NHS
Blood and Transplant

KIDNEY TRANSPLANTATION ANNUAL RENAL UNIT REPORT

REPORT FOR 2021/22
(1 APRIL 2013 – 31 MARCH 2022)

March 2024

PRODUCED IN COLLABORATION WITH THE UK RENAL REGISTRY

Contents

Contents

Introduction

This report presents data on activity and outcomes of kidney transplant candidates and recipients between 1 April 2013 and 31 March 2022, for all 68 renal centres in the UK. Data were obtained from the UK Transplant Registry, at NHS Blood and Transplant, which holds information relating to donors, recipients and outcomes for all kidney transplants performed in the UK. Renal unit information was supplied by the UK Renal Registry.

Graft and patient survival estimates are reported at 1- and 5- year post-transplant for the periods 1 April 2017 to 31 March 2021 and 1 April 2013 to 31 March 2017, respectively. Adjusted mean eGFR post-transplant is reported at 3- and 12- months post-transplant for the period 1 April 2017 to 31 March 2021. Results are described separately according to the type of donor (deceased and living).

The unit specific results for survival estimates are adjusted for differences in risk factors between the units. The risk models used are described in in Appendix A3.

Patients requiring multi-organ transplants are excluded from all analyses and all results are described for adult (aged ≥ 18 years) patients.

Use of the contents of this report should be acknowledged as follows:
Annual Report on Kidney Transplantation 2021/2022 by Renal Unit, NHS Blood and Transplant.

Adult kidney transplant list

1.1 Kidney only transplant list, 30 April 2021 – 31 March 2022

Figure 1.1 shows the mean number of adults on the active kidney only transplant list per million population (pmp) at the end of each month by renal unit for the period 30 April 2021 to 31 March 2022. West London, 'L West' below, had the highest mean rate of adults on the waiting list per million population. **Figure 1.2** shows similar information for adults on the suspended kidney only transplant list. Guy's, 'L Guys' below, had the highest mean rate of suspended adults.

Figure 1.1 Adults on the active kidney only transplant list (pmp) end of month average, 30 April 2021 - 31 March 2022, by renal unit

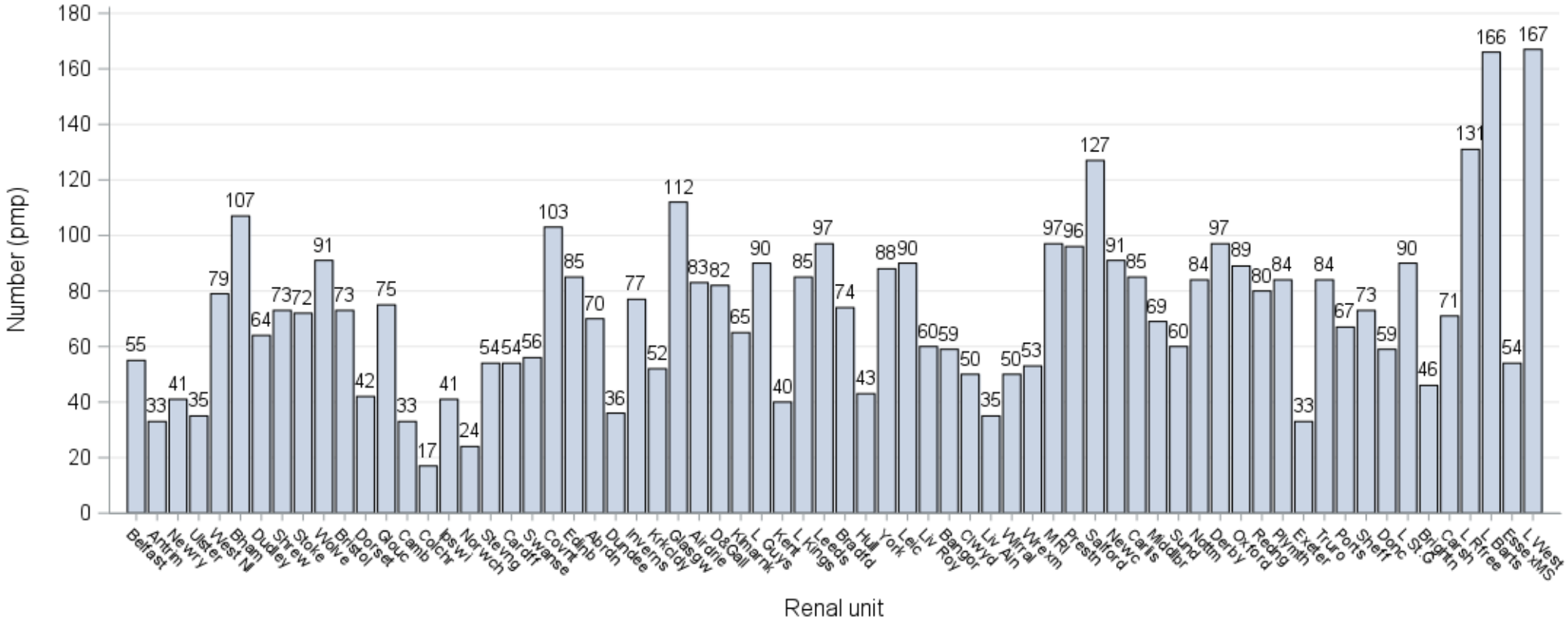
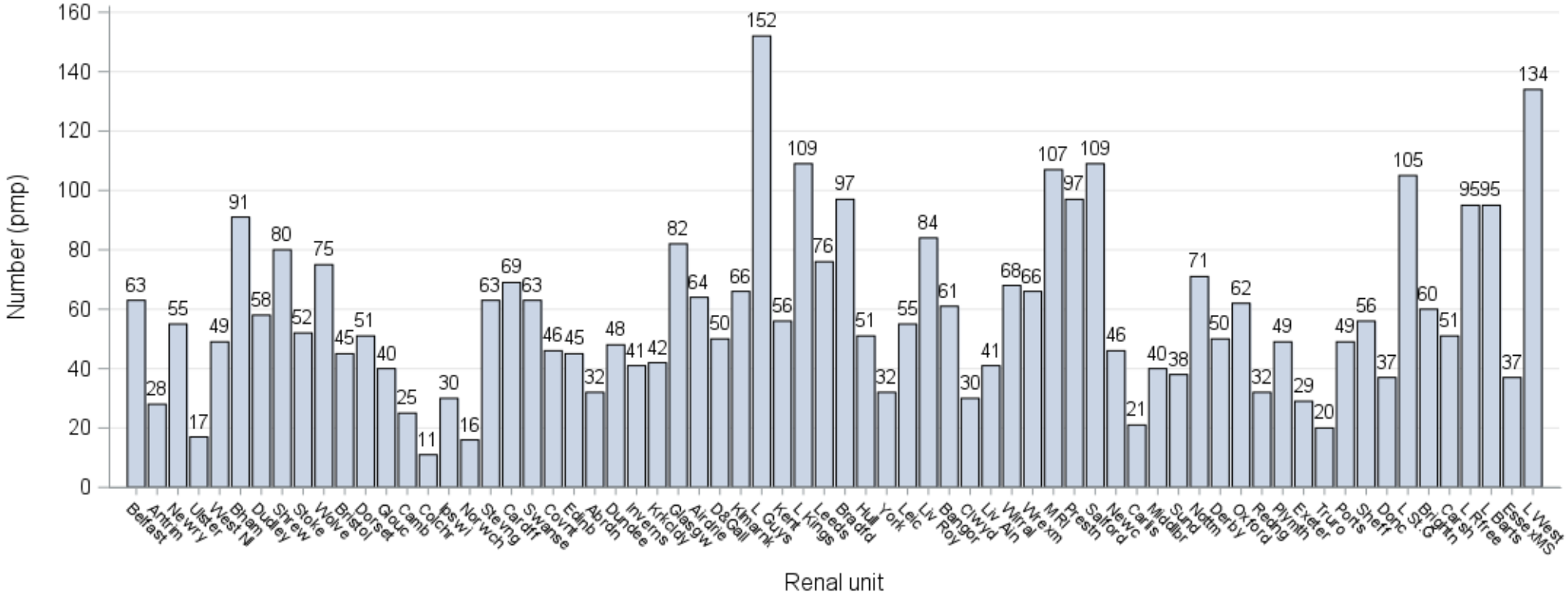


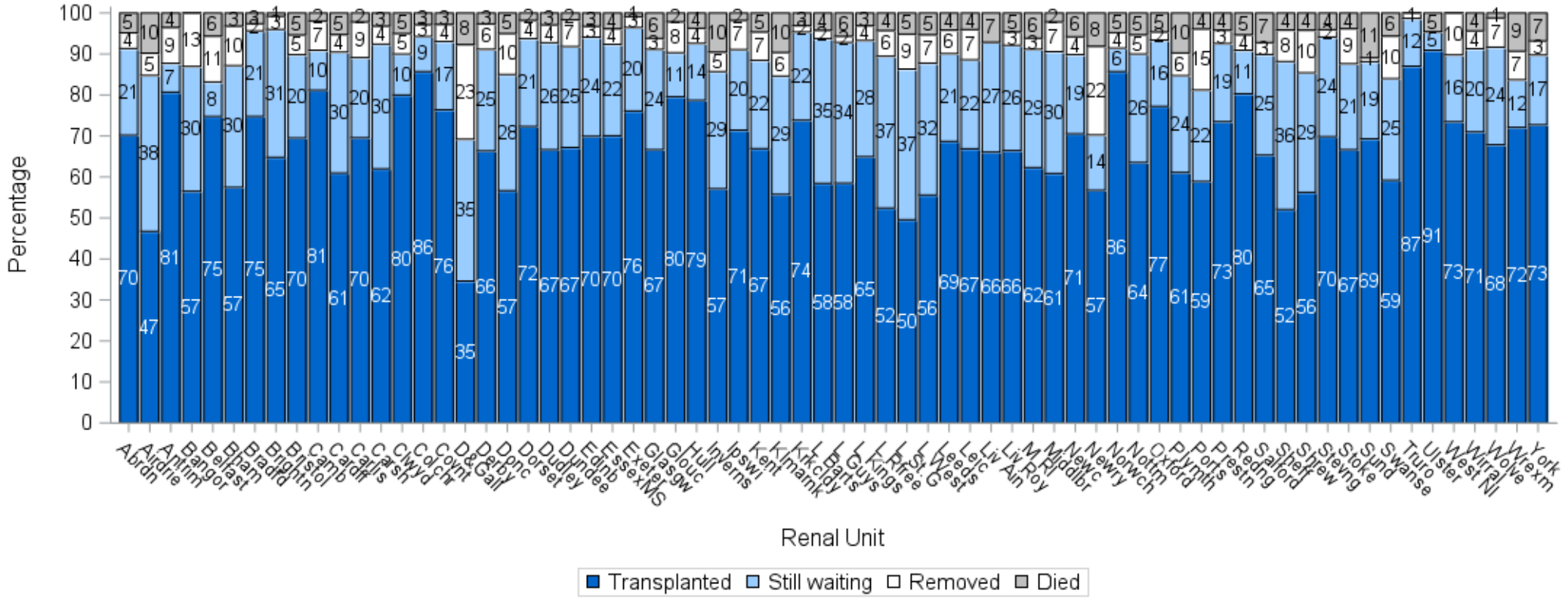
Figure 1.2 Adults on the suspended kidney only transplant list (pmp) end of month average, 30 April 2021 - 31 March 2022, by renal unit



1.2 Post-registration outcomes, 1 April 2016 – 31 March 2019

Figure 1.3 shows the registration outcomes of patients registered between 1 April 2016 and 31 March 2019 by renal unit at three years post-registration. The proportion of patients transplanted three years after listing at each unit ranges from 35% at Dumfries and Galloways, 'D & Gall' below, to 91% at Ulster. A small proportion of patients across centres were removed or died on the list.

Figure 1.3 Three-year post-registration outcome for 10259 new adult kidney only registrations made in the UK, 1 April 2016 - 31 March 2019, by renal unit



1.3 Demographic characteristics, 1 April 2019 – 31 March 2022

The ethnicity and age group of patients registered onto the transplant list between 1 April 2019 and 31 March 2022 are shown by renal unit in **Figures 1.4** and **1.5,** respectively. Note that all percentages quoted are based only on data where relevant information was available.

Figure 1.4 Ethnicity of patients registered onto the active kidney only transplant list between 1 April 2019 and 31 March 2022, by renal unit

