

# VETERANS HEALTH ADMINISTRATION

# Office of Health Equity

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# OFFICE OF HEALTH EQUITY

Created in 2012

Vision: To ensure that VHA provides appropriate individualized health care to each Veteran in a way that-

- Eliminates disparate health outcomes and
- Assures health equity

# OFFICE OF HEALTH EQUITY GOALS

1. **Leadership:** Strengthen VA leadership to address health inequalities and reduce health disparities.
2. **Awareness:** Increase awareness of health inequalities and disparities.
3. **Health Outcomes:** Improve outcomes for Veterans experiencing health disparities.
4. **Workforce Diversity:** Improve cultural and linguistic competency and diversity of the VHA workforce.
5. **Data, Research and Evaluation:** Improve data and diffusion of research to achieve health equity.

## Veterans who experience greater obstacles to health related to:

- Race or ethnicity
- Gender
- Age
- Geographic location
- Religion
- Socio-economic status
- Sexual orientation
- Mental health
- Military era
- Cognitive /sensory / physical disability

# OFFICE OF HEALTH EQUITY WEBSITE

<https://www.va.gov/healthequity>

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## Office of Health Equity

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**NATIONAL CENTER FOR HEALTH STATISTICS**

Among adults with underlying diabetes, veterans are more likely to be diagnosed by a health professional

95.1% Veterans | 73.5% Nonveterans

**Veteran Diabetes Data**

Recent data analysis describes diabetes among Veterans and Nonveterans. Source: Healthy People 2020. Learn more »

NEW LGB Chartbook | Health Equity Video | Veteran Diabetes Data

### VHA Office of Health Equity

Equitable access to high-quality care for all Veterans is a major tenet of the VA healthcare mission. The Office of Health Equity (OHE) champions the elimination of health disparities and achieving health equity for all Veterans. OHE supports the VHA's vision to provide appropriate individualized health care to each Veteran in a way that eliminates disparate health outcomes and assures health equity.

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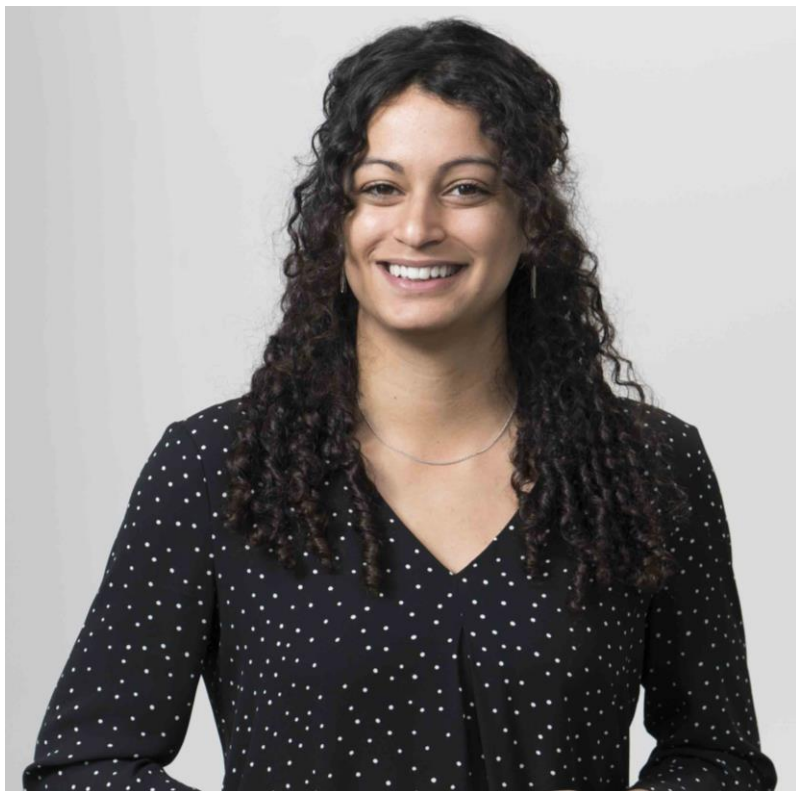
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## Identifying Differences in COVID-19 Infection, Mortality, and Vaccine Receipt in Veterans



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# Time Trends in Racial/Ethnic Differences in COVID-19 Infection and Mortality

**Michelle Wong, PhD**

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VA Greater Los Angeles Healthcare System, HSR&D

Health Equity Cyberseminar

January 12, 2022



@VA\_CSHIIP

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Wong, M. S., Haderlein, T. P., Yuan, A. H., Moy, E., Jones, K. T., & Washington, D. L. (2021). Time Trends in Racial/Ethnic Differences in COVID-19 Infection and Mortality. *International Journal of Environmental Research and Public Health*, 18(9), 4848.



International Journal of  
*Environmental Research  
and Public Health*



Article

# Time Trends in Racial/Ethnic Differences in COVID-19 Infection and Mortality

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**Abstract:** Studies documenting coronavirus disease 2019 (COVID-19) racial/ethnic disparities in the United States were limited to data from the initial few months of the pandemic. In order to address these gaps, we examined time trends in racial/ethnic differences in COVID-19 infection and mortality. We used the Veteran Health Administration (VHA) National Partnered Evaluation Initiative (NPEI) data over three time periods (2020-2021, 2021-2022, and 2022-2023).





# Racial/Ethnic COVID-19 Infection and Mortality Disparities Exist

*Compared to non-Hispanic White (White) patients:*

- More research:
  - Non-Hispanic Black (Black) patients
  - Hispanic patients
- Little research:
  - Native Hawaiians/Other Pacific Islander (NH/OPI) patients
  - American Indian/Alaskan Native (AI/AN) patients

Ref: Mackey, K.; Ayers, C.K.; Kondo, K.K.; Saha, S.; Advani, S.M.; Young, S.; Spencer, H.; Rusek, M.; Anderson, J.; Veazie, S.; et al. Racial and Ethnic Disparities in COVID-19–Related Infections, Hospitalizations, and Deaths. *Ann. Intern. Med.* 2021.



# Pandemic Changing Over Time

- Awareness of & efforts to address racial/ethnic disparities
- Improved COVID-19 treatment
- Risk-mitigation policies e.g., social distancing, masking, work from home
- Vaccines
- New variants

**GAP**

**Studies should consider how disparities change as the pandemic evolves**



# Study Objective & Hypothesis

## *Objective:*

To examine racial/ethnic differences in COVID-19 infection and mortality *over three time periods* from 3/1/2020–11/25/2020 in a national and racial/ethnically diverse sample of veterans

## *Hypotheses:*

- Racial/ethnic disparities in COVID-19 infection and mortality would **change over time**
- **Decrease** over time



# Methods

**Data:** VHA national database of veterans evaluated for potential COVID-19 infection at any VHA facility

**Sample:** Veterans who received a COVID-19 PCR test from 3/1/2020 – 11/25/2020 (n = 705,715)  
– Excluding veteran VHA employees



# Methods

## Key variables

### Dependent variables

- Testing positive for COVID-19
- Mortality (among those who tested positive)

### Independent variables

#### Race/ethnicity:

- AI/AN
- Asian
- Black
- Hispanic
- NHOPI
- White (reference)

### Effect Modifiers

#### 3 time periods:

- Spring: 3/20 - 5/20
- Summer: 6/20 - 8/20
- Fall: 9/20 - 11/25/20

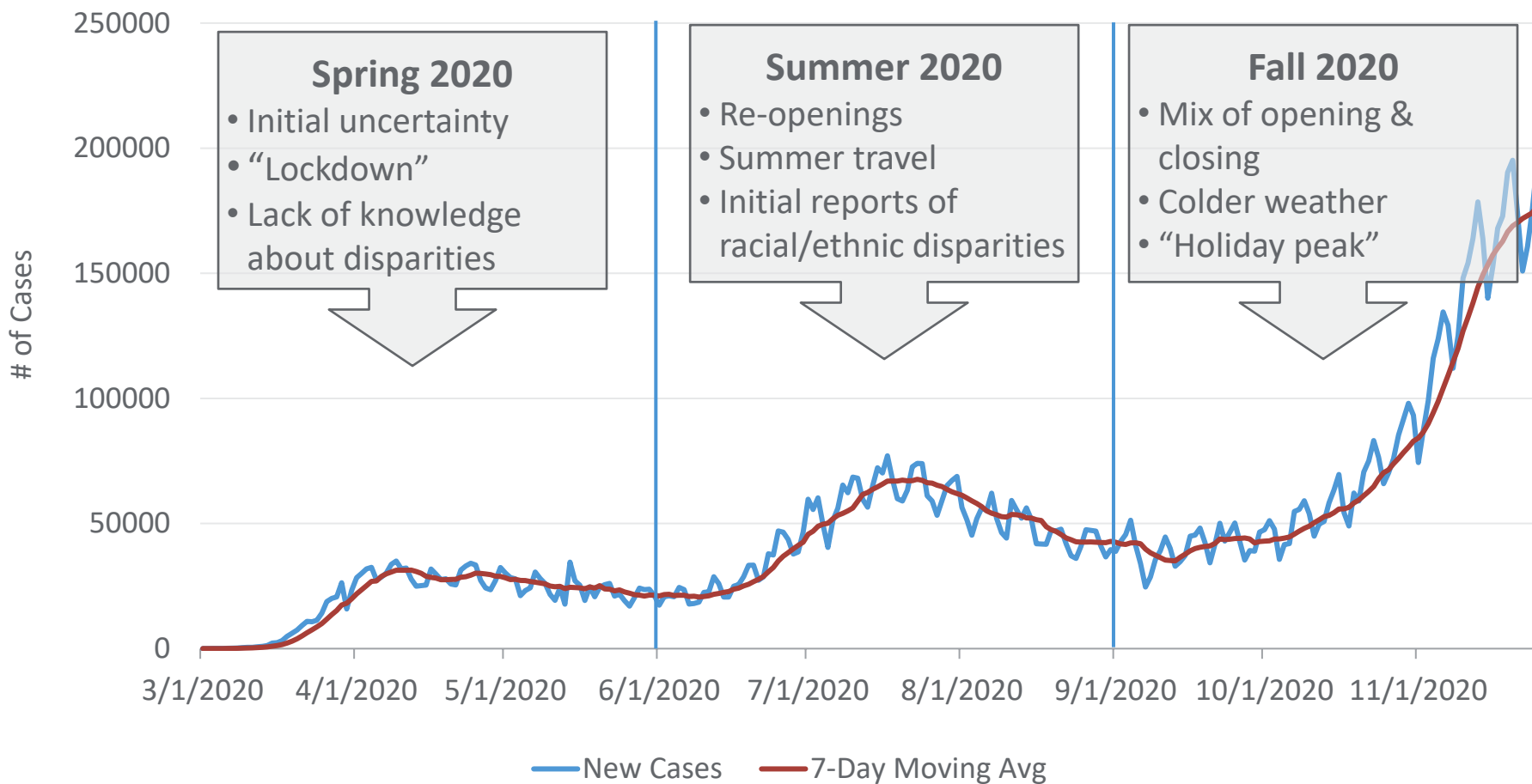
**Control variables:** age, gender, CDC's risk factors for severe COVID-19





# Time Periods Correspond to Peaks in the Pandemic

Daily New COVID-19 Case Trends





# Methods

## Statistical Analysis

- Descriptive statistics
- Adjusted *logistic regression* models
  - Interaction: race/ethnicity x time period
  - Adjusted predicted probabilities (margins)
- **To compare within each time period:** calculated *linear combinations* of odds ratios for each racial/ethnic group vs. White veterans for each time period
- Statistical significance at  $p < 0.05$



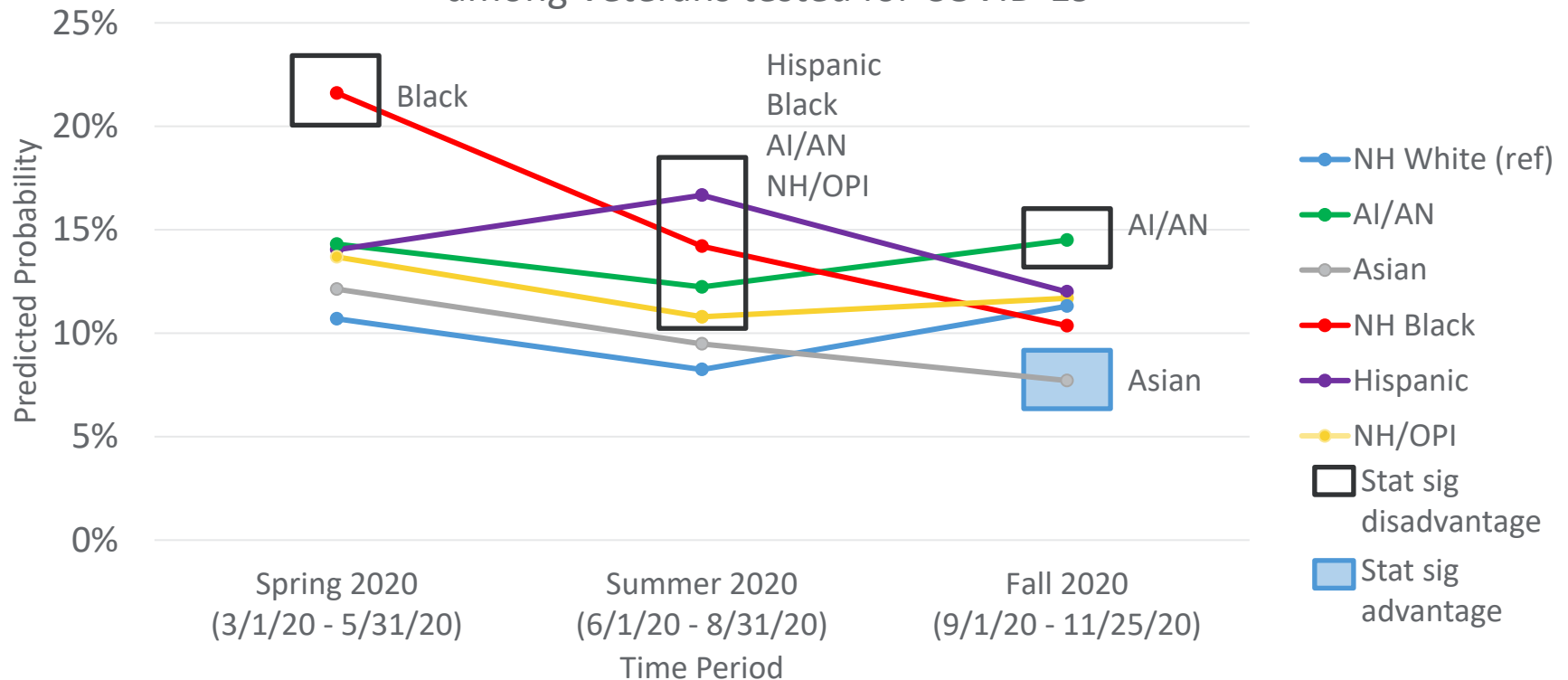
# Results – Sample Characteristics

	Tested (n = 705,715)	Tested positive (n = 83,542)
<i>Race/ethnicity, %</i>		
Non-Hispanic White	61.8	56.1
AI/AN	0.7	0.8
Asian	1.1	0.8
Non-Hispanic Black	22.1	25.2
NHOPI	0.7	0.7



