

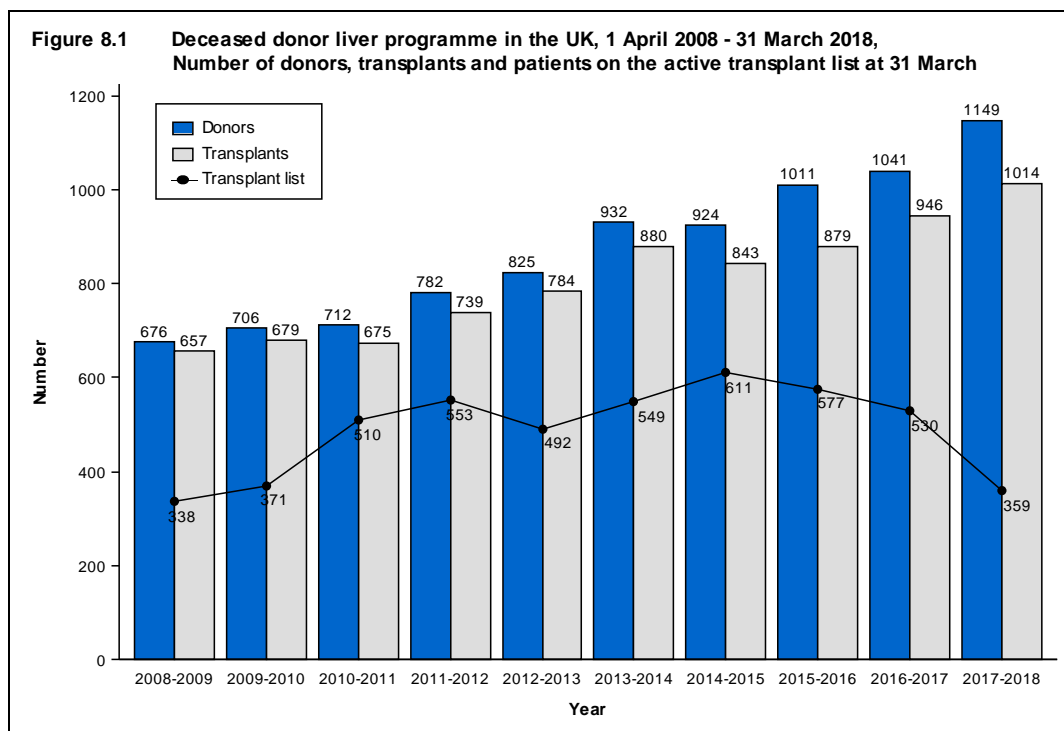
Liver Activity

Key messages

- On 20 March 2018, the new National Liver Offering Scheme (NLOS) was introduced for offering livers from donors after brain death
- The number of patients on the active liver transplant list at 31 March 2018 was 359, a fall of 32% from 2017
- The number of liver donors after brain death increased by 14% to 850, while transplants from donors after brain death increased by 10% to 814
- The number of liver donors after circulatory death increased by 1% to 299, while transplants from donors after circulatory death fell by 4% to 200

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 2017-2018, 1,149 organ donors donated their liver for transplant: 850 donors after brain death and 299 donors after circulatory death. There were 359 patients on the active transplant list at 31 March 2018, a fall of 32% from 2017.