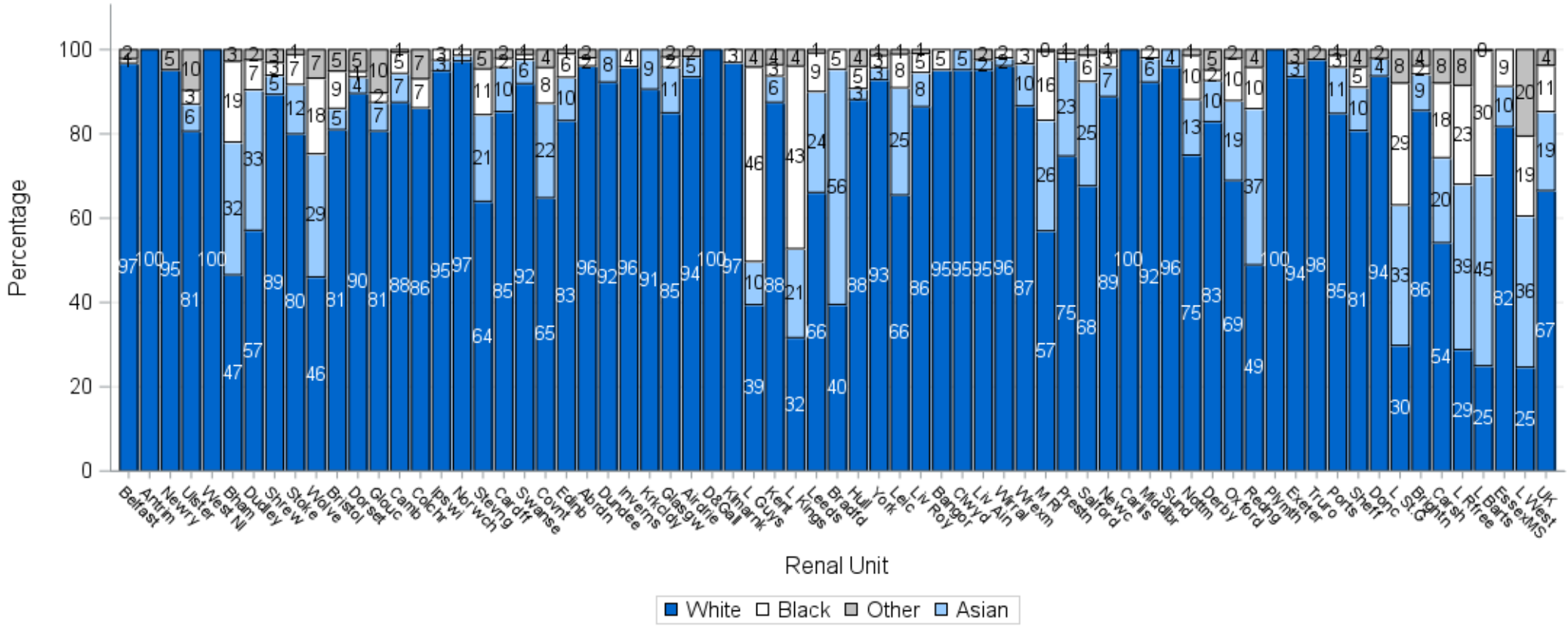
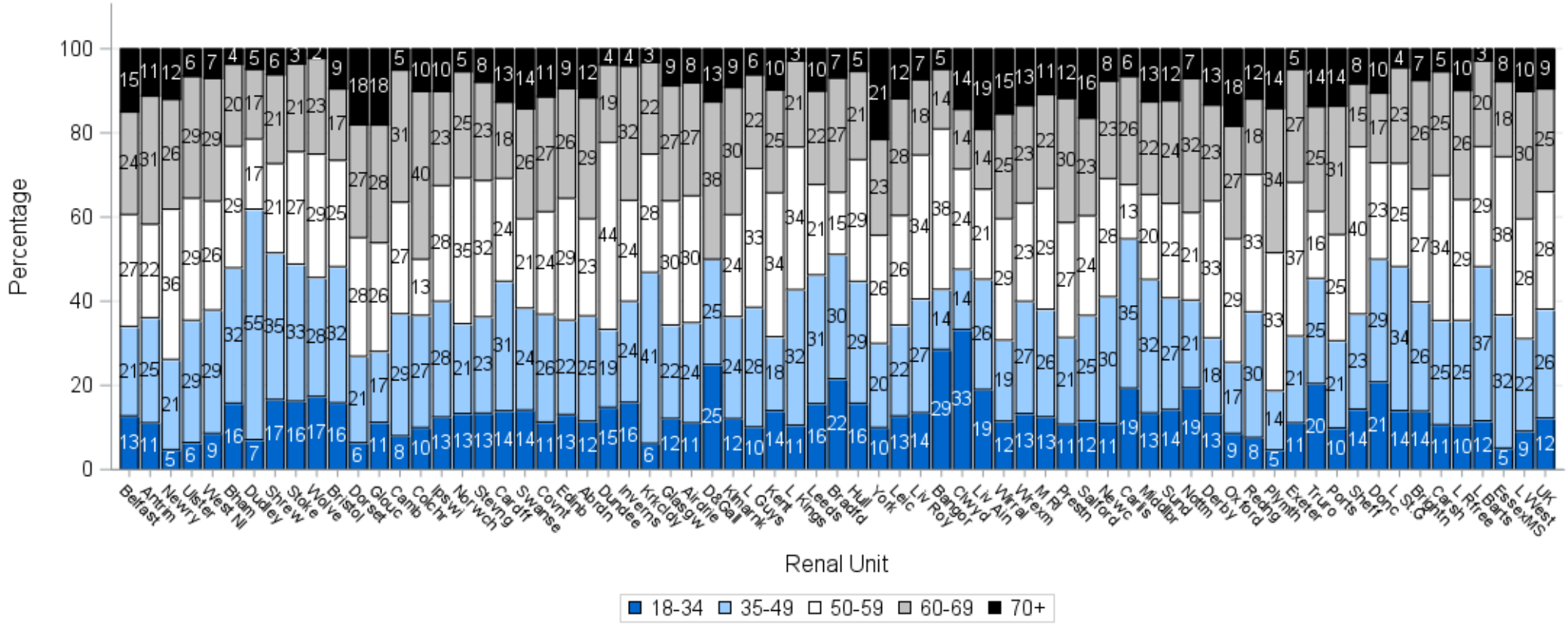


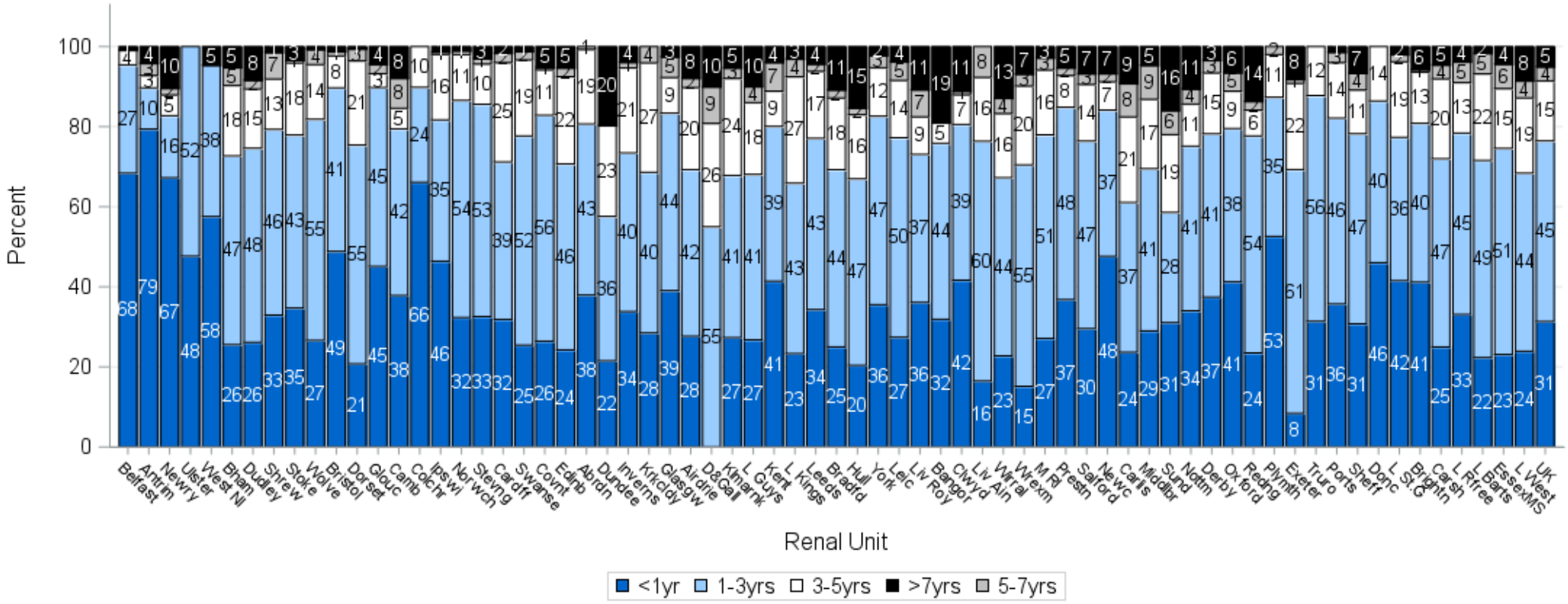
Figure 1.5 Age of patients registered onto the active kidney only transplant list between 1 April 2019 and 31 March 2022, by renal unit



1.4 Waiting times for patients on the list as at the end of each month, 30 April 2021 - 31 March 2022

Figure 1.6 shows the length of time patients have been waiting on the kidney only transplant list by renal unit for those active on the list as at the end of each month, 30 April 2021 - 31 March 2022. A small proportion of patients (5%) have been waiting for a transplant for more than seven years. 99% of these long waiters are highly sensitised with a calculated reaction frequency (cRF) of 85% or higher, with 93% having a cRF of 100% which makes these patients very difficult to match.

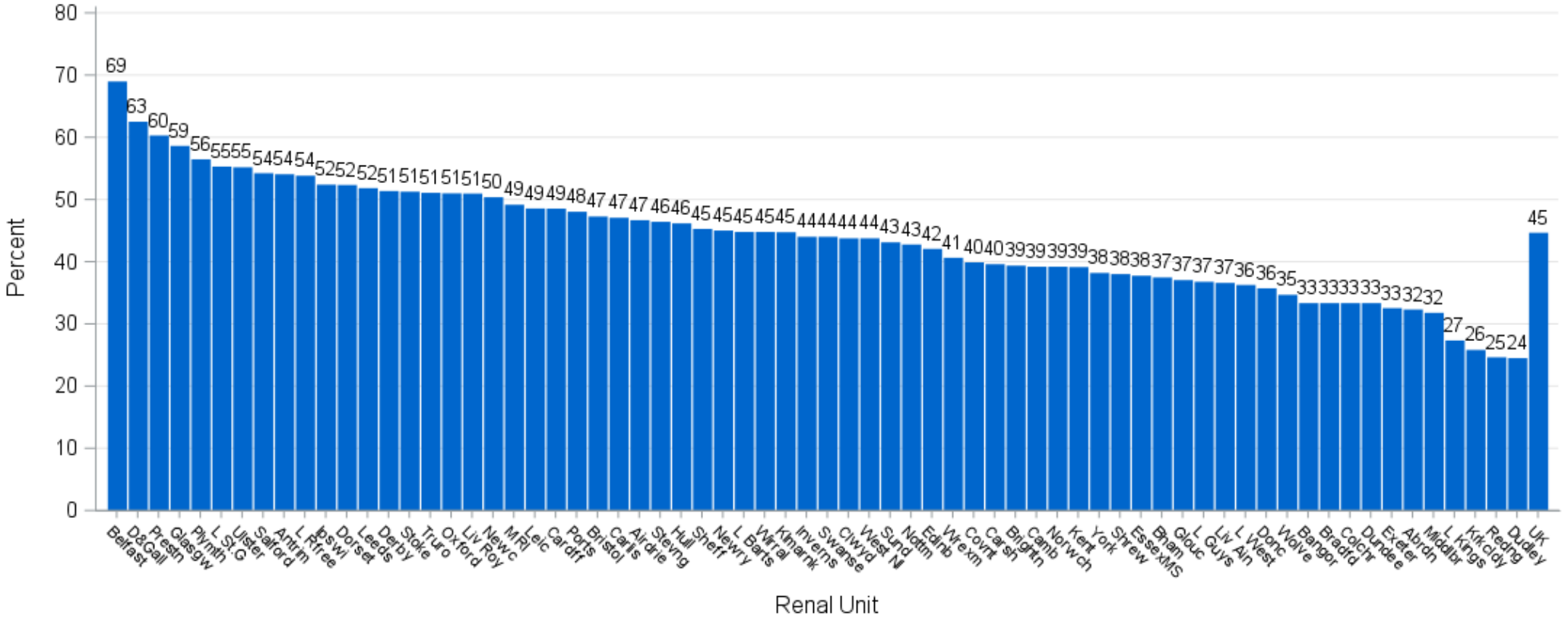
Figure 1.6 Waiting time of patients on the active kidney only transplant list as at the end of each month, 30 April 2021 - 31 March 2022, by renal unit



1.5 Pre-emptive listing rates, 1 April 2018 - 31 March 2021

Rates of pre-emptive kidney only listings are shown in **Figure 1.7** for adults joining the list between 1 April 2018 and 31 March 2021. Patients listed on the deceased donor transplant list prior to receiving a living donor transplant are excluded. Pre-emptive listing accounted for 45% of all adult registrations across the UK ranging from 69% Belfast to 24% at Dudley.

Figure 1.7 Adult pre-emptive listing rates by centre, registrations between 1 April 2018 and 31 March 2021



Adult kidney transplants

2.1 Kidney only transplants, 1 April 2019 – 31 March 2022

Figure 2.1 shows the mean number of adult kidney only transplants performed per million population (pmp) between 1 April 2019 and 31 March 2022, by renal unit and type of donor. Belfast had the highest overall mean rate of adult kidney only transplants per million population at 97 pmp; Belfast also had the highest living donor rate (46 pmp) and West London, 'L West' below, had the highest deceased donor rate (68 pmp). **Figure 2.2** shows the proportion of DBD, DCD and living donor transplants performed for each unit.

Figure 2.1 Adult kidney only transplants (pmp) annual average, 1 April 2019 - 31 March 2022, by donor type and renal unit

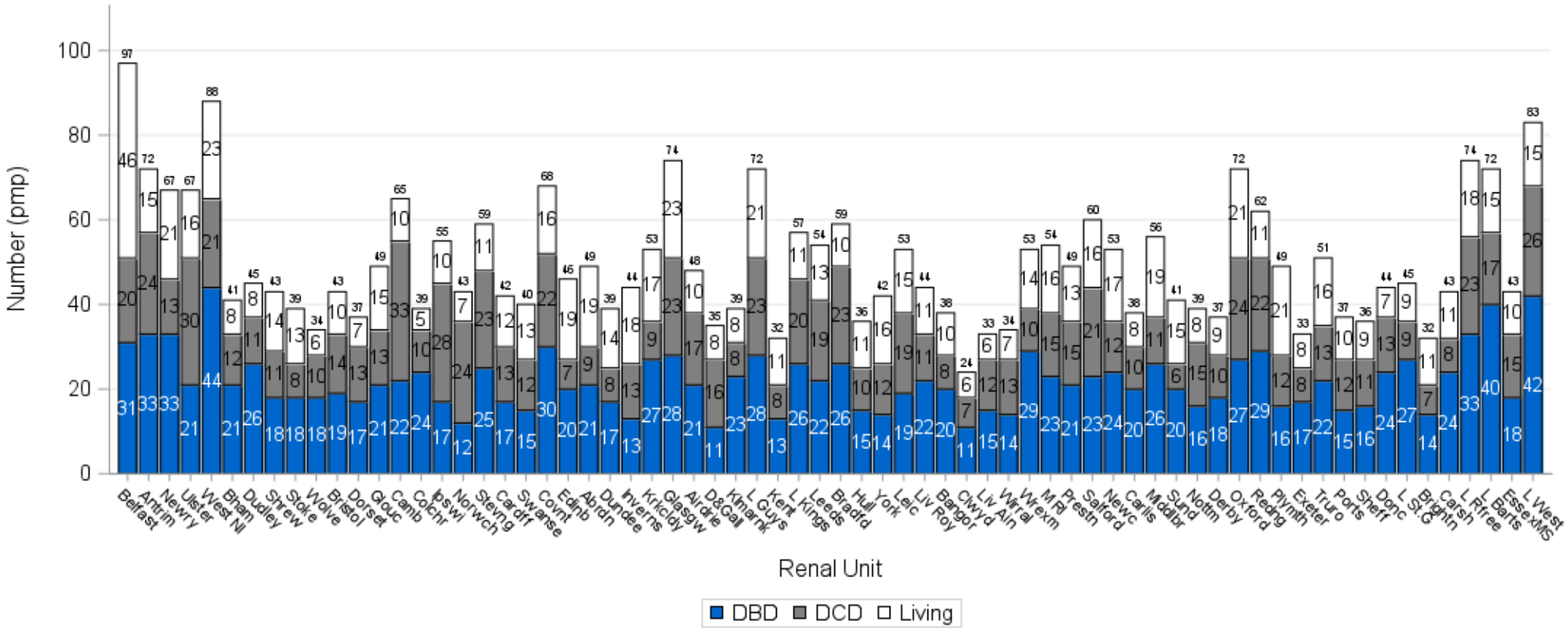
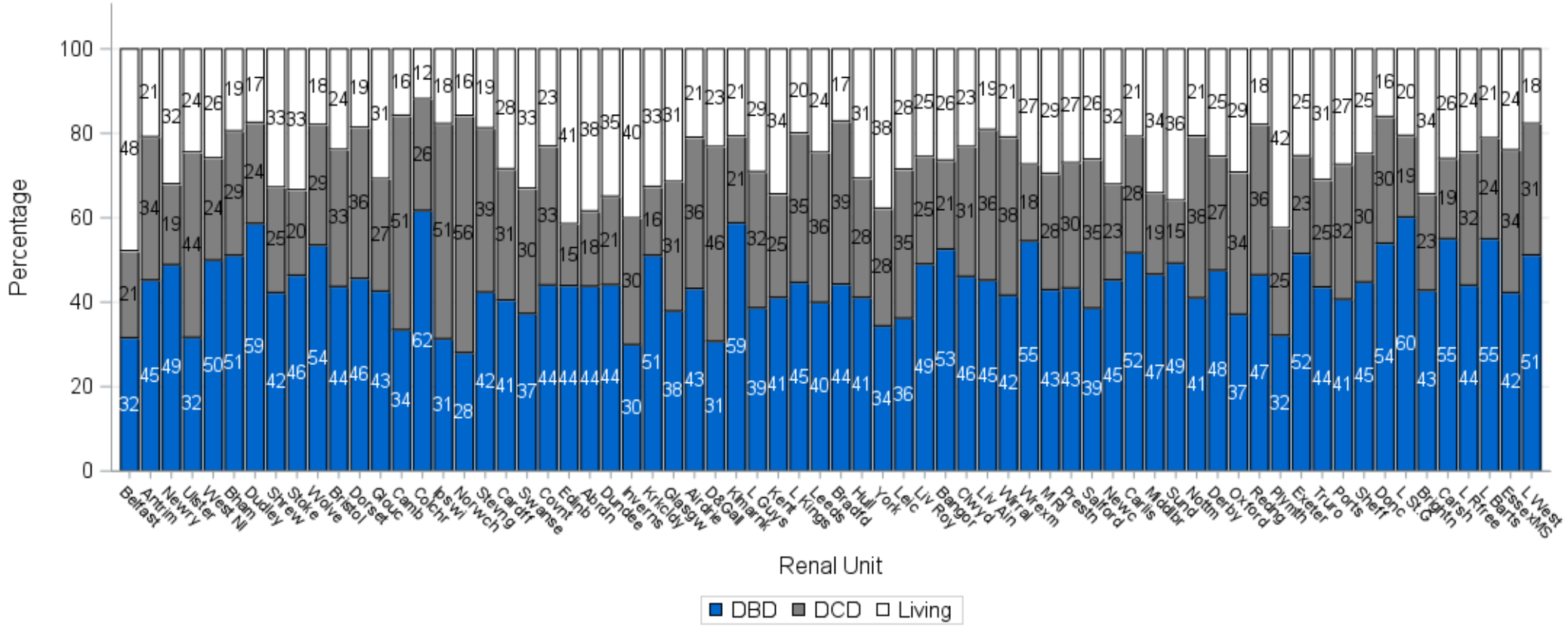


