

Racial and Ethnic Differences in Treatment of Hospitalized and Critical COVID-19, January 2021-April 2022

Ashley I. Martinez¹, Jillian Burk¹, Meredith Epperson¹, Caroline Jjingo², Jane Baumblatt³, Hye Seung Lee², Yueqin Zhao², Danijela Stojanovic², Efe Eworuke², Adebola Ajao²

¹ Department of Population Medicine, Harvard Medical School and Harvard Pilgrim Health Care Institute, Boston, MA, USA; ² Center for Drug Evaluation and Research, United States Food and Drug Administration, Silver Spring, MD, USA; ³ Center for Biologics Evaluation and Research, United States Food and Drug Administration, Silver Spring, MD, USA

Presented at the 39th International Conference on Pharmacoepidemiology and Therapeutic Risk Management (Halifax, Nova Scotia, Canada; 23-27 August 2023)

BACKGROUND



- Characteristics of patients with COVID-19 and risk factors for severe disease are well-described.
- Research has shown that minoritized groups have been disproportionately impacted by COVID-19 infections, hospitalizations, and deaths.^{1,2}
- As therapeutic options have expanded, treatment patterns are less clear. Of particular interest is whether disparities persist in treatment patterns among racial and ethnic groups.

OBJECTIVES



Describe treatments for hospitalized and critical COVID-19 patients by race and ethnicity from January 2021 through April 2022.

METHODS

Data and Population:

- The U.S. Food and Drug Administration (FDA) Sentinel System's TriNetX Live™ EHR database³
 - Data aggregated from 36 organizations in the USA Network who maintain actual dates for all records
- Constructed cohorts (only patients with known race) from January 1, 2021 to April 30, 2022 (Figure 1)
 - "Hospitalized COVID-19": inpatient stay within ± 3 days of first COVID-19 diagnosis/(+) test
 - "Critical COVID-19": ICU stay/respiratory support 0-7 days after first COVID-19 diagnosis/(+) test

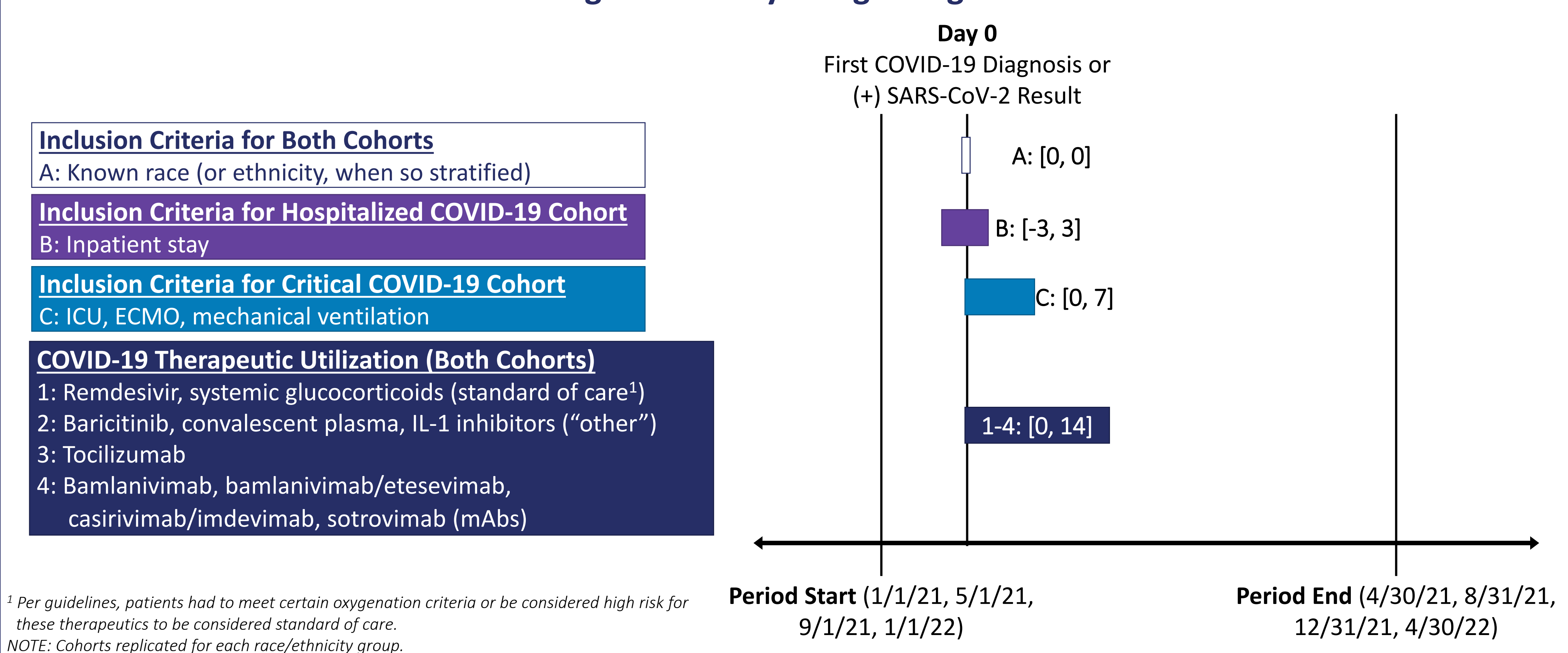
Outcomes:

