped since 2008 among youth in the 12 to 17 age group, and also among young adults aged 18 to 25 years.

Data Source: SAMHSA, 2017⁵⁰

Non-medical use of pain relievers in Texas Region 6a, which includes Harris County and surrounding counties, shows a similar pattern of slightly decreasing use among those aged 12 and older (Table 1).

Table 1: Non-medical Use of Pain Relievers in the Past Year, Aged 12+, Texas Region 6a, 2006-2014

2006-2008	2008-2010	2010-2012	2012-2014
4.5%	3.9%	4.0%	3.9%

Data Source: Houston State of Health website

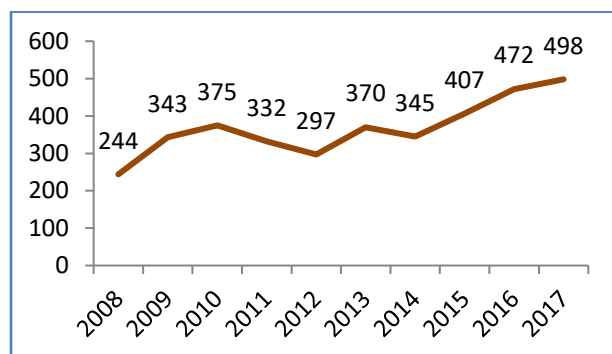
Opioids and Drug Overdose

Opioids are a class of drugs that include the illegal drug heroin; synthetic opioids such as fentanyl; and pain relievers available legally by prescription, such as oxycodone (OxyContin®), hydrocodone (Vicodin®), codeine, morphine, and many others. Opioid pain relievers are generally safe when taken for a short time and as prescribed by a doctor, but because they produce euphoria in addition to pain relief, they can be misused (taken in a different way or in a larger quantity than prescribed, or taken without a doctor's prescription). Regular use—even as prescribed by a doctor—can lead to dependence and, when misused, opioid pain relievers can lead to addiction, overdose incidents, and deaths.⁵¹

Drug overdose in the United States has become an epidemic, and opioids are at the center of this crisis. Since 2000, the rate of deaths from drug overdoses has increased 137%, including a 200% increase in the rate of overdose death involving opioids, which includes opioid pain relievers and heroin.⁵²

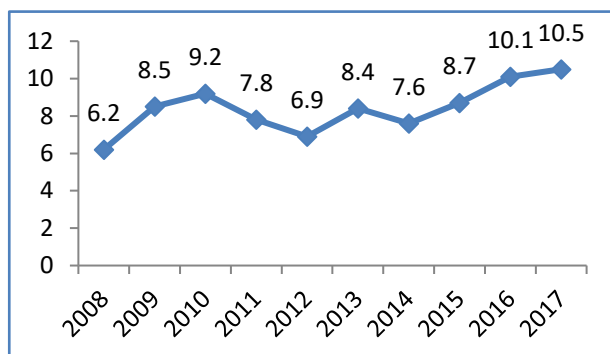
Figures 24 and 25 show the rise in Harris County deaths due to drug overdoses, both in raw numbers and in rates. Figure 24 shows the numbers of deaths due to accidental drug overdose, and Figure 25 shows the rate of deaths per 100,000 population. The rate of accidental drug overdoses has increased 69% since 2008 from a rate of 6.2 per 100,000 in 2008 to 10.5 per 100,000 in 2017.⁵³

Figure 24: Number of Accidental Drug Poisoning Deaths, Harris County TX 2008-2017



Data Source: CDC WONDER website, 2018

Figure 25: Rate of Accidental Drug Poisoning Deaths, Harris County TX 2008-2017*



Data Source: CDC WONDER website, 2018

*Age-Adjusted Rate per 100,000 Population

SEXUAL RISK BEHAVIOR

Sexual behavior can impact health disparities when it leads to the spread of sexually transmitted diseases or to unplanned pregnancy for those who are unprepared to become parents. Many young people engage in sexual risk behaviors and experiences that can result in unintended health outcomes. CDC reported that in 2017, among Houston high school students:

- 35% had ever had sexual intercourse
- 10% had four or more sexual partners
- 24% had had sexual intercourse during the previous 3 months, and, of these

- 45% did not use a condom the last time they had sex
- 23% did not use any method to prevent pregnancy
- 18% had drunk alcohol or used drugs before last sexual intercourse⁵⁴

The potential results of sexual risk behavior are described in the sections on Health Outcomes (Teen Births) and Communicable Diseases (HIV and Sexually Transmitted Diseases).

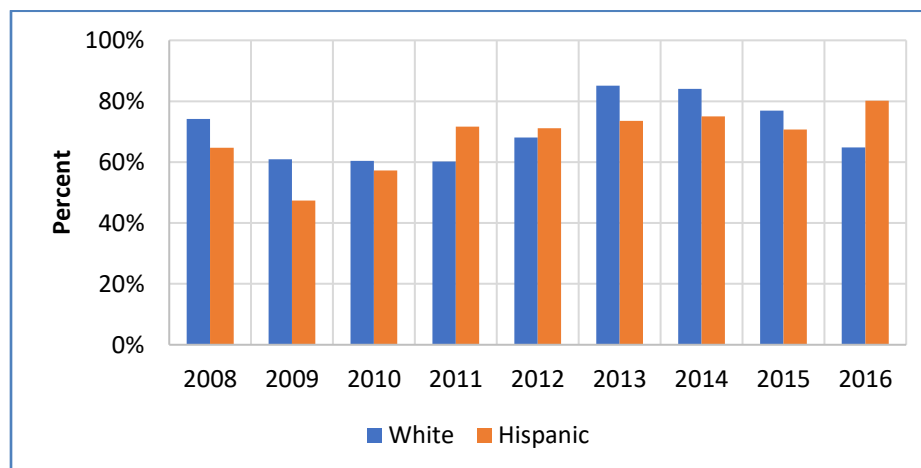
USE OF PREVENTIVE SERVICES

Use of preventive services, such as immunizations and screening tests, can reflect a positive attitude towards personal health. Decisions about use of preventive services can be impacted by one's social/economic status, insurance coverage, and education. As a result, participation in medical screening and other preventive services contribute to health disparities in many aspects. Regular preventive medical care can discover diseases at an early stage when treatment is more effective, and thus save medical expenses and decrease morbidity.

Immunizations—Children

High levels of vaccination coverage are important to reduce vaccine-preventable diseases, in both the vaccinated and the under-vaccinated population. At ages 19-35 months, children are immunized with 4 doses of diphtheria-tetanus-pertussis (DTaP), 3 doses of polio, 1 dose of measles-mumps-rubella (MMR), 3 or 4 doses of Hib depending on the product, 3 doses of hepatitis B, 1 dose of varicella, and 4 doses of pneumococcal conjugate vaccine (PCV).⁵⁵ A Centers for Disease Control and Prevention (CDC) report noted that the overall combined seven vaccine series coverage among children aged 19 to 35 months for 2016 in Houston was 73.1% compared to the Texas level of 69.5%.⁵⁶

Figure 26: Combined 7-Vaccine Series Coverage Among Children 19-35 Months by Race/Ethnicity, Houston TX 2008-2016*



Vaccination rates fluctuated during 2008-2016, from a low of 60.2% in 2011 to a high of 85.1% in 2013 for whites, and a low of 47.4% in 2009 to a high of 80.2% in 2016 for Hispanics.

Data Source: CDC, 2017⁵⁷ *Due to data gaps, the trends the black population could not be explored.

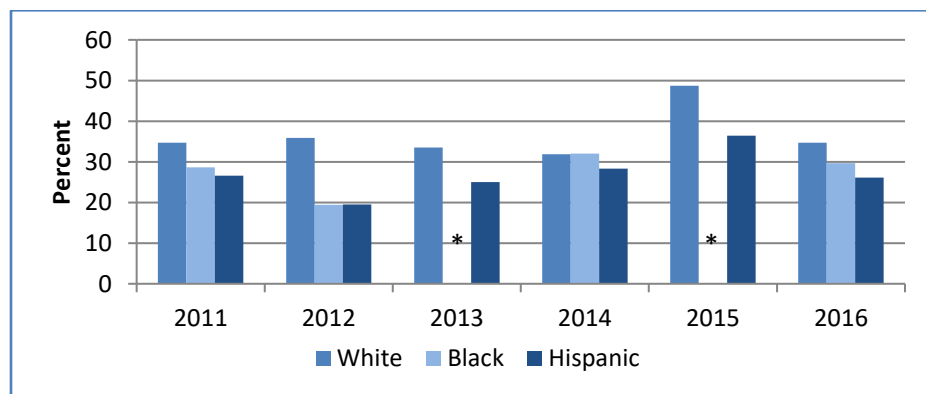
The CDC report also showed the trend according to income level. From 2008 to 2011, Houston children aged 18-35 months living below the poverty level had consistently lower immunization coverage compared to children living at or above poverty level. However, in recent years, 2011 to 2016, these differences were not significant.⁵⁸

Immunizations—Adults

Several immunizations are recommended for adults. Among these are vaccinations for shingles, pneumococcal disease (a serious infection that causes pneumonia, meningitis, and bloodstream infection or sepsis), and influenza. Shingles, pneumococcal disease, and most other vaccinations are done once in a lifetime, or at long intervals. The influenza vaccine, however, is needed yearly.

Influenza, or flu, is a potentially serious disease that can lead to hospitalization and sometimes death. The flu season is typically from October until May. During this time, millions of people get the flu and hundreds of thousands are hospitalized. During the 2016-2017 flu season, 80,000 Americans died, due to complications from having the flu. The flu is especially dangerous for older adults and children. An annual seasonal flu vaccine is the best way to help protect against flu.⁵⁹

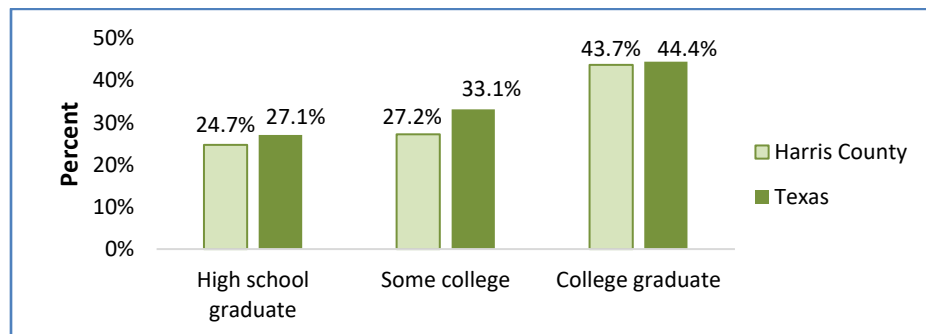
Figure 27: Percentage of Adults Aged 18-64 Reporting They Had a Flu Shot in the Past Year by Racial/Ethnic Group, Harris County 2011-2016



While whites aged 18-64 were generally more likely to have had a flu shot in the past year, none of the racial/ethnic groups came close to the Healthy People 2020 goal of 90%.

Data Source: Texas BRFSS, *Insufficient data

Figure 28: Percentage of Adults Reporting They Had A Flu Shot in the Past Year by Education, Harris County TX 2016



The percentage of adults in Harris County who received the flu vaccine in 2016 was higher among college graduates (43.7%) compared to adults with lower levels of education.

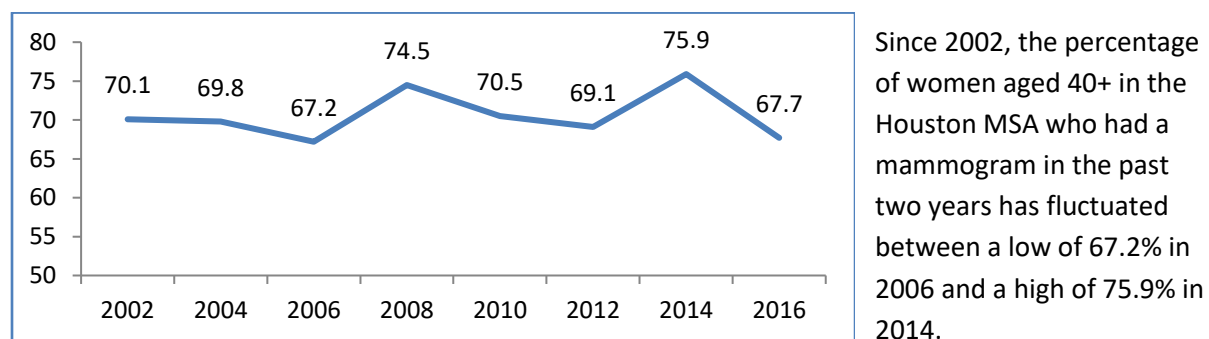
Data Source: Texas BRFSS

Those with higher incomes were more likely to get a flu vaccination. In 2016, 25% of adults age 18-64 in Harris County who earned less than \$25,000 received flu vaccine in the past 12 months compared to those earning \$25,000-\$49,999 (36.3%) and over \$50,000 (35.6%) according to BRFSS data.

Mammograms

A mammogram is an x-ray of the breast that can be used to detect changes in the breast such as tumors and calcifications. The test may be done for screening or for diagnostic purposes. A positive screening mammogram leads to further testing to determine if cancer is present. Mammograms may also be used to evaluate known cases of breast cancer. Although mammograms do not detect all cases of breast cancer, they have been shown to increase early detection, thus reducing mortality.⁶⁰ Studies show that women ages 50-59 who get mammograms on a regular basis have a 14% lower risk of dying from breast cancer than their peers who did not get mammograms.⁶¹

Figure 29: Percentage of Woman Aged 40+ Who Had a Mammogram in the Past Two Years Houston-The Woodlands-Sugarland MSA 2002-2016



Source: CDC BRFSS, 2018

According to the Texas Behavioral Risk Factor Surveillance System (BRFSS) survey, women aged 40+ in Harris County, in 2016, were more likely to have gotten a mammogram in the past two years if they were:

- Employed (70.2%) compared to not employed (65.4%)
- Married (73.4%) compared to not married (60.3%)
- College graduates (77.3%) compared to some college (60.3%)
- Higher income (79.2% for income over \$50,000) compared to lower income (56.7% for income below \$25,000) in 2012*
- Hispanic (84.6%) compared to white (81.6%) in 2014**

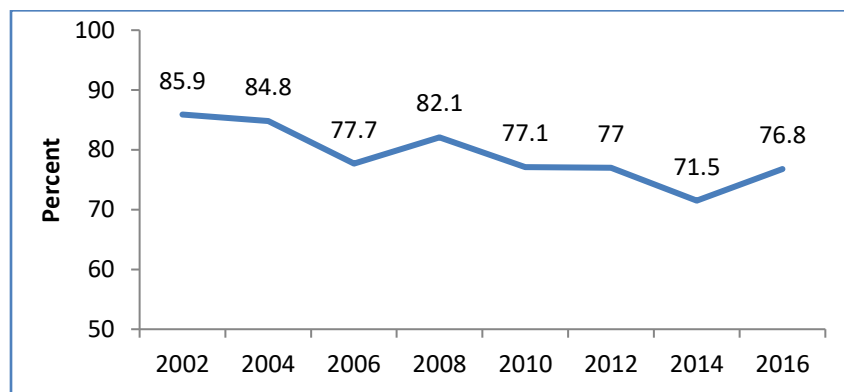
(*more recent data not available **recent data, and data to compare with the black population not available)

Cervical Cancer Screening (Pap Test)

The Pap test, also known as a Pap or Pap smear, checks for changes in the cells of the cervix that can be early signs of cervical cancer. Cervical cancer is a common cancer that has a very high cure or remission

rate when caught early. If Pap results are abnormal, further testing or treatment may be necessary. Many abnormalities resolve without leading to cancer. The American College of Obstetricians and Gynecologists recommends that all women aged 21-29 have a Pap test every three years while women aged 30-65 should have a Pap test and an HPV test every five years or a Pap test alone every three years.⁶²

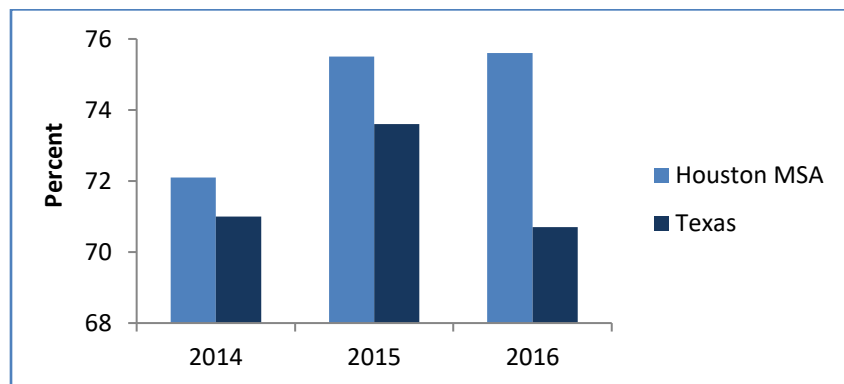
**Figure 30: Percentage of Women Aged 18+ Who Had a Pap Test in the Past Three Years
Houston-The Woodlands-Sugarland MSA 2002-2016**



Since 2002, the percentage of women aged 18+ in the Houston MSA who had a pap test in the past three years has decreased from 85.9% in 2002 to 76.8% in 2016.

Data Source: CDC BRFSS, 2018

Figure 31: Percentage of Women Aged 18+ Who Had a Pap Test in the Past Three Years, Houston-The Woodlands-Sugarland MSA vs. Texas, 2014-2016



Houston MSA women (75.6%) were more likely to have gotten a pap test in 2016 compared to Texas women (70.7%), a pattern that was also true in 2014 and 2015.

Data Source: Texas BRFSS

According to the Texas BRFSS, Harris County women aged 18+ were more likely to get a pap test in 2016 if they were:

- Employed (76.6%) compared to not employed (71.8%)
- Married (87.3%) compared to not married (62.5%)
- College graduates (84.5%) compared to some college (74.5%)
- Higher income (71.7% for income \$50,000+ compared to 63.9% for below \$25,000) in 2014*
- White (78.1%) compared to Hispanic (74.1%)**

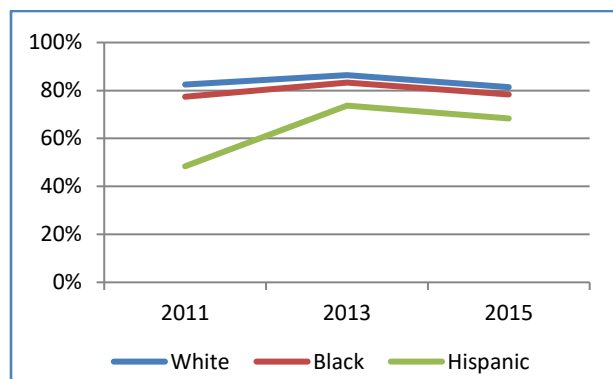
(*more recent data not available **Comparison data for the black population not available)

Cholesterol Screening

According to the Centers for Disease Control and Prevention, about one in six adults have high blood cholesterol. High blood cholesterol is one of the major risk factors for heart disease. Studies show that higher blood cholesterol levels lead to greater risk for developing heart disease or having a heart attack; heart disease is the number one cause of death in the US, and causes most heart attacks. High blood cholesterol does not cause symptoms, so screening tests are necessary to evaluate blood cholesterol. Lowering cholesterol levels lessens the risk for developing heart disease and reduces the chance of having a heart attack. Lowering high cholesterol levels is important for people of all ages, and for both men and women.⁶³

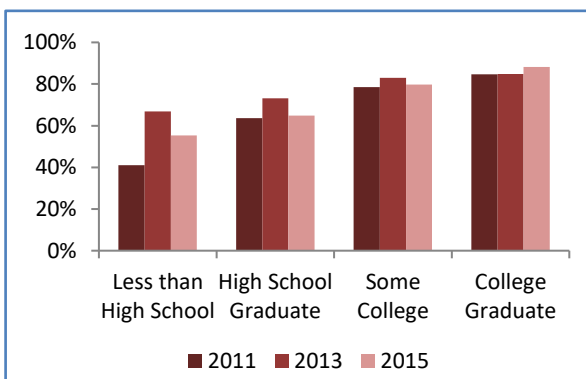
Figure 32 and Figure 33 show trends and disparities in cholesterol testing among Harris County adults. In 2015, Harris County whites (81.4%) and blacks (78.4%) were more likely to have a cholesterol test in the past five years compared to Hispanics (68.3%). Those with the most education (college graduates, 88.2%; some college, 79.8%) were more likely to have the test, compared to those with less education (high school graduates, 64.8%; less than high school, 55.4%).⁶⁴

Figure 32: Percentage Reporting They Had Their Cholesterol Checked in the Past Five Years by Racial/Ethnic Group, Harris County TX 2011-2015



Data Source: Texas BRFSS, 2018

Figure 33: Percentage Reporting They Had Cholesterol Checked in the Past Five Years by Education Level, Harris County TX 2011-2015



Data Source: Texas BRFSS, 2018

Income also makes a difference in those who decide to get cholesterol screening, although it is less pronounced than education level. In 2015, 81.6% of Harris County respondents with incomes of \$50,000 and above had a cholesterol test in the past year, compared to 76.1% of those with incomes of \$25,000-\$49,999, and 69.6% of those with incomes less than \$25,000.⁶⁵

According to the Texas BRFSS, in 2015, Harris County residents were more likely to have gotten a screening for cholesterol if they were:

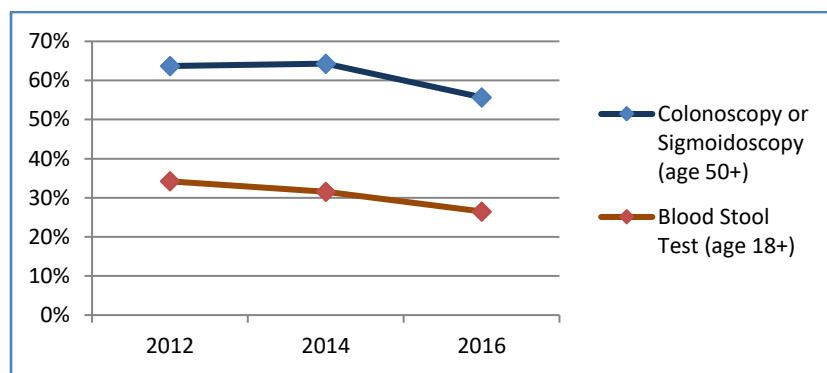
- Men (79.4%) compared to women (76.3%)
- Insured (85.7%) compared to those without health insurance (56.4%)
- Married (85.9%) compared to those who were not married (68.8%)
- Employed (83.7%) compared to those who were unemployed (69.7%)

Colorectal Cancer Screening

According to the Centers for Disease Control and Prevention (CDC), colorectal cancer, or cancer of the colon or rectum, is one of the most commonly diagnosed cancers in the United States, and is the second leading cause of deaths due to cancer in the United States. The CDC estimates that if all adults aged 50 or older had regular screening tests for colon cancer, as many as 60% of the deaths from colorectal cancer could be prevented. CDC recommends people from ages 50 to 75 years undergo regular screening for colorectal cancer. The recommended tests are:

- Yearly: stool test for blood (FIT or FOBT)
- Every 5-10 years: sigmoidoscopy
- Every 10 years: colonoscopy⁶⁶

Figure 34: Percentage Reporting Having a Colonoscopy or Sigmoidoscopy, or a Blood Stool Test, Harris County TX 2012-2016

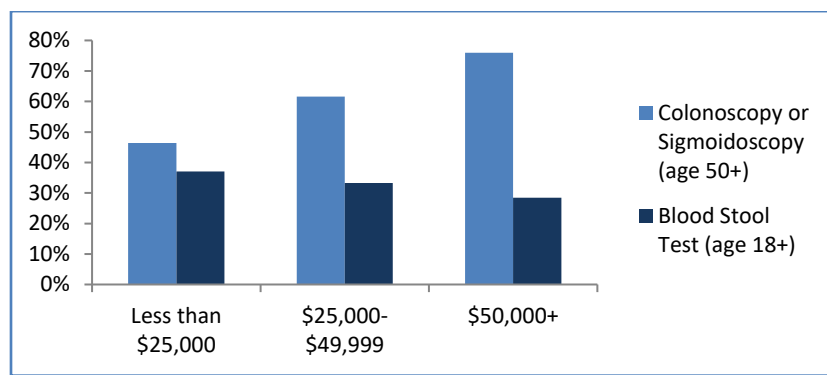


Among Harris County adults, a higher percentage reported that they had been screened with colonoscopy or sigmoidoscopy (55.7%) compared to those who had a blood stool test (26.5%). Screenings among both groups decreased from 2012.

Data Source: Texas BRFSS

Harris County females (29.2%) were more likely to have had a stool blood test than males (23.5%), and also to have had a colonoscopy or sigmoidoscopy (females = 70.7%; males = 56.0%). Whites (71.7%) were more likely to report having a colonoscopy or sigmoidoscopy than Hispanics (43.8%) in 2014, according to the Texas Behavioral Risk Factor Surveillance System survey (BRFSS). Due to the limited sample size, other racial/ethnic group comparisons were not available.