Figure 2.2 Distribution of adult kidney only transplants, 1 April 2019 and 31 March 2022, by donor type and renal unit



2.2 Demographic characteristics of recipients, 1 April 2019 - 31 March 2022

The ethnicity and age group of adults who received a kidney only transplant between 1 April 2019 and 31 March 2022 are shown by renal unit in **Figures 2.3** and **2.4,** respectively. Note that all percentages quoted are based only on data where relevant information was available.

Figure 2.3 Ethnicity of kidney only transplant recipients, 1 April 2019 and 31 March 2022, by renal unit

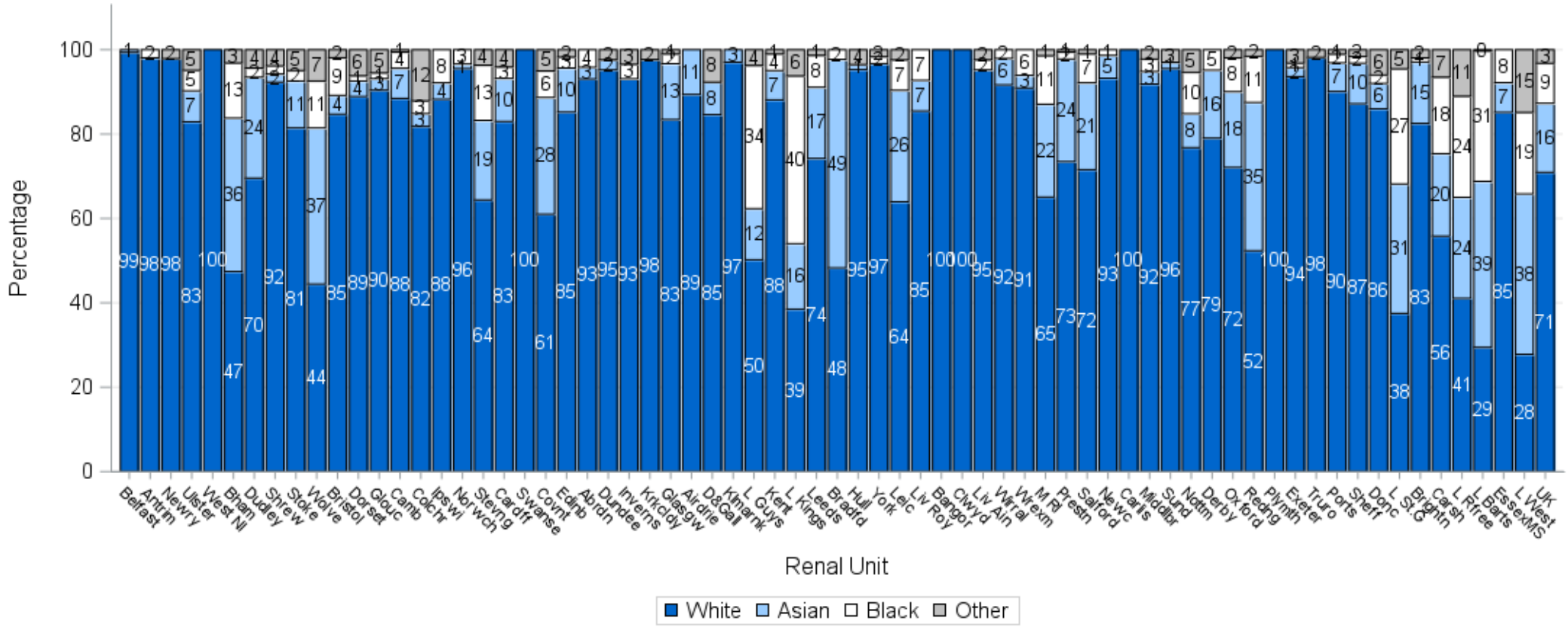
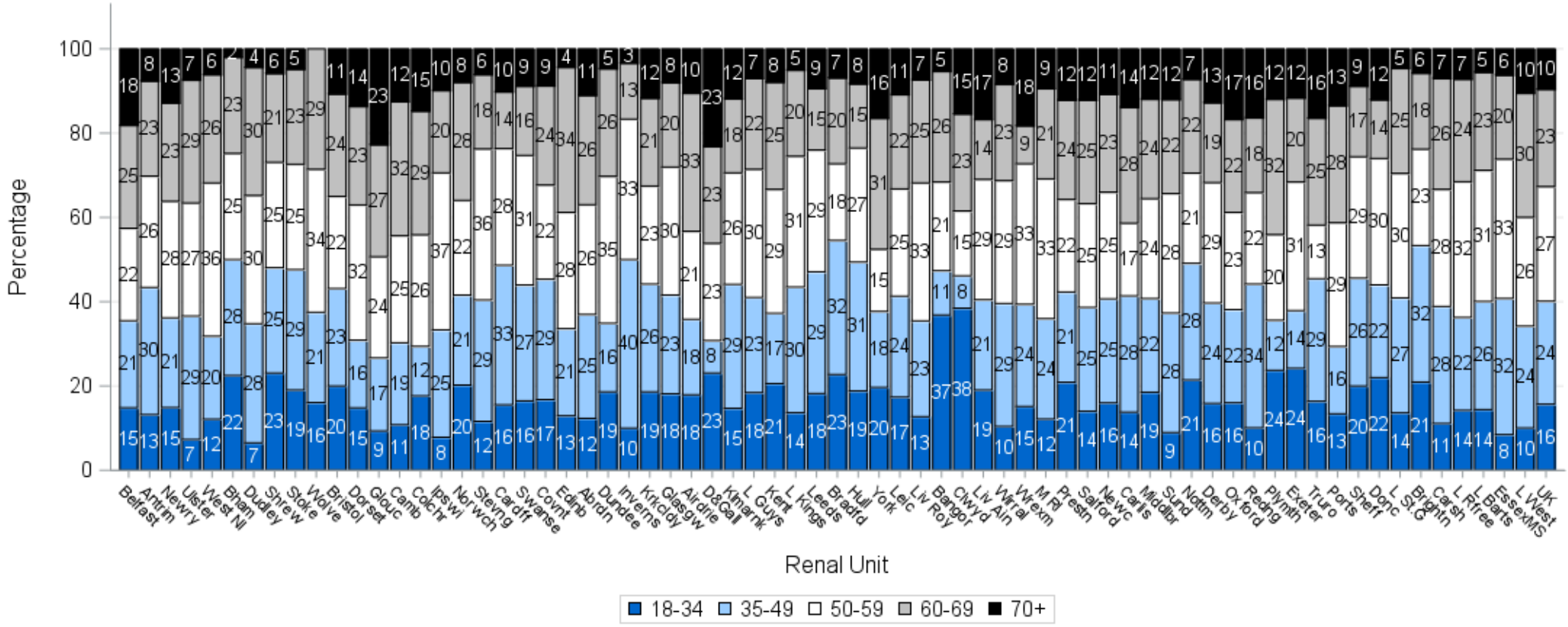


Figure 2.4 Age of kidney only transplant recipients, 1 April 2019 and 31 March 2022, by renal unit



2.3 Pre-emptive transplant rates, 1 April 2019 - 31 March 2022

Rates of pre-emptive kidney only transplantation for transplants performed between 1 April 2019 and 31 March 2022 are shown in **Figure 2.5** for deceased donor transplants and **Figure 2.6** for living donor transplants. Living donor transplants are more likely to be carried out before the need for dialysis than deceased donor transplants: 37% and 14% respectively. This is because a living donor transplant can often be carried out more quickly than a deceased donor kidney transplant. Adult deceased donor pre-emptive transplant rates ranged from 33% at Belfast to 2% at Airdrie. Adult living donor pre-emptive transplant rates ranged from 56% at Newcastle to 0% at several units.

Figure 2.5 Adult deceased donor pre-emptive transplant rates by renal unit, 1 April 2019 - 31 March 2022

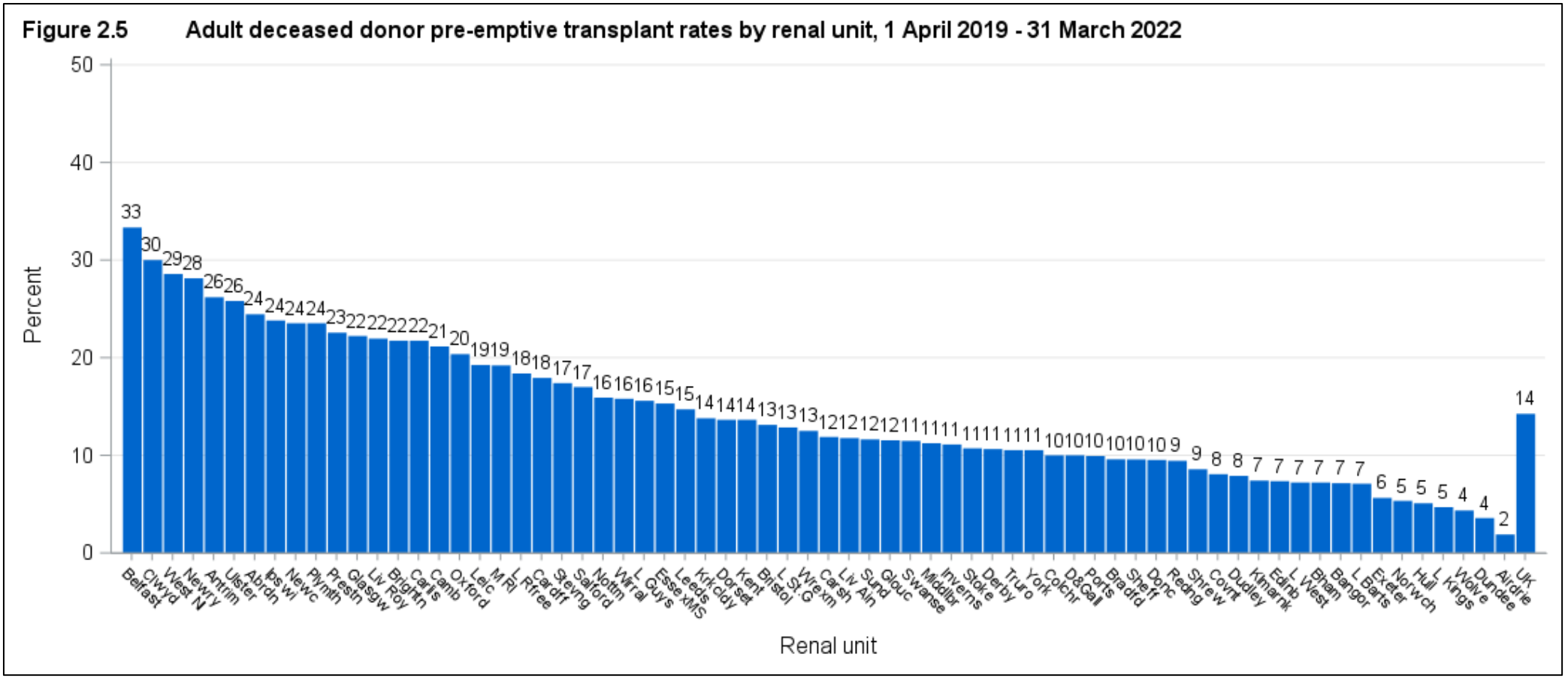
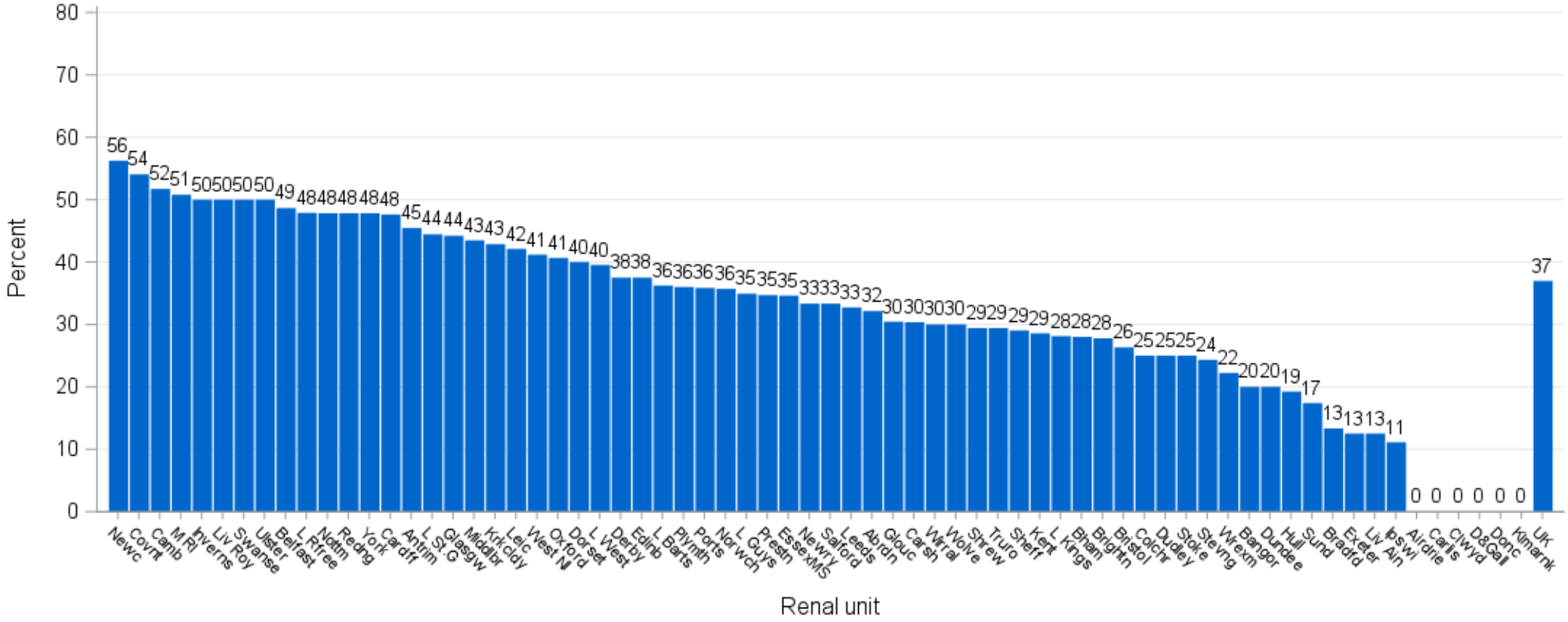


Figure 2.6 Adult living donor pre-emptive transplant rates by renal unit, 1 April 2019 - 31 March 2022



Adult kidney outcomes – post transplant survival

We present a visual comparison of survival rates among renal units that is based on a graphical display known as a funnel plot (1,2). This display is used to show how consistent the rates of the different renal units are with the national rate. Funnel plots show the risk-adjusted survival rate plotted against the number of transplants for each unit, with the overall national unadjusted survival rate (solid line), and its 95% (thin dotted lines) and 99.8% (thick dotted lines) confidence limits superimposed. Each dot in the plot represents one of the units.

