Healthcare Utilization and Charges Associated with US **Hospitalized Adult Patients with COVID-19**

Fayolah Richards¹, Antoine C. El Khoury¹, Chantal Holy¹, Lilla Di Scala¹, Brandon J. Patterson¹, Andrea R. Mospan², Julie M. Crawford², Breda Munoz², Heather L. Morris², Michael W. Fried² Janssen Pharmaceutical Companies of Johnson & Johnson¹; Target RWE, Durham, NC, USA²

Introduction



The coronavirus disease 2019 (COVID-19) pandemic is a worldwide public health concern that presents an urgent need for understanding the impact on the way healthcare is utilized in the United States.

• COVID-19 hospitalization rates have fluctuated since the onset of the pandemic.

• The total economic cost of COVID-19 in the United States through the Fall of 2021 has been estimated at \$16 trillion.¹

Results

A total of 152,770 patients were included in the study with a median length of hospital stay of 7 days. The majority of patients were aged 60+ and males. 16% required a stay in the ICU with a median duration of 8 days (1-193 day). 50% of patients were diagnosed with pneumonia within the first 24 hours of admission and 81% were diagnosed at some point during hospitalization

• Adults 60+ (\$58,112), males (\$57,131) and Hispanics (\$61,997) had the highest median total charges within each of the demographic categories. The median total charges during hospitalization for all patients was \$52,821.

Table 1. Total Medical Charges of the first COVID-19 hospitalization by US patients and hospital characteristics

spital characteristics				
Characteristics	Total Costs (Number of patients=152,770)			
	Median (n)	Min – Max	P-value	
Total	\$52,821 (152,770)	\$1,005-\$5,324,068		
Age group 18-40 41-60 >60	\$36,274 (16,591) \$50,033 (43,430) \$58,112 (92,749)	\$1,057-\$4,140,326 \$1,005-\$4,324,068 \$1,097-\$3,652,729	<.0001	
Sex Female Male	\$48,467 (72,531) \$57,131 (80,239)	\$1,057-\$3,679,920 \$1,005-\$4,324,068	<.0001	
Race Black Hispanic Other White	\$50,535 (9,529) \$61,997 (15,924) \$54,198 (7,544) \$46,675 (28,191)	\$1,333 - \$3,379,743 \$1,057 - \$4,324,068 \$1,284 - \$2,925,721 \$1,124 - \$3,856,706	<.0001	
Insurance Commercial Medicaid Medicare Other Unknown	\$49,084 (32,300) \$56,530 (19,692) \$58,945 (69,185) \$48,782 (6,794) \$42,455 (24,799)	\$1,124 - \$4,161,629 \$1,086 - \$4,324,068 \$1,114 - \$3,379,743 \$1,200 - \$2,820,609 \$1,005 - \$2,604,411	<.0001	
Hospital Characteristics				
Hospital Type Major Teaching Minor Teaching Non-Teaching	\$62,302 (37,094) \$45,390 (25,682) \$51,871 (89,994)	\$1,097 - \$3,856,706	<.0001	
Census Region Midwest Northeast South West	\$32,444 (11,557) \$64,434 (29,364) \$45,957 (71,623) \$66,247 (40,226)		<.0001	
Hospital Location Rural Urban	\$56,948 (13,564) \$52,435 (139,206)		<.0001	

charges as \$75.517 (95% CI = \$53.559 - \$97.475).

p<0.001), and were on Medicaid insurance (\$9,935, p<0.001).

