2023 National Healthcare Quality and Disparities Report

Agency for Healthcare Research and Quality

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2023 NATIONAL HEALTHCARE QUALITY AND DISPARITIES REPORT

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Executive Summary

The United States is a global leader in scientific discovery and developing innovative technologies to diagnose and treat disease. Health professionals, provider organizations, health insurance plans, and other diverse entities bring those advancements to people. But the various healthcare systems often emerged at different points in our nation's history, under varied contexts and for different purposes. Thus, they were not always designed to function as a single, coherent system. But it is essential that they work together to ensure that the benefits of science and innovation reach all Americans.

Since 2003, the Agency for Healthcare Research and Quality's (AHRQ) *National Healthcare Quality and Disparities Report* (NHQDR) has summarized the status of healthcare delivery in the United States, providing a statistical portrait of how effectively healthcare delivery systems provide safe, high-quality, and equitable care to Americans. At its core, the NHQDR asks: *How successful are the nation's healthcare systems in ensuring that all people benefit from the scientific advancements and treatments available today?*

Many partners, including Department of Health and Human Services (HHS) agencies and health officials from all U.S. states, contribute data for the report, which the Secretary of HHS delivers to Congress annually as mandated by law. The 2023 NHQDR examines the data in three sections:

- **Portrait of American Healthcare** provides an overview of healthcare delivery systems. It characterizes the U.S. population, their leading health concerns, the main components of healthcare delivery, and the nation's capacity to deliver services to the population.
- **Special Emphasis Topics** are focused data briefs that examine quality and disparities in healthcare. This year's special emphasis topics explore the nation's experiences with COVID-19 healthcare delivery from five perspectives: the U.S. population, hospitals, ambulatory care settings, nursing and residential care facilities, and telehealthcare.
- **Quality and Disparity Tables** provide statistical assessments of healthcare delivery performance in eight topic-elated areas through the application of more than 550 quality measures.

Portrait of American Healthcare: Key Findings

Demographics

- The U.S. population is aging. The number of people age 65 and over increased from 40.2 million to 55.9 million between 2010 and 2021, or from 13.0% to 16.8% of the population. Currently, there is one adult age 65 or over for every three working age adults; the Census Bureau projects that there will be two older adults for every three working age adults by 2060.

  - This trend has important implications for healthcare delivery because older adults are more likely to have chronic conditions; mental disorders, including cognitive limitations; and physical disabilities. A higher ratio of older adults to working age adults raises concern that the number of people who need healthcare services will exceed the number available to provide care.
  - Healthcare delivery systems can respond to this demographic concern by pursuing approaches that promote "heathy aging." Such approaches include preventing chronic

diseases, addressing chronic conditions early so they do not lead to disability, and enabling people with disabilities to participate more fully in society.

- The population has become more diverse racially and ethnically. Non-Hispanic (NH) White people accounted for a smaller share of the population in 2020 (57.8%) than in 2010 (63.7%). At the same time, Hispanic (16.3% to 18.7%), NH-multiracial (1.9% to 4.1%), and NH-Asian (4.7% to 5.9%) people increased as a share of the population.
  - The change in racial and ethnic diversity has occurred largely in younger age groups. For example, 92.2% of Hispanic, 94.0% of NH-multiracial, and 86.8%% of NH-Asian people are under age 65.
  - In contrast, only 79.0% of NH-White people are age 65 years or younger.

  This trend suggests an increased need for more culturally and linguistically appropriate services for pediatric care, obstetric care, and mental health care, among others.

- More people are living in metropolitan areas. The population in both metropolitan and nonmetropolitan counties grew between 1990 and 2020, but it grew faster in metropolitan areas. Large central metropolitan areas ("cities") grew by 32.0%, large fringe metropolitan ("suburban") counties grew by 52.7%, micropolitan ("small town") counties grew by 14.5%, and noncore ("rural") areas grew by 5.7%. Therefore, healthcare services have declined in many nonmetropolitan areas, even as services in metropolitan communities have grown. However, substantial numbers of people (46 million, or 13.9% of the population) still live in nonmetropolitan counties, resulting in a healthcare access crisis for some people in those communities.

Leading Health Concerns

- In 2021, overall life expectancy decreased for the second year in a row, further expanding a life expectancy gap between U.S. residents (76.1 years) and people who live in peer countries, including Japan (84.5 years), Switzerland (84.0 years), Australia (83.4 years), Sweden (83.2 years), France (82.5 years), Belgium (81.9 years), the Netherlands (81.5 years), Austria (81.3 years), Germany (80.9 years), and the United Kingdom (80.8 years).
- The leading contributors to the drop in life expectancy in 2021 were COVID-19 (which contributed 50% of the decrease in life expectancy), unintentional injuries (15.9%, a plurality of which were drug overdose), heart disease (4.1%), liver disease (3.0%), and suicide (2.1%). The decrease in life expectancy would have been even greater except that deaths due to homicide, influenza and pneumonia, congenital malformations, and perinatal events decreased in 2021 compared with historical trends.
- Substantial disparities in life expectancy exist among people of different racial and ethnic backgrounds. NH-Asian people had the highest life expectancy in 2021 (83.5 years), followed by Hispanic (77.7 years), NH-White (76.4 years), NH-Black (70.8 years), and NH-American Indian or Alaska Native (AI/AN) (65.2 years) people. For comparison, the average life expectancy for peer countries in 2021 was 82.4 years.
- All racial and ethnic groups experienced substantial loss of life expectancy during the COVID-19 public health emergency (PHE) . Between 2019 and 2021, NH-AI/AN communities suffered the greatest loss in life expectancy (-6.6 years, a 9.2% decline), followed by Hispanic (-4.2 years, 5.1% decline), NH-Black (-4 years, 5.3% decline), NH-White (-2.4 years, 3.0%

decline), and NH-Asian (-2.1 years, 2.5% decline) people. For comparison, the average loss of life expectancy in peer countries during COVID-19 was -0.2 years, a 0.2% decline.

Social Determinants of Health

- Social determinants of health, (social, economic, environmental, and community conditions) often have a stronger influence on the population's health and well-being than services delivered by practitioners and healthcare delivery organizations. They also influence the extent to which people use healthcare services and how well they respond to treatment and recover from illness.
- One of the most important social determinants of health is having health insurance. The percentage of people under age 65 years with health insurance coverage continued to increase in 2021. Between 2020 and 2021, the percentage of Americans with private health insurance coverage increased 1.1%, and the percentage of those with public insurance increased 0.2%.

  However, insurance coverage varied by state and by race and ethnicity. States ranged between providing health insurance coverage to as many as 96.7% of their populations to as little as 77.6% of their populations. Hispanic and NH-AI/AN populations are less likely to have any health insurance coverage compared with other racial and ethnic groups.

Healthcare Delivery Systems

- Healthcare delivery systems are sectors of the healthcare industry that perform distinct but overlapping functions. They include healthcare workers and resources, as well as organizations, such as outpatient medical offices, clinical laboratories, pharmacies, home and community-based services, hospitals, and nursing and residential care facilities. Americans receive healthcare services from a diverse range of healthcare delivery systems.

  (As a concept, "healthcare delivery systems" are distinct from "health systems," which are networks of healthcare entities that share a central organizational structure, such as a network of medical offices and community hospitals anchored by a tertiary care academic hospital.)
- The number of healthcare workers decreased sharply during the COVID-19 PHE. As of January 2023, overall healthcare workforce participation has returned to levels reported in January 2020. The recovery, however, has varied by healthcare setting and by occupation.

  - Although the population is aging and demand for long-term services and supports has grown, the nursing and residential care facilities workforce shrank during the COVID-19 PHE. In January 2023, there were 8.4% fewer nursing and residential care workers than in January 2020. In contrast, the number of "employed and at work" hospital and ambulatory care workers has returned to or surpassed prepandemic levels.

- Although a potential shortage of nurses and doctors has received much attention, the total number of physicians and nurses employed and at work was stable between January 2020 and December 2022. However, the number of workers employed in occupations requiring an associate's degree or less education (medical assistants, phlebotomists, etc.) decreased from 2.26 million workers in January 2020 to a low of 1.55 million workers in April 2020, before partially recovering to 2.15 million workers as of December 2022.

  The data suggest that a widely reported shortage of healthcare workers may be driven by loss of workers in occupations that required less educational attainment for entry, many of whom have employment options beyond healthcare.

- Many rural Americans lack access to primary care services, and the primary care providers who are available are often isolated from their professional peers. The Health Resources and Services Administration (HRSA) has designated more than 63% of U.S. counties as "whole county" primary care health professional shortage areas (HPSAs), indicating areas where lack of primary care practitioners threatens access to needed services. Of these 71.7% are rural and micropolitan (i.e., small town) counties.
- Many rural Americans also lack access to hospital care, as 174 rural hospitals closed (i.e., either closed completely or stopped offering inpatient services while continuing to provide other healthcare services) between 2005 and 2020. The pace of rural hospital closures slowed during the COVID-19 PHE, with 2 closures in 2021 and 6 closures in 2022, compared with an annual average of 13.8 closures per year in the preceding 5 years. The slowdown occurred after passage of several federal COVID-19-related bills, which included temporary financial support for at-risk hospitals.
- Nearly one-fifth of the population has provided unpaid long-term and postacute care for a loved one instead of using a formally recognized healthcare establishment. This estimate reflects the growing share of the population that relies on long-term and postacute care services. The long-term and postacute care sector that seeks to address this need is fragmented and consists of many different types of healthcare delivery organizations and varying levels of government support and health insurance coverage.

National Health Expenditures

- Where a nation spends its limited resources often reflects its needs and priorities. The National Healthcare Expenditures provide a financial accounting of healthcare spending.
- National healthcare consumption represents the sum of all spending for medical care services plus governmental health administration and public health activities. As a share of national healthcare consumption, out-of-pocket spending has decreased, correlating with an increase in spending by publicly sponsored health insurance (Medicare and Medicaid). In 2021, publicly sponsored health insurance accounted for 40.4% of all healthcare consumption. Private health insurance accounted for 29.9%, and out-of-pocket spending accounted for 10.7%.
- Spending on public health activities, which includes worksite and school-based healthcare services, maternal and child health programs, the Indian Health Service, HRSA's Health Center program, and many other federal programs, declined from 18.0% to 12.4% of national health consumption between 1960 and 2019. During the COVID-19 PHE, spending on public health and other federal health programs increased to 19.0% of national health consumption in 2020 before decreasing to the most recent estimate of 14.7% in 2021.

- *Personal healthcare expenditures* represent all spending for medical goods and services, excluding government administration and public health activities. They show the nation is transitioning from hospital-based care toward delivering medical services in nonacute care settings.
  - Hospitals' share of personal health expenditures peaked at 47.8% in 1982. Since then, it has decreased steadily to 37.7% in 2021.
  - During the same period, spending for services typically delivered in nonacute care settings and people's homes replaced hospital's share of personal healthcare expenditures. These include increased spending between 1982 and 2021 for prescription drugs (5.4% to 10.6%); home care (1.2% to 3.5%); nonphysician professional care, such as physical therapists and home health aides (1.8% to 3.7%); and durable and nondurable medical equipment, such as wheelchairs, nebulizers, and home oxygen (8.7% to 10.9%).

Geographic Variations in Care

- Overall quality of care varied among states. Four states in the Northeast region (Maine, New Hampshire, Pennsylvania, and Rhode Island), five in the Midwest region (Iowa, Minnesota, Nebraska, South Dakota, and Wisconsin), one state in the South region (Delaware), and two states in the West region (Idaho and Utah) had the highest overall quality scores.
- There also were differences in quality of care by race and ethnicity among states. Five states in the West region (Hawaii, Idaho, Montana, Oregon, and Washington), four states in the South region (Arkansas, Kentucky, Virginia, and West Virginia), and two states in the Midwest region (Kansas and Nebraska) had the fewest racial and ethnic healthcare disparities overall.

Special Emphasis Topics: Key Findings

The 2023 NHQDR includes an **Overview** that describes SARS-CoV-2 and the biologic and clinical considerations that enabled this virus to cause the disease COVID-19. Five other sections examine how the COVID-19 pandemic affected U.S. healthcare delivery from the perspectives of five groups within the healthcare delivery system. Highlights from each are below.

Impact of COVID-19 on the U.S. Population

This topic examines the population's experience during the COVID-19 PHE, which varied across regions and communities due, in part, to the way that SARS-CoV-2 first affected densely populated coastal cities before spreading to suburban, rural, and remote communities. Nationally, COVID-19 death rates increased between the pandemic's first and second years, despite the nation having more knowledge about the disease and greater availability of testing, treatments, and vaccines.

Two types of factors drove the rise in COVID-19 death rates:

- First were factors that enhanced risks of getting infected. These included the emergence of variants with higher transmissibility, relaxation of public health initiatives that had limited exposure to the virus, and varying use of COVID-19 vaccines.

- Second were factors that enhanced risk of dying if infected. These included higher lethality of some SARS-CoV-2 variants, case surges that reduced hospital capacity and reduced access to appropriate treatment, and variable use of COVID-19 vaccines.

Healthcare delivery systems, such as hospitals, nursing homes, pharmacies, home and community-based service providers, and medical offices, had crucial roles mitigating both types of risks. They performed essential functions such as conducting surveillance testing, educating the public, and distributing vaccines. Healthcare delivery systems helped because the public health system lacked the resources to deliver these services at the scale needed for a global health crisis such as COVID-19 without health systems' involvement.

Despite limited vaccine availability in the early months of 2021, the combined efforts of the public health and healthcare delivery systems successfully achieved vaccination levels that were initially expected to confer population immunity. However, populations lacking health insurance, living in low-income communities, and living in rural locations were less likely to receive counseling to get the vaccine and less likely to receive it. As these groups often lack access to personal healthcare providers, the data suggest that healthcare delivery systems may have lacked capacity to equitably distribute vaccines beyond their traditional markets.

The data also show that initial targets for vaccination coverage did not achieve population immunity, as anticipated. This was due, in part, to the emergence of more transmissible variants of the virus, which occurred concurrently with declining adherence to public health guidance aimed at slowing disease transmission. Thus, multiple surges in cases associated with the Alpha (November 2020 to February 2021), Delta (August 2021 to October 2021), and Omicron (November 2021 to March 2022) variants were able to evade the population immunity conferred by vaccination efforts. These surges led to recurring spikes in cases, hospitalizations, and deaths throughout 2021.

Key data findings follow:

- In 2021, more than 70% of adults had received at least one COVID-19 vaccine, and more than half of adults (56.6%) completed a two-dose "primary series" vaccination.
- Vaccine use also varied within the population. Older adults, NH-Asian people, and people living in metropolitan areas were more likely to complete the primary COVID-19 vaccine series than other groups.
- Although a federal mandate covered the cost of COVID-19 vaccines and prohibited prior authorization or cost sharing to get the vaccine, uninsured, publicly insured, and low-income people were less likely to complete the COVID-19 primary series. The data signal that factors other than vaccine costs hindered vaccination efforts.
- Most Americans trust their healthcare professional for information about the COVID-19 vaccine. But the percentage of Americans who received a recommendation to get the COVID-19 vaccine from their healthcare professional was lower than 40% in 2021, and rates were similar among all racial and ethnic groups.
- Uninsured people and people with annual incomes lower than $75,000 were less likely to be recommended for COVID-19 vaccination by a healthcare professional. This was probably because these populations had less access to healthcare professionals, not because healthcare professionals treated them differently.

- Healthcare professionals were especially vulnerable to SARS-CoV-2 infection and its consequences. Thus, they were prioritized to receive the COVID-19 vaccine early. Healthcare workers were more likely to complete the two-dose COVID-19 vaccination series than other adults in 2021. But healthcare workers in nonmetropolitan areas and in publicly insured, uninsured, low-income, and high social vulnerability groups were less likely to get the vaccine than their colleagues in other groups, mirroring disparities seen in the overall adult population. These findings provide further evidence that financial and structural access barriers hindered health systems' ability to equitably distribute vaccines.
- Most COVID-19 deaths occurred among adults age 65 and over. But large numbers of deaths also occurred among adults ages 50-64 and 18-49, especially during surges associated with the Alpha, Delta, and Omicron variants. During the second year of the pandemic, adults age 65 and over were less likely to get infected but substantially more likely to die if infected.
- Among racial and ethnic groups, NH-AI/AN, NH-Native Hawaiian/Pacific Islander (NHPI), Hispanic, and NH-Black populations were more likely to die from COVID-19 than other groups. NH-NHPI people were less likely to get infected but more likely to die if infected. Hispanic and NH-Black people were more likely to get infected but exhibited similar risks of dying if infected as NH-White people. NH-AI/AN individuals were both more likely to get infected and more likely to die if infected.
- The varying patterns among different racial and ethnic groups suggest that different underlying factors caused each group's higher COVID-19 death rates. They signal the possibility that achieving equitable health outcomes may require tailored disease mitigation strategies to address different groups' specific concerns.
- Disparities in COVID-19 deaths also occurred between metropolitan and nonmetropolitan communities. People in nonmetropolitan communities appeared to be somewhat more likely to get infected and appeared to be at higher risk of dying if infected. Limited access to hospital and critical care services may have contributed to the higher COVID-19 death rates experienced in those communities. Lower uptake of the COVID-19 vaccine in small towns and rural areas may also have contributed to these outcomes.

Impact of COVID-19 on Hospitals

This topic examines the healthcare delivery sector that provides acute care services to people with serious, sometimes critical, injuries and illnesses. Hospitals were a vital resource during the COVID-19 PHE. Thus, the nation had strong interest in ensuring that they had sufficient capacity to meet demand for acute and critical care services, particularly during the initial surge of cases in early 2020 and subsequent surges associated with the Alpha, Delta, and Omicron variants.

Key findings follow:

- Hospital and emergency department (ED) capacity was closely coupled with COVID-19 cases. Data show increased ED visits and hospital admissions during the spike in cases associated with the Alpha, Delta, and Omicron variants that occurred throughout 2021. Data also show decreased ED visits and hospital admissions for non-COVID-19 conditions during surge periods, suggesting that non-COVID-19 conditions were crowded out by COVID-19 cases.

- Admissions for COVID-19 often required critical care services. Among middle-age and older adults hospitalized for COVID-19 between March 2020 and March 2022, the median weekly percentage who required ventilator support was more than 10%. At times, use of ventilators rose as high as 26.6% for adults ages 30-59 and 28.2% for adults age 60 and over. For context, approximately 5.3% of people hospitalized for severe community-acquired pneumonia required mechanical ventilation.
- Adults admitted for COVID-19 age 60 and over were more likely to die in the hospital than adults ages 30-59, but death rates in both groups were high. For example, in the first week of July 2022, during the surge associated with the Omicron variant, 17.5% of adults age 60 and over admitted for COVID-19 died, and 11.9% of adults ages 30-59 died.
- People hospitalized with COVID-19 often required prolonged treatment, especially if they needed ventilator support. The weekly average hospital length of stay (LOS) ranged between 6.8 and 14.7 days for adults with COVID-19 age 60 and over and 5.1 and 34.5 days for adults ages 30-59.
- One outcome of people with COVID-19 needing prolonged care was that flow through the hospital slowed, resulting in delays admitting people from the ED and overall delays in assessing and treating people from the ED. The overall average hospital LOS increased by 4.3%, from 4.7 days in 2019 to 4.9 days in 2020.
- Median ED wait times (the total time spent in the ED) increased from 141 to 151 minutes (a 7.1% increase) between 2019 and 2020-2021. Median ED boarding times (the time between decision to admit and moving into a hospital bed) increased from 100 to 126 minutes (a 26.0% increase) between 2019 and 2020-2021.
- The stress put on hospitals by the COVID-19 PHE affected people hospitalized with COVID-19 more than patients hospitalized for non-COVID-19 conditions. Patient safety measures that did not include COVID-19 patients had been improving over the past 5 years.

    - From 2016 to 2020, rates of sepsis after surgery decreased from 5.1 to 3.8 infections per 1,000 admissions.
    - Rates of central line-associated bloodstream infections decreased from 0.13 to 0.09 infection per 1,000 admissions.
    - Rates of hospital-associated pulmonary embolism or deep vein thrombosis (blood clots) decreased from 3.8 to 3.0 cases per 1,000 admissions.

Impact of COVID-19 on Ambulatory Care

This topic examines preventive care services, which are typically delivered in primary care settings. Early experiences during the COVID-19 PHE raised concern that financially distressed primary care practices would close, limiting access to preventive care services. Reports that many people were deferring routine medical visits also raised concern that fewer people would receive primary care services, leading to a wave of preventable disease later. Two exemplars of preventive services provided in primary care settings are chronic diabetes management and screening for cancer. Measures related to these conditions suggest that COVID-19 had a limited impact on quality of preventive care.

Key findings follow:

- Approximately 1 in 6 adults delayed getting medical care due to COVID-19 in 2020. Adults age 65 and over were more likely to defer medical visits than adults ages 18-44 (22.0% vs. 12.8%), as were people with any disability compared with people with no disability (25.2% vs. 15.0%). Hispanic people were less likely to defer medical care than other racial and ethnic groups. People in micropolitan (small town) areas were less likely to defer care compared with other communities.
- Diabetes management:
  - For preventive diabetes care, the percentage of people with diabetes who received influenza vaccination increased in 2020. There were, however, no statistically significant changes in the percentage of people who received recommended diabetes monitoring or dilated eye examination. The percentage of people with diabetes who received a foot examination decreased (worsened), continuing a multiyear trend.
  - Disparities in delivering preventive diabetes care were observed. In 2020, Hispanic adults age 40 and over with diabetes were less likely to have at least two hemoglobin A1c measurements, have their feet checked for sores or irritation, or receive a flu vaccination compared with NH-White adults. Although the differences among these groups fell short of statistical significance in 2019, similar patterns were observed.
  - Although minor differences in preventive care services were observed among people living in different locations of residence, overall trends for preventive care delivery between 2002 and 2019 show an absence of urban/rural disparities for hemoglobin A1c monitoring, dilated eye exams, and diabetic foot exams.

- Cancer screening:
  - Nationally, there were no statistically significant differences in screening rates for breast and cervical cancer between 2019 and 2021. Year-to-year colorectal cancer screening was not assessed due to recent changes in how these data are collected.
  - Cancer screening appeared to decrease among some racial and ethnic groups:

    - Rates of breast cancer screening with mammogram decreased between 2019 and 2021 for Hispanic (78.2% to 73.8%), NH-Asian (72.4% to 66.3%), and NH-multiracial people (73.7% to 64.2%), while rates increased slightly for NH-White people (75.9% to 76.%). None of the changes were statistically significant.
    - Rates of cervical cancer screening with a Pap smear or human papillomavirus test decreased between 2019 and 2021 for Hispanic (70.4% to 69.1%), NH-Asian (67.8% to 63.9%), NH-Black (78.1% to 74.4%), and NH-multiracial people (80.2% to 77.2%) and remained unchanged for NH-White people (79.9% in both years). These changes were not statistically significant.

- Among urban and rural groups, overall, people in metropolitan communities were more likely to receive cancer screening than those in nonmetropolitan ones. This disparity appeared to narrow, as cancer screening rates decreased among people in cities and increased among people in rural counties:
  - Between 2019 and 2021, breast cancer screening rates decreased from 77.3% to 75.5% for people in large central metropolitan areas and from 78.5% to 77.3% for large fringe metropolitan areas. At the same time, it increased from 67.6% to 71.9% for people in noncore counties. These changes were not statistically significant.
  - Between 2019 and 2021, cervical cancer screening rates decreased by 4.9% for people in large central metropolitan areas (77.5% to 73.7%) but increased by 10.6% for people in noncore counties (66.8% to 73.9%). These changes met criteria for statistical significance.

Impact of COVID-19 on Nursing Homes

This topic examines the healthcare delivery sector that provides long-term and residential support for older adults and other people with disabilities that prevent independent living. Some services also furnish short-term postacute care to safely transition people from the hospital to home. During the COVID-19 PHE, nursing homes, as one example, were an epicenter of disease activity due to factors that included close living conditions, physically vulnerable residents, and limited access to personal protective equipment.

Key findings follow:

- Case rates among nursing home residents correlated with case rates among nursing home workers, indicating infections transmitted bidirectionally between workers and residents. But COVID-19 deaths among nursing home residents far exceeded deaths among workers, emphasizing the heightened risks experienced by nursing home residents who were mostly older, medically vulnerable, and at higher risk than the mostly younger workforce who cared for them.
- COVID-19 vaccination rates among nursing home residents and workers increased gradually over the first year of vaccine availability and approached 90% as of 2022. Six months after vaccines became available, almost 80% of nursing home residents had received the primary COVID-19 vaccine series, and almost 60% of nursing home workers had. By February 2022, the percentage of primary series vaccine completion exceeded 85% in both groups.
- The nursing home workforce largely consists of low-wage personnel with limited training and high rates of turnover. Workforce capacity had been shrinking before the COVID-19 PHE, and COVID-19 exacerbated this issue. COVID-19 infections required that nursing home workers isolate several days to weeks to avoid infecting residents, which led to understaffing and conditions that promoted worker burnout.
- More than 80% of nursing home workers are women. Between 2019 and 2022, the number of female nursing home workers decreased 12%, and the number of male workers decreased 7%.

- Between May 2020 and January 2023, the percentage of nursing homes reporting "critical" shortages of nursing staff ranged between 14% and 27%. The percentage reporting a critical shortage of aides ranged between 16% and 29%. The percentage reporting a critical shortage of clinical staff, such as physicians, physician assistants, and advanced practice nurses, ranged between 2% and 4%.
- Worsening shortages coincided with surges associated with the Alpha, Delta, and Omicron variants. More than one in four (28%) nursing facilities nationally reported staffing shortages as of March 2022, when the Omicron-associated surge was receding. The greatest shortages were in Alaska (63%), the lowest in California (3%).
- Interventions to limit disease transmission, such as isolation or reduced mobility, and shortages of nursing home workers may have negatively affected quality of care for nursing home residents. The overall pattern of nursing home quality measures suggests that long-stay nursing home residents may have had less access to staff assistance and less mobility.
- The Centers for Medicare & Medicaid Services temporarily exempted nursing home providers from submitting Minimum Data Set assessment data, so apparent trends should be interpreted with caution. But available data indicate that long-stay nursing home residents who reported needing help with daily activities was 23.7% in 2020, up from 19.9% in 2019.
- Long-stay nursing home residents who had moderate to severe pain was 7.6% in 2020, up from 7.0% in 2019. Long-stay nursing home residents who reported worsening ability to move independently was 30.3% in 2020, up from 23.2% in 2019.
- In contrast, measures that assess the effects of limiting interventions on residents or limiting their mobility were essentially unchanged. Rates of long-stay nursing home residents with urinary tract infections were 1.8% in 2019 and 1.9% in 2020; and rates of long-stay nursing home residents who experienced a serious fall were 0.6% in 2019 and 0.55% in 2020.

Impact of COVID-19 on Telehealthcare

This topic examines the delivery of healthcare services through telecommunication technologies. Policy changes implemented during COVID-19 enabled more telehealthcare service use to minimize in-person contact and decrease disease transmission. The term "telehealthcare" includes many different types of services, including audio-only encounters that resemble telephone consultations, and video-plus-audio encounters. NHQDR data indicate that the type of service and overall telehealthcare use varied across populations. Telehealthcare use rates were often lower in populations with the potential to benefit the most from virtual care.

Key findings follow:

- Telehealthcare use has increased, especially for behavioral health specialties (such as psychology and psychiatry) and primary care. Telehealthcare accounted for about 1% of behavioral health specialty visits and non-behavioral health primary care visits in January 2020. But rates increased during the COVID-19 pandemic such that more than 55% of behavioral health specialty visits and approximately 23% of non-behavioral health primary care visits were telehealthcare visits in April 2020.

- Although telehealthcare use waned as COVID-19 receded, it still accounted for approximately 35% of behavioral health specialty visits and 5% of non-behavioral health primary care visits in December 2021.
- Overall, 8.8% of all physician's office visits in 2021 were telehealthcare visits. Use varied by medical practice type and by population characteristics. Rates were higher for practices that provided services that do not require in-person contact, such as ordering and interpreting diagnostic studies, prescribing medications, and counseling patients. Rarely, practices that require physical contact to examine or treat people, such as ophthalmology, provided telehealthcare services.
- In 2021, telehealthcare use rates were lowest for people age 65 years and over (3.1% vs. 15.8% for people ages 18-44 years) and people living in noncore areas and small metropolitan areas (3.7% and 4.8%, respectively, vs. 11.7% in large central metropolitan areas).
- In 2021, more practices provided audio-only services (67.0%) than video-plus-audio services (56.4%).
- In 2021, older patients and low-income people were less likely to have audio-plus-video visits: 42.2% of people age 65 and over vs. 71.7% of adults ages 18-44 years; and 50.1% of people with family incomes less than 100% of the poverty guideline vs. 71.5% of people with family incomes 400% or more of the poverty guideline.
- Telehealthcare poses identifiable barriers to healthcare delivery. In 2021, of practices that use telehealthcare technology, 70.4% of physicians reported patients' difficulty using technology as a factor affecting use of telehealthcare and 64.3% reported limitations in patients' access to technology as a factor.
- While healthcare providers perceived telehealthcare as a useful resource, they indicated the need for telehealthcare quality improvement. In 2021, 62.0% of practices that used telehealthcare technology were very or somewhat satisfied with using telehealthcare technology for patient visits and 70.8% planned to continue using telehealthcare visits when appropriate after the COVID-19 pandemic ended. However, only 31.0% of practices that used telehealthcare technology described being able to provide similar quality of care during telehealthcare visits as during in-person visits.

Quality and Disparities Tables: Key Findings

Readers will find the full collection of 555 NHQDR measures online at https://datatools.ahrq.gov/nhqdr and in the Healthcare Quality and Disparity tables in Appendix B of the report. The tables summarize each measure, and each table shows (1) key details about the measure; (2) the nation's overall performance (*quality*) on the measure; and (3) difference in performance for priority populations or subgroups (*disparities*).

Readers will discover many healthcare delivery trends in the tables. Five notable findings follow.

Cost of Care – More Americans report higher burden of healthcare costs, particularly those with private health insurance:

- The overall percentage of people under age 65 whose family health insurance premium and out-of-pocket health expenditures consumed more than 10% of total family income rose 8.9% (from 14.3% to 15.7%) between 2002 and 2020.

- The percentage of people with private, employer-sponsored health insurance reporting that premiums plus out-of-pocket costs consumed more than 10% of family income rose by 25.9% (from 12.3% to 16.6%) between 2002 and 2020.
- For comparison, the percentage of people with publicly sponsored health insurance reporting that premiums plus out-of-pocket costs consumed more than 10% of family income *decreased* by 35.1% (from 17.7% to 13.1%) between 2002 and 2020.

Postoperative Sepsis – Efforts to improve patient safety by avoiding healthcare-associated infections have yielded measurable improvements in hospital and other healthcare settings:

- Rates of sepsis after surgery decreased 31.9% (decreasing from 5.1 to 3.8 infections per 1,000 elective surgery admissions) between 2016 and 2020.
- Similarly, hospital admissions with central venous catheter-related bloodstream infections—a common underlying cause of sepsis—decreased 44.4% (from 0.13 to 0.09 infections per 1,000 hospital discharges) between 2016 and 2020.

Adolescent Mental Health – Adolescents' need for mental health services has grown but access to treatment remains limited, particularly among low-income and Hispanic youths.

- Emergency department visits for mental health diagnosis by children and adolescents ages 0-17 years increased 11.5% (from 784.1 to 886.4 visits per 100,000 population) between 2016 and 2020.
- Death due to suicide among adolescents ages 12-17 increased by 75.7% (rising from 3.7 to 6.5 deaths per 100,000 population) between 2008 and 2021.
- Only 40.6% of adolescents ages 12-17 with a major depressive episode received treatment for depression in 2021.
    - Access to treatment was far lower for adolescents with household incomes below the poverty guideline (35.8%) than for adolescents with household incomes 400% of the poverty guideline or higher (46.4%).
    - Access to treatment was also far lower for Hispanic (30.2%) youths than for NH-White (47.4%) youths.

Opioid Use Disorder – Opioids fall into three broad categories: "natural opioids" are extracted from the seed pods of certain varieties of poppy plants; "semisynthetic opioids" are compounds derived from natural opiates; and "synthetic opioids" are compounds manufactured from chemical raw materials that act on the same receptors as natural opioids. Natural opioids include medications such as oxycodone, hydrocodone, oxymorphone, and hydromorphone. Synthetic opioids include medications such as fentanyl and tramadol, as well as legally and illegally manufactured substances.

Mortality data indicate that overprescribing and diversion of prescription opioid analgesics initiated the early waves of the opioid overdose epidemic. But deaths due to illicit "synthetic" opioids, which are manufactured and distributed outside healthcare delivery systems, drive the current wave. Other data also show that health systems' efforts to limit prescribing of natural and semisynthetic opioid analgesics have had modest effects on the opioid overdose epidemic because much of the recent rise in opioid-related mortality is attributable to synthetic opioids.

The data indicate greater need for health systems to prescribe medication for opioid use disorder (MOUD, which includes treatment with methadone, buprenorphine, or naltrexone). These are evidence-based treatments that reduce opioid use and risk for overdose.

- The national percentage of adults who filled four or more outpatient opioid prescriptions in the calendar year decreased between 2013 and 2020 (from 4.6% to 2.6%).
- Between 2011 and 2021, the rate of drug overdose deaths due to natural or semisynthetic opioids fluctuated between 3.5 and 4.4 deaths per 100,000 population, while rates of drug overdose due to synthetic opioids increased sharply from 0.9 to 21.8 deaths per 100,000 population (an over 2,000% increase).
- Only 22.1% of people with an opioid use disorder received MOUD in 2021

Kidney Transplantation – Chronic kidney disease affects approximately 14% of adults, and approximately 0.2% have end stage kidney disease that requires long-term dialysis or kidney transplantation. Although dialysis can be lifesaving, kidney transplantation is preferred because it often provides people with better quality of life, reduced treatment burden, and longer life expectancy. Yet relatively few Americans have access to this option:

- The national percentage of people who were registered on a waiting list or received a kidney transplant within a year of starting dialysis did not change between 2000 and 2019 (15.2% to 15.7%).
- Although racial and ethnic disparities for this measure narrowed between 2000 and 2019, the percentage of Hispanic (12.9% to 14.1%) and NH-Black (11.2% to 13.1%) people who were registered on a waiting list or received a kidney transplant within a year of starting dialysis remained lower than for NH-White people (18.0% to 17.1%).

Resources To Improve Healthcare

HHS and the administration have produced and distributed a range of resources to support healthcare delivery systems and aid Americans in addressing the concerns outlined in this report. For resources relevant to each Special Emphasis Topic, the NHQDR links to HHS websites relevant to the topic. The NHQDR team invites readers to use the data and resources in this report to improve quality of care and advance health equity. They also invite readers' suggestions for ways to improve how they monitor healthcare quality and disparities in our nation.

Portrait of American Healthcare

Healthcare quality assessments evaluate health systems' effectiveness to provide patient care that is timely, affordable, and based on reliable evidence. This section of the report provides a broad portrait of U.S. healthcare to support contextual understanding of the structural factors, including societal inequities, that affect how today's healthcare is organized, financed, and delivered.

This section includes:

- **Demographics:** trends in age, race and ethnicity, population density.
- **Leading Health Concerns:** trends in life expectancy, mortality.
- **Social Determinants of Health:** prevalence of social, economic, environmental, and community conditions affecting health outcomes.
- **Healthcare Delivery Systems:** capacities of the healthcare workforce and organizations.
- **National Healthcare Expenditures:** estimates on spending for medical goods and services.
- **Geographic Variations in Care:** state-level data on quality and disparities.

Demographics

Healthcare systems and providers in the United States serve a large and growing population. Over the 10 years between the 2010 Census and the 2020 Census,[i] the U.S. population increased 7.4% to 331,449,281 people.[1]

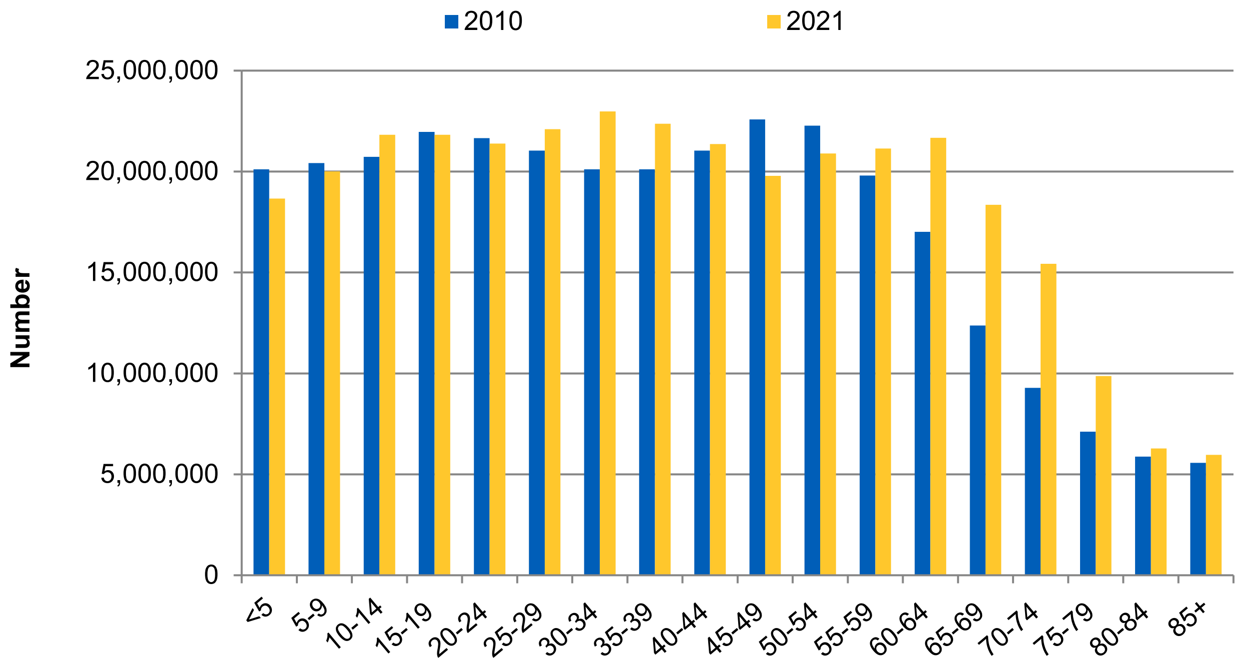
The following demographic data describe emerging trends related to the aging population, increasing racial and ethnic diversity, and more Americans living in metropolitan areas.

❖ **The U.S. population is aging.**

The U.S. Census Bureau estimates that the percentage of the population age 65 years and over increased from 12.7% to 16.1% between 2010 and 2020. Compared with 2010, when nearly 1 in 8 people in the United States was age 65 years or over, now approximately 1 in 6 people is age 65 years or over.

[i] In this report, "Census" refers to the decennial census.

Figure 1. Distribution of people in the United States, by age group, 2010 and 2021

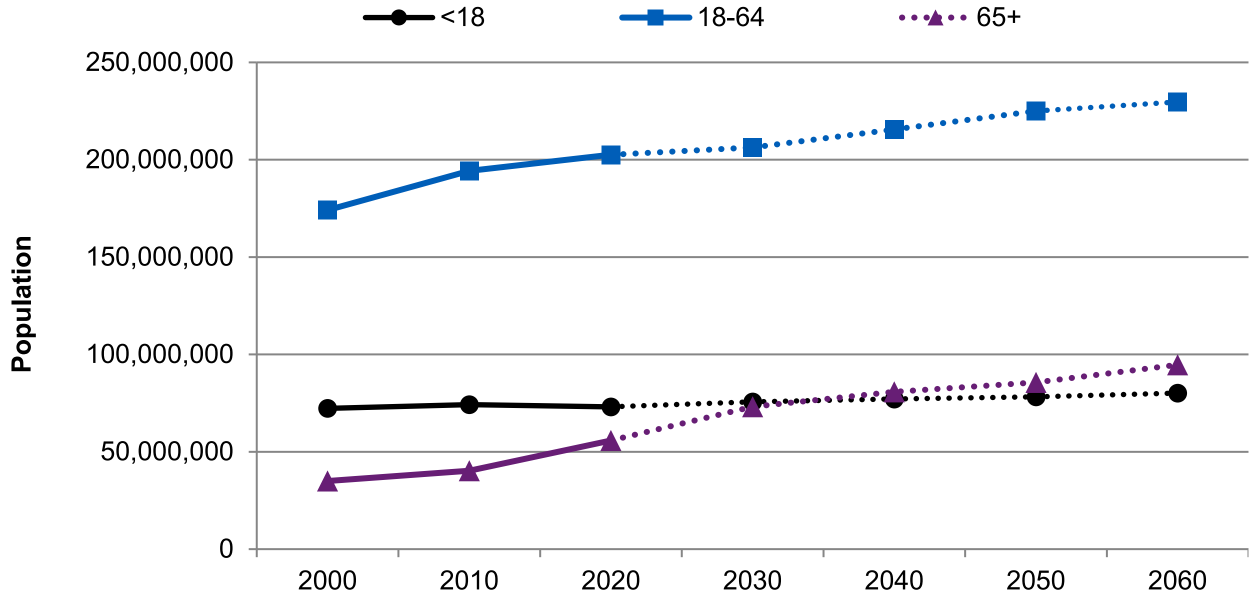


Source: U.S. Census Bureau, American Communities Survey, 1-year estimates, 2010 and 2021 (Table S0101).

- The number of youths under age 20 years decreased from 83,215,066 (26.9% of the population) in 2010 to 82,317,638 (24.8% of the population) in 2021 (Figure 1).
- The number of adults ages 20-44 years increased from 103,941,496 in 2010 to 110,195,342 in 2021 but decreased as a percentage of the total population (from (33.6% to 33.2%).
- The number of adults ages 45-64 years increased from 81,668,318 in 2010 to 83,488,751 in 2021 but decreased as a percentage of the total population (from 26.4% to 25.2%) .
- The number of adults age 65 years and over increased from 40,215,460 (13.0% of the population) in 2010 to 55,892,014 (16.8% of the population) in 2021.

The Census Bureau anticipates that the population will continue to age in the coming decades, with the population of people age 65 years and over projected to exceed the population of children and adolescents around 2040.

Figure 2. Historic, current, and projected U.S. population, by age, 2000-2060



Source: U.S. Census Bureau, Decennial Census 2000, Table DP1 and American Community Survey 1-year estimates, 2010 and 2021, Table S0101 (solid trend lines); and Projected Age Groups and Sex Composition of the Population: Main Projections Series for the United States, 2017-2060, Table 2 (dotted trend lines).

- Between 2000 and 2021, the number of adults age 65 years and over grew from approximately 35 million to nearly 56 million. This population is projected to increase to approximately 95 million people by 2060 (Figure 2).
- Between 2000 and 2021, the number of adults ages 18-64 years grew from approximately 174 million to approximately 202.5 million. This population is projected to increase to nearly 230 million people by 2060.
- Between 2000 and 2021, the number of children and adolescents less than 18 years old remained relatively stable, growing from approximately 72 million to 73 million. This population is projected to grow slowly to approximately 80 million people by 2060.

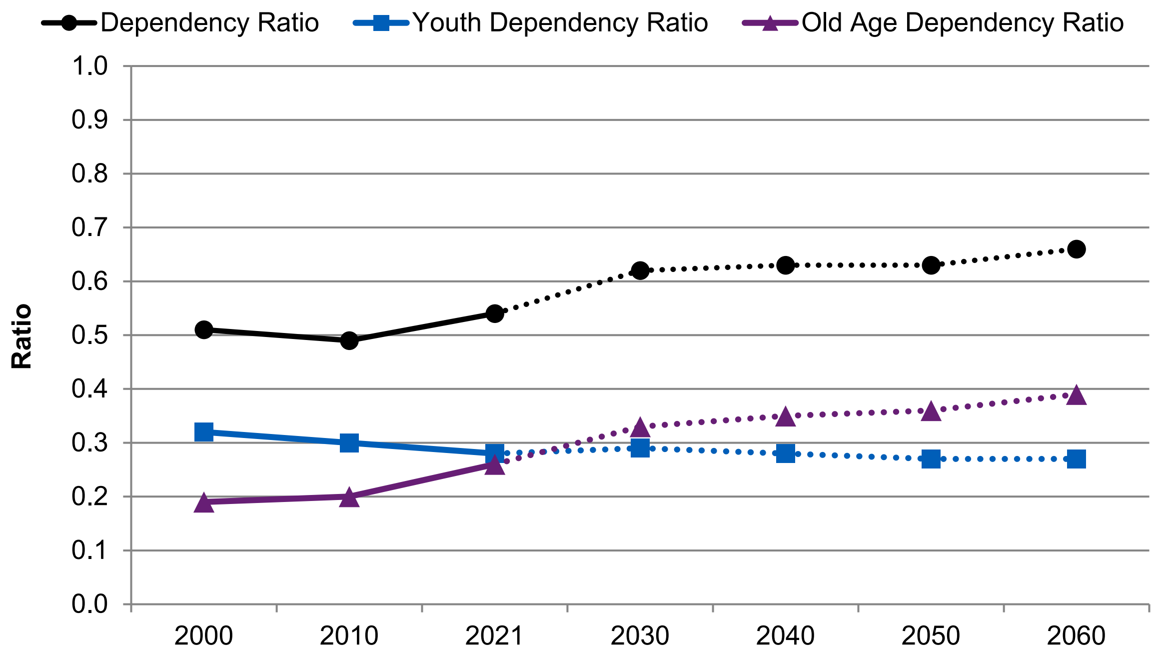
❖ **An aging population has implications for healthcare delivery.**

An aging population has significance for healthcare delivery because many older adults have left the workforce and rely on younger adults to provide clinical care and long-term services and supports (LTSS). The “dependency ratio” is often used to measure a population’s potential for economic activity and the burden borne by its workforce. It compares the total number of dependent youths under age 15 plus the number of adults age 65 and over to the number of “working age” people ages 15-64 years.

A higher dependency ratio indicates that more people need socioeconomic support relative to the number of people who can provide support. For example, a population with a 0.25 dependency ratio is one in which only 1 in 4 people is either younger than 15 or age 65 and over; thus, three working age people are available to support every dependent person. In contrast, a population with a 0.6 dependency ratio is one in which 3 in 5 people are potentially dependent and signals a relatively higher burden for the 2 in 5 people left to support them.

Projections from the Census Bureau anticipate a meaningful rise in the dependency ratio, driven entirely by the growth in the number of older adults.

Figure 3. Historic, current, and projected dependency ratio, 2010-2060

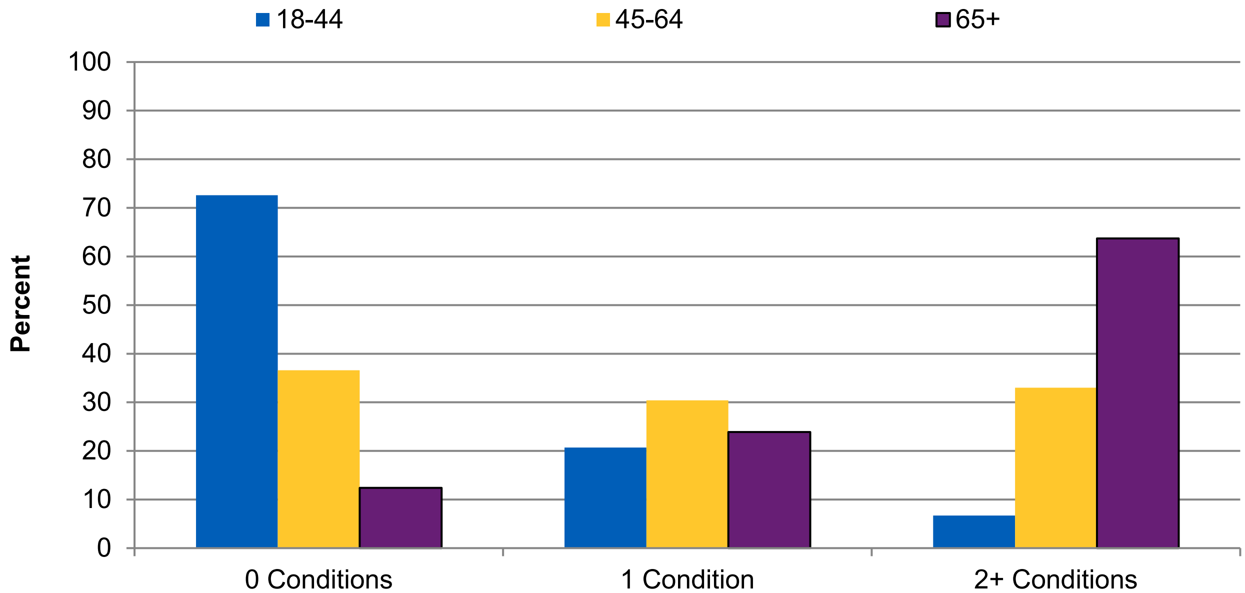


Source: Estimates generated with data from U.S. Census Bureau, Decennial Census 2000, Table P1 and American Community Survey 1-year estimates, 2010 and 2021, Table S0101 (solid lines); and Projected Age Groups and Sex Composition of the Population: Main Projections Series for the United States, 2017-2060, Table 2 (dotted trend lines).
Note: Dependency ratio is the ratio of people less than 15 years old and people 65 years and over to people ages 15-64 years. The dependency ratio sums together the old-age dependency ratio, which is the ratio of people 65 years and over to people ages 15-64 years, and the youth dependency ratio, which is the ratio of people less than 15 years old to people ages 15-64 years. The Census Main Projection Series data assume historical immigration patterns, based on trends that occurred in 1980-2014. Data for alternate immigration scenarios are available from Johnson S. A Changing Nation: Population Projections Under Alternative Migration Scenarios. Current Population Reports, P25-1146. Washington, DC: U.S. Census Bureau; 2020. https://www.census.gov/content/dam/Census/library/publications/2020/demo/p25-1146.pdf.

- Between 2000 and 2021, the dependency ratio increased from 0.51 to 0.54. This change was led by an increase in the old-age dependency ratio from 0.19 to 0.26. During the same period, the youth dependency ratio decreased from 0.32 to 0.28 (Figure 3).
- By 2060, the dependency ratio is projected to rise to 0.66. The old-age dependency ratio is projected to increase to 0.39, while the youth dependency ratio is projected to decrease to 0.27.

An aging population also implies greater need for healthcare services because the prevalence of chronic disease, multiple chronic diseases, functional decline, and cognitive decline all increase with advancing age. Thus, older people are more likely to need healthcare services and long-term care. For example, one analysis conducted for the Administration on Community Living estimated that 70% of people age 65 and over will require LTSS before they die.[2]

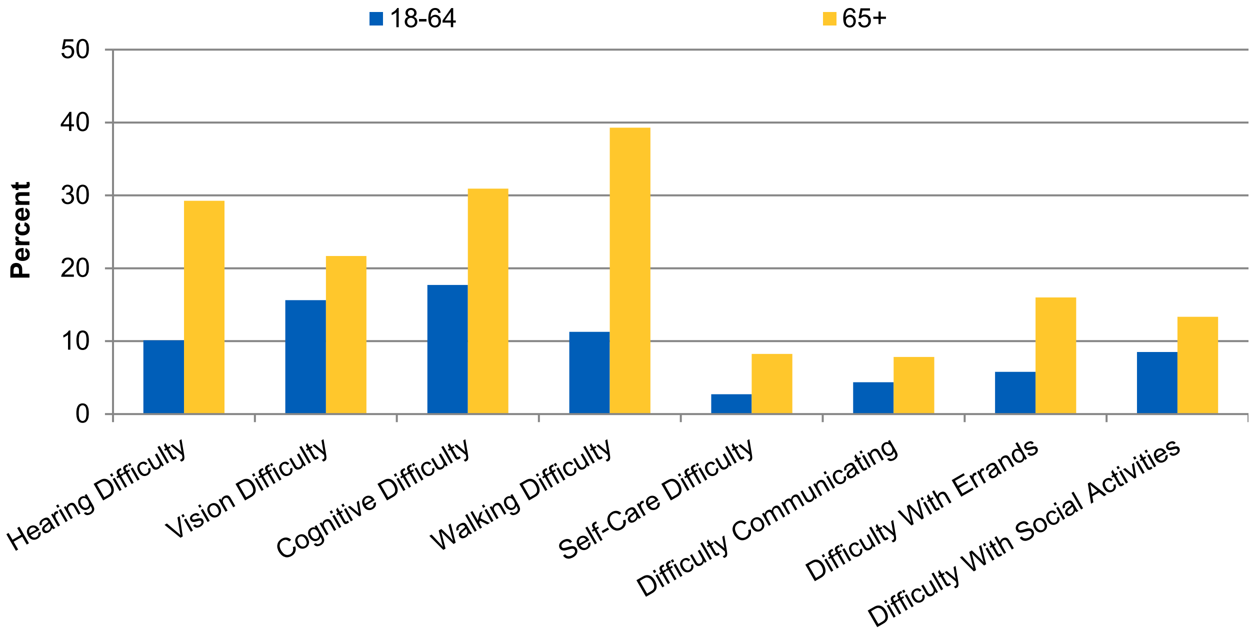
Figure 4. Adults with chronic conditions, by age, 2018



Source: Boersma P, Black LI, Ward BW. Prevalence of multiple chronic conditions among U.S. adults, 2018. Prev Chronic Dis. 2020 Sep 17:17:E106. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7553211/.
Note: Chronic conditions measured were arthritis, cancer, chronic obstructive pulmonary disease, coronary heart disease, current asthma, diabetes, hepatitis, hypertension, stroke, and weak/failing kidneys.

- In 2018, the percentage of people with no chronic diseases was 72.6% among adults ages 18-44 years, 36.6% among adults ages 45-64 years, and 12.4% among adults age 65 years and over (Figure 4).
- The percentage of people with one chronic disease was 20.7% among adults ages 18-44 years, 30.4% among adults ages 45-64 years, and 23.9% among adults age 65 years and over.
- The percentage of people with two or more chronic diseases was 6.7% among adults ages 18-44 years, 33.0% among adults ages 45-64 years, and 63.7% among adults age 65 years and over.

Figure 5. Adults reporting any limitation with performing tasks, by age, 2021



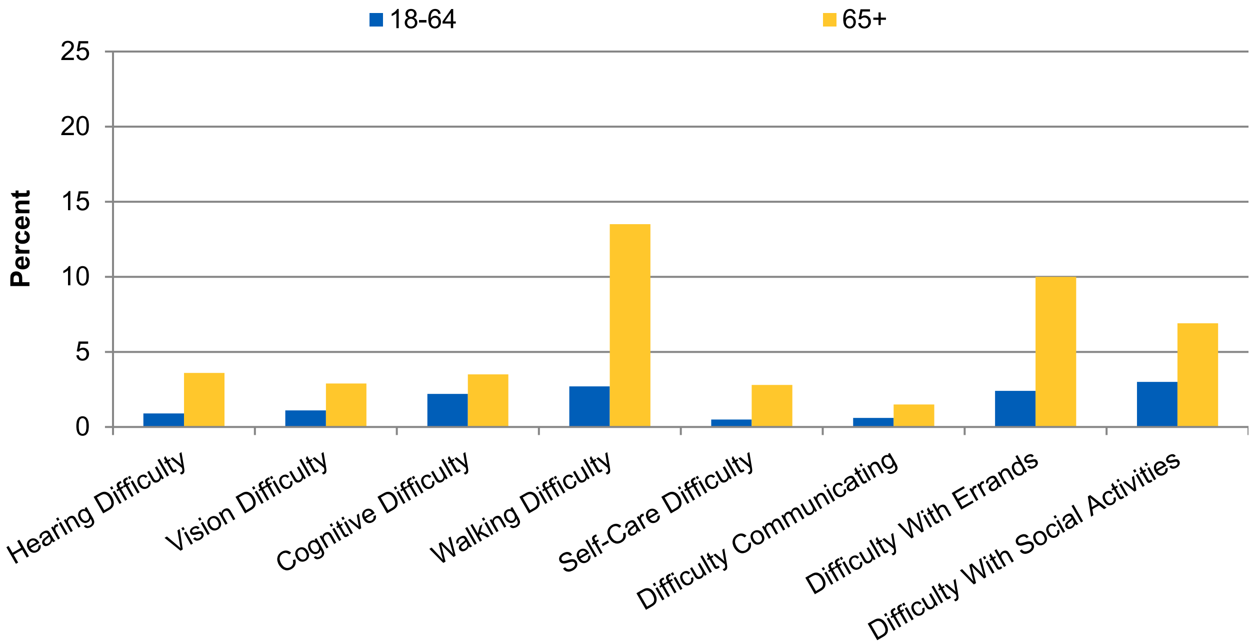
Source: AHRQ analysis of Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey public use data, Adult Sample, 2021.
Note: “Any limitation” includes responses in which respondents indicated “some difficulty,” “a lot of difficulty,” or “cannot do at all.” The survey asks about the use of assistive devices, such as eyeglasses and hearing aids, and whether the person has difficulty seeing, hearing, walking, or completing other activities even with the use of devices.

- In 2021, among adults age 65 years and over, 29.3% reported any difficulty hearing; 21.7% reported any difficulty seeing, even with glasses; 30.9% reported any difficulty with memory or cognition; 39.3% reported any difficulty walking; 8.3% reported any difficulty with self-care activities such as dressing or bathing; 7.8% reported any difficulty communicating; 16.0% reported any difficulty running errands alone; and 13.3% reported any difficulty participating in social activities (Figure 5).
- Among adults ages 18-64 years, 10.1% reported any difficulty hearing; 15.6% reported any difficulty seeing, even with glasses; 17.7% reported any difficulty with memory or cognition; 11.3% reported any difficulty walking; 2.7% reported any difficulty with self-care activities such as dressing or bathing; 4.4% reported any difficulty communicating; 5.8% reported any difficulty running errands alone; and 8.5% reported any difficulty participating in social activities.

Most older people live productive and meaningful lives. While many people age 65 years and over experience *some* disability, only a small percentage have *severe* limitations, mostly due to limited mobility (Figure 6). The gap between the prevalence of older people with *some* disability and those with *severe* disability signals an important role for healthcare delivery systems as promoters of healthy aging.[3] It suggests high-quality healthcare services can mitigate the most important consequences of an aging population by:

- Preventing chronic diseases.
- Managing chronic illnesses early and effectively enough to delay the onset of disability.
- Enabling people with disabilities to participate in society more fully.

Figure 6. Adults reporting severe limitation with performing tasks, by age, 2021



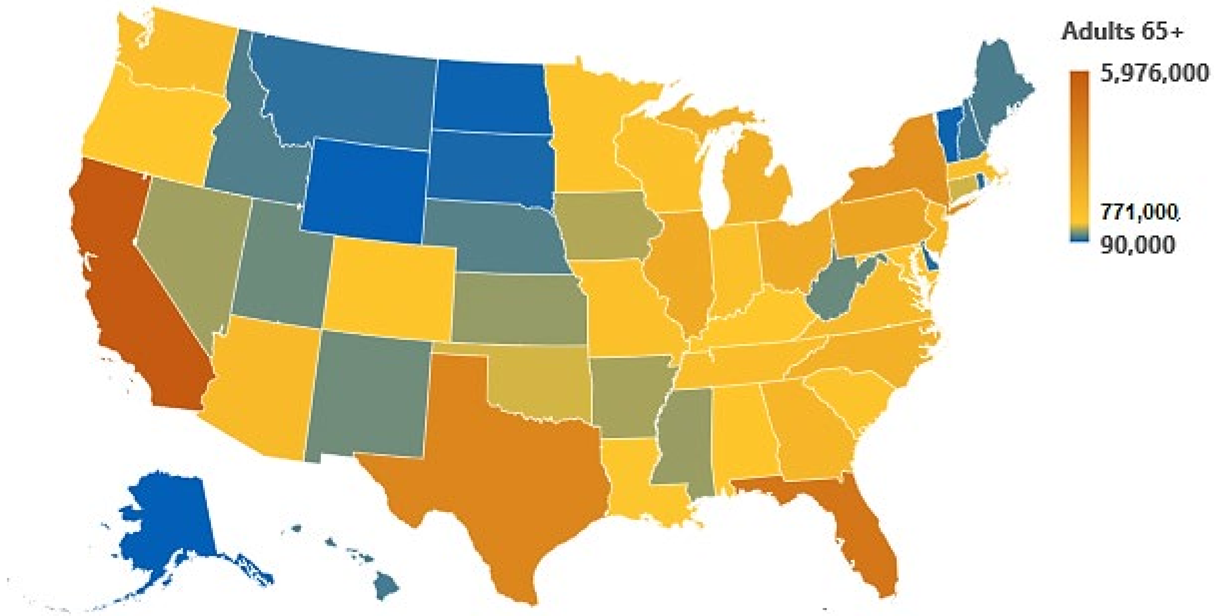
Source: AHRQ analysis of Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey public use data, Adult Sample, 2021.
Note: "Severe limitation" includes only responses in which respondents indicated "a lot of difficulty" or "cannot do at all."

- In 2021, among adults age 65 years and over, 3.6% reported severe limitation hearing; 2.9% reported severe limitation seeing, even with glasses; 3.5% reported severe limitation with memory or cognition; 13.5% reported severe limitation walking; 2.8% reported severe limitation with self-care activities such as dressing or bathing; 1.5% reported severe limitation communicating; 10.0% reported severe limitation running errands alone; and 6.9% reported severe limitation participating in social activities (Figure 6).
- Among adults ages 18-64 years, 0.9% reported severe limitation hearing; 1.1% reported severe limitation seeing, even with glasses; 2.2% reported severe limitation with memory or cognition; 2.7% reported severe limitation walking; 0.5% reported severe limitation with self-care activities such as dressing or bathing; 0.6% reported severe limitation communicating; 2.4% reported severe limitation running errands alone; and 3.0% reported severe limitation participating in social activities.

The impact of aging on healthcare delivery will vary by location, with some areas anticipating greater burden than others. In 2020, more than one-third of all people age 65 and over lived in five states (Figure 7): California (6.0 million), Florida (4.6 million), Texas (3.9 million), New York (3.4 million), and Pennsylvania (2.4 million).

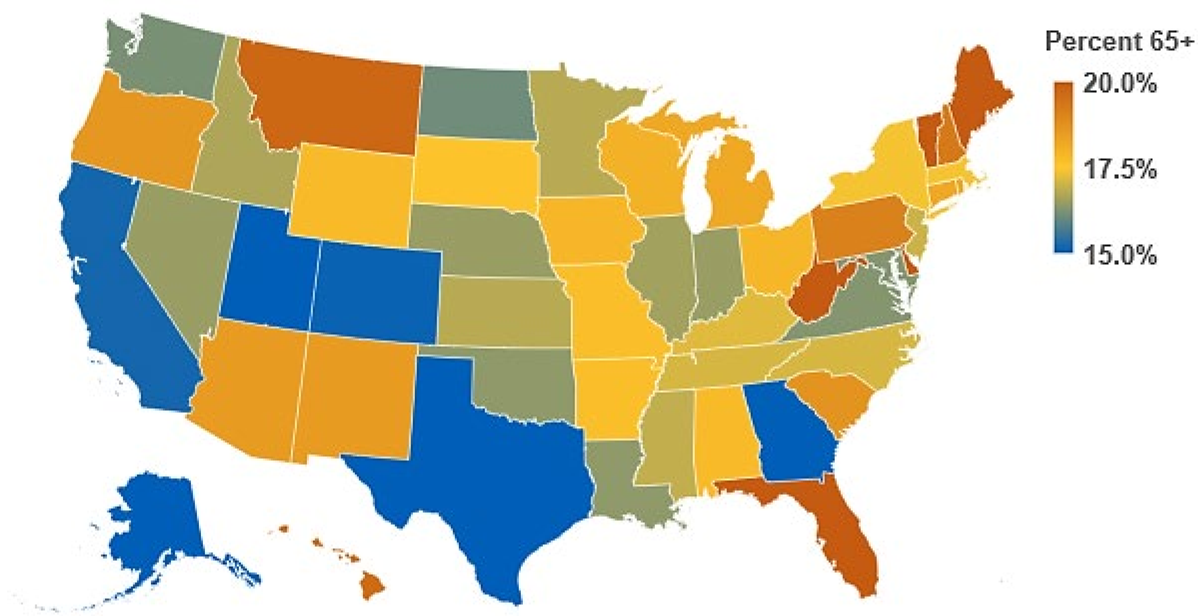
States also vary in the percentage of older people in their populations (Figure 8). People age 65 and over accounted for 20% or more of the population in five states in 2020: Maine (21.8%), Florida (21.3%), West Virginia (20.9%), Vermont (20.6%), and Delaware (20.0%). Within states, rural communities often have older populations than metropolitan ones.[4]

Figure 7. Number of people age 65 and over, by state, 2020



Source: Administration for Community Living, *2021 Profile of Older Americans*, November 2022, using Census Bureau population estimates. https://acl.gov/sites/default/files/Profile%20of%20OA/2021%20Profile%20of%20OA/2021ProfileOlderAmericans_508.pdf.

Figure 8. People 65 years and over as a percentage of state population, 2020



Source: Administration for Community Living, *2021 Profile of Older Americans*, November 2022, using Census Bureau population estimates. https://acl.gov/sites/default/files/Profile%20of%20OA/2021%20Profile%20of%20OA/2021ProfileOlderAmericans_508.pdf.

❖ The United States has grown more racially and ethnically diverse.

The NHQDR defines racial and ethnic groups according to Standards for the Classification of Federal Data on Race and Ethnicity (https://www.govinfo.gov/app/details/FR-1997-10-30/97-28653), issued by the Office of Management and Budget. Racial and ethnic categories for federal statistics and program administrative reporting are defined as follows:

- **American Indian or Alaska Native (AI/AN).** A person who has origins in any of the original peoples of North and South America (including Central America) and maintains tribal affiliation or community attachment.
- **Asian.** A person having origins in any of the original peoples of the Far East, Southeast Asia, or Indian subcontinent, including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
- **Black or African American.** A person having origins in any of the Black racial groups of Africa. Regional, cultural, geographic, and heritage terms such as “Haitian” are sometimes used in addition to “Black or African American.”
- **Hispanic or Latino.** A person of Cuban, Mexican, Puerto Rican, Central or South American, or other Spanish culture or origin, regardless of race. The term “Spanish origin” can be used in addition to “Hispanic or Latino.”
- **Native Hawaiian/Pacific Islander (NHPI).** A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific islands.
- **White.** A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

In 2020, non-Hispanic (NH) White people made up the largest racial and ethnic group in the United States, accounting for 191,697,647 people. The next largest groups were:

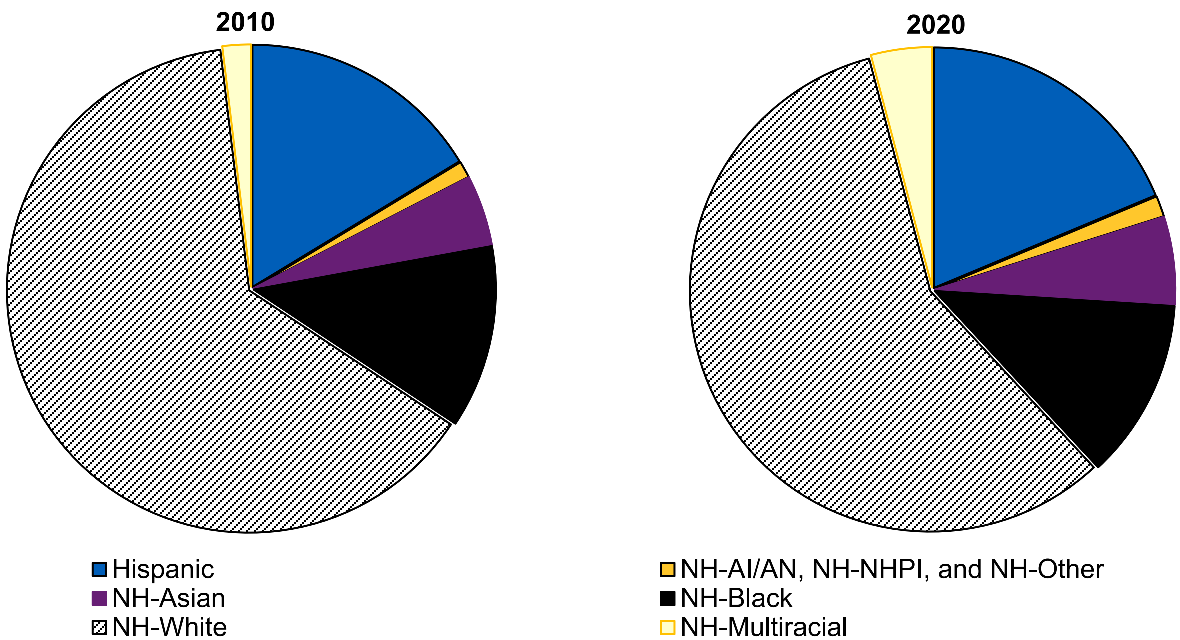
- Hispanic (62,080,044 people),
- NH-Black (39,940,338 people),
- NH-Asian (19,618,719 people),
- NH-multiracial/other race (15,238,816 people),
- NH-AI/AN (2,252,699 people), and
- NH-NHPI (622,018 people).

Although they are the largest racial and ethnic group, non-Hispanic White people’s share of the population has decreased over the past decade. Between 2010 and 2020, the percentage of people who self-identify as NH-White decreased by 9.3%. Much of the increase in racial and ethnic diversity can be attributed to a larger number of people who identify as NH-multiracial, NH-other race, or Hispanic.[ii]

[ii] Comparisons of racial and ethnic data between the 2020 and 2010 Census should be made with caution, taking into account improvements in how the Census asks respondents about Hispanic origin and race. See https://www.census.gov/library/stories/2021/08/improved-race-ethnicity-measures-reveal-united-states-population-much-more-multiracial.html for more details.

As a percentage of the population, Hispanic groups grew by 14.7%. As a percentage of the population, NH-Asian groups grew by 25.5%, NH-multiracial groups grew by 115.8%, and NH-other race groups grew by 150.0%, but these still account for a smaller number of people than Hispanic groups. NH-Black, NH-AI/AN, and NH-NHPI groups accounted for approximately the same percentage of the population as they did in 2010.

Figure 9. Distribution of people in the United States, by ethnicity and race, 2010 and 2020



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: U.S. Census Bureau. American Community Survey, Table P2, 2010 and 2020.
Note: Percentages may not add to 100 due to rounding.

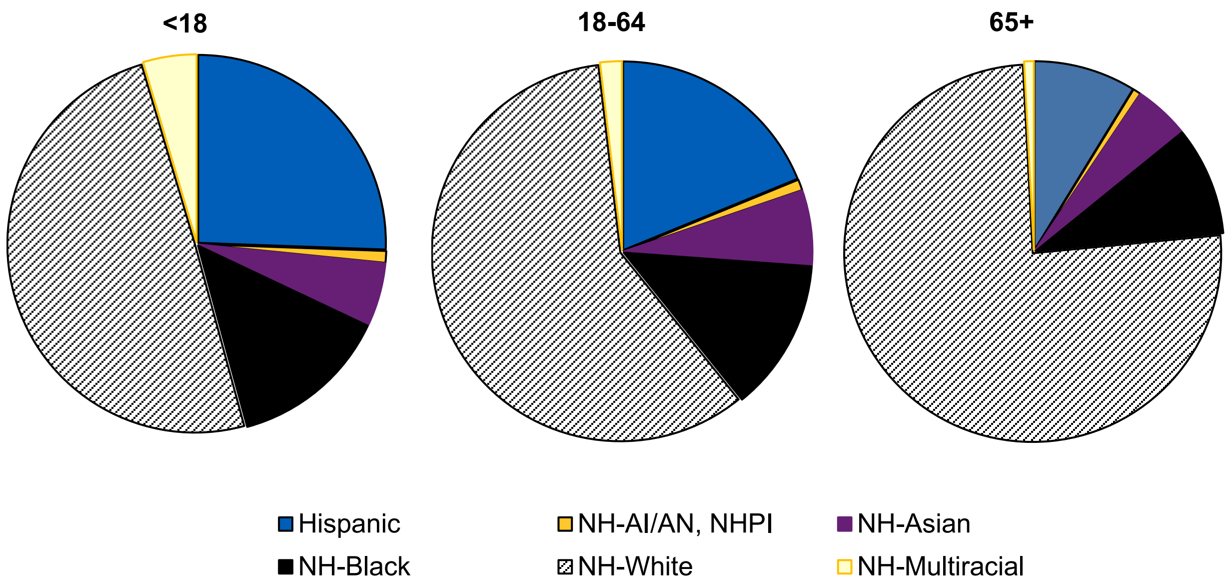
- In 2020, 18.7% of people identified as Hispanic alone, 0.7% of people identified as NH-AI/AN, 5.9% identified as NH-Asian, 12.1% identified as NH-Black, 0.2% identified as NH-NHPI, 57.8% identified as NH-White, 4.1% identified as NH-multiracial, and 0.5% identified as NH-some other race (Figure 9).
- In 2010, the percentages of racial and ethnic groups were 16.3% Hispanic, 0.7% NH-AI/AN, 4.7% NH-Asian, 12.2% NH-Black, 0.2% NH-NHPI, 63.7% NH-White, 1.9% NH-multiracial, and 0.2% NH-some other race.

Minority populations that grew in the past decade are also younger than the NH-White population. This difference contributed to widening age differences between the majority NH-White population and minority groups. For example, in 2021, 22% of NH-White people were adults age 65 years and over, while 19% were children or adolescents less than 18 years old. But among Hispanic people, the next largest racial/ethnic group, only 8% were adults age 65 years and over, while 32% were children and adolescents less than 18 years old.[5]

In 2020, most (75.7%) adults age 65 and over were NH-White, while just over half (50.4%) of all children and adolescents under 18 years old were in minority groups (Figure 10). Increased diversity among children and working age adults has important implications for healthcare delivery, including a growing need for a broader range of culturally and linguistically appropriate pediatric, obstetric, and mental health services. Higher rates of socioeconomic disadvantage among racial and ethnic minority groups also suggests a growing need to address social determinants of health in addition to healthcare needs.

- **Demographic trends suggest an increased need for more culturally and linguistically appropriate services for younger populations.**

Figure 10. U.S. population by race/ethnicity and age, 2020



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Annual Estimates of the Resident Population by Sex, Age, Race, and Hispanic Origin for the United States: April 1, 2020, to July 1, 2022 (NC-EST2022-ASR6H), released June 2023.

- In 2020, among children and adolescents less than 18 years old, 18,771,972 (25.6%) identified as Hispanic; 585,847 (0.8%) identified as NH-AI/AN; 3,992,252 (5.4%) identified as NH-Asian; 10,103,581 (13.8%) identified as NH-Black; 156,622 identified as NH-NHPI (0.2%); 36,424,964 (49.6%) identified as NH-White; and 3,380,954 (4.6%) identified as NH-multiracial (Figure 10).
- In 2020, among adults ages 18-64 years, 38,262,455 (18.8%) identified as Hispanic; 1,509,615 (0.7%) identified as NH-AI/AN; 13,000,114 (6.4%) identified as NH-Asian; 26,525,792 (13.0%) identified as NH-Black; 396,347 (0.2%) identified as NH-NHPI; 119,782,248 (58.9%) identified as NH-White; and 3,792,226 (1.9%) identified as NH-multiracial.
- Among adults age 65 years and over, 4,804,123 (8.8%) identified as Hispanic; 310,327 (0.6%) identified as NH-AI/AN; 2,586,750 (4.7%) identified as NH-Asian; 5,108,118 (9.3%) identified as NH-Black; 63,998 (0.1%) identified as NH-NHPI; 41,496,956 (75.7%) identified as NH-White; and 456,251 (0.8%) identified as NH-multiracial.

❖ A growing percentage of people resides in metropolitan communities.

Between 2010 and 2020, the percentage of people who live in metropolitan areas increased from 85.0% to 86.2% of the population, while the percentage of people in nonmetropolitan counties decreased from 15% to 13.9% of the population.[6]

The NHQDR examines differences in health outcomes by rural-urban location of residence using the 2013 National Center for Health Statistics (NCHS) classification.[iii] Data on state-based rural-urban metrics are also available through the NHQDR State Snapshots.

The 2013 NCHS classification approach includes six urbanization categories. Four are ***metropolitan*** county designations derived from census-defined metropolitan statistical areas (MSAs). MSAs are areas containing a large population center and adjacent communities that have a high degree of economic and social integration with that core. MSAs have at least 50,000 residents and include an urban core with population density of at least 1,000 people per square mile and adjacent areas with at least 500 people per square mile. The four metropolitan county descriptions are:

- **Large Central Metropolitan:** Counties in an MSA of 1 million or more residents:

  1. That contain the entire population of the largest principal city of the MSA, or
  2. Whose entire population is contained within the largest principal city of the MSA, or
  3. That contain at least 250,000 residents of any principal city in the MSA.

  Examples of large central metro areas are Denver County, Colorado; Washington, DC; and Cook County, Illinois.
- **Large Fringe Metropolitan:** Counties in MSAs of 1 million or more population that do not qualify as large central areas.[iv] Large fringe metropolitan areas are also described as suburban areas. Examples of large fringe metro areas are San Bernardino County, California; Broward County, Florida; and Bergen County, New Jersey.
- **Medium Metropolitan:** Counties in MSAs of 250,000 to 999,999 population. Examples of medium metro areas are Scott County, Kentucky; York County, Maine; and Douglas County, Nebraska.
- **Small Metropolitan:** Counties in MSAs of less than 250,000 population. Examples of small metro areas are Baldwin County, Alabama; Wayne County, North Carolina; and Allen County, Ohio.

[iii] The 2013 NCHS Urban-Rural classification scheme is the most recent version available. NCHS anticipates releasing updated specifications for classifying urban and rural populations in 2024.
[iv] For comparisons across residence locations, large fringe MSAs (large city suburbs) are used as the reference group since these counties have the lowest levels of poverty and typically have the best quality and access to healthcare.

The remaining two categories are ***nonmetropolitan*** county designations, which are defined as not meeting the criteria for being an MSA (i.e., population less than 50,000 inhabitants and/or population density less than 500 people per square mile). These nonmetropolitan designations are:

- **Micropolitan:** Nonmetropolitan counties in a "micropolitan statistical area," which are defined as counties that are less densely populated than MSAs and centered around smaller urban clusters with 2,500-49,999 inhabitants. Examples of micropolitan areas are Woodward County, Oklahoma; Cherokee County, South Carolina; and Harrison County, West Virginia.
- **Noncore:** Nonmetropolitan counties that are outside of a micropolitan statistical area. Noncore counties are also described as rural. Examples of noncore areas are Wallowa County, Oregon; Bedford County, Pennsylvania; and Crane County, Texas.

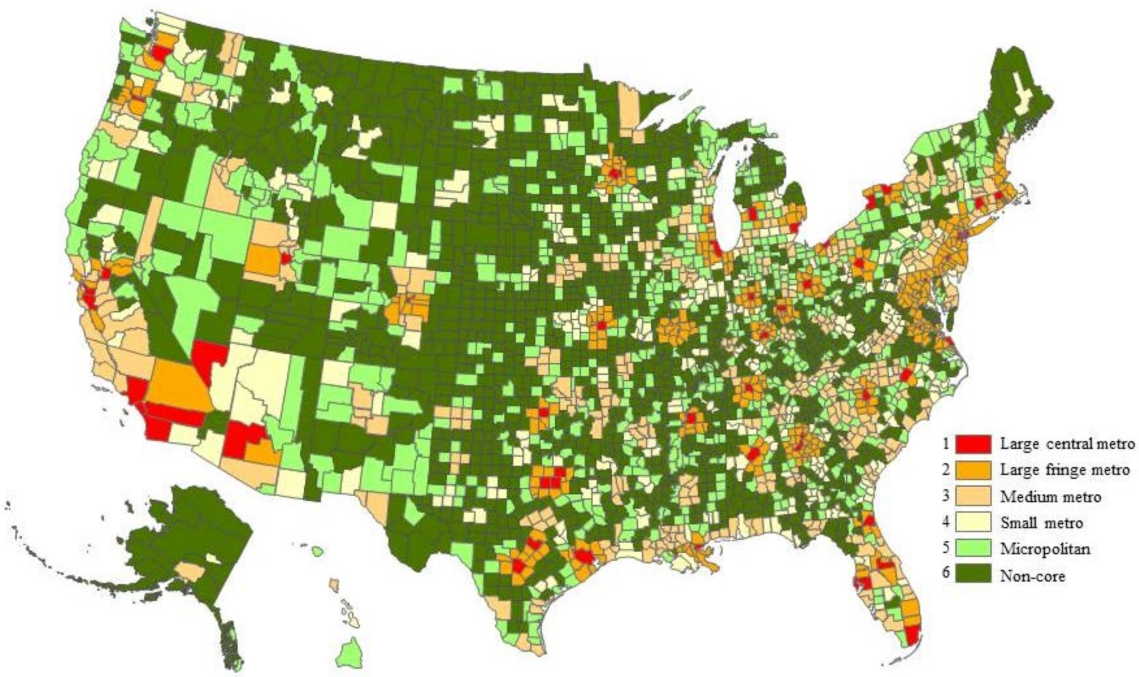
When examining trends, it is important to recognize that the key differences between the 2013 NCHS Urban-Rural Classification scheme and the earlier 2006 version are in how it describes small metropolitan, micropolitan, and noncore areas. The 2013 classification broadens the inclusion criteria for each of these residence locations. All other definitions are unchanged (Table 1).[7]

Table 1. NCHS Urban-Rural Classification Scheme, 2006 vs. 2013

Areas	2006 Classification	2013 Classification
Small Metropolitan	Counties in MSAs of 50,000-249,999 population	Counties in MSAs of less than 250,000 population
Micropolitan	Urban cluster population of 10,000-49,999 individuals	Counties in a micropolitan statistical area
Noncore	Nonmetropolitan counties that did not qualify as micropolitan	Nonmetropolitan counties that are not in a micropolitan statistical area

Figure 11 shows a map of U.S. county classifications according to the 2013 NCHS Urban-Rural Classification system.

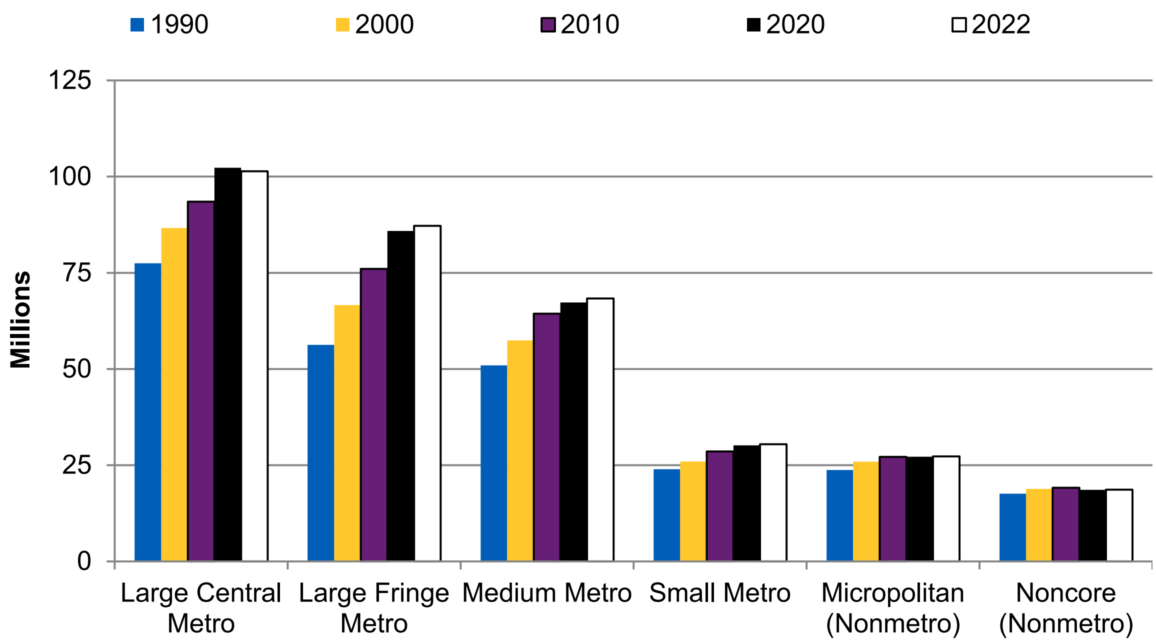
Figure 11. 2013 NCHS Urban-Rural County Classifications in the United States



Source: Ingram DD, Franco SJ. 2013 NCHS Urban–Rural Classification Scheme for Counties. National Center for Health Statistics. Vital Health Stat 2. 2014 Apr;(166):1-73. https://www.cdc.gov/nchs/data/series/sr_02/sr02_166.pdf.

Between 1990 and 2022, the number of people grew faster in metropolitan counties than nonmetropolitan counties. But between 2020 and 2022, during the COVID-19 public health emergency (PHE), the population of large central metro areas decreased slightly, while large fringe metro areas continued to grow.

Figure 12. U.S. population, by location of residence, 1990-2022



Source: U.S. Department of Agriculture Economic Research Service county-level population data files, using data from U.S. Census Bureau population estimates. Accessed at https://www.ers.usda.gov/data-products/county-level-data-sets/ and linked with National Center for Health Statistics 2013 Urban-Rural Classification Scheme for Counties data files located at https://www.cdc.gov/nchs/data_access/urban_rural.htm.

- Between 1990 and 2020, the population increased:
  - 32.0% in large central metro counties (from 77.5 million to 102.3 million),
  - 52.7% in large fringe metro counties (from 56.3 million to 85.9 million),
  - 32.1% in medium metro counties (from 50.9 million to 67.3 million),
  - 25.9% in small metro counties (from 23.9 million to 30.2 million),
  - 14.5% in micropolitan counties (from 23.8 million to 27.2 million), and
  - 5.7% in noncore counties (from 17.6 million to 18.6 million) (Figure 12).
- Between 2020 and 2022, the population decreased 0.9% in large central metro counties (from 102.3 million to 101.4 million). It increased:
  - 1.5% in large fringe metro counties (from 85.9 million to 87.2 million),
  - 1.5% in medium metro counties (from 67.3 million to 68.3 million),
  - 1.0% in small metro counties (from 30.2 million to 30.5 million),
  - 0.2% in micropolitan counties (from 27.22 million to 27.28 million), and
  - 0.2% in noncore counties (from 18.61 million to 18.64 million).

Summary

The U.S. population is aging rapidly, even as it grows more diverse racially and ethnically and becomes more metropolitan. These demographic trends have important implications for healthcare delivery, including an urgent need for services that address the needs of older adults and that support people with disabilities.

In addition, growing racial and ethnic diversity has largely occurred among younger adults and children, which suggests a growing need for culturally and linguistically appropriate healthcare services for conditions that affect younger populations, including pediatric, obstetric, mental health, and substance use treatment services.

Leading Health Concerns

Measures of life expectancy and premature death suggest that the United States has fallen short of its potential to promote and protect health. The following data quantify those trends.

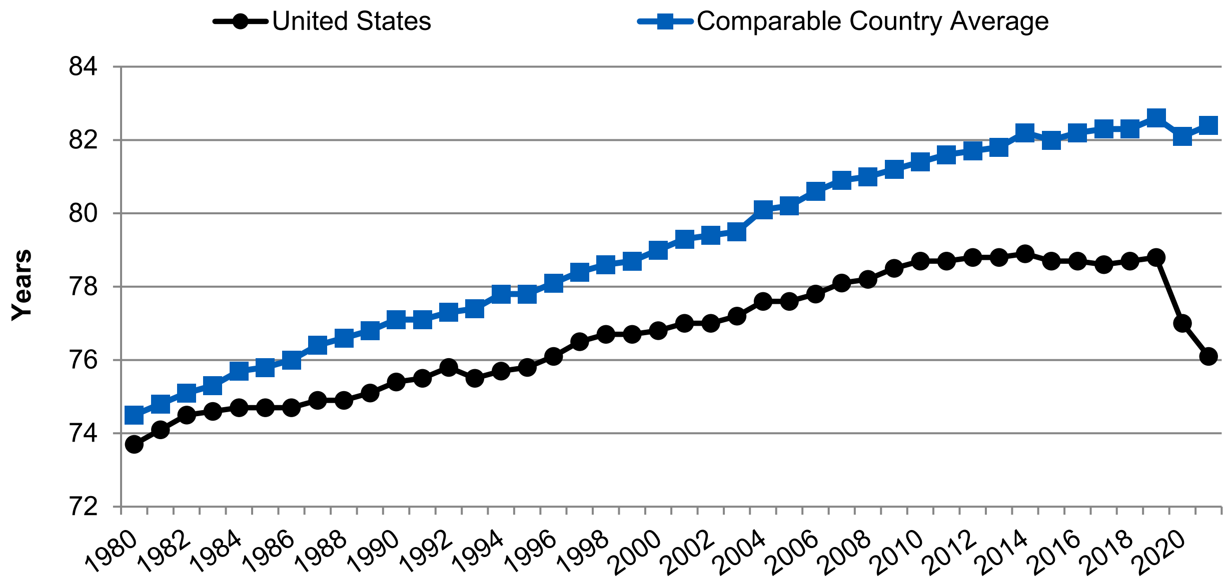
- **Life expectancy has not kept pace with other nations.**

U.S. life expectancy at birth lags behind the average life expectancy of similar industrialized nations in the Organisation for Economic Co-operation and Development (OECD).[v] The gap grew steadily after 1980 and widened markedly during the COVID-19 pandemic, when life expectancy decreased from 78.8 years in 2019 to 76.1 years in 2021.[8]

The 2021 decrease in U.S. life expectancy is largely attributable to deaths from COVID-19, which contributed to half of the decrease. Unintentional injuries (a plurality of which were drug overdose, 15.9% of the decrease), heart disease (4.1% of the decrease), liver disease (3.0% of the decrease), and suicide (2.1% of the decrease) were other important causes. The decrease in life expectancy would have been even greater except that deaths due to homicide, influenza and pneumonia, congenital malformations, and perinatal events decreased in 2021 compared with historical trends.[9]

[v] Compared with averaged data for Japan (life expectancy in 2021: 84.5 years), Switzerland (84.0 years), Australia (83.4 years), Sweden (83.2 years), France (82.5 years), Belgium (81.9 years), the Netherlands (81.5 years), Austria (81.3 years), Germany (80.9 years), the United Kingdom (80.8 years), and Canada (not included in 2021).

