

Kidney Activity

Key messages

- The number of patients registered on the kidney transplant list this year fell by 7% from 5686 to 5275
- The number of deceased kidney donors increased by 7% to 1293
- Kidney transplants from living donors decreased by 2% to 1035, while transplants from deceased donors increased by 8% to 2228
- 83 kidney transplants were made possible by the paired living kidney donation programme
- There were 83 non-directed altruistic living kidney donors resulting in 83 living donor kidney transplants

5.1 Overview

The number of deceased kidney donors increased by 7% in 2015-2016 compared to 2014-2015 and the number of deceased donor kidney transplants increased by 8%. There were 5275 patients waiting for a kidney transplant at 31 March 2016, and for the seventh year running the number of patients on the national list for a kidney transplant has declined.

A summary of activity for deceased donor kidney transplants and the transplant list at year end for the last ten years is shown in **Figure 5.1**. The number of patients registered on the active transplant list at 31 March 2016 for a kidney or kidney and pancreas transplant has fallen by 19% since 2007.

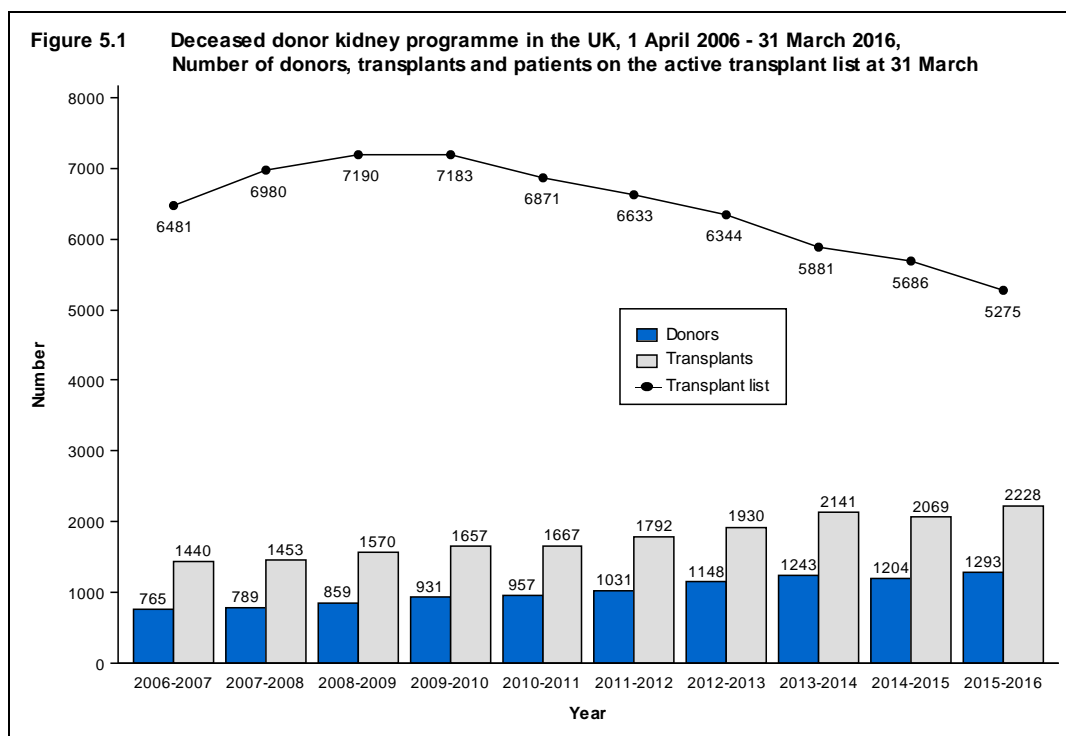


Table 5.1 shows the number of deceased and living donor kidney transplants carried out in 2015-2016 at each centre. Kidney transplants from donors after circulatory death are increasingly common and in this financial year all adult kidney transplant centres performed such transplants. As yet, very few kidneys from donors after circulatory death are transplanted in paediatric patients (<18 years). Donation figures for centres in North and South Thames are not reported individually as they have shared designated areas and donor populations. Multi-organ transplants including a kidney are included in the table.

The total number of deceased kidney donors rose to 1293 in 2015-2016 from 1204 in 2014-2015 and the number of transplants increased from 2069 to 2228. The number of kidney donors after circulatory death increased to 557 from 484 in 2014-2015 and the number of transplants from such donors increased by 16% to 899.

Throughout this chapter, intestinal transplants involving a kidney are not included in the kidney transplant activity reported. Any kidneys retrieved and used for such transplants are however used in the kidney donor activity.

Table 5.1 Kidney donors and transplants, 1 April 2015 - 31 March 2016 (2014-2015) and transplant list at 31 March 2016 (2015) in the UK, by centre

