

COVID-19 survivors who are experiencing financial distress following diagnosis with COVID-19 based on ethnicity

Ethnicity	Are you now in financial distress due to your COVID illness?			
	Total	Yes (%)	No (%)	No Response
African American	46	17	29	0
Caucasian/White	31	4	27	0
Hispanic	79	31	48	0
Asian	14	3	11	0
Total	170	55	115	0

**Conclusion.** Hispanics reported the most financial distress and with nearly 40% losing their jobs, the highest in our study group. 37% of African Americans experienced job loss and financial distress following their diagnosis with COVID-19. Only 63% of African Americans and 80.7% of Hispanics were willing to get vaccinated, mostly due to lack of trust in the vaccine. Statistical analysis showed Hispanics and African Americans were more likely to lose their jobs and refuse COVID-19 vaccination following diagnosis with COVID-19.

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

#### 457. High Levels of Serum Troponin I Indicate Higher Mortality Risk in Patients with COVID-19

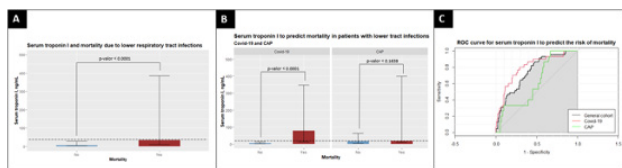
Paula Ramirez, n/a<sup>1</sup>; Daniela Parra-Tanoux, n/a<sup>2</sup>; Ingrid G. Bustos-Moya, BSc<sup>2</sup>; Yuli Fuentes, n/a<sup>2</sup>; Elsa Daniela Ibañez-Prada, BSc<sup>1</sup>; Oriana Narváez - Ramírez, n/a<sup>2</sup>; Lina Morales-Cely, n/a<sup>2</sup>; Laura A. Bravo-Castelo, n/a<sup>2</sup>; Salome Gomez-Duque, n/a<sup>1</sup>; Enrique Gamboa-Silva, n/a<sup>1</sup>; Edar Caceres, MD<sup>2</sup>; Luis F. Reyes, MD, PhD<sup>3</sup>; <sup>1</sup>Universidad de la Sabana, Chía, Colombia, Bogota, Distrito Capital de Bogota, Colombia; <sup>2</sup>Universidad de la Sabana, Bogota, Distrito Capital de Bogota, Colombia; <sup>3</sup>Universidad de La Sabana, Bogota, Distrito Capital de Bogota, Colombia

**Session:** P-21. COVID-19 Research

**Background.** Up until this day, over 3.5 million fatalities related to coronavirus disease 2019 (COVID-19) have been registered worldwide by the World Health Organization. Healthcare professionals require prognostic tools for COVID-19 patients in order to guide treatment strategies. Elevated troponin levels, a biomarker of cardiac injury, have been detected among patients with COVID-19, hence associating it with cardiac injury. Although several studies have mentioned it, the role of troponin as a prognosis biomarker is unclear. Elevation in troponin levels has been observed in patients with community-acquired pneumonia (CAP). However, its association with mortality is scarcely mentioned in literature. Thus, we sought to determine the utility of serum troponin I levels as a mortality predictor for patients with COVID-19 and CAP.

**Methods.** A prospective observational study was carried out at Clinica Universidad de La Sabana, Colombia, with patients hospitalized due to CAP and COVID-19. Troponin biomarker was quantified in serum samples using the PATHFAST system within the first 24 hours of hospital admission. Serum concentrations of troponin were compared among study groups. To assess the biomarker's capacity to predict mortality, ROC curves were used, quantifying their differences through the DeLong's test.

**Results.** A total of 88 patients with CAP and 152 with COVID-19 were included in the study. In all cohort the median [IQR] serum concentration of troponin (ng/ml) was higher in those who died (34.2, [9.74-384] vs 5.89, [2.44-27.9]  $p < 0.001$ ). Furthermore, troponin was higher in deceased patients with COVID-19 vs those who survived (77.35 [11.9-346.5] vs 4.88 [2.10-13.02],  $p < 0.001$ ). However, there was no significant difference between CAP deceased and not deceased patients (18.1 [8.52-398] vs 15.7 [3.75-62.8],  $p = 0.16$ ). Although sample size might be a limitation when analyzing these results, the AUC ROC of troponin I to predict mortality was 0.799 for COVID-19 and 0.615 for CAP; the DeLong's test for compared ROC curves was a  $p = 0.0351$ .



