Improving Racial Equity in the Veterans Health Administration Care Assessment Needs Risk Score

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Research Objective: The VA computes the Care Assessment Needs (CAN) score weekly for over 5 million Veterans to predict risk of one-year mortality and to improve resource allocation to high-risk Veterans. Motivated by evidence of unfair predictive algorithms in other settings, our objective was to examined the CAN score for racial unfairness.

Study Design: We constructed a cross-sectional cohort of Veterans who were alive and had at least one outpatient primary care encounter during 2016, based on a VA national repository of administrative claims and electronic health data containing inpatient, outpatient, laboratory, procedure, and pharmacy encounters. We used the last score of the CAN 2.5 model (current CAN version) in 2016 for all analyses. First, we descriptively compared distributions of the last CAN scores in 2016 for self-identified White and Black Veterans. Second, we assessed CAN fairness by calculating the false-negative rate (FNR) as our primary fairness metric, defining a "positive" prediction at or above the 80th percentile for Black and White Veterans. Deaths were confirmed using 2017 mortality data. Third, to investigate contributors to unfairness, we compared pooled mortality within strata of Black and White Veterans based on exact matches of the most influential variables in the CAN model: age and Elixhauser comorbidities. To account for class imbalance (lower representation of Black Veterans) we re-assessed fairness after re-training the CAN model by upweighting the Black cohort.

Population Studied: Our population consisted of 791,438 (18.3%) Blacks and 540,877 (81.7%) Whites.

Principal Findings: Black Veterans were younger (median age 59 vs. 67) and more likely to suffer from PTSD (30.9% vs. 22.4%) and be unmarried (58.8% vs. 42.9%). CAN scores were lower for Blacks than Whites (mean [SD] 41.8 [28.2] vs 52.2 [28.1]) and appeared more unfair for Blacks than Whites (FNR 35.3% vs. 26.5%, meaning CAN under-predicted death for Blacks versus Whites). When matching on comorbidities, the pooled mortality rate was lower for Blacks (2.1% vs. 3.6%), largely because younger Blacks had similar comorbidities to older White Veterans. This discrepancy was mitigated after additionally matching on age (pooled mortality 2.9% vs. 3.0%). Accounting for class imbalance marginally reduced unfairness for Blacks vs. Whites (FNR 34.1% vs. 25.4%).

Conclusions: The CAN score, a widely-used VA risk model, underestimates mortality risk for Black relative to White Veterans. Differences in the age distributions strongly suggest statistical unfairness driven by confounded social factors. Addressing class imbalance only marginally improves fairness.

Implications for Policy or Practice: This is the first study to show systematic racial unfairness in a VA algorithm due to a relatively young and sick Black population, a mechanism of unfairness that could apply to other care management algorithms. Mitigating algorithmic unfairness may require data on social determinants of health and should be a priority to improve VA healthcare equity.

Primary Funding Source: Department of Veterans Affairs.

Racial Disparities in Access to Potential COVID-19 Vaccine Administration Facilities across US States: A Geographic Information Systems Analysis

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Research Objective: A major challenge in the design of vaccine distribution and administration plans is ensuring equitable access to COVID-19 vaccines among racial minority populations, who have been disproportionately affected by the pandemic.

We calculated driving distance to the closest potential COVID-19 vaccine administration facility for a representative sample of the US population and estimated whether race was associated with access to healthcare facilities that may serve as COVID-19 vaccine administration locations.

Study Design: We mapped community pharmacies providing immunization services as of October 1, 2020, federally qualified health centers, rural health clinics, and hospital outpatient departments. For a 1% sample of a US synthetic population, we computed driving distance to the closest facility using ArcGIS Network Analyst and a national transportation dataset. For each state, we calculated the proportion of population with ≥10 miles distance to the closest facility and the odds ratio of having a distance≥10 miles to the closest facility for Black compared to White residents.

Population Studied: 1% sample of the 2010 U.S. Synthetic Population developed by RTI International (n = 2,982,544).