If a unit lies within all the limits, then that unit has a survival rate that is statistically consistent with the national rate. If a unit lies outside the 95% confidence limits, this serves as an alert that the unit may have a rate that is significantly different from the national rate. If a unit lies outside the 99.8% limits, then further investigations may be carried out to determine the reasons for the possible difference. When a unit lies above the upper limits, this indicates a survival rate that is higher than the national rate, while a unit that lies below the lower limits has a survival rate that is lower than the national rate. It is important to note that adjusting for patient mix through the use of risk-adjustment models may not account for all possible causes of unit differences. There may be other factors that are not taken into account in the risk-adjustment process that may affect the survival rate of a particular unit.

This section excludes multi-organ transplants and includes first time transplants only, with results presented separately for deceased and living donor transplants. One-year patient and graft survival rates are based on transplants performed in the period 1 April 2017 to 31 March 2021 while five-year patient and graft survival rates are based on transplants in the period 1 April 2013 to 31 March 2017. The risk factors used to produce the risk-adjusted survival rates are detailed in **Table A3.1** in Appendix A3.

Note that although we report survival according to renal unit, many patients receive after care from their transplant centre before returning to their local renal units. **We do not know at what point a patient is transferred back from the transplant centre to their renal unit, but we do know that this practice can differ widely across the country.**

References:

1. Tekkis PP, McCulloch P, Steger AC, Benjamin IS, Poloniecki JD. Mortality control charts for comparing performance of surgical units: validation study using hospital mortality data. British Medical Journal 2003; 326: 786 – 788.

2. Stark J, Gallivan S, Lovegrove J, Hamilton JRL, Monro JL, Pollock JCS, Watterson KG. Mortality rates after surgery for congenital heart defects in children and surgeons' performance. Lancet 2000; 355: 1004 – 1007.

3.1 Deceased donor graft and patient survival

Figures 3.1-3.4 and **Table 3.1** show the risk-adjusted patient and graft survival rates for each unit and nationally following deceased donor transplantation. At five years post-transplant, the national patient survival rate was 88% and the graft survival was also 86%.

The funnel plots show that, for the most part, the renal units lie within the confidence limits. The funnel plots show one unit that lies outside the lower 95% confidence limits in the one-year estimates for patient survival, indicating that this unit has a survival rate that is significantly lower than the national rate. All of the funnel plots show some units to be above the upper 99.8% confidence limit. This suggests that these units may have survival rates that are considerably higher than the national rate. Units can be identified by the information shown in **Table 3.1**.

Figure 3.1 **Risk-adjusted one year graft (death censored) survival rates for first deceased donor kidney transplants in adults, between 1 April 2017 and 31 March 2021**

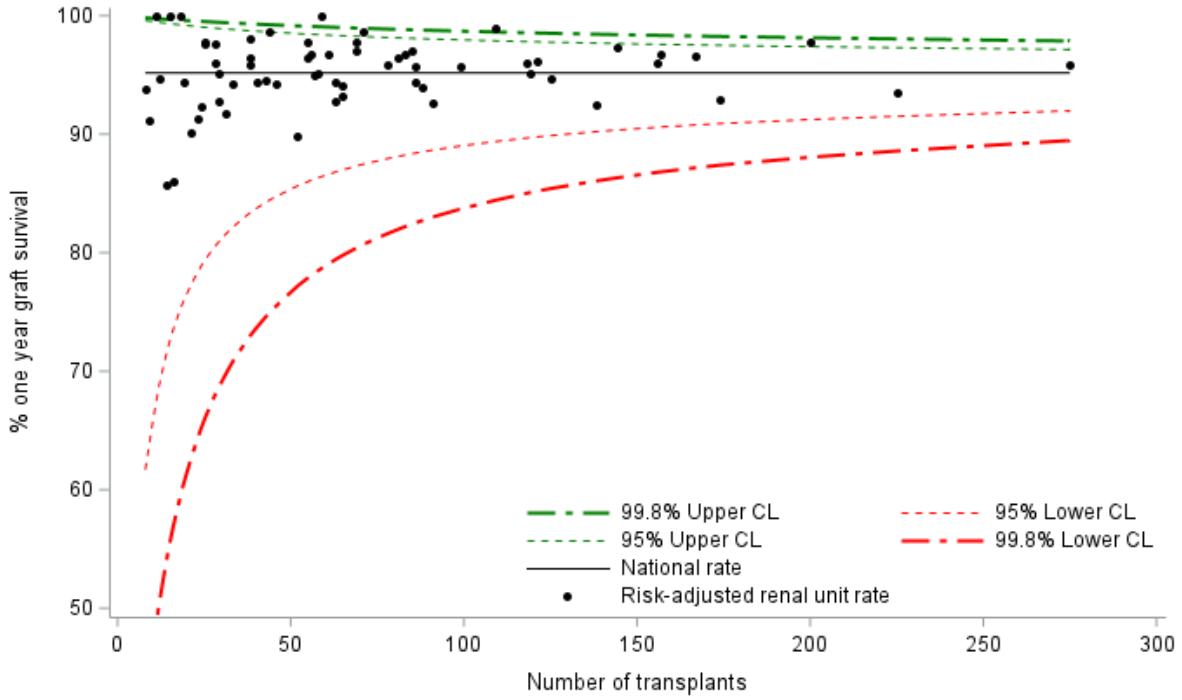


Figure 3.2 **Risk-adjusted one year patient survival rates for first deceased donor kidney transplants in adults, between 1 April 2017 and 31 March 2021**

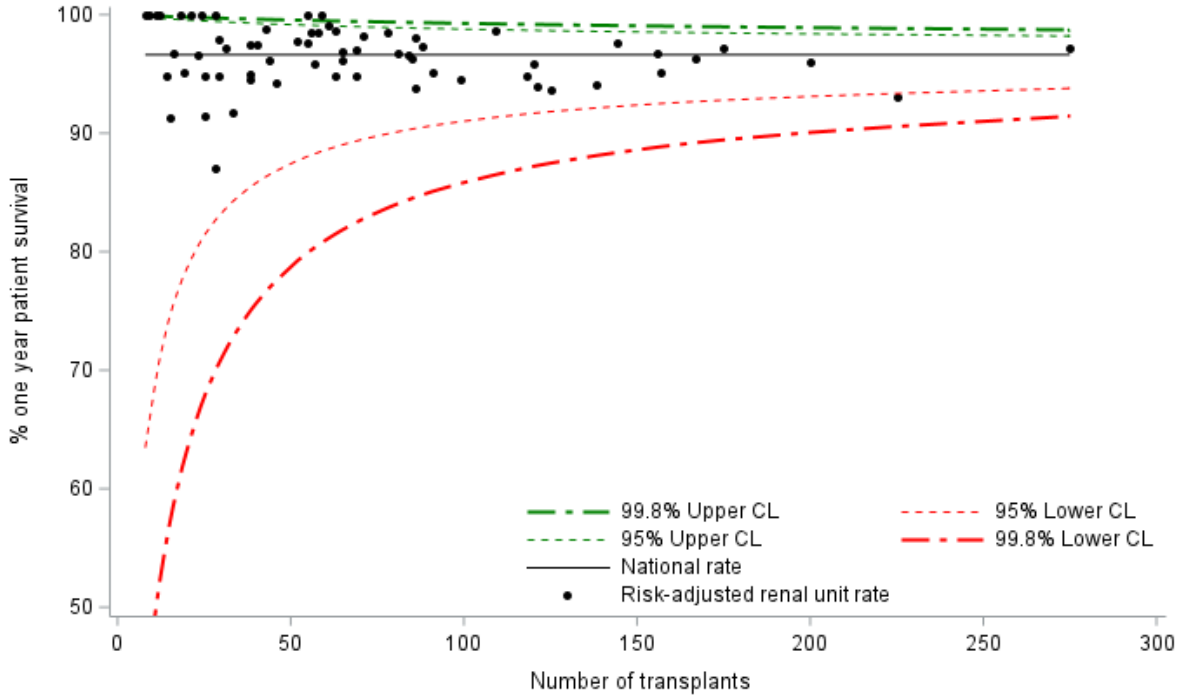


Figure 3.3 **Risk-adjusted five year graft (death censored) survival rates for first deceased donor kidney transplants in adults, between 1 April 2013 and 31 March 2017**

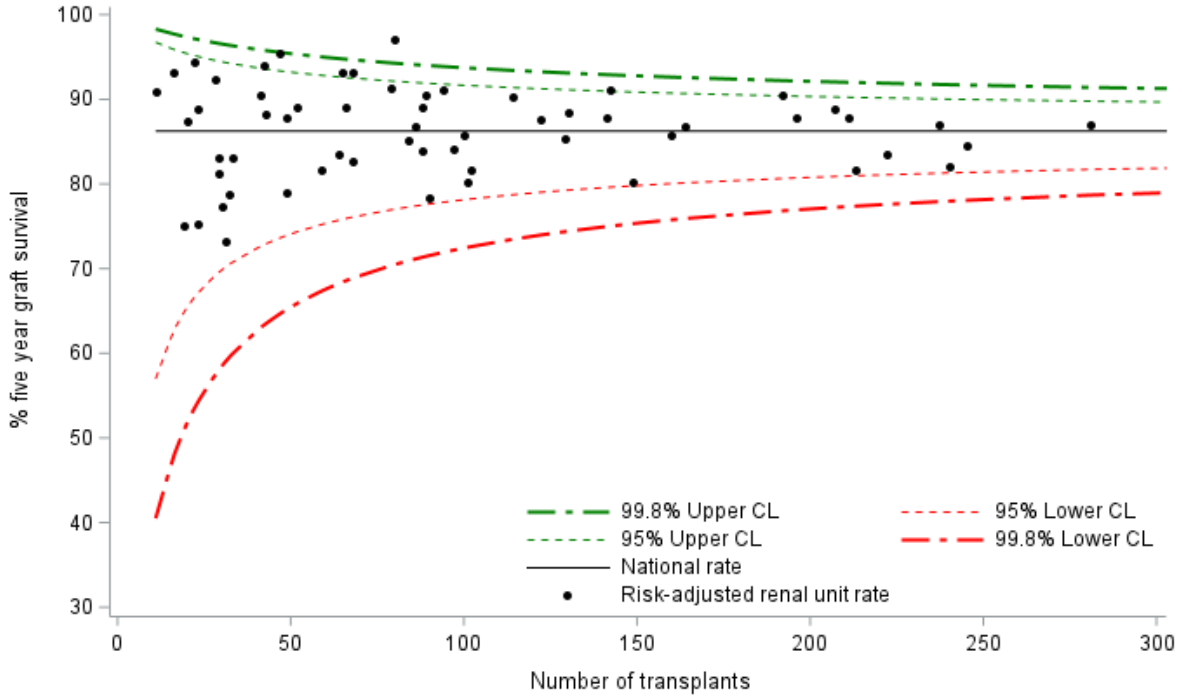


Figure 3.4 **Risk-adjusted five year patient survival rates for first deceased donor kidney transplants in adults, between 1 April 2013 and 31 March 2017**

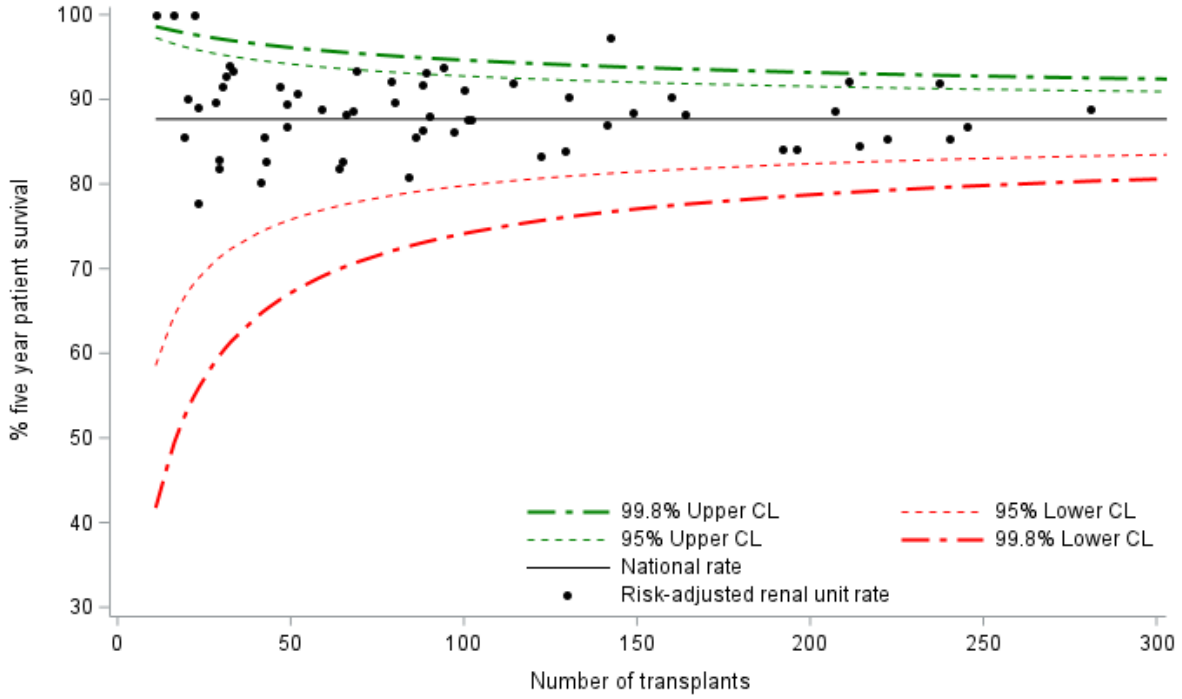


Table 3.1 One and five year first adult kidney-only graft and patient survival using kidneys from deceased donors

