HEALTH EQUITY REPORT 2019-2020

Special Feature on Housing and Health Inequalities

U.S. Department of Health and Human Services
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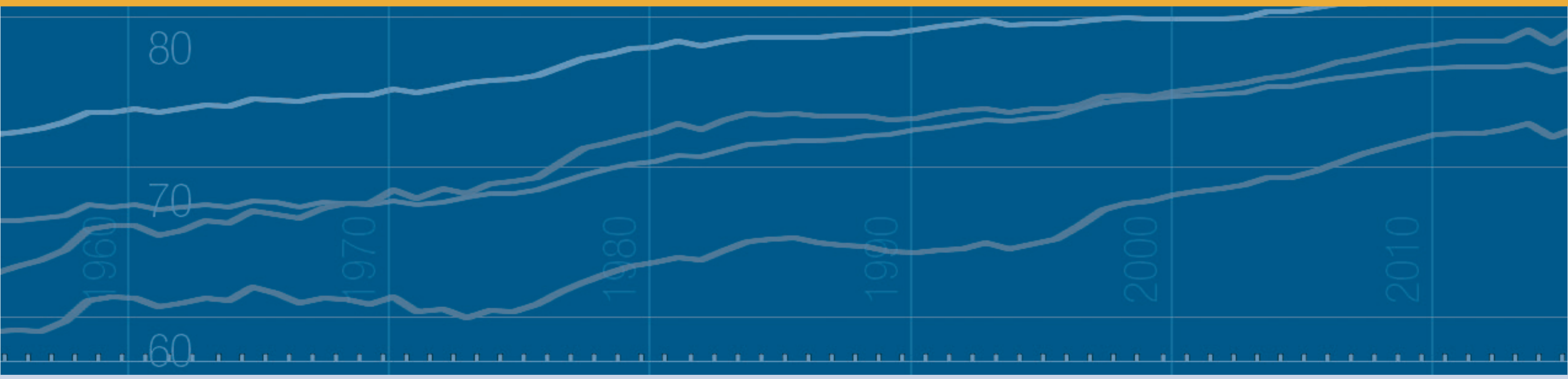
Office of Health Equity



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Foreword

I am pleased to present the *HRSA Health Equity Report 2019-2020: Special Feature on Housing and Health Inequalities*. The report is a comprehensive analysis of HRSA program efforts in reducing health disparities and promoting health equity for various populations at the national, state, and local levels and is the biennial product of a dynamic and ongoing HRSA project. It includes a special feature on housing and health inequalities in the United States, and shows the impact of housing status and housing conditions on population health and health equity. The report also provides ground-level examples of HRSA's coordination of regional efforts, addresses multiple key HRSA Strategic Plan goals, and contains an impressive array of qualitative and empirical data, information, and analysis for a number of vital program areas, including maternal and child health; primary health care access and quality; health care systems; HIV/AIDS; mental and behavioral health; chronic disease prevention and health promotion; health workforce; and rural-urban and geographic disparities.

Systematic monitoring and analysis of health equity data across multiple and complex settings are crucial to understanding incremental improvements that have been made and improvements needed for the nation and HRSA program areas. They are also critical for identifying persistent and emerging patterns of health disparities in order to better identify programs, processes, and solutions. Empirical data presented in this report are essential for evaluating programs and informing HRSA and non-HRSA intervention efforts and represent a significant contribution to the burgeoning field of health equity and social determinants of health.

I hope that the data and information presented in this report will be useful for a wide variety of audiences, including HRSA leadership and program managers; other HHS and federal government agencies; state and local governments and communities; policy and decision makers; public health organizations; health practitioners; grantees; academic institutions; and researchers.

I would like to congratulate the staff from HRSA's Office of Health Equity and other participating Bureaus and Offices for completing this important work. A special note of thanks goes to all the HRSA grantees for their dedicated and tireless efforts in compiling the data and information for various HRSA programs, without which the work on this report would not have been possible.

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Abstract

The 2019-2020 Health Equity Report presents a comprehensive analysis of HRSA's program efforts in reducing health disparities and promoting health equity for various populations at the national, state, and local levels. The Report addresses HRSA's key Strategic Plan goals such as improving access to quality health services; fostering a health care workforce that is able to address current and emerging needs; and achieving health equity and enhancing population health.

The Report presents analyses of various health equity trends affecting the nation's diverse, vulnerable, and socially disadvantaged populations. This report presents trends in health disparities and improvements in health equity for a number of program areas, including maternal and child health, primary health care access and quality, HIV/AIDS, mental and behavioral health, chronic disease prevention and health promotion, health workforce, and rural-urban and geographic disparities. Also addressed are patterns of disparities in several priority areas for HHS: life expectancy, infant mortality, mental health, opioid use, and social determinants of health. Health equity analyses are conducted using a variety of national and HRSA program databases, often stratified by important socioeconomic and demographic characteristics such as gender, race/ethnicity, family structure, education, income, employment status, housing, rural-urban residence, and geographic area/location. On several health outcomes and performance measures, the HRSA programs outperform the national trends by providing greater access to preventive health services, social services, and needed medical care to the underserved and disadvantaged populations and communities in the United States.

Although substantial progress has been made in improving the health and well-being of all Americans, health inequities between population groups and geographic areas have persisted and remain marked. Substantial disparities by social determinants, including housing, are found for a number of health indicators, including infant mortality, life expectancy, cardiovascular disease, cancer, diabetes, chronic obstructive pulmonary disease, kidney disease, Alzheimer's disease, HIV/AIDS, health care access and utilization, health insurance, disability, mental health, preventive health services, smoking, obesity, substance use, drug overdose mortality, suicide, homicide, and unintentional injuries.

Chapter 1. Introduction

Achieving health equity, reducing and eliminating health disparities, and ensuring optimal health for all Americans are overarching goals of HHS and its component agencies.[1] HRSA is the primary federal agency for improving access to quality health care services and population health and achieving health equity. HRSA's programs provide health care to people who are geographically isolated and economically or medically vulnerable.

The 2019-2020 Health Equity Report provides a comprehensive analysis of HRSA's program efforts aimed at narrowing the health gap and achieving health equity for various populations at the national, state, regional, and local levels. The new report provides an update of HRSA's program activities and successes in the field of health equity and population health since the publication of the 2017 Health Equity Report.[2] The report addresses HRSA's key Strategic Plan goals such as improving access to quality health services; fostering a health care workforce that is able to address current and emerging needs; and achieving health equity and enhancing population health. The 2019-2020 Report includes a special feature on housing and health inequalities that presents empirical evidence linking various aspects of housing and neighborhood conditions to health, disease, and health care disparities in the United States by analyzing national and HRSA program data. Improvements in housing and neighborhood conditions have long been key policy measures to improve population health and to reduce health disparities among populations.[3, 4]

Health equity is defined as the absence of disparities or avoidable differences among socioeconomic and demographic groups or geographic areas in health status and health outcomes such as disease, disability, or mortality. Health inequities refer to inequalities that are unfair, unjust, avoidable or unnecessary, and that can be reduced or remedied through policy action.[5, 6] The concepts of health inequities and health disparities (broadly defined as systematic differences in health between social groups) are generally similar in that they both involve normative judgements about the nature of social-group differences.[6]

The report presents a current picture of and progress made in addressing health equity issues affecting the nation's diverse, vulnerable, and socially disadvantaged populations. The report includes evidence-based analysis of HRSA's programs in reducing health disparity and improving health equity among populations at the national, state, regional, and local levels in such areas as maternal and child health, primary health care access and quality, HIV/AIDS, mental and behavioral health, chronic disease prevention and health promotion, health workforce, and rural-urban and geographic disparities. Where possible, the report compares key health indicators and performance measures based on HRSA program data with those at the national level. To facilitate health equity analysis and reporting, both aggregate- and individual- level national and HRSA program data are presented by important social and demographic characteristics such as gender, race/ethnicity, family structure, education, income, employment status, housing tenure, housing costs, housing instability, household crowding, rural-urban residence, and geographic area/location.

The report makes an important and unique contribution to the health equity and population health field. It highlights the important investments and contributions made by HRSA in promoting health equity and reducing disparities across the nation by improving access to comprehensive health care services through its various programs, including the Health Center Program, the Ryan

White HIV/AIDS Program (RWHAP), the Health Workforce Programs, the Federal Office of Rural Health Policy (FORHP), the Title V Maternal and Child Health (MCH) Services Block Grant Program, the Maternal, Infant, and Early Childhood Home Visiting Program, and the Office for the Advancement of Telehealth. The Health Center Program aims to improve the health of the nation's underserved communities and vulnerable populations by assuring access to comprehensive, culturally competent, quality primary health care services. More than 28 million people, i.e., 1 out of 12 people who reside in the United States, received primary care services through the Health Center Program in 2018.[7] The RWHAP works with cities, states, and local community-based organizations to provide HIV care and treatment services to more than 535,000 people with diagnosed HIV in the United States. The RWHAP reaches more than 50 percent of all people diagnosed with HIV in the United States and the majority of program clients are from low-income and racial/ethnic-minority groups.[8] The Title V Program, one of the largest federal block grant programs, addresses the health services needs of more than 56 million mothers and children in the United States, including pregnant women, infants, and children with special health care needs.[9] The Health Workforce Program improves the health of underserved and vulnerable populations by strengthening the health workforce and connecting skilled professionals to communities in need. In fiscal year (FY) 2019, approximately 13,053 National Health Service Corps and 1,930 Nurse Corps clinicians provide primary medical, dental or mental health care to over 13 million people living in health professional shortage areas nationwide.[10] The Telehealth Program, administered by FORHP, promotes the use of telehealth technologies for health care delivery, education, and health information services in rural and other remote areas that lack sufficient health care services, including specialty care.[11]

HRSA developed the graphics and maps of key population health indicators and social determinants at various geographic levels such as state, county, and ZIP code levels using national and HRSA program data. These charts, maps, and tables identify and highlight health and social inequities that exist across demographic groups, geographic areas, and HRSA program sites. Demographic trends and geographic maps of specific health and social indicators over time show the magnitude of improvements in health and living conditions for HRSA program areas and for different regions of the United States. They also show changing patterns of disease burden and social disadvantage, and the potential impact of programmatic interventions and policies in reducing disparities and achieving health equity for the nation.

The report presents time trend and geographic data on leading health and health care indicators such as infant mortality, life expectancy, cardiovascular disease, cancer, diabetes, chronic obstructive pulmonary disease (COPD), kidney disease, HIV/AIDS, health care access and utilization, health insurance, disability, preventive health services such as cervical and colorectal cancer screening, mental health, suicide and depression rates, homicide, and unintentional injuries. Also presented are disparities in major health risk behaviors such as smoking, obesity, physical inactivity, and inadequate access to healthy diet. Key social determinants of health (SDOH) include racial/ethnic population composition, educational attainment, unemployment, poverty, family income, immigrant status, language use, housing, transportation, and computer and internet access. Several of these indicators are mapped to describe patterns of inequities in social and economic conditions that HRSA populations experience.

A variety of federal national and HRSA program databases are used for analysis and reporting of health, health care, behavioral, and sociodemographic disparities. For health and health care disparities at the national level and for HRSA populations, the following databases are used:

- The National Vital Statistics System;
- The CDC Wonder online databases;

- Behavioral Risk Factor Surveillance System;
- National Health Interview Survey;
- National Longitudinal Mortality Study;
- County Health Rankings and Roadmaps;
- USDA Food Environment Atlas;
- HRSA Data Warehouse;
- Area Health Resources File;
- Title V Information System;
- The National Survey of Children's Health;
- Data Resource Center for Child & Adolescent Health;
- Health Center Program data; and
- RWHAP data.

For socioeconomic, demographic, housing, health insurance, and disability data for the United States and at state, county, and ZIP code levels, decennial Census and American Community Survey (ACS) databases are used.

The contents of the report are organized into various chapters. The introduction precedes a description of SDOH in Chapter 2, which are shown to have profound effects on health and well-being at the individual and community levels for both national and HRSA program populations. Chapter 3 presents empirical evidence linking several aspects of housing to health, morbidity, and health-risk factors in the United States, using both individual- and county-level data. Both material and psychosocial aspects of housing, such as those related to housing tenure, housing quality, lack of safe and affordable housing, housing instability, and neighborhood housing conditions, are shown to be associated with health and health care inequalities. Chapter 4 presents life expectancy estimates and all-cause and cause-specific mortality rates in the United States by housing tenure, using national longitudinal mortality data. This chapter also examines the association between various housing variables (such as home ownership, severe housing problems, housing cost burden, household crowding, housing stability, and residential segregation) and life expectancy and cause-specific mortality rates at the area level.

Chapters 5 through 10 provide descriptions of major programs, policy and research initiatives, and analyses of health equity data in maternal and child health; primary health care access and quality; organ donation and transplantation; HIV/ AIDS; mental and behavioral health; chronic disease prevention and health promotion; health workforce; and rural-urban and geographic disparities. Chapter 11 describes the intersection of HRSA programs and civil rights, its regional visibility and impact, and an example of how HRSA supports the future of sustainable, cross-agency housing and health initiatives. The final chapter summarizes major findings on health equity and population health issues as well as progress on efforts to promote health equity and health improvement; and provides recommendations and future directions for more comprehensive health equity data collection and measurement strategies, better reporting and monitoring of key social determinants and health outcomes, and opportunities for cross-sectoral efforts, partnerships, and collaborations across agencies.

The Health Equity Report is intended for a wide variety of audiences who are committed to promoting equity and reducing disparities in health and well-being among nation's diverse and vulnerable populations. The targeted audiences include the HRSA leadership and program managers, other HHS and federal government agencies, state and local governments and communities, policy and decision makers, public health organizations, health practitioners, grantees, academic institutions, and researchers.

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Chapter 2. Social Determinants of Health: National Trends and Patterns

Achieving health equity involves examining the existence of and reduction of inequities in health, health care access, and use of quality health services according to major SDOH over time.[1] HHS and HRSA have a long history of examining social inequities in health, disease, and mortality; building related data monitoring capacity; and developing programs aimed at reducing health inequities among populations that experience increased risk of poor health based on race/ethnicity, gender, socioeconomic status, insurance status, rural/urban residence, and housing status.[1-7] Although HRSA was created in 1982, several programs have existed for decades. For example, since its inception in 1935, HRSA's Maternal and Child Health Bureau's Title V Maternal and Child Health Services Block Grant Program, has promoted improving the health and welfare services for all mothers and children in the United States.[8, 9] For over 50 years, HRSA's Health Center Program has provided access to quality health care services to millions of Americans, who live in underserved communities and who are among the most socially disadvantaged segments of the population.[10]

Since the establishment of the Ryan White Comprehensive AIDS Resources Emergency (CARE) Act in 1990, the Ryan White HIV/AIDS Program has improved the quality and availability of care and health outcomes for low-income, uninsured, and minority populations living with HIV.[11]

Social Determinants of Health

SDOH are conditions in the social environment in which people are born, live, learn, work, and play that affect a wide range of health, functioning, and quality-of- life outcomes and risks.[2, 7, 12] These social and/or demographic characteristics of individuals, groups, communities, and societies have been shown to have powerful influences on health and well-being at the individual and population levels. Examples of individual or group-level social determinants include gender, race/ethnicity, socioeconomic status, social class, education, income, occupation, employment status, housing tenure, immigrant status, language use, disability status, and social capital. Examples of social determinants at the population level include socioeconomic deprivation, poverty rate, income inequality, educational opportunity, labor market structure, affordable housing, neighborhood housing conditions, access to healthy foods/good nutrition, provision of health services, access to essential goods and services, transportation infrastructure, physical and built environments, racial/ethnic population composition, medically underserved or health professional shortage areas, and spending on public safety, social and welfare services. Social determinants at the population level are considered fundamental determinants of health and disease and are amenable to change through public policy.[7, 13, 14]

Population Health Research

Population Health Research is concerned with investigation of differences in health status and health determinants among social and demographic groups and geographically-defined populations. This approach involves examining interrelationships between the distribution of social, economic, demographic, cultural, political, and other valued societal resources and health at the community level and is aimed at improving the health of the entire population rather than individuals.[7, 14, 15] The causes of health inequities at the population level may differ from those at the individual level.[7, 14, 15]

Remarkable achievements have been made in improving the overall health of the U.S. population during the past several decades, particularly in terms of increasing the life expectancy and reducing overall mortality among Americans.[1, 3, 4, 7, 16] However, substantial variations in health among various social groups and geographic areas continue to exist, and, in many instances, health disparities appear to be widening.[1, 3, 4, 7, 9, 17-24] Social factors, whether expressed in terms of education, occupation, income, wealth, social class, ethnicity, family structure, or living arrangements, remain fundamental determinants of health and disease. While these social characteristics themselves may not be direct determinants of health, they can create conditions or circumstances that give rise to risk factors (e.g., smoking, alcohol and drug use, unhealthy diet, lack of physical activity, obesity, and hypertension) which cause disease, ill health, and death.[7, 14, 23] The social determinants involve such resources as "knowledge, money, power, prestige, and social connections that strongly influence people's ability to avoid risks and to minimize the consequences of disease once it occurs".[25] Inequities in health are closely linked to social inequities through several intervening mechanisms, including health behaviors, medical care, working conditions, environmental exposure, personality, and early life conditions.[26, 27] Emphasizing the role of SDOH is important for several reasons.[14, 28] First, documenting health disparities between the least and most advantaged social groups can tell us about the extent to which a society's health can be improved. However, health inequities are not just about addressing differences between the rich and the poor. Rather, the consistently inverse socioeconomic gradients in health found across many industrialized societies indicate that the health deficit of a population is concentrated in the middle classes because of the large numbers of people in those categories.[14, 15]

To achieve health equity and to maximize health improvement, it therefore makes sense to focus on health differences across the entire social hierarchy or socioeconomic continuum. Second, documenting health inequities according to social factors can help identify social groups who are at greatest risk of poor health and who are therefore in need of social and medical services. Third, considering social factors along with behavioral and health care factors can help us understand the mechanisms through which social factors affect health. A better understanding of the pathways through which social determinants influence health and disease outcomes should help us develop and implement more effective social and public health interventions for population health improvement.[14, 15]

National Level Patterns and Trends in Health Disparities

The following charts and tables show marked racial/ethnic and socioeconomic disparities in infant mortality, life expectancy, leading causes of death such as cardiovascular disease (CVD), cancer, injuries, drug overdoses, chronic disease prevalence, immigrant health, health care access and unmet medical need. Disparities by race/ethnicity, socioeconomic status, social disadvantage, and geography persist despite overall health improvements in the United States.

Disparities in Social Determinants of Health

Several of the Nation's racial and ethnic minorities have historically been disadvantaged in terms of social and economic attainment. The 2017 data from the American Community Survey in Figure 2.1 indicate 2 times higher poverty rates among American Indians/Alaska Natives (AIANs) (25.4 percent), African Americans/Blacks (23.0 percent), Hispanics (19.4 percent), and Native Hawaiians and other Pacific Islanders (18.3 percent), compared with non-Hispanic Whites (9.6 percent).[29] Unemployment rates are more than 2 times higher among AIANs (10.2 percent) and Blacks (9.5 percent), compared with non-Hispanic Whites (4.2 percent). Hispanics (6.0 percent) and Native Hawaiians and other Pacific Islanders (6.2 percent) have approximately 50 percent higher unemployment rates than non-Hispanic Whites. There are substantial disparities in educational attainment; 53.8 percent of Asian Americans in 2017 had a college degree, compared with 35.8 percent of non-Hispanic Whites, 23.0 percent of Blacks, 14.7 percent of AIANs, 17.7 percent of Native Hawaiians and other Pacific Islanders, and 16.0 percent of Hispanics.[29]

Ethnic-minority groups are also more likely to live in low-income and disadvantaged neighborhoods and communities than their non-Hispanic White counterparts.[24] Geographic patterns in educational attainment indicate that the population in the Southeastern region of the U.S. has the lowest percentage of adults with a college degree although education levels in all regions have improved over time (Figure 2.2). The geographic pattern in poverty rates has remained essentially the same over time, with communities in the Southeastern and Southwestern regions experiencing higher poverty rates than those in the other regions of the U.S. (Figure 2.3). The unemployment maps shows wide geographic disparities. Many ZIP codes and counties in the Southeastern, Southwestern, and Western United States had at least 9 percent of their workforce unemployed during 2013-2017 (Figure 2.4).

Ethnic-minority groups are more likely to be without health insurance than non-Hispanic Whites. In 2017, 5.9 percent of non-Hispanic Whites lacked health insurance, compared with 10.0 percent of Blacks, 19.3 percent of AIANs, 17.8 percent of Hispanics, 6.6 percent of Asians, and 10.5 percent of Native Hawaiians and other Pacific Islanders (Figure 2.1). Access to health insurance also varies by education, income, employment status, nativity/ immigrant status, and geographic area. In 2017, 21.3 percent of adults with less than a high school education lacked health insurance, compared with only 3.7 percent of adults with a college degree. About 27.0 percent of unemployed individuals lacked health insurance, compared with 10.9 percent of employed individuals. In 2017, 15.4 percent of those with income levels below 138 percent of the poverty threshold were uninsured, compared with 3.4 percent of those with incomes at or above 400 percent of the poverty threshold.[29] One in five immigrants lacked health insurance, compared with 7.0 percent of U.S.-born individuals. Nearly 32 percent of immigrants who were not a U.S. citizen were without health insurance in 2017. Wide geographic disparities in access to health insurance can be seen in Figure 2.5, with many ZIP codes in the Southeastern and Southwestern, and Western U.S. having high rates of uninsurance among children and adults during 2013-2017.

Disability status is an important SDOH. Adults with disabilities have higher all-cause mortality and mortality from several leading causes of death such as heart disease, cancer, stroke, COPD, unintentional injuries, suicide, and homicide.[30] Disability is also strongly associated with poor health status and psychological distress and increased health care utilization, including hospital stay.[29, 31, 32] Disability rates vary significantly by race/ethnicity, nativity/ immigrant status, education, income, employment status, and geographic area.[33] Marked geographic disparities in rates of overall disability and cognitive disability can be noted in Figure 2.6, with many ZIP codes in the Southeastern and Appalachian regions of the U.S. showing high rates of overall disability and cognitive/mental disability. Appalachia is a geographically based cultural region in the eastern U.S., covering 428 counties, including all counties in West Virginia and some counties in Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia.[22] Appalachia has historically been recognized as a socially and economically disadvantaged region.[22]

Digital Divide: Disparities in Access to Computer and Broadband Internet

Access to and use of computers as well as internet are widespread and have had a considerable impact on many aspects of social and economic life in the U.S. during the past 2 decades.[34] Both computer and internet use have had profound effects not only on individual empowerment, educational attainment, economic growth, and community development, but also on accessing health care, health-related information, and health education and promotions efforts, and, as such, has come to be seen as an important SDOH.[34, 35]

Among all households in 2017, 91 percent had a computer, which includes smartphones, and 84 percent had a broadband Internet subscription.[29] Despite the high levels of overall access in the United States, there are significant disparities in computer and Internet use by sociodemographic characteristics. Persons aged 65 and older are substantially less likely to have access to computer and broadband Internet than those younger than age 65.[34] In 2016, Asian households (95 percent) were more likely and Black households (84 percent) less likely than other racial/ethnic groups to own or use a computer (including smartphones). More than 90 percent of Asian households had broadband subscription, compared with 72 percent of Black households, 77 percent of Hispanic households, and 83 percent of non- Hispanic White households.[34] Household education and income are strongly linked to both computer and Internet use. Persons with less than a high school education were 30 percent less likely to own or use a computer than those with a college degree (69 percent vs. 97 percent). Persons with less than a high school education were 40 percent less likely to have a broadband subscription than those with a college degree (56 percent vs. 93 percent). Disparities in computer and Internet use by income were similar. In 2016, more than 96 percent of households with incomes more than $150,000 had a broadband Internet subscription, compared with 58 percent for households with incomes less than $25,000.[34] During 2013-2017, there were marked geographic disparities in computer and Internet use, with many ZIP codes in the Southeast, Southwest, Appalachia, Upper Midwest, and the rural United States having lower access to computer and broadband Internet (Figure 2.7).

Disparities in Life Expectancy

Life expectancy at birth has improved substantially during the past 7 decades, increasing from 68.2 years for the total U.S. population in 1950 to 78.6 years in 2017.[7, 16] However, despite the overall improvement, Black-White and gender disparities in life expectancy persist (Figure 2.8). In 1950, Blacks had a life expectancy of 60.8 years compared with 69.1 years for Whites. In 2017, the Black and White life expectancies were 76.0 and 79.1 years respectively. In 1950, the life expectancy at birth for White males, White females, Black males, and Black females were 66.2, 72.2, 59.1, and 62.9 years respectively. In 2017, the corresponding figures for these race-gender groups were 76.7, 81.6, 72.6, and 79.3 years.

In 2017, AIANs had a lower life expectancy (74.3 years) than non-Hispanic Whites (78.8), non-Hispanic Blacks (76.0), Asian/Pacific Islanders (APIs) (87.8), and Hispanics (83.7) [Figure 2.9]. Life expectancy among males ranged from a low of 71.3 years for AIANs to a high of 85.4 years for APIs. Life expectancy among females ranged from a low of 77.4 years for AIANs to a high of 89.8 years for APIs. During 2012-2016, life expectancy varied inversely in relation to county poverty levels for the total U.S. population and for White and Black populations (Figure 2.10). In the United States, residents of high-poverty areas (county poverty rate greater than or equal to 20 percent) had a life expectancy of 76.7 years, 6.2 years shorter than the life expectancy for the residents of low-poverty areas (county poverty rate less than 5 percent). When stratified by gender, race, and poverty level, life expectancy in 2012-2016 ranged from 71.0 years among Black men in high- poverty areas to 84.6 years among White women in low-poverty areas of the United States.

Disparities in Infant Mortality

The infant mortality rate in the United States has declined dramatically over the past several decades, from a rate of 55.7 per 1,000 live births in 1935 to 5.8 in 2017, at an average annual rate of decline of 3.1 percent per year.[9] Mortality rates have declined impressively over time for both White and Black infants. However, the racial disparity has continued to grow in relative terms (Figure 2.11). In 2017, the mortality rate for Black infants was 10.8 per 1,000 live births, 2.2 times higher than the mortality rate of 4.8 for White infants. In 1935, the infant mortality rate for Black infants was 81.9 per 1,000 live births, 1.6 times higher than the mortality rate of 51.9 for White infants.

Socioeconomic disparities in infant mortality rates have widened over time as more educated or higher-income groups have seen a larger decline in mortality than less educated or less-affluent groups.[9] In 2016, infant mortality rates varied inversely by levels of maternal education for all racial/ethnic groups (Figure 2.12). For example, the infant mortality rate for mothers without a high school diploma was 3.4 times higher than the rate for mothers with a college degree (11.4 vs. 3.4). Simultaneous examination of racial/ethnic and education disparities indicates a 4-fold difference in infant mortality, with the rates varying from 2.9 for non-Hispanic White and Asian/Pacific Islander mothers with a college degree to 13.4 for Black mothers without a high school diploma. Maternal educational disparities in postneonatal mortality were greater than those in neonatal mortality are. Non-Hispanic White and API mothers without a high school diploma had 5.2 and 3.4 times higher postneonatal mortality rates than their counterparts with a college degree, respectively (Figure 2.12).

Disparities in Mortality from Leading Causes of Death

Heart disease, cancer, unintentional injuries, COPD, stroke, Alzheimer's disease, diabetes, influenza and pneumonia, kidney disease, and suicide were the 10 leading causes of death and accounted for 74.2 percent of all deaths in the United States in 2017.[16] There are marked gender, racial/ethnic, socioeconomic, and geographic disparities in all-cause mortality and mortality from leading causes of death.[7, 16] For example, although CVD (including heart disease and stroke) mortality rates declined for all major racial/ethnic groups over the past 3 decades, in 2017, compared with non-Hispanic White, Blacks had 26 percent higher CVD mortality and APIs, AIANs, and Hispanics had 28-42 percent lower mortality (Table 2.1). Geographic (county-level) maps on all-cause and CVD mortality show higher risks of mortality in the Southeastern region of the United States even though mortality rates have declined in all regions and states (Figures 2.13 and 2.14).[7]

CVD mortality rates are higher in areas with higher unemployment levels or lower socioeconomic status.[19-21] For example, during 2012-2016, individuals aged 25-64 in high-unemployment areas (unemployment rate greater than or equal to 9 percent) had 79 percent higher CVD mortality rates than those in low-unemployment areas (unemployment rate less than 3 percent). We see similarly consistent unemployment patterns in CVD mortality for non-Hispanic White, Blacks, APIs, and Hispanics (Figure 2.15).

Between 1990 and 2017, mortality declined for all cancers combined and for all major cancer sites, including lung, colorectal, prostate, breast, cervical, and brain cancer, and non-Hodgkin's lymphoma. Compared with Whites, cancer mortality rates in 2017 were 9 percent higher for Blacks but 37 percent lower for AIANs, 40 percent lower for APIs, and 32 percent lower for Hispanics (Table 2.1).

Racial/ethnic disparities in cancer mortality differed by cancer type and over time. In 1990, the mortality rate for lung cancer was 26 percent higher for Blacks than for non-Hispanic Whites, whereas in 2017, the rate was 6 percent lower for Blacks than for non-Hispanic Whites. This difference is because of the faster decline in lung cancer mortality among Blacks compared with Whites (47.7 percent vs. 30.0 percent). In both 1990 and 2017, compared with non-Hispanic Whites, lung cancer mortality among AIANs, APIs, and Hispanics was substantially lower. In 2017, the rates of mortality from colorectal, prostate, breast, and cervical cancer were, respectively, 30 percent, 101 percent, 34 percent, and 69 percent higher for Blacks than for non-Hispanic Whites (Table 2.1). Geographic maps on all-cancer mortality show a substantial decline in mortality between 1998 and 2017 for most counties, with higher risks of all-cancer mortality in the Southeastern region and eastern half of the United States (Figure 2.16).

COPD mortality is highest among non-Hispanic Whites, who had a 4-fold higher mortality risk than APIs in 2017. COPD mortality was 33-63 percent lower in Blacks, AIANs, and Hispanics compared with non-Hispanic Whites (Table 2.1). Mortality rates for COPD increased for the total population as well as for non-Hispanic Whites, Blacks, and AIANs and decreased for APIs and Hispanics between 1990 and 2017 (Table 2.1). The county map shows higher COPD mortality rates in Appalachia, the Southeast, and Western parts of the United States (Figure 2.17).

Diabetes mortality increased between 1990 and 2017, with the rates showing an upward trend from 2014 to 2017.[16] During 1990-2017, whereas diabetes mortality declined for Blacks, AIANs, and Hispanics, it increased by 8.6 percent for non-Hispanic Whites and by 13.8 percent for APIs (Table 2.1). In 2017, compared with non-Hispanic Whites, diabetes mortality was 2 times higher among Blacks, 83 percent higher among AIANs, 35 percent higher among Hispanics, and 13 percent lower among APIs. The county map shows higher rates of diabetes mortality in the Southeast, Southwest, and Appalachian regions than elsewhere in the United States (Figure 2.17).

During 1990-2017, nephritis (kidney disease) mortality increased by 41 percent for the total U.S. population and by 52 percent for non-Hispanic Whites, 25 percent for Blacks, 21 percent for APIs, and 35 percent for Hispanics (Table 2.1). In 2017, compared with non-Hispanic Whites, Blacks had 2.1 times higher kidney disease mortality and APIs had 28 percent lower mortality. The geographic maps indicate a significant rise in kidney disease mortality of many counties during 1990-2017, with the Southeastern and Eastern United States having substantially increased rates of mortality (Figure 2.18).

There are marked racial/ethnic disparities in chronic liver disease and cirrhosis mortality, for which alcohol consumption is a major risk factor. In 2017, compared with non-Hispanic Whites, the risk of cirrhosis mortality was 2.3 times higher for AIANs, 27 percent higher for Hispanics, 36 percent lower for Blacks, and 67 percent lower for APIs (Table 2.1). County maps on cirrhosis mortality show a similar geographic pattern in mortality over time, with the Southeastern, Southwestern, and Western regions of the United States having higher risks of cirrhosis mortality (Figure 2.19). Cirrhosis mortality rates are higher in areas with higher unemployment levels. During 2012-2016, individuals aged 25-64 in high-unemployment areas (unemployment rate greater than or equal to 9 percent) had 50 percent higher cirrhosis mortality rates than those in low-unemployment areas did (unemployment rate less than 3 percent). Gradients in cirrhosis mortality by unemployment level were especially marked among non-Hispanic Whites, who had 81 percent higher mortality in high-unemployment areas than in low-unemployment areas (Figure 2.15).

Although HIV/AIDS mortality declined dramatically between 1990 and 2017, racial/ethnic disparities remain substantial. While HIV/AIDS is not a leading cause of the death for the total U.S. population, it is the sixth leading cause of death among the Black population aged 20-54 years.[1, 7, 16] In 2017, HIV/AIDS mortality was 8.8 times higher among the Black population and 2.2 times higher among Hispanics compared with non-Hispanic Whites (Table 2.1).

Mortality from Alzheimer's disease has been increasing steadily since the 1980s; Alzheimer's disease is currently the sixth leading cause of death in the United States.[16] Between 1990 and 2017, Alzheimer's disease mortality rates increased by 390 percent for the total population, 406 percent for non-Hispanic Whites, 601 percent for Blacks, 764 percent for AIANs, 671 percent for APIs, and 857 percent for Hispanics (Table 2.1). In 2017, non-Hispanic Whites had the highest Alzheimer's disease mortality rate (32.8 deaths per 100,000 population), 18 percent higher than the rate for Blacks, 99 percent higher than the rate for AIANs, 116 percent higher than the rate for APIs, and 33 percent higher than the rate for Hispanics.

The county map indicates higher rates of Alzheimer's mortality in the Southeastern region of the United States (Figure 2.20).

Pneumonia and influenza mortality has declined substantially during the past 5 decades.[16] However, it remains the eighth leading cause of death in the United States. Between 1990 and 2017, pneumonia and influenza mortality declined by 61 percent for the total population, 58 percent for non-Hispanic Whites, 62 percent for Blacks, 66 percent for AIANs, 58 percent for APIs, and 62 percent for Hispanics (Table 2.1). In 2017, Blacks had the highest mortality rate, followed by non-Hispanic Whites, AIANs, APIs, and Hispanics. The county map shows higher rates of pneumonia and influenza mortality in the Southeastern region than elsewhere in the United States (Figure 2.20).

Between 1990 and 2017, unintentional injury mortality rates rose by 32 percent for the total population and 63 percent for non-Hispanic Whites (Table 2.1). During the past 20 years, 2 countervailing trends characterized the overall trend in unintentional injury mortality. Marked declines in mortality from motor-vehicle accidents were offset by steep increases in drug overdose mortality leading to a rising overall trend in unintentional injury mortality.[7] In 2017, non-Hispanic Whites and AIANs had the highest unintentional injury mortality rates, followed by Blacks, Hispanics, and APIs. County maps indicate higher rates of unintentional injury mortality in the Western and Appalachian counties, with rates increasing in several parts of the United States (Figure 2.21).

Non-Hispanic Whites have a 2.7 times higher suicide rate and AIANs have a 2.0 times higher suicide rate than Blacks (Table 2.1). There has been an upward trend in suicide mortality, with rates increasing consistently from 10.5 in 1999 to 14.0 per 100,000 population in 2017.[16] Geographic maps show higher suicide mortality rates in many counties of the Western United States, with suicide risks increasing over time in the Western and Appalachian regions (Figure 2.22).

Homicide is the third leading cause of death among the American youth aged 15-34. Between 1990 and 2017, age-adjusted homicide rates declined by 35 percent for the total population, 25 percent for non-Hispanic Whites, 41 percent for Blacks and for AIANs, 66 percent for APIs, and 67 percent for Hispanics. In 2017, the overall homicide rate was 7.3 times higher among Blacks, 2.2 times higher among AIANs, 1.8 times higher among Hispanics, and 43 percent lower among APIs, compared with non-Hispanic Whites (Table 2.1). Homicide rates are higher in the Southeast and Southwest regions than elsewhere in the United States (Figure 2.23). Homicide rates are higher in areas with higher unemployment levels. During 2012-2016, individuals aged 25-64 in high-unemployment areas (unemployment rate greater than or equal to 9 percent) had a 4.5 times higher homicide mortality rate than those in low-unemployment areas (unemployment rate less than 3 percent). Marked and consistent gradients in homicide rates by unemployment level were found for all major racial/ethnic groups (Figure 2.15).

Drug overdose mortality

Drug overdose deaths, driven primarily by illicit and prescription opioids, contributed significantly to the recent rise in mortality among middle-aged White Americans and to declining life expectancy among men and women in the United States.[36-38] Rising deaths from drug overdose have been identified as a major public health problem in the United States and a national emergency.[1, 36, 37] Figure 2.24 shows increasing trends in drug overdose mortality among all major racial/ethnic groups. The average rate of increase in drug overdose mortality during 1999-2017 was the fastest among non-Hispanic Whites (7.6 percent per year), followed by AIANs (6.1 percent), APIs (5.9 percent), Blacks (3.6 percent), and Hispanics (3.3 percent). In 2017, non-Hispanic Whites had the highest rate of drug overdose mortality (27.5 deaths per 100,000 population), 39 percent higher than the rate for Blacks, 7.8 times higher than the rate for APIs, and 2.6 times higher than the rate for Hispanics. Figure 2.25 shows rapid increases in drug overdose mortality during 1999-2007 in both metropolitan/urban and non-metropolitan/rural areas of the United States, with significantly higher rates in urban areas than in rural areas in 2016 and 2017. Figure 2.26 shows steep increases in drug overdose mortality between 1999 and 2017 for all 9 geographic regions, with residents of the New England, Middle Atlantic, and East North Central regions (primarily the east coast region of the United States) experiencing the greatest mortality increase (149 percent to 220 percent increase) during 2009-2017. Regional patterns have changed and geographic disparities in drug overdose mortality have widened over time. In 2017, the New England, Middle Atlantic, and East North Central regions had the highest drug-overdose mortality rates, while the Mountain and Pacific regions had the lowest mortality rates.[36]

Disparities in Life Expectancy, Cause-Specific Mortality, and Chronic Disease Risk Factors by Immigrant Status

The U.S. immigrant population has grown considerably in the past 5 decades, from 9.6 million in 1970 to 44.5 million in 2017.[29, 39, 40] Immigrants currently account for 13.7 percent of the total U.S. population, the highest percentage in 8 decades.[29, 40] The rapid increase in the immigrant population in recent decades reflects large-scale immigration from Latin America and Asia.[39, 40] Consequently, the immigrant population has become more heterogeneous in its ethnic and county-of-birth composition.[39] Currently, 51 percent of U.S. immigrants are from Latin America, 31 percent from Asia, 11 percent from Europe, 5 percent from Africa, and 2 percent from North America.[29, 39] Since 2008, immigrants from Asia have outnumbered those from Latin America.[29, 39]

A number of studies have shown that immigrants have better infant, child, and adult health, higher life expectancy, and lower disability and mortality rates than U.S.-born individuals.[39-41] Healthy immigrant effect, a lower prevalence of many health-risk behaviors, including lower rates of smoking, drinking, obesity, and better diet, and higher levels of social and familial support and social integration among immigrants, compared to the U.S.-born, have been cited as factors explaining the immigrant health advantage.[39-41]

Figure 2.27 shows consistently widening life expectancy differences between immigrants and the U.S.-born from 1979 to 2017. In 2017, immigrants lived 6.0 years longer than the U.S.-born (84.1 vs. 78.1 years). Immigrants lived longer than the U.S.-born by 2.3 years in 1979-1981, 2.8 years in 1989-1991, 3.4 years in 1999-2001, 5.6 years in 2011-2013, and 6.0 years in 2017. Differences in age-specific survival functions for nativity/immigrant groups indicate that the U.S.-born population not only had worse survival experiences than the immigrant population in 2017 but they experienced similar survival probabilities as those enjoyed by the immigrant population almost 4 decades earlier (Figure 2.28).

In 2017, immigrants experienced 36 percent lower all- cause mortality than their U.S.-born counterparts (Figure 2.29). Compared with the U.S.-born, immigrants had 30 percent lower mortality from CVD, 27 percent lower mortality from cancer, 17 percent lower mortality from diabetes, 63 percent lower mortality from COPD, 38 percent lower mortality from cirrhosis, 32 percent lower mortality from kidney disease, 42 percent lower mortality from HIV/AIDS, 54 percent lower mortality from unintentional injuries, 79 percent lower mortality from drug overdose, 32 percent lower mortality from motor vehicle accidents, 54 percent lower mortality from suicide, and 50 percent lower mortality from homicide.

Smoking, obesity, physical inactivity, and hypertension are major risk factors that are associated with increased risk of mortality and morbidity from several chronic diseases such as CVD, cancer, diabetes, and COPD. In 2014-2016, compared with the U.S.-born, immigrants had a 50 percent lower rate of smoking, 26 percent higher rate of physical inactivity, 32 percent lower rate of obesity, 46 percent lower rate of moderate/heavy drinking, and 16 percent lower rate of hypertension (Figure 2.30). However, consistent with the acculturation hypothesis, increasing duration of residence in the United States was generally associated with higher rates of health-risk behaviors among immigrants.

Disparities in Prevalence of Major Chronic Conditions and Risk Factors

Heart disease, cancer, diabetes, and COPD are the leading chronic diseases affecting the U.S. adult population.[1, 7] Overall, 28.2 million or 10.6 percent of U.S. adults aged 18 and over in 2017 had ever been told by a doctor or other health professional that they had heart disease (Table 2.2).[31] All racial/ethnic groups, except mixed-race, reported significantly lower heart disease prevalence than Whites. Unemployed adults had 87 percent higher heart disease prevalence than adults with full-time employment. Those with lower education and income levels had higher heart disease prevalence than their high education or income counterparts.

Residents of rural/nonmetropolitan areas had a 29 percent higher heart disease prevalence than urban/metropolitan residents.

The prevalence of diabetes in the United States has more than doubled during the past 2 decades.[1, 7] In 2017, 23.2 million or 8.8 percent of adults aged 18 and over reported having diabetes. In 2017, the prevalence of physician-diagnosed diabetes varied from 8.3 percent for White adults to 16.6 percent for AIANs (Table 2.2). Compared with Whites, Blacks, AIANs, and Hispanics had 37 percent, 100 percent, and 59 percent higher diabetes prevalence, respectively. Higher diabetes prevalence was observed for lower socioeconomic groups. Adults with less than a high school education, below the poverty line, or unemployed had more than twice the prevalence of diabetes as their advantaged counterparts. Geographical patterns indicate higher prevalence of adult diabetes in the South and rural areas of the United States (Table 2.2).

The prevalence and sociodemographic patterns in cancer varies according to cancer type (Tables 2.2 and 2.3). In 2017, 23.2 million or 8.5 percent of adults aged 18 and over had ever been told by a doctor or other health professional that they had some form of cancer (Table 2.2). Compared with White adults, all other racial/ethnic groups had lower prevalence of cancer. Adults with higher education and income levels had higher rates of cancer. However, unemployed adults were 30 percent more likely to be diagnosed with cancer than those working full time.

In 2017, 3.9 million or 2.6 percent of women reported having breast cancer. Compared with White women, AIAN women reported a 57 percent lower prevalence of breast cancer, whereas Black, Asian, and Hispanic women had similar prevalence (Table 2.3). Education and family income levels were not consistently associated with breast cancer prevalence. Unemployed women had 80 percent higher breast cancer prevalence than women with full-time employment.

In 2017, 1.2 million or 0.9 percent of women reported having been diagnosed with cervical cancer. Compared with White women, all other racial/ethnic groups reported lower prevalence of cervical cancer. Socioeconomic status was inversely associated with cervical cancer prevalence. Women with less than a high school education had 2.8 times higher cervical cancer prevalence than women with a college degree. Women with family incomes less than $35,000 were 2 times more likely to be diagnosed with cervical cancer than those with family income of $100,000 or more. Unemployed women and those with part-time employment had at least two times higher cervical cancer prevalence than women with full-time employment. Women in rural areas had 2.3 times higher prevalence of cervical cancer than women in urban areas (Table 2.3).

In terms of mental health problems, 8.0 million or 3.3 percent of U.S. adults in 2017 experienced serious psychological distress during the past 1 month. Asians reported the lowest prevalence of psychological distress (1.2 percent), whereas AIANs and mixed-race adults had the highest prevalence, 6.1 percent and 8.8 percent respectively (Table 2.4). Adults without a job or with lower education and income levels were at an increased risk of psychological distress. Adults with an annual family income less than $35,000 were 6.6 times more likely to experience serious psychological distress than those with annual family incomes of $100,000 or more.

Disparities in Health Care Access and Quality

Racial/ethnic and socioeconomic patterns in access to health insurance are described above. One important measure of access to quality health care is affordability.[1, 7] As shown in Table 2.4, there are marked disparities in unmet medical need among the U.S. population according to various sociodemographic factors. In 2017, 5.3 percent of Hispanics, 6.1 percent of Blacks, and 8.0 percent of mixed-race individuals reported not receiving medical care because they could not afford it, compared with 2.2 percent of Asians and 4.2 percent of Whites. Additionally, 6.6 percent of Hispanics, 6.8 percent of Blacks and 11.2 percent of mixed-race individuals delayed seeking medical care because of the worry about the cost, compared with 3.1 percent of Asians and 6.4 percent of Whites.

Affordability of health care costs is a major issue in health care decision making among those in lower socioeconomic strata or among those living in rural areas. Individuals with an annual family income less than $35,000 were 8.45 times more likely to forgo needed medical care due to cost than those with annual family incomes of $100,000 or more. Individuals living in rural areas were 24 percent to 33 percent more likely to delay or forgo needed medical care due to cost than those in urban areas.

Emergency room (ER) visits are associated with substantially increased health care costs. In 2017, the likelihood of 1 or more ER visits during the past year was greater among American Indian/Alaska Natives (32.1 percent) and Blacks/African Americans (26.3 percent), compared with APIs (10.3 percent), Hispanics (17.2 percent), and non-Hispanic White adults (18.6 percent) (Figure 2.31). The likelihood of an ER visit was two-to-three times higher among adults with low education and income levels Adults with fair/poor self-assessed health, activity limitation, obesity, smoking, or those who delayed or forwent needed medical care due to cost were at substantially increased risk of one or more ER visits in the past year. U.S.-born individuals, veterans, and lesbian/gay/bisexual (LGB) individuals also had a higher likelihood of one or more ER visits.

Hospital admission rate is an important health care outcome measure. In 2017, the hospital admission rate was significantly higher among non-Hispanic Whites, Blacks, and AIANs, compared with APIs and Hispanics (Figure 2.32). The likelihood of hospital admission in the past year was two-to-three times higher among adults with low education and income levels. Adults with fair/ poor self-assessed health and those who delayed or forwent needed medical care due to cost were at three-to-six times increased risk of hospital admission. Veterans, LGB individuals, smokers, adults without health insurance, and those with disability had a higher likelihood of hospital admission, compared with the general population.

Summary

This chapter describes key population health concepts and analyzes empirical trends in health, morbidity, mortality, and health care inequalities in the United States according to important social determinants such as race/ethnicity, education, income, poverty, unemployment, nativity/immigrant status, disability status, and geographic location. Life expectancy at birth increased from 68.2 years in 1950 to 78.6 years in 2017. Despite the overall improvement, racial/ethnic, gender, and socioeconomic disparities persist. In 2017, AIANs had a life expectancy of 74.3 years, compared with 78.8 years for non-Hispanic Whites, 76.0 years for non-Hispanic Blacks, 87.8 years for APIs, and 83.7 years for Hispanics. Life expectancy in the United States ranged from a low of 71.3 years of AIAN males to a high of 89.8 years for API females, a gap of 18.5 years. During 2012-2016, residents of high-poverty areas had a 6.2 years shorter life expectancy than residents of low-poverty areas. Life expectancy differences between immigrants and the U.S.-born have increased consistently over the past 4 decades. In 2017, immigrants lived 6.0 years longer than the U.S.-born (84.1 vs. 78.1 years). Infant mortality rates declined dramatically during the past 8 decades; however, racial and socioeconomic disparities have widened over time as more educated or higher-income groups have seen a larger decline in infant mortality than less educated or less affluent groups. In 2017, the mortality rate of Black infants was 2.2 times higher than the rate for White infants. Racial/ethnic, socioeconomic, and geographic disparities were particularly marked in mortality and/or morbidity from CVD, cancer, diabetes, COPD, HIV/AIDS, kidney disease, liver cirrhosis, injuries, drug overdose, suicide, homicide, Alzheimer's disease, psychological distress, ER use, hospital admissions, and access to quality health care.

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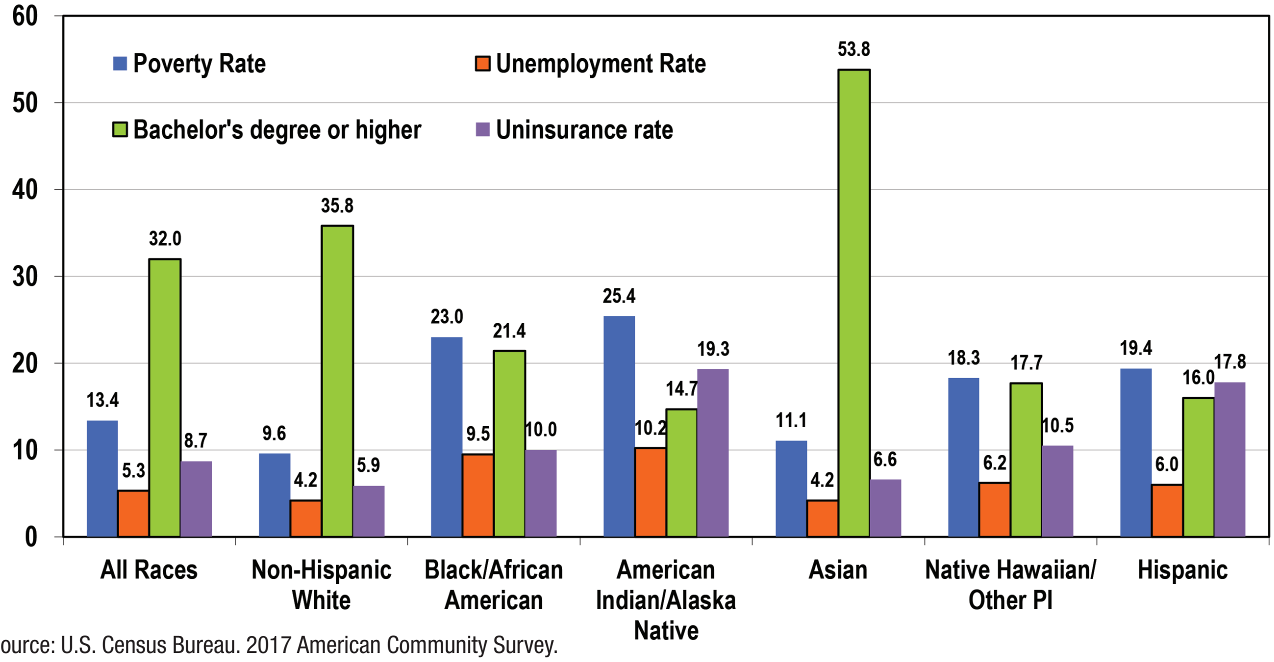
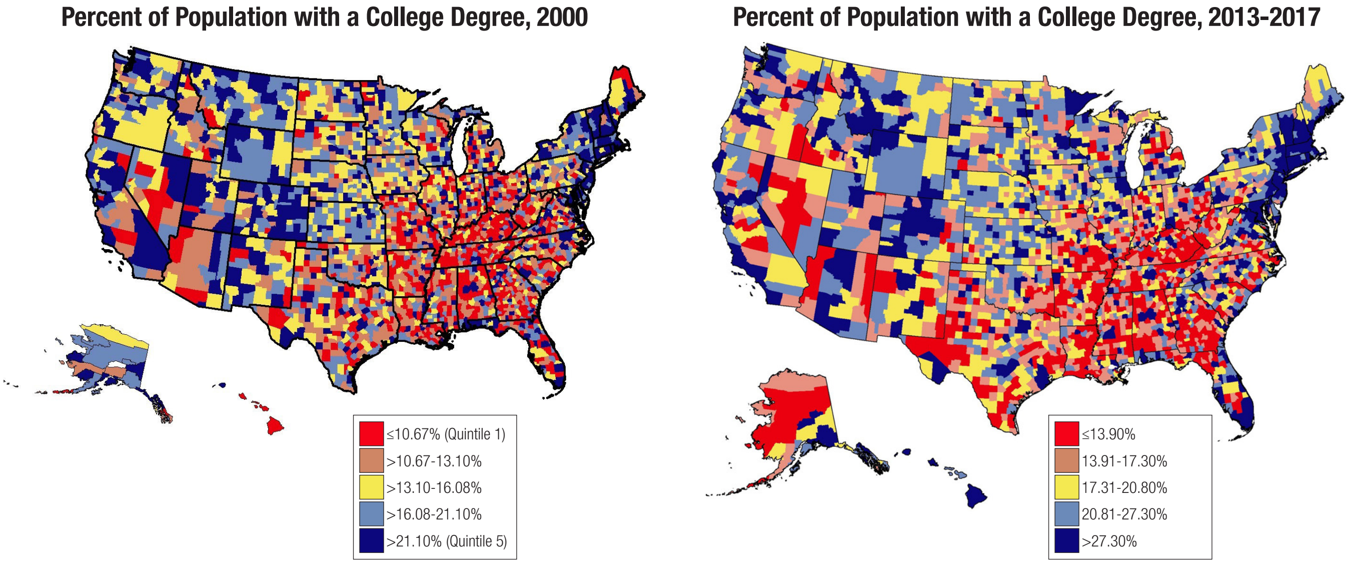
FIGURE 2.1: Poverty, Unemployment, Educational Attainment, and Health Uninsurance Rates (%) by Race/Ethnicity, United States, 2017



Source: U.S. Census Bureau. 2017 American Community Survey.

FIGURE 2.2: Percentage of Population aged ≥25 Years with a College Degree, United States, 2000 and 2013-2017 (3,143 Counties)

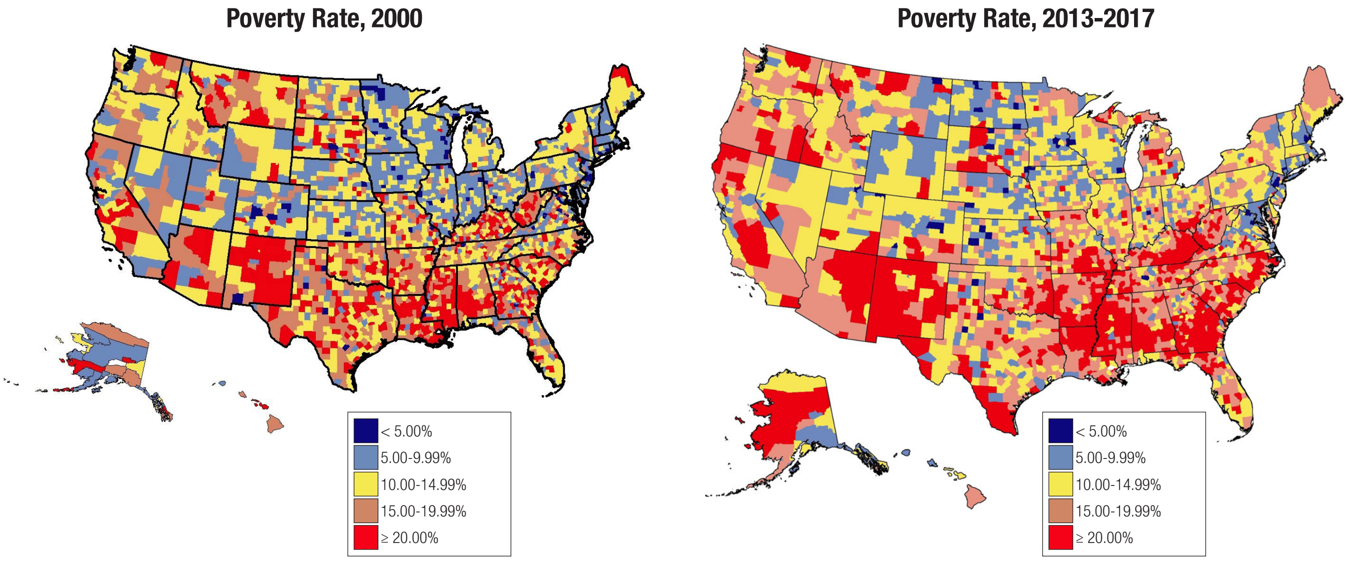


Percent of Population with a College Degree, 2000

Percent of Population with a College Degree, 2013-2017

Source: Data derived from the 2000 Census and 2013-2017 American Community Survey.

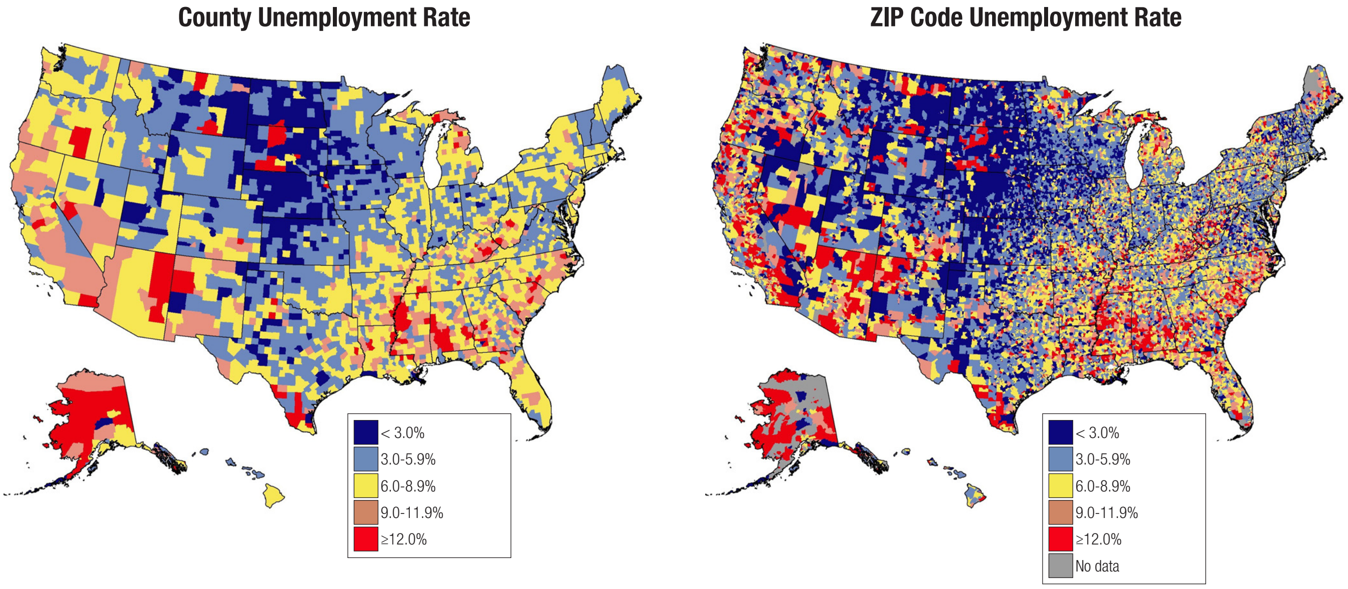
FIGURE 2.3: Percentage of Population Below the Federal Poverty Level, United States, 2000 and 2013-2017 (3,143 Counties)


Poverty Rate, 2000

Poverty Rate, 2013-2017

Source: Data derived from the 2000 Census and 2013-2017 American Community Survey.

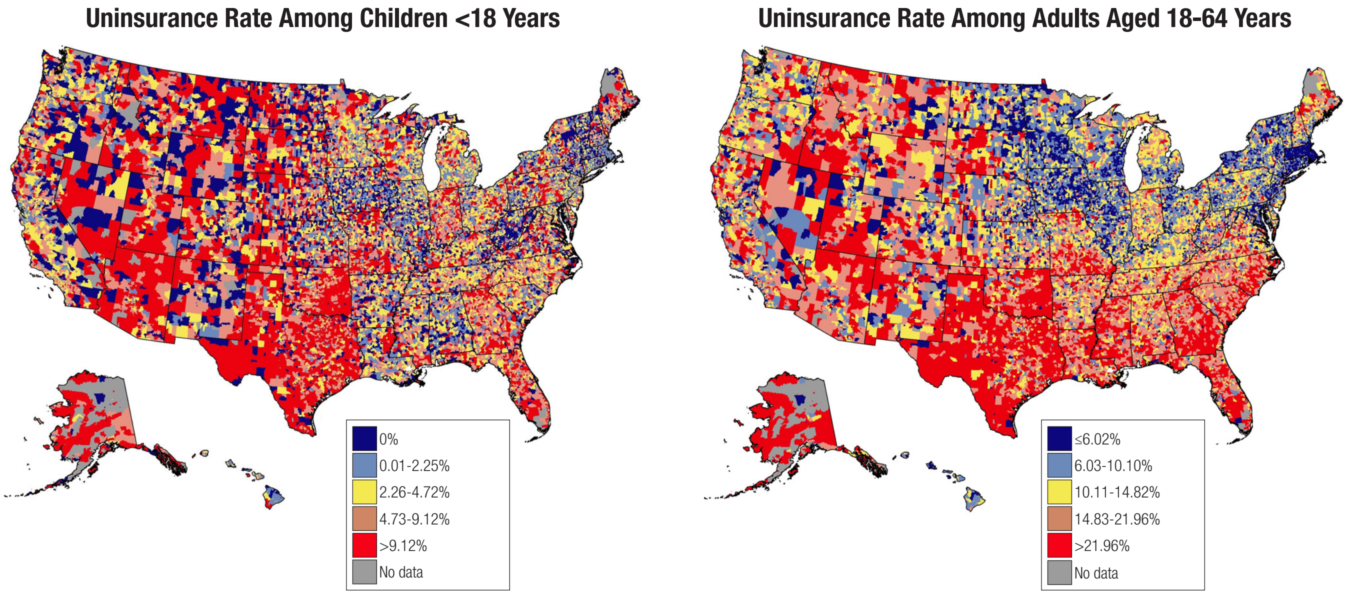
FIGURE 2.4: Unemployment Rate (Percentage of Civilian Labor Force that is Unemployed), United States, 2013-2017 (3,143 Counties and 32,989 ZIP Codes)


County Unemployment Rate

ZIP Code Unemployment Rate

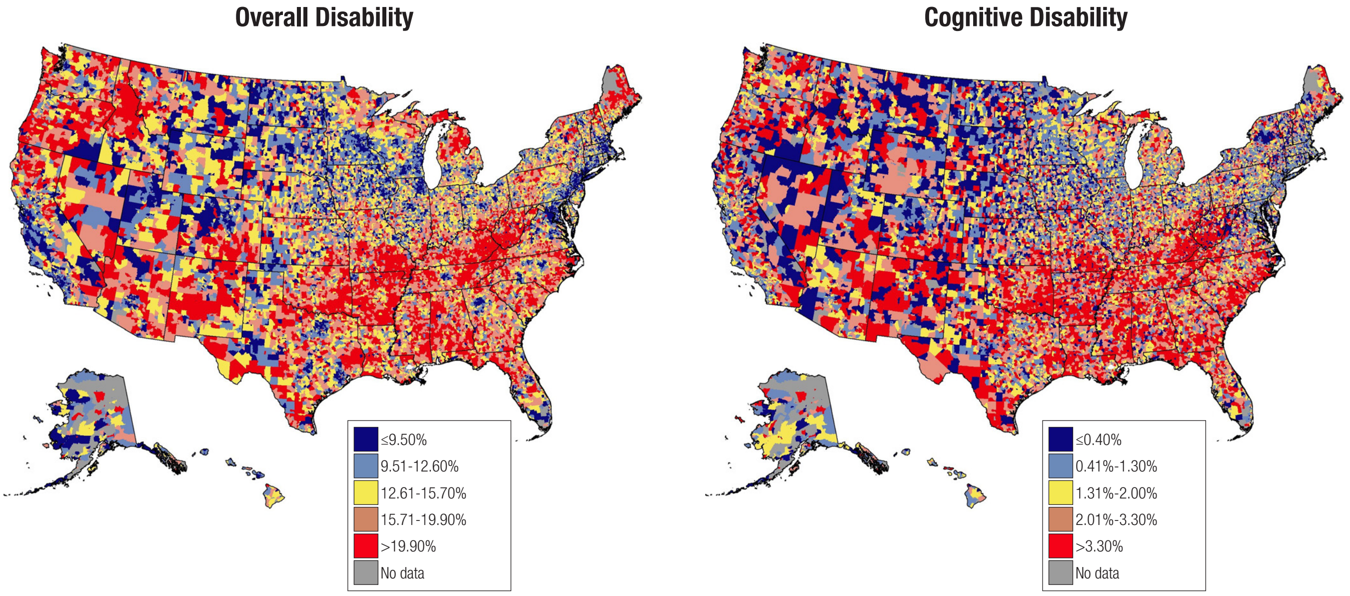
Source: Data derived from the 2013-2017 American Community Survey.

FIGURE 2.5: Percentage of Children Under 18 Years of Age and Adults Aged 18-64 Years Without Health Insurance, United States, 2013-2017 (32,989 ZIP Codes)



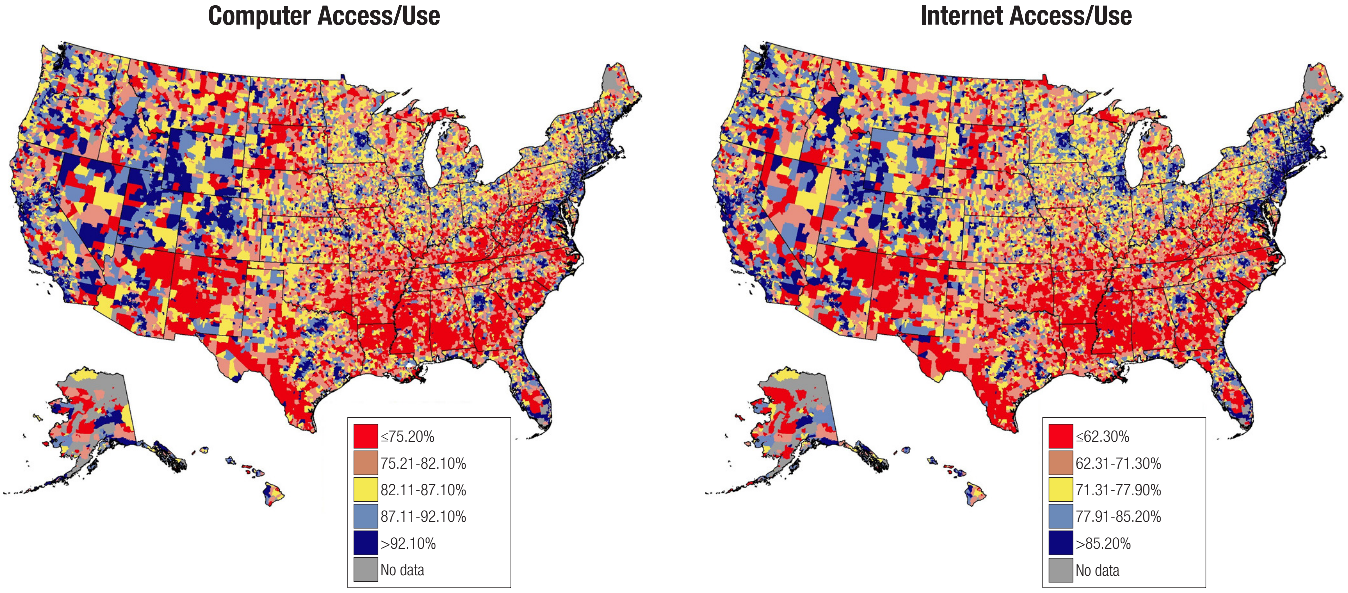
Source: Data derived from the 2000 Census and 2013-2017 American Community Survey.

FIGURE 2.6: Overall Disability and Cognitive Disability Rates, United States, 2013-2017 (32,989 ZIP Codes)



Source: Data derived from the 2000 Census and 2013-2017 American Community Survey.

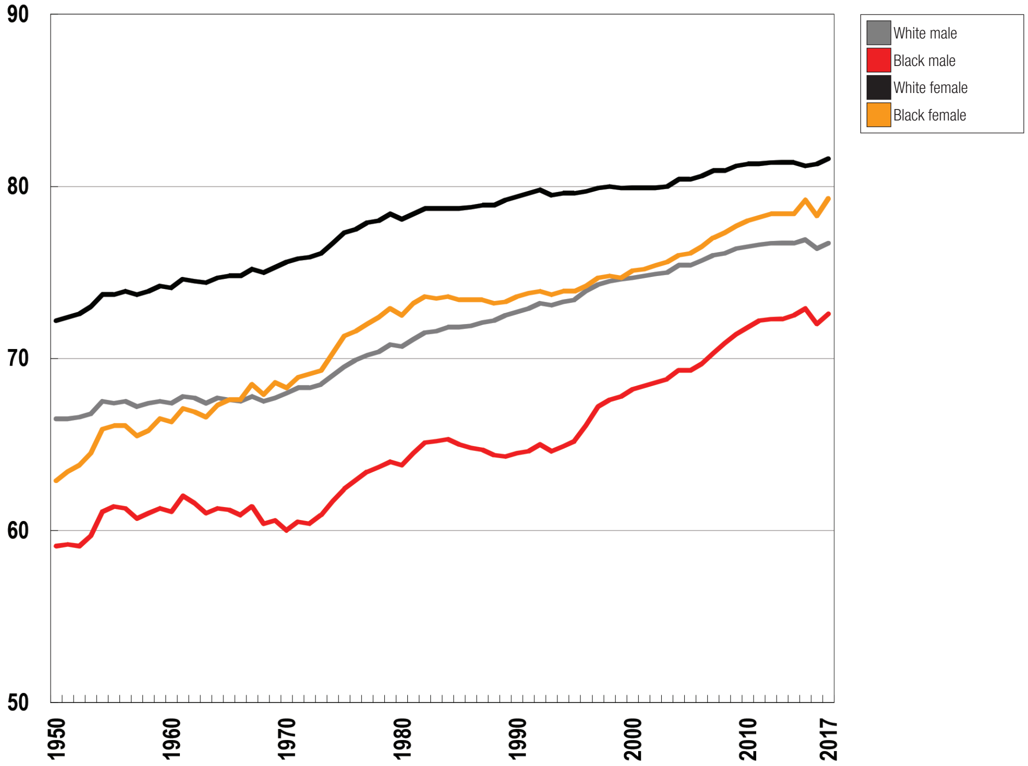
FIGURE 2.7: Percentage of Households with Computer and Internet Access, United States, 2013-2017 (32,989 ZIP Codes)


Computer Access/Use

Internet Access/Use

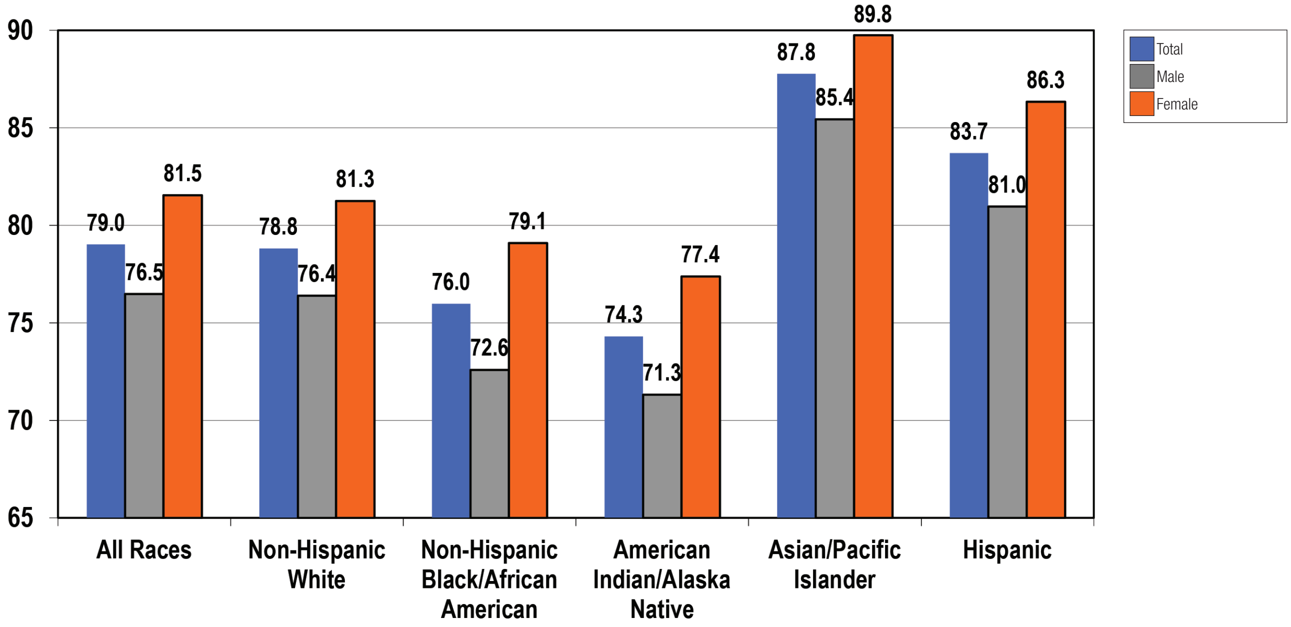
Source: Data derived from the 2013-2017 American Community Survey.

FIGURE 2.8: Life Expectancy at Birth (in Years) by Race and Sex, United States, 1950-2017



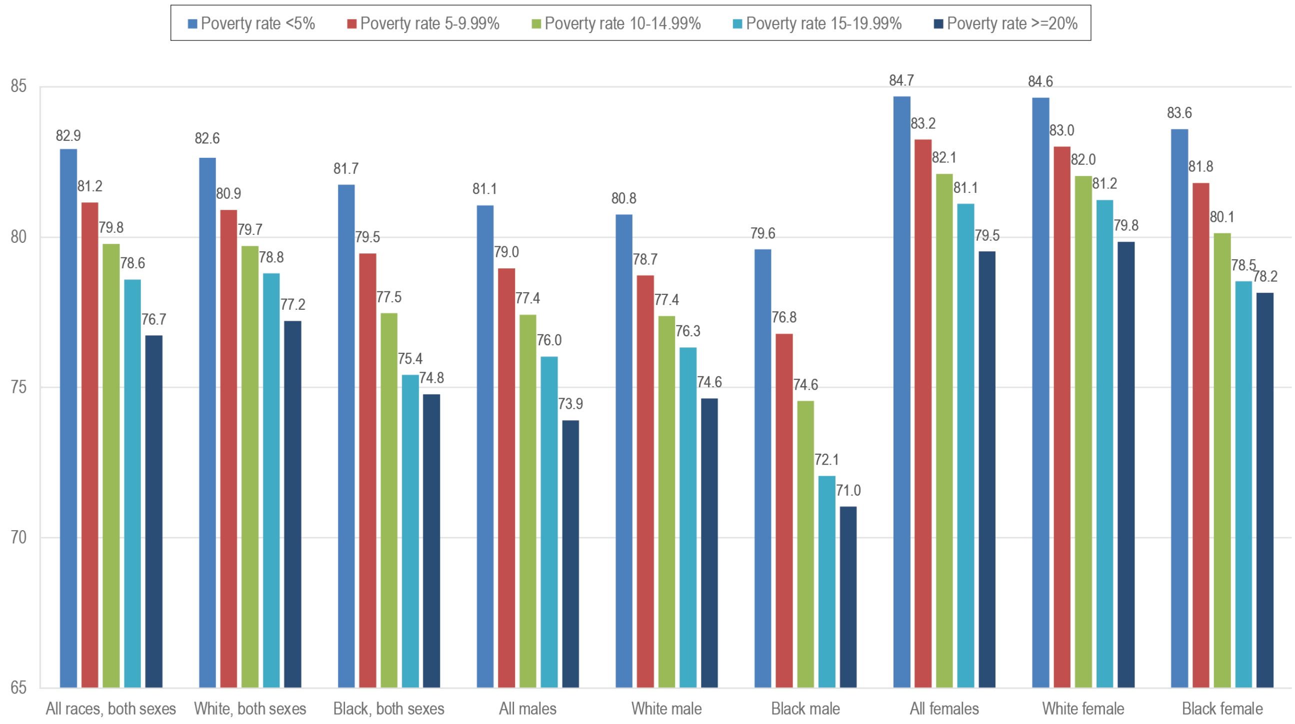
Source: CDC/NCHS. National Vital Statistics System.

