

Referral of ILD Patient for Lung Transplantation

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Disclosures

- No disclosures relevant to this topic

Objectives

- Prognosis with ILD
- Which patients with ILD should be referred for lung transplantation
- When should patients with ILD be referred for transplantation
- Overview of lung transplant activity
- What can the referring physician and patient expect
 - Evaluation process
 - The waitlist
 - Organ Donors
 - Transplant surgery

ILD Classification

Diffuse Parenchymal Lung Disease

DPLD of known cause e.g. drugs or association e.g. collagen vascular disease

Idiopathic interstitial pneumonias

Granulomatous DPLD e.g. sarcoidosis

Other forms of DPLD e.g. LAM, HX etc.

Idiopathic pulmonary fibrosis

IIP other than idiopathic pulmonary fibrosis

Desquamative interstitial pneumonia

Acute interstitial pneumonia

Nonspecific interstitial pneumonia (provisional)

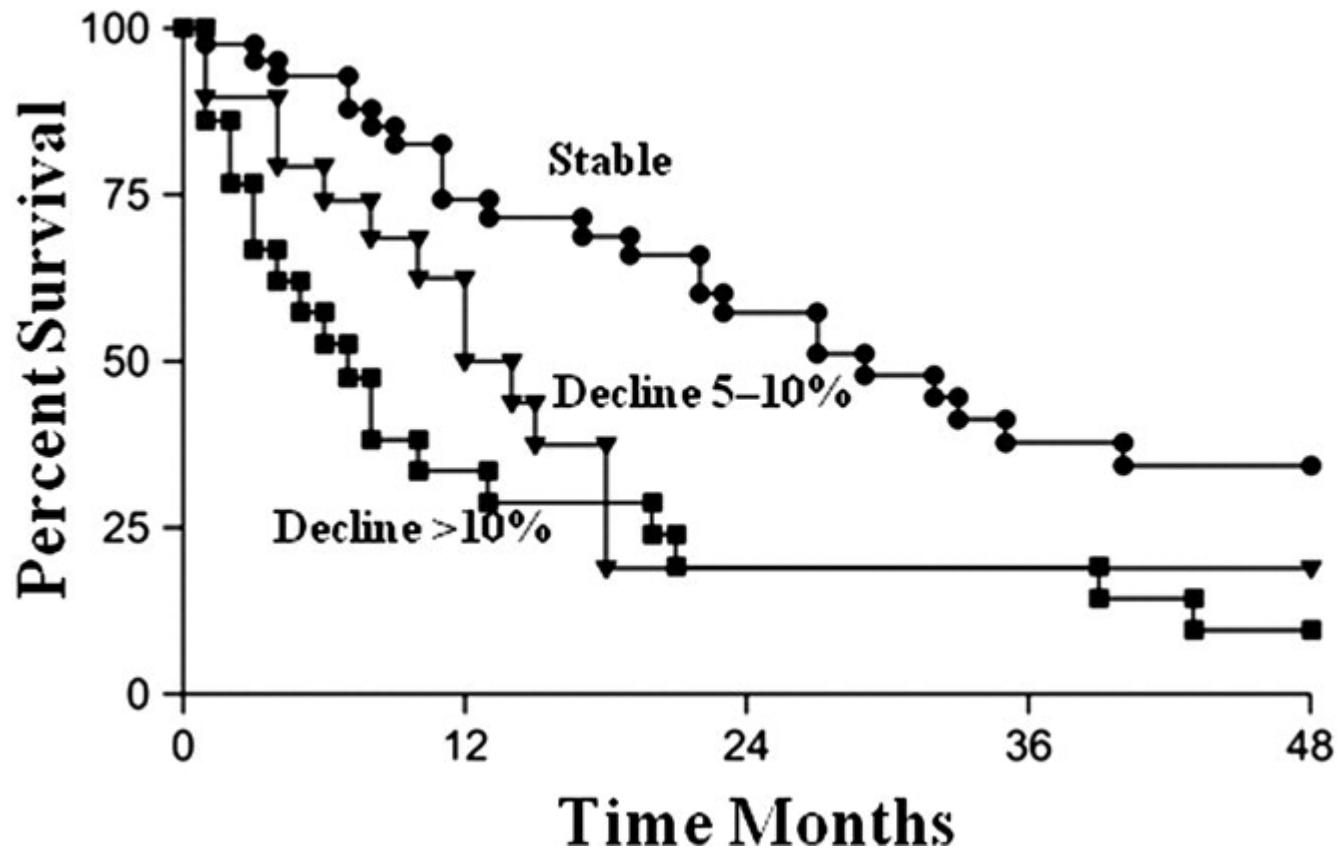
Respiratory bronchiolitis interstitial lung disease

Cryptogenic organising pneumonia

Lymphocytic interstitial pneumonia

American Thoracic Society/European Respiratory Society international multidisciplinary consensus classification of the idiopathic interstitial pneumonias. *Am J Respir Crit Care Med* 2002;165:277-304.

Prognosis in IPF

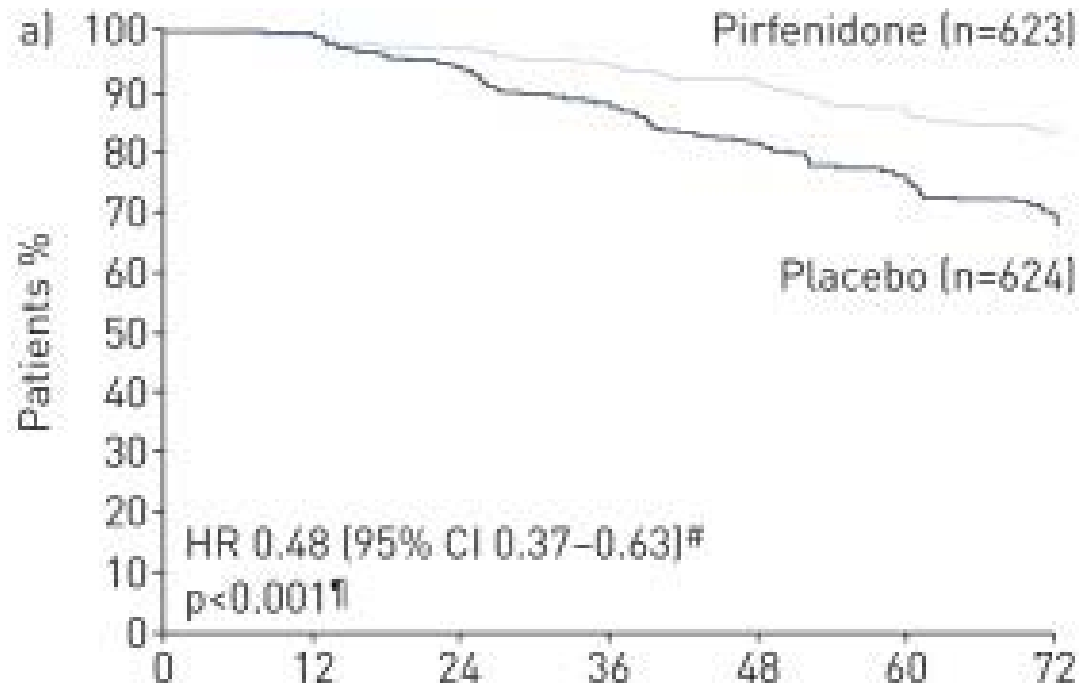


Zappala CJ, Latsi PI, Nicholson AG, Colby TV, Cramer D, Renzoni EA, Hansell DM, du Bois RM, Wells AU. Marginal decline in forced vital capacity is associated with a poor outcome in idiopathic pulmonary fibrosis. *Eur Respir J* 2010;35:830-836.

INDIVIDUAL PREDICTORS OF SURVIVAL IN IDIOPATHIC PULMONARY FIBROSIS

Clinical Predictors	Radiographic Predictors	Physiologic Predictors	Pathologic Predictors	Biomarker Predictors
<i>Demographic</i>	<i>HRCT</i>	<i>Pulmonary function tests</i>	<i>Histopathology</i>	<i>Blood</i>
Age (older)	UIP pattern	FVC	UIP pattern	BNP
Sex	Extent of fibrosis	TLC	Fibroblastic foci	Albumin
Ethnicity		DL _{CO}		KL-6M
Smoking status		CPI		MP-7
<i>Symptom-based</i>		Change in FVC		CCL-18
Dyspnea scores		Change in DL _{CO}		SP-A & -D
				Circulating fibrocytes
<i>Physical examination</i>		<i>Exercise tests</i>		<i>BAL</i>
Clubbing		6MWT		SP-A & -D
BMI (low)		Desaturation		MMP-3, -7, -8, -9
<i>Comorbidities</i>		Distance		CCL-2, -17, -22
Emphysema		Heart rate recovery		Neutrophilia
Pulmonary hypertension		Others		
		15-step test		
		4-min step test		

Medical Therapy in IPF - Pirfenidone



Patients at risk*	Week						
Pirfenidone	618	612	591	561	540	287	188
Placebo	618	615	573	533	486	264	169

Noble P. Eur Respir J. 2016 Jan;47(1):243-53

Candidate Selection General Guidelines

- Clinically and physiologically severe disease
- Medical therapy not available or ineffective
- Limited life expectancy
- Ambulatory with rehabilitation potential
- Good nutritional status, +/- 20% IBW
- Satisfactory psychosocial profile
- Adequate funding



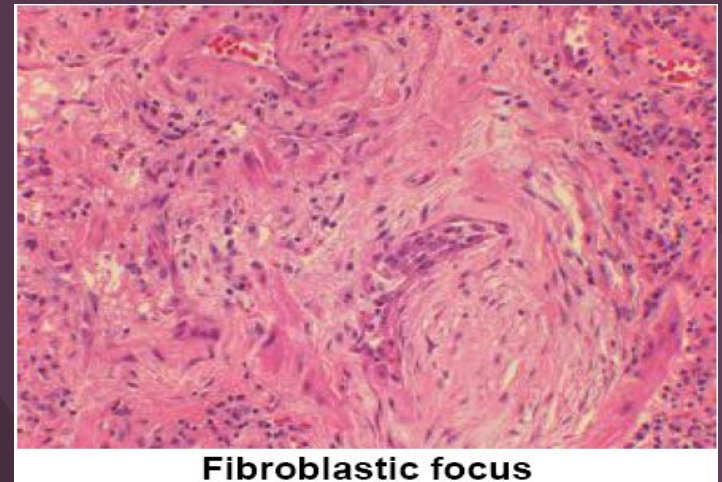
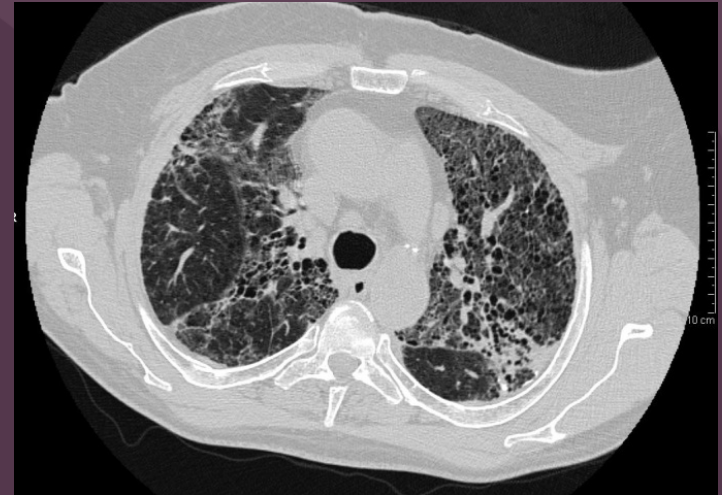
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Idiopathic Pulmonary Fibrosis

- When to refer?
 - Histologic or radiographic evidence of usual interstitial pneumonia (UIP)
 - ***No such thing as too early**
- When to transplant?
 - D_LCO under 40%
 - Rapid decline in FVC
 - Development of pulmonary hypertension
 - Hypercapnea
 - Severe honeycombing



Fibroblastic focus



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Candidate Selection Relative Contraindications

–Age

- > 65 (single)
- > 60 (double)
- > 55 (heart/lung)

–Acute illness

- Poor rehab potential - frailty
- Obesity (BMI > 30 Kg/m²)
- Underweight - BMI < 18 Kg/m²
- Extensive pleural thickening
- Prior thoracic surgery

- Colonization with resistant organisms
- Severe osteoporosis
- Mechanical ventilation
- Chronic steroid therapy on more than 20 mg prednisone
- Insurance limitations
- Other co-morbidities (i.e. severe GERD)
- HIV Disease



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Candidate Selection Absolute Contraindications

–Malignancy

–Multiorgan system dysfunction

–Extra-thoracic involvement in systemic disease

–Chronic, untreatable infection

–Chest wall/Spinal deformity

–Medical noncompliance

–Uncontrolled psychiatric disease

–Lack of social support

–Substance abuse



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Transplanting the Marginal Recipient

- The older patient
- The patient with CAD
- The patient with history of malignancy
- The ventilated patient
- The ECMO patient
- The previously transplanted patient
- The sensitized patient