A. Serum troponin I and mortality due to lower respiratory tract infections B. Serum troponin I to predict mortality in patients with lower tract infections C. ROC curve for serum troponin I to predict risk of mortality

**Conclusion.** Overall, troponin levels were higher among deceased patients. Our findings suggest that high troponin levels are a mortality predictor for patients with COVID-19.

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#### 458. A Machine Learning Approach Identifies Distinct Early-Symptom Cluster Phenotypes Which Correlate with Severe SARS-CoV-2 Outcomes

Nusrat J. Epsi, n/a<sup>1</sup>; John H. Powers, MD<sup>2</sup>; David A. Lindholm, MD<sup>3</sup>;

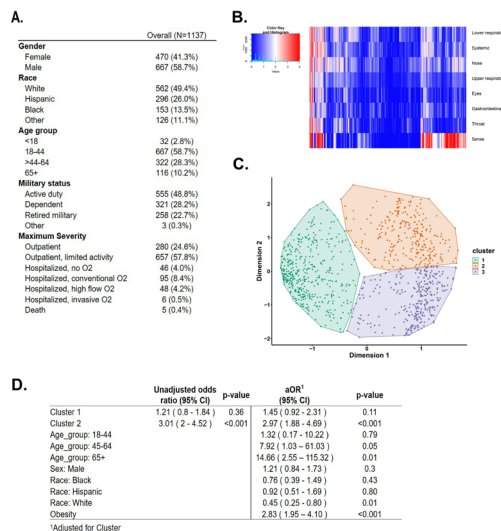
David A. Lindholm, MD<sup>3</sup>; Alison Helfrich, DO<sup>4</sup>; Nikhil Huprikar, MD<sup>5</sup>; Anuradha Ganesan, MBBS, MPH<sup>6</sup>; Tahaniyat Lalani, MBBS<sup>7</sup>; Rupal Mody, MD<sup>8</sup>; Cristian Madar, MD<sup>9</sup>; Samantha Bazan, DNP, MS<sup>10</sup>; Rhonda E. Colombo, MD, MHS<sup>11</sup>; Derek Larson, MD<sup>12</sup>; Ryan C. Maves, MD<sup>13</sup>; Ryan C. Maves, MD<sup>13</sup>; Gregory Utz, MD<sup>14</sup>; David Tribble, MD, DrPH<sup>15</sup>; Brian Agan, MD<sup>16</sup>; Timothy Burgess, MD, MPH<sup>17</sup>; Allison Malloy, MD<sup>4</sup>; Simon Pollett, MBBS<sup>14</sup>; Stephanie A. Richard, PhD, MHS<sup>18</sup>; <sup>1</sup>HJF, Bethesda, Maryland; <sup>2</sup>Support to National Institute of Allergy and Infectious Disease, Bethesda, MD; <sup>3</sup>Uniformed Services University of the Health Sciences; Brooke Army Medical Center, San Antonio, TX; <sup>4</sup>Walter Reed National Military Medical Center, Bethesda, Maryland; <sup>5</sup>Walter Reed National Military Medical Center (WRNMMC), Bethesda, Maryland; <sup>6</sup>Infectious Disease Clinical Research Program and the Henry M. Jackson Foundation for the Advancement of Military Medicine and Walter Reed National Military Medical Center, Bethesda, MD; <sup>7</sup>Infectious Disease Clinical Research Program, Bethesda, MD, The Henry M. Jackson Foundation, Bethesda, MD, and Naval Medical Center Portsmouth, VA, Portsmouth, Virginia; <sup>8</sup>William Beaumont Army Medical Center, El Paso, Texas; <sup>9</sup>Tripler Army Medical Center, Tripler Army Medical Center, Hawaii; <sup>10</sup>Carl R. Darnall Army Medical Center, Fort Hood, Texas; <sup>11</sup>Madigan Army Medical Center, Tacoma, WA, Infectious Disease Clinical Research Program, Bethesda, MD, and Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc., Bethesda, MD, Tacoma, Washington; <sup>12</sup>Fort Belvoir Community Hospital Infectious Disease, Fort Belvoir, Virginia; <sup>13</sup>Naval Medical Center San Diego, San Diego, CA and Infectious Disease Clinical Research Program, Bethesda, MD, San Diego, California; <sup>14</sup>Uniformed Services University of the Health Sciences, Bethesda, Maryland; <sup>15</sup>Uniformed Services University, Bethesda, MD; <sup>16</sup>Infectious Disease Clinical Research Program, USU/HJF, Bethesda, Maryland; <sup>17</sup>Infectious Disease Clinical Research Program, Bethesda, Maryland; <sup>18</sup>Infectious Disease Clinical Research Program, Department of Preventive Medicine and Biostatistics, Uniformed Services University of the Health Sciences, Bethesda, MD and Henry M. Jackson Foundation, Bethesda, MD, Bethesda, Maryland

