

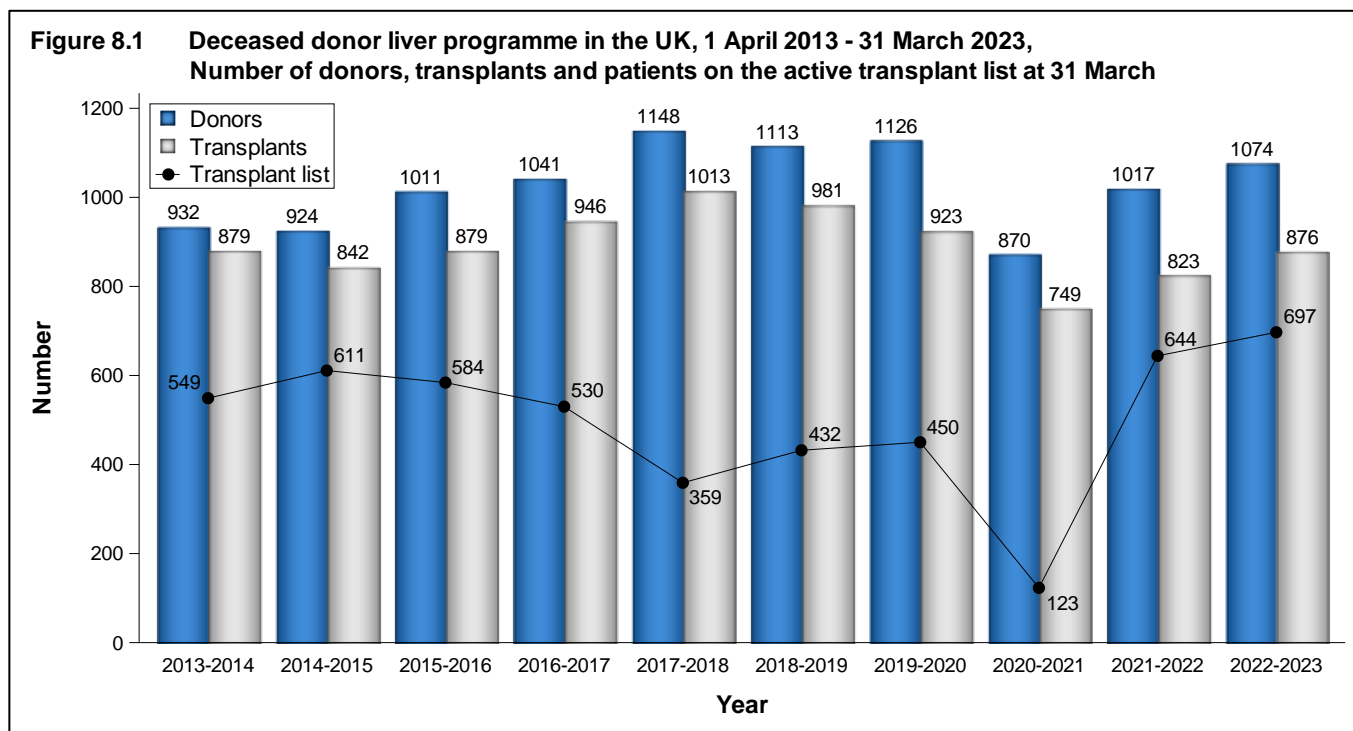
# Liver Activity

## Key messages

- The number of patients on the active liver transplant list at 31 March 2023 was 697, an increase of 8% from 2022.
- The number of liver donors after brain death fell by 1% to 700, while transplants from donors after brain death fell by 5 (0.8%) to 624
- The number of liver donors after circulatory death increased by 21% to 374, while transplants from donors after circulatory death increased by 30% to 252 which was the highest ever number of DCD liver transplants performed in a financial year

## 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**. There has been a decrease in the number of patients registered on the active liver transplant list between 2013-2014 and 2019-2020. However, this number has increased to 697 patients active in March 2023, higher than pre-pandemic levels. The numbers of donors and transplants has steadily increased over the last decade although both have slightly decreased over the last three years.



