

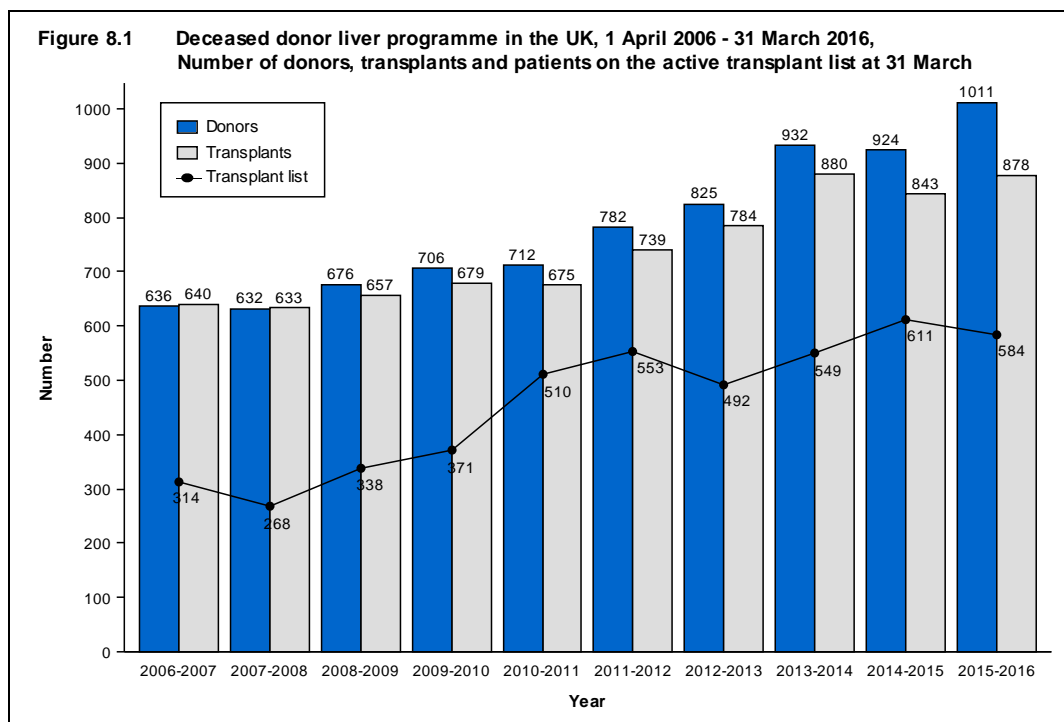
Liver Activity

Key messages

- The number of patients on the active liver transplant list at 31 March 2016 was 584, a fall of 4% from 2015
- The number of liver donors after brain death increased by 5% to 715, while transplants from donors after brain death increased by 1% to 672
- The number of liver donors after circulatory death increased by 23% to 296, while transplants from donors after circulatory death increased by 16% to 206

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 a steady increase in the number of patients registered on the active transplant list at 31 March, despite a small fall in the last year, and a recent increase in the numbers of donors and transplants.



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 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 zone (by any retrieval team) rather than the number of retrievals made by that centre. In 2015-2016, 1011 organ donors donated their liver for transplant: 715 donors after brain death and 296 donors after circulatory death. There were 584 patients on the active transplant list at 31 March 2016, a fall of 4% from 2015.

Overall, the number of liver transplants (whole liver or liver lobe transplants) from donors after brain death increased by 1% to 672, and transplants from donors after circulatory death increased by 16% to 206, compared with the previous financial year. Additionally, there were 36 living liver lobe donor transplants in NHS Group 1 (28) and Group 2 (8) paediatric and adult recipients, and 3 domino donor transplants in NHS Group 1 (3) adult recipients. 2 of the donors were altruistic non-directed donors.

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 94 deceased donor adult super-urgent transplants in 2015-2016, representing 12% of all adult transplants. There were 13 deceased donor paediatric super-urgent transplants in 2015-2016, representing 17% of all paediatric transplants.