Figure 1. Adjusted total charges of COVID-19 Inpatient Hospitalization

Mean total charges (Intercept)	; 	\$75,517 (\$53,559 - \$97,475)	152,770
Age (yrs)	•	\$45(-\$97 - \$186)	152,770
Sex: Male vs Female	! •	\$19,781 (\$16,655 - \$22,907)	80,239
Hospital location: Urban vs Rural	- 	\$1,765(-\$19,365 - \$22,895)	139,206
Hospital type: Major teaching vs Non-teaching	⊢ ,●I	\$8,991(-\$10,543 - \$28,525)	37,094
Hospital type: Minor teaching vs Non-teaching	⊢ ●; -1	-\$7,992(-\$28,210 - \$12,226)	25,682
Elixhauser comorbidity index	•	\$1,841 (\$1,319 - \$2,364)	152,770
Hospital admission month	•	-\$2,907(-\$3,794\$2,021)	152,770
Point of Origin: Clinic/Physician vs Home	H++ i	-\$19,659(-\$28,612\$10,706)	6,597
Point of Origin: Hospital/Ambulatory Surgery Center transfer vs Home-	I 1 1	\$44,629 (\$27,389 - \$61,869)	9,657
Point of Origin: Hospice vs Home	!	-\$62,427(-\$87,042\$37,812)	18
Point of Origin: Law enforcement vs Home	⊢	-\$10,431(-\$30,848-\$9,986)	381
Point of Origin: Other Transfer vs Home		\$12,770(-\$16,065-\$41,604)	2,150
Point of Origin: SNF Transfer vs Home		-\$9,889(-\$24,102 - \$4,324)	6,281
Point of Origin: Transfer Unit vs Home	Land Land Land Land Land Land Land Land	-\$19,383(-\$33,338\$5,429)	377
Point of Origin: Unknown vs Home	L	\$15,950(-\$9,202-\$41,102)	7,225
Census Region: Midwest vs South		-\$37,799(-\$53,024\$22,574)	11,557
Census Region: Northeast vs South		\$13,220(-\$14,092 - \$40,532)	29,364
Census Region: West vs South		\$37,114 (\$22,698 - \$51,530)	40,226
Insurance: Commercial vs Medicare	L · · ·	-\$1,028(-\$5,055 - \$2,998)	32,300
	T		
Insurance: Medicaid vs Medicare		\$9,935 (\$2,407 - \$17,463) \$44,377 (\$21,502 - \$1,463)	19,692
Insurance: Other/Unknown vs Medicare		-\$11,377(-\$21,592\$1,163)	31,593
Hospital number of beds: 100-199 beds vs <100 beds		\$6,546(-\$16,744 - \$29,835)	26,169
Hospital number of beds: 200-299 beds vs <100 beds		\$7,066(-\$11,202 - \$25,335)	28,315
Hospital number of beds: 300-499 beds vs <100 beds		\$13,281(-\$4,845 - \$31,408)	47,652
Hospital number of beds: 500 or more beds vs <100 beds	-\$78 -\$60 -\$41 -\$23 -\$4 \$15 \$33 \$52 \$70 \$89	\$33,329 (\$16,032 - \$50,627)	38,652
	es and 95% Confidence intervals (in the		
E model includes Age, Sex, Elixhauser comoribidity index, Point of Origin, Insurance, Hospital Type in font/color indicates a significant effect after adjusting for the other variables in the model.	, noopial locator (census region and rataraba) and no	apital number of beda.	
 mechanical ventilation estimated the ave \$65,404). Charges were higher in for patients red 	rage total charges as \$45,2		
 mechanical ventilation estimated the ave \$65,404). Charges were higher in for patients red commercial insurance (\$2,523). 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on	
 mechanical ventilation estimated the ave \$65,404). Charges were higher in for patients red 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on	
 mechanical ventilation estimated the ave \$65,404). Charges were higher in for patients red commercial insurance (\$2,523). 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on	No.of pat
 mechanical ventilation estimated the ave \$65,404). Charges were higher in for patients red commercial insurance (\$2,523). 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on ntilation	
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients reaction commercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of the second second	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on ntilation Parameter estimates (95% CI)	152,77
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept): Age (yrs): 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on ntilation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$85,404) -\$212(-\$307 - \$118)	152,77 152,77
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept) Age (yrs) Sex: Male vs Female 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on ntilation Parameter estimates (95% Cl) \$45,270 (\$25,135 - \$65,404) -\$212(-\$307 - \$118) \$590(-\$1,037 - \$2,216)	152,77 152,77 80,239
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept): Age (yrs)- Sex: Male vs Female Hospital location: Urban vs Rural 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on ntilation Parameter estimates (95% CI) - \$45,270 (\$25,135 - \$65,404) - \$212(-\$307 - \$118) \$590(-\$1,037 - \$2,216) - \$5,090(-\$19,578 - \$9,398)	152,77 152,77 80,239 139,20
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients reacommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept) Age (yrs). Sex: Male vs Female Hospital location: Urban vs Rural-Hospital location: vs Rural-Hospital type: Major teaching vs Non-teaching - 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on ntilation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$85,404) -\$212(-\$307 - \$118) \$550(-\$1,037 - \$2,216) -\$5,090(-\$19,578 - \$9,398) -\$7,902(-\$16,897 - \$1,094)	152,77 152,77 80,239 139,20 37,09
