UK Kidney Association
UK Renal Registry

Chapter 2

Adults starting kidney replacement therapy (KRT) for end-stage kidney disease (ESKD) in the UK in 2022

Contents

Introduction

This chapter describes the population of patients who developed end-stage kidney disease (ESKD) and started kidney replacement therapy (KRT) in the UK in 2022 (figure 2.1). This includes patients starting dialysis therapies – haemodialysis (HD) and peritoneal dialysis (PD) – and patients who received a pre-emptive kidney transplant (Tx). Patients with a failed Tx who returned to dialysis are not included. Patients who received dialysis for acute kidney injury (AKI), as coded by their reporting kidney centre, were only included if their dialysis was subsequently recoded as being for ESKD, when they failed to recover native kidney function. Recoding is automatically applied at 90 days for individuals still on KRT (unless advised otherwise by the kidney centre – see appendix A for details), but can be applied earlier by reporting centres that identify ESKD before day 90. Individuals who commenced dialysis for AKI and subsequently recovered kidney function, died or withdrew from dialysis within the first 90 days of treatment are not included in this chapter (although they are shown in figure 2.1). Patients who died, or withdrew from dialysis after being coded as ESKD are included in this chapter, but patients who recovered kidney function are not included if they recovered before 90 days on dialysis.

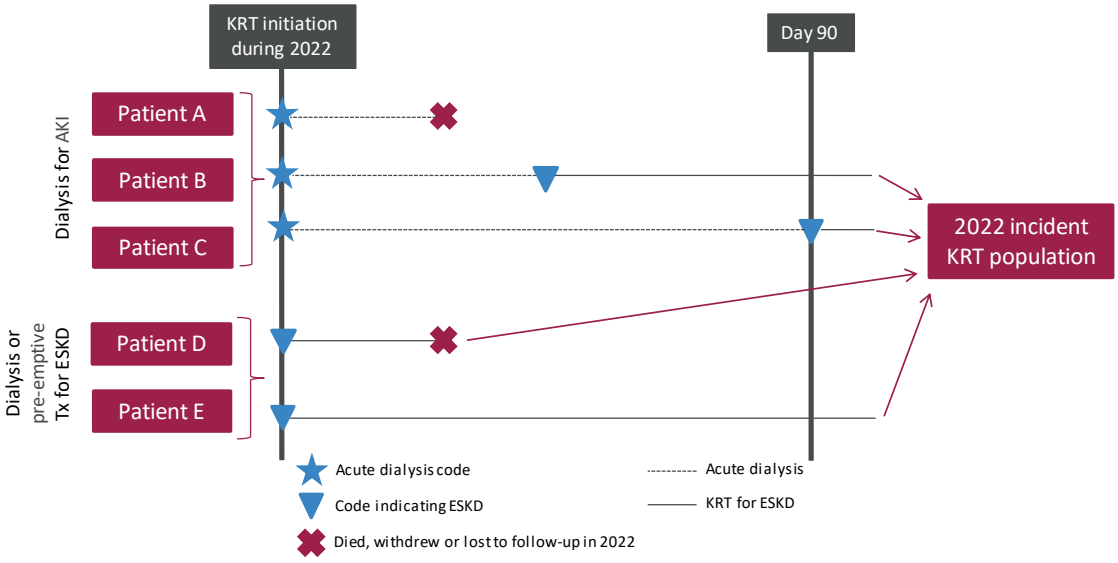

Figure 2.1 Example histories for patients starting KRT, illustrating the use of timeline codes to define dialysis as being 'acute' or for ESKD

Patients who recovered kidney function before 90 days on dialysis are not included in this chapter, whether they were coded as AKI or ESKD

Patients who followed patterns B–E received KRT for ESKD and are counted as 'incident to KRT' throughout this report. Patients who followed pattern A are not counted as 'incident to KRT' and do not feature in this chapter

Survival and cause of death analyses were undertaken on historic incident cohorts to allow sufficient follow-up time and numbers of patients. For most centres, dialysis access data were collected separately to the main UKRR quarterly data returns via the 2022 Multisite Dialysis Access Audit. For a few centres with complete data, dialysis access information could be derived from the quarterly return. In future years we hope that data quality will improve such that we can extend this to more centres.

This chapter addresses the following key aspects of the care of patients incident to KRT for which there are UK Kidney Association guidelines (table 2.1):

- **Modality selection, pre-emptive transplantation and Tx wait-listing:** the percentage of patients starting on each KRT modality, including a home therapy – home HD (HHD) or PD – or a kidney Tx, as well as the percentage of patients pre-emptively listed for a Tx, are reported in this chapter.
- **Late presentation:** a patient first seen by kidney services within 90 days of starting KRT for ESKD is defined as a 'late presentation' (in this report 'late presentation' is used interchangeably with 'late referral').
- **Complications associated with ESKD:** these include anaemia and mineral bone disorders.
- **Type of dialysis access:** definitive access – either a surgically created arteriovenous fistula (AVF) or arteriovenous graft (AVG), or a PD catheter. Alternatively, more temporary access can be provided through a central venous catheter – either a tunnelled line (TL) or a non-tunnelled line (NTL).

Rationale for analyses

The analyses begin with a description of the 2022 incident adult KRT population, including the incident number on KRT per million population (pmp). The inclusion of centre-specific reports on the survival of KRT patients reflects the need for transparency following the Francis and Keogh enquiries and the ongoing Care Quality Commission inspections of patient care and outcomes at a number of hospital trusts. Survival analyses have been adjusted for age, sex and comorbidity using kidney centre data. Comorbidity data have been augmented using Hospital Episode Statistics (HES) for English kidney centres and Patient Episode Database for Wales (PEDW) for Welsh kidney centres.

The UK Kidney Association guidelines (ukkidney.org/health-professionals/guidelines/guidelines-commentaries) provide audit measures relevant to the care of patients incident to KRT and, where data permit, their attainment by UK kidney centres in 2022 is reported in this chapter (table 2.1). Audit measures in guidelines that have been archived are not included, and neither are guidelines which took effect after data collection.

Some audit measures – for example, the target for glycated haemoglobin (HbA1c) in those on hypoglycaemia-inducing treatment – cannot be reported because the completeness of the required data is too low. Further detail about the completeness of data returned to the UK Renal Registry (UKRR) is available through the UKRR data portal (ukkidney.org/audit-research/data-portals). Audit measures that cannot be reported because the required data items were not collected by the UKRR are omitted.

For definitions and methods relating to this chapter see appendix A. Centres were exluded from caterpillar plots and cells were blanked in tables where data completeness for a biochemical variable fell <70% and/or the number of patients reported was <10. The number preceding the centre name in each caterpillar plot indicates the percentage of missing data for that centre, unless specified to the contrary.

Exeter was unable to submit patient level data for 2021 and 2022. Aggregate numbers by modality were provided, enabling inclusion in Tables 2.2 and 2.3. Exeter also submitted data to the 2022 Multisite Dialysis Access Audit allowing inclusion in Tables 2.15 and 2.16, and Figures 2.13 to 2.17. Exeter is excluded from all other analyses.

Manchester was unable to submit data for the last quarter of 2022. Therefore incident data for Manchester is for patients starting KRT between 1 January 2022 and 30 September 2022 only. For the 2022 Multisite Dialysis Access Audit, data were submitted separately to the quarterly returns and cover the whole of 2022. For analyses involving follow up of patients to the end of 2022, the Manchester cohort was restricted so that the duration of follow up remained the same.

Table 2.1 The UK Kidney Association audit measures relevant to KRT incidence that are reported in this chapter

The UK Kidney Association guideline	Audit criteria	Related analysis/analyses
Planning, initiating and withdrawing KRT (2014)	Proportion of patients commencing PD or HHD	Table 2.3
	Proportion of patients remaining on initial treatment modality 3 and 12 months post initiation of KRT	Tables 2.6–2.8, figures 2.6–2.7
	Percentage of patients commencing KRT referred <3 months and <12 months before date of starting KRT	Tables 2.9–2.12, figure 2.8
	Proportion of patients on UK Tx waiting list at KRT initiation	Table 2.3
	Proportion of KRT patients transplanted pre-emptively from living and deceased donors	Table 2.3, figure 2.5 (partly addressed)
	Estimated glomerular filtration rate (eGFR) at start of KRT and at time of pre-emptive Tx	Figure 2.9
	Proportion of planned initiations with established access or pre-emptive Tx	Table 2.16, figure 2.16
	Number of patients withdrawing from dialysis as a proportion of all deaths on dialysis	Table 2.21
Anaemia (2020)	Proportion of patients initiating KRT with haemoglobin <100 g/L not on erythropoiesis stimulating agent (ESA)	Table 2.13, figure 2.10-2.11 (ESA not included)
Chronic kidney disease (CKD) mineral bone disorder (2018)	Percentage of KRT patients with serum calcium above the normal reference range of 2.2–2.5 mmol/L	Table 2.14, figure 2.12
Vascular access (2015)[1]	>60% of all patients with established ESKD commencing planned HD should receive dialysis via a functioning AVF or AVG	Table 2.16, figure 2.17
Peritoneal access (2009)	>80% of catheters should be patent at 1 year (censoring for death and elective modality change)	Figure 2.7 shows the KRT modality of PD patients at 1 year

AVF – arteriovenous fistula; AVG – arteriovenous graft
[1]The UKKA published a new vascular access guideline in 2023, which we will include next year as it took effect after the data published in this report.

Key findings

- 8,254 adult patients started KRT for ESKD in the UK in 2022, with little change from the previous year.
- KRT incidence in adults was 154 pmp.
- The median age of incident KRT patients was 63.4 years, but this was dependent on ethnicity (White 65.3 years, Asian 62.1 years and Black 57.4 years).
- 64.5% of incident KRT patients were male.
- Diabetes remained the most common identifiable primary renal disease (PRD) and continues to account for an increasing proportion of patients starting KRT (29.7%).
- By 90 days after KRT start 5.7% of patients had died or stopped treatment.
- In 2022 18.8% of patients started KRT on PD, compared to 20.8% in 2021. PD rates increased during the COVID-19 pandemic but are now lower than pre-pandemic levels.
- In 2022, 6.6% of patients started KRT with a transplant, higher than previous years and potentially signalling a recovery from COVID-19-related disruption.
- The mean eGFR at the start of KRT was 6.9 mL/min/1.73m^2 (HD 6.6 mL/min/1.73m^2, PD 7.4 mL/min/1.73m^2 and pre-emptive Tx 10.1 mL/min/1.73m^2). In 2021, the mean eGFR at the start of KRT was 7.0 mL/min/1.73m^2.
- Late presentation was 18.6% which is higher than previous years for centres which have submitted data consistently.
- Of the 7,375 incident dialysis patients with dialysis access data, 47.9% started dialysis with definitive access (20.7% PD and 27.2% HD with an AVF or AVG), 32.5% with a TL and 19.6% with an NTL.
- A similar proportion of patients started haemodialysis with definitive access this year at 34.3% compared to 35.1% in 2021.
- Short-term (90 day) age-adjusted survival of incident KRT patients in a combined 2 year cohort (2020-2021) was 96.3%, which was similar to survival in the 2019-2020 cohort.
- 1 year after 90 day age-adjusted survival for incident KRT patients in a combined 2 year cohort (2020-2021) was 90.4% (unchanged from previous survival in the 2019-2020 cohort).
- There were 11 outlying centres in the funnel plot showing 1 year after 90 day case-mix-adjusted survival for incident KRT patients in a combined 4 year cohort (2018-2021): 2 centres below the lower 95% limit and 9 centres above the upper 95% limit. It is expected that 3 centres would be outside the limits by chance.
- This year for the first time, cause of death records from Civil Registration were used where the cause of death was missing in the UKRR data. This resulted in improved completeness and changes in proportions of the causes of death. The leading causes of death in the first 90 days in incident KRT patients were cardiac disease (22.0%) and infection (22.0%).

Analyses

Changes to the incident adult KRT population

For the 67 adult kidney centres, the number of incident patients on KRT was calculated as a proportion of the estimated centre catchment population (calculated as detailed in appendix A).

Table 2.2 Number of incident adult KRT patients by year and by centre; number of KRT patients as a proportion of the adult catchment population

Centre	N on KRT					Estimated catchment population (millions)	2022 crude rate (pmp)
	2018	2019	2020	2021	2022		
ENGLAND							
Bham	369	373	332	365	403	2.03	199
Bradfd	71	106	83	81	94	0.50	189
Brightn	176	153	143	131	104	1.08	96
Bristol	166	165	130	158	151	1.25	121
Camb	122	135	137	150	118	0.96	123
Carlis	33	40	34	43	36	0.26	140
Carsh	244	228	296	293	274	1.64	167
Colchr	38	40	39	38	42	0.30	141
Covnt	129	141	141	150	138	0.84	165
Derby	85	90	72	89	121	0.56	217
Donc	52	53	47	44	78	0.38	207
Dorset	106	91	88	79	95	0.73	129
Dudley	53	56	61	61	49	0.34	142
EssexMS	124	150	127	132	169	1.00	170
Exeter	132	157	105	157	134	0.98	137
Glouc	70	64	86	81	86	0.52	166
Hull	106	105	106	95	106	0.80	132
Ipswi	57	57	44	60	36	0.31	115
Kent	136	154	140	182	167	1.08	155
L Barts	344	309	324	284	293	1.61	182
L Guys	181	208	160	194	156	1.00	156
L Kings	150	186	159	219	203	0.93	219
L Rfree	244	267	233	283	249	1.33	188
L St.G	84	101	84	94	96	0.65	147
L West	392	392	364	419	384	1.97	195
Leeds	181	162	152	169	181	1.39	130
Leic	312	367	337	306	342	2.11	162
Liv UH	169	163	150	169	189	1.26	150
M RI	189	209	172	212	133	1.36	98
Middlbr	118	109	97	110	90	0.82	110
Newc	137	112	125	132	132	0.97	136
Norwch	83	105	98	99	99	0.70	141
Nottm	125	128	122	129	115	0.94	122
Oxford	216	202	202	193	220	1.48	149
Plymth	64	62	60	84	72	0.41	177
Ports	222	223	219	240	272	1.77	154
Prestn	181	156	165	197	179	1.25	143
Redng	103	115	100	109	142	0.70	202
Salford	161	172	173	143	192	1.17	165
Sheff	184	163	175	170	173	1.15	151
Shrew	77	66	45	62	52	0.42	124
Stevng	176	193	171	179	175	1.12	156
Stoke	105	101	120	135	131	0.74	178

Table 2.2 Continued

Centre	N on KRT					Estimated catchment population (millions)	2022 crude rate (pmp)
	2018	2019	2020	2021	2022		
Sund	89	88	68	72	78	0.55	141
Truro	61	55	45	70	66	0.37	181
Wirral	62	64	48	54	33	0.47	70
Wolve	94	94	110	129	115	0.55	209
York	51	58	47	50	75	0.50	151
N IRELAND							
Antrim	58	42	29	39	31	0.25	126
Belfast	73	74	78	102	91	0.53	170
Newry	32	30	31	40	22	0.24	93
Ulster	32	28	28	25	25	0.20	122
West NI	41	39	38	34	32	0.25	127
SCOTLAND							
Abrdn	58	29	56	54	50	0.50	101
Airdrie	64	70	56	65	59	0.46	129
D&Gall	18	17	19	13	20	0.12	164
Dundee	36	27	27	37	29	0.37	79
Edinb	105	108	88	91	114	0.84	135
Glasgw	210	204	180	209	210	1.37	154
Inverns	37	18	18	35	23	0.23	102
Klmarnk	38	44	57	39	47	0.29	162
Krkcldy	38	45	36	43	37	0.27	135
WALES							
Bangor	25	19	29	18	23	0.20	113
Cardff	188	165	136	155	191	1.17	163
Clwyd	32	28	26	30	36	0.18	198
Swanse	140	159	122	126	144	0.76	189
Wrexm	29	32	38	26	32	0.21	154
TOTALS							
England	6,824	6,988	6,536	7,095	7,038	45.20	156
N Ireland	236	213	204	240	201	1.47	136
Scotland	604	562	537	586	589	4.44	133
Wales	414	403	351	355	426	2.53	169
UK	**8,078**	**8,166**	**7,628**	**8,276**	**8,254**	**53.65**	**154**

Country KRT populations were calculated by summing the KRT patients from centres in each country. Estimated country populations were derived from Office for National Statistics figures (see appendix A for details on estimated catchment population by kidney centre)
Exeter was unable to submit 2021 and 2022 patient level data. Aggregate numbers for those 2 years were submitted by the unit.
pmp – per million population
Manchester was unable to submit data for the last quarter of 2022 and no correction has been applied so their incident numbers are much smaller for 2022 compared to previous years