	Kidney graft survival				Patient survival			
	One-year*		Five-year**		One-year*		Five-year**	
Unit	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Belfast	95	(87 - 98)	88	(70 - 97)	99	(94 - 100)	83	(64 - 93)
Antrim	93	(81 - 98)	87	(54 - 98)	95	(85 - 99)	90	(64 - 99)
Newry	86	(67 - 95)	79	(54 - 92)	97	(82 - 100)	94	(79 - 99)
Ulster	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
West NI	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bham	93	(89 - 96)	85	(79 - 89)	97	(94 - 99)	87	(81 - 91)
Dudley	92	(81 - 97)	77	(53 - 91)	97	(84 - 100)	91	(69 - 99)
Shrew	94	(80 - 99)	73	(49 - 88)	95	(72 - 100)	93	(74 - 99)
Stoke	99	(92 - 100)	93	(82 - 98)	96	(86 - 100)	83	(69 - 91)
Wolve	90	(79 - 96)	88	(73 - 96)	98	(88 - 100)	89	(75 - 97)
Bristol	96	(91 - 98)	85	(77 - 91)	94	(87 - 98)	84	(75 - 90)
Dorset	97	(91 - 99)	N/A	N/A	97	(89 - 100)	N/A	N/A
Glouc	94	(86 - 98)	N/A	N/A	97	(91 - 99)	N/A	N/A
Camb	96	(92 - 98)	89	(79 - 95)	99	(95 - 100)	86	(76 - 93)
Colchr	100	N/A	81	(56 - 94)	100	N/A	82	(54 - 95)
Ipswi	92	(78 - 98)	95	(84 - 99)	100	N/A	92	(78 - 98)
Norwch	94	(87 - 98)	91	(80 - 96)	99	(92 - 100)	93	(84 - 98)
Stevng	96	(91 - 98)	88	(80 - 93)	95	(88 - 98)	87	(79 - 93)
Cardff	94	(88 - 97)	88	(80 - 93)	97	(92 - 99)	83	(75 - 89)
Swanse	94	(85 - 98)	83	(70 - 91)	94	(83 - 99)	89	(78 - 95)
Covnt	96	(92 - 99)	97	(90 - 100)	97	(92 - 99)	90	(80 - 96)
Edinb	97	(91 - 99)	89	(76 - 96)	99	(92 - 100)	88	(76 - 95)
Abrdn	96	(87 - 100)	82	(65 - 92)	97	(86 - 100)	89	(71 - 97)
Dundee	98	(87 - 100)	92	(73 - 99)	100	N/A	90	(70 - 98)
Inverns	100	N/A	75	(42 - 92)	100	N/A	89	(61 - 99)
Krkcldy	90	(71 - 98)	94	(68 - 100)	100	N/A	100	N/A
Glasgw	97	(94 - 98)	84	(77 - 89)	96	(92 - 99)	85	(79 - 90)
Airdrie	98	(87 - 100)	83	(69 - 92)	95	(81 - 99)	82	(68 - 91)
D&Gall	94	(66 - 100)	91	(50 - 100)	100	N/A	100	N/A
Klmarnk	86	(63 - 96)	83	(61 - 95)	95	(71 - 100)	93	(76 - 99)
L Guys	99	(96 - 100)	80	(72 - 86)	99	(95 - 100)	88	(81 - 93)
Kent	95	(88 - 99)	80	(69 - 88)	98	(92 - 100)	88	(78 - 94)
L Kings	97	(92 - 99)	91	(85 - 95)	97	(90 - 99)	97	(92 - 99)
Leeds	95	(91 - 97)	82	(75 - 87)	94	(88 - 97)	84	(78 - 89)
Bradfd	96	(89 - 99)	82	(71 - 89)	100	N/A	88	(76 - 94)
Hull	95	(87 - 99)	84	(73 - 91)	96	(85 - 99)	92	(82 - 97)
York	94	(83 - 99)	93	(82 - 98)	98	(86 - 100)	93	(83 - 98)
Leic	98	(95 - 99)	87	(82 - 91)	96	(93 - 98)	89	(84 - 92)
Liv Roy	93	(86 - 97)	87	(75 - 94)	96	(89 - 99)	85	(73 - 93)
Bangor	95	(70 - 100)	93	(62 - 100)	100	N/A	100	N/A
Clwyd	91	(51 - 100)	75	(36 - 93)	100	N/A	86	(58 - 97)
Liv Ain	98	(87 - 100)	83	(56 - 95)	92	(78 - 98)	83	(60 - 94)
Wirral	94	(83 - 99)	N/A	N/A	92	(76 - 98)	N/A	N/A
Wrexm	91	(75 - 98)	89	(60 - 99)	97	(81 - 100)	78	(48 - 93)
M RI	96	(92 - 98)	88	(82 - 92)	94	(90 - 97)	84	(78 - 89)
Prestn	96	(92 - 98)	87	(79 - 92)	95	(90 - 97)	88	(82 - 93)
Salford	95	(91 - 98)	90	(85 - 95)	96	(92 - 98)	84	(78 - 89)
Newc	97	(92 - 99)	85	(73 - 93)	99	(95 - 100)	81	(68 - 89)

Table 3.1 **One and five year first adult kidney-only graft and patient survival using kidneys from deceased donors**

	Kidney graft survival				Patient survival			
	One-year*		Five-year**		One-year*		Five-year**	
Unit	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Carlis	100	N/A	90	(72 - 98)	91	(68 - 99)	80	(61 - 92)
Middlbr	98	(93 - 100)	78	(66 - 87)	95	(87 - 98)	88	(79 - 94)
Sund	96	(88 - 99)	94	(78 - 99)	95	(85 - 99)	86	(69 - 95)
Nottm	97	(92 - 99)	89	(81 - 94)	96	(90 - 99)	90	(83 - 95)
Derby	98	(92 - 100)	91	(82 - 97)	95	(85 - 99)	92	(82 - 97)
Oxford	97	(94 - 99)	89	(83 - 93)	95	(92 - 98)	89	(83 - 93)
Redng	99	(95 - 100)	90	(83 - 95)	98	(93 - 100)	92	(85 - 96)
Plymth	96	(85 - 100)	79	(59 - 91)	87	(70 - 96)	87	(73 - 95)
Truro	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Exeter	93	(86 - 97)	84	(73 - 92)	95	(87 - 99)	86	(76 - 93)
Ports	97	(94 - 99)	88	(82 - 92)	98	(94 - 99)	92	(88 - 95)
Sheff	94	(88 - 98)	N/A	N/A	98	(93 - 100)	N/A	N/A
Donc	95	(86 - 99)	89	(76 - 96)	98	(88 - 100)	91	(78 - 97)
L St.G	98	(92 - 100)	N/A	N/A	98	(91 - 100)	N/A	N/A
Brightn	100	N/A	91	(82 - 96)	100	N/A	94	(85 - 98)
Carsh	93	(88 - 96)	86	(78 - 91)	94	(89 - 97)	90	(83 - 95)
L Rfree	96	(93 - 98)	87	(82 - 91)	97	(93 - 99)	92	(87 - 95)
L Barts	94	(90 - 96)	82	(76 - 87)	93	(89 - 96)	85	(79 - 90)
EssexMS	93	(87 - 96)	86	(77 - 92)	95	(89 - 98)	91	(82 - 96)
L West	96	(93 - 97)	87	(82 - 90)	97	(95 - 99)	85	(81 - 89)
UK	**95**	**(95 - 96)**	**86**	**(85 - 87)**	**97**	**(96 - 97)**	**88**	**(87 - 88)**

Unit has reached the upper 99.8% confidence limit
Unit has reached the upper 95% confidence limit
Unit has reached the lower 95% confidence limit
Unit has reached the lower 99.8% confidence limit

* Includes transplants performed between 1 April 2017 - 31 March 2021
** Includes transplants performed between 1 April 2013 - 31 March 2017
Centres have been omitted where less than 75% of data reported

3.2 Living donor graft and patient survival

Figures 3.5-3.8 and **Table 3.2** show the risk-adjusted patient and graft survival rates for each unit and nationally following living donor transplantation. At five years post-transplant, the national patient survival rate was 94% and the graft survival was 93%.

Many units appear above the upper 99.8% confidence limit in the funnel plots. This suggests that these units may have survival rates that are considerably higher than the national rate. Units can be identified by the information shown in **Table 3.2**.

Figure 3.5 **Risk-adjusted one year graft (death censored) survival rates for first live donor kidney transplants in adults, between 1 April 2017 and 31 March 2021**

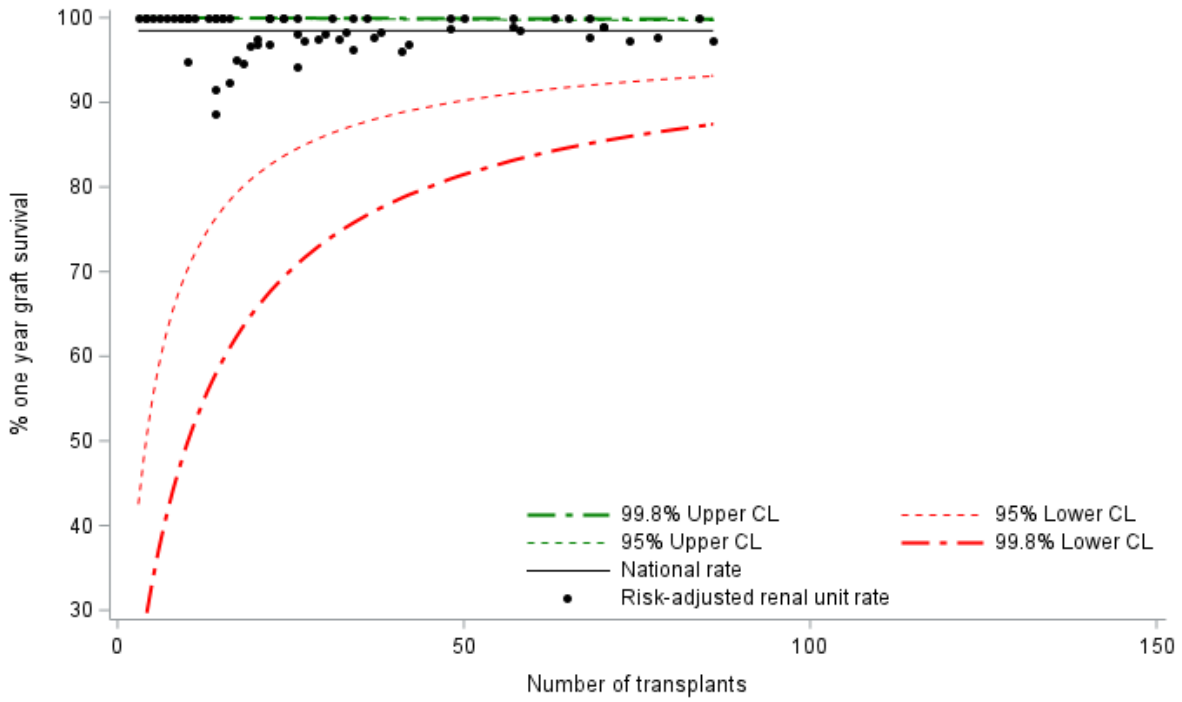


Figure 3.6 **Risk-adjusted one year patient survival rates for first live donor kidney transplants in adults, between 1 April 2017 and 31 March 2021**

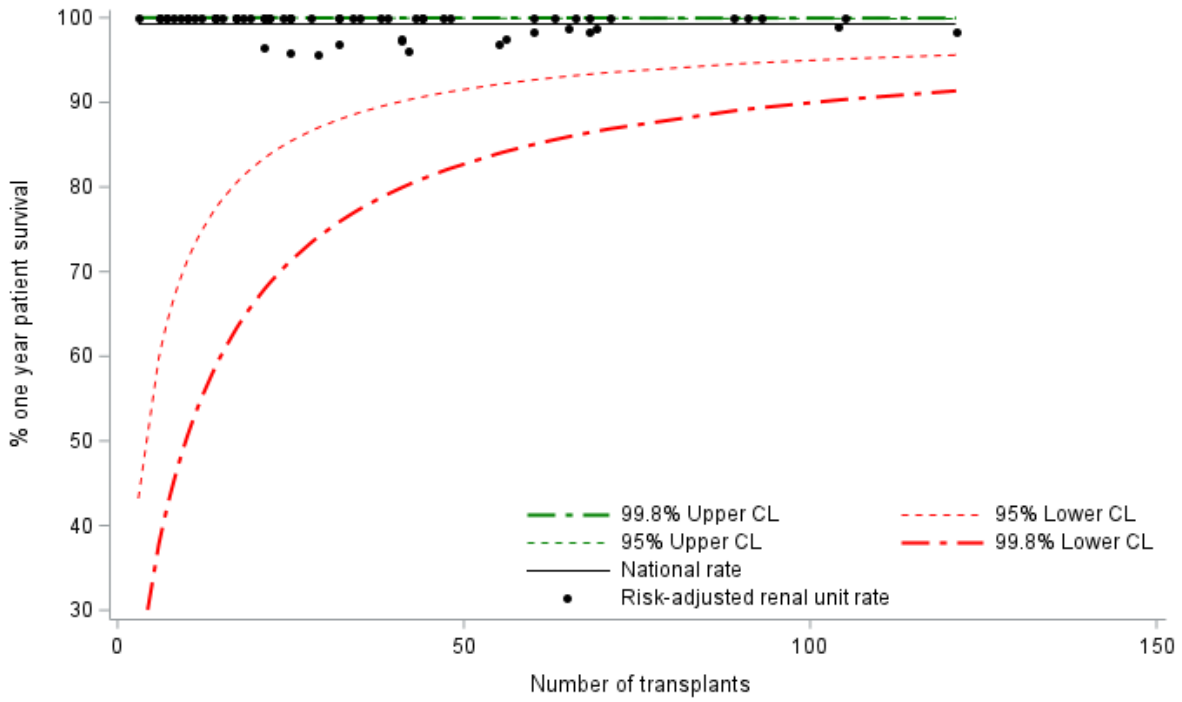


Figure 3.7 **Risk-adjusted five year graft (death censored) survival rates for first live donor kidney transplants in adults, between 1 April 2013 and 31 March 2017**

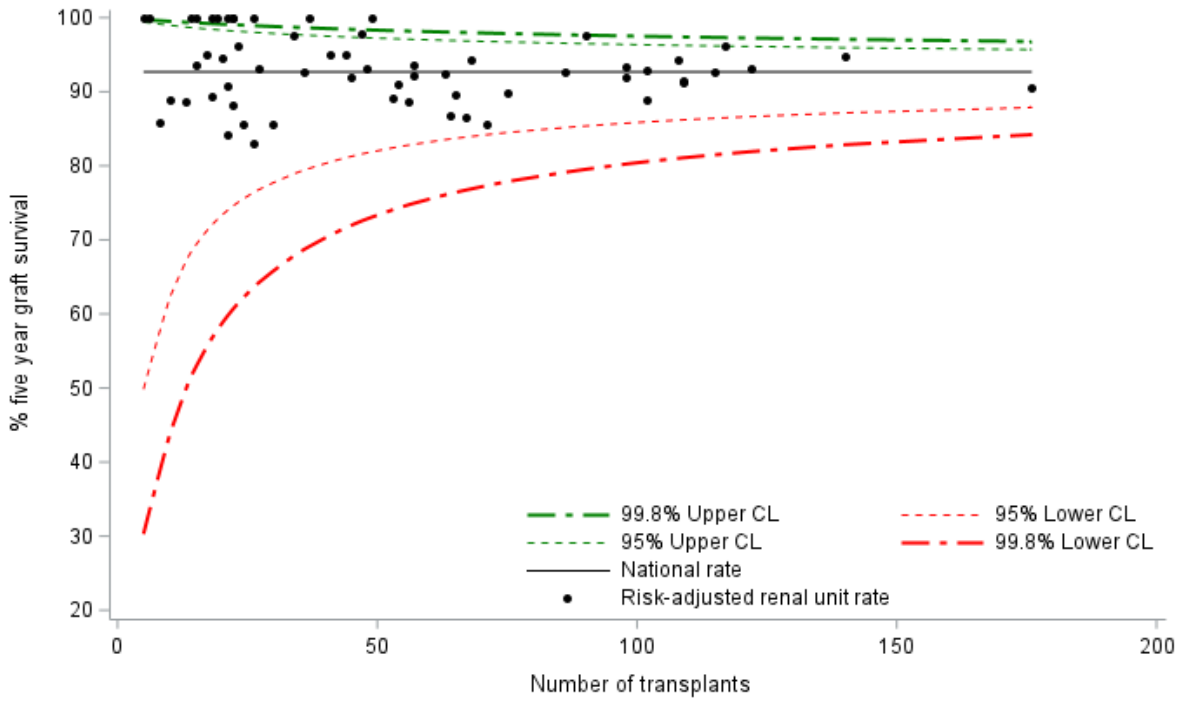


Figure 3.8 **Risk-adjusted five year patient survival rates for first live donor kidney transplants in adults, between 1 April 2013 and 31 March 2017**

