

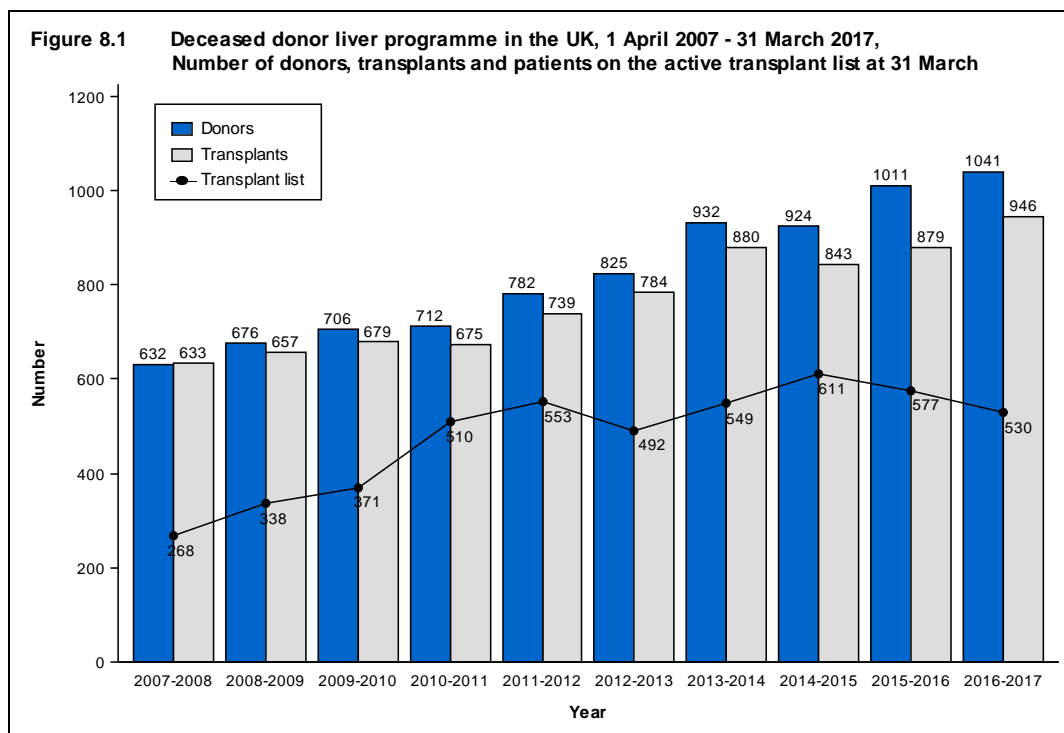
Liver Activity

Key messages

- The number of patients on the active liver transplant list at 31 March 2017 was 530, a fall of 8% from 2016
- The number of liver donors after brain death increased by 4% to 747, while transplants from donors after brain death increased by 10% to 738
- The number of liver donors after circulatory death fell by 1% to 294, while transplants from donors after circulatory death increased by 1% to 208

8.1 Overview

The number of deceased liver donors and transplants in the UK in the last ten years is shown in **Figure 8.1**. Over this period, there has been an increase in the number of patients registered on the active transplant list at 31 March, although this number has fallen in the last two years. The numbers of donors and transplants has steadily increased over the last decade.



Intestinal transplants that used a liver are not included in the liver activity reported. However, any livers retrieved and used for such transplants are included in the liver donor activity. Liver only transplants in intestinal failure patients are included in the liver transplant activity. Intestinal transplant activity is reported in the Chapter 9.

The number of deceased donors, deceased and living donor transplants, and patients on the active transplant list, by centre, is shown in **Table 8.1**. The numbers of liver donors reflect the number of organs retrieved from within each centre's allocation zone (by any retrieval team) rather than the number of retrievals made by that centre. In 2016-2017, 1041 organ donors donated their liver for transplant: 747 donors after brain death and 294 donors after circulatory death. There were 530 patients on the active transplant list at 31 March 2017, a fall of 8% from 2016.

