

# EXTRACORPOREAL MEMBRANE OXYGENATION IN TRAUMA BEFORE AND AFTER COVID-19: ASSOCIATIONS OF UTILIZATION, TIMING, AND OUTCOMES

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**VIRGINIA HEALTH SCIENCES**  
AT OLD DOMINION UNIVERSITY

## Introduction

- The COVID-19 pandemic expanded and altered general ECMO utilization and provider experience; however, any impact on trauma-specific ECMO practice following this shift remains unclear. We hypothesize that trauma ECMO utilization patterns, timing of initiation, and outcomes have differed following COVID-19.

## Objective

- To characterize changes in ECMO utilization patterns, patient characteristics, and clinical outcomes in adult trauma patients before and after the COVID-19 pandemic using a large national trauma registry.

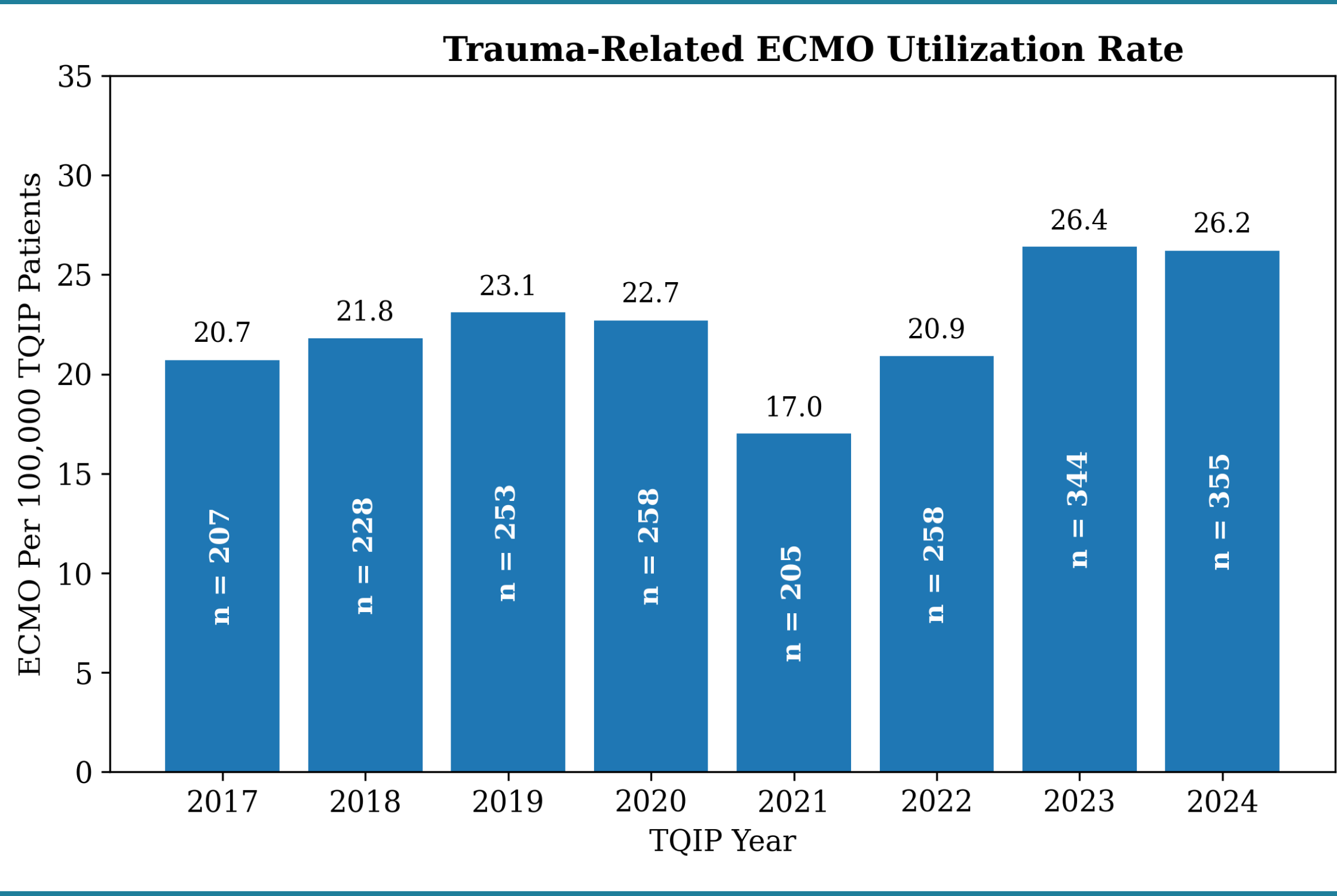