FIGURE 2.9: Life Expectancy at Birth (Years) by Race/Ethnicity and Sex, United States, 2017



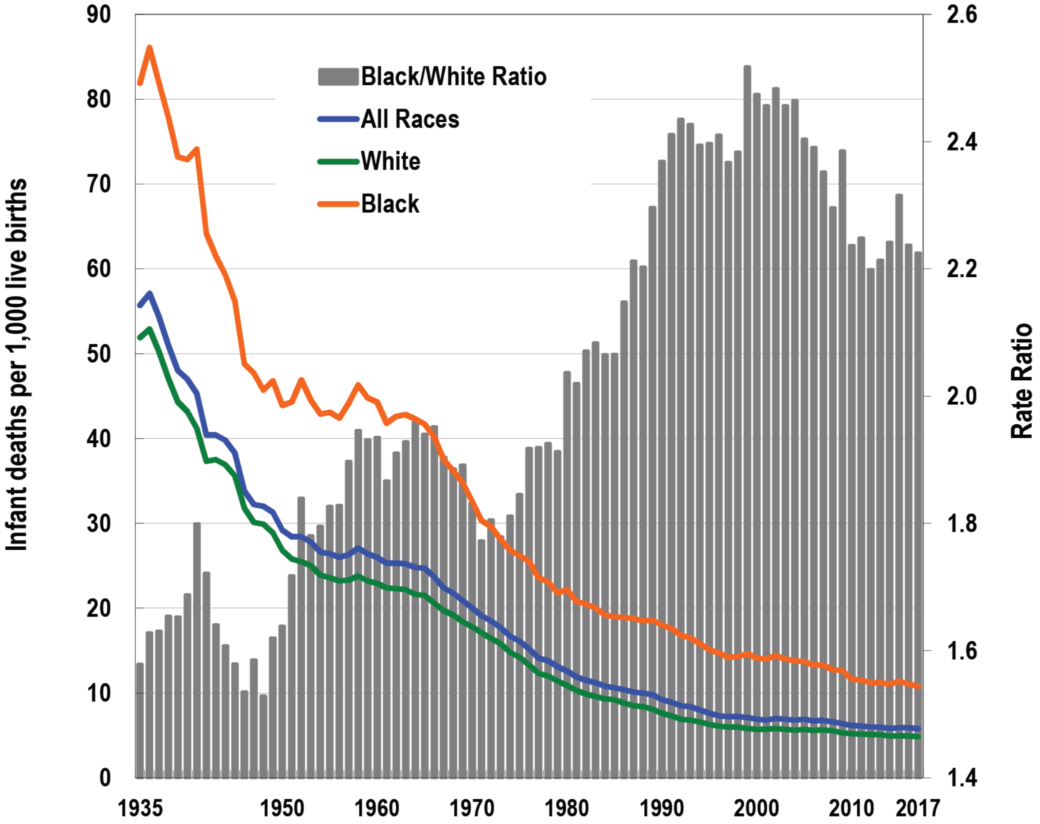
Source: Data derived from the National Vital Statistics System.

FIGURE 2.10: Life Expectancy at Birth (in Years) by County Poverty Level, Race, and Sex, United States, 2012-2016



Source: Data Derived from the 2012-2016 National Vital Statistics System.

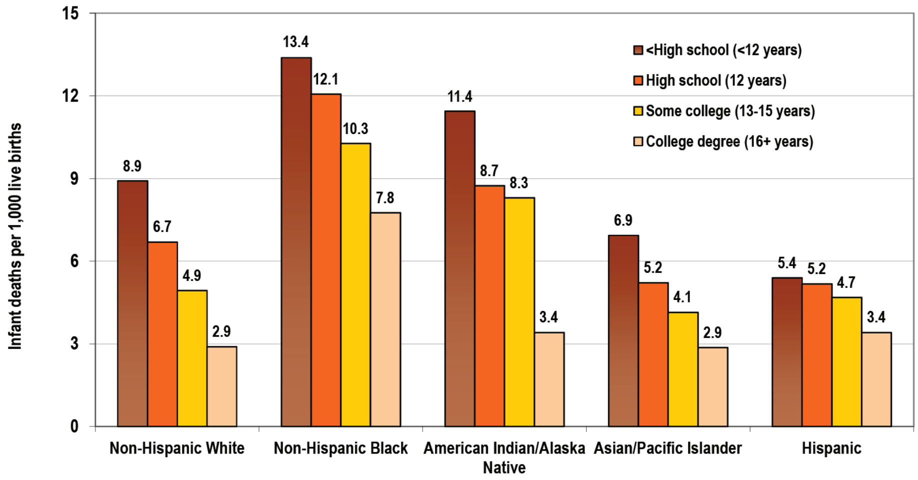
FIGURE 2.11: Infant Mortality Rate by Race, United States, 1935-2017



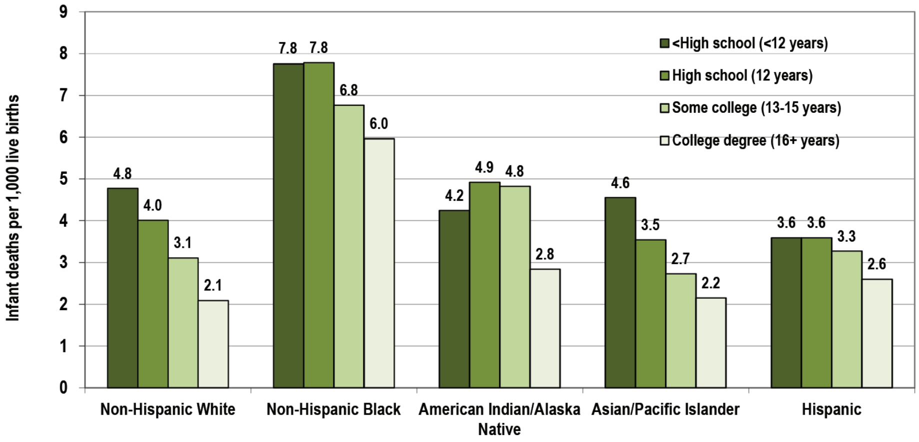
Source: Singh GK, Yu SM. Infant Mortality in the United States, 1915-2017: Large Social Inequalities Have Persisted for Over a Century. *International Journal of MCH and AIDS*. 2019; 8(1):19-31.

FIGURE 2.12: Maternal Educational Inequalities in Infant, Neonatal, and Postneonatal Mortality by Race/Ethnicity, United States, 2016

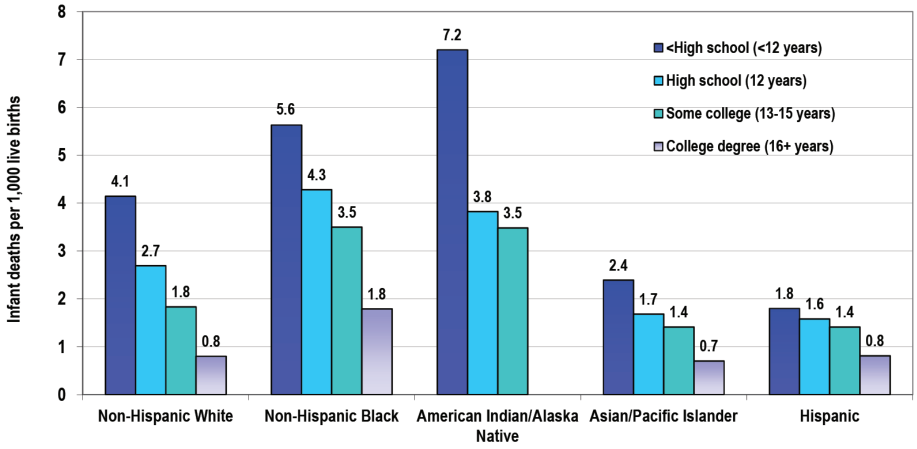
Infant mortality



Neonatal mortality

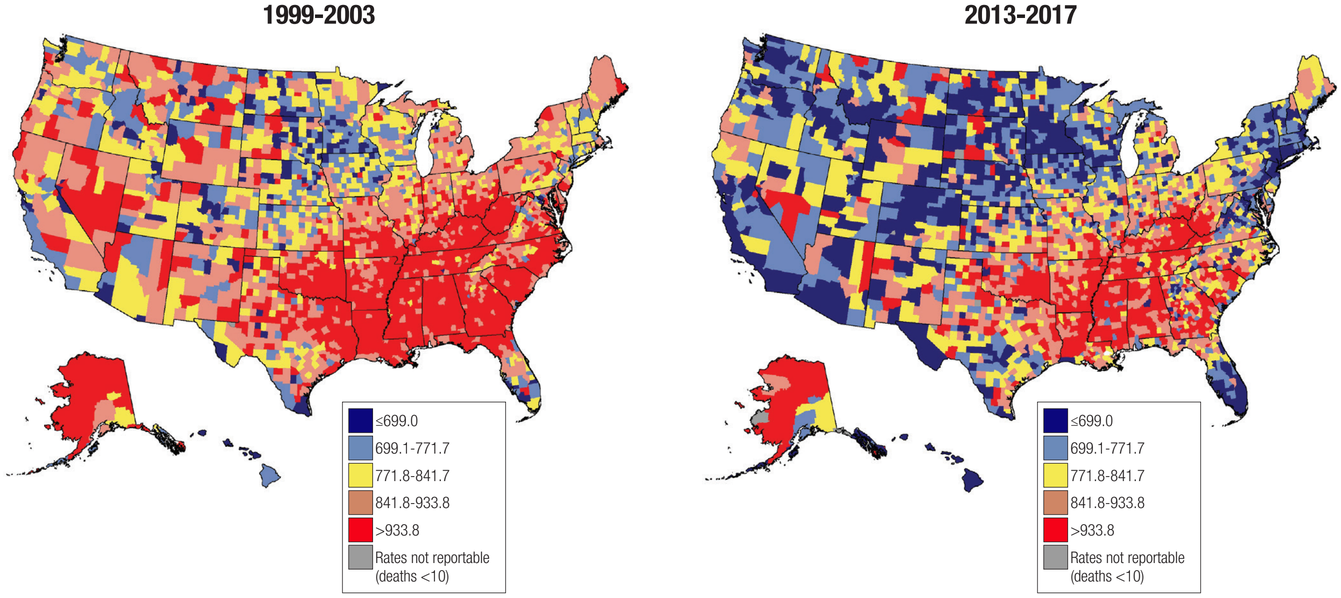


Postneonatal mortality



Source: Singh GK, Yu SM. Infant Mortality in the United States, 1915-2017: Large Social Inequalities Have Persisted for Over a Century. *International Journal of MCH and AIDS* . 2019; 8(1):19-31.

FIGURE 2.13: Age-Adjusted All-Cause Mortality Rates per 100,000 Population for the United States (3,143 Counties), 1999-2003 and 2013-2017

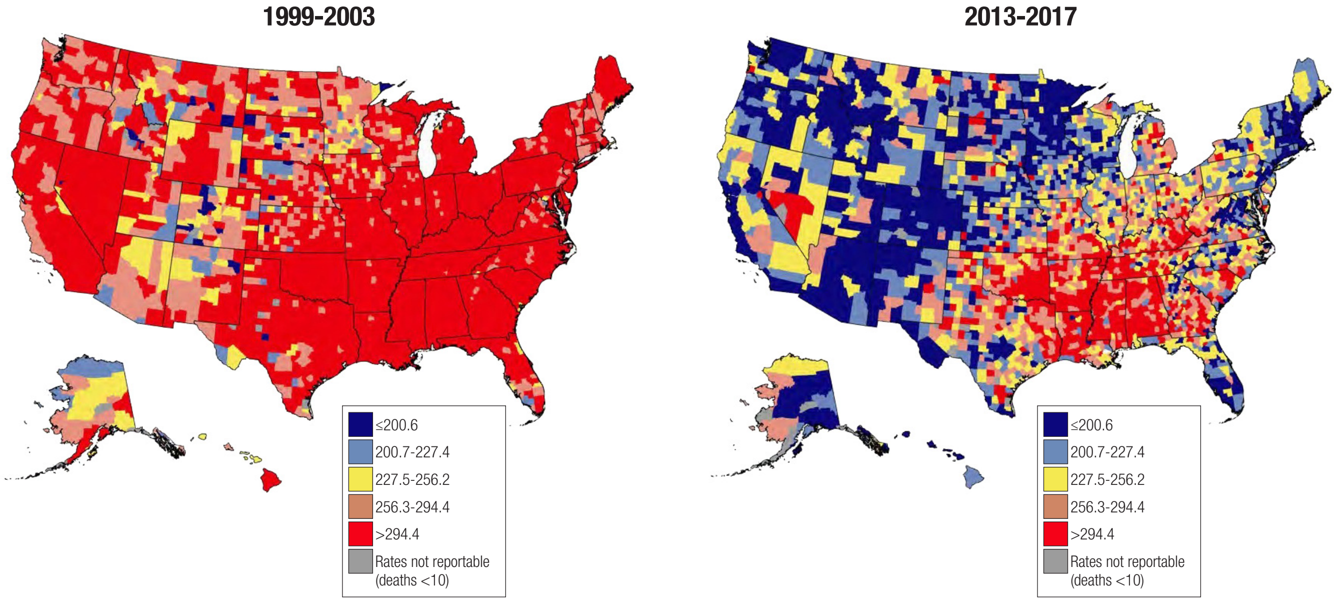


1999-2003

2013-2017

Derived from the 1999-2017 National Vital Statistics System.

FIGURE 2.14: Age-Adjusted Cardiovascular Disease (CVD) Mortality Rates per 100,000 Population for the United States (3,143 Counties), 1999-2003 and 2013-2017



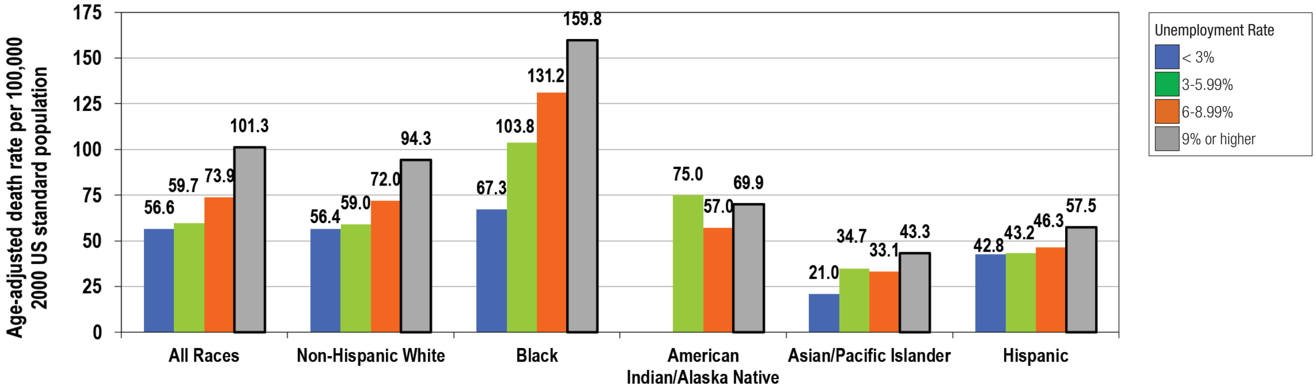
1999-2003

2013-2017

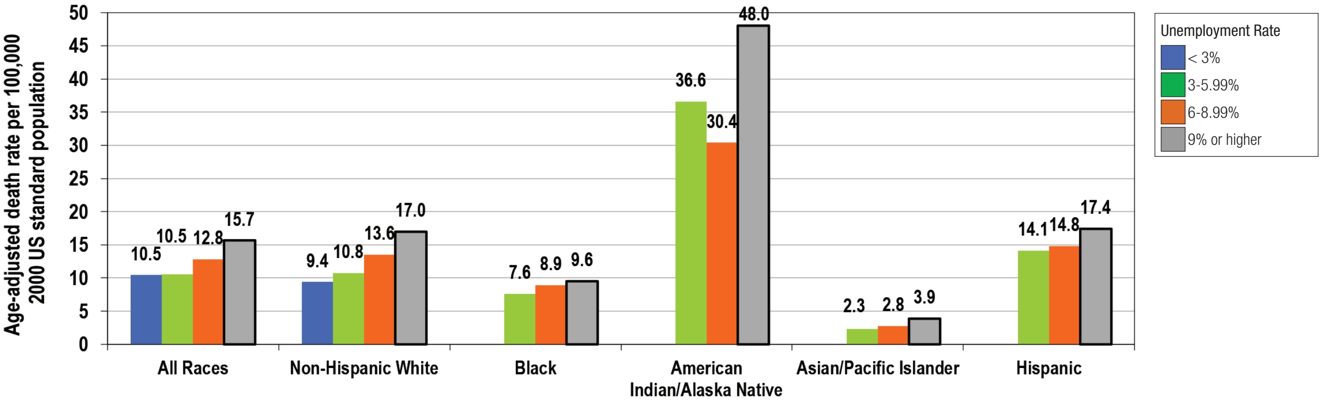
Source: Derived from the 1999-2017 National Vital Statistics System.

FIGURE 2.15: Age-Adjusted Cardiovascular Disease (CVD), Liver Cirrhosis, and Homicide Mortality Rates by Unemployment Level, U.S. Population Aged 25-64 Years, 2012-2016

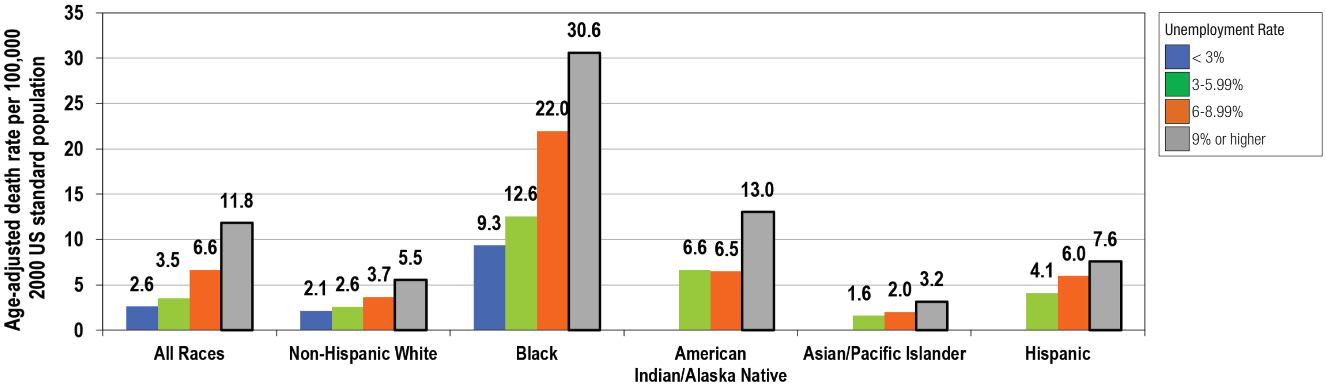
CVD Mortality Rates by Unemployment Level



Chronic Liver Disease and Cirrhosis Mortality Rates by Unemployment Level

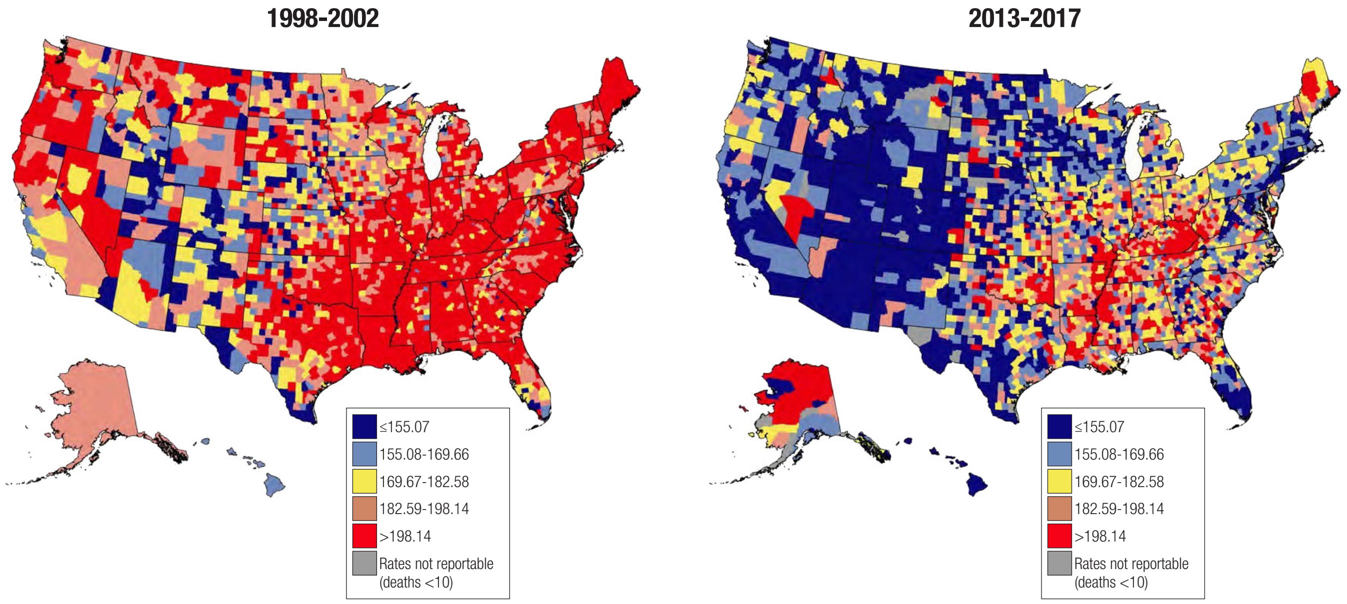


Homicide Mortality Rates by Unemployment Level



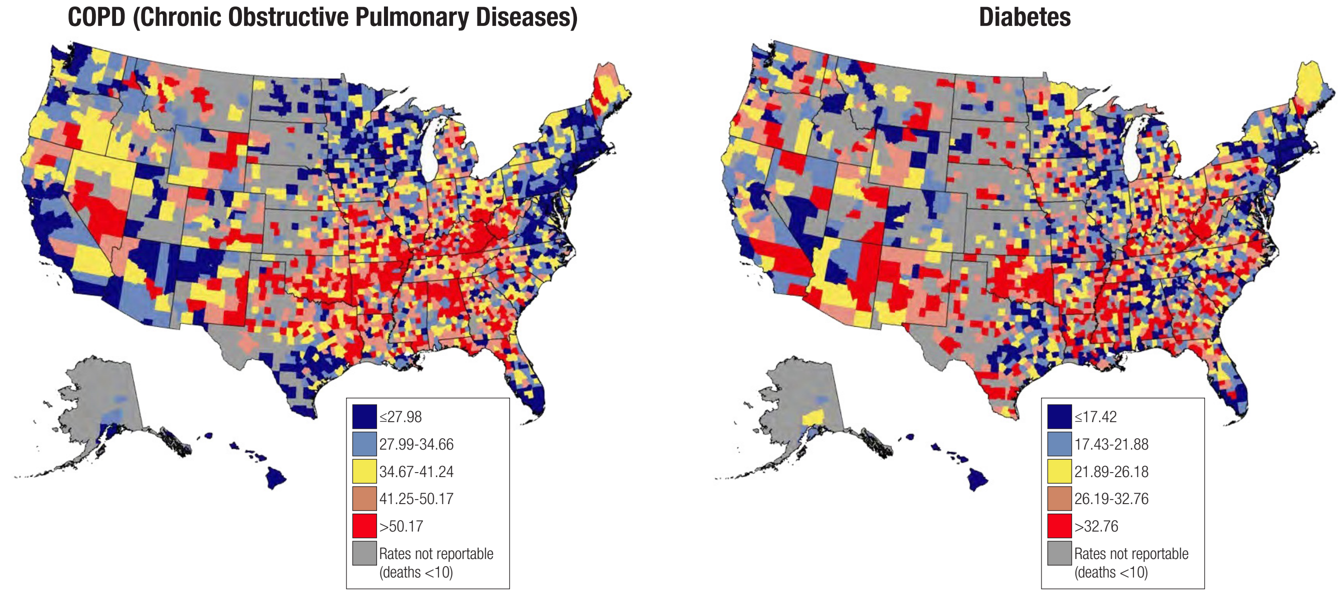
Source: Derived from the 2012-2016 National Vital Statistics System.

FIGURE 2.16: Age-Adjusted All-Cancer Mortality Rates per 100,000 Population for the United States (3,143 Counties), 1998-2002 and 2013-2017



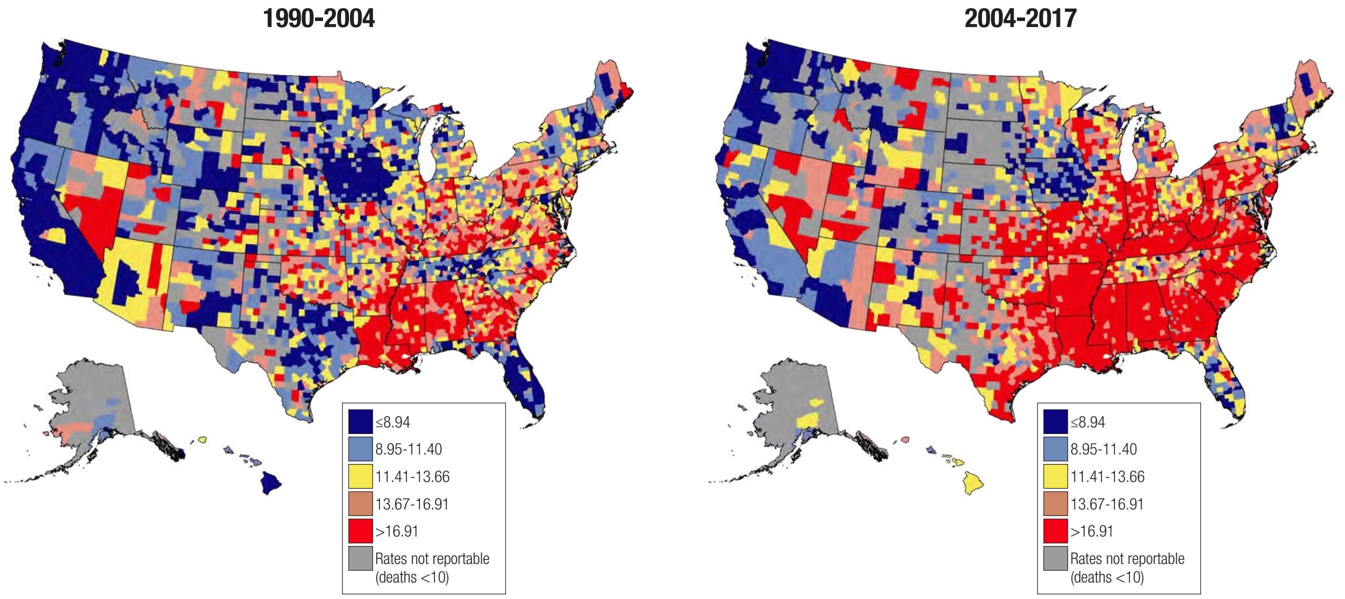
Source: Derived from the 1998-2017 National Vital Statistics System.

FIGURE 2.17: Age-Adjusted COPD and Diabetes Mortality Rates per 100,000 Population for the United States (3,143 Counties), 2013-2017



Source: Derived from the 2013-2017 National Vital Statistics System.

FIGURE 2.18: Age-Adjusted Nephritis (Kidney Disease) Mortality Rates per 100,000 Population for the United States (3,143 Counties), 1990-2004 and 2004-2017

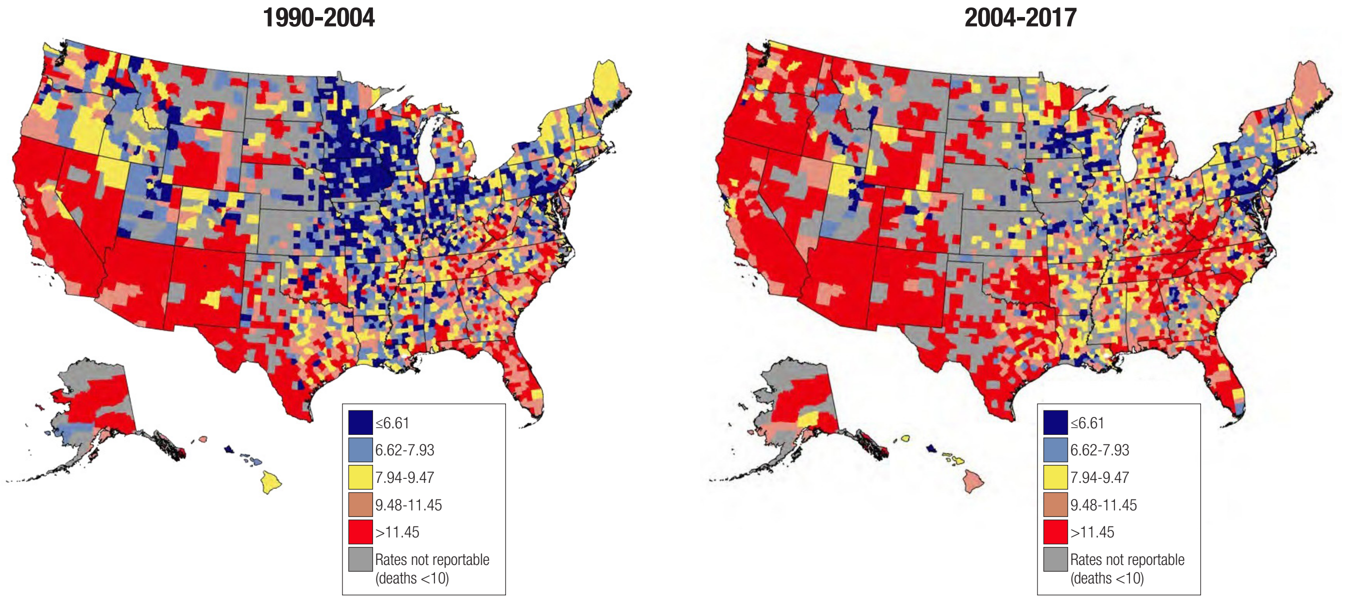


1990-2004

2004-2017

Source: Derived from the 1990-2017 National Vital Statistics System.

FIGURE 2.19: Age-Adjusted Chronic Liver Disease and Cirrhosis Mortality Rates per 100,000 Population for the United States (3,143 Counties), 1990-2004 and 2004-2017

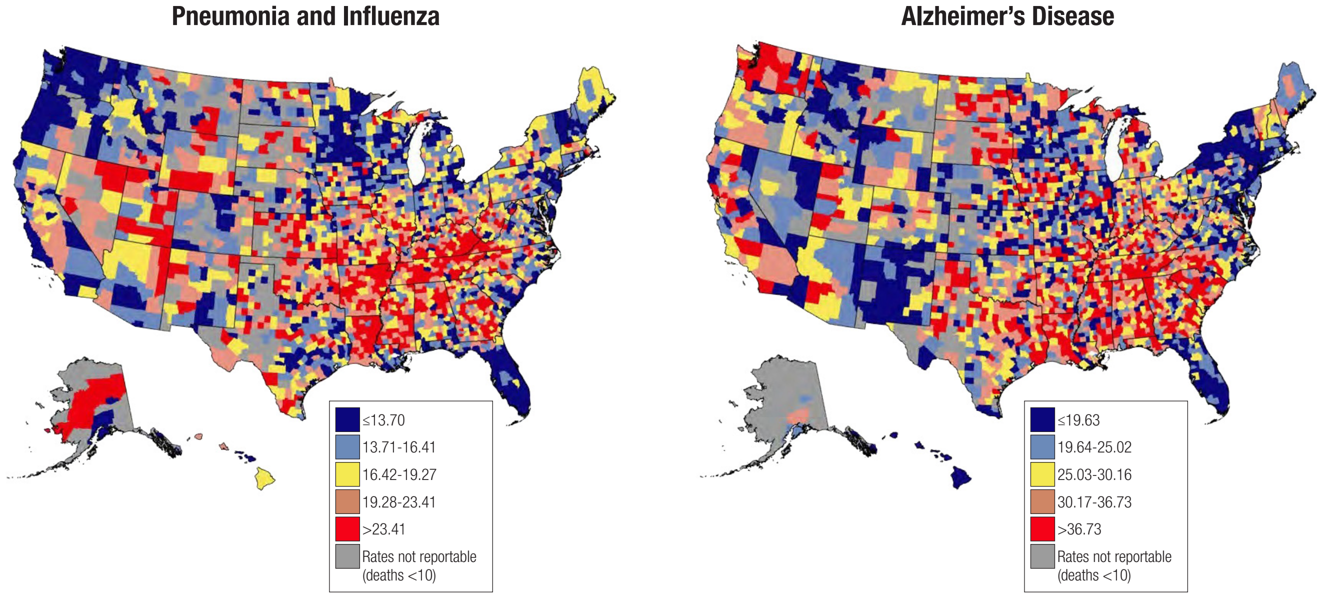


1990-2004

2004-2017

Source: Derived from the 1990-2017 National Vital Statistics System.

FIGURE 2.20: Age-Adjusted Pneumonia & Influenza and Alzheimer's Disease Mortality Rates per 100,000 Population for the United States (3,143 Counties), 2004-2017

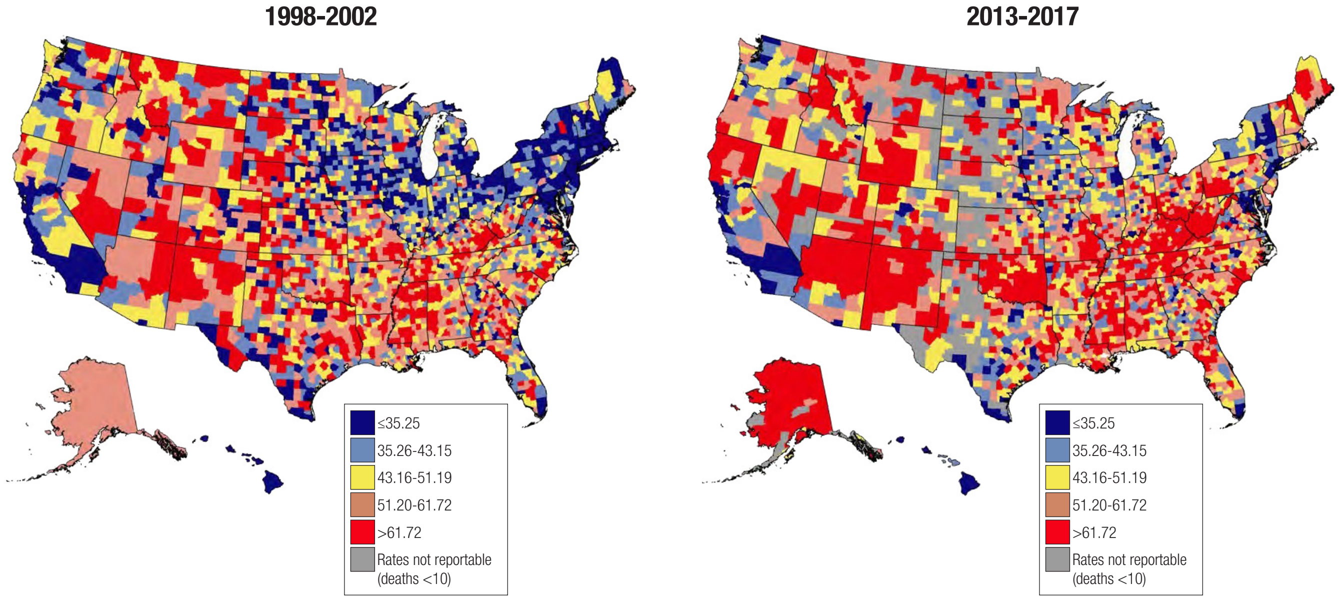


Pneumonia and Influenza

Alzheimer's Disease

Source: Derived from the 2004-2017 National Vital Statistics System.

FIGURE 2.21: Age-Adjusted Unintentional Injury Mortality Rates per 100,000 Population for the United States (3,143 Counties), 1998-2002 and 2013-2017

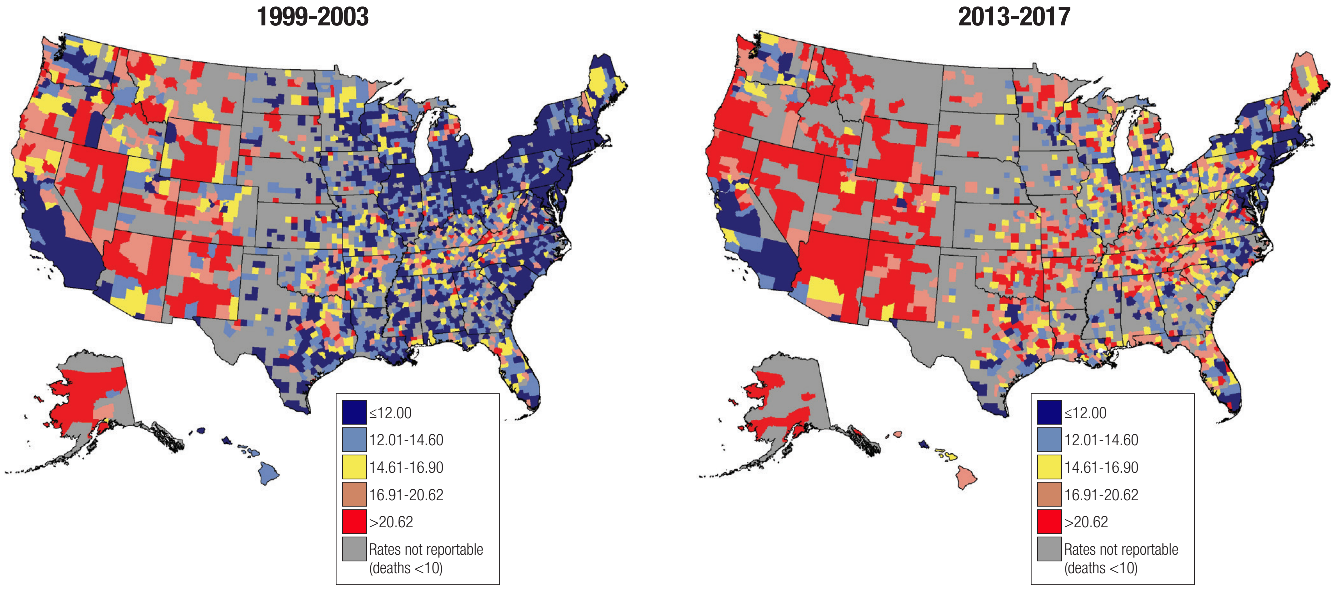


1998-2002

2013-2017

Source: Derived from the 1998-2017 National Vital Statistics System.

FIGURE 2.22: Age-adjusted Suicide Mortality Rates per 100,000 Population, United States (3,143 Counties), 1999-2003 and 2013-2017

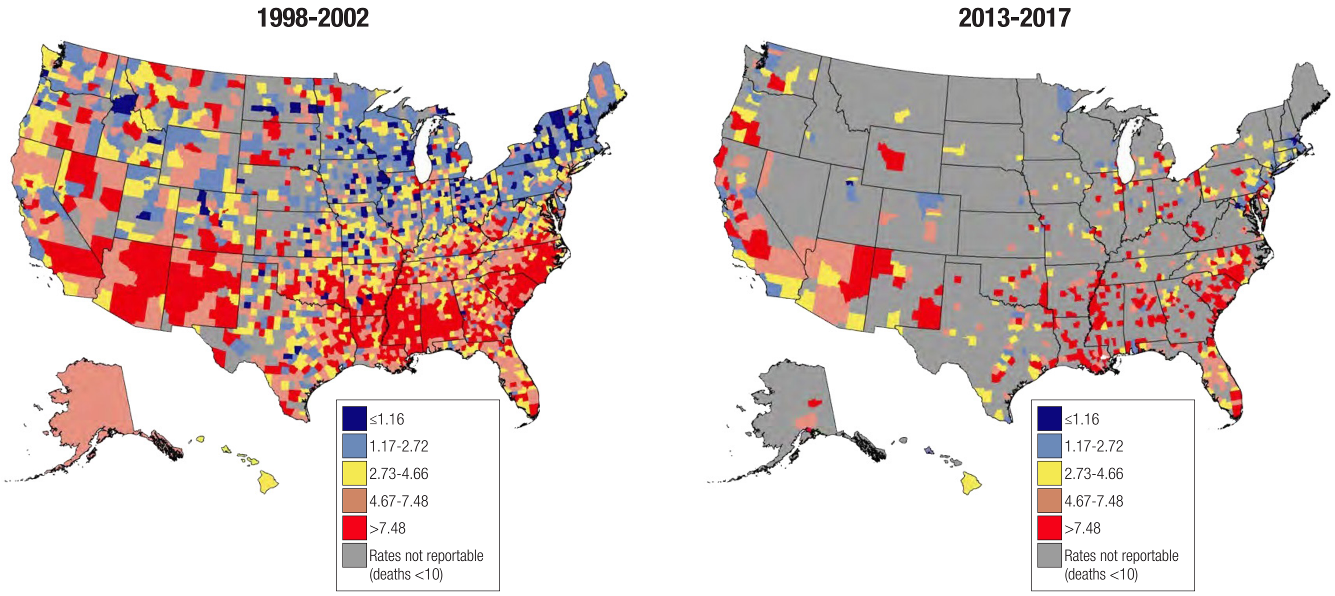


1999-2003

2013-2017

Source: Derived from the 1999-2017 National Vital Statistics System.

FIGURE 2.23: Age-Adjusted Homicide Rates per 100,000 Population for the United States (3,143 Counties), 1998-2002 and 2013-2017

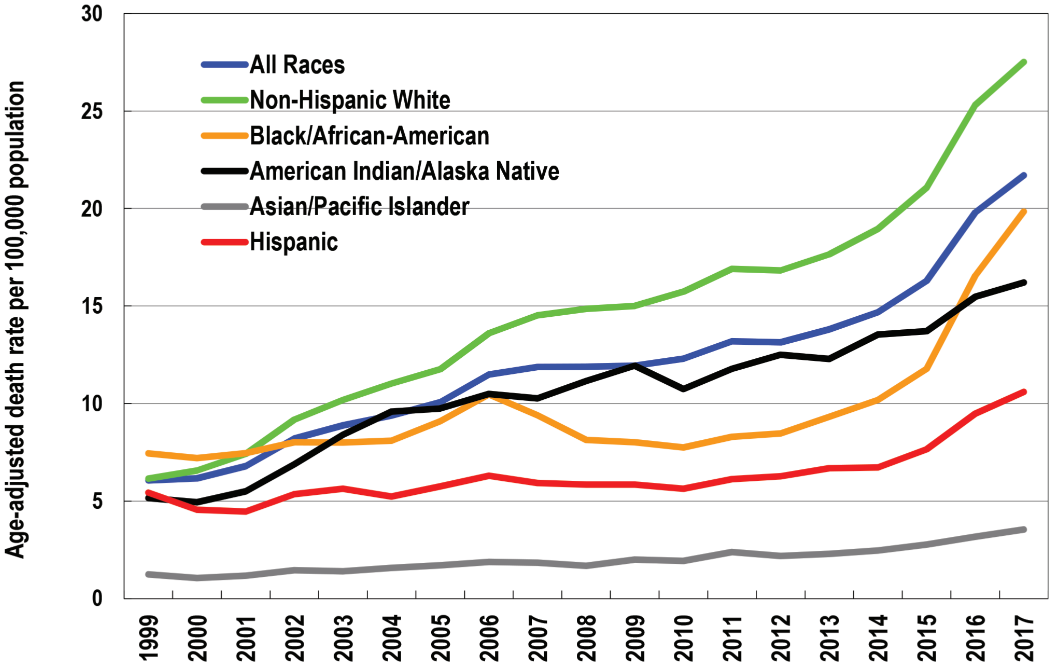


1998-2002

2013-2017

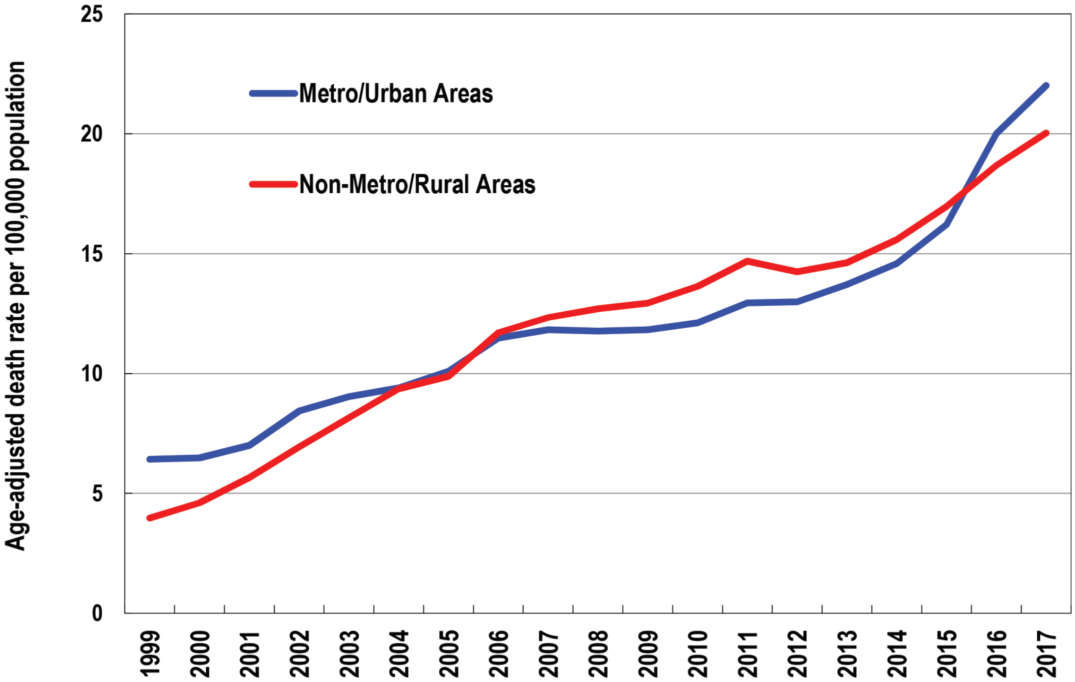
Source: Derived from the 1998-2017 National Vital Statistics System.

FIGURE 2.24: Racial/Ethnic Trends in Drug Overdose Mortality, Both Sexes, United States, 1999-2017



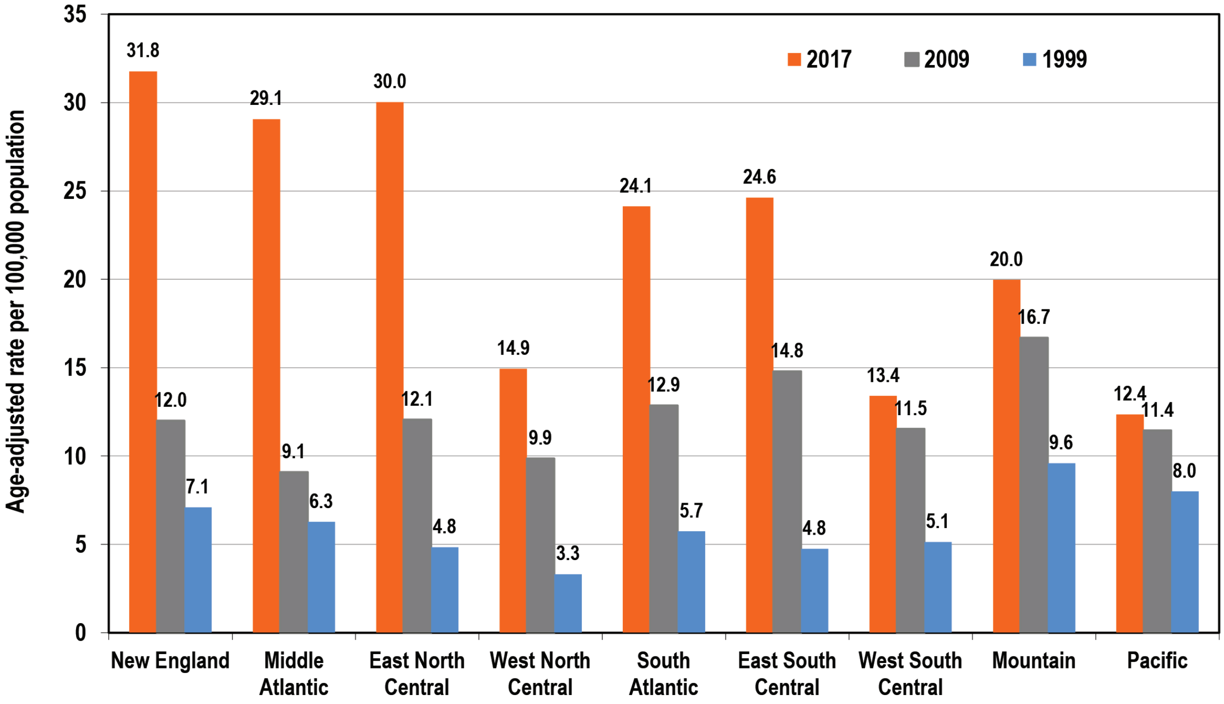
Source: Data derived from the National Vital Statistics System, National Mortality Database. Singh GK, Kim IE, Girmay M, et al. Opioid epidemic in the United States. *International Journal of MCH and AIDS.* 2019; 8(2):89-100.

FIGURE 2.25: Trends in Drug Overdose Mortality in Urban and Rural Areas, United States, 1999-2017



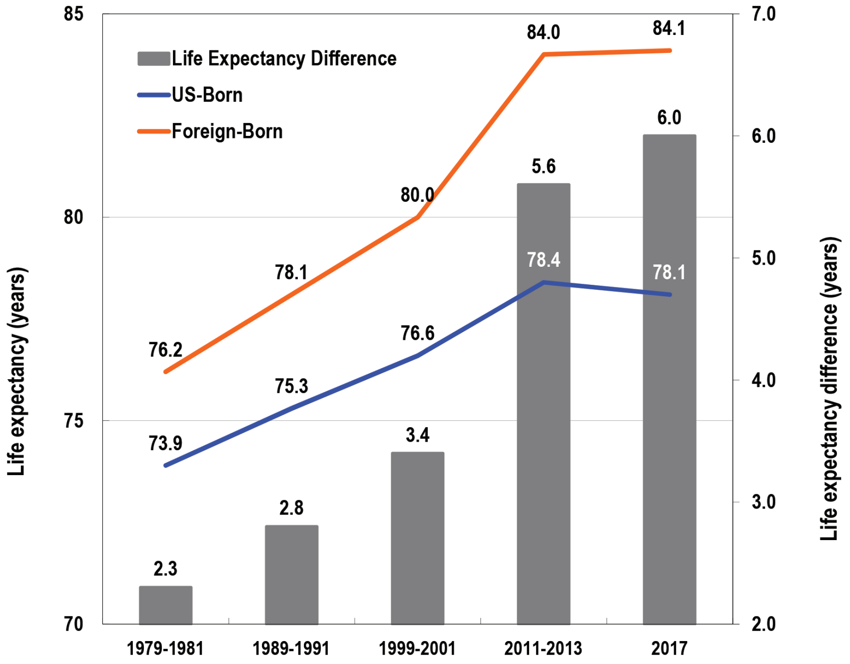
Source: Data derived from the National Vital Statistics System, National Mortality Database. Singh GK, Kim IE, Girmay M, et al. Opioid epidemic in the United States. *International Journal of MCH and AIDS.* 2019; 8(2):89-100.

FIGURE 2.26: Trends in Drug Overdose Mortality in 9 Census Regions, United States, 1999-2017



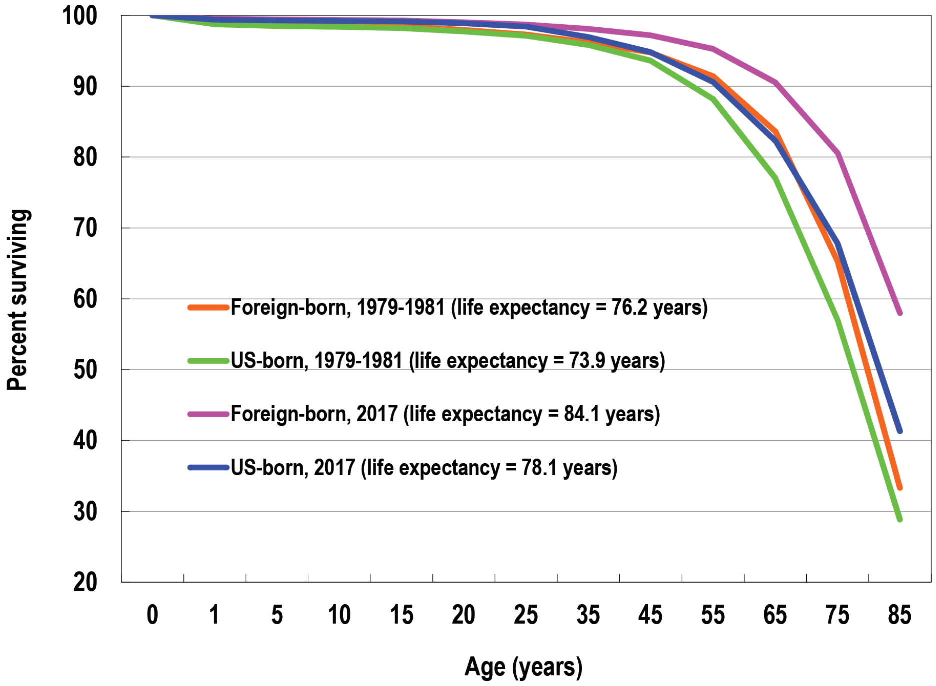
Source: Data derived from the National Vital Statistics System, National Mortality Database. Singh GK, Kim IE, Girmay M, et al. Opioid epidemic in the United States. *International Journal of MCH and AIDS.* 2019; 8(2):89-100.

FIGURE 2.27: Life Expectancy at Birth (in Years) by Nativity/Immigrant Status, United States, 1979-2017



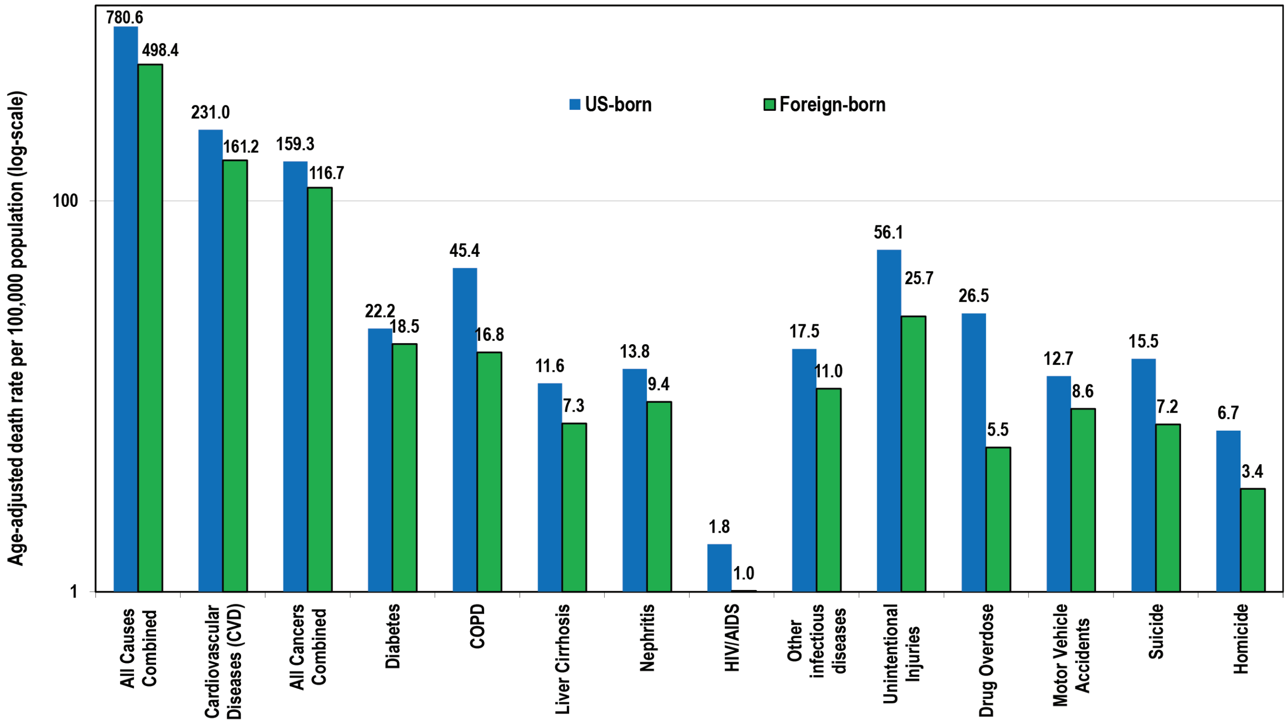
Source: Singh GK, Liu L. 2018 (updated data). Derived from the National Vital Statistics System.

FIGURE 2.28: Survivorship by Age and Nativity/Immigrant Status, United States, 1979-2017



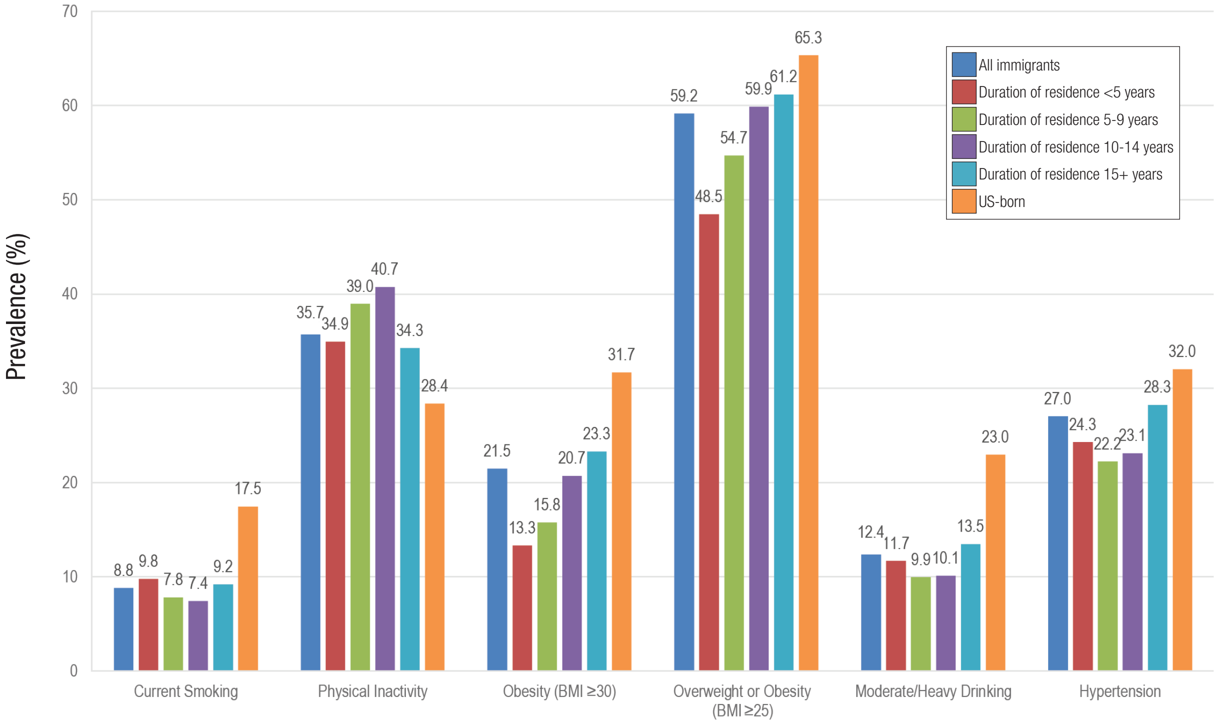
Source: Singh GK, Liu L. 2018 (updated data). Derived from the National Vital Statistics System

FIGURE 2.29: Age-Adjusted Death Rates for Selected Major Causes of Death by Nativity/Immigrant Status, United States, 2017



Differences in all-cause and cause-specific mortality rates by nativity/immigrant status were statistically significant at p<.01.
Source: Singh GK, Liu L. 2018 (updated data). Derived from the National Vital Statistics System.

FIGURE 2.30: Age-Adjusted Prevalence (%) of Selected Health-Risk Factors by Nativity/Immigrant Status and Duration of U.S. Residence, United States, 2014-2016



Differences in prevalence by nativity/immigrant status and by duration of residence were statistically significant at p<.01 for all indicators.
Source: Data derived from the 2014-2016 National Health Interview Survey.

FIGURE 2.31: Emergency Room (ER) Visits by Sociodemographic Factors, Adults Aged ≥18 Years, United States, 2014-2016 National Health Interview Survey (N = 102,019)

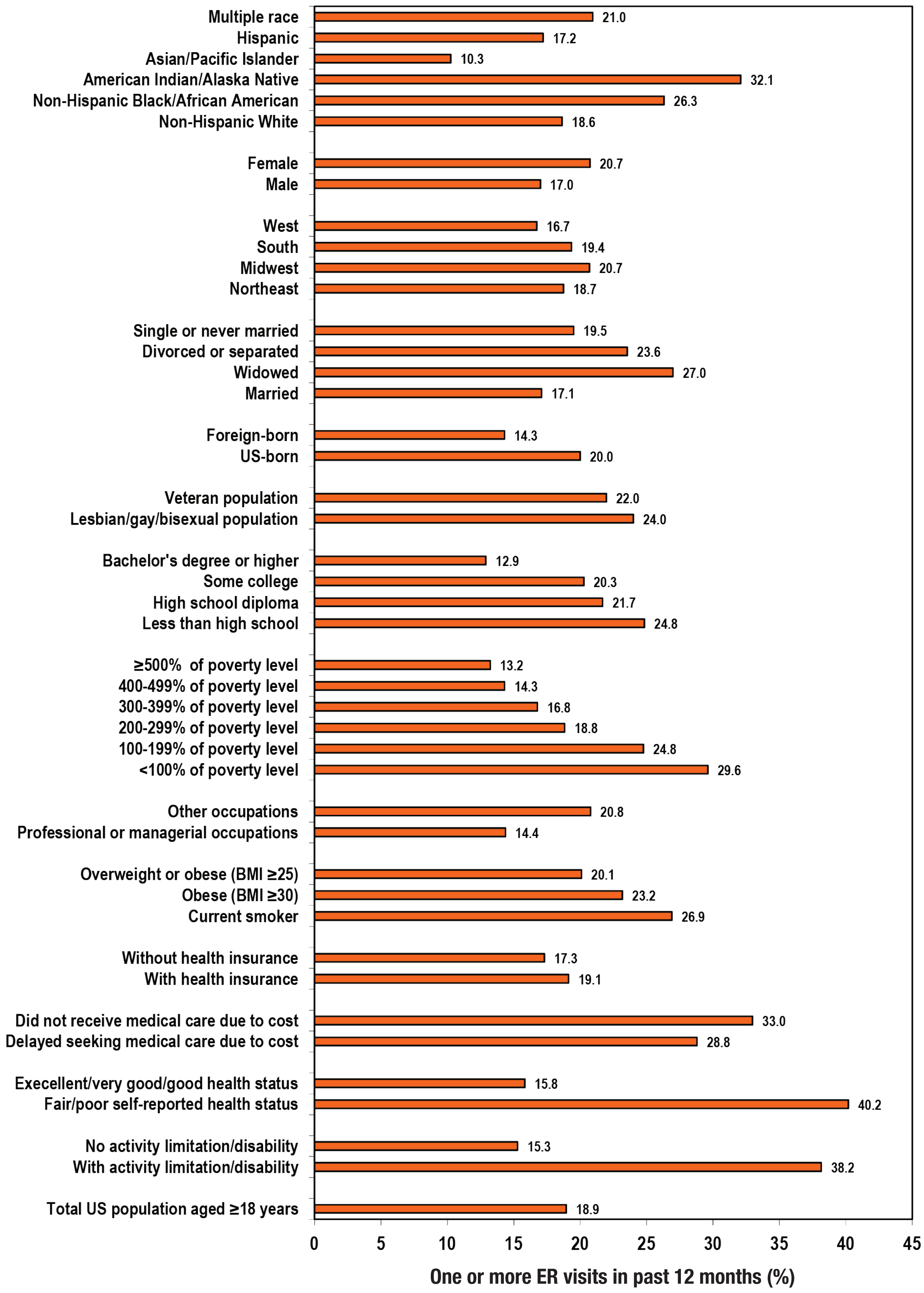


FIGURE 2.32: Hospital Admission by Sociodemographic Factors, Adults Aged ≥18 Years, United States, 2014-2016 National Health Interview Survey (N = 234,961)

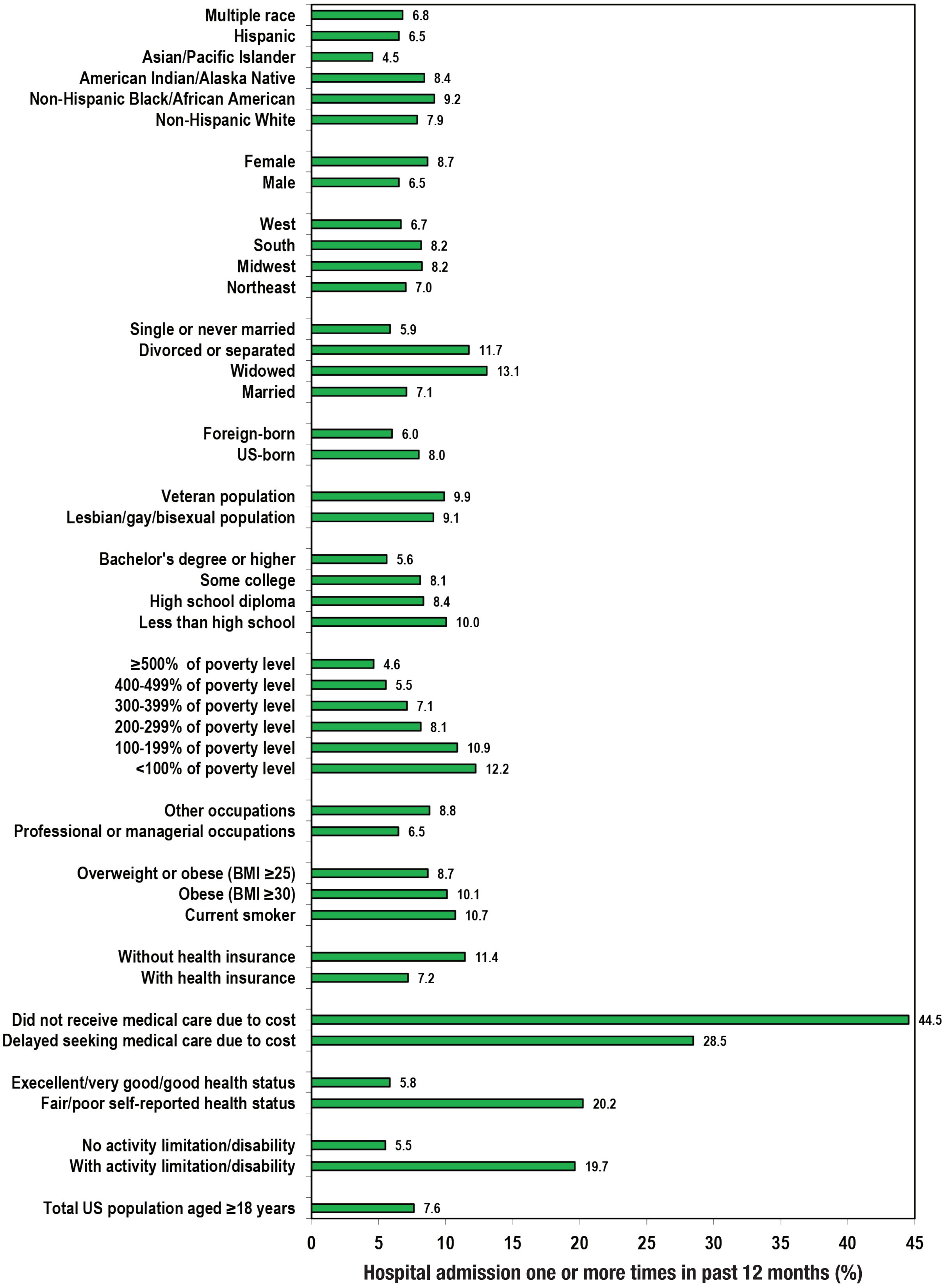


TABLE 2.1: Age-Adjusted Death Rates from Leading Causes of Death by Race/Ethnicity, United States, 1990 and 2017

1990	ALL RACES		NON-HISPANIC WHITE		BLACK		AIAN		API		HISPANIC		Rate Ratio Black to NHW	% Decline in Death Rate 1990-2017
Cause of Death	Death Rate	SE	Death Rate	SE	Death Rate	SE	Death Rate	SE	Death Rate	SE	Death Rate	SE		
All Causes of Death	934.01	0.64	867.25	0.67	1,249.75	2.53	750.22	9.27	576.71	4.47	688.03	2.79	1.44	21.64
Cardiovascular Diseases (CVD)	408.71	0.43	385.52	0.45	513.27	1.68	265.93	5.86	251.53	3.10	276.06	1.88	1.33	46.64
Heart Disease	320.26	0.38	303.17	0.40	391.64	1.46	211.70	5.19	180.81	2.63	216.44	1.66	1.29	48.47
Stroke	65.23	0.17	60.37	0.18	91.91	0.71	43.63	2.44	56.87	1.47	45.34	0.77	1.52	42.37
All Cancers Combined	214.95	0.31	204.33	0.32	279.30	1.19	127.25	3.82	132.58	1.99	136.18	1.23	1.37	29.06
Lung Cancer	58.85	0.16	57.08	0.17	72.06	0.59	31.94	1.87	29.77	0.95	26.38	0.54	1.26	37.77
Colorectal Cancer	24.65	0.10	23.59	0.11	30.77	0.40	12.78	1.29	14.33	0.67	14.70	0.41	1.30	44.34
Prostate Cancer	38.56	0.22	34.62	0.23	77.98	1.13	19.76	2.74	16.75	1.21	23.55	0.92	2.25	51.40
Breast Cancer (female)	33.14	0.16	32.17	0.17	38.00	0.56	14.01	1.53	13.45	0.77	19.43	0.57	1.18	39.95
Cervical Cancer	3.66	0.05	2.96	0.05	7.77	0.25	7.22	1.11	3.45	0.38	4.17	0.25	2.63	39.62
Brain Cancer	4.87	0.05	5.05	0.05	2.97	0.12	1.76	0.43	1.88	0.21	2.92	0.16	0.59	9.86
Non-Hodgkin's Lymphoma	7.87	0.06	7.92	0.06	5.39	0.16	5.09	0.79	4.63	0.37	5.40	0.24	0.68	32.66
HIV/AIDS	10.14	0.07	6.97	0.06	26.50	0.31	1.72	0.30	2.19	0.18	16.04	0.30	3.80	84.22
Diabetes Mellitus	20.54	0.10	17.35	0.09	40.54	0.46	35.76	2.03	14.45	0.70	28.00	0.57	2.34	-4.43
Alzheimers Disease	6.34	0.05	6.48	0.06	3.96	0.16	1.91	0.52	1.97	0.30	2.58	0.19	0.61	-389.59
Pneumonia and Influenza	36.59	0.13	34.54	0.14	39.43	0.47	38.67	2.36	31.15	1.17	29.64	0.64	1.14	60.92
COPD	37.03	0.13	37.18	0.14	28.14	0.38	26.74	1.86	19.19	0.84	19.22	0.50	0.76	-10.50
Chronic Liver Disease & Cirrhosis	11.06	0.07	9.41	0.07	16.55	0.28	24.53	1.41	5.11	0.35	18.16	0.40	1.76	1.63
Nephritis and Kidney Diseases	9.25	0.06	7.72	0.06	19.92	0.33	12.29	1.25	7.05	0.51	8.37	0.32	2.58	-40.65
Unintentional Injuries (Accidents)	37.31	0.12	34.39	0.14	45.60	0.44	63.94	2.11	24.41	0.78	34.65	0.49	1.33	-32.38
Suicide	12.45	0.07	13.09	0.08	7.06	0.16	11.79	0.81	6.60	0.36	7.66	0.22	0.54	-12.53
Homicide	9.43	0.06	3.90	0.05	36.22	0.34	10.76	0.78	4.91	0.26	15.89	0.27	9.29	34.68

TABLE 2.1 (CONTINUED): Age-Adjusted Death Rates from Leading Causes of Death by Race/Ethnicity, United States, 1990 and 2017

2017	**ALL RACES**		**NON-HISPANIC WHITE**		**BLACK**		**AIAN**		**API**		**HISPANIC**		**Rate Ratio** Black to NHW
Cause of Death	**Death Rate**	**SE**	**Death Rate**	**SE**	**Death Rate**	**SE**	**Death Rate**	**SE**	**Death Rate**	**SE**	**Death Rate**	**SE**	
All Causes of Death	731.91	0.44	755.00	0.53	854.11	1.51	587.49	4.36	393.59	1.47	524.75	1.24	1.13
Cardiovascular Diseases (CVD)	218.10	0.24	220.09	0.28	277.74	0.87	153.13	2.33	127.32	0.84	158.15	0.70	1.26
Heart Disease	165.04	0.21	168.94	0.24	202.42	0.74	115.81	2.01	85.38	0.69	114.13	0.59	1.20
Stroke	37.59	0.10	36.36	0.11	51.16	0.38	26.22	0.99	30.09	0.41	31.79	0.32	1.41
All Cancers Combined	152.49	0.20	157.87	0.24	172.84	0.67	99.24	1.78	94.37	0.71	108.12	0.56	1.09
Lung Cancer	36.62	0.10	39.94	0.12	37.70	0.31	23.52	0.87	20.30	0.33	15.56	0.22	0.94
Colorectal Cancer	13.72	0.06	13.72	0.07	17.89	0.22	10.90	0.59	9.27	0.22	10.91	0.18	1.30
Prostate Cancer	18.74	0.11	17.80	0.12	35.84	0.53	11.46	1.02	8.37	0.34	15.42	0.36	2.01
Breast Cancer (female)	19.90	0.10	19.98	0.12	26.86	0.34	11.44	0.80	11.74	0.32	13.38	0.25	1.34
Cervical Cancer	2.21	0.04	2.00	0.04	3.37	0.12	1.53	0.27	1.78	0.13	2.54	0.11	1.69
Brain Cancer	4.39	0.03	5.06	0.04	2.63	0.08	1.76	0.22	2.09	0.10	3.07	0.09	0.52
Non-Hodgkin's Lymphoma	5.30	0.04	5.61	0.04	3.92	0.10	2.65	0.30	3.43	0.14	4.39	0.11	0.70
HIV/AIDS	1.60	0.02	0.75	0.02	6.62	0.12	0.93	0.15	0.32	0.04	1.65	0.06	8.83
Diabetes Mellitus	21.45	0.08	18.84	0.08	37.53	0.32	34.40	1.06	16.44	0.30	25.46	0.28	1.99
Alzheimers Disease	31.04	0.09	32.81	0.10	27.77	0.29	16.50	0.84	15.18	3.00	24.68	0.29	0.85
Pneumonia and Influenza	14.30	0.06	14.43	0.07	14.89	0.20	13.06	0.68	12.98	0.27	11.27	0.19	1.03
COPD	40.92	0.10	46.44	0.13	29.37	0.28	31.15	1.05	11.88	0.26	17.20	0.24	0.63
Chronic Liver Disease & Cirrhosis	10.88	0.05	11.25	0.07	7.25	0.13	26.11	0.80	3.68	0.14	14.26	0.19	0.64
Nephritis and Kidney Diseases	13.01	0.06	11.74	0.06	24.91	0.26	10.92	0.61	8.51	0.22	11.26	0.19	2.12
Unintentional Injuries (Accidents)	49.39	0.10	56.20	0.10	45.72	0.33	55.76	1.19	16.78	0.29	32.53	0.26	0.81
Suicide	14.01	0.07	17.83	0.10	6.65	0.12	13.49	0.54	6.63	0.18	6.89	0.11	0.37
Homicide	6.16	0.04	2.94	0.00	21.38	0.22	6.33	0.37	1.67	0.09	5.20	0.09	7.27

Death rates are directly standardized to the 2000 US standard population.
COPD = Chronic Obstructive Pulmonary Diseases. AIAN = American Indian or Alaska Native. API = Asian or Pacific Islander. NHW = Non-Hispanic White.

All ratios and percentage change in death rates were statistically significant at p <.05. The minus (-) percentage change indicates an increase in mortality rates during 1990-2017.

