SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS

Liver Waitlist Dropout and Transplant Rates for Metropolitan vs. Non-Metropolitan Candidates

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Introduction

- It has been suggested that rural candidates are disadvantaged on the liver waiting list.
- We evaluated the rate and hazard of waitlist dropout and transplant by urbanicity.
- Although non-metropolitan adult liver candidates saw higher rates and hazards for waitlist dropout than metropolitan candidates, they also saw higher rates and hazards for transplant.

Methods

- We selected active adult deceased donor liver candidate statuses from the SRTR standard analysis files July 1, 2013-June 30, 2017.
- Chi-sqare tests and t-tests were used to compare categorical and continuous demographic variables, respectively.
- Urbanicity (metropolitan vs. non-metropolitan) was defined using candidate residence zip codes and corresponding RUCA codes.
- Dropout (waitlist mortality or removal due to becoming too sick) and transplant rates were calculated by MELD group and urbanicity.
- Cox proportional hazard (PH) models were used to estimate the effect of urbanicity on waitlist dropout and transplant.
- We adjusted for potential confounders (age, BMI, sex, blood type, race, Latino ethnicity, and private vs. public insurance).

Table 1. Demographics

	Metropolitan	Non-Metropolitan	
Characteristic	% (n)	% (n)	p-value
Total	84.79(48857)	15.21(8763)	
Allocation MELD group:			
1A/1B	2.04(996)	1.49(131)	<.0001
35+	6.71(3276)	6.65(583)	
29-34	6.76(3305)	6.56(575)	
25-28	7.01(3427)	6.90(605)	
15-24	36.66(17909)	40.93(3587)	
<15	40.82(19944)	37.45(3282)	
Lab MELD group:			
35+	7.46(3643)	7.12(624)	<.0001
29-34	6.66(3255)	6.66(584)	
25-28	5.74(2806)	5.97(523)	
15-24	34.09(16653)	38.06(3335)	
<15	46.05(22500)	42.19(3697)	
Sex:			
Female	36.00(17588)	37.04(3246)	0.0613
Male	64.00(31269)	62.96(5517)	
ABO:			
A	36.99(18073)	40.81(3576)	<.0001
AB	3.57(1743)	3.16(277)	
B	12.63(6170)	9.80(859)	
O	46.81(22871)	46.23(4051)	
Race:			
African American	9.76(4770)	3.30(289)	<.0001
Other	6.20(3031)	4.09(358)	
White	84.03(41056)	92.62(8116)	
Latino:			
Not Latino	83.42(40757)	91.86(8050)	<.0001
Latino	16.58(8100)	8.14(713)	
Insurance type:			
Missing	.(4)		<.0001
Private	55.93(27324)	52.27(4580)	
Public	44.07(21529)	47.73(4183)	
Age at status, mean(std):	56.08(10.54)	56.25(10.15)	0.1591
BMI, mean(std):	28.71(7.28)	29.52(5.98)	<.0001

Table 2. Waitlist Dropout and Transplant Rates by Urbanicity

Urbanicity	Total	Dropout Count	Tx Count	Dropout Percent	Tx Percent	Dropout Rate (per person year)	Tx Rate (per person year)
Metropolitan	48857	9021	21324	18.46	43.65	0.196	0.464
Non-Metropolitan	8763	1703	3947	19.43	45.04	0.214	0.495

Table 3. Waitlist Dropout and Transplant Rates by Allocation MELD Group and Urbanicity

Allocation MELD Group	Urbanicity	Total	Dropout Count	Tx Count	Dropout Percent	Tx Percent	Dropout Rate (per person year)	Tx Rate (per person year)
1A/1B	Metropolitan	996	190	618	19.08	62.05	4.401	14.316
1A/1B	Non-metropolitan	131	32	80	24.43	61.07	5.721	14.302
35+	Metropolitan	3276	690	2439	21.06	74.45	4.517	15.965
35+	Non-metropolitan	583	121	432	20.75	74.10	5.965	21.297
29-34	Metropolitan	3305	647	2283	19.58	69.08	1.036	3.655
29-34	Non-metropolitan	575	115	402	20.00	69.91	1.408	4.921
25-28	Metropolitan	3427	656	2115	19.14	61.72	0.528	1.702
25-28	Non-metropolitan	605	120	383	19.83	63.31	0.654	2.088
15-24	Metropolitan	17909	3622	8254	20.22	46.09	0.240	0.548
15-24	Non-metropolitan	3587	756	1739	21.08	48.48	0.258	0.594
<15	Metropolitan	19944	3216	5615	16.13	28.15	0.112	0.195
<15	Non-metropolitan	3282	559	911	17.03	27.76	0.118	0.192

Figure 1. Waitlist Dropout Rates By Allocation MELD

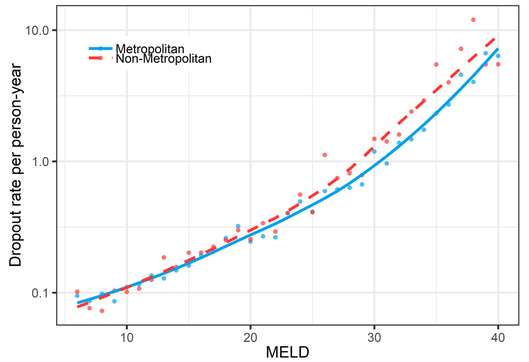
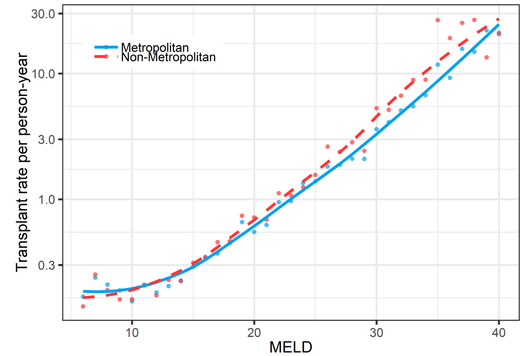


Figure 2. Transplant Rates By Allocation MELD



Results

- Overall, metropolitan candidates had lower dropout rates than non-metropolitan candidates (0.196 vs. 0.214 dropouts per person-year) and lower transplant rates (0.464 vs. 0.495) (Table 2).
- In univariable Cox PH models, these differences were significant (P=0.0036 and 0.0036 and HR=1.08 and 1.05, for dropout and transplant, respectively).
- Accounting for allocation MELD group, metropolitan candidates still had lower dropout rates and transplant rates (Table 3).
- However, the scale of the differences was small (Figures 1 and 2)
- In Cox PH models, these differences were significant, even after adjusting for potential confounders (P=0.0031 and <0.0001 and HR=1.08 and 1.07, for dropout and transplant, respectively)
- Results were similar when adjusting for laboratory MELD instead of allocation MELD.

Conclusions

- Although non-metropolitan adult liver candidates saw higher rates and hazards for waitlist dropout than metropolitan candidates, they also saw higher rates and hazards for transplant.
- This trend remained even after accounting for MELD, age, BMI, sex, blood type, race, Latino ethnicity, and insurance type.
- Although significant, the absolute differences in dropout and transplant rates were quite small, on the scale of 1 to 3 events per 100 person-years.

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