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The impact of COVID-19 on healthcare coverage and access in racial and ethnic minority populations in the United States

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Abstract

This study described spatiotemporal changes in health insurance coverage, healthcare access, and reasons for non-insurance among racial/ethnic minority populations in the United States during the COVID-19 pandemic using four national survey datasets. Getis-Ord *Gi** statistic and scan statistics were used to analyze geospatial clusters of health insurance coverage by race/ethnicity. Logistic regression was used to estimate odds of reporting inability to access healthcare across two pandemic time periods by race/ethnicity. Racial/ethnic differences in insurance were observed from 2010 through 2019, with the lowest rates being among Hispanic/Latino, African American, American Indian/Alaska Native, and Native Hawaiian/Pacific Islander populations. Pre-pandemic insurance coverage rates were geographically clustered. The percentage of adults citing change in employment status as the reason for non-insurance increased by about 7% after the start of the pandemic, with a small decrease observed among African American adults. Almost half of adults reported reduced healthcare access in June 2020, with 38.7% attributing reduced access to the pandemic; however, by May 2021, the percent of respondents reporting reduced access for any reason and due to the pandemic fell to 26.9% and 12.7%, respectively. In general, racial/ethnic disparities in health insurance coverage and healthcare access worsened during the pandemic. Although coverage and access improved over time, pre-COVID disparities persisted with African American and Hispanic/Latino populations being the most affected by insurance loss and reduced healthcare access. Cost, unemployment, and eligibility drove non-insurance before and during the pandemic.

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Introduction

In the United States (US), the racial and ethnic gap in healthcare access and health outcomes is well documented. Studies show African American, Hispanic/Latino, Native Hawaiian and Pacific Islander, and American Indian/Alaska Native (AIAN) populations experience disparities in chronic disease and mortality and that health disparities are persistent sources of inequity and injustice (Holtgrave *et al.*, 2020; Quiñones *et al.*, 2019; Admon *et al.*, 2018; Hardeman, 2020; Devakumar & Selvarajah, 2020; Bailey *et al.*, 2020). During the COVID-19 pandemic, there have been substantial advances in research and an increased awareness of health disparities associated with this disease (Abedi *et al.*, 2021; Okonkwo *et al.*, 2021). However, there continue to be significant access barriers to healthcare and supportive services for racial and ethnic minority populations, including African American and Hispanic persons (Douthit *et al.*, 2015), who comprise a disproportionate number of cases of COVID-19 (Tai *et al.*, 2021). The COVID-19 pandemic has been cited as a case study in social determinants of health. Due to disparities in wealth, housing, work conditions, and chronic illness prevalence, racial and ethnic

minority populations in the US have experienced greater exposure to COVID-19 and higher mortality (Dalsania *et al.*, 2022; Gómez *et al.*, 2021; Paul *et al.*, 2021). Studies further suggest COVID-19 has been underreported among racial and ethnic minority populations and that early detection may not have been achieved through appropriate medical intervention (Chinchih, Frey, & Presidente, 2021). Research has also shown that many racial and ethnic minority populations remain without affordable health insurance. Although insurance coverage has increased nationwide, African American, Hispanic/Latino, and AIAN populations are overrepresented among those who are uninsured (Cha & Cohen, 2022; missing from the list Lee *et al.*, 2023). According to Lee *et al.* (2023), among adults under the age of 65, 20.2% of Hispanic/Latino persons, 22.4% of AIAN persons, and 12.4% of African American persons lacked health insurance in 2019, compared with 11.1% of the overall population. In addition, historical and social factors, including racism, language barriers, and unequal distribution of resources have limited healthcare access for racial and ethnic minority populations in America (Hardeman, 2020; Dalsania *et al.*, 2022; Paul *et al.*, 2021; Chinchih, Frey, & Presidente, 2021). These factors contribute to disproportionately high rates of chronic illness (Lee, 2022; Patrick & Yang, 2021; Ma, Sanchez, & Ma, 2022). To further quantify healthcare disparities in the time of COVID-19, this study investigated racial and ethnic differences in health insurance coverage, reasons for non-insurance, and healthcare access before, during, and after the pandemic start. The analysis took a holistic approach, incorporating multiple national surveys at different geographic scales to paint a richer picture of the healthcare landscape. Although direct comparison of health insurance and healthcare access measures across surveys is not possible due to differences in sampling populations, data collection periods, and survey instruments, this study seeks to provide a more complete analysis of pandemic related impacts by considering overall consistency in the direction and magnitude of outcomes.

Materials and Methods

Data

We analyzed data from four national surveys to assess the impact of the COVID-19 pandemic on health insurance coverage and healthcare access among racial and ethnic minority populations: the American Community Survey (ACS) (U.S. Census Bureau, 2020a), the Household Pulse Survey (HPS) (U.S. Census Bureau, 2020b), the National Health Interview Survey (NHIS) (National Center for Health Statistics, 2020a), and the Research and Development Survey During COVID-19 (RANDS) (National Center for Health Statistics, 2020b). Each survey is publicly available and was downloaded from the corresponding application programming interface (API) or website. Surveys varied in the temporal resolution and time-period covered (Figure 1) as well as race/ethnicity classifications provided (Table 1). We used ACS 1-year annual estimates for 2010 through 2019 (the Census Bureau did not release ACS 1-year estimates for 2020) to establish a pre-pandemic baseline to compare changes in health insurance coverage since the start of the pandemic in 2020. Because HPS sampled approximately weekly beginning in April 2020, we used these data to evaluate changes during the COVID-19 period (2020 or later). NHIS provided annual data for a longitudinal sample for 2019 and 2020 that we used to compare the pre-COVID-19 and during-COVID-19 periods (Table 2). We updated sample SAS code from NCHS to recode each NHIS survey and create the 2020 longitudinal dataset. Finally, RANDS collected data in three rounds, beginning June 2020 and then again in August 2020 and May 2021 (Table 2). Analyses of non-response bias for NHIS and RANDS are available from NCHS (Bramlett, Dahlhamer, & Bose, 2023).

ACS 1-year estimates for 2010 through 2019 were requested from the US Census Bureau API at county and state levels by race/ethnicity using the tidycensus package (Walker & Herman, 2022) in R v4.1.3. We transposed and combined the data across age and sex groups as rate estimates with a margin of error corresponding to a 90% confidence interval. ACS sample sizes and response

Table 1. Race/ethnicity classifications by survey.

