UK Kidney Association
UK Renal Registry

Chapter 2

Adults starting kidney replacement therapy (KRT) for end-stage kidney disease (ESKD) in the UK in 2023

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 2023 (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.

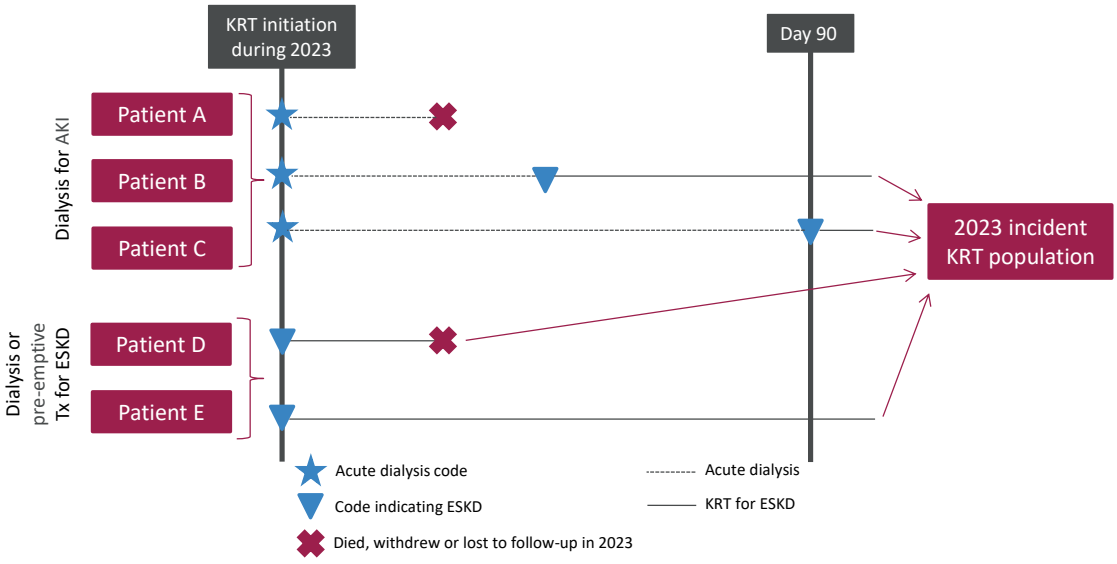

Figure 2.1 Example histories for patients starting KRT, illustrating the use of timeline codes to define dialysis as being 'acute' or for ESKD

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

Several analyses, including survival and cause of death, 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 UK Renal Registry (UKRR) quarterly data returns via the 2023 Multisite Dialysis Access Audit. For around a quarter of 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 2023 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 2023 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 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 to 2023. Manchester was unable to submit patient level data for 2023. Aggregate numbers by modality were provided, enabling inclusion in Tables 2.2 and 2.3. Exeter and Manchester also submitted data to the 2023 Multisite Dialysis Access Audit allowing inclusion in Table 2.17 and Figures 2.16 and 2.17. Exeter and Manchester are excluded from all other analyses.

London Kings was unable to submit data for the last quarter of 2023. Therefore incident data for London Kings is for patients starting KRT between 1 January 2023 and 30 September 2023 only. For analyses involving follow up of patients to the end of 2023, the London Kings cohort was restricted so that the duration of follow up remained the same.

Some new dialysis patients were not submitted by Cambridge. This means that the incident dialysis patients, and total incident patients, are underestimated, while the percentage of pre-emptive transplants amongst incident patients is overestimated. The number of missing patients was unknown at the time of publication.

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 2.22
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 (2023)	Access outcome for all new access in all patients at 3 and 12 months	Table 2.16 (partly addressed)
	Proportion of patients with each access/modality, of those starting kidney replacement therapy who were known to kidney services for at least 12 months	Table 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

Key findings

- 8,556 adult patients started KRT for ESKD in the UK in 2023, an increase of 2.6% from the previous year.
- KRT incidence in adults was 158 pmp.
- The median age of incident KRT patients was 63.2 years, but this was dependent on ethnicity (White 64.9 years, Asian 61.6 years and Black 55.5 years).
- 63.3% of incident KRT patients were male.
- Diabetes remained the most common identifiable primary renal disease (PRD), accounting for 30.6% of incident patients.
- By 90 days after KRT start 5.1% of patients had died or stopped treatment.
- In 2023 17.7% of patients started KRT on PD, compared to 19.0% in 2022. PD rates increased during the COVID-19 pandemic but are now lower than pre-pandemic levels.
- In 2023, 6.7% 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 7.5 mL/min/1.73m^2 and pre-emptive Tx 10.0 mL/min/1.73m^2). In 2022, the mean eGFR at the start of KRT was 6.9 mL/min/1.73m^2.
- Late presentation was 17.5% which is lower than the past two years.
- Of the 7,671 incident dialysis patients with dialysis access data, 49.2% started dialysis with definitive access (19.6% PD and 29.7% HD with an AVF or AVG), 33.7% with a TL and 17.1% with an NTL.
- A higher proportion of patients started haemodialysis with definitive access this year at 36.9% compared to 34.3% in 2022.
- Short-term (90 day) age-adjusted survival of incident KRT patients in a combined 2 year cohort (2021-2022) was 96.5%, which was similar to survival in the 2020-2021 cohort.
- 1 year after 90 day age-adjusted survival for incident KRT patients in a combined 2 year cohort (2021-2022) was 90.5% (unchanged from previous survival in the 2020-2021 cohort).
- There were 9 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 (2019-2022): 2 centres below the lower 95% limit and 7 centres above the upper 95% limit. It is expected that 3 centres would be outside the limits by chance.
- 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 (20.9%) and infection (22.7%).

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)	2023 crude rate (pmp)
	2019	2020	2021	2022	2023		
ENGLAND							
Bham	369	331	365	410	367	2.10	175
Bradfd	106	83	81	93	101	0.51	199
Brightn	153	143	131	104	157	1.08	145
Bristol	162	130	157	150	172	1.27	136
Camb	134	137	149	116	87	0.99	88
Carlis	40	34	43	36	45	0.26	174
Carsh	229	296	296	271	320	1.68	191
Colchr	40	39	38	40	47	0.30	158
Covnt	140	141	147	139	131	0.81	162
Derby	90	72	89	121	109	0.58	189
Donc	54	47	44	78	71	0.38	187
Dorset	91	87	79	94	98	0.75	131
Dudley	56	61	61	58	49	0.35	140
EssexMS	150	127	132	168	210	1.01	208
Exeter	160	107	157	134	150	0.99	152
Glouc	64	85	81	87	84	0.53	160
Hull	105	106	95	107	119	0.81	147
Ipswi	57	44	60	35	42	0.32	132
Kent	154	140	182	170	163	1.08	150
L Barts	309	322	284	292	348	1.62	215
L Guys	208	160	193	154	164	1.01	163
L Kings	186	159	217	203	157	0.94	166
L Rfree	266	231	282	249	265	1.27	208
L St.G	100	84	93	106	88	0.67	132
L West	392	364	418	391	390	2.03	192
Leeds	161	152	169	182	179	1.40	127
Leic	369	337	307	337	357	2.18	164
Liv UH	163	150	169	191	160	1.27	126
M RI	209	172	212	131	205	1.37	150
Middlbr	109	97	110	94	111	0.82	135
Newc	111	125	132	132	155	0.96	162
Norwch	104	101	103	123	75	0.71	106
Nottm	128	121	130	115	109	0.93	117
Oxford	202	203	193	220	221	1.54	143
Plymth	61	57	84	72	61	0.41	147
Ports	223	219	239	272	241	1.79	135
Prestn	155	165	198	187	198	1.27	156
Redng	115	100	109	146	132	0.74	178
Salford	171	173	142	195	198	1.19	167
Sheff	163	174	170	169	164	1.12	146
Shrew	66	45	62	52	63	0.42	149
Stevng	193	170	180	171	173	1.15	150
Stoke	103	121	139	135	121	0.75	162

Table 2.2 Continued

Centre	N on KRT					Estimated catchment population (millions)	2023 crude rate (pmp)
	2019	2020	2021	2022	2023		
Sund	88	68	74	80	76	0.54	140
Truro	56	45	69	66	58	0.37	159
Wirral	64	48	55	35	40	0.48	83
Wolve	94	110	129	119	139	0.55	251
York	58	47	50	76	46	0.49	93
N IRELAND							
Antrim	42	29	39	31	41	0.25	165
Belfast	74	78	102	91	82	0.54	152
Newry	30	31	40	22	34	0.24	143
Ulster	28	28	25	24	37	0.21	180
West NI	38	38	34	31	38	0.25	150
SCOTLAND							
Abrdn	39	62	55	57	69	0.50	138
Airdrie	76	57	74	65	86	0.47	184
D&Gall	19	21	14	21	11	0.12	91
Dundee	30	27	40	30	49	0.37	133
Edinb	81	78	87	100	88	0.85	104
Glasgw	199	178	212	203	189	1.38	137
Inverns	22	19	38	27	48	0.23	213
Klmarnk	45	58	46	51	57	0.29	195
Krkcldy	51	41	45	40	45	0.28	164
WALES							
Bangor	19	29	18	23	26	0.16	165
Cardff	165	135	153	196	202	1.16	175
Clwyd	28	26	30	36	41	0.18	226
Swanse	159	122	126	144	159	0.75	211
Wrexm	32	37	29	38	38	0.21	182
TOTALS							
England	6981	6530	7099	7106	7216	45.78	158
N Ireland	212	204	240	199	232	1.48	156
Scotland	562	541	611	594	642	4.48	143
Wales	403	349	356	437	466	2.46	190
UK	**8158**	**7624**	**8306**	**8336**	**8556**	**54.20**	**158**

Country KRT populations were calculated by summing the KRT patients from centres in each country. Estimated country populations were derived from publicly available sources (see appendix A for details on estimated catchment population by kidney centre).
Some new patients were not submitted by Cambridge, therefore recent incident numbers are underestimated.
Exeter was unable to submit 2021-2023 patient level data. Manchester was unable to submit 2023 data. Aggregate numbers for those years were submitted by the centres.
pmp – per million population
For Exeter 2020, Manchester 2022 and London Kings 2023, Q4 was not submitted so incidence is for 3 quarters only.

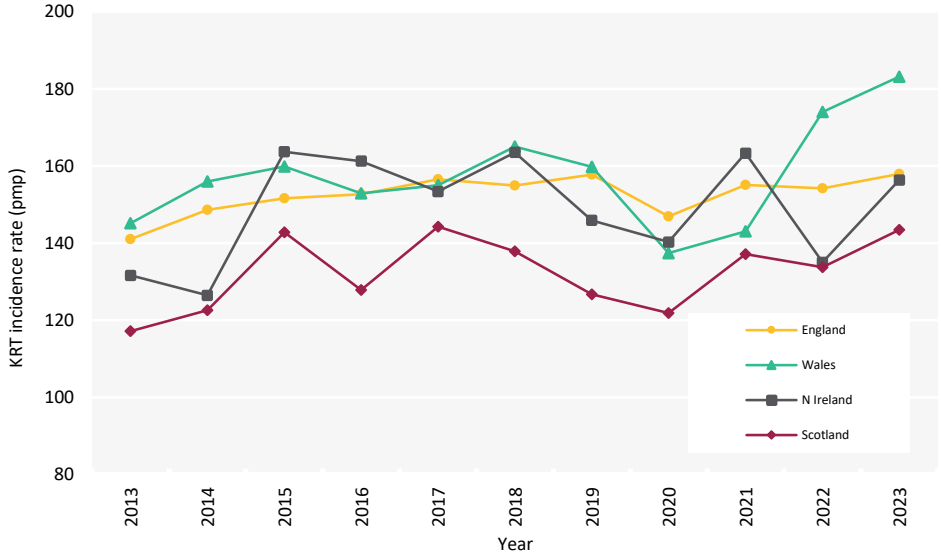

Figure 2.2 Adult KRT incidence rates by country between 2013 and 2023
pmp – per million population

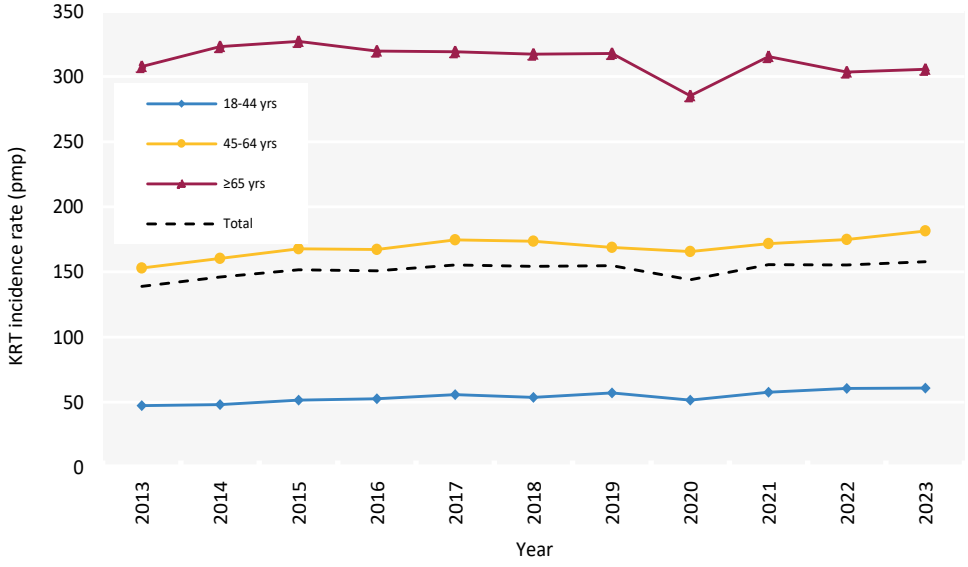

Figure 2.3 Adult KRT incidence rates by age group between 2013 and 2023
pmp – per million population