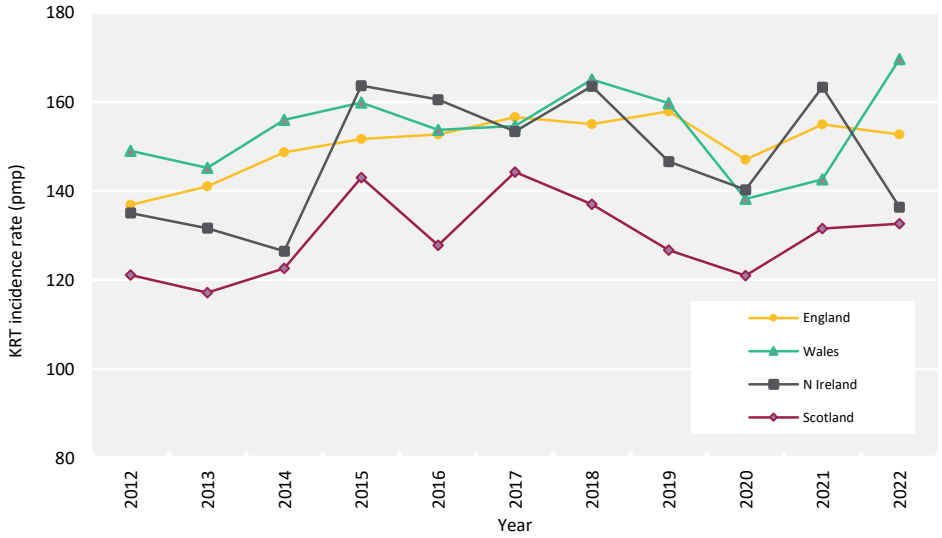

Figure 2.2 Adult KRT incidence rates by country between 2012 and 2022
pmp – per million population

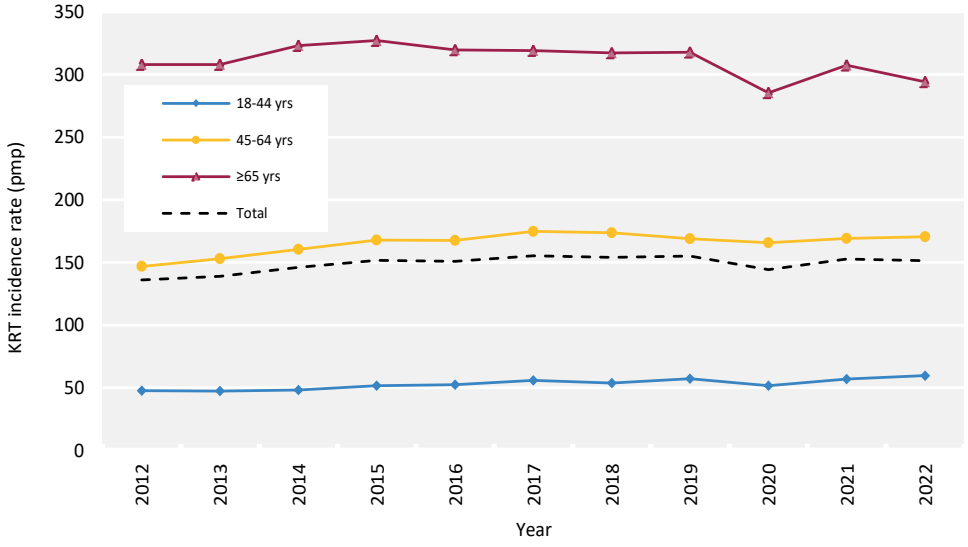

Figure 2.3 Adult KRT incidence rates by age group between 2012 and 2022
pmp – per million population

Demographics and start modality of incident adult KRT patients

The proportion of KRT patients from each ethnic group is shown for patients with ethnicity data – the proportion of centre patients with no ethnicity data is shown separately.

Table 2.3 Demographics and start modality of adult patients incident to KRT in 2022 by centre

Centre	N on KRT	% on ICHD	% on PD	% on HHD	% on Tx	% pre-emptive listing/Tx	Median age (yrs)	% male	Ethnicity				
									% White	% Asian	% Black	% Other	% missing
ENGLAND													
Bham	403	75.4	22.1	0.3	2.2	13.9	64.7	66.0	52.7	30.5	13.9	2.9	7.2
Bradfd	94	80.9	13.8	0.0	5.3	16.0	58.7	56.4	52.1	46.8	1.1	0.0	0.0
Brightn	104	78.9	17.3	0.0	3.9	15.4	65.2	63.5	93.8	4.2	2.1	0.0	7.7
Bristol	151	78.8	15.9	0.0	5.3	19.2	60.1	72.2	83.8	3.7	9.6	2.9	9.9
Camb	118	71.2	7.6	0.0	21.2	25.4	65.6	66.9	94.3	3.8	1.0	1.0	11.0
Carlis	36	72.2	22.2	0.0	5.6	16.7	62.4	58.3	97.2	0.0	2.8	0.0	0.0
Carsh	274	81.4	16.1	0.4	2.2	7.3	67.7	66.8	69.4	16.3	9.0	5.3	10.6
Colchr	42	100.0	0.0	0.0	0.0	7.1	67.3	69.0	100.0	0.0	0.0	0.0	14.3
Covnt	138	68.1	25.4	0.7	5.8	17.4	68.6	70.3	77.2	14.0	8.8	0.0	1.4
Derby	121	81.0	17.4	0.0	1.7	15.7	65.2	66.9	86.4	9.7	3.9	0.0	14.9
Donc	78	89.7	10.3	0.0	0.0	7.7	65.7	73.1	89.3	4.0	5.3	1.3	3.8
Dorset	95	87.4	9.5	0.0	3.2	13.7	66.6	74.7	92.6	4.2	1.1	2.1	0.0
Dudley	49	93.9	6.1	0.0	0.0	8.2	70.8	67.3	73.5	22.4	4.1	0.0	0.0
EssexMS	169	76.3	20.1	0.0	3.6	13.0	66.7	62.1	87.2	6.7	4.7	1.3	11.8
Exeter	134	77.6	14.9	5.2	2.2								
Glouc	86	77.9	12.8	0.0	9.3	24.4	66.4	72.1	90.5	3.6	3.6	2.4	2.3
Hull	106	74.5	22.6	0.0	2.8	7.5	64.7	76.4	97.1	0.0	1.0	1.9	0.9
Ipswi	36	100.0	0.0	0.0	0.0	8.3	70.6	75.0	85.3	2.9	2.9	8.8	5.6
Kent	167	73.7	22.8	0.0	3.6	10.2	65.5	65.9	93.1	5.6	0.6	0.6	4.2
L Barts	293	67.9	25.3	0.0	6.8	15.7	58.3	63.5	31.4	37.5	23.4	7.7	10.9
L Guys	156	80.1	10.3	0.0	9.6	20.5	59.7	62.8	50.8	11.1	31.7	6.3	19.2
L Kings	203	78.3	17.7	0.0	3.9	11.3	60.2	61.6	42.3	14.4	38.7	4.6	4.4
L Rfree	249	67.5	24.1	0.0	8.4	25.7	62.6	63.5	48.8	18.2	17.7	15.3	16.1
L St.G	96	71.9	27.1	0.0	1.0	12.5	63.5	63.5	27.3	28.4	30.7	13.6	8.3
L West	384	71.9	22.1	0.0	6.0	18.2	63.2	64.6	33.9	39.2	15.1	11.7	0.3
Leeds	181	77.9	9.4	1.1	11.6	28.7	57.9	66.3	70.4	19.6	5.6	4.5	1.1
Leic	342	74.6	18.4	0.0	7.0	14.3	63.3	65.8	69.5	21.2	5.5	3.8	14.6
Liv UH	189	70.4	18.0	3.7	7.9	17.5	62.7	64.6	89.5	4.9	1.9	3.7	14.3
M RI	133	64.7	25.6	0.8	9.0	18.8	57.3	66.2					58.6
Middlbr	90	80.0	11.1	0.0	8.9	21.1	62.0	71.1	90.4	9.6	0.0	0.0	7.8
Newc	132	72.0	12.1	0.0	15.9	26.5	58.1	54.5	93.2	6.1	0.8	0.0	0.0
Norwch	99	84.9	15.2	0.0	0.0	3.0	71.7	75.8	94.7	2.6	1.3	1.3	23.2
Nottm	115	64.4	29.6	0.0	6.1	17.4	63.5	54.8	80.0	8.6	7.6	3.8	8.7
Oxford	220	64.1	23.2	0.0	12.7	30.0	63.3	61.4					32.3
Plymth	72	61.1	30.6	0.0	8.3	25.0	67.0	55.6	94.4	4.2	0.0	1.4	1.4
Ports	272	73.2	21.3	0.7	4.8	19.1	64.1	59.9					41.2
Prestn	179	71.5	14.0	1.1	13.4	31.8	63.7	58.1	82.6	15.1	0.6	1.7	3.9
Redng	142	72.5	19.0	2.8	5.6	17.6	64.4	65.5	58.7	24.8	3.7	12.8	23.2
Salford	192	71.4	17.7	0.0	10.9	28.6	62.3	72.4	72.3	17.3	5.2	5.2	0.5
Sheff	173	83.2	15.0	0.0	1.7	13.9	63.9	61.3	79.1	10.4	5.5	4.9	5.8
Shrew	52	53.9	44.2	0.0	1.9	15.4	64.9	69.2	93.9	2.0	2.0	2.0	5.8
Stevng	175	75.4	18.3	1.1	5.1	9.7	65.1	64.0	66.0	23.1	7.7	3.2	10.9
Stoke	131	64.9	31.3	1.5	2.3	13.7	65.1	61.1	88.7	4.8	2.4	4.0	5.3
Sund	78	80.8	18.0	0.0	1.3	10.3	68.7	67.9	93.6	3.8	1.3	1.3	0.0
Truro	66	87.9	10.6	0.0	1.5	9.1	68.6	69.7	95.5	3.0	1.5	0.0	0.0
Wirral	33	81.8	15.2	0.0	3.0	9.1	61.8	69.7	97.0	3.0	0.0	0.0	0.0
Wolve	115	76.5	18.3	4.4	0.9	9.6	65.1	73.0	57.9	23.7	7.9	10.5	0.9

Table 2.3 Continued

Centre	N on KRT	% on ICHD	% on PD	% on HHD	% on Tx	% pre-emptive listing/Tx	Median age (yrs)	% male	Ethnicity				
									% White	% Asian	% Black	% Other	% missing
York	75	69.3	21.3	0.0	9.3	26.7	63.8	73.3	95.7	2.9	0.0	1.4	8.0
N IRELAND													
Antrim	31	64.5	25.8	0.0	9.7	19.4	67.9	64.5					74.2
Belfast	91	42.9	18.7	0.0	38.5	50.5	60.0	71.4					42.9
Newry	22	72.7	13.6	0.0	13.6	22.7	67.8	59.1	100.0	0.0	0.0	0.0	27.3
Ulster	25	84.0	12.0	0.0	4.0	16.0	71.6	72.0	90.9	9.1	0.0	0.0	12.0
West NI	32	71.9	12.5	0.0	15.6	28.1	57.8	37.5	92.9	7.1	0.0	0.0	12.5
SCOTLAND													
Abrdn	50	74.0	26.0	0.0	0.0	22.0	59.1	50.0					
Airdrie	59	83.1	17.0	0.0	0.0	0.0	63.2	49.2					
D&Gall	20	65.0	35.0	0.0	0.0	0.0	63.8	60.0					
Dundee	29	69.0	31.0	0.0	0.0	0.0	65.9	51.7					
Edinb	114	60.5	15.8	0.0	23.7	34.2	57.7	60.5					
Glasgw	210	75.7	11.9	0.0	12.4	30.0	61.8	55.2					
Inverns	23	69.6	30.4	0.0	0.0	0.0	67.0	65.2					
Klmarnk	47	85.1	14.9	0.0	0.0	0.0	64.7	78.7					
Krkcldy	37	86.5	10.8	2.7	0.0	0.0	62.5	62.2					
WALES													
Bangor	23	78.3	21.7	0.0	0.0	4.3	66.3	65.2					39.1
Cardff	191	77.5	16.8	0.5	5.2	16.8	62.4	65.4	88.5	8.1	3.4	0.0	22.5
Clwyd	36	69.4	30.6	0.0	0.0	2.8	63.5	58.3	96.6	0.0	0.0	3.4	19.4
Swanse	144	77.8	17.4	0.0	4.9	9.0	65.4	59.0	96.4	2.2	1.5	0.0	4.9
Wrexm	32	62.5	31.3	0.0	6.3	15.6	62.9	50.0	100.0	0.0	0.0	0.0	25.0
TOTALS													
England	7,038	74.6	18.9	0.5	6.0	17.1	63.5	65.2	70.9	15.9	8.8	4.4	10.8
N Ireland	201	59.2	17.4	0.0	23.4	34.8	63.6	63.7					37.3
Scotland	589	73.9	17.0	0.2	9.0	24.3	61.7	57.9					
Wales	426	75.8	19.5	0.2	4.5	12.2	63.3	61.5	93.5	4.3	2.0	0.3	17.4
UK	**8,254**	**74.2**	**18.8**	**0.4**	**6.6**	**17.8**	**63.4**	**64.5**	**72.5**	**15.1**	**8.3**	**4.1**	**11.8**

Blank cells - no data retuned by the centre or data completeness <70%
Breakdown by ethnicity is not shown for centres with <70% data completeness, but these centres were included in national averages
Exeter was unable to submit 2022 patient level data, aggregate numbers by modality were submitted and included in this table
Manchester was unable to submit data for the last quarter of 2022 and no correction has been applied so their incident numbers are much smaller for 2022 compared to previous years.
UK ethnicity distribution and completeness does not include Scotland
Pre-emptive transplanted patients in Scotland were all allocated to the 2 transplanting centres, as the information on referring centre was not available. From next year these patients will be allocated to the expected referring centre based on patient postcode, in accordance with the Scottish Renal Registry Annual Report https://www.srr.scot.nhs.uk/

Table 2.4 Demographics, primary renal diseases (PRDs), referral time and start modality of adult patients incident to KRT in 2022 by age group

Characteristic	Age group (yrs)							Total	Median age (yrs)
	18-34	35-44	45-54	55-64	65-74	75-84	≥85		
Total									
N	619	786	1,218	1,750	2,006	1,512	229	8,120	63.4
%	7.6	9.7	15.0	21.6	24.7	18.6	2.8		
Sex (%)									
Male	61.1	63.2	61.6	63.6	64.3	69.5	68.6	64.5	64.0
Female	38.9	36.8	38.4	36.4	35.7	30.5	31.4	35.5	62.1
Ethnicity (%)									
White	67.7	63.4	66.0	69.1	75.3	82.9	83.0	72.5	65.3
Asian	17.3	18.4	17.6	13.9	16.3	10.8	11.5	15.1	62.1
Black	10.2	11.8	11.1	12.8	5.2	3.4	3.0	8.3	57.4
Other	4.9	6.4	5.3	4.3	3.2	2.9	2.5	4.1	58.5
Missing	13.5	13.1	11.7	10.5	11.6	12.6	11.1	11.8	63.5
PRD (%)									
Diabetes	20.3	21.8	29.5	36.6	33.1	26.4	21.2	29.7	63.4
Glomerulonephritis	24.8	23.8	13.6	11.5	9.1	8.4	6.2	12.8	55.0
Hypertension	5.5	7.7	10.1	6.2	6.6	8.3	9.8	7.5	62.9
Polycystic kidney disease	3.8	9.6	11.6	8.9	4.6	3.5	2.1	6.8	56.3
Pyelonephritis	7.0	5.2	4.6	3.9	5.8	5.5	7.8	5.2	65.1
Renal vascular disease	0.9	1.2	1.7	3.0	5.3	9.3	9.3	4.3	74.0
Other	23.9	18.1	16.8	16.9	20.4	18.5	13.5	18.6	63.8
Uncertain aetiology	13.9	12.6	12.1	12.9	15.1	20.0	30.1	15.1	67.4
Missing	14.1	12.3	12.2	14.3	16.5	16.2	15.7	14.7	65.5
Referral time (%)									
<90 days	26.5	24.1	17.8	17.9	18.2	17.4	17.0	19.1	61.5
≥90 days	73.5	75.9	82.2	82.1	81.8	82.6	83.0	80.9	63.9
Missing	3.2	3.0	2.0	2.3	3.0	3.1	3.1	2.7	65.7
Start modality (%)									
ICHD	59.6	61.8	69.8	75.7	78.4	81.0	86.5	74.2	64.9
HHD	0.2	0.5	1.1	0.3	0.0	0.5	0.0	0.4	53.5
PD	25.2	24.8	19.9	17.8	16.8	16.9	13.5	18.8	60.6
Tx	15.0	12.8	9.2	6.3	4.8	1.7	0.0	6.6	51.9

