

HEALTH DISPARITY AND HEALTH INEQUITY

2019 Trends and Data Report

Houston/Harris County



SECTION 1:

ROOT CAUSES CREATING HEALTH INEQUITIES

UPSTREAM FACTORS



CITY OF HOUSTON

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Dear Fellow Houstonians,

Health disparities and health inequities are a serious public health concern in Houston. Some parts of our population have much poorer overall health than others. The Houston Health Department has developed this report as a means of highlighting these issues and recommending actions for improvement. The report was a cooperative effort of key sections of the department with public health expertise and access to important health data and measures.

In this report, you will find current data on the causes and prevalence of morbidity (illness) and mortality (death), differences in health among racial/ethnic and other groups, and health trends for Houston and Harris County. Many of you are aware that a large portion of each person's health status is impacted by their environment, the places where they work, live, play, grow and thrive. This report includes data about how environment impacts health in Houston/Harris County, and presents a framework for addressing health disparities and health inequities. A myriad of factors affects health and a vast amount of data is available, so some features, such as a discussion of healthcare disparities, are beyond the scope of this report.

As urban life becomes increasingly complex, public health is challenged to find new and creative ways to promote and protect the health and social well-being of our residents. This report is intended to serve as a resource for our community partners for initiating conversations, setting goals, and planning programs and processes. I hope the conversations will continue, so that new ideas can emerge; recommendations, such as developing more partnerships with non-health sectors, can be implemented; and we can move closer to addressing health disparities and health inequities as a community.

Sincerely,

A handwritten signature in blue ink that reads "Stephen L. Williams".

Stephen L. Williams, M.Ed., M.P.A.

Director

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ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

“it is an ethical responsibility and consonant with principles of human rights to give special priority to action on important public-health problems that differentially affect those with fewer resources and/or greater obstacles to addressing problems.”

Michael Marmot

Health disparities are differences in the burden of disease, injury, violence, or opportunities to achieve optimal health that are experienced by socially disadvantaged populations. These population groups can be defined through different demographic measures, such as geography, gender, age, sexual orientation, socio-economic status, or race/ethnicity. In a community, health disparities represent differences in health status that can be prevented or decreased through making changes in factors such as living conditions, employment opportunities, and changes to the social environment. Improving health disparities benefits those who are disadvantaged, but also the community at large. Better health and health conditions leads to broader prosperity across the economy through a more robust and skilled work force, improved productivity, fewer sick days and decreased healthcare costs.

The Houston Health Department (HHD) has a core mission to “promote and protect the health and social well-being of Houstonians.” In 2008, HHD presented ***The City of Houston Health Disparities Data Report***,¹ with measures of disparities across the city and county. The current 2019 report was developed as an update, and also includes models for understanding the root causes of disparities with recommendations for improvement from some of the most forward thinking experts in public health.

Houston/Harris County is at the center of the most diverse large metropolitan area in the US. It is also a place where many health disparities exist. Often, these disparities are evident in differences in the health of various racial/ethnic groups in the city and county. Other disparities are seen in the access residents have to quality education, housing, transportation, and healthcare. In some richer Houston ZIP codes, life expectancy is more than 10 years longer compared to ZIP codes where incomes are less.

Houston has changed in the past 10 years. One obvious difference is the growth of minority groups in the population. Trends in health have changed as well. Some health measures have improved. Births to adolescent mothers, below age 18, are down by half, from 4.4% of all births, to 2.2%; decreases were most dramatic in the Hispanic and black populations. There are fewer smokers in Houston/Harris County, a drop from 17.3% to 12.5%. However, poverty levels are essentially unchanged and Houston/Harris County remains one of the most segregated metropolitan areas in the US, with pockets of poverty and disadvantage that disproportionately affect minorities, those with disabilities or less education, children, and other vulnerable groups. No one sector can address these health issues alone. Improving health disparities will need to involve many aspects of our community, with partnerships across the private, public and non-profit sectors.

INTRODUCTION

Our nation’s founders wrote that all people are created equal with rights to “life, liberty and the pursuit of happiness.” The concepts of equal standing and equal opportunity are deeply rooted in our nation’s values.

Health equity is a key and basic component of these rights. The Robert Wood Johnson Foundation defines health equity as “everyone has a fair and just opportunity to be healthier. This requires removing obstacles to health such as poverty, discrimination, and their consequences, including powerlessness and lack of access to good jobs with fair pay, quality education and housing, safe environments, and health care.” Health equity benefits everyone, not just those who are disadvantaged, through results such as an improved economy, better quality of life in communities, and a stronger current and future work force.

This report delves into health equity in Houston/Harris County, with measures of health disparities and health inequities among our population. Relevant research is presented, and recommendations for action provide a road map for the way forward.

BACKGROUND

The study of health equity began over 50 years ago. Sir Michael Marmot, the seminal scholar and pioneer in the field of social epidemiology, spoke of the socioeconomic gradient in health among British civil servants in the 1960’s. He observed a relationship between socio-economic status (described as education, occupation and income at that time) and health. As the person’s socio-economic status increased, their health outcomes appeared to get better.

Years later, Margaret Whitehead, a health disparities scholar, issued a call to governments and all sections of society to draw attention to differences in health associated with social position.² The World Health Organization's (WHO) Commission on the Social Determinants of Health, led by Sir Michael Marmot, released its report in 2008, ***Closing the Gap in a Generation: Health Equity Through Action on the Social Determinants of Health***.³ This treatise is connected to human rights and implies that the State has a legal obligation to provide all citizens with not only access to health care, but also infrastructure and support for the underlying determinants of health such as safe drinking water, clean air, food, safe environment, housing, health related information, education and employment. It also says that the State has a responsibility to mitigate the effects of discriminatory policies and practices. A rights-based approach prioritizes the needs of the most vulnerable population to achieve equity. This type of a rights-based approach has been adopted by WHO for the ***Transforming the World: 2030 Agenda for Sustainable Development***, and includes economic, social and environmental factors.⁴ The WHO agenda focuses on five P’s: ***people, planet, prosperity, peace and partnership***.

Marmot, Braveman and other scholars assert that “The circumstances of people’s lives are shaped by the distribution of money, power and resources at global, national and local levels. These circumstances are beyond one’s control and are mostly responsible for health inequities--the unfair and avoidable differences in health status seen within and between countries. Root causes and structural inequities involve multiple sectors that need to work in concert with each other to realize the vision of health equity for all. Root causes can be further broken into two types of health inequity, the ‘allocation’ of resources and power and the ‘distribution’ of resources and power due to established structures and systems.”^{5,6}

The US Department of Health and Human Services and the World Health Organization (WHO) both define “health equity” as “attainment of the highest level of health for all people.” The definition goes on to add “Achieving health equity requires valuing everyone equally with focused and ongoing societal efforts to address avoidable inequalities, historical and contemporary injustices, and the elimination of health and healthcare disparities.”⁷

Did you know that your
ZIP code is more
important than your
genetic code to predict
how many years you will
live?

Robert Wood Johnson Foundation
(2009).

Health inequity is a result of disparities in the core causes of health that are less than optimal for individuals or groups of people. The health of those in a community is impacted by many factors. Access to health care and medical care are obviously important to the health of a community; however health is also affected by many more aspects of life such as social, economic, environmental, political and cultural factors. Among the primary variables are: socio-economic factors such as education, income, and occupation at the individual and the neighborhood level; environment; institutional and systems level discrimination; poverty; racism; neighborhood conditions; biology; access to health care; housing; immigration status; and individual risk behaviors.

Sectors and systems such as public health, medical or clinical care, education, housing, policies and processes, government institutions and programs, and corporations all play key roles in impacting the health of a population and maintaining the current status quo in the health of a community. Disparities and inequities can vary widely among communities (defined as groups of people sharing a common geography or a set of common characteristics). Adding to this complexity, the various systems and sectors are dynamic and are continually evolving and often impact each other.

The social determinants of health are major factors in overall health. For many years, the term *social determinants of health*, also called *root causes of ill-health*, has been defined in terms of gender, socio-economic status, race/ethnicity and poverty status. However, views of scholars and the scientific evidence on health disparities have been evolving and it has become increasingly evident that the determinants of health are far broader than originally thought. The current thinking on root causes of ill-health encompasses demographic factors, structural factors and environmental factors. These factors

refer to conditions in which people live, work and play that affect a wide range of health, functioning, and quality-of-life outcomes and disease risks. This requires the health sector to view determinants of health through a more expansive and updated lens. This deeper understanding of the root causes of ill-health and premature death provides insights about how to address health disparities and inequities.

Some examples of determinants of health include: availability of resources to meet daily needs (e.g., safe housing and local fresh food markets); access to educational, economic, and job opportunities; access to health care services; quality of schools and job training; availability of community-based resources in support of community living; opportunities for recreational and leisure-time activities; transportation options; public safety; social support; social norms and attitudes (e.g., discrimination, racism, and distrust of government); exposure to crime, violence, and social disorder (e.g., presence of trash and lack of cooperation and trust in a community); socioeconomic conditions (e.g., concentrated poverty and the stressful conditions that accompany it); residential segregation; language/literacy; access to mass media and emerging technologies (e.g., cell phones, the Internet, and social media); and culture.

Social justice is a matter of life and death. It affects the way people live, their consequent chance of illness, and their risk of premature death.

Poverty is a condition that affects nearly all aspects of one's life and has a direct impact on a community's health and well-being. It results in challenges in paying for basic needs. It limits the choice of neighborhood one lives in, the access to resources one has, the schools that one's children attend, the type of employment and number of hours one works, and the air pollution exposure that one faces. Poverty can limit access to resources such as availability of parks, transportation, food environment, quality education, health care facilities, housing stock and safe neighborhoods. Poverty has therefore been used as a proxy for "living conditions" by researchers. However, unpacking these conditions and identifying the disparities is the first step in addressing the disparities.

DEFINITIONS

"It is essential to be explicit about defining health disparities and related concepts. Some people may use the terms health disparity, health inequity, health differences interchangeably. There needs to be a common language and common understanding of these terms to address health disparities and health inequities."

Paula Braveman

Health Differences and Health Disparities: These are two different concepts. Health "differences" refer differences in health such as between the aging population and the young, or differences in health between professional athletes and the general population. Health differences are not necessarily disparities. A "health disparity" refers to a higher burden of illness, injury, disability, or mortality

experienced by one group relative to another; usually in a group that is at a disadvantage due to their social or economic status. Scholars recommend that health disparities be examined through different lenses, particularly through a lens of “health equity.”⁸

Health Inequities are systematic, unfair and avoidable health outcomes of different population groups based on social position, demographics or geography. According to WHO, “Health inequities arise from social factors, including education, employment status, income level, gender and ethnicity. Ample evidence indicates that these factors have a marked influence on how healthy a person is. In all countries – whether low-, middle- or high-income – there are wide disparities in the health status of different social groups. The lower an individual’s socio-economic position, the higher their risk of poor health. These inequities have significant social and economic costs both to individuals and societies.”⁹

Health Inequities resulting from structural inequities or root causes can be due to:

1) ALLOCATION of resources and power

2) DISTRIBUTION of resources and power due to established systemic factors

Health equity is the principle underlying a commitment to reduce—and, ultimately, eliminate—disparities in health and in its determinants or root causes. The determinants of health can be addressed by taking a health equity approach. Pursuing health equity means striving for the highest possible standard of health for all people and giving special attention to the needs of vulnerable populations and those at greatest risk of poor health, based on social conditions.¹⁰

SCOPE OF THE REPORT

The previous Houston/Harris County Health Disparity Report was published in 2008, and is available at <http://www.houstontx.gov/health/disparity.pdf>. Since that time, major incidents have impacted our communities. These occurred at multiple levels:

- International impacts, such as conflict and war, famine, displaced populations and refugees, natural disasters, immigration policies, etc.
- National changes, including passage of the Affordable Care Act, policy changes due to administration changes, changes in allocation of funds based on changing priorities and ideologies, new immigration policies, etc.
- Local shifts, brought about by natural disasters, administration changes, priority shifts, changes in funding streams, etc.

This report was created to:

1. Provide an update on health disparities in Houston/Harris County by presenting key health indicators using the most recently available data.

2. Assess changes and critical trends in the past decade, to better understand the health of our community.
3. Inform a broader audience about how structural factors that support the conditions that create inequities.
4. Stimulate conversations on root causes of ill-health and health disparities.

To understand health equity and health disparities in Houston/Harris County, having access to data is the first step. For this report, data was selected from primary and secondary sources on health disparities, in the realm of established public health practice. Public health programs, policies, and organizational infrastructure work to address health disparities through an equity lens. Public health agencies also support health equity by convening multi-sectoral partnerships and assisting grass roots and community-based activities. This report is intended to be used as a resource to inform partners, constituents and decision makers about root causes of ill-health.

Disparities also exist in healthcare, such as in the systems that provide healthcare and in how well people are able to access healthcare services. The Institute of Medicine report ***Unequal Treatment Confronting Racial and Ethnic Disparities in Healthcare*** highlighted the deep health inequities that exist in health care and health care delivery.¹¹ However, a deeper discussion on the inequities in healthcare is beyond the scope of this report. It is important to note that this report presents data on “health” disparities and not “healthcare” disparities.

MODELS OF HEALTH EQUITY AND HEALTH DISPARITIES

CONCEPTUAL MODEL TO PROMOTE HEALTH EQUITY

The Robert Wood Johnson Foundation (RWJF) noted that “Americans today live shorter, sicker lives than people in other developed countries, and, across the nation, health varies by income, education, race and ethnicity, and geography.” Support from RWJF led to the publication ***Communities in Action: Pathways to Health Equity*** by the National Academy of Sciences, Engineering and Medicine.¹² This report is the result of a year-long analysis by a 19-member committee of national experts in public health, health care, civil rights, social science, education, research and business. The report includes key points:

- Health equity is crucial to the well-being and vibrancy of communities.
- Social inequities matter more than health care in shaping health disparities.
- Health equity holds benefits for the entire nation, from economic vitality to national security.
- Communities have the power to take steps toward health equity.

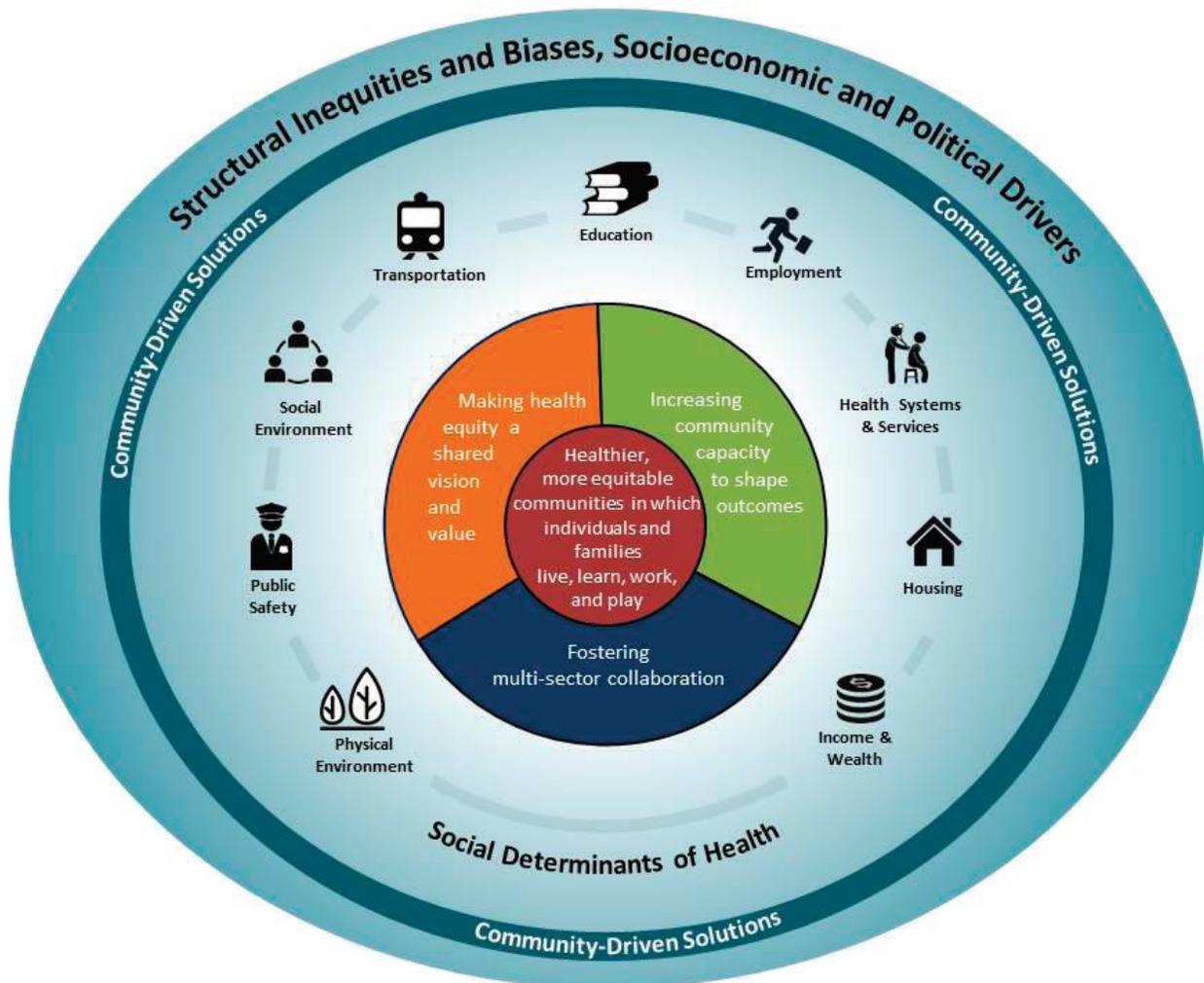
The report also presents a conceptual model for community solutions to promote health equity, based on work by the Robert Wood Johnson Foundation’s ***Culture of Health Action Framework***¹³ and the

Prevention Institute’s *Countering the Production of Inequities: A Framework of Emerging Systems to Achieve an Equitable Culture of Health*.¹⁴ This conceptual framework, in Figure 1, depicts the social-ecological model used in the field of public health by experts and practitioners. The sectors are spelled out under the social determinants of health, also referred to as the root causes. Nine components that impact health are identified: the physical environment, public safety, the social environment, transportation, education, employment, health services and systems, housing, and income and wealth.

The framework recommends three strategies that need to be adopted by communities:

1. Involvement of all community sectors, to come together and create a shared vision.
2. Building community capacity to provide tools to help residents advocate for themselves.
3. Emphasizing collaboration across sectors.

Figure 1: Conceptual Model to Promote Health Equity



Source: Reprinted with permission from *Communities in Action: Pathways to Health Equity*, 2017, by the National Academies of Sciences, Courtesy of the National Academies Press, Washington, D.C.

Multi-sectoral collaboration includes diverse partners, such as agriculture, banking and finance, business and industry, economic development, education, health care, housing, human/social services, justice, labor, land use and management, media, public health, transportation, and workforce development.

FRAMEWORK TO ADDRESS HEALTH DISPARITIES IN PUBLIC HEALTH PRACTICE

The extensive literature on health disparities and inequities has generated many models to conceptualize the key domains, factors, mediators and moderators, indicators and pathways to health outcomes. Some of the models are more comprehensive than others. For this report, the Bay Area Regional Health Inequities Initiative (BARHII) Public Health framework was chosen to present public health trends and data about Houston and Harris County. The BARHII Framework¹⁵ has been adapted for this report (Figure 2). This perspective is especially useful as it speaks to actions that can be initiated by local health departments and other groups that are deeply embedded in the community.

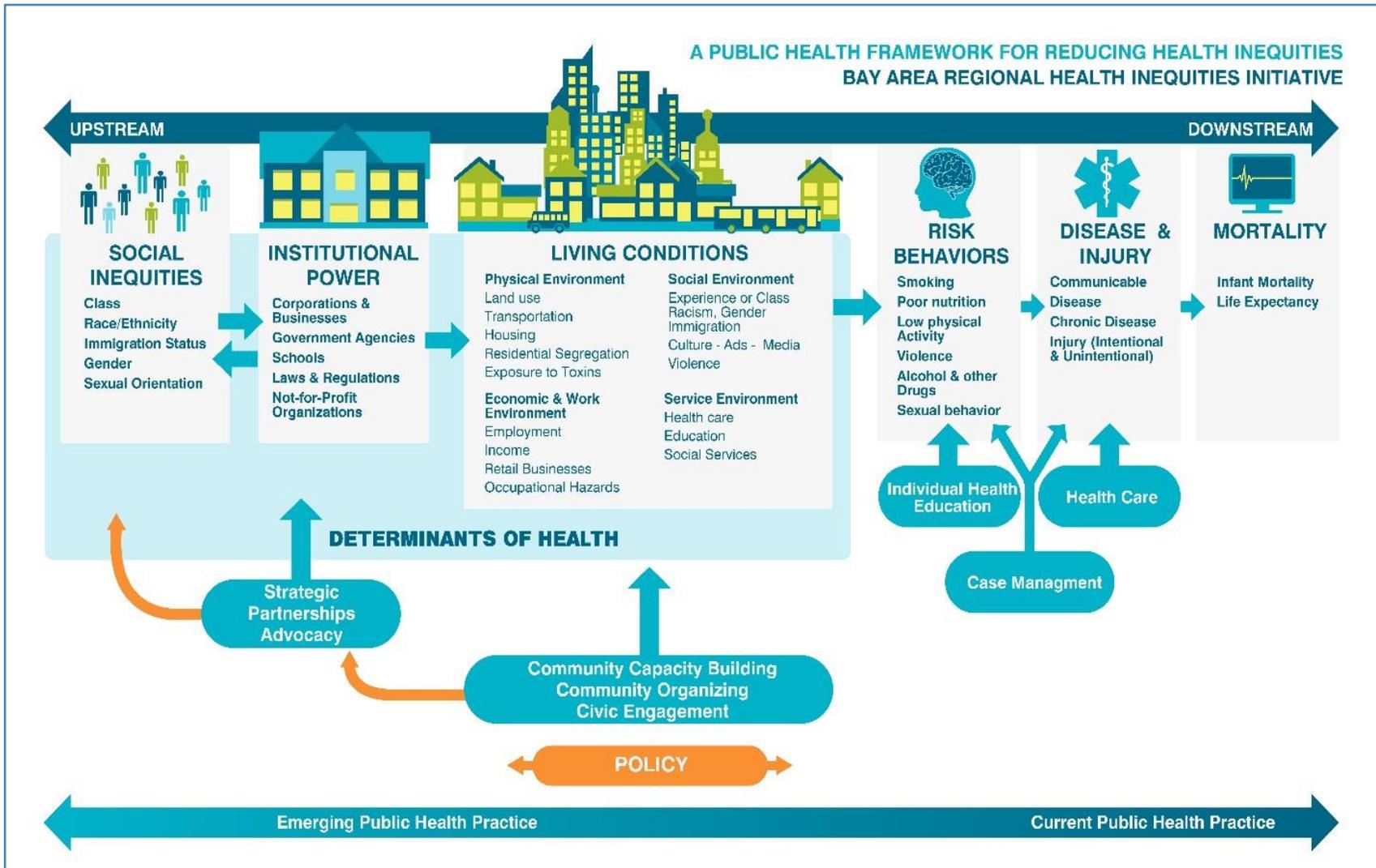
The adapted BARHII framework separates health into two sections, “upstream” and “downstream.” Upstream factors are the determinants of health, including social inequities, such as class, race/ethnicity, immigration status, gender and sexual orientation; institutional power from organizations such as corporations and businesses, government agencies, schools, laws and regulations, and not-for-profit organizations; and living conditions such as housing, exposure to toxins, experience of racism, employment opportunities, culture, community violence, and available resources such as education and healthcare.

