

The Australian Corneal Graft Registry 2024

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**The ACGR is funded by the Commonwealth Government of Australia via the
Organ and Tissue Authority (DonateLife)**

The ACGR Database - 15th Feb 2024

	Registered
Total	46,782
1985 onwards	
PK	28,611 (61%)
Patch/TLK	1,799 (4%)
Limbal	88 (<1%)
Introduced	
2000	DALK 2,359 (5%)
2006	DS(A)EK 8,621 (18%)
2007	DMEK 5,219 (11%)
Introduced 2021	CAIRS 85 (<1%)

PK=Penetrating keratoplasty; TLK=Traditional/tectonic Lamellar Keratoplasty; DALK=Deep anterior lamellar keratoplasty; DS(A)EK= Descemet's stripping (automated) endothelial keratoplasty; DMEK=Descemet's membrane endothelial keratoplasty; CAIRS=Corneal allogenic intrastromal ring segments

The ACGR Database - 15th Feb 2024

	Registered	Followed	
Total	46,782	78%	
1985 onwards			
PK	28,611	83%	
Patch/TLK	1,799	75%	
Limbal	88	77%	
Introduced			
2000	DALK	2,359	62%
2006	DS(A)EK	8,621	75%
2007	DMEK	5,219	63%
Introduced 2021	CAIRS	85	4%

PK=Penetrating keratoplasty; TLK=Traditional/tectonic Lamellar Keratoplasty; DALK=Deep anterior lamellar keratoplasty; DS(A)EK= Descemet's stripping (automated) endothelial keratoplasty; DMEK=Descemet's membrane endothelial keratoplasty; CAIRS=Corneal allogenic intrastromal ring segments

The ACGR Database - 15th Feb 2024

	Registered	Followed	Failed	
Total	46,782	78%	24%	
1985 onwards				
PK	28,611	83%	27%	
Patch/TLK	1,799	75%	22%	
Limbal	88	77%	37%	
Introduced				
2000	DALK	2,359	62%	8%
2006	DS(A)EK	8,621	75%	24%
2007	DMEK	5,219	63%	17%
Introduced 2021	CAIRS	85	4%	2%

PK=Penetrating keratoplasty; TLK=Traditional/tectonic Lamellar Keratoplasty; DALK=Deep anterior lamellar keratoplasty; DS(A)EK= Descemet's stripping (automated) endothelial keratoplasty; DMEK=Descemet's membrane endothelial keratoplasty; CAIRS=Corneal allogenic intrastromal ring segments

The ACGR Database - 15th Feb 2024

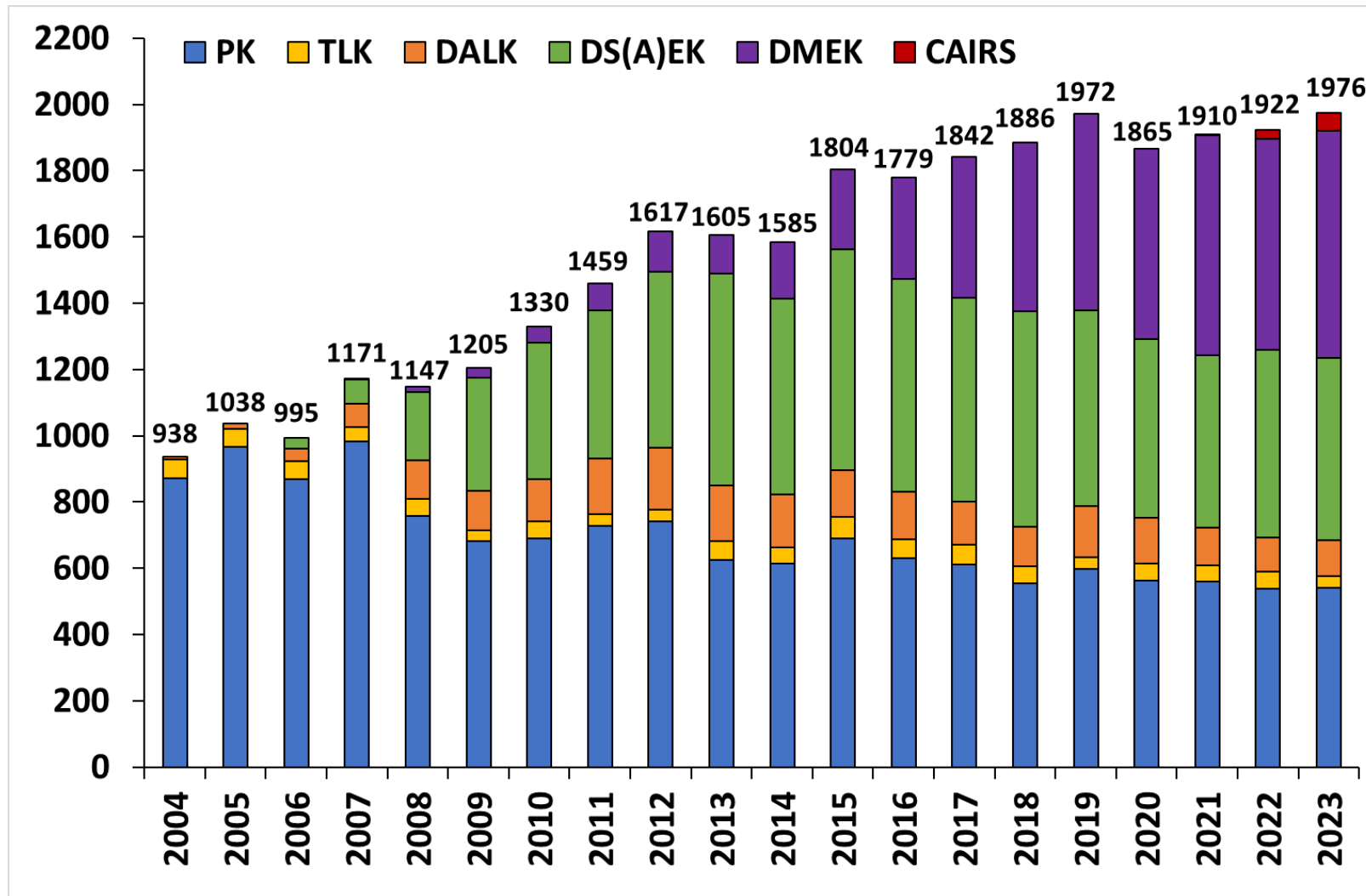
	Registered	Followed	Failed	EGF*	PNF*
Total	46,782	78%	24%	7%	2%
1985 onwards					
PK	28,611	83%	27%	6%	<1%
Patch/TLK	1,799	75%	22%	12%	1%
Limbal	88	77%	37%	17%	0%
Introduced					
2000					
2006					
2007					
DALK	2,359	62%	8%	3%	<1%
DS(A)EK	8,621	75%	24%	9%	5%
DMEK	5,219	63%	17%	12%	8%

EGF = Early graft failure, failed within 12 months of graft

PNF = Primary non-functioning graft, surgeon specified that graft never cleared/attached

***Both likely to be underreported for grafts from 2022 and 2023**

Registered Grafts 2004 to 2023



*Registrations for grafts performed in 2023 are still being received

Consent Issues

- ▶ Consent boxes on registration forms
 - ▶ **Cannot enter data without first box ticked!**
 - ▶ Linkage with NDI is optional

Registry No. <small>Registry use only</small>	THE AUSTRALIAN CORNEAL GRAFT REGISTRY REGISTRATION FORM	Date Rec'd <small>Registry use only</small>
OPERATING SURGEON (surname and initial): _____ CONSULTANT (if different): _____		STATE: _____
RECIPIENT IDENTIFICATION		
Patient's name: _____		
SURNAME		FIRST NAME
Patient's record number (if applicable): _____		Please select applicable boxes
Patient's date of birth: / /	Patient's sex: Male <input type="checkbox"/> Female <input type="checkbox"/>	
Date of graft: / /	Eye grafted: R <input type="checkbox"/> L <input type="checkbox"/>	
CONFIRMATION OF CONSENT (please tick) I have gained consent from the corneal graft recipient to: Forward their data to the Australian Corneal Graft Registry (ACGR) <input type="checkbox"/> Allow the ACGR to perform confidential linkage with the National Death Index to determine if recipients have died <input type="checkbox"/>		

