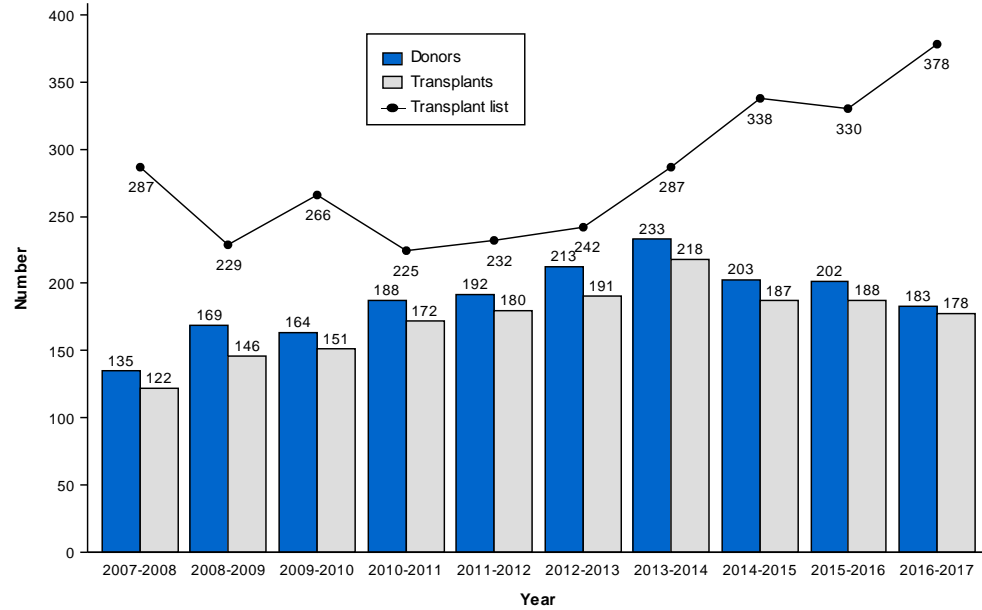


Disease-specific differences and outcomes from listing for lung transplantation in the UK

Antonios Kourliouros, Rachel Hogg, Jenny Mehew, Mohamed Al-Aloul, Martin Carby,
James Lordan, Richard Thompson, Steven Tsui, Jasvir Parmar

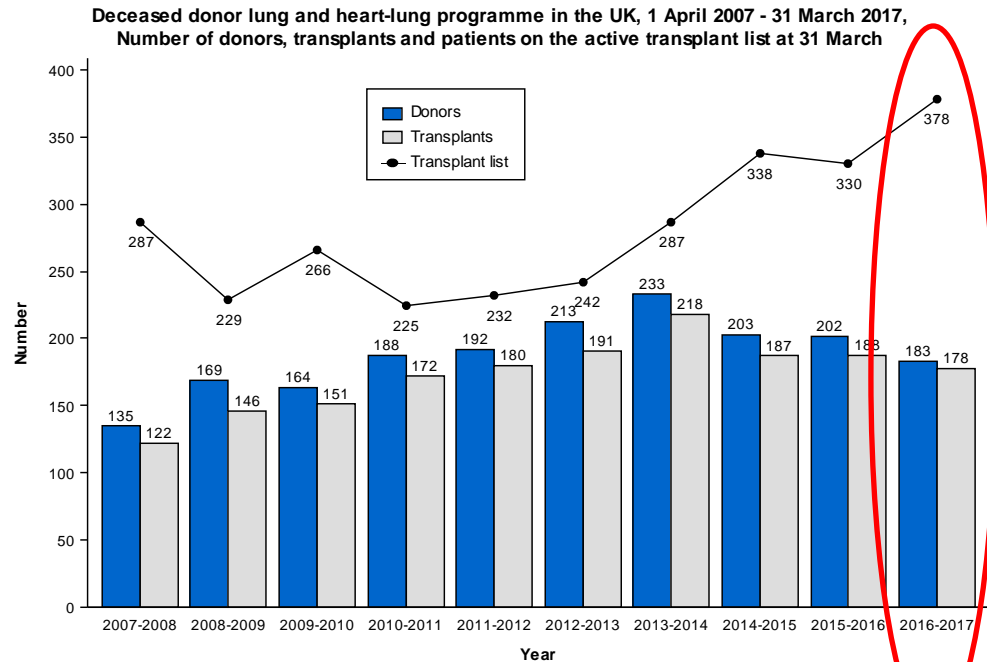
Introduction

Deceased donor lung and heart-lung programme in the UK, 1 April 2007 - 31 March 2017,
Number of donors, transplants and patients on the active transplant list at 31 March