Table 8.1 Deceased and living liver donors and transplants, 1 April 2015 - 31 March 2016 (2014-2015) and transplant list patients at 31 March 2016 (2015) 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	144	(140)	64	(63)	208	(203)	141	(143)	58	(49)	199	(192)	6	(2)	115	(129)
Cambridge	58	(71)	43	(27)	101	(98)	56	(59)	34	(28)	90	(87)	0	(0)	59	(59)
Edinburgh	74	(93)	29	(20)	103	(113)	72	(82)	23	(15)	95	(97)	1	(0)	57	(47)
King's College	179	(166)	64	(52)	243	(218)	130	(147)	37	(39)	167	(186)	6	(9)	140	(147)
Leeds	111	(105)	55	(43)	166	(148)	79	(75)	24	(22)	103	(97)	5	(8)	84	(86)
Newcastle	40	(31)	11	(8)	51	(39)	38	(30)	7	(5)	45	(35)	0	(0)	23	(27)
Royal Free	84	(61)	18	(19)	102	(80)	84	(72)	18	(15)	102	(87)	2	(1)	57	(71)
TOTAL	690	(667)	284	(232)	974	(899)	600	(608)	201	(173)	801	(781)	20²	(20)³	535	(566)
Paediatric																
Birmingham	9	(8)	5	(1)	14	(9)	35	(23)	2	(0)	37	(23)	5	(4)	19	(21)
Cambridge	3	(3)	2	(0)	5	(3)	1	(0)	0	(0)	1	(0)	0	(0)	0	(0)
Edinburgh	5	(1)	0	(2)	5	(3)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
King's College	2	(3)	1	(3)	3	(6)	20	(29)	3	(4)	23	(33)	11	(8)	23	(18)
Leeds	4	(0)	4	(1)	8	(1)	16	(6)	0	(0)	16	(6)	3	(8)	7	(6)
Newcastle	2	(1)	0	(0)	2	(1)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
Royal Free	0	(1)	0	(1)	0	(2)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
TOTAL	25	(17)	12	(8)	37	(25)	72	(58)	5	(4)	77	(62)	19⁴	(20)⁵	49	(45)

¹ Includes donors whose livers were retrieved by other teams

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

³ Includes 9 and 9 living liver lobe transplants, 2 and 0 domino transplants in NHS Group 1 and Group 2 recipients, respectively

⁴ Includes 15 and 3 living liver lobe transplants, 1 and 0 altruistic donor transplants in NHS Group 1 and Group 2 recipients, respectively

⁵ Includes 17 and 3 living liver lobe transplants in NHS Group 1 and Group 2 recipients, respectively

8.2 Transplant list

During 2015-2016, 1,161 patients joined the liver transplant list. Outcomes for patients on the list at 1 April 2015 and those joining the list during the year are shown in **Table 8.2**. There have been 137 (12%) new registrations that were super-urgent.

Table 8.2 Liver transplant list and new registrations in the UK, 1 April 2015 – 31 March 2016						
Outcome of patient at 31 March 2016	Active and suspended patients at 1 April 2015		New registrations in 2015-2016 ¹		TOTAL	
	N	%	N	%	N	%
Remained active/suspended	183	29	421	36	604	34
Transplanted	303	49	614	53	917	51
Removed	105	17	74	6	179	10
Died	30	5	52	4	82	5
TOTAL	621		1161		1782	

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 2016, the overall rate was 9 pmp and ranged from 6.9 to 10 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)			
	2016		2015	
North East	18	(6.9)	20	(7.6)
North West	68	(9.5)	64	(9.0)
Yorkshire and The Humber	51	(9.5)	51	(9.5)
North of England	137	(9.1)	135	(8.9)
East Midlands	32	(6.9)	25	(5.4)
West Midlands	47	(8.2)	65	(11.4)
East of England	56	(9.3)	65	(10.8)
Midlands and East	135	(8.2)	155	(9.5)
London	64	(7.5)	90	(10.5)
South East Coast	46	(10.0)	46	(10.0)
South Central	33	(7.7)	21	(4.9)
South West	51	(9.4)	47	(8.7)
South of England	130	(9.1)	114	(8.0)
England	466	(8.6)	494	(9.1)
Isle of Man	1	(12.5)	1	(12.5)
Channel Islands	1	(6.3)	1	(6.3)
Wales	21	(6.8)	22	(7.1)
Scotland	60	(11.2)	52	(9.7)
Northern Ireland	21	(11.4)	21	(11.4)
TOTAL¹	584	(9.0)	611	(9.4)

¹ Includes patients in 2016 (2015) resident in: Republic of Ireland - 4 (2); Overseas - 10 (18)

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 their condition deteriorating). At one year post-registration, 73% of patients had received a liver transplant while 9% of patients had died whilst waiting or had been removed due to their condition deteriorating. 4% 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.

