ORIGINAL ARTICLE | COVID-19 VACCINATIONS

Marked Inequalities in COVID-19 Vaccination by Racial/Ethnic, Socioeconomic, Geographic, and Health Characteristics, United States, January 6 – February 15, 2021

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ABSTRACT

Background: The COVID-19 pandemic has had a substantial adverse impact on the health and wellbeing of populations in the United States (US) and globally. Since the availability of COVID-19 vaccines in December 2020, efforts have been underway to vaccinate priority populations who are at increased risks of COVID-19 infections, morbidity, and mortality, but rigorous and analytical national data on vaccination rates are lacking. Using the latest nationally representative data, we examine disparities in COVID-19 vaccination among US adults aged 18 years and older by a wide range of social determinants.

Methods: Using three consecutive rounds of the US Census Bureau's Household Pulse Survey from January 6 to February 15, 2021 (N=224,458), disparities in vaccination rates by race/ethnicity, socioeconomic status, health insurance, health status, and metropolitan area were modeled by multivariate logistic regression.

Results: An estimated 33.6 million or 13.6% of US adults received COVID-19 vaccination. Vaccination rates varied 5-fold across the age range, from a low of 5.8% for adults aged 18-24 to 19.1% for those aged 65-74, and 29.0% for those aged ≥75 years. Males, non-Hispanic Blacks, Hispanics, divorced/separated and single individuals, those with lower education and household income levels, renters, not-employed individuals, the uninsured, and individuals with higher depression levels reported significantly lower rates of vaccination. Controlling for covariates, non-Hispanic Blacks had 11% lower odds and Asians had 50% higher odds of receiving vaccination than non-Hispanic Whites. Adults with less than a high school education had 64% lower adjusted odds of receiving vaccination than those with a Master's degree. Adults with an annual income of <$25,000 had 33% lower adjusted odds of vaccination than those with a ≥$200,000. Vaccination rates ranged from 10.7% in Riverside-San Bernardino, California to 16.1% in Houston, Texas.

Conclusion and Implications for Translation: Ethnic minorities, socioeconomically-disadvantaged individuals, uninsured adults, and those with serious depression reported significantly lower vaccination rates. Equitable vaccination coverage is critical to reducing inequities in COVID-19 health outcomes.

Keywords: • COVID-19 • Pandemic • Vaccination • Disparities • Race/Ethnicity • Socioeconomic Status • Vaccine Equity • Coronavirus

1. Introduction

The coronavirus disease (COVID-19) pandemic has had a substantial adverse impact on the health and wellbeing of populations in the United States (US) and globally over the past year, leading to widespread social and economic disruptions, social isolation, mental health problems, excess premature mortality, and declines in life expectancy.[1–8] United States has borne the brunt of the pandemic, with 30.2 million confirmed COVID-19 cases and 548,087 deaths as of March 27, 2021,[8] in comparison to 125,507,698 confirmed cases and 2,755,212 deaths globally.[2] In the US, since the availability of the COVID-19 vaccines to residents at no cost in December 2020, efforts have been underway to first vaccinate priority populations (such as elderly populations, long-term care facility residents, and frontline healthcare workers) who are at increased risks of COVID-19 infections, severe morbidity, and mortality and, more recently, to extend and ensure equitable access to vaccines among the general population.[9,10] However, recent studies have found marked disparities in COVID-19 vaccination rates among racial/ ethnic minority groups and socially disadvantaged populations, with Black and Hispanic Americans being half as likely to receive vaccination as White Americans and socially vulnerable communities having lower vaccination coverage compared to more-advantaged communities.[10,11] Despite the availability of the early US data on racial/ethnic and community-level disparities in vaccine coverage, a comprehensive analysis of COVID-19 vaccination disparities by a wide range of social determinants (such as age, gender, race/ethnicity, marital status, education, household income, employment status, housing tenure, health status, health insurance status, and geographic region or metropolitan area) has not yet been conducted. Such analyses of disparities are urgently needed to ensure a more equitable vaccine access and prevent widening disparities in COVID-19 health outcomes.[10,11]