Intestinal transplants that used a liver are not included in the liver transplant 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 centre's allocation zone (by any retrieval team) rather than the number of retrievals made by that centre. In 2022-2023, 1074 organ donors donated their liver for transplant: 700 donors after brain death and 374 donors after circulatory death. There were 697 patients on the active transplant list at 31 March 2023, an increase of 8% from 31 March 2022.

Overall, the number of liver transplants (either whole liver or liver lobe transplants) from donors after brain death fell by 5 to 624, and donors after circulatory death increased by 30% to 252, compared with the previous financial year. Additionally, there were 35 living liver lobe donor transplants (NHS Group 1: 21 and Group 2: 14).

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. In 2022-2023, there were 97 deceased donor adult super-urgent transplants, representing 12% of all adult deceased donor transplants and 24 deceased donor paediatric super-urgent transplants, representing 28% of all paediatric deceased donor transplants.

**Table 8.1 Deceased and living liver donors and transplants, 1 April 2022 - 31 March 2023 (2021-2022) and transplant list patients at 31 March 2023 (2022) in the UK, by age group and centre**

Allocation zone/ transplant centre	Deceased donors <sup>1</sup>						Deceased donor transplants						Living donor transplants		Active transplant list	
	DBD		DCD		TOTAL		DBD		DCD		TOTAL					
<b>Adult</b>																
Birmingham	134	(140)	79	(64)	213	(204)	136	(140)	57	(26)	193	(166)	0	(0)	189	(186)
Cambridge	64	(65)	55	(53)	119	(118)	55	(53)	55	(49)	110	(102)	0	(0)	57	(52)
Edinburgh	85	(84)	46	(32)	131	(116)	45	(42)	26	(18)	71	(60)	0	(0)	51	(38)
King's College	162	(176)	86	(75)	248	(251)	115	(142)	51	(46)	166	(188)	1	(0)	195	(166)
Leeds	141	(127)	59	(44)	200	(171)	86	(73)	26	(15)	112	(88)	6	(4)	91	(80)
Newcastle	35	(36)	14	(12)	49	(48)	22	(28)	14	(13)	36	(41)	0	(0)	24	(28)
Royal Free	63	(67)	25	(19)	88	(86)	86	(76)	17	(25)	103	(101)	1	(0)	50	(59)
<b>TOTAL</b>	<b>684</b>	<b>(695)</b>	<b>364</b>	<b>(299)</b>	<b>1048</b>	<b>(994)</b>	<b>545</b>	<b>(554)</b>	<b>246</b>	<b>(192)</b>	<b>791</b>	<b>(746)</b>	<b>15<sup>2,6</sup></b>	<b>(11)<sup>3,7</sup></b>	<b>657</b>	<b>(609)</b>
<b>Paediatric</b>																
Birmingham	5	(9)	4	(0)	9	(9)	27	(28)	1	(1)	28	(29)	0	(0)	10	(3)
Cambridge	4	(1)	0	(0)	4	(1)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
Edinburgh	2	(0)	1	(1)	3	(1)	1	(0)	0	(0)	1	(0)	0	(0)	0	(0)
King's College	4	(3)	5	(6)	9	(9)	33	(28)	5	(1)	38	(29)	13	(8)	23	(19)
Leeds	1	(0)	0	(2)	1	(2)	18	(19)	0	(0)	18	(19)	7	(5)	6	(12)
Newcastle	0	(0)	0	(1)	0	(1)	0	(0)	0	(0)	0	(0)	0	(0)	1	(1)
Royal Free	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)
<b>TOTAL</b>	<b>16</b>	<b>(13)</b>	<b>10</b>	<b>(10)</b>	<b>26</b>	<b>(23)</b>	<b>79</b>	<b>(75)</b>	<b>6</b>	<b>(2)</b>	<b>85</b>	<b>(77)</b>	<b>20<sup>4</sup></b>	<b>(14)<sup>5,8</sup></b>	<b>40</b>	<b>(35)</b>