Overall, the number of liver transplants (either whole liver or liver lobe transplants) from donors after brain death increased by 10% to 738, and donors after circulatory death increased by 1% to 208, compared with the previous financial year. Additionally, there were 31 living liver lobe donor transplants in NHS Group 1 (23) and Group 2 (8) paediatric and adult recipients, and 3 domino donor transplants in NHS Group 1 adult recipients.

Patients are prioritised as super-urgent if they require a new liver as soon as possible due to rapid failure of the native organ. Other patients are referred to as elective. There were 76 deceased donor adult super-urgent transplants in 2016-2017, representing 9% of all adult transplants. There were 12 deceased donor paediatric super-urgent transplants in 2016-2017, representing 13% of all paediatric transplants. There was one living donor paediatric super-urgent transplant.

Table 8.1 Deceased and living liver donors and transplants, 1 April 2016 - 31 March 2017 (2015-2016) and transplant list patients at 31 March 2017 (2016) in the UK, by age group and centre

Allocation zone/ transplant centre	Deceased donors ¹						Deceased transplants						Living donor transplants		Active transplant list	
	DBD		DCD		TOTAL		DBD		DCD		TOTAL					
Adult																
Birmingham	151	(144)	48	(64)	199	(208)	142	(141)	54	(58)	196	(199)	5	(6)	86	(115)
Cambridge	62	(58)	44	(43)	106	(101)	68	(56)	34	(34)	102	(90)	0	(0)	37	(59)
Edinburgh	96	(74)	21	(29)	117	(103)	85	(73)	18	(23)	103	(96)	0	(1)	35	(50)
King's College	171	(179)	74	(64)	245	(243)	127	(130)	59	(37)	186	(167)	6	(6)	131	(140)
Leeds	128	(111)	57	(55)	185	(166)	105	(79)	19	(24)	124	(103)	2	(5)	104	(84)
Newcastle	42	(40)	10	(11)	52	(51)	36	(38)	6	(7)	42	(45)	0	(0)	15	(23)
Royal Free	76	(84)	28	(18)	104	(102)	90	(84)	13	(18)	103	(102)	1	(2)	76	(57)
TOTAL	726	(690)	282	(284)	1008	(974)	653	(601)	203	(201)	856	(802)	14²	(20)³	484	(528)
Paediatric																
Birmingham	6	(9)	4	(5)	10	(14)	26	(35)	3	(2)	29	(37)	7	(5)	15	(19)
Cambridge	1	(3)	0	(2)	1	(5)	0	(1)	0	(0)	0	(1)	0	(0)	0	(0)
Edinburgh	1	(5)	1	(0)	2	(5)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
King's College	4	(2)	5	(1)	9	(3)	42	(20)	2	(3)	44	(23)	11	(11)	25	(23)
Leeds	5	(4)	1	(4)	6	(8)	17	(16)	0	(0)	17	(16)	2	(3)	6	(7)
Newcastle	3	(2)	0	(0)	3	(2)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
Royal Free	1	(0)	1	(0)	2	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
TOTAL	21	(25)	12	(12)	33	(37)	85	(72)	5	(5)	90	(77)	20⁴	(19)⁵	46	(49)

¹ Includes donors whose livers were retrieved by other teams

² Includes 7 and 4 living liver lobe transplants, 3 and 0 domino transplants in NHS Group 1 and Group 2 recipients, respectively

³ Includes 11 and 5 living liver lobe transplants, 1 and 0 altruistic donor transplants, and 3 and 0 domino transplants in NHS Group 1 and Group 2 recipients, respectively

⁴ Includes 16 and 4 living liver lobe transplants in NHS Group 1 and Group 2 recipients, respectively

⁵ Includes 15 and 3 living liver lobe transplants, 1 and 0 altruistic donor transplants in NHS Group 1 and Group 2 recipients, respectively

8.2 Transplant list

During 2016-2017, 1,169 patients joined the liver transplant list. Outcomes for patients on the list at 1 April 2016 and those joining the list during the year are shown in **Table 8.2**. There have been 127 (11%) new registrations that were super-urgent.