Survey name	Race/ethnicity variables
American Community Survey (ACS)	African American (C27001B) Asian (C27001D) Hispanic/Latino (C27001I) Non-Hispanic White (C27001H)
Household Pulse Survey (HPS)	Hispanic Non-Hispanic Non-Hispanic Black Non-Hispanic Asian Non-Hispanic Other: Multiple
National Health Interview Survey (NHIS)	Hispanic Non-Hispanic White Only Non-Hispanic Black/African American Only Non-Hispanic Asian Only Non-Hispanic AIAN Only Non-Hispanic AIAN and any other group Other Single and Multiple Races
Research and Development Survey (RANDS) During COVID-19	Hispanic Non-Hispanic White Non-Hispanic Black Non-Hispanic Other (collapsed, all other non-Hispanic)

rates vary by year (U.S. Census Bureau, 2019-2023) and are reported in Table 2.

We used custom scripts in Python v3.10.4 (Van Rossum & Drake, 2009) to access and aggregate HPS data for Weeks 1 to 42 (HPS Phase 1 through 3.3) from the publicly available website. We summarized indicator questions about health insurance coverage (HLTHN1–8) into a binary indicator of coverage status (insured or non-insured), multiplied the new indicator by its respective person weight (PWEIGHTS), and summed it over respondents to form estimates of the number of insured adults by race/ethnicity at the state level. Margins of error for a 90% confidence interval were estimated based on Successive Differences Replicate (SDR) methodology and associated equations for pooling and transforming standard errors (Fay & Train, 1995). An analogous procedure was used to aggregate counts and margins of error to the national level by phase. HPS sample sizes and response rates vary by week, and an analysis of non-response bias is available from the Census Bureau (Peterson, Toribio, & Farber, 2023).

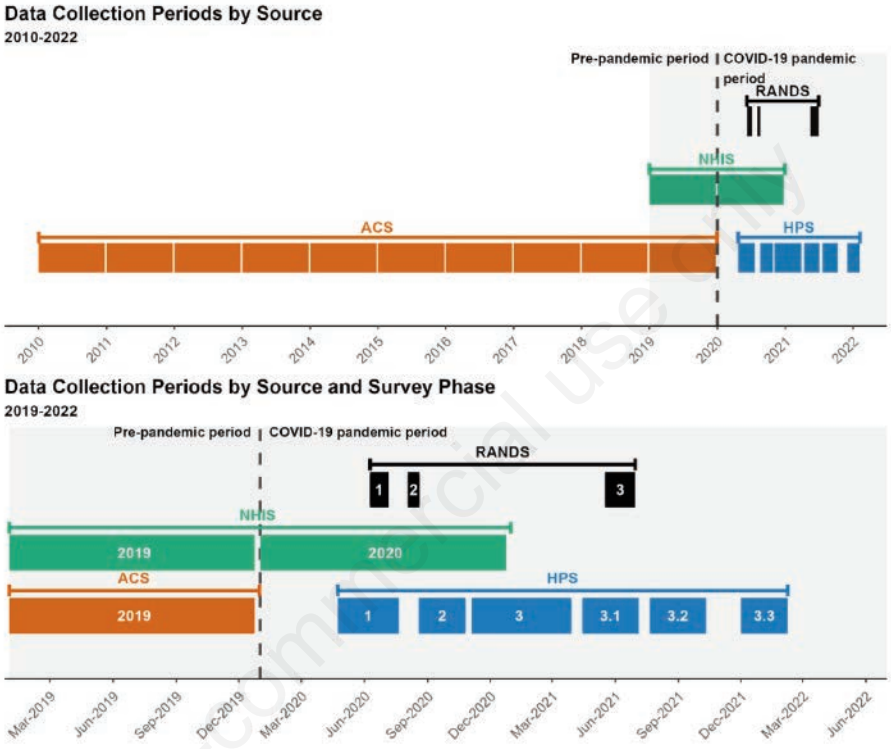

Figure 1. Data collection period by source and survey phase. The surveys used for this analysis cover January 2010-March 2022. The dashed vertical line delineates surveys that were used to establish a pre-pandemic baseline (2010-2019 ACS, 2019 NHIS) from surveys that were used to assess conditions during the COVID-19 pandemic. Surveys along the same horizontal axis were loosely compared to one another (e.g., ACS and HPS). Each block segment represents a year or phase of that survey. More information about each survey may be found on their public website.

Table 2. Sample size and response rates for annual surveys.

Survey	Timeframe	Sample Size	Response Rate %
American Community Survey 1-Year Estimates (Final Interviews, Housing Units)	2010	1,917,799	97.5
	2011	2,128,104	97.6
	2012	2,375,715	97.3
	2013	2,208,513	89.9
	2014	2,322,722	96.7
	2015	2,305,707	95.8
	2016	2,229,872	94.7
	2017	2,145,639	93.7
	2018	2,143,000	92
	2019	2,059,945	86
Research and Development Survey During COVID-19	June 2020	6,800	23
	August 2020	5,981	20.3
	May 2021	5,458	11.8
National Health Interview Survey	2019-2020 Longitudinal	10,415	29.6

There are important differences among these data sources. ACS is a long-running program, which serves as one of the primary sources for demographic data in the US and typically releases new files annually. HPS is part of the Census Bureau's experimental data series, using a short turnaround survey instrument to capture more timely data during a public health emergency. Similarly, NHIS, a well-established data collection program based on in-person interviews, serves as one of NCHS's flagship products. On the other hand, RANDS produces experimental results from a commercial panel survey, designed to collect pandemic-specific data as a supplement to the primary NCHS surveys.

Measures

All four surveys addressed health insurance coverage through at least one question. For each survey, we included respondents 18 to 64 years old and used the race/ethnicity categories described in Table 1. While each survey asked whether respondents had coverage, NHIS and RANDS captured more detailed information about insurance status and healthcare access, described in Table 3.

We assessed changes in years spent uninsured and reasons for non-insurance using the NHIS 2020 Longitudinal Survey. Adults who were uninsured at some point during the past year were asked how long they had been uninsured. Adults who had been uninsured for less than three years were asked to select reasons for non-insurance, and respondents who spent a year or less without insurance were also asked if other reasons, in addition to cost, applied for their non-insurance. Additionally, two RANDS questions specifically addressed changes in access to healthcare during the pandemic. The first question assessed whether respondents were unable to access urgent care for an accident or illness, a surgical procedure, diagnostic or medical screening test, treatment for an ongoing condition, a regular check-up, prescription drugs or medications, dental care, vision care, or hearing care in the two months prior to the survey. Respondents who were unable to receive one or more of these types of care were also asked if they were unable to get the care described due to the COVID-19 pandemic.