# More Disparities in Infection Over the Summer Months

Predicted probability of COVID-19 infection over time by race/ethnicity among Veterans tested for COVID-19



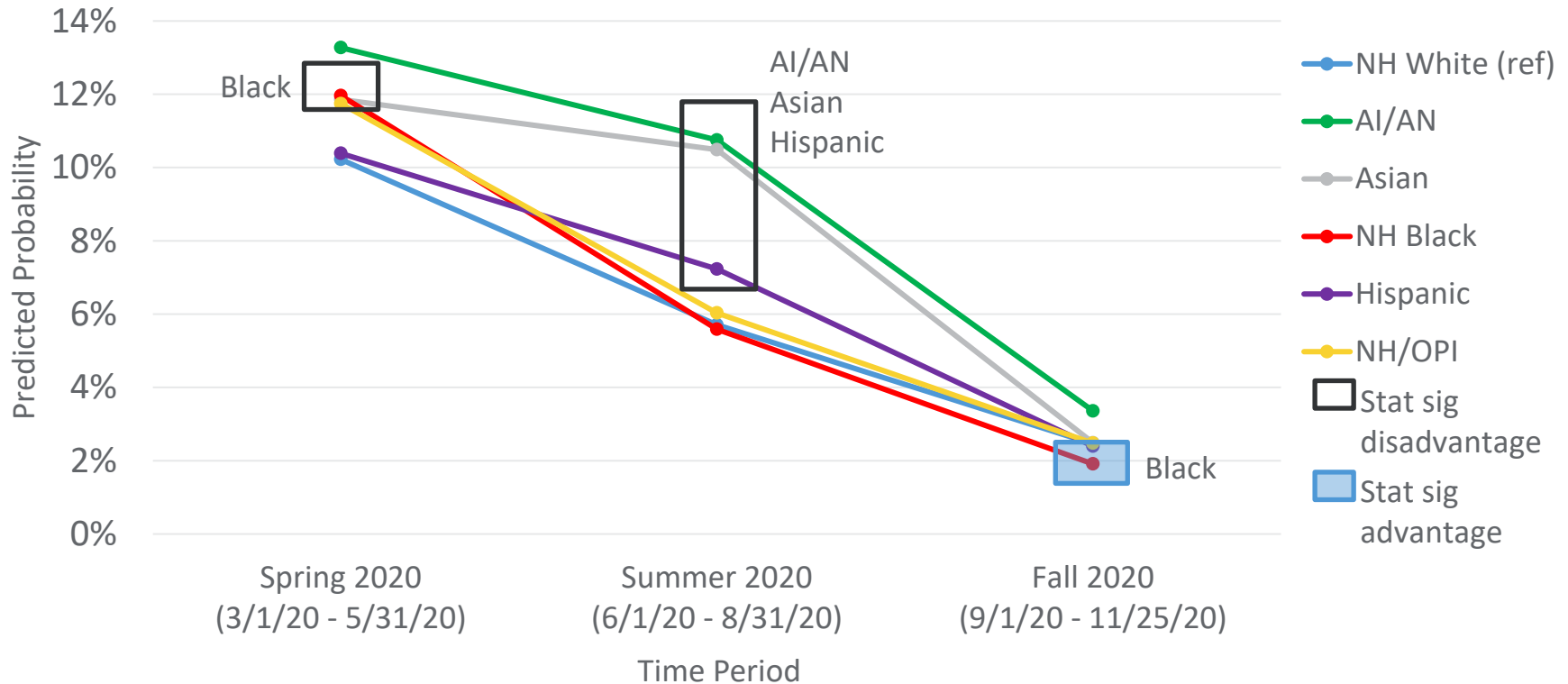
Model controlled for age, gender, CDC's risk factors for severe COVID-19  
 statistical significance at  $p < 0.05$





# COVID-19 Mortality Decreased for All Groups & Disparities Changed

Predicted probability of mortality over time by race/ethnicity among Veterans with COVID-19



Model controlled for age, gender, CDC's risk factors for severe COVID-19  
statistical significance at  $p < 0.05$





# Conclusions

- Patterns in infection and mortality disparities changed over time
- More racial/ethnic minoritized groups experienced disparities vs. non-Hispanic Whites **in the summer 2020**

## **Findings that differ from studies in other samples:**

- Asian mortality disparities in the summer
- Black advantage in the Fall



# Policy and Practice implications

How do **specific** changes affect disparities:

- Policy
- Public health guidance
- Other advances (e.g., vaccines)
- Natural experiments

*Risk mitigation efforts and advances help reduce risk in the entire population*



**BUT...**

*We must ensure they do not inadvertently widen gaps for historically marginalized groups*





# Limitations

- Limited generalizability to non-VA settings
- Did not consider geographic variation
- Did not account for social determinants of health
- AI/AN mortality may be overrepresented in our sample
  - VA's 4<sup>th</sup> mission to support Indian Health Service clinics





# What's Next?

- Continue to account for time as the pandemic continues to progress e.g., vaccines, new variants
- Also account for geographic variation

Perspectives | Expert Voices in Health & Health Care



NATIONAL ACADEMY OF MEDICINE

COMMENTARY

## Researchers Should Consider How Disparities Change Over Time and Space: Lessons from the COVID-19 Pandemic

**Michelle S. Wong, PhD**, VA Greater Los Angeles Healthcare System; **Donna L. Washington, MD, MPH, FACP**, VA Greater Los Angeles Healthcare System and University of California, Los Angeles, David Geffen School of Medicine; and **Ernest Moy, MD, MPH**, Department of Veterans Affairs

September 8, 2021



# Acknowledgement

## *Co-authors:*

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Donna L. Washington

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- VA Office of Health Equity (OHE) and VA Quality Enhancement Research Initiative (QUERI) (grant #PEC-15-239 to the OHE/QUERI National Partnered Evaluation Center)
- VA Health Services Research and Development (HSR&D grant #SDR-20-402)



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# Questions?

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# APPENDIX

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## Full sample characteristics

	Tested (n = 705,715)	Tested Positive (n = 83,542)
<i>Age, %</i>		
<60 years	39	43.7
60-64 years	11.7	10.1
65-69 years	12	10.2
70-74 years	19.4	17.1
75-79 years	9	8.3
80+ years	8.9	10.6
<i>Gender, %</i>		
Female	10.9	10.1
Male	89.1	89.9
<i>CDC Co-morbidities, %</i>		
Asthma	7.1	6.7
Chronic Kidney Disease	2	1.9
Chronic pulmonary disease	25	20.6
Types 2 Diabetes	33.5	35.6
Heart Disease	35.9	32.4
Immunocompromised	9.7	7.6
Liver Disease	10.5	8
Obesity	50.2	58
<i>Time Period of Visit, %</i>		
Spring (3/1/20 - 5/31/20)	8.1	13.5
Summer (6/1/20 - 8/31/20)	36.2	33.1
Fall (9/1/20 - 11/25/20)	55.7	53.4



# Adjusted odds ratios of COVID-19 infection by race/ethnicity over time

	Spring 3/1/20-5/31/20	Summer 6/1/20-8/31/20	Fall 9/1/20-11/25/20
<b>Non-Hispanic White</b>	1.00 (ref)	1.00 (ref)	1.00 (ref)
<b>AI/AN</b>	1.40 (0.90, 2.16)	1.56 (1.31, 1.85)*	1.33 (1.08, 1.64)*
<b>Asian</b>	1.15 (0.76, 1.74)	1.17 (0.89, 1.53)	0.65 (0.48, 0.89)**
<b>Non-Hispanic Black</b>	2.32 (1.95, 2.76)*	1.85 (1.66, 2.07)*	0.91 (0.81, 1.01)
<b>Hispanic</b>	1.37 (0.93, 2.02)	2.24 (1.51, 3.32)*	1.07 (0.86, 1.34)
<b>NH/OPI</b>	1.33 (0.93, 1.89)	1.35 (1.10, 1.66)*	1.04 (0.85, 1.27)

\* Statistically significant disadvantage vs. non-Hispanic White (ref)

\*\* Statistically significant advantage vs. non-Hispanic White (ref)





# Adjusted odds ratio of mortality among COVID-positive Veterans by race/ethnicity over time

	Spring 3/1/20-5/31/20	Summer 6/1/20-8/31/20	Fall 9/1/20-11/25/20
<b>Non-Hispanic White</b>	1.00 (ref)	1.00 (ref)	1.00 (ref)
<b>AI/AN</b>	1.41 (0.70, 2.82)	2.16 (1.17, 3.97)*	1.40 (0.70, 2.81)
<b>Asian</b>	1.21 (0.57, 2.58)	2.09 (1.09, 4.01)*	1.01 (0.25, 4.09)
<b>Non-Hispanic Black</b>	1.23 (1.04, 1.45)*	0.98 (0.84, 1.14)	0.77 (0.60, 0.98)**
<b>Hispanic</b>	1.03 (0.70, 1.49)	1.32 (1.06, 1.64)*	0.97 (0.69, 1.36)
<b>NH/OPI</b>	1.20 (0.41, 3.52)	1.07 (0.54, 2.09)	1.00 (0.46, 2.20)

\* Statistically significant disadvantage vs. non-Hispanic White (ref)

\*\* Statistically significant advantage vs. non-Hispanic White (ref)





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VA Greater Los Angeles Healthcare System



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Quality Enhancement Research Initiative  
National Partnered Evaluation Initiative



# Geographic and temporal variation in racial and ethnic disparities in SARS-CoV-2 positivity

Jacqueline Ferguson, PhD

Center for Innovation to Implementation (Ci2i)  
VA Palo Alto Healthcare System

VA HSR&D Cyberseminar  
Focus on Health Equity and Action  
January 12, 2022



VA



U.S. Department of Veterans Affairs  
Veterans Health Administration  
Health Services Research & Development Service

Views expressed are those of the authors and the contents do not represent the views of the U.S. Department of Veterans Affairs or the United States Government

# Evaluating Difference by Time

- Evidence has highlighted the vast disparities in SARS-CoV-2 infection and subsequent COVID-19 among persons who were Black, Hispanic or Latino, Native Hawaiian/Pacific Islander, American Indian/Alaska Native, or Asian.

International Journal of Environmental Research and Public Health

MDPI

Article

## Time Trends in Racial/Ethnic Differences in COVID-19 Infection and Mortality

Michelle S. Wong <sup>1,\*</sup>, Taona F. Haderlein <sup>1</sup>, Anita H. Yuan <sup>1</sup>, Ernest Moy <sup>2</sup>, Kenneth T. Jones <sup>2</sup> and Donna L. Washington <sup>1,3</sup>

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**Abstract:** Studies documenting coronavirus disease 2019 (COVID-19) racial/ethnic disparities in the United States were limited to data from the initial few months of the pandemic, did not account for changes over time, and focused primarily on Black and Hispanic minority groups. To fill these gaps, we examined time trends in racial/ethnic disparities in COVID-19 infection and mortality. We used the Veterans Health Administration's (VHA) national database of veteran COVID-19 infections over three time periods: 3/1/2020-5/31/2020 (spring); 6/1/2020-8/31/2020 (summer); and 9/1/2020-11/25/2020 (fall). We calculated COVID-19 infection and mortality predicted probabilities from logistic regression models that included time period-by-race/ethnicity interaction terms, and controlled for age, gender, and prior diagnosis of CDC risk factors. Racial/ethnic groups at higher risk for COVID-19 infection and mortality changed over time. American Indian/Alaskan Natives (AI/AN), Blacks, Hispanics, and Native Hawaiians/Other Pacific Islanders experienced higher COVID-19 infections compared to Whites during the summertime. There were mortality disparities for Blacks in springtime, and AI/ANs, Asians, and Hispanics in summertime. Policy makers should consider the dynamic nature of racial/ethnic disparities as the pandemic evolves, and potential effects of risk mitigation and other (e.g., economic) policies on these disparities. Researchers should consider how trends in disparities change over time in other samples.

**Keywords:** veterans; COVID-19; racial/ethnic disparities

Citation: Wong, M.S.; Haderlein, T.F.; Yuan, A.H.; Moy, E.; Jones, K.T.; Washington, D.L. Time Trends in Racial/Ethnic Differences in COVID-19 Infection and Mortality. *Int. J. Environ. Res. Public Health* **2021**, *18*, 4648. <https://doi.org/10.3390/ijerph1804648>

Academic Editors: Paul B. Tchicaya, Kathi C. Nierus, Arden F. Benson and Richard J. Thorpe

Research

## Differences in COVID-19 Testing and Test Positivity Among Veterans, United States, 2020

Jacqueline M. Ferguson, PhD <sup>1,2</sup>; Hoda S. Abdel Magid, PhD <sup>1,3,4</sup>; Amanda L. Purnell, PhD <sup>5</sup>; Mathew V. Kiang, ScD <sup>1,2,6</sup>; and Thomas F. Osborne, MD <sup>1,7</sup>

**Abstract**

**Objective:** COVID-19 disproportionately affects racial/ethnic minority groups in the United States. We evaluated characteristics associated with obtaining a COVID-19 test from the Veterans Health Administration (VHA) and receiving a positive test result for COVID-19.

**Methods:** We conducted a retrospective cohort analysis of 6 292 800 veterans in VHA care at 130 VHA medical facilities. We assessed the number of tests for SARS-CoV-2 administered by the VHA (n = 822 934) and the number of positive test results (n = 82 094) from February 8 through December 28, 2020. We evaluated associations of COVID-19 testing and test positivity with demographic characteristics of veterans, adjusting for facility characteristics, comorbidities, and county-level area-based socioeconomic measures using nested generalized linear models.

**Results:** In fully adjusted models, veterans who were female, Black/African American, Hispanic/Latino, urban, and low income had a disability had an increased likelihood of obtaining a COVID-19 test, and veterans who were Asian had a decreased likelihood of obtaining a COVID-19 test. Compared with veterans who were White, veterans who were Black/African American (risk ratio [RR] = 1.23; 95% CI, 1.19-1.27) and Native Hawaiian/Other Pacific Islander (RR = 1.13; 95% CI, 1.05-1.21) had an increased likelihood of receiving a positive test result. Hispanic/Latino veterans had a 43% higher likelihood of receiving a positive test result than non-Hispanic/Latino veterans did.