<sup>1</sup> Includes donors whose livers were retrieved by other teams

<sup>2</sup> Includes 8 and 7 living liver lobe transplants in NHS Group 1 and Group 2 recipients, respectively

<sup>3</sup> Includes 4 and 7 living liver lobe transplants in NHS Group 1 and Group 2 recipients, respectively

<sup>4</sup> Includes 13 and 7 living liver lobe transplants in NHS Group 1 and Group 2 recipients, respectively

<sup>5</sup> Includes 12 and 2 living liver lobe transplants in NHS Group 1 and Group 2 recipients, respectively

<sup>6</sup> Includes 4 transplants at London Cromwell and 3 transplants at London Bridge involving private patients

<sup>7</sup> Includes 3 transplants at London Cromwell and 4 transplants at London Bridge involving private patients

<sup>8</sup> Includes 1 transplant at London Cromwell involving a private patient

## 8.2 Transplant list

During 2022-2023, 1,269 patients joined the liver transplant list. Outcomes for patients on the list at 1 April 2022 and those joining the list during the year are shown in **Table 8.2**. There have been 147 (12%) new registrations that were super-urgent.

<b>Table 8.2 Liver transplant list and new registrations in the UK, 1 April 2022 - 31 March 2023</b>						
<b>Outcome of patient at 31 March 2023</b>	<b>Active and suspended patients at 1 April 2022</b>		<b>New registrations in 2022-2023<sup>1</sup></b>		<b>TOTAL</b>	
	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>	<b>%</b>
	Remained active/suspended	288	38	527	42	815
Transplanted	293	39	615	48	908	45
Removed <sup>2</sup>	140	19	91	7	231	11
Died <sup>3</sup>	33	4	36	3	69	3
<b>TOTAL</b>	<b>754</b>		<b>1269</b>		<b>2023</b>	

<sup>1</sup> Includes re-registrations for second or subsequent patients  
<sup>2</sup> Includes 29 patients removed and re-registered at a different centre or on different pathway  
<sup>3</sup> Includes patients removed due to deteriorating condition

**Table 8.3** shows the active transplant list in the UK at 31 March 2023 and 2022 by country/NHS region of patient's residence. At 31 March 2023, the overall rate was 10.4 pmp and ranged from 7.9 to 12.3 pmp across English NHS regions.

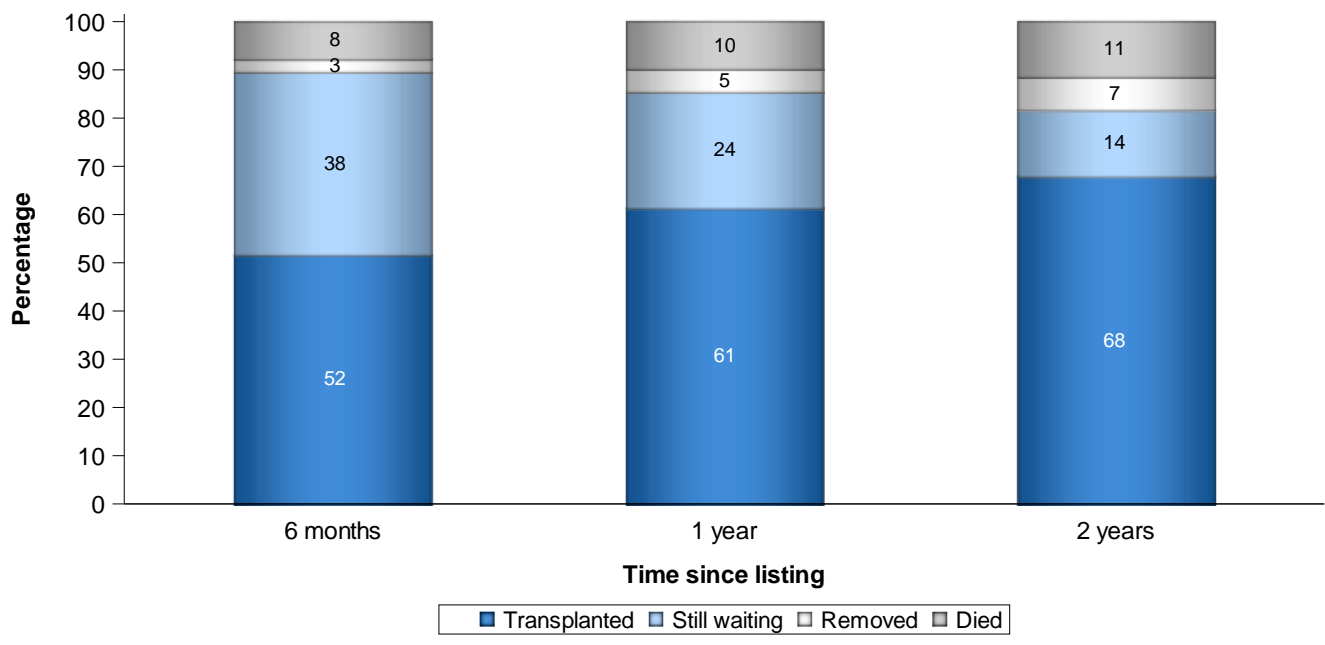
**Table 8.3 Active liver transplant list at 31 March by Country/NHS region of patient residence**

