Kidney Activity

Key messages

The number of patients registered on the kidney transplant list this year fell by 4% from 5,233 to 5,033

- **The number of deceased kidney donors increased by 11% to 1,480**
- **Kidney transplants from living donors increased by 1% to 1,020, while transplants from deceased donors increased by 10% to 2,573**
- **78 kidney transplants were made possible by the paired living kidney donation programme**
- **There were 89 non-directed altruistic living kidney donors, this led to 138 patients benefitting from a living donor transplant**

5.1 Overview

The number of deceased kidney donors increased by 11% in 2017-2018 compared to 2016-2017 and the number of deceased donor kidney transplants increased by 10%. There were 5,033 patients waiting for a kidney transplant at 31 March 2018, and for the 9th year running the number of patients on the national list for a kidney transplant has declined.

A summary of activity for deceased donor kidney transplants and the transplant list at year end for the last ten years is shown in **Figure 5.1**. The number of patients registered on the active transplant list at 31 March 2018 for a kidney only or multi-organ kidney transplant has fallen by 30% since 2009. These registrations include patients suspended on the kidney waiting list but active on the liver waiting list for a combined liver and kidney transplant.

Figure 5.1 **Deceased donor kidney programme in the UK, 1 April 2008 - 31 March 2018, Number of donors, transplants and patients on the active transplant list at 31 March**

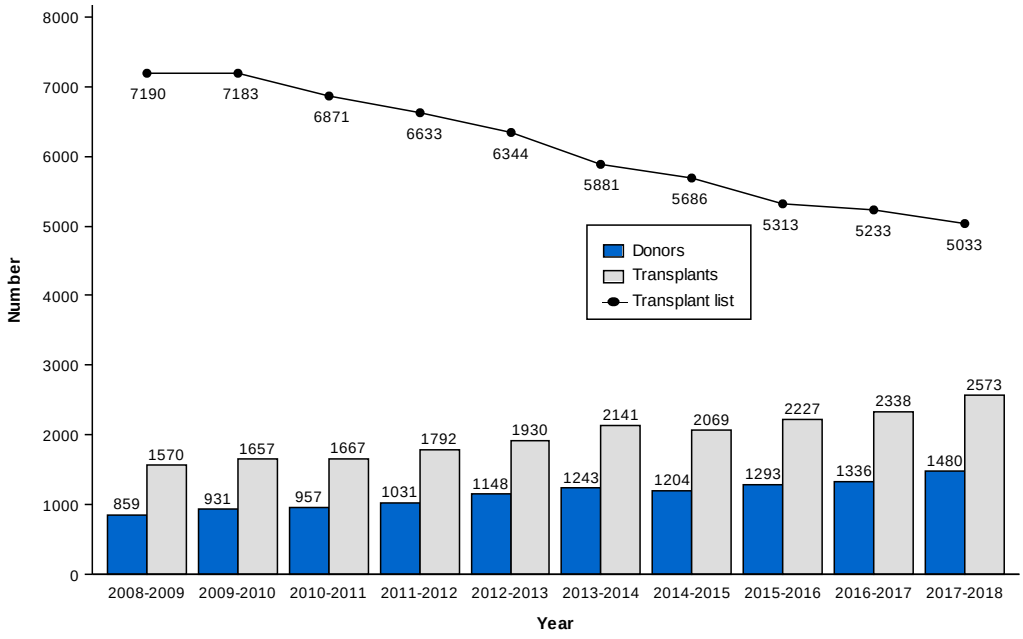


Table 5.1 shows the number of deceased and living donor kidney transplants carried out in 2017-2018 at each centre. As yet, very few kidneys from donors after circulatory death are transplanted in paediatric patients (<18 years). Donation figures for centres in North and South Thames are not reported individually as they have shared designated areas and donor populations. Multi-organ transplants including a kidney are included in the table.

The total number of deceased kidney donors rose to 1,480 in 2017-2018 from 1,336 in 2016-2017 and the number of transplants increased from 2,338 to 2,573. The number of kidney donors after circulatory death increased to 596 from 567 in 2016-2017 and the number of transplants from such donors increased by 6% to 992.

Throughout this chapter, intestinal transplants involving a kidney are not included in the kidney transplant activity reported. Any kidneys retrieved and used for such transplants are however used in the kidney donor activity.

Table 5.1 **Kidney donors and transplants, 1 April 2017 - 31 March 2018 (2016-2017) and transplant list at 31 March 2018 (2017) in the UK, by centre**