TABLE 2.2: Age-Adjusted Chronic Disease Prevalence (%) Among US Adults Aged ≥25 years by Sociodemographic Characteristics 2017 National Health Interview Survey

	HEART DISEASE			ALL CANCERS COMBINED			DIABETES		
Characteristic	**Prevalence**	**SE**	**RR**	**Prevalence**	**SE**	**RR**	**Prevalence**	**SE**	**RR**
Sex/gender	**10.6**	**0.22**		**8.5**	**0.18**		**8.8**	**0.19**	
Male	11.8	0.34	1.24*	8.4	0.26	0.97*	9.9	0.29	1.27*
Female	9.5	0.29	1.00	8.7	0.25	1.00	7.8	0.26	1.00
Race/ethnicity									
White	11.0	0.26	1.00	9.3	0.21	1.00	8.3	0.21	1.00
Black/African American	9.7	0.57	0.88*	5.1	0.42	0.55*	11.4	0.63	1.37*
American Indian/Alaska Native	7.0	2.15	0.64*				16.6	3.02	2.00*
Asian	6.1	0.74	0.55*	5.3	0.74	0.57*	9.4	0.94	1.13
Hispanic or Latino	7.4	0.50	0.67*	4.4	0.41	0.47*	13.2	0.73	1.59*
Multiple race	12.7	1.66	1.15	8.7	1.30	0.94*	10.7	1.55	1.29
Marital status									
Married	10.3	0.30	1.00	9.4	0.29	1.00	8.5	0.28	1.00
Widowed	11.6	1.45	1.13	10.1	1.94	1.07	13.4	2.35	1.58*
Divorced/separated	12.5	0.63	1.21*	8.5	0.51	0.90	11.2	0.65	1.32*
Never married	9.9	0.60	0.96	6.5	0.49	0.69*	9.2	0.59	1.08
Living with a partner	11.0	1.15	1.07	9.4	1.08	1.00	8.3	0.98	0.98
Place of residence									
Large metropolitan area	9.9	0.31	1.00	8.1	0.26	1.00	8.0	0.27	1.00
Small metropolitan area	10.9	0.37	1.10*	9.0	0.33	1.11*	9.1	0.32	1.14*
Non-metropolitan area	12.8	0.63	1.29*	8.8	0.41	1.09	11.4	0.58	1.43*
Educational attainment									
< High school	12.0	0.68	1.20*	7.8	0.53	0.72*	16.1	0.86	2.44*
High school graduate	12.3	0.46	1.23*	8.7	0.37	0.80*	11.0	0.45	1.67*
Some college/associate degree	13.2	0.45	1.32*	10.4	0.38	0.95	10.6	0.43	1.61*
College graduate or higher	10.0	0.36	1.00	10.9	0.39	1.00	6.6	0.32	1.00
Family income									
<$35,000	12.5	0.41	1.34*	7.8	0.31	0.82*	12.20	0.42	2.18*
$35,000 - $49,999	11.7	0.69	1.26*	8.7	0.52	0.92	10.50	0.73	1.88*
$50,000 - $74,999	11.0	0.55	1.18*	8.2	0.43	0.86*	8.50	0.48	1.52*
$75,000 - $99,999	10.5	0.71	1.13	9.3	0.62	0.98	8.60	0.64	1.54*
$100,000 or more	9.3	0.45	1.00	9.5	0.46	1.00	5.60	0.35	1.00
Employment status									
Employed, full time	7.5	0.49	1.00	8.2	0.60	1.00	6.5	0.40	1.00
Employed, part time	10.5	0.75	1.40 *	8.1	0.64	0.99	6.9	0.59	1.06
Not employed, but has worked previously	14.0	0.47	1.87 *	10.7	0.38	1.30 *	12.1	0.44	1.86 *

Rates are age-adjusted to the 2000 US standard population. SE = standard error. RR = prevalence rate ratio.* P <0.05.

TABLE 2.3: Age-adjusted Breast, Cervical, and Prostate Cancer Prevalence (%) among US Adults Aged ≥25 Years by Sociodemographic Characteristics: 2017 National Health Interview Survey

	FEMALE BREAST CANCER			CERVICAL CANCER			PROSTATE CANCER		
Characteristic	**Prevalence**	**SE**	**RR**	**Prevalence**	**SE**	**RR**	**Prevalence**	**SE**	**RR**
Sex/gender									
Male							2.3	0.14	
Female	2.6	0.13		0.9	0.08				
Race/ethnicity									
White	1.4	0.08	1.00	1.1	0.10	1.00	2.2	0.15	1.00
Black/African American	1.4	0.26	1.00	0.5	0.16	0.45*	3.6	0.57	1.64*
American Indian/Alaska Native	0.6	0.33	0.43*	0.8	0.86	0.73			
Asian	1.4	0.39	1.00	0.3	0.19	0.27*	1.3	0.62	0.59
Hispanic or Latino	1.2	0.22	0.86	0.3	0.12	0.27*	1.8	0.5	0.82
Multiple race	1.8	0.64	1.29	0.4	0.27	0.36*			
Marital status									
Married	1.4	0.11	1.00	0.8	0.12	1.00	2.3	0.19	1.00
Widowed	1.6	0.20	1.14				2.1	0.37	0.91
Divorced/separated	1.3	0.16	0.93	1.5	0.33	1.88*	2.7	0.37	1.17
Never married	1.5	0.28	1.07	0.6	0.17	0.75	2.4	0.73	1.04
Living with a partner	1.0	0.34	0.71	1.5	0.38	1.88	1.4	0.65	0.61
Place of residence									
Large metropolitan area	1.4	0.11	1.00	0.7	0.10	1.00	2.4	0.22	1.00
Small metropolitan area	1.3	0.12	0.93	1.1	0.15	1.57*	2.4	0.23	1.00
Non-metropolitan area	1.5	0.16	1.07	1.6	0.32	2.29*	1.6	0.27	0.67*
Educational attainment									
< High school	1.4	0.24	0.88	1.7	0.40	2.83*	2.6	0.40	0.90
High school graduate	1.8	0.18	1.13	1.3	0.25	2.17*	2.1	0.26	0.72*
Some college/associate degree	1.7	0.16	1.06	1.1	0.18	1.83*	2.7	0.31	0.93
College graduate or higher	1.6	0.14	1.00	0.6	0.12	1.00	2.9	0.31	1.00
Family income									
<$35,000	1.6	0.14	1.33	1.2	0.16	2.00*	2.0	0.23	0.67*
$35,000 - $49,999	1.5	0.25	1.25	1.0	0.25	1.67	2.6	0.21	0.87
$50,000 - $74,999	1.2	0.18	1.00	0.9	0.21	1.50	2.4	0.34	0.80
$75,000 - $99,999	1.5	0.29	1.25	0.8	0.29	1.33	3.0	0.50	1.00
$100,000 or more	1.2	0.16	1.00	0.6	0.17	1.00	3.0	0.44	1.00
Employment status									
Employed, full time	1.0	0.19	1.00	0.6	0.09	1.00	3.2	0.82	1.00
Employed, part time	1.3	0.22	1.30*	1.2	0.34	2.00	1.9	0.61	0.59
Not employed, but has worked previously	1.8	0.15	1.80*	1.3	0.18	2.17*	2.4	0.22	0.75

Rates are age-adjusted to the 2000 US standard population. SE = standard error. RR = prevalence rate ratio.* P <0.05.

TABLE 2.4: Age-Adjusted Prevalence (%) of Serious Psychological Distress and Unmet Medical Need among US Population by Sociodemographic Characteristics: 2017 National Health Interview Survey

	Serious psychological distress[1]			Did not receive medical care due to cost[2]			Delayed seeking medical care due to cost[2]		
Characteristic	**Prevalence**	**SE**	**RR**	**Prevalence**	**SE**	**RR**	**Prevalence**	**SE**	**RR**
Sex/gender	**3.3**	**0.14**		**4.4**	**0.11**		**6.3**	**0.13**	
Male	2.5	0.17	0.61*	4.0	0.13	0.83*	5.7	0.16	0.84*
Female	4.1	0.21	1.00	4.8	0.14	1.00	6.8	0.16	1.00
Race/ethnicity									
White	3.4	0.16	1.00	4.2	0.12	1.00	6.4	0.15	1.00
Black/African American	3.2	0.37	0.94	6.1	0.33	1.45*	6.8	0.33	1.06
American Indian/Alaska Native[3]	6.1	1.27	1.79*	4.7	0.86	1.12	5.4	1.05	0.84
Asian	1.2	0.31	0.35*	2.2	0.27	0.52*	3.1	0.32	0.48*
Hispanic or Latino	3.7	0.37	1.09	5.3	0.28	1.26*	6.6	0.32	1.03
Multiple race	8.8	1.57	2.59*	8.0	0.89	1.90*	11.2	0.98	1.75*
Marital status									
Married	1.9	0.14	1.00						
Widowed	7.3	1.76	3.84*						
Divorced/separated	6.6	0.56	3.47*						
Never married	4.3	0.35	2.26*						
Living with a partner	3.8	0.56	2.00*						
Place of residence									
Large metropolitan area	2.9	0.18	1.00	4.0	0.15	1.00	5.9	0.17	1.00*
Small metropolitan area	3.7	0.23	1.28*	4.8	0.19	1.20*	6.5	0.23	1.10*
Non-metropolitan area	4.7	0.47	1.62*	5.3	0.34	1.33*	7.3	0.39	1.24*
Educational attainment									
< High school	6.2	0.57	4.77*	9.6	0.49	3.10*	11.3	0.53	2.05*
High school graduate	4.6	0.35	3.54*	6.5	0.27	2.10*	8.5	0.28	1.55*
Some college/associate degree	3.7	0.27	2.85*	6.8	0.25	2.19*	9.6	0.29	1.75*
College graduate or higher	1.3	0.14	1.00	3.1	0.15	1.00	5.5	0.20	1.00*
Family income									
<$35,000	7.3	0.36	6.64*	9.3	0.29	8.45*	11.3	0.31	4.91*
$35,000 - $49,999	3.7	0.40	3.36*	6.9	0.39	6.27*	10.1	0.50	4.39*
$50,000 - $74,999	2.6	0.34	2.36*	4.3	0.25	3.91*	7.2	0.34	3.13*
$75,000 - $99,999	2.2	0.39	2.00*	2.6	0.25	2.36*	4.4	0.34	1.91*
$100,000 or more	1.1	0.18	1.00	1.1	0.10	1.00	2.3	0.15	1.00*
Employment status									
Employed, full time	1.4	0.13	1.00						
Employed, part time	3.1	0.41	2.21*						
Not employed, but has worked previously	7.5	0.41	5.36*						

Rates are age-adjusted to the 2000 US standard population. SE = standard error. RR = prevalence rate ratio.* P <0.05.

1 Adults aged 18 years and older.

2 Population of all ages. Education-specific estimates for population aged ≥25.

3 Estimates for American Indians and Alaska Natives are for the period 2016-2017.

Chapter 3. Housing and Health Inequalities

Housing is an important social determinant of health, which affects health, disease, and health care outcomes in a variety of ways.[1, 2] Improvements in housing and neighborhood conditions have long been used as key policy instruments to improve population health and to reduce health disparities among populations.[1, 3] A number of studies have shown links between various aspects of housing, such as housing tenure (owner-occupied homes vs. rental units), subsidized housing, housing quality, lack of safe and affordable housing, household crowding, housing instability, homelessness, and neighborhood housing conditions, and morbidity and mortality, cardiovascular health, COPD or respiratory problems, physical and mental health, health care access and utilization, injuries, and violence.[1, 3-9]

Housing tenure is the most widely used variable when studying links between housing and health inequalities, primarily because of availability of data on housing tenure in decennial censuses, the American Community Survey, and national health surveys. People who rent their houses generally have poorer health than those who own their homes.[1, 3] This is partly due to the fact that home ownership is an indicator of wealth and represents higher socioeconomic position in most societies, which is generally associated with better health However, homeownership does not only represent material aspects of one's social position. It also has other social and psychological meanings and benefits, such as increased attachment to one's immediate neighborhood as well as to the larger community, higher community engagement, social connectedness, and social support, all of which are associated with people's health and wellbeing.[1, 3, 10]

The two-category measure of housing tenure (i.e., homeowners vs. renters) has been frequently related to health, disease, and mortality patterns in a number of studies.[1, 7, 11] However, few studies have studied the detailed nature of housing tenure, differentiating renters who receive rental or housing assistance from a government program from those who do not receive any rental assistance.[12, 13] Homeowners and renters vary substantially in terms of demographic, socioeconomic, psychological, and neighborhood characteristics.[1] Homeowners are more likely to be male, married, have higher incomes, life satisfaction and self-esteem. However, renters, particularly those receiving rental assistance or living in subsidized housing, are more likely to be female, ethnic minorities, and report marital disruption, living alone, higher unemployment, lower education and incomes, and problems with their neighborhood.[1, 12] Compared with homeowners and non-rental assistance renters, public housing residents and rental assistance renters have higher rates of obesity, smoking, secondhand smoke exposure at home, asthma, poorer health status, depressive symptoms, and hypertension.[12, 14]

Relationships between housing and health are not well studied for vulnerable groups such as ethnic minorities, immigrants, low-income, and socially disadvantaged populations. Since many of these demographic groups live in substandard housing conditions and deprived neighborhoods, they are more likely to experience poorer health or higher disease burden.[4, 10] Homelessness is an extreme form of housing and social deprivation and is linked to a number of adverse health outcomes.[5, 15] Homeless persons experience high rates of chronic mental and physical health conditions, diabetes, hypertension, depression, substance use disorder, HIV infection, tuberculosis, violence, unemployment, use of emergency services, barriers to health care and affordable housing, and premature mortality.[1, 5, 15] According to HRSA's Health Center Patient Survey, homeless patients are 2 times more likely to experience serious psychological distress and 57 percent more likely to report being in fair/poor health than community health center patients.[11]

Housing instability, defined in terms of being unable to pay rent, overcrowding, housing cost burden, and frequent residential moves, is strongly linked to poor physical and mental health and reduced access to health care.[5] Data from the Ryan White HIV/AIDS Program (RWHAP) show that patients with temporary or unstable housing have the lowest percentages of viral suppression, although the rates of viral suppression for both temporarily housed and unstably housed patients increased markedly between 2010 and 2017.[16] The RWHAP data also show that, regardless of race/ethnicity, HIV patients with temporary housing and unstable housing had significantly lower rates of retention in care than patients with stable permanent housing.[16] A recent study showed that the use of patient navigation models to create a network of services for unstably-housed HIV patients improved housing stability and HIV-related outcomes such as retention in care, antiretroviral therapy prescription, and viral suppression.[17]

This chapter addresses some of the gaps in U.S. research on housing and health by analyzing individual-level inequalities in physical and mental health, chronic conditions, health risk- behaviors, and health care outcomes among children and adults according to housing tenure and housing cost concerns. Using the 2014-2016 National Health Interview Survey data, these analyses are carried out by age, gender, race/ethnicity, nativity/immigrant status, and sexual orientation. In addition, using recent county-level data from the American Community Survey, the Behavioral Risk Factor Surveillance System, and the County Health Rankings, this chapter examines area-level associations between housing variables (e.g., home ownership rates, severe housing problems, housing cost burden, and residential segregation) and rates of poor health, mental distress, HIV prevalence, smoking, heavy drinking, physical inactivity, violent crime, and community social integration.

Sociodemographic and Neighborhood Characteristics Associated with Homeownership, Rental Assistance/ Subsidized Housing, and Housing Costs Concerns

Table 3.1 shows differences in homeownership and housing costs concerns by selected sociodemographic characteristics during 2014-2016. Homeownership rates rose consistently with increasing age. Individuals aged 65 and older were 70 percent more likely to own a home than those aged 18–24 (81.6 percent vs. 48.2 percent). Non-Hispanic Whites had the highest rate of homeownership (74.2 percent), followed by APIs (60.6 percent), AIANs (55.4 percent), Hispanics (50.1 percent), and non-Hispanic Blacks (47.6 percent). Immigrants and those residing in the Western United States had lower home ownership rates than the U.S.-born and those residing in other regions, respectively. Homeownership rates were substantially lower among the never married and divorced, compared with currently married individuals. Education and income levels were inversely related to homeownership rates. Individuals with a college degree had a homeownership rate of 75.2 percent, compared with 52.5 percent for those with less than a high school diploma. Those with income levels at or above the 500 percent of poverty level were 3.0 times more likely to own a home than those living in poverty (85.3 percent vs. 28.1 percent).

Individuals aged 35-54 were most likely to be concerned about housing costs, compared to those aged under 25 and older than 65 years. Ethnic minorities, immigrants, divorced/separated adults, the unemployed, and those with low-income and education levels were more likely to report being concerned about housing costs than non-Hispanic Whites, the U.S.-born, currently-married individuals, the employed, and adults with high education and income levels, respectively.

Homeowners were more likely to stay in their local neighborhoods for a longer period of time and report higher levels of social capital than renters. For example, during 2014-2016, 56.0 percent of homeowners reported living in their neighborhood for 11 years or longer, compared with 13.7 percent of renters (data not shown). Approximately 89.6 percent of homeowners reported that people in their neighborhood could be trusted, compared with 72.4 percent of renters. Approximately 69.6 percent of homeowners reported that theirs was a close-knit or cohesive neighborhood, compared with 54.6 percent of renters (data not shown).

The category of renters can be classified into groups of renters who receive rental assistance from a government program and those who do not receive rental assistance. During 2014-2016, a larger proportion of individuals aged 65 and older lived in subsidized housing, compared with homeowners and renters who did not receive any rental assistance (Table 3.2). Two-thirds of those receiving rental assistance or living in subsidized housing were women. Compared with homeowners and renters not receiving any rental assistance, those living in subsidized housing were more likely to be single, divorced/separated, residents of Northeast United States, poor, unemployed, and without a high school diploma. Those receiving rental assistance or living in subsidized housing are also more likely to report that people in their neighborhoods are less helpful or trustworthy.

Inequalities in Psychological Distress by Housing Tenure and Housing Costs Concerns

Figure 3.1 shows the prevalence of serious psychological distress (SPD) among U.S. adults aged 18 and older by housing tenure, gender, and age. Renters were two times more likely to report experiencing SPD than homeowners. Renters receiving rental assistance or living in subsidized housing were 3.9 more likely to experience SPD than homeowners (9.80 percent vs. 2.54 percent).

The prevalence of SPD was the highest among homeowners and renters in the age groups 45-54 and 55-64. Renters aged 55-64 were almost 3 times more likely to experience SPD than homeowners aged 55-64 (8.67 percent vs. 3.05 percent). Renters aged 45-54 receiving rental assistance or living in subsidized housing were 4.9 more likely to experience SPD than homeowners aged 45-54 (14.72 percent vs. 3.02 percent).

Figure 3.2 shows the prevalence of SPD by housing tenure, race/ethnicity, nativity/immigrant status, and LGB status. Renters, in particular those receiving rental assistance, had a higher prevalence of SPD than homeowners across all racial/ethnic groups although the association between housing tenure and SPD was most pronounced for non-Hispanic Whites and Blacks. Of all racial/ethnic groups, AIAN renters and homeowners reported the highest levels of SPD (11.01 percent and 9.74 percent respectively). Immigrant renters and homeowners reported lower levels of SPD than their U.S.-born counterparts, while LGB renters and homeowners reported higher levels of SPD than their straight/heterosexual counterparts.

Figure 3.3 shows the prevalence of SPD by housing/mortgage/rental costs concerns, gender, and age. Individuals who were very concerned about housing costs were 9.2 times more likely to report experiencing SPD than those who were not worried at all (15.77 percent vs. 1.71 percent). Similar levels of SPD by housing cost concerns were found for males and females. The relationship between housing cost concerns and SPD levels was particularly strong for those aged 35 and older. Adults aged 65 and older who were very concerned about housing costs were 12.0 times more likely to report experiencing SPD than those who were not worried at all (15.76 percent vs. 1.31 percent).

Figure 3.4 shows the prevalence of SPD by housing cost concerns, race/ethnicity, nativity/immigrant status, and LGB status. For all racial/ethnic groups, individuals who were very concerned about housing costs reported experiencing higher SPD levels than those who were not worried at all. More than 20 percent of AIANs and non-Hispanic Whites who were very concerned about housing costs reported SPD. Immigrants with housing cost concerns were much less likely to report SPD than their U.S.-born counterparts. More than 35 percent of LGB adults who were very concerned about housing costs reported experiencing SPD, compared with 15.12 percent of straight/heterosexual adults with similar cost concerns.

Inequalities in Self-Assessed Health by Housing Tenure and Housing Costs Concerns

Figure 3.5 shows the prevalence of self-assessed fair/ poor health among U.S. adults by housing tenure, gender, and age. During 2014-2016, renters were 37 percent more likely to assess their health as fair or poor than homeowners (15.18 percent vs. 11.05 percent). One-third of renters who received rental assistance or in subsidized housing reported being in fair or poor health. The association between housing tenure and self-assessed health was stronger for females than for males. Nearly one- third of renters aged 55-64 and 65 and older rated their health as fair or poor, compared with 14.38 percent and 19.24 percent of homeowners in the respective age groups.

Figure 3.6 shows the prevalence of self-assessed fair/ poor health among U.S. adults by housing tenure, race/ethnicity, nativity/immigrant status, and LGB status. Except for AIANs, renters from all racial/ ethnic groups were significantly more likely to rate their health as fair or poor than homeowners. AIAN renters and homeowners were more likely than other racial/ethnic groups to rate their health as fair/poor (20.93 percent and 21.95 percent). Renters receiving rental assistance or living in subsidized housing were substantially more likely to be in fair or poor health than overall renters and homeowners. For nativity/immigrant and LGB groups, homeownership was also associated with a lower likelihood of self-assessed fair/poor health.

Figure 3.7 shows variations in parent-reported fair/ poor health among U.S. children under age 18 by housing tenure. Except for AIAN children, children from all racial/ethnic groups in owner-occupied homes were less likely to have fair/poor health than children living in rental housing units. Children living in subsidized housing units were 4.0 times more likely to be in fair/poor health than those living in owner-occupied homes (4.39 percent vs. 1.08 percent). For both U.S.-born and immigrant children, living in owner-occupied homes was associated with a reduced likelihood of fair/poor health.

Figure 3.8 shows differentials in self-assessed fair/ poor health by housing cost concerns, gender, and age. About 30 percent of males, females, and the overall population aged 18 and older with housing cost concerns rated their health as fair or poor. Nearly half of those aged 55-64 and 65 and older with housing cost concerns rated their health as fair or poor. Figure 3.9 shows variations in self-assessed fair/ poor health by housing cost concerns, race/ethnicity, nativity/immigrant status, and LGB status. Higher housing cost concerns were associated with a higher prevalence of self-assessed fair/poor health for all sociodemographic groups; 32-42 percent of the U.S.-born, non-Hispanic Whites, and AIANs with housing costs concerns rated their health as fair/poor.

Changes in Health Status by Housing Tenure and Housing Costs Concerns

Figure 3.10 shows the prevalence of worsening health over the past 1 year by housing tenure, gender, and age. During 2014-2016, a higher proportion of renters reported worsening health status over the past year, compared with homeowners (9.15 percent vs. 7.76 percent). Approximately 15.23 percent of adults receiving rental assistance or living in subsidized housing reported worsening health over the past year. Among both homeowners and renters, the health status worsened more rapidly with increasing age. Figure 3.11 shows the prevalence of worsening health over the past 1 year by housing tenure, race/ ethnicity, nativity/immigrant status, and LGB status, with renters in all groups, particularly renters receiving housing assistance, being more likely to report worsening health than homeowners, except for AIANs. Figure 3.12 shows the prevalence of worsening health over the past 1 year by housing cost concerns, gender, and age. Higher housing cost concerns were strongly related to worsening health status; those who were very worried about housing costs were three times more likely to experience worsening health than those who were not worried at all. Gradients in worsening health by housing cost concerns can be noted for both males and females and for all age groups. In Figure 3.13, the higher the housing cost concerns, the higher the likelihood of worsening health for all racial/ethnic, LGB, and nativity/immigrant groups.

Inequalities in Health and Health-Risk Factors by Housing Tenure and Housing Costs Concerns

Table 3.3 shows age-adjusted prevalence of selected health indicators and health-risk behaviors by housing tenure. During 2014-2016, compared with homeowners aged 18 and older, renters had a 19 percent higher risk of heart disease, 43 percent higher risk of diabetes, 60 percent higher risk of COPD, 78 percent higher risk of kidney disease,14 percent higher risk of hypertension, 76 percent higher risk of disability or activity limitation, 72 percent higher risk of smoking, 11 percent higher risk of obesity, and 16 percent higher risk of heavy drinking. Relative risks of morbidity were even greater for those receiving rental assistance or living in subsidized housing. Compared with homeowners, those receiving rental assistance or living in subsidized housing had 2.0-3.4 times higher risks of diabetes, COPD, kidney disease, smoking, and activity limitation.

Table 3.4 shows consistent gradients in health and health-risk factors by housing cost concerns. Compared with adults who were not worried at all about housing costs, those very worried about housing costs had a 57 percent higher risk of heart disease, 94 percent higher risk of diabetes, 134 percent higher risk of COPD, 164 percent higher risk of kidney disease, 33 percent higher risk of hypertension, 120 percent higher risk of disability/activity limitation, 95 percent higher risk of smoking, and 33 percent higher risk of obesity.

Health Insurance Access by Housing Tenure and Housing Costs Concerns

During 2014-2016, 19.0 percent of renters aged 18 and older lacked health insurance, compared with7.35 percent of homeowners (Figure 3.14). Renters receiving housing assistance generally had lower uninsurance rates than those not receiving any rental assistance. For both males and females and for all age groups, renters were 2 to 3 times more likely to be uninsured, compared with homeowners. For example, in the age group 35-44, renters were 2.3 times more likely to be without health insurance than homeowners (24.37 percent vs. 10.47 percent). Although renters in each racial/ethnic groups had higher a likelihood of being uninsured, both renters and homeowners in certain ethnic-minority groups such as Hispanics, AIANs, and Blacks had high rates of uninsurance (Figure 3.15). For example, 33.52 percent of Hispanic renters and 27.51 percent of AIAN renters lacked health insurance. Immigrant homeowners and renters were more than two times more likely to be without health insurance than their U.S.-born counterparts. The percentage of immigrant renters who lacked health insurance was 30.99 percent.

Access to health insurance was inversely associated with housing cost concerns (Figure 3.16). Of adults aged 25-34 who were very worried about housing costs, 40.13 percent lacked health insurance, compared with 11.0 percent of those not worried at all about housing costs. Health insurance also varied inversely by housing cost concerns among various racial/ethnic, immigrant, and LGB groups (Figure 3.17). Of adults who were very worried about housing costs, 40.72 percent of Hispanics and 37.56 percent of immigrants lacked health insurance, compared with 16.48 percent of Hispanics and 13.70 percent of immigrants with no housing cost concerns, respectively.

Health insurance among children in different racial/ethnic and immigrant groups varied significantly by housing tenure (Figure 3.18). During 2014-2016, 17.48 percent of AIAN children living in rental housing units lacked health insurance, compared with 15.32 percent of AIAN children in owner-occupied homes. 23.72 percent of immigrant children in rental housing units were without health insurance, compared with 4.92 percent of U.S.-born children.

Health Care Outcomes by Housing Tenure and Housing Costs Concerns

Figure 3.19 shows marked disparities in ER visits and hospital admission rates by housing tenure. During 2014-2016, 23.41 percent of adults aged 18 and older and 21.60 percent of children under age 18 living in rental housing units had 1 or more ER visits during the past year, compared with 16.58 percent of adults and 14.30 percent of children in owner-occupied homes. Among those living in subsidized housing 35.63 percent of adults and 26.33 percent of children had 1 or more ER visits during the past year. The likelihood of hospital admission was, respectively, 18 percent and 36 percent and higher among children and adults living in rental units, compared with those in owner-occupied homes. Housing cost concerns were consistently related to the likelihood of ER visits and hospital admission among adults during the past year (Figure 3.20). Among adults who were very worried about housing costs 31.43 percent had 1 or more ER visits in the past year, compared with 17.07 percent of those not worried at all. Nearly 17 percent of adults who were very worried about housing costs had 1 or more hospital admissions in the past year, compared with 6.57 percent of those not worried at all.

Geographic Inequalities in Housing and Health Indicators

The county maps of homeownership rates and housing cost burden, defined as the percentage of households spending 50 percent or more of their household income on housing, show wide geographic disparities (Figure 3.21). Counties in the Western and Northeastern United States have lower homeownership rates and higher housing cost burden, whereas counties in the Midwest have higher homeownership rates and lower housing cost burden. The county maps in Figure 3.22 show higher rates of severe housing problems (which include overcrowding, high housing costs, and lack of kitchen or plumbing facilities) and low rates of social associations (memberships in voluntary organizations often used as an indicator of social or community integration) in the Western and Eastern United States.

Figure 3.23 show geographic patterns in self-assessed fair/poor overall health and in poor mental health, with counties in the Southeast, Southwest, and Appalachia at higher risks of poor overall health and mental health. The county maps in Figure 3.24 show higher prevalence of HIV in the Southeast and higher rates of violent crime in the Western, Southern, and Northeastern United States.

County-Level Associations between Housing, Health, and Health-Risk Indicators

Table 3.4 shows correlations between several housing variables, morbidity, and health-risk indicators at the county level during 2004-2017. Homeownership was inversely associated with rates of self-assessed fair/poor health (γ=-0.19945), mental distress (γ=-0.31794), HIV prevalence (γ=-0.33768), smoking (γ=-0.23684), teen birth (γ=-0.19557), and violent crime (γ=-0.30233). Severe housing problems and housing cost burden were directly related to the above health and social indicators in an expected manner. For example, severe housing cost burden was associated with increased rates of self-assessed fair/poor health (γ=0.23498), mental distress (γ=0.26232), HIV prevalence (γ=0.41957), smoking (γ=0.09102), and violent crime (γ=0.32001). Non-White/White residential segregation was associated with increased rates of mental distress (γ=0.20495), HIV prevalence (γ=0.11383), smoking (γ=0.12177), excessive drinking (γ=0.15954), physical inactivity (γ=0.06616), and violent crime (γ=0.17933). Not surprisingly, all housing variables were related to memberships in voluntary organizations at the county level, as they (particularly homeownership) can be considered measures of social or community integration or disorganization, and people's sense of community.

Summary

This chapter presents empirical evidence linking several aspects of housing to health, morbidity, and health-risk factors in the United States, using both individual- and county-level data. Both material and psychosocial aspects of housing, such as those related to housing tenure, housing quality, lack of safe and affordable housing, housing instability, homelessness, and neighborhood housing conditions, are associated with health and health care inequalities. Housing tenure and housing cost concerns vary greatly by sociodemographic and neighborhood characteristics.

Homeowners are more likely to be older, non-Hispanic Whites, U.S.-born, employed, and have higher education and income levels. The renters, particularly those receiving financial assistance from a government program or living in subsidized housing, are more likely to be socially and economically disadvantaged. They are more likely to be single, divorced/separated, residents of the Northeast, poor, unemployed, without a high school diploma, and live in unfavorable neighborhood environments.

Both housing tenure and housing cost concerns are strongly linked to psychological distress, self-rated health, and changes in health status. Renters receiving financial assistance or living in subsidized housing are four times more likely to experience SPD than homeowners. Individuals who are very concerned about housing costs are nine times more likely to experience SPD than those without similar housing concerns. Renters are more likely to rate their health as fair/poor than homeowners, with one-third of renters living in subsidized housing report being in fair/poor health. More than 15 percent of adults receiving rental assistance report experiencing worsening health over the past year, compared with less than 8 percent of homeowners. Adults with high housing cost concerns are three times more likely to experience worsening health than those without such concerns. Compared with homeowners, renters, especially those living in subsidized housing, have substantially higher risks of heart disease, diabetes, COPD, kidney disease, hypertension, activity limitation, smoking, physical inactivity, and obesity. Renters and those with high housing cost concerns have lower access to health insurance and are significantly more likely to report ER visits and hospital admissions in the past year.

Area-level associations also indicate significant housing and health correlations. Counties with lower homeownership rates and severe housing cost burden had higher rates of fair/poor health, mental distress, HIV prevalence, smoking, and violent crime. Counties with higher racial residential segregation had higher rates of mental distress, HIV prevalence, smoking, heavy drinking, physical inactivity, and violent crime.

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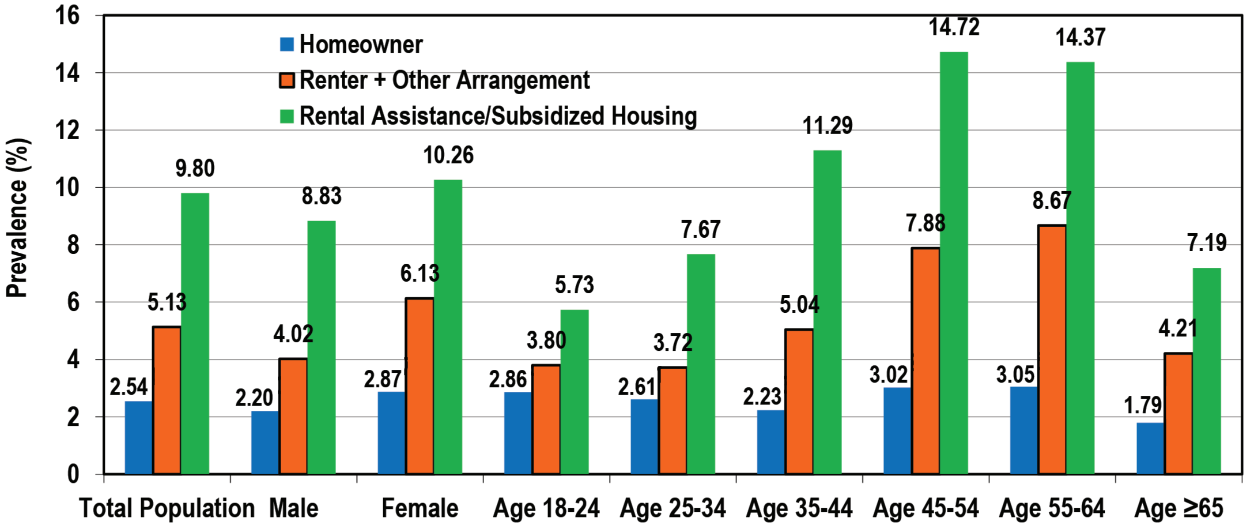
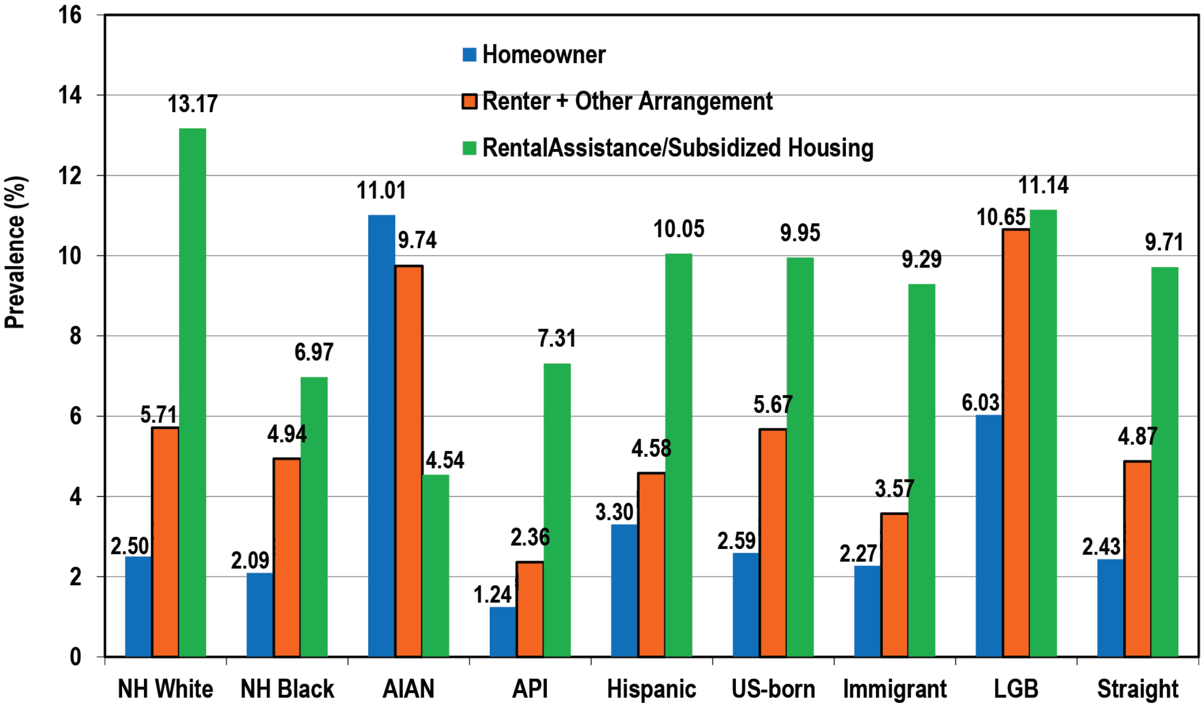
FIGURE 3.1: Prevalence of Serious Psychological Distress by Housing Tenure, Gender and Age Group, U.S. Population Aged ≥18 Years, 2014-2016 (N = 99,385)



Differences by housing tenure across gender and age groups were statistically significant at p<.001. Renters include those receiving rental assistance from a government program. Source: Data derived from the 2014-2016 National Health Interview Survey.

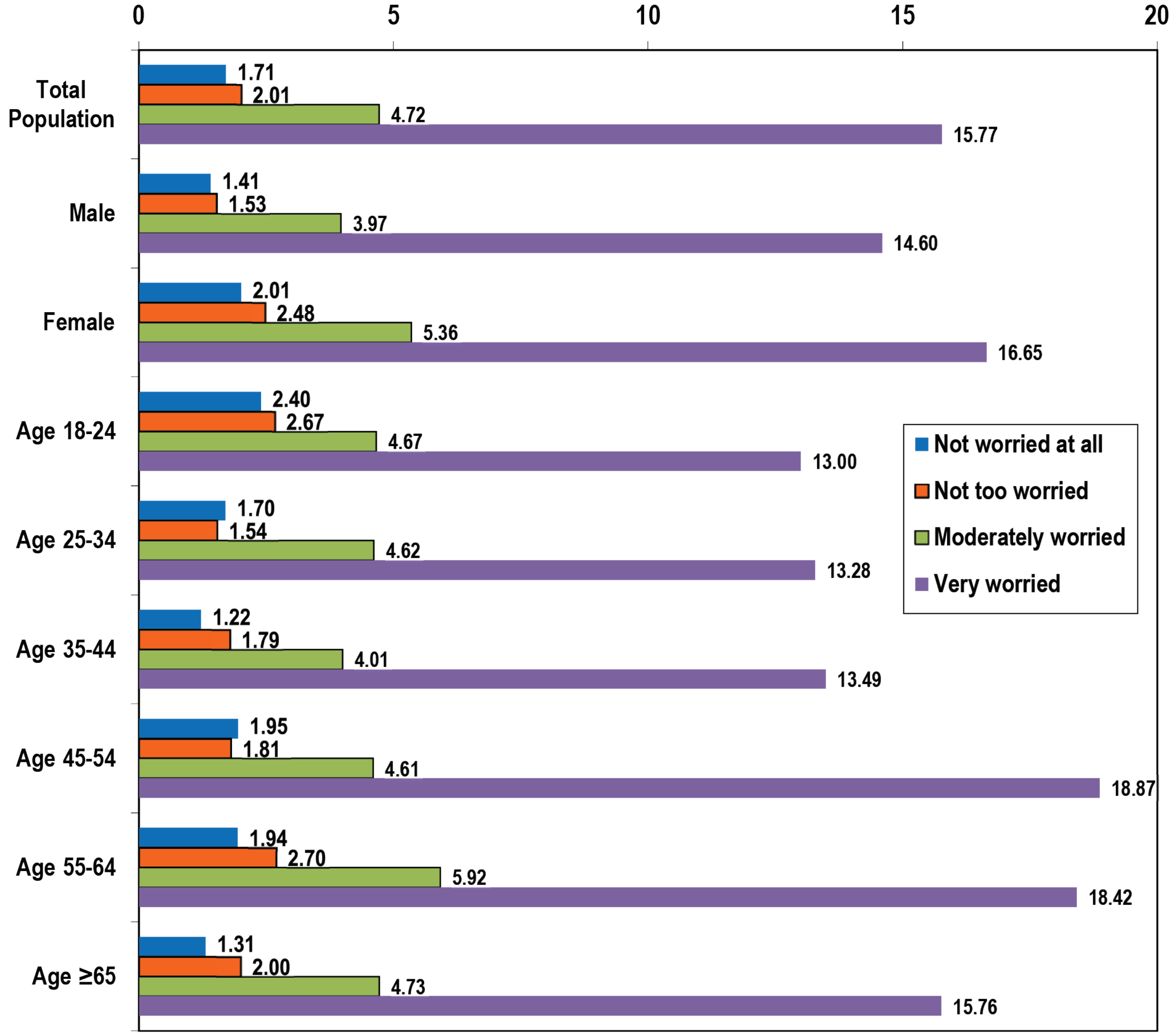
FIGURE 3.2: Prevalence of Serious Psychological Distress by Housing Tenure, Race/Ethnicity, Nativity Status, and LGB Status, U.S. Population Aged ≥18 Years, 2014-2016 (N = 99,385)



AIAN = American Indian/Alaska Native; API = Asian/Pacific Islander; NH = Non-Hispanic. LGB = Lesbian, Gay, and Bisexual; Straight = Straight/Heterosexual. Differences by housing tenure across race/ethnicity, nativity status, and LGB status were statistically significant at p<.001. Renters include those receiving rental assistance from a government program.

Source: Data derived from the 2014-2016 National Health Interview Survey.

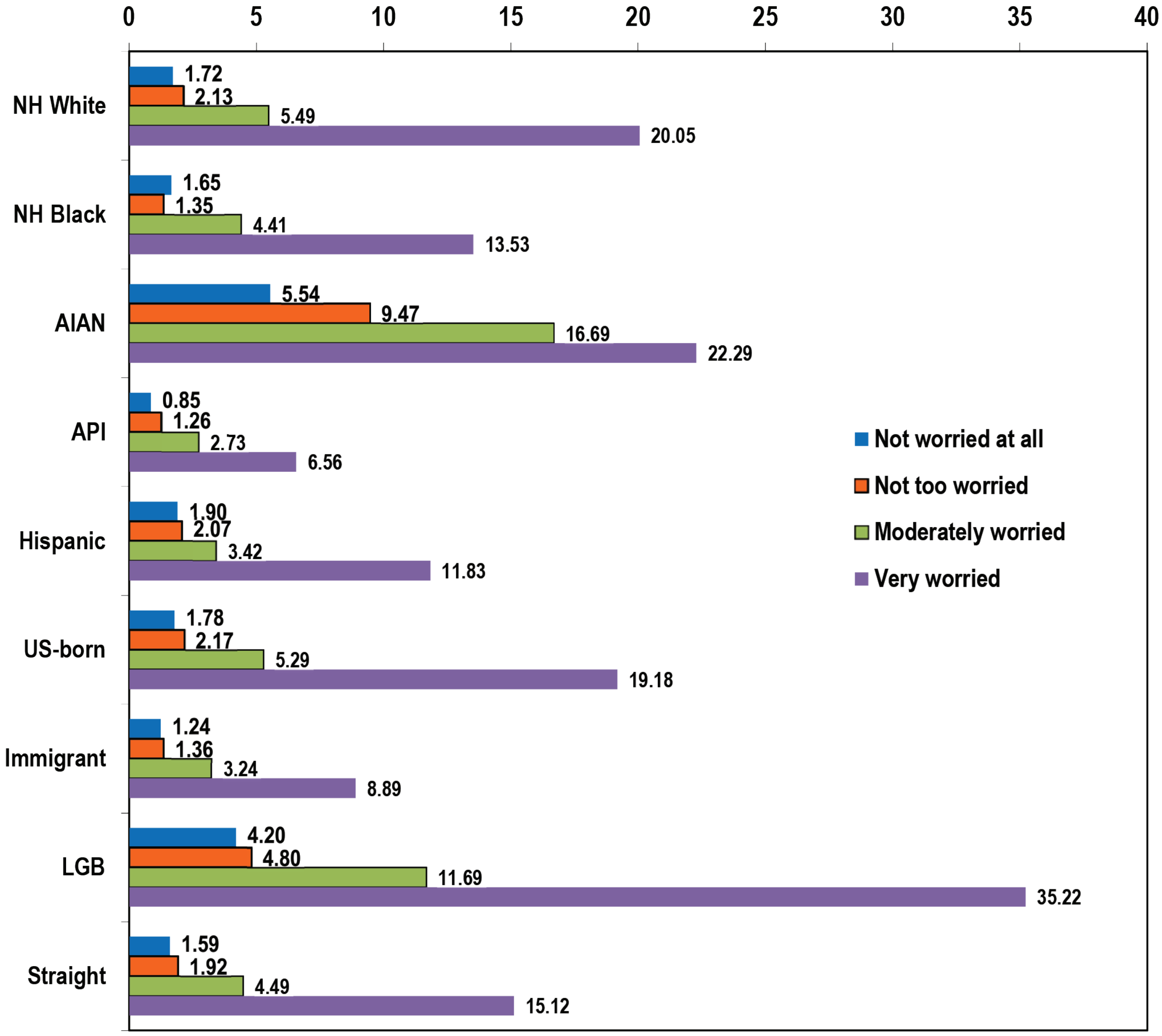
FIGURE 3.3: Prevalence of Serious Psychological Distress by Housing/Mortgage/Rental Costs Worry, Gender, and Age Group, U.S. Population Aged ≥18 Years, 2014-2016 (N = 99,430)



Differences by housing costs worry across gender and age groups were statistically significant at p<.001.

Source: Data derived from the 2014-2016 National Health Interview Survey.

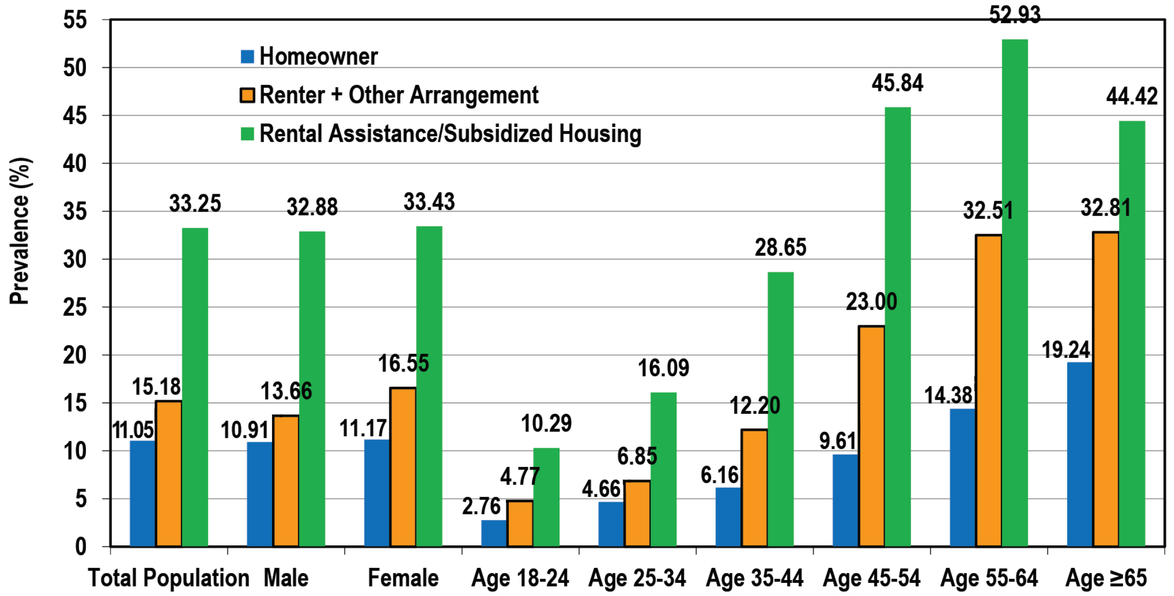
FIGURE 3.4: Prevalence of Serious Psychological Distress by Housing/Mortgage/Rental Costs Worry, Nativity Status, and LGB Status, U.S. Population Aged ≥18 Years, 2014-2016 (N = 99,430)



AIAN = American Indian/Alaska Native; API = Asian/Pacific Islander; NH = Non-Hispanic. LGB = Lesbian, Gay, and Bisexual; Straight = Straight/Heterosexual. Differences by housing costs worry across race/ethnicity, nativity status, and LGB status were statistically significant at p<.001.

Source: Data derived from the 2014-2016 National Health Interview Survey.

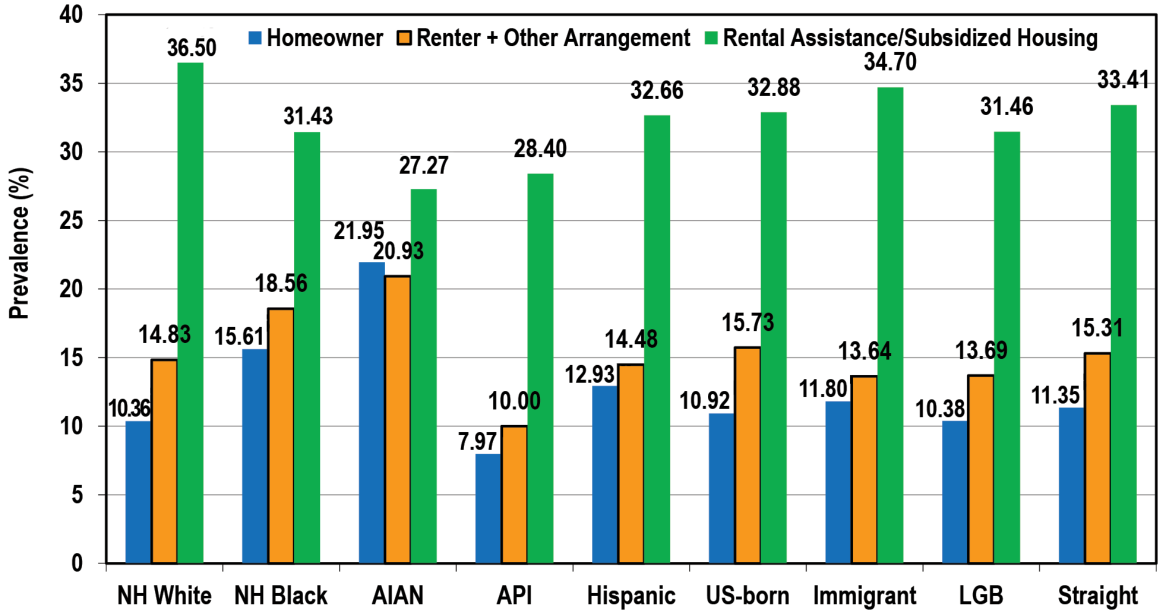
FIGURE 3.5: Prevalence of Self-Assessed Fair/Poor Health by Housing Tenure, Gender, and Age Group: US Population Aged ≥18 Years, 2014-2016 (N = 231,368)



Differences by housing tenure across gender and age groups were statistically significant at p<.001. Renters include those receiving rental assistance from a government program.

Source: Data derived from the 2014-2016 National Health Interview Survey.

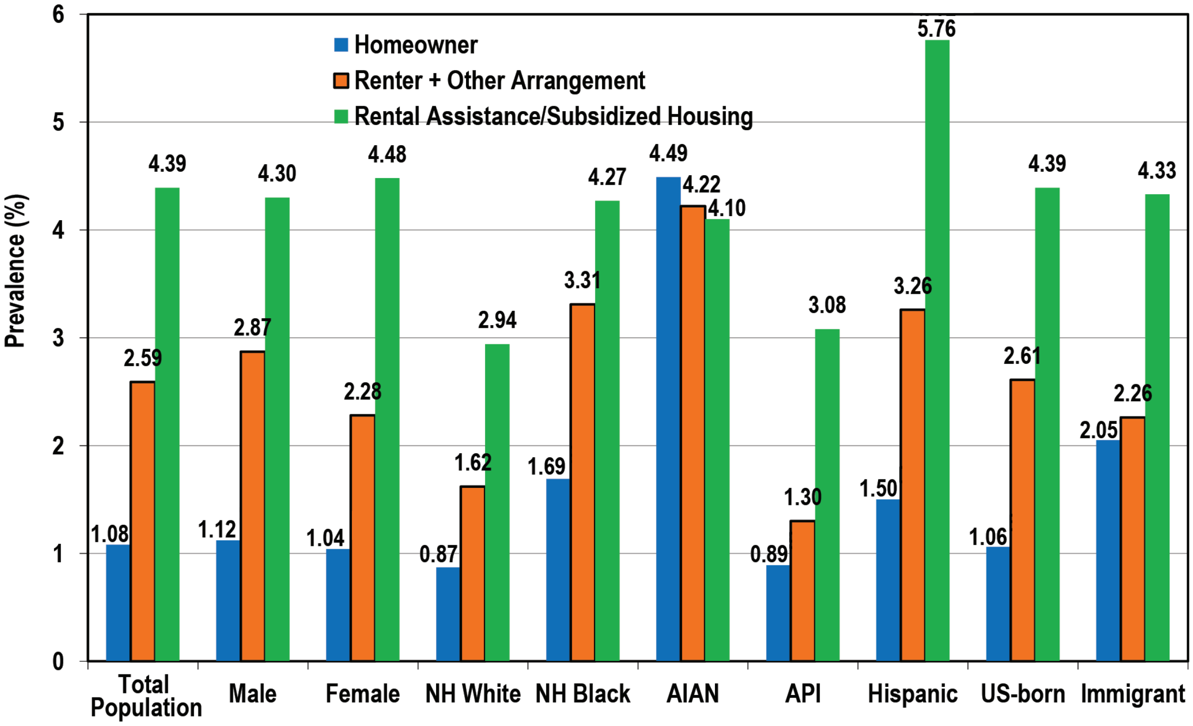
FIGURE 3.6: Prevalence of Self-Assessed Fair/Poor Health by Housing Tenure, Race/Ethnicity, Nativity Status, and LGB Status, U.S. Population Aged ≥18 Years, 2014-2016 (N = 231,368)



AIAN = American Indian/Alaska Native; API = Asian/Pacific Islander; NH = Non-Hispanic. LGB = Lesbian, Gay, and Bisexual; Straight = Straight/Heterosexual. Differences by housing tenure across race/ethnicity, nativity status and LGB status were statistically significant at p<.001. Renters include those receiving rental assistance from a government program.

Source: Data derived from the 2014-2016 National Health Interview Survey.

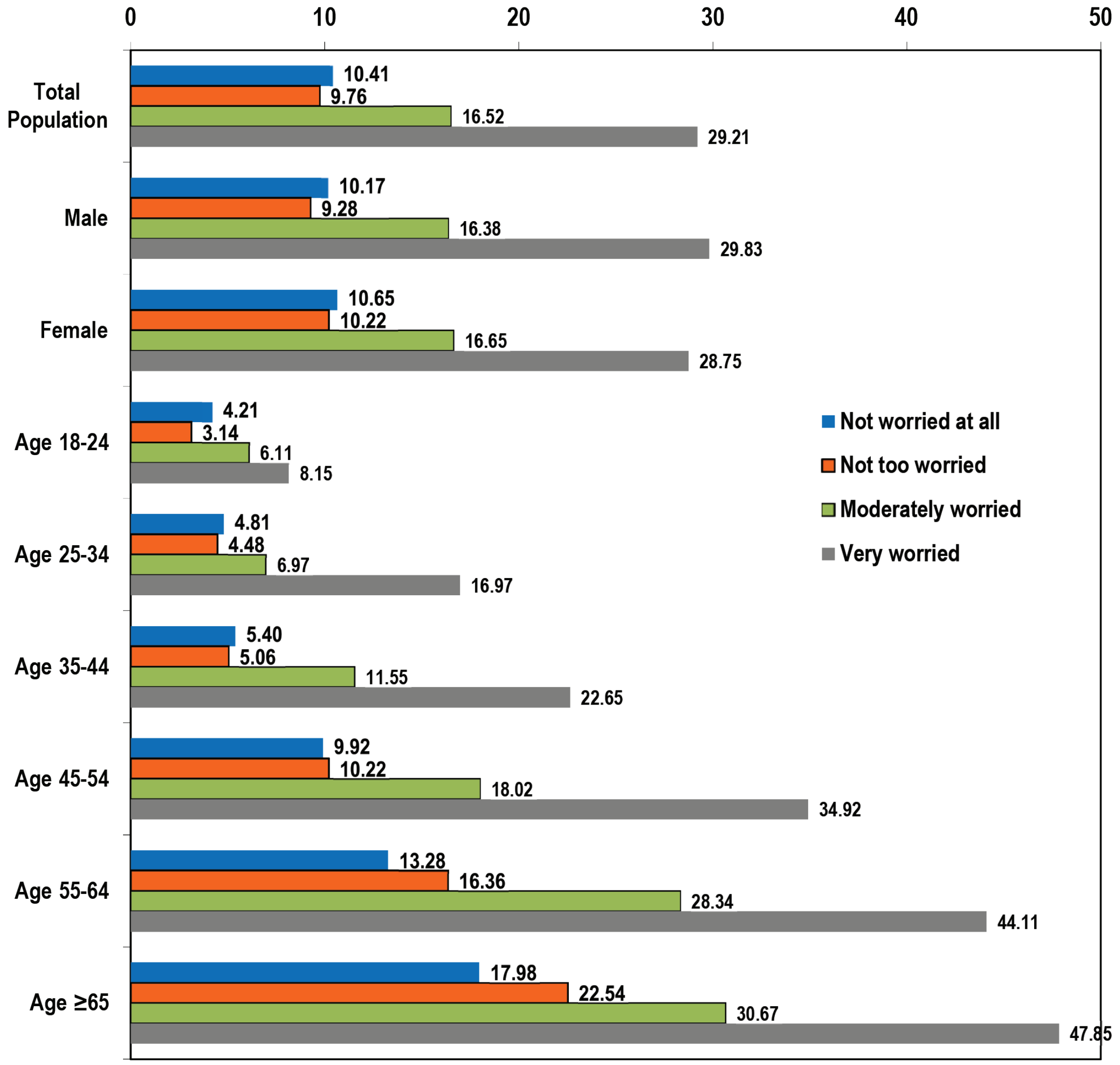
FIGURE 3.7: Prevalence of Parent-Reported Fair/Poor Health by Housing Tenure, Gender, Race/Ethnicity, and Nativity Status, U.S. Children Aged <18 Years, 2014-2016 (N = 75,608)



Differences by housing tenure across gender, race/ethnicity, and nativity status were statistically significant at p<.001. Renters include those receiving rental assistance from a government program.

Source: Data derived from the 2014-2016 National Health Interview Survey.

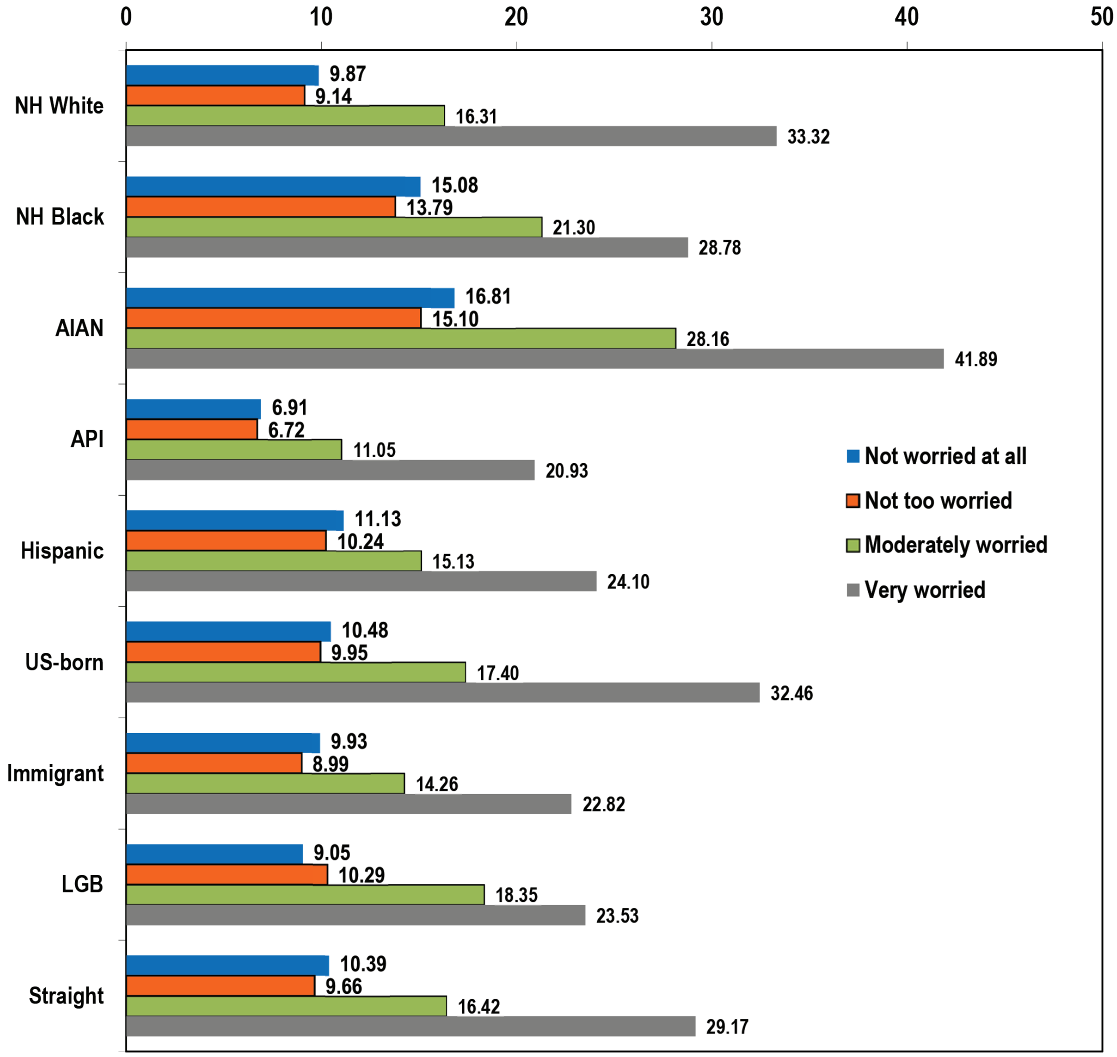
FIGURE 3.8: Prevalence (%) of Self-Assessed Fair/Poor Health by Housing/Mortgage/Rental Costs Worry, and Age Group, U.S. Population Aged ≥18 Years, 2014-2016 (N = 100,597)



Differences by housing costs worry across gender and age groups were statistically significant at p<.001.

Source: Data derived from the 2014-2016 National Health Interview Survey.

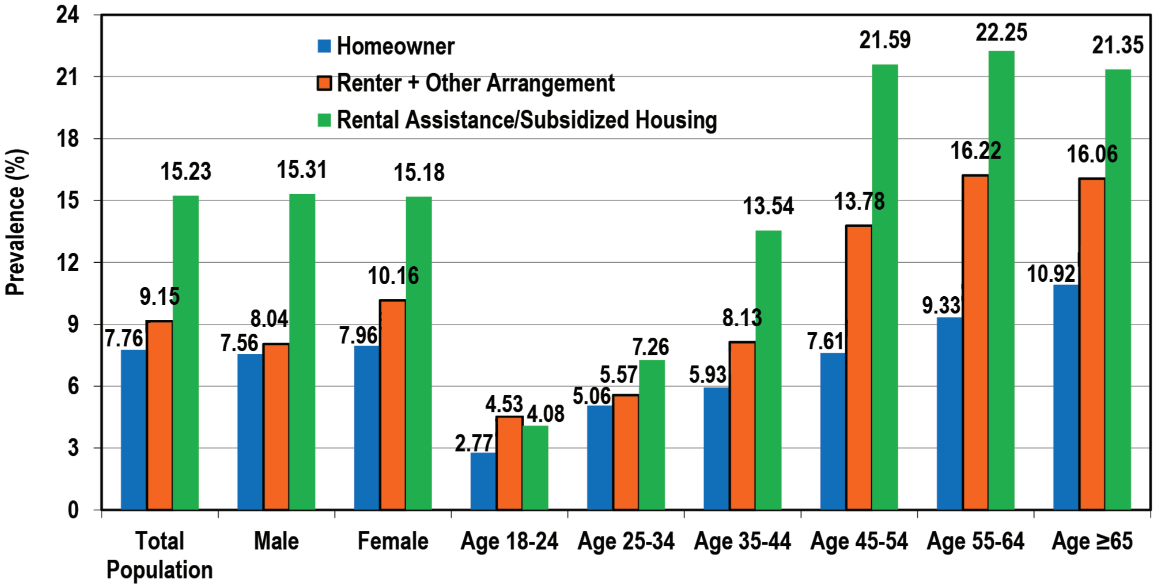
FIGURE 3.9: Prevalence (%) of Self-Assessed Fair/Poor Health by Housing/Mortgage/Rental Costs Race/Ethnicity, Nativity Status, and LGB Status, U.S. Population Aged ≥18 Years, 2014-2016 (N = 100,597)



AIAN = American Indian/Alaska Native; API = Asian/Pacific Islander; NH = Non-Hispanic. LGB = Lesbian, Gay, and Bisexual; Straight = Straight/Heterosexual. Differences by housing costs worry across race/ethnicity, nativity status, and LGB status were statistically significant at p<.001.

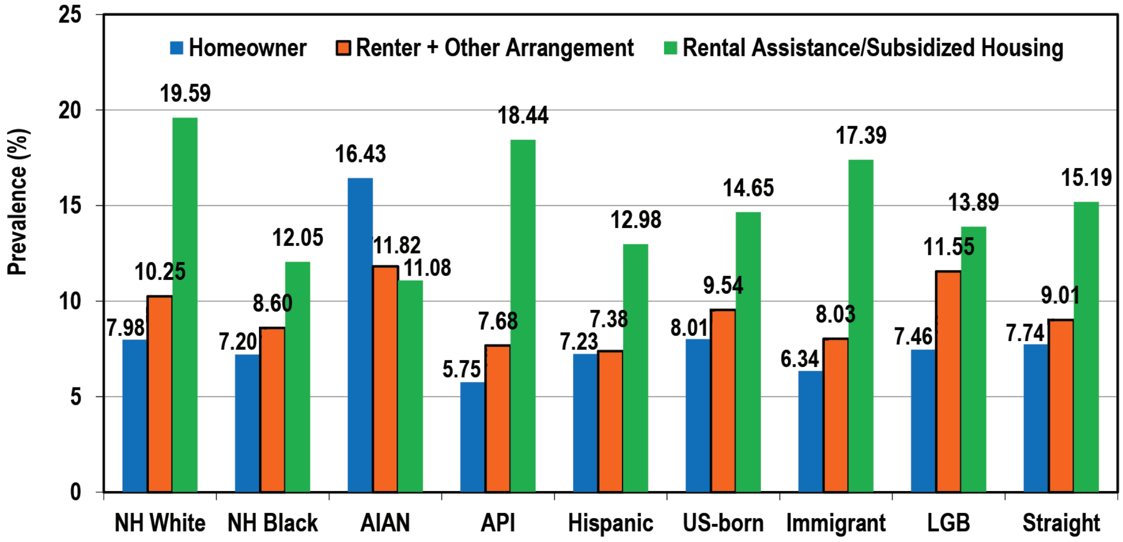
Source: Data derived from the 2014-2016 National Health Interview Survey.

FIGURE 3.10: Prevalence of Worse Health Status Compared to 1 Year Ago by Housing Tenure, Gender and Age Group, U.S. Population Aged ≥18 Years, 2014-2016 (N = 103,123)



Differences by housing tenure across gender and age groups were statistically significant at p<.001. Renters include those receiving rental assistance from a government program. Source: Data derived from the 2014-2016 National Health Interview Survey.

FIGURE 3:11: Prevalence of Worse Health Status Compared to 1 Year Ago by Housing Tenure, Race/Ethnicity, Nativity Status, and LGB Status, U.S. Population Aged ≥18 Years, 2014-2016 (N = 103,123)

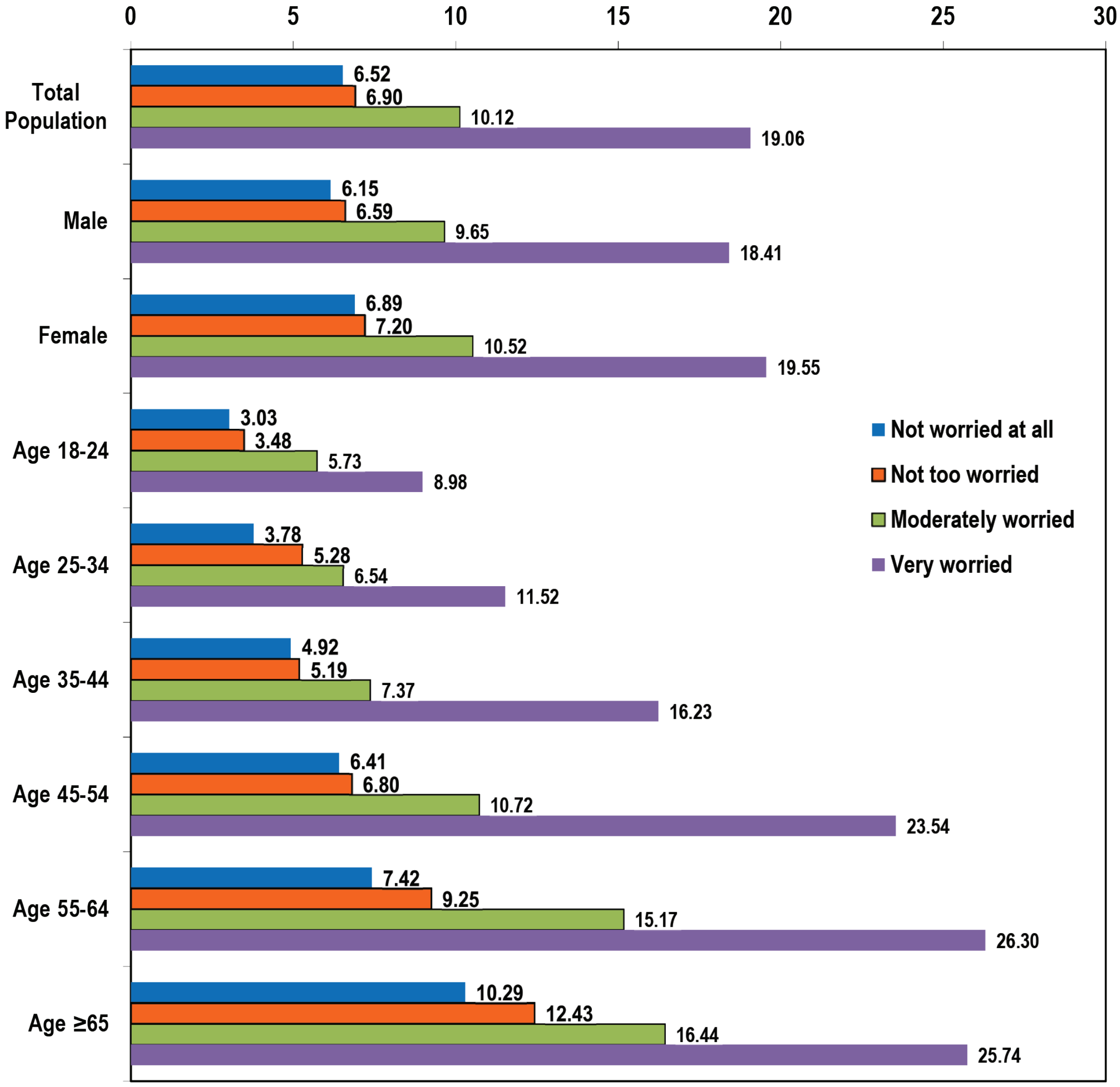


AIAN = American Indian/Alaska Native; API = Asian/Pacific Islander; NH = Non-Hispanic. LGB = Lesbian, Gay, and Bisexual;

Straight = Straight/Heterosexual. Differences by housing tenure across race/ethnicity, nativity status, and LGB status were statistically significant at p<.001. Renters include those receiving rental assistance from a government program.

Source: Data derived from the 2014-2016 National Health Interview Survey.

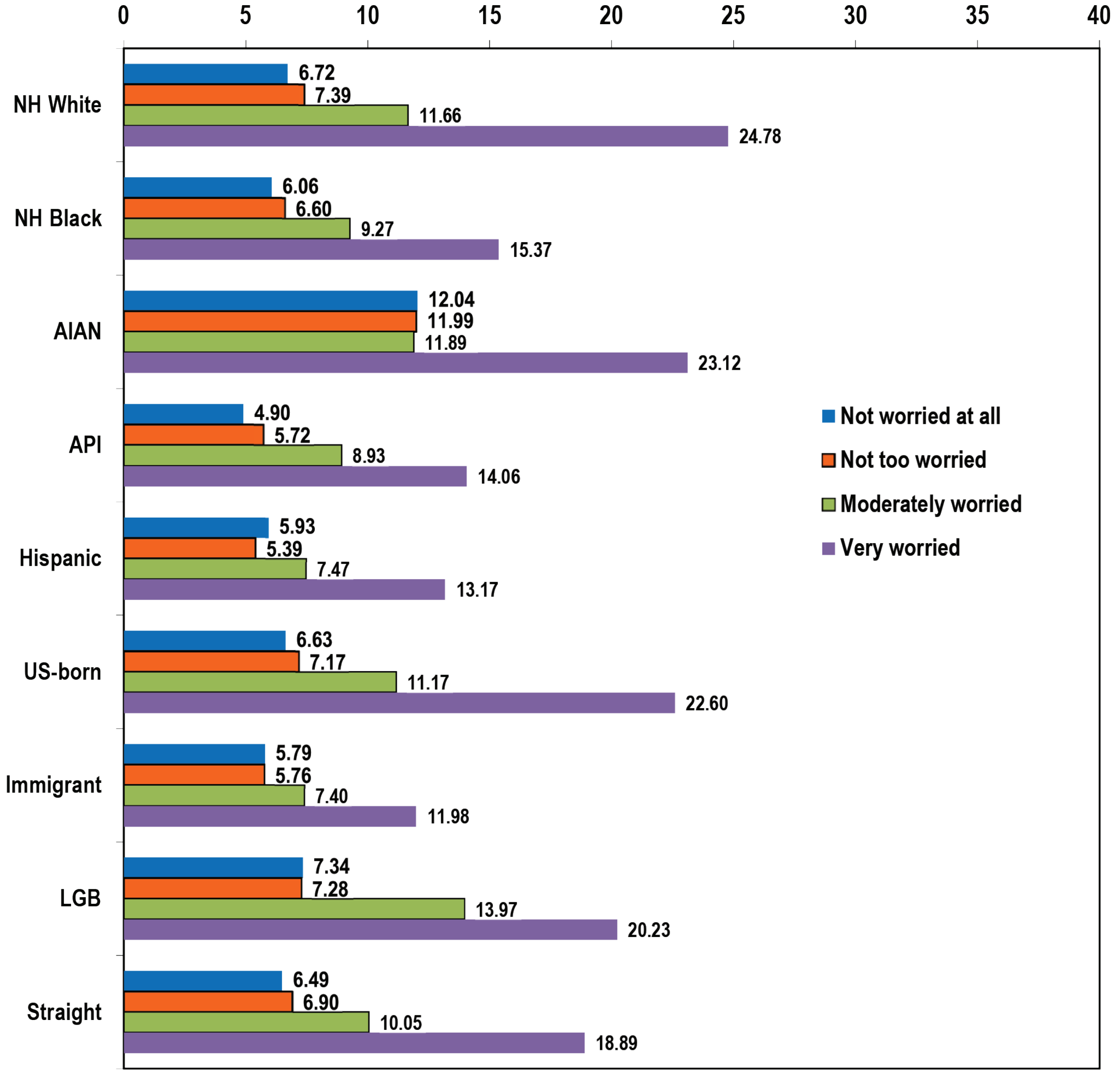
FIGURE 3.12: Prevalence (%) of Worse Health Status Compared to 1 Year Ago by Housing/Mortgage/Rental Worry, Gender and Age Group, U.S. Population Aged ≥18 Years, 2014-2016 (N = 100,582)



Differences by housing costs worry across gender and age groups were statistically significant at p<.001.

Source: Data derived from the 2014-2016 National Health Interview Survey.

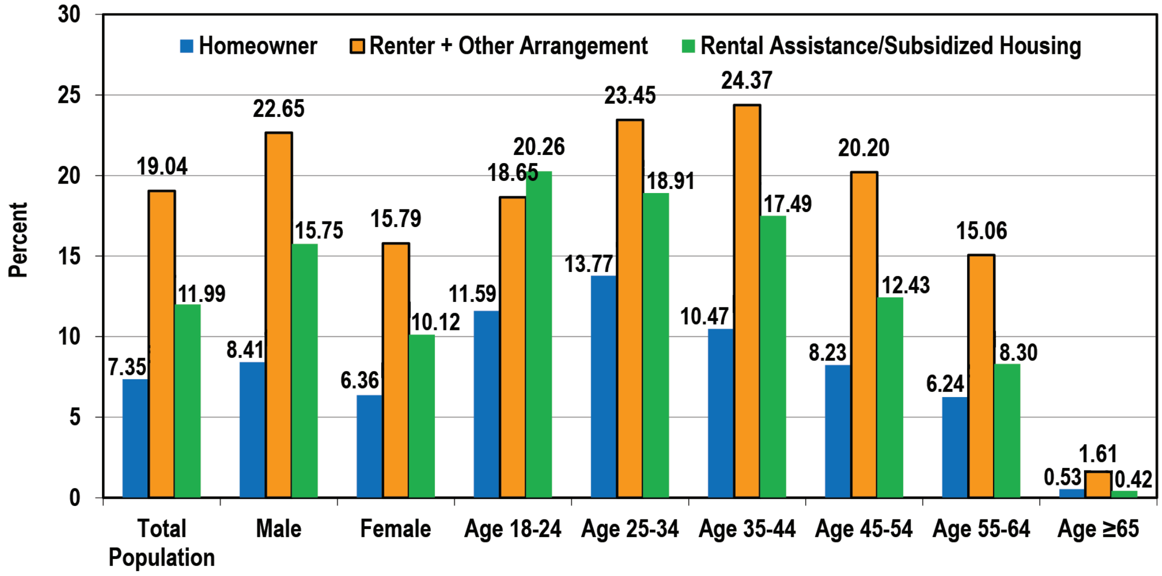
FIGURE 3.13: Prevalence (%) of Worse Health Status Compared to 1 Year Ago by Housing/Mortgage/Rental Worry, Race/Ethnicity, Nativity Status, and LGB Status, U.S. Population Aged ≥18 Years, 2014-2016 (N = 100,582)



AIAN = American Indian/Alaska Native; API = Asian/Pacific Islander; NH = Non-Hispanic. LGB = Lesbian, Gay, and Bisexual; Straight = Straight/Heterosexual. Differences by housing costs worry across race/ethnicity, nativity status, and LGB status were statistically significant at p<.001.