Figure 13. Life expectancy in United States vs. comparable OECD countries, 1980-2021



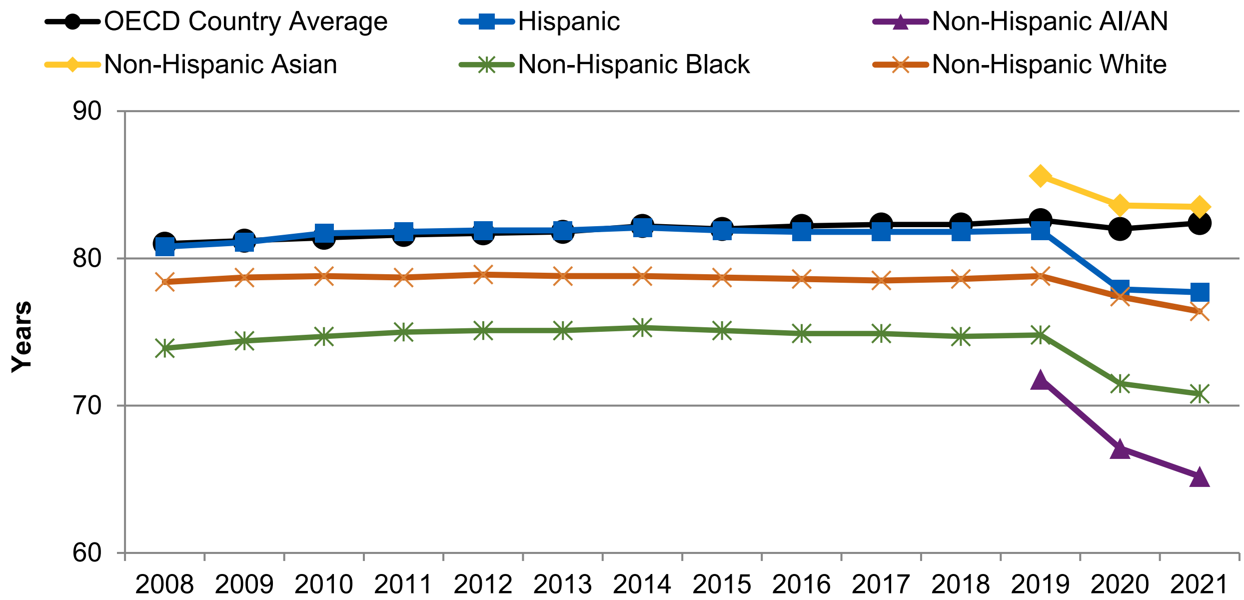
Source: Peterson-Kaiser Family Foundation Health System Tracker analysis of Centers for Disease Control and Prevention, Australian Bureau of Statistics, and Organisation for Economic Co-operation and Development data. https://www.healthsystemtracker.org/chart-collection/quality-u-s-healthcare-system-compare-countries/.

- In 2019, before the COVID-19 global pandemic, average life expectancy in the United States was 78.8 years vs. 82.6 years in comparable OECD countries (Figure 13).
- In 2020, average life expectancy in the United States was 77.0 years vs. 82.1 years in comparable OECD countries.
- In 2021, average life expectancy in the United States decreased further to 76.1 years even as life expectancy improved to 82.4 years in comparable OECD countries.

❖ **U.S. life expectancy lags behind that of people in similar OECD countries for all racial/ethnic groups except non-Hispanic Asian people. All groups experienced sharp declines in life expectancy during the COVID-19 public health emergency.**

National averages can obscure wide disparities in life expectancy among racial/ethnic groups. Gaps among Hispanic, NH-Black, and NH-White groups were persistent in the decade that preceded the COVID-19 pandemic and all groups experienced large drops in life expectancy in 2020 and 2021.

Figure 14. Life expectancy, United States, by race/ethnicity, 2008-2021



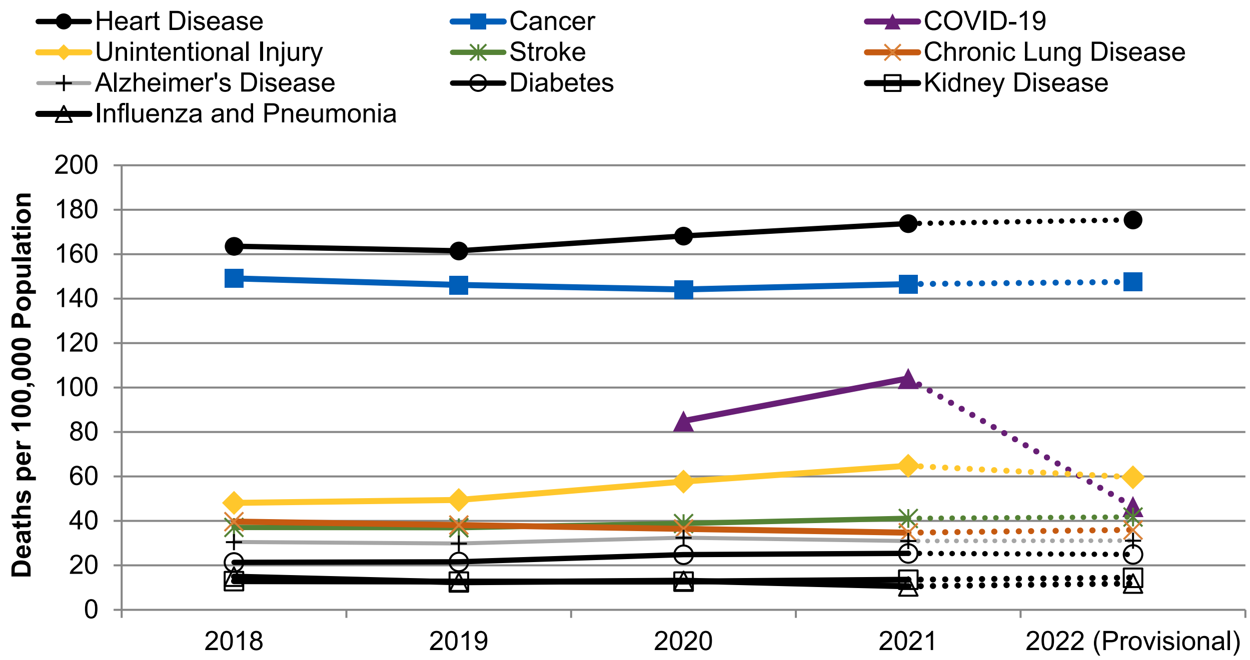
Key: OECD = Organisation for Economic Co-operation and Development; NH = non-Hispanic; AI/AN = American Indian or Alaska Native.
Source: Peterson-Kaiser Family Foundation Health System Tracker analysis of Centers for Disease Control and Prevention data, 2008-2021. https://www.healthsystemtracker.org/indicator/health-well-being/life-expectancy/.
Note: Data for NH-AI/AN and NH-Asian groups are not available for years prior to 2019.

- In 2021, life expectancy was highest for NH-Asian individuals (83.5 years). They were the only group in which average life expectancy was higher than the average life expectancy of comparable OECD countries(Figure 14).
- NH-Asian life expectancy was followed by that of Hispanic (77.7 years), NH-White (76.4 years), NH-Black (70.8 years), and NH-AI/AN (65.2 years) people.
- Life expectancy was higher for all groups before the COVID-19 pandemic. In 2019, life expectancy was highest for NH-Asian individuals (85.6 years), followed by Hispanic (81.9 years), NH-White (78.8 years), NH-Black (74.8 years), and NH-AI/AN (71.8 years) people.
- The largest declines in life expectancy between 2019 and 2021 occurred among NH-AI/AN individuals (9.2% decrease in life expectancy), followed by NH-Black (5.3% decrease), Hispanic (5.1% decrease), NH-White (3.0% decrease), and NH-Asian (2.5% decrease) people.

Exploring the clinical conditions that contribute to shortened life expectancy and widened disparities can provide insights for improving healthcare delivery and associated outcomes. The following figures and tables characterize the leading causes of death and years of potential life lost among Americans.

❖ **The leading causes of death in the United States include heart disease, cancer, COVID-19, and unintentional injuries/accidents.**

Figure 15. Ten leading causes of death, based on age-adjusted mortality, 2018-2022



Source: Centers for Disease Control and Prevention, Web-based Injury Statistics Query and Reporting System (WISQARS), 2018-2022. https://www.cdc.gov/injury/wisqars/index.html.
Note: Mortality data for 2022 are based on provisional estimates.

- Heart disease and cancer remained the leading causes of death in 2021, accounting for 173.8 deaths and 146.6 deaths per 100,000 population, respectively (Figure 15).
- Provisional data indicate that death rates for these causes continued to increase in 2022 to 175.5 heart disease deaths per 100,000 population and to 147.6 cancer deaths per 100,000 population.
- COVID-19 remained the third leading cause of death in 2021, with mortality rates rising from 85.0 deaths per 100,000 population in 2020 to 104.1 deaths per 100,000 population in 2021. However, provisional data indicate that COVID-19 death rates decreased to 46.5 deaths per 100,000 population in 2022.
- Unintentional injuries were the 4th leading cause of death in 2021, accounting for 64.8 deaths per 100,000 population. Approximately 40% of these deaths were attributable to accidental poisonings/overdoses, including those caused by overdose due to opioids and other drugs. Provisional data indicate that deaths from this cause declined in 2022 to 59.7 deaths per 100,000 population.
- Other leading causes of death in 2021 were stroke, chronic lung disease, Alzheimer's disease, diabetes, kidney disease, and influenza and pneumonia.

- **The leading causes of death vary among racial/ethnic groups, locations of residence, and age groups.**

Age-adjusted mortality and the leading causes of death vary by race/ethnicity, location of residence, and age. But the ways they vary depend on which groups are compared.

Table 2 shows the top five leading causes of death by race and ethnicity, in ranked order. It shows that each group has different patterns of vulnerability to specific diseases. For example, COVID-19 was the third leading cause of death in the overall population in 2021, but it was the number 1 cause of death for Hispanic, NH-AI/AN, and NH-NHPI groups. Age-adjusted mortality rates due to COVID-19 for these groups were similar in magnitude to mortality rates due to the leading cause of death for NH-White people, heart disease.

Table 2. Five leading causes of death, by race/ethnicity, based on age-adjusted deaths per 100,000 population, 2021

Race/Ethnicity	#1	#2	#3	#4	#5
Hispanic	COVID-19 (151.8)	Heart disease (119.0)	Cancer (105.1)	Unintentional injury (47.3)	Stroke (36.1)
NH-AI/AN	COVID-19 (184.0)	Heart disease (155.2)	Cancer (124.9)	Unintentional injury (122.8)	Liver disease (77.8)
NH-Asian	Cancer (92.9)	Heart disease (85.5)	COVID-19 (61.9)	Stroke (32.6)	Unintentional injury (18.8)
NH-Black	Heart disease (226.2)	Cancer (167.4)	COVID-19 (136.4)	Unintentional injury (79.6)	Stroke (59.6)
NH-NHPI	COVID-19 (185.4)	Heart disease (182.4)	Cancer (144.6)	Unintentional injury (53.1)	Diabetes (54.4)
NH-White	Heart disease (179.8)	Cancer (153.7)	COVID-19 (93.5)	Unintentional injury (70.0)	Chronic lung disease (39.9)
NH-Multiracial	Heart disease (74.9)	Cancer (67.3)	Unintentional injury (37.0)	COVID-19 (45.7)	Stroke (20.3)

Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System - Mortality, 2018-2021, Single Race. Accessed on CDC WONDER Online Database, released in 2023.

Table 3 similarly ranks leading causes of death by geographic location of residence. Among these groups, the relative ranks of heart disease, cancer, COVID-19, and unintentional injury are consistent across urban-rural settings, but the scale of deaths varies. For each disease condition, people in less densely populated communities experienced higher death rates than those who lived in more metropolitan communities.

Table 3. Five leading causes of death, by location of residence, based on age-adjusted deaths per 100,000 population, 2021

Location	#1	#2	#3	#4	#5
Large Central Metropolitan	Heart disease (178.1)	Cancer (151.4)	COVID-19 (109.2)	Unintentional injury (63.0)	Stroke (43.3)
Large Fringe Metropolitan	Heart disease (188.3)	Cancer (173.1)	COVID-19 (103.7)	Unintentional injury (58.5)	Stroke (46.4)
Medium Metropolitan	Heart disease (213.0)	Cancer (188.5)	COVID-19 (128.9)	Unintentional injury (73.9)	Stroke (51.7)
Small Metropolitan	Heart disease (240.6)	Cancer (205.9)	COVID-19 (147.1)	Unintentional injury (72.2)	Chronic lung disease (56.9)

Location	#1	#2	#3	#4	#5
Micropolitan	Heart disease (274.6)	Cancer (227.2)	COVID-19 (171.6)	Unintentional injury (80.0)	Chronic lung disease (68.0)
Noncore	Heart disease (318.2)	Cancer (265.0)	COVID-19 (199.3)	Unintentional injury (87.9)	Chronic lung disease (80.7)

Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System - Mortality, 2018-2021, Single Race. Accessed on CDC WONDER Online Database, released in 2023.

Table 4 examines the leading causes of death by age group. It shows that suicide, homicide, and unintentional injuries (including drug overdose) are important causes of death among children, adolescents, and younger adults.

Table 4. Five leading causes of death, by age group, based on age-adjusted deaths per 100,000 population, 2021

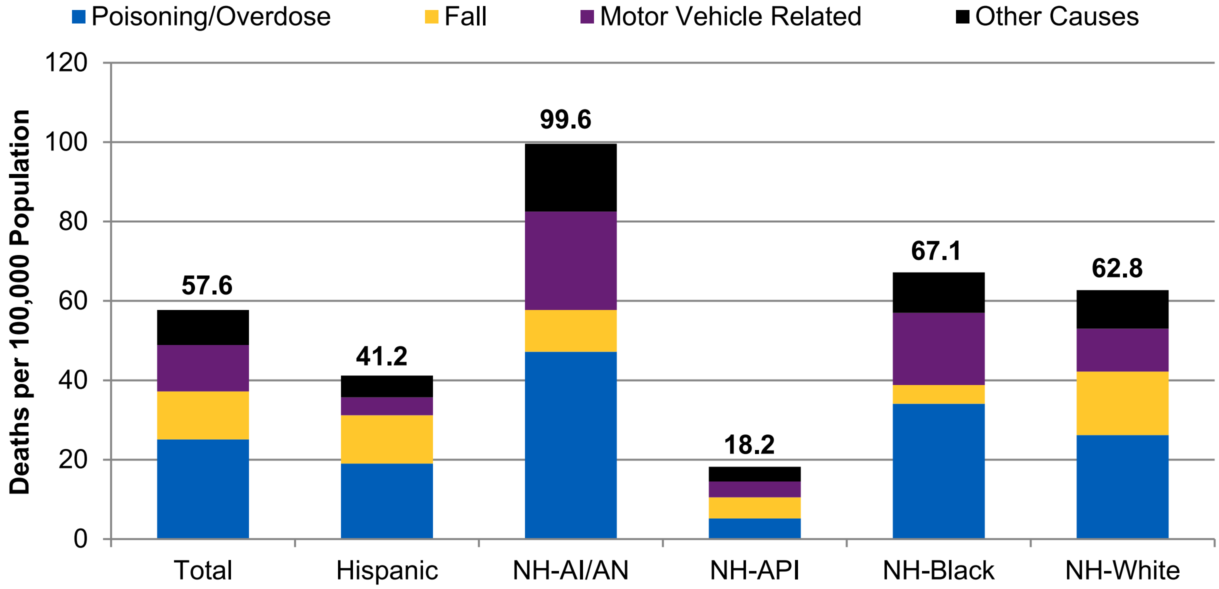
Age	#1	#2	#3	#4	#5
<5 years	Perinatal event (53.2)	Congenital abnormality (24.4)	Unintentional injury (14.1)	Homicide (3.1)	Heart disease (2.1)
5-24 years	Unintentional injury (20.1)	Suicide (8.2)	Homicide (8.1)	Cancer (2.5)	COVID-19 (1.8)
25-44 years	Unintentional injury (80.2)	COVID-19 (26.3)	Heart disease (20.2)	Suicide (18.7)	Cancer (17.1)
45-64 years	Cancer (149.2)	Heart disease (133.5)	COVID-19 (122.7)	Unintentional injury (77.6)	Liver disease (31.9)
≥65 years	Heart disease (1,088.6)	Cancer (849.1)	COVID-19 (541.9)	Stroke (277.8)	Chronic lung disease (234.0)

Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System - Mortality, 2018-2021, Single Race. Accessed on CDC WONDER Online Database, released in 2023.

- **"Unintentional injuries" describe multiple causes of death. For many racial/ethnic groups, opioid overdose contributes to a plurality of these deaths.**

"Unintentional injuries" is a category that reflects many different causes of death. Three causes (poisonings/overdoses, falls, and motor vehicle accidents) account for more than 90% of deaths due to unintentional injuries. Overall, poisonings/overdoses accounted for 43.6% of these deaths, but they accounted for a larger share of unintentional injury deaths for NH-AI/AN, NH-Black, and NH-White people and a smaller share among Hispanic and NH-API people (Figure 16).

Figure 16. Underlying causes of death due to unintentional injuries/accidents, by race/ethnicity, 2020



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; API = Asian or Pacific Islander.
Source: Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System (WISQARS), 2020. https://www.cdc.gov/injury/wisqars/index.html.
Note: "Other Causes" include suffocation, drowning, fire/burn related, natural environment related, other land transportation-related accident, struck by/against physical object, pedestrian accident, firearm related, machinery related, other transportation related, pedal cyclist accident, cut/piercing related, overexertion, and unspecified accidents. The category "Asian or Pacific Islander" combines data for non-Hispanic Asian and non-Hispanic Native Hawaiian/Pacific Islander populations.

- In 2020, the overall rate of death due to unintentional injuries/accidents was 57.6 deaths per 100,000 population. Poisonings/overdoses, falls, motor vehicle-related accidents, and other causes contributed to 43.6%, 21.0%, 20.3%, and 15.3% of these deaths, respectively.
- Among NH-AI/AN people, 99.6 deaths per 100,000 population were due to unintentional injuries/accidents. Poisonings/overdoses, falls, motor vehicle-related accidents, and other causes contributed to 47.4%, 10.5%, 24.9%, and 17.2% of these deaths, respectively.
- Among NH-Black people, 67.1 deaths per 100,000 population were due to unintentional injuries/accidents. Poisonings/overdoses, falls, motor vehicle-related accidents, and other causes contributed to 50.8%, 7.0%, 27.1%, and 15.2% of these deaths, respectively.
- Among NH-White people, 62.8 deaths per 100,000 population were due to unintentional injuries/accidents. Poisonings/overdoses, falls, motor vehicle-related accidents, and other causes contributed to 41.7%, 25.5%, 17.2%, and 15.4% of these deaths, respectively.
- Among Hispanic people, 41.2 deaths per 100,000 population were due to unintentional injuries/accidents. Poisonings/overdoses, falls, motor vehicle-related accidents, and other causes contributed to 46.1%, 29.6%, 10.9%, and 13.3% of these deaths, respectively.
- Among NH-Asian/Pacific Islander people, 18.2 deaths per 100,000 population were due to unintentional injuries/accidents. Poisonings/overdoses, falls, motor vehicle-related accidents, and other causes contributed to 28.6%, 29.1%, 22.0%, and 20.3% of these deaths, respectively.

❖ Chronic diseases contribute to many of the leading causes of death.

Chronic diseases are conditions that last 1 year or more and require ongoing medical attention or limit activities of daily living or both.[vi] They are the primary factor underlying most leading causes of death. Healthcare delivery systems and clinicians can mitigate their impact on the population's health by managing and treating these conditions to delay onset of complications and prevent premature mortality.

Six in 10 adults in the United States have a chronic disease, and 4 in 10 have two or more chronic conditions. Chronic conditions contribute to 7 of the 10 leading causes of death and 6 of the 10 leading causes of premature death. Many could be eased or avoided by helping people modify a short list of health behaviors or by managing or treating prevalent health conditions that influence the outcomes of other chronic diseases:

- Healthcare delivery organizations and providers can partner with communities, local social service providers, and public health departments to reduce the burden of chronic diseases by helping people engage in lifestyles and behaviors that reduce risk factors associated with chronic diseases, including:
  - Poor nutrition.
  - Inadequate physical activity.
  - Tobacco use and exposure to secondhand smoke.
  - Alcohol use.
  - Use of illicit opioids and other substances.
  - Unsafe driving.
- Healthcare delivery organizations and providers can also reduce the burden of chronic diseases by treating health conditions that are risk factors for other chronic disease outcomes, including:
  - Obesity.
  - High blood pressure.
  - High cholesterol.
  - Uncontrolled diabetes.
  - Mental illness.
  - Substance use disorders (including use of alcohol, tobacco, opioids, and other drugs).
  - Some infections, such as human papillomavirus (HPV), HIV, and hepatitis B and hepatitis C viruses.

[vi] Examples of chronic diseases include: diseases of the brain, such as stroke and traumatic brain injury; affective disorders, such as depression, bipolar disorder, and schizophrenia; vascular diseases, such as high blood pressure, high cholesterol, heart disease, and complications from stroke; metabolic disorders, such as diabetes and thyroid disease; digestive diseases, such as Crohn's disease; liver diseases, such as cirrhosis; kidney diseases, such as chronic kidney disease; diseases of the joints, such as arthritis; and diseases of the blood, such as thalassemia and sickle cell disease. Given the diverse range of these conditions, measures of chronic disease often count different specific diseases when defining the concept. The NHQDR reports on "chronic disease" as defined by data sources.

Summary

Between 1980 and 2020, U.S. life expectancy improved by 6.9% before decreasing sharply during the COVID-19 PHE. However, this assessment overlooks the greater gains experienced by similar OECD countries, where life expectancy increased by an average of 10.9% during the same years and COVID-19 had a smaller impact on health.

The National Academies of Sciences, Engineering, and Medicine reported that deaths from drug overdose, alcohol-related causes, suicide, and cardiometabolic disease, such as heart disease and diabetes, were the primary causes for the United States' lagging performance before 2020.[10] Deaths due to COVID-19 compounded this trend, resulting in a loss of more than 20 years of life expectancy gains in 2020 and 2021.

Because life expectancy is more strongly influenced by conditions that disproportionately affect the lifespans of working-age people, the nation's lagging performance on this measure suggests other economic and societal concerns, including a smaller workforce and fewer people to care for children and an aging population.

National vital statistics also show that life expectancy varies across different racial and ethnic groups but the rate of improvement lags the average for similar OECD countries for all groups, indicating that life expectancy for all groups may soon fall below that of people in other industrialized economies. As the ranking and magnitude of causes of death vary among different racial and ethnic groups, the data suggest that each racial and ethnic group may require tailored policies and interventions to achieve optimal health outcomes.

In contrast, data showing that people in nonmetropolitan areas die from the same underlying causes but at higher rates than people in metropolitan areas suggest that nonmetropolitan communities may have less access to effective healthcare services.

Researchers recently studied 12 disease conditions that contribute most to life expectancy. They estimated that public health activities (including reducing tobacco use, screening for cancer, and improving motor vehicle safety) accounted for 44% of the nation's life expectancy gains between 1990 and 2015. They found that access to improved pharmaceutical treatment (such as antihypertensive medications) and improved medical treatment (such as interventional cardiac procedures) accounted for 35% and 13%, respectively.[11]

The findings of this study suggest that catching up to the life expectancy experienced by people in similar OECD countries will require attention to both public health and medical care services, particularly services that address chronic disease.

Social Determinants of Health

Considerable evidence indicates that social determinants of health (SDOH)—the social, economic, environmental, and community conditions in which people live—have an even stronger influence on people's health outcomes than clinical services provided by healthcare delivery systems.[12] Thus, healthcare delivery systems and healthcare workers should account for SDOH when addressing patients' health concerns.

This section describes the extent to which SDOH factors are present among people in the United States, which healthcare delivery systems must address to produce optimal health outcomes.

The importance of understanding SDOH is underscored in Healthy People 2030, which sets national objectives for improving health and well-being. Healthy People 2030 describes five SDOH domains that can influence health outcomes (Figure 17). Only one of these specifically includes services provided by healthcare delivery systems.

The **Health Care Access and Quality** domain accounts for a population's ability to receive healthcare services when needed. It characterizes the extent to which people can access healthcare services and whether they receive high-quality care.[vii] It also addresses whether people have access to health insurance, which increases access to preventive and chronic disease care, as well as care for major health conditions.

Figure 17. Social Determinants of Health

Source: U.S. Department of Health and Human Services. Healthy People 2030. https://health.gov/healthypeople/priority-areas/social-determinants-health.

❖ **Health insurance coverage in the United States has expanded in recent years.**

Evidence from observational studies and randomized controlled trials such as the Oregon Health Insurance Experiment (OHIE) links having health insurance coverage with positive outcomes, including:

- Increased financial security,
- Access to primary care,
- Adherence to prescription medications,

[vii] The NHQDR includes multiple measures characterizing access to healthcare services and quality of those services later in the report.

- Screening for treatable health conditions (such as diabetes, cholesterol, HIV, and breast, prostate, and colon cancer),
- Improved perceptions of health,
- Reduced depression symptoms, and
- Earlier detection of cancer.[13,14]

The OHIE also reported increased outpatient medical office visits and increased ED and hospital use among people randomized to receive health insurance.[15] However, longer term studies found decreased ED utilization and increased use of preventive care services after Medicaid expansion under the Affordable Care Act.[16,17]

Viewed together, these studies show that expanding health insurance access increases demand for primary care services and may reduce long-term demand for emergency and acute care services, after a backlog of unmet need has been addressed.

The NHQDR mostly reports on disparities related to insurance status among people ages 0-64 years. It focuses on people less than age 65 years because more than 98% of Americans age 65 years and over have Medicare.[18] It should be noted, however, that this statistic also means approximately 2% of older adults, or more than 1.1 million people, lack insurance coverage despite meeting Medicare's age criteria for eligibility.

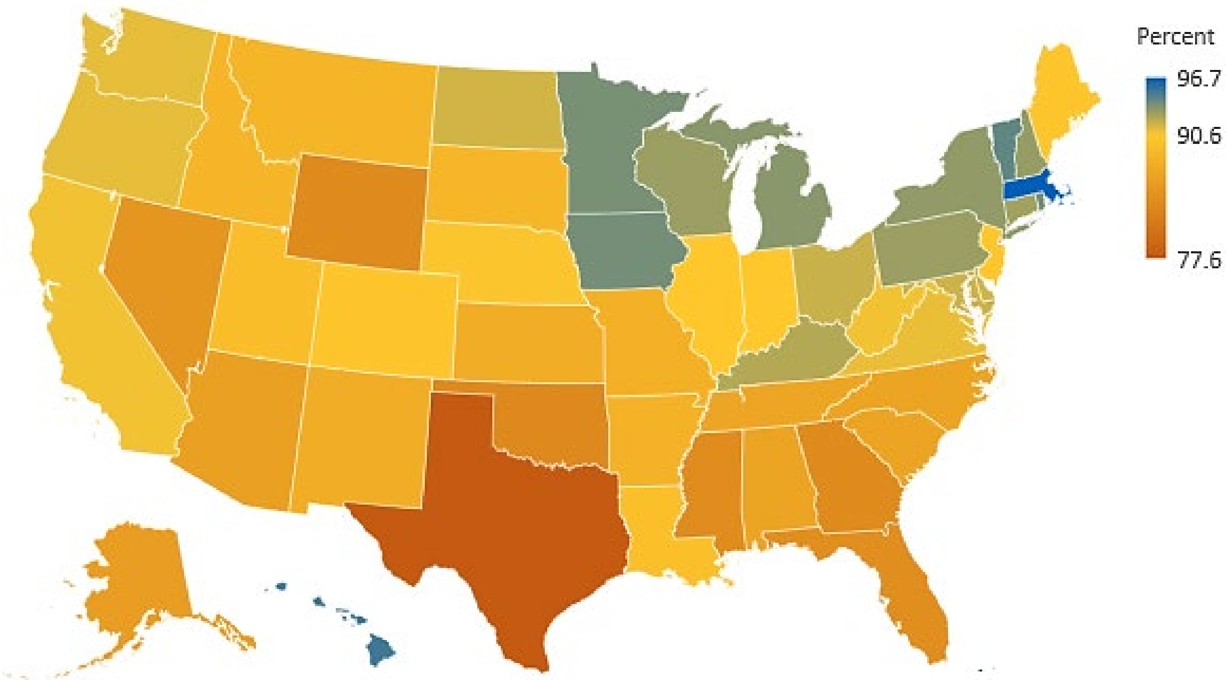
Insurance status for people ages 0-64 years consists of three categories:

- Private Insurance: Person has insurance from a private insurer.
- Publicly Sponsored Insurance: Person receives insurance from one or more government-sponsored sources, including Medicaid, State Children's Health Insurance Program (S-CHIP), state-sponsored or other government-sponsored health plans, Medicare, and military and veteran health plans.
- Uninsured: Person does not have any health insurance.

❖ Health insurance coverage in the United States has expanded in recent years.

Data from the National Health Interview Survey indicate that an average of 89.7% of people under age 65 had some form of health insurance in 2021, a 1.3% increase from 2020. But level of health insurance coverage varies among states (Figure 18).

Figure 18. People under age 65 years with any health insurance coverage, 2022

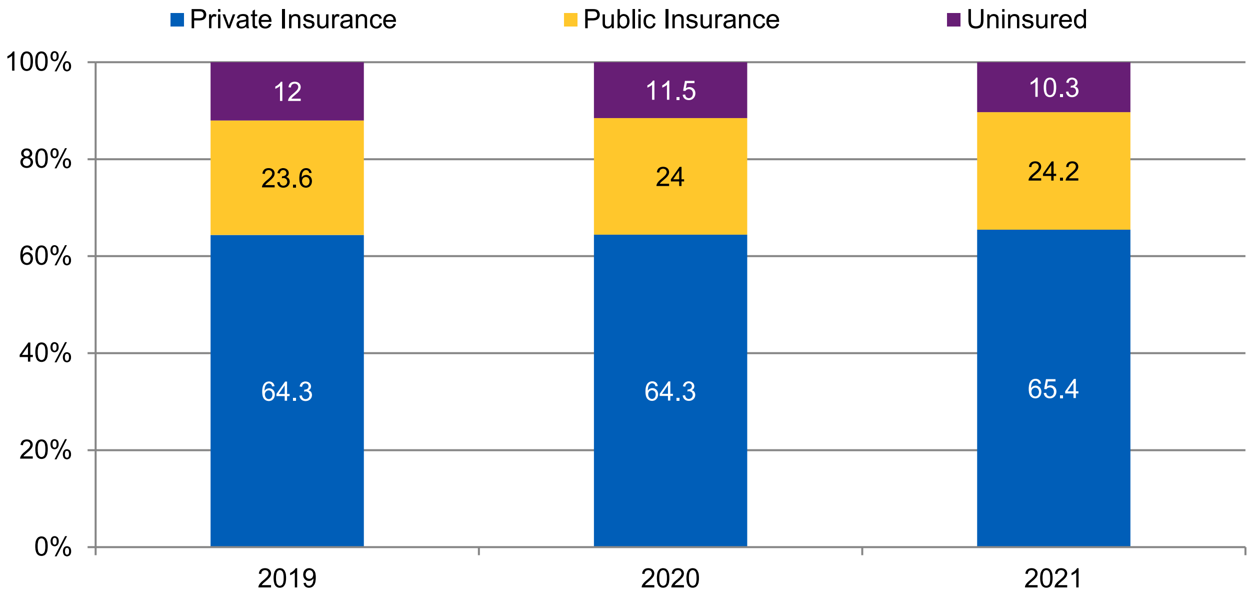


Source: U.S. Census Bureau, American Community Survey, Table HI05_ACS, 2022.

- The percentage of state population with any health insurance coverage ranges from 77.6% to 96.7%. The median percentage is 90.6%.

Of those with health insurance, approximately 27% had Medicaid, a combination of Medicare and Medicaid, or some other form of publicly sponsored health insurance. Just under three-fourths of people with health insurance had private insurance, often from an employer.

Figure 19. People under age 65 years with private, public, or no health insurance, 2019-2021



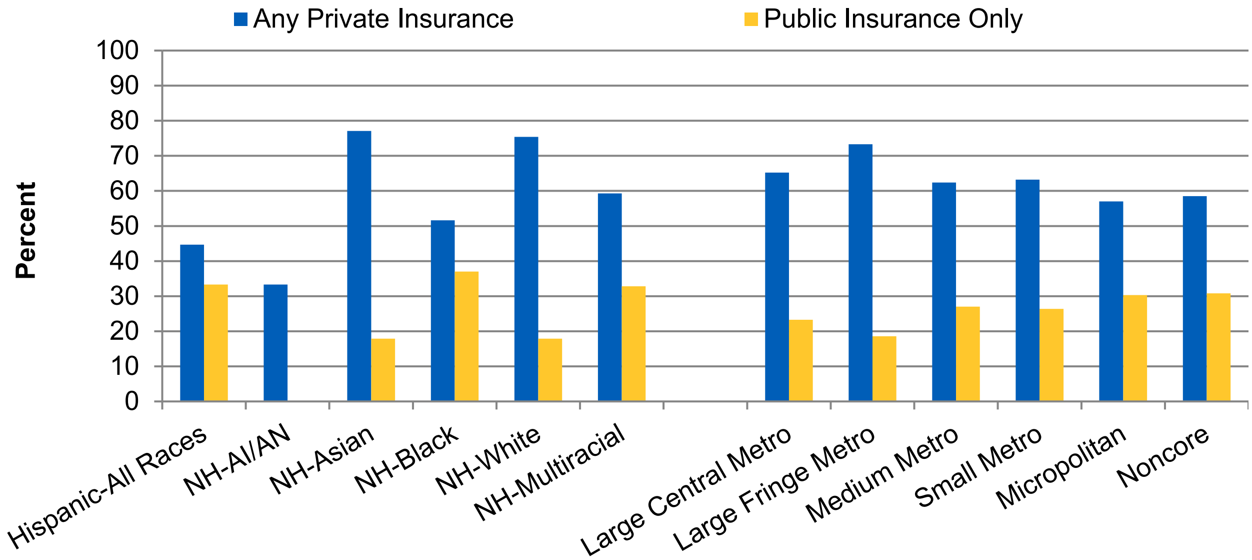
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2019-2021.

- In 2019, 88.0% of people under age 65 years had health insurance nationally: 64.3% had any private health insurance; 23.6% had publicly sponsored health insurance[viii] (Figure 19).
- In 2020, 88.5% of people under age 65 years had health insurance nationally: 64.3% had any private health insurance; 24.0% had publicly sponsored health insurance.
- In 2021, 89.7% of people under age 65 years had health insurance nationally: 65.4% had any private health insurance; 24.2% had publicly sponsored health insurance.

The distribution of people with health insurance varies by demographic factors, including race/ethnicity and location of residence.

[viii] The National Health Interview Survey (NHIS) estimates of the overall percentage of people with health insurance coverage are slightly larger than the sum of the percentage of people with any private health insurance coverage and the percentage of people with publicly sponsored insurance. The overall percentage includes people with other sources of health insurance, such as coverage provided under state and local programs established through the Ryan White Act or through special programs for farm workers and refugees. More information is available in National Health Interview Survey 2021 CAPI Manual for NHIS Field Representatives, https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2021/frmanual-508.pdf.

Figure 20. People under age 65 years with any health insurance, by race/ethnicity and location of residence, 2021

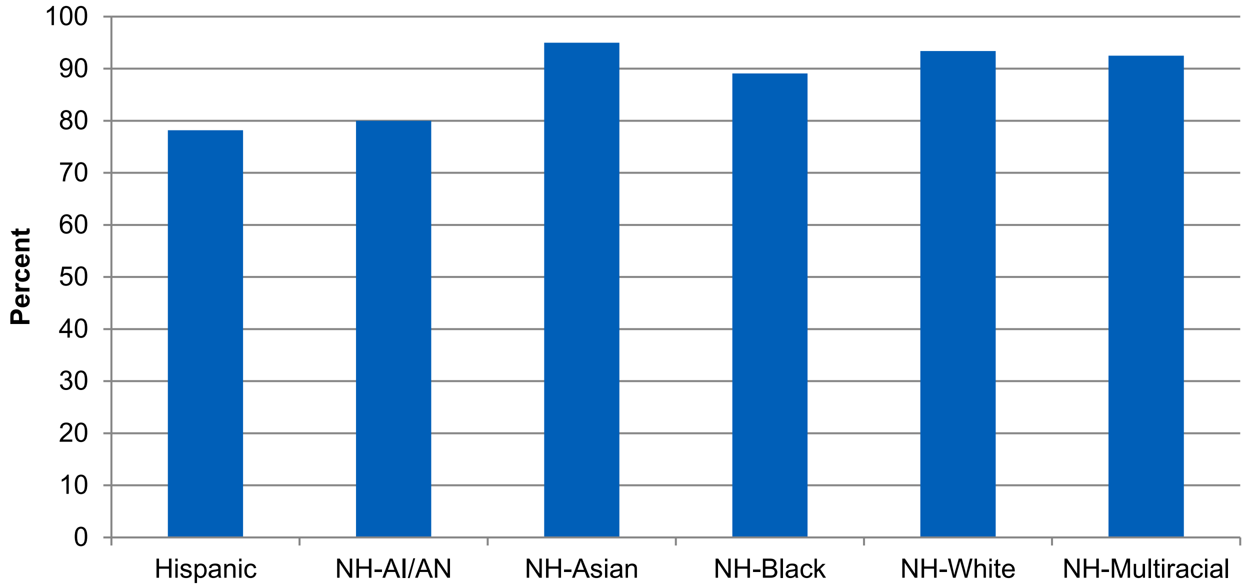


Key: NH = non-Hispanic.
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.
Note: Data disaggregated by insurance status for NH-NHPI are not reported because samples from these populations are too small to produce statistically stable estimates. Data for public insurance for NH-AI/AN are not reported because samples are too small to produce statistically stable estimates.

- In 2021, among racial and ethnic groups, NH-Asian groups (95.0%) were the most likely to have any health insurance, followed by NH-White (93.3%), NH-multiracial (92.1%), NH-Black (88.6%), and Hispanic (78.0%) (Figure 20).
- Insured people in all racial/ethnic groups were more likely to have private health insurance for at least part of the year. Having any private health insurance was most common among NH-Asian groups (77.1%), followed by NH-White (75.4%), NH-multiracial (59.3%), NH-Black (51.6%), and Hispanic (44.7%).
- Among location of residence, people in large fringe metro counties (i.e., "suburbs," 91.9%) were most likely to have any health insurance, followed by people in small metro areas (89.6%), medium metro areas (89.4%), noncore counties (i.e., "rural," 89.3%), large central metro areas (i.e., "cities," 88.5%), and micropolitan areas (i.e., "small towns," 87.3%).
- Having private health insurance was most common in metropolitan areas and tapered in less densely populated communities. Having any private health insurance was most common in large fringe metro counties (73.3%), followed by large central metro areas (65.2%), small metro counties (63.2%), medium metro counties (62.4%), noncore areas (58.5%), and micropolitan counties (57.0%).

Breakdowns for private and publicly sponsored insurance are unavailable for NH-AI/AN and NH-NHPI people because sample sizes are too small to report. But data for overall insurance coverage show that NH-AI/AN people, along with Hispanic people, are less likely to have any insurance coverage than other racial and ethnic groups (Figure 21). Additional disparities may also exist within racial and ethnic groups. For example, studies examining disaggregated data show inequitable levels of access for subgroups among NH-Asian people.[19]

Figure 21. People under age 65 years with any health insurance, by race/ethnicity, 2021



Key: NH = non-Hispanic.
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.
Note: Data for NH-NHPI groups are not reported because samples are too small to produce statistically stable estimates.

- The percentage of people with any insurance coverage in 2021 was highest for NH-Asian people (95.0%), followed by NH-White (93.4%), NH-multiracial (92.5%), NH-Black (89.1%), NH-AI/AN (80.0%), and Hispanic (78.2%) people (Figure 21).

❖ **Economic stability is associated with better health.**

The **Economic Stability** domain accounts for a population's ability to maintain steady employment and afford basic needs, such as housing, utilities, food, medical care, and medications. It also considers how health issues, such as arthritis or health-related disabilities, can limit a person's ability to work, earn income, and accumulate wealth. Employment, income (the amount a person earns each year), and wealth (their net worth and assets) all enhance health.[ix]

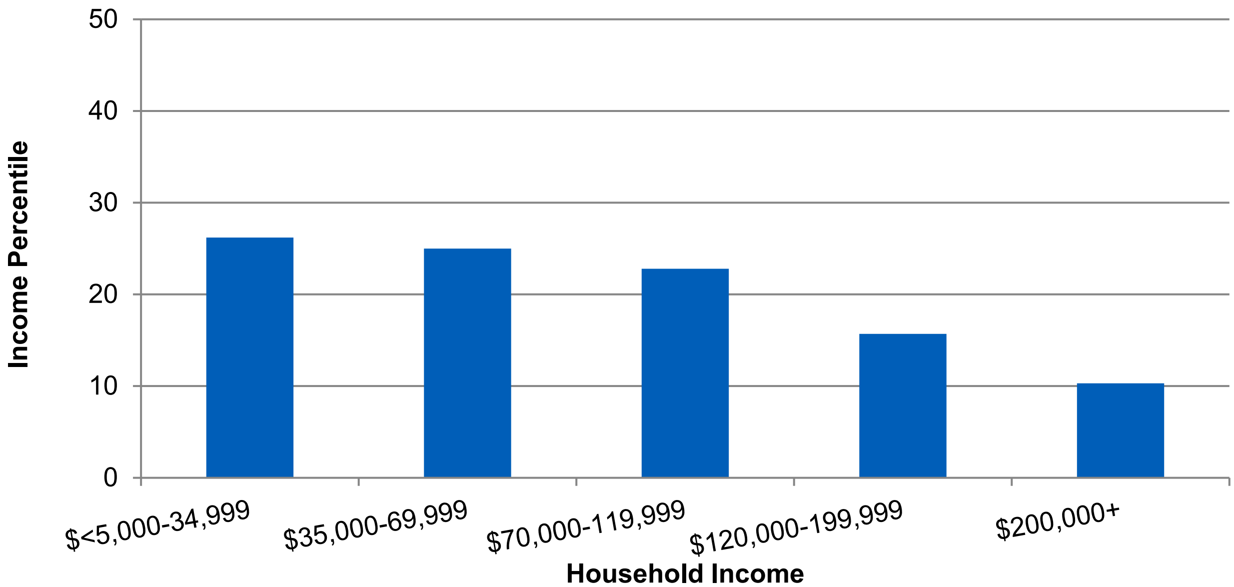
The relationship between income and health outcomes has been studied for many years, and researchers have shown the positive relationship between more income and better health outcomes.[20,21,22,23] One way to assess the relationship between income and healthcare quality is by examining the delivery of services in relationship to the poverty levels of households or communities.

[ix] The NHQDR frequently examines healthcare delivery and outcomes in relation to household income. However, income is not the same as wealth, which can include assets other than income. Wealth is disproportionately dispersed among higher income categories, and research also shows a positive association between greater wealth and better health outcomes.

Poverty is a state in which a person or household lacks sufficient financial resources to afford basic needs, such as food, shelter, or clothing. It also interferes with people's ability to participate in community life, engage in healthy activities, or access healthcare services when needed. Thus, people who live in poverty are at higher risk for receiving poor quality care and experiencing undesirable outcomes.

Federal guidelines defining the poverty level are issued annually in the *Federal Register* by the Department of Health and Human Services, Assistant Secretary for Planning and Evaluation.[x] The guidelines vary by family size and different family income criteria are used for the contiguous 48 states, Alaska, and Hawaii. The poverty guidelines are not defined for Puerto Rico, the U.S. Virgin Islands, American Samoa, Guam, the Republic of the Marshall Islands, the Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, or Palau.[24]

Figure 22. U.S. household Income distribution by percent population, 2020



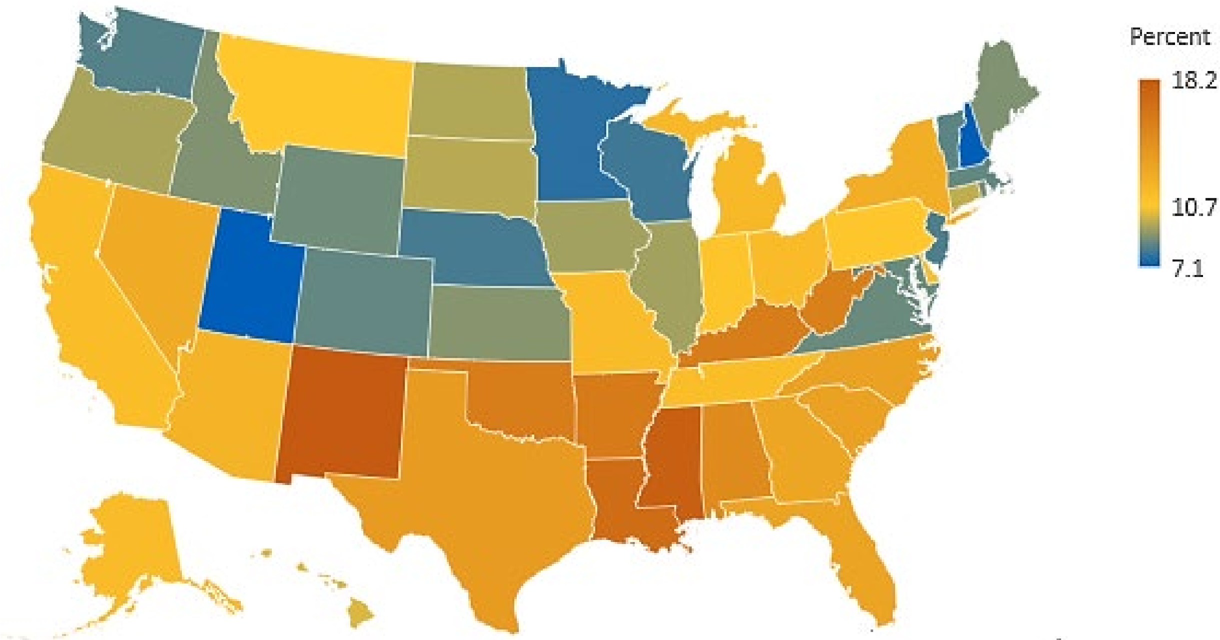
Source: U.S. Census Bureau. American Community Survey, Table HINC06, 2020.
Note: Percentiles add to 100. Ranges represent quartiles but each quartile may represent less than or more than 25% of the population. The last quartile is divided into two groups, showing 15.7% and 10.3% of the population, respectively.

- In 2020, the lowest quartile of individual households earned less than $35,000 each year; the highest quartile of households earned $120,000 or more annually (Figure 22).

The Census estimates that 12.8% of the population lives below the federal poverty guideline (PG) but percentages can vary more than twofold among states (Figure 23).

[x] Federal guidelines for determining poverty thresholds based on income, size of household, and other considerations are available online at https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines/prior-hhs-poverty-guidelines-federal-register-references/2020-poverty-guidelines.

Figure 23. Population with household income less than the poverty guideline, 2020-2022



Source: U.S. Census Bureau. Current Population Survey, Annual Social and Economic Supplements, Table B-5, 2020-2022.

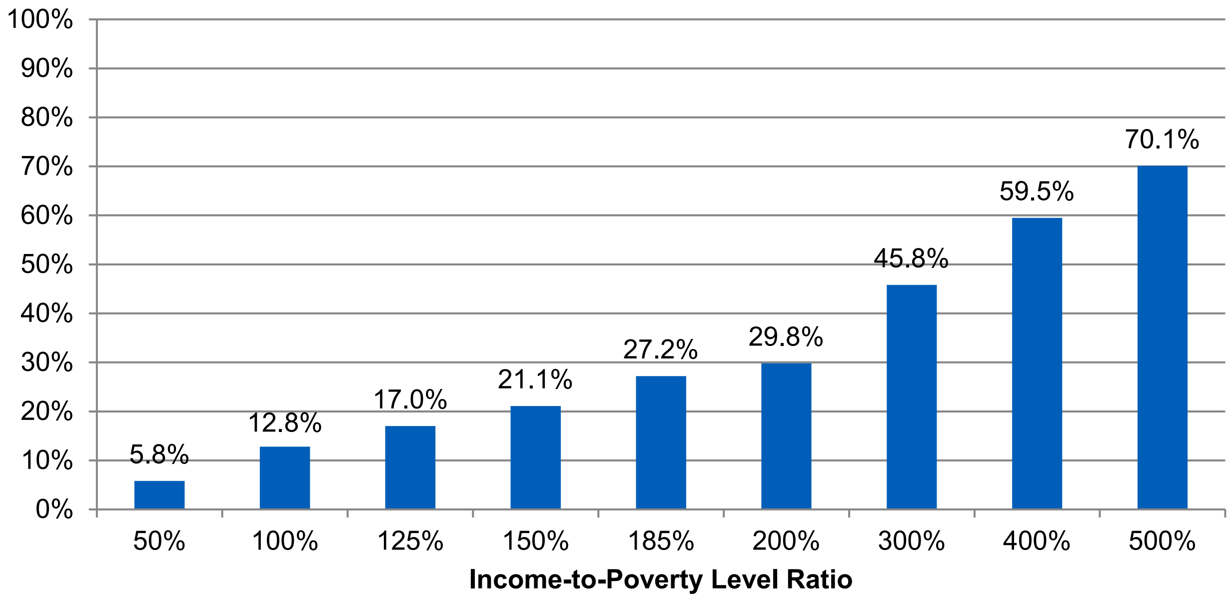
- The percentage of state population with household income less than PG ranges from 7.1% to 18.2%. The median percentage of state population living in poverty is 10.7% (Figure 23).

For most measures, the NHQDR tracks disparities data based on the ratio of household income to the PG for the household's size. For measures drawn from AHRQ's Healthcare Cost and Utilization Project (HCUP), income is defined using the median income of the patient's residential ZIP Code.[xi] In 2020, the median household income was $64,994. More than one-quarter of households (26.2%) earned less than $35,000 per year; the top 10% of households earned $200,000 or more per year.

The NHQDR uses the ratio of household income to PG[24] to characterize the relationship between poverty and healthcare delivery. Figure 24 shows the percentage of the U.S. population that lives below PG thresholds commonly used in this report.

[xi] Measures using HCUP data analyze health outcomes by community-level household income. In 2020, the median households in the lowest earning quartile of ZIP Codes earned $49,999 or less each year, while the median households in the highest earning quartile of ZIP Codes earned $86,000 or more. More detail can be found at https://www.hcup-us.ahrq.gov/db/vars/zipinc_qrtl/nisnote.jsp.

Figure 24. Cumulative percentage of U.S. households with different ratios of income to poverty, 2020



Source: American Community Survey, 5-year estimates, 2020, Table S1701, 2020.
Note: In 2020, the PG, which is used to determine income-to-PG ratios, was $12,760 for a one-person household, $17,240 for a two-person household, $21,720 for a three-person household, and $26,200 for a four-person household.

- In 2020, 12.8% of the population had annual household incomes equal to or lower than 100% of the PG; 17.0% had household incomes between 100% and 199% of the PG; 29.7% had household incomes between 200% and 399% of the PG; and 59.5% of the population had household incomes at or lower than 400% of the PG (meaning that more than 40% had higher household incomes).

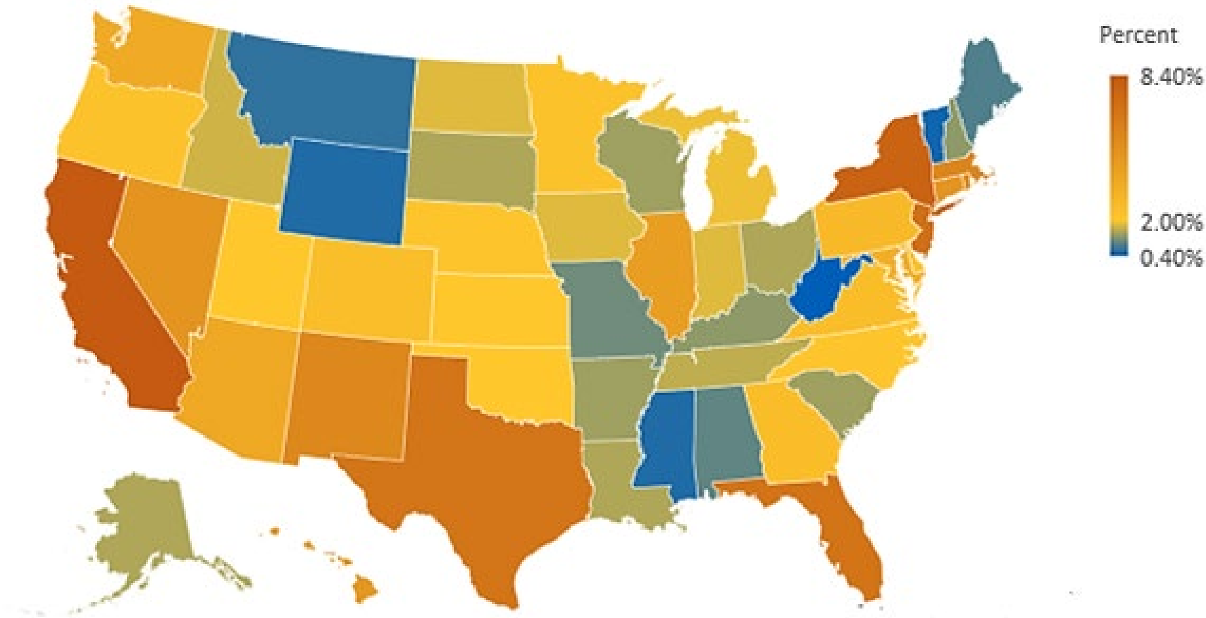
❖ **Social connectedness is associated with better health.**

The **Social and Community Context** domain accounts for the influence that positive and negative relationships with family, friends, coworkers, and the broader community can have on health. This domain includes the ability to communicate with healthcare providers and navigate social norms in healthcare delivery processes. Interpersonal relationships and rapport with clinicians are difficult to measure in a population. However, a few statistics provide a window on this domain.

Five-year estimates from the American Community Survey report that 86.5% of the population was born in the United States, and 93.0% of the population are U.S. citizens. Of the 13.5% born outside the United States, 6.9% are naturalized U.S. citizens and 6.6% are not naturalized U.S. citizens.[25]

More than one-fifth (21.5%) of the population age 5 years and over speaks a language other than English as their primary language at home, but the percentage of households with limited English proficiency varies among states. Spanish is the second most spoken language in the United States (13.2%). Asian and Pacific island languages account for 3.5%, other Indo-European languages for 3.7%, and other languages for 1.1%.[26]

Figure 25. Percentage of households with limited English proficiency, 2022



Source: U.S. Census Bureau. American Community Survey 1-year estimates, Table S1602, 2022.

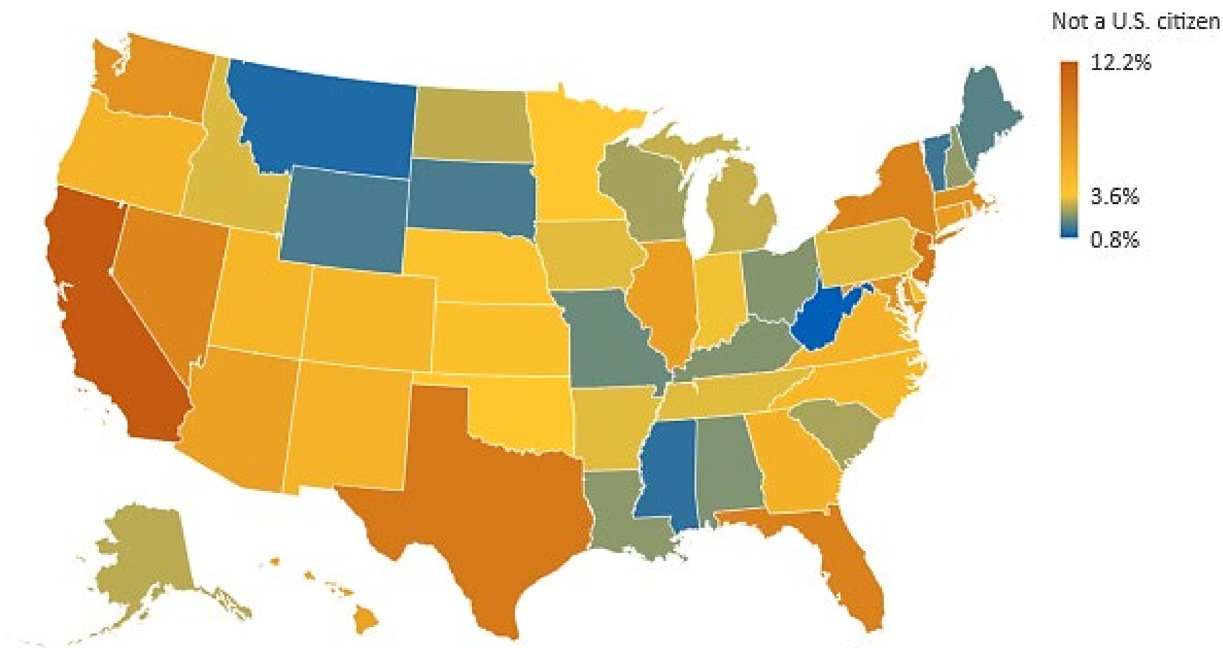
- The percentage of state population from households with limited English proficiency ranges from 0.4% to 8.4%. The median is 2.0% (Figure 25).

Most communities appear to have relatively stable populations, with the vast majority (86.2%) staying in the same place the previous year. Fewer than 1 in 7 people reported moving in the previous year.[25] Specifically:

- 7.7% moved within the same county.
- 3.2% moved to a different county but remained in the same state.
- 2.3% moved to a different state.
- 0.6% moved abroad.

Nationally, in 2022, 13.9% of people in the United States were foreign born. Just over half (7.4%) were either naturalized citizens or Americans born abroad, while the remaining people (6.5%) were not U.S. citizens. But immigration patterns vary widely among states and local communities. Because publicly sponsored healthcare and social service programs often exclude people who are not American citizens, communities where noncitizens live may receive fewer resources than needed, leading to socioeconomic disadvantage for the healthcare systems that serve them.

Figure 26. Percentage of people who are not U.S. citizens, 2022



Source: U.S. Census Bureau. American Community Survey 1-year estimates, Table B05001, 2022.

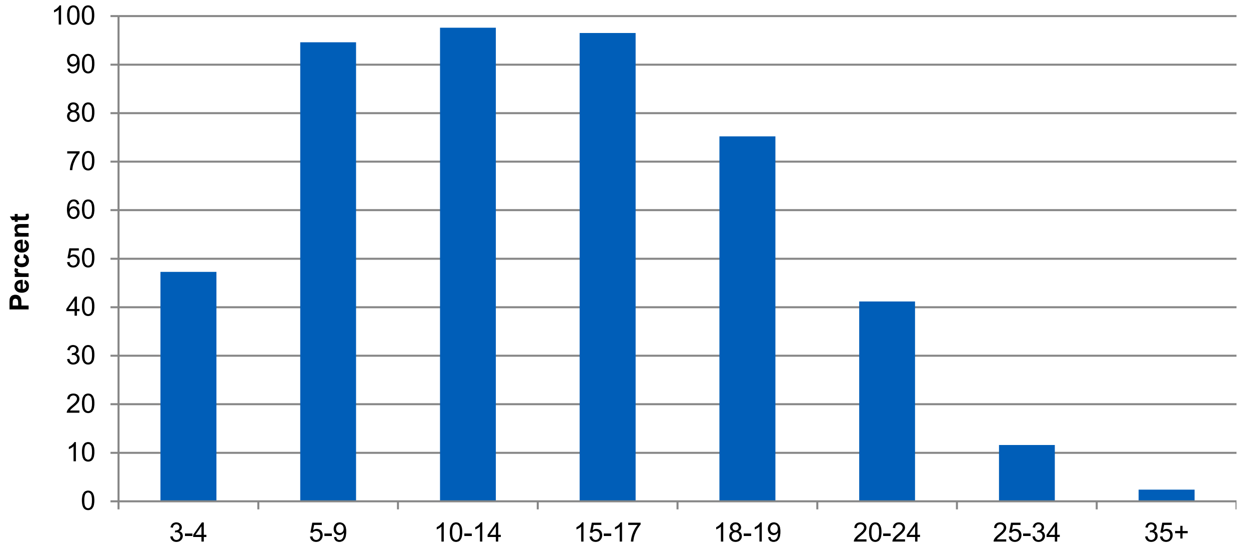
- The percentage of state population who are not U.S. citizens ranges from 0.8% to 12.2%. The median is 3.6% (Figure 26).

❖ **Access to high-quality education is associated with better health.**

The **Education Access and Quality** domain accounts for the association between having a higher level of education and living a longer, healthier life. Access to high-quality formal education can improve economic stability, enhance the likelihood of engaging in healthy behaviors, and improve a person's ability to understand and adhere to medical treatment.

Just under half of children between 3 and 4 years old are enrolled in school, but nearly all children between 5 and 8 years are. School enrollment declines steadily after age 18 years.

Figure 27. Percentage of people in the United States enrolled in school, by age, 2020



Source: American Community Survey, 5-year estimates, 2020, Table S1401, 2020.

- Among the population age 3 years and over and enrolled in kindergarten to 12th grade (Figure 27):
  - 7.5% are enrolled in kindergarten.
  - 29.8% are enrolled in grade 1 to grade 4.
  - 31.1% are enrolled in grade 5 to grade 8.
  - 31.6% are enrolled in grade 9 to grade 12.

Most adults age 25 years and over in the United States (88.5%) have a high school diploma. Approximately one-third have a bachelor's degree, and about 13% have a graduate or professional degree. About 20% of adults attended college but did not get a degree, and about 9% have an associate's degree. About 5% of the adult population did not attend school beyond eighth grade.[27]

❖ **Health quality is influenced by community characteristics.**

The **Neighborhood and Built Environment** domain accounts for the influence physical infrastructure (e.g., access to transportation, access to healthy food options, spaces for engaging in physical activity, access to high-speed internet) and the environment (e.g., air quality, water quality) have on health.

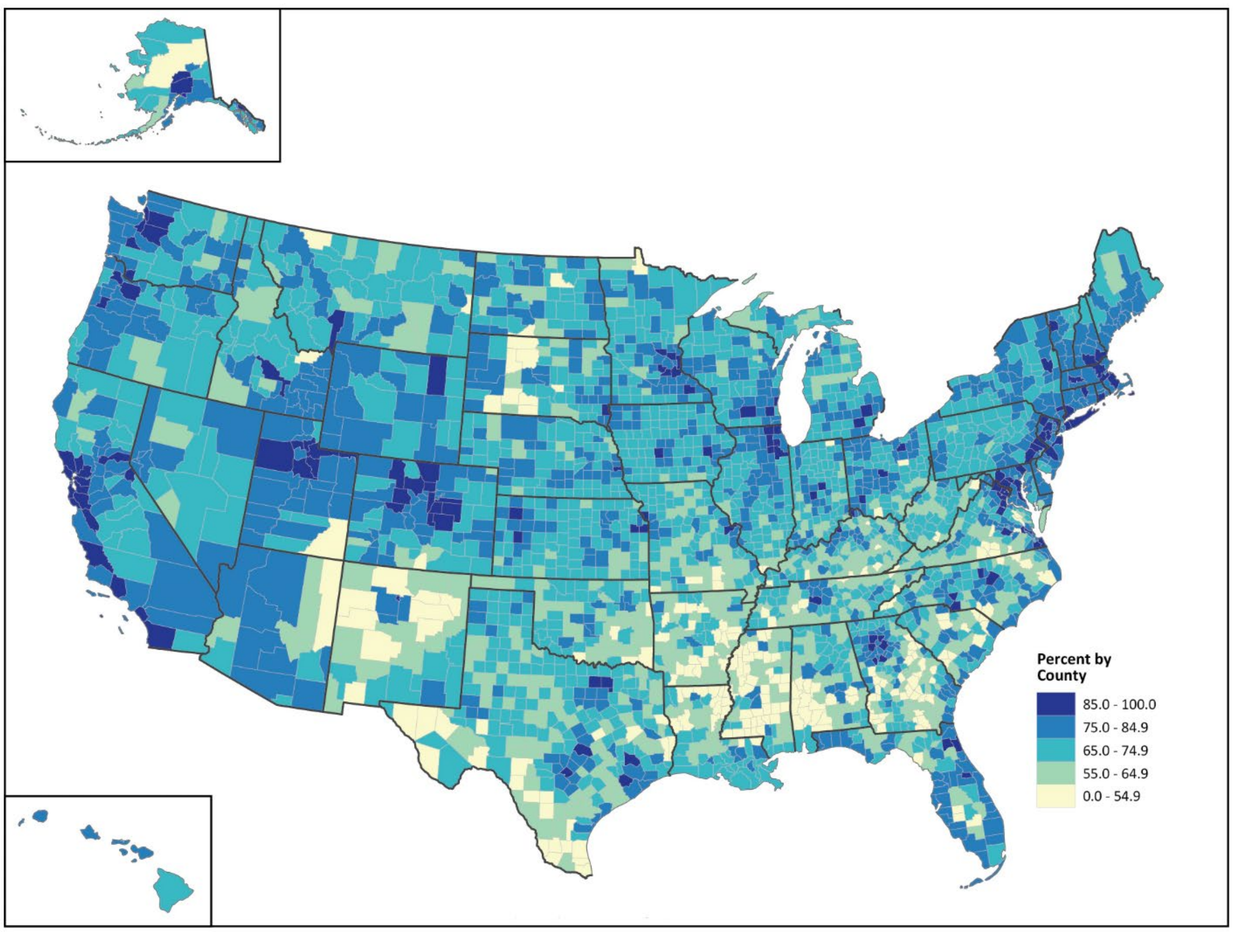
Neighborhood and built environment often interact with health and healthcare delivery in bidirectional and reinforcing ways. For example, studies show that unstable housing and lack of transportation can influence a person's ability to access healthcare services, adhere to treatment recommendations, and recover from an illness or injury. In addition, the consequences of poor health can limit a person's ability to obtain housing or afford transportation.

Broadband internet access is another example of the built environment as a social determinant of health. With healthcare delivery organizations expanding telehealthcare services, a person's access to healthcare services may come to depend on having access to high-speed internet. From 2015 to 2020, 85.5% of people in the United States had a broadband internet subscription, up from 78.7% from 2013 to 2017.

Many people still lack access, particularly those in lower income households and those in nonmetropolitan areas (Figure 28).[28] AHRQ offers a data visualization on poverty and broadband access to help readers explore this issue.

Public libraries (a third example of the built environment) may offer a way to partially offset lack of individual access to broadband internet. Libraries are actively exploring opportunities to provide people with public access to private spaces equipped with computers and broadband for patrons to access telehealth services.[29]

Figure 28. Percentage of households with any broadband service subscription, 2013-2017

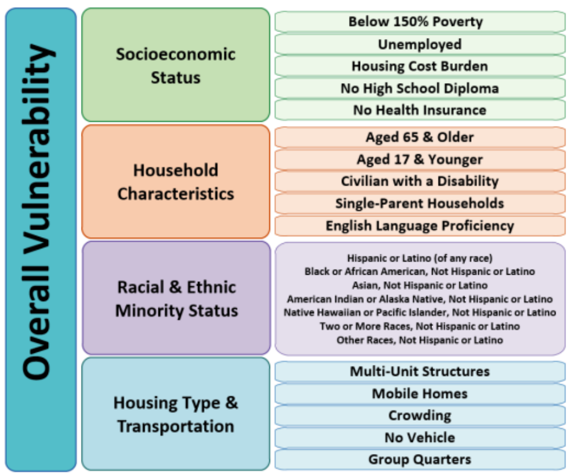


Source: U.S. Census Bureau, American Communities Survey 5-year estimates, 2013-2017. https://www.census.gov/library/stories/2018/12/rural-and-lower-income-counties-lag-nation-internet-subscription.html.

❖ The Social Vulnerability Index is a tool to help assess the relationship between social determinants of health and healthcare delivery.

The Social Vulnerability Index (SVI) is a tool that can enable users to account for social factors that contribute to healthcare delivery and outcomes. The SVI is a composite index that combines indicators of social vulnerability from four domains (Figure 29) using geographically linked indicators from the Census Bureau's American Community Survey and other sources.

Figure 29. Social Vulnerability Index domains



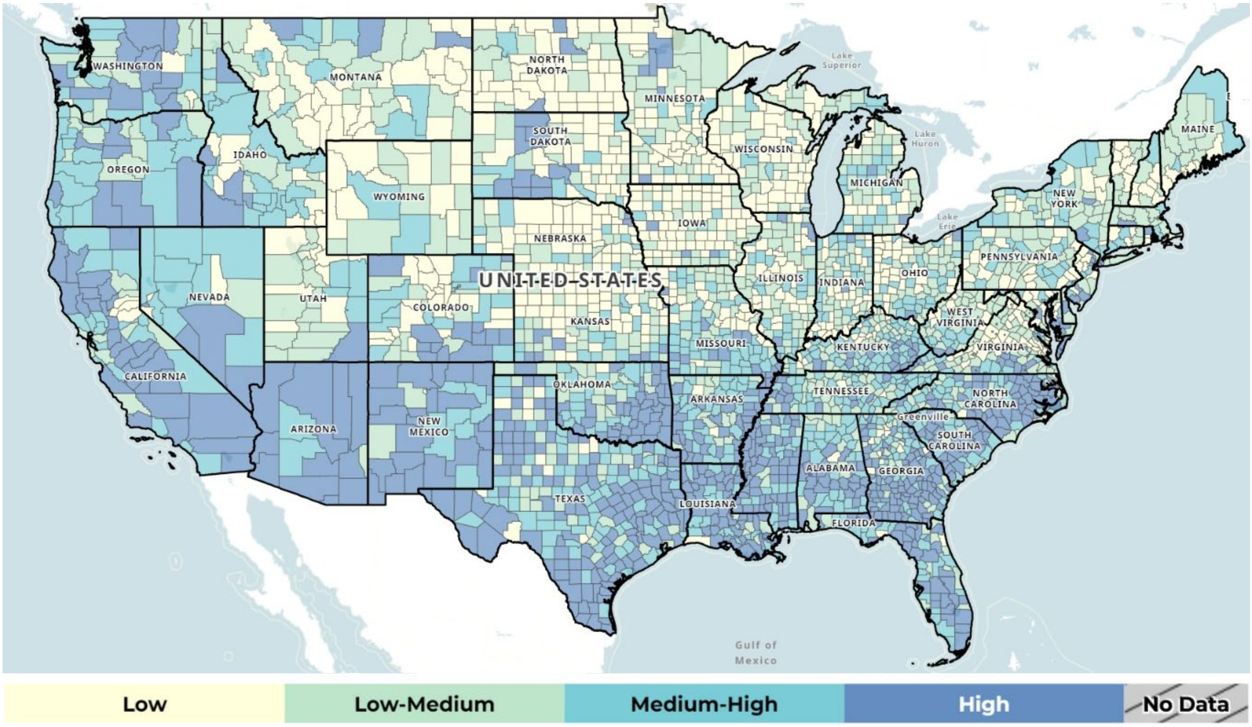
Source: Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry, CDC/ATSDR SVI 2020 Documentation - 8/5/2022. https://www.atsdr.cdc.gov/placeandhealth/svi/documentation/pdf/SVI2020Documentation_08.05.22.pdf.

The SVI rates communities with a summary score that indicates whether a community has high social vulnerability (i.e., more likely to experience undesirable outcomes due to socioeconomic risks), low social vulnerability (i.e., less likely to experience undesirable outcomes), or in-between. Health systems, policymakers, and others can use the SVI in several ways, including:

- Identifying populations vulnerable to social, economic, and environmental stressors that can affect their ability to access healthcare services or adhere to treatment plans.
- Informing resource allocation decisions to increase the likelihood that vulnerable communities can access the services most appropriate for their needs.
- Guiding planning and development of healthcare services.
- Evaluating healthcare delivery policies and interventions.

Mapping tools and other SVI resources are available from the Centers for Disease Control and Prevention (CDC) (Figure 30).

Figure 30. County-level SVI score in continental United States, 2020



Source: Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry, Social Vulnerability Index. Accessed at https://www.atsdr.cdc.gov/placeandhealth/svi/interactive_map.html on September 1, 2023.
Note: People in high SVI counties (darker shading) have more socioeconomic vulnerability and are at greater risk for experiencing unfavorable outcomes than people in in low SVI counties (lighter shading).

Summary

Social determinants of health (SDOH) shape a person's well-being and health and thus have a crucial role in determining both the need for healthcare services and how successfully people respond to treatment. In fact, such determinants often have a stronger influence on health and use of healthcare services than care provided by healthcare systems. SDOH that can affect health include health insurance coverage, household income, education, employment opportunities, housing availability and quality, access to broadband internet, culture, and language.

Prevalence of social vulnerability related to SDOH varies widely within the population and among states. Thus, state and local efforts to improve socioeconomic conditions within communities play an essential role in improving healthcare quality and eliminating health disparities.

Healthcare Delivery Systems

The United States must have an adequate healthcare delivery infrastructure to meet population needs. Americans receive healthcare from a complex ecosystem of people, institutions, organizations, and resources. The healthcare workforce includes more than 60 occupations that provide direct care to patients, as well as many other administrative, technological, and support occupations.

Healthcare infrastructure includes diverse organizations, such as medical offices; dental offices; hospitals; long-term care facilities; home care services; ambulatory surgery centers; public health departments; health insurance plans; and various industries that produce medications, medical devices, and healthcare technological applications.

- **The healthcare workforce plays a key role in healthcare delivery.**

Delivering high-quality care often requires that the right number and combination of healthcare workers are available and can work together effectively. For example, routine surgical procedures can be delayed if only a surgeon is present. Safe, high-quality procedures may require anesthesiologists, nurses, pharmacy staff, laboratory technicians, staff who clean operating rooms, staff to sterilize and safely store instruments, and other professions.

Reports of hospital, nursing home, and community-based healthcare staff shortages due to increased healthcare worker turnover, burnout, lack of support for dependent family members, illness, and death during the COVID-19 PHE have raised concerns about whether the United States has the capacity to deliver safe, high-quality care. Data from the Bureau of Labor Statistics (BLS) offer support for these concerns but also highlight important nuances.

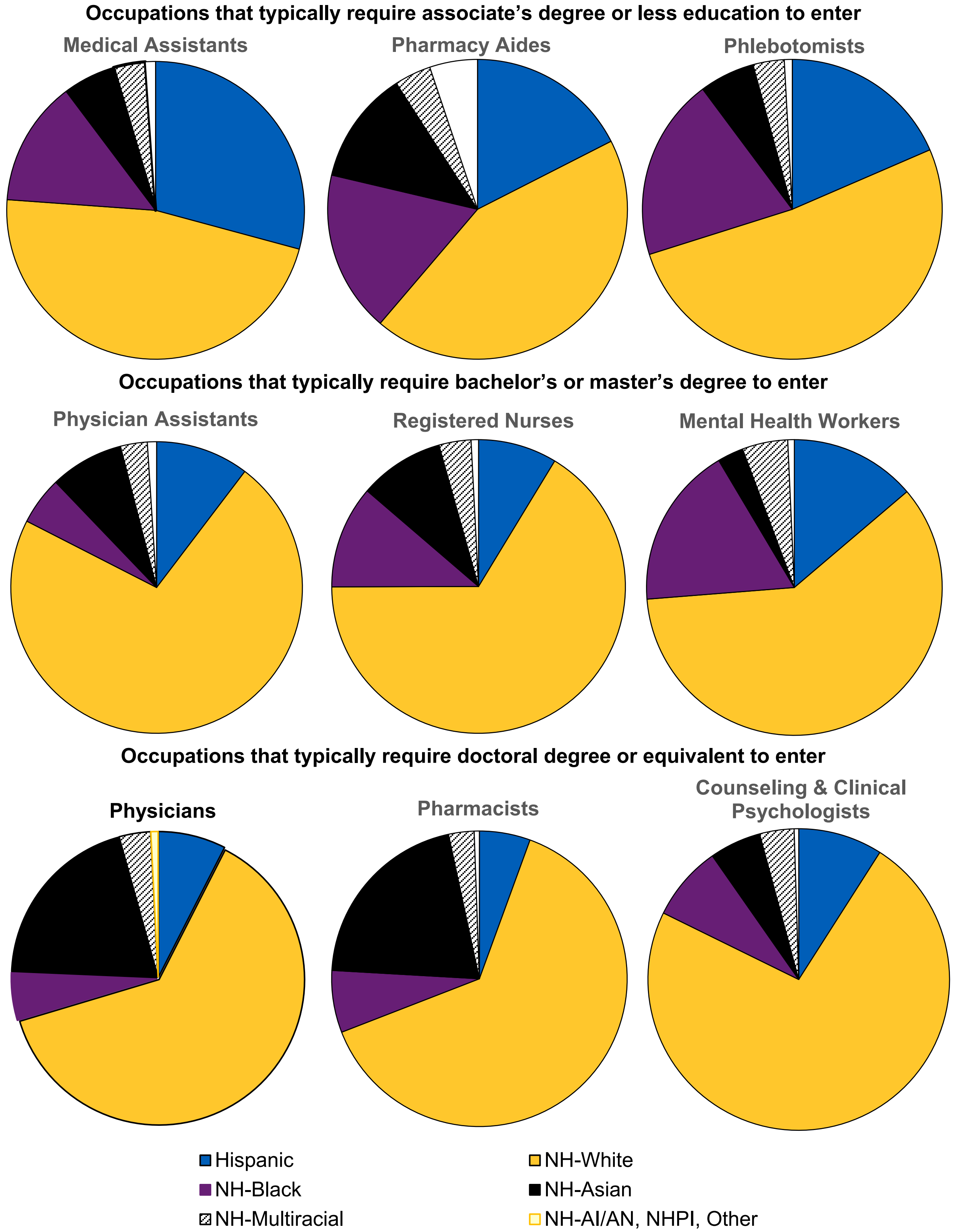
The BLS classifies healthcare delivery "establishments" into major types of settings: ambulatory healthcare, hospitals, and nursing and residential care facilities.[xii] Its Standard Occupational Classifications lists more than 60 different healthcare occupations that provide direct care services in those settings. Other, non-direct care occupations, such as managers, security, and catering, also work in healthcare settings.

This section uses data from the BLS Current Employment Survey and BLS Current Population Survey to describe overall workforce trends and trends for seven types of healthcare occupations: physicians, advanced practice registered nurses (APRNs), registered nurses, mental health workers, and three sets of other groups of healthcare occupations, classified by level of education needed to enter the profession (Figure 31).[xiii,30]

[xii] The NHQDR uses the North American Industry Classification System (NAICS) to describe trends in workforce participation. NAICS groups establishments into business sectors and more specific industries according to similarity in the processes used to produce goods or deliver services. NAICS groupings do not necessarily align with clinical taxonomies for organizing healthcare services. For example, within the "Health Care and Social Assistance" sector (NAICS 62xxxx), "nursing care facilities (skilled nursing facilities)" (NAICS 623110) are grouped with long-term institutional services such as "continuing care retirement communities" (NAICS 623311) and "assisted living facilities for the elderly" (NAICS 623312) in the "Nursing and Residential Care Facilities" subsector (NAICS 623xxx), but "home health care services" (NAICS 621610) are grouped with outpatient services, such as "offices of physicians" (NAICS 621111) and "kidney dialysis centers" (NAICS 621492) in the "Ambulatory Health Care Services" subsector (NAICS 621xxx). Readers may find more information at https://www.census.gov/programs-surveys/economic-census/year/2022/guidance/understanding-naics.html.

[xiii] The NHQDR's analysis uses the Standard Occupational Classification system (SOC codes 29-xxxx and 31-xxxx) and the BLS Occupational Outlook Handbook to group healthcare occupations into three categories according to the level of education typically required to enter a profession. Examples of occupations requiring an **associate's degree or less** education are dental hygienist, medical assistant, phlebotomist, and paramedic. Examples of occupations requiring a **bachelor's or master's degree** are dietitian and laboratory technician. Examples of occupations requiring a **doctorate** or equivalent training are pharmacist and podiatrist.

Figure 31. Distribution of race and ethnicity in different healthcare occupations, 2021

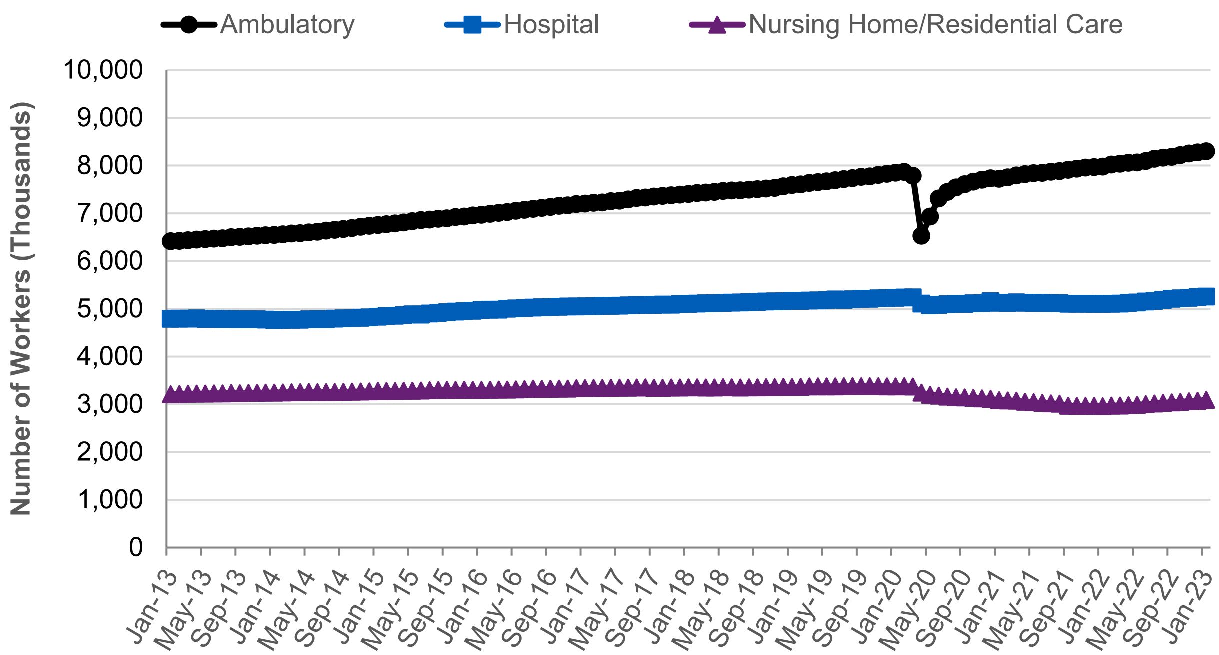


Source: U.S. Census, American Community Survey, 2021.

❖ Postpandemic employment has improved in many sectors but workforce participation in the nursing and residential care sector continues to shrink.

The healthcare workforce grew approximately 15.5% over the past decade, with most rapid growth occurring in the ambulatory sector. Although workforce size decreased sharply at the beginning of the COVID-19 PHE, there were approximately 16.6 million workers as of January 2023, which was 1.2% higher than it had been in January 2020. This increase signals that overall healthcare workforce participation had returned to levels reported immediately before the PHE in January 2020. However, the recovery has been uneven among different healthcare settings and worker groups.

Figure 32. Number of workers employed and at work in ambulatory healthcare, hospitals, and nursing and residential care facilities, January 2013-January 2023



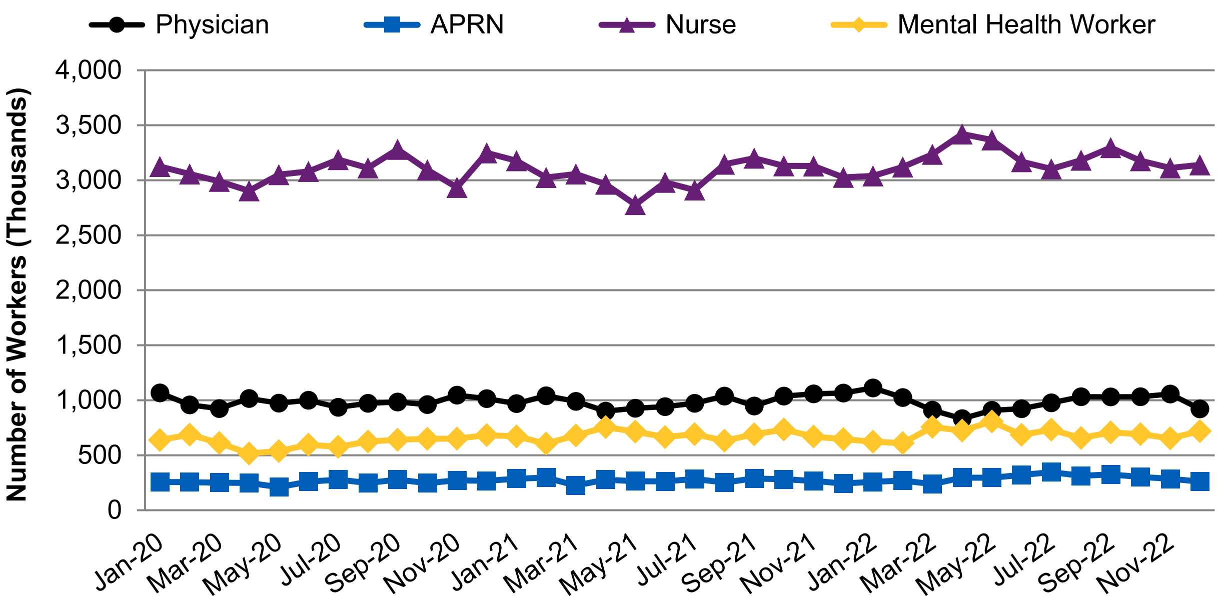
Source: Bureau of Labor Statistics, Current Employment Statistics (National), January 2013-January 2023. Accessed at https://www.bls.gov/ces/data/ on August 2, 2023.

- Workforce participation in the ambulatory healthcare sector was 8.3 million workers in January 2023, up 5.7% from levels reported in January 2020 (Figure 32).[xiv]
- Workforce participation in the hospital sector was 5.3 million workers in January 2023, statistically unchanged from levels reported in January 2020.
- Workforce participation in the nursing home and residential care sector was 3.1 million workers in January 2023, down 8.4% from levels reported in January 2020.

[xiv] Changes in workforce participation data from the Current Employment Statistics and the Current Population Survey are based on the Bureau of Labor Statistics methodology, which calculates differences at the 90% level of confidence. See the Handbook of Methods at https://www.bls.gov/opub/hom/ces/calculation.htm#reliabiliity and https://www.bls.gov/opub/hom/cps/calculation.htm for more detail.

Data from the BLS Current Population Survey provide less statistically stable estimates due to smaller sample sizes but allow examination of employment trends by occupation and worker demographic characteristics. The data show similar levels of workforce participation by physicians, nurses, and APRNs in December 2022 as in January 2020.

Figure 33. Number of physicians, advanced practice registered nurses, nurses, and mental health workers employed and at work in any healthcare setting, January 2020-December 2022

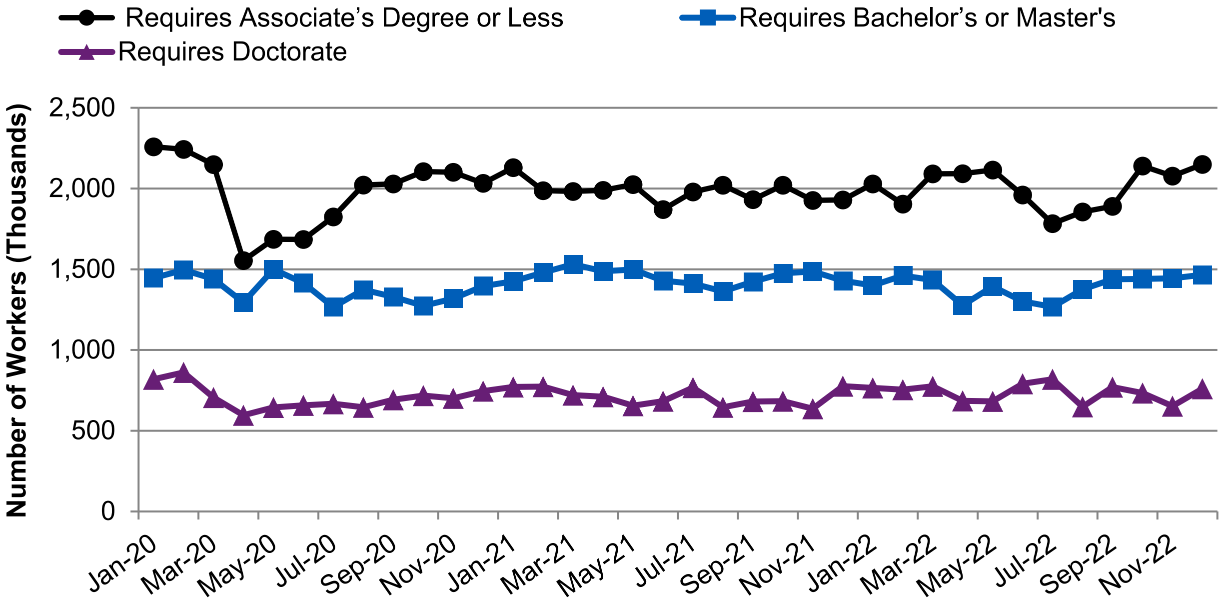


Key: APRN = advanced practice registered nurse.
Source: U.S. Bureau of Labor Statistics, Current Population Survey, monthly data, January 2020-December 2022.

- Approximately 3,139,000 nurses participated in the workforce in December 2022, unchanged from the 3,125,000 nurses reported in January 2020 (Figure 33).
- Approximately 921,000 physicians participated in the workforce in December 2022, unchanged from the 1,067,000 physicians reported in January 2020.
- Approximately 719,000 mental health workers participated in the workforce in December 2022, unchanged from the 637,000 workers reported in January 2020.
- Approximately 260,000 APRNs participated in the workforce in December 2022, unchanged from the 256,000 APRNs reported in January 2020.

Current Population Survey data also show approximately 100,000 fewer workers in December 2022 than in January 2020 for nonphysician, non-nurse healthcare professions that typically require an associate's degree or less education (such as medical assistants, paramedics, and pharmacy assistants). Numbers were also lower for professions that typically require a doctoral degree or clinical internship (such as podiatrists, physical therapists, and pharmacists). Although not statistically significant, the size of these gaps signals a less robust recovery for these worker categories and warrants monitoring.

Figure 34. Number of workers in other healthcare occupations employed and at work in any healthcare setting, by education needed to enter the occupation, January 2020-December 2022



Source: U.S. Bureau of Labor Statistics, Current Population Survey, monthly data. Accessed on July 3, 2023.

- In December 2022, approximately 2,150,000 workers were employed in roles requiring an associate's degree or less education, unchanged from the 2,259,000 workers reported in January 2020 (Figure 34).
- In December 2022, approximately 1,466,000 workers were employed in roles requiring a bachelor's or master's degree, unchanged from the 1,446,000 workers reported in January 2020.
- In December 2022, approximately 760,000 workers were employed in roles requiring a doctoral degree or more education, unchanged from the 819,000 workers reported in January 2020.