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 2023 by centre

									Ethnicity				
Centre	N on KRT	% on ICHD	% on PD	% on HHD	% on Tx	% pre-emptive listing/Tx	Median age (yrs)	% male	% White	% Asian	% Black	% Other	% missing
ENGLAND													
Bham	367	74.9	20.2	0.0	4.9	16.1	64.3	61.0	59.4	26.3	10.6	3.7	4.6
Bradfd	101	84.2	9.9	0.0	5.9	18.8	63.0	57.4	45.0	46.0	3.0	6.0	1.0
Brightn	157	73.9	22.3	0.0	3.8	12.7	65.9	64.3	85.7	5.0	4.3	5.0	10.8
Bristol	172	77.9	14.5	0.6	7.0	18.0	61.1	69.2	80.1	5.8	11.1	2.9	0.6
Camb	87	46.0	11.5	0.0	42.5	52.9	55.9	63.2	83.9	9.2	4.6	2.3	0.0
Carlis	45	82.2	17.8	0.0	0.0	4.4	69.5	60.0	95.1	2.4	0.0	2.4	8.9
Carsh	320	80.6	15.3	0.3	3.8	11.9	64.2	61.3	65.2	18.5	11.5	4.9	10.3
Colchr	47	100.0	0.0	0.0	0.0	8.5	66.9	68.1	95.2	0.0	0.0	4.8	10.6
Covnt	131	72.5	20.6	1.5	5.3	17.6	63.8	64.1	78.1	14.8	3.9	3.1	2.3
Derby	109	69.7	26.6	0.0	3.7	17.4	64.0	56.9	76.5	17.6	2.4	3.5	22.0
Donc	71	80.3	15.5	0.0	4.2	18.3	66.8	66.2	91.5	5.6	0.0	2.8	0.0
Dorset	98	73.5	17.4	0.0	9.2	20.4	64.5	66.3	95.9	2.1	1.0	1.0	1.0
Dudley	49	73.5	24.5	0.0	2.0	12.2	68.0	61.2	75.5	20.4	4.1	0.0	0.0
EssexMS	210	71.4	28.1	0.0	0.5	7.1	66.6	67.1	82.3	3.8	8.6	5.4	11.4
Exeter	150	86.7	2.7	4.7	6.0								
Glouc	84	72.6	20.2	0.0	7.1	17.9	65.1	61.9	90.5	6.0	1.2	2.4	0.0
Hull	119	73.1	22.7	0.0	4.2	8.4	62.1	61.3	94.7	0.0	0.9	4.4	5.0
Ipswi	42	85.7	9.5	0.0	4.8	16.7	69.0	66.7	85.7	0.0	2.4	11.9	0.0
Kent	163	78.5	14.1	0.0	7.4	16.0	63.5	64.4	91.8	1.9	1.3	5.1	3.1
L Barts	348	67.5	25.6	0.0	6.9	18.7	60.9	57.2	26.5	43.4	21.8	8.3	6.6
L Guys	164	78.1	8.5	0.0	13.4	23.8	61.6	68.3	49.6	9.9	33.3	7.1	14.0
L Kings	157	79.6	16.6	0.0	3.8	14.0	61.0	63.7	45.9	11.5	37.8	4.7	5.7
L Rfree	265	73.2	18.1	0.4	8.3	24.9	60.6	61.5	41.5	16.1	21.4	21.0	6.4
L St.G	88	65.9	26.1	0.0	8.0	22.7	64.9	58.0	41.9	27.0	21.6	9.5	15.9
L West	390	74.4	19.2	0.0	6.4	18.7	62.9	65.6	30.8	42.3	17.9	9.0	0.0
Leeds	179	78.2	15.1	0.0	6.7	25.1	58.1	57.5	71.3	18.5	7.9	2.2	0.6
Leic	357	73.4	20.2	0.0	6.4	19.0	63.4	66.7	75.1	18.9	4.2	1.9	12.3
Liv UH	160	75.6	15.6	0.6	8.1	18.8	57.9	68.8	88.4	3.1	2.3	6.2	19.4
M RI	205	66.3	19.5	4.4	9.8								
Middlbr	111	91.9	0.9	0.0	7.2	15.3	63.6	64.9	91.7	4.6	1.9	1.9	2.7
Newc	155	76.1	16.8	0.0	7.1	27.7	59.6	61.3	90.3	5.2	1.9	2.6	0.6
Norwch	75	64.0	34.7	0.0	1.3	6.7	69.0	68.0	93.8	4.6	1.5	0.0	13.3
Nottm	109	66.1	28.4	0.0	5.5	21.1	62.9	67.9	80.2	5.7	5.7	8.5	2.8
Oxford	221	64.3	25.8	0.0	10.0	27.6	63.9	70.1	78.2	12.4	4.1	5.3	23.1
Plymth	61	63.9	18.0	3.3	14.8	27.9	68.2	62.3	94.9	1.7	1.7	1.7	3.3
Ports	241	73.4	17.8	1.2	7.5	19.5	64.5	64.3					34.4
Prestn	198	79.3	15.2	1.0	4.6	21.7	61.8	63.1	87.2	10.7	1.3	0.7	24.7
Redng	132	79.6	15.9	1.5	3.0	18.2	62.2	70.5	64.9	18.6	4.1	12.4	26.5
Salford	198	72.7	15.7	0.5	11.1	28.3	59.9	61.1	75.8	17.0	5.5	1.8	16.7
Sheff	164	83.5	13.4	0.6	2.4	8.5	64.4	65.2	83.1	8.1	5.0	3.8	2.4
Shrew	63	60.3	38.1	0.0	1.6	17.5	65.3	65.1	91.7	6.7	1.7	0.0	4.8
Stevng	173	82.1	13.3	1.2	3.5	15.0	61.9	68.2	64.1	19.6	7.2	9.2	11.6
Stoke	121	77.7	18.2	1.7	2.5	9.9	63.7	46.3	94.7	2.6	0.9	1.8	5.8
Sund	76	72.4	23.7	0.0	4.0	17.1	62.9	64.5	93.3	4.0	1.3	1.3	1.3
Truro	58	89.7	10.3	0.0	0.0	15.5	71.4	63.8	100.0	0.0	0.0	0.0	0.0
Wirral	40	72.5	20.0	0.0	7.5	20.0	67.1	52.5	92.5	5.0	2.5	0.0	0.0
Wolve	139	69.1	23.0	5.8	2.2	9.4	58.8	62.6	61.3	21.9	10.2	6.6	1.4

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	46	80.4	13.0	0.0	6.5	19.6	69.8	73.9	89.7	5.1	0.0	5.1	15.2
N IRELAND													
Antrim	41	75.6	14.6	0.0	9.8	19.5	63.4	63.4					34.1
Belfast	82	48.8	17.1	0.0	34.2	50.0	63.9	63.4	96.8	1.6	1.6	0.0	23.2
Newry	34	79.4	11.8	0.0	8.8	23.5	68.0	55.9	96.0	0.0	4.0	0.0	26.5
Ulster	37	86.5	2.7	0.0	10.8	16.2	69.2	67.6	94.4	2.8	2.8	0.0	2.7
West NI	38	79.0	10.5	0.0	10.5	21.1	62.7	50.0	100.0	0.0	0.0	0.0	23.7
SCOTLAND													
Abrdn	69	76.8	15.9	0.0	7.3	14.5	61.7	63.8					
Airdrie	86	86.1	9.3	0.0	4.7	17.4	62.7	65.1					
D&Gall	11	81.8	18.2	0.0	0.0	9.1	66.5	81.8					
Dundee	49	75.5	18.4	0.0	6.1	22.4	60.9	69.4					
Edinb	88	77.3	14.8	0.0	8.0	25.0	61.6	70.5					
Glasgw	189	78.3	12.2	0.0	9.5	24.9	64.8	61.4					
Inverns	48	81.3	8.3	0.0	10.4	10.4	65.8	58.3					
Klmarnk	57	70.2	22.8	3.5	3.5	17.5	61.2	54.4					
Krkcldy	45	91.1	6.7	0.0	2.2	8.9	62.0	71.1					
WALES													
Bangor	26	73.1	15.4	7.7	3.9	11.5	73.6	57.7					73.1
Cardff	202	78.7	11.4	1.0	8.9	16.8	62.9	59.9	92.7	2.7	0.7	4.0	25.7
Clwyd	41	70.7	24.4	4.9	0.0	7.3	65.6	61.0					31.7
Swanse	159	81.8	13.2	1.3	3.8	12.6	66.3	65.4	96.3	1.5	0.7	1.5	14.5
Wrexm	38	76.3	18.4	0.0	5.3	13.2	63.1	39.5	100.0	0.0	0.0	0.0	15.8
TOTALS													
England	7,216	74.7	18.6	0.4	6.3	18.2	62.9	63.5	70.4	15.6	8.8	5.2	9.0
N Ireland	232	69.0	12.5	0.0	18.5	30.6	65.8	60.8	97.2	1.1	1.7	0.0	22.4
Scotland	642	79.3	13.4	0.3	7.0	19.5	63.2	64.2					
Wales	466	78.5	14.0	1.7	5.8	13.9	65.3	60.1	95.2	2.0	0.6	2.3	24.2
UK	**8,556**	**75.1**	**17.7**	**0.5**	**6.7**	**18.4**	**63.2**	**63.3**	**72.4**	**14.5**	**8.2**	**4.9**	**10.3**

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.
Some new dialysis patients were not submitted by Cambridge, therefore the percentage starting on HD and PD is underestimated, while the percentage on Tx is overestimated.
Exeter and Manchester were unable to submit 2023 patient level data, aggregate numbers by modality were submitted and included in this table.
London Kings was unable to submit data for the last quarter of 2023 and no correction has been applied so their incident numbers are much smaller for 2023 compared to previous years.
UK ethnicity distribution and completeness do not include Scotland.

Table 2.4 Demographics, primary renal diseases (PRDs), referral time and start modality of adult patients incident to KRT in 2023 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	627	769	1,276	1,759	2,007	1,521	242	8,201	63.2
%	7.6	9.4	15.6	21.4	24.5	18.5	3.0		
Sex (%)									
Male	58.2	62.2	60.7	63.2	63.4	66.7	73.6	63.3	63.9
Female	41.8	37.8	39.3	36.8	36.6	33.3	26.4	36.7	61.9
Ethnicity (%)									
White	68.2	61.3	65.4	70.5	73.5	84.6	84.6	72.4	64.9
Asian	15.0	16.2	17.3	14.4	17.2	9.0	5.3	14.5	61.6
Black	9.6	14.8	11.8	9.5	5.6	3.4	7.2	8.2	55.5
Other	7.3	7.7	5.6	5.6	3.7	3.0	2.9	4.9	57.0
Missing	8.9	9.5	10.8	10.1	10.2	11.4	10.7	10.3	63.7
PRD (%)									
Diabetes	18.9	24.6	30.8	38.1	34.7	25.8	19.9	30.6	63.2
Glomerulonephritis	22.1	19.4	14.8	11.9	8.6	8.5	1.5	12.1	56.0
Hypertension	6.2	9.2	9.1	6.2	7.2	8.9	10.2	7.8	63.5
Polycystic kidney disease	3.6	9.5	12.3	8.3	4.9	3.9	1.9	6.8	57.6
Pyelonephritis	5.3	4.0	4.4	5.3	5.3	6.7	8.7	5.4	65.9
Renal vascular disease	0.7	0.9	1.6	2.5	6.0	8.2	11.7	4.2	73.4
Other	27.6	17.6	14.3	15.8	17.0	17.3	17.5	17.3	62.9
Uncertain aetiology	15.7	14.8	12.8	11.8	16.4	20.7	28.6	15.8	67.4
Missing	10.4	9.6	11.8	10.5	9.9	13.1	14.9	11.1	63.9
Referral time (%)									
<90 days	28.0	25.1	17.1	17.3	17.4	14.5	18.9	18.4	60.7
≥90 days	72.0	74.9	82.9	82.7	82.6	85.5	81.1	81.6	63.7
Missing	2.6	2.7	2.9	1.6	2.6	1.7	2.6	2.3	62.3
Start modality (%)									
ICHD	59.0	65.1	70.5	75.4	79.0	83.2	88.4	75.1	64.9
HHD	0.5	0.7	0.5	0.5	0.4	0.4	0.0	0.5	60.3
PD	24.6	22.9	19.0	17.0	15.8	15.6	11.6	17.7	60.1
Tx	15.9	11.3	10.0	7.1	4.7	0.9	0.0	6.7	52.2

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

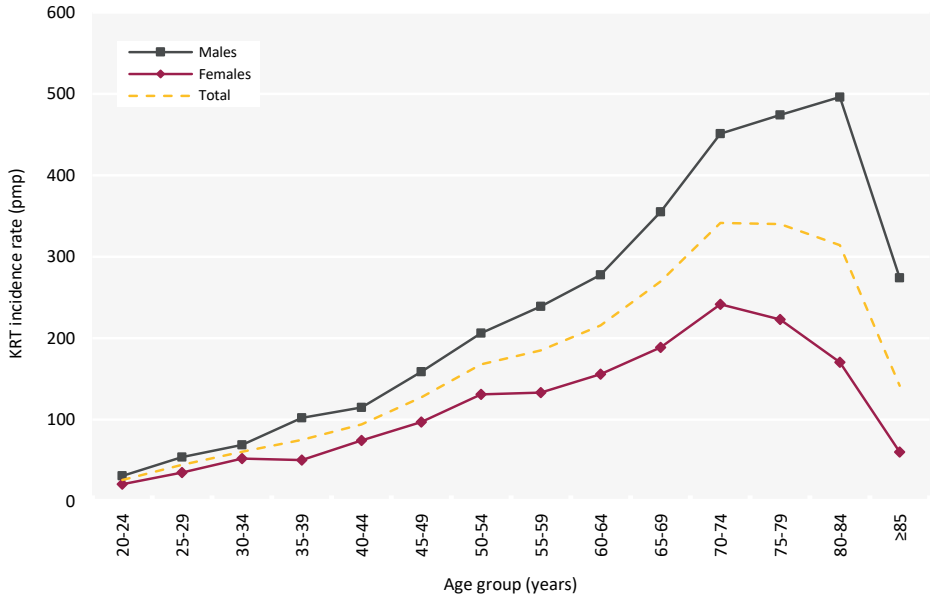

Figure 2.4 Incidence rates for adult patients starting KRT in 2023 by age group and sex
pmp – per million population

Table 2.5 Change in primary renal disease (PRD) of adult patients incident to KRT from 2014 to 2023

	Year of KRT start									
PRD	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Diabetes	26.6	27.6	28.0	29.0	30.1	30.7	30.7	31.1	29.6	30.6
Glomerulonephritis	13.2	13.6	13.4	13.9	13.1	13.1	12.3	13.4	12.5	12.1
Hypertension	6.4	6.7	6.3	6.6	6.9	7.5	7.1	6.9	7.3	7.8
Polycystic kidney disease	6.6	7.3	6.8	6.9	7.1	6.9	6.6	6.2	6.7	6.8
Pyelonephritis	5.7	5.7	5.9	5.6	5.1	5.4	5.4	4.8	5.1	5.4
Renal vascular disease	6.3	6.0	6.2	5.7	5.6	5.5	4.9	4.5	4.4	4.2
Other	17.0	16.6	16.8	16.6	16.9	16.4	17.6	17.3	17.7	17.3
Uncertain aetiology	18.3	16.5	16.5	15.7	15.1	14.4	15.4	15.8	16.6	15.8
Missing	1.7	2.6	3.1	5.2	4.0	5.9	7.4	9.8	10.7	11.1

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 2023. Please visit the UKRR data portal (ukkidney.org/audit-research/data-portals) to identify individual kidney centres.