905 not ticked initially

32 no consent stated
Excluded

873 returned for clarification

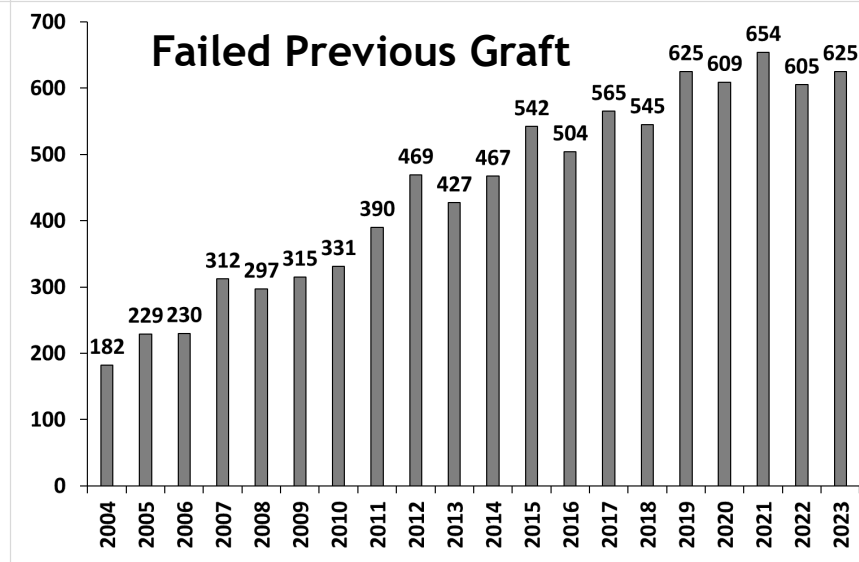
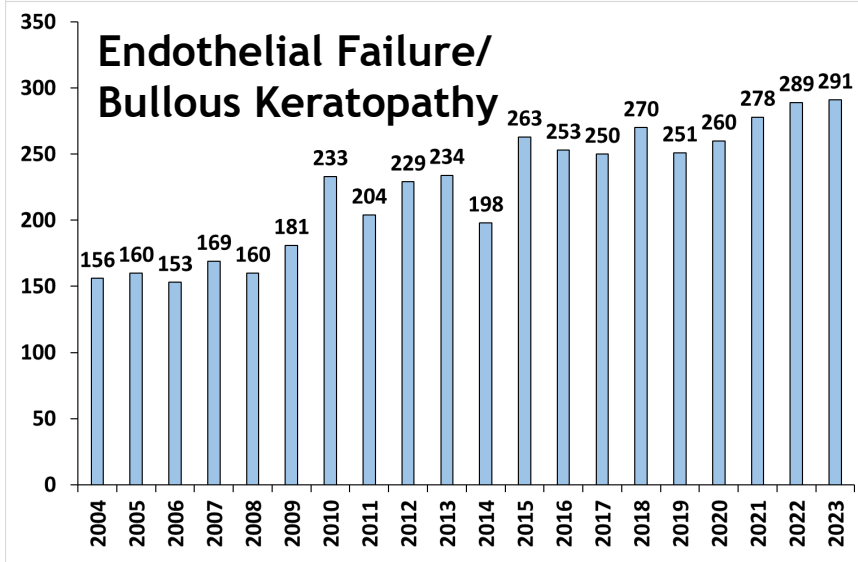
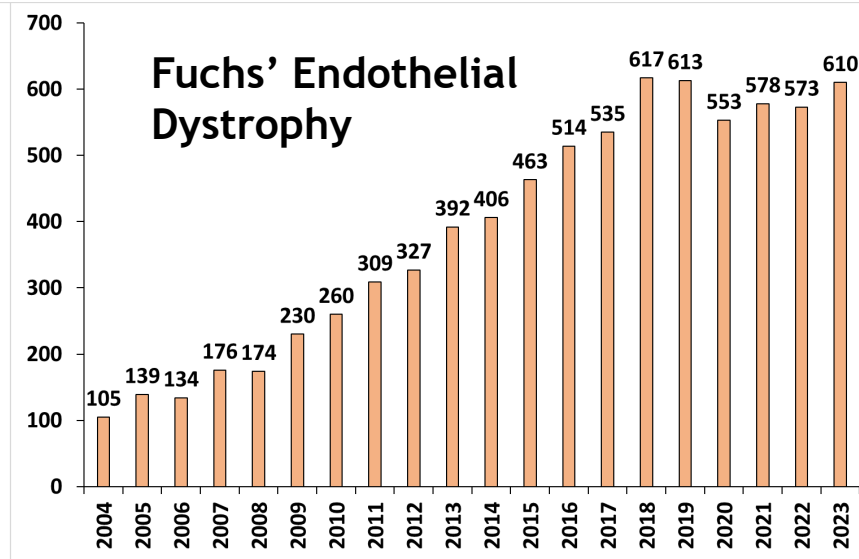
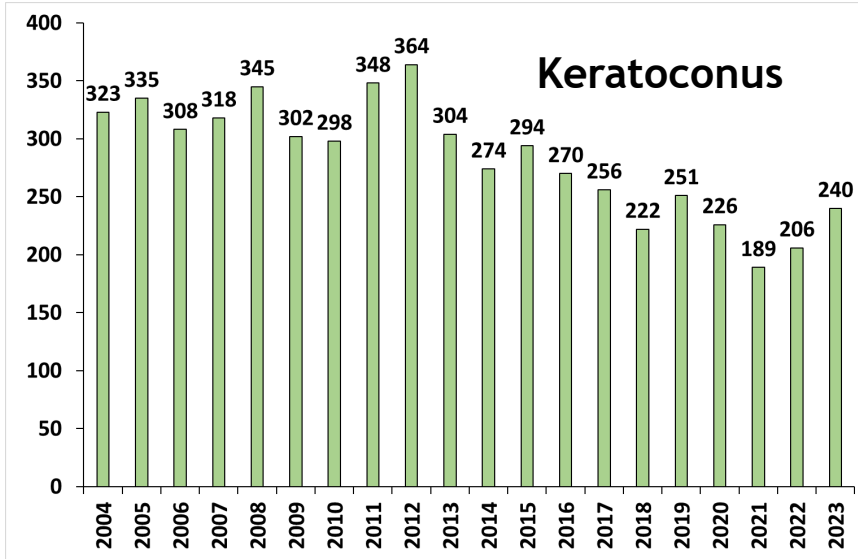
536 returned ticked
Entered

66 returned still not ticked
Excluded

271 not yet returned
Unknown

Indication for Graft 2004 to 2023

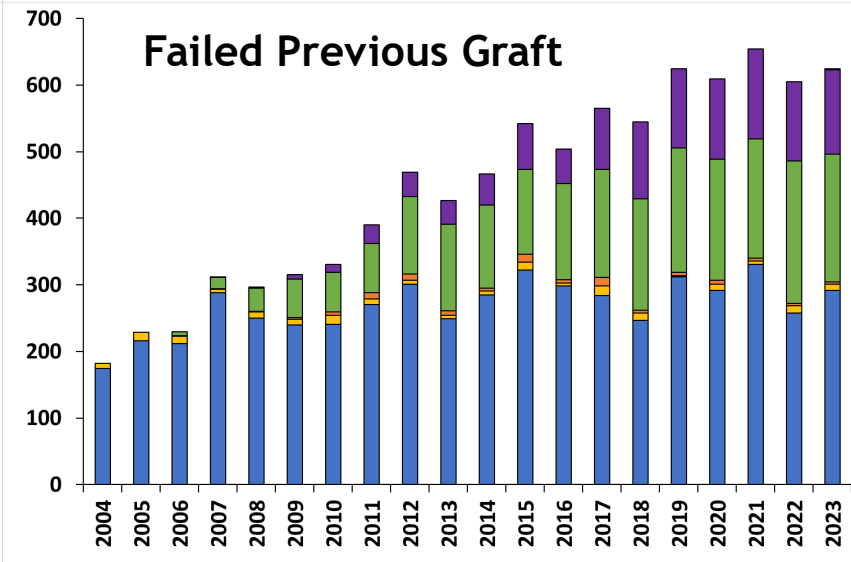
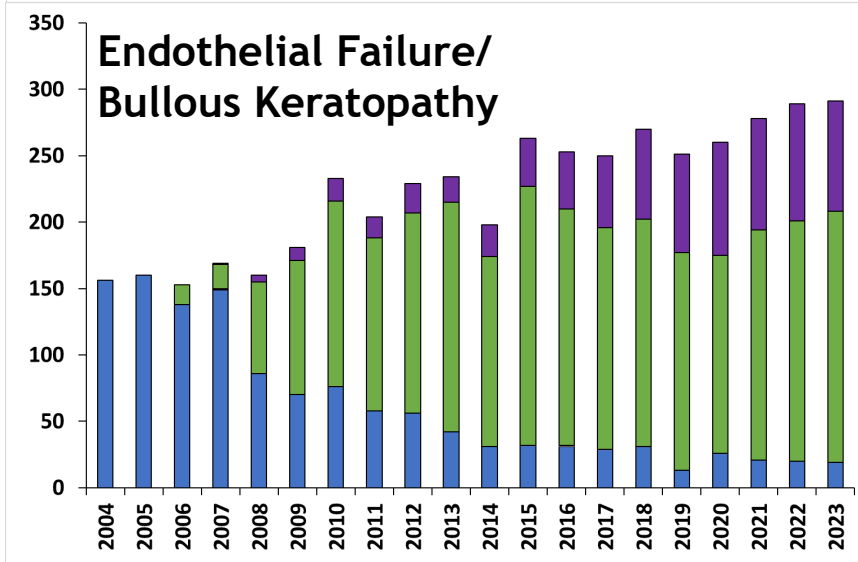
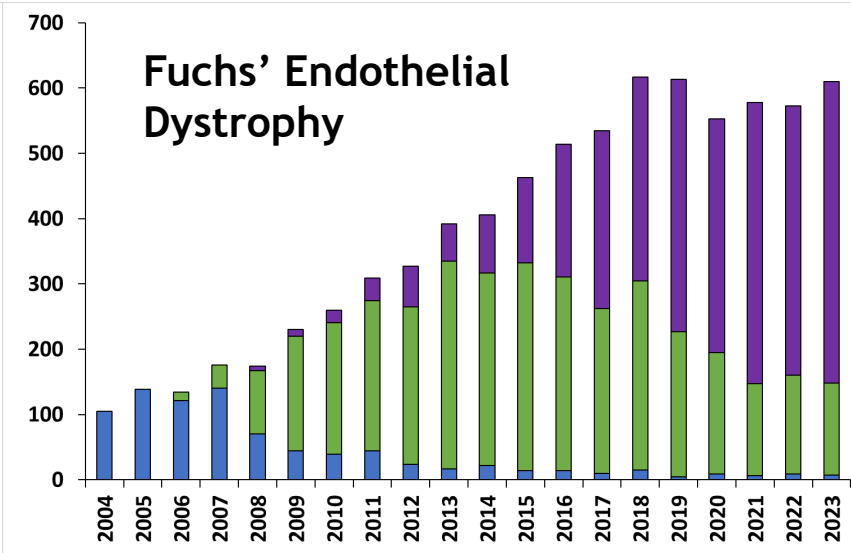
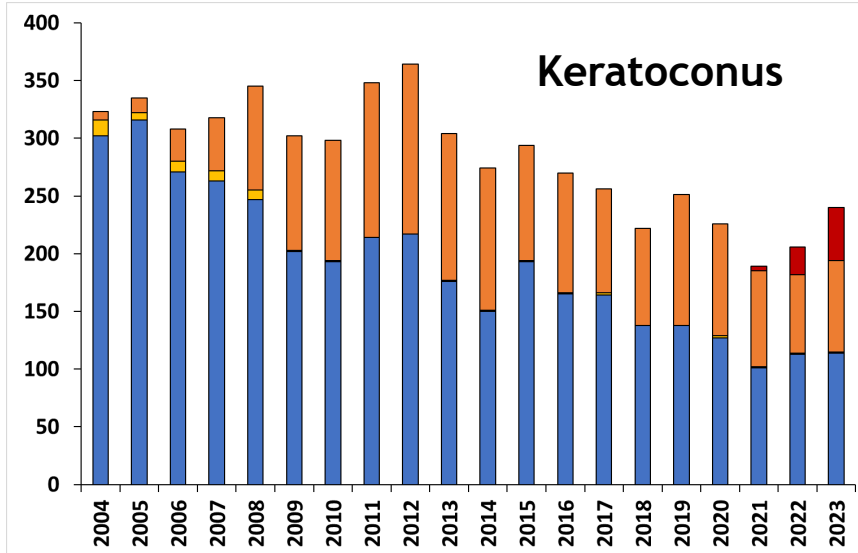
NUMBER OF GRAFTS