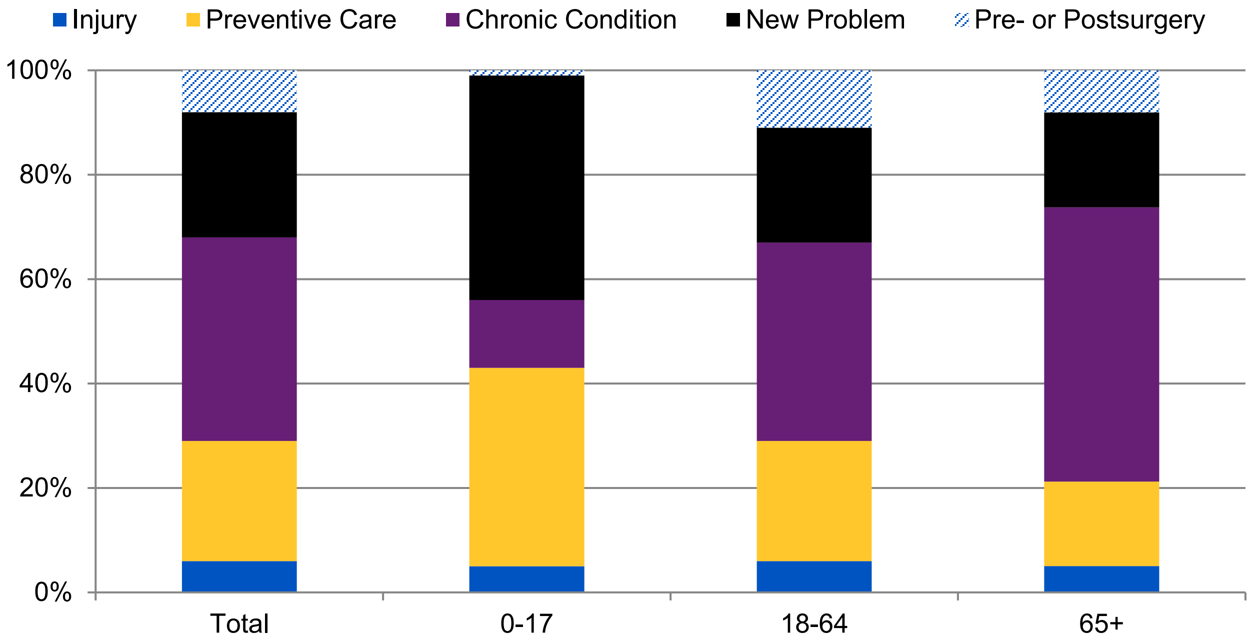
❖ **In a complex U.S. healthcare system, medical offices remain by far the setting most commonly visited for care.**

In any given year, most people in the United States interact with healthcare delivery systems through routine office-based physician visits. A smaller percentage of people seek emergency care services, and even fewer require hospitalization. In 2020, 83.4% of adults and 94.0% of children had an office visit with a physician or other healthcare professional in the past year.[31] For comparison, 19.0% of adults had an emergency department visit that year. In 2018, only 7.4% of people in the United States required an overnight hospital stay.[32]

Ambulatory Medical and Surgical Offices

In 2018, there were 860.4 million medical physician office visits, or 267.1 visits per 100 people. Just over half (136.6 visits per 100 people) were with a primary care provider. Approximately one-quarter of encounters (67.1 visits per 100 people) were with medical specialists, while the remaining encounters (63.3 visits per 100 people) were with surgical specialists.

Figure 35. Major reasons for office-based physician visits, by patient age in years, 2018



Source: Ashman JJ, Santo L, Okeyode T. Characteristics of Office-Based Physician Visits, 2018. NCHS Data Brief. 2021 May;408:1-8. https://www.cdc.gov/nchs/products/databriefs/db408.htm.
Note: Analysis is based on the National Ambulatory Medical Care Survey, which annually surveys 3,000 physician practices in nonfederal, office-based settings. Some of the surveyed offices provide telehealthcare services.

- Overall, most office visits (39.0%) were for managing one or more chronic conditions, followed by evaluating a new problem (24.0%), providing preventive care services (23.0%), and performing pre- or postoperative evaluation (8%) (Figure 35).
- Only 6.0% of ambulatory healthcare visits were for evaluation or management of an injury.
- Among children less than 18 years old, this overall pattern of visits differs, giving greater emphasis to visits for new problems and preventive services.

The 10 leading principal reasons for visits account for less than half (42.3%) of all reasons for all office visits in 2019. The list illustrates the wide scope of healthcare services delivered in ambulatory settings. It also highlights primary care offices' counseling, medication maintenance, and followup activities, which are central to successfully managing chronic diseases.[33]

The top reasons for visits in 2019 were:

- Progress visit, not otherwise specified (21.3%).[xv]
- General medical examination (5.8%).
- Postoperative visit (2.7%).

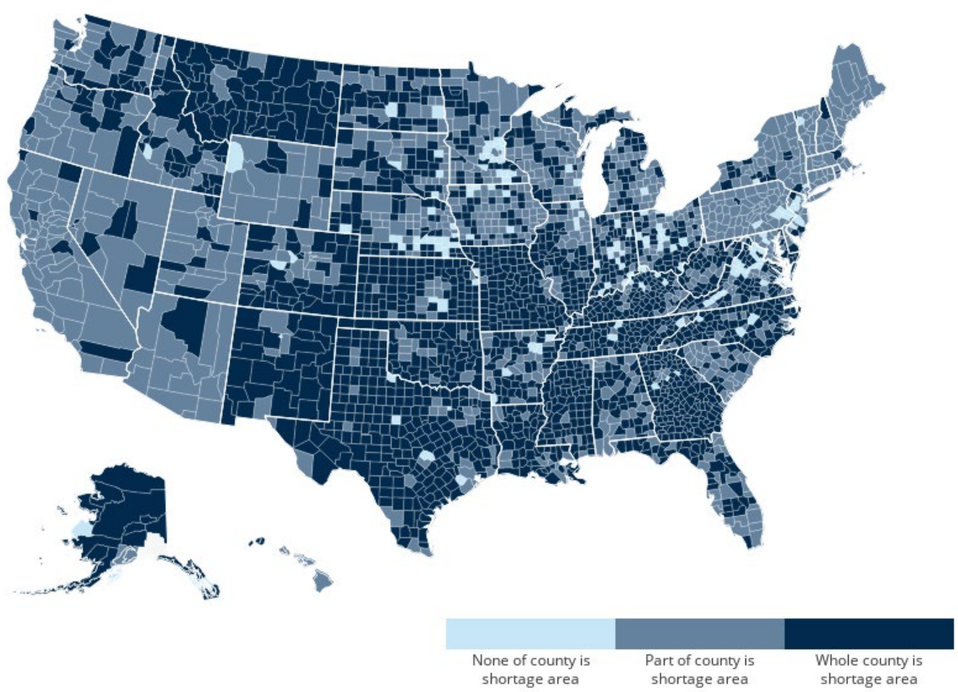
[xv] Terms in this list are based on the National Ambulatory Medical Care Survey's Reason for Visit Classification for Ambulatory Care (RVC), defined in the National Ambulatory Medical Care Survey 2019 National Summary Tables, available at https://www.cdc.gov/nchs/data/ahcd/namcs_summary/2019-namcs-web-tables-508.pdf.

- Gynecological examination (2.4%),
- Counseling, not otherwise specified (2.2%),
- Medication (prescribing or refill), other and unspecified kinds (1.8%),
- Shoulder symptoms (1.6%),
- Hypertension (1.5%),
- Well baby examination (1.5%),
- Cough (1.5%).

Living near primary care services could improve a person's likelihood of receiving high-quality care for chronic disease. However, many communities in the United States report limited or no access to primary care, especially nonmetropolitan communities. The Health Resources and Services Administration (HRSA) has designated 7,955 locations, population groups, and healthcare facilities as Primary Care Health Professional Shortage Areas (HPSAs).

More equitable distribution of primary care providers may reduce the number of primary care HPSAs. HRSA reports that there were 256,220 full-time-equivalent primary care providers in 2018[34] and estimates that 16,461 additional practitioners would fulfill the needs of existing HPSAs.[35]

Figure 36. Counties where all, part, or none of the county is a primary care HPSA



Source: Rural Health Information Hub. Population in Primary Care HPSAs (Health Professional Shortage Area) for Metro and Nonmetro Counties, 2022. https://www.ruralhealthinfo.org/charts/5. Accessed July 20, 2023.

- Overall, 2,002 (63.7%) of 3,143 counties and county equivalents are classified as "whole county shortage areas" in 2023. Of these, 566 (28.3%) are metropolitan counties and 1,436 (71.7%) are nonmetropolitan counties (Figure 36).

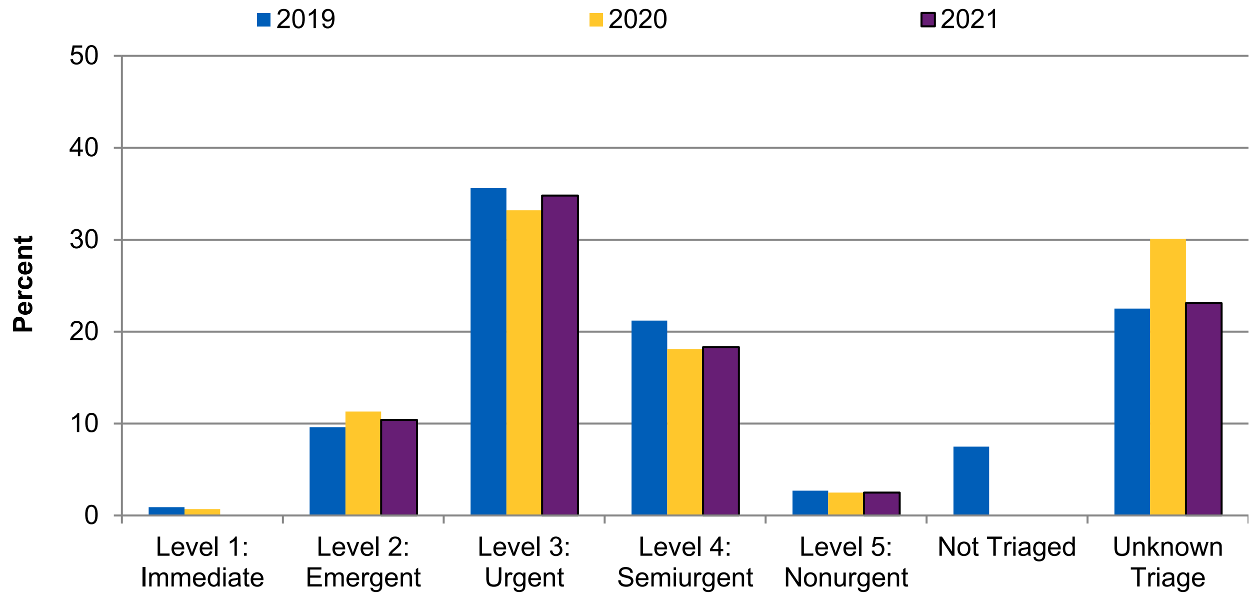
- In contrast, only 144 (4.6%) counties and county equivalents are classified as having "no primary care shortage area" in 2023. More than two-thirds (103 or 71.5%) are metropolitan counties while only 41 (28.5%) are nonmetropolitan counties.
- More rural counties have primary care HPSAs than metropolitan counties. However, most people who live in areas designated as primary care HPSAs live in metropolitan counties because those counties are more densely populated.
  - Of the approximately 79 million people who live in counties where the entire county has been designated a primary care HPSA, 51 million (64.6%) are in metropolitan counties and 28 million (35.4%) are in nonmetropolitan counties.[36]
  - Of the approximately 226 million people who live in counties where part of the county has been designated a primary care HPSA, 210 million (92.9%) are in metropolitan counties, and 16 million (7.1%) live in nonmetropolitan counties.[35]
  - Approximately 22.6 million people live in counties where none of the county has been designated a primary care HPSA. Nearly all (21 million or 92.9%) live in metropolitan counties.[35]

Emergency Departments

Emergency departments (EDs) play a critical role in healthcare delivery systems as a provider of acute care and an important gateway for hospitalization.[37] Their central role in healthcare delivery is supported in part by the Emergency Medical Treatment and Labor Act, which requires hospitals to provide acute medical care to all patients, regardless of their demographic characteristics or ability to pay.[38]

In 2021, there were approximately 139.8 million ED visits, or 42.7 visits per 100 people. Among visits with triage data available, almost half (45.2%) of visits were classified as "urgent" or higher acuity, 18.3% were classified as "semiurgent," and a small portion (2.5%) was deemed "nonurgent." The remaining visits were not triaged or had unknown triage status[39] (Figure 37).

Figure 37. Triage status of emergency department visits, 2019-2021



Source: Centers for Disease Control and Prevention, National Hospital Ambulatory Medical Care Survey, 2019-2021.
Note: Data for the 2020 and 2021 Not Triaged groups and the 2021 Level 1: Immediate group not shown because estimates are statistically unreliable.

The eight most common ED diagnoses recorded in 2021 account for more than three-fourths of all diagnoses made in this setting. The broadly defined diagnoses reflect EDs' importance as a source of care for conditions that lack a definitive diagnosis or may require urgent treatment. These diagnoses are:

- Symptoms, signs, and abnormal clinical laboratory findings, not classified elsewhere (26.0%),
- Injury, poisoning, and certain other consequences of external causes (16.9%),
- Diseases of the respiratory system (7.3%),
- Diseases of the musculoskeletal system and connective tissue (6.8%),
- Diseases of the digestive system (6.0%),
- Diseases of the genitourinary system (5.5%),
- Mental, behavioral, and neurodevelopmental disorders (4.2%), and
- Diseases of the circulatory system (3.9%).

Although the number of freestanding EDs (defined as EDs that are not physically attached to a hospital) has increased in recent years, most EDs are located within hospitals.[40]

Hospitals

Hospitals are organizations that bring together different types of healthcare professionals, diagnostic and therapeutic equipment, and services, typically to provide medical and surgical care for short-term (acute) illnesses.[41] In 2022, the American Hospital Association (AHA) counted 6,093 hospitals with a total 920,531 staffed beds in the United States. Most are community hospitals.

More specifically:

- Nearly half (48.6%) are not-for-profit, nongovernment community hospitals.
- About one-fifth (20.2%) are for-profit, nongovernment community hospitals.
- Close to one-sixth (15.6%) are state and local government community hospitals.
- About one-tenth (10.4%) are nonfederal psychiatric hospitals.
- A small portion (3.4%) are federal government hospitals, and the remaining 1.8% are other types.

Most hospitals (3,483 or 57.2%) are affiliated with a *health system*, which the AHA defines as "a central organization linking either two or more hospitals, or a hospital and three or more non-acute care entities, such as a multispecialty outpatient office or a skilled nursing facility."[xvi] Health systems have the potential to extend the efficiencies hospitals offer by linking them to a broader network of resources and services than any individual hospital can provide onsite.

Hospitals Serving Communities That Experience Higher Risk for Poor Health Outcomes

The NHQDR focuses additional attention to care delivered by three types of hospitals that play an important role in rural areas and other at-risk communities. The Healthcare Cost and Utilization Project (HCUP), which supplies data for many NHQDR measures, defines *minority serving hospitals* (MSHs) as hospitals with the 25% highest number of discharges for people who are not identified as non-Hispanic White. HCUP similarly defines *safety net hospitals* (SNHs) as hospitals that have the highest 25% of hospital discharges paid for by Medicaid or uninsured people. (Academic literature offers varying definitions of SNHs.)

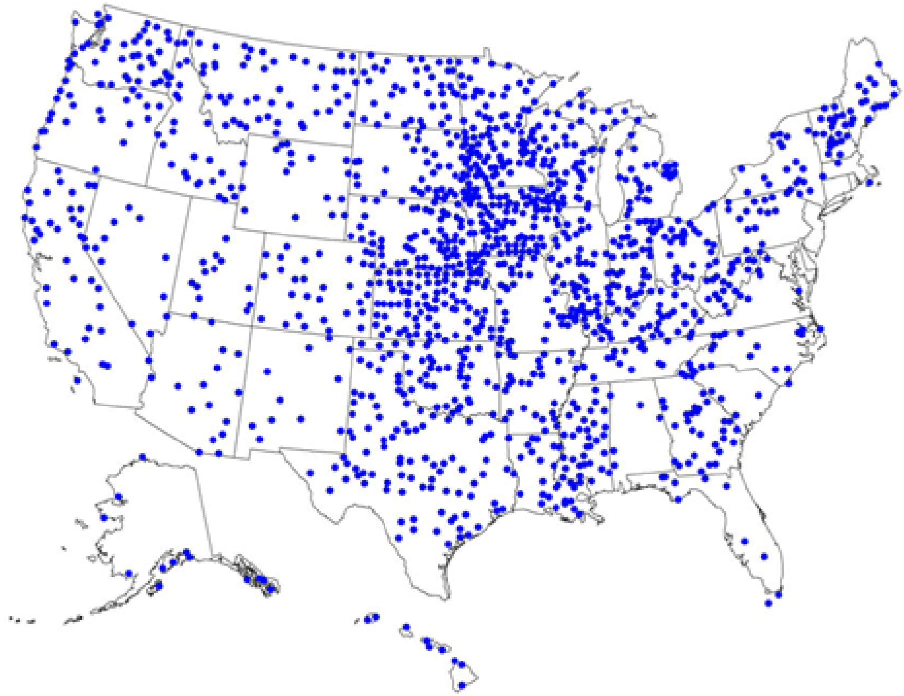
MSHs and SNHs are often large, located in metropolitan centers, and classified as teaching hospitals. Although the MSH and SNH designations do not confer additional resources on hospitals, they provide a useful window for understanding differences in hospital performance.

Critical access hospitals (CAHs) are facilities that meet certain statutory and regulatory criteria. Such criteria include having 25 or fewer acute care inpatient beds, providing 24/7 emergency care services, being located more than 35 miles from another hospital or CAH (with exceptions), and maintaining an annual average length of stay of 96 hours or less.[42] CAHs are thus smaller than most hospitals, and most are located in rural communities (Figure 38).

The Centers for Medicare & Medicaid Services (CMS) certifies a facility as a CAH if a facility (1) is located in a state that has established a Medicare rural hospital flexibility program; (2) is designated as a CAH by the state in which it is located; and (3) meets other criteria as CMS may require.

[xvi] The AHRQ Comparative Health System Performance Initiative similarly defines a health system as "an organization that includes at least one hospital and at least one group of physicians that provides comprehensive care (including primary and specialty care) who are connected with each other and with the hospital through common ownership or joint management." More information and additional resources for examining health systems may be found in the AHRQ Compendium of Health Systems at https://www.ahrq.gov/chsp/data-resources/compendium.html.

Figure 38. Distribution of critical access hospitals in the United States, 2022



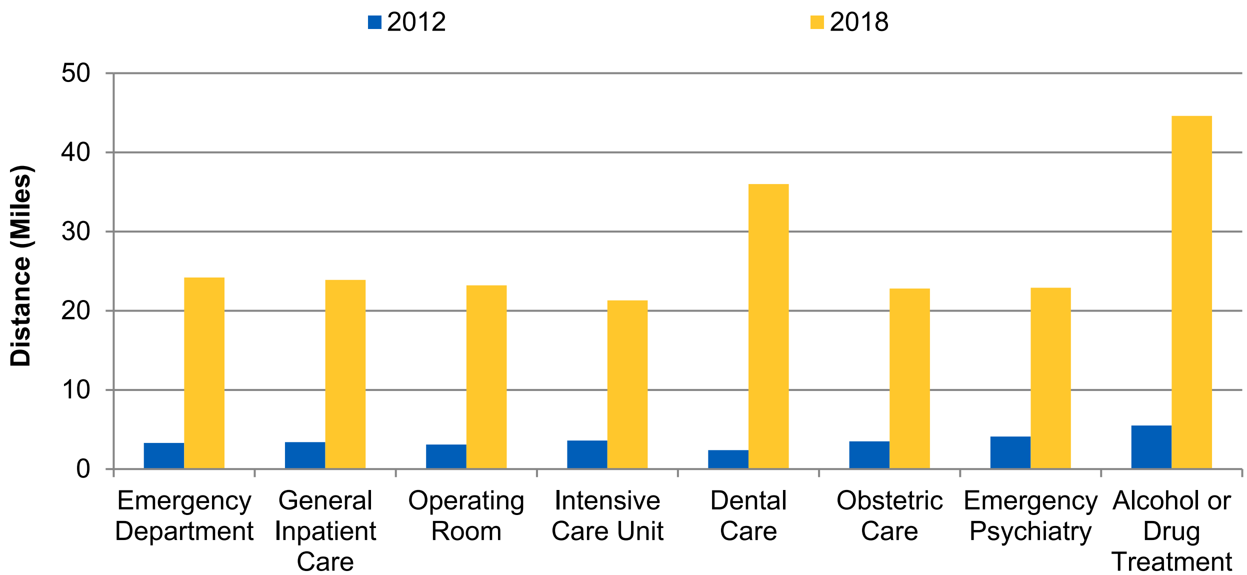
Source: Rural Health Information Hub, using data.HRSA.gov, U.S. Department of Health and Human Services, April 2022.
Note: Alaska and Hawaii are not to scale.

Hospital availability in nonmetropolitan (rural) communities is of particular interest to the nation's health. In sparsely populated communities, hospitals may be the only source of routine and specialized services that would otherwise be unavailable. In addition, they are often the only source of emergency and after-hours care. Thus, when rural hospitals are unavailable or stop providing services, access to healthcare services may be hindered.

For example, 174 rural hospitals closed between 2005 and 2020.[xvii] The Government Accountability Office (GAO) recently examined the effects of rural hospital closures on healthcare services. GAO found that people who lived in a closed hospital's service area had to travel considerably farther to access dental, mental health, substance use, and obstetric services, as well as services typically associated with hospital care[43] (Figure 39).

[xvii] The Cecil G. Sheps Center for Health Services Research, which provides data on rural hospital closures, includes two types of status changes when defining hospital closures: (1) "Complete" closures, in which facilities no longer provide healthcare services, and (2) "Converted' closures, in which facilities no longer provide inpatient care but continue to provide some healthcare services, such as primary care or skilled nursing care (https://www.shepscenter.unc.edu/programs-projects/rural-health/rural-hospital-closures/).

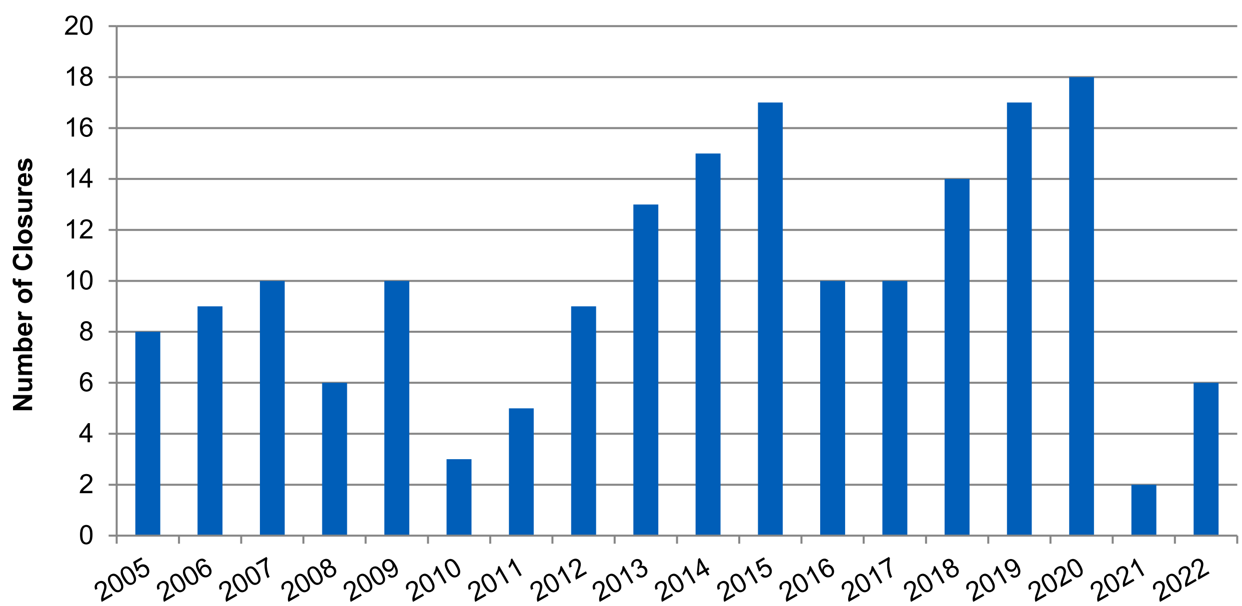
Figure 39. Median distance people in the service area of a rural hospital that offered a selected healthcare service traveled to receive the service after the hospital closed, 2012 and 2018



Source: Rural Hospital Closures: Affected Residents Had Reduced Access to Healthcare Services. GAO-21-93. Washington, DC: U.S. Government Accountability Office; December 2020. https://www.gao.gov/products/gao-21-93.

National data compiled by the North Carolina Rural Health Research Program show that rural hospitals had been closing at an accelerating pace in the years leading up to the first year of the COVID-19 PHE, but fewer hospital closures occurred in 2021 and 2022 (Figure 40). This finding might be related to financial support provided to rural hospitals in the first year of the PHE.

Figure 40. Number of rural hospital closures across the United States by year, 2005-2022



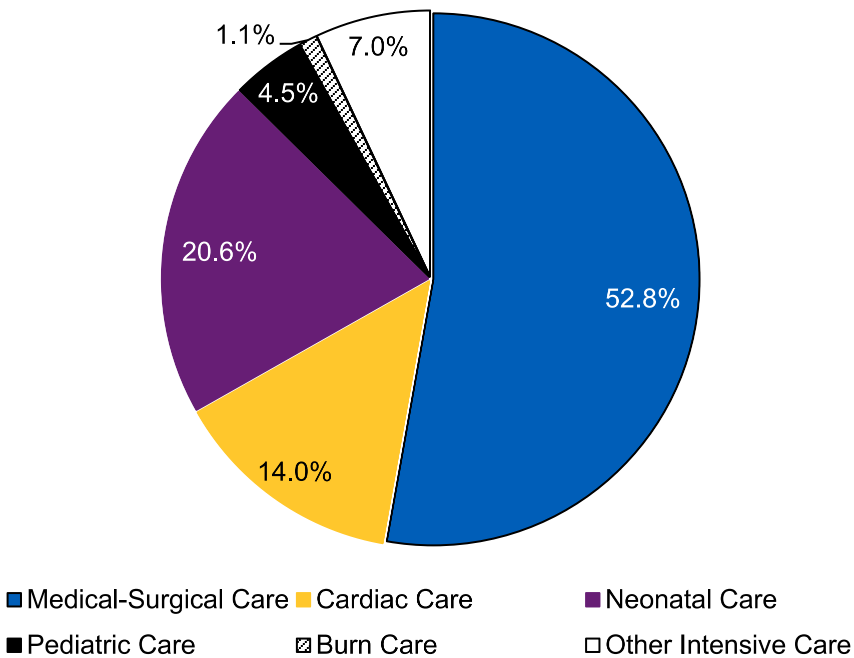
Source: North Carolina Rural Health Research Program. Rural Health Closures, 2005-2022. Accessed at https://www.shepscenter.unc.edu/programs-projects/rural-health/rural-hospital-closures/. on December 7, 2023.

Hospital Bed Capacity

Although hospitals provide a wide range of services, not every hospital provides every service, and not every staffed bed may be appropriate for every need. The AHA notes that 789,354 (85.7%) staffed beds are in community hospitals, and 696,223 (75.6%) beds are in hospitals affiliated with health systems.[44] However, only some support general healthcare activities, while many staffed beds are intended for specialized purposes, such as intensive care, care for children, or labor and delivery (Figure 41).

For example, the AHA estimates that 112,359 (12.2%) of all staffed hospital beds are designated for providing intensive care services. However, the specific types of critical care services they provide vary. While a hospital where the need for medical-surgical intensive care beds has exceeded capacity may realistically reallocate a cardiac intensive care bed to treat an adult with pneumonia-induced respiratory failure, it would be much more challenging to reallocate neonatal intensive care beds for the same purpose.

Figure 41. Types of staffed intensive care beds in community hospitals, 2020



Source: American Hospital Association, Fast Facts on U.S. Hospitals, 2022, updated January 2022. https://www.aha.org/system/files/media/file/2022/01/fast-facts-on-US-hospitals-2022.pdf.

The number and type of hospital beds available in a community, especially in relation to specific needs, may provide a more meaningful way to assess the United States' capacity to anticipate and meet demand for hospital services. During the COVID-19 PHE, the Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network established a system for estimating general medical and intensive care bed capacity at national and state levels. The system allowed estimates to be updated biweekly to provide federal decision makers with timely guidance. Although no longer updated after July 2020, the hospital capacity dashboard (https://www.cdc.gov/nhsn/covid19/report-overview.html) still provides valuable information about the distribution of acute care services in the United States.

Postacute and Long-Term Care

A diverse patchwork of healthcare delivery systems supports people who need help because they have limited ability to self-manage their health. They may face barriers to self-care because of aging; chronic illness; physical, cognitive, or mental disability; or other health-related conditions. In some cases, people may need support for a limited time to successfully recover after an acute illness. In other cases, they may need long-term support for weeks, months, or years.

The Patient Protection and Affordable Care Act uses the term "long-term services and supports" (LTSS) to describe a broad range of paid and unpaid services that support people with limited capacity for self-care.[45] LTSS encompasses paid services delivered in healthcare facilities, paid "home and community-based services" (HCBS), and unpaid services provided by family, friends, or neighbors.

Data for this report come from the *National Post-acute and Long-term Care Study* (NPALS),[46] which gathers data on paid, regulated entities in institutional and HCBS healthcare delivery systems and is an important source of national estimates on postacute services and paid LTSS. As NPALS includes only paid, regulated services, the NHQDR uses "long-term care" when referring to paid services delivered in healthcare facilities, in people's homes, or in community-based settings and "LTSS" to describe both paid and unpaid services. The NHQDR also uses "HCBS" to describe a subset of LTSS that occurs outside of healthcare facilities.

NPALS reports on healthcare delivery systems that provide two types of care: postacute care and long-term care. Although the specific services provided by entities described in NPALS vary and sometimes overlap, they often include one or more of the following:

- *Health maintenance* tasks, such as changing wound dressing or administering medications;
- *Therapeutic* tasks, such as engaging people in rehabilitation exercises;
- Assistance with *activities of daily living* (ADLs), such as eating, dressing, bathing, or toileting; and
- Assistance with *instrumental activities of daily living* (IADLs), such as organizing medications or housekeeping.

Postacute care refers to services that people receive after hospital discharge to help them successfully transition from inpatient care to home. HCUP data indicate that just over one-fifth of hospitalized people were discharged to postacute care in 2013,[47] and an analysis of Medicare data found that 26.3% of beneficiaries were discharged to postacute care in 2015.[48]

Some patients need a period of rehabilitation to fully recover function. Some need help managing a chronic illness so they can transition from hospital to home successfully. Others require months or years of 24-hour nursing care, including ventilator management, after experiencing critical illnesses or complex traumatic injuries. Still others have a terminal illness that requires palliative services.

Over the past two decades, hospitals have increasingly relied on discharging people to postacute care settings to support patients after hospitalization, reduce length of stay, and increase their capacity to admit new patients.[46] When access to postacute care declines, hospitals may struggle to maintain their capacity to treat people.[49]

Medicare pays for postacute care on a time-limited basis as long as people meet specific criteria for receiving services. The most common conditions associated with discharge to postacute care in 2014 were:

1. Total hip/knee joint replacement,
2. Sepsis,
3. Heart failure with shock,
4. Stroke,
5. Simple pneumonia,
6. Renal failure,
7. Kidney and urinary tract infection,
8. Chronic obstructive pulmonary disease,
9. Hip and femur procedure other than major joint procedure, and
10. Cellulitis.[45]

Long-term care refers to a range of services that help people with functional limitations perform daily activities and that provide supervision to avoid unsafe outcomes. In contrast to postacute care services, long-term care typically provides nonmedical support to help people live as independently as possible instead of medical services. Although paid, regulated long-term care entities support younger people with one or more disabilities, most recipients of long-term care are age 65 years and over.

The current capacity of paid long-term care services (Table 5) appears insufficient to meet projected LTSS needs. The Administration on Community Living estimates that 69% of people age 65 years and over will require LTSS for an average of 3 years before they die.[50] It also projects that the need for services will grow with the increased prevalence of disability and an aging population.

Finding a way to pay for long-term care is a growing concern for many people. Of the more than $400 billion spent on long-term care in 2020, 13% was paid for with out-of-pocket spending, 8% by private insurance, 25% by other public and private payers, and 54% by Medicaid.[51]

As Medicare does not cover the cost of long-term care, older adults and other people needing LTSS (e.g., people who become disabled) must often spend retirement funds, mortgage their homes, or use personal savings to afford it. In many cases, people reduce their personal wealth to near or below poverty guidelines to qualify for Medicaid, which does pay for LTSS.[52]

When people needing LTSS lack the financial means to access long-term care, they must instead rely on family, friends, and neighbors to support them. AARP estimates that the number of people who provided unpaid care for an adult in the previous 12 months increased from 39.8 million (16.6% of the adult population) in 2015 to 47.9 million (19.2%) in 2020.

While caregiving can be personally rewarding, many caregivers experience worse physical and mental health and reduced financial prospects because of caregiving. Twenty-three percent of caregivers agreed that caregiving made it difficult to attend to their own health needs, 36% reported feeling some or high emotional stress, 23% felt that caregiving made their health worse, and 45% experienced at least one financial impact (e.g., stopped saving, left bills unpaid/paid them late, borrowed money).[53]

Lack of access to paid long-term care also has broader economic implications for the nation because unpaid caregivers often cannot participate in the workforce, engage in commerce, or accumulate wealth. A substantial portion of caregivers in 2020 were in their prime working years (26% were 18-49 years old; 25% were 50-65 years old), and approximately 1 in 4 (24%) caregivers supported more than one adult. AARP estimates the economic value of unpaid caregiving in 2021 was approximately $600 billion.

NPALS describes seven types of services that provide postacute care, long-term care, or both:

- **Adult day services** are programs that provide care and companionship for adults who need assistance or supervision during the day. They provide people with an alternative to institutionalized care, encourage socialization, and support health. They also provide relief for family members and caregivers, enabling them to work and attend to personal business. Medicare does not pay for adult day services, but Medicaid does in some cases.
- **Home health agencies** provide part-time, intermittent nursing, medical, and social work services in a person's home to help people address medical needs and live as independently as possible. Home health agencies also help them recover from an acute illness or injury, such as after discharge from the hospital. Medicare covers home care if a physician certifies that a person requires part-time care and would have difficulty leaving home to obtain it in an ambulatory setting. Medicaid supports home health services as part of its HCBS program.
- **Residential care communities**, which include assisted living facilities, are community-based housing units that offer support for ADLs, including tasks such as building maintenance and housekeeping, as well as dressing, bathing, cooking, and taking medicines. Residential care communities do not provide 24-hour nursing supervision but are intended to help people with functional limitations live as independently as possible. Medicare does not cover the cost of residential care.
- **Nursing homes** are facilities for people who need inpatient LTSS or rehabilitative services but do not require hospital care. They support ADLs and provide limited healthcare services to people who do not have an acute illness but still need 24/7 support for a condition that prevents them from living at home (e.g., advanced dementia).

  Many nursing homes are dual certified as **skilled nursing facilities** (SNFs), enabling them to provide medical services as well as rehabilitative care. SNFs employ registered nurses, rehabilitation specialists, and medical doctors who often provide limited medical services to people transitioning between hospital care and home. Medicare covers up to 100 days of SNF services per benefit period provided that beneficiaries enter the SNF after a qualifying 3-night hospital admission and require extended services related to the hospital admission. Medicare does not cover long-term care services provided by nursing homes.

The NHQDR uses the CMS Minimum Data Set to report separate quality of care measures for services delivered in the long-term components of nursing homes (reported as "*long-stay* nursing homes," in which people have cumulative days in the facility of 101 days or more) and their skilled nursing facility components (reported as "*short-stay* nursing homes, in which people have cumulative days in the facility of 100 days or less).

- **Inpatient rehabilitation facilities** provide postacute nursing care and inpatient physical, occupational, and speech therapy services to help people recover from an illness, injury, or surgery. They provide both short-term services similar to the postacute care offered by SNFs, as well as long-term services that serve as a bridge between acute hospital care and transition to home. Medicare covers inpatient rehabilitation services. Compared with SNFs, inpatient rehabilitation facilities typically offer more intensive rehabilitation services. They also must meet specific criteria established by Medicare, such as ensuring 60% of patients are treated for one of 13 primary conditions.
- **Long-term care hospitals**, sometimes referred to as long-term acute care hospitals or LTACHs, are certified acute care hospitals that provide extended hospital-level care to people with serious illnesses. People often transfer from an acute care hospital to a long-term care hospital from an intensive care unit because of a continued need for services such as ventilator management or management of complex chronic comorbidities. Many had received prolonged care in an intensive care unit during their acute care hospital admission. Medicare covers long-term care hospital services through the inpatient prospective payment system if patients meet eligibility criteria.
- **Hospice services** are programs that support people and their caregivers at the end of life, by focusing on managing symptoms and offering pain relief instead of seeking to treat or cure a person's illness. Medicare covers hospice services, as do some Medicaid programs.

Table 5 provides data on the number of organizations and employees in each sector.

Table 5. Characteristics of postacute and long-term care facility services in the United States, 2018

Service	Number of Facilities/ Services	Average Maximum Capacity per Facility/Service	Average People per Program	Provides Postacute Care	Provides Long-Term Care	Total Workers*
Adult day services	4,200	68	65 per day		X	24,300
Home health agencies	11,500	Not available	458 per year	X	X	139,200
Residential care communities	31,400	38	32 per day		X	474,200
Nursing homes	15,600	106	85 per day	(X)†	X	660,000
Inpatient rehabilitation facilities	1,200	298	348 per year	X	X	263,000
Long-term care hospitals	400	68	293 per year	X	X	13,600

Service	Number of Facilities/ Services	Average Maximum Capacity per Facility/Service	Average People per Program	Provides Postacute Care	Provides Long-Term Care	Total Workers*
Hospice services	4,700	Not available	356 per year		X	91,300

Source: Centers for Disease Control and Prevention, National Center for Health Statistics, Post-Acute and Long-Term Care Providers and Services Users in the United States, 2017-2018.
* Nursing and social work full-time-equivalent workers.
† Medicare only covers qualifying postacute care services provided by home care agencies and by skilled nursing facilities co-located with nursing homes. Medicare does not cover long-term care services from home care agencies or nursing homes.

Summary

Multiple healthcare delivery systems provide overlapping but distinct services to address the U.S. population's diverse needs. The descriptive statistics in this report provide an outline of health systems' capacity to deliver services, but more work is needed to understand how each system aligns with its counterparts and how they work together as a whole.

Short-term labor trends show that workforce participation in the ambulatory and hospital sectors, which had declined during the COVID-19 PHE, has returned to or exceeded levels reported before the pandemic. But workforce participation in the nursing home sector continues to decline, even as demand from an aging population grows.

Although concerns about shortages of physicians and nurses have received prominent attention, labor data suggest that much of the decrease in workforce participation occurred among people in occupations that require lower levels of educational attainment, many of which are held by women and people in racial and ethnic minority groups.

Longer labor trends signal a shift toward more outpatient healthcare delivery, as employment in the ambulatory sector has grown rapidly, while employment in hospitals and nursing homes has remained flat or decreased.

Data characterizing healthcare delivery settings show that each delivers distinct types of services and that service lines within each setting are often fragmented and unevenly distributed across populations. These findings imply that people, and the providers who guide them, must be able to identify which services they need and where to find services to meet those needs. However, research suggests many people have difficulty navigating the healthcare system.[54]

National Healthcare Expenditures

Where a nation spends its limited resources often reflects its needs and priorities. Two measures from the National Health Expenditure Accounts characterize the nation's healthcare delivery spending. "Personal healthcare expenditures" measures the total amount spent to treat individuals with specific medical conditions. It includes spending for all medical goods and services, such as:

- Hospital care;
- Healthcare professional services;

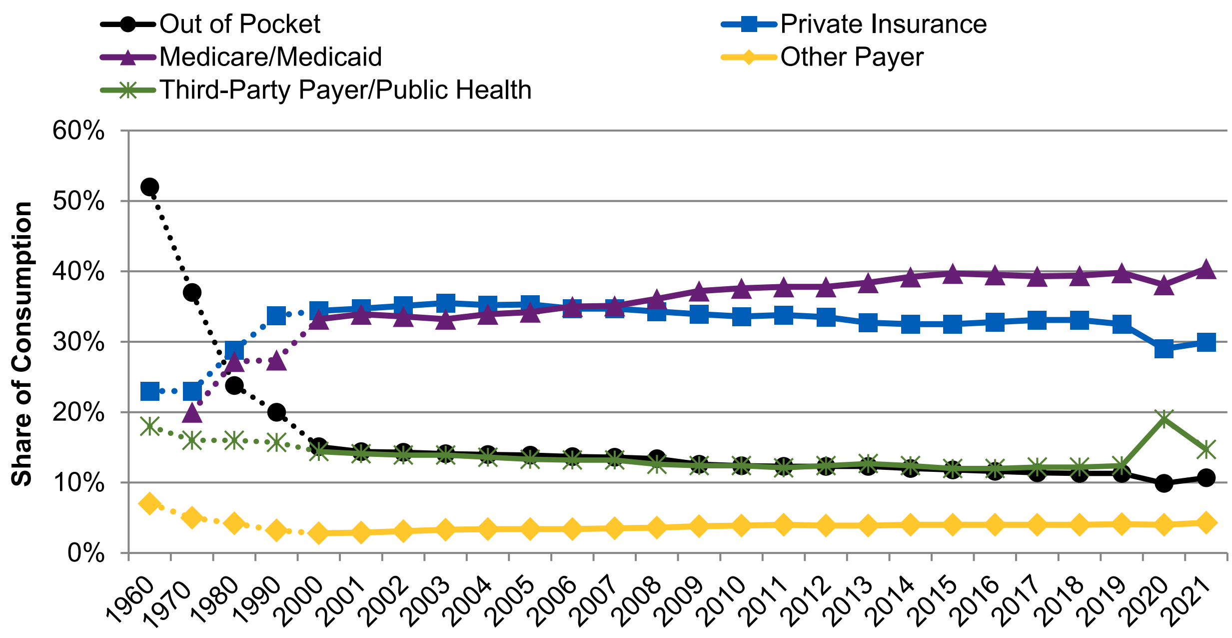
- Home health care;
- Long-term nursing care;
- Continuing care retirement communities;
- Medical products sold in retail outlets; and
- Other health, residential, and personal care services.[55]

"National healthcare consumption" measures the amount the nation spends on healthcare and related activities. It includes all personal healthcare expenditures plus spending for public health activities, government administration of healthcare programs, and, for private insurers, the difference between earnings from premiums and costs or liabilities they incur. It does not include investments in noncommercial medical research or capital spending on structures or equipment.

- **Medicare and Medicaid expenditures now account for a larger share of healthcare consumption than private health insurance expenditures.**

Over the past two decades, Medicare and Medicaid have assumed an increasing share of the nation's healthcare expenditures, accounting for approximately 40% of healthcare consumption in 2021. Over the same period, private health insurance and out-of-pocket spending have decreased (Figure 42). In addition, expenditures for government healthcare programs and public health have declined, except for a significant increase in spending during the COVID-19 PHE in 2020 and 2021.

Figure 42. Contributions of payment sources to national healthcare consumption, 1960-2021

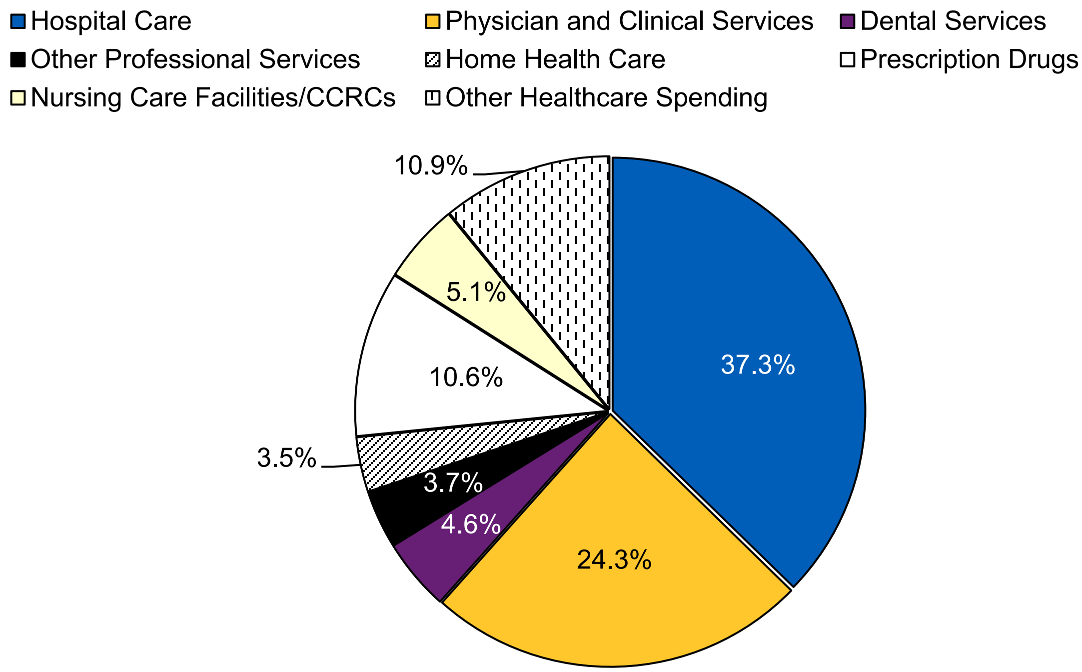


Source: Centers for Medicare & Medicaid Services, National Health Expenditure Accounts (NHEA) by source of funds, CY 1960-2021; and NHEA Table 3. https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical.html.
Note: "Other Payer" includes Children's Health Insurance Program (Titles XIX and XXI) and programs available through the Department of Defense and the Department of Veterans Affairs. "Third-Party Payer/Public Health" may include worksite healthcare, other private venues, Indian Health Service, workers' compensation, general assistance, maternal and child health programs, vocational rehabilitation programs, other federal programs, Substance Abuse and Mental Health Services Administration, other state and local programs, and school health programs.

❖ **Hospital care accounts for nearly 40% of personal healthcare spending, but its share of national spending has decreased as healthcare delivery transitions to nonacute care settings.**

Although relatively few people in the United States require hospitalization, the people who do often need care that is complex, labor intensive, and expensive. Thus, hospital services represent the largest sector of healthcare spending, accounting for 37.3% of the nation's personal healthcare expenditures in 2021 (Figure 43).

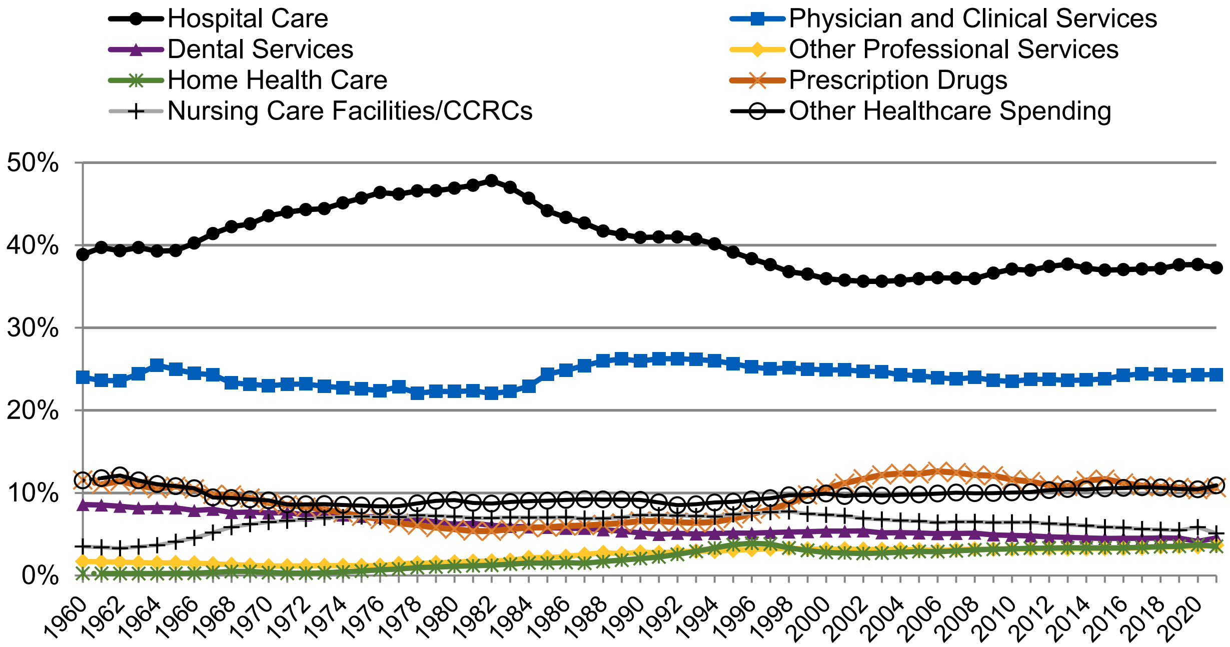
Figure 43. Distribution of personal healthcare expenditures by type of spending, 2021



Key: CCRCs = continuing care retirement communities.
Source: Centers for Medicare & Medicaid Services, National Health Expenditure Accounts, by type of service and source of funds, CY 2021. https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical.html.
Note: Other Professional Services covers services provided in establishments operated by health practitioners other than physicians and dentists. These professional services include those provided by private-duty nurses, chiropractors, podiatrists, optometrists, and physical, occupational, and speech therapists, among others. Other Healthcare Spending refers to other health, residential, and personal care expenses; durable medical equipment; and nondurable medical products.

The healthcare system is transitioning toward an emphasis on ambulatory care, postacute care, and residential care services. Accordingly, hospital care has decreased as a percentage of personal healthcare expenditures from its peak at 48% in 1982, while relative spending for prescription drugs, home care, nonphysician professional services, and durable and nondurable medical equipment has increased (Figure 44).

Figure 44. Personal healthcare expenditures by type of spending, 1960-2021



Key: CCRCs = continuing care retirement communities.
Source: Centers for Medicare & Medicaid Services, National Health Expenditures by type of service and source of funds, CY 1960-2021. https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical.html.
Note: Percentages do not add to 100 due to rounding. Personal healthcare expenditures are outlays for goods and services related directly to patient care. These expenditures are total national health expenditures minus expenditures for investment, health insurance program administration and the net cost of insurance, and public health activities. Other Healthcare Spending refers to durable medical equipment, nondurable medical products, and other health, residential, and personal care expenses.

Summary

The National Healthcare Expenditure Accounts show that publicly sponsored health insurance spending for healthcare services has grown over the past two decades, while coverage by private health insurance has declined as a percentage of overall spending. At the same time, out-of-pocket spending by Americans has also declined.

Notably, data also show a steady decline in public health spending over the 60 years before the COVID-19 PHE, providing context to concerns about the public health system's readiness to address the pandemic or future threats.

Other trends identified in these data include a decrease in hospital spending as a percentage of personal health expenditures. This decrease is accompanied by a proportional increase in spending for prescription drugs, physician and other clinical services, home health care, and other professional services. Other professional services include care delivered by private duty nurses and physical, occupational, and speech therapy.

Together with the growth in ambulatory sector employment reported earlier in this section of the report, these data lend further evidence that healthcare delivery is shifting away from care in centralized acute care settings toward care delivery in diverse ambulatory settings as well as in people's homes.

Geographic Variations in Care

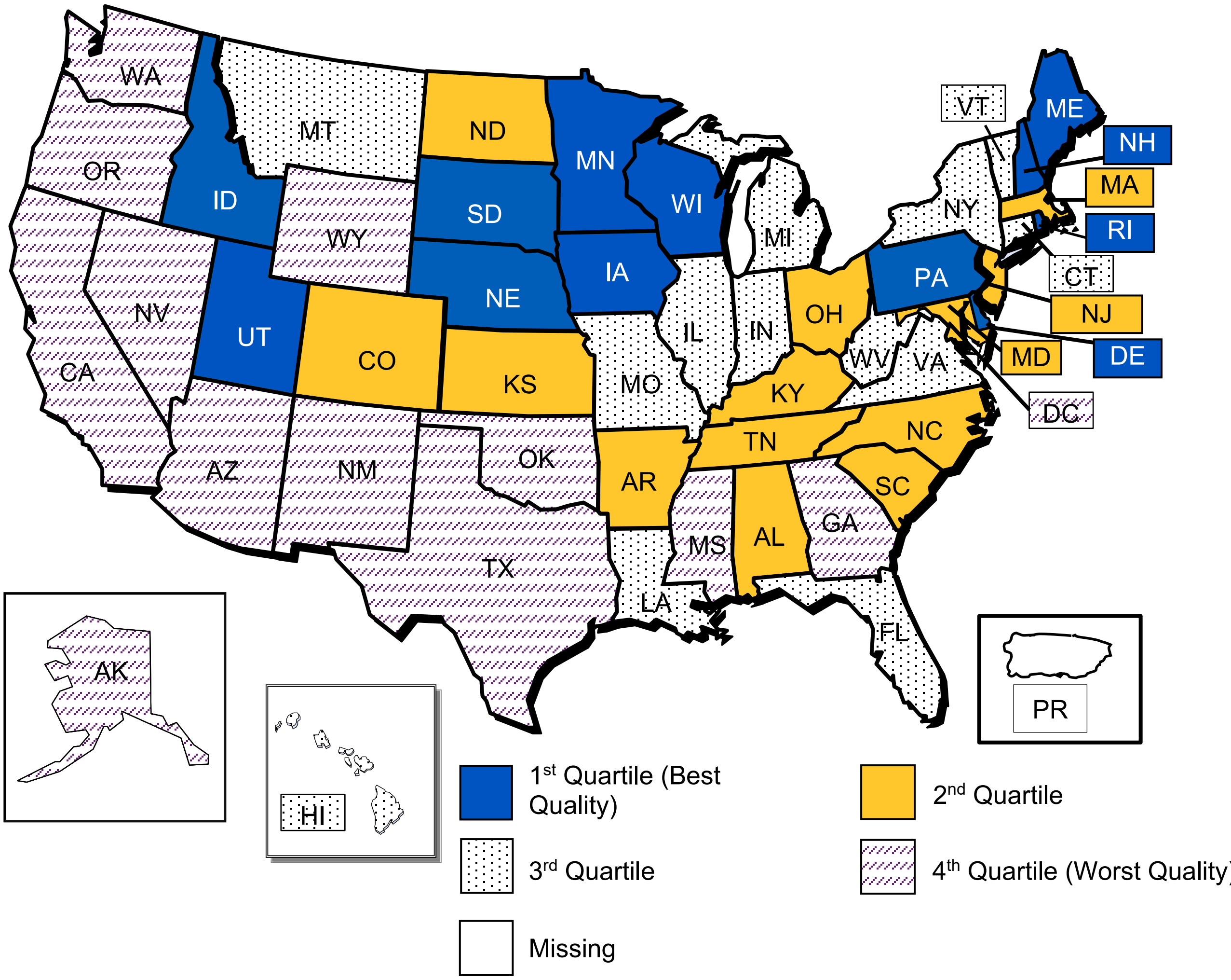
States have been described as "laboratories of democracy"[56]; and data suggest they may also be viewed as laboratories for healthcare policy. State-level data show that healthcare quality and disparities vary widely, depending on state and region. Although a state may perform well in overall quality, the same state may face significant disparities in healthcare access or disparities within specific areas of quality.

State-level analysis included 179 measures for which state data were available. Of these measures, 137 are core measures and 42 are supplemental measures from the National CAHPS Benchmarking Database (NCBD), which provides state data for core measures with Medical Expenditure Panel Survey national data only. The state healthcare quality analysis included all 179 measures, and the state disparities analysis included 110 measures for which state-by-race or state-by-ethnicity data were available.

State-level data are also available for 110 supplemental measures. These data are available from the Data Query tool on the NHQDR website but are not included in data analysis.

- **Quality varied between states, but in some regions nearby states had similar quality scores.**

Figure 45. Overall quality of care, by state, 2016-2021



Note: All state-level measures with data were used to compute an overall quality score for each state based on the number of quality measures above, at, or below the average across all states. States were ranked and quartiles are shown on the map. The states with the worst quality scores are in the fourth quartile, and states with the best quality scores are in the first quartile. Historically, the NHQDR has included state-specific estimates for selected AHRQ Quality Indicators based on Healthcare Cost and Utilization Project data.

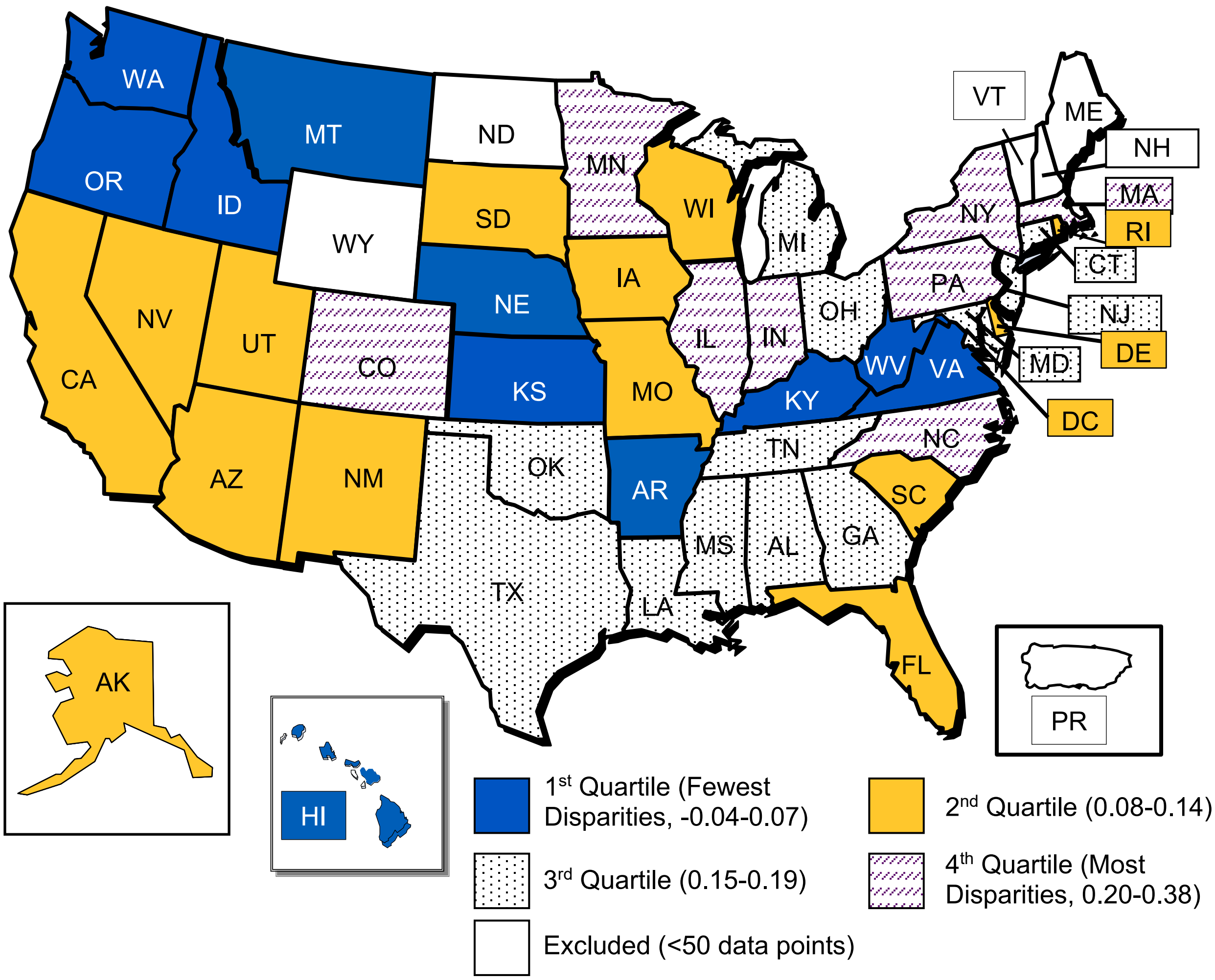
- Overall quality of care varied across the United States (Figure 45):
  - Four states in the Northeast region (Maine, New Hampshire, Pennsylvania, and Rhode Island), five in the Midwest region (Iowa, Minnesota, Nebraska, South Dakota, and Wisconsin), one state in the South region (Delaware), and two states in the West region (Idaho and Utah) had the highest overall quality scores.
  - Eight states in the West region (Alaska, Arizona, California, Nevada, New Mexico, Oregon, Washington, and Wyoming), and five states in the South region (District of Columbia,[xviii] Georgia, Mississippi, Oklahoma, and Texas) had the lowest overall quality scores.

[xviii] For purposes of the NHQDR, the District of Columbia is treated as a state.

The disparities map (Figure 46) shows average differences in quality of care for AI/AN, Asian, Black, Hispanic, NHPI, and multiracial people compared with the reference group, non-Hispanic White or White people. States with fewer than 50 data points are excluded.

❖ **Many factors may account for the variation in disparities between states.**

Figure 46. Average differences in quality of care for American Indian or Alaska Native, Asian, Black, Hispanic, Native Hawaiian/Pacific Islander, and multiracial people compared with non-Hispanic White or White people, by state, 2018-2021



Note: More information about the measures and data sources included in the creation of the quality and disparities maps can be found in Appendix C. Specific information about healthcare quality in each state can be found on the NHQDR Data Tools website, https://datatools.ahrq.gov/nhqdr. All measures in this report that had state-level data to assess racial and ethnic disparities were used. Separate quality scores were computed for AI/AN, Asian, Black, Hispanic, multiracial, NHPI, and White people. For each state, the average of the AI/AN, Asian, Black, Hispanic, multiracial, and NHPI scores was divided by the White score. States were ranked on this ratio, and quartiles are shown on the map. The states with the worst disparity scores are in the fourth quartile, and states with the best disparity scores are in the first quartile. Disparity scores were not risk adjusted for population characteristics in each state, so these findings do not take into account population differences between states. Historically, the NHQDR has included state-specific estimates for selected AHRQ Quality Indicators based on Healthcare Cost and Utilization Project data. States with fewer than 50 data points were excluded. More information is available in Appendix A.

- Racial and ethnic disparities varied across the United States (Figure 46). Factors may include differences in prevalence of chronic conditions, policies that limit behavioral risk factors, and the availability of infrastructure that allows easy access to quality healthcare:
  - Five states in the West region (Hawaii, Idaho, Montana, Oregon, and Washington), four states in the South region (Arkansas, Kentucky, Virginia, and West Virginia), and two states in the Midwest region (Kansas and Nebraska) had the fewest racial and ethnic healthcare disparities overall.
  - Three states in the Northeast region (Massachusetts, New York, and Pennsylvania), three states in the Midwest region (Illinois, Indiana, and Minnesota), one state in the South region (North Carolina), and one state in the West region (Colorado) had the most racial and ethnic healthcare disparities overall.

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Overview of NHQDR Special Emphasis Topics

Each year, the World Health Organization (WHO), U.S. Centers for Disease Control and Prevention (CDC), and other public health authorities receive multiple reports of disease clusters to investigate. On December 31, 2019, the Wuhan Municipal Health Commission informed the WHO China Office of a cluster of cases of severe, often-fatal pneumonia spreading through Wuhan City in the Hubei Province of the People's Republic of China.[1] Little was known about the cases initially, other than that the disease appeared to be severe and that the earliest documented symptoms from this cluster of cases dated to December 1, 2019.[2]

Epidemiologic investigation traced most cases to the Huanan Seafood Wholesale Market, where sellers trade live animals as well as seafood. Health authorities would subsequently confirm that the causative agent was a novel coronavirus, which would later be named the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2).[3] The disease resulting from infection with this virus would be termed coronavirus disease-2019 (COVID-19).[4]

SARS-CoV-2 was one of several novel viruses identified around the world each year.[5] Most do not affect humans, and health authorities initially thought that SARS-CoV-2 was only transmitted from animals to humans. However, evidence for human-to-human transmission among people with symptomatic disease emerged by late January 2020.[6,7,8,9] Soon after, the first human-to-human transmission case from an asymptomatic carrier was documented in Germany.[10]

After more than 118,000 cases in 114 countries and 4,291 deaths, the WHO declared COVID-19 a pandemic on March 11, 2020.[11] COVID-19 would become the seventh and most widespread viral pandemic since the influenza pandemic of 1918.[12]

In response to the spread of COVID-19, the Secretary of Health and Human Services issued a public health emergency (PHE) notice on January 31, 2020.[13] The COVID-19 PHE had an outsized influence on the healthcare delivery system through direct and indirect effects on the organization of healthcare services, as well as on the health and well-being of the public and healthcare workers. The Special Emphasis Topics in this year's NHQDR describe how the healthcare delivery system responded to the COVID-19 PHE and anticipate its ability to respond to other emergencies in the years ahead.

Biologic and Clinical Features of COVID-19

SARS-CoV-2 is an RNA virus with genetic makeup and appearance under electron microscope that places it within the family of coronaviruses. This group includes hundreds of viruses that do not affect humans, as well as the highly pathogenic viruses SARS-CoV and Middle East respiratory syndrome virus (MERS-CoV).[14,15]

SARS-CoV-2 spreads through respiratory droplets transmitted by an infected person when they sneeze, cough, speak, sing, laugh, or breathe and enters the human body by invading epithelial cells in exposed mucous membranes, such as in the respiratory tract. Once infected, people may respond in different ways, ranging from having no symptoms to dying from severe cardiopulmonary complications.

A review of data collected from people with test-confirmed COVID-19 early in the COVID-19 pandemic (before vaccines became available) estimated that approximately 33% of people infected with SARS-CoV-2 never developed symptoms. Those who had symptoms typically exhibited them after an incubation period, which lasted 1-14 days (typically 5 days). During the incubation period, people were often contagious despite not exhibiting symptoms.[16]

After the incubation period, many people only developed mild symptoms, which included fever, fatigue, dry cough, and loss of smell that typically lasted 7-14 days before full recovery. However, a small percentage of infected people would go on to develop severe disease, which manifested as severe shortness of breath, need for supplemental oxygen, or pneumonia requiring hospitalization. An even smaller percentage would develop critical symptoms that required mechanical ventilator support in an intensive care unit. Of 1.3 million U.S. cases reported to CDC through May 2020, 14% were hospitalized, 2% were admitted to an intensive care unit, and 5% died.[17]

In addition to its direct effects on people, COVID-19's transmissibility produced surges in severe cases of COVID-19 that strained hospital capacity and hindered their ability to treat people with other illnesses.

COVID-19 vs. Influenza

COVID-19 has been described as a respiratory disease comparable to influenza. Influenza is a "top 10" cause of overall mortality in the United States, accounting for an estimated 9 million to 41 million illnesses, 140,000 to 710,000 hospitalizations, and 12,000 to 52,000 deaths annually between 2010 and 2020.[18] But it is sometimes perceived as a relatively benign illness, giving a false impression that COVID-19 may also be benign.

In contrast to typical strains of the influenza virus, SARS-CoV-2 exhibited greater potential for inducing a severe inflammatory response that manifested in various ways, including:

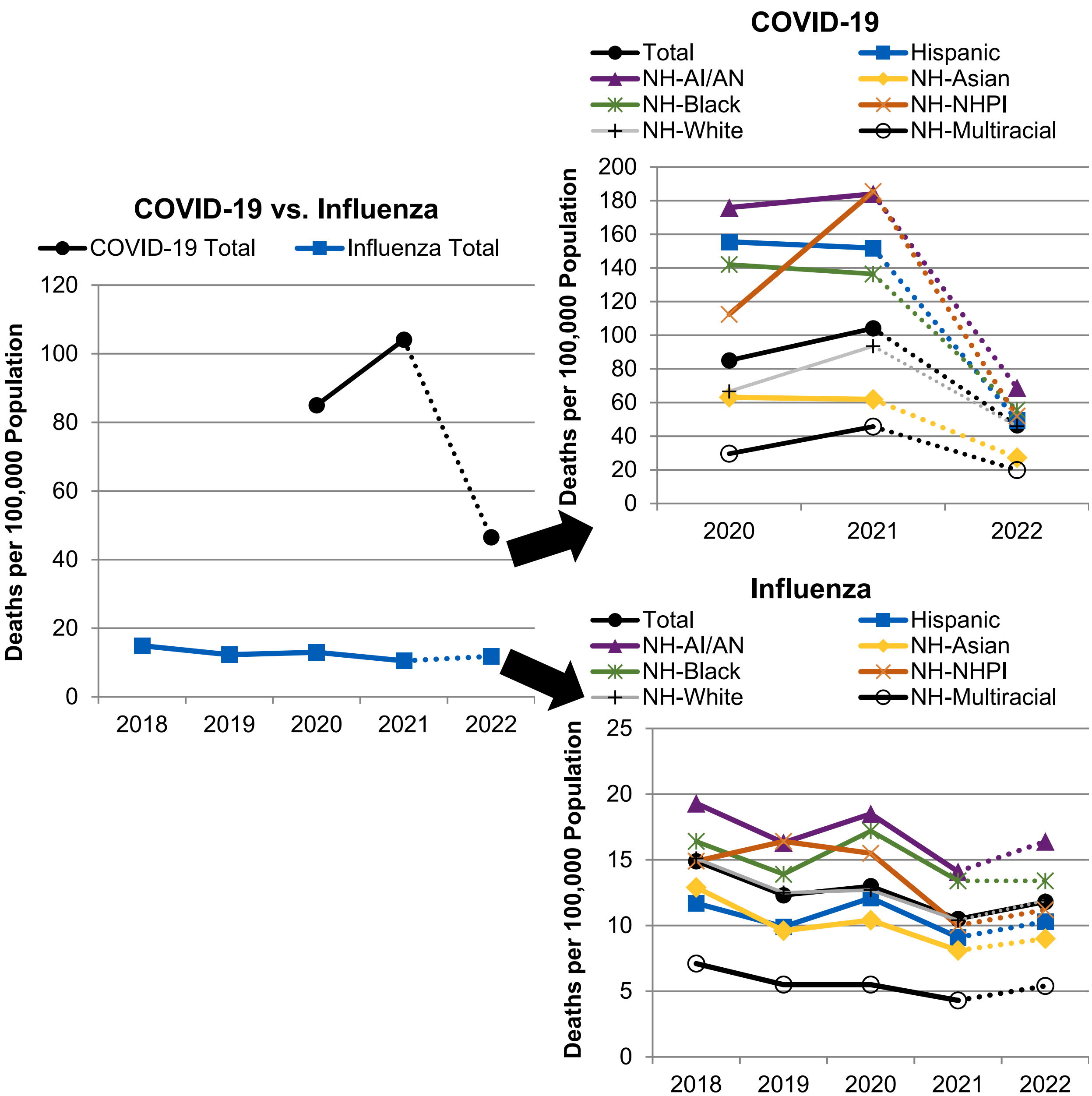
- Acute respiratory distress syndrome, leading to respiratory failure and need for mechanical ventilation to support lung function.
- Heart-related complications, including heart attacks, heart failure, and arrhythmia.
- Blood clotting disorders, which may present as stroke, heart attacks, or need for amputation due to loss of blood supply to the limbs.
- Inflammation of brain and spinal cord tissue, leading to events such as stroke, mental confusion, abnormal sensation, and movement disorders.[19]

In addition, people with severe manifestations of COVID-19 were more likely to need prolonged hospital care, increasing their risk of developing hospital-associated complications, such as:

- Pressure ulcers,
- Ventilator-associated pneumonia,
- Central line-associated bloodstream infections,
- Nutritional deficiencies,
- Cognitive impairment, and
- Physical deconditioning.[20]

The severity of COVID-19 led to more deaths and produced wider racial and ethnic disparities than recent strains of influenza.

Figure 1. Deaths per 100,000 population due to COVID-19 and Influenza (left) for the U.S. population, and due to COVID-19, 2020-2022 (upper right) and influenza, 2018-2022 (lower right), by race/ethnicity



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System - Mortality, 2018-2022. Accessed on CDC WONDER Online Database, released in 2023.
Note: Data for 2022 (shown with dotted lines) are provisional estimates. Vertical scales for upper and lower right panels differ to show disparities among racial and ethnic groups.

- COVID-19 death rates for the overall population were 85.0, 104.1, and 46.5 deaths per 100,000 population in 2020, 2021, and 2022, respectively (Figure 1).
- COVID-19 death rates varied approximately 3.5- to 6-fold among racial/ethnic groups. They were highest among non-Hispanic American Indian or Alaska Native (NH-AI/AN) groups (175.9, 184.0, and 68.8 deaths per 100,000 population in 2020, 2021, and 2022, respectively). Rates were lowest among NH-multiracial groups (29.6, 45.7, and 19.9 deaths per 100,000 population in 2020, 2021, and 2022, respectively).
- Influenza death rates for the overall population were 14.9, 12.3, 13.0, and 10.5 per 100,000 population in 2018, 2019, 2020, and 2021, respectively. The death rate for 2022 was 11.8 per 100,000 population.
- Influenza death rates varied approximately 2.5- to 3.5-fold among racial/ethnic groups. They were highest among NH-AI/AN groups (19.3, 16.3, 18.5, 14.1, and 16.4 deaths per 100,000 population in 2018, 2019, 2020, 2021, and 2022, respectively). Rates were lowest among NH-multiracial groups (7.1, 5.5, 5.5, 4.3, and 5.4 deaths per 100,000 population in 2018, 2019, 2020, 2021, and 2022, respectively).

Post-COVID-19 Conditions

Reports have also linked COVID-19 with symptoms that persist for months beyond the initial SARS-CoV-2 infection, particularly among people infected early in the pandemic. This condition has been termed “Long COVID” by advocacy groups and “Post-COVID-19 condition” (PCC) by CDC and WHO.[21] It encompasses a range of symptoms associated with reduced function, impairment in people’s ability to work, and worsened quality of life.[i]

Estimates of the incidence and prevalence of PCC vary, in part due to varying definitions and timing of surveys. However, the U.S. Household Pulse Survey reported that as many as 35.1% of adults with a history of SARS-CoV-2 infection have experienced symptoms consistent with PCC.[22]

In response to the potential burden of PCC on the population, economic activity, and healthcare delivery systems, Congress allocated funds to the National Institutes of Health to launch a variety of programs related to COVID-19. These programs include:

- RECOVER (Researching COVID to Enhance Recovery), a 4-year initiative to conduct basic and clinical research about this condition; and
- CEAL (Community Engagement Alliance), which continues to convene representatives of communities most affected by COVID-19.

Congress has also allocated funds to the Agency for Healthcare Research and Quality to support nine multidisciplinary Long COVID clinics. These clinics, which often serve rural, minority, and other disadvantaged populations, had developed during the pandemic in response to this novel disease and, in doing so, had become exemplars for treating people affected by PCC.

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[i] Examples include tiredness, malaise after exertion, mental confusion, abnormal sensation, elevated heart rate, difficulty breathing, persistent abdominal discomfort, chronic diarrhea, and chronic muscle and joint pain.

With AHRQ support, the clinics will expand access to treatment for PCC and will provide the nation with applied research, education, and consultative support needed to help other health systems learn how to deliver comprehensive, coordinated, and person-centered PCC services. A more extensive examination of PCC's impact on healthcare delivery is currently beyond the scope of this report.

COVID-19 Variants of Concern

Like influenza and other RNA viruses, SARS-CoV-2 is prone to genetic mutations due to inherent instability in how the virus copies its genetic material. These mutations result in variants with different characteristics than earlier strains and create potential for the virus to resist previously effective treatments or to exhibit increased virulence. Although dozens of variants of SARS-CoV-2 were detected between 2020 and 2023, only a few resulted in meaningful changes that enhanced the virus's virulence or decreased its susceptibility to vaccines or treatments.

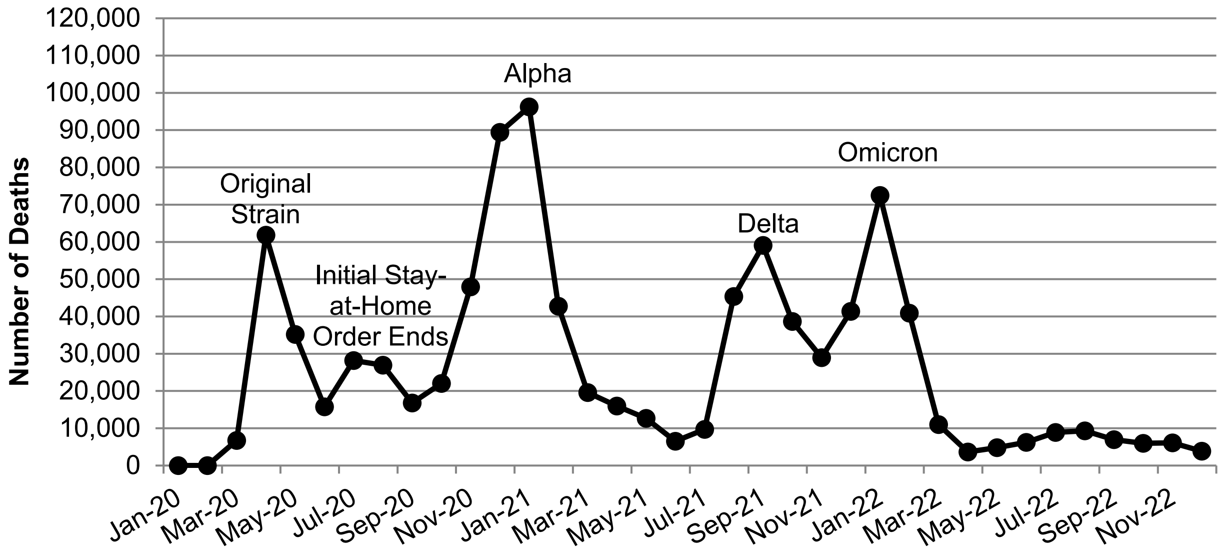
The WHO has described five variants of concern based on epidemiologic evidence of their impact on public health[23]:

- **Alpha (B.1.1.7)** was the first variant of concern. It was first reported in the United Kingdom in late December 2020 and later determined to have been circulating as early as September 2020. Its arrival in the United States resulted in a second major wave of COVID-19 deaths. The Alpha variant was approximately 50% to 75% more transmissible than earlier strains. Studies also associated this variant with more severe disease. For example, a matched cohort study linked infection with the Alpha strain with approximately 60% higher mortality.
- **Beta (B.1.351)** was first reported in South Africa in December 2020 and in the United States at the end of January 2021. Mutations associated with this variant raised concern for increased transmissibility due to immune evasion. (Studies had found that the variant was less susceptible to neutralization antibodies collected from vaccinated or previously infected people). It did not become a globally dominant variant.
- **Gamma (P.1)** was first reported in Brazil in early January 2021 and first detected in the United States in January 2021. As with the Beta variant, studies raised concern for increased transmissibility and antibody evasion with this variant. It also did not become a globally dominant variant.
- **Delta (B.1.617.2**) was first reported in India in December 2020 and first detected in the United States in March 2021. The Delta variant was more transmissible than the Alpha variant and was associated with more severe disease among those infected. However, studies found that COVID-19 vaccines were highly effective in reducing risk for severe disease, hospitalization, and death among those who received the vaccine. The Delta variant was responsible for the third major wave of COVID-19 deaths in the United States.
- **Omicron (B.1.1.529)** was first reported in Botswana in November 2021 and first detected in the United States in December 2021. Studies indicated that this variant was associated with a higher rate of infectivity and transmission than the Delta variant, due in part to mutations that enabled it to evade the immune systems of vaccinated people and previously infected people.

Although the Omicron variant had lower potential to induce severe disease than earlier variants of concern, its high rate of infection cumulatively resulted in excess hospitalizations and deaths. Omicron led to the fourth major wave of COVID-19 in the United States.

Figure 2 shows the number of deaths associated with the original strain of SARS-CoV-2 and the variants associated with additional major waves of COVID-19.

Figure 2. SARS-CoV-2 variants relative to monthly COVID-19 deaths, January 2020-December 2022



Source: Centers for Disease Control and Prevention, COVID Data Tracker, Surveillance Public Use Data, January 2020-December 2022.

National Response to the COVID-19 Public Health Emergency

The healthcare delivery system's response to COVID-19 occurred within the context of federal and state responses to the pandemic starting in 2020, which sought to reduce disease transmission while concurrently expanding the healthcare delivery system's capacity to provide services. In issuing PHE and national emergency declarations in the first quarter of 2020, the federal government gained flexibilities under several statutes to respond to the pandemic, including:

- Public Health Service Act;
- Social Security Act;
- Food, Drug, and Cosmetic Act;
- Public Readiness and Emergency Preparedness (PREP) Act; and
- National Emergencies Act.

The pandemic response coordinated the efforts of multiple departments and agencies intended to address key concerns related to COVID-19, including the strategies noted below. Most of these strategies were implemented in the first months of the PHE and illustrate the uncertainty under which the policies were developed. Although many were sustained until the end of the PHE in May 2023, some were abandoned because they were ineffective, no longer relevant, or lacked funding.

Mitigating SARS-CoV-2 Transmission

- Implementing international entry screening requirements at selected airports.
- Restricting travel from selected countries.
- Requiring nursing homes and hospitals to restrict access to visitors and nonessential personnel (with limited exceptions).
- Issuing national social distancing recommendations, including to temporarily close schools and avoid gatherings of more than 10 people.
- Requiring the wearing of masks by federal employees and contractors and on federal property and public transportation.

Accelerating Development of COVID-19 Tests, Treatments, and Vaccines

- Exercising emergency authority under the Defense Production Act to accelerate production of mechanical ventilators, syringes, glass vials, and other items.
- Exercising authority under the Public Health and Emergency Preparedness Act to issue emergency use authorization for "medical countermeasures" determined to be safe and effective but not yet formally approved.
- Funding the Biomedical Advanced Research and Development Authority (BARDA) and National Institutes of Health to research and develop diagnostics, therapeutics, and vaccines for COVID-19.
- Prepurchasing vaccines.

Expanding Health Insurance Coverage To Respond to COVID-19

- Requiring coverage for tests, test-related services, vaccines, and antiviral treatment without cost sharing, prior authorization, or other cost management requirements.
- Increasing federal match rates for Medicaid if states continuously enrolled beneficiaries, did not restrict eligibility requirements, did not increase premiums, and covered COVID-19-related services.

Expanding Healthcare System Capacity To Respond to COVID-19

- Modifying Medicare payment requirements to enable nonphysicians, such as nurse practitioners, physician assistants, physical therapists, and pharmacists, to provide and bill for a wider range of services than previously allowed.
- Modifying Medicare supervision requirements, enabling certain trainees and auxiliary personnel to deliver a wider range of services without physician supervision.
- Modifying Medicare payment requirements to cover acute care services delivered in a wider range of settings, such as delivering outpatient infusion services in a beneficiary's home.
- Expanding the range of telehealth services covered by Medicare.
- Expanding the range of healthcare practitioners who could provide telehealth services, such as physical therapists, occupational therapists, dietitians, and behavioral health counselors.
- Expanding the range of healthcare settings that could provide telehealth services.
- Allowing clinicians to provide telehealth services across state lines.
- Allowing clinicians to prescribe Schedule III-V nonnarcotic controlled substances via telemedicine.

- Allowing qualified practitioners to prescribe buprenorphine to people with opioid use disorder via telemedicine.
- Waiving penalties related to certain Health Insurance Portability and Accountability Act privacy and security rules, thereby allowing providers to use a wider range of technologies to provide telehealthcare services..
- Providing liability immunity to providers who administer critical services; for example, to enable pharmacists to administer vaccines to children.
- Suspending nonemergency survey inspections and certain administrative documentation and quality reporting requirements.
- Allowing state governments to obtain waivers from certain Medicare, Medicaid, and Children's Health Insurance Program requirements to respond more effectively to the pandemic, such as allowing critical access hospitals to admit more than the statutorily mandated limit of 25 patients to respond to surges in demand for hospital care.

Mitigating Socioeconomic Impact of COVID-19

- Distributing loans to support financially distressed businesses using disaster relief funds.
- Providing federal financial relief to states to support state unemployment insurance programs.
- Deferring payroll tax withholding, deposit, and payments without penalty.
- Temporarily waiving interest on federally held student loans and allowing borrowers to suspend student loan repayments without penalty.
- Issuing a moratorium on residential evictions and foreclosures.
- Allowing borrowers with federally guaranteed home loans to suspend mortgage payments if they lost income during the COVID-19 PHE.

In addition to the executive branch actions, Congress enacted six major bills relevant to the COVID-19 PHE, providing additional flexibilities and approximately $5.3 trillion to support the nation's COVID-19 response. The first four were enacted in March and April of 2020:

1. Coronavirus Preparedness and Response Supplemental Appropriations Act, enacted March 6, 2020;
2. Families First Coronavirus Response Act, enacted March 18, 2020;
3. Coronavirus Aid Relief and Economic Security (CARES) Act, enacted March 27, 2020; and
4. Paycheck Protection Program and Health Care Enhancement Act, enacted April 24, 2020.

Subsequently, Congress enacted the Consolidated Appropriations Act of 2021 on December 27, 2020; and the American Rescue Plan Act on March 11, 2021.

Details about these legislative actions are beyond the scope of this report. Collectively, they directed the healthcare delivery system's response to COVID-19 in important ways, including:

- Funding the development of COVID-19 tests, vaccines, and treatments.
- Funding public health services to disseminate and administer COVID-19 tests and vaccines and funding direct investments in public health infrastructure, such as community health centers and community health workers.
- Funding global health programs related to COVID-19.

- Modifying Medicare requirements to remove certain face-to-face encounter requirements and allow provision of telehealth services regardless of beneficiary location.
- Providing financial support to hospitals and healthcare provider practices.
- Providing financial relief to companies in economically distressed sectors.
- Providing people with a temporary basic income in the form of direct payments to taxpayers.
- Extending unemployment benefits.
- Funding and facilitating increased access to food assistance programs, including school breakfast and lunch programs and the Supplemental Nutrition Assistance Program.
- Expanding access to sick leave and family medical leave for certain employees and providing tax credits to fund program changes.

Taken together, these policy and legislative events produced a time-limited environment in which more people had access to national health insurance and social safety net services. In addition, national standards for certain services, such as those related to telehealthcare, superseded state requirements.

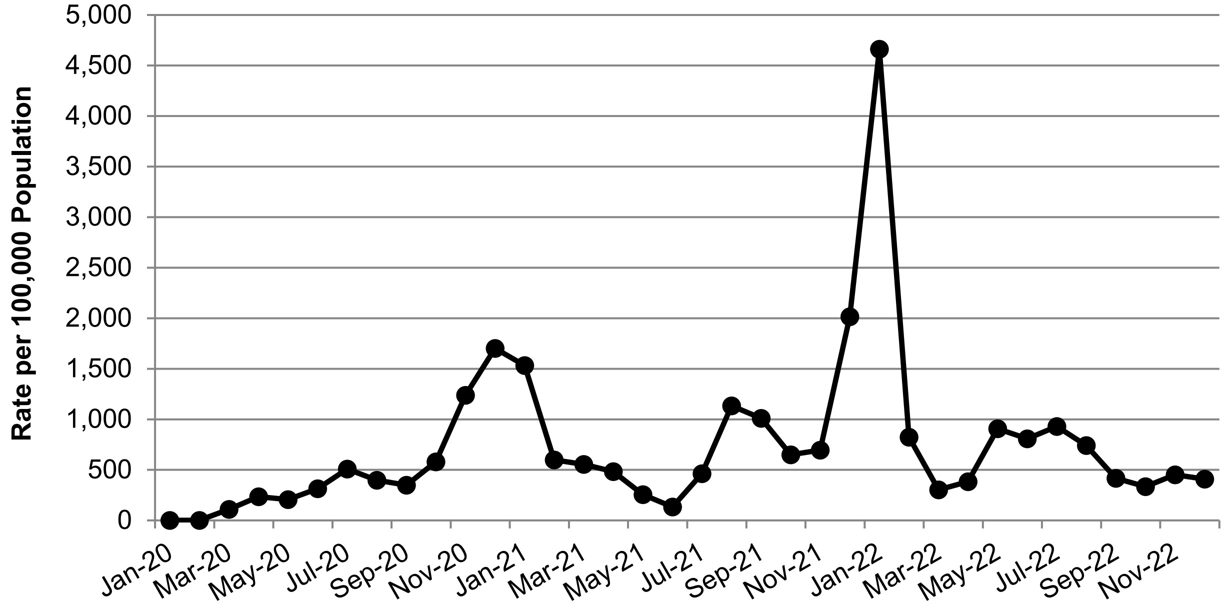
Tracking COVID-19: National Measures of COVID-19 Activity

One advance that resulted from the COVID-19 PHE was the popularization of data visualizations that informed people about national and local disease activity. COVID-19 dashboards published on federal websites and in lay media often reported four surveillance indicators: case rate, hospitalization rate, death count, and case-mortality rate.

The **case rate** reports the number of people per 100,000 population with epidemiologic links to people with laboratory-confirmed COVID-19 and documented signs and symptoms of COVID-19 infection or with laboratory-confirmed COVID-19 infection. As a measure of COVID-19 activity, the monthly case rate describes how extensively and how quickly SARS-CoV-2 spread in the United States at different points in time.

A lag may occur between the time a person becomes ill with COVID-19 and the time their case is reported. In addition, the case rate depends on people feeling symptomatic enough to seek testing and having access to testing facilities that also report results to data sources. Therefore, case rates may not show the precise time when the number of people infected changed and are likely to underestimate the actual number of cases at a particular time. For example, Figure 3 shows low case rates in March through May 2020, even though the initial surge of cases peaked in these months, because the United States lacked capacity to conduct national surveillance testing then.

Figure 3. Monthly COVID-19 case rate per 100,000 population, January 2020-December 2022

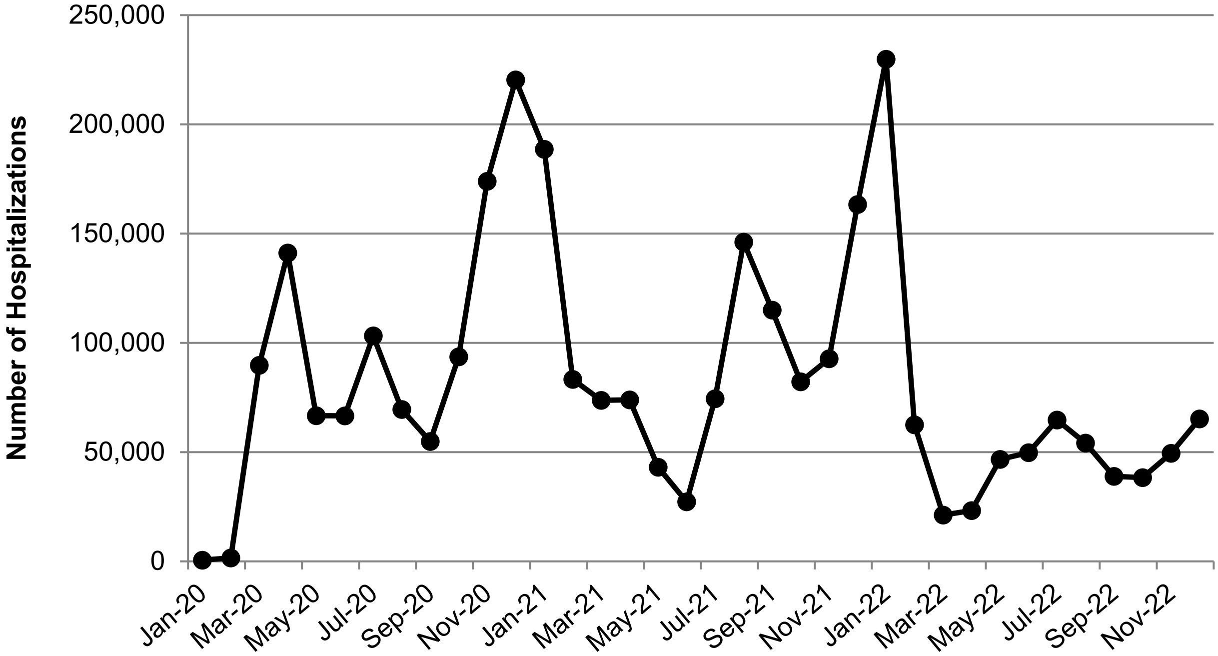


Source: Centers for Disease Control and Prevention, COVID-19 Response, COVID-19 Case Surveillance Public Use Data With Geography (version date: June 2, 2023).

