the COVID-19 pandemic, Medicaid enrollment offset employer-based insurance losses precipitated by the recession.[4] The aim of this study was to evaluate whether Medicaid expansion may have impacted COVID-19 mortality.

Methods. We conducted an ecologic study that included all US counties in the 50 states and District of Columbia. County-specific Medicaid expansion status was based on whether expansion was adopted within the state. COVID-19 cases and deaths for each county were obtained from the Centers of Disease Control (CDC). Unadjusted and multivariable negative binomial regression with robust standard errors to account for clustering of counties within each state were used to evaluate the association of COVID-19 case fatality rate and Medicaid expansion status. Adjusted models included the addition of four sets of county-level covariates thought to influence the association of Medicaid status and COVID-19 fatality rate: demographics, comorbidities, economic indicators, and physician density. These analyses were then performed in subgroups of counties defined by urbanicity (metro, suburban or rural) and quartiles of poverty rates. Incidence Rate Ratios (IRR) and 95% confidence intervals (CI) are reported.

Results. A total of 1,814 Medicaid expansion and 1,328 non-expansion counties were included in the analysis. Crude case fatality rates were 2.1% (non-expansion) and 1.8% (expansion). Medicaid expansion was not associated with a significantly lower COVID-19 case fatality rate in either the unadjusted (IRR: 0.86; 95% CI: 0.74, 1.01) or fully adjusted (IRR: 1.02; 95% CI: 0.90, 1.16) models. In adjusted models, Medicaid expansion status was also not associated with differences in COVID-19 case fatality rate when counties were stratified by either urbanicity or percent of individuals living below the poverty line.

Table 1 Incidence Rate Ratios of Expansion Counties Compared to Non-Expansion Counties in Unadjusted and Adjusted Models

Analysis	Number of Counties	Unadjusted Model	Adjusted for Demographics[a]	Adjusted for Demograhics & Comorbidities[b]	Adjusted for Demographics, Comorbidities, & Economic Indicators[c]	Adjusted for Demographics, Comorbidities, Economic Indicators & Physician Density[d]
All Counties[e]	3139	0.86 (0.74, 1.01)	0.97 (0.85, 1.10)	1.02 (0.90, 1.15)	1.02 (0.90, 1.16)	1.02 (0.90, 1.16)
Metropolitan Counties	436	1.09 (0.94, 1.27)	1.09 (0.95, 1.25)	1.17 (1.04, 1.33)	1.08 (0.95, 1.23)	1.08 (0.95, 1.23)
Suburban Counties	729	0.91 (0.77, 1.06)	1.04 (0.92, 1.19)	1.08 (0.96, 1.22)	1.06 (0.93, 1.20)	1.06 (0.93, 1.20)
Rural Counties	1974	0.82 (0.69, 0.98)	0.92 (0.78, 1.07)	0.95 (0.82, 1.10)	0.97 (0.83, 1.14)	0.98 (0.84, 1.14)
Poverty 4th Quartile[f]	786	0.82 (0.68, 1.00)	0.94 (0.80, 1.10)	0.95 (0.81, 1.11)	N/A	0.95 (0.81, 1.11)
Poverty 3rd Quartile[f]	785	0.94 (0.78, 1.13)	0.98 (0.85, 1.14)	1.02 (0.89, 1.17)	N/A	1.03 (0.89, 1.18)
Poverty 2nd Quartile[f]	785	1.01 (0.85, 1.20)	1.03 (0.86, 1.22)	1.10 (0.96, 1.26)	N/A	1.10 (0.96, 1.26)
Poverty 1st Quartile[f]	783	0.90 (0.72, 1.14)	0.97 (0.82, 1.15)	1.04 (0.90, 1.21)	N/A	1.04 (0.90, 1.21)