Centre	Deceased kidney donors				Deceased donor transplants				Living donor transplants		Active transplant list	
	DBD		DCD		DBD		DCD					
Belfast	24	(31)	14	(10)	38	(35)	28	(10)	65	(79)	91	(120)
Birmingham	54	(47)	48	(44)	111	(96)	53	(31)	67	(65)	346	(413)
Bristol	37	(32)	22	(19)	60	(63)	44	(31)	29	(30)	210	(227)
Cambridge	52	(36)	64	(51)	72	(58)	84	(87)	37	(41)	218	(211)
Cardiff	32	(27)	25	(15)	25	(29)	29	(24)	30	(38)	135	(135)
Coventry[1]	9	(10)	7	(5)	39	(19)	12	(11)	22	(22)	70	(84)
Edinburgh	23	(29)	28	(34)	63	(46)	32	(33)	38	(36)	187	(169)
Glasgow	33	(43)	11	(19)	85	(61)	46	(45)	54	(47)	245	(271)
Great Ormond Street	0	(0)	0	(0)	10	(4)	0	(0)	14	(18)	11	(12)
Leeds	45	(42)	52	(33)	79	(87)	72	(57)	35	(46)	271	(216)
Leicester	9	(10)	16	(10)	43	(59)	32	(25)	27	(26)	171	(154)
Liverpool	60	(46)	22	(32)	47	(35)	34	(38)	42	(41)	161	(155)
Manchester	81	(56)	52	(42)	131	(139)	121	(105)	80	(78)	362	(395)
Newcastle	44	(50)	30	(31)	55	(63)	34	(48)	73	(58)	220	(244)
North Thames[2]	123	(90)	39	(52)	-	-	-	-	-	-	-	-
Royal Free	-	-	-	-	83	(60)	29	(33)	30	(34)	247	(243)
Royal London	-	-	-	-	69	(77)	21	(38)	40	(33)	286	(295)
WLRTC	-	-	-	-	103	(86)	38	(44)	45	(49)	448	(429)
Nottingham	17	(16)	23	(18)	45	(40)	44	(32)	21	(10)	115	(145)
Oxford[1]	33	(34)	21	(25)	120	(97)	80	(72)	49	(54)	258	(273)
Plymouth	28	(19)	19	(19)	23	(18)	19	(22)	22	(17)	89	(90)
Portsmouth	32	(35)	30	(18)	47	(58)	38	(26)	33	(23)	163	(188)
Sheffield	24	(18)	13	(11)	33	(27)	26	(20)	22	(22)	129	(151)
South Thames[2]	124	(98)	60	(79)	-	-	-	-	-	-	-	-
Guy's	-	-	-	-	130	(93)	46	(72)	93	(79)	336	(343)
St George's	-	-	-	-	70	(53)	30	(31)	41	(54)	264	(270)
TOTAL	**884**	**(769)**	**596**	**(567)**	**1581**	**(1403)**	**992**	**(935)**	**1020[3,5]**	**(1012[4,6])**	**5033**	**(5233)**

WLRTC - West London Renal and Transplant Centre
[1] As of 1 June 2016 Coventry and Oxford began working in partnership as a transplant network.
[2] Donor figures in this area cannot be linked to individual transplant centres due to shared retrieval areas.
[3] Includes an additional 6 transplants performed at London Cromwell Hospital and 5 transplants performed at London Bridge
[4] Includes an additional 1 transplant performed at Newcastle, Royal Victoria Infirmary, 1 transplant performed at London Clinic, 1 transplant performed at London Independent, 5 transplants performed at London Cromwell Hospital and 4 transplants performed at London Bridge
[5] Includes 2 domino donor; [6] Includes 1 domino donor

5.2 Transplant list

The number of patients registered on the kidney or kidney and pancreas transplant list fell by 4% in the year: on 31 March 2018, 5,033 patients were registered as active, compared with 5,233 at the end of March 2017. The number of patients waiting for a kidney transplant represents 76.4 patients per million population (pmp).

Of the 5,033 patients on the active transplant list at 31 March 2018, 185 required a kidney and pancreas transplant (195 at 31 March 2017). Additionally, 33 patients were registered for a pancreas only transplant (29 at 31 March 2017).

The outcome of patients registered on the UK kidney and kidney/pancreas transplant list at 1 April 2017, or subsequently registered during the financial year, is shown in **Table 5.2**. A total of 3,779 patients joined the kidney transplant list last year, while a further 211 joined the kidney/pancreas transplant list.

Table 5.2 Kidney transplant list and new registrations in the UK, 1 April 2017 - 31 March 2018

Outcome of patient at 31 March 2017	Active and suspended patients at 1 April 2017		New registrations in 2017-2018[1]		**TOTAL**	
	N	**%**	**N**	**%**	**N**	**%**
Kidney transplant list						
Remained active/suspended	4963	62	2908	77	**7871**	**66**
Transplanted	2462	31	822	22	**3284**	**28**
Removed	414[2]	5	25	1	**439**	**4**
Died	221	3	24	1	**245**	**2**
TOTAL	**8060**		**3779**		**11839**	
Kidney/pancreas transplant list						
Remained active/suspended	158	48	172	82	**330**	**61**
Transplanted	139	42	35	17	**174**	**32**
Removed	15	5	2	1	**17**	**3**
Died	17	5	2	1	**19**	**4**
TOTAL	**329**		**211**		**540**	

[1] Includes re-registrations for second or subsequent transplants
[2] Includes 4 patients removed from kidney list and made active on kidney/pancreas list

Table 5.3 shows the active transplant list in the UK at 31 March 2018 and 2017 by country/ former Strategic Health Authority of patient's residence. In 2018, the overall kidney transplant list rate was 76.4 pmp with rates across the Strategic Health Authorities ranging from 53.9 pmp to 133.4 pmp.

Table 5.3 Active kidney transplant list at 31 March, by Country/ Strategic Health Authority of patient residence

Country/ Strategic Health Authority of residence	Kidney transplant list (pmp) 2018		2017	
North East	195	(73.9)	206	(78.0)
North West	473	(65.5)	520	(72.0)
Yorkshire and The Humber	384	(70.7)	342	(63.0)
North of England	**1052**	**(68.8)**	**1068**	**(69.8)**
East Midlands	325	(68.9)	359	(76.1)
West Midlands	435	(75.0)	509	(87.8)
East of England	377	(61.5)	384	(62.6)
Midlands and East	**1137**	**(68.3)**	**1252**	**(75.2)**
London	**1173**	**(133.4)**	**1129**	**(128.4)**
South East Coast	251	(53.9)	269	(57.7)
South Central	302	(69.4)	356	(81.8)
South West	383	(69.4)	389	(70.5)
South of England	**936**	**(64.4)**	**1014**	**(69.8)**
England	**4298**	**(77.8)**	**4463**	**(80.7)**
Isle of Man	**7**	**(87.5)**	**6**	**(75.0)**
Channel Islands	**9**	**(56.3)**	**11**	**(68.8)**
Wales	**189**	**(60.8)**	**185**	**(59.5)**
Scotland	**430**	**(79.6)**	**437**	**(80.9)**
Northern Ireland	**93**	**(50.0)**	**125**	**(67.2)**
TOTAL[1]	**5033**	**(76.4)**	**5233**	**(79.4)**