Overall, the number of liver transplants (either whole liver or liver lobe transplants) from donors after brain death increased by 10% to 814, and donors after circulatory death fell by 4% to 200, compared with the previous financial year. Additionally, there were 29 living liver lobe donor transplants in NHS Group 1 (20) and Group 2 (9) paediatric and adult recipients, and 1 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 100 deceased donor adult super-urgent transplants in 2017-2018, representing 11% of all adult transplants. There were 13 deceased donor paediatric super-urgent transplants in 2017-2018, representing 16% 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 2017 - 31 March 2018 (2016-2017) and transplant list patients at 31 March 2018 (2017) 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	158	(151)	55	(48)	213	(199)	155	(142)	52	(54)	207	(196)	0	(5)	86	(86)
Cambridge	86	(62)	49	(44)	135	(106)	84	(68)	33	(34)	117	(102)	0	(0)	26	(37)
Edinburgh	87	(96)	19	(21)	106	(117)	90	(85)	13	(18)	103	(103)	0	(0)	33	(35)
King's College	205	(171)	64	(74)	269	(245)	151	(127)	51	(59)	202	(186)	5	(6)	91	(131)
Leeds	161	(127)	70	(58)	231	(185)	126	(104)	25	(20)	151	(124)	3	(2)	40	(104)
Newcastle	29	(42)	11	(10)	40	(52)	32	(36)	5	(6)	37	(42)	0	(0)	8	(15)
Royal Free	106	(76)	18	(28)	124	(104)	102	(90)	14	(13)	116	(103)	2	(1)	41	(76)
TOTAL	832	(725)	286	(283)	1118	1008)	740	(652)	193	(204)	933	(856)	10²	(14)³	325	(484)
Paediatric																
Birmingham	2	(6)	3	(4)	5	(10)	21	(26)	1	(3)	22	(29)	3	(7)	6	(15)
Cambridge	2	(1)	3	(0)	5	(1)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
Edinburgh	1	(1)	0	(1)	1	(2)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
King's College	5	(4)	6	(5)	11	(9)	34	(42)	6	(2)	40	(44)	12	(11)	21	(25)
Leeds	6	(5)	1	(1)	7	(6)	18	(17)	0	(0)	18	(17)	5	(2)	7	(6)
Newcastle	1	(3)	0	(0)	1	(3)	1	(0)	0	(0)	1	(0)	0	(0)	0	(0)
Royal Free	1	(1)	0	(1)	1	(2)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
TOTAL	18	(21)	13	(12)	31	(33)	74	(85)	7	(5)	81	(90)	20⁴	(20)⁵	34	(46)

¹ Includes donors whose livers were retrieved by other teams

² Includes 4 and 5 living liver lobe transplants, and 1 and 0 domino transplants in NHS Group 1 and Group 2 recipients, respectively

³ Includes 7 and 4 living liver lobe 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 16 and 4 living liver lobe transplants in NHS Group 1 and Group 2 recipients, respectively

8.2 Transplant list

During 2017-2018, 1,169 patients joined the liver transplant list. Outcomes for patients on the list at 1 April 2017 and those joining the list during the year are shown in **Table 8.2**. There have been 136 (12%) new registrations that were super-urgent.

Table 8.2 Liver transplant list and new registrations in the UK, 1 April 2017 – 31 March 2018						
Outcome of patient at 31 March 2018	Active and suspended patients at 1 April 2017		New registrations in 2017-2018¹		TOTAL	
	N	%	N	%	N	%
Remained active/suspended	130	24	314	27	444	26
Transplanted	301	55	736	63	1037	60
Removed	100	18	76	7	176	10
Died	15	3	43	4	58	3
TOTAL	546		1169		1715	

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 2018, the overall rate was 5.4 pmp and ranged from 2.3 to 7.1 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)			
	2018		2017	
North East	6	(2.3)	14	(5.3)
North West	29	(4.0)	68	(9.4)
Yorkshire and The Humber	29	(5.3)	55	(10.1)
North of England	64	(4.2)	137	(9.0)
East Midlands	21	(4.4)	25	(5.3)
West Midlands	41	(7.1)	32	(5.5)
East of England	31	(5.1)	44	(7.2)
Midlands and East	93	(5.6)	101	(6.1)
London	44	(5.0)	69	(7.8)
South East Coast	26	(5.6)	48	(10.3)
South Central	23	(5.3)	29	(6.7)
South West	29	(5.3)	40	(7.2)
South of England	78	(5.4)	117	(8.1)
England	279	(5.0)	424	(7.7)
Isle of Man	0	(0.0)	0	(0.0)
Channel Islands	1	(6.3)	0	(0.0)
Wales	14	(4.5)	25	(8.0)
Scotland	36	(6.7)	37	(6.9)
Northern Ireland	23	(12.4)	30	(16.1)
TOTAL¹	359	(5.4)	530	(8.0)

¹ Includes patients in 2018 (2017) resident in: UK unknown 0 (3)
Republic of Ireland - 1 (3); Overseas - 5 (8)

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, 70% of patients had received a liver transplant while 10% 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.