 mechanical ventilation estimated the average of the second state of the s	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on ntilation Sector 25,135 - 86,404) -\$212(-\$307 - \$118) \$590(-\$1,037 - \$2,216) -\$5,900(-\$1,037 - \$2,216) -\$5,900(-\$1,037 - \$2,216) -\$5,900(-\$15,78 - \$9,398) -\$7,902(-\$16,897 - \$1,094) -\$2,168(-\$8,179 - \$3,843)	152,77 152,77 80,239 139,20 37,09 25,68
 mechanical ventilation estimated the average of the second structure of the second struct	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on ntilation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$65,404) -\$212(.\$307 - \$116) \$590(-\$1,037 - \$2,216) -\$5,090(-\$19,578 - \$9,398) -\$7,902(-\$16,897 - \$1,094) -\$2,168(-\$8,179 - \$3,843) \$151(-\$23 - \$326)	152,77 152,77 80,239 139,20 37,094 25,682 152,77
 mechanical ventilation estimated the average of the second second	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on ntilation Sector 25,135 - 86,404) -\$212(-\$307 - \$118) \$590(-\$1,037 - \$2,216) -\$5,900(-\$1,037 - \$2,216) -\$5,900(-\$1,037 - \$2,216) -\$5,900(-\$1,578 - \$9,398) -\$7,902(-\$16,897 - \$1,094) -\$2,168(-\$8,179 - \$3,843)	152,77 152,77 80,239 139,20 37,094 25,682 152,77
 mechanical ventilation estimated the average of \$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of the set of the s	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on ntilation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$65,404) -\$212(.\$307 - \$116) \$590(-\$1,037 - \$2,216) -\$5,090(-\$19,578 - \$9,398) -\$7,902(-\$16,897 - \$1,094) -\$2,168(-\$8,179 - \$3,843) \$151(-\$23 - \$326)	152,77 152,77 80,233 139,20 37,09 25,68 152,77 152,77
 mechanical ventilation estimated the average of \$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of the set of the s	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on ntilation Parameter estimates (95% Cl) \$45,270 (\$25,135 - \$65,404) -\$212(-\$307 - \$118) \$590(-\$1,037 - \$2,216) -\$5,090(-\$19,578 - \$9,398) -\$7,902(-\$16,887 - \$1,094) -\$2,168(-\$8,179 - \$3,843) \$151(-\$23 - \$326) -\$605(-\$1,138 - \$72)	152,77 152,77 80,239 139,20 37,094 25,682 152,77 152,77 6,597
 mechanical ventilation estimated the average of \$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of the set of the s	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on ntilation Parameter estimates (95% CI) → \$45,270 (\$25,135 - \$65,404) -\$212(-\$307 - \$118) \$590(-\$1,037 - \$2,216) -\$5,090(-\$19,578 - \$9,398) -\$7,902(-\$16,897 - \$1,094) -\$2,168(-\$8,179 - \$3,843) \$151(-\$23 - \$326) -\$605(-\$1,138 - \$72) -\$4,984(-\$9,773 - \$196)	152,77 152,77 80,239 139,20 37,094 25,682 152,77 152,77 6,597
 mechanical ventilation estimated the average of \$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept) - Age (yrs) - Sex: Male vs Female - Hospital tocation: Urban vs Rural - Hospital type: Major teaching vs Non-teaching - Hospital type: Minor teaching vs Non-teaching - Elixhauser comorbidity index - Hospital admission month - Point of Origin: Hospital/Ambulatory Surgery Center transfer vs Home - Point of Origin: Law enforcement vs Home	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on ntilation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$65,404) -\$212(-\$307 - \$116) \$590(-\$1,037 - \$2,216) -\$5,090(-\$19,578 - \$9,398) -\$7,902(-\$16,897 - \$1,094) -\$2,168(-\$8,179 - \$3,843) \$151(-\$23 - \$326) -\$606(-\$1,138 - \$772) -\$4,984(-\$9,773 - \$196) \$2,445(-\$5,803 - \$10,693) \$2,445(-\$5,803 - \$10,693) \$2,445(-\$5,803 - \$10,693) \$2,445(-\$5,803 - \$10,693) \$2,445(-\$5,803 - \$10,693) \$2,445(-\$5,803 - \$10,693) \$2,445(-\$5,803 - \$10,693) \$2,7798(-\$15,803 - \$208)	152,77 152,77 80,239 139,20 37,094 25,682 152,77 152,77 152,77 6,597 9,657 381
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept) Age (yrs) Sex: Male vs Female-Hospital location: Urban vs Rural Hospital location: Urban vs Rural Hospital type: Major teaching vs Non-teaching - Elixhauser comorbidity index Hospital admission month Point of Origin: Hospital/Ambulatory Surgery Center transfer vs Home-Point of Origin: Cher Transfer vs Home - Point of Origin: Other Transfer vs Home - Point of Origin: Other	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on ntilation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$65,404) -\$212(-\$307 - \$118) \$590(-\$1,037 - \$2,216) -\$5,090(-\$19,578 - \$9,398) -\$7,902(-\$16,897 - \$1,094) -\$2,168(-\$8,179 - \$3,843) \$151(-\$22 - \$326) -\$605(-\$1,138 - \$72) -\$4,984(-\$9,773 - \$196) \$2,445(-\$5,803 - \$10,693) -\$7,798(-\$15,803 - \$208) -\$3,347(-\$8,577 - \$1,703)	152,77 152,77 80,233 139,200 37,094 25,682 152,77 152,77 152,77 9,657 9,657 3,81