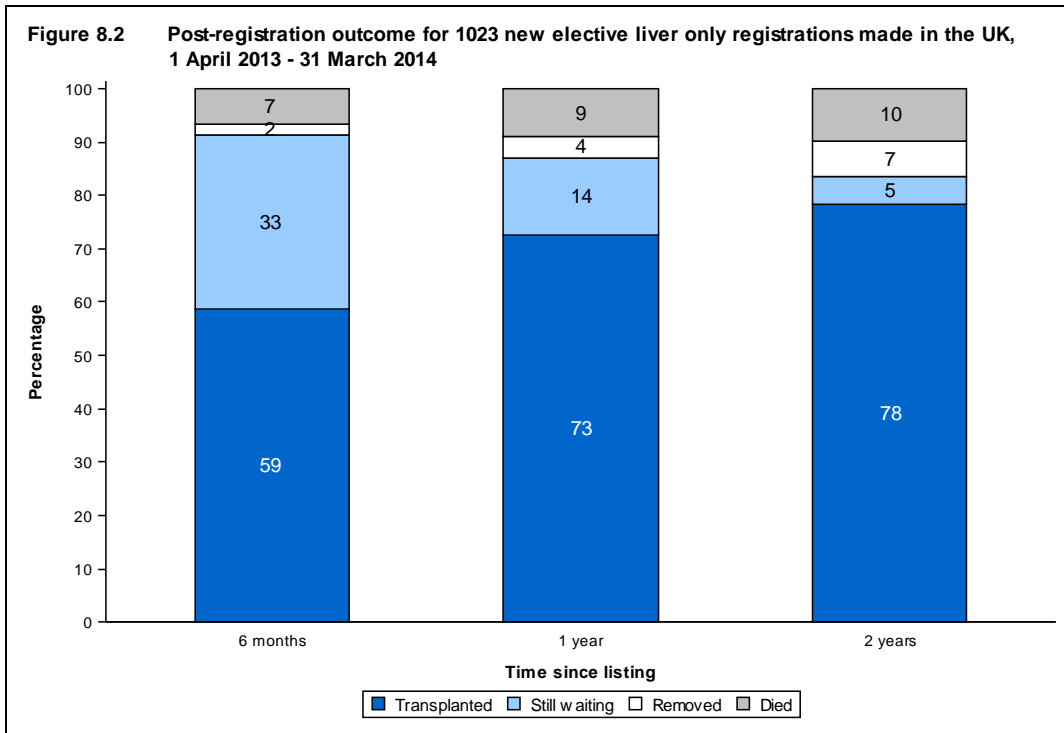


Table 8.4 and **Table 8.5** show the median waiting time to liver transplant for adult and paediatric elective registrations, separately, including a breakdown by blood group and ethnicity for adult elective registrations only. On average, adult patients wait 135 days for a transplant while paediatric patients wait an average of 82 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	1192	243	218 - 268
A	1005	84	75 - 93
B	299	129	97 - 161
AB	87	56	27 - 85
TOTAL	2583	135	124 - 146
Paediatric	204	82	58 - 106

Table 8.5 Median waiting time to liver transplant in the UK, for patients registered 1 April 2011 - 31 March 2014			
Ethnicity	Number of patients registered	Waiting time (days)	
		Median	95% Confidence interval
Adult			
White	2271	135	124 - 146
Asian	185	133	87 - 179
Black	68	182	49 - 315
Other	59	80	46 - 114
TOTAL	2583	135	124 - 146
Paediatric	204	82	58 - 106

