

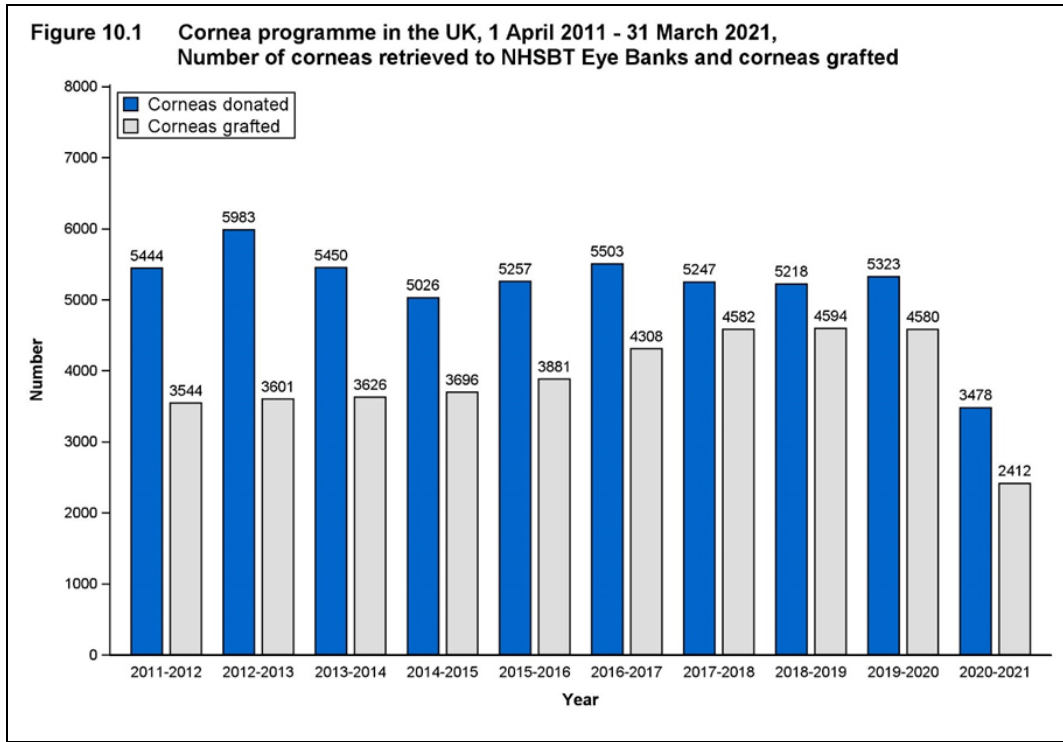
Cornea Activity

Key messages

- 3,478 corneas were supplied to NHSBT Eye Banks
- Corneas were retrieved from 1,467 cornea-only donors and from 332 solid organ donors after brainstem death (64%) or after circulatory death (36%)
- The number of transplants decreased to 2,412 due to COVID-19
- 9%, 32% and 16% of corneal transplants were for keratoconus, Fuchs endothelial dystrophy and pseudophakic bullous keratopathy patients, respectively
- The proportion of descemet membrane endothelial keratoplasty transplants have increased to 29%
- 833 eyes (corneas or globes) were supplied to support research or training

10.1 Overview

The number of corneas donated in 2020-2021 was 3478, representing a decrease of 35% from last year, as shown in **Figure 10.1**. In the last financial year, the number of corneal transplants has fallen to 2412, representing a decrease of 47% from last year, as a result of the impact of COVID-19 on donation and transplantation from March 2020. It should be noted that not all corneal donations in the UK are reported to NHSBT and thus the donation data reported are not the full national data.



In 2020-2021, of 1799 donors whose corneas were received by NHSBT Eye Banks, 1467 were cornea-only donors and 332 were cornea and solid organ donors: see **Table 10.1**. Compared to 2019-2020, the number of cornea-only donors decreased by 37%, and the number of cornea and solid organ donors decreased by 16%. In 2020-2021, corneas were retrieved from 213 organ donors after brainstem death and 119 organ donors after cardiac death.