[1]Includes patients in 2018 (2017) residing in: Unspecified UK 4 (6); Overseas 3 (0)

An indication of outcomes for adult patients listed for a kidney only transplant is summarised in **Figure 5.2**. This shows the proportion of patients transplanted or still waiting one, three and five years after joining the list. It also shows the proportion removed from the transplant list (typically because they become too unwell for transplant) and those dying while on the transplant list. Only 26% of patients are transplanted within one year, while five years after listing 72% of patients have received a transplant.

The median (average) waiting time for a kidney only transplant has fallen from 864 days reported last year to 782 days for an adult patient and is shown by blood group in **Table 5.4** and patient ethnicity in **Table 5.5**. Because of the need to match donor and recipient blood groups and tissue types, waiting times to transplant differ according to patient blood groups and ethnicity due to differences between the donor pool and patients awaiting a kidney transplant. Note that these waiting times are not adjusted for other relevant factors which may be influential and which may differ across blood or ethnic groups.

Figure 5.2 **Post-registration outcome for 2873 new adult kidney only registrations made in the UK, 1 April 2012 - 31 March 2013**

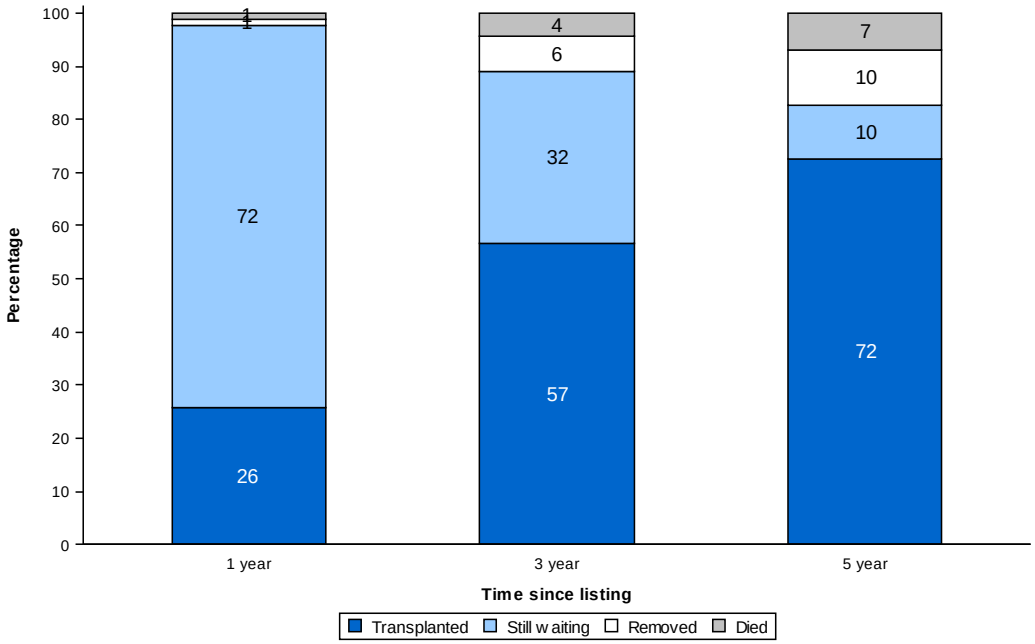


Table 5.4 **Median waiting time to kidney only transplant in the UK, for patients registered 1 April 2011 - 31 March 2015, by blood group**

Blood group	Number of patients registered	Waiting time (days) Median	95% Confidence interval
Adult			
O	4234	957	932 - 982
A	3313	578	557 - 599
B	1344	980	935 - 1025
AB	415	231	183 - 279
TOTAL	**9306**	**782**	**764 - 800**
Paediatric			
O	111	343	258 - 428
A	82	251	170 - 332
B	35	202	114 - 290
AB	15	281	149 - 413
TOTAL	**243**	**277**	**212 - 342**

Table 5.5 Median waiting time to kidney only transplant in the UK, for patients registered 1 April 2011 - 31 March 2015, by ethnicity

Ethnicity	Number of patients registered	Waiting time (days)	
		Median	95% Confidence interval
Adult			
White	6492	723	703 - 743
Asian	1515	891	846 - 936
Black	879	985	926 - 1044
Other	274	871	796 - 946
TOTAL[1]	**9303**	**782**	**764 - 800**
Paediatric			
White	143	228	176 - 280
Asian	68	366	209 - 523
Black	18	323	0 - 668
Other	10	498	181 - 815
TOTAL[2]	**243**	**277**	**212 - 342**

[1] Includes 143 patients whose ethnicity was not reported
[2] Includes 4 patients whose ethnicity was not reported

5.3 Donor and organ supply

Of the 955 organ donors after brain death in the UK in 2017-2018, 884 (93%) were kidney donors. From these donors, 1,748 kidneys were retrieved. There were 596 kidney donors after circulatory death in 2017-2018. From these donors, 1,179 kidneys were retrieved. **Table 5.6** shows this activity by donor country/Strategic Health Authority of donor's residence. No adjustments have been made for potential demographic differences in populations.

