

NHS BLOOD AND TRANSPLANT
MULTI-VISCERAL AND COMPOSITE TISSUE ADVISORY GROUP
POTENTIAL BOWEL DONORS

SUMMARY

BACKGROUND

- 1 Potential donors after brain death (DBD) who meet the following criteria are considered for bowel donation:
 - Age < 56 years
 - Weight < 80 kg
- 2 Potential bowel donors were defined as DBD donors who donated at least one solid organ for the purpose 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”.

KEY MESSAGES

- 3 The last financial year, 2019/20, was analysed. In this period there were 946 UK DBD donors, of which 304 (32%) met the criteria for bowel donation. Of these, consent for bowel donation was given in 243 (80%) donors and the bowels of 166 (68%) were offered to intestinal transplant centres. 20 (12%) of those offered were accepted for transplantation.
- 4 Over the past three financial years, the number of DBD donors has fallen slightly by 1%, but there was an 8% increase in those meeting the bowel donor criteria from 281 in 2017/18 to 304 in 2019/20. The offered rate fell due to the implementation of maximum donor weight criteria in March 2018. However, this did not affect the transplanted rate (12% of those offered in 2019/20 compared to 14% in 2017/18).
- 5 Of the 146 bowels that were offered and declined, only 8 (5%) were from donors weighing < 50 kg which were declined for a variety of reasons. Of the 304 donors meeting the potential bowel donor criteria, 9 (3%) weighed less than 30 kg. Four of these particularly small potential donors were not offered, two were offered and declined, and three were offered, accepted and the bowel was transplanted.
- 6 There were 13 non-UK donors offered to the UK for bowel donation in 2019/20 and in 9 cases, only the bowel was available. One was not offered to centres due to lack of availability of other organs required for the patients listed. One was accepted for transplant but declined after retrieval due to size.

ACTION

- 7 Members are asked to note these results and discuss any actions required. Additionally, members are asked to review the contents of this report and whether any of the content is no longer required.

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POTENTIAL BOWEL DONORS

BACKGROUND

- 1 Potential donors after brain death (DBD) who meet the following criteria are considered for bowel donation:
 - Age < 56 years
 - Weight < 80 kg
- 2 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”. Small potential bowel donors (weight < 50 kg) are examined in more detail as these have the greatest potential. The geographical distribution of potential bowel donors is also examined.

DATA AND METHODS

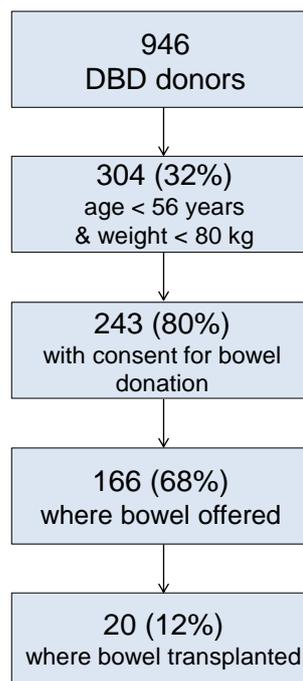
- 3 Potential bowel donors were defined as DBD donors who donated at least one solid organ for the purposes of transplantation, who met the criteria for bowel donation and whose family gave consent for bowel donation.
- 4 Data on 946 DBD donors who died in the UK between 1 April 2019 and 31 March 2020 were extracted from the UK Transplant Registry (UKTR) on 2 October 2020. Data from the previous two years were also extracted for comparison.
- 5 Reasons for the non-use of bowels from potential bowel donors were analysed. The reasons were reported by NHS Blood and Transplant Hub Operations 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 or consent was not sought for that organ.
- 6 Data on bowel offers to the UK from non-UK donors between 1 April 2019 and 31 March 2020 were also extracted from the UKTR. The outcome of these offers, along with other organs available are presented.
- 7 The COVID-19 pandemic has led to unprecedented challenges for UK transplantation. Concerns about the ability to care for transplant recipients, lack of access to resource because it is being used for patients in the pandemic, and the risk versus benefit for immunosuppressed transplant recipients, have resulted in a reduction in the number of organ transplants undertaken. A small part of the data presented in this report would have been impacted by the COVID-19 pandemic, particularly, data arising in March 2020.