Scotland was excluded from analysis of ethnicity and referral time as these two data items are not available from the Scottish Renal Registry

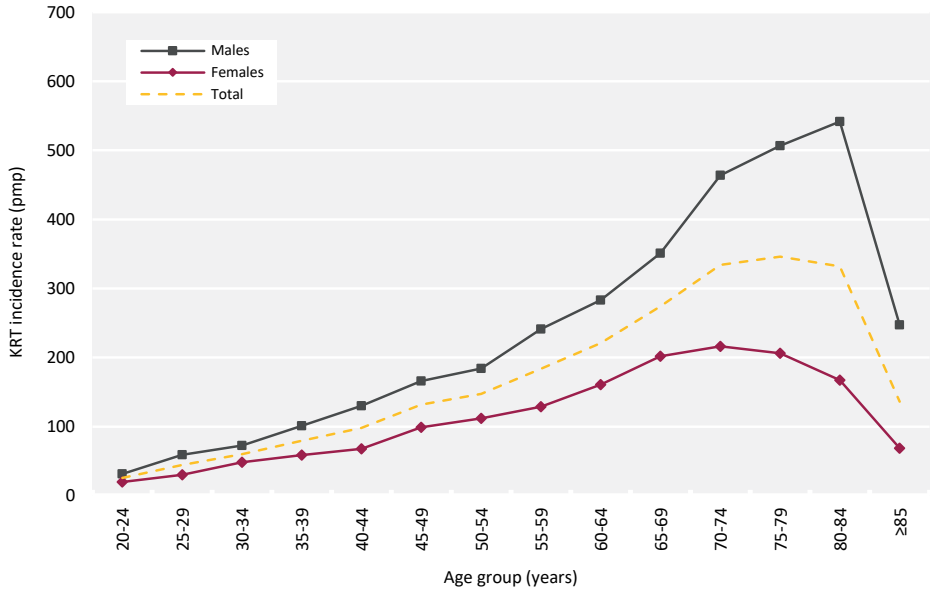

Figure 2.4 Incidence rates for adult patients starting KRT in 2022 by age group and sex
pmp – per million population

Table 2.5 Change in primary renal disease (PRD) of adult patients incident to KRT from 2013 to 2022

	Year of KRT start									
PRD	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Diabetes	25.5	26.5	27.0	27.6	28.7	29.8	30.7	30.6	31.2	29.7
Glomerulonephritis	14.5	13.1	13.5	13.4	13.7	13.0	13.2	12.4	13.3	12.8
Hypertension	7.7	6.5	6.7	6.3	6.5	6.8	7.6	7.2	7.0	7.5
Polycystic kidney disease	7.6	6.6	7.2	6.8	6.8	7.0	6.9	6.7	6.3	6.8
Pyelonephritis	6.6	5.8	6.3	6.2	5.7	5.1	5.4	5.4	4.8	5.2
Renal vascular disease	5.4	6.2	5.9	6.2	5.7	5.6	5.4	4.9	4.5	4.3
Other	18.5	20.0	18.8	18.7	18.6	18.8	16.8	18.2	17.6	18.6
Uncertain aetiology	14.3	15.3	14.6	14.9	14.3	13.9	14.0	14.6	15.4	15.1
Missing	3.1	1.7	2.6	3.2	5.3	4.2	6.2	8.4	11.4	14.7

The percentages in each PRD category add up to 100% in each year; the percentages with missing PRD data are shown separately

The audit of pre-emptive listing and pre-emptive transplantation was merged as a single metric. Figure 2.5 shows the percentage of patients at each centre who were either pre-emptively listed or pre-emptively transplanted on day one of their KRT treatment in 2022. Please visit the UKRR data portal (ukkidney.org/audit-research/data-portals) to identify individual kidney centres.

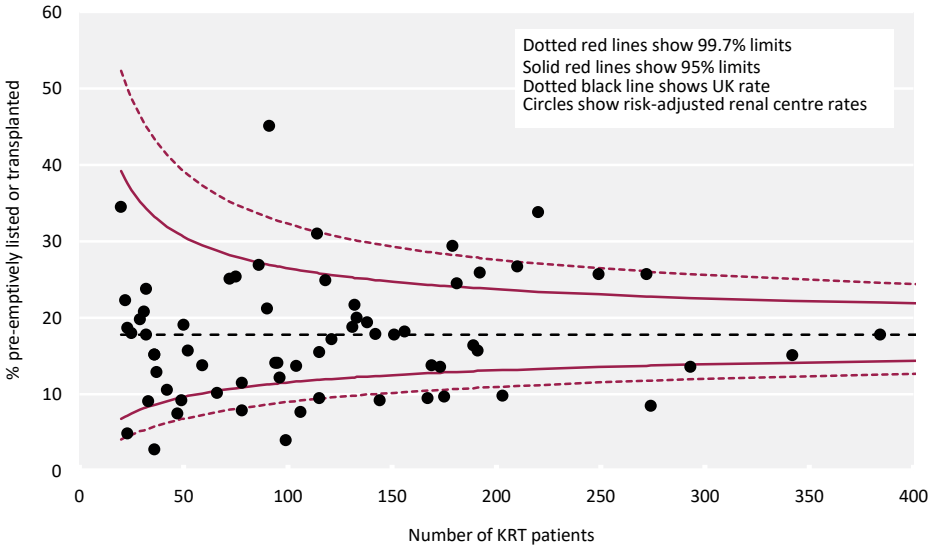

Figure 2.5 Transplant-status (listed or transplanted) at the start of KRT for adult patients incident to KRT in 2022 by centre
Analysis is adjusted for age, sex and PRD (diabetes versus non-diabetes)

Modality changes of incident adult KRT patients

Many patients start on HD, but then switch to other modalities, so the modality in use at 90 days may be more representative of the first elective modality. The analysis of the proportion of patients by treatment modality at three months post-KRT initiation is shown over time (table 2.6) and by UK country (table 2.7). Changes from start modality and deaths during the first five years are shown by start modality (table 2.8). Due to small numbers, the percentage of incident patients on HHD and ICHD at start and 90 days after start of KRT is shown at a UK level (table 2.6), but all HD patients are combined for other analyses.

Table 2.6 KRT modality at start and 90 days after start of KRT for incident adult KRT patients by year of start

KRT start year	% on ICHD	% on HHD	% on PD	% with Tx
Day 0 modality				
2017	71.5	0.4	19.1	9.0
2018	71.7	0.4	19.6	8.3
2019	71.0	0.4	20.2	8.4
2020	71.9	0.4	21.8	5.9
2021	72.8	0.6	20.8	5.8
2022	74.2	0.4	18.8	6.6
Day 90 modality				
Oct 2016 - Sept 2017	68.5	0.8	20.0	10.7
Oct 2017 - Sept 2018	69.1	1.0	19.8	10.2
Oct 2018 - Sept 2019	68.3	1.0	20.8	9.9
Oct 2019 - Sept 2020	69.8	1.0	21.5	7.7
Oct 2020 - Sept 2021	70.5	1.1	21.3	7.1
Oct 2021 - Sept 2022	71.6	0.9	19.9	7.7

For 90 day analyses, the incident cohort from the 12 months starting 1 October of the previous year was used, so that follow-up to 90 days was possible for all patients

Table 2.7 KRT modality at 90 days for adult patients incident to KRT between 01/10/2021 and 30/09/2022 by country

		Patients who started RRT					Patients still on RRT at 90 days		
Country	N	% on HD[1]	% on PD	% with Tx	% discontinued[2]	% died	% on HD[1]	% on PD	% with Tx
England	6,920	68.3	19.2	6.7	1.2	4.7	72.5	20.4	7.1
N Ireland	199	55.8	17.1	22.1	2.5	2.5	58.7	18.0	23.3
Scotland	582	71.5	16.2	8.9	0.3	3.1	74.0	16.7	9.3
Wales	414	71.3	16.7	6.5	1.4	4.1	75.5	17.7	6.9
UK	**8,115**	**68.3**	**18.8**	**7.2**	**1.2**	**4.5**	**72.4**	**19.9**	**7.7**

[1]HD includes ICHD and HHD

[2]Discontinued did not include patients who recovered function within 90 days, because by definition they were not included in the incident cohort

Table 2.8 Start and subsequent KRT modalities for adult patients incident to KRT in 2017 by time after start

			Time after start (%)			
Start modality	N	Later modality	90 days	1 yr	3 yrs	5 yrs
HD	5,811	HD	90.4	73.0	44.4	25.9
		PD	2.6	3.0	1.2	0.4
		Tx	1.3	6.1	15.1	17.9
		Other	0.9	2.1	2.6	2.5
		Died	4.8	15.8	36.7	53.3
PD	1,549	HD	6.1	17.4	20.3	14.1
		PD	88.4	58.9	18.7	6.0
		Tx	3.0	15.4	34.4	38.4
		Other	0.8	0.7	1.0	1.2
		Died	1.7	7.6	25.6	40.3
Tx	731	HD	0.3	1.1	1.8	2.2
		PD	0.1	0.1	0.4	0.1
		Tx	98.8	96.9	92.8	87.7
		Other	0.4	1.2	1.5	1.8
		Died	0.4	0.7	3.6	8.2

Shading indicates proportion of individuals maintained on their initial modality
HD included ICHD and HHD
Other is discontinued, recovered, moved away or currently transferring between centres

The modality at one year after KRT initiation is shown in figure 2.6 for all KRT starters and in figure 2.7 for those starting on PD by centre, using incident patients starting KRT in 2021 to allow one year follow-up time.

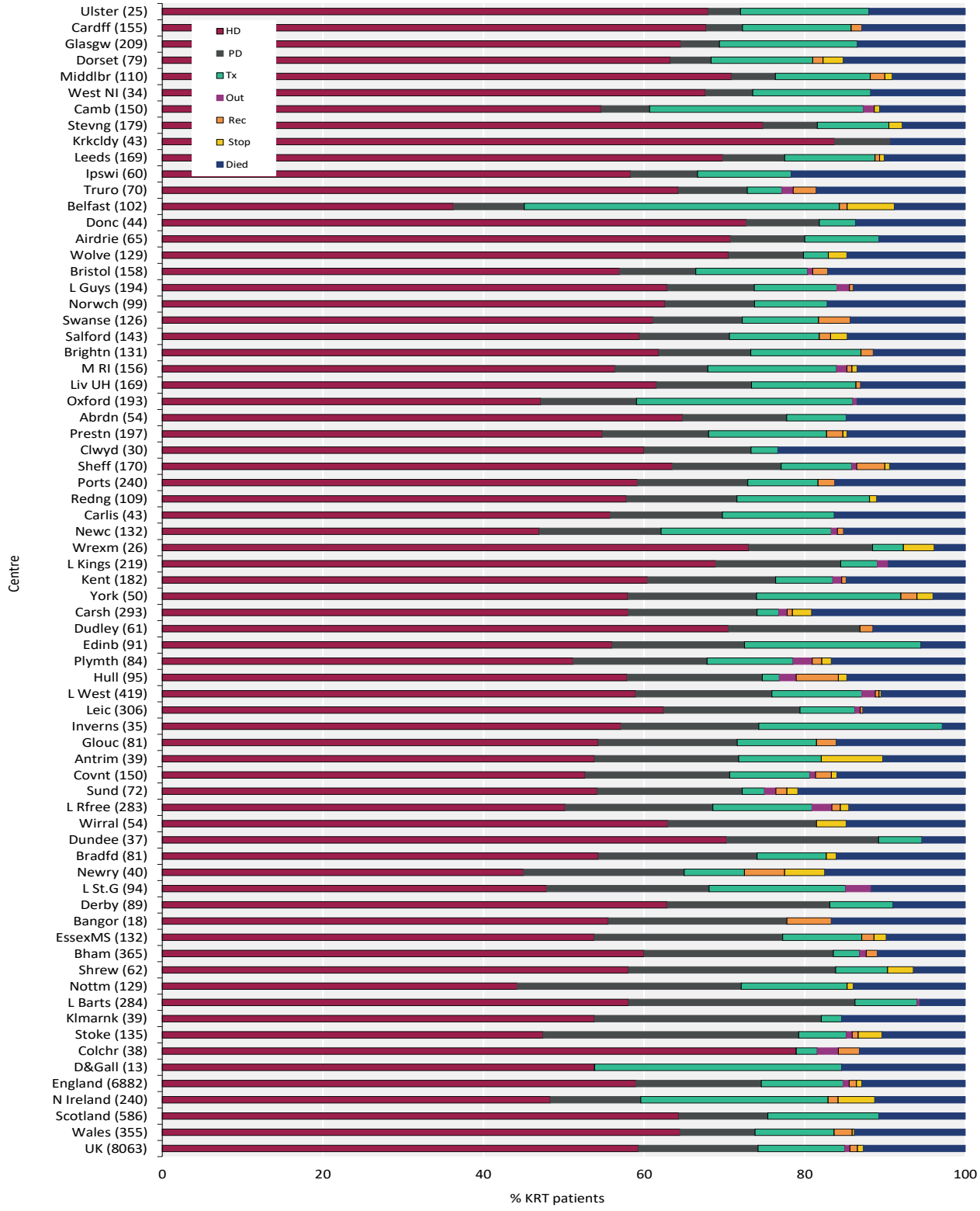

Figure 2.6 KRT modality at 1 year for incident adult KRT patients who started KRT in 2021 by centre

Number of patients in a centre in brackets

Out – moved out of a centre but did not reappear in another centre; Rec – recovered kidney function; Stop – treatment withdrawal

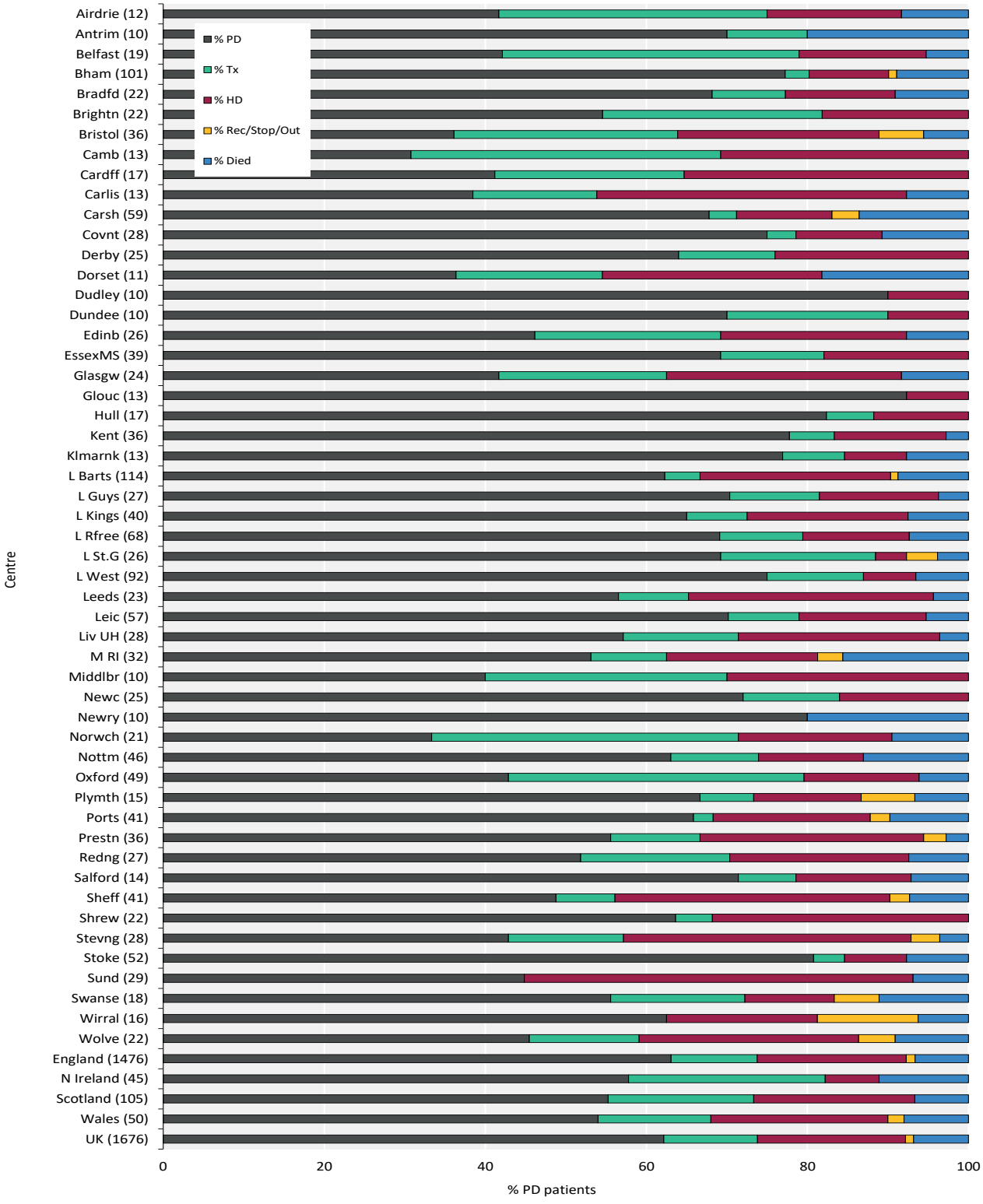

Figure 2.7 KRT modality at 1 year for incident adult PD patients who started KRT in 2021 by centre

Number of patients in a centre in brackets

Out – moved out of a centre but did not reappear in another centre; Rec – recovered kidney function; Stop – treatment withdrawal

Late presentation to nephrology services of incident adult KRT patients

Late presentation to a nephrologist is defined as a patient being seen by the kidney service for the first time within 90 days of starting KRT and is used interchangeably with referral time in this report. Due to small numbers, a two year cohort (2021-2022) was used at a centre level to estimate late referral to a nephrologist and centres with a completeness of <70% were excluded. A seven year cohort was used to show national longitudinal trends (table 2.12).

