

Lung Transplant for ILD

When to Refer

What to Expect

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Disclosures

I have been involved in sponsored research agreements with Celgene/Bristol Myers Squibb and Bayer

These slides are my view, not those of the MGH lung transplant program

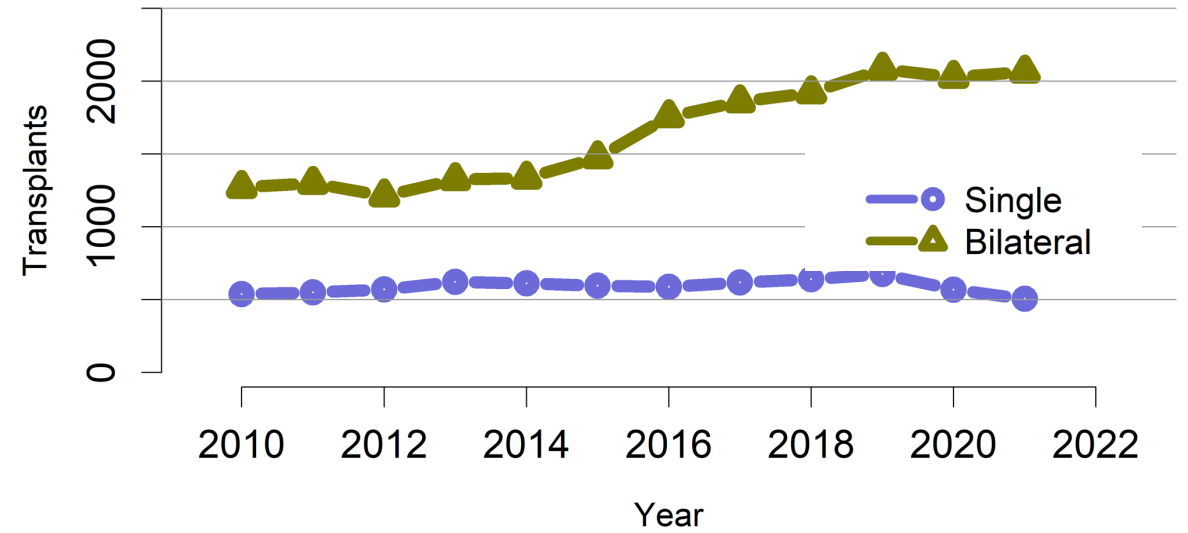


Lung Transplant History

- 1963:** First human single lung transplant (lived 18 days)
- 1983:** First single lung transplant with long term survival (lived 7 years)
- 1986:** Double lung transplant en bloc
- 1990:** Bilateral sequential lung transplant technique
- Jan 1992–June 2018:** 67,493 lung transplants worldwide

Lung Transplant in US

Adult transplants	2022	2021	1988- now
Lung only	2674	2501	48,292
Heart-Lung	48	43	1268
Kidney	23,851	22,107	525,655
Liver	9002	8735	184,890
Heart	3620	3330	77160
Intestine	60	57	1704
Re-transplant	73	93	1679



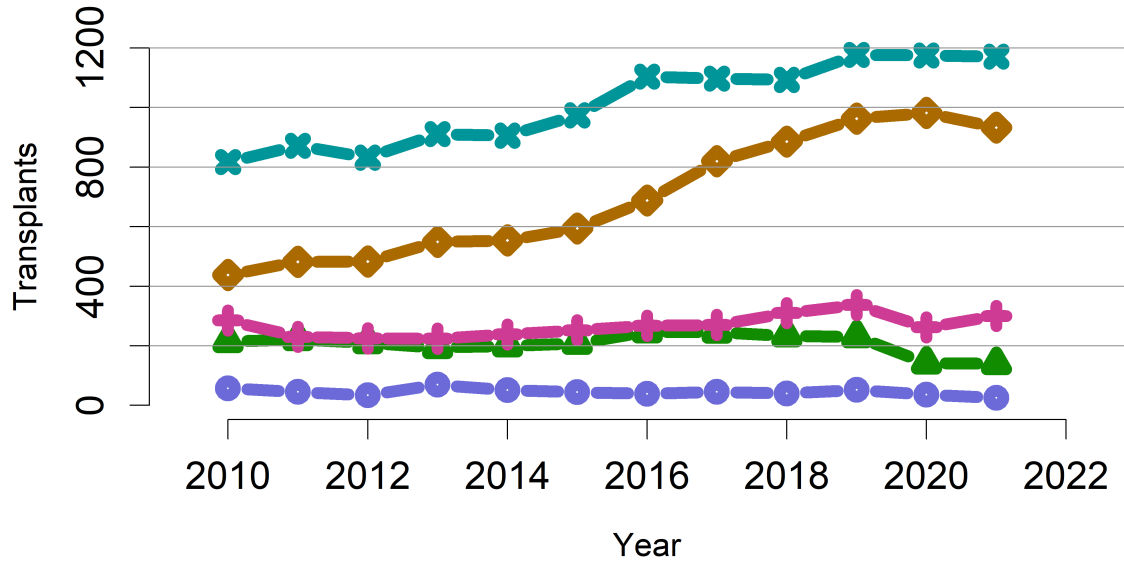
Last living lobar transplant in US 2013
 946 so far in 2023. Current waitlist 1020

