



# Social Determinants of Health Impact COVID-19-Related Mortality Among Liver Transplant Recipients in the United States



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## Background

- Patient and health system factors are known to be associated with COVID-19-related mortality (C19M).
- Liver transplant (LT) recipients are particularly vulnerable due to chronic immunosuppression and comorbid conditions.
- However, it remains unknown the impact of SDOH on C19M in LT recipients on a national scale.
- We aimed to assess whether non-medical factors impact C19M related mortality in this population.

## Methods

- National databases, SRTR, Distressed Community index, and area health resources files.
- Adult LT Recipients
- 3/13/2020-12/31/2023.
- The primary event was C19 related mortality, and the competing event was any other all-cause mortality.
- Those who did not experience either event were censored.
- We also included both medical and non-medical covariates in our regression.

Table 1. Adjusted sub distribution hazard ratios (SHR) for C19M competing risks models.

Hazard model covariates	SHR (95% C.I.)	p-value	Hazard model covariates	SHR (95% C.I.)	p-value
<b>Age at start of pandemic (March 13, 2020)</b>			<b>Race/Ethnicity</b>		
18 - 34 years old (ref)	--	--	White (ref)	--	--
35 - 49 years old	1.47 (0.65-3.32)	0.35	Black	1.02 (0.74-1.39)	0.93
50 - 59 years old	2.54 (1.19-5.42)	0.02*	Native American/American Indian	3.59 (2.29-5.64)	<0.001***
60 - 64 years old	4.65 (2.18-9.89)	<0.001***	Hispanic	1.72 (1.31-2.26)	<0.001***
≥ 65 years old	5.89 (2.77-12.46)	<0.001***	≤ High school level education	1.35 (1.14-1.59)	<0.001***
Female	0.82 (0.70-0.95)	0.01*	> High school level education (ref)	--	--
Diabetes	1.54 (1.31-1.82)	<0.001***	<b>DCI Quintile</b>		
Simultaneous Liver Kidney Transplant	1.85 (1.45-2.36)	<0.001***	Q1 (least distressed) (ref)	--	--
*p value significant at the 0.05 level.			Q2	1.18 (0.93-1.49)	0.17
**p value significant at the 0.01 level.			Q3	1.16 (0.91-1.49)	0.23
***p value significant at the 0.001 level.			Q4	1.36 (1.06-1.74)	0.02*
DCI; distressed community index.			Q5 (most distressed)	1.33 (1.01-1.75)	0.04*

Average C19M Rates for LT Recipients within Demographic Categories

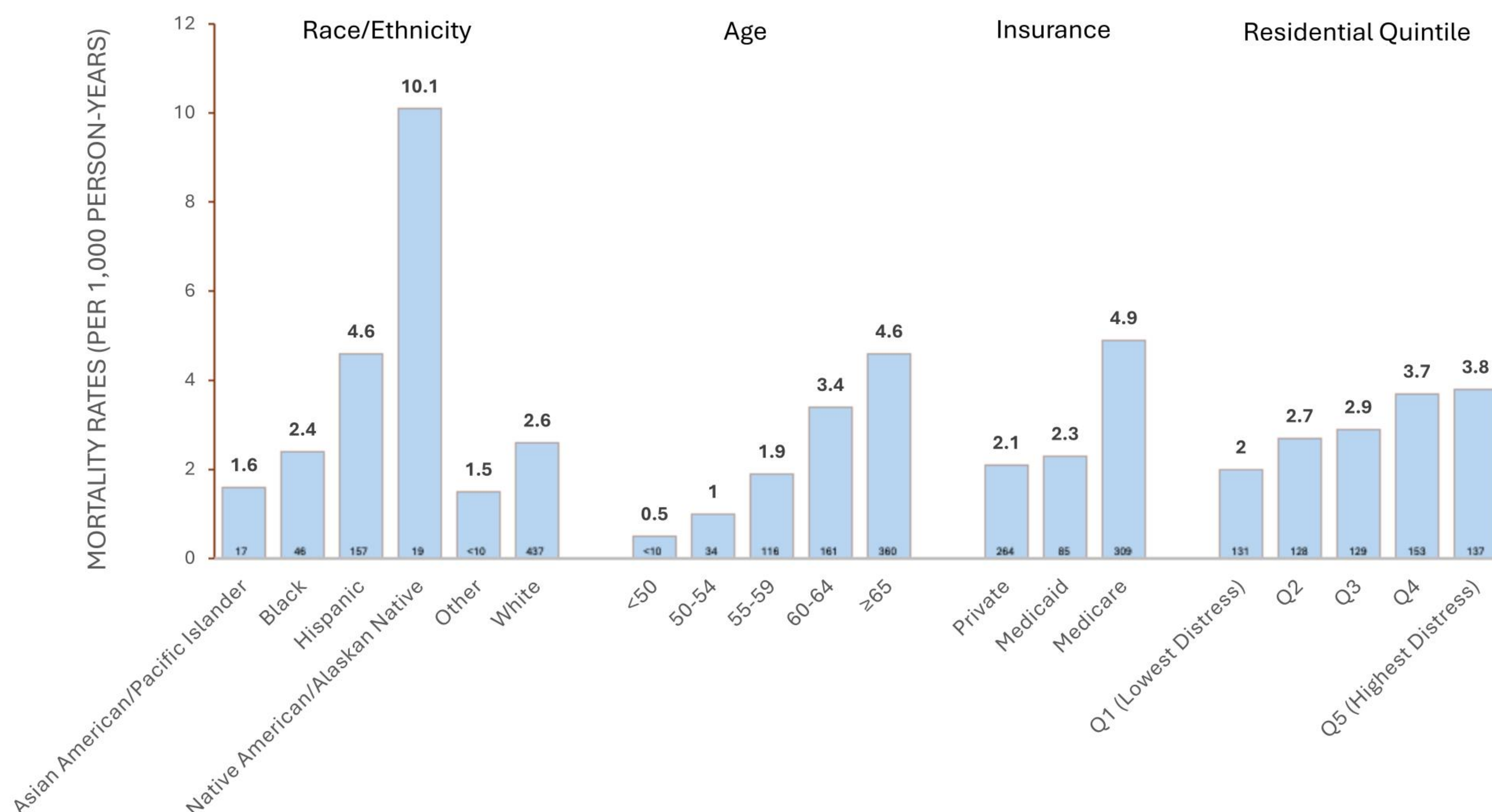


Figure 1. Average C19M for LT Recipients within Demographic Categories

C19M rates in LT recipients per 1000 person-years. C19, COVID-19; LT, liver transplant; Q, quintile. Mortality rate values are at top of bars and n values are at bottom.

## Results

- There were 82,995 Adult LT recipients.
- **C19M (n=678)**. Other all-cause mortality (n=8,950). Censored (n=73,367).
- Expectantly, increasing **age**, **BMI** and **higher medical acuity** predicted C19M.
- Several non-medical factors that predicted C19M:
  - **Native American/Hispanic** groups, **lower than high school education**, residing in a **more distressed community**, having **Medicare** vs private health insurance.

## Conclusions

- One of the first national studies to show that LT recipients are not only medically, but socially vulnerable to C19M.
- Given these identified social factors in predicting C19M, health systems should continue to prioritize their approach to mitigating these risk factors in this vulnerable patient population.



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