Downstream factors are strongly influenced by the upstream factors. These include risk behaviors, such as smoking, use of alcohol and drugs, and lack of physical activity; diseases and injury from communicable and chronic illness, and intentional and unintentional injuries; and finally, mortality, which includes infant mortality and life expectancy.

Interventions can be helpful at any point along the continuum. Upstream interventions focus on prevention and partnership strategies to improve equity in the resources that impact living conditions. Downstream interventions, such as health education, healthcare, and case management, can assist persons to cope with illness and risk behaviors.

Many local level interventions intervene in the midpoint of the upstream/downstream continuum. As an example, community capacity building training builds skills in community organizing and advocating, and in civic engagement, to assist communities in improving their living conditions. Other interventions may target specific areas such as improving school conditions and resources, providing early childhood education, increasing employment opportunities, and expanding affordable housing.

Figure 2: Adapted BARHII Framework to Address Health Inequities in Houston/Harris County



Source: BARHII Framework, 2018. Adapted by the Houston Health Department.

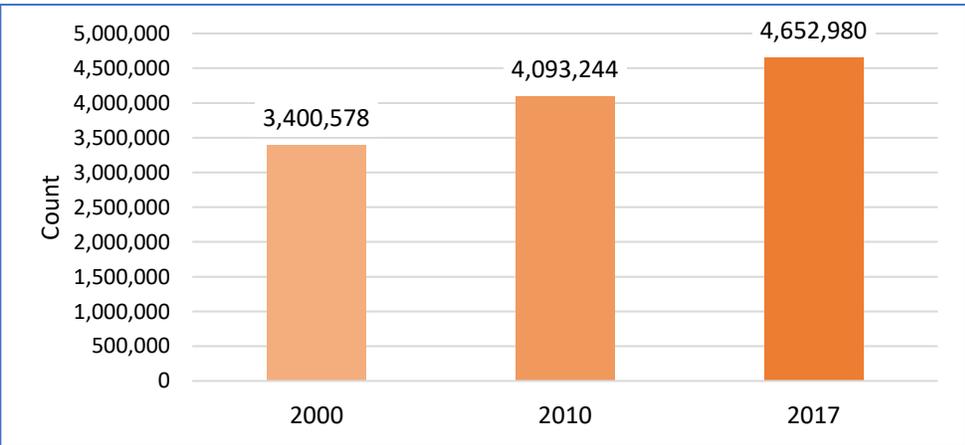
DEMOGRAPHIC CHARACTERISTICS AND ROOT CAUSES

Houston is the fourth largest city in the US, with an estimated 2017 population of 2.3 million. Most of Houston is contained within Harris County, although Houston also extends slightly into Fort Bend and Montgomery counties. Harris County, including Houston, is home to approximately 4.7 million residents. The Houston metropolitan area, sometimes referred to as Greater Houston, encompasses a nine-county area of Harris and surrounding counties that stretches to Galveston and along the Gulf Coast. This area, also known as the Houston-The Woodlands-Sugar Land Metropolitan Statistical Area (MSA), contains approximately 6.9 million residents, according to US Census estimates. This area has been growing rapidly for years.

The Kinder Institute at Rice University in Houston has determined that the greater Houston area is becoming increasingly diverse. The Kinder Institute noted that in 2010, the Houston metropolitan area became the nation's most racially/ethnically diverse large metropolitan area in the nation. While the largest growth has been among Latinos, other racial/ethnic groups in the metropolitan region have also either increased or remained the same.¹⁶

This growth and expanding racial/ethnic diversity can bring social, economic and health system challenges that exacerbate disparities.

Figure 3: Population Growth in Harris County TX 2000-2017

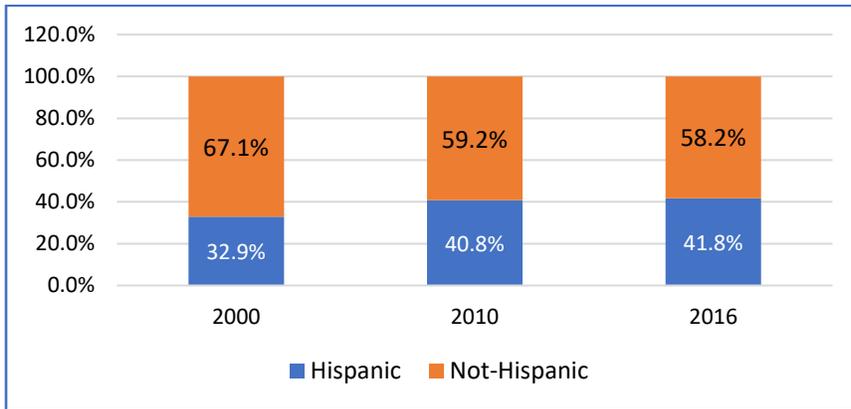


The Harris County population is expanding rapidly. In the period from 2000 to 2017, the population increased by 1.3 million, a 36.8% increase.

Data Source: US Census, American Community Survey

During the period from 2000 to 2016, the percentage of Hispanics in the Houston/Harris County population increased from 32.9% to 41.8%. During this same time period, the white population decreased from 42.1% of the population to 31.0%, and the black population remained relatively steady, changing from 18.2% in 2000 to 18.5% in 2016. The Asian population increased from 6.1% of the Houston/Harris County population in 2000 to 6.7% in 2016.

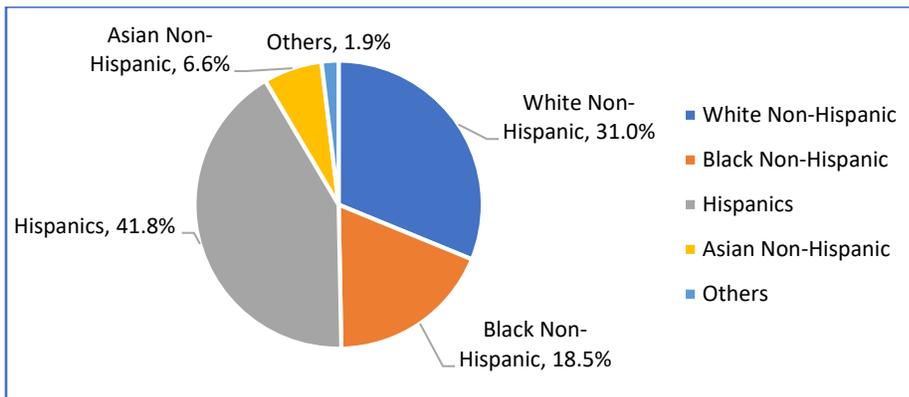
Figure 4: Growth of the Hispanic Population, Harris County TX 2000-2016



Data Source: US Census Bureau, American Community Survey

The largest Harris County population is Hispanic (41.8%) followed by non-Hispanic whites and non-Hispanic blacks. Asians, even though comprising just 6.6% of the total Harris County population, are the fastest growing ethnic group in Harris County.

Figure 5: Racial/Ethnic Distribution, Harris County TX 2012-2016

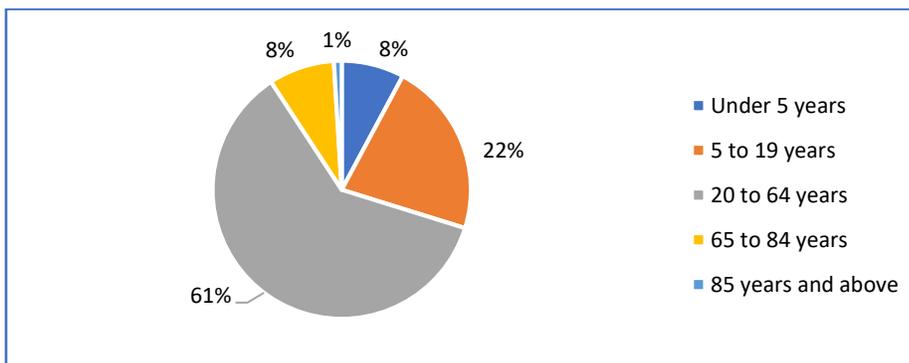


Data Source: US Census Bureau, American Community Survey

Houston/Harris County has become a “minority majority” area, where no one racial/ethnic group is in the majority. Hispanics (41.8%) are the largest group, followed by whites (31.0%) and blacks (18.5%).

Harris County is a relatively young county; 27.4% of the county population are under age 18, compared to 23.3% in the US. The county also has fewer seniors, 65 years and older (9%), compared to the national (16%) or state (12%) populations.

Figure 6: Population by Age Category, Harris County TX 2012-2016



Data Source: US Census Bureau, American Community Survey

Slightly over three-fifths of the Harris County population is considered working age (20-64 years), similar to the US percentage.

STRUCTURAL INEQUALITY

To examine the root causes of health inequities, we need to look at the multitude of factors that impact how a person grows, learns, and experiences the world. One way to assess these factors is to examine *structural inequities*. Structural inequities refer to the many causes that lead to unfair distribution of health opportunities and outcomes. These may exist at the personal, interpersonal, institutional, and systemic levels. Some examples are racism, sexism, classism, ableism (discrimination in favor of able-bodied persons), xenophobia (dislike or fear of people from other countries), and homophobia.

The impact of structural inequities follows individuals “from womb to tomb.”¹⁷ Structural inequities such as living in an under-resourced neighborhood with low performing schools set up children to be persistently behind academically and socially, with deficits in learning and competencies. Racism and residential segregation can result in pockets of poverty that create chronic stress for residents and are a central cause of health disparities. Chronic stress, such as that caused by adverse childhood experiences that are more likely in high poverty areas, impacts many physical and mental health outcomes throughout a person’s life.

ALLOCATION OF RESOURCES AND INSTITUTIONAL POWER

Many policies that foster inequities have been in place for decades. These policies are present throughout the US, from local communities to county, state and national levels, and are critical drivers of structural inequities. Many of these policies relate to the allocation of resources and institutional power. Some of the key structural factors are discussed below.

Corporations, Businesses, Government, Non-Profit and Laws/Policies

Some examples of the organizational structural causes for historical inequities are lending policies by banks that favor certain groups over others; grocery store chains that locate supermarkets in more affluent areas, leaving food deserts in areas of poverty; new housing developments that displace current residents and may eventually lead to homelessness; disparities in the ability to secure a small business loan; and less funding for schools and roads in low income areas. Structural inequities create differences in opportunities. These patterns of inequity do not allow residents a voice in decision making that involves their community, livelihood, and quality of life.

ROLE OF LIVING CONDITIONS

LAND USE

Land use decisions shape the physical environment of a community. Land use can include design, permitted use of space, the natural environment, transportation, housing location and density, and level of segregation. All of these factors can impact the health of community residents. In the past, some land use regulations and local planning policies have worsened health inequities by limiting access to important neighborhood features and exposing specific populations to harmful or unhealthy environments.

Some examples of policies that lead to land use inequities are redlining (refusing to provide a loan or insurance to someone because they live in an area deemed to be a poor financial risk), urban renewal (land redevelopment to upgrade housing and business sections of a city, often in areas of urban decay), and segregation policies from the 1800s and early 1900s that defined communities in ways that are still apparent.

The greater Houston area is the most diverse and one of the most segregated large metropolitan areas in the country.

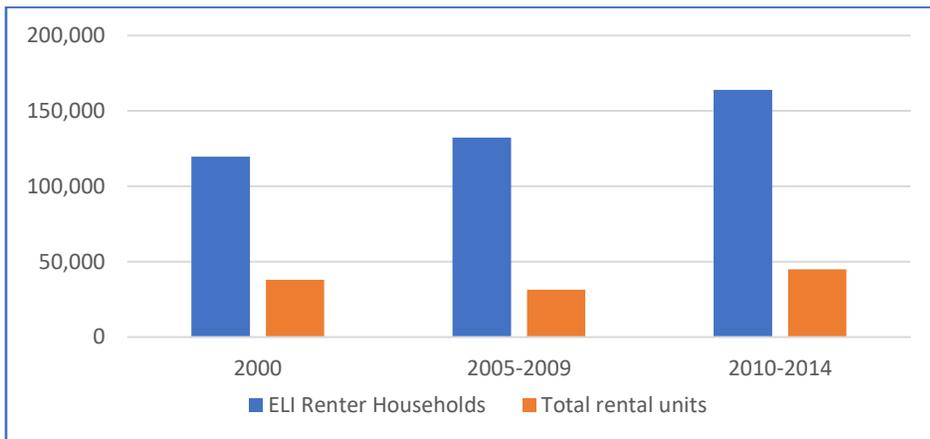
HOUSING

Housing is the single largest expense for most households, and far too many pay too much for housing, particularly low-income families and households of color. High housing costs squeeze household budgets leaving few resources to pay for other expenses, save for emergencies, or make long-term investments.

One in five households in Harris County reported severe housing problems, based on data from 2010-2014. Severe housing problems are defined as overcrowding, high housing costs, lack of a kitchen, or lack of plumbing facilities.¹⁸ The current housing crisis in the region indicates that this estimate is an undercount because this proportion does not take into account the severe effects of Hurricane Harvey. In areas where housing costs are high, low-income residents may be forced into substandard living conditions with an increased exposure to mold and mildew growth, pest infestation, and lead or other environmental hazards. In addition, young children who live in crowded housing conditions are at increased risk of food insecurity, which may impede their academic performance.

Part of the housing crisis is a shortage of affordable rental properties. About half of Harris County residents are renters, including many with very low incomes, defined as a maximum of \$23,850 for a family of four. According to the Urban Institute, Harris County had 45,048 adequate, affordable and available units for 164,064 low income families that needed housing in 2010-2014.¹⁹

Figure 7: Extremely Low Income (ELI) Renters and Available, Affordable Units, Harris County TX 2000-2014

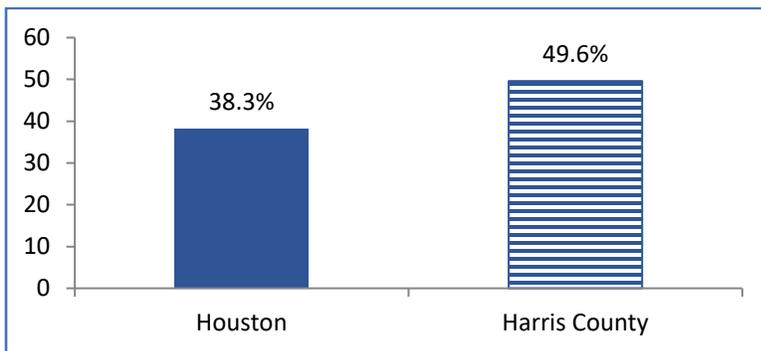


Since 2000, the number of extremely low-income households in Harris County has increased by 25%. However, the rental housing units have not increased proportionally.

Data Source: Urban Institute, 2017

Homeownership is associated with building wealth for the current and future generations. Blacks, Hispanics and other minorities face barriers such as lower incomes and disparities in lending practices, that lead to difficulty buying a home and thus to less opportunity to build wealth from homeownership. Among other things, wealth through home ownership can provide resources and a safety net that is not available to those without. Besides monetary resources, having wealth bestows power and prestige, attitudes and behavior, powerful social networks and social capital. These qualities can also support and perpetuate growth of wealth.

Figure 8: Percent of Homeowners in Houston Compared to Harris County TX 2012-2016



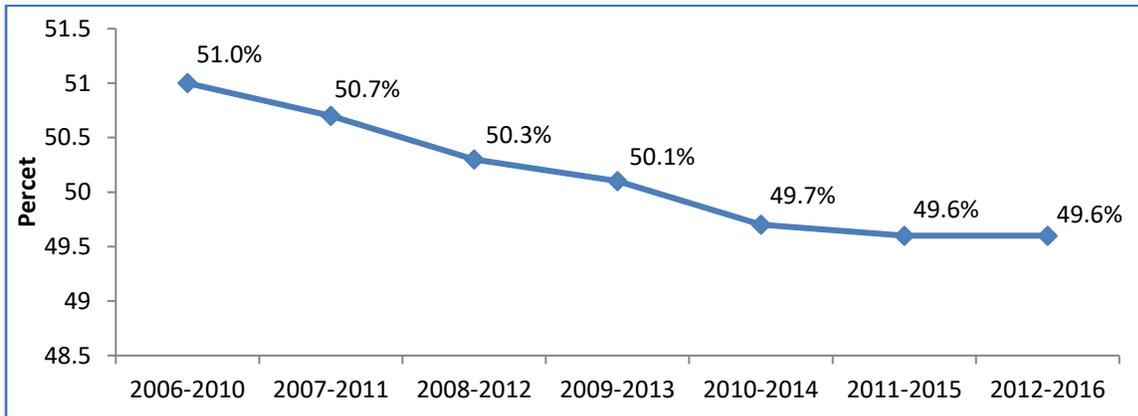
In Houston, only 38.3% of all housing units are occupied by homeowners, compared to 49.6% in Harris County, which includes Houston. Those who are not homeowners live in rental property or other facilities such as campus dorms, where they do not own their residences.

Data Source: Houston State of Health website

Home ownership can indicate a household's level of income, wealth, and residential stability. Owners include families or persons living in their own homes, cooperatives or condominium apartments, or townhouses. According to the US Census, in 2016, 72% of white households in the US owned a home with or without a mortgage, compared to 42% of black, 46% of Hispanic, and 55% of Asian or Native Hawaiian/Pacific Islander households.

Homeownership in Houston/Harris County has decreased since 2006-2010. Figure 9 depicts the gradual decline in the percentage of households that own their homes. This percentage may have been impacted by the national recession that began in 2008, which led to an increase in foreclosures.

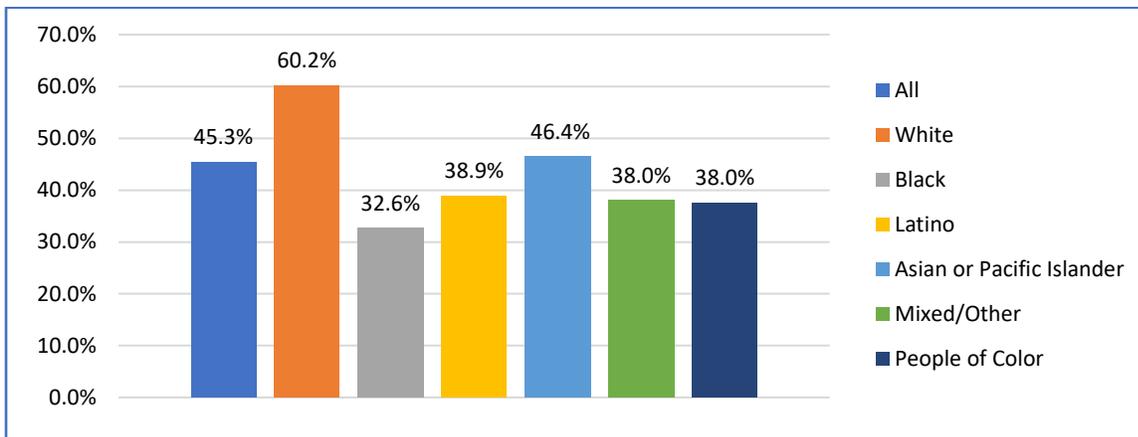
Figure 9: Percentage of Households Occupied by Homeowners, Harris County TX 2006-2012



Data Source: Houston State of Health website

In 2015, homeownership among white residents of Houston was 60.2%, compared to 32.6% among black and 38.9% among Hispanic residents.

Figure 10: Homeownership by Race/Ethnicity, Houston TX 2015



Data Source: National Equity Atlas

Another measure of equity in housing is the proportion of household income that is spent on housing. This percentage is also known as the “housing burden.” The US Department of Housing and Urban Development (HUD) defines cost-burdened families as those “who pay more than 30% of their income for housing” and “may have difficulty affording necessities such as food, clothing, transportation, and medical care.”²⁰ Severe rent burden is defined as paying more than 50% of one’s income on rent. Figure 11 shows that several minority groups in Houston, on average, spend more than 50% of their income on housing.

Figure 11: Percentage of Income Spent on Housing by Race/Ethnicity, Houston TX 2015.

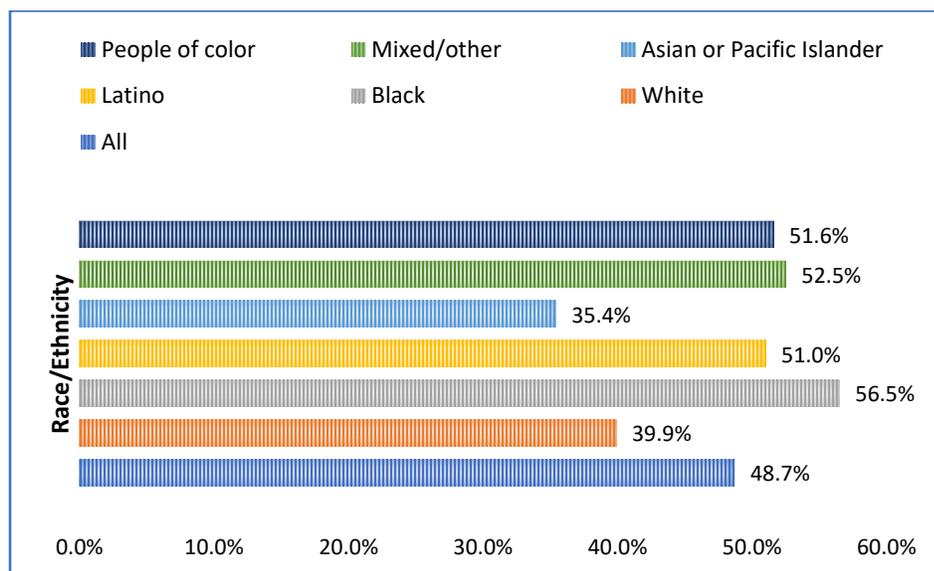


Figure 11 shows that many minority populations spent half or more of their salary on housing costs. Blacks and Hispanics and some other minority groups spent a larger proportion of their salary paying for their housing costs in Houston compared to white and Asian households.

Data Source: National Equity Atlas

An interesting study about housing practices that discriminate among minorities was conducted by the Urban Institute for the US Department of Housing and Urban Development, Office of Policy Development and Research. The study found that blacks, Latinos and Asians looking for homes were shown fewer housing options than whites who were equally qualified. The researchers used a method called "pair testing" in which two people, one a person of color and one white person, would call and then visit a real estate office to inquire about properties for rent or sale. Both of the testers were of the same gender and presented similar incomes, employments, and personal assets. The testers were equally likely to be given an appointment and to be shown at least one property. But whites were told about more properties, were shown more units, and were more likely to be offered lower rents. The results were apparent nationwide; the testers contacted real estate offices more than 8,000 times in 28 different metropolitan regions.

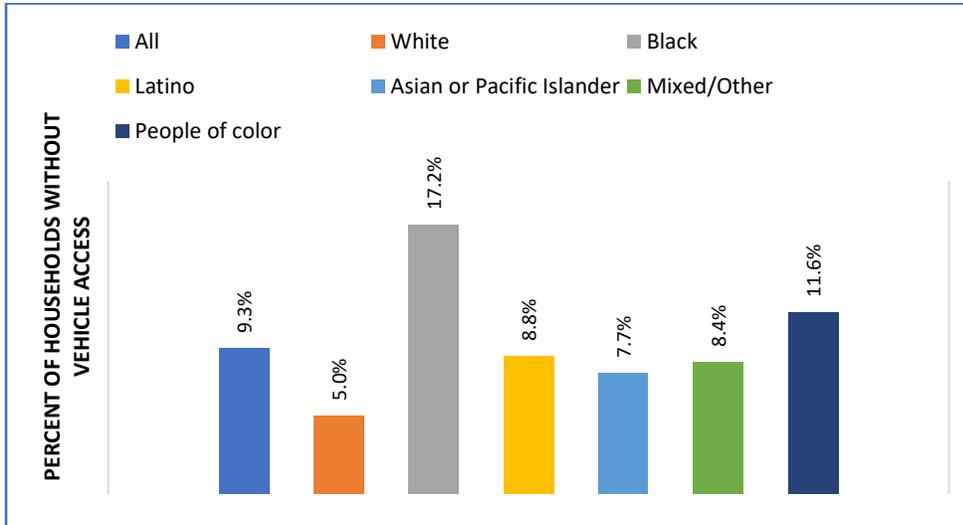
- Black renters learned about 11% fewer rental units, and black homebuyers were shown about a fifth fewer homes.
- Asian renters learned about 10% fewer rental units, and Asian homebuyers saw about a fifth fewer homes.
- Latino renters learned about 13% fewer rental units. There was not a difference in numbers of homes shown to Latino or white homebuyers.²¹

TRANSPORTATION

Reliable and affordable transportation is critical for meeting daily needs and accessing educational and employment opportunities. For households living in regions without robust transit systems,

access to a car is critical, but lower-income people and people of color are more likely to be without cars in Houston.

