Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. Comparison of Cox Semi-Parametric and Royston-Parmar Flexible Parametric Models of Univariate and Multivariable Variables Associated With Mortality for Single- and Double-Lung Transplant Recipients With an Underlying Diagnosis of Idiopathic Pulmonary Fibrosis

	Idiopathic Pulmonary Fibrosis, Multivariable				Idiopathic Pulmonary Fibrosis, Univariate			
	Flexible parametric multivariable hazard ratio (95% CI)[a]	*P*[b]	Cox regression multivariable hazard ratio (95% CI)	*P*[c]	Flexible parametric univariate hazard ratio (95% CI)	*P*[d]	Cox regression univariate hazard ratio (95% CI)	*P*[e]
Baseline Characteristics								
Age, y	1.014 (1.007-1.022)	<0.001	1.014 (1.007-1.021)	<0.001	1.019 (1.012-1.025)	<0.001	1.018 (1.012-1.025)	<0.001
Age >60 y					1.27 (1.14-1.41)	<0.001	1.26 (1.14-1.40)	<0.001
Male gender	1.07 (0.95-1.20)	0.30	1.07 (0.95-1.20)	0.30	1.05 (0.94-1.18)	0.39	1.05 (0.93-1.17)	0.44
Caucasian race					1.11 (0.97-1.28)	0.12	1.11 (0.97-1.27)	0.13
African-American race	0.90 (0.71-1.13)	0.36	0.90 (0.71-1.13)	0.36	0.83 (0.67-1.04)	0.10	0.83 (0.67-1.04)	0.11
Hispanic race					0.96 (0.80-1.16)	0.70	0.97 (0.80-1.16)	0.71
College education					1.10 (0.98-1.23)	0.10	1.10 (0.99-1.23)	0.08
Private insurance	0.92 (0.83-1.03)	0.14	0.92 (0.83-1.03)	0.14	0.84 (0.75-0.93)	0.001	0.84 (0.76-0.93)	0.001
BMI, kg/m^2					0.995 (0.982-1.008)	0.41	0.995 (0.982-1.008)	0.43
BMI ≤18 or ≥35 kg/m^2	1.49 (1.14-1.93)	0.003	1.49 (1.14-1.93)	0.003	1.44 (1.11-1.86)	0.006	1.44 (1.11-1.87)	0.005
Severity of Illness/Functional Status								
Lung Allocation Score[f]					1.006 (1.003-1.009)	<0.001	1.006 (1.00-1.009)	<0.001
NYHA IV (symptoms at rest, usually bedbound)[g]	1.38 (1.20-1.58)	<0.001	1.37 (1.20-1.58)	<0.001	1.44 (1.26-1.64)	<0.001	1.44 (1.26-1.63)	<0.001
NYHA III or IV (marked limitation in activities)[g]					1.24 (1.05-1.47)	0.01	1.24 (1.05-1.47)	0.01
6-min walk, ft					0.99983 (0.99972-0.99994)	0.003	0.9998 (0.9997-0.9999)	0.003
6-min walk <500 ft	1.21 (1.08-1.36)	0.001	1.21 (1.08-1.36)	0.001	1.19 (1.06-1.32)	0.002	1.18 (1.06-1.32)	0.003
Life Support								
Any life support (ventilator or ECMO)	1.16 (0.90-1.50)	0.24	1.16 (0.90-1.50)	0.24	1.31 (1.03-1.65)	0.03	1.29 (1.02-1.62)	0.04
Ventilation/Oxygenation Parameters								
Forced vital capacity, %					0.999 (0.996-1.002)	0.64	0.999 (0.996-1.002)	0.66
O_2 requirement at rest					1.21 (0.96-1.51)	0.10	1.20 (0.96-1.51)	0.11

eTable 1. Comparison of Cox Semi-Parametric and Royston-Parmar Flexible Parametric Models of Univariate and Multivariable Variables Associated With Mortality for Single- and Double-Lung Transplant Recipients With an Underlying Diagnosis of Idiopathic Pulmonary Fibrosis (continued)

Hemodynamic Parameters								
Cardiac index, L/min/m^2					0.97 (0.90-1.05)	0.44	0.97 (0.90-1.06)	0.50
Mean PAP, mmHg					0.996 (0.991-1.001)	0.14	0.996 (0.991-1.001)	0.14
Mean PAP ≥30 mmHg	0.96 (0.85-1.09)	0.53	0.96 (0.85-1.09)	0.53	0.94 (0.84-1.06)	0.32	0.94 (0.84-1.06)	0.31
PCWP, mmHg					0.993 (0.984-1.003)	0.17	0.993 (0.984-1.003)	0.17
Renal Function, Diabetes								
CrCl, mL/min					0.997 (0.995-0.998)	<0.001	0.997 (0.995-0.998)	<0.001
CrCl <50 mL/min or on dialysis	1.46 (0.98-2.18)	0.07	1.46 (0.98-2.18)	0.08	1.58 (1.07-2.35)	0.02	1.58 (1.07-2.35)	0.02
Diabetes					0.98 (0.86-1.11)	0.76	0.98 (0.86-1.12)	0.78
Lung Preference at Transplant								
Bilateral only					0.85 (0.76-0.95)	0.004	0.85 (0.76-0.95)	0.005
Single only					1.26 (1.14-1.40)	<0.001	1.26 (1.13-1.39)	<0.001
Single or bilateral					0.91 (0.81-1.02)	0.10	0.91 (0.82-1.02)	0.11
Transplant Center								
High-performing transplant center[h]	0.74 (0.66-0.82)	<0.001	0.74 (0.66-0.82)	<0.001	0.79 (0.71-0.88)	<0.001	0.79 (0.71-0.88)	<0.001
Moderate- or high-volume institution[i]	0.82 (0.73-0.92)	0.001	0.82 (0.73-0.92)	0.001	0.84 (0.75-0.94)	0.003	0.84 (0.75-0.94)	0.003
High-volume institution[j]					1.003 (0.90-1.11)	0.95	1.007 (0.91-1.12)	0.90
Operative Characteristics								
Double-lung transplant	Modeled as TVC, eFigure 2A		0.78 (0.69-0.87)	<0.001	0.76 (0.68-0.84)	<0.001	0.76 (0.69-0.84)	<0.001
Organ ischemic time, h					1.00 (0.97-1.03)	0.98	1.00 (0.97-1.03)	0.96
Distance organ transported, mi					1.0002 (1.0000-1.0004)	0.04	1.0002 (1.0000-1.0004)	0.04
Local organ (non-regional, non-national)	0.88 (0.79-0.98)	0.02	0.88 (0.79-0.98)	0.02	0.86 (0.78-0.95)	0.004	0.86 (0.78-0.95)	0.004
Donor Characteristics								
Age, y	1.005 (1.001-1.009)	0.01	1.005 (1.001-1.008)	0.01	1.006 (1.002-1.009)	0.001	1.006 (1.002-1.009)	0.001
Age >50 y					1.30 (1.14-1.47)	<0.001	1.30 (1.14-1.47)	<0.001
PO2:FiO2 ratio[k]					1.0000 (0.9996-1.0005)	0.84	1.0000 (0.9996-1.0005)	0.84
PO2:FiO2 ratio <250					1.01 (0.80-1.29)	0.92	1.01 (0.80-1.29)	0.91
Smoking history >20 pack-years	1.12 (0.96-1.30)	0.16	1.12 (0.96-1.30)	0.16	1.13 (0.97-1.31)	0.11	1.13 (0.98-1.32)	0.10