YEAR GRAFT PERFORMED

Indication for Graft 2004 to 2023

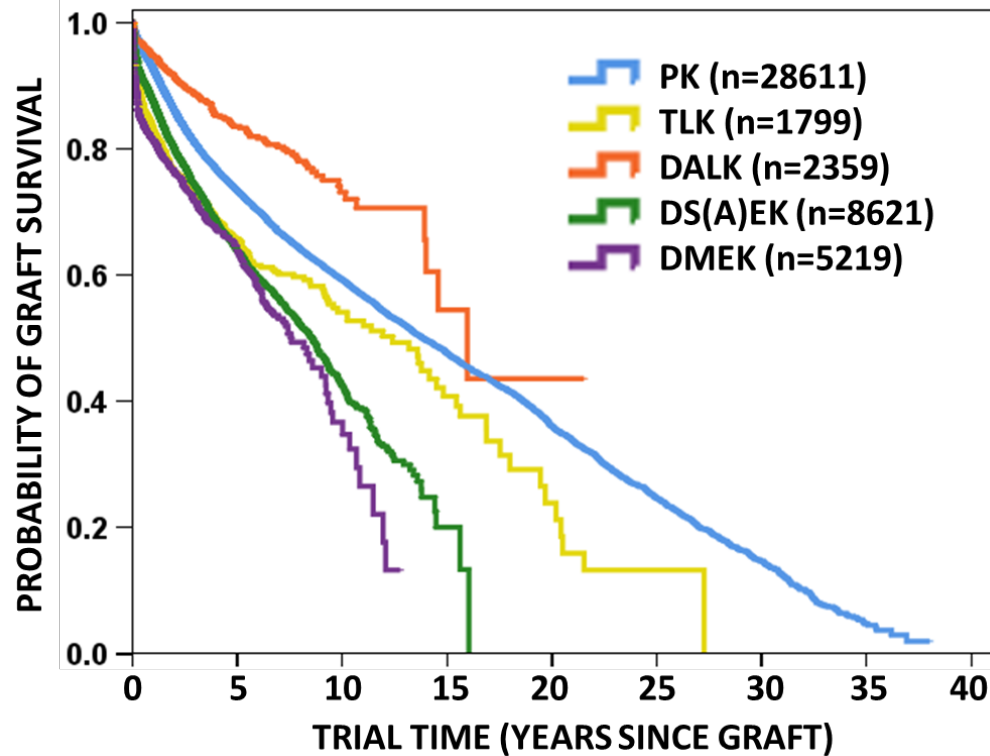
NUMBER OF GRAFTS



YEAR GRAFT PERFORMED

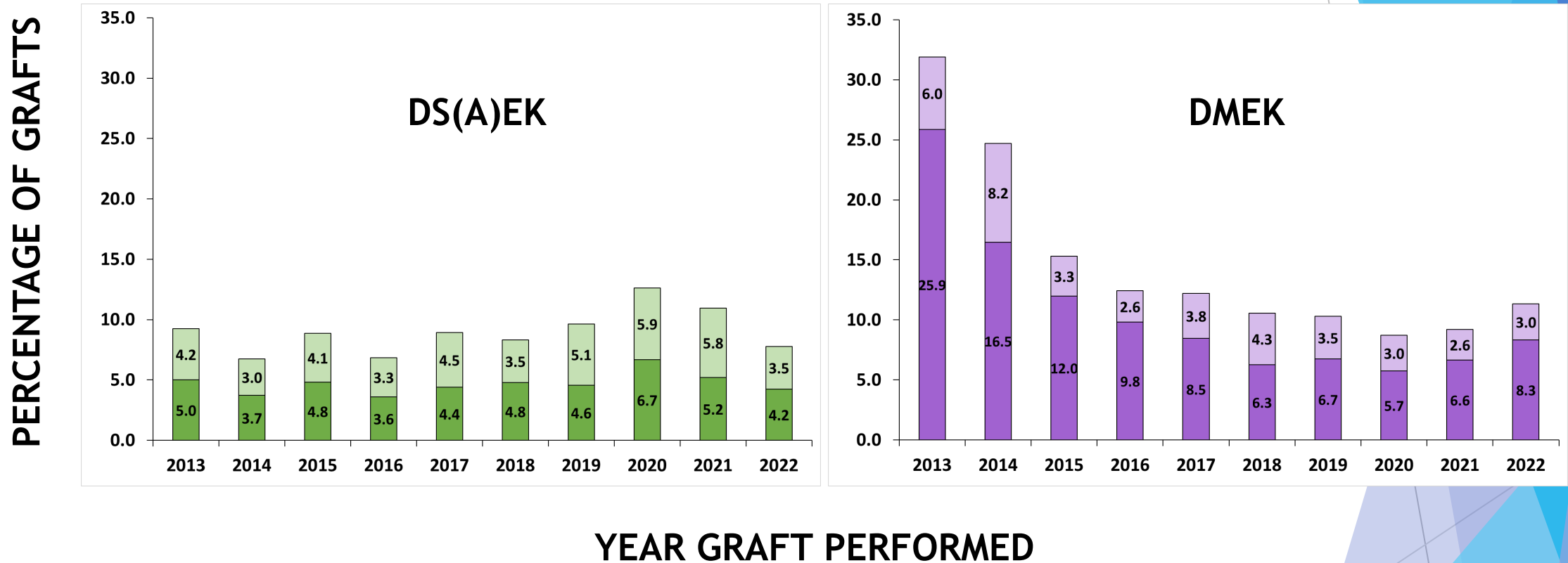
Survival of All Registered Grafts

1985 to 2023



	1	2	5	10	15	20	25	30	35
PK	19823	15199	8377	3881	1985	1046	494	191	21
TLK	843	588	274	81	29	9	1	NA	NA
DALK	1251	873	350	72	7	1	NA	NA	NA
DS(A)EK	4783	3625	1612	263	6	NA	NA	NA	NA
DMEK	2039	1272	316	19	NA	NA	NA	NA	NA