Figure 12: Percentage of Households Without Vehicle Access by Race/Ethnicity, Houston TX 2015



In Houston, 17.2% of black households do not have access to a car, a larger proportion than faced by all other groups. This creates many challenges in their daily lives.

Data Source: National Equity Atlas

Transportation has been identified as a crucial factor in the odds of moving out of poverty. In a large ongoing study of upward mobility, researchers at Harvard found that families living in areas with shorter daily commute times had a better chance of moving up the economic scale compared to families in areas with longer commutes. The longer the average commute, the lower the chances of low-income families improving their financial circumstances.²²

Many low-income persons with long commutes rely on public transportation for at least part of their commute. Public transportation may be unreliable or involve several transfers, requiring them to allow extra time in order to be on time for work or school. Some public transportation may feel unsafe to the riders, adding to the stress of their work or school day. In this way, the quality and accessibility of public transportation is directly tied to chronic stress and income inequality for low income persons.

The public transit system for the Houston area is the METRO Transit Authority. METRO serves Houston and nearby areas through their bus and rail network. However, the suburban and outlying areas are very minimally served by their transportation network. The Houston area is wide-spread and covers 1,285 square miles, making adequate public transportation more of a challenge.

The use of public transit among residents of the Houston area is very low. Only 7% of workers in Houston ride public transit.

Efforts are underway to improve transportation in the greater Houston area. For example, a four-year Transportation Improvement Program (TIP) to improve mobility among residents of our region is scheduled to begin in 2019. The proposed projects will benefit eight

counties, including Harris County, and will be funded by federal, state, and local sources within the Houston-Galveston Metropolitan Area.²³

Daily public transportation ridership is defined as boardings or unlinked passenger trips. The Houston area METRO provides reports about average daily boardings by bus route and by rail station for weekday, Saturday and Sunday services, as shown in Table 1. Since 2008, the number of METRO rail cars has grown (18 rail cars in 2008, 76 rail cars in 2017), while the number of buses is relatively similar (1,342 buses in 2008, 1,393 buses in 2017).²⁴

Table 1: Metro Average Daily Ridership for the month of July 2017 and 2018

Average Weekday	Local Network			Commuter Network	Entire Network
July	Local Bus	Light Rail	Total	Park and Ride	Grand Total
2018	179,717	60,104	239,821	30,005	269,827
2017	175, 239	60,145	235,384	29,681	265,065

Data Source: METRO Monthly Ridership Report

ENVIRONMENTAL POLLUTION

Health disparities may arise from unequal exposure to environmental hazards which can harm health. In Houston, two classes of environmental hazards are of most concern: toxic air pollutants and lead-based paint.

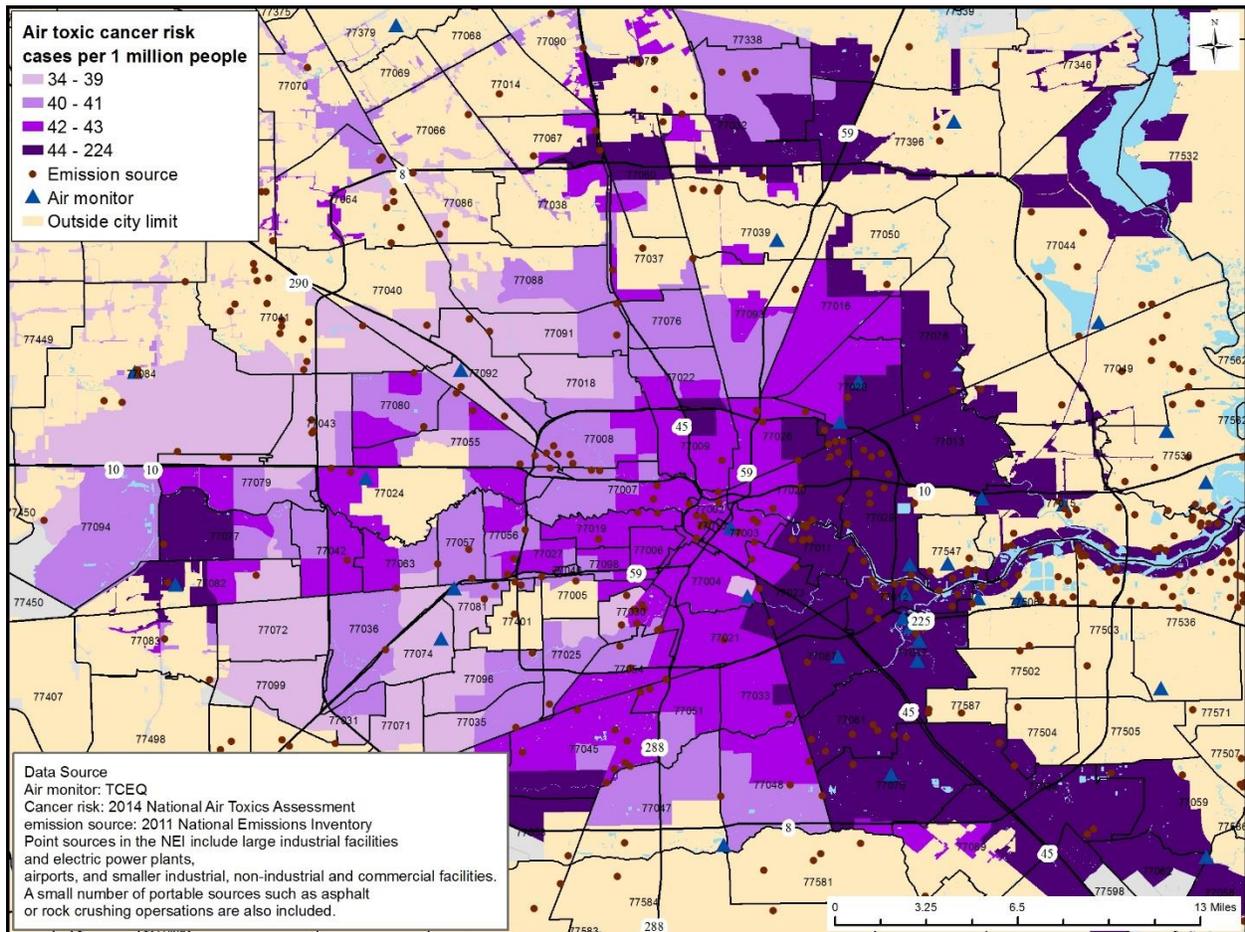
▪ Toxic Air Pollutants

Houston air pollution comes from emissions from one of the largest ports in the US and the many industrial refining and chemical companies along the Houston ship channel, including one of the largest petrochemical complexes in the world.^{25,26} These sources exposed Houston/Harris County to an estimated 11 million pounds of hazardous air pollutants in 2012, including 327,275 pounds of benzene, which is linked to cancer.²⁷ Houston does not have zoning, so some communities exist next to these industrial sites. Inhalation of toxic air pollutants from industrial emissions can cause cancer as well as other respiratory illnesses in these communities.

Cancer Risk

Figure 13 shows the long-term risk of cancer from inhaling outdoor toxic air pollutants over many years. The map uses data from the US Environmental Protection Agency (EPA) National Air Toxics Assessment.²⁸ Areas of highest risk for cancer are shown in the darkest purple colors. The dots on the map are emission points reported to the National Emissions Inventory, such as large industrial facilities; electric power plants; airports; smaller industrial, non-industrial and commercial facilities; and a small number of portable sources such as asphalt or rock crushing operations.²⁹

Figure 13: Air Toxic Cancer Risk from Air Pollution, Houston TX 2014
 Measured in cancer risk cases per 1 million people



Data Source: US Environmental Protection Agency and the Texas Commission on Environmental Quality. Map by the Houston Health Department.

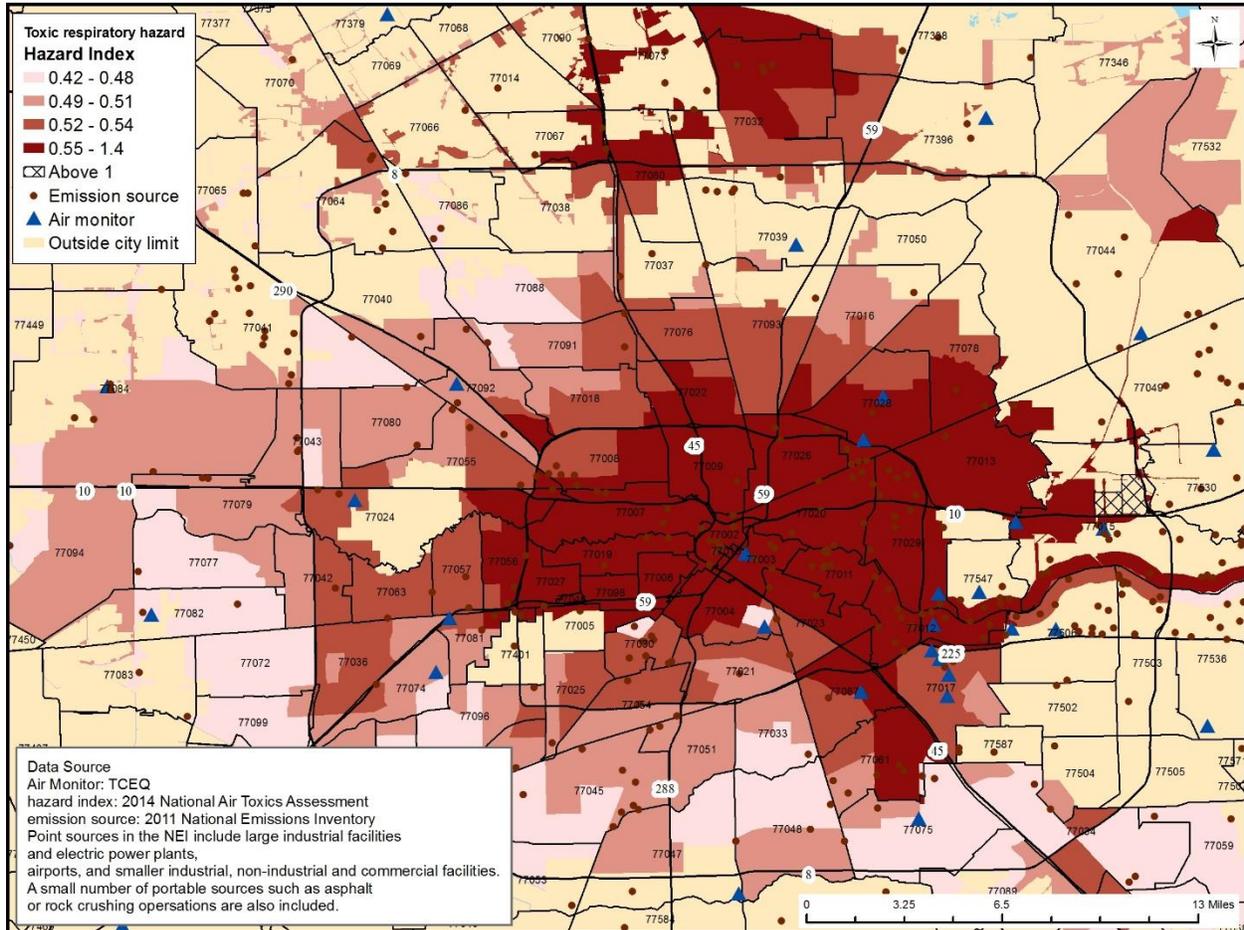
Respiratory Effects

Exposure to air toxics can also cause serious health effects other than cancer, such as respiratory effects. The EPA uses a respiratory hazard index to indicate health risk from air toxics. A hazard index of 1.0 or lower means air toxics are unlikely to cause adverse non-cancer health effects over a lifetime of exposure. Above 1.0 means that higher levels of air toxics are present; it does not necessarily mean that adverse effects are likely.

Figure 14 shows the respiratory hazard index for Houston. The darkest red areas show areas that were measured in the upper 25% of the hazard index, with a range from 0.55 to 1.4. There is only one ZIP code with census tracts where the hazard index is greater than 1.0, ZIP code 77015. It is shown on Figure 14 with hatch marking on the far right side of the map. Again, the dots show the locations of sites that emit pollution.

Many of the most polluted areas overlap with parts of Houston that are also low-income and have higher percentages of minority group residents. In these cases, air pollution can exacerbate health disparities already present in these low income communities.

Figure 14. Air Pollution in Houston Measured by the Toxic Respiratory Hazard Index, Houston TX



Data Source: US Environmental Protection Agency and the Texas Commission on Environmental Quality. Map by the Houston Health Department.

• Lead-Based Paint

Lead is recognized as the leading environmental poison for children in the City of Houston and exposure to lead-based paint is the primary source. The Centers for Disease Control and Prevention (CDC) has designated lead-based paint as “the most widespread and dangerous high-dose source of lead exposure for young children.”³⁰ In 1977, the Consumer Product Safety Commission restricted the allowable concentration of lead in household paint to 600 parts per million.³¹

Children living in older, deteriorated homes are at highest risk of lead exposure. Homes built before 1978 are more likely to contain lead-based paint than those built after 1978.³²

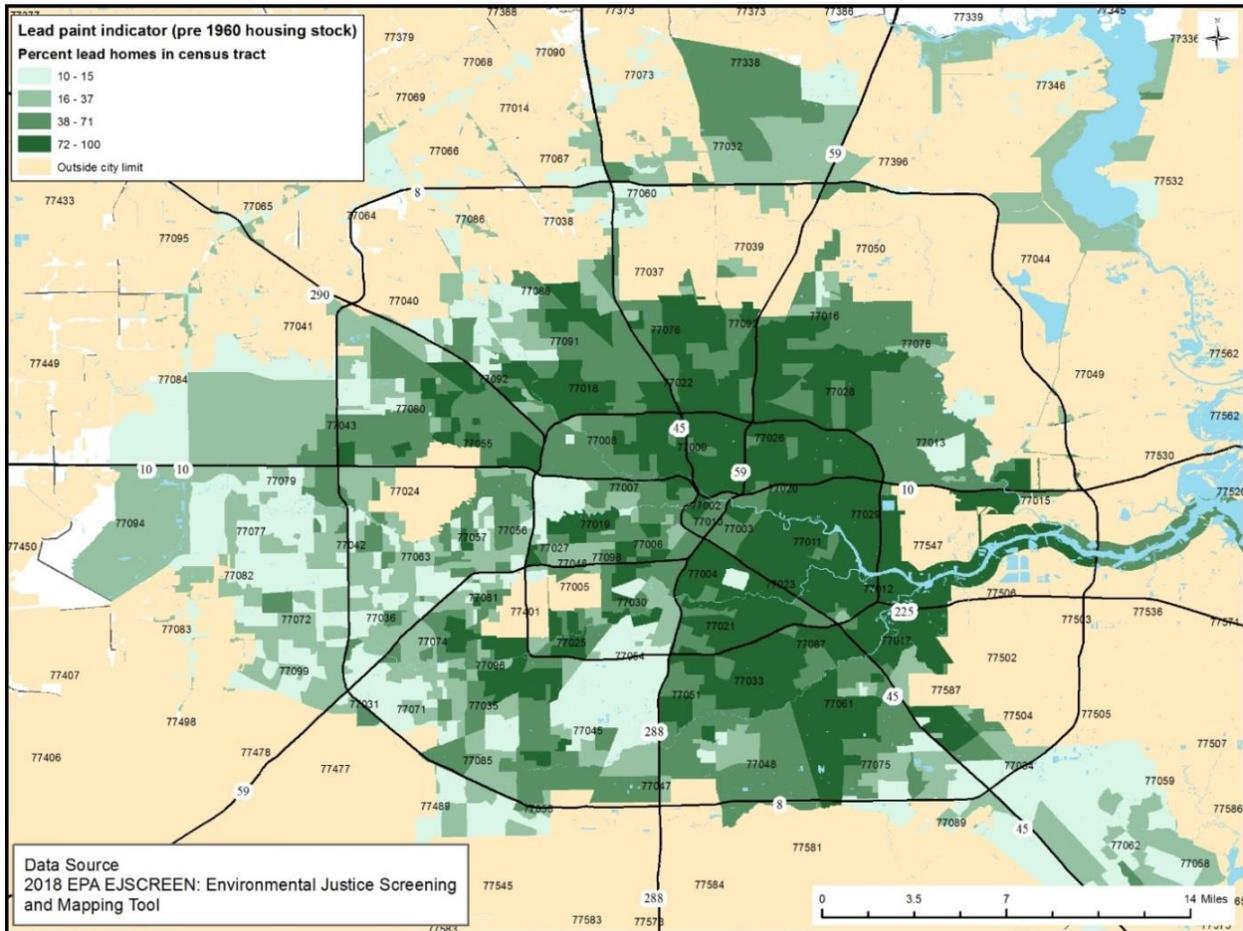
Table 2: Age of Homes and Percentage with Lead-Based Paint, Houston TX

<i>Does Your House Contain Lead-Based Paint?</i>	
When House was Built	Percentage with Lead-Based Paint
1978 or later	Not many. New paint regulations started in 1977.
1960-1977	24%
1940-1959	69%
Before 1940	87%

Source: EPA, 2017

Using data from EPA, the Houston Health Department (HHD) mapped the percent of homes built before 1960 in Houston census tracts.³³ Figure 15 shows the percentage of these older homes by census tracts. The darkest green color indicates those areas where 72% to 100% of homes were built before 1960.

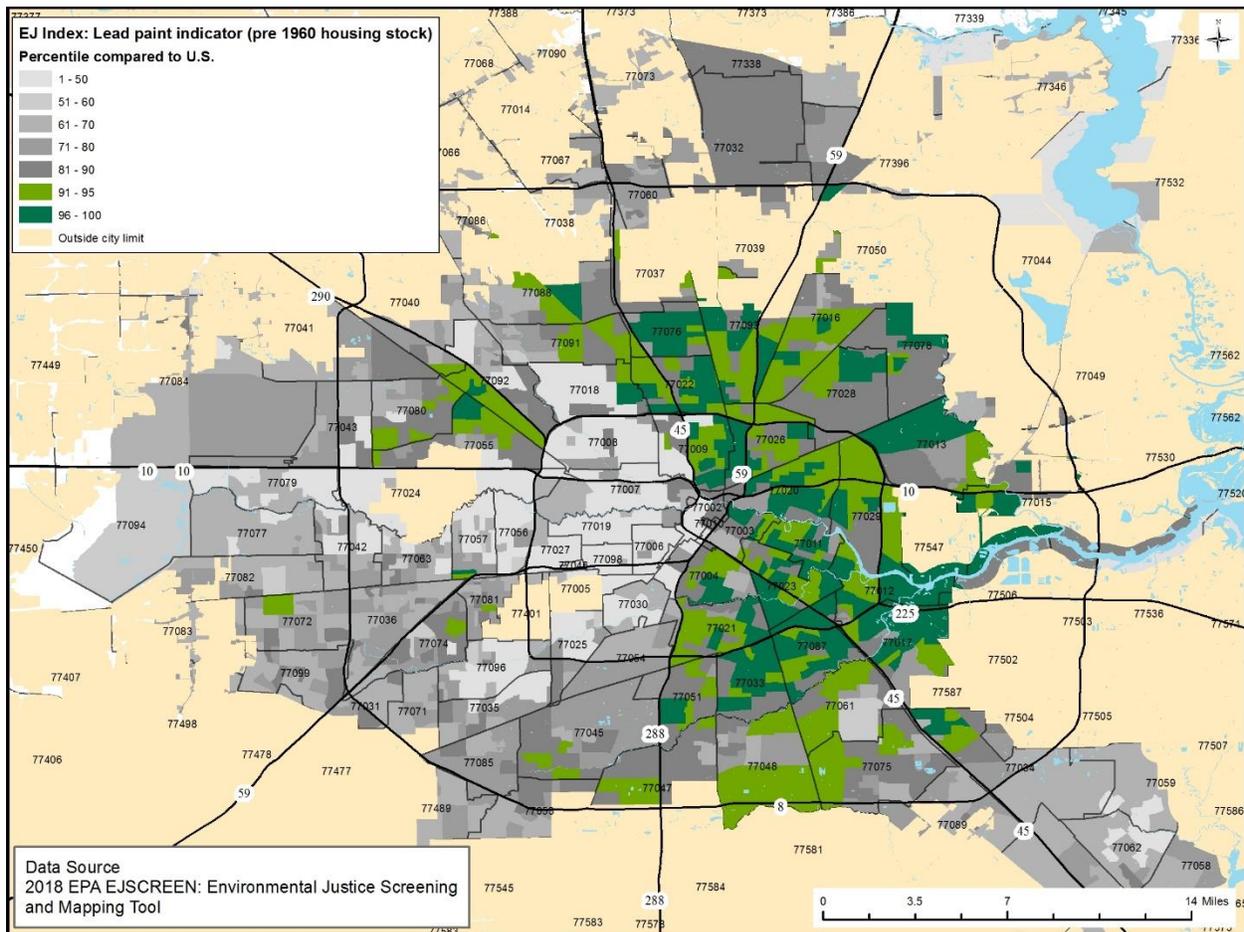
Figure 15: Percentage of Homes Built before 1960 by Census Tract, Houston TX



Data Source: EPA, 2018. Map by the Houston Health Department.

The Houston Health Department also mapped the EPA Environmental Justice Index for the lead paint in housing stock, shown in Figure 16.³⁴ This Index shows where areas of old housing likely to have lead-based paint overlap with low income communities that have high percentages of minority residents, compared to the national average. Lead-based paint in these low income areas may be especially toxic for children, as the families may not have sufficient income to remediate old and crumbling paint. According to Figure 16, the highest Environmental Justice Index associated with lead housing stock includes ZIP codes 77012, 77013, 77017, 77033, 77076, and 77087.

Figure 16: Lead Paint Index, Showing the Percentage of Homes Likely to Have Lead-Based Paint, Compiled with Low Income and Minority Group Measures, Houston TX 2018



Data Source: EPA, 2018. Map by the Houston Health Department.

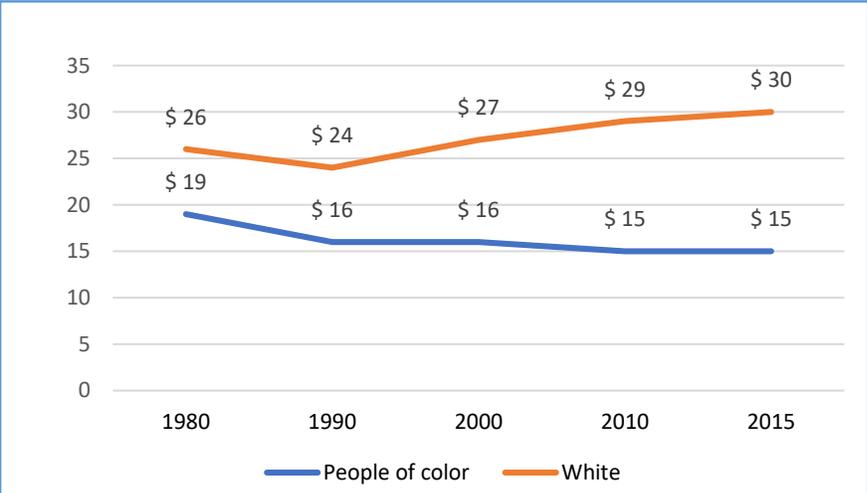
Environmental pollution can exacerbate health disparities. As is true for many of the other health risk factors, environmental pollution most often affects those who already experience health disparities and live in low income communities. In the case of air pollution, low income communities are most likely to be located near polluting sources. Lead paint exposure is also more common in low income communities where people live in older homes and have not remediated the lead paint on walls and trim in the homes.