Table 10.1 also shows the number and rate per million population (pmp) of donors whose corneas were retrieved to NHSBT Eye Banks in 2020-2021, by country and NHS region. Information for 2019-2020 is shown for comparison. No adjustments have been made for potential demographic differences in populations. In 2020-2021, the corneal donor rate fell across England, Scotland, Wales, and Northern Ireland. England had the highest corneal donor rate of countries in the UK (28.0 pmp). Across the NHS regions in England, the corneal donor rate ranged from 13.4 pmp to 54.9 pmp.

Table 10.1 Corneal donor rates per million population (pmp) in the UK, 1 April 2020 - 31 March 2021 (2019 - 2020), by country/ NHS region for donors whose corneas were retrieved to NHSBT Eye Banks								
Country of residence/ NHS region	Cornea-only		Solid organ and cornea		TOTAL		TOTAL pmp	
North East and Yorkshire	185	(235)	47	(52)	232	(287)	27.0	(33.4)
North West	300	(522)	39	(38)	339	(560)	48.0	(79.3)
Midlands	191	(310)	23	(58)	214	(368)	20.2	(34.7)
East of England	176	(237)	40	(41)	216	(278)	33.1	(42.6)
London	72	(158)	48	(64)	120	(222)	13.4	(24.8)
South East	84	(195)	60	(63)	144	(258)	16.2	(29.0)
South West	268	(284)	41	(31)	309	(315)	54.9	(56.0)
England	1276	(1941)	298	(347)	1574	(2288)	28.0	(40.6)
Isle of Man	0	(0)	0	(0)	0	(0)	0.0	(0.0)
Channel Islands	0	(0)	0	(0)	0	(0)	0.0	(0.0)
Wales	42	(85)	16	(17)	58	(102)	18.4	(32.4)
Scotland	25	(43)	12	(12)	37	(55)	6.8	(10.1)
Northern Ireland	7	(13)	5	(13)	12	(26)	6.3	(13.8)
TOTAL¹	1467	(2332)	332	(394)	1799	(2726)	26.8	(40.7)

¹ Includes UK recipients where the postcode was unspecified and non-UK recipients

10.2 NHSBT Eye Bank activity

NHSBT Eye Bank activity levels for Filton, David Lucas (in Liverpool) and Manchester Eye Banks are shown in **Table 10.2**. Manchester Eye Bank closed in July 2019 and David Lucas Eye Bank started to regularly process corneas in the northern regions in September 2019. The number of corneas retrieved by NHSBT Eye Banks fell by 35% in 2020-2021 and the number of corneas issued fell by 38%. In 2020-2021, 3478 corneas were retrieved to NHSBT Eye Banks, of which 2548 (73%) were subsequently issued for transplantation. A further 833 eyes (corneas or globes) were supplied to support research or training.

Table 10.2 Corneas retrieved into NHSBT Eye Banks, by year 1 April 2020 - 31 March 2021 (2019-2020)								
Eye bank	Total retrieved		Number issued¹		% issued		Difference between number retrieved and issued	
Filton	2253	(4027)	1716	(3266)	76	(81)	537	(761)
David Lucas	1225	(938)	832	(614)	68	(65)	393	(324)
Manchester	0	(358)	0	(251)	0	(70)	0	(107)
Total	3478	(5323)	2548	(4131)	73	(78)	930	(1192)

¹ Number issued of those retrieved in each year
Please note that Manchester Eye Bank closed in July 2019 and David Lucas Eye Bank started to regularly process corneas in September 2019

