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UK Kidney Association
UK Renal Registry

UK Renal Registry
26th Annual Report

Data to 31/12/2022

- Chronic kidney disease
- Incidence of KRT
- Prevalence of KRT
- Transplant
- In-centre haemodialysis
- Peritoneal dialysis
- Home haemodialysis
- Paediatrics

UK Renal Registry 26th Annual Report

Data to 31/12/2022

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Patient summary of the UKRR 26th Annual Report – adults

UK Renal Registry (2024) UK Renal Registry Summary of Annual Report – analyses of adult data to the end of 2022, Bristol, UK.
Available from https://ukkidney.org/audit-research/annual-report

Patient summary of the UKRR 26th Annual Report – children and young people

UK Renal Registry (2024) UK Renal Registry Summary of Annual report – analyses of paediatric data to the end of 2022, Bristol, UK.
Available from https://ukkidney.org/audit-research/annual-report

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Foreword

Professor James Medcalf
Medical director, The UK Kidney Association

Welcome to the 26th UK Renal Registry Annual Report. This report includes people starting kidney replacement therapy during the year 2022, and reports the number of people (and their treatment) as of December 2022.

As I write this I am aware that some regions are describing an increase in the numbers of people receiving in-centre haemodialysis beyond what was expected. In the data here however that effect is not yet apparent – with an overall incidence of KRT of 154 per million population in 2022 (a little higher in Northern Ireland and a little lower in Scotland) which is identical to 2021, and only discernibly different during the disrupted 2020.

During 2022 it was still clear that the proportion of people starting KRT with a kidney transplant was improving again – 6.6% of people started KRT with a transplant compared to 5.9% and 5.8% during 2020 and 2021 respectively. Prior to that the rate was 8.4-9% however.

And there is significant variation between kidney centres in this report – with four centres reporting that greater than 30% of their patients started KRT either with a kidney transplant, or were on the deceased donor transplant waiting list. In contrast there are at least 10 centres where that was true for fewer than 10% of patients. In figure 4.2 it is clear that these differences persist for at least the first two years of KRT, and reported separately (UK Renal Registry (2024) Inequity of access to the UK kidney transplant waiting list) we have shown that the access to kidney transplant listing is not equal across patient level characteristics. Those interested in other ways that KRT is disparate between patients should also look at our range of reports published in conjunction with our Patient Council on this (UK Kidney Association Disparities Report).

The prevalence of people receiving KRT is increasing again at a rate similar to before the disruption of COVID-19 (0.6% overall per million population in this report with a 2.3% increase in those receiving in-centre haemodialysis). One of the challenges for planning services for patients needing KRT is that these numbers have been very varied the last five years (page 12 table 3.4) – with no increase in ICHD in 2019 and a fall during 2020 before the rate increased again at 2.3% the last two years. Whilst kidney centres enable as many people who want to have dialysis at home, and put as many people forward for a kidney transplant who are suitable, kidney centres still need to plan for more people (in the country as a whole) to have ICHD.

As previous years – we should be collectively very proud of the fact that we consistently collect so much information to help kidney centres provide the best care they can to patients with advanced CKD. It is only possible with your continued support – so as always thank you all.

Professor James Medcalf

Medical director, The UK Kidney Association, July 2024

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Appendices available from **ukkidney.org/audit-research/annual-report**

Appendix A Definitions and methodologies used in the 26th Annual Report – data to the end of 2022

Appendix B Integrated Care Board (ICB) and health board (HB) adult incidence and prevalence numbers, rates and standardised ratios – data to the end of 2022

Introduction: The UK Renal Registry's 26th Annual Report

The UK Renal Registry (UKRR) collects and reports data annually on approximately 70,000 kidney patients on kidney replacement therapy (KRT) in the UK. The annual report is an audit of the care provided to these patients at each of the 67 adult and 13 paediatric centres against national standards, in particular, the UK Kidney Association's guidelines – ukkidney.org/health-professionals/guidelines/guidelines-commentaries.

The 26th Annual Report includes patients who started KRT in 2022, as well as all patients who were on KRT at the end of 2022. The chapters are split by treatment modality (transplant, in-centre haemodialysis, peritoneal dialysis and home haemodialysis), as well as by adults and children. The online appendices cover the methodologies, including how data are collected and coded (appendix A) and include basic analyses at Integrated Care Board and health board level (appendix B) – ukkidney.org/audit-research/annual-report. Plain English summaries of the annual report have been developed in partnership with the UK Kidney Association's Patient Council and all graphs used in the report are available for use in presentations – ukkidney.org/audit-research/annual-report.

How to interpret centre analyses and outlying centres

The UKRR advises caution when comparing centre-specific attainment of clinical audit measures, because for many of these analyses no adjustment can be made for the range of factors known to influence the measured variable. The UKRR does not test for significant differences between centres – arbitrary 95% and 99% confidence intervals are created from the data to illustrate variability between centres and highlight outlying centres. Centre comparisons will become more meaningful when advanced CKD data are included to understand differences in the transition of patients onto both KRT and conservative non-dialysis pathways. Identifiable centre-specific analyses on the survival of KRT patients are published in the annual report. Although the UKRR has no statutory powers, the UKRR senior management team communicates survival outlier status with kidney centres prior to publication. Centres are asked to report their outlying status internally at trust level and to follow-up with robust mortality and morbidity meetings. They are also asked to provide evidence that the clinical governance department and chief executive of the trust housing the service have been informed. In the event that no such evidence is provided, the chief executive officer or medical director of the UKRR informs the president of the UK Kidney Association, who then takes action to ensure that the findings are properly investigated.

Chapter 1

Adults with chronic kidney disease (CKD) and estimated glomerular filtration rate (eGFR) <30mL/min/1.73m² in the UK at the end of 2022

Contents

Introduction

This is the fourth year the UKRR has published data in the annual report about patients with chronic kidney disease (CKD) outside the context of kidney replacement therapy (KRT) or acute kidney injury (AKI). The primary aim of this chapter is to present the demographic and clinical features of patients receiving treatment for CKD stages G4 and 5 at UK kidney centres at the end of 2022 (figure 1.1). A '2022 prevalent CKD population' is described, comprising individuals who:

- were reported by an adult kidney centre as receiving treatment for CKD at the end of 2022, and

- had an eGFR of <30mL/min/1.73m^2 on their last recorded creatinine measurement.
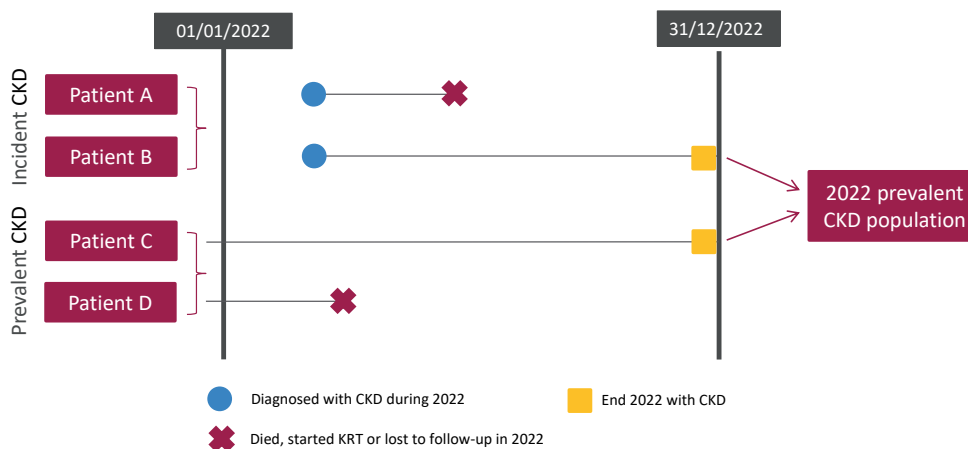
Figure 1.1 Pathways adult patients could follow to be included in the UK 2022 prevalent CKD population

Auditable aspects of care for this population are highlighted and described. For the purpose of this chapter, individuals are categorised as having CKD stage G5 (estimated glomerular filtration rate [eGFR] <15 mL/min/1.73m^2) or CKD stage G4 (eGFR 15–29mL/min/1.73m^2). The eGFR was calculated with CKD-EPI 2009 equation without racial adjustment using their last recorded creatinine from the last 2 years. Further categorisation, e.g. by eGFR trend or albuminuria is not possible using UKRR data.

Information about completeness of primary renal disease (PRD) data are presented. Whilst PRD data are known to be incomplete, no triangulation was performed using other datasets available to the UKRR, e.g. Hospital Episode Statistics (HES).

It is important to highlight that the individuals described in this chapter represent a sub-population of those with CKD in the UK. Many individuals with diagnosed CKD receive care without referral to a kidney centre, particularly those with earlier stages. Furthermore, not all kidney centres are yet submitting CKD data to the UKRR. For this reason, it is not appropriate to generalise findings from this chapter to the wider CKD population, even to those cared for in kidney centres.

Consequently, this CKD chapter asks simple questions:

- Which individuals with CKD are currently reported to the UKRR?

- What data are captured and which aspects of CKD care can be audited using them?

Rationale for analyses

Since 2016, kidney centres in England and Wales have been asked by the National Clinical Reference Group to report individuals with CKD under their care to the UKRR. In 2022 the UKRR received data from 18 units of the 53 adult centres in England and Wales (same as in 2021).

Reliable estimates of CKD prevalence in secondary care are required to inform CKD management and policy planning. The presented analyses will be performed annually to help clinicians and policy makers in this task and will be expanded as data quality and quantity improve. The UK Kidney Association guidelines (ukkidney. org/health-professionals/guidelines/guidelines-commentaries) provide audit measures relevant to the care of patients with CKD, and where data permit, their attainment by UK kidney centres in 2022 is reported in this chapter (table 1.1). Some audit measures cannot be reported because the completeness of the required data items is too low. Audit measures in guidelines that have been archived are not included. For consistency with other chapters, table 1.1 is provided to outline the addressed UK Kidney Association audit measures. However, data completeness is poor even for the analyses presented, necessitating caution in interpretation. Further detail about the completeness of data returned to the UKRR is available through the UKRR (data portal ukkidney.org/audit-research/data-portals).

Table 1.1 The UK Kidney Association audit measures relevant to CKD that are reported in this chapter

The UK Kidney Association guideline	Audit criteria	Related analysis/analyses
Commentary on the Kidney Disease Improving Global Outcomes (KDIGO) guideline on the diagnosis, evaluation, prevention and treatment of CKD mineral bone disorder (2018)	Percentage of adult CKD G5 patients with serum calcium above the normal reference range 2.2–2.5 mmol/L	Figure 1.3
Cardiovascular disease in CKD (2008)	Blood pressure in CKD stages G1–4 should be managed according to National Institute for Health and Care Excellence (NICE) guidance: <140/90 mmHg in patients without significant proteinuria and <130/80 mmHg in those with proteinuria or with diabetes	Table 1.4 (partly addressed)
Anaemia of CKD (updated 2020)	Proportion of CKD patients with eGFR <30mL/min/1.73m^2 (using CKD-EPI equation) and a 6 monthly haemoglobin level measurement	Figure 1.4
	Proportion of CKD stage G4–5 patients with haemoglobin 100–120 g/L	Figures 1.5–1.6
Commentary on the National Institute for Health and Care Excellence (NICE) guideline on KRT and conservative management (2020)	The number of patients with stage G5 CKD who were reported as being under conservative care	Table 1.2

For definitions and methods relating to this chapter see appendix A. The number preceding the centre name in each caterpillar plot indicates the percentage of missing data for that centre.

Adults with CKD in the UK at the end of 2022

Key findings

- Data about patients with CKD stages G4 and 5 who were not on KRT was reported by just 18 of the UK's adult kidney centres.

- The 2022 prevalent CKD population comprised 22,976 patients, with a median age of 77.0 years, compared to a median age of 59.7 years for those on KRT.

- CKD prevalence was 1,240 per million population (pmp) overall, but ranged from 144 to 2,497 pmp between centres. There were also substantial differences in the ages and distribution of disease stages between centres. Such large variation suggests discrepancies in the definitions used for processes of care or reporting of people with CKD between centres.

- The data reported in this chapter highlight the need for improved capture and reporting of CKD data to enable national quality assurance. Concordance with audit measures for the CKD not on KRT population cannot be addressed until this is achieved.

Analyses

Stage and demographics of adult CKD patients

For the 18 adult kidney centres, the number of prevalent patients with CKD and eGFR ≤30 mL/min/1.73m^2 was calculated as a proportion of the estimated centre catchment population (details in appendix A). Only a few centres reported patients with kidney failure as undergoing conservative care (CC). It is not clear whether a CC code means the same thing at all centres and for each patient. In particular, it is unclear which CC codes represent planned KRT for the eventuality of kidney failure, and which represent active treatment for an individual who might otherwise have started KRT. As such, people coded as receiving CC are included throughout this chapter.

Table 1.2 Number of adult patients prevalent to CKD stages G4 and 5 on 31/12/2022, including those on conservative care (CC) by stage and centre; completeness of proteinuria; number of CKD and and KRT patients as a proportion of the adult catchment population

Centre	N with CKD	N on CC	Total	% stage G4	% stage G5	% with proteinuria data (either PCR or ACR)	Estimated catchment population (millions)	CKD 2022 crude rate (pmp)	KRT 2022 crude rate (pmp)
Bham[1]	864	10	874	72.7	27.3	0.0	2.03	431	1,668
Camb	138	0	138	58.0	42.0	2.9	0.96	144	1,739
Carlis	463	53	516	80.0	20.0	65.1	0.26	2,011	1,181
Covnt	1,536	0	1,536	88.0	12.0	3.0	0.84	1,835	1,344
Derby	925	0	925	79.6	20.4	0.0	0.56	1,661	1,286
Glouc	1,115	3	1,118	87.0	13.0	0.0	0.52	2,155	1,068
L Guys	943	0	943	71.6	28.4	51.4	1.00	943	2,309
L Kings	443	0	443	44.0	56.0	24.6	0.93	478	1,505
L Rfree	2,008	296	2,304	74.8	25.2	67.3	1.33	1,737	1,823
Leic	3,789	0	3,789	83.2	16.8	57.3	2.11	1,792	1,286
Middlbr	555	1	556	69.2	30.8	0.0	0.82	680	1,168
Oxford	1,875	0	1,875	75.5	24.5	0.1	1.48	1,270	1,409
Plymth	1,012	1	1,013	84.7	15.3	40.2	0.41	2,497	1,346
Ports	2,144	1	2,145	75.2	24.8	45.2	1.77	1,213	1,131
Prestn	1,482	6	1,488	79.1	20.9	23.9	1.25	1,190	1,119
Salford	579	1	580	90.0	10.0	70.0	1.17	498	1,092
Swanse	1,855	34	1,889	82.7	17.3	0.0	0.76	2,481	1,113
Truro	796	48	844	85.0	15.0	51.2	0.37	2,312	1,290
Total	**22,522**	**454**	**22,976**	**79.1**	**20.9**	**31.7**	**18.53**	**1,240**	**1,411**

[1]The catchment population and 2022 crude rate for KRT reflect the combined Bham population (QEH and Heartlands kidney centres), but CKD patients were only reported for QEH
CC - conservative care
PCR - protein creatinine ratio
ACR - albumin creatinine ratio
QEH - Queen Elizabeth Hospital

The proportion of patients with CKD and eGFR ≤30 mL/min/1.73m^2 from each ethnic group is shown for patients with ethnicity data – the proportion of centre patients with no ethnicity is shown separately. The completeness of PRD data varies greatly between centres, making interpretation difficult. PRD completeness is shown for each centre overall and by CKD stage.

Table 1.3 Demographics and completeness of primary renal disease (PRD) data of adult patients prevalent to CKD stages G4 and 5 on 31/12/2022 by centre

Centre	N with CKD	Median age (yrs)	% male	Ethnicity					PRD completeness		
				% White	% Asian	% Black	% Other	% missing	% all stages	% stage G4	% stage G5
Bham	874	69.0	56.4	60.8	23.8	12.9	2.4	10.8	18.3	9.8	41.0
Camb	138	72.1	57.2	93.1	3.1	2.3	1.5	5.1	50.0	36.2	69.0
Carlis	516	78.3	54.7	99.7	0.3	0.0	0.0	37.6	16.3	13.6	27.2
Covnt	1,536	80.0	56.1	88.8	9.4	1.8	0.0	7.2	74.3	72.9	84.8
Derby	925	78.2	52.2	91.7	5.4	2.3	0.6	14.1	95.7	95.1	97.9
Glouc	1,118	78.9	58.1	95.0	2.1	1.4	1.4	7.2	49.9	47.0	69.7
L Guys	943	71.6	55.2	59.7	7.0	28.7	4.5	27.7	70.2	63.3	87.7
L Kings	443	68.2	59.4	43.8	8.9	44.7	2.7	23.7	22.3	9.2	32.7
L Rfree	2,304	76.0	56.3	56.4	18.1	12.8	12.7	15.0	45.2	40.7	58.7
Leic	3,789	78.0	55.0	79.6	16.2	2.8	1.4	28.1	58.2	57.1	63.8
Middlbr	556	72.5	55.9	95.9	3.2	0.5	0.5	21.4	20.0	11.4	39.2
Oxford	1,875	75.9	57.8	88.0	6.2	2.4	3.3	77.7	11.2	8.8	18.5
Plymth	1,013	79.5	51.8	98.1	0.6	0.1	1.1	5.2	14.1	13.1	20.0
Ports	2,145	76.2	58.7	98.0	1.1	0.4	0.4	42.7	10.2	7.8	17.5
Prestn	1,488	77.0	56.0	92.3	5.5	1.2	0.9	50.1	4.8	3.4	10.0
Salford	580	74.6	59.3	83.3	11.5	3.5	1.8	11.4	9.1	8.8	12.1
Swanse	1,889	78.8	55.1	98.3	0.7	0.4	0.6	42.4	32.8	29.7	47.7
Truro	844	79.9	55.1	99.2	0.5	0.1	0.2	0.4	21.9	17.3	48.0
Total	**22,976**	**77.0**	**56.0**	**83.3**	**8.8**	**5.4**	**2.6**	**28.5**	**37.1**	**34.7**	**46.0**
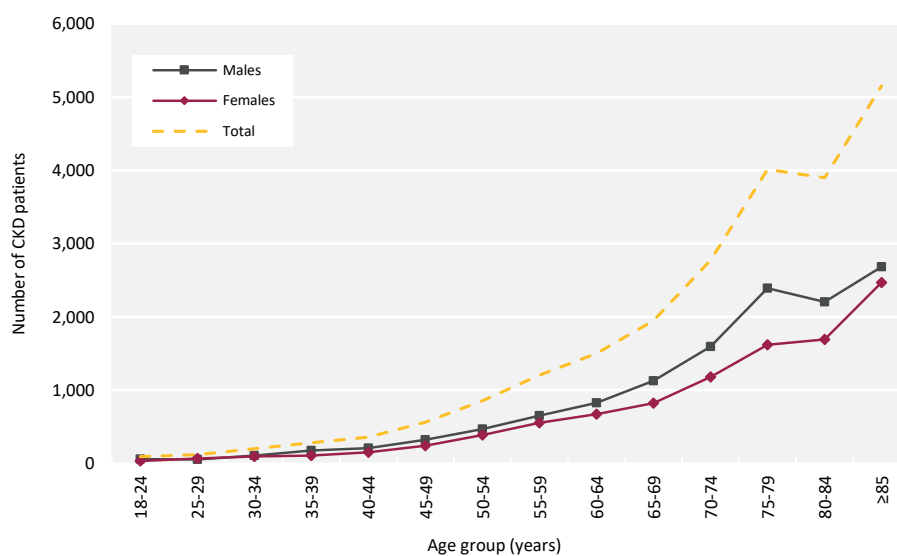
Figure 1.2 Number of adult patients prevalent to CKD stages G4 and 5 on 31/12/2022 by age group and sex

Blood pressure in adult CKD patients

Only 7 centres submitted sufficient blood pressure data for analysis (Bham, Derby, Glouc, L Rfree, Plymth, Ports, Swansea).