[a] Adjusted for county demographics: population, age distribution, percent of male, Black, and Hispanic residents.
[b] Adjusted for county demographics and comorbidities: prevalence of diabetes, obesity, chronic kidney disease, coronary artery disease, and chronic obstructive disease.
[c] Adjusted for county demographics, comorbidities, and economic indicators: median household income, mean percent unemployed in 2020, and percent living in poverty. The economic indicators were not included in this model for the sub-analyses stratified by poverty quartiles.
[d] Adjusted for county demographics, comorbidities, economic indicators, and number of physicians per 100,000 residents. The economic indicators were not included in this model for the sub-analyses stratified by poverty quartiles.
[e] Three small counties with 0 COVID-19 cases were excluded from all analyses
[f] Poverty Quartiles: Percent of county residents living under the federal poverty level:
1st Quartile: <10.99%; 2nd Quartile: 10.99%-14.77%; 3rd Quartile: 14.78%-19.08%; 4th Quartile: >19.08%

Conclusion. In this county-level analysis, Medicaid expansion status was not associated with a significant difference in county-level COVID-19-related case fatality rates among people of all ages. Future individual-level studies are needed to better characterize the effect of Medicaid on COVID-19 mortality.

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445. COVID-19 Pharmacotherapy Was Not Associated with Mortality in a Community Teaching System

Eric Urnoski, PharmD, BCPS, BCCCP[1]; Thomas Butler, MD, MS, FACS[1]; [1]Crozer-Chester Medical Center, Havertown, Pennsylvania

Session: P-21. COVID-19 Research

Background. During the COVID-19 pandemic, a task force was assembled to collect data on patient characteristics and treatment exposures to assess what factors may contribute to patient outcomes, and to help develop institutional treatment guidelines.

Methods. A retrospective study was performed on COVID-19 inpatient admissions within a four-hospital community health system over a six-month period from April-October 2020. Positive COVID-19 immunology results and/in conjunction with an inpatient admission was criteria for inclusion. Covariates for age, gender, race were added *apriori*. Covariates of interest included baseline comorbidities, admission level-of-care, vital signs, mortality outcomes, need for intubation, and specific pharmacological treatment exposures. Logistic regression was performed on our final model and reported as OR +/- 95% CI.

Results. A total of 349 patients met inclusion criteria. Pharmacotherapies were not associated with a difference in mortality in a four-hospital system. Corticosteroids (p = 0.99); Remdesivir (p = 0.79); hyrdroxychloroquine (p = 0.32); tocilizumab (p = 0.91); were not associated with mortality. ACE-inhibitor or angiotensin II receptor blockers OR 0.29 (0.09-0.93) (p = 0.03); convalescent plasma OR 7.85 (1.47-42.1) (p = 0.02); neuromuscular blocking agents (NMBA) OR 5.51 (1.28-23.8) (p = 0.02); vasopressors OR 17.6 (5.62-54.9) (p = 0.00) were associated with in-hospital mortality. Covariates that were associated with a difference in mortality were: age > 60 years OR 2.73 (1.04-7.14) (p = 0.04); structural lung disease OR 3.02 (1.28-7.10) (p = 0.01). Covariates not associated with mortality included African American race (p = 0.30); critical care admission (p = 0.19); obesity (p = 0.06); cardiovascular disease (p = 0.89); diabetes (p = 0.28).

Conclusion. The use of corticosteroids, remdesivir, tocilizumab, and hydroxychloroquine, and admission to a critical care bed was not associated with a difference of in-hospital mortality. Patients who required vasopressors or NMBA were associated with in-hospital mortality. Despite national trends reporting increased mortality in patients with obesity, diabetes, cardiovascular disease, and of African American race, this was not observed in our health system safety net hospitals.

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446. Prognostic Value of Absolute Lymphocyte Count for Disease Severity and Clinical Outcomes in Adult COVID-19 Inpatients

Jianli Niu, MD, PhD[1]; Candice Sareli, MD[1]; Maria Deane, n/a[1]; Aharon E. Sareli, MD[1]; [1]Memorial Healthcare System, Hollywood, FL

Session: P-21. COVID-19 Research

Background. Lymphopenia has been reported as a relatively frequent finding in patients with coronavirus disease 2019 (COVID-19). This study aimed to assess the use of absolute lymphocyte count (ALC) as a prognostic biomarker for disease severity and clinical outcomes.