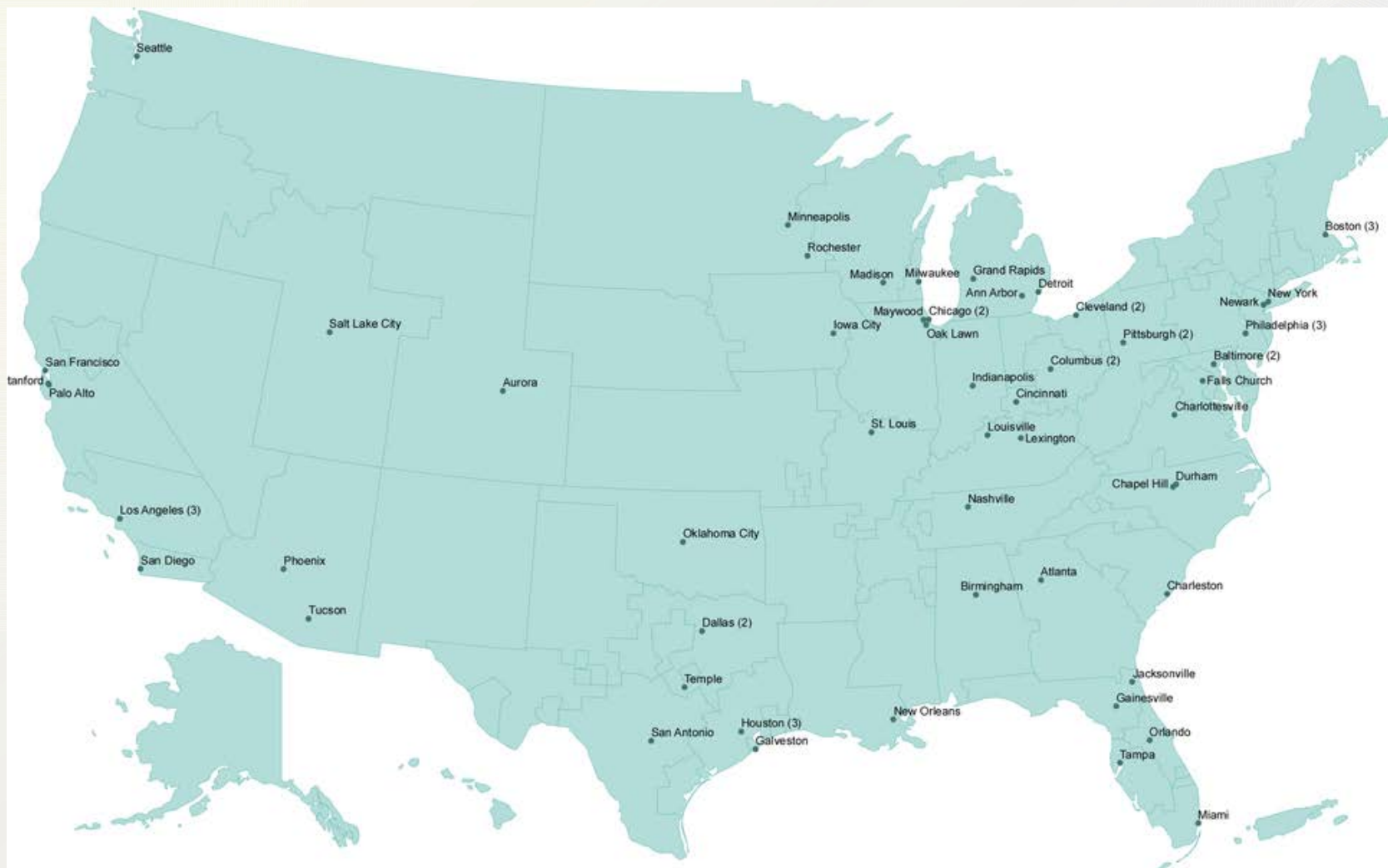


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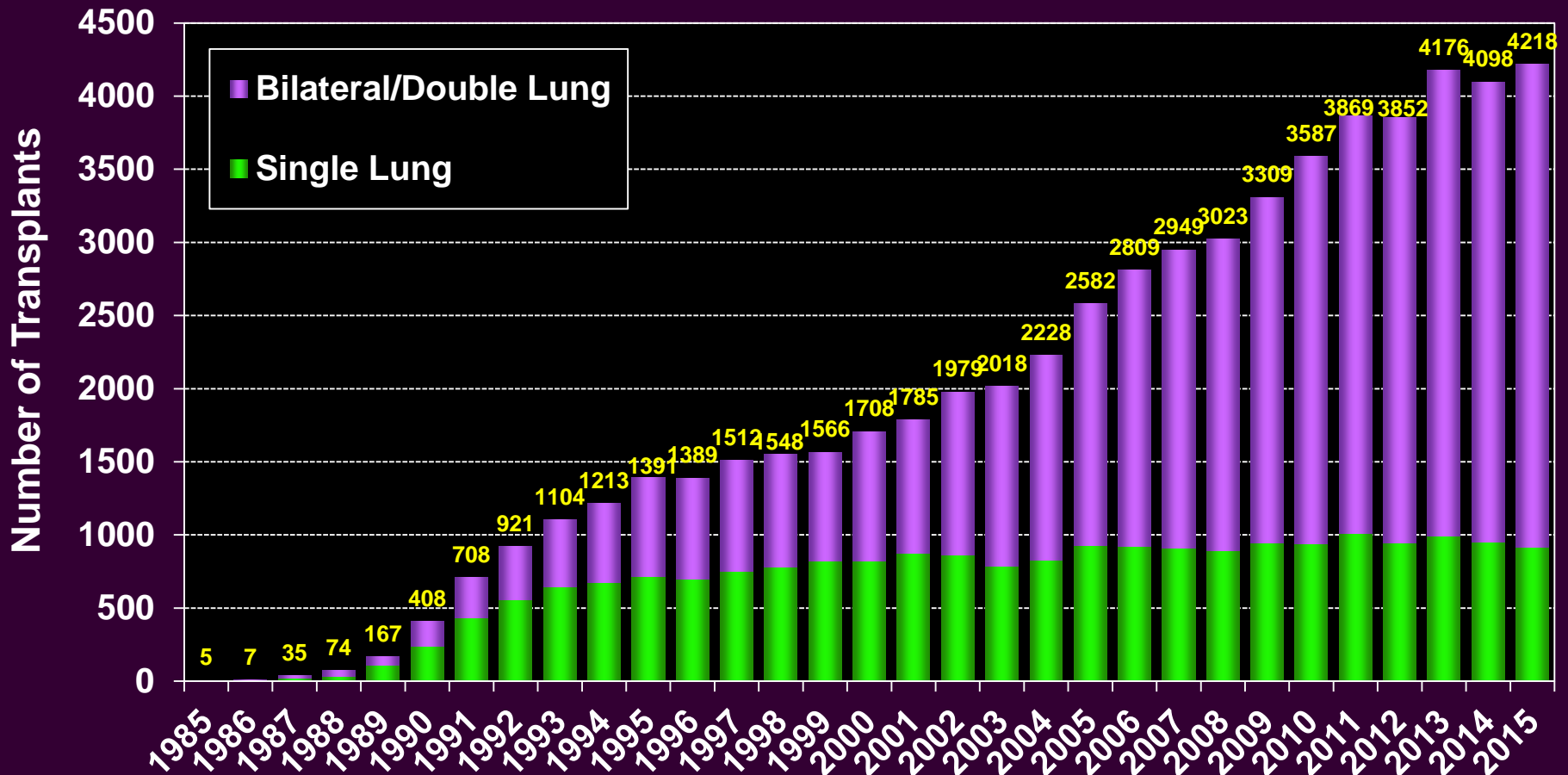
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Centers performing transplants or listing active lung candidates, ages 18 years or older, within DSAs, 2012-2014



Adult and Pediatric Lung Transplants

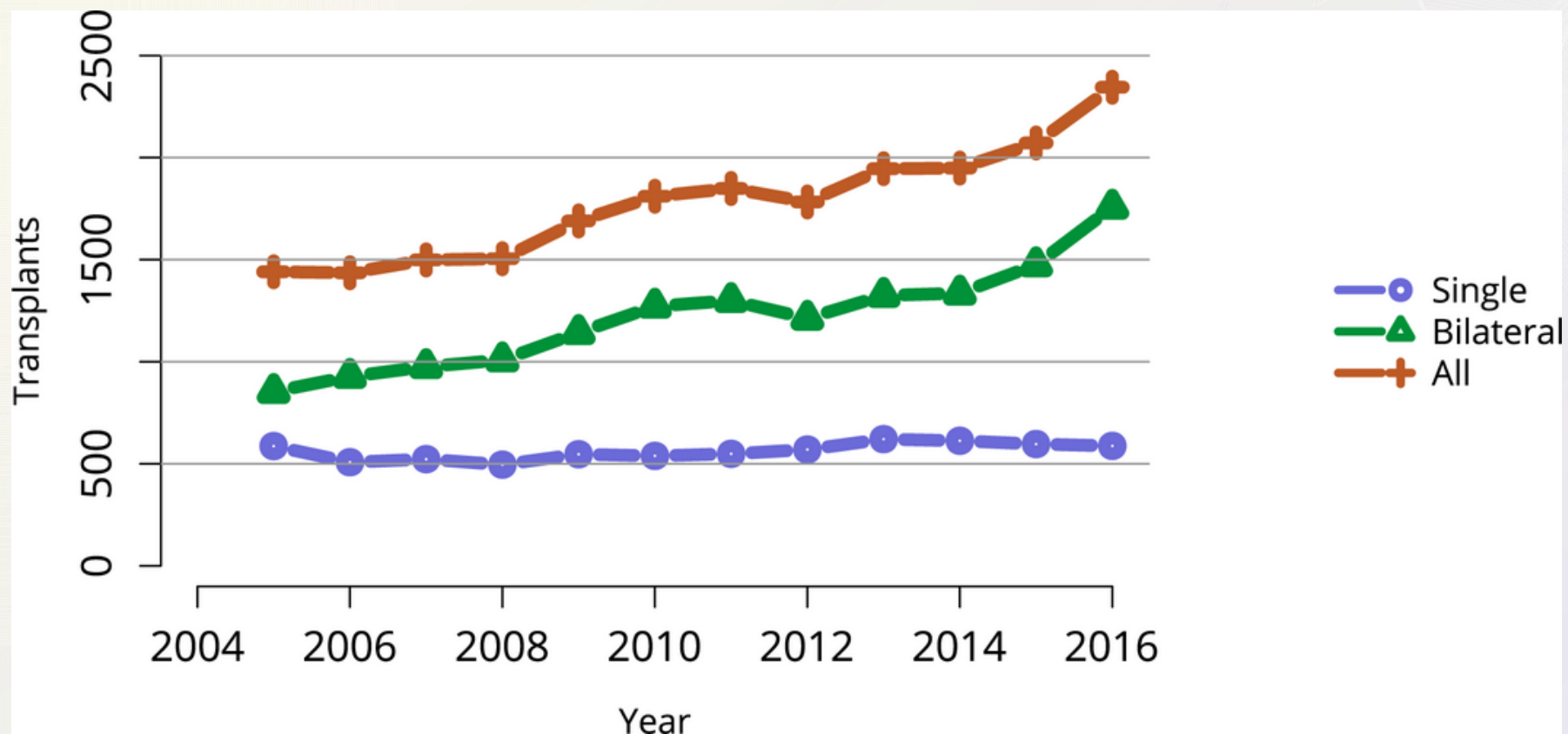
Number of Transplants by Year and Procedure Type



NOTE: This figure includes only the lung transplants that are reported to the ISHLT Transplant Registry. As such, this should not be construed as representing changes in the number of lung transplants performed worldwide.