2021: 2063 bilateral 506 single



Lung Transplants in US

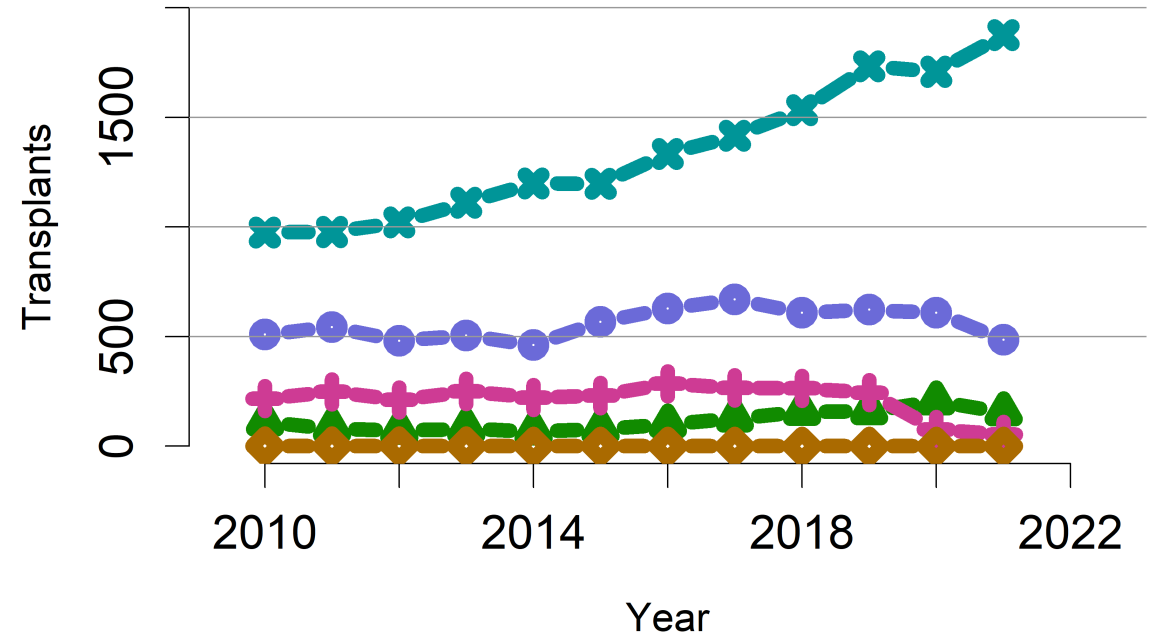
Age



- <18 years
- △ 18-34
- + 35-49
- × 50-64
- ◇ 65+

2021:
 440 in age 18-49
 1171 50-64
 933 65 and older

Disease Category



- A - obstructive
- △ B - pulmonary vascular
- + C - cystic fibrosis
- × D - restrictive
- ◇ Unknown

ISHLT guidance on referral

Lung transplantation should be considered for adults with chronic, end-stage lung disease who meet all the following general criteria:

1. High (>50%) risk of death from lung disease within 2 years if lung transplantation is not performed.
2. High (>80%) likelihood of 5-year post-transplant survival from a general medical perspective provided that there is adequate graft function.



ISHLT guidance on referral for ILD

Any UIP on pathology or probable or definite UIP on CT

Any pulmonary fibrosis with FVC <80% or DLCO <40%

Relative fall in FVC >10%, DLCO >15%

Any supplemental oxygen use - even exertional

Progression despite therapy if inflammatory ILD

Early referral for CTD or familial pulmonary fibrosis

Consider listing when

Absolute fall in: FVC >10%, DLCO >15%, 6MWT 50m

Pulmonary hypertension, hospitalization for exacerbation



Lung Transplant Evaluation

Intended to determine necessity and safety of transplant

Disease severity

Comorbidities

Anatomy

Functional status, nutritional status, frailty

Health-related behaviors

Psychosocial circumstances

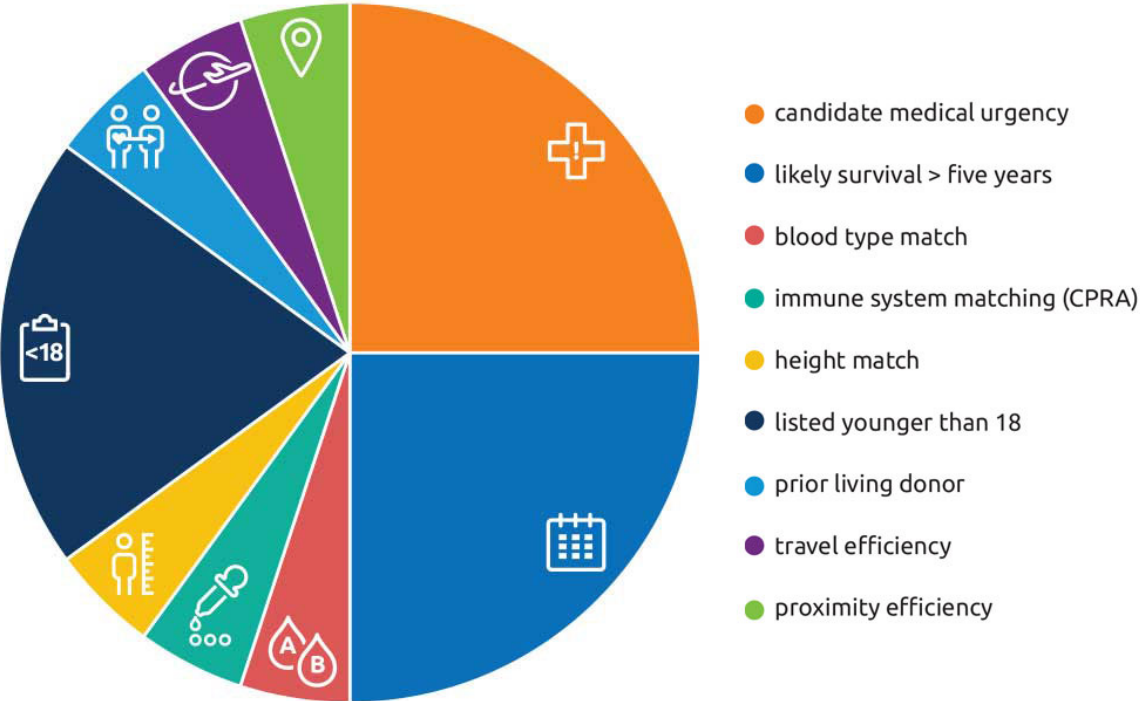
ISHLT Guidelines highlight risk factors in each category



