



Predictors and Outcomes of Readmission after Heart Transplantation



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Background

Hospital readmission is associated with adverse outcomes and increased costs. We assessed predictors of 30-day and 1-year readmission among U.S. heart transplant (HT) recipients, and long-term outcomes. No previous study has assessed predictors, timing, outcomes and of HT readmissions.

Methods

We assessed 30-day readmission among HT recipients in the National Readmission Database who were discharged between January and November 2013, and 1-year readmission among recipients in the UNOS database between 2000 and 2015 who had follow-up visit data. Readmission, mortality and their predictors were assessed by standard methods.

Results

Table 1. Selected Patient Characteristics by 30-Day Readmission

	30-Day Readmission			
	Total (n=956)	Yes (n=225)	No (n=731)	P Value
Age (years)	54 [37-62]	53 [37-67]	54 [38-62]	0.8313
Female	276 (28.9%)	64 (28.4%)	212 (29.0%)	0.8719
Anemia	213 (22.3%)	61 (27.1%)	152 (20.8%)	0.0464
Weight loss	144 (15.1%)	48 (21.3%)	96 (13.1%)	0.0026
Pulm. circ. disorder	19 (2.0%)	8 (3.6%)	11 (1.5%)	0.0539
Paralysis	19 (2.0%)	10 (4.4%)	9 (1.2%)	0.0056
No. chronic conditions	8 [6-10]	9 [7-11]	8 [6-10]	0.0316
Length of stay (days)	24 [13-56]	22 [13-51]	30 [15-68]	0.0034
No. Procedures	11 [6-15]	10 [6-14]	13 [7-15]	0.0007

Nonsignificant differences in median ZIP code income, insurance, DM, renal failure, obesity, discharge disposition, hospital characteristics and costs.