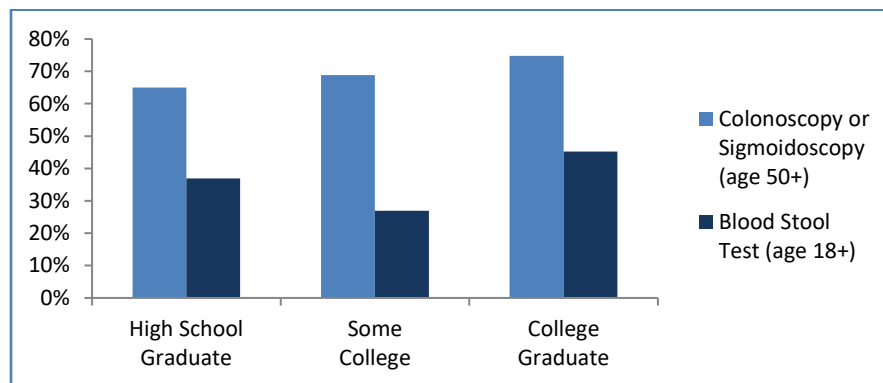
Figure 35: Percentage Reporting Having a Colonoscopy or Sigmoidoscopy, or a Blood Stool Test, by Income, Harris County TX 2016



As incomes rose for Harris County adults in 2016, they became more likely to report having a colonoscopy or sigmoidoscopy, as compared to a blood stool test using a home kit.

Data Source: Texas BRFSS

Figure 36: Percentage Reporting Having a Colonoscopy or Sigmoidoscopy, or a Blood Stool Test, by Education, Harris County TX 2016



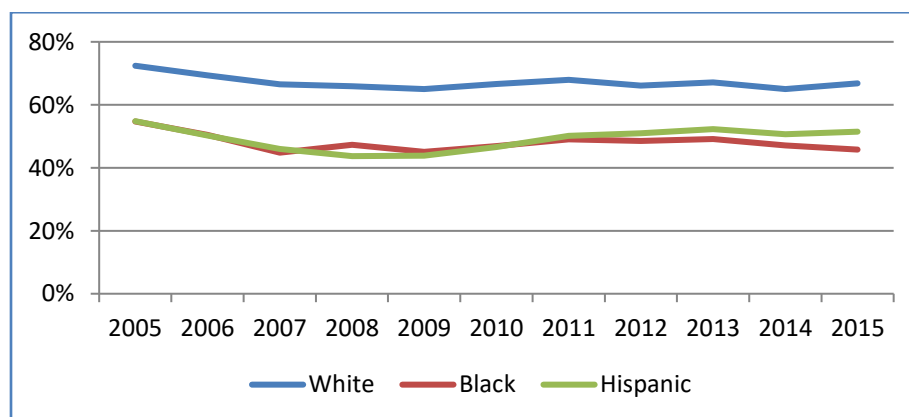
Among Harris County adults in 2016, college graduates were more likely to report having had a colonoscopy or sigmoidoscopy, or a blood stool test, compared to those with less education.

Data Source: Texas BRFSS

Prenatal Care

Babies born to mothers who do not receive prenatal care are three times more likely to have a low birth weight and five times more likely to die than those born to mothers who do get care. Early prenatal care, which refers to care that begins in the first trimester of a pregnancy, allows women and their health care providers to identify and, when possible, treat or correct health problems and health-compromising behaviors that can be particularly damaging during the initial stages of fetal development. Increasing the number of women who receive prenatal care, and who do so early in their pregnancies, can improve birth outcomes and lower health care costs by reducing the likelihood of complications during pregnancy and childbirth.⁶⁷

Figure 37: Percentage of Births to Mothers Who Began Prenatal Care in the First Trimester of their Pregnancies, Harris County TX, 2005-2015

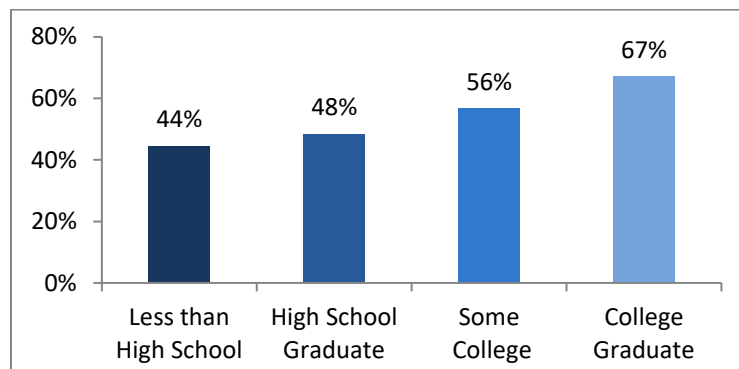


In 2015, white mothers (66.8%) were more likely to begin prenatal care in the first trimester, compared to black (45.8%) and Hispanic (51.5%) mothers.

Data Source: Texas DSHS Center for Health Statistics⁶⁸

There were 73,427 births in Harris County in 2015. Of these, 41,089 (56.0%) were to married women, and 32,325 (44.0%) were to women who were not married. Married mothers (60.9%) were more likely to have gone for prenatal care in the first trimester compared to unmarried mothers (46.4%).⁶⁹

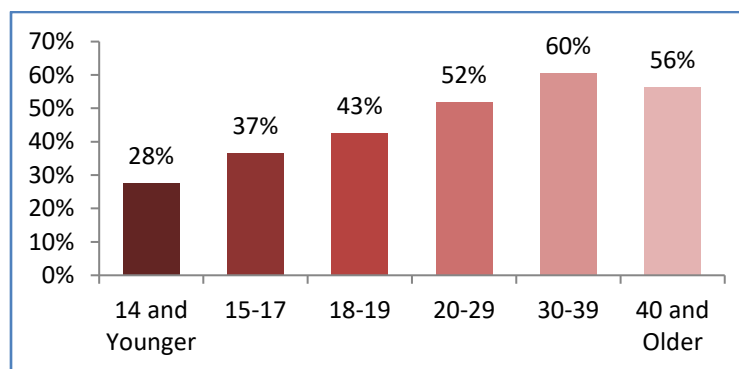
Figure 38: Percentage of Births to Mothers Who Began Prenatal Care in the First Trimester of Their Pregnancies by Education, Harris County TX, 2015



Harris County mothers with more education were more likely to enter prenatal care in the first trimester in 2015. Each increment in completed education was associated with a higher likelihood of entering prenatal care in the first trimester.

Data Source: Texas DSHS Center for Health Statistics

Figure 39: Percentage of Births to Mothers Who Began Prenatal Care in the First Trimester of their Pregnancies by Age, Harris County TX, 2005-2015



Significant disparities by age group were apparent in whether Harris County mothers entered prenatal care in the first trimester. The youngest mothers were least likely to seek early prenatal care, while mothers aged 30-39 years had the highest percentage with early prenatal care.

Data Source: Texas DSHS Center for Health Statistics

The majority of pregnant women do enter prenatal care in the first trimester of pregnancy. Only 4.3% did not receive any prenatal care. In the Houston-The Woodlands-Sugar Land MSA, in 2015, the percentages of women entering prenatal care at different stages of the pregnancy were:

- 56.5% — first trimester
- 25.2% — second trimester
- 7.9% — third trimester
- 4.3% — no prenatal care

HEALTH OUTCOMES

Health outcomes are the results in one's health of the genetics, health behaviors, environments, medical treatments, and other structural factors that impact one's health. Health outcomes are affected by age, income, racial/ethnic group, risk behaviors, and many other factors in one's life. Outcomes can include positive health and well-being, but also diseases such as cancer, arthritis, heart disease, loss of teeth, and many other conditions, including death.

BIRTH OUTCOMES

Preterm Birth and Low Birth Weight

Fortunately, the vast majority of mothers and babies are healthy. However, some births result in poor health outcomes. Two kinds of adverse birth outcomes are preterm birth and low birth weight. Preterm birth refers to a live birth before 37 completed weeks of gestation. Low birth weight infants are defined as weighing less than 2,500 grams (about 5 pounds, 8 ounces). Preterm birth is one of the primary causes of low birth weight.

In the cases of preterm birth and low birth weight, the newborn has not fully developed, and therefore is at increased risk for health complications such as disabilities, neurological disorders, and other chronic conditions.⁷⁰ Premature birth is also a risk factor for infant mortality. In the US, preterm birth and low birth weight accounted for about 17% of infant deaths.⁷¹ In the US, about 1 in 12 babies is considered underweight (less than 5.5 pounds) at birth, and approximately 1 in 10 newborns is delivered prematurely, at less than 37 weeks.⁷²

Many environmental or physical factors such as air pollution, pesticides, lead or mercury exposure, and the health and age of the mother can influence the birth outcomes. Risk factors for premature birth and low birth weight infants also include stressors the mother faces, such as domestic violence or low socioeconomic status (SES) which includes factors such as lack of education, a low-paying job, and low income.⁷³ These stressors can lead to poor birth outcomes which can then increase the risk of health disparities later in life.

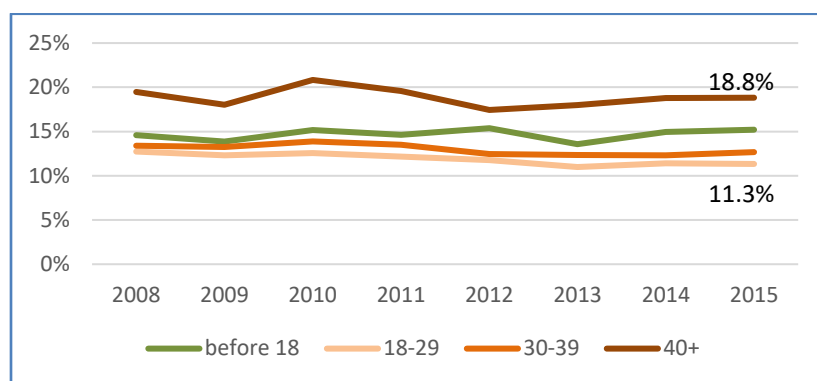
In Harris County, the percentages of preterm births have decreased in the past few years, from 13.1% in 2008 to 12.2% in 2015. Percentages of low birth weight births have also dropped, from 8.8% of all births in 2008 to 8.5% in 2015.⁷⁴

Education made a difference in premature births in Harris County, but was less important in low birth weight births, according to Texas Department of State Health Services (DSHS) Center for Health Statistics records. Women who are college graduates were less likely to have premature births in 2015, with 10.3% of births that were preterm, compared to 13.5% of births to women who had not graduated from

high school. However, this difference was not seen in in relation to low birth weight. College graduates (8.1%) delivered a similar percentage of low birth weight infants compared to females who had not graduated from high school (8.0%); interestingly, percentages in both groups were lower than among high school graduates (9.0%) and women with some college (8.9%). These differences were apparent in 2015, and also were similar for the period of 2008-2015.

The mother's age is a key variable in preterm births. Older mothers aged 40 and above are at greater risk for preterm birth compared to younger mothers.

Figure 40: Percentage of Premature Births by Mother's Age, Harris County TX 2015

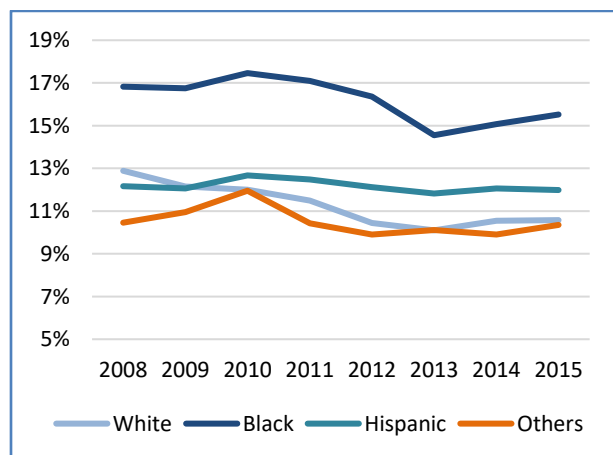


In Harris County, in 2015, the highest percentages of preterm births were to the oldest mothers, over age 40 (18.8%), or the youngest mothers, under age 18 (15.2%), compared to mothers aged 30-39 (12.7%) or 18-29 (11.3%) in 2015.

Source: Texas DSHS Center for Health Statistics

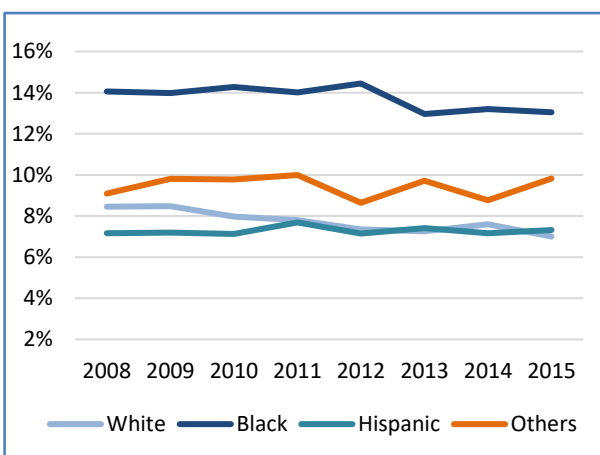
Racial/ethnic differences exist in preterm and low birthweight deliveries. Compared to other racial/ethnic groups, blacks have a significantly higher risk of premature birth. While the percentage has dropped since 2008 for black mothers, it is still much higher, at 15.5 % of births, compared to whites (10.6%) and Hispanics (12.0%). A similar pattern is seen among low birth weights. Much research is focused on this disparity among black mothers and infants, but the reasons remain unknown.⁷⁵

Figure 41: Percentage of Premature Births by Race/Ethnicity, Harris County TX 2015



Data Source: Texas DSHS Center for Health Statistics

Figure 42: Percentage of Low Birth Weight Births by Race/Ethnicity, Harris County TX 2015



Data Source: Texas DSHS Center for Health Statistics

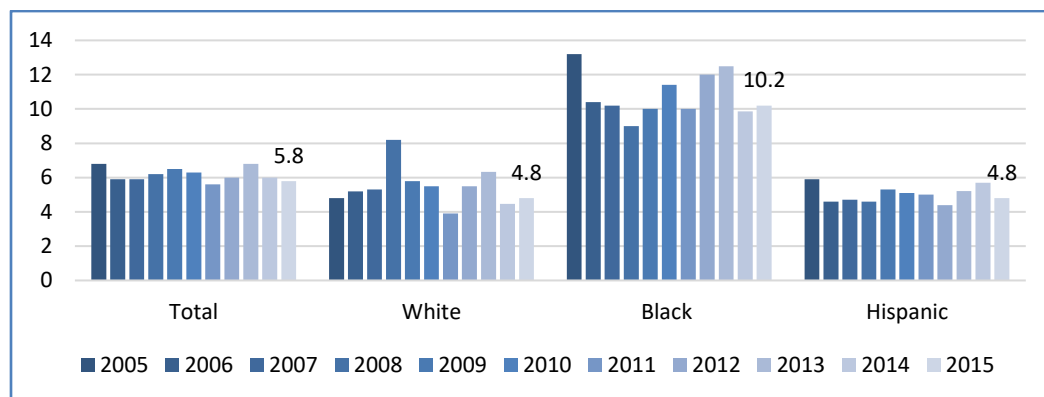
Infant Mortality

Infant mortality refers to the number of infants that are born alive, but die before they are one year of age. The infant mortality rate is the number of deaths per 1,000 live births, and is often considered to be one of the most useful indicators of the overall health status of a community. The leading causes of death among infants are birth defects, preterm birth and low birth weight, Sudden Infant Death Syndrome (SIDS), maternal pregnancy complications, and accidents such as suffocation.⁷⁶

As can be seen in Figure 43, the infant mortality rate in Harris County has decreased from 6.8 per 1,000 live births in 2005 to 5.8 per 1,000 in 2015. The infant mortality rate in the United States was also 5.8 deaths per 1,000 live births in 2015.

A large disparity is apparent in the infant mortality rate among racial/ ethnic groups. Figure 43 depicts the higher rate for black infants (10.2 per 1,000 in 2015) compared to whites (4.8 per 1,000) and Hispanics (4.8 per 1,000). This disparity has been present for many years.

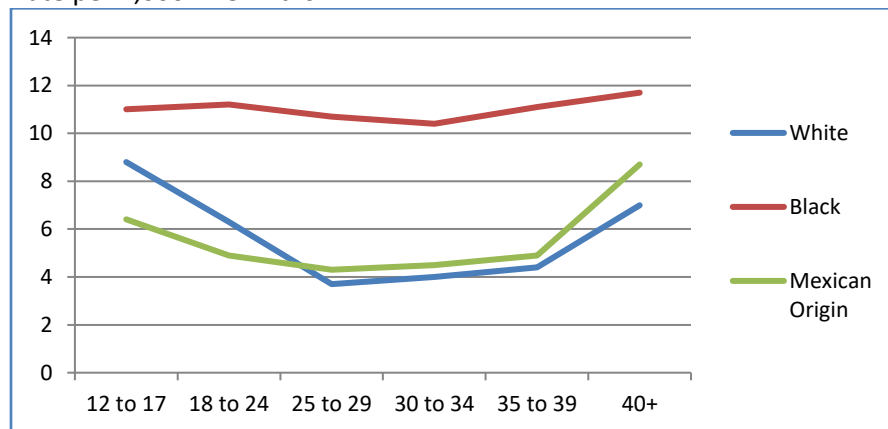
Figure 43: Infant Mortality Rate by Race/Ethnicity, Harris County, TX 2005-2015
Deaths per 1,000 Live Births



The Harris County infant mortality rate among black infants is more than twice as high compared to whites and Hispanics.

Data Source: Texas DSHS Center for Health Statistics

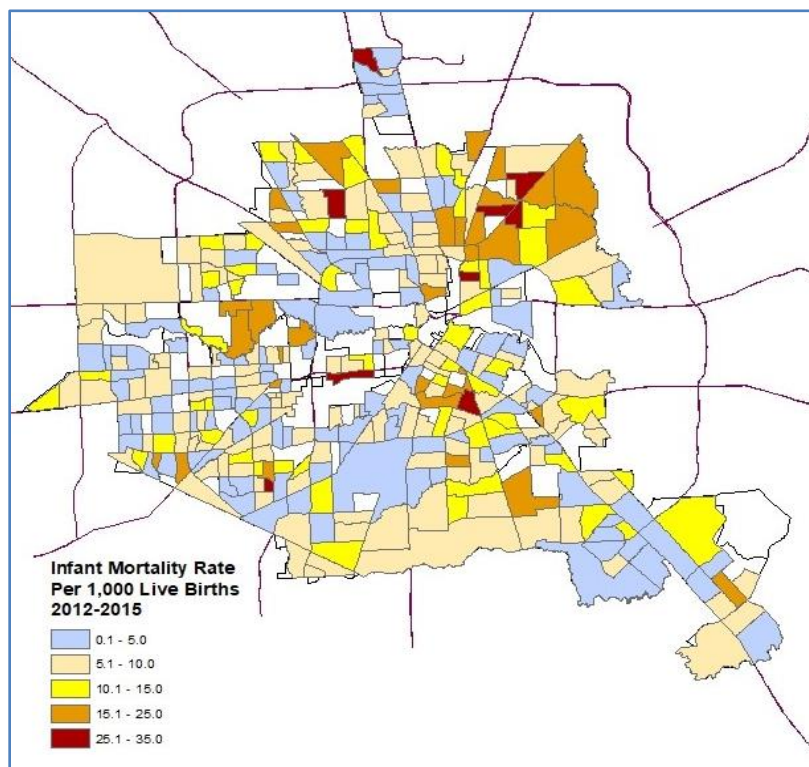
Figure 44: Infant Mortality Rate in the US by Race/Ethnicity and Age of the Mother 2013⁷⁷
Rate per 1,000 Live Births



This 2013 study looked into the race/ethnicity and age of the mothers to evaluate whether this impacted the infant mortality rate. The study found that age had a large impact among whites and Hispanics, but much less among the black population.

Data Source: Cohen, 2016

Figure 45: Infant Mortality Rate by Census Tract, Harris County TX 2012-2015



Wide disparities in infant mortality exist in different Houston/Harris County census tracts. Figure 45 shows infant mortality disparities that range from low (5.0 or less per 1,000 live births, in blue/gray) to very high (25.1 to 35.0 per 1,000, in the dark rust color). The areas with higher infant mortality frequently correlate with areas that have higher rates of poverty and higher percentages of minority groups, especially of the black population.

Data Source: Texas DSHS Center for Health Statistics data. Map by HHD.

ADOLESCENT PREGNANCY

Births to very young females have implications for both the mother and the child. According to the Texas Department of State Health Services, teenage mothers are less likely to receive adequate prenatal care, less likely to gain adequate weight during pregnancy, and more likely to smoke than older mothers. Children born to teenage mothers are also at greater risk of having infants born with low birth weight, and at higher risk for disabilities and mortality during the first year of life. Teen mothers are less likely to finish high school, and their children suffer higher rates of abuse and neglect compared to mothers who delay childbearing.

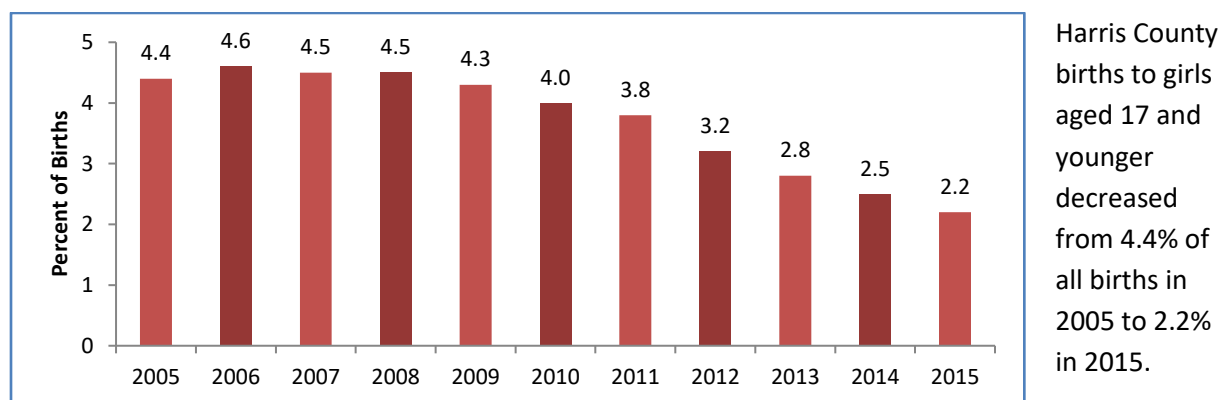
Many risk factors contribute to teen pregnancy. A teen is more likely to become pregnant if she: lives in poverty, has a mother with low educational achievement or who gave birth before the age of 20, is from a single-parent home, lives in a home with frequent family conflict, starts sexual activity or uses alcohol and drugs at an early age, has low self-esteem, or is from a geographic area or racial/ethnic group with high rates of teen pregnancy.⁷⁸

Some protective factors include open communication with parents and/or adults about accurate contraception use, parental support and healthy family dynamics, positive attitudes towards condom use and peer use of condoms, intent to abstain from sex or limit one's number of partners, and accurate

knowledge of sexual health, HIV infection, sexually transmitted infections, the importance of abstinence, and pregnancy.⁷⁹

Teen pregnancy has been dropping across the US in recent years, from 41.5 live births per 1,000 females aged 15-19 in 2007 to 22.3 births per 1,000 in 2015.⁸⁰ Births to adolescents, age 17 and younger, have been dropping in the past years in Harris County, as well. Although the reasons for this decline are not completely clear, evidence suggests these declines are due to more teens abstaining from sexual activity, and more sexually active teens are using birth control than in previous years.⁸¹ Still, the US teen pregnancy rate is substantially higher than in other western industrialized nations.⁸²

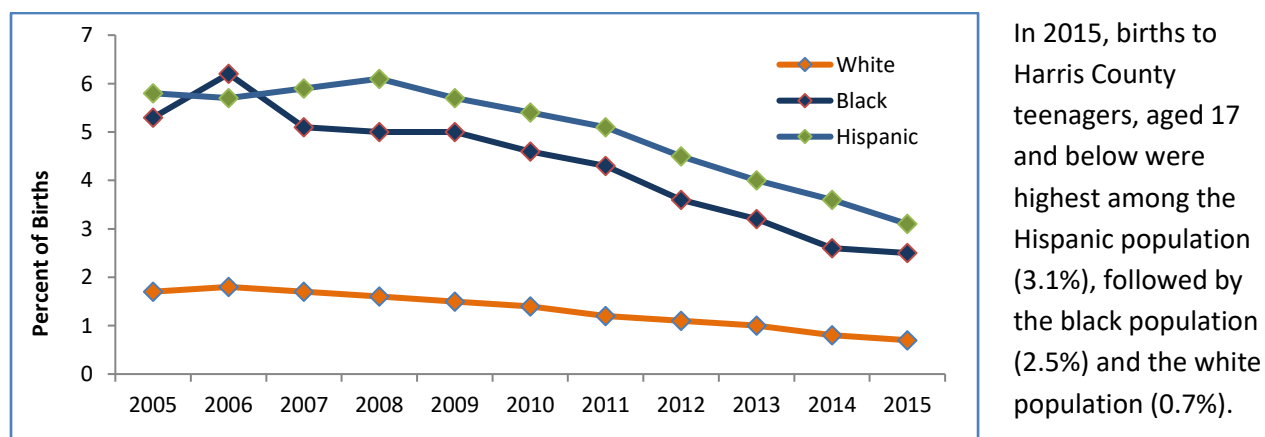
Figure 46: Percentage of Births to Females Aged 17 and Younger, Harris County TX 2005-2015



Data Source: Texas DSHS Center for Health Statistics

While the percentages of births to all Harris County mothers aged 17 and below has decreased since 2005, significant disparities among racial/ethnic groups have persisted, as shown in Figure 47.