Table 1.4 Blood pressures in adult patients prevalent to CKD stages G4 and 5 on 31/12/2022 by stage

	All stages				Stage G4				Stage G5			
	N (% complete)	Median SBP	Median DBP	N (%) <140/90[1]	N (% complete)	Median SBP	Median DBP	N (%) <140/90[1]	N (% complete)	Median SBP	Median DBP	N (%) <140/90[1]
All	5008 (48.8)	141	76	2212 (44.2)	3632 (44.8)	140	76	1681 (46.3)	1376 (63.5)	145	76	531 (38.6)
Age group (yrs)												
18-29	70 (66.7)	135	82	40 (57.1)	55 (68.8)	136	83	31 (56.4)	15 (60)	131	75	9 (60)
30-39	118 (61.1)	135	83	70 (59.3)	86 (60.1)	134	81.5	56 (65.1)	32 (64)	140	85.5	14 (43.8)
40-49	273 (63.3)	136	84	149 (54.6)	175 (58.3)	134	82	107 (61.1)	98 (74.8)	139.5	87	42 (42.9)
50-59	539 (60.8)	139	82	251 (46.6)	366 (57.4)	137	82	182 (49.7)	173 (69.8)	144	82	69 (39.9)
60-64	377 (56.1)	142	79	165 (43.8)	251 (51.3)	140	79	114 (45.4)	126 (68.9)	146	79	51 (40.5)
65-69	478 (54.4)	142	76	212 (44.4)	341 (50.7)	140	77	158 (46.3)	137 (66.8)	145	74	54 (39.4)
70-74	642 (52.7)	141	75	296 (46.1)	507 (50.5)	141	75	235 (46.4)	135 (63.1)	142	75	61 (45.2)
75-79	894 (48.1)	142	73	390 (43.6)	660 (43.9)	140	73	302 (45.8)	234 (65.9)	146	74	88 (37.6)
80-84	817 (47.1)	144	73	320 (39.2)	612 (43.6)	143	73	246 (40.2)	205 (61.9)	147	72	74 (36.1)
≥85	800 (34.9)	144	71	319 (39.9)	579 (31.1)	142	71	250 (43.2)	221 (51.9)	148	71	69 (31.2)
Sex												
Male	2836 (49.3)	142	76	1255 (44.3)	2061 (45.6)	140	76	959 (46.5)	775 (63.2)	145	76	296 (38.2)
Female	2172 (48.1)	141	76	957 (44.1)	1571 (43.9)	140	76	722 (46)	601 (63.8)	145	76	235 (39.1)

[1] % <140/90 mmHg of patients with complete blood pressure data

DBP - diastolic blood pressure; SBP - systolic blood pressure (both measured in mmHg)

Biochemistry parameters in adult CKD patients

The UK Kidney Association guideline on CKD mineral bone disease contains only one audit measure, which is the percentage of patients with adjusted calcium above the target range.
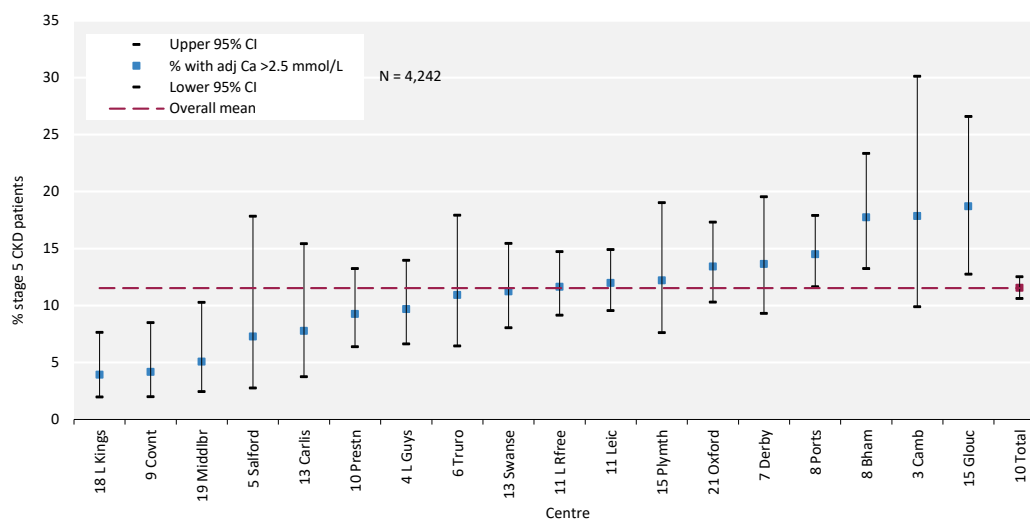
Figure 1.3 Percentage of adult patients prevalent to CKD stage G5 on 31/12/2022 with adjusted serum calcium (Ca) >2.5 mmol/L by centre

CI - confidence interval

Anaemia in adult CKD patients

The percentage of patients with haemoglobin (Hb) 100–120 g/L is presented overall and by CKD stage.
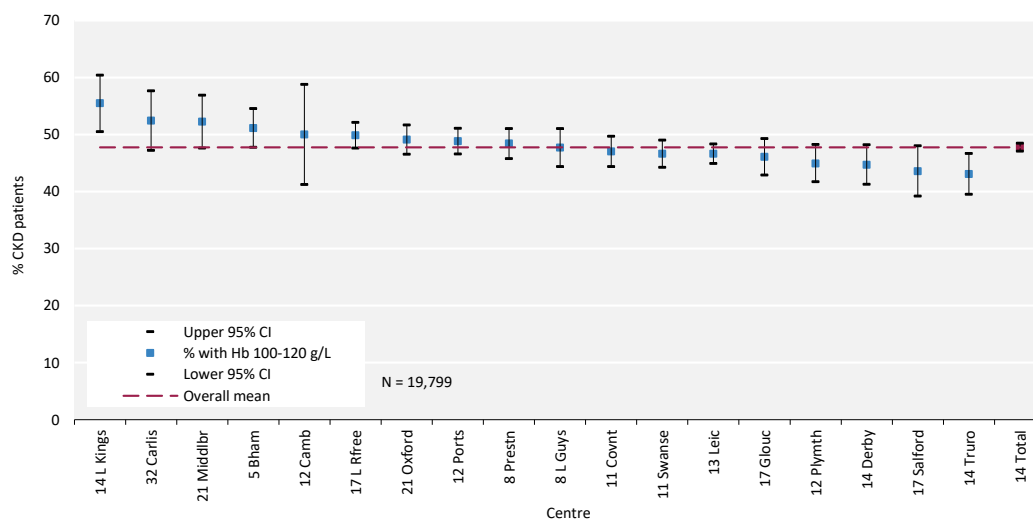
Figure 1.4 Percentage of adult patients prevalent to CKD stages G4 and 5 on 31/12/2022 with haemoglobin (Hb) 100–120 g/L by centre

CI - confidence interval
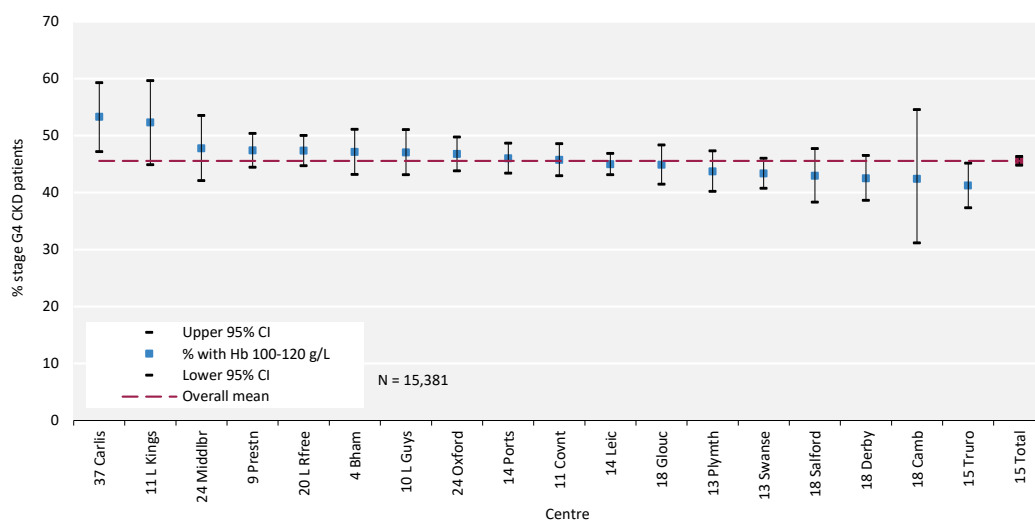
Figure 1.5 Percentage of adult patients prevalent to CKD stage G4 on 31/12/2022 with haemoglobin (Hb) 100–120 g/L by centre

CI - confidence interval
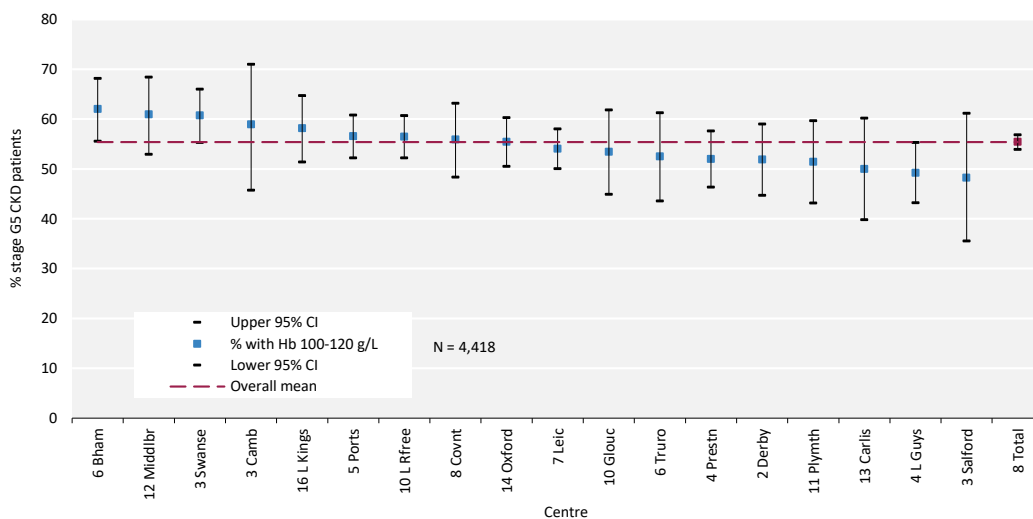
Figure 1.6 Percentage of adult patients prevalent to CKD stage G5 on 31/12/2022 with haemoglobin (Hb) 100-120 g/L by centre

CI - confidence interval

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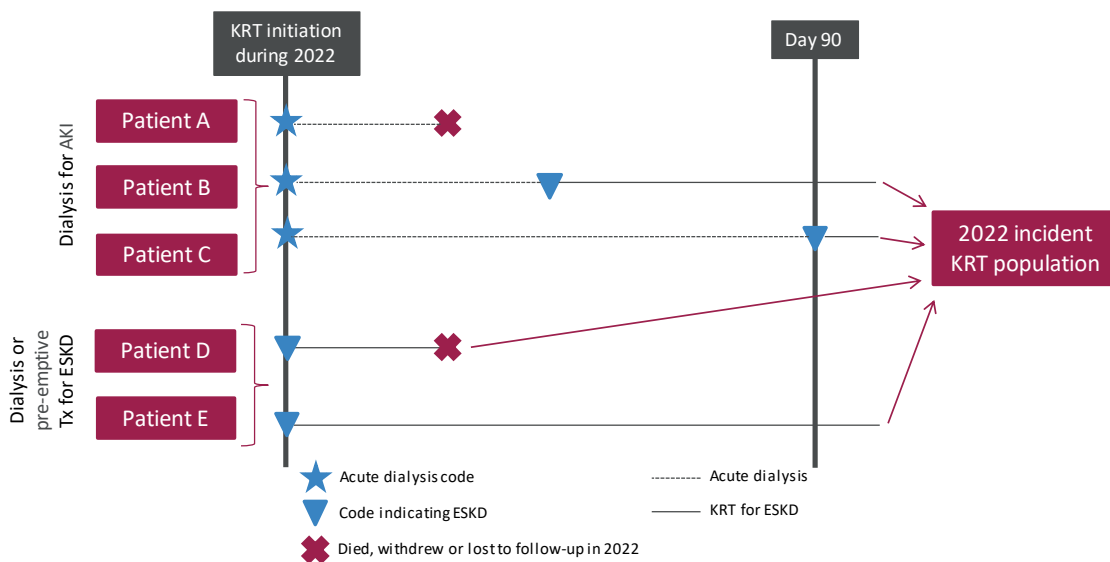
Figure 2.1 Example histories for patients starting KRT, illustrating the use of timeline codes to define dialysis as being 'acute' or for ESKD

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 2018	2019	2020	2021	2022	Estimated catchment population (millions)	2022 crude rate (pmp)
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
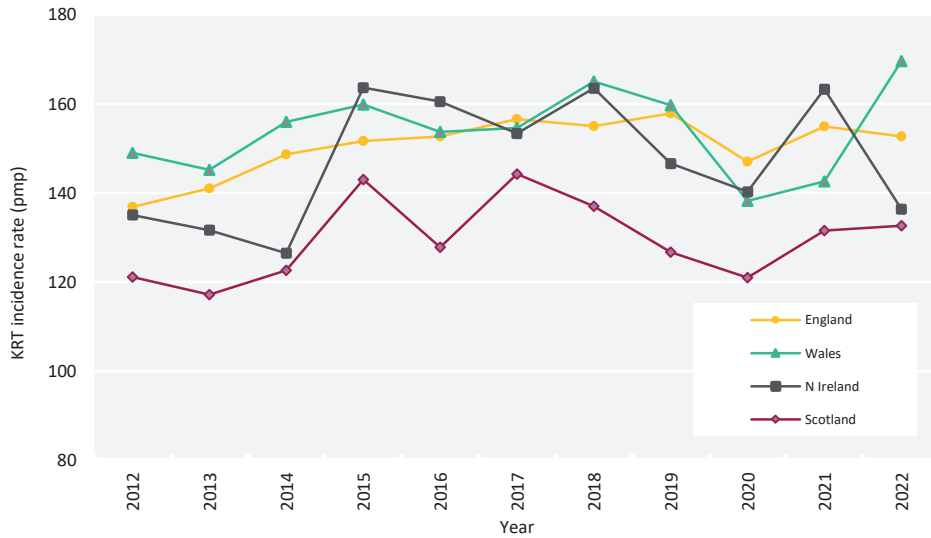
Figure 2.2 Adult KRT incidence rates by country between 2012 and 2022
pmp – per million population
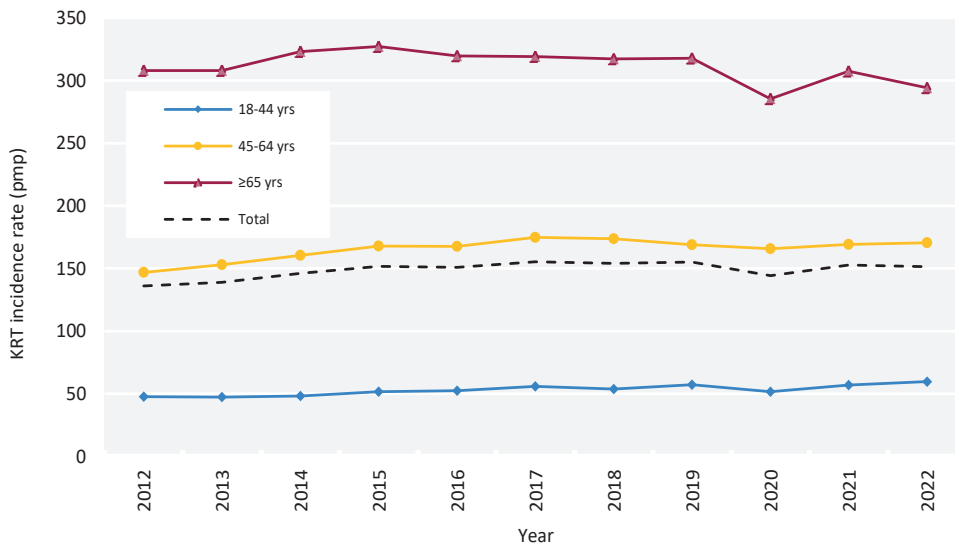
Figure 2.3 Adult KRT incidence rates by age group between 2012 and 2022
pmp – per million population