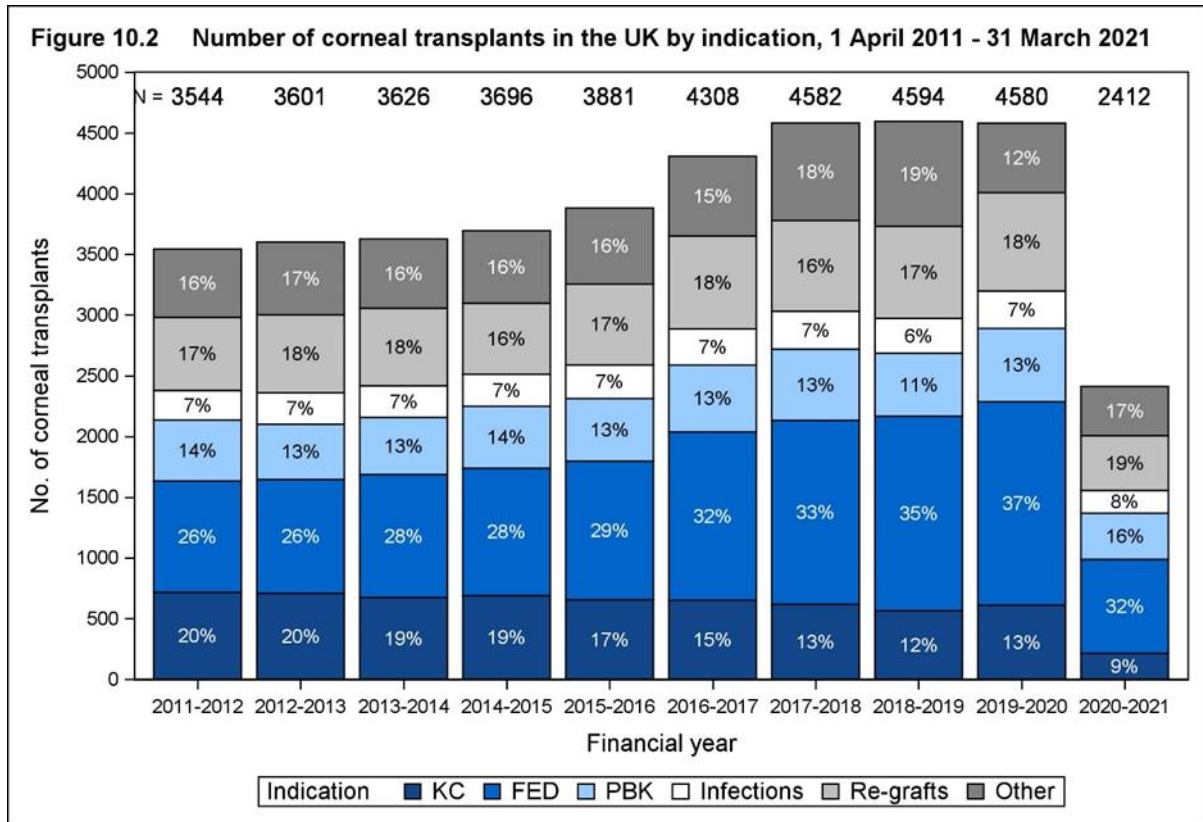
10.3 Transplants

Corneal transplant activity in the UK by country of residence and NHS regions for the years 2019-2020 and 2020-2021 is detailed in **Table 10.3**. Corneas were supplied by NHSBT and non-NHSBT Eye Banks for corneal transplants in the UK. No adjustments have been made for potential demographic differences in populations. The overall transplant rate was 68.3 pmp in 2019-2020. This fell to 36.0 pmp in 2020-2021. Transplant rates decreased in all countries and NHS regions. England had the highest transplant rate in the UK: 38.5 pmp, and this ranged from 24.8 pmp to 50.3 pmp across the NHS regions.

Table 10.3 Cornea transplants performed per million population (pmp) in the UK, 1 April 2019 - 31 March 2021, by country/NHS region				
Country of residence/ NHS region	Number of transplants (pmp)			
	2019-2020		2020-2021	
North East and Yorkshire	511	(59.4)	250	(29.1)
North West	611	(86.5)	355	(50.3)
Midlands	712	(67.2)	263	(24.8)
East of England	467	(71.5)	276	(42.3)
London	646	(72.1)	392	(43.8)
South East	673	(75.6)	386	(43.4)
South West	359	(63.8)	244	(43.3)
England	3979	(70.7)	2166	(38.5)
Isle of Man	5	(62.5)	0	(0)
Channel Islands	8	(47.1)	2	(11.8)
Wales	169	(53.7)	67	(21.3)
Scotland	282	(51.6)	127	(23.3)
Northern Ireland	64	(33.9)	17	(9.0)
TOTAL¹	4580	(68.3)	2412	(36.0)

¹ Includes UK recipients where the postcode was unspecified and non-UK recipients

Figure 10.2 shows the number of corneal transplants in the UK by indication for transplant from 1 April 2011 to 31 March 2021. For corneas transplanted in 2019-2020 and 2020-2021, a further breakdown by indication is shown in **Table 10.4**.