ECONOMIC AND WORK ENVIRONMENT

EMPLOYMENT AND WAGES

In geographic areas that are equitable, wages are fair and are based on differences in education, training, experience, type of industry and pay scales. Wages should not vary systematically by race or gender, regardless of the business or industry. However, this is not the case in most of the country. Wages discrepancies are commonly seen by race/ethnicity and gender in Houston/Harris County.

Figure 17: Trends in Median Hourly Wage by Race/Ethnicity, Houston TX 1980-2015³⁵



According to the National Equity Atlas, in 2015 in Houston, the median wage of workers of color was \$15 less than those of white workers. Over 35 years, from 1980 to 2015, the gap has increased to more than twice as much.

Data Source: National Equity Atlas

The Pew Research Center reported on disparities in wages among those with similar educations in 2015. The study showed that national median hourly earnings among those with a bachelor’s degree showed disparities when race, ethnicity and gender are considered. White men (\$32 per hour) earned more than black men (\$25) and Hispanic men (\$26), and white women (\$25 per hour) earned more than black (\$23) and Hispanic women (\$22), although men earned more than women in each racial category.³⁶

Similarly, in 2015, a large wage gap existed between men and women doing the same work, with the same experience, and same qualifications in Houston, according to data from the National Equity Atlas. Figure 18 depicts the wage gap by gender and according to race/ethnicity. The gender gap in wages was the greatest among white workers in Houston; the median hourly wage for women was \$9 less than that of men doing the same work and with similar experience and qualifications. In contrast, the difference in wages between black men and women, and Hispanic men and women was only \$1. Among Asians or Pacific Islanders, women earned a median hourly wage which was \$4 less than the median wage for males. Figure 18 also shows differences between racial/ethnic groups, with white males earning more than males in other racial/ethnic groups, and white females earning more than females in other racial/ethnic groups.

Figure 18: Gender Median Hourly Wage Disparities, Houston TX 2015



Data Source: National Equity Atlas

Gaps in wages between those with similar levels of education but different genders or different racial/ethnic backgrounds may suggest discrimination and bias among employers. Bias may be intentional, or can also operate outside of the awareness of the employer. For example, an employer may choose to hire and promote employees with similar cultural backgrounds and interests to the employer, since he/she finds these employees easier to communicate with. However, this can result in a bias toward those similar to the employer, without equal regard to the qualifications of this and other employees.

Improving wage disparities can have a positive impact for the total population. Policy and systems changes that ensure equal pay for equal work, fair hiring, and rising wages for low-wage workers will boost incomes, resulting in more of the consumer spending that drives economic growth and job creation.³⁷ Policy interventions such as ensuring living wages and paid sick days are additional strategies that may be helpful in reducing the gaps in wages.

OCCUPATIONAL DISPARITIES AND HAZARDS

One's occupation can have a large impact on one's health. Workers with lower levels of occupational income report worse overall health, have a higher probability of disability, and often die earlier than workers in higher income occupations.³⁸ Many times, these lower income workers are also in minority groups.

According to the Centers for Disease Control and Prevention (CDC), African American, Hispanic, and immigrant workers are disproportionately employed in some of the most dangerous occupations. African American males are twice as likely as non-Hispanic white males to work in low paying service

occupations and as laborers, fabricators, and operators, and are half as likely to be in managerial or professional specialty occupations. The result is that the African American injury rate is about a third higher for both African American males and females compared to white non-Hispanic workers. In addition to the disproportionate employment of African Americans and Hispanics in dangerous and low wage jobs, within individual workplaces African American and Hispanic workers may also experience additional stress caused by a discriminatory and racist work climate.

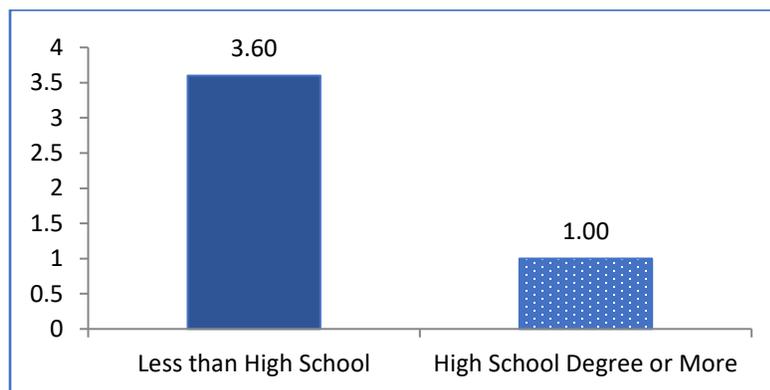
Occupational disparities research has found that low income jobs are more common in occupations such as service and sales workers, handlers/cleaners/helpers/laborers, machine operators/assemblers, and administrative support. Minority groups are often found in these low income jobs, many of which also pose hazards to workers. For example, Hispanic workers are overrepresented in occupational injuries.

In addition to potential injury from chemical and physical hazards, these jobs may affect worker safety and health through job features such as low levels of autonomy, moderate to high levels of physical demands, low required skill levels, and limited interpersonal contacts.

Dr. Andrea Steege and other researchers at the National Institute for Occupational Safety and Health looked into occupations with high risk for injury, defined as illness and injury rates two or more times the national rate. They found marked differences in the characteristics of those likely to be in high risk occupations, as summarized in the following charts.³⁹

Figure 19: Workers at High Risk of Occupational Injury by Education, US 2010

Unadjusted Odds Ratio



Those with less than a high school education (odds of 3.60) have much higher odds of being in a high risk job compared to those with a high school degree or more (1.00). Also, males have much higher odds (2.71) of working in a job with a high risk of injury, compared to females (1.00).

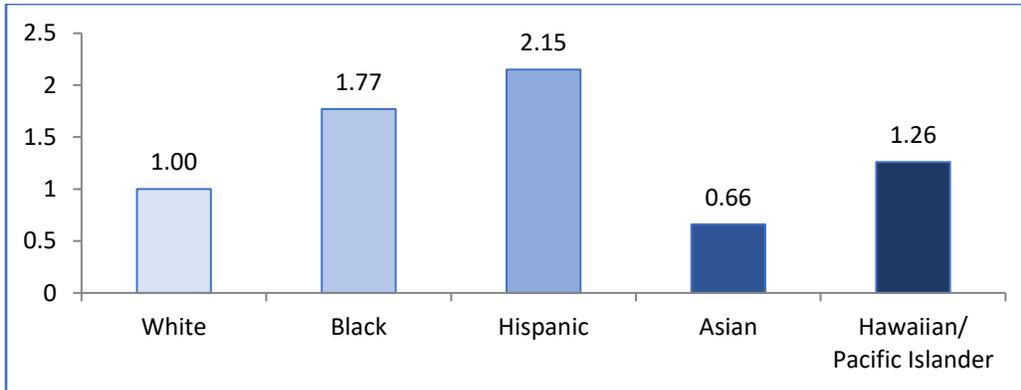
Data Source: Steege, et al., 2014

Those in low wage occupations are also more likely to face occupational hazards and to risk injury. Persons in jobs paying \$435 per week or less, or approximately \$11 or less per hour, had higher odds of being in a high risk occupation (1.40), compared to those earning higher wages (1.00).

Those born in foreign countries (1.76) also have higher odds of working in a high risk job, compared to persons born in the US (1.00).

Hispanic and black workers face relatively frequent workplace injury. They are more likely than other racial/ethnic groups to work in industries and occupations that are hazardous.

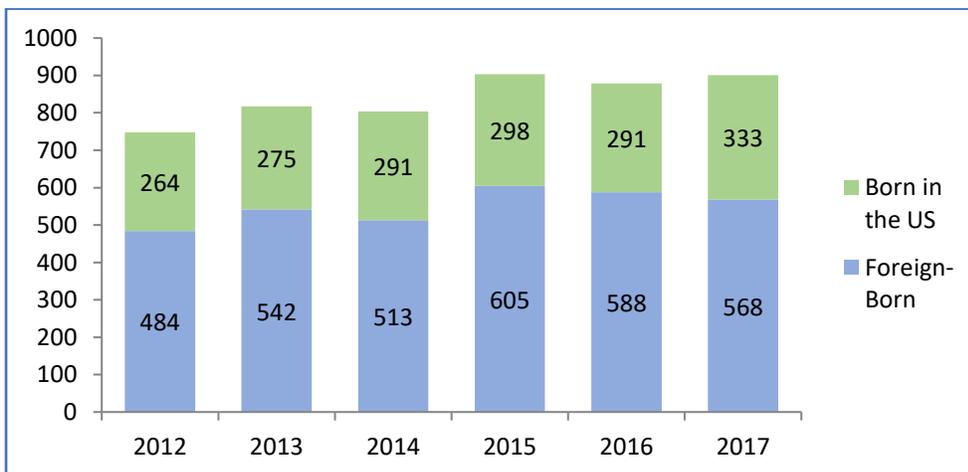
Figure 20: Workers at High Risk of Occupational Injury by Race/Ethnicity, US 2010
Unadjusted Odds Ratio



Data Source: Steege, et al., 2014

While Hispanics have high odds of workplace injury, their rate of death from these injuries (3.7 per 100,000 full-time equivalent workers) was similar to that of whites (3.7 per 100,000) and blacks (3.6 per 100,000) in 2017. Forty-seven percent of 2017 workplace fatalities were caused by transportation and materials-moving accidents (which include the occupations of drivers/sales workers, and heavy and tractor-trailer truck drivers) and were also in construction and extraction occupations, so the various racial/ethnic groups may face similar risk in these occupations.⁴⁰ However, disparities are apparent within the Hispanic population. In the US, about one-third of Hispanics are foreign-born, and this group faces a much higher risk of death from workplace injury compared to Hispanics who are native-born (born as a US citizen).^{41,42}

Figure 21: Number of Fatal Workplace Injuries for Native-Born Compared to Foreign-Born Hispanic Workers in the US 2012-2017



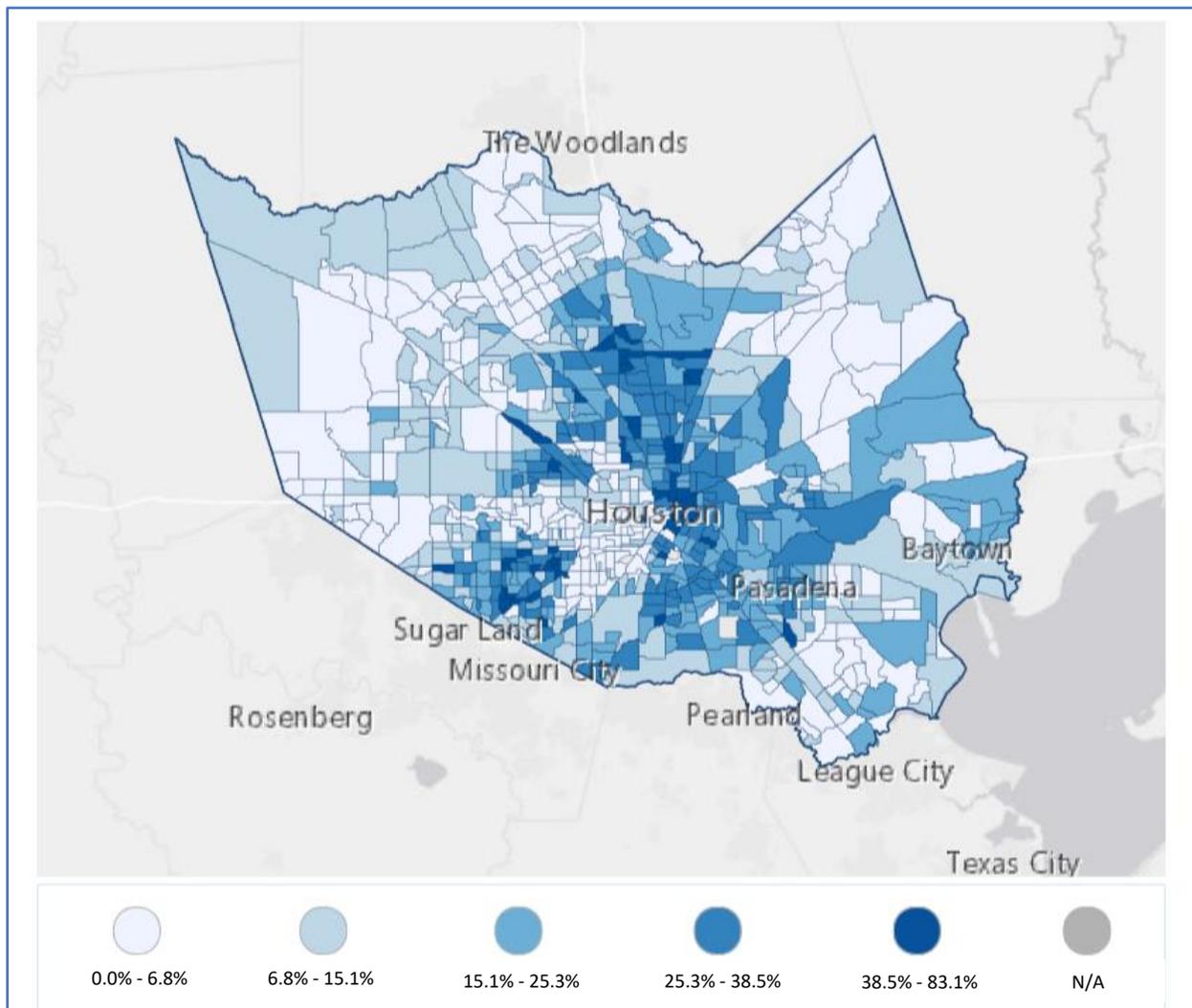
Foreign-born Hispanics comprise 34% of the Hispanic population in the US, but accounted for 64% of workplace fatalities among Hispanic workers in the US in 2017.

Data Source: US Dept. of Labor, Bureau of Labor Statistics

POVERTY LEVEL

Poverty has a powerful impact to shape the conditions in communities. Poverty is measured by the proportion of people living below the Federal Poverty Level (FPL) or twice/three times the FPL. Poverty is a powerful determinant of health, impacting many aspects of life, such as access to nutritious food and quality healthcare. Both allocation and distribution of resources are most affected by poverty. Figure 22 shows where the highest concentrations of poverty are present across Houston/Harris County. Higher percentages of poverty are shown in the darkest blue colors.

Figure 22: Percent of Families Living Below the Federal Poverty Level, Harris County TX 2012-2016



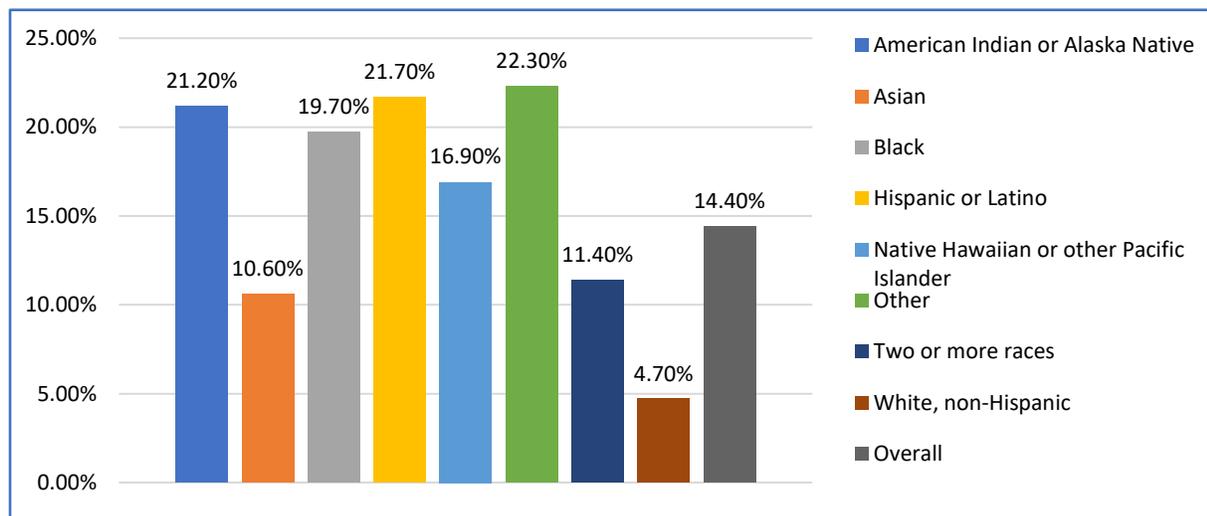
Data Source: American Community Survey. Map from Houston State of Health website.

In the period 2012-2016, 18.8% of Houston families lived below the FPL. This can be compared to 14.4% in Harris County, 13.0% in Texas, and 11.0% in the US.⁴³ The US Census Bureau reports that the poverty

threshold for a family with two adults and one child was \$20,780 in 2018. The income threshold for a one person household was \$12,140.

Poverty varies among racial/ethnic groups. According to Kaiser Foundation, in the US, 8% of the white population lives below the FPL, compared to 21% of the black population and 17% of the Hispanic population.⁴⁴ Figure 23 shows the pattern across Harris County of persons of various races/ethnicities who live below the FPL. The highest percentages of those living in poverty are among minority groups, especially American Indian or Alaska Native, black, Hispanic or Latino, and Native Hawaiian or other Pacific Islander.

Figure 23: Families Below Poverty Level by Race/Ethnicity, Harris County TX 2015



Data Source: Houston State of Health website

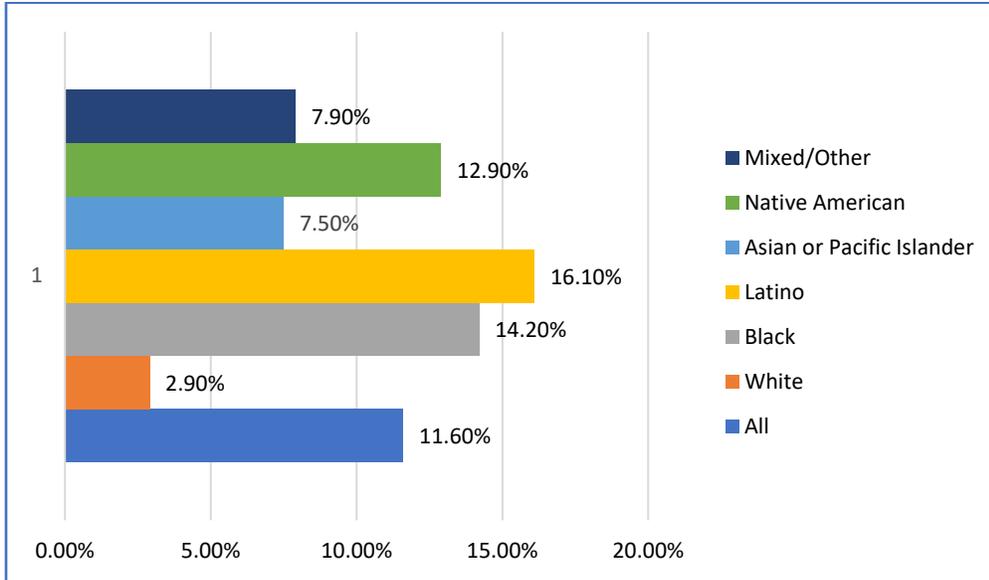
In all major cities in the US, a large proportion of black and Hispanic residents live in neighborhoods that are considered poor or extremely poor. Opportunities are limited for residents living in these neighborhoods. In Houston/Harris County, higher poverty neighborhoods or ZIP codes also generally have a higher proportion of non-white residents. Children living in higher poverty neighborhoods throughout the country are often zoned to school districts that have 75% or more of students on free and reduced lunch, which is largely based on family income. These schools, based in low income areas, often have fewer resources and less funding per student than schools in areas of higher income.⁴⁵

People who live in high-poverty neighborhoods have less access to jobs, services, high-quality education, parks, safe streets, and other essential ingredients of economic and social success that are the backbone of strong economies. They are more likely to face exposure to environmental pollutants and crime. Housing policies, lending policies, and employment policies can also impair their ability to improve their incomes and health.⁴⁶

In the Houston area, the black and Latino populations are most likely to live in neighborhoods with high poverty, defined by the US census as areas with 40% of the tract population living below the federal

poverty threshold. Residents in these areas face higher levels of crime and delinquency, poorer education, psychological distress, and various health problems, among many other issues.

Figure 24: People Living in High Poverty Neighborhoods by Race/Ethnicity, Houston TX 2015



A greater proportion of blacks, Hispanics and minority residents of Houston lived in high poverty neighborhoods although they were not necessarily poor.

Data Source: National Equity Atlas

SOCIAL ENVIRONMENT

INCOME INEQUALITY

Income inequality refers to the extent to which income is distributed in an uneven manner among a population. In the United States, income inequality, or the gap between the rich and everyone else, has been increasing rapidly since the 1970s. A Pew Research Center analysis found that the wealth gaps between upper income families and lower and middle income families in 2016 were at the highest levels ever recorded. In addition, America's upper-income families have a median net worth that is nearly 70 times that of the country's lower-income families, also the widest wealth gap between these families in 30 years.⁴⁷

Rising income inequality and the associated gaps in health, wealth, employment, education, and opportunity prevent low income people and people of color from realizing their full economic potential. And as the nation becomes more diverse, the costs of inequity will grow. Some of the costs of income inequality involve the lost potential of bright young people who are unable to complete the education and find the employment to match their capabilities. When this happens, not only the individual, but society loses. Productivity nationwide is less than it could be when many young persons are left behind.

The United States is becoming a nation where the place you start out, such as in a low income community or with a single parent, is becoming increasingly important. These aspects can overshadow one's intelligence and ambition to obtain higher education and advance in life. Robert Putnam, Professor of Public Policy at Harvard Kennedy School, said "Smart poor kids are less likely to graduate from college now than dumb rich kids. That's not because of the schools, that's because of all the advantages that are available to rich kids."⁴⁸

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. Nationally, since 1979, incomes of workers at the bottom fell by 11.4% while those at the top increased 14.8%.⁴⁹ During the same approximate time, from 1971-2016, the Pew Research Center found that the middle class has been shrinking, from 61% of adults in 1971 to 52% in 2016, while numbers in the lower and upper classes have been growing. In other words, more people are becoming rich or poor, with fewer in the middle.⁵⁰

Houston follows a similar pattern, with rising income among those in the highest income groups, and decreases in purchasing power among those with the lowest incomes. Figure 25 displays changes in income in Houston in the years of 1980-2015, when those in the lowest 10th percentile of earners saw their purchasing power drop by 28.8% since 1980, while those in the 90th percentile saw an increase of 24.5%.