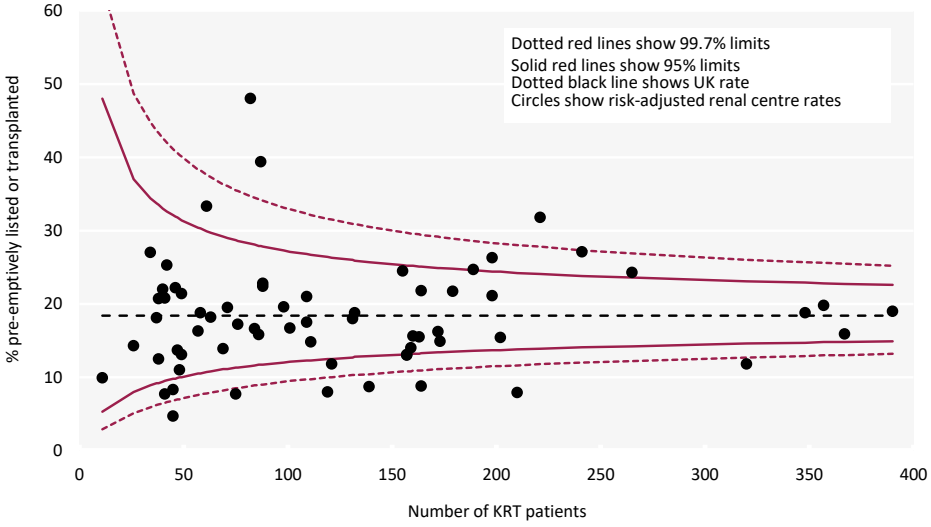

Figure 2.5 Transplant-status (listed or transplanted) at the start of KRT for adult patients incident to KRT in 2023 by centre
Analysis is adjusted for age, sex and PRD (diabetes versus non-diabetes)

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 (in-centre haemodialysis) 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				
2018	71.7	0.4	19.5	8.4
2019	71.0	0.4	20.2	8.4
2020	71.9	0.4	21.8	6.0
2021	72.7	0.6	20.8	5.8
2022	74.1	0.4	19.0	6.5
2023	75.1	0.5	17.7	6.7
Day 90 modality				
Oct 2017 - Sep 2018	69.1	1.0	19.8	10.2
Oct 2018 - Sep 2019	68.3	1.0	20.8	9.9
Oct 2019 - Sep 2020	69.8	1.0	21.5	7.7
Oct 2020 - Sep 2021	70.4	1.1	21.4	7.1
Oct 2021 - Sep 2022	71.4	0.9	20.1	7.7
Oct 2022 - Sep 2023	72.9	0.9	18.3	7.9

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 01/10/2022 and 30/09/2023 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	6,892	69.3	18.1	7.1	1.5	4.1	73.3	19.2	7.5
N Ireland	236	62.3	11.9	21.6	2.1	2.1	65.0	12.4	22.6
Scotland	664	77.1	13.6	7.2	0.0	2.1	78.8	13.9	7.4
Wales	474	74.9	15.0	6.5	1.1	2.5	77.7	15.5	6.8
UK	**8,266**	**70.0**	**17.4**	**7.5**	**1.3**	**3.8**	**73.8**	**18.3**	**7.9**

[1]HD includes ICHD and HHD

[2]'Discontinued' is defined as people who stopped treatment without recovery of kidney function. Those who recovered function within 90 days were not included in the incident cohort

Table 2.8 Start and subsequent KRT modalities for adult patients incident to KRT in 2018 by time after start

			Time after start (%)			
Start modality	N	Later modality	90 days	1 yr	3 yrs	5 yrs
HD	5,826	HD	90.6	73.7	45.2	25.7
		PD	1.8	2.9	0.9	0.3
		Tx	1.3	5.4	13.6	17.5
		Other	0.9	2.3	2.3	2.5
		Died	5.4	15.7	38.0	54.0
PD	1,578	HD	5.5	17.3	21.3	16.7
		PD	89.4	59.9	21.9	6.5
		Tx	2.9	13.6	29.3	35.6
		Other	1.0	1.3	1.5	2.0
		Died	1.3	8.0	26.0	39.2
Tx	675	HD	1.3	1.3	2.5	2.7
		PD	0.0	0.3	0.1	0.4
		Tx	97.0	95.9	90.2	86.7
		Other	1.2	1.3	2.8	3.3
		Died	0.4	1.2	4.3	7.0

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
'Discontinued' is defined as people who stopped treatment without recovery of kidney function. Those who recovered function within 90 days were not included in the incident cohort.

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 2022 to allow one year follow-up time.

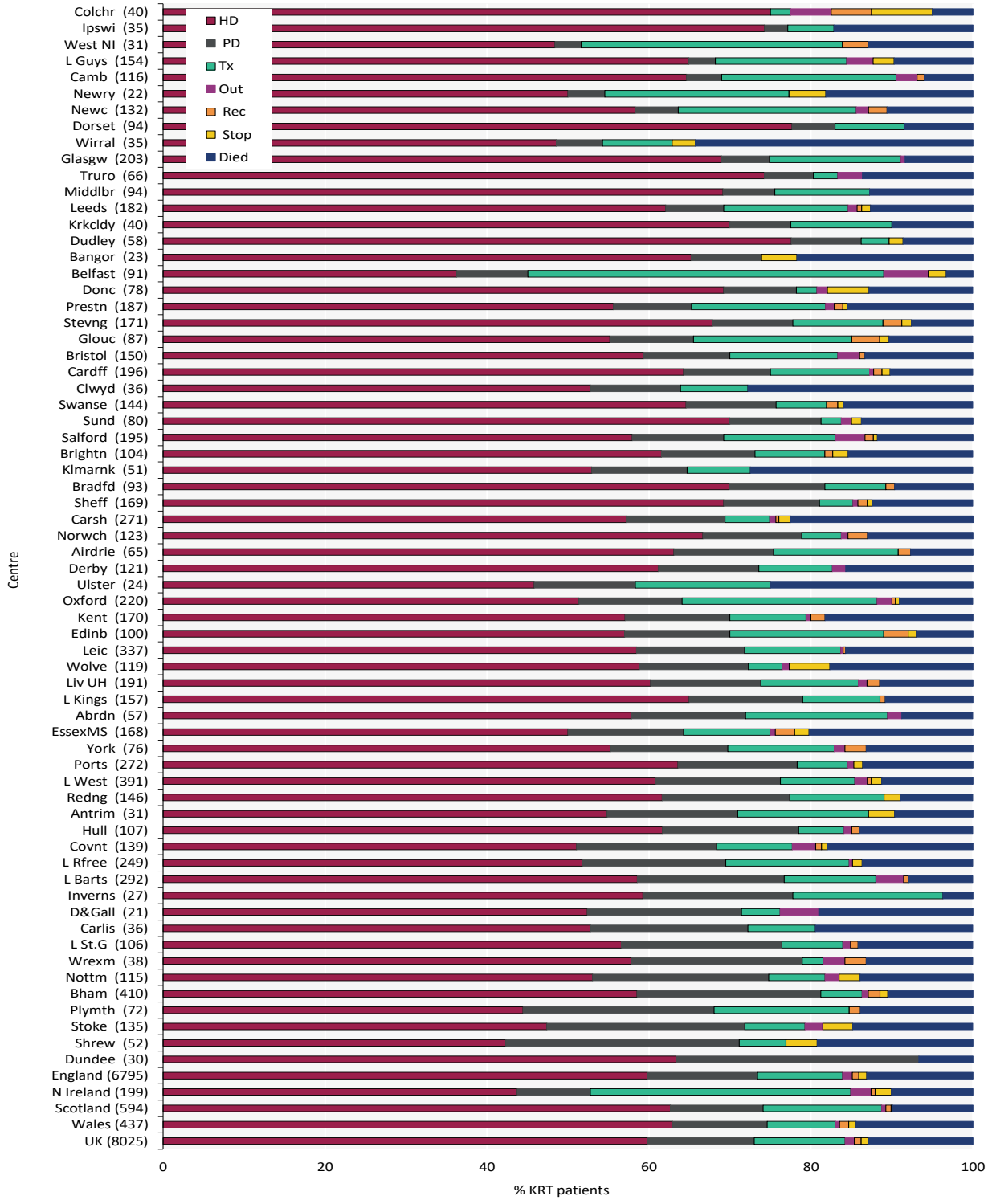

Figure 2.6 KRT modality at 1 year for incident adult KRT patients who started KRT in 2022 by centre

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

Centres are ordered by increasing use of PD at 1 year

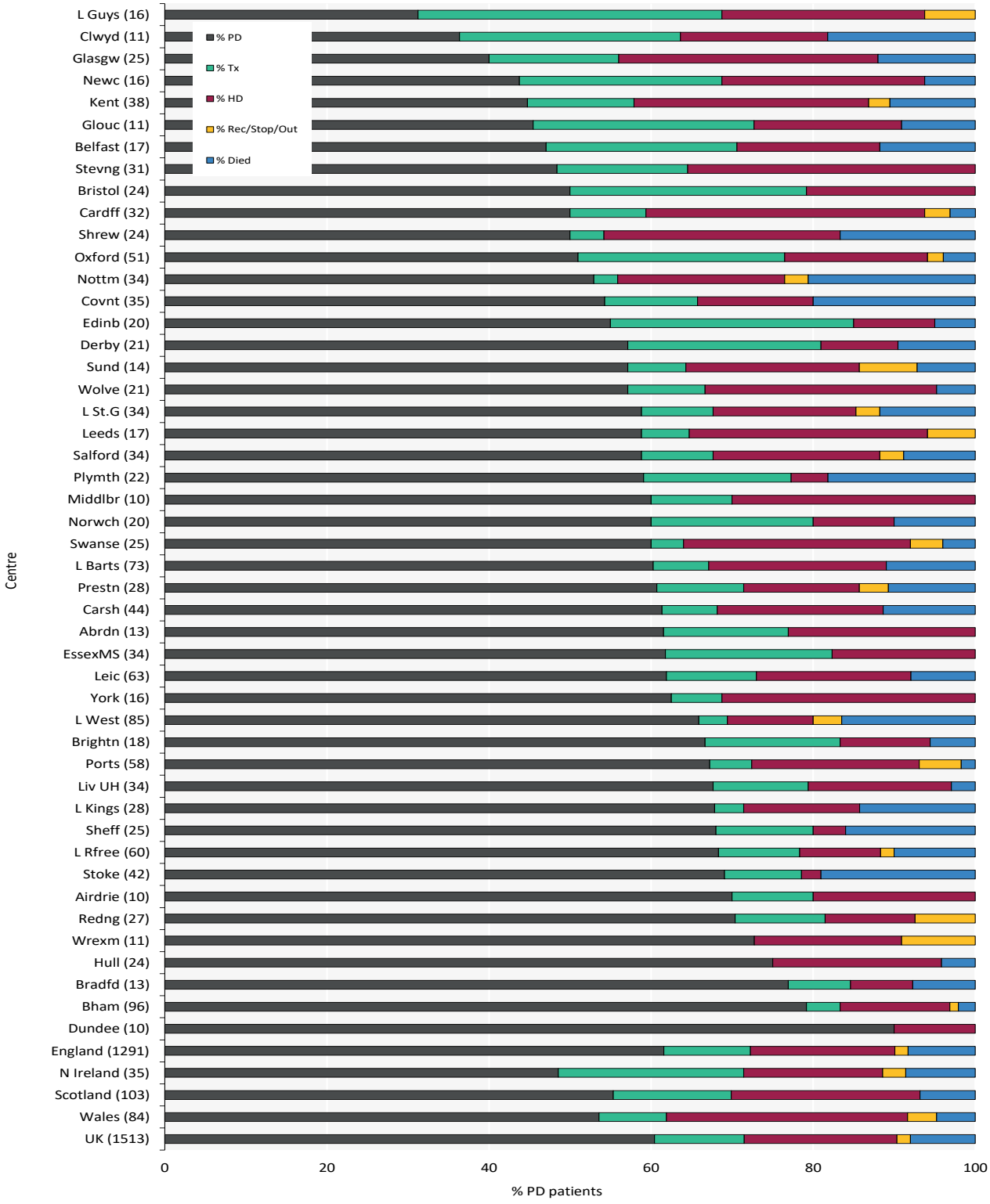

Figure 2.7 KRT modality at 1 year for incident adult PD patients who started KRT in 2022 by centre

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

Centres are ordered by increasing use of PD at 1 year

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 (2022-2023) 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 2022-2023, 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	2022	2023		2022	2023	All PRDs	Non-diabetes PRDs	All PRDs
ENGLAND								
Bham	410	367	777	100.0	100.0	19.7	21.2	31.8
Bradfd	93	101	194	100.0	100.0	16.0	20.4	26.3
Brightn	104	157	261	100.0	100.0	16.1	18.6	27.6
Bristol	150	172	313	94.0	100.0	20.1	23.4	29.4
Camb	116	87	203	100.0	100.0	16.3	13.2	33.5
Carlis	36	45	78	100.0	93.3	24.4	29.5	33.3
Carsh	271	320	589	100.0	99.4	21.1	19.3	34.6
Colchr	40	47		5.0	2.1			
Covnt	139	131	267	100.0	97.7	18.4	23.6	32.2
Derby	121	109	230	100.0	100.0	15.7	21.5	26.1
Donc	78	71	147	97.4	100.0	15.0	15.9	25.2
Dorset	94	98	191	98.9	100.0	19.4	20.0	31.4
Dudley	58	49	107	100.0	100.0	15.9	18.8	27.1
EssexMS	168	210	365	96.4	96.7	23.6	28.6	37.3
Exeter								
Glouc	87	84	160	90.8	96.4	19.4	19.1	26.3
Hull	107	119	226	100.0	100.0	19.5	22.3	38.9
Ipswi	35	42	34	42.9	81.0	29.4		47.1
Kent	170	163	332	100.0	99.4	10.8	12.4	18.4
L Barts	292	348	619	97.3	96.3	37.3	43.0	50.9
L Guys	154	164	300	94.8	93.9	18.7	20.4	34.3
L Kings	203	157	353	98.0	98.1	17.6	24.1	26.6
L Rfree	249	265	493	99.6	92.5	13.0	12.6	25.6
L St.G	106	88	194	100.0	100.0	21.6	26.3	43.3
L West	391	390	781	100.0	100.0	21.4	27.1	37.5
Leeds	182	179	361	100.0	100.0	13.0	15.9	26.3
Leic	337	357	691	99.7	99.4	19.0	16.0	31.1
Liv UH	191	160	347	99.5	98.1	23.1	28.5	36.3
M RI	131		125	95.4		25.6		36.8
Middlbr	94	111	202	97.9	99.1	19.8	19.5	32.7
Newc	132	155	287	100.0	100.0	19.5	22.8	28.6
Norwch	123	75	172	92.7	77.3	33.1	37.8	45.9
Nottm	115	109	224	100.0	100.0	17.0	21.8	24.6
Oxford	220	221	434	100.0	96.8	13.6		25.8
Plymth	72	61	127	100.0	90.2	14.2	19.1	26.8
Ports	272	241	509	98.9	99.6	13.6		26.5
Prestn	187	198	385	100.0	100.0	15.3	16.7	27.8
Redng	146	132	277	99.3	100.0	17.3	21.2	31.4
Salford	195	198	393	100.0	100.0	14.8	20.0	22.6
Sheff	169	164	330	99.4	98.8	18.2	21.8	30.3
Shrew	52	63	115	100.0	100.0	13.0	17.4	20.0
Stevng	171	173	343	100.0	99.4	18.1	23.9	30.0