Figure 47: Percentage of Births to Adolescent Mothers Aged 17 and Younger by Race/Ethnicity, Harris County TX 2005-2015



Data Source: Texas DSHS Center for Health Statistics

OBESITY

The percentage of obese adults is an indicator of the overall health and lifestyle of a community. Obesity increases the risk of many diseases and health conditions, including heart disease, type 2 diabetes, cancer, hypertension, stroke, liver and gallbladder disease, respiratory problems, and osteoarthritis. Losing weight and maintaining a healthy weight help to prevent and control these diseases. Being obese also carries significant economic costs due to increased healthcare spending and lost earnings.⁸³

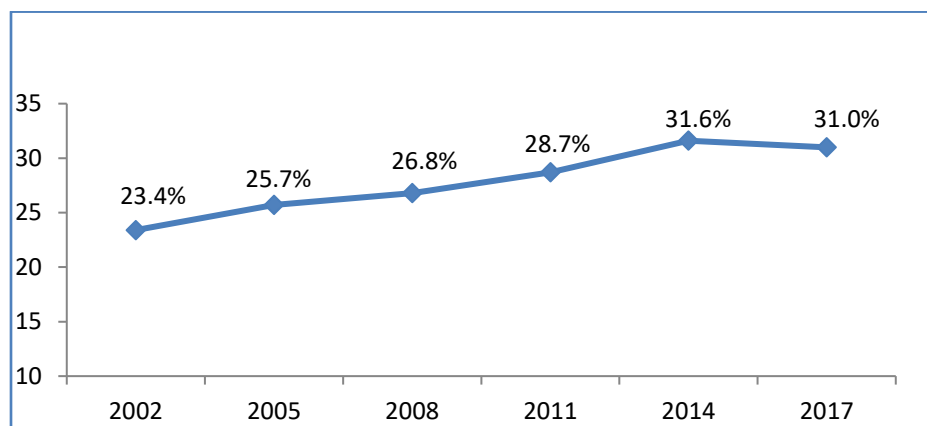
The majority of the US population is now either overweight, defined as a Body Mass Index (BMI) of 25.0 to 29.9, or obese, with a BMI of 30+. Excess body weight has many causes and contributing factors. While the most obvious are poor diet, with excess calories, and lack of exercise, these are not the whole picture. According to CDC, other factors might include environment (poor availability of healthy foods, lack of safe opportunities for exercise, traditional high calorie foods in the community and family); genetics (some people more easily gain weight than others, and overweight and obesity vary by racial/ethnic group); diseases (those with disabilities have greater percentages of obesity; also diseases such as Cushing's Disease can lead to weight gain) and drugs (steroids and antidepressants, among others). Poverty and low income are also risk factors for overweight and obesity.⁸⁴

Some recent studies, including one titled *Overweight Versus Obese: Different Risk and Different Management* by Dr. Ann Barnes,⁸⁵ have indicated that obesity is a greater health risk than overweight; therefore, this report will focus on obesity. That is not to say that overweight should be ignored, according to Barnes. Overweight is the stage where prevention of further weight gain can take place.

Obesity in Adults

In Harris County, about two-thirds of adults are overweight (BMI of 25.0 to 29.9) or obese (BMI of 30+). Obesity has been steadily rising in the Houston area.

Figure 48: Percentage of Obese Adults, Houston-The Woodlands-Sugar Land Metropolitan Statistical Area 2002-2017



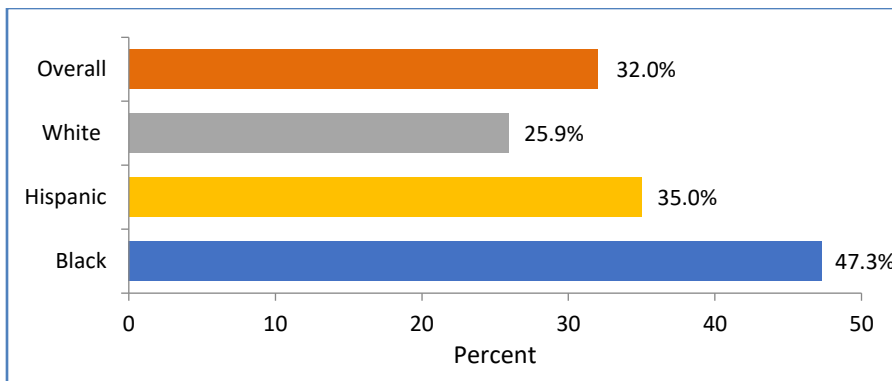
Source: CDC BRFSS

The percentage of the Houston area population with obesity has been trending upward, from 23.4% in 2002, to 31.0% in 2017. Obesity is most common among those aged 45-64 years compared to other age groups.

Obesity rates in Houston are higher than the US. The CDC 500 Cities Project found that obesity was 34.1% in the City of Houston in 2015, compared to 28.8% in the US.⁸⁶

Among Harris County residents who responded to the Texas BRFSS survey, obesity percentages among men (32.0%) and women (31.9%) were similar in 2015. Racial/ethnic disparities were apparent, however. While all racial/ethnic groups had greater percentages of obesity in 2015 compared to 2011, the Hispanic populations showed the largest increase.

Figure 49: Percentage of Obese Adults by Racial/Ethnic Group, Harris County, TX 2016

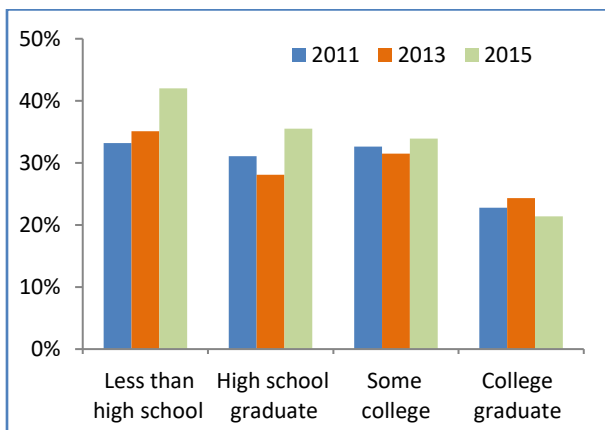


In Harris County, blacks (47.3%) and Hispanics (35.0%) were more likely to be obese than whites (25.9%) among those responding to the BRFSS survey in 2016.

Data Source: Texas DSHS BRFSS

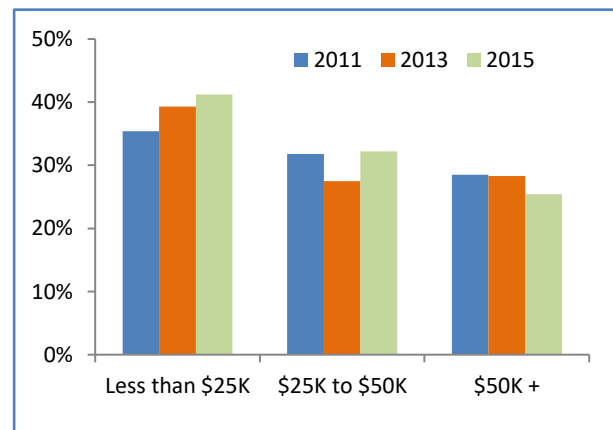
Persons with less education and lower incomes are more likely to be obese, a trend that is especially pronounced for those with less than a high school education and earning less than \$25,000 per year. Figures 50 and 51 show the percentages of obese residents in Harris County; in 2015, the percentage of obese among those with less than a high school education (42.0%) was nearly twice that of residents with a college degree (21.4%).

Figure 50: Percentage of Obese Adults by Education, Harris County TX 2011-2015



Data Source: TDSHS BRFSS survey

Figure 51: Percentage of Obese Adults by Income, Harris County TX 2011-2015

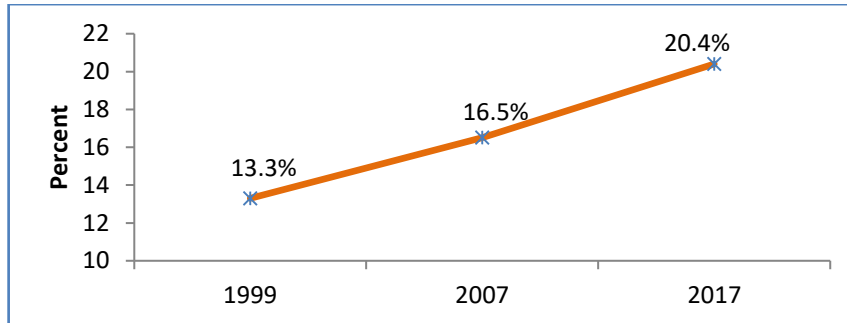


Data Source: TDSHS BRFSS survey

Obesity in Youth

Houston Independent School District (HISD) high school students responded to the Youth Risk Factor Surveillance System (YRBSS) survey in 2017.⁸⁷ Their answers revealed that 20.4% of Houston students are obese. Obesity is more prevalent among Houston students compared to Texas (18.6%) and the US (14.8%). Even more concerning is that obesity among high school students has risen by about 50% in the past two decades.

Figure 52: Percentage of Obese Students in HISD High School Students, Houston TX 1997-2017

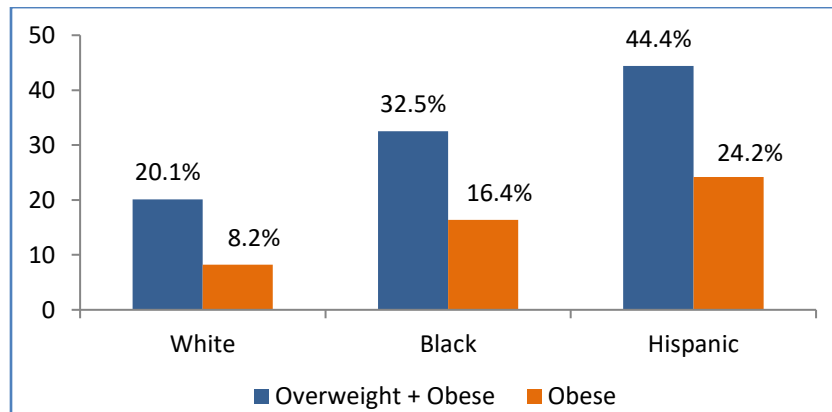


The percentage of Houston Independent School District (HISD) high school students who are obese has been rising, from 13.3% in 1997 to 20.4% in 2017.

Data Source: CDC YRBSS survey

Racial/ethnic differences are apparent among HISD students who are overweight or obese.

Figure 53: Percentage of HISD Students Who are Overweight and Obese, or Obese By Racial/Ethnic Group 2017



In 2017, the percentage of obese students was highest among the Hispanic population (24.4%), followed by the black population of students (16.4%) and the white population (8.2%).

The survey showed that HISD boys (24.1%) were more likely to be obese than girls (16.6%).

Source: CDC YRBSS survey

DISABILITIES

People with a disability have difficulties performing activities due to a physical, mental, or emotional condition. The extent to which a person is limited by a disability is heavily dependent on the social and physical environment in which he or she lives. Without sufficient accommodations, people with disabilities may have difficulties living independently or fulfilling work responsibilities.⁸⁸

Disabilities are a common outcome of health risk behaviors. Disabilities are also strongly associated with increasing age. CDC reported that 26% of adults in the United States have some form of disability. Adults living with disabilities are more likely to:

- Be obese (38.2% with disabilities, 26.2% without disabilities)
- Smoke (28.2% with disabilities, 13.4% without disabilities)
- Have heart disease (11.5% with disabilities, 3.5% without disabilities)
- Have diabetes (16.3% with disabilities, 7.2% without disabilities)⁸⁹

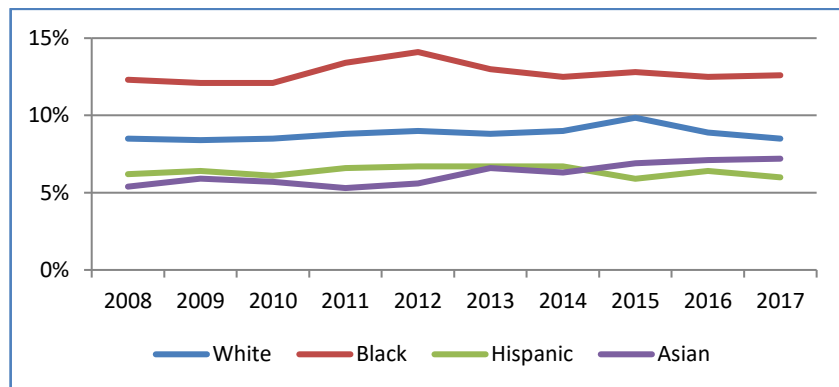
Disabilities are especially common in older adults and minorities.

- 1 in 4 adults have some form of disability
- 2 in 5 adults age 65 years and older have a disability
- 1 in 4 women have a disability
- 2 in 5 non-Hispanic American Indians/Alaska Natives have a disability⁹⁰

The American Community Survey (ACS),⁹¹ a branch of the US Census Bureau, asks respondents about six disability categories in the survey: vision, hearing, cognitive, ambulatory, self-care, and independent living. In Harris County, in 2017, of those who reported that they were disabled, 1.8% had vision difficulties, 2.2% had problems with hearing, 3.7% reported cognitive problems such as memory or concentration difficulties, 5.1% were disabled because of ambulatory problems, 2.0% had difficulty with self-care, and 4.3% were unable to live independently.

According to the American Community Survey, the percentage of those with a disability in the Harris County civilian population slowly increased from 7.8% in 2008 to 9.0% in 2017. These persons reported that they were disabled, in that they were limited in some activities because of physical, mental, or emotional problems. Most persons who reported disability were in the 65+ age group (35.0% of respondents in that age group), followed by ages 18-64 (7.9%), ages 5-17 (4.5%) and younger than 5 years (0.9%). Harris County has lower percentages of disabled (9.0%), compared to the US overall, where 12.7% reported they were disabled in 2017.

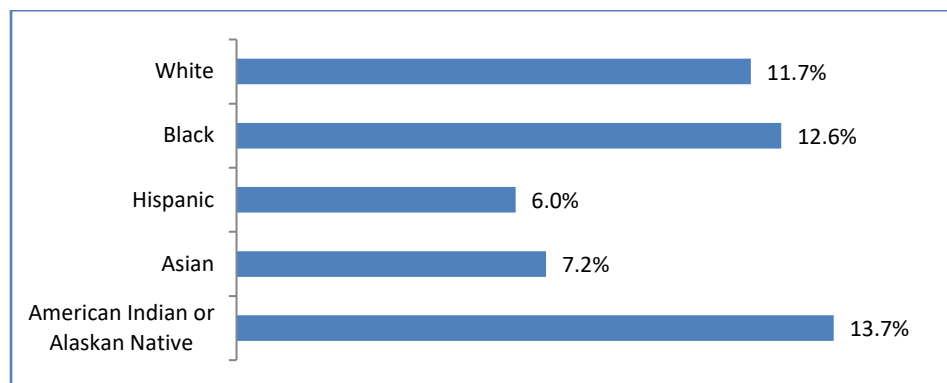
Figure 54: Percentage of Adults with Disabilities by Racial/Ethnic Group, Harris County TX 2008-2017



Disabilities in Harris County have consistently been highest among the black population in the period of 2008-2017. In 2017, 12.6% of blacks reported they were disabled, compared to 8.5% of whites, 6.0% of Hispanics, and 7.2% of Asians.

Data Source: American Community Survey

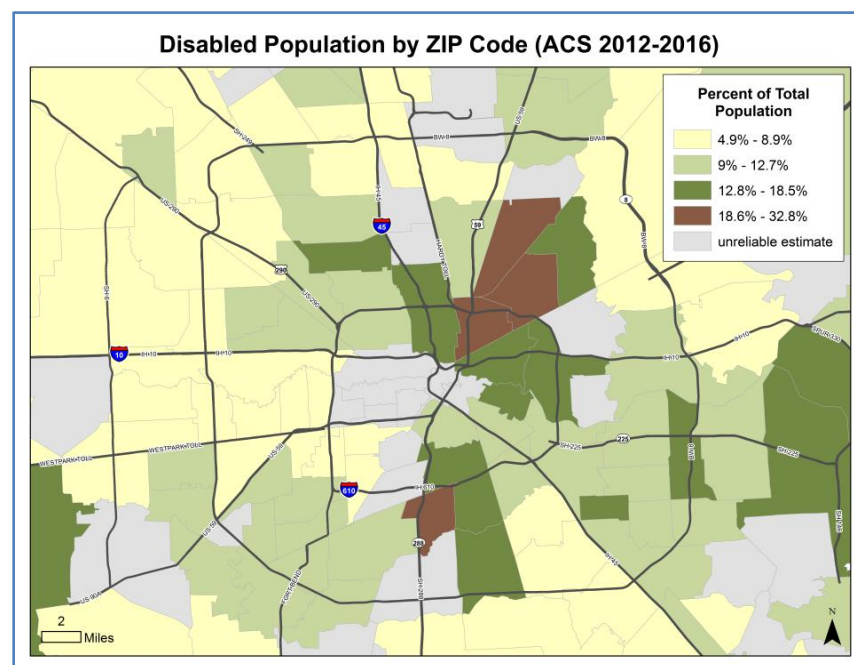
Figure 55: Percentage of Disabled Persons, Harris County TX 2016



Data Source: American Community Survey

Disability varied by racial/ethnic group in Harris County in 2017. American Indians or Alaskan Natives had the highest percentage of disabilities (13.7%), followed by blacks (12.6%).

Figure 56: Percentage of Disabled Residents by ZIP Code, Houston/Harris County TX 2012-2106



Data Source: American Community Survey. Map by the Houston Health Department

The percentage of residents with disabilities varied in 2012-2016 across Houston communities. The ZIP codes with the highest percentages of persons with disabilities overlap in many areas with neighborhoods that have high levels of poverty and large minority populations. Areas with high levels of disability may have two or more times as many residents with disabilities, compared to areas with fewer disabled residents.

LIFE EXPECTANCY

Life expectancy, or the years an infant can be expected to live, has been steadily rising in the US for many years, until recently. In 1900, a male could expect to live 46.3 years, and a female 48.3 years. By 2014, those ages had become 76.5 years for men and 81.3 years for women.⁹²

These gains were not distributed equally, however. From 2001 to 2014, life expectancy for the top 5% of income earners rose by about three years, while life expectancy for the bottom 5% of earners saw no increase.⁹³ The Robert Wood Johnson Foundation noted that “your ZIP code may be more important to

your health than your genetic code.”⁹⁴ This pattern of higher life expectancy in some ZIP codes compared to others can be seen in Table 2. Life expectancy in ZIP code 77019, River Oaks, where most incomes are far above average, is over 11 years higher than in lower income areas such as ZIP codes 77026 (Kashmere Gardens) and 77051 (Sunnyside). A mere five miles separates some of the wealthier neighborhoods compared to poorer neighborhoods in Houston/Harris County.

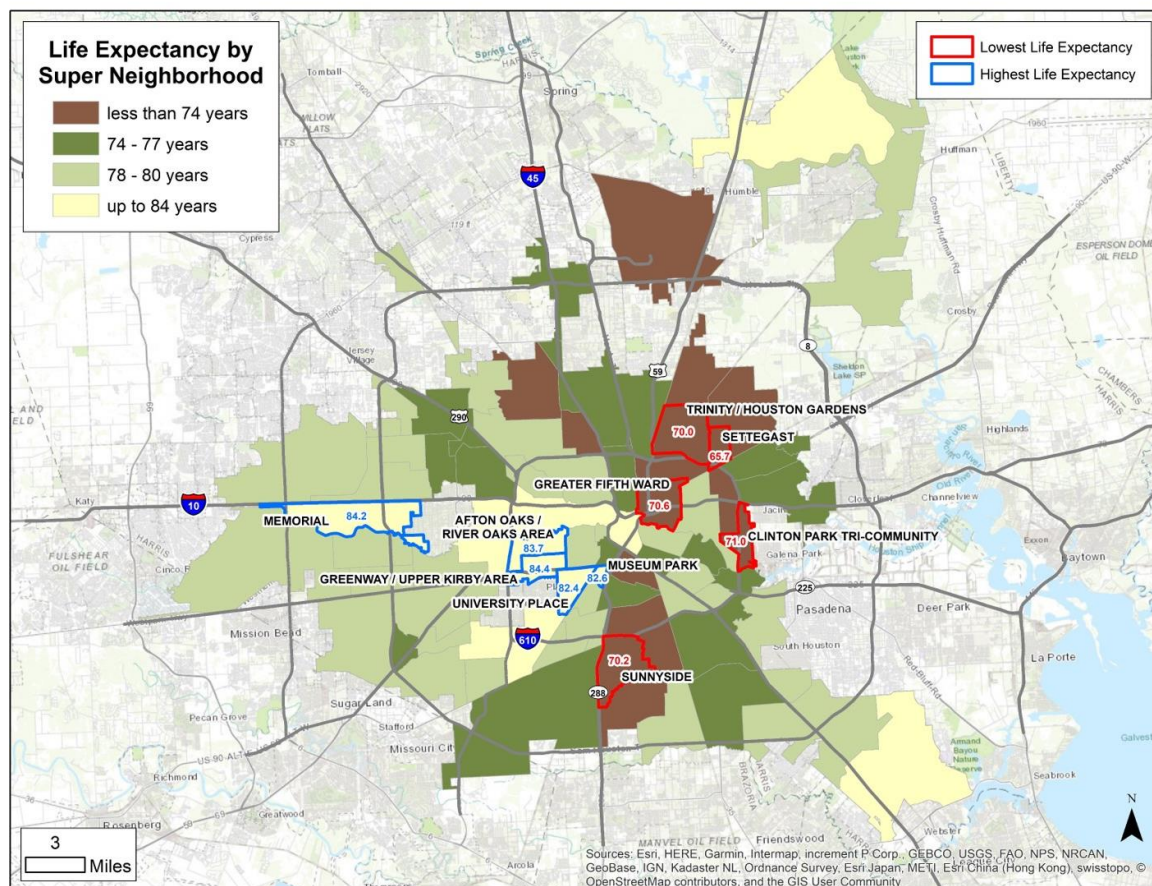
Table 2: Residential ZIP Code and Life Expectancy, Houston/Harris County, 2010-2015

77026	77019	77051	77007
Kashmere Gardens	River Oaks	Sunnyside	Rice Military
71.8 years	83.6 years	71.4 years	79.0 years

Source: CDC, National Vital Statistics System

Figure 57 shows differences in life expectancy in Houston Super Neighborhoods. Life expectancy varied from a low of 65.7 years in Settegast (outlined in red) to a high of 84.4 years in Greenway/Upper Kirby (outlined in blue), an 18 year difference in life expectancy. The two neighborhoods are approximately 12 miles apart.

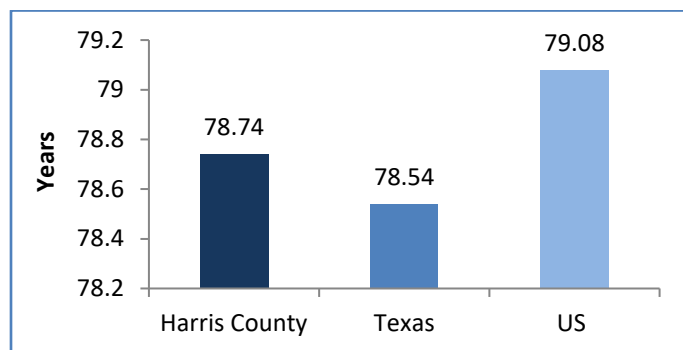
Figure 57: Life Expectancy by Super Neighborhood, Houston/Harris County 2010-2015



Data Source: CDC, National Vital Statistics System. Map by the Houston Health Department.