Source: Data derived from the 2014-2016 National Health Interview Survey.

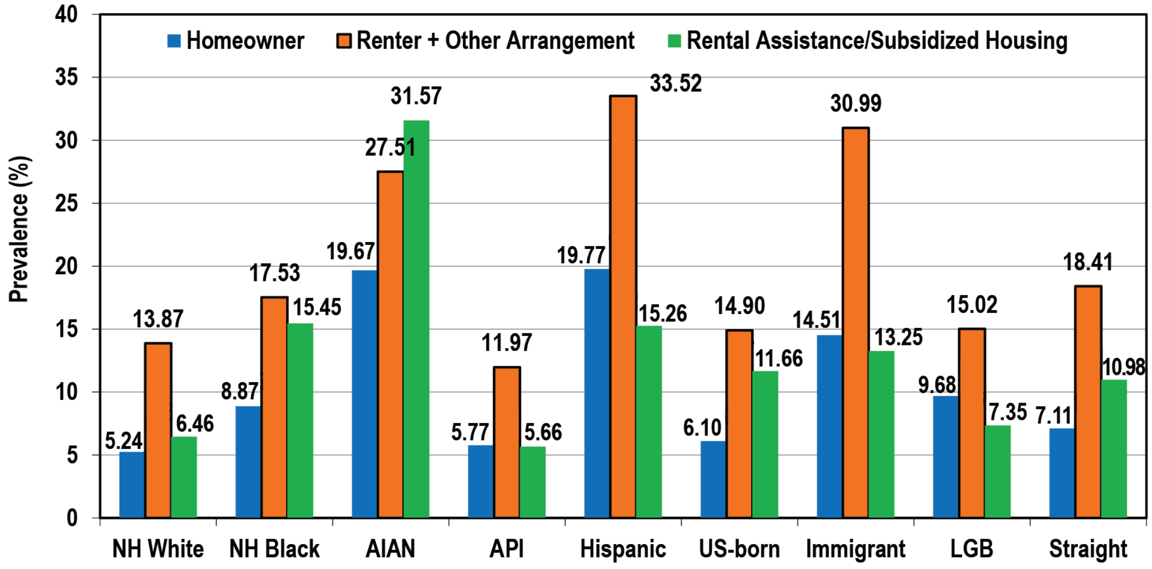
FIGURE 3.14: Percentage Without Health Insurance by Housing Tenure, Gender and Age Group, U.S. Population Aged ≥18 Years, 2014-2016 (N = 229,231)



Differences by housing tenure across gender and age groups were statistically significant at p<.001. Renters include those receiving rental assistance from a government program.

Source: Data derived from the 2014-2016 National Health Interview Survey.

FIGURE 3.15: Percentage Without Health Insurance by Housing Tenure, Race/Ethnicity, Nativity Status, and LGB Status, U.S. Population Aged ≥18 Years, 2014-2016 (N = 229,231)

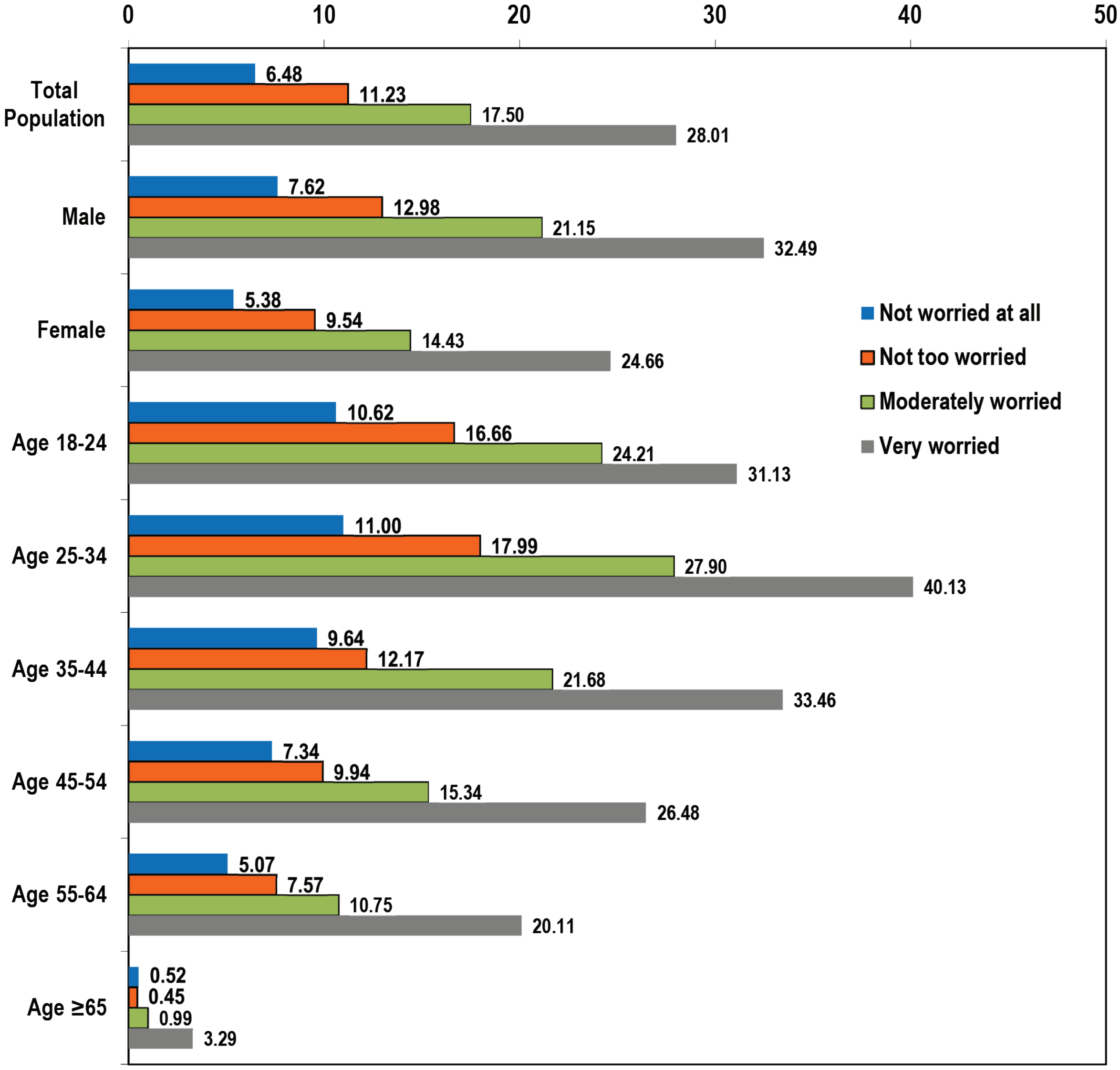


AIAN = American Indian/Alaska Native; API = Asian/Pacific Islander; NH = Non-Hispanic. LGB = Lesbian, Gay, and Bisexual;

Straight = Straight/Heterosexual. Differences by housing tenure across race/ethnicity, nativity status, and LGB status were statistically significant at p<.001. Renters include those receiving rental assistance from a government program.

Source: Data derived from the 2014-2016 National Health Interview Survey.

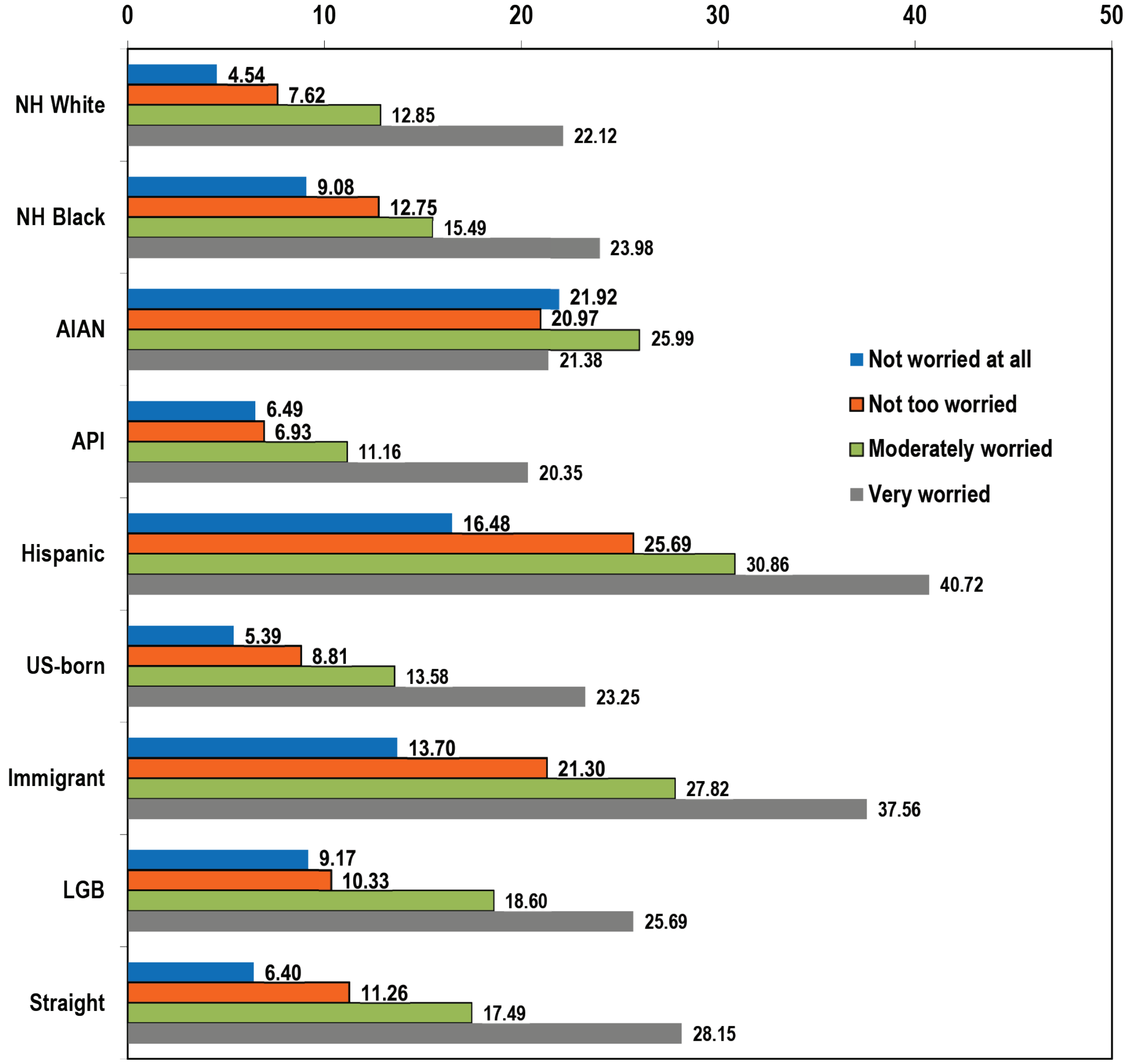
FIGURE 3.16: Percentage Without Health Insurance by Housing/Mortgage/Rental Costs Worry, Gender Age Group, U.S. Population Aged ≥18 Years, 2014-2016 (N = 100,225)



Differences by housing costs worry across gender and age groups were statistically significant at p<.001.

Source: Data derived from the 2014-2016 National Health Interview Survey.

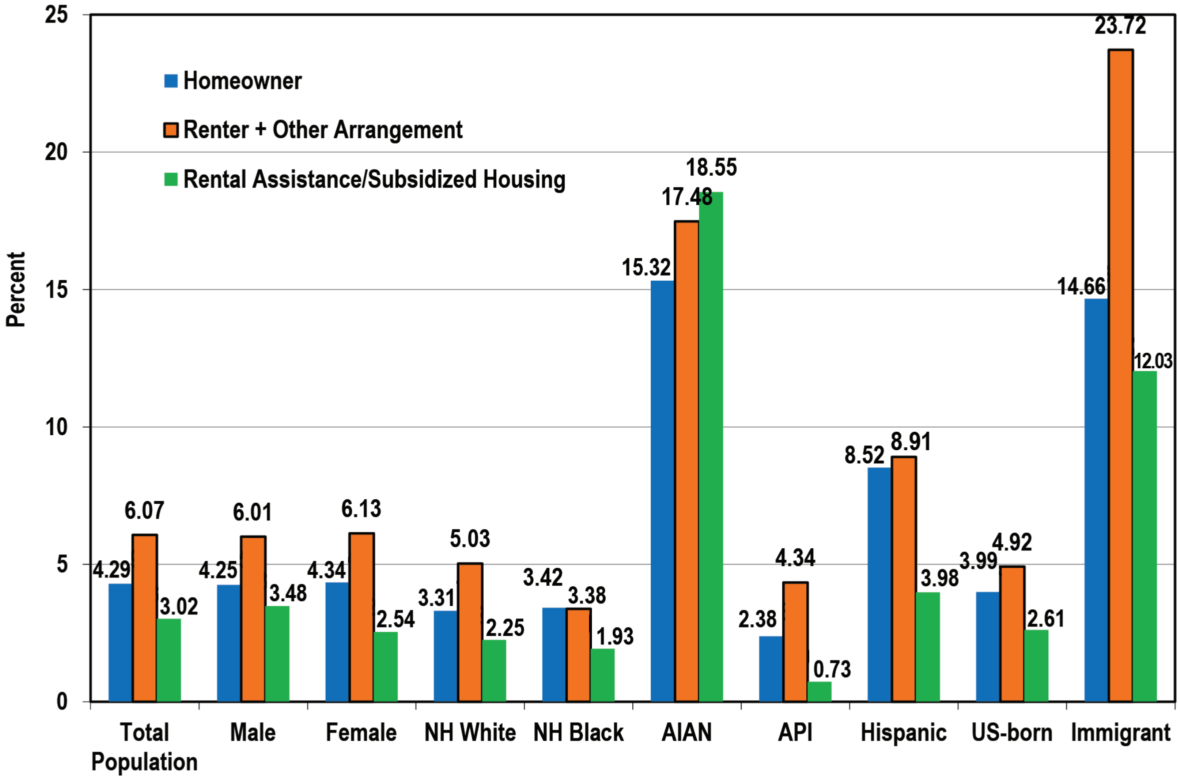
FIGURE 3.17: Percentage Without Health Insurance by Housing/Mortgage/Rental Costs Worry, Nativity Status, and LGB Status, U.S. Population Aged ≥18 Years, 2014-2016 (N = 100,225)



AIAN = American Indian/Alaska Native; API = Asian/Pacific Islander; NH = Non-Hispanic. LGB = Lesbian, Gay, and Bisexual; Straight = Straight/Heterosexual. Differences by housing costs worry across race/ethnicity, nativity status, and LGB status were statistically significant at p<.001.

Source: Data derived from the 2014-2016 National Health Interview Survey.

FIGURE 3.18: Percentage Without Health Insurance by Housing Tenure, Gender, Race/Ethnicity, and Nativity Status, U.S. Children Aged <18 Years, 2014-2016 (N = 75,189)

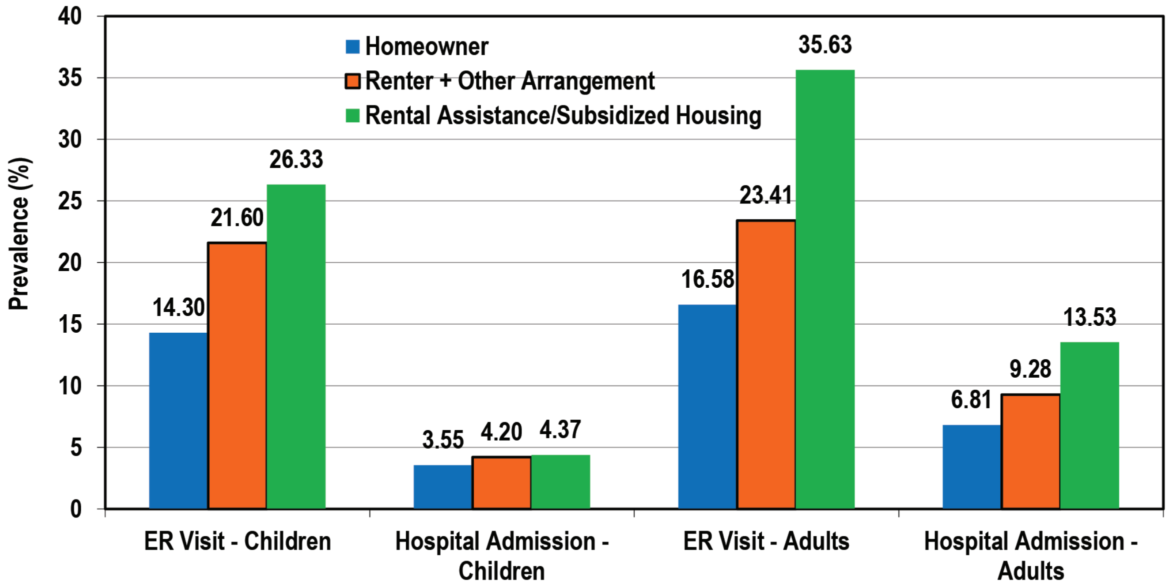


AIAN = American Indian/Alaska Native; API = Asian/Pacific Islander; NH = Non-Hispanic.

Differences by housing tenure across gender, race/ethnicity, and nativity status were statistically significant at p<.001. Renters include those receiving rental assistance from a government program.

Source: Data derived from the 2014-2016 National Health Interview Survey.

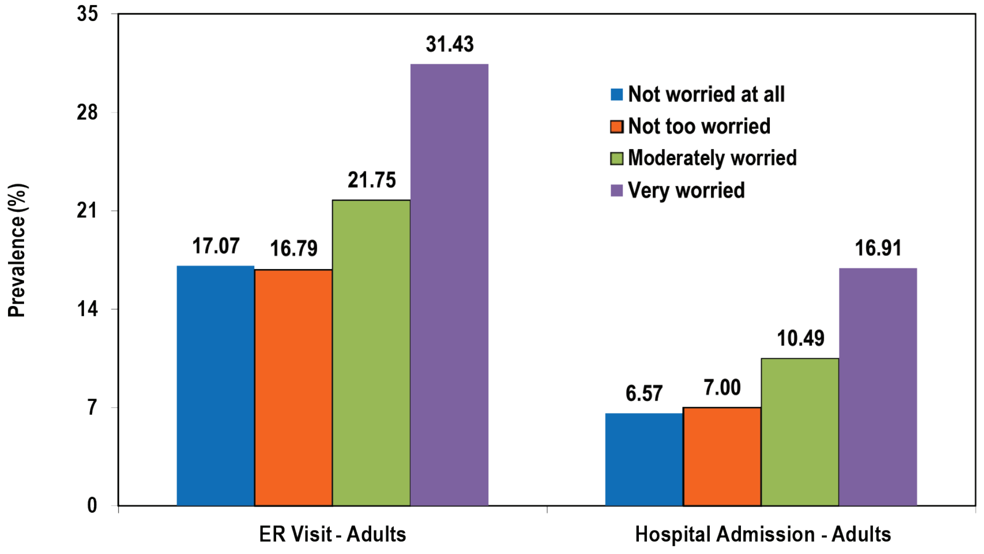
FIGURE 3.19: Emergency Room (ER) Visits (≥1 Visits in Past 12 Months) and Hospital Admission (≥1 Times in Past 12 Months) among U.S. Children Under Age 18 and U.S. Adults Aged ≥18 Years, by Housing Tenure, 2014-2016 (N = 36,715 Children and 231,491 Adults)



Differences in ER visits and hospital admission by housing tenure were statistically significant for both children and adults at p<.001. Renters include those receiving rental assistance from a government program.

Source: Data derived from the 2014-2016 National Health Interview Survey.

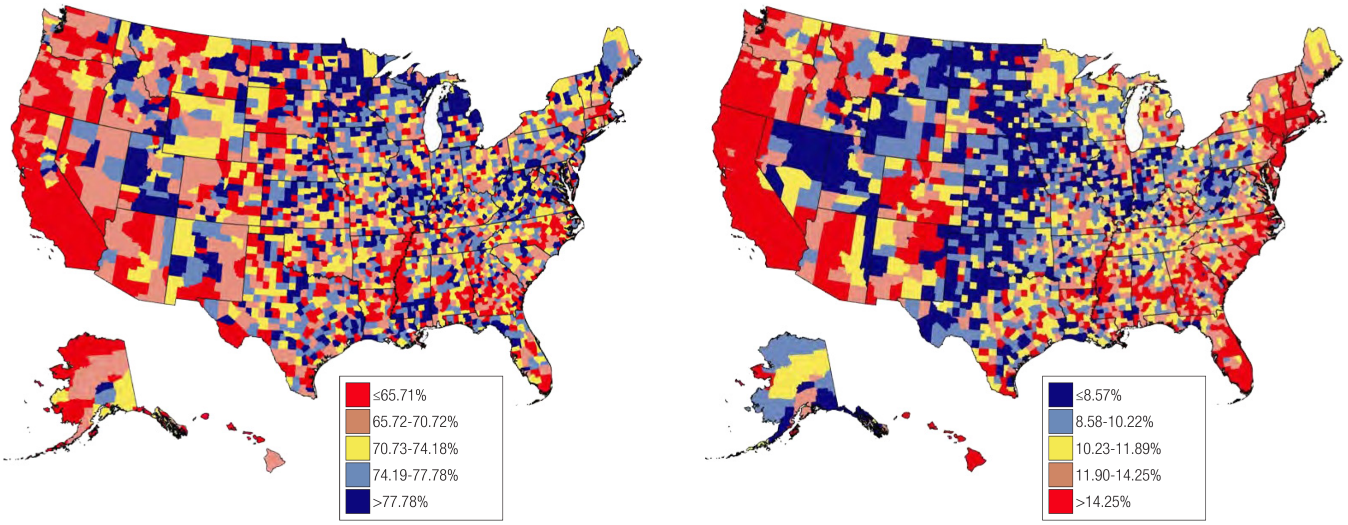
FIGURE 3.20: Emergency Room (ER) Visits (≥1 Visits in Past 12 Months) and Hospital Admission (≥1 times in Past 12 Months) by Housing/Mortgage/Rental Costs Worry, U.S. Population Aged ≥18 Years, 2014-2016 (N = 100,596)



Differences in ER visit and hospital admission by housing costs were statistically significant at p<.001.

Source: Data derived from the 2014-2016 National Health Interview Survey.

FIGURE 3.21: Homeownership Rates and Housing Cost Burden, United States, 2013-2017 (3,143 Counties)

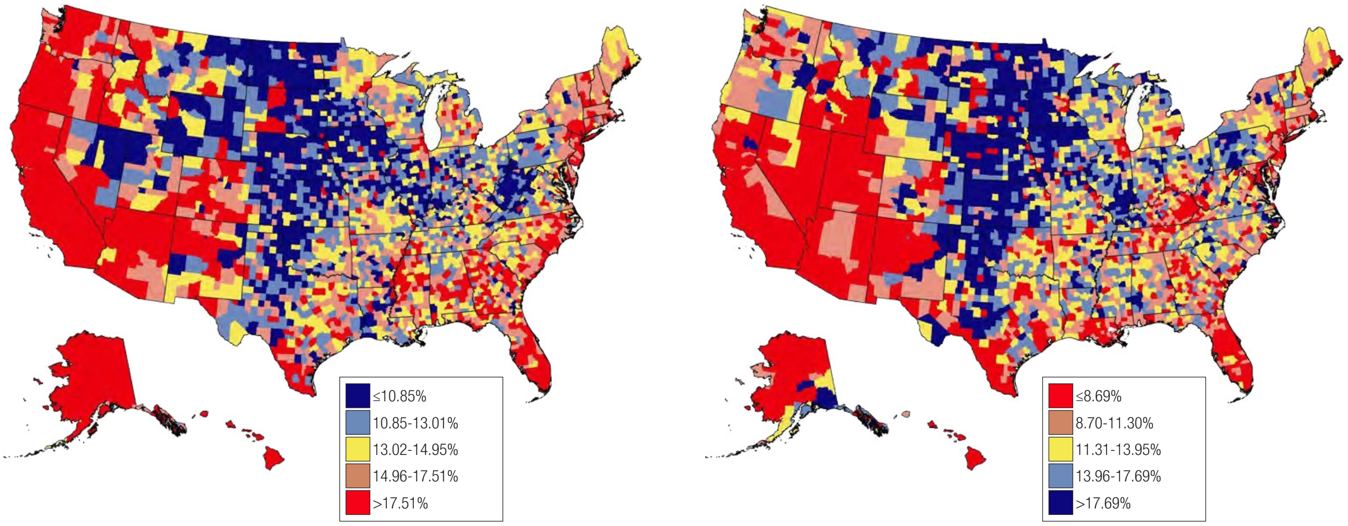


Home Ownership Rate
Percentage of owner-occupied housing units, 2013-2017

Housing Cost Burden
Percentage of households spending ≥50% of their household income on housing, 2013-2017

Source: Data derived from the 2013-2017 American Community Survey.

FIGURE 3.22: Severe Housing Problems (Overcrowding, High Housing Costs, or Lack of Kitchen or Plumbing Facilities) and Social Associations per 10,000 Population, United States, 2010-2015 (3,144 Counties)

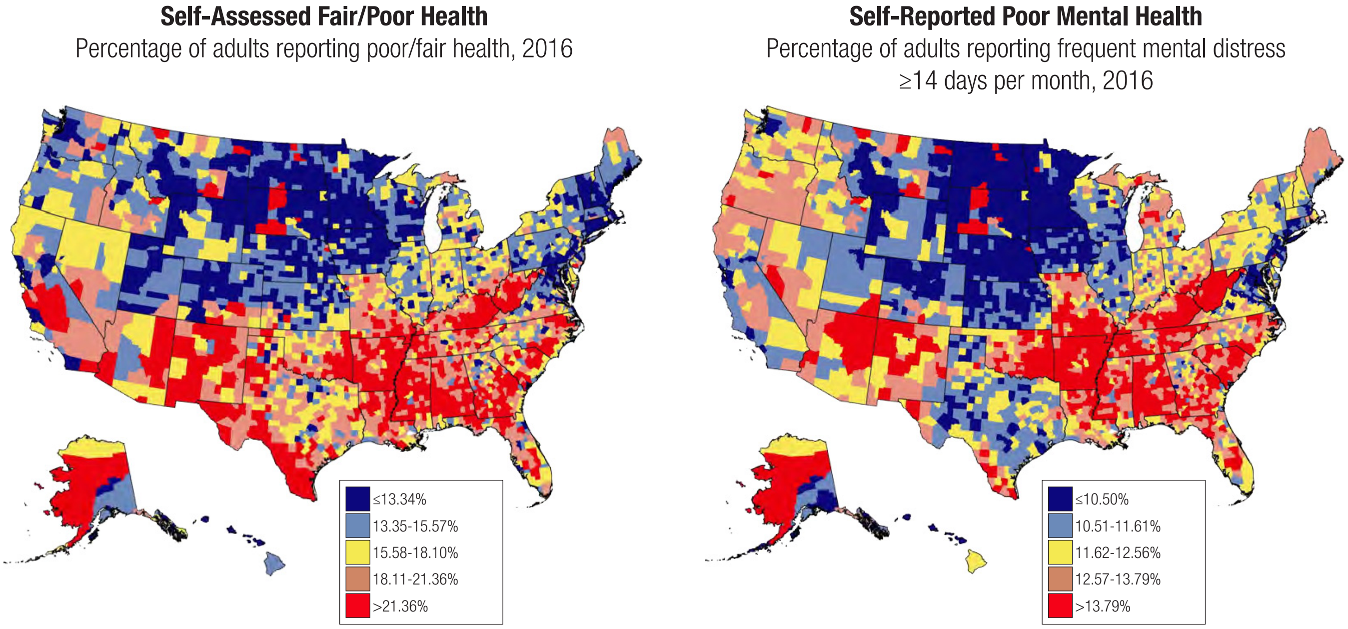


Severe Housing Problems, 2010-2014
Percentage of households reporting severe housing problems

Number of Social Associations per 10,000 Population, 2015

Sources: County Health Rankings and American Community Survey.

FIGURE 3.23: Age-Adjusted Fair/Poor Health Status and Poor Mental Health, US Adults Aged ≥18 Years, 2016 (3,144 Counties)

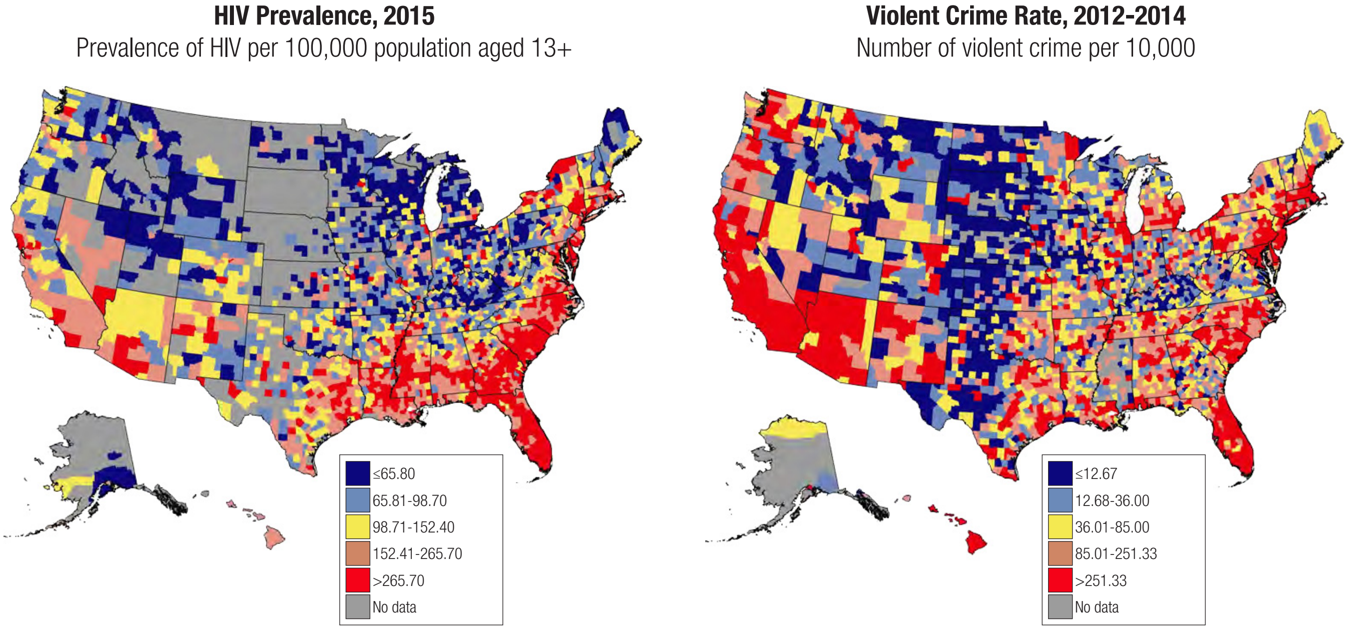


Self-Assessed Fair/Poor Health
Percentage of adults reporting poor/fair health, 2016

Self-Reported Poor Mental Health
Percentage of adults reporting frequent mental distress ≥14 days per month, 2016

Sources: Behavioral Risk Factor Surveillance System and County Health Rankings.

FIGURE 3.24: HIV Prevalence Rate and Violent Crime Rate, United States, 2012-2015 (3,144 Counties)



HIV Prevalence, 2015
Prevalence of HIV per 100,000 population aged 13+

Violent Crime Rate, 2012-2014
Number of violent crime per 10,000

Sources: County Health Rankings, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP), and FBI's Uniform Crime Reporting Program.

TABLE 3.1: Homeownership Rates and Housing Costs Concerns by Socioeconomic and Demographic Characteristics, U.S. Population Aged ≥18 years, 2014-2016 (N = 231,622)

	HOMEOWNERSHIP		MODERATELY WORRIED OR VERY WORRIED ABOUT HOUSING COSTS	
Characteristics	**%**	**SE**	**%**	**SE**
Age				
18-24	48.21	0.67	17.72	0.56
25-34	47.83	0.51	24.94	0.49
35-44	62.61	0.47	28.78	0.53
45-54	72.64	0.39	29.47	0.52
55-64	78.58	0.34	23.29	0.46
65+	81.56	0.40	12.28	0.31
Gender				
Male	66.83	0.34	21.09	0.31
Female	65.78	0.32	24.35	0.31
Race/ethnicity				
Non-Hispanic White	74.17	0.31	17.50	0.25
Non-Hispanic Black	47.60	0.71	30.86	0.59
American Indian/Alaska Native	55.41	2.57	28.05	2.71
Asian/Pacific Islander	60.59	0.97	23.14	0.83
Hispanic	50.12	0.66	38.44	0.60
Immigrant status				
US-born	69.26	0.31	19.62	0.23
Foreign-born	53.20	0.59	36.70	0.59
Marital status				
Married	73.70	0.30	21.40	0.30
Widowed	72.31	0.68	16.76	0.58
Divorced/separated	54.52	0.49	32.99	0.55
Single	49.91	0.51	22.95	0.43
Geographic region				
Northeast	66.55	0.66	25.16	0.52
Midwest	69.53	0.69	19.02	0.45
South	68.25	0.56	22.98	0.47
West	59.77	0.63	24.27	0.46
Education (years of school completed)				
<12	52.49	0.57	35.86	0.59
12	64.03	0.40	26.41	0.43
13-15	65.56	0.41	23.43	0.39
16+	75.15	0.40	13.78	0.29
Poverty status (ratio of family income to poverty threshold)				
<100%	28.13	0.64	40.55	0.65
100-199%	48.98	0.55	36.21	0.55
200-299%	64.84	0.53	25.40	0.53
300-399%	71.20	0.57	20.22	0.62
400-499%	81.37	0.46	13.81	0.45
≥500%	85.33	0.39	9.42	0.28
Employment status				
Employed	65.84	0.35	22.15	0.31
Unemployed	45.22	0.78	46.67	1.10
Not in labor force	69.56	0.37	20.96	0.32

All Chi-square tests for differences in characteristics by housing tenure/housing costs were statistically significant at P<.001.

TABLE 3.2: Age-Adjusted Prevalence (Derived from Logistic Regression Models) of Selected Health and Health-Risk Factors by Housing Tenure, U.S. Population Aged ≥18 years: The National Health Interview Survey, 2014-2016 (N = 103,180)

	HOMEOWNERS		RENTERS		RELATIVE RISK
Health Indicator	**Prevalence %**	**SE**	**Prevalence %**	**SE**	**Renters vs. Homeowners**
Heart disease	11.01	0.17	13.15	0.26	1.19*
Diabetes	8.49	0.14	12.14	0.25	1.43*
COPD	5.32	0.12	8.53	0.23	1.60*
Nephritis/kidney diseases	1.65	0.06	2.93	0.12	1.78*
Hypertension	29.91	0.26	34.01	0.35	1.14*
Current smoking	12.58	0.24	21.66	0.34	1.72*
Physical inactivity	26.47	0.37	36.34	0.47	1.37*
Obesity (BMI ≥ 30)	28.69	0.30	31.89	0.34	1.11*
Obesity or overweight (BMI ≥ 25)	63.47	0.31	65.55	0.34	1.03*
Heavy drinking	4.89	0.13	5.65	0.21	1.16*
Activity limitation	13.25	0.20	23.33	0.36	1.76*

SE = standard error; * p <0.05.

TABLE 3.3: Age-Adjusted Prevalence (Derived from Logistic Regression Models) of Selected Health and Health-Risk Factors by Housing/Mortgage/Rental Costs Worry, U.S. Population Aged ≥18 years: The National Health Interview Survey, 2014-2016 (N = 100,609)

	NOT WORRIED AT ALL		NOT TOO WORRIED		MODERATELY WORRIED		VERY WORRIED		RELATIVE RISK
Health Indicator	**Prevalence %**	**SE**	**Prevalence %**	**SE**	**Prevalence %**	**SE**	**Prevalence %**	**SE**	**Very worried vs. not worried at all**
Heart disease	10.85	0.19	10.83	0.29	13.22	0.39	17.04	0.55	1.57*
Diabetes	8.16	0.15	8.92	0.25	12.05	0.34	15.79	0.51	1.94*
COPD	5.23	0.12	5.73	0.21	7.43	0.30	12.23	0.47	2.34*
Nephritis/kidney diseases	1.66	0.06	1.75	0.12	2.42	0.18	4.39	0.30	2.64*
Hypertension	29.65	0.27	30.23	0.41	33.27	0.50	39.38	0.63	1.33*
Current smoking	13.40	0.26	14.68	0.33	19.32	0.50	26.07	0.62	1.95*
Physical inactivity	25.85	0.38	28.73	0.52	36.44	0.61	44.92	0.77	1.74*
Obesity (BMI ≥ 30)	27.89	0.31	29.10	0.42	33.51	0.55	37.16	0.69	1.33*
Obesity or overweight (BMI ≥ 25)	62.38	0.34	64.83	0.45	66.81	0.56	69.72	0.66	1.12*
Heavy drinking	5.44	0.15	4.97	0.24	4.79	0.26	4.98	0.31	0.92
Activity limitation	13.94	0.22	13.33	0.30	19.78	0.46	30.65	0.67	2.20*

SE = standard error; * p <0.05.

TABLE 3.4: Correlations Between Housing Variables and Selected Health and Health-Risk Indicators, United States, 2004-2017

	HOME OWNERSHIP RATE (%)	SEVERE HOUSING PROBLEM (%)	SEVERE HOUSING COST BURDEN (%)	NON-WHITE/ WHITE RESIDENTIAL SEGREGATION
	2013-2017 N = 3,142 counties	**2010-2014** N = 3,141 counties	**2013-2017** N = 3,127 counties	**2012-2016** N = 2,786 counties
Self-assessed fair/poor health (%), adults, 2016 (age-adjusted)	-0.19945	0.25695	0.23498	-0.0549
p-value	<.0001	<.0001	<.0001	0.0037
Mental distress, adults, 2016[1]	-0.31794	0.24988	0.26232	0.20495
p-value	<.0001	<.0001	<.0001	<.0001
HIV prevalence rate, 2015	-0.33768	0.27805	0.41957	0.11383
p-value	<.0001	<.0001	<.0001	<.0001
Current smoking rate (%), adults, 2016	-0.23684	0.26473	0.09102	0.12177
p-value	<.0001	<.0001	<.0001	<.0001
Excessive (binge or heavy) drinking (%), adults, 2016	-0.0949	0.04242	-0.07549	0.15954
p-value	<.0001	0.0174	<.0001	<.0001
Physical inactivity rate, adults, 2014	-0.07018	0.00166	-0.20196	0.06616
p-value	<.0001	0.9258	<.0001	0.0005
Teen birth rate, 2010-2016	-0.19557	0.14429	-0.0456	-0.02741
p-value	<.0001	<.0001	0.0125	0.1484
Violent crime rate, 2012-2014	-0.30233	0.27827	0.32001	0.17933
p-value	<.0001	<.0001	<.0001	<.0001
Rate of social associations, 2015	0.16265	-0.34582	-0.32569	-0.0546
p-value	<.0001	<.0001	<.0001	0.0039

[1] Percentage reporting ≥14 days of poor mental health per month.

Source: Data derived from the 2018-2019 County Health Rankings and Roadmaps.

Chapter 4. Housing, Life Expectancy, and Mortality

Although there are many studies linking various aspects of housing to physical and mental health inequalities in the United States,[1-3] studies on the association between housing, life expectancy, and mortality disparities are limited. Especially lacking are studies linking housing tenure (home ownership vs. house renting) to inequalities in all-cause mortality and mortality from leading causes of death such as CVD, cancer, diabetes, COPD, cirrhosis, kidney disease, infectious diseases, and injuries. To our knowledge, there have not been any U.S. studies that show whether there are differences in life expectancy between homeowners and renters or those living in public housing.

Longitudinal studies from the United Kingdom and other European countries show a strong association between housing tenure and housing quality and mortality with renters experiencing significantly higher mortality risks than homeowners, even after controlling for other social determinants.[4, 5] For England and Wales, differences in mortality by housing tenure have increased over time in relative and absolute terms, with the renters or those living in social housing experiencing even higher relative risks of mortality than homeowners in more recent time periods.[4]

Although individual-level studies linking housing variables to mortality are lacking, a number of aggregate-level ecological studies have examined the relationship between aspects of housing such as neighborhood deprivation and residential segregation and mortality in the United States.[6-19] The U.S. socioeconomic deprivation indices developed for different time periods have included, in addition to education, income, poverty, occupation, employment, and transport, a number of housing variables such as home ownership rate, household crowding, lack of complete plumbing facilities, median number of rooms per housing unit, housing units with four or more bedrooms, median home value, gross rent, monthly mortgage, and annual real estate taxes.[6-13] These deprivation indices, constructed at various geographic levels such as census tracts, counties, ZIP codes, cities, towns, places, and metropolitan areas, have been used to analyze temporal inequalities in life expectancy, infant and child mortality, all-cause mortality, and mortality from CVD, cancer, diabetes, respiratory diseases, and HIV/AIDS, showing marked and persistent or increasing disparities in life expectancy and mortality over time.[3, 6-13] Studies on residential segregation and mortality in the United States show higher rates of infant mortality, all-cause mortality, CVD mortality, lung cancer mortality, and homicide associated with residential segregation, with the effects often varying for Whites and Blacks and for rural and urban communities.[14-19]

Given the wide gap in research on housing and mortality in the United States, in this chapter we use prospective individual-level data from the National Longitudinal Mortality Study (NLMS) to derive life expectancy estimates and all-cause and cause-specific mortality rates by housing tenure.[20, 21] In addition, by linking the 2004-2017 mortality data from the National Vital Statistics System to the 2010-2017 ACS data at the county-level, we examine the association between various housing variables (such as home ownership, severe housing problems, housing cost burden, household crowding, housing stability, and residential segregation) and life expectancy and cause-specific mortality rates at the area level.[22, 23]

Housing Tenure, Life Expectancy, and Cause-Specific Mortality: The National Longitudinal Mortality Study

To examine the association of housing tenure with all-cause and cause-specific mortality, we used the 1979-2011 NLMS data. The NLMS is a longitudinal data set for examining socioeconomic, occupational, and demographic factors associated with all-cause and cause- specific mortality in the United States.[20, 21] The NLMS is conducted by the National Heart, Lung, and Blood Institute in collaboration with the U.S. Census Bureau, the National Cancer Institute, the National Institute on Aging, and the National Center for Health Statistics.[20, 21] The NLMS consists of 39 Current Population Survey (CPS) and census cohorts between 1973 and 2011 whose survival (mortality) experiences were studied between 1979 and 2011.[20] The CPS is a sample household and telephone interview survey of the civilian non-institutionalized population in the United States and is conducted by the U.S. Census Bureau to produce monthly national statistics on unemployment and the labor force. Data from death certificates on the fact of death and the cause of death are combined with the socioeconomic and demographic characteristics of the NLMS cohorts by means of the National Death Index.[20, 21] Detailed descriptions of the NLMS have been provided elsewhere.[20, 21]

For this chapter, we used the public-use NLMS file to derive cohort-based mortality risks during 1979-2011, with a maximum mortality follow-up of 11 years or 4,018 days.[20] Differentials in mortality risks by housing tenure were adjusted by multivariate Cox proportional hazards regression for age and sex.[11, 12, 21] The 1979-2011 sample included 1,313,627 individuals aged 20 and older at the baseline and 156,617 deaths during the 11-year mortality follow-up. In estimating the mortality risk, all those surviving beyond the 11-year follow-up (measured in days) during the follow-up period were treated as right-censored observations. Relative risks were measured by hazard ratios and age-sex-specific and age-sex-adjusted mortality rates and life expectancy estimates were computed using the person-years approach and estimated Cox models.[11, 12]

Figure 4.1 shows the estimates of life expectancy at birth by housing tenure and sex, based on cohort life tables. During 1979-2011, homeowners had a life expectancy of 74.22 years, about 3.5 years longer than the life expectancy of 70.76 years for renters. The difference in life expectancy between homeowners and renters was longer for males than females (4.0 vs. 3.6 years).

Mortality rates for male and female homeowners are significantly lower than those for renters (Figure 4.2). During 1979-2011, the age-adjusted mortality rate for male homeowners was 1,242 per 100,000 person years, 20 percent lower than the rate of 1,548 for male renters. The reduced mortality associated with homeownership was similar for females. For all major racial/ethnic groups, homeowners had significantly lower mortality rates than renters.

Homeownership was associated with 24 percent lower mortality among the U.S.-born and 10 percent lower mortality among immigrants. Homeownership is associated with reduced mortality risks regardless of education or income levels (Figure 4.3). During 1979-2011, education and income levels were strongly and consistently associated with reduced all-cause mortality rates for both homeowners and renters. Within each level of education and income, homeowners had significant lower mortality rates than renters (Figure 4.3).

Table 4.1 presents the results of the age-sex-adjusted Cox models, showing all-cause and cause- specific mortality risks associated with housing tenure. Overall, renters had 28 percent higher all-cause mortality than homeowners, with the risk of mortality being 31 percent higher for male renters and 25 percent higher for female renters. Homeownership was associated with a reduced risk of CVD mortality, with the impact of homeownership on reduced stroke mortality being significantly greater for men than women. Homeownership was associated with lower cancer mortality, and the association was particularly strong for cervical cancer mortality. Female renters had an 83 percent higher risk of cervical cancer mortality than female homeowners. Renters had higher mortality from stomach, liver, and esophageal cancer than homeowners, reflecting their higher risks of Helicobacter pylori infection, alcohol consumption, hepatitis infection, and smoking.[24]

Compared with homeowners, renters had 36-64 percent higher risks of mortality from diabetes, pneumonia and influenza, COPD, cirrhosis, and kidney disease. Renters were at higher risk of infectious disease mortality; renters had 2.9 times higher risk of HIV/AIDS mortality than homeowners. Renters had 41 percent higher unintentional injury mortality, 27 percent higher suicide mortality, and 97 percent higher risk of homicide victimization, compared with homeowners.

County-level Associations between Housing Variables, Life Expectancy, and Cause-Specific Mortality

Table 4.2 shows correlations between several housing variables, life expectancy, and mortality at the county level during 2014-2017. Homeownership was strongly associated with White life expectancy (γ=0.41752) and negatively associated with homicide mortality (γ=-0.28157). Severe housing problems (which include overcrowding, high housing costs, and lack of kitchen or plumbing facilities) were associated with lower total life expectancy (γ=-0.07646) and White life expectancy (γ=-0.32722), higher cirrhosis mortality (γ=0.15931), and higher homicide rates (γ=0.27379). Severe housing cost burden, where households spend ≥50 percent of their household income on housing, was associated with increased homicide rates (γ=0.1702). Non-White/White residential segregation was associated with lower total life expectancy (γ=-0.08362) and Black life expectancy (γ=-0.22068), and higher all-cause mortality (γ=0.06147), CVD mortality (γ=0.12135), and homicide mortality (γ=0.45707).

County-Level Associations between Household Crowding and Cause-Specific Mortality

Table 4.3 shows age-adjusted cause-specific mortality rates at the county-level by household crowding (percent of households with greater than 1 person per room) during 2012-2016. The higher the level of household crowding, the higher the rate of mortality from hypertension. For example, Whites living in areas with high levels of household crowding were 42 percent more likely to die from hypertension than Whites in areas with low levels of crowding. We found consistent gradients in mortality by household crowding for several prominent causes of death, including cirrhosis, liver and stomach cancer, influenza and pneumonia, tuberculosis (TB), and HIV/AIDS. Compared to those living in areas with low household crowding, those living in areas with high levels of crowding had 21 percent higher risk of cirrhosis mortality, 35 percent higher risk of liver cancer mortality, 65 percent higher stomach cancer mortality, and 8 percent higher influenza and pneumonia mortality. Those living in areas with high levels of household crowding were, respectively, 2.6 and 3.0 times more likely to die from HIV/AIDS and TB than those living in areas with low crowding.

While adverse socioeconomic conditions (such as low educational attainment, poverty, and social deprivation) associated with household crowding may contribute to higher rates of mortality, several other factors associated with crowding such as higher levels of stress, mental health problems, alcohol consumption, close-contact infections, Helicobacter pylori infection, and hepatitis infection might also account for increased mortality from these causes.[24]

County-Level Associations between Housing Stability and Cause-Specific Mortality

Table 4.4 shows age-adjusted cause-specific mortality rates from 2012 to 2016 at the county-level by housing stability levels (defined as the percentage of those living in the same house during the past year). Low housing stability was associated with increased mortality from stroke, COPD, liver cirrhosis, kidney disease, and suicide. Those living in areas of low housing stability had 37 percent higher risk of stroke mortality than those living in areas with high housing stability.

The stroke mortality risk associated with low housing stability increased by 87 percent in the Black population. The risk of cirrhosis mortality and suicide in the Black population increased by 51 percent and 69 percent in areas with low housing stability, respectively.

Summary

This chapter presents empirical evidence linking several aspects of housing to life expectancy and all-cause and cause-specific mortality in the United States, using both longitudinal individual-level data and county-level ecological analyses. Life expectancy at birth is 3.6 and 4.0 years longer for female and male homeowners, respectively, than their renting counterparts. Overall, renters have 28 percent higher all-cause mortality than homeowners, but the reduced mortality or increased survival advantage associated with homeownership is greater among females than males. Housing tenure continues to be associated with all-cause mortality even after controlling for socioeconomic status. At each education or income level, homeowners have significantly lower mortality than renters. Compared to renters, homeowners have lower risks of mortality from several leading causes of death, including CVD, all cancers combined, stomach, liver, esophageal and cervical cancer, diabetes, influenza and pneumonia, COPD, cirrhosis, kidney disease, HIV/AIDS, infectious diseases, unintentional injuries, suicide, and homicide. Analysis of the housing variables and mortality at the county-level indicates strong associations of low homeownership rates, severe housing problems, severe housing cost burden, and residential segregation with lower life expectancy and high rates of overall mortality and homicide rates. Household crowding and housing instability at the community level contribute to increased mortality from several leading causes of death, including cardiovascular, respiratory, and infectious diseases, and injuries. The housing variables influence mortality not only through associated socioeconomic pathways, but their mortality effects may also operate via psychosocial stress, mental health problems, infections, smoking, drinking, physical inactivity, and inadequate access to health care associated with adverse housing conditions.

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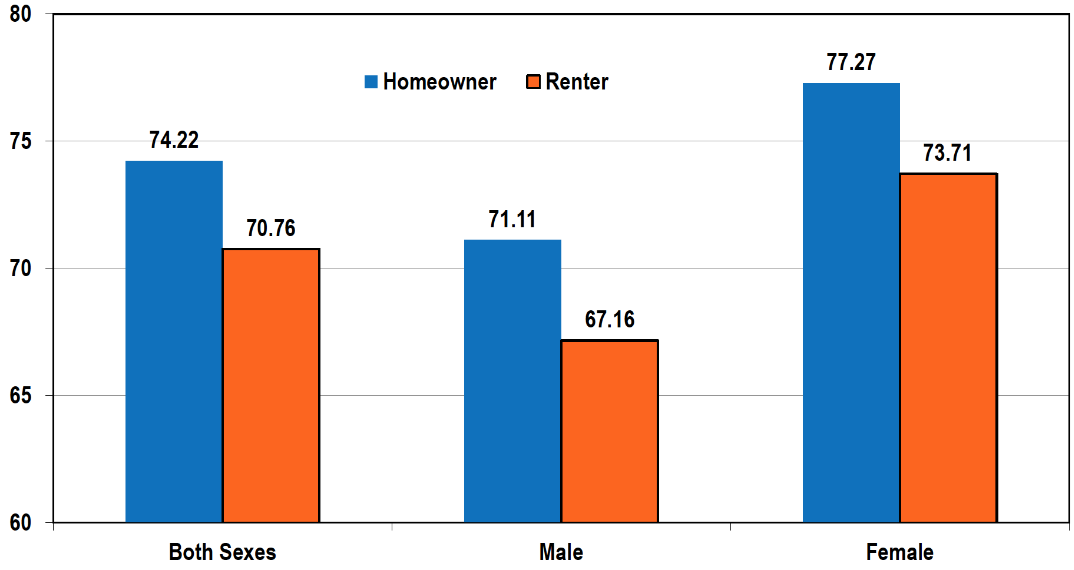
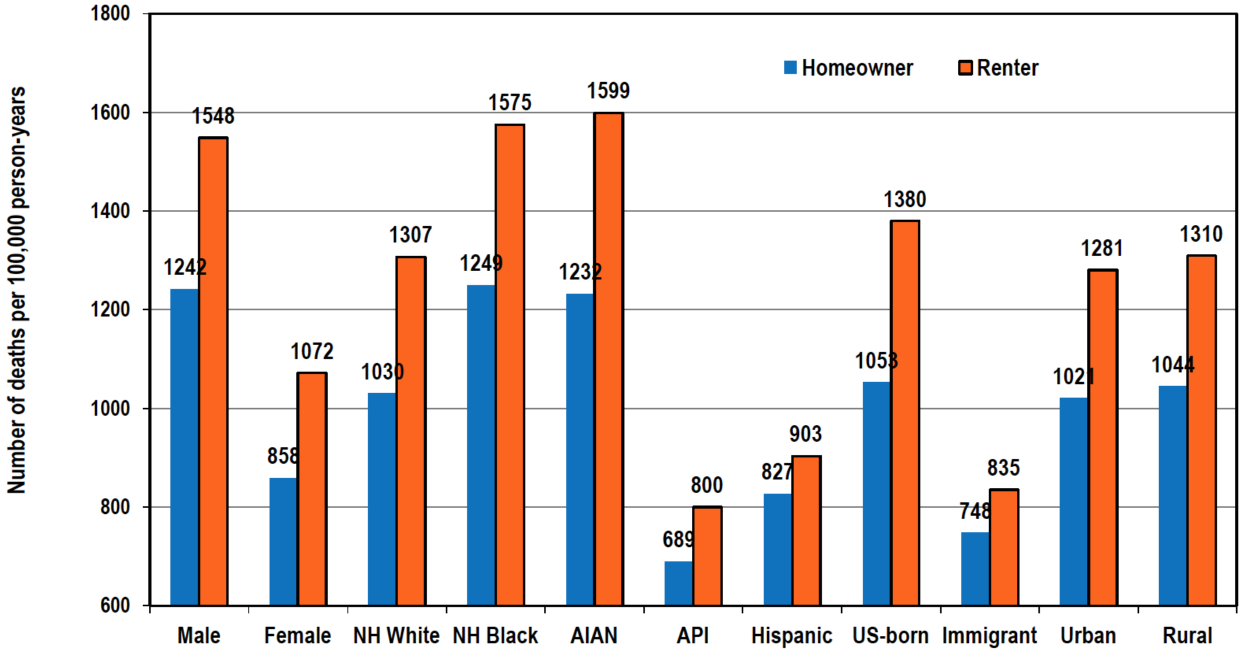
FIGURE 4.1: Life Expectancy at Birth (Years) by Housing Tenure and Sex, United States, 1979-2011, The National Longitudinal Mortality Study



The life expectancy estimates roughly correspond to the midpoint of the study time period, i.e., 1995.

Source: Data derived from the 1979-2011 National Longitudinal Mortality Study (NLMS).

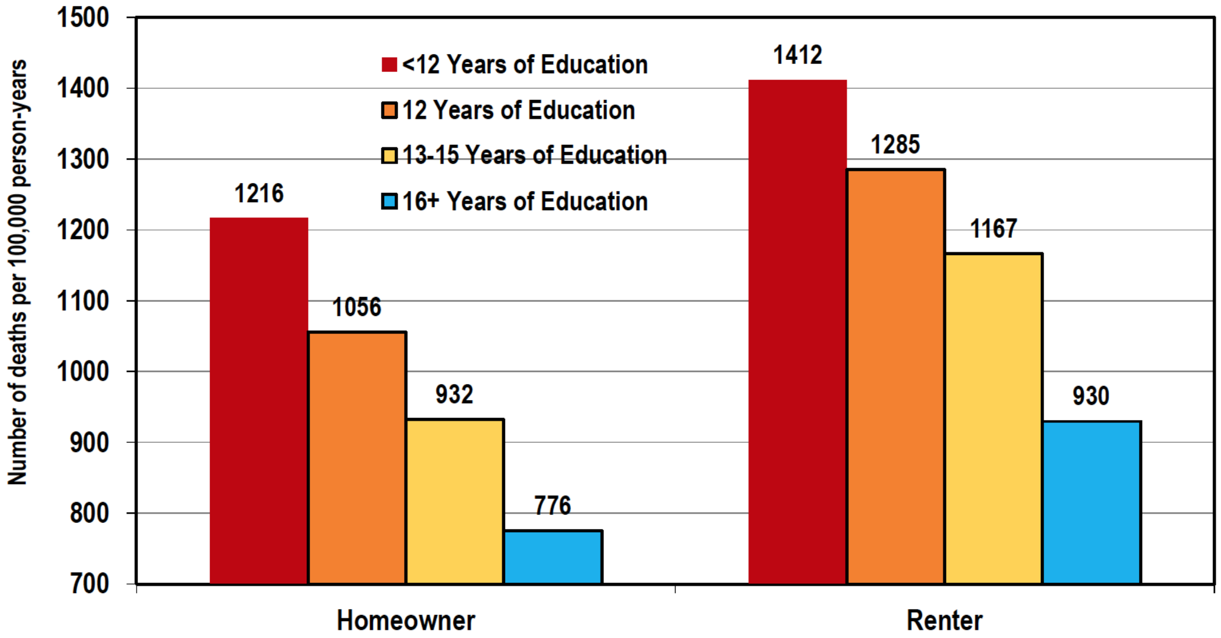
FIGURE 4.2: Age-Sex-Adjusted All-Cause Mortality Rates by Housing Tenure and Selected Sociodemographic Characteristics, US Population Aged 20+ Years, 1979-2011

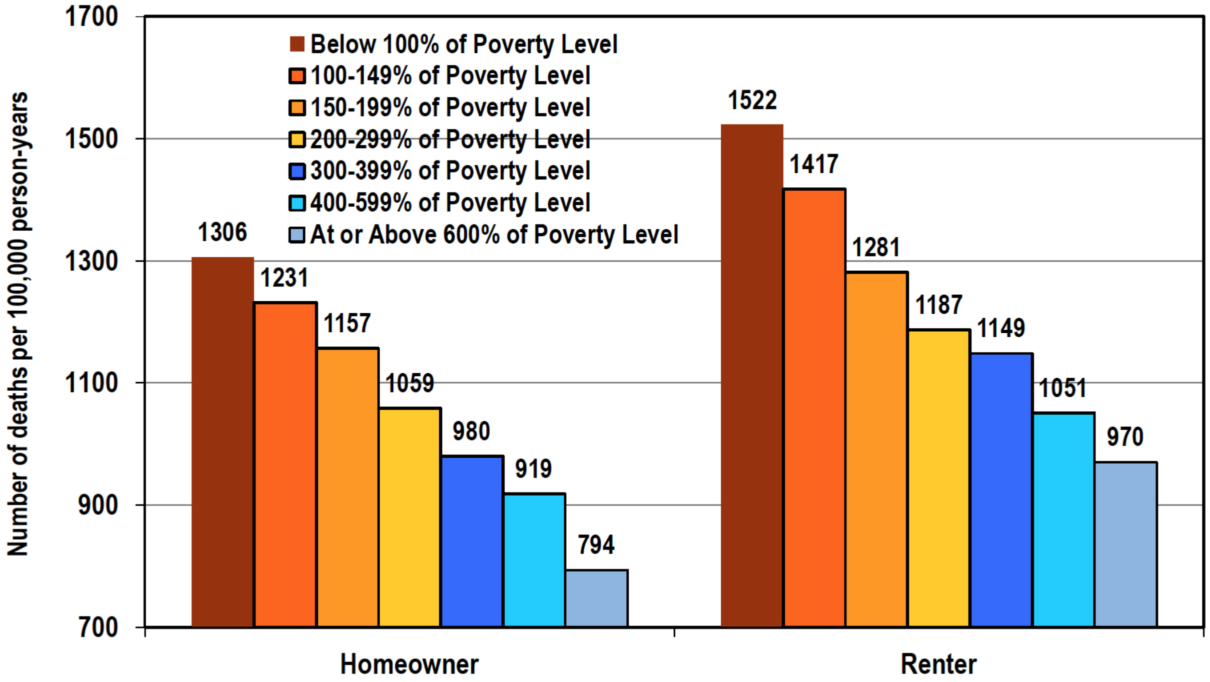


AIAN = American Indian/Alaska Native; API = Asian/Pacific Islander; NH = Non-Hispanic. Differences in all-cause mortality rates by housing tenure across sex, race/ethnicity, nativity status, and rural-urban residence were statistically significant at p<.01.

Source: Data derived from the 1979-2011 National Longitudinal Mortality Study (NLMS)

FIGURE 4.3: Age-Sex-Adjusted All-Cause Mortality Rates by Housing Tenure, Educational Attainment, and Family Income/Poverty Level, US Population Aged 20+ Years, 1979-2011





Differences in all-cause mortality rates by housing tenure and education and by housing tenure and family income were statistically significant at p<.01.

Source: Data derived from the 1979-2011 National Longitudinal Mortality Study (NLMS).

TABLE 4.1: Age-Sex-Adjusted Mortality Risks (Derived from Cox Regression Models) for Renters Relative to Homeowners Aged ≥20 Years, by Major Causes of Death:
The US National Longitudinal Mortality Study, 1979-2011, 11-Year Mortality Follow-up (N = 1,313,627)

	BOTH SEXES COMBINED[1]			MALE[2]			FEMALE[2]		
Cause of death	**Hazard Ratio**	**95% Confidence Interval**		**Hazard Ratio**	**95% Confidence Interval**		**Hazard Ratio**	**95% Confidence Interval**	
All causes combined	1.28	1.27	1.30	1.31	1.29	1.33	1.25	1.23	1.27
Cardiovascular diseases (CVD)	1.24	1.22	1.27	1.23	1.20	1.26	1.24	1.21	1.27
Heart disease	1.26	1.23	1.28	1.22	1.19	1.26	1.26	0.12	1.30
Stroke	1.17	1.12	1.22	1.27	1.19	1.37		1.05	1.18
All cancers combined	1.09	1.06	1.11	1.12	1.08	1.16	1.08	1.05	1.12
Lung cancer	1.18	1.13	1.23	1.21	1.14	1.29	1.17	1.09	1.25
Colorectal cancer	1.03	0.96	1.11	1.05	0.94	1.17	1.03	0.93	1.13
Prostate cancer				0.94	0.85	1.05			
Breast cancer							0.94	0.86	1.02
Cervical cancer							1.83	1.45	2.31
Stomach cancer	1.30	1.13	1.49	1.24	1.03	1.50	1.40	1.13	1.72
Liver and IBD cancer	1.46	1.24	1.71	1.55	1.26	1.92	1.34	1.04	1.73
Esophageal cancer	1.34	1.14	1.57	1.20	0.99	1.47	1.67	1.26	2.22
Diabetes	1.45	1.35	1.56	1.41	1.26	1.57	1.49	1.36	1.64
Pneumonia and influenza	1.40	1.31	1.50	1.45	1.32	1.59	1.37	1.25	1.50
COPD	1.36	1.29	1.43	1.39	1.29	1.49	1.36	1.26	1.47
Liver cirrhosis	1.64	1.48	1.80	1.79	1.58	2.03	1.42	1.21	1.67
Nephritis/kidney diseases	1.38	1.25	1.53	1.45	1.24	1.68	1.35	1.17	1.55
Alzheimer's disease	0.73	0.65	0.84	0.61	0.48	0.79	0.79	0.68	0.92
HIV/AIDS	2.88	2.56	3.25	2.99	2.60	3.44	2.35	1.87	2.97
Other infectious diseases	1.64	1.48	1.81	1.66	1.44	1.93	1.61	1.40	1.84
Unintentional injuries	1.41	1.32	1.50	1.41	1.30	1.52	1.33	1.20	1.47
Motor vehicle accidents	1.19	1.08	1.31	1.21	1.07	1.37	1.13	0.96	1.34
Non-motor-vehicle injuries	1.53	1.41	1.65	1.54	1.39	1.70	1.37	1.20	1.56
Suicide	1.27	1.14	1.40	1.31	1.17	1.47	1.13	0.91	1.41
Homicide	1.97	1.69	2.30	1.88	1.55	2.28	2.15	1.65	2.81
Firearm injuries	1.21	1.09	1.35	1.25	1.11	1.41	2.15	0.83	1.39

[1] Adjusted for age and sex. [2] Adjusted for age only.

TABLE 4.2: Correlations Between Housing Variables and Life Expectancy and Age-Adjusted Cause-Specific Mortality Rates, United States, 2004-2017

	HOME OWNERSHIP RATE (%)	SEVERE HOUSING PROBLEMS (%)	SEVERE HOUSING COST BURDEN (%)	NON-WHITE/WHITE RESIDENTIAL SEGREGATION
	2013-2017 N = 3,142 counties	**2010-2014** N = 3,141 counties	**2013-2017** N = 3,127 counties	**2012-2016** N = 2,876 counties
Life expectancy, total population, 2015-2017	0.06061	-0.07646	-0.01907	-0.08362
p-value	0.0008	<.0001	0.2916	<.0001
Life expectancy, Black population, 2015-2017	0.04717	0.01747	0.00346	-0.22068
p-value	0.084	0.5225	0.8998	<.0001
Life expectancy, Hispanic population, 2015-2017	0.08073	-0.1238	0.03542	0.04732
p-value	0.0042	<.0001	0.2124	0.095
Life expectancy, White population, 2015-2017	0.41752	-0.32722	0.17621	-0.06457
p-value	<.0001	<.0001	<.0001	0.0074
All-cause mortality rate, 2013-2017	-0.06685	0.04839	0.01713	0.06147
p-value	0.0002	0.0068	0.339	0.0012
Cardiovascular disease (CVD) mortality rate, 2013-2017	-0.05944	0.02366	0.03069	0.12135
p-value	0.001	0.1888	0.0889	<.0001
Diabetes mortality rate, 2013-2017	-0.09515	0.04869	-0.04631	-0.00703
p-value	<.0001	0.0198	0.0271	0.7374
Chronic liver disease & cirrhosis mortality rate, 2004-2017	-0.1287	0.15931	0.01081	-0.20931
p-value	<.0001	<.0001	0.6067	<.0001
Homicide mortality rate, 2013-2017	-0.28157	0.27379	0.1702	0.45707
p-value	<.0001	<.0001	<.0001	<.0001

Source: Data derived from the 2014-2017 National Vital Statistics System and the 2018-2019 County Health Rankings and Roadmaps.

TABLE 4.3: Selected Age-Adjusted Cause-Specific Mortality Rates per 100,000 Population by Household Crowding, United States, 2012-2016 (N = 3,143 Counties)

	HOUSEHOLD CROWDING (% households with >1 person per room, 2012-2016)						
	<1.62%		1.62% TO 4.84%		≥4.85%		RELATIVE RISK
Cause of Death	**Mortality rate**	**SE**	**Mortality rate**	**SE**	**Mortality rate**	**SE**	**High vs. Low Crowding**
Hypertension without heart disease	7.49	0.04	8.24	0.03	10.41	0.06	1.39 *
White	6.93	0.04	7.30	0.03	9.83	0.06	1.42 *
Black	15.61	0.22	15.81	0.13	17.85	0.24	1.14 *
Other (AIAN + API)	4.23	0.25	6.56	0.15	8.11	0.13	1.92 *
Liver cirrhosis	9.55	0.04	10.39	0.03	11.53	0.06	1.21 *
White	9.89	0.05	11.07	0.04	13.34	0.08	1.35 *
Black	7.39	0.13	7.07	0.47	6.90	0.14	0.93 *
Other (AIAN + API)	5.05	0.22	8.14	0.13	6.45	0.11	1.28 *
Liver and IBD cancer	5.71	0.03	6.55	0.03	7.73	0.05	1.35 *
White	5.45	0.03	6.12	0.03	7.36	0.06	1.35 *
Black	8.19	0.15	8.56	0.08	8.00	0.15	0.98
Other (AIAN + API)	7.93	0.30	9.09	0.16	9.27	0.14	1.17 *
Stomach cancer	2.58	0.02	3.02	0.02	4.26	0.04	1.65 *
White	2.33	0.02	2.62	0.02	3.84	0.04	1.65 *
Black	5.40	0.13	5.62	0.07	5.43	0.13	1.01
Other (AIAN + API)	4.18	0.22	4.32	0.11	5.65	0.11	1.35 *
Influenza and pneumonia	15.10	0.05	14.20	0.04	16.26	0.07	1.08 *
White	15.16	0.06	15.14	0.04	15.74	0.08	1.04 *
Black	14.88	0.21	15.28	0.12	19.26	0.25	1.29 *
Other (AIAN + API)	8.44	0.06	10.25	0.18	16.84	0.19	2.00 *
Tuberculosis (TB)	0.09	0.00	0.13	0.00	0.27	0.01	3.00 *
White	0.07	0.00	0.09	0.00	0.18	0.01	2.57 *
Black	0.21	0.03	0.23	0.01	0.29	0.03	1.38 *
Other (AIAN + API)	0.48	0.08	0.59	0.04	0.67	0.04	1.40 *
HIV/AIDS	1.09	0.02	2.13	0.02	2.79	0.03	2.56 *
White	0.63	0.01	1.06	0.01	2.04	0.03	3.24 *
Black	5.54	0.12	8.51	0.08	10.51	0.17	1.90 *
Other (AIAN + API)	0.25	0.04	0.51	0.03	0.57	0.03	2.28 *

SE = standard error. AIAN = American Indian and Alaska Native. API = Asian and Pacific Islander. IBD = Intrahepatic bile duct. * $p < 0.05$.

Source: Data derived from the 2012-2016 National Vital Statistics System and 2012-2016 American Community Survey.

TABLE 4.4: Selected Age-Adjusted Cause-Specific Mortality Rates per 100,000 Population by Housing Stability (% Living in the Same House During the Past Year, No Residential Mobility, 2008-2012), United States, 2008-2016 (N = 3,143 Counties)

	HOUSING STABILITY (% living in the same house during past year, 2008-2012)								
	<60%		60% TO 69.99%		70% TO 89.99%		90% TO 100%		RELATIVE RISK
Cause of Death 2012-2016	Mortality rate	SE	Mortality rate	SE	Mortality rate	SE	Mortality rate	SE	High vs. Low Stability
Stroke	45.53	3.60	38.82	1.01	37.25	0.05	33.17	0.06	1.37 *
White	41.28	3.71	38.05	1.03	35.89	0.05	32.56	0.15	1.27 *
Black	72.92	17.21	63.97	7.07	51.03	0.19	40.57	0.53	1.80 *
COPD	45.29	3.63	41.05	1.05	41.70	0.05	38.26	0.15	1.18 *
White	47.54	3.92	42.32	1.10	44.42	0.06	40.56	0.17	1.17 *
Black			24.95	4.47	29.77	0.14	23.58	0.40	1.06
Liver cirrhosis	10.09	1.63	10.21	0.52	10.52	0.03	8.79	0.08	1.15 *
White	10.67	1.80	10.34	0.55	11.30	0.03	8.90	0.08	1.20 *
Black			8.75	2.20	7.22	0.06	5.78	0.19	1.51 *
Nephritis/kidney disease	19.74	2.43	11.27	0.55	13.15	0.03	13.86	0.09	1.42 *
White	19.15	2.53	10.65	0.55	11.94	0.03	13.21	0.09	1.45 *
Black			24.19	4.32	25.60	0.13	21.15	0.19	1.14
Suicide	13.64	1.85	12.69	0.59	13.07	0.03	11.72	0.10	1.16 *
White	15.16	0.06	15.14	0.04	15.74	0.08	15.74	0.08	0.96
Black			6.92	1.77	5.72	0.05	4.10	0.16	1.69 *

SE = standard error. COPD = Chronic obstructive pulmonary diseases. * $p < 0.05$.

Source: Data derived from the 2012-2016 National Vital Statistics System and 2008-2012 American Community Survey.

Chapter 5. Maternal and Child Health

HRSA's Maternal and Child Health Bureau (MCHB) seeks to improve the health and well-being of America's mothers, children and families by striving for an America where all mothers, children, and families are thriving. To achieve its mission, MCHB relies upon evidence-based and evidence-informed strategies to design and implement programs to monitor the effectiveness of its programs.

The Bureau's commitment aligns with HRSA's broader goals, which are to: (1) improve access to quality health care and services; (2) strengthen the health workforce; (3) build healthy communities; (4) improve health equity; and (5) strengthen program operations.[1, 2]

MCHB's programs are funded through 11 different legislative authorities, which include the:

1. MCH Block Grant;
2. Maternal, Infant, and Early Childhood Home Visiting Program;
3. Healthy Start Initiative: Eliminating Disparities in Perinatal Health (Healthy Start);
4. Emergency Medical Services for Children;
5. Pediatric Mental Health Care Access;
6. Screening and Treatment for Maternal Depression and Related Behavioral Disorders;
7. Early Hearing Detection and Intervention;
8. Heritable Disorders in Newborns and Children;
9. Family to Family Health Information Centers;
10. Sickle Cell Disease Treatment Demonstration Program; and
11. Autism and Other Developmental Disabilities.

Through their programs, MCHB offices and divisions play important roles in the Bureau's efforts to improve health equity. Several programs highlighted in this chapter are:

- **State and Community Health:** Title V MCH Services Block Grant Program;
- **Home Visiting and Early Childhood Systems:** Maternal, Infant, and Early Childhood Home Visiting Program;
- **Healthy Start and Perinatal Services:** Healthy Start Program;
- **Child, Adolescent, and Family Health:** Emergency Medical Services for Children Program, Fetal, Infant and Child Death Review, National Action Partnership to Promote Safe Sleep Improvement and Innovation Network, and the Children's Safety Network Program;
- **MCH Workforce Development:** MCH Pipeline Training Program, MCH Public Health Catalyst Program;
- **Services for Children with Special Health Care Needs:** Family to Family Health Information Centers, the Sickle Cell Disease Newborn Screening and Follow-Up Program;
- **Epidemiology and Research:** The Data Resource Initiative for Child and Adolescent Health, the National Survey of Children's Health, the Research Network Program, and the Strengthen the Evidence for Maternal and Child Health Program; and
- **Policy and Planning:** State Maternal and Child Health Policy Innovations Program.

State and Community Health

Background

The Division of State and Community Health administers the Title V MCH Services Block Grant to States Program (Title V), which is one of the largest federal block grants. Title V serves as a key source of support for promoting and improving the health of the nation's mothers and children. Administered by the Division of State and Community Health, the purpose of Title V is to create federal and state partnerships that enable each state/jurisdiction to address the health services needs of its mothers, infants, and children, including children with special health care needs and their families.

Title V funds are distributed to grantees from 59 states and jurisdictions. The funds seek to create federal and state partnerships that provide:

- Access to quality care, especially for people with low incomes or limited availability of care;
- Health promotion efforts that seek to reduce infant mortality and the incidence of preventable diseases, and to increase the number of children appropriately immunized against disease;
- Access to comprehensive prenatal and postnatal care for women, especially low-income and at-risk pregnant women;
- An increase in health assessments and follow-up diagnostic and treatment services, especially for low-income children;
- Access to preventive and child care services as well as rehabilitative services for children in need of specialized medical services;
- Family-centered, community-based systems of coordinated care for children with special health care needs; and
- Toll-free hotlines and assistance in applying for services to pregnant women with infants and children who are eligible for Title XIX (Medicaid).

Program Highlights

State/jurisdictional MCH agencies submit a yearly application/annual report for receipt of Title V funding and conduct a legislatively mandated state/jurisdiction-wide comprehensive needs assessment every 5 years. Title V funds are then used to design and implement a wide range of activities that address identified state/jurisdictional MCH priority needs. States/jurisdictions have discretion in the types of activities they implement, based on the individual needs of their MCH populations.

Each year, Congress sets aside funding for the Title V MCH Block Grant. Individual state/jurisdiction allocations are determined legislatively by a formula that considers in part the proportion of low-income children in a particular state/jurisdiction compared with the total number of low-income children in all U.S. states and jurisdictions. State/jurisdictions must match every four dollars of federal Title V money that they expend by at least three dollars of state/jurisdiction and/or local money (i.e., nonfederal dollars). The legislation also contains a Maintenance of Effort requirement that mandates each state/jurisdiction to maintain a level of expenditure for MCH programs at a level that is equal to the amount provided in FY 1989. Combined, the Title V MCH federal-state partnership investment totaled more than $6.5 billion in FY 2018. Based on state and jurisdictional reporting, more than 91 percent of pregnant women and more than 54 percent of children benefited from a Title V service.

