

**NHS BLOOD AND TRANSPLANT****BOWEL ADVISORY GROUP****POTENTIAL BOWEL DONORS AND LOCATION****SUMMARY****BACKGROUND**

- 1 The bowels of donors after brain death (DBD) meeting the following criteria are currently considered for intestinal transplantation in the UK:  
Age  $\leq$  55 years  
Weight  $\leq$  80 kg
- 2 Potential bowel donors were defined as DBD donors who donated at least one solid organ for the purposes of transplantation, who met the criteria for bowel donation and whose family gave consent for bowel donation. This paper examines the pathway from identification of potential bowel donors to transplantation of the bowel and the points at which potential bowel donors are “lost”.

**DATA ANALYSIS**

- 3 A recent one year period was analysed; 1 September 2013 to 31 August 2014. In this period there were 778 UK DBD donors and 307 (39%) of these met the criteria for bowel donation. Of these, consent for bowel donation was given in 260 cases (85%). Of these 260 potential bowel donors, the bowels of 221 (85%) were offered to intestinal transplant centres and 20 (9%) bowels were transplanted. The most common reason given for 39 bowels not being offered was donor history.
- 5 Adult centres accepted and transplanted 18 donor bowels (5% of the total number of bowel offers made to them) and paediatric centres accepted and transplanted 2 donor bowels (0.3% of the total number of bowel offers made to them). Of the 201 bowels that were offered and declined, only 9 (4%) were from donors weighing  $\leq$  50 kg. The most common reasons given by adult centres for declining bowel offers were donor history, donor size and logistical reasons such as a lack of available beds or staff. The vast majority of offers declined by paediatric centres were declined due to donor size.
- 6 206 (93%) livers and 94 (43%) pancreases were transplanted from the 221 potential bowel donors whose bowels were offered for transplantation, compared with just 20 (9%) bowels. These bowels came from 16 donor hospitals and the densest areas for bowel donation in this period were London and Bath/Bristol.

**ACTION**

- 7 Members are asked to consider the contents of this report and advise on additional data that may help to understand the pathway from bowel donation to transplantation.

**Sally Rushton**  
**September 2014**

## NHS BLOOD AND TRANSPLANT

### BOWEL ADVISORY GROUP

#### POTENTIAL BOWEL DONORS AND LOCATION

##### BACKGROUND

- 1 Since 14 April 2011 the donation outcome of each UK deceased donor's bowel, and any offering data if applicable, has been recorded on the UK Transplant Registry (UKTR).
- 2 The bowels of donors after brain death (DBD) meeting the following criteria are currently considered for intestinal transplantation:  
Age  $\leq$  55 years  
Weight  $\leq$  80 kg
- 3 On 22 July 2013 new schemes for allocating donor organs to patients requiring an intestinal transplant were implemented such that elective patients are offered to through the National Bowel Allocation Scheme and super-urgent patients are offered to through the liver and intestinal super-urgent allocation scheme. However, these schemes were suspended between 29 August and 30 October 2013 whilst a system error was rectified and during this time the old rules for allocating were used (based purely on waiting time).
- 4 Although the number of new registrations in a year for an intestinal transplant is small (31 in the 2013/14 financial year), some patients wait a substantial amount of time for a transplant and some die waiting (one patient has died of those registered during 2013/14).
- 5 This paper examines the pathway from identification of potential bowel donors in the UK to transplantation of the bowel and points at which potential bowel donors are "lost".