- COVID-19 therapeutic utilization (Figure 2)

Statistical Analysis:

- Descriptive statistics; variation quantified with standardized mean differences (SMDs)

Figure 1. Study Design Diagram



RESULTS

- Identified 189,230 patients with known race and hospitalized COVID-19 and 32,960 (17.4%) critical COVID-19 patients with known race
 - 74.3% White, 22.2% Black, 2.9% Asian, 0.6% Other Race
- Compared to white patients, minoritized races and ethnicities were younger.

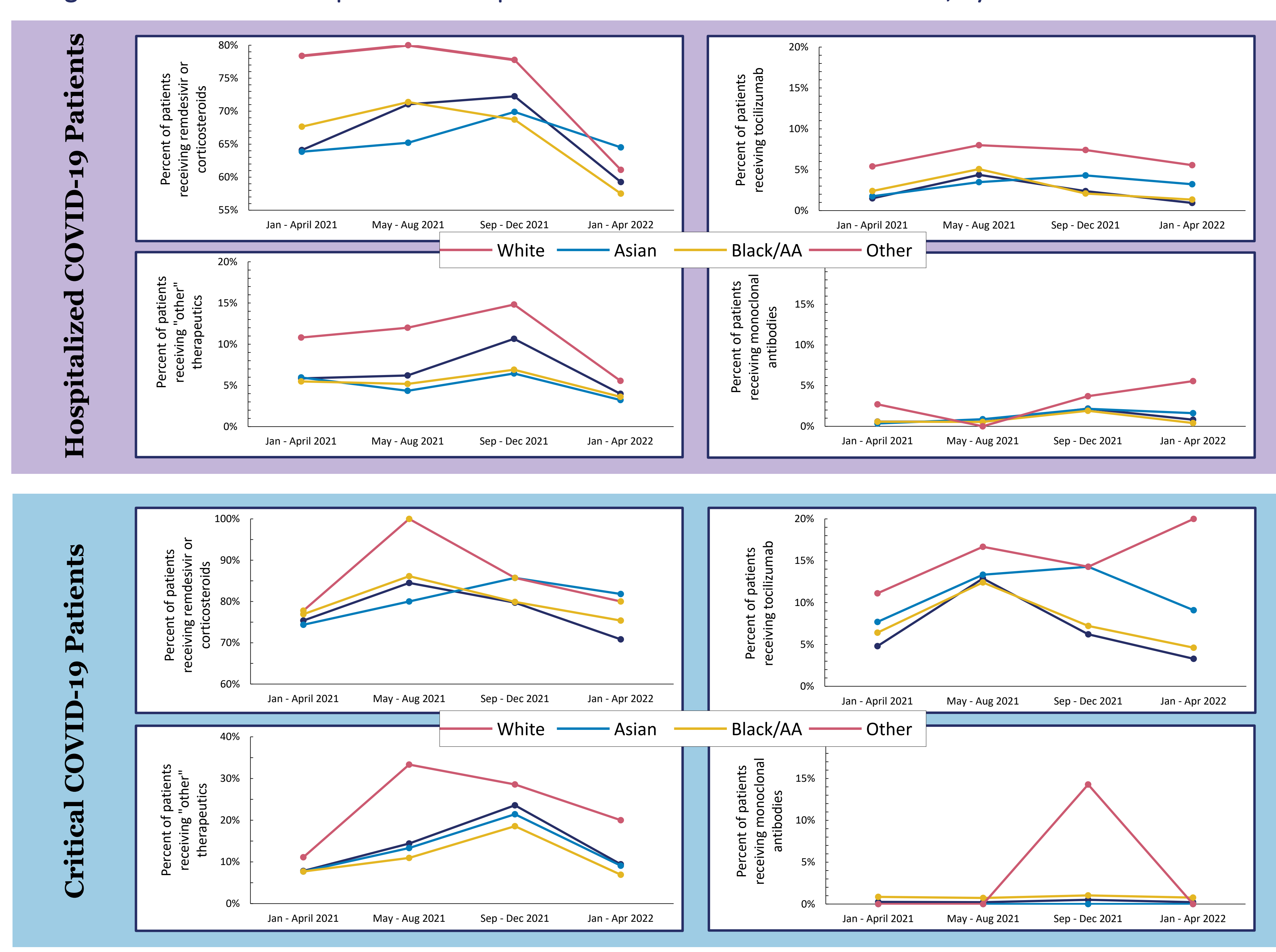
Table 1. Hospitalized COVID-19 Cohort Characteristics, by Race and Ethnicity¹

