Association of Uninsurance and VA Coverage with the Uptake and Equity of COVID-19 Vaccination: January–March 2021

BACKGROUND

Efficient, equitable vaccination is essential to controlling COVID-19. However, health coverage might indirectly influence the rapidity and fairness of vaccine administration, and racial/ethnic minorities with elevated COVID-19 mortality have had relatively low vaccination rates.

We examined COVID vaccine uptake in the USA in early 2021 by insurance status and race/ethnicity.

METHODS

We analyzed the Census Bureau's nationally representative Household Pulse Survey (Phase 3) fielded biweekly January 6–March 29, 2021 (response rate 6.4–7.5%).[1]

We examined receipt of ≥ 1 dose of a COVID-19 vaccine according to three mutually exclusive insurance coverage groups[1]: any VA coverage or use,[2] only non-VA coverage, and[3] uninsured. All information was self-reported. Respondents' missing data for vaccination or coverage (n = 82,021 [18% of sample]) were excluded.

We tabulated respondent characteristics by insurance coverage, and weekly trends in vaccination by insurance and race/ethnicity. We performed 2 multivariable logistic regressions adjusted for age, gender, and insurance. Model 1 additionally included survey-week and a survey-week*insurance interaction term; Model 2 was restricted to the final survey-week and additionally included race/ethnicity and a race/ethnicity*insurance interaction term. These allowed estimation of the predicted probabilities of vaccination by insurance and time (Model 1) and by insurance and race/ethnicity (Model 2).

We used Stata/SE 16.1 (and Stata's *margins* commands) and Census Bureau–provided weights and replicate weights to calculate nationally representative estimates and standard errors.

RESULTS

Our final sample included 377,214 adults. Compared to those with non-VA coverage (mean age 49.9 years), uninsured individuals were younger (40.3 years) and VA-covered individuals older (58.7 years). Of respondents with non-VA coverage, 53.8% were female vs. 44.5% of the uninsured and 31.7% of those with VA coverage.

Figure 1 provides unadjusted (panel 1) and age- and gender-adjusted (panel 2) estimates of vaccination by insurance status over the study period. In mid-January, adjusted vaccination rates were similar for VA- (7.2%) and non-VA- (8.0%) covered adults, but lower among the uninsured (4.2%). Vaccination rates subsequently rose fastest among VA-covered individuals and slowest among the uninsured. By late March, the adjusted vaccination rate was 55.3% for the VA coverage group vs. 50.1% for those with non-VA coverage and 30.4% among the uninsured. Relative to those with non-VA coverage, persons with VA coverage had an adjusted 5.9 percentage point greater increase in vaccination rates between mid-January and late March (95% CI 2.1, 9.6; $p = 0.002$), with a significantly slower increase among the uninsured.

Table 1 presents adjusted vaccination rates by race in the final survey sample. Relative to Whites, vaccination rates for Blacks and Hispanics were lower among those with non-VA coverage but higher among those with VA-coverage; Asians had the highest rates in both settings. Relative to Whites, VA coverage vs. non-VA coverage was associated with markedly higher rates of vaccination among Blacks (13.5 percentage points; 95% CI 5.4, 21.7) and Asians.

DISCUSSION

From January to March 2021, SARS-Co-V-2 vaccination rates increased more slowly among the uninsured relative to the insured, and more equitably among those with VA relative to non-VA coverage.