RESULTS

The pathway to bowel donation

- 8 Of the 946 DBD donors in the time period, 304 (32%) met the criteria for bowel donation. Of these, consent for bowel donation was gained from the donor family in 243 cases (80%). Of these 243 potential bowel donors, the bowels of 166 (68%) were offered to intestinal transplant centres and 20 (12%) bowels were transplanted. A flow diagram of this pathway is shown in **Figure 1**. An equivalent figure for donors aged <18 years is shown in **Appendix I**.

Figure 1 Flow diagram of the pathway from DBD donors during 2019/20 to bowel donors



- 9 These rates are compared with the corresponding rates in the previous two financial years and presented in **Figure 2** and **Table 1**. The consent rate has remained stable in the time period (between 80% and 82%). An equivalent figure and table just for donors aged <18 years is shown in **Appendix II** and **Appendix III** respectively.
- 10 The number of DBD donors has fallen slightly since 2017/18, and the proportion not meeting the potential bowel donor criteria has fallen slightly from 71% to 68%. As a result, the number meeting the criteria has increased by 8% from 281 in 2017/18 to 304 in 2019/20. The consent rate was similar in 2019/20 to 2017/18, and the offering rate was relatively low (68% in 2019/20 compared to 78% in 2017/18).
- 11 In March 2018, a change was implemented to bowel offering meaning recipients would not appear on the matching run for a donor if the donor's weight was greater than the maximum donor weight specified on the recipient's registration form. This has increased the number of occasions where no recipients appeared on the matching run, resulting in the low offering rate for 2018/19 and 2019/20. This has also meant a drop in the number of offers to paediatric patients as they are no longer being offered inappropriately sized donors.

Figure 2 The pathway from DBD donors between 1 April 2017 and 31 March 2020 to bowel donors, by financial year

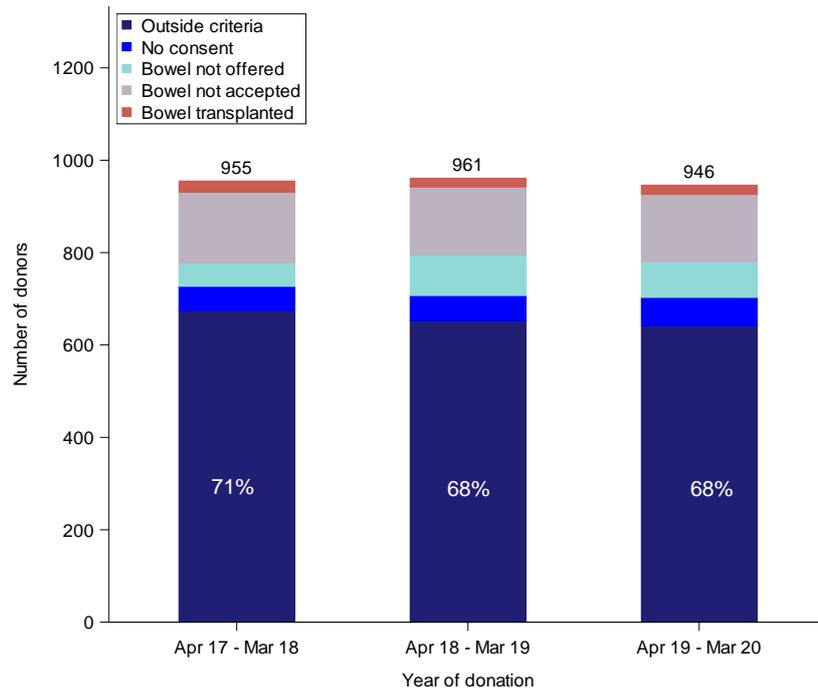


Table 1 The pathway from DBD donors between 1 April 2017 and 31 March 2020 to bowel donors, by financial year

| | | Financial year | | |
|---|---------------|----------------|---------|---------|
| | | 2017/18 | 2018/19 | 2019/20 |
| DBD donors | N | 955 | 961 | 946 |
| Met criteria for bowel donation (age < 56 years & weight < 80 kg) | N | 281 | 308 | 304 |
| | % of previous | 29 | 32 | 32 |
| Consent given for bowel donation | N | 228 | 254 | 243 |
| | % of previous | 81 | 82 | 80 |
| Bowel offered | N | 177 | 166 | 166 |
| | % of previous | 78 | 65 | 68 |
| Bowel transplanted | N | 24 | 19 | 20 |
| | % of previous | 14 | 11 | 12 |