| Centre | Deceased kidney donors | | | | Deceased donor transplants | | | | Living donor transplants | | Active transplant list | |
|---------------------------|------------------------|--------------|------------|--------------|----------------------------|---------------------------|------------|--------------|---------------------------|-----------------------------|------------------------|---------------|
| | DBD | | DCD | | DBD | | DCD | | | | | |
| Belfast | 28 | (34) | 18 | (14) | 27 | (31) | 23 | (13) | 66 | (54) | 115 | (131) |
| Birmingham | 51 | (49) | 29 | (27) | 111 | (101) | 32 | (18) | 64 | (67) | 404 | (458) |
| Bristol | 28 | (27) | 27 | (19) | 57 | (52) | 36 | (13) | 45 | (40) | 262 | (306) |
| Cambridge | 30 | (40) | 59 | (48) | 46 | (65) | 82 | (69) | 53 | (40) | 183 | (169) |
| Cardiff | 31 | (24) | 18 | (21) | 32 | (22) | 37 | (38) | 29 | (36) | 98 | (110) |
| Coventry | 11 | (9) | 9 | (10) | 14 | (24) | 12 | (8) | 29 | (30) | 92 | (112) |
| Edinburgh | 19 | (28) | 31 | (27) | 56 | (47) | 23 | (30) | 39 | (31) | 164 | (175) |
| Glasgow | 34 | (32) | 11 | (7) | 66 | (56) | 51 | (37) | 41 | (44) | 264 | (272) |
| Great Ormond Street | 0 | (0) | 0 | (0) | 7 | (5) | 0 | (2) | 19 | (23) | 6 | (7) |
| Leeds | 43 | (29) | 27 | (34) | 84 | (74) | 58 | (87) | 46 | (46) | 225 | (261) |
| Leicester | 18 | (20) | 7 | (12) | 42 | (58) | 29 | (25) | 21 | (32) | 190 | (234) |
| Liverpool | 34 | (37) | 30 | (19) | 39 | (35) | 30 | (26) | 43 | (41) | 185 | (185) |
| Manchester | 42 | (36) | 41 | (28) | 127 | (114) | 91 | (54) | 105 | (98) | 482 | (583) |
| Newcastle | 50 | (42) | 34 | (33) | 44 | (25) | 30 | (36) | 51 | (57) | 218 | (213) |
| North Thames ¹ | 93 | (90) | 49 | (46) | - | - | - | - | - | - | - | - |
| Royal Free | - | - | - | - | 52 | (71) | 30 | (37) | 39 | (32) | 246 | (243) |
| Royal London | - | - | - | - | 57 | (65) | 27 | (17) | 34 | (47) | 306 | (317) |
| WLRTC | - | - | - | - | 86 | (87) | 47 | (29) | 36 | (64) | 400 | (423) |
| Nottingham | 15 | (12) | 28 | (21) | 40 | (28) | 34 | (27) | 19 | (17) | 128 | (131) |
| Oxford | 25 | (32) | 19 | (16) | 87 | (84) | 72 | (56) | 48 | (51) | 280 | (258) |
| Plymouth | 36 | (34) | 21 | (21) | 22 | (22) | 24 | (16) | 13 | (20) | 67 | (85) |
| Portsmouth | 33 | (19) | 26 | (11) | 31 | (52) | 33 | (10) | 23 | (23) | 203 | (205) |
| Sheffield | 14 | (30) | 12 | (12) | 32 | (37) | 19 | (18) | 23 | (20) | 164 | (179) |
| South Thames ¹ | 101 | (96) | 61 | (58) | - | - | - | - | - | - | - | - |
| Guy's | - | - | - | - | 114 | (82) | 55 | (68) | 89 | (87) | 318 | (347) |
| St George's | - | - | - | - | 55 | (59) | 24 | (38) | 49 | (37) | 275 | (282) |
| TOTAL | 736 | (720) | 557 | (484) | 1329² | (1297³) | 899 | (772) | 1035^{4,6} | (1052^{5,7}) | 5275 | (5686) |

WLRTC - West London Renal and Transplant Centre

¹ Donor figures in this area cannot be linked to individual transplant centres due to shared retrieval areas

² Includes an additional 1 transplant performed at London, The London Independent Hospital

³ Includes an additional 1 transplant performed at Manchester, Wythenshawe Hospital

⁴ Includes an additional 1 transplant performed at London, The London Independent Hospital, 6 transplants at London, Cromwell Hospital, and 4 transplants at London, London Bridge Hospital

⁵ Includes an additional 8 transplants performed at London, Cromwell Hospital and 7 transplants performed at London, London Bridge Hospital

⁶ Includes 2 domino donors; ⁷ Includes 3 domino donors

5.2 Transplant list

The number of patients registered on the kidney or kidney and pancreas transplant list fell by 7% in the year: on 31 March 2016, 5,275 patients were registered as active, compared with 5,686 at the end of March 2015. The number of patients waiting for a kidney transplant represents 81.4 patients per million population (pmp).

Of the 5,275 patients on the active transplant list at 31 March 2016, 184 required a kidney and pancreas transplant (201 at 31 March 2015). Additionally, 43 patients were registered for a pancreas only transplant (51 at 31 March 2015).

The outcome of patients registered on the UK kidney and kidney/pancreas transplant list at 1 April 2015, or subsequently registered during the financial year, is shown in **Table 5.2**. A total of 3,430 patients joined the kidney transplant list last year, a decrease of 4% from the previous year. A further 213 joined the kidney/pancreas transplant list.

| Table 5.2 Kidney 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 2015-2016¹ | | TOTAL | | |
| | N | % | N | % | N | % | |
| Kidney transplant list | | | | | | | |
| Remained active/suspended | 5532 | 64 | 2727 | 80 | 8259 | 69 | |
| Transplanted | 2303 | 27 | 656 | 19 | 2959 | 25 | |
| Removed | 550 ² | 6 | 26 | 1 | 576 | 5 | |
| Died | 236 | 3 | 21 | 1 | 257 | 2 | |
| TOTAL | 8621 | | 3430 | | 12051 | | |
| Kidney/pancreas transplant list | | | | | | | |
| Remained active/suspended | 153 | 47 | 173 | 81 | 326 | 61 | |
| Transplanted | 139 | 43 | 31 | 15 | 170 | 32 | |
| Removed | 13 | 4 | 6 | 3 | 19 | 4 | |
| Died | 20 | 6 | 3 | 1 | 23 | 4 | |
| TOTAL | 325 | | 213 | | 538 | | |

¹ Includes re-registrations for second or subsequent transplants
² Includes 7 patients removed from kidney list and made active on kidney/pancreas list

Table 5.3 shows the active transplant list in the UK at 31 March 2016 and 2015 by country/ former Strategic Health Authority of patient's residence. In 2016, the overall kidney transplant list rate was 81.4 pmp with rates across the Strategic Health Authorities ranging from 58.8 pmp to 128.9 pmp.

| Table 5.3 Active kidney transplant list at 31 March, by country/ Strategic Health Authority of patient residence | | | | |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------|-------------|----------------|
| Country/ Strategic Health Authority of residence | Kidney transplant list (pmp) | | | |
| | 2016 | | 2015 | |
| North East | 186 | (71.0) | 173 | (66.0) |
| North West | 613 | (86.0) | 714 | (100.1) |
| Yorkshire and The Humber | 374 | (69.8) | 425 | (79.3) |
| North of England | 1173 | (77.6) | 1312 | (86.8) |
| East Midlands | 371 | (80.0) | 413 | (89.0) |
| West Midlands | 517 | (90.5) | 587 | (102.8) |
| East of England | 370 | (61.5) | 362 | (60.1) |
| Midlands and East | 1258 | (76.8) | 1362 | (83.2) |
| London | 1101 | (128.9) | 1166 | (136.5) |
| South East Coast | 270 | (58.8) | 266 | (58.0) |
| South Central | 366 | (85.3) | 371 | (86.5) |
| South West | 393 | (72.5) | 450 | (83.0) |
| South of England | 1029 | (72.0) | 1087 | (76.0) |
| England | 4561 | (84.0) | 4927 | (90.7) |
| Isle of Man | 9 | (112.5) | 10 | (125.0) |
| Channel Islands | 12 | (75.0) | 4 | (25.0) |
| Wales | 144 | (46.6) | 159 | (51.5) |
| Scotland | 426 | (79.6) | 442 | (82.6) |
| Northern Ireland | 120 | (65.2) | 141 | (76.6) |
| TOTAL¹ | 5275 | (81.4) | 5686 | (87.7) |

¹ Includes patients in 2016 (2015) residing in: Unspecified UK 1 (1); Overseas 2 (2)

An indication of outcomes for adult patients listed for a kidney only transplant is summarised in **Figure 5.2**. This shows the proportion of patients transplanted or still waiting one, three and five years after joining the list. It also shows the proportion removed from the transplant list (typically because they become too unwell for transplant) and those dying while on the transplant list. Only 22% of patients are transplanted within one year, while five years after listing 70% of patients have received a transplant.