Table 2.9 Referral times of incident adult KRT patients by centre (2021-2022 2 year cohort)

	N on KRT		N with referral data	% data completeness		% presenting <90 days before KRT start		% presenting <1 yr before KRT start
Centre	2021	2022		2021	2022	All PRDs	Non-diabetes PRDs	All PRDs
ENGLAND								
Bham	365	403	765	99.2	100.0	20.0	23.9	32.5
Bradfd	81	94	175	100.0	100.0	14.3	20.3	22.9
Brightn	131	104	235	100.0	100.0	17.4	19.8	26.4
Bristol	158	151	297	98.1	94.0	17.8	20.0	26.9
Camb	150	118	267	99.3	100.0	21.0	20.8	37.1
Carlis	43	36	79	100.0	100.0	15.2	20.0	24.1
Carsh	293	274	559	97.3	100.0	22.9	20.6	37.0
Colchr	38	42		15.8	2.4			
Covnt	150	138	286	99.3	99.3	16.8	22.8	30.1
Derby	89	121	210	100.0	100.0	19.5	24.6	28.1
Donc	44	78	119	97.7	97.4	10.9	11.8	19.3
Dorset	79	95	173	100.0	98.9	20.8	22.8	32.4
Dudley	61	49	110	100.0	100.0	18.2	19.0	29.1
EssexMS	132	169	282	91.7	95.3	23.4	26.6	39.4
Exeter								
Glouc	81	86	156	96.3	90.7	20.5	20.0	26.3
Hull	95	106	201	100.0	100.0	25.9	28.7	42.3
Ipswi	60	36	45	75.0	36.1	15.6		37.8
Kent	182	167	349	100.0	100.0	11.7	14.7	16.6
L Barts	284	293	565	98.6	97.3	32.2	35.2	44.8
L Guys	194	156	329	94.8	92.9	16.7	16.7	33.4
L Kings	219	203	411	97.3	97.5	20.2	25.0	28.2
L Rfree	283	249	525	97.5	100.0	17.3	18.0	29.9
L St.G	94	96	190	100.0	100.0	22.1	27.2	42.6
L West	419	384	800	99.5	99.7	21.0	26.7	37.5
Leeds	169	181	350	100.0	100.0	12.6	14.5	23.1
Leic	306	342	646	99.7	99.7	19.7	17.3	30.2
Liv UH	169	189	358	100.0	100.0	18.7	23.0	29.6
M RI	212	133	305	84.9	94.0	26.2		34.8
Middlbr	110	90	195	97.3	97.8	18.5	22.1	32.3
Newc	132	132	264	100.0	100.0	16.3	20.9	25.4
Norwch	99	99	93	45.5	93.9	36.6		57.0
Nottm	129	115	243	99.2	100.0	14.4	19.2	25.9
Oxford	193	220	413	100.0	100.0	14.0		27.1
Plymth	84	72	156	100.0	100.0	26.9	31.0	40.4
Ports	240	272	483	93.8	94.9	14.7		27.7
Prestn	197	179	370	97.0	100.0	15.4	16.7	30.5
Redng	109	142	251	100.0	100.0	15.9	18.2	27.5
Salford	143	192	334	99.3	100.0	14.1	17.7	23.1
Sheff	170	173	342	100.0	99.4	17.8	20.2	28.4
Shrew	62	52	112	98.4	98.1	10.7	13.3	25.0
Stevng	179	175	351	98.3	100.0	19.9	26.5	29.9

Table 2.9 Continued

Centre	N on KRT 2021	N on KRT 2022	N with referral data	% data completeness 2021	% data completeness 2022	% presenting <90 days before KRT start: All PRDs	% presenting <90 days before KRT start: Non-diabetes PRDs	% presenting <1 yr before KRT start: All PRDs
Stoke	135	131	119	58.5	90.8	36.1		47.1
Sund	72	78	149	98.6	100.0	16.1	18.8	31.5
Truro	70	66	136	100.0	100.0	13.2	18.7	22.8
Wirral	54	33	87	100.0	100.0	9.2	14.0	23.0
Wolve	129	115	238	98.4	96.5	22.7	25.6	28.6
York	50	75	125	100.0	100.0	18.4	24.2	28.0
N IRELAND								
Antrim	39	31	68	100.0	93.5	16.2	13.2	26.5
Belfast	102	91	164	93.1	75.8	18.9	16.7	28.0
Newry	40	22	55	95.0	77.3	23.6	17.6	34.5
Ulster	25	25	50	100.0	100.0	24.0	30.6	30.0
West NI	34	32	65	100.0	96.9	21.5	26.5	27.7
WALES								
Bangor	18	23	40	100.0	95.7	12.5	16.0	27.5
Cardff	155	191	344	98.7	100.0	12.2	12.4	20.9
Clwyd	30	36	65	100.0	97.2	12.3	12.2	20.0
Swanse	126	144	270	100.0	100.0	12.6	15.8	23.7
Wrexm	26	32	49	92.3	78.1	20.4	38.9	36.7
TOTALS								
England	6,938	6,904	13,392	95.9	97.6	19.2	21.5	31.2
N Ireland	240	201	402	96.3	85.1	20.1	19.6	28.9
Wales	355	426	768	98.9	97.9	12.9	14.8	23.2
E, W & NI	**7,533**	**7,531**	**14,562**	**96.1**	**97.3**	**18.9**	**21.0**	**30.7**

Blank cells – no data returned by the centre or data completeness <70%
If a centre had low referral completeness (<70%) for 1 of the 2 years, only a 1 year cohort was included in the analysis
For the analysis of late referral in people without diabetes, patients with missing PRD were excluded from the analysis and the results not shown if the completeness of PRD was <70%
PRD – primary renal disease

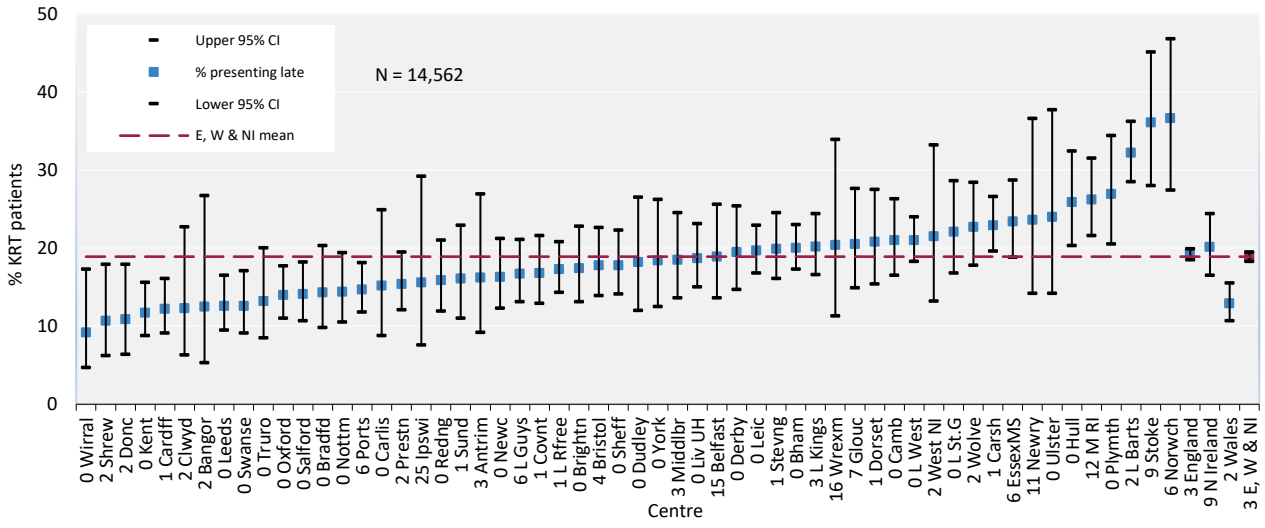

Figure 2.8 Percentage of incident adult KRT patients presenting late (<90 days) to a nephrologist (2021-2022 2 year cohort)

CI – confidence interval

If a centre had low referral completeness (<70%) for 1 of the 2 years, only a 1 year cohort was included in the analysis

Table 2.10 Characteristics of incident adult KRT patients by referral time (2021-2022 2 year cohort)

	Referral time	
Characteristic	<90 days	≥90 days
Median age (yrs)	61.6	64.0
% male	67.7	63.6
% starting on PD	10.6	22.5
% on PD at 90 days	12.9	22.7
Mean haemoglobin at KRT start (g/L)	94	100
Mean eGFR at KRT start (mL/min/1.73m2)[1]	6.0	7.1

[1]Data available for approximately 38% of patients. Geometric mean reported.

eGFR – estimated glomerular filtration rate

Late presentation is shown by PRDs, which were grouped into categories as shown in table 2.11, with the mapping of disease codes into groups explained in more detail in appendix A. The proportion of patients with each PRD presenting late is shown for patients with PRD data. The proportion of patients with no PRD data is shown on a separate line.

Table 2.11 Referral time of incident adult KRT patients by primary renal disease (PRD) (2021-2022 2 year cohort)

		Referral time			
		<90 days		≥90 days	
PRD	N with data	N	%	N	%
Diabetes	3,929	401	10.2	3,528	89.8
Glomerulonephritis	1,664	219	13.2	1,445	86.8
Hypertension	952	174	18.3	778	81.7
Polycystic kidney disease	829	41	4.9	788	95.1
Pyelonephritis	626	103	16.5	523	83.5
Renal vascular disease	542	78	14.4	464	85.6
Other	2,343	856	36.5	1,487	63.5
Uncertain aetiology	1,958	405	20.7	1,553	79.3
Total (with data)	**12,843**	**2,277**	**17.7**	**10,566**	**82.3**
Missing	1,719	472	27.5	1,247	72.5

Table 2.12 Referral time of incident adult KRT patients by year of start (restricted to centres reporting continuous data for 2016-2022)

	KRT start year (%)						
Referral time	2016	2017	2018	2019	2020	2021	2022
<90 days	15.8	16.8	15.6	15.9	16.1	18.5	18.6
3-6 mths	4.8	4.8	4.5	4.2	3.8	4.5	4.7
6-12 mths	8.2	7.0	7.5	7.8	7.6	6.7	7.5
≥12 mths	71.3	71.5	72.5	72.1	72.5	70.3	69.2

Start estimated glomerular filtration rate in incident adult KRT patients

Start eGFR was calculated using the CKD Epidemiology Collaboration method for incident KRT patients by age group and by start modality. Care needs to be taken in interpreting these data because (i) start eGFR data completeness is poor (38% overall), (ii) if the date of KRT start is incorrect, the documented start eGFR may have been taken after the patient had started KRT.

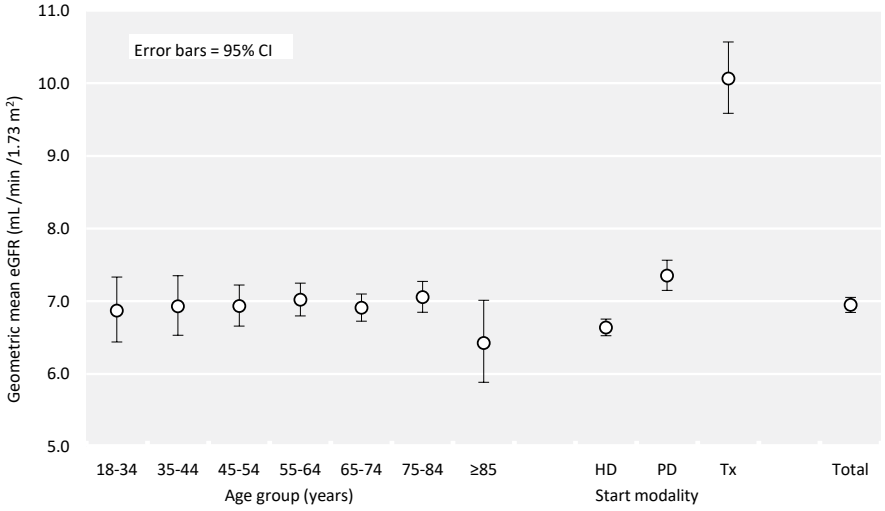

Figure 2.9 Geometric mean estimated glomerular filtration rates (eGFR) for adult patients incident to KRT in 2022 by age group and start modality

CI – confidence interval

Anaemia in incident adult KRT patients

The analyses of haemoglobin by modality and timing of presentation used haemoglobin measurements from after the start of KRT but still within the same quarter.

Table 2.13 Haemoglobin (Hb) data for adult patients incident to KRT in 2022 by centre

	All KRT patients		Median Hb (g/L) by modality			Median Hb (g/L) by presentation time		
Centre	Median Hb (g/L)	% Hb ≥100 g/L	Tx	PD	HD	≥90 days	<90 days	% data completeness
ENGLAND								
Bham	97	43.1	122	106	94	98	92	96.8
Bradfd	98	45.4			96	99	96	91.5
Brightn	98	46.1		116	96	101	93	98.1
Bristol	104	74.3	117	106	103	104	101	98.0
Camb	101	56.8	112		98	105	93	80.5
Carlis	95	38.9			90	98		100.0
Carsh	96	40.7		101	94	97	89	98.5
Colchr								61.9
Covnt	99	47.7		109	94	99	97	92.8
Derby	99	49.6		106	98	102	92	98.4
Donc	94	33.3			93	95	85	100.0
Dorset	101	52.6			100	103	87	100.0
Dudley	98	43.8			96	98		98.0
EssexMS	94	40.1		108	89	100	83	95.9
Exeter								
Glouc	101	54.1		109	99	102	91	98.8
Hull	98	44.3		101	95	98	88	91.5
Ipswi	95	36.1			95			100.0
Kent	100	50.9		111	96	101	89	97.6
L Barts	94	37.5	99	102	89	94	94	95.6
L Guys	93	34.8	106	97	92	95	87	99.4
L Kings	96	41.2		103	91	94	99	89.7
L Rfree	99	49.8	111	106	96	100	95	99.2
L St.G	92	30.9		100	88	91	93	97.9
L West	102	56.6	105	101	101	102	101	75.5
Leeds	92	30.9	108	108	89	93	89	96.7
Leic	96	42.5	121	107	94	98	95	93.6
Liv UH	97	45.4	110	107	93	99	92	96.8
M RI	94	37.8	105	100	91	95	89	95.5
Middlbr	96	43.2		114	92	97	92	97.8
Newc	99	48.8	101	107	95	100	91	97.7
Norwch	96	39.3		113	93	102	90	84.9
Nottm	91	27.0		99	87	92	84	100.0
Oxford	95	43.7	103	107	92	99	88	97.7
Plymth	100	50.0		111	93	101	93	100.0
Ports	100	50.4	117	110	97	101	93	100.0
Prestn	95	40.9	99	109	91	95	93	95.5
Redng	90	31.9		106	87	90	85	95.1
Salford	96	39.8	96	103	94	97	92	94.3
Sheff	94	38.9		107	91	96	84	96.5
Shrew	107	66.7		111	100	107		98.1
Stevng	98	45.1	111	112	96	98	94	98.9
Stoke	109	72.6		110	105	109	103	94.7
Sund	100	52.6		105	100	100	93	100.0
Truro	102	59.1			101	103		100.0