Failure Rates 2013 to 2022

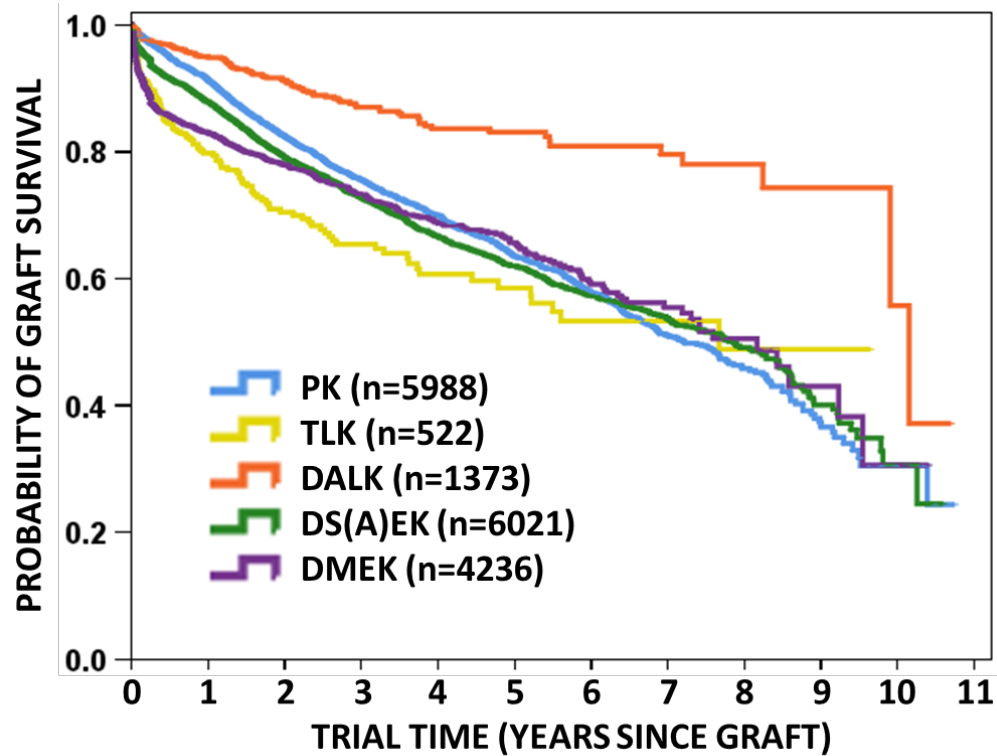


Darker portion = Primary Non-Functioning Grafts

Lighter portion = Early Graft Failure (1 year)

Survival of Recent Registered Grafts

2013 to 2022

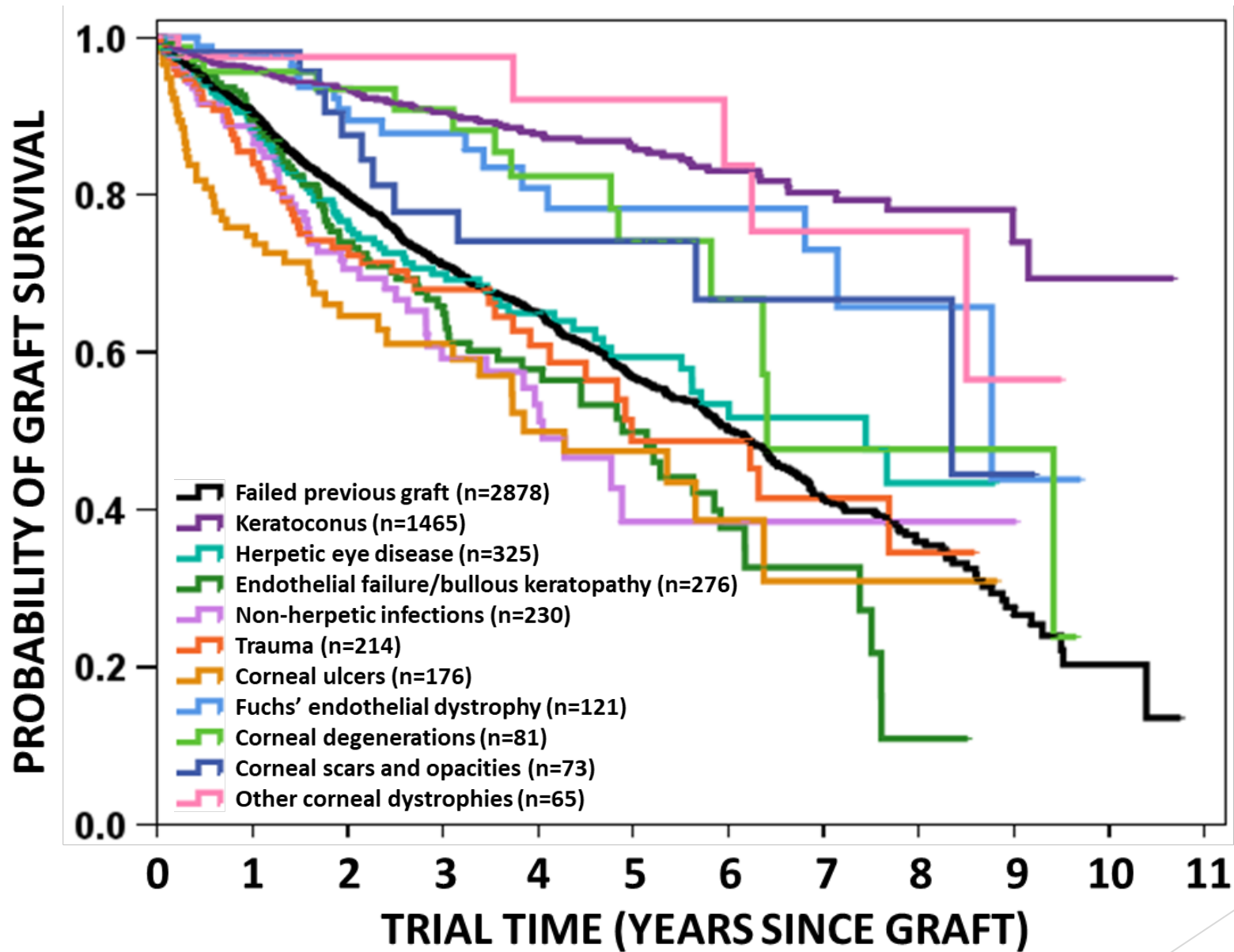


	3m	6m	1	2	3	4	5	6	7	8	9	10
PK	4188	4002	3641	2525	1749	1235	850	548	326	169	53	9
TLK	303	266	220	140	98	66	50	30	18	10	6	NA
DALK	749	734	669	459	297	194	135	90	57	29	9	3
DS(A)EK	4098	3836	3348	2426	1781	1269	886	563	346	186	67	11
DMEK	2527	2325	1924	1195	754	440	272	150	70	31	9	2

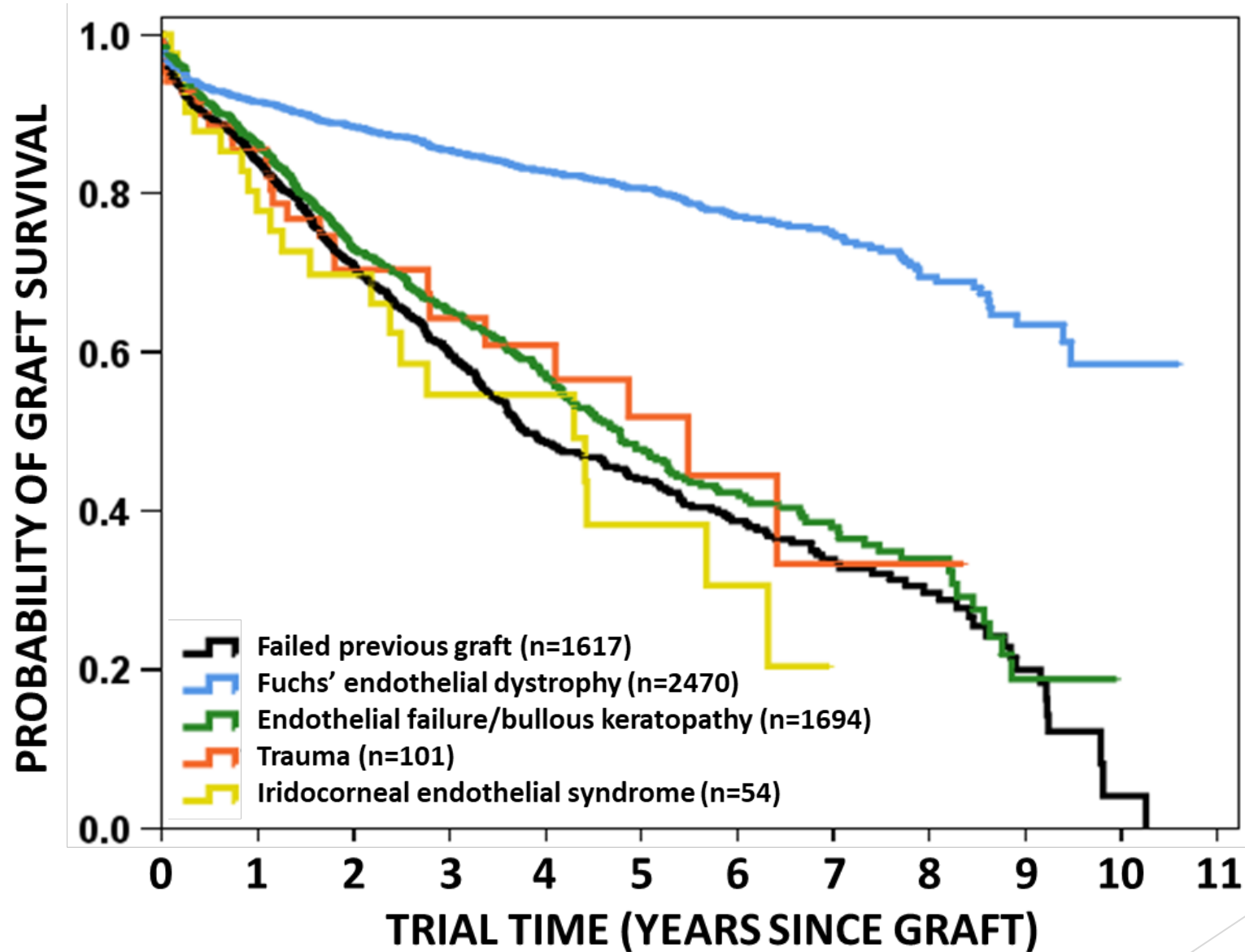
Indication for Graft 2013 to 2022

- ▶ **>50% grafts for Fuchs' were DMEK**
- ▶ **28% PK not repeat or for keratoconus**
- ▶ **67% of grafts for herpetic eye disease were PK**
- ▶ **Herpetic eye disease 3rd most common indication for PK**
- ▶ **Few PK are for bullous keratopathy and Fuchs'**
- ▶ **EK treatment of choice for ICE syndrome**
 - ▶ **5th most common indication for DS(A)EK and DMEK**
 - ▶ **Paper released in 2023**
 - ▶ **Roberts PK et al, Clin Exp Ophthalmol 2023 Sep-Oct, 51(7)**
 - ▶ **Available at: <http://doi.org/10.1111/ceo.14283>**