The median (average) waiting time for a kidney only transplant is 944 days for an adult patient and is shown by blood group in **Table 5.4** and patient ethnicity in **Table 5.5**. Because of the need to match donor and recipient blood groups and tissue types, waiting times to transplant differ according to patient blood groups and ethnicity due to differences between the donor pool and patients awaiting a kidney transplant. 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.

Figure 5.2 Post-registration outcome for 2808 new adult kidney only registrations made in the UK, 1 April 2010 - 31 March 2011

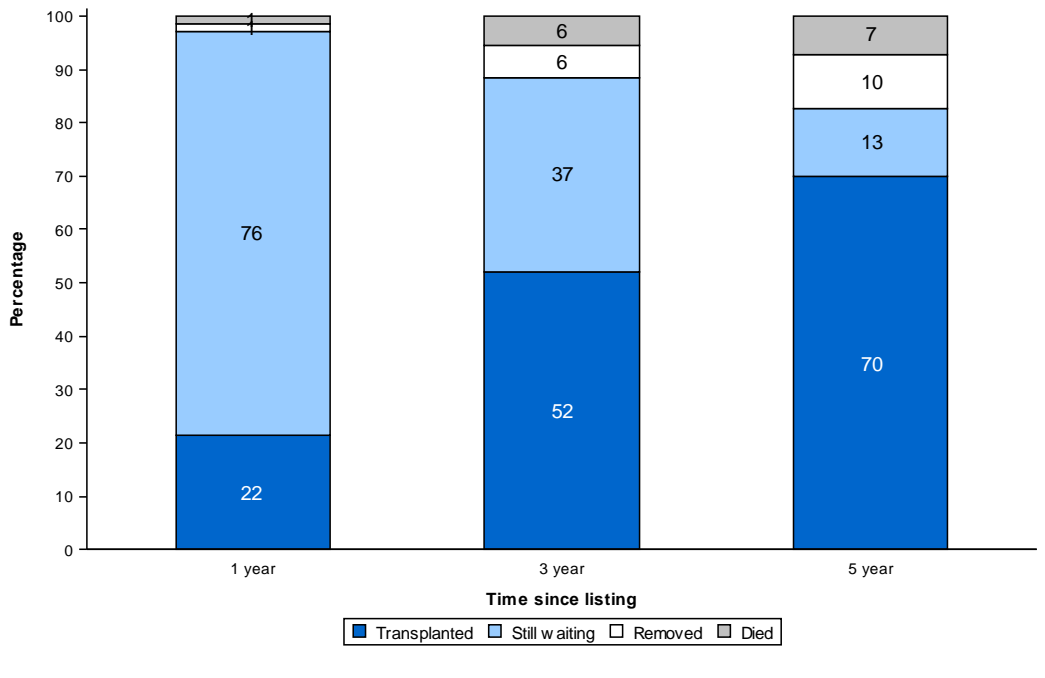


Table 5.4 Median waiting time to kidney only transplant in the UK, for patients registered 1 April 2009 - 31 March 2013

| Blood group | Number of patients registered | Waiting time (days) | |
|-------------------|-------------------------------|---------------------|-------------------------|
| | | Median | 95% Confidence interval |
| Adult | | | |
| O | 3999 | 1112 | 1085 - 1139 |
| A | 3111 | 752 | 724 - 780 |
| B | 1234 | 1091 | 1035 - 1147 |
| AB | 359 | 383 | 329 - 437 |
| TOTAL | 8703 | 944 | 924 - 964 |
| Paediatric | | | |
| O | 128 | 370 | 281 - 459 |
| A | 101 | 217 | 123 - 311 |
| B | 44 | 177 | 108 - 246 |
| AB | 15 | 326 | 246 - 406 |
| TOTAL | 288 | 290 | 228 - 352 |

Table 5.5 Median waiting time to kidney only transplant in the UK, for patients registered 1 April 2009 - 31 March 2013

| Ethnicity | Number of patients registered | Waiting time (days) | |
|-------------------|-------------------------------|---------------------|-------------------------|
| | | Median | 95% Confidence interval |
| Adult | | | |
| White | 6293 | 882 | 859 - 905 |
| Asian | 1359 | 1070 | 1010 - 1130 |
| Black | 736 | 1134 | 1085 - 1183 |
| Other | 252 | 990 | 882 - 1098 |
| TOTAL | 8703¹ | 944 | 924 - 964 |
| Paediatric | | | |
| White | 179 | 235 | 183 - 287 |
| Asian | 73 | 493 | 334 - 652 |
| Black | 23 | 326 | 0 - 672 |
| Other | 10 | 222 | 0 - 581 |
| TOTAL | 288² | 290 | 228 - 352 |

¹ Includes 63 patients whose ethnicity was not reported

² Includes 3 patients whose ethnicity was not reported

5.3 Donor and organ supply

Of the 785 organ donors after brain death in the UK in 2015-2016, 736 (94%) were kidney donors. From these donors, 1,462 kidneys were retrieved. There were 557 kidney donors after circulatory death in 2015-2016. From these donors, 1,103 kidneys were retrieved. **Table 5.6** shows this activity by donor country/Strategic Health Authority of donor's residence. No adjustments have been made for potential demographic differences in populations.

The overall rate for kidney donors after brain death is 11.4 pmp, with rates across the Strategic Health Authorities ranging from 8.9 to 16.6 pmp. The number of kidneys retrieved from donors after brain death in the UK is 22.5 pmp and varies from 17.8 to 32.9 pmp.