The overall rate for kidney donors after brain death is 13.4 pmp, with rates across the Strategic Health Authorities ranging from 9.5 to 19.0 pmp. The number of kidneys retrieved from donors after brain death in the UK is 26.5 pmp and varies from 18.9 to 37.3 pmp.

The overall rate for kidney donors after circulatory death is 9 pmp, with rates across the Strategic Health Authorities ranging from 4.3 to 14.5 pmp. The number of kidneys retrieved from donors after circulatory death is 17.9 pmp and varies from 8.3 to 28.4 pmp.

Table 5.6 Kidney donation and retrieval rates for deceased donors in the UK, 1 April 2017 - 31 March 2018, by Country/ Strategic Health Authority

Country/ Strategic Health Authority of residence	Kidney donors (pmp)				Kidneys retrieved (pmp)			
	DBD		DCD		DBD		DCD	
North East	35	(13.3)	25	(9.5)	69	(26.1)	50	(18.9)
North West	137	(19.0)	77	(10.7)	269	(37.3)	153	(21.2)
Yorkshire and The Humber	64	(11.8)	62	(11.4)	127	(23.4)	124	(22.8)
North of England	**236**	**(15.4)**	**164**	**(10.7)**	**465**	**(30.4)**	**327**	**(21.4)**
East Midlands	45	(9.5)	43	(9.1)	89	(18.9)	86	(18.2)
West Midlands	59	(10.2)	52	(9.0)	117	(20.2)	103	(17.8)
East of England	97	(15.8)	89	(14.5)	193	(31.5)	174	(28.4)
Midlands and East	**201**	**(12.1)**	**184**	**(11.1)**	**399**	**(24.0)**	**363**	**(21.8)**
London	**128**	**(14.6)**	**38**	**(4.3)**	**253**	**(28.8)**	**73**	**(8.3)**
South East Coast	71	(15.2)	41	(8.8)	140	(30.0)	82	(17.6)
South Central	56	(12.9)	38	(8.7)	112	(25.7)	76	(17.5)
South West	66	(12.0)	46	(8.3)	132	(23.9)	91	(16.5)
South of England	**193**	**(13.3)**	**125**	**(8.6)**	**384**	**(26.4)**	**249**	**(17.1)**
England	**758**	**(13.7)**	**511**	**(9.2)**	**1501**	**(27.2)**	**1012**	**(18.3)**
Isle of Man	**-**		**1**	**(12.5)**	**-**		**2**	**(25.0)**
Channel Islands	**2**	**(12.5)**	**-**		**4**	**(25.0)**	**-**	
Wales	**45**	**(14.5)**	**29**	**(9.3)**	**88**	**(28.3)**	**58**	**(18.6)**
Scotland	**56**	**(10.4)**	**41**	**(7.6)**	**110**	**(20.4)**	**79**	**(14.6)**
Northern Ireland	**23**	**(12.4)**	**14**	**(7.5)**	**45**	**(24.2)**	**28**	**(15.1)**
TOTAL[1]	**884**	**(13.4)**	**596**	**(9.0)**	**1748**	**(26.5)**	**1179**	**(17.9)**

[1]Includes 26 donors where the hospital postcode was used in place of an unknown donor postcode

5.4 Transplants

The number of kidney transplants by recipient country/Strategic Health Authority of residence is shown in **Table 5.7**. No adjustments have been made for potential demographic differences in populations. The deceased donor transplant rate ranged from 21.5 to 45.4 pmp across Strategic Health Authorities and overall was 36.1 pmp. The living donor transplant rate ranged from 10.1 to 25.4 pmp across the Strategic Health Authorities and overall was 15.2 pmp.

Table 5.7 Kidney only transplant rates per million population (pmp), in the UK, 1 April 2017 - 31 March 2018, by country and English Strategic Health Authority

Country/ Strategic Health Authority of residence	DBD		DCD		**TOTAL**		Living	
	N	(pmp)	N	(pmp)	N	(pmp)	N	(pmp)
North East	42	(15.9)	27	(10.2)	69	(26.1)	67	(25.4)
North West	151	(20.9)	124	(17.2)	275	(38.1)	119	(16.5)
Yorkshire and The Humber	104	(19.2)	90	(16.6)	194	(35.7)	55	(10.1)
North of England	**297**	**(19.4)**	**241**	**(15.8)**	**538**	**(35.2)**	**241**	**(15.8)**
East Midlands	91	(19.3)	85	(18.0)	176	(37.3)	55	(11.7)
West Midlands	150	(25.9)	71	(12.2)	221	(38.1)	79	(13.6)
East of England	111	(18.1)	96	(15.7)	207	(33.8)	82	(13.4)
Midlands and East	**352**	**(21.1)**	**252**	**(15.1)**	**604**	**(36.3)**	**216**	**(13.0)**
London	**291**	**(33.1)**	**108**	**(12.3)**	**399**	**(45.4)**	**119**	**(13.5)**
South East Coast	71	(15.2)	29	(6.2)	100	(21.5)	77	(16.5)
South Central	99	(22.8)	86	(19.8)	185	(42.5)	66	(15.2)
South West	112	(20.3)	82	(14.9)	194	(35.1)	78	(14.1)
South of England	**282**	**(19.4)**	**197**	**(13.6)**	**479**	**(33.0)**	**221**	**(15.2)**
England	**1222**	**(22.1)**	**798**	**(14.4)**	**2020**	**(36.5)**	**797**	**(14.4)**
Isle of Man	**2**	**(25.0)**	**2**	**(25.0)**	**4**	**(50.0)**	**0**	**(0.0)**
Channel Islands	**6**	**(37.5)**	**2**	**(12.5)**	**8**	**(50.0)**	**4**	**(25.0)**
Wales	**32**	**(10.3)**	**37**	**(11.9)**	**69**	**(22.2)**	**41**	**(13.2)**
Scotland	**133**	**(24.6)**	**75**	**(13.9)**	**208**	**(38.5)**	**92**	**(17.0)**
Northern Ireland	**39**	**(21.0)**	**28**	**(15.1)**	**67**	**(36.0)**	**66**	**(35.5)**
TOTAL[1,2]	**1436**	**(21.8)**	**943**	**(14.3)**	**2379**	**(36.1)**	**797**	**(14.4)**