**Conclusions:** Although veterans have access to subsidized health care at the VHA, the increased risk of receiving a positive test result for COVID-19 among Black and Hispanic/Latino veterans, despite receiving more tests than White and non-Hispanic/Latino veterans, suggests that other factors (eg, social inequities) are driving disparities in COVID-19 prevalence.

PLOS MEDICINE

RESEARCH ARTICLE

## Patterns of COVID-19 testing and mortality by race and ethnicity among United States veterans: A nationwide cohort study

Christopher T. Rentsch <sup>1,2\*</sup>, Farah Kidwai-Khan <sup>1,2\*</sup>, Janet P. Tate <sup>3,4\*</sup>, Lesley S. Park <sup>5,6\*</sup>, Joseph T. King Jr. <sup>1,3,4\*</sup>, Melissa Skanderson <sup>1\*</sup>, Ronald G. Hauser <sup>1,4\*</sup>, Anna Schultze <sup>7\*</sup>, Christopher I. Jarvis <sup>8\*</sup>, Mark Holodny <sup>9,10\*</sup>, Vincent Lo Re III <sup>9,10\*</sup>, Kathleen M. Akçgin <sup>11\*</sup>, Kristina Grothues <sup>11,12\*</sup>, Tamar H. Taddei <sup>13\*</sup>, Matthew S. Freiberg <sup>13,14\*</sup>, Amy C. Justice <sup>1,15\*</sup>

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\* These authors contributed equally to this work.

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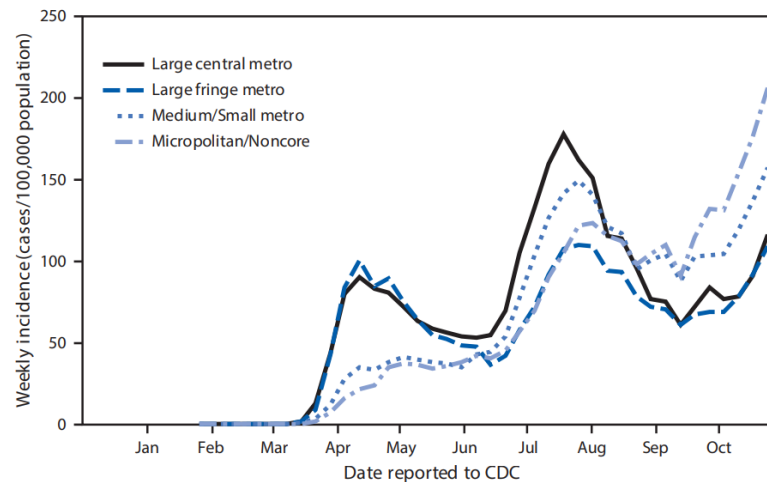
**Citation:** Rentsch CT, Kidwai-Khan F, Tate JP, King JT, Jr, Skanderson M, et al. (2020) Patterns of COVID-19 testing and mortality by race and ethnicity among United States veterans: A nationwide cohort study. *PLoS Med* 17(9): e1003379. <https://doi.org/10.1371/journal.pmed.1003379>

**Academic Editor:** Jonathan Ziller, University of Michigan School of Public Health, UNITED STATES

# Evaluating Difference by Time and Space

- Evidence has highlighted the vast disparities in SARS-CoV-2 infection and subsequent COVID-19 among persons who were Black, Hispanic or Latino, Native Hawaiian/Pacific Islander, American Indian/Alaska Native, or Asian.

COVID-19 Incidence,\* by Urban-Rural Classification<sup>†</sup> — United States, January 22–October 31, 2020<sup>§</sup>



Duca, L. M., Coyle, J., McCabe, C. & McLean, C. COVID-19 Stats: COVID-19 Incidence, by Urban-Rural Classification — United States, January 22–October 31, 2020. *Morb. Mortal. Wkly. Rep.* **69**, 2020 (2020).

**Motivation:** Prior work showed a decrease in disparities of testing positive over time

**Objective:** Evaluate changes in disparities for testing SARS-CoV-2 positive over the first 18 months of the pandemic and by geographic region among Veterans at VA

Collaboration between Drs. Christopher Rentsch, Jacqueline Ferguson, Amy Justice, Thomas Osborne, Hoda S. Abdel Magid, and Amanda Purnell

## Methods:

- Retrospective cohort analysis of all Veterans tested for SARS-CoV-2 in VA medical facilities between February 12, 2020 and August 16, 2021
  - 1,313,402 Veterans
- Searched for laboratory test results in electronic health records at VA using text searching algorithm. Excluded antibody tests



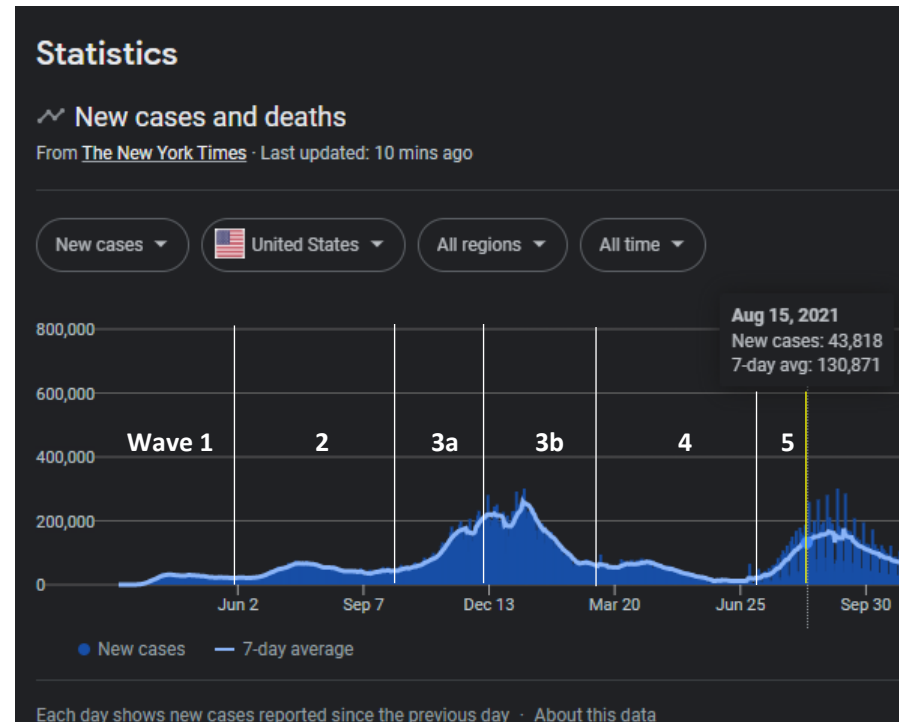
# Methods:

- We estimated the odds of testing positive for SARS-CoV-2 for Black, Hispanic or Latino (Hispanic), Asian, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, and people of mixed race (Mixed), relative to White individuals.
- Models adjusted for personal characteristics (sex, age, rural/urban residence) and a wide range of clinical characteristics (baseline comorbidities: asthma, cancer, chronic kidney disease, chronic obstructive pulmonary disease, diabetes mellitus, hypertension, liver disease, vascular disease), substance use (alcohol consumption, alcohol use disorder, smoking status), medication history (angiotensin converting enzyme inhibitor, angiotensin II receptor blocker). Models were additionally conditioned on VA site of care.



# Methods:

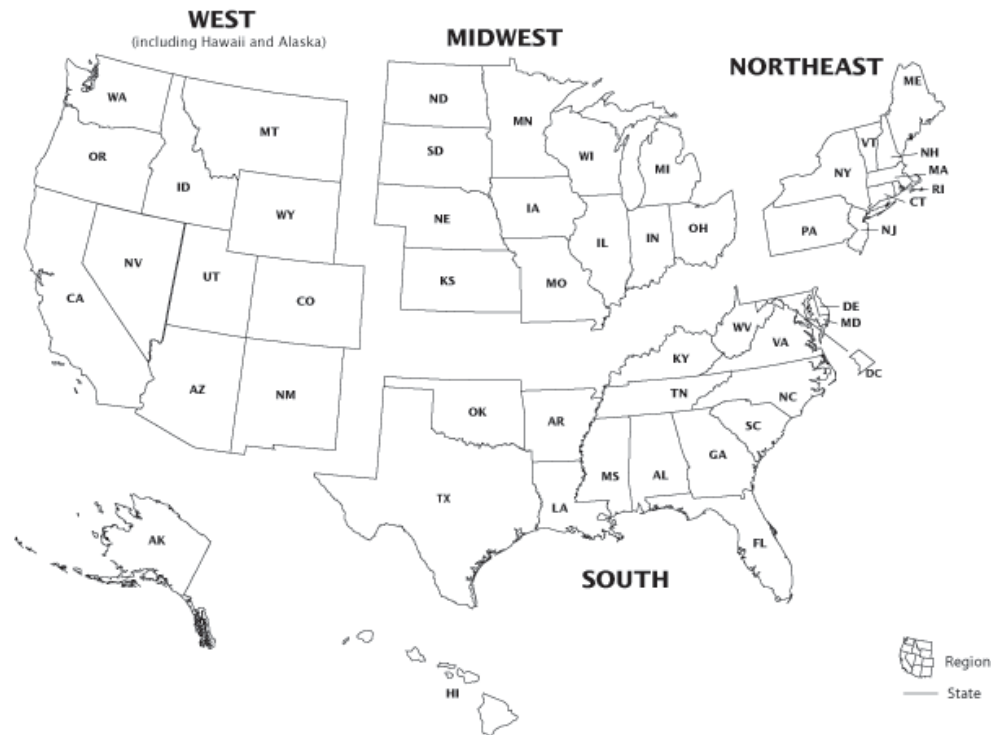
- Stratified into five waves based on the temporal distribution of SARS-CoV-2 cases nationally:
  - February 12 – May 31, 2020 (wave 1)
  - June 1 – September 30, 2020 (wave 2)
  - October 1, 2020 – February 28, 2021 (wave 3)
  - March 1, 2021- June 30, 2021 (wave 4)
  - July 1, 2021- August 16, 2021 (wave 5)
- Due to the large size of the third national wave, we split this period into two waves containing roughly equal numbers of SARS-CoV-2 cases
  - October 1 – December 11, 2020 (wave 3a)
  - December 12, 2020 – February 28, 2021 (wave 3b).





# Methods:

To evaluate regional differences by time, models were further stratified by US Census region



**Table 1.** Characteristics of all individuals tested and tested positive for SARS-CoV-2 between February 12, 2020 and August 16, 2021 in the US Department of Veterans Affairs (VA).

	No. tested	No. tested positive	(row%)
Sample size	1,313,402	144,597	(11.0)
<b>Race/ethnicity</b>			
White	846,678	86,164	(10.2)
Black	304,893	37,159	(12.2)
Hispanic	115,012	16,219	(14.1)
Asian	15,422	1519	(9.8)
American Indian/Alaska native	9120	1096	(12.0)
Native Hawaiian/Pacific islander	10,008	1125	(11.2)
Mixed	12,269	1315	(10.7)
<b>Age, years</b>			
20–39	164,579	23,934	(14.5)
40–49	130,658	18,011	(13.8)
50–59	220,712	27,046	(12.3)
60–69	315,548	30,730	(9.7)
70–79	374,750	34,022	(9.1)
≥ 80	107,155	10,854	(10.1)
<b>Sex</b>			
Female	143,523	15,369	(10.7)
Male	1,169,879	129,228	(11.0)
<b>Region</b>			
West	262,898	32,441	(12.3)
South	159,668	15,324	(9.6)
Northeast	598,551	67,287	(11.2)
Midwest	292,285	29,545	(10.1)

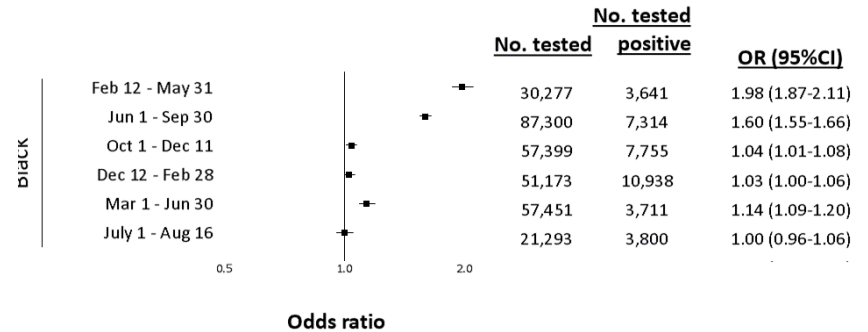
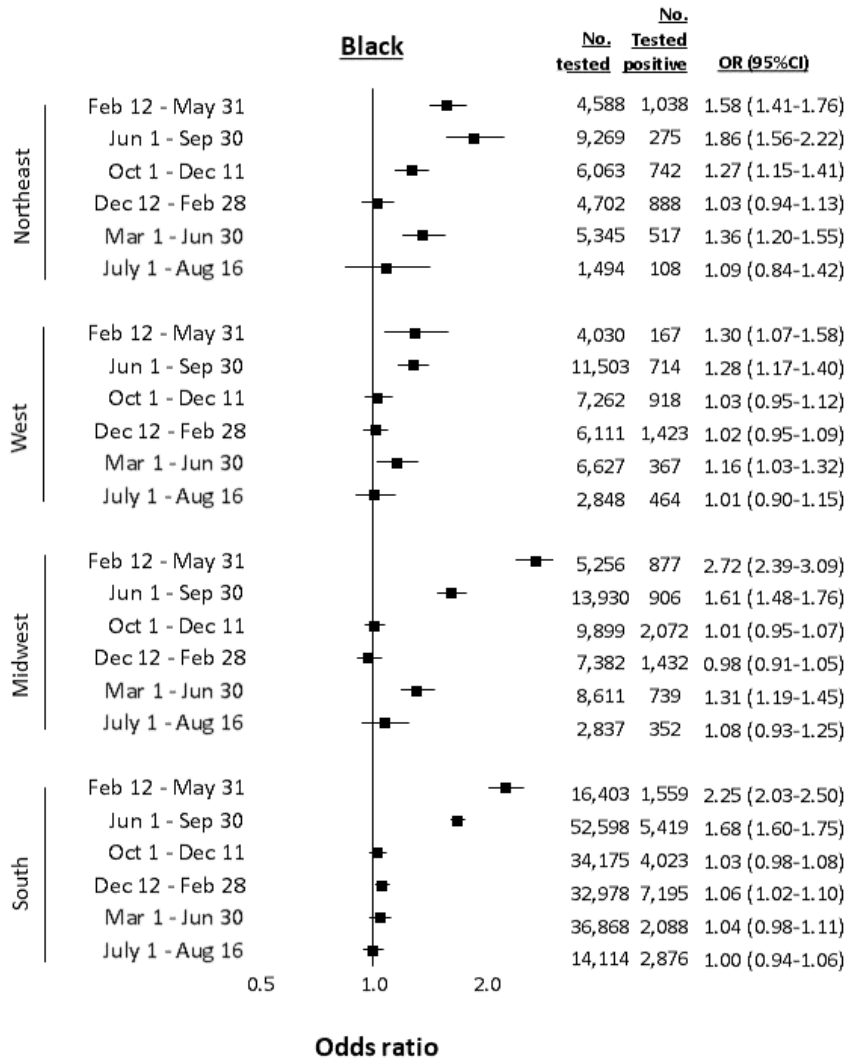
- Similar to population of all Veterans who are active in VA healthcare
- All non-White groups had a higher crude prevalence of SARS-CoV-2 positivity than White individuals
- Veterans who were younger or male had a higher crude prevalence than older or female Veterans.
- West had the highest crude prevalence and the South the lowest