Source: Transplant activity in the UK, 2016-2017, NHS Blood and Transplant

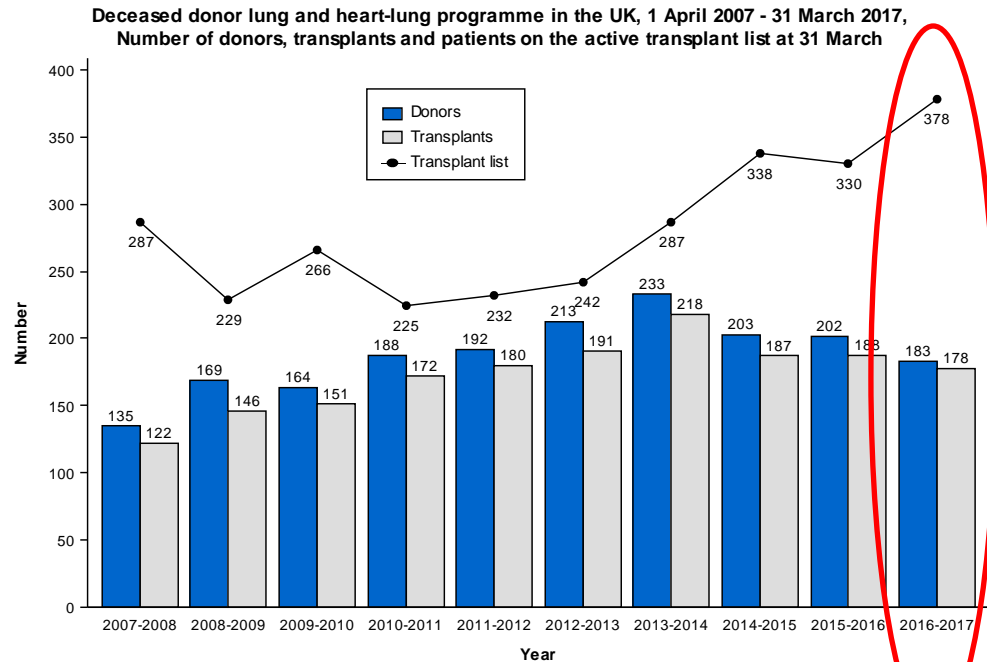
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- Mismatch between the demand for lung transplantation and availability of donor organs.
- Allocation of donor CT organs in the UK used to be centre-specific and based on a zonal system.

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Source: Transplant activity in the UK, 2016-2017, NHS Blood and Transplant

- Mismatch between the demand for lung transplantation and availability of donor organs.
- Allocation of donor organs in the UK used to be centre-specific and based on a zonal system.



We set out to assess factors influencing patient outcomes from the time of listing for lung transplantation examining for differences by patient characteristics, lung disease category and transplant centre.

Methods

- Data were obtained from the UK Transplant Registry held by NHS Blood and Transplant for adult lung-only registrations between 1st January 2004 and 31st March 2014.
- Adult lung transplantation in the UK is provided by five designated units. Registrations at all five transplant centres were analysed.
- Outcomes of interest:
 - Registrations
 - Transplants
 - Post registration outcome (transplanted, still waiting, removed from the list or died while waiting)
 - One year survival from registration
 - Time to transplant
 - Time to death on the list

Results - registrations

- Distribution of registration by centre according to disease group

Centre	Disease group							
	CF		COPD		Other		PF	
	N	% at centre	N	% at centre	N	% at centre	N	% at centre
A	234	35.8%	149	22.8%	98	15.0%	173	26.5%
B	69	18.4%	96	25.6%	140	37.3%	70	18.7%
C	194	32.1%	192	31.8%	91	15.1%	127	21.0%
D	18	9.3%	57	29.4%	37	19.1%	82	42.3%
E	46	11.9%	135	35.0%	78	20.2%	127	32.9%
Total	561	25.4%	629	28.4%	444	20.1%	579	26.2%

N= 2,213

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Results - transplants

- 79.2% (n=498) of the COPD listed patients were transplanted, followed by 62.2% (n=349) CF patients, 61.3% (n=272) of patients with other lung pathology and 48.9% (n=283) of those with PF diagnosis