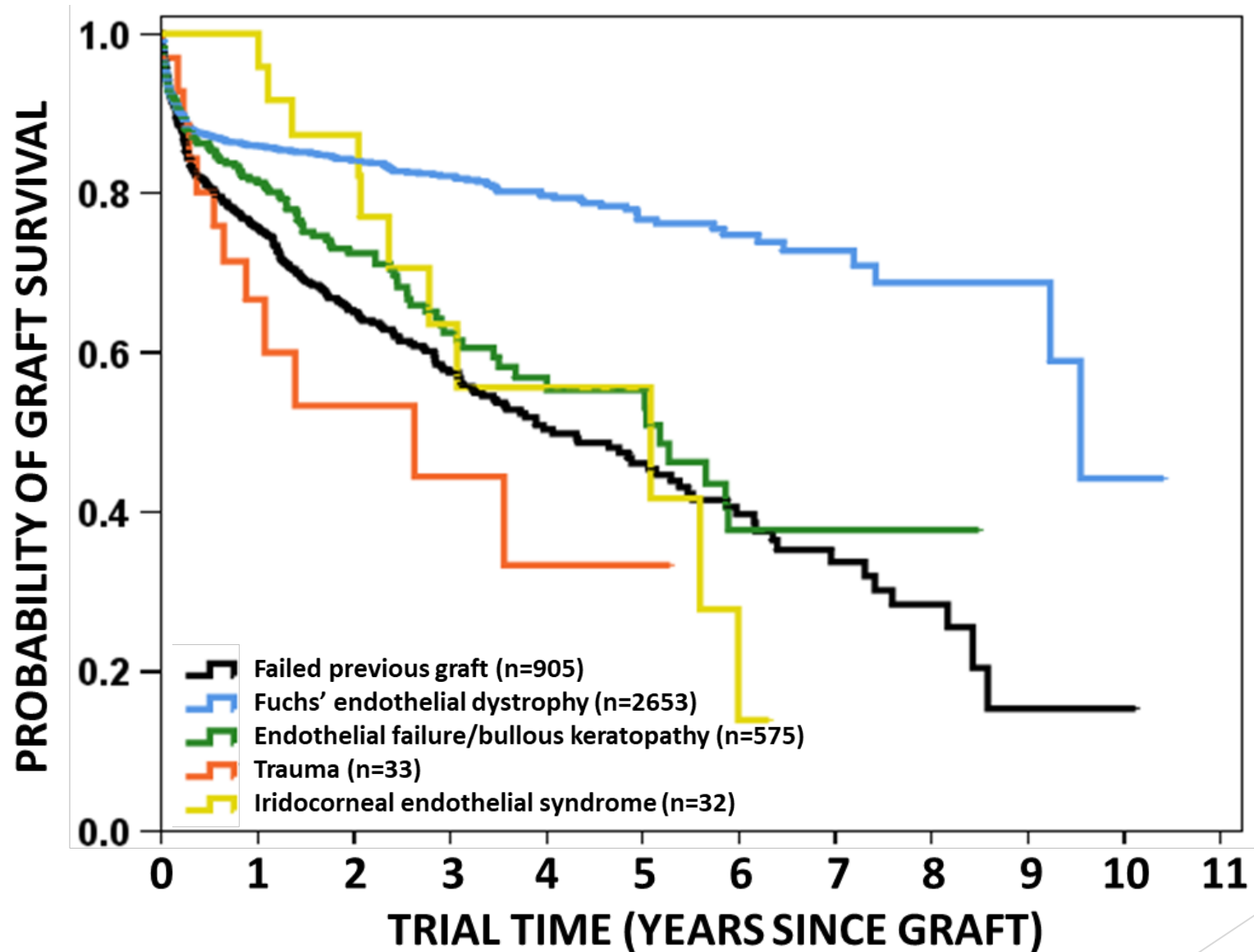
PK Survival 2013-22 by Indication



DS(A)EK Survival 2013-22 by Indication

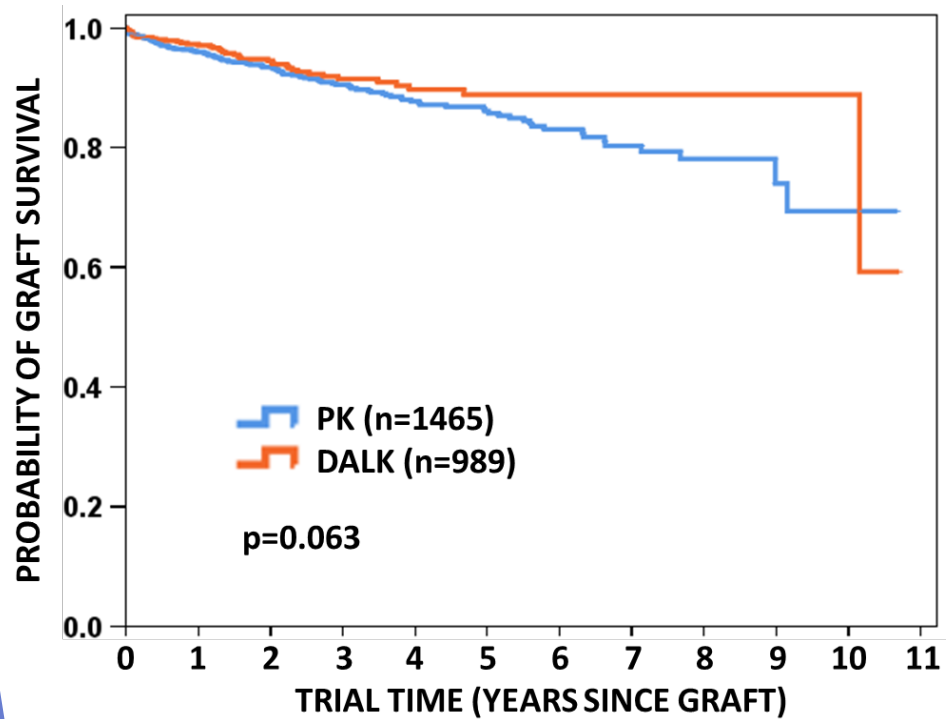


DMEK Survival 2013-22 by Indication

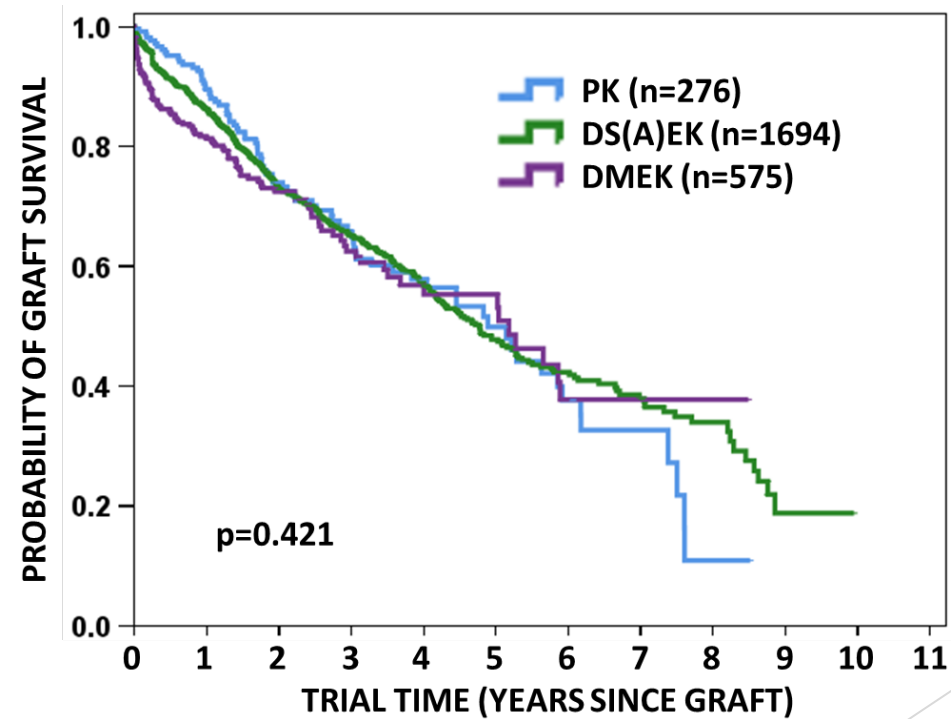


Graft Type Comparisons 2013 to 2022

Keratoconus

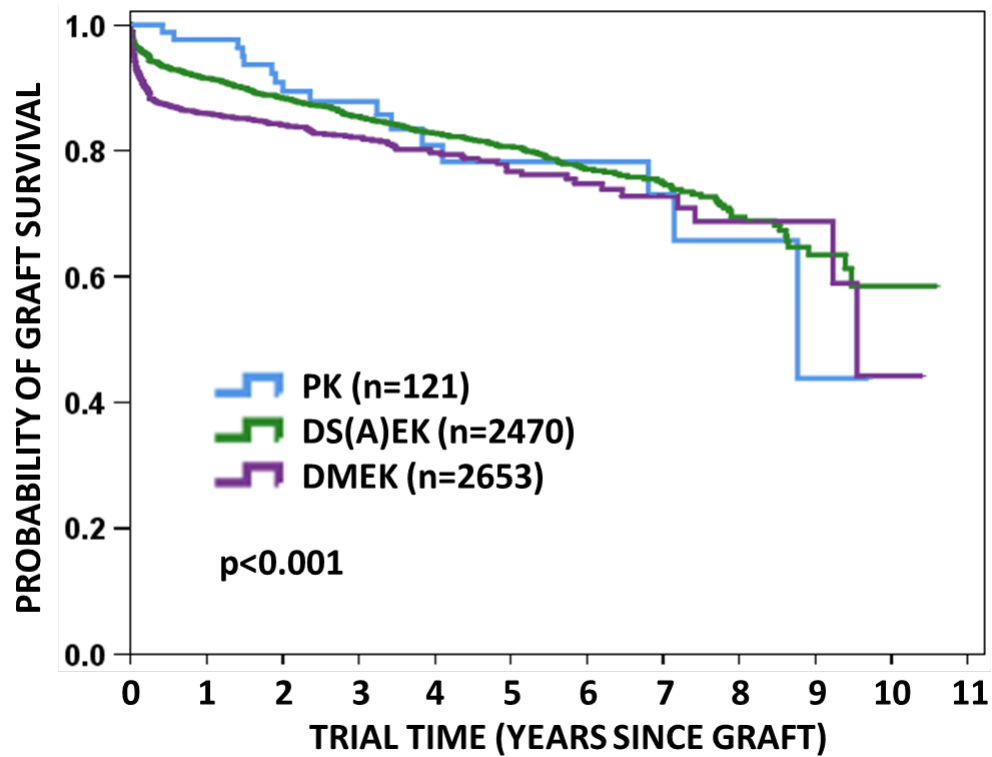


Bullous keratopathy

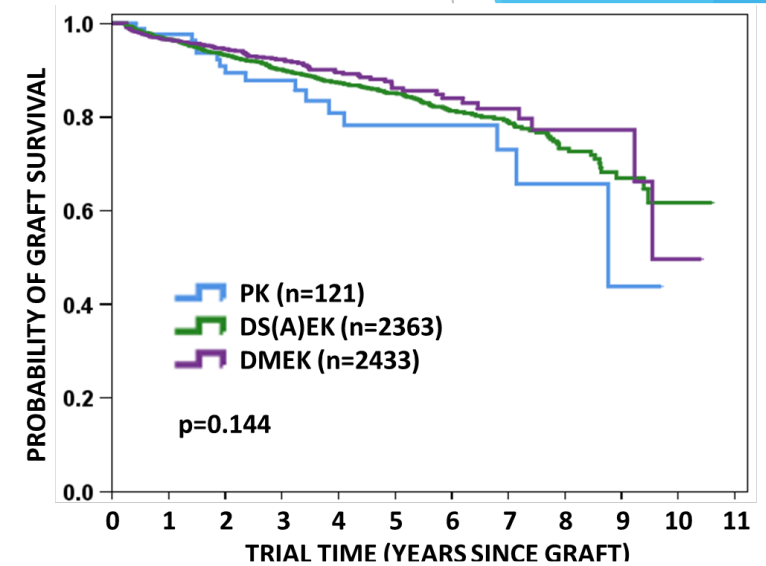


Graft Type Comparisons 2013 to 2022

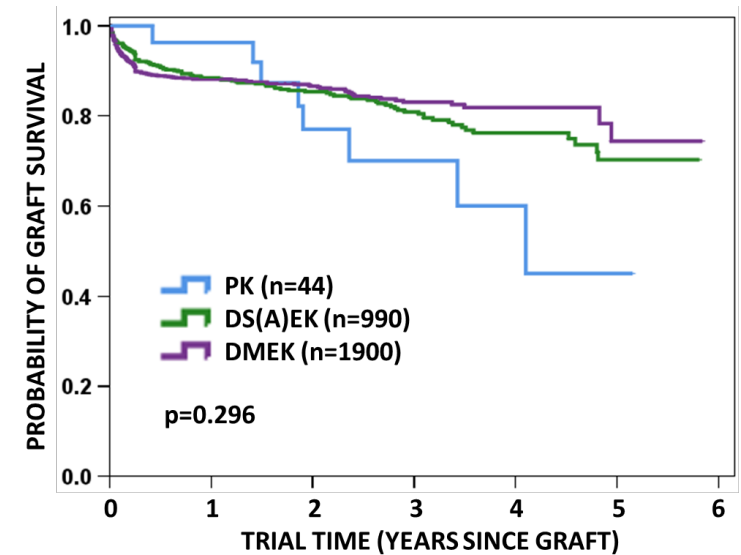