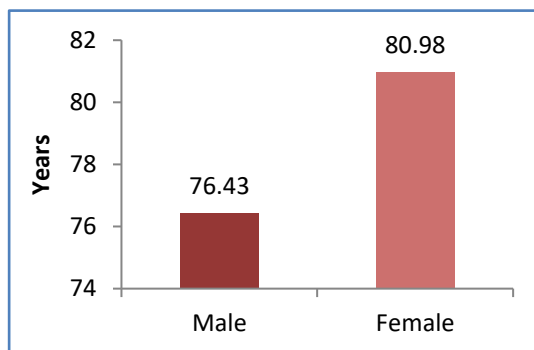
The Institute for Health Metrics and Evaluation, an independent global health research center at the University of Washington, reported that in 2014, life expectancy in Harris County was 78.74 years, which can be compared to 78.54 years in Texas and 79.08 in the US. Females in Harris County lived years longer than males, 80.98 years, compared to 76.43 years for males.⁹⁵

Figure 58: Life Expectancy, Harris County, Texas and the US 2014



Data Source: Institute for Health Metrics

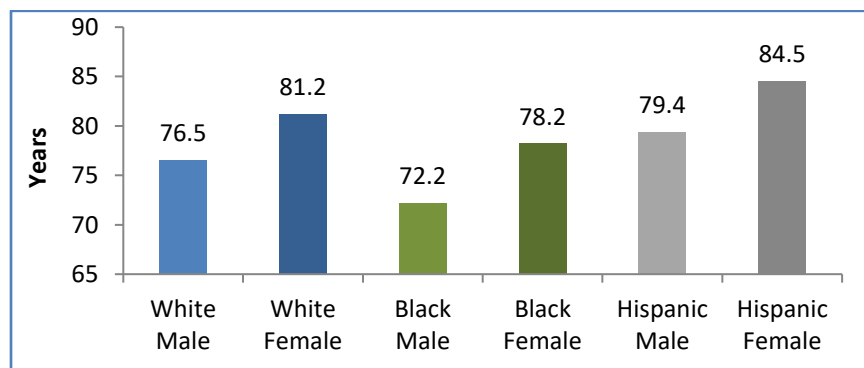
Figure 59: Life Expectancy by Gender, Harris County TX 2014



Data Source: Institute for Health Metrics

Disparities also exist according to race. CDC's National Vital Statistics System section did a recent analysis of life expectancy among the US white, black and Hispanic populations in 2014. Life expectancy was lowest among non-Hispanic black males (72.2 years) as shown in Figure 60. Since 2006, however, non-Hispanic black males have made the greatest gains in life expectancy, 2.7 years, compared to non-Hispanic white males (0.8 years), non-Hispanic white females (0.6 years), non-Hispanic black females (1.8 years), Hispanic males (1.9 years) and Hispanic females (1.6 years).⁹⁶

Figure 60: Life Expectancy by Race and Gender, US 2014



Data Source: CDC, National Vital Statistics System, United States Life Tables

According to CDC, in each racial/ethnic group, females had higher life expectancies than males in 2014. Life expectancy ranged from 72.2 years for non-Hispanic black males to 84.5 years for Hispanic females.

In Harris County, in 2009, life expectancy for a white male was 76.6 years, compared to 71.5 years for a black male. Among females, life expectancy was 81.2 years for a white female, compared to 77.4 years for a black female.⁹⁷

MORBIDITY: COMMUNICABLE DISEASES

Communicable diseases account for a smaller percentage of deaths than before antibiotics became available, but still remain major causes of illness, disability and death. Moreover, new infectious agents and disease are being detected, and some diseases considered under control have re-emerged in recent years. In Texas, over 70 communicable diseases diagnosed by local healthcare providers are reported to the Texas Department of State Health Services (Texas DSHS). These reports protect the public by tracking potential outbreaks and trends, which lead to public health action. Some diseases are preventable by vaccinations, others may be treated with antibiotics, and a few require quarantine to prevent spreading among the population.

This chapter presents data on the incidence or prevalence of selected communicable diseases of high public health importance. **Incidence** is defined as the number new cases of specific disease during a particular time period, usually a year, and **prevalence** refers to the total number of individuals in a population who have the health condition as a percentage of the population. The following diseases are included in this chapter: HIV new diagnoses, people living with HIV (PLWH), acute hepatitis B, acute and chronic hepatitis C, and diarrheal diseases.

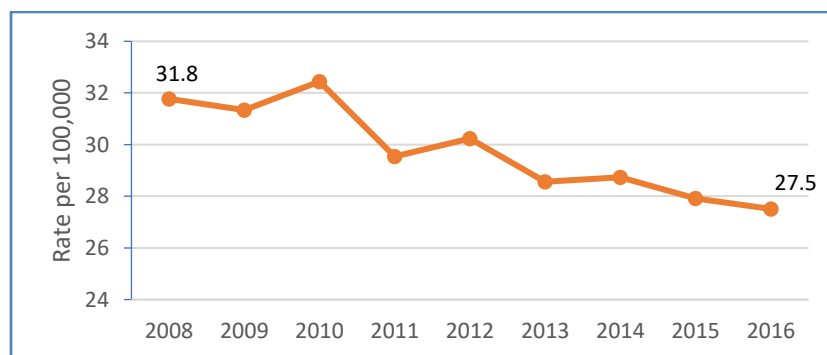
HIV (Human Immunodeficiency Virus)

HIV—New Diagnoses

AIDS (acquired immune deficiency syndrome) develops after years of HIV infection. AIDS has been a reportable disease in Texas since March 1983, and HIV since January 1999. HIV incidence refers to the total number of new persons diagnosed with HIV, regardless of AIDS status, in Houston/Harris County. HIV incidence has been declining over recent years due to the effectiveness of HIV treatment. Cases remain highest among males, who had more than triple the incidence rate as females in 2016.

Figure 61: Incidence (New Cases) of HIV in Houston/Harris County 2008-2016

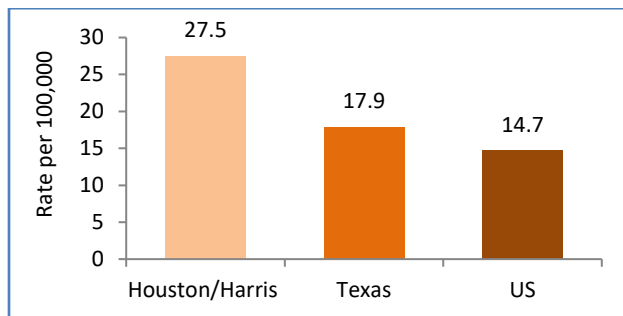
Rate per 100,000 Population



New cases of HIV decreased in Houston/Harris County from 2008 to 2016, although the rate (27.5 per 100,000 population) is still high compared to the Texas (17.9) or US populations (14.7).

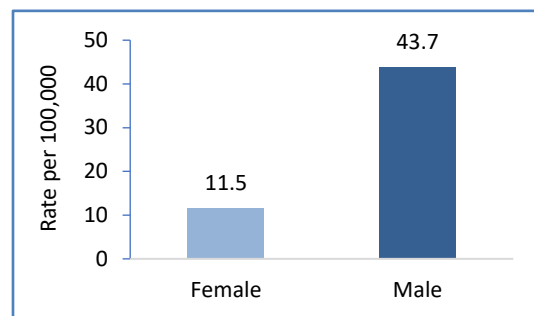
Data Source: Texas eHARS data as of May, 2018

Figure 62: Incidence (New Cases) of HIV, Houston/Harris County, Texas, and the US 2016
Rate per 100,000 Population



Data Source: Texas eHARS, May 2018

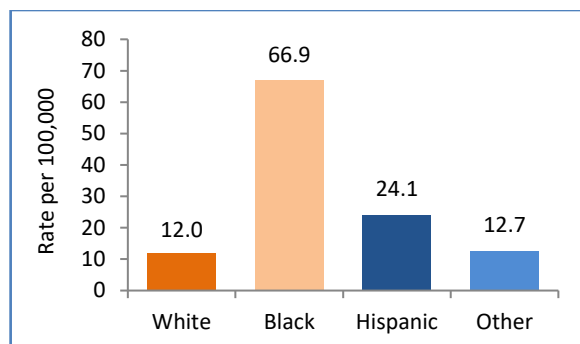
Figure 63: Incidence (New Cases) of HIV by Birth Sex, Houston/Harris County 2016
Rate per 100,000 Population



Data Source: Texas eHARS, May 2018

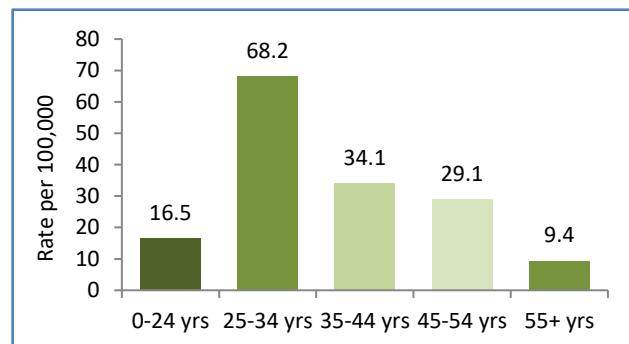
Differences in new HIV cases can be seen among racial/ethnic groups. African Americans had the highest incidence rate of HIV (66.9 per 100,000 population), followed by Hispanics (24.1 per 100,000) and whites (12.0 per 100,000) in Houston/Harris County in 2016. Young adults aged 25-34 years had the highest incidence rate (68.2 per 100,000), followed by 35-44 years (34.1 per 100,000) and 45-54 years age group (29.1 per 100,000). The lowest rates were in the 55 years and older group, 9.4 per 100,000.

Figure 64: Incidence (New Cases) of HIV by Race/Ethnicity, Houston/Harris County TX 2016
Rate per 100,000 population



Data Source: Texas eHARS, May 2018

Figure 65: Incidence (New Cases) of HIV by Age Group, Houston/Harris County 2016
Rate per 100,000 population



Data Source: Texas eHARS, May 2018

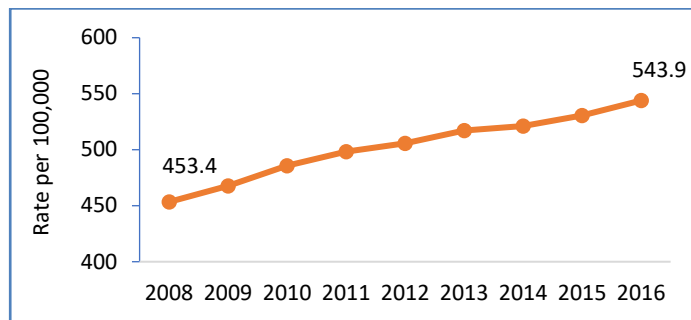
People Living with HIV (PLWH)

In the early days of HIV/AIDS, the disease was deadly; it was often fatal within 10 years. However, medical treatment has improved since that time, so that many people can live with HIV for years. This has allowed the numbers of people living with HIV (PLWH) to rise over time, even as the rates of new infection have dropped.

In 2008, there were 18,197 people living with HIV in Houston/Harris County and the number increased to 25,132 in 2016. The number of deaths each year was much lower than the number of new HIV diagnoses, resulting in a continuous increase in the number of PLWH.

Figure 66: People Living with HIV (PLWH), Houston/Harris County TX 2008-2016

Rate per 100,000 population



Data Source: Texas eHARS, May 2018

The prevalence, or total numbers, of persons living with HIV in Houston/Harris County has been steadily increasing in recent years. The rate has risen from 453.4 per 100,000 population in 2008 to 543.9 per 100,000 in 2016; the Houston/Harris County rate is higher than Texas (358.5 per 100,000).

Following the patterns of HIV new cases described on the previous pages, the PLWH population shows higher prevalence among the black population and persons in the 25-34 year old group. The prevalence among the older populations, especially the 35-44 year old group, is growing as people are living with HIV for longer periods of time. The rate of males (825.8 per 100,000) who are PLWH is over three times higher than the rate for females (265.5).

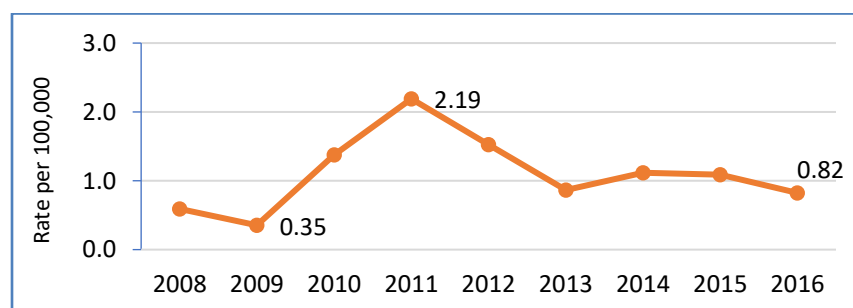
ACUTE HEPATITIS B

Hepatitis B is a liver disease that results from infection with the hepatitis B virus (HBV). Hepatitis B can be diagnosed as acute or chronic. People are considered to have acute hepatitis B at the time of infection with HBV. In Texas, only acute hepatitis B is reportable to the Texas state health department; it is not mandatory for providers and laboratories to report chronic hepatitis B.

Surveillance data from the Centers for Disease Control and Prevention (CDC) in 2016 shows that acute HBV infection in the United States is the most common among whites, followed by blacks. However, chronic HBV infection in the US is most prevalent among Asian/Pacific Islanders, followed by whites and then blacks.⁹⁸

Figure 67: Incidence (New Cases) of Acute Hepatitis B, Houston TX 2008-2016

Rate per 100,000 population



Data Source: Texas DSHS, National Electronic Disease Surveillance System (NEDSS), July 2018

Acute hepatitis B fluctuated between 2008 and 2016, with a peak in 2011 (2.19 per 100,000 population). There were less than three cases each year per 100,000, so the variation between years has been small.

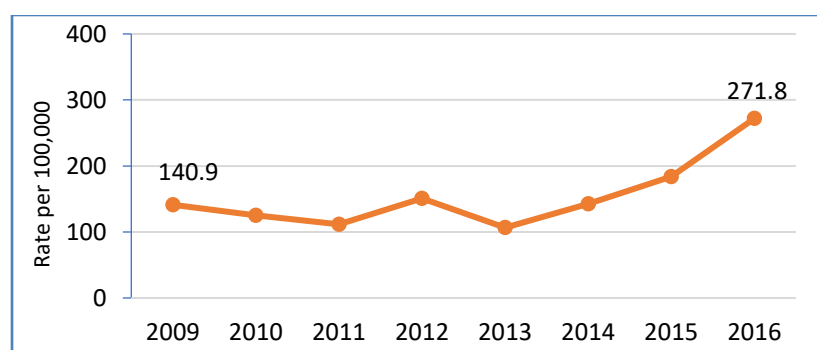
The incidence rate of new cases of acute hepatitis B in Houston was 0.82 per 100,000 population in 2016, which was higher than Texas (0.56 per 100,000). Males (1.21 per 100,000) were more likely to be diagnosed with hepatitis B than females (0.43 per 100,000). Adults aged 60 years and older had the highest incidence of acute hepatitis B (1.74 per 100,000), followed by the 30-39 years age group (1.66 per 100,000) and the 40-49 years age group (1.02 per 100,000) in Houston in 2016.

ACUTE AND CHRONIC HEPATITIS C

Hepatitis C is a liver disease that results from infection with the hepatitis C virus (HCV). Like hepatitis B, chronic hepatitis C is not required for providers and laboratories to report to local health authorities. Only acute hepatitis C is reportable. The data received for analysis by HHD does not differentiate hepatitis B from C, so these are combined in this report. The rate of new cases of hepatitis C reported in Houston/Harris County was 271.8 per 100,000 in 2016. The rate for males (326.0 per 100,000) was higher compared to females (214.5 per 100,000).

Race/ethnicity is not always included in the reports to the Texas state health department, since this is not a requirement of the reporting, so this data is not available. However, CDC reported that African Americans have substantially higher rates of chronic hepatitis C and hepatitis C-related deaths compared to other ethnic groups in the US.⁹⁹ This is consistent with a recent finding that the national hepatitis C prevalence is the highest among non-Hispanic blacks, followed by non-Hispanic whites and Hispanics/others.¹⁰⁰

Figure 68: Incidence (New Cases) of Acute and Chronic Hepatitis C, Houston/Harris County 2008-2016
Rate per 100,000 population



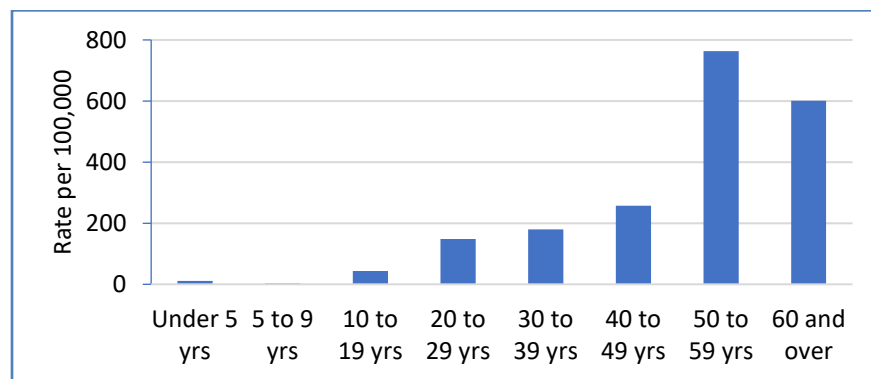
The incidence (new cases) of Hepatitis C diseases has increased from 140.9 per 100,000 in 2009 to 271.8 per 100,000 in 2016. This could be due to greater awareness and increased screening in recent years.

Data Source: Texas NEDSS ELR data, July 2018

In 2012, the US Centers for Disease Control and Prevention (CDC) added a recommendation for a single screening test for those born between 1945 and 1965, to assess for chronic cases of hepatitis. An estimated 1 in 30 older Americans is likely to have hepatitis C, but most don't know that they have it. The disease may not have symptoms for years, but it eventually often leads to liver disease. Screening has become more important, as a cure for hepatitis C was approved by the FDA in 2015. While very expensive, this antiviral drug does clear the virus from the body and is covered by some insurance.

Figure 69: Incidence (New Cases) of Hepatitis C by Age Group, Houston/Harris County 2016

Rate per 100,000 Population



Adults aged 50-59 years had the highest incidence of hepatitis C (763.7 per 100,000), followed by 60+ years (600.1 per 100,000) in Houston/Harris County in 2016. Older adults are encouraged to be tested for hepatitis C, which can be dormant and yet serious.

Data Source: Texas NEDSS ELR data, July 2018

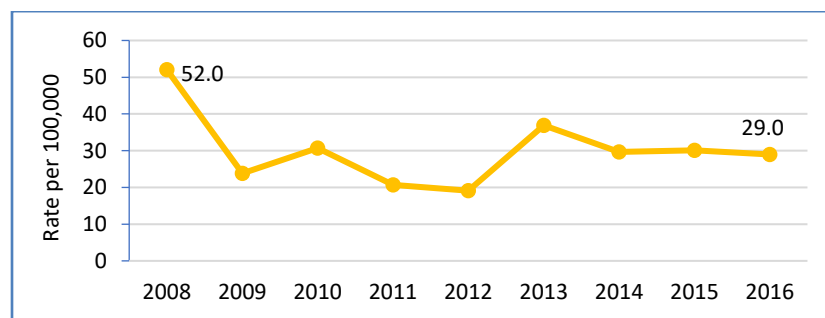
DIARRHEAL DISEASES

Multiple viral, bacterial, and parasitic organisms can cause diarrhea, defined as the passage of three or more loose or liquid stools per day. Diarrheal diseases that are reportable to the Texas Department of State Health Services include: campylobacteriosis, cholera, cryptosporidiosis, cyclosporiasis, cysticercosis, postdiarrheal hemolytic uremic syndrome, acute hepatitis A, listeriosis, salmonellosis, Shiga toxin-producing *Escherichia coli* (STEC), shigellosis, trichinosis (trichinellosis), typhoid fever (*Salmonella Typhi*), *Vibrio* infection (including cholera), and yersiniosis.

These diseases are most common, and most dangerous, among young children. Severe diarrhea can quickly lead to dehydration and is a leading cause of death in young children worldwide. In Houston, in 2016, children under age 5 had the highest incidence of diarrheal diseases (103.7 per 100,000), followed by children aged 5-9 years (73.1 per 100,000), as compared to other age groups. Males (29.6 per 100,000) had a slightly higher incidence of diarrheal diseases compared to females (28.4 per 100,000). The incidence rate of diarrheal diseases was lower in Houston (29.0 per 100,000) as compared to Texas (61.9 per 100,000) in 2016.

Figure 70: Incidence (New Cases) of Diarrheal Diseases, Houston 2008-2016

Rate per 100,000 Population



The incidence rate of diarrheal diseases has fluctuated during the years 2008-2016 in Houston, with a high incidence of 52.0 per 100,000 population in 2008. The 2016 rate was 29.0 per 100,000.

Data Source: Texas NEDSS, July 2018

SEXUALLY TRANSMITTED DISEASES (STDs)

Sexually transmitted diseases that must be reported to the Texas Department of State Health Services include chlamydia, gonorrhea and syphilis. Data from these reports is exported and analyzed by the Houston Health Department. The rates of all the reported STDs in Houston have been rising in recent years.

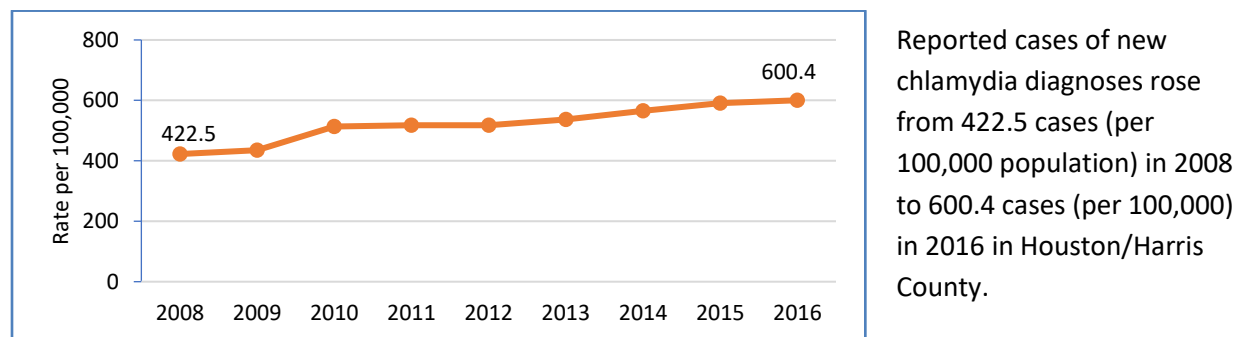
Chlamydia

Chlamydia is a common sexually transmitted infection that can lead to serious health problems and difficulty getting pregnant if left untreated. Many people who have this infection don't know it, since there are often no symptoms.

In 2016, the rate of chlamydia in Houston/Harris County was 600.4 per 100,000 population. This rate exceeded that of the state of Texas overall (494.4 per 100,000 population), and the US (497.3 per 100,000). Chlamydia rates by race/ethnicity are unavailable due to a substantial amount of missing data. However, African Americans have the highest burden of chlamydia nationally.¹⁰¹

Figure 71: Incidence (New Cases) of Chlamydia, Houston/Harris County TX 2008-2016

Rate per 100,000 Population



Data Source: HHD Epidemiology

Young women are most at risk; females had more than twice the rate of chlamydia compared to males in Houston/Harris County in 2016. Young adults aged 15-24 years had the highest rate of chlamydia (2,698.2 per 100,000), followed by 25-34 years (1,027.2 per 100,000) and 35-44 years (267.6 per 100,000) in Houston/Harris County in 2016.

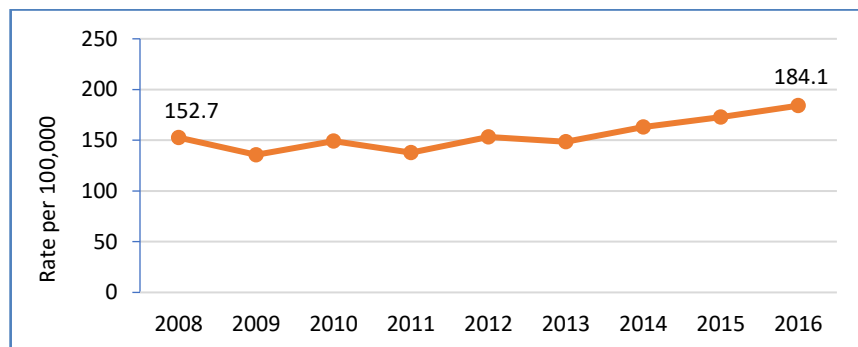
Gonorrhea

Gonorrhea is a sexually transmitted disease (STD) that can infect both men and women. It can cause infections in the genitals, rectum, and throat. It is a very common infection, especially among young people ages 15-24 years. CDC recommends that sexually active women younger than 25 years, women with new or multiple sex partners, or those with a sex partner who has an STD should be tested every year. The early disease may not have symptoms, but untreated gonorrhea can cause serious and permanent health problems in both women and men.