Methods. A cohort of adult patients with COVID-19 admitted to Memorial Healthcare System, Hollywood, Florida from March 7, 2020 to January 18, 2021 was retrospectively analyzed. An absolute lymphocyte count (ALC) < 1.1×10^9/L was used as cutoff point to define lymphopenia. Correlations of ALC upon admission with age and serum levels of C-reactive protein, interleukin-6, lactate dehydrogenase, and creatinine were analyzed. Univariate and multivariate regression models were developed to assess the association of lymphopenia with the risk of ICU admission and clinical outcomes.

Results. 4,485 hospitalized patients were included in the final analyses. Median age was 61 (interquartile range, 47-73) years and 2,311 (51.5%) were men. Lymphopenia was more frequent in patients admitted to the ICU compared to those that were not admitted to the ICU, with an odds ratio of 2.14 (95% confidence interval [CI], 1.78-2.56, p < .0001) (Figure 1). The actual value of the ALC was negatively correlated with age and serum levels of C-reactive protein, interleukin-6, lactate dehydrogenase, and creatinine (all p < 0.005). Patients with lymphopenia (n=2,409) compared to those without lymphopenia (n=2,076) had multivariable-adjusted odds ratios of 1.85 (95% CI, 1.53-2.24) for ICU admission, 2.08 (95% CI, 1.67-2.58) for intubation, 1.98 (95% CI, 1.31-3.00) for development of acute kidney failure, and 2.23 (95% CI, 1.79-2.79) for in-hospital mortality (Table 1). Analyses were adjusted for age, gender, race, hypertension, diabetes, chronic obstructive pulmonary disease, chronic kidney disease, coronary artery disease, malignancy, obesity, and smoking.

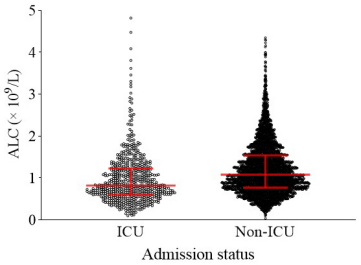

Figure 1. Scatter plots for distribution of absolute lymphocyte counts (ALC) among patients with different admission status. The ALC significantly decreased in patients with ICU admission versus Non-ICU admission (p < 0.000). Red solid lines represent median with interquartile range. ALC < 1.1×10^9/L was more frequent in patients admitted to the intensive care unit (ICU) compared to those who were not, with an odds ratio of 2.14 (95% CI, 1.78-2.56, p < .0001).

Table 1. Multivariable-adjusted risk association of absolute lymphocyte count and outcomes

	Absolute Lymphocyte Count			
Outcomes	< 1.1×10^9/L	≥ 1.1×10^9/L	OR (95% CI)	P value
Patients, n (%)	2409 (53.7)	2076 (46.3)		
ICU admission, n (%)	431 (17.9)	197 (9.5)	1.85 (1.53-2.24)	0.000
Required intubation, n (%)	347 (14.4)	135 (6.5)	2.08 (1.67-2.58)	0.000
Developed AKI, n (%)	82 (3.4)	37 (1.8)	1.98 (1.31-3.00)	0.001
In-hospital mortality, n(%)	401 (16.6)	137 (6.6)	2.23 1.79-2.79)	0.000

ICU, intensive care unit; AKI, acute kidney injury; OR, odds ratio; CI, confidence interval.

Conclusion. Lymphopenia in adult COVID -19 hospitalized patients was associated with increased risk of disease severity (as evidenced by need for ICU admission) and poor clinical outcomes. Absolute lymphocyte count may help with prognostication in individuals hospitalized with COVID-19.