##### DATA AND METHODS

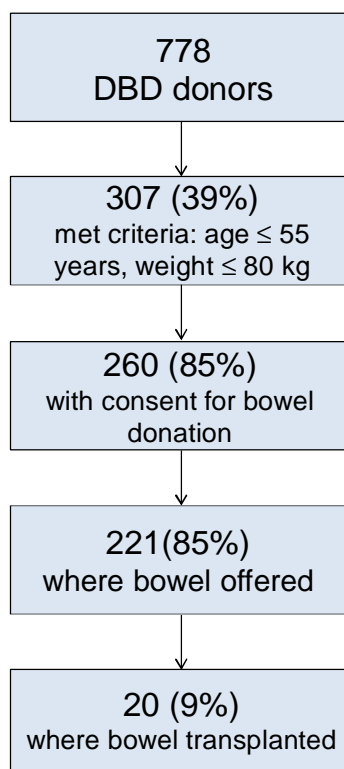
- 6 Potential bowel donors were defined as DBD donors who donated at least one solid organ for the purposes of transplantation, who met the criteria for bowel donation and whose family gave consent for bowel donation.
- 7 This paper looks specifically at the 778 UK DBD donors within the one year period, 1 September 2013 to 31 August 2014, but also draws on data from the corresponding two years prior to this period for comparison purposes (1 September 2011 to 31 August 2012 and 1 September 2012 to 31 August 2013). Data were extracted from the UKTR on 14 September 2014.
- 8 Reasons for the non-use of bowels from potential bowel donors were analysed. The reasons were provided by NHS Blood and Transplant's Duty Officers or Specialist Nurses in Organ Donation in cases where no offering took place and by the centres themselves in cases where offering did take place. Donors were classed as not having consent for bowel donation if the reason recorded for non-use was that the family refused consent for this organ or consent was not sought for this organ.
- 9 There were 24 intestinal transplants carried out in the UK between 1 September 2013 and 31 August 2014. Four (17%) of these transplants used organs from overseas donors and these donors have been excluded from analysis. The location of the hospitals where bowel donors donated was analysed.

## RESULTS

### The pathway to bowel donation

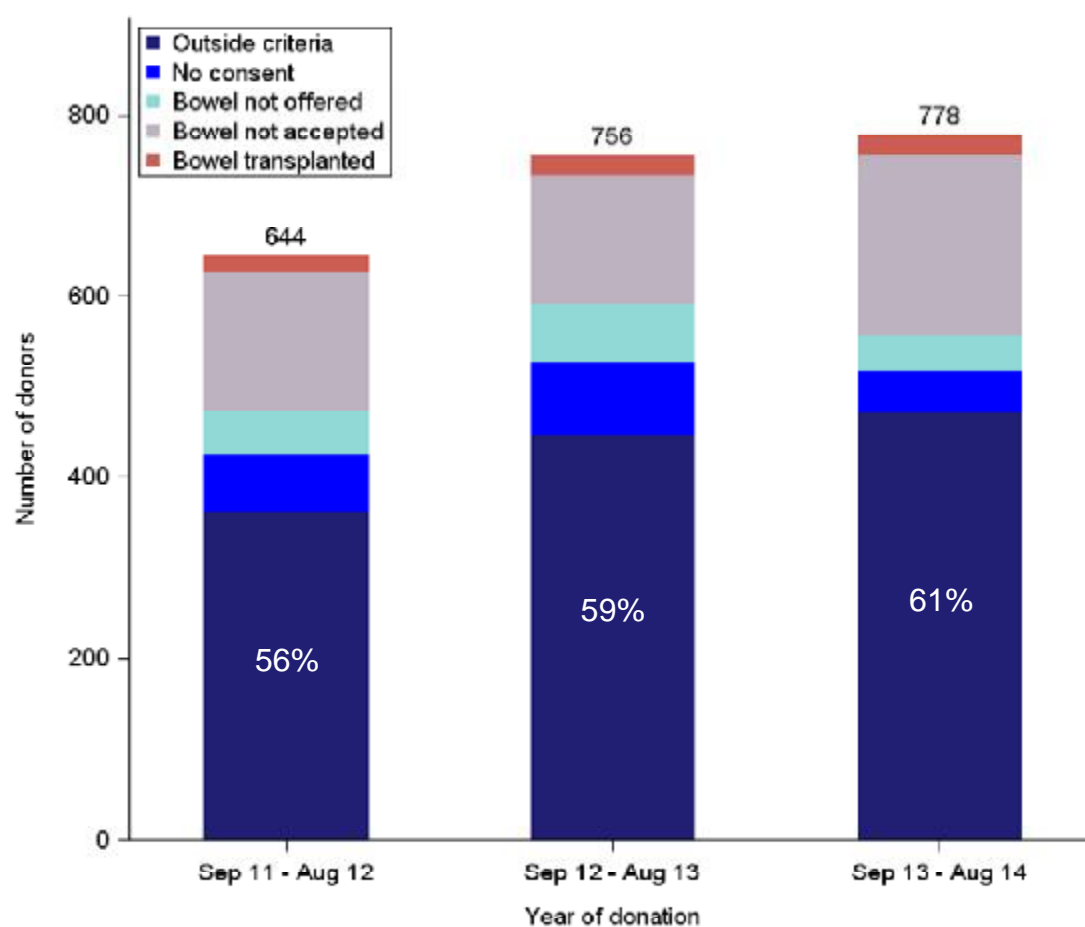
- 10 Of the 778 DBD donors in the time period, 307 (39%) met the criteria for bowel donation. Of these, consent for bowel donation was gained from the donor family in 260 cases (85%). Of these 260 potential bowel donors, the bowels of 221 (85%) were offered to intestinal transplant centres and 20 (9%) bowels were transplanted. A flowchart of this pathway is shown below.