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
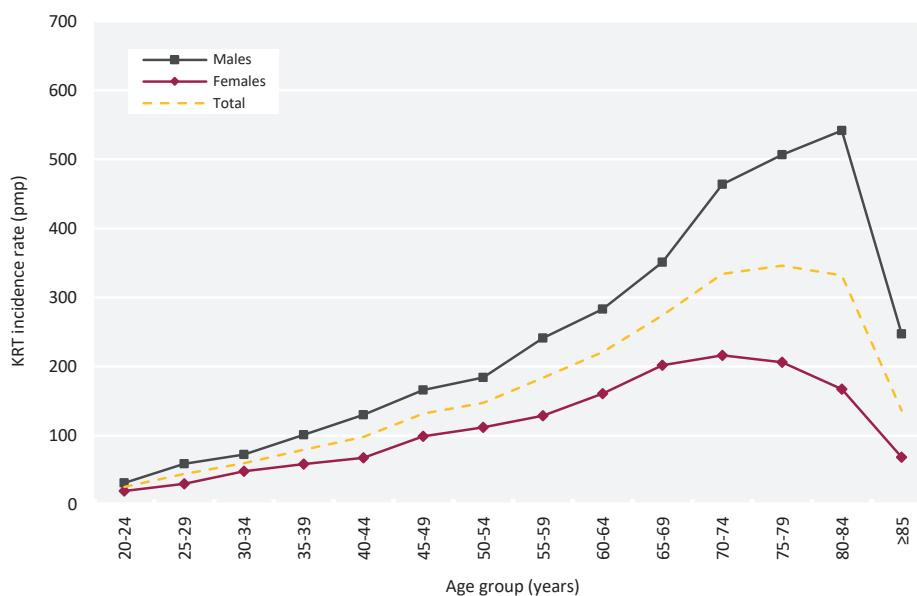
Figure 2.4 Incidence rates for adult patients starting KRT in 2022 by age group and sex

pmp – per million population

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

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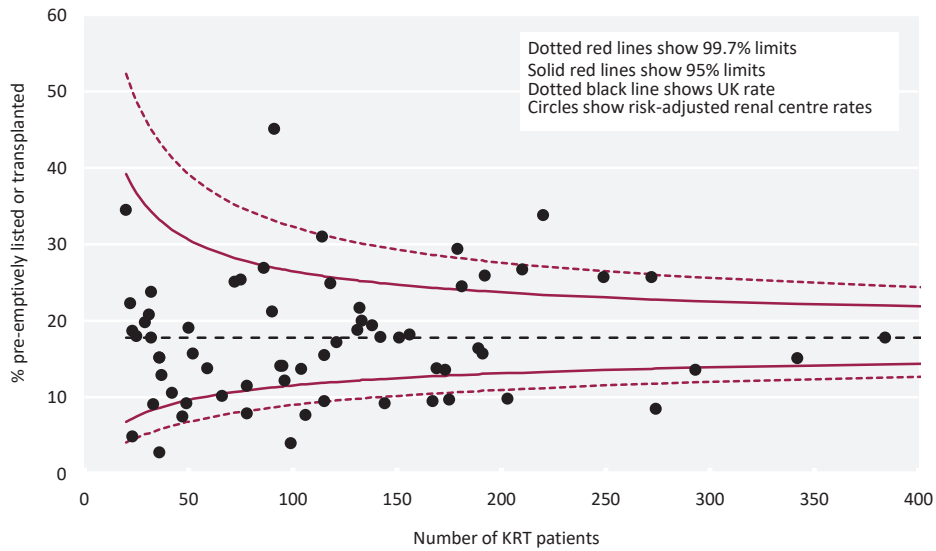
Figure 2.5 Transplant-status (listed or transplanted) at the start of KRT for adult patients incident to KRT in 2022 by centre
Analysis is adjusted for age, sex and PRD (diabetes versus non-diabetes)

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

Country	N	Patients who started RRT					Patients still on RRT at 90 days		
		% 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

Start modality	N	Later modality	Time after start (%)			
			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.
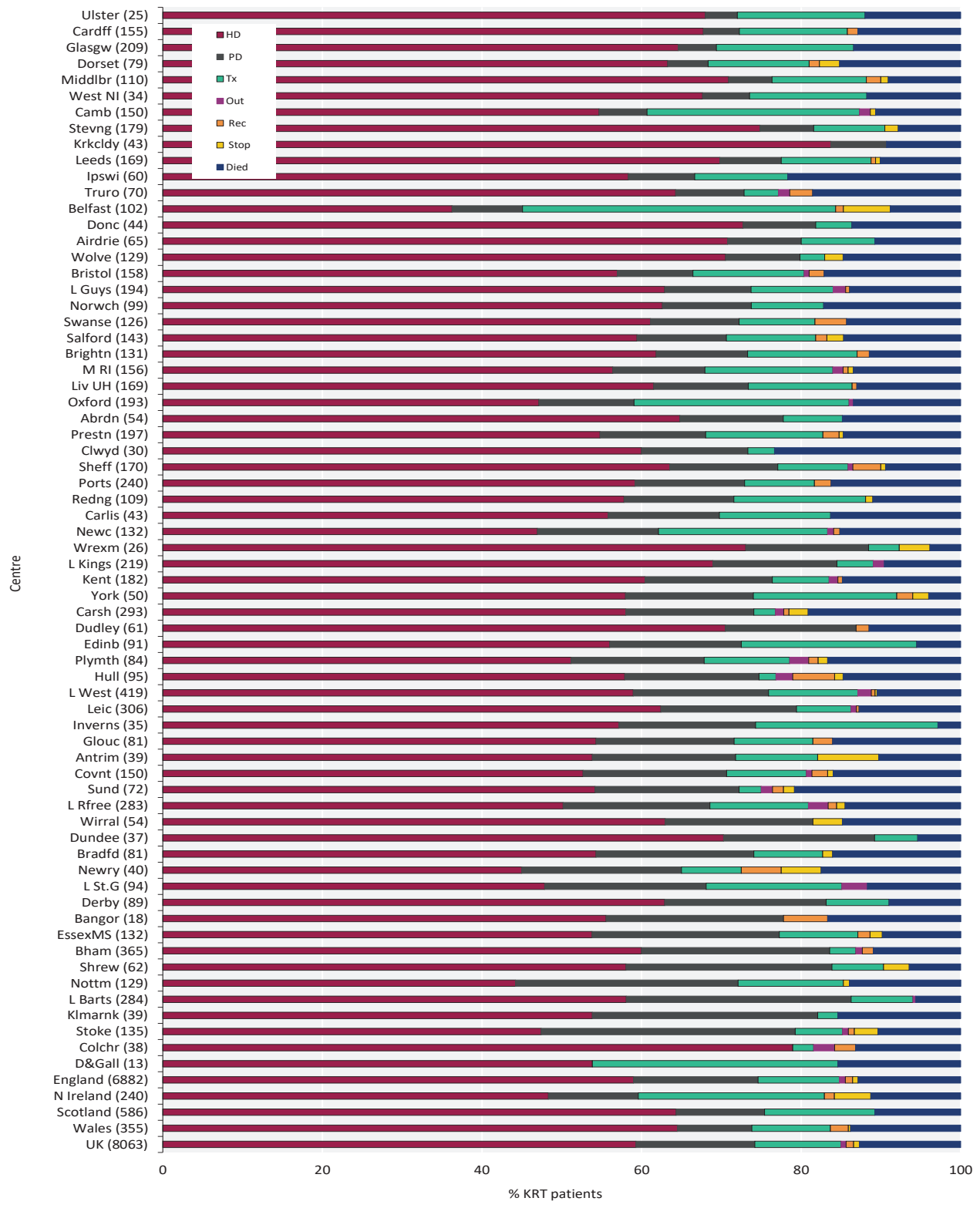
Figure 2.6 KRT modality at 1 year for incident adult KRT patients who started KRT in 2021 by centre

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

Adults starting KRT in the UK in 2022
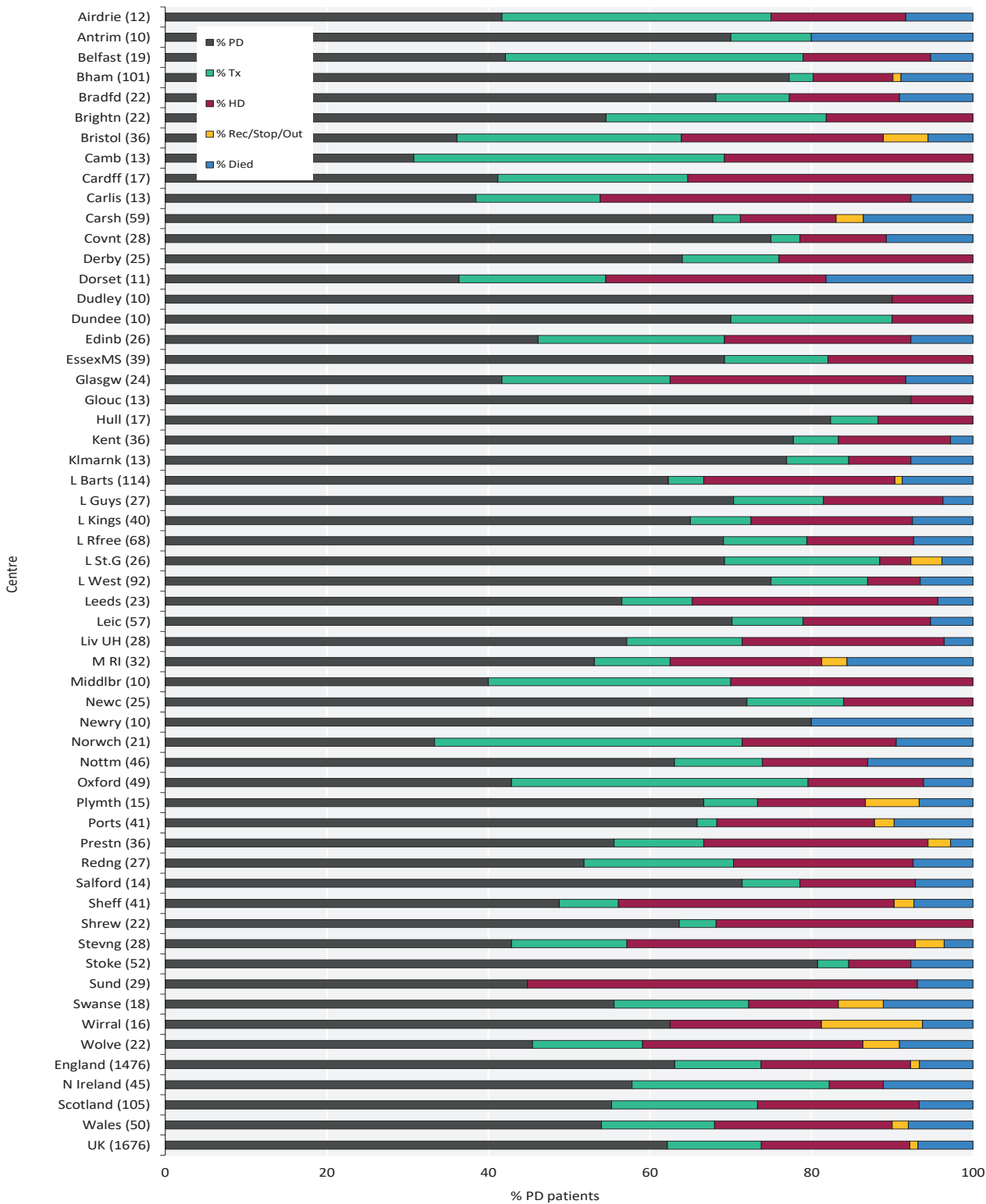
Figure 2.7 KRT modality at 1 year for incident adult PD patients who started KRT in 2021 by centre

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)

Centre	N on KRT		N with referral data	% data completeness		% presenting <90 days before KRT start		% presenting <1 yr before KRT start
	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		N with referral data	% data completeness		% presenting <90 days before KRT start		% presenting <1 yr before KRT start
	2021	2022		2021	2022	All PRDs	Non-diabetes PRDs	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
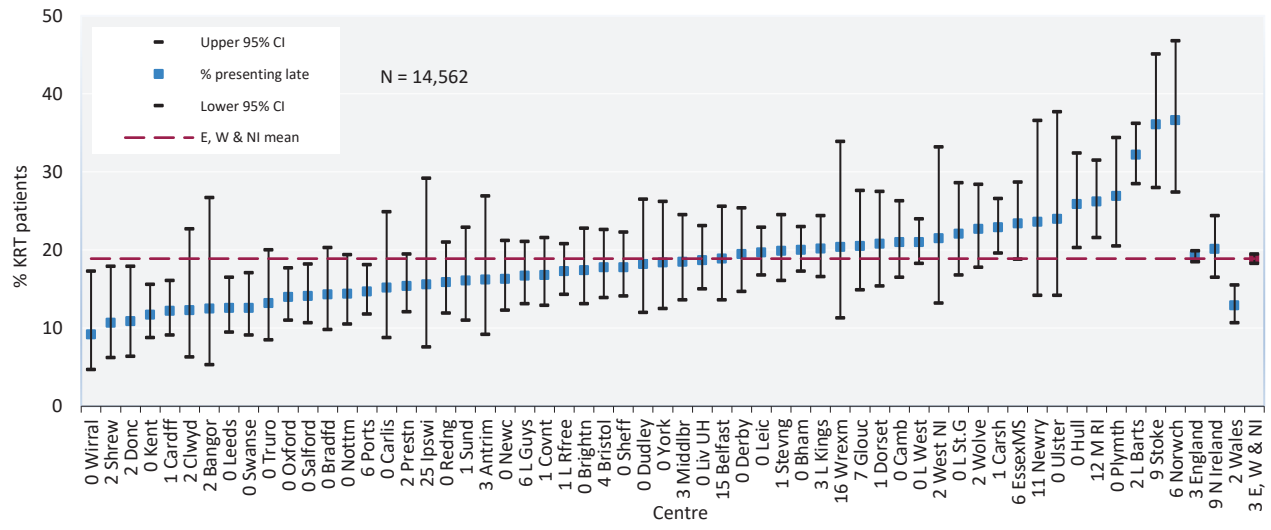
Figure 2.8 Percentage of incident adult KRT patients presenting late (<90 days) to a nephrologist (2021-2022 2 year cohort)

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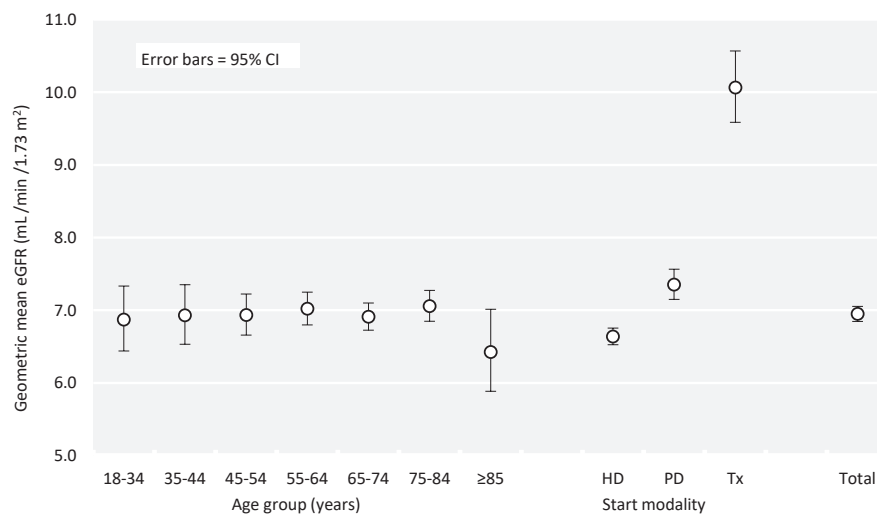
Figure 2.9 Geometric mean estimated glomerular filtration rates (eGFR) for adult patients incident to KRT in 2022 by age group and start modality

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

Centre	All KRT patients		Median Hb (g/L) by modality			Median Hb (g/L) by presentation time		
	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