This analysis was classified as public health surveillance and was exempted from institutional review board (IRB) review.

Analysis

Our analyses varied based on the structure and format of the survey. For ACS and HPS, we reported rate estimates with 90% confidence intervals, which are the default intervals provided by the Census Bureau for these data. Although insurance coverage estimates from ACS and HPS are reported with 90% CIs, all formal statistical tests in this study were conducted at a significance level of 0.05. As our methodological approach was primarily exploratory, we chose not to adjust the significance level for multiple testing and instead monitored family-wise error rates to identify batches where results could be the result of Type 1 error. To assess geographical patterns of pre-pandemic insurance coverage and to test if coverage was disproportionately high or low in and around particular geographic areas, we conducted a hotspot analysis with the 2019 ACS 1-year estimates (as insured rates per 1000) using Getis-Ord *Gi** (Ord & Getis, 1995) in R v4.1.2. We conducted the hotspot analysis at both the county (Admin 2) and state (Admin 1) levels because it is possible that significant hotspots (or coldspots) may exist at the county level that might be obscured when data are aggregated to the state level. For both types of geographic units, we defined neighbors using adjacency (queen contiguity) with row-standardized weights and excluded locations with zero neighbors. A *Z*-score transformation of the *Gi** statistic was used as a diagnostic tool for testing and mapping. As a complementary hotspot analysis at the state level, we ran spatial scan statistics on ACS data using SaTScan. Scan statistics use a moving window approach to define neighbors and significant clusters are detected by identifying window centers where observed counts are significantly elevated. SaTScan is widely used in public health for

Table 3. Survey measures and possible responses (NHIS is National Health Interview Survey; RANDS is Research and Development Survey; CHIP is Children's Health Insurance Program).

Survey measure	Possible responses
NHIS 2020 Longitudinal: Reasons for Non-Insurance Among those uninsured less than 3 years	Job loss/employment change Missing a deadline Ineligibility due to age/leaving school Increase in coverage cost Ineligibility for Medicaid/CHIP/other public coverage
NHIS 2020 Longitudinal: Reasons for Non-Insurance Other Than Cost Among those uninsured less than 1 year	Not needing/wanting coverage Ineligibility for coverage Difficult/confusing sign-up process, Inability to find suitable coverage Timing of coverage start date Other, including missing a deadline or job loss
RANDS During COVID-19: Access to Healthcare by Type of Healthcare Respondents were asked if they had been unable to receive desired care in each category.	Urgent care for an accident or illness Surgical procedure Diagnostic or medical screening test Treatment for an ongoing condition Regular check-up Prescription drugs or medications Dental care Vision care Hearing care
RANDS During COVID-19: Lack of Access to Healthcare Due to COVID-19 Among respondents unable to access at least one type of healthcare.	Due to COVID-19 pandemic Not due to COVID-19 pandemic

detecting clusters as it provides a flexible framework for analysis. We used the SaTScan Poisson model to estimate expected counts with the number of insured as the case data and the total surveyed as the population for each state. This was performed for each of the aggregated ACS insurance coverage variables. We restricted the maximum cluster size to less than 25% of the total surveyed population with no geographic overlap in identified clusters. Given the substantial regional variation in our outcomes across the national scale, sensitivity analyses were performed suggesting the 25% maximum cluster size yielded more interpretable results while maintaining statistical significance (Li *et al.*, 2019). Our results are represented in maps of likelihood (relative risk) of insurance coverage with hot spots (spatial clusters of higher insurance coverage) and cold spots (spatial clusters of lower insurance coverage). We also developed cross-sectional maps, space-time plots, and time-series plots to describe the spatiotemporal patterns of insurance coverage prior to and during the COVID-19 pandemic for ACS and HPS, respectively. We analyzed variables of interest from the NHIS Longitudinal Survey using the surveyfreq and surveymeans procedures in SAS statistical software package v9.4. Missing data were removed during the analysis of each variable by default and respondents who indicated "Don't Know" were included in the denominator. For the longitudinal analysis, we used the NCHS-calibrated longitudinal sample survey weight (WTSA_L). We compared differences in RANDS variables on health insurance coverage among respondents under 65 years of age and reduced access to care between Round 1 and Round 3 using a survey logistic regression model that accounted for the covariance of estimates in clustered samples. The first two rounds of RANDS were longitudinal and only panelists who participated in Round 1 (June 2020) were eligible for participation in Round 2 (August 2020). Round 3 (May 2021) participants were sampled independently of previous rounds. Due to the unavailability of longitudinal weights in the public-use dataset, statistical testing across survey rounds was only performed on Round 1 and Round 3 estimates. All RANDS analyses were performed using the survey package v4.1.1 in R v4.1.2.

Results

Health insurance coverage

Pre-COVID-19 pandemic

We analyzed ACS data to establish a pre-pandemic baseline of insurance coverage. For all racial/ethnic groups examined, the rate of insured adults changed through time in the decade leading up to the COVID-19 pandemic in 2020, with an upwards surge in rates between 2013 and 2014 that plateaued by 2016 (Figure 2). Overall, rates for non-Hispanic White and Asian populations exceeded the overall rate in the United States, while rates for African American, AIAN, and Hispanic/Latino populations were consistently lower. At the beginning of the decade, insurance rates were highest in the non-Hispanic White (84.67% [90% CI: 84.59, 84.75]) and lowest in the Hispanic/Latino (57.13% [56.87, 57.40]) populations. However, by 2019 (Table 4), insured rates for the Asian population (91.91% [91.70, 92.12]) exceeded non-Hispanic Whites (91.0% [90.94, 91.09]). Although health insurance rates in Hispanic/Latino and AIAN populations remained lower than other groups, differences between these two groups that existed at the beginning of the decade had diminished by 2016. While there was not an equalization of rates among all groups, differences between most groups narrowed considerably between 2010 to 2016. For example, the difference in percent insured between non-Hispanic White and