Distribution of transplants by centre according to disease group

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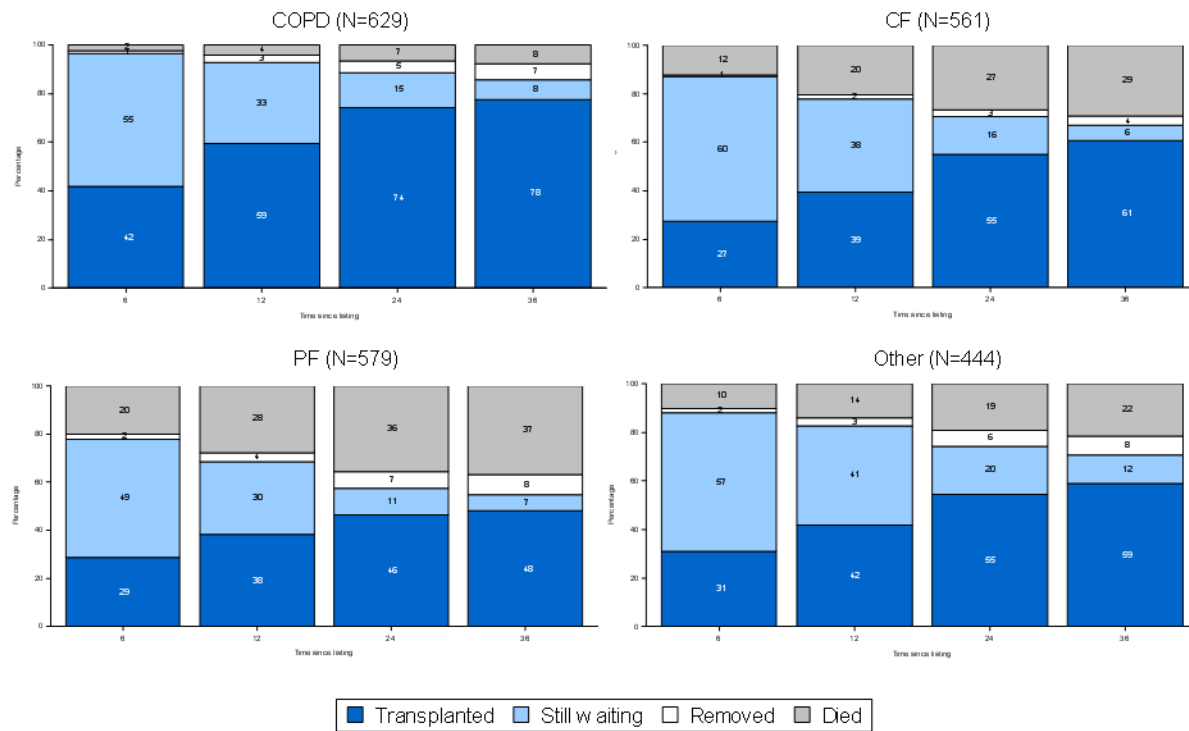
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The distribution of transplants performed in each disease group differed significantly between centres (Chi-squared: $p < 0.001$)