In 2016, the rate of gonorrhea in Houston/Harris County was 184.1 per 100,000 population. This rate exceeded that of Texas overall (147.0 per 100,000) and the US (145.8 per 100,000).

Figure 72: Incidence (New Cases) of Gonorrhea, Houston/Harris County 2008-2016

Rate per 100,000 Population



Houston/Harris County gonorrhea rates rose from 152.7 cases per 100,000 population in 2008 to 184.1 per 100,000 in 2016.

Data Source: HHD Epidemiology

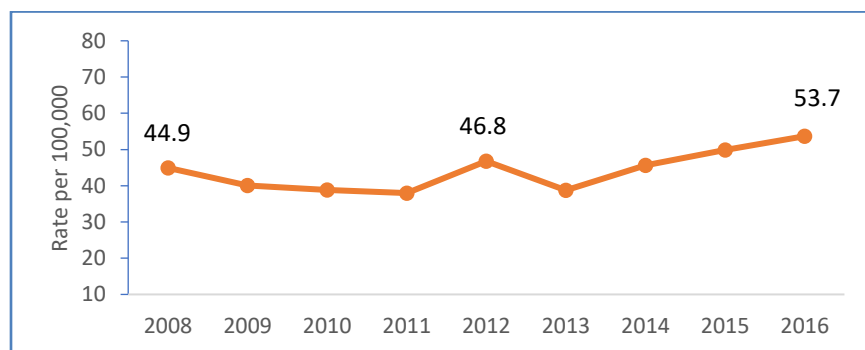
Young adults and adolescents are most at risk for gonorrhea. Those aged 15-24 years had the highest rate of gonorrhea (717.8 per 100,000), followed by 25-34 years (350.8 per 100,000) and 35-44 years age groups (109.3 per 100,000) in Houston/Harris County in 2016. The rate of gonorrhea among males (215.4 per 100,000) in Houston/Harris County was about 1.5 times higher than the rate among females (152.2 per 100,000) in 2016. Local rates by race/ethnicity are not available due to a substantial amount of missing data. However, African Americans have the highest burden of gonorrhea nationally.¹⁰²

Syphilis (All Stages)

Syphilis is a sexually transmitted infection that can cause serious health problems if it is not treated. Syphilis is divided into stages (primary, secondary, latent, and tertiary). There are different signs and symptoms associated with each stage. In the later stages, the disease can spread to the internal organs, brain, and nervous system, and even cause death. CDC recommends testing for syphilis for pregnant women at their first prenatal visit, men who have sex with men, anyone living with HIV, and anyone who has a partner or partners who have tested positive for syphilis.¹⁰³

Figure 73: Incidence (New Cases) of Syphilis in Houston/Harris County 2008-2016

Rate per 100,000 Population

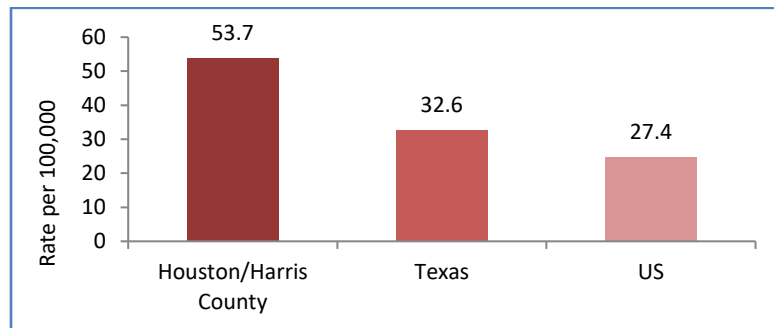


Syphilis rates increased from 44.9 per 100,000 in 2008 to 53.7 per 100,000 in 2016. In 2012, the rate of syphilis peaked due to an outbreak and response.

Data Source: HHD Epidemiology

Figure 74: Incidence (New Cases) of Syphilis, Houston/Harris County, Texas and the US 2016

Rate per 100,000 Population



In 2016, the rate of syphilis (all stages: primary, secondary, early latent, late latent and congenital) in Houston/Harris County was 53.7 per 100,000 population, higher than Texas (32.6 per 100,000 population) and the US (27.4 per 100,000).

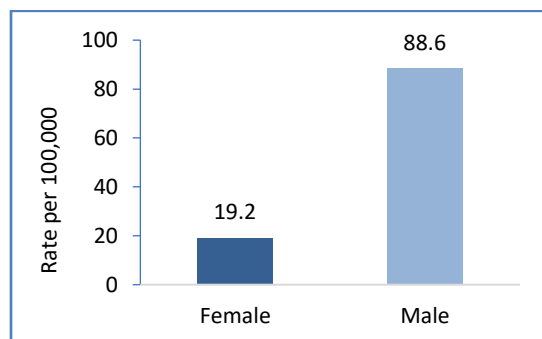
Data Source: HHD Epidemiology Case files, CDC STD Case Reports

Adults aged 25-34 years had the highest rate of syphilis (129.4 per 100,000), followed by those aged 15-24 years (89.4 per 100,000) and 35-44 years (75.7 per 100,000) in Houston/Harris County in 2016.

Males (88.6 per 100,000) had more than four times the rate of syphilis compared to females (19.2 per 100,000) in Houston/Harris County in 2016. The black population had the highest rate of syphilis (129.1 per 100,000), followed by the Hispanic population (44.5 per 100,000) in Houston/Harris County in 2016.

Figure 75: New Syphilis Cases by Birth Sex, Houston/Harris County 2016

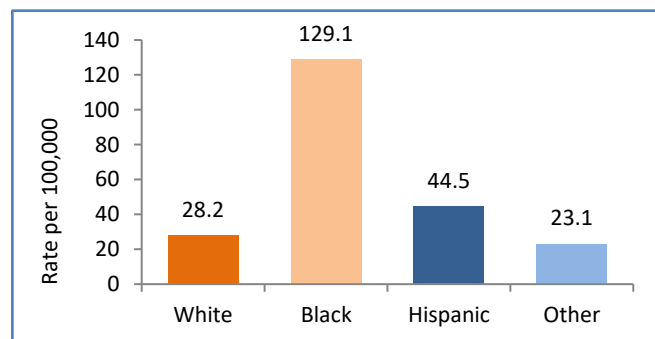
Rate per 100,000 Population



Data Source: HHD Epidemiology Case Files

Figure 76: New Syphilis Cases by Race/Ethnicity in Houston/Harris County 2016

Rate per 100,000 Population



Data Source: HHD Epidemiology Case Files

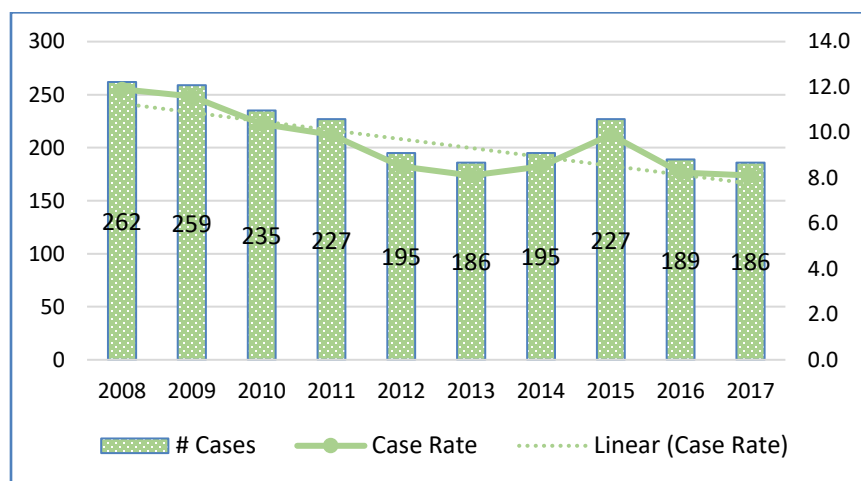
TUBERCULOSIS

Tuberculosis (TB) is a bacterial disease primarily affecting the lungs. TB can take one of two forms, an active version (TB disease) or one that lies dormant in the body (latent TB infection or LTBI). TB transmission occurs through the air, when an individual with TB disease coughs, sneezes, laughs, or sings. TB was once one of the leading causes of death in the US, but the use of antibiotics greatly reduced the rates of infection and mortality. Worldwide, TB rates have been on the decline; however strains of TB resistant to multiple forms of antibiotics have increased.¹⁰⁴

The Houston Health Department tracks persons diagnosed with TB and works with local healthcare providers to ensure that those who are infected follow the recommended treatment protocols.

Figure 77: TB New Cases and Case Rates, City of Houston 2008-2017

Total Cases (left side scale) and Rate per 100,000 Population (right side scale)



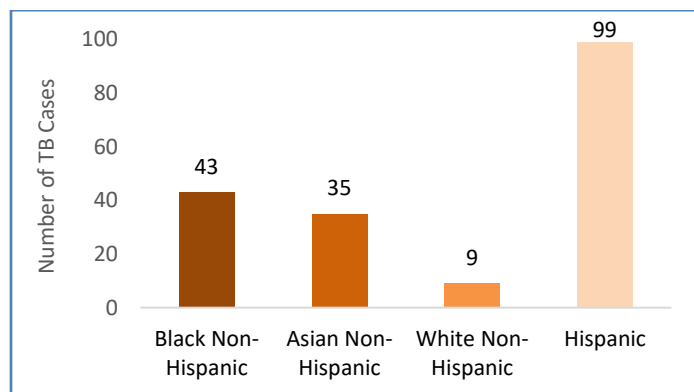
Data Source: HHD Bureau of Tuberculosis Control Case Files

The number of new cases of tuberculosis in Houston declined from 262 new cases in 2008 to 186 in 2017. During this same time period, the rate of TB cases dropped from 11.9 per 100,000 population in 2008 to 8.1 per 100,000 in 2017. The number of TB cases is shown by the columns while the Case Rate is shown by the line.

The rate of new cases was higher in Houston (8.1 per 100,000) compared to the US (2.8 per 100,000) in 2017. In 2017, in the US, 70.1% of reported TB cases in the United States occurred among persons not born in the US. The case rate among non-US born persons (14.7 per 100,000) was approximately 15 times higher than among persons born in the US (1.0 per 100,000).¹⁰⁵

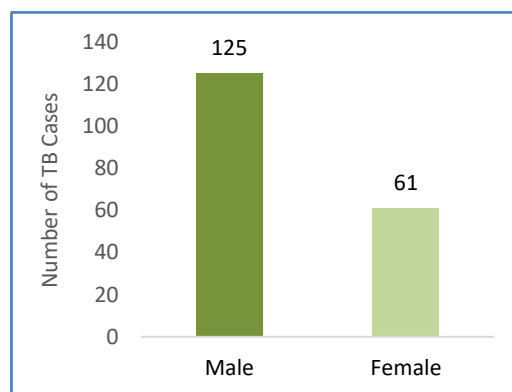
The large majority of TB cases in Houston are among the Hispanic population (99 per 100,000), followed by the black population (43 per 100,000). In 2017, in Houston, more TB cases were males (125), more than twice the number of cases compared to females (61).

Figure 78: Number of New TB Cases by Race/Ethnicity, Houston TX 2017



Data Source: HHD Bureau of Tuberculosis Control Case Files

Figure 79: Number of New TB Cases by Birth Sex, Houston TX 2017



Data Source: HHD Bureau of Tuberculosis

MORBIDITY: CHRONIC DISEASE

TOP 10 CHRONIC CONDITIONS AND DISEASES

Chronic diseases are defined broadly as conditions that last one year or more and require ongoing medical attention or limit activities of daily living or both. Chronic diseases such as heart disease, cancer, and diabetes are the leading causes of death and disability in the United States. They are also leading drivers of the nation's \$3.3 trillion in annual health care costs. Six in ten adults in the US have a chronic disease, and four in ten adults have two or more. Chronic diseases are more common among the elderly.¹⁰⁶

Most chronic diseases are caused by a short list of risk behaviors:

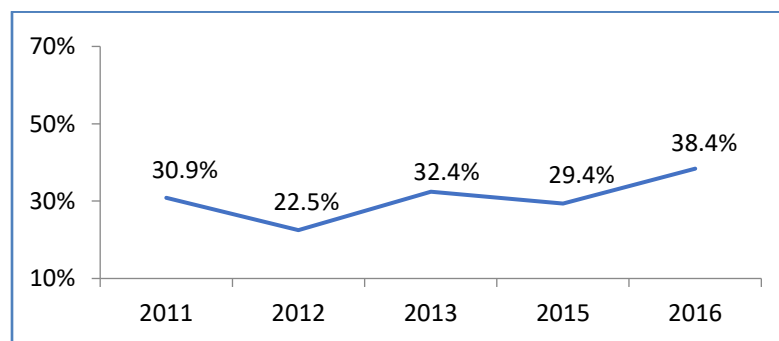
- Tobacco use and exposure to secondhand smoke.
- Poor nutrition, including diets low in fruits and vegetables and high in sodium and saturated fats.
- Lack of physical activity
- Excessive alcohol use¹⁰⁷

For this report, chronic conditions and diseases are listed according to the percentages of Harris County residents who reported on the Texas BRFSS survey that they are dealing with these conditions.

#1 HYPERTENSION—38.4%

Hypertension, or high blood pressure, contributes to stroke, heart attacks, heart failure, kidney failure, and atherosclerosis. In the United States, one in three adults has high blood pressure, and nearly one-third of these people are not aware that they have it. Because there are no symptoms associated with high blood pressure, it is often called the "silent killer." High blood pressure can occur in people of any age or sex; however, it is more common among those over age 35.¹⁰⁸

Figure 80: Percentage of Adults with High Blood Pressure, Harris County 2011-2016

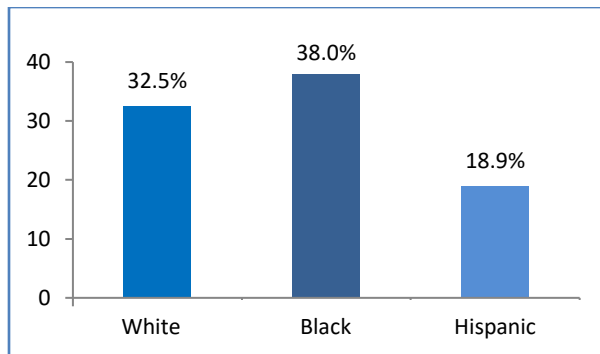


Data Source: Texas BRFSS

In 2016, 38.4% of Harris County adult respondents to the BRFSS survey reported that they had been told by a healthcare professional that they had high blood pressure. This was an increase from 30.9% in 2011. Males (42.2%) were more likely report high blood pressure compared to females (35.1%).

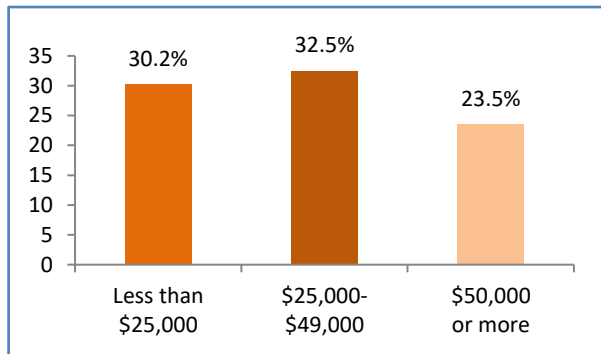
In the Houston Metropolitan Statistical Area (MSA), 27.8% of 2015 BRFSS survey respondents reported they had been diagnosed with high blood pressure. High blood pressure was more common among the black population (38.0%) followed by the white population (32.5%), and was more prevalent among those with lower incomes compared to those with incomes above \$50,000. High blood pressure was more common as people aged, 4.5% among 18-29 year olds, rising to 59.9% in those aged 65 and older. Those with less than a high school education had higher rates of high blood pressure (31.9%) compared to high school graduates (28.9%), those with some college (27.5%) and college graduates (24.8%).

Figure 81: Percentage of Adults with High Blood Pressure by Race/Ethnicity, Houston MSA 2015



Data Source: Texas BRFSS survey

Figure 82: Percentage of Adults with High Blood Pressure by Income, Houston MSA 2015

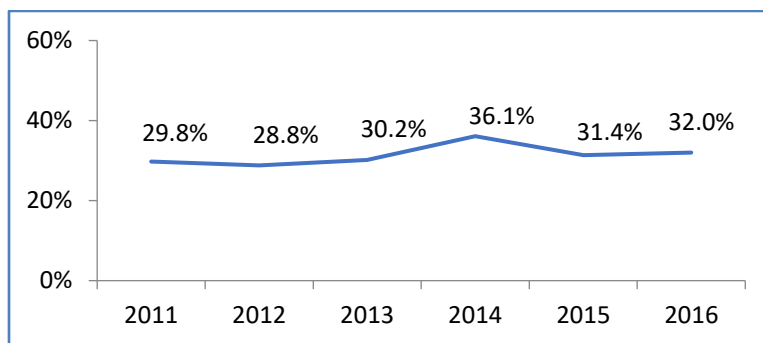


Data Source: Texas BRFSS survey

#2 OBESITY—32.0%

Obesity, defined as a Body Mass Index (BMI) of 30 or greater, increases the risk of many diseases and health conditions, including heart disease, type 2 diabetes, cancer, hypertension, stroke, liver and gallbladder disease, respiratory problems, and osteoarthritis.¹⁰⁹ The percentage of obese adults in Harris County has been steadily rising for many years, which is also true for the US as a whole. In 2002, the Texas Behavior Risk Factor Surveillance System (BRFSS) found that 24.6% of adults in the Houston-The Woodlands-Sugar Land MSA were obese. By 2016, that number had increased to 30.1%.

Figure 83: Percentage of Obese Adults, Harris County TX 2011-2016



Data Source: Texas BRFSS survey

In 2016, 32.0% of Harris County adult respondents to the BRFSS survey were obese, with a Body Mass Index greater than 30.0, based on their self-reported height and weight. This was an increase from 29.8% in 2011.

Obesity impacts the individual at many levels. It is a risk factor, in that obesity increases the risk for many diseases, including heart disease and cancer. It is a health outcome, in that it is a result of other risk factors that include poor nutrition and lack of exercise. And it is also now recognized by the American Medical Association as a disease.¹¹⁰ Therefore, it is included in multiple places in this report. Please see the Obesity section under Health Outcomes for more detail about obesity in the Houston area.

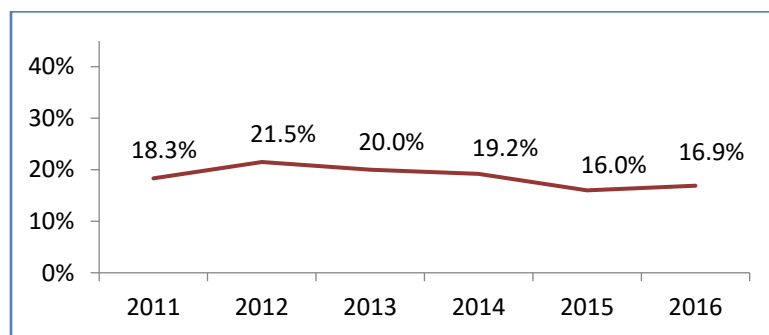
#3 ARTHRITIS—16.9%

Arthritis is a collection of conditions and disorders of the joints, bones, muscles, cartilage and other connective tissues. According to the Arthritis Foundation, more than 50 million adults have doctor-diagnosed arthritis, and arthritis is the number one cause of disability in the US. Two common types of arthritis are osteoarthritis (OA)and rheumatoid arthritis (RA).

Osteoarthritis (OA), sometimes called degenerative joint disease, is the most common form of arthritis. Osteoarthritis is characterized by the breakdown of the joint's cartilage as well as bony overgrowth, leading to pain and joint stiffness. Common risk factors for OA include genetics, advanced age, obesity, and injury.

Rheumatoid arthritis (RA) is a systemic inflammatory arthritis and an autoimmune disease that typically affects the small joints of the hands and feet, but can also impact other organs. Symptoms include pain, swelling, stiffness and loss of function of the affected joint. Treatments include medications, lifestyle changes and surgery.¹¹¹

Figure 84: Percentage of Adults with Arthritis, Harris County TX 2011-2016

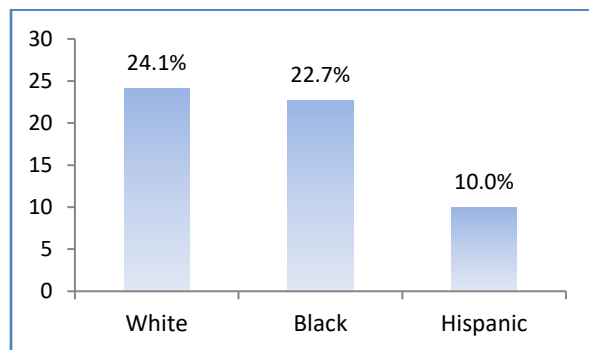


Data Source: Texas BRFSS survey

In 2016, 16.9% of Harris County adult respondents to the BRFSS survey reported that they had been told by a healthcare professional that they had some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia. This was a decrease from 18.3% in 2011.

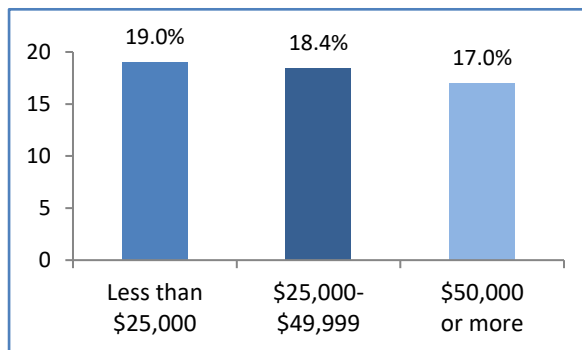
Arthritis is much more common among older adults. In Houston-The Woodlands-Sugar Land MSA , in 2016, most persons with arthritis were aged 45-64 years (22.5%) or age 65 and older (51.0%). Women (23.6%) were more likely to be diagnosed with arthritis than men (12.6%). Whites were more likely to have arthritis (24.1% of the white population) compared to the black (22.7%) and Hispanic (10.0%) populations. Persons at all income and education categories reported similar percentages of arthritis.

Figure 85: Percentage of Adults with Arthritis by Racial/Ethnic Group, Houston MSA 2016



Data Source: Texas BRFSS survey

Figure 86: Percentage of Adults with Arthritis by Income, Houston MSA 2016



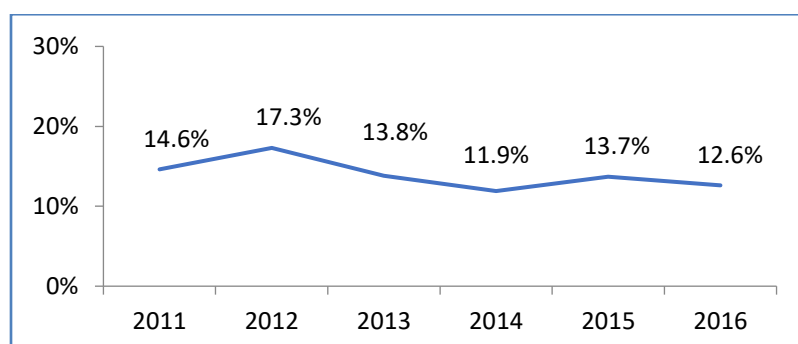
Data Source: Texas BRFSS survey

#4 DEPRESSIVE DISORDERS—12.6%

Depressive disorders are characterized by sadness severe enough or persistent enough to interfere with function and often by fatigue and a decreased interest or pleasure in daily activities. These disorders negatively affect a person's feelings, behaviors and thought processes.¹¹²

In the Houston-The Woodlands-Sugar Land MSA, 15.2% of adult respondents to the BRFSS survey reported that they had been told by a health professional that they have a depressive disorder, including depression, major depression, dysthymia, or minor depression.

Figure 87: Percentage of Adults with Depressive Disorders, Harris County TX 2011-2016

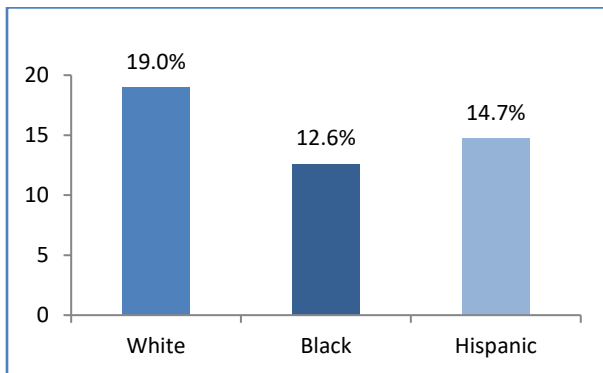


Data Source: Texas BRFSS survey

In 2016, 12.6% of Harris County adult respondents to the BRFSS survey reported that they had been told by a healthcare professional that they had a depressive disorder. This was a decrease from 14.6% in 2011.