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447. An Ordinal Scale Assessing SARS-CoV-2 Infected Patient Outcomes Using Electronic Health Records

Maryam Khodaverdi, MSc[1]; Bradley S. Price, Ph.D.[2]; Susan L. Santangelo, Sc.D.[3]; Alfred (Jerrod) Anzalone, MS[4]; Wesley Kimble, MPA[2]; J. Zachary Porterfield, MD, PhD[5]; Michael T. Vest, DO[6]; Sally L. Hodder, M.D.[7]; Brian Hendricks, PhD[2]; Clifford james Rosen, MD[8]; H TImothy Bunnell, PhD[9]; HAMIDREZA MORADI, Ph.D.[10]; [1]WVCTSI, Morgantown, West Virginia; [2]West Virginia University, Morgantown, West Virginia; [3]Tufts University School of Medicine, Portland, Maine; [4]University of Nebraska Medical Center, Omaha, NE; [5]University of Kentucky College of Medicine, Lexington,

Kentucky; [6]Christiana Care Healthcare System, Hockessin, Delaware; [7]West Virginia University School of Medicine, Morgantown, West Virginia; [8]Maine Medical Center Research Institute, scarborough, Maine; [9]Nemours Children's Health System & University of Delaware, Wilmington, Delaware; [10]University of Mississippi Medical Center, JACKSON, Mississippi

Session: P-21. COVID-19 Research

Background. A major challenge to identifying effective treatments for COVID-19 has been the conflicting results offered by small, often underpowered clinical trials. The World Health Organization (WHO) Ordinal Scale (OS) has been used to measure clinical improvement among clinical trial participants and has the benefit of measuring effect across the spectrum of clinical illness. We modified the WHO OS to enable assessment of COVID-19 patient outcomes using electronic health record (EHR) data.

Methods. Employing the National COVID Cohort Collaborative (N3C) database of EHR data from 50 sites in the United States, we assessed patient outcomes, April 1,2020 to March 31, 2021, among those with a SARS-CoV-2 diagnosis, using the following modification of the WHO OS: 1=Outpatient, 3=Hospitalized, 5=Required Oxygen (any), 7=Mechanical Ventilation, 9=Organ Support (pressors; ECMO), 11=Death. OS is defined over 4 weeks beginning at first diagnosis and recalculated each week using the patient's maximum OS value in the corresponding 7-day period. Modified OS distributions were compared across time using a Pearson Chi-Squared test.

Results. The study sample included 1,446,831 patients, 54.7% women, 14.7% Black, 14.6% Hispanic/Latinx. Pearson Chi-Sq P< 0.0001 was obtained comparing the distribution of 2nd Quarter 2020 OS with the distribution of later time points for Week 4.

Table 1. OS at week 1 and 4 by quarter

	2nd Quarter 2020		3rd Quarter 2020		4th Quarter 2020		1st Quarter 2021	
Modified OS	**Week 1 N (%)**	**Week 4 N (%)**	**Week 1 N (%)**	**Week 4 N (%)**	**Week 1 N (%)**	**Week 4 N (%)**	**Week 1 N (%)**	**Week 4 N (%)**
1 Outpatient	179,953 (83.31)	203,869 (94.38)	224,956 (90.72)	241,740 (97.49)	595,935 (90.94)	637,383 (97.27)	291,602 (89.02)	318,033 (97.09)
3 Hospitalized	26,437 (12.24)	5,200 (2.41)	18,369 (7.41)	3,456 (1.39)	45,782 (6.99)	8,561 (1.31)	27,612 (8.43)	4,679 (1.43)
5 Oxygen	2,792 (1.29)	386 (0.18)	1,761 (0.71)	212 (0.09)	6,706 (1.02)	721 (0.11)	4,182 (1.28)	402 (0.12)
7 Mechanical Ventilation	4,032 (1.87)	784 (0.36)	1,878 (0.76)	355 (0.14)	4,109 (0.63)	953 (0.15)	2,428 (0.74)	435 (0.13)
9 Organ Support	265 (0.12)	129 (0.06)	239 (0.1)	51 (0.02)	319 (0.05)	105 (0.02)	286 (0.09)	54 (0.02)
11 Death	2,529 (1.17)	5,640 (2.61)	764 (0.31)	2,153 (0.87)	2,442 (0.37)	7,570 (1.16)	1,453 (0.44)	3,960 (1.21)
Total N	216,008	216,008	247,967	247,967	655,293	655,293	327,563	327,563