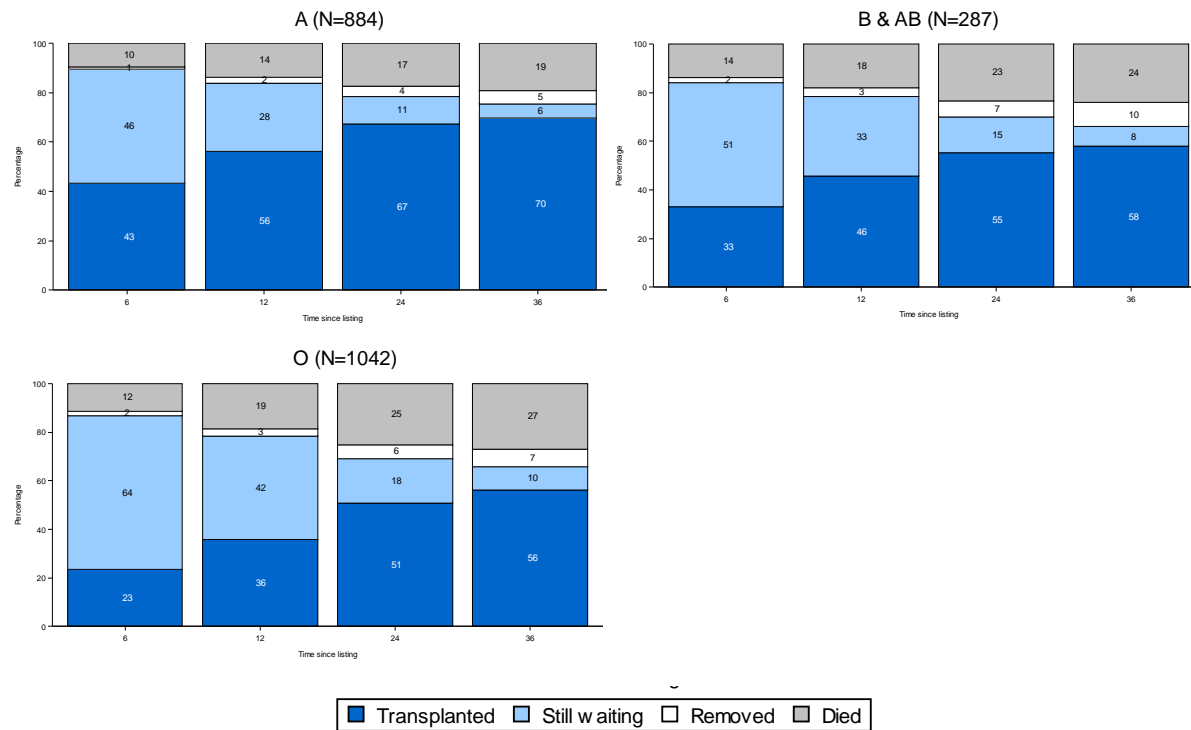
Results - post registration outcome

By disease group



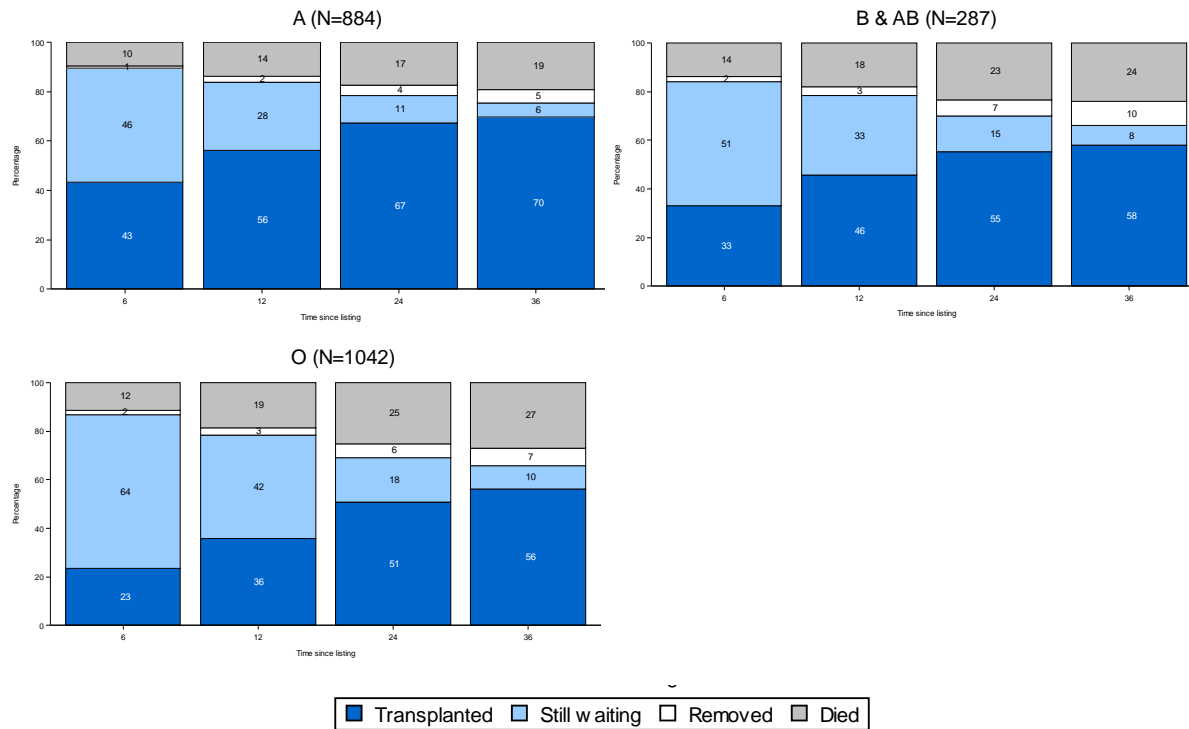
Results - post registration outcome

By blood group