The overall rate for kidney donors after circulatory death is 8.6 pmp, with rates across the Strategic Health Authorities ranging from 5.4 to 12.8 pmp. The number of kidneys retrieved from donors after circulatory death is 17.0 pmp and varies from 10.5 to 25.6 pmp.

| Table 5.6 Kidney donation and retrieval rates for deceased donors in the UK, 1 April 2015 - 31 March 2016, by country/ Strategic Health Authority | | | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------|------------|---------------|--------------------------------|---------------|-------------|---------------|
| Country/ Strategic Health Authority of residence | Kidney donors (pmp) | | | | Kidneys retrieved (pmp) | | | |
| | DBD | | DCD | | DBD | | DCD | |
| North East | 40 | (15.3) | 30 | (11.5) | 79 | (30.2) | 59 | (22.5) |
| North West | 77 | (10.8) | 59 | (8.3) | 153 | (21.5) | 117 | (16.4) |
| Yorkshire and The Humber | 57 | (10.6) | 40 | (7.5) | 112 | (20.9) | 80 | (14.9) |
| North of England | 174 | (11.5) | 129 | (8.5) | 344 | (22.8) | 256 | (16.9) |
| East Midlands | 42 | (9.1) | 43 | (9.3) | 84 | (18.1) | 86 | (18.5) |
| West Midlands | 61 | (10.7) | 32 | (5.6) | 120 | (21.0) | 64 | (11.2) |
| East of England | 61 | (10.1) | 77 | (12.8) | 122 | (20.3) | 154 | (25.6) |
| Midlands and East | 164 | (10.0) | 152 | (9.3) | 326 | (19.9) | 304 | (18.6) |
| London | 76 | (8.9) | 46 | (5.4) | 152 | (17.8) | 90 | (10.5) |
| South East Coast | 76 | (16.6) | 44 | (9.6) | 151 | (32.9) | 87 | (19.0) |
| South Central | 52 | (12.1) | 35 | (8.2) | 103 | (24.0) | 69 | (16.1) |
| South West | 73 | (13.5) | 52 | (9.6) | 146 | (26.9) | 103 | (19.0) |
| South of England | 201 | (14.1) | 131 | (9.2) | 400 | (28.0) | 259 | (18.1) |
| England | 615 | (11.3) | 458 | (8.4) | 1222 | (22.5) | 909 | (16.7) |
| Isle of Man | 1 | (12.5) | 1 | (12.5) | 2 | (25.0) | 2 | (25.0) |
| Channel Islands | 2 | (12.5) | 1 | (6.3) | 4 | (25.0) | 2 | (12.5) |
| Wales | 34 | (11.0) | 36 | (11.7) | 68 | (22.0) | 71 | (23.0) |
| Scotland | 55 | (10.3) | 44 | (8.2) | 108 | (20.2) | 86 | (16.1) |
| Northern Ireland | 29 | (15.8) | 17 | (9.2) | 58 | (31.5) | 33 | (17.9) |
| TOTAL¹ | 736 | (11.4) | 557 | (8.6) | 1462 | (22.5) | 1103 | (17.0) |

¹ Includes 11 donors where the hospital postcode was used in place of an unknown donor postcode

5.4 Transplants

The number of kidney transplants by recipient country/Strategic Health Authority of residence is shown in **Table 5.7**. No adjustments have been made for potential demographic differences in populations. The deceased donor transplant rate ranged from 20 to 41.7 pmp across Strategic Health Authorities and overall was 31.4 pmp. The living donor transplant rate ranged from 11.8 to 19.9 pmp across the Strategic Health Authorities and overall was 15.7 pmp.

| Country/ Strategic Health Authority of residence | DBD | | DCD | | TOTAL | | Living | |
|--------------------------------------------------|-------------|---------------|------------|---------------|-------------|---------------|-------------|---------------|
| | N | (pmp) | N | (pmp) | N | (pmp) | N | (pmp) |
| North East | 29 | (11.1) | 27 | (10.3) | 56 | (21.4) | 42 | (16) |
| North West | 140 | (19.6) | 100 | (14) | 240 | (33.7) | 142 | (19.9) |
| Yorkshire and The Humber | 111 | (20.7) | 72 | (13.4) | 183 | (34.1) | 63 | (11.8) |
| North of England | 280 | (18.5) | 199 | (13.2) | 479 | (31.7) | 247 | (16.3) |
| East Midlands | 89 | (19.2) | 70 | (15.1) | 159 | (34.3) | 55 | (11.9) |
| West Midlands | 117 | (20.5) | 45 | (7.9) | 162 | (28.4) | 85 | (14.9) |
| East of England | 74 | (12.3) | 90 | (15) | 164 | (27.2) | 87 | (14.5) |
| Midlands and East | 280 | (17.1) | 205 | (12.5) | 485 | (29.6) | 227 | (13.9) |
| London | 227 | (26.6) | 129 | (15.1) | 356 | (41.7) | 138 | (16.2) |
| South East Coast | 66 | (14.4) | 26 | (5.7) | 92 | (20) | 79 | (17.2) |
| South Central | 68 | (15.9) | 78 | (18.2) | 146 | (34) | 55 | (12.8) |
| South West | 86 | (15.9) | 73 | (13.5) | 159 | (29.3) | 76 | (14) |
| South of England | 220 | (15.4) | 177 | (12.4) | 397 | (27.8) | 210 | (14.7) |
| England | 1007 | (18.5) | 710 | (13.1) | 1717 | (31.6) | 822 | (15.1) |
| Isle of Man | 1 | (12.5) | 0 | (0) | 1 | (12.5) | 3 | (37.5) |
| Channel Islands | 1 | (6.3) | 3 | (18.8) | 4 | (25) | 4 | (25) |
| Wales | 39 | (12.6) | 45 | (14.6) | 84 | (27.2) | 46 | (14.9) |
| Scotland | 105 | (19.6) | 74 | (13.8) | 179 | (33.5) | 80 | (15) |
| Northern Ireland | 28 | (15.2) | 23 | (12.5) | 51 | (27.7) | 63 | (34.2) |
| TOTAL¹ | 1181 | (18.2) | 855 | (13.2) | 2036 | (31.4) | 1018 | (15.7) |

¹ Excludes 17 recipients of a living donor kidney who reside outside of the UK

The number of kidney only transplants from deceased donors at each transplant centre is shown in **Table 5.8** for adult patients only. Kidney transplants from donors after brain death include 4 en bloc kidneys and 14 double kidney transplants in 2015-2016 (2 and 15 in 2014-2015). Kidney transplants from donors after circulatory death include 8 en bloc and 32 double kidney transplants in 2015-2016 (6 and 41 in 2014-2015). This table excludes multi-organ transplants: 19 kidney and liver, 167 kidney and pancreas and 2 modified multivisceral.