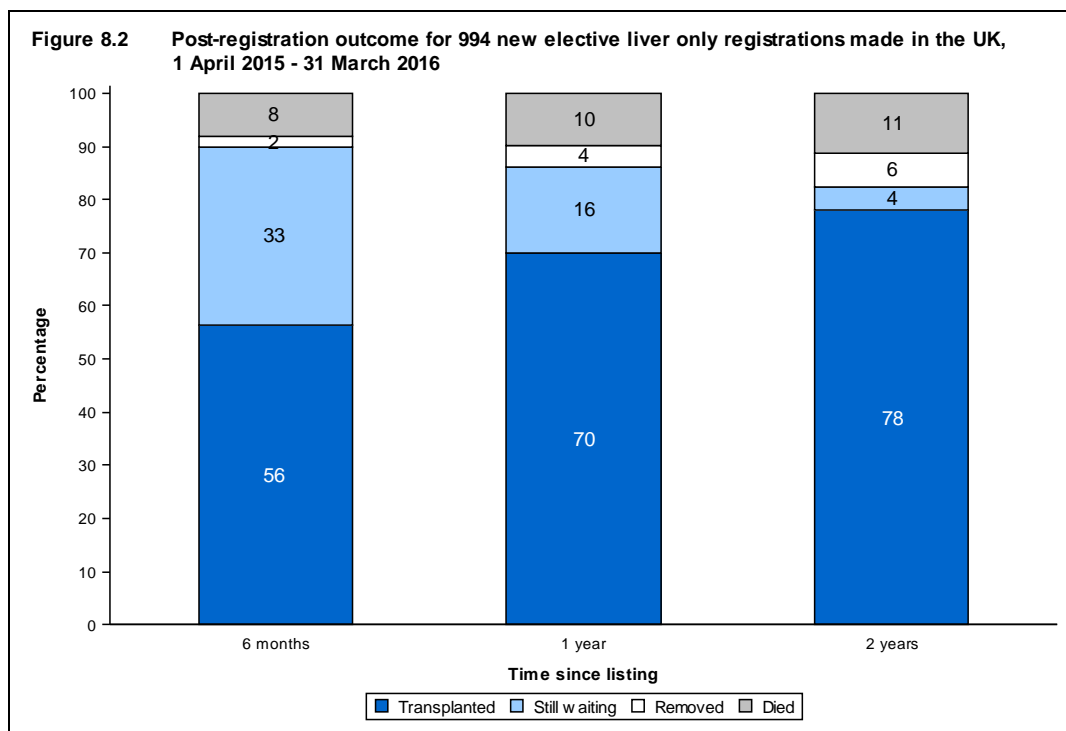


Table 8.4 and **Table 8.5** show the median waiting time to liver transplant for adult and paediatric elective registrations, separately, including a breakdown by blood group and ethnicity for adult elective registrations only. On average, adult patients wait 130 days for a transplant while paediatric patients wait an average of 107 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	1274	208	186 - 230
A	1032	78	70 - 86
B	310	173	130 - 216
AB	90	56	29 - 83
TOTAL	2706	130	120 - 140
Paediatric	214	107	79 - 135

Table 8.5 Median waiting time to liver transplant in the UK, for patients registered 1 April 2013 - 31 March 2016, by ethnicity			
Ethnicity	Number of patients registered	Waiting time (days)	
		Median	95% Confidence interval
Adult			
White	2376	132	121 - 143
Asian	199	118	93 - 143
Black	78	150	51 - 249
Other	51	75	34 - 116
TOTAL¹	2706	130	120 - 140
Paediatric	214	107	79 - 135

¹ Includes 2 patients whose ethnicity was not reported

8.3 Donor and organ supply

On 20 March 2018, the new National Liver Offering Scheme was introduced to offer livers from donors after brain death. This change introduced a national waiting list for all adult liver patients and liver offering for these donors are now made on a patient basis. For donors after circulatory death, the allocation scheme has not changed from centre based offering.