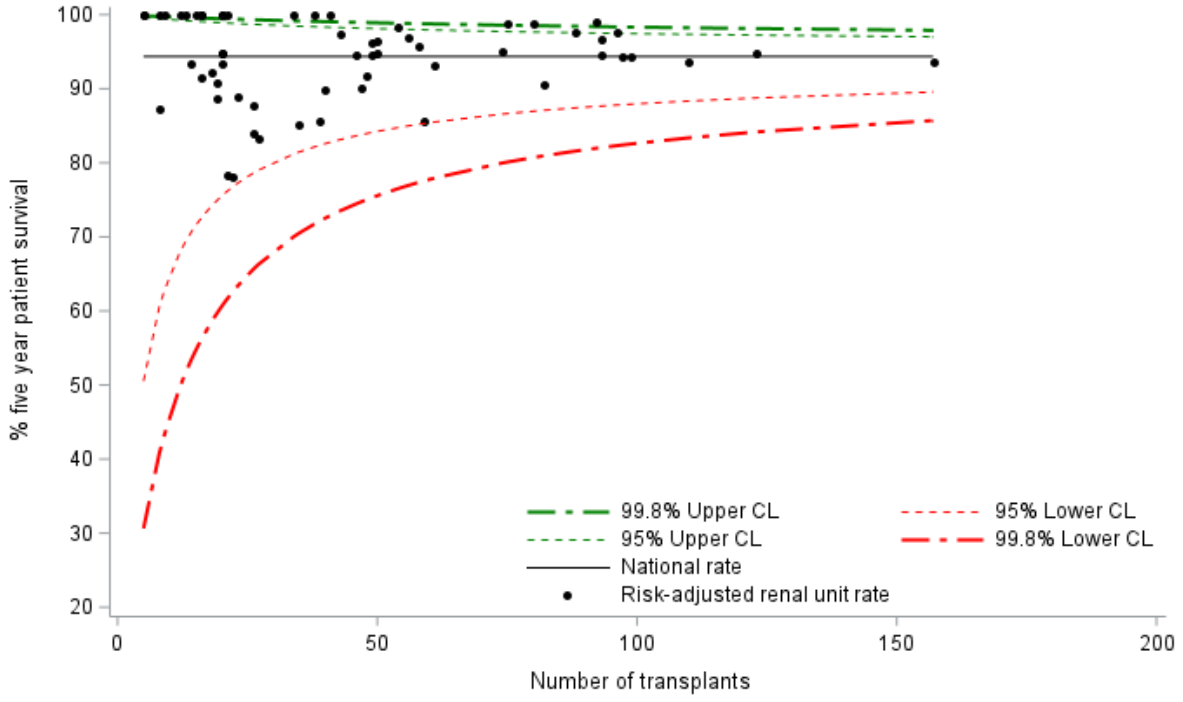


Table 3.2 **One and five year first adult kidney-only graft and patient survival using kidneys from living donors**

Unit	Kidney graft survival				Patient survival			
	One-year*		Five-year**		One-year*		Five-year**	
	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Belfast	100	N/A	92	(83 - 97)	100	N/A	99	(94 - 100)
Antrim	100	N/A	100	N/A	100	N/A	89	(67 - 98)
Newry	100	N/A	86	(58 - 97)	100	N/A	83	(64 - 94)
Ulster	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
West NI	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bham	98	(92 - 100)	95	(89 - 98)	100	N/A	95	(89 - 98)
Dudley	95	(71 - 100)	84	(54 - 97)	100	N/A	95	(71 - 100)
Shrew	100	N/A	94	(65 - 100)	100	N/A	94	(64 - 100)
Stoke	98	(87 - 100)	95	(82 - 99)	100	N/A	86	(70 - 94)
Wolve	100	N/A	91	(67 - 99)	100	N/A	78	(45 - 94)
Bristol	98	(91 - 100)	90	(79 - 96)	100	N/A	93	(82 - 98)
Dorset	92	(72 - 99)	93	(73 - 99)	96	(80 - 100)	84	(59 - 96)
Glouc	97	(83 - 100)	N/A	N/A	96	(76 - 100)	N/A	N/A
Camb	100	N/A	92	(79 - 98)	100	N/A	100	N/A
Colchr	100	N/A	100	N/A	100	N/A	100	N/A
Ipswi	100	N/A	89	(38 - 100)	100	N/A	100	N/A
Norwch	100	N/A	93	(75 - 99)	100	N/A	78	(49 - 93)
Stevng	98	(89 - 100)	94	(82 - 99)	100	N/A	95	(81 - 99)
Cardff	100	N/A	86	(73 - 93)	100	N/A	86	(69 - 95)
Swanse	89	(59 - 99)	86	(58 - 97)	100	N/A	91	(66 - 99)
Covnt	96	(87 - 100)	89	(76 - 96)	100	N/A	95	(81 - 99)
Edinb	98	(88 - 100)	95	(82 - 99)	96	(86 - 100)	100	N/A
Abrdn	100	N/A	96	(78 - 100)	100	N/A	100	N/A
Dundee	95	(72 - 100)	100	N/A	100	N/A	100	N/A
Inverns	100	N/A	100	N/A	100	N/A	100	N/A
Krkcldy	100	N/A	100	N/A	100	N/A	100	N/A
Glasgw	97	(92 - 99)	91	(84 - 96)	99	(94 - 100)	94	(87 - 98)
Airdrie	100	N/A	88	(66 - 98)	100	N/A	100	N/A
D&Gall	100	N/A	89	(39 - 100)	100	N/A	100	N/A
Klmarnk	100	N/A	100	N/A	100	N/A	100	N/A
L Guys	100	N/A	96	(91 - 99)	100	N/A	98	(91 - 100)
Kent	100	N/A	92	(82 - 98)	100	N/A	96	(86 - 100)
L Kings	100	N/A	100	N/A	100	N/A	97	(86 - 100)
Leeds	99	(93 - 100)	90	(77 - 96)	98	(91 - 100)	98	(91 - 100)
Bradfd	100	N/A	100	N/A	100	N/A	92	(57 - 100)
Hull	98	(86 - 100)	89	(76 - 96)	100	N/A	95	(80 - 99)
York	95	(80 - 99)	89	(61 - 99)	100	N/A	92	(53 - 100)
Leic	99	(94 - 100)	93	(86 - 97)	100	N/A	94	(87 - 98)
Liv Roy	96	(86 - 100)	87	(73 - 95)	97	(85 - 100)	97	(89 - 100)
Bangor	100	N/A	100	N/A	100	N/A	100	N/A
Clwyd	100	N/A	86	(21 - 100)	100	N/A	87	(28 - 100)
Liv Ain	91	(53 - 100)	94	(69 - 100)	100	N/A	95	(71 - 100)

Table 3.2 **One and five year first adult kidney-only graft and patient survival using kidneys from living donors**

	Kidney graft survival				Patient survival			
	One-year*		Five-year**		One-year*		Five-year**	
Unit	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Wirral	100	N/A	N/A	N/A	100	N/A	N/A	N/A
Wrexm	100	N/A	100	N/A	100	N/A	93	(63 - 100)
M RI	99	(94 - 100)	91	(84 - 96)	100	N/A	99	(95 - 100)
Prestn	97	(89 - 100)	93	(86 - 98)	98	(86 - 100)	91	(81 - 96)
Salford	98	(91 - 100)	93	(84 - 97)	97	(89 - 100)	95	(87 - 99)
Newc	99	(92 - 100)	92	(80 - 98)	99	(93 - 100)	90	(77 - 97)
Carlis	100	N/A	100	N/A	100	N/A	100	N/A
Middlbr	100	N/A	87	(75 - 94)	100	N/A	96	(87 - 100)
Sund	98	(90 - 100)	100	N/A	97	(83 - 100)	85	(70 - 94)
Nottm	97	(81 - 100)	98	(87 - 100)	100	N/A	88	(64 - 97)
Derby	100	N/A	95	(72 - 100)	100	N/A	100	N/A
Oxford	97	(93 - 99)	93	(86 - 97)	100	N/A	94	(87 - 97)
Redng	100	N/A	98	(89 - 100)	100	N/A	100	N/A
Plymth	97	(83 - 100)	83	(56 - 95)	96	(77 - 100)	89	(68 - 98)
Truro	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Exeter	94	(79 - 99)	93	(80 - 99)	97	(86 - 100)	90	(74 - 97)
Ports	100	N/A	98	(91 - 100)	99	(93 - 100)	99	(94 - 100)
Sheff	98	(86 - 100)	N/A	N/A	100	N/A	N/A	N/A
Donc	100	N/A	100	N/A	100	N/A	100	N/A
L St.G	100	N/A	N/A	N/A	100	N/A	N/A	N/A
Brightn	100	N/A	94	(86 - 98)	100	N/A	96	(85 - 99)
Carsh	99	(94 - 100)	94	(88 - 98)	98	(91 - 100)	97	(90 - 99)
L Rfree	100	N/A	93	(86 - 97)	100	N/A	98	(92 - 100)
L Barts	98	(92 - 100)	89	(80 - 94)	100	N/A	95	(86 - 99)
EssexMS	97	(85 - 100)	91	(79 - 97)	100	N/A	92	(76 - 98)
L West	100	N/A	91	(85 - 95)	98	(94 - 100)	94	(88 - 97)
UK	**98**	**(98 - 99)**	**93**	**(92 - 94)**	**99**	**(99 - 100)**	**94**	**(93 - 95)**

Unit has reached the upper 99.8% confidence limit
Unit has reached the upper 95% confidence limit
Unit has reached the lower 95% confidence limit
Unit has reached the lower 99.8% confidence limit

* Includes transplants performed between 1 April 2017 - 31 March 2021
** Includes transplants performed between 1 April 2013 - 31 March 2017
Centres have been omitted where less than 75% of data reported

Adult kidney outcomes – risk adjusted eGFR

4.1 Risk adjusted eGFR

Funnel plots were used to compare the adjusted mean 3 and 12 month eGFR at each renal unit to the national average. The plots show each unit's adjusted mean eGFR at 3- and 12-months post-transplant against the number of patients at each unit. The national adjusted mean eGFRs at 3- and 12-months post-transplant are shown by the black line and the 95% and 99.8% confidence limits around this national average are shown by the dotted lines. Units that fall within the upper and lower 95% confidence limits have an adjusted mean eGFR statistically consistent with the national average eGFR. Those units that are above the 95% upper confidence limit have significantly higher adjusted mean eGFR than the national average and units that are below the 95% lower confidence limit have significantly lower adjusted mean eGFR than the national average.

Where graft failure has occurred within 3 months post-transplant, eGFR is set to 8.6ml/min/1.73m^2 at 3 months and 12 months. Where graft failure has occurred between 3 and 12 months post-transplant, eGFR is calculated as usual for 3 months post-transplant and set to 8.6ml/min/1.73m^2 for 12 months post-transplant.

This section excludes multi-organ transplants and includes first time transplants only, with results presented separately for deceased and living donor transplants. Estimates are based on transplants performed in the period 1 April 2017 to 31 March 2021. The risk factors used to produce the risk-adjusted eGFR values are detailed in **Table A3.2** in Appendix A3.

Figures 4.1-4.4 and **Table 4.1** show the risk-adjusted mean eGFR for each unit and nationally. The funnel plots show a number of units outside the lower 95% and 99.8% confidence limits from both deceased and living donors, this may indicate adjusted mean eGFR values considerably lower than the national rate. Units can be identified by the information shown in **Table 4.1**. At 12 months post-transplant, the national mean eGFR rate was 49.9 mL/min/1.73m^2 and 56.8 mL/min/1.73m^2 for deceased and living donor transplants respectively.

Figure 4.1 Adjusted mean eGFR at 3 months by renal unit for first adult deceased donor kidney transplants in the UK, 1 April 2017 and 31 March 2021

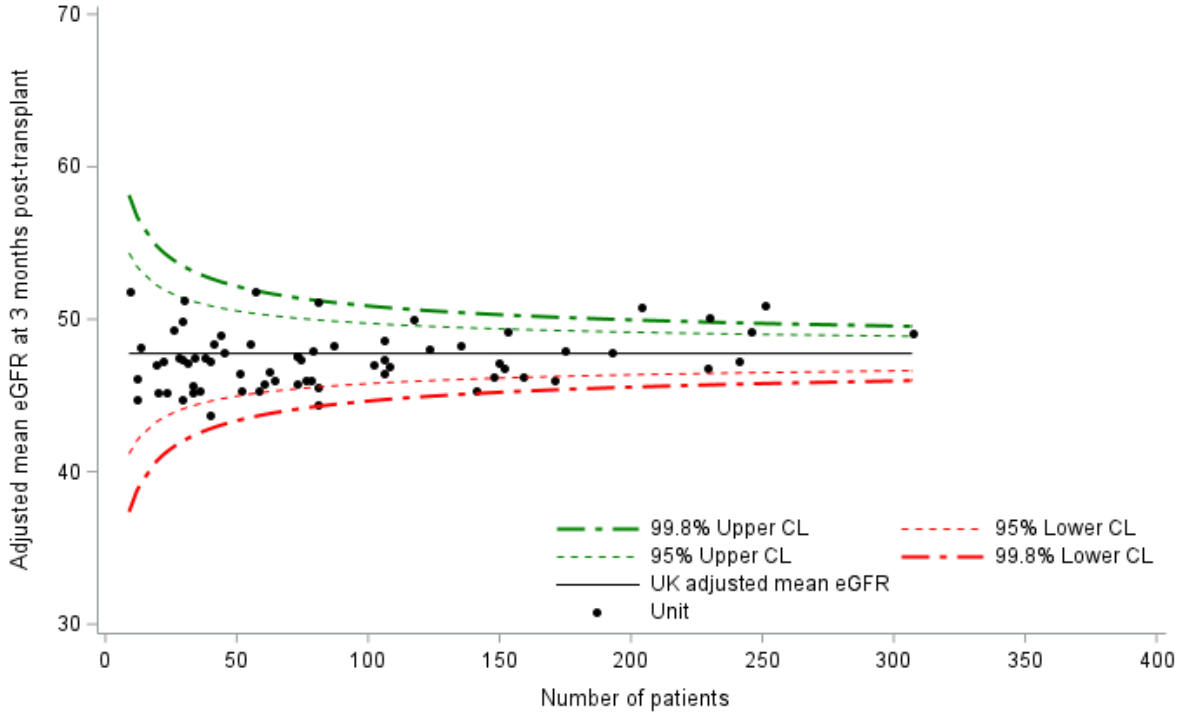


Figure 4.2 Adjusted mean eGFR at 12 months by renal unit for first adult deceased donor kidney transplants in the UK, 1 April 2017 and 31 March 2021