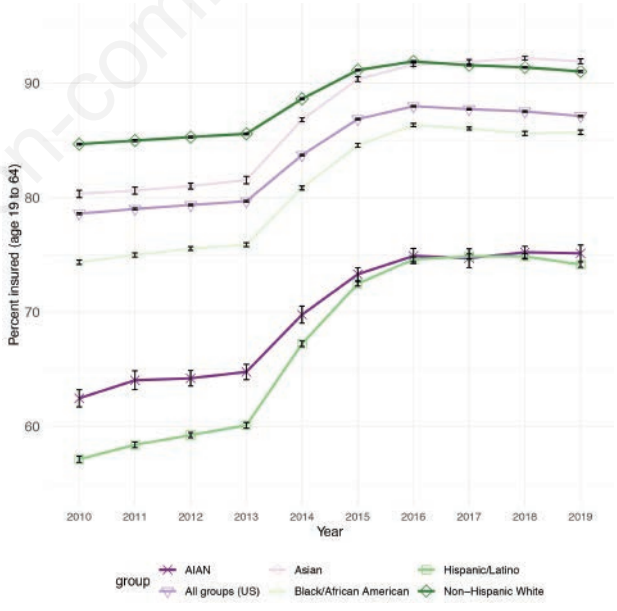

Figure 2. American Community Survey (ACS) 1-year estimates of the percentage of adults (aged 18 to 64) with health insurance in the United States (US) between 2010 and 2019 for five racial/ethnic groups (represented by different colored symbols with lines of the same color connecting years). The annual estimate for all groups in the US is included for reference (light purple color with upside-down triangle). Error bars (in black) around each estimated percentage represent 90% confidence intervals. Note a general surge in percent insured across all groups from 2013 to 2014, plateauing by 2016. Although differences between groups persisted after 2016, differences between many groups narrowed.

Table 4. Insurance coverage results by race/ethnicity for each survey for adults aged 18-64.

Survey	American Community Survey	National Health Interview Survey		Research and Development Survey During COVID-19			Household Pulse Survey					
Survey Year	2019	2019	2020	2020	2020	2021	2020	2020	2020/2021	2021	2021	2021
Phase/Round				Round 1	Round 2	Round 3	Phase 1	Phase 2	Phase 3	Phase 3.1	Phase 3.2	Phase 3.3
Race/ Ethnicity	**% (90% CI)**	**% (95% CI)**		**% (95% CI)**			**% (90% CI)**					
Hispanic	74.15 (73.91 - 74.39)	67.4 (63.3 - 71.4)	68.3 (64.2 - 72.3)	82.9 (79.0 - 86.8)	82.3 (78.4 - 86.2)	83.3 (78.0 - 88.7)	68.28 (64.82 - 71.75)	59.39 (58.64 - 60.14)	56.97 (56.36 - 57.59)	54.47 (53.74 - 55.20)	61.93 (61.14 - 62.72)	63.29 (62.20 - 64.39)
NH White	91.02 (90.94 - 91.10)	90.3 (88.9 - 91.6)	91.0 (89.7 - 92.3)	90.9 (89.1 - 92.7)	89.6 (87.4 - 91.8)	91.5 (90.0 - 93.0)	84.52 (80.48 - 88.57)	76.43 (76.20- 76.66)	74.86 (74.65 - 75.06)	73.17 (72.91 - 73.43)	79.39 (79.13 - 79.65)	82.36 (82.03 - 82.69)
NH Black	85.71 (85.52 - 85.90)	87.0 (83.6 - 90.4)	84.2 (80.5 - 88.0)	83.8 (79.4 - 88.2)	81.9 (77.3 - 86.5)	82.5 (77.7 - 87.2)	74.18 (70.59 - 77.77)	63.70 (62.90 - 64.50)	62.48 (61.86 - 63.13)	61.13 (60.31 - 61.95)	67.64 (66.74 - 68.55)	70.75 (69.44 - 72.06)
NH other	71.65 (71.49 - 71.81)			89.2 (85.6 - 92.8)	88.1 (85.0 - 91.2)	86.9 (79.2 - 94.6)						
NH Asian	91.91 (91.7 - 92.12)	91.0 (85.9- 96.1)	91.5 (86.2 - 96.7)				81.75 (78.32 - 85.19)	73.30 (72.11 - 74.49)	68.96 (67.87 - 70.05)	66.17 (64.96 - 67.39)	74.08 72.75 - 75.40)	76.31 (74.52 - 78.09)
NH AIAN	75.12 (74.38 - 75.86)	80.1 (66.0 - 94.2)	85.6 (77.5 - 93.7)									
NH AIAN and any other group		87.7 (77.5 - 98.0)	78.8 (64.5 - 93.2)									
NHPI	85.21 (83.85 - 86.57)											
Other single or multiple races	87.16 (86.66 - 87.66)	90.0 (81.0 - 99.1)	88.6 (78.7 - 98.5)									

NH indicates Non-Hispanic; AIAN indicates American Indian/Alaska Native; NHPI indicates Native Hawaiian/Pacific Islander.

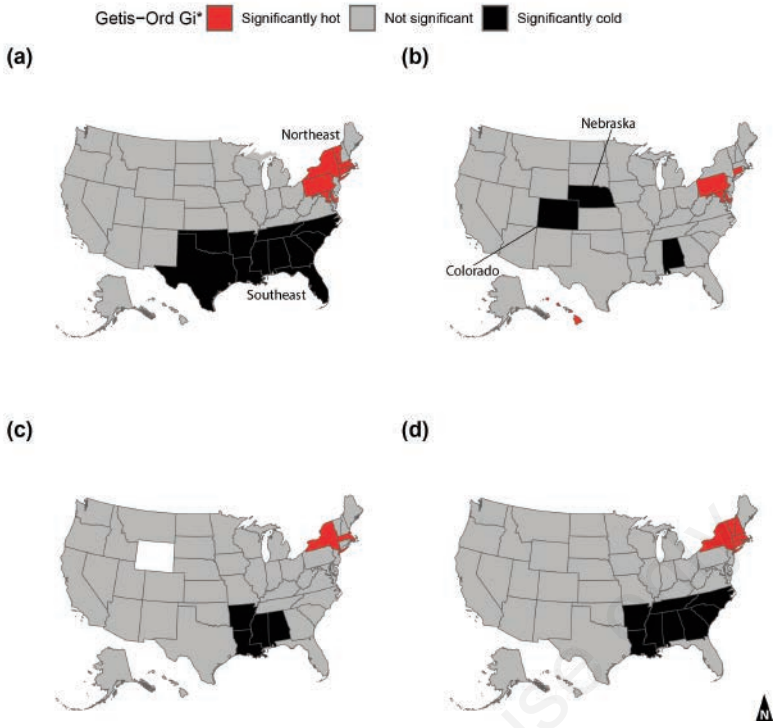

Figure 3. State-level hotspot analysis (Getis-Ord Gi*) for insurance coverage rates of individuals between 19 and 64 years by racial/ethnic subgroup: (a) non-Hispanic White, (b) African American, (c) Asian, (d) Hispanic/Latino (ACS 2019 1-Year Estimates). States with significantly high Gi* scores are shown in red, and states with significantly low Gi* scores are shown in black; states that did not have a significant Gi* score are shown in dark gray. In panel (c) (Asian persons), one state (Wyoming) had an insufficient sample size for a 1-year ACS estimate (indicated here by no fill color).