8.3 Donor and organ supply

Of the 1,364 deceased organ donors, 1,011 (74%) donated their liver and 843 (83%) of these donated livers were used; see **Table 8.6**. Of livers retrieved from donors after brain death and donors after circulatory death, 89% and 70% 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 2015 - 31 March 2016, 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						
Birmingham	162	120	282	153	69	222	153	(139)	69	(51)	222	(190)
Cambridge	63	84	147	61	45	106	61	(57)	45	(28)	106	(85)
Edinburgh	88	65	153	79	29	108	79	(71)	29	(24)	108	(95)
King's College	206	128	334	181	65	246	181	(149)	65	(36)	246	(185)
Leeds	128	107	235	115	59	174	115	(108)	59	(47)	174	(155)
Newcastle	47	33	80	42	11	53	42	(39)	11	(6)	53	(45)
Royal Free	91	42	133	84	18	102	84	(74)	18	(14)	102	(88)
TOTAL	785	579	1364	715	296	1011	715	(637)	296	(206)	1011	(843)

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 15.6 pmp in 2015-2016 and varied across the Strategic Health Authorities from 11.4 pmp to 20.9 pmp.

Table 8.7 Liver donor rates in the UK, 1 April 2015 - 31 March 2016, by country/ Strategic Health Authority						
Country/ Strategic Health Authority	DBD		Deceased donors (pmp)		Total	
			DCD			
North East	35	(13.4)	13	(5.0)	48	(18.3)
North West	71	(10.0)	37	(5.2)	108	(15.1)
Yorkshire and The Humber	57	(10.6)	20	(3.7)	77	(14.4)
North of England	163	(10.8)	70	(4.6)	233	(15.4)
East Midlands	42	(9.1)	27	(5.8)	69	(14.9)
West Midlands	57	(10.0)	19	(3.3)	76	(13.3)
East of England	60	(10.0)	40	(6.6)	100	(16.6)
Midlands and East	159	(9.7)	86	(5.3)	245	(15.0)
London	76	(8.9)	21	(2.5)	97	(11.4)
South East Coast	70	(15.3)	26	(5.7)	96	(20.9)
South Central	53	(12.4)	18	(4.2)	71	(16.6)
South West	76	(14.0)	27	(5.0)	103	(19.0)
South of England	199	(13.9)	71	(5.0)	270	(18.9)
England	597	(11.0)	248	(4.6)	845	(15.6)
Isle of Man	1	(12.5)	1	(12.5)	2	(25.0)
Channel Islands	2	(12.5)	0	(0)	2	(12.5)
Wales	36	(11.7)	18	(5.8)	54	(17.5)
Scotland	52	(9.7)	25	(4.7)	77	(14.4)
Northern Ireland	27	(14.7)	4	(2.2)	31	(16.8)
TOTAL¹	715	(11.0)	296	(4.6)	1011	(15.6)

¹ Includes 12 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 8.6 to 17.7 pmp across the Strategic Health Authorities and overall was 13.3 pmp.

Table 8.8 Liver transplant rates per million population (pmp) in the UK, 1 April 2015 - 31 March 2016, by country/ Strategic Health Authority								
Country/ Strategic Health Authority	Deceased transplants (pmp)						Living transplants (pmp)	
	DBD		DCD		Total			
North East	34	(13.0)	5	(1.9)	39	(14.9)	1	(0.4)
North West	68	(9.5)	26	(3.6)	94	(13.2)	5	(0.7)
Yorkshire and The Humber	51	(9.5)	12	(2.2)	63	(11.8)	4	(0.7)
North of England	153	(10.1)	43	(2.8)	196	(13.0)	10	(0.7)
East Midlands	38	(8.2)	10	(2.2)	48	(10.3)	1	(0.2)
West Midlands	71	(12.4)	30	(5.3)	101	(17.7)	5	(0.9)
East of England	56	(9.3)	30	(5.0)	86	(14.3)	3	(0.5)
Midlands and East	165	(10.1)	70	(4.3)	235	(14.4)	9	(0.5)
London	93	(10.9)	25	(2.9)	118	(13.8)	5	(0.6)
South East Coast	34	(7.4)	9	(2.0)	43	(9.4)	2	(0.4)
South Central	30	(7.0)	7	(1.6)	37	(8.6)	0	(0.0)
South West	44	(8.1)	9	(1.7)	53	(9.8)	0	(0.0)
South of England	108	(7.6)	25	(1.7)	133	(9.3)	2	(0.1)
England	519	(9.6)	163	(3.0)	682	(12.6)	26	(0.5)
Isle of Man	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Channel Islands	2	(12.5)	1	(6.3)	3	(18.8)	0	(0.0)
Wales	36	(11.7)	8	(2.6)	44	(14.2)	0	(0.0)
Scotland	79	(14.8)	23	(4.3)	102	(19.1)	3	(0.6)
Northern Ireland	24	(13.0)	9	(4.9)	33	(17.9)	1	(0.5)
TOTAL¹	660	(10.2)	204	(3.1)	864	(13.3)	30²	(0.5)