Table 2.9 Continued

Centre	N on KRT 2022	N on KRT 2023	N with referral data	% data completeness 2022	% data completeness 2023	% 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	121	241	90.4	98.3	29.9		38.2
Sund	80	76	156	100.0	100.0	17.3	21.2	34.6
Truro	66	58	124	100.0	100.0	12.1	14.3	22.6
Wirral	35	40	75	100.0	100.0	21.3	24.5	32.0
Wolve	119	139	251	96.6	97.8	21.5	27.8	32.3
York	76	46	122	100.0	100.0	16.4	20.2	30.3
N IRELAND								
Antrim	31	41	70	93.5	100.0	17.1	16.0	25.7
Belfast	91	82	146	75.8	93.9	10.3	11.1	17.8
Newry	22	34	54	95.5	97.1	16.7	17.5	29.6
Ulster	24	37	61	100.0	100.0	21.3	27.7	31.1
West NI	31	38	68	96.8	100.0	22.1	30.4	32.4
WALES								
Bangor	23	26	46	95.7	92.3	10.9	12.9	23.9
Cardff	196	202	398	100.0	100.0	11.6	14.3	20.4
Clwyd	36	41	76	97.2	100.0	14.5	15.7	25.0
Swanse	144	159	303	100.0	100.0	11.2	15.0	22.4
Wrexm	38	38	71	89.5	97.4	12.7	14.9	26.8
TOTALS								
England	6,972	6,861	13,523	97.9	97.6	19.2	21.6	31.5
N Ireland	199	232	399	86.9	97.4	16.0	18.8	25.3
Wales	437	466	894	98.6	99.4	11.7	14.6	22.1
E, W & NI	**7,608**	**7,559**	**14,816**	**97.7**	**97.7**	**18.6**	**21.0**	**30.8**

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

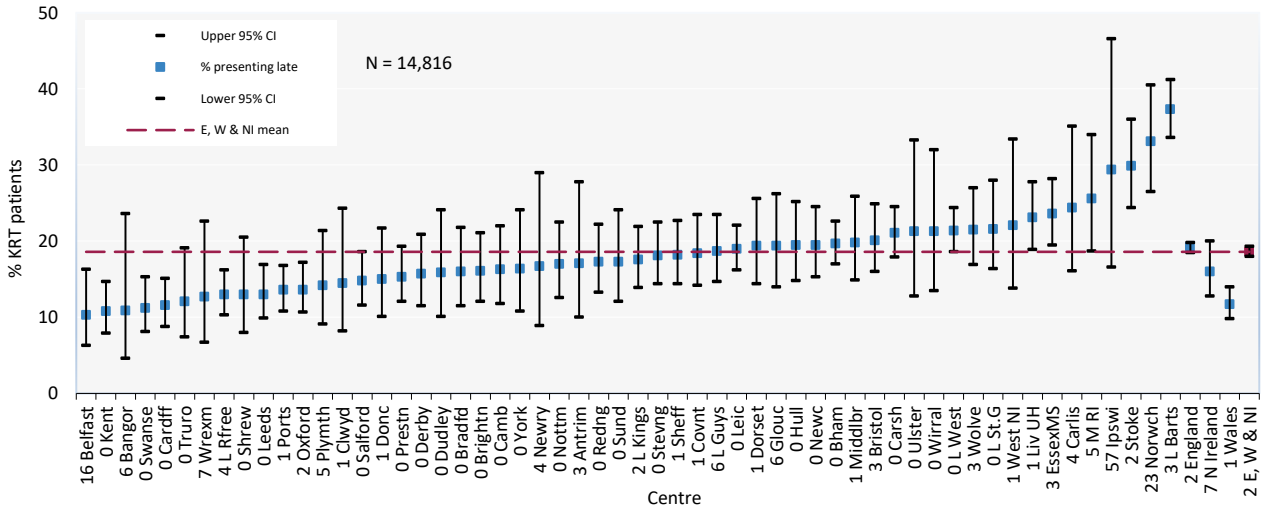

Figure 2.8 Percentage of incident adult KRT patients presenting late (<90 days) to a nephrologist 2022-2023, 2 year cohort

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 2022-2023, 2 year cohort

	Referral time	
Characteristic	<90 days	≥90 days
Median age (yrs)	61.1	63.8
% male	65.6	63.8
% starting on PD	10.2	20.8
% on PD at 90 days	12.0	20.0
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 number 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) 2022-2023, 2 year cohort

		Referral time			
		<90 days		≥90 days	
PRD	N with data	N	%	N	%
Diabetes	4,024	410	10.2	3,614	89.8
Glomerulonephritis	1,607	211	13.1	1,396	86.9
Hypertension	1,018	205	20.1	813	79.9
Polycystic kidney disease	884	35	4.0	849	96.0
Pyelonephritis	696	120	17.2	576	82.8
Renal vascular disease	542	76	14.0	466	86.0
Other	2,312	853	36.9	1,459	63.1
Uncertain aetiology	2,150	438	20.4	1,712	79.6
Total (with data)	**13,233**	**2,348**	**17.7**	**10,885**	**82.3**
Missing	1,583	414	26.2	1,169	73.8

Table 2.12 Referral time of incident adult KRT patients by year of start (restricted to centres reporting continuous data for 2017-2023)

	KRT start year (%)						
Referral time	2017	2018	2019	2020	2021	2022	2023
<90 days	16.5	15.3	15.5	16.0	18.3	18.4	17.5
3-6 mths	4.7	4.5	4.4	3.9	4.6	4.8	4.4
6-12 mths	7.0	7.5	7.8	7.7	6.8	7.5	8.1
≥12 mths	71.8	72.7	72.3	72.5	70.3	69.4	70.1

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.

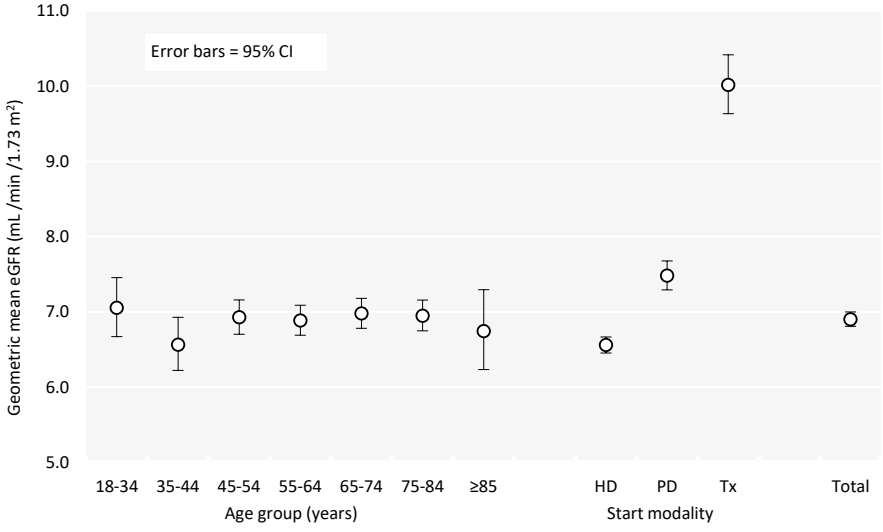

Figure 2.9 Geometric mean estimated glomerular filtration rates (eGFR) for adult patients incident to KRT in 2023 by age group and start modality

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 2023 by centre

	All RRT 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	95	40.6	110	108	91	97	87	98.6
Bradfd	100	50.0			98	101	90	97.0
Brightn	102	57.3		111	98	104	97	95.5
Bristol	103	69.8	116	106	102	104	102	98.3
Camb	102	53.9	103	100	99	102	96	89.7
Carlis	99	48.9			96	101	89	100.0
Carsh	96	40.8	109	106	94	97	92	98.1
Colchr	96	25.0			96			76.6
Covnt	98	44.9		102	96	98	95	97.0
Derby	103	55.6		107	100	104	92	99.1
Donc	93	40.0		110	89	94	87	98.6
Dorset	101	52.6	121	108	95	105	88	99.0
Dudley	98	47.9		109	93	98		98.0
EssexMS	97	43.5		108	93	99	89	98.6
Exeter								
Glouc	98	40.5		103	94	98	93	100.0
Hull	102	54.6		112	96	105	84	90.8
Ipswi	95	24.3			95	96		88.1
Kent	95	40.4	105	108	93	95	97	95.7
L Barts	96	39.9	108	103	92	95	98	98.6
L Guys	93	35.0	107	101	89	94	82	75.0
L Kings	96	38.1		106	92	97	92	88.5
L Rfree	104	59.9	107	106	103	104	101	99.6
L St.G	93	31.3		101	88	96	91	94.3
L West	101	53.7	113	101	101	102	100	80.3
Leeds	92	30.1	116	103	90	93	89	96.7
Leic	98	46.0	109	107	94	99	93	91.3
Liv UH	98	43.1	108	102	96	99	95	95.6
M RI								
Middlbr	99	49.6			99	99	100	100.0
Newc	97	44.5	120	107	91	100	86	100.0
Norwch	100	50.0		107	88	100	98	88.0
Nottm	96	43.1		105	93	96	95	100.0
Oxford	98	44.7	102	100	95	99	86	89.1
Plymth	95	41.0		105	92	97		100.0
Ports	100	51.9	111	109	96	100	97	99.2
Prestn	96	40.8		104	94	96	90	99.0
Redng	96	38.3		104	92	98	82	97.0
Salford	96	44.3		109	92	99	86	88.9
Sheff	94	37.3		112	91	97	87	98.2
Shrew	101	51.6		107	96	104	94	98.4
Stevng	95	35.7		103	94	96	93	97.1
Stoke	105	60.9		113	101	106	99	95.0
Sund	99	50.0		107	95	102	92	97.4
Truro	99	50.0			94	101		100.0

Table 2.13 Continued

Centre	All RRT 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	98	47.1			91	100		85.0
Wolve	94	36.3		103	91	96	85	97.1
York	94	44.2			90	98		93.5
N IRELAND								
Antrim	99	46.2			94	102		95.1
Belfast	101	52.5	108	104	97	101		97.6
Newry	99	50.0			94	104		94.1
Ulster	98	46.0			95	100		100.0
West NI	101	55.3			98	105	95	100.0
SCOTLAND								
Abrdn								55.1
Airdrie	99	49.4			94			89.5
D&Gall								81.8
Dundee	101	52.6			99			77.6
Edinb								48.9
Glasgw	92	34.2		107	91			82.0
Inverns								60.4
Klmarnk	93	34.0			92			87.7
Krkcldy								62.2
WALES								
Bangor	102	60.0			101	102		96.2
Cardff	99	49.8	115	106	97	100	88	99.5
Clwyd	96	39.0		115	93	97		100.0
Swanse	97	44.7		106	95	99	89	100.0
Wrexm	100	55.3			95	101		100.0
TOTALS								
England	98	45.4	108	106	94	99	92	94.7
N Ireland	100	50.4	110	113	96	101	90	97.4
Scotland	95	41.5		109	94			72.7
Wales	99	48.1	112	114	96	100	88	99.6
UK	**98**	**45.4**	**109**	**107**	**95**	**99**	**92**	**93.4**

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

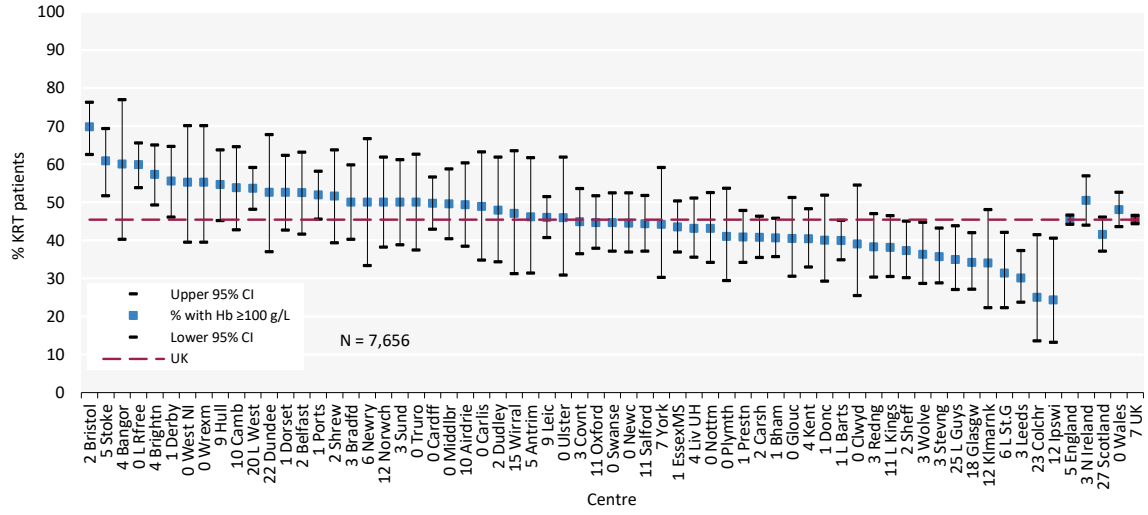

Figure 2.10 Percentage of adult patients incident to KRT in 2023 with haemoglobin (Hb) ≥100 g/L at start of KRT treatment by centre
CI – confidence interval