Using a large nationally representative survey, this study aims to examine disparities in COVID vaccination rates among US adults aged ≥18 years during the ongoing coronavirus pandemic. The COVID-19 pandemic has widened health and healthcare inequalities in the US as socially disadvantaged and underserved populations have experienced disproportionately higher rates of disease, mortality, and health risks.[12–15] Our study aims to address inequalities in COVID-19 vaccination consistent with one of the most important goals of the Healthy People initiative and the US Department of Health and Human Services to reduce health inequalities. [16–18] In addition, the study's aim is consistent with the Presidential Executive Orders on COVID-19 that emphasize (1) addressing factors that have contributed to disparities in COVID-19 outcomes, and (2) developing evidence-based research and equitable public health response for mitigating the health inequities caused or exacerbated by the COVID-19 pandemic and for preventing such inequities in the future.[19–21]

2. Methods

2.1. Data

We used pooled data from the three consecutive rounds of the US Census Bureau's Household Pulse Survey (HPS) conducted from January 6 to February 15, 2021. The three independent HPS samples in Phase 3 included: Week 22, January 6-18; Week 23, January 18–February 1; and Week 24, February 3-15), which was the latest HPS available at the time of the study.[22] The HPS is a national sample household survey in which data on socioeconomic, demographic, self-assessed health, mental health, and healthcare characteristics during the COVID-19 pandemic are collected in near real-time via email and internet. All information collected in the survey are based on self-reports. The HPS uses a systematic sample design and is representative of the civilian non-institutionalized population of the United States.

The HPS was developed as a rapid response survey in order to track the social and economic impacts of the COVID-19 pandemic on American households on a weekly or a bi-weekly basis in partnership with seven US federal statistical agencies, namely: Bureau of Labor Statistics, National Center for Health Statistics, United States Department of Agriculture's Economic Research Service, National Center for Education Statistics, Department of Housing and

Urban Development, Social Security Administration, Bureau of Transportation Statistics.[23,24]

2.2. Measurement of Vaccination and Covariates

The binary outcome variable, the receipt of the COVID-19 vaccine, was derived from the question, "Have you received a COVID-19 vaccine?" Those receiving the vaccine coded as 1 and those not receiving the vaccine coded as 0. The pooled sample size from January 6 to February 15, 2021, HPS was 226,037 for adults aged 18 years and older. There were 1,579 (0.70%) observations with missing data for vaccination excluding which resulted in an effective sample size of 224,458 for analysis.

Based on previous research and the social determinants of health framework, we selected the following covariates: age, gender, race/ethnicity, marital status, region or metropolitan statistical area (MSA) of residence, educational attainment, household income, housing tenure, employment status, health insurance status, and depression level.[9–11,17] These covariates were measured as shown in Tables 1 and 2.

2.3. Statistical Methods

Multivariate logistic regression was used to model vaccination disparities after controlling for socioeconomic, demographic, and health characteristics. The Chi-square statistic was used to test the overall association between each covariate and vaccination prevalence, whereas the two-sample t-test was used to test the difference in prevalence between any two groups or geographic areas. To account for the complex sample design of the HPS, SUDAAN software was used to conduct all statistical analyses, including the logistic modeling procedure RLOGIST.[25]

3. Results

3.1. Disparities in COVID-19 Vaccination by Social Determinants

During January 6-February 15, 2021, an estimated 33.6 million or 13.6% of US adults received COVID-19 vaccination (data not shown). The vaccination rate varied 5-fold across the age range, from a low of 5.8% for adults aged 18-24 to 19.1%

for those aged 65-74 and 29.0% for those aged ≥75 years (Table 1). Between January 6 and February 15, vaccination rates increased nearly two-fold for those under 65 years of age, 5-fold for those aged 65-74, and 6-fold for those aged ≥75 years (Table 1). Adjusted for covariates, those aged 18-24 and 65-74 had, respectively, 86% and 52% lower odds of vaccination than those aged ≥75 (Table 2).