Country/ NHS region of residence	Liver transplant list (pmp)			
	2023		2022	
North East and Yorkshire	73	(9.0)	71	(8.7)
North West	78	(10.5)	74	(10.0)
Midlands	121	(11.2)	114	(10.5)
East of England	64	(10.1)	52	(8.2)
London	84	(9.5)	79	(9.0)
South East	73	(7.9)	81	(8.7)
South West	70	(12.3)	60	(10.5)
<b>England</b>	<b>563</b>	<b>(10.0)</b>	<b>531</b>	<b>(9.4)</b>
<b>Isle of Man</b>	<b>1</b>	<b>(12.5)</b>	<b>0</b>	<b>(0.0)</b>
<b>Channel Islands</b>	<b>0</b>	<b>(0.0)</b>	<b>0</b>	<b>(0.0)</b>
<b>Wales</b>	<b>32</b>	<b>(10.3)</b>	<b>37</b>	<b>(11.9)</b>
<b>Scotland</b>	<b>55</b>	<b>(10.0)</b>	<b>39</b>	<b>(7.1)</b>
<b>Northern Ireland</b>	<b>38</b>	<b>(20.0)</b>	<b>28</b>	<b>(14.7)</b>
<b>TOTAL<sup>1</sup></b>	<b>697</b>	<b>(10.4)</b>	<b>644</b>	<b>(9.6)</b>

<sup>1</sup>Includes patients in 2023 (2022) residing in: Unspecified UK 1 (2); Republic of Ireland 5 (2); Overseas 2 (5)

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, 61% of patients had received a liver transplant while 10% of patients had died whilst waiting or had been removed due to their condition deteriorating. 5% had been removed for other reasons such as the patient's condition improving, or as a result of non-compliance or at the request of the patient or family.

**Figure 8.2 Post-registration outcome for 946 new elective liver only registrations made in the UK, 1 April 2020 - 31 March 2021**



**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 119 days for a transplant while paediatric patients wait an average of 64 days. Note that these waiting times are not adjusted for other relevant factors which may be influential and differ across blood or ethnic groups.

<b>Table 8.4 Median waiting time to liver transplant in the UK, for patients registered 1 April 2020 - 31 March 2022</b>			
Blood group	Number of patients registered	Waiting time (days)	
		Median	95% Confidence interval
<b>Adult</b>			
O	844	182	145 - 219
A	750	80	63 - 97
B	222	137	67 - 207
AB	57	23	9 - 37
<b>TOTAL</b>	<b>1873</b>	<b>119</b>	<b>106 - 132</b>
<b>Paediatric</b>	<b>131</b>	<b>64</b>	<b>32 - 96</b>