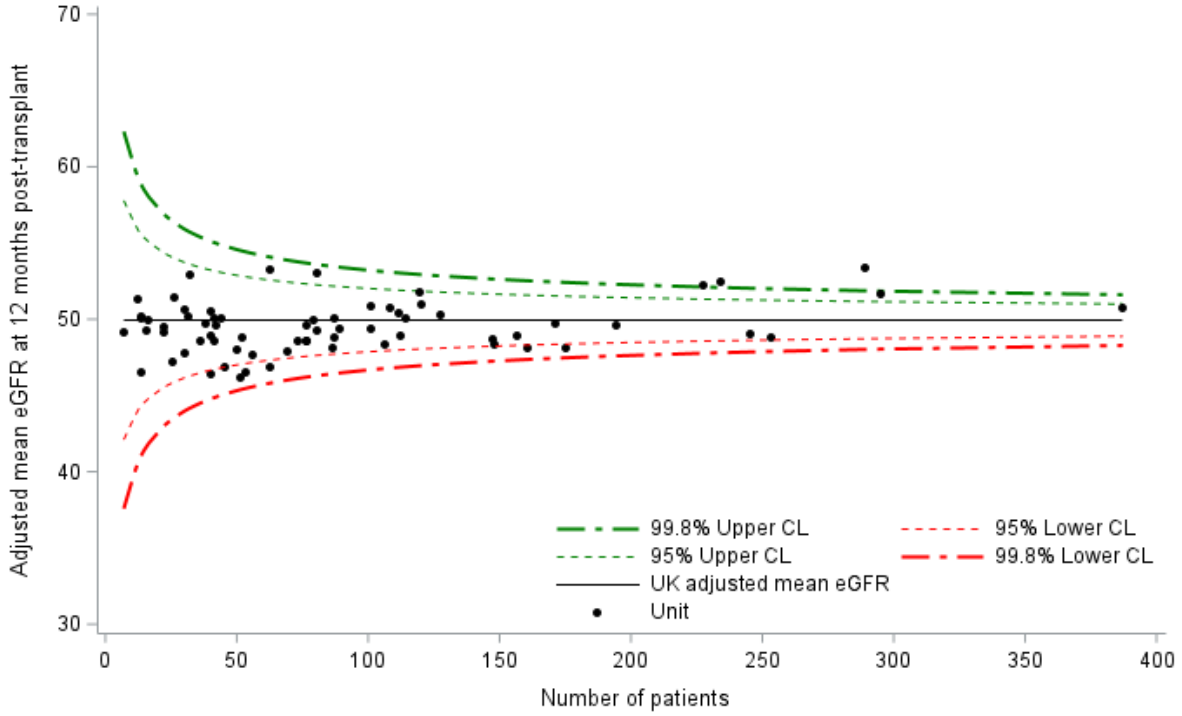


Figure 4.3 Adjusted mean eGFR at 3 months by renal unit for first adult living donor kidney transplants in the UK, 1 April 2017 and 31 March 2021

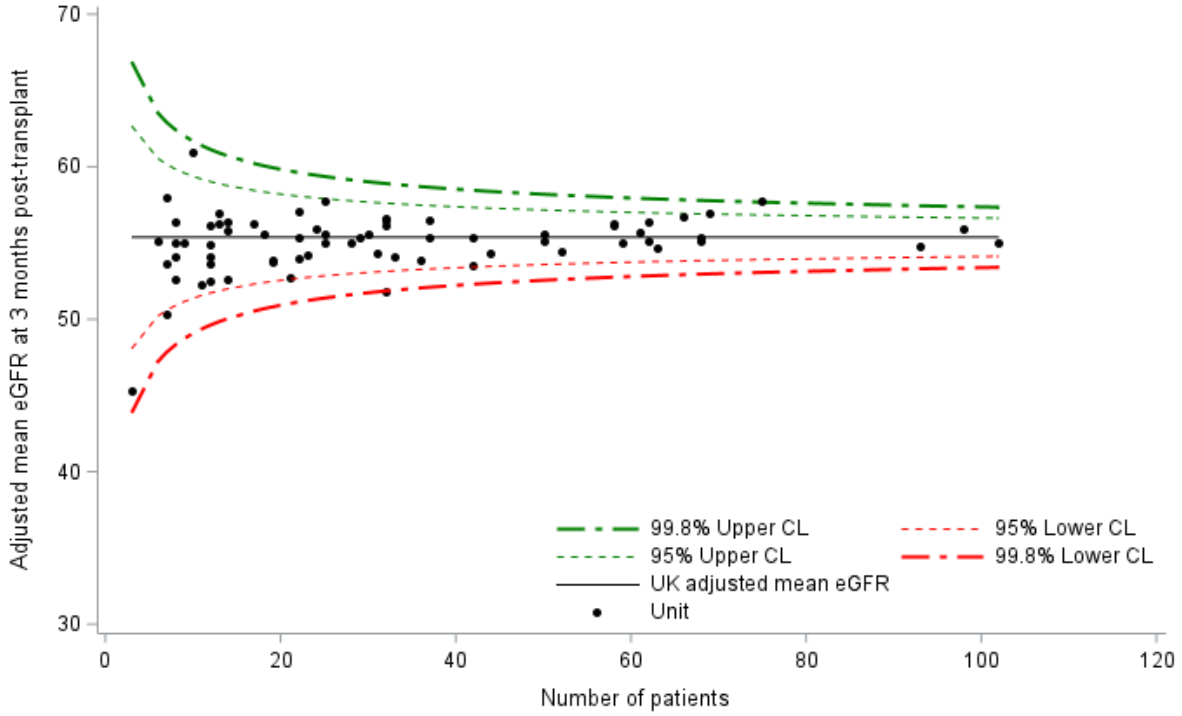


Figure 4.4 Adjusted mean eGFR at 12 months by renal unit for first adult living donor kidney transplants in the UK, 1 April 2017 and 31 March 2021

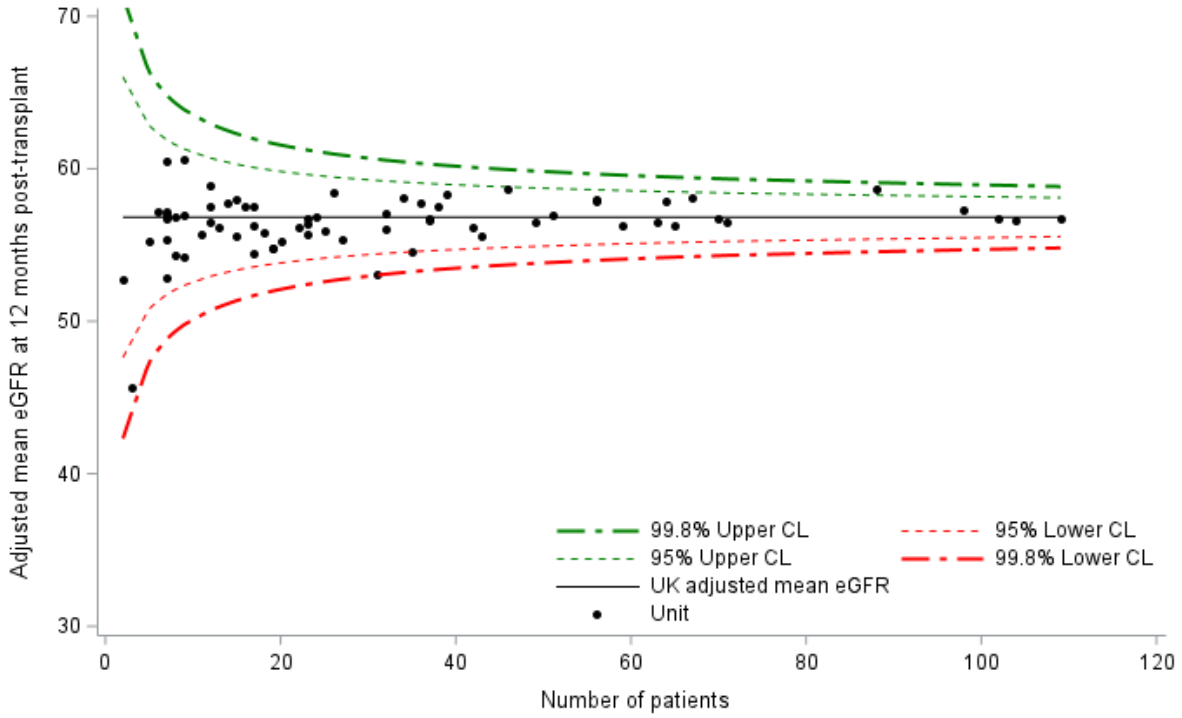


Table 4.1 Adjusted mean eGFR at 3 and 12 months, by donor type and renal unit

	Deceased donor transplants				Living donor transplants			
	3 months post-transplant*		12 months post-transplant**		3 months post-transplant***		12 months post-transplant****	
Unit	N	Mean	N	Mean	N	Mean	N	Mean
Belfast	73	47.6	79	50.0	68	55.3	70	56.8
Antrim	45	47.9	40	50.5	23	54.2	20	55.2
Newry	28	47.5	30	50.7	19	53.7	19	54.8
Ulster	29	47.4	13	46.6	13	56.3	7	56.9
West NI	44	49.0	22	49.5	24	56.0	17	56.2
Bham	204	50.7	234	52.5	62	56.3	67	58.1
Dudley	36	45.3	45	46.9	12	56.2	12	57.6
Shrew	29	49.9	26	51.5	8	56.4	9	57.0
Stoke	58	45.4	56	47.7	22	55.4	24	56.8
Wolve	57	51.8	62	53.3	13	57.0	15	58.0
Bristol	135	48.3	127	50.3	44	54.3	42	56.2
Dorset	33	45.7	69	47.9	12	52.5	19	54.8
Glouc	81	44.4	51	46.2	28	55.0	18	55.8
Camb	141	45.3	148	48.4	36	53.9	35	54.5
Colchr	30	51.3	32	53.0	8	52.6	8	54.4
Ipswi	38	47.5	40	49.0	8	54.1	9	54.2
Norwch	81	45.6	86	48.2	12	53.7	11	55.7
Stevng	153	49.2	120	51.1	32	56.6	27	55.4
Cardff	123	48.0	108	50.8	42	55.3	37	56.6
Swanse	62	46.6	52	48.8	21	52.8	17	54.4
Covnt	117	50.0	119	51.8	37	55.4	38	57.5
Edinb	51	46.4	40	46.4	29	55.3	7	57.2
Abrdn	40	43.7	53	46.6	32	56.2	32	57.1
Dundee	22	47.2	31	50.3	14	52.7	15	55.6
Inverns	13	48.2	16	50.0	12	54.9	12	56.5
Krkcldy	26	49.3	13	50.3	18	55.6	2	52.7
Glasgw	241	47.2	245	49.1	102	55.1	102	56.8
Airdrie	40	47.2	42	49.6	17	56.3	17	57.5
D&Gall	12	46.1	13	50.1	3	45.3	3	45.7
Klmarnk	23	45.2	25	47.2	7	50.4	7	52.9
L Guys	148	46.2	147	48.7	58	56.3	56	57.9
Kent	78	46.0	76	48.6	50	55.1	49	56.5
L Kings	106	48.7	101	50.9	25	57.8	26	58.4
Leeds	193	47.8	194	49.6	58	56.2	56	58.0
Bradfd	81	51.1	80	53.0	14	55.8	12	58.9
Hull	64	46.0	73	48.7	30	55.6	34	58.1
York	52	45.4	50	48.0	25	55.0	23	56.7
Leic	307	49.1	295	51.7	98	56.0	98	57.3
Liv Roy	73	47.6	87	50.1	37	56.5	39	58.3
Bangor	12	44.8	15	49.3	7	53.7	7	55.4
Clwyd	9	51.9	12	51.3	7	58.0	7	60.5
Liv Ain	34	47.4	38	49.7	10	60.9	9	60.6
Wirral	33	45.2	41	48.6	14	56.5	16	57.5
Wrexm	29	44.8	30	47.8	6	55.1	6	57.2
M RI	171	46.0	175	48.2	62	55.1	65	56.3
Prestn	150	47.2	156	49.0	52	54.4	51	56.9
Salford	159	46.2	160	48.1	50	55.6	46	58.7
Newc	102	47.0	101	49.4	68	55.1	71	56.5
Carlis	20	45.2	22	49.2	8	55.0	7	56.7

Table 4.1 Adjusted mean eGFR at 3 and 12 months, by donor type and renal unit

	Deceased donor transplants				Living donor transplants			
	3 months post-transplant*		12 months post-transplant**		3 months post-transplant***		12 months post-transplant****	
Unit	N	Mean	N	Mean	N	Mean	N	Mean
Middlbr	73	45.8	76	48.7	63	54.7	63	56.5
Sund	60	45.7	62	46.9	32	51.9	31	53.1
Nottm	108	46.9	112	49.0	22	54.0	25	55.9
Derby	74	47.4	80	49.3	12	54.1	14	57.7
Oxford	229	46.8	253	48.8	93	54.8	104	56.6
Redng	106	47.3	114	50.1	25	55.6	23	56.4
Plymth	31	47.1	41	50.1	19	53.9	22	56.2
Exeter	76	46.0	89	49.5	32	56.5	36	57.7
Truro	19	47.0	7	49.2	11	52.3	5	55.2
Ports	152	46.8	87	48.9	59	55.0	23	55.8
Sheff	87	48.3	111	50.5	31	54.3	37	56.7
Donc	41	48.5	44	50.1	9	55.0	13	56.1
L St.G	55	48.4	36	48.7	22	57.1	8	56.9
Brightn	79	48.0	76	49.6	42	53.6	43	55.6
Carsh	175	48.0	171	49.8	66	56.7	64	57.9
L Rfree	230	50.1	227	52.3	69	57.0	59	56.3
L Barts	251	50.9	289	53.4	75	57.8	88	58.7
EssexMS	106	46.4	106	48.4	33	54.1	32	56.0
L West	246	49.2	387	50.8	61	55.7	109	56.8
UK	**6084**	**47.8**	**6258**	**49.9**	**2233**	**55.4**	**2195**	**56.8**

Unit has reached the upper 99.8% confidence limit
Unit has reached the upper 95% confidence limit
Unit has reached the lower 95% confidence limit
Unit has reached the lower 99.8% confidence limit

* Adjusted for recipient ethnicity, donor type, donor hypertension, recipient sex, donor diabetes history, donor alcohol abuse history, donor ethnicity, recipient diabetic status, donor age, donor height and cold ischaemia time.
** Adjusted for recipient sex, recipient ethnicity, donor hypertension history, donor type, donor diabetes history, donor alcohol abuse history, donor age, donor height, cold ischaemia time, waiting time and recipient age
*** Adjusted for recipient ethnicity, relationship between donor and recipient, donor age, donor GFR, donor weight, cold ischaemia time and donor BMI.
**** Adjusted for recipient ethnicity, recipient sex, financial year of transplant, donor age, donor GFR, donor weight, donor height and cold ischaemia time.

Appendix

A1 Glossary of terms

ABO
The most important human blood group system for transplantation is the ABO system. Every human being is of blood group O, A, B or AB, or of one of the minor variants of these four groups. ABO blood groups are present on other tissues and, unless special precautions are taken, a group A kidney transplanted to a group O patient will be rapidly rejected.