Males, non-Hispanic Blacks, Hispanics, divorced/separated and single individuals, those with lower education and household income levels, renters, not-employed individuals, the uninsured, and individuals with higher depression levels reported significantly lower rates of vaccination (Table 1). Controlling for sociodemographic and health characteristics, non-Hispanic Blacks had lower 11% lower odds and Asians 50% higher odds of receiving vaccination than non-Hispanic Whites (Table 2). Compared with those with at least a master's degree, adults with less than a high school education, high school, some college, and bachelor's degree had, respectively, 64%, 61%, 41%, and 29% lower adjusted odds of receiving a vaccination (Table 2). Adults with a household income of <$25,000 had 33% lower adjusted odds of receiving vaccination than those with a ≥$200,000 (Table 2).

Controlling for covariates, non-employed individuals had 50% lower odds of vaccination than employed individuals. Uninsured adults and those with serious depression had 41% and 29% lower odds of receiving vaccination than those with health insurance and no depression, respectively (Table 2).

3.2. Disparities in COVID-19 Vaccination among Large Metropolitan Areas

Rates of COVID-19 vaccination ranged from a low of 10.7% in Riverside-San Bernardino MSA in California and 11.4% in San Francisco-Oakland MSA in California to a high of 14.0% in Boston-Cambridge MSA in Massachusetts and 16.1% in Houston MSA in Texas (Figure 1). Age, gender, race/ethnicity, education, household income, housing tenure, employment status, marital status, health insurance, and depression level were independent and significant predictors of COVID-19 vaccination in metropolitan areas (data not shown). After controlling for covariates, the

Table 1: Descriptive Characteristics of the Sample and Unadjusted Weighted Prevalence and Odds of COVID-19 Vaccination by Socioeconomic and Demographic Characteristics, US Adults Aged ≥18 Years: The Household Pulse Survey, Phase 3, Weeks 22 to 24, January 6 - February 15, 2021 (N = 224,458)

Covariates	Total Sample		Unadjusted		Unadjusted			% Increase
	Weighted %	SE	Preva-lence	SE	OR[1]	95% CI		in vaccin-ation rate
Age (years)								
18-24	9.10	0.18	5.77	0.46	0.15	0.13	0.18	76.62
25-34	17.53	0.18	10.38	0.28	0.28	0.26	0.31	87.62
35-44	17.65	0.17	11.85	0.29	0.33	0.30	0.36	90.46
45-54	16.50	0.16	12.66	0.28	0.35	0.33	0.38	82.74
55-64	17.49	0.15	12.94	0.28	0.36	0.33	0.39	89.33
65-74	14.86	0.14	19.05	0.38	0.58	0.53	0.62	412.73
≥75	6.88	0.11	29.03	0.70	1.00	reference		499.65
Gender								
Male	48.36	0.23	11.36	0.19	1.00	reference		186.48
Female	51.64	0.23	15.73	0.18	1.46	1.39	1.52	143.09
Race/ethnicity								
Non-Hispanic White	62.58	0.24	14.62	0.15	1.00	reference		167.41
Non-Hispanic Black	11.37	0.16	11.14	0.39	0.73	0.68	0.79	174.03
Asian	5.29	0.10	19.47	0.77	1.41	1.28	1.56	90.91
Other and multiple race[2]	3.70	0.09	11.87	0.61	0.79	0.70	0.88	164.15
Hispanic	17.06	0.21	10.16	0.38	0.66	0.61	0.72	154.73
Marital status								
Married	55.04	0.23	15.71	0.17	1.00	reference		154.65
Widowed	4.33	0.09	20.59	0.79	1.39	1.26	1.53	429.40
Divorced/separated	13.62	0.15	12.97	0.37	0.80	0.75	0.86	169.30
Single	27.02	0.23	8.59	0.25	0.50	0.47	0.54	113.11
Geographic region								
Northeast	17.22	0.18	14.00	0.35	1.01	0.94	1.08	158.52
South	38.18	0.22	13.89	0.23	1.00	reference		140.22
Midwest	20.67	0.16	13.12	0.24	0.94	0.89	0.99	156.52
West	23.93	0.19	13.33	0.25	0.95	0.90	1.01	199.41
Education (years of school completed)								
Less than high school (<12)	8.77	0.20	7.47	0.64	0.24	0.20	0.29	229.76
High school (12)	30.42	0.24	9.39	0.27	0.31	0.29	0.33	273.22
Some college (13-15)	30.46	0.19	12.85	0.19	0.44	0.42	0.46	138.11
College degree (16)	17.28	0.12	16.83	0.24	0.60	0.58	0.63	131.51
Graduate degree or higher (≥17)	13.07	0.10	25.10	0.29	1.00	reference		126.81
Household income in 2019 ($)								
<25,000	10.24	0.16	6.98	0.32	0.30	0.27	0.34	208.07
25,000-34,999	7.80	0.12	10.21	0.42	0.45	0.41	0.51	259.38
35,000-49,999	9.39	0.14	11.83	0.43	0.54	0.49	0.59	254.38
50,000-74,999	12.72	0.14	13.85	0.35	0.64	0.59	0.70	190.75