Potential bowel donors

- 12 The reasons for not offering the bowels of 77 potential bowel donors between 1 April 2019 and 31 March 2020 are presented in **Table 2**. The most common reasons given were no suitable recipients on the list for that donor (56%) and donor history (19%).

| Reasons for not offering | Donor bowels not offered | |
|---|--------------------------|------------|
| | N | % |
| Donor reasons | | |
| History | 15 | 19 |
| Poor function | 1 | 1 |
| Age ¹ | 2 | 3 |
| Donor unstable | 1 | 1 |
| Virology | 1 | 1 |
| Logistical reasons | | |
| No suitable recipients ² | 43 | 56 |
| Other organs required were not available ³ | 10 | 13 |
| Permission refused by coroner | 2 | 3 |
| Donor type ⁴ | 2 | 3 |
| Total | 77 | 100 |
| ¹ Ages of these donors were 45 years, 54 years ² Blood group, HLA, or size incompatible ³ For example liver accepted for super-urgent liver recipient and no blood group compatible intestinal recipients not requiring a liver ⁴ Donor started as DCD but proceeded as DBD after offering began | | |

- 13 The total number of patient specific offers associated with the 166 donor bowels that were offered was reported to be 313, with adult centres receiving 291 (93%) of the offers and paediatric centres receiving 22 (7%). Adult centres accepted and transplanted 17 donor bowels (6% of offers made to them) and paediatric centres accepted and transplanted 3 donor bowels (14% of offers made to them).

Small potential bowel donors (< 50 kg)

- 14 Of the 146 bowels that were offered and declined, 8 (5%) were from donors weighing < 50 kg. The details of why these bowels were not used are shown in **Table 3 (removed as patient specific)**.

Particularly small potential bowel donors (< 30 kg)

- 15 Of the 304 donors who met criteria for bowel donation, 9 (3%) were less than 30kg. Four were not offered: three did not have any suitable recipients appear on the matching run, and one was not offered due to past history. Two were offered and declined (donors 7 and 8 in **Table 3**), and three were offered and the bowel was transplanted.

Large potential bowel donors (≥ 50 kg and < 80 kg)

- 16 The 138 declined bowels from donors who weighed ≥ 50 kg corresponded to 12 paediatric offers and 251 adult offers. Paediatric centres declined mostly on size and other donor reasons. The most common reasons for decline cited by adult centres were donor history (26%) and poor function (16%).

Organs transplanted from potential bowel donors

- 17 **Table 4** shows summary statistics on the 166 potential bowel donors where bowel offering occurred, by whether the liver, pancreas, or 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. 145 (87%) livers and 69 (42%) pancreases were transplanted compared with just 20 (12%) bowels. 29 of the livers that were transplanted were used in super-urgent liver only recipients but these were from the heavier donors.

Table 4 Transplants performed using organs from potential bowel donors where bowel offering occurred, during 2019/20

