



# LIVER TRANSPLANT OUTCOMES AND HEALTH CARE UTILIZATION RESOURCES IN AFRICAN AMERICANS: ARE THEY EQUITABLE?

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## OBJECTIVES

Liver transplantation continues to increase in the United States, and end-stage liver disease in African Americans (AA) has been shown to be associated with higher morbidity and mortality. However, there are few studies on in-hospital outcomes and hospital healthcare utilization for AA patients who have undergone liver transplant (LT).

## METHODS

Retrospective review of the Nationwide Inpatient Sample (NIS) database using ICD10CM/PCS codes. A cross-sectional analysis was performed of patients aged 18 years and older that underwent liver transplant in 2018. Univariable logistic regression analysis was used to calculate unadjusted odds ratios (ORs) for the primary and secondary outcomes. Multivariable logistic regression analysis was used to adjust for potential confounders.

## RESULTS

A total of 7,290 LTs were performed in 2018; of these, 615 (8.4%) were performed in AA patients. AA patients compared to other races are more likely to be in the lowest quartile of income (40.1% vs 23.2%, P<0.01), have Medicaid as primary payer (20.0% vs. 14.8%, P=0.04), and to be from the South (56.1% vs 39.8%, P<0.01) or Northeast (20.3% vs 17.3%, P<0.01) region of the country.

## RESULTS

On univariate analysis, AA patients do not have increased length of stay (LOS) [OR 2.98; 95%CI (-1.05-7.02)], total charges [OR -18,285; 95%CI (-113,299-76,727)] and total costs [OR 12,128; 95%CI (-9,094-33,350)] (Table 1).

After adjusting for patient and hospital-level confounders, AA patients do not have significantly increased adjusted odds of mortality (aOR 0.48; P=0.59), length of stay (aOR 1.47days; P=0.57), total charges (aOR -\$46,196; P= 0.26) or total costs (aOR \$6,342; P=0.61) (Table 2).

**Table 1. General Characteristics**

	Total	White	African American	Hispanic	Asian	Native American	Other	P
<b>No. (%) of patients</b>	7290	4775	615	1065	270	65	220	0.03
<b>Female, (%)</b>	36	35	50	33	37	46	32	0.03
<b>Mean age, years</b>	55.3	56	52	55.0	57.5	56.2	53.2	0.10
<b>Elective admission (%)</b>	19.2	20.4	16.5	17.8	14.8	15.4	13.6	.60
<b>Charlson Comorbidity index score, no. (%)</b>								
≥3	94.0	94.8	90.2	92.5	92.6	100	95.5	.11
<b>Median annual income in patient's zip code, US\$ (%)</b>								
1-42,999	23.2	19.3	40.1	35.1	9.2	36.3	14.6	<.01
43,000-53,999	25.8	26.6	22.3	23.1	31.4	36.3	19.5	<.01
54,000-70,999	27.1	29.1	17.21	25.0	20.4	9.1	31.7	<.01
>71,000	23.9	24.9	18.8	16.8	38.9	18.2	34.1	<.01
<b>Insurance type, (%)</b>								
Medicare	34.7	34.5	39.1	34.5	28.0	41.6	34.9	0.01
Medicaid	14.8	11.6	20.0	20.5	34.0	16.6	16.2	.04
Private	53.0	40.8	43.6	38.0	41.7	48.9	40.0	.01
Self-pay	0.8	0.7	0	0.1	0	0	0	.67
<b>Hospital Region (%)</b>								
Northeast	17.3	17.9	20.3	10.3	18.5	7.6	31.8	<.01
Midwest	21.9	25.9	14.6	9.8	20.3	0	22.7	.08
South	39.8	33.9	56.1	38.9	16.6	23.8	29.5	<.01
West	20.9	16.2	8.9	40.8	44.4	69.2	15.9	<.01
<b>Hospital bed size (%)</b>								
Small	2.2	1.7	1.6	4.6	1.8	0	2.2	0.23
Medium	15.5	16.5	24.3	8.4	1.8	0	9.0	.08
Large	82.7	81.6	73.9	86.8	96.3	100	88.6	.31
<b>Hospital location / teaching status (%)</b>								
Urban teaching	99.2	99.3	100	100	100	100	100	0.51
<b>Mortality rate and mean values for secondary outcomes</b>								
<b>Mortality rate (%)</b>	2.2	2.8	2.4	2.3	3.7	15.4	2.2	
<b>Length of stay, d</b>	20.2	20.1	20.9	21.5	18.9	15.1	23.9	
<b>Total charges, US\$</b>		591743	562748	765958	877081	518387	730274	0.09
<b>Total costs, US\$</b>		143594	139471	167842	177460	132274	181499	<.01

**Table 2. Crude Odds Ratio and Adjusted Differences for Primary and Secondary Outcomes for Patients that Underwent LT Classified by Races.**

Race	Mortality	LOS (Days)	Time to transplant (Days)	Total charges (US\$)	Total costs (US\$)
<b>Crude Odds Ratio (95% Confidence Interval)</b>					
White	Reference				
African American	0.41 (0.05-3.26)	2.98 (-1.05-7.02)	0.95 (-1.49-3.40)	-18,285(-113,299-76,727)	12,128 (-9094-33,350)
Hispanic	1.84 (0.84-4.02)	7.19 (2.27-12.12)	2.07 (0.11-4.02)	306,940 (128,279-485,602)	67,502 (22,361-112,642)
Asian	1.00	-0.86 (-5.38-3.66)	0.62 (-2.94-4.18)	91,986 (-48,261-232,235)	24,409 (-8,251-57,071)
Native American	3.79 (0.93-32.96)	2.02 (-12.53-16.67)	-0.37 (-6.30-5.57)	77038 (-203,265-357,342)	20,459 (-58,338-80,991)
Other	0.77 (0.09-5.33)	10.25 (1.92-18.59)	1.84 (-0.35-4.05)	185,296(-10,542-381,135)	43,111 (5,231-80,991)
<b>Adjusted difference; P value</b>					
White	Reference				
African American	0.48; 0.59	1.47; 0.57	0.50; 0.65	-46,196; 0.26	6,342; 0.61
Hispanic	2.50; 0.02	5.10; 0.03	0.93; 0.30	197,975; <0.01	48,533; <0.01
Asian	1.00	-3.79; 0.16	-0.53; 0.81	-83,365; 0.41	-6,582; 0.74
Native American	4.19; 0.19	0.98; 0.89	-0.80; 0.80	50,184; 0.75	11,434; 0.79
Other	1.46; 0.71	9.27; 0.04	0.77; 0.36	140,160; 0.16	38,885; 0.04

Abbreviations: LOS: length of stay

## CONCLUSIONS

In 2018, this nationwide retrospective study does not show significantly higher odds of mortality or healthcare utilization resources in AA patients.