eTable 1. Comparison of Cox Semi-Parametric and Royston-Parmar Flexible Parametric Models of Univariate and Multivariable Variables Associated With Mortality for Single- and Double-Lung Transplant Recipients With an Underlying Diagnosis of Idiopathic Pulmonary Fibrosis (continued)

CDC high-risk donor[l]					1.05 (0.86-1.27)	0.64	1.05 (0.86-1.28)	0.61
Hypertension					1.17 (1.04-1.32)	0.008	1.18 (1.05-1.33)	0.007
Diabetes	1.17 (0.96-1.43)	0.12	1.17 (0.96-1.43)	0.12	1.24 (1.02-1.51)	0.03	1.24 (1.02-1.51)	0.03
Donor/Recipient Matching								
Gender match, n (%)					0.98 (0.88-1.09)	0.70	0.98 (0.88-1.10)	0.78
Race match, n (%)	0.87 (0.78-0.97)	0.009	0.87 (0.78-0.97)	0.009	0.89 (0.80-0.98)	0.02	0.88 (0.80-0.98)	0.02
CMV: donor positive, recipient negative	1.28 (1.13-1.43)	<0.001	1.28 (1.14-1.43)	<0.001	1.23 (1.12-1.34)	<0.001	1.25 (1.12-1.40)	<0.001
Donor/recipient pTLC ratio[m]					0.78 (0.57-1.07)	0.12	0.79 (0.58-1.08)	0.14
Donor/recipient pTLC ratio ≥1.1					0.99 (0.86-1.14)	0.92	1.00 (0.87-1.15)	0.97
Donor/recipient pTLC ratio 0.8-1.2	0.91 (0.81-1.02)	0.11	0.91 (0.81-1.02)	0.11	0.92 (0.82-1.04)	0.17	0.92 (0.82-1.03)	0.15
Non-identical ABO blood group match (only compatible)					1.04 (0.86-1.26)	0.70	1.04 (0.86-1.27)	0.67
Total HLA mismatches (maximum 6)[n]					1.05 (1.00-1.10)	0.05	1.05 (1.00-1.10)	0.06
Complete HLA mismatch (all 6 allele mismatch)	1.13 (1.00-1.27)	0.05	1.13 (0.99-1.28)	0.06	1.13 (1.00-1.28)	0.05	1.13 (1.00-1.28)	0.05
Panel reactive antibody[o]					1.002 (0.998-1.006)	0.32	1.002 (0.998-1.006)	0.32
Panel reactive antibody ≥20%	1.18 (0.97-1.44)	0.10	1.18 (0.97-1.44)	0.10	1.16 (0.96-1.41)	0.12	1.17 (0.96-1.41)	0.12
Panel reactive antibody ≥10%					1.13 (0.96-1.33)	0.13	1.12 (0.96-1.32)	0.15

Abbreviations: BMI, body mass index; CDC, Centers for Disease Control; CI, confidence interval; CMV, cytomegalovirus; CrCl, creatinine clearance; ECMO, extracorporeal membrane oxygenation; HLA, human leukocyte antigen; NYHA, New York Heart Association; PAP, pulmonary artery pressure; PCWP, pulmonary capillary wedge pressure; pTLC, predicted total lung capacity; TVC, time-varying covariate.

[a] The reference increment for each continuous variable is the unit of measurement (eg, Age, per year; Forced vital capacity, per percentage point) unless otherwise noted.

[b] *P* value obtained from multivariable Royston-Parmar flexible parametric model with the variable "double-lung transplant versus single-lung transplant" modeled as having a time-dependent effect, as described in the Methods.

[c] *P* value obtained from multivariable Cox proportional hazards regression model, as described in the Methods.

[d] *P* value obtained from univariate Royston-Parmar flexible parametric model, as described in the Methods.

[e] *P* value obtained from univariate Cox proportional hazards regression model, as described in the Methods.

[f] Lung Allocation Score: This score ranges from 0 to 100 and is based on risk factors associated with either waitlist or post-transplant mortality.[1]

[g] NYHA IV, NYHA III or IV: New York Heart Association Functional Classification classes.

[h] High-performing transplant center: In the top third of graft survival performance among all 72 transplant centers.

[i] Moderate- or high-volume institution: Performed >194 lung transplants during the 93-month study period (>25 transplants/y).

[j] High-volume institution: Performed at least 388 lung transplants during the 93-month study period (≥50 transplants/y).

[k] The reference increment for PO2:FiO2 ratio is each 1-unit increase.

[l] CDC high-risk donor: A donor who is thought to be at high risk for HIV/HBV/HCV/STD infection according to CDC criteria.[2]

[m] Ratio of predicted total lung capacity of the donor over the predicted donor lung capacity of the recipient. Predicted total lung capacity is calculated for males by the equation: 7.99 × [height in meters] − 7.08; predicted total lung capacity is calculated for females by the equation: 6.60 × [height in meters] − 5.79).

[n] The reference increment for total HLA mismatches (maximum 6) is each 1-unit increase.