Home Visiting and Early Childhood Systems

Background

The Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program supports voluntary, evidence-based home visiting for at-risk pregnant women and parents with children until the child enters kindergarten. The MIECHV Program builds upon decades of scientific research showing that home visits by a nurse, social worker, early childhood educator, or other trained professionals during pregnancy and early childhood improve the lives of children and families. Home visiting helps prevent child abuse and neglect, supports positive parenting, improves maternal and child health, and promotes child development and school readiness. Evidence-based home visiting can be cost-effective in the long-term, with the largest benefits coming through reduced spending on government programs and increased individual earnings.

Program Highlights

HRSA administers the MIECHV program in partnership with the Administration for Children and Families. States, territories, and tribal entities receive funding and have the flexibility to tailor the program to serve the needs of their communities. In February 2018, the MIECHV Program was allocated $400 million per year through FY 2022. Awardees must prioritize families living in at-risk communities, as identified by the statewide needs assessment. In FY 2018, the program served individuals and families from different backgrounds, including:

- Household Income: 71 percent of families had household incomes at or below 100 percent of the federal poverty level (FPL); 42 percent of the families were at or below 50 percent of the FPL;
- Housing: Approximately 3 percent of participants were homeless and 4 percent lived in public housing;
- Education: 65 percent of adult program participants had a high school education or less; 38 percent had a high school diploma; and 27 percent had less than a high school education; and
- Health Insurance: Approximately 76 percent of participating adults and children relied on Medicaid or the Children's Health Insurance Program.
- In FY 2018, MIECHV awardees served over 150,000 parents and children in 896 counties and conducted over 930,000 home visits. Over the past 7 years, the program has conducted about 5.2 million home visits.

Healthy Start and Perinatal Services

Background

The Division of Healthy Start and Perinatal Services administers a wide portfolio of programs that promote improvement and innovation in women's and perinatal health. These programs also advance health equity, particularly by addressing the key SDOH, such as housing. The Healthy Start program aims to improve maternal health outcomes and to reduce racial and ethnic disparities in infant mortality, as well as other adverse perinatal outcomes in the United States. The program seeks to achieve these goals by improving access to quality health care and services for women, infants, children, and families; strengthening the health workforce; building healthy communities; and promoting and improving health equity through community collaboration. For example, Healthy Start encourages the integration of housing-related issues by addressing program participants' needs and offering strategic services to improve specific social conditions that can contribute to poor health outcomes among the populations served.

Program Highlights

Since 1991, the Healthy Start program has grown from a demonstration project in 15 communities to 101 Healthy Start projects in 34 states, Washington, DC, and Puerto Rico. Close collaboration with local, state, regional, and national partners is key to the program's success.

Infant Mortality Collaborative Improvement and Innovation Network (CoIIN)

CoIINs are multidisciplinary teams of federal, state, and local leaders working together to tackle a common problem. Participants with a collective vision share information and track progress toward shared goals using common benchmarks. Several Healthy Start grantees participate in the Infant Mortality CoIIN on the SDOH, which was launched in 2017. By 2020, the CoIIN aims to develop, adopt, or improve at least 2 policies and/or practices at the state or local levels that will directly affect the social determinants that influence birth outcomes.

Community-Based Projects

Participating Healthy Start grantees are also working on relevant projects such as implementing medical-legal partnerships, assessing the need for 'emergency' childcare in circumstances related to obtaining perinatal care (e.g., prenatal appointments, hospital admissions), and developing women/family-friendly childcare strategies for maternal care providers.

Child, Adolescent, and Family Health

Background

The Division of Child, Adolescent and Family Health (DCAFH) provides leadership, in partnership with key stakeholders, to identify gaps and pioneer efforts that influence the health and safety of MCH populations. DCAFH synthesizes existing and emerging knowledge to activate changes within systems and to improve their readiness to support the healthy development and well-being of all infants, children, adolescents, young adults, and families. DCAFH uses four strategies to achieve its mission:

- Identifying gaps in addressing child, adolescent, young adult, and family health, safety and well-being;
- Engaging a diverse group of partners to establish shared priorities;
- Innovating and testing change concepts to build evidence of effectiveness for addressing priority health and safety issues; and
- Disseminating and implementing effective strategies for improving health, safety, and well-being.

Program Highlights

Emergency Medical Services for Children (EMSC)

The EMSC program is the only federal program dedicated to addressing the emergency care needs of children in both prehospital and hospital systems. Since its inception, the EMSC program has provided funding to all 50 states, the District of Columbia, 5 U.S. territories, and 3 Freely Associated States to expand and improve emergency medical services for children who need treatment for trauma or critical care. Rural, frontier, and under-resourced areas often have extremely limited specialized pediatric emergency care. EMSC is a health equity program for children experiencing medical emergencies.

National Action Partnership to Promote Safe Sleep Improvement and Innovation Network

This partnership program aligns stakeholders' efforts through a coalition of over 60 organizations. The program works with families to implement a National Action Plan to address safe infant sleep, with activities such as testing safety bundles to improve the likelihood that infant caregivers and their families receive consistent, evidence-based information regarding safe infant sleep and breastfeeding. While sudden unexpected infant death (SUID) is a public health issue across population groups, significant disparities in SUID rates exist across race and ethnicity that the program works to address.

Children's Safety Network (CSN)

The CSN program addresses health disparities in child injury by increasing the understanding and capacity of Title V agencies to catalyze innovative methods informed by data and metrics through technical assistance and continuous quality improvement. The CSN also convenes the Children's Safety Now Alliance, a group of leaders and experts representing national organizations, federal agencies, state health departments, hospitals, and universities. Their aims include improving collaboration among public and private stakeholders, engaging populations disproportionately affected by injuries and violence, and addressing SDOH that impact injury rates.

Fetal, Infant, and Child Death Review

The program supports the National Center for Fatality Review and Prevention (National Center) to reduce fetal, infant, and child deaths by improving the quality of fatality reviews and providing evidence-based prevention strategies. The National Center initiated a Fatality Review Health Disparities workgroup to develop education and resources for fetal/infant mortality review and child death review teams to help increase their understanding of health equity and implicit bias.

Maternal and Child Health Workforce Development

Background

The Division of Maternal and Child Health Workforce Development (DMCHWD) provides national leadership and direction in educating and training the nation's current and future leaders in maternal and child health. DMCHWD places special emphasis on the development and implementation of inter-professional, family-centered, community-based, and culturally competent systems of care across the entire life course. Latest data indicate that in FY 2016, the division awarded 152 grants - an investment of approximately $47 million. DMCHWD supports a continuum of training and workforce development investments to develop MCH leaders at the undergraduate, graduate, and post-graduate levels in the areas of public health, clinical practice, MCH teaching, research, and/or administration/policymaking, and to provide continuing education and professional development to address the ongoing training needs for practicing MCH professionals. Grants are also awarded to community-based partnerships and collaborations aimed at improving the health status of disadvantaged children, youth, and families nationwide by increasing their access to health services. The division has a unique role in addressing disparities in health and access to care by developing an MCH workforce that reflects the diversity of populations served and ensuring reach to vulnerable and underserved populations.

Program Highlights

In FY 2016, MCH training programs trained 2,276 long-term trainees (trainees receiving greater than or equal to 300 contact hours with an MCH training program). Of these long-term trainees, 26.7 percent were from an underrepresented racial group and percent were from an underrepresented ethnic group. While all DMCHWD training programs have a focus on developing diverse MCH professionals, two programs have a special emphasis on recruiting students from underrepresented backgrounds:

Maternal and Child Health Pipeline Training

This program promotes the development of a culturally diverse and representative health care workforce by recruiting undergraduate training students from economically and educationally disadvantaged backgrounds (including racial and ethnic minorities) into MCH professions. The program educates, mentors, guides, and provides enriching experiences to increase students' interests and entry into MCH public health, and related fields. The program also encourages and motivates students to seek careers in MCH, by making the appropriate undergraduate didactic research, clinical, and/or field experiences available and exposing students to Title V and other MCH agencies that serve children and families. In FY 2016, 71.3 percent of Pipeline trainees were from an underrepresented racial group and 30 percent were from an underrepresented ethnic group. The percentage of trainees from underrepresented racial and ethnic groups remained relatively stable between 2012 and 2016.

Maternal and Child Health Public Health Catalyst

This program provides: (1) an increased focus on fundamental MCH content and competencies within schools of public health where no concentration currently exists, and (2) MCH content exposure to public health students by introducing them to careers in the MCH field. Catalyst Programs seek to provide MCH exposure to graduate students, including individuals from underrepresented backgrounds (including racial and ethnic minorities) and underrepresented in the MCH field. According to the latest data, in FY 2016, 54.2 percent of Catalyst trainees were from an underrepresented racial group and 16.0 percent were from an underrepresented ethnic group. Initiated in FY 2015, the MCH Catalyst Program trained 294 students in FY 2015-16.

Services for Children with Special Health Needs

Background

The Division of Services for Children with Special Health Needs oversees MCHB's investments related to children with special health needs and their families. Children and youth with special health care needs (CYSHCN) have been defined as "those children and youth who have or are at increased risk for chronic physical, developmental, behavioral or emotional conditions and who also require health and related services of a type or amount beyond that required by children generally."[4, 5] The 2016–2017 NSCH estimates that nearly 20 percent of children under 18 years of age in the United States, or approximately 13.8 million children, have special health care needs. NSCH Programs address disparities and reduce barriers, including cultural and linguistic barriers, access to services and unmet needs of medically underserved populations, including those living in poverty or in a rural geographic location. The division's guiding principles for all programs include programs that are evidence-based/informed; ensure health equity; promote family engagement; and are innovative and collaborative and work to achieve the following six critical systems outcomes:

1. Family/professional partnership at all levels of decision-making;
2. Access to coordinated, ongoing comprehensive care within a medical home;
3. Access to adequate private and/or public insurance and financing to pay for needed services;
4. Early and continuous screening for special health needs;
5. Organization of community services for easy use; and
6. Youth transition to adult health care, work, and independence.

Program Highlights

Family-to-Family Health Information Centers (F2F HIC)

The F2F HICs provide information, education, technical assistance, and peer support to families of CYSHCN and health care professionals. The program has specific objectives about training families from underrepresented and diverse communities. In FY 2018, F2F HICs provided assistance and/or training to 181,938 families and 83,859 health professionals. Forty-three percent of the families served by F2F HICs were from diverse ethnic populations, with 18 percent identifying as Hispanic. In 2018, tribal organizations received 3 grants and 7 of the 51 statewide grants provided direct outreach and information sharing to tribal populations in the state.

Sickle Cell Disease Programs

In the United States, sickle cell disease occurs most commonly among people of African and Hispanic ancestries. Many individuals face barriers to accessing quality care through a medical home. The Sickle Cell Disease Programs, including the Sickle Cell Disease Treatment Demonstration Program and the Sickle Cell Disease Newborn Screening and Follow-Up Programs fund five regional grantees and a national technical assistance center to increase access to evidence-based care and social services.

Trained hematologists use Project ECHO to train primary care providers on treatments, such as hydroxyurea. In addition, the project supports 16 sickle cell community-based organizations (CBOs) in 15 states. These CBOs and community health workers work to reduce barriers by providing culturally competent care coordination, education, and linkages to resources such as prescription assistance, transportation, and housing.

Epidemiology and Research

Background

MCHB's Epidemiology and Research program promotes the health and well-being of women, children, and families by providing national leadership in the advancement and use of scientific research to inform MCH programs. The programs collaborate with state and local MCH partners, academic institutions, professional organizations, and other federal government agencies. To inform policy and program development, MCHB funds projects that: examine health disparities, the quality of care, the social and environmental context of child and family health and well-being, and encourage an integrated view of family health over the lifespan and across generations. MCHB's Office of Epidemiology and Research, which encompasses the Division of Epidemiology and the Division of Research, performs the majority of the epidemiology and research activities in MCHB.

Program Highlights

The Division of Epidemiology advances MCH epidemiology and research by building data capacity at the national, state, and local levels; improving data access for Title V partners; producing original research; and strengthening the evidence base in MCH. The division implements a number of initiatives including:

National Survey of Children's Health (NSCH)

NSCH is an annual survey that provides national and state level estimates of key measures of child health and well-being for children ages 0-17 years. NSCH is sponsored and directed by HRSA and conducted by the U.S. Census Bureau. Data are collected from the child's parent or caregiver in English or Spanish using either a paper or web-based questionnaire;

Data Resource Center for Child and Adolescent Health (DRC)

DRC advances the effective use of public data on children's health and health-related services for children, youth and families in the United States. DRC provides access to national, state, and regional data from the NSCH for a wide range of child health indicators as well as National Performance and Outcome Measures for the Title V Maternal and Child Health Services Block Grant program; and

Strengthen the Evidence for MCH Programs

This project uses a consortium-based approach to provide technical assistance, expert consultation, training, and resources to assist all 59 states and jurisdictions that receive funding through the Title V Maternal and Child Health Services Block Grant program. This program assists in developing evidence-based or evidence-informed programs, State Action Plans, and in responding to the National Outcome Measures, National Performance Measures, and State Performance Measures.

The Division of Research oversees MCHB's extramural research program, providing leadership and funding that supports innovative, applied, and translational research to inform practitioners, the scientific community, and the public. The Division of Research's programs help advance the MCH field and improve the health and well-being of women, children, and families. Funded programs also address the needs of economically or medically vulnerable MCH populations. This is achieved through the administration of four broad programmatic grant competitions under both general MCH and autism topics. These include the following grant programs:

Research Network (RN)

The RN Program supports the establishment and maintenance of interdisciplinary, national, multi-site, collaborative RNs, which lead, promote, and coordinate national research activities on broad and specific fields of MCH;

Field-Initiated Innovative Research Studies (FIRST)

The FIRST program supports innovative, applied, and translational intervention research studies on critical issues affecting the MCH populations. The research findings of this program should be generalizable to the broader U.S. population, and of regional and national significance;

Secondary Data Analysis Research (SDAR)

The SDAR program supports applied and translational research that exclusively utilizes the secondary analysis of existing national databases and/or administrative records to improve the health and well-being of MCH populations; and

Single Investigator Innovation Program (SIIP)

The SIIP supports focused research on priority, emerging, and underdeveloped research areas in MCH, autism, or developmental disabilities, where the need has been identified, in collaboration with field-based researchers or based on Bureau's interest, in the exploration of an under- researched topic or research topics with significant relevance to MCH populations.

In 2018, the Division of Research awarded 9 new research program grants. These include one RN, three FIRST grants, and five SDAR grants. The RN program, in particular, provides unique opportunities through an interdisciplinary science focus that allows researchers from across the country to examine different aspects of the SDOH by exploring the interwoven roles of families, neighborhoods, health care services, and health policies on MCH. Figure 5.1 depicts the proportion of extramural programs that target the five social determinants.

In addition, the RN program contributes to improvements in the lives of the MCH populations and advancement of the field. For example, as of July 2019, the RN program accomplished the following key outcomes:

- Total number of research participants enrolled: 3,869,956;
- Number of peer-reviewed articles published: 849;
- Number of researchers involved in the RNs: 5,136; and
- Number of trainee-investigators mentored: 208.

Policy and Planning

Background

The Office of Policy and Planning, an extension of the Office of the Associate Administrator, is a single intake point for MCHB's external stakeholders. The office coordinates across the divisions of MCHB to plan and carry out policy and grant activities.

Program Highlights

Supporting State Maternal and Child Health Policy Innovation Program (State MCH PIP)

The State MCH PIP supports innovative state-level policy initiatives that improve access to quality health care and services for the MCH population, including those that experience disparities. This program involves cooperative agreements with four national stakeholders: (1) the National Conference of State Legislatures, (2) the Association for State and Territorial Health Officials, (3) the National Academy for State Health Policy, and (4) the Association of Maternal & Child Health Programs. Stakeholders work with key state-level policymakers and health professionals to develop these policy initiatives to benefit the MCH population. Through the MCH PIP, the partners have the opportunity to infuse ongoing policy initiatives with an MCH focus and to develop new initiatives centered on MCH priority topics.

Through the MCH PIP, the awardees convene subsets of state and local policy stakeholders in learning collaboratives. There will be multiple rounds, resulting in several cohorts of any given learning collaborative with different states participating in each iteration. Providing a one-time account of 'enrolled' states will not hold true for long since the learning collaboratives last, in some cases, for less than a year.

Maternal and Child Health Outcomes According to the Social Determinants of Health

The SDOH framework illustrates the range of social and environmental factors that can influence an individual's health.[1] The Healthy People 2020 definition of SDOH considers the environments in which people are born, live, learn, work, play, worship, and age.[1] Social determinants can affect a wide range of health, functioning, and quality of life outcomes in the following key areas: (1) economic stability, (2) educational attainment, (3) social and community context, (4) health and health care, (1) economic stability, (2) educational attainment, (3) social and community context, (4) health and health care, and (5) neighborhood and built environment.1 It is important to note that while this section is structured around the key areas defined by Healthy People 2020, the social determinants are interrelated. This section utilizes data from the 2016-2017 NSCH and other national data sources to explore the status of the social determinants components relevant to the U.S. child and family populations.[3]

Economic Stability

Healthy People 2020 measures economic stability through factors such as poverty and food insecurity. Economic stability affects a person's ability to acquire education, live in a positive social and community environment, obtain health care, and reside in quality housing. In the United States, a person's health is often strongly associated with socioeconomic status, as more affluent individuals tend to be consistently physically healthier compared to their less affluent counterparts.[4]

Poverty or economic instability can affect a person's emotional and mental health. For example, people in households with incomes below $20,000 have increased risk of incident mood disorders compared to people in households with incomes above $70,000.[5] Similarly, mothers who live in lower income households are at increased risk of mental health disorders.[6] An analysis of the combined 2016-2017 NSCH found that the proportion of mothers who were reported to be in excellent/very good mental health was nearly 15 percent lower among those living in the poorest households (less than 100 percent FPL) compared to those living in wealthier households (greater than or equal to 400 percent FPL) (Figure 5.2). Studies indicate that maternal psychological distress and mental illness can negatively influence a child's emotional, cognitive, and behavior development.[7] This association presents a potential opportunity for interventions aimed at preventing negative impacts on a child's well-being when the mother is experiencing mental health challenges. In addition to the role of poverty on mental health and food security, children living in poverty are more likely to have fair or poor health; higher rates of hospital admissions; lower access to preventative care; and lower rates of high school graduation.[8]

According to the National Academy of Sciences, food security is defined as access to enough food for an active, healthy life.[9] At a minimum, this access includes the ready availability of nutritionally adequate and safe foods and an assured ability to acquire acceptable foods in socially acceptable ways.[10] Food insecurity is associated with behavior problems, disrupted social interactions, compromised school performance and attendance, poor dietary intake, reduced physical activity, altered daily activities, and poor health, in children.[11] These outcomes have also been linked with increasing risk for obesity.[12] Conversely, long-term exposure to residential environments with greater resources to support physical activity and healthy diets has been associated with a lower incidence of type 2 diabetes.[13] Figure 5.3 shows a significant relationship between poverty and weight status among children, with the highest percentage of overweight/obese children aged 10-17 living in poorer households (less than 200 percent FPL)—more than one-third were overweight or obese compared to less than one-quarter of their more affluent counterparts. Figure 5.4 shows that racial and ethnic-minority children are least likely to always be able to afford nutritious meals, most likely to eat non-nutritious meals, and most likely to sometimes not be able to afford to eat. Approximately 73.5 percent of children in non-Hispanic White households and 80.4 percent of children in non-Hispanic Asian households are more likely to always afford to eat good nutritious meals. Conversely, 55.0 percent and 59.4 percent of children in non-Hispanic Black and Hispanic households, respectively, are more likely to always afford to eat good nutritious meals.

Recent data show a close association between race/ ethnicity and income disparity and poverty.[14] The latest data from the CPS indicate that overall, 8.8 percent of non- Hispanic Whites in the United States lived below the poverty line (FPL less than 100 percent) while the same was true for 19.4 percent of Hispanics and 22.0 percent of non-Hispanic Blacks, respectively.[15] Further analysis by Child Trends showed that, in 2017, slightly less than 1 in 5 children in the United States lived in families with incomes below the federal poverty line and that there are also racial and ethnic disparities in poverty among children.[16] For example, the proportion of children living in poverty (less than 100 percent FPL) by race/ ethnicity was highest among non-Hispanic Black and Hispanic children (29 percent and 25 percent, respectively) compared with 11 percent among both non-Hispanic White and non-Hispanic Asian children.[16] Furthermore, Hispanic and non-Hispanic Black children were 2 to 3 times as likely to be living in "deep" poverty (less than 50 percent FPL), compared to their non-Hispanic White and non-Hispanic Asian counterparts (11 percent and 15 percent, respectively, compared to 5 percent).[16]

Education

Healthy People 2020 uses multiple indicators for education, including enrollment in higher education, high school graduation, language, literacy, and access to early childhood education and development. This section illustrates the associations between the educational attainment of parents and caregivers of children in the NSCH with race/ethnicity and indicators of child well- being. Across the board, there has been a substantial increase over the last decade in the proportion of children in the United States ages 6 to 18 whose parents hold a bachelor's degree or higher. Specifically, parental attainment of a bachelor's degree or higher has increased from 30 percent in 2005 to 38 percent in 2017 among fathers, and from 26 percent in 2005 to 36 percent among mothers.[17] However, gains in parental education have been uneven, culminating in racial and ethnic disparities that reflect persistent societal barriers to opportunities for different groups. Per a report from Child Trends, using CPS data, 45 percent and 46 percent of non-Hispanic White fathers and mothers, respectively, had attained a bachelor's degree or higher in 2017, only 28 and 27 percent of non-Hispanic Black fathers and mothers, respectively, and 16 percent of Hispanic mothers and fathers, have attained the same level of education.[18] CPS data also indicate that while non-Hispanic Asians were most likely to have a college education overall (31.4 percent), Hispanics were the least likely to be college educated (13 percent).[17, 19]

Greater parental/caregiver educational attainment has also been shown to be a protective factor for adverse childhood experiences (ACEs)—defined as a stressful or traumatic event, including physical or emotional abuse and neglect—and child well-being.[2] According to the 2016-2017 NSCH, 55.0 percent of children in the United States did not experience an ACE; 24.6 percent of children experienced 1 ACE; and 20.5 percent of children experienced 2 or more ACEs. The majority of children (68.2 percent) in households where at least 1 adult had attained a college degree reported no ACE. However, only 42.2 percent of children living in households where an adult completed some college or technical school did not report an ACE (Figure 5.5).

Social and Community Context

Healthy People 2020 measures this determinant through factors such as civic participation, discrimination, incarceration, and social cohesion. Social cohesion is the trusting network of relationships, shared values, and norms of residents in a neighborhood, and is an important mediator for family health, safety, and overall well-being.[20] In 1 study, higher neighborhood cohesion was associated with a 22 percent lower incidence of type 2 Diabetes, and neighborhood problems were associated with increased prevalence of type 2 Diabetes.[20] The NSCH collects information on whether or not children live in a supportive neighborhood. Supportive neighborhood data were derived from the NSCH responses to three statements: (1) people in my neighborhood help each other out; (2) we watch out for each other's children in this neighborhood; and (3) when we encounter difficulties, we know where to go for help in our community.[21] Children are considered to live in supportive neighborhoods if their parents/ caregivers reported that they "definitely agree" to at least one of these items and "somewhat agree" or "definitely agree" to the other two items. In 2016-17, over half of children living in poverty (FPL less than 100 percent) did not live in a supportive neighborhood according to this measure compared to only one-third of children living in more affluent households (FPL greater than 400 percent) (Figure 5.6). Compared to non-Hispanic White children (36.3 percent), 55.0 percent and 54.4 percent of Hispanic and non-Hispanic Black children, respectively, did not live in supportive neighborhoods (Figure 5.7). Across all racial/ethnic groups, at least 45 percent of all children lived in supportive neighborhoods. However, non-Hispanic White (63.7 percent) and non-Hispanic Asian (50.0 percent) children were more likely than other groups to reside in supportive neighborhoods.

Health and Health Care

Healthy People 2020 measures this determinant as access to comprehensive health care and primary care. According to the American Academy of Pediatrics (AAP), the medical home is an approach to providing comprehensive primary care that facilitates partnerships between patients, clinicians, medical staff, and families.[22, 23] The AAP asserts that having a medical home provides the optimal opportunity for children to obtain comprehensive care.[23] There are seven essential qualities of a medical home: accessible, family centered, continuous, comprehensive, coordinated, compassionate, and culturally effective.[23] The NSCH measures the presence of a medical home by a composite measure based on 5 components constructed from 16 survey items. These components are personal doctor or nurse; usual source for sick care; family-centered care; problems getting needed referrals; and effective care coordination when needed. To qualify as having a medical home, children's care must meet the criteria defined for adequate care on three components: personal doctor or nurse, usual source of care, and family-centered care.[21] Any child who requires referrals or care coordination must also meet criteria for those components to qualify as having a medical home.[21] Despite efforts to increase access to medical home, the care received by more than 50 percent of children of all racial/ ethnic groups in the United States did not meet the medical home criteria. For example, compared to the care received by non-Hispanic White children (43 percent), the care received by 59 percent of non-Hispanic Asian, 60 percent of non-Hispanic Black, and 63 percent of Hispanic children did not meet the medical home criteria.[21] Figure 5.8 shows that children living in poverty are the least likely to have a medical home. Lichstein and colleagues have found that race/ ethnicity and household income were significantly associated with a child having a usual source of care and a personal doctor or nurse, two important components of a medical home.[22] Additionally, parental/caregiver educational attainment has been shown to be associated with children's likelihood to have a medical home. Approximately, 59.1 percent of children from households whose parents hold a college degree or higher were reported to have a medical home compared to only 30.8 percent of children where the highest household level of education was less than high school (Figure 5.9).

Neighborhood and Built Environment

Healthy People 2020 specifies several factors as determinants of the neighborhood and built environment, including: having access to foods that support healthy eating patterns, exposure to crime and violence, environmental conditions, and the availability and affordability of quality housing. HRSA's 2019-2020 Health Equity Report focuses on housing and health inequalities. Therefore, the next section of this report explores the intersections between MCH and housing in additional detail.

Neighborhoods, the Built Environment, and Maternal and Child Health

The connection between housing quality and health outcomes cuts across different facets of health and well-being, such as poverty, homelessness, equity, discrimination, environmental health, and the criminal justice system. A Cochrane Review on housing inequalities concluded that improvement of housing may be an important mechanism for improving health.[24] Housing issues consist of not only the lack of housing but also the quality and cost of housing, housing tenure, and overcrowding.

The section below includes MCHB program initiatives that are addressing some of the housing challenges faced by the populations they served, a data analysis and literature review of housing and health inequalities, and sub-categories on well-being and chronic health conditions.

MCHB Programs Addressing Housing Inequalities and Health

Maternal and Child Environmental Health CoIIN

The purpose of CoIIN is to decrease maternal and child morbidity and mortality associated with exposure to lead. The program established multi-sector teams in 10 states, with partnerships between maternal and child health, environmental health, housing, community programs, family leaders and organizations, providers, and other programs working to address lead exposure and prevention. The U.S. Centers for Disease Control and Prevention reports that childhood lead poisoning is considered the most preventable environmental disease among young children.[25] Despite this, approximately half a million U.S. children have elevated blood lead levels. Housing, because of paint and dust, has been identified as the leading source of exposure in most states.[25] Some states are working closely with their Medicaid program and Children's Health Insurance Program to address risks within the home. MCHB's Division of Services for Children with Special Health Care Needs leads the program.

Healthy Tomorrows Partnership for Children

This program promotes the development and advancement of healthy communities through partnerships with organizations that work to change conditions in the community and environment to improve health. Healthy Tomorrows funds 40 grants across 23 states. These efforts may include a focus on housing, education, the labor workforce, socioeconomic conditions, neighborhood safety, transportation, food quality and availability, and physical fitness and recreational activities available for children and families. In addition, grantees in community practice often support the development of family-centered, culturally competent clinicians and public health professionals. MCHB's Division of Maternal and Child Health Workforce Development leads this program.

Healthy Start Program

The program funds 101 grantees to provide services and referrals to assist participants experiencing homelessness and other forms of housing instability. The program works towards improving participant circumstances by establishing trust, identifying specific needs, and providing referrals for a variety of community resources through the continual development of community partnerships. Many grantees assist participants with overcoming housing instability through contracting with local shelters and public housing authorities, assisting with the housing application completion process, providing access to transportation services, and contacting community partners for assistance with moving expenses, food, and educational and employment resources. MCHB's Division of Healthy Start and Perinatal Services leads this program.

Housing and Health Inequalities: Literature Review and Data Analysis

This section highlights significant publications and provides data charts to identify the status of housing issues connected with health outcomes in MCH populations. Research has shown that household economic and environmental factors influence overall well-being. Furthermore, low-income housing and neighborhood quality issues are related to chronic health issues in children and families. This section identifies some key aspects of housing and inequalities related to women and children.

Housing and Well-Being

Multiple factors related to poverty can impact whether families and children live in a safe neighborhood environment and consequently their overall well-being. Link and colleagues reported that as the cost of living increases in the United States, families with lower incomes are generally at an increased risk for negative impacts on their health and well-being, based on their access to quality housing.[26] Figure 5.10 shows that as a family's income increases, so does the likelihood of living in a safe neighborhood. About 55.5 percent of children living in families with a household income below 100 percent of the FPL were reported by their parents to reside in safe neighborhoods compared to 75.1 percent of children in families with household income greater than or equal to 400 percent FPL. Additionally, children living in neighborhoods with poorly kept housing were significantly more likely to have an ongoing mental health need (Figure 5.11). Dilapidated housing is associated not only with poorer mental health, but also with exposure to asthma triggers and lead, which is associated with lifelong mental health issues.[27, 28]

Unstable housing has been associated with poor health outcomes for children. In one study, one- third of parents seen in urban primary care clinics reported unstable housing, with almost 30 percent of them being behind on rent.[29] According to the study, "being behind on rent" was associated with significantly greater odds of child lifetime hospitalization, fair/poor child and parent health, positive maternal depression screen, and multiple hardships, which include food insecurity and forgoing medical care.[29] The study recommended improving referral to housing services when parents report being behind on rent, adding that urban primary care clinics were in a unique position to provide adequate intervention if referral services are provided at the appropriate time.

Housing and Chronic Health Conditions

Poor health has been associated with poor housing environments. An example of this association is the connection between environmental pollutants in the home and childhood asthma. According to Hughes and colleagues, poor quality housing is strongly associated with asthma morbidity. Their study found that the relationship between poor housing quality and asthma remained significant after adjusting for household exposures, such as cigarette smoke, mold, mice, and cockroaches. As a result, they suggested that policy makers target improving housing quality as a means of potentially reducing asthma disparities.[30]

Residences in poor and urban areas were linked with increased childhood asthma morbidity regardless of race/ethnicity, age, and gender.[31] In addition, high exposure to household pests, second-hand tobacco smoke, as well as poverty, poor quality housing, access to poor health care quality contribute to morbidity.[31] Childhood asthma is particularly prevalent in low-income living environments, in which children have increased exposure to dust mites and other insects, as well as mold and mouse exposure. Although medication therapy is the recommended intervention for asthma, costly medical interventions are usually unaffordable to low-income households.[30] This further illustrates the impact of social determinant number 4, health and health care, on population health.

Implications for Program and Policy

MCHB has a long history of addressing health disparities in its goals and funding priorities since its inception as the Children's Bureau in 1912. Many MCHB programs work towards reducing disparities and improving diversity in their target populations. Data presented in this chapter suggest that reducing disparities in MCH populations requires an intentional effort to collaborate and integrate with programmatic initiatives outside of the Bureau, such as those addressing housing inequities.

MCHB has the opportunity and potential to improve housing inequities by addressing the needs of families we serve through our programs. Program data can be reviewed for need, and opportunities for intervention. Data from programs and surveys can be used to identify evidence- based methods to achieve intervention goals. Interagency partnerships with experts across the government, as well as external experts, can improve our understanding of challenges families face, as well as challenges federal programs face to support families.

Conclusion

Disparities in health outcomes, ethnicity, race, and socio-economic factors and overall well- being among MCH populations persist. Children living in poverty and poor housing are more likely to have a chronic health condition such as asthma, less likely to live in safe neighborhoods, and less likely to have an adult in the household with a college education. Children of parents with lower educational attainment are more likely to live in poverty, less likely to have a medical home, and more likely to have an adverse childhood experience. The continued gaps in health outcomes among racial and ethnic-minority children living at the lowest poverty levels are worrisome. The introduction of new programs such as the MIECHV, the transformation of the Healthy Start program, and the renewed attention to addressing disparities in health outcomes such as maternal mortality provide the opportunity to improve health outcomes across the country's most vulnerable populations.

Summary

The MCHB seeks to improve the health and well-being of America's mothers, children and families, and strives for an America where all mothers, children, and families are thriving. Addressing health disparities by improving health equity and addressing the SDOH are central to the Bureau's work. To do this, MCHB relies upon current evidence-based and evidence-informed strategies to design and implement programs, and continually monitor their effectiveness and impact.

Several MCHB programs are working to ensure health equity. For example, the Title V program provides access to quality care to pregnant women and children. The Home Visiting program gives pregnant women and families, particularly those considered at-risk, necessary resources and skills to raise children who are physically, socially, and emotionally healthy and ready to learn. The Healthy Start program supports services and referrals to families experiencing homelessness or housing instability. The Workforce Development program trains the next generation of maternal and child health workers and ensures that an increasing number of trainees are from underrepresented racial and ethnic-minority groups. The Family-to-Family Health Information Centers assist and/or train families and health professionals serving an increasing number of families from diverse ethnic populations. The Epidemiology and Research program provides national leadership through the advancement of scientific research through the National Survey of Children's Health, which provides data on multiple, intersecting aspects of children's lives—including physical and mental health, access to quality health care, and the child's family, neighborhood, school, and social context. The Policy and Planning program supports State Maternal and Child Health Policy Innovations, which develop state-level policy initiatives that improve access and services for the MCH population.

MCHB is poised to continue its efforts to address health equity and ensure that the benefits of its programs and services extend to all MCH populations across gender, race/ethnicity, socioeconomic status, and place of residence.

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GENERAL NOTES FOR ALL CHAPTER 5 GRAPHS

Note that all charts:

- All differences are statistically significant;
- Percentages and population estimates are weighted to represent the child population in the United States; and
- Have been generated via the childhealthdata.org interactive data query.[32]

FIGURE 5.1: Division of Research Investments According to the SDOH Topic Areas

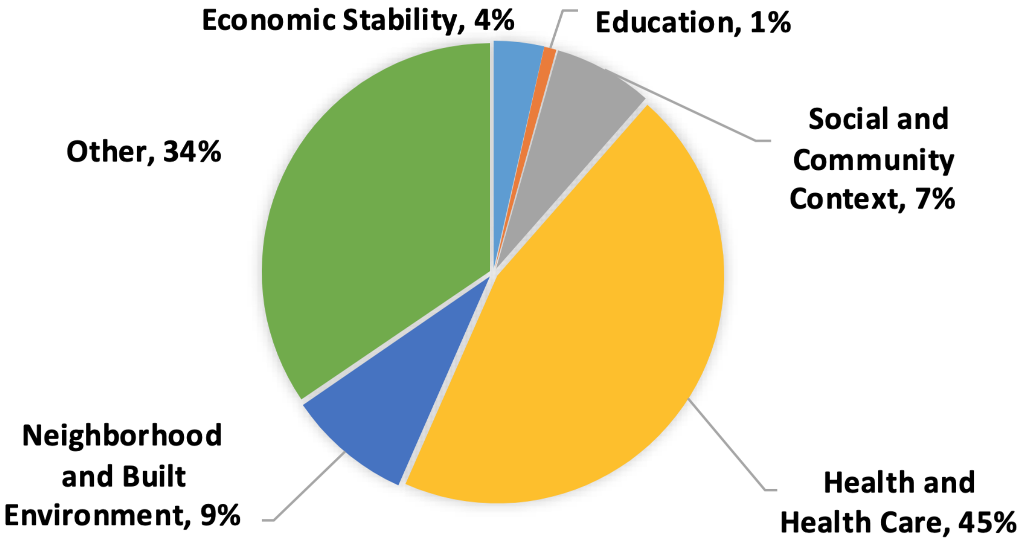


FIGURE 5.2: Mothers' Mental and Emotional Health Status by Household Income (%), 2016-2017 National Survey of Children's Health

FIGURE 5.3: Weight Status of U.S. Children Aged 10-17 (%) by Household Federal Poverty Level, 2016-2017 National Survey of Children's Health

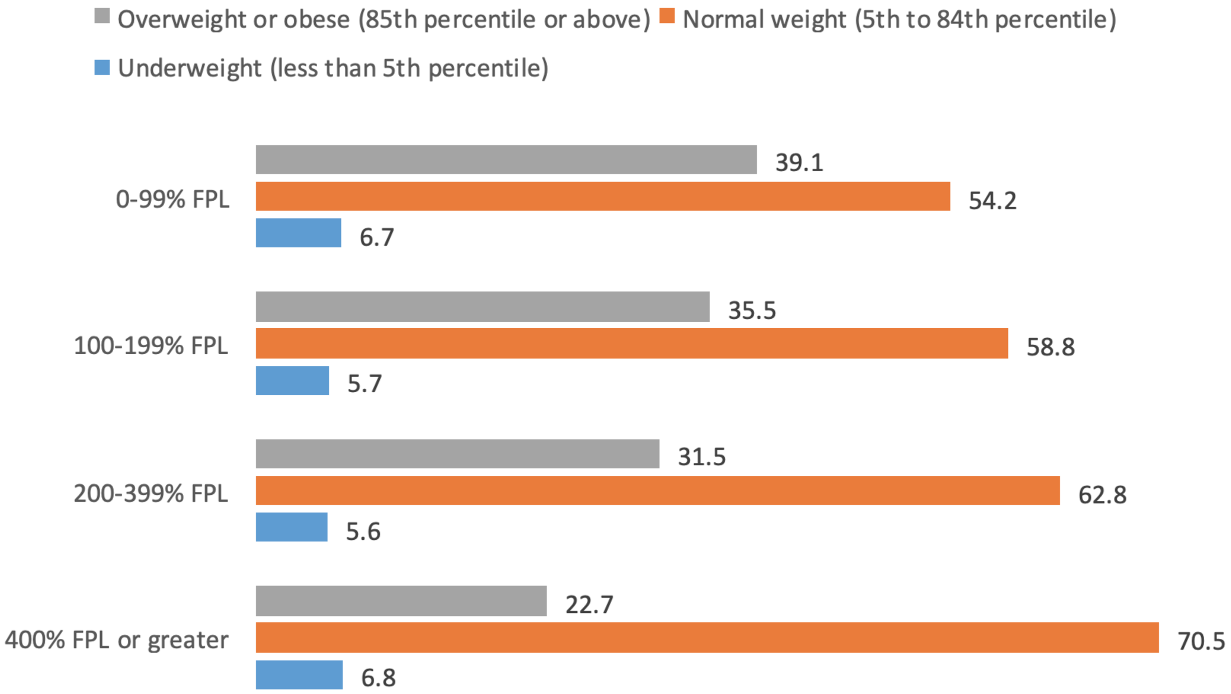
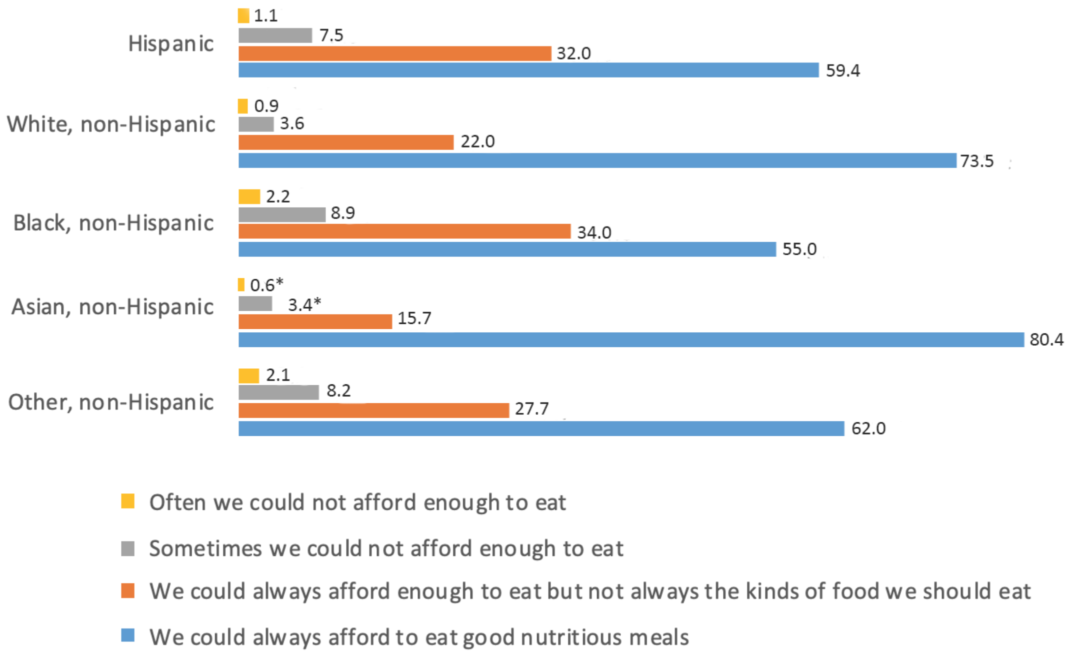


FIGURE 5.4: Household Food Insecurity by Children's Race/Ethnicity (%), 2016-2017 National Survey of Children's Health



Note: *Estimates are considered unreliable and should be used with caution as estimate has a 95% confidence interval width exceeding 1.2 times the estimate.

FIGURE 5.5: Adverse Childhood Experiences by Parental Educational Attainment (%), 2016-2017 National Survey of Children's Health

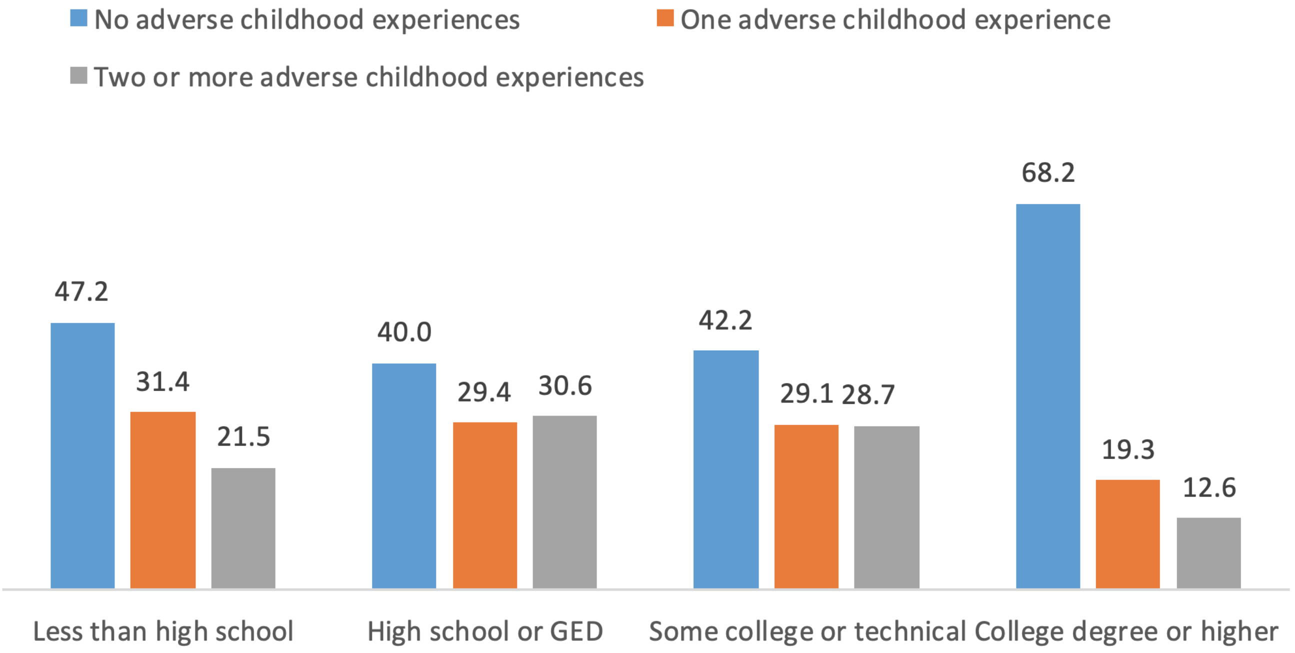


FIGURE 5.6: Children's Residence in Supportive Neighborhoods by Household Federal Poverty Level (%), 2016-2017 National Survey of Children's Health

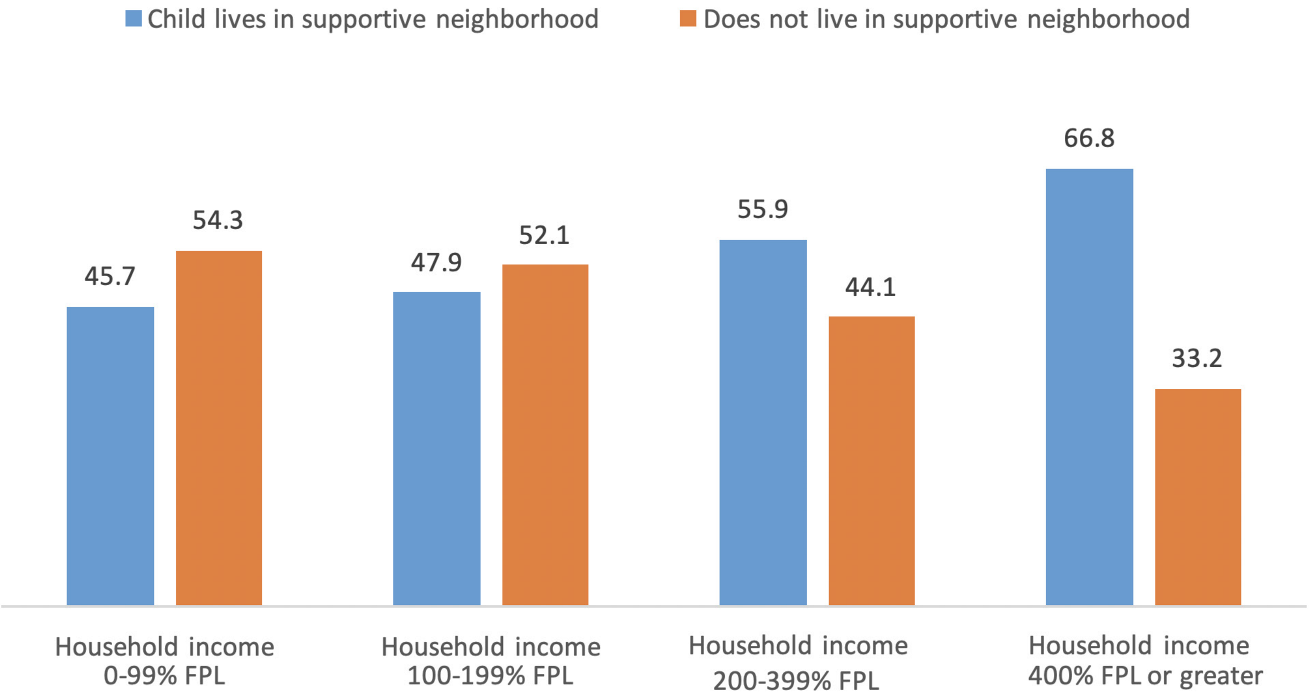


FIGURE 5.7: Children's Residence in Supportive Neighborhoods by Race/Ethnicity (%), 2016- 2017 National Survey of Children's Health

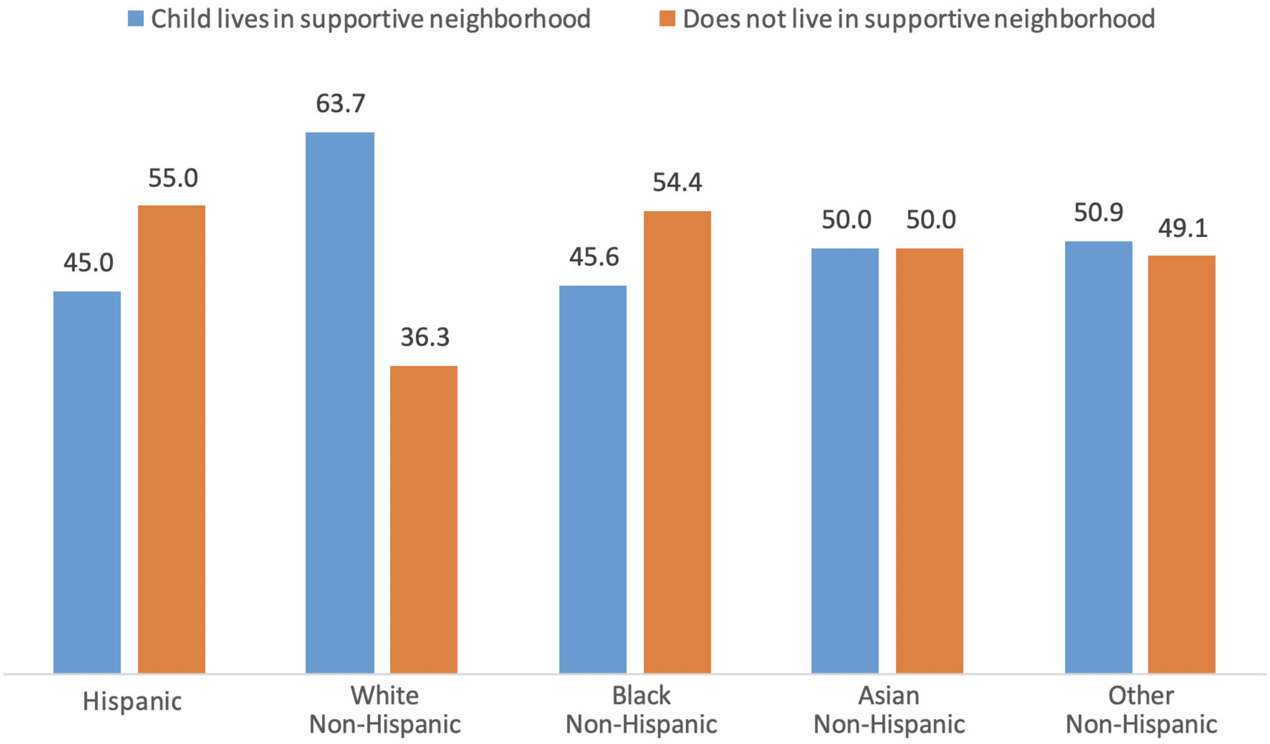


FIGURE 5.8: Children's Access to a Medical Home by Household Federal Poverty Level (%), 2016-2017 National Survey of Children's Health

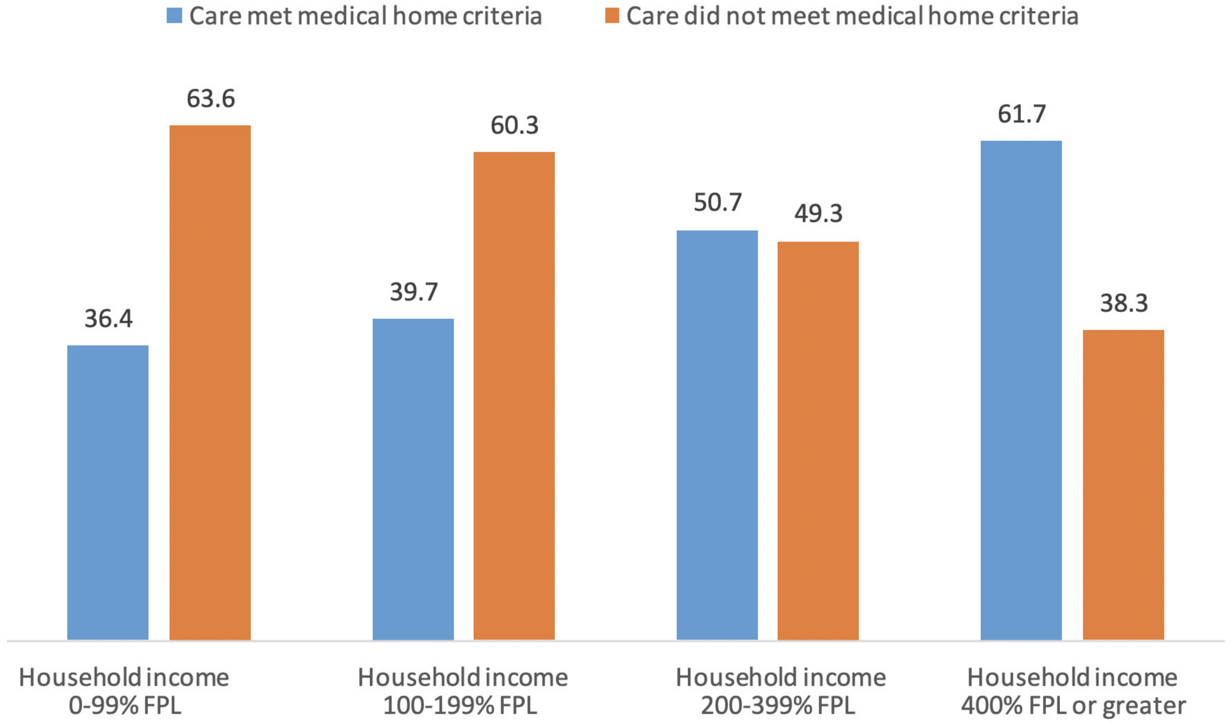


FIGURE 5.9: Children's Access to a Medical Home by Parental Educational Attainment (%), 2016-2017 National Survey of Children's Health

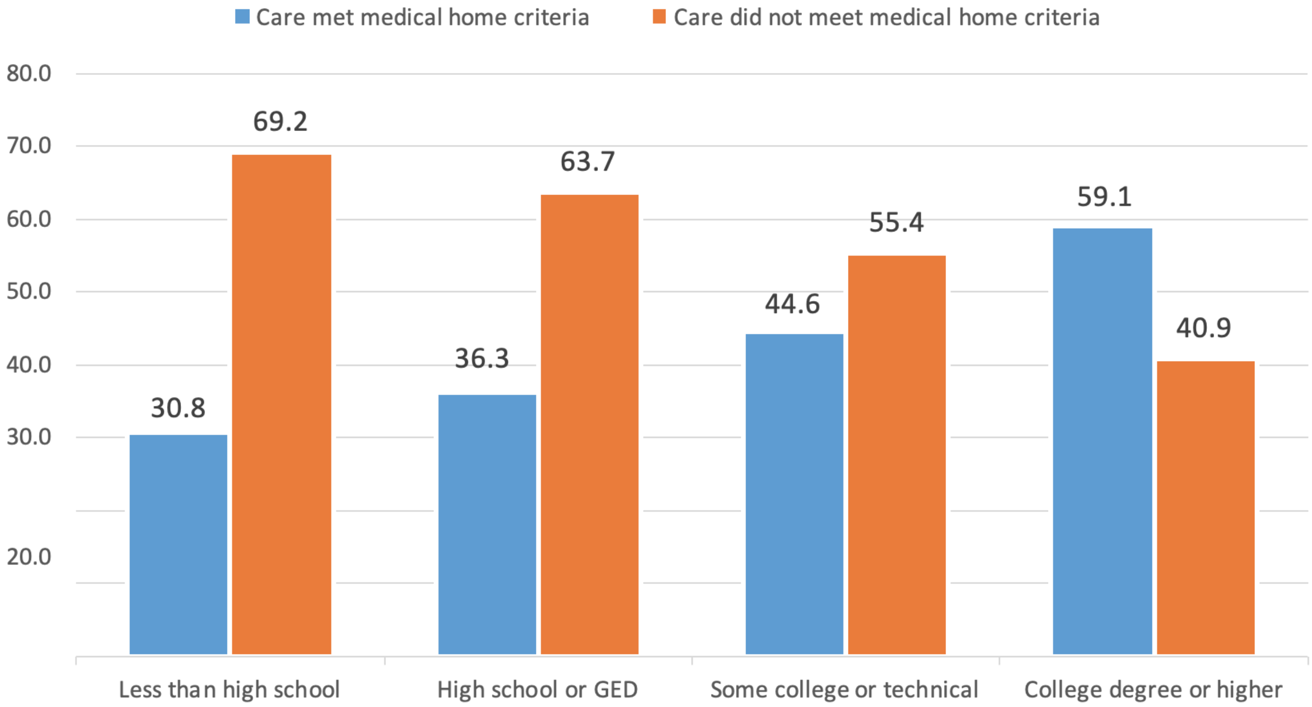


FIGURE 5.10: Children's Residence in a Safe Neighborhood by Household Federal Poverty Level (%), 2016-2017 National Survey of Children's Health

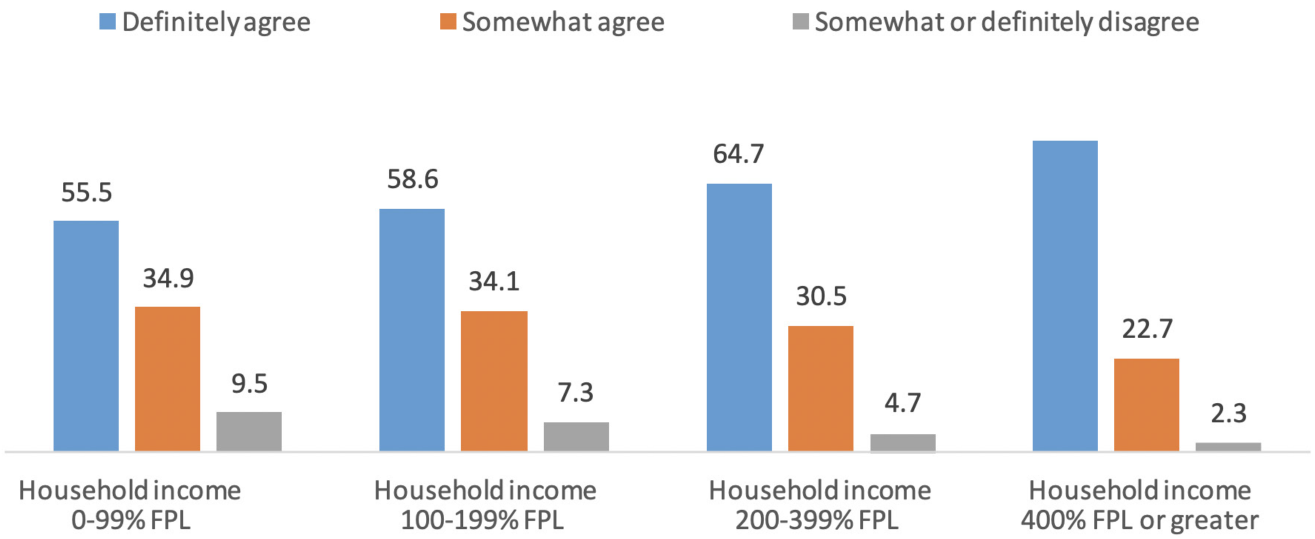
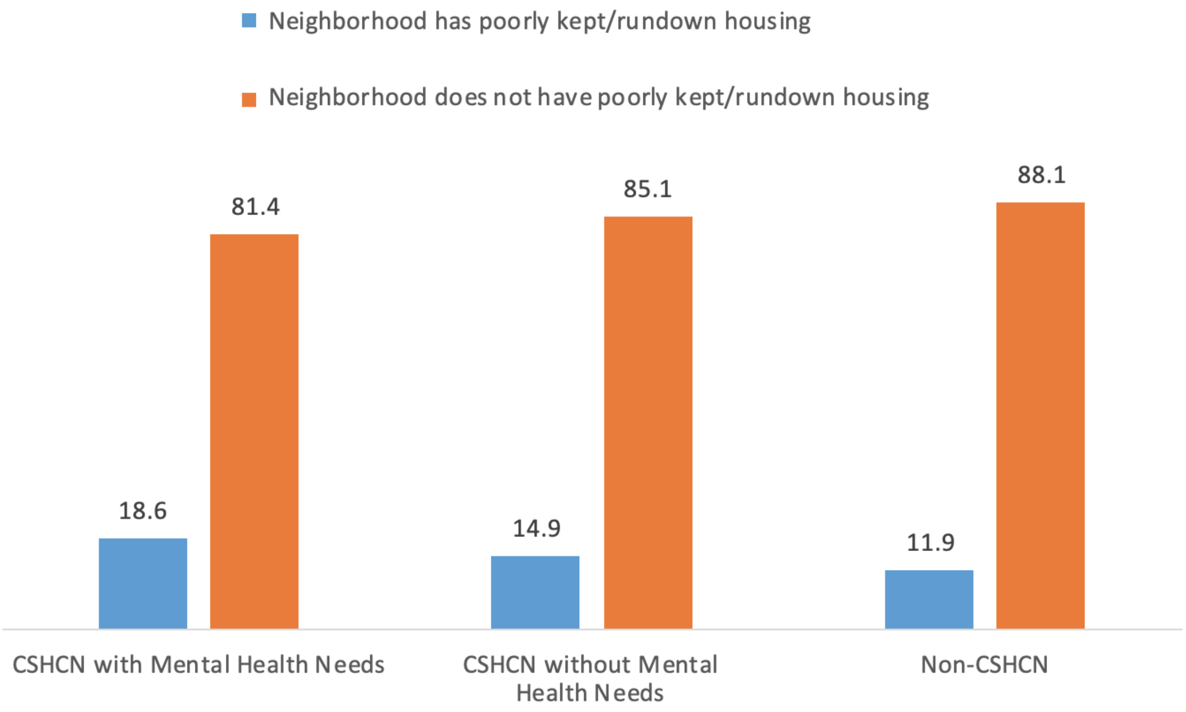


FIGURE 5.11: Mental Health Status of Children with Special Health Care Needs by Neighborhood Characteristics (%), 2016-2017 National Survey of Children's Health



Chapter 6. Primary Health Care Access and Quality

The Bureau of Primary Health Care's (BPHC) mission is to improve the health of the nation's underserved communities and vulnerable populations by ensuring access to comprehensive, culturally competent, quality primary health care services.

BPHC oversees the Health Center Program, a national network of health centers that deliver care to the nation's most vulnerable individuals and families, including people experiencing homelessness, agricultural workers, public housing residents, and America's veterans (Figure 6.1). For more than 50 years, health centers have provided essential primary care and enabling services for America's most vulnerable populations regardless of a patient's ability to pay. Health centers advance a model of coordinated, comprehensive, and patient-centered care, and coordinate a wide range of medical, dental, behavioral, and patient services. Today, nearly 1,400 health centers operate approximately 12,000 service delivery sites that provide care in every U.S. state, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and the Pacific Basin.

Health Center Program Fundamentals

HRSA supported health centers:

- Are located in or serve a high-need community;
- Are governed by a community board composed of a majority (51 percent or more) of health center patients who represent the population served;
- Provide comprehensive primary health care services, as well as supportive services (education, translation, transportation, etc.) that promote access to health care;
- Provide services available to all patients with fees adjusted based on ability to pay; and
- Meet other performance and accountability requirements regarding administrative, clinical, and financial operations.

Increasing Access to Care

In 2017, more than 27 million people, approximately 1 in 12 nationwide, relied on a HRSA funded health center for accessible primary health care, including:

- One in three individuals living in poverty.[1]
- One in 9 children nationwide and nearly 4 in 10 children living in poverty.
- Nearly 1.4 million patients experiencing homelessness and approximately 3.5 million people living in or near public housing.
- More than 8.9 million patients in rural health centers, across nearly 4,500 sites.
- More than 355,000 veterans, a number that is increasing as more health centers participate in the Veterans Access, Choice, and Accountability Act.[2]

Improving Health Outcomes

Health centers focus on integrated patient care across a full range of services - including medical, dental health, vision, mental health, substance use disorder, and pharmacy services. Health centers also provide enabling services such as case management, transportation, and health education, which are crucial levers for improving access to care, and in turn, improving health outcomes.

Health centers improve health outcomes by emphasizing care management of patients with multiple health care needs and quality improvement practices, including use of health information technology to facilitate care delivery and population health management. In fact, approximately 67 percent of health center patients have their diabetes under control, exceeding the national average of 60 percent,[3] and 63 percent of health center patients have their blood pressure under control, exceeding the national average of 57 percent.[4]

Bureau of Primary Health Care Data

There are two primary data collection modalities for BPHC: (1) the Uniform Data System and (2) the Health Center Patient Survey.

Overview of the Uniform Data System

The Uniform Data System (UDS) is a standardized annual data set that provides consistent information about recipients of Health Center Program operational grants. The data are collected and reviewed annually to ensure compliance with legislative and regulatory requirements, improve health center performance and operations, and report overall program accomplishments.

The UDS includes a core set of information, including patient demographics, services provided, clinical processes and outcomes, patient's use of services, costs, and revenues appropriate for documenting the operation and performance of health centers. The UDS also collects data on a number of clinical quality measures (CQMs) and health outcomes that align with national quality efforts. Annually, BPHC assesses and, as appropriate, revises the type of information collected within the UDS in order to align with the evolving health care system and new federal policies.

All entities receiving operational grants authorized under Section 330 of the Public Health Service Act are required to report UDS data. These recipients include awardees of the Community Health Center, Migrant Health Center, Health Care for the Homeless, and Public Housing Primary Care grants. Health centers designated as "look-alike" entities (entities that meet all program requirements applicable to HRSA-funded health centers but do not receive federal operating grants) also submit a UDS report.

Health centers use UDS data to monitor programmatic operations and track service use, document characteristics of their patient populations and services delivered, identify opportunities for efficiencies, and allocate resources, such as staff and services across delivery sites Public health agencies and policymakers also use health center data to monitor trends in health service utilization and identify potential needs of medically vulnerable populations, as well as to better understand the sociodemographic and health characteristics of these individuals. The UDS also proves to be a rich source of data for health service researchers studying the impact of Health Center Program on key policy issues. Specific details on what is reported through the UDS is available through HRSA's webpage on Uniform Data System Resources.[5]

Since UDS data are aggregated at the health center level and reported to BPHC, the data are complemented with patient-level data through the Health Center Patient Survey (HCPS).

Overview of the Health Center Patient Survey

The HCPS collects comprehensive patient-level data among Health Center Program grant recipients.[6] The HCPS provides data essential to examining access to primary and preventive health care, as well as patient experience of those services. The survey explores:

- How well health centers meet the health care needs of the medically underserved; and
- How health center patients perceive the quality of their care.

The HCPS is cross-sectional by design and offers a robust snapshot of health center patients, including:

- Sociodemographic characteristics
- Health insurance status
- Employment status
- Living arrangements (homelessness)
- Health conditions
- Health behaviors

- Access to and utilization of health care services, including medical, dental, mental health, and substance use disorder services
- Cancer screening and early detection
- Satisfaction with health care services

Conducted about every 5 years since the mid- 1990s, the 2014 HCPS survey results came from in-person, one-on-one interviews with 7,002 patients, and are nationally representative of the Health Center Program patient population. While other studies examine the process and outcomes of care under the umbrella of the Health Center Program, the HCPS has its specific focus on comprehensive patient-level data. The Public Use File for the 2014 HCPS is currently available for external analyses and research and BPHC is in the process of conducing the 2019 HCPS with findings expected to be available by 2021.

A summary of the national performance for the Health Center Program on the UDS CQMs from 2015 to 2017 is displayed in Table 6.1 below. In general, the performance on the CQMs has improved over time. These improvements are, in part, an outcome of BPHC's investments supporting health centers' adoption of:

- Office of the National Coordinator for Health Information Technology (ONC) certified electronic health record (EHR) systems;
- The Patient-Centered Medical Home (PCMH) model of care;[7, 8]
- Enhanced accountability of care delivery through data transparency efforts; and
- Quality improvement activities through the HRSA Quality Improvement Awards (QIA).

Advances in health center performance have been observed on several CQMs. The CQMs that improved from 2016 to 2017 include cervical cancer screening, weight assessment for children, adolescents, and adults, tobacco screening and intervention, colorectal cancer screening, depression screening, dental sealants, lipid therapy, aspirin therapy, blood pressure control, and HIV linkage to care.

The observed performance of these CQMs is promising due to the fact that they were achieved while the proportion of health centers that leveraged their EHRs to report on the entirety of their patients for their CQMs, vis-à-vis patient chart sampling, also grew. This is noteworthy because chart sampling can introduce bias to the reported CQM measures. Reporting on the universe of patients provides a better indication of health center performance and progress.

The progress in CQMs has largely been with process measures. Progress on the health outcome CQMs has been less pronounced. The proportion of patients with hypertension with their blood pressure under control and diabetes patients with controlled HbA1c has remained relatively stable over the past 3 years. Health center patients are outperforming the national average on diabetes and hypertension control; however, making additional advances in these areas has remained difficult.

Exploring Rural and Urban Differences

The rural and urban classification of health centers is determined by health centers (i.e., self-identified) during their grant application process. Many health centers have delivery sites that are nested both in rural and urban geographies.

Table 6.2 compares performance on the 2017 UDS CQMs between rural and urban health centers. Of the 1,373 Health Center Program awardees in 2017, 608 were identified as rural. Clinical quality was comparable between rural and urban health centers. There was almost an even split on the number of CQMs on which rural health centers performed better than their urban counterparts (4 out of 16). These measures included early access to prenatal care, low birth weight, tobacco use screening and cessation, CRC screening, dental sealants, aspirin therapy for patients with ischemic vascular disease, and blood pressure control for patients with hypertension. In contrast, there were nine CQMs on which rural health centers did not do as well as urban health centers. Rural health centers' poorest performance was on the clinical measure for weight assessment and counseling for children and adolescents.

Health Outcomes by Race and Ethnicity

Tables 6.3 and 6.4 show racial/ethnic differences for 3 UDS 2017 CQMs: low birth weight, blood pressure control for patients with hypertension, and uncontrolled diabetes. Non-Hispanic African Americans have the highest rate of low birth weight (11.68 percent), followed by Native Hawaiians (9.51 percent), American Indian/Alaska Natives (7.92 percent), Asians (7.62 percent), and other Pacific Islanders (7.56 percent) respectively.

As seen in Table 6.3 (Section B), most racial/ethnic groups have about 60 percent to 67 percent of patients with controlled blood pressure; Native Hawaiians have the lowest rate of controlled blood pressure (59.27 percent) and Asians exhibit the highest rate (67.66 percent).

Table 6.4 outlines racial/ethnic differences in diabetes outcomes and highlights how diabetes control seems to be a challenge for many racial/ethnic groups. Among all racial/ethnic groups, 32.95 percent of diabetic patients have uncontrolled diabetes. Other Pacific Islanders and Native Hawaiians have the highest rates of uncontrolled diabetes, 43.24 percent and 38.65 percent, respectively. In contrast, Asians have the lowest rate of uncontrolled diabetes, 21.98 percent, followed by non-Hispanic Whites (30.27 percent), Hispanic African Americans (32.36 percent), and More than 1 race (34.32 percent).

Health disparities reported through individual patient interviews conducted by the 2014 HCPS can be found in the 2017 Health Equity Report.[9] The 2017 Report included analyses on access and quality of care in regards to health services including medical, dental, and mental health care.

Homeless and Public Housing Patients

In the design of the HCPS, health centers were stratified by their funding streams (Community Health Center (CHC), Migrant Health Care (MHC), Health Care for the Homeless (HCH) and Public Housing Primary Care (PHPC). In these analyses, we compared health center populations that were singularly funded by CHC, HCH and PHPC mechanisms. The purpose of the following discussion was to determine if individuals who sought care at these different health center types were systematically different and/or reported varying levels patient experience and access to care.

Figure 6.2 highlights the geographic pockets for counties at-risk for homelessness and how health centers serve as a resource that can be utilized to bring the needs of homeless patients under one roof. Data from the ACS 5-year (2013-2017) Public Use Microdata Sample (PUMS) file and the Missouri Census Data Center were used to crosswalk Public Use Microdata Areas (PUMAs) to counties to provide contextual data on where health centers are geographically located compared to states and counties with a propensity for homelessness. Risk for homelessness in this map was defined as households that meet the following criteria: (1) total household income that falls below poverty threshold, and (2) paying 50 percent or more of total household income on rent.

In 2017, 106 health centers received funding under section 330(i) of the PHPC Act to increase access to care and improve health outcomes for individuals and families living in public housing or its vicinity. Additionally, 299 health centers were funded under section 330(h) of the Public Health Service Act (HCH Program). As a whole, the Health Center Program in 2017 served almost 3.5 million patients who lived in or near public housing and 1.4 million homeless patients.

Health centers with PHPC funding have the capacity to address the emerging health care needs of individuals and families living in or near public housing. For example, some health centers have developed comprehensive substance use disorder programs that integrate primary care and behavioral health in response to the opioid epidemic. Health centers, in collaboration with the public housing agencies, are also well-positioned to provide the treatment and prevention services needed among public housing residents for smoking cessation as well as nutrition education and physical activity programs to combat childhood obesity.

Health centers (and other safety net providers) are challenged to meet the unique health care needs of public housing residents, often times without the benefit of a centralized location to deploy services and provide outreach. For those residents still living in traditional housing projects, the availability of resources, like primary care, education, and occupational training, remains scarce. Roughly, 70 percent of patients who sought care at PHPC health centers reported not being in the labor force or were unemployed (Table 6.5).

In Table 6.5, the age distribution of CHC and PHPC patients were similar with approximately one-third of patients under the age of 18 (31.03 percent and 30.03 percent respectively). Nearly two-thirds of patients were between the ages of 18 and 64 in CHC (61.1 percent) and PHPC (63.6 percent) and about 5 to 7 percent were over the age of 65. However, in HCH patients, almost all (94.8 percent) patients were between the ages of 18 and 64 with 4 percent being under the age of 18 years old. Both CHC and PHPC patients were slightly more likely to be female (58.71 percent and 60.14 percent respectively) than HCH patients (45.97 percent).

Across racial/ethnic groups in CHC patients, non-Hispanic Whites were the largest population group (43.22 percent) followed by Hispanic/Latino patients (30.69 percent), non-Hispanic African Americans (19.52 percent), and Asians (3.70 percent). American Indian/Alaskan Natives (1.17 percent) and Native Hawaiian/Other Pacific Islanders (0.50 percent) each made up 1 percent or less in CHC patients. Within HCH patients, White non-Hispanic patients still remained the largest race/ethnic category (43.15 percent) while African American non-Hispanic patients were the second largest group (29.24 percent) followed by Hispanic/Latino patients (23.72 percent) and American Indian/Alaskan Natives (1.82 percent). Hispanic patients and African American non-Hispanic patients were the largest recipients of care at PHPC health centers, 34.85 percent and 34.67 percent respectively with a significantly smaller proportion of non-Hispanic Whites (3.60 percent). PHPC patients were also more likely to be American Indian/Alaskan Native (4.95 percent) when compared to their CHC (1.17 percent) and HCH (1.82 percent) counterparts.

The majority of PHPC patients had less than a high school education (55.85 percent). A larger proportion of homeless patients (33.99 percent) compared to PHPC (19.80 percent) and CHC (22.16 percent) reported a high school education. Many Health Center Program patients experience poverty with about 84.25 percent of HCH patients reporting being less at or below 100 percent of FPL. We found that about 67.24 percent of patients reported being ≤100 percent FPL, with 55.59 percent of CHC patients reporting this level of poverty. Employment status is inextricably linked to poverty and large proportions of patients in health centers report not being in the labor force. The majority of PHPC patients (54.48 percent) are not in the labor force, with similar reporting in HCH patients (47.75 percent) and CHC patients (47.23 percent). Homeless patients reported the highest prevalence of unemployment (34.09 percent) amongst the subpopulations. About 16.10 percent of PHPC patients were unemployed, while 15.49 percent of CHC patients were unemployed.

Medicaid was the highest reported form of health of insurance across the three patient subpopulations. This is to be expected considering the majority of patients report extreme poverty. 57.58 percent of patients at health centers serving the homeless reported having Medicaid coverage, followed by CHC patients (54.09 percent) and PHPC patients (50.04 percent). HCH patients also reported the highest proportion of uninsured status (28.78 percent) followed by CHC patients (21.38 percent) and PHPC patients (18.79 percent).

Homeless and publically housed patients were predominantly in urban areas. About 79.34 percent of PHPC patients and 65.28 percent of homeless patients received care in health centers in urban areas. The large majority of homeless patients were English only speakers (80.88 percent). Conversely, a relatively small proportion of homeless patients were not English speakers (6.87 percent) compared to CHC patients (17.35 percent) and PHPC patients (18.81 percent). This could have implication for the investment for enabling services (language translation, patient navigation) for health centers that serve patients who serve PHPC patients. Health centers serving public housing patients also have the highest prevalence of bilingual patients (21.59 percent).

