

Utilizing Quantitative COVID-19 Serological Testing to Determine Current Immune Status and Predict Future Protection

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Background

Coronavirus disease 2019 (COVID-19 caused by SARS-COV-2) was first detected in China in late 2019 and has become a global pandemic. While there are many studies of COVID-19 including the creation of a vaccine, no study has yet determined the strength and length of antibody response to the disease, or the potential modifying effects on developing an antibody response.

Methods

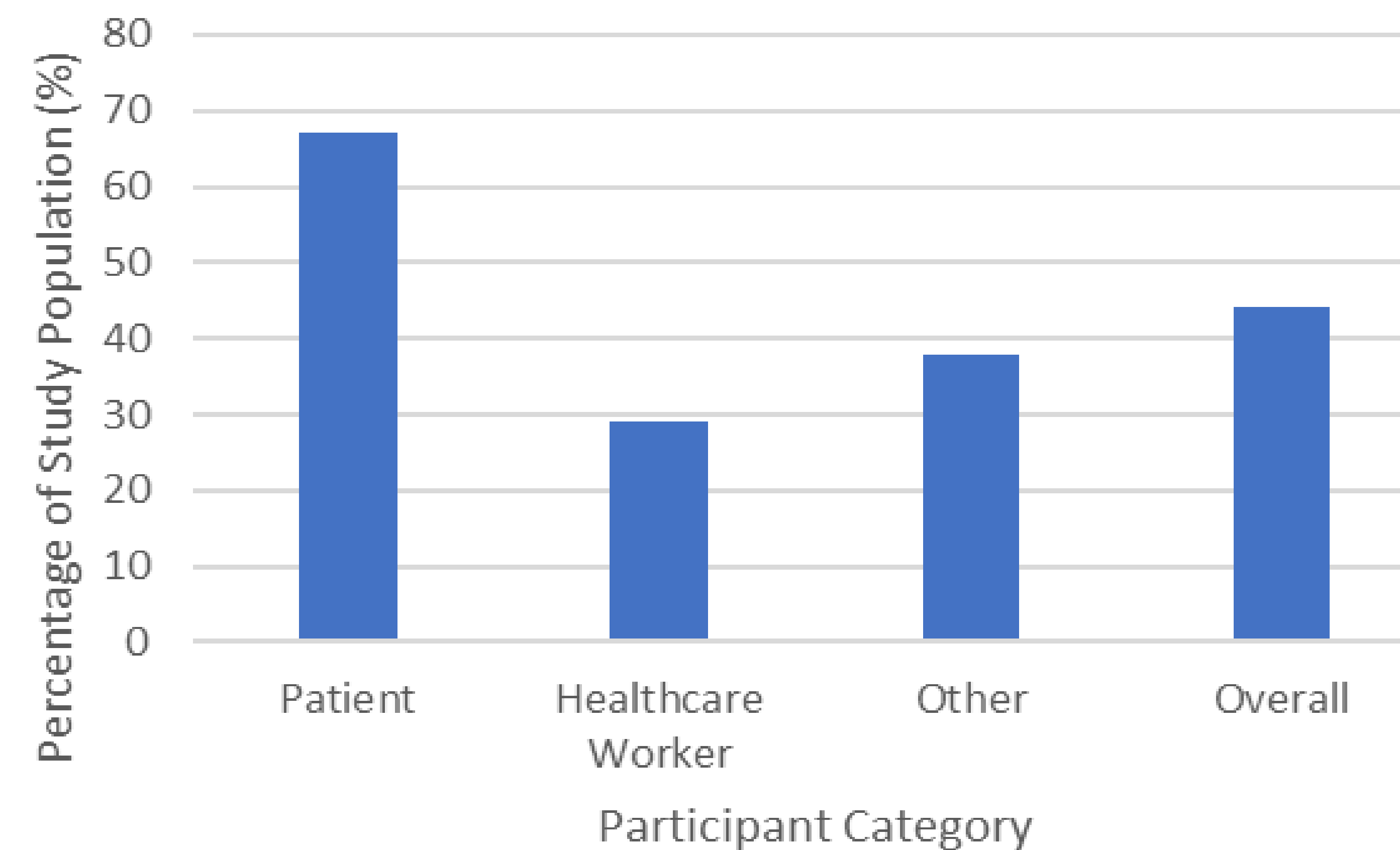
We have an ongoing prospective cohort study of 166 participants which included healthcare workers, and those patients with a COVID diagnosis. The participants filled out a demographic survey which included COVID-19 related questions and had baseline blood samples collected to determine antibody status. ELISAs to purified receptor binding domain of SARS-COV-2 were performed. Seropositivity was defined as values greater than 3 standard deviations above the average of serum collected prior to 2018. Factors related to seropositivity were investigated using SPSS Chi-square analysis to determine significance using $p < 0.05$ as threshold for significance.