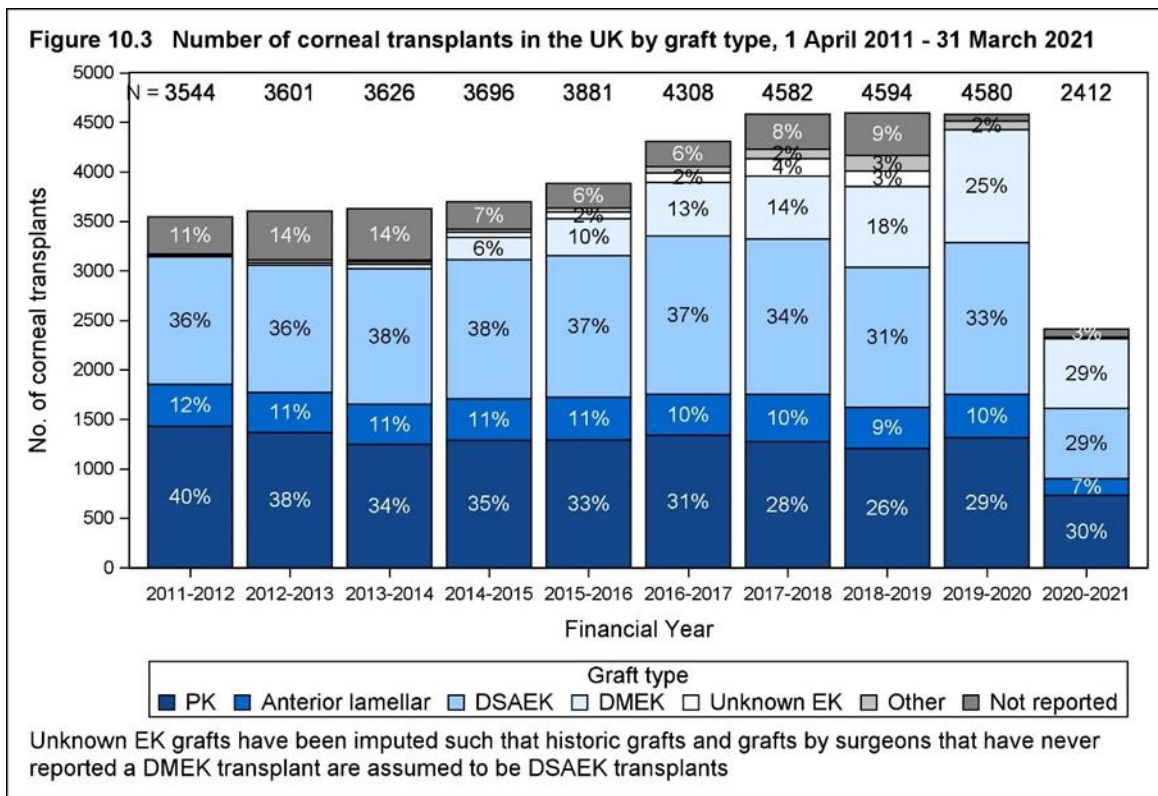


Higher risk indications were prioritised in 2020-2021 due to COVID-19, therefore the proportion of transplants performed for keratoconus (KC) patients reduced from 13% to 9%. There was also a decrease in the proportion of corneal transplants for Fuchs endothelial dystrophy (FED) patients and a slight increase in the proportion of pseudophakic bullous keratopathy (PBK) patients. The proportion of patients with an infection or re-graft has remained stable. The most common indication for transplantation is FED representing 32% of corneal transplants in 2020-2021.