[1] Excludes 17 recipients of a living donor kidney who reside outside of the UK (17 living donors)
[2] Includes 4 recipients with an unknown UK postcode (3 deceased donors, 1 living donor)

The number of kidney only transplants from deceased donors at each transplant centre is shown in **Table 5.8** for adult patients only. Kidney transplants from donors after brain death include 2 en bloc kidneys and 13 double kidney transplants in 2017-2018 (5 and 17 in 2016-2017). Kidney transplants from donors after circulatory death include 6 en bloc and 26 double kidney transplants in 2017-2018 (8 and 36 in 2016-2017). This table excludes multi-organ transplants: 19 kidney and liver, 168 kidney and pancreas, 4 kidney and islets, and 2 multivisceral.

Table 5.8 Adult kidney only transplants in the UK, 1 April 2016 - 31 March 2018, by transplant centre

Transplant centre	2016-2017 DBD	DCD	Living donor	TOTAL	2017-2018 DBD	DCD	Living donor	TOTAL
Belfast	34	10	74	118	38	27	65	130
Birmingham	82	31	56	169	101	53	61	215
Bristol	55	31	29	115	55	44	28	127
Cambridge	39	79	41	159	55	77	37	169
Cardiff	24	24	35	83	20	27	29	76
Coventry[1]	19	11	22	52	39	12	22	73
Edinburgh	25	33	36	94	48	29	38	115
Glasgow	60	45	43	148	80	46	46	172
Guy's	75	64	68	207	90	40	77	207
Leeds	79	57	44	180	70	72	30	172
Leicester	59	25	26	110	43	32	27	102
Liverpool	35	38	41	114	47	34	42	123
Manchester	118	91	68	277	110	98	68	276
Newcastle	52	48	53	153	45	34	71	150
Nottingham	30	30	8	68	39	44	18	101
Oxford[1]	59	59	54	172	80	72	49	201
Plymouth	18	22	16	56	23	19	22	64
Portsmouth	58	26	23	107	46	38	33	117
Sheffield	27	20	22	69	33	26	21	80
St George's	53	31	54	138	70	30	41	141
The Royal Free	58	33	34	125	82	29	30	141
The Royal London	77	38	33	148	68	21	39	128
WLRTC	82	41	49	172	97	36	45	178
TOTAL	**1218**	**887**	**940[2]**	**3045**	**1379**	**940**	**950[3]**	**3269**

WLRTC - West London Renal and Transplant Centre
[1] As of 1 June 2016 Coventry and Oxford began working in partnership as a transplant network
[2] Includes 1 transplant performed at London Clinic, 1 at London Independent, 5 at London Cromwell Hospital and 4 at London Bridge
[3] Includes an additional 6 transplants performed at London, Cromwell Hospital and 5 transplants performed at London, London Bridge Hospital

Living donor kidney transplants increased by 1% to 1,020 in 2017-2018, representing 28% of the total kidney transplant programme. The total number of living donor adult transplants performed by each transplant centre is shown in **Table 5.9**. Also shown is the number as a percentage of patients listed at the end of the year, to indicate the size of the living donor programme relative to the centre's transplant list.

Most living donor transplants are 'directed'. This means that a kidney is donated to a specific recipient known to the donor - a close family member or friend. There has been a 2% decrease in these transplants. In addition there are now a number of 'undirected' living donor transplants (also known as altruistic donor transplants). Last year 89 such donors donated a kidney to a recipient, 85 transplanted into an adult recipient and 4 transplanted into a paediatric recipient. Of the 89 altruistic donors, 33 went into an altruistic donor chain (17 short (2 transplants each) and 16 long chains (3 transplants each)) benefiting 48 adult and 1 paediatric patient in the paired/pooled scheme. The kidneys from the paired donors of these recipients led to 30 adult and 3 paediatric transplant for patients on the deceased donor transplant list. Thus 33 altruistic donors creating chains benefited 78 adult and 4 paediatric patients in total.

When a potential donor and recipient are biologically incompatible (blood group or tissue type), they may consider joining a list of others in the same situation with the hope that an exchange of kidneys between them can lead to a compatible living donor transplant. The scheme also includes compatible pairs that would like a better match. This type of exchange is known as paired donation and most exchanges are between two pairs (i.e. two donors and their respective incompatible recipients), or between three pairs. In 2017-2018, there were also 78 paired living kidney donor transplants (77 adult and 1 paediatric recipients).

As a percentage of the number of patients on the active transplant list at 31 March 2018, the number of living donor adult transplants in the year was 19% and ranged from 10% to 72% at individual transplant centres.