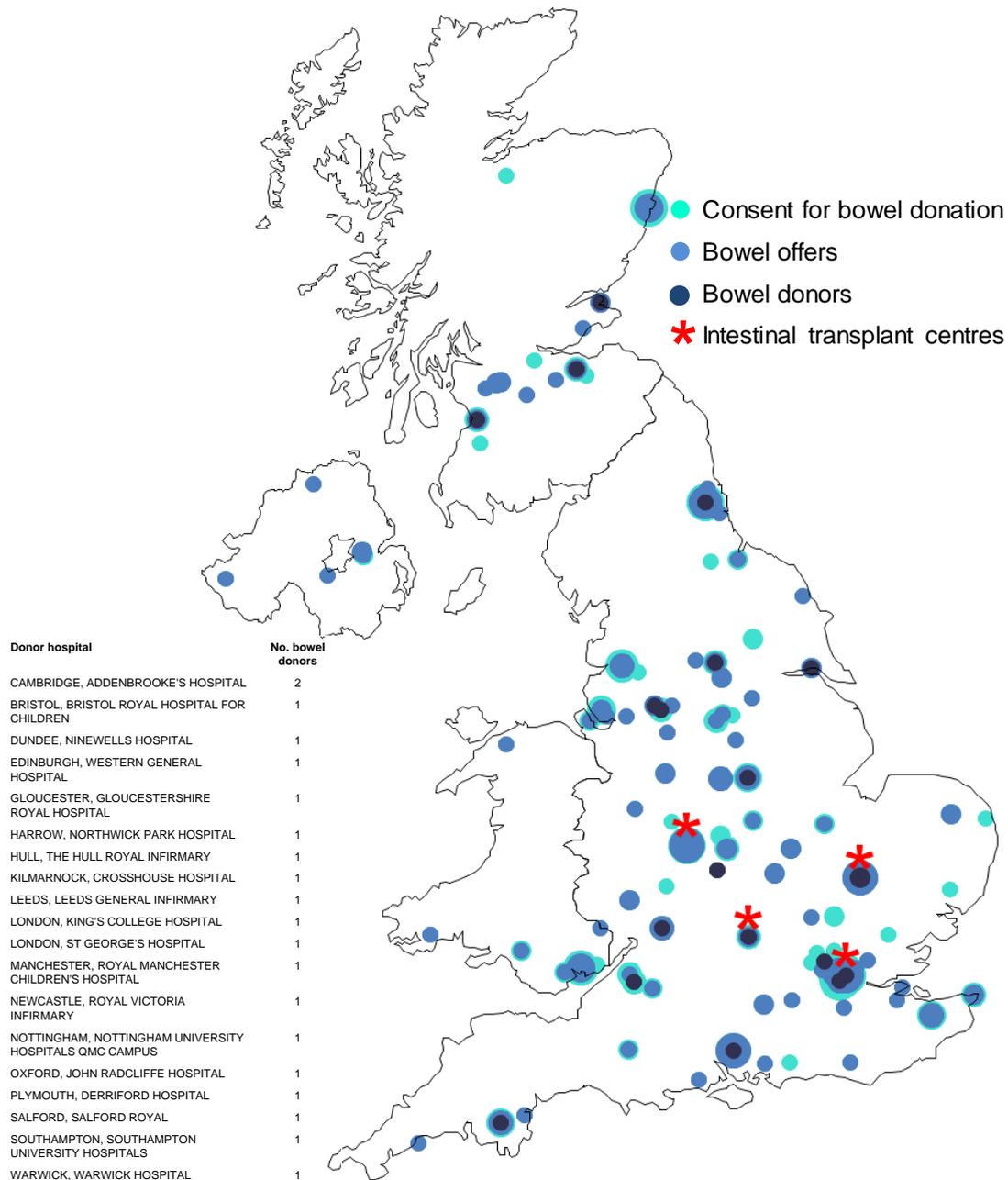
| | No. donors | Liver | | Organs transplanted (Liver only super-urgent transplants)* | | Pancreas | | Bowel | |
|-------------------------------------|------------|------------|-------------|---|---------------|-----------|-------------|-----------|-------------|
| | | N | % of donors | (N) | (% of donors) | N | % of donors | N | % of donors |
| Donor blood group | | | | | | | | | |
| O | 99 | 86 | 86.9 | (24) | (24.2) | 39 | 39.4 | 10 | 10.1 |
| A | 61 | 53 | 86.9 | (5) | (8.2) | 28 | 45.9 | 9 | 14.8 |
| B | 5 | 5 | 100.0 | (0) | (0.0) | 2 | 40.0 | 1 | 20.0 |
| AB | 1 | 1 | 100.0 | (0) | (0.0) | 0 | 0.0 | 0 | 0.0 |
| Donor weight (kg) | | | | | | | | | |
| <20 | 4 | 2 | 50.0 | (0) | (0.0) | 2 | 50.0 | 2 | 50.0 |
| 20-<35 | 1 | 1 | 100.0 | (0) | (0.0) | 0 | 0.0 | 1 | 100.0 |
| 35-<50 | 9 | 7 | 77.8 | (1) | (11.1) | 6 | 66.7 | 3 | 33.3 |
| 50-<80 | 152 | 135 | 88.8 | (28) | (18.4) | 61 | 40.1 | 14 | 9.2 |
| Donor BMI (kg/m²) | | | | | | | | | |
| <18.5 | 16 | 12 | 75.0 | (2) | (12.5) | 8 | 50.0 | 4 | 25.0 |
| 18.5-<25 | 124 | 111 | 89.5 | (23) | (18.5) | 54 | 43.6 | 14 | 11.3 |
| 25+ | 26 | 22 | 84.6 | (4) | (15.4) | 7 | 29.9 | 2 | 7.7 |
| Donor age (years) | | | | | | | | | |
| 0-15 | 10 | 8 | 80.0 | (2) | (20.0) | 6 | 60.0 | 6 | 60.0 |
| 16-35 | 55 | 51 | 92.7 | 15 | (27.3) | 27 | 49.1 | 5 | 9.1 |
| 36-50 | 81 | 69 | 85.2 | 10 | (12.3) | 31 | 38.3 | 7 | 8.6 |
| 51-55 | 20 | 17 | 85.0 | (2) | (10.0) | 5 | 25.0 | 2 | 10.0 |
| Total | 166 | 145 | 87.4 | (29) | (17.5) | 69 | 41.6 | 20 | 12.1 |