OPTN/SRTR 2016 Annual Data Report: Lung

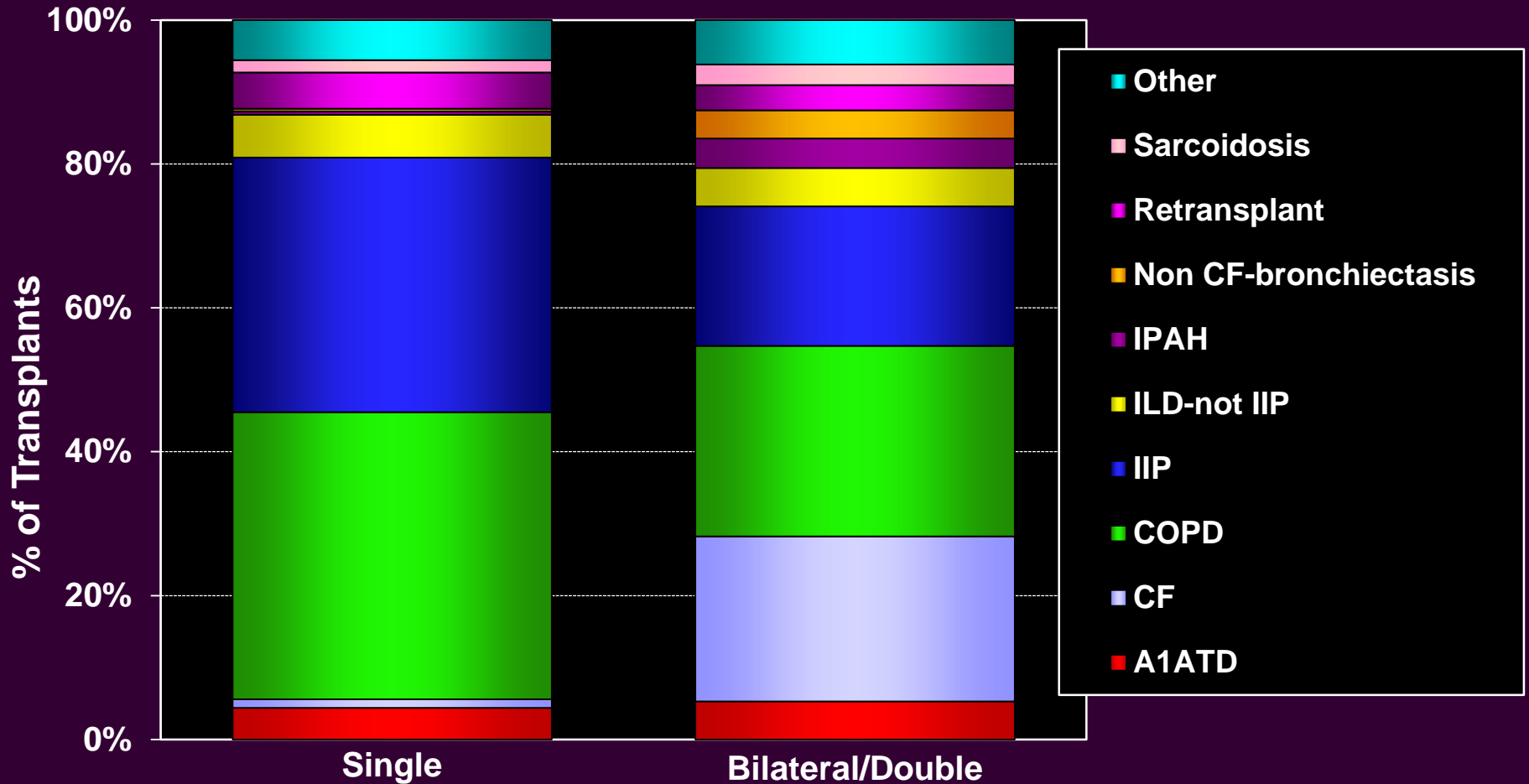
Total lung transplants



Adult Lung Transplants

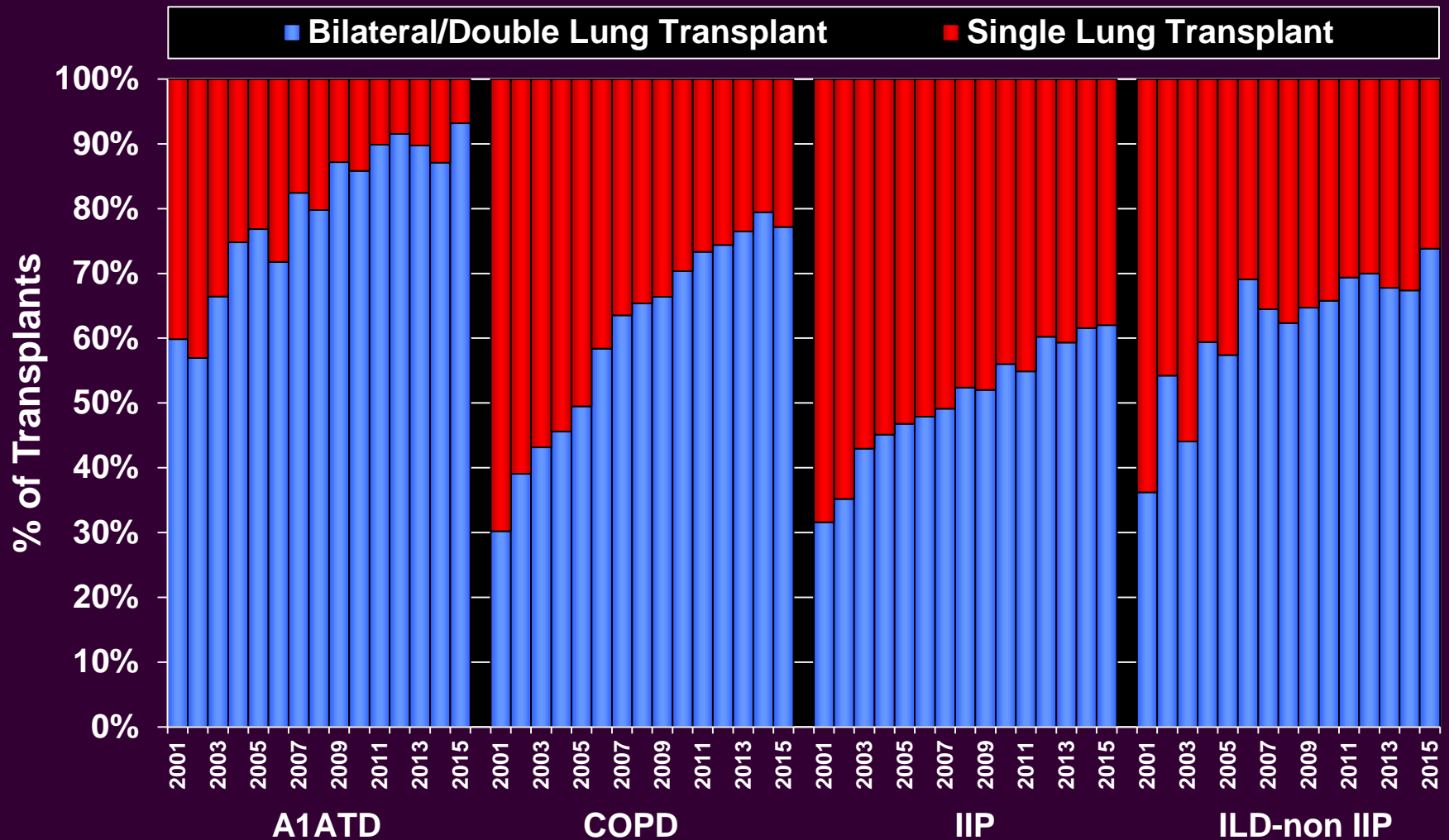
Diagnosis Distribution by Procedure Type

(Transplants: January 1995 – June 2016)



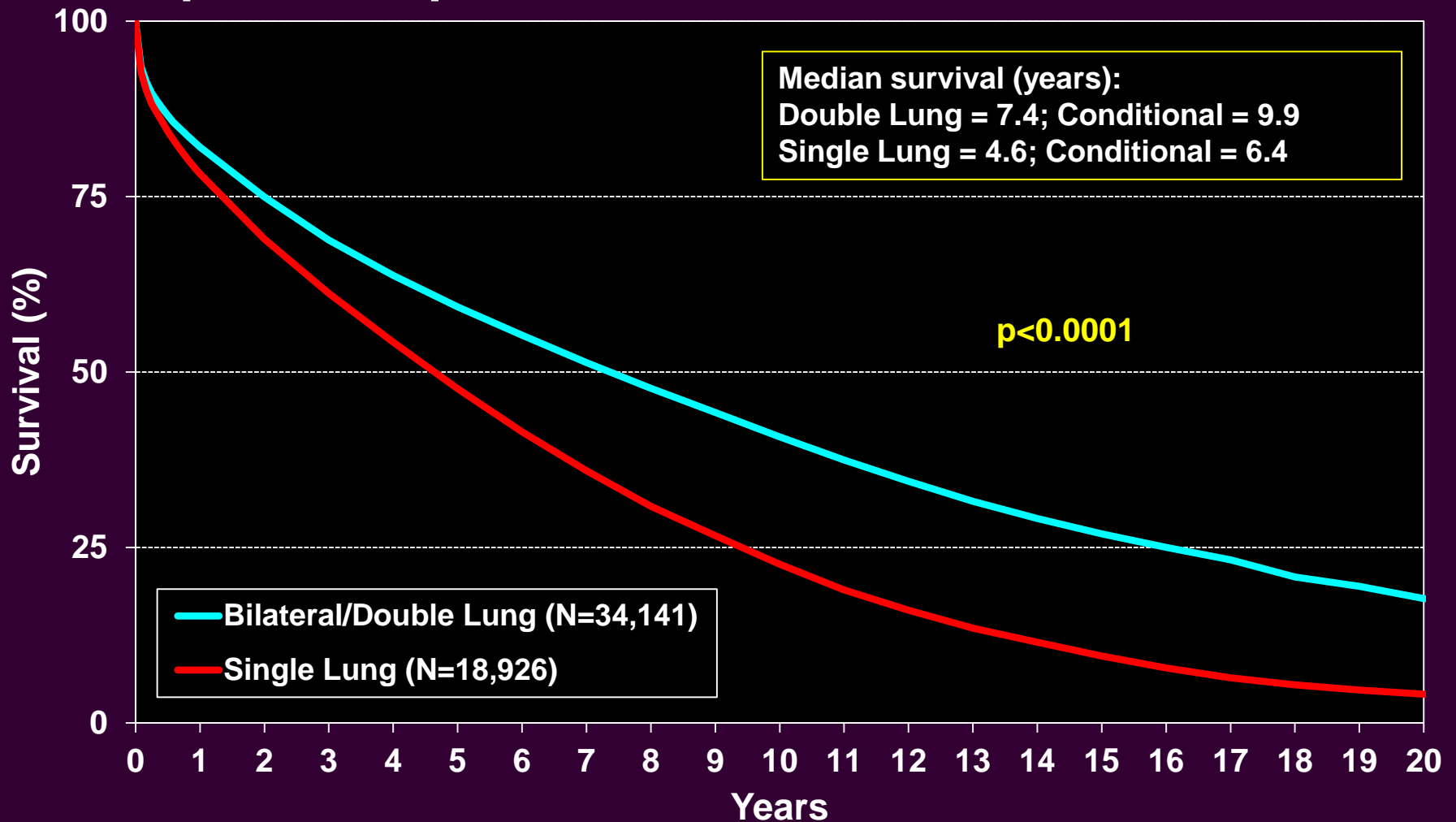
Adult Lung Transplants

Procedure Type within Indication, by Year



Adult Lung Transplants

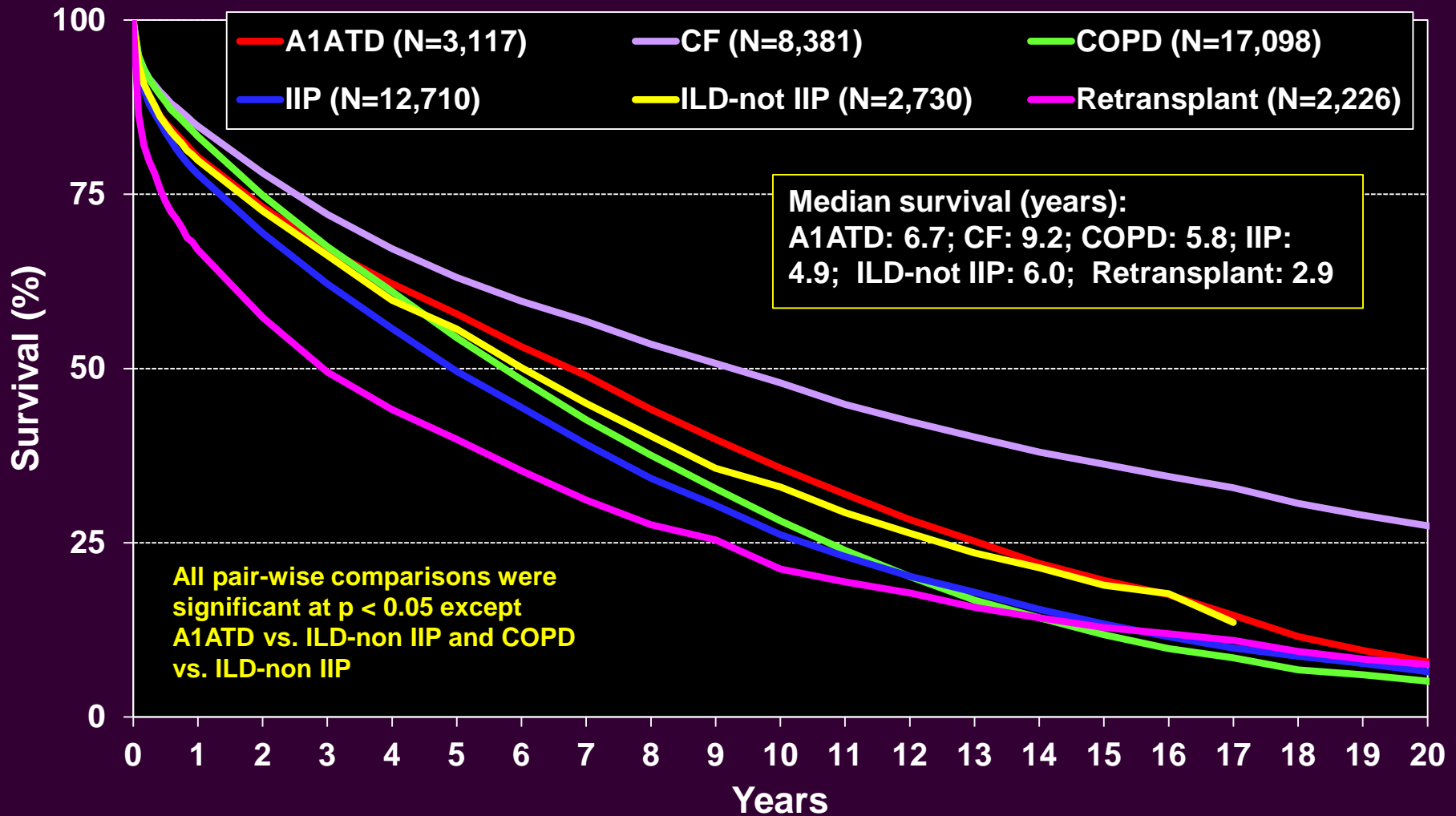
Kaplan-Meier Survival by Procedure Type for Primary Transplant Recipients (Transplants: January 1990 – June 2015)