Table 2.13 Continued

Centre	All KRT patients		Median Hb (g/L) by modality			Median Hb (g/L) by presentation time		% data completeness
	Median Hb (g/L)	% Hb ≥100 g/L	Tx	PD	HD	≥90 days	<90 days	
Wirral	94	43.3			89	94		90.9
Wolve	91	27.7		104	88	92	80	97.4
York	95	35.6		106	90	97	83	97.3
N IRELAND								
Antrim	101	51.6			95	107		100.0
Belfast	106	65.9	110	109	99	107		96.7
Newry	99	50.0			97	100		100.0
Ulster	98	40.0			96	98		100.0
West NI	99	48.4			92	97		96.9
WALES								
Bangor	102	59.1			97	104		95.7
Cardff	98	45.5	113	105	94	99	89	97.9
Clwyd	93	33.3		106	86	94		100.0
Swanse	100	50.0		113	95	100	99	100.0
Wrexm								56.3
TOTALS								
England	97	44.6	106	106	94	99	92	94.9
N Ireland	103	55.8	112	110	96	104	95	98.0
Wales	98	46.9	110	110	94	99	93	95.5
E, W & NI	**97**	**45.0**	**107**	**107**	**94**	**99**	**92**	**95.0**

Blank cells – no data returned by the centre, data completeness (including referral time) <70% or N<10

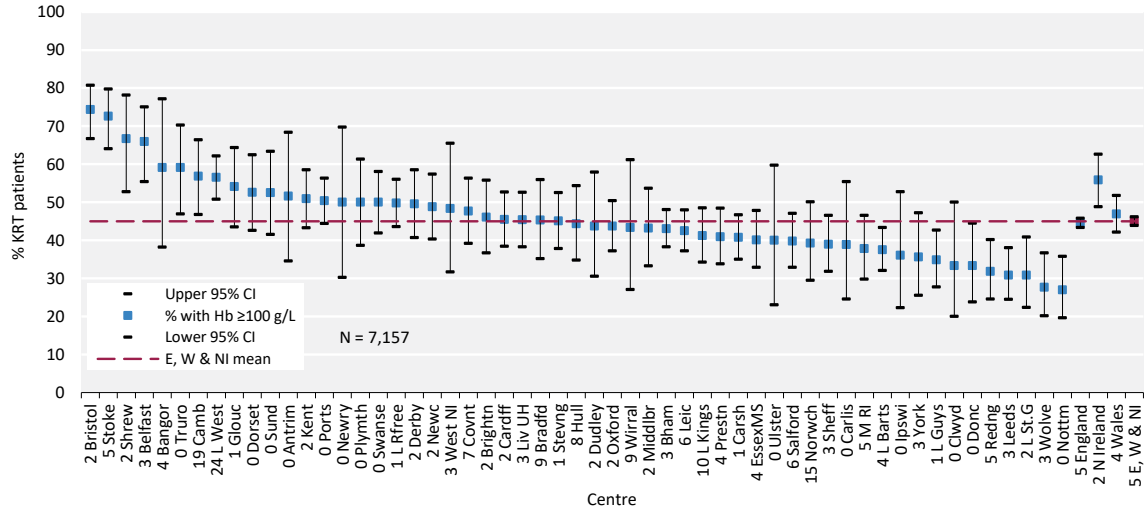

Figure 2.10 Percentage of adult patients incident to KRT in 2022 with haemoglobin (Hb) ≥100 g/L at start of KRT treatment by centre
CI – confidence interval

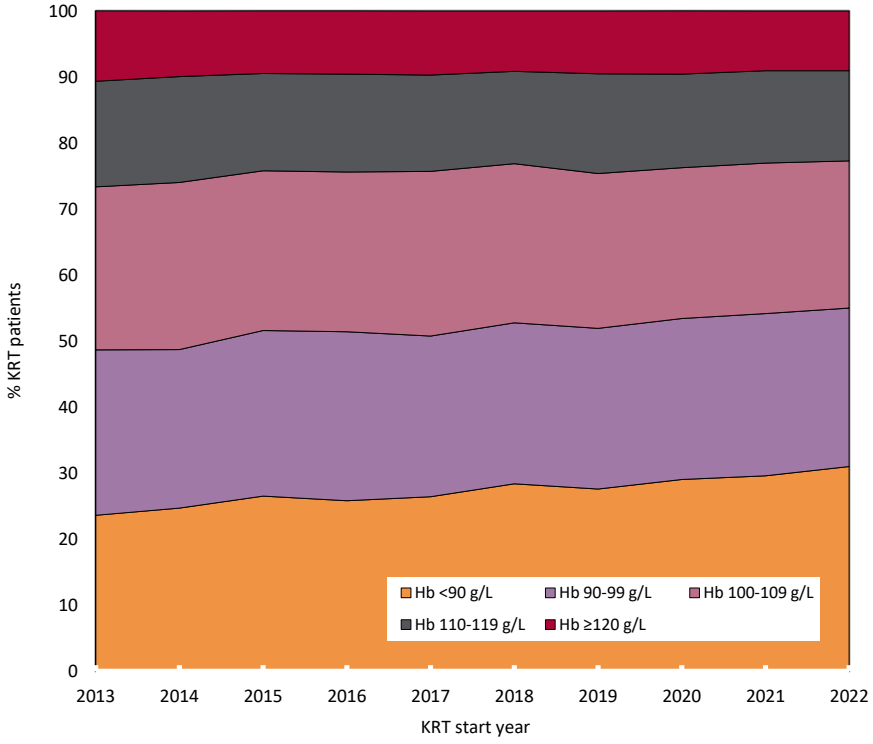

Figure 2.11 Distribution of haemoglobin (Hb) in incident adult KRT patients by year of start between 2013 and 2022

Biochemistry parameters in incident adult KRT patients

The latest UK Kidney Association guideline on CKD mineral bone disease contains only one audit measure, which applies to patients with CKD and patients on KRT. It is the percentage of patients with adjusted calcium above the target range.

Table 2.14 Median adjusted calcium (Ca) and percentage with adjusted Ca within and above the target range (2.2–2.5 mmol/L) in adult patients incident to KRT in 2022 by centre

Centre	Median adj Ca (mmol/L)	% adj Ca 2.2–2.5 mmol/L	% adj Ca >2.5 mmol/L	% data completeness
ENGLAND				
Bham	2.3	84.9	7.3	98.8
Bradfd	2.4	77.4	16.1	98.9
Brightn	2.3	77.9	8.7	100.0
Bristol	2.3	92.7	5.3	99.3
Camb	2.4	82.8	11.2	98.3
Carlis	2.2	72.2	2.8	100.0
Carsh	2.3	72.9	3.4	95.6
Colchr	2.3	79.5	5.1	92.9
Covnt	2.2	84.4	2.2	97.8
Derby	2.4	85.0	11.7	99.2
Donc	2.4	87.2	6.4	100.0
Dorset	2.4	86.3	10.5	100.0
Dudley	2.4	77.1	14.6	98.0
EssexMS	2.3	85.6	2.4	98.8
Exeter				
Glouc	2.3	76.7	9.3	100.0
Hull	2.3	70.3	5.9	95.3
Ipswi	2.3	83.3	5.6	100.0
Kent	2.4	81.8	9.7	98.8
L Barts	2.3	79.0	4.6	97.6
L Guys	2.4	84.5	11.0	99.4
L Kings	2.3	71.7	5.2	95.6
L Rfree	2.3	78.7	9.6	100.0
L St.G	2.4	81.3	12.5	100.0
L West	2.3	77.6	6.9	78.9
Leeds	2.3	81.1	6.7	99.5
Leic	2.3	78.6	6.8	98.5
Liv UH	2.4	82.8	11.3	98.4
M RI	2.3	84.5	7.0	97.0
Middlbr	2.3	81.2	2.4	94.4
Newc	2.3	80.8	8.5	98.5
Norwch	2.3	92.1	2.3	88.9
Nottm	2.3	79.1	8.7	100.0
Oxford	2.3	74.1	11.1	98.2
Plymth	2.3	90.3	1.4	100.0
Ports	2.3	76.3	7.0	99.3
Prestn	2.3	74.1	6.6	92.7
Redng	2.3	88.6	4.3	98.6
Salford	2.4	79.1	12.1	94.8
Sheff	2.3	74.9	1.8	98.8
Shrew	2.3	78.4	9.8	98.1
Stevng	2.3	82.8	4.0	99.4
Stoke	2.4	84.3	11.8	97.0
Sund	2.3	77.9	9.1	98.7
Truro	2.3	83.3	9.1	100.0
Wirral	2.3	86.7	3.3	90.9

Table 2.14 Continued

Centre	Median adj Ca (mmol/L)	% adj Ca 2.2–2.5 mmol/L	% adj Ca >2.5 mmol/L	% data completeness
Wolve	2.3	70.5	9.8	97.4
York	2.3	88.9	9.7	96.0
N IRELAND				
Antrim	2.3	74.2	12.9	100.0
Belfast	2.3	84.6	3.3	100.0
Newry	2.4	72.7	13.6	100.0
Ulster	2.4	80.0	16.0	100.0
West NI	2.3	83.9	3.2	96.9
WALES				
Bangor	2.4	90.9	4.6	95.7
Cardff	2.3	80.4	9.5	99.0
Clwyd	2.3	83.3	5.6	100.0
Swanse	2.4	79.2	8.3	100.0
Wrexm	2.3	96.0	0.0	78.1
TOTALS				
England	2.3	80.3	7.4	96.9
N Ireland	2.3	81.0	7.5	99.5
Wales	2.3	81.7	7.9	97.7
E, W & NI	**2.3**	**80.4**	**7.4**	**97.0**

Ca - calcium

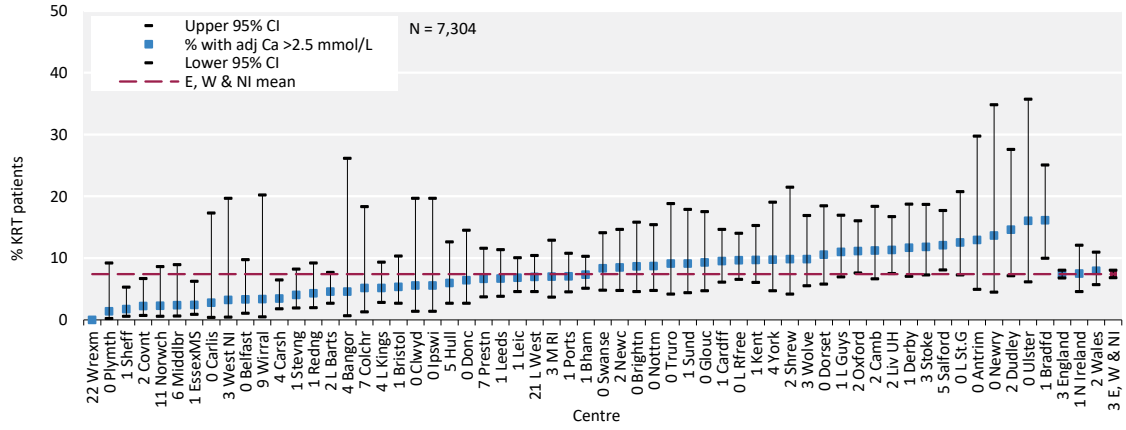

Figure 2.12 Percentage of adult patients incident to KRT in 2022 with adjusted calcium (Ca) above the normal range (>2.5 mmol/L) by centre
CI – confidence interval

Dialysis access in incident adult dialysis patients

In previous years, incident dialysis access data were collected separately to the main UKRR quarterly data returns via the Multisite Dialysis Access Audit. Since last year, in addition to the audit, some incident dialysis access data were collected through the dialysis sessions and access at start information in the quarterly returns. For more details please see appendix A. Patients who did not start dialysis for the first time in 2022 based on UKRR quarterly data submissions were excluded. Data are not included in this section from any centres with <70% completeness for type of access at dialysis start.

Two centres (Plymouth and Kirkcaldy) were not able to distinguish between tunnelled and non-tunnelled lines in their data submission, in which case access was classed as a tunnelled line.

Table 2.15 Demographics and characteristics of patients incident to dialysis in 2022 by first dialysis access type

		HD – first dialysis access type				PD	
Characteristic		N	AVF/AVG	TL	NTL	N	Total
Total							
N		5,850	2,007	2,398	1,445	1,525	7,375
%			34.3	41.0	24.7		
Age (%)	Median (yrs)	65	67	63	65	61	64
	IQR (yrs)	53,75	56,76	51,73	52,74	47,73	52,74
	<45 yrs	823	21.3	49.9	28.8	350	1,173
	45–54 yrs	830	33.6	43.0	23.4	241	1,071
	55–64 yrs	1,285	35.4	41.2	23.4	311	1,596
	65–74 yrs	1,515	36.1	38.6	25.3	336	1,851
	≥75 yrs	1,397	39.4	36.9	23.6	287	1,684
PRD (%)	Diabetes	1,504	38.1	40.4	21.5	333	1,837
	Glomerulonephritis	488	33.0	44.9	22.1	222	710
	Hypertension	365	37.5	37.5	24.9	90	455
	Polycystic kidney disease	220	64.1	29.1	6.8	92	312
	Pyelonephritis	231	35.5	39.8	24.7	50	281
	Renal vascular disease	223	38.6	38.1	23.3	53	276
	Other	898	20.4	42.8	36.9	186	1,084
	Uncertain aetiology	720	37.9	40.4	21.7	196	916
	Missing	364	20.1	36.3	43.7	48	412
Referral time (%)	<90 days	1,256	6.0	47.3	46.7	161	1,417
	90–179 days	260	16.9	56.9	26.2	61	321
	180–364 days	415	30.8	45.1	24.1	133	548
	≥365 days	3,388	46.6	37.0	16.4	1,057	4,445
	Missing	67	22.4	29.9	47.8	13	80
Sex (%)	Male	3,767	34.3	39.7	26.0	960	4,727
	Female	1,979	33.9	43.3	22.8	556	2,535
	Missing	31	22.6	74.2	3.2	8	39
Ethnicity (%)	White	3,148	35.6	39.2	25.2	825	3,973
	Asian	729	33.6	42.7	23.7	180	909
	Black	398	27.6	45.0	27.4	89	487
	Other	187	29.4	47.1	23.5	55	242
	Missing	421	30.9	39.2	29.9	91	512
eGFR at start[1]	Median	7	7	7	6	7	7
	IQR	5,8	6,9	5,8	5,9	6,9	5,9
Diabetes[2] **(%)**	Yes	895	40.8	38.7	20.6	155	1,050
	No	1,004	37.5	39.9	22.5	287	1,291
	Missing	180	27.8	46.1	26.1	37	217

[1]eGFR units are mL/min/1.73m^2

[2]Diabetes at start of dialysis as a comorbidity or PRD from the UKRR database

A centre was excluded from the analysis of a particular variable if it returned data for <70% of patients

AVF – arteriovenous fistula; AVG – arteriovenous graft; eGFR – estimated glomerular filtration rate; IQR – interquartile range; NTL – non-tunnelled line; PRD – primary renal disease; TL – tunnelled line

Dialysis access is best interpreted in the context of all patients starting KRT, so data were supplemented with pre-emptive Tx numbers.

Dialysis access data are described in relation to age, PRD and timing of presentation. Delayed presentation/ referral to kidney services is defined as being within 90 days (3 months) prior to the start of KRT.