**Figure 1** Flowchart of the pathway from DBD donors between 1 September 2013 and 31 August 2014 to bowel donors



- 11 These rates are compared with the corresponding rates during 1 September 2011 to 31 August 2012 and 1 September 2012 to 31 August 2013 in **Figure 2** and **Table 1**. It can be seen that the proportion of donors meeting the criteria for bowel donation has reduced over these three one year periods, from 44% to 39%. However, the proportion where consent for bowel donation was given out of those meeting the criteria has improved from 77% to 85%, and of those with consent, the bowel offering rate has also improved from 77% to 85%.
- 12 An equivalent figure and table just for donors weighing  $\leq 50$  kg are shown in the **Appendix** (page 10).

**Figure 2** The pathway from DBD donors between 1 September 2011 and 31 August 2014 to bowel donors, by time period



**Table 1** The pathway from DBD donors between 1 September 2011 and 31 August 2014 to bowel donors, by time period

		Time period			Total
		Sep 11-Aug 12	Sep 12-Aug 13	Sep 13-Aug 14	
DBD donors	N	644	756	778	2178
Met criteria for bowel donation (age ≤ 55 years, weight ≤ 80 kg)	N	283	310	307	900
	% of previous	44	41	39	41
Consent given for bowel donation	N	219	229	260	708
	% of previous	77	74	85	79
Bowel offered	N	169	163	221	553
	% of previous	77	71	85	78
Bowel transplanted	N	16	21	20	57
	% of previous	9	13	9	10

## Potential bowel donors

- 13 The reasons for not offering the bowels of 39 potential bowel donors between 1 September 2013 and 31 August 2014 are presented in **Table 2**. The most common reasons given were donor history (28%) and other organs required not being available (21%), for instance the donor liver being accepted for a super-urgent liver only recipient and there were not suitable intestinal patients who did not require a liver.

<b>Table 2 Reasons for not offering bowels from DBD donors aged ≤ 55 years and weighing ≤ 80 kg with consent for bowel donation, between 1 September 2013 and 31 August 2014</b>		
Reasons for not offering	Donor bowels not offered N	%
<b>Donor reasons</b>	<b>20</b>	<b>51</b>
History	11	28
Age <sup>1</sup>	3	8
Organ damaged	2	5
Initially DCD	1	3
Donor unstable	1	3
Size	1	3
Virology	1	3
<b>Logistical reasons</b>	<b>15</b>	<b>38</b>
Other organs required were not available	8	21
Permission refused by coroner	4	10
No suitable recipients	3	8
Other	4	10
<b>Total</b>	<b>39</b>	<b>100</b>
<sup>1</sup> All donors were aged 55 years.		