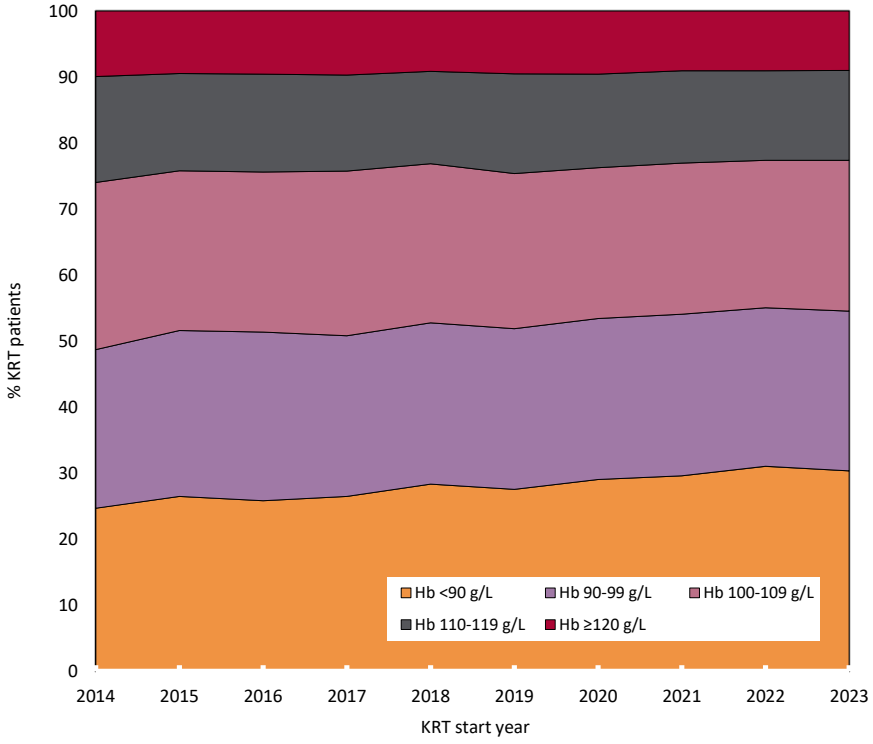

Figure 2.11 Distribution of haemoglobin (Hb) in incident adult KRT patients by year of start between 2014 and 2023

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 2023 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	83.3	8.5	99.5
Bradfd	2.4	81.8	11.1	98.0
Brightn	2.3	85.9	8.3	99.4
Bristol	2.3	87.8	5.2	100.0
Camb	2.4	85.9	8.2	97.7
Carlis	2.3	64.4	11.1	100.0
Carsh	2.3	81.9	5.0	94.7
Colchr	2.3	88.1	9.5	89.4
Covnt	2.3	81.7	3.1	100.0
Derby	2.3	84.3	7.4	99.1
Donc	2.3	84.5	7.0	100.0
Dorset	2.4	86.7	10.2	100.0
Dudley	2.4	71.4	22.5	100.0
EssexMS	2.3	81.7	4.8	99.1
Exeter				
Glouc	2.4	83.3	6.0	100.0
Hull	2.4	81.2	12.0	98.3
Ipswi	2.3	82.5	7.5	95.2
Kent	2.4	80.9	9.9	99.4
L Barts	2.3	80.9	5.2	99.4
L Guys	2.4	92.6	4.9	74.4
L Kings	2.3	78.8	6.0	96.2
L Rfree	2.3	86.4	4.5	100.0
L St.G	2.4	92.8	4.8	94.3
L West	2.3	76.9	8.7	80.0
Leeds	2.3	78.8	5.6	100.0
Leic	2.3	80.1	7.3	95.8
Liv UH	2.4	82.8	10.2	98.1
M RI				
Middlbr	2.2	66.7	6.5	97.3
Newc	2.4	85.1	7.8	99.4
Norwch	2.3	84.9	1.5	88.0
Nottm	2.3	79.8	14.7	100.0
Oxford	2.2	56.0	3.2	97.7
Plymth	2.3	82.0	3.3	100.0
Ports	2.3	79.6	6.7	99.6
Prestn	2.3	79.3	6.1	100.0
Redng	2.3	82.6	3.0	100.0
Salford	2.4	74.2	13.2	91.9
Sheff	2.3	79.9	3.1	100.0
Shrew	2.4	80.3	14.8	96.8
Stevng	2.3	81.2	4.7	98.3
Stoke	2.4	78.4	16.2	91.7
Sund	2.3	72.4	9.2	100.0
Truro	2.4	84.5	8.6	100.0
Wirral	2.3	72.2	11.1	90.0

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	2.4	75.9	11.0	98.6
York	2.4	80.4	17.4	100.0
N IRELAND				
Antrim	2.4	85.0	10.0	97.6
Belfast	2.3	82.9	6.1	100.0
Newry	2.4	84.9	9.1	97.1
Ulster	2.4	78.4	16.2	100.0
West NI	2.3	86.8	2.6	100.0
WALES				
Bangor	2.4	80.8	15.4	100.0
Cardff	2.3	81.7	7.9	100.0
Clwyd	2.3	92.7	4.9	100.0
Swanse	2.3	83.0	5.7	100.0
Wrexm	2.3	92.1	5.3	100.0
TOTALS				
England	2.3	80.4	7.4	96.4
N Ireland	2.3	83.5	8.3	99.1
Wales	2.3	83.9	7.1	100.0
E, W & NI	**2.3**	**80.8**	**7.4**	**96.8**

Ca - calcium

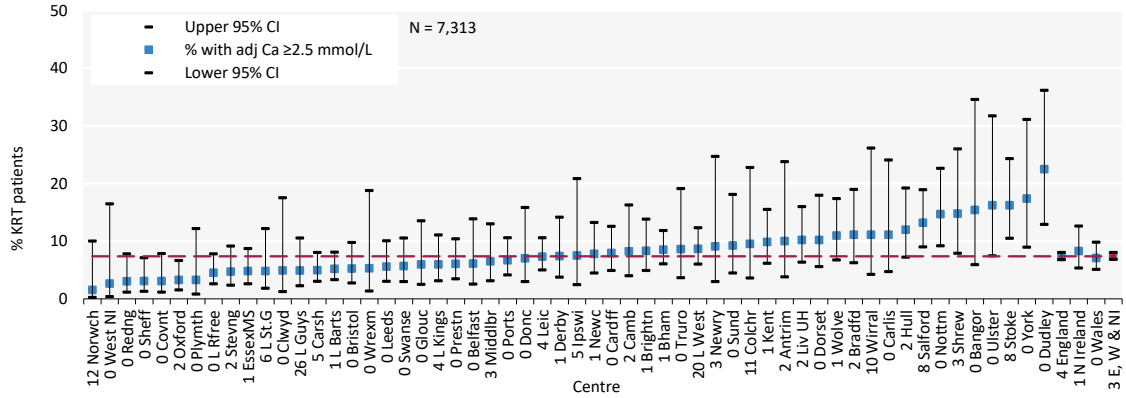

Figure 2.12 Percentage of adult patients incident to KRT in 2023 with adjusted calcium (Ca) above the normal range (>2.5 mmol/L) by centre
CI – confidence interval

Dialysis access in incident adult dialysis patients

Incident dialysis access data are primarily collected separately to the main UKRR quarterly data returns via the Multisite Dialysis Access Audit. In addition to the audit, some incident dialysis access data are 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 2023 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.

Table 2.15 Demographics and characteristics of patients incident to dialysis in 2023 by first dialysis access type

Characteristic		HD – first dialysis access type				PD	Total
		N	AVF/AVG	TL	NTL	N	
Total							
N		6,170	2,275	2,582	1,313	1,501	7,671
%			36.9	41.8	21.3		
Age (%)	Median (yrs)	65	67	62	66	60	64
	IQR (yrs)	53,75	57,76	50,73	52,75	47,73	52,74
	<45 yrs	876	22.4	53.2	24.4	343	1,219
	45–54 yrs	893	35.5	46.2	18.3	247	1,140
	55–64 yrs	1,341	37.4	44.4	18.1	305	1,646
	65–74 yrs	1,561	39.5	37.7	22.8	328	1,889
	≥75 yrs	1,499	43.0	34.6	22.5	278	1,777
PRD (%)	Diabetes	1,728	36.8	45.3	17.9	364	2,092
	Glomerulonephritis	555	42.9	39.6	17.5	198	753
	Hypertension	416	39.7	41.6	18.8	111	527
	Polycystic kidney disease	276	59.8	30.4	9.8	118	394
	Pyelonephritis	285	40.0	38.2	21.8	58	343
	Renal vascular disease	245	39.6	33.1	27.3	53	298
	Other	934	23.2	43.6	33.2	169	1,103
	Uncertain aetiology	803	42.6	38.7	18.7	231	1,034
	Missing	928	32.4	44.6	23.0	199	1,127
Referral time (%)	<90 days	1,305	7.0	49.7	43.2	163	1,468
	90–179 days	241	13.7	66.0	20.3	61	302
	180–364 days	464	27.2	53.9	19.0	110	574
	≥365 days	3,617	50.1	35.9	14.0	1,075	4,692
	Missing	543	39.2	41.3	19.5	92	635
Sex (%)	Male	3,796	36.5	42.0	21.5	919	4,715
	Female	2,125	37.3	41.2	21.5	533	2,658
	Missing	249	39.0	45.0	16.1	49	298
Ethnicity (%)	White	3,507	39.1	40.0	20.9	897	4,404
	Asian	717	34.0	43.4	22.6	196	913
	Black	443	28.0	46.7	25.3	82	525
	Other	240	31.3	47.5	21.3	52	292
	Missing	1,263	36.5	43.2	20.3	274	1,537
eGFR at start[1]	Median	7	7	6	7	8	7
	IQR	5,8	6,8	5,8	4,9	6,9	5,9
Diabetes[2] (%)	Yes	2,095	37.5	43.4	19.1	451	2,546
	No	1,062	41.2	37.8	21.0	307	1,369
	Missing	3,013	34.9	42.2	22.9	743	3,756

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

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

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 data are described in relation to age, PRD and timing of presentation. Dialysis access is best interpreted in the context of all patients starting KRT, so data were supplemented with pre-emptive Tx numbers.

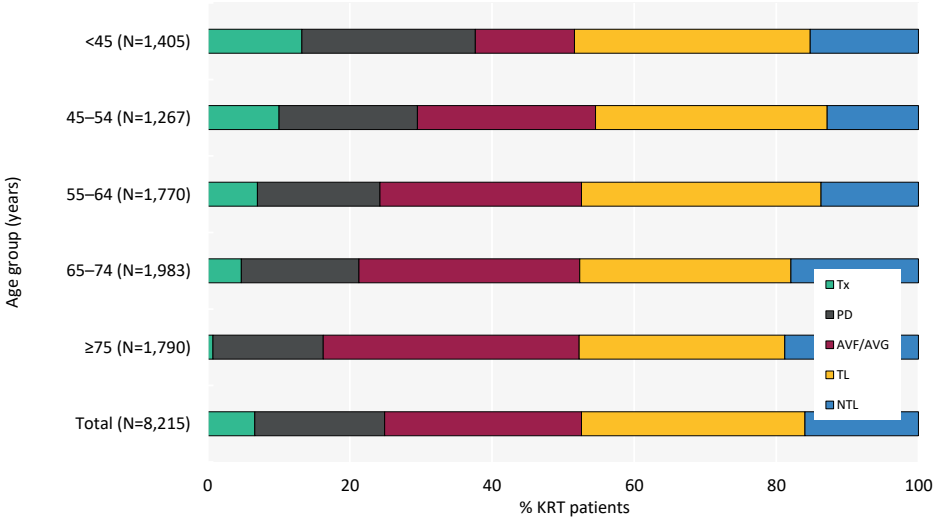

Figure 2.13 Dialysis access used for adult patients incident to KRT in 2023 by age group
AVF – arteriovenous fistula; AVG – arteriovenous graft; NTL – non-tunnelled line; TL – tunnelled line

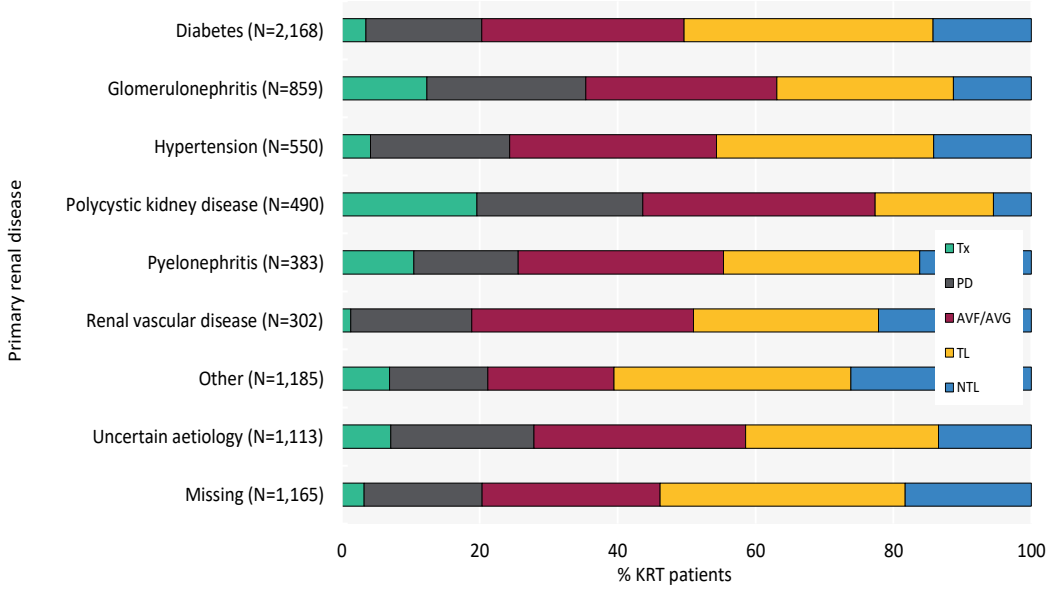

Figure 2.14 Dialysis access used for adult patients incident to KRT in 2023 by primary renal disease
AVF – arteriovenous fistula; AVG – arteriovenous graft; NTL – non-tunnelled line; TL – tunnelled line

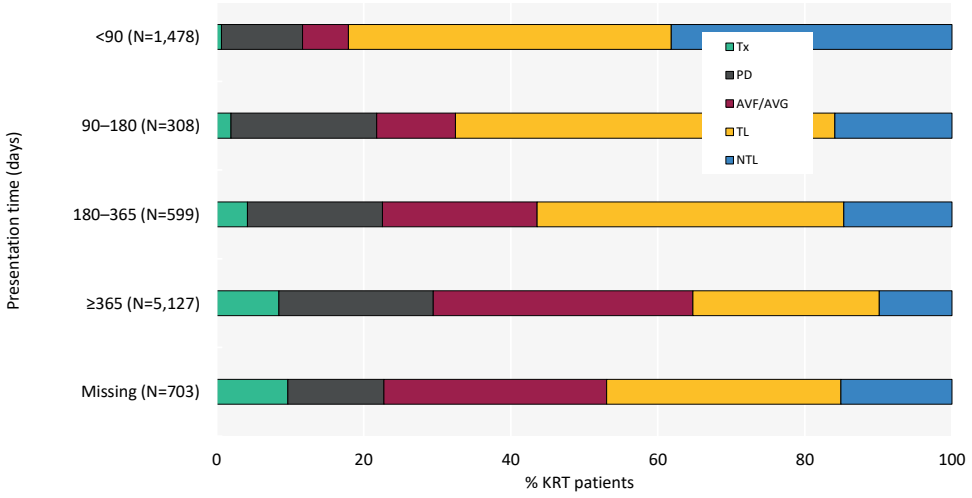

Figure 2.15 Dialysis access used for adult patients incident to KRT in 2023 by presentation time
AVF – arteriovenous fistula; AVG – arteriovenous graft; NTL – non-tunnelled line; TL – tunnelled line

The audit measures related to dialysis access for incident KRT patients have been updated following publication of the UK Kidney Association Vascular Access Guideline in 2023. Modality and access at 90 days and 1 year after KRT start are reported nationally in Table 2.16, but this is only possible for centres submitting adequate HD sessions data. The proportion of patients starting with each modality and access type is reported as previously, but split by those presenting before and after 365 days prior to KRT start in Table 2.17. This was changed from 90 days in concordance with the guideline.