(Contd...)

Table 1: *(Continued)*

Covariates	Total Sample		Unadjusted		Unadjusted			% Increase
	Weighted %	SE	Preva-lence	SE	OR[1]	95% CI		in vaccin-ation rate
75,000-99,999	9.25	0.12	15.50	0.39	0.73	0.67	0.79	183.23
100,000-149,999	10.62	0.11	16.87	0.35	0.81	0.75	0.87	112.44
150,000-199,999	4.87	0.07	19.42	0.56	0.96	0.88	1.05	106.99
≥200,000	5.45	0.08	20.03	0.46	1.00	reference		95.63
Unknown	29.64	0.22	13.38	0.29	0.62	0.57	0.66	155.93
Housing tenure								
Owner	71.64	0.24	15.52	0.17	1.00	reference		162.09
Renter	28.36	0.24	9.38	0.24	0.56	0.53	0.60	165.59
Employment status								
Employed	56.08	0.23	15.36	0.17	1.00	reference		86.77
Not employed	43.92	0.23	11.38	0.21	0.71	0.67	0.74	421.20
Health insurance status								
Insured	91.57	0.19	14.71	0.15	1.00	reference		158.89
Not insured	8.43	0.19	4.58	0.57	0.28	0.21	0.36	249.75
Depression level in past 7 days								
Not at all	46.01	0.25	16.49	0.23	1.00	reference		169.55
Several days	30.99	0.22	13.14	0.23	0.77	0.73	0.81	151.38
More than half the days	10.45	0.16	10.00	0.36	0.56	0.52	0.61	123.04
Nearly every day	12.54	0.18	8.12	0.34	0.45	0.41	0.49	195.72

SE= standard error. OR=odds ratio; CI=confidence interval. [1]ORs estimated by logistic model were unadjusted for the effects of other covariates. [2]Consists of American Indians and Alaska Natives, Native Hawaiians and Pacific Islanders, and mixed-race individuals. Chi-square statistics for testing the overall association between each covariate and COVID-19 vaccine rates were statistically significant at P<0.001 except for region (P=0.047). All percentage increases in vaccination rates between week 22 and week 24 were significantly different from zero at P<0.001

rates and odds of vaccination for all MSAs were significantly lower than those for Houston in Texas. Compared with Houston MSA, the adjusted odds of receiving COVID-19 vaccination were 50% lower (OR=0.50; 95% CI=0.42-0.61) for San-Francisco-Oakland MSA, 43% lower (OR=0.57; 95% CI=0.47-0.68) for Philadelphia-Camden MSA in Pennsylvania, and 42% lower (OR=0.58; 95% CI=0.48-0.69) for Washington-Arlington-Alexandria MSA in the US capital region. Both adjusted and unadjusted rates of COVID-19 vaccination were significantly higher for all metropolitan areas than for Houston MSA in Texas (Figure 1).

4. Discussion

In this study, using the latest national data, we have analyzed disparities in COVID-19 vaccination rates in the US. We showed wide disparities among various racial/ethnic and socioeconomic status (SES) groups and geographic areas. We found markedly lower vaccination rates among Black and Hispanic Americans (compared to non-Hispanic White and Asian Americans), those with lower education and household income levels, those without employment and health insurance, and those experiencing serious depression. These are also the population groups that are in urgent need of vaccination, given that they are at substantially higher risks of COVID-19 infections, hospitalization, and mortality.[12–15] Although racial/ethnic inequities in vaccination rates remained largely unchanged between January 6 and February 15, increases in vaccination rates were greater among the low-SES groups, uninsured, unemployed, and those in poor mental health, leading to reduced SES disparities in vaccine coverage during the latest period of February 3-15.