Adjusted racial and ethnic disparities in testing positive for SARS-CoV-2 between February 12, 2020 and August 16, 2021, by wave of the pandemic in the US Department of Veterans Affairs (VA)

**Wave 1:**  
**February 12- May 31, 2020**

Odds Ratio

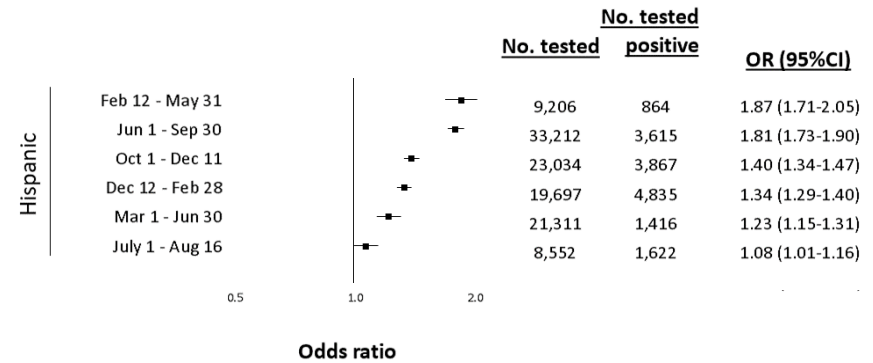
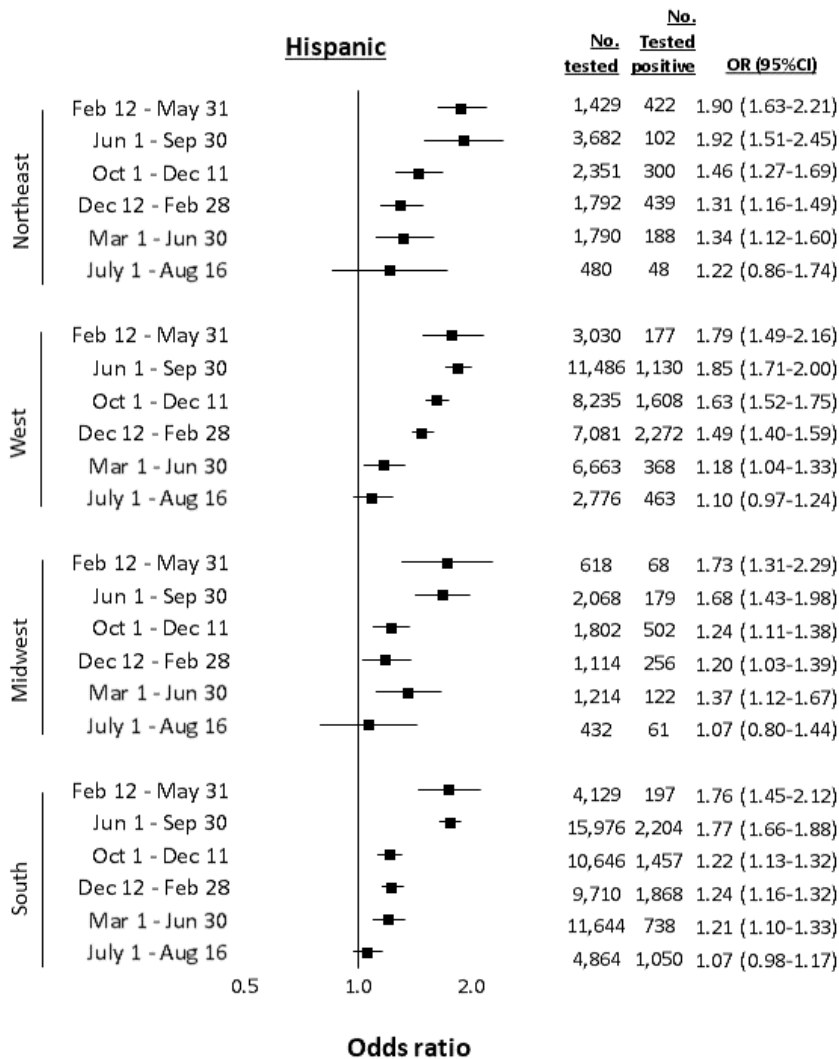
Note: Referent group for all comparisons is White



Adjusted odds ratios for testing positive for SARS-CoV-2 between February 12, 2020 and August 16, 2021 by wave of the pandemic

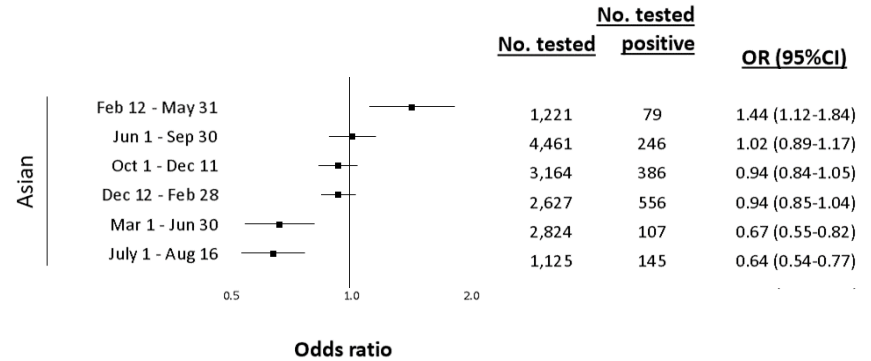
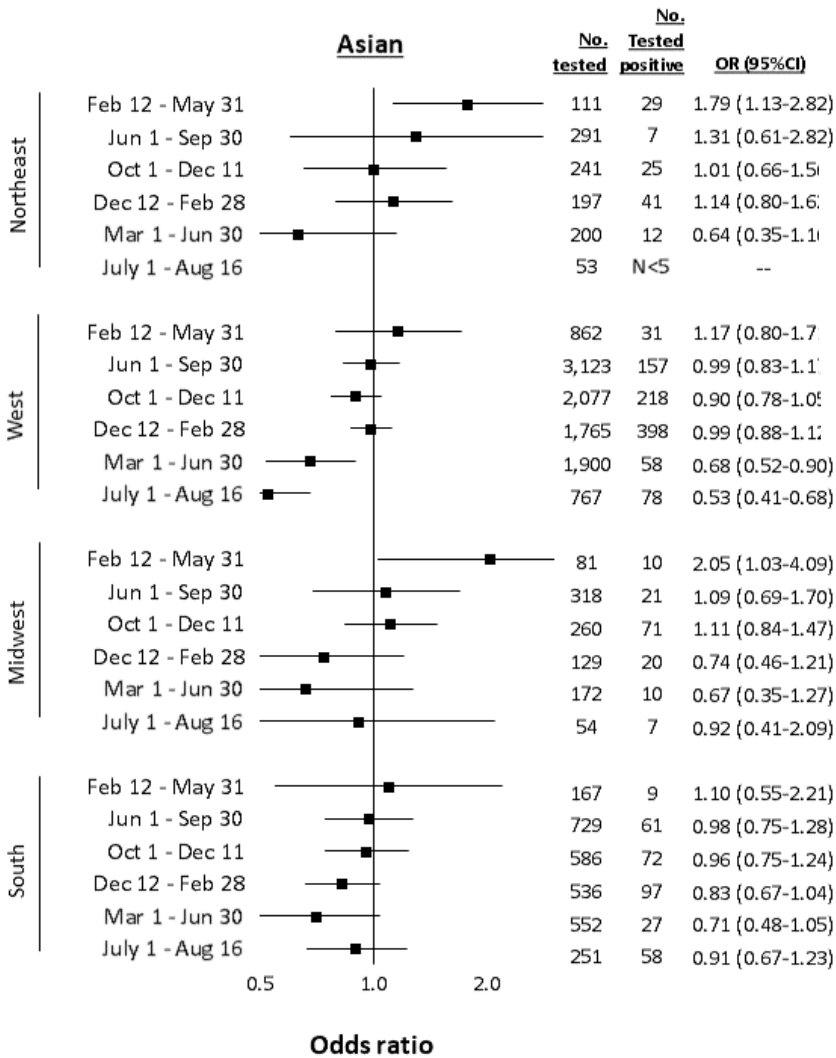
Black Veterans compared to White Veterans

Ferguson, J. M., Justice, A. C., Osborne, T. F., Magid, H. S. A., Purnell, A. L., & Rentsch, C. T. (2022). Geographic and temporal variation in racial and ethnic disparities in SARS-CoV-2 positivity between February 2020 and August 2021 in the United States. *Scientific Reports*, 12(1), 1-8.



Adjusted odds ratios for testing positive for SARS-CoV-2 between February 12, 2020 and August 16, 2021 by wave of the pandemic  
 Hispanic Veterans compared to White Veterans

Ferguson, J. M., Justice, A. C., Osborne, T. F., Magid, H. S. A., Purnell, A. L., & Rentsch, C. T. (2022). Geographic and temporal variation in racial and ethnic disparities in SARS-CoV-2 positivity between February 2020 and August 2021 in the United States. *Scientific Reports*, 12(1), 1-8.



Adjusted odds ratios for testing positive for SARS-CoV-2 between February 12, 2020 and August 16, 2021 by wave of the pandemic

Asian Veterans compared to White Veterans

Ferguson, J. M., Justice, A. C., Osborne, T. F., Magid, H. S. A., Purnell, A. L., & Rentsch, C. T. (2022). Geographic and temporal variation in racial and ethnic disparities in SARS-CoV-2 positivity between February 2020 and August 2021 in the United States. *Scientific Reports*, 12(1), 1-8.

### American Indian/Alaska Native

	No. tested	No. Tested positive	OR (95%CI)
--	------------	---------------------	------------

Region	Wave	No. tested	No. Tested positive	OR (95%CI)
Northeast	Feb 12 - May 31	60	9	1.53 (0.71-3.29)
	Jun 1 - Sep 30	142	N<5	--
	Oct 1 - Dec 11	129	20	1.52 (0.92-2.49)
	Dec 12 - Feb 28	82	13	0.80 (0.44-1.45)
	Mar 1 - Jun 30	108	8	1.16 (0.56-2.41)
July 1 - Aug 16	34	N<5	--	

Region	Wave	No. tested	No. Tested positive	OR (95%CI)
West	Feb 12 - May 31	328	18	2.23 (1.36-3.66)
	Jun 1 - Sep 30	1,056	76	1.60 (1.26-2.04)
	Oct 1 - Dec 11	657	109	1.28 (1.03-1.58)
	Dec 12 - Feb 28	546	135	1.29 (1.05-1.58)
	Mar 1 - Jun 30	645	45	1.53 (1.12-2.10)
July 1 - Aug 16	224	30	1.06 (0.71-1.58)	

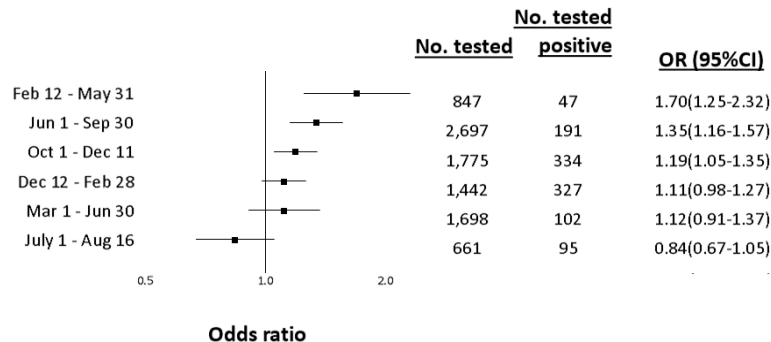
Region	Wave	No. tested	No. Tested positive	OR (95%CI)
Midwest	Feb 12 - May 31	158	10	1.93 (0.99-3.73)
	Jun 1 - Sep 30	480	22	0.86 (0.56-1.32)
	Oct 1 - Dec 11	333	85	0.98 (0.76-1.27)
	Dec 12 - Feb 28	239	37	0.79 (0.55-1.13)
	Mar 1 - Jun 30	299	17	0.82 (0.50-1.34)
July 1 - Aug 16	117	11	0.69 (0.36-1.31)	

Region	Wave	No. tested	No. Tested positive	OR (95%CI)
South	Feb 12 - May 31	301	10	1.09 (0.57-2.09)
	Jun 1 - Sep 30	1,019	90	1.34 (1.07-1.67)
	Oct 1 - Dec 11	656	120	1.25 (1.01-1.54)
	Dec 12 - Feb 28	575	142	1.15 (0.94-1.40)
	Mar 1 - Jun 30	646	32	0.92 (0.64-1.32)
July 1 - Aug 16	286	53	0.79 (0.58-1.08)	