Table 2.16 KRT modality and access at 90 days and 1 year after KRT start for 2022 incident HD patients

			Time after start (%)	
Access at start	N	Later modality	90 days	1 yr
AVF/AVG	965	HD access unknown	2.6	4.6
		HD - AVF/AVG	85.4	72.1
		HD - TL/NTL	5.9	6.8
		PD	0.1	0.5
		Tx	1.0	5.2
		Died	3.8	9.3
		Out/Rec/Stop	1.1	1.5
TL	1,133	HD access unknown	4.3	5.6
		HD - AVF/AVG	3.9	26.7
		HD - TL/NTL	84.7	45.1
		PD	1.9	2.6
		Tx	1.3	3.1
		Died	2.8	13.2
		Out/Rec/Stop	1.0	3.8
NTL	786	HD access unknown	3.2	3.4
		HD - AVF/AVG	4.7	16.3
		HD - TL/NTL	70.5	42.1
		PD	6.2	5.5
		Tx	0.1	2.0
		Died	13.1	26.3
		Out/Rec/Stop	2.2	4.3

Restricted to 28 centres that submitted adequate sessional data to determine access at 90 days and 1 year
Out - moved out of a centre but did not reappear in another centre; Rec - recovered kidney function (1 yr only, as patients recovering within 90 days were not included in the incident cohort); Stop - treatment withdrawal

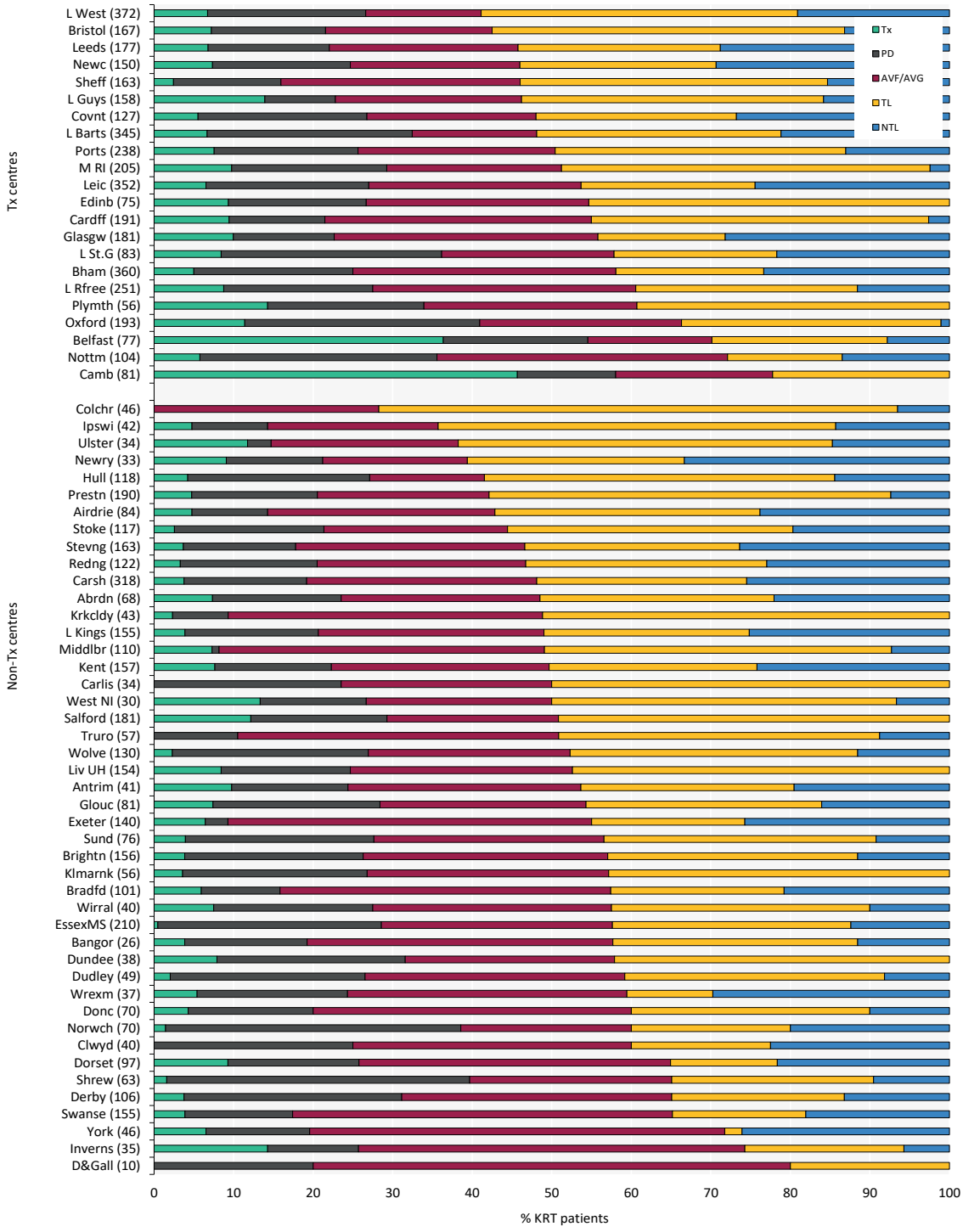

Figure 2.16 First dialysis access used for adult patients incident to KRT in 2023 by centre

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 2.17 Start modality and dialysis access used for adult patients incident to dialysis in 2023 by presentation before start of dialysis by centre

	Presenting ≥365 days (%)					Presenting <365 days (%)					Start modality (%)		
Centre	N	PD	AVF/ AVG	TL	NTL	N	PD	AVF/ AVG	TL	NTL	HD	PD	Tx
Antrim	28	14.3	42.9	32.1	10.7	9					75.6	14.6	9.8
Bangor	18	16.7	44.4	33.3	5.6	7					80.8	15.4	3.8
Belfast	40	32.5	30.0	32.5	5.0	9					45.5	18.2	36.4
Bham	231	24.2	43.7	15.2	16.9	111	14.4	16.2	28.8	40.5	75.0	20.0	5.0
Bradfd	67	13.4	49.3	25.4	11.9	28	3.6	32.1	17.9	46.4	84.2	9.9	5.9
Brightn	109	27.5	41.3	26.6	4.6	41	12.2	7.3	48.8	31.7	73.7	22.4	3.8
Bristol	102	21.6	31.4	36.3	10.8	53	3.8	5.7	69.8	20.8	78.4	14.4	7.2
Camb	32	18.8	43.8	37.5	0.0	12	33.3	16.7	50.0	0.0	42.0	12.3	45.7
Cardff	132	16.7	45.5	36.4	1.5	41	2.4	9.8	80.5	7.3	78.5	12.0	9.4
Carlis	22	36.4	36.4	27.3	0.0	12	0.0	8.3	91.7	0.0	76.5	23.5	0.0
Carsh	203	17.7	38.9	25.1	18.2	101	12.9	11.9	32.7	42.6	80.8	15.4	3.8
Clwyd	31	32.3	41.9	12.9	12.9	9					75.0	25.0	0.0
Colchr	0					1					100.0	0.0	0.0
Covnt	78	26.9	32.1	24.4	16.7	42	14.3	4.8	31.0	50.0	73.2	21.3	5.5
Derby	78	35.9	34.6	17.9	11.5	24	4.2	37.5	37.5	20.8	68.9	27.4	3.8
Donc	49	12.2	53.1	30.6	4.1	18	27.8	11.1	33.3	27.8	80.0	15.7	4.3
Dorset	60	23.3	56.7	6.7	13.3	28	7.1	14.3	32.1	46.4	74.2	16.5	9.3
Dudley	38	28.9	39.5	26.3	5.3	10	10.0	10.0	60.0	20.0	73.5	24.5	2.0
EssexMS	138	34.8	37.0	23.9	4.3	69	15.9	14.5	43.5	26.1	71.4	28.1	0.5
Exeter	100	10.0	60.0	17.0	13.0	39	5.1	10.3	25.6	59.0	90.7	2.9	6.4
Glouc	53	26.4	35.8	24.5	13.2	21	14.3	9.5	47.6	28.6	71.6	21.0	7.4
Hull	65	38.5	26.2	32.3	3.1	48	4.2	0.0	64.6	31.3	72.9	22.9	4.2
Ipswi	16	0.0	37.5	56.3	6.3	19	21.1	10.5	47.4	21.1	85.7	9.5	4.8
Kent	102	14.7	38.2	28.4	18.6	43	18.6	9.3	27.9	44.2	77.7	14.6	7.6
L Barts	141	21.3	28.4	33.3	17.0	180	32.8	7.2	32.8	27.2	67.5	25.8	6.7
L Guys	89	13.5	36.0	37.1	13.5	44	4.5	9.1	59.1	27.3	77.2	8.9	13.9
L Kings	109	21.1	37.6	24.8	16.5	37	8.1	5.4	35.1	51.4	79.4	16.8	3.9
L Rfree	161	24.8	46.0	21.7	7.5	60	10.0	10.0	53.3	26.7	72.5	18.7	8.8
L St.G	33	36.4	30.3	18.2	15.2	43	25.6	18.6	25.6	30.2	63.9	27.7	8.4
L West	217	25.8	20.7	37.3	16.1	130	13.8	6.9	51.5	27.7	73.4	19.9	6.7
Leeds	111	20.7	32.4	22.5	24.3	54	7.4	11.1	37.0	44.4	78.0	15.3	6.8
Leic	221	26.2	36.7	20.8	16.3	107	13.1	12.1	29.0	45.8	73.0	20.5	6.5
Liv UH	75	20.0	46.7	33.3	0.0	66	15.2	12.1	72.7	0.0	75.3	16.2	8.4
M RI	78	29.5	35.9	32.1	2.6	108	16.7	15.7	64.8	2.8	71.0	19.3	9.7
Middlbr	64	0.0	62.5	35.9	1.6	37	2.7	13.5	64.9	18.9	91.8	0.9	7.3
Newc	95	23.2	29.5	25.3	22.1	44	9.1	9.1	29.5	52.3	75.3	17.3	7.3
Newry	23	17.4	26.1	30.4	26.1	6					78.8	12.1	9.1
Norwch	33	51.5	27.3	15.2	6.1	21	28.6	14.3	23.8	33.3	61.4	37.1	1.4
Nottm	79	34.2	48.1	13.9	3.8	19	21.1	0.0	21.1	57.9	64.4	29.8	5.8
Oxford	126	34.1	34.1	30.2	1.6	44	29.5	13.6	56.8	0.0	59.1	29.5	11.4
Plymth	35	28.6	31.4	40.0	0.0	13	7.7	30.8	61.5	0.0	66.1	19.6	14.3
Ports	161	20.5	32.3	39.8	7.5	58	15.5	12.1	39.7	32.8	74.4	18.1	7.6
Prestn	124	17.7	32.3	46.8	3.2	57	14.0	1.8	66.7	17.5	79.5	15.8	4.7
Redng	78	19.2	38.5	28.2	14.1	40	15.0	5.0	37.5	42.5	79.5	17.2	3.3
Salford	111	23.4	30.6	45.9	0.0	48	10.4	10.4	79.2	0.0	70.7	17.1	12.2
Sheff	103	15.5	40.8	29.1	14.6	55	10.9	12.7	58.2	18.2	84.0	13.5	2.5
Shrew	48	43.8	33.3	16.7	6.3	14	21.4	0.0	57.1	21.4	60.3	38.1	1.6
Stevng	105	18.1	38.1	27.6	16.2	52	7.7	13.5	28.8	50.0	82.2	14.1	3.7
Stoke	67	23.9	34.3	34.3	7.5	47	12.8	8.5	40.4	38.3	78.6	18.8	2.6
Sund	50	30.0	40.0	30.0	0.0	23	13.0	8.7	47.8	30.4	72.4	23.7	3.9
Swanse	113	14.2	61.9	11.5	12.4	36	13.9	11.1	36.1	38.9	82.6	13.5	3.9
Truro	44	9.1	50.0	38.6	2.3	13	15.4	7.7	46.2	30.8	89.5	10.5	0.0
Ulster	19	0.0	36.8	47.4	15.8	11	9.1	9.1	63.6	18.2	85.3	2.9	11.8

Table 2.17 Continued

	Presenting ≥365 days (%)					Presenting <365 days (%)					Start modality (%)		
Centre	N	PD	AVF/ AVG	TL	NTL	N	PD	AVF/ AVG	TL	NTL	HD	PD	Tx
West NI	18	16.7	33.3	44.4	5.6	8					73.3	13.3	13.3
Wirral	24	29.2	45.8	20.8	4.2	13	7.7	7.7	61.5	23.1	72.5	20.0	7.5
Wolve	86	27.9	37.2	27.9	7.0	41	19.5	2.4	56.1	22.0	73.1	24.6	2.3
Wrexm	29	24.1	41.4	3.4	31.0	6					75.7	18.9	5.4
York	30	16.7	70.0	0.0	13.3	13	7.7	23.1	7.7	61.5	80.4	13.0	6.5
Total	**4,692**	**22.9**	**38.6**	**27.7**	**10.8**	**2,343**	**14.3**	**10.7**	**45.1**	**29.9**	**74.7**	**18.4**	**6.9**