**Table 5.8 Adult kidney only transplants in the UK,
1 April 2014 - 31 March 2016, by transplant centre**

| Transplant centre | 2014-2015 | | | | 2015-2016 | | | |
|-------------------|-------------|------------|------------------------|-------------|-------------|------------|------------------------|-------------|
| | DBD | DCD | Living donor | TOTAL | DBD | DCD | Living donor | TOTAL |
| Belfast | 30 | 13 | 53 | 96 | 27 | 23 | 66 | 116 |
| Birmingham | 88 | 17 | 58 | 163 | 96 | 32 | 58 | 186 |
| Bristol | 50 | 13 | 32 | 95 | 55 | 36 | 42 | 133 |
| Cambridge | 50 | 57 | 40 | 147 | 29 | 72 | 53 | 154 |
| Cardiff | 20 | 32 | 35 | 87 | 28 | 35 | 26 | 89 |
| Coventry | 23 | 8 | 30 | 61 | 14 | 12 | 29 | 55 |
| Edinburgh | 32 | 28 | 30 | 90 | 39 | 23 | 39 | 101 |
| Glasgow | 53 | 37 | 37 | 127 | 62 | 51 | 39 | 152 |
| Guys | 56 | 56 | 73 | 185 | 84 | 46 | 74 | 204 |
| Leeds | 62 | 86 | 43 | 191 | 73 | 57 | 41 | 171 |
| Leicester | 58 | 25 | 32 | 115 | 42 | 29 | 20 | 91 |
| Liverpool | 35 | 26 | 41 | 102 | 39 | 30 | 43 | 112 |
| Manchester | 91 | 42 | 82 | 215 | 108 | 77 | 86 | 271 |
| Newcastle | 20 | 36 | 53 | 109 | 35 | 30 | 49 | 114 |
| Nottingham | 27 | 27 | 13 | 67 | 30 | 34 | 16 | 80 |
| Oxford | 41 | 43 | 51 | 135 | 50 | 63 | 48 | 161 |
| Plymouth | 22 | 16 | 20 | 58 | 22 | 24 | 13 | 59 |
| Portsmouth | 52 | 10 | 23 | 85 | 31 | 33 | 23 | 87 |
| Sheffield | 37 | 18 | 20 | 75 | 32 | 19 | 23 | 74 |
| St George's | 59 | 38 | 37 | 134 | 55 | 24 | 49 | 128 |
| The Royal Free | 68 | 37 | 32 | 137 | 49 | 30 | 39 | 118 |
| The Royal London | 65 | 17 | 47 | 129 | 57 | 27 | 34 | 118 |
| WLRTC | 82 | 29 | 64 | 175 | 77 | 44 | 36 | 157 |
| TOTAL | 1121 | 711 | 961¹ | 2793 | 1134 | 851 | 957² | 2942 |

¹ Includes 8 transplants performed at London Cromwell Hospital and 7 at London Bridge

² Includes 1 transplant performed at London Independent, 6 at London Cromwell Hospital and 4 at London Bridge
WLRTC - West London Renal and Transplant Centre

Living donor kidney transplants fell by 2% to 1035 in 2015-2016, representing 32% of the total kidney transplant programme. The total number of living donor adult transplants performed by each transplant centre is shown in **Table 5.9**. Also shown is the number as a percentage of patients listed at the end of the year, to indicate the size of the living donor programme relative to the centre's transplant list.

Most living donor transplants are 'directed'. This means that a kidney is donated to a specific recipient known to the donor - a close family member or friend. There has been a 3% decrease in these transplants. In addition there are now a number of 'undirected' living donor transplants (also known as altruistic donor transplants). Last year 83 such donors donated a kidney to a recipient, 81 transplanted into an adult recipient and 2 transplanted into a paediatric recipient. Of the 81 transplanted into an adult recipient, 25 went into an altruistic donor chain (12 short and 13 long), benefiting 37 adult and 1 paediatric patients in the paired/pooled scheme. The kidneys from the paired donors of these recipients led to 23 adult and 2 paediatric transplants for patients on the deceased donor transplant list. Thus 25 altruistic donors creating chains benefited 60 adult and 3 paediatric patients.

When a potential donor and recipient are biologically incompatible (blood group or tissue type), they may consider joining a list of others in the same situation with the hope that an exchange of kidneys between them can lead to a compatible living donor transplant. The scheme also includes compatible pairs that would like a better match. This type of exchange is known as paired donation and most exchanges are between two pairs (i.e. two donors and their respective incompatible recipients), or between three pairs. In 2015-2016, there were also 83 paired living kidney donor transplants.

As a percentage of the number of patients on the active transplant list at 31 March 2016, the number of living donor adult transplants in the year was 18% and ranged from 9% to 57% at individual transplant centres.

| Table 5.9 Adult living donor kidney transplants in the UK, 1 April 2015 - 31 March 2016, and percentage of active transplant list at 31 March, by transplant centre | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------|--------------------------------|-------------------------------------------|------------------------|---------------|
| Transplant centre | 2015-2016 | | | | TOTAL | |
| | Directed | Non-directed (altruistic) to waiting list | Paired/pooled exchanges | Altruistic donor chain³ | N | % list |
| Belfast | 50 | 2 | 11 | 3 | 66 | 57 |
| Birmingham | 37 | 12 | 2 | 7 | 58 | 15 |
| Bristol | 25 | 8 | 4 | 5 | 42 | 16 |
| Cambridge | 46 | 0 | 4 | 3 | 53 | 29 |
| Cardiff | 22 | 1 | 3 | 0 | 26 | 27 |
| Coventry | 26 | 2 | 1 | 0 | 29 | 32 |
| Edinburgh | 31 | 1 | 6 | 1 | 39 | 24 |
| Glasgow | 31 | 2 | 3 | 3 | 39 | 15 |
| Guy's | 65 | 1 | 3 | 5 | 74 | 24 |
| Leeds | 37 | 0 | 4 | 0 | 41 | 19 |
| Leicester | 17 | 1 | 0 | 2 | 20 | 11 |
| Liverpool | 33 | 4 | 5 | 1 | 43 | 23 |
| Manchester | 68 | 5 | 8 | 5 | 86 | 18 |
| Newcastle | 45 | 0 | 2 | 2 | 49 | 23 |
| Nottingham | 14 | 1 | 1 | 0 | 16 | 13 |
| Oxford | 37 | 3 | 5 | 3 | 48 | 17 |
| Plymouth | 9 | 1 | 2 | 1 | 13 | 19 |
| Portsmouth | 17 | 2 | 2 | 2 | 23 | 11 |
| Sheffield | 18 | 3 | 1 | 1 | 23 | 14 |
| St George's | 32 | 2 | 7 | 8 | 49 | 18 |
| The Royal Free | 34 | 2 | 2 | 1 | 39 | 16 |
| The Royal London | 30 | 1 | 2 | 1 | 34 | 11 |
| WLRTC | 21 | 4 | 5 | 6 | 36 | 9 |
| TOTAL | 756¹ | 58² | 83 | 60 | 957¹ | 18 |