0.3 0.5 1.0 2.0 4.0

Odds ratio

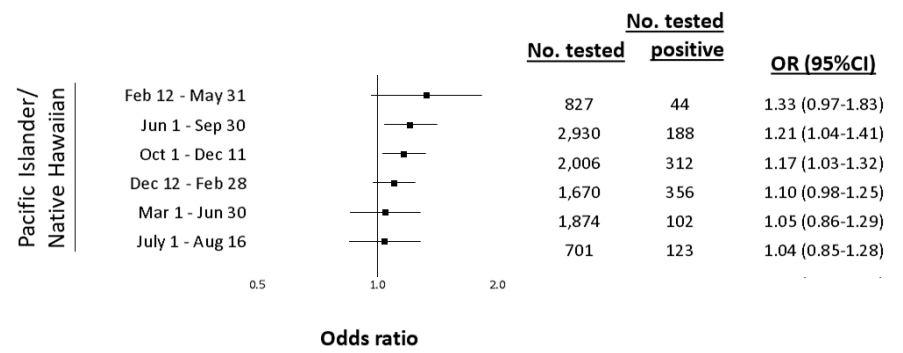
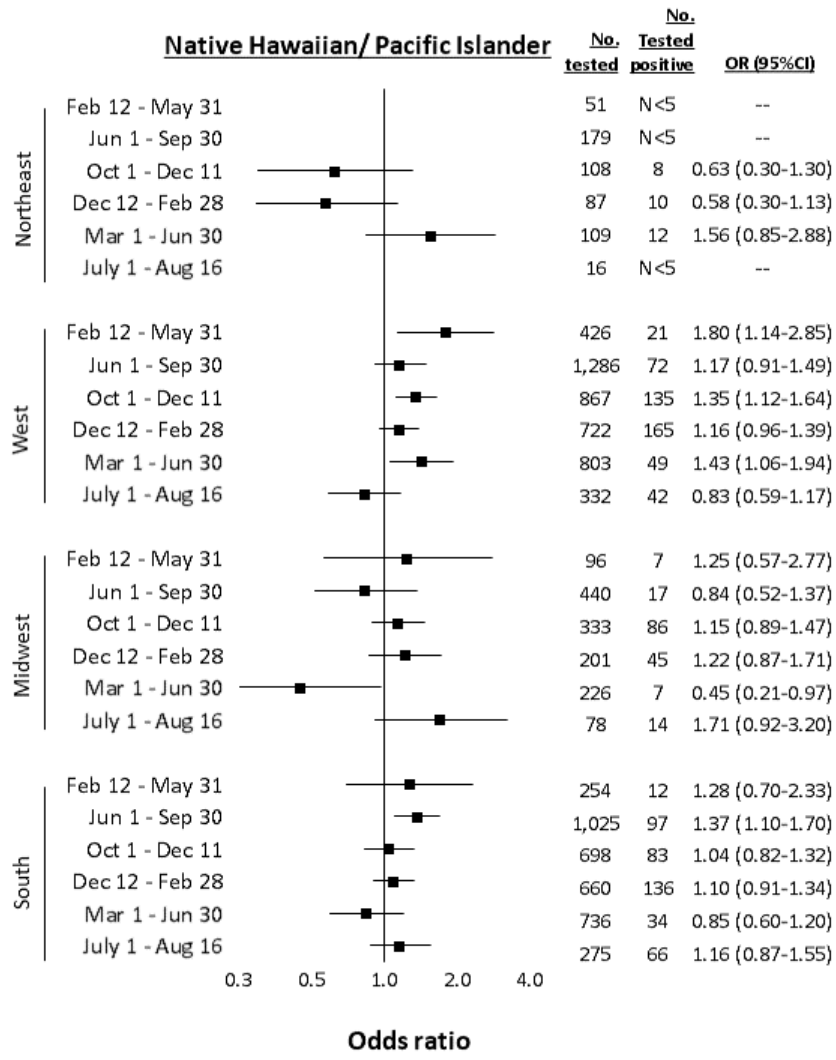
American Indian/  
Alaska Native



Adjusted odds ratios for testing positive for SARS-CoV-2 between February 12, 2020 and August 16, 2021 by wave of the pandemic

American Indian/Alaska Native Veterans compared to White Veterans

Ferguson, J. M., Justice, A. C., Osborne, T. F., Magid, H. S. A., Purnell, A. L., & Rentsch, C. T. (2022). Geographic and temporal variation in racial and ethnic disparities in SARS-CoV-2 positivity between February 2020 and August 2021 in the United States. *Scientific Reports*, 12(1), 1-8.

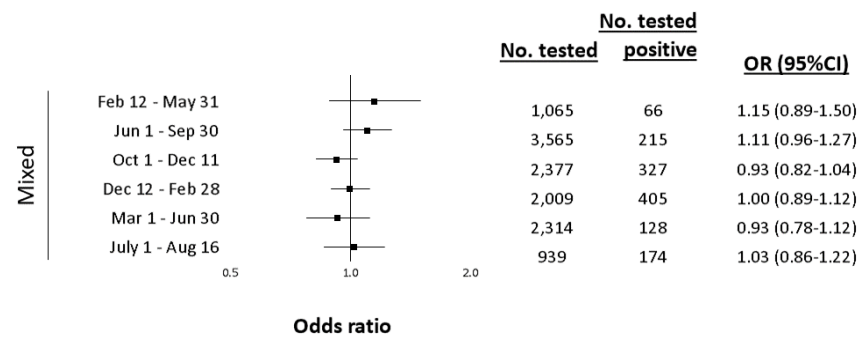
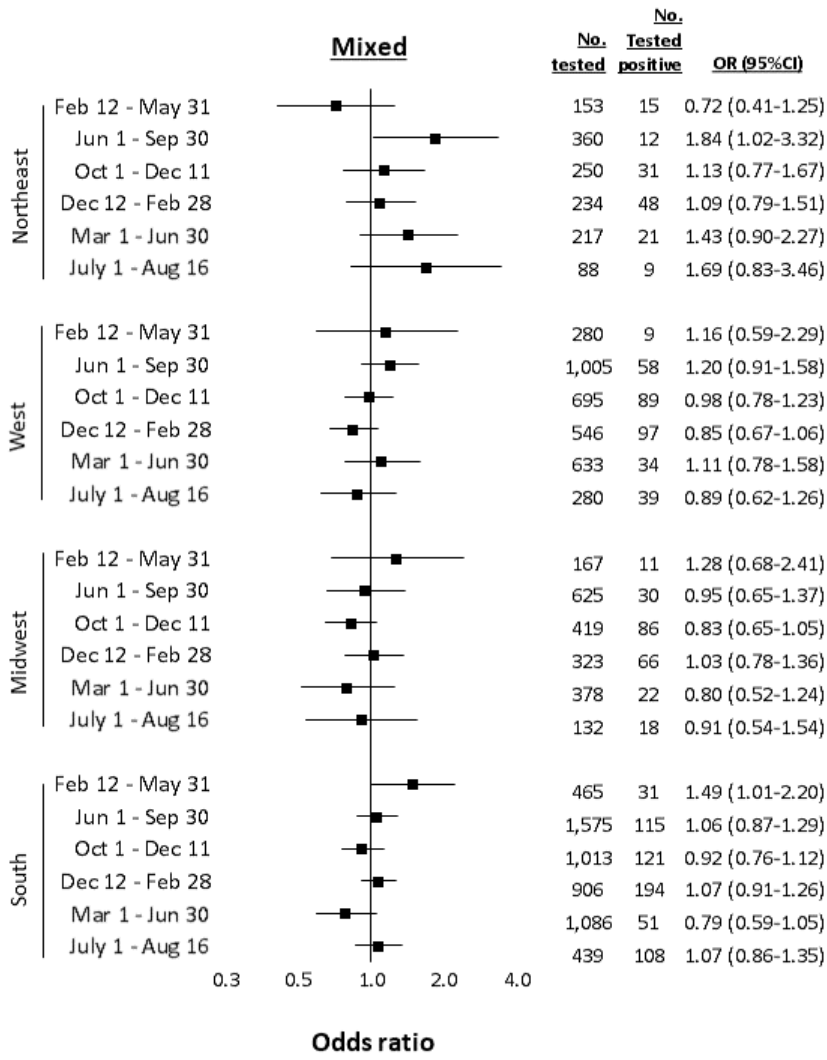


Adjusted odds ratios for testing positive for SARS-CoV-2 between February 12, 2020 and August 16, 2021 by wave of the pandemic

Native Hawaiian/Pacific Islander Veterans compared to White Veterans

Ferguson, J. M., Justice, A. C., Osborne, T. F., Magid, H. S. A., Purnell, A. L., & Rentsch, C. T. (2022). Geographic and temporal variation in racial and ethnic disparities in SARS-CoV-2 positivity between February 2020 and August 2021 in the United States. *Scientific Reports*, 12(1), 1-8.





Adjusted odds ratios for testing positive for SARS-CoV-2 between February 12, 2020 and August 16, 2021 by wave of the pandemic

Mixed race Veterans compared to White Veterans

Ferguson, J. M., Justice, A. C., Osborne, T. F., Magid, H. S. A., Purnell, A. L., & Rentsch, C. T. (2022). Geographic and temporal variation in racial and ethnic disparities in SARS-CoV-2 positivity between February 2020 and August 2021 in the United States. *Scientific Reports*, 12(1), 1-8.

# Conclusions

- Disparities were most pronounced at the beginning of the pandemic and decreased over time
- Disparities for testing positive were attenuated but remained elevated for Hispanic individuals
  - observed across all geographic regions between February 2020 and June 2021 and persisted after September 2020 most strongly in the West
  - Deeper understanding of this mechanism is needed
    - Possibly due to overrepresentation in essential and front-line jobs with higher exposure and precarious employment
- Asian Veterans had a lower odds of testing positive than White individuals between March and August 2021
  - Higher rates of vaccination among Asian Veterans than White Veterans
  - Differential barriers to care/lower likelihood of utilizing VA services- including getting tested
  - Disparities may be reduced due to increasing incidence among reference group (White individuals) but this does not imply overall cumulative burden of COVID-19 may be equal

# Limitations

- Only SARS-CoV-2 tests administered at VA
- Lack of information on social determinants of health and occupational exposures
- SARS-CoV-2 test availability varies by local case load, facility supply, and local policy for testing criteria

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## Collaborators

Amy Justice, Thomas Osborne, Hoda Abdel Magid, Amanda Purnell, Christopher Rentsch

## Ethics

This study AQ1 was approved by the institutional review boards of VA Connecticut Healthcare System (VA AJO013) and Yale University (1506016006). It has been granted a waiver of informed consent and is Health Insurance Portability and Accountability Act compliant.

## Disclaimer

Views expressed are those of the authors and the contents of this article do not represent the views of the US Department of Veterans Affairs or the United States Government.

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# Geographic and temporal variation in racial and ethnic disparities in SARS-CoV-2 positivity between February 2020 and August 2021 in the United States

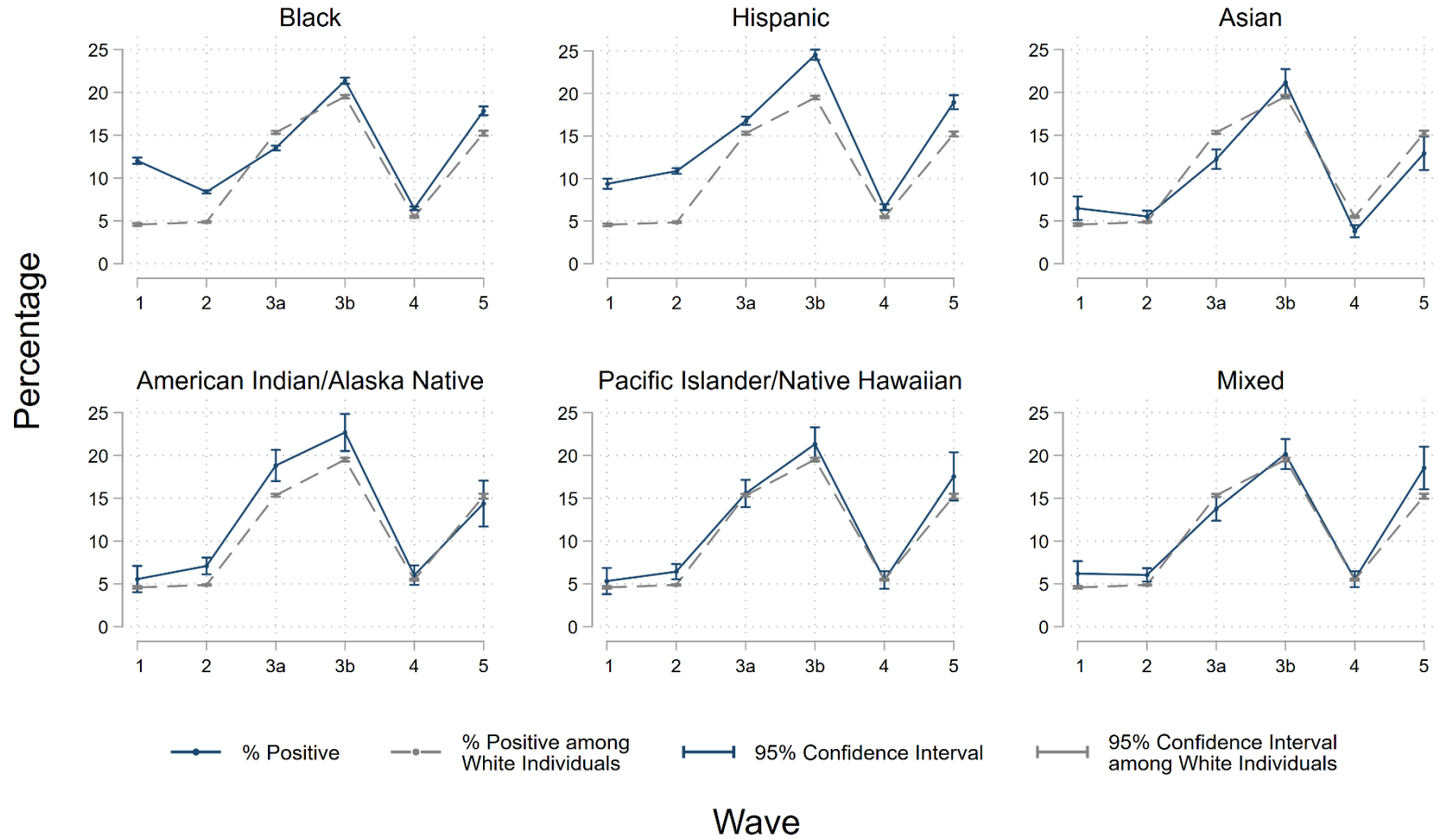
Jacqueline M. Ferguson<sup>1,2</sup>✉, Amy C. Justice<sup>3,4,5</sup>, Thomas F. Osborne<sup>1,6</sup>, Hoda S. Abdel Magid<sup>1,7,8</sup>, Amanda L. Purnell<sup>9</sup> & Christopher T. Rentsch<sup>3,5,10</sup>

The coronavirus pandemic has disproportionately impacted racial and ethnic minority communities in the United States. Patterns of these disparities may be changing over time as outbreaks occur in different communities. Utilizing electronic health record data from the US Department of Veterans Affairs (VA), we estimated odds ratios, stratified by time period and region, for testing positive among 1,313,402 individuals tested for SARS-CoV-2 between February 12, 2020 and August 16, 2021 at VA medical facilities. We adjusted for personal characteristics (sex, age, rural/urban residence, VA facility) and a wide range of clinical characteristics that have been evaluated in prior SARS-CoV-2 reports and could potentially explain racial/ethnic disparities in SARS-CoV-2. Our study found racial and ethnic disparities for testing positive were most pronounced at the beginning of the pandemic and decreased over time. A key finding was that the disparity among Hispanic individuals attenuated but remained elevated, while disparities among Asian individuals reversed by March 1, 2021. The variation in racial and ethnic disparities in SARS-CoV-2 positivity by time and region, independent of underlying health status and other demographic characteristics in a nationwide cohort, provides important insight for strategies to prevent further outbreaks.