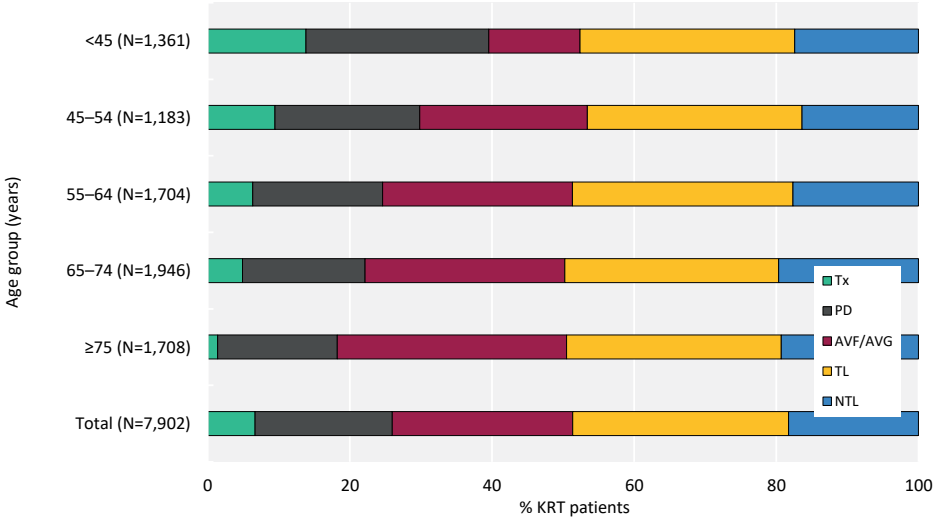

Figure 2.13 Dialysis access used for adult patients incident to KRT in 2022 by age group
AVF – arteriovenous fistula; AVG – arteriovenous graft; NTL – non-tunnelled line; TL – tunnelled line

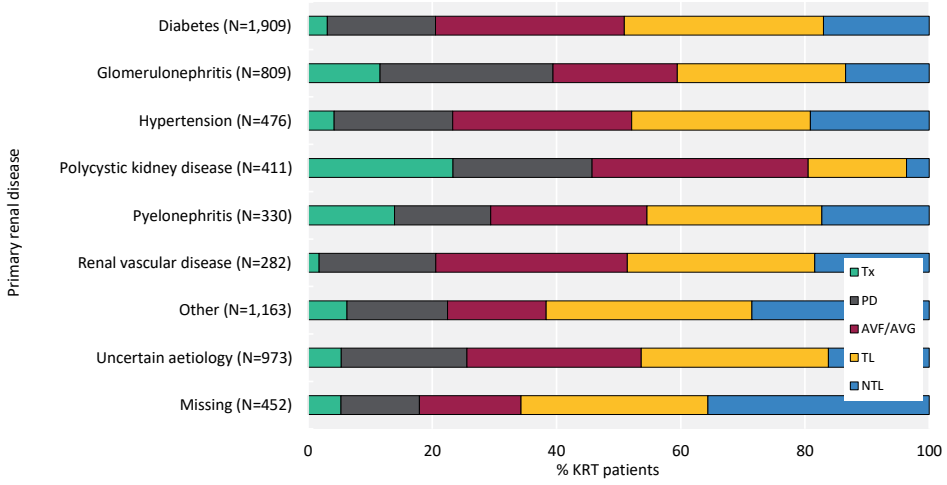

Figure 2.14 Dialysis access used for adult patients incident to KRT in 2022 by primary renal disease
AVF – arteriovenous fistula; AVG – arteriovenous graft; NTL – non-tunnelled line; TL – tunnelled line

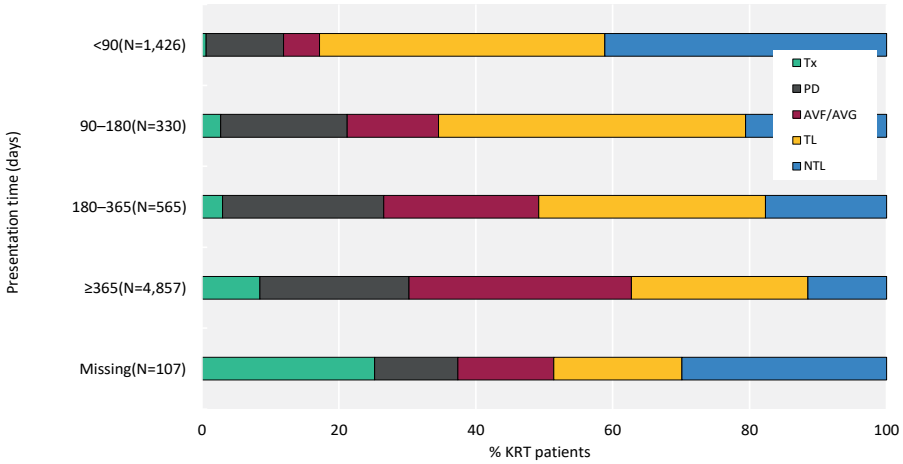

Figure 2.15 Dialysis access used for adult patients incident to KRT in 2022 by presentation time
AVF – arteriovenous fistula; AVG – arteriovenous graft; NTL – non-tunnelled line; TL – tunnelled line

The audit measures related to dialysis access at KRT start include the proportion of planned starts on KRT with a pre-emptive Tx or with definitive access. In addition, at least 60% of the planned HD starts should be with either an AVF or an AVG. The proportions of patients who commenced dialysis with definitive access (AVF/AVG/PD catheter) were reported for centres returning adequate data.

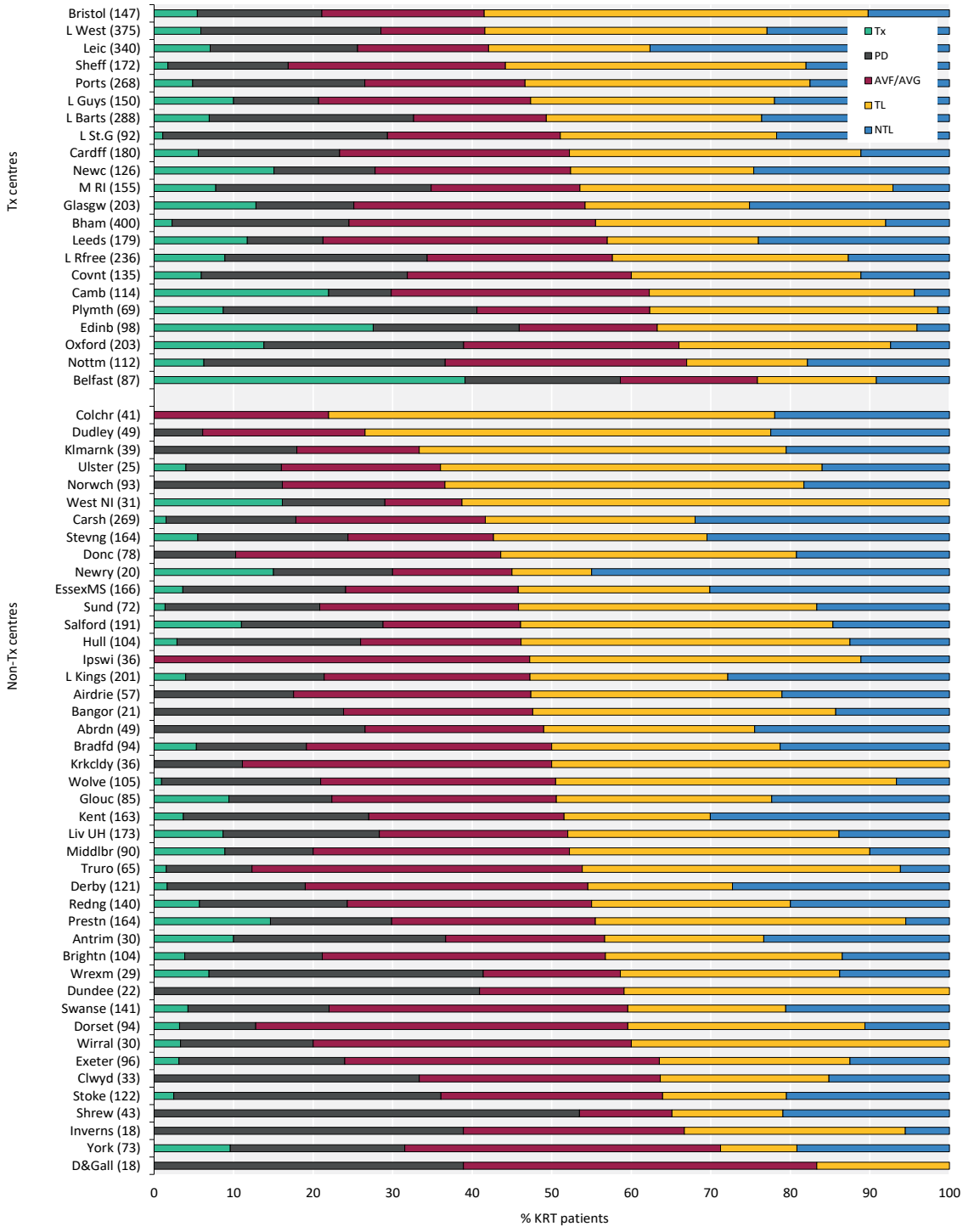

Figure 2.16 First dialysis access used for adult patients incident to KRT in 2022 by centre

Number of incident patients on KRT in a centre in brackets
Centres are ordered by decreasing use of lines
AVF – arteriovenous fistula; AVG – arteriovenous graft; NTL – non-tunnelled line; TL – tunnelled line

Table 2.16 Start modality and dialysis access used for adult patients incident to dialysis in 2022 by presentation before start of dialysis by centre

	Early presenters (≥90 days)(%)					Late presenters (<90 days) (%)					Start modality (%)		
Centre	N	PD	AVF/ AVG	TL	NTL	N	PD	AVF/ AVG	TL	NTL	HD	PD	Tx
Antrim	22	36.4	27.3	27.3	9.1	5	0.0	0.0	0.0	100.0	63.3	26.7	10.0
Bangor	19	26.3	26.3	42.1	5.3	2	0.0	0.0	0.0	100.0	76.2	23.8	0.0
Belfast	35	37.1	31.4	22.9	8.6	8	12.5	12.5	50.0	25.0	41.4	19.5	39.1
Bham	298	27.5	38.9	28.9	4.7	93	7.5	8.6	64.5	19.4	75.5	22.3	2.3
Bradfd	74	16.2	39.2	32.4	12.2	15	6.7	0.0	20.0	73.3	80.9	13.8	5.3
Brightn	78	20.5	47.4	25.6	6.4	22	9.1	0.0	50.0	40.9	78.8	17.3	3.8
Bristol	108	18.5	25.9	48.1	7.4	26	3.8	7.7	61.5	26.9	78.9	15.6	5.4
Camb	80	11.3	46.3	38.8	3.8	9	0.0	0.0	77.8	22.2	70.2	7.9	21.9
Cardff	147	21.8	34.7	37.4	6.1	23	0.0	4.3	47.8	47.8	76.7	17.8	5.6
Carsh	202	19.8	29.7	25.7	24.8	63	6.3	6.3	30.2	57.1	82.2	16.4	1.5
Clwyd	29	34.5	34.5	17.2	13.8	4	25.0	0.0	50.0	25.0	66.7	33.3	0.0
Colchr	1					0					100.0	0.0	0.0
Covnt	104	28.8	34.6	26.9	9.6	23	21.7	8.7	47.8	21.7	68.1	25.9	5.9
Derby	94	21.3	45.7	13.8	19.1	25	4.0	0.0	36.0	60.0	81.0	17.4	1.7
Donc	66	12.1	39.4	36.4	12.1	10	0.0	0.0	40.0	60.0	89.7	10.3	0.0
Dorset	70	11.4	60.0	22.9	5.7	20	0.0	10.0	60.0	30.0	87.2	9.6	3.2
Dudley	40	7.5	25.0	52.5	15.0	9	0.0	0.0	44.4	55.6	93.9	6.1	0.0
EssexMS	110	30.0	31.8	24.5	13.6	43	2.3	2.3	23.3	72.1	75.9	20.5	3.6
Exeter	56	1.8	64.3	25.0	8.9	18	0.0	11.1	50.0	38.9	76.0	20.8	3.1
Glouc	52	21.2	38.5	30.8	9.6	18	0.0	0.0	38.9	61.1	77.6	12.9	9.4
Hull	82	29.3	25.6	34.1	11.0	19	0.0	0.0	78.9	21.1	74.0	23.1	2.9
Ipswi	10					4					100.0	0.0	0.0
Kent	129	27.1	31.0	19.4	22.5	28	10.7	0.0	17.9	71.4	73.0	23.3	3.7
L Barts	148	20.3	25.7	33.8	20.3	116	37.1	7.8	24.1	31.0	67.4	25.7	6.9
L Guys	97	15.5	36.1	29.9	18.6	31	3.2	6.5	48.4	41.9	79.3	10.7	10.0
L Kings	151	21.2	33.1	24.5	21.2	38	7.9	2.6	34.2	55.3	78.6	17.4	4.0
L Rfree	187	29.9	29.4	32.1	8.6	28	14.3	0.0	35.7	50.0	65.7	25.4	8.9
L St.G	76	30.3	25.0	27.6	17.1	15	20.0	6.7	26.7	46.7	70.7	28.3	1.1
L West	268	27.6	17.5	39.6	15.3	85	12.9	2.4	31.8	52.9	71.5	22.7	5.9
Leeds	141	10.6	45.4	19.9	24.1	17	11.8	0.0	35.3	52.9	78.8	9.5	11.7
Leic	249	24.1	20.5	21.7	33.7	66	4.5	7.6	22.7	65.2	74.4	18.5	7.1
Liv UH	130	22.3	30.8	35.4	11.5	28	17.9	3.6	46.4	32.1	71.7	19.7	8.7
M RI	101	32.7	24.8	37.6	5.0	41	19.5	9.8	56.1	14.6	65.2	27.1	7.7
Middlbr	63	12.7	46.0	36.5	4.8	17	11.8	0.0	52.9	35.3	80.0	11.1	8.9
Newc	80	18.8	38.8	25.0	17.5	27	3.7	0.0	33.3	63.0	72.2	12.7	15.1
Newry	10	30.0	30.0	10.0	30.0	7	0.0	0.0	14.3	85.7	70.0	15.0	15.0
Norwch	41	29.3	29.3	39.0	2.4	50	6.0	12.0	52.0	30.0	83.9	16.1	0.0
Nottm	85	37.6	40.0	11.8	10.6	20	10.0	0.0	35.0	55.0	63.4	30.4	6.3
Oxford	143	35.0	35.0	23.8	6.3	32	3.1	15.6	62.5	18.8	61.1	25.1	13.8
Plymth	55	40.0	27.3	32.7	0.0	8	0.0	0.0	87.5	12.5	59.4	31.9	8.7
Ports	213	24.9	23.5	35.7	16.0	30	10.0	10.0	50.0	30.0	73.5	21.6	4.9
Prestn	120	20.0	35.0	38.3	6.7	20	5.0	0.0	90.0	5.0	70.1	15.2	14.6
Redng	111	21.6	36.0	26.1	16.2	21	9.5	14.3	28.6	47.6	75.7	18.6	5.7
Salford	148	21.6	21.6	41.9	14.9	22	9.1	4.5	59.1	27.3	71.2	17.8	11.0
Sheff	132	19.7	32.6	33.3	14.4	36	0.0	11.1	55.6	33.3	83.1	15.1	1.7
Shrew	40	57.5	12.5	12.5	17.5	3	0.0	0.0	33.3	66.7	46.5	53.5	0.0
Stevng	119	21.8	24.4	34.5	19.3	36	13.9	2.8	8.3	75.0	75.6	18.9	5.5
Stoke	69	33.3	46.4	8.7	11.6	39	43.6	5.1	28.2	23.1	63.9	33.6	2.5
Sund	55	21.8	30.9	38.2	9.1	16	12.5	6.3	37.5	43.8	79.2	19.4	1.4
Swanse	119	18.5	44.5	19.3	17.6	16	18.8	0.0	31.3	50.0	78.0	17.7	4.3
Truro	50	12.0	54.0	32.0	2.0	14	7.1	0.0	71.4	21.4	87.7	10.8	1.5
Ulster	17	17.6	29.4	41.2	11.8	7	0.0	0.0	71.4	28.6	84.0	12.0	4.0
West NI	20	20.0	15.0	65.0	0.0	6	0.0	0.0	100.0	0.0	71.0	12.9	16.1

Table 2.16 Continued

Centre	Early presenters (≥90 days)(%)					Late presenters (<90 days) (%)					Start modality (%)		
	N	PD	AVF/ AVG	TL	NTL	N	PD	AVF/ AVG	TL	NTL	HD	PD	Tx
Wirral	26	19.2	46.2	34.6	0.0	3	0.0	0.0	100.0	0.0	80.0	16.7	3.3
Wolve	80	22.5	38.8	35.0	3.8	24	12.5	0.0	70.8	16.7	79.0	20.0	1.0
Wrexm	21	33.3	19.0	38.1	9.5	3	33.3	0.0	0.0	66.7	58.6	34.5	6.9
York	54	25.9	51.9	7.4	14.8	12	16.7	8.3	25.0	50.0	68.5	21.9	9.6
Total	**5,325**	**23.5**	**32.9**	**30.0**	**13.6**	**1,421**	**11.3**	**5.3**	**42.0**	**41.3**	**74.0**	**19.6**	**6.5**

Start modality breakdown includes patients with missing presentation time
Blank cells - referral data completeness < 70%; breakdown by access type not presented but these centres were included in the totals
AVF - arteriovenous fistula; AVG - arteriovenus graft; NTL - non-tunnelled line; TL - tunnelled line

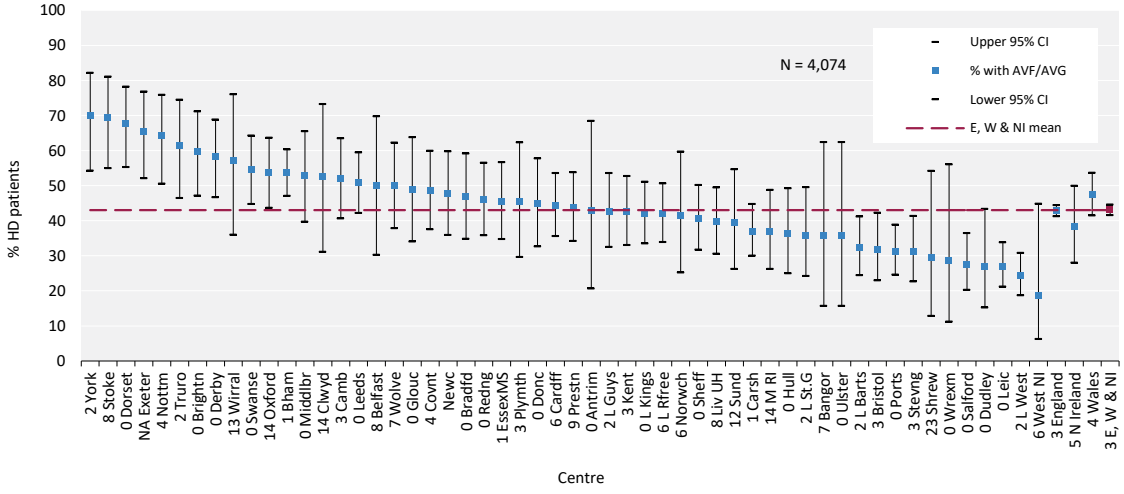

Figure 2.17 Percentage of adult patients incident to HD in 2022 who started dialysis using either an arteriovenous fistula (AVF) or an arteriovenous graft (AVG) by centre, excluding late presenters

CI - confidence interval
Exeter did not submit quarterly data so completeness could not be calculated.