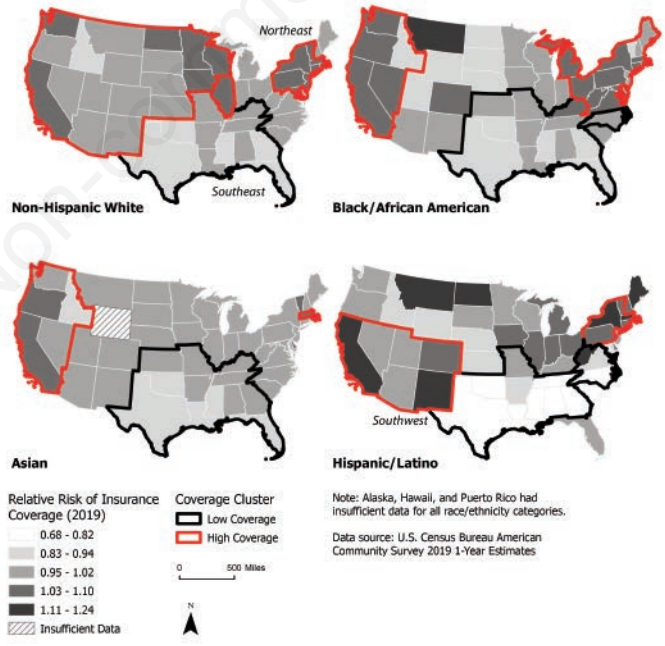

Figure 4. Cluster detection map of relative risk of insurance coverage (ACS 2019 1-Year Estimates), based on U.S. Census Bureau American Community Survey. A cluster indicates a collection of contiguous state(s) whose combined insurance rate is significantly higher/lower than elsewhere on the map. A cluster can also be comprised of a single state where the insurance rate is significantly higher/lower than elsewhere on the map. No significant clusters were found for total (all race/ethnicity categories combined.) Relative risk indicates higher levels of insurance compared to non-insurance.

Hispanic/Latino populations shrunk by approximately 10% over the course of the decade. Rates also varied among geographic regions. Getis-Ord *Gi** and SaTScan detected hot spots (areas of higher coverage) in the Northeastern US and cold spots (areas of lower coverage) in the Southeastern US for all racial/ethnic populations (Figure 3 and 4). For African American populations, cold spots were also detected around the states of Colorado and Nebraska by Getis-Ord *Gi** (Figure 3b), while SaTScan detected large cold spots for non-Hispanic White and Hispanic/Latino populations in the West Coast that extended into the Southwest and Great Plains (Figure 4). SaTScan results are represented as relative risk because the test compares risk within and outside of a potential cluster, with the null hypothesis implying constant risk. A "high coverage" cluster is analogous to a "hot spot" identified by Getis-Ord. Also in 2019, county-level results based on Getis-Ord *Gi** revealed significant hot and cold spots at smaller spatial extents within some states (Figure 5). For example, there were extensive hot spots for insurance coverage around many counties in the San Francisco Bay Area of Northern California that extended into the Central Valley of California for non-Hispanic White persons, and all the way to Los Angeles County in Southern California for African American persons. For all populations, except Asian persons, there were significant hot spots for insurance coverage at the county level detected in and around particular metropolitan areas in the upper Midwest (in states such as Wisconsin, Illinois, and Michigan) that did not always translate into significant hot spots at the state level based on the Getis-Ord method (Figure 3).

During the COVID-19 pandemic

We analyzed HPS data to track changes in coverage during the pandemic. Time-space choropleth maps for HPS data show that, for all groups, insurance rates declined early in the pandemic (through HPS Phase 3.1) but recovered by the last sampling phase (Figure 6). Geographic disparities in insurance coverage present at the beginning of the pandemic became more widespread and then reverted to pre-pandemic patterns as insurance coverage rebounded. Rates consistently differed between racial/ethnic populations across all analyzed HPS phases (Figure 7).

Overall

Although exact estimates of insurance coverage varied by survey, likely due to methodological differences described above, some overall trends are apparent. Racial/ethnic disparities in insurance coverage were evident in 2019, according to ACS and NHIS (Table 4). In 2020, Hispanic/Latino, African American, and AIAN populations continued to have relatively lower coverage, according to NHIS and RANDS. While the longitudinal NHIS survey did not offer evidence of significant year-to-year changes from 2019 to 2020, HPS reported a decline in coverage near the start of the pandemic, particularly between October 2020 and July 2021. For example, at the lowest point, just over half (54.45% [90% CI: 53.74, 55.20]) of the Hispanic/Latino population carried insurance, compared with 64.82% [90% CI: 64.82, 71.75] in April 2020. By late 2021, HPS shows that coverage had begun to increase but disparities remained. Between phases, 90% confidence intervals of the estimates were non-overlapping for all groups through Phase 3.2 (Figure 7 and Table 4).