Of the 1,574 organ donors, 1,149 (73%) donated their liver and 975 (85%) of these donated livers were used; see **Table 8.6**. Of livers retrieved from donors after brain death and donors after circulatory death, 91% and 67% 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 2017 - 31 March 2018, 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	176	120	296	160	58	218	160	(149)	58	(42)	218 (191)
Cambridge	97	90	187	88	52	140	88	(81)	52	(35)	140 (116)
Edinburgh	96	60	156	88	19	107	88	(85)	19	(14)	107 (99)
King's College	240	134	374	210	70	280	210	(183)	70	(44)	280 (227)
Leeds	189	153	342	167	71	238	167	(156)	71	(50)	238 (206)
Newcastle	39	28	67	30	11	41	30	(22)	11	(6)	41 (28)
Royal Free	118	34	152	107	18	125	107	(98)	18	(10)	125 (108)
TOTAL	955	619	1574	850	299	1149	850	(774)	299	(201)	1149 (975)

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 17.4 pmp in 2017-2018 and varied across the Strategic Health Authorities from 13.6 pmp to 24.6 pmp.

Table 8.7 Liver donor rates in the UK, 1 April 2017 - 31 March 2018, by Country/ Strategic Health Authority						
Country/ Strategic Health Authority	DBD		Deceased donors (pmp) DCD		Total	
	North East	28	(10.6)	9	(3.4)	37
North West	122	(16.9)	38	(5.3)	160	(22.2)
Yorkshire and The Humber	61	(11.2)	35	(6.4)	96	(17.7)
North of England	211	(13.8)	82	(5.4)	293	(19.2)
East Midlands	46	(9.7)	18	(3.8)	64	(13.6)
West Midlands	57	(9.8)	26	(4.5)	83	(14.3)
East of England	99	(16.2)	52	(8.5)	151	(24.6)
Midlands and East	202	(12.1)	96	(5.8)	298	(17.9)
London	127	(14.4)	19	(2.2)	146	(16.6)
South East Coast	70	(15.0)	21	(4.5)	91	(19.5)
South Central	51	(11.7)	19	(4.4)	70	(16.1)
South West	64	(11.6)	27	(4.9)	91	(16.5)
South of England	185	(12.7)	67	(4.6)	252	(17.3)
England	725	(13.1)	264	(4.8)	989	(17.9)
Isle of Man	0	(0.0)	1	(12.5)	1	(12.5)
Channel Islands	1	(6.3)	0	(0.0)	1	(6.3)
Wales	44	(14.1)	15	(4.8)	59	(19.0)
Scotland	59	(10.9)	14	(2.6)	73	(13.5)
Northern Ireland	21	(11.3)	5	(2.7)	26	(14.0)
TOTAL¹	850	(12.9)	299	(4.5)	1149	(17.4)

¹ Includes 14 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 10.3 to 17.8 pmp across the Strategic Health Authorities and overall was 15.1 pmp.

Table 8.8 Liver transplant rates per million population (pmp) in the UK, 1 April 2017 - 31 March 2018, by Country/ Strategic Health Authority								
Country/ Strategic Health Authority	Deceased transplants (pmp)						Living transplants (pmp)	
	DBD		DCD		Total			
North East	27	(10.2)	3	(1.1)	30	(11.4)	2	(0.8)
North West	93	(12.9)	23	(3.2)	116	(16.1)	3	(0.4)
Yorkshire and The Humber	77	(14.2)	9	(1.7)	86	(15.8)	2	(0.4)
North of England	197	(12.9)	35	(2.3)	232	(15.2)	7	(0.5)
East Midlands	40	(8.5)	17	(3.6)	57	(12.1)	2	(0.4)
West Midlands	78	(13.4)	25	(4.3)	103	(17.8)	0	(0.0)
East of England	77	(12.6)	27	(4.4)	104	(17.0)	0	(0.0)
Midlands and East	195	(11.7)	69	(4.1)	264	(15.9)	2	(0.1)
London	103	(11.7)	18	(2.0)	121	(13.8)	5	(0.6)
South East Coast	58	(12.4)	18	(3.9)	76	(16.3)	1	(0.2)
South Central	38	(8.7)	7	(1.6)	45	(10.3)	2	(0.5)
South West	52	(9.4)	17	(3.1)	69	(12.5)	1	(0.2)
South of England	148	(10.2)	42	(2.9)	190	(13.1)	4	(0.3)
England	643	(11.6)	164	(3.0)	807	(14.6)	18	(0.3)
Isle of Man	2	(25.0)	0	(0.0)	2	(25.0)	0	(0.0)
Channel Islands	1	(6.3)	0	(0.0)	1	(6.3)	1	(6.3)
Wales	34	(10.9)	11	(3.5)	45	(14.5)	1	(0.3)
Scotland	93	(17.2)	14	(2.6)	107	(19.8)	0	(0.0)
Northern Ireland	24	(12.9)	5	(2.7)	29	(15.6)	0	(0.0)
TOTAL^{1,2}	801	(12.2)	194	(2.9)	995	(15.1)	21³	(0.3)