[o] The reference increment for panel reactive antibody is each 1% increase.

eTable 2. Comparison of Cox Semi-Parametric and Royston-Parmar Flexible Parametric Models of Univariate and Multivariable Variables Associated With Mortality for Single- and Double-Lung Transplant Recipients With an Underlying Diagnosis of Chronic Obstructive Pulmonary Disease

	Chronic Obstructive Pulmonary Disease, Multivariable				Chronic Obstructive Pulmonary Disease, Univariate			
	Flexible parametric multivariable hazard ratio (95% CI)[a]	*P*[b]	Cox regression multivariable hazard ratio (95% CI)[a]	*P*[c]	Flexible parametric univariate hazard ratio (95% CI)[a]	*P*[d]	Cox regression univariate hazard ratio (95% CI)[a]	*P*[e]
Baseline Characteristics								
Age, y	1.027 (1.017-1.038)	<0.001	1.026 (1.016-1.038)	<0.001	1.028 (1.018-1.039)	<0.001	1.028 (1.018-1.039)	<0.001
Age > 60 y					1.33 (1.18-1.49)	<0.001	1.33 (1.18-1.49)	<0.001
Male gender	1.00 (0.87-1.14)	0.98	1.00 (0.87-1.14)	0.95	1.06 (0.95-1.19)	0.31	1.06 (0.94-1.19)	0.34
Caucasian race					0.96 (0.77-1.19)	0.72	0.96 (0.77-1.19)	0.69
African-American race					1.04 (0.82-1.33)	0.75	1.04 (0.82-1.33)	0.73
Hispanic race					1.03 (0.57-1.86)	0.93	1.03 (0.57-1.87)	0.91
College education					1.01 (0.89-1.14)	0.91	1.01 (0.89-1.15)	0.84
Private insurance	0.96 (0.85-1.08)	0.53	0.97 (0.86-1.09)	0.56	0.90 (0.80-1.01)	0.08	0.90 (0.80-1.02)	0.09
BMI, kg/m^2	1.014 (0.999-1.029)	0.07	1.013 (0.999-1.028)	0.08	1.019 (1.005-1.33)	0.008	1.019 (1.005-1.033)	0.008
BMI ≤18 or ≥35 kg/m²					0.98 (0.75-1.28)	0.87	0.98 (0.75-1.29)	0.90
Severity of Illness/Functional Status								
Lung Allocation Score[f]					1.012 (1.004-1.020)	0.003	1.012 (1.004-1.021)	0.003
NYHA IV (symptoms at rest, usually bedbound)[g]	1.25 (1.03-1.51)	0.02	1.25 (1.04-1.52)	0.02	1.25 (1.04-1.50)	0.02	1.26 (1.04-1.51)	0.02
NYHA III or IV (marked limitation in activities)[g]					1.15 (0.96-1.38)	0.12	1.16 (0.97-1.40)	0.10
6-min walk, ft					0.9995 (0.9994-0.9997)	<0.001	0.9995 (0.9994-0.9997)	<0.001
6-min walk <500 ft	1.25 (1.09-1.43)	0.001	1.26 (1.09-1.44)	0.001	1.34 (1.18-1.53)	<0.001	1.35 (1.18-1.54)	<0.001
Life Support								
Any life support (ventilator or ECMO)	1.09 (0.72-1.63)	0.69	1.09 (0.72-1.63)	0.68	1.33 (0.90-1.98)	0.15	1.34 (0.90-1.99)	0.15
Ventilation/Oxygenation Parameters								
Forced vital capacity, %					0.999 (0.996-1.003)	0.90	0.999 (0.996-1.003)	0.90
O_2 requirement at rest					1.03 (0.83-1.29)	0.77	1.03 (0.83-1.29)	0.77
Hemodynamic Parameters								
Cardiac index, L/min/m^2					0.98 (0.90-1.07)	0.67	0.98 (0.90-1.07)	0.66
Mean PAP, mmHg					1.011 (1.003-1.019)	0.005	1.012 (1.004-1.020)	0.003
Mean PAP ≥30 mmHg	1.14 (1.00-1.31)	0.05	1.15 (1.00-1.31)	0.05	1.24 (1.09-1.41)	0.001	1.24 (1.09-1.41)	0.001
PCWP, mmHg					1.005 (0.994-1.017)	0.37	1.006 (0.994-1.017)	0.33
Renal Function, Diabetes								
CrCl, mL/min					0.999 (0.996-1.001)	0.29	0.999 (0.997-1.001)	0.28
CrCl <50 mL/min or on dialysis	1.51 (1.07-2.13)	0.02	1.50 (1.07-2.12)	0.02	1.41 (1.01-1.98)	0.05	1.41 (1.01-1.98)	0.05
Diabetes	1.19 (0.99-1.42)	0.06	1.20 (1.00-1.44)	0.05	1.29 (1.08-1.53)	0.005	1.28 (1.07-1.52)	0.007

eTable 2. Comparison of Cox Semi-Parametric and Royston-Parmar Flexible Parametric Models of Univariate and Multivariable Variables Associated With Mortality for Single- and Double-Lung Transplant Recipients With an Underlying Diagnosis of Chronic Obstructive Pulmonary Disease (continued)

