

Length of Hospitalization and Outcomes of Coronavirus Disease 2019 (COVID-19) in Tennessee – Preliminary Report

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Purpose

- To determine if age, sex, race, Intensive Care Unit (ICU) admission, nursing home residency, Body Mass Index (BMI) and underlying medical conditions have an influence on the length of coronavirus disease-2019 (COVID-19) associated hospitalizations and deaths among an 8-county catchment area population in Tennessee (TN).

Background

- A new coronavirus, severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), was first identified in China in December 2019
- COVID-19 cases and deaths as of August 31,
 - ~25 million cases and ~840,000 deaths worldwide
 - ~6 million cases and ~180,000 deaths in the United States
 - ~150,000 cases and ~1,700 deaths in Tennessee
- Comprehensive data on patients with severe COVID-19 infections are needed to better understand high-risk groups with poor outcomes and to develop prevention efforts and future interventions

Methods

Population	Outcome	Analysis
<ul style="list-style-type: none"> Data collected by the TN Coronavirus Disease 2019-Associated Hospitalization Surveillance Network (COVID-NET) was used Catchment area: Davidson and 7 surrounding counties (1,767,209 people) in TN Laboratory-confirmed COVID-19 hospitalizations during March 1–June 30, 2020 	<ul style="list-style-type: none"> Length of hospital stay (LOS) Death 	<ul style="list-style-type: none"> Quantile regression models (model median) and Proportional odds regression models (<1 day, 1-7 days, 8-14 days, 15-30 days, >30 days) were performed for LOS Multiple logistic regression model was performed for the binary death outcome

Results

Table 1: Demographic Characteristics

Characteristic	Percentage (%)	Characteristic	Percentage (%)
N=1,488		N=1,488	
Age Group		Nursing Home Resident	
0-17	1%	Yes	17%
18-29	6%	No	83%
30-39	10%	BMI ^a	
40-49	15%	Underweight (<18.5)	3%
50-64	29%	Healthy weight (18.5-24.9)	21%
65-74	18%	Overweight (25.0-29.9)	24%
75+	22%	Obese (30-40)	33%
Sex		Severely obese (>40)	12%
Male	52%	Underlying Medical Conditions*	
Female	48%	Yes	77%
Race		No	23%
Non-Hispanic White	41%	ICU Admission	
Non-Hispanic Black	28%	Yes	32%
Hispanic	23%	No	68%
Other/Unknown/Missing	9%		

^aBMI is not collected for children and pregnant women

*chronic lung disease, chronic metabolic disease, cardiovascular disease, neurological disorders, immunocompromised condition, renal disease, blood disorders/hemoglobinopathy, history of Guillain-Barre Syndrome, liver disease, rheumatologic/ autoimmune/inflammatory conditions and other conditions

Table 2: Quantile Regression Model Results*

Risk Factor	Estimate	p-value
Age	0.05	<0.001
Sex		
Female	-0.24	0.392
Race		
Non-Hispanic Black	-0.11	0.776
Hispanic	-0.11	0.741
Nursing Home Resident		
Yes	-0.90	0.330
Number of Underlying Medical Conditions	0.16	0.278
ICU Admission		
Yes	6.46	<0.001
Discharged to Nursing home		
Yes	7.43	<0.001

*Model on the median of LOS (as continuous variable)