Table 5.9 Adult living donor kidney transplants in the UK, 1 April 2017 - 31 March 2018, and percentage of active transplant list at 31 March, by transplant centre

	2017-2018				TOTAL	
Transplant centre	Directed	Non-directed (altruistic) to waiting list	Paired/ pooled exchanges	Altruistic donor chain[4]	**N**	**% list**
Belfast	49	0	13	3	**65**	**72**
Birmingham	48	4	2	7	**61**	**19**
Bristol	26	0	0	2	**28**	**14**
Cambridge	33	3	1	0	**37**	**17**
Cardiff	23	2	3	1	**29**	**21**
Coventry[1]	12	0	4	6	**22**	**31**
Edinburgh	29	4	3	2	**38**	**20**
Glasgow	37	3	3	3	**46**	**19**
Guy's	63	4	5	5	**77**	**24**
Leeds	23	2	1	4	**30**	**11**
Leicester	24	0	1	2	**27**	**16**
Liverpool	34	5	3	0	**42**	**26**
Manchester	54	7	2	5	**68**	**19**
Newcastle	55	4	7	5	**71**	**32**
Nottingham	15	0	3	0	**18**	**16**
Oxford[1]	30	4	7	8	**49**	**19**
Plymouth	19	2	0	1	**22**	**25**
Portsmouth	22	4	2	5	**33**	**20**
Sheffield	16	0	3	2	**21**	**16**
St George's	29	1	6	5	**41**	**16**
The Royal Free	23	2	2	3	**30**	**12**
The Royal London	30	1	4	4	**39**	**14**
WLRTC	35	3	2	5	**45**	**10**
TOTAL	**740[2]**	**55[3]**	**77**	**78**	**950[2]**	**19**

WLRTC – West London Renal and Transplant Centre
[1] As of 1 June 2016 Coventry and Oxford began working in partnership as a transplant network
[2] Includes 6 transplants performed at London Cromwell Hospital and 5 transplants performed at London Bridge
[3] Includes 2 domino donor transplants
[4] Includes transplants for paired pooled and deceased donor transplant list patients

Non-directed, altruistic donor kidneys are matched to a suitable recipient on a national basis and thus are rarely used in the transplant centre responsible for the 'work-up' of the donor. The number of non-directed donors according to donor hospital (rather than transplant hospital) and whether the altruistic donor donated as part of a chain within the paired/ pooled scheme or directly to the deceased donor list is shown in **Table 5.10**.

Table 5.10 Altruistic kidney donors in the UK, 1 April 2016 - 31 March 2018, by donor centre

	2016-2017				2017-2018			
Donor centre	Transplant list	Chain	**Total**	**%**	Transplant list	Chain	**Total**	**%**
Belfast	2	2	4	5	0	4	4	4
Birmingham	3	2	5	6	1	1	2	2
Bristol	2	0	2	2	1	0	1	1
Cambridge	4	2	6	7	0	1	1	1
Cardiff	2	0	2	2	3	1	4	4
Coventry[1]	1	0	1	1	2	0	2	2
Edinburgh	9	2	11	13	5	1	6	7
Glasgow	1	4	5	6	1	2	3	3
Guy's	3	1	4	5	5	8	13	15
Leeds	2	0	2	2	6	1	7	8
Leicester	1	0	1	1	1	0	1	1
Liverpool	4	1	5	6	2	2	4	4
Manchester	5	2	7	8	9	1	10	11
Newcastle	1	0	1	1	4	3	7	8
Nottingham	2	2	4	5	0	0	0	0
Oxford[1]	4	2	6	7	5	0	5	6
Plymouth	1	0	1	1	7	3	10	11
Portsmouth	7	0	7	8	1	2	3	3
Sheffield	2	1	3	3	0	1	0	1
St George's	0	2	2	2	0	1	1	1
The Royal Free	0	0	0	0	2	0	2	2
The Royal London	4	1	5	6	0	1	1	1
WLRTC	2	0	2	2	1	0	1	1
Total donors	**62**	**24**	**86**	**100**	**56**	**33**	**89**	**100**

WLRTC – West London Renal and Transplant Centre
[1] As of 1 June 2016 Coventry and Oxford began working in partnership as a transplant network

The number of deceased donor and living donor transplants in paediatric patients (<18 years) performed by each paediatric transplant centre is shown in **Table 5.11**. There were 70 living donor transplants and 60 deceased donor transplants in paediatric patients in 2017-2018. The paediatric transplant list has fallen by 24% from 84 patients at 31 March 2017 to 64 at the end of March 2018.

Occasionally older paediatric patients are listed and/or transplanted at adult kidney transplant centres and these are indicated in **Table 5.11**.

Table 5.11 Paediatric patient kidney transplants in the UK, 1 April 2016 - 31 March 2018, by transplant centre

	2016-2017				2017-2018			
Paediatric transplant centre	DBD	DCD	Living donor	**TOTAL**	DBD	DCD	Living donor	**TOTAL**
Belfast	1	0	5	**6**	0	1	0	**1**
Birmingham	7	0	9	**16**	6	0	6	**12**
Bristol	8	0	1	**9**	5	0	1	**6**
Glasgow	1	0	4	**5**	5	0	8	**13**
Great Ormond Street	4	0	18	**22**	10	0	14	**24**
Guy's	2	0	11	**13**	9	0	16	**25**
Leeds	8	0	2	**10**	4	0	5	**9**
Manchester	6	1	10	**17**	7	2	12	**21**
Newcastle	3	0	5	**8**	2	0	2	**4**
Nottingham	10	2	2	**14**	6	0	3	**9**
Adult centres	2	0	5	**7**	3	0	3	**6**
TOTAL	**52**	**3**	**72[1]**	**127**	**57**	**3**	**70[2]**	**130**

[1] Includes 3 non-directed donor transplants, 2 paired living donor transplants and 2 altruistic donor chains (1 as a patient on transplant list at end of chain, and 1 as part of a paired programme)
[2] Includes 3 non-directed donor transplants, 1 paired living donor transplant and 4 altruistic donor chains (3 as a patient on transplant list at end of chain, and 1 as part of a paired programme)

At 31 March 2018, there were approximately 37,900 recipients with a functioning kidney transplant (including multi-organ transplants) being followed-up as reported to the UK Transplant Registry.