- Monthly COVID-19 case rates increased at six points between January 2020 and December 2022. Cases peaked in:
  - July 2020 (508 per 100,000 population),
  - December 2020 (1,702 per 100,000 population),
  - August 2021 (1,133 per 100,000 population),
  - January 2022 (4,662 per 100,000 population),
  - May 2022 (907 per 100,000 population), and
  - July 2022 (929 per 100,000 population) (Figure 3).
- Low case rates reported in early 2020 likely represent artifacts resulting from limited testing capacity during the early months of the COVID-19 pandemic.

The **hospitalization rate** reports the number of people hospitalized with the principal diagnosis of COVID-19 per 100,000 population. This measure assesses the impact of COVID-19 on healthcare utilization at different times during the PHE. When the COVID-19 hospitalization rate was high, demand for services may have exceeded emergency departments' and hospitals' capacity and crowded out their ability to provide care for people with non-COVID-19 conditions.

Figure 4. Monthly COVID-19 hospitalizations, January 2020-December 2022

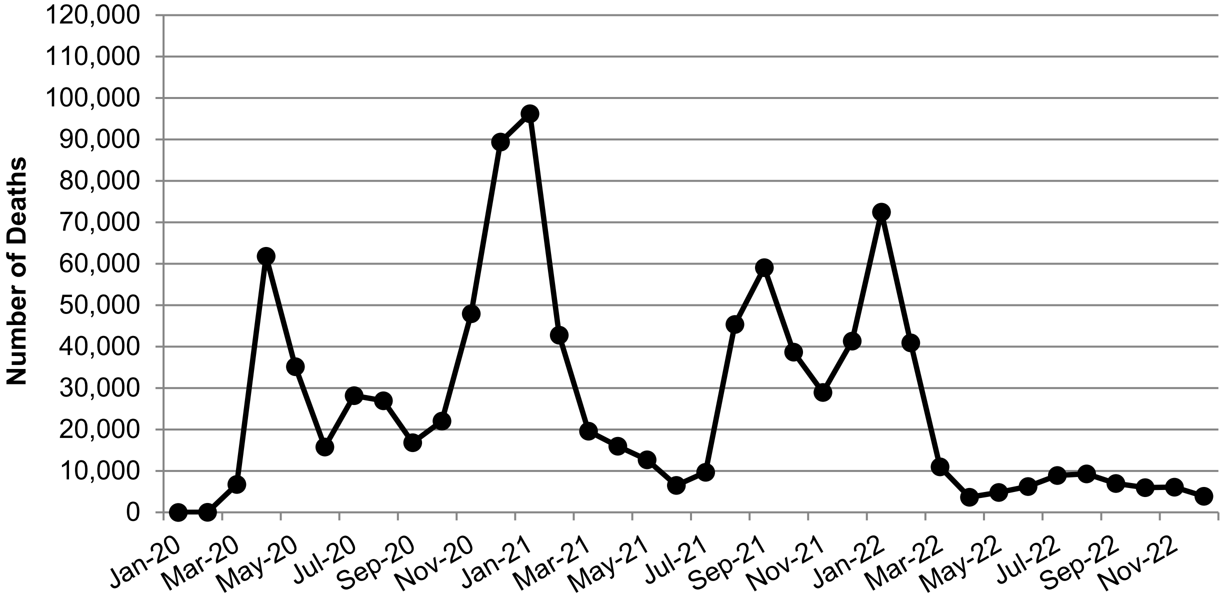


Source: Centers for Disease Control and Prevention, COVID-19 Response, COVID-19 Case Surveillance Public Use Data With Geography (version date: June 2, 2023).

- Monthly COVID-19 hospitalization counts increased at seven points between January 2020 and December 2022. Peaks in COVID-19 hospitalizations were reported for the months of:
  - April 2020 (141,165 admissions),
  - July 2020 (103,192 admissions),
  - December 2020 (220,360 admissions),
  - August 2021 (146,146 admissions),
  - January 2022 (229,865 admission),
  - July 2022 (64,725 admissions), and
  - December 2022 (65,211 admissions) (Figure 4).

The **death count** reports the number of people who died with COVID-19 within a given time. This measure assesses COVID-19's impact on the population at different times during the PHE. Population death rates may change in response to many conditions other than severity of the disease. For example, COVID-19 death rates may have increased during surge periods because critical supplies were unavailable or because the need for healthcare services overwhelmed the capacity of healthcare delivery organizations to provide them.

Figure 5. Monthly COVID-19 deaths, January 2020-December 2022

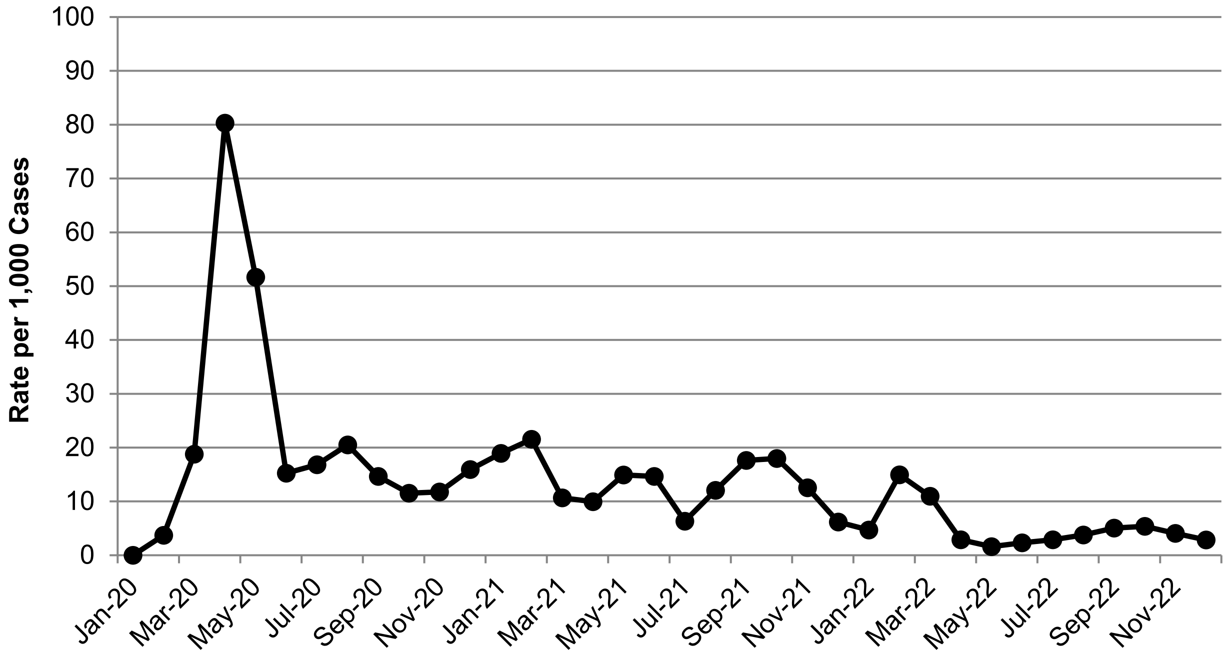


Source: Centers for Disease Control and Prevention, COVID-19 Response, COVID-19 Case Surveillance Public Use Data With Geography (version date: June 2, 2023).

- Monthly COVID-19 death counts increased six times between January 2020 and December 2022. Deaths peaked in:
  - April 2020 (61,824 deaths),
  - July 2020 (28,174 deaths),
  - January 2021 (96,235 deaths),
  - September 2021 (59,084 deaths),
  - January 2022 (72,483 deaths), and
  - August 2022 (9,310 deaths) (Figure 5).

The **case-mortality rate** (also called case-fatality rate and death per case) reports the number of people who died out of only those people with confirmed COVID-19 infections. As a measure of COVID-19 activity, it provides a useful complement to simple COVID-19 death rates. The case-mortality rate can be used to distinguish between changes in death rates resulting from changes in the number of people infected and changes in the severity of COVID-19 infections or the quality of treatment infected people received.

Figure 6. Monthly COVID-19 deaths per 1,000 cases, January 2020-December 2022



Source: Centers for Disease Control and Prevention, COVID-19 Response, COVID-19 Case Surveillance Public Use Data With Geography (version date: June 2, 2023).

- Deaths per 1,000 cases decreased gradually after SARS-COV-2's initial appearance in the United States. The case-mortality rate peaked at 80 deaths per 1,000 cases in April 2020, followed by lower peaks in the case-mortality rate of:
  - 21 deaths per 1,000 cases in August 2020,
  - 22 deaths per 1,000 cases in February 2021,
  - 15 deaths per 1,000 cases in May and June 2021,
  - 18 deaths per 1,000 cases in September and October 2021, and
  - 15 deaths per 1,000 cases in February 2022 (Figure 6).
- As of December 2022, the COVID-19 case-mortality rate was 3 per 1,000 cases.

NHQDR Special Emphasis Topics

In the next five sections, the NHQDR will examine healthcare delivery during the COVID-19 PHE from five perspectives:

1. Impact of COVID-19 on U.S. population.
2. Impact of COVID-19 on hospitals.
3. Impact of COVID-19 on ambulatory care.
4. Impact of COVID-19 on nursing homes.
5. Impact of COVID-19 on telehealthcare.

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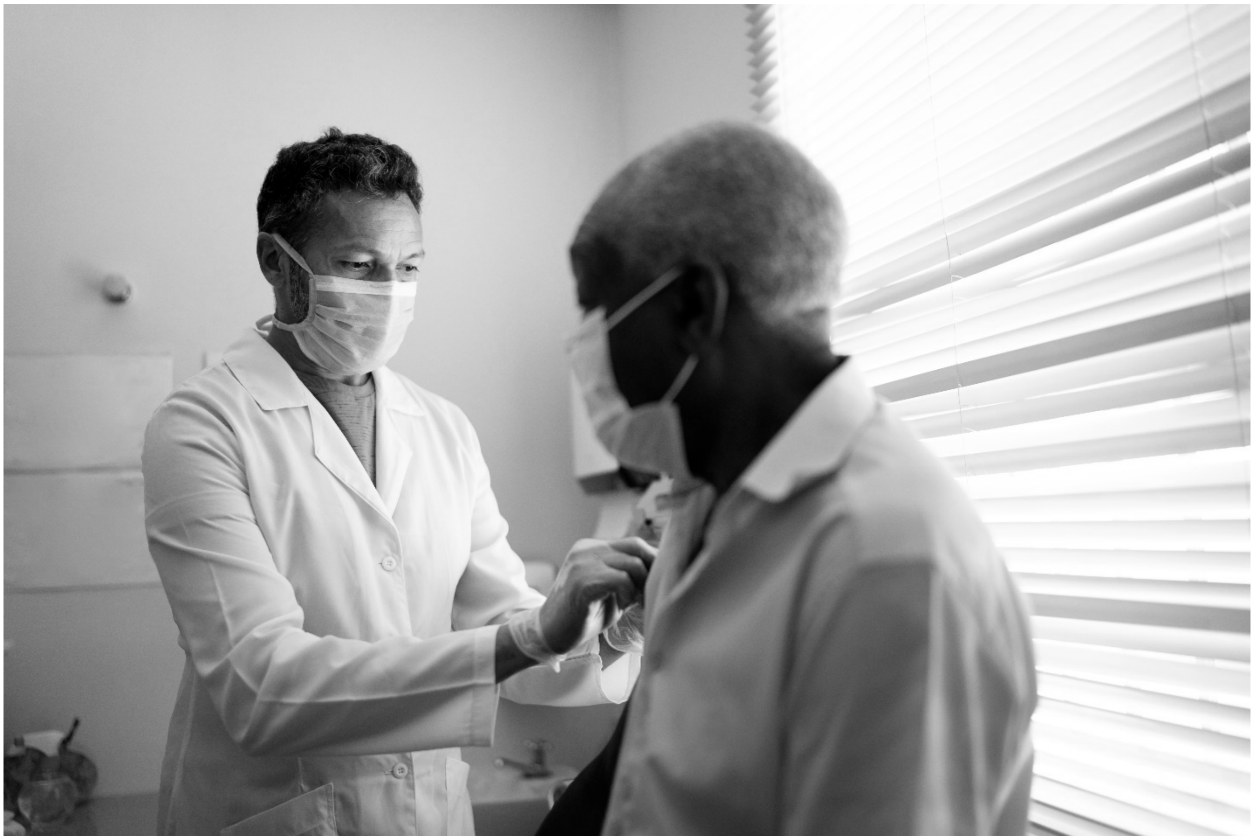


Impact of COVID-19 on Population Health, 2020-2022

Americans experienced COVID-19 in starkly different ways across regions and communities. The virus initially appeared in densely populated coastal cities, such as New York, Seattle, and Los Angeles, where high population density and close living arrangements facilitated its rapid spread through communities. The sudden surge in cases strained healthcare systems, states, and communities and generated visibly alarming images.

As the pandemic progressed, its spread to suburban, rural, and remote communities became less visible and manifested in different ways, even as COVID-19 deaths grew. In less densely populated communities, the virus often spread more slowly but had higher case-fatality rates, due in part to limited healthcare infrastructure. Thus, paradoxically, people living in these areas were often physically separated from the immediate effects of the pandemic and did not always perceive its impact.

Americans' varying experiences during the COVID-19 public health emergency (PHE) may partially explain how different communities held diverging perceptions of the pandemic's toll in the face of varying levels of risk and access to healthcare services. Nationally, however, COVID-19's effect on the population may be viewed as occurring in three overlapping periods between January 2020 and May 2023. During this time, the nation's response appeared to worsen, as deaths increased despite having more knowledge about the virus and greater access to tests, treatments, and, most notably, vaccines.

- **COVID-19 deaths increased during the second year of the public health emergency.**

January 2020 through February 2021. The first period was characterized by the emergence of a contagious, previously unknown pathogenic virus. It began with the Secretary of Health and Human Services announcing the COVID-19 PHE on January 31, 2020, and ended shortly after the Food and Drug Administration issued an emergency use authorization (EUA) for a third effective COVID-19 vaccine on February 27, 2021.

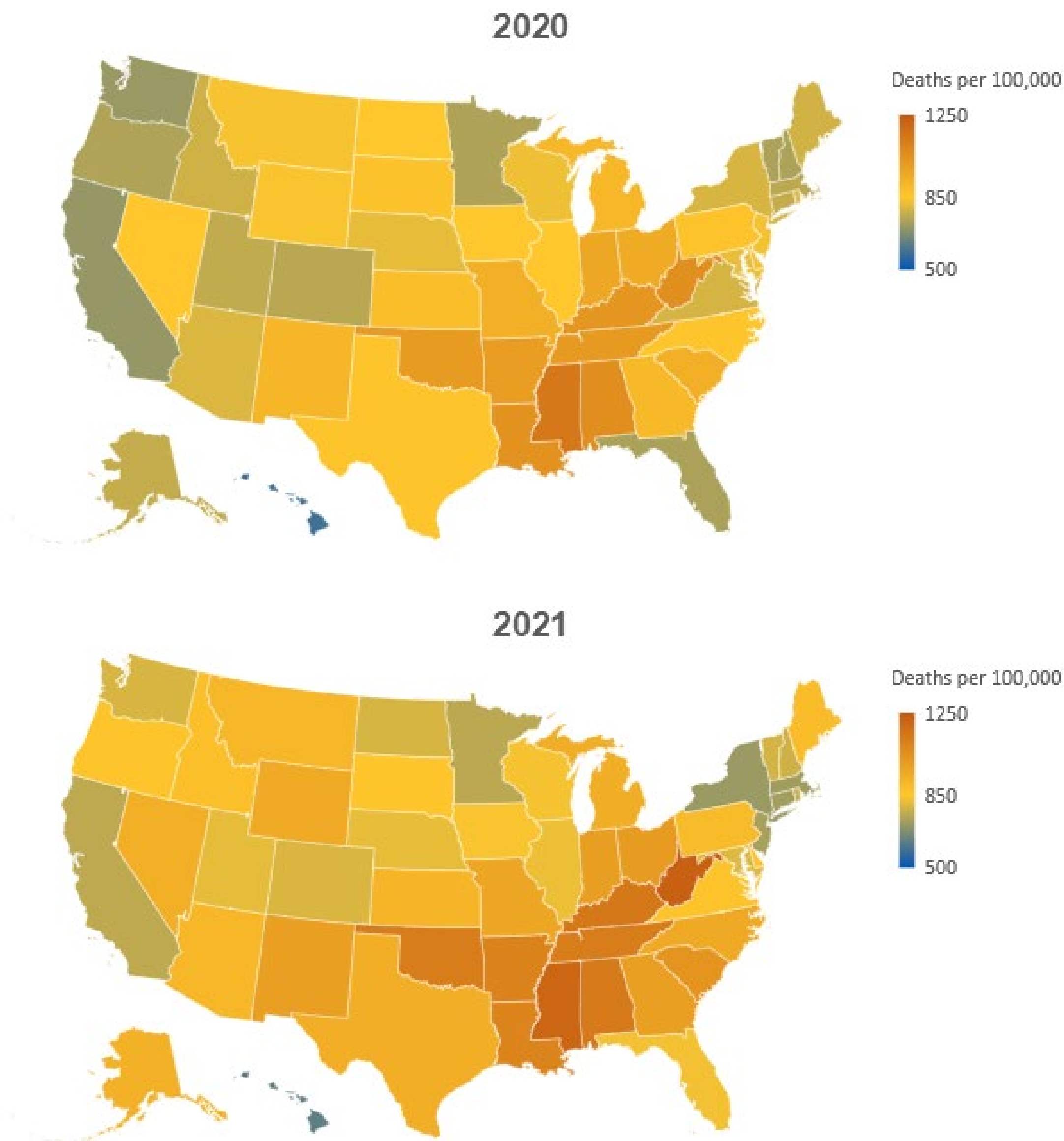
During this time, healthcare delivery systems had less knowledge about the disease, limited capacity to detect the virus that caused it, and few treatment options for people who got it. Global supply chain disruptions across multiple sectors added to the challenges, forcing healthcare delivery systems to contend with shortages of critical resources such as ventilators, disinfectants, and personal protective equipment.

The nation's initial response focused on limiting disease transmission, increasing capacity to treat it, and redirecting many healthcare delivery systems' resources to supporting public health activities. Although the disease continued to spread to previously unaffected regions of the country, the initial response appeared to blunt COVID-19's impact, as national mortality rates decreased in the latter half of 2020.

December 2020 through March 2022. The second period was characterized by the emergence of successive "variants of concern." It began with detection of the Alpha variant in Colorado on December 29, 2020, and continued through the tapering of a surge in COVID-19 associated with the Omicron variant in March 2022. The variants of concern were more transmissible than the original SARS-CoV-2 strain. But by the beginning of this period, knowledge about the disease and testing capacity had increased, treatments had improved, and effective vaccines had become available. Thus, the rise in COVID-19 mortality rates that occurred in 37 states in 2021 (Figure 1) may have been avoidable.

March 2022-May 2023. The third period began with the waning of the Omicron surge and ended with the lapse of the COVID-19 PHE declaration on May 11, 2023, when the nation left the emergency phase of the pandemic. This special emphasis topic does not cover this phase because data from this period are emerging or not yet available.

Figure 1. COVID-19 deaths per 100,000 population, 2020 (top) and 2021 (bottom)



Source: Centers for Disease Control and Prevention, National Center for Health Statistics. National Vital Statistics System, Mortality, 2020 and 2021. Accessed on CDC WONDER Online Database, released in 2023.

- In 2020, the median state-level mortality rate due to COVID-19 was 842 deaths per 100,000 population, ranging between 588 deaths per 100,000 population (Hawaii) and 1,139 deaths per 100,000 population (Mississippi) (Figure 1).
- In 2021, the median state-level mortality rate due to COVID-19 was 881 deaths per 100,000 population, ranging between 630 deaths per 100,000 population (Hawaii) and 1,229 deaths per 100,000 population (West Virginia).
- Ten States had lower COVID-19 mortality rates in 2021 than in 2020. Six began with 2020 COVID-19 death rates that were lower than the median:

  - Connecticut (decrease from 769.1 to 725.1 deaths per 100,000 population),
  - Maryland (decrease from 820.5 to 805.5 deaths per 100,000 population).
  - Massachusetts (decrease from 756.7 to 721.4 deaths per 100,000 population),
  - New Jersey (decrease from 834.4 to 731.1 deaths per 100,000 population),
  - New York (decrease from 797.1 to 713.1 deaths per 100,000 population), and
  - Rhode Island (decrease from 806.6 to 781.3 deaths per 100,000 population).

  The other four states were:

  - Illinois (decrease from 850.7 to 825.3 deaths per 100,000 population),
  - Iowa (decrease from 848.6 to 841.8 deaths per 100,000 population),
  - North Dakota (decrease from 848.8 to 794.2 deaths per 100,000 population), and
  - South Dakota (decrease from 868.1 to 858.9 deaths per 100,000 population).

Factors Contributing to COVID-19 Mortality

The two primary risks that determined overall COVID-19 mortality rates were:

1. The risk of becoming infected.
2. The risk of dying when infected.

Factors that influenced whether a person became infected included:

- The transmissibility of the virus and its variants.
- A weakened immune system, such as from cancer, previous organ transplantation, and chronic diseases, such as obesity and diabetes.
- Living conditions that increased risk for exposure to infected people, such as crowded multifamily housing and residential long-term care facilities.
- Activities that increased exposure to many people or to people likely to have an active infection, including:

  - Employment in "essential worker" occupations, such as serving food in restaurants; processing food in meat-packing facilities; teaching in schools; and providing healthcare services. Essential occupations were deemed necessary to maintain societal and economic activity, although states varied in terms of which occupations were included in this definition. Essential occupations often involved working in crowded conditions or in direct contact with customers, clients, and patients.
  - Participating in social activities, such as concerts or other large social gatherings.

- Lack of appropriate barrier protections, such as masks in public settings and personal protective equipment in healthcare delivery settings.
- Lack of receipt of the COVID-19 vaccine or its boosters.

Factors that influenced whether a person died from COVID-19 when infected included:

- The lethality of the virus and its variants.
- A weakened immune system, such as from cancer, previous organ transplantation, and chronic diseases, such as obesity and diabetes.
- Lack of COVID-19 vaccination.
- Lack of access to appropriate healthcare resources to support vital functions, such as oxygen, ventilators, and other intensive care services.
- Lack of access to treatments specific to COVID-19, such as monoclonal antibodies and antiviral medications.

Healthcare delivery systems played important roles responding to both risks.

- ❖ **Responding to COVID-19 depended on both the public health system and healthcare delivery systems.**

Although the COVID-19 pandemic was a PHE, decades of chronic underfunding left the public health system poorly prepared to respond to the scale and urgency of the threat posed by COVID-19. Thus, the nation also relied on healthcare delivery systems, such as hospitals, nursing homes, pharmacies, and medical offices, to perform essential functions, such as surveillance testing, contact tracing, and vaccine distribution. The data that follow reflect the effectiveness of both public health and healthcare delivery systems combined.

COVID-19 Vaccine Use

The nation initially anticipated that several years would be needed to develop a COVID-19 vaccine. Thus, the availability of effective vaccines by December 2020 was a welcome result of Operation Warp Speed (OWS), a public-private partnership to accelerate development, manufacturing, and distribution of vaccines, diagnostic tests, and treatments. This initiative involved the Departments of Health and Human Services and Defense, among others.

OWS ultimately produced four vaccines that received EUA from the Food and Drug Administration.[i] Two were developed with previously untested mRNA technology. This process

[i] The Pfizer-BioNTech mRNA vaccine was developed outside of Operation Warp Speed but received support from the program in the form of a $2 billion advance purchase order. It received EUA on December 11, 2020; it is currently available in the United States as a bivalent vaccine (original strain + Omicron BA.4). The Moderna mRNA vaccine(mRNA-1273) received EUA on December 18, 2020, and is currently available in the United States as a bivalent vaccine. The Janssen/Johnson & Johnson adenoviral vector vaccine (Ad25.COV2.S) received EUA on February 27 2021; the vaccine's EUA has expired, and it is no longer available in the United States. The Novavax adjuvanted recombinant protein vaccine (NVX-CoV2373) received EUA for people age 12 years and over on July 13, 2022.

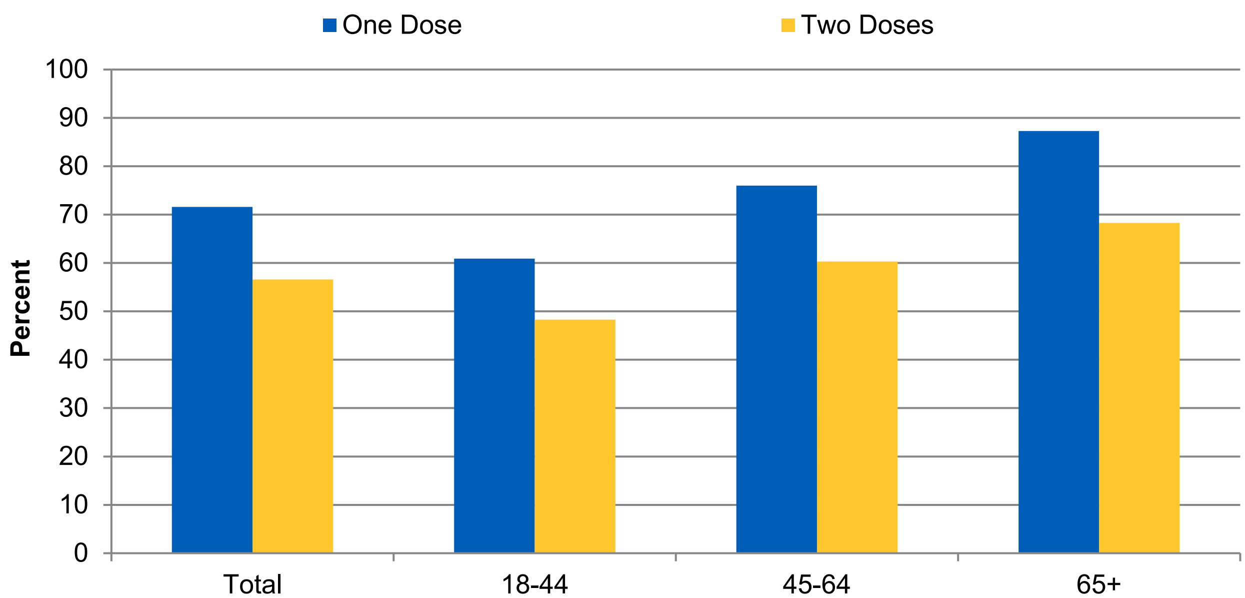
significantly accelerated vaccine development over previously established methods such as using adenovirus vectors or using adjuvanted recombinant proteins to stimulate antibody production.

Efficacy-focused clinical trials reported that the two-dose “primary series” Pfizer-BioNTech (BNT162b2) vaccine was 95% effective in preventing SARS-CoV-2 infection.[1] Other studies reported two-dose Moderna (mRNA-1273) COVID-19 vaccines as 94.1% effective in preventing infection.[2]

In addition to reducing disease transmission, COVID-19 vaccines decreased emergency department visits, hospitalizations, need for intensive care, and deaths associated with the virus.[3,4] A recent analysis by the Commonwealth Fund estimates that the vaccines averted more than 18.5 million hospitalizations and 3.2 million deaths between their EUA in December 2020 and the end of November 2022.[5]

Guidelines initially prioritized healthcare workers, residents of long-term care facilities, people age 65 and over, and people with certain medical conditions to receive the vaccine due to limited supplies in December 2020. But by May 2021, the nation had produced sufficient supplies to vaccinate all eligible adults, encouraging confidence that the United States would achieve the goal of administering at least one COVID-19 vaccine to 70% of the eligible population.[6,7]

Figure 2. Adults who received at least one dose or two doses of the COVID-19 vaccine, total and by age, 2021



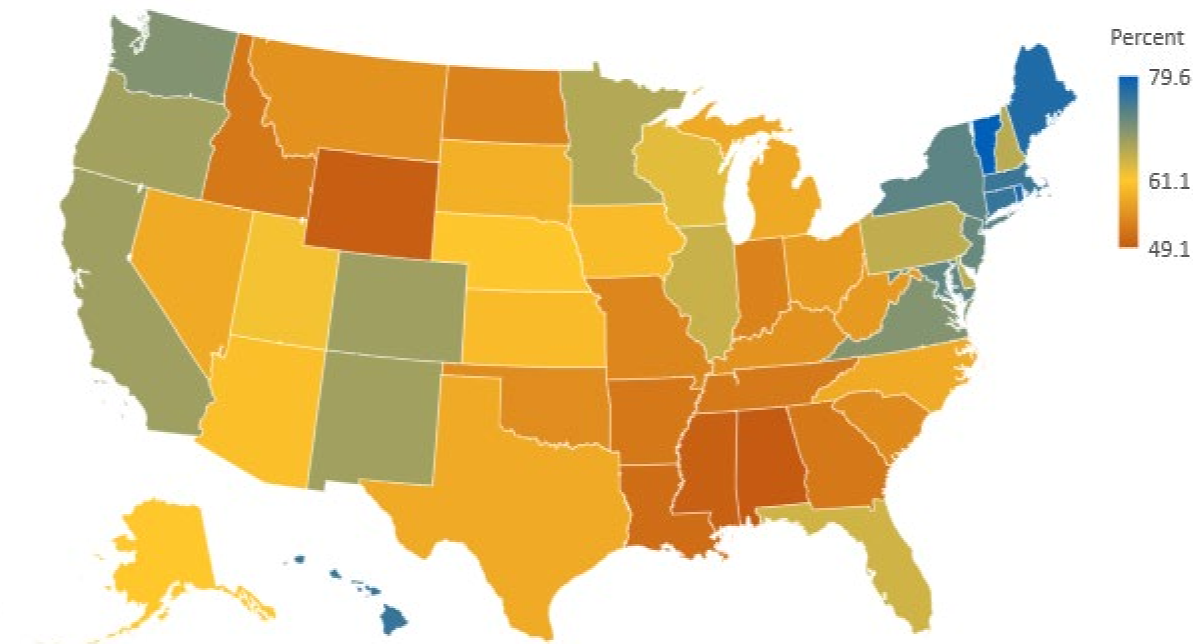
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.

- In 2021, 71.6% of all adults had received one dose of a COVID-19 vaccine, and 56.6% had received two doses (Figure 2).[ii]
- Adults age 65 years and over were more likely to receive two doses of the COVID-19 vaccine than adults ages 45-64 years (68.3% vs. 60.3%) and adults ages 18-44 years (68.3% vs. 48.3%).

Federal efforts to ensure wide distribution and use of the COVID-19 vaccine included funding information campaigns, establishing mass vaccination sites, and requiring health insurance coverage for the vaccine without cost sharing, prior authorization, or other cost management requirements.[iii] Despite these efforts, data show disparities in the percentage of people who received the primary series (i.e., two doses) of COVID-19 vaccines (Figures 3-6).

The data show state-level variation in vaccine use with a median state-level vaccination rate of 61.1%, ranging from 49.1% to 79.6%. Notably, the data show socioeconomic differences in vaccination rates, indicating that universal coverage for the vaccine was, by itself, insufficient to ensure equitable vaccine use.

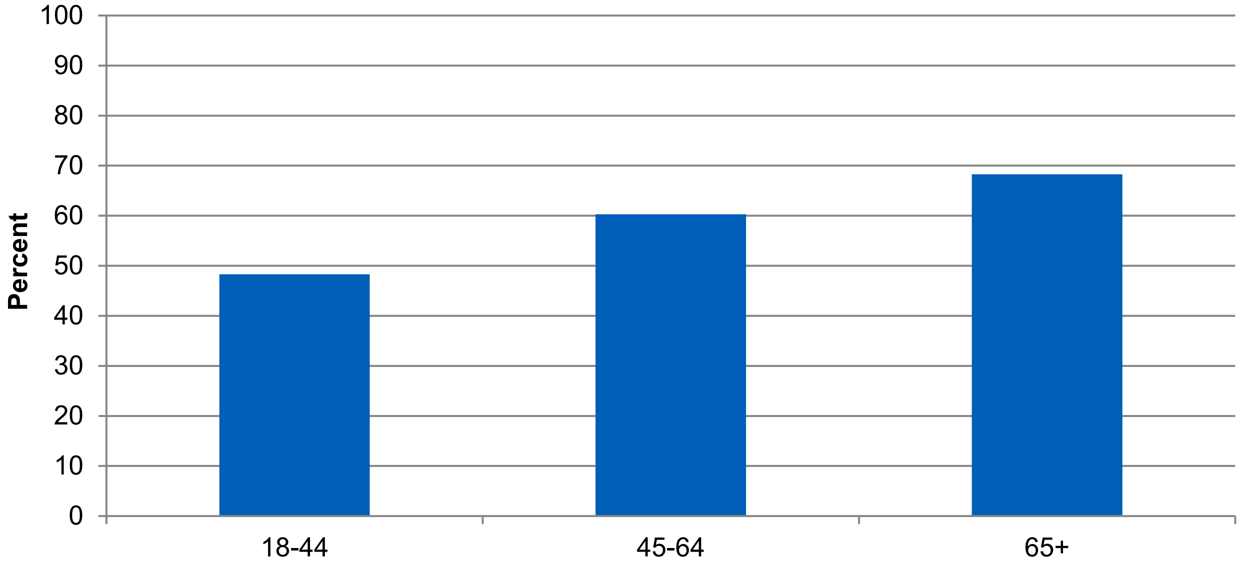
Figure 3. Adults who received two doses of the COVID-19 vaccine, by state, 2021



Source: Centers for Disease Control and Prevention, COVID-19 Data Tracker, COVID-19 Case Surveillance Public Use Data, 2021.

[ii] Unless noted otherwise, data points for trend analyses under each figure only report differences if they are statistically significant (i.e., p value less than 0.1) and show an average annual percentage change greater than 1% per year. For comparison between two populations, data points under each figure only report differences that are statistically significant (i.e., p value less than 0.05) and have a relative difference between the populations of at least 10%, unless noted otherwise. Readers may learn more about NHQDR's reporting methodology in Appendix A at https://www.ahrq.gov/research/findings/nhqrdr/nhqdr23/index.html.
[iii] The Office of the Assistant Secretary of Planning and Evaluation has compiled a list of federal and state-level vaccine outreach efforts: https://aspe.hhs.gov/reports/covid-19-vaccine-outreach.

Figure 4. Adults who received two doses of the COVID-19 vaccine, by age, 2021

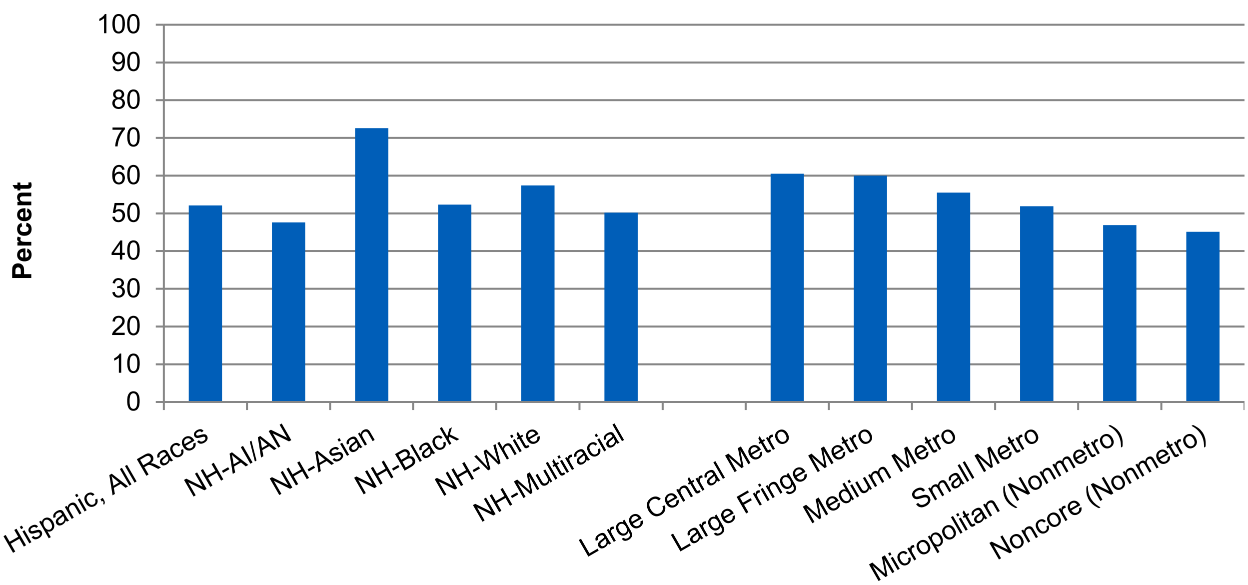


Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.

- In 2021, a higher percentage of adults age 65 years and over (68.3%) completed the primary series COVID-19 vaccine than adults ages 45-64 years (60.3%) or adults ages 18-44 years (48.3%) (Figure 4).

  - **People in nonmetropolitan locations were less likely to get the COVID-19 vaccine.**

Figure 5. Adults who received two doses of the COVID-19 vaccine, by race/ethnicity and location of residence, 2021

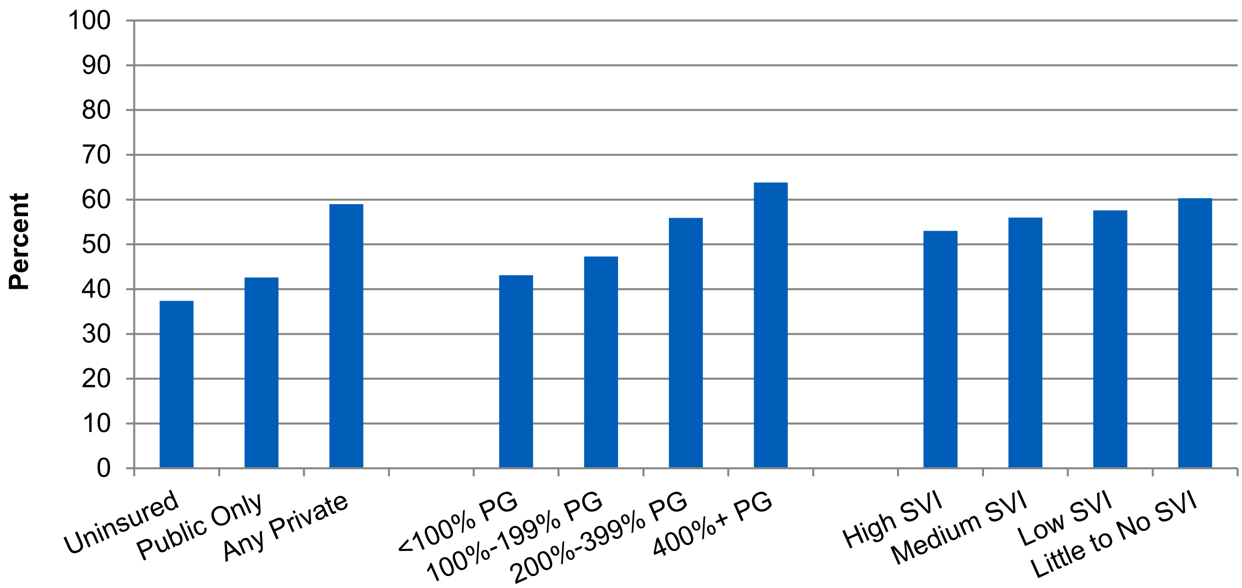


Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native.
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.
Note: Data for Native Hawaiian/Pacific Islander individuals did not meet the criteria for statistical reliability.

- The percentages of adults who completed the primary COVID-19 vaccine series were similar among non-Hispanic American Indian or Alaska Native (NH-AI/AN) (47.6%), NH-multiracial (50.2%), Hispanic (52.1%), and NH-Black (52.3%) adults (Figure 5).
- For comparison, 57.4% of NH-White and 72.6% of NH-Asian adults completed the primary COVID-19 vaccine series.
- The percentages were similar for people living in large central and large fringe metro areas (60.5% and 60.0%) and for people in micropolitan and noncore areas (46.9% and 45.1%).
- The percentages were higher for people in large central (60.5%) and large fringe metro areas (60.0%) than for people in medium metro areas (55.5%), followed by people in small metro areas (51.9%) and people in noncore areas (45.1%).

❖ **Private health insurance and higher socioeconomic status increased vaccine use.**

Figure 6. Adults who received two doses of the COVID-19 vaccine, by health insurance, household income, and Social Vulnerability Index group, 2021



Key: PG = federal poverty guideline; SVI = Social Vulnerability Index.
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.
Note: Vaccination rates by health insurance status include data only for adults under age 65 years.

- In 2021, the percentage of adults who completed the primary COVID-19 vaccine series was higher among people with private insurance (59.0%) than among those with publicly sponsored insurance (42.6%) or no insurance (37.4%) (Figure 6).
- The percentage of adults who completed the primary COVID-19 vaccine series was higher among people with household incomes 400% or more of the poverty guideline (PG) (63.8%) than among people with incomes 200%-399% of the PG (55.9%), 100%-199% of the PG (47.3%), or below the PG (43.1%).

- The percentage of adults who completed the primary COVID-19 vaccine series was higher among people who lived in the lowest Social Vulnerability Index (SVI)[iv] areas (60.3%) than among those who lived in low SVI areas (57.6%), medium SVI areas (56.0%), or high SVI areas (53.0%).

Healthcare Delivery of COVID-19 Vaccines

Factors that may explain variation in COVID-19 vaccine use include:

- *Structural health system barriers* (e.g., not knowing where to get the vaccine, having trouble using online scheduling systems, having trouble getting to vaccination sites, living in areas without appropriate vaccine storage facilities);
- *Socioeconomic barriers* (e.g., inability to take time off from work to get the vaccine or to recover from vaccination side effects); and
- *Vaccine hesitancy* (e.g., concern about risks associated with getting the vaccine).

Surveys and polls show that people, notably those living in rural areas, trusted their healthcare providers over other sources for information about the COVID-19 vaccine. Thus, local healthcare providers recommending the vaccine may have been an important determinant of vaccine use.[8,9,10]

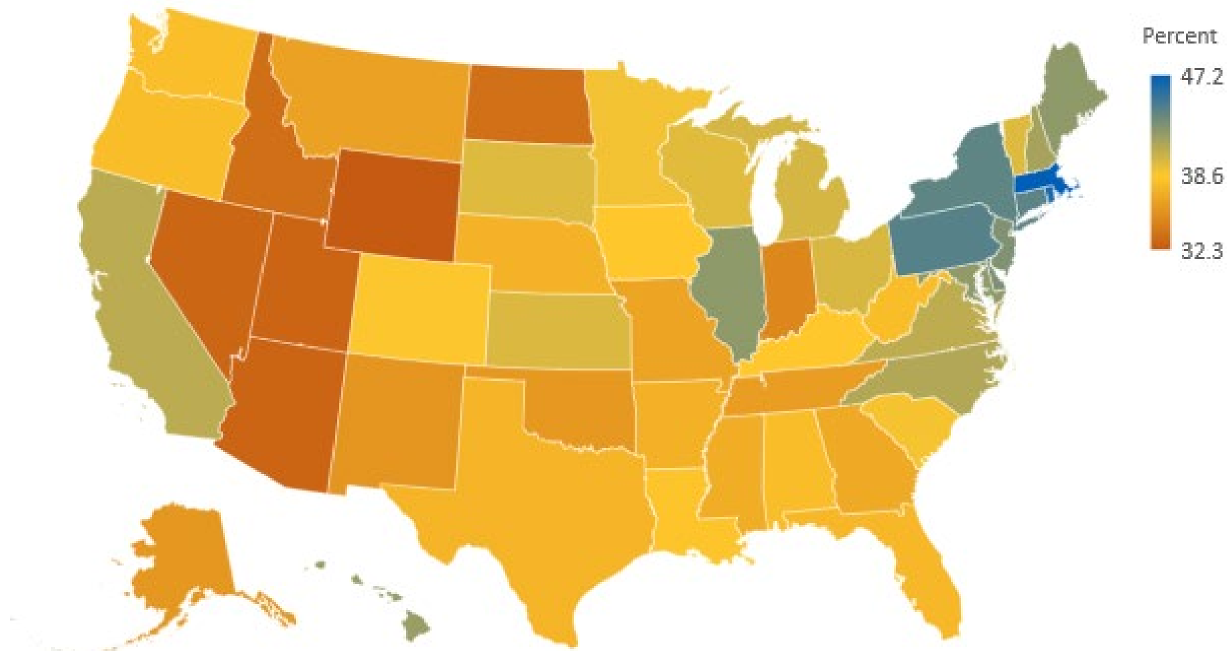
National Immunization Survey data show that the percentage of people who received a recommendation for the vaccine from their healthcare provider varied among states (Figure 7) and by age (Figure 8). They also show that a lower percentage of people in nonmetropolitan areas (not in a metropolitan statistical area, or MSA) received a recommendation than people in MSAs, both in principal cities and non-principal cities (Figure 9).

The percentage was also lower for people without health insurance compared with people with insurance. However, the percentage of people recommended to get the vaccine was similar among people with different incomes and among people living in counties with different SVI scores (Figure 10).

The overall pattern shown below suggests that people in non-MSAs were less likely to be recommended for the vaccine because they were also less likely to have access to a provider, not because providers in metropolitan and nonmetropolitan locations recommended the vaccine at different rates.

[iv] The Social Vulnerability Index is described in more detail in the Portrait of American Healthcare section of this report. Details may also be found at https://www.atsdr.cdc.gov/placeandhealth/svi/index.html.

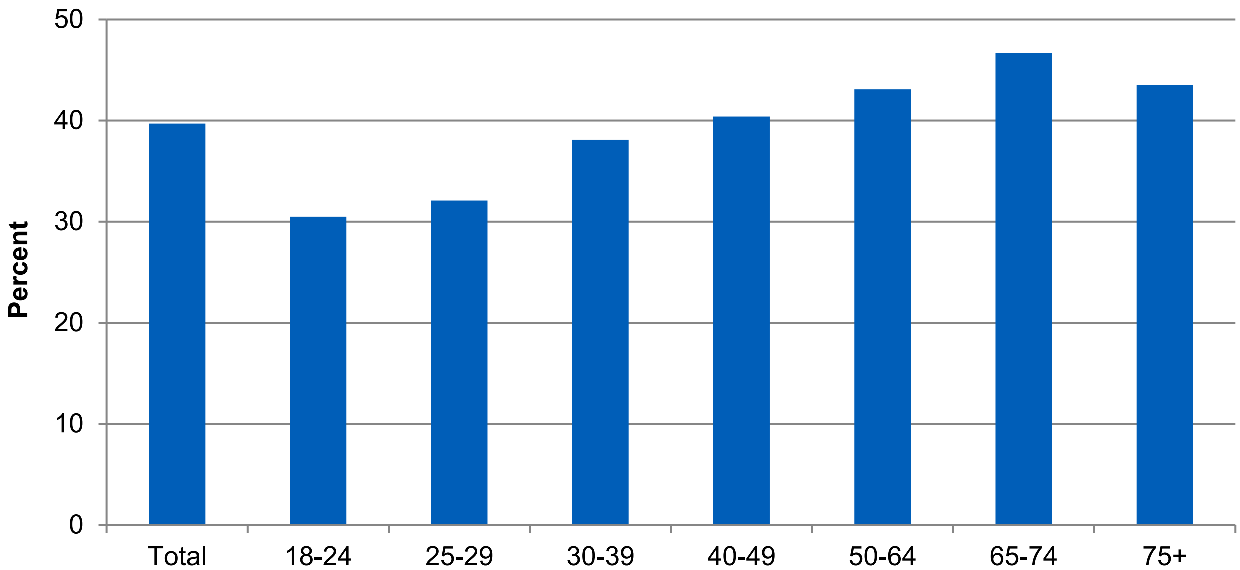
Figure 7. Adults who received a recommendation from a doctor, nurse, or other health professional to get the COVID-19 vaccine, by state, 2021



Source: Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, National Immunization Survey - Adult COVID Module, 2021.

- The median state-level percentage of people who received a recommendation from a health professional to get the COVID-19 vaccine was 38.6% in 2021. It ranged from 32.3% to 47.2% (Figure 7).

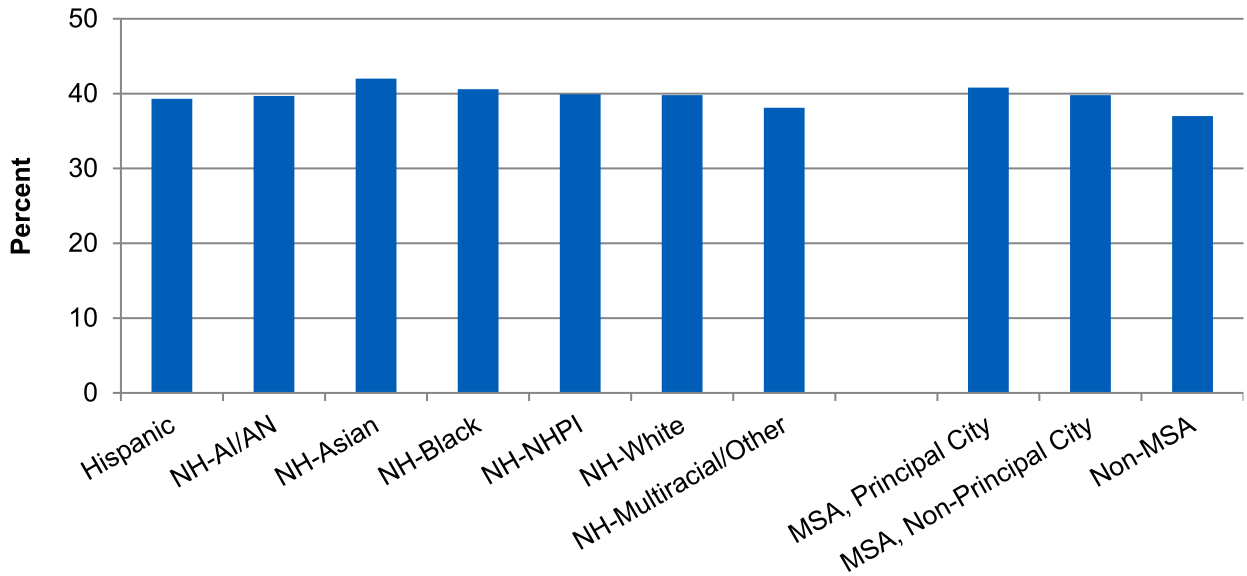
Figure 8. Adults who received a recommendation from a doctor, nurse, or other health professional to get the COVID-19 vaccine, by age, 2021



Source: Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, National Immunization Survey - Adult COVID Module, 2021.

- In 2021, the percentage of people who received a recommendation to get the COVID-19 vaccine was higher among people ages 65-74 years (46.7%) than among people ages 50-64 years (43.1%), 40-49 years (40.4%), 30-39 years (38.1%), 25-29 years (32.1%), and 18-24 years (30.5%) (Figure 8).
- In 2021, the percentage of people who received a recommendation to get the COVID-19 vaccine also was higher for people ages 65-74 years (46.7%) than for people age 75 years and over (43.5%).

Figure 9. Adults who received a recommendation from a doctor, nurse, or other health professional to get the COVID-19 vaccine, by race/ethnicity and location of residence, 2021

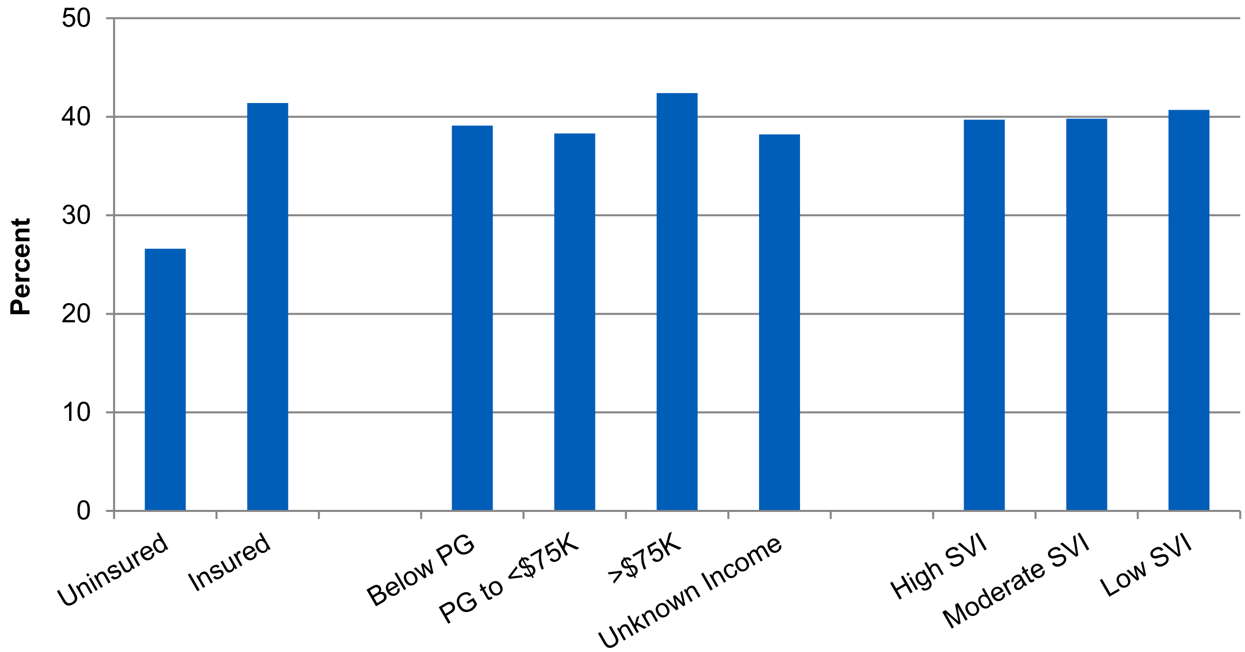


Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander; MSA = metropolitan statistical area.
Source: Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, National Immunization Survey - Adult COVID Module, 2021.

- Similar percentages of people in different racial/ethnic groups received a recommendation to get the COVID-19 vaccine (Figure 9).
- Similar percentages of people in the principal and non-principal cities of metropolitan statistical areas (MSAs) (40.8% and 39.8%, respectively) received a recommendation to get the COVID-19 vaccine. But a lower percentage of people in non-MSAs (37.0%) received the same recommendation. The difference between MSAs and non-MSAs falls just short of statistical significance.

❖ **Socioeconomic factors did not influence being counseled to get the vaccine, but lack of health insurance did.**

Figure 10. Adults who received a recommendation from a doctor, nurse, or other health professional to get the COVID-19 vaccine, by health insurance status, income, and Social Vulnerability Index group, 2021



Key: PG = federal poverty guideline; SVI = Social Vulnerability Index.
Source: Centers for Disease Control and Prevention, National Center for Immunization and Respiratory Diseases, National Immunization Survey - Adult COVID Module, 2021.

- The percentages of people who received a recommendation to get the COVID-19 vaccine was higher for adults with health insurance (41.4%) than for adults without health insurance (26.6%) (Figure 10).
- People with annual incomes higher than $75,000 per year were more likely to receive a recommendation for the COVID-19 vaccine than people with annual incomes between the PG and $75,000 and people below the PG (42.4% vs. 38.3% and 39.1%, respectively).
- The percentages of people who received a recommendation to get the COVID-19 vaccine were similar for people in counties in all SVI groups (low SVI, 40.7%; moderate SVI, 39.8%; high SVI, 39.7%,).

Healthcare Worker Use of COVID-19 Vaccines

Healthcare workers were a vulnerable population during the COVID-19 PHE.[11] More than 1.1 million were reported infected at work.[12] Counts compiled from published obituaries, news reports, and government private data sources estimate that more than 3,600 died during the first 12 months of the pandemic.[13]

Healthcare workers' vulnerability to COVID-19 also increased risks to patients due to the potential for disease transmission during the asymptomatic incubation phase of an infection.

Data for healthcare worker vaccination rates provide an opportunity to further examine disparities in COVID-19 vaccine receipt.

We examined National Health Interview Survey (NHIS) public use data to characterize two groups of healthcare workers.[v] “Direct care workers” were people who provided in-person medical services to patients, including physicians, nurses, home care workers, dental assistants, emergency responders, and other clinical professions. “Non-direct care workers” were people who worked in clinical facilities but did not have in-person contact with patients, such as hospital administrators, laboratory technicians, volunteers, and other roles. We then report vaccination rates among these groups of workers using measures provided by NHIS.

We might expect people who work in healthcare settings to have higher vaccination rates than the overall population, because they are at higher risk and direct healthcare workers were among the earliest group prioritized to receive the vaccine. In addition, we might anticipate that structural barriers, such as difficulty scheduling a vaccine appointment and getting to vaccination sites, were less likely to prevent healthcare workers from receiving the COVID-19 vaccine. Healthcare organizations actively facilitated employee vaccination and, in many cases, provided vaccines at work.

Outside their profession, healthcare workers shared many characteristics with the overall adult population. In the 2021 NHIS, the median age of *direct healthcare workers* was 43 years, 73.0% were female, and 85.3% lived in metropolitan counties. Most (78.3%) had private health insurance, 14.0% had publicly sponsored insurance or other coverage, and 7.6% had no insurance coverage (0.2% did not know their insurance coverage). More than half (52.4%) had household incomes 400% or more of the PG, 28.4% had incomes 200%-399% of the PG, 13.0% had incomes 100%-199% of the PG, and 6.2% lived below the PG.

The median age of *non-direct healthcare workers* was 50 years, 68.1% were female, and 87.3% lived in metropolitan counties. Most (81.3%) had private insurance, 11.6% had publicly sponsored or other coverage, 6.4% were uninsured, and 0.6% did not know their insurance coverage. Among non-direct healthcare workers, 48.3% had household incomes at least 400% of the PG, 32.7% had incomes 200%-399% of the PG, 12.7% had incomes 100%-199% of the PG, and 6.3% had household incomes below the PG.

Many findings related to healthcare worker vaccinations fall short of statistical significance due to the small sample of healthcare workers surveyed. But the data show that the percentage of healthcare workers who received the COVID-19 vaccine was higher than in the general population, as anticipated. They also show differences in health insurance status, household income, and location of residence associated with getting the COVID-19 vaccine. When considered in context with the overall adult population, the data suggest financial coverage for the vaccine was insufficient to ensure equitable vaccine distribution and implicate other structural, financial, and access barriers (Figures 11-16).

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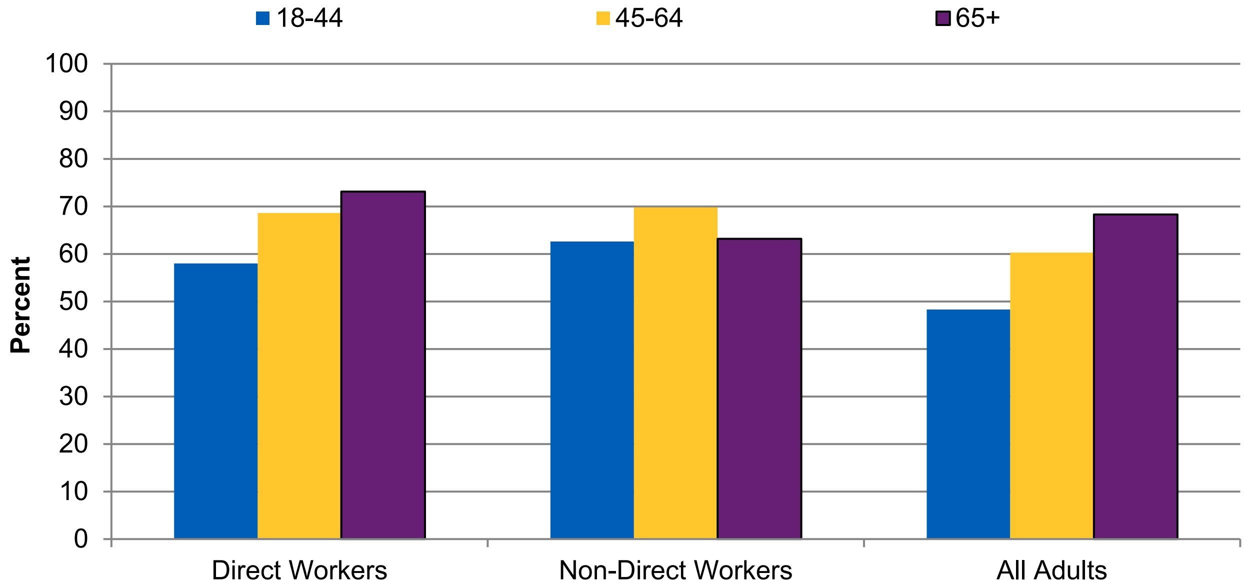
[v] National Center for Health Statistics. 2021 National Health Interview Survey, public use data. https://www.cdc.gov/nchs/nhis/2021nhis.htm.

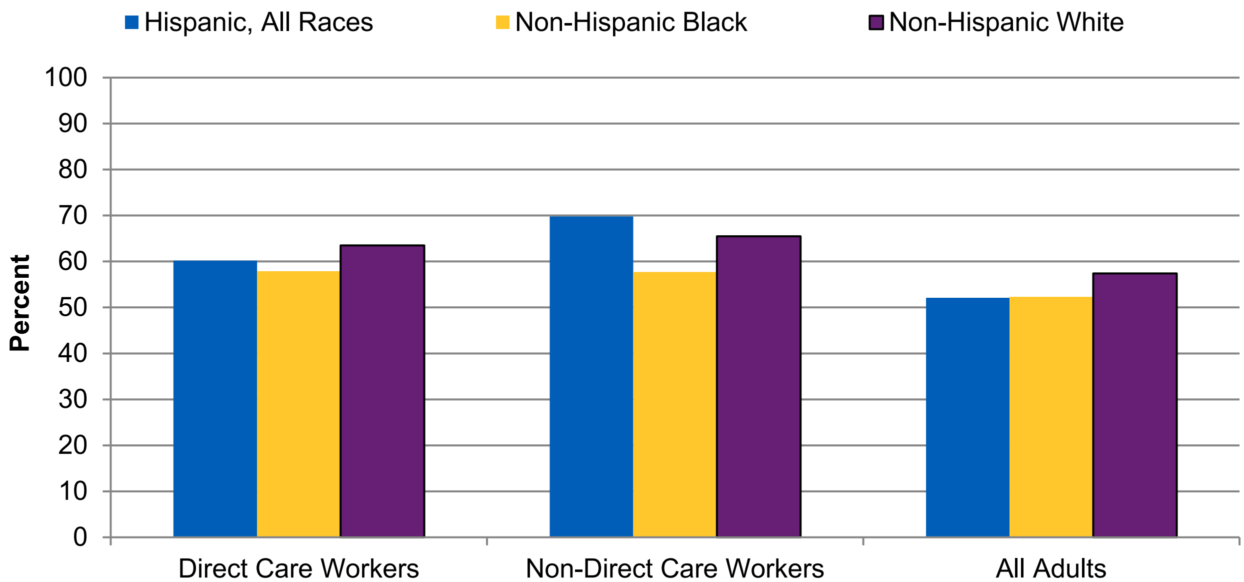
Figure 11. Healthcare workers and all adults who received two doses of the COVID-19 vaccine, by age, 2021



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.

- In 2021, among adults age 65 years and over, direct healthcare workers (73.1%) were more likely to complete the COVID-19 vaccine primary series than all adults (68.3%) and non-direct healthcare workers (63.2%). But the differences fell short of statistical significance (Figure 11).
- Among adults ages 45-64 years, direct and non-direct healthcare workers (68.6% and 69.8%) were more likely to complete the COVID-19 vaccine primary series than all adults (60.3%).
- Among adults ages 18-44 years, non-direct healthcare workers (62.6%) were more likely to complete the COVID-19 vaccine primary series than either direct healthcare workers (58.0%) or all adults (48.3%).

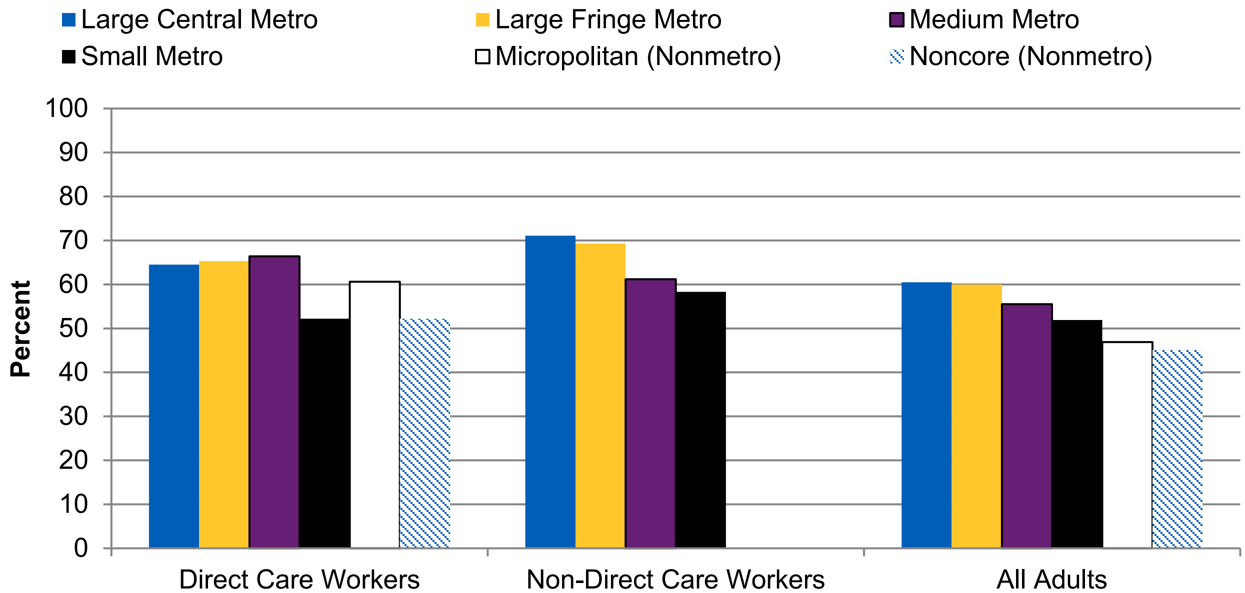
Figure 12. Healthcare workers and all adults who received two doses of the COVID-19 vaccine, by ethnicity, 2021



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.

- In 2021, within each ethnic group, direct and non-direct healthcare workers were more likely than all adults to complete the primary COVID-19 vaccine series, but the differences fell short of statistical significance due to small sample sizes of healthcare workers (Figure 12).
- Among direct and non-direct healthcare workers, ethnic differences in getting the vaccine were not statistically significant: 57.9% of NH-Black, 60.2% of Hispanic, and 63.5% of NH-White direct healthcare workers completed the COVID-19 vaccine primary series. Among non-direct healthcare workers, 57.7% of NH-Black, 65.5% of NH-White, and 69.8% of Hispanic workers did.

Figure 13. Healthcare workers and all adults who received two doses of the COVID-19 vaccine, by location of residence, 2021

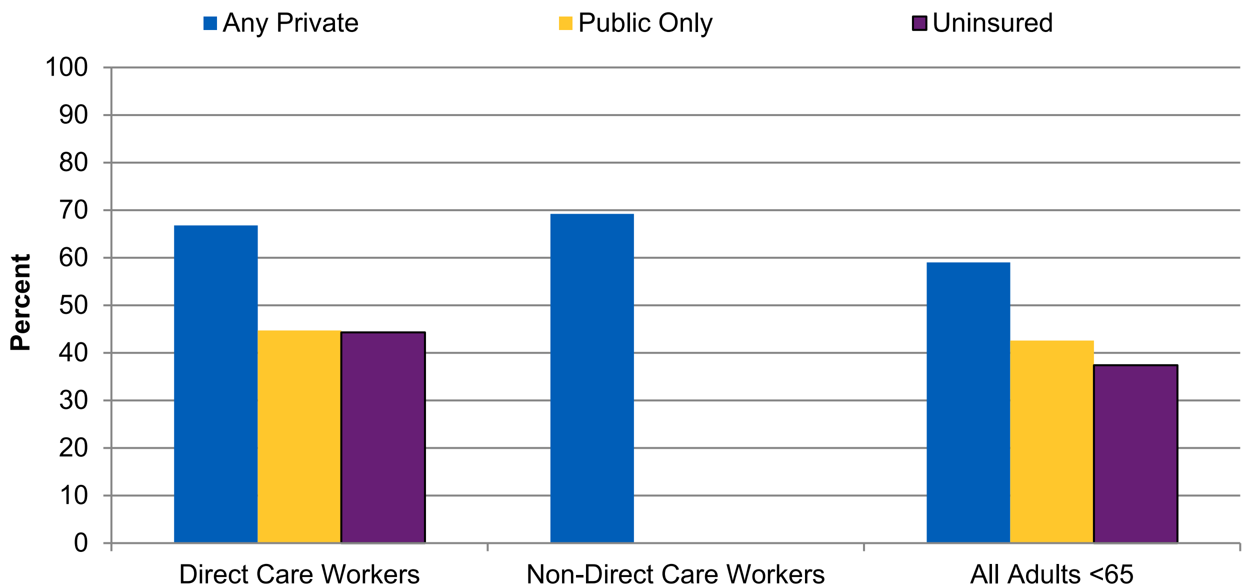


Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.
Note: Data for non-direct healthcare workers in micropolitan and noncore areas are not included because the sample sizes are too small to produce statistically reliable estimates.

- Healthcare worker vaccination correlated with metropolitan location of residence (Figure 13).
- The percentage of direct healthcare workers who completed the primary COVID-19 vaccine series in 2021 was higher in large central metro (64.5%), large fringe metro (65.3%), and medium metro (66.4%) counties than in small metro counties (52.2%) and noncore areas (52.2%).
- The percentage of non-direct healthcare workers who completed the primary COVID-19 vaccine series was higher in large central metro (71.1%) and large fringe metro (69.3%) counties than in medium metro (61.2%) and small metro (58.3%) counties, but the differences fell short of statistical significance.

❖ **Lack of health insurance and low socioeconomic status hindered COVID-19 vaccine receipt, even for healthcare workers.**

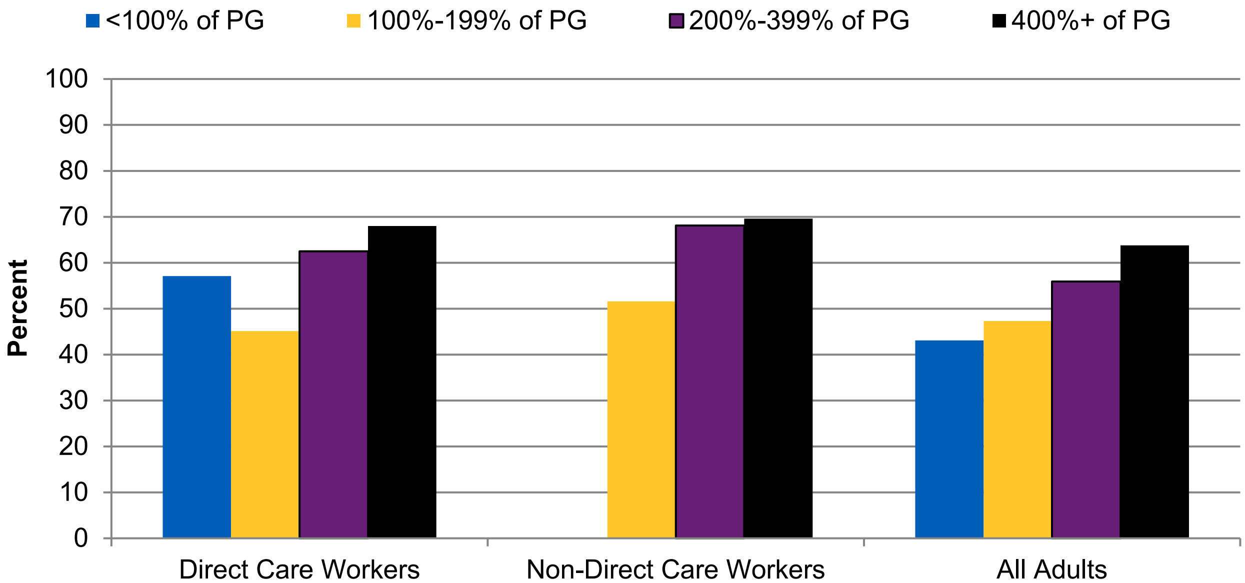
Figure 14. Healthcare workers and all adults under age 65 years who received two doses of the COVID-19 vaccine, by health insurance status, 2021



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.
Note: Data for non-direct healthcare workers with publicly sponsored or no insurance are not included because the sample sizes are too small to produce statistically reliable estimates.

- Direct healthcare worker vaccination correlated with private insurance status (Figure 14).
- In 2021, direct healthcare workers with private health insurance (66.8%) were approximately 1.5 times as likely to complete the primary series COVID-19 vaccine as direct healthcare workers with publicly sponsored insurance (44.7%) or no health insurance (44.3%).

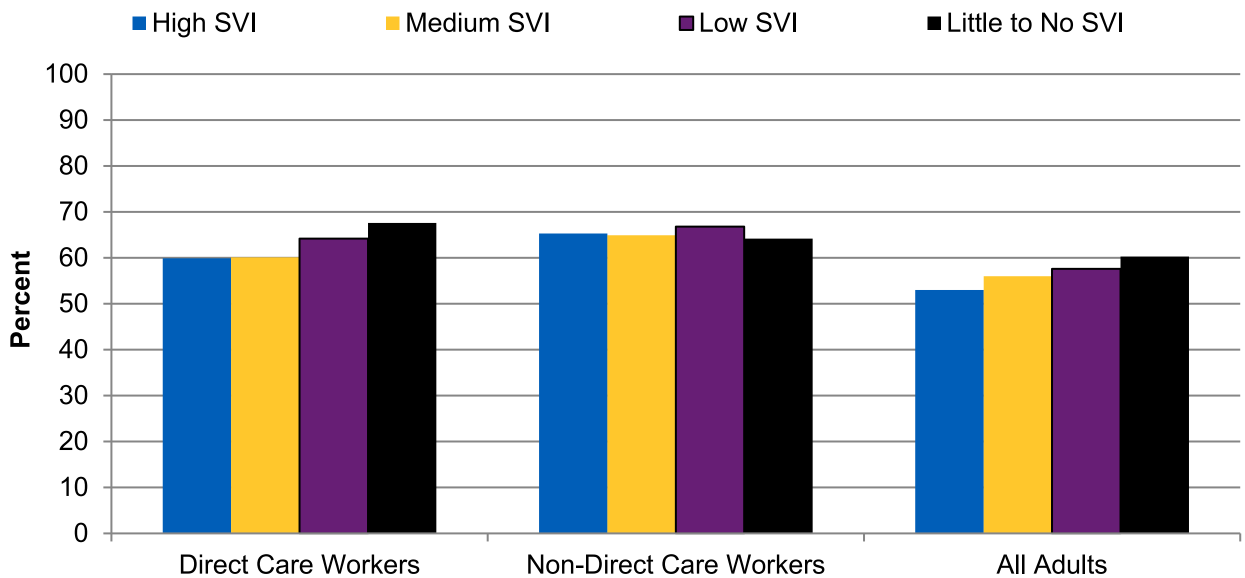
Figure 15. Healthcare workers and all adults who received two doses of the COVID-19 vaccine, by household income, 2021



Key: PG = federal poverty guideline.
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.
Note: Data for non-direct healthcare workers with household incomes less than 100% of the PG are not included because the sample sizes are too small to produce statistically reliable estimates.

- Healthcare worker vaccination correlated with higher household income (Figure 15).
- In 2021, the percentage of direct healthcare workers completing the primary COVID-19 vaccine series was higher among workers earning 400% or more of the PG (68.0%) than for workers earning less than the PG (57.1%) and those earning 100%-199% of the PG (45.1%).
- The percentage of non-direct healthcare workers completing the primary COVID-19 vaccine series was similarly higher among workers with incomes 400% of the PG or more (69.6%) or incomes 200%-399% of the PG (68.1%) than among workers earning 100%-199% of the PG (51.6%).

Figure 16. Healthcare workers and all adults who received two doses of the COVID-19 vaccine, by Social Vulnerability Index group, 2021



Key: SVI = Social Vulnerability Index.
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.

- In 2021, direct healthcare workers in areas with little or no social vulnerability (67.6%) were more likely to complete the primary COVID-19 vaccine series than people in areas with high SVI scores (59.9%) (Figure 16).
- Among non-direct healthcare workers, the percentages completing the primary COVID-19 vaccine series were similar in areas with little or no (64.2%), low (66.8%), moderate (64.9%), and high (65.3%) social vulnerability.

Disparities in COVID-19 Outcomes

The COVID-19 PHE exposed wide health disparities among people of different ages, racial and ethnic groups, and residence locations.[14,15] The data show different risk patterns behind the disparities experienced by different groups. Some groups had disproportionately high rates of infections (i.e., case rates), leading to more deaths (i.e., mortality rates). Other groups had relatively low case rates but still exhibited high mortality rates because their risk of dying when infected (i.e., case-mortality rates) was disproportionately high.

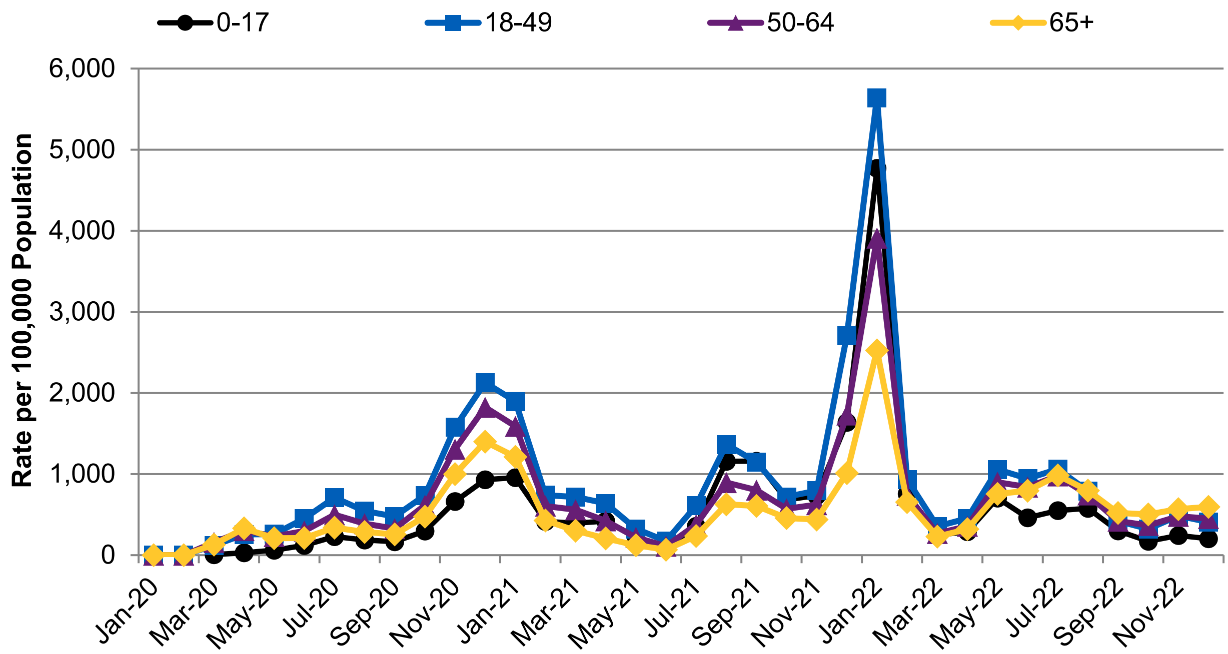
In some cases, high case-mortality rates may be explained by frailty and other age-related vulnerabilities. But in other cases, disproportionate case-mortality rates suggest that suboptimal vaccine use, access to hospital care, and quality of care or a combination of these factors contributed to the health disparity.

Age Disparities

COVID-19 disproportionately affected older populations. Although adults age 65 years and over were less likely to become infected with COVID-19 during surges associated with the Alpha, Delta, and Omicron variants and were more likely to get the COVID-19 vaccine when they became available, they were more likely to die from the disease. A plausible explanation for these findings is that older people sought to avoid exposure to COVID, but they were at greater risk of dying when infected due to age-related factors such as physical frailty, chronic illness, and a weakened immune system.

Data also show that older adults' risk of dying when infected decreased over time, possibly related to factors such as higher vaccination rates, rising prevalence of population-level immunity, and attenuation of the virus's virulence. It is also possible that the most vulnerable people died in earlier waves of the pandemic. Still, adults age 65 years and over remained at higher risk of dying from COVID-19 than the overall population as recently as 2022.

Figure 17. COVID-19 cases per 100,000 population, by age, January 2020-December 2022

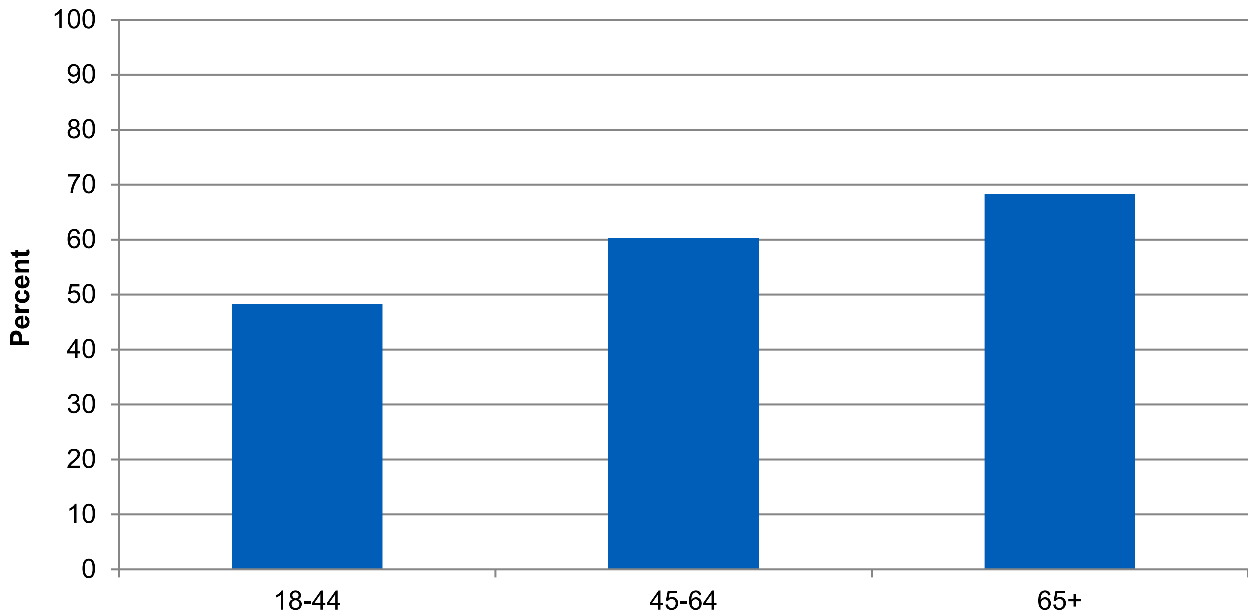


Source: Centers for Disease Control and Prevention, COVID Data Tracker, Surveillance Public Use Data, January 2020-December 2022.
Note: Case rate estimates in the first half of 2020 reflect limited testing capacity in the first months of the COVID-19 public health emergency and thus are artificially low.

- In 2021, older adults were less likely than other age groups to get infected (Figure 17).
- In December 2020, during a surge in cases associated with the Alpha variant, the highest case rates were reported in adults ages 18-49 years (2,128 cases per 100,000 population), followed by adults ages 50-64 years (1,824 cases per 100,000 population). The rate among adults age 65 years and over was 1,399 cases per 100,000 population, and the rate among children and adolescents ages 0-17 years was 930 cases per 100,000 population.

- In August 2021, during a surge in cases associated with the Delta variant, the highest case rates were reported in adults ages 18-49 years (1,367 cases per 100,000 population), followed by children and adolescents ages 0-17 years (1,158 cases per 100,000 population). The rate for adults ages 50-64 years was 896 cases per 100,000 population, and the rate for adults age 65 years and over was 628 cases per 100,000 population.
- In January 2022, during a surge in cases associated with the Omicron variant, the highest case rates were reported in adults ages 18-49 years (5,642 cases per 100,000 population), followed by children and adolescents ages 0-17 years (4,770 cases per 100,000 population). The rate for adults ages 50-64 years was 3,910 cases per 100,000 population, and the rate for adults age 65 years and over was 2,525 cases per 100,000 population.

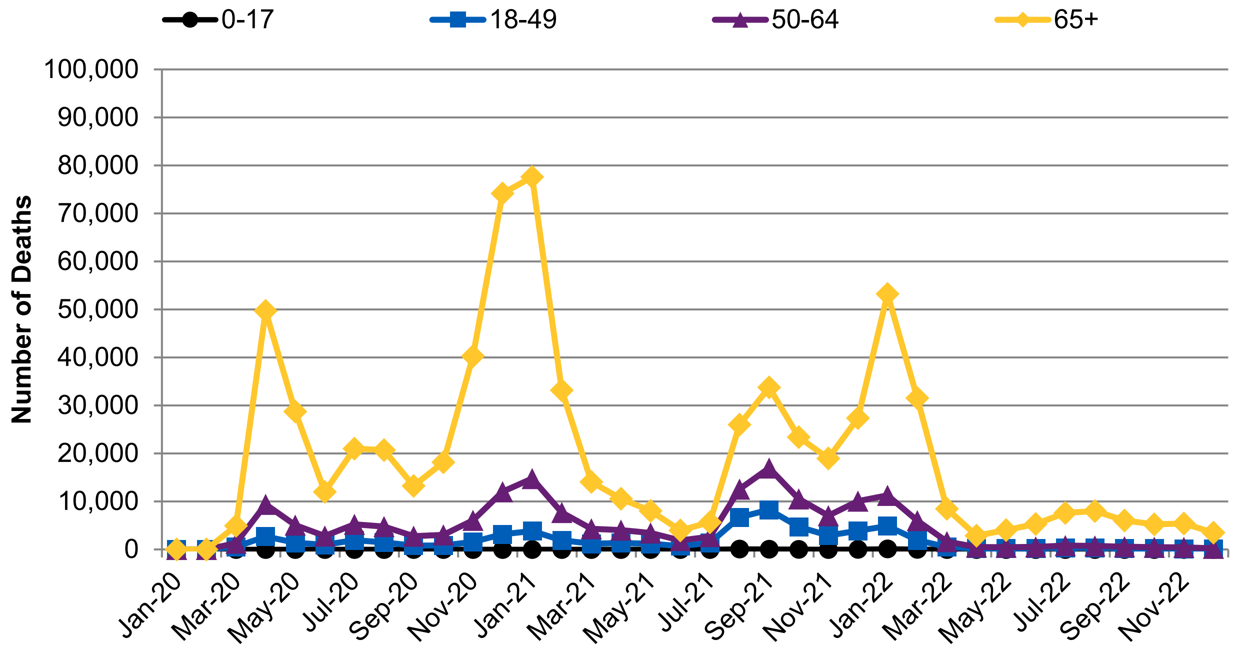
Figure 18. Adults who received two doses of the COVID-19 vaccine, by age, 2021



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.

- Older adults were more likely to get the COVID-19 vaccine than younger adults (Figure 18), but older adults were more likely to die from COVID-19 (Figure 19).

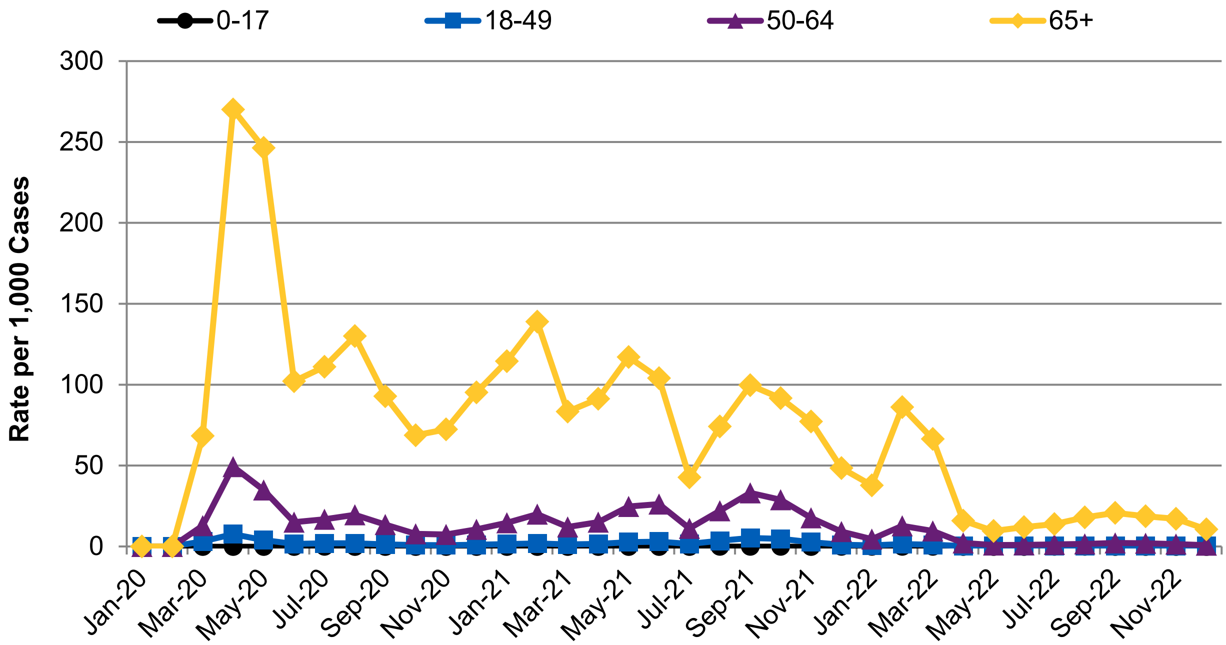
Figure 19. COVID-19 deaths, by age, January 2020-December 2022



Source: Centers for Disease Control and Prevention, COVID Data Tracker, Surveillance Public Use Data, January 2020-December 2022.

- In April 2020, during a surge associated with the original SARS-CoV-2 virus, the highest number of deaths occurred in adults age 65 years and over (49,705 deaths), followed by adults ages 50-64 years (9,409 deaths) and adults ages 18-49 years (2,689 deaths) (Figure 19).
- In January 2021, during a surge associated with the Alpha variant, the highest number of deaths occurred in adults age 65 years and over (77,583 deaths), followed by adults ages 50-64 years (14,764 deaths). The number of deaths among adults ages 18-49 years was 3,845, and 11 children and adolescents ages 0-17 years died.
- In September 2021, during a surge associated with the Delta variant, the highest number of deaths occurred in adults age 65 years and over (33,762 deaths), followed by adults ages 50-64 years (16,961 deaths). The number of deaths among adults ages 18-49 years was 8,268, and 78 children and adolescents ages 0-17 years died.
- In January 2022, during a surge associated with the Omicron variant, the highest number of deaths occurred in adults age 65 years and over (53,218 deaths), followed by adults ages 50-64 years (11,274 deaths). The number of deaths among adults ages 18-49 years was 4,879, and 115 children and adolescents ages 0-17 years died.

Figure 20. COVID-19 deaths per 1,000 cases, by age, January 2020-December 2022



Source: Centers for Disease Control and Prevention, COVID Data Tracker, Surveillance Public Use Data, January 2020-December 2022.