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept) Age (yrs) Sex: Male vs Female Hospital location: Urban vs Rural Hospital type: Major teaching vs Non-teaching Hospital dyna ws Home Point of Origin: Clinic/Physician vs Home Point of Origin: NF Transfer vs Home 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = $$25,135$ 9,785), and those on ntilation Parameter estimates (95% CI) 4 $$45,270 ($25,135 - $65,404)$ \$590 (\$10,37 + \$2,216) \$590 (\$10,37 + \$2,216) \$7,902 (\$16,897 - \$1,094) \$7,902 (\$16,897 - \$1,094) \$2,168 (\$8,179 + \$3,843) \$151 (\$23 + \$326) \$4505 (\$51,138 - \$72) \$4,984 (\$9,773 - \$196) \$2,445 (\$5,803 - \$10,693) \$-7,798 (\$15,803 - \$208) \$3,347 (\$5,877 + \$1,703) \$3,651 (\$5,707 + \$51,703) \$3,061 (\$5,707 + \$51,703)	152,77 152,77 80,233 139,200 37,099 25,683 152,77 152,77 6,597 9,657 381 2,150 6,281
 mechanical ventilation estimated the average of \$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept) Age (yrs). Sex: Male vs Female Hospital location: Urban vs Rural-Hospital type: Major teaching vs Non-teaching Hospital type: Minor teaching vs Non-teaching Elikhauser comorbidity index Hospital dmission month Point of Origin: Clinic/Physician vs Home Point of Origin: Clinic/Physician vs Home Point of Origin: Other Transfer vs Home Point of Origin: Stansfer Unit vs Home 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = $$25,135$ 9,785), and those on millation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$85,401) \$590 (\$1,037 - \$118) \$590 (\$1,037 - \$2,216) \$7,902 (\$16,897 - \$1,094) \$7,902 (\$16,897 - \$1,094) \$57,902 (\$1,188 - \$729) \$2,168 (\$8,179 - \$3,843) \$151 (\$23 - \$326) \$2,445 (\$5,803 - \$10,993) \$7,798 (\$15,803 - \$2008) \$2,445 (\$5,803 - \$10,693) \$7,788 (\$15,803 - \$10,933) \$57,804 (\$15,803 - \$10,933) \$57,788 (\$5,707 - \$51,703) \$3,061 (\$5,707 - \$584) \$4,435 (\$20,121 - \$11,251)	152,77 152,77 80,233 139,20 37,094 25,682 152,77 152,77 6,597 9,657 381 2,150 6,281 3,77
 mechanical ventilation estimated the average of \$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept) Age (yrs) Sex: Male vs Female Hospital tocation: Urban vs Rural Hospital type: Minor teaching vs Non-teaching Hospital type: Minor teaching vs Non-teaching Elixhauser comorbidity index Hospital admission month Point of Origin: Clinic/Physician vs Home Point of Origin: Law enforcement vs Home Point of Origin: SNF Transfer vs Home Point of Origin: SNF Transfer vs Home Point of Origin: SNF Transfer vs Home Point of Origin: Unknown vs Home 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = \$25,135 9,785), and those on ntilation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$65,404) -\$212(-\$307 - \$118) \$590(-\$1,037 - \$2,216) -\$5,090(-\$19,578 - \$9,398) -\$7,092(-\$16,897 - \$1,094) -\$2,168(-\$8,179 - \$3,843) \$151(-\$23 - \$326) -\$405(-\$1,138 - \$72) -\$4,984(-\$5,803 - \$10,693) -\$7,798(-\$15,803 - \$10,693) -\$3,437(-\$5,803 - \$10,693) -\$3,437(-\$5,707 - \$584) -\$4,435(-\$20,121 - \$11,251) \$32,166(-\$2,739 - \$67,072)	152,77 152,77 80,233 139,20 37,09 25,68; 152,77 152,77 6,597 9,657 381 2,150 6,281 3,77 7,225
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept) Age (yrs) - Sex: Male vs Female Hospital location: Urban vs Rural Hospital type: Major teaching vs Non-teaching Hospital type: Minor teaching vs Non-teaching Elixhauser comorbidity index Hospital admission month Point of Origin: Clinic/Physician vs Home Point of Origin: Other Transfer vs Home Point of Origin: SNF Transfer vs Home Point of Origin: SNF Transfer vs Home Point of Origin: Unknown vs Home Point O Origin: Unknown vs H	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = $$25,135$ 9,785), and those on ntilation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$65,404) \$252(2(\$307 - \$116) \$590(\$1,037 - \$2,216) \$590(\$1,037 - \$2,216) \$590(\$1,037 - \$2,216) \$590(\$1,037 - \$2,216) \$590(\$1,037 - \$2,216) \$5090(\$1,037 - \$2,216) \$5090(\$1,037 - \$2,216) \$5090(\$1,037 - \$2,216) \$5090(\$1,037 - \$2,216) \$5090(\$1,037 - \$2,384) \$151(\$23 - \$326) \$505(\$51,138 - \$72) \$4,984(\$59,773 - \$106) \$2,445(\$5,803 - \$10,693) \$7,798(\$15,803 - \$208) \$3,337(\$58,577 - \$1,703) \$3,306(\$5,777 - \$584) \$53,61(\$56,707 - \$584) \$54,435(\$520,121 - \$11,251) \$32,166(\$52,738 - \$57,072 - \$584) \$54,812(\$52,586 - \$10,651)	152,77 152,77 80,233 139,20 37,099 25,68; 152,77 152,77 6,597 9,657 381 2,150 6,281 377 7,225 11,557
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept) Age (yrs) Sex: Male vs Female Hospital location: Urban vs Rural Hospital type: Major teaching vs Non-teaching Hospital dynise with the set of origin: Clinic/Physician vs Home Point of Origin: Clinic/Physician vs Home Point of Origin: Clinic/Physician vs Home Point of Origin: Transfer vs Home Point of Origin: Makown vs Home Census Region: Midwest vs South 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = $$25,135$ 9,785), and those on mtilation Parameter estimates (95% CI) 4 $545,270$ ($525,135$ - $865,404$) -5212(-5307 - 5118) 5590(-519,578 - 89,398) -57,902(-516,887 - 51,094) -52,168(-58,179 - 53,843) 5151(-523 - 5326) -5605(-51,138 - 572) -54,984(-59,173 - 5186) 52,445(-55,803 - 510,693) -57,798(-515,803 - 5208) -53,437(-58,577 - 51,703) -53,661(-56,707 - 5584) -54,435(-52,739 - 567,072) -518,128(-52,566 - 510,651) -518,128(-52,566 - 510,651) -518,128(-52,566 - 510,651) -518,128(-52,566 - 510,651)	152,77 152,77 80,233 139,20 37,094 25,682 152,77 152,77 152,77 152,77 9,657 9,657 381 2,150 6,281 377 7,225 11,557 29,364