**Table 8.5 Median waiting time to liver transplant in the UK, for patients registered 1 April 2020 - 31 March 2022**

Ethnicity	Number of patients registered	Waiting time (days)	
		Median	95% Confidence interval
<b>Adult</b>			
White	1585	111	96 - 126
Asian	164	118	92 - 144
Black	52	243	93 - 393
Other	40	235	0 - 718
<b>TOTAL<sup>1</sup></b>	<b>1873</b>	<b>119</b>	<b>106 - 132</b>
<b>Paediatric</b>	<b>131</b>	<b>64</b>	<b>32 - 96</b>

<sup>1</sup> Includes 32 patients whose ethnicity was not reported

### 8.3 Donor and organ supply

Of the 1,429 actual organ donors, 1074 (75%) donated their liver and 850 (79%) of these donated livers were used; see **Table 8.6**. Of livers retrieved from donors after brain death and donors after circulatory death, 86% and 67% were transplanted, respectively. Segments from 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 2022 - 31 March 2023, by allocation zone**

Allocation zone	Number of donors						Number of livers retrieved (used)					
	Solid organ			Liver			DBD			DCD		
	DBD	DCD	TOTAL	DBD	DCD	TOTAL	DBD	DCD	TOTAL	DBD	DCD	TOTAL
Birmingham	156	147	<b>303</b>	139	83	<b>222</b>	139	(122)	83	(63)	<b>222</b>	<b>(185)</b>
Cambridge	76	89	<b>165</b>	68	55	<b>123</b>	68	(56)	55	(42)	<b>123</b>	<b>(98)</b>
Edinburgh	94	81	<b>175</b>	87	47	<b>134</b>	87	(74)	47	(29)	<b>134</b>	<b>(103)</b>
King's College	185	155	<b>340</b>	166	91	<b>257</b>	166	(146)	91	(55)	<b>257</b>	<b>(201)</b>
Leeds	152	111	<b>263</b>	142	59	<b>201</b>	142	(123)	59	(38)	<b>201</b>	<b>(161)</b>
Newcastle	37	30	<b>67</b>	35	14	<b>49</b>	35	(25)	14	(9)	<b>49</b>	<b>(34)</b>
Royal Free	72	44	<b>116</b>	63	25	<b>88</b>	63	(55)	25	(13)	<b>88</b>	<b>(68)</b>
<b>TOTAL</b>	<b>772</b>	<b>657</b>	<b>1429</b>	<b>700</b>	<b>374</b>	<b>1074</b>	<b>700</b>	<b>(601)</b>	<b>374</b>	<b>(249)</b>	<b>1074</b>	<b>(850)</b>



The rates per million population (pmp) for liver donors are shown in **Table 8.7** by donor country/NHS region of residence. No adjustments have been made for potential demographic differences in populations. The overall deceased liver donor rate was 16.0 pmp in 2022-2023 and ranged from 11.3 pmp to 17.2 pmp across English NHS regions.

<b>Table 8.7 Liver donation rates for deceased donors in the UK, 1 April 2022 - 31 March 2023, by Country/ NHS region</b>						
<b>Country/ NHS region of residence</b>	<b>DBD</b>		<b>Liver donors (pmp) DCD</b>		<b>TOTAL</b>	
	North East and Yorkshire	97	(11.9)	43	(5.3)	140
North West	72	(9.7)	30	(4.0)	102	(13.7)
Midlands	84	(7.7)	60	(5.5)	144	(13.3)
East of England	59	(9.3)	39	(6.1)	98	(15.4)
London	71	(8.1)	28	(3.2)	99	(11.3)
South East	94	(10.1)	62	(6.7)	156	(16.8)
South West	66	(11.6)	29	(5.1)	95	(16.6)
<b>England</b>	<b>543</b>	<b>(9.6)</b>	<b>291</b>	<b>(5.1)</b>	<b>834</b>	<b>(14.8)</b>
<b>Isle of Man</b>	-		-		-	
<b>Channel Islands</b>	<b>1</b>	<b>(5.9)</b>	<b>1</b>	<b>(5.9)</b>	<b>2</b>	<b>(11.8)</b>
<b>Wales</b>	<b>39</b>	<b>(12.5)</b>	<b>21</b>	<b>(6.8)</b>	<b>60</b>	<b>(19.3)</b>
<b>Scotland</b>	<b>49</b>	<b>(8.9)</b>	<b>36</b>	<b>(6.6)</b>	<b>85</b>	<b>(15.5)</b>
<b>Northern Ireland</b>	<b>27</b>	<b>(14.2)</b>	<b>8</b>	<b>(4.2)</b>	<b>35</b>	<b>(18.4)</b>
<b>TOTAL<sup>1</sup></b>	<b>700</b>	<b>(10.4)</b>	<b>374</b>	<b>(5.6)</b>	<b>1074</b>	<b>(16.0)</b>