Fuchs' endothelial dystrophy



Excluding primary non-function



2018 to 2022



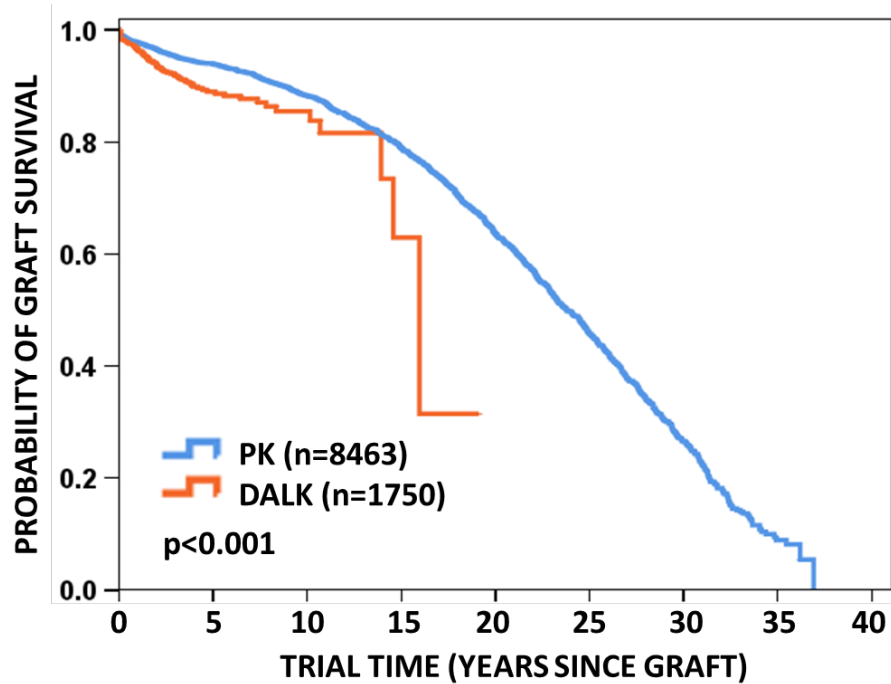
National Death Index

- ▶ **Linkage in March 2023**
- ▶ **Over 5000 records updated**
 - ▶ **Almost 13,000 grafts**
 - ▶ **99% date of death confirmed**
- ▶ **Focussed follow-up**
- ▶ **Enables more accurate modelling of survival**
- ▶ **Over 9,000 grafts potentially surviving at death**
- ▶ **Cohorts with loss to follow-up in good outcomes**