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept) Age (yrs). Sex: Male vs Female Hospital location: Urban vs Rural Hospital type: Major teaching vs Non-teaching Elixhauser comorbidity index Hospital dmission month Point of Origin: Clinic/Physician vs Home Point of Origin: Clinic/Physician vs Home Point of Origin: Clinic/Physician vs Home Point of Origin: Transfer vs Home Point of Origin: Transfer us Home Point of Origin: Transfer Unit vs Home Point of Origin: Transfer Unit vs Home Point of Origin: Northeast vs South Census Region: Northeast vs South 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = $$25,135$ 9,785), and those on milation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$65,404) - \$212(-\$307 - \$118) \$590(-\$1,037 - \$2,216) - \$5,900(-\$1,9578 - \$9,398) - \$5,7092(-\$16,887 - \$1,094) - \$5,902(-\$16,887 - \$1,094) - \$2,168(-\$8,179 - \$3,843) \$151(-\$23 - \$326) - \$605(-\$1,138 - \$7,298 - \$4,924(-\$9,773 - \$1,093) - \$5,7092(-\$16,807 - \$1,093) - \$7,798(-\$16,803 - \$10,693) - \$7,798(-\$16,803 - \$10,693) - \$7,798(-\$16,803 - \$10,693) - \$7,798(-\$16,803 - \$10,693) - \$7,798(-\$16,803 - \$10,693) - \$7,798(-\$16,803 - \$10,693) - \$7,788(-\$5,707 - \$51,703) - \$3,216(-\$2,739 - \$57,707) - \$32,166(-\$2,739 - \$57,707) - \$32,166(-\$2,739 - \$57,707) - \$32,166(-\$2,739 - \$57,707) - \$32,166(-\$2,739 - \$57,707) - \$32,166(-\$2,739 - \$57,707) - \$39,796(-\$16,181 - \$3,412) - \$9,766(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$1,600(-\$10,651	152,77 152,77 80,233 139,20 37,094 25,682 152,77 152,77 152,77 152,77 9,657 381 2,1500 6,281 377 7,225 11,557 29,364 40,224
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept) Age (yrs) Sex: Male vs Female Hospital location: Urban vs Rural Hospital type: Major teaching vs Non-teaching Hospital type: Minor teaching vs Non-teaching Elikhauser comorbidity index Hospital admission month Point of Origin: Clinic/Physician vs Home Point of Origin: Law enforcement vs Home Point of Origin: Transfer vs Home Point of Origin: Manown vs Home Census Region: Midwest vs South 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = $$25,135$ 9,785), and those on mtilation Parameter estimates (95% CI) 4 $545,270$ ($525,135$ - $865,404$) -5212(-5307 - 5118) 5590(-519,578 - 89,398) -57,902(-516,887 - 51,094) -52,168(-58,179 - 53,843) 5151(-523 - 5326) -5605(-51,138 - 572) -54,984(-59,173 - 5186) 52,445(-55,803 - 510,693) -57,798(-515,803 - 5208) -53,437(-58,577 - 51,703) -53,661(-56,707 - 5584) -54,435(-52,739 - 567,072) -518,128(-52,566 - 510,651) -518,128(-52,566 - 510,651) -518,128(-52,566 - 510,651) -518,128(-52,566 - 510,651)	152,77 152,77 80,233 139,20 37,094 25,682 152,77 152,77 152,77 152,77 9,657 381 2,1500 6,281 377 7,225 11,557 29,364 40,224
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept) Age (yrs). Sex: Male vs Female Hospital location: Urban vs Rural Hospital type: Major teaching vs Non-teaching Elixhauser comorbidity index Hospital dmission month Point of Origin: Clinic/Physician vs Home Point of Origin: Clinic/Physician vs Home Point of Origin: Clinic/Physician vs Home Point of Origin: Transfer vs Home Point of Origin: Transfer us Home Point of Origin: Transfer Unit vs Home Point of Origin: Transfer Unit vs Home Point of Origin: Northeast vs South Census Region: Northeast vs South 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = $$25,135$ 9,785), and those on milation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$65,404) - \$212(-\$307 - \$118) \$590(-\$1,037 - \$2,216) - \$5,900(-\$1,9578 - \$9,398) - \$5,7092(-\$16,887 - \$1,094) - \$5,902(-\$16,887 - \$1,094) - \$2,168(-\$8,179 - \$3,843) \$151(-\$23 - \$326) - \$605(-\$1,138 - \$7,298 - \$4,924(-\$9,773 - \$1,093) - \$5,7092(-\$16,807 - \$1,093) - \$7,798(-\$16,803 - \$10,693) - \$7,798(-\$16,803 - \$10,693) - \$7,798(-\$16,803 - \$10,693) - \$7,798(-\$16,803 - \$10,693) - \$7,798(-\$16,803 - \$10,693) - \$7,798(-\$16,803 - \$10,693) - \$7,788(-\$5,707 - \$51,703) - \$3,216(-\$2,739 - \$57,707) - \$32,166(-\$2,739 - \$57,707) - \$32,166(-\$2,739 - \$57,707) - \$32,166(-\$2,739 - \$57,707) - \$32,166(-\$2,739 - \$57,707) - \$32,166(-\$2,739 - \$57,707) - \$39,796(-\$16,181 - \$3,412) - \$9,766(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$9,760(-\$10,651) - \$1,600(-\$10,651	152,77 152,77 80,233 139,20 37,09, 25,68; 152,77 152,77 152,77 6,597 9,657 381 2,150 6,281 377 7,225 11,55; 29,366 40,224