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**Background.** The novel coronavirus disease 2019 (COVID-19) pandemic remains a global challenge. Accurate COVID-19 prognosis remains an important aspect of clinical management. While many prognostic systems have been proposed, most are derived from analyses of individual symptoms or biomarkers. Here, we take a machine learning approach to first identify discrete clusters of early stage-symptoms which may delineate groups with distinct symptom phenotypes. We then sought to identify whether these groups correlate with subsequent disease severity.

**Methods.** The Epidemiology, Immunology, and Clinical Characteristics of Emerging Infectious Diseases with Pandemic Potential (EPICC) study is a longitudinal cohort study with data and biospecimens collected from nine military treatment facilities over 1 year of follow-up. Demographic and clinical characteristics were measured with interviews and electronic medical record review. Early symptoms by organ-domain were measured by FLU-PRO-plus surveys collected for 14 days post-enrollment, with surveys completed a median 14.5 (Interquartile Range, IQR = 13) days post-symptom onset. Using these FLU-PRO-plus responses, we applied principal component analysis followed by unsupervised machine learning algorithm k-means to identify groups with distinct clusters of symptoms. We then fit multivariate logistic regression models to determine how these early-symptom clusters correlated with hospitalization risk after controlling for age, sex, race, and obesity.

**Results.** Using SARS-CoV-2 positive participants (n = 1137) from the EPICC cohort (Figure 1), we transformed reported symptoms into domains and identified three groups of participants with distinct clusters of symptoms. Logistic regression demonstrated that cluster-2 was associated with an approximately three-fold increased odds [3.01 (95% CI: 2-4.52);  $P < 0.001$ ] of hospitalization which remained significant after controlling for other factors [2.97 (95% CI: 1.88-4.69);  $P < 0.001$ ].



(A) Baseline characteristics of SARS-CoV-2 positive participants. (B) Heatmap comparing FLU-PRO response in each participant. (C) Principal component analysis followed by k-means clustering identified three groups of participants. (D) Crude and adjusted association of identified cluster with hospitalization.

**Conclusion.** Our findings have identified three distinct groups with early-symptom phenotypes. With further validation of the clusters' significance, this tool could be used to improve COVID-19 prognosis in a precision medicine framework and may assist in patient triaging and clinical decision-making.

**Disclaimer.**

**Draft Disclaimer**

Views expressed are those of the author(s) and do not reflect the official policy/position of USU; DHA; Henry M. Jackson Foundation; BAMC; MAMC; TAMC; WRNMMC; US Army Medical Department; US Army Office of the Surgeon General; Department of the Army, Air Force, or Navy; DOD; or the USG. Investigators followed human subjects protection 45CFR46 policies.

No COI to declare.