Results - post registration outcome

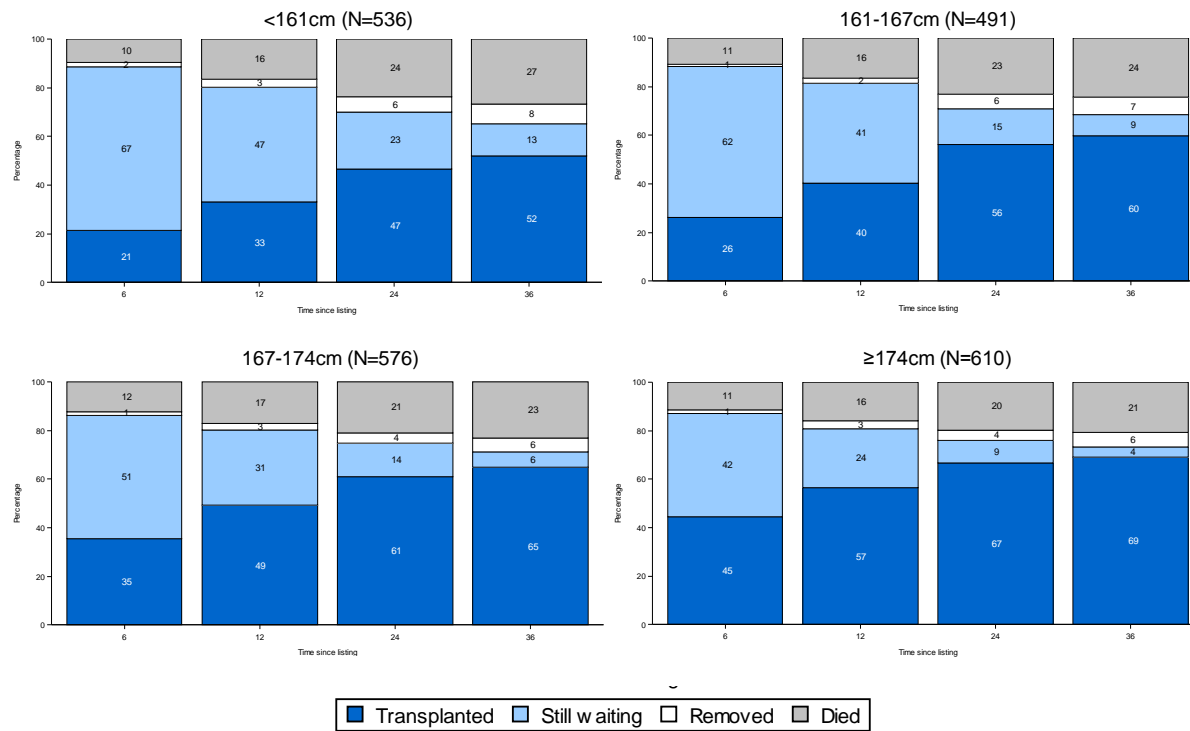
By blood group



18% of blood group O donor lungs were accepted and transplanted into non-blood group O recipients (12% to A, 6% to B or AB)