- A major reason for higher mortality rates is that older adults were more likely to die from COVID-19 if infected (Figure 20). Notably, the risk has decreased over time.
- In April 2020, during a surge associated with the original SARS-CoV-2 virus, the case-mortality rate was highest in adults age 65 years and over (270.1 deaths per 1,000 cases), followed by adults ages 50-64 years (49.3 deaths per 1,000 cases), and adults ages 18-49 years (7.6 deaths per 1,000 cases).
- In February 2021, during a surge associated with the Alpha variant, the case-mortality rate was highest in adults age 65 years and over (138.9 deaths per 1,000 cases), followed by adults ages 50-64 years (19.9 deaths per 1,000 cases), and adults ages 18-49 years (1.8 deaths per 1,000 cases).
- In September 2021, during a surge associated with the Delta variant, the case-mortality rate was highest in adults age 65 years and over (99.6 deaths per 1,000 cases), followed by adults ages 50-64 years (33.1 deaths per 1,000 cases), adults ages 18-49 years (5.2 deaths per 1,000 cases), and children and adolescents ages 0-17 years (0.1 deaths per 1,000 cases).
- In February 2022, during a surge associated with the Omicron variant, the case-mortality rate was highest in adults age 65 years and over (86.2 deaths per 1,000 cases), followed by adults ages 50-64 years (12.7 deaths per 1,000 cases), adults ages 18-49 years (1.5 deaths per 1,000 cases), and children and adolescents ages 0-17 years (0.1 deaths per 1,000 cases).

Racial and Ethnic Disparities

Although the Centers for Disease Control and Prevention (CDC) case surveillance data must be interpreted with caution, as only an estimated 67% of cases had data for race and ethnicity, they show that COVID-19 affected some racial and ethnic groups more than others. Of seven racial and ethnic groups monitored by the NHQDR team, four (Hispanic, NH-AI/AN, NH-Black, and

NH-Native Hawaiian/Pacific Islander [NHPI]) experienced disproportionately high COVID-19 mortality rates in 2021 compared with the overall population. Among these groups, however, the patterns of case and case-mortality data suggest different underlying causes of the disparities.

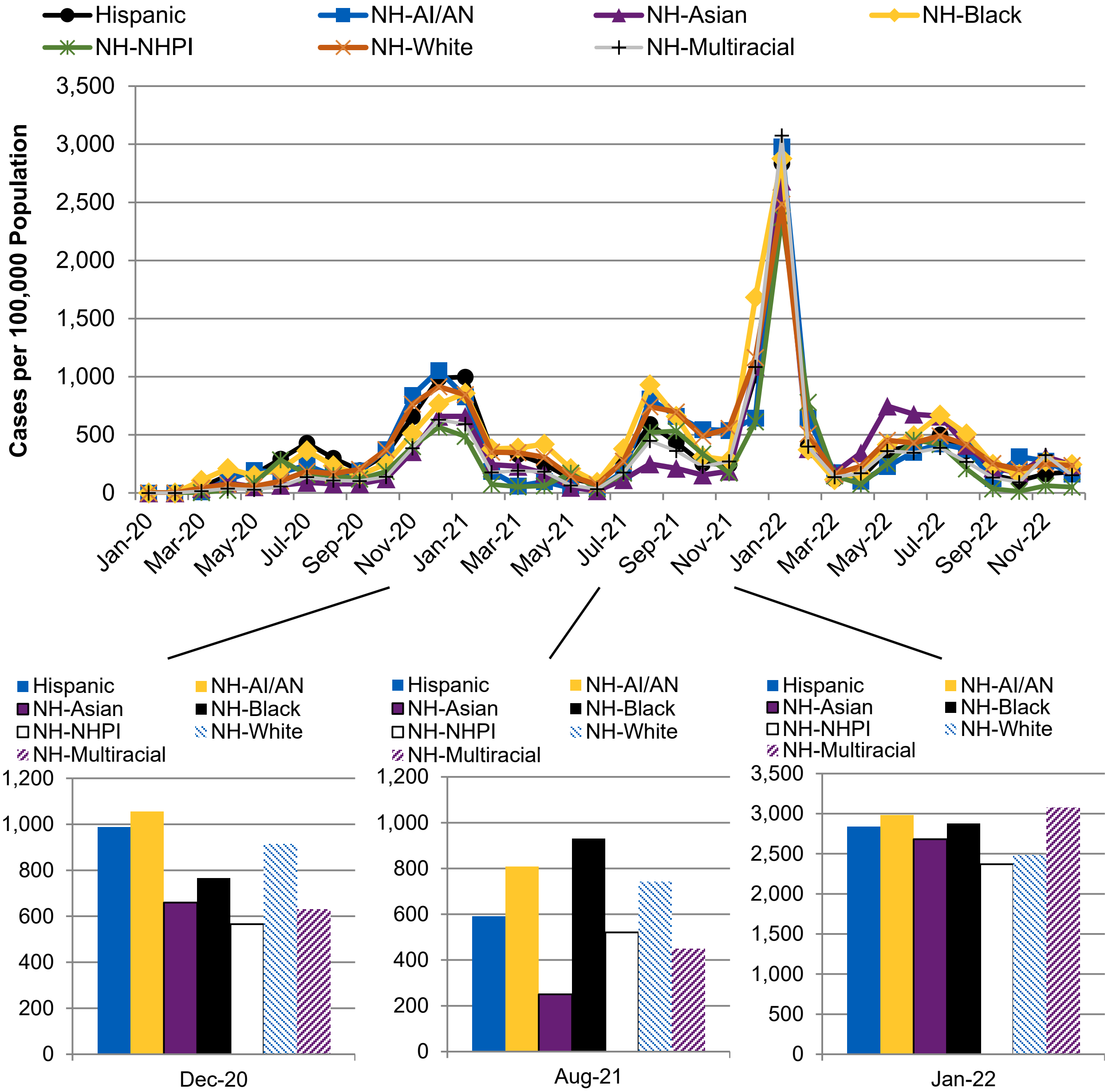
Case data show that NH-NHPI people were one of the least likely racial and ethnic groups to get infected with COVID-19 during the variant-associated surges. But case-mortality data indicate that NH-NHPI populations had the highest deaths per 1,000 cases when infected. This pattern suggests that lack of access to treatment or lack of treatment effectiveness was a more likely explanation for high COVID-19 deaths in this group than conditions exposing them to the disease.

Limited use of COVID-19 vaccines, which enhance treatment effectiveness, may have contributed to preventable deaths in this population, as case-mortality rates correlated with low vaccination rates among these groups. Barriers preventing access to treatment when local hospitals were overwhelmed during variant-associated surges may also have contributed.

In contrast, Hispanic and NH-Black populations had high case rates and case-mortality rates similar to or lower than NH-White populations. This finding suggests that elevated risk of acquiring the infection (e.g., work-related exposures or crowded housing conditions) was a more important contributor to high COVID-19 mortality than access to care or treatment effectiveness.

NH-AI/AN people experienced the highest overall COVID-19 mortality rates from 2020 to 2022. The pattern of disproportionately high case and case-mortality rates in this population suggests both increased risk of getting infected and decreased access to vaccines and healthcare services as contributing to high COVID-19 mortality rates in this population.

Figure 21. Monthly COVID-19 cases per 100,000 population, by race/ethnicity, January 2020-December 2022

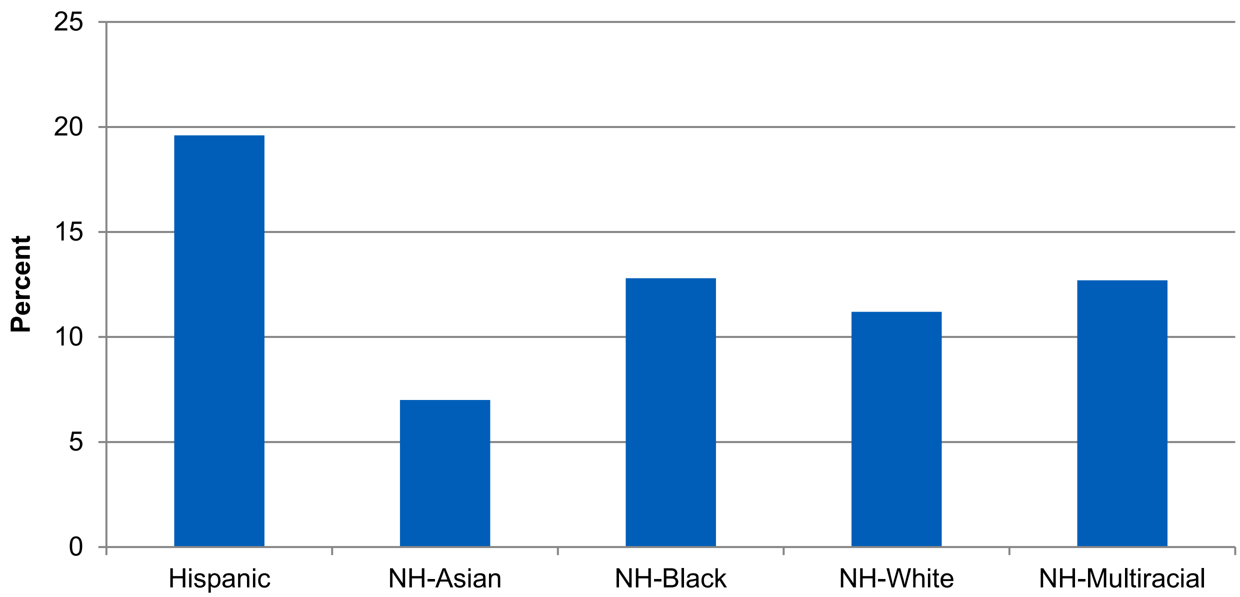


Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Disease Control and Prevention, COVID Data Tracker, Surveillance Public Use Data, January 2020-December 2022.
Note: CDC estimates that racial/ethnic data in public case surveillance files were available for approximately 67% of cases. Case rate estimates in the first half of 2020 reflect limited testing capacity in the first months of the COVID-19 public health emergency and thus are artificially low. Lower panels use different vertical axis scales to show differences among racial/ethnic groups.

- Case rates between the highest and lowest groups varied among people of different racial/ethnic groups, with rankings shifting among groups between January 2020 and December 2022 (Figure 21).

- In December 2020, during a surge in cases associated with the Alpha variant, the highest case rates were reported in NH-AI/AN groups (1,055 cases per 100,000 population), followed by Hispanic (988 per 100,000 population), NH-White (914 per 100,000 population), NH-Black (765 per 100,000 population), NH-Asian (659 per 100,000 population), NH-multiracial (630 per 100,000 population), and NH-NHPI (566 per 100,000 population) groups.
- In August 2021, during a surge in cases associated with the Delta variant, the highest case rates were reported in NH-Black groups (930 cases per 100,000 population), followed by NH-AI/AN (808 per 100,000 population), NH White (742 per 100,000 population), Hispanic (591 per 100,000 population), NH-NHPI (520 per 100,000 population), NH-multiracial (449 per 100,000 population), and NH-Asian (250 per 100,000 population) groups.
- In January 2022, during a surge in cases associated with the Omicron variant, the highest case rates were reported in NH-multiracial groups (3,074 cases per 100,000 population), followed by NH-AI/AN (2,979 per 100,000 population), NH-Black (2,877 per 100,000 population), Hispanic (2,837 per 100,000 population), NH-Asian (2,682 per 100,000 population), NH-White (2,485 per 100,000 population), and NH-NHPI (2,369 per 100,000 population) groups.

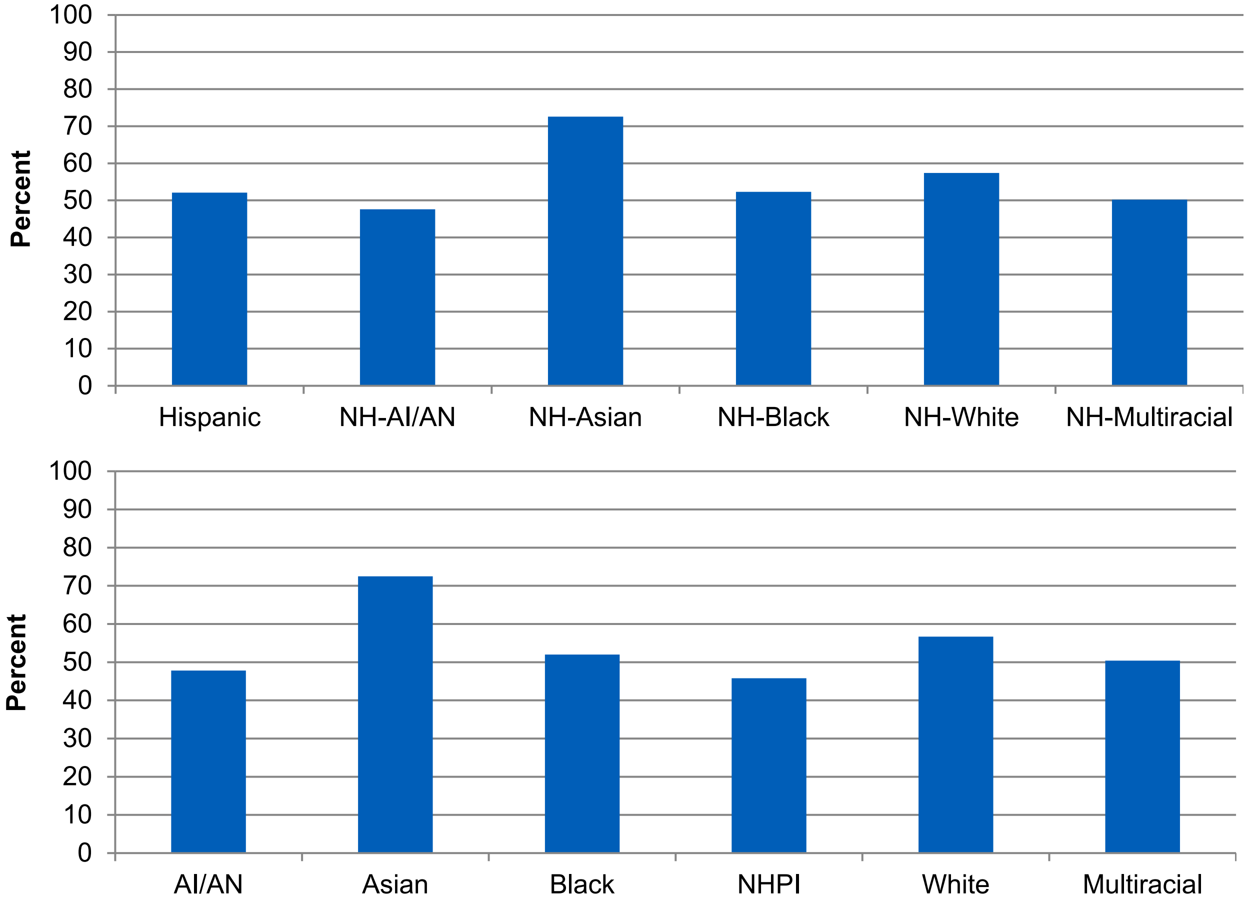
Figure 22. Adults who ever had COVID-19, by race/ethnicity, 2021



Key: NH = non-Hispanic.
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.
Note: Percentage of COVID-19 cases not shown for NH-AI/AN and NH-NHPI groups because sample sizes were too small to produce statistically reliable estimates.

- In 2021, the percentage of adults who ever had COVID-19 was highest for Hispanic people (19.6%) and lowest for NH-Asian people (7.0%) (Figure 22).

Figure 23. Adults who received two doses of the COVID-19 vaccine, by race/ethnicity (top) and by race alone (bottom), 2021



Key: AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.
Note: Data for race-only groups are included because sample sizes for NHPI individuals were too small to produce results that meet the criteria for statistical reliability when stratified by race and ethnicity.

- In 2021, for racial/ethnic groups, the percentage of adults completing the primary COVID-19 vaccine series (from lowest to highest) was:

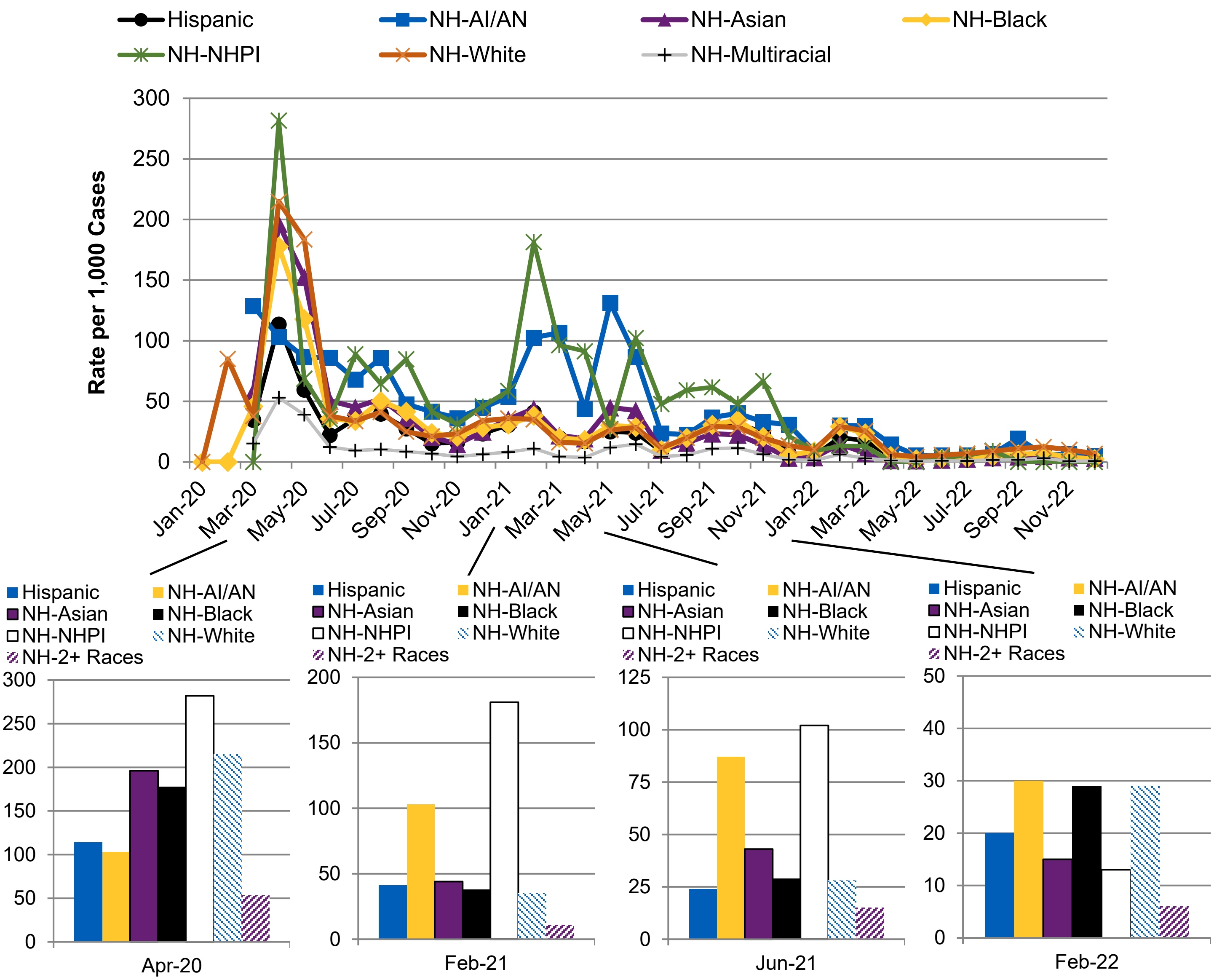
  - NH-AI/AN, 47.6%,
  - NH-multiracial, 50.2%,
  - Hispanic, 52.1%,
  - NH-Black, 52.3%,
  - NH-White, 57.4%, and
  - NH-Asian, 72.6% (Figure 23).

- In 2021, for race-only groups, the percentage of adults completing the primary COVID-19 vaccine series (from lowest to highest) was:

  - NHPI, 45.8%,
  - AI/AN, 47.8%,

- Multiracial, 50.4%,
- Black, 52.0%,
- White, 56.7%, and
- Asian adults, 72.5%.

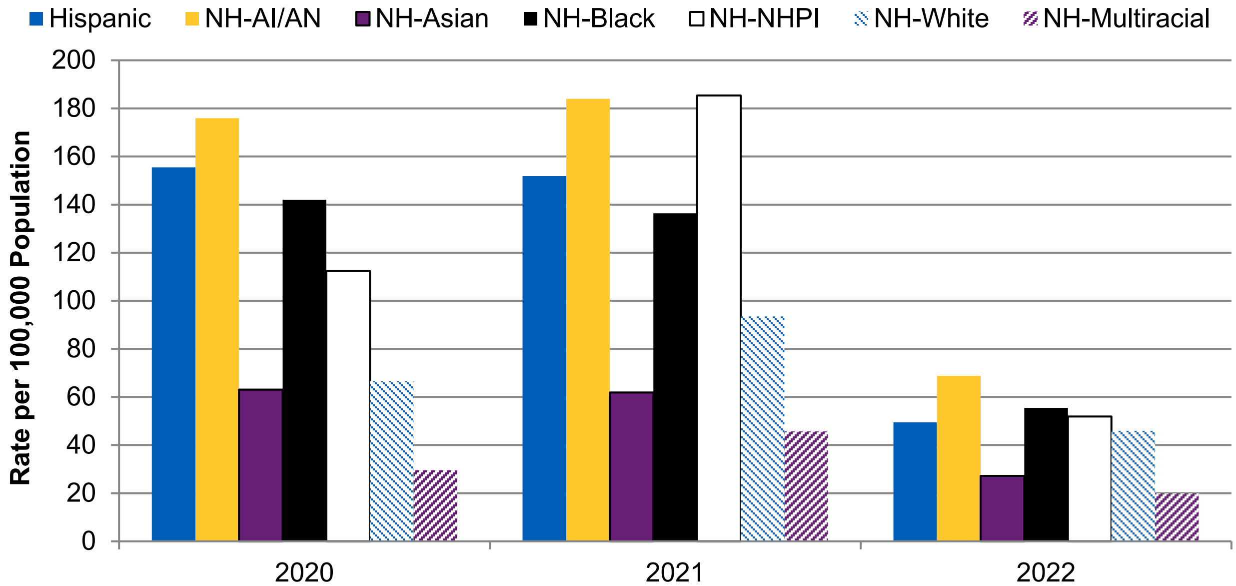
Figure 24. Monthly COVID-19 deaths per 1,000 cases, by race/ethnicity, January 2020-December 2022



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Disease Control and Prevention, COVID Data Tracker, Surveillance Public Use Data, January 2020-December 2022.
Note: Data for Hispanic, NH-AI/AN, NH-Asian, NH-NHPI, and NH-multiracial groups were not available before March 2020. Lower panels use different vertical axis scales to show differences among racial/ethnic groups.

- The case-mortality rate varied throughout January 2020 to December 2022, but NH-NHPI and NH-AI/AN exhibited disproportionately high deaths per 1,000 cases during surges associated with the Alpha, Delta, and Omicron variants (Figure 24).
- In April 2020, during the first COVID-19 surge, case-mortality was highest among NH-NHPI people (282 deaths per 1,000 cases), followed by NH-White people (215 deaths per 1,000 cases), NH-Asian people (196 deaths per 1,000 cases), NH-Black people (178 deaths per 1,000 cases), Hispanic people (114 deaths per 1,000 cases), NH-AI/AN people (103 deaths per 1,000 cases), and NH-multiracial people (53 deaths per 1,000 cases).
- In February 2021, during a surge associated with the Alpha variant, the case-mortality rate was highest among NH-NHPI people (181 deaths per 1,000 cases), followed by NH-AI/AN people (103 deaths per 1,000 cases), NH-Asian people (44 deaths per 1,000 cases), Hispanic people (41 deaths per 1,000 cases), NH-Black people (38 deaths per 1,000 cases), NH-White people (35 deaths per 1,000 people), and NH-multiracial people (11 deaths per 1,000 cases).
- In May and June 2021, during a surge associated with the Delta variant, a disproportionately high case-mortality rate was experienced by NH-AI/AN people (131 deaths per 1,000 cases in May 2021) and NH-NHPI people (102 deaths per 1,000 cases in June 2021). For comparison, the next highest case-mortality rates, experienced by NH-Asian people, were less than half as high (45 and 43 deaths per 1,000 cases in May and June 2021).
- In November 2021, at the beginning of a surge associated with the Omicron variant, case mortality was highest among NH-NHPI people (67 deaths per 1,000 cases), followed by NH-AI/AN people (33 deaths per 1,000 cases), Hispanic people (24 deaths per 1,000 cases), NH-Black people (21 deaths per 1,000 cases), NH-White people (20 deaths per 1,000 cases), NH-Asian people (14 deaths per 1,000 cases), and NH-multiracial people (6 deaths per 1,000 cases).
- In February 2022, during a surge associated with the Omicron variant, case-mortality rates had decreased in all racial and ethnic groups, and disparities among groups were also smaller. Case-mortality rates were highest among NH-AI/AN people (30 deaths per 1,000 cases) and NH-Black and NH-White people (both at 29 deaths per 1,000 cases), followed by Hispanic people (20 deaths per 1,000 cases), NH-Asian people (15 deaths per 1,000 cases), NH-NHPI people (13 deaths per 1,000 cases), and NH-multiracial people (6 deaths per 1,000 cases).

Figure 25. Annual COVID-19 deaths per 100,000 population, by race/ethnicity, 2020-2022



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System - Mortality, 2020-2022, accessed on CDC WONDER Online Database, released in 2023.

- The groups with the highest COVID-19 death rates from 2020 to 2022 were NH-AI/AN, Hispanic, NH-NHPI, and NH-Black people. Death rates among NH-NHPI people are notable for the sharp rise in 2021 (Figure 25).

Urban-Rural Disparities

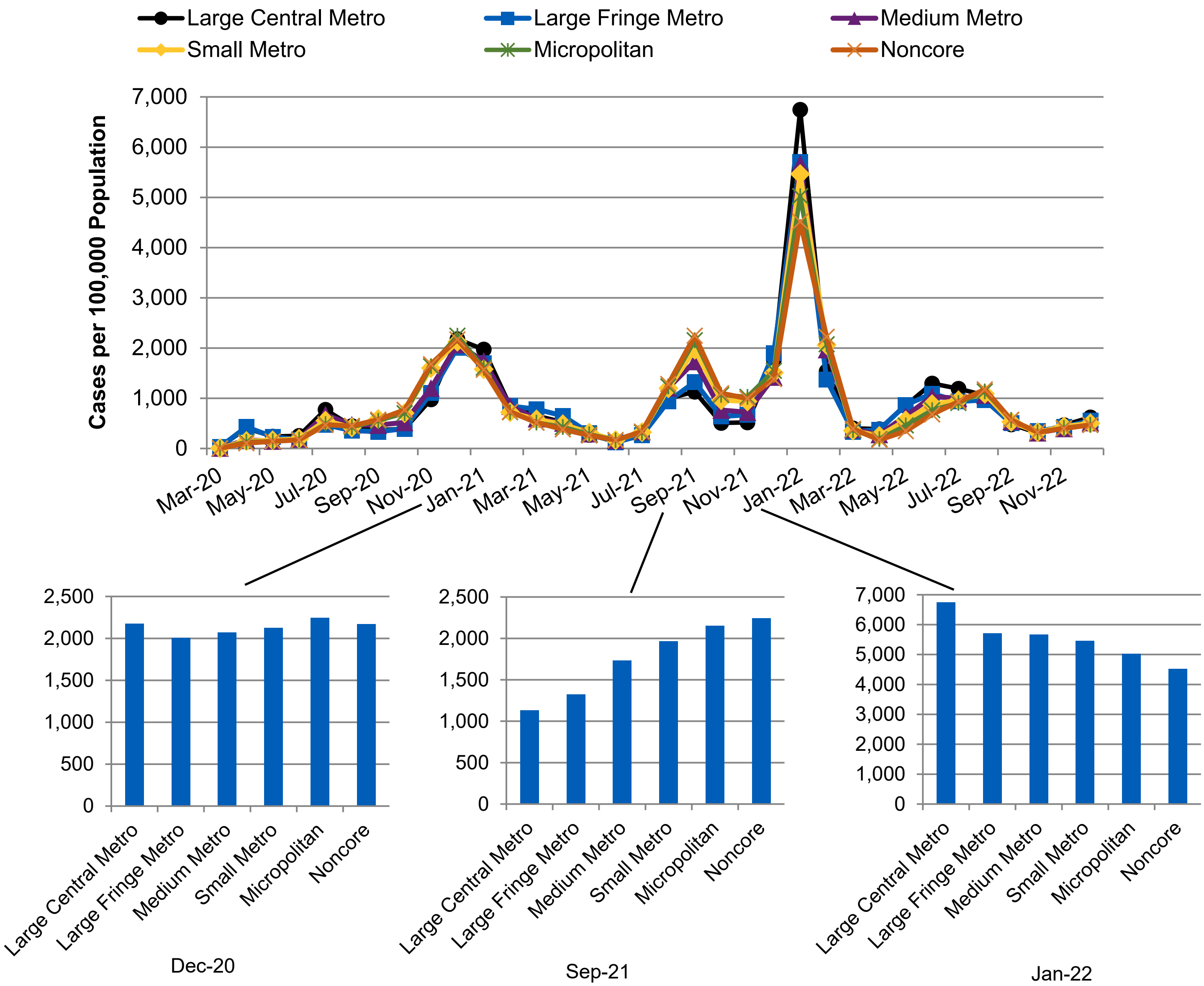
Although people in densely populated cities accounted for a large portion of COVID-19 deaths in early 2020, people in nonmetropolitan communities were more likely to die from the disease during the surges associated with the Alpha, Delta, and Omicron variants in the latter half of 2020 and 2021.

Monthly case surveillance data from 2021 show an inconsistent pattern of infection risk among rural and urban communities, whereby rural case rates were higher than urban case rates during some variant-associated surges and lower in other surges. However, mortality rates (i.e., risk of dying from COVID-19) were consistently higher in rural communities during every variant-associated surge in 2021.

One explanation for this pattern is rural populations are older than those in urban communities and thus more likely to die from age-related vulnerability to COVID-19. However, younger adults in rural communities also experienced higher mortality rates than people in urban areas. Another, more plausible explanation is that people in nonmetropolitan communities were less likely to be vaccinated.

Other potential reasons include less access to critical care services, worse care due to overwhelmed hospital capacity, or a combination of these factors. Although NHQDR data cannot disentangle the possibilities, they point to opportunities for improving vaccine distribution and increasing access to care in rural communities.

Figure 26. Monthly COVID-19 cases, by location of residence, March 2020-December 2022

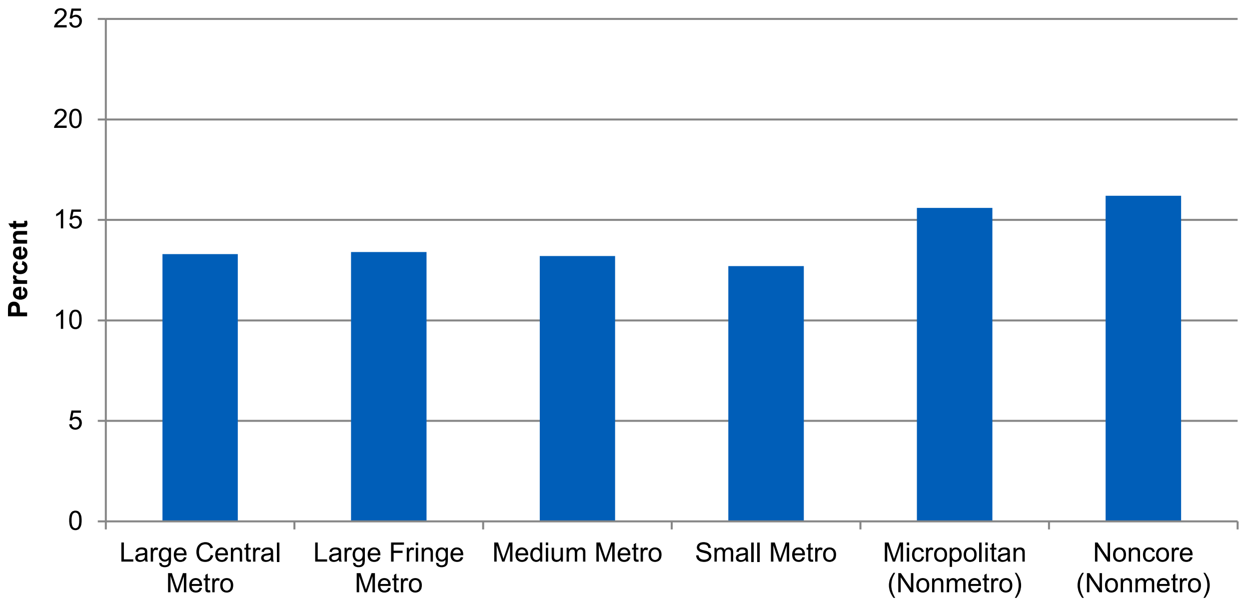


Source: Centers for Disease Control and Prevention, COVID Data Tracker, Surveillance Public Use Data, March 2020-December 2022.
Note: Case-rate estimates in the first half of 2020 reflect limited testing capacity in the first months of the COVID-19 public health emergency and thus are artificially low.

- Case rates did not follow a consistent pattern with regard to urban-rural status (Figure 26).
- In December 2020, during a surge associated with the Alpha variant, the highest to lowest cases per 100,000 population were 2,245 in micropolitan counties, 2,177 in large central metro counties, 2,171 in noncore areas, 2,127 in small metro counties, 2,070 in medium metro counties, and 2,005 in large fringe metro counties.

- In September 2021, during a surge associated with the Delta variant, case rates correlated with rurality. The highest to lowest cases per 100,000 population were 2,245 in noncore areas, 2,154 in micropolitan areas, 1,967 in small metro counties, 1,731 in medium metro counties, 1,325 in large fringe metro counties, and 1,131 in large central metro counties.
- In January 2022, during a surge associated with the Omicron variant, case rates correlated with urbanicity. The highest to lowest cases per 100,000 population were 6,745 in large central metro counties, 5,706 in large fringe metro counties, 5,667 in medium metro counties, 5,464 in small metro counties, 5,025 in micropolitan counties, and 4,517 in noncore areas.

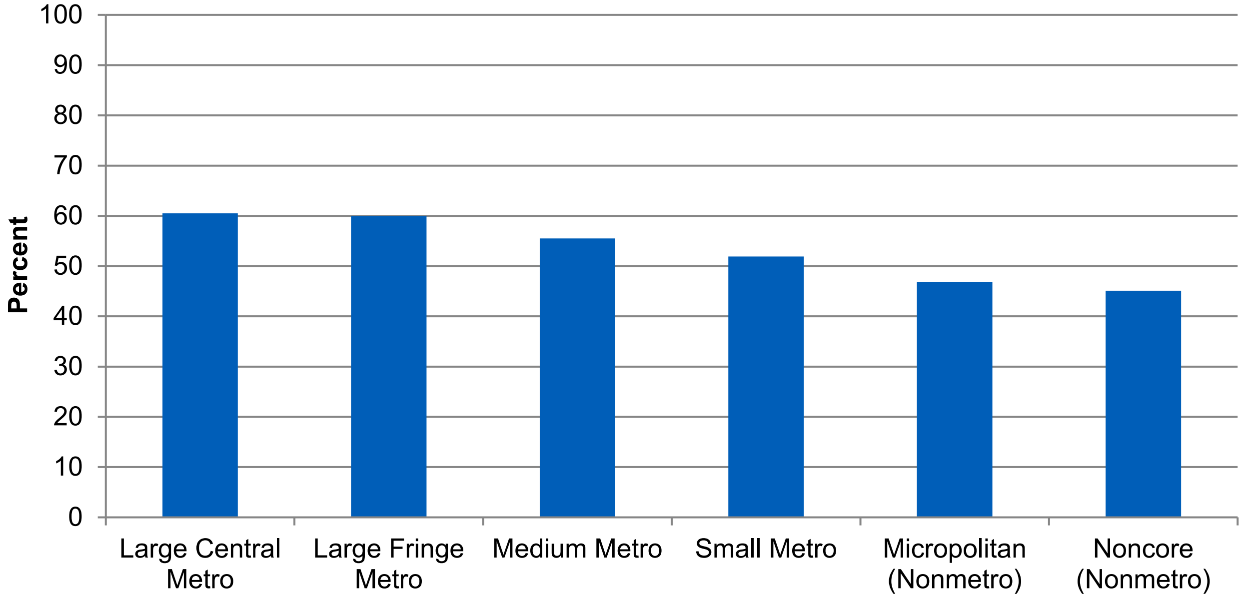
Figure 27. Adults who ever had COVID-19, by location of residence, 2021



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.

- The percentage of adults who ever had COVID-19 was highest in nonmetropolitan counties (Figure 27).
- In 2021, 16.2% of adults living in noncore counties and 15.6% of adults living in micropolitan counties reported ever having COVID-19, compared with 13.3%, 13.4%, 13.2%, and 12.7% of people living in large central metro, large fringe metro, medium metro, and small metro counties, respectively.

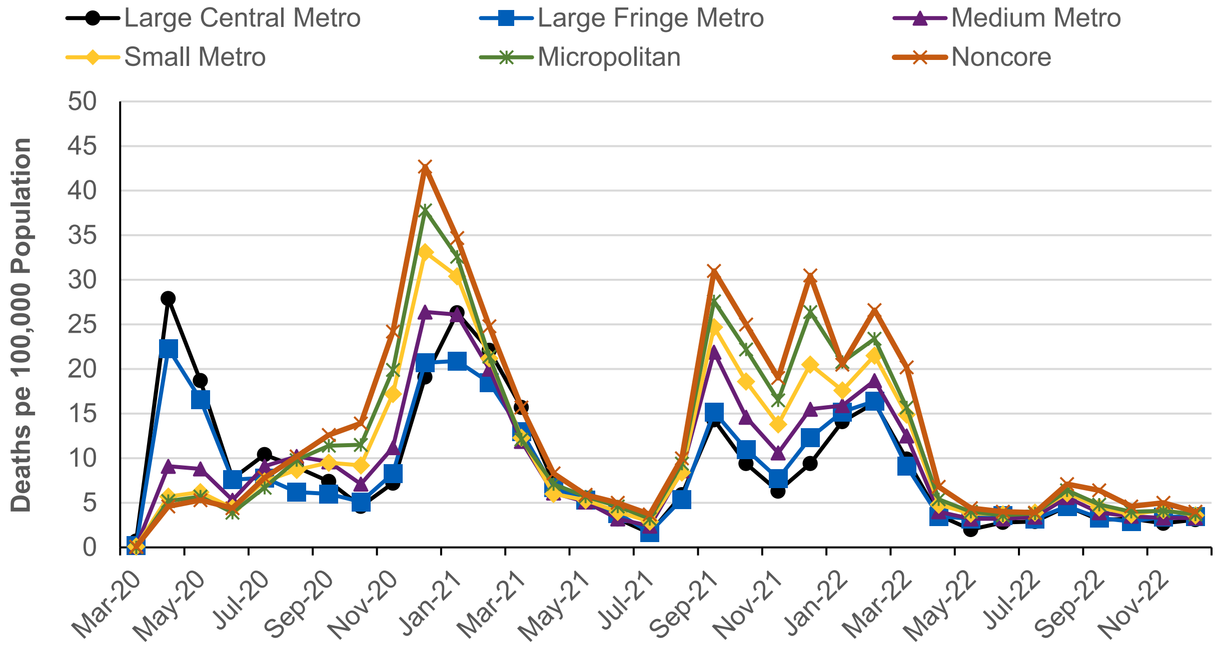
Figure 28. Adults who received two doses of the COVID-19 vaccine, by location of residence, 2021



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.

- Vaccination rates in 2021 were highest in metropolitan areas and progressively decreased with rurality (Figure 28).
- In 2021, 45.1% of adults living in noncore areas and 46.9% of adults in micropolitan counties completed the primary COVID-19 vaccine series, compared with 60.5%, 60.0%, 55.5%, and 51.9% in large central metro counties, large fringe metro counties, medium metro counties, and small metro counties, respectively.

Figure 29. Monthly COVID-19 deaths per 100,000 population, by location of residence, March 2020-December 2022

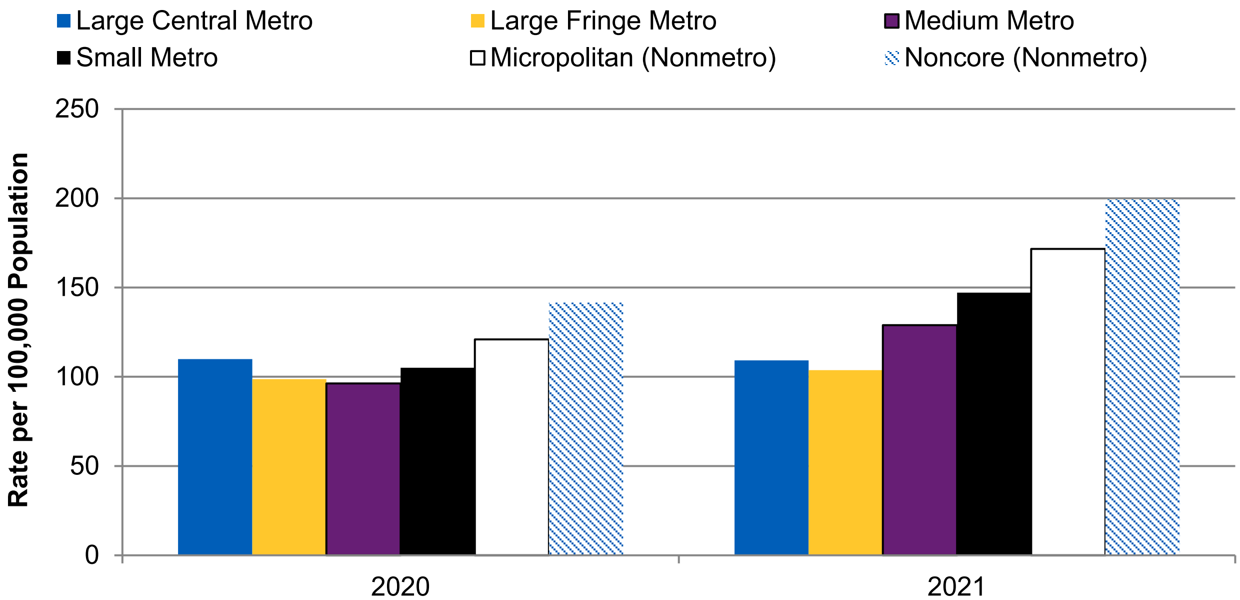


Source: Centers for Disease Control and Prevention, COVID Data Tracker, Surveillance Public Use Data, March 2020-December 2022.

- Although urban communities bore the burden of deaths associated with the original SARS-CoV-2 strain, smaller metropolitan communities and rural areas experienced the highest rates of COVID-19 deaths in every subsequent variant-associated surge (Figure 29).
- In April 2020, during a surge associated with the original SARS-CoV-2 strain, COVID-19 death rates correlated with urbanicity. Deaths per 100,000 population from highest to lowest were 27.9 in large central metro counties, 22.3 in large fringe metro counties, 9.1 in medium metro counties, 5.7 in small metro counties, 5.2 in micropolitan counties, and 4.6 in noncore areas.
- In December 2020, during a surge associated with the Alpha variant, COVID-19 death rates correlated with rurality. Deaths per 100,000 population from highest to lowest were 42.7 in noncore areas, 37.8 in micropolitan counties, 33.1 in small metro counties, 26.4 in medium metro counties, 20.7 in large fringe metro counties, and 19.1 in large central metro counties.
- In September 2021, during a surge associated with the Delta variant, death rates correlated with rurality. Deaths per 100,000 population from highest to lowest were 31.0 in noncore areas, 27.6 in micropolitan counties, 24.7 in small metro counties, 21.9 in medium metro counties, 15.2 in large fringe metro counties, and 14.3 in large central metro counties.
- In December 2021, during a surge associated with the Omicron variant, death rates correlated with rurality. Deaths per 100,000 population from highest to lowest were 30.5 in noncore areas, 26.4 in micropolitan counties, 20.5 in small metro counties, 15.5 in medium metro counties, 12.3 in large fringe metro counties, and 9.4 in large central metro counties.

- In February 2022, during the continued Omicron variant surge, death rates correlated with rurality. Deaths per 100,000 population from highest to lowest were 26.6 in noncore areas, 23.4 in micropolitan counties, 21.5 in small metro counties, 18.7 in medium metro counties, 16.4 in large fringe metro counties, and 16.2 in large central metro counties.

Figure 30. Crude COVID-19 deaths per 100,000 population, by location of residence, 2020 and 2021



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System, Mortality, 2020 and 2021, accessed on CDC WONDER Online Database, released in 2023.

- Nonmetropolitan communities experienced the highest COVID-19 death rates in both 2020 and 2021 (Figure 30).
- COVID-19 death rates were higher in nonmetropolitan counties than in metropolitan counties in 2020. Crude COVID-19 death rates in 2020 were:
  - 109.9 deaths per 100,000 population in large central metro,
  - 98.7 deaths per 100,000 population in large fringe metro,
  - 96.3 deaths per 100,000 population in medium metro,
  - 105.1 deaths per 100,000 population in small metro,
  - 120.9 deaths per 100,000 population in micropolitan, and
  - 141.6 deaths per 100,000 population in noncore counties.

- COVID-19 death rates in the largest metropolitan areas remained statistically unchanged in 2021 but increased in less densely populated counties. Crude COVID-19 death rates in 2021 were:
  - 109.2 deaths per 100,000 population in large central metro,
  - 103.7 deaths per 100,000 population in large fringe metro,
  - 128.9 deaths per 100,000 population in medium metro,
  - 147.1 deaths per 100,000 population in small metro,
  - 171.6 deaths per 100,000 population in micropolitan, and
  - 199.3 deaths per 100,000 population in noncore counties.

Discussion and Conclusions

COVID-19 imposed a heavy burden on the United States, accounting for more than 767,000 deaths in the first 2 years of the pandemic. It also exacerbated existing health disparities, leading to disproportionately high mortality among older adults, people in nonmetropolitan communities, and NH-AI/AN, NH-NHPI, Hispanic, and NH-Black populations.

Importantly, COVID-19 deaths grew by nearly 20% in the second year of the PHE, even though the nation had more knowledge about this previously unknown virus and greater access to tests, treatments, and vaccines. This observation prompts us to ask: *what factors accounted for these deaths, and how might healthcare delivery systems have prevented them?*

The emergence of more transmissible variants in 2021 provides a partial answer. Genetic mutations in the variants of concern enabled them to evade existing immunity and spread more easily through the population. Their emergence also coincided with a time when national consensus on pandemic mitigation strategies such as masking and social distancing had begun to fracture, potentially enabling the virus to spread further. But Americans also had access to COVID-19 vaccines, which had not yet been developed in the first year of the pandemic.

The public health and healthcare delivery systems achieved remarkable success engaging with communities and administering at least one dose of the COVID-19 vaccine to more than 70% of adults within the first year of vaccine availability. Although this accomplishment has been credited with averting millions of hospitalizations and death,[5] evidence suggests that more vaccination was both desirable and achievable.

A CDC analysis from early 2021 found that a single dose of mRNA COVID-19 vaccines was approximately 82% effective in reducing virus transmission compared with 94% effectiveness for two doses.[16] Earlier efficacy studies had reported lower levels of protection from a one-dose vaccination.[1,17] In addition, vaccine-induced immunity waned over time, and variants appeared that were capable of escaping vaccine-induced immunity and natural immunity generated by previous variants.

While 70% vaccine coverage was expected to confer herd immunity when COVID-19 vaccines first became available, subsequent studies found that vaccination levels approaching 90% would have been needed for highly transmissible viruses such as the Omicron variant.[18]

Data also show uneven distribution and use of COVID-19 vaccines in 2021, especially among uninsured, underinsured, and low-income people and people in nonmetropolitan communities. Federal law mandated health insurance coverage for COVID-19 vaccines without barriers (such as prior authorization or cost sharing) to increase use. However, lower rates of vaccine receipt by socioeconomically disadvantaged people (including healthcare workers) signal that other structural barriers may have reduced vaccine use.

For example, lack of paid sick leave and limited job flexibility appeared to prevent many low-income people from getting vaccinated.[19] Similarly, requiring online vaccine appointments may have limited access to people lacking computers and internet access, while locating mass vaccination sites in geographically isolated areas may have limited access for people with limited transportation options.[20]

The disparities may reflect, in part, the nation's reliance on personal healthcare delivery systems to equitably distribute vaccines instead of having a robust public health system to do it.[19] Providers of healthcare services, such as hospitals, nursing homes, and pharmacies, traditionally focus on providing care to individuals. Thus, many appeared to lack the capacity to serve populations beyond their traditional markets, including people who already had difficulty accessing their services due to socioeconomic and geographic barriers, such as people with disabilities. Yet, paradoxically, insufficient vaccination among these disadvantaged populations may have contributed to the surges that strained hospitals and nursing homes and potentially led to excess deaths.[21,22]

These findings underscore an urgent need to strengthen the public health system as a first line of defense against future transnational health crises, while reimagining how healthcare delivery systems might also address broader public health needs.

Resources

The CDC Bridge Access Program (https://www.cdc.gov/vaccines/programs/bridge/index.html) has been established to provide free COVID-19 vaccines to uninsured and underinsured people through local providers, publicly sponsored community health centers, and commercial pharmacies after the vaccines transition to the commercial market in fall 2023. The program is temporary and will phase out after December 2024.

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Impact of COVID-19 on Hospital Care

On March 13, 2020, the United States declared a public health emergency (PHE) to combat coronavirus disease 2019 (COVID-19). Community mitigation strategies were implemented to slow the spread of the disease and to protect all individuals, especially those at increased risk for severe illness that can result in hospitalization, intensive care, and ventilator use. These strategies were used to minimize morbidity and mortality of COVID-19 in societal sectors such as schools, workplaces, and healthcare organizations.[1]

COVID-19 spreads when an infected person breathes out droplets and very small particles that contain the virus. These droplets and particles can be breathed in by other people or land on their eyes, nose, or mouth. In some cases, people may contaminate surfaces they touch.[2] Limiting the number of contacts between potentially infected individuals and those who might be susceptible to the pathogen is one of the most valuable nonpharmaceutical interventions.

As part of the nonpharmacologic strategy to stop the spread of COVID-19, the federal government implemented a stay-at-home order to reduce travel. However, when residents perceive an infectious disease to be a threat in their communities, they may voluntarily reduce their movement.[3]

This section highlights the impact of COVID-19 on hospitalizations, emergency department (ED) use, and patient safety. Findings on changes over time and disparities experienced by some populations show that:

- From 2020 to 2022, ED visits and hospital admissions increased during COVID-19 infection surges associated with the Alpha, Delta, and Omicron variants. Hospital admissions and ED visits decreased for non-COVID-19 conditions during surge periods, suggesting that non-COVID-19 conditions were crowded out by COVID-19 cases.
- From 2020 to 2022, hospitalizations were worse for large urban areas at the start of the pandemic but by the time the Alpha variant became dominant, rural areas experienced more hospitalizations than large urban areas.
- In 2020, ED wait times worsened for Black and Hispanic patients, particularly for psychiatric or mental health and cardiovascular conditions, potentially leading to worse outcomes and increased disparities.
- In 2020, several patient safety measures continued to improve through 2020 for non-COVID-19 patients. These included postoperative sepsis, central venous catheter-related bloodstream infections (also known as central line-associated bloodstream infections, or CLABSIs), and postoperative pulmonary embolism or deep vein thrombosis. But data show disparities in patient safety. Residents of rural areas and non-Hispanic (NH) Black patients experienced the worst outcomes.

Inpatient and Emergency Department Visits With Confirmed COVID-19

- ❖ **As the volume of confirmed COVID-19 patients increased, the number of non-COVID patients seeking both inpatient and ED care decreased. Over time, the locations most affected by COVID-19 changed and adverse outcomes of COVID-19 infections declined in older adults.**

By June 30, 2020, an estimated 41% of U.S. adults reported having delayed or avoided medical care during the pandemic because of concerns about COVID-19, including 12% who reported having avoided urgent or emergency care. Avoidance of urgent or emergency care was more prevalent among unpaid caregivers for adults, people with underlying medical conditions, Black adults, Hispanic adults, young adults, and people with disabilities.[4]

People with disabilities hospitalized with COVID-19 had higher risk for severe outcomes, longer stays, and increased readmission, particularly those with mobility or intellectual/developmental disabilities (IDD). Community-dwelling people with disabilities had higher risk of discharge to skilled nursing or long-term care facilities.

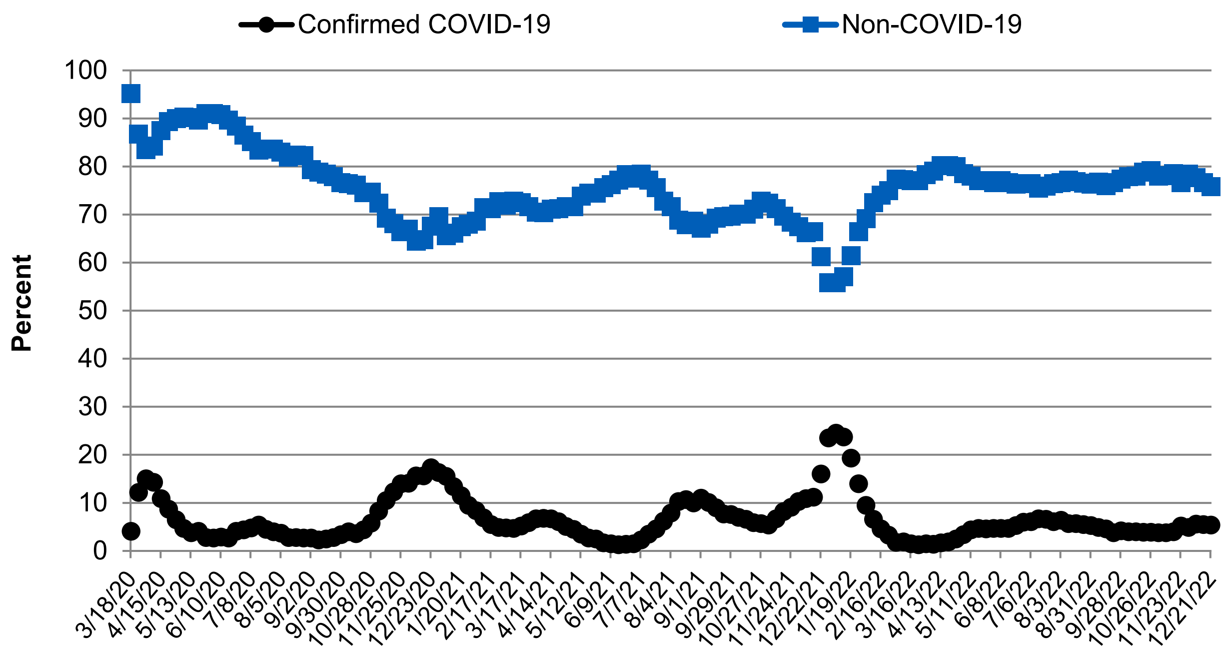
Increased risk of severe outcomes due to COVID-19 in hospitalized people with disabilities varied by disability type, with the highest risk for all outcomes among people with IDD. However, people with mobility disabilities also had an increased risk of adverse outcomes. People with any disability and people with each disability type who were admitted from the community were less likely to be discharged home than people without disabilities.[5]

Studies have shown that dementia was associated with an increased COVID-19 risk and lower adherence to hand washing among U.S. older adults.[6] In addition, people with dementia sought hospital care far less than usual, were not admitted to nursing homes, and experienced excess mortality during the first wave of the pandemic. Most services returned to historic levels, but telehealthcare visits remained a feature of care.[7]

During the COVID-19 pandemic, the number of ED visits was substantially lower than in previous years. Diagnoses associated with lower respiratory disease, pneumonia, difficulty breathing, cardiac arrest, and ventricular fibrillation increased. The number of visits for conditions such as nonspecific chest pain and acute myocardial infarction decreased, suggesting that some people might have delayed care for conditions that could lead to death if left untreated.

The striking decline in ED visits nationwide, with the highest declines in regions where the pandemic was most severe, suggests that the pandemic altered the public’s use of EDs. People who use the ED as a safety net because they lack access to primary care and telehealthcare could be disproportionately affected if they avoid seeking care because of concerns about the infection risk in the ED.[8]

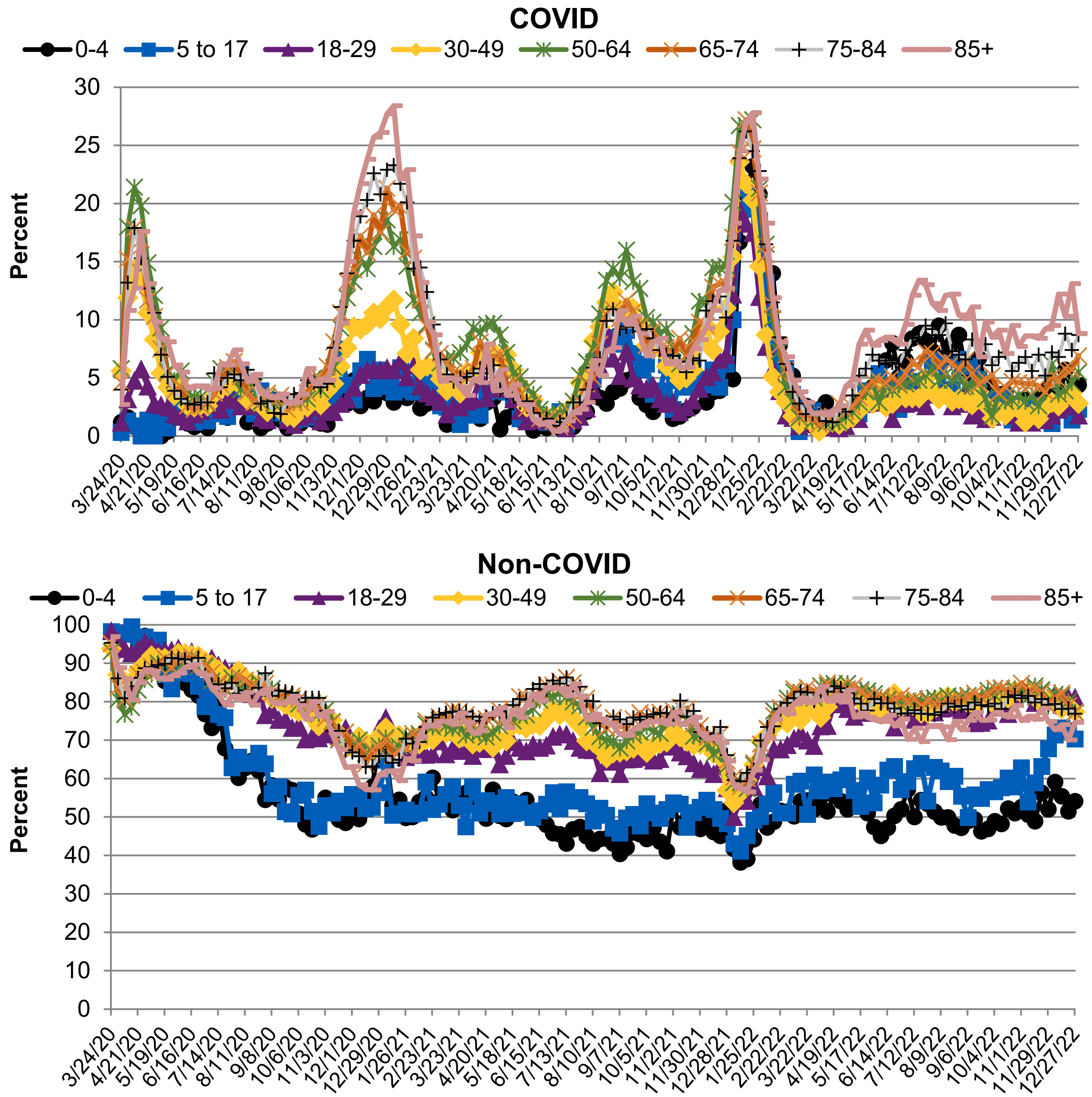
Figure 1. Inpatients with confirmed COVID-19 and non-COVID diagnoses from selected hospitals, March 2020-December 2022



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Care Survey, March 2020-December 2022.
Note: A confirmed COVID-19 hospital encounter is defined as an any listed International Classification of Diseases, 10th Revision, diagnosis code of B97.29 or U07.1. Before April 1, 2020, the Centers for Disease Control and Prevention guidance said to code a confirmed COVID-19 hospital encounter as B97.29. On April 1, 2020, the guidance changed to code confirmed COVID-19 hospital encounters as U07.1. The figure shows the percentage of hospital encounters coded with a B97.29 or U07.1 code. The data are from selected hospitals and considered preliminary. The data are not nationally representative.

- From March 2020 to December 2022, the highest percentage of inpatients with confirmed COVID-19 was observed from December 2021 to January 2022 (Figure 1).
- From March 2020 to December 2022, the lowest percentage of non-COVID-19 inpatient visits was observed from December 2021 to January 2022.

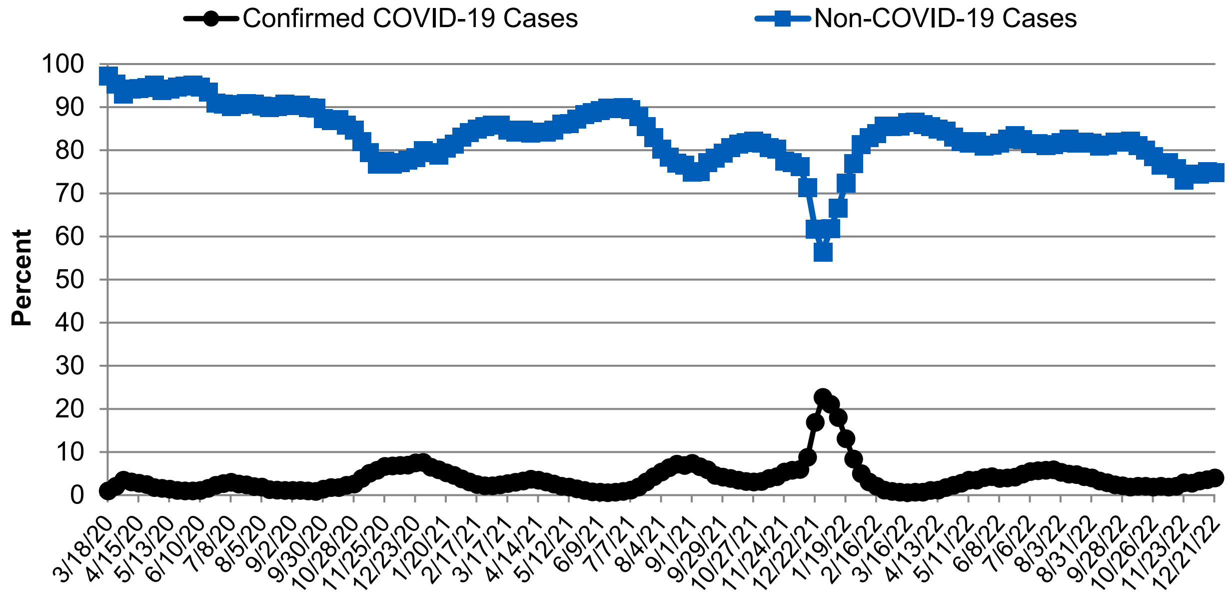
Figure 2. Inpatients with confirmed COVID-19 (top) and non-COVID diagnoses from selected hospitals (bottom), by age, March 2020-December 2022



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Care Survey, March 2020-December 2022.
Note: The data are from selected hospitals and considered preliminary. The data are not nationally representative.

- From March 2020 to December 2022, the highest percentage of inpatients with confirmed COVID-19 among all age groups was observed from December 2021 to January 2022 (Figure 2).
- From March 2020 to December 2022, the lowest percentage of non-COVID-19 inpatient visits among all age groups was observed from December 2021 to January 2022.

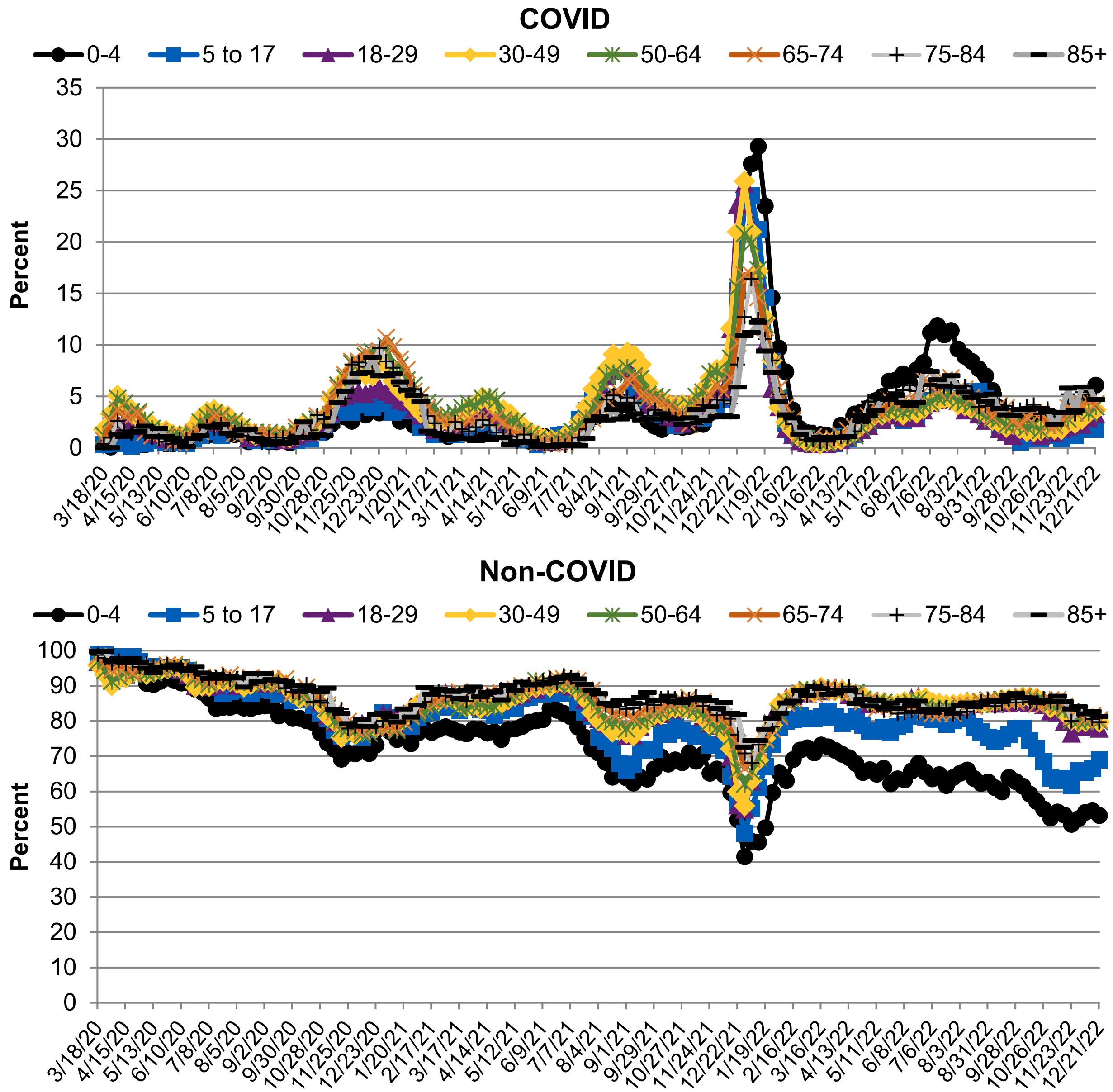
Figure 3. Emergency department visits with confirmed COVID-19 and non-COVID-19 from selected hospitals, March 2020-December 2022



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Care Survey, March 2020-December 2022.
Note: The data are from selected hospitals and considered preliminary. The data are not nationally representative.

- From March 2020 to December 2022, the highest percentage of ED visits with confirmed COVID-19 was observed from December 2021 to January 2022 (Figure 3).
- From March 2020 to December 2022, the lowest percentage of non-COVID-19 ED visits was observed from December 2021 to January 2022.

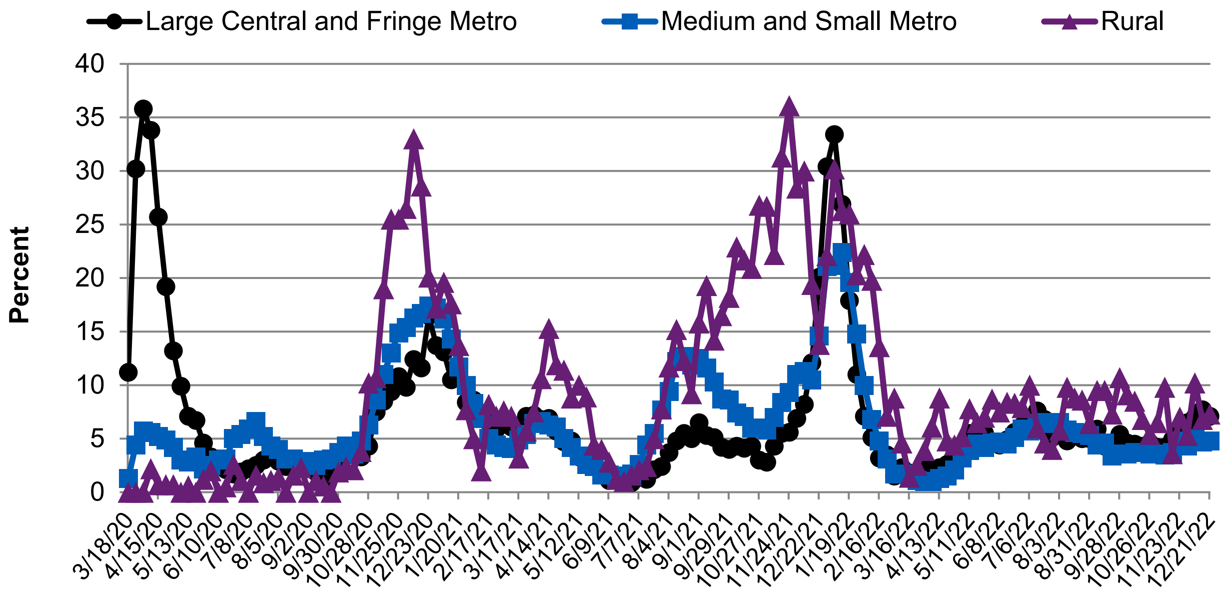
Figure 4. Confirmed COVID-19 (top) and non-COVID-19 (bottom) ED visits from selected hospitals, by age, March 2020-December 2022



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Care Survey, March 2020-December 2022.
Note: The data are from selected hospitals and considered preliminary. The data are not nationally representative.

- From March 2020 to December 2022, the highest percentage of confirmed COVID-19 ED visits among all age groups was observed from December 2021 to January 2022 (Figure 4).
- From March 2020 to December 2022, the lowest percentage of non-COVID-19 ED visits among all age groups was observed from December 2021 to January 2022.

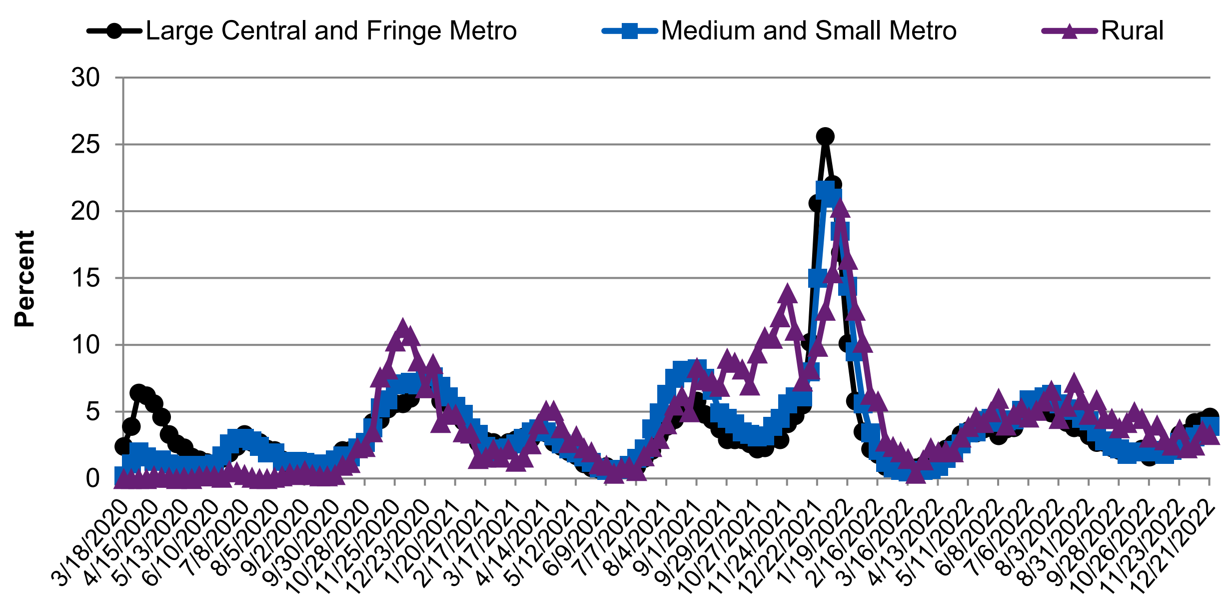
Figure 5. Confirmed COVID-19 Inpatient visits from selected hospitals, by hospital location, March 2020-December 2022



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Care Survey, March 2020-December 2022.
Note: The data are from selected hospitals and considered preliminary. The data are not nationally representative.

- From March 2020 to December 2022, the highest percentage of confirmed COVID-19 inpatient visits was observed in rural areas during November 2021 (Figure 5).

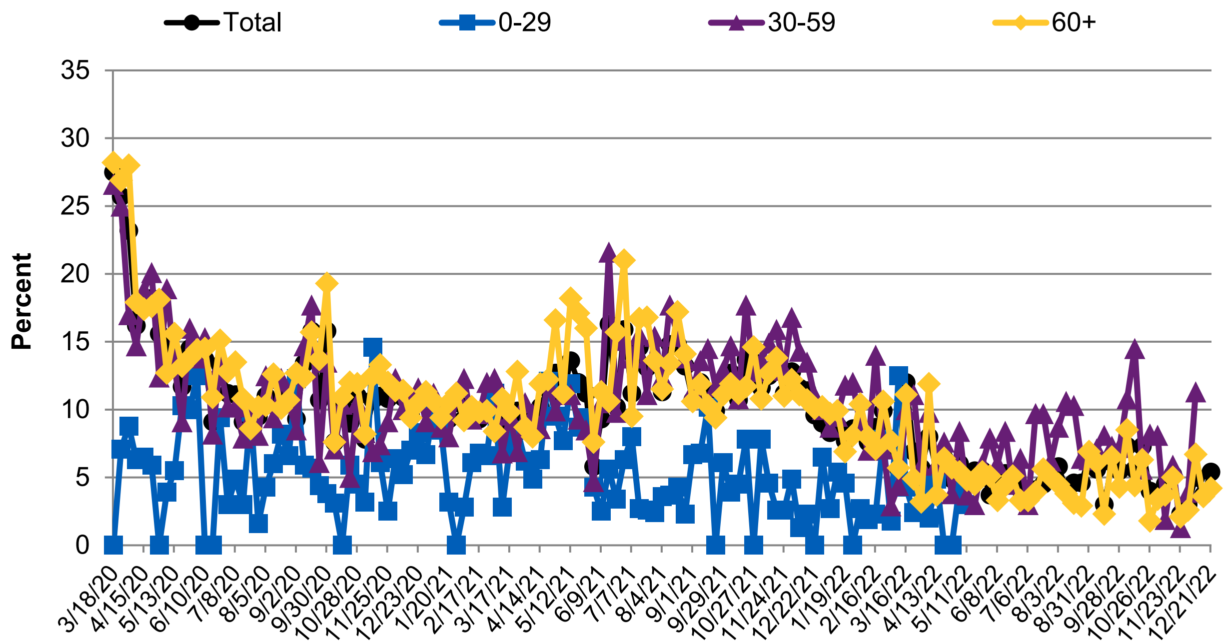
Figure 6. Confirmed COVID-19 ED visits from selected hospitals, by hospital location, March 2020-December 2022



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Care Survey, March 2020-December 2022.
Note: The data are from selected hospitals and considered preliminary. The data are not nationally representative.

- From March 2020 to December 2022, the highest percentage of confirmed COVID-19 ED visits was observed in large central and fringe metropolitan areas during December 2021 (Figure 6).

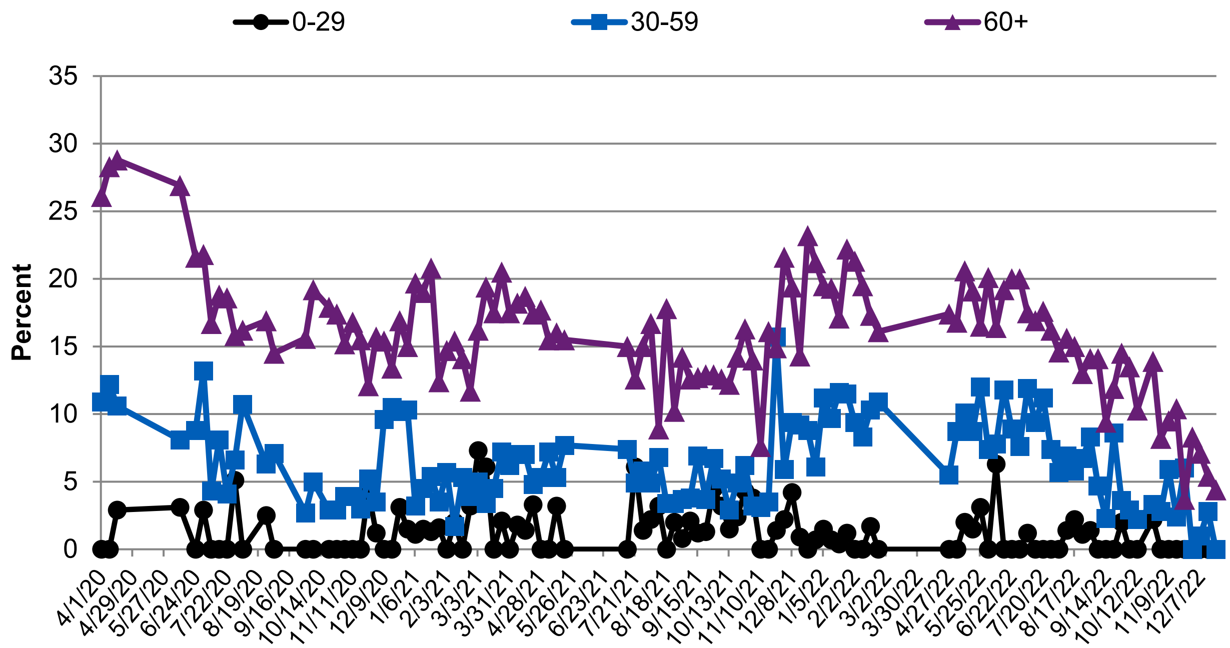
Figure 7. Confirmed COVID-19 inpatient discharges with intubation use from selected hospitals, by age, March 2020-December 2022



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Care Survey, March 2020-December 2022.
Note: The data are from selected hospitals and considered preliminary. The data are not nationally representative.

- From March 2020 to December 2022, the highest percentage of confirmed COVID-19 inpatient discharges with intubation use was observed in the early stage of the PHE (March 2020) among patients age 60 and over (28.2%) and later in 2021 and in 2022 by patients ages 30-59 (21.6% in June 2021) (Figure 7). For context, a 2015 CDC study found that approximately 5.3% of people hospitalized for severe community-acquired pneumonia required intubation and mechanical ventilation.[9]

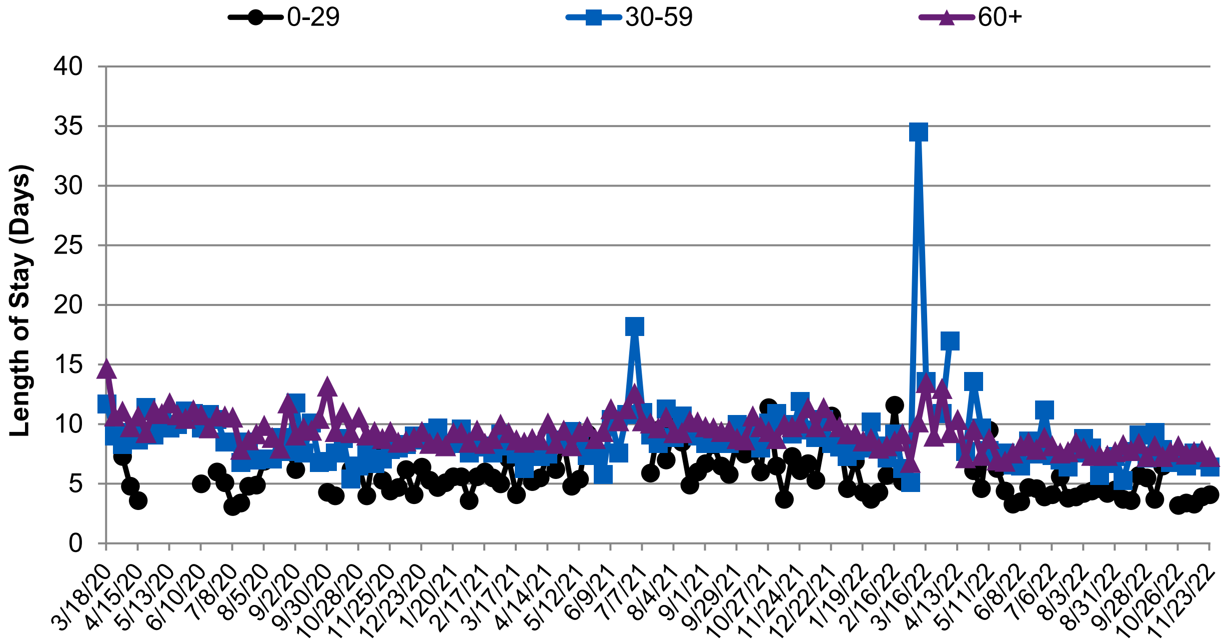
Figure 8. Confirmed COVID-19 patients who died in the hospital from selected hospitals, by age, April 2020-December 2022



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Care Survey, April 2020-December 2022.
Note: The data are from selected hospitals and considered preliminary. The data are not nationally representative.

- From April 2020 to December 2022, the highest percentage of confirmed COVID-19 patients who died in the hospital was observed in the early stage of the PHE (April 2020) (data not shown).
- From April 2020 to December 2022, the highest percentage of confirmed COVID-19 patients who died in the hospital was observed in the early stage of the PHE (April 2020) among patients age 60 and over (Figure 8).

Figure 9. Average length of stay of confirmed COVID-19 inpatients discharged from selected hospitals, by age, March 2020-November 2022



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Care Survey, March 2020-November 2022.
Note: The data are from selected hospitals and considered preliminary. The data are not nationally representative.

- In 2020, the average hospital length of stay (LOS) was 4.9 days, compared with 4.7 days in 2019 (data not shown).
- From March 2020 to November 2022, the longest average LOS of confirmed COVID-19 patients was 35 days, observed during March 2022 among patients ages 30-59 years Figure 9).

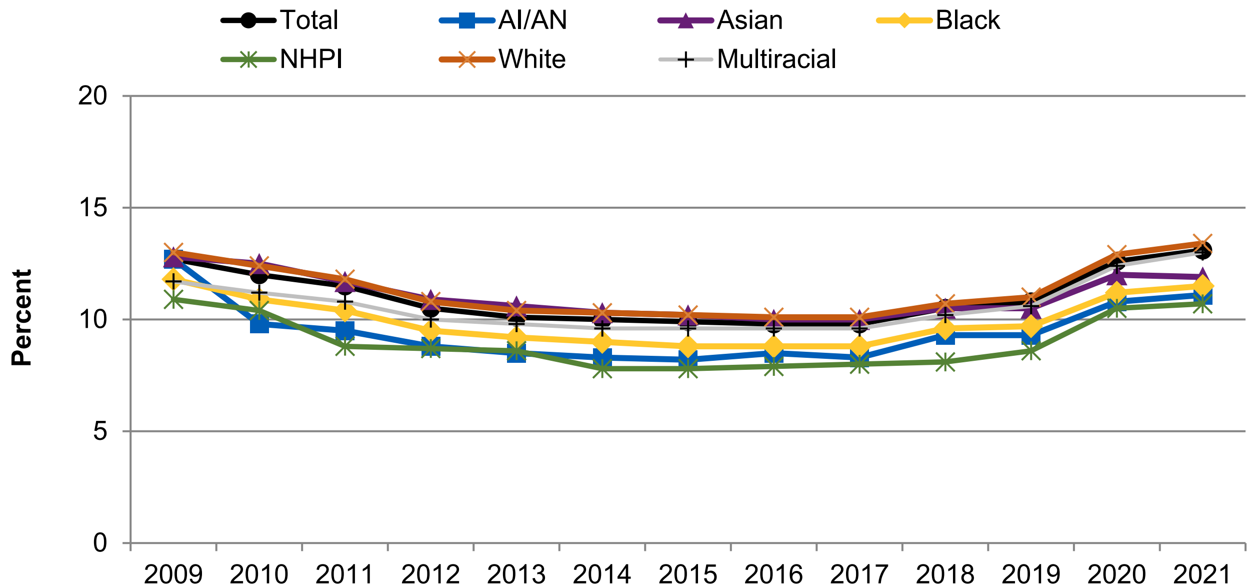
Patient Experience With Hospital Care

According to the Consumer Assessment of Healthcare Providers and Systems (CAHPS), patient experience encompasses the range of interactions patients have with the healthcare system. These interactions include their care from health plans and from physicians, nurses, and staff in hospitals, physician practices, and other healthcare facilities.

As an integral component of healthcare quality, patient experience includes several aspects of healthcare delivery that patients value highly when they seek and receive care. These include timely appointments, easy access to information, and good communication with healthcare providers.

Understanding patient experience is a key step in moving toward patient-centered care. By looking at various aspects of patient experience, we can assess the extent to which patients are receiving care that is respectful of and responsive to their preferences, needs, and values. Evaluating patient experience along with other components such as effectiveness and safety of care is essential to providing a complete picture of healthcare quality.

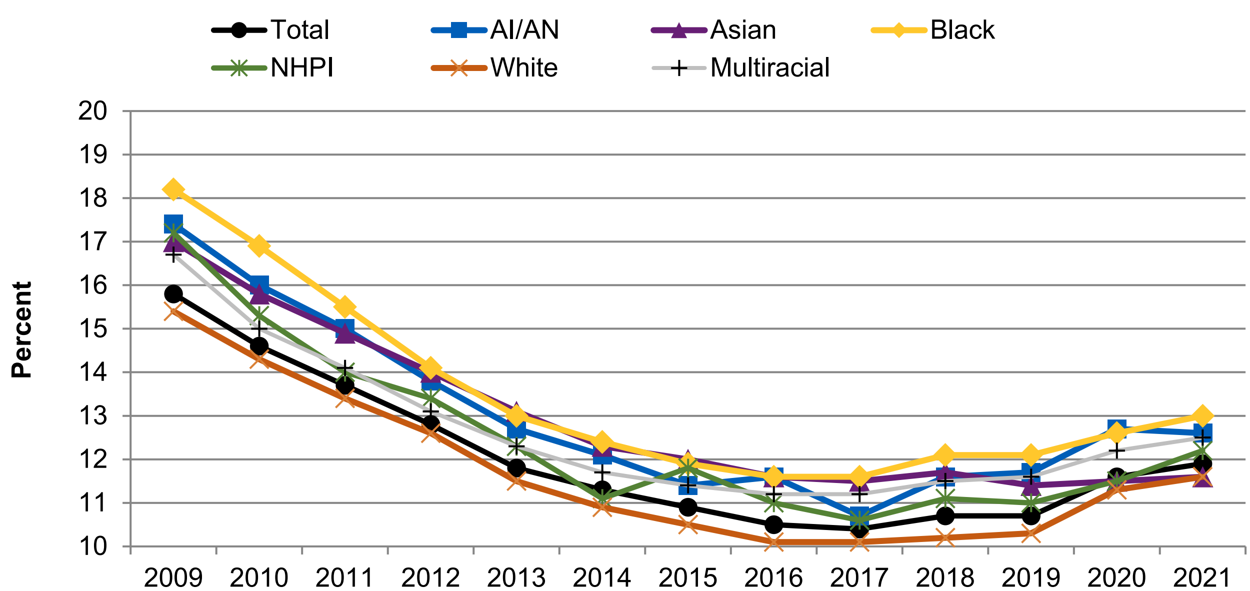
Figure 10. Adult hospital patients who sometimes or never had good communication about medications they received in the hospital, by race, 2009-2021 (lower rates are better)



Key: AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Hospital Consumer Assessment of Healthcare Providers and Systems, 2009-2021.

- From 2019 to 2021, the percentage of adult hospital patients who sometimes or never had good communication about medications they received in the hospital increased for all racial groups (Figure 10).

Figure 11. Adult hospital patients who did not receive good communication about discharge information, by race, 2009-2021 (lower rates are better)



Key: AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Hospital Consumer Assessment of Healthcare Providers and Systems, 2009-2021.

- From 2009 to 2021, the percentage of adult hospital patients who did not receive good communication about discharge information decreased for all racial groups (Figure 11).
- From 2019 to 2021, the percentage of adult hospital patients who did not receive good communication about discharge information increased for NHPI and White people.