- 14 The total number of patient specific offers associated with the 221 donor bowels that were offered was reported to be 1,035: 369 (36%) to adult centres and 666 (64%) to paediatric centres. Adult centres accepted and transplanted 18 donor bowels (5% of offers made to them) and paediatric centres accepted and transplanted 2 donor bowels (0.3% of offers made to them).

**Small potential bowel donors ( $\leq 50$  kg)**

- 15 Of the 201 bowels that were offered and declined, 9 (4%) were from donors weighing  $\leq 50$  kg. The details of why these bowels were not used are shown in **Table 3**.

<b>Table 3 Details of why the 9 bowels from DBD donors aged <math>\leq 55</math> years and weighing <math>\leq 50</math> kg with consent for bowel donation, between 1 September 2013 and 31 August 2014, were declined by centres</b>					
<b>Donor</b>	<b>Blood group</b>	<b>Height (cm)</b>	<b>Weight (kg)</b>	<b>Age (years)</b>	<b>Details of the decline of the donor bowel</b>
1	O	144	42	55	Centres declined on poor function and size.
2	O	158	36	14	Centres declined on size and damage.
3	A	81	8.9	1	Birmingham accepted the bowel, liver and pancreas but later declined as "donor asplenic, very thickened mesentery and bowel, turbid peritoneal fluid, also cause of death".
4	A	142	35	9	Birmingham declined bowel on size and King's College initially accepted but subsequently declined on logistics.
5	O	163	50	33	Cambridge declined as recipient too sick to accept an offer from this distance (donor's location was Exeter). Birmingham and King's College declined on size and Oxford on virology.
6	A	164	46	13	Centres declined on size.
7	A	160	50	23	Liver was taken for super-urgent so only one patient, waiting for a modified multivisceral transplant at Cambridge, was offered to. They declined because they felt they would not have the necessary vessels.
8	AB	83	12	1	Cambridge declined on size.
9	A	163	50	18	Centres declined on size and medical history.

**Large potential bowel donors ( $> 50$  kg and  $\leq 80$  kg)**

- 16 The 192 declined bowels from donors who weighed  $> 50$  kg corresponded to 627 paediatric offers and 322 adult offers. The reasons that these offers were declined are shown in **Table 4** and **Table 5** for paediatric and adult centres respectively. 90% of the offers declined by paediatric centres were declined on size. The most common reasons for decline given by adult centres were donor history (27%) and size (20%). Logistical reasons such as a lack of available beds or staff were cited in 10% of the offers that were declined by adult centres.

**Table 4** Reasons for the decline of bowels from DBD donors aged  $\leq 55$  years and weighing  $> 50$  kg and  $\leq 80$  kg, with consent for bowel donation, that were offered to paediatric centres between 1 September 2013 and 31 August 2014

Reasons for decline	Centre				Total	
	King's College N	%	Birmingham N	%	N	%
<b>Donor reasons</b>	<b>379</b>	<b>99</b>	<b>231</b>	<b>95</b>	<b>610</b>	<b>97</b>
Size	350	91	213	88	563	90
History	14	4	4	2	18	3
Centre criteria not achieved	13	3	5	2	18	3
Virology	1	0	5	2	6	1
Age	0	0	4	2	4	1
Poor function	1	0	0	0	1	0
<b>Logistic reasons</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>0</b>
No time	1	0	1	0	2	0
Other	4	1	11	5	15	2
<b>Total</b>	<b>384</b>	<b>100</b>	<b>243</b>	<b>100</b>	<b>627</b>	<b>100</b>

**Table 5** Reasons for the decline of bowels from DBD donors aged  $\leq 55$  years and weighing  $> 50$  kg and  $\leq 80$  kg, with consent for bowel donation, that were offered to adult centres between 1 September 2013 and 31 August 2014