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

Location of potential bowel donors

18 **Figure 3** shows the location of the 243 potential bowel donors (those meeting the criteria and with consent) during the time period, using the location of the donor hospital. Overlaid on the potential bowel donors (●) are the donors where bowel offering occurred (●) and overlaid on those are the donors where the bowel was transplanted (●). See **Appendix IV** for a comparison of the geographical distribution of liver offers and bowel offers.

Figure 3 Geographical distribution of potential bowel donors during 2019/20



- 19 **Table 5** shows the distribution of the 243 potential bowel donors with consent for both bowel and liver donation by Organ Donation Services Team, with the number of these donors who had the liver and bowel offered. Of the 243 donors, 239 (98%) had the liver offered and 166 (68%) had the bowel offered.

| Organ Donation Services Team | No. donors | Livers offered | | Bowels offered | |
|------------------------------|------------|----------------|-----------|----------------|-----------|
| | | N | % | N | % |
| A | 20 | 20 | 100 | 13 | 65 |
| B | 30 | 29 | 97 | 21 | 70 |
| C | 30 | 29 | 97 | 21 | 70 |
| D | 24 | 23 | 96 | 15 | 63 |
| E | 14 | 14 | 100 | 9 | 64 |
| F | 7 | 7 | 100 | 6 | 86 |
| G | 27 | 27 | 100 | 18 | 67 |
| H | 17 | 17 | 100 | 16 | 94 |
| I | 22 | 22 | 100 | 14 | 64 |
| J | 15 | 15 | 100 | 10 | 67 |
| K | 18 | 17 | 94 | 11 | 61 |
| L | 19 | 19 | 100 | 12 | 63 |
| Total | 243 | 239 | 98 | 166 | 68 |

Non-UK offers

- 20 In 2019/20, there were 13 bowel offers to the UK from non-UK donors, with one retrieved, but none progressing to transplant. **Table 6** summarises what was offered and the outcome.

Table 6 Details of 13 non-UK donors where the bowel was offered to the UK in 2019/20

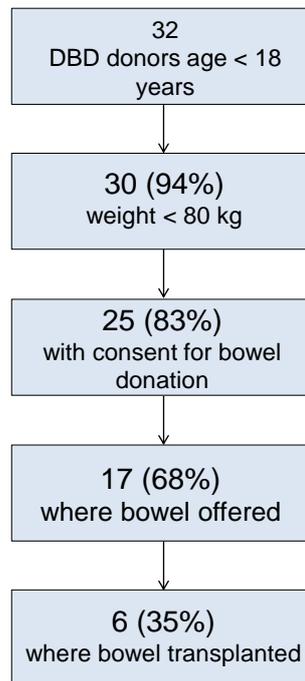
| Donor | Donor country | Blood group | Organs available | Offered to centres | Outcome | Reason for non-use/Organs transplanted |
|-------|---------------------|-------------|--|--------------------|-------------------------------|---|
| 1 | Netherlands | O | Bowel only | Yes | Declined | Size and no suitable recipients |
| 2 | Germany | A | Bowel only | Yes | Declined | No suitable recipients |
| 3 | Hungary | A | Bowel only | Yes | Declined | Logistics and no suitable recipients |
| 4 | Germany | O | Bowel only | Yes | Declined | Logistics |
| 5 | Germany | O | Bowel only | Yes | Declined | Size and logistics |
| 6 | Europe ¹ | O | Bowel and multivisceral organs | Yes | Declined | No suitable recipients and logistics |
| 7 | Hungary | B | Bowel and multivisceral organs | Yes | Declined | No suitable recipients and logistics |
| 8 | Hungary | A | Bowel only | Yes | Declined | No suitable recipients |
| 9 | Europe ¹ | O | Bowel only | No | | No suitable recipients |
| 10 | Austria | O | Bowel, pancreas, multivisceral organs, lungs | Yes | Accepted, retrieved, not used | King's College accepted bowel and colon but declined after retrieval as too small for recipient |
| 11 | Germany | O | Bowel only | Yes | Declined | No suitable recipients |
| 12 | Germany | A | Bowel, lungs | Yes | Declined | No suitable recipients and logistics |
| 13 | Germany | A | Bowel, pancreas | Yes | Declined | No suitable recipients and logistics |