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**459. COVID-19 Hospitalization and 30-Day Readmission: A Cohort Study of U.S. Hospitals**

Essy Mozaffari, PharmD, MPH, MBA<sup>1</sup>; Shuting Liang, MPH<sup>1</sup>; Henry Morgan Stewart, PhD<sup>2</sup>; Mark Thrun, MD<sup>3</sup>; Paul Hodgkins, PhD, MSc<sup>4</sup>; Richard Haubrich, MD<sup>1</sup>; <sup>1</sup>Gilead Sciences, Foster City, CA; <sup>2</sup>IQVIA, Brighton, England, UK

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**Background.** Evidence on outcomes after COVID-19 hospitalization is limited. This study aimed to characterize 30-day readmission beyond the initial COVID-19 hospitalization.

**Methods.** This descriptive retrospective cohort study included adult patients admitted between 07/01/2020 and 01/31/2021 with a discharge diagnosis of COVID-19 (ICD-10-CM: U07.1), using a large hospital inpatient chargemaster with a linked open claims dataset. The first COVID-19 hospitalization was considered index hospitalization; baseline was defined as first 2 days of index hospitalization; readmission was assessed within 30 days of discharge from index hospitalization. We describe the demographics, treatments and outcomes of the index hospitalization and readmission.

**Results.** For index hospitalization, we identified 111,624 COVID-19 patients from 327 hospitals across US. Mean age was 63 and 54% were male. Over the study period, use of remdesivir (RDV) increased from 11% to 50% while use of steroids (66% -73%) and anticoagulants (32% - 35%) remained relatively stable (Figure 1). Overall, 21% required ICU or CCU admission, 13% died, and median length of stay (LOS) was 7 days (range 4 -11 days). Among 61,182 (55%) with ≥ 30-day follow-up post discharge, all-cause 30-day readmission was 16% and remained stable (15% - 17%) over the study period; median days to readmission was 6 days (range 1-30). All-cause readmission (13% vs 17%) was lower in patients treated with RDV during index hospitalization over time (Figure 2), particularly in those requiring high flow oxygen (17% vs 18%), low flow oxygen (13% vs 16%) or no oxygen (12% vs 17%), but not in ECMO or invasive ventilation (33% vs 29%). Compared to non-readmitted, readmitted patients were older (60 vs 65), had more comorbidities such as COPD (24% vs 37%) (see Table 1) and LOS (6 vs 7 days) in index hospitalization. Overall, the most frequent diagnoses of readmission were COVID-19 (63%), other viral pneumonia (36%), and acute respiratory failure with hypoxia (34%).

Figure 1. Use of anticoagulants, remdesivir and steroids over time during index hospitalization

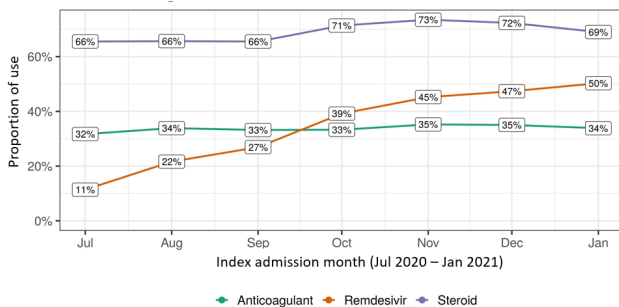


Figure 2. Monthly 30-day all-cause readmission by RDV treatment during index hospitalization

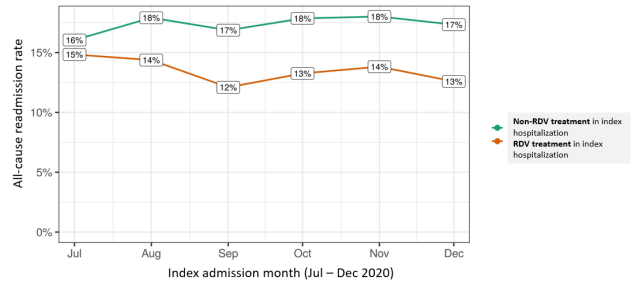


Table 1. Baseline characteristics and comorbidities of non-readmitted and readmitted patients