## Methods

- Retrospective cohort study using the Trauma Quality Improvement Program (TQIP) database (2017–2024)
- Included adult trauma patients (≥15 years) receiving non-operative ECMO (ICD-10-PCS: 5A15xx), excluding intraoperative ECMO and ED deaths
- Excluded calendar year 2020 to minimize COVID-19 transition-period confounding
- Categorical variables compared by  $\chi^2$  test; continuous variables by Wilcoxon rank-sum test
- Univariable and multivariable logistic regression for binary outcomes; linear regression for time-to-ECMO
- Results reported as odds ratios (95% CI);  $p < 0.05$  considered significant

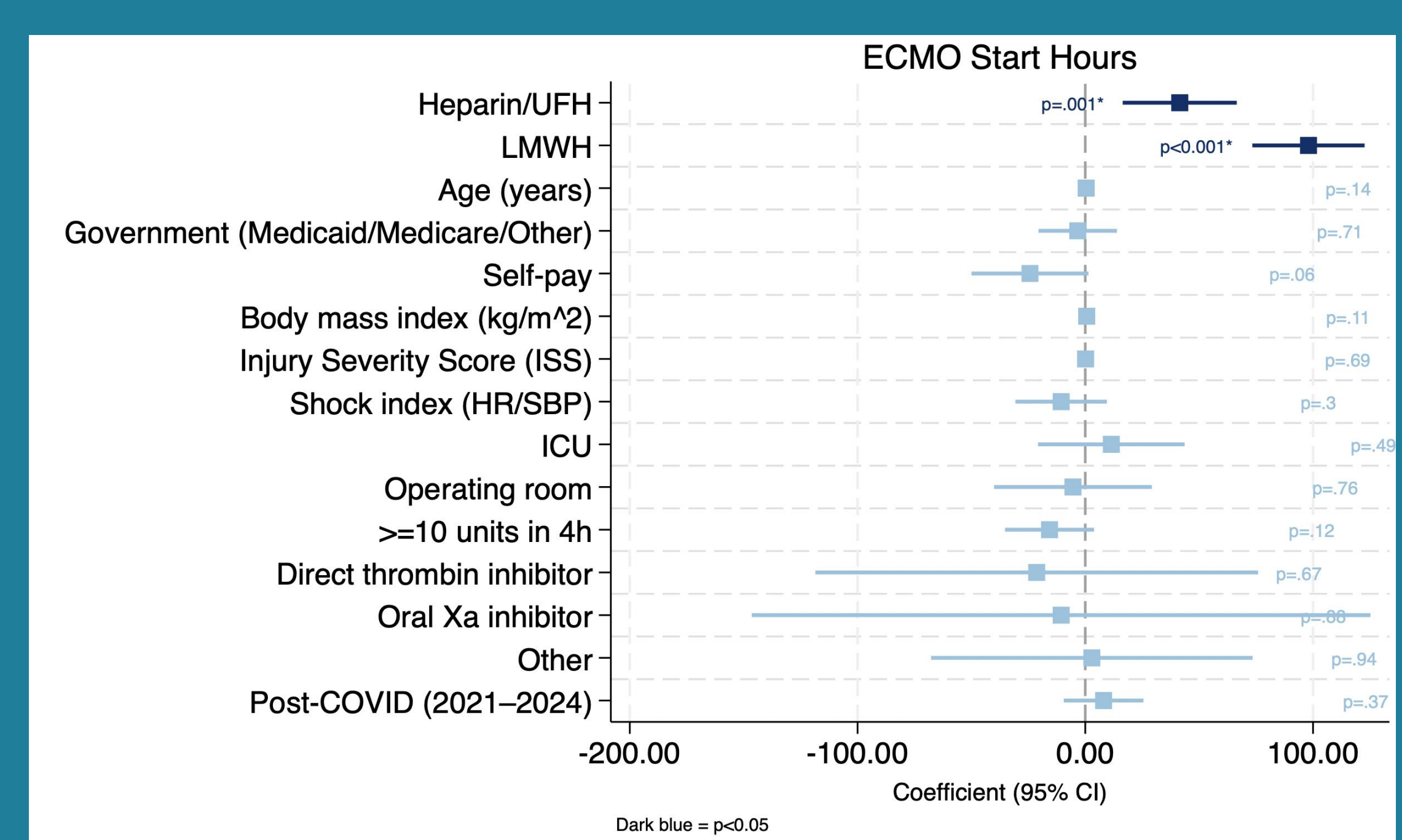
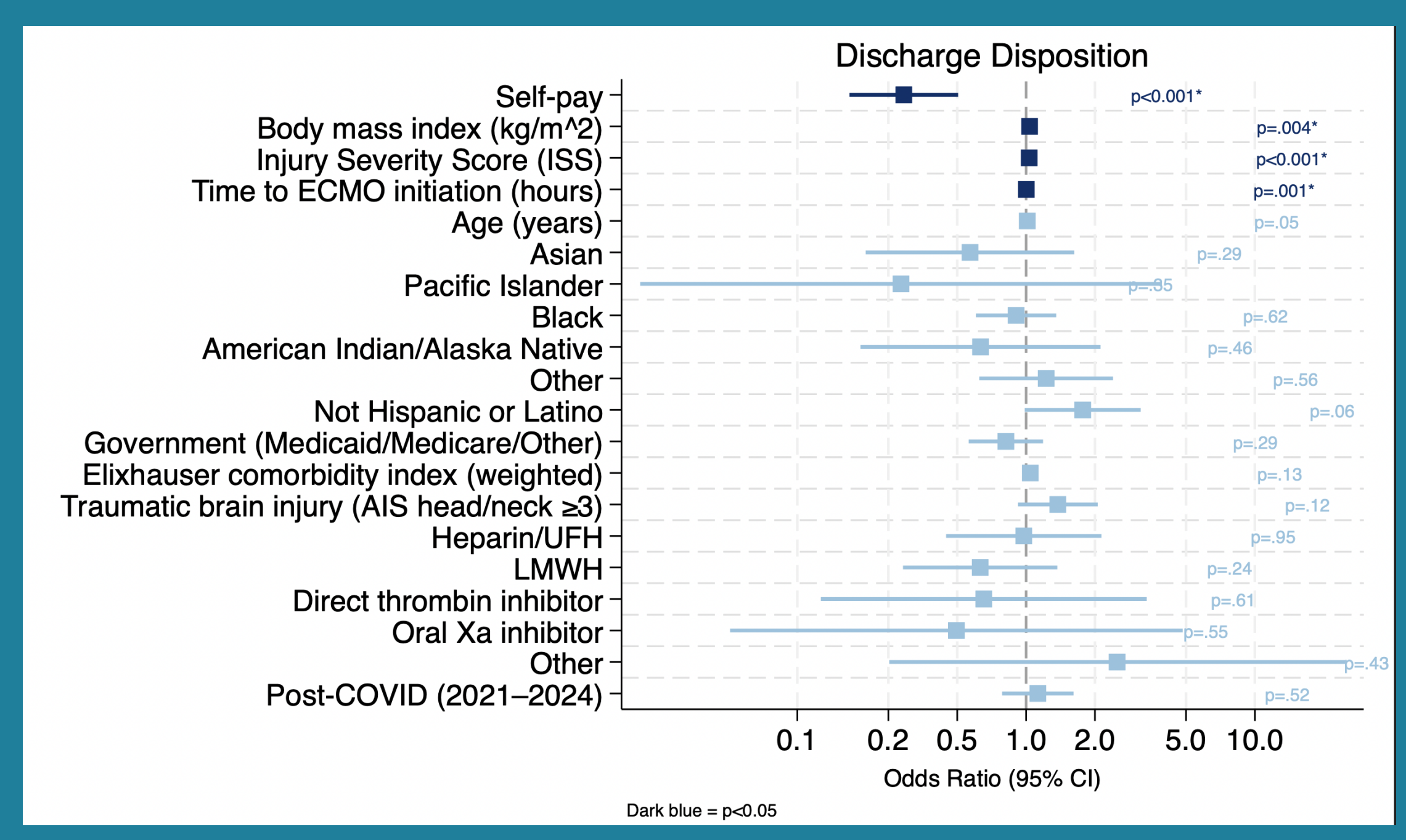
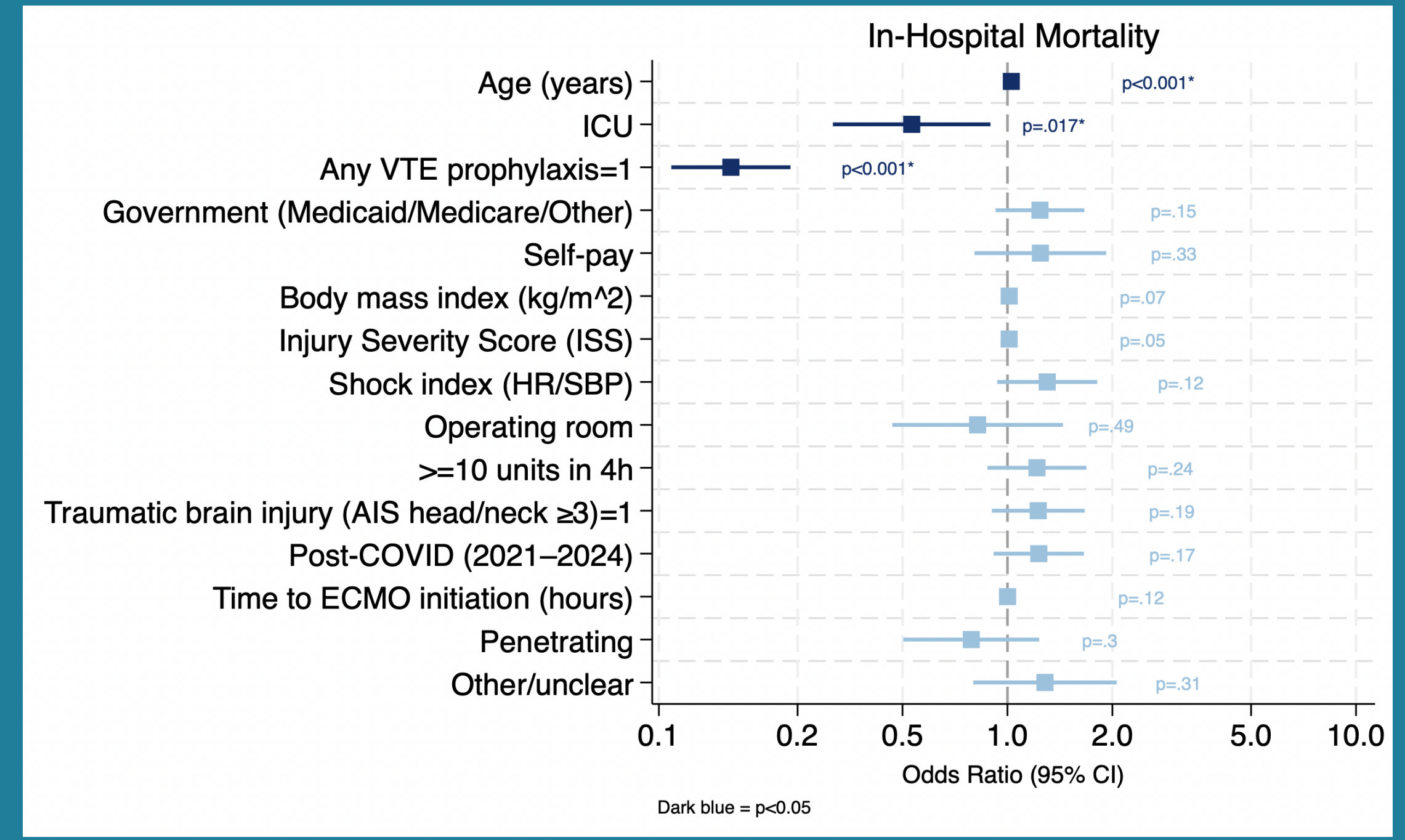
## Results

### Demographics and Utilization Trends

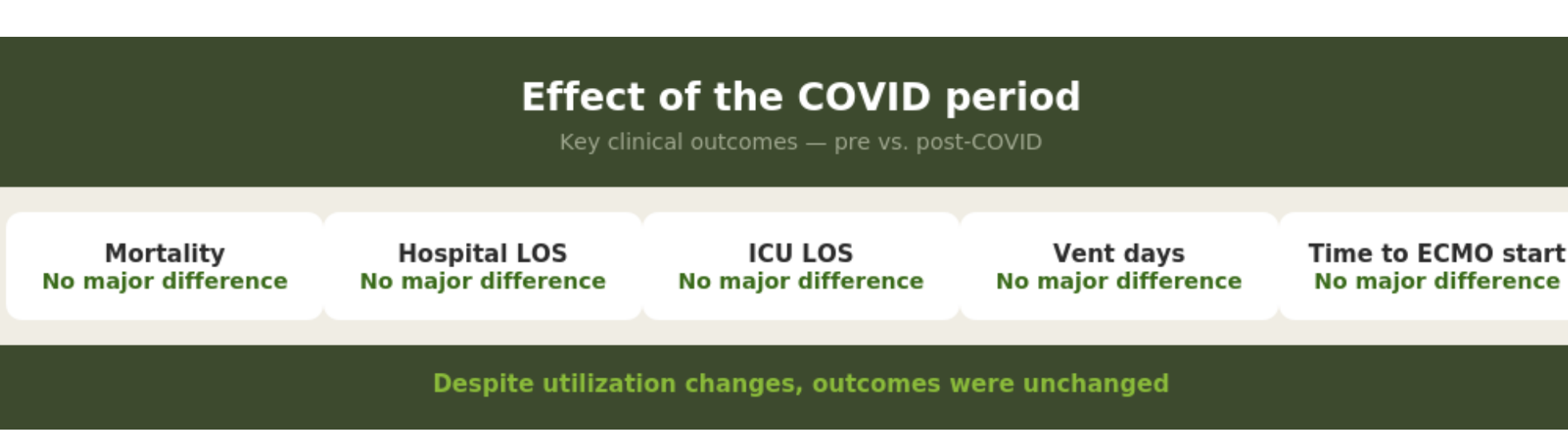
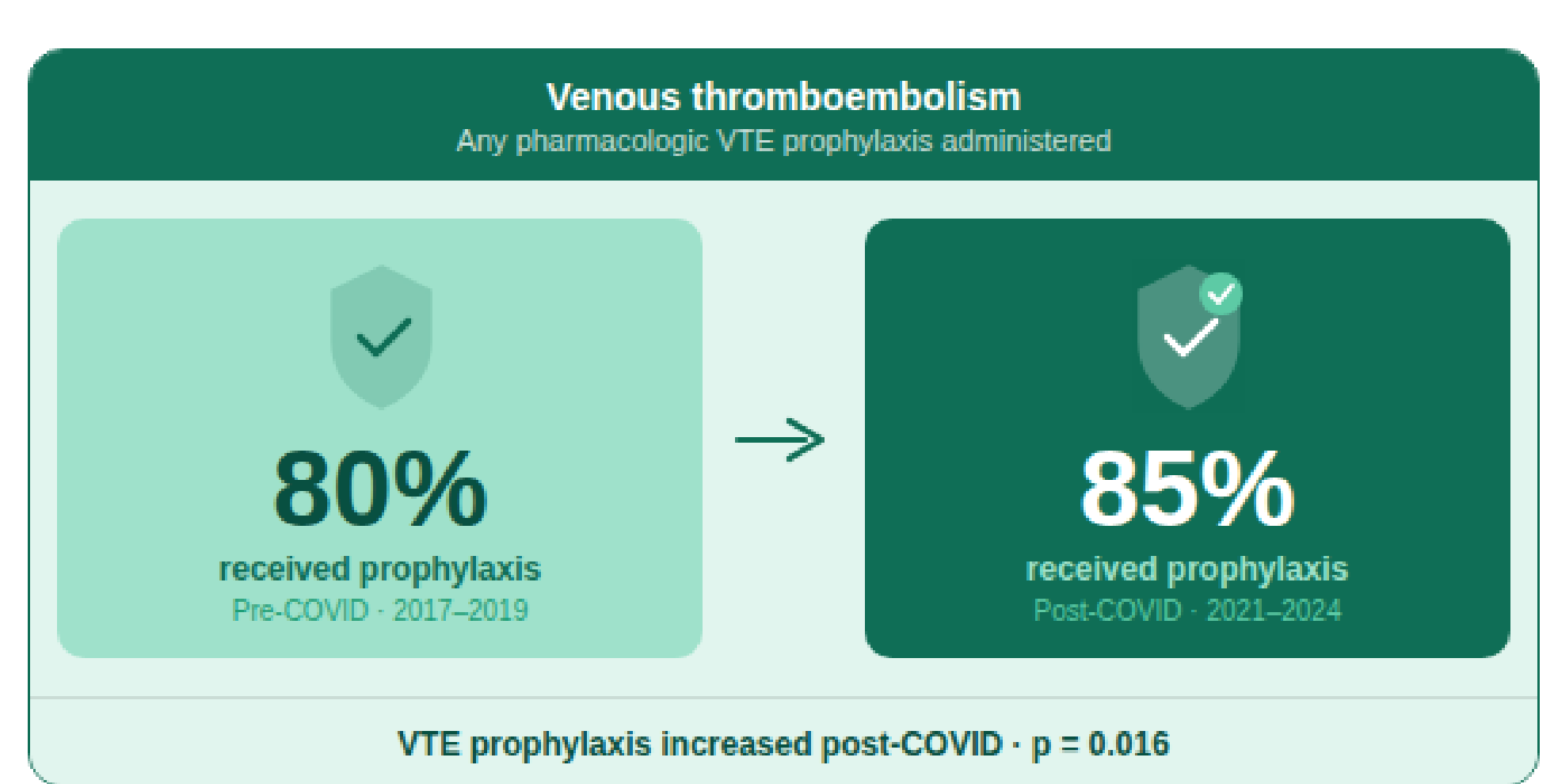