<sup>1</sup> Includes 58 donors (41 DBD and 17 DCD) with unknown UK postcode

## 8.4 Transplants

The number of liver transplants by recipient country/NHS region 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 10.1 to 15.4 pmp across English NHS regions and overall was 13.0 pmp.

<b>Table 8.8 Liver transplant rates per million population (pmp), in the UK, 1 April 2022 - 31 March 2023, by country and English NHS region</b>								
<b>Country/ NHS region of residence</b>	<b>DBD</b>		<b>DCD</b>		<b>TOTAL</b>		<b>Living</b>	
	<b>N</b>	<b>(pmp)</b>	<b>N</b>	<b>(pmp)</b>	<b>N</b>	<b>(pmp)</b>	<b>N</b>	<b>(pmp)</b>
North East and Yorkshire	72	(8.9)	30	(3.7)	102	(12.5)	4	(0.5)
North West	60	(8.1)	15	(2.0)	75	(10.1)	7	(0.9)
Midlands	105	(9.7)	52	(4.8)	157	(14.5)	1	(0.1)
East of England	58	(9.1)	40	(6.3)	98	(15.4)	3	(0.5)
London	76	(8.6)	33	(3.8)	109	(12.4)	0	(0.0)
South East	77	(8.3)	34	(3.7)	111	(11.9)	3	(0.3)
South West	59	(10.3)	15	(2.6)	74	(13.0)	1	(0.2)
<b>England</b>	<b>507</b>	<b>(9.0)</b>	<b>219</b>	<b>(3.9)</b>	<b>726</b>	<b>(12.8)</b>	<b>19</b>	<b>(0.3)</b>
<b>Isle of Man</b>	<b>0</b>	<b>(0.0)</b>	<b>0</b>	<b>(0.0)</b>	<b>0</b>	<b>(0.0)</b>	<b>0</b>	<b>(0.0)</b>
<b>Channel Islands</b>	<b>0</b>	<b>(0.0)</b>	<b>0</b>	<b>(0.0)</b>	<b>0</b>	<b>(0.0)</b>	<b>0</b>	<b>(0.0)</b>
<b>Wales</b>	<b>36</b>	<b>(11.6)</b>	<b>6</b>	<b>(1.9)</b>	<b>42</b>	<b>(13.5)</b>	<b>0</b>	<b>(0.0)</b>
<b>Scotland</b>	<b>49</b>	<b>(8.9)</b>	<b>26</b>	<b>(4.7)</b>	<b>75</b>	<b>(13.7)</b>	<b>1</b>	<b>(0.2)</b>
<b>Northern Ireland</b>	<b>20</b>	<b>(10.5)</b>	<b>1</b>	<b>(0.5)</b>	<b>21</b>	<b>(11.1)</b>	<b>0</b>	<b>(0.0)</b>
<b>TOTAL<sup>1,2</sup></b>	<b>617</b>	<b>(9.2)</b>	<b>252</b>	<b>(3.8)</b>	<b>869</b>	<b>(13.0)</b>	<b>23</b>	<b>(0.3)</b>

<sup>1</sup> Excludes 19 recipients who reside outside the UK (7 DBD, 12 Living)  
<sup>2</sup> Includes 8 (5 DBD and 3 living) recipients with an unknown UK postcode

The number of whole, reduced and split liver transplants by urgency status of the transplant (elective, super-urgent) in 2022-2023 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 6% in 2022-2023. There were 876 deceased donor liver transplants performed in 2022-2023: 782 whole liver, including 8 liver and kidney and 2 liver and heart; 62 split liver, and 32 deceased liver lobe. Split liver transplants accounted for 67% of liver only lobe transplant activity.