Table 2: Covariate-Adjusted Odds and Prevalence of COVID-19 Vaccination by Socioeconomic and Demographic Characteristics, US Adults Aged ≥18 Years: The Household Pulse Survey, Phase 3, Weeks 22 to 24, January 6 - February 15, 2021 (N = 224,458)

Covariates	Adjusted Model[1]			Adjusted[1]	
	OR	95% CI		Prevalence	SE
Age (years)					
18-24	0.14	0.11	0.17	7.60	0.62
25-34	0.19	0.17	0.21	9.84	0.28
35-44	0.20	0.18	0.22	10.56	0.28
45-54	0.22	0.20	0.24	11.31	0.26
55-64	0.25	0.22	0.27	12.56	0.28
65-74	0.48	0.44	0.53	21.34	0.45
≥75	1.00	reference		34.56	0.85
Gender					
Male	1.00	reference		11.19	0.18
Female	1.54	1.47	1.62	15.91	0.18
Race/ethnicity					
Non-Hispanic White	1.00	reference		13.41	0.15
Non-Hispanic Black	0.89	0.82	0.98	12.23	0.43
Asian	1.50	1.36	1.67	18.43	0.71
Other and multiple race	1.02	0.89	1.17	13.64	0.76
Hispanic	1.03	0.95	1.12	13.74	0.46
Marital status					
Married	1.00	reference		13.98	0.17
Widowed	1.06	0.95	1.18	14.61	0.61
Divorced/separated	0.95	0.88	1.03	13.44	0.39
Single	0.86	0.79	0.94	12.37	0.38
Geographic region					
Northeast	0.90	0.84	0.97	13.24	0.33
South	1.00	reference		14.40	0.23
Midwest	0.88	0.83	0.93	13.02	0.23
West	0.90	0.85	0.95	13.22	0.24
Education (years of school completed)					
Less than high school (<12)	0.36	0.30	0.43	9.02	0.72
High school (12)	0.39	0.36	0.42	9.58	0.28
Some college (13-15)	0.59	0.56	0.62	13.68	0.20
College degree (16)	0.71	0.68	0.75	15.91	0.24
Graduate degree or higher (≥17)	1.00	reference		20.68	0.30

(Contd...)

Table 2: *(Continued)*

Covariates	Adjusted Model[1]			Adjusted[1]	
	OR	95% CI		Prevalence	SE
Household income in 2019 ($)					
<25,000	0.67	0.59	0.77	10.45	0.50
25,000-34,999	0.81	0.72	0.91	12.12	0.49
35,000-49,999	0.87	0.78	0.97	12.93	0.48
50,000-74,999	0.92	0.84	1.00	13.48	0.37
75,000-99,999	0.95	0.87	1.03	13.81	0.39
100,000-149,999	0.97	0.90	1.04	14.07	0.34
150,000-199,999	1.07	0.97	1.17	15.22	0.52
≥200,000	1.00	reference		14.44	0.41
Unknown	0.98	0.88	1.10	14.24	0.44
Housing tenure					
Owner	1.00	reference		13.32	0.27
Renter	0.92	0.86	0.99	12.47	0.38
Employment status					
Employed	1.00	reference		17.05	0.22
Not employed	0.50	0.47	0.54	9.84	0.20
Health insurance status					
Insured	1.00	reference		14.60	0.35
Not insured	0.59	0.45	0.76	9.37	1.14
Depression level in past 7 days					
Not at all	1.00	reference		14.35	0.33
Several days	0.87	0.82	0.91	12.78	0.29
More than half the days	0.76	0.69	0.83	11.42	0.45
Nearly every day	0.71	0.64	0.78	10.79	0.45

SE= standard error. OR=odds ratio; CI=confidence interval. [1]Adjusted by logistic regression model for age, gender, race/ethnicity, marital status, region of residence, education, household income, housing tenure, employment status, insurance status, and depression level.