Figure 25: Earned Income Growth for Full-Time Wage and Salary Workers, Houston TX 1980-2015

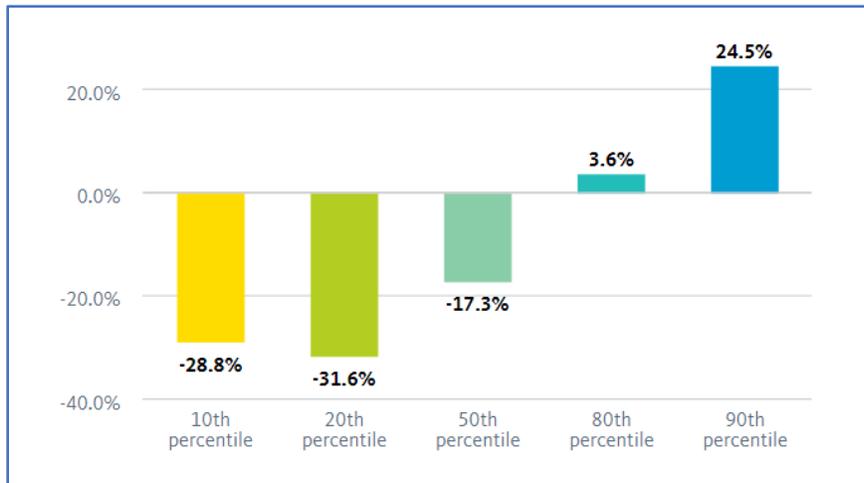
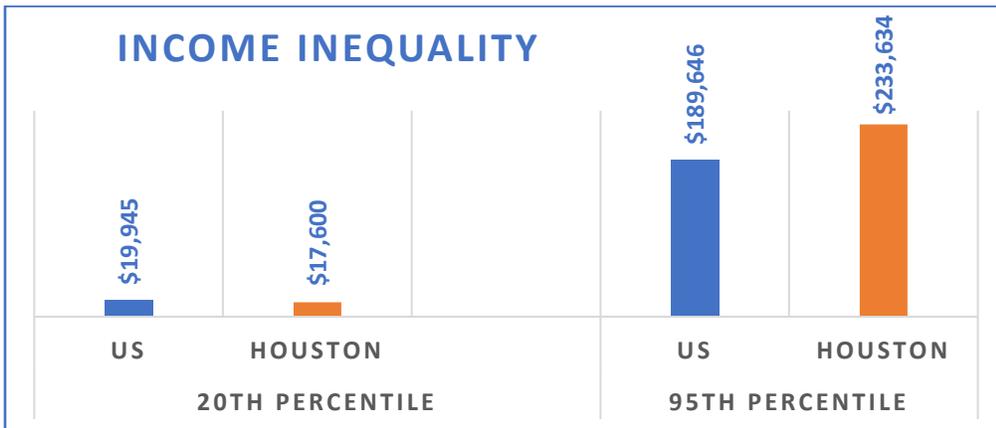


Figure 25 shows that Houston full-time workers in the lower half of the income range saw their earned income drop during the period 1980-2015. Decreases in purchasing power were greatest at the 10th and 20th percentiles. Increases came only for the higher earners.

Data Source: National Equity Atlas

Figure 26 displays the income differences between the wealthier and poorer wage earners of Houston, as compared to the US. The bottom one-fifth of Houston workers earned \$17,600 in 2015, about equal to \$8.50 per hour for a full time job. In contrast, the top 5% earned \$233,634, or about \$112.30 per hour. Earnings were both lower for the lowest earners in Houston and higher for the highest earners, compared to the US.

Figure 26: Income Inequality, Houston TX vs. US, 2015
Annual Income Differences Between the Lower 20th Percentile and the 95th Percentile



Data Source: National Equity Atlas, 2018

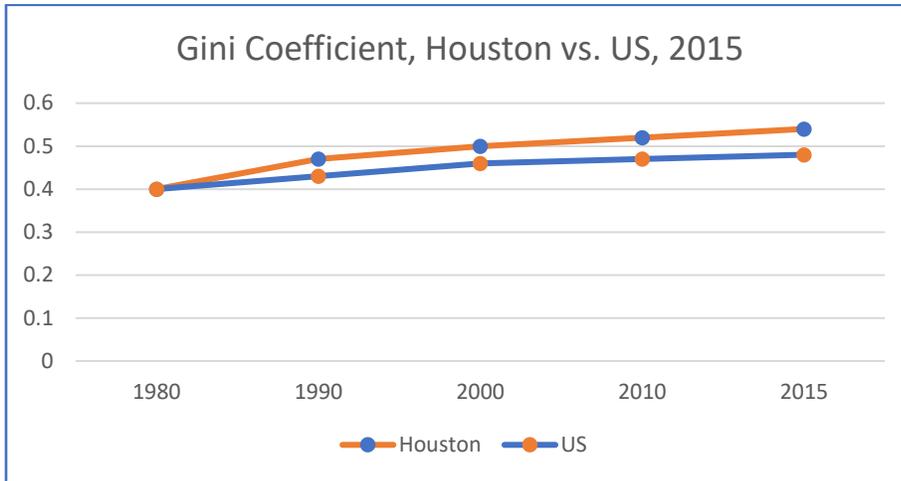
The Gini scale is often used to compare how the distribution of income in a society compares to a hypothetical society in which everyone earned exactly the same amount. The Gini scale is measured between 0, where everyone earns the same, to 1, where all the country's income is earned by a single person. Table 3 shows how the Gini Coefficient, measuring income inequality, has been growing in Houston.⁵¹

Table 3: The GINI Coefficient, Showing Increasing Income Inequality, Houston TX vs. US, 1980-2015

	1980	1990	2000	2010	2015
Houston	0.40	0.47	0.50	0.52	0.54
US	0.40	0.43	0.46	0.47	0.48

Data Source: National Equity Atlas

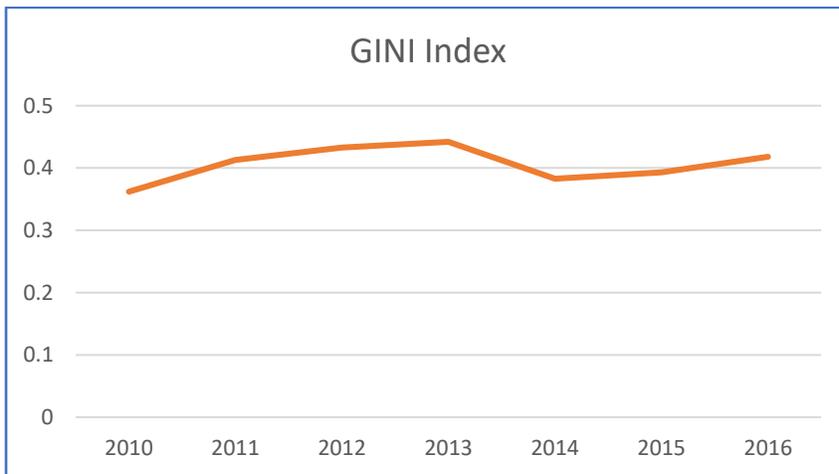
Figure 27: The Gini Coefficient in Houston TX vs. US, 1980-2015



The Gini Scale or Coefficient in Figure 27 depicts how income inequality has been growing more rapidly in Houston compared to the US since 1980.

Data Source: National Equity Atlas

Figure 28: GINI Index for Income Inequality, Harris County TX 2010-2016



Income inequality in Harris County is lower than in Houston, and has been relatively stable since 2010, indicating that incomes are more evenly distributed across Harris County compared to Houston.

Data Source: National Equity Atlas

There is a growing consensus that inequality has a negative impact on growth. Recent research by prominent economists finds that inequality hinders economic growth, and that greater economic inclusion leads to more robust and sustained growth.⁵²

RACISM

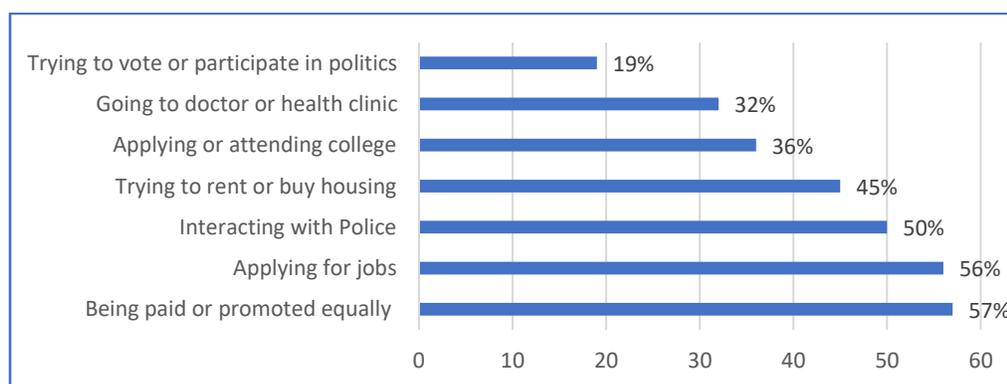
Racism a form of discrimination and social ostracism in which the physical or cultural characteristics of a particular race are used to assign those individuals to an outcast status, rendering them targets of social exclusion or harassment, limiting their access to opportunities, and promoting unfair treatment. Racism, or racial/ethnic discrimination, can be internalized by some individuals, so that it becomes a part of their identity and how they see the world. Racism can exist on several levels: internalized (within the individual), interpersonal or institutional. Institutional racism includes racism at the environmental, structural and cultural levels.⁵³

When individuals are exposed to experiences of racism, it is a stressor that has mental and physical health implications. A large body of research supports racism's impact on increased risk for cardiovascular disease, hypertension, mood disorders such as depression, and mortality from all causes.

A recent meta-analysis was done to examine the links between racism and health. The analysis evaluated 293 studies conducted between 1983 and 2013 that were published in 333 articles. The authors found that racism is associated with poorer mental health, poorer general health status and poorer physical health. However, the effects of racism on health varied among racial/ethnic groups. Although all minority groups experienced poorer health due to racism, the association between racism and negative mental health was much stronger for Asian American and Latino(a) respondents compared to African American respondents. Likewise, the association between racism and poorer physical health was greater in Latino(a), compared to African American respondents.⁵⁴

Racism is a common experience among minority groups. In the spring of 2017, a team from National Public Radio, the Robert Wood Johnson Foundation, and the Harvard T.H. Chan School of Public Health conducted a survey of 802 African American US adults. The results are shown in Figure 29. A large percentage of African American respondents reported they had experienced discrimination in many situations in their daily lives.⁵⁵

Figure 29: Percent of US Adult African Americans Who Experienced Personal Discrimination in Various Situations Because They are Black, 2017



Source: Data from Robert Wood Johnson Foundation, with NPR and T.H. Chan School of Public Health

RESIDENTIAL SEGREGATION

Access to high quality, safe, and affordable housing is one important neighborhood feature that shapes health outcomes. As anyone who has bought or rented a home knows, housing prices and rental costs vary by location. People choose their neighborhood in large part based on their ability to afford housing in that area and secondly on their preferences for location, which includes safety and proximity to work, schools, parks, and other amenities.

The ability to afford housing in a given neighborhood is generally tied to income, so this leads to residential sorting by income: high-income families tend to live in neighborhoods with other high-income families, and low-income families with other low-income families. This factor is called “income segregation.” Income segregation may accentuate the economic advantages of high-income families and exacerbate the economic disadvantages of low-income families.

An interesting experiment by the US Department of Housing and Urban Development was called the Moving to Opportunity study. This study measured neighborhood impacts by moving some families into lower-poverty (higher income) neighborhoods and comparing their outcomes to similar families who did not move. Those who moved to higher income areas in general reported positive impacts on their physical and mental health.⁵⁶

Some other factors that impact choice of housing include poverty rates, average educational attainment levels, and the proportion of single-parent families. The choice of where to live can lead to disparities when resources, such as high-quality schools or public parks, are more available in higher income areas. Conversely, public hazards, such as crime, are often more prevalent in low income areas.

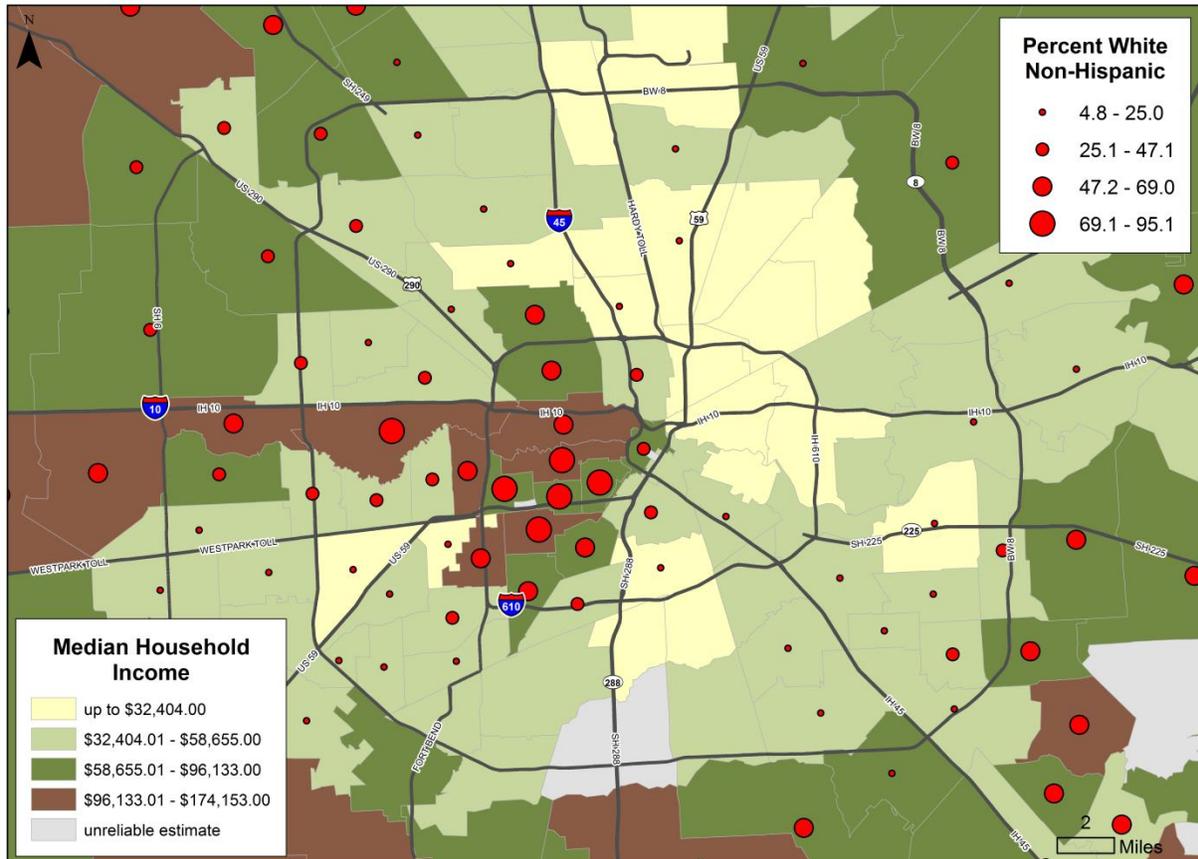
Regional decisions can also impact communities and the health of residents. For example, where to locate train, subway, and bus lines, or where to locate a new hospital or a new landfill all have potential implications for those who live near these amenities or hazards.

The Kinder Institute reported that the Houston area is the most diverse large metropolitan area in the US, and is also one of the most segregated. Residential segregation can be by race/ethnicity or by income, and is related to income inequality.

The following maps show the patterns of income and racial segregation, and how these patterns correlate with housing in Houston. Figure 30 shows the association between household income and race in Houston ZIP codes. Household income tends to be higher in parts of Houston that have greater percentages of white, non-Hispanic residents.

Figure 30: Household Income and Percent White Non-Hispanic Residents by ZIP Code, Houston TX 2012-2016

Household Income & Racial Segregation by ZIP Code (ACS 2012-2016)

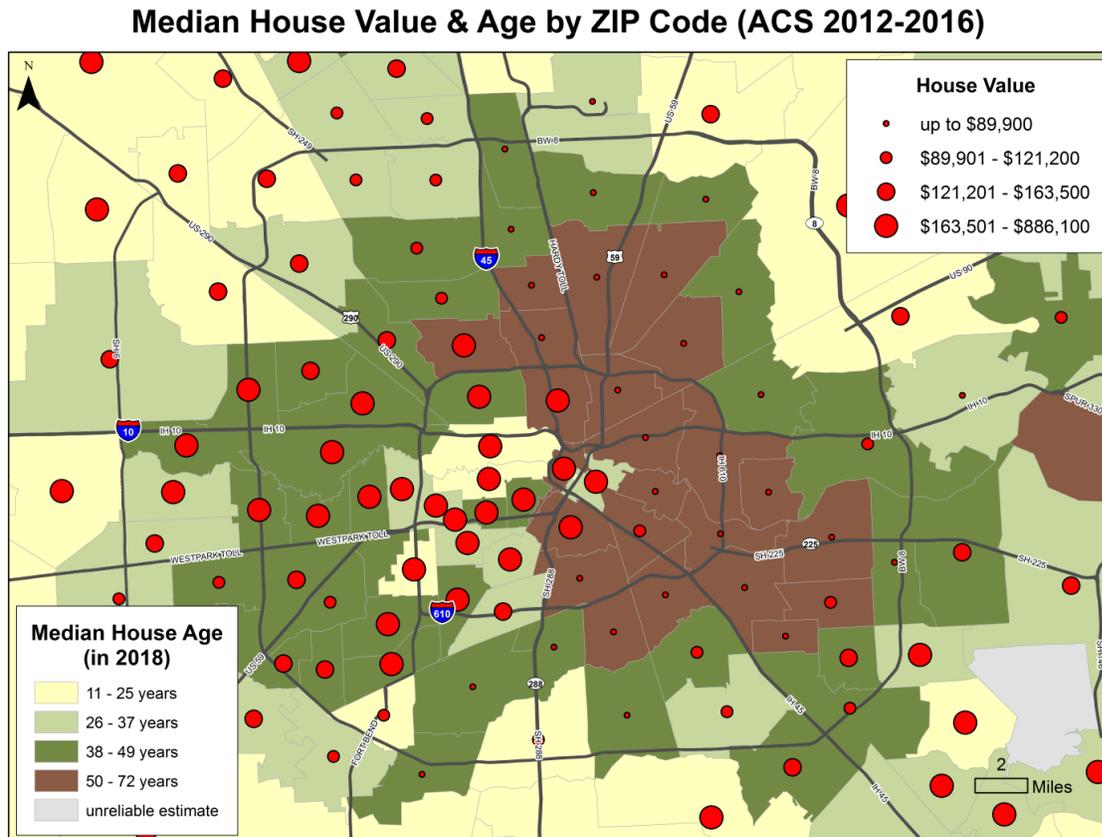


Data Source: US Census Bureau, American Community Survey. Map by the Houston Health Department.

The following map, Figure 31, shows the median (middle point) value of houses across Harris County. The larger dots represent more expensive housing. The background colors show the age of most homes. The areas marked in brown indicate the oldest parts of Houston/Harris County, which is generally where the least expensive housing exists. Some areas, such as parts of the Houston Heights, are undergoing revitalization to upgrade or replace older homes, increasing property values in the older areas.

The value of houses often results in a type of segregation by socioeconomic class, in which persons of similar incomes buy homes in the same neighborhoods.

Figure 31: Median House Value and Age of House by ZIP code, Houston TX 2012-2016

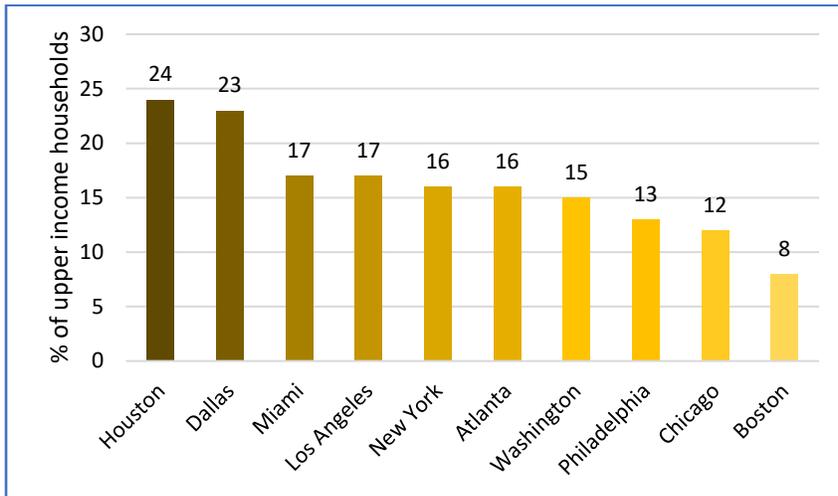


Data Source: US Census Bureau, American Community Survey. Map by the Houston Health Department.

Comparing the two previous maps, Figures 30 and 31, shows that in general, areas with higher percentages of white non-Hispanic residents are also areas with higher incomes and newer, more expensive housing in Houston.

Residential segregation by income can also be evaluated by use of the Residential Income Segregation Index Score (RISI). This score is computed by adding the percentage of low income households located in census tracts where a majority of households are also low income, to the percentage of upper income households located in the upper income census tracts. Using this formula, the Pew Research Center found that Houston (score of 61) has highest RISI score among the 10 largest metropolitan areas in the country, followed closely by Dallas (60) and New York (57). At the lower end of the scale are Chicago (41) and Boston (36). For Houston, that meant 37% of low-income households were in low-income neighborhoods and 24% of high-income households were in high-income neighborhoods. This is partly a result of the many people moving to Houston in recent years. Two disparate groups have been most prominent: high-end workers attracted to economically vibrant areas and low-end, low-skill persons who have come for jobs “to build the new houses, to mow the lawns, to do the lower-end service jobs.”⁵⁷

Figure 32: Percentage of Upper Income Households Residing in Majority Upper Income Census Tracts, 10 Largest US Metropolitan Areas, 2010

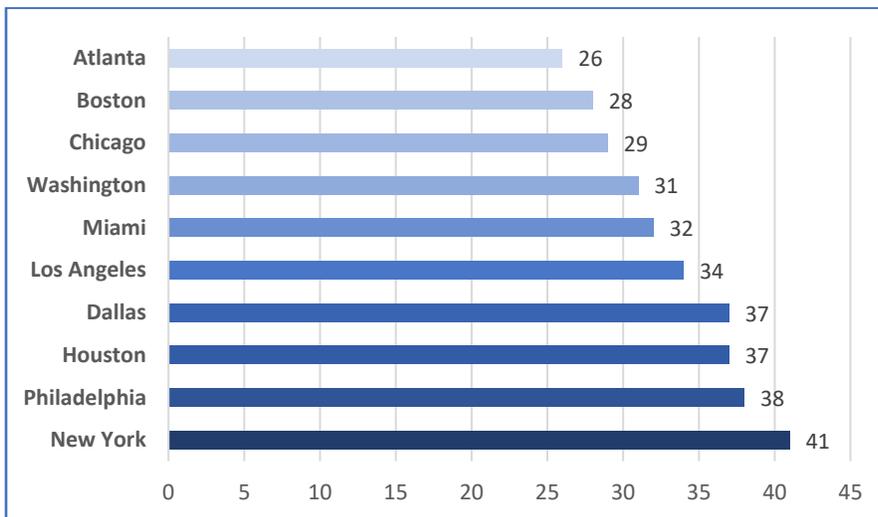


Data Source: Pew Research Center

In Houston, 24% of upper income households are located in upper income census tracts, indicating a high concentration of upper income families living in close proximity. This concentration of upper income households can result in areas with greater relative resources and better schools, as well as upper income residents who have little contact with low income persons.

Similarly, lower income households are also grouped together in Houston.