Adult Lung Transplants

Kaplan-Meier Survival by Diagnosis

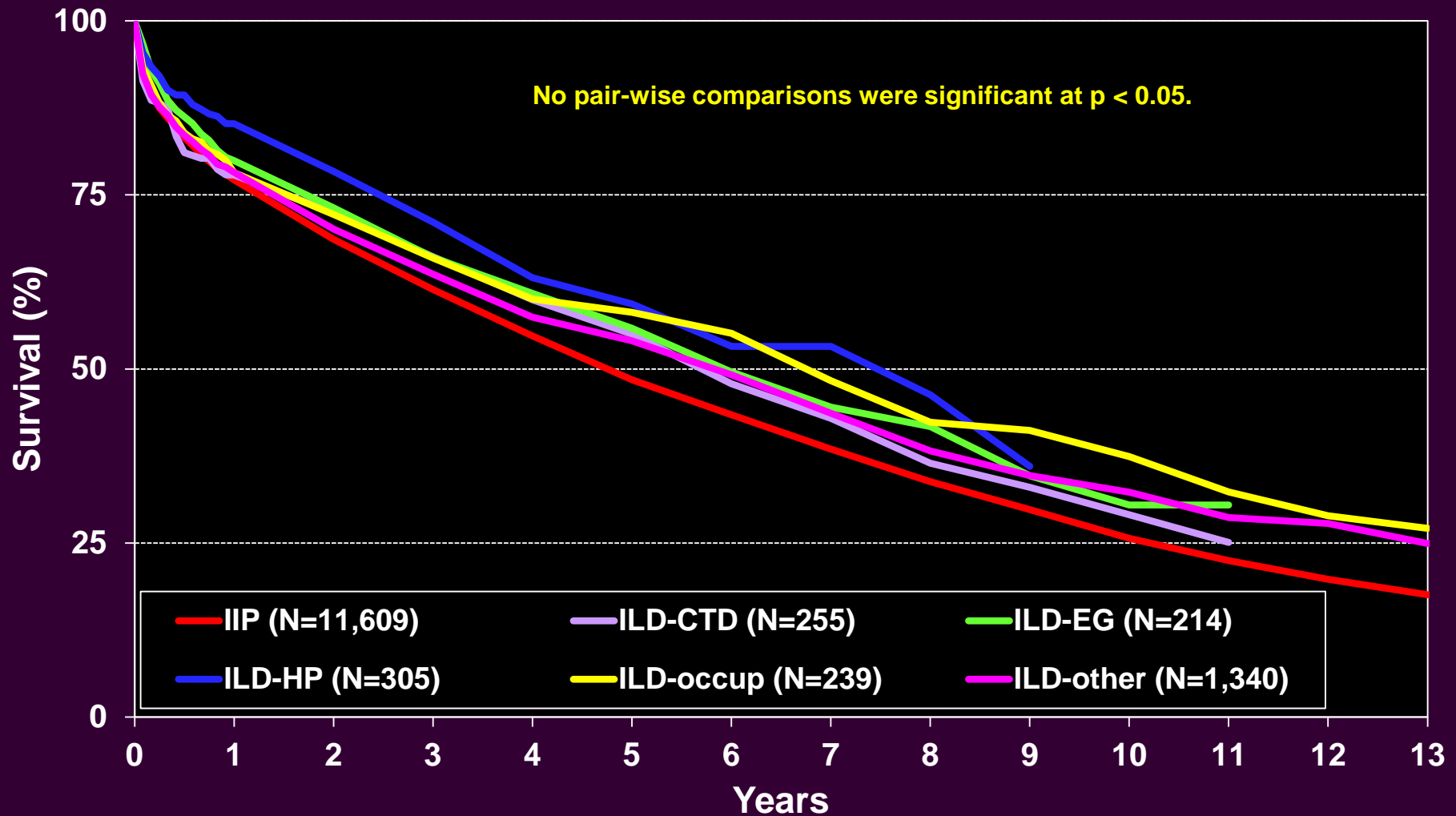
(Transplants: January 1990 – June 2015)



Adult Lung Transplants

Kaplan-Meier Survival by Diagnosis

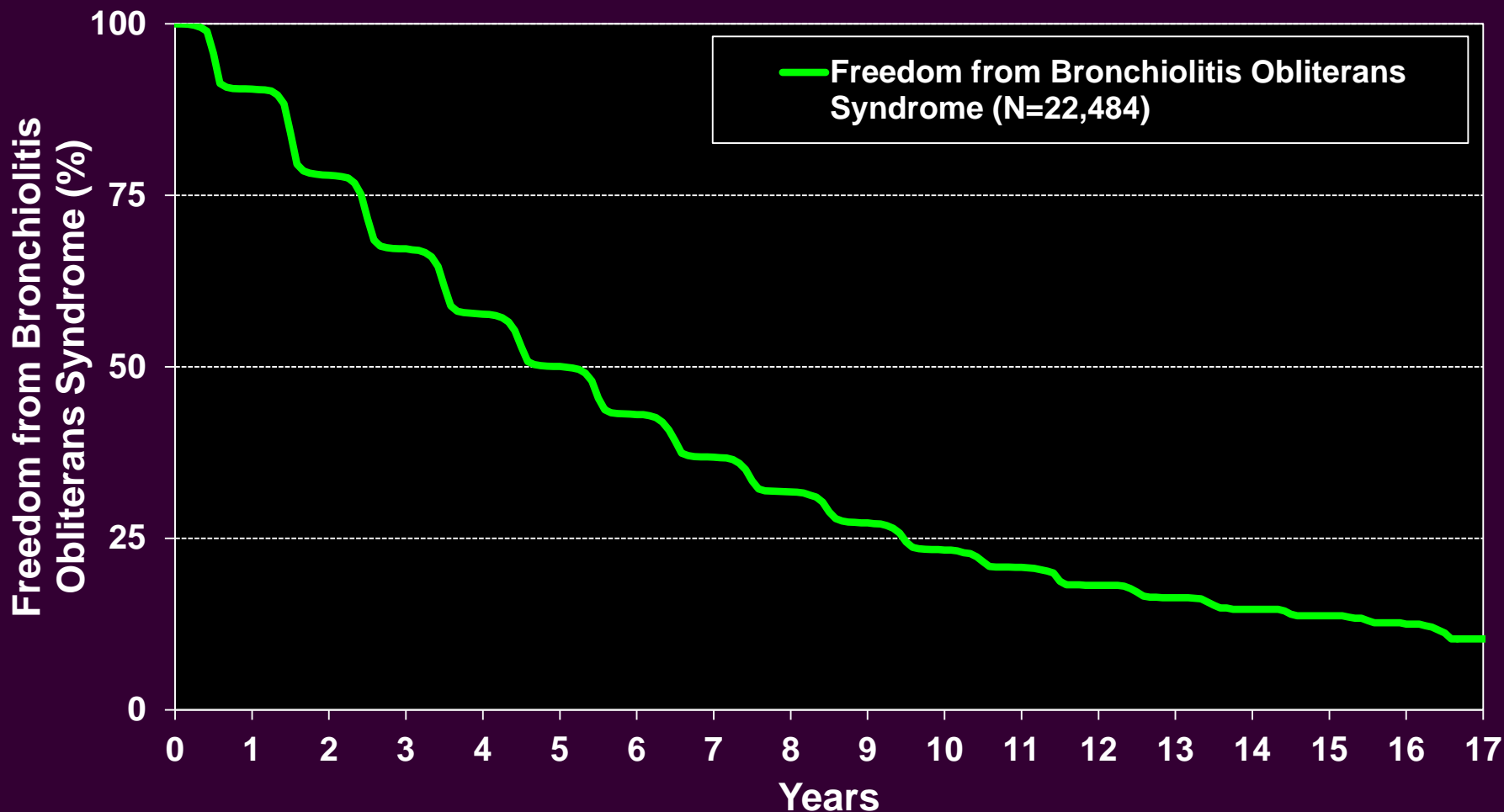
(Transplants: January 1990 – June 2014)



Adult Lung Transplants

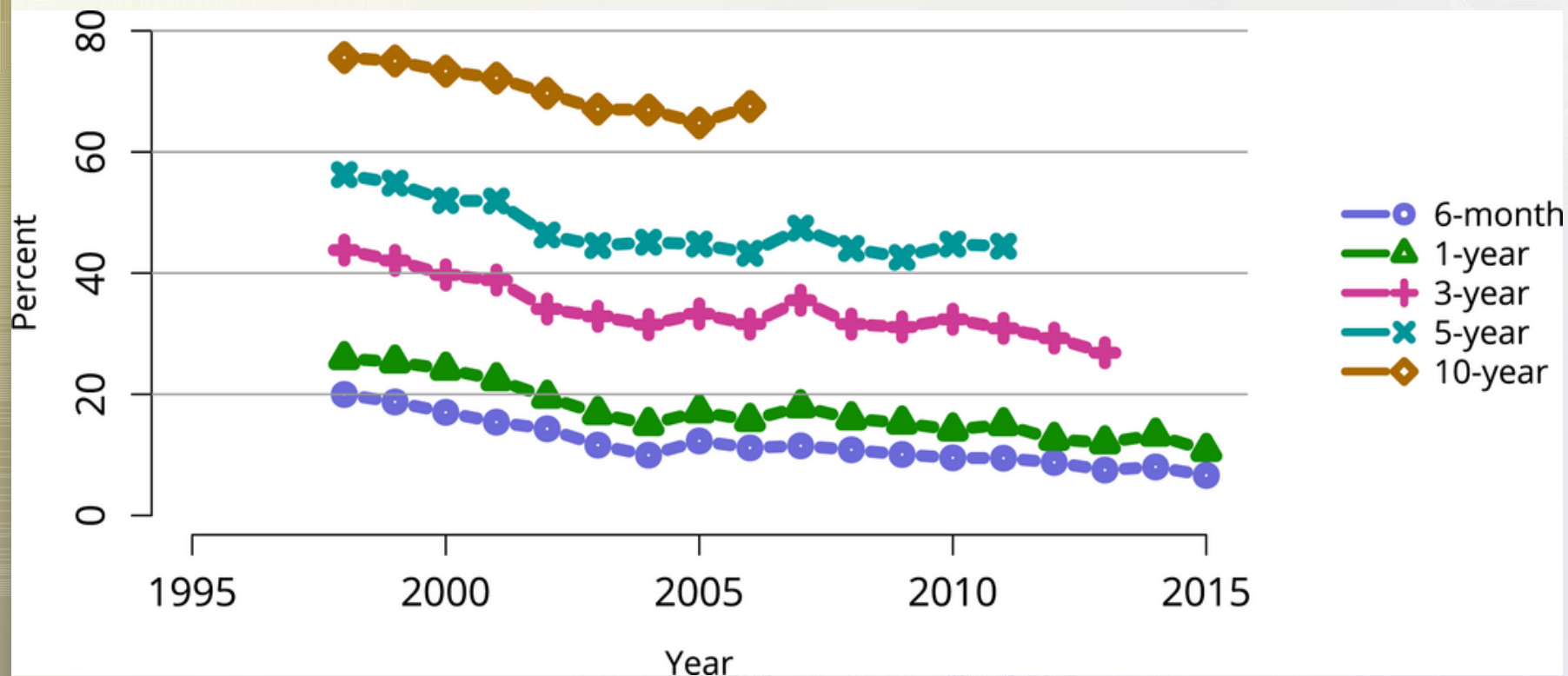
Freedom from Bronchiolitis Obliterans Syndrome

Conditional on Survival to 14 days (Transplants: January 1994 – June 2015)



OPTN/SRTR 2016 Annual Data Report: Lung

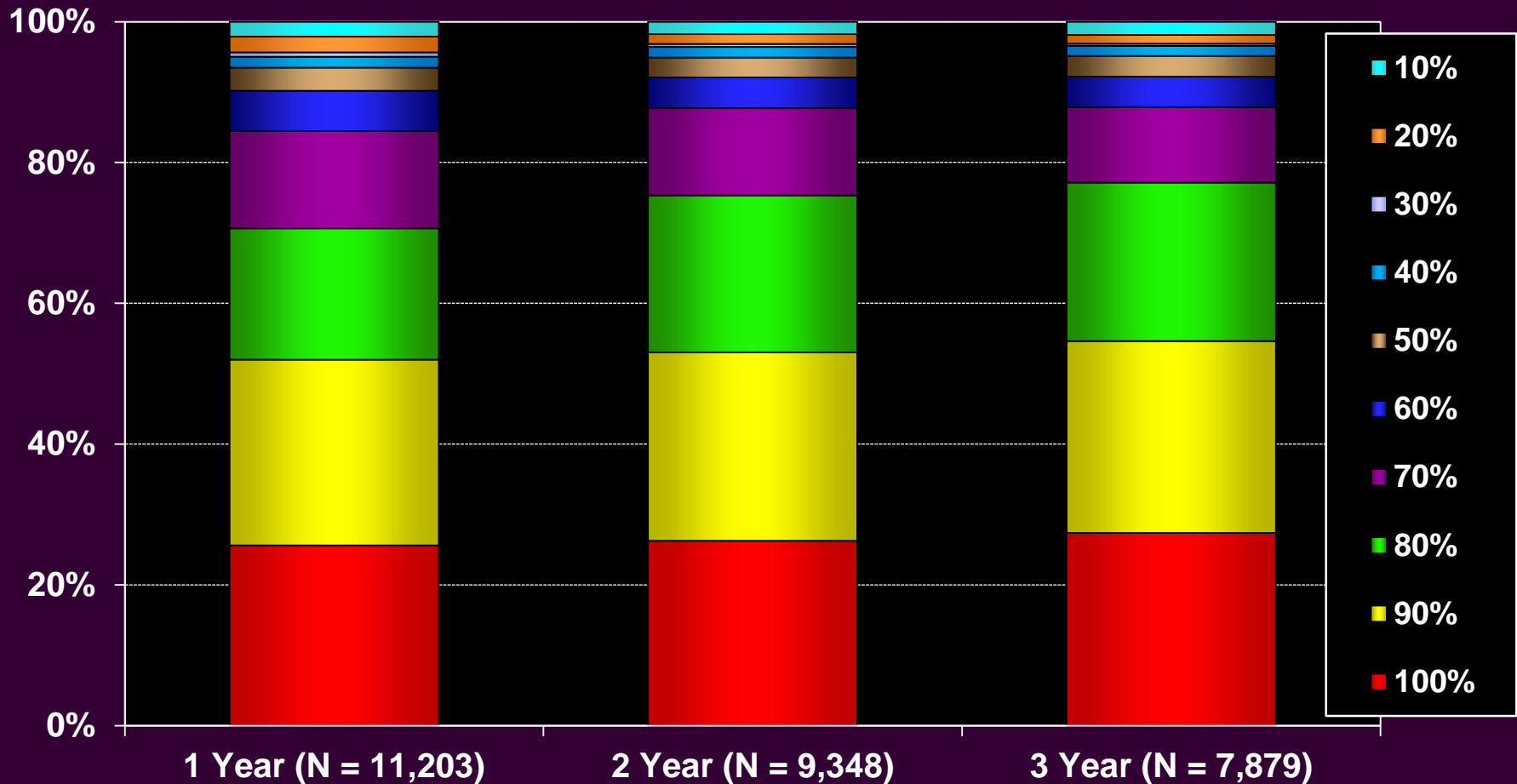
Patient death among lung transplant recipients aged 12 years or older