The study sample included 1,446,831 patients, 54.7% women, 14.7% Black, 14.6% Hispanic/Latinx. Pearson Chi-Sq P< 0.0001 was obtained comparing the distribution of 2nd Quarter 2020 OS with the distribution of later time points for Week 4.

Conclusion. All Week 4 OS distributions significantly improved from the initial period (April-June 2020) compared with subsequent months, suggesting improved management. Further work is needed to determine which elements of care are driving the improved outcomes. Time series analyses must be included when assessing impact of therapeutic modalities across the COVID pandemic time frame.

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448. COVID-19 Acute Care at Home: A Substitution for Hospitalization in Patients with Mild Symptoms

Joel A. Kammeyer, MD, MPH[1]; Brian Perkins, MD[2]; Sara Seegert, RN, MSN[2]; Dave E. Caris, RN, MPH[2]; Caitlyn M. Hollingshead, MD[1]; Evan D. Brochin, MD[3]; Benjamin H. Russell, n/a[3]; [1]University of Toledo College of Medicine and Life Sciences, Toledo, Ohio; [2]ProMedica-Toledo Hospital, Toledo, Ohio; [3]University of Toledo College of Medicine, Toledo, Ohio

Session: P-21. COVID-19 Research

Background. Constraints on resources require healthcare systems to implement alternative and innovative means for delivering care. The COVID-19 pandemic amplified this issue throughout the world, leading to shortages of ventilators, hospital beds, and healthcare personnel. We report the results of an Acute Care at Home Program (ACHP) response to COVID-19, providing in-home hospital-level care to patients with mild symptoms, preserving in-hospital beds for more serious illness.

Methods. Patients with COVID-19 were selected for ACHP after undergoing risk stratification for severe disease, including oxygen evaluation, time course of illness, and evaluation of comorbidities. Patients admitted to ACH met inpatient criteria, required oxygen supplementation of ≤4 liters, and received insurance approval. Services were provided consistent with best practice of inpatient care, including 24/7 provider availability via TeleMedicine, bedside care provided by paramedics and nurses, respiratory therapy, radiology and laboratory services, pulse oximetry monitoring, and administration of medications. Protocols existed for patient transfer to hospital in the event of clinical deterioration.

Results. Our initial cohort included 62 patients enrolled October 1, 2020 – May 31, 2021. Of these, 57 patients were discharged successfully from ACHP. Patients presented with initial oxygen requirements of 0-4 liters. Average length-of-stay in ACHP was 5.4 days. Five patients required hospitalization after enrollment in ACHP; one subsequently expired, two were discharged home, one returned to ACHP after inpatient hospitalization, and one remains hospitalized. One additional patient that was successfully discharged home from ACHP was later readmitted and expired in a subsequent hospitalization. The patients that expired had significant immunocompromising conditions that may have contributed to their outcomes.

Conclusion. ACHP can provide care equivalent to hospitalization for select COVID-19 patients. Immunocompromised hosts with COVID-19 may represent a subset of patients in which in-house hospitalization must be carefully considered, even with mild oxygen requirements. Health systems should consider ACHP as a substitution for hospitalization for COVID-19 patients with mild symptoms.