Adults starting KRT in the UK in 2022

Table 2.13 Continued

| Centre | All KRT patients | | Median Hb (g/L) by modality | | | Median Hb (g/L) by presentation time | | |
	Median Hb (g/L)	% Hb ≥100 g/L	Tx	PD	HD	≥90 days	<90 days	% data completeness
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
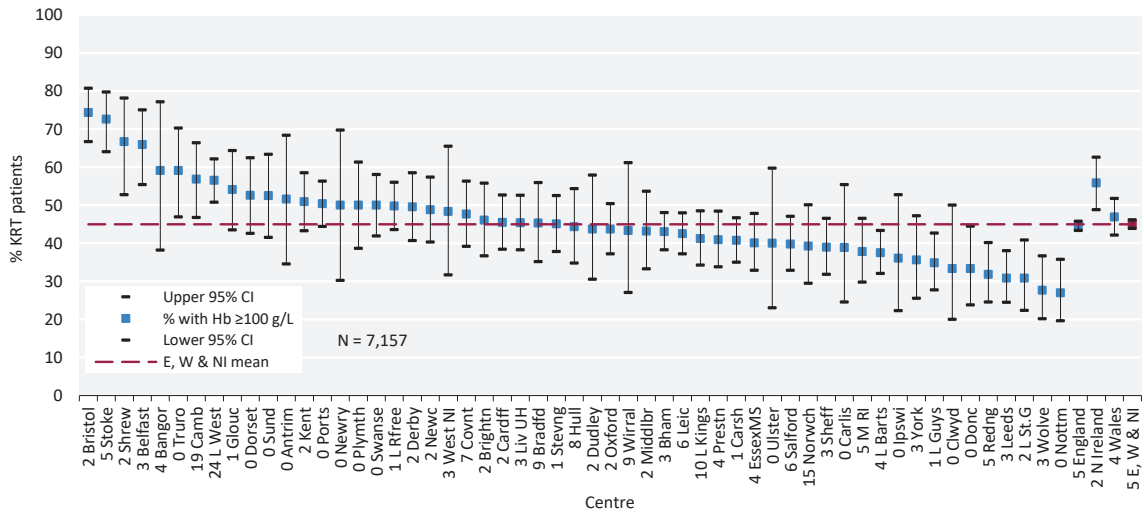
Figure 2.10 Percentage of adult patients incident to KRT in 2022 with haemoglobin (Hb) ≥100 g/L at start of KRT treatment by centre
CI – confidence interval
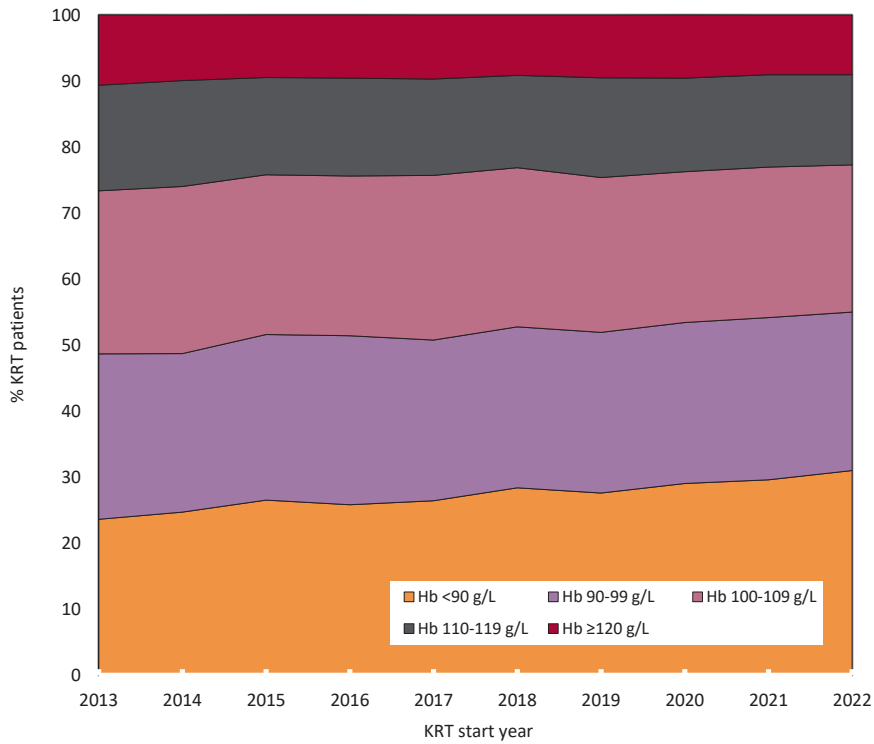
Figure 2.11 Distribution of haemoglobin (Hb) in incident adult KRT patients by year of start between 2013 and 2022

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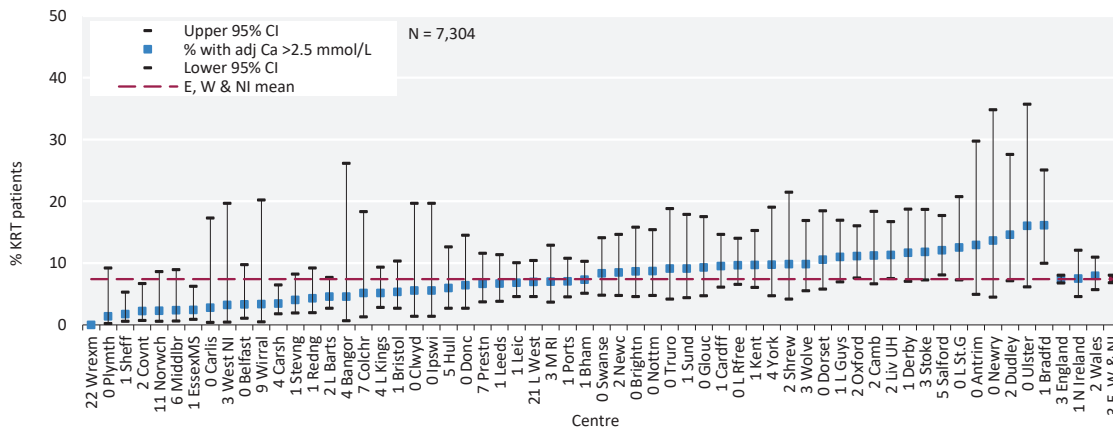
Figure 2.12 Percentage of adult patients incident to KRT in 2022 with adjusted calcium (Ca) above the normal range (>2.5 mmol/L) by centre
CI – confidence interval

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

| Characteristic | | HD – first dialysis access type | | | PD | Total |
		N	AVF/AVG	TL	NTL	N	
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/1.73m²
[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.
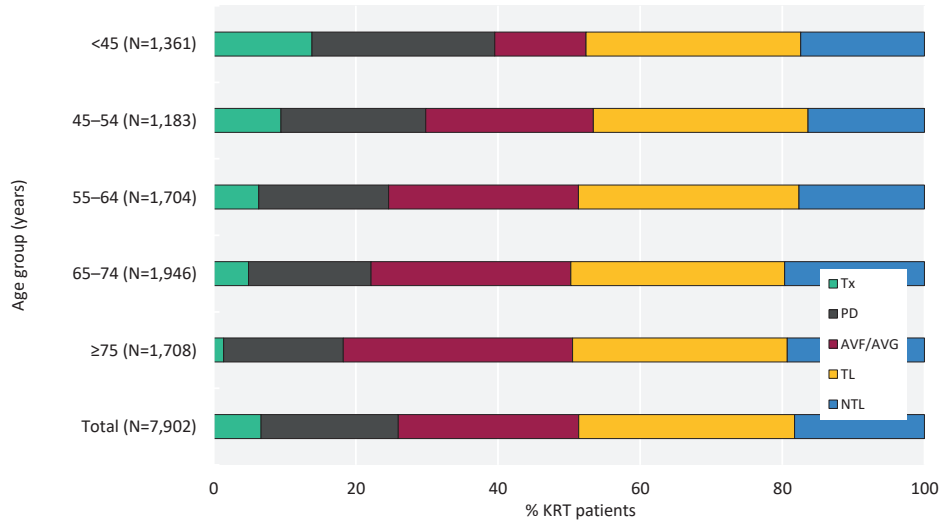
Figure 2.13 Dialysis access used for adult patients incident to KRT in 2022 by age group
AVF – arteriovenous fistula; AVG – arteriovenous graft; NTL – non-tunnelled line; TL – tunnelled line
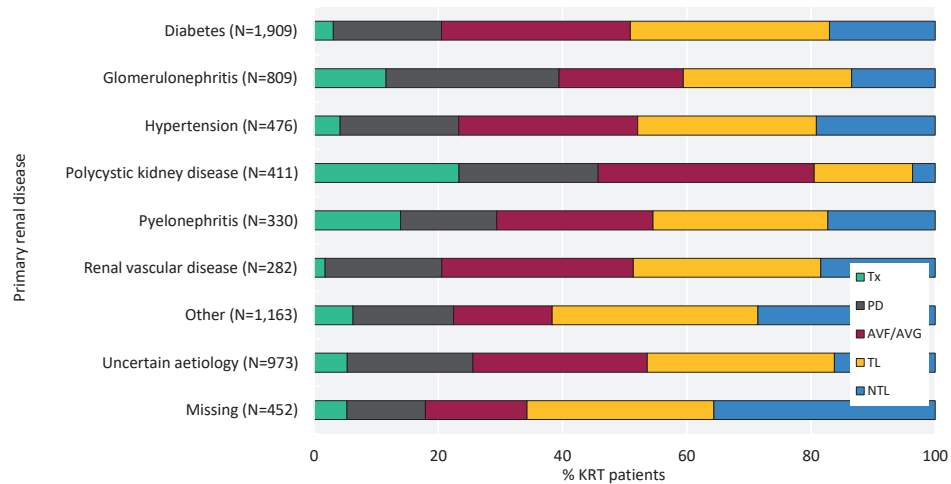
Figure 2.14 Dialysis access used for adult patients incident to KRT in 2022 by primary renal disease
AVF – arteriovenous fistula; AVG – arteriovenous graft; NTL – non-tunnelled line; TL – tunnelled line

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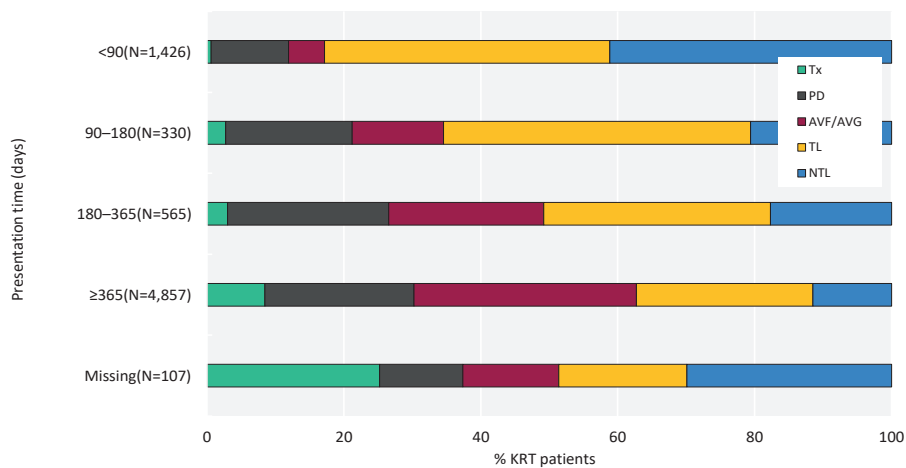
Figure 2.15 Dialysis access used for adult patients incident to KRT in 2022 by presentation time
AVF – arteriovenous fistula; AVG – arteriovenous graft; NTL – non-tunnelled line; TL – tunnelled line

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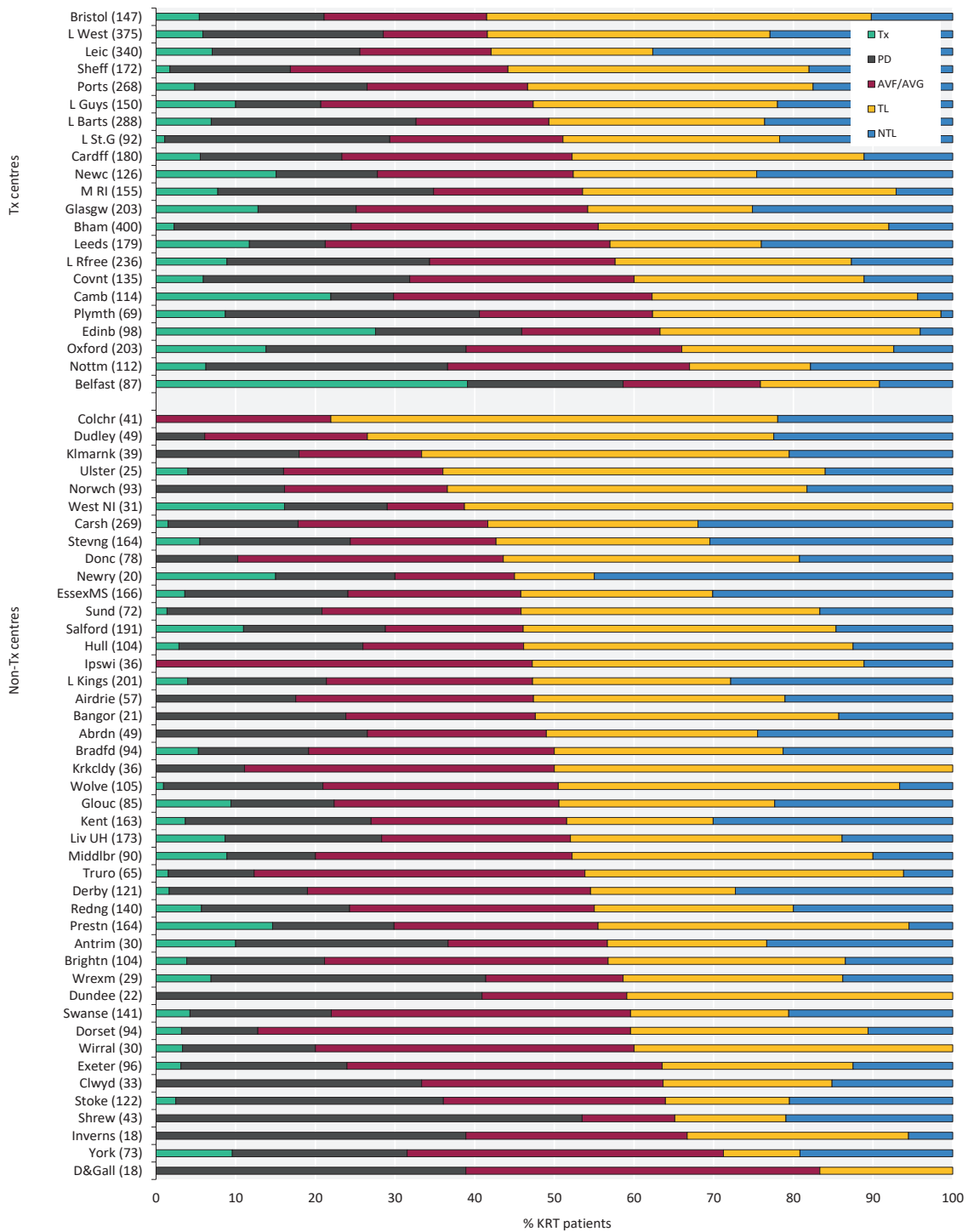
Figure 2.16 First dialysis access used for adult patients incident to KRT in 2022 by centre

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

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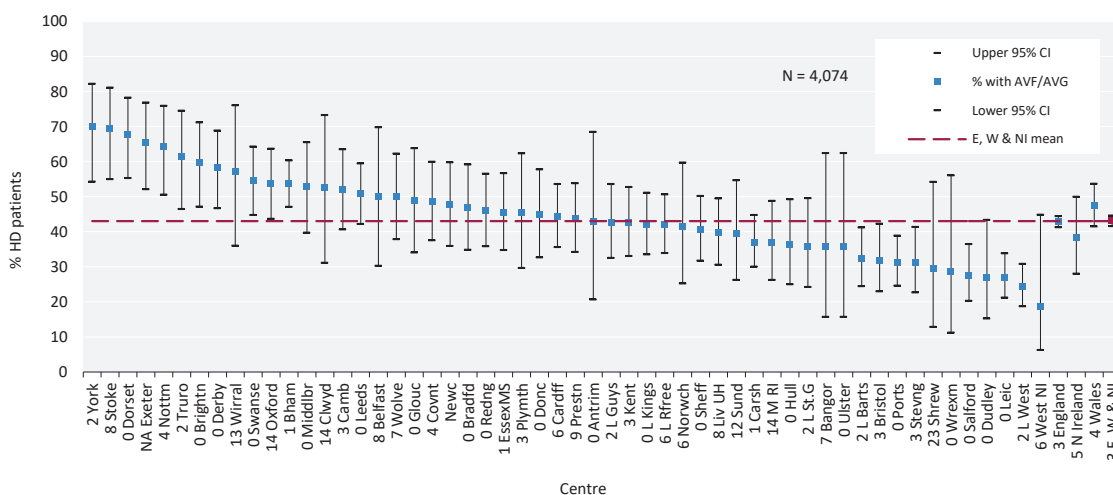
Figure 2.17 Percentage of adult patients incident to HD in 2022 who started dialysis using either an arteriovenous fistula (AVF) or an arteriovenous graft (AVG) by centre, excluding late presenters

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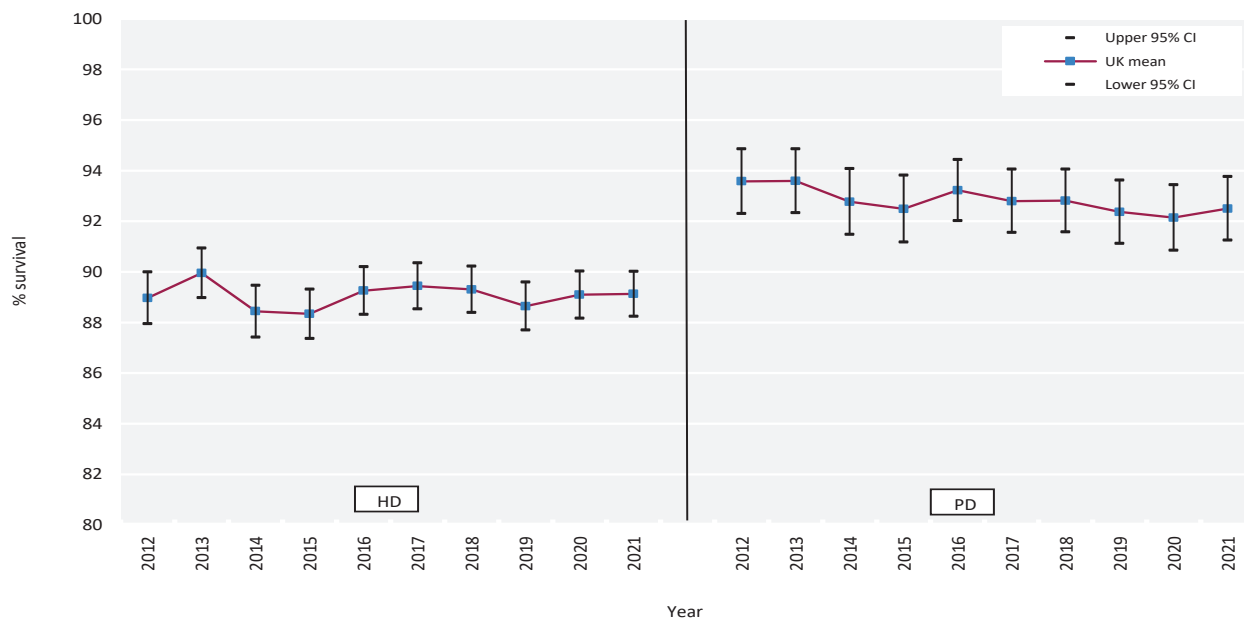
Figure 2.18 1 year after 90 days survival (adjusted to age 60 years) of incident adult KRT patients by start modality between 2012 and 2021