Adult Lung Transplants

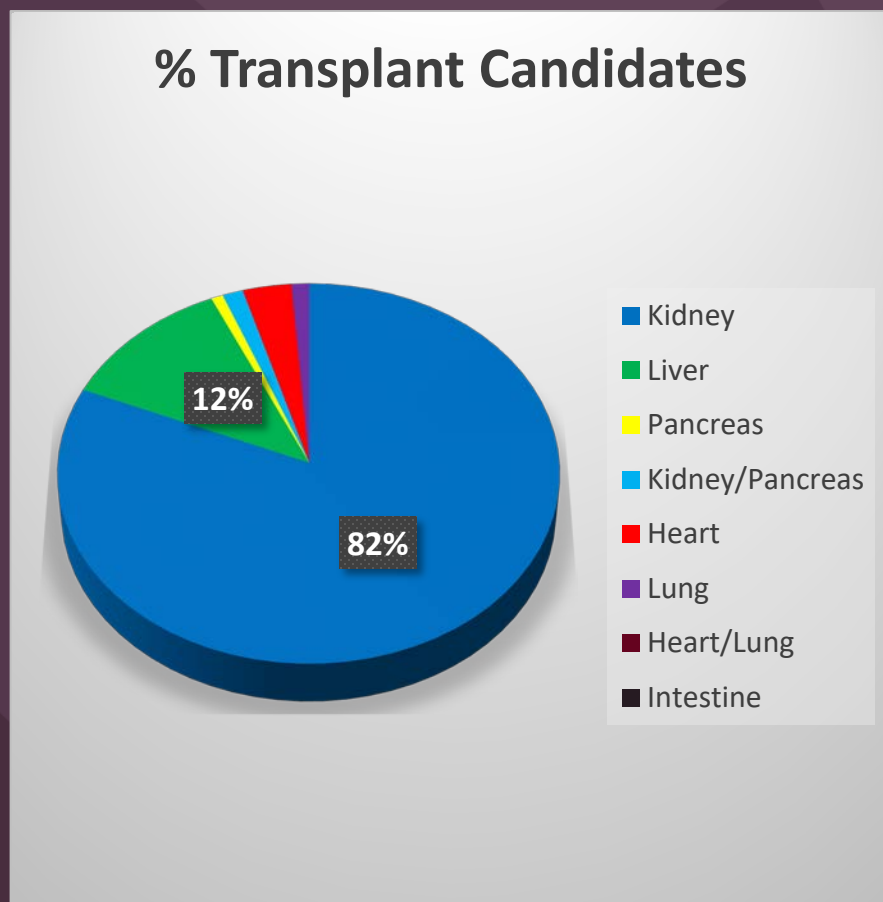
Functional Status of Surviving Recipients

(Follow-ups: January 2009 – June 2016)



Waiting List Candidates by Organ Type - All Patient States Based on OPTN data as of January 15, 2018

Organ	Candidates
Kidney	95,626
Liver	13,902
Pancreas	910
Kidney/Pancreas	1,692
Heart	3,925
Lung	1,366
Heart/Lung	43
Intestine	257
Total	115,105



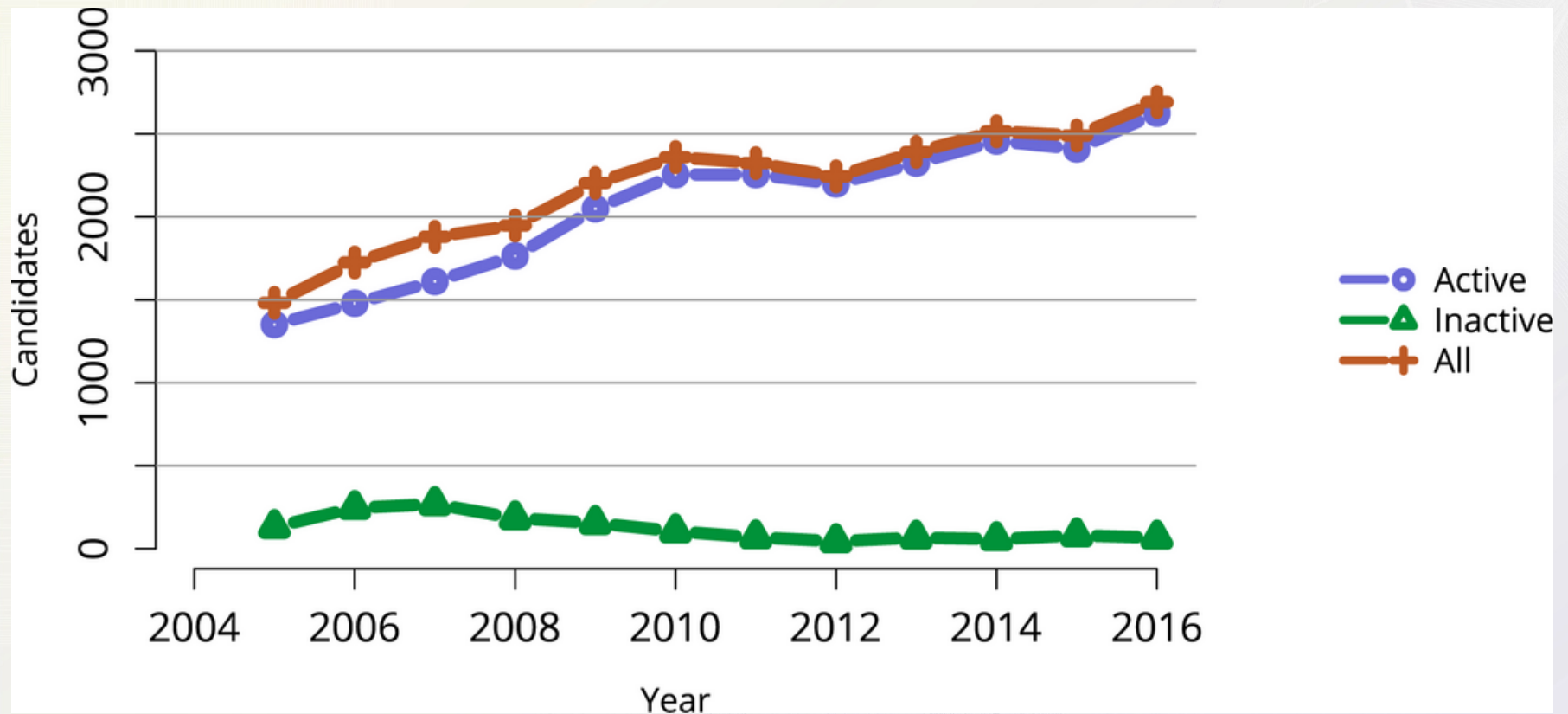
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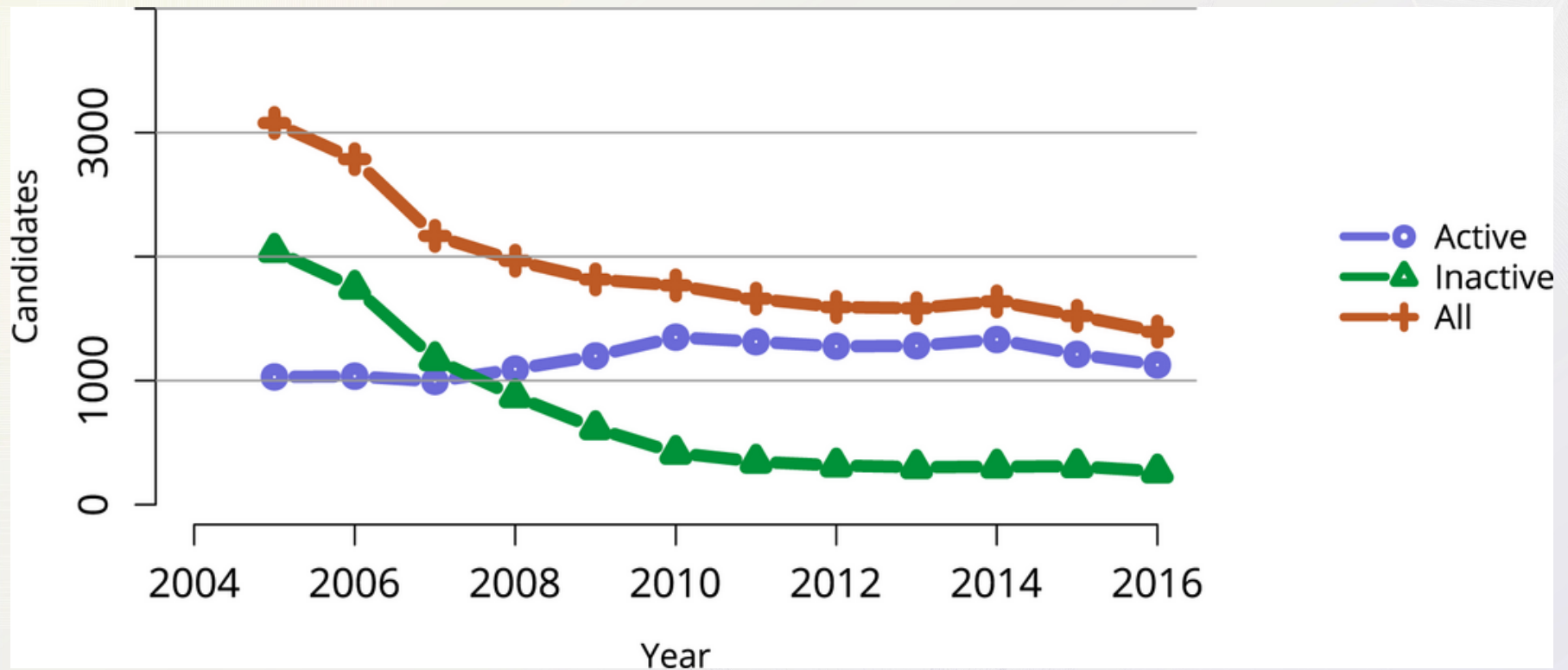
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OPTN/SRTR 2016 Annual Data Report: Lung

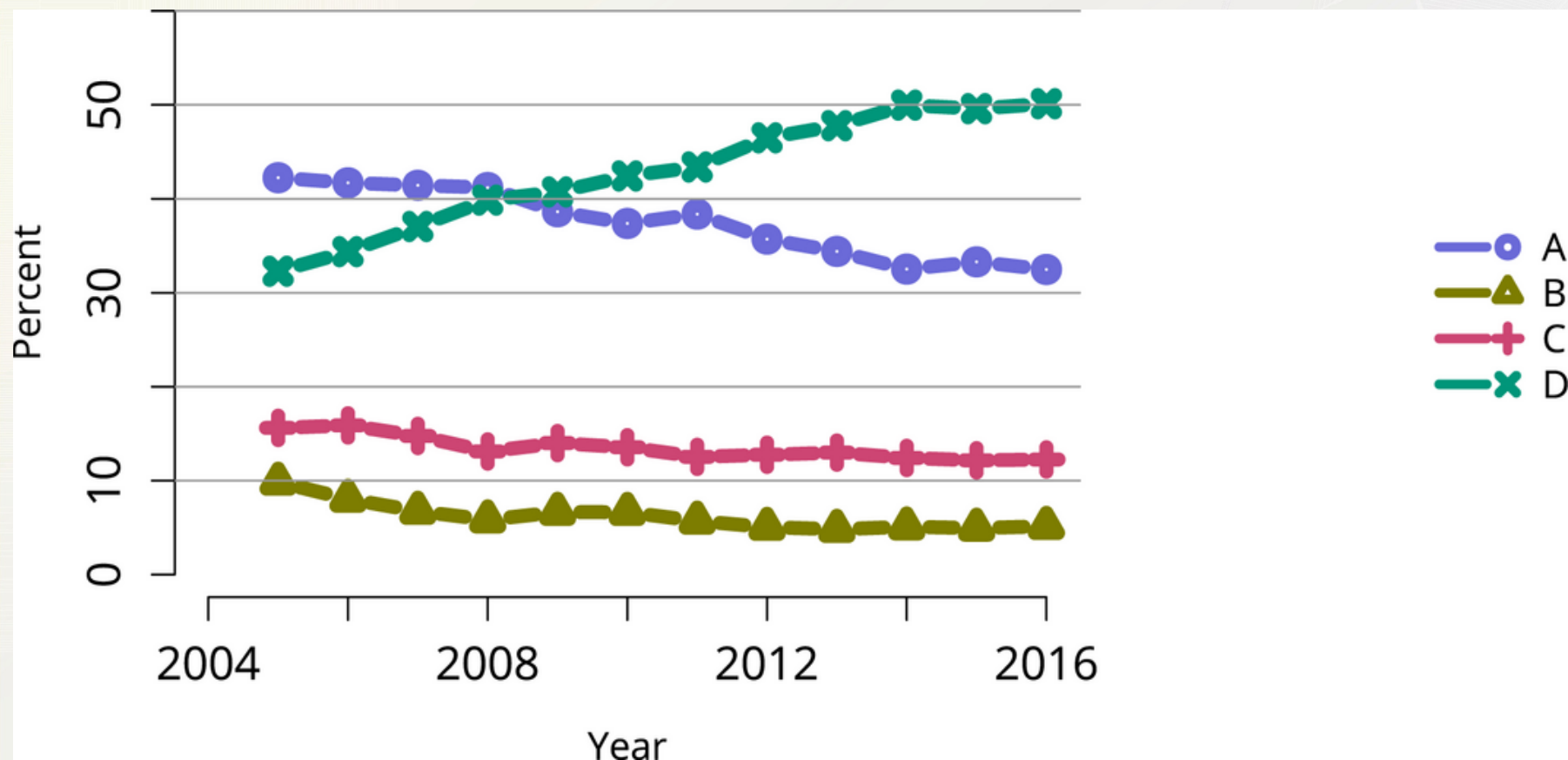
New Candidates Added to the Waiting List