Results

Table 1. Characteristics of Study Participants (N=166)

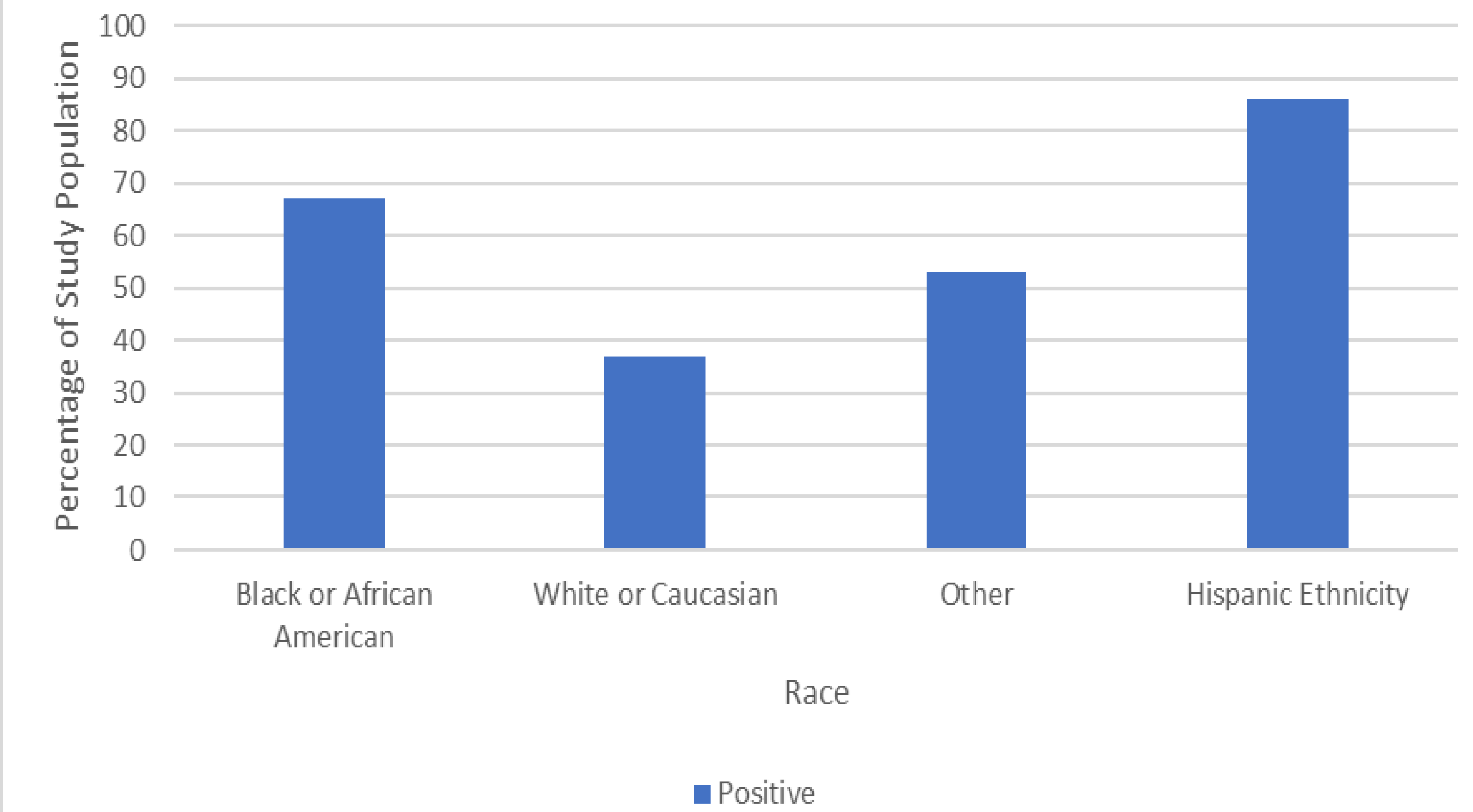
	Positive Serology (%)	Negative Serology (%)	P-Value
Number of Participants	73 (44)	93 (56)	
Participant Category			p<0.000
Patient	38 (67)	18 (33)	
Healthcare Worker	22 (29)	54 (71)	
Other	13 (38)	21 (62)	
Age in Years			p=0.143
<35	19 (36)	34 (64)	
35- 55	33 (53)	29 (47)	
>55	20 (40)	30 (60)	
Gender			p=0.984
Male	30 (43)	40 (57)	
Female	40 (43)	53 (57)	
Hispanic or Latino	12 (86)	2 (14)	p=0.001
Race			p=0.011
Black or African American	20 (67)	10 (33)	
White or Caucasian	45 (37)	76 (63)	
Other	8 (53)	7 (47)	
Took Care of COVID + Patients at Job	24 (36)	42 (64)	p=0.361

Participants with Positive Serology by Category



Results

Serology of Study Population by Race



Discussion

Patients were more likely to have a positive antibody serology than health care workers. Furthermore, those with Hispanic ethnicity and those of Black or African American race were also more likely to have COVID-19 antibodies. Gender and age were not related to antibody positivity. Interestingly, participants who have taken care of COVID-19 patients at work were no more likely to have positive antibodies than those who haven't.

Future Studies

Future studies will follow those who are seropositive over time to determine length and strength of antibody response as well as measuring the antibody response to the current vaccines.

Acknowledgement

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