	White (N = 140,670)	Other ² (N = 1,070)	Asian (N = 5,550)	Black/AA (N = 41,940)	Not Hispanic/Latino (N = 161,270)	Hispanic/Latino (N = 32,790)
	N/Mean (%/SD)	N/Mean (%/SD)	N/Mean (%/SD)	N/Mean (%/SD)	N/Mean (%/SD)	N/Mean (%/SD)
Mean Age ³	53.3 (25.3)	48.0 (22.5)*	45.3 (26.3)*	47.5 (24.0)*	53.8 (24.5)	37.0 (25.3)*
Age ≥ 90 years ³	5,713 (4.1%)	17 (1.6%)	164 (3.0%)	807 (1.9%)	6,253 (3.9%)	357 (1.1%)
Female	70,091 (49.8%)	569 (53.2%)	2,731 (49.2%)	23,437 (55.9%)	82,094 (50.9%)	16,276 (49.6%)
COVID-19 Vaccination	7,540 (5.4%)	80 (7.5%)	280 (5.0%)	2,190 (5.2%)	8,550 (5.3%)	1,430 (4.4%)
Critical COVID-19	24,950 (17.7%)	270 (25.2%)	790 (14.2%)	6,950 (16.6%)	27,100 (16.8%)	4,410 (13.4%)

* |SMD| ≥ 0.2. When stratifying by race, SMDs were calculated using White Race as the referent group. Not Hispanic/Latino was the reference group when stratifying by ethnicity.
¹ Cohorts stratified by race created among those with known race (90.5%). Cohorts stratified by ethnicity created among those with known ethnicity (92.8%).
² Other race includes American Indian, Alaska Native, Native Hawaiian, and Other Pacific Islander.
³ Age distribution calculated among patients less than 90 years old at admission to protect patient privacy.

- Standard of care was the most common treatment across all groups. More critical COVID-19 patients were treated compared to hospitalized COVID-19 patients (SMDs 0.2-0.3 depending on treatment).
- The "Other" race cohort had the highest proportion of treatment in each category.
- Hospitalized COVID-19 Asian, Black, and White patients' treatment rates were similar, except for tocilizumab, where minoritized patients' rates were ~20% higher.

Figure 2. COVID-19 Therapeutics in Hospitalized and Critical COVID-19 Patients, by Race and Time Period



CONCLUSIONS

- Both COVID-19 cohorts were mainly of White race and non-Hispanic ethnicity (though 9.5% and 7.2% of patients were excluded due to unknown race and ethnicity, respectively)
- Larger treatment differences between minoritized and non-minoritized groups among critical COVID-19
- Future work should adjust for known confounders and explore potential causes of treatment differences.

ACKNOWLEDGEMENTS, DISCLOSURES, AND REFERENCES

- This project was supported by Task Order 75F40119F19001 under Master Agreement 75F40119D10037 from the U.S. FDA.
- The views expressed represent those of the presenter and do not necessarily represent the official views of the U.S. FDA.
- Many thanks are due to TriNetX who provided data used in the analysis.
- The authors have no conflicts of interest to disclose.

¹ Golestaneh L et al. The association of race and covid-19 mortality. *EclinicalMedicine*. 2020;25:100455.

² Pan D et al. The impact of ethnicity on clinical outcomes in COVID-19: A systematic review. *EclinicalMedicine*. 2020;23:100404.

³ For more information on TriNetX and Sentinel, see: <https://www.sentinelinitiative.org/methods-data-tools/methods/trinetx-rapid-querying>