Reasons for decline	Centre				Total	
	Cambridge N	%	Oxford N	%	N	%
<b>Donor reasons</b>	<b>187</b>	<b>79</b>	<b>65</b>	<b>76</b>	<b>252</b>	<b>78</b>
History	76	32	12	14	88	27
Size	37	16	26	31	63	20
Poor function	23	10	2	2	25	8
Virology	9	4	13	15	22	7
Centre criteria not achieved	14	6	0	0	14	4
HLA/ABO type	3	1	6	7	9	3
Cause of death	6	3	2	2	8	2
Medication	8	3	0	0	8	2
Age	3	1	2	2	5	2
X-match positive	1	0	2	2	3	1
Other	7	3	0	0	7	2
<b>Logistic reasons</b>	<b>19</b>	<b>8</b>	<b>12</b>	<b>14</b>	<b>31</b>	<b>10</b>
Centre already transplanting	7	3	2	2	9	3
No time	7	3	0	0	7	2
No beds	0	0	7	8	7	2
Distance	5	2	0	0	5	2
Other	0	0	3	4	3	1
Other	31	13	8	9	39	12
<b>Total</b>	<b>237</b>	<b>100</b>	<b>85</b>	<b>100</b>	<b>322</b>	<b>100</b>

**Organs transplanted from potential bowel donors**

- 17 **Table 6** shows summary statistics on the 221 potential bowel donors whose bowels were offered, by whether the liver was transplanted, whether the pancreas was transplanted and whether the bowel was transplanted. Note that these are not mutually exclusive groups. Note also that those livers that went to super-urgent liver only recipients have been shown for additional information.
- 18 206 (93%) livers and 94 (43%) pancreases were transplanted from the 221 potential bowel donors whose bowels were offered for transplantation compared with just 20 (9%) bowels. 35 of the livers that were transplanted were used in super-urgent liver only recipients and all but one of these donors weighed more than 50 kg.

**Table 6 Transplants performed using organs from DBD donors aged  $\leq 55$  years and weighing  $\leq 80$  kg with consent for bowel donation and whose bowel was offered for donation, between 1 September 2013 and 31 August 2014**

	No. donors	Organs transplanted							
		Liver		(Liver only super-urgent transplants)*		Pancreas		Bowel	
	N	N	% of donors	(N)	(% of donors)	N	% of donors	N	% of donors
<b>Donor blood group</b>									
O	100	92	92	(27)	(27)	45	45	12	12
A	95	90	95	(7)	(7)	43	45	5	5
B	22	21	95	(1)	(5)	6	27	3	14
AB	4	3	75	(0)	(-)	0	0	0	0
<b>Donor weight (kg)</b>									
<20	4	3	75	(0)	(-)	2	50	2	50
20-<35	1	1	100	(0)	(-)	0	0	1	100
35-50	8	7	88	(1)	(13)	6	75	1	13
>50-80	208	195	94	(34)	(16)	86	41	16	8
<b>Donor BMI (kg/m<sup>2</sup>)</b>									
<18.5	11	10	91	(1)	(9)	6	55	3	27
18.5-<25	132	121	92	(22)	(17)	61	46	14	11
25+	78	75	96	(12)	(15)	27	35	3	4
<b>Donor age (years)</b>									
0-15	12	10	83	(2)	(17)	7	58	3	25
16-35	75	72	96	(16)	(21)	39	52	13	17
36-50	105	97	92	(12)	(11)	40	38	3	3
51-55	29	27	93	(5)	(17)	8	28	1	3
<b>Total</b>	<b>221</b>	<b>206</b>	<b>93</b>	<b>(35)</b>	<b>(16)</b>	<b>94</b>	<b>43</b>	<b>20</b>	<b>9</b>