Lung Preference at Transplant								
Bilateral only					0.92 (0.81-1.04)	0.18	0.92 (0.81-1.04)	0.19
Single only					1.18 (1.04-1.33)	0.008	1.18 (1.04-1.33)	0.009
Single or bilateral					0.92 (0.81-1.05)	0.21	0.93 (0.82-1.05)	0.22
Transplant Center								
High-performing institution[h]	0.80 (0.70-0.90)	<0.001	0.80 (0.71-0.91)	<0.001	0.85 (0.75-0.96)	0.009	0.86 (0.76-0.97)	0.01
Moderate- or high-volume institution[i]	0.78 (0.69-0.88)	<0.001	0.78 (0.68-0.88)	<0.001	0.74 (0.66-0.84)	<0.001	0.73 (0.63-0.84)	<0.001
High-volume institution[j]					0.87 (0.77-0.99)	0.03	0.87 (0.77-0.99)	0.03
Operative Characteristics								
Double-lung transplant	Modeled as TVC, eFigure 2B		0.93 (0.82-1.05)	0.25	0.85 (0.76-0.96)	0.007	0.85 (0.76-0.96)	0.007
Organ ischemic time, h					0.97 (0.94-1.01)	0.14	0.98 (0.94-1.01)	0.18
Distance organ transported, mi					0.9998 (0.9996-1.0001)	0.20	0.9999 (0.9996-1.0001)	0.24
Local organ (non-regional, non-national)					1.08 (0.96-1.22)	0.20	1.07 (0.95-1.21)	0.24
Donor Characteristics								
Age, y	1.000 (0.996-1.005)	0.86	1.000 (0.996-1.005)	0.85	1.000 (0.996-1.004)	0.96	1.000 (0.996-1.005)	0.82
Age >50 y					1.04 (0.89-1.20)	0.63	1.04 (0.90-1.21)	0.60
PO2:FiO2 ratio[k]					0.9999 (0.9994-1.0005)	0.82	1.0000 (0.9995-1.0005)	0.97
PO2:FiO2 ratio <250					1.12 (0.88-1.42)	0.35	1.12 (0.90-1.42)	0.33
Smoking history >20 pack-years					1.02 (0.87-1.20)	0.80	1.03 (0.87-1.21)	0.73
CDC high-risk donor[l]					0.91 (0.72-1.14)	0.41	0.91 (0.72-1.15)	0.44
Hypertension					1.08 (0.95-1.24)	0.25	1.08 (0.95-1.24)	0.25
Diabetes	1.15 (0.91-1.45)	0.24	1.15 (0.91-1.45)	0.24	1.22 (0.98-1.51)	0.08	1.22 (0.98-1.52)	0.08
Donor/Recipient Matching								
Gender match, n (%)					0.99 (0.87-1.13)	0.90	1.00 (0.88-1.13)	0.98
Race match, n (%)	0.96 (0.85-1.08)	0.50	0.95 (0.84-1.08)	0.44	0.88 (0.78-0.99)	0.03	0.89 (0.78-1.00)	0.05
CMV: donor positive, recipient negative	1.18 (1.03-1.36)	0.02	1.19 (1.03-1.36)	0.01	1.12 (0.98-1.29)	0.09	1.12 (0.98-1.29)	0.09
Donor/recipient pTLC ratio[m]					0.70 (0.51-0.96)	0.03	0.71 (0.52-0.98)	0.04
Donor/recipient pTLC ratio ≥1.1	0.85 (0.75-0.97)	0.02	0.86 (0.76-0.98)	0.02	0.86 (0.77-0.97)	0.01	0.86 (0.77-0.97)	0.01
Donor/recipient pTLC ratio 0.8-1.2					1.00 (0.88-1.14)	0.98	1.00 (0.88-1.13)	0.99
Non-identical ABO blood group match (only compatible)					1.07 (0.89-1.28)	0.45	1.07 (0.90-1.29)	0.44
Total HLA mismatches (maximum 6)[n]					1.08 (1.02-1.15)	0.01	1.08 (1.02-1.15)	0.01
Complete HLA mismatch (all 6 allele mismatch)	1.22 (1.05-1.42)	0.008	1.22 (1.05-1.41)	0.01	1.24 (1.07-1.43)	0.004	1.23 (1.06-1.43)	0.005
Panel reactive antibody[o]					1.007 (1.004-1.011)	<0.001	1.007 (1.004-1.011)	<0.001
Panel reactive antibody ≥20%					1.40 (1.14-1.73)	0.001	1.38 (1.13-1.70)	0.002
Panel reactive antibody ≥10%	1.34 (1.11-1.61)	0.003	1.32 (1.10-1.59)	0.004	1.32 (1.11-1.59)	0.002	1.31 (1.10-1.57)	0.003

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Abbreviations: BMI, body mass index; CDC, Centers for Disease Control; CI, confidence interval; CMV, cytomegalovirus; CrCl, creatinine clearance; ECMO, extracorporeal membrane oxygenation; HLA, human leukocyte antigen; NYHA, New York Heart Association; PAP, pulmonary artery pressure; PCWP, pulmonary capillary wedge pressure; pTLC, predicted total lung capacity; TVC, time-varying covariate.

[a] The reference increment for each continuous variable is the unit of measurement (eg, Age, per year; Forced vital capacity, per percentage point) unless otherwise noted.

[b] *P* value obtained from multivariable Royston-Parmar flexible parametric model with the variable "double-lung transplant versus single-lung transplant" modeled as having a time-dependent effect, as described in the Methods.

[c] *P* value obtained from multivariable Cox proportional hazards regression model, as described in the Methods.

[d] *P* value obtained from univariate Royston-Parmar flexible parametric model, as described in the Methods.

[e] *P* value obtained from univariate Cox proportional hazards regression model, as described in the Methods.

[f] Lung Allocation Score: This score ranges from 0 to 100 and is based on risk factors associated with either waitlist or post-transplant mortality.[1]

[g] NYHA IV, NYHA III or IV: New York Heart Association Functional Classification classes.

[h] High-performing institution: In the top third of graft survival performance among all 72 transplant centers.

[i] Moderate- or high-volume institution: Performed >194 lung transplants during the 93-month study period (>25 transplants/y).

[j] High-volume institution: Performed at least 388 lung transplants during the 93-month study period (≥50 transplants/y).

[k] The reference increment for PO2:FiO2 ratio is each 1-unit increase.

[l] CDC high-risk donor: A donor who is thought to be at high risk for HIV/HBV/HCV/STD infection according to CDC criteria.[2]

[m] Ratio of predicted total lung capacity of the donor over the predicted donor lung capacity of the recipient. Predicted total lung capacity is calculated for males by the equation: 7.99 × [height in meters] − 7.08; predicted total lung capacity is calculated for females by the equation: 6.60 × [height in meters] − 5.79).

[n] The reference increment for total HLA mismatches (maximum 6) is each 1-unit increase.

[o] The reference increment for panel reactive antibody is each 1% increase.

eTable 3. Test for Interaction Between Lung Diagnosis (COPD or IPF) and Treatment Type (Single- or Double-Lung Transplantation), in a Multivariable Cox Proportional Hazards Model Including All Patients With a Diagnosis of COPD or IPF (n=7308)

	Cox regression multivariable hazard ratio (95% CI)[a]	*P*[b]
Baseline Characteristics		
Age, y	1.019 (1.013-1.025)	<0.001
Male gender	1.08 (0.99-1.18)	0.08
African-American race	0.93 (0.79-1.11)	0.44
Private insurance	0.94 (0.87-1.02)	0.13
BMI ≤18 or ≥35 kg/m²	1.21 (1.00-1.47)	0.045
Severity of Illness/Functional Status		
NYHA IV (symptoms at rest, usually bedbound)[c]	1.33 (1.19-1.49)	<0.001
6-min walk <500 ft	1.23 (1.12-1.34)	<0.001
Life Support		
Any life support (ventilator or ECMO)	1.17 (0.95-1.45)	0.15
Hemodynamic Parameters		
Mean PAP ≥30 mmHg	1.06 (0.97-1.16)	0.18
Renal Function, Diabetes		
CrCl <50 mL/min or on dialysis	1.41 (1.09-1.83)	0.01
Diabetes	1.01 (0.91-1.12)	0.82
Transplant Center		
High-performing institution[d]	0.77 (0.71-0.83)	<0.001
Moderate- or high-volume institution[e]	0.80 (0.73-0.87)	<0.001
Lung Diagnosis		
Diagnosis of COPD (compared with a diagnosis of IPF)	0.84 (0.75-0.94)	0.003
Operative Characteristics		
Double-lung transplant	0.78 (0.70-0.87)	<0.001
Local organ (non-regional, non-national)	0.95 (0.88-1.03)	0.24
Interaction Term		
Interaction between lung diagnosis (COPD vs IPF) and treatment type (single- versus double-lung transplant)	1.17 (1.00-1.37)	0.049
Donor Characteristics		
Age, y	1.003 (1.000-1.006)	0.02
Smoking history >20 pack-years	1.10 (0.99-1.24)	0.09
Diabetes	1.17 (1.00-1.36)	0.045
Donor/Recipient Matching		
Race match, n (%)	0.90 (0.83-0.98)	0.01
CMV: donor positive, recipient negative	1.24 (1.14-1.35)	<0.001
Donor/recipient pTLC ratio 0.8-1.2	0.95 (0.87-1.04)	0.25
Complete HLA mismatch (all 6 allele mismatch)	1.16 (1.06-1.28)	0.002
Panel reactive antibody ≥20%	1.28 (1.11-1.47)	0.001