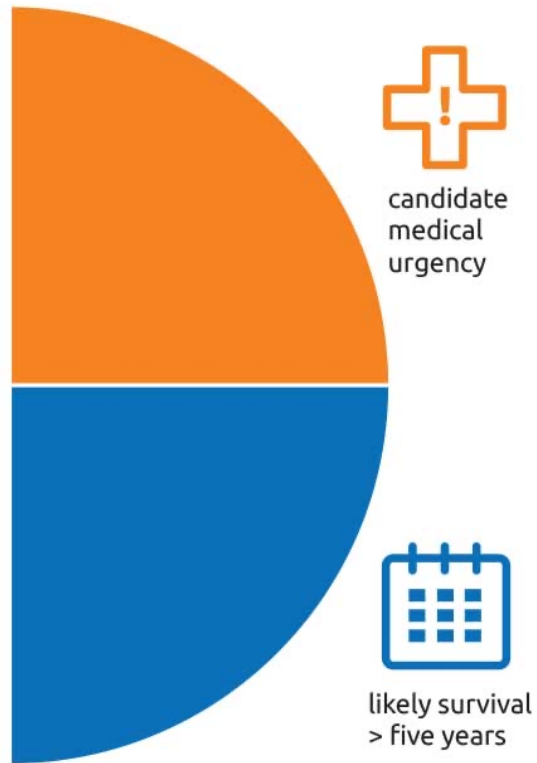
Composite Allocation Score (CAS)

CAS as of March 9, 2023

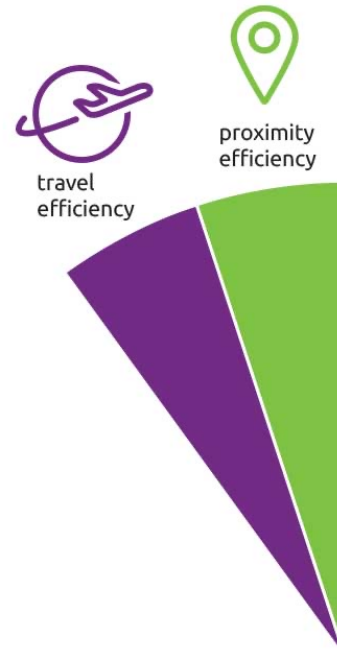
Prior Lung Allocation Score
LAS considered waitlist and
posttransplant mortality 2:1
Donors offered first within 250
nautical miles of donor hospital



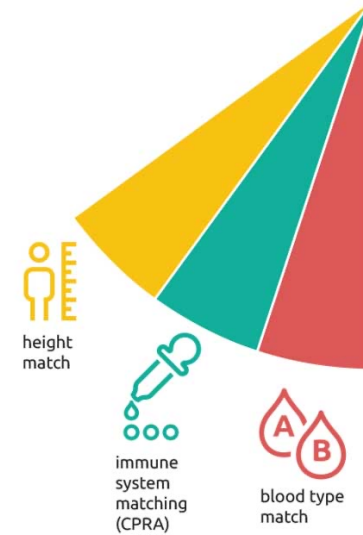
Composite Allocation Score



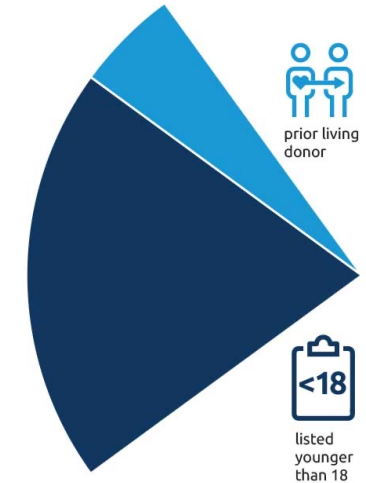
Patient factors
-Urgency (≤ 25)
-5 year survival (≤ 25)



Distance
-travel expense (≤ 5)
-proximity (≤ 5)