Emergency Department Wait Times

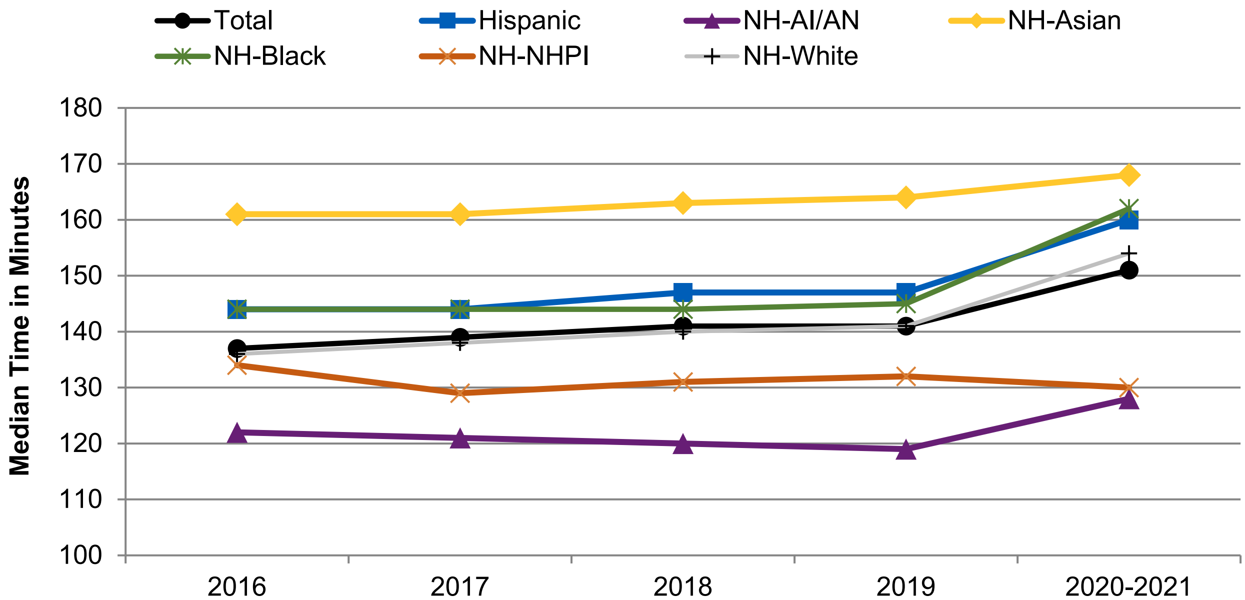
- ❖ **Emergency department wait times have worsened overall and for patients with psychiatric or mental health conditions. Wait times for patients with cardiac symptoms also worsened.**

The lack of ED capacity during the COVID-19 PHE was in part due to patients waiting in the ED until an inpatient bed became available, a practice referred to as boarding. It occurs when people present to the ED, either for an initial evaluation or after being transferred from another hospital, and then wait an extended time to move from the ED to a hospital ward. In a Centers for Medicare & Medicaid Services review of data from calendar year 2019, of the hospitals that reported using the ED-2 boarding metric, the average median boarding time was 101 minutes.[10]

Boarding is associated with several adverse outcomes, including increased medical errors and death. These outcomes likely occur because the ED is ill equipped to provide longitudinal and focused inpatient care and attention is frequently diverted to new patients who present with undifferentiated conditions.[10]

Negative effects such as death increase exponentially as the system becomes more stressed. The Department of Health and Human Services time series dataset showed that as of October 25, 2021, capacity in adult intensive care units nationwide had exceeded 75% for at least 12 weeks. This level meant that the United States experienced the high and sustained levels of hospital strain associated with significant subsequent increases in excess deaths.[11]

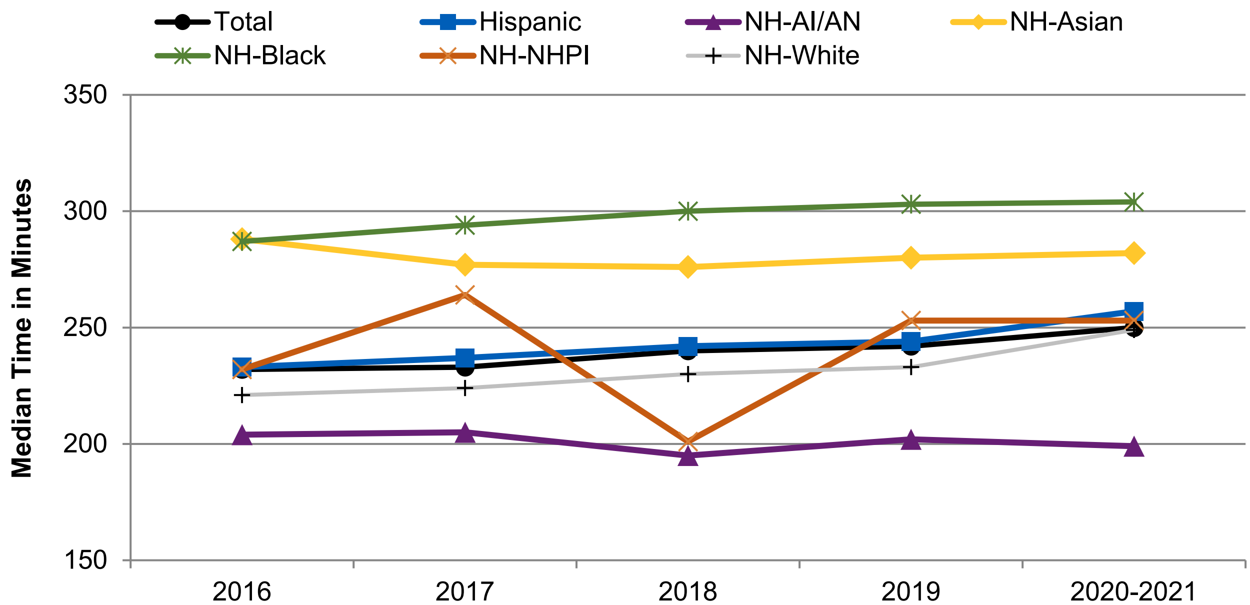
Figure 12. Median time in minutes outpatients spent in the emergency department from arrival to departure, by race/ethnicity, 2016-2021 (lower rates are better)



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Clinical Data Warehouse, 2016-2021.

- From 2019 to 2021, the median time outpatients spent in the ED from arrival to departure increased overall and for most racial/ethnic groups (Figure 12):
  - The median time for Hispanic patients increased from 147 to 160 minutes.
  - The median time for NH-AI/AN patients increased from 119 to 128 minutes.
  - The median time for NH-Asian patients increased from 164 to 168 minutes.
  - The median time for NH-Black patients increased from 145 to 162 minutes.
  - The median time for NH-White patients increased from 141 to 154 minutes.
  - The median time for NH-NHPI patients decreased by 2 minutes, from 132 to 130 minutes.

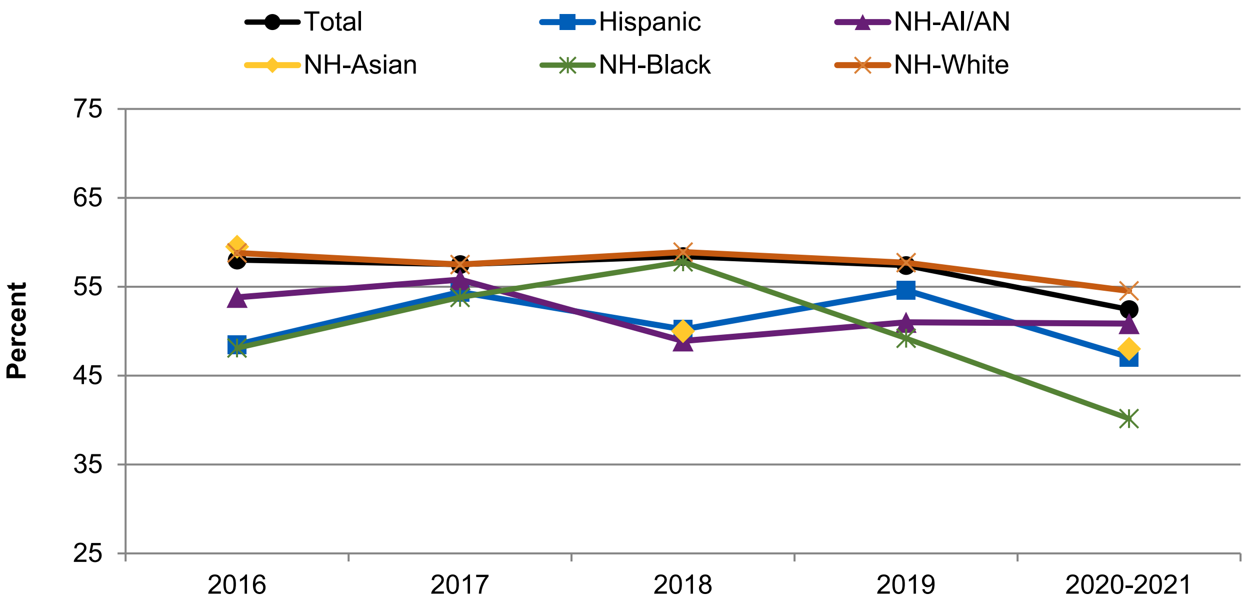
Figure 13. Median time in minutes outpatients with psychiatric or mental health conditions spent in the emergency department from arrival to departure, by race/ethnicity, 2016-2021 (lower rates are better)



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Clinical Data Warehouse, 2016-2021.

- From 2019 to 2021, the median time outpatients with psychiatric or mental health conditions spent in the ED from arrival to departure increased overall from 242 to 250 minutes (Figure 13):
    - The median time for Hispanic patients increased from 244 to 257 minutes.
    - The median time for NH-White patients increased from 233 to 249 minutes.

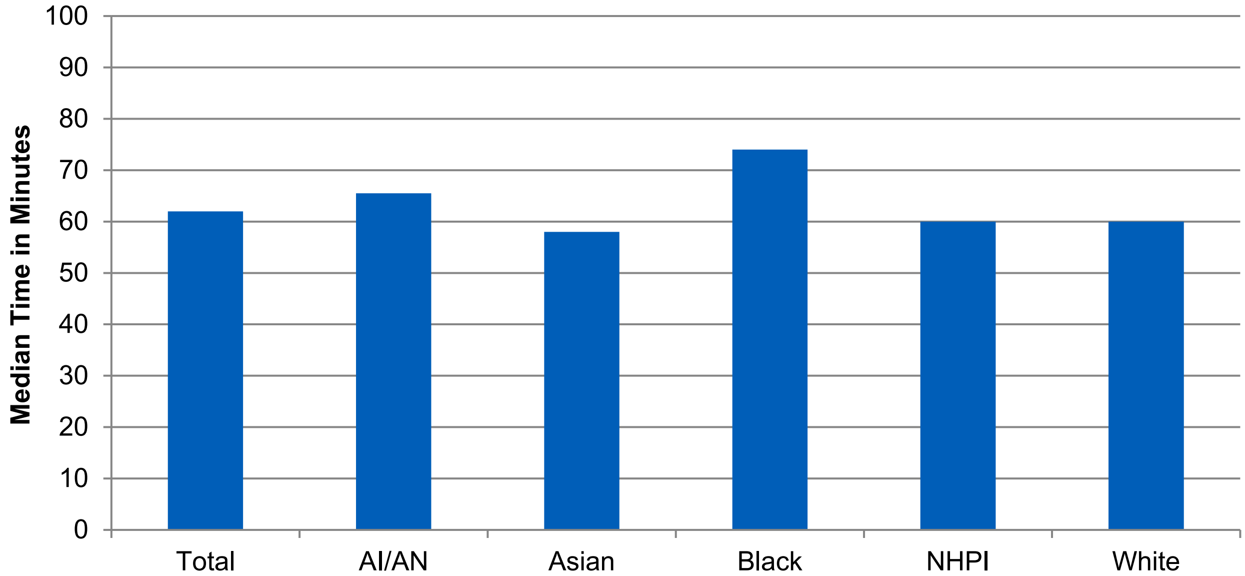
Figure 14. Outpatients with chest pain or possible heart attack who received fibrinolytic therapy within 30 minutes of arrival, by race/ethnicity, 2016-2021



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native.
Source: Centers for Medicare & Medicaid Services, Clinical Data Warehouse, 2016-2021.
Note: Data for NH-Native Hawaiian/Pacific Islander patients and 2017 and 2019 data for non-Hispanic Asian patients did not meet the criteria for statistical reliability.

- From 2019 to 2021, the percentage of outpatients with chest pain or possible heart attack who received fibrinolytic therapy within 30 minutes of arrival fell, overall, from 57.4% to 52.4% (Figure 14).
- From 2019 to 2021, the percentage of outpatients with chest pain or possible heart attack who received fibrinolytic therapy within 30 minutes of arrival fell sharply for NH-Black (49.2% to 40.2%) and Hispanic patients (54.6% to 47.1%).

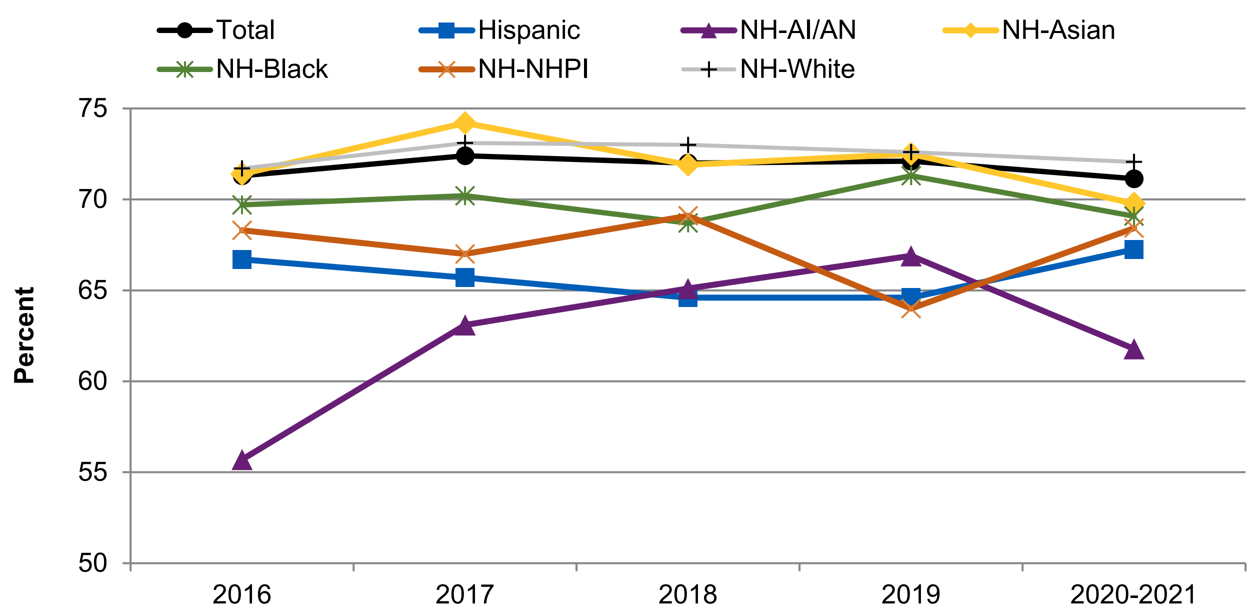
Figure 15. Median time to transfer to another facility for acute coronary intervention, by race, 2020 (lower rates are better)



Key: AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Clinical Data Warehouse, 2020.

- In 2020, the median time to transfer to another facility for acute coronary intervention was longest for Black patients (74 minutes) and shortest for Asian patients (58 minutes) (Figure 15).

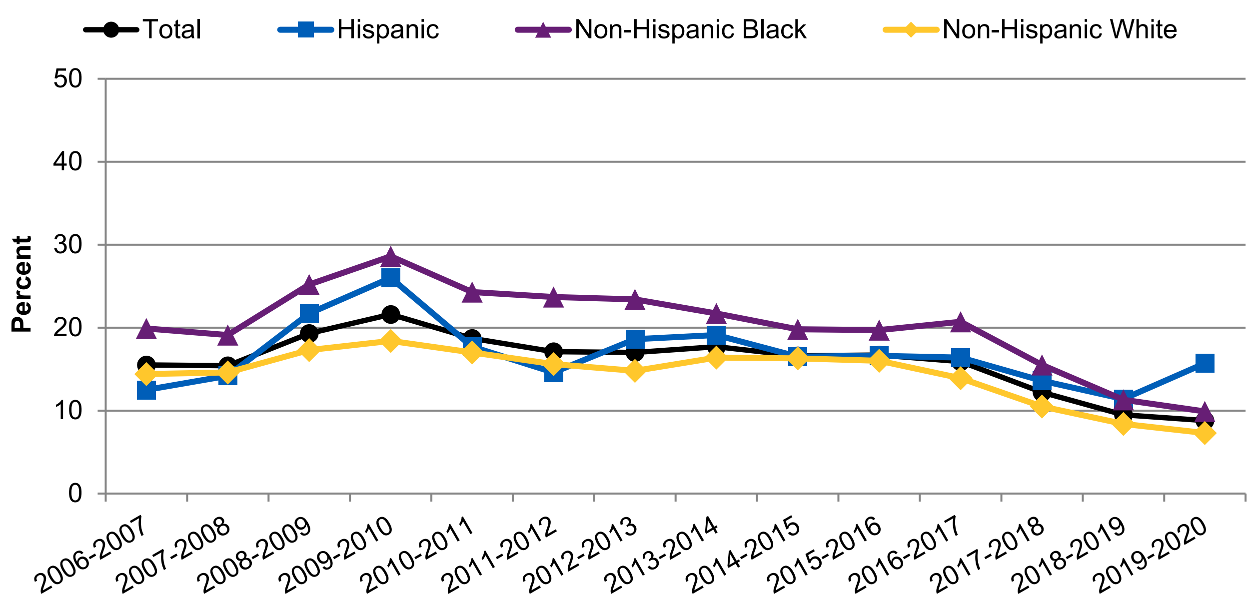
Figure 16. Ischemic or hemorrhagic stroke patients who came to the emergency department with stroke symptoms and received head CT or MRI who received the interpretation of the results within 45 minutes of ED arrival, by race/ethnicity, 2016-2021



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Clinical Data Warehouse, 2016-2021.

- From 2016 to 2019, the percentage of ischemic or hemorrhagic stroke patients who came to the ED with stroke symptoms and received head CT or MRI who received the interpretation of the results within 45 minutes of ED arrival increased among AI/AN patients but fell between 2019 and 2021 from 66.9% to 61.8% (Figure 16).
- From 2016 to 2019, the percentage of ischemic or hemorrhagic stroke patients who came to the ED with stroke symptoms and received head CT or MRI who received the interpretation of the results within 45 minutes of ED arrival decreased among Hispanic patients. The percentage increased from 64.6% in 2019 to 67.3% in 2021.
- From 2019 to 2021, the percentage of ischemic or hemorrhagic stroke patients who came to the ED with stroke symptoms and received head CT or MRI who received the interpretation of the results within 45 minutes of ED arrival increased from 64.0% to 68.4% among NHPI patients.

Figure 17. Emergency department visits triaged as immediate or emergent at which patients waited to see a physician for 1 hour or more, by ethnicity, 2006-2020 (lower rates are better)



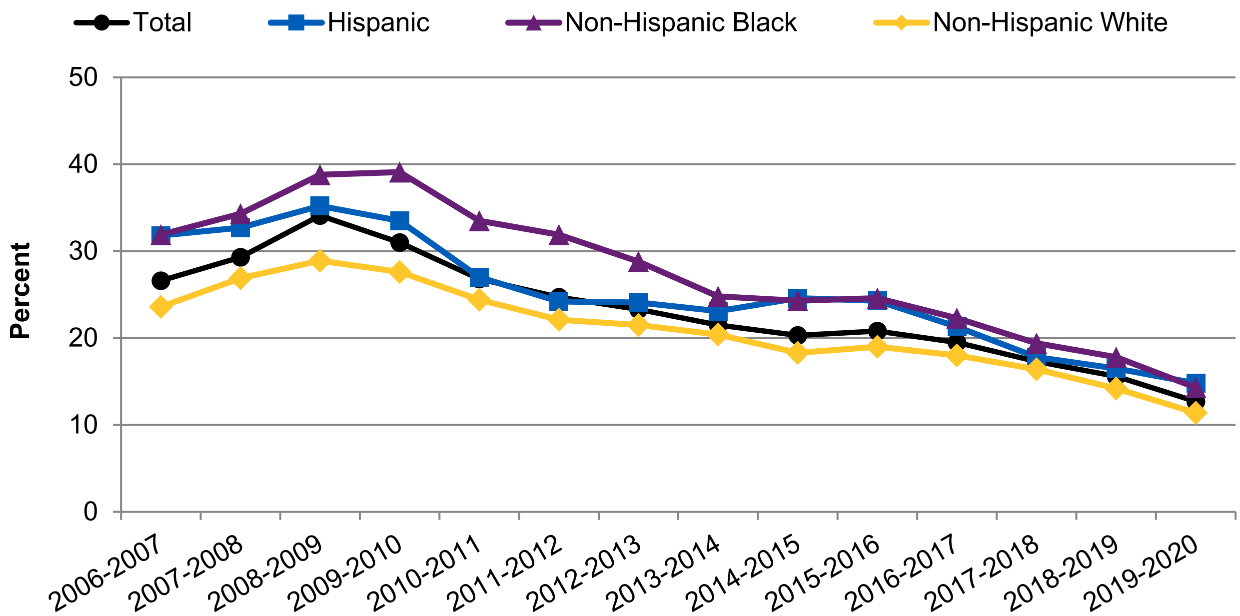
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2006-2020.
Note: The National Hospital Ambulatory Medical Care Survey classifies emergency department visits based on one of five levels of severity during nursing triage. "Immediate" visits involve the most life-threatening conditions, which require immediate attention. "Emergent refers to conditions that warrant evaluation within 15 minutes.

- From the 2-year period 2006-2007 to the 2-year period 2019-2020, the percentage of ED visits triaged as immediate or emergent at which patients waited to see a physician for 1 hour or more improved for NH-Black and NH-White patients but showed no statistically significant[i] change for Hispanic patients (Figure 17).

[i] Unless noted otherwise, for trend analyses, data points under each figure only report differences that are statistically significant (i.e., p value less than 0.1) and show an average annual percentage change greater than 1% per year. For comparisons between two populations, data points under each figure only report differences that are statistically significant (i.e., p value less than 0.05) and have a relative difference between the populations of at least 10%. Readers may learn more about NHQDR's reporting methodology in Appendix A at https://www.ahrq.gov/research/findings/nhqrdr/nhqdr23/index.html.

- From the 2-year period 2018-2019 to the 2-year period 2019-2020, the percentage of ED visits triaged as immediate or emergent at which patients waited to see a physician for 1 hour or more increased from 11.4% to 15.7% for Hispanic patients.

Figure 18. Emergency department visits triaged as urgent at which patients waited to see a physician for 1 hour or more, by ethnicity, 2006-2020 (lower rates are better)



Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Ambulatory Medical Care Survey, 2006-2020.
Note: The National Hospital Ambulatory Medical Care Survey classifies emergency department visits based on one of five levels of severity during nursing triage. "Urgent" visits warrant assessment within 15-60 minutes.

- From the 2-year period 2006-2007 to the 2-year period 2019-2020, the percentage of ED visits triaged as urgent at which patients waited to see a physician for 1 hour or more improved overall and for Hispanic, NH-Black, and NH-White patients (Figure 18).
- In the 2-year period 2019-2020, overall, 12.7% of ED visits triaged as urgent had patients who waited to see a physician for 1 hour or more. Among Hispanic patients, 14.8% of visits, among NH-Black patients, 14.3% of visits, and among NH-White patients, 11.4% of visits triaged as urgent had patients who waited to see a physician for 1 hour or more.

COVID-19 and Patient Safety

- ❖ **The COVID-19 public health emergency put enormous stress on the healthcare system and disrupted many normal activities in hospitals and other facilities. However, postoperative sepsis, central venous catheter-related bloodstream infections, and postoperative pulmonary embolism or deep vein thrombosis all continued to improve through 2020 for non-COVID-19 patients.**

An AHRQ study published in *JAMA* showed that rates of in-hospital adverse events for healthcare-related patient harm fell significantly in the United States in the decade before the onset of the COVID-19 pandemic.[12] Unfortunately, multiple sources have reported a reversal in this trend since 2020. It was both difficult and essential to manage the competing priorities of providing care for large numbers of patients with COVID-19, as well as for the patients without COVID-19 who needed routine care. At the same time, it was crucial to maintain safety efforts such as robust infection control practices.[13]

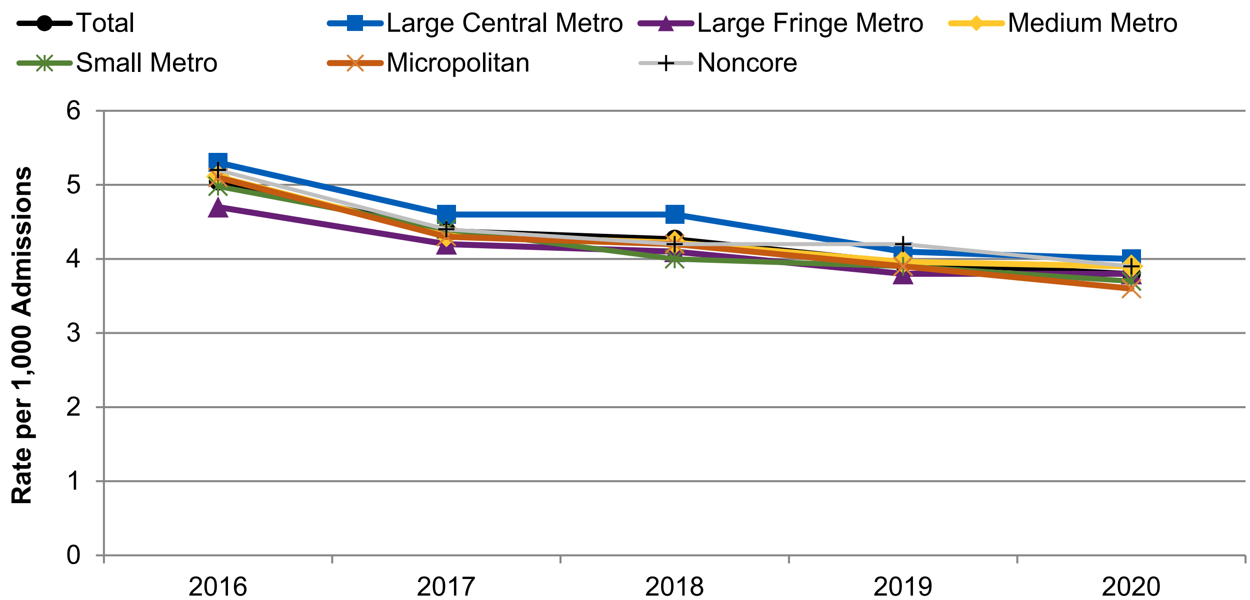
Since the COVID-19 pandemic began, many indicators make it clear that patient safety has declined. The average risk of healthcare-associated infections,[14] CLABSIs, and falls increased during the pandemic.[13] Potential reasons for the increase in patient safety events include newly implemented contact isolation procedures and use of personal protective equipment (PPE). PPE, particularly respiratory protection (e.g., face masks, respirators), muffles sounds, prevents lip reading, and makes reading facial expressions challenging, creating potential patient safety challenges.[15]

The risk of pressure injuries of the skin and soft tissue has increased during the pandemic. Prone positioning for ventilated patients has been widely adopted for patients with COVID-19. While the prone position has led to better outcomes, it has also created a unique challenge for nursing staff when it comes to preventing pressure injuries. Not only is patient repositioning more challenging, but also the continuous pressure points are very different from those nurses typically encounter and manage.[16]

Among COVID-19 patients in particular, hospital data have indicated an increased risk of hospital-acquired infections during the pandemic. This increased risk of infection may, in part, be due to increased device utilization and prolonged hospitalization of COVID-19 patients, but also to challenges in maintaining those devices (catheters, central lines, etc.) while trying to limit provider exposure and conserve PPE.[16]

Patient safety analyses in this report use AHRQ Patient Safety Indicators (PSIs), Healthcare Cost and Utilization Project data on postoperative sepsis, CLABSI, and postoperative pulmonary embolism or deep vein thrombosis that exclude COVID-19 patients. When the PSIs were calculated for the NHQDR, PSI software excluded all COVID-19 hospitalizations. We report patient safety events only for people hospitalized without COVID-19.[17] This approach may have resulted in lower rates of patient safety events compared with other studies.

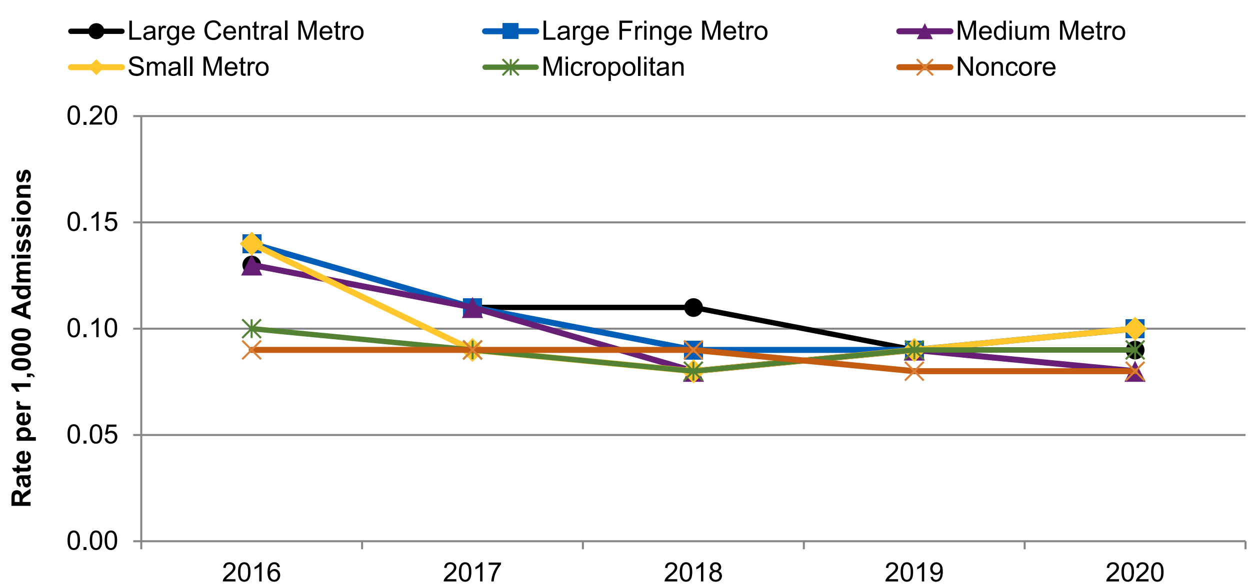
Figure 19. Postoperative sepsis per 1,000 elective-surgery admissions, age 18 and over, by residence location, 2016-2020 (lower rates are better)

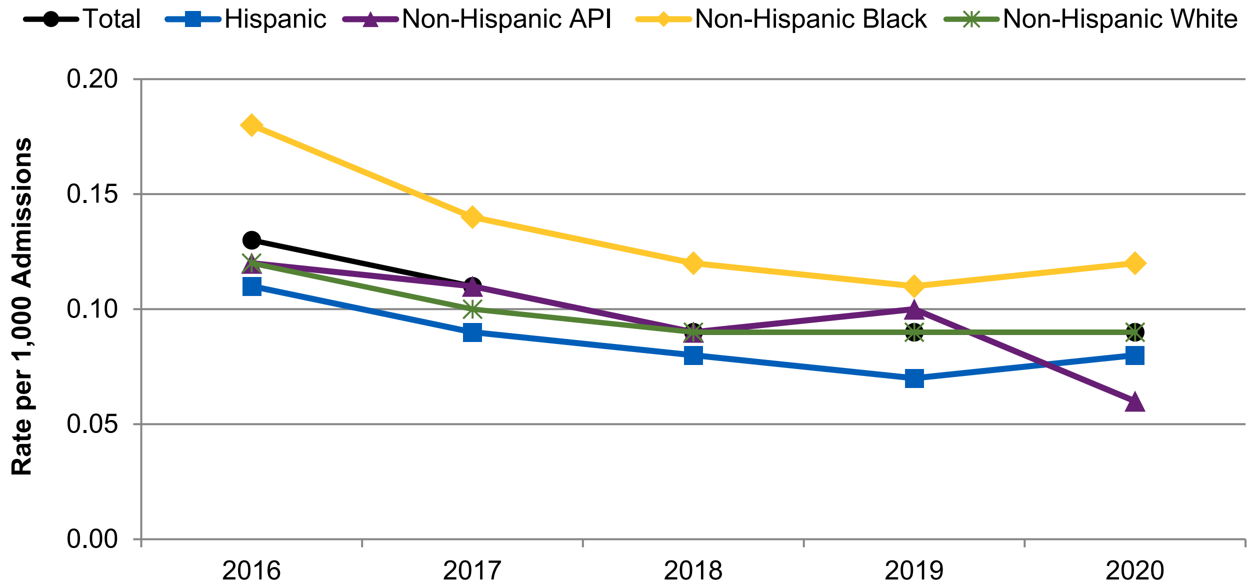


Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases, weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.1, 2016-2020. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).

- From 2016 to 2020, the rate of postoperative sepsis declined among patients in all residence locations (Figure 19).

Figure 20. Hospital admissions with central venous catheter-related bloodstream infection per 1,000 medical and surgical discharges of length 2 or more days, age 18 and over or obstetric admissions, by residence location (top) and race/ethnicity (bottom), 2016-2020 (lower rates are better)

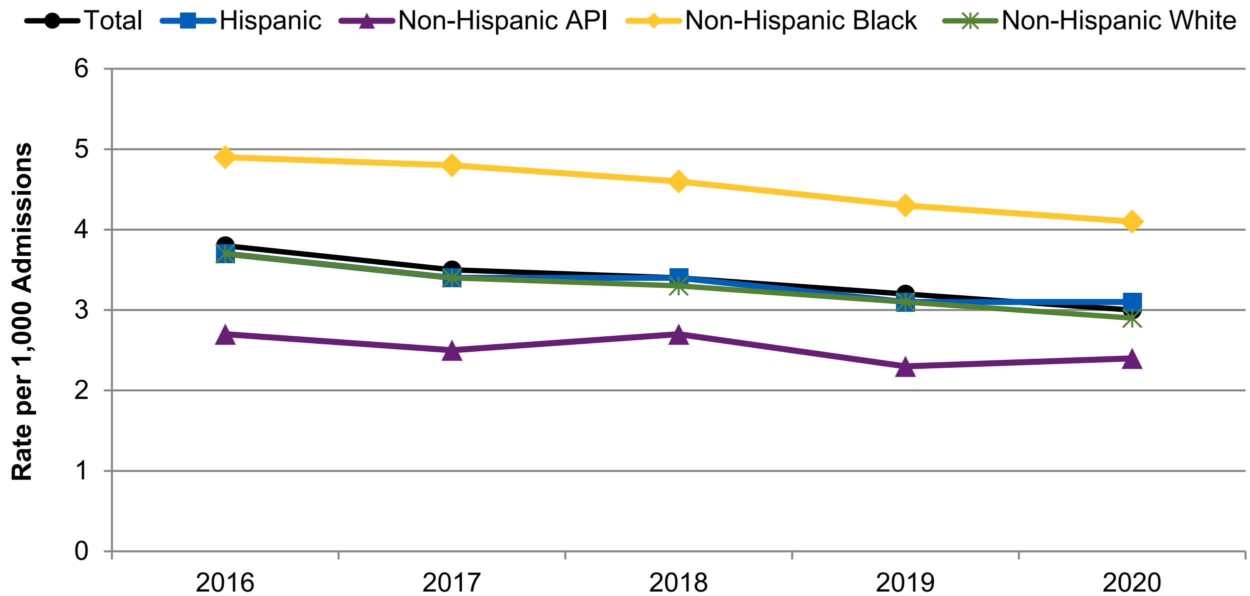




Key: API = Asian or Pacific Islander.
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases, weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.1, 2016-2020. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).

- From 2016 to 2020, the rate of hospital admissions with CLABSI decreased among residents of large central and medium metro areas from 0.13 to 0.09 per 1,000 medical and surgical discharges and from 0.13 to 0.08 per 1,000 medical and surgical discharges, respectively (Figure 20).
- The rate of hospital admissions with CLABSI decreased among patients from noncore areas from 0.09 to 0.08 per 1,000 medical and surgical discharges.
- From 2016 to 2020, the rate of hospital admissions with CLABSI decreased among patients from all ethnic groups.

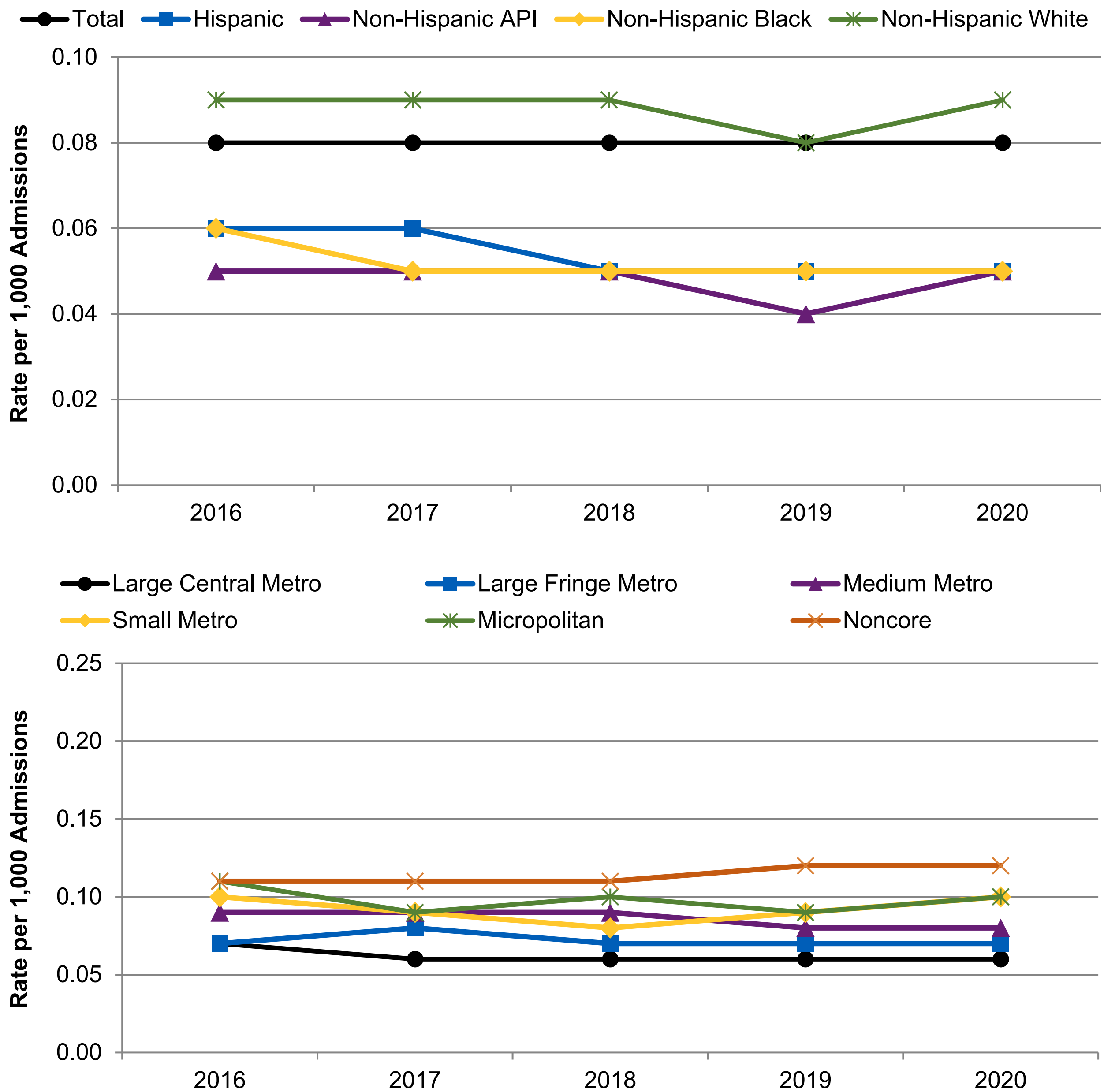
Figure 21. Postoperative pulmonary embolism or deep vein thrombosis per 1,000 surgical admissions, age 18 and over, race/ethnicity, 2016-2020 (lower rates are better)



Key: API = Asian or Pacific Islander.
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases, weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.1, 2016-2020. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).

- From 2016 to 2020, the rate of postoperative pulmonary embolism or deep vein thrombosis improved overall and for Hispanic, non-Hispanic Black, and non-Hispanic White patients (Figure 21):
  - Overall, patients experienced a decrease from 3.8 to 3.0 per 1,000 surgical admissions.
  - Non-Hispanic Black patients experienced a decrease from 4.9 to 4.1 per 1,000 surgical admissions.
  - Hispanic patients experienced a decrease from 3.7 to 3.1 per 1,000 surgical admissions.
  - Non-Hispanic White patients experienced a decrease from 3.7 to 2.9 per 1,000 surgical admissions.

Figure 22. Postoperative hip fracture per 1,000 surgical admissions who were not susceptible to falling, age 18 and over, by race/ethnicity (top) and residence location (bottom), 2016-2020 (lower rates are better)



Key: API = Asian or Pacific Islander.
Source: Agency for Healthcare Research and Quality (AHRQ), Healthcare Cost and Utilization Project (HCUP), State Inpatient Databases, weighted to provide national estimates; and the AHRQ Quality Indicators, v2022.1, 2016-2020. For more information, see the HCUP Methods Series Report on Methods Applying AHRQ Quality Indicators to HCUP Data (https://www.hcup-us.ahrq.gov/reports/methods/methods.jsp).

- From 2016 to 2020, rates of postoperative hip fracture decreased for Hispanic patients and residents of medium metro areas but increased for residents of noncore areas (Figure 22):
  - Hispanic patients experienced a decrease from 0.06 to 0.05 per 1,000 surgical admissions.
  - From 2016 to 2020, rates decreased for residents of medium metro areas from 0.09 to 0.08 per 1,000 surgical admissions.
  - From 2016 to 2020, rates increased for residents of noncore areas from 0.11 to 0.12 per 1,000 surgical admissions.

Discussion and Conclusions

The COVID-19 pandemic caused massive disruption in the usual care delivery patterns in hospitals across the United States and highlighted longstanding inequities in healthcare delivery and outcomes.[18]

Hospital and ED visits closely aligned with the volume of COVID-19 cases. Data show increased hospitalization and ED visits with confirmed COVID-19 during surges associated with the Alpha and Omicron variants. At the same time, data show a decrease in hospitalization and ED visits for non-COVID-19 conditions during surge periods, suggesting that patients with non-COVID-19 chose to avoid hospitals or capacity was reduced due to the number of COVID-19 cases.

During the first 3 months of the pandemic before effective treatments and vaccines became available, worse health outcomes, including ventilator use and deaths, were observed in large central and fringe metropolitan areas. As the alpha variant emerged, rural areas began experiencing more hospitalizations.

Delays in emergency care can lead to serious health consequences. Routinely crowded EDs are associated with increased stress on staff, poor adherence to protocols, and clinical errors.[19] Data show that during the COVID-19 pandemic, ED wait times worsened for Black and Hispanic patients, particularly for psychiatric or mental health and cardiovascular conditions, potentially leading to worse outcomes and increased disparities.

The COVID-19 pandemic necessitated drastic changes to the way healthcare services were delivered across care settings, in particular in hospital EDs and inpatient units. Hospitals experienced an increase in device use (e.g., ventilators, catheters) and strains on availability of PPE. Particularly in the earlier phases of the pandemic, there were patient safety concerns associated with factors such as disease exposure, timely diagnosis, and treatment access related to pressures on the system.[16]

During the COVID-19 PHE, wait times for “treat and release” ED patients appeared to increase, but triage for immediate and emergent need patients continued to improve. While earlier accounts had reported increased patient safety events during the COVID-19 PHE, data collected for the NHQDR do not show higher event rates when analyses are restricted to hospitalized non-COVID-19 patients. NHQDR data, however, do show disparities in some patient safety outcomes. Hispanic, non-Hispanic Black, and non-Hispanic API patients experienced the worst outcomes for postoperative sepsis.

Resources

AHRQ Tools To Reduce Hospital-Acquired Conditions (https://www.ahrq.gov/hai/ hac/tools.html). Hospital-acquired conditions (HACs) are those a patient develops while in the hospital being treated for something else. These conditions harm patients. Hospitals and healthcare providers are focused on reducing specific HACs that occur frequently, can cause significant harm, and are often preventable based on existing evidence. To reduce these HACs and other adverse events in hospitals, AHRQ has created numerous tools and resources.

Toolkit for Decolonization of Non-ICU Patients With Devices (https://www.ahrq.gov/hai/tools/abate/index.html) can help hospital infection prevention programs implement a decolonization protocol that was found to reduce bloodstream infections by more than 30% in adult inpatients who were not in intensive care units and who had specific medical devices. It includes implementation instructions, demonstration videos, and customizable tools.

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Impact of COVID-19 on Ambulatory Care

Ambulatory care is provided by healthcare professionals in outpatient settings. These settings include medical offices and clinics, ambulatory surgery centers, hospital outpatient departments, and dialysis centers. The scope of ambulatory care has expanded over the past decade, as the volume and complexity of interventions have expanded. Safe, high-quality ambulatory care requires complex information management and care coordination across multiple settings, especially for patients with chronic illnesses.[1]

In 2019, physician and clinical services expenditures, which cover services provided in establishments operated by doctors of medicine and doctors of osteopathy, in outpatient care centers was $767.9 billion. In 2021, this total increased 5.6% to $864.6 billion, slower growth than the 6.6% in 2020.[2,3]

This special emphasis topic focuses on the impact of COVID-19 on two exemplar services provided in ambulatory care settings: diabetes management and cancer screening. Findings follow:

- During the COVID-19 pandemic, Hispanic people were less likely to delay both medical and dental care compared with non-Hispanic (NH) White people. Similarly, micropolitan area residents were less likely to delay both medical and dental care compared with large fringe metropolitan area residents.
- Despite the challenges to ambulatory care caused by the COVID-19 pandemic, changes to receipt of recommended diabetes care were minimal for patients in most locations during the first year of the pandemic. The one measure of recommended care for people diagnosed with diabetes that decreased was the percentage of people who had their feet checked for sores or irritation in the calendar year. From 2002 to 2019, worsening trends were observed among residents of large central, large fringe, and medium metropolitan areas. From 2002 to 2020, residents of all four metropolitan areas showed worsening trends.
- Among ethnic groups, in 2021, NH-Black women ages 50-74 were more likely to receive a mammogram in the last 2 years compared with NH-White women. On the other hand, NH-Asian women were less likely to receive a mammogram compared with NH-White women. Women residing in micropolitan and noncore areas were less likely to receive a mammogram compared with women in large fringe metropolitan areas.
- In 2021, Hispanic, NH-Asian, and NH-Black women were all less likely to receive a Pap smear or human papillomavirus test compared with NH-White women.

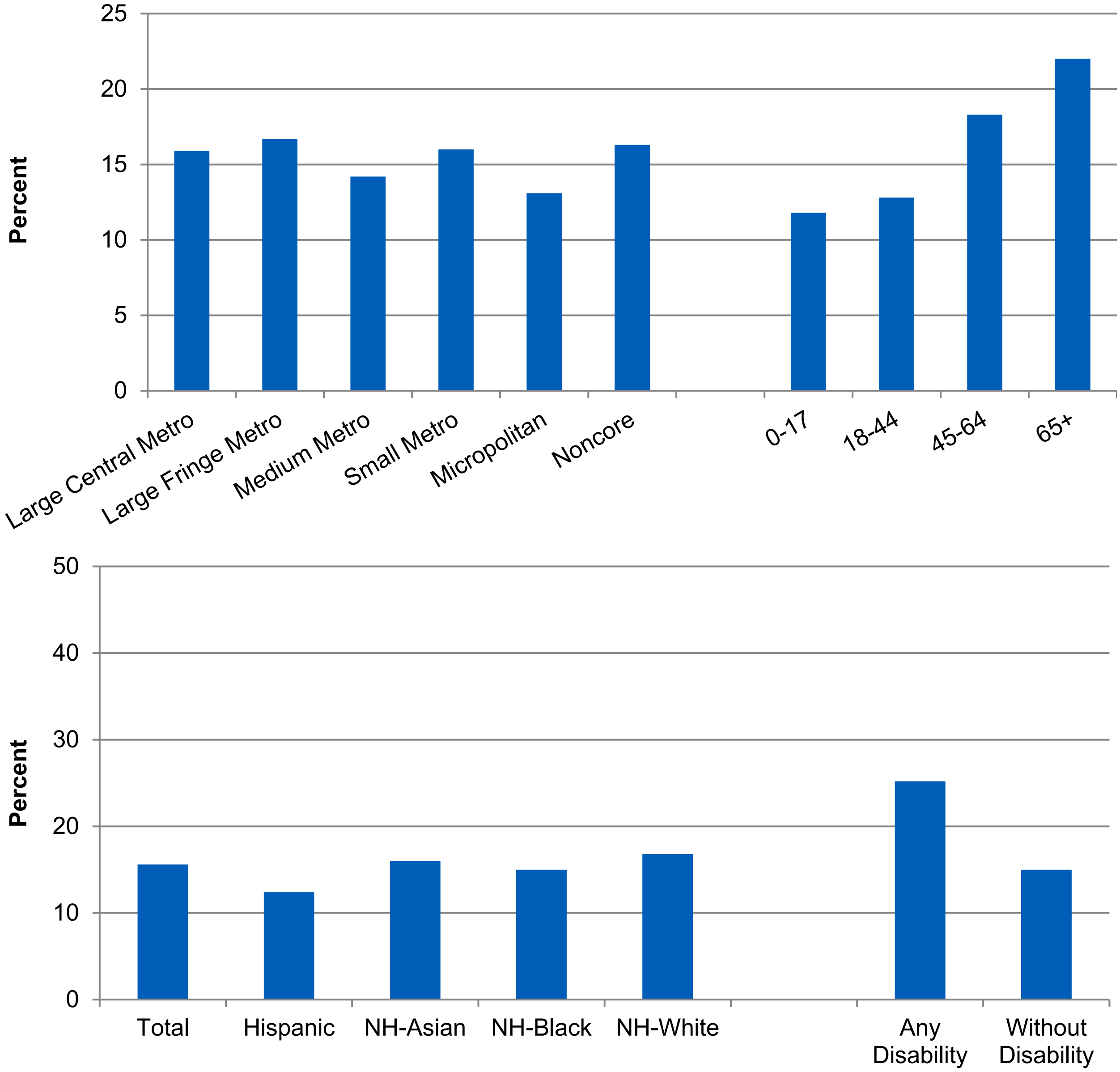
To evaluate ambulatory care delivery during the COVID-19 public health emergency (PHE), this section highlights quality of preventive care delivered to two exemplar populations: chronic disease management for people diagnosed with diabetes and cancer screening for at-risk groups.

Delayed Care Due to COVID-19

During the early stages of the 2019 coronavirus (COVID-19) outbreak, the Centers for Medicare & Medicaid Services recommended that all elective surgeries and nonessential medical, surgical, and dental procedures be delayed.[4] In addition, to limit the spread of COVID-19, CMS recommended that healthcare providers encourage patients to delay in-person care for nonemergency services. This recommendation was to protect others while also limiting one's own exposure to the virus.[4]

Nearly one-third of U.S. adults reported having delayed or avoided routine medical care, which could reflect adherence to community mitigation efforts such as stay-at-home orders, temporary closures of health facilities, or additional factors. However, if routine care avoidance were sustained, adults could miss opportunities for management of chronic conditions, receipt of routine vaccinations, or early detection of new conditions, which might worsen outcomes.[5]

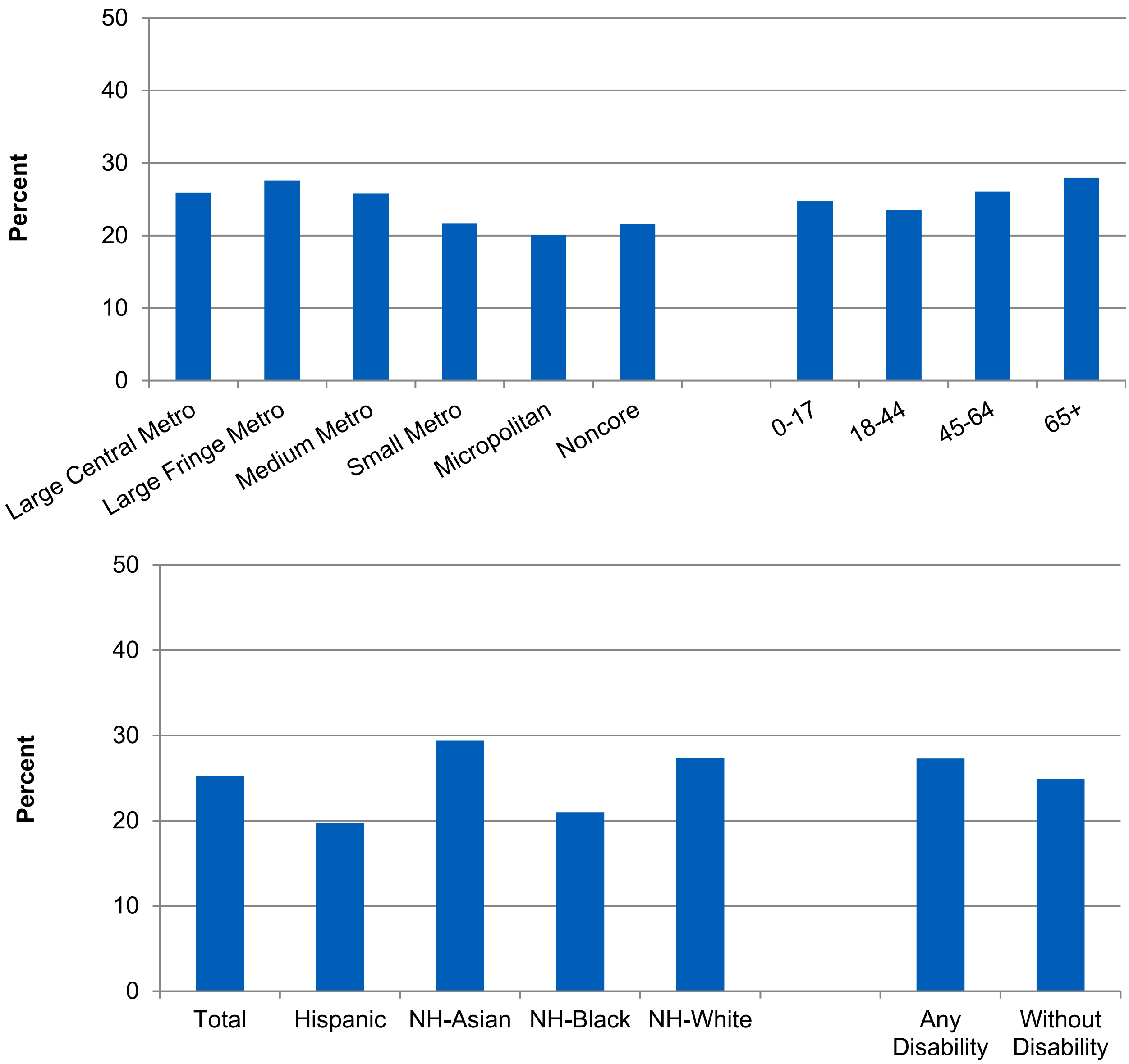
Figure 1. People delayed in getting medical care due to the coronavirus pandemic, by location and age (top) and by ethnicity and disability status (bottom), 2020



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2020.

- In 2020, residents of medium metro (14.2%) and micropolitan (13.1%) areas were less likely to delay medical care due to the COVID-19 pandemic compared with residents of large fringe metro areas (16.7%) (Figure 1).
- In 2020, adults ages 45-64 (18.3%) and age 65 and over (22.0%) were more likely to delay medical care due to the COVID-19 pandemic compared with adults ages 18-44 (12.8%)
- In 2020, Hispanic adults (19.7%) were less likely to delay medical care due to the COVID-19 pandemic compared with NH-White adults (27.4%).
- In 2020, people with any disability (25.2%) were more likely to delay medical care due to the COVID-19 pandemic compared with people with no disabilities (15%).

Figure 2. People delayed in getting dental treatment due to the coronavirus pandemic, by location and age (top) and race/ethnicity and disability status (bottom) (lower rates are better), 2020



Key: NH = non-Hispanic.
Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2020.

- In 2020, residents of small metro (21.7%), micropolitan (20.1%), and noncore (21.6%) areas were less likely to delay dental care due to the COVID-19 pandemic compared with residents of large fringe metro areas (27.6%) (Figure 2).
- In 2020, adults ages 45-64 (26.1%) and age 65 and over (28.0%) were more likely to delay dental care due to the COVID-19 pandemic compared with adults ages 18-44 (23.5%)
- In 2020, Hispanic (19.7%) and NH-Black adults (21.0%) were less likely to delay dental care due to the COVID-19 pandemic compared with NH-White adults (27.4%).

Impact of COVID-19 on Diabetes Care

- ❖ **During the COVID-19 pandemic, fewer residents of urban areas with diabetes had their feet checked for sores or irritation. Conversely, more residents of suburban areas with diabetes received influenza vaccination. Other diabetes care remained stable.**

Importance

Diabetes affects a large percentage of the population and is the leading cause of a wide range of costly complications. During the COVID-19 PHE, the incidence of both type 1 and type 2 diabetes increased among youth, with the largest increases observed among Black and Hispanic individuals.[6]

The COVID-19 pandemic has disproportionately affected certain groups, such as older people, minority populations, and people with specific chronic conditions, including diabetes, cardiovascular disease, kidney disease, and some respiratory diseases. Recurrent lockdowns and public health measures throughout the pandemic have restricted access to routine diabetes care, limiting new diagnoses and affecting self-management, routine followup, and access to medications, as well as affecting lifestyle behaviors. Short-term delays in delivery of routine care, even by 12 months, are associated with adverse effects and worse microvascular, macrovascular, and mortality outcomes in people with diabetes.[7]

Frequency of hemoglobin A1c testing and retinal screening exams in the first 2 months of the pandemic each dropped to less than 50% of prior years' total frequency but both rebounded to prior years' assessment frequency during June 2020.[8]

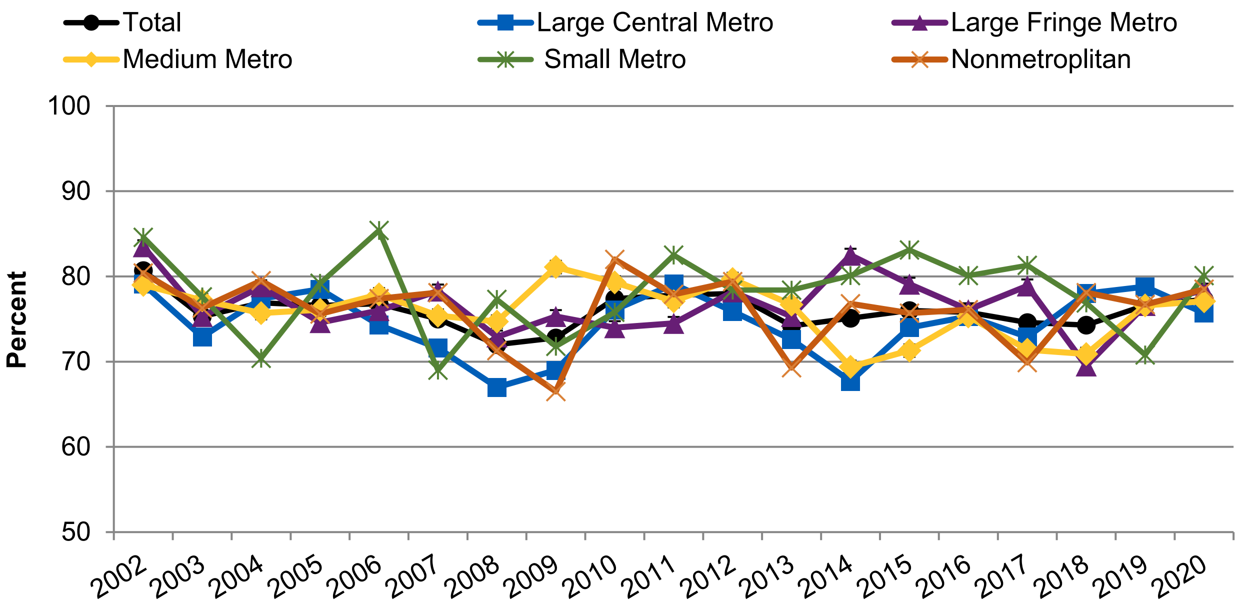
The COVID-19 pandemic challenged the healthcare delivery system, including services responsible for providing diabetes care. Multiple factors created barriers to delivering routine diabetes care, including:

- Lockdowns of nonessential outpatient clinics,
- Decreased inpatient capacity,
- Staff and medicine shortages,
- Unaffordable medicine,
- Delayed care seeking,
- Limited self-care practice,
- Transportation difficulties, and
- Undiagnosed cases/events.[9]

Diabetes was also associated with increased risks of COVID-19 infection and worse COVID-19 outcomes.[10] Thus, many people with diabetes understandably delayed or avoided interacting with the healthcare delivery system. These delays raised concern that people with diabetes would experience diabetes complications because they did not receive appropriate chronic diabetes management during the pandemic. However, NHQDR data show no evidence that these concerns were realized.

Findings

Figure 3. Adults age 40 and over with diagnosed diabetes who received at least two hemoglobin A1c measurements in the calendar year, by location, 2002-2020



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2020.

- From 2002 to 2020, the percentage of adults age 40 and over with diagnosed diabetes who received at least two hemoglobin A1c measurements in the calendar year worsened for residents of medium metro areas, decreasing from 79.0% to 74.5%[i] (Figure 3).

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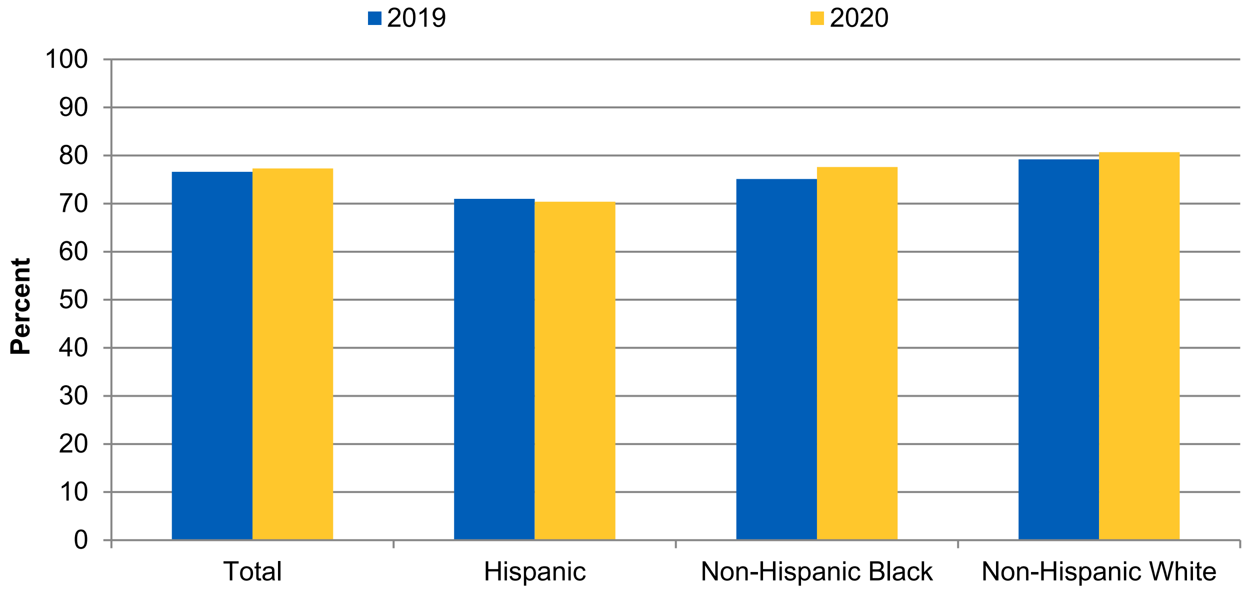
[i] Unless noted otherwise, data points under each figure only report differences that are statistically significant (i.e., p value less than 0.1) and show an average annual percentage change greater than 1% per year. For comparisons between two populations, data points under each figure only report differences that are statistically significant (i.e., p value less than 0.05) and have a relative difference between the populations of at least 10%, unless noted otherwise. Readers may learn more about NHQDR's reporting methodology in Appendix A at https://www.ahrq.gov/research/findings/nhqrdr/nhqdr23/index.html.

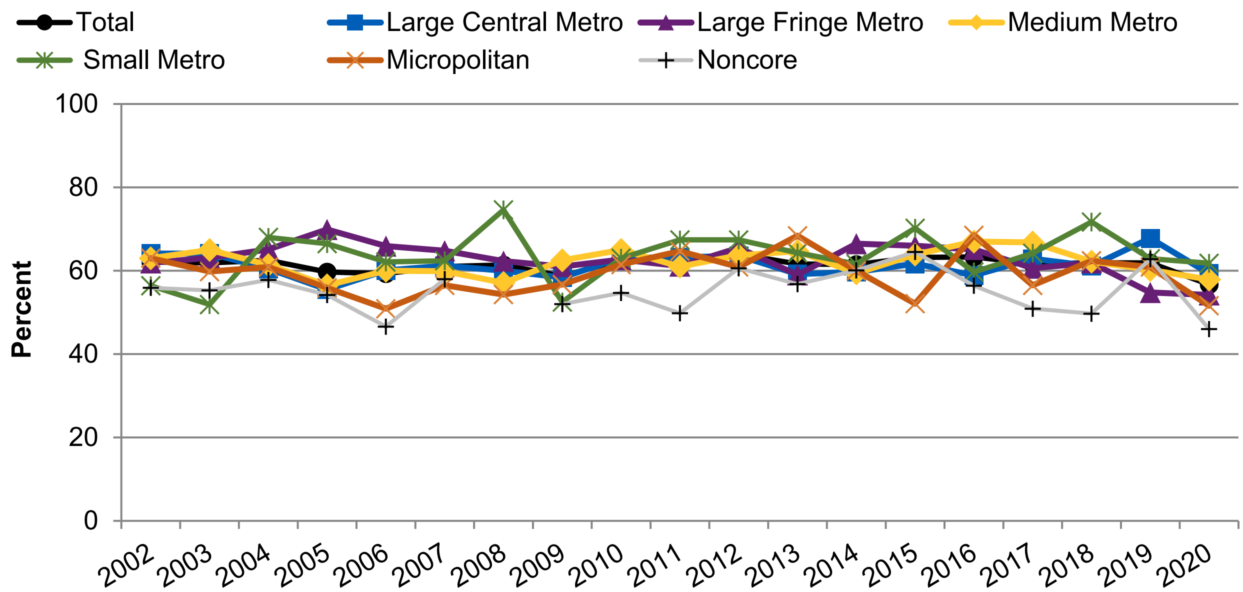
Figure 4. Adults age 40 and over with diagnosed diabetes who received at least two hemoglobin A1c measurements in the calendar year, by ethnicity, 2019 and 2020



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2019 and 2020.

- In 2019, among all ethnic groups, there was little difference in the percentage of adults age 40 and over with diagnosed diabetes who received at least two hemoglobin A1c measurements (Figure 4).
- In 2020, Hispanic adults age 40 and over with diagnosed diabetes were less likely to receive at least two hemoglobin A1c measurements compared with NH-White adults age 40 and over with diagnosed diabetes.

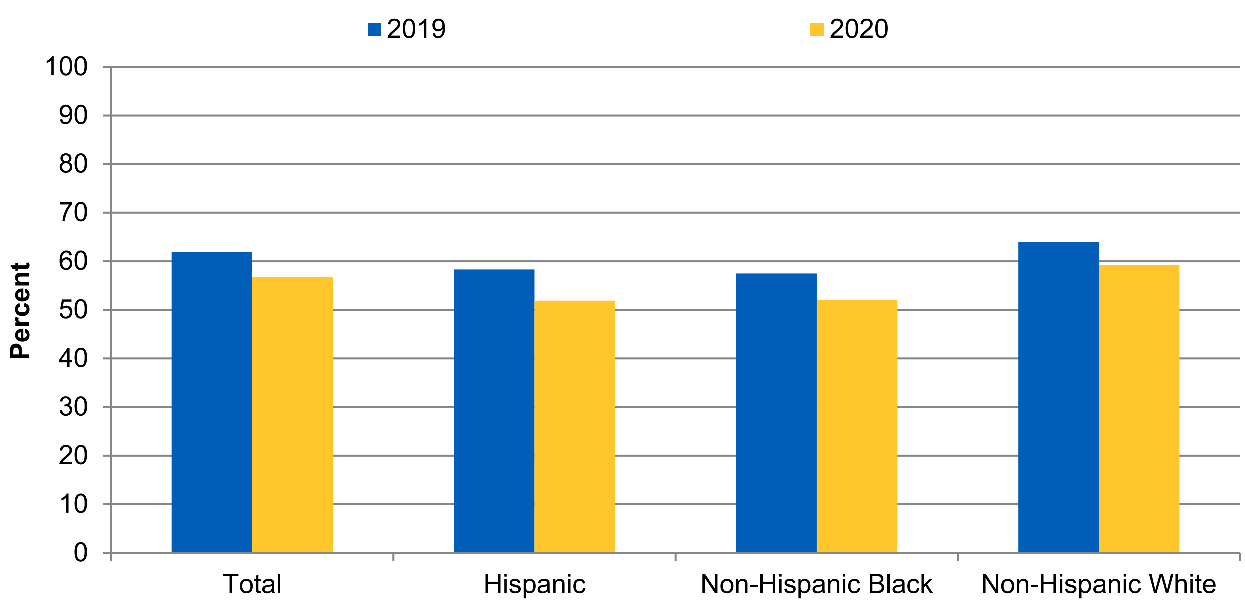
Figure 5. Adults age 40 and over with diagnosed diabetes who received a dilated eye examination in the calendar year, by location, 2002-2020



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2020.

- From 2002 to 2020, the percentage of adults age 40 and over with diagnosed diabetes who received a dilated eye examination in the calendar year showed no statistically significant changes by residence location (Figure 5).

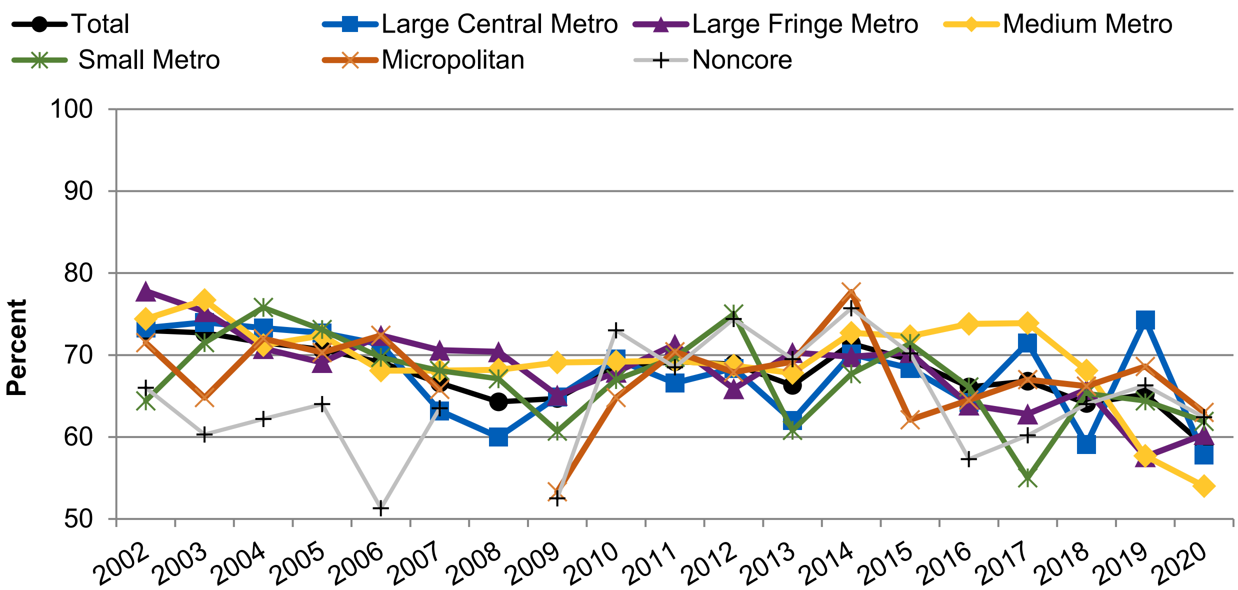
Figure 6. Adults age 40 and over with diagnosed diabetes who received a dilated eye examination in the calendar year, by ethnicity, 2019 and 2020



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2019 and 2020.

- In 2019 and 2020, there were no statistically significant differences by ethnicity in the percentage of adults age 40 and over with diagnosed diabetes who received a dilated eye examination (Figure 6).

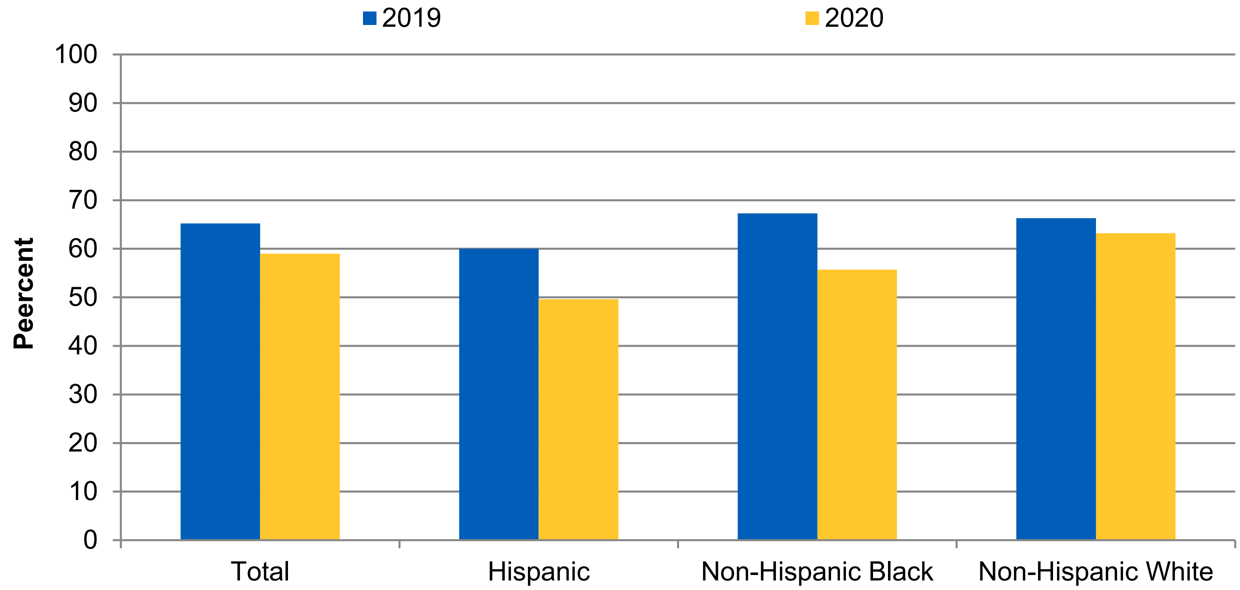
Figure 7. Adults age 40 and over with diagnosed diabetes who had their feet checked for sores or irritation in the calendar year, by location, 2002-2020



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2002-2020.

- From 2002 to 2020, the percentage of adults age 40 and over with diagnosed diabetes who had their feet checked for sores or irritation in the calendar year decreased for residents of most locations (Figure 7):
  - Residents of large central metro areas experienced a decrease from 73.3% to 57.8%.
  - Residents of large fringe metro areas experienced a decrease from 77.8% to 60.3%.
  - Residents of medium metro areas experienced a decrease from 74.4% to 54.0%.
  - Residents of small metro areas experienced a decrease from 64.4% to 61.9%.

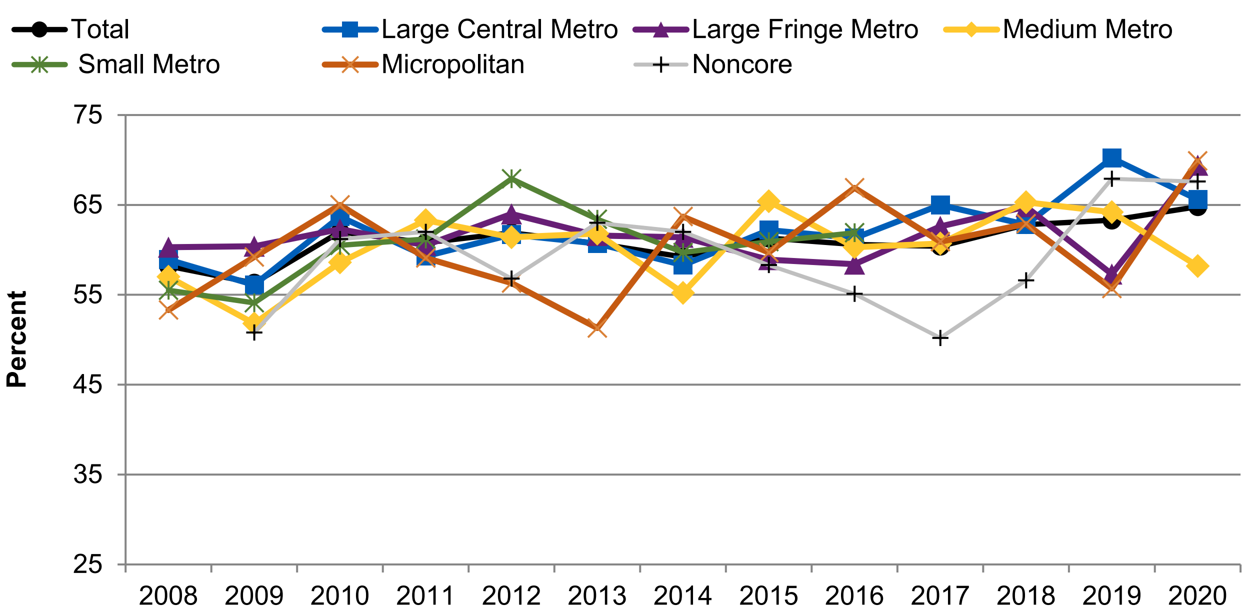
Figure 8. Adults age 40 and over with diagnosed diabetes who had their feet checked for sores or irritation in the calendar year, by ethnicity, 2019 and 2020



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2019 and 2020.

- In 2020, Hispanic adults age 40 and over with diagnosed diabetes were less likely to have their feet checked for sores or irritation compared with NH-White adults (Figure 8).

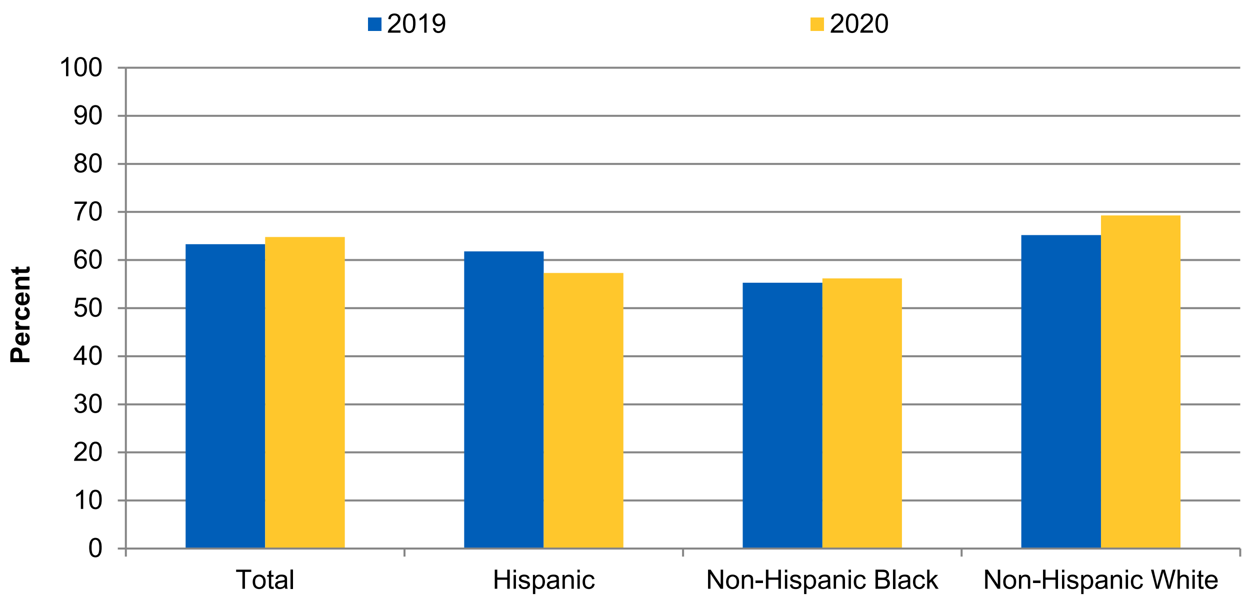
Figure 9. Adults age 40 and over with diagnosed diabetes who received a flu vaccination in the calendar year, by location, 2008-2020



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2008-2020.
Note: Data for noncore areas for 2008 did not meet the criteria for statistical reliability.

- From 2008 to 2020, the percentage of adults age 40 and over with diagnosed diabetes who received a flu vaccination in the calendar year increased among residents of large central metro areas (from 58.9% to 65.6%) (Figure 9).
- From 2019 to 2020, the percentage of adults age 40 and over with diagnosed diabetes who received a flu vaccination in the calendar year increased among residents of large fringe metro areas (from 57.3% to 69.4%).

Figure 10. Adults age 40 and over with diagnosed diabetes who received a flu vaccination in the calendar year, by ethnicity, 2019 and 2020



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2019 and 2020.

- In 2019, NH-Black adults (55.3%) were less likely than NH-White (65.2%) adults age 40 and over with diagnosed diabetes to receive a flu vaccination (Figure 10).
- In 2020, Hispanic (57.3%) and NH-Black (56.2%) adults were less likely than NH-White (69.3%) adults age 40 and over with diagnosed diabetes to receive a flu vaccination.

Impact of COVID-19 on Cancer Screening

❖ **During the COVID-19 pandemic, screening for breast and cervical cancer remained stable overall and there was little change in the differences in screening rates across areas of residence and race.**

Importance

Cancer is the second leading cause of death and is exceeded only by heart disease. One of every five deaths in the United States is due to cancer. In 2019, 264,121 new cases of breast cancer were reported among women, 12,795 new cases of cervical cancer were reported, and 142,462 new cases of colorectal cancer were reported.[11]

The Centers for Disease Control and Prevention (CDC) estimates that screening can prevent thousands of cancer deaths. Mammography can significantly reduce breast cancer mortality, and the notable reductions in cervical cancer incidence and mortality over the past 30 years are largely due to screening with the Pap test.[12]

If the current level of cancer screenings were maintained, 10,179 deaths from breast cancer would be prevented among the cohort of 50-year-old women over their lifetime; 27,166 deaths from cervical cancer would be prevented among the cohort of 21-year-old women; and 74,470 deaths from colorectal cancer would be prevented among the cohort of 50-year-old men and women.[13]

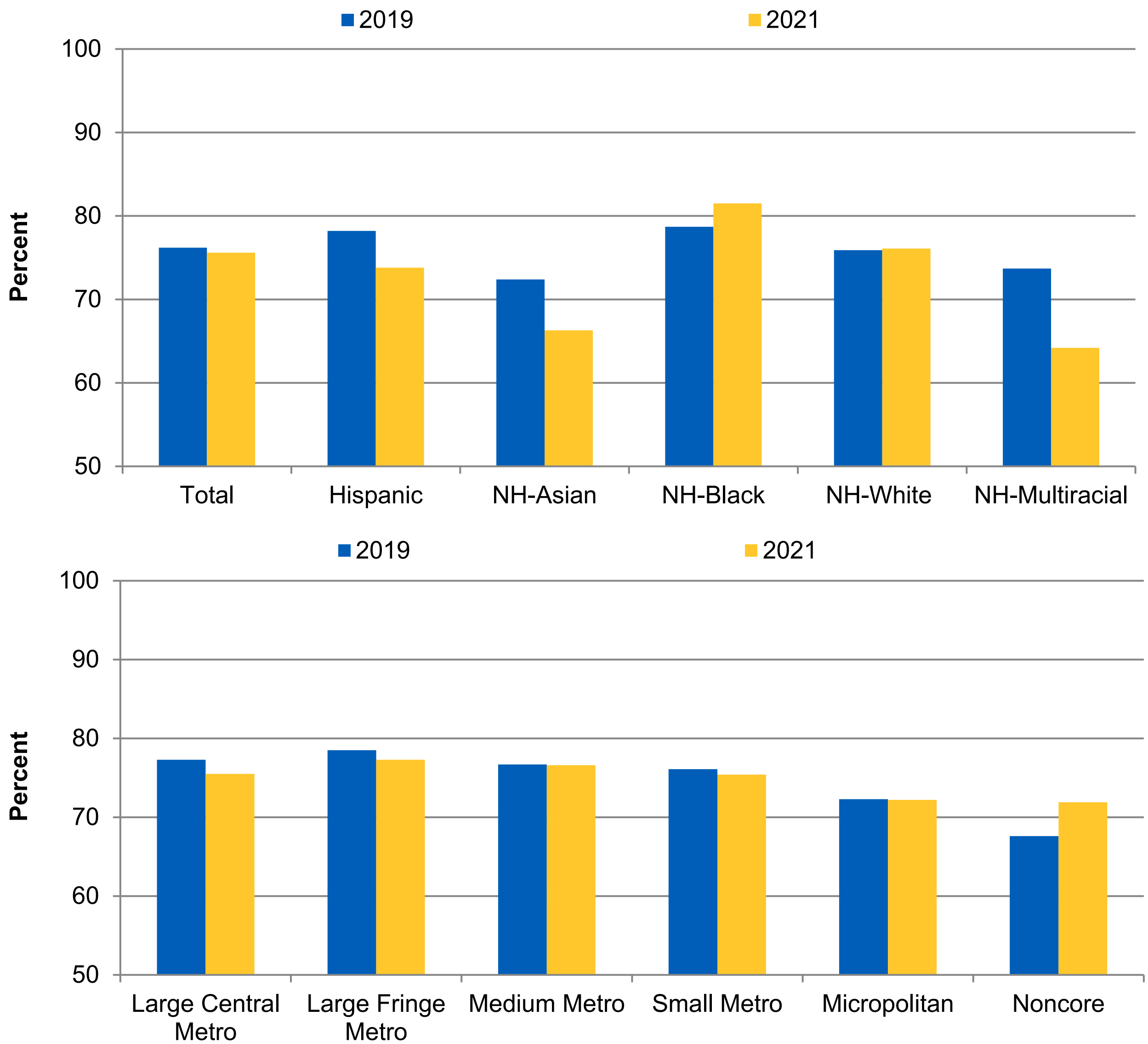
Early in 2020, many cancer screening facilities closed temporarily, while others faced severe staffing shortages. In addition, people feared going to hospitals and other medical facilities for nonemergency procedures for fear of contracting COVID-19.[14]

Consistent with these observations, a 2020 National Cancer Institute report noted that the number of people getting screened for cancer in the United States had dropped dramatically.[15] This development raised concern that cancer morbidity and mortality would subsequently rise because of missed screening opportunities.[16]

NHQDR data show that, despite these early concerns, overall screening rates for the most common cancers have remained stable; however, disparities among racial and ethnic groups and between urban and rural populations persist. The data also show a sharp rise in deaths from breast and colorectal cancers in 2020 and 2021 among NH-Native Hawaiian/Pacific Islander (NH-NHPI) people, which mirrors the excess COVID-19 deaths experienced by this group.

Findings

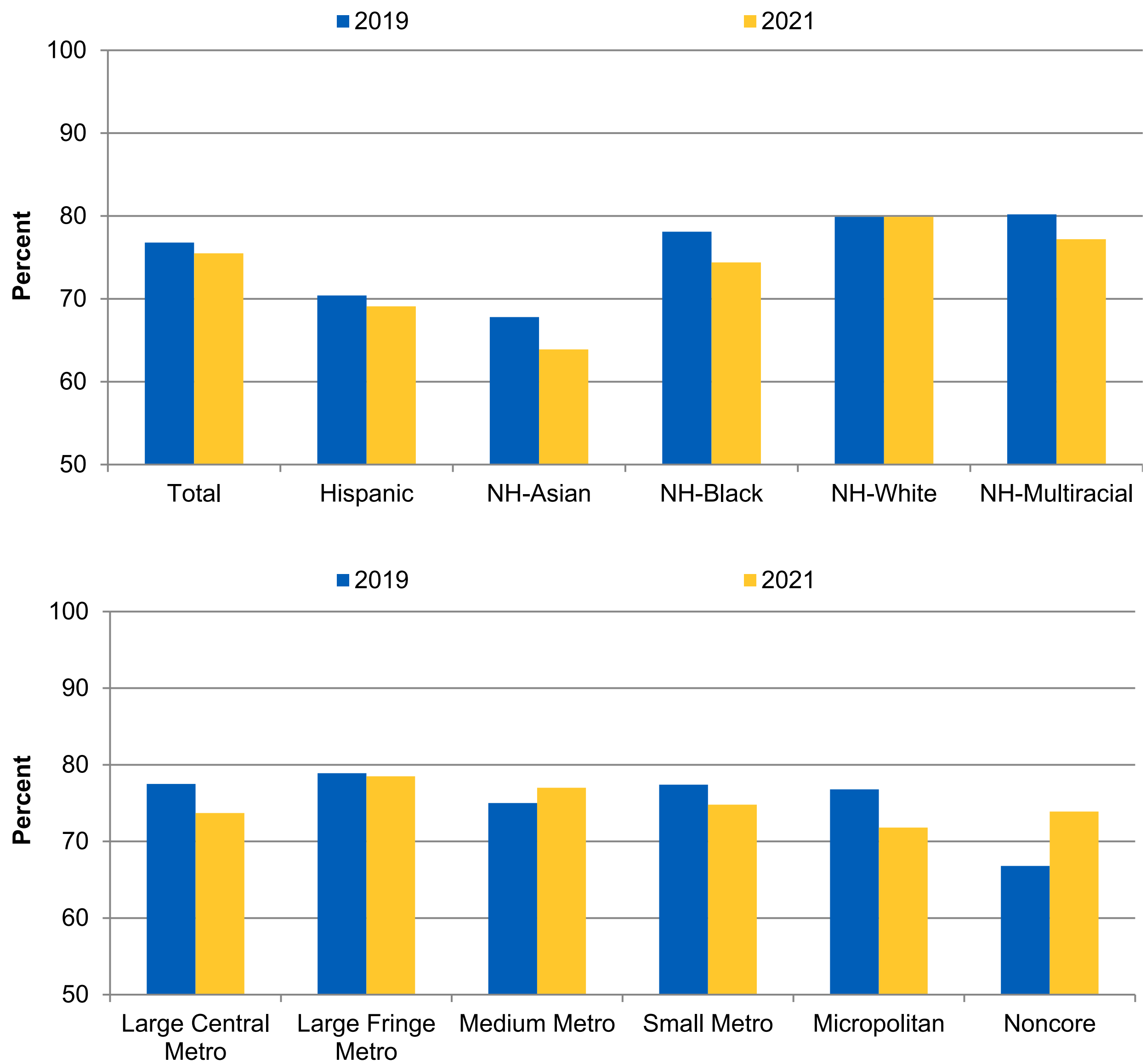
Figure 11. Women ages 50-74 who received a mammogram in the last 2 years, by race/ethnicity (top) and location (bottom), 2019 and 2021



Key: NH = non-Hispanic.
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2019 and 2021.
Note: Data for American Indians and Alaska Native groups do not meet the criteria for statistical reliability, data quality, or confidentiality. Data were not available for Native Hawaiian/Pacific Islander groups.

- Overall, and among women ages 50-74 of different racial/ethnic groups and residing in different geographic locations, there were no statistically significant changes in the receipt of a mammogram in 2019 compared with 2021 (Figure 11).