Results - post registration outcome

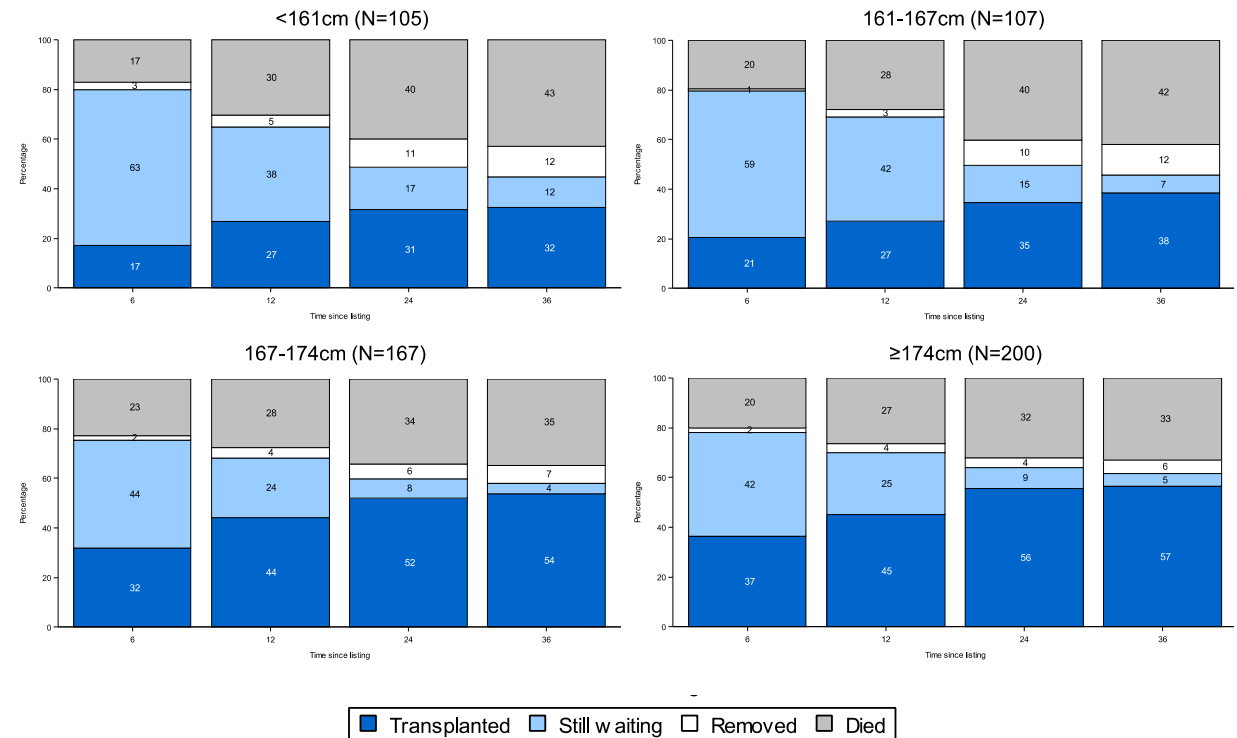
By height



Results - post registration outcome

By height

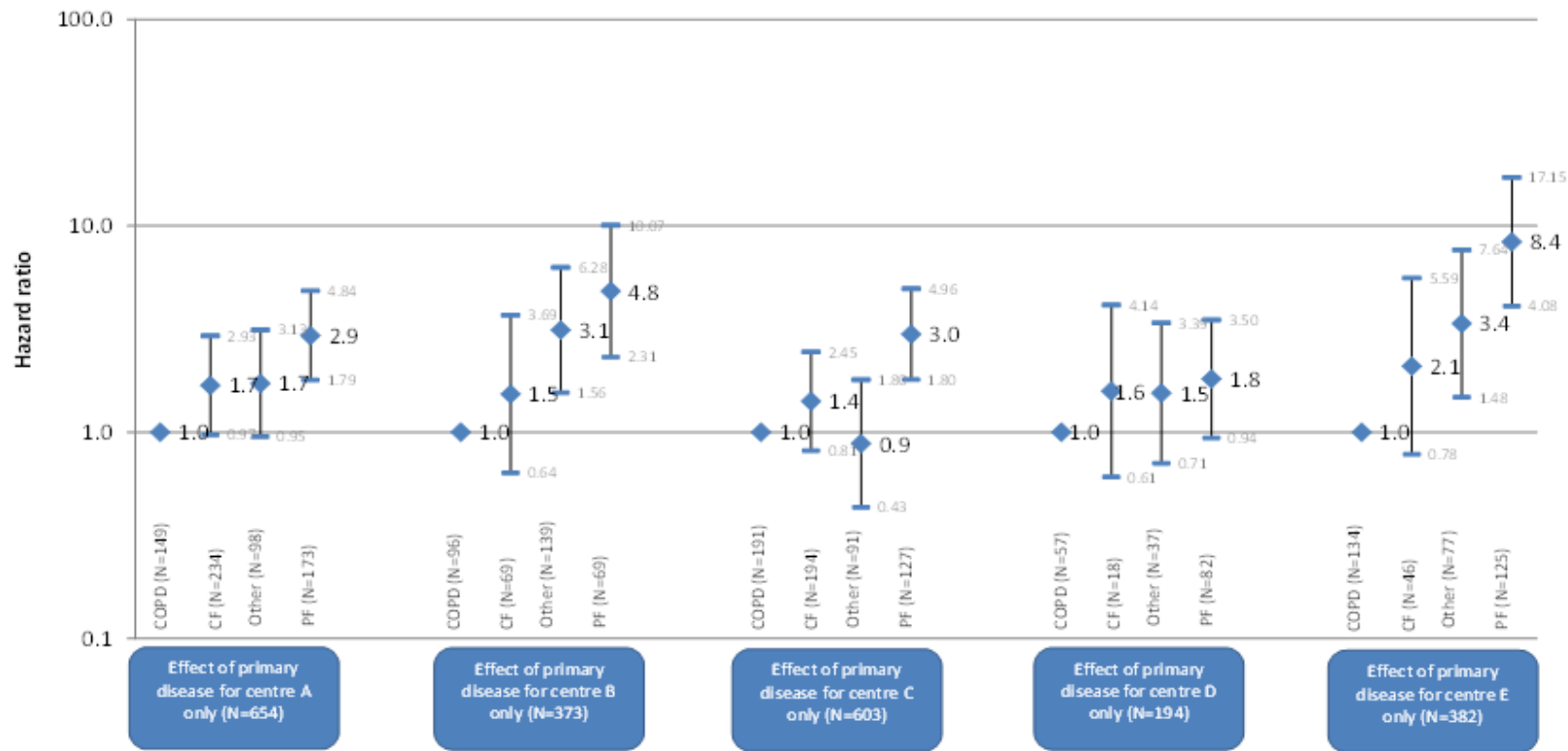
Post-registration outcome for 579 new UK adult lung registrations for pulmonary fibrosis patients by height