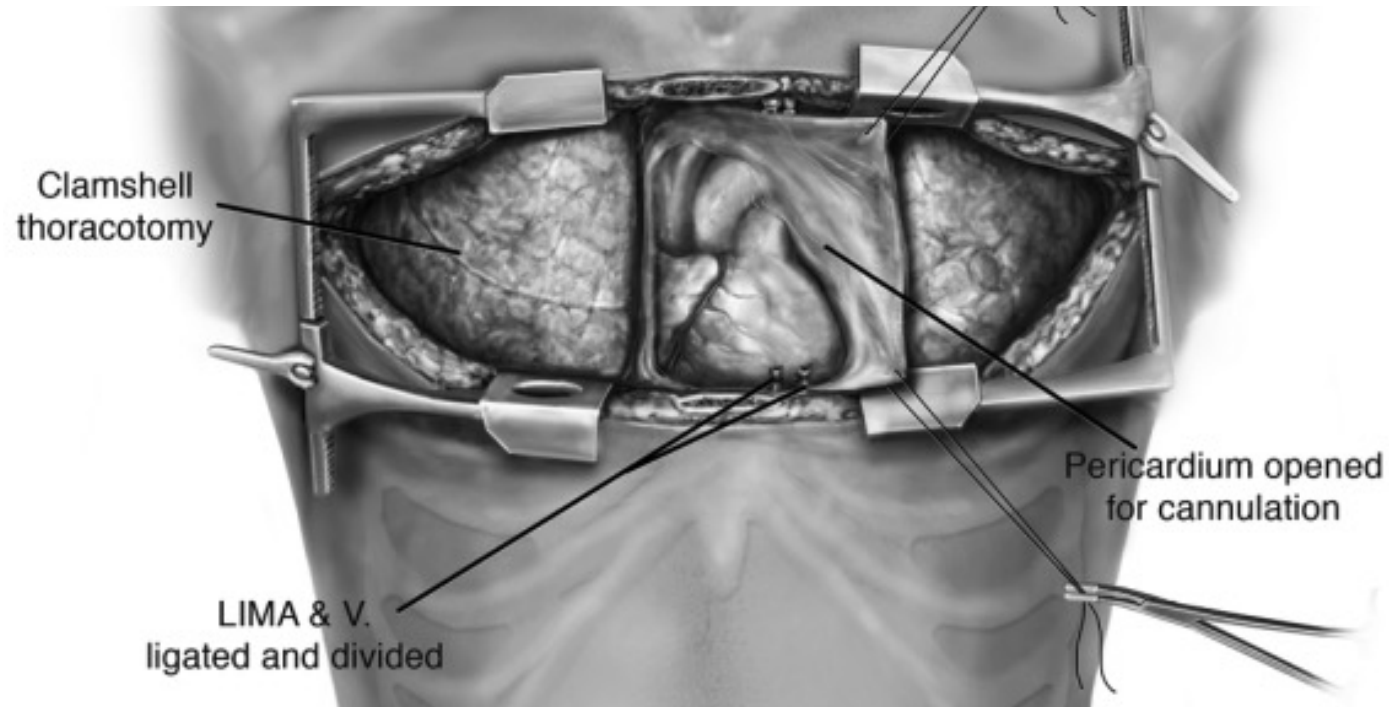
Hard to Match
-Extreme of height (≤ 5)
-Sensitized to donors (≤ 5)
-Rare blood type



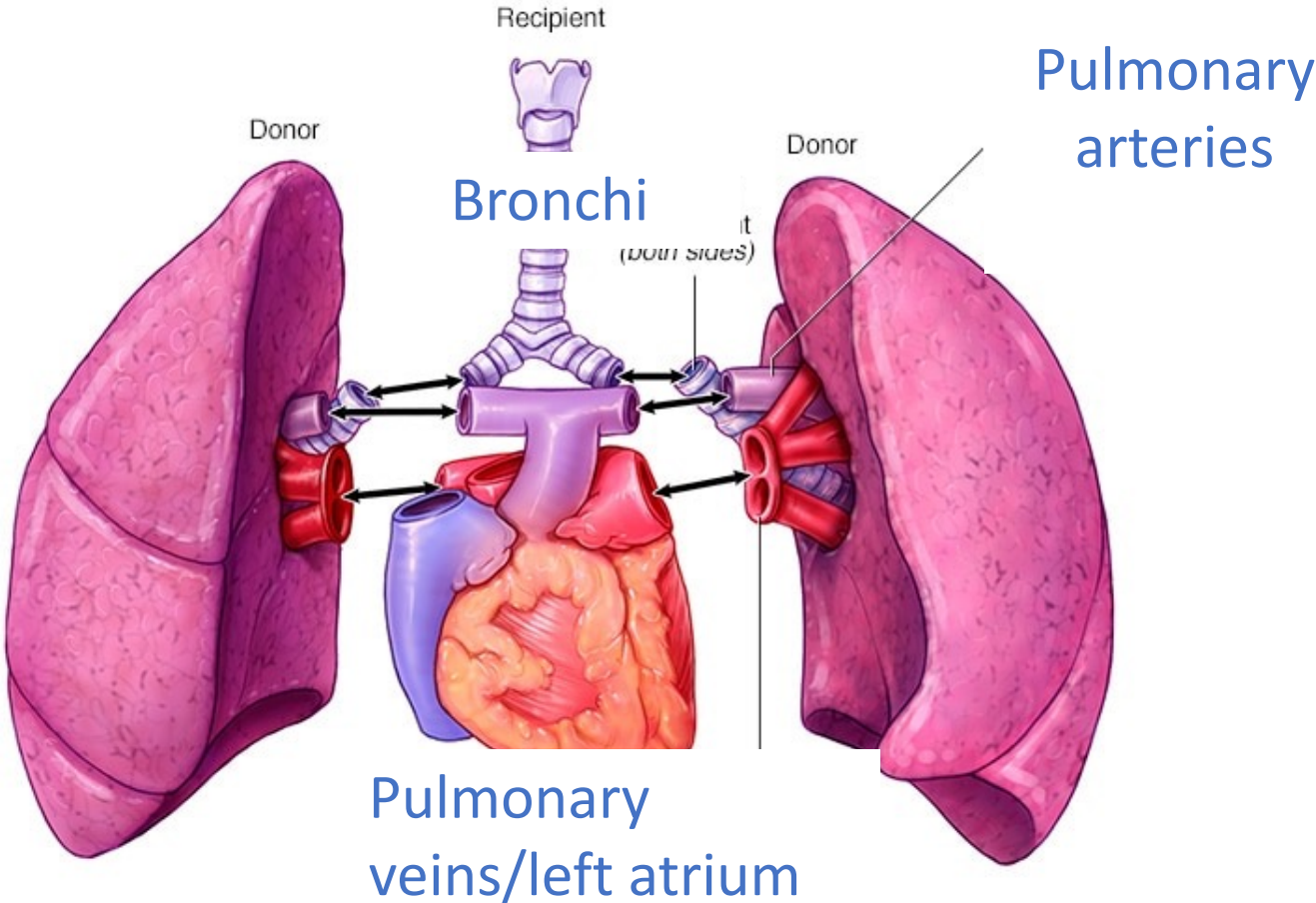
Extra Credit
-Under 18 (≤ 10)
-Prior living donor (≤ 5)