Table 10.4 Corneal transplants in the UK by indication and financial year, 1 April 2019 - 31 March 2021				
Indication for transplant	2019 - 2020		2020 - 2021	
	N	%	N	%
Keratoconus (KC)	610	13.3	214	8.9
Fuchs endothelial dystrophy (FED)	1676	36.6	773	32.0
Pseudophakic bullous keratopathy (PBK)	604	13.2	381	15.8
Infections	308	6.7	187	7.8
Re-grafts	810	17.7	450	18.7
Other (listed below)	572	12.5	407	16.9
Ectasias	16	0.3	15	0.6
Dystrophies	67	1.5	34	1.4
Previous ocular surgery	125	2.7	65	2.7
Injury	61	1.3	35	1.5
Ulcerative keratitis	46	1.0	28	1.2
Opacification	99	2.2	52	2.2
Miscellaneous	130	2.8	106	4.4
Not reported	28	0.6	72	3.0
Total	4580	100.0	2412	100.0

Figure 10.3 shows the number of corneal transplants in the UK by graft type from 1 April 2011 to 31 March 2021. Over the last 10 years, the proportion of penetrating keratoplasty (PK) grafts has reduced by a quarter, whilst the proportion of endothelial keratoplasty (EK) grafts has almost doubled.

Since March 2014, the type of EK graft has been collected on the Ocular Tissue Outcome and Transplant Record form reported to the UK Transplant Registry. Prior to 2019-2020, unknown EK graft types have been imputed such that historic grafts and grafts by surgeons that have never reported a Descemet Membrane EK (DMEK) transplant are assumed to be Descemet Stripping Automated EK (DSAEK) transplants. A further breakdown by graft type for corneas transplanted in 2019-2020 and 2020-2021 is shown in **Table 10.5**.



In 2020-2021, 29.4% of grafts were DSAEK and 29.1% were DMEK grafts. Anterior lamellar transplants dropped to 7.0% of all grafts, likely due to the reduction in corneal transplants for KC patients. PK grafts account for 30.3% of transplants in 2020-2021.

Table 10.5 Corneal transplants in the UK by graft type and financial year, 1 April 2019 - 31 March 2021

Graft type	2019 - 2020		2020 - 2021	
	N	%	N	%
PK	1313	28.7	731	30.3
Anterior lamellar	439	9.6	169	7.0
DSAEK	1533	33.5	710	29.4
DMEK	1141	24.9	702	29.1
Other	87	1.9	18	0.7
Not reported	67	1.5	82	3.4
All grafts	4580	100.0	2412	100.0

Unknown EK grafts have been imputed such that historic grafts and grafts by surgeons that have never reported a DMEK transplant are assumed to be DSAEK transplants

10.4 Demographic characteristics

The age, sex and ethnicity of cornea donors and transplant recipients are shown in **Table 10.6**.

Table 10.6 Demographic characteristics of donors whose corneas were retrieved to NHSBT Eye Banks and transplant recipients in the UK, 1 April 2020 - 31 March 2021						
	Cornea-only donors		Solid organ and cornea donors		Transplant recipients	
	N	%	N	%	N	%
Age group (years)						
0 - 17	11	0.7	2	0.6	30	1.2
18 - 34	32	2.2	28	8.4	184	7.6
35 - 49	101	6.9	67	20.2	247	10.2
50 - 59	174	11.9	109	32.8	262	10.9
60 - 69	302	20.6	80	24.1	450	18.7
70-79	550	37.5	43	13.0	705	29.2
80+	297	20.2	3	0.9	534	22.1
Mean (SD)	68	(13)	54	(13)	65	(18)
Sex						
Male	886	60.4	199	59.9	1241	51.5
Female	581	39.6	133	40.1	1171	48.5
Ethnicity						
White	71	4.8	298	89.8	1955	81.1
Asian	3	0.2	10	3.0	185	7.7
Black	1	0.1	3	0.9	101	4.2
Chinese	0	0.0	0	0.0	11	0.5
Other	3	0.2	1	0.3	21	0.9
Not reported	1389	94.7	20	6.0	139	5.8
TOTAL	1467	100.0	332	100.0	2412	100.0