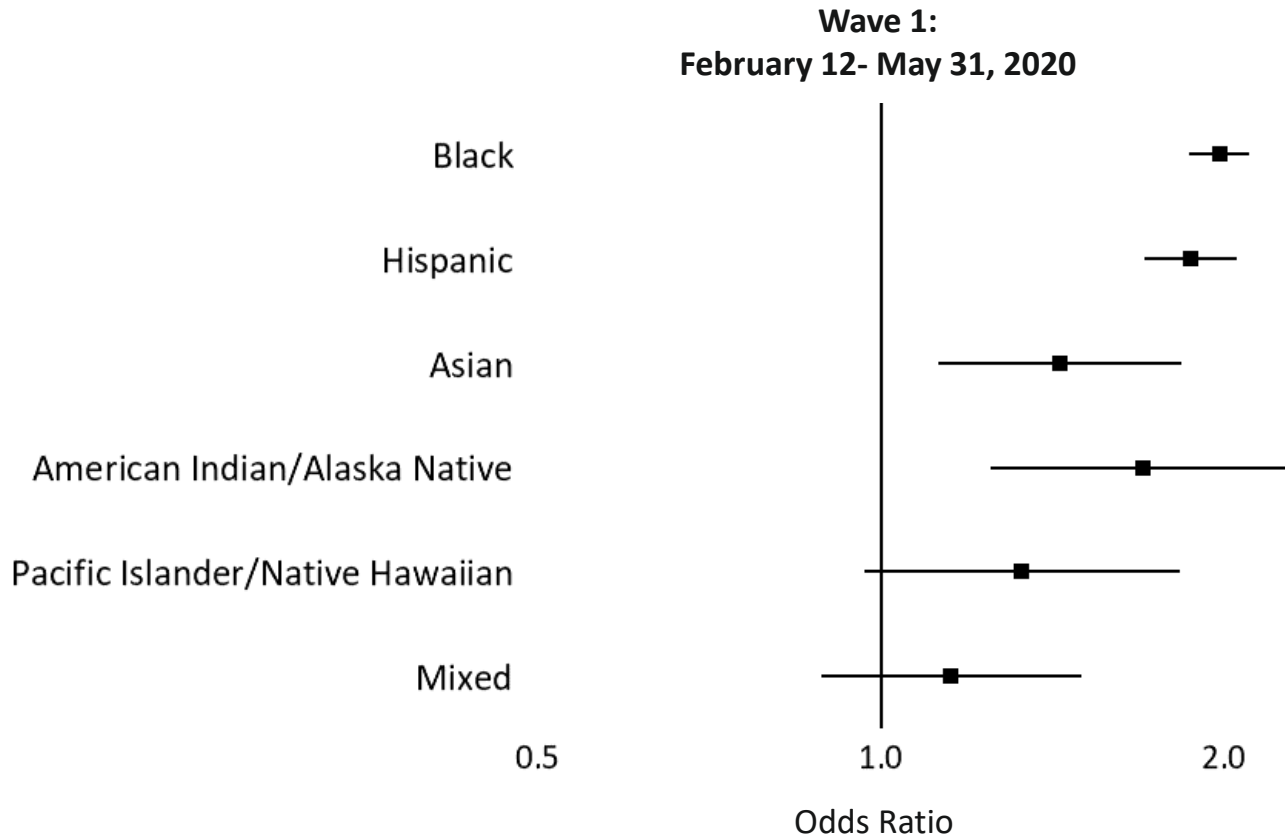
<https://www.nature.com/articles/s41598-021-03967-5>

# Supplemental Slides

## SARS-CoV-2 Test Positivity Percentage by Wave Between February 12, 2020 and August 16, 2021

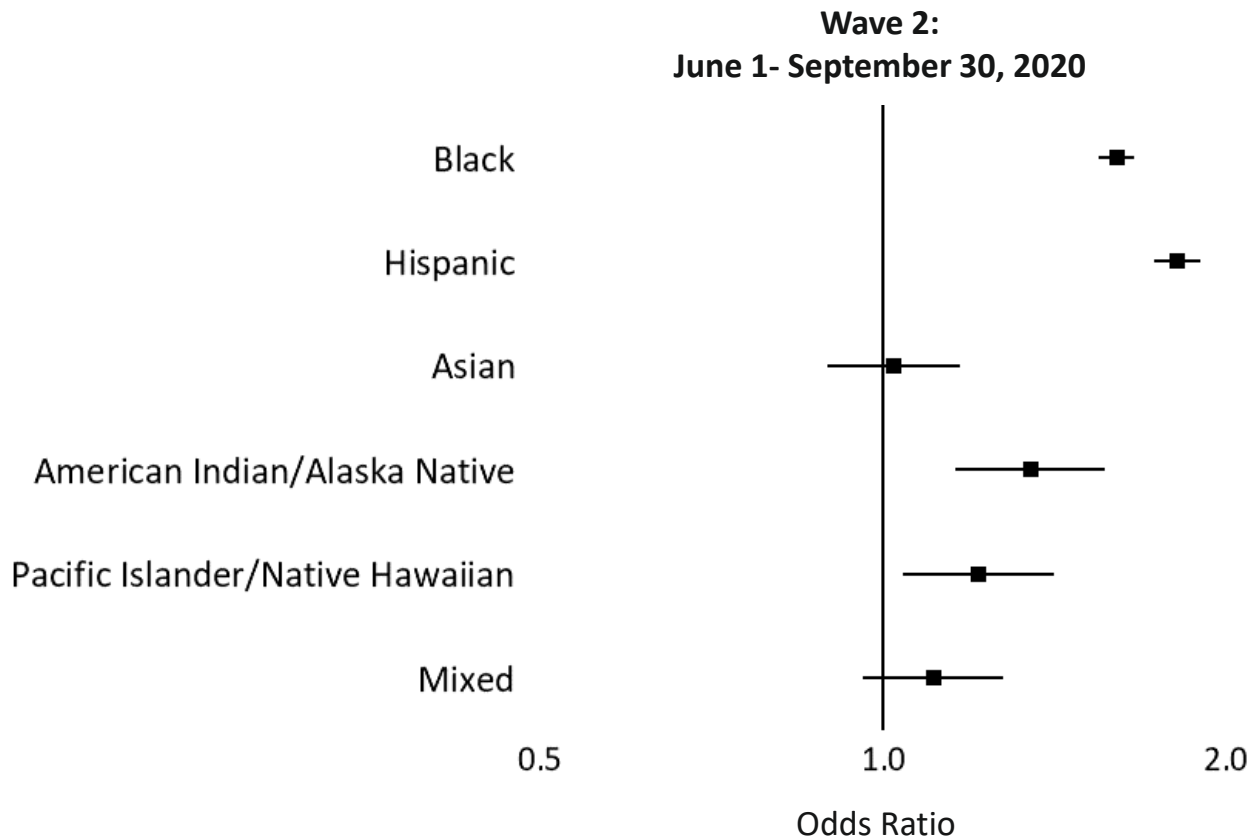


Adjusted racial and ethnic disparities in testing positive for SARS-CoV-2 between February 12, 2020 and August 16, 2021, by wave of the pandemic in the US Department of Veterans Affairs (VA)



Ferguson, J. M., Justice, A. C., Osborne, T. F., Magid, H. S. A., Purnell, A. L., & Rentsch, C. T. (2022). Geographic and temporal variation in racial and ethnic disparities in SARS-CoV-2 positivity between February 2020 and August 2021 in the United States. *Scientific Reports*, 12(1), 1-8.

Adjusted racial and ethnic disparities in testing positive for SARS-CoV-2 between February 12, 2020 and August 16, 2021, by wave of the pandemic in the US Department of Veterans Affairs (VA)

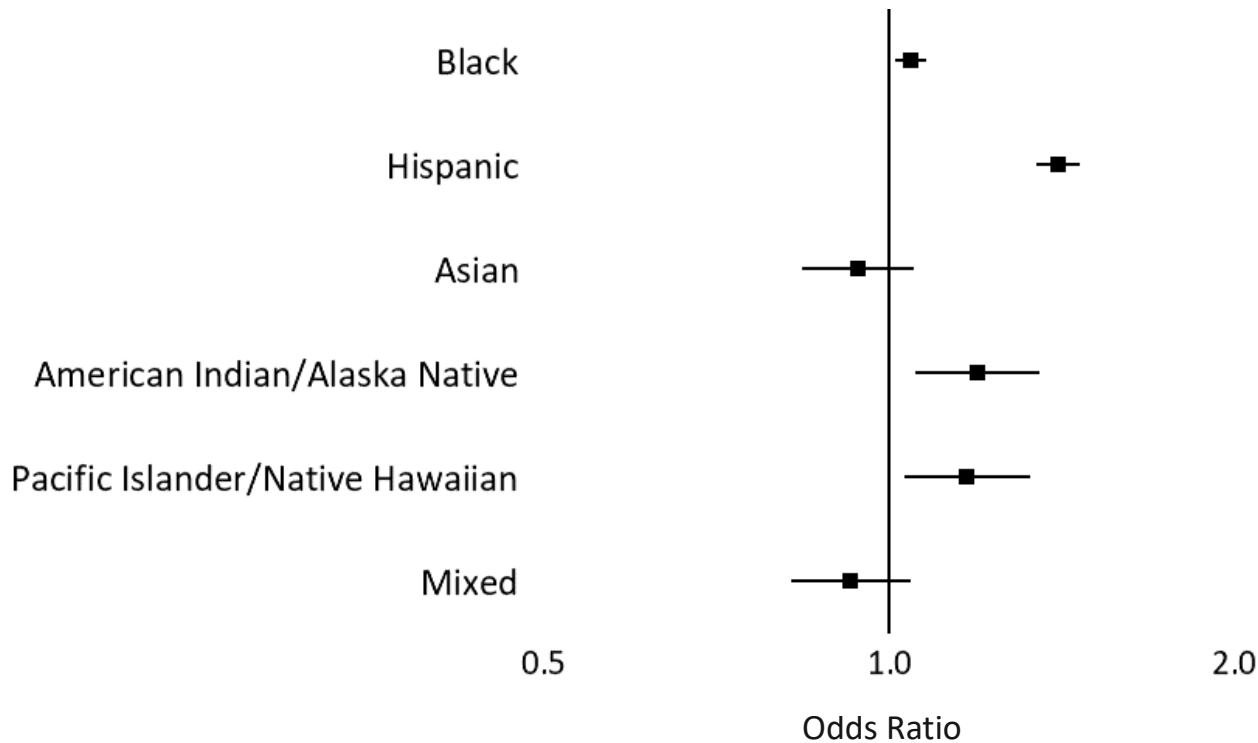


Ferguson, J. M., Justice, A. C., Osborne, T. F., Magid, H. S. A., Purnell, A. L., & Rentsch, C. T. (2022). Geographic and temporal variation in racial and ethnic disparities in SARS-CoV-2 positivity between February 2020 and August 2021 in the United States. *Scientific Reports*, 12(1), 1-8.



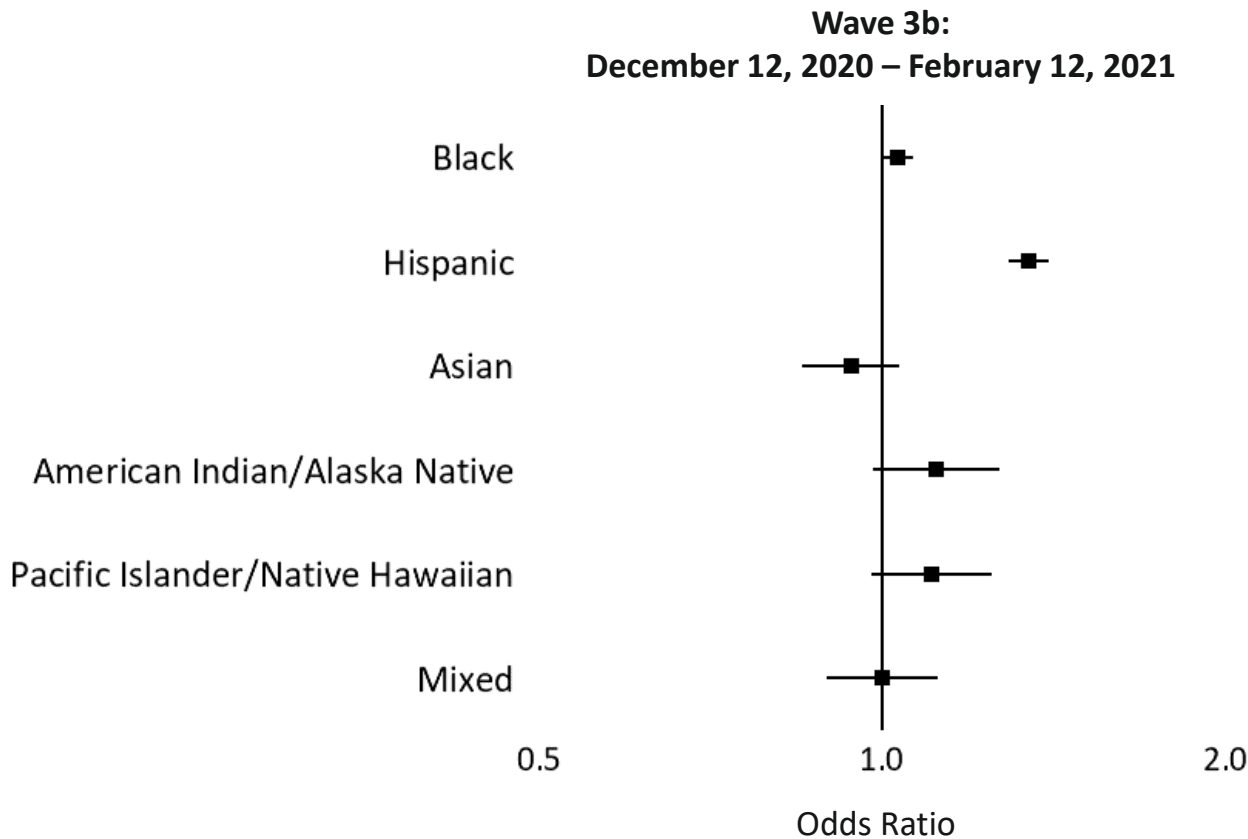
Adjusted racial and ethnic disparities in testing positive for SARS-CoV-2 between February 12, 2020 and August 16, 2021, by wave of the pandemic in the US Department of Veterans Affairs (VA)

Wave 3a:  
October 1- December 11, 2020



Ferguson, J. M., Justice, A. C., Osborne, T. F., Magid, H. S. A., Purnell, A. L., & Rentsch, C. T. (2022). Geographic and temporal variation in racial and ethnic disparities in SARS-CoV-2 positivity between February 2020 and August 2021 in the United States. *Scientific Reports*, 12(1), 1-8.