However, equitable vaccination coverage is critical to ensuring reductions in COVID-19 health inequities among ethnic minorities and socially disadvantaged populations.[10,11]

Our study findings on racial/ethnic disparities in COVID-19 vaccination are consistent with those reported in other recent studies which, however, unlike our study, did not examine whether racial/ethnic disparities persist after controlling for individual socioeconomic and demographic characteristics.[10,11] Racial/ethnic disparities in COVID-19 vaccination shown here are consistent with similar disparities in flu vaccine uptake during
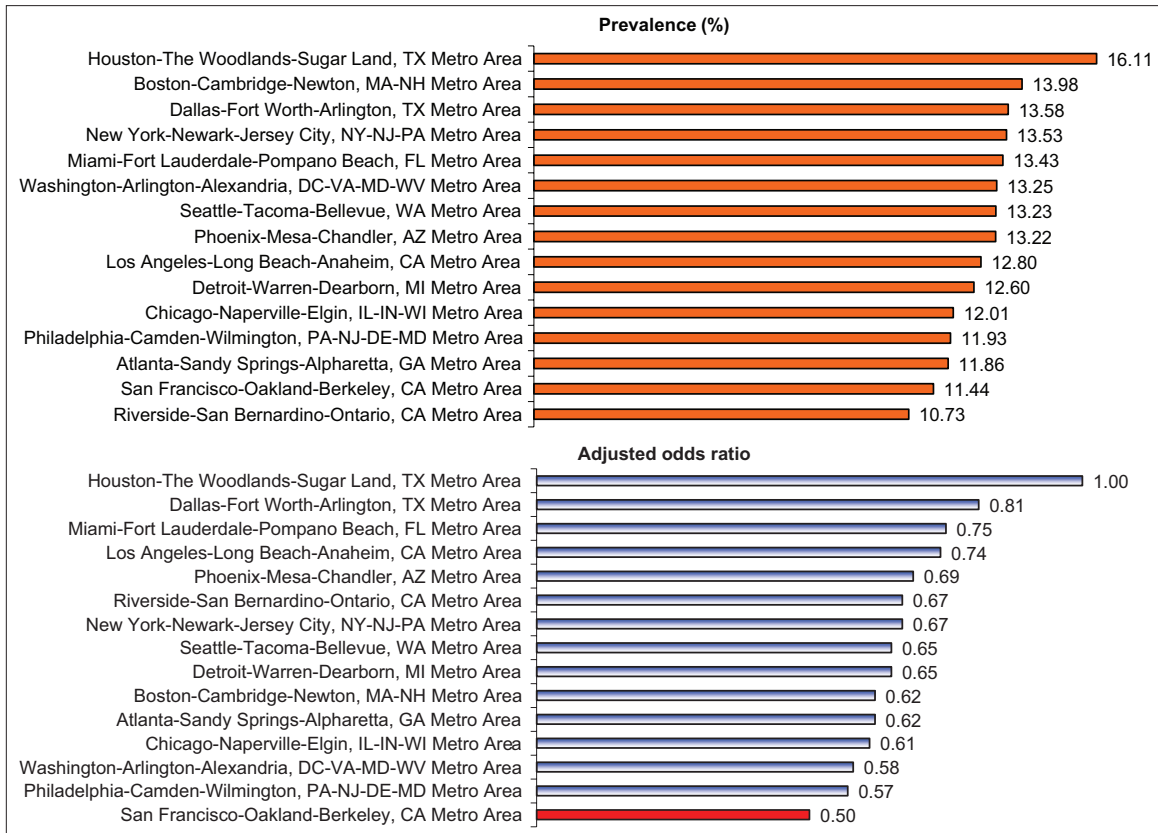
Figure 1: Prevalence[1] and Adjusted[2] Odds Ratios for COVID-19 Vaccination among Adults Aged ≥18 Years in 15 Largest Metropolitan Statistical Areas (MSAs), United States, January 6-February 15, 2021
Notes: [1]Prevalence rates of COVID-19 vaccination for all MSAs were significantly lower than the rate for Houston-The Woodlands-Sugar Land MSA at P<0.05. [2]Adjusted by logistic regression for age, gender, race/ethnicity, marital status, education, household income, housing tenure, employment status, insurance status, and depression level. All adjusted odds ratios were statistically significant at P<0.05. **Source:** Data derived from January 6 - February 15, 2021 Household Pulse Survey

the 2019-2010 season showing significantly lower rates of flu vaccination among Hispanics, Blacks, and American Indians/Alaska Natives compared to Asians and non-Hispanic Whites.[26] Socioeconomic and healthcare access factors in COVID-19 vaccination are also consistent with those in flu vaccination that show lower immunization rates among low-SES and uninsured individuals.[27,28]