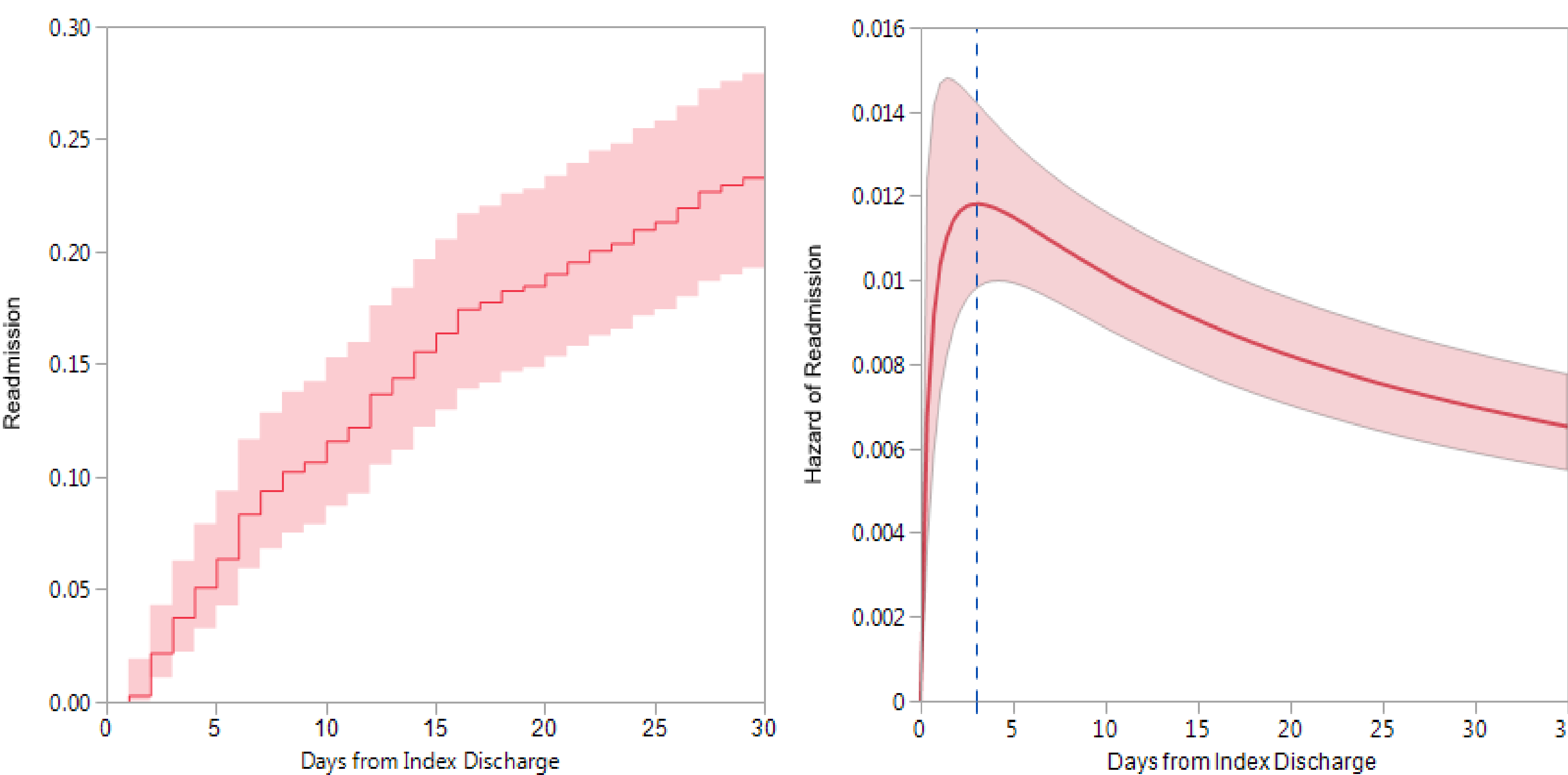


Figure 1. Cumulative incidence and hazard rate of early readmission. Shaded bands represent 95% CI.

Results

Table 2. Selected Patient Characteristics by 1-Year Readmission

	OR [95% CI]	P Value	aOR [95% CI]	P Value
Age <25 Years	1.27 [1.21-1.35]	<0.0001		
Female Sex	1.14 [1.08-1.19]	<0.0001		
Race				
White	Reference			
Black	1.18 [1.12-1.25]	<0.0001	1.14 [1.07-1.21]	<0.0001
Latino	1.06 [0.98-1.15]	0.1429		
Asian	1.14 [1.00-1.30]	0.0469		
SES Quartile				
1 (lowest)	1.12 [1.05-1.20]	0.0009	1.17 [1.12-1.23]	<0.0001
2	1.01 [0.94-1.08]	0.8632		
3	1.03 [0.96-1.10]	0.3894		
4	Reference			
Priority Status at HT				
1A	1.47 [1.37-1.57]	<0.0001	1.20 [1.14-1.27]	<0.0001
1B	1.14 [1.07-1.23]	0.0002		
2	Reference			
Public Insurance	1.22 [1.17-1.28]	<0.0001	1.17 [1.12-1.23]	<0.0001
Diabetes	1.13 [1.07-1.19]	<0.0001	1.14 [1.07-1.21]	<0.0001
Dialysis prior to HT	1.41 [1.26-1.58]	<0.0001		
ECMO	1.61 [1.30-2.01]	<0.0001		
IABP	1.09 [0.98-1.21]	0.1016		
VAD	1.17 [1.12-1.24]	<0.0001		
Wait >50 days	1.13 [1.08-1.19]	<0.0001	1.19 [1.13-1.25]	<0.0001
Dialysis after HT	2.22 [2.03-2.43]	<0.0001	1.69 [1.53-1.86]	<0.0001
LOS >16 Days	1.92 [1.83-2.01]	<0.0001	1.69 [1.61-1.77]	<0.0001
HT Ctr. Vol. Quartile				
1	1.58 [1.24-2.02]	0.0002		
2	1.36 [1.26-1.47]	<0.0001		
3	1.04 [0.99-1.10]	0.1104		
4 (highest volume)	Reference			
Donor Age <15 Years	1.36 [1.27-1.45]	<0.0001	1.23 [1.15-1.32]	<0.0001

Conclusion

30-day readmission vulnerability peaks within 3 days of discharge and predicted by atypical patient characteristics. 1-year readmission is modestly predicted by demographic variables and is associated with excess long-term mortality.