Table 8.2 Liver transplant list and new registrations in the UK, 1 April 2016 – 31 March 2017						
Outcome of patient at 31 March 2017	Active and suspended patients at 1 April 2016		New registrations in 2016-2017¹		TOTAL	
	N	%	N	%	N	%
Remained active/suspended	164	27	388	33	552	31
Transplanted	324	54	653	56	977	55
Removed	88	15	80	7	168	9
Died	24	4	48	4	72	4
TOTAL	600		1169		1769	

¹ Includes re-registrations for second or subsequent transplants

Table 8.3 shows the transplant list rate per million population in the UK, by country/Strategic Health Authority of patient's residence. At 31 March 2017, the overall rate was 8.1 pmp and ranged from 5.3 to 10.2 pmp across the Strategic Health Authorities.

Table 8.3 Active liver transplant list at 31 March, by country/ Strategic Health Authority of patient residence				
Country/ Strategic Health Authority of residence	Liver transplant list (pmp)			
	2017		2016	
North East	14	(5.3)	18	(6.9)
North West	68	(9.5)	68	(9.5)
Yorkshire and The Humber	55	(10.2)	51	(9.5)
North of England	137	(9.0)	137	(9.0)
East Midlands	25	(5.3)	32	(6.8)
West Midlands	32	(5.6)	47	(8.2)
East of England	44	(7.2)	56	(9.2)
Midlands and East	101	(6.1)	135	(8.2)
London	69	(8.0)	64	(7.4)
South East Coast	47	(10.2)	46	(9.9)
South Central	29	(6.7)	33	(7.6)
South West	40	(7.3)	51	(9.3)
South of England	116	(8.0)	130	(9.0)
England	423	(7.7)	466	(8.5)
Isle of Man	0	(0.0)	1	(12.5)
Channel Islands	0	(0.0)	1	(6.3)
Wales	25	(8.1)	21	(6.8)
Scotland	37	(6.9)	53	(9.9)
Northern Ireland	30	(16.2)	21	(11.4)
TOTAL¹	530	(8.1)	577	(8.8)

¹ Includes patients in 2017 (2016) resident in: UK unknown – 4 (0); Republic of Ireland - 3 (4); Overseas - 8 (10)

An indication of longer term outcomes for patients listed for a liver transplant is summarised in **Figure 8.2**. This shows the proportion of patients transplanted or still waiting six months, one year and two years after joining the transplant list. It also shows the proportion removed from the transplant list and those dying while on the transplant list (which includes those patients removed due to condition deteriorated). At one year post-registration, 67% of patients had received a liver transplant while 11% of patients had died whilst waiting or had been removed due to their condition deteriorating. 6% had been removed for other reasons such as the patient's condition improving, as a result of non-compliance or at the request of the patient or family.