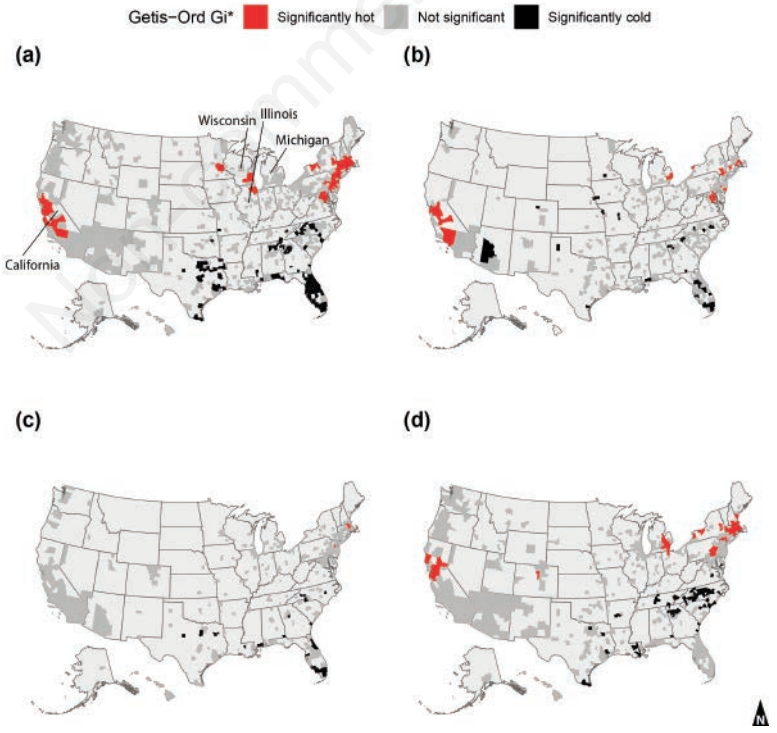

Figure 5. County-level Hotspot analysis (Getis-Ord Gi*) for insurance coverage rates of individuals between 19 and 64 years by racial/ethnic subgroup: (a) non-Hispanic White, (b) African American, (c) Asian, (d) Hispanic/Latino (ACS 2019 1-Year Estimates). Counties with significantly high Gi* scores are shown in red, and counties with significantly low Gi* scores are shown in black; counties with a non-significant Gi* score are shown in dark gray. Many counties were missing data (indicated by no fill color) due to populations below the threshold for 1-year ACS estimates (65,000).

Reasons for non-insurance

Before the pandemic, most adults who had been uninsured for less than 3 years cited job loss or a change in employment status as one of the reasons they were uninsured (Figure 8). After the start of the pandemic, adults who cited this reason increased by about 7%. This pattern is consistent for all racial/ethnic populations, except for non-Hispanic African American persons, who saw about a 1% decrease in adults who gave this reason.

About 67% of adults who had been uninsured for less than 1 year cited unaffordable coverage as a reason they were uninsured before and/or after the start of the pandemic (Figure 9). When responses were broken out by race/ethnicity, Hispanic adults who cited this reason for why they were uninsured increased by about 2% since the start of the pandemic, while non-Hispanic White adults who cited this reason decreased by about the same amount.

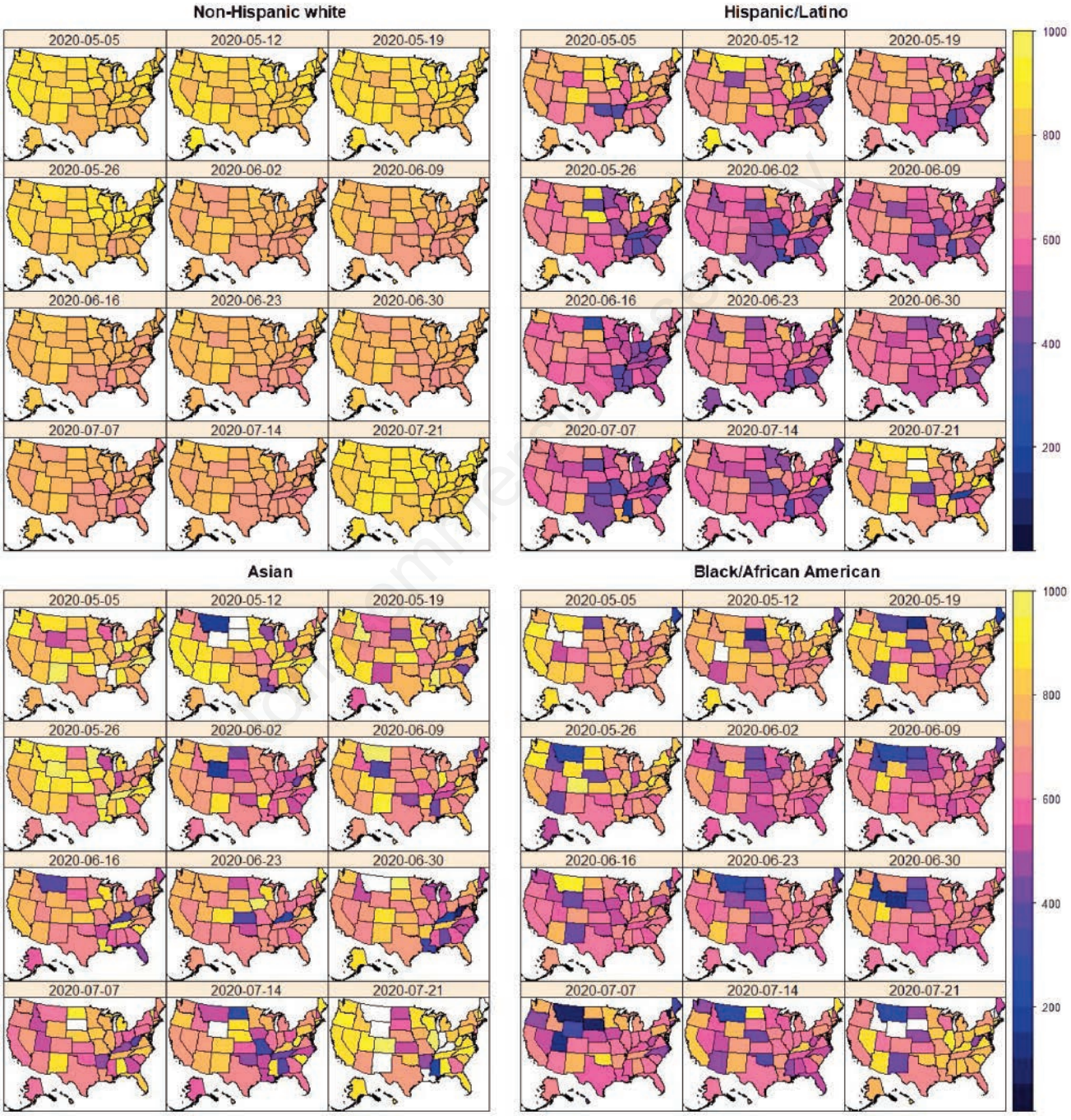

Figure 6. Insurance coverage (per 1000) by race and ethnicity, mapped by state (HPS, April 23, 2020 – July 1, 2020). In all groups, insurance coverage declined during early weeks of the HPS before recovering in the last phase.

In addition to cost, the most cited reason adults without health insurance gave for non-insurance was ineligibility for coverage. Respondents who cited this reason for non-insurance decreased since the start of the pandemic by 2%. Looking at these results by race/ethnicity, this decrease is only seen in non-Hispanic White and non-Hispanic African American respondents, while all other populations saw a slight increase in respondents who cited ineligibility as one of the reasons that they were uninsured.