	Non-readmitted patients N=51,434		Readmitted patients N=9,748	
	N	%	N	%
Mean age (SD)		60 (15.5)		65 (14.8)
Baseline severity (index hospitalization)				
ECMO/invasive mechanical ventilation	723	1%	308	3%
High-flow oxygen of non-invasive mechanical ventilation	4,254	8%	887	9%
Low-flow oxygen or oxygen supply	11,076	22%	1,938	20%
Key comorbidities				
COPD Without Asthma	12,316	24%	3,577	37%
Aids/HIV	555	1%	159	2%
Asthma	12,555	24%	2,759	28%
Cerebrovascular disease	14,400	28%	4,065	42%
Diabetes	27,931	54%	6,312	65%
Congestive heart failure	14,315	28%	4,320	44%
Hypertension	40,546	79%	8,704	89%
Obesity	26,605	52%	5,298	54%
Renal disease	2,839	6%	1,375	14%

**Conclusion.** In a large, geographically diverse cohort of hospitalized COVID-19 patients, 16% required readmission, especially in those with greater age and comorbidities. Over the study period, all-cause readmission remained stable and was lower in RDV treated patients.

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**460. Disproportionalities in COVID-19 Clinical Drug Trials in the United States: A Systematic Literature Review**

Daniel B. Chastain, Pharm.D., BCIDP, AAHIVP<sup>1</sup>; Vishwa S. Patel, n/a<sup>2</sup>; Alexandria M. Jefferson, n/a<sup>2</sup>; Sharon P. Osae, Pharm.D., BCACP<sup>1</sup>; Joanna S. Chastain, Pharm.D., BCPS<sup>3</sup>; Andrés F. Henao Martínez, MD<sup>4</sup>; Carlos Franco-Paredes<sup>5</sup>; Henry N. Young, Ph.D.<sup>1</sup>; <sup>1</sup>University of Georgia College of Pharmacy, Albany, GA; <sup>2</sup>University of Georgia, Athens, Georgia; <sup>3</sup>Phoebe Putney Memorial Hospital, Albany, Georgia; <sup>4</sup>University of Colorado Anschutz Medical Campus, Aurora, Colorado; <sup>5</sup>University of Colorado Denver, School of Medicine, Aurora, CO

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**Background.** To combat higher rates of COVID-19 infection, hospitalization, and death among minorities, it is crucial to identify safe, efficacious, and generalizable treatments. Therefore, the purpose of this systematic literature review was to assess the demographic characteristics of COVID-19 clinical trial participants.

**Methods.** A literature search was performed according to the PRISMA checklist using PubMed from December 1, 2019 to November 24, 2020 with the following search terms: 2019-nCoV, COVID-19, SARS-CoV-2, clinical trial, randomized controlled trial, observational study, and veterinary. To capture additional results, keyword searches were performed using various versions and plural endings with the title/abstract field tag. Randomized controlled trials evaluating a pharmacologic treatment for COVID-19 patients from one or more U.S. site written in the English language were eligible for inclusion. Descriptive statistics were calculated to characterize age, gender, race, and ethnicity of patients enrolled in the included COVID-19 clinical trials, as well as for comparison with national COVID-19 data.

**Results.** A total of 4472 records were identified, of which 16 were included. Most were placebo-controlled (69%) and included hospitalized patients with COVID-19 (69%). Demographic data were reported for each study arm in 81% of studies. Median number of participants was higher in studies of nonhospitalized patients (n=452 [range 20-1062] vs n=243 [range 152-2795]). Nine (56%) studies reported mean or median ages of 50 years or older amongst all study arms. Males comprised more than half of the study cohort in 50% of studies. Race and ethnicity were reported separately in five (31%) studies, reported in combination in four (25%), while six (38%) reported only race or ethnicity. White or Caucasian patients made up most participants across all arms in 75% of studies. Based on national COVID-19 data, hospitalizations were similar between White persons and African American persons, but higher than other race or ethnic groups, and evenly distributed among males and females.

**Conclusion.** Lack of heterogeneously reporting demographic characteristics of COVID-19 clinical trial participants limits the ability to assess the generalizability of pharmacologic treatments for COVID-19.

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