Table 6.6 provides comparisons of health characteristics between patients receiving care at CHCs, HCHs, and PHPCs. Patients from HCHs were significantly more likely to report being in fair or poor health (49.50 percent) compared to CHC (31.60 percent) and PHPC (32.11 percent) patients. Cardiovascular disease was slightly more prevalent in HCH patients (11.76 percent) compared to CHC (8.26 percent) and PHPC (6.48 percent) patients. While the percentage of patients reporting diabetes were similar across CHC (15.77 percent), HCH (12.75 percent), and PHPC (12.51 percent) patients, hypertension was significantly higher among HCH patients (43.39 percent) compared to CHC patients (30.23 percent) and PHPC patients (30.01 percent). Mirroring existing literature, HCH patients reported significantly more behavioral health issues including mental health and substance use disorders. Significantly more HCH patients (28.01 percent) reported serious mental illness with a score of 13 or higher on the Kessler K6 Psychological Distress Scale when compared to CHC (14.00 percent) and PHPC patients (16.04 percent). The analysis for substance use disorders in HCH patients included smoking, alcohol, and illicit drugs, all of which were significantly higher in HCH patients. Tobacco use (current smokers) in HCH patients at 58.88 percent was more than double that of CHC patients at 25.54 percent and PHPC patients at 22.11 percent. More HCH patients (24.85 percent) expressed a strong desire for alcohol at least once or twice in the past 3 months compared to 16.15 percent in PHPC and 16.91 percent in CHC patients. Illicit drug use was defined as cannabis, cocaine, amphetamines, inhalants, sedatives or sleeping pills, hallucinogens, and opioids and was more than doubled in homeless patients (70.96 percent) when compared to 32.85 percent in CHC patients and 33.41 percent in PHPC patients. The complexity of homeless and public housing patients underline the importance of providing access to high-quality care as outlined in Table 6.7.

Complications in controlling conditions are often associated with issues of receiving care. Table 6.7 shows the disparities in access to high quality medical care, mental health care, and dental care among homeless or PHPC patients. A meta-analysis of the literature states homeless housing patients are significantly more likely to experience barriers to accessing care than non-homeless patients.[10] Patients experiencing homelessness are three times more likely to report not having a usual source of care (7.87 percent) than CHC patients (2.21 percent). Differences are statistically significant. Homeless patients are twice as likely to be unable to get necessary medical care (24.50 percent) as CHC patients (11.77 percent) and PHPC patients (12.87 percent). CHC patients are less likely to have a delay in receiving medical care (15.31 percent) than homeless patients (23.10 percent). Inability to receive medical care and delays in receiving medical care are statistically significant across funding streams. Both PHPC (34.19 percent) and HCH patients (37.01 percent) are more likely to be unable to receive dental care than CHC patients (27.79 percent). CHC patients are also less likely to have a delay in receiving dental care (27.48 percent) than HCH patients (34.11 percent) and PHPC patients (32.02 percent). HCH patients (19.79 percent) are more likely to be unable to receive mental health care than CHC patients (13.54 percent). For mental health care, CHC patients are also less likely to have to delay care (16.17 percent) than HCH patients (27.90 percent). Access to mental health care varies significantly depending on funding stream. Homeless patients served by the Health Center Program have higher barriers to care for primary care, mental health, and dental health than patients with more housing stability. Given the significant barriers faced by HCH patients, the HCPS provides patient perspectives on the quality of care as seen in Table 6.8.

To better understand patient experience with care and services provided by HRSA-supported health centers, the HCPS included a series of nationally standardized questions aligned with the Agency for Healthcare Research and Quality's (AHRQ) Consumer Assessment of Healthcare Providers and Systems (CAHPS) program (https://www.ahrq.gov/cahps/index.html). These questions cover constructs such as health center staff responsiveness to patients (e.g., getting timely appointments, care, and information), health center provider communication with patients, and overall patient satisfaction with care receipt. Table 6.8 summarizes patient responses to these experience questions, and compares the responses across patients surveyed at CHC, HCH, and PHPC delivery sites.

Responsiveness

Patients largely got a prompt appointment for needed care regardless for the type of health center. More than 80 percent of patients at PHPC health centers "Usually/Always" got an appointment "right away," followed by CHC (78.14 percent) and HCH (74.12 percent) health centers, though these differences were not statistically significant. With regards to check-up or routine care, 85.41 percent of CHC, 83.98 percent of HCH, and 81.42 percent of PHPC patients "Usually/Always" got an appointment as soon as they needed them. There was some variability when it came to telecommunication turnaround time, receiving visit reminders and time it took to see a provider. Eighty-two percent of patients served at PHPC health center sites "Usually/ Always" got an answer to a medical question on the same day they called the health center during office hours, followed by 80.49 percent of CHC and 70.4 percent of HCH patients. These variations were statistically significant. Additionally, 70.53 percent of CHC patients received an answer to a medical question when they phoned the health center after office hours, but sample of HCH and PHPC patients were not large enough to determine significance on a statistical level. About 62.97 percent of HCH patients "Usually/Always" were seen by a provider within 15 minutes of their appointment time, followed by 52.88 percent of PHPC and 56.48 percent of CHC patients. Finally, there were statistically significant differences for patients who reported receiving visit reminders, with 73.34 percent of CHC patients, followed by 71.88 percent of PHPC and 60.00 percent of HCH patients.

Communication

There were several questions in the HCPS that gauged different dimensions of provider-patient communication. Results suggest some level of uniformity across patient groups when it came to perceptions that health center providers listened carefully to them. Nine out of 10 patients across the CHC, HCH and PHPC health centers reported their providers were careful listeners. There was statistically significant variability in how these patients perceived how providers communicated information to them. For instance, 93.8 percent of CHC patients, 90.6 percent of HCH patients, and 88.5 percent of PHPC patients felt that their providers gave information to them that was easy to understand "Usually/Always." Patients from CHC, HCH, and PHPC health centers largely felt their providers showed respect for what they had to say, 95.0 percent, 92.7 percent, and 92.3 percent, respectively; though these were statistically different. Less patients felt like their providers knew important information about them, with 87.6 percent of CHC and 88.1 percent of PHPC patients citing "Usually/Always" followed by 82.0 percent of HCH patients. This difference was also statistically noteworthy. Although 88.6 percent to 91.1 percent of patients across CHC, HCH, and PHPC sites felt their providers spent enough time with them, about 80.9 percent to 81.6 percent felt that someone from the health center would follow-up to with them regarding test results "Usually/Always." The vast majority of patients, regardless of the type of health center, felt that clerk and receptionist staff treated them courteously and respectfully. When it came to communication about medication, patients across all types of health centers were satisfied. Ninety-three to 99 percent of patients were satisfied in how medication was explained to them, as well as how answers to their medication questions were provided.

Satisfaction

Overall, health center patients report being satisfied with the care and services they received. When asked to rate their provider on a scale from 0-10, where 10 is the "best," 9 out of 10 patients provided ratings that were 7 or higher. There were statistical differences across patients from the CHC, HCH, and PHPC sites. Furthermore, about 84.8 percent of CHC patients, 81.9 percent of HCH, and82.4 percent of PHPC patients would "definitely" recommend their provider to family and friends.

Summary

In summary, variations in access to health care services, health care quality, patient experience, and health outcomes across geographic settings and race/ethnicities illustrate the importance of disaggregating these data.[11] When analyses tease apart these groupings of patients, meaningful differences may surface. Understanding these differences further supports BPHC's mission to improve the health of the nation's underserved communities and vulnerable populations by assuring access to comprehensive, culturally competent, quality, primary health care services.

Health centers also play a critical role for patients experiencing housing instability. Clinically, these patients are more likely to report less favorable health status. HCH and PHPC health centers are critical in providing access to medical, dental, and behavioral health care as well as enabling services that provide support in finding stable housing, applying for insurance, and transportation services. Despite the challenges faced by homeless and public housing patients, the reported experience of care points to the success of the Health Center Program in delivering high quality, culturally competent, comprehensive care.

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FIGURE 6.1: Geographic Location of Health Centers, Look-alikes and Service Delivery Site, 2018

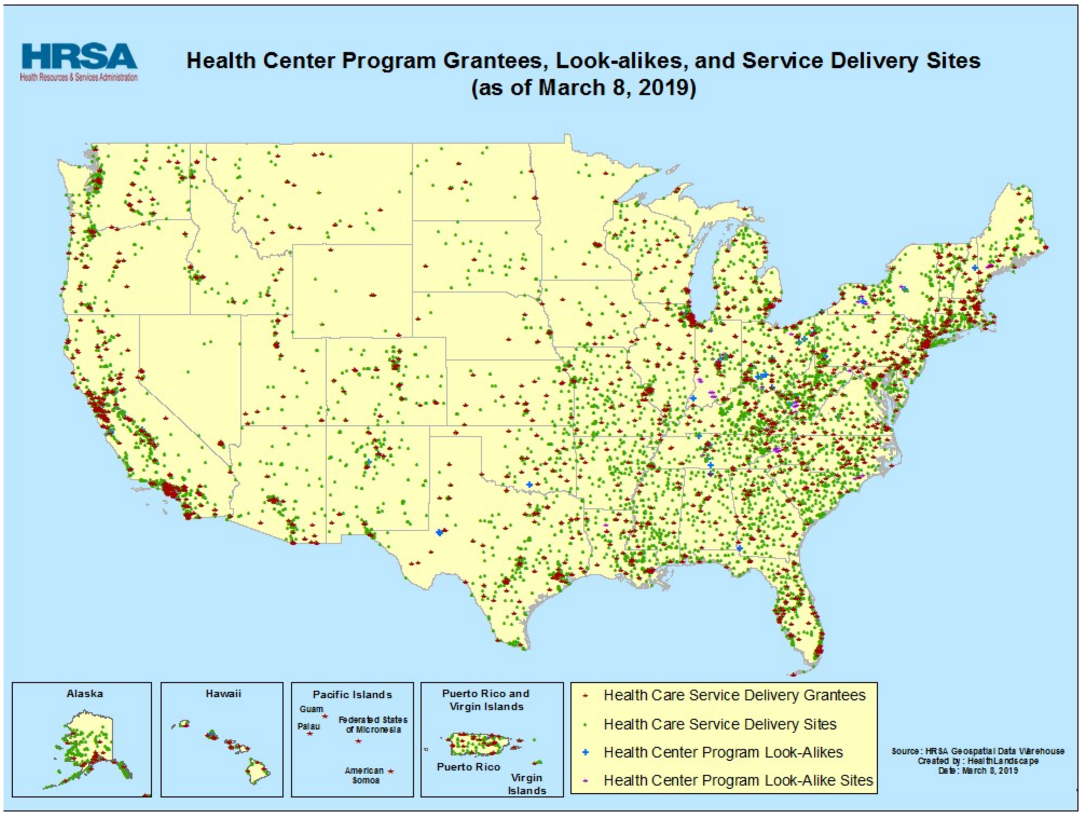
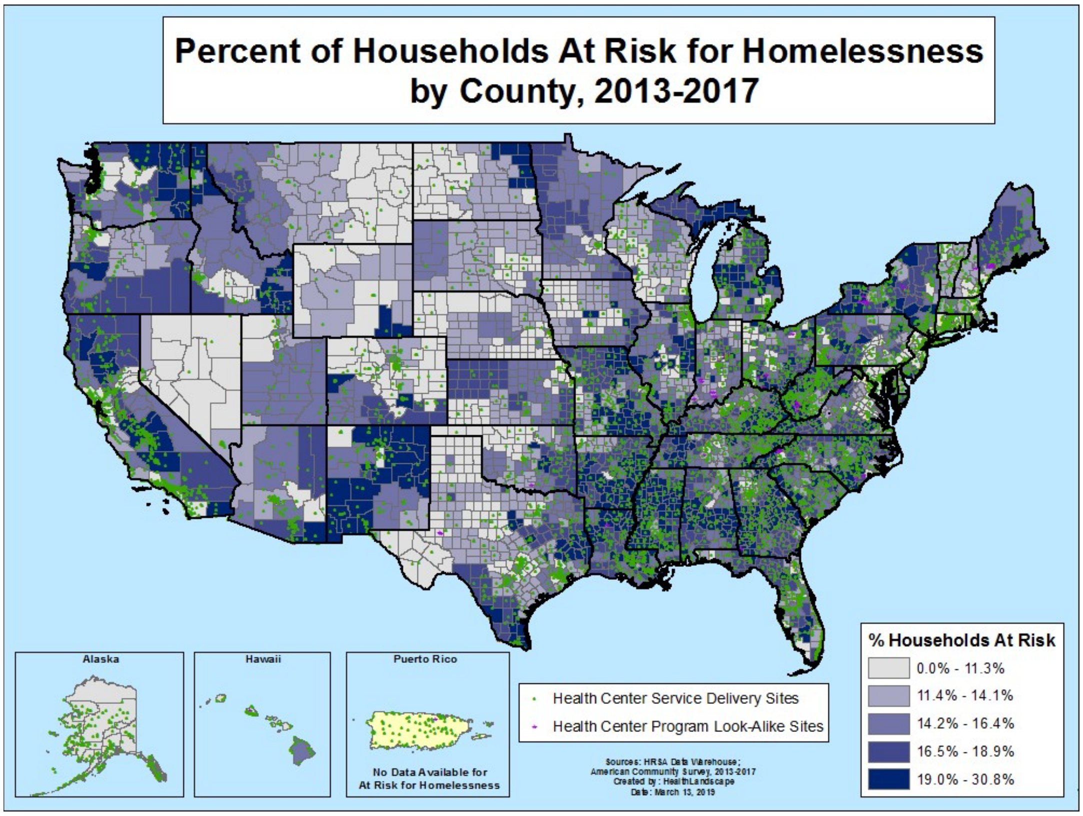


FIGURE 6.2: Households at Risk for Homeless by Health Center Service Areas


Percent of Households At Risk for Homelessness by County, 2013-2017

Sources: HRSA Data Warehouse;
American Community Survey, 2013-2017
Created by: HealthLandscape
Date: March 13, 2019

TABLE 6.1: Health Center Clinical Performance: 2015-2017 UDS

	% IN 2015 (N=1,375)	**% IN 2016** (N=1,367)	**% IN 2017** (N=1,373)
Quality of Care Measures			
Perinatal Health			
Access to Prenatal Care (First Prenatal Visit in 1st Trimester)	73.00	74.06	73.97
Low Birth Weight	7.60	7.80	8.03
Preventive Health Screening & Services			
Cervical Cancer Screening	56.00	54.36	55.67
Weight Assessment and Counseling for Nutrition and Physical Activity of Children and Adolescents	57.90	62.92	65.85
Adult Weight Screening and Follow-Up	59.40	62.46	63.85
Adults Screened for Tobacco Use and Receiving Cessation Intervention	82.80	85.19	87.50
Colorectal Cancer Screening	38.30	39.89	42.02
Childhood Immunization	77.50	42.80	40.24
Depression Screening	50.60	60.34	66.15
Dental Sealants	42.40	48.71	50.71
Chronic Disease Management			
Asthma Treatment (Appropriate Treatment Plan)	84.10	87.38	86.62
Cholesterol Treatment (Lipid Therapy for Coronary Artery Disease Patients)	77.90	79.46	80.72
Heart Attack/Stroke Treatment (Aspirin Therapy for Ischemic Vascular Disease Patients)	78.00	78.40	79.27
Blood Pressure Control (Hypertensive Patients with Blood Pressure < 140/90	63.80	62.39	62.71
Uncontrolled Diabetes (Diabetic Patients with HbA1c > 9% or No Test During Year)	29.80	32.10	32.95
HIV Linkage to Care	74.70	83.17	84.52

TABLE 6.2: Clinical Quality Performance Comparison of Rural and Urban Health Centers: 2017 UDS

	RURAL (%) (N=608)	**URBAN (%)** (N=765)
Quality of Care Measures		
Perinatal Health		
Access to Prenatal Care (first prenatal visit in 1st trimester)	76.61	73.24
Low Birth Weight	7.50	8.18
Preventive Health Screenings and Services		
Weight Assessment and Counseling for Children and Adolescents	61.16	67.90
Adult Weight Screening and Follow-Up	64.56	63.47
Tobacco Use Screening and Cessation Intervention	87.15	87.68
Colorectal Cancer Screening	42.35	41.81
Depression Screening and Follow-Up	64.90	66.77
Cervical Cancer Screening	51.68	57.44
Childhood Immunizations	36.14	41.83
Dental Sealants	49.86	57.01
Chronic Disease Management		
Asthma Pharmacologic Therapy (appropriate treatment plan)	85.29	87.10
Cholesterol Treatment (lipid therapy for patients with coronary artery disease)	80.52	80.89
Heart Attack/Stroke Treatment (aspirin therapy for patients with ischemic vascular disease)	78.54	79.83
HIV Linkage to Care	76.54	85.74
Blood Pressure Control (hypertensive patients with blood pressure < 140/90)	63.84	62.02
Uncontrolled Diabetes (diabetic patients with HbA1c > 9% or No Test During Year)	32.18	33.34

TABLE 6.3: Racial/Ethnic Differences in Low Birth Weight and Hypertension, 2017 UDS

Section A: Deliveries and Birth Weight

Race and Ethnicity	Prenatal Care Patients Who Delivered During the Year		Live Births < 1500 grams	Live Births 1500-2499 grams	Live Births ≥ 2500 grams	% Low and Very Low Birth Weight
By Race						
Asian	11,280	3.95%	110	773	10,709	7.62%
Native Hawaiian	825	0.28%	13	65	742	9.51%
Other Pacific Islander	3,913	1.31%	50	246	3,618	7.56%
Black/African American	57,346	19.16%	1,163	5,355	49,305	11.68%
Hispanic/Latino	2,915	0.97%	55	223	2,626	9.57%
Non-Hispanic/Latino	54,431	18.18%	1,108	5,132	46,679	11.79%
American Indian/Alaska Native	3,356	1.12%	42	226	3,115	7.92%
White	166,879	55.74%	1,667	9,727	151,106	7.01%
Hispanic/Latino	101,460	33.89%	1,013	5,385	92,645	6.46%
Non-Hispanic/Latino	65,419	21.85%	654	4,342	58,461	7.87%
More than one race	8,883	2.97%	101	600	8,585	7.55%
By Ethnicity						
Hispanic/Latino	149,005	49.77%	1,527	8,224	137,371	6.63%
Non-Hispanic/Latino	145,560	48.62%	2,076	11,215	129,149	9.33%
Total	299,373	100.00%	3,838	20,185	275,207	8.03%

Section B: Hypertension

Patients 18 to 85 Diagnosed with Hypertension Whose Last Blood Pressure Reading was < 140/90 mm

Race and Ethnicity	Total Hypertensive	Estimated % Patients with Controlled Blood Pressure
By Race		
Asian	154,403	67.66%
Native Hawaiian	7,881	59.27%
Other Pacific Islander	24,413	60.05%
Black/African American	1,068,643	55.74%
Hispanic/Latino	29,491	62.34%
Non-Hispanic/Latino	1,039,152	55.53%
American Indian/Alaska Native	43,133	60.92%
White	2,464,154	65.34%
Hispanic/Latino	721,205	65.22%
Non-Hispanic/Latino	1,742,949	65.39%
More than one race	74,983	63.28%
By Ethnicity		
Hispanic/Latino	1,087,099	64.96%
Non-Hispanic/Latino	3,083,507	61.94%
Total	4,240,467	62.71%

TABLE 6.4: Racial/Ethnic Differences in Diabetes Control, 2017 UDS

Patients 18 to 75 Years Diagnosed with Type I or Type II Diabetes: Most Recent Test Results

Race and Ethnicity	Total Patients with Diabetes	Estimated % Patients with HbA1c > 9% or No Test During the Year
By Race		
Asian	86,522	21.98%
Native Hawaiian	5,011	38.65%
Other Pacific Islander	19,937	43.24%
Black/African American	487,096	34.96%
Hispanic/Latino	17,206	32.36%
Non-Hispanic/Latino	479,890	35.07%
American Indian/Alaska Native	27,096	37.49%
White	1,296,498	32.15%
Hispanic/Latino	544,196	34.77%
Non-Hispanic/Latino	752,302	30.27%
More than one race	47,642	34.32%
By Ethnicity		
Hispanic/Latino	815,461	34.77%
Non-Hispanic/Latino	1,411,566	31.83%
Total	2,266,902	32.95%

TABLE 6.5: Socioeconomic and Demographic Characteristics of Special Populations, 2014 Health Center Patient Survey

Variable	UNWEIGHTED SAMPLE SIZE	COMMUNITY HEALTH CENTER (± S.E.)	HEALTH CARE FOR THE HOMELESS (± S.E.)	PUBLIC HEALTH PRIMARY CARE	*P*-VALUE
All Persons	**5,784**	**3,965**	**1,229**	**590**	
Age					
0–17 Years	995	31.03% (±2.45%)	3.98% (±1.68%)	30.03% (±4.62%)	0.0009 0.0028
18–44 Years	1,825	36.67% (±1.99%)	54.66% (±3.63%)	28.73% (±2.84%)	
45–64 Years	2,454	24.44% (±2.01%)	40.09% (±3.64%)	34.84% (±5.49%)	
65–74 Years	379	5.29% (±1.78%)	1.17% (±0.59%)	4.43% (±1.48%)	
≥ 75 Years	131	2.56% (±0.70%)	-	-	
Gender					
Male	2,301	41.29% (± 1.92%)	54.03% (± 3.42%)	39.86% (± 4.09%)	0.0028
Female	3,483	58.71% (± 1.92%)	45.97% (± 3.42%)	60.14% (± 4.09%)	0.0009
Race/Ethnicity					
Asian	383	3.70% (± 1.26%)	-	3.60% (± 1.91%)	0.0009 0.0009
Native Hawaiian/Other Pacific Islander	129	0.50% (± 0.12%)	-	-	
White, Non-Hispanic	1,464	43.22% (± 3.50%)	43.15% (± 6.86%)	13.14% (± 3.55%)	
Black/African American, Non-Hispanic	1,520	19.52% (± 2.41%)	29.24% (± 4.54%)	34.67% (± 6.99%)	
Hispanic	1,659	30.69% (± 3.17%)	23.72% (± 3.89%)	34.85% (± 8.20%)	
American Indian/Alaskan Native	595	1.17% (± 0.22%)	1.82% (± 0.37%)	4.95% (± 1.49%)	
Education					
Less Than High School	2,411	48.62% (± 2.37%)	39.34% (± 2.58%)	55.85% (± 4.55%)	0.0009 0.0009
High School	1,396	22.16% (± 1.82%)	33.99% (± 1.84%)	19.80% (± 2.32%)	
More Than High School	1,536	29.22% (± 1.53%)	26.67% (± 2.07%)	24.35% (± 4.34%)	
Poverty Status					
≤ 100% FPG	3,618	55.59% (±2.07%)	84.25% (±2.42%)	67.42% (±6.53%)	0.0009 0.0284
101% to 199% FPG	1,424	29.95% (±1.5%)	11.13% (±1.93%)	26.64% (±4.13%)	
≥ 200% FPG	576	14.46% (±1.54%)	4.62% (±1.57%)	-	
Health Insurance					
Medicaid Only	2,879	54.09% (±3.39%)	57.58% (±7.00%)	50.04% (±5.09%)	0.0284 0.0009
Medicare Only	461	8.05% (±1.70%)	3.47% (±0.59%)	6.86% (±1.26%)	
Dually Eligible	620	6.72% (±0.98%)	6.88% (±1.75%)	14.26% (±3.17%)	
Other (Employee +Private +Other)	450	9.77% (±1.27%)	-	10.06% (±2.92%)	
Uninsured	1,000	21.38% (±2.47%)	28.78% (±8.09%)	18.79% (±5.41%)	
Employment					
Employed	1,431	37.28% (± 2.38%)	18.15% (± 2.90%)	29.42% (± 4.46%)	0.0009 0.0102
Unemployed	926	15.49% (± 1.50%)	34.09% (± 2.34%)	16.10% (± 2.87%)	
Not in Labor Force	2,501	47.23% (± 2.80%)	47.75% (± 3.99%)	54.48% (± 3.63%)	
Location					
Urban	4,168	50.82% (± 6.07%)	65.28% (± 12.00%)	79.34% (± 11.53%)	0.102
Rural	1,616	49.18% (± 6.07%)	34.72% (± 12.00%)	20.66% (± 11.53%)	0.015
Language Preference					
English Only	3,644	66.33% (± 2.97%)	80.88% (± 3.78%)	59.60% (± 6.45%)	0.015
Other Non-English Language Only	1,183	17.35% (± 2.24%)	6.87% (± 1.73%)	18.81% (± 5.04%)	
English and Non-English Language	957	16.32% (± 1.67%)	12.25% (± 3.06%)	21.59% (± 5.50%)	

All proportions are weighted to the national health center population. Bonferroni adjustments were made to the p-values. '-' Data cannot be calculated or has been suppressed for confidentiality purposes.

TABLE 6.6: Health and Disease Characteristics of Health Center Patients, 2014 Health Center Patient Survey

Variable	UNWEIGHTED SAMPLE SIZE	COMMUNITY HEALTH CENTER (± S.E.)	HEALTH CARE FOR THE HOMELESS (± S.E.)	PUBLIC HEALTH PRIMARY CARE	*P*-VALUE
All Persons	**5,784**	**3,965**	**1,229**	**590**	
Self-Reported Health Status					<.0001
Excellent	659	15.33% (± 1.45%)	6.65% (± 1.05%)	16.34% (± 2.55%)	
Very Good/Good	2,725	53.07% (± 1.27%)	43.85% (± 2.57%)	51.55% (± 3.43%)	
Fair or Poor	2,395	31.60% (± 1.44%)	49.50% (± 2.48%)	32.11% (± 3.72%)	
Cardiovascular Disease Indicator					0.0529
Yes	576	8.26% (± 0.97%)	11.76% (± 1.32%)	6.48% (± 2.12%)	
No	5,208	91.74% (± 0.97%)	88.24% (± 1.32%)	93.52% (± 2.12%)	
Diabetes					0.2287
Yes	1,081	15.77% (±1.49%)	12.75% (±1.51%)	12.51% (±2.51%)	
No	4700	84.23% (±1.49%)	87.25% (±1.51%)	87.49% (±2.51%)	
Hypertension					0.0005
Yes	2333	30.23% (±2.12%)	43.39% (±3.03%)	30.01% (±5.39%)	
No	3,451	69.77% (±2.12%)	56.61% (±3.03%)	69.99% (±5.39%)	
Mental Health: K6 Score					<.0001
K6 = 0	755	14.78% (± 1.41%)	7.69% (± 1.49%)	19.16% (± 4.22%)	
0< K6 <13	3,225	71.22% (± 1.37%)	64.30% (± 3.35%)	64.81% (± 4.07%)	
K6>=13	809	14.00% (± 1.26%)	28.01% (± 4.2%)	16.04% (± 3.67%)	
Smoking Status					<.0001
Non-Smoker	3,280	74.46% (± 2.64%)	41.12% (± 3.41%)	77.89% (± 3.71%)	
Current Smoker	1,664	25.54% (± 2.64%)	58.88% (± 3.41%)	22.11% (± 3.71%)	
Strong Desire for Alcohol, past 3 months					<.0001
Never	1,171	64.00% (±3.00%)	43.41% (±3.65%)	53.84% (±6.27%)	
Once or Twice	413	16.91% (±2.22%)	24.85% (±2.42%)	16.15% (±4.31%)	
Monthly	137	5.71% (±1.33%)	8.35% (±1.70%)	-	
Weekly	173	7.31% (±1.74%)	8.38% (±1.67%)	-	
Daily or Almost Daily	196	6.08% (±1.23%)	15.01% (±1.85%)	-	
Ever Used Illicit Drugs					<.0001
Yes	2,368	32.85% (±2.54%)	70.96% (±3.06%)	33.41% (±4.51%)	
No	3,416	67.15% (±2.54%)	29.04% (±3.06%)	66.59% (±4.51%)	
Selected Infectious Disease Indicator (Hep, TB, HIV)					<.0001
Yes	554	5.10% (± 0.61%)	14.90% (± 1.69%)	8.44% (± 1.57%)	
No	5,230	94.90% (± 0.61%)	85.10% (± 1.69%)	91.56% (± 1.57%)	

All proportions are weighted to the national health center patient population

'-' Data cannot be calculated or has been suppressed for confidentiality purposes

TABLE 6.7: Access to Care Among Special Populations of Health Center Patients, 2014 Health Center Patient Survey

	UNWEIGHTED SAMPLE SIZE	COMMUNITY HEALTH CENTER (± S.E.)	HEALTH CARE FOR THE HOMELESS (± S.E.)	PUBLIC HEALTH PRIMARY CARE	*P*-VALUE
Sample Size	**5,784**	**3,965**	**1,229**	**590**	
Access to Care (%)					
Usual Source of Care (N=5,777)					0.0007
Health Center	5,323	92.13% (± 0.84%)	80.67% (± 4.85%)	96.91% (± 0.9%)	
Other	333	5.66% (± 0.71%)	11.46% (± 2.42%)	-	
None	121	2.21% (± 0.49%)	7.87% (± 2.8%)	-	
Unable to Get Necessary Medical Care, Tests, or Treatments Last Year (N=3,966)					
Yes	588	11.77% (± 1.59%)	24.50% (± 2.35%)	12.87% (± 3.36%)	0.0007
No	3,378	88.23% (± 1.59%)	75.50% (± 2.35%)	87.13% (± 3.36%)	
Delay in Getting Necessary Medical Care, Tests, or Treatments Last Year (N=3,967)					
Yes	710	15.31% (± 1.55%)	23.10% (± 2.54%)	12.74% (± 2.87%)	0.004
No	3,257	84.69% (± 1.55%)	76.90% (± 2.54%)	87.26% (± 2.87%)	
Unable to Get Necessary Dental Care, Tests, or Treatments Last Year (N=2,670)					
Yes	944	27.79% (± 2.50%)	37.01% (± 2.98%)	34.19% (± 5.37%)	0.0514
No	1,726	72.21% (± 2.50%)	62.99% (± 2.98%)	65.81% (± 5.37%)	
Delay in Getting Necessary Dental Care, Tests, or Treatments Last Year (N=2,674)					
Yes	897	27.48% (± 2.12%)	34.11% (± 4.41%)	32.02% (± 6.23%)	0.2813
No	1,777	72.52% (± 2.12%)	65.89% (± 4.41%)	67.98% (± 6.23%)	
Unable to Get Necessary Mental Care Last Year (N=1,487)					
Yes	240	13.54% (± 2.15%)	19.79% (± 2.29%)	-	0.0423
No	1,247	86.46% (± 2.15%)	80.21% (± 2.29%)	90.47% (± 4.03%)	
Delay in Getting Necessary Mental Care Last Year (N=1,487)					
Yes	305	16.17% (± 2.69%)	27.90% (± 6.06%)	-	0.0204
No	1,182	83.83% (± 2.69%)	72.10% (± 6.06%)	86.49% (± 3.77%)	

All proportions are weighted to the national health center population. Bonferroni adjustments were made to the p-values.
'-' Data cannot be calculated or has been suppressed for confidentiality purposes.

TABLE 6.8: Patient Experience with Care Services Received at Health Centers, 2014 Health Center Patient Survey

	UNWEIGHTED SAMPLE SIZE	COMMUNITY HEALTH CENTER (± S.E.)	HEALTH CARE FOR THE HOMELESS (± S.E.)	PUBLIC HEALTH PRIMARY CARE	*P*-VALUE
Sample Size	**5,784**	**3,965**	**1,229**	**590**	
Quality of Care (%)					
Get an Appointment for Care When Needed Right Away (N=2,187)					1.0000
Usually/ Always	1,659	78.14% (± 2.46%)	74.12% (± 5.32%)	81.17% (± 3.36%)	
Get an Appointment for a Check-up or Routine Care as Soon as Needed (N=3,532)					1.0000
Usually/ Always	2,966	85.41% (± 1.62%)	83.98% (± 2.23%)	81.42% (± 3.11%)	
Get an Answer of a Medical Question the Same Day That a Patient Phones the Health Center During the Office Hours (N=2,089)					0.0944
Usually/ Always	1,587	80.49% (± 2.39%)	70.43% (± 4.01%)	81.87% (± 3.81%)	
Get an Answer of a Medical Question When a Patient Phones the Health Center After the Office Hours (N=424)					0.7227
Usually/ Always	270	70.53% (± 4.49%)	-	-	
Get Reminders Between Visits (N=4,943)					0.0714
Yes	3,497	73.34% (± 2.19%)	60.00% (± 4.56%)	71.88% (± 4.16%)	
See a Doctor or Other Health Professional Within 15 Minutes of Your Appointment (N=4,933)					1.0000
Usually/ Always	2,81	56.48% (± 2.65%)	62.97% (± 3.26%)	52.88% (± 4.63%)	
The Doctor or Other Health Professional Listen Carefully to You (N=4,944)					1.0000
Usually/ Always	4,483	91.77% (± 1.12%)	92.45% (± 1.33%)	90.26% (± 1.92%)	
The Doctor or Other Health Professional Gives You Easy to Understand Information (N=4,054)					0.2030
Usually/ Always	3,694	93.84% (± 0.95%)	90.57% (± 1.54%)	88.50% (± 2.98%)	
The Doctor or Other Health Professional Seem to Know the Important Information About Patient's Medical History (N=4,935)					0.1485
Usually/ Always	4,179	87.60% (± 1.3%)	82.02% (± 2.04%)	88.11% (± 2.21%)	
The Doctor or Other Health Professional Show Respect for What You Had to Say (N=4,945)					0.2327
Usually/ Always	4,591	95.01% (± 0.66%)	92.71% (± 1.01%)	92.29% (± 1.34%)	
The Doctor or Other Health Professional Spend Enough Time with You (N=4,945)					1.0000
Usually/ Always	4,359	91.13% (± 1.02%)	88.63% (± 1.71%)	88.79% (± 2.01%)	
When a Test is Ordered, How Often Did Someone Follow-up To Give You Test Results (N=3,877)					1.0000
Usually/ Always	3,160	81.12% (± 2.07%)	81.57% (± 2.15%)	80.94% (± 3.48%)	
How often Were the Clerks and Receptionists as Helpful as You Thought they Should be (N=4,948)					1.0000
Usually/ Always	4,342	89.15% (± 1.11%)	88.38% (± 1.57%)	90.52% (± 2.01%)	
How often did the Clerks and Receptionists Treat You With Courtesy and Respect (N=4,951)					1.0000
Usually/ Always	4,588	93.50% (± 0.91%)	93.10% (± 1.32%)	94.57% (± 1.71%)	
Were You Satisfied With the Way the Medication Was Explained to You (N=1,341)					1.0000
Yes	1,284	96.22% (± 1.11%)	97.78% (± 1.23%)	92.83% (± 5.07%)	
Were you Satisfied With the Way Your Questions About Medication Were Answered (N=1,341)					0.0036
Yes	1,276	94.93% (± 1.43%)	99.05% (± 0.53%)	98.7% (± 1.02%)	
Would You Recommend this Provider to Family and Friends (N=4,949)					1.0000
Yes-Definitely	4,042	84.75% (± 1.37%)	81.90% (± 2.35%)	82.44% (± 2.86%)	
Using any number from 0 to 10, where 0 is the worst possible provider and 10 is the best possible provider, what would you use to rate your provider (N=4,945)					0.3468
≥7	4,556	94.21% (± 0.81%)	90.79% (± 1.45%)	93.32% (± 1.87%)	

All proportions are weighted to the national health center population. Bonferroni adjustments were made to the p-values.
'-' Data cannot be calculated or has been suppressed for confidentiality purposes.

Chapter 7. Organ and Blood Stem Cell Donation and Transplantation

Underrepresented racial or ethnic populations and other disadvantaged persons are disproportionately affected by many acute and chronic diseases that lead to end-stage organ disease or other conditions requiring organ transplantation[1-4] and have disparate access to both organ and blood stem cell transplantation.[3-8] HRSA's Division of Transplantation (DoT) within the Healthcare Systems Bureau is the primary federal entity responsible for overseeing the organ transplant system and blood stem cell transplant programs in the United States. DoT also promotes public education and research to increase the supply of donated organs and tissues and recruits underrepresented racial or ethnic populations as volunteer adult blood stem cell and cord blood donors.[9]

Organ Donation and Transplantation

Figure 7.1 describes the number of patients on the waiting list for all organs, number of living and deceased donors from which organs were recovered, and number of transplants performed from 2000 to 2018.

The more than 36,500 organ transplants performed in the United States in 2018 set an annual record for the sixth straight year.

Despite advances in medicine and technology and increased awareness of organ donation and transplantation, there continues to be a gap between supply and demand. More progress is needed to ensure that all candidates have a chance to receive a transplant.

Figure 7.2 shows the percentage of people on the waiting list by race/ethnicity. More than half (59 percent) of all people on the transplant waiting list are from underrepresented racially and ethnically diverse populations. There are multiple reasons for this; one of which is because some diseases that cause end-stage organ failure are more common in these populations than in the general population.

Donor organs are matched for transplant according to several factors, including blood and tissue type, which can vary by ethnicity. While people of every race frequently match each other, those on the waiting list are more likely to receive transplants if more people from all backgrounds donate. Many more donors from underrepresented racially and ethnically diverse populations are needed.

Over 80 percent of the waiting list is comprised of patients waiting for a kidney. Figure 7.3 depicts the percentage of people on the waiting list who are waiting for specific organs by race/ethnicity. Variability is seen with the kidney and the liver waiting lists in particular, with more underrepresented racially and ethnically diverse populations waiting for kidneys than Whites.

Figure 7.4 depicts the percentage of people on the kidney waiting list by race/ethnicity, percentage of deceased kidney donors by race/ethnicity, and percentage of living kidney donors by race/ethnicity. The percentage of underrepresented racially and ethnically diverse populations who are waiting for kidney transplants is greater than the percentage of underrepresented racially and ethnically diverse populations who become organ donors.

Figure 7.5 shows variation in the percentage of patients on the kidney waiting list who underwent deceased donor transplant within 5 years of listing by the Donation Service Area (DSA).[10] There is great geographic variation in the percentage of patients on the kidney waiting list who underwent deceased donor transplant within 5 years of listing; the percentage varied from 10.2 percent to 80.3 percent across DSA. DSA is the geographic area designated by Center for Medicare & Medicaid Services

(CMS) that is served by one organ procurement organization (OPO), one or more transplant centers, and one or more donor hospitals.

Figure 7.6 shows great geographic variation in the percentage of patients on the liver waiting list who underwent deceased donor transplant within 3 years of listing by DSA.[11] The percentage varied from 31.9 percent to 85.5 percent across DSA.

The graph (Figure 7.7) shows the percentage of deceased donor kidney transplants before the kidney allocation system (KAS) implementation (pre-KAS) and after the KAS implementation (post-KAS), by race/ethnicity.

The Organ Procurement and Transplantation Network (OPTN) KAS changed in December 2014. One of the key goals of the KAS is to increase fairness by awarding waiting time points based on dialysis start date. Analyses of data 1 to 4 years after implementation of the KAS show that Blacks and Hispanics are receiving higher proportions of kidney transplants. Specifically, for Black candidates, percent received kidney transplants 1-year pre-KAS. One-year post-KAS, the percentage of candidates receiving kidney transplants increased to 35.5 percent and was 32.4 percent in 4-year post-KAS. For Hispanic candidates, 16.8 percent received kidney transplants 1-year pre-KAS, and this percentage increased to 18.4 percent in 1-year post-KAS and to 20.1 percent in 4-year post-KAS.

In addition to overseeing the organ allocation policies, HRSA also supports efforts to increase the number of organs available for transplant. For example, the Reimbursement of Travel and Subsistence Expenses Incurred Toward Living Organ Donation Program provides financial assistance for people who wish to be living organ donors who might not otherwise be able to donate. Qualified expenses include reimbursement of travel and subsistence expenses related to donor's evaluation, surgery, and follow-up visits. This program aims at increasing access to transplantation to low-income patients on the waiting list by providing reimbursement for qualified expenses incurred by living organ donors who donate their organs to recipients whose yearly household income are no more than 300 percent of the HHS poverty level.

In 2018, the program received over 1,000 applications for assistance and approximately 88 percent met the program eligibility guidelines. Among the over 900 applications approved, 42 percent were from recipients of underrepresented populations. Over 89 percent of the approved applications were for living kidney transplants. Figure 7.7 shows the percentages of living kidney transplants by race/ ethnicity in the HRSA program and the United States. Among the over 800 kidney applications approved, approximately 56 percent (464) resulted in living kidney transplants. Figure 7.8 shows that over one-quarter (26 percent) of the living kidney transplants from the HRSA program were performed in Hispanic patients. The percentage of living kidney transplants for Hispanic patients in the United States during this period was 15 percent.

The program provided more than $1.8 million in travel expense reimbursement and facilitated nearly 600 living organ transplants in 2018. The median household income of the transplant recipients was approximately $27,500 and the donors' median household income was approximately $35,000.

Blood Stem Cell Transplantation

Even with nearly 34 million potential adult marrow donors and 778,113 cord blood units available worldwide, it is more challenging for patients of racially and ethnically diverse backgrounds to find a suitable match.[12]

The C.W. Bill Young Cell Transplantation Program (CWBYCTP) aids in the recruitment and facilitation of a successful match of an unrelated (non-biological family) donor with the patient in need of a stem cell transplant (bone marrow and/or cord blood). By the end of FY 2018, the CWBYCTP included approximately 20.6 million volunteer adult marrow registrants who are willing to donate to a matched patient in need.

Diversity of Bone Marrow Donors on the Registry

Figure 7.9 shows the likelihood of finding a matched donor by race/ethnicity. Approximately 77 percent of non-Hispanic Whites are able to find a matched adult bone marrow donor; the likelihood is lower in underrepresented, racially and ethnically diverse populations. Fifty-seven percent of AIANs can find a matched adult bone marrow donor, followed by 46 percent of Hispanics, 41 percent of Asians, and 23 percent of African Americans.[13]

The best marrow transplant outcomes happen when a patient's human leukocyte antigen (HLA) and the HLA of a registry member or cord blood unit closely match. In regards to matching HLA types, a patient's ethnic background is important in predicting the likelihood of finding a match. This is because HLA markers used in matching are inherited. Some ethnic groups have more complex HLA tissue types than others. So a person's best chance of finding a donor may be with someone of the same ethnic background.

Because patients are more likely to match with someone of the same racial and ethnic background, donors of these racial and ethnic heritages are especially needed: AIANs, Asian, Black or African American, Hispanic or Latino, Native Hawaiian or other Pacific Islander, and multiple race.

Figure 7.10 shows the percentage of adult volunteer marrow donors on the registry by race/ethnicity as of September 2018. Approximately 3.9 million of the registrants (approximately 20 percent) self-identified as belonging to an underrepresented racial or ethnic population, with the largest underrepresented racially and ethnically diverse population being Hispanic (7.0 percent), followed by Asian (5.0 percent).

Blood Stem Cell Transplants Facilitated by the C.W. Bill Young Cell Transplantation Program

Figure 7.11 shows the number of blood stem cell transplants for underrepresented racial and ethnic populations performed from FY 2008 through FY 2018. The number of blood stem cell transplants facilitated by the CWBYCTP increased over the years, including for African American, Hispanic, Asian, and other populations.

Unrelated Transplant One-Year Survival Data

The 1-year survival rate of unrelated blood stem cell transplant among 3 specific populations improved from 2006 to 2016 (Figure 7.12). These three populations constituted majority of the transplants that were facilitated by the CWBYCTP.[14]

Sickle cell anemia predominantly affects African Americans and is one of the diseases that can be treated by blood stem cell transplantation. Using data from 2011 through 2015, among 129 non-White patients, the 1-year survival rate of unrelated blood stem cell transplants for patients with sickle cell anemia was 82.9 percent. The 1-year survival rate for unrelated blood stem cell transplants for female patients with sickle cell anemia was 83.8 percent and for male patients was 82.1 percent.[15]

Diversity of Cord Blood Units on the Registry and Transplants

Cord Blood Units (CBUs) serve an important role for patients from ethnically and racially underrepresented populations in need of stem cell transplant, as these populations are less likely to find a suitable match from the adult bone marrow donor registry. Approximately 1 in 3 patients from ethnically and racially underrepresented populations received either a single (31.6 percent) or multiple cord (35.5 percent) transplant. Figure 7.13 shows the percentage of transplants that were from cord blood or bone marrow/peripheral blood stem cell by race/ethnicity in FY 2017. Between 15 and 29 percent of the transplants in ethnically and racially underrepresented populations received cord blood instead of bone marrow or peripheral blood stem cell.

Of CBUs added to the National Cord Blood Inventory (NCBI) by race/ethnicity from 2007 to 2018, nearly 2 out of 3 (63 percent) units were from donors who identified as coming from racially and ethnically underrepresented populations.

The NCBI Program contracts with cord blood banks to meet the statutory goal to build a public inventory of at least 150,000 new, high-quality, genetically diverse CBUs, which are to be made available to patients through the CWBYCTP. Between FY 2007 and FY 2018, over 113,000 new units of cord blood were added to the NCBI. Approximately 38 percent (5,830) of the over 15,500 CBUs (NCBI and non-NCBI) released for transplantation through the CWBYCTP used CBUs selected from the NCBI inventory.

Although cord blood can help patients who cannot find a well-matched marrow donor, matching is still important. Cord blood is especially needed from communities such as:

- Black/African American
- American Indian and Alaska Native
- Asian
- Hispanic and Latino
- Native Hawaiian and Other Pacific Islander
- Multiple race

Umbilical cord blood may help more people from many diverse racial and ethnic communities have a second chance at life.

How DoT Contributes to Health Equity Organ Transplantation

The demand for organ transplantation greatly exceeds the available supply of organs. There are approximately 113,000 individuals on the transplant waiting list as of April 2019; every 10 minutes a new awaiting recipient is added to the list; 20 individuals die each day while waiting for an organ.

The Organ Transplantation Program within HRSA DoT oversees:

- The OPTN, the national system that allocates and distributes donor organs to individuals waiting for an organ transplant, and
- The Scientific Registry of Transplant Recipients (SRTR), which provides statistical and other analytic support to the OPTN

The OPTN is a non-government body, established by law, composed of volunteer professionals and other stakeholders involved in donation and transplantation.

- OPTN operates according to National Organ Transplant Act (NOTA), OPTN Final Rule regulations, and the scope of the OPTN contract.
- OPTN Board of Directors establishes and maintains transplant policies and bylaws that govern the OPTN.
- OPTN Minority Affairs Committee identifies and considers aspects of organ procurement, allocation, and transplantation that have the potential to impact underrepresented racially and ethnically diverse populations.
- Since 2017 the OPTN has been modifying organ allocation policies to reduce disparities in geographic distribution of the organs.

Blood Stem Cell Transplantation

The CWBYCTP and NCBI programs' goals are to increase the number of blood stem cell sources of umbilical cord blood and volunteer adult marrow registrants, particularly those from underrepresented racially and ethnically diverse populations, while also addressing the statutory aim of ensuring that members of such populations, to the extent practical, have the same probability of finding a suitable, unrelated donor as an individual who is not a member of an underrepresented population.

Both the CWBYCTP and NCBI address the gaps in availability and access to blood stem cell transplantation in underrepresented racially and ethnically diverse populations through system capacity improvement. The CBWYCTP and NCBI activities support increasing patient access to transplantation as a potential treatment. In addition, both programs have demonstrated improvement in blood stem cell transplant availability in underrepresented racially and ethnically diverse populations over the years.

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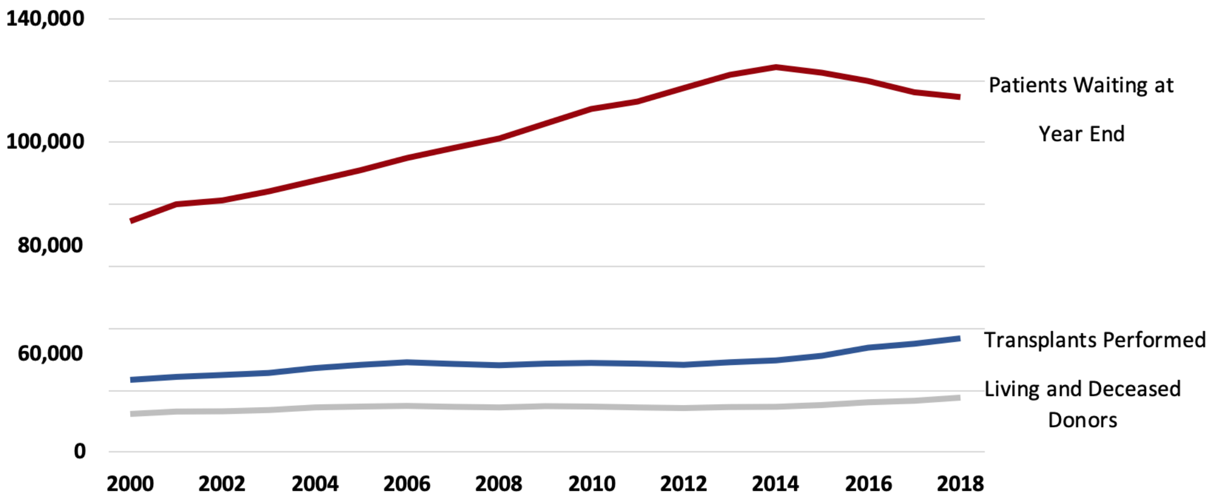
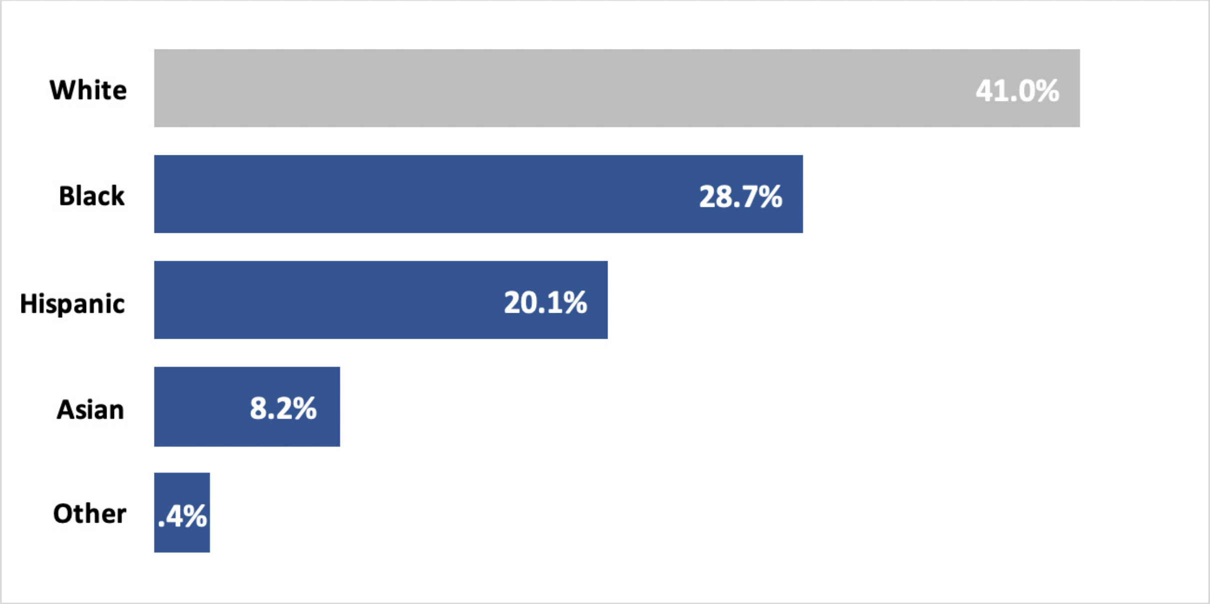
FIGURE 7.1: Number of Patients on the Waiting List, Donors, and Transplants Performed from 2000-2018



Data source: OPTN Data as of April 5, 2019

FIGURE 7.2: Percentage of People on the Waiting List in April 2019, by Race/Ethnicity [a,b]

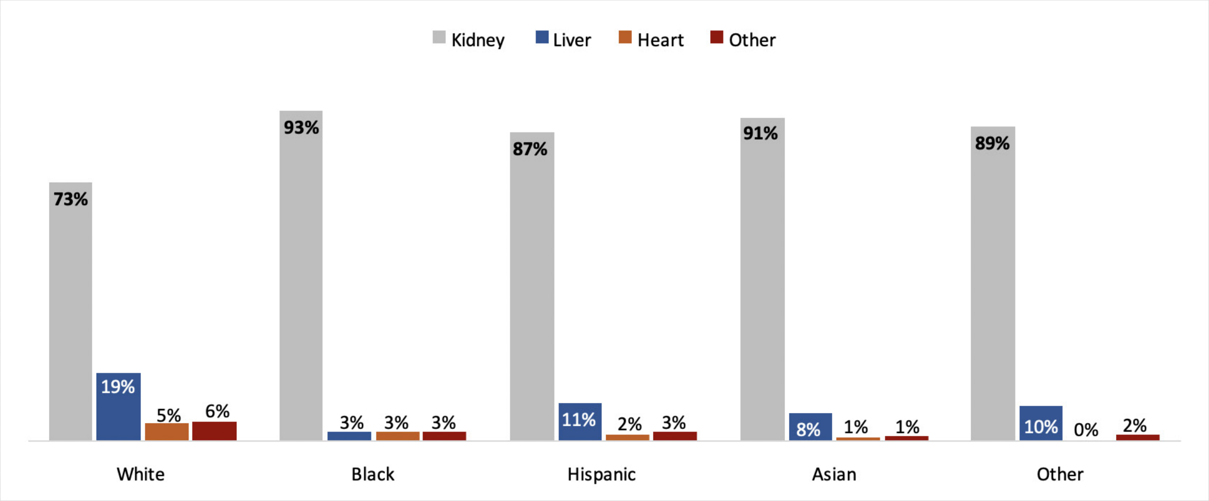


Data source: OPTN Data as of April 5, 2019

[a] Other includes American Indian/Alaska Native, Pacific Islander, and Multiracial.

[b] The percentages for the Other group are as follows: 2.4 percent on waiting list, 2.3 percent deceased donor transplant, and 1.5 percent living donor transplant.

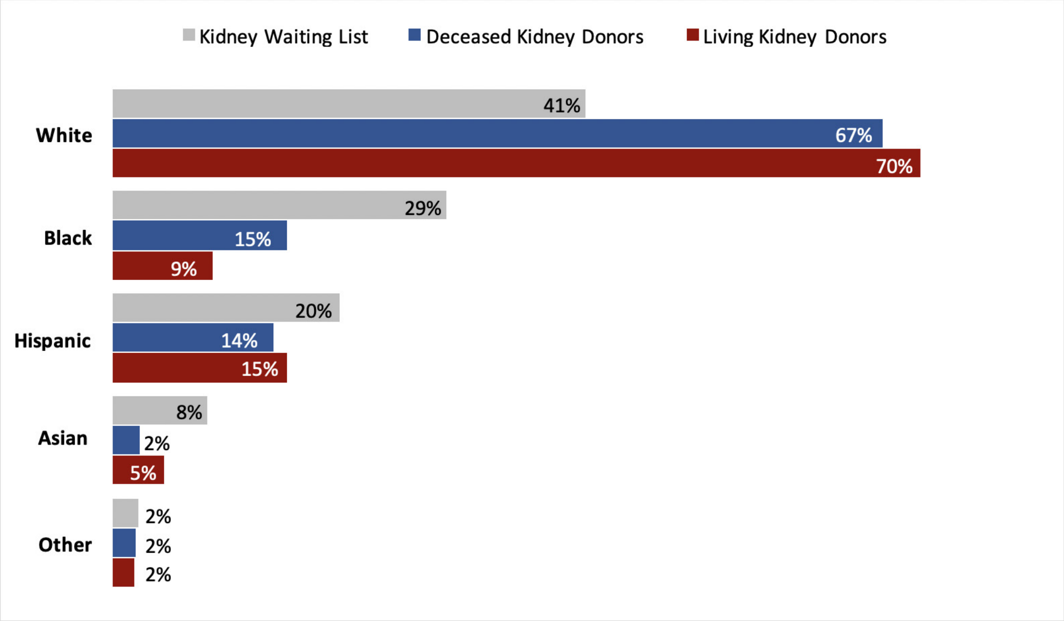
FIGURE 7.3: Percentage of Organs People Are Waiting For in 2018, by Race/Ethnicity[a]



Data source: OPTN data as of April 5, 2019

[a] The percentage might not add to 100% since individuals can be on the waiting list for multiple organs.

FIGURE 7.4: Percentage of Kidney Waiting List, Deceased Kidney Donors and Living Kidney Donors in 2018, by Race/Ethnicity[a,b]

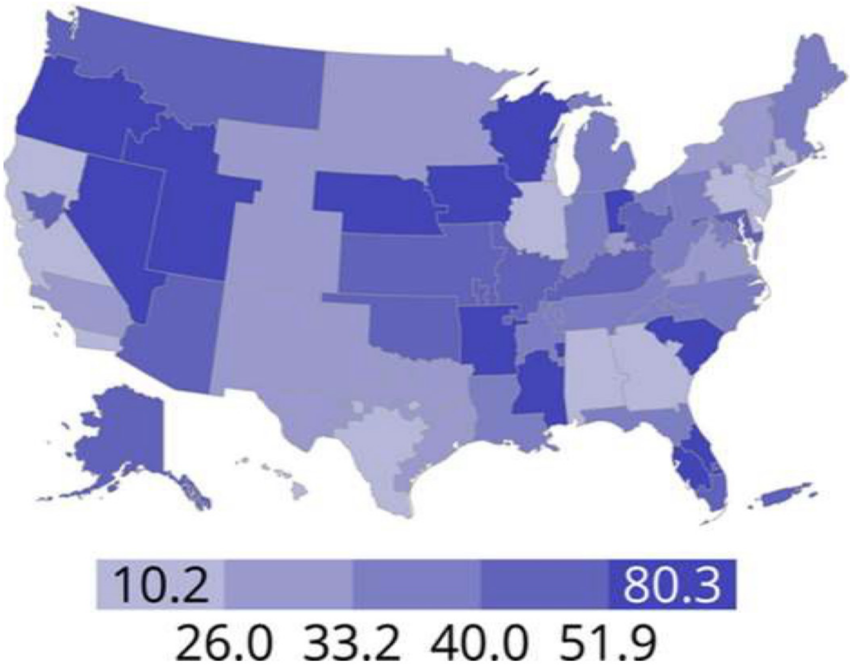


Data source: OPTN data as of March 28, 2019

[a] Kidney waiting list is from April 2019 OPTN data and deceased and living kidney donors are from the 2018 data

[b] Other includes American Indian/Alaska Native, Pacific Islander, and Multiracial.

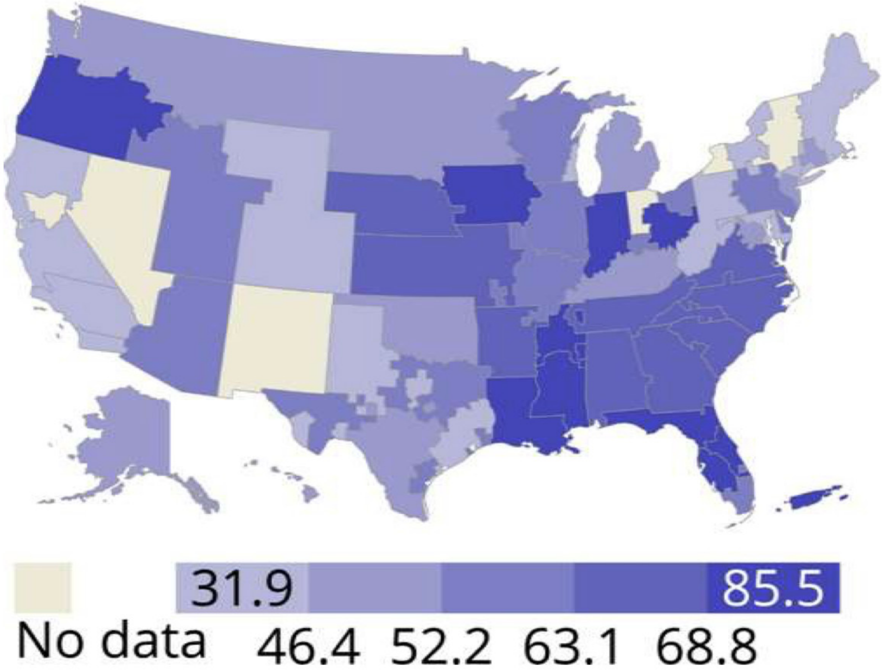
FIGURE 7.5: Geographic Variation in the Percentages of Patients on Kidney Waiting List Who Underwent Deceased Donor Transplant within 5 Years of Listing [a]



Data source: Hart, A., Smith, J. M., Skeans, M. A., Gustafson, S. K., Wilk, A. R., Castro, S., Robinson, A., Wainright, J. L.,Snyder, J. J., Kasiske, B. L. & Israni, A. K. OPTN/SRTR 2017 Annual Data Report: Kidney. *Am J Transplant* 2019; 19 (Suppl 2): 19 – 123. doi: 10.1111/ajt.15274

[a] Based on the 2012 Listing

FIGURE 7.6: Geographic Variations in the Percentages of Patients on Liver Waiting List Who Underwent Deceased Donor Transplant within 3 Years of Listing[a]



Data source: Kim, W. R., Lake, J. R., Smith, J. M., Schladt, D. P., Skeans, M. A., Noreen, S. M., Robinson, A. M., Miller, E.,Snyder, J. J., Israni, A. K. & Kasiske, B. L. OPTN/SRTR 2017 Annual Data Report: Liver. *Am J Transplant* 2019;19 (Suppl 2): 184 – 283. doi: 10.1111/ajt.15276

[a] Based on the 2014 Listing

FIGURE 7.7: Improvement in the Percentages of Deceased Donor Kidney Transplants in Ethnic Minorities after the 2014 Kidney Allocation System Policy Change[a,b]


White

Black

Hispanic

Asian

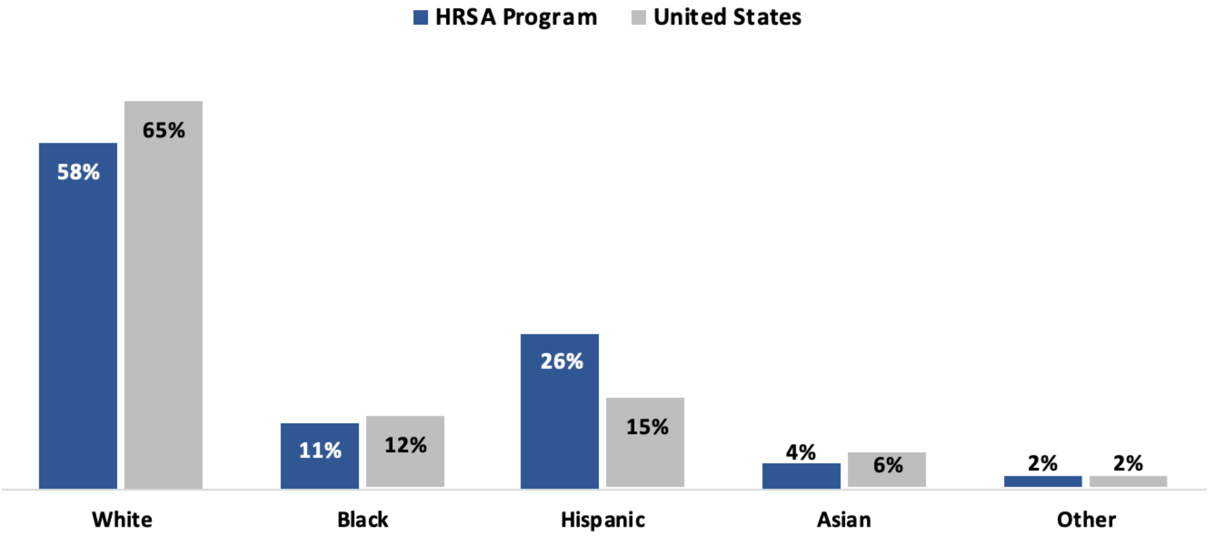
Other

Data source: OPTN data as of March 22, 2019

[a] Other includes American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, and Multiracial

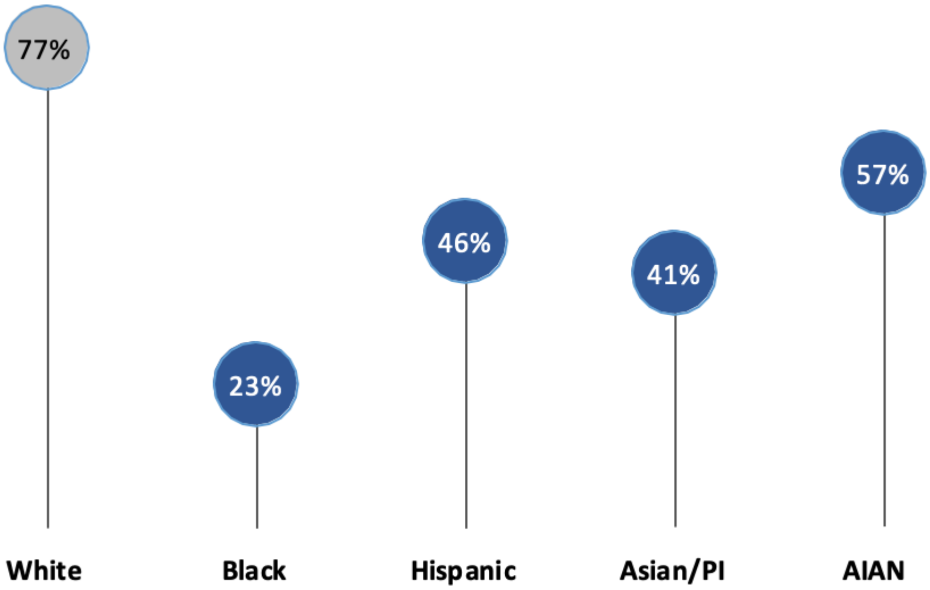
[b] Data using transplants performed during the following periods:
1 Year Pre-KAS: 12/4/2013-12/3/2014; Year 1 Post-KAS: 12/4/2014-12/3/2015;Year 2 Post- KAS: 12/4/2015-12/3/2016; Year 3 Post-KAS: 12/4/2016-12/3/2017; Year 4 Post-KAS: 12/4/2017-12/3/2018

FIGURE 7.8: Percentage of Living Kidney Transplants Performed in Recipients of the HRSA Program and United States in 2018, by Race/Ethnicity



Data source: HRSA Program from the National Living Donor Assistance Center program data as of February 2019, United States data from OPTN data as of April 8, 2019

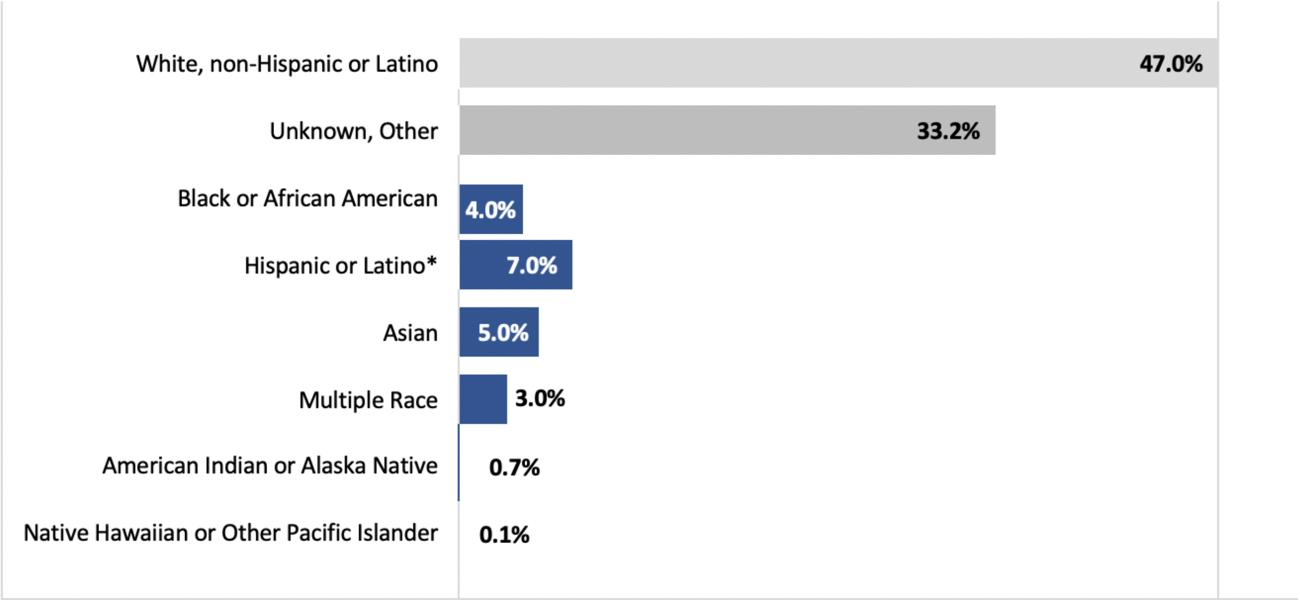
FIGURE 7.9: Likelihood of Finding a Matched Donor by Patient Ethnic Background [a]



Source: National Marrow Donor Program (NMDP)

[a] PI: Pacific Islander, AI: American Indian, Alaska Native

FIGURE 7.10: Number of Adult Bone Marrow Donors on the Registry in 2018 by Race/Ethnicity[a]

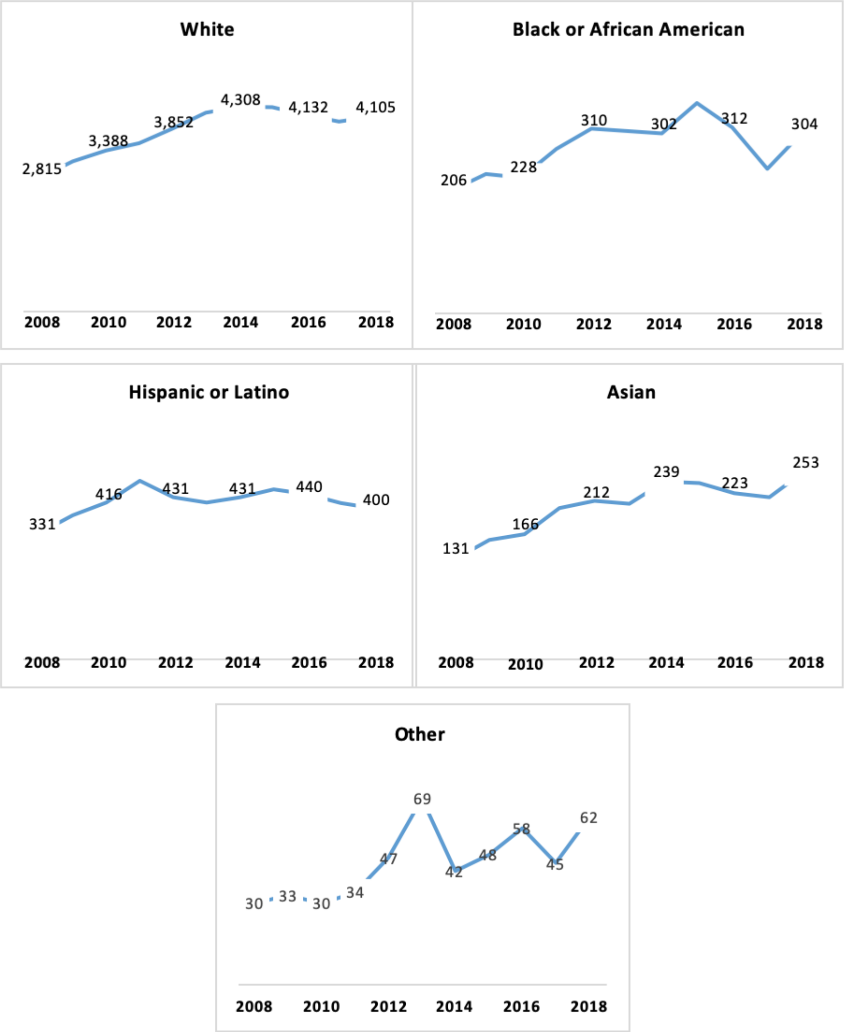


Data source: NMDP as of September 2018

[a] Total number indicating Hispanic or Latino ethnicity or race; not a mutually exclusive category.

[*] Unknown primarily represents donors from international registries, and data on race/ethnicity are not collected.

FIGURE 7.11: Number of Transplants Facilitated by the CWBYCTP, FY 2008-2018 [a]

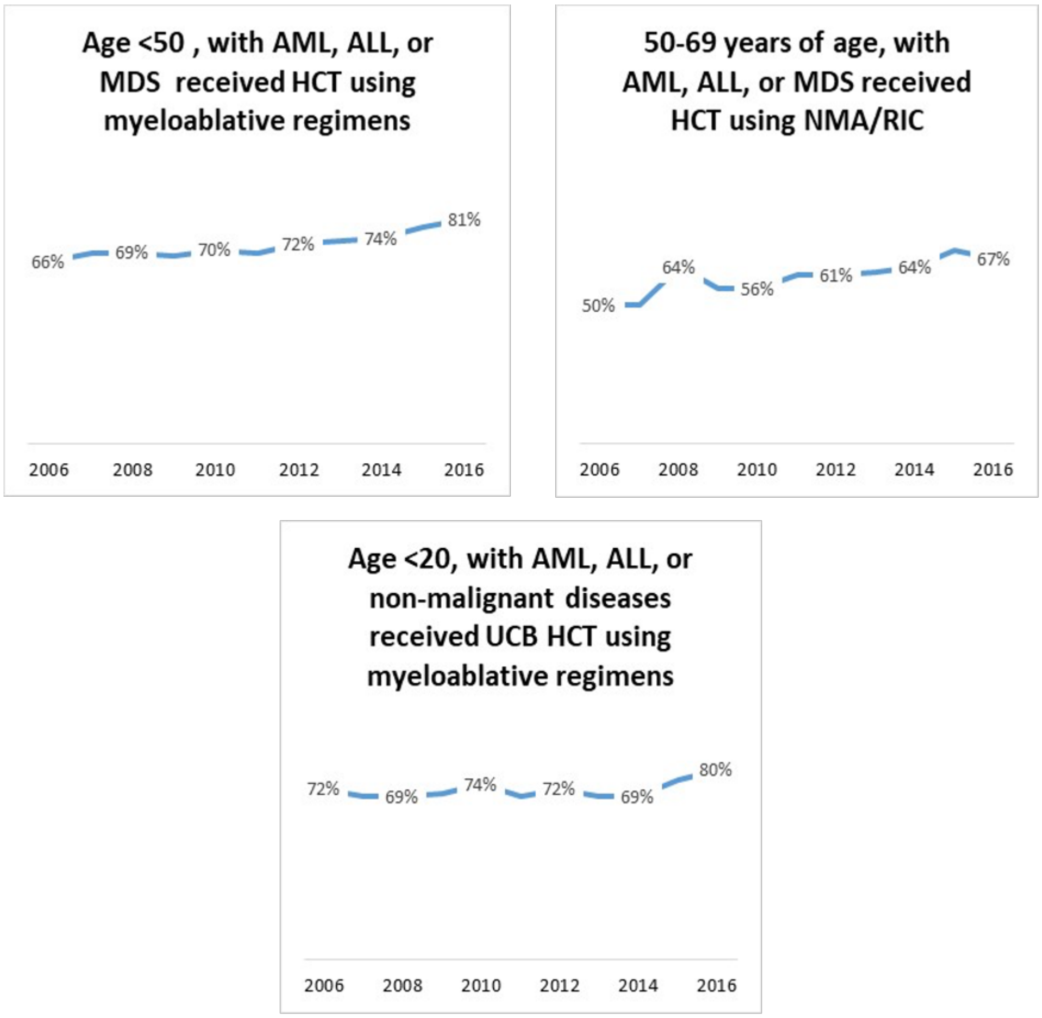


Data source: NMDP

[a] Other includes multiracial, other, Native Hawaiian/Other Pacific Islander, American Indian/Alaska Native

* Total number indicating Hispanic or Latino ethnicity or race; not a mutually exclusive category.

