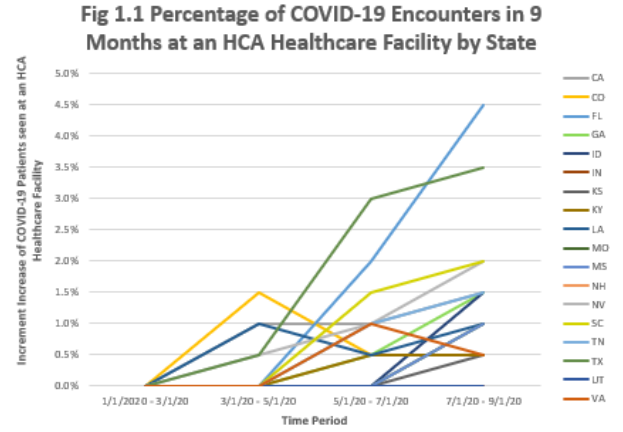
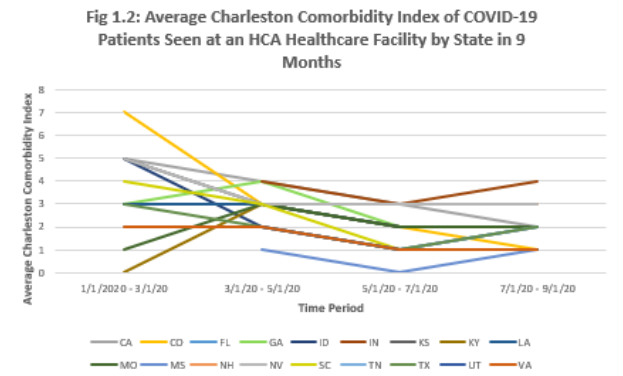
with the average CCI score for COVID-19 patients in 2-month increments. Patient outcomes were obtained across the entire population.

Results. A clear surge of infected patients was seen in almost all states in the dataset from May 2020 onward except in Colorado and Louisiana where the percentage of COVID-19 positive encounters decreased until July 2020. As summer 2020 progressed, the highest percentage of COVID-19 positive encounters among HCA Healthcare facilities was in Florida and Texas. However, despite the fact that more patients were COVID-19 positive in these states, the CCI score was the lowest (Figure 1). The highest average CCI throughout the 9-month period was 7.66 in Colorado. In the first two months of the pandemic, patients who tested positive for COVID-19 had higher CCI scores on average than those who became COVID-19 positive later in the pandemic. Missouri had the lowest CCI average but the highest ICU admissions and in-hospital mortality. Indiana had the lowest average CCI score, and lowest admission rate (Figure 2).

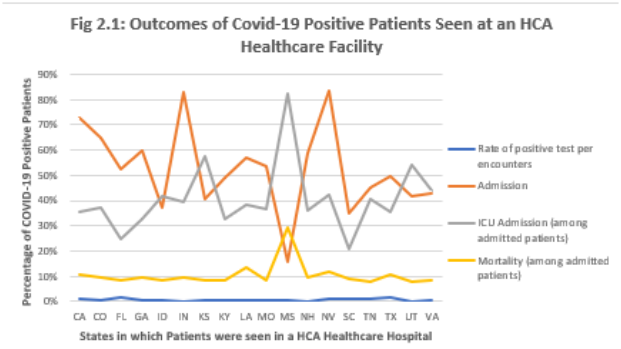
COVID-19 Encounters and Average CCI score by State from January 2020 to September 2020