Bilateral Sequential Lung Transplant

Clamshell incision: bilateral thoracotomy and transverse sternotomy



Bilateral Sequential Lung Transplant



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Outcomes

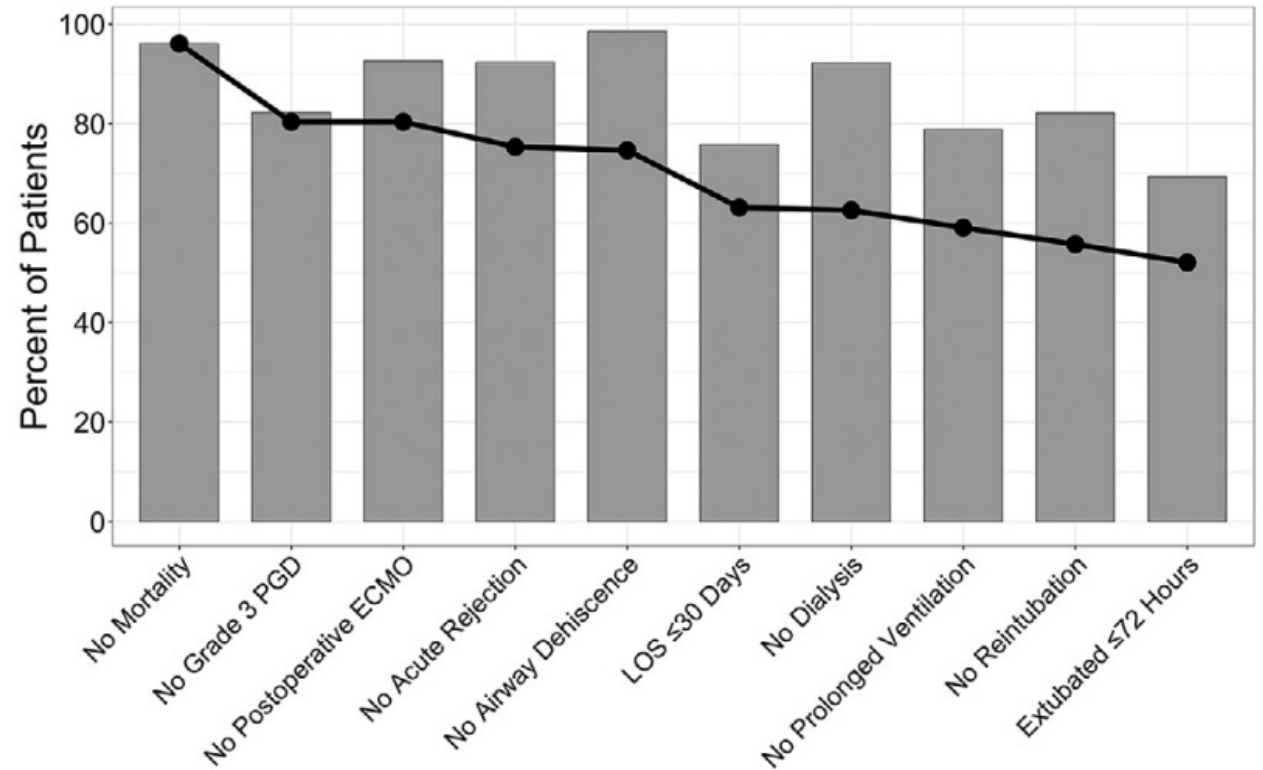
Textbook outcome

Freedom from:

- Length of stay > 30 days,
- 90-day mortality
- Intubation/ECMO at 72 h post-transplant
- Ventilator support lasting ≥ 5 days
- Postoperative airway dehiscence,
- Inpatient dialysis,
- Pre-discharge acute rejection,
- Grade 3 primary graft dysfunction at 72h