¹ Excludes 28 recipients who reside outside the UK (13 DBD, 6 DCD, 9 Living).
² Includes 4 recipients in the UK with an unknown postcode.
³ Includes 1 domino donor transplants.

The number of whole, reduced and split liver transplants by urgency status of the transplant (elective, super-urgent) in 2017-2018 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 7% in 2017-2018. There were 1,014 deceased donor liver transplants performed in 2017-2018: 912 whole liver, including 18 liver and kidney, 1 liver and heart, 1 liver and lung; 91 split liver, including 3 liver and kidney; and 11 deceased liver lobe, including 1 liver and kidney. Split liver transplants accounted for 89% of liver lobe transplant activity.

Table 8.9 Deceased liver transplants performed in the UK, 1 April 2016 - 31 March 2018																	
Transplant centre	2016 - 2017							2017 - 2018							TOTAL		
	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	174	15	6	1	27	2	207	18	180	22	3	2	21	1	204	25	
Cambridge	85	7	0	0	10	0	95	7	102	13	0	0	2	0	104¹	13	
Edinburgh	92	6	0	0	5	0	97	6	90	9	0	0	4	0	94	9	
King's College	167	14	1	3	41	4	209	21	184	17	1	3	34	3	219	23	
Leeds	110	14	1	0	14	2	125	16	131	17	2	0	15	4	148	21	
Newcastle	38	3	0	0	1	0	39	3	34	4	0	0	0	0	34	4	
Royal Free	72	17	0	0	14	0	86	17	92	17	0	0	6	1	98	18	
TOTAL	738	76	8	4	112	8	858	88	813	99	6	5	82	9	901	113	

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
¹ Includes 1 urgent heart/liver transplant and 1 super-urgent lung/liver transplant

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 2017-2018, the median CIT for a DBD donor whole liver only transplant was 8.3 hours (Inter-Quartile (IQ) range 6.7 – 10.2) and for a DCD donor whole liver only transplant was 7.5 hours (IQ range 6.3 - 8.7) and overall is 8.1 hours (IQ range 6.5 – 9.9).

At 31 March 2018 there were approximately 10,100 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 2017 - 31 March 2018, 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	45	(4)	86	(8)	37	(10)
18 - 34	175	(15)	132	(13)	57	(16)
35 - 49	254	(22)	173	(17)	81	(23)
50 - 59	292	(25)	312	(31)	103	(29)
60 - 69	228	(20)	286	(28)	78	(22)
70+	155	(13)	25	(2)	3	(1)
mean (SD)	51	(17)	48	(18)	45	(18)
Male	626	(54)	603	(59)	222	(62)
Female	523	(46)	411	(41)	137	(38)
White	1048	(92)	873	(86)	309	(87)
Asian	25	(2)	69	(7)	27	(8)
Black	22	(2)	28	(3)	12	(3)
Chinese	6	(1)	9	(1)	0	(0)
Other	34	(3)	31	(3)	6	(2)
Not reported	14	-	4	-	5	-
O	589	(51)	475	(47)	210	(58)
A	429	(37)	389	(38)	87	(24)
B	103	(9)	117	(12)	49	(14)
AB	28	(2)	33	(3)	13	(4)
First graft			922	(91)	309	(86)
Re-graft			92	(9)	50	(14)
TOTAL	1149	(100)	1014	(100)	359	(100)