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of the second se	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = $$25,135$ 9,785), and those on ntilation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$65,404) -\$212(-\$307 - \$116) \$590(-\$1,037 - \$2,216) -\$5,090(-\$19,578 - \$9,398) -\$7,902(-\$16,807 - \$1,094) -\$2,168(-\$8,179 - \$3,843) \$151(-\$23 - \$326) -\$605(-\$1,138 - \$72) -\$4,984(-\$5,803 - \$10,693) -\$3,437(-\$5,803 - \$10,693) -\$3,437(-\$5,707 - \$5,844) -\$4,435(-\$20,121 - \$11,251) \$32,166(-\$2,739 - \$67,072) -\$18,128(-\$25,806 - \$10,651) -\$9,796(-\$16,181 - :\$3,412) \$9,765(-\$1,182 - \$37,200)	152,77 152,77 80,233 139,20 37,09 25,68; 152,77 152,77 6,597 9,657 381 2,150 6,281 377 7,225 11,55; 29,36 40,224 32,300
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept) Age (yrs) Sex: Male vs Female Hospital location: Urban vs Rural Hospital type: Major teaching vs Non-teaching Hospital type: Mior teaching vs Non-teaching Elixhauser comorbidity index Hospital admission month Point of Origin: Clinic/Physician vs Home Point of Origin: Other Transfer vs Home Point of Origin: Other Transfer vs Home Point of Origin: Unknown vs Home Point Of Origin: Un	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = $$25,135$ 9,785), and those on ntilation Parameter estimates (95% CI) 4 $545,270$ ($525,135$ - $865,404$) -5212(-5307 - 5118) 5590(-519,578 - 89,398) -57,902(-516,887 - 51,094) -52,168(-58,179 - 53,843) 5161(-523 - 5326) -54,984(-59,773 - 5186) 52,445(-55,803 - 510,693) -57,798(-515,803 - 520,893) -53,061(-56,707 - 5584) -54,435(-52,739 - 567,072) -518,128(-525,666 - 510,651) -54,435(-52,739 - 567,072) -518,128(-525,666 - 510,651) -54,986(-516,181 - 53,412) -59,796(-516,181 - 53,412) -59,796(-516,181 - 53,412) -54,788(-510,880 - 51,304)	152,77 152,77 80,233 139,20 37,094 25,68; 152,77 152,77 152,77 9,657 9,657 9,657 381 2,150 6,281 377 7,225 21,155 29,364 40,224 40,224 32,300 19,692 31,593
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of the set of the set	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = $$25,135$ 9,785), and those on ntilation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$85,404) \$212(-\$307 - \$118) \$590(-\$1,037 - \$2,216) \$7,902(-\$16,887 - \$1,094) \$7,902(-\$16,887 - \$1,094) \$2,168 (-\$8,179 - \$3,843) \$151(-\$23 - \$326) \$2,445(-\$5,803 - \$10,993) \$7,798(-\$16,897 - \$1,703) \$2,445(-\$5,803 - \$10,693) \$7,798(-\$16,807 - \$1,703) \$2,445(-\$5,707 - \$58,40) \$2,435(-\$20,121 - \$11,251) \$2,2166(-\$2,739 - \$67,702) \$3,306(-\$5,707 - \$584) \$59,765 (\$1,920 - \$17,609) \$2,523(-\$618 - \$4,427) \$593(-\$3,389 - \$4,776) \$4,149(-\$7,184 - \$15,481)	9,657 381 2,150 6,281 377 7,225 11,557 29,364 40,226 32,300 19,692 31,593 26,165
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept) (Age (yrs)) Sex: Male vs Female Hospital tocation: Urban vs Rural Hospital type: Minor teaching vs Non-teaching Hospital type: Minor teaching vs Non-teaching Elixhauser comorbidity index Hospital type: Minor teaching vs Non-teaching Elixhauser comorbidity index Hospital damission month Point of Origin: Clinic/Physician vs Home Point of Origin: Clinic/Physician vs Home Point of Origin: SNF Transfer vs Home Point of Origin: SNF Transfer vs Home Point of Origin: Wast vs South Census Region: Wortheast vs South Census Region: Wortheast vs South Insurance: Commercial vs Medicare Insurance: Medicaid vs Medicare Insurance: Medicaid vs Medicare Insurance: Other/Unknown vs Medicare Hospital number of beds: 200-299 beds vs <100 beds 	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = $$25,135$ 9,785), and those on ntilation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$65,404) \$5212(-\$307 - \$118) \$590(-\$1,037 - \$2,216) -\$5,900(-\$1,037 - \$2,216) -\$5,900(-\$1,037 - \$2,216) -\$5,900(-\$1,037 - \$2,216) -\$5,900(-\$1,037 - \$2,216) -\$2,168(-\$8,179 - \$3,843) \$151(-\$23 - \$326) -\$202(-\$16,803 - \$10,093) -\$2,445(-\$5,803 - \$10,693) -\$3,437(-\$8,877 - \$1,703) -\$3,437(-\$58,877 - \$1,703) -\$3,437(-\$58,803 - \$10,683) -\$4,435(-\$20,121 - \$11,251) \$32,166(-\$2,739 - \$67,072) -\$18,128(-\$25,806 - \$10,651) -\$9,796(-\$16,181 - \$3,412) \$9,765(-\$1,182 - \$13,245) -\$3,3389 - \$4,776) -\$4,788(-\$10,800 - \$1,304) \$4,149(-\$7,144 - \$15,481) -\$609(-\$12,268 - \$11,463)	152,77 152,77 80,238 139,20 37,094 25,682 152,77 152,77 152,77 6,597 9,657 381 2,150 6,281 3,77 7,225 11,557 29,364 40,226 32,300 19,699 31,593 26,166