The federal government made COVID vaccination free. However, uninsured persons may have harbored concerns about costs because of past experiences.[2] Moreover, those who lack coverage are less likely to have an established relationship with a primary care provider[3]—an important potential source of information on vaccines.
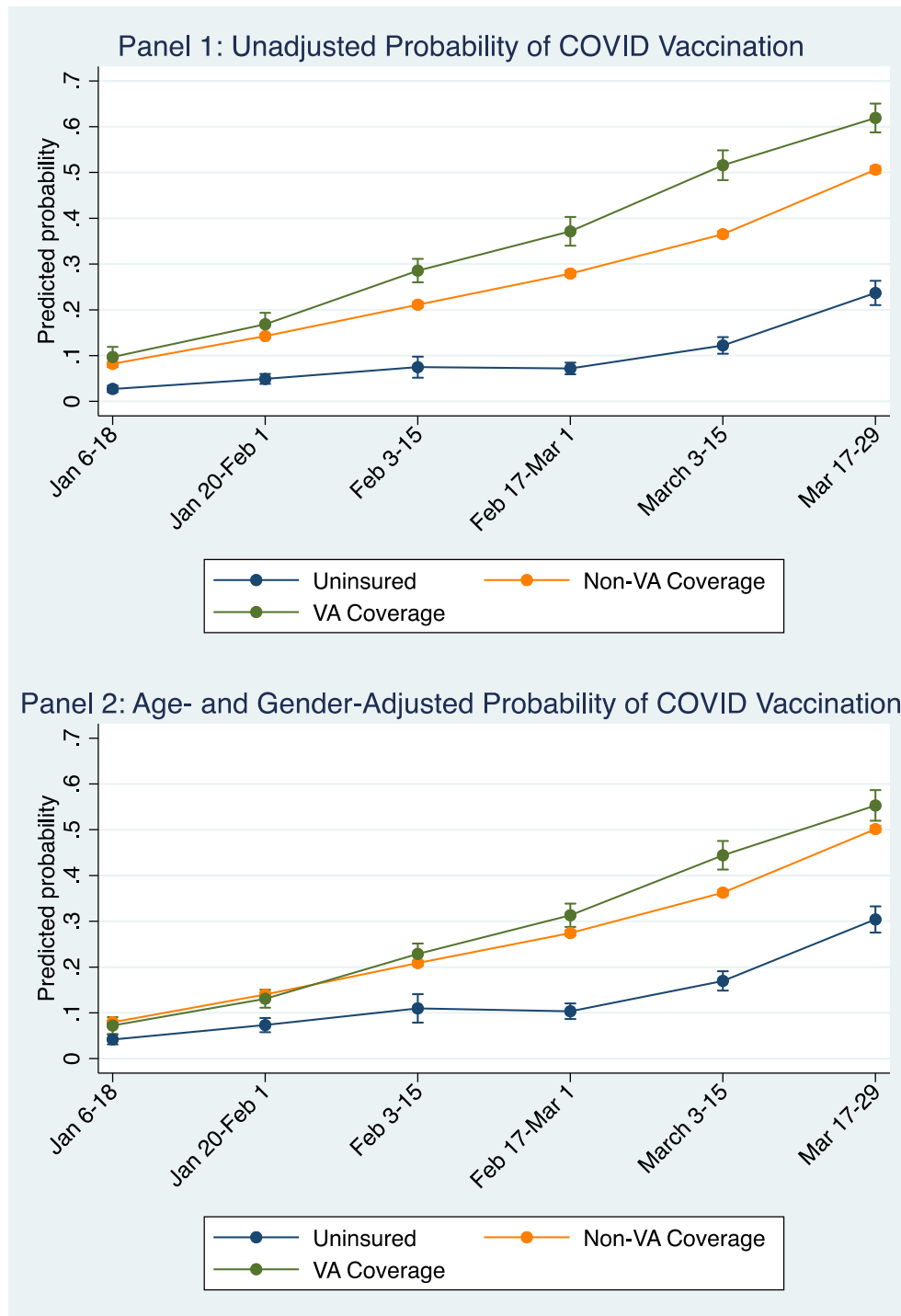
Figure 1 Probability of COVID-19 vaccination by coverage status, January 6–March 29, 2021 (*n* = 377,214). Sample size by coverage: uninsured, *N* = 18,976; non-VA coverage, *N* = 339,975; VA coverage, *N* = 18,263. Panel 1 displays predictive margins estimated from a survey-weighted logistic regression adjusted for insurance status (uninsured, non-VA coverage, VA-coverage), week, and week*insurance status interaction term. Point estimates are identical to calculations of weighted proportions of those vaccinated, by week and insurance subgroup. Panel 2 displays predictive margins produced from the survey-weighted logistic regression analysis adjusted for age category (18–29, 30–39, 40–49, 50–59, 60–69, 70–79, 80+), gender (male/female), insurance status (uninsured, non-VA coverage, and VA-coverage), week, and week*insurance status interaction term. For both panels, "weeks" refers to an indicator of one of 6 biweekly survey samples (January 6–18, January 20–February 1, February 3–15, February 17–March 1, March 3–15, and March 17–29) as shown on the *x*-axis labels. Following the Census Bureau's classification scheme, we categorized individuals as "uninsured" if they were without any public coverage (Medicare, Medicaid, or TRICARE/other military) and without private insurance (employer-provided or direct purchase); those with only Indian Health Service (IHS) or "other" coverage" were considered uninsured. We used code provided by the Stata Corporation for the calculation of margin standard errors that reflect successive difference replication (SDR) variance.