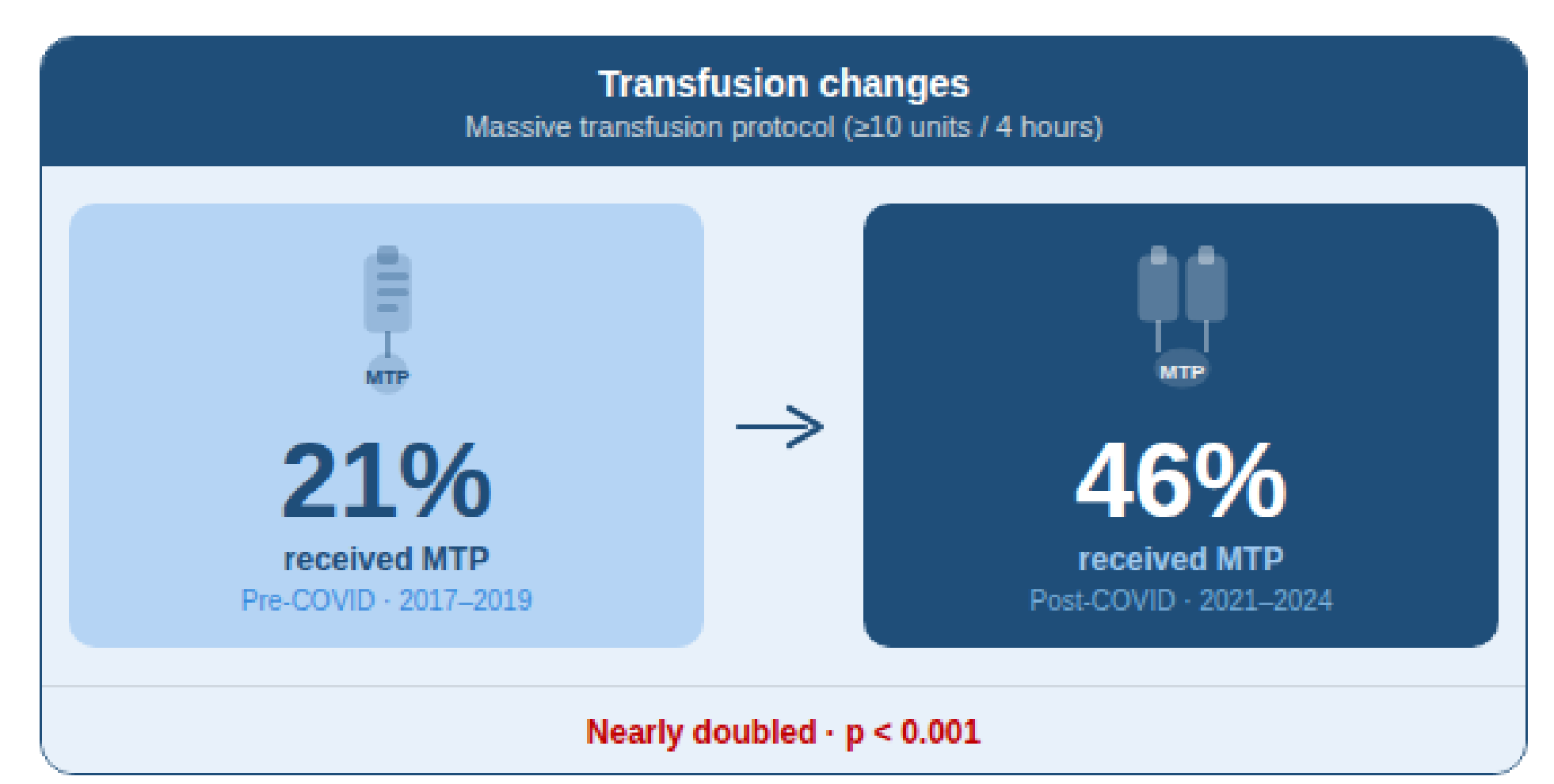
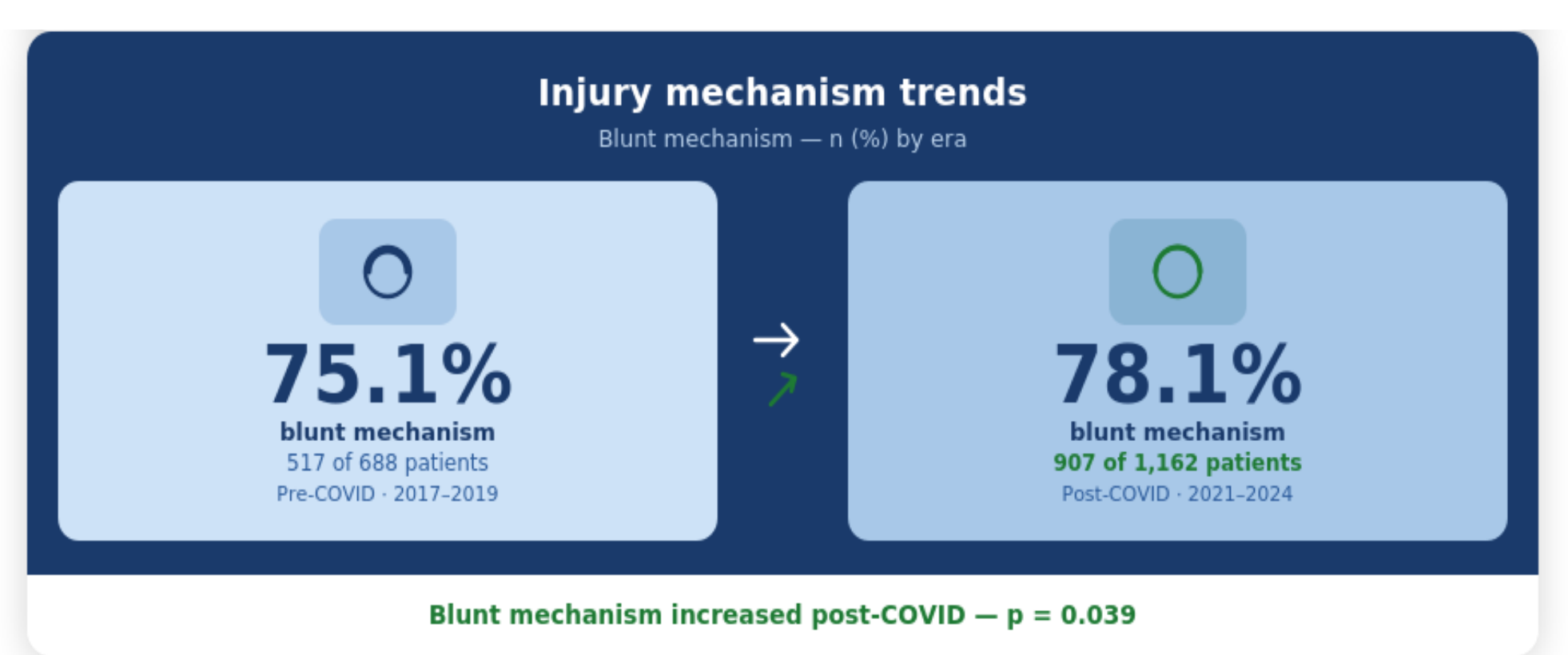
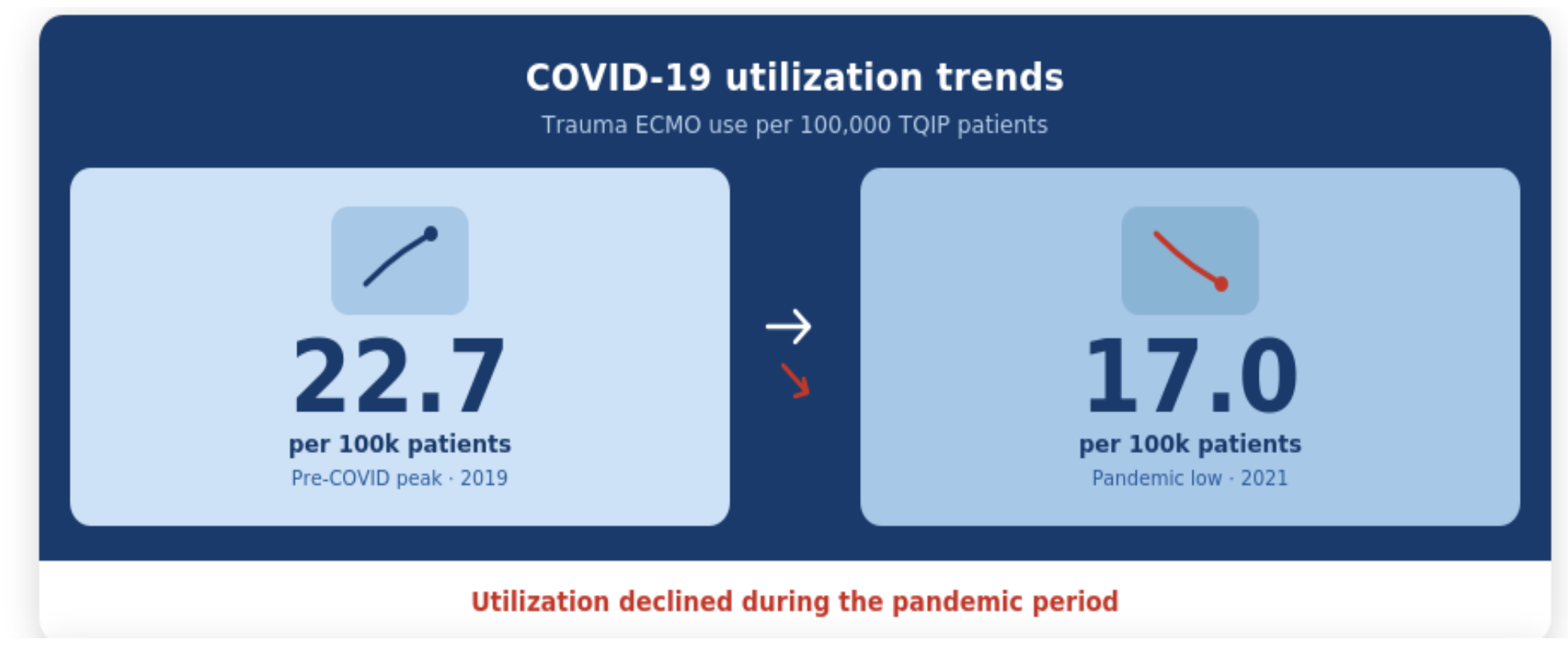
Patient and Hospital Characteristics by COVID Period			
Characteristic	Pre-COVID 2017–2019 (n=688)	Post-COVID 2021–2024 (n=1,182)	p-value
<b>Demographics</b>			
Age, years — median (IQR)	32 (23–50)	33 (22–49)	0.778
Male sex — n (%)	573 (83.3%)	929 (80.5%)	0.137