 mechanical ventilation estimated the average (\$65,404). Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (Intercept) Age (yrs) Sex: Male vs Female Hospital Iocation: Urban vs Rural Hospital type: Major teaching vs Non-teaching Hospital type: Minor teaching vs Non-teaching Elixhauser comorbidity index Hospital admission month Point of Origin: Clinic/Physician vs Home Point of Origin: Other Transfer vs Home Point of Origin: SNF Transfer vs Home Point of Origin: Unknown vs Home Point of Origin: Unknown vs Home Point of Origin: Unknown vs Home Census Region: Midwest vs South Csusu Region: West vs South Insurance: Commercial vs Medicare Insurance: Medicare Insurance: Medicare Medicare Insurance: Other/Unknown vs Medicare Insurance: Other/Unknown vs Medicare Insurance: Other/Unknown vs Medicare Insurance: Other/Unknown vs Medicare Insurance: Medicare Medicare Insurance: Me	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = $$25,135$ 9,785), and those on ntilation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$65,404) (\$-5212 (\$307 - \$116) (\$590 (\$1,037 + \$2,216) (\$-55,090 (\$19,578 - \$8,398) (\$-57,092 (\$16,897 - \$1,094) (\$-52,168 (\$-58,179 - \$3,843) (\$151 (\$-523 - \$326) (\$-5806 (\$-51,138 - \$72) (\$-54,984 (\$-59,179 - \$1,094) (\$-52,168 (\$-58,179 - \$3,843) (\$151 (\$-523 - \$326) (\$-5806 (\$-51,138 - \$72) (\$-54,984 (\$-59,77 - \$1,516) (\$2,445 (\$-58,003 - \$10,693) (\$-24,445 (\$-58,003 - \$10,693) (\$-33,437 (\$-58,577 - \$1,703) (\$-53,061 (\$-56,707 - \$584) (\$-54,445 (\$-58,003 - \$10,651) (\$-59,796 (\$1,920 - \$17,609) (\$2,523 (\$618 - \$4,427) (\$593 (\$-53,389 - \$4,776) (\$-54,788 (\$-510,880 - \$1,340) (\$4,149 (\$-57,184 - \$15,481) (\$-560 (\$-51,148) (\$-500 (\$-51,148) (\$-500 (\$-51,148) (\$-500 (\$-51,148) (\$-500 (\$-51,148) (\$-500 (\$-51,148) (\$-500 (\$-51,148) (\$-500 (\$-51,148) (\$-500 (\$-51,148) (\$-500 (\$-53,338 - \$21,117) (\$-58,334 (\$-52,117) (\$-58,334 (\$-52,117) (\$-58,334 (\$-52,117) (\$-58,334 (\$-52,117) (\$-58,334 (\$-52,117) (\$-58,334 (\$-52,117) (\$-58,334 (\$-52,117) (\$-58,334 (\$-52,117) (\$-58,334 (\$-52,117) (\$-58,334 (\$-52,117) (\$-58,334 (\$-52,117) (\$-58,334 (\$-52,117) (\$-58,334 (\$-58,334 (\$-52,117) (\$-58,334 (\$	152,77 152,77 80,233 139,20 37,094 25,682 152,77 152,77 152,77 8,597 9,657 381 2,150 6,281 3,77 7,225 11,557 29,364 40,222 32,300 19,692 31,593 24,165 28,314 47,652
mechanical ventilation estimated the ave - \$65,404). - Charges were higher in for patients recommercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of Mean total charges (intercept) Age (yrs) Sex: Male vs Female Hospital location: Urban vs Rural Hospital type: Major teaching vs Non-teaching Hospital type: Major teaching vs Non-teaching Hospital type: Major teaching vs Non-teaching Hospital dimission month Point of Origin: Clinic/Physician vs Home Point of Origin: Clinic/Physician vs Home Point of Origin: Transfer vs Home Point of Origin: Money vs South Census Region: Northeast vs South Census Region: Northeast vs South Insurance: Commercial vs Medicare Insurance: Other/Unknown vs Medicare Hospital number of beds: 200-299 beds vs <100 beds Hospital number of beds: 200-299 beds vs <100 beds Hospital number of beds: 200-299 beds vs <100 beds	rage total charges as \$45,2 ceiving care in the West (\$ who received mechanical ver	270 (95% CI = $$25,135$ 9,785), and those on ntilation Parameter estimates (95% CI) 4 $545,270$ ($$25,135 - 865,404$) -\$212(-\$307 - \$118) 5590(-\$1,037 - \$2,216) -\$5,900(-\$19,578 - \$9,398) -\$7,902(-\$16,887 - \$1,094) -\$2,168(-\$8,179 - \$3,843) 5151(-\$23 - \$326) -\$605(-\$11,687 - \$1,094) -\$2,168(-\$8,179 - \$3,843) 5151(-\$23 - \$326) -\$605(-\$11,887 - \$1,094) -\$4,984(-\$9,773 - \$196) \$2,445(-\$5,803 - \$10,693) -\$7,796(-\$15,803 - \$2008) -\$3,3051(-\$6,707 - \$584) -\$4,435(-\$22,739 - \$67,072) -\$18,128(-\$25,666 - \$10,651) -\$518,128(-\$25,566 - \$10,651) -\$9,796(-\$16,181 - \$3,412) \$9,765(-\$16,181 - \$3,412) \$9,765(-\$19,202 - \$17,609) \$2,523(-\$618, \$20,212 - \$11,241) \$5093(-\$3,389 - \$4,776) -\$4,488(-\$10,880 - \$1,304) \$4,149(-\$7,184 - \$15,481) \$3,886(-\$3,345 - \$21,117) \$2,684(-\$9,788 - \$15,127)	152,77 152,77 80,233 139,20 37,09, 25,68; 152,77 152,77 152,77 6,597 9,657 381 2,150 6,281 3,77 7,225 11,55; 29,36 40,22(32,300 19,69; 31,593; 26,16(28,31);
mechanical ventilation estimated the aver - \$65,404). • Charges were higher in for patients reaconnercial insurance (\$2,523). Figure 2. Adjusted total charges for patients of the second se	rage total charges as \$45,2 ceiving care in the West (\$	270 (95% CI = $$25,135$ 9,785), and those on ntilation Parameter estimates (95% CI) \$45,270 (\$25,135 - \$65,401) \$590 (\$1,037 - \$2,16) \$590 (\$1,037 - \$2,216) \$590 (\$1,037 - \$2,216) \$5,500 (\$1,037 - \$2,216) \$5,500 (\$1,037 - \$2,216) \$5,500 (\$1,037 - \$2,216) \$2,405 (\$1,138 - \$72) \$4,984 (\$9,773 - \$1094) \$2,445 (\$5,803 - \$10,993) \$7,798 (\$15,803 - \$10,993) \$7,798 (\$15,803 - \$208) \$3,306 (\$5,707 - \$584) \$3,306 (\$5,707 - \$584) \$3,306 (\$5,707 - \$584) \$3,306 (\$5,707 - \$584) \$3,2166 (\$1,920 - \$11,651) \$3,2166 (\$1,920 - \$11,651) \$3,2166 (\$1,920 - \$11,651) \$9,765 (\$1,920 - \$17,609) \$2,523 (\$618 - \$4,427) \$693 (\$3,389 - \$4,776) \$4,149 (\$7,144 - \$15,481) \$509 (\$12,680 - \$1,044) \$3,346 (\$3,345 - \$21,117) \$2,684 (\$9,758 - \$15,127)	152 152 80, 133 37, 25, 152 6, 3 3 2, 7, 6, 3 3 2, 7, 2, 6, 3 11, 29, 40, 32, 7, 31, 29, 40, 32, 19, 31, 34, 29, 40, 32, 7, 40, 32, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5,