Survival in incident adult KRT patients

The survival of patients who started KRT for ESKD is described, with primary focus on the one year incident to KRT in the 2021 cohort, followed up for a year. Some analyses used rolling incident cohorts over several years (two years or more as stated) to increase cohort patient numbers and more reliably identify survival differences between compared countries or centres. Analyses included patients who were coded as being on chronic dialysis for ESKD who died during the first 90 days (unless stated otherwise), provided that data were returned to the UKRR. Analyses were often adjusted to age 60 years to allow comparisons between centres with different age distributions and one analysis was also adjusted for sex and comorbidity. However, analyses were not generally adjusted for differences in ethnicity, PRD, socioeconomic status or comorbidity.

To enable comparisons with international registries, survival was described to day 90, one year and one year after the first 90 days. The UKRR defines day 0 as the first day of KRT, but some countries define day 90 of KRT as day 0 and do not include patients who died in the first 90 days. Analyses were not censored for Tx unless stated (for more details see appendix A).

Table 2.17 90 days and 1 year after 90 days survival (adjusted to age 60 years) of incident adult KRT patients (2020-2021 2 year cohort) by country

Survival	England	N Ireland	Scotland	Wales	UK
Survival at 90 days (%)	96.2	98.9	96.3	96.9	96.3
95% CI	95.8-96.6	98.0-99.7	95.4-97.3	95.9-98.0	96.0-96.7
Survival 1 year after 90 days (%)	90.4	92.1	91.2	88.4	90.4
95% CI	89.8-90.9	89.8-94.5	89.6-92.8	86.2-90.6	89.9-90.9

CI – confidence interval

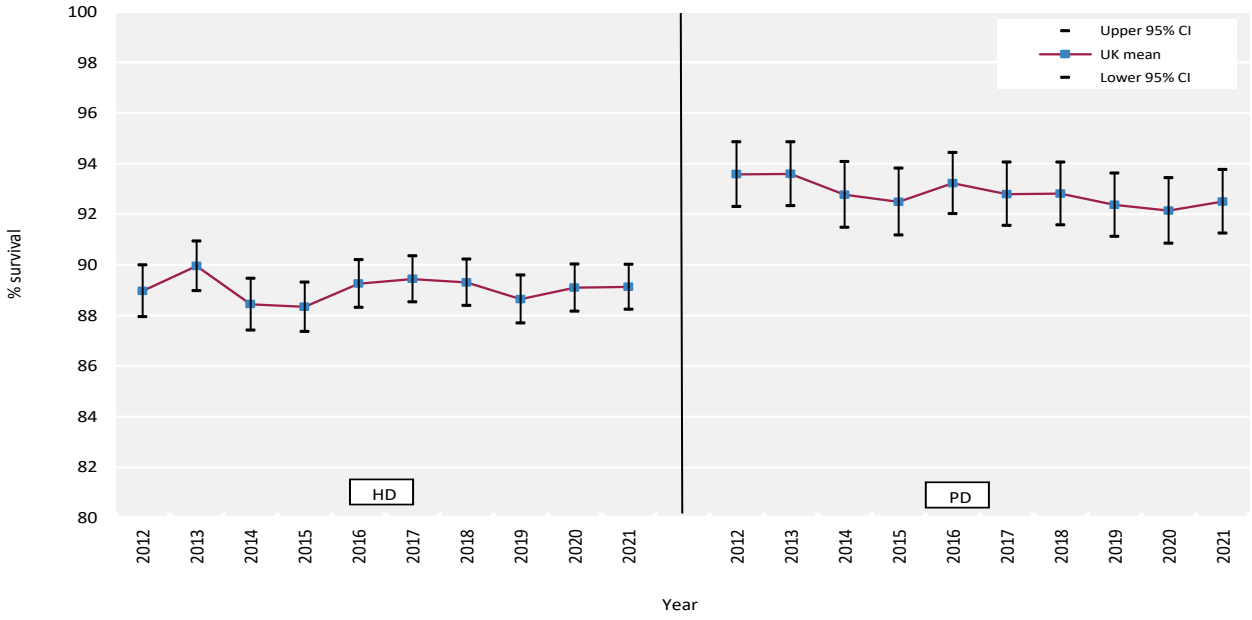

Figure 2.18 1 year after 90 days survival (adjusted to age 60 years) of incident adult KRT patients by start modality between 2012 and 2021
CI – confidence interval

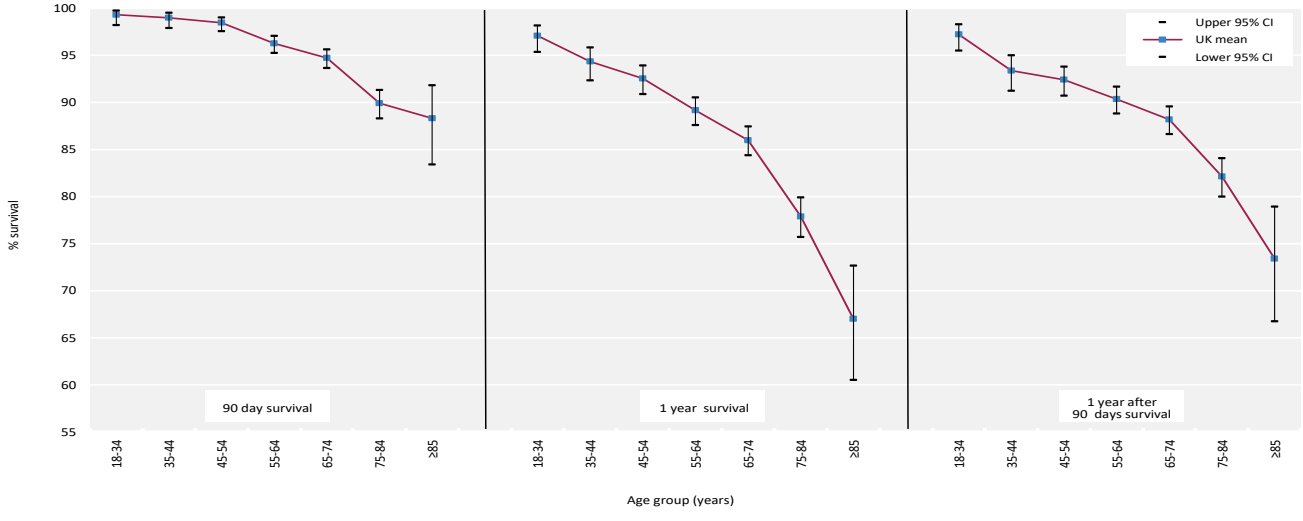

Figure 2.19 90 days, 1 year and 1 year after 90 days survival of incident adult KRT patients by age group (2021 cohort)
CI – confidence interval

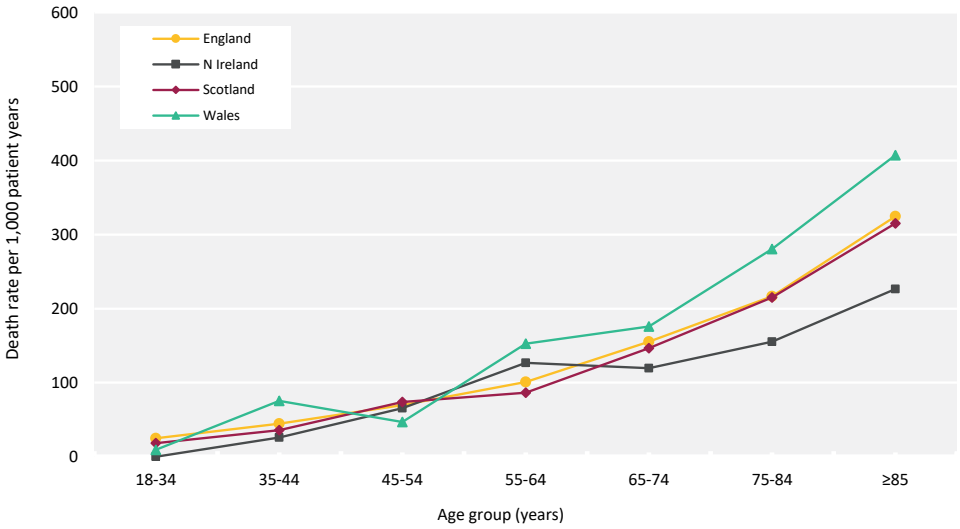

Figure 2.20 1 year after 90 days death rate per 1,000 incident KRT adult patient years by age group and country (2018-2021 4 year cohort)

A ten year rolling cohort was used to analyse the long term survival of incident patients from start of KRT (day 0), according to age at KRT start (figure 2.21), with median survival identifiable from the y-axis. The same cohort was used in analyses of the monthly and six monthly hazard of death on KRT by age group (figures 2.22 and 2.23).

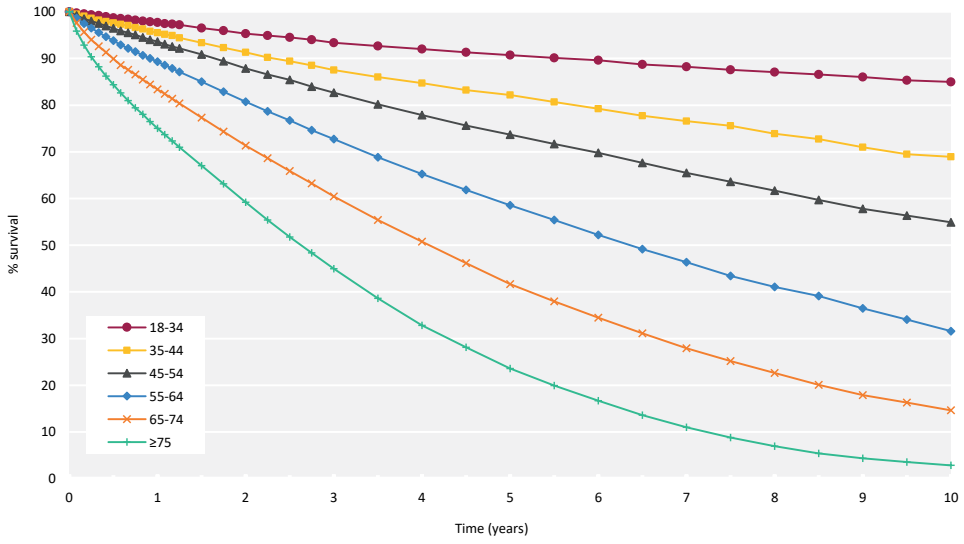

Figure 2.21 Survival (unadjusted) of incident adult KRT patients from day 0 by age group (2012-2021 10 year cohort)

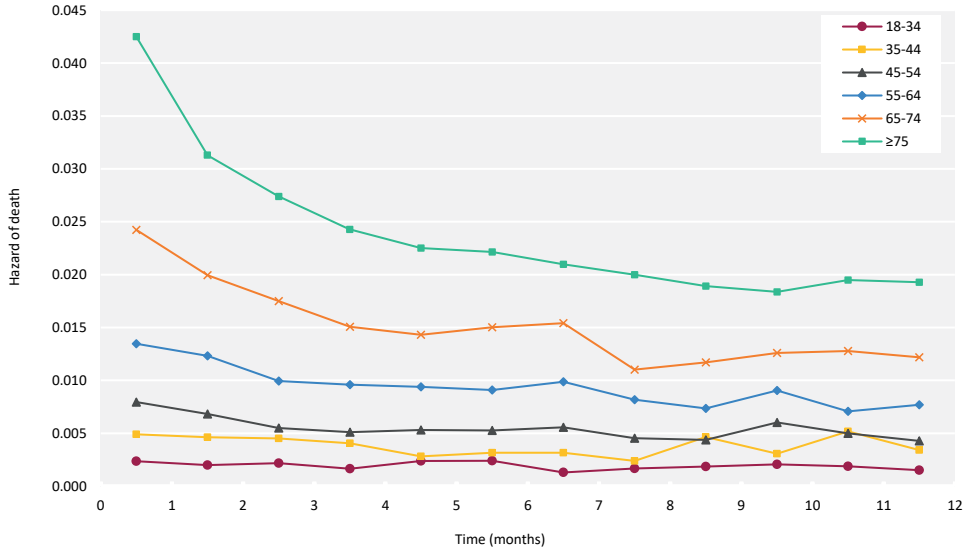

Figure 2.22 Monthly hazard of death (unadjusted) of incident adult KRT patients from day 0 to 1 year by age group (2012-2021 10 year cohort)

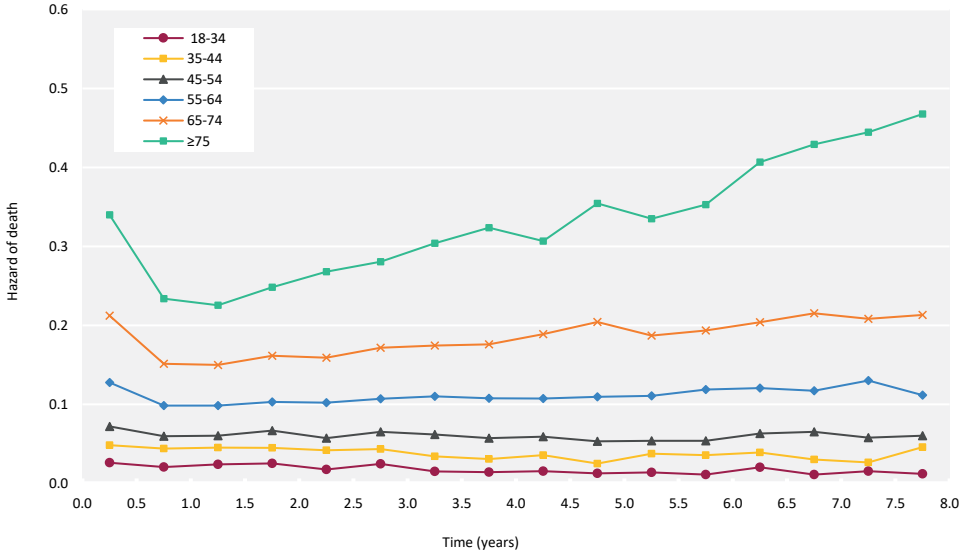

Figure 2.23 6 monthly hazard of death (unadjusted) of incident adult KRT patients from day 0 to 8 years by age group (2012-2021 10 year cohort)

Table 2.18 Survival (unadjusted) of incident adult KRT patients aged <65 years (2002-2021)