**Table 8.9 Deceased donor liver transplants performed in the UK, 1 April 2021 - 31 March 2023**

Transplant centre	2021-2022								2022-2023							
	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	155	15	3	2	17	3	<b>175</b>	<b>20</b>	174	25	5	4	11	2	<b>190</b>	<b>31</b>
Cambridge	91	7	0	0	4	0	<b>95</b>	<b>7</b>	91	16	0	0	3	0	<b>94</b>	<b>16</b>
Edinburgh	58	2	0	0	0	0	<b>58</b>	<b>2</b>	66	6	0	0	0	0	<b>66</b>	<b>6</b>
King's College	153	29	6	6	19	4	<b>178</b>	<b>39</b>	149	14	6	11	21	3	<b>176</b>	<b>28</b>
Leeds	70	15	6	2	13	1	<b>89</b>	<b>18</b>	101	11	4	2	10	2	<b>115</b>	<b>15</b>
Newcastle	38	3	0	0	0	0	<b>38</b>	<b>3</b>	29	7	0	0	0	0	<b>29</b>	<b>7</b>
Royal Free	85	11	0	0	5	0	<b>90</b>	<b>11</b>	75	18	0	0	10	0	<b>85</b>	<b>18</b>
<b>TOTAL</b>	<b>650</b>	<b>82</b>	<b>15</b>	<b>10</b>	<b>58</b>	<b>8</b>	<b>723</b>	<b>100</b>	<b>685</b>	<b>97</b>	<b>15</b>	<b>17</b>	<b>55</b>	<b>7</b>	<b>755</b>	<b>121</b>

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 2022-2023, the median CIT for a DBD donor whole liver only transplant was 8.5 hours (Inter-Quartile (IQ) range 7.0 – 10.3) and for a DCD donor whole liver only transplant was 7.1 hours (IQ range 5.8 – 9.0) and overall was 8.1 hours (IQ range 6.5 – 10.0). Please note some of the reported CITs may include the use of donor organ maintenance systems, in which cases the CIT reported will be an overestimate of the true cold ischaemia time.

At 31 March 2023 there were approximately 11,700 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** along with the liver graft number for transplant recipients and patients active on the transplant list.

<b>Table 8.10 Demographic characteristics of deceased liver donors and transplant recipients, 1 April 2022 - 31 March 2023, and transplant list patients at 31 March</b>							
		<b>Donors</b>		<b>Transplant recipients</b>		<b>Active transplant list patients</b>	
		<b>N</b>	<b>(%)</b>	<b>N</b>	<b>(%)</b>	<b>N</b>	<b>(%)</b>
Age (years)	0-17	34	(3)	88	(10)	44	(6)
	18-34	159	(15)	93	(11)	92	(13)
	35-49	267	(25)	165	(19)	177	(25)
	50-59	266	(25)	235	(27)	189	(27)
	60-69	222	(21)	281	(32)	187	(27)
	70+	126	(12)	14	(2)	8	(1)
	Mean (SD)	50	(16)	48	(19)	48	(16)
Sex	Male	592	(55)	554	(63)	406	(58)
	Female	482	(45)	322	(37)	291	(42)
Ethnicity	White	966	(92)	695	(84)	542	(83)
	Asian	46	(4)	92	(11)	67	(10)
	Black	21	(2)	23	(3)	26	(4)
	Other	18	(2)	17	(2)	16	(2)
	Unknown	23	-	49	-	46	-
Blood group	O	509	(47)	363	(41)	385	(55)
	A	447	(42)	370	(42)	219	(31)
	B	95	(9)	113	(13)	86	(12)
	AB	23	(2)	30	(3)	7	(1)
Graft number	First graft	-	-	812	(93)	626	(90)
	Re-graft	-	-	64	(7)	71	(10)
<b>TOTAL</b>		<b>1074</b>	<b>(100)</b>	<b>876</b>	<b>(100)</b>	<b>697</b>	<b>(100)</b>