Figure 33: Percentage of Lower Income Households Residing in Majority Lower Income Census Tracts, 10 Largest Metropolitan Areas, 2010



Data Source: Pew Research Center

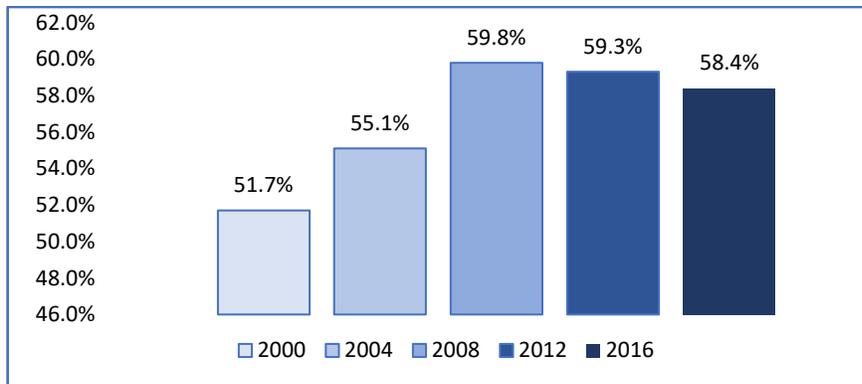
In Houston, 37% of lower income households are located in lower income census tracts. This highly segregated concentration of low income households has major implications for the living conditions and resources available to these families.

These high levels of economic segregation in Houston can lead to conditions where upper income residents and lower income residents have little contact with each other, and little awareness of the challenges faced by the other group. This can further exacerbate income inequality, as those in the upper income brackets are more likely to be in leadership and governmental positions where they develop policies that impact funding and resources across the city.

CIVIC ENGAGEMENT

Civic attitudes and behaviors play a key role in the health of a community. Volunteering and voting behaviors indicate how engaged residents are in creating positive changes in their community. Through civic engagement, people can develop the skills and knowledge needed to have a voice in decision making that involves the community.

Figure 34: Voter Turnout for Presidential Elections, Harris County TX 2000-2016

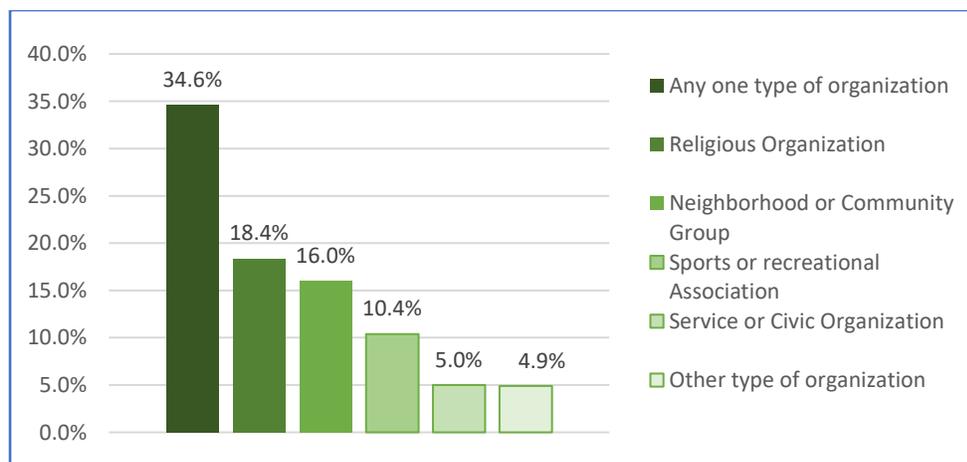


A larger percentage of Harris County residents who were eligible to vote did cast a vote in the period 2008-2016 compared to previous years. Still, only 58.4% of eligible voters did vote in 2016.

Data Source: Houston State of Health website

The US Census Bureau and the US Bureau of Labor Statistics conduct periodic Current Population Surveys. These surveys are the primary source of monthly labor force statistics and also collect data for a variety of other studies related to the economic and social well-being of Americans. Some of these surveys include questions about local civic engagement, an important factor in the health and robustness of a community. Figures 35-37 are based on Current Population Surveys, as described in the **2018 Houston Civic Health Index**, a report by the Rice/Kinder Institute for Urban Research, Houston Endowment, LEAP, and the National Conference on Citizenship.⁵⁸

Figure 35: Percentage Who Reported Participation in a Community Group, Greater Houston TX 2013

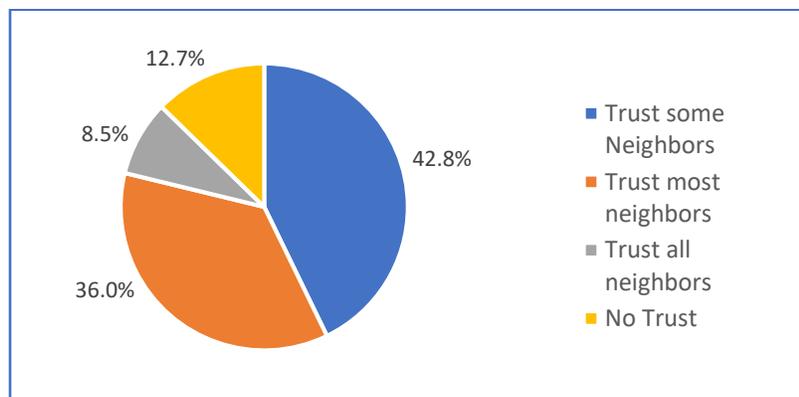


Participation in a community group is a measure of engagement in one's community and can also be an indication of trust and desire to be involved with one's neighbors.

Data Source: 2018 Houston Civic Health Index

Trusting neighbors is a key indicator of civic engagement. In Greater Houston, trust in neighbors is far lower than the national average; 45% trust most or all of their neighbors, compared to 57% in the US.⁵⁹

Figure 36: Percentage Who Reported Various Levels of Trust in Neighbors, Greater Houston Area, 2013

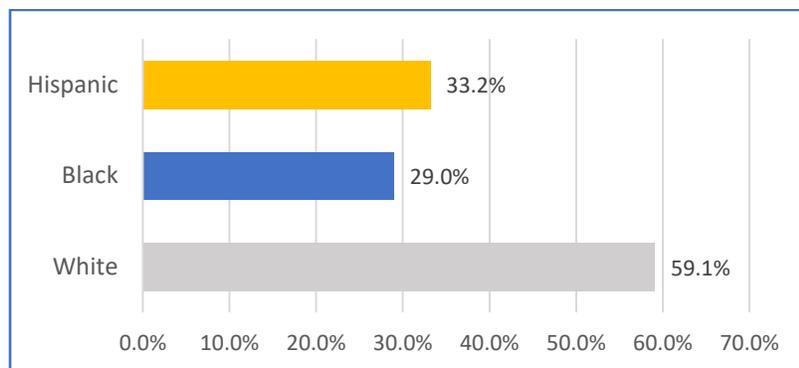


Respondents to the Current Population Survey in the Greater Houston area indicated that most residents trust some, most, or all of their neighbors.

Data Source: 2018 Houston Civic Health Index

Figure 37 depicts responses to questions about the level of trust that respondents felt toward neighbors based on the race/ethnicity of the respondents.

Figure 37: Percentage Who Reported that They Trust Most or All Neighbors, Greater Houston Area, 2013



Among Current Population Survey respondents, the white population indicated the most trust in their neighbors, while those in the black population were less likely to report that they trusted most or all of their neighbors.

Data Source: 2018 Houston Civic Health Index

SOCIAL CLASS

Social class refers to a division of a society based on social and economic status. In the US, the most commonly heard division of social class relates to income and is divided into three categories:

- Upper class (the rich)
- Middle class (most people)
- Lower class (the poor)

However, social class can also include other aspects such as wealth (accumulated assets), education, type of occupation, and membership in a specific subculture or social network. Sociologist Dennis Gilbert proposed an American class system with six distinct social classes:

- Upper or capitalist class consisting of the rich and powerful
- Upper middle class consisting of highly educated and affluent professionals
- Middle class consisting of college-educated individuals employed in white-collar industries
- Lower middle class composed of semi-professionals with typically some college education
- Working class constituted by clerical and blue collar workers whose work is highly routinized
- Lower class divided between the working poor and the unemployed underclass⁶⁰

The personal experience of belonging to a social class has an impact on health and in maintaining the status quo for health disparity. The lower one's social class, the higher one's level of chronic psychological stress. Lower social class individuals have fewer resources to control their environment and therefore experience uncertainty, helplessness, and lack of freedom. In contrast, upper class individuals have more financial, social, and intellectual resources at their disposal, which enable them to feel socially valued and in control of their lives.⁶¹

The sense of control over one's life can be experienced on three levels, according to Whitehead:

- Micro/personal—these can involve stresses from lack of resources (such as money, information, and power) and lack of confidence in one's ability to overcome challenges, which can lead to chronic stress which damages physical and mental health
- Meso/community—at this level, features such as community safety and the community's ability to improve unhealthy conditions impact each resident's experience and stress level
- Macro/societal—at the society level, issues like maintaining law and order, and a stable employment market, impact one's sense of control over one's life⁶²

While it would seem that moving to a higher social class would lead to improved health, this may not always be the case. Both upward and downward social mobility can have unintended health impacts. At the same time, the ability to improve one's social class is one criterion for judging the fairness of a society.⁶³

In the US, social mobility, or the ability to climb up the social ladder, has been decreasing in America as income inequality increases. Of those born in 1940, 90% grew to earn more income than their parents. But for those born in 1980, that figure had dropped to 50%.⁶⁴ The American ideal that hard work and talent will enable any person to improve their status in life is less likely than it was years ago, contributing to increasing income and health inequalities.

IMMIGRATION

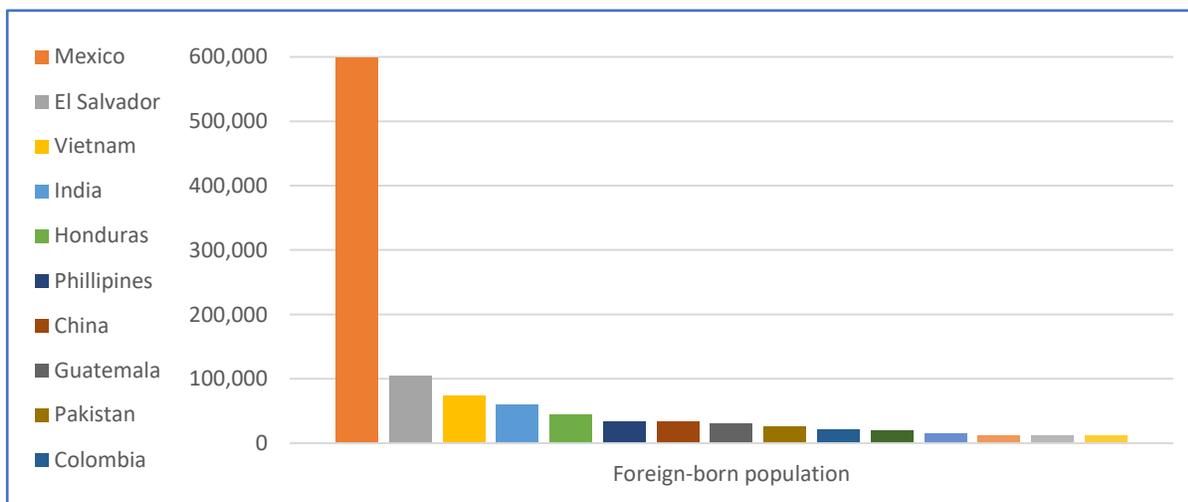
The Equity Profile of the Houston-Galveston area, along with many other sources, reports that the Houston-Galveston area is one of the most diverse regions in the country, in terms of race and ethnicity.

Diverse populations such as Hispanics and Asians are among the driving forces for growth and change in the region.⁶⁵ The Kinder Institute report on Houston also affirms the clear generational differences in the city, with a high proportion of white residents who are aging and a high proportion of the non-white population who are younger.^{66,67}

The National Origins Quota Act, between 1924 and 1965, severely limited immigration to the United States from anywhere except northern Europe. Then, in 1965, the Immigration and Nationality Act Amendments, also called Hart-Cellar Act, opened immigration to the rest of the world, with preferences for family reunification, refugees fleeing persecution in their home countries, and highly qualified professionally skilled individuals. This resulted in a dramatic change in the demographics of Houston and Harris County over the last 50 years, as many immigrants arrived and stayed in the area. More than 40% of the immigrants are recent arrivals from Latino and Asian countries and the newer arrivals are a much younger cohort compared to the white population.⁶⁸

Figure 38 shows the country of origin for immigrants to Houston in the 2008-2012 period. The largest group, by far, came from Mexico.

Figure 38: Top 16 Countries of Origin for Houston Area’s Foreign-Born Population, 2008-2012

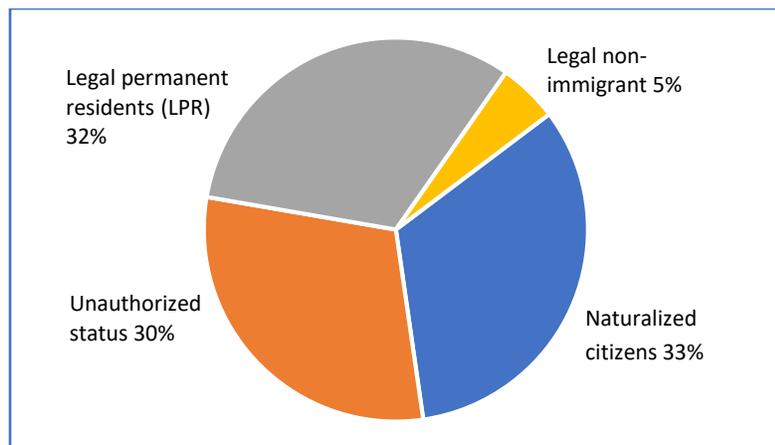


Data Source: Capps and Soto⁶⁹

The Houston metropolitan area has been rapidly growing, from 6 million in 2010 to 7 million in 2017; immigrants account for 1.7 million of the total population. Resulting from this growth, Houston has become a majority-minority city, where no one racial/ethnic group is in the majority. Immigrants in Houston come primarily from Spanish speaking countries in Central and South America or from countries in Asia. The aggregate education and income profile by country of origin of the immigrant population in Houston is bimodal, meaning that they are either highly educated or they have fewer than 12 years of schooling. The aggregated income profile shows that either they are earners with a high family income or they are at less than 200% of the Federal Poverty Level. This type of a pattern is seen consistently, based on their country of origin.⁷⁰

Immigrants to the Houston area are categorized into five groups, according to their immigration status. They may be US born citizens, naturalized citizens, legal non-immigrants, legal permanent residents, or unauthorized immigrants. Their status has large implications on their ability to find employment, and their earnings once they are employed.

Figure 39: Legal Status of the Foreign-Born Population in the Houston TX Metro Area, 2012-2016



Naturalized citizens represent the largest group of foreign-born Houston residents, at 33%, followed closely by legal permanent residents at 32%. Out of a total of 1.66 million Houston foreign-born residents, 541,000 were naturalized citizens and 531,000 were legal permanent residents.

Data Source: Capps and Soto⁷¹

Many immigrants have come to the US for the opportunity to find better jobs and better lives for themselves and their families. Houston immigrants range from highly skilled professionals to working class families to international students. Most immigrants are working. Over 80% of men and about 50% of women are in the labor force in all categories of foreign born residents. Fifty-six percent of immigrants in the Houston area own their homes, almost at the percentage (65%) of US residents who own their homes.⁷²

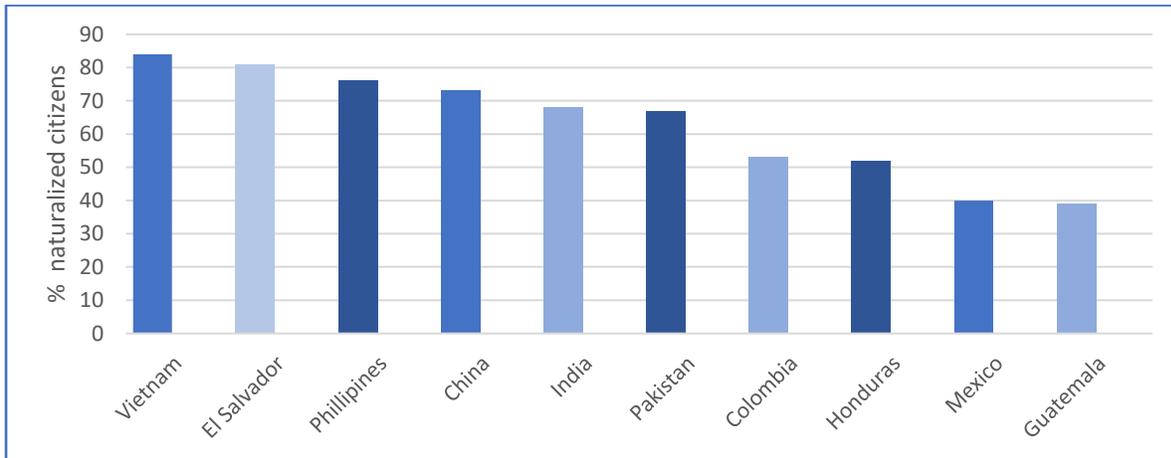
A “green card” is an important asset for immigrants. Having a green card, officially known as a Permanent Resident Card, allows immigrants to live and work permanently in the United States. Most green cards are issued for those who have close relatives in the US, those with employment skills needed in the US, and those seeking asylum.

Once an individual has obtained a green card, he/she is eligible to apply for US citizenship after five years, or after three years if married to a US citizen. To complete the naturalization process, the applicant must pay the related fees and pass an oral examination in English, requirements that can represent barriers to some who might otherwise be eligible. If citizenship is granted, this person becomes what is termed a “naturalized citizen.”

Immigrants from some countries have higher percentages of those who are eligible to become naturalized citizens. Figure 40 shows the countries of origin of green card holders who are eligible to become US citizens, and the percentages of those who have actually applied for and gained citizenship.

Immigrants with green cards from Vietnam have the largest percentage of those eligible who have gone on to obtain US citizenship.

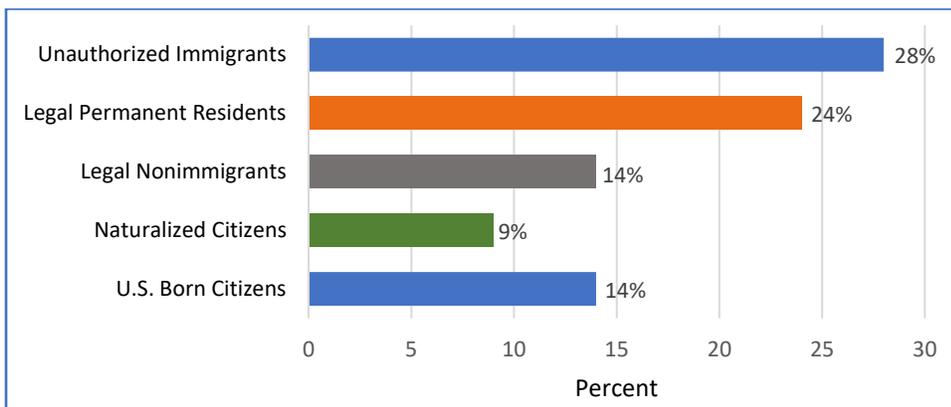
Figure 40: Naturalized Citizens in the Houston TX Metropolitan Area as a Percentage of Green Card Holders Eligible for Citizenship, 2008-2012



Data Source: Capps and Soto, 2018⁷³

Almost half of children in Houston area are children of immigrants. Immigrants were almost one quarter of the population in the Houston area and children with one foreign born parent made up 44% of all children under 18 years of age, as of 2016. A large percentage of these children live in low income families, with many implications for their and their families' health. More than half of unauthorized immigrants and legal permanent residents had incomes less than 200% of the Federal Poverty Level, about \$48,000 for a family of four in 2016.

Figure 41: Percentage of US Citizens and Foreign-Born with Incomes Below the Federal Poverty Level in the Houston TX Metropolitan Area, 2012-2016



Unauthorized immigrants were mostly likely to live in poverty among foreign born groups; 28% lived below the Federal Poverty Level.

Data Source: Capps and Soto, 2018⁷⁴

Immigrants face many difficulties. This begins with immigration policy, which is a form of structured racism. Immigrants must abide by a quota system for admission to the US, and once admitted, do not

have the right to vote. They also encounter barriers to entry into educational institutions and face consequences if they have received any assistance from the government such as Head Start, WIC, or CHIP health insurance for children. A large proportion of immigrants in Houston face challenges with their official immigration status, lack of health insurance, lack of primary care providers, lack of access to social services, poor housing quality, low resourced neighborhoods, language barriers, unfamiliarity with the education system in the US, fear of being deported and being separated from their families, and racism and discrimination. These conditions affect the health status of many immigrants.

CHRONIC STRESS

The Centers for Disease Control and Prevention noted that childhood experiences, both positive and negative, have a tremendous impact on future violence, victimization and perpetration, and lifelong health and opportunity. Adverse experiences, such as exposure to crime, violence, and child abuse, can impact many physical and mental outcomes. One of the most severe impacts comes from child abuse, which is more common in areas of higher poverty.⁷⁵

Childhood abuse, which can be sexual, physical or emotional, has a lifelong impact. Both genders are affected, as shown in the following table, Table 4. Percentages of physical and emotional abuse are similar between men and women, but a history of childhood sexual abuse is more than twice as common in women. Women are also more likely to report adverse experiences with substance abuse and mental illness in the home.⁷⁶

Table 4: Gender Differences in Adverse Childhood Experiences (ACE) in the US 2010

ACE Category	Women	Men	Total
	Percent (N =32,539)	Percent (N =21,245)	Percent (N =53,784)
ABUSE			
Emotional Abuse	34.1%	35.9%	35.0%
Physical Abuse	15.8%	15.9%	15.9%
Sexual Abuse	15.2%	6.4%	10.9%
HOUSEHOLD CHALLENGES			
Intimate Partner Violence	15.6%	14.2%	14.9%
Household Substance Abuse	27.2%	22.9%	25.1%
Household Mental Illness	19.3%	13.3%	16.3%
Parental Separation or Divorce	23.1%	22.5%	22.8%
Incarcerated Household Member	5.2%	6.2%	5.7%

Data Source: CDC Behavioral Risk Factor Surveillance Survey 2010

Adverse childhood experiences also impact health later in life. The Center on the Developing Child at Harvard University calls these ACE experiences “toxic stress.” The Center notes that toxic stress leads to excessive activation of the stress-response system which can lead to long term wear and tear on the body and brain, similar to revving a car engine for days or weeks at a time.⁷⁷

The groundbreaking research on ACEs and health outcomes is an ongoing cooperative effort between the Centers for Disease Control and Prevention and Kaiser Permanente's Health Appraisal Clinic in San Diego. The Adverse Childhood Experiences (ACE) Study is one of the largest investigations ever conducted to assess associations between childhood maltreatment and health and well-being later in life. Thus far, the study has found links between ACE experiences and more than 40 health outcomes later in life, with negative impacts such as:

- Health: obesity, diabetes, depression, suicide attempts, STDs, heart disease, cancer, stroke, COPD, broken bones
- Behaviors: smoking, alcoholism, drug use
- Life Potential: graduation rates, academic achievement, lost time from work⁷⁸

Figure 42 shows how the risk for developing ischemic heart disease increases as adverse childhood events increase. Those with five or six ACE experiences are twice as likely to develop heart disease later in life, and persons with seven to eight ACEs are 3.6 times more likely.