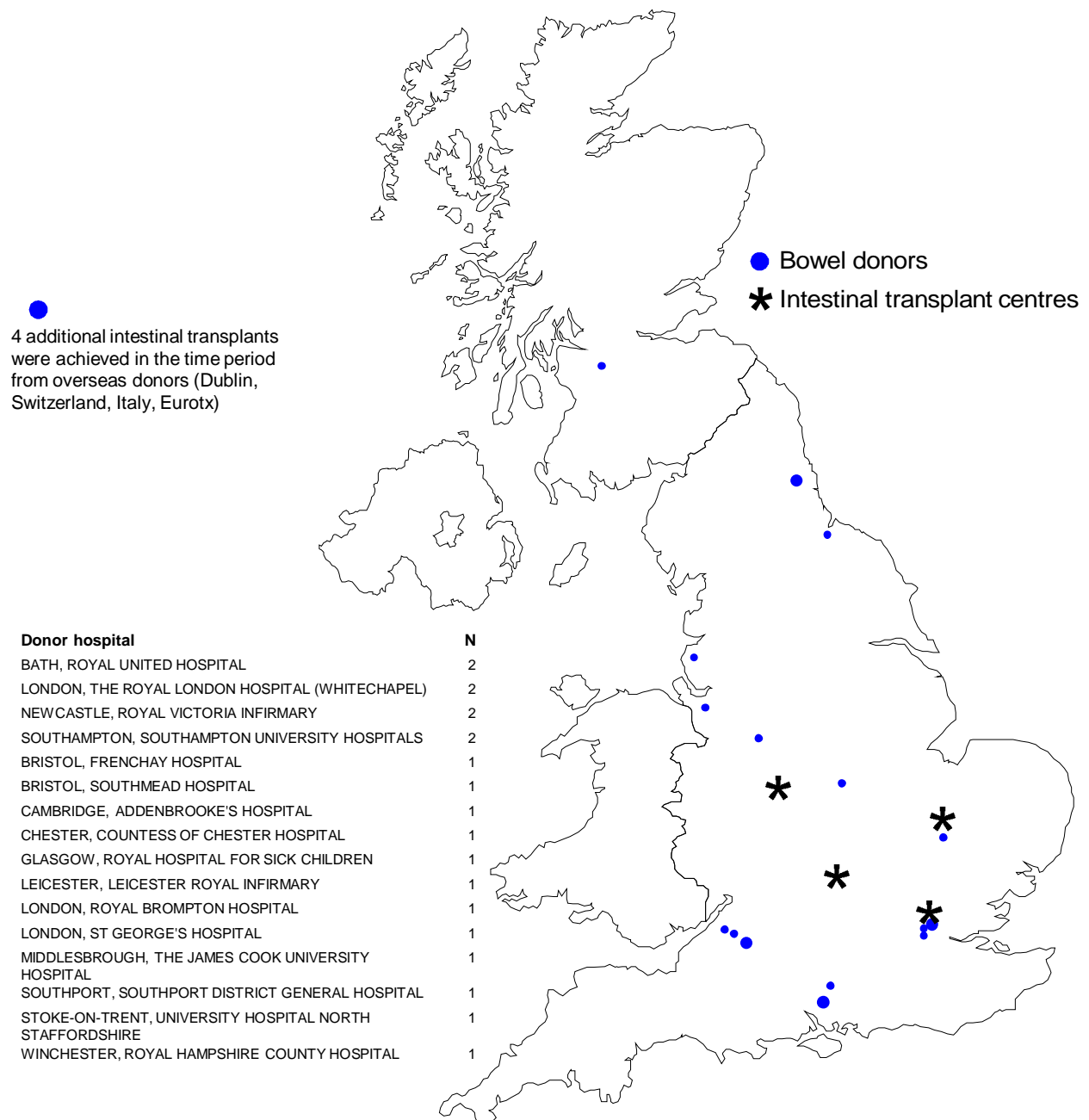
\* This is a subset of the "Liver" column, showing those that were transplanted into super-urgent liver only recipients



## Location of actual bowel donors

- 19 **Figure 3** shows the location of the 20 UK bowel donors whose bowels were transplanted in the time period. A total of 16 donor hospitals had 1-2 bowel donors. The densest areas for bowel donation in this period were London and Bath/Bristol.