FIGURE 7.12: 1-Year Survival Rate of Unrelated Blood Stem Cell Transplant among Three Specific Populations[a-c]



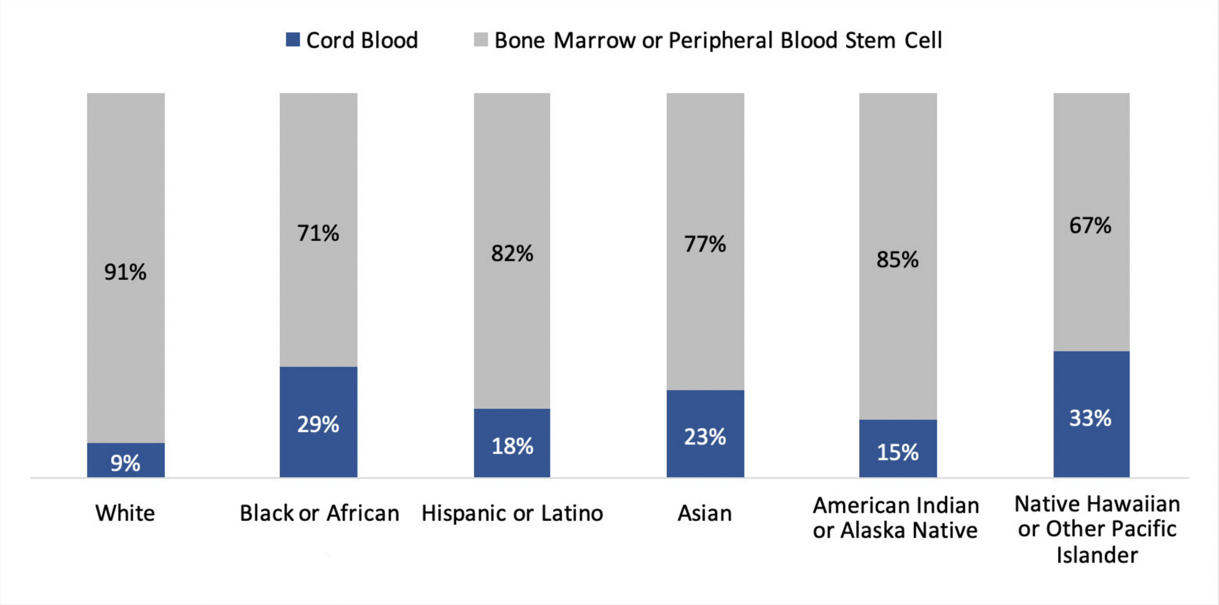
Data source: NMDP

[a] Transplants facilitated by the CWBYCTP

[b] AML: Acute Myelogenous Leukemia, ALL: Acute Lymphoblastic Leukemia, MDS: Myelodysplastic Syndromes, HCT: hematopoietic cell transplantation, NMA/RIC: non-myeloablative/reduced intensity conditioning regimens, UCB: umbilical cord blood

[c] Survival rate adjusted for patient characteristics

FIGURE 7.13: Percentage of Transplants from Cord Blood or Bone Marrow/Peripheral Blood Stem Cell Source in FY 2017, by Race/ Ethnicity



Data source: NMDP

Chapter 8. Ryan White HIV/AIDS Program

For 30 years, HRSA has funded grants to states, cities, counties, clinics, and community-based organizations to provide HIV services to patients. These services include medical care, medications, and essential support services to low-income people with HIV through the RWHAP. In 2017, the RWHAP served over a half million clients, representing over half of all people with diagnosed HIV in the United States.[1] The RWHAP is a comprehensive system of high-quality, direct health HIV care, treatment, and support services, delivered by an extensive network of providers. This is the foundation for reaching the public health goal of ending the HIV epidemic in the United States.

The RWHAP provides services to the most underserved communities; nearly two-thirds of RWHAP clients live at or below 100 percent of the FPL and almost 13 percent do not have stable housing (i.e., 7.8 percent have temporary housing and 5.1 percent have unstable housing). Approximately three-fourths of RWHAP clients are racial and ethnic minorities. HIV viral suppression outcome measures demonstrate the success of the RWHAP; 85.9 percent of patients receiving medical care were virally suppressed in 2017, which has a major public health benefit of reducing HIV transmission.[2]

The RWHAP is critical to ensuring that individuals with HIV are linked to and retained in care, able to adhere to medication regimens, and ultimately, remain virally suppressed. This is not only crucial to improving the health outcomes of people with HIV but to preventing further transmission of the virus and, ultimately, ending the HIV epidemic.[3, 4] People with HIV who take HIV medicine as prescribed and achieve and maintain an undetectable viral load have effectively no risk of sexually transmitting the virus to an HIV-uninfected partner.[5]

HIV in the United States

In 2017, 38,739 people received an HIV diagnosis in the United States and 6 dependent areas.[6] Gay and bisexual men accounted for 66.5 percent of all newly diagnosed infections and 80.6 percent of all HIV diagnoses among men in the United States and 6 dependent areas. HIV diagnosis rates decreased among Blacks/African Americans from 2012 through 2016. However, according to 2017 statistics, Blacks/African Americans continue to have the highest rate of HIV diagnoses at per 100,000 population. Most racial and ethnic groups (i.e., Hispanics/Latinos and people of multiple races) experienced declines in HIV diagnosis rates since 2012. However, HIV diagnosis rates increased for AIANs and Asians in the period from 2012 through 2016.[6]

In 2017, areas in the South continued to have higher rates of HIV diagnoses (16.1 per 100,000) despite experiencing a decrease in rates from 2012 through 2016. The Northeast has the second highest rate of HIV diagnosis (10.6), followed by the West (9.4) and the Midwest (7.4).[6]

Ryan White HIV/AIDS Program

The RWHAP provides a comprehensive system of care that includes HIV primary medical care, medication, and essential support services for low-income people with HIV who are uninsured or underserved.[4] The Program funds grants to states, cities, counties, clinics, and community-based organizations to provide HIV care and treatment services to more than a half million people each year. The RWHAP reaches more than half of all people with diagnosed HIV in the United States.

The RWHAP consists of five Parts as described in the statute:

- Part A provides grant funding for medical and support services to Eligible Metropolitan Areas and Transitional Grant Areas. These are population centers that are the most severely affected by the HIV epidemic.
- Part B provides grant funding to states and territories to improve the quality, availability, and organization of HIV health care and support services. Grant recipients include all 50 states, the District of Columbia, Puerto Rico, Guam, the U.S. Virgin Islands, and 5 additional U.S. Pacific jurisdictions. In addition, Part B also includes grants for the AIDS Drug Assistance Program (ADAP), which provides access to HIV-related medications through the purchase of medication and the purchase of health insurance coverage.
- Part C provides grant funding to local community-based organizations to support outpatient HIV early intervention services and ambulatory care. Part C also funds capacity development grants, which help organizations more effectively deliver HIV care and services.
- Part D provides grant funding to support family-centered, comprehensive care to women, infants, children, and youth with HIV.
- Part F provides grant funding that supports demonstration models, technical assistance, and access-to-care programs. These programs include:
    - The Special Projects of National Significance Program, supporting the testing, evaluation, and replication of innovative interventions of care delivery for hard- to-reach populations; The AIDS Education and Training Centers Program, supporting the education and training of health care providers treating people with HIV through a network of eight regional centers and two national centers;
    - The Dental Programs, providing additional funding for oral health care for people with HIV through the Dental Reimbursement Program and the Community-Based Dental Partnership Program.

Together, the Parts of the RWHAP provide a comprehensive system of direct patient services, medications, and essential support services (e.g., nonmedical case management, housing, transportation, nutritional services) that results in linkage to care, retention in care, medically appropriate treatment, and viral suppression.[4]

The RWHAP requires all grant recipients to conduct needs assessments and to allocate resources and services based on their local process and local decision-making. This allows the RWHAP recipients to determine the HIV care and treatment service delivery system to meet patient needs based on their demographics, their health status and/or co- morbidities, the other services available through public or private health coverage, and their geography (e.g., distance to an HIV care provider).[4] Additionally, due to the “payor of last resort” provision in the RWHAP statute, recipients are required to use the RWHAP funding only if other funds are not available for that purpose. HRSA works closely with recipients to help create a service mix that leverages existing resources to meet the needs of local communities.

Clients Served by the Ryan White HIV/AIDS Program

Nearly three-quarters of RWHAP clients are from racial and ethnic-minority populations. In 2017, 47.1 percent of clients identified as Black/African American, 23.1 percent Hispanic/Latino, and less than 2 percent each are AIAN, Asian, Native Hawaiian/Pacific Islander, and persons of multiple races. Whites accounted for 26.4 percent of clients.

HRSA’s RWHAP provides life-saving care and treatment to low-income people with HIV in the United States. Nearly two-thirds of RWHAP clients are living at or below 100 percent of the FPL. In 2017, 62.8 percent of clients were living at or below 100 percent FPL. A higher percentage of females (72.2 percent) and transgender (76.2 percent) clients were living at or below 100 percent FPL, compared with male clients (58.9 percent).

People with HIV are living longer because of advances in HIV treatment and systems of care. Through the RWHAP, people with HIV receive crucial care, treatment, and support services that help them reach and maintain viral suppression and live near-normal life expectancies. In 2017, people aged 50 years and older accounted for 45.2 percent of all RWHAP clients, an increase from 37.9 percent of clients in 2013. In total, this amounts to an increase of over 42,000 clients aged 50 years and older during this time.

RWHAP Health Outcomes

According to a CDC Clinical Monitoring Project study, receipt of care and support services at RWHAP-funded facilities is associated with improved outcomes (such as viral suppression), compared with other facilities.[7] RWHAP client-level data help HRSA, recipients, and sub-recipients to better understand the populations served and identify opportunities for innovation to improve health outcomes. RWHAP client-level data are reported to HRSA by recipients and sub-recipients who provide HIV care, treatment, and support services. These data demonstrate the impact of the RWHAP investments in core medical and support services across RWHAP Parts A, B, C, and D recipients. Data reported annually in the Ryan White HIV/AIDS Program Services Report (RSR) detail the services provided, as well as client characteristics and their HIV-related health outcomes. In addition to demonstrating health outcomes, client-level data are essential for program development and innovation. HRSA uses client-level data to identify geographic areas and populations (e.g., racial and ethnic minorities) with health disparities and to measure the impact of programmatic innovation to improve health outcomes for people with HIV.

Viral suppression is a widely accepted outcome measure in HIV care and treatment. Viral suppression is the result of ongoing, effective HIV treatment. People with HIV who reach and maintain viral suppression have significantly reduced HIV-related morbidity and mortality, are likely to live near-normal lifespans, and have effectively no risk of sexually transmitting HIV to others. From 2010 through 2017, the overall percentage of RWHAP clients with viral suppression increased by 16.4 percentage points, from 69.5 percent to 85.9 percent (Figure 8.1).

Viral suppression varies by state, and in particular, percentages of viral suppression are generally lower in the Southern United States. Overall, however, great progress has been made toward improving viral suppression among RWHAP clients across all states (Figure 8.2).[4]

Figure 8.3 displays the change over time in percentages of RWHAP clients who are virally suppressed by race and ethnicity. All racial and ethnic groups have seen improved percentages of viral suppression from 2010 through 2017. Improved percentages of viral suppression throughout the RWHAP demonstrate the program's effectiveness in ensuring positive health outcomes for clients. While the percentage of people with HIV who are virally suppressed in the RWHAP have increased and racial disparities have decreased, disparities persist. The percentage of Black/African American clients in the RWHAP who achieve viral suppression is lower than the overall percentage of virally suppressed RWHAP clients. These results demonstrate the importance of interventions to improve engagement of Black/African American clients in RWHAP care.

Age-based disparities also exist, although the disparities are decreasing. Younger RWHAP clients have lower viral suppression percentages than other age groups. Only 74.1 percent of youth aged 13-24 in the RWHAP achieved viral suppression in 2017. Comparatively, 91.1 percent of RWHAP clients aged 55-64 achieved viral suppression and 94.3 percent of RWHAP clients aged 65 years and older achieved viral suppression.

RWHAP Clients and Housing

Stable housing improves health outcomes for all people, and this is particularly true for people with HIV. Nearly 8 percent of RWHAP clients had temporary housing in 2017 and 5.1 percent had unstable housing.[8] Clients with unstable housing have lower rates of viral suppression than clients with stable or temporary housing. In 2017, 71.2 percent of clients with unstable housing achieved viral suppression, compared with 79.0 percent of clients with temporary housing and 87.2 percent of clients with stable housing (Figure 8.4). Although viral suppression among clients identified as having unstable housing has increased by 16 percentage points since 2010, those clients still have among the lowest viral suppression rates of any subpopulation in the RWHAP system, and the disparity gap has not improved.

Summary

Over the past 30 years, there have been monumental advancements in science, services, and treatment options for HIV. It is clear, however, that many people with HIV need an array of medical and support services in addition to medication and routine medical visits, in order to reach and maintain viral suppression. From 2010 to 2017, the overall documented percentage of viral suppression among RWHAP clients receiving medical care has improved from 69.5 percent to 85.9 percent, an increase of more than 16 percentage points. This improvement can be seen geographically as well as across race and ethnicity groups. As the disparities across many populations lessen, there remain populations among which significant disparities continue (e.g., youth and unstably housed) and will require enhanced effort and investments. The HRSA HIV/AIDS Bureau (HAB) continues to assess the disparities and identify successful interventions to improve health outcomes among all low-income people with HIV served by HRSA's RWHAP.

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FIGURE 8.1: Viral Suppression among Clients Served by the Ryan White HIV/AIDS Program (non-ADAP), 2010–2017—United States and 3 Territories (Guam, Puerto Rico, and U.S. Virgin Islands)

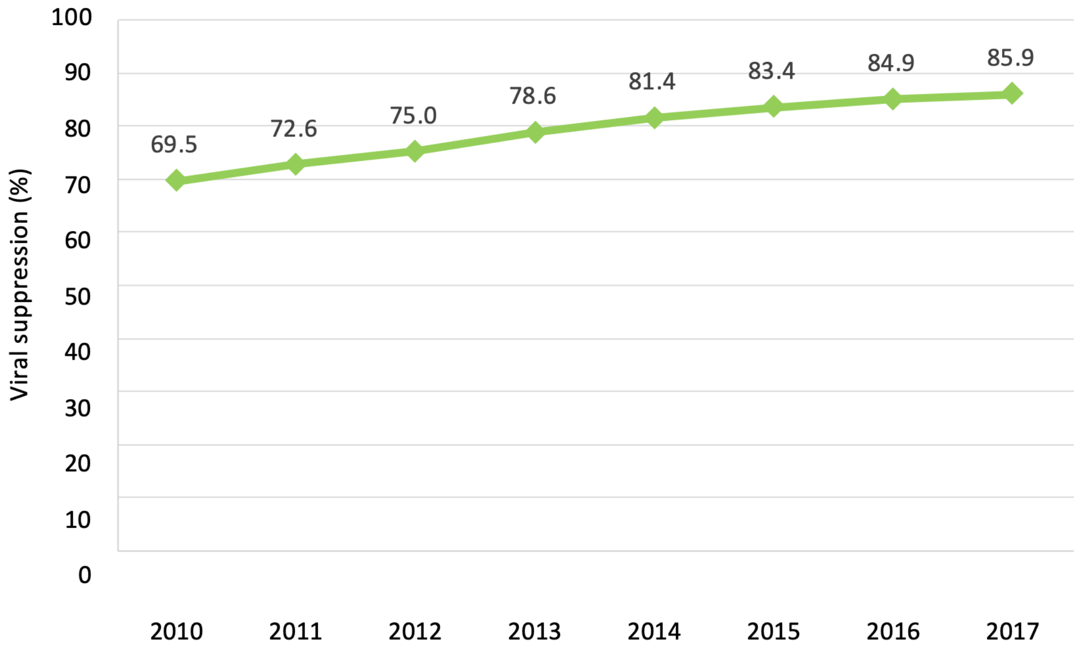


FIGURE 8.2: Viral Suppression among Clients Served by the Ryan White HIV/AIDS Program (non-ADAP) by State, 2010–2017—United States and 2 Territories (Puerto Rico and U.S. Virgin Islands)

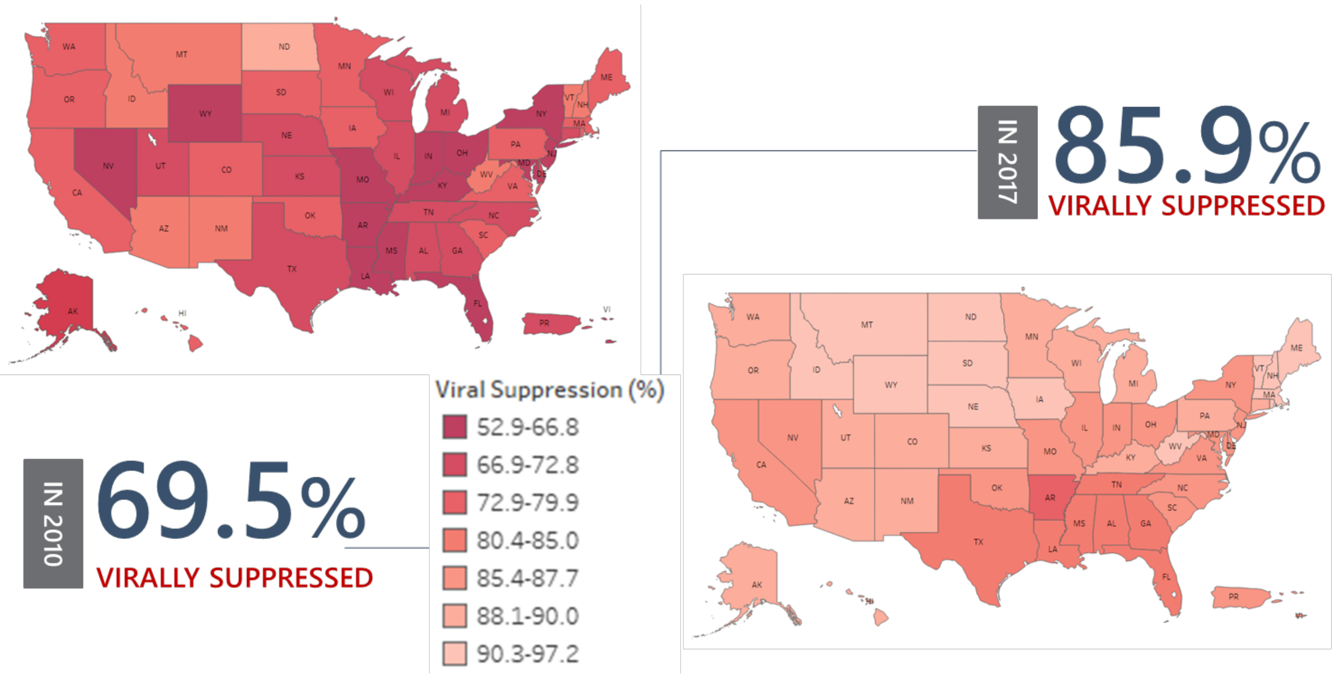


FIGURE 8.3: Viral Suppression among Clients Served by the Ryan White HIV/AIDS Program (non-ADAP), by Race/Ethnicity, 2010-2017—United States and 3 Territories (Guam, Puerto Rico, and U.S. Virgin Islands)

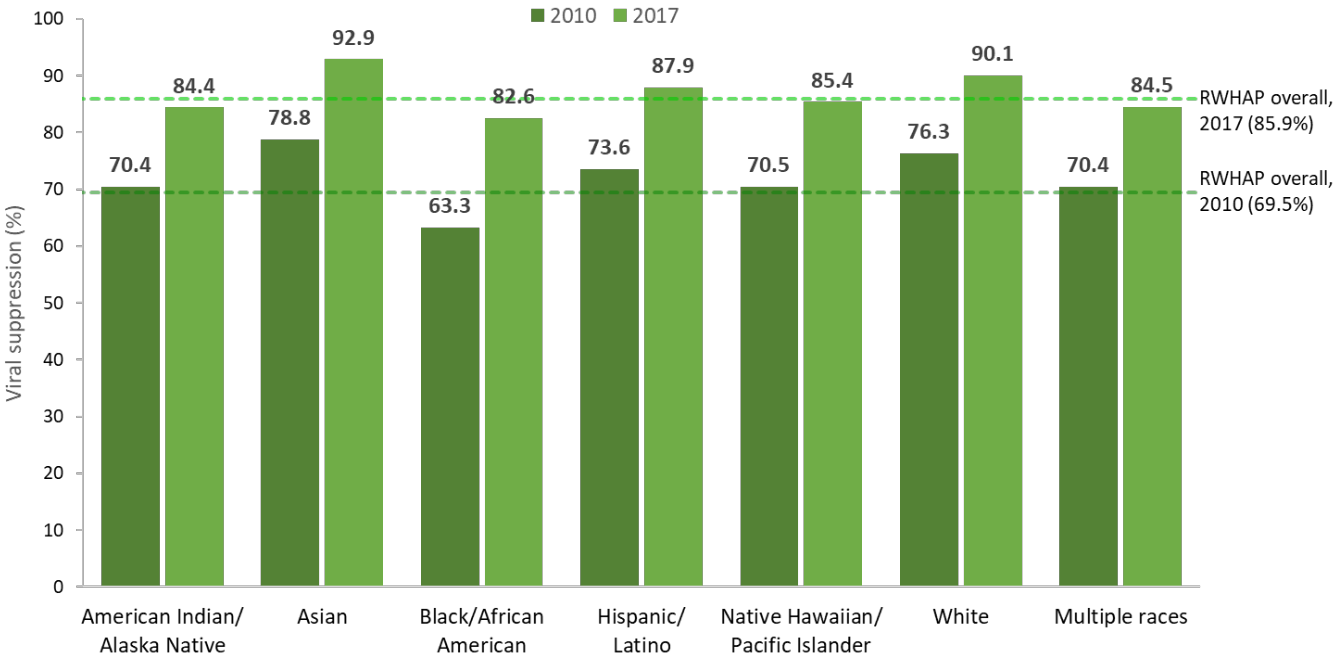
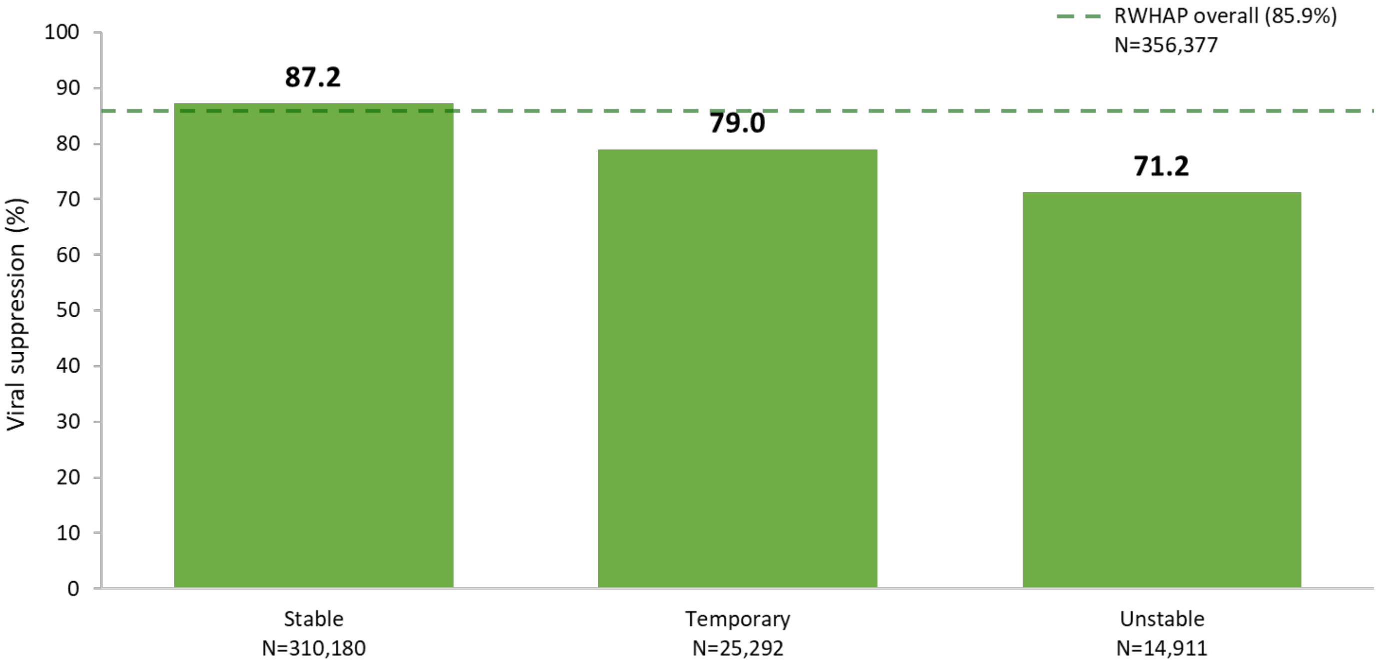


FIGURE 8.4: Viral Suppression among Clients Served by the Ryan White HIV/AIDS Program (non-ADAP), by Housing Status, 2017—United States and 3 Territories (Guam, Puerto Rico, and U.S. Virgin Islands)



Chapter 9. Health Workforce

The Bureau of Health Workforce (BHW) improves the health of underserved and vulnerable populations by strengthening the health workforce and connecting skilled professionals to communities in need. BHW focuses resources on positively impacting every aspect of a health professional's career, from education and training, to service in the community.

The BHW's efforts are driven by three priorities:

- Transforming the health care workforce through sustained support of clinicians working in underserved areas.
- Increasing access to behavioral health services, including substance use disorder (SUD) treatment.
- Leveraging health care workforce data to inform program and policy decisions.

Health Careers Pipeline and Diversity Programs

Evidence indicates that diversity among health professionals is associated with (1) improved access to care for racial and ethnic-minority patients, (2) greater patient choice and satisfaction, and (3) better patient- clinician communication.[1] The health workforce, however, is not representative of the racial and ethnic diversity of the population as a whole.[2]

A recent review of 72 peer-reviewed research studies determined that the factors most strongly associated with primary care physicians working in underserved areas (both urban and rural) include: (1) being a racial/ethnic underrepresented minority (URM) and (2) growing up in an inner city or rural area.[3] Although URMs comprise more than 25 percent of the U.S. population and are projected by the U.S. Census Bureau to increase to 39 percent by 2050,[4] URMs account for approximately 13 percent of the physician workforce; 18 percent of the nursing workforce; 11 percent of dental workforce; and 13 percent of the psychologist workforce.[5]

Titles VII and VIII of the Public Health Service Act (PHSA) authorize several programs that are intended to increase the number of diverse, culturally competent primary care providers representing various disciplines. Overall, the diversity programs authorized under Titles VII and VIII of PHSA play a key role in filling the pipeline of health care professionals throughout the United States and its Territories, and expanding the numbers of minority health care professionals to be more reflective of the people they serve. The following programs highlight how these investments are enabling individuals from diverse backgrounds to receive training and provide services in underserved areas across the country.

Centers of Excellence (COE)

The COE Program is authorized under Title VII of the PHSA to increase the supply and competencies of URMs in the health professions workforce. The COE Program provides grants to health professions schools and other public and nonprofit health or educational entities to serve as innovative resource and education centers for the recruitment, training and retention of URM students and faculty.

- In Academic Year 2017-2018, the most recent reporting period, programs and activities supported through the COE program reached 5,045 trainees across the country.
    - Of those, 49.9 percent were disadvantaged students and 88.7 percent were URM students.
    - A subset of 1,191 structured program trainees received direct financial support. The majority of these students were considered URM in the health professions and included 41 percent of students who self-identified as being Hispanic/Latino and 56 percent who self-identified as being non-Hispanic Black or African American.

  - COE grantees supported 365 collaborative faculty-student research projects related to minority health issues, involving 544 faculty and 599 health professions students.

Area Health Education Centers (AHEC)

The AHEC Program is authorized under Title VII of the PHSA to develop and enhance education and training networks within communities, academic institutions, and community- based organizations with the broader goal of improving health care delivery to rural and underserved areas and populations.

- In Academic Year 2017-2018, programs and activities supported through the AHEC program reached 297,169 trainees across the country.
  - Of those, 33.7 percent were disadvantaged students and 24 percent were URM students.
  - AHEC grantees partnered with 5,512 clinical sites to provide training experiences to students and medical residents (e.g., ambulatory practice sites, hospitals, and physician offices).
  - Approximately 60 percent of these clinical training sites were situated in primary care settings; 66 percent were located in medically underserved communities; and 45 percent were in rural areas. Nearly 14 percent of the training sites offered substance use treatment services.

Health Careers Opportunity Program (HCOP)

The goal of the HCOP, authorized under Title VII of the PHSA, is to provide individuals from disadvantaged backgrounds who desire to pursue a health professions career an opportunity to develop the skills needed to successfully compete for, enter, and graduate from schools of health professions or allied health professions.

- In Academic Year 2017-2018, programs and activities supported through HCOP reached 5,017 trainees across the country.
- Of those, 91.7 percent were disadvantaged students and 71.7 percent were URM students.
- A subset of 2,000 structured program trainees who received direct funding support were URM in the health professions and included 37 percent who self- identified as being Hispanic/ Latino, 43 percent who self-identified as being non- Hispanic Black/African American, and 4 percent who self- identified as being non-Hispanic American Indian or Alaska Native.
- HCOP grantees partnered with 140 different sites to provide clinical training to students interested in careers in the health professions (e.g., academic institutions, hospitals, and community health centers). Over 70 percent of clinical training sites were in a medically underserved communities and 31 percent were in primary care settings.

Nursing Workforce Diversity (NWD)

The NWD Program, authorized under Title VIII of the PHSA, increases nursing education opportunities for individuals from disadvantaged backgrounds, including racial and ethnic minorities underrepresented among registered nurses.

- In Academic Year 2017-2018, programs and activities supported through the NWD program reached 6,549 trainees across the country.
  - Of those, 83.9 percent were disadvantaged students and 65.9 percent were URM students.
  - NWD grantees partnered with 743 clinical sites to provide 6,888 training experiences to NWD trainees and 24,000 experiences to other interprofessional trainees. Clinical training sites offered substance use (31 percent) and opioid use (26 percent) treatment services.
  - Approximately 41 percent of these training

sites were situated in primary care settings and approximately 34 percent were located in medically underserved communities.

Scholarships for Disadvantaged Students (SDS)

The SDS program, authorized under Title VII, provides grants to schools who use the funding for scholarships to students from disadvantaged backgrounds, enrolled in health professions programs.

- In Academic Year 2017-2018, the SDS program provided 3,047 scholarships – all to students from disadvantaged backgrounds.
    - Of the total scholarship awards, 1,095 awards went to URM students including approximately 37 percent of students self-identified as Hispanic/Latino and 28 percent self-identified as non-Hispanic Black/African American.
    - In addition, 1,051 students who received SDS-funded scholarships successfully graduated from their degree programs by the end of Academic Year 2017-2018.
    - The majority of graduates intended to seek employment or further education in medically underserved communities (68 percent) and/or primary care settings (52 percent).

Behavioral Health Workforce Education and Training (BHWET)

The BHWET Program aims to develop and expand the number and distribution of the behavioral health workforce to ensure an adequate supply of professional and paraprofessionals across the country (with a particular emphasis on medically underserved and rural communities).

- In Academic Year 2017-2018, 44.1 percent of these trainees reported coming from disadvantaged backgrounds.
    - BHWET grantees partnered with 2,244 training sites (e.g., hospitals, ambulatory practice sites, and academic institutions) to provide clinical training experiences to student trainees.
    - Two-thirds of training sites were located in medically underserved communities where trainees provided over 1.1 million hours of behavioral health services to patients and clients. Nearly half of the sites (48 percent) offered substance use disorder treatment services and over 20 percent offered opioid use disorder treatment services.
    - BHWET grantees developed or enhanced and offered nearly 1,200 behavioral health-related courses and training activities, reaching over 23,000 students, fellows, medical residents, and practicing professionals.

Key BHW Loan and Scholarship Program Accomplishments

BHW's loan and scholarship programs (https://bhw. hrsa.gov/loansscholarships) improve the health of the nation's underserved communities by recruiting health care providers to health professional shortage areas (HPSAs). In addition, these program also attract disproportionately higher percentages of clinicians who are URM and from rural and disadvantaged backgrounds. The following descriptions outline the main loan and scholarship programs administered by BHW.

The National Health Service Corps (NHSC) Scholarship and Loan Repayment Programs

The NHSC helps improve the health of the nation's underserved communities by recruiting clinicians to provide primary health services in HPSAs of greatest need. Over the last 45 years, more than 50,000 clinicians have participated in the program. The NHSC provides care to approximately 13.7 million medically underserved people at 5,200 NHSC- approved sites across the country. Approximately 36 percent of clinicians are serving in rural areas, which is considerably more than the 21 percent of the U.S. population considered rural. Currently, minorities represent approximately 23 percent of the FY 2018 NHSC field strength (clinicians presently fulfilling their service obligation), while they represented 37 percent of the FY 2018 NHSC pipeline (students presently in health professions programs).

NHSC State Loan Repayment Program (SLRP)

The NHSC SLRP, authorized under Title III of the PHSA, is a grant program to states and territories that provides cost-sharing grants to assist them in operating their own state educational loan repayment programs for primary care providers working in HPSAs within their state and serves as a complement to the NHSC.

Nurse Corps

Nurse Corps, authorized under Title VIII of the PHSA, awards scholarships and loan repayment to nurses, nursing students, and nurse faculty in exchange for a minimum commitment of 2 years of service at a facility experiencing a critical shortage of nurses. Both Nurse Corps scholarship and loan repayment programs award individuals based on those with the greatest financial need.

With a total FY 2018 Nurse Corps field strength of 1,928, Nurse Corps participants are employed in health care facilities in 47 states. Over 70 percent of Nurse Corps participants remain at their assigned site after fulfilling their service obligation; and approximately 90 percent plan to continue to work at their critical shortage facility for an additional year. Approximately 54 percent of participants completing their initial 2-year service commitment extended their service for one additional year.

Currently, as self-reported, minorities represent approximately 26 percent of the FY 2018 Nurse Corps field strength (clinicians presently completing their service obligation) while they represented 41 percent of the FY 2018 Nurse Corps pipeline (students presently in nursing school programs).

Health Professional Shortage Areas (HPSAs)

The authorizing statute for the NHSC created HPSAs to fulfill the statutory requirement that NHSC personnel be directed to areas of greatest need. To further differentiate areas of greatest need, HRSA calculates a score for each HPSA. There are three categories of HPSAs based on health discipline: primary care, dental health, and mental health. HPSAs may be designated for:

- Geographic Areas – a shortage of providers for the entire population within a defined geographic area (Table 9.1).
- Population Groups – a shortage of providers for a specific population group within a defined geographic area (e.g., low-income, migrant farmworkers) (Table 9.1).
- Facilities – Correctional Facilities (federal, state and youth detention); State Mental Hospitals; Auto-HPSAs (Federally Qualified Health Centers, Look-A-Likes; Indian Health Facilities, Rural Health Clinics) (Table 9.1).

Once designated, HRSA scores HPSAs on a scale of 1-25 for primary care and mental health, and 1-26 for dental health, with higher scores generally indicating greater need. As part of BHW's cooperative agreement with the State and territorial Primary Care Offices (PCOs), the PCOs conduct needs assessments in their states, determine what areas are eligible for designations, and submit designation applications to HRSA/BHW for review and approval. BHW reviews all new or updated HPSA designation applications and makes the final determination on designation. Shortage designations help the agency prioritize and focus limited resources on the areas of highest need.

As of June 30, 2019, there were 6,418 designated primary care HPSAs, 5,304 designated dental HPSAs, and 4,592 designated mental health HPSAs. Geographic mal-distribution also contributes to the shortage of primary care providers in many communities. Rural areas have less than half the number of physicians to population compared to urban areas.[6] To address this shortage, BHW administers programs that support the training of a skilled health workforce who are prepared to practice in underserved and rural areas, as well as programs that incentivize primary care providers to work in areas with identified health workforce shortages. The subsequent maps display the HPSA scores for primary care, dental, and mental health across the country (Figures 9.1, 9.2, 9.3 respectively).

In FY 2018, HRSA launched the Clinician Tracker (now referenced as the Clinician Dashboard as of FY 2019), which captures a variety of data, including the percentage of NHSC and Nurse Corps alumni who continue to work in a HPSA or the community where they completed service, and the percentage of alumni who currently work or previously worked in a rural area. The total dataset currently includes almost 17,000 NHSC and Nurse Corps clinicians with a National Provider Identifier (NPI), who completed service between 2012 and 2017. Based on the FY 2018 Participant Satisfaction Survey, approximately 84 percent of those who had fulfilled their NHSC commitments remained in service to the underserved in the short term, defined as up to 2 years after their NHSC commitments ended.[7] The Lewin Group also found in a September 2016 study that “79 percent of NHSC participants serve in primary care HPSAs 1 year after completion of their NHSC service,” though “less than half of participants who are still in primary care HPSAs 1 year after separation are actually in the same county as the one in which they served while in service (i.e., 43 percent of participants).”[8] An evaluation conducted in FY 2012 showed that 55 percent of NHSC clinicians continue to practice in underserved areas 10 years after completing their NHSC service commitment[9] reaffirming findings from an earlier study in FY 2000, which showed the majority of NHSC clinicians remained committed to service to the underserved in the short and long term.[10]

Opioid Investments

BHW funds and manages programs which address the impacts of the opioid epidemic and disparities in access to behavioral health treatment. These programs build the capacity of the behavioral health and primary care workforce and improve the distribution of providers across the U.S. by:

- Expanding use of NHSC to supply needed health care workers in regions with high opioid use and abuse:
  - In FY 2019, HRSA used a special Congressional substance use disorder/opioid use disorder (SUD/OUD) appropriation to develop the NHSC SUD Workforce Loan Repayment Program (LRP). The SUD Workforce LRP provided 1,074 health care professionals with awards of up to $75,000 each in exchange for a 3-year commitment to provide SUD treatment to vulnerable communities across the country.
  - In addition, in FY 2019, HRSA launched the NHSC Rural Community LRP, a new program specifically targeted to providers working to combat the opioid epidemic in the nation’s rural communities. The NHSC LRP made 174 FY 2019 loan repayment awards in coordination with the Rural Communities Opioid Response Program (RCORP) initiative within the FORHP to provide evidence-based substance use treatment, assist in recovery, and to prevent overdose deaths across the nation. The NHSC Rural Community LRP offers awards to providers working in rural communities who use evidence-based treatment models to treat substance use disorders and opioid use disorders.
- Prioritizing addiction treatment knowledge across all health disciplines:
  - HRSA also builds the capacity of the primary care and behavioral health workforce by supporting academic institutions, hospitals, and community-based training sites that train current and future providers.
  - In FY 2019, HRSA provided nearly $20 million in supplemental funding to education and training programs for the nursing, oral health, primary care and allied health workforce in addiction prevention and treatment.

- In FY 2019, HRSA announced over $87 million in funding for the Opioid Workforce Expansion Program for Professionals and Paraprofessionals and the Graduate Psychology Education Program. These programs support behavioral health professional and paraprofessional trainees in the provision of SUD and OUD prevention, treatment, and recovery services in high-need areas.
- Another HRSA workforce initiative, the Behavioral Health Workforce Education and Training (BHWET) Program, increases the number of behavioral health providers entering the behavioral health workforce, with a special emphasis on clinical intervention and treatment for those at risk of developing behavioral health disorders. In FY 2018, HRSA made an additional $8 million in awards to current BHWET grantees for a 2-year project that will increase the number of professionals and paraprofessionals trained to deliver behavioral health and primary care services through integrated teams at HRSA-funded health centers.
- HRSA's Primary Care Training and Enhancement Program awarded an additional $6 million in FY 2019 to innovative primary care physician and physician assistant training programs that integrate behavioral health care—including OUD treatment—into primary care, particularly in rural and underserved settings.

National Center for Health Workforce Analysis (NCHWA)

BHW's NCHWA is a national resource for health workforce research, information, and data. NCHWA provides policymakers with information and data to help them make decisions regarding health workforce education, training, and delivery of care. To achieve this, NCHWA analyzes the supply, demand, distribution, education, and training of the nation's health workforce, and coordinates and manages data collection, analysis, and evaluation efforts for BHW programs.[11]

For many years, HRSA has supported the collection and analysis of health workforce data. This data informs national, regional, and state-level health care policy. One of these data products is the Area Health Resource File (AHRF), which provides comprehensive information on a broad range of health care resources and socioeconomic indicators. The AHRF data are designed to be used by planners, policymakers, researchers, and others interested in the nation's health care delivery system and factors that may impact health status and health care in the United States. The AHRF data includes county, state, and national-level files in eight broad areas: Health Care Professions, Health Facilities, Population Characteristics, Economics, Health Professions Training, Hospital Utilization, Hospital Expenditures, and Environment. The HRSA Data Warehouse (HDW) is a website that allows users to interact with AHRF data in charts, tables/reports, maps, and tools. For more information go to https://datawarehouse.hrsa.gov/topics/ahrf.aspx.

Health Workforce Projections

NCHWA's workforce projection reports and factsheets serve as critical planning resources for educators, professional organizations, funding agencies, and policy/decision makers at the local, state, and federal levels. These reports and factsheets provide information on the supply numbers for a given occupation and/or demand for that same type of health care provider, based on the utilization of health care services. They also provide an estimate on the extent to which the supply of a particular health care profession will meet the demand nationally, regionally, and by state.

Long-Term Services and Supports: Direct Care Worker Demand Projections 2015-2030[12]

This projection report shows that in the Long-Term Services and Supports (LTSS) industry, direct care workers (Nursing Assistants, Home Health Aides, Personal Care Aides and Psychiatric Assistants/Aides) comprise 71 percent of the workforce.

Continued increases in national-level demand for this industry are anticipated for these 4 occupations between 2015 and 2030.

- In 2015, there was a demand for approximately 2.3 million direct care workers. Based on the projected demand, by 2030 an estimated 3.4 million direct care workers will be needed to work in LTSS settings.
- Many people with LTSS needs reside in the community, and the workforce demand reflects this fact. Half (50 percent) of the direct care workforce demand is in home- and community-based settings, 25 percent of the workforce demand is in residential care facilities, and the remaining 25 percent is in nursing homes.
- Under an alternative scenario which takes into account possible improvements in population health, short-term demand for direct care workers in LTSS will likely decline. However, because of the increased longevity associated with these improvements in population health, changes, long-term demand for direct care workers in LTSS would increase by 7 percent (255,000 full-time equivalents).

Long-Term Services and Supports: Nursing Workforce Demand Projections 2015-2030[13]

This projection report shows that the increase in demand for nursing occupations in LTSS in the United States, although anticipated to be seen in all states, will be distributed unevenly across the nation. Specifically, projected demand growth for registered nurses (RNs) and licensed practical nurses (LPNs) between 2015 and 2030 varies substantially by state and region.

- The demand for RNs will grow by 46 percent from 438,600 FTEs in 2015 to 638,800 FTEs in 2030, and demand for LPNs is projected to drive the workforce to grow by 46 percent, from 364,200 FTEs in 2015 to 532,900 FTEs in 2030.
- If current levels of LTSS care are maintained, Texas is projected to have the largest increase in demand for overall LTSS nursing care provided by RNs and LPNs between 2015 and 2030.
    - For RNs, the states with the highest projected increases in demand include Colorado (76 percent), Utah (74 percent), New Mexico (72 percent), Arizona (72 percent), California (71 percent) and Texas (71 percent).
    - For licensed practical/vocational nurses, the highest projected increases in demand include Colorado (78 percent), Utah (75 percent), New Mexico (74 percent), Arizona (73 percent), California (72 percent) and Texas (72 percent).
- The state projected to experience the smallest demand increase is Nebraska (4 percent), followed by New York (21 percent). These states have the same percentage of increase in demand for both registered nurses and licensed practical nurses.
- When accounting for possible improvements in population health, short-term demand for RNs and LPNs in LTSS will likely decline. However, because of anticipated increases in longevity, long-term demand for LTSS is likely to rise by about 8 percent compared to baseline projections for RNs (increased by 49,800 full-time equivalents) and LPNs (increased by 43,100 full-time equivalents).

Behavioral Health Workforce Projections, 2016-2030[14]

This projection report includes national-level health workforce estimates for the health workforce for the following behavioral health occupations between 2016 and 2030: addiction counselors; marriage and family therapists; mental health and school counselors; psychiatric technicians and psychiatric aides; psychiatric nurse practitioners and psychiatric physician assistants; psychiatrists; psychologists; and social workers.

In addition to the updated national projections, this report included state-level projections for each occupation. The release of this information supports HHS's continued efforts to combat the ongoing opioid and substance use disorder crisis across the nation, as mental health and substance abuse disorder providers are critical to addressing this epidemic.

Allied Health Workforce Projections, 2016-2030[15]

This projection report includes national-level health workforce estimates for the following allied health occupations between 2016 and 2030: chiropractors and podiatrists; community health workers; emergency medical technicians and paramedics; medical and clinical laboratory technologists; occupational and physical therapists; optometrists and opticians; pharmacists; registered dieticians; and respiratory therapists.

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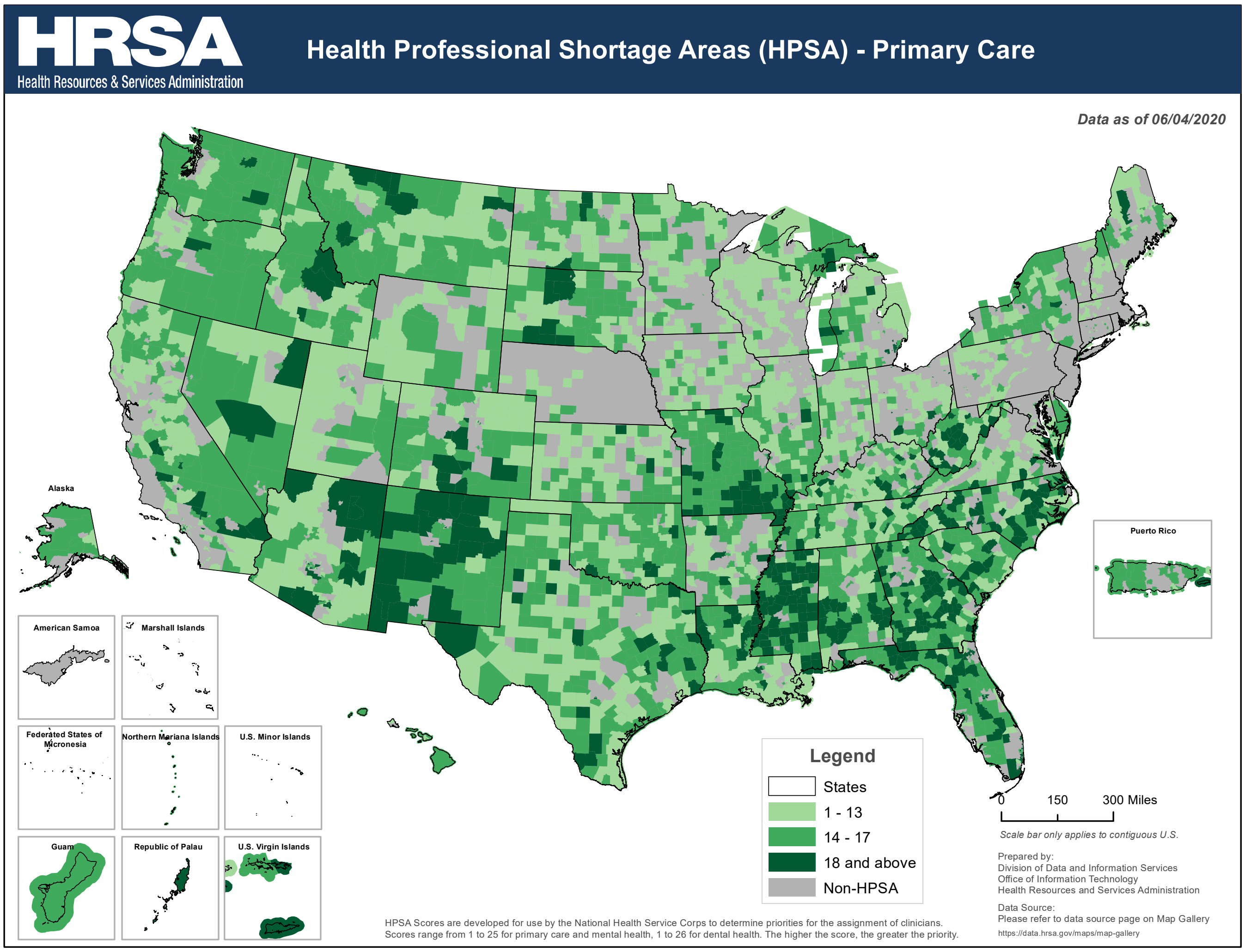
TABLE 9.1: Health Professional Shortage Areas: Number, Population, and Additional Practitioners Needed for Geographic Areas, Population Groups, and Facilities as of June 30, 2019

	NUMBER OF DESIGNATIONS	POPULATION OF DESIGNATED HPSAS	PERCENT OF NEED MET	PRACTITIONERS NEEDED TO REMOVE DESIGNATIONS
Primary Medical HPSAs	**6,418**	**75,384,039**	**44.88%**	**13,758**
Geographic Area	1,316	31,473,315	58.32%	4,071
Population Group	1,640	43,027,528	36.37%	9,115
Facility	3,462	883,196	34.37%	572
Dental HPSAs	**5,304**	**53,913,560**	**30.17%**	**9,527**
Geographic Area	589	11,229,672	49.92%	1,283
Population Group	1,699	41,747,387	25.21%	7,811
Facility	3,016	936,501	31.52%	433
Mental Health HPSAs	**4,592**	**111,671,772**	**27.27%**	**6,100**
Geographic Area	1,015	77,007,162	29.87%	3,501
Population Group	438	33,462,927	18.02%	1,988
Facility	3,139	1,201,683	37.00%	611

For the most up to date HPSA statistics and definitions of data points, please visit the Designated HPSA Quarterly Summary at https://data.hrsa.gov/Default/GenerateHPSAQuarterlyReport

FIGURE 9.1: Health Professional Shortage Area (HPSA) – Primary Care



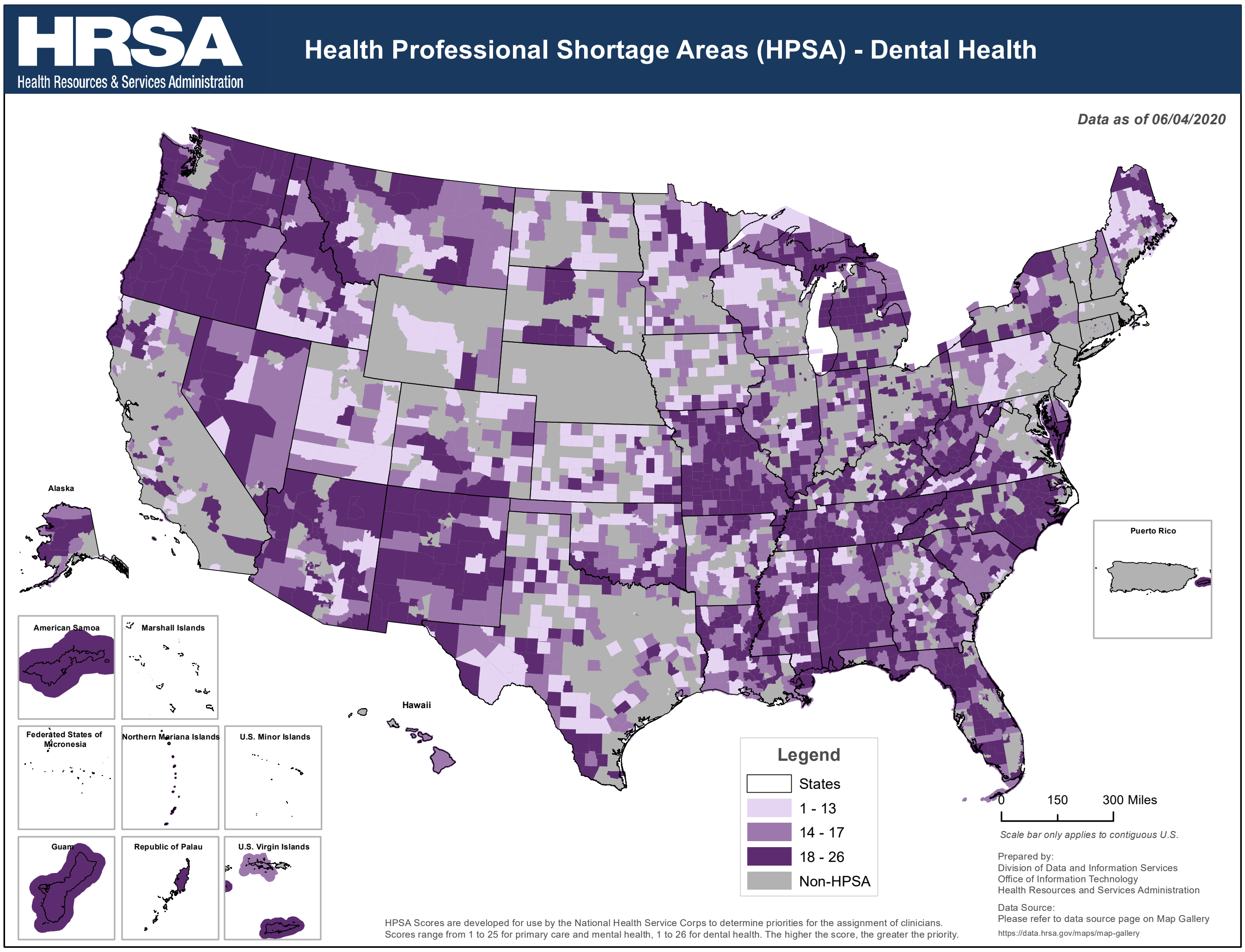
Scale bar only applies to contiguous U.S.

Prepared by:
Division of Data and Information Services
Office of Information Technology
Health Resources and Services Administration

Data Source:
Please refer to data source page on Map Gallery
https://data.hrsa.gov/maps/map-gallery

HPSA Scores are developed for use by the National Health Service Corps to determine priorities for the assignment of clinicians. Scores range from 1 to 25 for primary care and mental health, 1 to 26 for dental health. The higher the score, the greater the priority.

FIGURE 9.2: Health Professional Shortage Area (HPSA) – Dental Health



Data as of 06/04/2020

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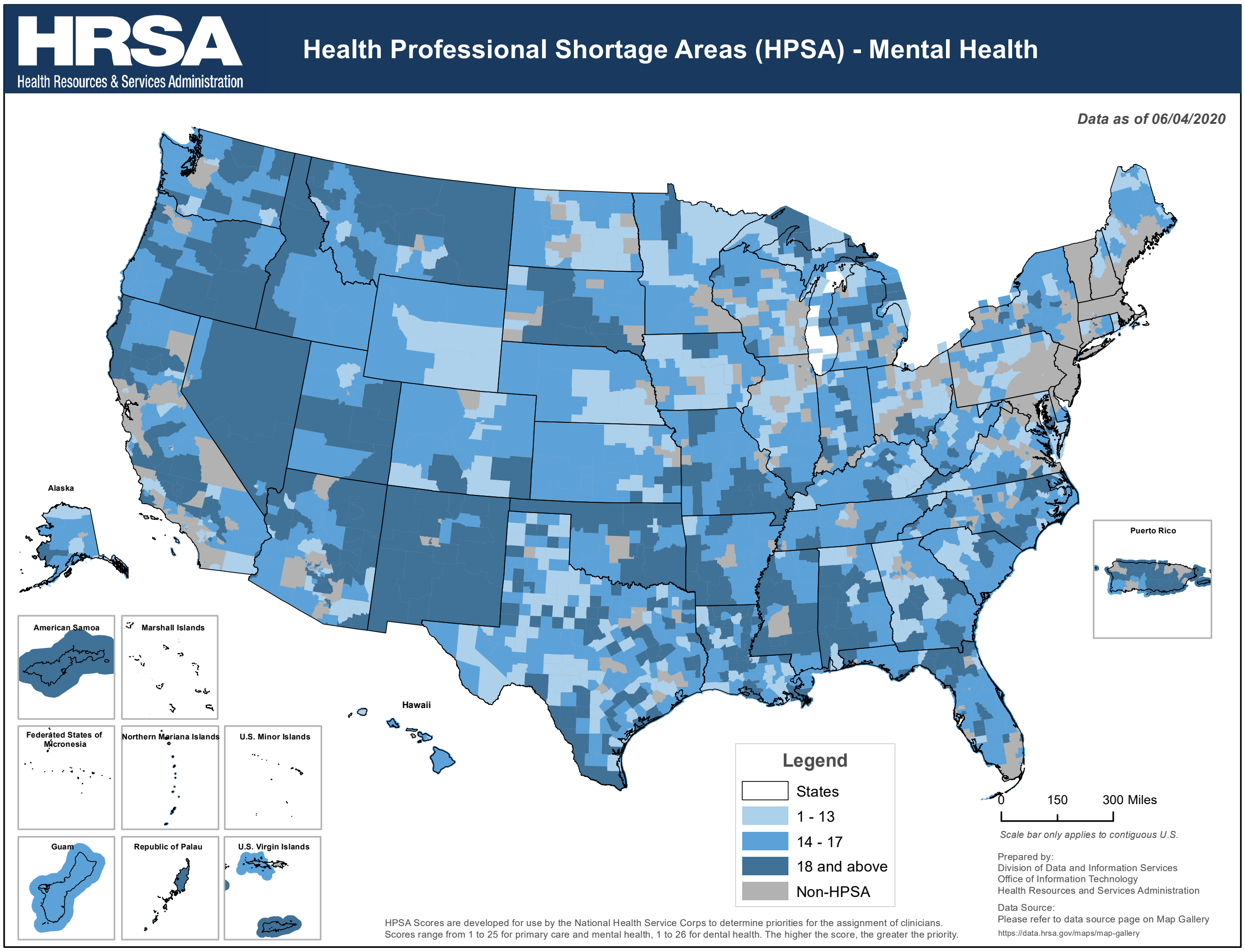
HPSA Scores are developed for use by the National Health Service Corps to determine priorities for the assignment of clinicians. Scores range from 1 to 25 for primary care and mental health, 1 to 26 for dental health. The higher the score, the greater the priority.

FIGURE 9.3: Health Professional Shortage Area (HPSA) – Mental Health



Scale bar only applies to contiguous U.S.

HPSA Scores are developed for use by the National Health Service Corps to determine priorities for the assignment of clinicians. Scores range from 1 to 25 for primary care and mental health, 1 to 26 for dental health. The higher the score, the greater the priority.

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Chapter 10. Rural-Urban Health Disparities

Established in 1987 under Section 711 of the Social Security Act, FORHP plays 2 distinct but complementary roles within HHS to address the unique issues confronting more than 57 million people who live in rural America:[1] (1) advising the Secretary of Health and Human Services on rural policy issues across HHS and (2) administering grant programs to improve health care in rural areas. Locating both functions in the same office allows FORHP to use its policy role to inform the development of grant programs and its programmatic role to provide community-level perspectives when assessing the impact of HHS policy on rural areas.[2]

Historically, rural communities have struggled with issues related to declining population, limited access to care, recruitment and retention of health care providers, and maintaining the economic viability of small rural health care providers. These remain current and vital issues. People under age 65 in the most rural counties are most likely to be without health insurance, with a Census report showing that in 2017 nonmetropolitan areas had an uninsured rate of 9.2 percent, while metropolitan areas had a rate of 8.8 percent.[3] Most primary care health professional shortage areas were in rural counties in 2018 and compared to health care providers serving urban areas there were more rural providers per capita in occupations requiring fewer years of education and training (e.g., licensed practical nurses) than those requiring more (e.g., physicians, registered nurses) from 2008 to 2010. While rural Americans represent approximately 15 to 20 percent of the population, fewer than 10 percent of all physicians and surgeons practice in rural areas.[4] However, primary care physicians are more likely to practice in rural areas with an average of 6.8 primary care physicians per 10,000 in rural areas and 8.4 per 10,000 in urban areas.[5] People living in rural areas also often live farther away from health care resources, adding to the burden of accessing care.

The availability of services is a key aspect of access to health care and closures of rural hospitals can lead to reduced availability. FORHP-supported research of 47 rural hospital closures from 2010 to 2014 found that, compared to rural hospitals that stopped providing inpatient care but continued to offer other health care services, hospital facilities that closed completely and no longer provided any services served markets with a higher proportion of people of color.[6] In partnership with the North Carolina Rural Health Research Program, FORHP monitors rural hospital closures to inform stakeholders and policymakers and has identified 119 rural hospitals that have closed from January 1, 2010 through December 1, 2019. In addition to these historic rural health issues, persistent rural-urban disparities in health outcomes are often attributed to rural populations being “older, sicker, and poorer” than their urban peers.

Rural Housing Inequities

The relationship between socioeconomic status, housing, and poor health has been studied in depth but the relationship is complex and confounding factors make it difficult to know which and how housing conditions directly impact health outcomes.[7] Research on housing has many facets including examining location of residence, housing tenure, and housing quality.

The American Housing Survey (AHS) is sponsored by the U.S. Department of Housing and Urban Development and conducted by the U.S. Census Bureau. The 2017 AHS shows that there are some disparities between urban and rural housing. Rural housing is more likely to be reported as inadequate (6.6 percent) compared to urban housing (4.6 percent). Rural housing is also more likely to be reported as damaged than urban housing, with 9.1 percent of rural houses having damaged or sagging roofs compared to 4.6 percent of urban housing; 5.5 percent of rural housing missing siding, bricks or other exterior wall materials compared to 2.6 percent of urban housing; and 6.4 percent of rural housing having broken or boarded-up windows compared to 3.7 percent of urban housing.[8]

In one study, increased incidence of coronary heart disease was associated with living in a neighborhood with disadvantaged socioeconomic characteristics, even after controlling for personal characteristics such as income, education and occupation.[9] Housing tenure, indicated by whether a person rents or owns a home, is associated with health outcomes. Another study highlighted how respondents who rent were 2.1 times more likely to report fair or poor health and home ownership was associated with lower odds of hospital emergency department visits due to asthma in another study.[10] Lack of housing is also associated with poorer health. For vulnerable populations such as those living with HIV/AIDS, living in an unstable housing situation can be a challenge to obtaining consistent access to appropriate medical services.[11] Additionally, frequent residential relocations, three or more times a year, was associated with increased use of inpatient mental health and substance abuse services.[12]

Although evidence on improvement in housing conditions such as improving warmth and energy efficiency is tentative, research seems to indicate an association with improved health.[13] Poor housing quality such as cracks in floors or walls or windows, broken plumbing, and exposed wire has been significantly associated with asthma diagnosis.[10] In another study, adjusting for poor housing conditions such as mold, rot, lack of heat, and overcrowding significantly reduced socioeconomic inequalities in non-communicable conditions such as headaches and breathing problems.[14] Based on this evidence, housing conditions in rural communities may ultimately protect people living in these areas from the psychosocial stressors and environmental exposures that may lead to poorer health. For example, AHS data shows that, compared to urban counties, a smaller share of homes in rural counties were surveyed as damp (i.e., water leakage from inside the structure within the last 12 months) (8.4 percent vs. 7.3 percent, respectively) or moldy (i.e., housing units with mold in the last 12 months) (3.7 percent vs. 3.2 percent), while similar shares were surveyed as cold (i.e., uncomfortably cold for 24 hours or more within the last 12 months) (5.7 percent vs. 5.6 percent).[8]

In the original analysis of the 2015-2017 Behavioral Risk Factor Surveillance System (BRFSS) data, urban and rural differences in health behavior risks and health outcomes were examined among those who own their homes compared to those who rent. BRFSS participants who lived in rural areas (n=217,324) were more likely to be older (38.3 percent rural greater than or equal to 65 years old vs. 36.7 percent urban greater than or equal to 65 years old), male (42.5 percent rural vs. 41.0 percent urban), White (86.1 percent rural vs. 71 percent urban), less educated (16.5 percent less than high school education in rural vs. 11.8 percent less than high school education in urban), impoverished (32.2 percent less than $25,000 rural vs. 23.7 percent urban), and a homeowner (84.9 percent rural vs. 81.0 percent urban). Figure 10.1 shows rural-urban differences in age-adjusted prevalence of selected health indicators by housing status for the time period 2015 through 2017. In examining differences in health indicators by geography, Figure 10.1 indicates a higher prevalence of renters identified as a current smoker than homeowners in rural areas (28.1 percent vs. 15.8 percent, respectively). Compared to homeowners in rural areas, renters had a higher prevalence of poor or fair health (21.6 percent vs. 40.0 percent) and poorer general mental health (10.2 percent vs. 18.6 percent where respondents indicated that they experienced greater than 13 days where mental health was not good, including stress, depression, and problems with emotions). Additionally, prevalence of adverse health outcomes such as asthma, heart disease, stroke, diabetes, chronic obstructive pulmonary disease, cancer, arthritis, and depression were higher among rural renters compared to rural home owners.

Opioid Epidemic

Impacts of the opioid crisis are unevenly distributed across the nation. Rural communities shoulder a disproportionate burden that significantly affects health and quality of life.[15] Overdose deaths increased faster in rural (nonmetropolitan) areas (270 percent) than in urban areas (150 percent) between 2010 and 2015, and by 2016 the rural overdose death rate (18.7 per 100,000 persons) surpassed that of its metropolitan counterparts.[16] Among only rural areas, the overdose death rate was 4.8 times higher in 2016 than it was in 2000.[17] In 2017, there was a 21.4 percent increase in drug overdose deaths from the previous year, with 6 out of 10 overdose deaths involving an opioid.[18]

Rural communities face a disproportionate supply of opioid analgesics. In 2017, 14 rural counties were among the 15 counties nationwide with the highest opioid prescribing rates,[19] putting rural patients at higher risk for misuse, addiction, and overdose mortality.[20] Unfortunately, rural communities also often lack access to necessary treatment, particularly medication-assisted treatment (MAT), which practitioners recognize as the most effective intervention for OUD.[21] The number of rural physicians with waivers authorized by the Drug Addiction Treatment Act of 2000 to prescribe buprenorphine for MAT grew from 117 in 2004 to 852 in 2011,[22] but more than 60 percent of rural counties lacked a waivered physician in 2016.[23]

Socioeconomic vulnerabilities such as limited educational attainment and lower incomes[24] may also amplify many rural opioid users' risk of adverse outcomes. In many rural areas, increasing economic instability that accompanies these vulnerabilities may have led to premature "deaths of despair" caused by self-destructive health behaviors such as the misuse of opioids and other substances. Evidence suggests such deaths were primarily of middle-aged (i.e., 45-64 years) non- Hispanic White adults with fewer years of education.[25] Age-adjusted premature death rates for all adults declined by 8 percent between 1999-2001 and 2013-2015 but death rates increased 4 to 6 percent for nine subpopulations of middle-aged White adults largely residing outside large urban areas.[26] This was attributed primarily to White populations having had the highest rate of drug overdose mortality in 2015: 79 percent higher than the rate for non-Hispanic Black populations and 180 percent higher than the rate for Hispanic populations.[27] Often lost in the "deaths of despair" analysis, however, is that death rates for middle-aged White adults remained substantially lower than among similarly aged Black adults in 2015 in both urban (40 percent less) and rural (28 percent less) areas.[28]

Social and economic circumstances may significantly influence the rising mortality rate among rural White populations compared to their urban counterparts but may also contribute to longstanding intra-rural disparities by race and other factors. For example, drug overdose mortality rates (per 100,000 population) among White populations, Black populations, and AIANs are higher in urban than in rural areas. However, the change in the number of deaths increased faster among racial/ethnic groups residing in rural rather than urban areas, including AIAN (+519 percent between 1999 (3.9) and 2015 (19.8) vs. +261 percent between 1999 (7.1) and 2015 (22.1), respectively), White populations (+343 percent between 1999 (4.0) and 2015 (19.2) vs. +224 percent between 1999 (6.6) and 2015 (21.4), respectively), and Black populations (+148 percent between 1999 (3.1) and 2015 (7.1) vs. +107 percent between 1999 (8.0) and 2015 (12.7), respectively).[16] By geography, investigation at the county level reveals that higher and lower drug overdose death rates among rural communities tended to cluster together.[29] Between 2007 and 2009, rural counties with significantly higher opioid-related mortality were located in the North Pacific coast (i.e., northern California, Washington), Appalachia (i.e., areas of Kentucky, Tennessee, West Virginia, Virginia, North Carolina), and the Gulf Coast (i.e., the coast of Louisiana, Mississippi, and Florida) while those in the Central Plains (i.e., North and South Dakota, Nebraska, Kansas), Texas, and regions of Alaska experienced significantly lower opioid-related mortality.[29] These spatial relationships have persisted. Taken together, rural counties in West Virginia experienced greater opioid-involved overdose deaths (32.3 deaths per 100,000) between 2012 and 2016 while rural counties in Nebraska (2.2), South Dakota (3.9), and North Dakota (4.0) experienced far fewer.[30]

Housing is another social and economic factor worth special consideration for its association with opioid misuse. In particular, nonclinical living environments for individuals recovering from SUD, known as “recovery housing,” have shown positive outcomes on long-term sobriety.[31] In 1 study, patients with OUD, including 25 percent facing homelessness, who received outpatient psychosocial treatment and stayed in recovery housing were significantly more likely to be opioid-abstinent at 1-month (5.5 times), 3-month (4.3 times), and 6-month (4.1 times) follow-up than patients who received outpatient psychosocial treatment alone.[32] Despite such evidence of success, the national prevalence of recovery housing programs in rural and urban areas is unknown.[31]

FORHP Programs

Opioid Response

In its programmatic role emphasizing grants, cooperative agreements, technical assistance, and other activities to support and improve health care in rural communities, FORHP has instituted new programs to address the crisis of OUD and opioid-involved deaths in rural communities.

Rural Health Opioid Program (RHOP)

In FY 2017, FORHP launched RHOP, which provides grant funding to rural, community-based consortia to increase access to treatment for individuals with OUD; implement care coordination practices; and support individuals in recovery by establishing new or enhancing existing behavioral counseling, peer support, and alternative pain management activities. RHOP supports 36 award recipients in rural communities across the country.

Rural Communities Opioid Response Program (RCORP)[33]

In FY 2018, FORHP launched RCORP, a new, multi-year program with the overall goal of reducing the morbidity and mortality of SUD, including OUD, in rural counties at the highest risk for SUD. Since its inception, Congress has appropriated $250 million for RCORP, which encompasses several initiatives designed to increase access to prevention, treatment, and recovery services for SUD, particularly OUD, in high-need rural communities, including:

- *Planning (P).* RCORP-P grants support RCORP’s overall goal by strengthening the organizational and infrastructure capacity of multi-sector consortia to address OUD prevention, treatment, and recovery in high-risk rural communities. Over the course of the 1-year period of performance, consortia received up to $200,000 to formalize their partnership, identify OUD workforce and service needs in their communities, and develop plans to address those needs.
- *Implementation (I).* RCORP-I grants fund established networks and consortia to enhance and expand SUD/OUD prevention, treatment, and recovery service delivery in high-risk rural communities. RCORP-I award recipients receive up to $1 million for 3 years to implement a set of core activities that align with the HHS “Five-Point Strategy to Combat the Opioid Crisis”[34] and develop plans to sustain those activities after the grant period ends.
- *MAT expansion.* RCORP-MAT grants fund small rural hospitals and clinics to establish sustainable MAT programs, thereby increasing the number of access points where rural opioid users can receive evidence-based treatment.
- *Technical assistance (TA).* The RCORP-TA cooperative agreement provides technical assistance support for rural communities engaging in activities to combat SUD, focusing on OUD. The TA efforts enhance the

organizational and infrastructural capacity of multi- sector consortia at the community, county, state, and/or regional levels. The overall goal is the reduction of morbidity and mortality associated with opioid overdoses focusing on prevention, treatment and recovery in high-risk rural communities.

- *Rural centers of excellence on substance use disorders (RCOE).* The RCORP-RCOE cooperative agreement supports the dissemination and implementation of best practices related to the treatment for and prevention of SUD within rural communities, with a focus on the current opioid crisis and developing methods to address future substance use disorder epidemics. Three independent centers serve as a resource for technical assistance to county and state health departments and other entities serving rural communities. These clinicians and public health practitioners face unique challenges but often do not have the guidance or protocols necessary to implement proven drug prevention programs, particularly for communities that were not the subjects of the original research as is often the case for rural communities.[30] For example, one center will provide technical assistance to help rural communities develop and implement recovery housing programs for SUD intervention, a proven intervention with evidence of success.[31, 32] Adapting this intervention to address rural housing issues and the norms, values, and cultures of rural communities can advance long-term recovery outcomes for rural communities often disconnected from the most effective treatment options.[23]
- *Evaluation*. The RCORP-Evaluation cooperative agreement evaluates all RCORP award recipient activities and technical assistance activities and develop evaluation tools and resources for use in rural communities. Given the limited access to SUD treatment providers and the high needs for OUD prevention, treatment, and recovery services in rural communities, it is especially important that providers have access to the right resources, latest data, and user-friendly tools to effectively and efficiently address this crisis. However, the misuse of opioids in rural populations is a surprisingly understudied area of research that merits greater attention.[15] To help address these research gaps, RCORP-Evaluation will evaluate RCORP award recipient activities and their progress towards the stated award goals; collaborate with the RCORP-TA provider to identify RCORP best practices; use RCORP findings to identify research needs; provide valuable resources for rural communities to use; and make recommendations for future rural SUD/OUD programs. Data collected by RCORP will be used to help rural communities better understand areas for improvement and identify effective improvement interventions to efficiently target limited resources.

Policy Research Division (PRD). FORHP accomplishes its mission to advise the Secretary of Health and Human Services on rural issues through routine regulatory policy review and analysis and the development of memos and White papers for HRSA and HHS leadership. FORHP also administers a variety of programs to inform the public and relevant stakeholders about critical issues in rural health policy.

Information Dissemination. The FORHP-funded Rural Health Information Hub is a national clearinghouse on rural health information designed to support health care delivery and population health in rural communities. It is home to a wide variety of tools and resources.

Rural Health Research. The purpose of the Rural Health Research Center cooperative agreement is to increase the amount of impartial, policy-relevant research available to assist health care providers and decision-makers at the Federal, State and local levels better understand the challenges faced by rural communities and provide information that will inform policies designed to improve access to health care and population health. Findings are synthesized into publically available policy briefs designed to be easily understood by a non-technical audience and are disseminated by the FORHP-funded Rural Health Research Gateway.

Policy Analysis and Technical Assistance. PRD supports a number of programs designed to analyze health care policies and provide TA to rural communities, including:

- *The Rural Health Innovation and Transformation Technical Assistance* program, better known as Rural Health Value, analyzes rural implications of changes in the organization, finance, and delivery of health care services and assists rural communities and health care providers transition to a high-performance rural health system. Analyses, resources, and tools developed by the Rural Health Value Team for rural communities and providers are available at https://ruralhealthvalue.public-health.uiowa.edu/.
- *The Rural Health and Economic Development Analysis* program is designed to increase public and stakeholder awareness of the economic impacts of rural health care sectors on rural, state, and national economies as well as the relationship between community economic development and the health outcomes of rural people living in rural areas.
- The purpose of the *Rural Health Clinic Policy and Clinical Assessment* program is to identify key policy, regulatory and clinical challenges facing Rural Health Clinics (RHC) and identify possible solutions, while also informing them and other rural stakeholders about key RHC issues, including regulatory and programmatic changes that affect care delivery in these locations.
- The *Rural Policy Analysis* program supports research and analysis of cross-cutting health and human services policy issues affecting rural communities in order to identify trends and challenges in a changing rural environment.

Rural Residency Planning and Development (RRPD) Program. Training medical residents in rural areas is one strategy shown to successfully encourage graduates to practice in rural settings and increase access to health care for these communities.[35] The RRPD Program is jointly administered by FORHP and the BHW. The grant program supports the development of new rural residency programs or rural training tracks in family medicine, internal medicine, and psychiatry to expand the physician workforce in rural communities that are sustainable through ongoing Medicare, Medicaid, State or private funding. 27 grants were awarded for a project period beginning August 1, 2019, and ending July 31, 2022. Through a cooperative agreement, FORHP has also established a rural residency planning and development technical assistance (RRPD-TA) center. Awarded September 30, 2018, the RRPD-TA center provides post-award technical assistance to RRPD grant award recipients engaged in creating sustainable, successful rural residency programs and maintains a website with portal access for RRPD grant program recipients at https://www.ruralgme.org.

Community-Based Division (CBD). The Community-Based Division provides funding to increase access to care in rural communities and to address their unique health care challenges. Currently, the programs include the Rural Health Care Services Outreach, Rural Network Development and Planning, Small Health Care Provider Quality Improvement, and Delta States Network Grant Program as well as pilot programs targeting specific priority areas or areas of need. These grant programs improve access to care, coordination of care through collaboration (including partnerships with housing authorities to provide affordable, stable housing), integration of services, and quality improvement. These non-categorical grants give flexibility to award recipients to determine the best ways to meet local need. Recipients are required to use a promising practice or evidence-based model and develop a sustainability plan that will allow the services to continue in the community after funding has ended. CBD includes the Black Lung Clinics Program with the goal of reducing the morbidity and mortality associated with occupationally related coal-mine dust lung disease. CBD also funds the Radiation Exposure Screening and Education Grant Program which supports programs for cancer screening for individuals adversely affected by the mining, transport and processing of uranium and the testing of nuclear weapons for the nation's weapons arsenal.

FORHP emphasized three elements within Outreach, Network, and Quality Improvement grant programs over the past 8 years: building the rural evidence base, sustainability, and assessing economic impact. In FY 2017, more than 700,000 individuals received direct services through CBD programs and 100 percent of the award recipients reported having sustained their programming.

Rural Health Care Services Outreach Grant Programs. Rural Health Care Services Outreach grant programs focus on improving access to and coordination of care in rural communities through the work of health care networks, community coalitions and partnerships. The 60 Outreach grants in the 2018 cohort focused on a broad range of issues as determined by the community, such as disease prevention and health promotion, and supported expansion of services such as primary care, mental and behavioral health, and oral health care services. Twelve of the award recipients in the 2018 cohort also focused specifically on cardiovascular disease risk under the Outreach Program Health Improvement Special Project (HISP). The project's focus is to support a cohort of award recipients to do more targeted and clinical interventions and measure their ability to reduce risk through the Centers for Disease Control and Prevention (CDC) Heart Age Calculator.

