Addressing racial/ethnic disparities in the COVID-19 vaccination campaign

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Introduction

As the COVID-19 vaccination campaign advances in the United States, unequal vaccination rates have compounded existing disparities in cases, hospitalizations, and deaths among Black, Indigenous, and Hispanic populations.[1–3] With states opening eligibility to all adults, equitable vaccine scale-up requires action to address the causes of differential coverage.

In this study, we quantify differential vaccine uptake rates by race/ethnicity within each US state in order to project disparities in vaccine coverage through July 2021, under a '*status quo*' scenario of continued differential uptake, and alternative scenarios that include efforts to reduce disparities by addressing allocation, access, and acceptance.

Methods

We analyzed demographic data (population distribution by age, race/ethnicity, census tract) from the American Community Survey. From state websites, we extracted shares of people receiving ≥1 vaccine dose, stratified by age and separately by race/ethnicity, through March 31, 2021. Combining these data, we estimated relative uptake rates by race/ethnicity within each state as the observed share of vaccinations for a racial/ethnic group, divided by the expected share if uptake across racial/ethnic groups within each age group were proportional to population size. This approach allowed us to control for the interaction of age-based eligibility criteria with differing demography by race/ethnicity, and thereby isolate impacts of differential vaccination accessibility and confidence.

We modeled vaccination scale-up within each census tract in a state under three scenarios. In all scenarios, we assumed a steady vaccination rate based on state-specific seven-day averages reported by the CDC between March 26-April 1. We assumed doses would be allocated to census tracts within a state either in proportion to population or prioritized based on the CDC Social Vulnerability Index, depending on the scenario. Within a census tract, we assumed doses would be allocated across groups in proportion to population size, weighted by relative uptake rates.

Results

In most states, relative uptake rates have been substantially higher among White compared to Black and Hispanic populations, by a median factor of 1.3 times for White compared to Black adults (IQR, 1.2-1.4) and median 1.4 times for White compared to Hispanic adults (IQR, 1.2-1.9) (Figure 1). Combined effects of disproportionate uptake and age-based eligibility have resulted in estimated coverage among Black and Hispanic adults (27%) being 39% lower than among White adults (44%) as of March 31, 2021.

If current disparities in uptake rates persist, Hispanic and Black adults would reach 75% coverage of ≥1 vaccine dose nationally 24 days and 30 days later, respectively, than White adults (Figure 2, '*Status quo*'). If relative uptake rates across racial/ethnic groups trended steadily from starting values toward 1.0 over six weeks, delays in reaching 75% thresholds would shrink to 16 and 21 days for Hispanic and Black adults, respectively (Figure 2, '*Equalized uptake*'). Geographic targeting, operationalized as doubling per-capita dose allocations for the

most disadvantaged quartile of census tracts in each state, would further reduce delays to reach 75% thresholds to 7 and 12 days for Hispanic and Black adults, respectively, and could narrow national coverage disparities on July 1, 2021 by 91% for Hispanic adults and 66% for Black adults (Figure 2, '*Equalized uptake and geographic targeting*').

Discussion

States should work to achieve equitable vaccination coverage through interventions that act on both supply and demand. Multiple states have implemented place-based allocation schemes.[4] Actions are also needed to eliminate transportation and language barriers, minimize unfair competition for appointments, increase vaccine confidence among marginalized populations, and accommodate work schedules. As the country races toward coverage goals required to control the epidemic, pro-equity policies are critical to ensuring that underserved communities are not left behind.[5]

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Figure 1. Relative rates of COVID-19 vaccination uptake, by race/ethnicity and state. Estimates shown for populations that exceed 200,000 and have data available on state reporting dashboards.