Rates of pre-emptive kidney only transplantation are shown in **Table 5.12**. Of the 3,399 kidney only transplant recipients in 2017-2018, dialysis status at time of transplant was reported for 3,267 (96%). Of these 3,267 transplants, 773 (24%) were carried out in pre-dialysis patients.

Pre-emptive transplants accounted for 29% of all paediatric kidney only transplants with reported dialysis status, compared with 23% of those in adults. Living donor transplants are more likely to be carried out before the need for dialysis than deceased donor transplants: 40% and 12% respectively. This is because a living donor transplant can often be carried out more quickly than a deceased donor kidney transplant as the latter often necessitates a long waiting time.

Table 5.12 Pre-emptive kidney only transplants in the UK, 1 April 2017 - 31 March 2018

	Number of kidney only transplants	Number of transplants with known dialysis status at transplant (% of all)		Percentage of patients transplanted prior to the need for dialysis (of those with known status)
Adult				
Deceased donor transplant	2319	2222	(95.8)	16.5
Living donor transplant	950	919	(96.7)	40.2
Paediatric				
Deceased donor transplant	60	58	(96.7)	22.4
Living donor transplant	70	68	(97.1)	35.3

The length of time that elapses between a kidney being removed from the donor to its transplantation into the recipient is called cold ischaemia time (CIT). Generally, the shorter this time, the more likely the kidney is to work immediately and the better the long-term outcome. The factors which determine CIT include a) transportation of the kidney from the retrieval hospital to the hospital where the transplant is performed, b) the need to tissue type the donor and cross-match the donor and potential recipients, c) the occasional necessity of moving the kidney to another hospital if a transplant cannot go ahead, d) contacting and preparing the recipient for the transplant and e) access to the operating theatre. Median CITs are shown in addition to inter-quartile ranges in **Table 5.13**.

Table 5.13 Median cold ischaemia time for kidney only transplants in the UK, 1 April 2017 - 31 March 2018

	Number of kidney only transplants[1]	Median (hours)	Inter-quartile range[2] Q1	Q3
Adult				
DBD donor transplant	1379	13.1	9.9	16.8
DCD donor transplant	940	12.6	9.6	15.9
Total	**2319**	**12.9**	**9.9**	**16.4**
Paediatric				
DBD donor transplant	57	13.3	10.1	16.8
DCD donor transplant	3	11.1	8.7	13.5
Total	**60**	**13.3**	**10.1**	**16.6**
TOTAL	**2379**	**12.9**	**9.9**	**16.5**

[1] Not all cold ischaemia times are reported
[2] 25% of times are shorter than Q1, 25% are longer than Q3

Kidneys from donors after brain death and some kidneys from donors after cardiothoracic death are allocated on the basis of a national Kidney Allocation Scheme which incorporates HLA matching between donor and recipient. These HLA matches are based on four levels which are described in **Table 5.14**. Patients with 000 HLA-A, B, DR mismatch (Level 1) are prioritised in the scheme, whereas kidneys are rarely transplanted as a Level 4 match. More information about the allocation scheme can be found at www.odt.nhs.uk. **Table 5.15** gives the HLA mismatch group for adult and paediatric patients for DBD donor transplants but also for DCD and living donor transplants. For living donor transplantation, many transplants have a less good HLA match between donor and recipient. Very often there is no genetic relationship between donor and recipient.

Table 5.14 HLA mismatch groups

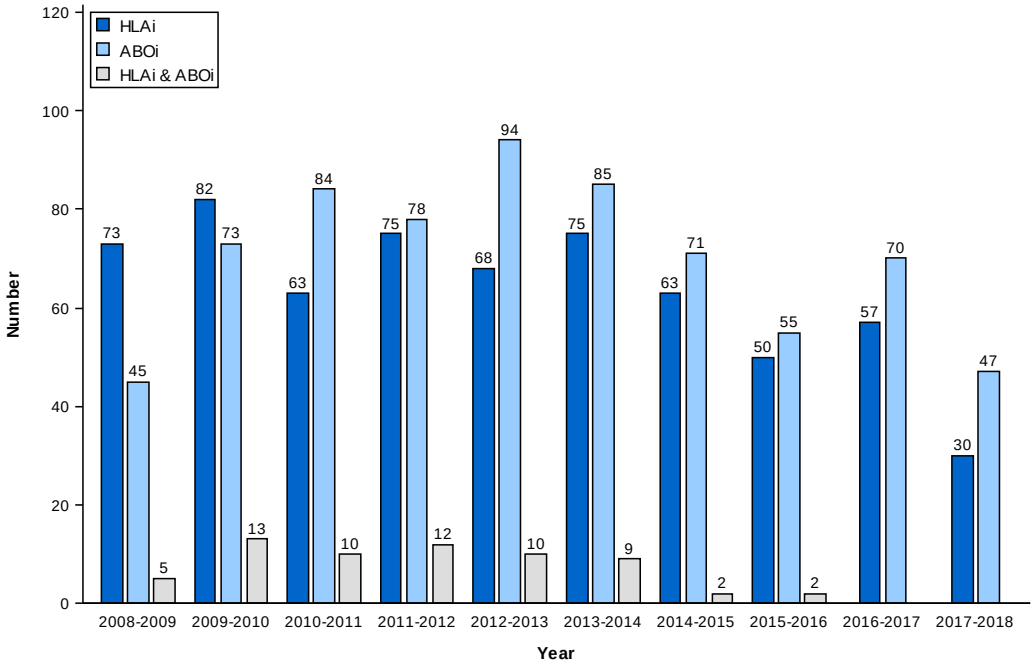
Level	HLA mismatch summary	HLA mismatch combinations included
1	000	000
2	[0 DR and 0/1 B]	100, 010, 110, 200, 210
3	[0 DR and 2 B] or [1 DR and 0/1 B]	020, 120, 220, 001, 101, 201, 011, 111, 211
4	[1 DR and 2 B] or [2 DR]	021, 121, 221, 002, 102, 202, 012, 112, 212, 022, 122, 222