Abbreviations: BMI, body mass index; CI, confidence interval; CMV, cytomegalovirus; CrCl, creatinine clearance; ECMO, extracorporeal membrane oxygenation; HLA, human leukocyte antigen; NYHA, New York Heart Association; PAP, pulmonary artery pressure; pTLC, predicted total lung capacity.

[a] The reference increment for each continuous variable is the unit of measurement (eg, Age, per year; Forced vital capacity, per percentage point) unless otherwise noted.

[b] *P* value obtained from multivariable Cox proportional hazards regression model, including all terms shown in the table.

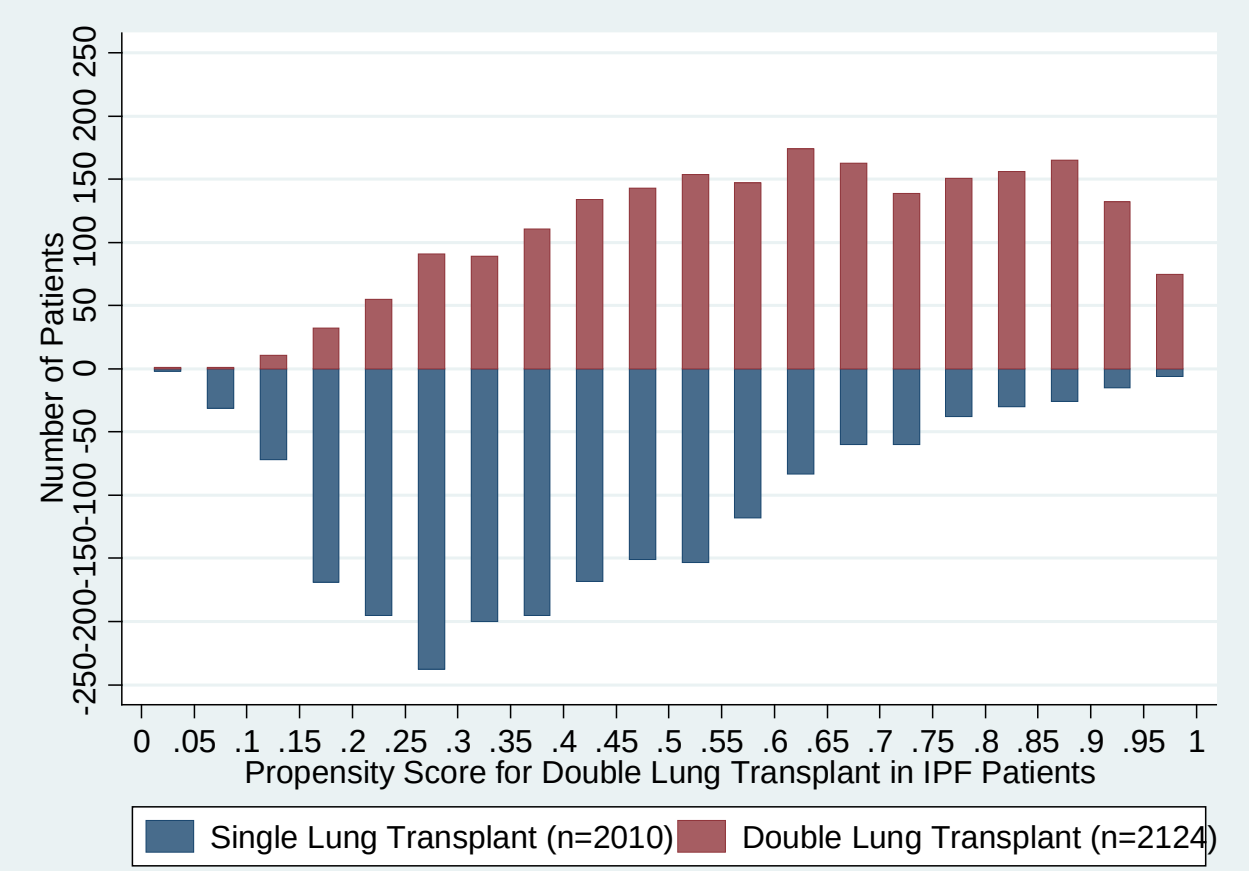
[c] NYHA IV: New York Heart Association Functional Classification class IV.