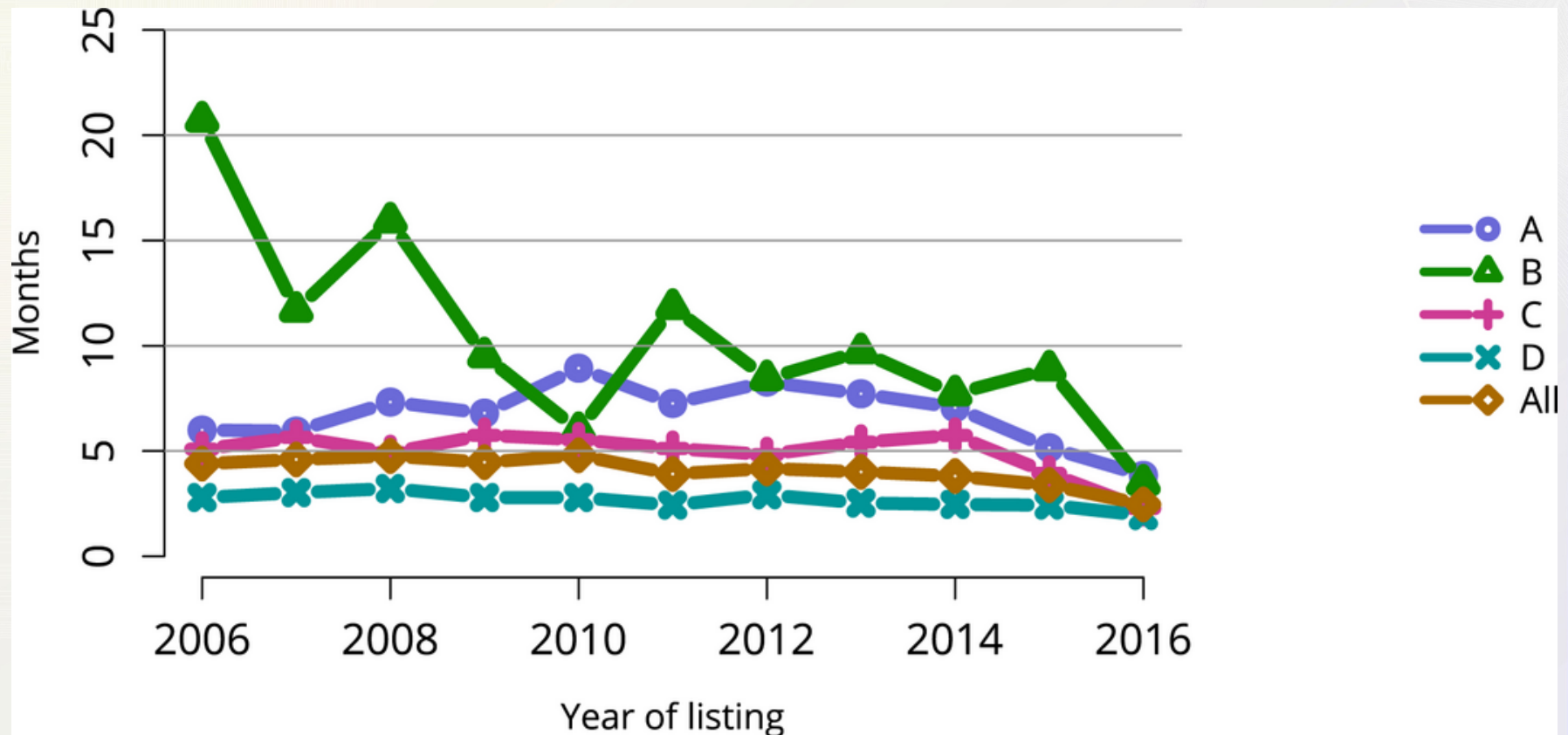
OPTN/SRTR 2016 Annual Data Report: Lung Candidates Waiting at Year End



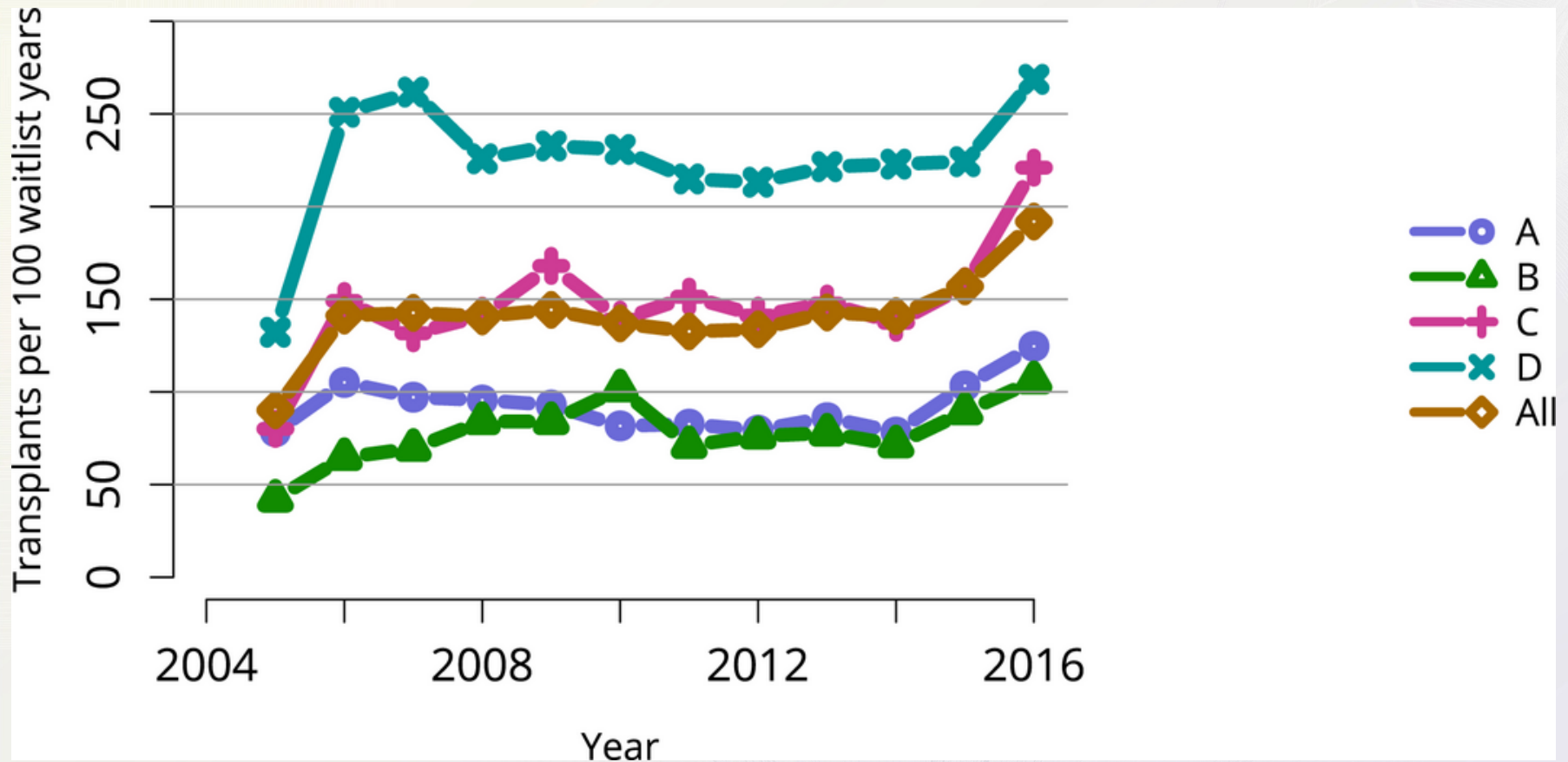
Distribution of candidates aged 12 years or older actively waiting for lung transplant by diagnosis group



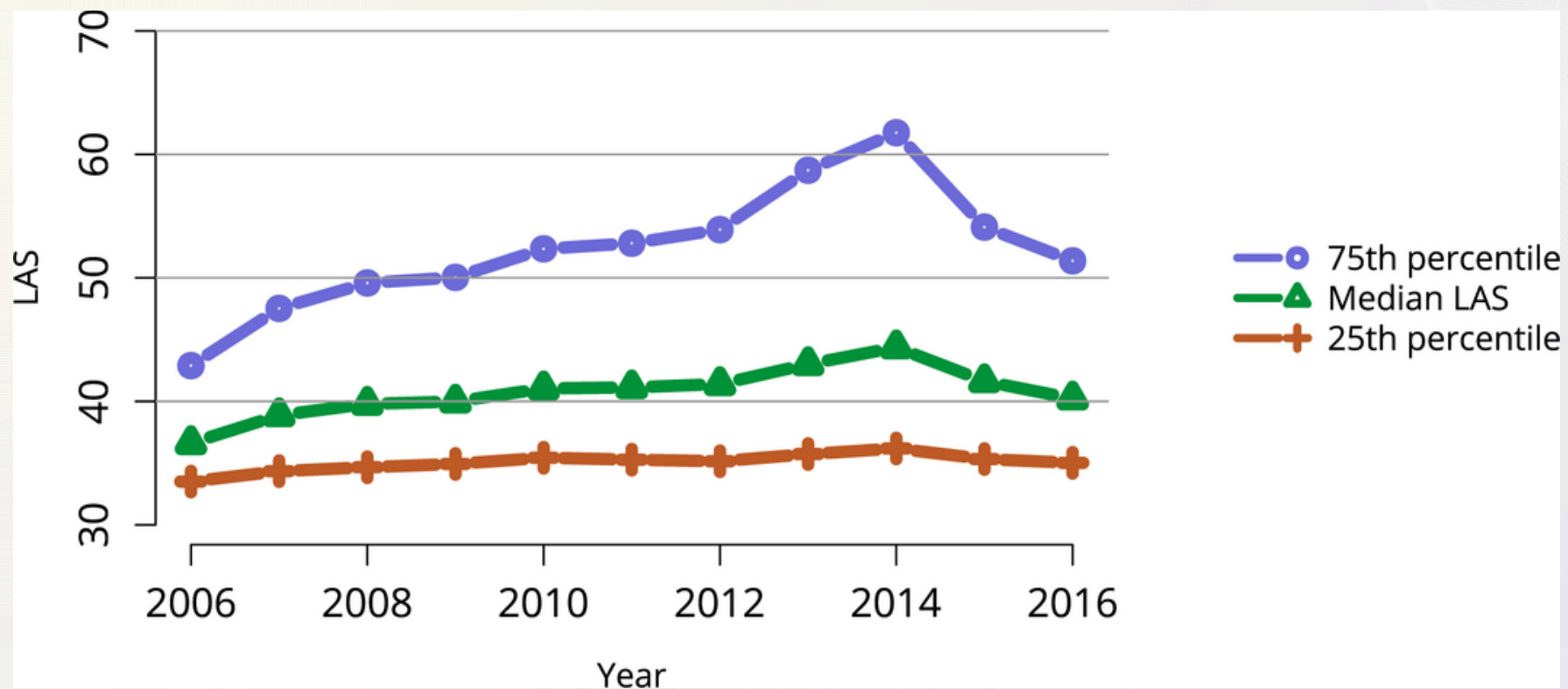
OPTN/SRTR 2016 Annual Data Report: Lung Median Months to Transplant