Disclosures

None of the authors has actual or potential financial relationship or conflict of interest.

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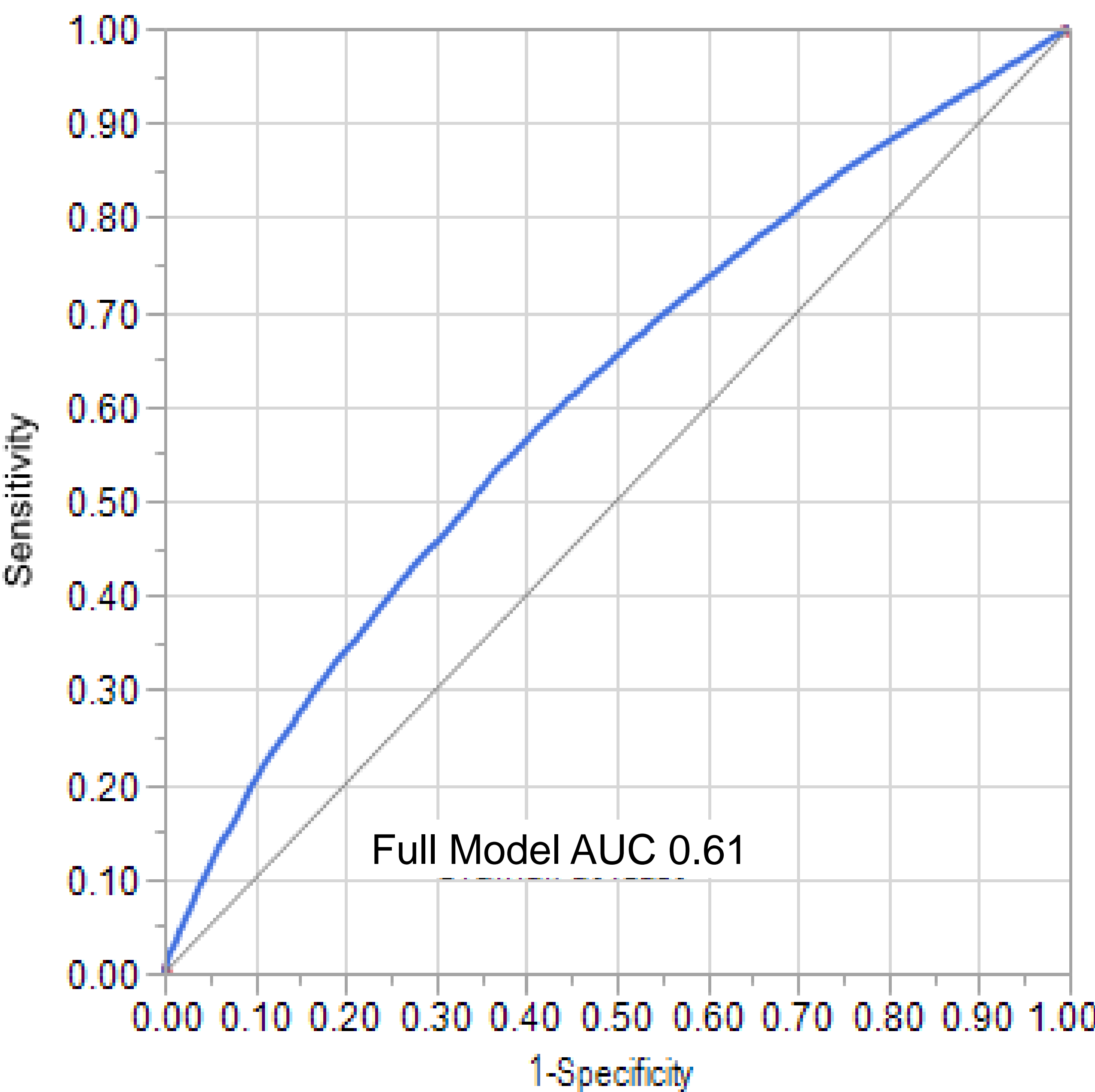