Results – one year survival from listing

Centre	Disease group									
	COPD		CF		Other		PF		Total	
	N patients registered	% deaths	N patients registered	% deaths	N patients registered	% deaths	N patient registered	% deaths	N patients registered	% deaths
A	149	14.8	234	24.4	98	22.4	173	34.1	654	24.5
B	96	10.4	69	18.8	139	28.1	69	37.7	373	23.6
C	191	13.6	194	23.7	91	12.1	127	33.1	603	20.7
D	57	22.8	18	38.9	37	35.1	82	36.6	194	32.5
E	134	6.7	46	19.6	77	20.8	125	39.2	382	21.7
Total	627	12.8	561	23.5	442	22.9	576	35.8	2206	23.5

Results – on year survival from listing

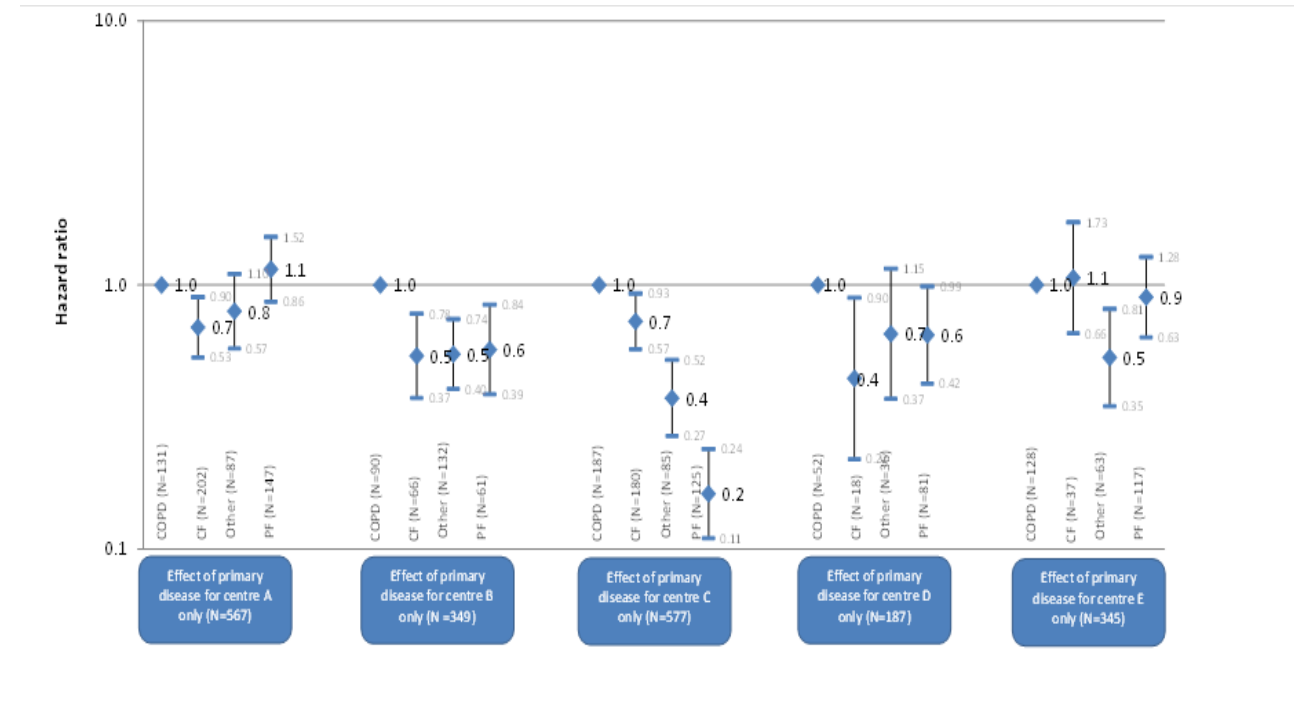


Results – time to transplant

	Factor	p-value	Hazard ratio (95%)
A	Sex	0.02	
	Male		1.20 (1.02 – 1.40)
	Female		1
B	Previous thoracotomy	<0.001	
	No		1.67 (1.33 – 2.10)
	Yes		1
C	Blood group	<0.001	
	A		1.42 (1.18 – 1.70)
	B+AB		1
	O		0.76 (0.64 – 0.91)
D	NYHA Class	0.03	
	I		1.31 (0.71 – 2.41)
	II		1.61 (1.18 – 2.18)
	III		1.23 (0.98 – 1.55)
	IV		1
E	Height at registration (linear)	<0.001	1.03 (1.02 – 1.04)
F	Primary disease group	0.02	Incorporated through G
G	Primary disease group*centre	<0.001	See Figure