Radiation Exposure Screening and Education Program (RESEP). RESEP provided 8 grants to states, local governments, and appropriate health care organizations in the 2018 cohort to support programs for cancer screening for individuals adversely affected by the mining, transport, and processing of uranium and the testing of nuclear weapons. Award recipients help clients with appropriate medical referrals, engage in public information development and dissemination, and facilitate claims documentation to aid individuals who may wish to apply for support under the Radiation Exposure Compensation Act (RECA). In 2017 the percent of patients screened at RESEP clinics who file RECA claims that received RECA benefits was nearly 83.7 percent, exceeding the target of 72 percent.

Hospital-State Division (HSD). The Hospital-State Division works to enhance access to quality care by supporting states and hospitals with resources to strengthen the rural health infrastructure. This includes ensuring a focal point for rural health issues in all 50 states through the State Offices of Rural Health. It also includes state programs focused on supporting rural hospitals and direct technical assistance to rural hospitals.

State Offices of Rural Health (SORH). The SORH Grant Program creates a focal point for rural health issues within each state, linking communities with state, federal, and nonprofit resources and helping to develop long-term solutions. Depending on the needs in each state, SORHs may help keep providers aware of new rural health care initiatives, collect and disseminate data and resources, offer technical assistance for funding and quality improvement, and support workforce recruitment and retention. Collectively SORHs assisted more than 22,000 clients in 2017 including health care organizations, communities, government agencies, and health networks.

State-Managed Rural Hospital Programs. There are three programs targeted to states to support a range of activities to assist Critical Access Hospitals (CAHs) and eligible small rural hospitals. They are:

- *Medicare Rural Hospital Flexibility (Flex) Program.* Flex provides support and technical assistance to more than 1,300 CAHs in 45 states on quality reporting and performance improvement initiatives, helps eligible rural hospitals convert to CAH status, and improves rural emergency medical services. A report conducted by the Flex Monitoring Team concluded that hospitals with greater financial need were participating in Flex intervention activities and that participation in Flex interventions was associated with improved revenue cycle performance, and days revenue in accounts receivable was lower.[36] The Flex Program plays a key role in ensuring that CAHs are aligned with quality initiatives across the Medicare program. CAHs are exempt from the Centers for Medicare & Medicaid Services (CMS) quality data reporting requirements, but through the Flex Program, FORHP created a pathway for CAHs to submit quality data and use that information to demonstrate areas of high quality and identify areas for improvement. This pathway, the Medicare Beneficiary Quality Improvement Project (MBQIP), is a recognized National Quality Strategy program that began as a voluntary initiative in FY 2010 and became a required Flex Program activity in FY 2015. In 2017, 98 percent of CAHs reported at least one MBQIP measure. Figure 10.2 shows the percent of Critical Access Hospitals (CAHs) reporting Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) between 2011 and 2017. Through the work of state Flex programs the percentage of CAHs reporting HCAHPS survey data has more than doubled since 2011. Figure 10.2 shows consistent increases in the percent of CAHs reporting HCAHPS data, from 41.3 percent in 2011 to 84.4 percent in 2017.

- *Small Rural Hospital Improvement Grant Program (SHIP)*. SHIP provides funding for rural hospitals with 49 beds or fewer for investments in hardware, software, and related training efforts to act as a catalyst to assist in the adaptation to changing payment systems and movement toward value, including valued-based purchasing, accountable care organizations, payment bundling, and implementation of prospective payment systems. These facilities often lack the administrative capacity or the cash reserves to consistently meet new and emerging requirements. In 2017 more than half (59 percent) of all SHIP funds went to support for improved data collection to facilitate quality reporting.
- Flex Rural Veterans Health Access Program (RVHAP). RVHAP operates in collaboration with the U.S. Department of Veterans Affairs Office of Rural Health. The program provides competitive grant funding to states to work with providers and other partners to improve the access to needed health care services and improve the coordination of care for veterans living in rural areas. The FY 2019-2021 program focuses on increasing care coordination, access to mental health and SUD services, and access to crisis intervention services. The FY 2016-2019 RVAHP focused on methods that utilize health information technology through telehealth networks providing clinical services and/or Health Information Exchange networks implementing activities to support the transfer of clinical information for veterans in rural areas to other providers.

Direct Technical Assistance for Rural Hospitals. Three programs offer direct supports to rural hospitals:

- Small Rural Hospitals Transitions (SRHT) Project. SRHT supports small rural hospitals nationally in transitioning to value-based systems by providing technical assistance through educational trainings and comprehensive onsite consultations. SRHT supports hospitals in communities with high levels of socioeconomic vulnerabilities by requiring that participating hospitals must be located in persistent poverty counties, defined as counties where 20 percent of more of residents were poor over the past 4 decades. The SRHT Project has supported 34 hospitals since 2014. Based on this intensive, onsite support, hospitals have reported significant improvements in both financial and quality outcomes including a 17 percent increase in net patient revenue, 14-day increase in days cash on hand, and 10 percentage point increase in HCAHPS discharge planning score.
- Delta Region Community Health Systems Development (DRCHSD) Program. DRCHSD enhances health care delivery in the Delta region through intensive, multi-year technical

assistance to health care facilities in rural communities. Participating hospitals and communities must be in the rural Delta Region and apply through the Delta Regional Authority. The project emphasizes health care value through increased financial viability and operational efficiency, increased quality of care, patient-centered care, and community care coordination.

- Vulnerable Rural Hospitals Assistance Program (VRHAP). VRHAP started in late 2018 to offer targeted, in-depth technical assistance to vulnerable rural hospitals and their communities that are struggling to maintain health care services, whether at risk of losing their hospital or working to maintain services following the recent closure of a rural hospital. VRHAP works with individual hospitals to assess hospital capacity to provide services, identify cost efficiencies and explore options to meeting community health need.

Office for the Advancement of Telehealth (OAT). Telehealth is critical in rural, frontier, and other remote areas that lack access to health care services, including specialty care. In 1 survey, 44.3 percent of health care system respondents said that patient care gaps due to community remoteness was the main reason for adopting telemedicine.[37] HRSA defines telehealth as the use of electronic information and telecommunication technologies to support long-distance clinical health care, patient and professional health-related education, public health and health administration.[38] Telehealth is one effort that allows people to have full and equal access to care enabling them to lead healthy lives. Expanding telehealth use in rural areas helps to link rural health care providers with specialists in urban areas, therefore increasing convenient and timely access, reducing staff costs, and improving patient outcomes and the quality of health care provided to rural communities.

In FY 2018, OAT-funded programs saved nearly 3.2 million patient miles by providing primary and specialty care closer to home.[39] OAT promotes the use of telehealth technologies for health care delivery, education, and health information services. OAT funds multiple grant and cooperative agreement programs that support telehealth networks to expand sites and services, provide technical assistance around the effective use of telehealth, and conduct research.

Telehealth Network Grant Program (TNGP). This program provides grants that demonstrate the use of telehealth networks to improve health care services for medically underserved populations that can be used to (1) expand access to coordinate and improve the quality of health care services; (2) improve and expand the training of health care providers; and/or (3) expand and improve the quality of health information available to health care providers, patients and their families. The current TNGP encourages telehealth services delivered through school-based health centers/clinics, particularly those serving high-poverty populations. OAT currently funds 21 awardees for this program (FY 2016-2020). TNGP has a total number of 110 sites and 45 of those sites have no local providers.

Telehealth Resource Centers (TRCs). Telehealth Resource Centers provide expert and customized telehealth technical assistance across the country. Through a cooperative agreement, TRCs provide (1) training and support; (2) disseminate information and research findings; (3) promote effective collaboration; and (4) foster the use of telehealth technologies to provide health care information and education for health care providers who serve rural and medically underserved areas and populations. TRCs share expertise through individual consultations, training, webinars, conference presentations, and a significant web presence. There are 14 TRCs: 12 regional and 2 specialized to support specific issues (FY 2017-2021).

Licensure Portability Grant Program (LPGP). The LPGP provides support to State professional licensing boards implementing cross-border activities to develop and implement state policies that will reduce statutory and regulatory barriers for clinicians using telehealth who are practicing in multiple states. OAT currently funds 2 awardees in this program (FY 2019- 2024).

Evidence-Based Telehealth Network Program (EB-THNP). The purpose of this program is to use telehealth networks to (1) increase access to behavioral health care services in rural and frontier communities and (2) conduct evaluations of those efforts to establish an evidence base for assessing the effectiveness of tele-behavioral health care for patients, providers, and payers. OAT currently funds 14 awardees in this program (FY 2018-2021). Collected program data reported that over 50 percent of the services at rural and frontier sites in 2018-2019 were new behavioral health care services resulting from EB THNP funding, as shown in Figure 10.3.

Telehealth-Focused Rural Health Research Center (RHRC). There is one RHRC whose focus is to increase the amount of high-quality, impartial, policy-relevant research available to assist health care providers and decision-makers at the federal, state and local level to understand the challenges faced by rural communities. They also provide information to inform policies to improve access to health care and population health (FY 2015-2020).

Substance Abuse Treatment Telehealth Network Grants Program (SAT-TNGP). The purpose of this program is to demonstrate how telehealth programs and networks can improve access to health care services, particularly substance abuse treatment services, in rural, frontier, and underserved communities. OAT currently funds 3 awardees in this program (FY 2017- 2020).

Telehealth Center of Excellence (TCOE). There are two TCOEs located in public academic medical centers. These centers have (1) successful telehealth programs with high volumes of telehealth visits; (2) an established reimbursement structure that allows telehealth to be financially self-sustaining; and (3) established programs that provide telehealth services in medically underserved areas with chronic disease prevalence and high-poverty areas. The TCOEs examine the efficacy of telehealth services in rural and urban areas and serve as a national clearinghouse for telehealth research and resources, including technical assistance (FY 2017-2021).

Summary

The health disparities that exist in rural America are attributed to longstanding issues such as declining population, limited access to care, lack of health care providers, and maintaining the economic viability of small rural health care providers. These issues are compounded by a population that is generally older, sicker, poorer, and living in housing that is more likely to be inadequate. In original research, renters in rural America had a higher prevalence of identifying as a current smoker and adverse health outcomes such as asthma, heart disease, stroke, diabetes, chronic obstructive pulmonary disease, cancer, arthritis, and depression compared to urban renters. In addition to historic socioeconomic and public health challenges, rural America faces new ones such as the increasing number of opioid-related overdose deaths contributing to smaller gains in life expectancy compared to urban areas. FORHP was created to address these unique health issues specific to rural America by administering community-based grant programs, connecting rural and frontier areas to health care services through the use of telehealth, enhancing access to and quality of care at rural hospitals, and advising HHS on the effect of national health care policies and regulations.

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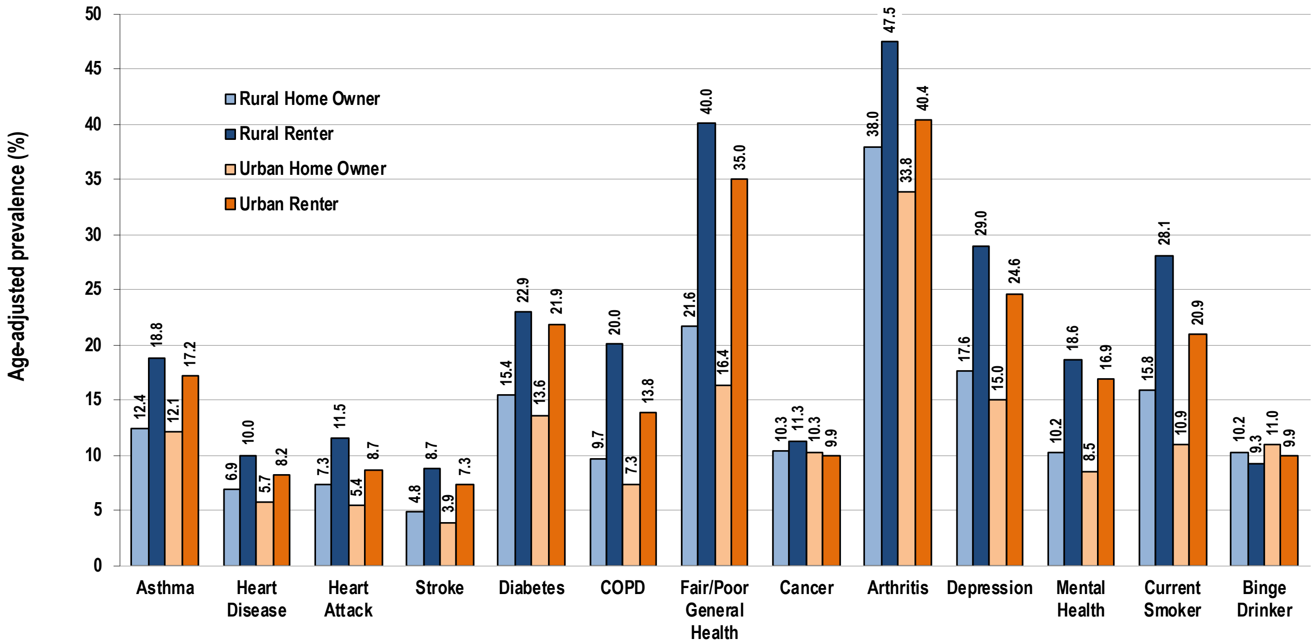
FIGURE 10.1: Rural-Urban Differences in Age-Adjusted Prevalence of Selected Health Indicators by Housing Status, 2015-2017



Source: Data derived from the 2015-2017 Behavioral Risk Factor Surveillance System. COPD = Chronic Obstructive Pulmonary Disease.

All differences by housing status were statistically significant at p<.05 except cancer in urban areas.

FIGURE 10.2: Percent of Critical Access Hospitals (CAHs) Reporting Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS)

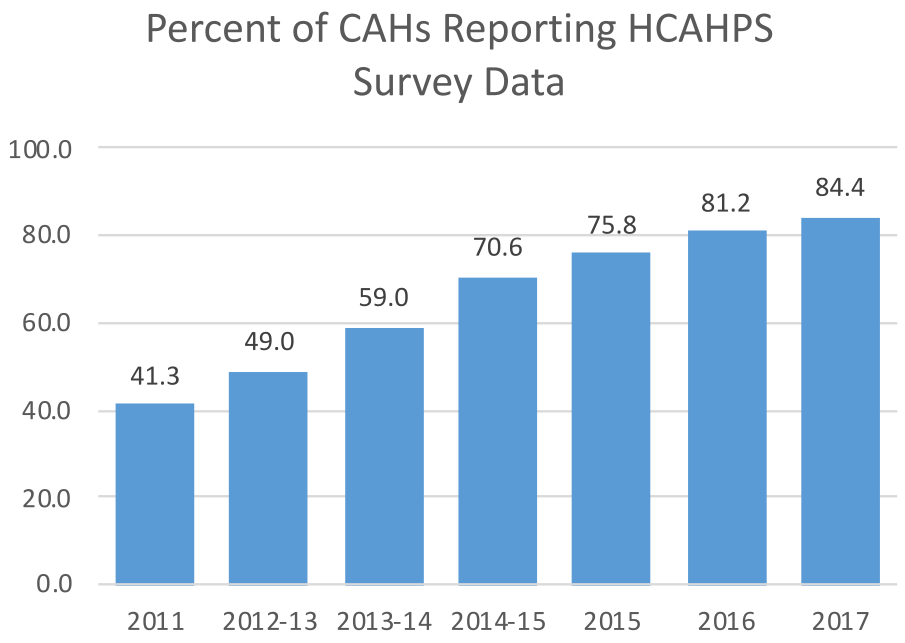
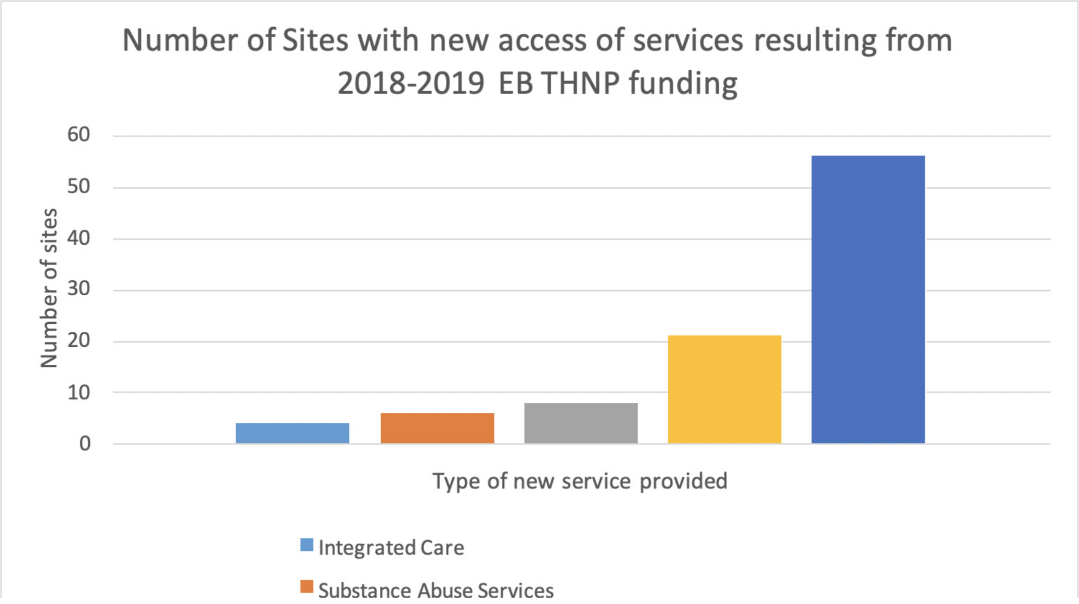


FIGURE 10.3: Number of Sites with New Access of Services Resulting from 2018-2019 EB THNP Funding*



Sites with new access to services because of Evidence Based Tele-Behavioral Health Network Program (EB THNP) 2018-2019 funding.

*Data reflects information from 13 awardees

Chapter 11. Civil Rights and HRSA's Housing and Health Equity Initiatives

Civil rights are the rights of individuals to be free from discrimination and receive equal treatment under the law regardless of one's race, color, national origin, sex, disability status, or other personal characteristic. This chapter explores the history and impact of federal civil rights laws as they relate to housing and health disparities, as well as HRSA's activities at the federal, regional, and local level to improve access and combat health inequities.

Civil Rights as a Foundation for Impacting Health Equity and Secure Housing

The civil rights movement was a social, legal, and political struggle that challenged segregation, pushed for equality, and resulted in the passage of civil rights laws that prohibit discrimination against individuals based on race, disability, and other protected classes. Federal civil rights laws also work to increase access to conditions, such as high- level educational opportunities, safe and affordable housing, and quality health care services, which improve health outcomes. These conditions are examples of population-level SDOH because they affect a population's health, well-being, and quality-of-life. Extensive literature documents the persistent health inequities that exist across the United States based on a population's race, gender, disability, housing status, and other characteristics. To promote health equity and reduce health disparities, the federal government uses civil rights laws as a tool to achieve two objectives. First, the federal government uses enforcement procedures, based on a civil rights legal framework, to address specific instances of discrimination. In addition, the federal government proactively works to equip recipients with information and resources to help ensure compliance with civil rights laws and promote accessibility to their programs.

Enforcement procedures provide potential remedies for victims of discrimination when there is a violation of a federal civil rights law. Members of the public have several options to initiate the enforcement process. First, depending on the law, victims of discrimination may file a lawsuit against a discriminatory entity in federal court. Additionally, if the entity is receiving federal funds, members of the public can file a complaint with a federal civil rights office, which may initiate an investigation against the entity. Although these enforcement procedures are frequently used, they are generally triggered after an individual or group has filed a complaint about the discriminatory act. The federal government does not solely rely on reactive enforcement measures; through its funding agencies, the federal government also works with recipients to proactively prevent discrimination and promote compliance with civil rights laws.

HRSA's Office of Civil Rights, Diversity, and Inclusion

To complement enforcement efforts, HRSA's Office of Civil Rights, Diversity, and Inclusion (OCRDI) provides technical assistance and education regarding civil rights laws to HRSA grant recipients. HRSA has awarded over $10 billion in grants to support health care programs and services that reach people who are geographically isolated, and economically or medically challenged. HRSA, alongside other federal agencies, use civil rights laws as a tool to educate recipients on their legal obligations and promote access and equity across population-level SDOH, such as health care, housing, and other conditions that improve health and quality-of-life.

The Enactment of the Fair Housing Act as a Response to Housing Discrimination and Its Impact on Health Care

Research has shown that discriminatory practices in housing, such as redlining[1] and race-based mortgage lending,[2] are linked to poorer health outcomes, such as colorectal cancer survival,[3] breast cancer survival rates,[4] and pre-term birth rates.[5] Housing discrimination may also result in a disproportionate isolation[6] from resources that improve health outcomes, such as clean recreational spaces, quality pharmacies and clinics, and healthy food options. Other studies[7] have linked housing discrimination to creating barriers in accessing high-quality education, employment opportunities, and economic growth - all of which are significant SDOH that improve health and well-being.

To reduce discrimination in housing, Congress passed Title VIII of the Civil Rights Act of 1968, more commonly known as the Fair Housing Act (FHA), which prohibits a recipient from discriminating in the lease, sale, or rental of housing based on an individual's race, religion, and national origin.[8] Leading to the passage of the FHA, African American communities became increasingly frustrated by the prevalence of segregation, policy brutality, and poor housing conditions. Prominent civil rights advocates, such as Dr. Martin Luther King, Jr., called for legal efforts to combat discrimination and segregation in housing. From 1966-1967, Congress considered the fair housing bill; however, it failed to garner enough support for its passage, even with President Lyndon Johnson's support.

In 1968, the FHA was again brought to Congress for its consideration. On April 4, 1968, the day of the Senate vote, Dr. King was assassinated in Memphis, Tennessee. Tensions, race riots, and violence flared in over 100 cities following Dr. King's death. Amid the turbulence, President Johnson and civil rights activists increased pressure on Congress to pass the FHA. On April 10, Congress passed the FHA and President Johnson signed it into law the following day. In the years following the enactment of the FHA, Congress expanded the law to include protections based on disability, sex, and familial status.

> *"Much progress remains to be made in our Nation's continuing struggle against racial isolation. In striving to achieve our historic commitment to creating an integrated society, we must remain wary of policies that reduce homeowners to nothing more than their race."*
>
> – U.S. Supreme Court Justice Anthony Kennedy
> Texas Department of Housing and Community Affairs v.
> Inclusive Communities Project, Inc. (2015)[9]

In 2015 the Supreme Court was asked to provide further clarification on the FHA. As written, the FHA prohibits intentional discrimination, which occurs when an entity explicitly intends to treat an individual or group differently based on race, religion, sex, or another protected status. However, the case called into question whether the FHA also prohibits entities from implementing neutral policies that result in a negative impact on a particular group.

In this case, the State of Texas was sued by the Inclusive Communities Project (ICP), a nonprofit organization that advocates for racially and economically inclusive communities. The ICP sued Texas over the state's distribution of federal tax credits to private developers to build low-cost housing. ICP noted that Texas awarded less tax credits to developers to build low-cost housing in White suburban areas and, instead, distributed more tax credits to build low-cost housing in inner-city locations that were "marked by the same ghetto conditions that the FHA was passed to remedy." The ICP argued that the state's distribution of tax credits to build low-cost housing in areas that were already predominantly African American resulted in a negative impact on minorities by furthering segregation. The Supreme Court agreed with the ICP, stating that Texas limited access to affordable housing in White, suburban areas that would provide minorities with opportunities for better employment, education, and health care. Based on the Supreme Court's ruling, federal agencies utilize the FHA as a tool to "counteract unconscious prejudices" and "foster diversity" in communities.

Recent studies[10] support the Supreme Court and ICP's push to address disparities in housing, indicating that families that face severe housing costs and are at-risk for homelessness are more likely to experience poor mental health, preventable hospitalizations, and negative health outcomes for all family members, including children. Additionally, as described on the Healthy People 2020[11] sub-page on housing instability, cost-burdened households are unable to afford necessities that improve health outcomes, such as food, attire, utilities, and health care.

Disparities in housing overall have been shown to deteriorate health, quality-of-life, and well- being. In response, the federal government and federal courts have been working to advance housing equity, reduce discrimination in housing, and promote inclusive communities.

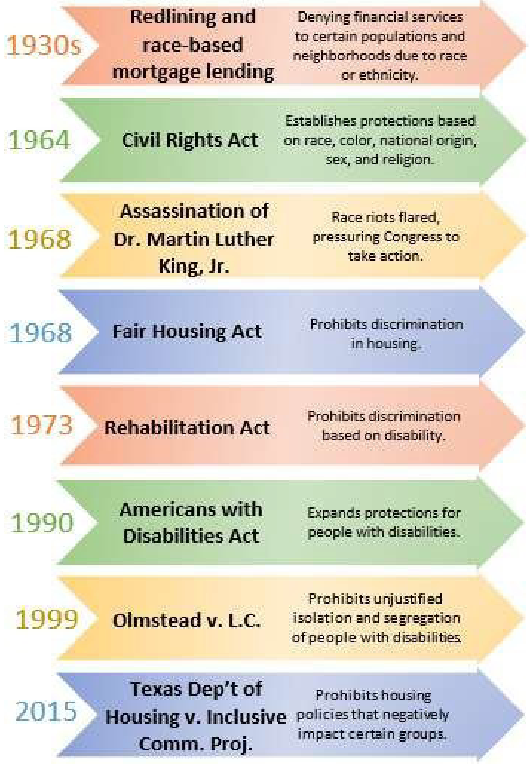
Overview of Civil Rights Protections for People with Disabilities to Promote Equality in Health and Housing

In addition to the FHA, other civil rights laws have significant roles in combatting discrimination and providing protections for vulnerable populations, such as people with disabilities. In 1973, Congress passed Section 504 of the Rehabilitation Act, which became the first federal law that prohibited recipients as well as the federal government from discriminating against people with disabilities.[12] However, this was only the beginning of providing legal protections to persons with disabilities. The Department of Health, Education, and Welfare (HEW), now divided into HHS and the Department of Education, was tasked by Congress to publish agency regulations, which would further clarify how HEW and its recipients would implement Section 504.

Between 1973 and 1977, HEW continued to delay publishing regulations. In response, the American Coalition of Citizens with Disabilities (ACCD formed and led protests across the United States. ACCD organized the 504 Sit-in, calling for people with disabilities to occupy HEW's federal buildings in protest and pressure the HEW Secretary to sign the regulations. Over 300 people in Washington, DC demonstrated inside the HEW building where the HEW Secretary's office was located. In San Francisco, more than 150 people refused to leave the federal building for 25 days. In addition to Washington DC and San Francisco, protests took place in Boston, Seattle, New York, Atlanta, Philadelphia, Chicago, Dallas, and Denver. The composition of the 504 Sit-in represented the broad spectrum of the disability community with participants from different racial, social, and economic backgrounds. On April 28, 1977, the Secretary of HEW signed the Section 504 regulations. The 504 Sit-in lasted almost a month and remains the longest nonviolent occupation of a federal building in U.S. history.

To expand upon Section 504 and its protections, Congress enacted the Americans with Disabilities Act (ADA) in 1990, prohibiting discrimination against people with disabilities in employment, state and local government services, public accommodations, commercial facilities, and transportation.[13] Title II of the ADA covers public housing agencies, community development agencies, and other housing that is developed or operated by state or local government, such as housing on a state university campus Therefore, for example, a housing provider generally cannot refuse to sell or rent to a person with a disability solely based on the individual's disability.

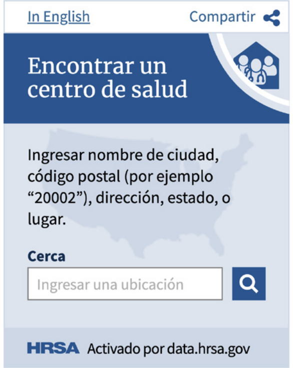
The disability rights movement continued to push for integrated health and housing services. Historically, people with disabilities have faced discrimination that limited their opportunity to live independently in the community and required them to live in institutions and other segregated settings. In 1999, the Supreme Court ruled that the ADA prohibits unjustified isolation and institutionalization of people with disabilities.[14] The case was brought by two Georgia women who were receiving mental health services in state-run institutions, despite the fact that their treatment professionals recommended that they could be appropriately served in a community-based setting. The Supreme Court ruled that people with disabilities cannot be unnecessarily segregated, and cited “family relations, social contacts, work options, economic independence, educational advancement, and cultural enrichment” as SDOH that are affected by a person’s ability and right to live in an integrated community that meets their health care needs. With this in mind, Congress has turned to Executive agencies to further implement civil rights laws through regulatory work, enforcement, and education.



1930s	Redlining and race-based mortgage lending	Denying financial services to certain populations and neighborhoods due to race or ethnicity.
1964	Civil Rights Act	Establishes protections based on race, color, national origin, sex, and religion.
1968	Assassination of Dr. Martin Luther King, Jr.	Race riots flared, pressuring Congress to take action.
1968	Fair Housing Act	Prohibits discrimination in housing.
1973	Rehabilitation Act	Prohibits discrimination based on disability.
1990	Americans with Disabilities Act	Expands protections for people with disabilities.
1999	Olmstead v. L.C.	Prohibits unjustified isolation and segregation of people with disabilities.
2015	Texas Dep’t of Housing v. Inclusive Comm. Proj.	Prohibits housing policies that negatively impact certain groups.

HRSA’s Proactive Role in Achieving Housing and Health Equity Using Federal Civil Rights Laws

To complement HHS civil rights activities, HRSA provides technical assistance and education to its grant recipients to improve access to SDOH, such as quality health care services, and other conditions that improve health outcomes. Additionally, HRSA fosters collaborative relationships across its Bureaus and Offices to share effective practices and informational resources that address improving health outcomes for all individuals. Recently, OCRDI, in partnership with each of HRSA’s Bureaus and Offices, developed a HRSA-wide Language Access Plan and Disability Access Plan, establishing steps that HRSA will take to ensure that people who are limited English proficient as well as people with disabilities have meaningful access to HRSA’s programs and activities, in accordance with federal law.



Ingresar nombre de ciudad, código postal (por ejemplo “20002”), dirección, estado, o lugar.

Figure 11.1

One of the steps that HRSA has taken to promote access to health services is to create Spanish language versions of online tools (publicly available on the HRSA.gov website) called “widgets,” (Figure 11.1) which allow individuals to search for Health Centers, HeadStart Centers, Ryan White HIV/AIDS Medical Providers, and dental care for children on Medicaid and CHIP in their local area. HRSA has also created a Spanish language widget, which assists individuals in registering to be an organ donor and finding local organ transplant programs. All of the widgets can be added to any website as a means of directing individuals to affordable, high quality health care.

To assist and support recipients in complying with federal civil rights laws, OCRDI provides targeted technical assistance, informational resources, and consultations designed to prevent discrimination and ensure that all members of the public have access to HRSA’s funded and conducted programs and activities. OCRDI works closely with enforcement agencies, such as the HHS Office for Civil Rights (OCR) and U.S. Department of Justice (DOJ) to create technical assistance designed to proactively prevent discrimination, therefore avoiding negative health outcomes related to discriminatory treatment.

Internally, OCRDI has partnered with the Office of Federal Assistance Management (OFAM), HAB, and the Office of Regional Operations (ORO) to provide in-person workshops on Language Access and Disability Access to HRSA recipients in the DC metro area and throughout the regions. The workshops provide critical information about recipient obligations in an approachable format and allow recipients the opportunity to ask questions and engage in discussions around practical solutions to accessibility challenges. In addition to in-person training, OCRDI is developing interactive webinars that can be tailored to specific recipient needs. OCRDI's multifaceted approach to the provision of technical assistance is designed to proactively support all of HRSA's recipients in achieving compliance and promoting access to health care in a way that is both effective and efficient.

While OCRDI leads HRSA's efforts to combat health iniquities on a national scale by promoting compliance with federal civil rights laws, HRSA's ORO, which consists of 10 regional offices (Figure 11.2), works to increase the reach, impact, and awareness of HRSA programs through on-the-ground outreach. In addition to 10 regional offices, ORO has its headquarters in Rockville, Maryland and one sub-regional office in Puerto Rico. ORO has four core functions: External Affairs & Outreach, Strategic Stakeholder Partnerships, Regional Surveillance, and Regional Management (https://www.hrsa.gov/about/ organization/bureaus/oro/index.html).

HRSA's regional presence extends the reach of HRSA's programs, and facilitates local partnerships with key stakeholders and communities in need to increase awareness of, and access to, HRSA resources. Having ORO "boots on the ground" also provides HRSA with additional context about the social, economic, demographic and geographic considerations needed to address health inequalities; and proximity to communities to address them.

A Regional Level Framework for Addressing Health Inequities

With a focus on increasing impact in communities, ORO serves as HRSA Ambassadors to implement a framework of six priorities and goals aimed to address health inequities across the regions. The framework positions ORO's regional offices to strategically and cohesively address the SDOH and the associated wide range of health risk and outcomes while also providing the flexibility to focus on issues unique to the region. Raising awareness about and increasing access to HRSA programs and resources in communities and states is the foundation of the ORO framework, and influences decision-making at the individual, organizational, and public policy levels. Furthermore, the framework calls for ORO to collaborate with regional networks across the nation and mobilize partners across sectors to increase HRSA's reach, especially within underserved communities (Table 11.1).

ORO On-the-Ground: Eliminating Housing and Health Inequalities through Regional Partnerships

Through community engagement, collaboration, and connecting stakeholders to relevant HRSA programs and resources, ORO has been instrumental in expanding HRSA's reach in efforts to increase access to health care services for homeless individuals and families. Additionally, ORO developed and supported numerous federal, state, and local efforts to address the intersection of housing and health across the nation. ORO regional offices, on behalf of HRSA, continue to actively participate in coordinated federal efforts to address homelessness such as the Federal Regional Interagency Councils on Homelessness.

The stories below illustrate ORO's national efforts and impact towards addressing housing and health inequalities.

A National Approach to Improve Coordination of Services for the Homeless

In 2015-2016, ORO represented HRSA and collaborated with the U.S. Department of Housing and Urban Development (HUD) on their Healthcare and Housing Systems Integration Initiative (H2).HUD selected 20 communities to receive on-site direct technical assistance to develop state and community strategic plans focused on integrating health care and housing systems and services Concurrently, the Substance Abuse and Mental Health Services Administration and the state of California identified resources for an additional 15 communities in California to participate in the H2 sessions.

ORO participated in the planning for each session and leveraged the extensive ORO regional network to ensure broad participation from the health care safety net. Additionally, ORO identified local or statewide advocacy groups for the sessions, provided on-site subject matter expertise and presented information on the state health care landscape, HRSA programs and initiatives. The H2 initiative resulted in the development of 35 state or community strategic plans to improve coordination of services for homeless or at-risk persons. ORO's outreach efforts were invaluable to the success of the initiative and instrumental in linking the health care safety net with housing and homeless providers in the targeted communities.

Subsequent to the H2 sessions, several ORO regional offices reported increased capacity and readiness to respond to homelessness emergency declarations, reconstitution of their Federal Regional Interagency Councils on Homelessness, with some convening Federal summits, and developing resources to address regional, state, and local homelessness issues.

A Targeted Approach to End Homelessness

In 2016, homelessness programs in the State of Georgia, conducted a count of homeless individuals and families in 152 of its 159 counties. Key findings revealed that at least 4,063 people were homeless in Georgia. Of those, 1,782 were in emergency shelters (44 percent), 1,443 (35 percent) were in transitional housing, and 838 (21 percent) were unsheltered.[15] Given these findings, local, state and federal stakeholders coordinated a response to address homelessness in Georgia.

The state-federal response included the development of an "Initiative to End Homelessness," which was led by the Atlanta Federal Executive Board, included HRSA representation through regional ORO staff, and comprised 26 federal agencies, state and local governments, advocates, and service providers. The group developed a strategic plan and identified and targeted subsets of the homeless population and geographic areas with the greatest need. Target populations included homeless veterans, and youth and families located in the City of Atlanta and DeKalb and Fulton Counties.

As part of the strategic plan and to increase awareness and service utilization, ORO collaborated with the initiatives partners to develop and publish a comprehensive Resource Guide in May 2017 that outlined programs aimed to assist homeless individuals and families and how to access them. ORO identified HRSA resources and collaborated with several HRSA funded Community Health Centers to promote the guide to its patients. The Guide was distributed to over 100 organizations including Continuity of Care organizations, local/ community organizations, and state leadership.

This initiative, in concert with a number of other targeted efforts to address homelessness, showed early signs of a positive impact. From 2016-2017, Georgia reported the largest decrease in homeless individuals, especially homeless veterans compared to previous years.[16] On November 6, 2017, Atlanta Mayor Kasim Reed announced the City of Atlanta had effectively ended veteran homelessness.[17]

A Citywide Approach to Improve Homelessness

New York City has over 60,000 homeless individuals sleeping in the shelter system nightly. Over 22,000 are children as part of over 15,000 sheltered families.[18] Homelessness is, often, the result of a combination of medical and social factors,[19] hence improving homelessness in New York requires a multipronged effort, utilizing the strengths and resources of numerous agencies and organizations.

August 2019 marked the 10th anniversary of HRSA's Region 2 Health Care for the Homeless Summit in New York City. ORO invited HRSA Health Care for the Homeless Health Center funding recipients in the New York City area, their community partners, and governmental and academic stakeholders to meet for an annual ORO-hosted Summit.

The Summit convened federal, state, and local government, academia, and community advocates and organizations together to discuss successes and challenges with keeping the homeless population healthy, improving social determinants which lead to homelessness, and raising awareness of the homeless.

The HRSA-led Summits have led directly to numerous positive outcomes, including providers who treat the homeless partnering to establish a nonprofit organization: NYC Providers of Health Care for the Homeless (NYC PHCP). NYC PHCP developed health care standards for homeless patients, provided technical assistance to New York State's Medicaid Reform Initiative, launched a homeless health-based Medicaid Health Maintenance Organization, consults on New York's Initiative to End the HIV/AIDS Epidemic, and collaborates on homeless-related initiatives with New York State and New York City Departments of Health. Summit attendees have joined to reduce veteran homelessness. As a result, New York State veteran homelessness has been reduced by nearly 80 percent over the last decade.[19] This was achieved by linking veterans to case management, housing, family, jobs, education, and health care.

Region 2 stakeholders agree that, when working with the homeless, social determinants must remain a priority. For every patient, a provider must consider, "Why is this person homeless?" The answer eases referrals to applicable medical and social services, such as affordable housing services, mental health and substance abuse services, job training, family planning, re-entry counseling, and veteran programs. Homeless shelters and health centers must have strong social service linkages to minimize any obstacles for clients.

Food Insecurity, Health, and Housing

According to Hunger in America 2014, 57 percent of families report having to choose between paying for housing and buying food.[20] Among low-income families with children, housing instability correlates with severe food insecurity.[21] In a study conducted by the North Carolina Housing Finance Agency of more than 1,600 individuals, Medicaid costs decreased by 12 percent as a result of fewer emergency room visits and lower medical costs after people moved into affordable housing. In addition, the Center for Outcomes Research and Education found that housing and rental assistance for families who are homeless or food insecure improved health outcomes of vulnerable children and decreased health care spending.[22]

HRSA regional offices in collaboration with HRSA's Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program, the U.S. Department of Agriculture Food and Nutrition Service (USDA FNS), and local organizations are implementing clinical-community linkages to address food insecurity in Regions 4, 6, and 9. Food insecurity is defined as the limited access to adequate food due to a lack of money or other resources. One in six U.S. children lives in a food insecure household. These children often experience poor health outcomes that include higher risks of mental health disorders, such as anxiety and depression. The health effects of food insecurity may persist into adulthood leading to chronic medical conditions such as diabetes and cardiovascular disease.[23] ORO has helped to establish clinical-community linkages to improve access to preventive services and reduce or prevent disease in communities. Two projects are highlighted below.

Providing Summer Meals at Community Health Centers in California

From February 2016 through April 2019 ORO, USDA FNS, the California Department of Education, and local school districts collaborated to establish the Summer Food Service Program (Summer Meals) at HRSA funded CHCs. The objective was to provide meals to vulnerable, low-income children who visit health center program grantees as patients or while accompanying family members. As a result of this collaboration, in 2018, more than 1,500 meals were served to children at 2 new Summer Meals sites at CHC's. Additionally, more than 300 families participated in community outreach events and received enrollment assistance for the Supplemental Nutrition Assistance Program, nutritional counseling, and information on CHCs health care services, local walking clubs, and training on car seat safety. This collaboration demonstrates a successful and sustainable effort for nutrition assistance at CHC's.

Multi-State Pilot to Create Healthy Food Environments (CHFE Pilot)

ORO Regions 4 and 6, the Maternal, Infant, and Early Childhood Home Visiting (MIECHV) Program, and the USDA FNS (Southeast and Southwest regional offices) conducted a 6 month pilot to reduce food insecurity and improve diet quality in low-income families with preschool children from ages 2 to 4. The CHFE Pilot was managed by a multidisciplinary core team with representation from ORO, MCHB, and the Federal Office of Rural Health Policy. ORO was instrumental in developing the partnership with the USDA FNS, and together ORO and MCHB developed a new model framework, the Food Security Network Model. The Food Security Network Model aligns the nation's health care safety net, including home visiting and health center programs, with the largest federal nutrition safety net funded by the United States Department of Agriculture Food and Nutrition Service. Through the model and partnership, the CHFE Pilot aimed to expand access to healthy, affordable food choices that align with the 2015-2020 Dietary Guidelines for Americans.

Six communities in Alabama, Arkansas, South Carolina, and Texas implemented the Pilot in 2019 with a target of up to 300 families with preschool children enrolled. Health center program grantees and home visiting programs funded by the MIECHV Program screen families for food insecurity using the Hunger Vital Sign™ and Healthy Kids,[24] created referrals for nutrition education through the Supplemental Nutrition Assistance Program-Education (SNAP-Ed) and link families to a sustainable source of fresh produce. At the end of the Pilot, participants complete the Wilder Collaboration Factors Inventory[25] to assess the strength of the clinical-community linkages formed.

Early results of the pilot have shown promise. The Marion County, South Carolina CHFE Project received a $250,000 Bold, Upstream, Integrated, Local and Data-Driven (BUILD) Health Challenge Award. The Marion County CHFE Project is 1 of 18 projects selected from more than 130 applicants. BUILD empowers multi-sector collaborations to address health issues affecting their communities. To date, the BUILD Health Challenge has supported 55 projects in 24 states and Washington, DC.[26] The Project is led by the Marion County Coordinating Council which includes Health Care Partners of South Carolina, a HRSA-funded health center. Other partners include the South Carolina Department of Health and Environmental Control – Pee Dee Region, SNAP-Ed, the Clemson Cooperative Extension Service, Pee Dee Community Action Partnership, and FoodShare South Carolina. In addition to the BUILD award, the Medical University of South Carolina Marion Medical Center provided $295,877, for a total of $545,877 in funding or the CHFE Project.

Supporting the Future of Sustainable, Cross-Agency Housing and Health Initiatives

The Office of Planning, Analysis and Evaluation (OPAE) is part of HRSA's Office of the Administrator. As such, OPAE provides Agency-wide leadership for policy development, data collection and management, major analytic activities, research, and evaluation.

Background

To facilitate collaboration across HRSA Bureaus and Offices and promote cross-HRSA dialogue, in 2010, OPAE created an agency-level cooperative agreement program called the National Organizations for State and Local Officials (NOSLO). The rationale for creating an agency-level cooperative agreement (by consolidating multiple cooperative agreements awarded to these national organizations) enabled HRSA to foster better communication and collaboration with national organizations, ensuring maximum integration of HRSA's priorities and fostering the agency's ability to speak with one voice to these stakeholders. Through NOSLO, HRSA developed a strategic approach to address the inadequacies and problems of the safety net health delivery system, and to establish a venue to reinforce the successes in health services by providing training and technical assistance to promote capacity building and management and operating capabilities of safety net providers.

Since its creation, the consolidated NOSLO mechanism has addressed HRSA's evolving priorities such as health care workforce, health care delivery systems, oral health, behavioral health, and substance use disorders. For example, NOSLO award recipients facilitate the promotion and understanding of HRSA's programs to the states and local communities, while at the same time providing an opportunity for HRSA staff to learn about important issues at the state and local level (e.g., rural hospital closures). NOSLO award recipients translate what HRSA does for its constituencies (such as health centers and Ryan White HIV/AIDS Program clinics) so that state and local policy makers understand (1) how to work with them, (2) why their needs matter, and what interventions are in their state/locality around which they need to coalesce.

The NOSLO cooperative agreements fund the capacity building of national-level organizations in support of state and local government leadership in health care and public health. One of the NOSLO recipients is National Academy for State Health Policy (NASHP), which targets state Medicaid Directors through its cooperative agreement. NASHP is "a nonpartisan forum of policymakers throughout state governments, learning, leading and implementing innovative solutions to health policy challenges" (www.nashp.org). As such, NASHP provides a unique forum for productive interchange across all lines of state authority, including the executive and legislative branches. NASHP does this by convening state leaders to solve problems and share solutions; conducting policy analyses and research; disseminating information on state policies and programs; and providing technical assistance to states.

In Support of Sustainable Housing

With the support of its NOSLO agency-level cooperative agreement with HRSA, NASHP has created a state Health and Housing Institute (HHI), which is composed of state Medicaid agencies, state housing agencies, and other state agencies from five states to address the challenges of sustainably financing health and housing initiatives (see Table 11.2).

State teams work to break down agency silos and improve health while controlling housing costs for vulnerable populations. These populations include people who are experiencing homelessness, are struggling with behavioral health or substance use disorders, or are transitioning out of institutions into communities. An advisory group of health and housing experts helps to guide the project by providing technical assistance support to the state teams.

A key strength of the HHI is the multi-sector partnerships it facilitates among the state team members. Teams are composed of representatives from state agencies and departments that address affordable housing, aging and adult services, developmental disabilities, public health, housing and community services, human services, and mental health. In addition to collaborating with one another, these state agencies also partner with local housing authorities, local housing providers, and health plans to advance their goals.

Project goals for the five participating states include:

- Make effective use of data in order to target services where they are most needed and make the case for supportive housing initiatives;
- Partner across agencies to strengthen services that help vulnerable populations become and remain stably housed;
- Integrate health and housing priorities into state health system transformation initiatives, in order to maximize state investments in improving health through housing;
- Develop housing and health pilot programs;
- Test the impact of integrated housing and tenancy support services on emergency department usage; and
- Use state policy levers, such as state requirements for distributing housing tax credits, to spur capital investment in affordable housing acquisitions and/or development.

Through its agency-level cooperative agreement with HRSA, NASHP supports state policymakers by convening quarterly group teleconferences with technical and policy experts, including federal partners, and providing individualized technical assistance through quarterly calls focused on implementing each state's project work plan and year-round technical assistance. To support the states' work and share information with a broader audience, NASHP has developed publicly available technical assistance tools as part of its cooperative agreement with HRSA, including cross-state analyses, case studies, and guidance documents (https://nashp.org/nashps-housing-and-health-resources-for-states/).

State teams developed their project work plans in early 2018, and have seen successes and promising, replicable developments in their programs including:

- Leveraging Medicaid dollars for housing transition and tenancy-sustaining services (See "Housing-Related Services Included in 1915(i) State Plan Amendments, 1915(c) Waivers, and Section 1115 Demonstrations" (https://nashp.org/wp-content/uploads/2019/01/Service-definitions-for-tenancy-support-final-3.11.19.pdf);
- Drafting data-sharing agreements between Homeless Management Information Systems (HMIS) and Medicaid and/or Medicaid managed care organizations in order to identify populations with unmet need (https://nashp.org/qa-how-connecticut-matched-its-medicaid-and-homelessness-data-to-improve-health-through-housing/);
- Addressing housing and other SDOH (https://nashp.org/resources-for-states-to-address-health-equity-and-disparities/) through value-based payment systems or managed care/coordinated care settings, such as Oregon's model contract for Medicaid Coordinated Care Organizations, which identifies housing-related services and supports as a statewide priority (https://www.oregon.gov/oha/OHPB/CCODocuments/03-CCO-RFA-4690-0-Appendix-B-Sample-Contract-Final.pdf);
- Utilizing resources under the CMS program Money Follows the Person to test the impact of tenancy support services made available through Medicaid targeted case management and mental health rehabilitation services; and
- Developing pilot programs to work with health systems to advance supportive housing.

Through this HRSA-supported cooperative agreement, in addition to these successes, NASHP has observed the progress of participating states towards the development of medium- and long-term state policy improvements. For example, the Illinois team is using a NASHP-developed chart (https://nashp.org/wp-content/uploads/2018/11/Housing-and-service-options-1_24_2019.pdf) to inform the implementation of pilot programs related to its behavioral health transformation Medicaid Section 1115 demonstration. Specifically, this pilot seeks to integrate at-risk beneficiaries into the community by providing tenancy services and supports (https://www.illinois.gov/hfs/info/1115Waiver/Pages/default.aspx). The Louisiana team participated in the development of a Medicaid managed care request for proposals which identifies housing as a priority social determinant of health for which the state will hold Medicaid Care Organizations (MCOs) accountable for the provision of services. The Oregon team identified housing as a priority in its Coordinated Care Organizations 2.0 re-procurement, which was launched in January 2019 with participation from HHI state team members. Finally, the Oregon team is developing a new substance use disorder Medicaid Section 1115 demonstration application that would include housing-related services.

NASHP's HHI has made substantial progress towards the short-term goals of information dissemination and knowledge transfer, including responding to 35 specific technical assistance requests to date, and convening 6 group learning calls on shared topics of interest. In addition, NASHP has developed a range of resources (https://nashp.org/nashps-housing-and-health-resources-for-states/) on homelessness, financing models, and healthy homes to assist states in their efforts to align health and housing to implement their plans.

Many of these tools originated through a state technical assistance request, including:

- A compilation of Housing-Related Service Definitions in 1915(i) State Plan Amendments, 1915(c) Waivers, and Section 1115 Demonstrations (https://nashp.org/wp-content/uploads/2019/01/Service-definitions-for-tenancy-support-final-3.11.19.pdf)
- A table sharing Tenancy Supports in Three States' Medicaid Waivers (https://nashp.org/wp-content/uploads/2018/11/Housing-Waiver-Language- 1_24_2019.pdf)
- A table of State Housing and Services Options in 1915(c) Waivers for People with Developmental Disabilities (https://nashp.org/ wp-content/uploads/2018/11/Housing-and-service-options-1_24_2019.pdf)
- A blog post that shares one state's lessons: Q&A: How Connecticut Matched Its Medicaid and Homelessness Data to Improve Health through Housing (https://nashp.org/qa-how-connecticut-matched-its-medicaid-and-homelessness-data-to-improve-health-through-housing/), 425 views in February 2019.
- A blog post noting states' progress after 1 year of the institute: NASHP's Health and Housing Institute Celebrates First Anniversary, (https://nashp.org/nashps-health-and-housing-institute-celebrates-first-anniversary/) 111 views in February 2019.
- A blog post on federal housing programs' impact on state housing efforts: How Federal Housing Policy Developments Could Affect State Health and Housing Programs, (https://nashp.org/federal-housing-policy-developments-could-affect-state-health-and-housing-programs/), 431 views in February 2019.
- A blog post describing the NASHP Health and Housing Institute: States Jumpstart Efforts to Integrate Health and Housing Policies, (https://nashp.org/states-jumpstart-efforts-to-integrate-health-and-housing-policies) 1,017 views in February 2019.
- A toolkit on housing accommodations and modifications for people with disabilities and their family members: Reasonable Accommodations Resources (https://nashp.org/wp-content/uploads/2018/11/Reasonable-Accommodation-Appeals-Resources_8.20.18.pdf)

Summary

HRSA, in addition to HUD, DOJ, and other federal agencies, supports the federal government's use of civil rights laws as a tool to proactively combat disparities in health, housing, and other population-level SDOH through technical assistance, education, and outreach to recipients.

Although the federal government has provided victims of discrimination with several methods to initiate the enforcement process, these enforcement procedures can only be utilized after a discriminatory act has occurred. To complement enforcement efforts, the federal government is taking proactive measures to prevent discrimination and increase accessibility to SDOH that improve health outcomes, such as quality health care and affordable housing. The federal government is continuing to build collaborative relationships across agencies, partnering with stakeholders to inform the government of current discriminatory patterns, and educating recipients on civil rights obligations in order to achieve housing and health equity.

Further, by delivering upon ORO's core functions and framework to address health inequities, HRSA nationwide efforts are better positioned to maximize the value and impact of HRSA programs with the aim to improve health outcomes and address health inequities. The regional offices continue to serve as the focal point for federal, state, and local partners across the nation. These collaborations have led to numerous initiatives that have positively impacted the lives of homeless or at-risk individuals.

Finally, by developing innovative cross-agency cooperating agreements and forming partnerships among clinical, community, and public health organizations, HRSA can effectively explore and identify best practices for removing barriers to housing securing as well as address food insecurity, an important social determinant of health.

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Figure 11.2: HRSA Office of Regional Operations Locations

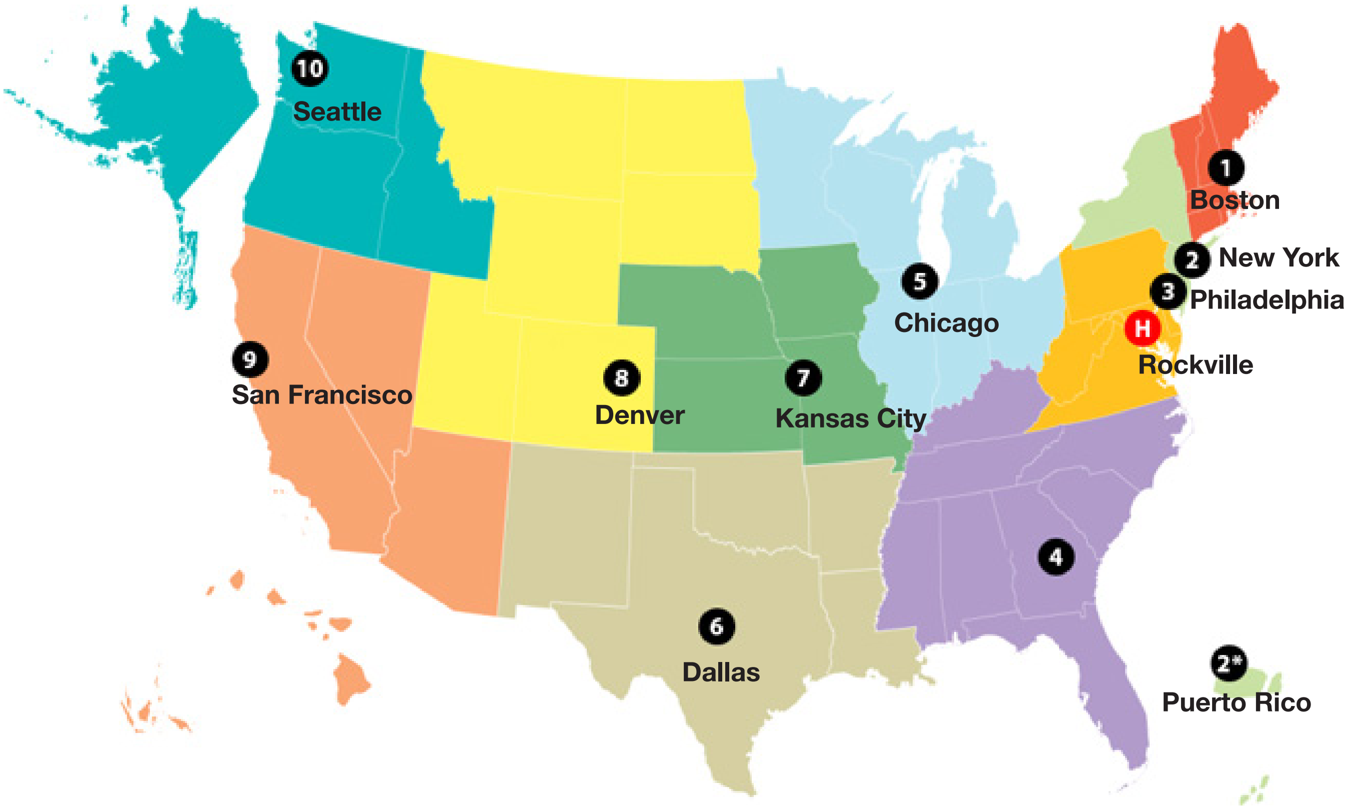

Table 11.1: HRSA Framework to Address Regional Health Inequities

PRIORITIES	GOALS	2017-2018 IMPACT
1. HRSA Outreach & Education	Increase stakeholder knowledge of HRSA funding opportunities, awards, initiatives, program resources, and impact	ORO provided nearly 600 outreach, education, and technical assistance events and activities addressing HRSA resources, programs and priority issues, to over 29,000 individuals from more than 8,000 stakeholder organizations.
2. State, Local and Tribal Government Engagement	Improve the state and local health and tribal leaders' ability to leverage HRSA programs and resources	ORO met with over 1,300 leaders of 50 States, as well as the District of Columbia, Puerto Rico, United States Virgin Islands, and other jurisdictions, 100 cities, 180 counties, and 420 tribes, to disseminate information, gather HRSA specific feedback about priorities, and to provide technical assistance.
3. HRSA Bureau/Office Collaboration	Foster collaboration across HRSA programs to support improved operations and outcomes, enhance utilization of service programs, and/or increase recognition of HRSA	Collaborated with all HRSA bureaus and offices to develop responses to 174 program related issues that surface through engagement with regional, state, local, and tribal health leaders and other stakeholders
4. HRSA Priorities	Increase awareness of HRSA priorities and program resources with states and communities in need	ORO increased awareness of HRSA priorities and program resources by delivering 87 state and regional initiatives and large-scale events for 11,667 health providers related to HRSA priorities, focusing on areas of greatest need.
5. Targeted Regional Initiatives	Strengthen HRSA's response to national or regional health- related needs	In response to the 2017 back-to-back Hurricanes Irma and Maria, ORO conducted two on-site, U.S. territory- based grant-writing workshops designed to educate stakeholders about the federal grant application process and build technical, competitive grant application writing skills.
6. Regional Surveillance	Increase HRSA's knowledge about regional, state and local issues, trends and promising practices	ORO identified and reported an HIV provider shortage in one state which prompted a HRSA plan to increase HIV care sites in the state, resulting in two new providers in a rural part of the state and reconnection to HIV care for over 100 consumers.

Table 11.2: States and State Agencies Participating in the Health and Housing Institute

STATE	STATE AGENCIES INVOLVED IN HEALTH AND HOUSING INSTITUTE
Illinois	• Illinois Department of Human Services • Illinois Department of Healthcare and Family Services • Illinois Housing Development Authority • Illinois Council on Developmental Disabilities
Louisiana	• Louisiana Department of Health, Office of Aging and Adult Services • Louisiana Housing Corporation
New York	• New York State Department of Health • New York State Division of Homes and Community Renewal • New York State Office of Mental Health
Oregon	• Oregon Health Authority • Oregon Housing and Community Services
Texas	• Texas Health and Human Services Commission • Texas State Affordable Housing Corporation

Chapter 12. Summary, Conclusions, and Future Directions

The 2019-2020 Health Equity Report presents a comprehensive analysis of HRSA's program efforts in reducing health disparities and promoting health equity for various populations at the national, state, and local levels. The report addresses HRSA's key Strategic Plan goals such as improving access to quality health services; fostering a health care workforce that is able to address current and emerging needs; and achieving health equity and enhancing population health.

The report presents analyses of various health equity trends affecting the nation's diverse, vulnerable, and socially disadvantaged populations Trends in health disparities and improvements in health equity are presented for a number of program areas, including maternal and child health, primary health care access and quality, HIV/AIDS, mental and behavioral health, chronic disease prevention and health promotion, health workforce, and rural-urban and geographic disparities. Health equity analyses are conducted using a variety of national and HRSA program databases, often stratified by important socioeconomic and demographic characteristics such as gender, race/ethnicity, immigrant status, family structure, education, income, employment status, housing tenure, housing costs, housing instability, household crowding, rural-urban residence, and geographic area/location. On several health outcomes and performance measures, the HRSA programs outperform the national trends by providing greater access to preventive health services, social services, and needed medical care to the underserved and disadvantaged populations and communities in the United States.

Although substantial progress has been made in improving the health and well-being of all Americans, health inequities between population groups and geographic areas have persisted and remain marked.[1] Disparities are found in a number of health indicators, including infant mortality, life expectancy, cardiovascular disease, cancer, diabetes, COPD, HIV/AIDS, health care access and utilization, health insurance, disability, mental health, preventive health services such as cervical and colorectal cancer screening, smoking, obesity, substance use, suicide, homicide, and unintentional injuries. Causes of these disparities are multifactorial in nature.

Research indicates that differences in social and built environments, socioeconomic and living conditions, health-risk behaviors such as tobacco use, obesity, lack of access to healthy foods, and access to and use of quality health care services are important social determinants contributing to persistent health disparities between population groups and geographic areas.[1-3]

Although reduced smoking, greater physical activity, lower obesity, healthy diet, higher seatbelt use, avoiding substance use, and improved access to and use of health care services can lead to improvements in population health and health equity, these factors are themselves primarily influenced by broader, more upstream social determinants such as education, income, social and welfare services, affordable housing, job creation, labor market opportunities, and transportation.

Addressing inequities in these social determinants should be an important area of focus from both research and policy standpoints. Since policy action on many of the social determinants goes beyond the health sector and since health inequities are multifaceted, a multi-sectoral approach involving health, education, nutrition, housing, urban planning, transportation, and economic sectors is needed to effectively tackle health inequalities.[1, 3, 4] Such an approach calls for increased collaboration between public and private sectors and various stakeholders including state and local agencies and emphasizes the need for community-based approaches to reducing health disparities in the United States.[1, 3-5] Healthy Start, Maternal, Infant, and Early Childhood Home Visiting Program, and Title V MCH Block Grant Programs are excellent examples of HRSA programs that emphasize investments in early child development, leading to positive health outcomes not only during childhood but throughout the life course. HRSA's other health care programs, particularly the Health Center Program, work to mitigate adverse health effects of social disadvantage, poverty, and unfavorable living conditions by providing increased access to health and social services to vulnerable populations who otherwise would lack or be unable to afford such services.

Systematic monitoring and analysis of health inequalities data are crucial to understanding the level of health improvement for the nation and HRSA program areas and for identifying persistent and emerging patterns of health disparities Empirical data are essential for evaluating programs and for informing intervention efforts.[1, 5] To facilitate such monitoring and analysis, it is imperative that the HRSA programs strive towards collecting and reporting health equity data by important socioeconomic, demographic, and community characteristics on a consistent basis. At the minimum, the program data should be collected for the broad racial/ethnic groups (non-Hispanic Whites, African Americans/Blacks, AIANs, APIs, and Hispanics), by gender, socioeconomic status (education, income/poverty status, occupation, and employment status), housing tenure, rural-urban residence, geographic region, state or county, and disability status. Program data should be more broadly available so that the effectiveness of programs in promoting health equity and improved outcomes can be better assessed at the local and community level. To the extent possible, program data should be collected at the individual or patient level. This would allow policy analysts and program managers greater flexibility in analyzing and reporting data that are more suited for program planning and evidence-based decision making. When program data are only available at the aggregate level (e.g., state, county, or ZIP code level), efforts should be made to analyze and report such data in conjunction with census-based socioeconomic and demographic data at the area level. Use of standard measures of health equity/disparity across HRSA programs is vital for better reporting of population health and equity data over time. Examples of such measures may include reporting the number and proportion of individuals from specific racial/ethnic, socioeconomic, or demographic groups; the absolute and relative (percentage) increases in the number of program participants served over time or between time periods; and rate ratio or prevalence ratio defined as the rate or prevalence of a specific health, health care, or social outcome/indicator, or process measure for a specific demographic group to that for another group.[1]

The Health Equity Report is a dynamic and ongoing project that routinely updates national and HRSA program-level health and sociodemographic data and related narratives. While routine updates of the data and topics reported here are considered annually, each edition of the report explores a specific health equity or an emerging public health issue in depth, such as housing and health inequalities for the 2019-2020 edition.

The health equity data and information presented in this report are expected to be useful for a wide variety of audiences, including the HRSA leadership and program managers, other HHS and federal government agencies, state and local governments and communities, policy and decision makers, public health organizations, health practitioners, grantees, academic institutions, and researchers.

The major highlights from the report are listed below:

Health Disparities at the National Level

- Life expectancy of Americans increased from 68.2 years in 1950 to 78.6 years in 2017. However, disparities have persisted. In 2017, life expectancy was 74.3 years for AIANs, 76.0 years for non-Hispanic Blacks, 78.8 years for non-Hispanic Whites, 83.7 years for Hispanics, and 87.8 years for APIs.
- During 2012-2016, residents of high-poverty areas (county poverty rate 20 percent or higher) had a life expectancy of 76.7 years, 6.2 years shorter than the life expectancy for the residents of low-poverty areas (county poverty rate less than 5 percent).
- In 2017, immigrants had a life expectancy of 84.1 years, 6.0 years longer than the life expectancy of 78.1 years for the U.S.-born. From 1979-1981, immigrants lived 2.3 years longer than the U.S.-born.
- During the past 8 decades, infant mortality rates have decreased greatly for all groups. However, racial disparities have continued to increase in relative terms. In 2017, the mortality rate for Black infants was 10.8 per 1,000 live births, 2.2 times higher than the rate of 4.8 for White infants.
- Socioeconomic disparities in infant mortality are large and have widened over time. In 2016, the infant mortality rate for mothers without a high school diploma was 11.4 per 1,000 live births, 3.4 times higher than the rate of 3.4 for mothers with a college degree.
- The likelihood of an ER visit is greater among AIANs (32.1 percent) and Blacks (26.3 percent), compared with APIs (10.3 percent) and non-Hispanic White adults (18.6 percent). Likelihood of an ER visit is higher among adults with lower education and income levels and higher obesity and smoking rates.
- In 2017, 8.0 million or 3.3 percent of U.S. adults experienced serious psychological distress during the past 1 month. AIAN and mixed- race adults reported the highest level of serious psychological distress, 6.1 percent and 8.8 percent, respectively.
- Adults with low-education, low-income, and without a job were five to seven times more likely to experience serious psychological distress than those with high education and income levels and with employment.
- In 2017, 1.2 million women reported having cervical cancer. Women with less than a high school education had a 2.8 times higher cervical cancer prevalence than women with a college degree. Women with family incomes less than $35,000 were 2 times more likely to be diagnosed with cervical cancer than those with family income of $100,000 or more.
- In 2017, 10.0 percent of Blacks, 19.3 percent of AIANs, 17.8 percent of Hispanics, 6.6 percent of Asians, and 10.5 percent of Native Hawaiians and other Pacific Islanders lacked health insurance, compared with 5.9 percent of non-Hispanic Whites.
- Approximately 21.3 percent of adults with less than a high school education lacked health insurance, compared with 3.7 percent of adults with a college degree.
- In 2017, 6.1 percent of Blacks and 8.0 percent of mixed-race individuals reported not receiving medical care because they could not afford it, compared with 2.2 percent of Asians and 4.2 percent of Whites.
- Individuals with an annual family income of less than $35,000 were 8.5 times more likely to forgo needed medical care due to cost than those with annual family incomes of $100,000 or more.
- Although HIV/AIDS mortality declined dramatically between 1990 and 2017, racial/ethnic disparities remain substantial. In 2017, HIV/AIDS mortality was 8.8 times higher among the Black population and 2.2 times higher among Hispanics, compared with non-Hispanic Whites.

- Between 1990 and 2017, diabetes mortality rates increased for the total population, non-Hispanic Whites, and APIs. In 2017, compared with non-Hispanic Whites, diabetes mortality was 2 times higher among Blacks, 83 percent higher among AIANs, 35 percent higher among Hispanics, and 13 percent lower among APIs. Higher diabetes mortality rates are observed in the Southeastern United States.
- Between 1990 and 2017, the kidney disease mortality rate increased by 41 percent for the total U.S. population. In 2017, compared with non-Hispanic Whites, Blacks had 2.1 times higher kidney disease mortality and APIs had 28 percent lower mortality. The highest kidney mortality rates are observed in the Southeastern and Eastern United States.
- Between 1990 and 2017, the Alzheimer's disease mortality rate increased fivefold. The Alzheimer's disease mortality rates are highest among non-Hispanic Whites and in the Southeastern region.
- AIANs and Whites have, respectively, 2.0 and 2.7 times higher suicide rates than Blacks. Suicide rates have risen consistently in recent years, increasing from 10.5 per 100,000 population in 1999 to 14.0 in 2017.
- Higher suicide mortality rates are observed in many counties of the Western United States, with suicide risks increasing over time in the Western and Appalachian regions.
- During 1999-2017, drug overdose mortality rose rapidly for the total population and for all major racial/ethnic groups. In 2017, non-Hispanic Whites had the highest drug overdose mortality rate (27.5 deaths per 100,000 population), followed by Blacks, AIANs, Hispanics, and APIs.
- During 1999-2017, drug overdose mortality increased in both metropolitan/urban and non-metropolitan/rural areas, with the rate being 10 percent higher in urban areas than in rural areas in 2017.
- During 1979-2011, homeowners had a life expectancy of 74.2 years, about 3.5 years longer than the life expectancy of 70.8 years for renters. The difference in life expectancy between homeowners and renters was 4.0 years for males and 3.6 years for females.
- Renters have 28 percent higher all-cause mortality than homeowners. Housing tenure is associated with all-cause mortality even after controlling for socioeconomic status. At each education or income level, homeowners have significantly lower mortality than renters.
- Compared with renters, homeowners have significantly lower risks of mortality from CVD, all cancers combined, stomach, liver, esophageal and cervical cancer, diabetes, influenza and pneumonia, COPD, cirrhosis, kidney disease, HIV/AIDS, infectious diseases, unintentional injuries, suicide, and homicide.
- Renters receiving financial assistance or living in subsidized housing are four times more likely to experience serious psychological distress than homeowners (9.80 percent vs. 2.54 percent).
- Individuals who are very concerned about housing costs are nine times more likely to experience serious psychological distress than those without similar housing concerns (15.77 percent vs. 1.71 percent).
- Renters are 37 percent more likely to assess their health as fair or poor than homeowners (15.18 percent vs. 11.05 percent). More than 33 percent of renters who receive rental assistance or in subsidized housing report being in fair or poor health.
- Children living in subsidized housing units are 4 times more likely to be in fair/poor health than those living in owner-occupied homes (4.39 percent vs. 1.08 percent).
- Compared with homeowners, renters, especially those living in subsidized housing, have substantially higher risks of heart disease, diabetes, COPD, kidney disease, hypertension, activity limitation, smoking, physical inactivity, and obesity.

- Compared with homeowners, renters and those with high housing cost concerns have lower access to health insurance and are significantly more likely to report ER visits and hospital admissions in the past year.
- Counties with lower homeownership rates and severe housing cost burden have higher rates of fair/poor health, mental distress, HIV prevalence, smoking, and violent crime.
- Counties with higher racial residential segregation have higher rates of mental distress, HIV prevalence, smoking, heavy drinking, physical inactivity, and violent crime.

Health Disparities in HRSA Program Areas and Populations

- In FY 2018, an estimated 55 million women, infants, and children, including children with special health care needs, benefitted from a Title V service, which represents approximately 91 percent of pregnant women, 99 percent of infants, and 54 percent of children nationally.
- In FY 2019, the Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV) served approximately 154,000 parents and children in 1,005 counties and conducted over 1 million home visits. Over the past 8 years, the program has conducted about 6.2 million home visits.
- Childhood obesity varies consistently by household income. Children aged 10-17 with household incomes below the federal poverty level are nearly twice as likely to be overweight or obese as those with household incomes at or above 400 percent of the poverty level (39.1 percent vs. 22.0 percent).
- Children in low-education or low-income families are 40 percent less likely to have access to a medical home than children from high-education or high-income families.
- Children living in neighborhoods with poorly kept or rundown housing are significantly more likely to have an ongoing mental health need than children living in neighborhoods without poor housing.
- Maternal mental health is inversely related to household poverty level. Mothers with household incomes below the federal poverty level are 3.2 times more likely to be in fair or poor mental health than those with household incomes at or above 400 percent of the poverty level (8.4 percent vs. 2.6 percent).
- Black and Hispanic children are at an increased risk of experiencing food insecurity. In 2016-2017, 45 percent of Black children and 41 percent of Hispanic children could not always afford to eat good nutritious meals, compared with 26 percent of non-Hispanic White children and 20 percent of Asian children.
- In 2016-2017, 60 percent of children whose parents had a high school diploma experienced 1 or more adverse childhood experiences (defined as stressful or traumatic events, including physical or emotional abuse and neglect), compared with children whose parents had at least a college degree.
- More than 28 million people, i.e., 1 out of 12 people who reside in the United States, received primary care services through the Health Center Program in 2018. Indeed, 1 in 3 people living in poverty, 1 in 9 children, 1 in 5 people living in rural areas, 1.4 million people experiencing homelessness, and more than 385,000 veterans rely on HRSA-funded health centers for primary health care.
- In 2014, at least 84 percent of the health center patients reported having received necessary medical care and mental health services in the past year. However, AIANs, in particular, faced significant barriers in accessing medical care, prescription medications, mental health care, and dental care.
- According to the UDS data, 33 percent of diabetic patients in health centers had uncontrolled diabetes in 2017. However, the rate of uncontrolled diabetes was highest among Other Pacific Islanders (43.24 percent), Native Hawaiians (38.65 percent) and AIANs (37.49 percent) and lowest among Asian Americans (21.98 percent).

- In 2017, 63 percent of the health center patients had controlled hypertension, with the rate ranging from 55.74 percent for Blacks and 59.27 percent for Native Hawaiians to 67.66 percent for Asians.
- Homeless patients (49.50 percent) are significantly more likely to report being in fair or poor health than community health center patients (31.60 percent) and public housing primary care center patients (32.11 percent).
- Homeless patients (28.01 percent) are significantly more likely to report serious psychological distress than community health center patients (14.0 percent) and public housing primary care center patients (16.04 percent).
- Illicit drug use, defined as cannabis, cocaine, amphetamines, inhalants, sedatives or sleeping pills, hallucinogens, and opioids, is more than 2 times higher among homeless patients (70.96 percent) than community health center patients (32.85 percent) and public housing primary care center patients (33.41 percent).
- Patients experiencing homelessness are three times more likely to report not having usual sources of care (7.87 percent) than community health center patients (2.21 percent).
- Homeless patients (24.50 percent) are 2 times more likely to report being unable to get necessary medical care than community health center patients (11.77 percent) and public housing primary care center patients (12.87 percent).
- In 2018, more than 36,500 organ transplants were performed, with the majority of them being kidney and liver transplants.
- More than half (59 percent) of all people on the organ transplant waiting list are from racial/ethnic-minority groups such as African Americans, Hispanics, and Asians.
- During 2011-2015, the 1-year survival rate for unrelated blood stem cell transplants for male patients with sick cell anemia was 82.1 percent and for female patients 83.8 percent.
- From 2007-2018, nearly 2 out of 3 (63 percent) of new cord blood units were from donors who identified as coming from racially and ethnically underrepresented populations.
- The Ryan White HIV/AIDS Program provides HIV care and treatment services to approximately 535,000 people with diagnosed HIV in the United States. The program reaches more than 50 percent of all people diagnosed with HIV in the United States, the majority of whom are from low-income and racial/ethnic-minority groups.
- In 2017, 86 percent of the Ryan White HIV/AIDS Program clients were virally suppressed, up from 70 percent in 2010, and exceeding the national average of 57 percent.
- HIV viral suppression rates are lower in the South, although all states showed improvements in viral suppression between 2010 and 2017.
- HIV viral suppression rates are significantly lower among Blacks, AIANs, and Native Hawaiians/ Pacific Islanders compared with non-Hispanic Whites, although all racial/ethnic groups experienced improvement in viral suppression between 2010 and 2017.
- In 2017, HIV viral suppression rates were lower among unstably housed patients (71.2 percent) and temporarily housed patients (79.0 percent), compared with patients with stable housing (87.2 percent).
- Regardless of race/ethnicity, HIV patients with temporary housing (76.3 percent) and unstable housing (73.7 percent) have significantly lower rates of retention in care than patients with stable permanent housing (81.8 percent).
- Over 13 million people living in health professional shortage areas receive primary medical, dental or mental health care from a National Health Service Corps or Nurse Corps clinician.
- As of June 30, 2019, there were 6,418 designated HPSAs for primary care; 5,304 designated dental HPSAs, and 4,592 designated mental health HPSAs, indicating a large proportion of

geographic areas and population groups in the United States with unmet health care need.

- In rural areas of the United States, renters have nearly a 2-fold higher prevalence of smoking than homeowners (28.1 percent vs. 15.8 percent).
- In the rural United States, renters report nearly 2-fold higher prevalence of fair/poor health (21.6 percent vs. 40.0 percent) and poorer general mental health (10.2 percent vs. 18.6 percent) compared with homeowners.
- In the rural United States, renters report significantly higher prevalence of asthma, heart disease, stroke, diabetes, COPD, cancer, and arthritis, compared with homeowners.

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