Table 1 COVID-19 Vaccination Status by Insurance Coverage and Race/Ethnicity, March 17–29 2021 (*n* = 62,953)

	Unadjusted	Adjusted*			
	Probability of vaccination	Probability of vaccination	Adjusted effect of coverage status	Adjusted effect of coverage status * race (95% CI)	*p* value
Uninsured—White	0.22	0.30	− 0.21	Reference	
Uninsured—Black	0.25	0.35	− 0.10	0.11 (0.02, 0.21)	0.021
Uninsured—Asian	0.34	0.49	− 0.08	0.13 (− 0.04, 0.29)	0.14
Uninsured—other	0.29	0.40	− 0.08	0.13 (−0.03, 0.29)	0.11
Uninsured—Hispanic	0.24	0.35	− 0.14	0.07 (− 0.01, 0.14)	0.087
Non-VA coverage—White	0.53	0.51	Reference	Reference	
Non-VA coverage—Black	0.44	0.45	Reference	Reference	
Non-VA coverage—Asian	0.55	0.57	Reference	Reference	
Non-VA coverage—other	0.44	0.48	Reference	Reference	
Non-VA coverage - Hispanic	0.43	0.49	Reference	Reference	
VA Coverage - White	0.62	0.49	− 0.02	Reference	
VA Coverage—Black	0.61	0.57	0.12	0.14 (0.05, 0.22)	0.001
VA Coverage—Asian	0.83	0.84	0.26	0.28 (0.09, 0.46)	0.003
VA Coverage—Other	0.59	0.54	0.06	0.08 (− 0.05, 0.21)	0.23
VA Coverage—Hispanic	0.56	0.54	0.05	0.07 (− 0.05, 0.18)	0.26

*Predictive margins and marginal effects were calculated using Stata's margins command after estimation of a survey-weighted logistic regression model. *The adjusted model was controlled for the following: age category (18–29, 30–39, 40–49, 50–59, 60–69, 70–79, 80+), gender (male/female), insurance status (uninsured, non-VA coverage, and VA-coverage), race/ethnicity (white, Black, Asian, other, Hispanic), and an insurance status*race/ethnicity interaction term. The "Adjusted effect of coverage status" represents the difference in the probability of vaccination between those with VA coverage (or uninsured) relative to those with non-VA coverage within each race/ethnicity group (e.g., Blacks with VA coverage relative to Blacks with non-VA coverage = 0.57 − 0.45 = 0.12). The "adjusted effect of coverage status * race" represents the difference in the probability of vaccination between those with VA coverage (or uninsured) relative to those with non-VA coverage, for each non-whiterace/ethnicity group, relative to the corresponding difference among whites (e.g., [Blacks with VA coverage − Blacks with Non-VA Coverage] − [Whites with VA coverage − Whites with Non-VA Coverage] = [0.57–0.45] − [0.49–0.51] = [0.12] − [− 0.02] = 0.14).*

Equitable access to VA facilities, greater vaccine supply, and direct outreach efforts—e.g., using mobile vaccination units[4] and air-lifting vaccine teams to remote areas[5]—may have contributed to the more equitable and faster vaccine uptake among those with VA access.

Our study has limitations. VA enrollment was self-reported and although our nationwide estimate of enrollment (8.6 million) appears reasonably accurate, some of these respondents might not be current enrollees/users, and our sample included a disproportionately large number of female veterans, limiting generalizability. The total number of persons who reported having been vaccinated in late March (116.5 million) exceeded the CDC's March 26 estimate of 101 million,[6] which might reflect inaccuracies in participants' recall, sampling error, or incomplete reporting to the CDC. Finally, many who reported VA coverage were likely vaccinated at non-VA facilities.

The relative success of the VA's vaccination roll-out could help inform ongoing and future vaccination efforts. Universal, comprehensive coverage, meanwhile, would likely mitigate disparities in uptake of services, including vaccination.

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Declarations:

REFERENCES

1. US Census Bureau. Source of the Data and Accuracy of the Estimates for the Household Pulse Survey. [cited 2021 Apr 26]; Available from: https://www2.census.gov/programs-surveys/demo/technical-documentation/hhp/Phase3_Source_and_Accuracy_Week_27.pdf

2. Kliff S. The Covid Vaccine Is Free, but Not Everyone Believes That. The New York Times [Internet]. 2021 Jun 1 [cited 2021 Oct 30]; Available from: https://www.nytimes.com/2021/06/01/upshot/covid-vaccine-hesitancy-cost.html

3. Levine DM, Linder JA, Landon BE. Characteristics of Americans With Primary Care and Changes Over Time, 2002–2015. JAMA Intern Med 2020 Mar 1;180(3):463–6.

4. Many veterans don't trust coronavirus vaccines. For a VA crew in the rural West, that means changing minds, one by one. [Internet]. Washington Post. [cited 2021 Apr 27]. Available from: http://www.washingtonpost.com/politics/2021/04/17/veterans-coronavirus-vaccine/

5. "As rural as you can get": Montana VA flies coronavirus vaccine to eager veterans [Internet]. Stars and Stripes. [cited 2021 Apr 27]. Available from: https://www.stripes.com/news/veterans/as-rural-as-you-can-get-montana-va-flies-coronavirus-vaccine-to-eager-veterans-1.664937

6. CDC. COVID Data Tracker [Internet]. Centers for Disease Control and Prevention. 2020 [cited 2021 Apr 27]. Available from: https://covid.cdc.gov/covid-data-tracker