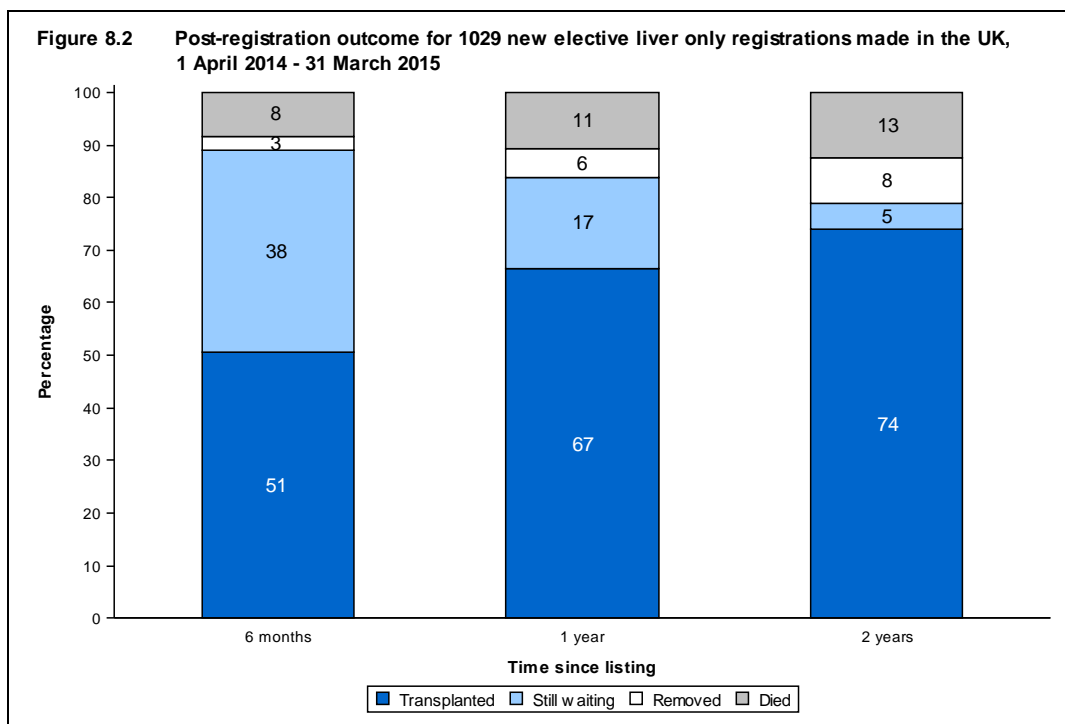


Table 8.4 and **Table 8.5** show the median waiting time to liver transplant for adult and paediatric elective registrations, separately, including a breakdown by blood group and ethnicity for adult elective registrations only. On average, adult patients wait 138 days for a transplant while paediatric patients wait an average of 92 days. 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.

Blood group	Number of patients registered	Waiting time (days)	
		Median	95% Confidence interval
Adult			
O	1269	234	211 - 257
A	1036	87	77 - 97
B	313	133	105 - 161
AB	85	51	36 - 66
TOTAL	2703	138	127 - 149
Paediatric	203	92	68 - 116

Table 8.5 Median waiting time to liver transplant in the UK, for patients registered 1 April 2012 - 31 March 2015			
Ethnicity	Number of patients registered	Waiting time (days)	
		Median	95% Confidence interval
Adult			
White	2388	142	130 - 154
Asian	185	118	85 - 151
Black	74	150	99 - 201
Other	56	92	53 - 131
TOTAL	2703	138	127 - 149
Paediatric	203	92	68 - 116

8.3 Donor and organ supply

Of the 1413 organ donors, 1041 (74%) donated their liver and 882 (85%) of these donated livers were used; see **Table 8.6**. Of livers retrieved from donors after brain death and donors after circulatory death, 90% and 71% were transplanted, respectively. One liver can be used in more than one transplant, see **Table 8.9**.

Table 8.6 Deceased liver donation and retrieval in the UK, 1 April 2016 - 31 March 2017, by allocation zone												
Allocation zone	Number of donors						Number of livers retrieved (used)					
	Solid organ			Liver			DBD			DCD		TOTAL
	DBD	DCD	TOTAL	DBD	DCD	TOTAL	DBD	DCD	TOTAL	DBD	DCD	
Birmingham	164	115	279	157	52	209	157	(146)	52	(41)	209	(187)
Cambridge	76	74	150	63	44	107	63	(58)	44	(33)	107	(91)
Edinburgh	115	74	189	97	22	119	97	(90)	22	(17)	119	(107)
King's College	188	129	317	175	79	254	175	(144)	79	(50)	254	(194)
Leeds	151	113	264	133	58	191	133	(128)	58	(44)	191	(172)
Newcastle	50	28	78	45	10	55	45	(38)	10	(8)	55	(46)
Royal Free	85	51	136	77	29	106	77	(70)	29	(15)	106	(85)
TOTAL	829	584	1413	747	294	1041	747	(674)	294	(208)	1041	(882)

The rates per million population (pmp) for liver donors are shown in **Table 8.7** by donor country/Strategic Health Authority of residence. No adjustments have been made for potential demographic differences in populations. The overall deceased liver donor rate was 15.9 pmp in 2016-2017 and varied across the Strategic Health Authorities from 10.7 pmp to 21.8 pmp.