Figure 2. ROC Curve and C-Statistic for the Full Model Predicting 1-Year Readmission

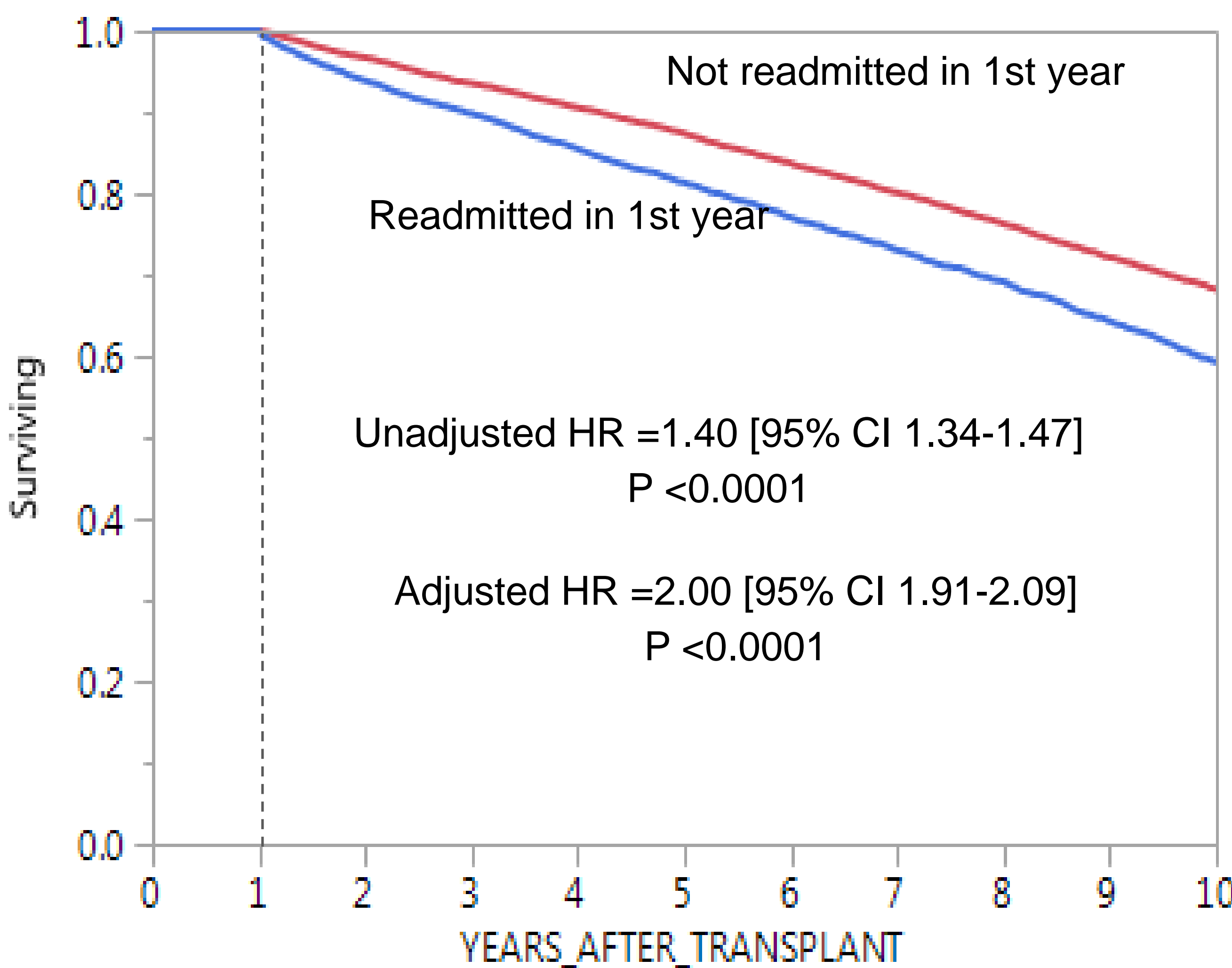


Figure 3. 10-year survival among HT recipients by 1-year readmission, conditional upon survival to 1 year.