Principal Findings: The mean (median) number of potential COVID-19 vaccine administration facilities per state was 988 (1335) and ranged from 201 in WY to 6577 in CA. In 21 states, more than 5% of the population had a driving distance ≥10 miles to the closest facility. In ND, SD, MT, WY, NE, and KS, over 10% of the population had a driving distance ≥10 miles.

In 17 states, Black residents were more likely to live ≥10 miles to the closest facility than White residents. Among these 17 states showing statistically significant disparities, there were 8 states where Black residents were at least 5 times more likely to have a driving distance ≥10 miles than White residents, including AK, CT, DE, MA, NJ, RI, UT, and DC. Additionally, in CA, NV, and SC, Black patients were 2 to 5 times more likely to have a driving distance ≥10 miles to the closest facility.

Conclusions: There exists large state-level variation in racial disparities in access to potential COVID-19 vaccine administration facilities. While states with a greater proportion of the overall population ≥ 10 miles to the closest facility were concentrated in the Midwest, states with significant racial disparities, mostly placed along the coasts, tend to be more populous with highly diverse racial composition.

Implications for Policy or Practice: Ensuring an equitable COVID-19 vaccine administration among the U.S. population is the current public health priority. Our analyses can guide public health officials in the identification of areas that necessitate additional infrastructure for a equitable vaccine distribution. This is of upmost importance to prevent the historical disparities in access to health care from further magnifying disparities in COVID-19 related outcomes.

Primary Funding Source: West Health Policy Center.

An Examination of COVID-19 Mortality in High-Minority Nursing Homes

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Research Objective: Racial/ethnic disparities in healthcare have been highlighted by the recent COVID-19 pandemic. Using the Centers for Medicare and Medicaid Services' Nursing Home COVID-19 Public File, we examined the relationship between nursing home racial/ethnic mix and COVID-19 resident mortality. Additionally, we examined the effects of resident characteristics, market resource availability, and organizational characteristics as it relates to nursing home racial/ethnic disparities in COVID-19 mortality.

Study Design: Multivariate regressions were used to model the relationship between COVID-19 deaths and the proportion of racial/ethnic minority residents (Black and Hispanic residents). Given the overdispersion of the count dependent variable (number of COVID-19 deaths), negative binomial regressions were used. We used four nested sequential models to examine the separate contributions of facility-level resident characteristics, resource availability, and other organizational characteristics to racial/ethnic disparities in COVID-19 deaths. In addition, we controlled for size and interstate differences using state fixed effects.

Population Studied: The study sample consisted of all US nursing homes included in the CMS Nursing Home COVID-19 Public File, or 15,382 nursing homes, which mirrors the national census of facilities.

Principal Findings: As of October 25, 2020, high minority nursing homes reported 6.5 COVID-19 deaths as compared to 2.6 deaths for nursing homes that had no racial/ethnic minorities. After controlling for interstate differences, facility-level resident characteristics, resource availability, and organizational characteristics, high-minority nursing homes had 61% more COVID-19 deaths (Incidence Rate Ratio [IRR] = 1.61; p < 0.001) as compared to nursing facilities with no minorities.

Conclusions: From a policy perspective, nursing homes, that serve primarily minority populations, may need additional resources, such as, funding for staffing and personal protective equipment in the face of the pandemic. The COVID-19 pandemic has sharpened the focus on healthcare disparities and societal inequalities in the delivery of long-term care.

Implications for Policy or Practice: This study shows the disparate effect that COVID-19 has had on nursing home mortality based on resident racial/ethnic mix. Even after controlling for interstate differences, facility-level resident characteristics, resource availability, and organizational characteristics, high-minority nursing homes had almost three times the probability of having COVID-19 deaths compared to those with no minorities. These findings highlight the existing and systemic health disparities in nursing homes and the tangible impact it has on racial/ethnic minorities. Death due to COVID-19 is greater risk for racial/ethnic minorities in nursing homes relative to White residents. Nursing homes that serve larger minority populations may need additional resources to combat this crisis.

Bridging Data Science Approaches to Improve the Health and Care of Children of Incarcerated Parents

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Research Objective: Mass incarceration has had an undeniable toll on childhood poverty and inequality, however, little is known about the