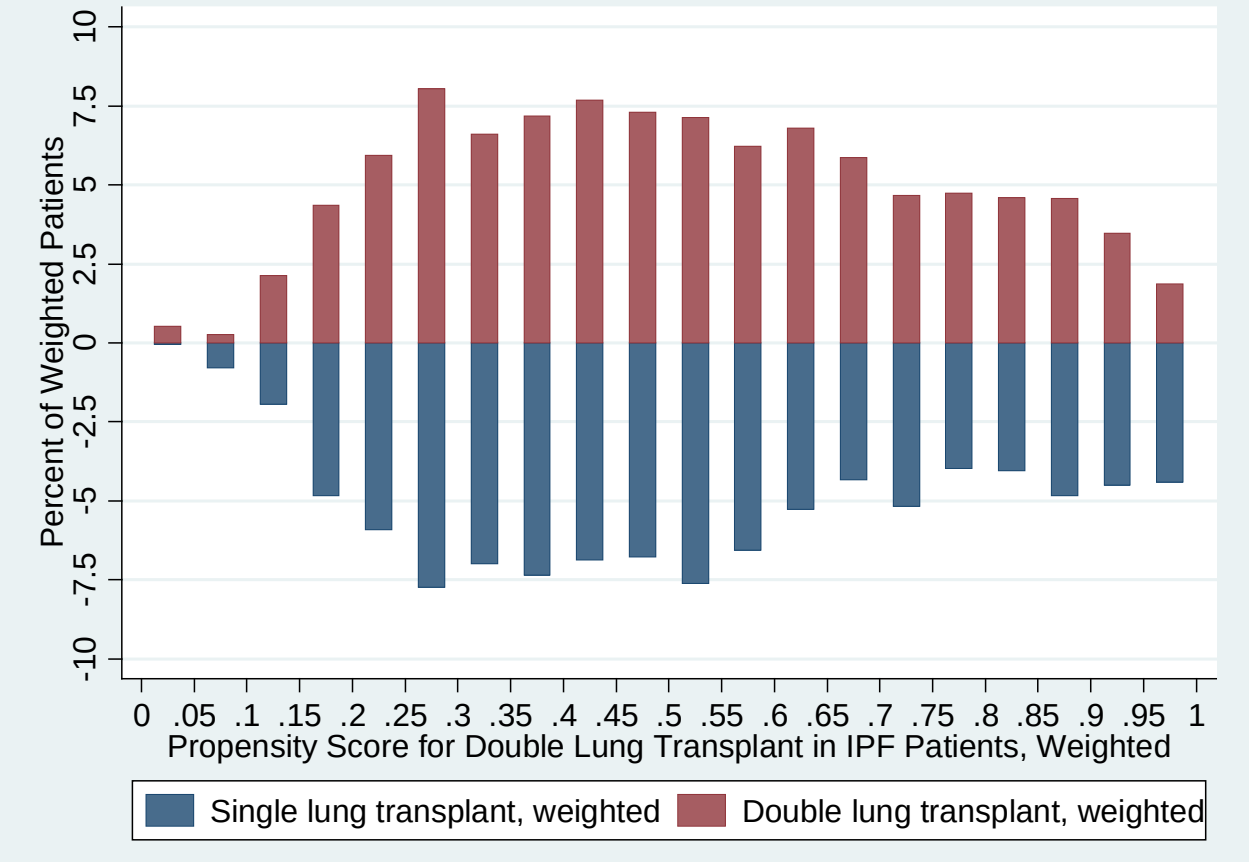
[d] High-performing institution: In the top third of graft survival performance among all 72 transplant centers.

[e] Moderate- or high-volume institution: Performed >194 lung transplants during the 93-month study period (>25 transplants/y).

eFigure 1. Distributions of Propensity Scores for Single- and Double-Lung Transplant Recipients