	Unadjusted survival (%)										95% CI for longest	
Cohort	1 yr	2 yr	3 yr	4 yr	5 yr	6 yr	7 yr	8 yr	9 yr	10 yr	survival	N
2021	92.1										91.2-92.9	4,212
2020	92.2	84.9									83.8-86.0	4,084
2019	93.1	86.3	80.0								78.7-81.2	4,142
2018	92.9	86.9	80.0	74.6							73.2-75.9	4,204
2017	93.0	87.2	81.5	76.4	71.6						70.2-73.0	4,177
2016	92.9	87.5	82.1	77.2	71.4	66.5					65.0-67.9	3,959
2015	92.3	86.5	81.4	76.9	72.7	68.5	63.5				61.9-65.0	3,873
2014	92.8	86.8	81.4	77.0	73.4	69.2	65.0	61.4			59.8-63.0	3,623
2013	93.7	88.2	83.1	77.7	73.2	68.6	64.6	60.3	56.5		54.8-58.1	3,533
2012	93.1	87.4	81.9	76.8	72.5	68.6	64.8	61.0	57.5	54.0	52.3-55.7	3,476
2011	93.2	88.6	83.6	79.0	74.5	70.9	67.7	64.7	60.7	57.5	55.8-59.2	3,287
2010	92.3	86.6	81.7	77.4	72.9	69.6	66.5	62.6	59.6	56.7	55.0-58.4	3,315
2009	91.2	85.1	80.4	76.3	71.1	67.0	63.8	60.4	57.4	54.6	52.9-56.3	3,344
2008	91.5	86.1	81.2	76.9	73.3	69.7	65.8	62.5	59.5	56.6	54.9-58.3	3,461
2007	92.5	86.9	81.7	76.6	72.9	69.1	65.8	62.4	59.1	56.1	54.3-57.8	3,310
2006	90.6	84.9	80.0	75.5	71.8	67.9	63.7	60.8	57.8	55.1	53.3-56.8	3,149
2005	89.6	83.5	78.4	73.7	69.0	65.5	62.4	59.4	56.4	53.8	52.0-55.7	2,782
2004	89.6	83.3	77.9	72.5	67.8	64.0	60.9	57.1	54.6	53.0	51.0-54.9	2,536
2003	89.3	82.5	77.2	72.4	67.1	62.9	59.4	56.6	54.1	51.5	49.4-53.6	2,175
2002	88.8	81.1	75.2	69.6	65.5	61.5	58.0	55.0	51.9	49.8	47.5-52.0	1,981

CI - confidence interval

Table 2.19 Survival (unadjusted) of incident adult KRT patients aged ≥65 years (2002-2021)

	Unadjusted survival (%)										95% CI for longest	
Cohort	1 yr	2 yr	3 yr	4 yr	5 yr	6 yr	7 yr	8 yr	9 yr	10 yr	survival	N
2021	81.5										80.2-82.7	3,744
2020	79.4	65.1									63.5-66.6	3,596
2019	80.1	64.5	52.9								51.3-54.5	3,854
2018	79.3	65.2	51.8	41.7							40.1-43.3	3,736
2017	79.3	67.5	53.7	42.1	33.0						31.5-34.5	3,745
2016	80.1	65.2	52.9	40.3	30.8	24.1					22.7-25.6	3,665
2015	78.2	64.9	52.2	42.0	32.0	24.8	19.4				18.2-20.7	3,723
2014	78.5	64.2	52.2	41.3	32.8	26.3	19.8	15.4			14.2-16.6	3,499
2013	78.5	64.6	53.1	42.9	34.5	27.6	20.8	15.6	11.4		10.3-12.5	3,359
2012	77.2	65.1	54.2	44.0	35.4	27.7	21.8	17.1	13.2	10.7	9.6-11.8	3,241
2011	77.2	62.7	51.2	41.1	32.4	24.7	18.9	14.4	11.1	7.9	7.0-8.9	3,285
2010	76.0	63.0	51.1	41.8	32.1	25.4	19.6	14.5	11.3	8.3	7.4-9.3	3,193
2009	76.4	63.0	52.4	41.4	32.8	26.1	20.0	15.3	11.2	8.2	7.3-9.2	3,286
2008	74.6	61.0	49.7	40.3	32.0	25.6	20.5	16.1	12.2	9.0	8.0-10.1	3,187
2007	74.9	61.1	49.5	40.3	31.8	25.2	20.1	15.4	11.8	9.1	8.1-10.2	3,219
2006	72.0	58.1	46.8	37.2	28.8	23.0	17.4	13.3	10.5	8.4	7.4-9.4	3,111
2005	71.2	57.3	45.5	36.3	27.9	21.2	16.6	12.5	9.9	7.7	6.8-8.8	2,873
2004	68.9	53.9	42.2	33.8	26.6	20.8	16.1	12.8	9.7	7.4	6.4-8.5	2,598
2003	68.3	53.2	41.3	31.6	24.3	18.0	13.9	10.7	8.2	6.4	5.5-7.5	2,229
2002	65.9	50.9	40.4	31.8	24.0	18.4	13.7	10.8	8.1	6.4	5.4-7.5	2,039

CI - confidence interval

Due to small numbers of incident patients in a given year, centre one year after the first 90 days survival is compared using a rolling four year cohort (table 2.20). Centre-specific one year survival rates were adjusted for not only age (figure 2.24), but also sex and comorbidities for centres with at least 85% completeness (figure 2.25). UKRR comorbidity data have been augmented using diagnostic and procedure codes from HES in England and PEDW in Wales (see appendix A for details). Centres can be identified in the funnel plots using the number of patients in the centre in table 2.20. Given there are 66 centres with data for age adjusted survival, it would be expected that three centres would fall outside the 95% (1 in 20) confidence limit, entirely by chance.

Table 2.20 1 year after 90 days adjusted survival (60 years, male and median comorbidity score) of incident adult KRT patients by centre (2018-2021 4 year cohort)

	Age adjusted survival				Case-mix adjusted survival[1]			
			Limits for funnel plot				Limits for funnel plot	
Centre	N on KRT	Adj 1 yr after 90 days survival (%)	Lower 95% limit	Upper 95% limit	N on KRT	Adj 1 yr after 90 days survival (%)	Lower 95% limit	Upper 95% limit
D&Gall	64	89.5	80.5	95.7				
Bangor	92	88.9	82.6	95.0	92	91.2	84.5	96.1
Inverns	98	95.2	82.9	94.9				
Clwyd	105	88.7	83.2	94.8	105	90.4	85.1	95.9
Ulster	113	89.8	83.6	94.7	109	88.5	85.3	95.9
Dundee	121	94.0	83.9	94.6				
Newry	130	87.9	84.1	94.5	112	86.5	85.4	95.8
Wrexm	132	85.0	84.2	94.5	132	87.2	86.1	95.6
Carlis	138	89.8	84.4	94.4	138	91.2	86.2	95.6
Colchr	142	93.5	84.5	94.4	136	95.2	86.2	95.6
West NI	145	93.1	84.6	94.3	144	91.9	86.4	95.5
Krkcldy	160	92.9	84.9	94.2				
Klmarnk	162	87.1	84.9	94.2				
Antrim	168	93.5	85.1	94.1				
Donc	182	89.1	85.3	94.0	181	90.8	87.1	95.2
Abrdn	186	89.2	85.4	94.0				
York	187	89.1	85.4	94.0	187	90.6	87.2	95.2
Ipswi	192	89.0	85.5	93.9	181	90.4	87.1	95.2
Wirral	198	91.9	85.6	93.9	197	93.9	87.4	95.1
Truro	209	90.3	85.7	93.8	203	92.3	87.5	95.1
Dudley	229	92.7	86.0	93.7	229	94.0	87.8	94.9
Plymth	238	87.8	86.1	93.6	236	90.8	87.9	94.9
Shrew	244	87.8	86.1	93.6	244	90.3	88.0	94.9
Airdrie	249	90.6	86.2	93.6				
Glouc	283	89.8	86.5	93.4	279	91.4	88.3	94.7
Sund	312	84.8	86.7	93.3	308	88.9	88.5	94.6
Bradfd	314	86.8	86.7	93.3	314	89.7	88.5	94.6
Belfast	316	93.9	86.8	93.3				
Derby	333	93.0	86.9	93.2	332	94.7	88.6	94.5
L St.G	337	91.9	86.9	93.2	328	93.0	88.6	94.6
Dorset	346	91.9	86.9	93.2	344	93.1	88.7	94.5
Norwch	359	91.1	87.0	93.1	349	92.1	88.7	94.5
Hull	379	91.0	87.1	93.1	379	92.6	88.9	94.4
Wolve	385	85.9	87.2	93.1	385	89.3	88.9	94.4
Edinb	395	93.4	87.2	93.0				
Redng	415	93.9	87.3	93.0	415	95.2	89.1	94.3
Stoke	417	86.4	87.3	93.0	413	89.0	89.1	94.3
Middlbr	432	93.5	87.4	92.9	431	94.8	89.1	94.3
Newc	479	90.4	87.5	92.8	479	92.4	89.3	94.2
Nottm	479	87.9	87.5	92.8	479	90.2	89.3	94.2
Covnt	505	90.4	87.6	92.8	493	91.6	89.3	94.2

Table 2.20 Continued

Centre	Age adjusted survival				Case-mix adjusted survival[1]			
			Limits for funnel plot				Limits for funnel plot	
	N on KRT	Adj 1 yr after 90 days survival (%)	Lower 95% limit	Upper 95% limit	N on KRT	Adj 1 yr after 90 days survival (%)	Lower 95% limit	Upper 95% limit
Camb	510	94.5	87.6	92.8	510	95.2	89.4	94.1
EssexMS	512	92.8	87.7	92.8	506	94.2	89.4	94.1
Swanse	530	89.5	87.7	92.7	530	91.6	89.5	94.1
Kent	567	88.2	87.8	92.7	567	89.7	89.6	94.0
Brightn	569	88.2	87.8	92.7	561	89.9	89.5	94.0
Bristol	578	89.0	87.8	92.6	563	91.3	89.5	94.0
Liv UH	607	89.7	87.9	92.6	596	92.2	89.6	94.0
Cardff	634	88.2	88.0	92.6	634	90.0	89.7	93.9
Salford	639	88.3	88.0	92.6	638	90.5	89.7	93.9
Leeds	642	92.4	88.0	92.6	642	93.6	89.7	93.9
Prestn	654	86.5	88.0	92.5	653	89.4	89.7	93.9
Sheff	658	90.5	88.0	92.5	657	92.4	89.8	93.9
Stevng	661	92.8	88.0	92.5	655	94.2	89.7	93.9
L Kings	682	92.6	88.1	92.5	672	94.0	89.8	93.9
L Guys	702	90.9	88.1	92.5	702	91.9	89.8	93.9
M RI	706	89.9	88.1	92.5	684	92.1	89.8	93.9
Glasgw	764	89.9	88.2	92.4				
Oxford	784	92.3	88.3	92.4	771	93.8	90.0	93.8
Ports	840	89.4	88.3	92.3	821	91.2	90.0	93.7
Carsh	939	90.3	88.5	92.2	915	91.9	90.1	93.7
L Rfree	978	89.2	88.5	92.2	953	91.6	90.2	93.6
Leic	1,234	91.7	88.7	92.0	1,217	92.9	90.4	93.5
L Barts	1,260	93.5	88.8	92.0	1,193	94.4	90.4	93.5
Bham	1,395	90.6	88.9	91.9	1,382	92.2	90.5	93.4
L West	1,508	90.9	88.9	91.9	1,460	92.5	90.6	93.4

[1]Centres excluded if <85% comorbidity data were available – this included Belfast, Antrim and all Scottish kidney centres
Survivial adjusted to age 60 years, male and median comorbidity score
The Scottish Renal Registry reports survival adjusted for age, sex, primary renal disease and deprivation in its annual report https://www.srr.scot.nhs.uk/Publications/Main.html

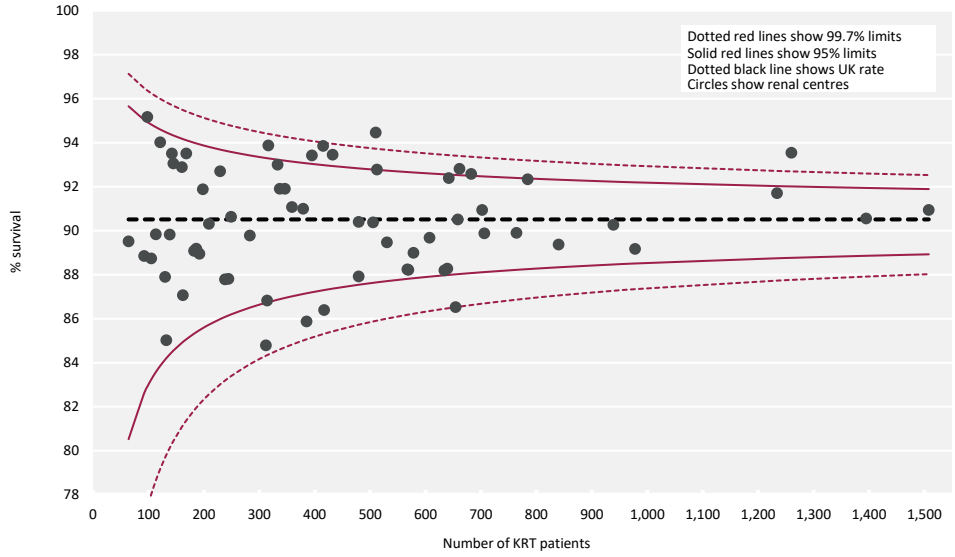

Figure 2.24 1 year after 90 days survival (adjusted to age 60 years) of incident adult KRT patients by centre (2018-2021 4 year cohort)

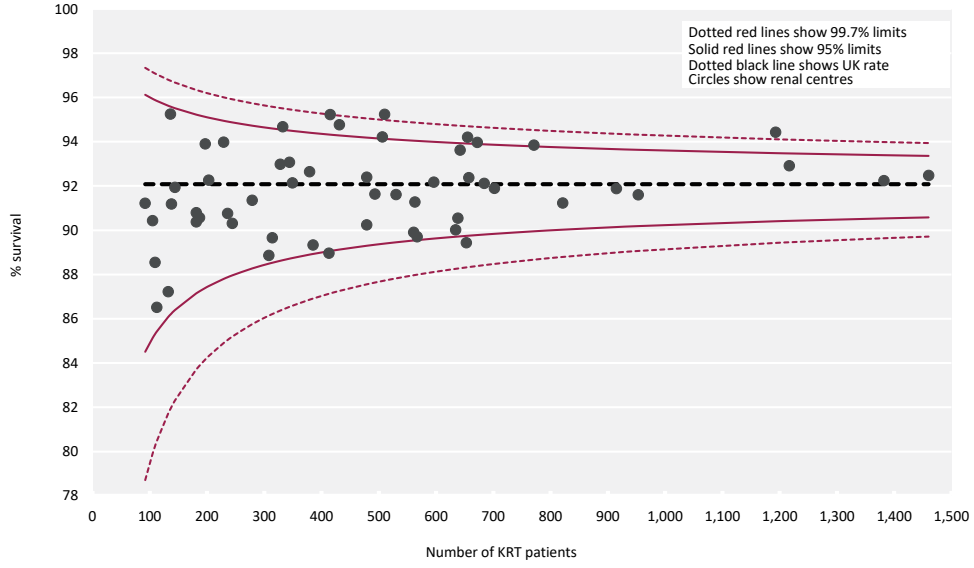

Figure 2.25 1 year after 90 days survival (adjusted to age 60 years, male and median comorbidity score) of incident adult KRT patients by centre (2018-2021 4 year cohort)

Cause of death in incident adult KRT patients

Cause of death was analysed in incident KRT patients using a four year incident cohort followed up for 90 days and 1 year after 90 days. The proportion of incident adult KRT patients with each cause of death is shown for patients with cause of death data and these total 100% of patients with data. The proportion of patients with no cause of death data is shown on a separate line. Where the cause of death was missing in the UKRR data, cause of death from Civil Registration records was used.

Table 2.21 Cause of death in the first 90 days and one year after 90 days in incident adult KRT patients by age group (2018-2021 4 year cohort)

	First 90 days				1 year after 90 days			
	All ages				All ages			
Cause of death	N	%	<65 yrs (%)	≥65 yrs (%)	N	%	<65 yrs (%)	≥65 yrs (%)
Cardiac disease	317	22.0	24.6	21.1	670	20.5	23.5	19.0
Cerebrovascular disease	35	2.4	3.5	2.1	105	3.2	4.3	2.7
Infection	317	22.0	22.7	21.7	673	20.6	22.0	19.9
Malignancy	146	10.1	8.0	10.9	314	9.6	7.1	10.8
Treatment withdrawal	130	9.0	5.1	10.4	425	13.0	9.1	14.8
Other	438	30.4	31.6	30.0	913	27.9	28.7	27.5
Uncertain aetiology	59	4.1	4.6	3.9	174	5.3	5.2	5.4
Total (with data)	**1,442**	**100.0**	**100.0**	**100.0**	**3,274**	**100.0**	**100.0**	**100.0**
Missing	75	4.9	5.3	4.8	181	5.2	5.5	5.1