Modelled Analyses - Keratoconus

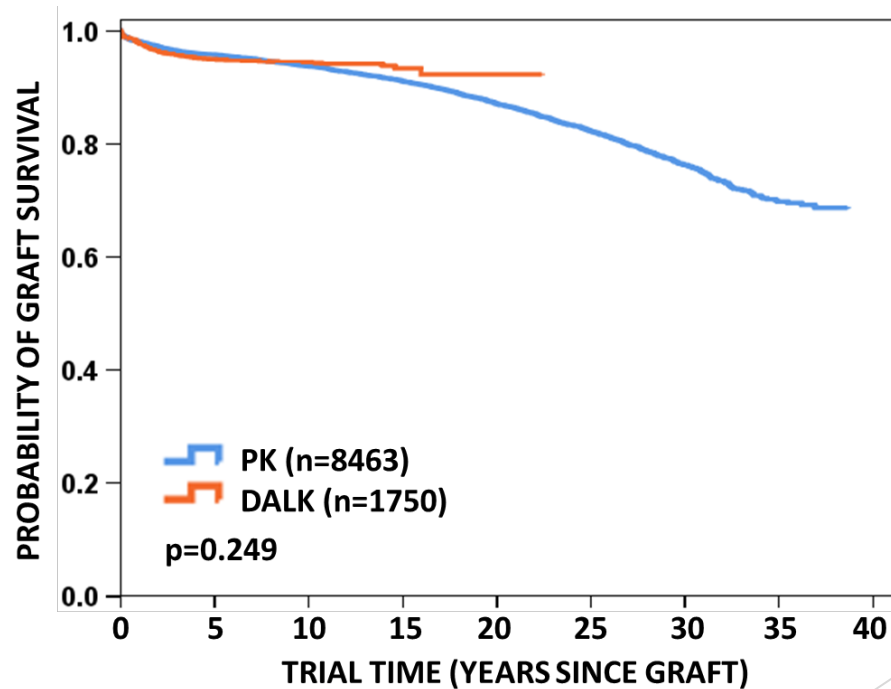
Grafts 1985 to 2023

Actual Data



	1	2	5	10	15	20	25	30	35
PK	6395	5138	3223	1909	1227	749	390	148	15
DALK	926	633	249	53	4	NA	NA	NA	NA

Modelled Data

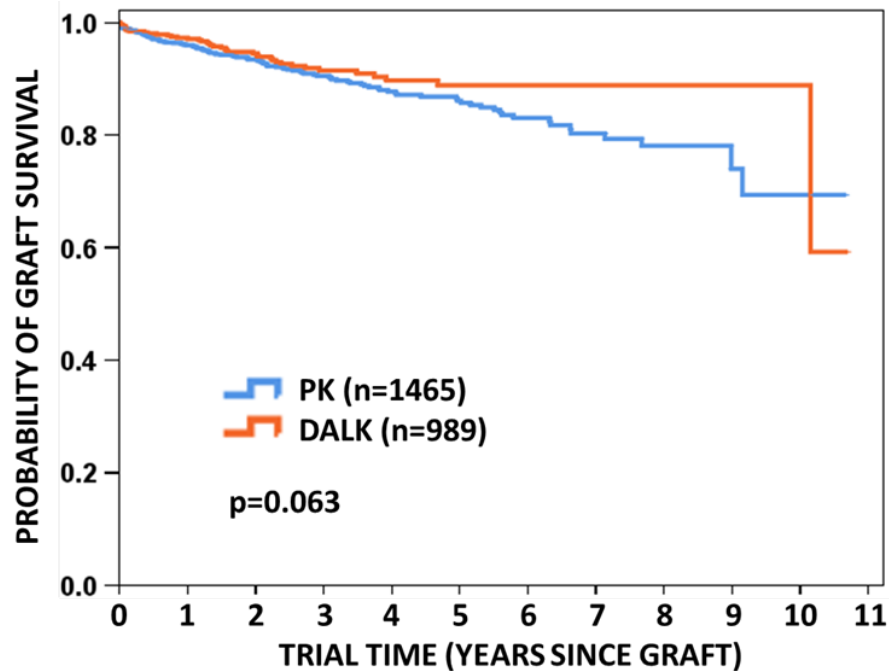


	1	2	5	10	15	20	25	30	35
PK	8180	7986	7488	6511	5353	3878	2488	1291	325
DALK	1629	1541	1228	740	167	10	NA	NA	NA

Modelled Analyses - Keratoconus

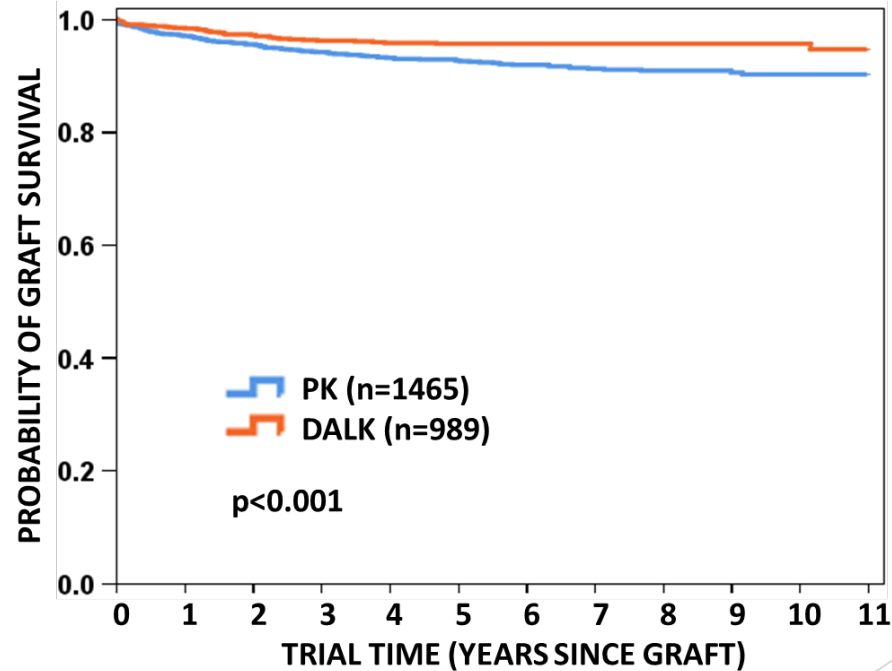
Grafts 2013 to 2022

Actual Data



	1	2	3	4	5	6	7	8	9	10
PK	925	657	446	317	231	144	91	48	17	3
DALK	480	328	211	133	91	65	40	22	7	3

Modelled Data

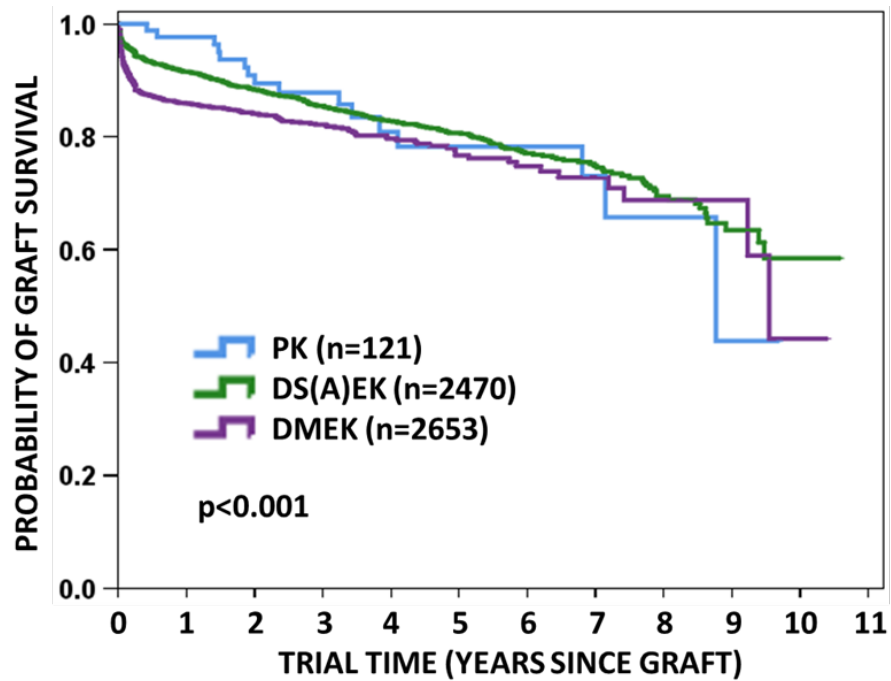


	1	2	3	4	5	6	7	8	9	10
PK	1421	1287	1171	1039	902	762	605	452	285	156
DALK	974	895	805	705	597	517	433	339	242	122

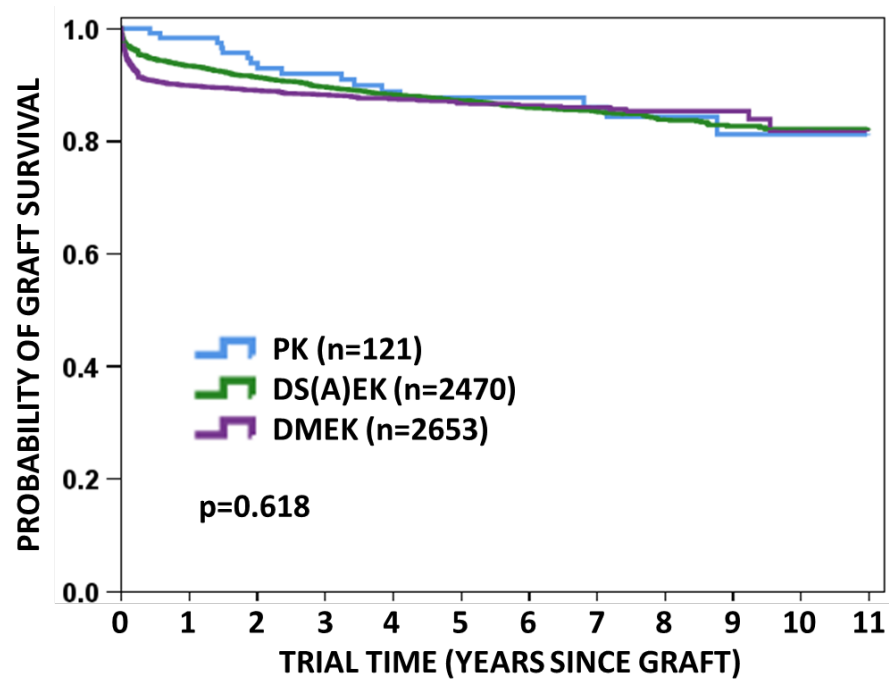
Modelled Analyses - Fuchs' Endothelial Dystrophy