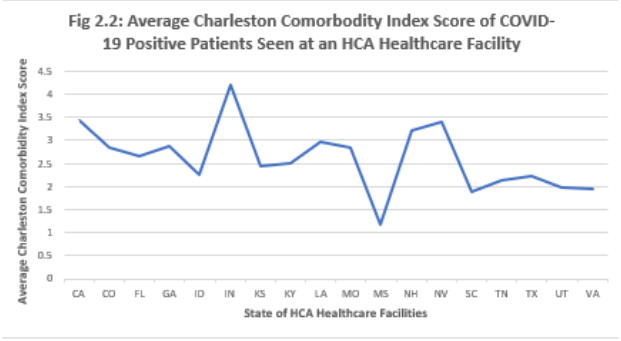




Graph 1: Percentage of COVID-19 Encounters in 9 Months at an HCA Healthcare Facility by State: Graph presents data obtained for the total of 92,800 patient encounters from January to September 2020 and recorded in 2-month increments. The rate of positive encounters throughout 18 states increased on average from May to September. From January to March 2020, the facilities with the highest rate of COVID-19 encounters were in Colorado, Louisiana and Texas. The states with the highest increment increase of COVID-19 positive patients were Texas, Florida and South Carolina and were trending up as the pandemic wore on through the summer of 2020. Graph 2: Average Charleston Comorbidity Index of COVID-19 Patient Seen at an HCA Healthcare Facility by State in 9 Months: In winter 2020 (January to March 2020) the average CCI score for patients seen with COVDI-19 was higher than in the Spring and Summer 2020 in all states except in Montana and Kentucky. Summer 2020 (May to July 2020) demonstrated some of the lowest average CCI scores for COVID-19 positive patients seen at an HCA Healthcare Facility.

Rate of Positive COVID-19, Patient Outcomes and Average Charleston Comorbidity Index Score by State





Graph 3: Outcomes of COVID-19 Positive Patients Seen at an HCA Healthcare Facility: Mortality and ICU admission was the highest in Missouri, however, the state had the least COVID-19 patients admitted. The rate of positive test per encounter was the highest in Florida and Texas. Texas had a higher mortality among admitted COVID-19 patients than Florida, however, Florida had a higher percentage of COVID-19 patients admitted. Graph 4: Average Charleston Comorbidity Index Score of COVID-19 Positive Patients Seen at an HCA Healthcare Facility: Average CCI was the lowest in Missouri. The states with the highest CCI score were Indiana, California, New Hampshire and Nevada.

Conclusion. We observed an inverse correlation between CCI score and COVID-19 incidence while seeing that, on average, COVID-19 positive patients had higher CCI score in the first few months of the pandemic when incidence rate was lower. CCI score did not correlate to ICU admission, but a higher CCI score correlated to higher admission rate.

Disclosures. **All Authors**: No reported disclosures

453. Neutralizing Antibody Responses to SARS-CoV-2 in Professional Soccer Players

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Session: P-21. COVID-19 Research

Background. The Brazilian Football Confederation (CBF) protocol to control the spread of COVID-19 among professional soccer players is based on four cornerstone measures: (1) Tracing all symptomatic and asymptomatic COVID-19 cases by clinical monitoring and nasal swab SARS-CoV-2 RT-PCR testing up to 3 days before the

soccer games; (2) Respiratory isolation of all SARS-CoV-2 positive players for at least 10 days, regardless symptoms; (3) All player with clinical suspicion of COVID-19 were immediately quarantined; (4) If a player became SARS-CoV-2 positive after the game, the other players were allowed to play the next game, if they remained asymptomatic and SARS-CoV-2 RT-PCR negative. Understanding how antibody responses to SARS-CoV-2 evolve can provide insights into therapeutic and testing approaches for COVID-19. In the present study we profile the antibody responses of players up to nine months from a SARS-CoV-2 positive RT-PCR test.

Methods. Serum samples were obtained from 955 soccer players, and analyzed at the same laboratory in São Paulo city, in the Hospital Israelita Albert Einstein. It was used the cPas Technology, the sVNT kit for detecting and measuring circulating neutralizing antibodies against the SARS-CoV-2 virus.

Results. Neutralizing antibody was positive for 416 samples (416/955=44%; C.I. 95%= [40%; 47%]). From the 955 soccer players, 454 had RT-PCR+ previously, up to nine months until the neutralizing antibody tests. From this 454 players, 172 (38%) had neutralizing antibody below 20% (C.I. 95% = [34%; 42%]), 30 (7%) between 20% and 30% (C.I. 95% = [5%; 9%]), and e 252 (56%) above 30% (C.I. 95% =[51%; 60%]). Antibody responses to SARS-CoV-2 were significantly higher in individuals RT-PCR+ (Table 1). There was no difference between the neutralizing antibody responses status to SARS-CoV-2 and the time between the RT-PCR+ and the neutralizing antibody test (p-value = 0.423; Figures 1 and 2, Table 2).

Table 1. Neutralizing antibody responses to SARS-CoV-2.

		Neutralizing Antibody			
RT-PCR for SARs-CoV-2	Sample size	Below 20%	Between 20% and 30%	Above 30%	p-value
+	454	172 (38%)	30 (7%)	252 (56%)	< 0.01
-	501	367 (73%)	17 (3%)	117 (23%)	

Figure 1. Scatter plot with Time between RT-PCR+ and neutralizing antibody (days) versus Neutralizing antibody levels.