¹ Excludes 23 recipients who reside outside the UK (12 DBD, 2 DCD, 9 Living)
² Includes 3 domino donor transplants

The number of whole, reduced and split liver transplants by urgency status of the transplant (elective, super-urgent) in 2015-2016 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 dropped by 4% in 2015-2016. There were 878 deceased donor liver transplants performed in 2015-2016: 777 whole liver, including 19 liver and kidney, and 1 liver and heart; and 101 deceased donor liver lobe, including 6 liver and kidney. Split liver transplants accounted for 85% of liver lobe transplant activity.

Table 8.9 Deceased liver transplants performed in the UK, 1 April 2014 - 31 March 2016

Transplant centre	2014 - 2015								2015 - 2016							
	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	164	23	1	1	25	1	190	25	173	21	4	0	34	4	211	25
Cambridge	72	9	0	0	5	1	77	10	75	11	1	0	4	0	80	11
Edinburgh	85	8	0	0	4	0	89	8	83	10	0	0	2	0	85	10
King's College	154	24	1	7	27	6	182	37	148	14	2	3	21	2	171	19
Leeds	88	10	0	0	5	0	93	10	87	13	3	1	11	4	101	18
Newcastle	28	5	0	0	2	0	30	5	36	8	0	0	1	0	37	8
Royal Free	70	13	0	0	4	0	74	13	84	14	0	1	2	1	86	16
TOTAL	661	92	2	8	72	8	735	108	686	91	10	5	75	11	771	107

E=Elective, SU=Super-urgent
 Birmingham, King's College and Leeds transplant paediatric patients
 Super-urgent registration categories were changed on 17 June 2015 to account for development in treatment of patients with acute liver failure

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 2015-2016, the median CIT for a DBD donor whole liver only transplant was 9.0 hours (Inter-Quartile (IQ) range 7.0 – 12.0) and for a DCD donor whole liver only transplant was 7.9 hours (IQ range 6.1 – 10.2) and overall is 8.5 hours (IQ range 6.7 – 11.7).

At 31 March 2016 there were approximately 9,200 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 is shown in **Table 8.10**.

Table 8.10 Demographic characteristics of deceased liver donors and transplant recipients 1 April 2015 - 31 March 2016, 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	(5)	78	(9)	50	(9)
18 - 34	156	(15)	90	(10)	76	(13)
35 - 49	240	(24)	180	(21)	118	(20)
50 - 59	242	(24)	293	(33)	171	(29)
60 - 69	213	(21)	220	(25)	159	(27)
70+	114	(11)	17	(2)	10	(2)
mean (SD)	50	(17)	48	(18)	47	(18)
Male	545	(54)	535	(61)	337	(58)
Female	466	(46)	343	(39)	247	(42)
White	958	(95)	753	(86)	505	(86)
Asian	22	(2)	83	(9)	50	(9)
Black	15	(1)	22	(3)	18	(3)
Chinese	3	(0)	8	(1)	1	(0)
Other	12	(1)	12	(1)	10	(2)
Not reported	1					
O	473	(47)	355	(40)	375	(64)
A	420	(42)	393	(45)	126	(22)
B	95	(9)	98	(11)	80	(14)
AB	23	(2)	32	(4)	3	(1)
First graft			790	(90)	531	(91)
Re-graft			88	(10)	53	(9)
TOTAL	1011	(100)	878	(100)	584	(100)