Start modality breakdown includes patients with missing presentation time
Blank cells - referral data completeness < 70% or N<10; 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

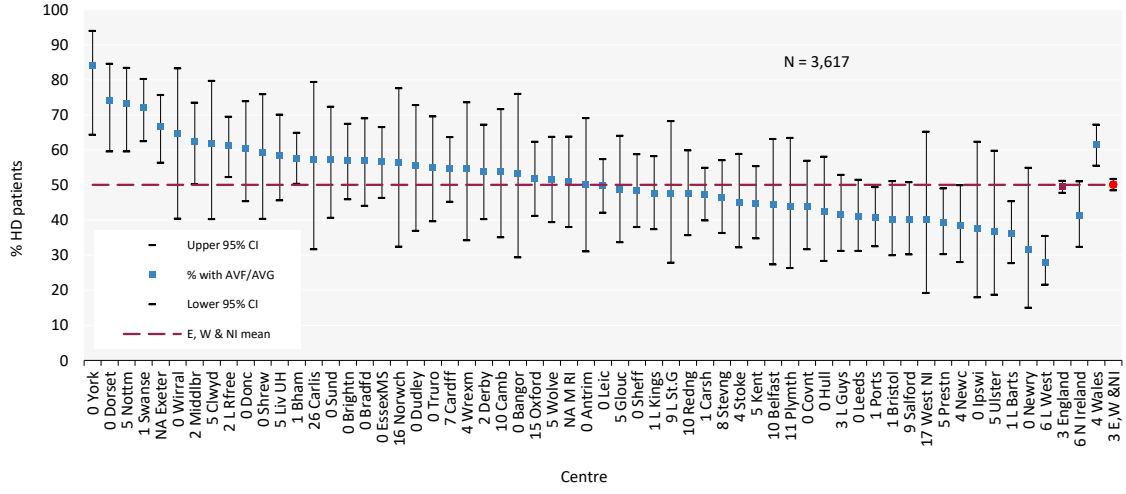

Figure 2.17 Percentage of adult patients incident to HD in 2023 who started dialysis using either an arteriovenous fistula (AVF) or an arteriovenous graft (AVG) by centre, excluding those presenting less than 365 days before KRT start

CI - confidence interval
Exeter and Manchester 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 2022 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 2.18 90 days and 1 year after 90 days survival (adjusted to age 60 years) of incident adult KRT patients (2021-2022 2 year cohort) by country

Survival	England	N Ireland	Scotland	Wales	UK
Survival at 90 days (%)	96.4	98.5	96.9	96.7	96.5
95% CI	96.1-96.8	97.7-99.5	96.0-97.8	95.6-97.8	96.2-96.9
Survival 1 year after 90 days (%)	90.5	92.2	90.7	88.9	90.5
95% CI	90.0-91.1	89.9-94.5	89.1-92.3	86.7-91.1	90.0-91.0

CI – confidence interval

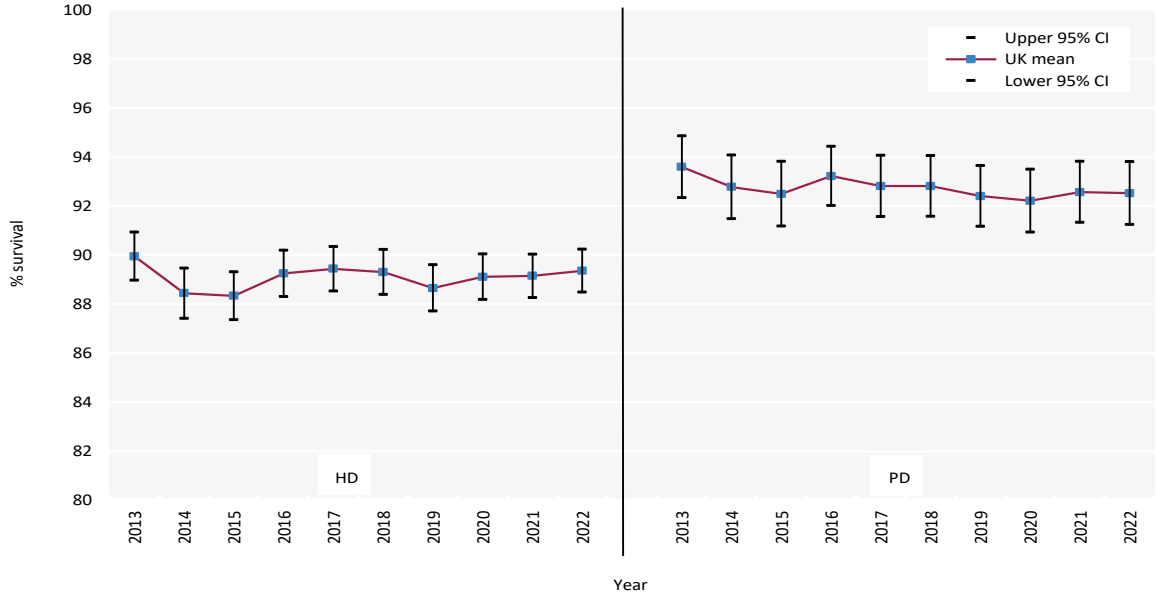

Figure 2.18 1 year after 90 days survival (adjusted to age 60 years) of incident adult KRT patients by start modality between 2013 and 2022
CI – confidence interval

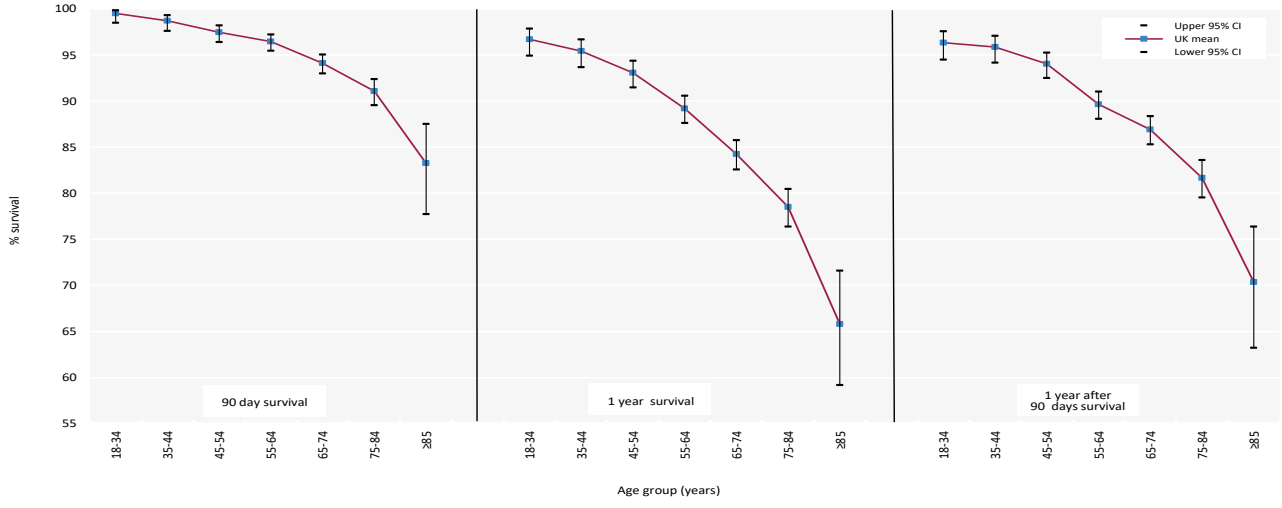

Figure 2.19 90 days, 1 year and 1 year after 90 days survival of incident adult KRT patients by age group (2022 cohort)
CI – confidence interval

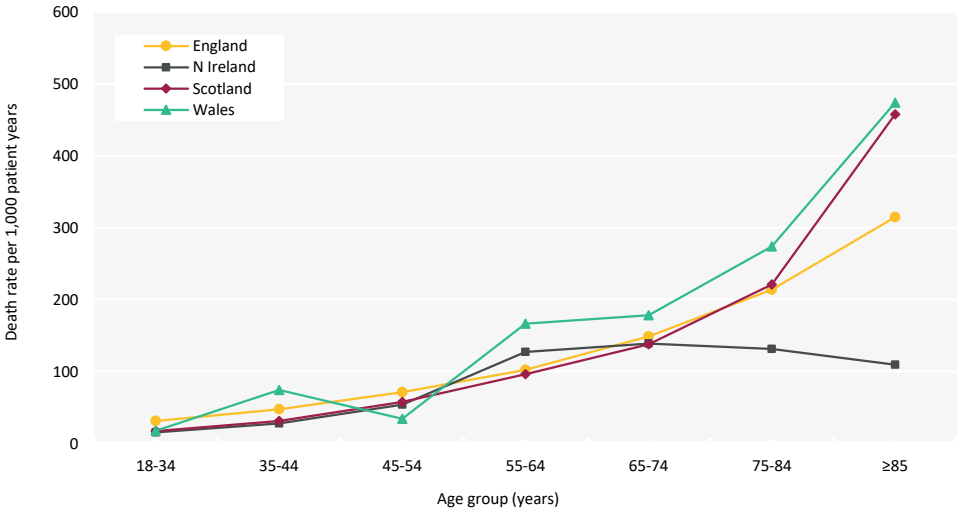

Figure 2.20 1 year after 90 days death rate per 1,000 incident KRT adult patient years by age group and country (2019-2022 4 year cohort)

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).

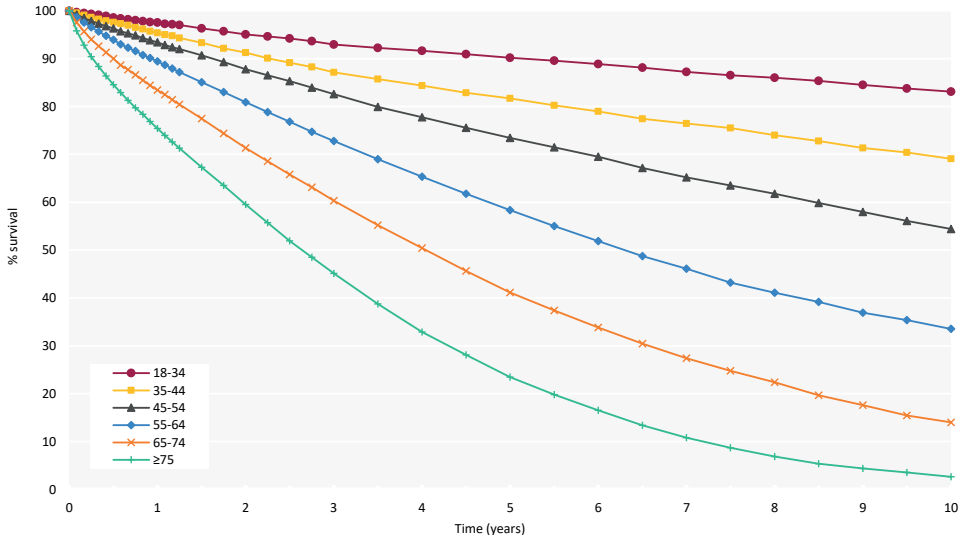

Figure 2.21 Survival (unadjusted) of incident adult KRT patients from day 0 by age group (2013-2022 10 year cohort)

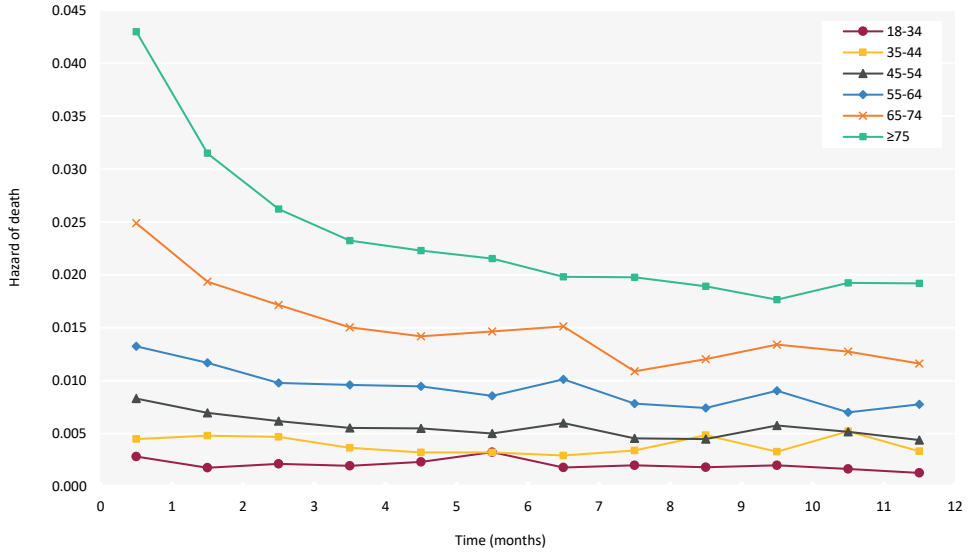

Figure 2.22 Monthly hazard of death (unadjusted) of incident adult KRT patients from day 0 to 1 year by age group (2013-2022 10 year cohort)

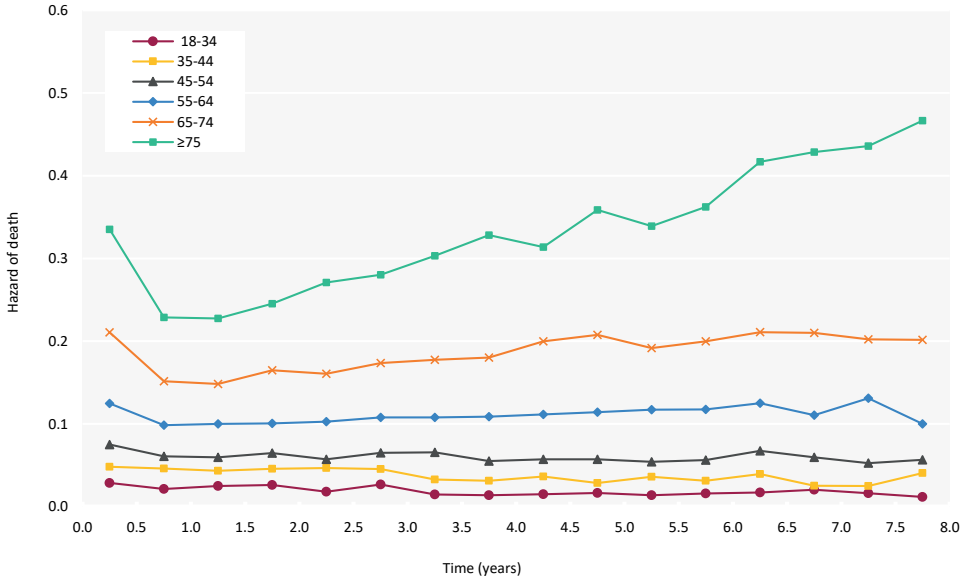

Figure 2.23 6 monthly hazard of death (unadjusted) of incident adult KRT patients from day 0 to 8 years by age group (2013-2022 10 year cohort)