Table 8.7 Liver donor rates in the UK, 1 April 2016 - 31 March 2017, by country/ Strategic Health Authority						
Country/ Strategic Health Authority	DBD		Deceased donors (pmp) DCD		Total	
	North East	47	(17.9)	10	(3.8)	57
North West	77	(10.7)	32	(4.5)	109	(15.2)
Yorkshire and The Humber	50	(9.3)	20	(3.7)	70	(13.0)
North of England	174	(11.5)	62	(4.1)	236	(15.5)
East Midlands	34	(7.3)	16	(3.4)	50	(10.7)
West Midlands	68	(11.8)	21	(3.7)	89	(15.5)
East of England	65	(10.7)	48	(7.9)	113	(18.6)
Midlands and East	167	(10.1)	85	(5.1)	252	(15.3)
London	87	(10.0)	30	(3.5)	117	(13.5)
South East Coast	70	(15.1)	31	(6.7)	101	(21.8)
South Central	47	(10.9)	24	(5.6)	71	(16.4)
South West	63	(11.5)	26	(4.8)	89	(16.3)
South of England	180	(12.5)	81	(5.6)	261	(18.1)
England	608	(11.1)	258	(4.7)	866	(15.8)
Isle of Man	2	(25.0)	0	(0.0)	2	(25.0)
Channel Islands	4	(25.0)	1	(6.3)	5	(31.3)
Wales	38	(12.3)	15	(4.8)	53	(17.1)
Scotland	67	(12.5)	18	(3.4)	85	(15.8)
Northern Ireland	28	(15.1)	2	(1.1)	30	(16.2)
TOTAL¹	747	(11.4)	294	(4.5)	1041	(15.9)

¹ Includes 13 donors where the hospital postcode was used in place of an unknown donor postcode

8.4 Transplants

The number of liver transplants by recipient country/Strategic Health Authority of residence are shown in **Table 8.8**. No adjustments have been made for potential demographic differences in populations. The deceased donor transplant rate ranged from 10 to 16.9 pmp across the Strategic Health Authorities and overall was 14.2 pmp.

Table 8.8 Liver transplant rates per million population (pmp) in the UK, 1 April 2016 - 31 March 2017, by country/ Strategic Health Authority								
Country/ Strategic Health Authority	Deceased transplants (pmp)						Living transplants (pmp)	
	DBD		DCD		Total			
North East	28	(10.7)	5	(1.9)	33	(12.6)	0	(0.0)
North West	87	(12.1)	24	(3.3)	111	(15.5)	3	(0.4)
Yorkshire and The Humber	61	(11.3)	10	(1.9)	71	(13.2)	2	(0.4)
North of England	176	(11.6)	39	(2.6)	215	(14.2)	5	(0.3)
East Midlands	35	(7.5)	12	(2.6)	47	(10.0)	0	(0.0)
West Midlands	69	(12.0)	20	(3.5)	89	(15.5)	2	(0.3)
East of England	76	(12.5)	27	(4.4)	103	(16.9)	1	(0.2)
Midlands and East	180	(10.9)	59	(3.6)	239	(14.5)	3	(0.2)
London	82	(9.5)	23	(2.7)	105	(12.1)	1	(0.1)
South East Coast	42	(9.1)	18	(3.9)	60	(13.0)	0	(0.0)
South Central	44	(10.2)	14	(3.2)	58	(13.4)	2	(0.5)
South West	59	(10.8)	18	(3.3)	77	(14.1)	4	(0.7)
South of England	145	(10.1)	50	(3.5)	195	(13.5)	6	(0.4)
England	583	(10.6)	171	(3.1)	754	(13.8)	15	(0.3)
Isle of Man	2	(25.0)	0	(0.0)	2	(25.0)	1	(12.5)
Channel Islands	1	(6.3)	0	(0.0)	1	(6.3)	0	(0.0)
Wales	25	(8.1)	11	(3.5)	36	(11.6)	1	(0.3)
Scotland	98	(18.2)	19	(3.5)	117	(21.8)	0	(0.0)
Northern Ireland	14	(7.6)	5	(2.7)	19	(10.3)	4	(2.2)
TOTAL^{1,2}	725	(11.1)	206	(3.2)	931	(14.2)	22³	(0.3)

¹ Excludes 27 recipients who reside outside the UK (13 DBD, 2 DCD, 12 Living)
² Includes 3 recipients in the UK with an unknown postcode
³ Includes 3 domino donor transplants

The number of whole, reduced and split liver transplants by urgency status of the transplant (elective, super-urgent) in 2016-2017 is shown in **Table 8.9**. The term 'reduced' is used when only one lobe of the liver is transplanted and the term 'split' applies when both lobes of the liver are transplanted into two different recipients.