4664 of 8959 (52.1%) overall
ranged at centers 27.0% to 72.4
Bilateral 1537/3197 (48.1%) Single 931/467 (63.5%)

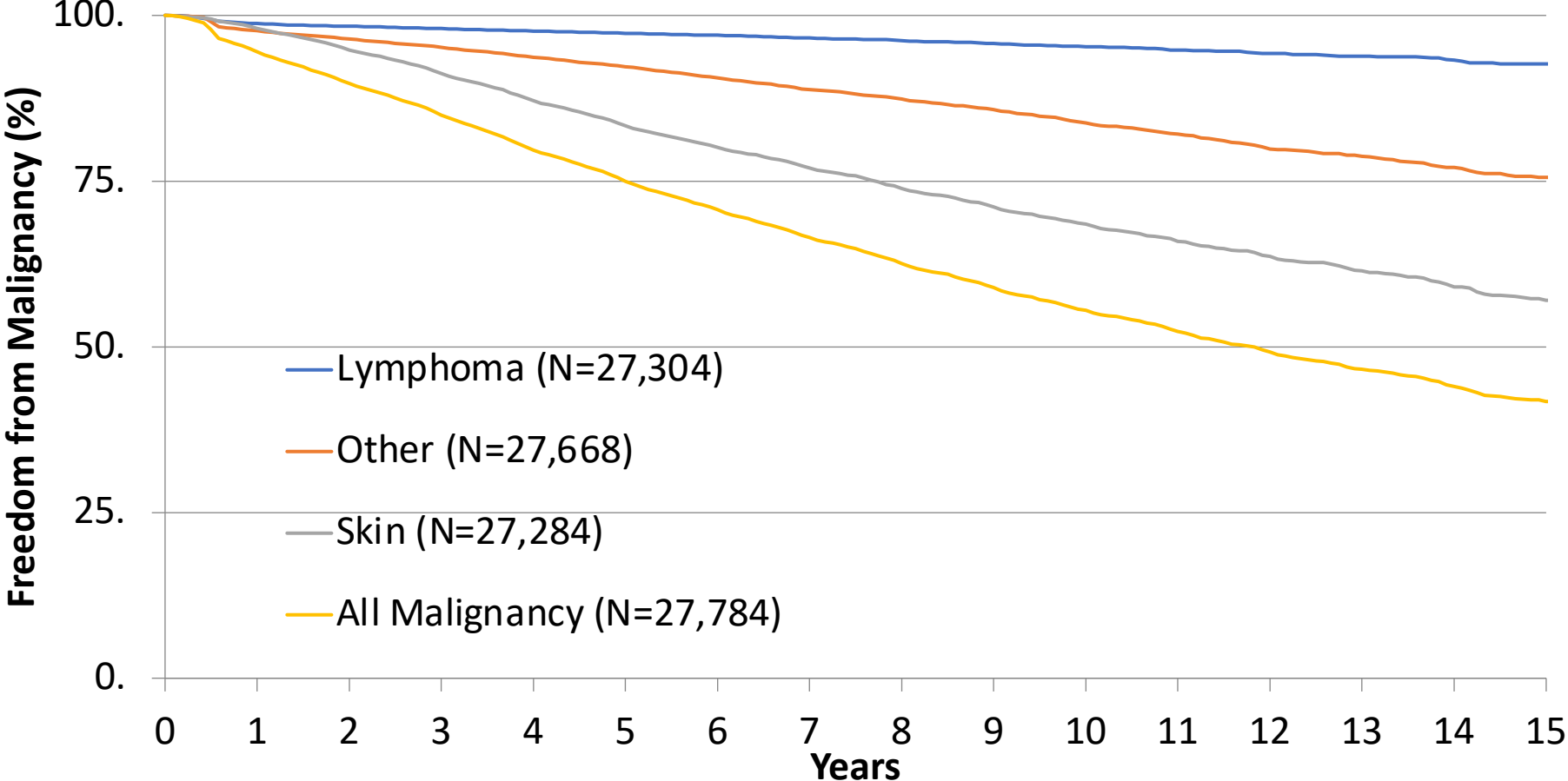
8959 Adult patients isolated LTx 2016 – 2019



Common Post-Transplant Complications

Complications (1995–2017)	1 year	5 year	10 year
All severe renal dysfunction	5.6%	16.0%	24.6%
Creatinine > 2.5 mg/dl	4.2%	12.6%	14.8%
Chronic Dialysis	1.4%	2.8%	6.4%
Renal Transplant	0.0%	0.5%	3.5%
Diabetes	19%	33%	
Malignancy (all non skin cancer types)	5.3%	20.4%	32.6%
Bronchiloitis obliterans syndrome	8.5%	41.4%	67.1%