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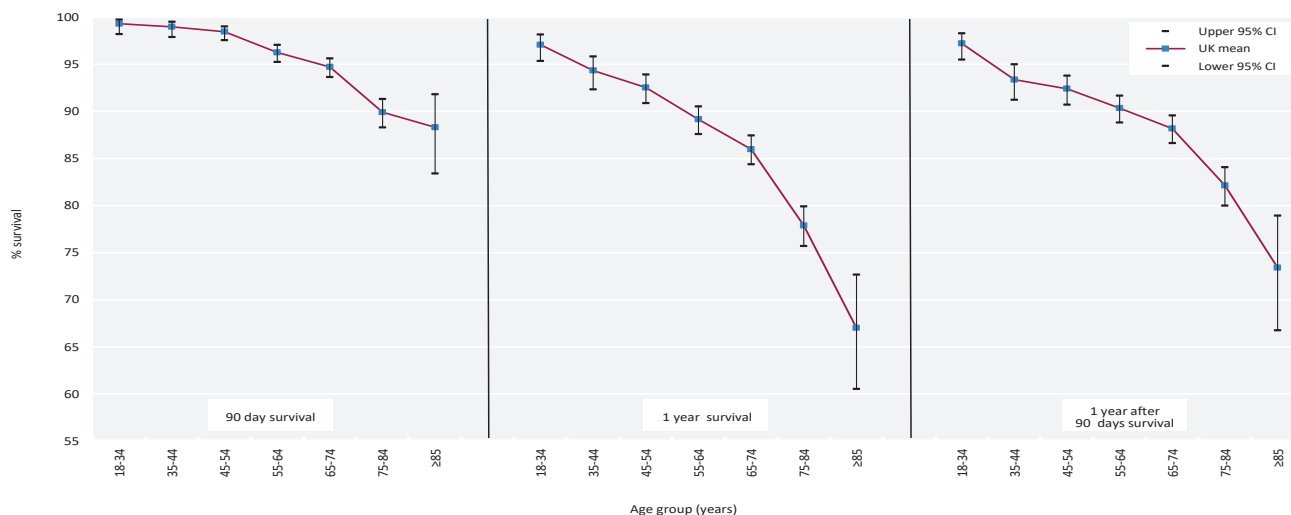
Figure 2.19 90 days, 1 year and 1 year after 90 days survival of incident adult KRT patients by age group (2021 cohort)

CI – confidence interval

Adults starting KRT in the UK in 2022
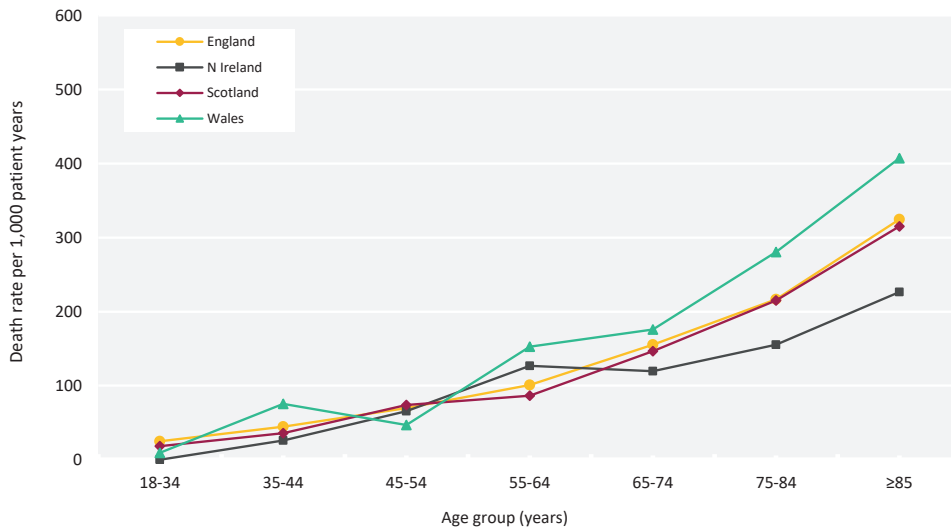
Figure 2.20 1 year after 90 days death rate per 1,000 incident KRT adult patient years by age group and country (2018-2021 4 year cohort)

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).
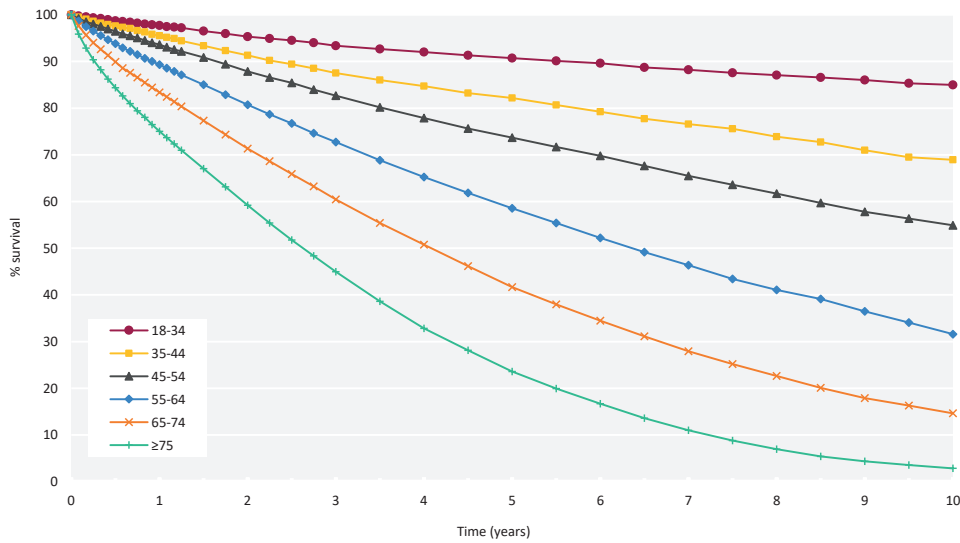
Figure 2.21 Survival (unadjusted) of incident adult KRT patients from day 0 by age group (2012-2021 10 year cohort)
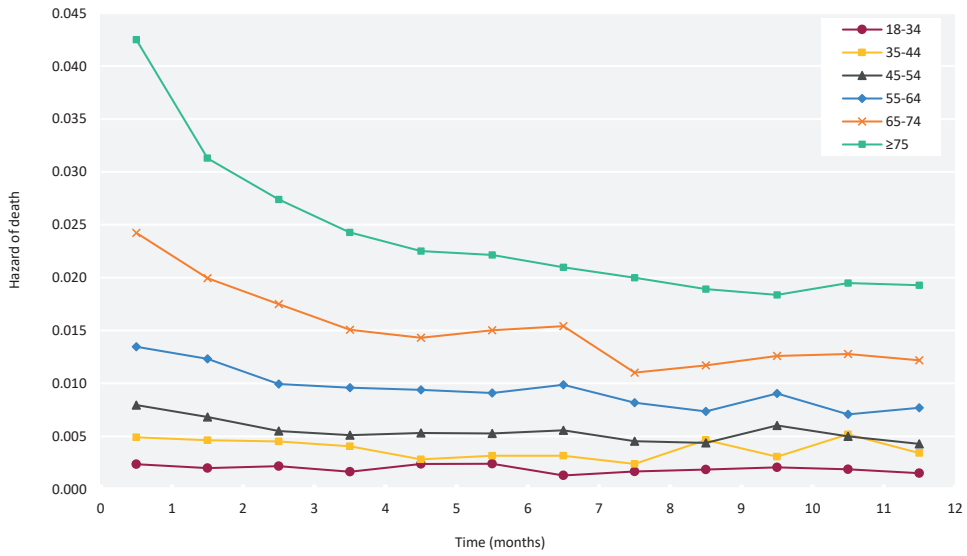
Figure 2.22 Monthly hazard of death (unadjusted) of incident adult KRT patients from day 0 to 1 year by age group (2012-2021 10 year cohort)
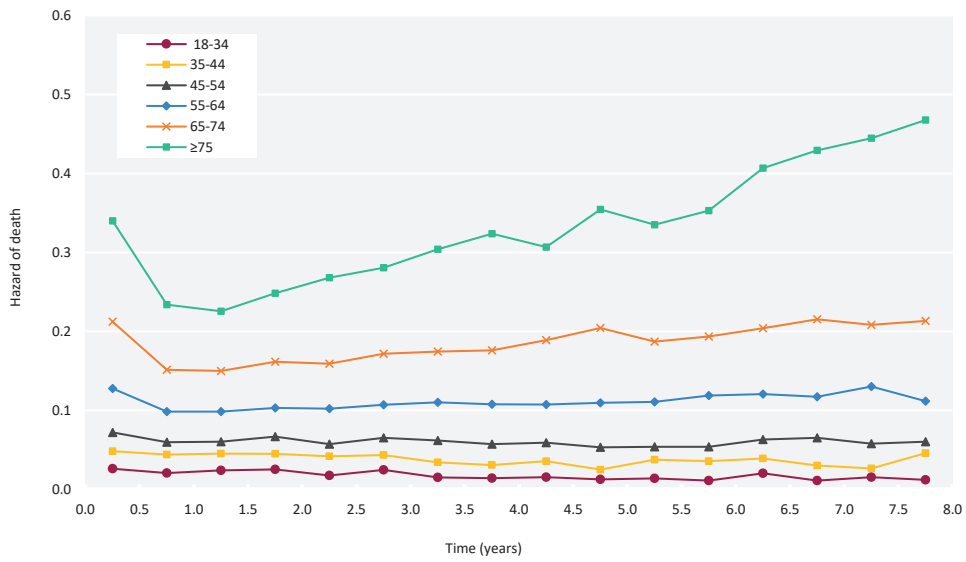
Figure 2.23 6 monthly hazard of death (unadjusted) of incident adult KRT patients from day 0 to 8 years by age group (2012-2021 10 year cohort)

Adults starting KRT in the UK in 2022

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

Cohort	Unadjusted survival (%)										95% CI for longest survival	N
	1 yr	2 yr	3 yr	4 yr	5 yr	6 yr	7 yr	8 yr	9 yr	10 yr		
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)

Cohort	Unadjusted survival (%)										95% CI for longest survival	N
	1 yr	2 yr	3 yr	4 yr	5 yr	6 yr	7 yr	8 yr	9 yr	10 yr		
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)

Centre	Age adjusted survival				Case-mix adjusted survival[1]			
	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] | | | |
| | N on KRT | Adj 1 yr after 90 days survival (%) | Limits for funnel plot | | N on KRT | Adj 1 yr after 90 days survival (%) | Limits for funnel plot | |
			Lower 95% limit	Upper 95% limit			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
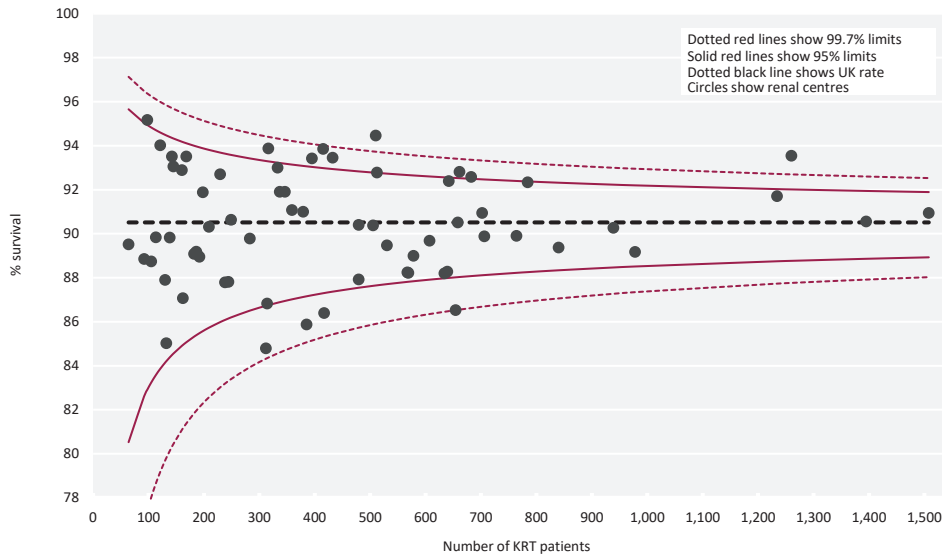
Figure 2.24 1 year after 90 days survival (adjusted to age 60 years) of incident adult KRT patients by centre (2018-2021 4 year cohort)
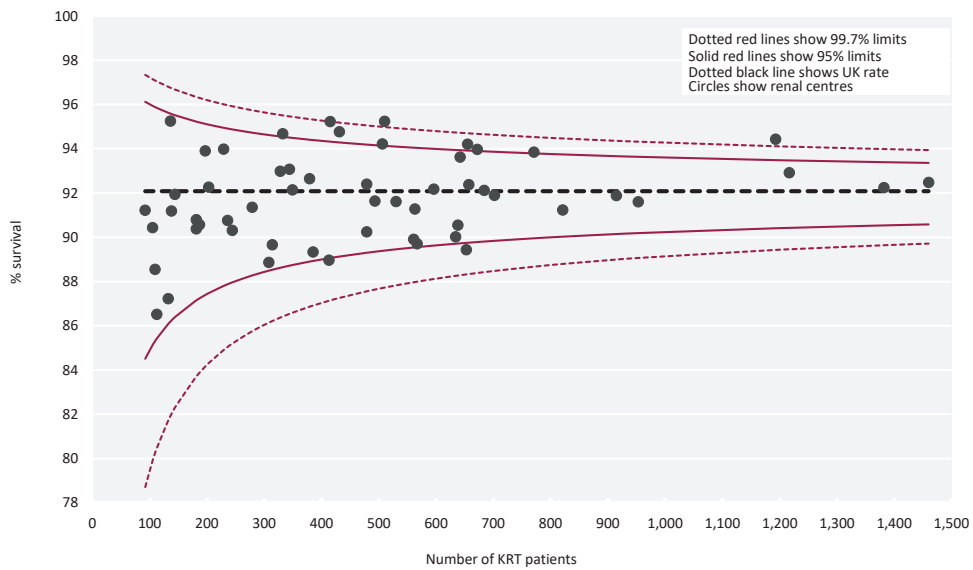
Figure 2.25 1 year after 90 days survival (adjusted to age 60 years, male and median comorbidity score) of incident adult KRT patients by centre (2018-2021 4 year cohort)

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

Chapter 3

Adults on kidney replacement therapy (KRT) in the UK at the end of 2022

Contents

Introduction

This chapter describes the population of adult patients with end-stage kidney disease (ESKD) who were on kidney replacement therapy (KRT) in the UK at the end of 2022 (figure 3.1). Patients may have started KRT prior to 2022 or during 2022. Three KRT modalities are available to patients with ESKD – haemodialysis (HD), peritoneal dialysis (PD) and kidney transplantation. HD may be undertaken in-centre (ICHD) or at home (HHD).

The size of the prevalent population on each KRT modality reflects uptake to the modality by new KRT patients (chapter 2); the number of patients switching from one modality to another; and the length of time patients remain on a modality before they switch to another, withdraw from KRT or die.
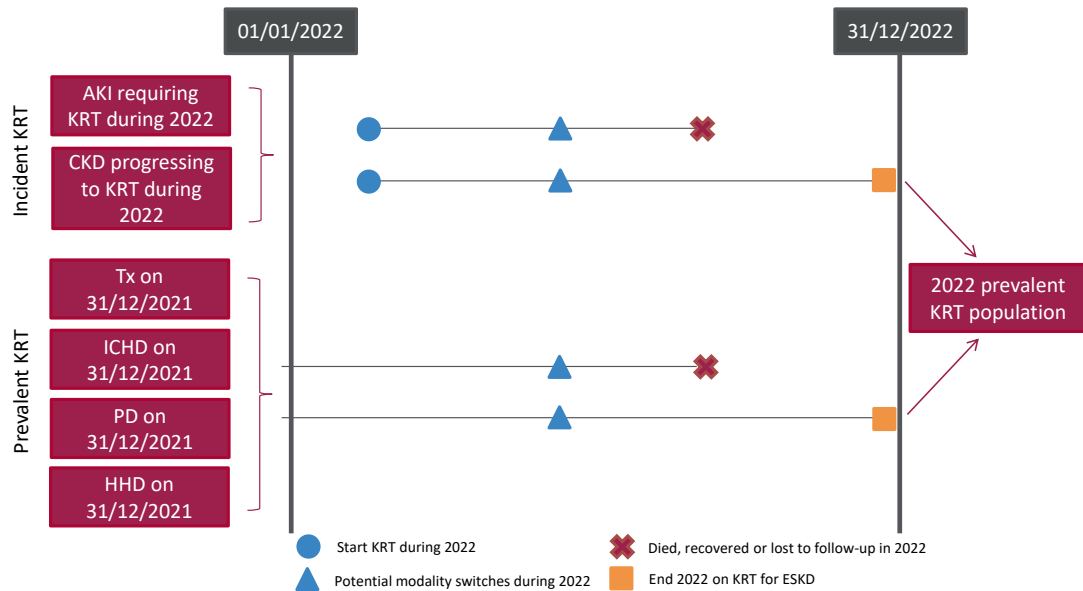
Figure 3.1 Pathways adult patients could follow to be included in the UK 2022 prevalent KRT population

Note that patients receiving dialysis for acute kidney injury (AKI) are only included in this chapter if they had a timeline or KRT modality code for chronic KRT at the end of 2022 or if they had been on KRT for ≥90 days and were on KRT at the end of 2022

CKD – chronic kidney disease; Tx – transplant

Survival and cause of death analyses were undertaken on historic prevalent cohorts to allow sufficient follow-up time.