**Figure 3 Location of UK bowel donors during 1 September 2011 - 31 August 2014**



## ACTION

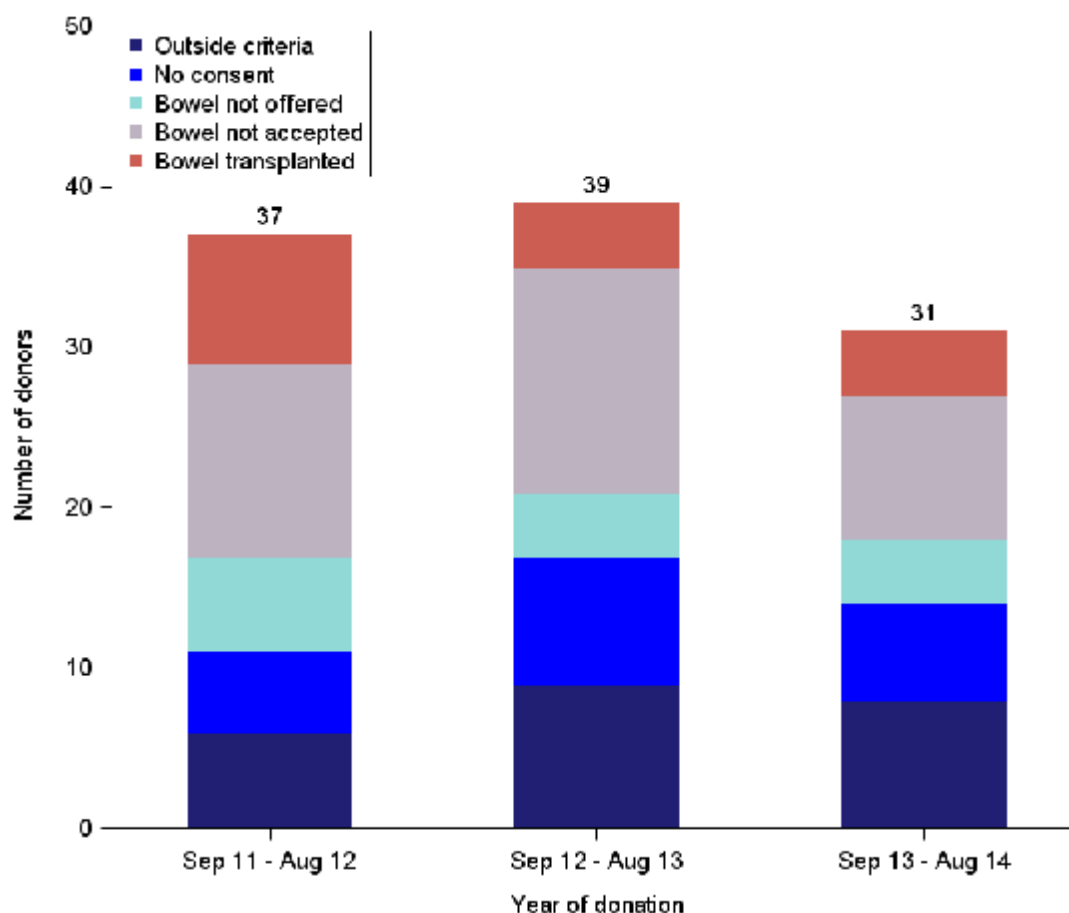
- 20 Members are asked to consider the contents of this report and advise on additional data that may help to understand the pathway from bowel donation to transplantation.

**Sally Rushton**  
Statistics and Clinical Studies

**September 2014**

## APPENDIX

**Appendix I** The pathway from DBD donors weighing  $\leq 50$  kg between 1 September 2011 and 31 August 2014 to bowel donors, by time period



**Appendix II** The pathway from DBD donors weighing  $\leq 50$  kg between 1 September 2011 and 31 August 2014 to bowel donors, by time period

		Time period			Total
		Sep 11-Aug 12	Sep 12-Aug 13	Sep 13-Aug 14	
DBD donors	N	37	39	31	107
Met criteria for bowel donation (age $\leq 55$ years)	N	31	30	23	84
	% of previous	84	77	74	79
Consent given for bowel donation	N	26	22	17	65
	% of previous	84	73	74	77
Bowel offered	N	20	18	13	51
	% of previous	77	82	76	78
Bowel transplanted	N	8	4	4	16
	% of previous	40	22	31	31