Figure 42: Adverse Childhood Experience (ACE) Score and Increased Risk of Ischemic Heart Disease

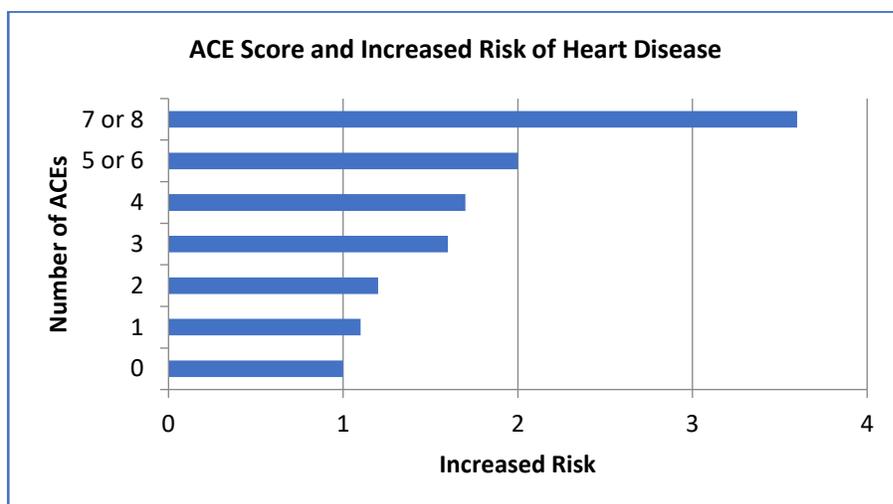


Figure 42 shows how the risk of developing ischemic heart disease increases as a person experiences more adverse childhood experiences. Those with five or more ACEs face a 200% or more greater risk.

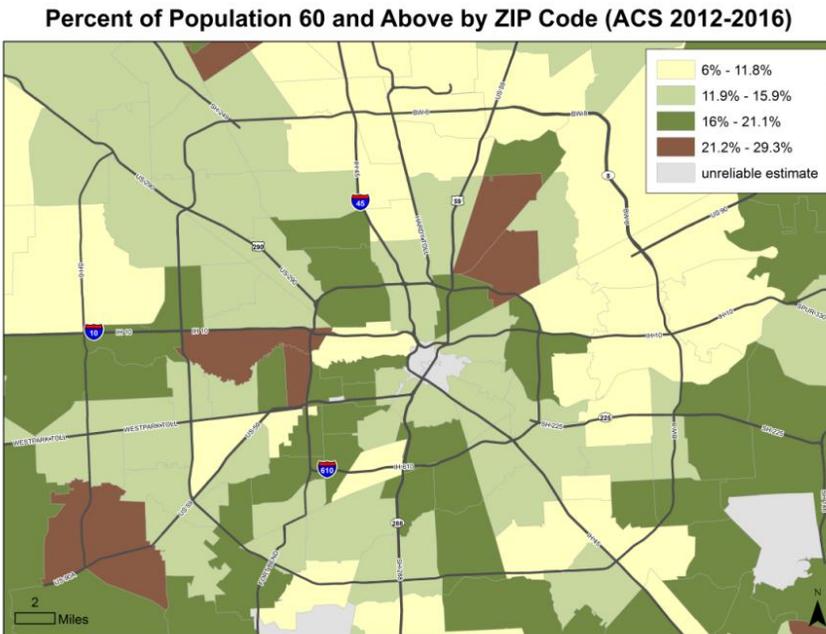
Data Source: M. Dong et al, 2004⁷⁹

SOCIAL ISOLATION

Social isolation describes a disparity that can negatively impact health, especially for the elderly. Those over age 60 are more likely to have health concerns or disabilities that can make maintaining social contacts more difficult. They may have experienced major life events, such as the death of a spouse or retirement, that have led to declining social outlets placing them at risk of social isolation.

The Commonwealth Fund Commission on the Elderly Living Alone indicated that one third of older Americans live alone, and that one quarter of those living alone live in poverty and report poor health. Rates of living alone are typically higher in urban areas and among women.

Figure 43: Percentage of Population Aged 60 and Above, Houston TX



In Houston, certain parts of the city are home to greater numbers of older persons. Figure 43 shows the percentage of persons aged 60 and above in ZIP codes across town. Darker colors indicate higher percentages of older persons.

Data Source: US Census Bureau, American Community Survey. Map by the Houston Health Department.

Figure 44: Percentage of Population Aged 65 and Above Living Alone, Houston TX

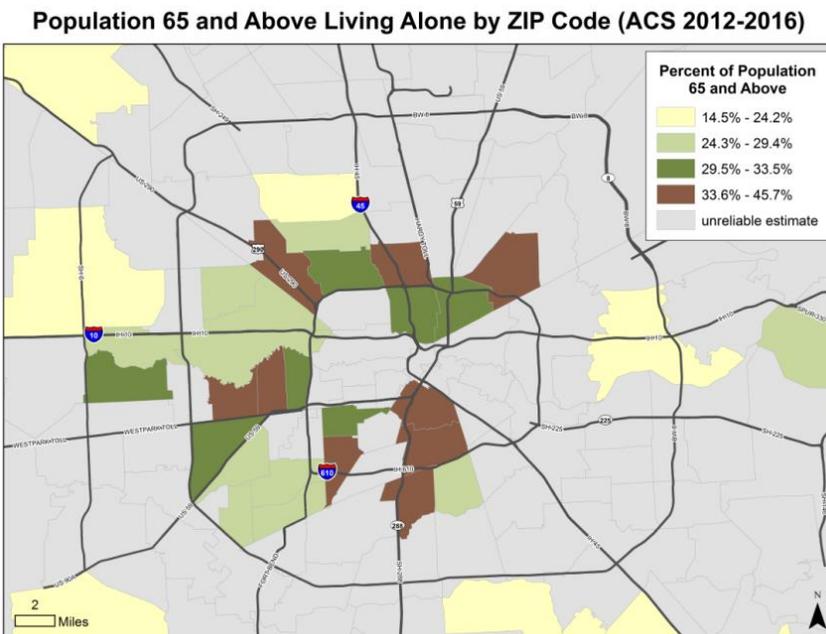


Figure 44 shows the areas in Houston that have the highest percentages of persons aged 65 and older, living alone. Areas shown in dark brown have the highest percentage of older persons living alone, up to 45.7%. Elderly persons who live alone may be at risk for social isolation, limited access to support, or inadequate assistance in emergency situations.

Data Source: US Census Bureau, American Community Survey. Map by the Houston Health Department.

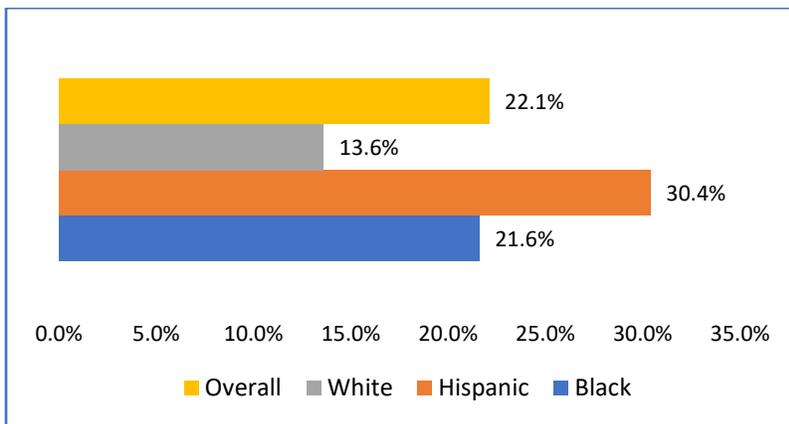
SERVICE ENVIRONMENT

HEALTHCARE ACCESS

Access to healthcare is important for the health and well-being of the community. However, access to healthcare is only one of the factors that affect a community’s health. The root causes play a far greater role in health in terms of access, allocation and distribution of different types of resources. At the same time, access to healthcare is crucial for maintaining good health.

According to the Houston State of Health website, using 2015 data, 22.1% of Harris County adults are unable to see a doctor due to cost. This is higher than the proportion of adults who cannot see the doctor in Texas (18.3%) and the US (12.1%). More females (27.1%) found visits to a doctor unaffordable compared to men (16.7%).⁸⁰

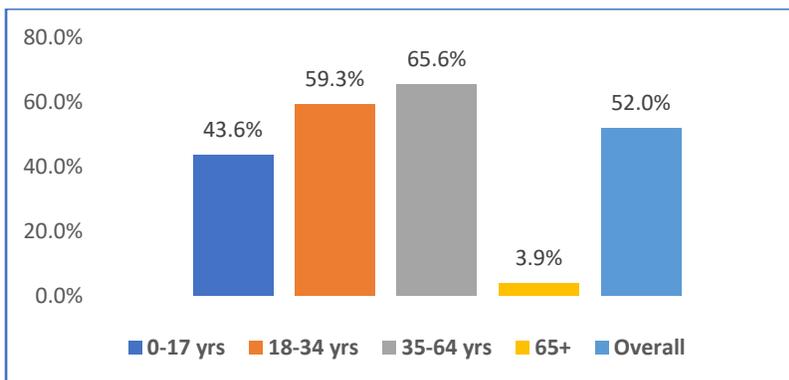
Figure 45: Percentage of Adults Who Reported They Cannot See a Doctor Due to Cost by Race/Ethnicity, Harris County TX 2017



The Harris County Hispanic population faces more difficulty in finding the funds to see a doctor, compared to other groups. Among Hispanics adults, 30.4% reported that they had not been able to see a doctor when they needed to, due to cost.

Data Source: Houston State of Health website

Figure 46: Percentage with Private Health Insurance by Age, Harris County TX 2016



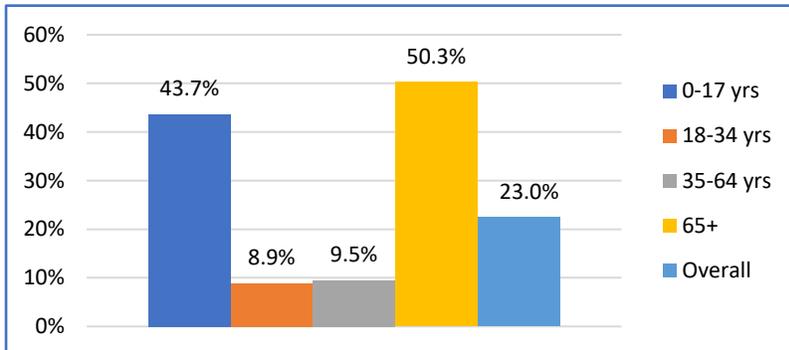
In Harris County, those aged 35-64 years old (65.6%) were most likely to have private health insurance in 2016; most of these individuals probably had health insurance from their workplace. A very small proportion of 65+ individuals had private insurance, likely because most older adults had Medicare coverage.

Data Source: Houston State of Health website

Access to healthcare has three major components:

- Having health insurance
- Utilizing healthcare
- Overcoming barriers to access due to cost, transportation, language and cultural factors, or the quality of the clinical encounter

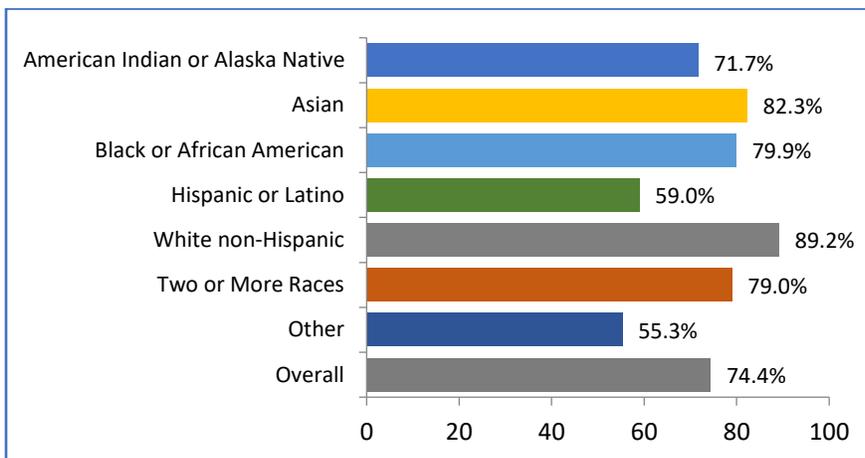
Figure 47: Percentage with Public Health Insurance by Age, Harris County TX 2016



Data Source: Houston State of Health website

For those on public health insurance such as Medicaid and Medicare, more than half of individuals aged 65+ were using public insurance, primarily Medicare. Children, who have access to Medicaid/CHIP, also often use public insurance.

Figure 48: Percentage of Adults with Health Insurance by Race/Ethnicity, Harris County TX 2016



Data Source: Houston State of Health website

The proportion of people that have health insurance varies by race/ethnicity in Harris County. The white non-Hispanic population has the highest percentage of persons with health insurance (89.2%). The Hispanic population has the lowest percentage of persons (59.0%) who are insured.

FOOD ENVIRONMENT

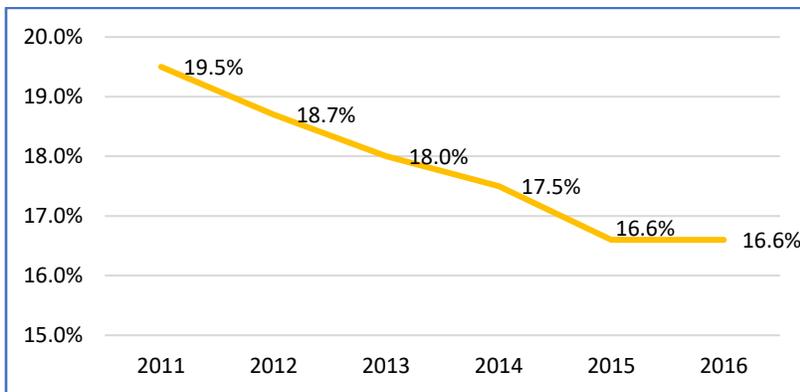
A lack of access to healthy foods is often a significant barrier to healthy eating habits. Low-income and underserved areas often have limited numbers of stores that sell healthy foods. People living farther away from grocery stores are less likely to access healthy food options on a regular basis and thus more likely to consume foods which are readily available at convenience stores and fast food outlets.

Food Insecurity

Food insecurity, defined by the United States Department of Agriculture (USDA) as limited availability or uncertain ability to access nutritionally adequate foods, is associated with chronic health problems including diabetes, heart disease, high blood pressure, high cholesterol, obesity, and mental health issues including major depression.⁸¹

Food insecurity is an economic and social indicator of the health of a community. In Harris County, 16.6% of the households reported uncertain or limited access to nutritious food in 2016. This could be due to a number of reasons such as cost of nutritious foods, lack of transportation, lack of easy access to a grocery store or food preparation challenges.

Figure 49: Percentage Reporting Food Insecurity, Harris County TX 2016

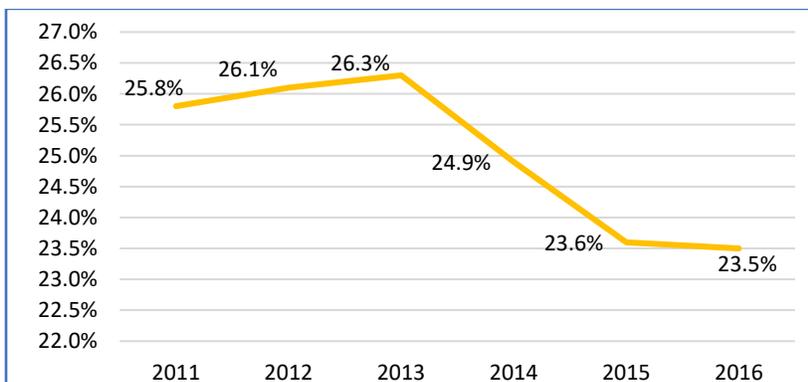


Although food insecurity in Harris County is trending downwards, still one out of six households sometimes are unsure if they will have food. This remains of great concern due to the association between food insecurity and hunger with poor physical and mental health outcomes.

Source: Houston State of Health website

Child food insecurity has serious long-term implications for the child's health and development. Children who are food insecure are more likely to be hospitalized and to develop many physical and mental health issues. Food insecurity can also exacerbate the academic, behavioral or disciplinary problems encountered in school.⁸²

Figure 50: Percentage Reporting Child Food Insecurity, Harris County TX 2011-2016



Food insecurity among children in Harris County has been trending down since 2013; however still nearly one in four children faces uncertainty in whether adequate and nutritious food will be available in their homes.

Data Source: Houston State of Health website

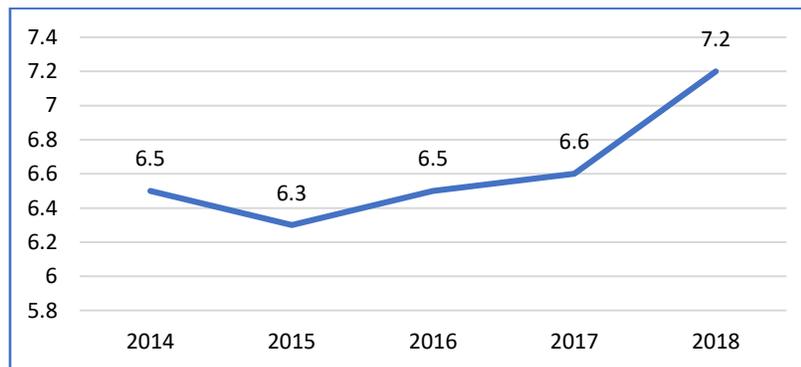
According to 2014 figures from Feeding America, 749,260 individuals live with food insecurity in Harris County, which is equal to 17.5% of the population. This percentage can be compared to:

- 13.3% San Diego County
- 13.9% Cook County (Chicago)
- 14.0% Los Angeles County
- 16.4% New York (five boroughs)
- 17.5% Harris County (Houston)
- 18.1% Tarrant County (Fort Worth)
- 19.3% Dallas County
- 22.0% Wayne County (Detroit)⁸³

Food Environment Index

The food environment index combines two measures of food access: the percentage of the population that is low-income and has low access to a grocery store, and the percentage of the population that did not have access to a reliable source of food during the past year (food insecurity). The index ranges from 0 (worst) to 10 (best) and equally weights the two measures.⁸⁴

Figure 51: Food Environment Index, Harris County, TX 2014-2018



The Houston State of Health website reported the Food Environment Index from Harris County data from 2014 through 2018. This calculation shows the trend line for the index is moving upwards and the food environment in Harris County is improving.

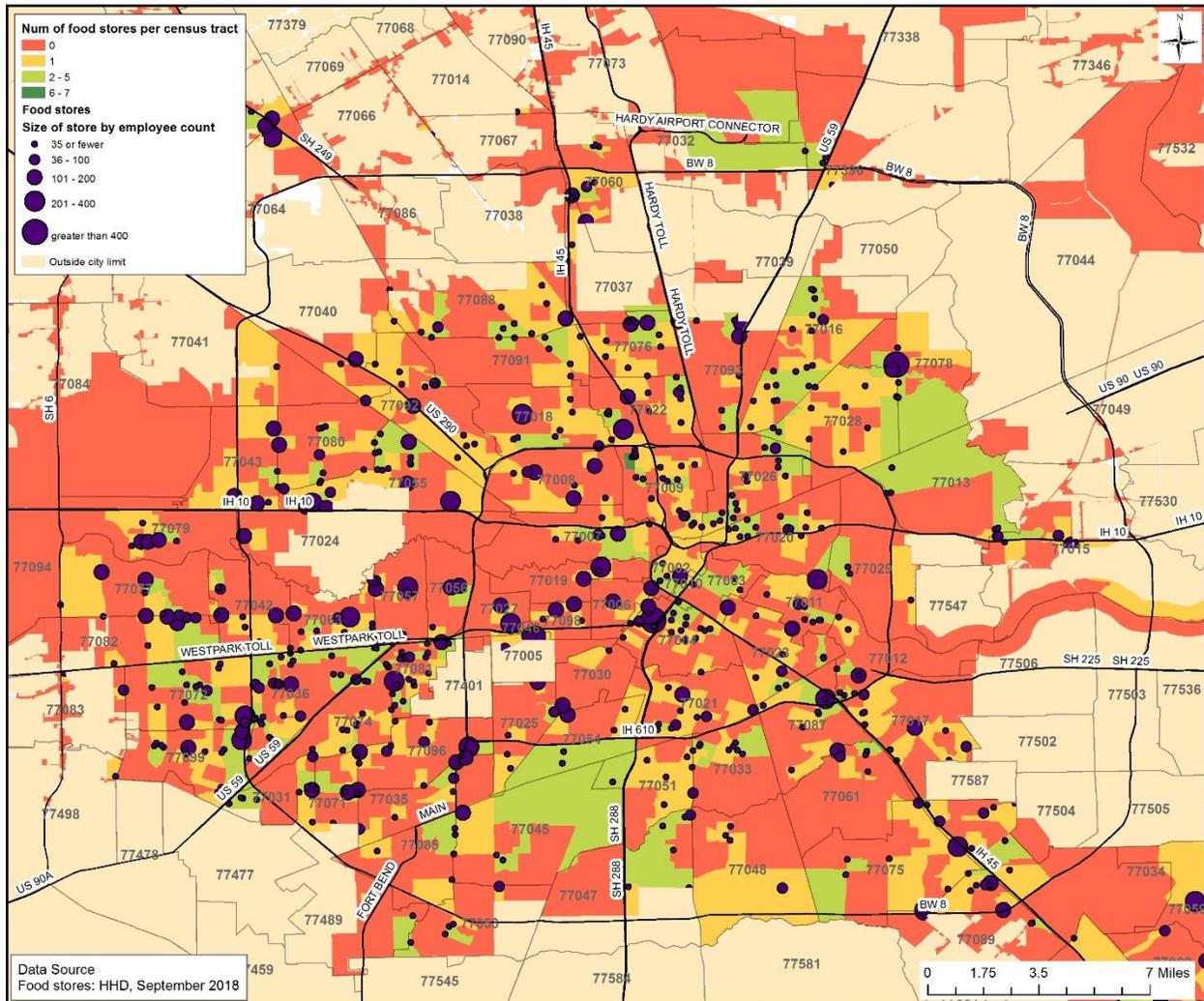
Data Source: Houston State of Health website

Location of Food Stores

Proximity to food stores can impact whether a family has easy and reliable access to stores where they can purchase healthy and affordable food. It's also important that the food stores be large enough to offer a good selection of fresh fruits and vegetables. Many low income areas have multiple convenience stores that sell food, but the selection of fresh produce is quite limited and prices are higher compared to supermarkets.

The following map, Figure 52, shows the distribution of food stores across Houston. The larger stores, shown as larger dots, are those most likely to have good selections of fresh produce. The map shows that the largest grocery stores are located primarily in neighborhoods with higher incomes, while the smaller stores, many of which are convenience stores, are more frequent in low income areas.

Figure 52: Number, Size and Location of Food Stores, Houston TX 2018



Data Source: Houston Health Department, Environmental Health records of food stores in Houston. Map by the Houston Health Department.

EDUCATION

Multiple sources have found that educational attainment, measured by number of years of schooling or degrees obtained, is related to health indicators. Educational attainment is related to obesity, health risk behaviors, preventive care and screening behaviors, and automobile and home safety. Higher education leads to lower rates of chronic illness and death, and longer years of life (life expectancy). The health advantage that education grants can be seen through one or more generations. This means that the parent’s education, particularly the mother’s, is strongly associated with their child’s health outcomes. Level of education has a “dose response” relationship with health status, i.e. a greater number of years of education leads to better health status.⁸⁵

There are many mechanisms by which education can impact health status such as:

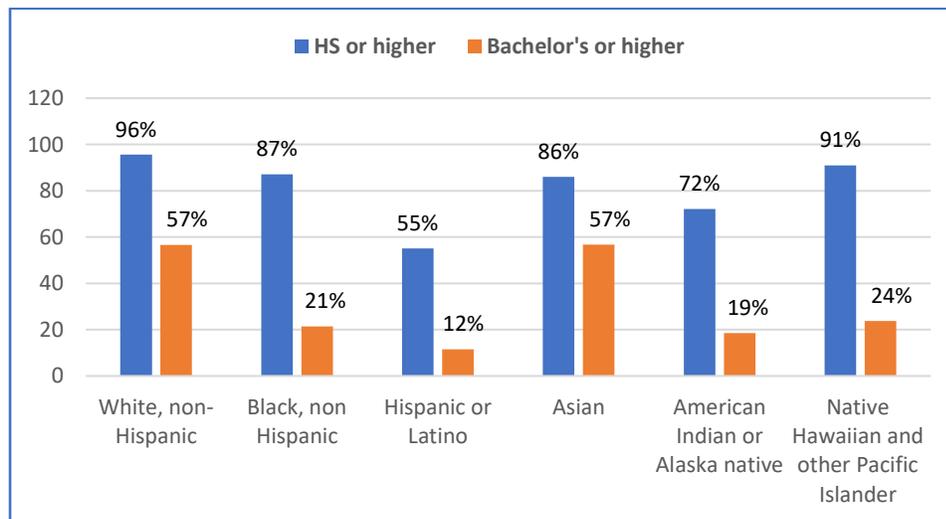
- 1) increasing knowledge about health (health literacy)
- 2) improving coping and problem-solving skills
- 3) expanding employment opportunities and earning potential
- 4) facilitating greater self-efficacy in problem solving, stress management and more access to social support

Some research shows that the relationship between educational attainment and health can also manifest in the opposite direction so that better health leads to more educational opportunities.