Rationale for analyses

The analyses focus on a description of the 2022 prevalent adult KRT population, including the number on KRT per million population (pmp). These analyses are performed annually to help clinicians and policy makers plan future KRT requirements in the UK. Variation in case-mix is also reported to aid understanding of how to improve equity of KRT provision in the UK.

The UK Kidney Association guidelines (ukkidney.org/health-professionals/guidelines/guidelines-commentaries) provide audit measures relevant to the care of patients on KRT, but these are treatment-specific – for further details see the guideline tables in each chapter.

Exeter was unable to submit patient level data for 2022. Aggregate numbers by modality were provided, enabling inclusion in Tables 3.1 and 3.2. Exeter is excluded from all other analyses.

Manchester moved to a new Trust IT system, and as a result data were not submitted for the final quarter of 2022. Data for Manchester presented in this chapter are for patients who were on KRT on 30th September 2022, rather than 31st December 2022.

For definitions and methods relating to this chapter see appendix A.

Key findings

- 70,951 adult patients were receiving KRT for ESKD on 31/12/2022. This represents a 2.0% increase from 2021 and approaches the 2-2.5% increase that was seen in the years before the pandemic.

- KRT prevalence was 1,323 per million population compared 1,307 per million population in 2021.

- The median age of KRT patients was 59.9 years (ICHD 65.8 years, HHD 55.5 years, PD 63.5 years and Tx 56.7 years). In 2010 the median age was 57.9 years (ICHD 66.8 years, HHD 52.4 years, PD 61.5 years and Tx 51.2 years).

- 61.3% of KRT patients were male.

- Tx continued as the most common treatment modality (56.2%) – ICHD comprised 36.4%, PD 5.4% and HHD 2.1% of the KRT population.

- The most common identifiable primary renal disease was glomerulonephritis (19.9%), followed by diabetes (18.6%).

- There were 4 centres above the upper 95% limit and 0 centres below the lower 95% limit in the funnel plots showing 1 year age-, sex- and comorbidity-adjusted survival for patients prevalent to dialysis on 31/12/2021. 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 cause of death was cardiac disease (24.1%) in younger patients (<65 years) and infections (20.6%) in patients ≥ 65 years.

Analyses

Changes to the prevalent adult KRT population

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

Table 3.1 Number of prevalent adult KRT patients by year and by centre; number of KRT patients as a proportion of the catchment population

Centre	N on KRT					Estimated catchment population (millions)	2022 crude rate (pmp)
	2018	2019	2020	2021	2022		
ENGLAND							
Bham	3,249	3,312	3,261	3,302	3,378	2.03	1,668
Bradfd	689	733	725	736	781	0.50	1,572
Brightn	1,055	1,064	1,078	1,091	1,100	1.08	1,015
Bristol	1,471	1,487	1,476	1,496	1,524	1.25	1,223
Camb	1,389	1,456	1,511	1,628	1,663	0.96	1,739
Carlis	293	302	297	306	303	0.26	1,181
Carsh	1,752	1,781	1,849	1,905	1,936	1.64	1,183
Colchr	122	145	150	146	157	0.30	528
Covnt	965	1,082	1,109	1,129	1,125	0.84	1,344
Derby	586	654	675	691	716	0.56	1,286
Donc	330	342	341	339	376	0.38	996
Dorset	764	773	798	787	792	0.73	1,078
Dudley	360	366	374	403	383	0.34	1,112
EssexMS	844	852	885	895	897	1.00	900
Exeter	1,083	1,089	1,092	1,077	1,128	0.98	1,153
Glouc	522	531	522	545	554	0.52	1,068
Hull	880	904	913	917	933	0.80	1,166
Ipswi	428	428	426	422	395	0.31	1,257
Kent	1,112	1,140	1,144	1,192	1,224	1.08	1,136
L Barts	2,599	2,656	2,676	2,729	2,851	1.61	1,767
L Guys	2,231	2,321	2,318	2,326	2,309	1.00	2,309
L Kings	1,183	1,248	1,253	1,331	1,394	0.93	1,505
L Rfree	2,233	2,344	2,336	2,395	2,418	1.33	1,823
L St.G	834	852	853	870	855	0.65	1,311
L West	3,560	3,607	3,532	3,558	3,626	1.97	1,843
Leeds	1,683	1,727	1,751	1,784	1,836	1.39	1,321
Leic	2,452	2,580	2,621	2,634	2,719	2.11	1,286
Liv UH	1,487	1,483	1,446	1,462	1,479	1.26	1,176
M RI	2,067	2,047	1,986	2,072	2,111	1.36	1,555
Middlbr	930	953	946	959	955	0.82	1,168
Newc	1,153	1,172	1,197	1,224	1,245	0.97	1,286
Norwch	788	810	810	803	783	0.70	1,116
Nottm	1,197	1,217	1,208	1,217	1,211	0.94	1,286
Oxford	1,944	1,976	2,019	2,003	2,080	1.48	1,409
Plymth	540	535	542	543	546	0.41	1,346
Ports	1,763	1,882	1,900	1,942	2,000	1.77	1,131
Prestn	1,322	1,342	1,368	1,374	1,400	1.25	1,119
Redng	814	862	870	878	924	0.70	1,313
Salford	1,173	1,243	1,267	1,217	1,273	1.17	1,092
Sheff	1,485	1,491	1,495	1,502	1,488	1.15	1,297
Shrew	430	437	427	440	445	0.42	1,062
Stevng	938	963	980	1,020	1,066	1.12	948

Table 3.1 Continued

Centre	N on KRT					Estimated catchment population (millions)	2022 crude rate (pmp)
	2018	2019	2020	2021	2022		
Stoke	806	806	813	844	903	0.74	1,226
Sund	561	570	556	547	562	0.55	1,019
Truro	437	450	445	461	471	0.37	1,290
Wirral	401	417	417	415	400	0.47	848
Wolve	609	614	655	695	722	0.55	1,313
York	569	582	572	581	608	0.50	1,227
N IRELAND							
Antrim	274	285	287	295	306	0.25	1,240
Belfast	878	881	889	909	926	0.53	1,731
Newry	252	253	264	281	269	0.24	1,137
Ulster	191	185	201	203	210	0.20	1,029
West NI	327	328	351	339	356	0.25	1,416
SCOTLAND							
Abrdn	572	558	565	580	594	0.50	1,194
Airdrie	488	524	518	505	519	0.46	1,134
D&Gall	145	149	156	154	148	0.12	1,215
Dundee	445	449	430	411	399	0.37	1,091
Edinb	862	885	890	928	976	0.84	1,158
Glasgw	1,813	1,855	1,850	1,873	1,921	1.37	1,405
Inverns	279	282	271	278	280	0.23	1,244
Klmarnk	340	359	369	368	374	0.29	1,290
Krkcldy	298	296	292	296	292	0.27	1,067
WALES							
Bangor	203	201	216	217	220	0.20	1,079
Cardff	1,720	1,730	1,681	1,701	1,758	1.17	1,500
Clwyd	190	205	204	202	204	0.18	1,120
Swanse	825	869	850	852	847	0.76	1,113
Wrexm	314	311	323	304	307	0.21	1,480
TOTALS							
England	56,083	57,628	57,885	58,833	60,045	45.20	1,328
N Ireland	1,922	1,932	1,992	2,027	2,067	1.47	1,402
Scotland	5,242	5,357	5,341	5,393	5,503	4.44	1,239
Wales	3,252	3,316	3,274	3,276	3,336	2.53	1,320
UK	**66,499**	**68,233**	**68,492**	**69,529**	**70,951**	**53.65**	**1,323**

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, but provided aggregate numbers of patients on KRT at the end of each year, by treatment modality

pmp – per million population

Prevalence

Adults on KRT in the UK at the end of 2022
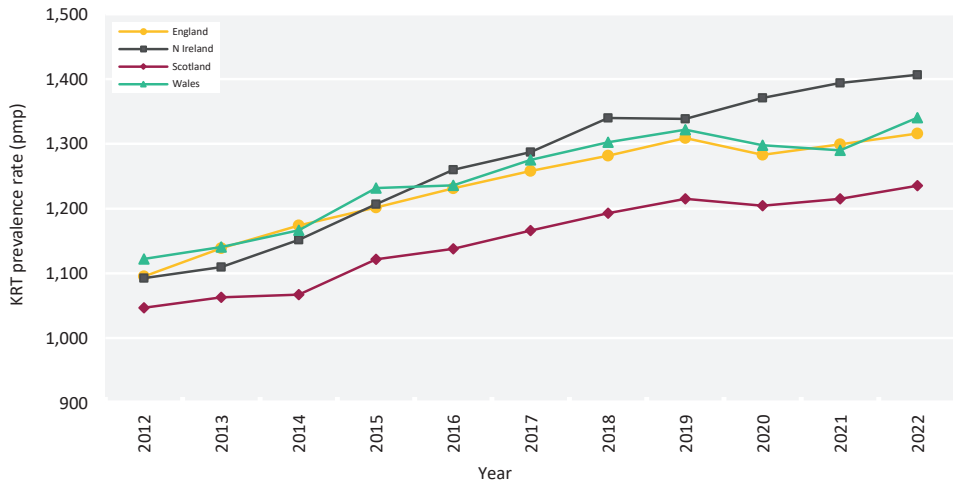
Figure 3.2 Adult KRT prevalence rates by country between 2012 and 2022
pmp – per million population
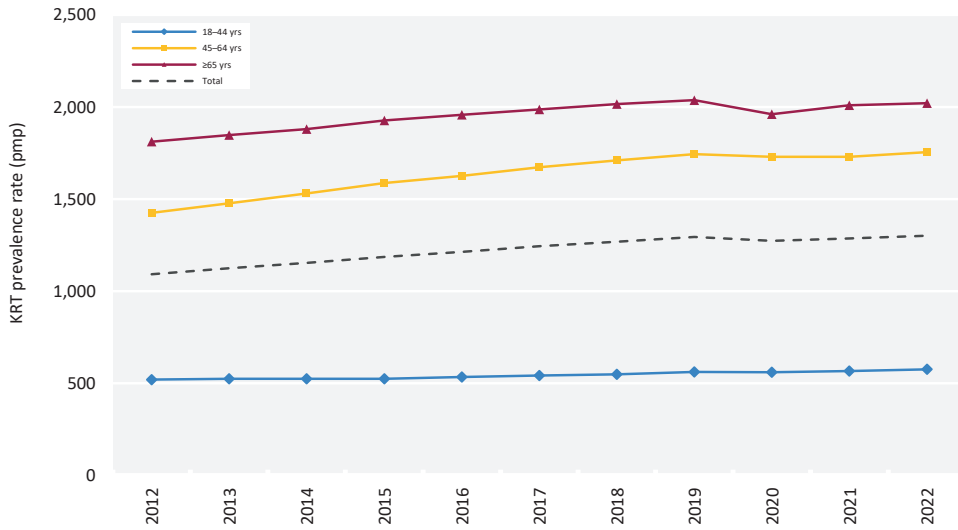
Figure 3.3 Adult KRT prevalence rates by age group between 2012 and 2022
pmp – per million population

Adults on KRT in the UK at the end of 2022

Demographics and treatment modality of prevalent 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.

Variation between centres in the proportion of dialysis patients on home therapies (PD and HHD combined) is shown in figure 3.4.

Table 3.2 Demographics and treatment modality of adult patients prevalent to KRT on 31/12/2022 by centre

Centre	N on KRT	% on ICHD	% on PD	% on HHD	% with Tx	Median age (yrs)	% male	% White	% Asian	% Black	% Other	% missing
						ENGLAND						
Bham	3,378	41.7	8.2	2.0	48.1	59.0	59.4	55.2	30.1	11.7	3.0	1.7
Bradfd	781	39.6	5.1	1.2	54.2	56.5	58.5	51.5	43.9	2.7	1.9	0.0
Brightn	1,100	38.5	5.1	3.2	53.3	61.3	60.9	89.7	6.0	2.1	2.2	3.4
Bristol	1,524	32.2	4.1	1.0	62.7	58.8	62.0	87.5	4.3	6.2	2.1	1.0
Camb	1,663	21.8	1.7	1.4	75.1	58.5	62.6	89.3	6.3	2.8	1.6	2.8
Carlis	303	35.0	9.2	2.0	53.8	60.1	60.4	97.7	1.7	0.7	0.0	0.0
Carsh	1,936	45.7	6.6	1.3	46.4	62.2	62.4	65.0	17.9	11.5	5.7	3.2
Colchr	157	100.0	0.0	0.0	0.0	71.2	66.9	95.3	0.7	2.0	2.0	5.1
Covnt	1,125	32.9	7.1	1.6	58.4	60.0	62.8	76.8	16.9	6.1	0.2	0.4
Derby	716	40.6	8.2	8.5	42.6	61.4	63.7	82.9	11.9	3.0	2.2	3.6
Donc	376	52.9	4.0	2.4	40.7	62.8	63.6	92.2	3.0	2.7	2.2	1.3
Dorset	792	41.4	2.4	1.8	54.4	65.1	62.5	95.2	2.5	0.6	1.6	0.0
Dudley	383	55.4	7.8	3.7	33.2	64.8	64.0	77.5	16.2	5.7	0.5	0.0
EssexMS	897	48.6	9.1	2.6	39.7	63.3	66.1	84.1	6.1	6.3	3.6	4.2
Exeter	1,128	44.0	6.6	1.4	48.0							
Glouc	554	41.2	5.8	0.4	52.7	63.6	61.7	91.2	3.5	2.4	2.9	1.1
Hull	933	38.4	6.1	1.8	53.7	60.0	65.2	95.6	1.9	1.2	1.3	0.8
Ipswi	395	33.2	5.6	0.0	61.3	63.1	63.0	83.2	2.6	4.1	10.1	2.3
Kent	1,224	38.9	6.0	1.7	53.3	60.6	60.8	91.4	3.6	2.1	3.0	1.5
L Barts	2,851	40.6	8.1	1.6	49.7	58.0	59.2	31.7	35.9	26.0	6.4	2.7
L Guys	2,309	30.6	2.0	1.6	65.7	57.3	59.3	56.8	10.5	27.8	4.9	4.4
L Kings	1,394	50.1	7.4	2.8	39.7	59.8	61.3	42.1	14.4	39.8	3.7	1.6
L Rfree	2,418	31.7	6.1	0.4	61.9	58.8	60.3	42.8	22.3	22.4	12.5	6.4
L St.G	855	35.7	7.1	0.6	56.6	60.0	58.2	39.8	25.6	25.5	9.1	5.0
L West	3,626	36.2	5.4	1.1	57.4	60.9	62.1	36.8	37.2	19.0	7.1	0.0
Leeds	1,836	33.2	2.9	1.2	62.6	57.7	61.7	74.9	17.8	5.5	1.8	0.2
Leic	2,719	38.1	5.5	1.8	54.6	60.5	61.4	71.9	20.8	5.3	1.9	4.9
Liv UH	1,479	37.7	4.1	3.8	54.4	59.0	61.9	90.4	3.4	3.2	3.0	3.2
M RI	2,111	25.7	4.3	3.9	66.1	57.7	60.3	65.9	14.1	17.6	2.4	6.2
Middlbr	955	36.0	2.3	2.1	59.6	60.0	62.9	92.2	5.4	0.8	1.6	0.9
Newc	1,245	30.2	3.5	1.5	64.8	59.2	59.5	92.5	4.9	1.3	1.3	0.2
Norwch	783	37.4	4.9	1.3	56.4	62.8	62.2	96.8	1.3	0.8	1.1	4.2
Nottm	1,211	29.9	7.8	2.5	59.9	58.5	60.4	81.0	8.2	7.9	2.9	1.0
Oxford	2,080	23.2	3.6	1.3	72.0	58.8	60.7	78.8	11.5	5.3	4.5	16.1
Plymth	546	29.1	8.2	0.5	62.1	62.2	64.1	96.7	1.5	0.2	1.6	0.0
Ports	2,000	33.6	5.4	3.9	57.2	60.6	59.3	92.1	4.4	1.3	2.2	12.4
Prestn	1,400	36.6	3.6	2.7	57.0	59.7	60.6	82.0	15.9	1.0	1.1	0.5
Redng	924	36.5	6.1	1.4	56.1	60.5	63.0	62.7	24.4	6.0	6.9	8.7
Salford	1,273	35.2	7.3	2.4	55.1	58.9	62.3	75.9	18.2	3.5	2.4	0.1
Sheff	1,488	38.7	5.5	3.6	52.2	59.7	62.7	86.1	7.9	3.1	2.9	1.9
Shrew	445	38.7	10.6	9.0	41.8	61.9	64.0	90.6	3.4	2.5	3.4	1.8
Stevng	1,066	53.5	3.9	3.4	39.2	61.5	63.3	69.7	18.5	8.9	2.9	3.1
Stoke	903	35.0	11.8	3.2	49.9	60.1	63.6	89.2	6.1	2.4	2.2	4.2