¹ Includes 1 transplant performed at London Independent, 6 at London Cromwell Hospital and 4 at London Bridge

² Includes 2 domino donor transplants

³ Includes transplants for paired pooled and deceased donor transplant list patients

Non-directed, altruistic donor kidneys are matched to a suitable recipient on a national basis and thus are rarely used in the transplant centre responsible for the 'work-up' of the donor. The number of non-directed donors according to donor hospital (rather than transplant hospital) and whether the altruistic donor donated as part of a chain within the paired/ pooled scheme or directly to the deceased donor list is shown in **Table 5.10**.

| Table 5.10 Altruistic kidney donors in the UK, 1 April 2014 - 31 March 2016, by donor centre | | | | | | | | |
|-----------------------------------------------------------------------------------------------------|-----------------|-----------|------------|------------|-----------------|-----------|-----------|------------|
| Donor centre | 2014-2015 | | | | 2015-2016 | | | |
| | Transplant list | Chain | Total | % | Transplant list | Chain | Total | % |
| Belfast | 6 | 4 | 10 | 9 | 3 | 1 | 4 | 5 |
| Birmingham | 5 | 1 | 6 | 6 | 3 | 1 | 4 | 5 |
| Bristol | 4 | 0 | 4 | 4 | 1 | 0 | 1 | 1 |
| Cambridge | 3 | 1 | 4 | 4 | 2 | 1 | 3 | 4 |
| Cardiff | 3 | 1 | 4 | 4 | 2 | 0 | 2 | 2 |
| Coventry | 2 | 0 | 2 | 2 | 2 | 1 | 3 | 4 |
| Edinburgh | 6 | 3 | 9 | 8 | 3 | 3 | 6 | 7 |
| Glasgow | 4 | 0 | 4 | 4 | 2 | 0 | 2 | 2 |
| Guy's | 10 | 0 | 10 | 9 | 1 | 2 | 3 | 4 |
| Leeds | 2 | 2 | 4 | 4 | 3 | 1 | 4 | 5 |
| Leicester | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 2 |
| Liverpool | 5 | 0 | 5 | 5 | 2 | 0 | 2 | 2 |
| Manchester | 8 | 0 | 8 | 7 | 11 | 0 | 11 | 13 |
| Newcastle | 4 | 0 | 4 | 4 | 3 | 2 | 5 | 6 |
| Nottingham | 3 | 0 | 3 | 3 | 3 | 0 | 3 | 4 |
| Oxford | 4 | 2 | 6 | 6 | 3 | 7 | 10 | 12 |
| Plymouth | 6 | 2 | 8 | 7 | 3 | 3 | 6 | 7 |
| Portsmouth | 7 | 0 | 7 | 7 | 3 | 1 | 4 | 5 |
| Sheffield | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 2 |
| St George's | 2 | 0 | 2 | 2 | 1 | 0 | 1 | 1 |
| The Royal Free | 2 | 0 | 2 | 2 | 1 | 1 | 2 | 2 |
| The Royal London | 0 | 1 | 1 | 1 | 2 | 0 | 2 | 2 |
| WLRTC | 3 | 0 | 3 | 3 | 1 | 0 | 1 | 1 |
| Total donors | 90 | 17 | 107 | 100 | 58 | 25 | 83 | 100 |

WLRTC – West London Renal and Transplant Centre

The number of deceased donor and living donor transplants in paediatric patients (<18 years) performed by each paediatric transplant centre is shown in **Table 5.11**. There were 78 living donor transplants and 51 deceased donor transplants in paediatric patients in 2015-2016. The paediatric transplant list has decreased by 4% from 73 patients at 31 March 2015 to 70 at the end of March 2016.

Occasionally older paediatric patients are listed and/or transplanted at adult kidney transplant centres and these are indicated in **Table 5.11**.

| Table 5.11 Paediatric patient kidney transplants in the UK, 1 April 2014 - 31 March 2016, by transplant centre | | | | | | | | |
|-----------------------------------------------------------------------------------------------------------------------|------------------|----------|-----------------------|------------|------------------|----------|-----------------------|------------|
| Paediatric transplant centre | 2014-2015 | | | | 2015-2016 | | | |
| | DBD | DCD | Living donor | TOTAL | DBD | DCD | Living donor | TOTAL |
| Belfast | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| Birmingham | 10 | 1 | 9 | 20 | 5 | 0 | 6 | 11 |
| Bristol | 2 | 0 | 8 | 10 | 2 | 0 | 3 | 5 |
| Glasgow | 3 | 0 | 7 | 10 | 4 | 0 | 2 | 6 |
| Great Ormond Street | 5 | 2 | 23 | 30 | 7 | 0 | 19 | 26 |
| Guy's | 4 | 1 | 14 | 19 | 4 | 1 | 15 | 20 |
| Leeds | 10 | 1 | 3 | 14 | 8 | 1 | 5 | 14 |
| Manchester | 5 | 1 | 16 | 22 | 5 | 2 | 19 | 26 |
| Newcastle | 0 | 0 | 4 | 4 | 2 | 0 | 2 | 4 |
| Nottingham | 1 | 0 | 4 | 5 | 10 | 0 | 3 | 13 |
| Adult centres | 1 | 0 | 2 | 3 | 0 | 0 | 4 | 4 |
| TOTAL | 42 | 6 | 91¹ | 139 | 47 | 4 | 78² | 129 |

¹ Includes 2 non-directed donor transplants and 2 altruistic donor chains (as patients on transplant list at end of chain)
² Includes 2 non-directed donor transplants and 3 altruistic donor chains (as patients on transplant list at end of chain)

At 31 March 2016, there were approximately 34,400 recipients with a functioning kidney transplant (including multi-organ transplants) being followed-up as reported to the UK Transplant Registry.