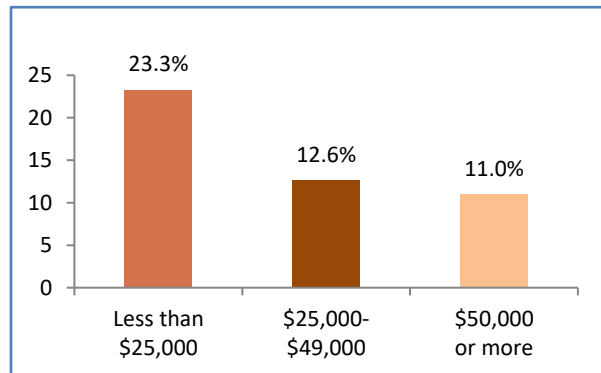
The percentage of persons who reported a history of depression was highest among the white population (19.0%), followed by Hispanics (14.7%) and blacks (12.6%) in the Houston-The Woodlands-Sugar Land MSA. Differences were also seen in income level. Depressive disorders were more common among those with less than a \$25,000 income (23.3%) compared to those earning higher incomes (12.6% for those earning \$25,000 to \$49,999, and 11.0% for those earning \$50,000 or more). A higher percentage of females (18.3%) reported depression compared to males (11.9%).

Figure 88: Percentage of Adults with Depressive Disorders by Racial/Ethnicity, Houston MSA 2015



Data Source: Texas BRFSS survey

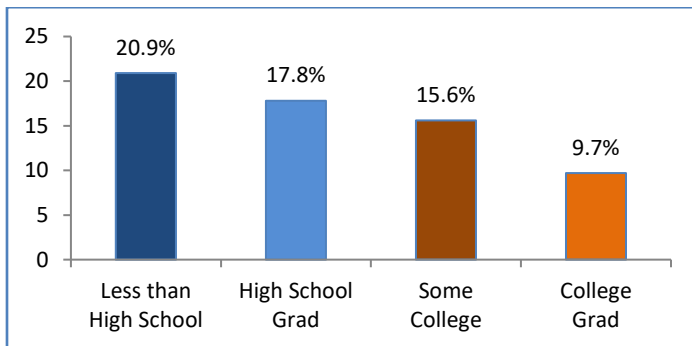
Figure 89: Percentage of Adults with Depressive Disorders by Income, Houston MSA 2015



Data Source: Texas BRFSS survey

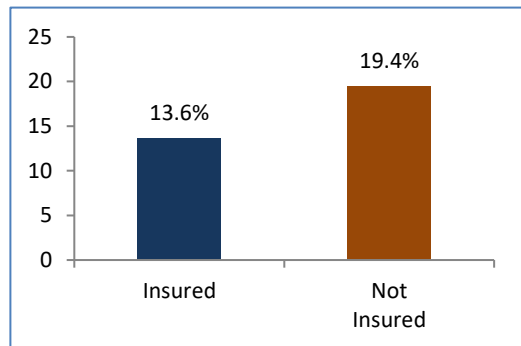
Disparities are present in the prevalence of depressive disorders among those with different levels of education; those with less education are more at risk for depression. Also, persons who have health insurance are less likely to be depressed.

Figure 90: Percentage of Adults with Depressive Disorders by Education, Houston MSA 2015



Source: Texas BRFSS survey

Figure 91: Percentage of Adults with Depressive Disorders by Insured Status Houston MSA 2015



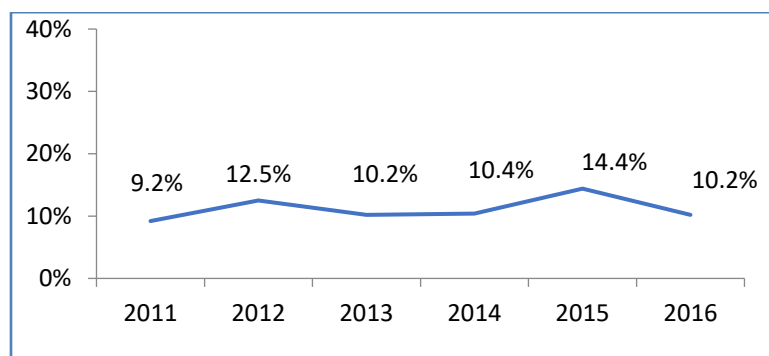
Data Source: Texas BRFSS survey

People in the 45 to 64 year-old age group (21.1%) were most likely to report that they had been diagnosed with depression, compared to ages 18-29 years (13.9%), 30-44 years (11.4%) and 65 and older (11.7%) a pattern that has been seen in other studies, as well (Blanco, 2011). Depression is also more common among those who were unemployed (19.3%) compared to those with a job (12.1%).

#5 DIABETES—10.2%

According to the Centers for Disease Control and Prevention (CDC), more than 25 million people have diabetes, including both diagnosed and undiagnosed cases. This disease can have a harmful effect on most of the organ systems in the human body. Persons with diabetes are at increased risk for kidney disease, lower leg amputations, blindness, ischemic heart disease, neuropathy, and stroke.¹¹³

Figure 92: Percentage of Adults with Diabetes, Harris County TX 2011-2016

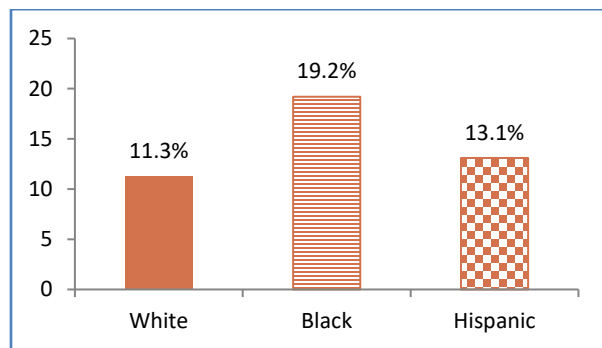


In 2016, 10.2% of Harris County adult respondents to the BRFSS survey reported that they had been told by a healthcare professional that they had diabetes. This was an increase from 9.2% in 2011.

Data Source: Texas BRFSS survey

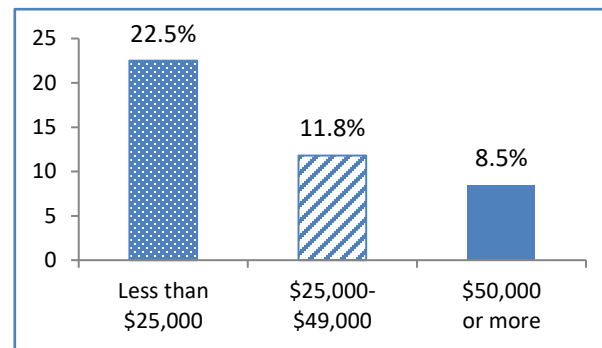
In the Houston-The Woodlands-Sugar Land MSA, 12.3% of BRFSS respondents had been told by a healthcare professional that they had diabetes in 2015. Diabetes was more common among the black population (19.2%) compared to the Hispanic (13.1%) and white (11.3%) populations. Diabetes is also more prevalent among those with lower incomes. Men (13.7%) were more likely to have diabetes than women (10.9%). Diabetes was more common among those with less than a high school education (19.7%), compared to high school graduates (9.0%), those with some college (15.8%) and college graduates (6.6%).

Figure 93: Percentage of Adults with Diabetes by Racial/Ethnic Group, Houston MSA 2015



Data Source: Texas BRFSS survey

Figure 94: Percentage of Adults with Diabetes by Income, Houston MSA 2015



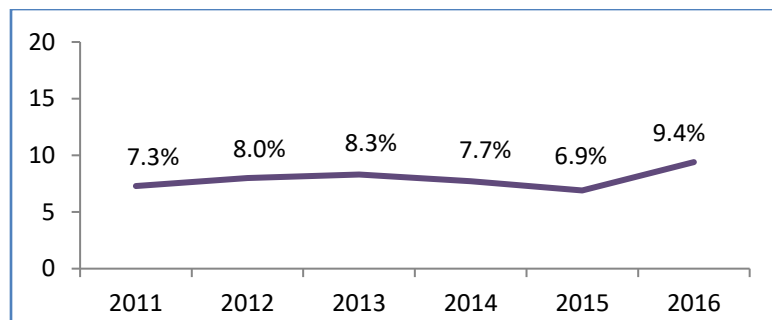
Data Source: Texas BRFSS survey

#6 CANCER—9.4%

Cancer is a serious condition that causes cells to divide uncontrollably. It can lead to tumors and many other harmful impacts on the body. It is also the second leading cause of death in the US and in Harris County. Cancer prevention and treatment efforts have made a large impact on the incidence and prognosis of cancer. According to the American Cancer Society, as of 2016, the cancer death rate for men and women combined had fallen 27% from its peak in 1991.¹¹⁴ Improvements in treatment and longer survival rates mean that for many people, cancer is a chronic disease.

Some forms of cancer are preventable. Key risk factors include smoking, heavy alcohol consumption, obesity, physical inactivity, and poor nutrition. Another key risk factor is not preventable, and that is age. According to the American Cancer Society, 87% of cancer cases are diagnosed in people aged 50 years or older.

Figure 95: Percentage of Adults with Cancer, Harris County TX 2011-2016

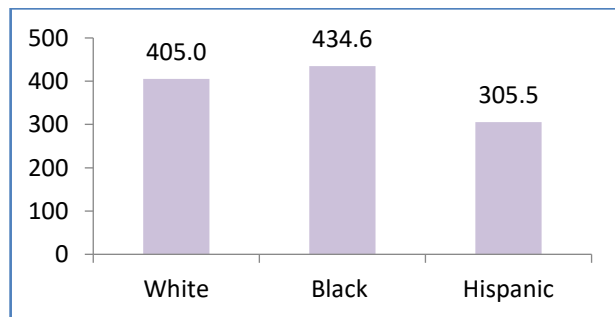


In 2016, 7.3% of Harris County adult respondents to the BRFSS survey reported that they had been told by a healthcare professional that they had been diagnosed with cancer. This was an increase from 7.3% in 2011.

Data Source: Texas BRFSS survey

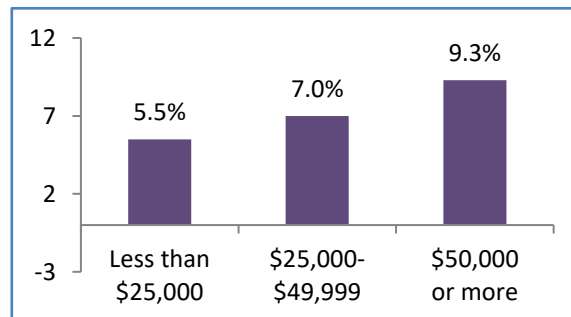
In the Houston-The Woodlands-Sugar Land MSA, 7.6% of BRFSS respondents had been told that they had cancer in 2015. Females (9.0%) were more likely to report that they had been diagnosed with cancer than males (6.1%). Cancer was less common among those with less than a high school education (3.1%) compared to high school graduates (7.0%), those with some college (9.4%) and college graduates (9.1%). According to the Texas Cancer Registry, new cancer diagnoses were more common among the black population (434.6 per 100,000) compared to the white (405.0 per 100,000) and Hispanic (305.5 per 100,000) populations in 2016. BRFSS data showed more cancer among those with higher incomes.

Figure 96: Incidence (New Cases) of Persons with Cancer, Harris County TX 2016 (Rate per 100,000)



Data Source: Texas Cancer Registry

Figure 97: Percentage of Persons with Cancer, Houston MSA 2015



Data Source: Texas BRFSS survey

#7 ORAL DISEASE—8.4%

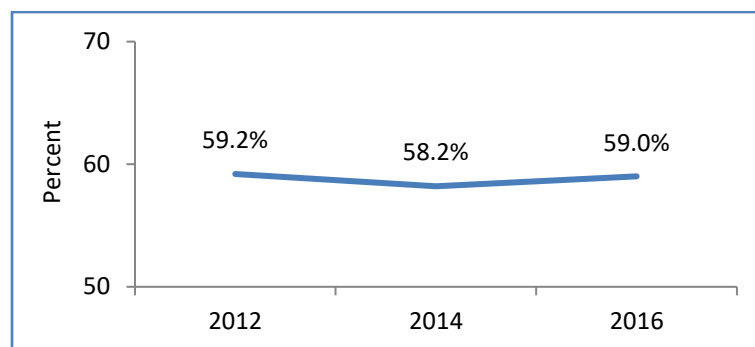
Oral health impacts overall health and well-being: it affects one's ability to speak, smile, eat, and show emotions, as well as self-esteem, school performance, and attendance to school and work. According to US Surgeon General, "You cannot be healthy without good oral health."¹¹⁵

In Harris County, in 2016, 8.4% of respondents to the BRFSS survey reported that they had six or more teeth (but not all teeth) removed because of tooth decay or gum disease.

Oral diseases range from dental caries (cavities or tooth decay) to oral cancers; and these diseases can also impact the rest of the organ systems. Periodontal (gum) disease has been linked to chronic diseases such as diabetes, heart disease, stroke, and premature births/low birth weight in pregnant women.¹¹⁶ According to CDC, nearly one-third of all adults in the United States have untreated tooth decay, or tooth caries, and one in seven adults aged 35 to 44 years old has periodontal (gum) disease. The recommended regular professional dental care helps to maintain the overall health of the teeth and mouth, and provides for early detection of pre-cancerous or cancerous lesions.

Water fluoridation systems and school dental sealant programs have been proven to save money and prevent cavities. Personal oral hygiene, with regular brushing and flossing are also important to maintain good oral health.¹¹⁷

Figure 98: Percentage of Adults Who Visited a Dentist in the Past Year, Harris County TX 2012-2016



In 2016, 59.0% of Harris County adult respondents to the BRFSS survey reported that they had visited a dentist in the past year. This was similar to the percentage in 2012.

Data Source: Texas BRFSS survey

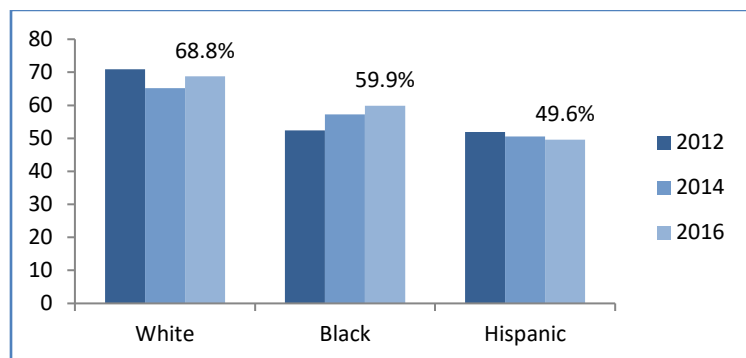
Racial/ethnic disparities are apparent in the presence of oral diseases. According to CDC, some of these are:

- Blacks (non-Hispanics), Hispanics, American Indians, and Alaskan Natives have the poorest oral health compared to other racial/ethnic groups.
- Hispanic and black children aged 2-4 years and 6-8 years have the most tooth decay.
- Black and Hispanic adults aged 35-44 years experience tooth decay nearly twice as much as white adults.
- Adults aged 35-44 with less than a high school education experience untreated tooth decay almost three times as frequently as adults with some college education.¹¹⁸

In Harris County, in 2016, whites (68.8%) were most likely to have visited a dentist during the past year, compared to blacks (59.9%) and Hispanics (49.6%). During the years 2012-2016, the percentage of adults in the white population that visited a dentist yearly was highest of the three racial/ethnic groups,

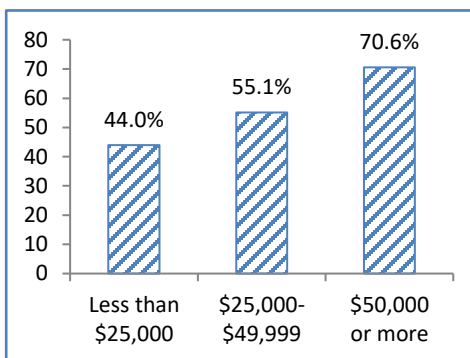
followed by black and Hispanic adults. The visits show gradual decreases for the white and Hispanic adults, while visits increased steadily for black non-Hispanic adults.

Figure 99: Percentage of Adult Dental Visits in the Past Year by Race/Ethnicity, Harris County TX 2012-2016



Data Source: Texas BRFSS survey

Figure 100: Percentage of Adult Dental Visits in the Past Year by Income, Harris County TX 2016



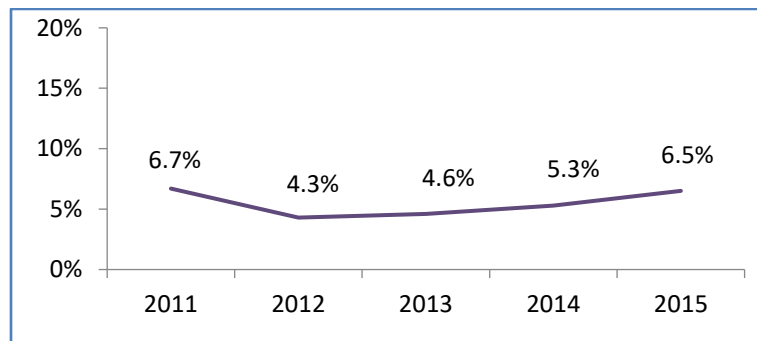
Data Source: Texas BRFSS survey

Income makes a difference in oral health visits, as well. In 2016, among Harris County adults who earned more than \$50,000 per year, 70.6% had visited a dentist in the past year in 2016, compared with 44% of adults earning less than \$25,000 per year. Education also makes a difference. Adults with less than a high school diploma visited the dentist in the past year much less (35.0%) compared to high school graduates (53.8%), some college (63.9%) and college graduates (74.4%).

#8 ASTHMA—6.5%

Asthma is a condition in which a person's air passages become inflamed, and the narrowing of the respiratory passages makes it difficult to breathe. Asthma is one of the most common long-term diseases of children, but it also affects millions of adults nationwide. Symptoms can include tightness in the chest, coughing, and wheezing. These symptoms are often brought on by exposure to inhaled allergens, such as dust, pollen, mold, cigarette smoke, and animal dander, or by exertion and stress.¹¹⁹

Figure 101: Percentage of Adults with Current Asthma, Harris County TX 2011-2015

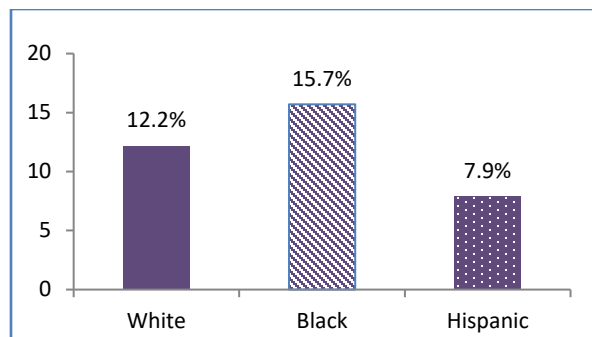


Data Source: Texas BRFSS survey

In 2015, 6.5% of Harris County adult respondents to the BRFSS survey reported that they had been told by a healthcare professional that they had asthma, and they currently still have asthma. This was similar to the percentage (6.7%) in 2011.

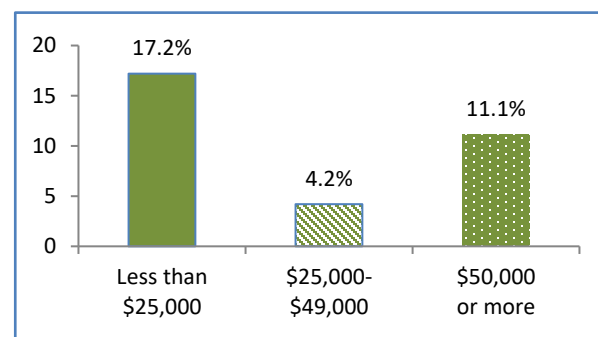
In the Houston MSA, a higher percentage of black survey respondents (15.7%) reported that they had been told by a healthcare professional that they have asthma, compared to white (12.2%) and Hispanic (7.9%) respondents. Persons with incomes below \$25,000 were more likely to have been told that they have asthma compared to those with higher incomes. Females (11.3%) were more likely to report having asthma than males (9.9%). Those with less than a high school education (6.7%) were less likely to report asthma than those with more education (10.4%-13.2%). Asthma was higher among younger adults aged 18-29 years (12.9%) compared to older adults aged 65 and older (9.1%).

Figure 102: Percentage of Adults with Asthma by Racial/Ethnic Group, Houston MSA 2015



Data Source: TDSHS BRFSS survey

Figure 103: Percentage of Adults with Asthma by Income, Houston MSA 2015

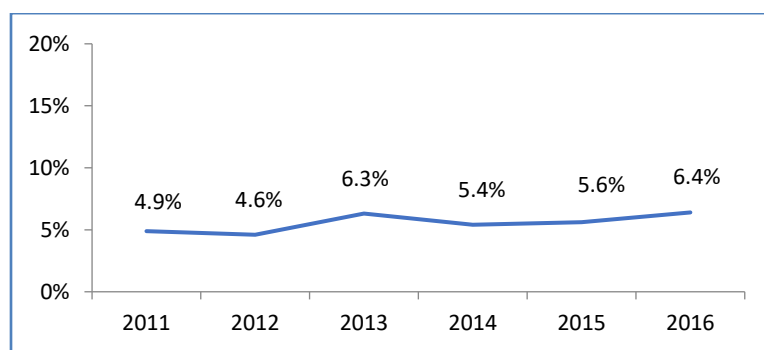


Data Source: TDSHS BRFSS survey

#9 HEART DISEASE—6.4%

Heart disease is a term that encompasses a variety of different diseases affecting the heart. The most common type in the United States is coronary artery disease, which can cause heart attack, angina, heart failure, and arrhythmias. There are many modifiable risk factors for heart disease and stroke including tobacco smoking, obesity, sedentary lifestyle, and poor diet. Controlling high blood pressure and cholesterol are also important prevention strategies. According to the Centers for Disease Control and Prevention, a 12-13 point reduction in systolic blood pressure can reduce risk for heart disease by 21% and resulting death by 25%.¹²⁰

Figure 104: Percentage of Adults with Heart Disease, Harris County 2011-2016



Data Source: Texas BRFSS survey

In 2016, 6.4% of Harris County adults reported that they had been told by a doctor, nurse, or other healthcare professional that they had heart disease, which includes having a heart attack, myocardial infarction, angina, or coronary heart disease. This was an increase from 4.9% in 2011.

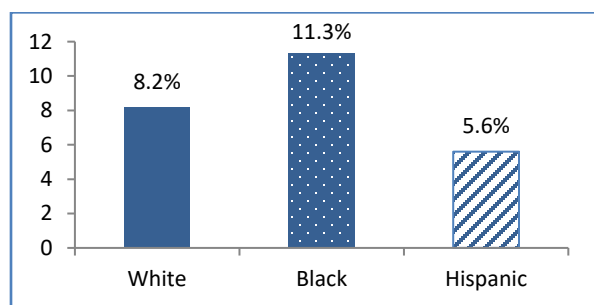
In the Houston-The Woodlands-Sugarland Metropolitan Statistical Area (Houston MSA), which includes Harris and surrounding counties, 7.8% of all respondents reported that they had been diagnosed with heart disease by a healthcare professional in 2015. This included 8.2% of white, 11.3% of black and 5.6% of Hispanic respondents.

Heart disease was more common in those with lower incomes; persons earning less than \$25,000 were more than twice as likely to have been diagnosed with heart disease, compared to those with incomes above \$50,000. Men (10.2%) were almost twice as likely to report heart disease as women (5.6%).