Table 5.15 HLA matching for kidney only transplants in the UK, 1 April 2017 - 31 March 2018

	DBD		DCD		Living	
	N	(%)	N	(%)	N	(%)
Adult						
Level 1 (Best match)	181	(13)	46	(5)	99	(11)
Level 2	524	(38)	257	(27)	133	(15)
Level 3	635	(46)	542	(58)	439	(48)
Level 4	39	(3)	95	(10)	240	(26)
Not reported					39	
Paediatric						
Level 1 (Best match)	2	(4)	0	(0)	7	(11)
Level 2	44	(77)	0	(0)	14	(21)
Level 3	11	(19)	2	(67)	45	(68)
Level 4	0	(0)	1	(33)	0	(0)
Not reported					4	

Often potential living donors and their recipients are HLA or blood group incompatible. Increasingly it is possible to proceed with transplantation across the incompatibilities with appropriate management. The number of HLA and ABO blood group incompatible transplants over the last ten years is shown in **Figure 5.3**. Of the 636 HLA incompatible (HLAi) transplants performed; 201 used kidneys from deceased donors and 435 used living donor kidneys whilst the vast majority of ABO incompatible (ABOi) transplants used living donor kidneys (698 of 702). Due to the nature of reporting HLA incompatible transplants the numbers presented may be subject to change over time.

Figure 5.3 Incompatible kidney only transplants in the UK, 1 April 2008 - 31 March 2018



5.5 Demographic characteristics

The age group, sex, ethnicity and blood group of deceased donors, transplant recipients and patients on the transplant list are shown in **Table 5.16** and for living donors and transplants in **Table 5.17**. Note that all percentages quoted are based only on data where relevant information was available. Changes made to the Kidney Allocation Scheme in 2006 mean that tissue matching criteria between donor and recipient are less strict than previously and waiting time to transplant is now more important than it was in deciding kidney allocation. These changes have an indirect benefit for patients from ethnic minority groups, who are less often a good tissue match with the predominantly white donor pool. As a result, access to transplantation is becoming more equitable.

Table 5.16 Demographic characteristics of deceased kidney donors and transplant recipients, 1 April 2017 - 31 March 2018, and transplant list patients at 31 March

Age group (years)	Donors		Transplant recipients		Active transplant list patients	
	N	(%)	N	(%)	N	(%)
0 - 17	51	(3)	63	(2)	64	(1)
18 - 34	194	(13)	335	(13)	560	(11)
35 - 49	323	(22)	731	(28)	1323	(26)
50 - 59	393	(27)	628	(24)	1490	(30)
60 - 69	323	(22)	589	(23)	1185	(24)
70+	196	(13)	227	(9)	411	(8)
mean (SD)	52	(17)	51	(15)	52	(14)
Male	829	(56)	1602	(62)	2899	(58)
Female	651	(44)	971	(38)	2134	(42)
White	1363	(93)	1815	(72)	3223	(65)
Asian	30	(2)	417	(16)	897	(18)
Black	19	(1)	207	(8)	590	(12)
Chinese	9	(1)	33	(1)	67	(1)
Other	41	(3)	65	(3)	173	(3)
Not reported	18	-	36	-	83	-
O	716	(48)	1126	(44)	2666	(53)
A	577	(39)	975	(38)	1325	(26)
B	138	(9)	336	(13)	924	(18)
AB	49	(3)	136	(5)	118	(2)
First graft			2222	(86)	3805	(76)
Re-graft			351	(14)	1228	(24)
TOTAL	**1480**	**(100)**	**2573**	**(100)**	**5033**	**(100)**

Table 5.17 Demographic characteristics of living kidney donors and transplant recipients, 1 April 2017 - 31 March 2018

Age group (years)	Donors		Transplant recipients	
	N	(%)	N	(%)
0 - 17	0	(0)	70	(7)
18 - 34	148	(15)	227	(22)
35 - 49	373	(37)	307	(30)
50 - 59	305	(30)	237	(23)
60 - 69	164	(16)	132	(13)
70+	30	(3)	47	(5)
mean (SD)	49	(12)	44	(17)
Male	454	(45)	649	(64)
Female	566	(55)	371	(36)
White	895	(88)	845	(85)
Asian	66	(6)	83	(8)
Black	17	(2)	24	(2)
Chinese	9	(1)	10	(1)
Other	31	(3)	38	(4)
Not reported	2		20	
O	591	(58)	420	(41)
A	307	(30)	406	(40)
B	97	(10)	153	(15)
AB	22	(2)	41	(4)
Not reported	3		0	
First graft			858	(84)
Re-graft			162	(16)
TOTAL	**1020**	**(100)**	**1020**	**(100)**