<b>Hispanic or Latino — n (%)</b>	<b>75 (11.3%)</b>	<b>181 (16.6%)</b>	<b>0.002</b>
White — n (%)	402 (60.1%)	653 (58.9%)	0.113
Black — n (%)	190 (28.4%)	282 (25.5%)	—
<b>Comorbidities &amp; Body Habitus</b>			
Elixhauser weighted score — median (IQR)	0 (0–0)	0 (–1–0)	<0.001
BMI — median (IQR)	28.6 (24.4–34.7)	28.4 (24.3–33.2)	0.095
<b>Insurance / Payer — n (%)</b>			
Private/Commercial	303 (47.5%)	524 (48.2%)	0.610
Government (Medicaid/Medicare)	247 (38.7%)	431 (39.7%)	—
Self-pay	88 (13.8%)	132 (12.1%)	—
<b>Injury Characteristics</b>			
ISS — median (IQR)	27 (17–38)	27 (17–38)	0.925
Shock index — median (IQR)	0.90 (0.72–1.21)	0.91 (0.71–1.20)	0.605
<b>Blunt mechanism — n (%)</b>	<b>517 (75.1%)</b>	<b>907 (78.1%)</b>	<b>0.039</b>
<b>Massive transfusion (≥10 u/4h) — n (%)</b>	<b>142 (21.0%)</b>	<b>531 (46.1%)</b>	<b>&lt;0.001</b>
TBI (AIS head/neck ≥3) — n (%)	234 (34.0%)	427 (36.8%)	0.230
Thoracic injury (AIS chest ≥3) — n (%)	486 (70.6%)	820 (70.6%)	0.996
<b>Hospital &amp; ED</b>			
Level 1 trauma center — n (%)	495 (92.2%)	842 (91.3%)	0.409
Academic center — n (%)	493 (72.1%)	780 (67.2%)	<b>0.008</b>
ED to ICU — n (%)	342 (55.4%)	545 (53.8%)	0.811
ED to OR — n (%)	232 (37.6%)	396 (39.1%)	—



### Multivariate Regression



## Conclusions



Despite utilization changes, outcomes were unchanged