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449. Performance of the Brighton Case Definition for Multisystem Inflammatory Syndrome in Children (MIS-C) Among a Large Single Center Cohort

Jessica Nguyen, MD[1]; Isabella Osuna, BS[2]; Eyal Muscal, MD[1]; Kristen Sexson, MD PhD MPH[1]; Marietta DeGuzman, MD[1]; Flor M. Munoz, MD[3]; Tiphanie Vogel, MD PhD[1]; [1]Baylor COM, Houston, Texas; [2]Rice University, Houston, Texas; [3]Baylor College of Medicine, Houston, Texas

Session: P-21. COVID-19 Research

Background. Multisystem Inflammatory Syndrome in Children (MIS-C) is a rare, life-threatening, hyperinflammatory condition presumed to follow SARS-CoV-2 infection. Whether MIS-C can also follow SARS-CoV-2 vaccination is not clear, making MIS-C an adverse event of special interest following immunization. Monitoring for post-vaccine MIS-C is complicated by the clinical overlap of MIS-C with numerous other inflammatory conditions including Kawasaki Disease, toxic shock syndrome, and viral myocarditis. A case definition for MIS-C was recently created with the Brighton Collaboration (BC). We aimed to determine the performance of the BC MIS-C case definition among a large, single-center MIS-C cohort.

Methods. Retrospective review was performed for the first 100 MIS-C cases at our institution (May 2020-February 2021). All cases met the Centers for Disease Control and Prevention (CDC) case definition. Data on age, presentation, laboratory results and cardiac studies were collected and used to determine cases that fulfilled the BC case definition for MIS-C (see figure).

Case Definition: Definite Case

Reference: *Vaccine* 2021 39(22):3037-3049

Results. Of 100 children (age < 21 years) diagnosed with MIS-C using the CDC case definition, 93 patients also fulfilled the BC definition. All 100 patients had elevated laboratory markers of inflammation and positive SARS-CoV-2 antibodies. However, 1 patient was excluded for significant respiratory symptoms (pulmonary hemorrhage), 5 were excluded due to only 1 clinical feature, and an additional patient was excluded for having none of the measures of disease activity. Among the 93 patients fulfilling the revised case definition, 88 (95%) met criteria for a definite case. Five of the 93 patients (5%) were considered probable cases, 1 reported only 1 day of fever and 4 had only 1 measure of disease activity.

Conclusion. The original case definitions for MIS-C were created rapidly following the first emerging reports of this hyperinflammatory state. Knowledge of the varied clinical presentations of this disorder has grown substantially. Modification of the case definition to include features truly representative of MIS-C will allow for more precise diagnosis in the face of conditions which mimic MIS-C, and for accurate and reliable monitoring for adverse events following immunization.

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450. Type I Interferon Autoantibodies Are Detected in Those with Critical COVID-19, Including a Young Female Patient

Debra Yee, B.S.[1]; Marana Tso, B.S.[1]; Elana Shaw, B.S.[2]; Lindsey B. Rosen, Ph.D.[2]; Emily Samuels, B.S.[1]; Paul Bastard, Ph.D.[3]; Jean-Laurent Casanova, M.D., Ph.D.[3]; Steven M. Holland, MD[4]; Helen C. Su, MD, PhD[5]; Stephanie A. Richard, PhD[6]; Katrin Mende, PhD[7]; Tahaniyat Lalani, MBBS[8]; David A. Lindholm, MD[9]; David A. Lindholm, MD[9]; Mark P. Simons, Ph.D., MSPH[1]; David Tribble, M.D., DrPH[1]; Allison Malloy, MD[10]; Eric Laing, PhD[1]; Brian Agan, MD[11]; Simon Pollett, MBBS[1]; Timothy Burgess, MD, MPH[12]; Andrew L. Snow, Ph.D.[1]; [1]Uniformed Services University of the Health Sciences, Bethesda, Maryland; [2]National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health, Bethesda, Maryland; [3]The Rockefeller University, New York, New York; [4]Laboratory of Clinical Immunology and Microbiology, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland; [5]Immune Deficiency Genetics Section, Laboratory of Clinical Immunology and Microbiology, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland; [6]IDCRP, Rockville, Maryland; [71]Infectious Disease Clinical Research Program, Department of Preventive Medicine and Biostatistics, Uniformed Services University of the Health Sciences and Brooke Army Medical Center, JBSA