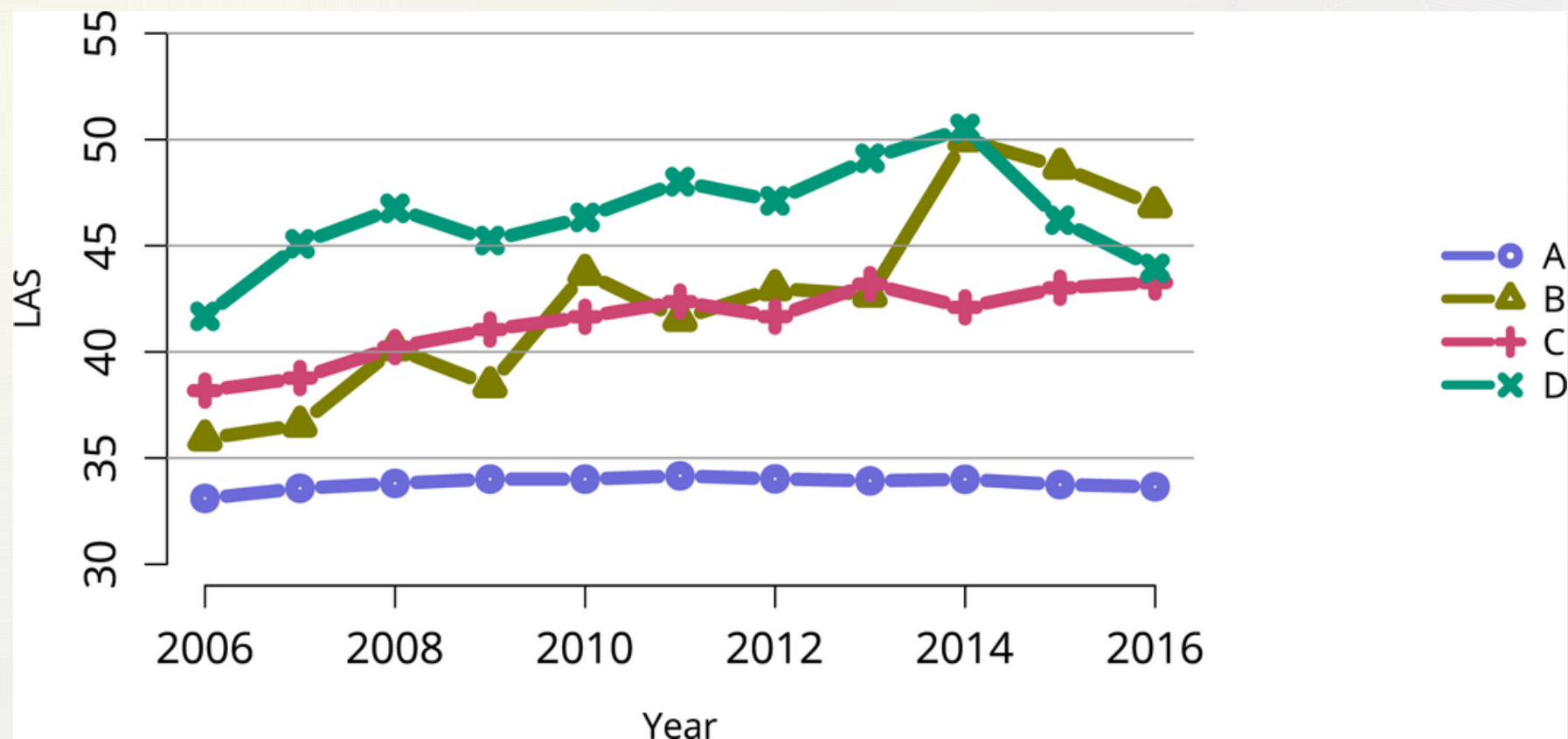
Deceased donor lung transplant rates among active waitlist candidates aged 12 years or older by diagnosis group



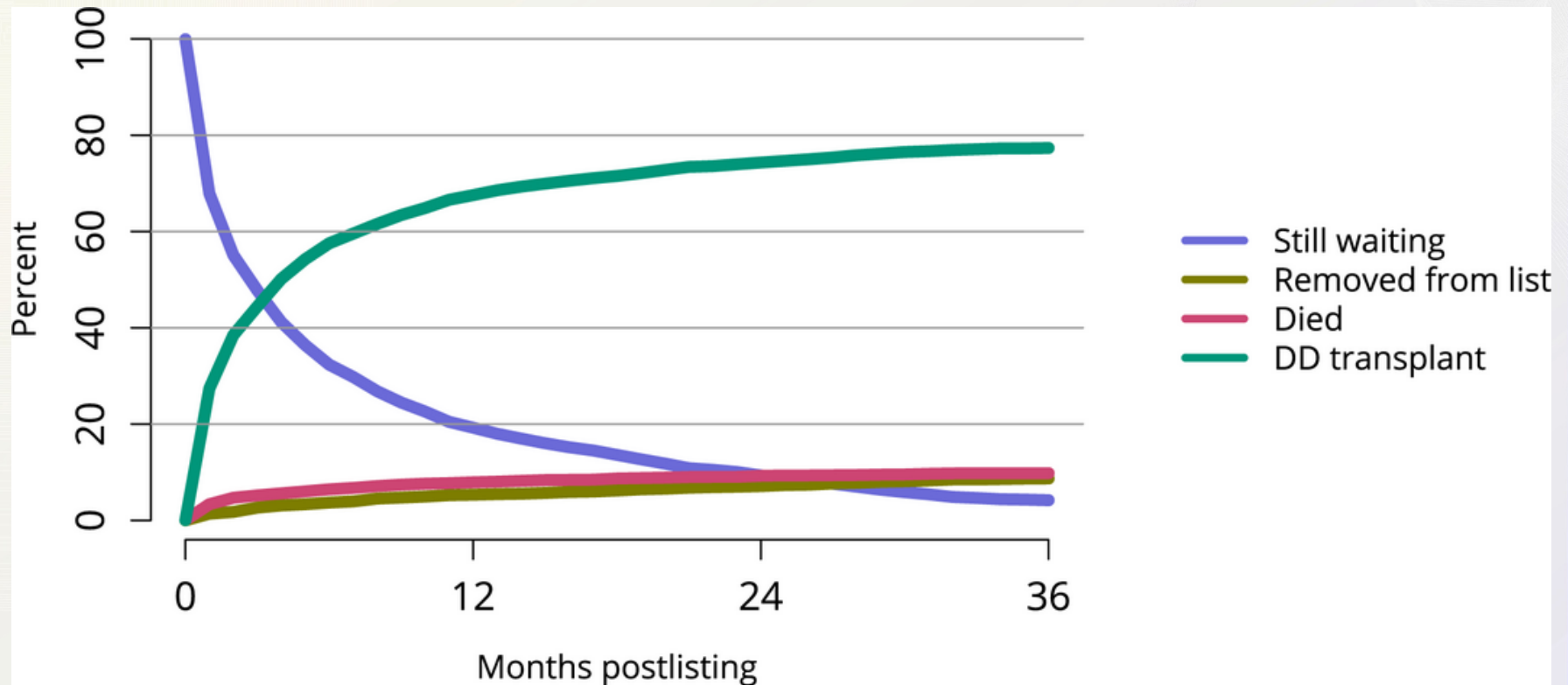
OPTN/SRTR 2016 Annual Data Report: Lung Median LAS at Transplant



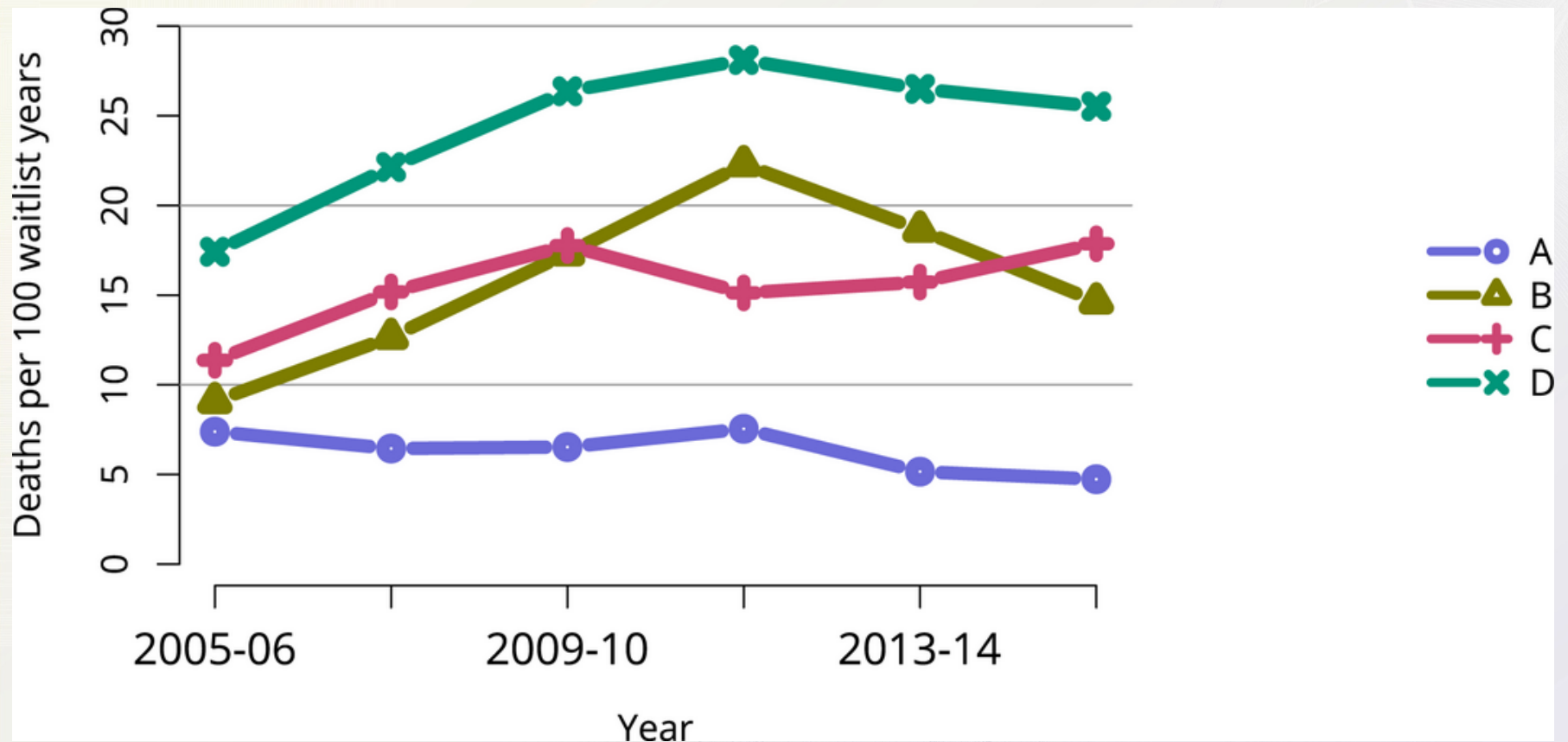
OPTN/SRTR 2016 Annual Data Report: Lung Median LAS at Transplant by Diagnosis



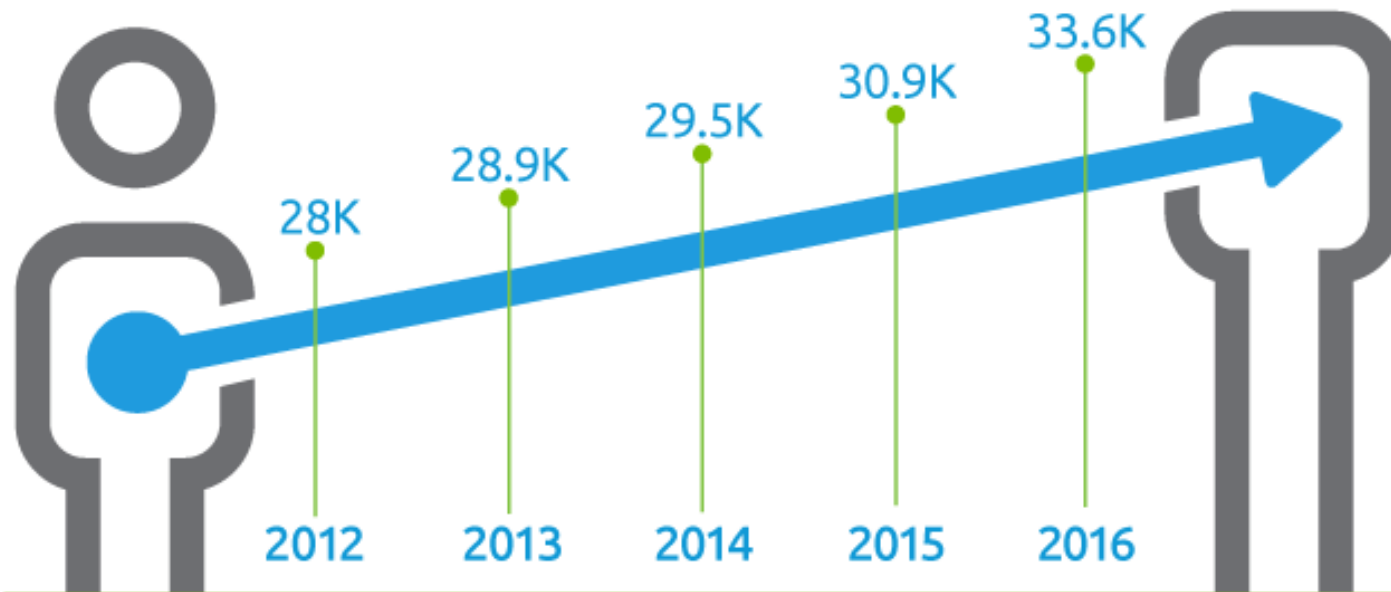
OPTN/SRTR 2016 Annual Data Report: Lung Three Year Wait List Outcomes



Pre-transplant mortality rates among candidates aged 12 years or older waitlisted for lung transplant by diagnosis group