BMI was calculated for non-pregnant adults, statistically non-significant

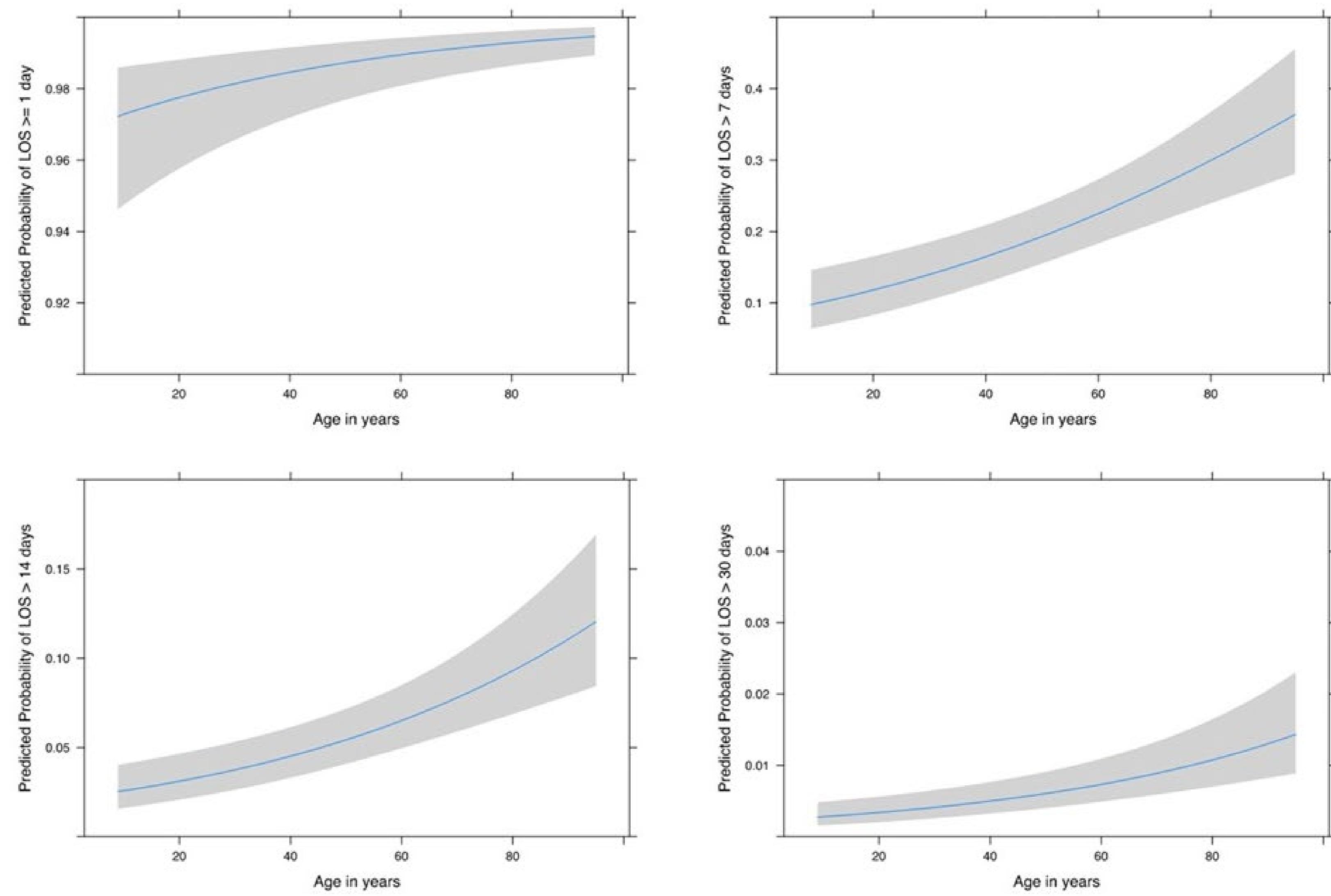
Results - continued

Table 3: Logistic Regression Model Results

Risk Factor	Outcome		
	LOS*	Death	
		OR	95% CI
Age (1-year increase)	1.02	1.01	1.03
Sex	0.85	0.68	1.06
Race	1.13	0.87	1.47
Non-Hispanic Black:Non-Hispanic White	1.05	0.76	1.46
Hispanic:Non-Hispanic White	1.04	0.65	1.67
Nursing Home Resident	1.11	1.02	1.21
Yes:No	1.69	1.01	2.82
ICU Admission	6.47	5.04	8.30
Discharged to Nursing Home	5.03	3.51	7.21
Yes:No	n/a	n/a	n/a

*LOS as five level ordinal variable, <1 day, 1-7 days, 8-14 days, 15-30 days, >30 days
BMI was calculated for non-pregnant adults, statistically non-significant

Figure: Predicted Probability of LOS with Increase in Age



Limitations

- Analysis only included hospitalizations through June 30, 2020 - results may not be representative of the entire TN COVID-NET population
- Not all COVID-19-associated hospitalizations may have been captured because of the lack of widespread testing capability, especially early on in the outbreak

Conclusions

- Older adults admitted to the ICU with pre-existing conditions had a prolonged hospital admission.
- Older Hispanic males admitted to the ICU had significantly higher death rates compared to others in their cohort.
- BMI showed no significant influence on length of hospitalization and death.
- Nursing homes commonly required at least two negative COVID-19 test results prior to accepting a patient which may have extended the length of stay in this group.
- These results highlight prolonged hospital stays and higher mortality rates for older adults with pre-existing conditions.

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