Overall, the number of deceased donor liver transplants increased by 8% in 2016-2017. There were 946 deceased donor liver transplants performed in 2016-2017: 814 whole liver, including 10 liver and kidney; 120 split liver, including 2 liver and kidney; and 12 deceased liver lobe, including 2 liver and kidney. Split liver transplants accounted for 91% of liver lobe transplant activity.

Table 8.9 Deceased liver transplants performed in the UK, 1 April 2015 - 31 March 2017

Transplant centre	2015 - 2016								2016 - 2017							
	Whole liver		Reduced liver		Split liver		TOTAL		Whole liver		Reduced liver		Split liver		TOTAL	
	E	SU	E	SU	E	SU	E	SU	E	SU	E	SU	E	SU	E	SU
Birmingham	172	22	4	0	34	4	210	26	174	15	6	1	27	2	207	18
Cambridge	75	11	1	0	4	0	80	11	85	7	0	0	10	0	95	7
Edinburgh	84	10	0	0	2	0	86	10	92	6	0	0	5	0	97	6
King's College	148	14	2	3	21	2	171	19	167	14	1	3	41	4	209	21
Leeds	87	13	3	1	11	4	101	18	110	14	1	0	14	2	125	16
Newcastle	36	8	0	0	1	0	37	8	38	3	0	0	1	0	39	3
Royal Free	84	14	0	1	2	1	86	16	72	17	0	0	14	0	86	17
TOTAL	686	92	10	5	75	11	771	108	738	76	8	4	112	8	858	88

E=Elective, SU=Super-urgent
Birmingham, King's College and Leeds transplant paediatric patients

The length of time that elapses between a liver being removed from the donor to its transplantation into the recipient is called the cold ischaemia time (CIT). Generally, the shorter this time, the more likely the liver is to work immediately and the better the long-term outcome. In 2016-2017, the median CIT for a DBD donor whole liver only transplant was 8.5 hours (Inter-Quartile (IQ) range 6.8 – 10.4) and for a DCD donor whole liver only transplant was 7.5 hours (IQ range 6.6 - 8.8) and overall is 8.2 hours (IQ range 6.7 - 10).

At 31 March 2017 there were approximately 9,700 recipients with a functioning liver transplant (or multi-organ including the liver) being followed-up as reported to the UK Transplant Registry.

8.5 Demographic characteristics

The age group, sex, ethnicity and blood group of liver donors, transplant recipients and transplant list patients are shown in **Table 8.10**.

Table 8.10 Demographic characteristics of deceased liver donors and transplant recipients 1 April 2016 - 31 March 2017, and transplant list patients at 31 March in the UK						
Age group (years)	Donors		Transplant recipients		Active transplant list patients	
	N	(%)	N	(%)	N	(%)
0 - 17	46	(4)	93	(10)	47	(9)
18 - 34	159	(15)	119	(13)	70	(13)
35 - 49	245	(24)	187	(20)	91	(17)
50 - 59	240	(23)	262	(28)	173	(33)
60 - 69	220	(21)	271	(29)	141	(27)
70+	131	(13)	14	(1)	8	(2)
mean (SD)	50	(17)	47	(19)	47	(18)
Male	594	(57)	594	(63)	298	(56)
Female	447	(43)	352	(37)	232	(44)
White	964	(94)	815	(86)	444	(84)
Asian	17	(2)	84	(9)	54	(10)
Black	18	(2)	32	(3)	18	(3)
Chinese	4	(0)	6	(1)	1	(0)
Other	27	(3)	8	(1)	12	(2)
Not reported	11		1		1	
O	496	(48)	415	(44)	337	(64)
A	439	(42)	402	(42)	107	(20)
B	90	(9)	94	(10)	84	(16)
AB	16	(2)	35	(4)	2	(0)
First graft			849	(90)	484	(91)
Re-graft			97	(10)	46	(9)
TOTAL	1041	(100)	946	(100)	530	(100)