Rates of pre-emptive kidney only transplantation are shown in **Table 5.12**. Of the 3,071 kidney only transplant recipients in 2015-2016, dialysis status at time of transplant was reported for 2,966 (97%). Of these 2,966 transplants, 664 (22%) were carried out in pre-dialysis patients.

Pre-emptive transplants accounted for 30% of all paediatric kidney only transplants with reported dialysis status, compared with 22% of those in adults. Living donor transplants are more likely to be carried out before the need for dialysis than deceased donor transplants: 37% and 15% respectively. This is because a living donor transplant can often be carried out more quickly than a deceased donor kidney transplant as the latter often necessitates a long waiting time.

| Table 5.12 Pre-emptive kidney only transplants in the UK, 1 April 2015 - 31 March 2016 | | | |
|-----------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| | Number of kidney only transplants | Number of transplants with known dialysis status at transplant (% of all) | Percentage of patients transplanted prior to the need for dialysis (of those with known status) |
| Adult | | | |
| Deceased donor transplant | 1985 | 1943 (97.9) | 15.1 |
| Living donor transplant | 957 | 898 (93.8) | 37.1 |
| Paediatric | | | |
| Deceased donor transplant | 51 | 50 (98.0) | 20.0 |
| Living donor transplant | 78 | 75 (96.2) | 36.0 |

The length of time that elapses between a kidney being removed from the donor to its transplantation into the recipient is called Cold Ischaemia Time (CIT). Generally, the shorter this time, the more likely the kidney is to work immediately and the better the long-term outcome. The factors which determine CIT include a) transportation of the kidney from the retrieval hospital to the hospital where the transplant is performed, b) the need to tissue type the donor and cross-match the donor and potential recipients, c) the occasional necessity of moving the kidney to another hospital if a transplant cannot go ahead, d) contacting and preparing the recipient for the transplant and e) access to the operating theatre. Median CITs are shown in addition to inter-quartile ranges in **Table 5.13**.

| Table 5.13 Median cold ischaemia time for kidney only transplants in the UK, 1 April 2015 - 31 March 2016 | | | | |
|------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------|-----------------------------------|-------------|
| | Number of kidney only transplants ¹ | Median (hours) | Inter-quartile range ² | |
| | | | Q1 | Q3 |
| Adult | | | | |
| DBD donor transplant | 1134 | 14.0 | 10.7 | 17.9 |
| DCD donor transplant | 851 | 13.2 | 10.4 | 16.3 |
| Total | 1985 | 13.7 | 10.6 | 17.1 |
| Paediatric | | | | |
| DBD donor transplant | 47 | 12.4 | 10.5 | 14.8 |
| DCD donor transplant | 4 | 12.5 | 10.2 | 15.2 |
| Total | 51 | 12.4 | 10.5 | 14.8 |
| TOTAL | 2036 | 13.6 | 10.6 | 17.1 |

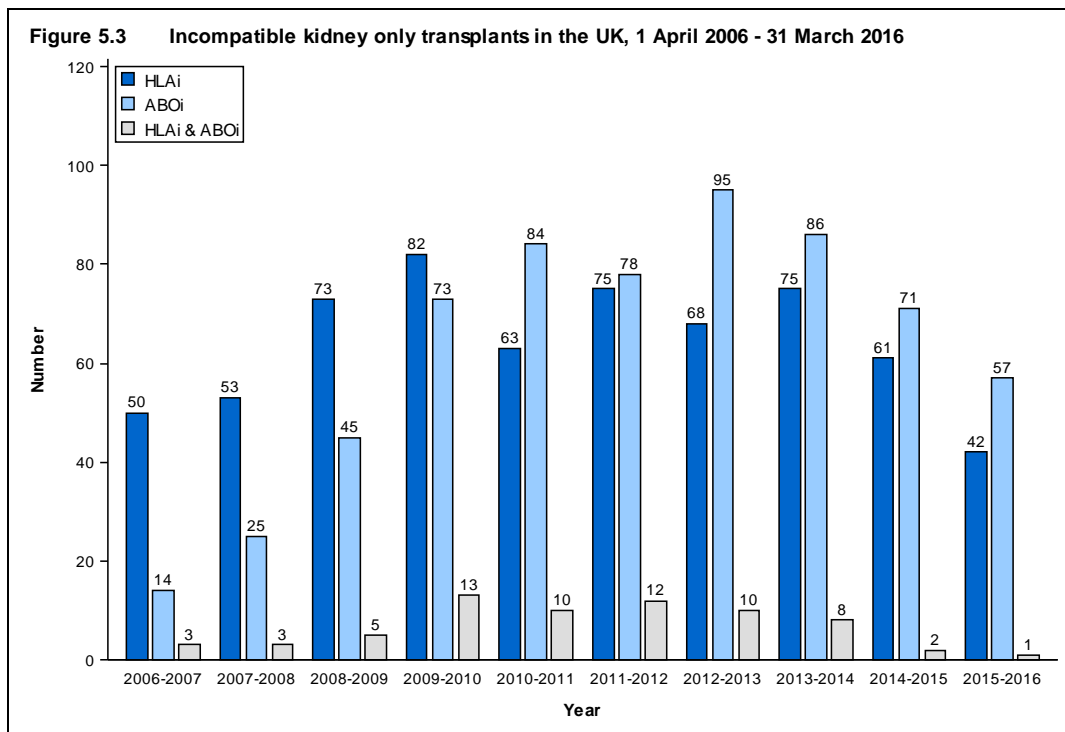
¹ Not all cold ischaemia times are reported
² 25% of times are shorter than Q1, 25% are longer than Q3

Kidneys from donors after brain death are allocated on the basis of a national Kidney Allocation Scheme which incorporates HLA matching between donor and recipient. These HLA matches are based on four levels which are described in **Table 5.14**. Patients with 000 HLA-A, B, DR mismatch (Level 1) are prioritised in the schemes, whereas kidneys are rarely transplanted as a Level 4 match. More information about the allocation scheme can be found at www.odt.nhs.uk. **Table 5.15** gives the HLA mismatch group for adult and paediatric patients for DBD donor transplants but also for DCD and living donor transplants. For living donor transplantation, many transplants have a less good HLA match between donor and recipient. Very often there is no genetic relationship between donor and recipient.