Healthcare access

Almost half (48.4%) of all Round 1 (June 2020) RANDS respondents reported that they experienced reduced access to healthcare in the two months prior to the survey and 38.7% reported that their reduced access to care was specifically due to the pandemic (Figure 10). By Round 3 (May 2021), the percent of respondents who reported a reduction in their access to healthcare overall fell to 26.9% and those who reported that their reduced access to

Figure 7. Mean health insurance coverage rate (per 1000) by Phase and race/ethnicity for adults under 65 (HPS, April 23, 2020 – February 7, 2022). Each race/ethnicity is represented by a different colored symbol; the 90% CI around each rate estimate is represented by vertical black lines from the center of each symbol. The pattern across phases is consistent with declining rates during early phases of the HPS survey, followed by a recovery. Results also support significant differences in rates estimates among groups, within in each phase.

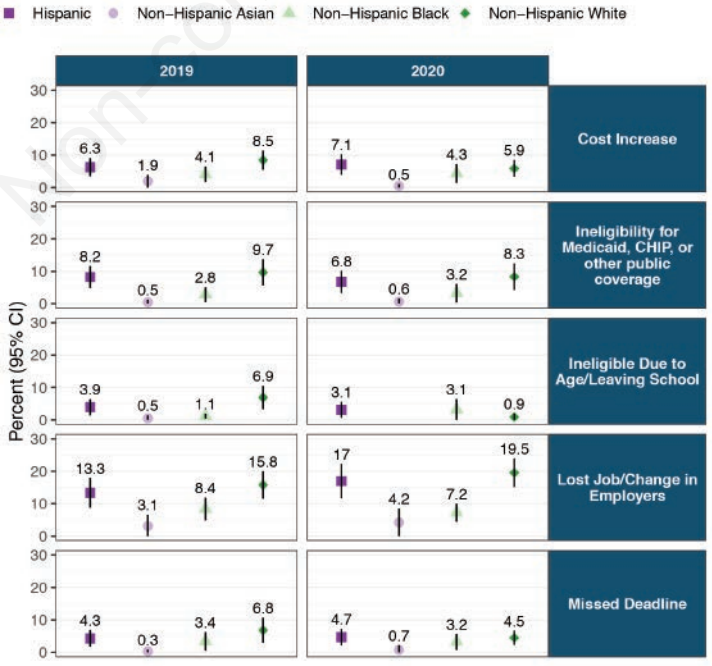

Figure 8. Reasons for non-insurance by race/ethnicity, adults uninsured for 3 years or less (NHIS). Includes race/ethnicity populations that had sufficient data to show estimates for both 2019 and 2020, for most questions.

healthcare was due to the pandemic fell to 12.7%. Significant decreases were observed in Round 3 compared to Round 1 among respondents in every race/ethnicity for both measures, with the largest decreases observed among non-Hispanic White respondents (Table 5).

Discussion

Our results suggest that loss of insurance coverage and reduced access to health services deepened inequities in an already uneven healthcare landscape, particularly for African American and Hispanic/Latino populations. The temporal patterns of pre-COVID-19 health insurance coverage are consistent with previous reports on the impact of the Affordable Care Act (ACA). Following the implementation of key provisions of ACA in 2014, overall insurance coverage increased and disparities in coverage decreased (Courtemanche *et al.*, 2019; Buchmueller & Levy, 2020). States that expanded Medicaid eligibility under ACA saw greater increases in insurance coverage than those that did not (Courtemanche *et al.*, 2017). Consistent with this pattern, our state-level geographic results found a cluster of low coverage in

Figure 9. Reasons for non-insurance related to cost by race/ethnicity, adults uninsured less than 1 year (NHIS). Includes race/ethnicity populations that had sufficient data to show estimates for both 2019 and 2020, for most questions.

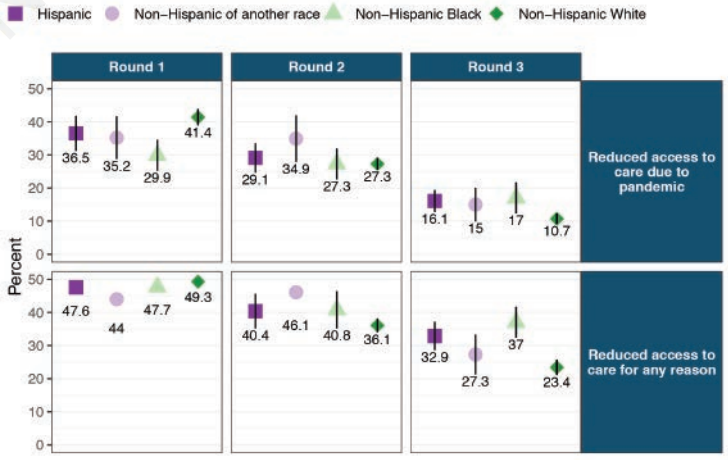

Figure 10. Reduced access to care by race/ethnicity, adults under 65 (RANDS; June 9, 2020 – July 6, 2020 [Round 1], August 3, 2020 – August 20, 2020 [Round 2], and May 17, 2021 – June 30, 2021 [Round 3]). "Non-Hispanic of another race" included all responses other than Hispanic, non-Hispanic White and non-Hispanic Black.

the Southeast, where most states did not expand Medicaid eligibility (Kaiser Family Foundation, 2022). However, our county-level results reveal variation within states, indicating that other factors contribute to insurance coverage at the local scale.

Previous research found that at least 2.7 million people became newly uninsured during 2020, likely reflecting a loss of employer-sponsored insurance (ESI) due to increased unemployment (Courtemanche *et al.*, 2017). Similarly, our analysis of HPS found that overall rates of coverage declined and began to recover during our study period. Other studies have suggested that the decline in ESI was partially offset by an increase in Medicaid enrollment (Bundorf, Gupta & Kim, 2021), though that increase may not have been entirely due to employment changes (Khorrami & Sommers, 2021). Policies enacted as part of the federal government's COVID-19 response, such as extending the special enrollment period for ACA Marketplace plans and suspending periodic Medicaid eligibility determinations for enrollees as a condition of receiving increased federal Medicaid match rates under the Families First Coronavirus Response Act of 2020 (FFCRA), may have further offset initial declines in coverage (Lee *et al.*, 2023).