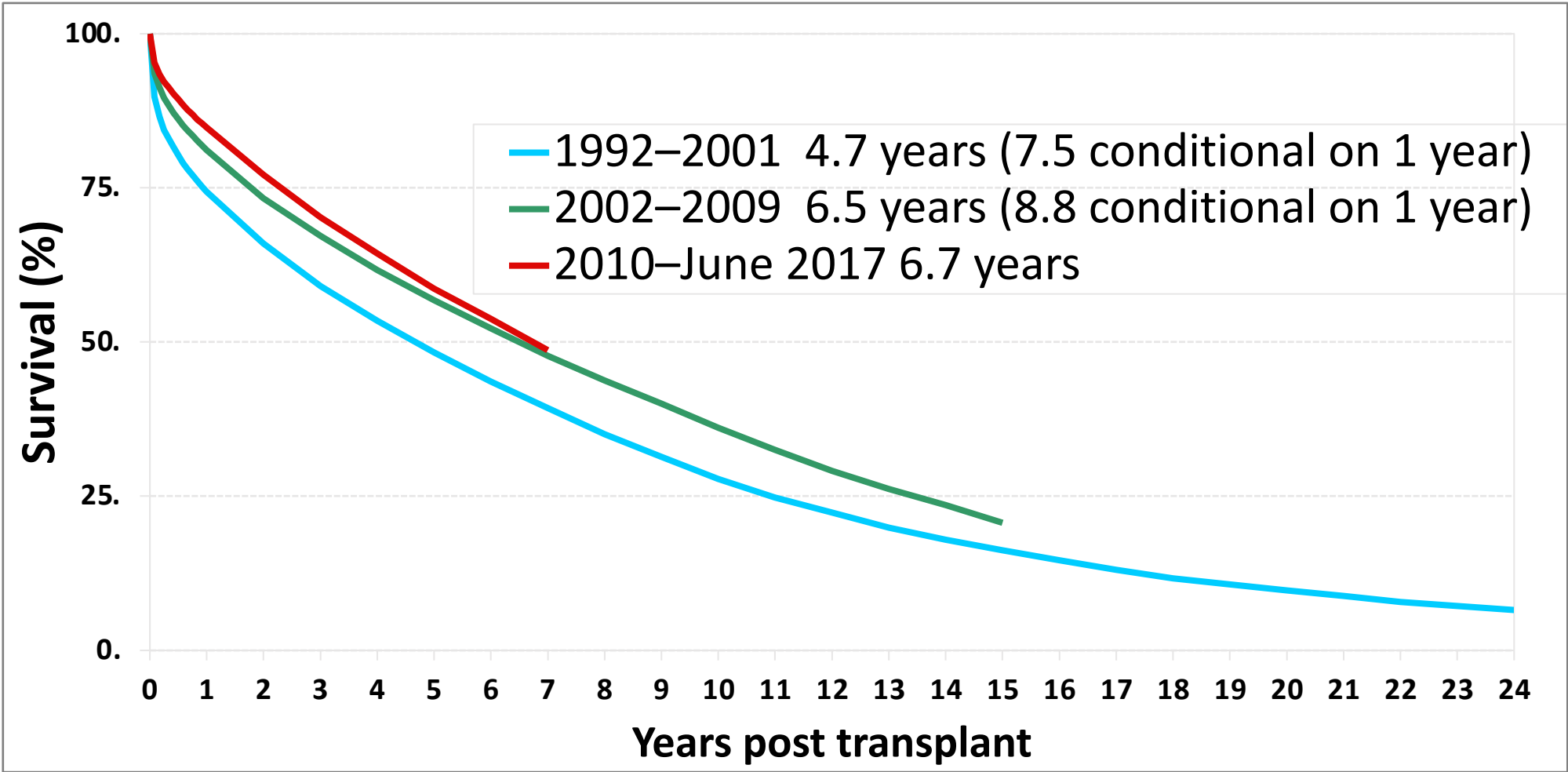
Freedom from Malignancy Post-Transplant



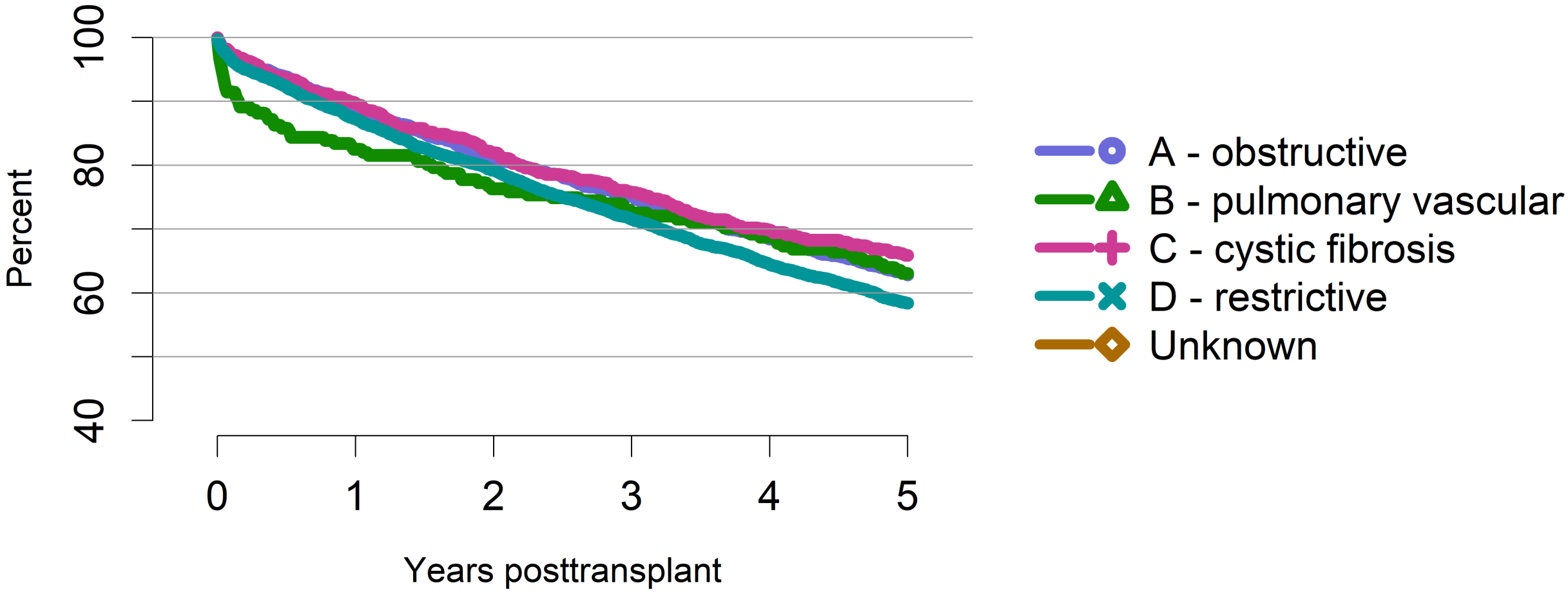
Survival (%) after lung transplant

	1 year	3 year	5 year	<i>N at 5 years</i>
Lung	87.77	74.8	61.2	3,371
Double Lung	87.7	71.8	58.6	2525
Single Lung	86.7	64.5	47.3	961