Deep disparities exist in educational attainment among different races/ethnicities. These become evident very early in life. Children from low income families have 600 fewer words in their vocabulary at age 3 compared to children from middle or upper income households. These vocabulary word gaps affect literacy and reading scores and reading achievement.⁸⁶

For every dollar spent on early child development, \$7 is saved over the child's life course because children with better early child development are less likely to end up delinquent, involved in crime, unemployed and so on. (Marmot, 2008)

Figure 53: Percentage of Educational Attainment by Race/Ethnicity, Houston TX 2012-2016

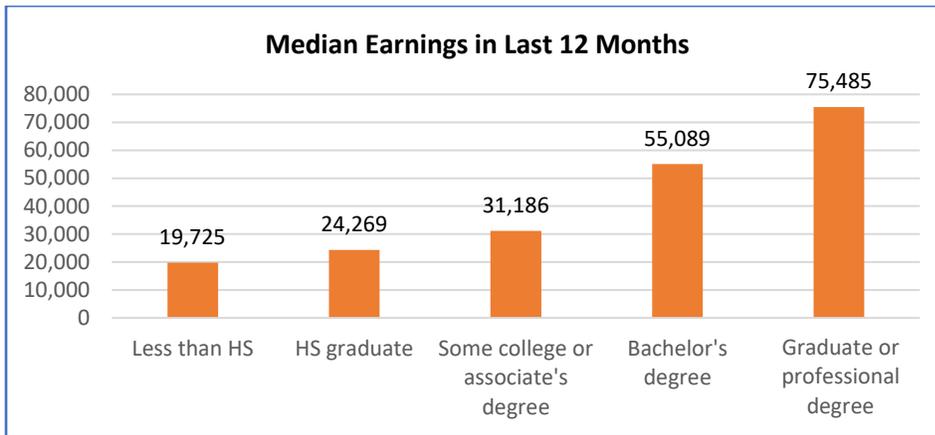


Each additional year of education leads to 11% more income annually, and additional benefits such as a safer work environment and better availability of health insurance.

Data Source: American Community Survey

One of the most obvious ways in which education impacts health and life circumstances is through earnings. As the following figures depict, increasing education leads to higher income and lower risk of poverty. High school dropouts are much more likely to live below the Federal Poverty Level. In Harris County, the percentage of the adult population aged 25 and older who have completed high school has increased slightly during the period 2009-2016; from 77.3% to 80.2%. During the same time period, the percentage of the Harris County population with a bachelor's degree or higher increased from 27.8% to 30.1%.

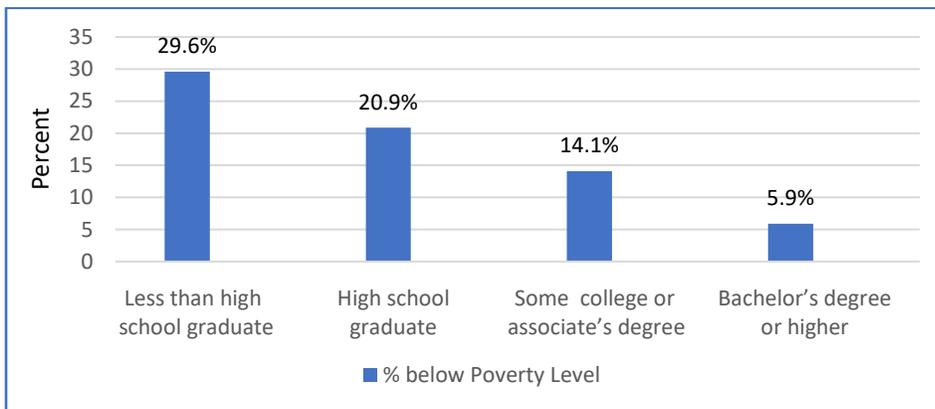
Figure 54: Median Annual Earnings by Level of Education, Houston TX 2012-2016



An individual with a bachelor's degree in Houston earned more than double the income, compared to an individual with only a high school education.

Data Source: American Community Survey data

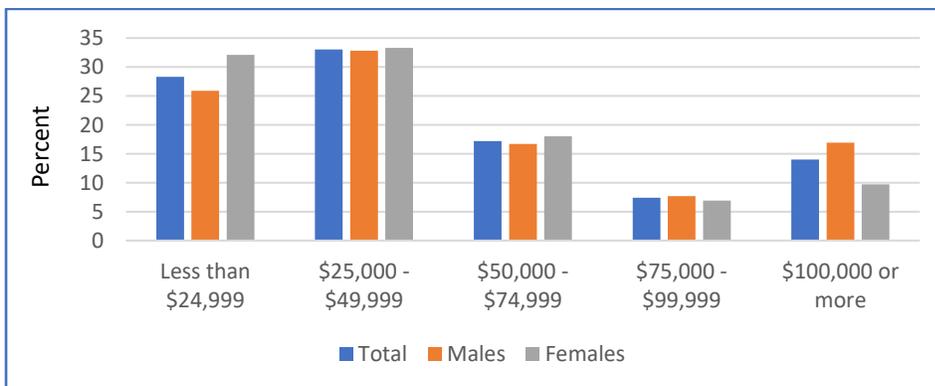
Figure 55: Percentage of Individuals Living Below the Poverty Level by Educational Attainment, Houston TX 2012-2016



Nearly 3 out of 10 persons in Houston who did not complete high school lived below the Federal Poverty Level, which was \$11,880 for a household of one in 2016.

Data Source: American Community Survey data

Figure 56: Percentage of Males/Females in Income Categories, Houston TX 2012-2016



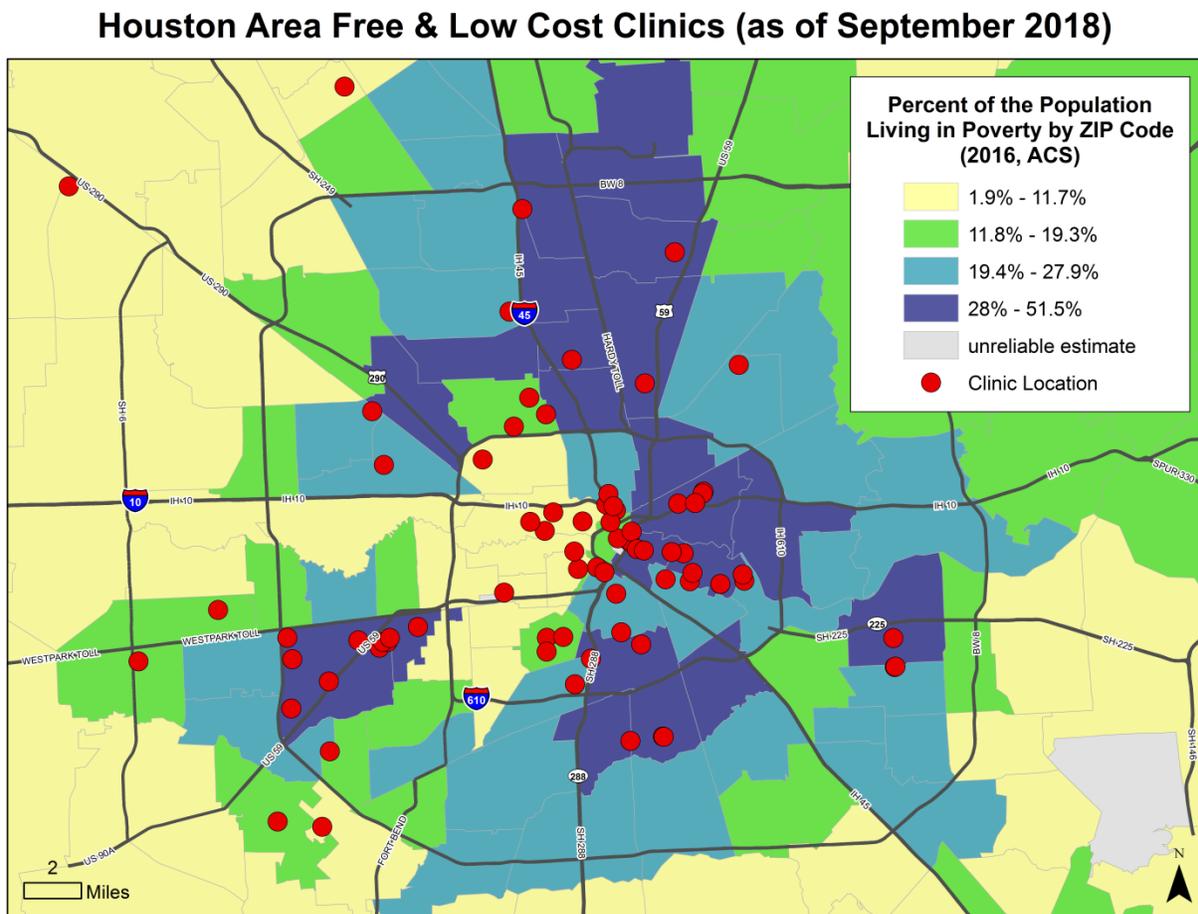
Women are over-represented at the lowest income level, while the percentage of men (compared to women) is higher at the upper income levels.

Data Source: American Community Survey data

RESIDENTIAL PROXIMITY TO SOCIAL SERVICES

Households vary by how far they must travel to find needed social services. Healthcare is one of the most necessary of the services. Houston has a number of low-cost and free healthcare clinics available to those with low incomes. However, the locations of these clinics are not always easily accessible to high-poverty areas. Figure 57 maps the Houston area free and low cost clinics, and also the areas of highest poverty in Houston. The free/low cost clinics are not necessarily located in the high poverty residential areas where residents are most in need. Transportation to these clinics can be a barrier for low income families without their own transportation, a concern in Houston where only half of low income households own a car.⁸⁷

Figure 57: Area Clinics for Low Income Residents, Houston TX 2018

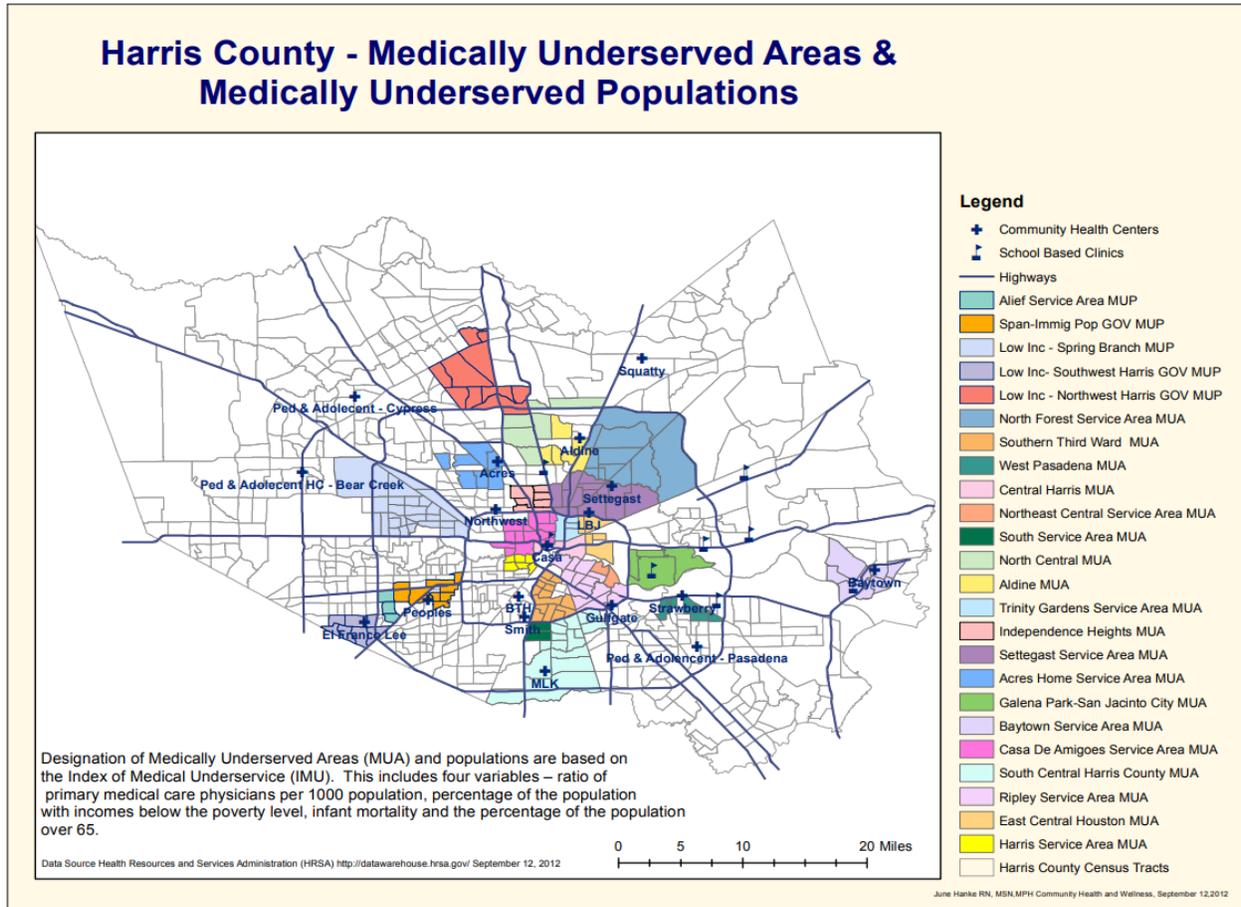


Data Sources: Free Clinics.com and NeedHelpPayingBills.com.^{88,89} Map by the Houston Health Department.

Other services that are necessary for families are facilities such as dental offices, schools, libraries, daycare facilities, and senior centers. These are often less accessible in low income areas. Figure 58 shows the areas in Harris County that have been designated as Medically Underserved Areas/Populations by HRSA (Health Resources and Services Administration in the US Department of Health and

Human Services). The designation is based on having too few primary care providers, high infant mortality, high poverty or a high elderly population.

Figure 58: Medically Underserved Areas and Populations, Houston TX 2012



Data Source: Harris Health System website⁹⁰

DISASTERS

Natural disasters can be another cause of income inequality. While they can impact individuals at all levels, natural disasters impact the most vulnerable more severely. According to a new study by Rice University and the University of Pittsburgh, damages caused by natural disasters and the actions taken to recover from these events have increased wealth inequality between races in the United States. Wealth is defined as the total financial assets minus the debts or other liabilities of a household.

The researchers followed nearly 3,500 families across the US in 20 counties, and looked at the gap in wealth between families that was attributed to natural disasters. The disasters included events such as hurricanes, floods, wildfires and tornados. The researchers found that family wealth changed in the years following natural disasters. In counties with minimal damages, Latino families fared best, although

all families increased wealth over the course of the study. However, in counties with severe damage (more than \$10 billion), white families increased their net worth, while other racial/ethnic groups lost. These differences occurred even after the researchers adjusted the data to account for age, education, homeownership, family status, residential mobility, neighborhood status and county population.⁹¹ Table 5 shows the results of the study.

Table 5: Changes in Wealth Following Natural Disasters 1999-2013

Race/Ethnicity	County Damages = \$100,000	County Damages = \$10 billion or more
White	+ \$26,000	+ \$126,000
Black	+ \$19,000	- \$27,000
Latino	+ \$72,000	- \$29,000
Asian	+ \$21,000	- \$10,000

Data Source: Howell and Elliott, 2018⁹²

In Harris County, Texas, the researchers found that the wealth gap following disasters was \$87,000 between whites and blacks during this time period. Some of the aspects of this difference in wealth were related to:

1. Federal Emergency Management Agency (FEMA) funding. Areas with more damage and more FEMA funding showed greater disparities over time.
2. Home ownership. Individuals who owned homes in counties with high levels of natural disasters accumulated more wealth, while renters lost wealth.
3. Education. College-educated residents in high disaster areas accumulated wealth, while those with only a 10th grade education lost wealth.

The researchers noted that the two challenges of wealth inequality and the rising costs of natural disasters are connected. They see a need for further examination of wealth inequality in the US and development of solutions to address the problem. Additionally, greater exploration of why more FEMA funding would exacerbate disparities is needed.

TAKING ACTION

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 (RWJF) has been one of the leaders in providing guidance about developing health equity. Figure 59 was developed by the Houston Health Department based on work done by RWJF. The model describes the interplay between key community sectors and the roles each can take to promote health equity: policy makers, housing and transit, community development, criminal justice, health and healthcare, education, media, and employers.

As shown in Figure 59, actions by key sectors to achieve health equity include:

- **Policy Maker** – support paid family leave, expand Medicaid, push for ban the box (remove from hiring applications the check box that asks if applicants have a criminal record), provide services for non-English speakers, increase minimum wages, use racial equity impact assessments in initiatives, take on the "Advance Health Equity and Optimal Health for All" challenge
- **Employer** – ban the box, support paid family leave, promote healthy behaviors, train on implicit bias, use equity in hiring practices, hire and retain disabled workers
- **Media** – understand the roles of determinants or root causes of health, understand differences between health disparities and health equity, consult experts, apply an equity lens to reporting, acquire knowledge of vulnerable populations, understand it is "health" not "healthcare" that is key to population health
- **Education** – provide quality early childhood education, minimize expulsions, ensure adequate resources for schools, consider implicit bias, institute school-based health centers, teach financial literacy, support high risk students, support LGBTQ students
- **Health and Healthcare** – screen for non-medical factors, train in cultural and linguistic competency, ensure representation of minorities in clinical trials, educate about effects of adverse childhood events and trauma-informed care
- **Criminal Justice** – provide officer training and mental health services; promote individual sentencing decisions; treat non-violent offenders as having civil violations rather than criminal; have clear, fair search and seizure rules for LGBTQ populations
- **Community Development** – build capacity in communities to advocate for their health and well-being, learn from winners of SPARCC (Strong, Prosperous, And Resilient Communities Challenge), the Invest Health initiative, and the Culture of Health Prize
- **Housing and Transit** – provide safe walking, bicycling and public transit for all; support zoning regulations that encourage high-density neighborhoods; be inclusionary; promote transit-oriented development, learn how structural barriers produce segregated neighborhoods

Figure 59: Achieving Health Equity



Data Source: Robert Wood Johnson Foundation website. Graphic: Developed by the Houston Health Department Office of Planning, Evaluation and Research for Effectiveness.

Many forward thinkers and organizations have developed recommendations for improvement in health equity. Some of the most pertinent recommendations follow.

Businesses and Organizations

Businesses and organizations have a role to play in health equity. Some of the strategies to promote equity by businesses and the government include paying living wages (enough wage to pay for basic needs), fair hiring practices, support of training and capacity building programs, creating local jobs, and developing underutilized or unidentified local assets, including land, to stimulate the economy. Some may serve as anchor institutions in community development so that broad based ownership and a supportive ecosystem can be established. These actions have a direct impact on the health of a community since there is a direct impact on the living conditions.

Private real estate developers can find other solutions to development so that new development does not displace local community residents, bring about loss of jobs and eventually lead to homelessness. Housing instability can result in food insecurity and homelessness. These conditions exacerbate the risk of chronic health conditions including depression. In addition, policy and systems changes that ensure equal pay for equal work, fair hiring, and rising wages for low-wage workers will boost incomes, resulting in more of the consumer spending that drives economic growth and job creation.⁹³

National Equity Atlas

The National Equity Atlas has comprehensive coverage of health disparity concerns, and has developed a list of recommendations:⁹⁴

The National Equity Atlas suggested the following to grow an equitable economy:

- Policies to build communities of opportunity
- Require or incentivize the inclusion of affordable housing within new developments using inclusionary zoning, community benefits agreements, density bonuses, or other tools
- Implement equitable economic development and community wealth-building strategies that bring jobs, sustainable infrastructure, and business opportunities to residents of high-poverty neighborhoods
- Ensure enforcement of fair housing laws and the application of HUD’s commitment to “affirmatively further fair housing”
- Dismantle exclusionary zoning policies and develop new affordable homes in high-opportunity neighborhoods

The Conceptual Model to Promote Health Equity

The *Conceptual Model to Promote Health Equity*, developed by the National Academy of Sciences⁹⁵ and shown in Figure 1, recommends multi-sectoral collaboration involving diverse partners, such as agriculture, banking and finance, business and industry, economic development, education, media, public health, transportation, and workforce development. Many sectors in the community can have a measurable impact on improving health equity: policy makers, employers, media, education, health and health care, criminal justice, community development, and housing and transit.

In this model, partners from diverse sectors are convened so that collective skills and resources can be leveraged for the health and well-being of a community. The public sector can identify and monitor indicators of health equity, build community capacity, organize interventions, and evaluate results. The private sector can create jobs locally to boost the economy and generate innovative solutions to some of the intractable social problems. Some private sector industries thrive on disruption, innovation and paradigm shifts. This type of thinking can promote looking at issues through a different lens and encourage fresh thinking.

The Conceptual Model lists three strategies that need to be adopted by communities to improve health equity:

1. Involvement of all community sectors, to come together and create a shared vision valuing health equity,
2. Building community capacity to provide tools to help residents advocate for themselves, and
3. Emphasizing collaboration across sectors.

The Role of Public Health

Public health has a unique role in bringing positive change to the health inequities in our area.

Some of the actions for public health can include:

- Gathering and reporting data on health inequities in our local area
- Educating the community and policy makers about health inequities in our community, the cost of these inequities to our most vulnerable and to the community as a whole, and steps to take toward solutions
- Providing leadership in convening community members and organizations
- Promoting community capacity building that trains community members and leaders in advocacy skills that will help them to improve their neighborhoods

The following recommendations from CDC were suggested as a blueprint for achieving health equity by state and local health agencies or other organizations.⁹⁶

In 2014, the Health Disparities Subcommittee of the Advisory Committee to the Director of the CDC made a series of recommendations to achieve health equity:

1. Develop a CDC framework for action to achieve health equity
2. Identify and monitor indicators of health equity
3. Align universal interventions that promote better public health with more targeted, culturally tailored interventions in communities at highest risk
4. Support rigorous evaluation of all programs and interventions
5. Build community capacity to implement and sustain programs
6. Support training and professional development of the workforce

As this report shows, the root causes of health and health disparities are many, complex, and often not commonly understood. Addressing these disparities will be important, not only for the health and well-being of those impacted, but also for the overall health and economic prosperity of Houston/Harris County in the future. The aspects of the community that will need to be improved touch every part of life. To make a real difference, many sectors of Houston/Harris County will need to work together toward this goal. This report was developed to increase awareness across the city and county of health inequities and their impact for all of us, and to serve as a basis for planning and action to improve the health and well-being of all who live here.

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”⁹⁷ 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, 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
- 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.

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