Grafts 2013 to 2022

Actual Data



Modelled Data



	3m	1	2	3	4	5	6	7	8	9	10
PK	87	81	63	47	31	23	17	13	6	1	NA
DS(A)EK	1765	1509	1212	963	746	547	350	227	126	49	10
DMEK	1611	1244	789	504	298	174	94	43	18	7	1

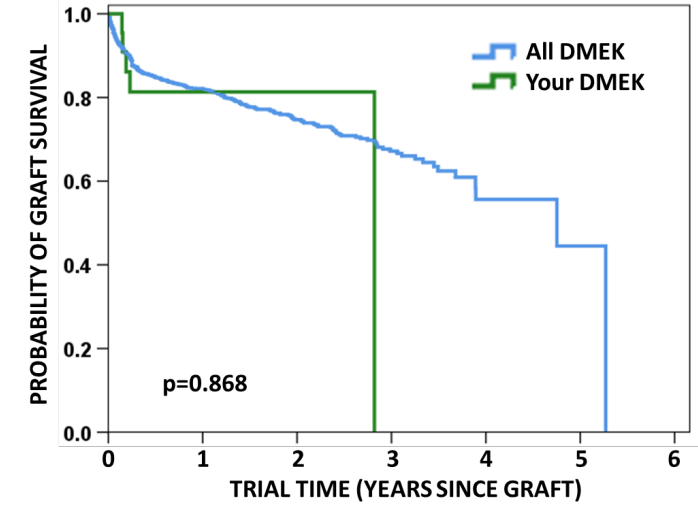
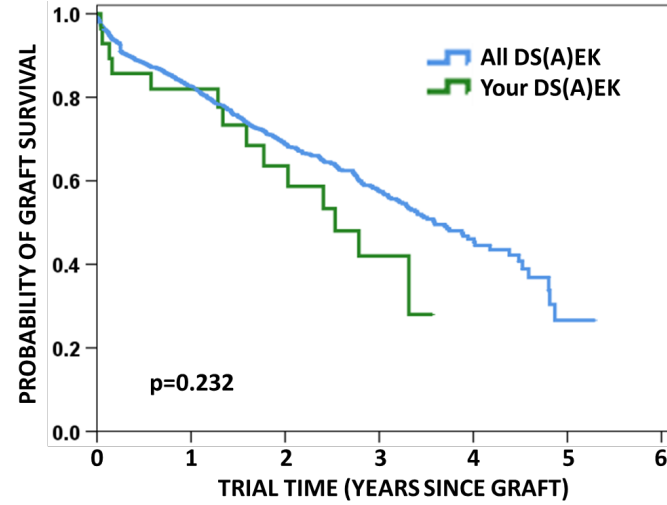
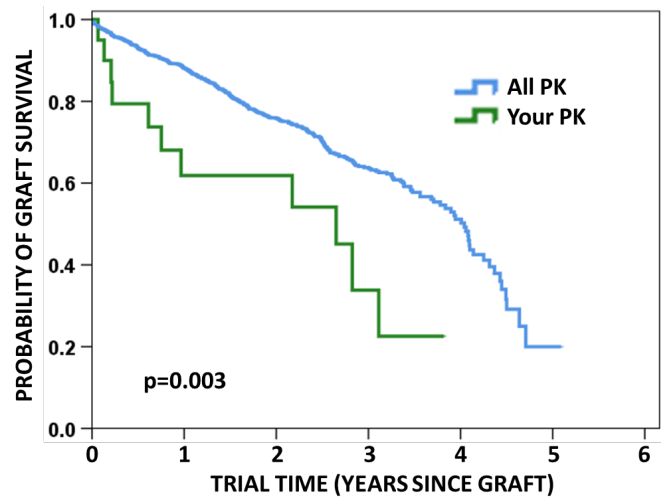
	3m	1	2	3	4	5	6	7	8	9	10
PK	120	117	101	92	82	76	60	50	36	25	11
DS(A)EK	2359	2276	2053	1854	1628	1412	1128	916	642	404	191
DMEK	2432	2365	1946	1522	1173	821	554	329	164	76	27

Individual Surgeon Audits

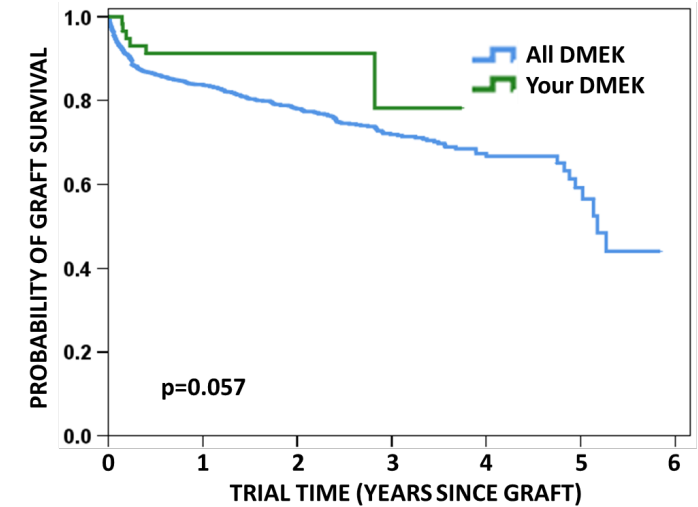
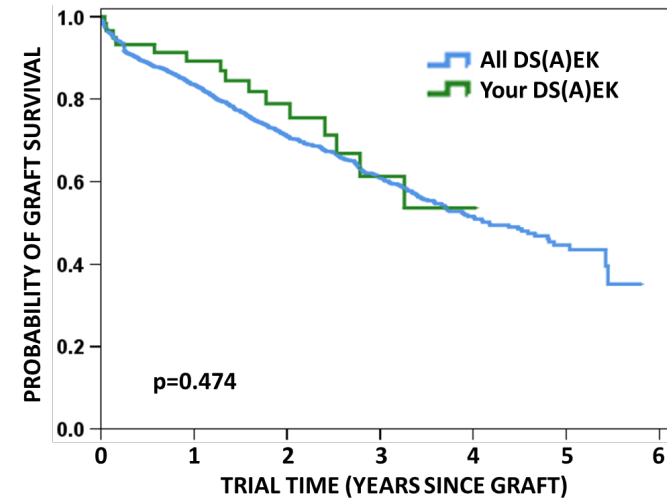
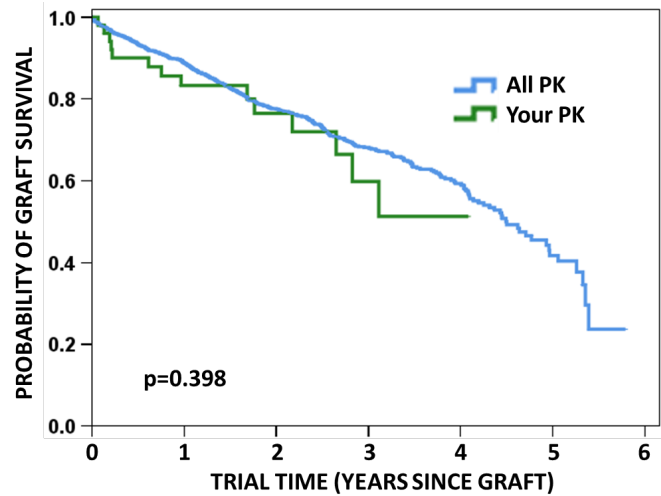
- ▶ **Provided every 2 years - December 2023**
- ▶ **Provided to all current contributing surgeons with**
 - ▶ **20+ registered grafts**
 - ▶ **15+ followed**
- ▶ **Can be used to meet CPD requirements**
- ▶ **Tailored to the individual surgeon**
 - ▶ **Type of grafts**
 - ▶ **Years grafts performed**
 - ▶ **Indications for graft**
- ▶ **Can be requested in between**

Individual Surgeon Audits - Follow-up

33% followed



68% followed



Post-graft Endophthalmitis

- ▶ As reported in ACGR follow-up
- ▶ 171 grafts with post-graft endophthalmitis (0.4%)
 - ▶ 138 failed: 120 endophthalmitis, 18 other causes
- ▶ Differed across graft types ($p < 0.001$)
 - ▶ PK: 0.5%, TLK 0.3%, DS(A)EK 0.2%, DMEK 0.1%, DALK 0.0%
- ▶ Differed across age groups ($p < 0.001$)
 - ▶ <60y: 0.2%, 60-69y: 0.4%, 70-79y: 0.6%, 80y+:0.5%
- ▶ No difference across graft State
- ▶ Lower rates in recent eras
- ▶ Within 1 month and up to 20 years post-graft

The ACGR in 2024

- ▶ **New Medical Director - Edward Greenrod**
- ▶ **Physical relocation**
 - ▶ **Flinders Health and Medical Research Building**
 - ▶ **New postal address and phone number TBA**
 - ▶ **No longer receive faxes**
- ▶ **Preparation for next Major Report**
 - ▶ **All data received by 31st March 2024**
 - ▶ **Early 2025 release**
- ▶ **Annual follow-up request in September**



Acknowledgments

- ▶ **Contributing surgeons and eye banks**
- ▶ **The Australian Government Organ and Tissue Authority**
- ▶ Assistance with updating the records held within the database is provided by the Australian Institute of Health and Welfare through linkage with the National Death Index.



Australian Corneal Graft Registry - Phone: 08 8204 5321; Email: miriam.keane@flinders.edu.au
2021/22 report: <https://doi.org/10.25957/9vyp-0j93>