Table 3.2 Continued

Centre	N on KRT	% on ICHD	% on PD	% on HHD	% with Tx	Median age (yrs)	% male	Ethnicity % White	% Asian	% Black	% Other	% missing
Sund	562	40.4	6.4	1.8	51.4	61.0	59.4	95.5	3.0	0.7	0.7	0.2
Truro	471	42.0	3.4	0.6	53.9	62.5	60.7	97.9	0.6	0.2	1.3	0.0
Wirral	400	47.5	3.8	1.5	47.3	61.0	62.8	96.3	2.0	1.0	0.8	0.0
Wolve	722	51.8	7.9	6.0	34.3	60.4	62.0	57.4	28.3	10.4	3.9	0.1
York	608	32.4	6.6	3.6	57.4	61.1	61.8	96.3	1.3	0.3	2.0	1.3
N IRELAND												
Antrim	306	37.6	6.5	0.3	55.6	64.0	64.1	99.2	0.0	0.4	0.4	16.3
Belfast	926	15.0	2.4	0.9	81.7	58.4	60.8	97.2	2.2	0.2	0.3	6.0
Newry	269	28.6	3.7	1.1	66.5	61.8	59.1	98.0	1.2	0.4	0.4	5.9
Ulster	210	47.6	2.4	0.0	50.0	65.0	61.0	94.2	4.3	1.4	0.0	1.4
West NI	356	30.1	2.0	0.3	67.7	59.6	59.8	98.6	1.1	0.3	0.0	2.0
SCOTLAND												
Abrdn	594	31.8	4.7	0.5	63.0	57.8	58.4					
Airdrie	519	39.9	5.0	0.0	55.1	59.5	57.6					
D&Gall	148	33.8	6.1	0.7	59.5	61.1	63.5					
Dundee	399	35.1	5.0	1.3	58.6	60.7	60.7					
Edinb	976	30.1	3.9	0.9	65.1	59.1	64.1					
Glasgw	1,921	32.3	1.9	0.6	65.2	59.1	58.7					
Inverns	280	30.4	5.0	1.1	63.6	59.8	60.4					
Klmarnk	374	39.6	8.3	3.2	48.9	60.9	63.1					
Krkcldy	292	55.5	4.5	1.4	38.7	63.3	62.0					
WALES												
Bangor	220	34.5	4.5	10.0	50.9	60.9	64.5	98.0	0.0	0.5	1.5	8.2
Cardff	1,758	32.4	3.0	2.8	61.8	58.7	62.5	90.6	6.4	1.4	1.6	4.7
Clwyd	204	41.7	5.9	4.9	47.5	62.5	66.2	96.9	2.1	1.0	0.0	6.4
Swanse	847	46.3	6.1	4.6	43.0	62.0	61.9	97.0	1.9	0.5	0.6	1.1
Wrexm	307	34.2	6.8	1.0	58.0	58.0	63.2	95.9	1.4	1.0	1.7	4.6
TOTALS												
England	60,045	36.9	5.6	2.1	55.4	59.9	61.4	71.1	15.6	9.7	3.6	3.2
N Ireland	2,067	26.0	3.1	0.6	70.2	60.4	60.9	97.5	1.8	0.4	0.3	6.4
Scotland	5,503	34.4	3.9	0.9	60.8	59.7	60.3					
Wales	3,336	36.8	4.4	3.7	55.1	59.9	62.8	93.6	4.1	1.1	1.2	4.1
UK	**70,951**	**36.4**	**5.4**	**2.1**	**56.2**	**59.9**	**61.3**	**73.1**	**14.5**	**9.0**	**3.4**	**3.4**

Blank cells – no data returned 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, but provided aggregate numbers of patients on KRT at the end of 2022, by treatment modality
UK ethnicity distribution and completeness does not include Scotland

PRDs were grouped into categories as shown in table 3.3, with the mapping of disease codes into groups explained in more detail in appendix A. The proportion of KRT patients in each ethnic group and with each PRD is shown for patients with ethnicity and PRD data, respectively, and these total 100% of patients with data. The proportions of patients with no ethnicity and no PRD data are shown on separate lines.

Table 3.3 Demographics, primary renal diseases (PRDs) and prevalent treatment modality of adult patients prevalent to KRT on 31/12/2022 by age group

| Characteristic	18–34	35–44	45–54	55–64	65–74	75–84	≥85	Total	Median age (yrs)
Total									
N on KRT	5,433	8,119	12,807	17,720	14,805	9,213	1,726	69,823	59.9
% on KRT	7.8	11.6	18.3	25.4	21.2	13.2	2.5		
Sex (%)									
Male	7.6	11.5	18.1	25.4	21.4	13.4	2.7	61.3	60.0
Female	8.1	11.8	18.7	25.3	21.0	12.9	2.2	38.7	59.6
Ethnicity (%)									
White	7.8	11.1	17.7	25.2	21.5	14.1	2.6	73.5	60.3
Asian	8.9	13.7	19.9	22.4	23.2	10.1	1.8	14.3	58.9
Black	6.0	12.1	22.4	33.1	15.4	8.6	2.4	8.9	57.8
Other	10.3	16.8	20.8	25.4	16.4	8.6	1.8	3.3	55.8
Missing	6.9	10.6	16.2	23.8	23.4	16.6	2.5	8.2	61.9
PRD (%)									
Diabetes	2.8	8.9	18.0	28.6	25.6	13.8	2.3	18.6	62.2
Glomerulonephritis	8.9	14.7	21.1	26.5	18.4	9.3	1.1	19.9	57.0
Hypertension	3.2	9.2	19.3	27.4	20.5	16.5	3.9	6.5	61.5
Polycystic kidney disease	2.0	5.8	18.9	33.8	26.8	11.7	1.0	10.6	61.9
Pyelonephritis	10.7	15.1	20.9	24.9	16.1	9.9	2.4	9.3	56.3
Renal vascular disease	2.3	4.1	6.8	14.5	28.1	34.8	9.3	2.5	73.6
Other	16.1	14.7	17.1	20.6	18.2	11.4	1.8	18.9	56.0
Uncertain aetiology	7.0	11.8	17.3	22.0	20.7	16.7	4.5	13.7	61.3
Missing	8.2	9.7	13.8	21.5	24.7	18.4	3.7	3.8	63.7
Modality (%)									
ICHD	4.7	7.6	13.7	22.3	23.6	22.4	5.7	36.3	65.8
HHD	9.3	15.3	23.4	27.8	14.7	8.4	1.1	2.1	55.5
PD	7.9	10.4	14.0	21.3	23.0	19.9	3.5	5.3	63.5
Tx	9.7	14.2	21.6	27.7	19.7	6.8	0.3	56.3	56.7

Variation between centres in the proportion of patients prevalent to dialysis on 31/12/2022 and on home therapies is shown in figure 3.4 . Please visit the UKRR data portal (ukkidney.org/audit-research/data-portals) to identify individual kidney centres.
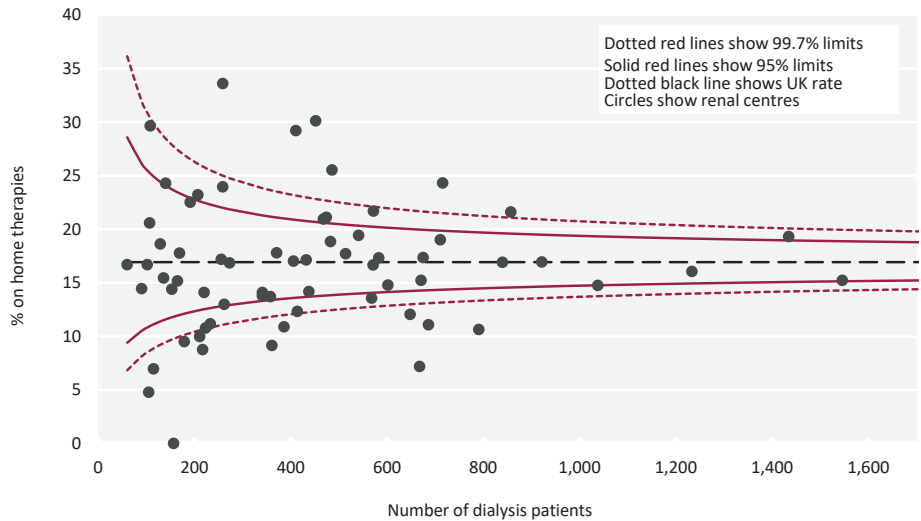
Figure 3.4 Percentage of adult patients prevalent to dialysis on 31/12/2022 on home therapies (PD and HHD) by centre
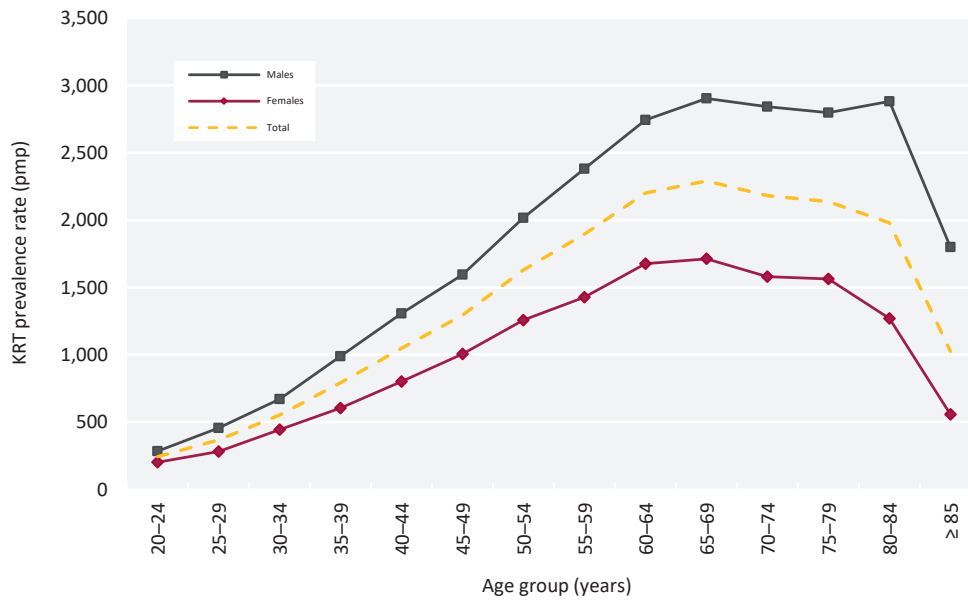
Figure 3.5 Prevalence rates for adult patients on KRT on 31/12/2022 by age group and sex
pmp – per million population

For each modality, the percentage of patients of each year of age is shown in figure 3.6.

Figure 3.6 Age profile of adult patients prevalent to KRT on 31/12/2022 by KRT modality
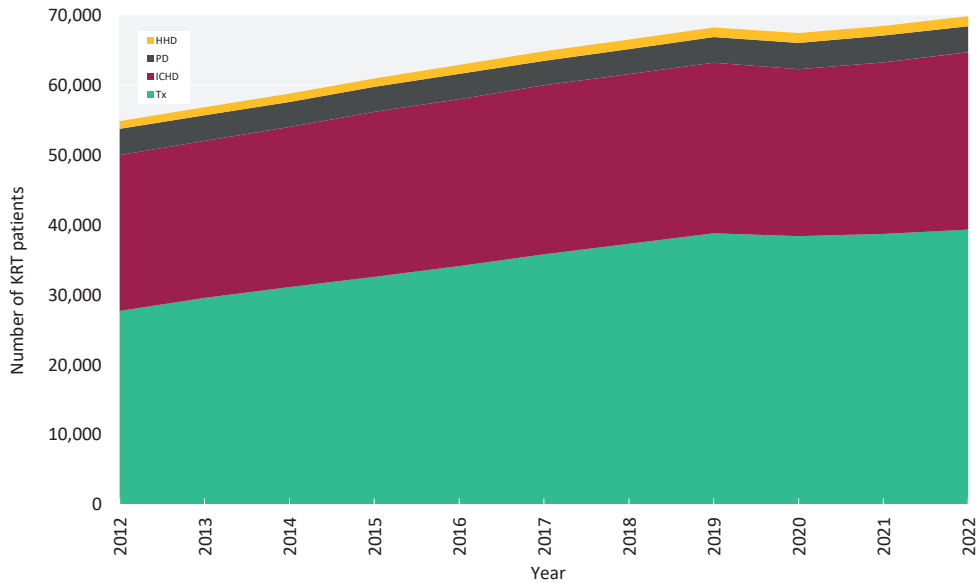
Figure 3.7 Growth in numbers of prevalent adult KRT patients by treatment modality between 2012 and 2022

Table 3.4 Change in adult KRT prevalence rates by modality between 2018 and 2022

Year	Prevalence (pmp)					% growth in prevalence				
	HD	PD	Dialysis	Tx	KRT	HD	PD	Dialysis	Tx	KRT
2018	490	68	558	711	1,269					
2019	490	69	559	736	1,295	0.0	1.3	0.2	3.5	2.0
2020	477	71	548	726	1,274	-2.6	2.6	-1.9	-1.4	-1.6
2021	488	72	559	727	1,287	2.2	1.3	2.0	0.2	1.0
2022	499	69	568	733	1,302	2.3	-3.4	1.6	0.8	1.1
Average annual growth 2018-2022						**0.5**	**0.4**	**0.5**	**0.8**	**0.6**

pmp – per million population

Prevalence

In table 3.5, for each PRD category, the proportion of patients on each treatment modality is shown for patients with PRD data and these total 100% of patients with data. The proportion of patients with no PRD data is shown on a separate line. Table 3.6 shows changes in PRDs between 2013 and 2022, in particular the increase in diabetes.

Table 3.5 Treatment modality of adult patients prevalent to KRT on 31/12/2022 by primary renal disease (PRD)

PRD	N on KRT	% KRT population	Modality (%)		
			HD	PD	Tx
Diabetes	12,514	18.6	56.5	6.5	37.0
Glomerulonephritis	13,378	19.9	27.0	4.1	69.0
Hypertension	4,398	6.5	45.0	5.9	49.0
Polycystic kidney disease	7,090	10.6	21.7	3.8	74.5
Pyelonephritis	6,235	9.3	28.5	3.4	68.2
Renal vascular disease	1,692	2.5	63.2	8.5	28.4
Other	12,659	18.9	35.2	4.4	60.3
Uncertain aetiology	9,189	13.7	39.2	6.3	54.5
Total (with data)	**67,155**	**100.0**	**37.4**	**5.0**	**57.6**
Missing	2,668	3.8	62.1	13.0	24.8

Table 3.6 Change in primary renal disease (PRD) of adult patients prevalent to KRT between 2013 and 2022

PRD	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Diabetes	16.7	17.0	17.4	17.6	17.9	18.2	18.5	18.7	18.8	18.6
Glomerulonephritis	19.9	19.8	19.8	19.8	19.8	19.7	19.8	19.8	19.9	19.9
Hypertension	6.6	6.6	6.5	6.5	6.5	6.4	6.6	6.5	6.5	6.5
Polycystic kidney disease	10.2	10.2	10.3	10.3	10.4	10.4	10.4	10.6	10.5	10.6
Pyelonephritis	11.5	11.2	10.9	10.7	10.4	10.1	9.8	9.6	9.4	9.3
Renal vascular disease	3.2	3.2	3.1	3.1	3.0	2.9	2.9	2.7	2.6	2.5
Other	17.1	17.5	17.7	18.0	18.2	18.5	18.5	18.6	18.7	18.9
Uncertain aetiology	14.8	14.5	14.3	14.1	13.8	13.7	13.5	13.5	13.6	13.7
Missing	0.7	0.7	0.7	0.8	1.0	1.1	1.4	1.9	2.8	3.8

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

The treatment modality distribution for prevalent adult KRT patients was further divided by treatment location for HD patients – hospital unit, satellite unit or home – and for PD patients by type of PD – automated PD (APD) and continuous ambulatory PD (CAPD).
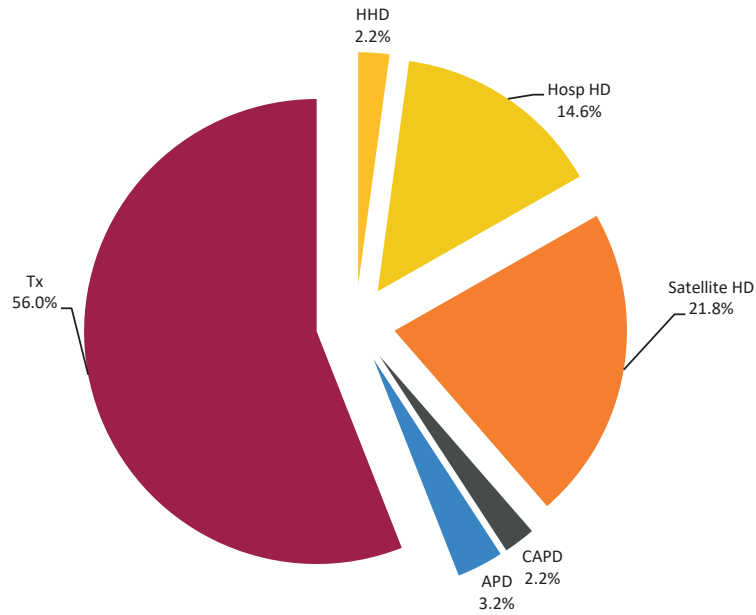
Prevalence

Figure 3.8 Detailed treatment modality of adult patients prevalent to KRT on 31/12/2022

No Scottish centres were included because data on satellite HD were not available

APD – automated PD; CAPD – continuous ambulatory PD
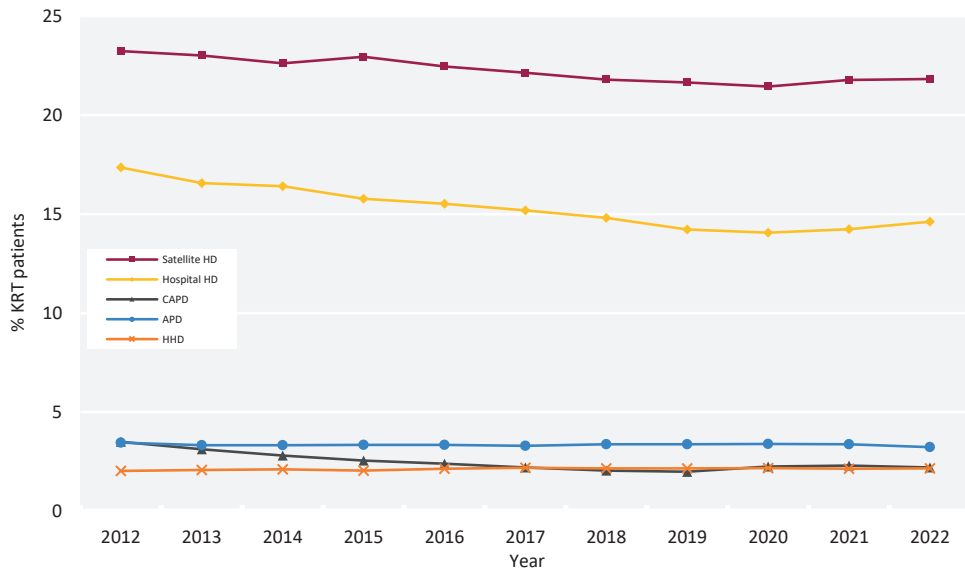
Figure 3.9 Detailed dialysis modality changes in prevalent adult KRT patients between 2012 and 2022