Although disparities in COVID-19 vaccination rates among racial/ethnic groups and socially vulnerable communities have been previously reported,[10,11] our study, to the best of our knowledge, is the first to have simultaneously examined vaccine inequalities by a far wider range of sociodemographic and health factors during the ongoing pandemic. Additionally, our study makes a unique contribution to COVID-19 research by identifying racial/ethnic and socioeconomic disparities in COVID-19 vaccination both at the national level and in the 15 largest metropolitan areas of the US and by documenting patterns of increase in vaccine coverage over a 6-week period.

4.1. Limitations

This study has limitations. First, ethnic detail in the HPS public use file is limited as we are unable to identify American Indians and Alaska Natives and specific Asian/Pacific Islander and Hispanic subgroups

as well as immigrant groups who may also have lower rates of COVID-19 vaccination. Second, the respondents in HSP are more likely to be women and non-Hispanic Whites and have higher education, compared with the American Community Survey.[29] This might have resulted in an underestimate of the magnitude of racial/ethnic and socioeconomic disparities in vaccine coverage. However, we addressed disproportionate sampling of demographic characteristics by using survey weights, which rakes the demographics of the interviewed persons to education attainment/sex/age distributions and ethnicity/race/sex/age population distributions.[23]

5. Conclusion and Implications for Translation

Based on the analysis of the latest census data on 224,458 US adults aged 18 years and older, this study has found large disparities in COVID-19 vaccination rates by race/ethnicity, SES, health care access, and metropolitan area. During January 6-February 15, 2021, more than 33.6 million or 1 in 7 US adults received COVID-19 vaccination. Hispanics, Blacks, socioeconomically-disadvantaged adults, uninsured adults, individuals with serious depression, and those living in Riverside-San Bernardino, California; San Francisco-Oakland, California; Atlanta, Georgia; and Philadelphia, Pennsylvania metropolitan areas had a substantially lower likelihood of receiving a vaccination.

Equitable vaccination coverage is critical to reducing inequities in COVID-19 health outcomes. Given the large vaccine disparities, additional efforts are needed to reach populations that continue to experience increased risks of infections, hospitalization, and mortality from COVID-19.[10] A number of vaccine access and distribution issues such as vaccine supply, vaccine clinic availability, transportation difficulties in poor and remote areas, and lack of prioritization of vulnerable groups as well as vaccine hesitancy are potential factors for the existing disparities, the impact of which needs to be examined in future investigations.[11]

Compliance with Ethical Standards

Key Messages

▶ During January 6 to February 15, 2021, more than 33.6 million or 1 in 7 US adults received the COVID-19 vaccination.

▶ Asian Americans had the highest vaccination rate (19.5%), followed by non-Hispanic Whites (14.6%), other/multiple races (11.9%), Blacks (11.1%), and Hispanics (10.2%).

▶ Adults with a graduate or advanced degree were more than 3 times more likely to receive COVID-19 vaccination than those with less than a high school education (25.1% vs. 7.5%).

▶ Adults with an annual household income of ≥$200,000 were nearly 3 times more likely to receive COVID-19 vaccination than those with a household income of <$25,000 (20.0% vs. (7.0%).

▶ Adults with health insurance were 3 times more likely to receive COVID-19 vaccination than uninsured adults (14.7% vs. 4.6%).

▶ COVID-19 vaccination rates among the 15 largest metropolitan areas ranged from 10.7% for Riverside-San Bernardino, California, and 11.4% for San Francisco-Oakland, California to 14.0% for Boston and 16.1% for Houston, Texas.

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