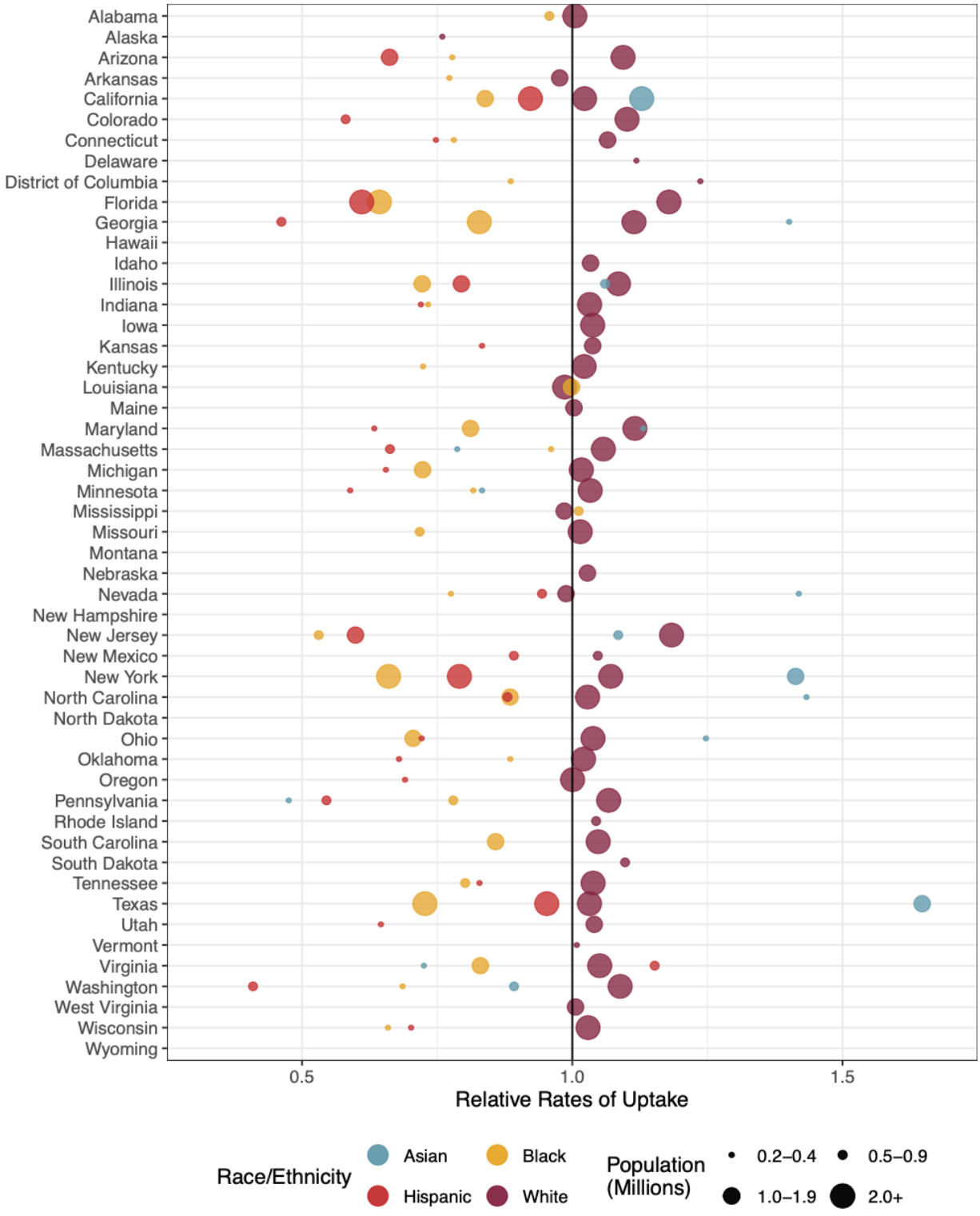

Figure 2. Coverage of one or more COVID-19 vaccination doses among population 16 years and older, by racial/ethnic group, aggregated to national level. Panels show scenarios: A) status quo, B) equalized uptake, and C) equalized uptake and geographic targeting. Dashed line shows overall coverage among the US population aged 16 years and older.