Education also makes a difference. For 2015, when data is available for all education levels in the Houston-the Woodlands-Sugar Land MSA, the percentages of those diagnosed with heart disease were:

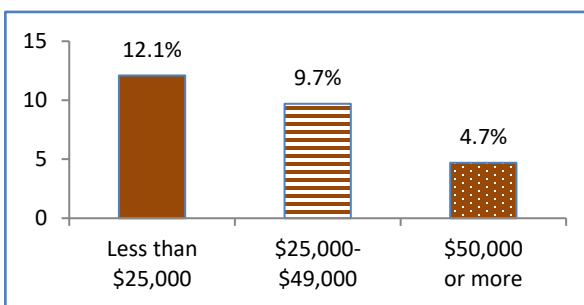
- Less than High School = 9.6%
- High School Graduate = 5.1%
- Some College = 5.5%
- College Graduate = 3.2%

Figure 105: Percentage of Adults with Heart Disease by Race/Ethnicity, Houston MSA 2015



Data Source: Texas DSHS BRFSS survey

Figure 106: Percentage of Adults with Heart Disease by Income, Houston MSA 2015



Data Source: Texas DSHS BRFSS survey

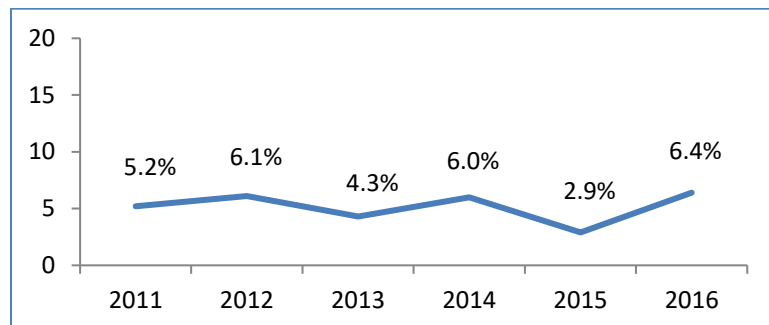
#10 CHRONIC OBSTRUCTIVE PULMONDARY DISEASE (COPD)—6.4%

Chronic obstructive pulmonary disease, or COPD, refers to a group of diseases that cause airflow blockage and breathing-related problems. COPD most commonly includes chronic bronchitis and emphysema and usually results from tobacco use, although it can also be a result of pollutants in the air, genetic factors, and respiratory infections. Common symptoms include shortness of breath, wheezing, and chronic cough. Although there is no cure for COPD, smoking cessation, medications, and therapy or surgery can help individuals manage their symptoms.¹²¹

COPD is much more common among the elderly. In the Houston-The Woodlands-Sugar Land MSA, in 2015, the prevalence of COPD rose as people aged, from ages 18-29 (1.6%), to ages 30-44 (2.5%), to ages 45-64 (6.0%), and ages 65 and older (9.8%). Females (5.0%) were more likely to have COPD than males (2.2%). Education levels did not show a pattern; those without a high school diploma and college

graduates reported less COPD than those who were high school graduates or had completed some college.

Figure 107: Percentage of Adults with COPD, Harris County TX 2011-2016

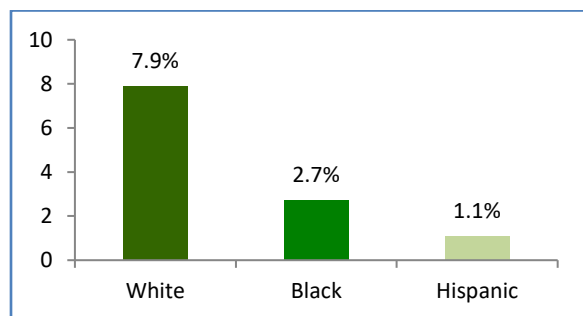


In 2016, 6.4% of Harris County adult respondents to the BRFSS survey reported that they had been told by a healthcare professional that they had COPD. This was an increase from 5.2% in 2011.

Data Source: Texas BRFSS survey

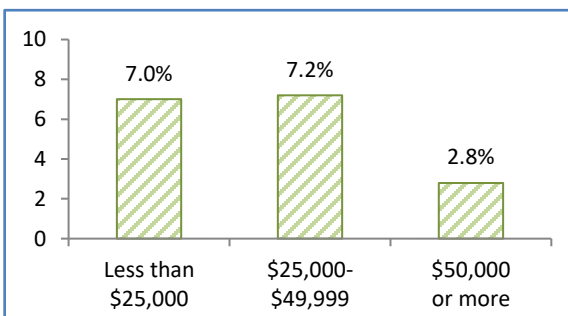
COPD was highest among the white population (7.9%) in 2015 in the Houston-The Woodlands-Sugar Land MSA, compared to the black (2.7%) and Hispanic (1.1%) populations. Those with middle and lower incomes were more likely to report COPD compared to those with the highest incomes.

Figure 108: Percentage of Adults with COPD, Houston MSA 2015



Data Source: Texas BRFSS survey

Figure 109: Percentage of Adults with COPD by Income, Houston MSA 2015



Data Source: Texas BRFSS survey

OTHER CHRONIC CONDITIONS

Harris County residents reported additional chronic diseases and conditions on Texas BRFSS surveys in 2015 and 2016:

- Blind or serious difficulty seeing even when wearing glasses 5.3%
- Deaf or serious difficulty hearing 5.1%
- Stroke 3.9%
- Chronic kidney disease 3.5%

MORTALITY: TOP 10 CAUSES OF DEATH

Introduction

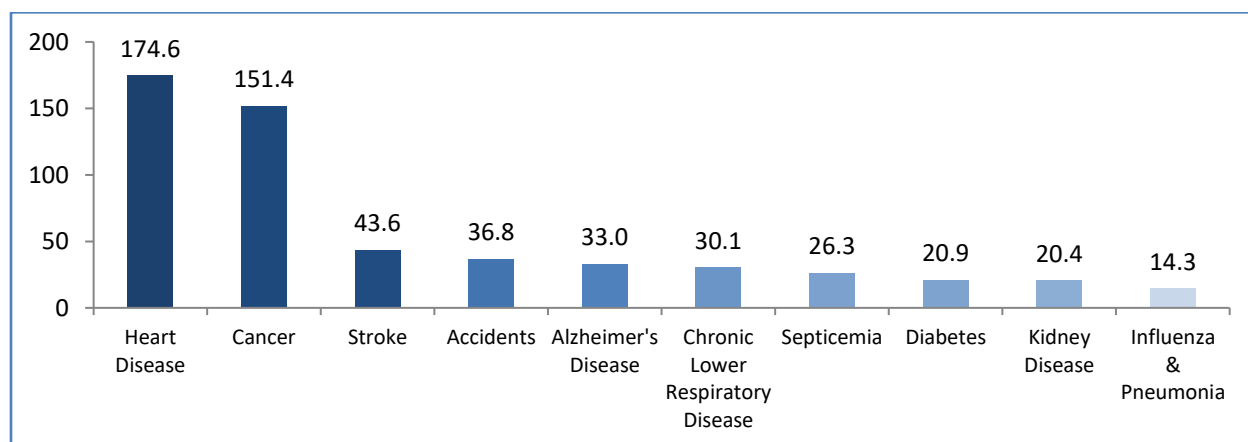
A mortality rate, or death rate, is defined as the number of individuals who die from a specified cause within a given population and time. The 10 leading causes of death in Harris County, according to age-adjusted rates, from most common to least common are listed below.¹²² The rates are for 2015, the most recent statistics available.

- | | |
|------------------------|--------------------------------------|
| 1. Heart Disease | 6. Chronic Lower Respiratory Disease |
| 2. Cancer | 7. Septicemia |
| 3. Stroke | 8. Diabetes |
| 4. Accidents | 9. Kidney Disease |
| 5. Alzheimer's Disease | 10. Influenza & Pneumonia |

Figure 110 shows the top 10 causes of death in Harris County, using age-adjusted rates to compensate for age differences in the population. Two of these, heart disease and cancer, have the highest rates of death, by far. Both heart disease and cancer also have many risk factors that are attributed to health behaviors.

Figure 110: Top 10 Causes of Death, Harris County TX 2015

Age-Adjusted Rate per 100,000 Population



Data Source: Texas Department of State Health Services (DSHS) Center for Health Statistics

Across all causes of death, the Hispanic population had lower mortality rates, on average, than the black or white populations. The male population experienced higher mortality rates than that of females for all causes of death except for Alzheimer's Disease.

Table 3 shows how the causes of death change for each age group. Unintentional injuries (accidents), suicides, and homicides are much higher in younger age groups, while heart disease and cancer are highest in those aged 45 and above. Unintentional injuries, suicides and homicides are shown in the colored blocks.

Table 3: Ten Leading Causes of Death by Total Numbers of Deaths and Age Group, Houston/Harris County TX 2015*

Rank	Age Groups										Total
	< 1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	
1	Congenital Anomalies (99)	Unintentional Injury (16)	Cancer (16)	Unintentional Injury (11)	Unintentional Injury (173)	Unintentional Injury (231)	Unintentional Injury (186)	Cancer (488)	Cancer (1213)	Heart Disease (4087)	Heart Disease (5706)
2	Short Gestation (57)	Cancer (10)	Unintentional Injury (15)	Cancer (6)	Homicide (126)	Homicide (126)	Cancer (183)	Heart Disease (452)	Heart Disease (940)	Cancer (3431)	Cancer (5436)
3	Maternal Pregnancy Comp. (30)	Homicide (8)	Homicide (9)	Homicide (5)	Suicide (65)	Suicide (94)	Heart Disease (146)	Unintentional Injury (222)	Unintentional Injury (225)	Stroke (1070)	Unintentional Injury (1493)
4	SIDS (22)	Heart Disease (7)	Stroke (3)	Heart Disease (3)	Cancer (22)	Cancer (67)	Suicide (80)	Chronic Liver Disease-Cirrhosis (109)	Diabetes Mellitus (159)	Alzheimer's Disease (869)	Stroke (1339)
5	Bacterial Sepsis (18)	Congenital Anomalies (4)	Chronic Lower Respiratory Disease (3)	Suicide (1)	Heart Disease (18)	Heart Disease (50)	Homicide (65)	Suicide (89)	Chronic Liver Disease-Cirrhosis (158)	Chronic Lower Respiratory Disease (780)	Chronic Lower Respiratory Disease (956)
6	Unintentional Injury (9)	Stroke (2)	Heart Disease (2)	Stroke (1)	Congenital Anomalies (7)	HIV/AIDS (16)	HIV/AIDS (44)	Diabetes Mellitus (77)	Stroke (152)	Septicemia (634)	Alzheimer's Disease (879)
7	Septicemia (8)	Septicemia (1)	Certain Conditions Originating in the PPOR (1)	Septicemia (1)	Influenza and Pneumonia (4)	Stroke (15)	Chronic Liver Disease-Cirrhosis (33)	Septicemia (68)	Chronic Lower Respiratory Disease (131)	Kidney Disease (503)	Septicemia (874)
8	Placenta Cord Membranes (8)	Meningitis (1)	N/A	Influenza and Pneumonia (1)	Septicemia (4)	Diabetes Mellitus (13)	Diabetes Mellitus (29)	Stroke (64)	Septicemia (122)	Diabetes Mellitus (468)	Diabetes Mellitus (750)
9	Respiratory Distress (8)	Kidney Disease (1)	N/A	Diabetes Mellitus (1)	Diabetes Mellitus (3)	Septicemia (11)	Stroke (28)	HIV/AIDS (60)	Kidney Disease (86)	Unintentional Injury (405)	Kidney Disease (657)
10	Neonatal Hemorrhage (6)	Anemias (1)	N/A	Chronic Lower Respiratory Disease (1)	Pregnancy, Childbirth and the Puerperium (2)	Chronic Liver Disease-Cirrhosis (10)	Septicemia (25)	Homicide (53)	Suicide (62)	Influenza and Pneumonia (342)	Suicide (461)

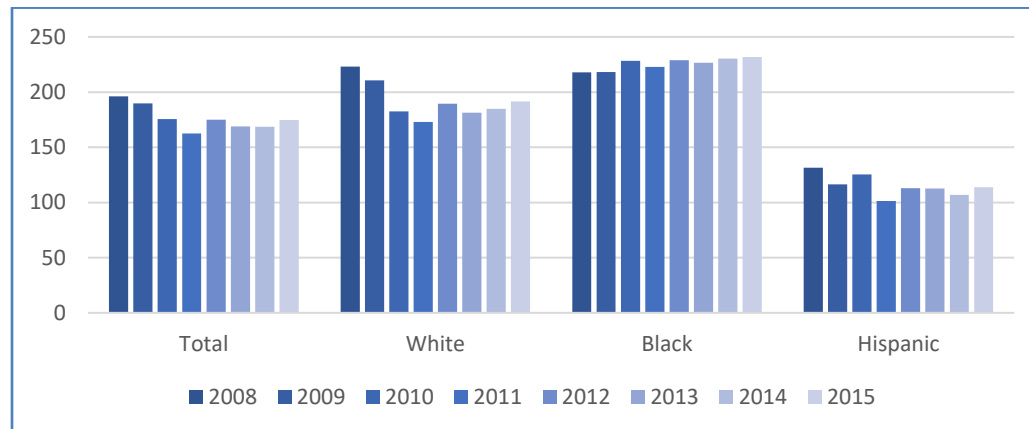
Data Source: Texas DSHS Center for Health Statistics. *The colored blocks are accidents (blue), homicides (red), and suicides (green), to enable comparisons across age groups, and follow formatting in national comparison tables.

#1 HEART DISEASE

Heart disease encompasses many different disorders that affect the heart, such as rheumatic fever, chronic heart failure, and acute myocardial infarction (heart attack). Heart disease is the leading cause of death for both men and women in the US. More than half of the deaths due to heart disease in 2015 were in men. Heart disease is the leading cause of death for people of most racial/ethnic groups in the United States, including African Americans, Hispanics, and whites. For Asian Americans or Pacific Islanders and American Indians or Alaska Natives, heart disease is second only to cancer. High blood pressure, high LDL cholesterol, and smoking are key risk factors for heart disease. About half of Americans (49%) have at least one of these three risk factors. Other risk factors include diabetes, overweight and obesity, poor diet, physical inactivity, and excessive alcohol use.¹²³

Figure 111: Heart Disease Mortality Rate by Race/Ethnicity, Harris County TX 2008-2015

Age-Adjusted, Per 100,000 Population



Data Source: Texas DSHS Center for Health Statistics

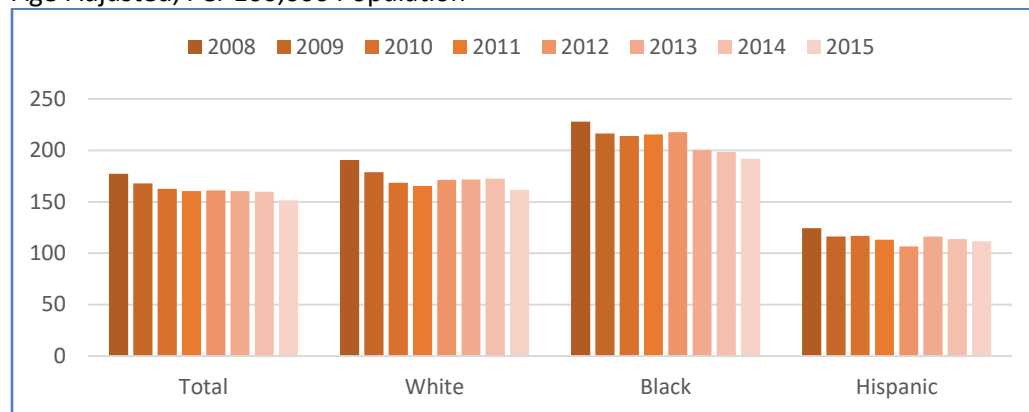
From 2008 to 2015, the rate of Harris County total deaths from heart disease has decreased from 196.1 per 100,000 to 174.6 per 100,000 population.

In Harris County, mortality rates from heart disease were highest among the black population (231.9 per 100,000 population) in 2015, followed by whites (191.6 per 100,000) and Hispanics (113.6 per 100,000). More men (215.4 per 100,000) died from heart disease than women (134.8 per 100,000).

#2 CANCER

The National Cancer Institute (NCI) defines cancer as a term used to describe diseases in which abnormal cells divide without control and are able to invade other tissues. According to the NCI there are over 100 different types of cancer, but breast, colon, lung, pancreatic, prostate, and rectal cancer lead to the greatest number of annual deaths. Risk factors of cancer include but are not limited to: age, alcohol use, tobacco use, a poor diet, certain hormones, and sun exposure. Although some of these risk factors cannot be avoided--such as age--limiting exposure to avoidable risk factors may lower risk of developing certain cancers.¹²⁴

Figure 112: Cancer Mortality Rate by Race/Ethnicity, Harris County TX 2008-2015
Age-Adjusted, Per 100,000 Population



Data Source: Texas DSHS Center for Health Statistics

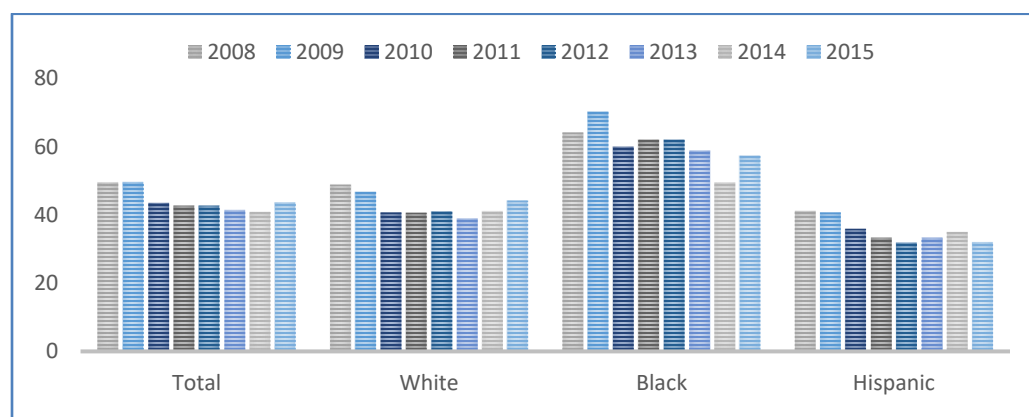
From 2008 to 2015, the rate of total Harris County deaths from cancer has decreased from 177.3 per 100,000 to 151.4 per 100,000 population.

In Harris County, mortality rates from cancer were highest among the black population (192.0 per 100,000 population) in 2015, followed by whites (161.6 per 100,000) and Hispanics (111.6 per 100,000). More men (177.1 per 100,000) died from cancer than women (128.0 per 100,000).

#3 CEREBROVASCULAR DISEASE/STROKE

Cerebrovascular disease (CVD) can impair the blood supply to the brain and increase the risk of stroke, the most common cause of CVD death. A stroke occurs when blood vessels carrying oxygen to the brain burst or become blocked, cutting off the brain's supply of oxygen and other nutrients. Lack of oxygen causes brain cells to die, which can lead to brain damage or death. Cerebrovascular disease is more common in older adults, but it can occur at any age. The most important modifiable risk factor for cerebrovascular disease/stroke is high blood pressure. Other risk factors include high cholesterol, heart disease, obesity, diabetes, physical inactivity, excessive alcohol use, and tobacco use.¹²⁵

Figure 113: CVD/Stroke Mortality Rate by Race/Ethnicity, Harris County TX 2008-2015
Age-Adjusted, Per 100,000 Population



Data Source: Texas DSHS Center for Health Statistics

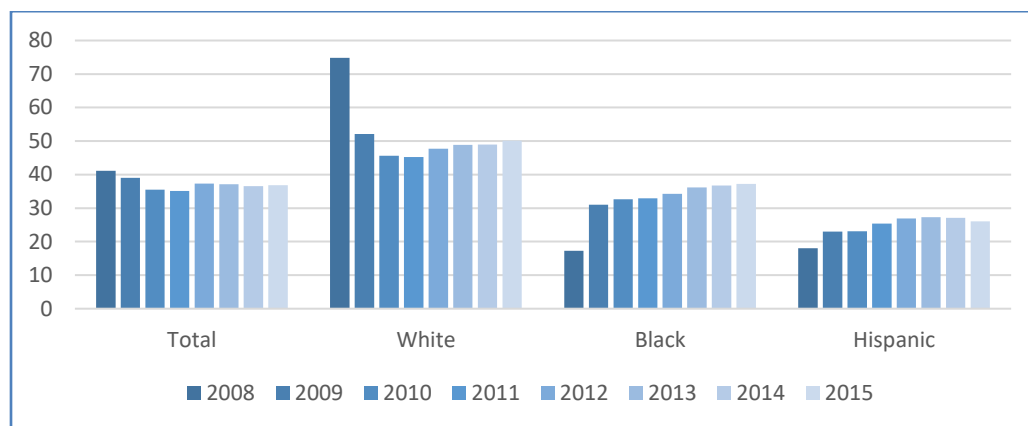
From 2008 to 2015, the rate of total Harris County deaths from stroke has decreased from 49.5 per 100,000 to 43.6 per 100,000 population.

In Harris County, mortality rates from strokes were highest among the black population (57.3 per 100,000 population) in 2015, followed by whites (44.2 per 100,000) and Hispanics (32.0 per 100,000). More men (44.2 per 100,000) died from strokes than women (40.8 per 100,000).

#4 ACCIDENTS

Accidents include falls, contacts with dangerous machinery, drowning, and other unintentional injuries. Motor vehicle collisions are a major cause of accidental deaths, and are the leading cause of death among people ages 5 through 34 in the United States.¹²⁶

Figure 114: Mortality Rate from Accidents by Race/Ethnicity, Harris County TX 2008-2015
Age-Adjusted, Per 100,000 Population



From 2008 to 2015, the rate of total Harris County deaths from accidents has decreased from 41.1 per 100,000 to 36.8 per 100,000 population.

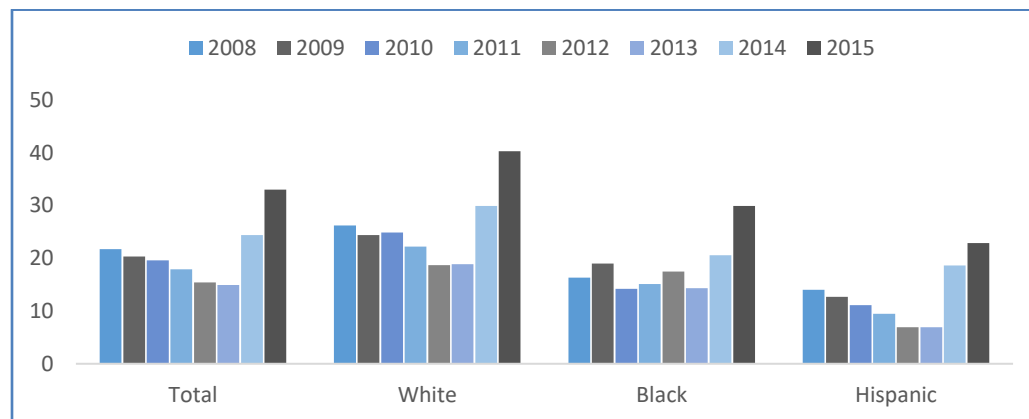
Data Source: Texas DSHS Center for Health Statistics

In Harris County, mortality rates from accidents were highest among the white population (50.1 per 100,000 population) in 2015, followed by blacks (37.2 per 100,000) and Hispanics (26.1 per 100,000). More men (43.9 per 100,000) died from accidents than women (23.4 per 100,000).

#5 ALZHEIMER'S DISEASE

Alzheimer's disease is the most common form of dementia among older people. It is a progressive and irreversible disease that impairs memory and affects thinking and behavior, to the point of eventually interfering with daily tasks. The greatest risk factor currently known is increasing age. After age 65, the likelihood of developing the disease doubles every five years; the risk is nearly 50% after age 85. Alzheimer's imposes heavy emotional and financial burdens on families. While there is currently no cure, there are treatments that can slow the progression of Alzheimer's and improve the quality of life for people with Alzheimer's and their caregivers.¹²⁷

Figure 115: Alzheimer's Disease Mortality Rate by Race/Ethnicity, Harris County TX 2008-2015
Age-Adjusted, Per 100,000 Population



From 2008 to 2015, the rate of total Harris County deaths from Alzheimer's Disease has increased from 21.7 to 33.0 per 100,000.

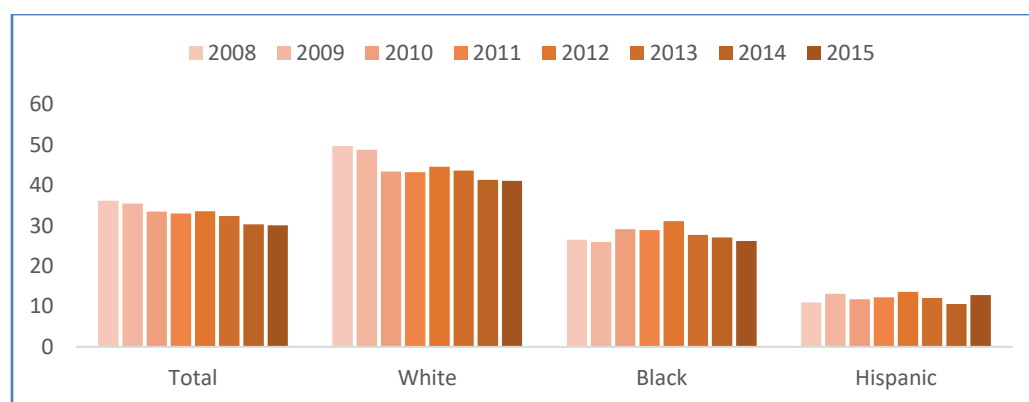
Data Source: Texas DSHS Center for Health Statistics

In Harris County, mortality rates from Alzheimer's Disease were highest among the white population (40.3 per 100,000 population) in 2015, followed by blacks (29.9 per 100,000) and Hispanics (22.9 per 100,000). More women (35.2 per 100,000) died from Alzheimer's Disease than men (25.9 per 100,000).