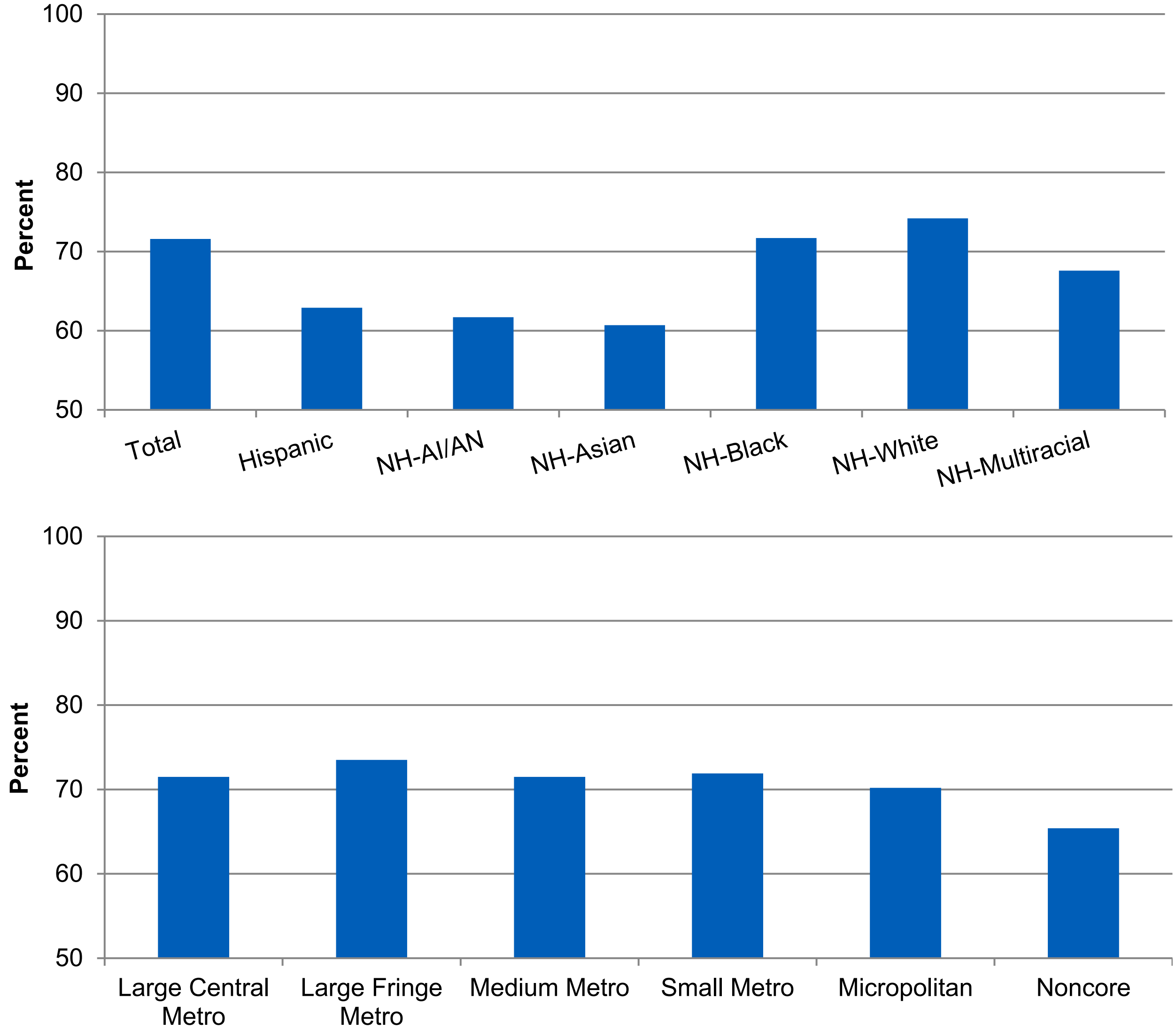
Figure 12. Women ages 21-65 who received a Pap smear in the last 3 years or human papillomavirus test in the last 5 years, by race/ethnicity (top) and location (bottom), 2019 and 2021



Key: NH = non-Hispanic.
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2019 and 2021.
Note: Data for American Indian and Alaska Native groups and Native Hawaiian/Pacific Islander groups did not meet the criteria for statistical reliability, data quality, or confidentiality.

- Overall, and among women ages 21-65 of different racial/ethnic groups and residing in different geographic locations, there were no statistically significant differences in the receipt of cervical cancer screening in 2019 compared with 2021 (Figure 12).

Figure 13. Adults ages 50-75 who received any type of colorectal cancer screening, by race/ethnicity (top) and location (bottom), 2021



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native.
Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.
Note: Data for Native Hawaiian/Pacific Islander groups did not meet the criteria for statistical reliability, data quality, or confidentiality. Colorectal cancer screening includes blood stool test in the past year, sigmoidoscopy in the past 5 years and blood stool test in the past 3 years, a colonoscopy in the past 10 years, a Cologuard test (FIT-DNA) in the past 3 years, or a CT colonography ("virtual colonoscopy") in the past 5 years.

- Overall, in 2021, 71.6% of adults ages 50-75 received colorectal cancer screening (Figure 13).
- In 2021, Hispanic adults ages 50-75 were less likely to have received colorectal cancer screening compared with NH-White adults (62.9% compared with 74.2%).
- In 2021, NH-AI/AN adults ages 50-75 were less likely to have received colorectal cancer screening compared with NH-White adults (61.7% compared with 74.2%).
- In 2021, NH-Asian adults ages 50-75 were less likely to have received colorectal cancer screening compared with NH-White adults (60.7% compared with 74.2%).

- In 2021, adults ages 50-75 residing in noncore areas were less likely to have received colorectal cancer screening compared with residents of large fringe metro areas (65.4% compared with 73.5%).

Discussion and Conclusions

The COVID-19 pandemic changed ambulatory healthcare delivery in many ways. Healthcare systems worked to mitigate barriers, including difficulty coordinating care and delays related to the pandemic, by pivoting to additional delivery mechanisms, such as telehealthcare. Preventive care was delivered during the pandemic at rates similar to prepandemic levels but still below Healthy People 2030 targets and U.S. Preventive Services Task Force recommendations. In addition, disparities persist, with some people more affected than others by the pandemic.

In March 2020, after the World Health Organization classified COVID-19 as a pandemic, national regulatory agencies temporarily recommended curtailing all nonurgent office visits and elective surgeries to preserve personal protective equipment, beds, and ventilators and to limit the spread of COVID-19.[4] These mitigation strategies and people's desire to prevent infection resulted in a decrease in in-person visits and an increase in telehealthcare use.[17] For additional information, refer to special emphasis topic, "Growth of Telehealthcare During the COVID-19 Pandemic" of this report.

The mitigation strategies also led to the temporary closing of many ambulatory care practices. More information is in the "Healthcare Delivery Systems" section of "Portrait of American Healthcare" in this report.

NHQDR data show that the pandemic led to delays in care; in 2020, approximately 15% of people delayed medical care and 25% delayed dental due to COVID-19. The pandemic affected some populations more than others. For example, in 2020, more than 15% of residents of large fringe metropolitan, large central metropolitan, small metropolitan, and noncore areas delayed medical care due to COVID-19.

In addition, adults ages 45-64 (18.3%) and age 65 and over (22.0%) were more likely to delay medical care due to the COVID-19 pandemic compared with adults ages 18-44 (12.8%). Nearly 30% of NH-White people and NH-Asian people delayed dental care.

Despite challenges posed by COVID-19 mitigation strategies and patients' reluctance to access healthcare facilities due to fear of COVID-19 infection, some people continued to get recommended diabetes and preventive cancer care, which often require in-person visits.

NHQDR data show that for some recommended services, including dilated eye exams, hemoglobin A1c testing, and flu vaccination, trends showed little to no change before and since the onset of the COVID-19 pandemic. The only diabetes care measure that changed reflects a longstanding decline that predates the pandemic in screening patients with diabetes for foot sores. The percentage of adults who had their feet checked for sores or irritation in the calendar year worsened steadily from 2002 to 2020 among people living in metropolitan areas.

Similar to diabetes care, cancer screening rates appeared to rebound to pre-COVID levels after an initial decline, suggesting that health systems were able to recalibrate resources and protocols fairly quickly.[18] While cancer screening rates have rebounded overall, some groups continue to experience disparities. Findings show that in 2019 and 2021, women ages 50-74 residing in rural areas were less likely to receive a mammogram compared with women in large fringe metropolitan areas.

Among racial/ethnic groups, in 2019, there were no differences in mammogram screening but in 2021, NH-Asian women ages 50-74 were less likely to receive a mammogram compared with NH-White women. NH-Black women were more likely to receive a mammogram compared with NH-White women.

Screening rates did not change in 2019 or in 2021 for cervical cancer screening among women ages 21-65 of different racial/ethnic groups. Among women from different geographic locations, only residents of large central metropolitan areas showed a decrease in screening rates.

Looking forward, telehealthcare could be a path to healthcare for people facing barriers to services such as lack of transportation and regional provider shortages. While the COVID-19 pandemic led to broad cancellations of nonemergency in-person healthcare appointments, telehealthcare appointments appeared to have enabled individuals to still receive medical consultation and advice. It also enabled people to reschedule screening tests. The “Growth of Telehealthcare During the COVID-19 Pandemic” special emphasis topic in this report has more information.

Finally, although the impact of the pandemic on preventive care and management of chronic conditions was not as negative as anticipated, disparities persist, particularly in nonmetropolitan areas. Ambulatory healthcare still has room for improvement in providing timely and equitable care, as measures show that while care remained stable during the pandemic, percentages of people receiving various types of care are suboptimal.

Resources

The impact of COVID-19 on care provided in ambulatory settings, such as care for diabetes and cancer, points to the importance of awareness and prevention, as well as alternative ways to access care, such as telehealthcare. Below are resources related to these efforts.

The **National Cancer Plan** was developed by the National Institutes of Health’s National Cancer Institute. The plan provides a framework for everyone across the federal government and the general public to collaborate in ending cancer as we know it. The plan includes eight essential goals and accompanying strategies that outline what must be accomplished to prevent more cancers, reduce deaths from the disease, and improve the lives of everyone after a diagnosis with cancer:

- Prevent Cancer.
- Detect Cancers Early.
- Develop Effective Treatments.
- Eliminate Inequities.
- Deliver Optimal Care.

- Engage Every Person.
- Maximize Data Utility.
- Optimize the Workforce.

The **National Breast and Cervical Cancer Early Detection Program (NBCCEDP)** helps those with low incomes who do not have adequate insurance gain access to timely breast and cervical cancer screening, diagnostic, and treatment services. NBCCEDP also provides patient navigation services to help them overcome barriers and get timely access to quality care.

In addition to funding screening and diagnostic services for those eligible, the NBCCEDP focuses on factors at the interpersonal, organizational, community, and policy levels that influence screening. The program supports use of population-based approaches to improve systems that increase high-quality breast and cervical cancer screening, including:

- Implementing evidence-based interventions in health systems.
- Connecting those eligible in the community to screening services.
- Informing policies that increase access to cancer screening.

The **National Comprehensive Cancer Control Program (NCCCP)** provides funds, guidance, and technical assistance to help cancer control coalitions implement effective and sustainable plans to prevent and control cancer. NCCCP brings together organizations interested in keeping community members healthy in places throughout the country to create plans that help lower the number of people affected by cancer. A cancer control plan focuses on the types of cancer unique to each community that have the highest burden and includes strategies that have worked in other places to help prevent and control those cancers.

The purpose of CDC's **Colorectal Cancer Control Program (CRCCP)** is to increase colorectal cancer screening rates among people ages 45-75 years. The program works with clinics, hospitals, and other healthcare organizations to implement and strengthen strategies that have been shown to increase colorectal cancer screening. Currently, the CRCCP funds 35 award recipients: 20 states, 8 universities, 2 tribal organizations, and 5 other organizations.

The **Special Diabetes Program for Indians** (https://www.ihs.gov/sdpi/sdpi-community-directed/sdpi-basics/) provides funds for diabetes prevention and treatment services to Indian Health Service, tribal, and urban Indian communities across the United States. As a result, AI/AN communities now have much needed diabetes programs and increased access to quality diabetes care.

The **National Diabetes Prevention Program** (https://www.cdc.gov/diabetes/prevention/about.htm) was created in 2010 to address the increasing burden of prediabetes and type 2 diabetes in the United States. This national effort created partnerships between public and private organizations to offer evidence-based, cost-effective interventions that help prevent type 2 diabetes in communities across the United States.

The **Diabetes Self-Management Education and Support (DSMES) Toolkit** (https://www.cdc.gov/diabetes/dsmes-toolkit/index.html) provides an evidence-based foundation to empower people with diabetes to navigate self-management decisions and activities. DSMES is a cost-effective tool proven to help improve health behaviors and health outcomes for people with diabetes.

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COVID-19
coronavirus
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Impact of COVID-19 on Nursing Homes

As the COVID-19 pandemic progressed, nursing homes drew attention due to high infection and death rates. Advanced age, underlying frailty, and communal living conditions make nursing home residents especially vulnerable.[1] Nursing home residents include older adults and people under age 65 with physical or intellectual/developmental disabilities. Their reliance on nursing home staff for daily routines put the staff at high risk for COVID-19 infection and spread. As a result, as of June 12, 2022, more than 209,000 COVID-19 deaths (21%) have been in a long-term care facility,[2] including nursing homes, assisted living facilities, intermediate care facilities for individuals with intellectual disability, and other settings.

Nursing home residents were among the first eligible populations for COVID-19 vaccine, because they are the most vulnerable age group due to chronic health conditions and communal living. COVID-19 negatively affected nursing home staff because missed workdays due to COVID-19 infection led to staff shortages and burnout, which affected the care provided to residents. Therefore, evaluation of quality measures in nursing homes is crucial to evaluate healthcare services provided during the COVID-19 pandemic.

Different types of postacute and long-term care were already described in the “Portrait of U.S. Healthcare” section. For Centers for Medicare & Medicaid Services (CMS) measures discussed in this section,” long-stay” and “short-stay” nursing homes are defined as follows:

- Long-stay nursing homes provide chronic care services, typically for patients or residents who choose to enter a nursing facility typically because they can no longer care for themselves at home. These residents tend to remain in the nursing facility anywhere from several months to several years. They may be referred to as “long-stay residents.”
- Short-stay nursing homes provide services for residents who stay fewer than 30 days. These admissions typically follow an acute care hospitalization and involve high-intensity rehabilitation or clinically complex care. These residents may be referred to as “short-stay residents.”

This section of the NHQDR will focus on the impact of COVID-19 on nursing homes. Based on analyses conducted for the NHQDR, this section provides findings such as:

- Confirmed COVID-19 cases among resident and staff were similar, but COVID-19 deaths among residents were much higher than among staff.
- Nursing home residents are more likely to receive recommended vaccines than older adults in the general population. Nursing homes overcame initial resistance to COVID-19 vaccination and had vaccination rates higher than the general population until the end of 2022.
- The COVID-19 pandemic exacerbated nursing home staff shortages, which may have negatively affected quality:
  - Long-stay and short-stay nursing home measures, which relied on care provided by nursing home healthcare personnel, showed changes in 2020. The rates cannot be compared with 2019, however, due to temporary changes in CMS reporting requirements.

- Long-stay nursing home measures for urinary tract infection and falls, which are indicators of care, had no statistically significant changes in 2020.

COVID-19 Cases and Deaths in Nursing Homes

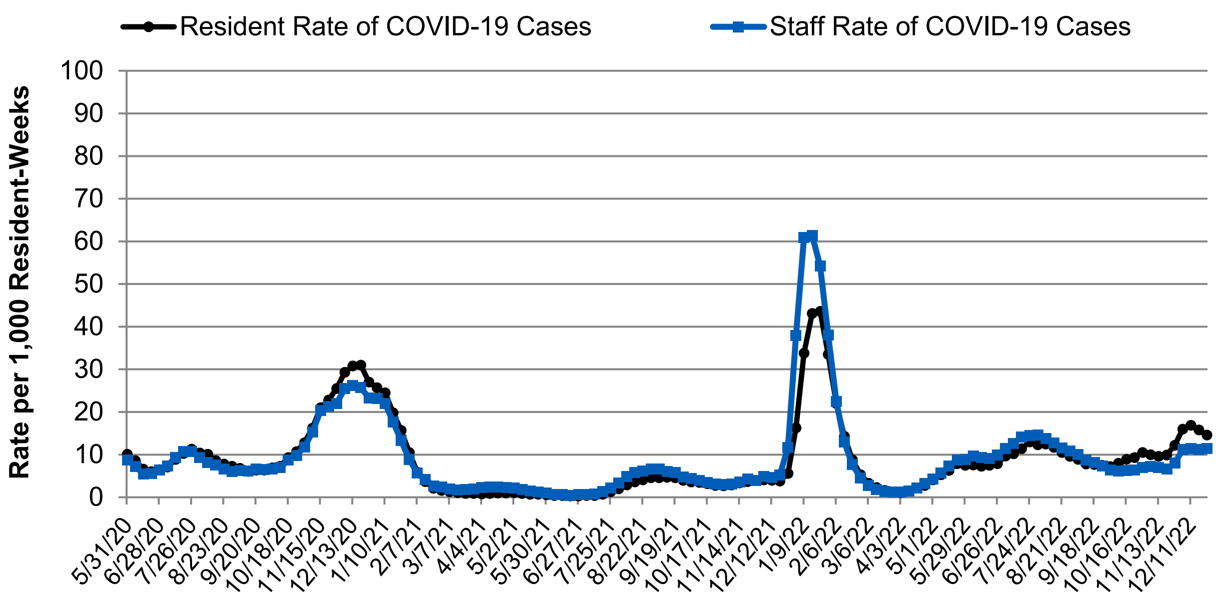
❖ **Confirmed COVID-19 cases among residents and staff were similar.**

All nursing homes experienced high rates of COVID-19 infections, and more than 1,000 nursing homes had infection rates of 75% or higher during surge periods.[3]

The median age of nursing home workers in 2022 was 43.9 years and only 7.3% were age 65 and over.[4] In contrast, 84.6% of long-stay and 81.1% of short-stay nursing home residents were age 65 years and over in 2017-2018.[5] Despite the wide difference in ages among these groups, data from the Centers for Disease Control and Prevention (CDC) COVID Tracker show that surge patterns for COVID-19 infection rates were similar for nursing home staff and residents. This finding suggests that these groups shared interdependent risks for COVID-19.

CDC data, reported earlier in the NHQDR (see "Impact of COVID-19 on the Population"), show that younger adults experienced higher rates of infection than older adults, but older adults and people with disabilities were at greater risk of death from COVID-19.[6] Younger adults contributed disproportionately to COVID-19 spread because they are active, mobile, and employed and thus in most contact with other adults, including those in nursing homes.

Figure 1. Confirmed COVID-19 cases per 1,000 resident-weeks among residents and staff, by week, May 2020-December 2022



Source: Centers for Disease Control and Prevention, National Healthcare Safety Network, Nursing Home Covid-19 Data Dashboard, May 2020-December 2022, https://www.cdc.gov/nhsn/covid19/ltc-report-overview.html.
Note: Case rates in the first half of 2020 may underestimate actual infections due to limited testing capacity then.

- The peak for COVID-19 confirmed cases occurred in late January 2022 for both residents and staff with the emergence of the Omicron variant (Figure 1).

- For residents, the highest weekly number of confirmed cases during the COVID-19 pandemic was 50,540, and the highest weekly rate of confirmed cases was 43.6 per 1,000 residents.
- For staff, the highest weekly number of confirmed cases was 71,198, and the highest weekly rate of confirmed cases was 61.4 per 1,000 resident-weeks.

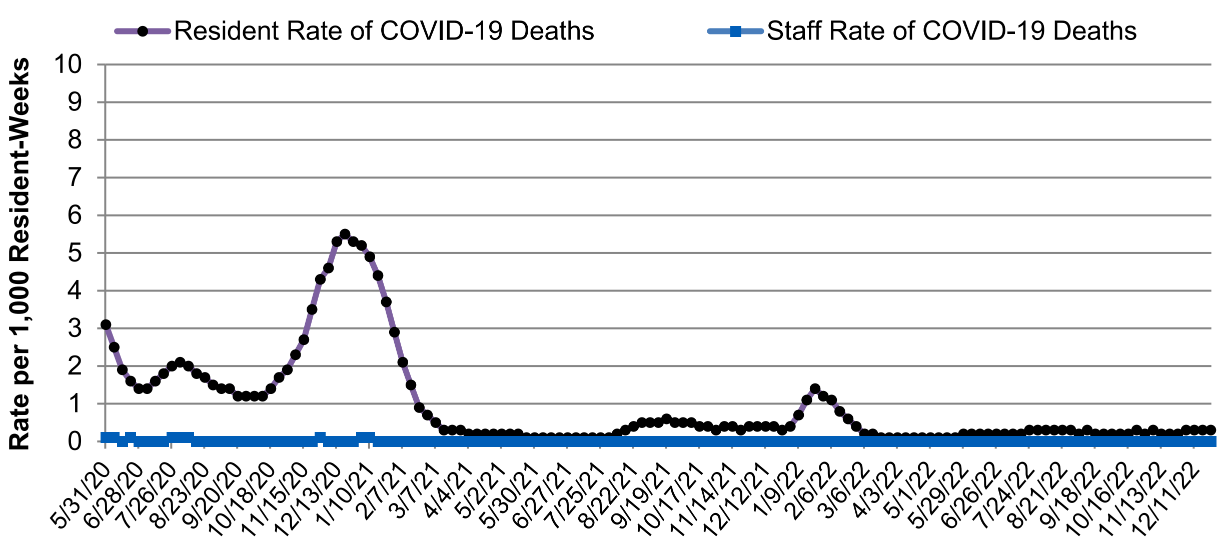
❖ **COVID-19 deaths among residents were much higher than deaths among staff.**

Figure 2 shows COVID-19 mortality rates for nursing home residents and staff among all nursing homes. They show that COVID-19 deaths among nursing home residents exceeded deaths among staff, especially during the first year of the public health emergency (PHE) and during variant-associated surges. The relative magnitude of deaths per 1,000 residents compared with case rates was higher in December 2020 when vaccines were less widely available than in January 2022 when most nursing home residents and staff had received a vaccine.

Significant disparities in COVID-19 deaths also existed among residents in nursing homes with different facility characteristics and locations. A study of 13,312 nursing homes found that facilities with the highest percentages of non-White residents had COVID-19 death counts in 2020 that were 3.3 times higher than those with the highest percentages of White residents.[7]

These racial and ethnic disparities were also linked with characteristics of nursing homes that were more likely to have non-White residents. Such characteristics include larger nursing home size and higher local prevalence of COVID-19, signaling that some nursing homes may have had greater need for resources than others.[7]

Figure 2. COVID-19 deaths per 1,000 resident-weeks among residents and staff, by week, May 2020-December 2022



Source: Centers for Disease Control and Prevention, National Healthcare Safety Network, Nursing Home Covid-19 Data Dashboard, May 2020-December 2022, https://www.cdc.gov/nhsn/covid19/ltc-report-overview.html.

- The peak for COVID-19 deaths occurred the week ending December 20, 2020, for residents, but for staff, the peak occurred much earlier, the week ending June 21, 2020 (data not shown). Although staff had higher infection rates, residents had higher death rates due to their health conditions (Figure 2).

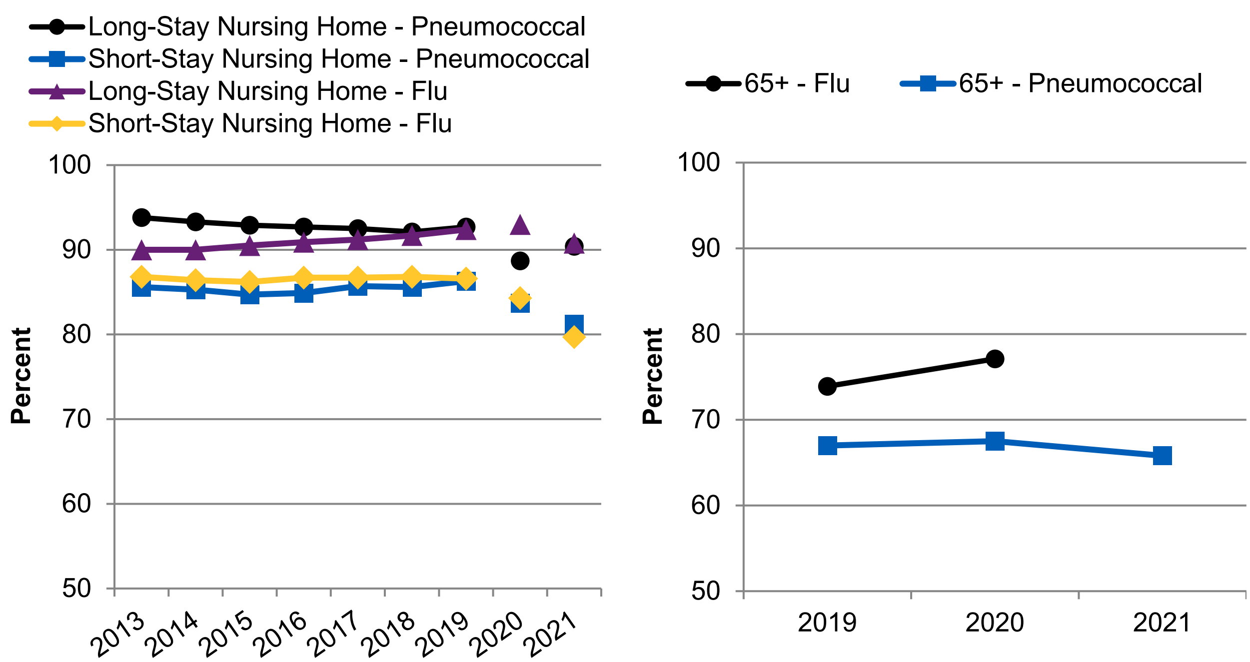
- For residents, the highest death count was 6,167 the week ending December 20, 2020. The highest death rate, 5.5 per 1,000 resident-weeks, also occurred that week.
- For staff, the highest death count was 69 the week ending June 21, 2020. The highest death rate, 0.1 per 1,000 resident-weeks, also occurred that week.

Vaccines in Nursing Homes During the COVID-19 Pandemic

❖ **Nursing home residents are more likely to receive recommended vaccines than older adults in the general population.**

Since 2005, CMS has required nursing homes to vaccinate residents against influenza and pneumococcal disease in order to participate in Medicare and Medicaid.[8] Thus, vaccination rates are typically higher for long- and short-stay nursing home residents than in the overall population. In addition, disparities among racial and ethnic groups in long-stay and short-stay nursing homes are narrower than in the overall population. For long-stay nursing homes, vaccination rates for pneumococcal and seasonal flu vaccines have been close to or above 90% in recent years.

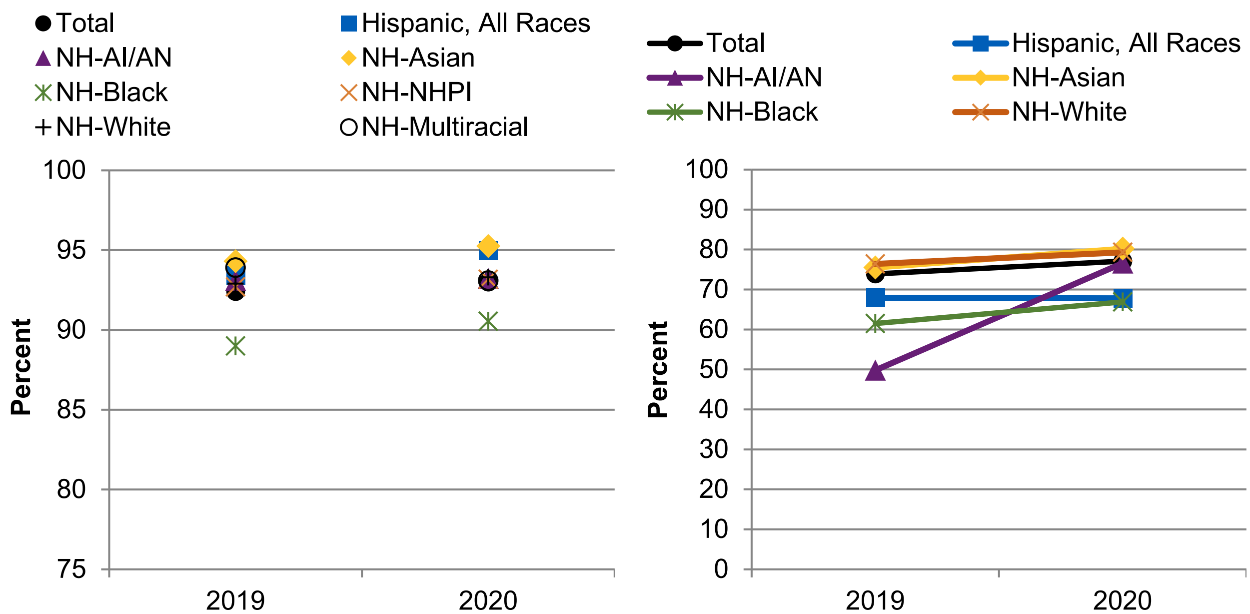
Figure 3. Long-stay and short-stay nursing home residents who were assessed and appropriately given the pneumococcal vaccination and the seasonal influenza vaccine, 2013-2019, 2020, and 2021 (left) and all adults age 65 years and over who ever received pneumococcal vaccine or received influenza vaccine in the last flu season, 2019-2021 (right)



Source: Centers for Medicare & Medicaid Services (CMS), Skilled Nursing Facility Quality Reporting Program (SNF QRP), Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2013-2019, 2020, and 2021; and Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2019-2021.
Note: Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submissions to the SNF QRP were optional. Influenza vaccination rates for adults age 65 and over use data from 2019-2020 and 2020-2021 surveys, so only two data points are shown.

- The percentage of long-stay nursing home residents who were assessed and appropriately given the seasonal influenza vaccine increased from 90.0% in 2013 to 92.4% in 2019[i] (Figure 3). The percentage was 93% in 2020 and 90.8.% in 2021.
- The percentage of short-stay nursing home residents who were assessed and appropriately given the pneumococcal vaccination increased from 85.6% in 2013 to 86.3% in 2019. The percentage was 83.7% in 2020 and 81.2% in 2021.
- Short-stay nursing homes had lower rates than long-stay nursing homes for both pneumococcal and seasonal influenza vaccines.
- Seasonal influenza vaccine for long-stay nursing home residents was the only measure out of four vaccine measures that did not show a statistically significant change in 2020.
- Short-stay and long-stay nursing homes had higher rates than all adults age 65 years and over for both pneumococcal and seasonal influenza vaccines.

Figure 4. Long-stay nursing home residents who were assessed and appropriately given the seasonal influenza vaccine by race/ethnicity, 2019 and 2020 (left) and all adults age 65 years and over who received influenza vaccine in the last flu season, by race/ethnicity, 2019-2020 (right)

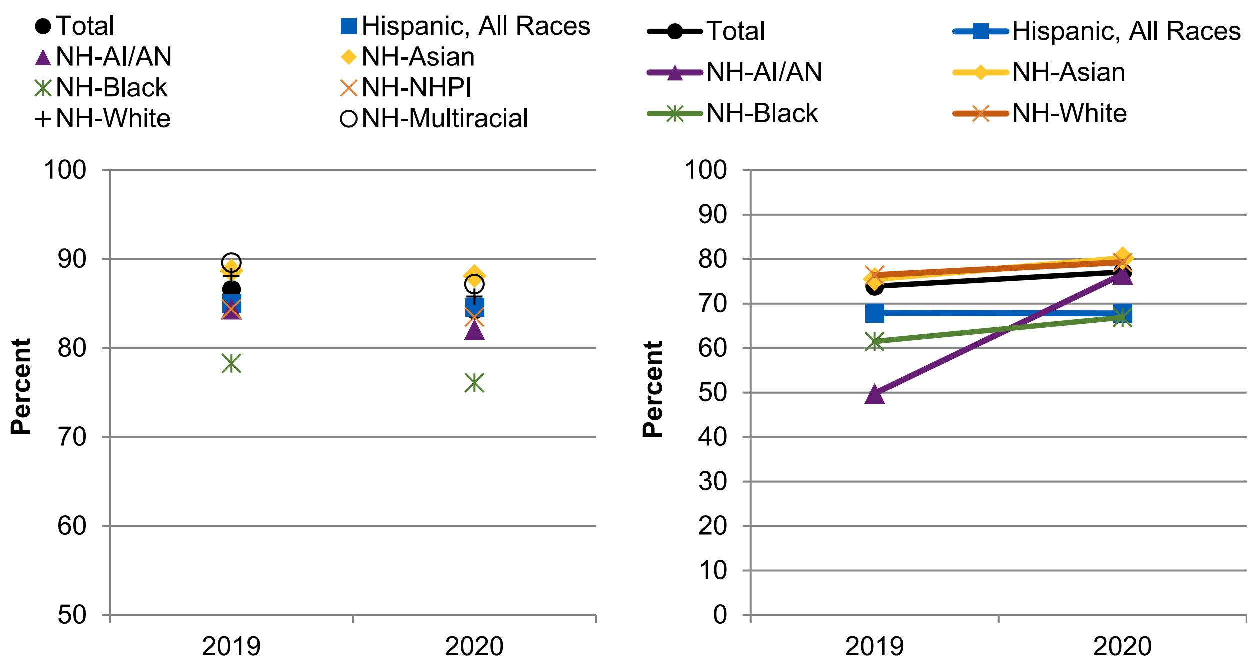


Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services (CMS), Skilled Nursing Facility Quality Reporting Program (SNF QRP), Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2019 and 2020; and Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2019-2020.
Note: Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submissions to the SNF QRP were optional. Influenza vaccination rates for adults age 65 and over use data from 2019-2020 and 2020-2021 surveys.

[i] Unless noted otherwise, for trend analyses, data points under each figure only report differences that are statistically significant (i.e., p value less than 0.1) and show an average annual percentage change greater than 1% per year. For comparison between two populations, data points under each figure only report differences that are statistically significant (i.e., p value less than 0.05) and have a relative difference between the populations of at least 10%, unless noted otherwise. Readers may learn more about NHQDR's reporting methodology in Appendix A at https://www.ahrq.gov/research/findings/nhqrdr/nhqdr23/index.html.

- Overall, the percentage of long-stay nursing home residents who received an influenza vaccine was much higher than the percentage of all adults age 65 years and over who received an influenza vaccine in the last flu season (Figure 4).
- In 2019 and 2020, the percentage of long-stay nursing home residents who received an influenza vaccine was highest for non-Hispanic (NH)-Asian people. The percentage of adults age 65 and over who received an influenza vaccine in the last flu season was also highest for NH-Asian people in 2020.
- In 2020, the percentages were lowest for NH-Black long-stay nursing home residents and NH-Black adults age 65 and over.
- The percentage of NH-American Indian or Alaska Native (AI/AN) adults age 65 and over who received an influenza vaccination in the last flu season increased 54% from 49.8% in 2019 to 76.6% in 2020.

Figure 5. Short-stay nursing home residents who had flu vaccination appropriately given, by race/ethnicity, 2019 and 2020 (left) and all adults age 65 years and over who received influenza vaccine in the last flu season, by race/ethnicity, 2019-2020 (right)



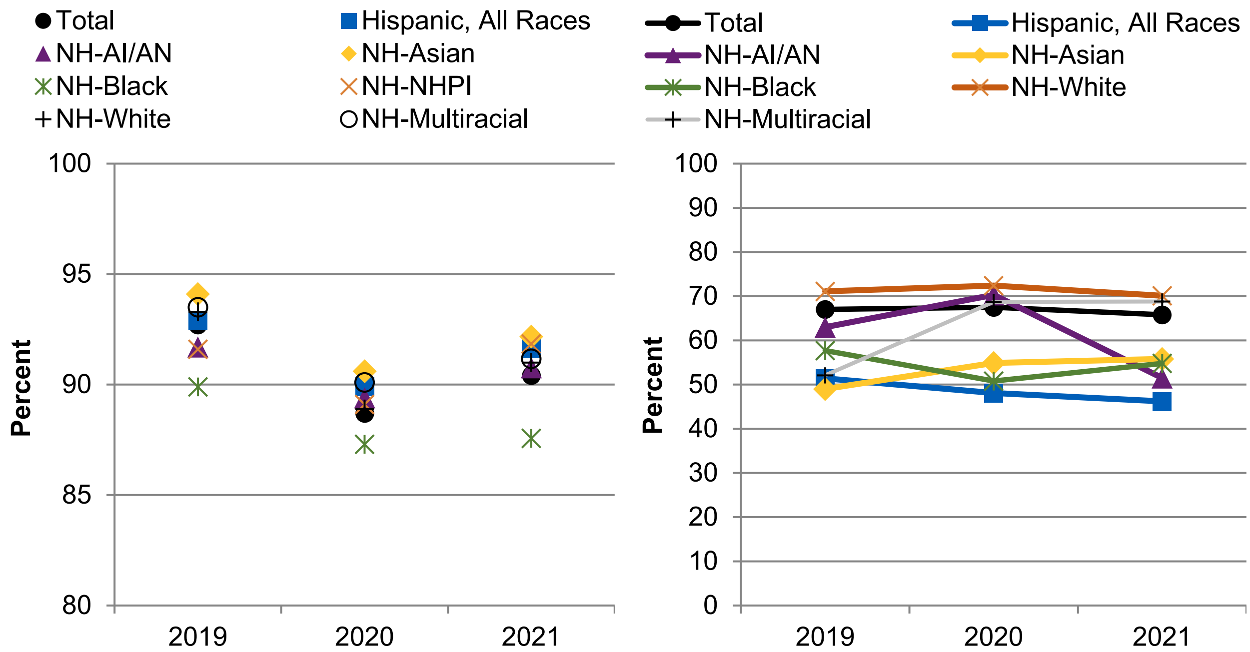
Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services (CMS), Skilled Nursing Facility Quality Reporting Program (SNF QRP), Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2019 and 2020; and Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2019-2020.
Note: Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submissions to the SNF QRP were optional. Influenza vaccination rates for adults age 65 and over use data from 2019-2020 and 2020-2021 surveys.

- Overall, the percentage of short-stay nursing home residents who received an influenza vaccine in the last flu season was much higher than the percentage of all adults age 65 years and over who received an influenza vaccine in the last flu season (Figure 5).
- In 2020, the percentage of short-stay nursing home residents who received an influenza vaccine in the last flu season was highest for NH-Asian people. The percentage of adults age

65 and over who had an influenza vaccine in the last flu season was also highest for NH-Asian people.

- In 2020, the percentages were lowest for NH-Black short-stay nursing home residents and for NH-Black adults age 65 years and over.

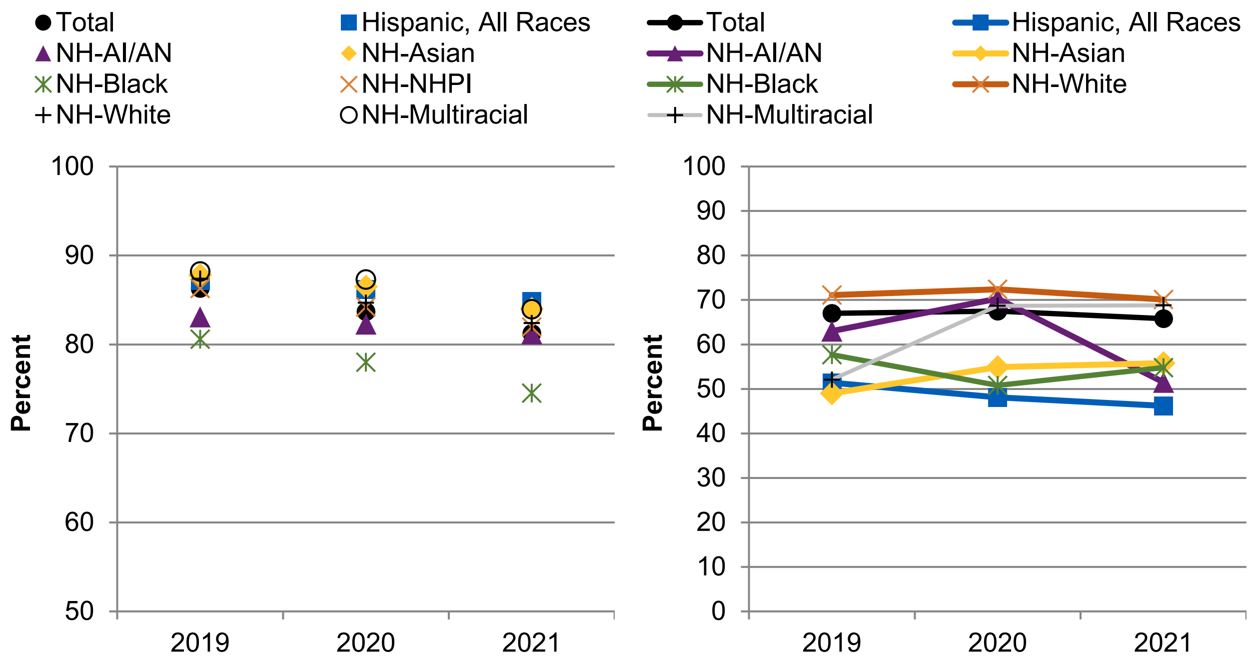
Figure 6. Long-stay nursing home residents who were assessed and appropriately given the pneumococcal vaccination, by race/ethnicity, 2019, 2020, and 2021 (left) and all adults age 65 years and over who ever received pneumococcal vaccine, by race/ethnicity, 2019-2021 (right)



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services (CMS), Skilled Nursing Facility Quality Reporting Program (SNF QRP), Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2019, 2020, and 2021; and Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2019-2021.
Note: Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submissions to the SNF QRP were optional.

- In 2019, 2020, and 2021, the percentage of long-stay nursing home residents who were assessed and appropriately given the pneumococcal vaccination was highest for NH-Asian residents and lowest for NH-Black residents (Figure 6).
- In 2019, 2020, and 2021, the percentage of adults age 65 and over who were assessed and appropriately given the pneumococcal vaccination was highest for NH-White people. In 2020 and 2021, the percentage was lowest for Hispanic people.

Figure 7. Short-stay nursing home residents who were assessed and appropriately given the pneumococcal vaccination by race/ethnicity, 2019, 2020, and 2021 (left) and all adults age 65 years and over who ever received pneumococcal vaccine, by race/ethnicity, 2019-2021 (right)



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services (CMS), Skilled Nursing Facility Quality Reporting Program (SNF QRP), Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2013-2019, 2020, and 2021; and Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2019-2021.
Note: Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submissions to the SNF QRP were optional.

- In 2021, the percentage of short-stay nursing home residents who were assessed and appropriately given the pneumococcal vaccination was highest for Hispanic people and lowest for NH-Black people (Figure 7).
- From 2019 to 2021, the percentage of adults age 65 and over who ever received pneumococcal vaccination was highest for NH-White people.
- In 2021, the percentage of short-stay nursing home residents who were assessed and appropriately given the pneumococcal vaccination was highest for Hispanic people while the percentage of adults age 65 and over who were given the vaccine was lowest for Hispanic people.

❖ **Nursing homes overcame initial resistance to COVID-19 vaccination and had vaccination rates higher than the general population until the end of 2022.**

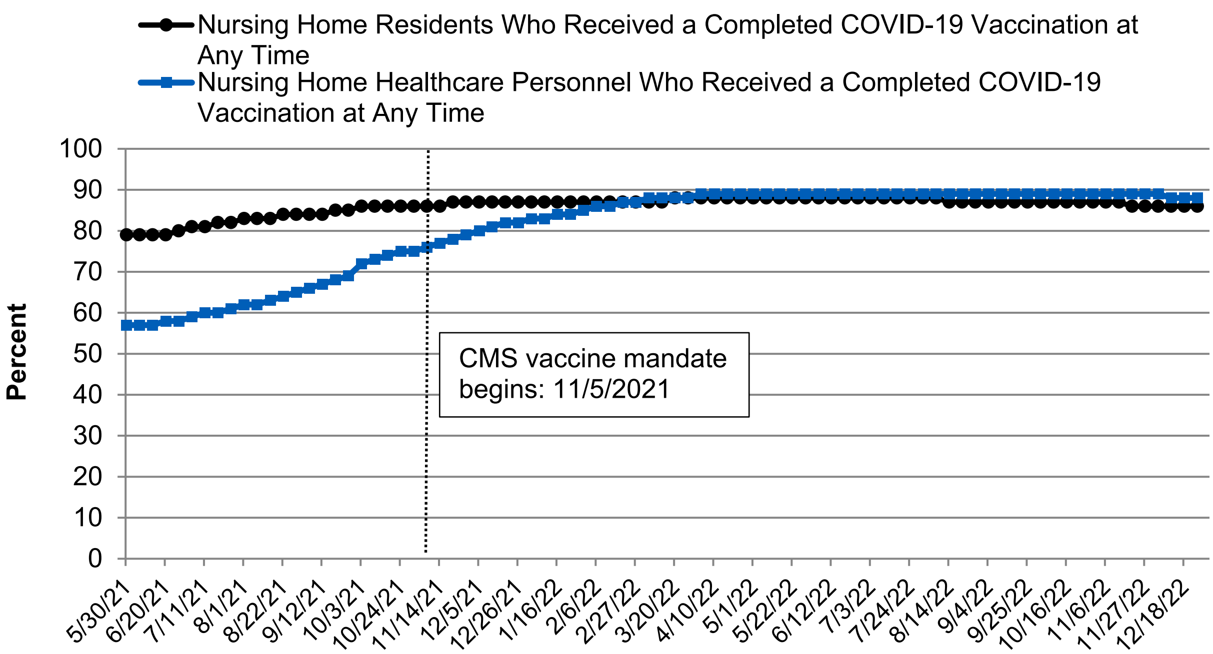
The COVID-19 vaccine became available in December 2020, and older people were advised to receive vaccines to protect themselves and others.[9] CDC also recommended that people who live and work in long-term care settings receive and stay up to date with COVID-19 vaccines.[10] Some people questioned the safety and effectiveness of the vaccines and, in some cases, residents and staff of nursing homes initially resisted getting the vaccination.[11]

While nursing homes made significant progress in vaccinating their residents in the months after COVID-19 vaccines became available, approximately one in five nursing home staff were not vaccinated at the end of 2021. In response, CMS amended federal regulations at 42 CFR §483.80 to require that nursing home personnel be fully vaccinated against COVID-19.[12]

The regulations allowed nursing homes to grant staff exemptions from the vaccination requirements based on federal law (e.g., for specific medical and religious reasons). But they required nursing homes to track and securely document the vaccination status of staff, exemptions requested, and exemptions granted.

The effective date of the regulations varied by state, but all states had to comply by March 21, 2022.[13] As of March 2022, 12% of nursing facilities nationally reported 100% staff vaccination rates, and 39% of facilities reported rates over 90% but less than 100%. The remaining 49% of facilities reported rates of 90% or below.[14] Vaccination, along with other infection control measures, is credited with a decrease in COVID-19 risk in nursing homes.[15]

Figure 8. Weekly rate of nursing home residents and healthcare personnel who received a completed COVID-19 vaccination at any time, May 2021-December 2022



Source: Centers for Medicare & Medicaid Services, COVID-19 Nursing Home Data, May 2021-December 2022. https://data.cms.gov/covid-19/covid-19-nursing-home-data.

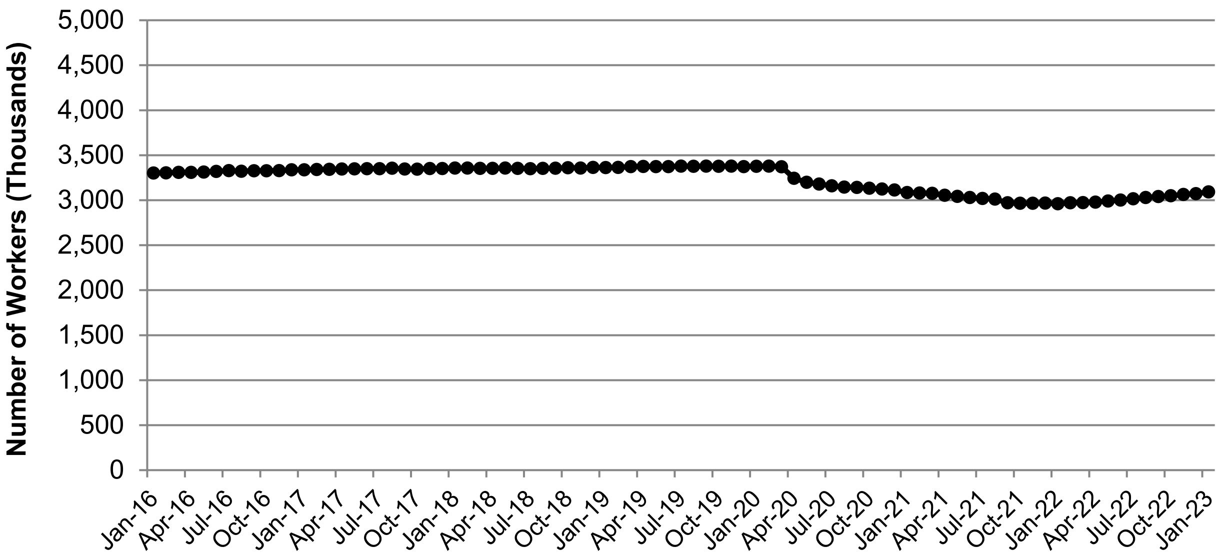
- In the first week of June 2021, shortly after COVID-19 vaccines became available for all adults in the United States, 79% of nursing home residents had received a completed COVID-19 vaccination at any time. The percentage of nursing home healthcare personnel who had received a completed COVID-19 vaccination was 57% (Figure 8).
- In mid-August 2021, during the surge associated with the Delta variant, 83% of nursing home residents were vaccinated and 63% of nursing home healthcare personnel were vaccinated.

- In the first week of November 2021, after CMS mandated COVID vaccination, 86% of nursing home residents were vaccinated and 76% of nursing home healthcare personnel were vaccinated.
- In mid-January 2022, during the surge associated with the Omicron variant, 87% of nursing home residents were vaccinated and 84% of nursing home healthcare personnel were vaccinated.
- During the last week of December 2022, by the end of the analytic period shown in Figure 8, 86% of nursing home residents were vaccinated and 88% of nursing home healthcare personnel were vaccinated.

Staff Shortages During the COVID-19 Pandemic

❖ **The COVID-19 pandemic exacerbated nursing home staff shortages.**

Figure 9. Number of workers employed and at work in nursing and residential care facilities, January 2016-January 2023



Source: Bureau of Labor Statistics, Current Employment Statistics (National), January 2016-January 2023. Accessed at https://www.bls.gov/ces/data/ on August 2, 2023.

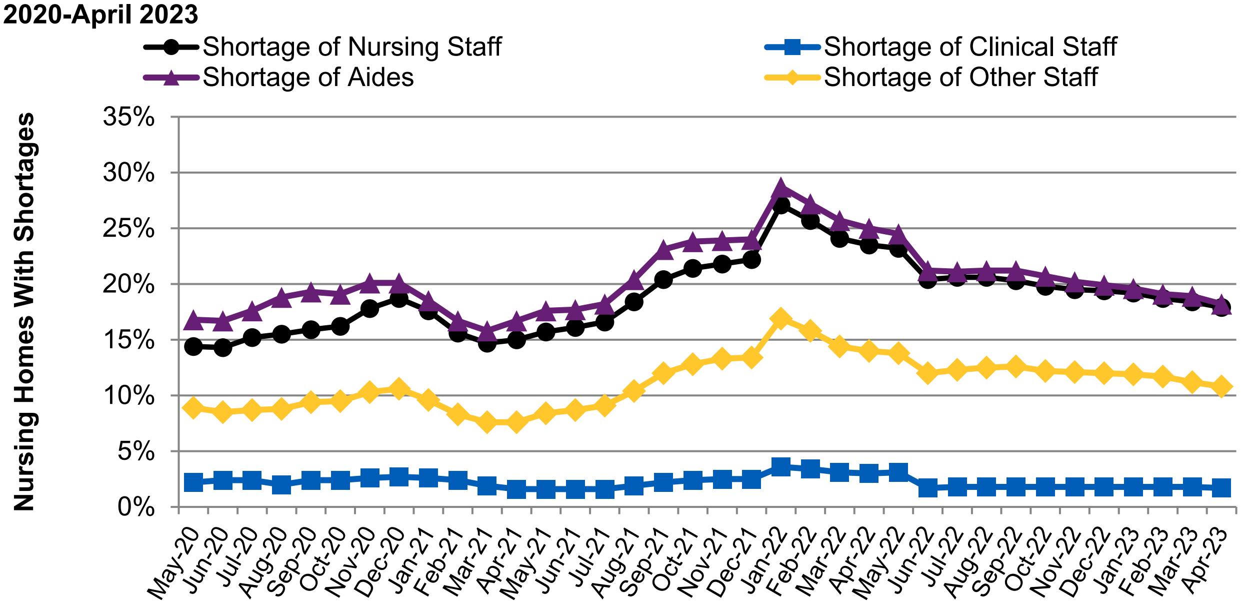
- In January 2023, the nursing home and residential care workforce had 3.1 million workers, down 8.4% from levels reported in January 2020 (Figure 9).

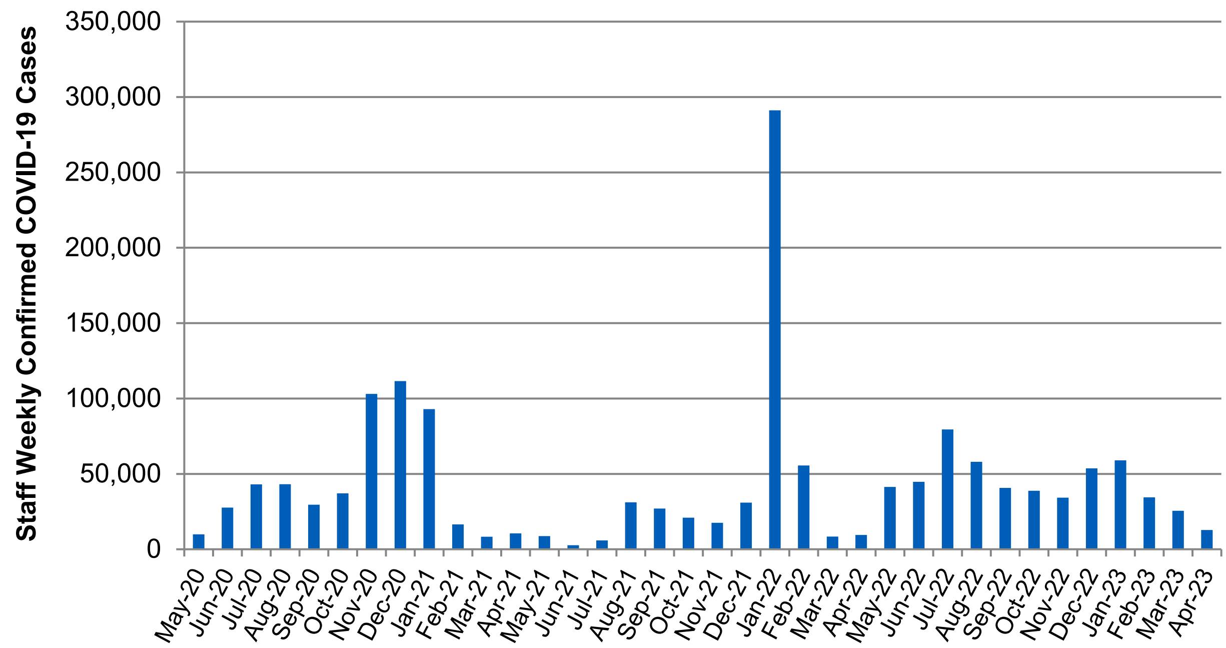
Nursing homes were challenged by staffing concerns before the pandemic,[16] and COVID-19 exacerbated staffing shortages. Infections led nursing home workers to leave the workplace for multiple weeks to avoid infecting residents or their colleagues. Some died because of their infections, permanently removing them from the workforce.

Among other nursing home workers, fear of infection, competing demands outside the workplace, and burnout resulting from staff shortages led to further workforce attrition. To fill the gap, nursing home staff may not have been adequately trained. Poorly trained staff are more likely to neglect important resident needs and cause harm due to their lack of knowledge.[17]

Adequate staffing is critical to providing safe and high-quality healthcare services, especially for people with chronic conditions. Yet more than one in four (28%) nursing facilities nationally reported staffing shortages as of March 2022, ranging from 63% in Alaska to 3% in California.[14]

Figure 10. Monthly percentage of nursing homes with nursing staff, clinical staff, aide, and other staff shortages (top) and monthly sum of staff weekly confirmed COVID-19 cases (bottom), May 2020-April 2023



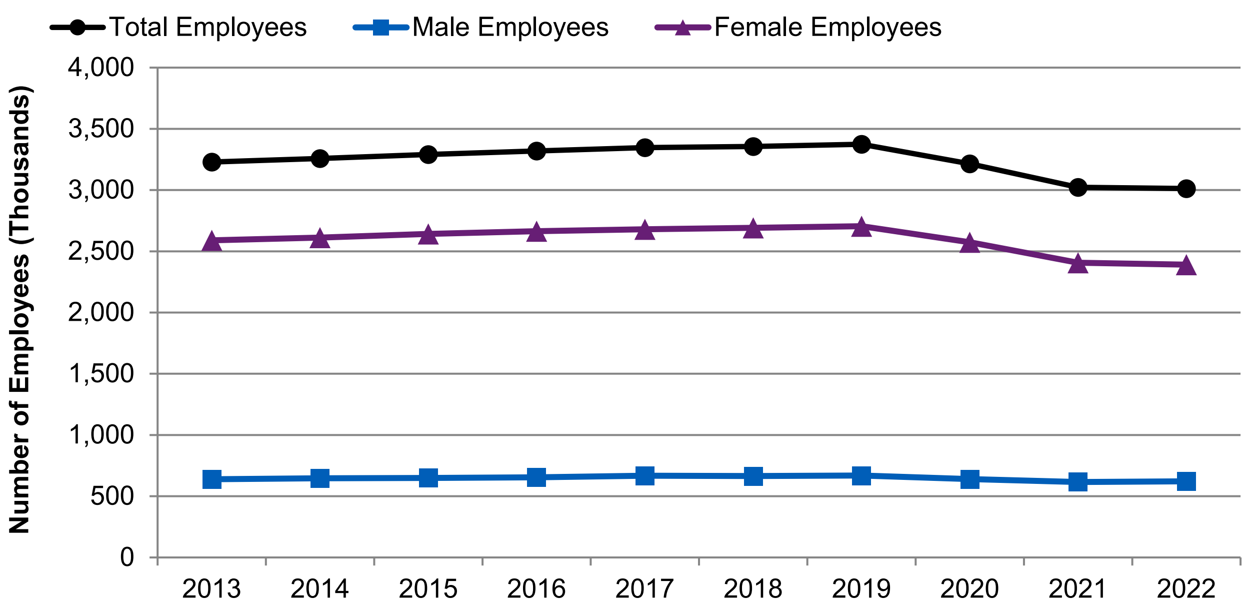


Source: Centers for Medicare & Medicaid Services, COVID-19 Nursing Home Data, May 2020-April 2023. https://data.cms.gov/covid-19/covid-19-nursing-home-data.
Note: "Other Staff" refers to staff not included in the other categories, regardless of clinical responsibility or resident contact, such as environmental services staff.

- Between May 2020 and April 2023, nursing home staff shortages were smallest among clinical staff, including physicians, physician assistants, and advanced practice nurses, and were largest among nursing staff and aides (Figure 10). Nursing staff include registered nurses, licensed practical nurses, and licensed vocational nurses. Aides include certified nursing assistants, nursing aides, medication aides, and medication technicians.
- Although shortages were highest among aides and nursing staff, people usually associate staff shortages with physicians and nurses.
- The peak of the shortage occurred in January 2022, especially for nursing staff and aides, which was also the peak for COVID-19 confirmed cases.

Women historically account for 80% of all employees in nursing and residential care facilities. Starting in September 2021, the percentage of women working in nursing and residential care decreased to 79%, as more women left the workplace than men. Closing of daycare facilities and schools may have contributed to more women leaving the labor market and accelerating the staff shortages in nursing homes and residential care facilities.[18]

Figure 11. Number of employees working in nursing and residential care facilities, overall and by gender, 2013-2022



Source: Bureau of Labor Statistics, Employment, Hours, and Earnings from the Current Employment Statistics Survey (national), nursing and residential care facilities, 2013-2022.

- The total number of employees of nursing and residential care facilities continuously increased until 2019 (Figure 11).
- The total number of employees dropped 11% from 3,374.1 in thousands in 2019 to 3,012.7 in thousands in 2022, and the number of female employees dropped 12% from 2,705.0 in thousands in 2019 to 2,391.1 in thousands in 2022. The number of male employees dropped 7% from 669.1 in thousands in 2019 to 621.6 in thousands in 2022.

Impact of Nursing Home Staff Shortages on Quality

❖ **Nursing home staff shortages may have negatively affected quality.**

Staffing shortages can affect the care provided to nursing home residents, as many residents depend on other people for assistance with essential tasks such as meals, personal hygiene, and emotional support. Although family/caregiver visitors and volunteers often provide additional support, as well as advocacy for residents, federal guidance restricted visitor access during the COVID-19 PHE to limit virus transmission.[19] When support from family and friends was lost, the effect of understaffing in nursing homes became apparent in quality of care.

Between 2013 and 2019, in the years leading up to the COVID-19 pandemic, long- and short-stay nursing homes had been improving on many measures. Some measures assessed tasks that require sustained attention from nursing home staff, such as:

- Percentage of staff who had moderate to severe pain (which assesses periodically reviewing and attending to residents' symptoms).
- Percentage of residents who report needing help with daily activities; and
- Percentage of residents who report worsening ability to move independently.

Other measures assess avoidance of potentially harmful interventions, such as percentage of residents with urinary tract infections, which can be modified by avoiding unnecessary urinary catheters. Other measures assess avoidance of unsupervised activity, such as percentage of residents with serious falls.

NHQDR data suggest that limited nursing home staffing may have adversely affected nursing home quality, as measures of tasks requiring sustained attention from staff worsened during the COVID-19 PHE. However, measures involving either avoidance of interventions (such as urinary tract infection rates) or limiting resident mobility (such as serious falls) did not change.

The data also show continued healthcare disparities between nursing home residents in nonmetropolitan communities and those in metropolitan areas, as well as disparities among nursing home residents of different races and ethnicities. But relative disparities among groups remained stable, suggesting that staffing-related concerns had similar effects on quality of care delivered to people in different urban/rural settings and of different races and ethnicities.

Findings

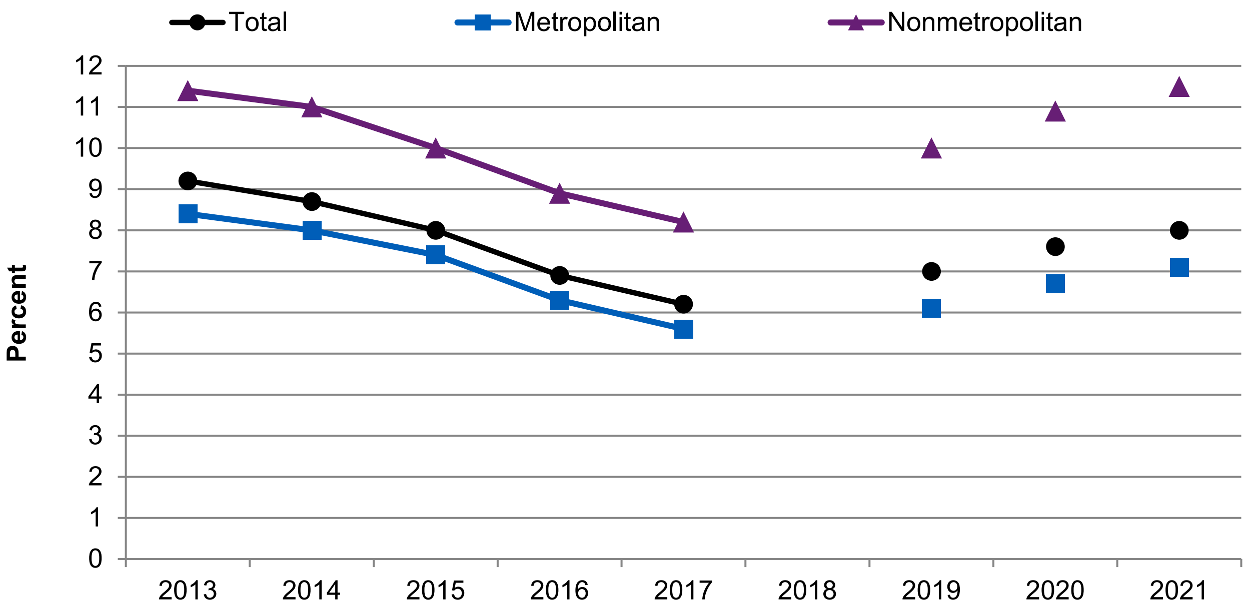
❖ **Long-stay and short-stay nursing home measures, which reflect care provided by nursing home healthcare personnel, showed changes in 2020 but cannot be compared with 2019 due to the temporary change in CMS reporting requirements.**

For the nursing home quality measures in this year's NHQDR, 2020 rates cannot be compared with prior years. Due to COVID-19, CMS temporarily exempted providers from submitting Minimum Data Set (MDS) Assessment Data for quarter 1 and quarter 2, 2020. In general, total sample size decreased about 20% from 2019 to 2020.

NH-Asian sample size decreased more than any other racial/ethnic group. For example, the sample size for long-stay nursing home residents with a urinary tract infection decreased 26% for NH-Asian, 20% for NH-White and multiracial, 16% for NH-Native Hawaiian/Pacific Islander (NHPI), 15% for NH-American Indian or Alaska Native (AI/AN) and Black, and 10% for Hispanic, all races.

Disparities among racial/ethnic groups are not discussed indepth because most (70%-75%) of the nursing home population is NH-White.

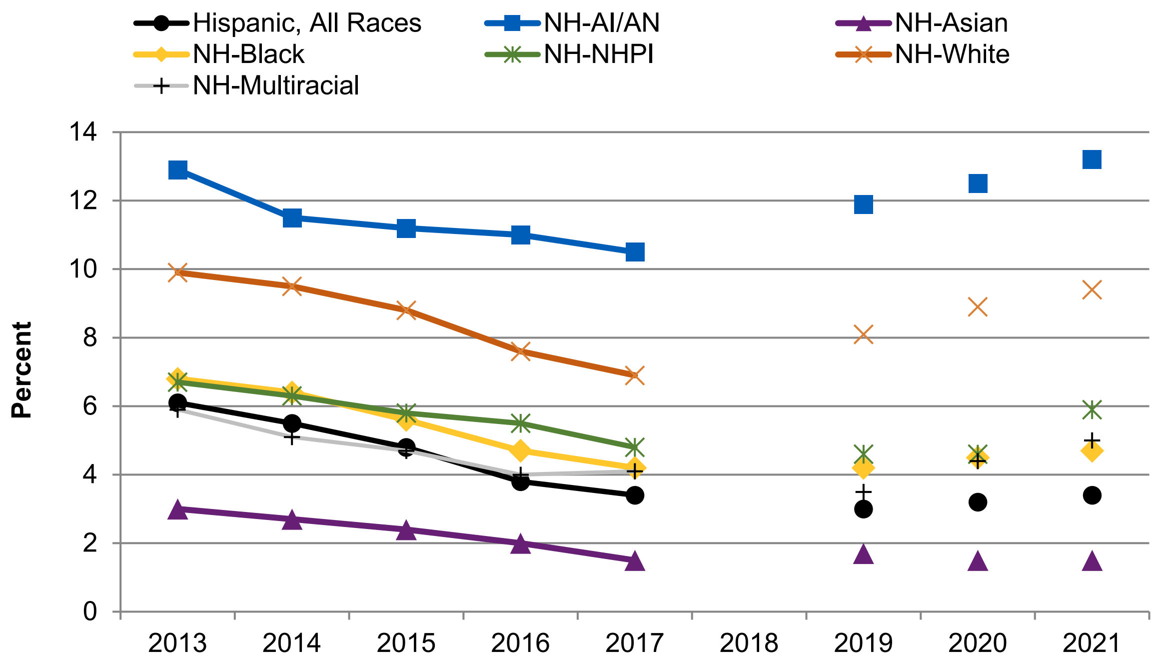
Figure 12. Long-stay nursing home residents with moderate to severe pain, by location of facility, 2013-2017, 2019, 2020, and 2021 (lower rates are better)



Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2013-2017, 2019, 2020, and 2021.
Note: Data for 2018 have not been analyzed. Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submissions were optional. Discharges on or after July 1, 2020, may have missing MDS admission data. Data for 2019 and 2020 cannot be compared with previous data due to the COVID-19 exemption in the numerator and a change in the denominator.

- The overall percentage of long-stay nursing home residents with moderate to severe pain decreased 33% from 9.2% in 2013 to 6.2% in 2017. The percentage was 7.0% in 2019, 7.6% in 2020, and 8.0% in 2021 (Figure 12).
- The percentage of metropolitan long-stay nursing home residents with moderate to severe pain decreased 33% from 8.4% in 2013 to 5.6% in 2017. The percentage was 6.1% in 2019, 6.7% in 2020, and 7.1% in 2021.
- The percentage of nonmetropolitan long-stay nursing home residents with moderate to severe pain decreased 28% from 11.4% in 2013 to 8.2% in 2017. The percentage was 10.0% in 2019, 10.9% in 2020, and 11.5% in 2021.

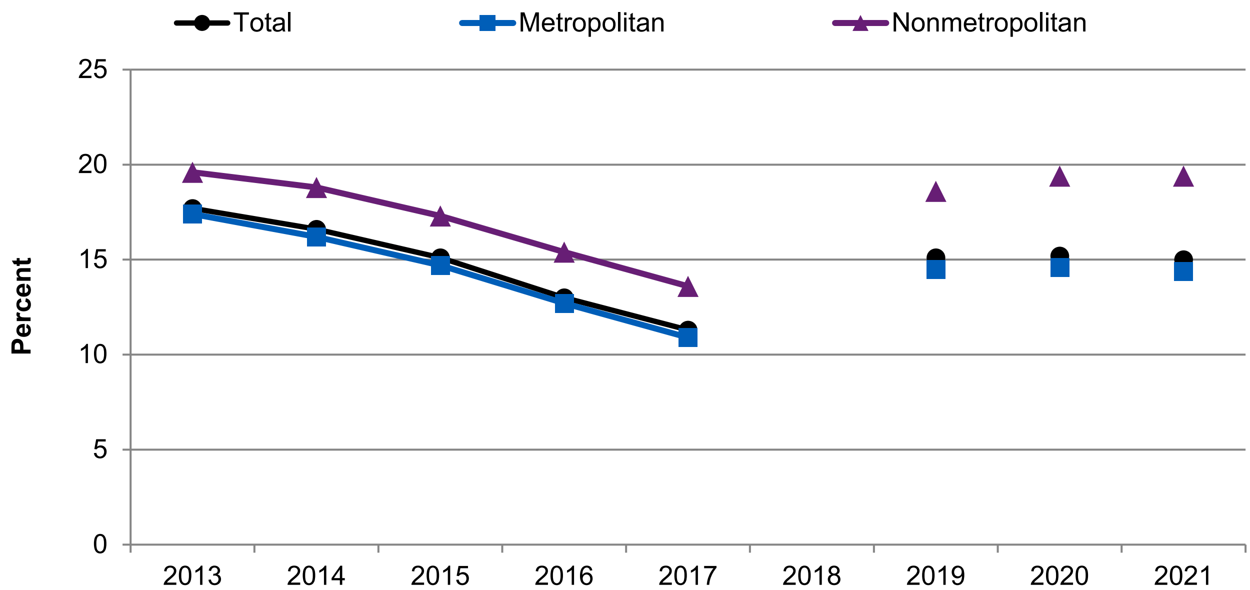
Figure 13. Long-stay nursing home residents with moderate to severe pain, by race/ethnicity, 2013-2017, 2019, 2020, and 2021 (lower rates are better)



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set (MDS 3.0), 2013-2017, 2019, 2020, and 2021.
Note: Data for 2018 have not been analyzed. Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submissions were optional. Discharges on or after July 1, 2020, may have missing MDS admission data. Data for 2019 and 2020 cannot be compared with previous data due to the COVID-19 exemption in the numerator and a change in the denominator.

- The percentage of NH-AI/AN long-stay nursing home residents with moderate to severe pain decreased 19% from 12.9% in 2013 to 10.5% in 2017 (Figure 13). The percentage of NH-AI/AN long-stay nursing home residents with moderate to severe pain was 11.9% in 2019, 12.5% in 2020, and 13.2% in 2021.
- The percentage of NH-Asian long-stay nursing home residents with moderate to severe pain decreased 50% from 3.0% in 2013 to 1.5% in 2017. The percentage was 1.7% in 2019, 1.5% in 2020, and 1.5% in 2021.
- The percentage of NH-White long-stay nursing home residents with moderate to severe pain was 8.1% in 2019, 8.9% in 2020, and 9.4% in 2021.

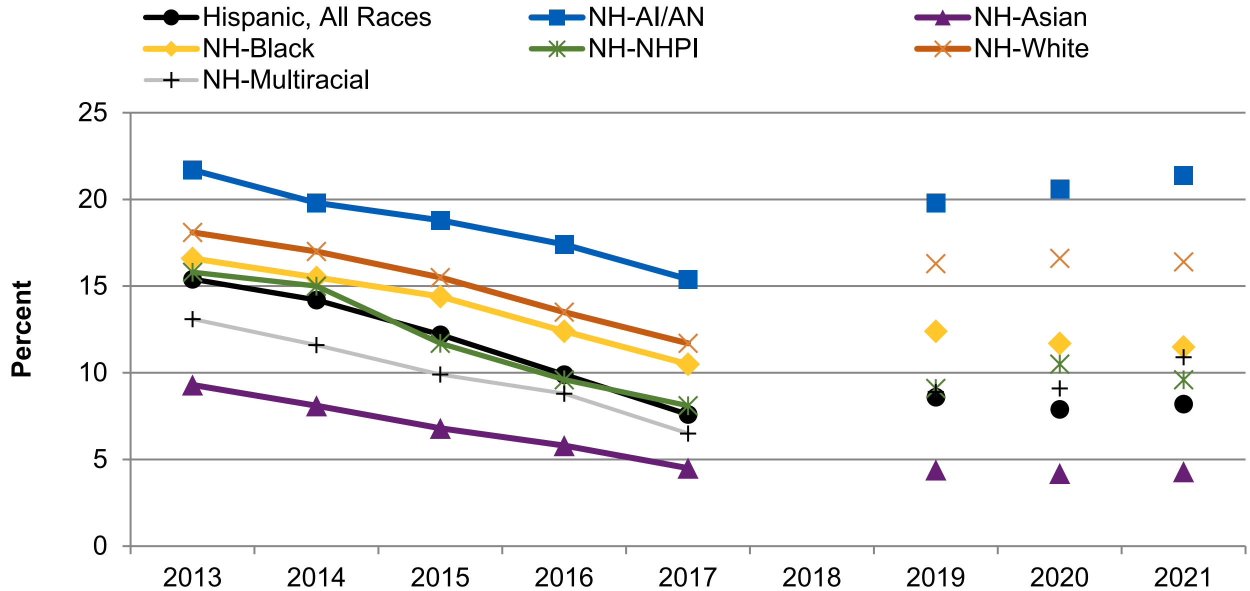
Figure 14. Short-stay nursing home residents with moderate to severe pain, by location of facilities, 2013-2017, 2019, 2020, and 2021 (lower rates are better)



Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2013-2017, 2019, 2020, and 2021.
Note: Data for 2018 have not been analyzed. Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submissions were optional. Discharges on or after July 1, 2020, may have missing MDS admission data. Data for 2019 and 2020 cannot be compared with previous data due to the COVID-19 exemption in the numerator and a change in the denominator.

- The overall percentage of short-stay nursing home residents with moderate to severe pain decreased 36% from 17.7% in 2013 to 11.3% in 2017 (Figure 14).
- The percentage of metropolitan short-stay nursing home residents with moderate to severe pain decreased 37% from 17.4% in 2013 to 10.9% in 2017. The percentage was 14.5% in 2019, 14.6% in 2020, and 14.4% in 2021.
- The percentage of nonmetropolitan short-stay nursing home residents with moderate to severe pain decreased 31% from 19.6% in 2013 to 13.6% in 2017. The percentage was 18.6% in 2019 and 19.4% in 2020 and 2021.

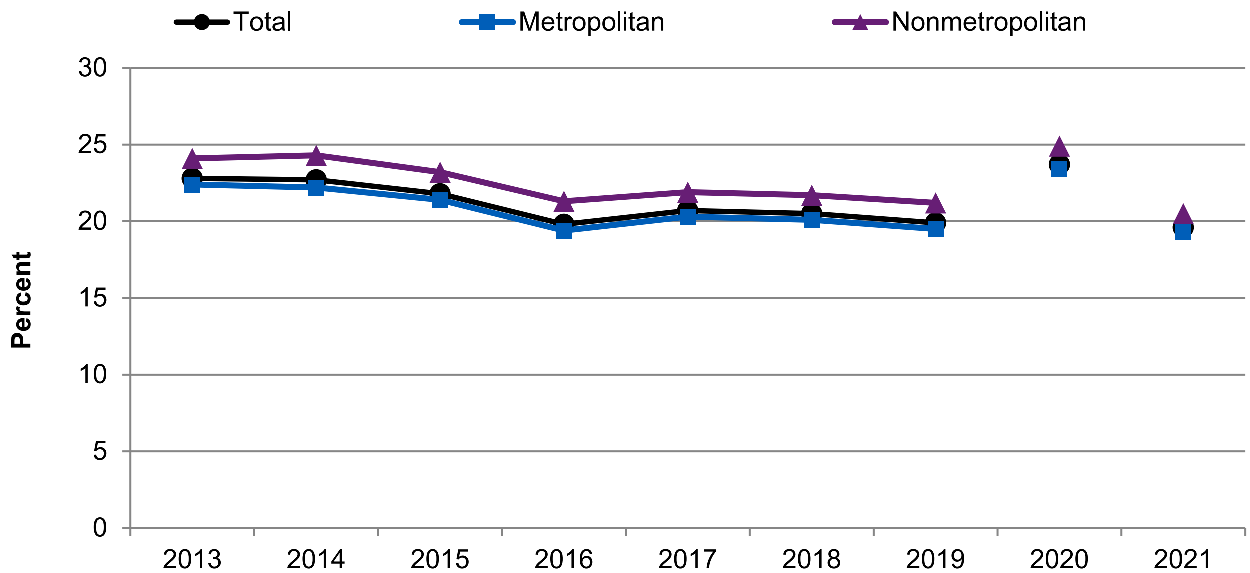
Figure 15. Short-stay nursing home residents with moderate to severe pain, by race/ethnicity, 2013-2017, 2019, 2020, and 2021 (lower rates are better)



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2013-2017, 2019, 2020, and 2021.
Note: Data for 2018 have not been analyzed. Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submissions were optional. Discharges on or after July 1, 2020, may have missing MDS admission data. Data for 2019 and 2020 cannot be compared with previous data due to the COVID-19 exemption in the numerator and a change in the denominator.

- The percentage of NH-AI/AN short-stay nursing home residents with moderate to severe pain decreased 29% from 21.7% in 2013 to 15.4% in 2017 (Figure 15). The percentage was 19.8% in 2019, 20.6% in 2020, and 21.4% in 2021.
- The percentage of NH-Asian short-stay nursing home residents with moderate to severe pain decreased 52% from 9.3% in 2013 to 4.5% in 2017.
- The percentage of NH-Native Hawaiian/Pacific Islander (NHPI) short-stay nursing home residents with moderate to severe pain was 9.1% in 2019, 10.5% in 2020, and 9.6% in 2021.

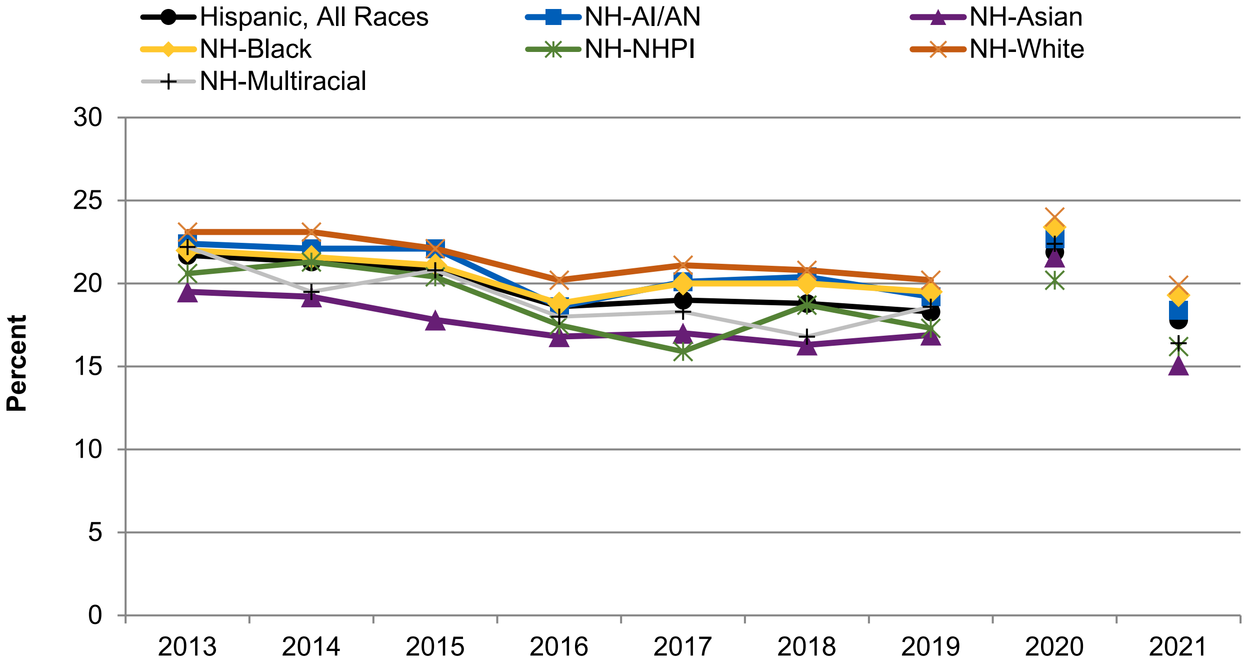
Figure 16. Long-stay nursing home residents whose need for help with daily activities increased, by location of facility, 2013-2019, 2020, and 2021 (lower rates are better)



Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2013-2019, 2020, and 2021.
Note: Data reflect care for the latest episode of a beneficiary in the calendar year. Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submission was optional. Discharges on or after July 1, 2020, may have missing MDS admission data. Data for 2020 cannot be compared with previous data due to the COVID-19 exemption in the numerator and a change in the denominator.

- The overall percentage of long-stay nursing home residents with an increased need for help with daily activities decreased 13% from 22.8% in 2013 to 19.9% in 2019. The percentage was 23.7% in 2020 and 19.6% in 2021 (Figure 16).
- The percentage of metropolitan long-stay nursing home residents with an increased need for help with daily activities decreased 13% from 22.4% in 2013 to 19.5% in 2019. The percentage was 23.4% in 2020, and 19.3% in 2021.
- The percentage of nonmetropolitan long-stay nursing home residents with an increased need for help with daily activities decreased 12% from 24.1% in 2013 to 21.2% in 2019. The percentage was 24.9% in 2020 and 20.5% in 2021.

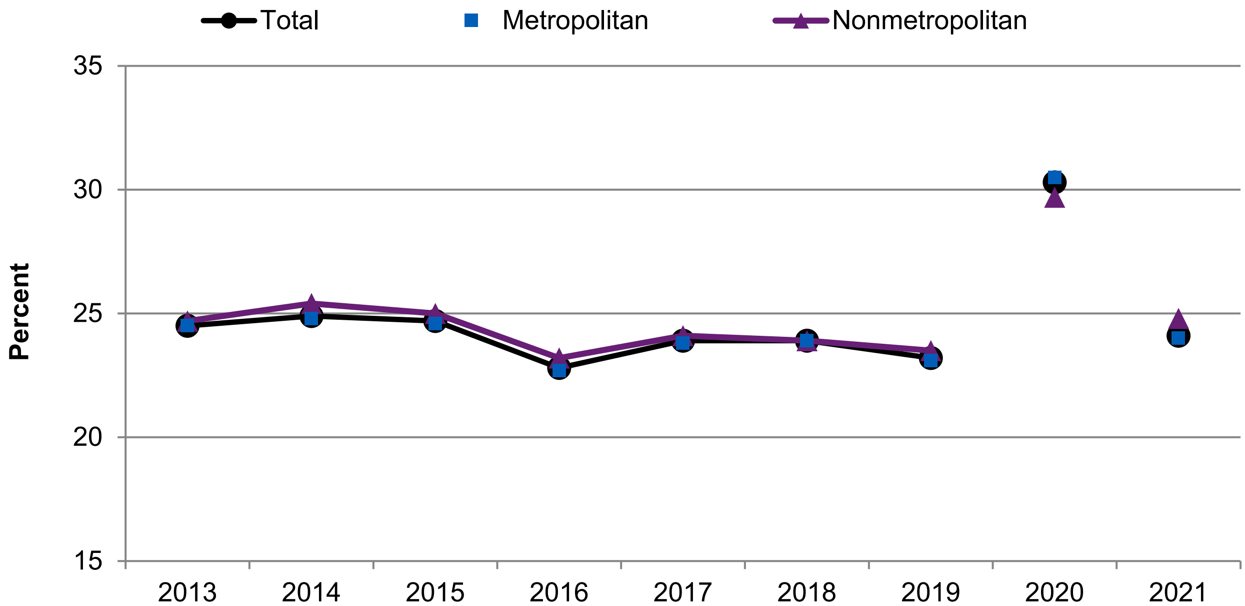
Figure 17. Long-stay nursing home residents whose need for help with daily activities increased, by race/ethnicity, 2013-2019, 2020, and 2021 (lower rates are better)



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2013-2019, 2020, and 2021.
Note: Data reflect care for the latest episode of a beneficiary in the calendar year. Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submission was optional. Discharges on or after July 1, 2020, may have missing MDS admission data. Data for 2020 cannot be compared with previous data due to the COVID-19 exemption in the numerator and a change in the denominator.

- The percentage of NH-White long-stay nursing home residents with an increased need for help with daily activities decreased 13% from 23.1% in 2013 to 20.2% in 2019. The percentage was 24.0% in 2020 and 19.9% in 2021 (Figure 17).
- The percentage of NH-Asian long-stay nursing home residents with an increased need for help with daily activities decreased 13% from 19.5% in 2013 to 16.9% in 2019. The percentage was 21.6% in 2020 and 15.1% in 2021.
- The percentage of NH-NHPI long-stay nursing home residents with an increased need for help with daily activities decreased 16% from 20.6% in 2013 to 17.3% in 2019. The percentage was 20.2% in 2020 and 16.2% in 2021.

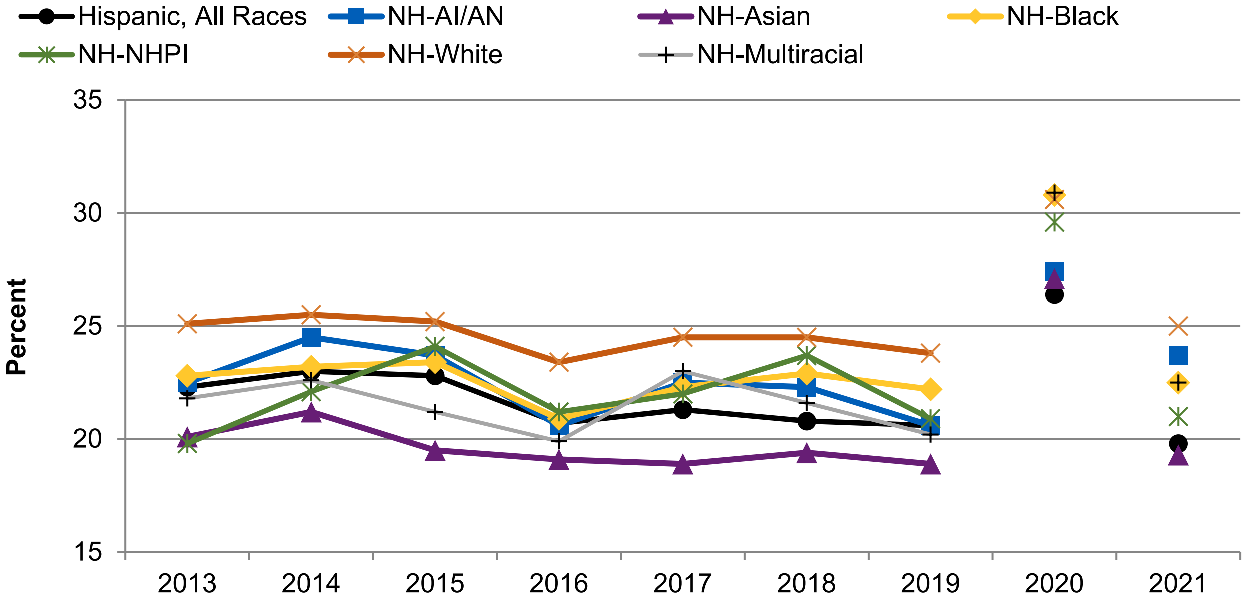
Figure 18. Long-stay nursing home residents whose ability to move independently worsened, by location of facility, 2013-2019, 2020, and 2021 (lower rates are better)



Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2013-2019, 2020, and 2021.
Note: Data reflect care for the latest episode of a beneficiary in the calendar year. Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submission was optional. Discharges on or after July 1, 2020, may have missing MDS admission data. Data for 2020 cannot be compared with previous data due to the COVID-19 exemption in the numerator and a change in the denominator.

- The overall percentage of long-stay nursing home residents whose ability to move independently worsened decreased 5% from 24.5% in 2013 to 23.2% in 2019. The percentage was 30.3% in 2020 and 24.1% in 2021 (Figure 18).
- The percentage of metropolitan long-stay nursing home residents whose ability to move independently worsened decreased 6% from 24.5% in 2013 to 23.1% in 2019. The percentage was 30.5% in 2020 and 24.0% in 2021.
- The percentage of nonmetropolitan long-stay nursing home residents whose ability to move independently worsened decreased 5% from 24.7% in 2013 to 23.5% in 2019. The percentage was 29.7% in 2020 and 24.8% in 2021.

Figure 19. Long-stay nursing home residents whose ability to move independently worsened, by race/ethnicity, 2013-2019, 2020, and 2021 (lower rates are better)

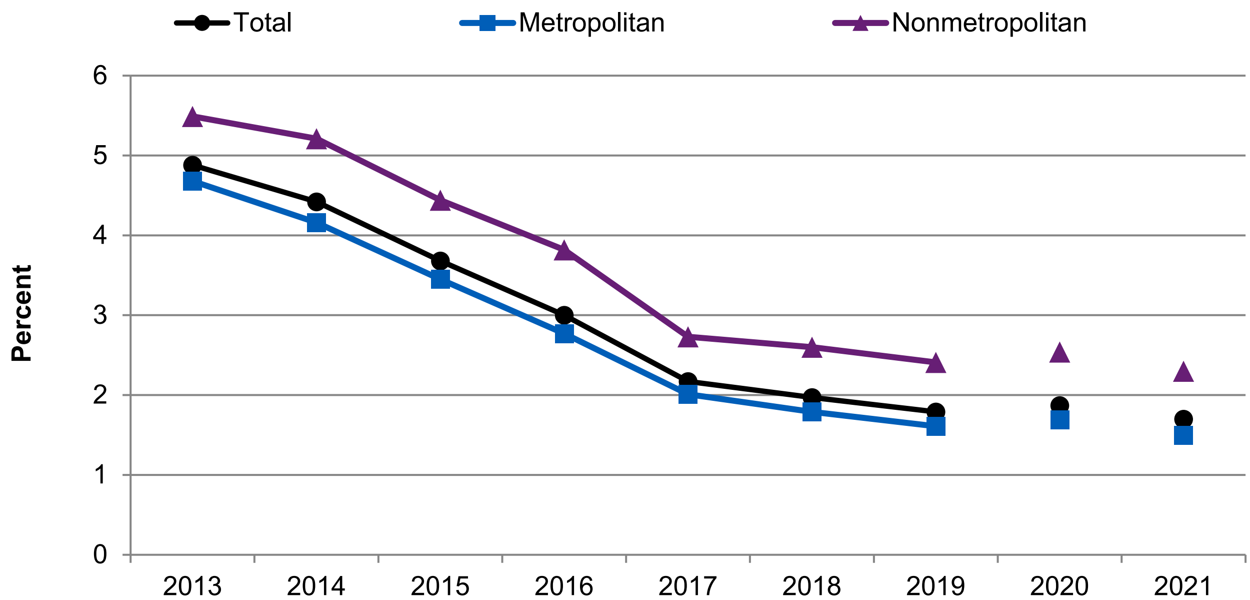


Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2013-2019, 2020, and 2021.
Note: Data reflect care for the latest episode of a beneficiary in the calendar year. Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submission was optional. Discharges on or after July 1, 2020, may have missing MDS admission data. Data for 2020 cannot be compared with previous data due to the COVID-19 exemption in the numerator and a change in the denominator.