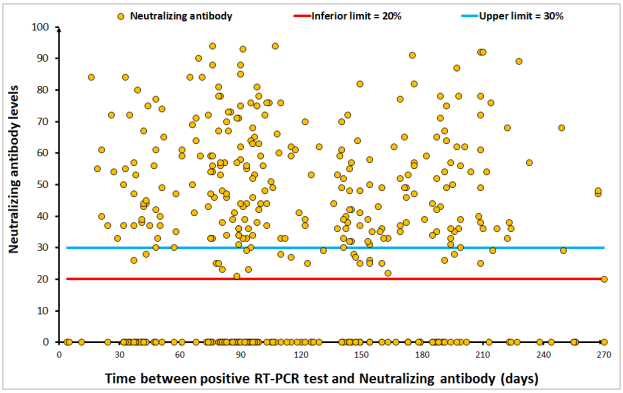
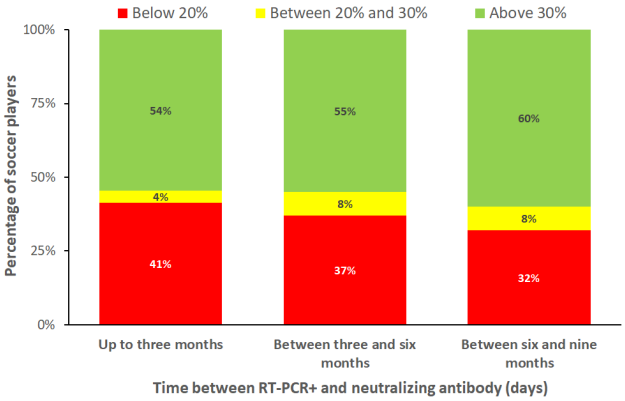


Table 2. Time between RT-PCR+ and neutralizing antibody (days) versus Neutralizing antibody levels.

		Neutralizing Antibody			
Time between RT-PCR+ and neutralizing antibody (days)	sample size	Below 20%	Between 20% and 30%	Above 30%	p-value
Up to three months	179	74 (41%)	8 (4%)	97 (54%)	
Between three and six months	190	71 (37%)	15 (8%)	104 (55%)	0.423
Between six and nine months	85	27 (32%)	7 (8%)	51 (60%)	

Conclusion. This study found neutralizing activity of infection against SARS-CoV-2 in 63% RT-PCR+ individuals, but only in 26% in RT-PCR(-) players. Level of neutralizing antibody responses maintained stable until up to nine months after a RT-PCR+.

Figure 2. Percentage of soccer players at each antibody level (below 20%, between 20% and 30%, and above 30%) versus time between the positive RT-PCR test and neutralizing antibody test (days).



Disclosures. **All Authors**: No reported disclosures

454. Impact of Covid-19 on Infectious Disease Fellows in the United States: A National Survey to Identify Targets for Intervention.

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Session: P-21. COVID-19 Research

Background. The Coronavirus disease of 2019 (COVID-19) global health crisis has resulted in an unprecedented strain on healthcare systems, reorganization of medical training programs and disruption in professional and personal lives of medical trainees. The impact of COVID-19 on infectious disease (ID) fellows, who are frontline healthcare professionals, has not been assessed.

Methods. We conducted a national survey of adult and pediatric ID fellows to assess impact on educational activities, availability of personal protective equipment (PPE), well-being, and career prospects. Anxiety and burnout were assessed by 7-item generalized anxiety disorder scale and abbreviated Maslach burnout inventory respectively. Invitations to participate in the survey were sent via email to all ID fellows through Accreditation Council for Graduate Medical Education (ACGME) fellowship directors. Survey responses collected from August 1 to September 30, 2020 have been reported.

Results. 136 fellows completed the survey (Table 1). 84% reported their institution had provided evidence-based didactics for management of COVID-19 and 53% indicated their general ID didactics were affected by the pandemic. 86% of fellows were involved in care of patients with COVID-19, and 31% reported a shortage of PPE affecting their clinical duties. Those living in highly impacted states (CA, FL, NY, TX) at the time of the survey were 1.70 times as likely to experience moderate to severe anxiety (vs. minimal to moderate) than those in other states; similarly, those who saw ≥11 COVID-19 patients weekly and reported PPE shortages were 2.5 and 2.0 times as likely,