Table 2.19 Survival (unadjusted) of incident adult KRT patients aged <65 years (2003-2022)

	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
2022	92.5										91.6-93.2	4,345
2021	92.1	85.7									84.6-86.7	4,220
2020	92.2	84.9	79.0								77.7-80.2	4,138
2019	93.2	86.4	80.0	74.3							73.0-75.6	4,188
2018	92.9	86.9	80.1	74.8	70.1						68.6-71.4	4,253
2017	93.0	87.2	81.6	76.4	71.7	67.1					65.7-68.5	4,237
2016	92.9	87.5	82.1	77.2	71.4	66.5	62.2				60.7-63.7	4,008
2015	92.3	86.5	81.4	76.9	72.6	68.4	63.4	59.6			58.1-61.2	3,925
2014	92.8	86.8	81.4	77.0	73.4	69.3	65.1	61.4	58.0		56.3-59.6	3,666
2013	93.7	88.2	83.1	77.7	73.3	68.6	64.6	60.2	56.5	53.5	51.8-55.1	3,572
2012	93.1	87.4	81.9	76.8	72.6	68.6	64.9	60.9	57.5	54.0	52.3-55.6	3,515
2011	93.3	88.6	83.6	79.0	74.5	70.9	67.7	64.7	60.7	57.5	55.8-59.2	3,341
2010	92.3	86.6	81.7	77.4	72.8	69.6	66.4	62.5	59.6	56.7	54.9-58.3	3,364
2009	91.2	85.1	80.4	76.3	71.2	67.1	63.8	60.4	57.4	54.6	52.9-56.3	3,392
2008	91.5	86.0	81.2	76.9	73.2	69.6	65.7	62.4	59.5	56.6	54.9-58.3	3,453
2007	92.5	86.9	81.7	76.7	72.9	69.2	65.8	62.5	59.1	56.1	54.4-57.8	3,317
2006	90.6	85.0	80.0	75.5	71.8	67.9	63.8	60.9	57.8	55.1	53.4-56.9	3,151
2005	89.6	83.5	78.4	73.7	69.1	65.5	62.4	59.4	56.4	53.9	52.0-55.7	2,834
2004	89.6	83.3	78.0	72.5	67.8	64.1	60.9	57.1	54.6	53.0	51.0-54.9	2,538
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

CI - confidence interval

Table 2.20 Survival (unadjusted) of incident adult KRT patients aged ≥65 years (2003-2022)

	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
2022	80.8										79.5-82.0	3,838
2021	81.6	68.1									66.6-69.6	3,761
2020	79.4	65.0	52.6								50.9-54.2	3,671
2019	80.0	64.4	52.9	42.1							40.6-43.7	3,949
2018	79.3	65.3	51.8	41.8	32.5						31.0-34.0	3,823
2017	79.3	67.5	53.6	42.0	32.9	25.1					23.7-26.5	3,831
2016	80.1	65.3	52.9	40.4	30.9	24.1	18.4				17.2-19.7	3,757
2015	78.2	64.9	52.2	42.0	32.0	24.9	19.5	14.5			13.4-15.7	3,811
2014	78.5	64.2	52.2	41.3	32.8	26.2	19.8	15.4	11.6		10.6-12.7	3,588
2013	78.5	64.6	53.1	42.9	34.5	27.6	20.7	15.5	11.3	8.4	7.5-9.4	3,435
2012	77.2	65.1	54.2	44.0	35.4	27.6	21.8	17.1	13.3	10.7	9.6-11.8	3,326
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	3,353
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	3,282
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	3,376
2008	74.6	61.0	49.7	40.3	32.0	25.6	20.4	16.1	12.1	9.0	8.0-10.0	3,180
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	37.1	28.8	22.9	17.4	13.2	10.5	8.3	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	2,943
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

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 2.21). 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 2.21. 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 2.21 1 year after 90 days adjusted survival (60 years, male and median comorbidity score) of incident adult KRT patients by centre (2019-2022 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	70	88.7	81.0	95.4				
Bangor	90	90.2	82.4	95.0	90	92.9	84.8	96.3
Inverns	101	95.0	83.0	94.8				
Ulster	104	89.8	83.1	94.8	97	89.0	85.1	96.2
Clwyd	107	86.9	83.2	94.7	107	88.9	85.6	96.1
Dundee	124	93.6	83.9	94.5				
Newry	129	87.1	84.0	94.4				
Wrexm	132	85.5	84.1	94.4	132	88.3	86.4	95.8
Carlis	137	87.7	84.2	94.3	136	89.8	86.5	95.8
Antrim	142	94.7	84.4	94.3				
West NI	142	91.5	84.4	94.3	138	90.4	86.6	95.8
Colchr	144	92.3	84.4	94.3	137	94.5	86.6	95.8
Krkcldy	166	94.1	84.9	94.1				
Klmarnk	180	88.8	85.2	93.9				
Wirral	182	89.5	85.2	93.9	182	92.6	87.5	95.4
Ipswi	186	89.5	85.3	93.9	179	91.2	87.5	95.5
York	194	88.6	85.4	93.8	194	90.8	87.7	95.4
Abrdn	201	90.3	85.5	93.8				
Donc	201	88.7	85.5	93.8	198	91.0	87.8	95.3
Truro	208	91.6	85.6	93.7	199	93.4	87.8	95.3
Shrew	223	86.1	85.8	93.7	221	89.1	88.1	95.2
Dudley	227	92.5	85.9	93.6	227	93.9	88.1	95.2
Plymth	240	88.7	86.0	93.6	240	91.7	88.3	95.1
Airdrie	261	90.7	86.2	93.4				
Glouc	287	91.0	86.4	93.3	276	92.6	88.6	95.0
Sund	299	86.4	86.5	93.3	297	89.8	88.8	94.9
Dorset	325	93.8	86.7	93.2	324	94.9	88.9	94.8
Bradfd	326	86.1	86.7	93.2	326	89.3	88.9	94.8
Edinb	330	91.5	86.7	93.2				
Belfast	332	94.4	86.8	93.2				
L St.G	354	90.6	86.9	93.1	339	92.2	89.0	94.8
Derby	358	92.9	86.9	93.1	358	94.4	89.1	94.7
Hull	381	91.0	87.0	93.0	381	93.0	89.2	94.6
Middlbr	390	92.6	87.1	93.0	389	94.1	89.3	94.6
Norwch	392	90.9	87.1	93.0	381	92.2	89.2	94.6
Wolve	411	87.5	87.2	92.9	411	90.8	89.4	94.6
Redng	444	94.5	87.3	92.8	443	95.6	89.5	94.5
Stoke	458	87.5	87.4	92.8	443	89.8	89.5	94.5
Newc	461	90.6	87.4	92.8	461	92.8	89.6	94.5
Nottm	482	87.5	87.5	92.7	482	90.8	89.6	94.4
Brightn	517	88.5	87.6	92.7	513	90.7	89.7	94.4

Table 2.21 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
Covnt	524	90.0	87.6	92.7	516	91.8	89.7	94.4
Camb	531	94.2	87.6	92.7	531	95.2	89.8	94.3
Swanse	535	88.6	87.6	92.6	535	91.2	89.8	94.3
EssexMS	537	91.4	87.6	92.6	526	93.4	89.8	94.4
Bristol	562	89.9	87.7	92.6	544	92.2	89.8	94.3
Kent	615	87.0	87.8	92.5	615	89.5	90.0	94.2
Cardff	616	88.3	87.8	92.5	616	90.4	90.0	94.2
Liv UH	624	90.7	87.9	92.5	611	93.2	90.0	94.2
Sheff	631	91.4	87.9	92.5	630	93.3	90.0	94.2
Salford	634	87.3	87.9	92.5	630	90.1	90.0	94.2
Leeds	639	91.7	87.9	92.5	639	93.4	90.0	94.2
Prestn	667	86.5	87.9	92.4	666	89.9	90.1	94.2
Stevng	686	93.0	88.0	92.4	677	94.5	90.1	94.1
L Guys	693	90.7	88.0	92.4	693	92.0	90.1	94.1
M RI	709	90.5	88.0	92.4	679	92.9	90.1	94.1
Glasgw	745	89.8	88.1	92.3				
L Kings	746	91.6	88.1	92.3	734	93.7	90.2	94.1
Oxford	782	92.7	88.2	92.3	774	94.3	90.3	94.0
Ports	884	89.3	88.3	92.2	868	91.7	90.4	94.0
Carsh	975	89.3	88.4	92.1	937	91.7	90.5	93.9
L Rfree	995	88.5	88.4	92.1	969	91.3	90.5	93.9
L Barts	1,191	93.8	88.6	92.0	1,140	95.0	90.7	93.8
Leic	1,278	90.6	88.7	91.9	1,261	92.4	90.8	93.7
Bham	1,406	92.0	88.8	91.9	1,385	93.7	90.9	93.7
L West	1,494	90.7	88.8	91.8	1,441	92.5	90.9	93.6

[1]Centres excluded if <85% comorbidity data were available – this included Belfast, Antrim, Newry and all Scottish kidney centres
[1]Survival 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.publichealthscotland.scot/publications/scottish-renal-registry/scottish-renal-registry-annual-report-2024/

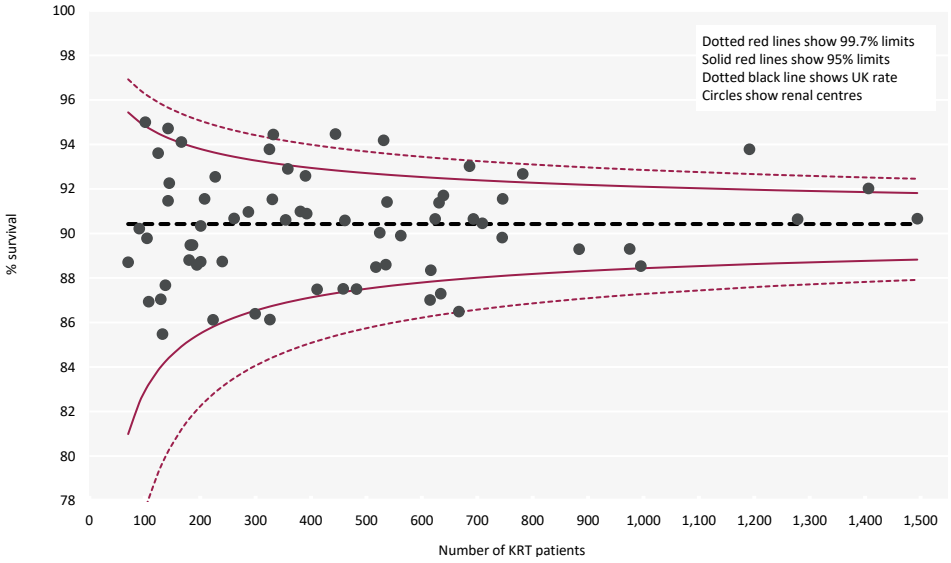

Figure 2.24 1 year after 90 days survival (adjusted to age 60 years) of incident adult KRT patients by centre (2019-2022 4 year cohort)

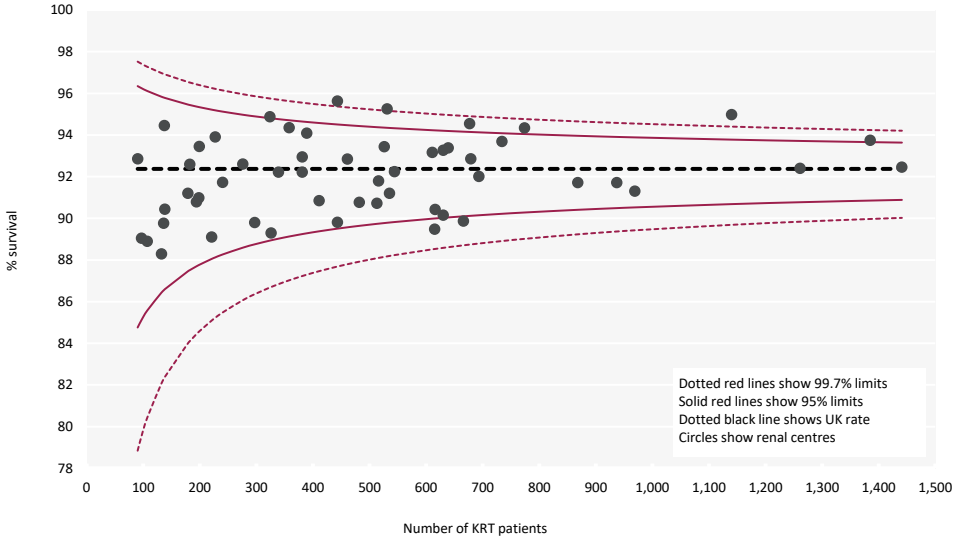

Figure 2.25 1 year after 90 days survival (adjusted to age 60 years, male and median comorbidity score) of incident adult KRT patients by centre (2019-2022 4 year cohort)

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 2.22 Cause of death in the first 90 days and one year after 90 days in incident adult KRT patients by age group (2019-2022 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	302	20.9	23.8	19.8	625	19.5	22.2	18.1
Cerebrovascular disease	34	2.3	3.2	2.1	114	3.6	4.7	3.0
Infection	328	22.7	23.0	22.5	679	21.2	22.8	20.4
Malignancy	132	9.1	6.9	9.9	296	9.2	6.8	10.5
Treatment withdrawal	118	8.1	4.8	9.4	353	11.0	7.9	12.6
Other	463	32.0	33.3	31.5	954	29.8	30.3	29.5
Uncertain aetiology	71	4.9	5.3	4.8	184	5.7	5.3	6.0
Total (with data)	**1,448**	**100.0**	**100.0**	**100.0**	**3,205**	**100.0**	**100.0**	**100.0**
Missing	91	5.9	7.1	5.5	244	7.1	7.3	7.0