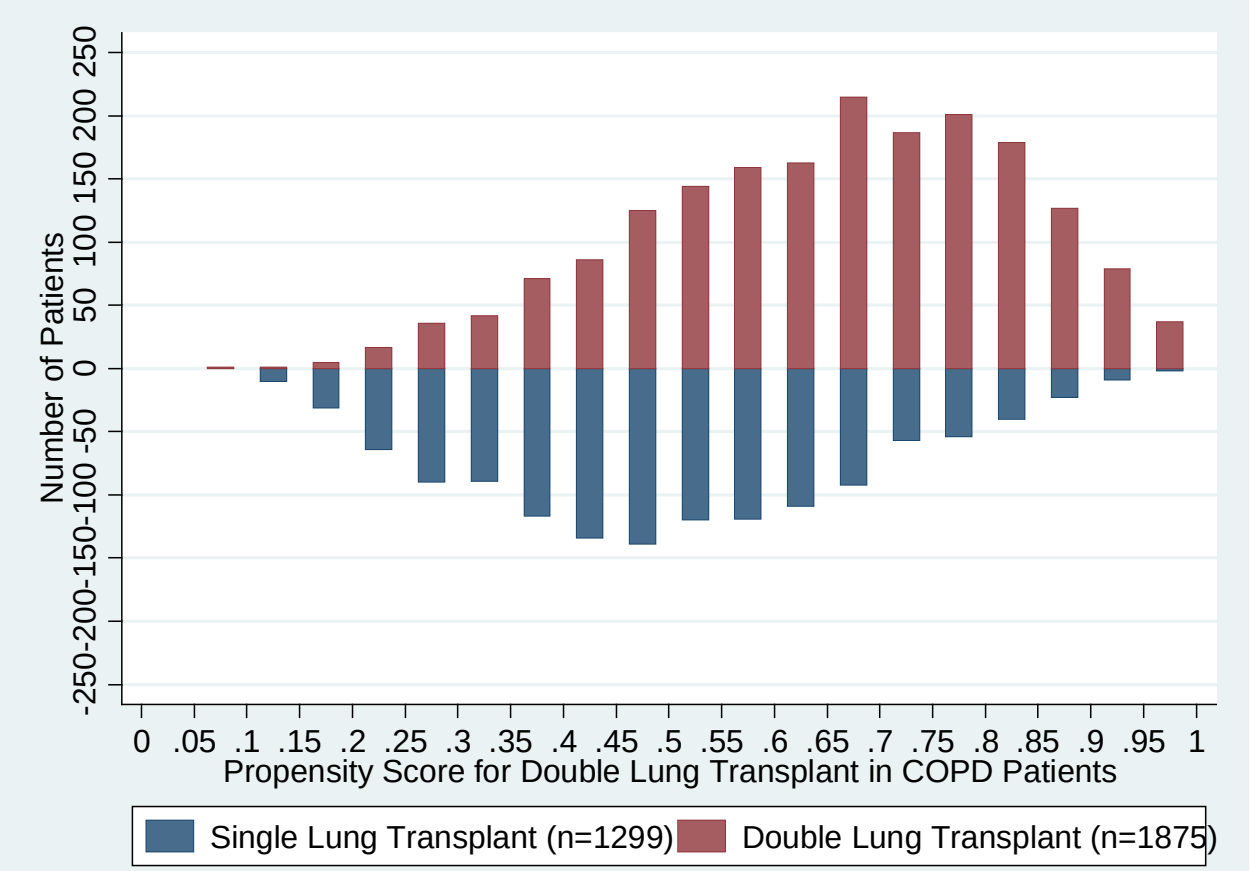
eFigure 1A and 1B

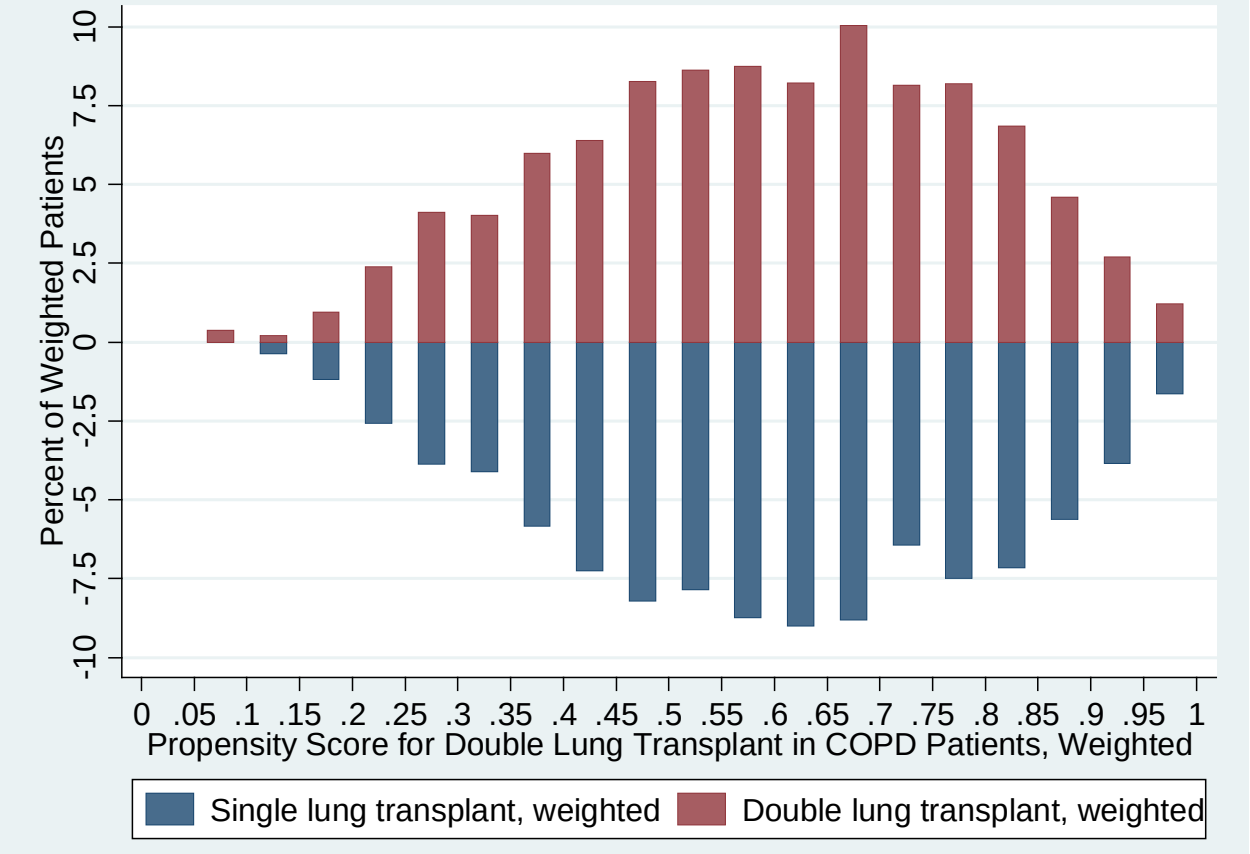




eFigure 1. Distributions of Propensity Scores for Single- and Double-Lung Transplant Recipients

eFigure 1C and 1D



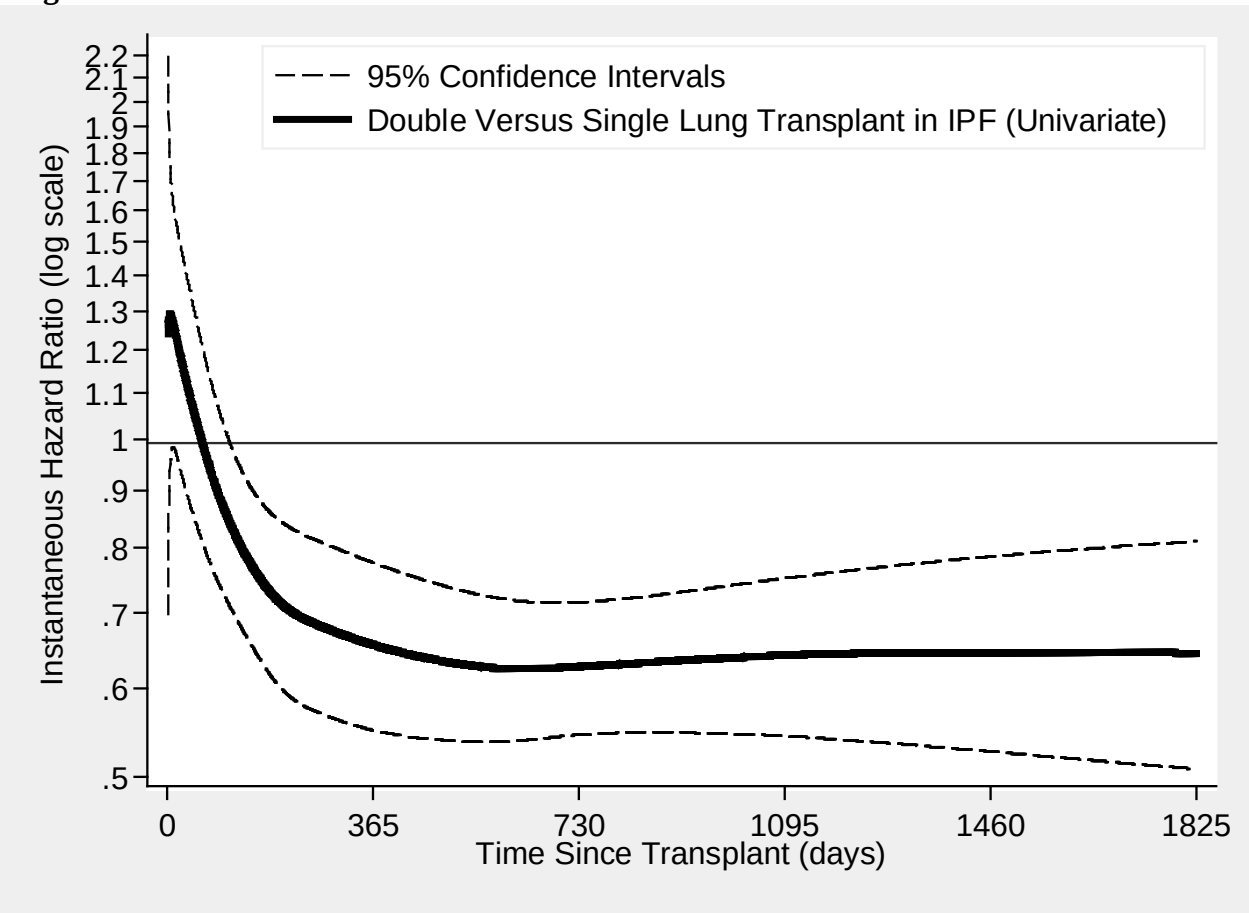


eFigure 1. Distributions of Propensity Scores for Single- and Double-Lung Transplant Recipients