Objectives

6		
(((γ	
(l)		

The purpose of this project was to estimate the total hospital charges associated with health services provided to COVID-19 inpatients hospitalized across the US during the study period of April -December 2020.

- Primary Objective: Identify patient and hospital characteristics associated with total hospital charges for healthcare utilization by patients admitted/hospitalized with a diagnosis of COVID-19.
- Secondary Objective: Identify patients with high care utilization during first COVID-19 hospitalization and investigate whether there are disparities in total charges for healthcare utilization among patients receiving healthcare for COVID-19.

Methods



This is a retrospective, observational study utilizing US hospital chargemaster deidentified data from 330 hospitals from April to December 2020.

- ICD-10 code U07.1 was used to identify patients with a primary diagnosis of COVID-19; patients with a secondary COVID-19 diagnosis and a primary diagnosis that was a complication of COVID-19 (i.e. pneumonia).
- Demographic data were analyzed descriptively and linked with total charges.
- A predictive model for total hospitalization charges related to the first hospitalization with generalized equation estimates (GEE) was developed to model the association between hospital charges and patient-level clinical and demographic variables available at admission, and hospital characteristics.

References

ECI – Elixhauser Comorbidity Index **GEE – Generalized Equation Estimates** US – United States

Abbreviations

1. Cutler, DM & Summers, LH (2020). The COVID-19 pandemic and the \$16 trillion virus. JAMA, 324(15), 1495-1496.



The Professional Society for Health Economics and Outcomes Research (ISPOR) 2022 • May 15 – May 18, 2022 • Washington, D.C.

A predictive model* for total COVID-19 hospitalization charges estimated the average total

• Charges were higher in male patients (\$19,781, p<.0001) and those with a higher Elixhauser comorbidity index (ECI) score (\$1,841, p<.0001), originated from the hospital/ambulatory surgery center (\$44,629, p<0.001), were treated in a hospital with >500 beds (\$33,329, p<0.001), treated in the West (\$37,114,

Acknowledgments and Disclosures

Target RWE is a health evidence solutions company headquartered in Durham, NC.

Key Findings

A total of 152,770 patients > 18 years of age had median total hospital charges of \$52,821 (range \$1,005 - \$5,324,068).

Older adults (60+, \$58,112), males (\$57,131), and Hispanics (\$61,997) had higher median total charges reported for their first COVID-19 hospitalization than their comparators (p<.0001).

Male patients (\$19,781), those with a higher ECI (\$1,841), transferred from an ambulatory surgical center (\$44,629), and treated in the West (\$37,114) had higher adjusted total charges.

Patients who received mechanical ventilation during their hospitalization in the West (\$9,785) and recipients of commercial insurance (\$2,523) had higher estimated total charges.

Conclusions

COVID-19 hospitalizations were associated with significant healthcare resource utilization.

Risk factors of total elevated hospital charges associated with an inpatient stay and mechanical ventilation included gender, comorbidities and hospital characteristics.

Total hospital charges associated with **COVID-19 hospitalizations need to be** examined in the future as patient burden may change over the evolution of the disease.