Multivisceral organs - Stomach, colon, abdominal wall, and other tissue

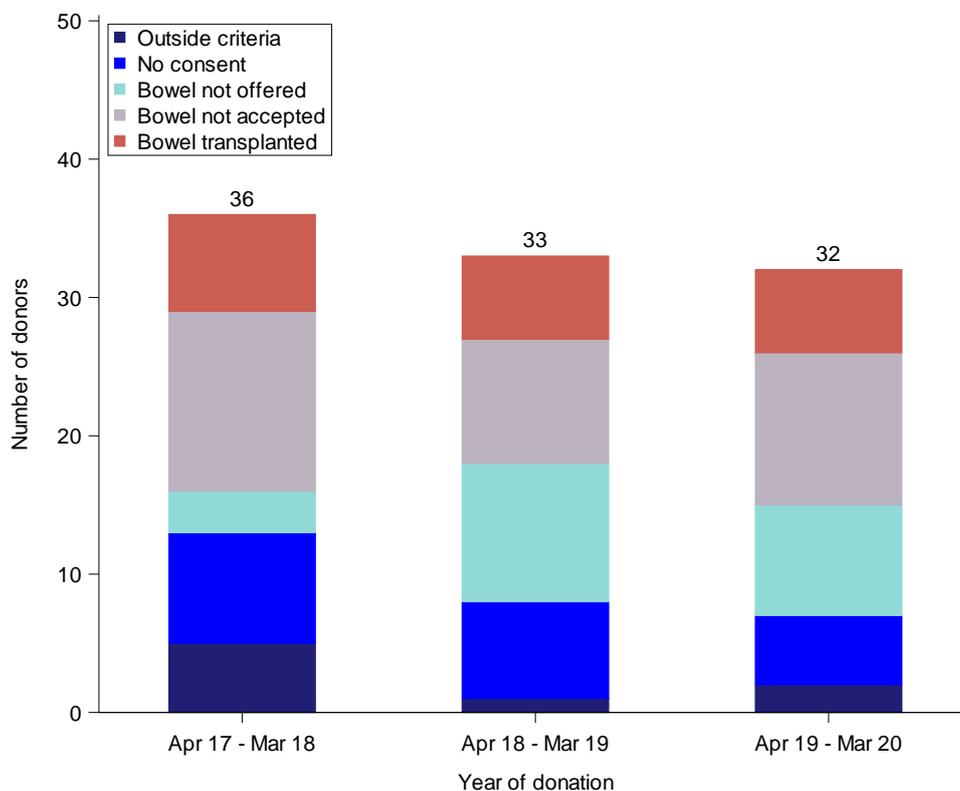
¹ Exact country of donor is not known

APPENDIX

Appendix I Flow diagram of the pathway from DBD donors aged < 18 years during 2019/20 to bowel donors



Appendix II The pathway from DBD donors aged <18 years between 1 April 2017 and 31 March 2020 to bowel donors, by financial year



Appendix III The pathway from DBD donors aged < 18 years between 1 April 2017 and 31 March 2020 to bowel donors, by financial year

| | | Financial year | | |
|--|---------------|----------------|-----------|-----------|
| | | 2017/2018 | 2018/2019 | 2019/2020 |
| DBD donors | N | 36 | 33 | 32 |
| Met criteria for bowel donation (weight < 80 kg) | N | 31 | 32 | 30 |
| | % of previous | 86 | 97 | 94 |
| Consent given for bowel donation | N | 23 | 25 | 25 |
| | % of previous | 74 | 78 | 83 |
| Bowel offered | N | 20 | 15 | 17 |
| | % of previous | 87 | 60 | 68 |
| Bowel transplanted | N | 7 | 6 | 6 |
| | % of previous | 35 | 40 | 35 |

Appendix IV Geographical comparison of liver offers and bowel offers from DBD donors during 2019/20 using location of donor hospitals (note that the bowel offers are restricted to donors meeting the criteria for bowel donation while there is no restriction on the liver offers)