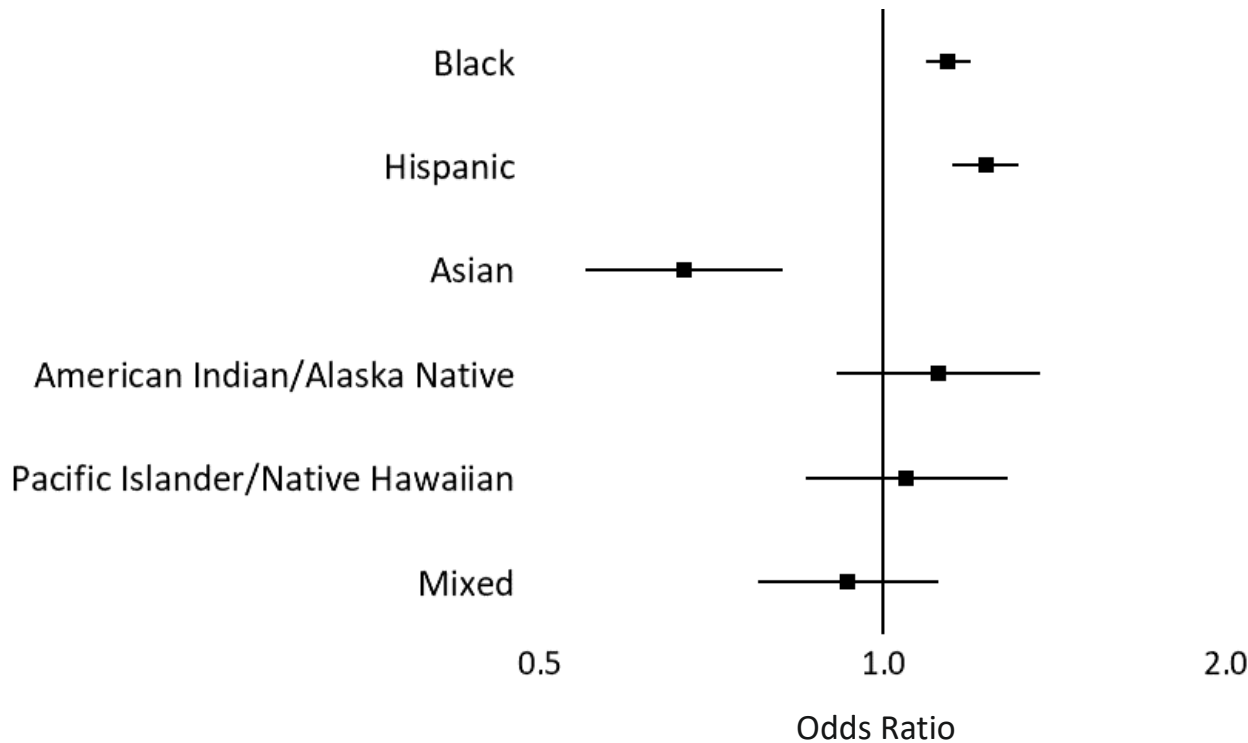
Adjusted racial and ethnic disparities in testing positive for SARS-CoV-2 between February 12, 2020 and August 16, 2021, by wave of the pandemic in the US Department of Veterans Affairs (VA)



Ferguson, J. M., Justice, A. C., Osborne, T. F., Magid, H. S. A., Purnell, A. L., & Rentsch, C. T. (2022). Geographic and temporal variation in racial and ethnic disparities in SARS-CoV-2 positivity between February 2020 and August 2021 in the United States. *Scientific Reports*, 12(1), 1-8.

Adjusted racial and ethnic disparities in testing positive for SARS-CoV-2 between February 12, 2020 and August 16, 2021, by wave of the pandemic in the US Department of Veterans Affairs (VA)

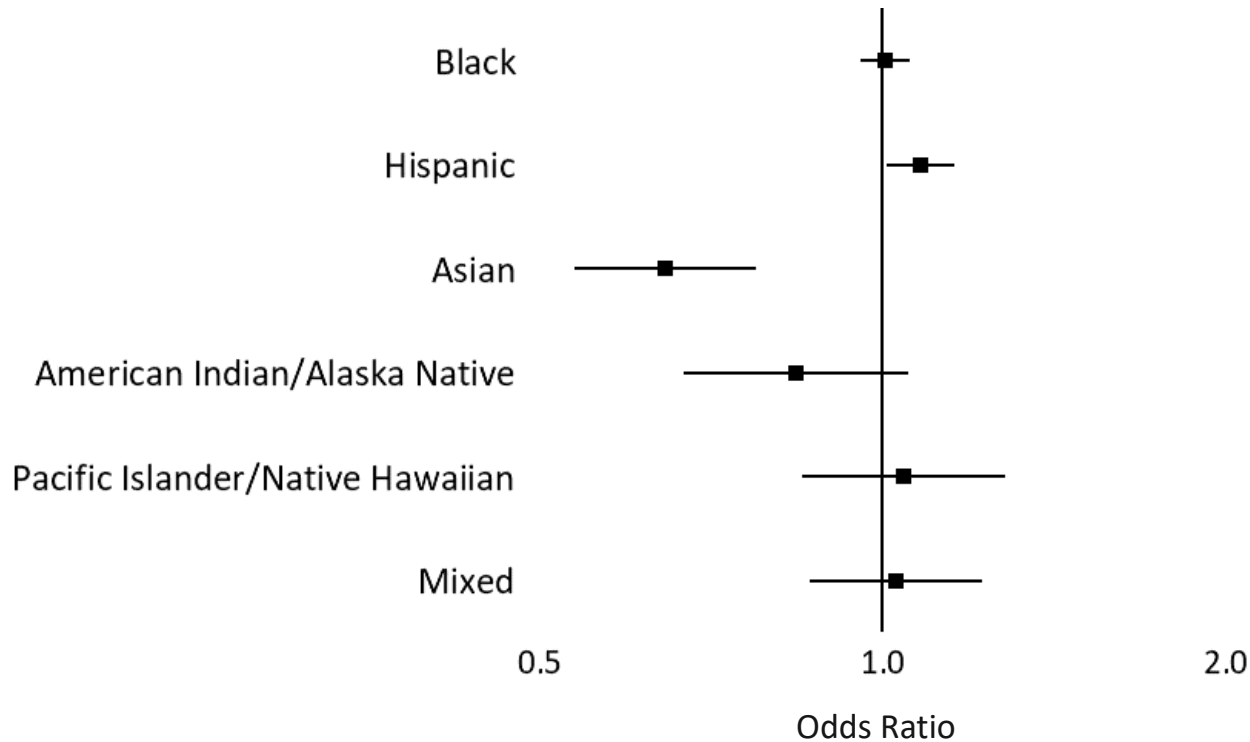
Wave 4:  
March 1- June 20, 2021



Ferguson, J. M., Justice, A. C., Osborne, T. F., Magid, H. S. A., Purnell, A. L., & Rentsch, C. T. (2022). Geographic and temporal variation in racial and ethnic disparities in SARS-CoV-2 positivity between February 2020 and August 2021 in the United States. *Scientific Reports*, 12(1), 1-8.

Adjusted racial and ethnic disparities in testing positive for SARS-CoV-2 between February 12, 2020 and August 16, 2021, by wave of the pandemic in the US Department of Veterans Affairs (VA)

Wave 5:  
July 1- August 16, 2021



Ferguson, J. M., Justice, A. C., Osborne, T. F., Magid, H. S. A., Purnell, A. L., & Rentsch, C. T. (2022). Geographic and temporal variation in racial and ethnic disparities in SARS-CoV-2 positivity between February 2020 and August 2021 in the United States. *Scientific Reports*, 12(1), 1-8.



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# Racial/ethnic Variation in Veterans Health Administration COVID-19 Vaccine Uptake

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**Taona P. Haderlein, PhD, MA**

VA HSR&D Center for the Study of Healthcare Innovation, Implementation & Policy (CSHIIP)  
VA Greater Los Angeles Healthcare System

Veterans Emergency Management Evaluation Center,  
Department of Veterans Affairs

VA HSR&D Cyberseminar  
Focus on Health Equity and Action  
January 12, 2022

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- Co-authors:
  - Michelle S. Wong, PhD
  - Kenneth T. Jones, PhD
  - Ernest M. Moy, MD, MPH
  - Anita Yuan, PhD, MA, MPH
  - Donna L. Washington, MD, MPH
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# Disclosures

- No conflicts of interest
- Views represented here are my own, and do not necessarily represent those of the VA or of the US government

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## Racial/Ethnic Variation in Veterans Health Administration COVID-19 Vaccine Uptake

Taona P. Haderlein, PhD, MA • Michelle S. Wong, PhD • Kenneth T. Jones, PhD • Ernest M. Moy, MD, MPH •

Anita Yuan, PhD, MA, MPH • Donna L. Washington, MD, MPH  

Published: October 20, 2021 • DOI: <https://doi.org/10.1016/j.amepre.2021.08.027>

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# Background – Racial/ethnic healthcare disparities during COVID-19 pandemic

- Black, Hispanic, American Indian/Alaska Native people, and people from Asian subgroups, at higher risk for COVID-19 infection, hospitalization, and death than White people
- Racial/ethnic minorities overrepresented among essential workers; higher residential population density; reduced medical care access
- Adverse effects of systemic racism on social determinants of health, health outcomes



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# Racial/ethnic vaccine disparities

- Lower U.S. COVID-19 vaccination rates among Black and Hispanic people than White people
- Attitudinal barriers - institutional mistrust, vaccine hesitancy contribute to lower vaccine uptake among racial/ethnic minorities
- In previous vaccine rollouts, structural barriers disproportionately affected racial/ethnic minorities
- American Indian/Alaska native community leaders led vaccine outreach campaigns in partnership with Indian Health Service



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# Veterans Health Administration (VA) COVID-19 Vaccine Rollout

- VA began administering COVID-19 vaccinations shortly after the U.S vaccine rollout began
- VA electronic health record provides COVID-19 vaccination rates among racial/ethnic minorities in managed care system with few access barriers

# Objective

- **To examine the association between racial/ethnic minority status and VA COVID-19 vaccine uptake**
  - Based on reports of higher vaccination rates among American Indian/Alaska Native peoples due to Indian Health Services use, residential proximity to federally recognized tribal reservation tested as moderator of association between race/ethnicity and vaccine uptake

# Sample and Measures

- Sample: 3,474,874 Veterans age 65+ with VA outpatient use between 3/1/18-2/29/20
- Electronic health record used to identify Veterans with one or more VA COVID-19 vaccine doses between 12/14/20-2/23/21 (includes Veterans who did not complete series)
- Race/ethnicity – combined data from multiple databases to reduce missing data; all individuals reporting Hispanic ethnicity classified as Hispanic, all others were classified by their race
- Co-variates: age, sex, urban/rural residence, Indian Health Service contract health service delivery area (CHSDA), influenza vaccination, medical comorbidities, VA Care Assessment Need score



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# Analysis

- Two logistic regression models with VA COVID-19 vaccination (0=No, 1=Yes) as the dependent variable
- Model 1 included all covariates
- Model 2 added a Race/Ethnicity\*CHSDA interaction term

# Results: Sample Characteristics

- N = 3,474,874
- 97% male
- 75% of Veterans were White, 11% Black, 4% Hispanic, 0.7% Asian, 0.6% American Indian/Alaska Native, 0.6% Native Hawaiian/Other Pacific Islander, 0.6% more than one race
- Black and Hispanic Veterans younger than White Veterans, higher percentage of women Veterans
- 25% of the cohort resided in Indian Health Service CHSDA counties, compared to 53% of American Indian/Alaska Native Veterans
- 24% of the cohort received at least one COVID-19 vaccine dose as of 2/23/21



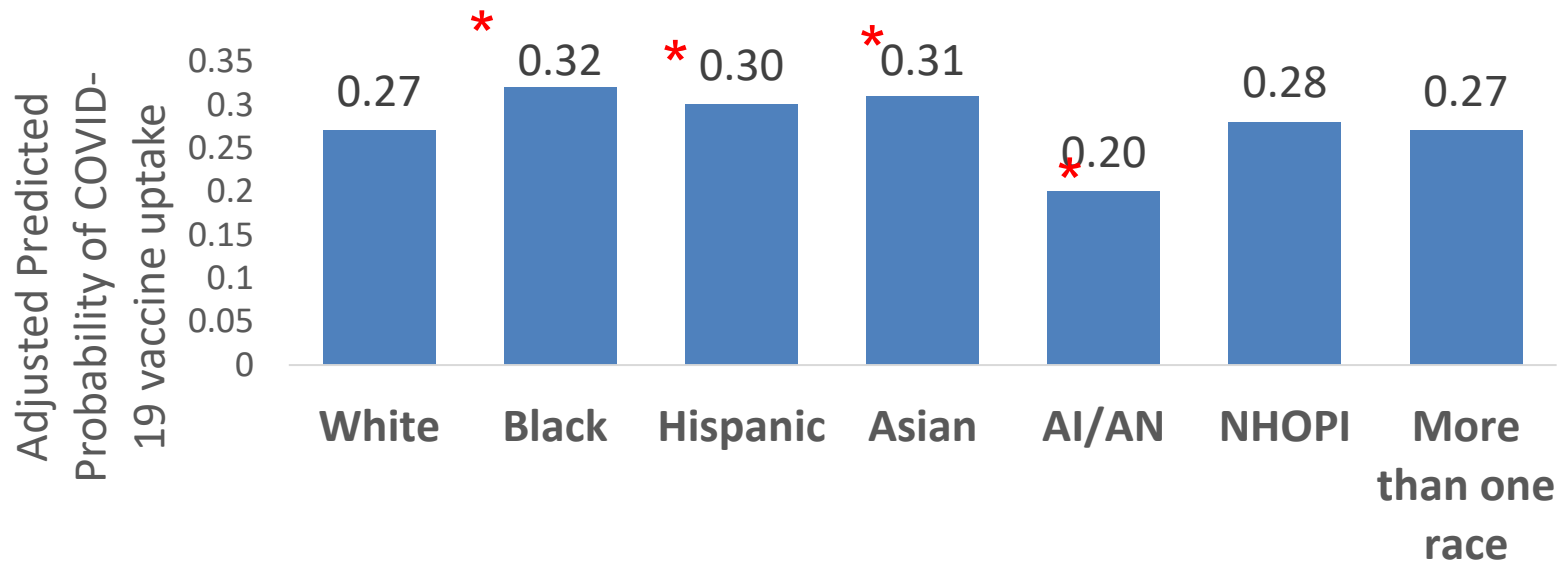
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# COVID-19 vaccine uptake by race/ethnicity