Racial and ethnic minority populations, particularly Hispanic/Latino and African American populations, consistently had lower rates of insurance coverage pre-COVID-19, according to ACS and NHIS (Table 4). Based on NHIS, RANDS, and HPS, these disparities persisted as overall rates of insurance coverage first decreased and then began to recover during 2020 and 2021. Furthermore, according to NHIS, approximately half of the adult population over 18 years old who were uninsured in 2019 and 2020 had spent 3 or more years without health insurance. For those with long-term uninsured status, barriers to access likely predated the pandemic. Cost, employment, and eligibility were important drivers of non-insurance both before and during the pandemic. For those uninsured in the short-term, cost and eligibility were the most common causes, while in the long-term, unemployment was the most common reason. Our analysis of NHIS data revealed a modest decrease in the proportion of adults citing ineligibility as a cause of short-term uninsurance in 2020, although this finding was limited to non-Hispanic White and Black respondents.

It is possible that this finding was impacted by FFCRA, which prevented participating states from disenrolling Medicaid beneficiaries due to changes to eligibility during the pandemic (Lee *et al.*, 2023). However, because FFCRA primarily extended Medicaid coverage for those adults who were already enrolled, it likely had a greater impact for states that had broader Medicaid eligibility requirements at the start of the pandemic. Challenges around eligibility may reflect the established "coverage gap." In non-Medicaid expansion states, most adults without children and with incomes below the federal poverty level are not eligible for Medicaid enrollment or ACA marketplace subsidies (Garfield & Orgera, 2021). For those in this group without ESI, health insurance coverage may be prohibitively expensive. Unemployment is also an expected cause of uninsurance, as ESI is the most prevalent source of coverage.

Reduced access to healthcare, as measured by RANDS, was widespread during early phases of the pandemic. Although there were improvements over time, these improvements were less pro-

Table 5. Reduced access to healthcare results by race/ethnicity.

Survey	**Research and Development Survey During COVID-19**					
	Reduced Access to Care for Any Reason			**Reduced Access to Care Due to Pandemic**		
Survey Year	2020	2020	2021	2020	2020	2021
Phase/Round	Round 1	Round 2	Round 3	Round 1	Round 2	Round 3
Race/ Ethnicity	**% 95% CI)**			**% (95% CI)**		
Hispanic	47.6 (42.5 - 52.7)	40.4 (35.1 - 45.8)	32.9 (28.6 - 37.1)	36.5 (31.3 - 41.7)	29.1 (24.6 - 33.6)	16.1 (12.7 - 19.4)
NH White	49.3 (46.8 - 51.7)	36.1 (34.0 - 38.2)	23.4 (21.1 - 25.7)	41.4 (38.9 - 43.9)	27.3 (25.5 - 29.1)	17 (12.3 - 21.7)
NH Black	47.7 (42.8 - 52.6)	40.8 (35.2 - 46.4)	37.0 (32.4 - 41.7)	29.9 (25.2 - 34.6)	27.3 (22.7 - 32.0)	15 (9.8 - 20.2)
NH other	44.0 (37.5 - 50.6)	46.1 (38.2 - 53.9)	27.3 (21.2 - 33.4)	35.2 (28.8 - 41.6)	34.9 (27.8 - 42.0)	16.1 (12.7 - 19.4)

NH indicates Non-Hispanic.

nounced for respondents from racial and ethnic minority populations. In 2021, although Hispanic/Latino, African American, and other racial identity respondents were more likely to report reduced access to care than non-Hispanic White respondents, among respondents that experienced reduced access, racial and ethnic minority respondents were more likely to attribute reduced healthcare access to the pandemic, highlighting the importance of ongoing barriers to healthcare for racial and ethnic minority populations. Existing barriers, such as transportation, language, insurance coverage, and structural racism, persist in the COVID-19 era.

Our analysis is subject to some limitations. For this study, we did not consider ways in which telemedicine usage may have affected access to healthcare. While video and telephone-based healthcare services have been proposed as a tool to improve access, recent studies have found evidence of racial/ethnic, language, and socioeconomic disparities in utilization of telemedicine (Lau *et al.*, 2022; Luo *et al.*, 2021; Ramirez *et al.*, 2020), indicating a need for further research on equitable implementation of this approach. Relatedly, estimates of healthcare access are likely influenced by differences in baseline usage and need and in the case of the analysis of RANDS data, the subjectivity of survey respondent opinions on whether pandemic conditions were responsible for any experienced reduced access to care. Finally, the surveys had smaller sample sizes when broken down by race/ethnicity and geography, which increased variability. In particular, the sparsity of ACS and HPS data for AIAN populations and Native Hawaiian/Pacific Islander populations limited county and state level spatial analysis for these groups, and HPS data may exhibit non-response bias to due low response rates, although the Census Bureau implemented measures to mitigate this (Peterson *et al.*, 2021). Similarly, in NHIS and RANDS, small sample sizes for these populations limited year-to-year comparisons; Bramlett *et al.* (2021) describes the methods NCHS used to reduce bias. Additionally, the RANDS estimates of reduced healthcare access, which were derived from a recruited panel and are considered experimental by NCHS, should be interpreted with caution due to non-response bias, and coverage bias resulting from non-complete coverage of the population by the sampling frame. RANDS response rates were markedly lower in 2021 which may further impact comparability of the data across time.

New contribution to the literature

This analysis combines several national surveys to assess health insurance coverage and health care access, and it is among the first to do so in the context of COVID-19. Taken together, our results provide evidence that insurance status declined for many Americans from mid-2020 through late 2021; barriers to healthcare access were prevalent; and cost, employment, and eligibility remained important drivers of coverage status. Our study also considered geography as a contributing factor in health insurance status. We assessed geographic trends in pandemic related changes in insurance status for racial and ethnic minority populations, both nationwide at the state-level and through smaller scale county-level analyses to highlight important variations in health insurance coverage within and among states.

Conclusions

Based on our results, lapses in health insurance coverage during the COVID-19 period were widespread and unevenly distributed across racial and ethnic minority populations. Notwithstanding a subsequent recovery in insurance coverage, it is possible that individuals who were newly uninsured missed important medical services, and future research should consider possible adverse outcomes associated with this potential decline in utilization. While this study did not address causality directly, the finding that obstacles to insurance coverage were similar in 2019 and 2020 indicates that the pandemic exacerbated existing challenges. In fact, regional, racial/ethnic, and financial disparities in insurance coverage and healthcare access predate the COVID-19 era. Public health practitioners should expect these challenges to persist after a return to the pre-pandemic baseline. Interventions to support healthcare access for racial and ethnic minority communities will continue to be necessary beyond the scope of the pandemic, and further research is needed to identify and understand health disparities.

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