#6 CHRONIC LOWER RESPIRATORY DISEASE

Chronic lower respiratory disease, primarily Chronic Obstructive Pulmonary Disease (COPD), is a chronic disease of the airways and other structures of the lung that causes airflow blockage and difficulty with breathing. Chronic lower respiratory diseases include COPD, emphysema, chronic bronchitis, and in some cases asthma.¹²⁸ Approximately 15 million Americans have been diagnosed with COPD. Risk factors for chronic lower respiratory disease include current or former smokers; age 65-74 years; non-Hispanic white race; individuals who were unemployed, retired, or unable to work; people with lower incomes or a less than high school education; and those with a history of asthma.¹²⁹

Figure 116: Chronic Lower Respiratory Disease Mortality Rate by Race/Ethnicity, Harris County TX 2008-2015
Age-Adjusted, Per 100,000 Population



From 2008 to 2015, the rate of total Harris County deaths from chronic lower respiratory disease has decreased from 36.2 to 30.1 per 100,000.

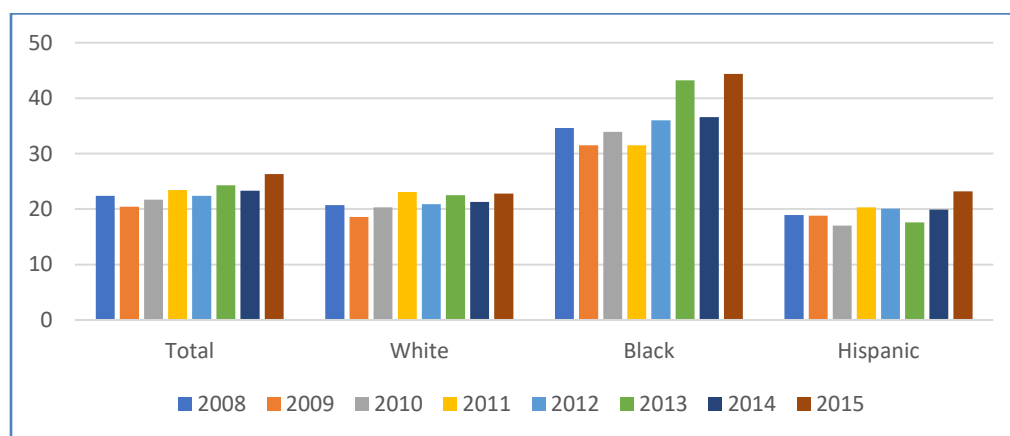
Data Source: Texas DSHS Center for Health Statistics

In Harris County, mortality rates from chronic lower respiratory diseases were highest among the white population (41.1 per 100,000 population) in 2015, followed by blacks (26.2 per 100,000) and Hispanics (12.8 per 100,000). More men (34.7 per 100,000) died from chronic lower respiratory disease than women (25.9 per 100,000).

#7 SEPTICEMIA

Septicemia is a serious bloodstream infection, also known as blood poisoning. Septicemia occurs when a bacterial infection elsewhere in the body, such as the lungs or skin, enters the bloodstream. It is a life-threatening medical emergency and triggers a chain reaction throughout the body. Without timely treatment, septicemia can rapidly lead to tissue damage, organ failure, and death. Anyone can get an infection that can lead to septicemia, but those most at risk are adults aged 65 and older; those with chronic medical conditions such as diabetes, lung disease, cancer, and kidney disease; people with weakened immune systems; and children younger than one year.¹³⁰

Figure 117: Septicemia Mortality Rate by Race/Ethnicity, Harris County TX 2008-2015
Age-Adjusted, Per 100,000 Population



From 2008 to 2015, the rate of total Harris County deaths from septicemia has increased from 22.4 per 100,000 to 26.3 per 100,000 population.

Data Source: Texas DSHS Center for Health Statistics

In Harris County, mortality rates from septicemia were highest among the black population (44.4 per 100,000 population) in 2015, followed by Hispanics (23.2 per 100,000) and whites (22.8 per 100,000). More men (29.4 per 100,000) died from septicemia than women (23.4 per 100,000).

#8 DIABETES

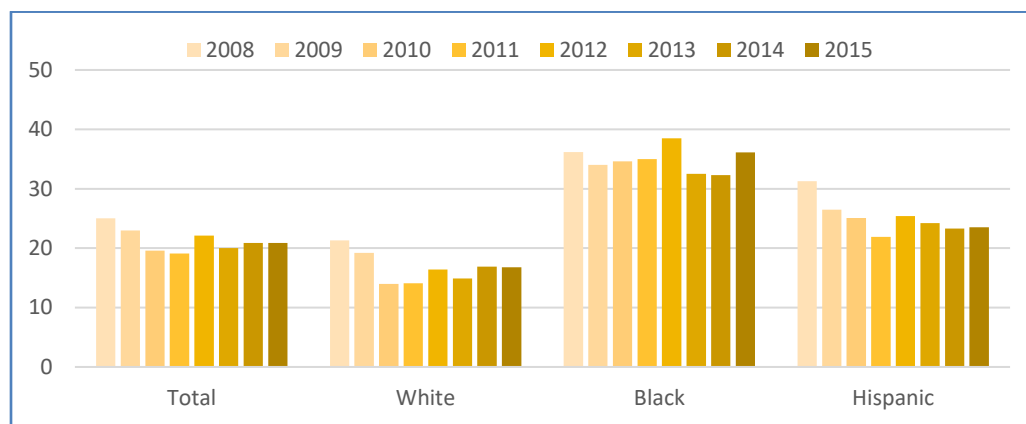
Diabetes is a group of diseases marked by high levels of blood glucose, also called blood sugar, resulting from defects in insulin production, insulin action, or both. About 1 in 11 people in the US have diabetes. The prevalence of diagnosed type 2 diabetes increased sixfold in the latter half of the last century. Diabetes risk factors such as obesity and physical inactivity have played a major role in this dramatic increase. Age, race, and ethnicity are also important risk factors. Diabetes disproportionately affects

minority populations and the elderly, and its incidence is likely to increase as minority populations grow and the US population becomes older.

This disease can have a harmful effect on most of the organ systems in the human body; it is a frequent cause of end-stage renal disease, non-traumatic lower-extremity amputation, and blindness among working-age adults. Persons with diabetes are also at increased risk for ischemic heart disease, neuropathy, and stroke. In economic terms, the CDC estimates that direct medical expenditures attributable to diabetes are over \$116 billion.¹³¹

Figure 118: Diabetes Mortality Rate by Race/Ethnicity, Harris County TX 2008-2015

Age-Adjusted, Per 100,000 Population



From 2008 to 2015, the rate of total Harris County deaths from diabetes has decreased from 25.0 per 100,000 to 20.9 per 100,000 population.

Data Source: Texas DSHS Center for Health Statistics

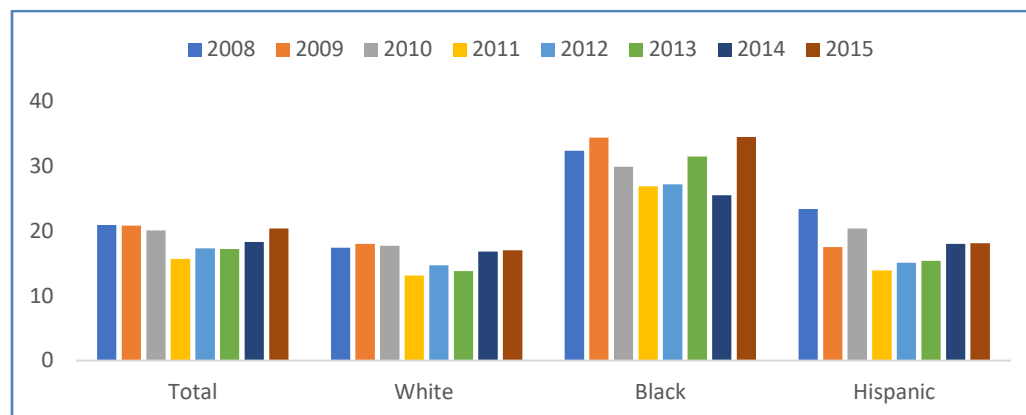
In Harris County, mortality rates from diabetes were highest among the black population (36.1 per 100,000 population) in 2015, followed by Hispanics (23.5 per 100,000) and whites (16.8 per 100,000). More men (24.9 per 100,000) died from diabetes than women (17.0 per 100,000).

#9 KIDNEY DISEASE

Kidney disease is most often caused by diabetes or high blood pressure, which slowly damage the blood vessels in the kidneys and decrease their ability to remove waste from the blood. Chronic kidney disease (CKD), also known as chronic renal disease, is a progressive loss of this function over time. The National Kidney Foundation reports that 26 million adults have chronic kidney disease and many others are at increased risk of developing the disease. The symptoms of declining kidney function are non-specific, and may include feeling generally unwell and a reduction of appetite. According to the American Kidney Fund, it is estimated that 40% of people with diabetes will develop CKD. CKD is more common among women, but men with CKD are 50% more likely to progress to kidney failure. The risk for kidney failure is also higher for some racial/ethnic groups, especially African Americans and Native Americans. Medicare expenditures for kidney failure account for about 6.7% of Medicare spending each year.¹³²

Figure 119: Kidney Disease Mortality Rate by Race/Ethnicity, Harris County TX 2008-2015

Age-Adjusted, Per 100,000 Population



From 2008 to 2015, the rate of total Harris County deaths from kidney disease has decreased from 20.9 per 100,000 to 20.4 per 100,000.

Data Source: Texas DSHS Center for Health Statistics

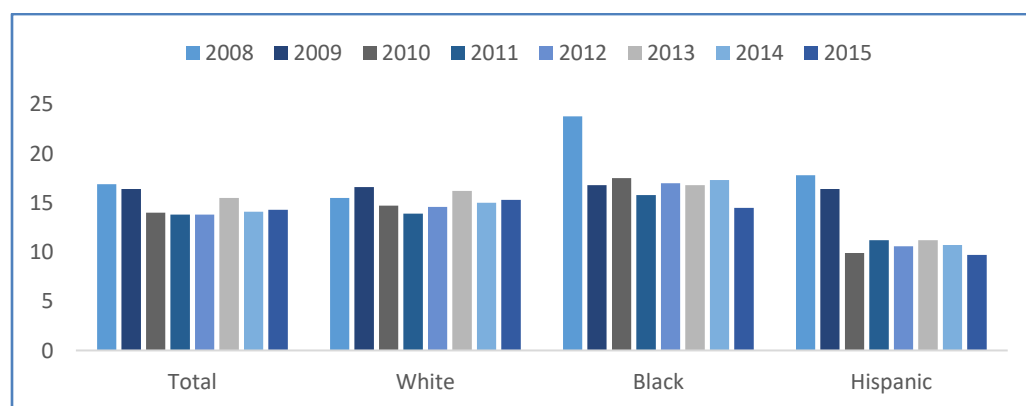
In Harris County, mortality rates from kidney disease were highest among the black population (34.5 per 100,000 population) in 2015, followed by Hispanics (18.1 per 100,000) and whites (17.0 per 100,000). More men (24.2 per 100,000) died from kidney disease than women (17.1 per 100,000).

#10 INFLUENZA & PNEUMONIA

Influenza (flu) and pneumonia are reported together because pneumonia is frequently a complication of influenza. Influenza is a contagious disease caused by a virus. The number of influenza deaths can fluctuate from one year to the next as the viruses constantly mutate, and some strains are more virulent than others. Pneumonia, caused mainly by bacteria, viruses, and mycoplasmas, is a serious infection of the lungs that develops when the immune system is weakened. Flu vaccination is suggested for all individuals six months and older, but flu and pneumonia vaccinations are especially recommended for the elderly, the very young, and the immunocompromised.¹³³

Figure 120: Influenza & Pneumonia Mortality Rate by Race/Ethnicity, Harris County TX 2008-2015

Age-Adjusted, Per 100,000 Population



From 2008 to 2015, the rate of total Harris County deaths from influenza and pneumonia decreased from 16.9 to 14.3 per 100,000 population.

Data Source: Texas DSHS Center for Health Statistics

In Harris County, mortality rates from influenza and pneumonia were highest among the white population (15.3 per 100,000 population) in 2015, followed by blacks (14.5 per 100,000) and Hispanics (9.7 per 100,000). More men (15.3 per 100,000) died from influenza and pneumonia than women (17.1 per 100,000).

SUMMARY: HOUSTON/HARRIS COUNTY SNAPSHOT

Houston is the fourth largest city in the US, with an estimated 2017 population of 2.3 million. The Houston metropolitan area, encompassing Harris and surrounding counties, has reached 6.9 million. The area is growing rapidly and has become the nation's most racially/ethnically diverse large metropolitan area. The largest growth has been in the Hispanic population, which is now the largest racial/ethnic group in both Houston and Harris County. With this growth and increasing diversity are social, economic and health system challenges that exacerbate disparities.

Disparities and inequities have upstream, or root causes, such as unequal distribution of resources and opportunities that impact health. The effects of these root causes are shown in downstream impacts such as unequal outcomes in health and longevity. Some of the most notable measures found in this report include:

- The Houston/Harris County population is now a “majority minority” urban area, where no one racial/ethnic group is in the majority.
- Life expectancy has grown, but mostly for those with higher incomes. From 2001 to 2014, life expectancy for the top 5% of income earners rose by about three years, while life expectancy for the bottom 5% saw no increase.
- Your ZIP code is more important than your genetic code in determining how long you will live; life expectancy in richer Houston neighborhoods is as much as 18 years longer compared to poorer neighborhoods.
- People of color face housing challenges, compared to the white population including: lower rates of home ownership, higher percentages of income needed for housing, lack of transportation, and greater exposure to environmental pollution/toxins in and near their residences.
- There is a severe housing shortage for low income people in the Houston area. The percentage of extremely low income households increased by 25% from 2000 to 2014 but the number of corresponding available, affordable housing units has remained almost unchanged during the same period.
- The gap in earnings is increasing. In 1980, whites in Houston earned \$7 more per hour than people of color; by 2015, that gap had more than doubled, to \$15 per hour.
- Over the past three decades, gains in income and wages have gone largely to the very top earners, while wages and incomes of working class and middle class workers have declined or stagnated.
- Poverty levels have not improved in Harris County in the past decade. In 2004, approximately 20% of Hispanics, 20% of blacks, and 5% of whites had incomes below the federal poverty level. In 2015, 22% of Hispanics, 20% of blacks, and 5% of whites lived below poverty.
- Each additional year of education leads to 11% more income annually, a safer work environment and better availability of benefits such as health insurance. Far more whites (57%) in Houston

have a bachelor's degree or higher, compared to 21% of blacks and 12% of Hispanics. Asians (57%) also more frequently have a bachelor's degree or higher.

- 17% of black households do not have access to a vehicle, compared to 5% of whites. Lack of transportation in a city as large as Houston places these households in stress, particularly when convenient public transportation is unavailable. Only 7% of workers use public transportation in Houston.
- Harris County infant mortality rates have dropped from 6.8 per 1,000 live births in 2005 to 5.8 per 1,000 in 2015. However, infant mortality rates have remained approximately twice as high among black infants during those years compared to white and Hispanic infants.
- Obesity is increasing, from 23.4% of adults in the Houston-The Woodlands-Sugar Land MSA in 2002 to 31.0% in 2017. Obesity is higher among black (47.3%) and Hispanic (35.0%) populations compared to whites (25.9%), and is higher among those with lower incomes and less education. Rising percentages of obesity are seen in children and adolescents as well. Obesity among youth increased from 16.5% of Houston high school students in 2007 to 20.4% in 2017.
- Of the foreign-born population in Houston, one-third have unauthorized status (do not have immigration papers). The rest are legal immigrants or naturalized citizens. Almost a third of unauthorized immigrants live below the poverty level.
- 89% of whites reported that they have health insurance, compared to 59% of Hispanics; 30% of Hispanics report that they cannot see a doctor due to the cost of the visit.
- Minorities are unequally impacted by upstream factors, in which they face many barriers to healthy living, such as lower incomes; poorer access to healthy foods, medical care, education and recreational facilities; greater exposure to environmental pollutions such as lead paint; and other situations in which they are disadvantaged.
- In general, those with lower incomes and less education face more stressors in their daily lives, with resulting higher rates of disease and disability.

The root causes of health disparities are pervasive in our society. For improvements to take place, many sectors of society will need to be involved. A number of experts have weighed in on suggested actions to improve health equity. The Robert Wood Johnson Foundation has identified eight segments of society that will need to work together to make improvements in health equity: policy, employment, the media, education, health and healthcare, criminal justice, community development, and housing and transit.

While making improvements to decrease health disparities in Houston/Harris County can seem daunting, the results would enhance the overall community as well as those personally affected by disparities. For example, improving wage disparities, with rising wages for low-wage workers would boost incomes, resulting in more of the consumer spending that drives economic growth and job creation. Another example is improving graduation rates from high schools and colleges, an intervention that would provide future industry with needed skilled workers.

Health disparities impact all of Houston in obvious and subtle ways. Creating a more equitable community will ultimately benefit us all.

DATA AND TECHNICAL NOTES

This report presents the most recently available data regarding health disparities for the Houston/Harris County area, anchored by the BARHII framework. The purpose of this report is to inform local decision makers who can impact policies about the status and trends in local health and health disparities. These include leaders in public health, other sectors in local government, and public/private organizations. The report also serves to inform the general public about health disparities in our local community.

This report presents information on how far we have come in the past decade, since the prior Houston/Harris County Health Disparity report in 2008. Some directions on steps toward improvement are also presented. These ideas can serve as a basis for discussion and dialogue among various sectors with the goal of improving disparities and overall health in Houston/Harris County.

Scope of the Report

Health and healthcare are very large subjects with a great deal of pertinent research. Because of this, the scope of this report had to be limited. Some important areas affecting health, but beyond the scope of this report, are a greater focus on data on mental health indicators and disparities in healthcare (medical services).

Upstream and Downstream Measures

The adage “what cannot be measured cannot be improved”¹³⁴ is germane to health disparities, health inequities and social determinants of health. Both upstream and downstream health measures are included in this report. Upstream factors are the overarching conditions in which people are born, grow, live, work and age. Downstream determinants include the outcomes of upstream factors, and aspects of health more easily addressed by the individual, such as a change in eating habits or reducing risk of injury on the job.

Data Comparisons and Methods

Data is presented at the Harris County or City of Houston level. When these were not available, Houston Metropolitan Statistical Area (MSA) data (Houston-The Woodlands-Baytown) are presented as an approximate proxy for Harris County. Data is compared to Texas or to US estimates when possible. In instances where local data is unavailable, data at the state or the national level may be presented.

When available, data on disparities in health risk factors and outcomes, and disease prevalence (total cases) and incidence (new cases) was presented by race/ethnicity, income, education, gender, age, sexual orientation, and disability status. These comparisons show differences between the various groups and also allow comparisons between each group and the overall rates for the city and county.

Data on health behaviors and health outcomes were obtained primarily from the Texas Department of State Health Services Behavioral Risk Factor Surveillance System (BRFSS), both from their BRFSS website and from data requested directly from the department.

Communicable disease data were collected by surveillance investigators from the Houston Health Department (HHD) and entered into electronic systems. HIV data were from Texas Enhanced HIV/AIDS Reporting System (eHARS) accessed on 05/01/2018. Acute hepatitis B and diarrheal diseases data were from the National Electronic Disease Surveillance System (TX-NEDSS). Acute and chronic hepatitis C data were from electronic laboratory reporting received from Houston Electronic Disease Surveillance (HEDSS).

HHD's hepatitis C data is from electronic laboratory reporting (ELR) received from HEDSS. Since we cannot differentiate acute from chronic hepatitis C infection based on ELR alone, "acute and chronic hepatitis C" is used for data obtained from ELR. In addition, race/ethnicity is not always populated in the data source since it is not a required field for ELR.

Mortality data was obtained from the Texas Department of State Health Services. The 13-category 2000 Standard Population was used to calculate the age-adjusted mortality rates for Harris County. The Harris County population estimates, by age category, were obtained from the 2010 U.S. Census, the 2011-2015 American Community Survey Demographic and Housing 5-Year Estimate and the 2015 American Community Survey 1-Year Estimate. All margins of error were evaluated and determined reliable. Populations included are non-Hispanic white, non-Hispanic black, and Hispanic. Due to unreliability of data, the Asian population was not included in comparisons. All mortality rates are per 100,000 persons.

Data Time Periods

The risk factors and health outcomes were measured over time, with a 10-year trend presented when possible. The 10-year trend was chosen in part to provide an update following the last disparities report that was done 10 years ago in 2008. If 10 years of data were not available, multiple years of the most recent data were presented as a trend; for example, charts might show the last three years or last five years of data.

Data Gaps and Data Limitations

Disparities in health exist across race/ethnicity, gender, sexual orientation, disability status, educational attainment and poverty status due to unequal allocation and distribution of resources. This report presents disparity data across race/ethnicity for almost all indicators in Harris County or Houston. Data on educational attainment and poverty status, when available, is also presented to demonstrate unequal allocation and distribution of resources. Health disparity data by sexual orientation or disability status was unavailable at the county or city level, and hence is not presented. Clearly, data gaps exist due to lack of sufficient data at a county and sub-county level on disability or sexual orientation.

Additional data gaps were present in BRFSS survey data. Some topics did not have sufficient responses in several categories, so that Harris County comparisons by racial/ethnic group, income level, or education could not be done. This impacted data on mammograms, cervical cancer screening, and several more categories. In these cases, data from the Houston-The Woodlands-Sugar Land Metropolitan Statistical Area was used, which provided a larger sample size and more comparisons. The

BRFSS also did not address some topics, leading to additional data gaps. For example, the local BRFSS survey does not question respondents about illicit drug use, so in this case, regional, state and national data were presented.

Data disaggregation, which shows the local component of national statistics, is critical to provide a clearer picture of health disparity and inequity in Houston/Harris County. More detailed survey questions are also needed, including information about race/ethnicity, gender, education, and income or occupation. Data collection on a standard set of indicators should be encouraged and whenever possible, data collection should follow these guidelines. In this report, at times, complete data on the minority groups is not presented because of gaps in data collection.

Data collection at the neighborhood level is very resource intensive. Small area prevalence estimates at the census tract level is available from the CDC's *500 Cities Project* data on specific chronic conditions. These data are "estimates" of estimates (BRFSS data) and one should use caution when using these indicators. Additionally, the reliability of data may be in question if the confidence intervals are wide, as is sometimes the case with US Census data.

Data Sources

Data presented in this report comes from multiple sources, including primary (collected by the Houston Health Department) and secondary (collected by others). Primary data was used for some measures of morbidity, such as cases and rates for TB and HIV/STD. These measures come from surveillance data collected by the Houston Health Department Bureau of Epidemiology and Tuberculosis Control. All charts in this section were prepared by HHD epidemiologists.

Data for secondary sources was selected from sources that include:

- Federal and state government reports from organizations such as the Centers for Disease Control and Prevention, Texas Department of State Health Services, US Census Bureau for birth and death data, Health Resource and Service Administration, and Environmental Protection Agency
- Academic peer-reviewed research papers from journals such as *Social Science and Medicine*; and the National Academies of Sciences, Engineering, and Medicine
- Public health reports
- Analyses based on Behavioral Risk Factor Surveillance System (BRFSS) data from the Texas Department of State Health Services and the Centers for Disease Control and Prevention
- University open access reports
- Houston State of Health online data portal at www.houstonstateofhealth.com
- Publicly available reports from public-health focused entities such as Robert Wood Johnson Foundation and Pew Research Center, Policy link, Urban Institute and Kinder Institute

In most cases, the charts were prepared by Houston Health Department analysts.

GLOSSARY

Age-adjusted rates: Rates adjusted to compensate for age differences. The rates of almost all causes of disease, injury, and death vary by age. Age adjustment is a technique for "removing" the effects of age from crude rates so as to allow meaningful comparisons across populations with different underlying age structures. For example, comparing the crude rate of heart disease in Florida with that of California is misleading, because the relatively older population in Florida leads to a higher crude death rate, even if the age-specific rates of heart disease in Florida and California were the same. For such a comparison, age-adjusted rates are preferable.¹³⁵

BRFSS: The Behavioral Risk Factor Surveillance System surveys done by the Texas Department of State Health Services (Texas DSHS) and the Centers for Disease Control and Prevention. Both groups conduct surveys in the Harris County area with questionnaires that assess the health of the population.

CDC: Centers for Disease Control and Prevention.

Dose dependent or dose response: The higher the dose, or number of events (such as years of education), the more the outcome changes (such as life expectancy).

HHD: Houston Health Department.

Houston-The Woodlands-Sugarland Metropolitan Statistical Area: A 9-county area, including Harris and surrounding counties, determined by the US Office of Management and Budget (OMB).

Incidence: The number new cases of specific disease during a particular time period, usually a year.

Prevalence: The total number of individuals in a population who have a health condition as a percentage of the total population.

Primary data: Data collected by the Houston Health Department.

Secondary data: Data collected by groups outside the Houston Health Department, such as by the Texas Department of State Health Services, the Centers for Disease Control and Prevention, and various university research groups.

Texas DSHS: Texas Department of State Health Services

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