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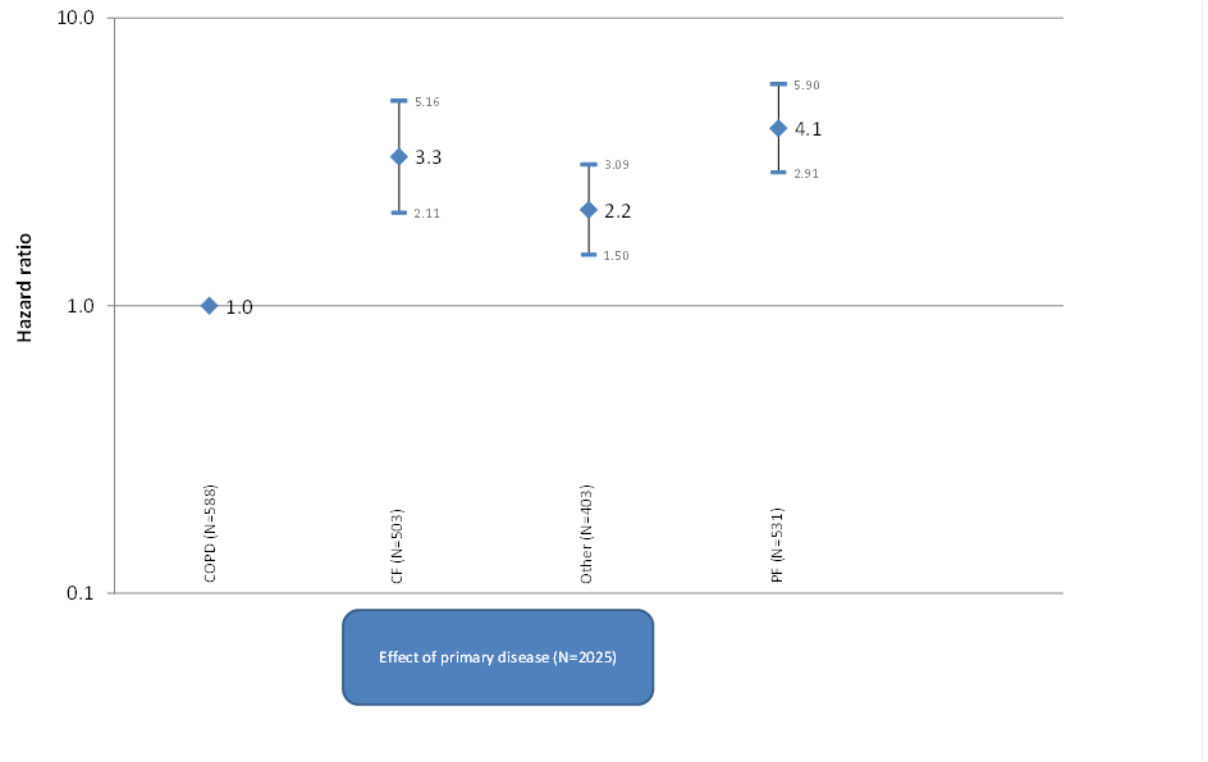


Results – time to death on the list

	Factor	p-value	Hazard ratio (95%)
A	Sex	<0.001	
	Male		1.92 (1.55 – 2.39)
	Female		1
B	Disease group	<0.001	
	CF		3.30 (2.11 – 5.16)
	COPD		1
	Other		2.16 (1.50 – 3.09)
	PF		4.14 (2.91 – 5.90)
C	Daily dose of prednisolone at registration	<0.001	
	0		
	1-14		0.57 (0.43 – 0.74)
	≥15		0.78 (0.60 – 1.00)
			1
D	In hospital at time of registration	<0.001	
	Yes		1
	No		0.39 (0.27 – 0.57)
E	NYHA Class	0.001	
	I		0.66 (0.28 – 1.55)
	II		0.51 (0.30 – 0.86)
	III		0.48 (0.33 – 0.68)
	IV		1
F	Ethnic group	0.01	
	White		1.68 (1.08 – 2.61)
	Non- white		1
G	Body mass index (linear)	<0.001	0.95 (0.93 – 0.98)
H	Forced vital capacity at registration (non-linear)	<0.001	
I	Age at registration (non-linear)	0.002	

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	0		0.57 (0.43 – 0.74)
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	≥15		1
D	In hospital at time of registration	<0.001	
	Yes		1
	No		0.39 (0.27 – 0.57)
E	NYHA Class	0.001	
	I		0.66 (0.28 – 1.55)
	II		0.51 (0.30 – 0.86)
	III		0.48 (0.33 – 0.68)
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PF patients, small stature and blood group O

- Discrepancies in waiting list duration of certain disease groups in specific transplant centres that did not translate in significant increase in mortality.
- Change in the donor allocation system in May 2017 to prioritise centrally super urgent and urgent cases, small adults ≤ 155 cm and blood group identical ahead of compatible ABO matching.