Active transplant list
When a patient is registered for a transplant, they are registered on what is called the 'active' transplant list. This means that when a donor kidney becomes available, the patient is included among those who are matched against the donor to determine whether or not the kidney is suitable for them. It may sometimes be necessary to take a patient off the transplant list, either temporarily or permanently. This may be done, for example, if someone becomes too ill to receive a transplant. The patient is told about the decision to suspend them from the list and is informed whether the suspension is temporary or permanent. If a patient is suspended from the list, they are not included in the matching of any donor kidneys that become available.

Case mix
The types of patients treated at a unit for a common condition. This can vary across units depending on the facilities available at the unit as well as the types of people in the catchment area of the unit. The definition of what type of patient a person is depends on the patient characteristics that influence the outcome of the treatment. For example the case mix for patients registered for a kidney transplant is defined in terms of various factors such as the blood group, tissue type and age of the patient. These factors have an influence on the chance of a patient receiving a transplant.

Confidence interval (CI)
When an estimate of a quantity such as a survival rate is obtained from data, the value of the estimate depends on the set of patients whose data were used. If, by chance, data from a different set of patients had been used, the value of the estimate may have been different. There is therefore some uncertainty linked with any estimate. A confidence interval is a range of values whose width gives an indication of the uncertainty or precision of an estimate. The number of transplants or patients analysed influences the width of a confidence interval. Smaller data sets tend to lead to wider confidence intervals compared to larger data sets. Estimates from larger data sets are therefore more precise than those from smaller data sets. Confidence intervals are calculated with a stated probability, usually 95%. We then say that there is a 95% chance that the confidence interval includes the true value of the quantity we wish to estimate.

Confidence limit
The upper and lower bounds of a confidence interval.

Cox Proportional Hazards model
A statistical model that relates the instantaneous risk (hazard) of an event occurring at a given time point to the risk factors that influence the length of time it takes for the event to occur. This model can be used to compare the hazard of an event of interest, such as graft failure or patient death, across different groups of patients.

Cross-match
A cross-match is a test for patient antibodies against donor antigens. A positive cross-match shows that the donor and patient are incompatible. A negative cross-match means there is no reaction between donor and patient and that the transplant may proceed.

Donor after brain death (DBD)
Donation after brainstem death means donation which takes place following the diagnosis of death using neurological criteria.

Donor after circulatory death (DCD)
Donation after circulatory death means donation which takes place following the diagnosis of death using circulatory criteria.

eGFR
Estimate of the glomerular filtration rate (GFR) – a recognised indication of renal function. Derived from serum creatinine, age and ethnicity, using the 4-variable Modification of Diet in Renal Disease (MDRD) formula.

Funnel plot
A graphical method that shows how consistent the survival rates of the different renal units are compared to the national rate. The graph shows for each unit, a survival rate plotted against the number of transplants undertaken, with the national rate and confidence limits around this national rate superimposed. In this report, 95% and 99.8% confidence limits were used. Units that lie within the confidence limits have survival rates that are statistically consistent with the national rate. When a unit is close to or outside the limits, this is an indication that the centre may have a rate that is considerably different from the national rate.

Graft survival rate
The percentage of patients whose grafts are still functioning. This is usually specified for a given time period after transplant. For example, a five-year transplant survival rate is the percentage of transplants still functioning five years after transplant.

HLA mismatch
Human Leucocyte Antigen (HLA) antigens are carried on many cells in the body and the immune system can distinguish between those that can be recognised as 'self' (belonging to you or identical to your own) and those that can be recognised as 'nonself'. The normal response of the immune system is to attack foreign/non-self material by producing antibodies against the foreign material. This is one of the mechanisms that provide protection against infection. This is unfortunate from the point of view of transplantation as the immune system will see the graft as just another 'infection' to be destroyed, produce antibodies against the graft and rejection of the grafted organ will take place. To help overcome this response, it is recognised that 'matching' the recipient and donor on the basis of HLA (and blood group)

reduces the chances of acute rejection and, with the added use of immunosuppressive drugs, very much improves the chances of graft survival. 'Matching' refers to the similarity of the recipient HLA type and donor HLA type. HLA mismatch refers to the number of mismatches between the donor and the recipient at the A, B and DR (HLA) loci. There can only be a total of two mismatches at each locus. For example, an HLA mismatch value of 000, means that the donor and recipient are identical at all three loci, while an HLA mismatch value of 210 means that the donor and recipient differ completely at the A locus, are partly the same at the B locus and are identical at the DR locus.

Inter-quartile range
The values between which the middle 50% of the data fall. The lower boundary is the lower quartile, the upper boundary the upper quartile.

Kaplan-Meier method
A method that allows patients with incomplete follow-up information to be included in estimating survival rates. For example, in a cohort for estimating one year patient survival rates, a patient was followed up for only nine months before they relocated. If we calculated a crude survival estimate using the number of patients who survived for at least a year, this patient would have to be excluded as it is not known whether or not the patient was still alive at one year after transplant. The Kaplan-Meier method allows information about such patients to be used for the length of time that they are followed-up, when this information would otherwise be discarded. Such instances of incomplete follow-up are not uncommon and the Kaplan-Meier method allows the computation of estimates that are more meaningful in these cases.

Live donor
A donor who is a living person and who is usually, but not always, a relative of the transplant patient. For example, a parent may donate one of their kidneys to their child.

Median
The midpoint in a series of numbers, so that half the data values are larger than the median, and half are smaller.

Multi-organ transplant
A transplant in which the patient receives more than one organ. For example, a patient may undergo a transplant of a kidney and liver.

National Kidney Allocation Scheme
A nationally agreed set of rules for sharing and allocating kidneys for transplant between transplant centres in the UK. The scheme is administered by NHS Blood and Transplant.

Patient survival rate
The percentage of patients who are still alive (whether the graft is still functioning or not). This is usually specified for a given time period after transplant. For example, a five-year patient survival rate is the percentage of patients who are still alive five years after their first transplant.

p value
In the context of comparing survival rates across units, the p value is the probability that the differences observed in the rates across centres occurred by chance. As this is a probability, it takes values between 0 and 1. If the p value is small, say less than 0.05, this implies that the differences are unlikely to be due to chance and there may be some identifiable cause for these differences. If the p value is large, say greater than 0.1, then it is quite likely that any differences seen are due to chance.

Pre-emptive
Patients that are placed on the kidney transplant list or receive a transplant prior to the need for dialysis are termed as pre-emptive. Patients listed pre-emptively will usually require dialysis within six months of being placed on the transplant list.

Risk-adjusted survival rate
Some transplants have a higher chance than others of failing at any given time. The differences in expected survival times arise due to differences in certain factors, the risk factors, among patients. A risk-adjusted survival rate for a unit is the expected survival rate for that unit given the case mix of their patients. Adjusting for case mix in estimating unit-specific survival rates allows valid comparison of these rates across centres and to the national rate.

Risk factors
These are the characteristics of a patient, transplant or donor that influence the length of time that a graft is likely to function or a patient is likely to survive following a transplant. For example, when all else is equal, a transplant from a younger donor is expected to survive longer than that from an older donor and so donor age is a risk factor.

Unadjusted survival rate
Unadjusted survival rates do not take account of risk factors and are based only on the number of transplants at a given centre and the number and timing of those that fail within the post-transplant period of interest. In this case, unlike for risk-adjusted rates, all transplants are assumed to be equally likely to fail at any given time. However, some centres may have lower unadjusted survival rates than others simply because they tend to undertake transplants that have increased risks of failure. Comparison of unadjusted survival rates across centres and to the national rate is therefore inappropriate.

A2 Methods

Unadjusted and risk-adjusted estimates of patient and graft survival are given for each centre. Unadjusted rates give an estimate of what the survival rate at a centre is, assuming that all patients at the centre have the same chance of surviving a given length of time after transplant. In reality, patients differ and a risk-adjusted rate that allows for these differences would give a more meaningful estimate of survival.

Computing unadjusted survival rates

Unadjusted survival rates were calculated using the Kaplan-Meier method, which allows patients with incomplete follow-up information to be included in the computation. For example, in a cohort for estimating one-year patient survival rates, a patient was followed up for only nine months before they relocated. If we calculated a crude survival estimate using the number of patients who survived for at least a year, this patient would have to be excluded, as it is not known whether or not the patient was still alive one year after transplant. The Kaplan-Meier method allows information about such patients to be used for the length of time that they are followed-up, when this information would otherwise be discarded. Such instances of incomplete follow-up are not uncommon in the analysis of survival data and the Kaplan-Meier method therefore allows the computation of survival estimates that are more meaningful.

Computing risk-adjusted survival rates

A risk-adjusted survival rate is an estimate of what the survival rate at a centre would have been if they had had the same mix of patients as that seen nationally. The risk-adjusted rate therefore presents estimates in which differences in patient mix across centres have been removed as much as possible. For that reason, it is valid to only compare centres using risk-adjusted rather than unadjusted rates, as differences among the latter can be attributed to differences in patient mix.

Risk-adjusted survival estimates were obtained through indirect standardisation. A Cox Proportional Hazards model was used to determine the probability of survival for each patient based on their individual risk factor values. The sum of these probabilities for all patients at a centre gives the number, E, of patients or grafts expected to survive at least one year or five years after transplant at that centre. The number of patients who actually survive the given time period is given by O. The risk-adjusted estimate is then calculated by multiplying the ratio O/E by the overall unadjusted survival rate across all centres.

The risk-adjustment models used were based on results from previous studies that looked at factors affecting the survival rates of interest. The factors included in the models are shown in **Table A3.1**.

A3 Risk adjustment factors

Table A3.1 Risk factors used in the adult kidney risk adjusted survival, by donor type and model

Donor Type	Model	Factors
Deceased	1 year graft survival	Donor age, donor type, donor cause of death, recipient age, waiting time to transplant, primary renal disease, HLA mismatch group, cold ischaemic time*, recipient ethnicity
	1 year patient survival	Donor age, recipient age, waiting time to transplant, primary renal disease, HLA mismatch group, cold ischaemic time*
	5 year graft survival	Graft year, donor age, donor type, donor cause of death, recipient age, waiting time to transplant, primary renal disease, HLA mismatch group, recipient ethnicity
	5 year patient survival	Graft year, donor age, recipient age, waiting time to transplant, primary renal disease
Living	1 year graft survival	Donor age, recipient age, primary renal disease, number of HLA mismatches
	1 year patient survival	Recipient age
	5 year graft survival	Graft year, donor age, recipient age, primary renal disease, number of HLA mismatches
	5 year patient survival	Recipient age, primary renal disease

*Time between retrieval of kidney from the donor and time of transplant in the patient.

Table A3.2 Risk factors used in the adult kidney risk adjusted eGFR, by donor type and model

Donor Type	Model	Factors
Deceased	3 month	recipient ethnicity, donor type, donor hypertension, recipient sex, donor diabetes history, donor alcohol abuse history, donor ethnicity, recipient diabetic status, donor age, donor height, cold ischaemic time*
	12 month	recipient sex, recipient ethnicity, donor hypertension history, donor type, donor diabetes history, donor alcohol abuse history, donor age, donor height, cold ischaemic time*, waiting time, recipient age
Living	3 month	recipient ethnicity, relationship between donor and recipient, donor age, donor GFR, donor weight, cold ischaemic time*, donor BMI
	12 month	recipient ethnicity, recipient sex, financial year of transplant, donor age, donor GFR, donor weight, donor height and cold ischaemic time*

*Time between retrieval of kidney from the donor and time of transplant in the patient.

A4 Renal unit names

Table A4.1 Renal unit's abbreviation and location

Abbreviation	Name	Location
Abrdn	Aberdeen Royal Infirmary	Aberdeen
Airdrie	Monklands Hospital	Airdrie
Antrim	Antrim Hospital	Antrim
Bangor	Ysbyty Gwynedd Hospital	Bangor
Belfast	Belfast City Hospital	Belfast
Bham	Heartlands hospital Queen Elizabeth Hospital	Birmingham
Bradfd	St Lukes Hospital	Bradford
Brightn	Royal Sussex County Hospital	Brighton
Bristol	Southmead Hospital	Bristol
Camb	Addenbrookes Hospital	Cambridge
Cardiff	University Hospital of Wales	Cardiff
Carlis	Cumberland Infirmary	Carlisle
Carsh	St Helier Hospital	Carshalton
Clwyd	Ysbyty Glan Clwyd	Rhyl
Colchr	Colchester General Hospital	Colchester
Covnt	University Hospital Coventry & Warwick	Coventry
D&Gall	Dumfries & Galloway Royal Infirmary	Dumfries
Derby	Royal Derby Hospital	Derby
Donc	Doncaster Royal Infirmary	Doncaster
Dorset	Dorset County Hospital	Dorchester
Dudley	Russels Hall Hospital	Dudley
Dundee	Ninewells Hospital	Dundee
Edinb	Edinburgh Royal Infirmary	Edinburgh
EssexMS	Basildon Hospital Broomfield Southend Hospital	Basildon Chelmsford Southend-on-Sea
Exeter	Royal Devon and Exeter Hospital	Exeter
Glasgw	Queen Elizabeth University Hospital	Glasgow
Glouc	Gloucestershire Royal Hospital	Gloucester
Hull	Hull Royal Infirmary	Hull
Inverns	Raigmore Hospital	Inverness
Ipswi	Ipswich Hospital	Ipswich
Kent	Kent & Canterbury Hospital	Canterbury
Klmarnk	University Hospital Crosshouse	Kilmarnock
KrkCldy	Victoria Hospital	Kirkcaldy
L Barts	Barts and The London Hospital	London
L Guys	Guy's and St Thomas's Hospital	London
L Kings	King's College Hospital	London
L Rfree	Royal Free Hospital	London
L St.G	St George's Hospital	London
L West	West London Transplant & Renal Centre	London
Leeds	St James's University Hospital	Leeds

Leic	Leicester General Hospital	Leicester
Liv Ain	Aintree University Hospital	Liverpool
Liv Roy	Royal Liverpool University Hospital	Liverpool
M RI	Manchester Royal Infirmary	Manchester
Middlbr	James Cook University Hospital	Middlesborough
Newc	Freeman Hospital & Royal Victoria Infirmary	Newcastle
Newry	Daisy Hill Hospital (Southern Trust)	Newry
Norwch	Norfolk & Norwich University Hospital	Norwich
Nottm	Nottingham City Hospital	Nottingham
Oxford	Oxford Radcliffe Hospital	Oxford
Plymth	Derriford Hospital	Plymouth
Ports	Queen Alexandra Hospital	Portsmouth
Prestn	Royal Preston Hospital	Preston
Redng	Royal Berkshire Hospital	Reading
Salford	Salford Royal Hospital	Salford
Sheff	Northern General Hospital	Sheffield
Shrew	Royal Shrewsbury Hospital	Shrewsbury
Stevng	Lister Hospital	Stevenage
Stoke	Royal Stoke University Hospital	Stoke-on-Trent
Sund	Sunderland Royal Hospital	Sunderland
Swanse	Morriston Hospital	Swansea
Truro	Royal Cornwall Hospital (Treliske)	Truro
Ulster	Ulster Hospital	Belfast
West NI	Tyrone County Hospital (Western Trust)	Omagh
Wirral	Arrowe Park Hospital	Wirral
Wolve	New Cross Hospital	Wolverhampton
Wrexm	Wrexham Maelor Hospital	Wrexham
York	York District General Hospital	York

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