Legend. Distributions of propensity scores for single- and double-lung transplant recipients. The graphs represent the unadjusted and adjusted data from patients with idiopathic pulmonary fibrosis (IPF; *A* and *B*) and from patients with chronic obstructive pulmonary disease (COPD; *C* and *D*). (Data were adjusted by the inverse probability of treatment weights.) The propensity score is the probability, computed from baseline variables, that a patient would receive a double-lung transplant (so that patients with a score closer to 1 are more like double-lung transplant recipients, and patients with a score closer to 0 are more like single-lung transplant recipients). Values within each bin are equal to or greater than the lower limit of the bin and less than the upper limit.

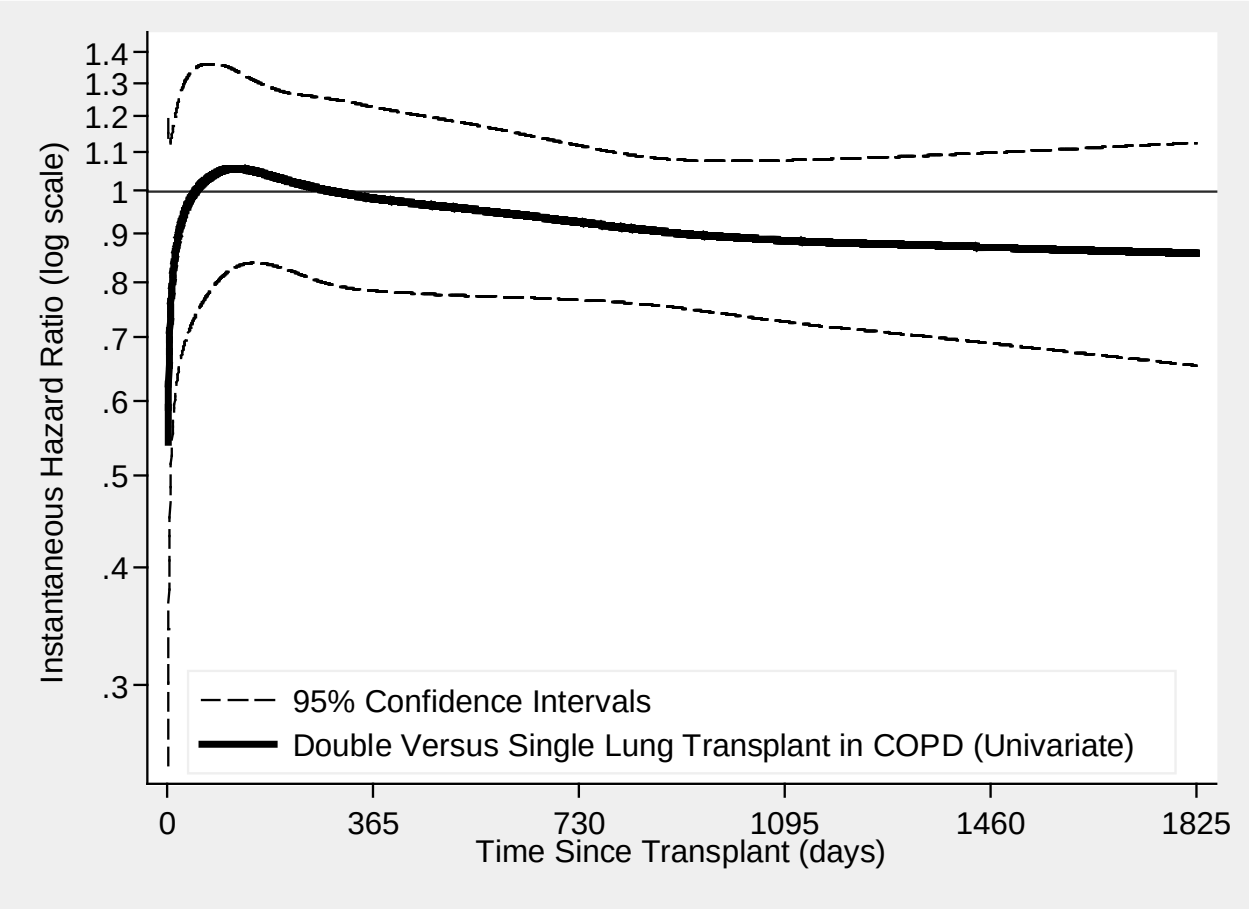
eFigure 2. Estimates of the Time-Varying Hazard of Double-Lung (as Compared to Single-Lung) Transplant Among Patients Who Received Lung Transplants Since the Lung Allocation Score Was Implemented

eFigure 2A



eFigure 2. Estimates of the Time-Varying Hazard of Double-Lung (as Compared to Single-Lung) Transplant Among Patients Who Received Lung Transplants Since the Lung Allocation Score Was Implemented (continued)

eFigure 2B



eFigure 2 Legend. Estimates of the time-varying hazard of double-lung (as compared to single-lung) transplant among patients who received lung transplants since the lung allocation score was implemented. Hazard ratio is expressed as a function of time, using a Royston-Parmar flexible parametric analysis model with 4 internal spline knots (5 degrees of freedom) for non-time varying parameters, and 2 internal spline knots (3 degrees of freedom) to model the time-varying effect of double- vs single-lung transplant. Estimates of the time-varying effect of double-lung transplant from a univariate Royston-Parmar model are shown for idiopathic pulmonary fibrosis (IPF) patients (*A*) and chronic obstructive pulmonary disease (COPD) patients (*B*).

eReferences

1. Eberlein M, Garrity ER, Orens JB. Lung allocation in the United States. *Clin Chest Med.* 2011;32(2):213-222.

2. Centers for Disease Control and Prevention. Guidelines for preventing transmission of human immunodeficiency virus through transplantation of human tissue and organs. http://wonder.cdc.gov/wonder/prevguid/m0031670/m0031670.asp. Accessed December 10, 2014.