Lung for "IPF"	87.0	68.2	52.5	1152
Lung for COPD	89.7	72.3	56.0	916
Lung re-transplant	68.3	34.3	33.8	102
Kidney	97.1	93%	86%	45,826
Intestine	83%	69%	59%	292
Heart-lung	81%	58%	50%	62

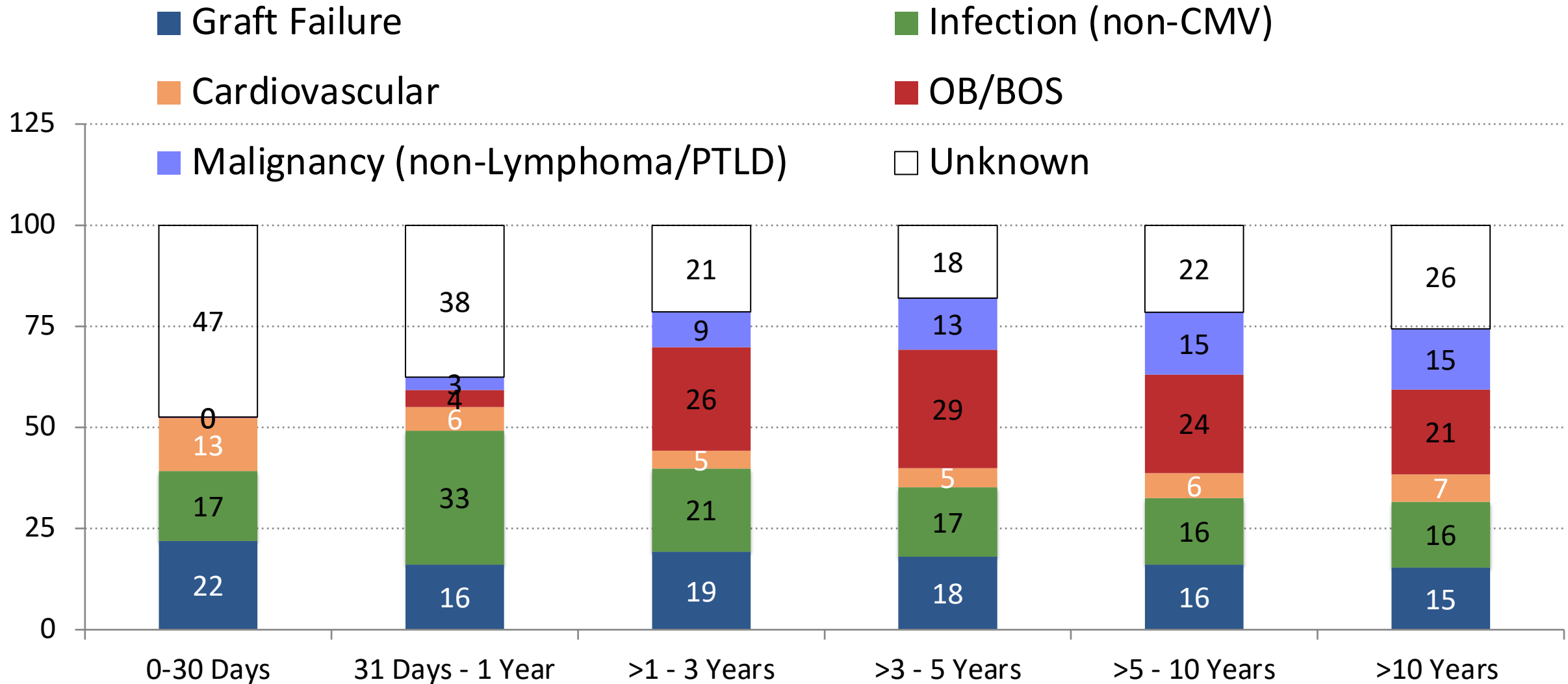
Worldwide survival



US survival



Causes of death after transplant



Thank you