20% increase in transplants over 5 years*

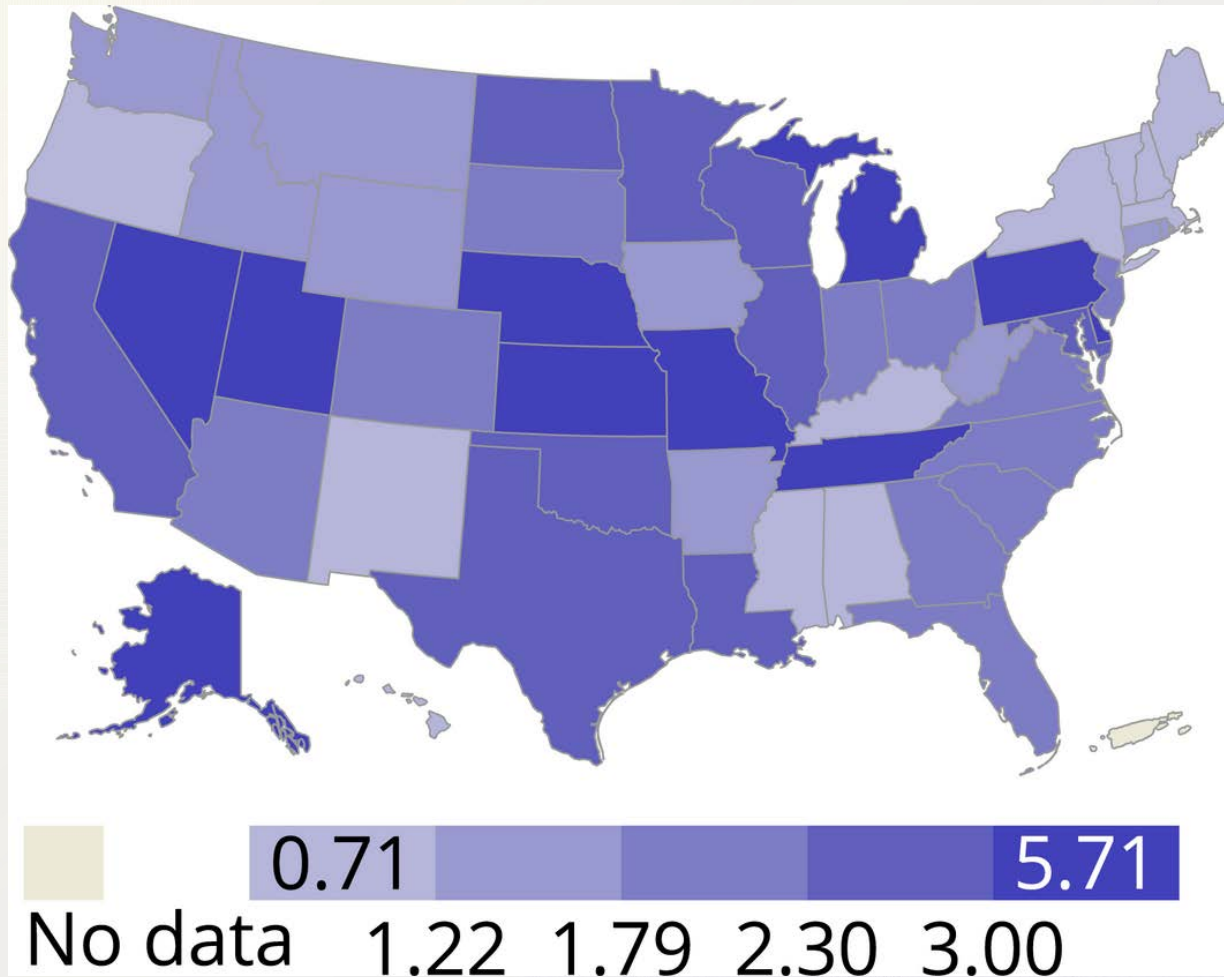


* Based on OPTN | UNOS data as of January 9, 2017. Data subject to change based on future data submission or correction.

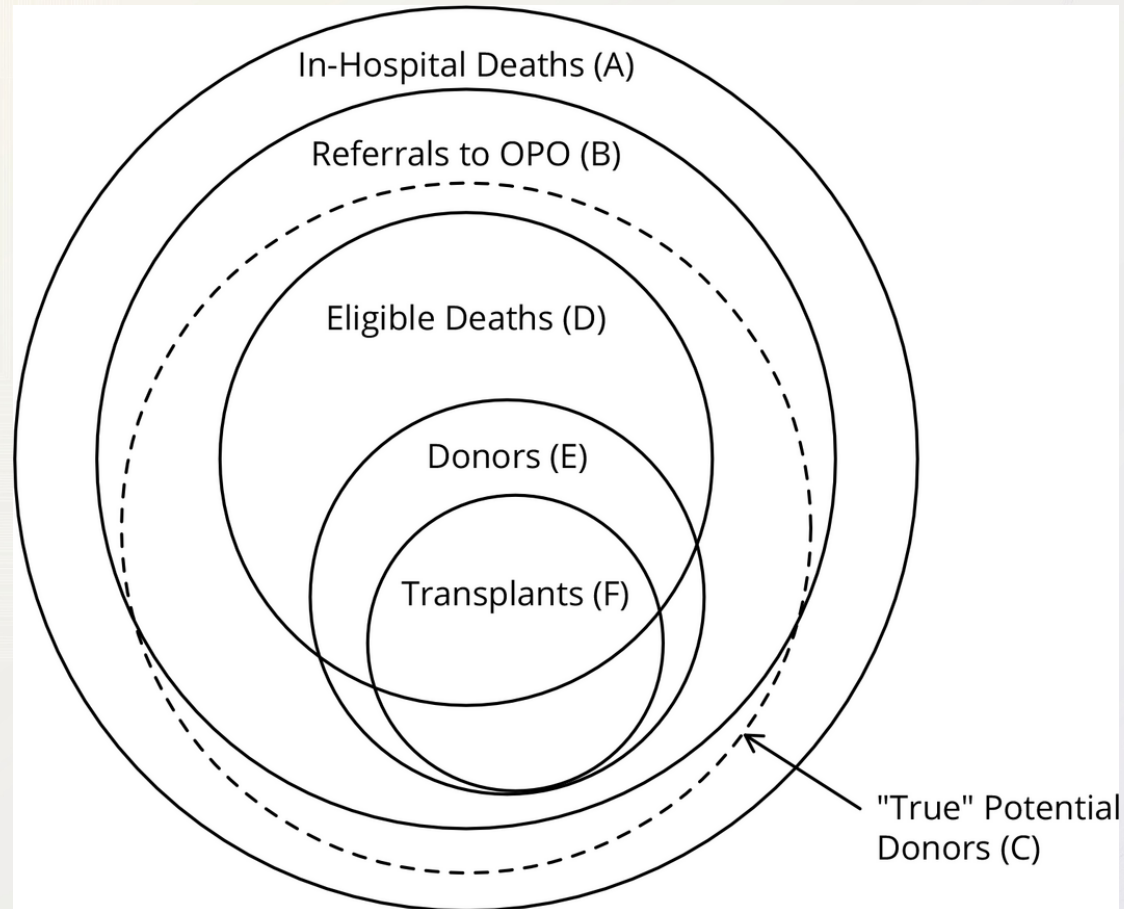
Matching organs. Saving lives.



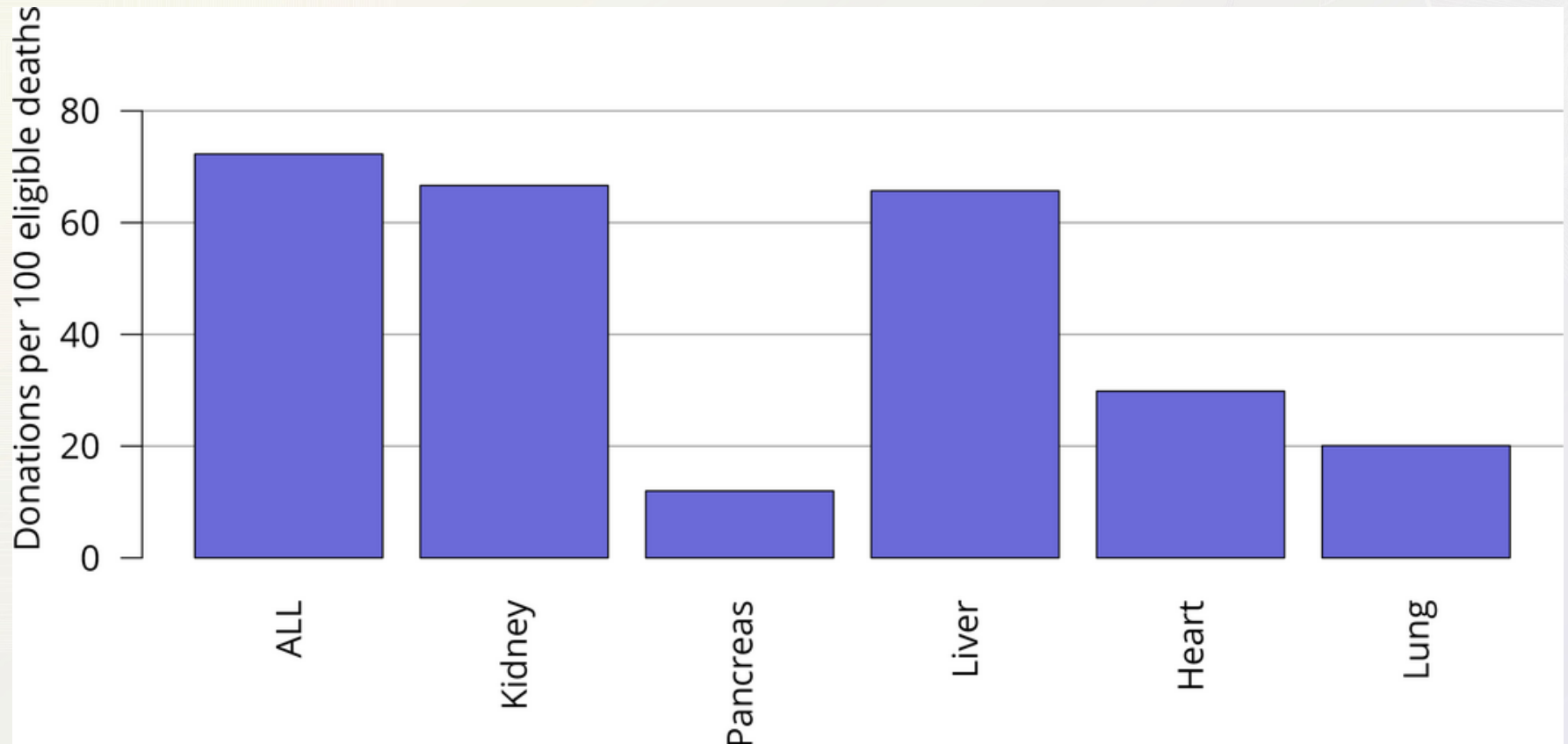
OPTN/SRTR 2016 Annual Data Report: Lung Donation Rates



OPTN/SRTR 2016 Annual Data Report: Deceased Organ Donation

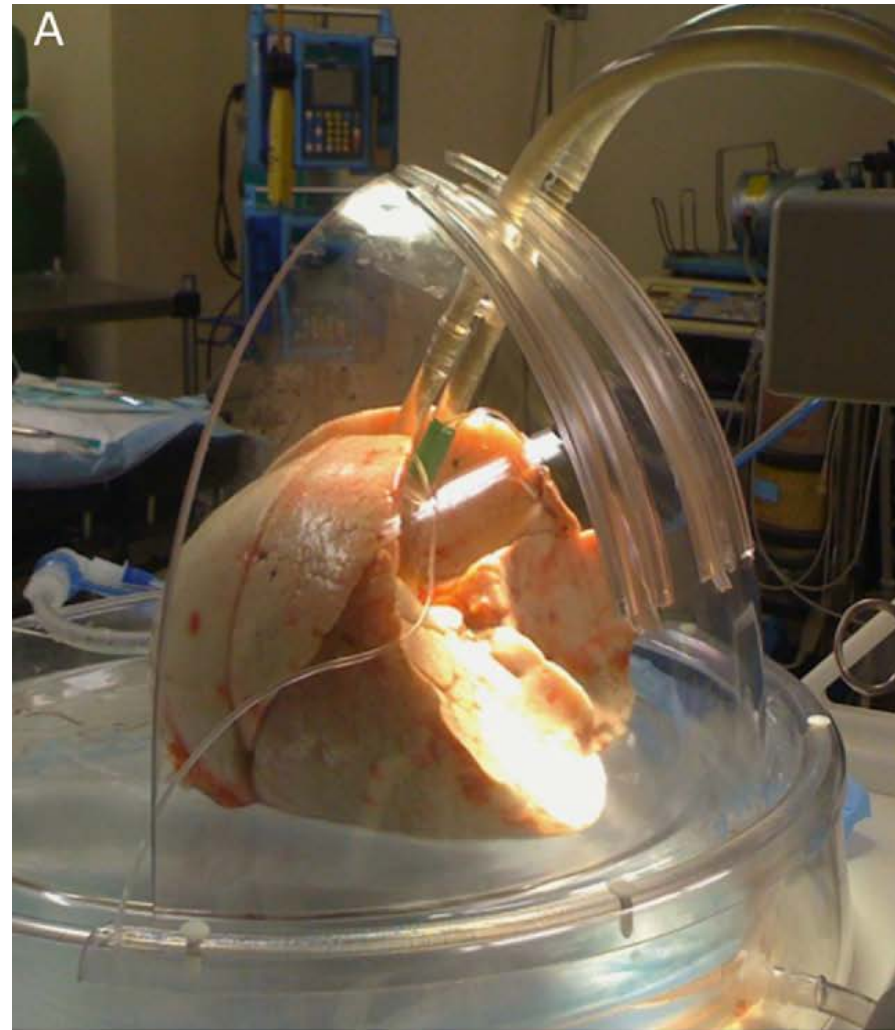


OPTN/SRTR 2016 Annual Data Report: Deceased Organ Donation



Transplant Surgery

- Bilateral vs. Single
- On-pump vs. off-pump
- Sternotomy vs. thoracotomy
- EVLP
- Ischemic time



Questions/Comments



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