Reference group: White

AI/AN = American Indian/Alaska Native

NHOPI = Native Hawaiian/Other Pacific Islander

\* Comparison statistically significant at  $p < .05$



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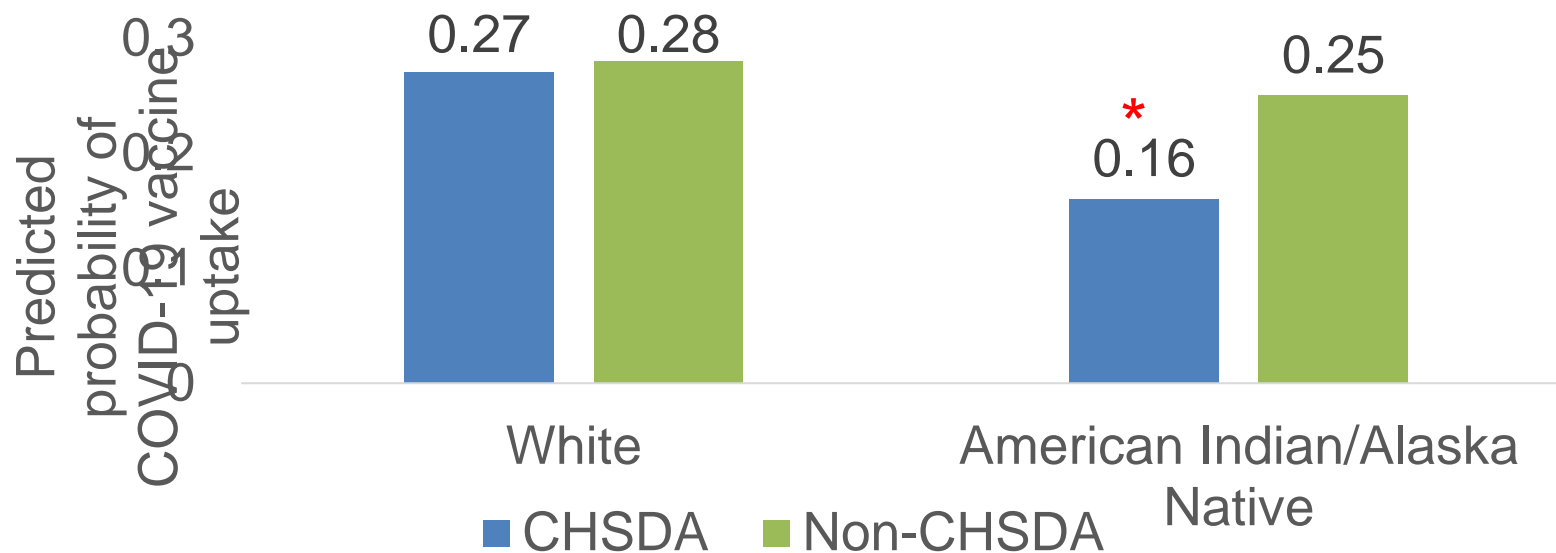
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# Race/ethnicity and County Health Service Delivery Area (CHSDA) residence as predictors of COVID-19 vaccine uptake



\* Comparison statistically significant at  $p < .05$



# Racial/ethnic variation in VA COVID-19 vaccine uptake

- Black, Hispanic, and Asian Veteran VA users were more likely than White Veterans to receive a VA COVID-19 vaccination
- In contrast, data from the U.S. general population as of 3/1/21 showed higher vaccination rates among White people relative to Black, Hispanic, and Asian people.
- Possible reasons:
  - reduced logistical barriers for VA patients compared to private healthcare
  - greater use of non-VA community care among Whites
  - higher perceived and actual risk for COVID-19 infection and death among Veterans from racial/ethnic minority communities



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# VA COVID-19 vaccination among American Indian/Alaska Natives

- American Indian/Alaska Natives Veterans less likely than Whites to receive VA vaccinations, but only those residing in CHSDA counties
- Points to role of Indian Health Service-delivered COVID-19 vaccinations among CHSDA-dwelling American Indian/Alaska Native Veterans
- Lower barriers to Indian Health Service care:
  - structural barriers such as physical proximity
  - higher institutional trust in Indian Health Service relative to VA



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# Limitations

- Effects of potential racial/ethnic differences in use of non-VA/alternative vaccination sites cannot be determined
- While it is posited that lower vaccine use among American Indian/Alaska Native Veterans could relate to Indian Health Service use, that was not assessed directly
- The findings may not be generalizable to non-VA populations

# Conclusions

- Lower logistical barriers to VA use may mitigate racial/ethnic disparities in vaccine uptake
- Indian Health Service may provide a safety net effective at reaching American Indian/Alaska Native Veterans
- Addressing vaccination access barriers in non-VA settings can potentially reduce racial/ethnic disparities in COVID-19 vaccination

# References

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Quality Enhancement Research Initiative  
National Partnered Evaluation Initiative

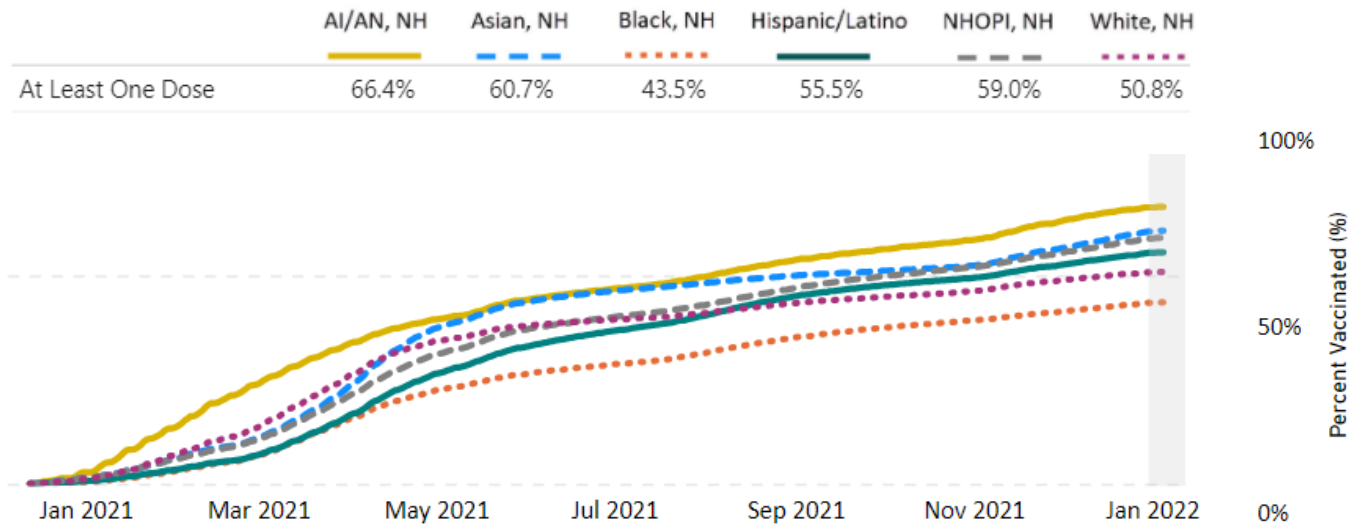
# SUPPLEMENTAL SLIDES

# Percent of People Receiving COVID-19 Vaccine by Race/Ethnicity and Date Administered, United States



December 14, 2020 – January 05, 2022

## Vaccine Administered Data



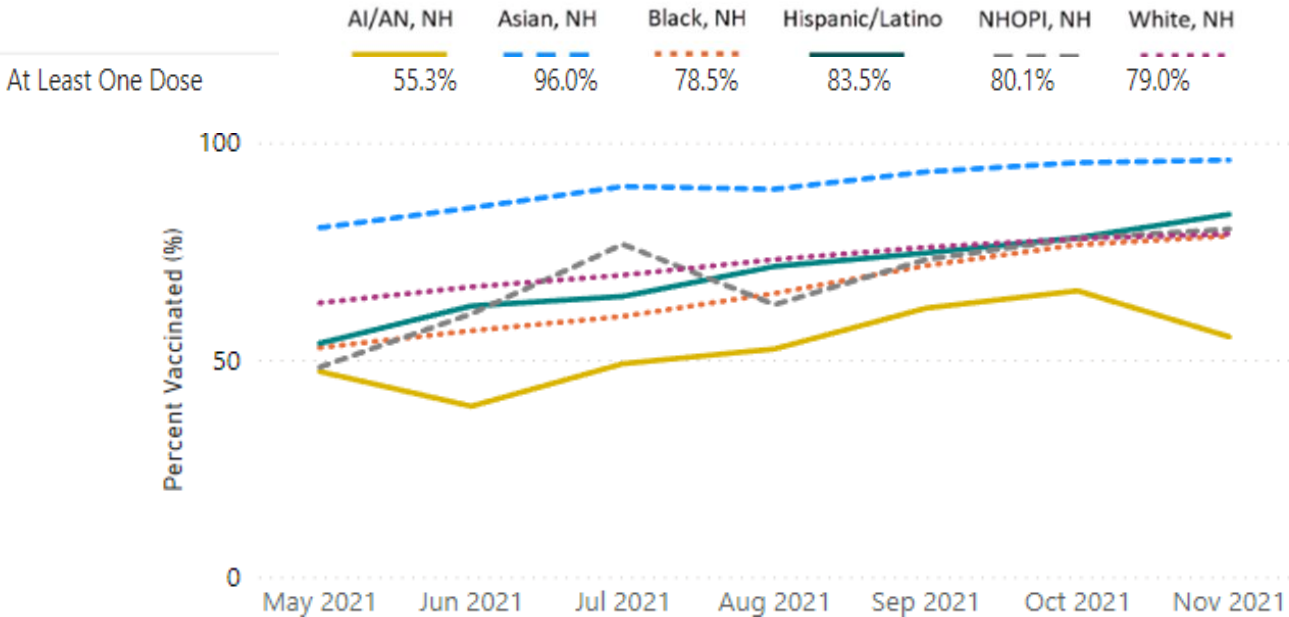
Source: <https://covid.cdc.gov/covid-data-tracker/#vaccination-demographics-trends>



# Estimated Percent of People 18 Years and Older in Each Race/Ethnicity Group Reporting COVID-19 Vaccination, National Immunization Survey Adult COVID Module



April 22, 2021 – November 27, 2021

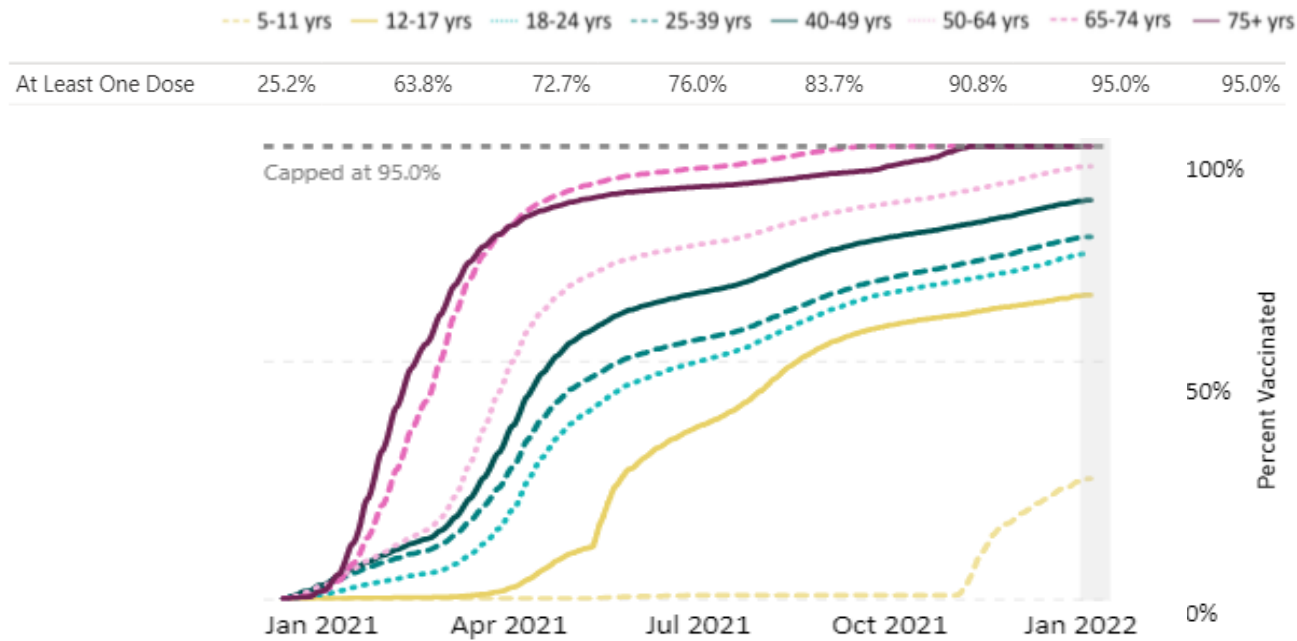


Source: <https://covid.cdc.gov/covid-data-tracker/#vaccination-demographics-trends>

# Percent of People Receiving COVID-19 Vaccine by Age and Date Administered, United States



December 14, 2020 – January 06, 2022



Source: <https://covid.cdc.gov/covid-data-tracker/#vaccination-demographics-trends>



# U.S. Department of Veterans Affairs COVID-19 Pandemic Response

Weekly Report: December 25–31, 2021



## VACCINE

### 64.7% Veteran users vaccinated

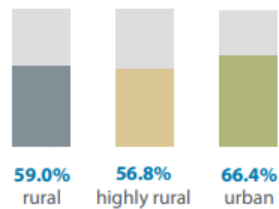
#### 4,535,300 people vaccinated

(at least one dose)

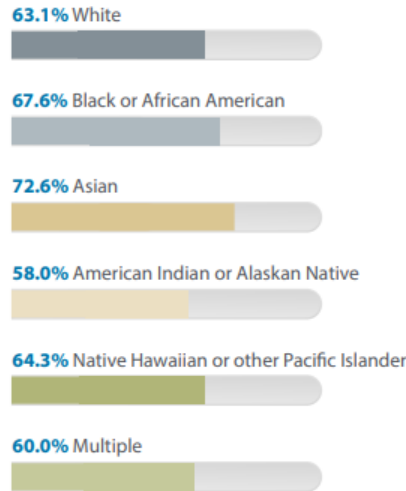
- 4,001,225 Veterans
- 349,397 employees
- 113,455 SAVE LIVES Act
- 30,056 other federal partners
- 31,964 other



### Rurality



### Race



Source: [https://www.va.gov/health/docs/VA\\_COVID\\_Response.pdf](https://www.va.gov/health/docs/VA_COVID_Response.pdf)



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