| Table 5.14 HLA mismatch groups | | |
|---------------------------------------|------------------------------------|------------------------------------------------------------|
| Level | HLA mismatch summary | HLA mismatch combinations included |
| 1 | 000 | 000 |
| 2 | [0 DR and 0/1 B] | 100, 010, 110, 200, 210 |
| 3 | [0 DR and 2 B] or [1 DR and 0/1 B] | 020, 120, 220, 001, 101, 201, 011, 111, 211 |
| 4 | [1 DR and 2 B] or [2 DR] | 021, 121, 221, 002, 102, 202, 012, 112, 212, 022, 122, 222 |

| Table 5.15 HLA matching for kidney only transplants in the UK, 1 April 2015 - 31 March 2016, | | | | | | |
|-----------------------------------------------------------------------------------------------------|------------|------------|------------|------------|---------------|------------|
| | DBD | | DCD | | Living | |
| | N | (%) | N | (%) | N | (%) |
| Adult | | | | | | |
| Level 1 (Best match) | 176 | (16) | 30 | (4) | 104 | (11) |
| Level 2 | 409 | (36) | 246 | (29) | 143 | (15) |
| Level 3 | 513 | (45) | 494 | (58) | 383 | (40) |
| Level 4 | 35 | (3) | 81 | (10) | 264 | (28) |
| Not reported | 1 | | | | 63 | |
| Paediatric | | | | | | |
| Level 1 (Best match) | 0 | (0) | 0 | (0) | 8 | (10) |
| Level 2 | 39 | (83) | 2 | (50) | 13 | (17) |
| Level 3 | 8 | (17) | 2 | (50) | 53 | (68) |
| Level 4 | 0 | (0) | 0 | (0) | 1 | (1) |
| Not reported | | | | | 3 | |

Often potential living donors and their recipients are HLA or blood group incompatible. Increasingly it is possible to proceed with transplantation across the incompatibilities with appropriate management. The number of HLA and ABO blood group incompatible transplants over the last ten years is shown in **Figure 5.3**. Of the 642 HLA incompatible (HLAi) transplants performed; 177 used kidneys from deceased donors and 465 used living donor kidneys whilst the vast majority of ABO incompatible (ABOi) transplants used living donor kidneys (623 of 628). Due to the nature of reporting HLA incompatible transplants the numbers presented may be subject to change over time.



5.5 Demographic characteristics

The age group, sex, ethnicity and blood group of deceased donors, transplant recipients and patients on the transplant list are shown in **Table 5.16** and for living donors and transplants in **Table 5.17**. Note that all percentages quoted are based only on data where relevant information was available. Changes made to the Kidney Allocation Scheme in 2006 mean that tissue matching criteria between donor and recipient are less strict than previously and waiting time to transplant is now more important than it was in deciding kidney allocation. These changes have an indirect benefit for patients from ethnic minority groups, who are less often a good tissue match with the predominantly white donor pool. As a result, access to transplantation is becoming more equitable.

| Table 5.16 Demographic characteristics of deceased kidney donors and transplant recipients, 1 April 2015 - 31 March 2016, and transplant list patients at 31 March | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------|------------------------------|--------------|----------------------------------------|--------------|
| Age group (years) | Donors | | Transplant recipients | | Active transplant list patients | |
| | N | (%) | N | (%) | N | (%) |
| 0 - 17 | 50 | (4) | 57 | (3) | 70 | (1) |
| 18 - 34 | 173 | (13) | 273 | (12) | 609 | (12) |
| 35 - 49 | 292 | (23) | 654 | (29) | 1485 | (28) |
| 50 - 59 | 324 | (25) | 605 | (27) | 1450 | (27) |
| 60 - 69 | 297 | (23) | 487 | (22) | 1255 | (24) |
| 70+ | 157 | (12) | 152 | (7) | 406 | (8) |
| mean (SD) | 51 | (17) | 50 | (14) | 51 | (14) |
| Male | 708 | (55) | 1384 | (62) | 3087 | (59) |
| Female | 585 | (45) | 844 | (38) | 2188 | (41) |
| White | 1232 | (95) | 1589 | (72) | 3487 | (67) |
| Asian | 25 | (2) | 352 | (16) | 944 | (18) |
| Black | 17 | (1) | 184 | (8) | 580 | (11) |
| Chinese | 3 | (0) | 28 | (1) | 70 | (1) |
| Other | 15 | (1) | 43 | (2) | 108 | (2) |
| Not reported | 1 | | 32 | | 86 | |
| O | 596 | (46) | 948 | (43) | 2799 | (53) |
| A | 531 | (41) | 883 | (40) | 1500 | (28) |
| B | 123 | (10) | 277 | (12) | 870 | (16) |
| AB | 43 | (3) | 120 | (5) | 106 | (2) |
| First graft | | | 1906 | (86) | 4008 | (76) |
| Re-graft | | | 321 | (14) | 1267 | (24) |
| Not reported | | | 1 | | | |
| TOTAL | 1293 | (100) | 2228 | (100) | 5275 | (100) |

Table 5.17 Demographic characteristics of living kidney donors and transplant recipients, 1 April 2015 - 31 March 2016

| Age group (years) | Donors | | Transplant recipients | |
|-------------------|-------------|--------------|-----------------------|--------------|
| | N | (%) | N | (%) |
| 0 - 17 | 0 | (0) | 78 | (8) |
| 18 - 34 | 166 | (16) | 220 | (21) |
| 35 - 49 | 400 | (39) | 289 | (28) |
| 50 - 59 | 275 | (27) | 247 | (24) |
| 60 - 69 | 160 | (15) | 170 | (16) |
| 70+ | 34 | (3) | 31 | (3) |
| mean (SD) | 48 | (12) | 44 | (17) |
| Male | 486 | (47) | 587 | (57) |
| Female | 549 | (53) | 448 | (43) |
| White | 910 | (88) | 867 | (85) |
| Asian | 67 | (6) | 83 | (8) |
| Black | 29 | (3) | 41 | (4) |
| Chinese | 2 | (0) | 3 | (0) |
| Other | 23 | (2) | 24 | (2) |
| Not reported | 4 | | 17 | |
| O | 582 | (57) | 451 | (44) |
| A | 325 | (32) | 410 | (40) |
| B | 96 | (9) | 129 | (12) |
| AB | 26 | (3) | 45 | (4) |
| Not reported | 6 | | | |
| First graft | | | 902 | (87) |
| Re-graft | | | 133 | (13) |
| TOTAL | 1035 | (100) | 1035 | (100) |