- The percentage of NH-White long-stay nursing home residents whose ability to move independently worsened decreased 5% from 25.1% in 2013 to 23.8% in 2019. The percentage was 30.6% in 2020 and 25.0% in 2021 (Figure 19).
- The percentage of Hispanic long-stay nursing home residents whose ability to move independently worsened decreased 8% from 22.3% in 2013 to 20.6% in 2019. The percentage was 26.4% in 2020 and 19.8% in 2021.
- The percentage of NH-Asian long-stay nursing home residents whose ability to move independently worsened decreased 6% from 20.1% in 2013 to 18.9% in 2019. The percentage was 27.1% in 2020 and 19.3% in 2021.
- The percentage of NH-NHPI long-stay nursing home residents whose ability to move independently worsened increased 6% from 19.8% in 2013 to 20.9% in 2019. The percentage was 29.6% in 2020 and 21.0% in 2021.

- ❖ **Critical long-stay nursing home measures for urinary tract infection and falls, which are indicators of care provided in nursing homes, had no statistically significant changes in 2020.**

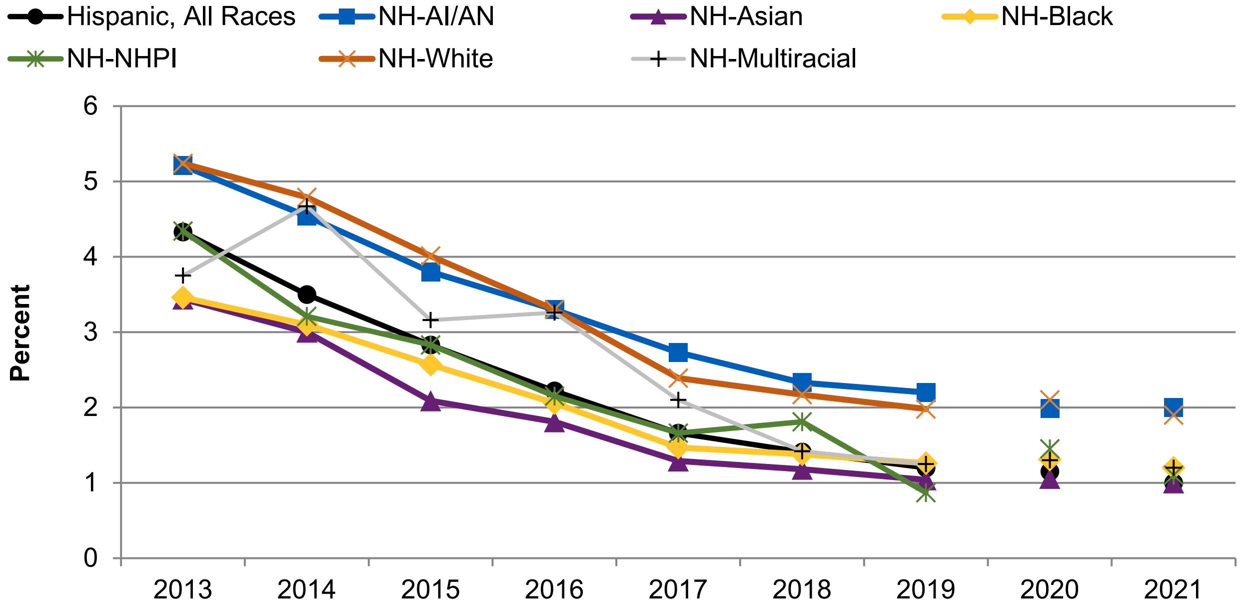
Figure 20. Long-stay nursing home residents with a urinary tract infection, by location of facility, 2013-2019, 2020, and 2021 (lower rates are better)



Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2013-2019, 2020, and 2021.
Note: Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submission was optional. Discharges on or after July 1, 2020, may have missing MDS admission data. Data for 2020 cannot be compared with previous data due to the COVID-19 exemption in the numerator and a change in the denominator.

- The overall percentage of long-stay nursing home residents with a urinary tract infection decreased 63% from 4.9% in 2013 to 1.8% in 2019. The percentage was 1.9% in 2020 and 1.7% in 2021 (Figure 20).
- The percentage of metropolitan long-stay nursing home residents with a urinary tract infection decreased 66% from 4.7% in 2013 to 1.6% in 2019. The percentage was 1.7% in 2020 and 1.5% in 2021.
- The percentage of nonmetropolitan long-stay nursing home residents with a urinary tract infection decreased 56% from 5.5% in 2013 to 2.4% in 2019. The percentage was 2.5% in 2020 and 2.3% in 2021.

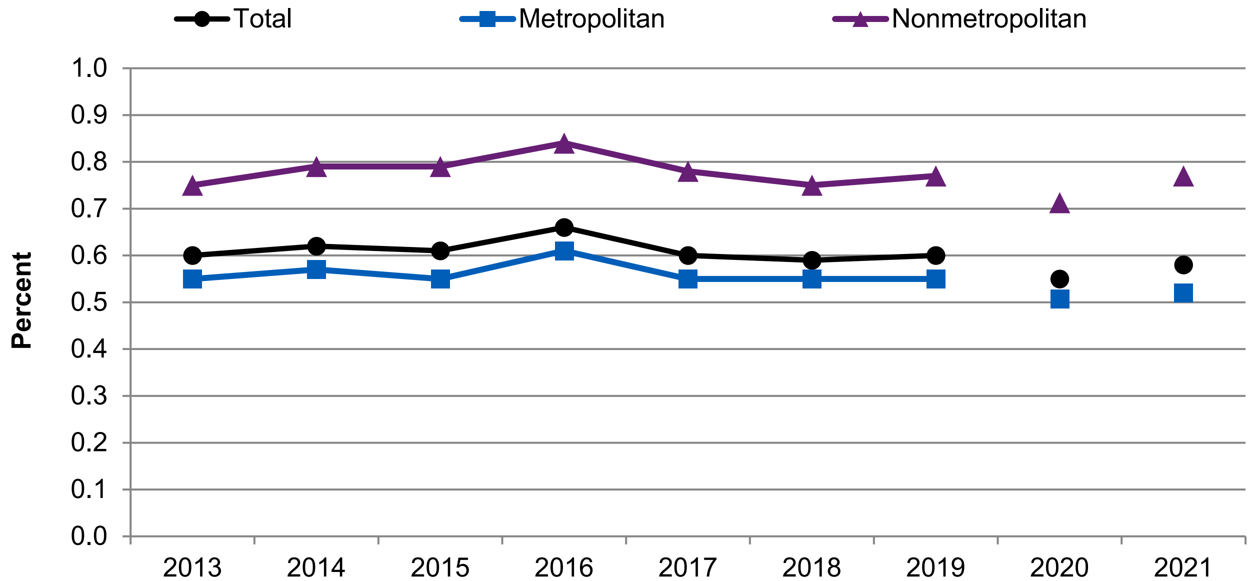
Figure 21. Long-stay nursing home residents with a urinary tract infection, by race/ethnicity, 2013-2019, 2020, and 2021 (lower rates are better)



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native; NHPI = Native Hawaiian/Pacific Islander.
Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2013-2019, 2020, and 2021.
Note: Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submission was optional. Discharges on or after July 1, 2020, may have missing MDS admission data. Data for 2020 cannot be compared with previous data due to the COVID-19 exemption in the numerator and a change in the denominator.

- The percentage of NH-NHPI long-stay nursing home residents with a urinary tract infection decreased 80% from 4.3% in 2013 to 0.87% in 2019. The percentage was 1.5% in 2020 and 1.1% in 2021 (Figure 21).
- The percentage of Hispanic long-stay nursing home residents with a urinary tract infection decreased 72% from 4.3% in 2013 to 1.2% in 2019. The percentage was also 1.2% in 2020 and 1.0% in 2021.

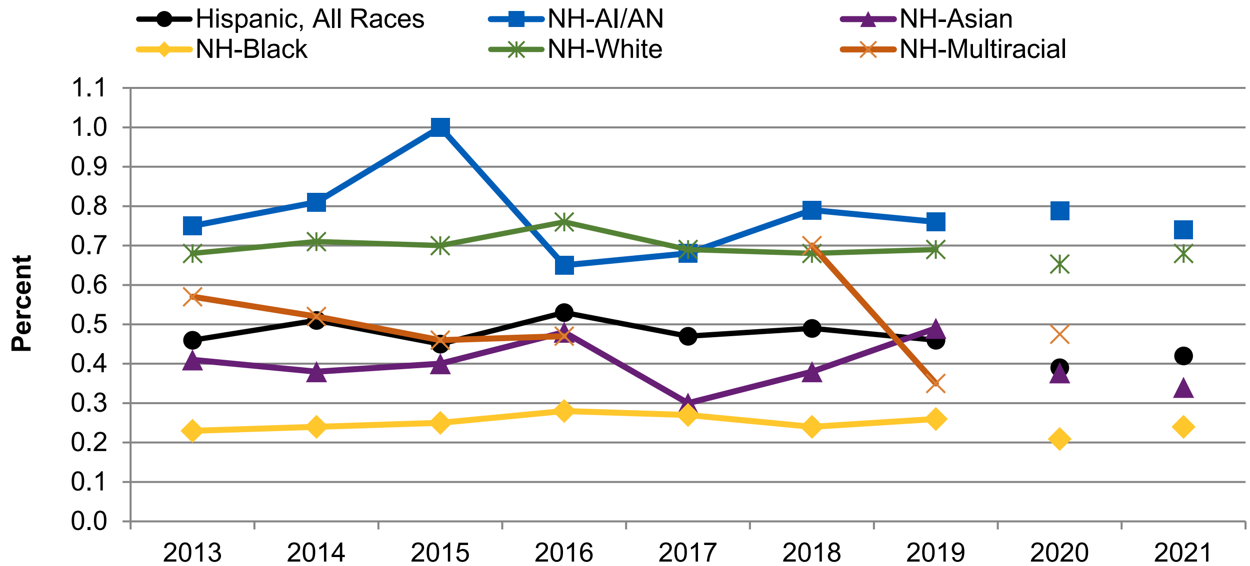
Figure 22. Long-stay nursing home patients experiencing one or more falls with major injury, by location of facilities, 2013-2019, 2020, and 2021 (lower rates are better)



Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2013-2019, 2020, and 2021.
Note: Data reflect care for the latest episode of a beneficiary in the calendar year. Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submission was optional. Discharges on or after July 1, 2020, may have missing MDS admission data. Data for 2020 cannot be compared with previous data due to the COVID-19 exemption in the numerator and a change in the denominator.

- The overall percentage of long-stay nursing home patients experiencing one or more falls with major injury showed no statistically significant changes from 2013 to 2019, remaining at 0.6%. The percentage was 0.55% in 2020 and 0.58% in 2021 (Figure 22).
- The percentage of metropolitan long-stay nursing home patients experiencing one or more falls with major injury showed no statistically significant changes, remaining at 0.55% in 2013 and 2019. The percentage was 0.51% in 2020 and 0.52% in 2021.
- The percentage of nonmetropolitan long-stay nursing home patients experiencing one or more falls with major injury increased 3% from 0.75% in 2013 to 0.77% in 2019. The percentage was 0.71% in 2020 and 0.77% in 2021.

Figure 23. Long-stay nursing home patients experiencing one or more falls with major injury, by race/ethnicity, 2013-2019, 2020, and 2021 (lower rates are better)



Key: NH = non-Hispanic; AI/AN = American Indian or Alaska Native.
Source: Centers for Medicare & Medicaid Services, Skilled Nursing Facility Quality Reporting Program, Resident Assessment Files, Minimum Data Set (MDS) 3.0, 2013-2019, 2020, and 2021.
Note: Data reflect care for the latest episode of a beneficiary in the calendar year. Due to COVID-19, CMS temporarily exempted providers from submitting MDS Assessment Data for quarter 1 and quarter 2, 2020. Submission was optional. Discharges on or after July 1, 2020, may have missing MDS admission data. Data for 2020 cannot be compared with previous data due to the COVID-19 exemption in the numerator and a change in the denominator. The data did not include the Native Hawaiian/Pacific Islander population and estimates did not meet the criteria for statistical reliability, data quality, or confidentiality for non-Hispanic-multiracial groups for 2017 and 2021.

- The percentage of NH-AI/AN long-stay nursing home patients experiencing one or more falls with major injury showed no statistically significant changes, at 0.75% in 2013 and 0.76% in 2019. The percentage was 0.79% in 2020 and 0.74% in 2021 (Figure 23).
- The percentage of NH-Black long-stay nursing home patients experiencing one or more falls with major injury increased from 0.23% in 2013 to 0.26% in 2019. The percentage was 0.21% in 2020 and 0.24% in 2021.

Discussion and Conclusions

The COVID-19 PHE revealed vulnerabilities in nursing homes and residential care communities. NHQDR data show that case and death rates among nursing home residents exceeded rates reported by other sectors in the healthcare delivery system. Case rates and deaths among nursing home workers were also higher than rates experienced by healthcare workers in other sectors and by the overall population.

A range of issues may have contributed to nursing homes' vulnerability, including:

- Staffing shortages,
- Insufficient training of nursing home staff,
- Lack of personal protective equipment (PPE),
- Limited testing capacity to guide response to outbreaks, and

- Inconsistent adherence to policies intended to limit disease transmission, such as hand washing and masking.[20]

In addition, older facility designs may have limited nursing homes' ability to adequately quarantine newly admitted residents and isolate infected current residents.[20]

Staff shortages had been a particular concern before the COVID-19 PHE, but the issue gained prominence during the pandemic. Although the nursing home workforce was shrinking due to economic forces before the pandemic, limited access to PPE exacerbated the problem by increasing workers' risk of infection, resulting in missed workdays. Concurrently, lockdowns intended to limit virus transmission reduced residents' access to friends and family, who may have partly compensated for staffing limitations before the pandemic.

Disruptions in CMS's data monitoring systems prevent us from directly trending data between 2019 and 2020. But these factors appeared to negatively affect measures such as long-stay nursing home residents with an increased need for help with daily activities and long-stay nursing home residents whose ability to move independently worsened. Residents may have received lesser care for issues such as these that require sustained attention from nursing home staff. If so, nursing home residents may continue to experience suboptimal care because staffing shortages persist, even though the PHE has ended.

Several initiatives sought to improve nursing home care through training and mentorships during the COVID-19 pandemic. For example, AHRQ invested $237 million of the Provider Relief Fund to launch the AHRQ ECHO National Nursing Home COVID-19 Action Network (the Network). This partnership between AHRQ, the University of New Mexico's ECHO Institute, and the Institute for Healthcare Improvement fielded 99 training centers under the Network. The centers provided training and mentorship to more than 9,000 nursing homes (58% of 15,400 eligible nursing homes) and nearly 32,000 nursing home staff in all 50 states, the District of Columbia, and Puerto Rico.[1] The Network's 16-week Training and Mentorship Program ultimately benefited 1.7 million nursing home residents.

Most of all, adequate staffing levels should be restored to provide proper healthcare to nursing home residents. The impact of staff shortages, including nursing home staff shortages, will be addressed in an upcoming Data Spotlight on the Healthcare Workforce.

Resources

COVID-19 Nursing Home Data (https://data.cms.gov/covid-19/covid-19-nursing-home-data) has information on COVID-19 reported by nursing homes to CDC's National Healthcare Safety Network COVID-19 Long-Term Care Facility Module.

AHRQ's Role in Nursing Home COVID-19 Response (https://www.ahrq.gov/sites/default/files/wysiwyg/nursing-home/materials/ahrq-network-factsheet.pdf) describes the COVID-19 Action Network and its attempt to remediate the lack of adequate training among nursing home workers to care for residents with and without COVID-19. The Network's goals are to:

- Keep SARS-COV 2 out of nursing homes.
- Promote early identification of COVID-19 infection among residents and staff.

- Prevent spread between staff, residents, and visitors.
- Provide safe and appropriate care to residents with COVID-19.
- Help nursing home staff implement best practice safety measures.
- Reduce social isolation for residents, families, caregivers, and staff.

CMS Nursing Home Quality Initiative (https://www.cms.gov/medicare/quality/nursing-home-improvement) focuses on the Minimum Data Set, Care Compare, payment, quality measures, and survey and certification information for providers. The website for the initiative provides information about quality measures shown on the Care Compare website, which allows consumers, providers, states, and researchers to compare information on nursing homes. Many nursing homes have already made significant improvements in the care provided to residents by taking advantage of these materials and the support of Quality Improvement Organization staff.

CMS Skilled Nursing Facility (SNF) Quality Reporting Program (QRP) Measures and Technical Information (https://www.cms.gov/medicare/quality/snf-quality-reporting-program/measures-and-technical-information) provides information on the measures reported by SNFs in accordance with the SNF QRP. This web page includes descriptions of each measure, links to measure specifications, measure updates, and other measure-related information. The page is updated as measure updates become available.

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Growth of Telehealthcare During the COVID-19 Pandemic

Telehealthcare is the delivery of healthcare services through telecommunication technologies and can be conducted via synchronous services (i.e., live interaction via audio or video) or asynchronous services such as messaging, file sharing, and remote monitoring. This section of the NHQDR focuses on telehealthcare services provided via synchronous video-plus-audio (referred to in this section as "video") or audio-only visits between a provider and patient.[1]

As in-person services were limited during the COVID-19 pandemic, policymakers, healthcare systems, providers, and patients pivoted to increase the use of telehealthcare services. This section provides a brief history of telehealthcare services, how they changed during the COVID-19 pandemic, and disparities in telehealthcare services. It also presents findings from analyses of data obtained for the NHQDR, including:

- Use of telehealthcare services before the pandemic was very low, due in part to policy restrictions, but rates increased in the first few months of the pandemic due to waivers and policy flexibilities by the federal and state governments. Although telehealthcare use waned as the pandemic progressed, despite continued federal flexibilities, its use remains higher than before the pandemic.
- Provider use of telehealthcare services was not consistent. Practices with fewer providers were less likely to report telehealthcare service use.
- Telehealthcare services were most often provided for mental health care.
- People living in areas with lower internet access or in rural areas and older adults were less likely to have a telehealthcare visit.
    - Of people with a telehealthcare visit, older and lower income individuals were less likely to have a telehealthcare visit that included video technology.
- Practices that used telehealthcare services most often reported that patient difficulty using telehealthcare technology and limitations in patient access to technology affected the practices' use of telehealthcare.
    - Although limited provider internet access or speed issues were less commonly reported overall, this limitation more often affected providers in non-metropolitan statistical areas (MSAs) and areas with a higher percentage of non-Hispanic (NH) White individuals.
- About one-third of practices indicated that quality was fully or to a great extent the same as in-person visits.
    - About 60% of practices were very or somewhat satisfied with telehealthcare technology and about 70% were planning to continue providing telehealthcare services after the pandemic ended.

Lastly, this section discusses the findings, presents conclusions based on findings and current telehealthcare practices, and provides resources for additional information about telehealthcare.

Background

Telehealthcare Service Use Before the COVID-19 Pandemic Was Limited

- **Although there was healthcare community and patient interest in telehealthcare before the COVID-19 pandemic, the use of telehealthcare services was infrequent, partly because of payer- and policy-related obstacles.**

Communication technology has long been touted as a useful tool for improving access to quality healthcare. More than 20 years ago, the Institute of Medicine, now the National Academy of Medicine, promoted innovative and expanded use of telehealthcare.[2] With the passage of the Affordable Care Act in 2010 and its focus on improving efficiency in healthcare delivery, policymakers and providers further increased interest in telehealthcare.[3]

Although telehealthcare use was low before the COVID-19 pandemic, patients and providers showed interest.[4] In a 2019 study, 69% of physicians and 66% of patients reported being willing to use telehealthcare. However, less than 10% of them reported receiving telehealthcare services.[5] The study also found that use varied by age and geography; telehealthcare users were more likely to be younger and living in the South.[5] Of consumers who had used telehealthcare services, experiences were generally positive, with at least two-thirds of recipients reporting satisfaction using telehealthcare services.**Error! Bookmark not defined.**[,6,7,8]

Before the COVID-19 pandemic, low use was often due to payer- and policy-related barriers. For example, reimbursement for telehealthcare services was limited, modes of technology were restricted, and limitations were placed on patient (originating) and provider (distant) sites eligible for telehealthcare, with Medicare excluding urban locations.[9]

Additional barriers for patients included lack of reliable internet access, limited patient awareness, and patient discomfort with use of technology.[10,11,12] For example, older adults, low-income individuals, and rural residents have lower rates of owning a smart phone or having home broadband internet access.[13,14,15]

Findings

The figures in this section of the NHQDR provide insight on the use of synchronous telehealthcare services during the COVID-19 pandemic. The findings section is divided into subsections: overall use of telehealthcare services, variation in telehealthcare service use, variation in mode of telehealthcare used (video and audio only), barriers to use of telehealthcare services, and perceptions of care for telehealthcare services. The measures present findings for the most recent data year.

Telehealthcare Service Use Increased During the COVID-19 Pandemic

- ❖ **Because of policies enabling telehealthcare service use and provider, staff, and patient desire to minimize in-person contacts, telehealthcare service use became more common during the COVID-19 pandemic. Some specialties provided services via telehealthcare technology more than others.**

Early in the COVID-19 public health emergency (PHE), government and healthcare facility regulations limited in-person care for noncritical health conditions. However, providers and policymakers recognized that delaying care could result in worse long-term outcomes, as noted in the Ambulatory Care section of the NHQDR.

The Centers for Disease Control and Prevention (CDC) noted excess deaths in 2020 not due directly to COVID-19. These deaths may have been due to individuals not receiving needed or timely care. Evidence also showed that individuals in poorer health were more likely to delay care than those in good health, which could have put them at risk for poor long-term health outcomes.[16]

To minimize the spread of COVID-19 and limit in-person interaction with medical providers and staff while still providing needed healthcare, policies were enacted to encourage greater use of telehealthcare services. These federal and state policies included:

- Providing the same rates of reimbursement for virtual visits as for in-office appointments.
- Using more types of mobile devices for virtual visits and not enforcing certain HIPAA Rules[i] that include the good faith provision of telehealth using a non-public-facing remote communication technology.
- Allowing audio-only telehealthcare reimbursement for certain services.
- Relaxing rules around telehealthcare patient (originating) and provider (distant) sites eligible for telehealthcare.
- Expanding the types of services and providers covered by telehealthcare (e.g., physical and occupational therapists).
- Permitting telehealthcare across state lines, with some state-specific provisions, including waivers of state licensure requirements.
- Using first-dollar coverage for telehealthcare services without first meeting a minimum deductible, or no patient cost sharing.

In addition to changes in federal and state regulations, hospital systems and providers implemented additional rules for COVID-19 safety, such as requiring virtual appointments only for certain office visits and deferring elective visits.

Due to factors such as COVID-19 pandemic-related policies and fear of COVID-19 contagion, the rate of telehealthcare visits increased noticeably.[17] The number of telehealthcare visits increased 154% in the last week of March 2020 compared with the same week in March 2019.[18]

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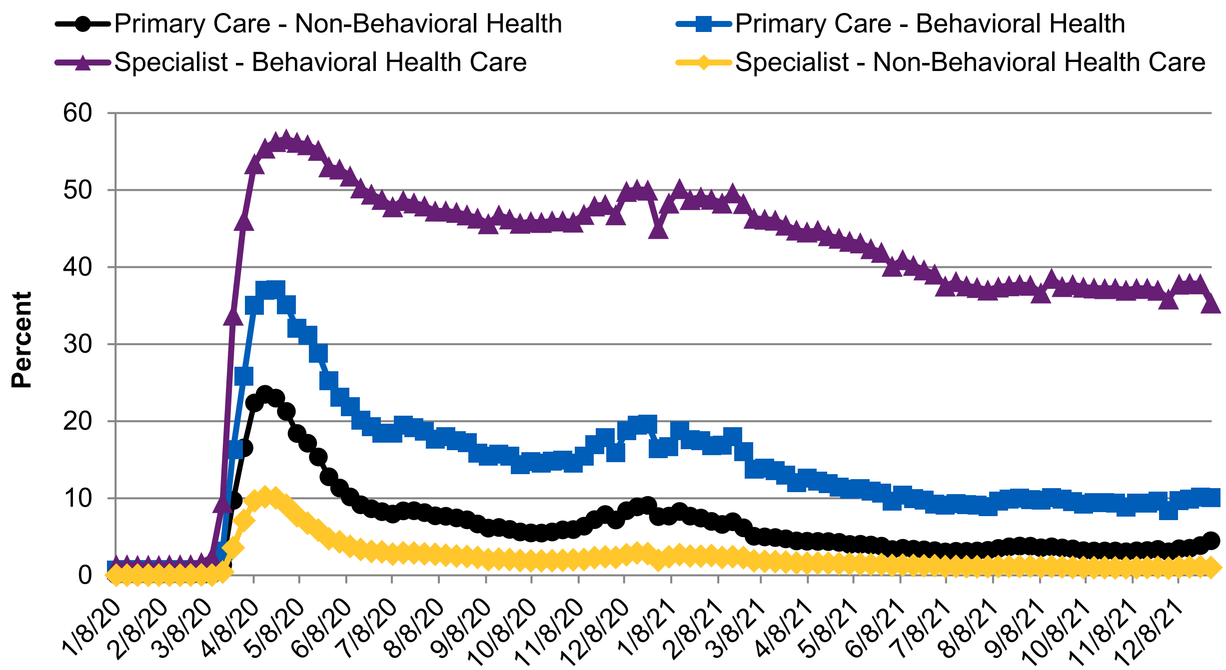
[i] HIPAA Rules = Health Insurance Portability and Accountability Act of 1996 Privacy, Security, and Breach Notification Rules.

The peak of telehealthcare use for Medicare fee-for-service and Medicare Advantage plans occurred in April 2020.[19,20]

The level of telehealthcare visits decreased after April 2020 but remained higher than before the pandemic, particularly for specialist behavioral health care (Figure 1). In 2021, 81% of adults and 80% of children who had a virtual medical appointment said it was because of COVID-19 (data not shown).[ii]

Figure 1. Outpatient telehealthcare services for Medicare fee-for-service beneficiaries, per week, by type of healthcare, 2020-2021



Source: Office of the Assistant Secretary for Planning and Evaluation analysis of Medicare fee-for-service claims, 2020-2021, in Samson LW, Couture SJ, Jacobus-Kantor L, Creedon TB, Sheingold S. Updated Medicare FFS Telehealth Trends by Beneficiary Characteristics, Visit Specialty, and State, 2019-2021. Issue Brief No. HP-2023-18. Washington, DC: U.S. Department of Health and Human Services, July 2023.

[ii] **Source:** Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey, 2021.

Although telehealthcare increased substantially during the pandemic, the decrease in in-person care was so large that telehealthcare services did not fully make up for the lack of in-person services. For example, individuals with Medicare coverage still had more total healthcare visits in the year before the pandemic (March 2019-February 2020) than in the first year of the pandemic (March 2020-February 2021).[19,20]

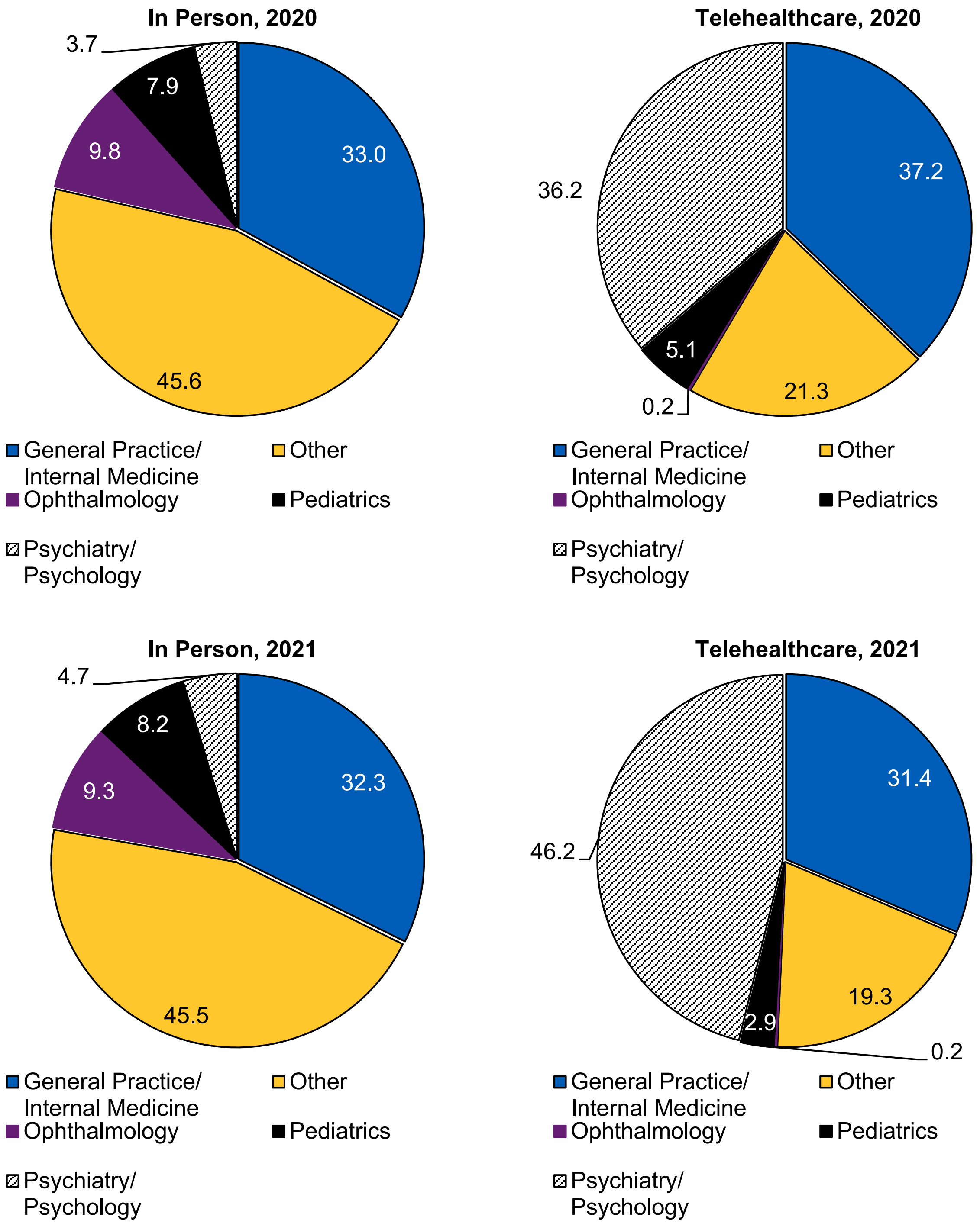
As shown above, use of telehealthcare varied by medical specialty. Practices that require physical contact to examine or treat people may not have been able to leverage telehealthcare technology as effectively as other specialties. Studies found that, similar to prepandemic patterns, most telehealthcare visits during the pandemic were for behavioral health.[21,22,23,24]

In addition, the rate of telehealthcare use for advanced practice registered nurses (APRNs), who commonly practice primary care, increased during the pandemic. A study found that 12% of APRNs surveyed used telehealthcare at least once a week before the pandemic compared with 70% of APRNs surveyed who used it at least weekly during the pandemic, a nearly sixfold increase.[25]

In contrast, specialties such as ophthalmology, obstetrics/gynecology, and surgery had few telehealthcare visits before and during the pandemic.[21] Analyses of NHQDR data also showed that behavioral health and primary care were more likely than other specialties to provide telehealthcare during the COVID-19 pandemic.

In 2020 and 2021, about a third of in-person outpatient visits were for general practice/internal medicine, but fewer than 5% of visits were for psychiatry/psychology (Figure 2). During the same period, more than a third of telehealthcare outpatient visits were for psychiatry/psychology and another third were for general practice/internal medicine.

Figure 2. Medical specialty of outpatient medical visits, by in person or telehealthcare visit, 2020 and 2021



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2020 and 2021.
Note: Outpatient medical appointments include office-based and hospital-based outpatient visits. The 2020 data include visits occurring July-December 2020. The 2021 data are for visits occurring anytime during 2021.

- In 2020, 33.0% of in-person outpatient visits were for general practice/internal medicine, 9.8% were for ophthalmology, 7.9% were for pediatrics, 3.7% were for psychiatry/psychology, and 45.6% were for other types of care (Figure 2).
- In 2021, 32.3% of in-person outpatient visits were for general practice/internal medicine, 9.3% were for ophthalmology, 8.2% were for pediatrics, 4.7% were for psychiatry/psychology, and 45.5% were for other types of care.
- In 2020, 37.2% of telehealthcare outpatient visits were for general practice/internal medicine, 0.2% were for ophthalmology, 5.1% were for pediatrics, 36.2% were for psychiatry/psychology, and 21.3% were for other types of care.
- In 2021, 31.4% of telehealthcare outpatient visits were for general practice/internal medicine, 0.2% were for ophthalmology, 2.9% were for pediatrics, 46.2% were for psychiatry/psychology, and 19.3% were for other types of care.

Use of Telehealthcare Services Varied by Provider and Patient Characteristics

- ❖ **Most practices reported use of some telehealthcare services, but a small percentage of all healthcare visits were via telehealthcare. Telehealthcare services were less frequently used by surgical practices and practices with fewer physicians. Rates of telehealthcare use were often lower in populations that may benefit the most from telehealthcare services, such as older individuals, individuals living in areas with less internet access, and individuals in more rural areas.**

Disparities exist in access to care and care provided via telehealthcare may address some historical barriers that disproportionately affect rural and low-income individuals. Since patients and providers may not need transportation, they may face fewer cost, logistic, and timing issues. Telehealthcare visits also have fewer childcare barriers.[26,27,28] Telehealthcare may also decrease burden on providers, particularly in rural areas.[26]

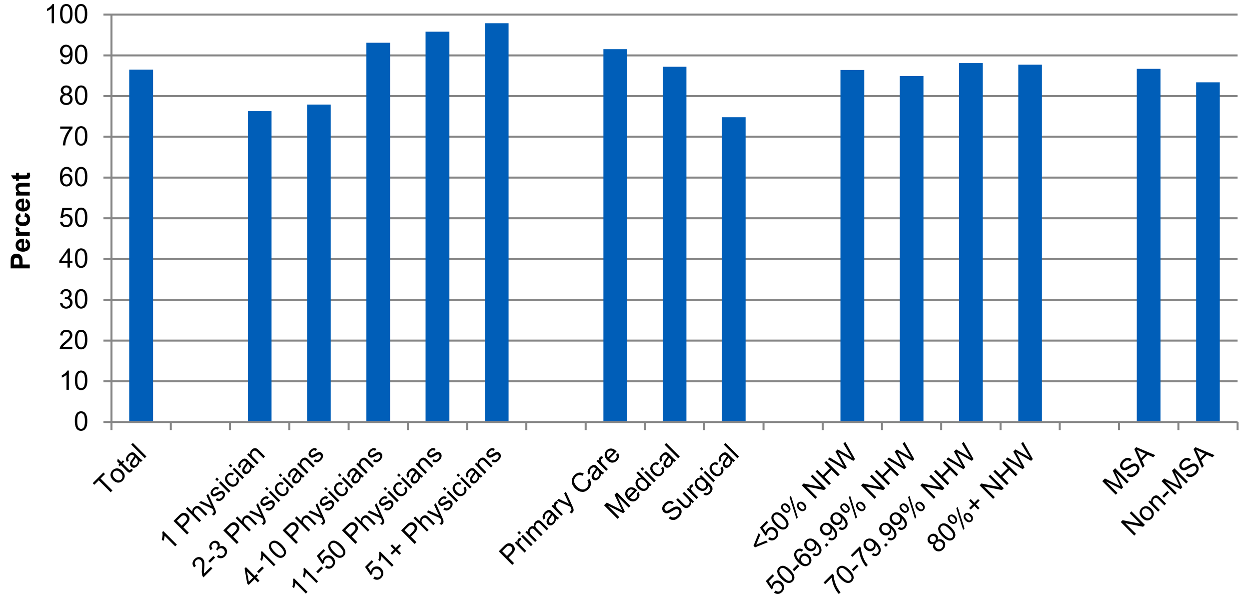
Findings from the NHQDR show that the percentage of practices that used telehealthcare increased more than fourfold during the COVID-19 pandemic, from 16.0% in 2019 to 86.5% in 2021 (2019 data not shown).[iii] In 2021, the use of telehealthcare services varied across practice characteristics.

As noted above, some variation, such as by specialty, may be related to appropriateness of care. However, other variations in telehealthcare use may indicate that the potential of telehealthcare has not been realized and disparities exist in resources and supports available to some practices.

As shown in Figure 3, practices with fewer providers and surgical practices were less likely to provide any telehealthcare services compared with larger practices and primary care practices, respectively.

[iii] **Source:** Centers for Disease Control and Prevention, National Electronic Health Records Survey, 2019.

Figure 3. Any use of any telehealthcare technology by practice size, specialty, percentage of non-Hispanic White individuals, and practice location, 2021



Key: NHW = non-Hispanic White; MSA = metropolitan statistical area.
Source: Centers for Disease Control and Prevention, National Electronic Health Records Survey, 2021.
Note: Telehealthcare includes audio-only and video services.

- In 2021, 86.5% of practices reported any use of telehealthcare technology (Figure 3).
- In 2021, the rate of practices reporting any use of telehealthcare technology was significantly[iv] lower for practices with 1 physician (76.3%) and practices with 2-3 physicians (77.9%) compared with practices with 51+ physicians (97.9%).
- In 2021, the rate of practices reporting any use of telehealthcare technology was significantly lower for surgical practices (74.8%) compared with primary care practices (91.5%).
- In 2021, there were no statistically significant differences by NH-White population or practice location in the rate of practices reporting any use of telehealthcare technology.

The literature indicates that use of telehealthcare services varies notably by individuals' geographic location and sociodemographic characteristics. Although telehealthcare services can benefit people in rural areas who have to travel long distances to receive healthcare, evidence shows that telehealthcare use is often more common in urban areas than in rural areas.[23,26,29,30]

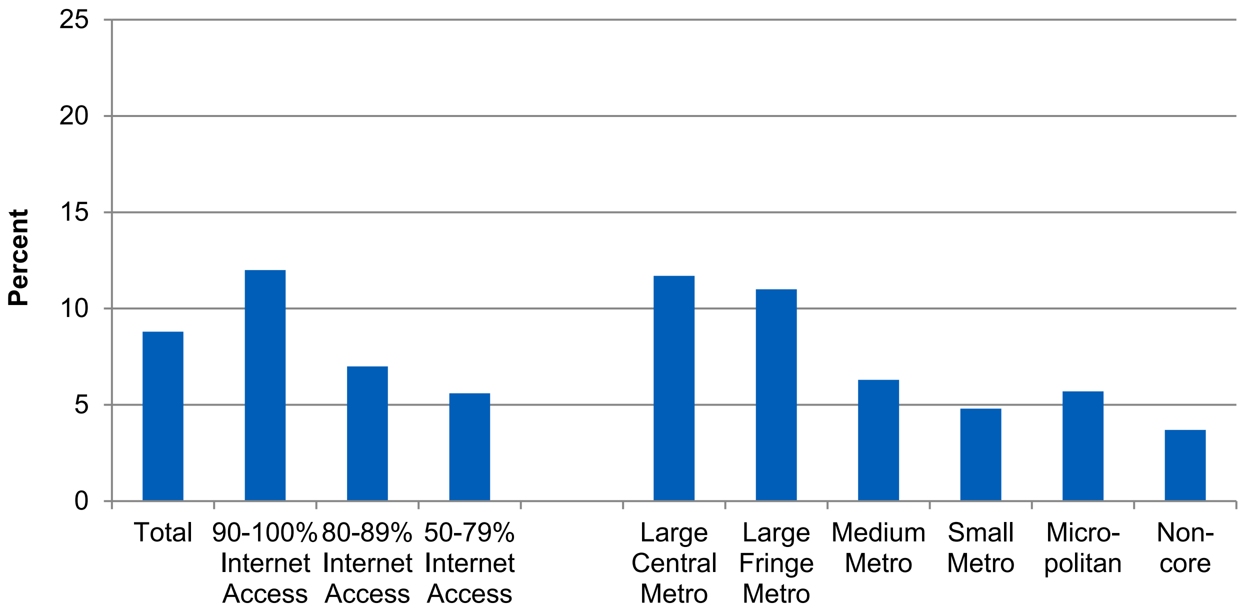
[iv] Unless noted otherwise, for trend analyses, data points under each figure only report differences that are statistically significant (i.e., p value less than 0.1) and show an average annual percentage change greater than 1% per year. For comparisons between two populations, data points under each figure only report differences that are statistically significant (i.e., p value less than 0.05) and have a relative difference between the populations of at least 10%, unless noted otherwise. Readers may learn more about NHQDR's reporting methodology in Appendix A at https://www.ahrq.gov/research/findings/nhqrdr/nhqdr23/index.html.

Studies of telehealthcare use during the pandemic often showed that younger individuals and those with higher incomes use telehealthcare services at higher rates than older individuals and those with lower incomes.[28,31,32,33,34] Studies also indicate women use telehealthcare services marginally more often than men.[18,22,28,30,33,35,36]

Rates by race and ethnicity have been less definitive. Telehealthcare service use by Black individuals for some medical care may be lower for some medical specialties (e.g., telehealthcare visits among those receiving behavioral health care), technologies used (e.g., video, audio only), and geographic areas.[22,28,30,33,34,36] Evidence is inconclusive regarding whether Asian and Hispanic people use telehealthcare services more or less than White individuals.[22,23,28,34]

Findings from the NHQDR are similar to the literature showing that rates of audio-only or video telehealthcare use for office-based providers (i.e., not in a hospital setting) were lower for older individuals, individuals living in areas with less internet access, and individuals from more rural areas. These groups may especially benefit from telehealthcare services.

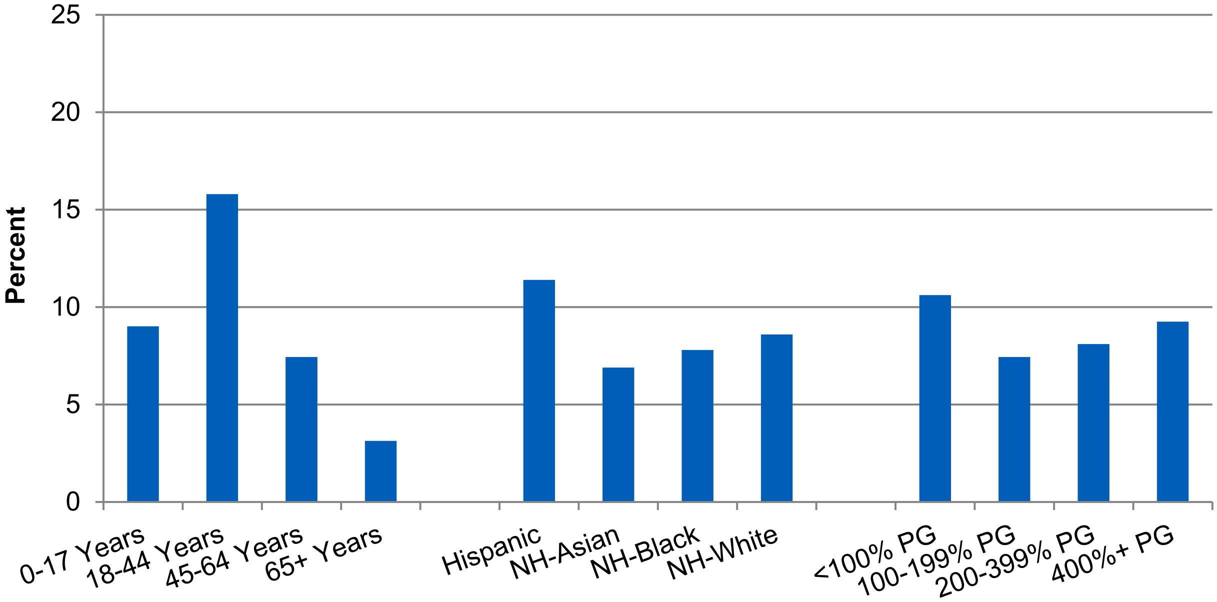
Figure 4. Office-based provider visits that were telehealthcare visits, by county-level internet access and geographic location, 2021



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2021.

- In 2021, 8.8% of doctor's office visits were telehealthcare visits (Figure 4).
- In 2021, the rate of doctor's office visits that were telehealthcare visits was significantly lower for individuals living in counties with 50-79% of households with internet access (5.6%) and 80-89% of households with internet access (7.0%) than for individuals living in counties with 90-100% of households with internet access (12.0%).
- In 2021, the rate of doctor's office visits that were telehealthcare visits was significantly lower for individuals living in medium metro (6.3%), small metro (4.8%), micropolitan (5.7%), and noncore (3.7%) areas than for individuals living in large fringe metro areas (11.0%).

Figure 5. Office-based provider visits that were telehealthcare visits, by patient age, patient race/ethnicity, and family income, 2021



Key: NH = non-Hispanic; PG = federal poverty guideline.
Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2021.
Note: Sample sizes for American Indian or Alaska Native and Native Hawaiian/Pacific Islander groups were too small to produce statistically reliable data.

- In 2021, the rate of doctor's office visits that were telehealthcare visits was significantly lower for individuals under age 18 years (9.0%), ages 45-64 years (7.4%), and age 65 years and over (3.1%) than for individuals ages 18-44 years (15.8%) (Figure 5).
- In 2021, there were no statistically significant differences by race/ethnicity or family income in the rate of doctor's office visits that were telehealthcare visits.

Studies indicate individuals using telehealthcare visits had higher rates of attended visits and adherence to therapy and medications. However, they may have had lower rates of up-to-date lab tests, paraclinical assessment, and care resolution in initial visit (i.e., higher rates of followup visits). The findings varied by medical specialty and across studies.[27]

Mode of Telehealthcare Use Varied by Patient Characteristics

- ❖ **Audio-only technology was frequently used by providers and patients. The rates of video technology use varied across populations and were less common for people with lower incomes and older people.**

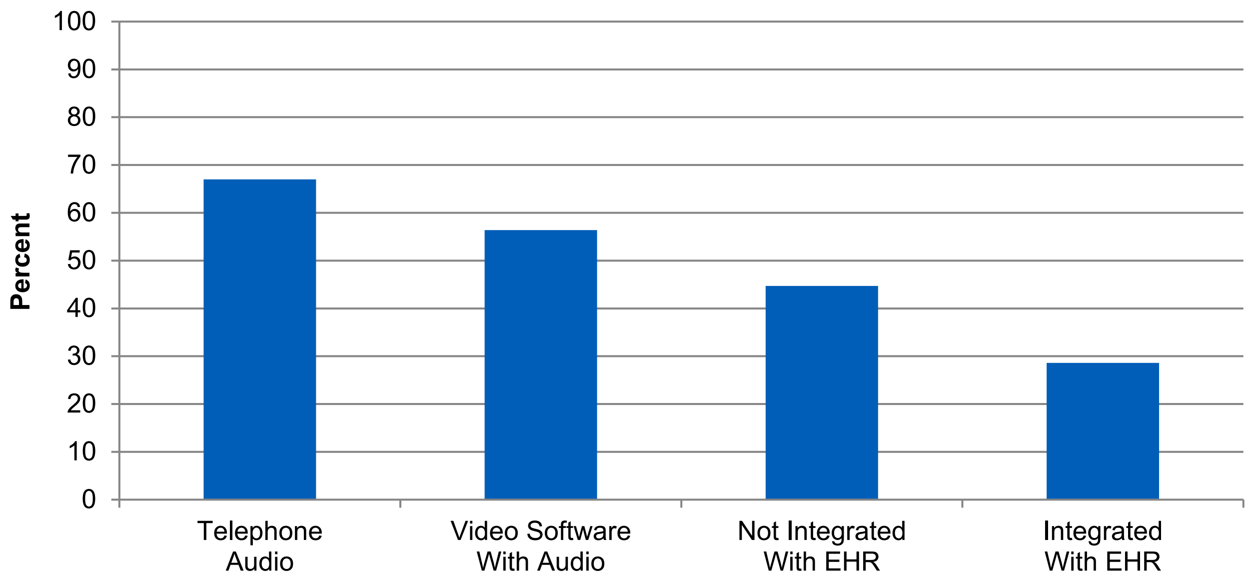
Between July 2021 and August 2022, about half (49% to 56%, depending on the month) of the telehealthcare appointments were video telehealthcare visits, while the remaining were audio-only visits.[37] Audio-only services are effective in many cases. However, in some cases, video is preferred so the provider can view the patient's physical appearance, note the patient's living conditions, and observe nonverbal cues (e.g., body language). Telehealthcare, whether it is provided via video or audio only, is better than no care.[38]

The most salient barrier to video telehealthcare visits is that visits require internet access and a supporting device. From 2015 to 2020, about 20% of adults in the United States did not have access to a smart phone and about 15% did not have broadband internet access at home.[39] The rates are even higher among older, lower income, rural, and less-educated individuals. Video telehealthcare use also requires comfort using the technology.[37]

Limited English proficiency also poses a barrier to video telehealthcare. Although routine provision of interpreter services is not yet the standard for telehealthcare platforms, a trained medical interpreter may need to join the visit remotely, requiring interpreters to have video capabilities and providers to have three-way communication technology.[27] Therefore, audio-only technology has been used more often by older and lower income individuals and those who require an interpreter.[37,40]

NHQDR data also indicate similar rates and variations in the use of audio only and video for individuals who have telehealthcare visits. In 2021, practices were more likely to report using telephone audio than video technology for telehealthcare.

Figure 6. Practices that use various modes of telehealthcare technology for telehealthcare visits, 2021

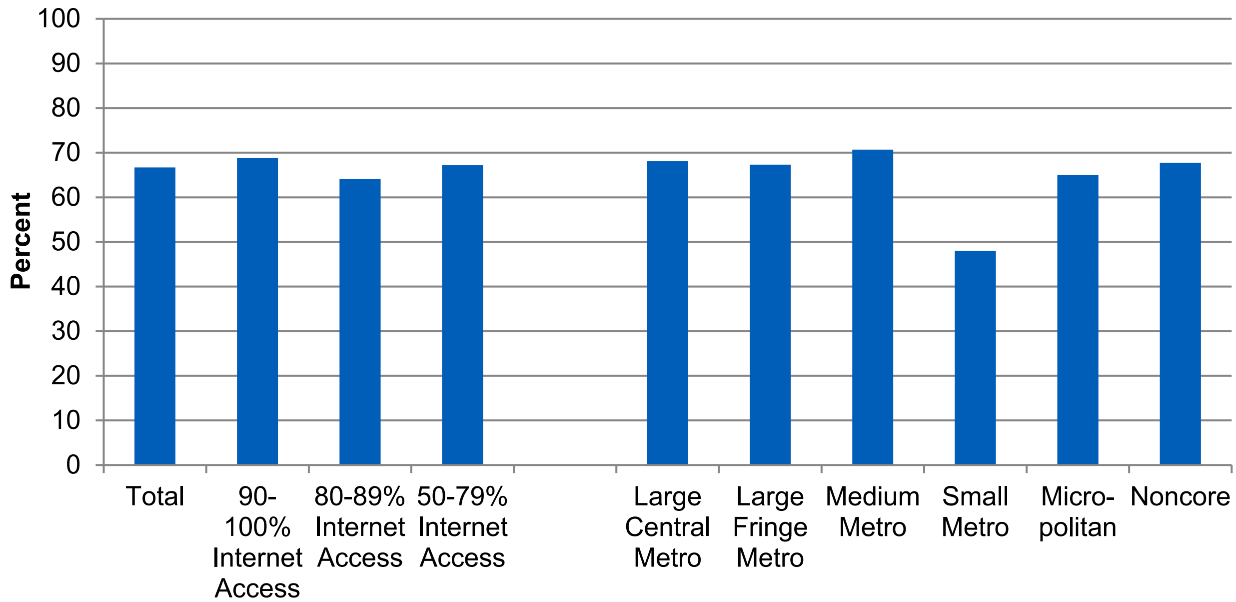


Key: EHR = electronic health record.
Source: Centers for Disease Control and Prevention, National Electronic Health Records Survey, 2021.

- Of practices that use telehealthcare technology:
  - 67.0% of practices reported using telephone audio for telehealthcare visits,
  - 56.4% reported using video software with audio,
  - 44.7% reported using telehealthcare platforms that were not integrated with electronic health records (EHRs), and
  - 28.6% reported using telehealthcare platforms that were integrated with EHRs (Figure 6).

NHQDR findings also indicated that, of telehealthcare visits with office-based providers, video technology was used less often by people with lower incomes and older people. This finding is particularly notable since older individuals were less likely to have care provided via telehealthcare and when they did have telehealthcare visits, the visits were more likely to be with audio only.

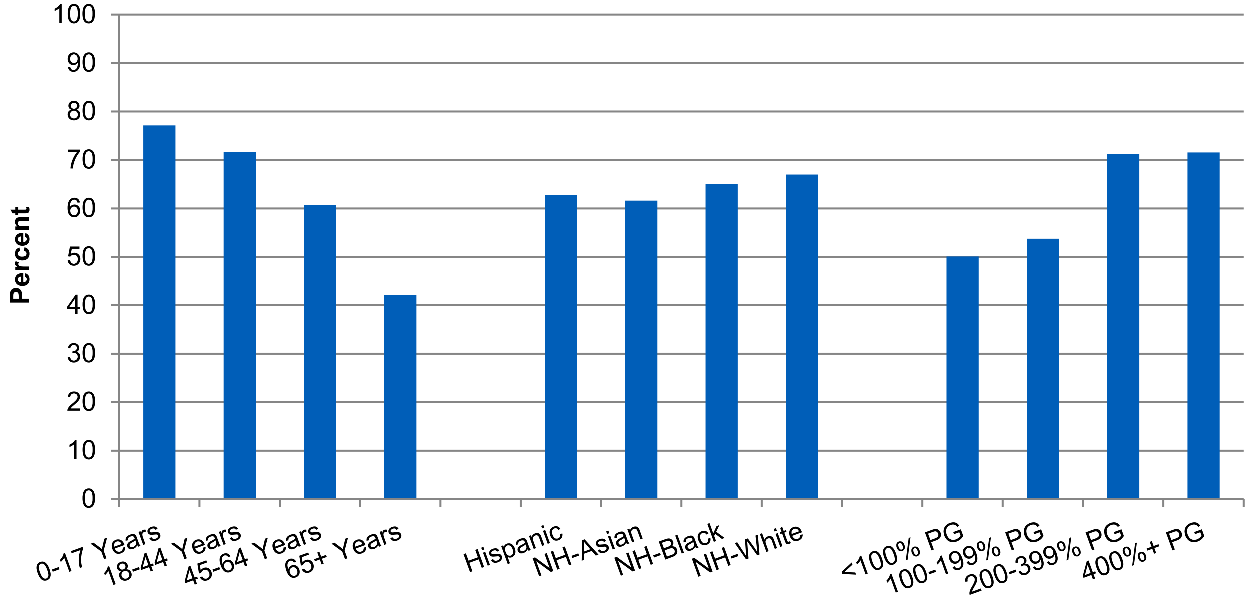
Figure 7. Telehealthcare visits for office-based providers that included video in the past 12 months, by county-level internet access and geographic location, 2021



Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2021.

- In 2021, 66.7% of telehealthcare visits to doctors' offices included video (Figure 7).
- In 2021, the rate of telehealthcare visits to doctor's offices that included video was significantly lower for individuals living in small metro areas (48.0%) than for individuals living in large fringe metro areas (67.3%).
- In 2021, there were no statistically significant differences by percentage of households in the county with internet access in the rate of telehealthcare visits to doctors' offices that included video.

Figure 8. Telehealthcare visits for office-based providers that included video in the past 12 months, by patient age, patient race/ethnicity, and family income, 2021



Key: NH = non-Hispanic; PG = federal poverty guideline.
Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey, 2021.
Note: Sample sizes for American Indian or Alaska Native and Native Hawaiian/Pacific Islander groups were too small to produce statistically reliable data.

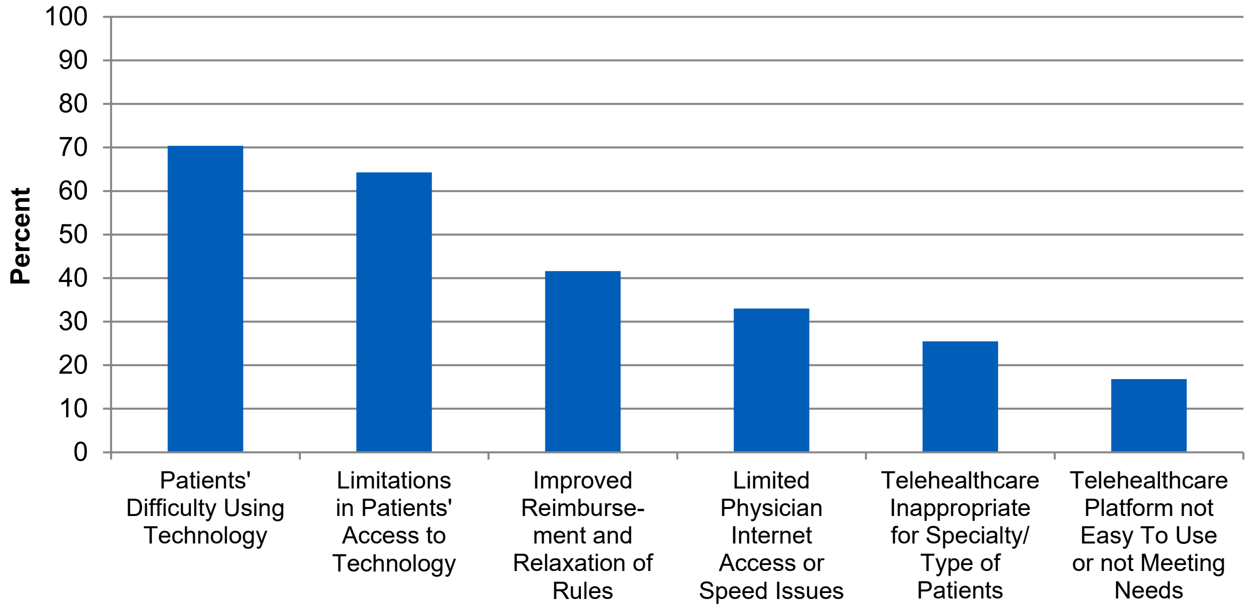
- In 2021, the rate of telehealthcare visits to doctors' offices that included video was significantly lower for individuals ages 45-64 (60.7%) and age 65 years and over (42.2%) than for individuals ages 18-44 years (71.7%) (Figure 8).
- In 2021, the rate of telehealthcare visits to doctors' offices that included video was significantly lower for individuals with family incomes less than 100% of the poverty guideline (50.1%) and 100% to 199% of the poverty guideline (53.7%) than for individuals with family incomes 400% or more of the poverty guideline (71.5%).
- In 2021, there were no statistically significant differences by race/ethnicity in the rate of telehealthcare visits to doctors' offices that included video.

Barriers to Telehealthcare Use Are Common

- ❖ **Patient difficulty using telehealthcare technology and limitations in patient access to technology were the most often reported barriers to telehealthcare use, affecting more than half the practices reporting. Although limited provider internet access or speed issues were less commonly reported overall, this limitation more often affected providers in non-MSAs (i.e., rural areas) and areas with a higher percentage of non-Hispanic White individuals.**

Practices reported on factors that affected their use of telehealthcare services.

Figure 9. Practice-reported factors affecting use of telehealthcare technology, 2021



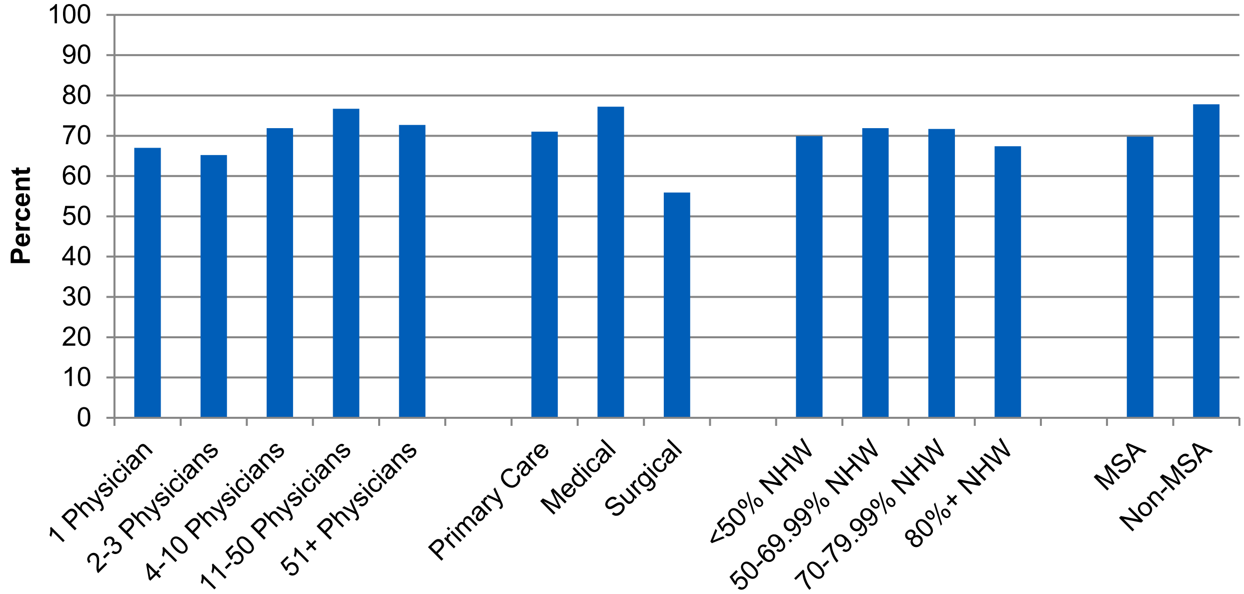
Source: Centers for Disease Control and Prevention, National Electronic Health Records Survey, 2021.
Note: Telehealthcare includes audio-only and video services.

- In 2021, of practices that use audio-only or video telehealthcare technology:
  - 70.4% of physicians reported patients' difficulty using technology as a factor affecting use of telehealthcare,
  - 64.3% reported limitations in patients' access to technology,
  - 41.6% reported improved reimbursement and relaxation of rules,
  - 33.0% reported limited physician internet access or speed issues,
  - 25.5% reported telehealthcare inappropriate for specialty/type of patients, and
  - 16.8% reported telehealthcare platform not easy to use or not meeting needs (Figure 9).

The rate at which the factors affected practices varied by practice characteristics. Surgical practices that provided telehealthcare services were less likely to report factors affecting their use of telehealthcare technology compared with primary care practices that provided telehealthcare services. Practices in non-MSAs were more likely to report factors affecting their use of telehealthcare technology compared with MSAs.

The barrier related to limited internet access or speed showed the most variation and was more problematic for primary care practices, practices in areas with 80-100% NH-White population, and practices in non-MSAs.

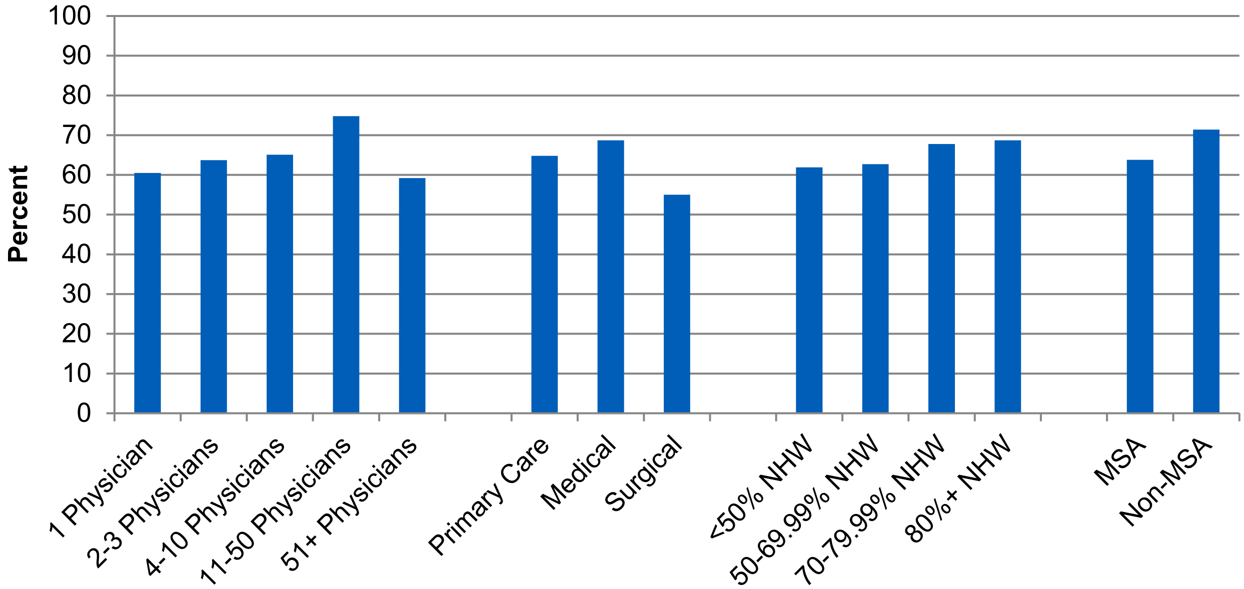
Figure 10. Practices that reported patients' difficulty using technology/platform as affecting their use of telehealthcare for office visits, by practice size, specialty, percentage of non-Hispanic White individuals, and practice location, 2021



Key: NHW = non-Hispanic White; MSA = metropolitan statistical area.
Source: Centers for Disease Control and Prevention, National Electronic Health Records Survey, 2021.
Note: Telehealthcare includes audio-only and video services.

- In 2021, of practices that use telehealthcare technology, the rate of practices that reported patients' difficulty using technology/platform as affecting their use of telehealthcare for office visits was significantly lower for surgical practices (55.9%) compared with primary care practices (71.0%) (Figure 10).
- In 2021, of practices that use telehealthcare technology, there were no statistically significant differences by practice size, NH-White population, or practice location in the rate of practices that reported patients' difficulty using technology/platform as affecting their use of telehealthcare for office visits.

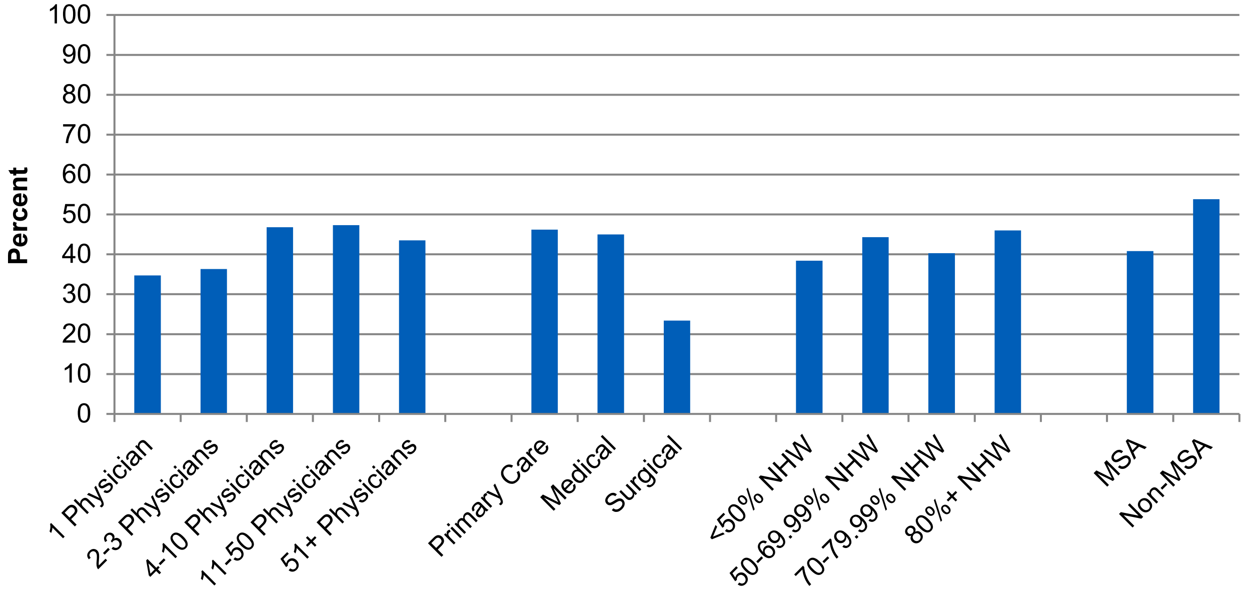
Figure 11. Practices that reported limitations in patients' access to technology as affecting their use of telehealthcare for office visits, by practice size, specialty, percentage of non-Hispanic White individuals, and practice location, 2021



Key: NHW = non-Hispanic White; MSA = metropolitan statistical area.
Source: Centers for Disease Control and Prevention, National Electronic Health Records Survey, 2021.
Note: Telehealthcare includes audio-only and video services.

- In 2021, of practices that use telehealthcare technology, the rate of practices that reported limitations in patients' access to technology as affecting their use of telehealthcare for office visits was significantly higher for practices with 11-50 physicians (74.8%) compared with practices with 51+ physicians (59.2%) (Figure 11).
- In 2021, of practices that use telehealthcare technology, there were no statistically significant differences by specialty, NH-White population, or practice location in the rate of practices that reported limitations in patients' access to technology as affecting their use of telehealthcare for office visits.

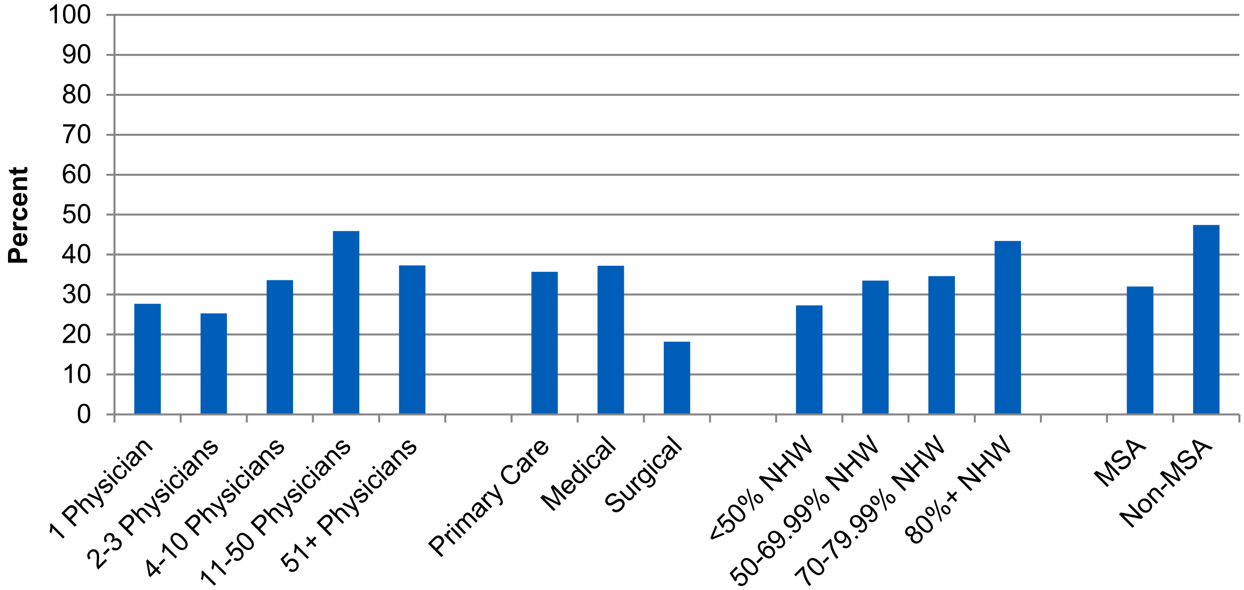
Figure 12. Practices that reported improved reimbursement and relaxation of rules related to use of telehealthcare visits as affecting their use of telehealthcare for office visits, by practice size, specialty, percentage of non-Hispanic White individuals, and practice location, 2021



Key: NHW = non-Hispanic White; MSA = metropolitan statistical area.
Source: Centers for Disease Control and Prevention, National Electronic Health Records Survey, 2021.
Note: Telehealthcare includes audio-only and video services.

- In 2021, of practices that use telehealthcare technology, the rate of practices that reported improved reimbursement and relaxation of rules related to use of telehealthcare visits as affecting their use of telehealthcare for office visits was significantly lower for surgical practices (23.4%) compared with primary care practices (46.2%) (Figure 12).
- In 2021, of practices that use telehealthcare technology, the rate of practices that reported improved reimbursement and relaxation of rules related to use of telehealthcare visits as affecting their use of telehealthcare for office visits was significantly higher for practices located in non-MSAs (53.8%) compared with practices located in MSAs (40.8%).
- In 2021, of practices that use telehealthcare technology, there were no statistically significant differences by practice size or NH-White population in the rate of practices that reported improved reimbursement and relaxation of rules related to use of telehealthcare visits as affecting their use of telehealthcare for office visits.

Figure 13. Practices that reported limited internet access or speed as affecting their use of telehealthcare for office visits, by practice size, specialty, percentage of non-Hispanic White individuals, and practice location, 2021



Key: NHW = non-Hispanic White; MSA = metropolitan statistical area.
Source: Centers for Disease Control and Prevention, National Electronic Health Records Survey, 2021.
Note: Telehealthcare includes audio-only and video services.

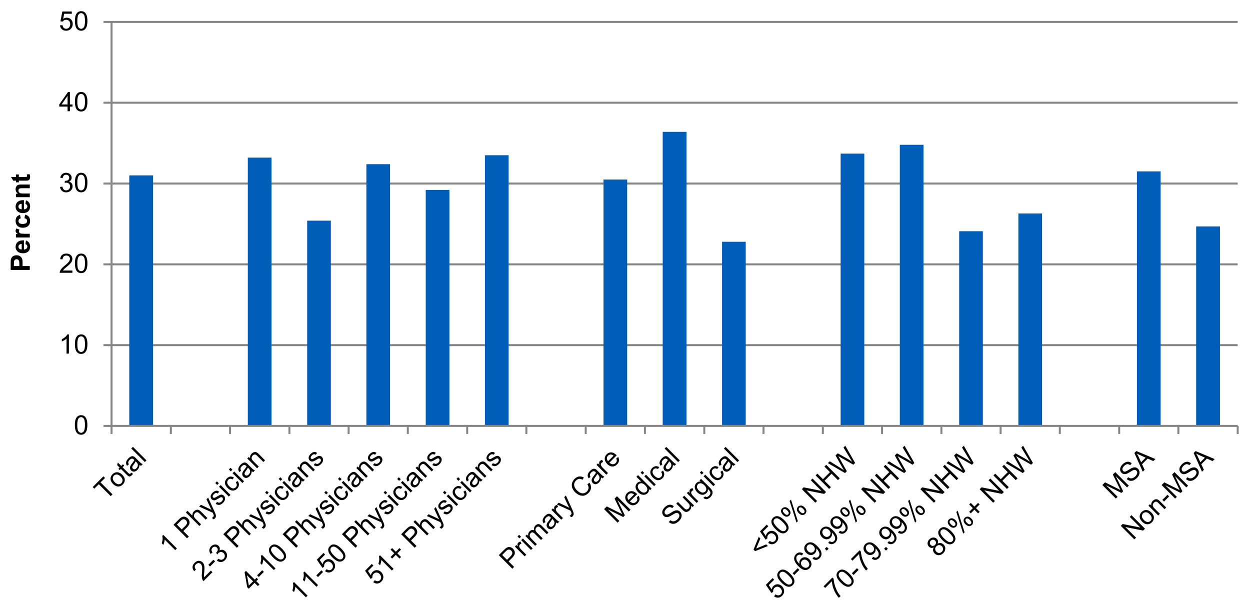
- In 2021, of practices that use telehealthcare technology, the rate of practices that reported limited internet access or speed as affecting their use of telehealthcare for office visits was significantly lower for surgical practices (18.2%) compared with primary care practices (35.7%) (Figure 13).
- In 2021, of practices that use telehealthcare technology, the rate of practices that reported limited internet access as affecting their use of telehealthcare for office visits was significantly lower for practices in areas with less than 50% NH-White population (27.3%) and practices in areas with 50-69.99% NH-White population (33.5%) compared with practices in areas with 80-100% NH-White population (43.4%).
- In 2021, of practices that use telehealthcare technology, the rate of practices that reported limited internet access as affecting their use of telehealthcare for office visits was significantly higher for practices located in non-MSAs (47.4%) compared with practices located in MSAs (32.0%).
- In 2021, of practices that use telehealthcare technology, there were no statistically significant differences by practice size in the rate of practices that reported limited internet access as affecting their use of telehealthcare for office visits.

Findings on Perception of Care Provided via Telehealthcare Are Mixed

- **Although few practices reported being able to provide similar care via telehealthcare services compared with in-person services, most practices were satisfied with the technology and intended to continue using telehealthcare services after the pandemic ended. Relative to primary care and medical practices, surgical practices were significantly less satisfied with telehealthcare and less likely to continue using it when the pandemic was over.**

While telehealthcare can improve access to care, it is imperative that the quality of care provided via telehealthcare is similar to the quality of in-person care and that providers are confident in their ability to provide needed care. The following figures provide measures of provider perceptions of quality of care, provider satisfaction with the technology, and provider intentions to continue providing care via telehealthcare.

Figure 14. Practices that described being able to provide similar quality care during telehealthcare visits as during in-person visits, by practice size, specialty, percentage of non-Hispanic White individuals, and practice location, 2021

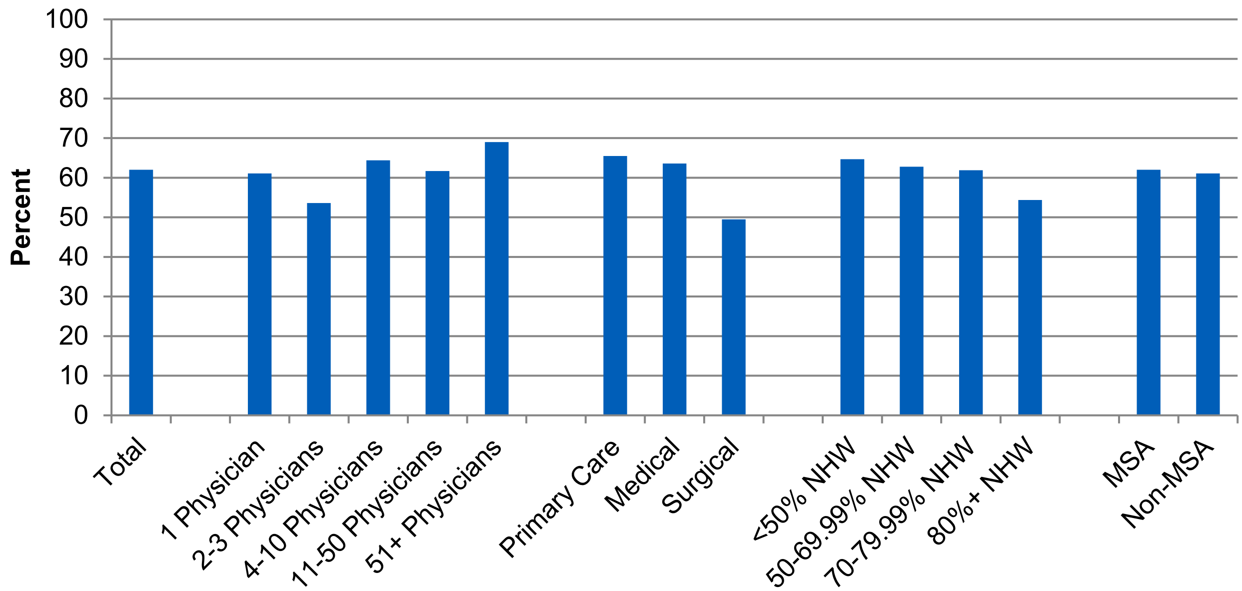


Key: NHW = non-Hispanic White; MSA = metropolitan statistical area.
Source: Centers for Disease Control and Prevention, National Electronic Health Records Survey, 2021.
Note: Telehealthcare includes audio-only and video services.

- In 2021, of practices that use telehealthcare technology, 31.0% of practices described being able to provide similar quality care during telehealthcare visits as during in-person visits (Figure 14).
- In 2021, of practices that use telehealthcare technology, the rate of practices that described being able to provide similar quality care during telehealthcare visits as during in-person visits was significantly higher for practices in areas with 50-69.99% NH-White population (34.8%) compared with practices in areas with 80%-100% NH-White population (26.3%).

- In 2021, there were no statistically significant differences by practice size, specialty, or practice location in the rate of practices that described being able to provide similar quality care during telehealthcare visits as during in-person visits.

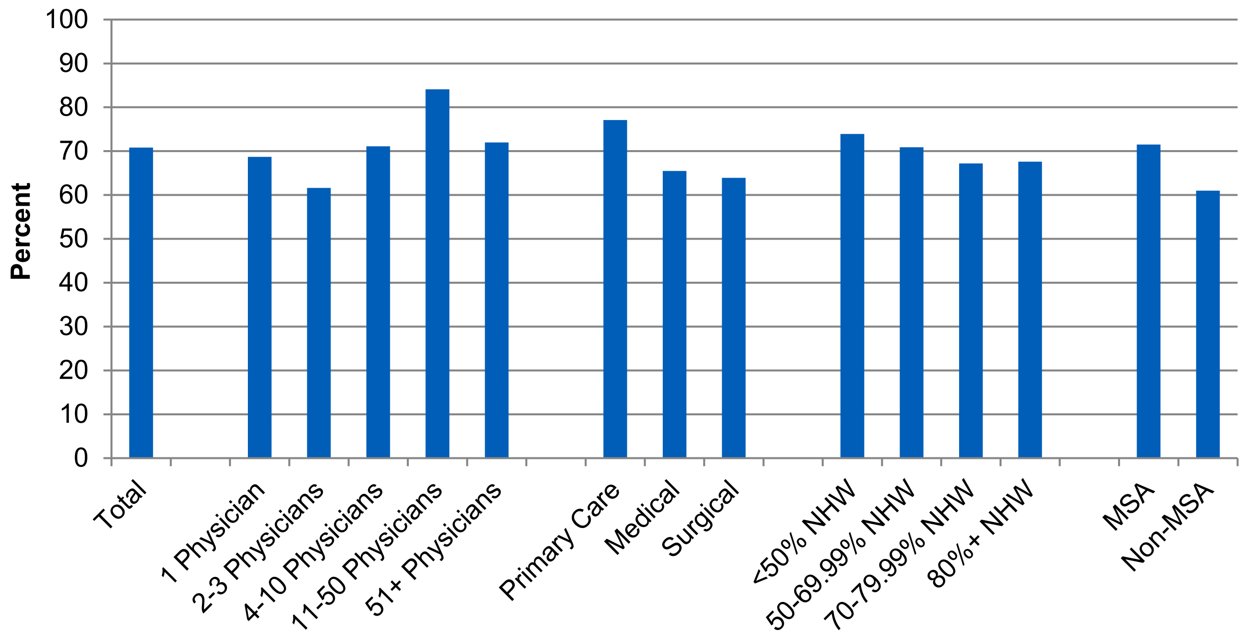
Figure 15. Practices very or somewhat satisfied with using telehealthcare technology for patient visits, by practice size, specialty, percentage of non-Hispanic White individuals, and practice location, 2021



Key: NHW = non-Hispanic White; MSA = metropolitan statistical area.
Source: Centers for Disease Control and Prevention, National Electronic Health Records Survey, 2021.
Note: Telehealthcare includes audio-only and video services.

- In 2021, of practices that use telehealthcare technology, 62.0% of practices were very or somewhat satisfied with using telehealthcare technology for patient visits (Figure 15).
- In 2021, of practices that use telehealthcare technology, the rate of practices very or somewhat satisfied with using telehealthcare technology for patient visits was significantly lower for practices with 2-3 physicians (53.6%) compared with practices with 51+ physicians (69.0%).
- In 2021, of practices that use telehealthcare technology, the rate of practices very or somewhat satisfied with using telehealthcare technology for patient visits was significantly lower for surgical practices (49.5%) compared with primary care practices (65.5%).
- In 2021, of practices that use telehealthcare technology, the rate of practices very or somewhat satisfied with using telehealthcare technology for patient visits was significantly higher for practices in areas with less than 50% NH-White population (64.7%) compared with practices in areas with 80-100% NH-White population (54.4%).
- In 2021, there were no statistically significant differences by practice location in the rate of practices very or somewhat satisfied with using telehealthcare technology for patient visits.

Figure 16. Practices planning to continue using telehealthcare visits when appropriate once the COVID-19 pandemic is over, by practice size, specialty, percentage of non-Hispanic White individuals, and practice location, 2021



Key: NHW = non-Hispanic White; MSA = metropolitan statistical area.
Source: Centers for Disease Control and Prevention, National Electronic Health Records Survey, 2021.
Note: Telehealthcare includes audio-only and video services.

- In 2021, of practices that use telehealthcare technology, 70.8% of practices planned to continue using telehealthcare visits when appropriate once the COVID-19 pandemic was over (Figure 16).
- In 2021, of practices that use telehealthcare technology, the rate of practices planning to continue using telehealthcare visits when appropriate once the COVID-19 pandemic was over was significantly higher for practices with 11-50 physicians (84.1%) compared with practices with 51+ physicians (72.0%).
- In 2021, of practices that use telehealthcare technology, the rate of practices planning to continue using telehealthcare visits when appropriate once the COVID-19 pandemic was over was significantly lower for surgical (63.9%) practices compared with primary care practices (77.1%).
- In 2021, there were no statistically significant differences by NH-White population or practice location in the rate of practices planning to continue using telehealthcare visits when appropriate once the COVID-19 pandemic was over.

Discussion and Conclusions

Telehealthcare has the potential to reduce disparities and improve access to healthcare. The COVID-19 pandemic increased the interest in and use of telehealthcare. As the pandemic waned, the rate of telehealthcare use decreased but remains higher than before the pandemic, especially for behavioral health care.

However, barriers remain for providers and patients. As noted above, more than half of practices reported patients' difficulty using technology and limitations in patients' access to technology. These barriers were reflected in variations in telehealthcare use. The NHQDR findings indicate use of audio-only or video telehealthcare was higher in areas with higher rates of internet access and in large central and large fringe metropolitan areas. Use also varied by age, with older people less likely to use telehealthcare services and when they did use telehealthcare, less likely to use video software.

Innovative programs aimed to expand reliable internet access, loan hardware to individuals, identify or create Wi-Fi hotspots for telehealthcare use, and provide training and technical assistance have received attention.[41,42,43,44] For example, libraries and library staff are exploring support of telehealthcare by providing broadband access and portable hotspots, laptops, and private spaces, as well as staff who can facilitate their use.[45,46,47]

Provider and staff engagement and patient outreach are also important to reach the most vulnerable individuals.[48] For example, some clinics in rural areas were less likely to add telehealthcare services during the pandemic.[49] Therefore, to expand telehealthcare to individuals in rural areas, more effort may be needed to support rural providers in setting up telehealthcare technology within their practices and working with individuals who have less access to or are less adept at telehealthcare technology.

Even if some of the barriers mentioned here are addressed, additional concerns about the future of telehealthcare policies remain now that the PHE has ended. For Medicare, some telehealthcare policies have been made permanent, most notably for behavioral health care, while other Medicare policies have been only temporarily extended (e.g., originating site flexibility, acceptance of additional providers and services). Other policies have ended (e.g., payment parity, state PHE waivers on licensure requirements).

The policies supporting telehealthcare are particularly important given that more than one-third of practices indicated that improved reimbursement and relaxation of rules affected their use of telehealthcare services. Since payers may revert their telehealthcare coverage to pre-COVID standards (e.g., reduce reimbursement rates for telehealthcare relative to in-person visits, limit coverage of specific interventions via telehealthcare), recommendations have been made to make virtual visit reimbursement permanent. The recommendations include fewer restrictions on audio-only visit reimbursement, to protect vulnerable groups without internet access and technology skills.[36,40,50]

Given the rapid expansion of telehealthcare use, it is critical to assess what is working well and what can be improved. The NHQDR measures assessing perceptions of care show that only 31% of practices indicated that quality was fully or to a great extent the same as in-person visits. However, 62% of practices were very or somewhat satisfied with telehealthcare technology and 71% were planning to continue providing telehealthcare services after the pandemic ended. Therefore, additional studies are needed to track use, disparities, and outcomes over time.[48]

Testing and evaluation of innovations are also needed, particularly innovations related to reliable internet availability, rural access, application in specific communities, interoperability of data, and the optimal balance of in-person and virtual care.[40]

In addition, the appropriateness and quality of telehealthcare, as measured by metrics such as rates of ED visits and hospitalizations, outcomes, and patient and provider satisfaction, vary across modes of telehealthcare, populations, specialties, services, and care complexity.[27,51] Therefore, AHRQ and other entities are assessing how to measure quality of telehealthcare services and develop a new generation of quality measures for telehealthcare and other care sites besides hospitals and physicians' offices.[31]

Standardized and validated measures related to telehealthcare will provide additional insight into the patient and caregiver experience and the quality and disparities of the nation's healthcare systems. Finally, with the end of the PHE, policies should be evaluated to determine which should remain and which should be removed, revised, or updated.

Resources

The Department of Health and Human Services has identified telehealthcare services as a key component in healthcare delivery. As such, resources such as the following are available for providers and patients to learn more about telehealthcare services:

- Telehealth.HHS.gov information hub (https://telehealth.hhs.gov/).
- AHRQ's Telehealth resource page (https://www.ahrq.gov/topics/telehealth.html).
- AHRQ's Evidence-based Practice Center evaluations of telehealth (https://effectivehealthcare.ahrq.gov/products/collections/evaluates-telehealth).
- Health Resources and Services Administration (HRSA) Office for the Advancement of Telehealth (https://www.hrsa.gov/about/organization/bureaus/oat).
- HRSA's Telehealth Resource Center Program (https://www.hrsa.gov/telehealth/telehealth-resource-centers).
- White House Office of National Drug Control Policy's Telehealth and Substance Use Disorder Services in the Era of COVID-19: Review and Recommendations (https://www.whitehouse.gov/wp-content/uploads/2022/06/Telehealth-and-Substance-Use-Disorder-Services-in-the-Era-of-COVID-19-FINAL.pdf).
- Affordable Connectivity Program (https://www.whitehouse.gov/getinternet/) for discounted internet service plans.
- Office of the Assistant Secretary for Planning and Evaluation Advances in Telehealth (https://aspe.hhs.gov/topics/health-health-care/advances-telehealth) web page, products, and reports.
- Network of the National Library of Medicine Bridging the Digital Divide: Telehealth and Libraries Webinar Series (https://www.nnlm.gov/training/class-catalog/bridging-digital-divide-telehealth-and-libraries-webinar-series).

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