No Scottish centres were included because data on satellite HD were not available

The denominator includes patients with a Tx

APD – automated PD; CAPD – continuous ambulatory PD

Adults on KRT in the UK at the end of 2022

Table 3.7 Adult patients prevalent to dialysis on 31/12/2022 by detailed dialysis modality and centre

Centre	N on dialysis	% Tx wait-listed <65 yrs	% Tx wait-listed ≥65 yrs	% on HD				% on PD		
				All HD	HHD	Hospital	Satellite	All PD	CAPD	APD
ENGLAND										
Bham	1,753	31.9	5.1	84.2	3.8	28.0	52.5	15.8	2.6	13.2
Bradfd	358	36.7	8.2	88.8	2.5	75.1	11.2	11.2	6.4	4.8
Brightn	514	35.5	5.4	89.1	6.8	39.1	43.2	10.9	6.8	4.1
Bristol	568	29.1	5.1	89.1	2.6	18.0	68.5	10.9	6.2	4.8
Camb	414	22.0	0.8	93.2	5.6	36.5	51.2	6.8	5.1	1.7
Carlis	140	30.4	8.2	80.0	4.3	47.9	27.9	20.0	5.0	15.0
Carsh	1,038	31.1	4.2	87.7	2.4	20.8	64.5	12.3	3.8	8.5
Colchr	157	17.9	2.0	100.0	0.0	73.3	26.8	0.0	0.0	0.0
Covnt	468	38.1	7.7	82.9	3.9	79.1	0.0	17.1	8.8	8.3
Derby	411	26.6	4.6	85.6	14.8	63.5	7.3	14.4	10.5	3.9
Donc	223	30.0	4.1	93.3	4.0	58.3	30.9	6.7	0.9	5.8
Dorset	361	26.7	10.0	94.7	3.9	23.8	67.0	5.3	2.5	2.8
Dudley	256	29.4	3.9	88.3	5.5	16.0	66.8	11.7	7.8	3.9
EssexMS	541	29.5	3.0	84.8	4.3	74.7	5.9	15.2	2.2	12.6
Exeter										
Glouc	262	37.5	3.8	87.8	0.8	70.6	16.4	12.2	0.8	11.5
Hull	432	19.4	3.3	86.8	3.9	38.4	44.4	13.2	10.0	3.2
Ipswi	153	13.0	.	85.6	0.0	79.1	6.5	14.4	8.5	3.3
Kent	571	31.0	5.2	87.0	3.7	34.9	48.5	13.0	12.1	0.9
L Barts	1,435	35.2	6.7	83.8	3.1	36.2	44.5	16.2	6.3	9.9
L Guys	791	31.3	5.1	94.1	4.7	15.2	74.2	5.9	1.1	4.8
L Kings	840	26.7	4.6	87.7	4.6	17.7	65.4	12.3	4.2	8.1
L Rfree	922	33.5	9.1	84.1	1.0	5.2	77.9	15.9	6.9	9.0
L St.G	371	39.9	4.6	83.6	1.4	18.1	64.2	16.4	2.4	14.0
L West	1,546	50.1	13.2	87.3	2.5	15.9	68.9	12.7	11.3	1.4
Leeds	686	38.3	12.7	92.1	3.2	11.4	77.6	7.9	2.3	5.5
Leic	1,234	36.6	9.3	87.8	3.9	15.1	68.9	12.2	2.4	9.7
Liv UH	675	26.4	6.1	91.0	8.3	23.0	59.7	9.0	2.5	6.5
M RI	716	36.5	12.1	87.3	11.6	15.2	60.5	12.7	4.6	8.1
Middlbr	386	32.1	6.8	94.3	5.2	28.5	60.6	5.7	5.7	0.0
Newc	438	32.5	8.1	90.2	4.3	59.4	26.5	9.8	1.4	8.5
Norwch	341	12.4	.	88.9	2.9	52.5	33.4	11.1	8.2	2.9
Nottm	486	34.3	8.0	80.7	6.2	31.9	42.6	19.3	5.1	14.2
Oxford	583	38.9	7.8	87.1	4.5	32.4	50.3	12.9	3.8	9.1
Plymth	207	40.4	8.0	78.3	1.5	72.0	4.8	21.7	5.8	15.9
Ports	857	30.8	9.5	87.5	9.1	18.1	60.3	12.5	6.5	6.0
Prestn	602	37.3	12.0	91.5	6.3	22.1	63.1	8.5	5.5	3.0
Redng	406	39.1	5.3	86.2	3.2	30.8	52.2	13.8	11.6	2.2
Salford	572	43.8	18.6	83.7	5.4	22.7	55.6	16.3	7.3	8.9
Sheff	711	27.5	6.0	88.5	7.5	46.3	34.7	11.5	4.1	7.5
Shrew	259	27.0	6.6	81.9	15.4	38.2	28.2	18.2	1.5	16.6
Stevng	648	27.3	6.7	93.5	5.6	22.5	65.4	6.5	3.4	3.1
Stoke	452	26.5	5.6	76.3	6.4	45.8	24.1	23.7	1.3	22.4
Sund	273	26.0	9.6	86.8	3.7	48.4	34.8	13.2	2.6	10.6
Truro	217	29.2	3.9	92.6	1.4	47.9	43.3	7.4	3.2	4.2
Wirral	211	30.3	11.8	92.9	2.8	38.4	51.7	7.1	0.5	6.6
Wolve	474	25.1	4.9	88.0	9.1	73.8	5.1	12.0	3.2	8.2
York	259	37.9	11.2	84.6	8.5	25.5	50.6	15.4	5.4	10.0
N IRELAND[1]										
Antrim	136	22.2	4.0	85.3	0.7	84.6	0.0	14.7	4.4	9.6
Belfast	169	25.0	2.4	87.0	4.7	82.3	0.0	13.0	0.0	11.8
Newry	90	28.1	3.4	88.9	3.3	85.6	0.0	11.1	4.4	4.4

Adults on KRT in the UK at the end of 2022

Table 3.7 Continued

| Centre	N on dialysis	% Tx wait-listed <65 yrs	% Tx wait-listed ≥65 yrs	% on HD				% on PD		
				All HD	HHD	Hospital	Satellite	All PD	CAPD	APD
Ulster	105	14.3	1.3	95.2	0.0	95.2	0.0	4.8	1.0	2.9
West NI	115	20.5	1.4	93.9	0.9	93.0	0.0	6.1	0.0	4.4
SCOTLAND[2]										
Abrdn	220	33.6	11.5	87.3	1.4	85.9	0.0	12.7	8.6	3.2
Airdrie	233	40.5	14.3	88.8	0.0	88.8	0.0	11.2	6.0	5.2
D&Gall	60	48.1	12.1	85.0	1.7	83.3	0.0	15.0	1.7	13.3
Dundee	165	31.1	3.3	87.9	3.0	84.9	0.0	12.1	2.4	6.1
Edinb	341	37.4	9.4	88.9	2.6	86.2	0.0	11.1	3.8	7.3
Glasgw	668	47.0	13.0	94.5	1.7	92.8	0.0	5.5	1.4	4.2
Inverns	102	22.0	11.5	86.3	2.9	83.3	0.0	13.7	10.8	2.9
Klmarnk	191	25.3	6.0	83.8	6.3	77.5	0.0	16.2	3.7	12.6
Krkcldy	179	32.9	6.8	92.7	2.2	90.5	0.0	7.3	1.7	5.6
WALES										
Bangor	108	28.6	3.4	90.7	20.4	54.6	15.7	9.3	0.9	8.3
Cardff	671	22.8	4.9	92.1	7.3	11.0	73.8	7.9	4.5	3.4
Clwyd	107	19.6	5.4	88.8	9.4	79.4	0.0	11.2	9.4	1.9
Swanse	483	25.1	6.3	89.2	8.1	47.0	34.2	10.8	5.0	5.8
Wrexm	129	17.9	3.2	83.7	2.3	50.4	31.0	16.3	1.6	14.7
TOTALS										
England	26,218	33.0	7.1	87.4	4.8	31.9	50.8	12.6	5.1	7.5
N Ireland	615	22.8	2.6	89.6	2.1	87.5	0.0	10.4	1.8	7.3
Scotland	2,159	38.4	10.3	90.0	2.2	87.8	0.0	10.0	3.8	5.9
Wales	1,498	23.2	5.2	90.1	8.2	34.1	47.9	9.9	4.5	5.4
UK	**30,490**	**32.8**	**7.1**	**87.8**	**4.7**	**37.0**	**46.0**	**12.2**	**4.9**	**7.2**

Blank cells – no data returned by the centre

[1]There were no satellite units in Northern Ireland

[2]All HD patients in Scotland were shown as receiving treatment at home or in hospital because no data were available regarding satellite dialysis

APD – automated PD; CAPD – continuous ambulatory PD

Prevalence

Adults on KRT in the UK at the end of 2022

The proportion of patients on HHD versus satellite HD is shown in figure 3.10, with the remaining patients on hospital HD.
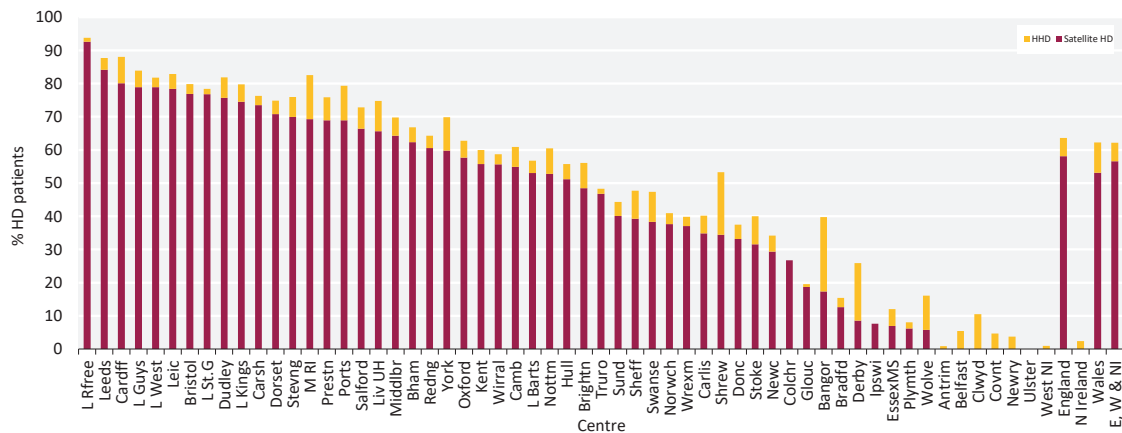
Figure 3.10 Adult patients prevalent to HD on 31/12/2022 treated with satellite HD or HHD by centre

There were no satellite units in Northern Ireland and Scottish centres were excluded because data on satellite HD were not available

Dialysis access in prevalent adult dialysis patients

The type of dialysis access used by the prevalent dialysis population is described in chapter 5.

Survival in adult dialysis patients

Survival was analysed in prevalent patients receiving dialysis on 31/12/2021 and followed-up for one year in 2022. Survival in patients with a Tx is presented in chapter 4.

Survival analyses, where stated, were adjusted to age 60 years to allow comparisons between centres with different age distributions. Centre-specific survival rates were further adjusted for not only age (figure 3.11), but also sex and comorbidities for centres with at least 85% completeness (figure 3.12). UKRR comorbidity data were augmented using diagnostic and procedure codes from Hospital Episode Statistics (HES) in England and Patient Episode Database for Wales (PEDW) in Wales (see appendix A for details). Centres are identifiable from the x-axis by using the number of prevalent dialysis patients by centre in table 3.8.

Table 3.8 1 year adjusted survival (age and case-mix) of adult patients prevalent to dialysis on 31/12/2021 by centre

Centre	Age-adjusted survival				Case-mix adjusted survival[1]			
	N on dialysis	1 yr (%)	Lower 95% limit	Upper 95% limit	N on dialysis	1 yr (%)	Lower 95% limit	Upper 95% limit
D&Gall	59	83.8	76.0	93.6				
Clwyd	92	87.5	78.7	92.6	92	89.8	82.2	94.8
Newry	100	84.4	79.1	92.4	86	83.8	81.8	94.9
Inverns	101	85.5	79.2	92.4				
Bangor	103	86.8	79.2	92.4	103	90.3	82.7	94.6
Ulster	110	92.4	79.6	92.3	106	91.2	82.8	94.5
Wrexm	121	84.0	80.0	92.1	121	87.5	83.4	94.3
West NI	129	90.9	80.2	91.9	119	89.0	83.3	94.4
Carlis	133	83.4	80.4	91.9	130	86.9	83.7	94.2
Colchr	136	85.5	80.5	91.8	134	89.2	83.8	94.2
Antrim	141	92.1	80.6	91.8	121	92.1	83.4	94.3
Dundee	160	87.5	81.1	91.5				
Ipswi	164	84.7	81.2	91.5	157	87.9	84.4	93.9
Krkcldy	167	88.6	81.2	91.5				
Klmarnk	174	86.1	81.4	91.4				
Plymth	181	83.2	81.5	91.3	181	87.8	84.9	93.7
Donc	182	85.9	81.5	91.3	180	89.0	84.8	93.7
Belfast	192	88.6	81.7	91.2				
Truro	195	86.2	81.7	91.2	189	90.1	85.0	93.6
Abrdn	203	86.0	81.9	91.1				
Wirral	205	88.8	81.9	91.1	204	92.1	85.2	93.5
Airdrie	207	86.7	81.9	91.1				
York	221	91.2	82.1	91.0	221	92.9	85.5	93.4
Glouc	241	85.5	82.3	90.9	236	89.0	85.6	93.3
Shrew	255	86.9	82.5	90.8	255	90.1	85.8	93.2
Sund	261	86.1	82.6	90.7	259	90.3	85.9	93.2
Dudley	262	85.9	82.6	90.7	262	88.9	85.9	93.2
Bradfd	306	89.8	83.0	90.5	305	92.6	86.3	93.0
Edinb	321	89.6	83.1	90.4				
Dorset	335	88.2	83.2	90.4	334	90.9	86.4	92.9
Norwch	339	85.8	83.2	90.3	332	88.4	86.4	92.9
Redng	342	85.8	83.2	90.3	342	89.8	86.5	92.9
Middlbr	365	86.3	83.4	90.2	363	89.3	86.6	92.8
L St.G	371	88.7	83.4	90.2	365	91.8	86.6	92.8
Derby	373	87.5	83.4	90.2	372	90.3	86.7	92.8
Camb	389	88.5	83.5	90.2	388	90.8	86.8	92.7
Stoke	399	88.8	83.5	90.1	395	91.2	86.8	92.7
Hull	400	88.4	83.5	90.1	400	90.7	86.8	92.7
Newc	402	84.5	83.6	90.1	402	88.8	86.8	92.7
Wolve	423	85.8	83.7	90.1	422	89.4	86.9	92.6
Covnt	433	84.3	83.7	90.0	426	87.0	86.9	92.6
Swanse	468	83.1	83.8	89.9	468	87.3	87.1	92.5
Nottm	478	84.4	83.9	89.9	478	88.6	87.1	92.5
Brightn	496	88.2	84.0	89.9	487	90.8	87.2	92.5
Kent	505	86.5	84.0	89.8	505	89.3	87.2	92.5
Salford	510	85.8	84.0	89.8	510	90.1	87.2	92.4
Oxford	511	84.0	84.0	89.8	504	88.2	87.2	92.5
EssexMS	520	84.9	84.0	89.8	517	88.6	87.3	92.4
Bristol	536	88.1	84.1	89.8	526	91.4	87.3	92.4
Prestn	556	83.7	84.1	89.7	556	88.2	87.4	92.4
Glasgw	569	87.1	84.2	89.7				
Stevng	574	87.5	84.2	89.7	566	90.6	87.4	92.3
Cardff	607	84.2	84.3	89.6	607	88.0	87.5	92.3
Leeds	611	88.4	84.3	89.6	610	91.2	87.5	92.3

Adults on KRT in the UK at the end of 2022

Table 3.8 Continued

Centre	Age-adjusted survival				Case-mix adjusted survival[1]			
	N on dialysis	1 yr (%)	Lower 95% limit	Upper 95% limit	N on dialysis	1 yr (%)	Lower 95% limit	Upper 95% limit
Liv UH	624	83.0	84.3	89.6	616	88.2	87.5	92.3
M RI	645	87.7	84.4	89.6	634	90.9	87.6	92.2
Sheff	667	85.8	84.4	89.5	667	88.8	87.6	92.2
L Kings	754	90.1	84.6	89.4	746	92.5	87.8	92.1
Ports	757	85.4	84.6	89.4	742	89.4	87.8	92.1
L Guys	804	90.4	84.7	89.3	803	92.3	87.9	92.0
L Rfree	883	87.2	84.8	89.2	870	90.6	88.0	92.0
Carsh	983	87.3	85.0	89.1	963	89.8	88.1	91.9
Leic	1,117	87.4	85.1	89.0	1,108	89.9	88.2	91.8
L Barts	1,332	89.7	85.3	88.9	1,290	91.8	88.4	91.7
L West	1,436	89.0	85.4	88.8	1,396	91.4	88.5	91.6
Bham	1,641	89.8	85.5	88.7	1,627	92.1	88.6	91.5

Centres are ordered by increasing number of patients

[1]Centres excluded if <85% comorbidity data were available – this included Belfast and all Scottish kidney centres
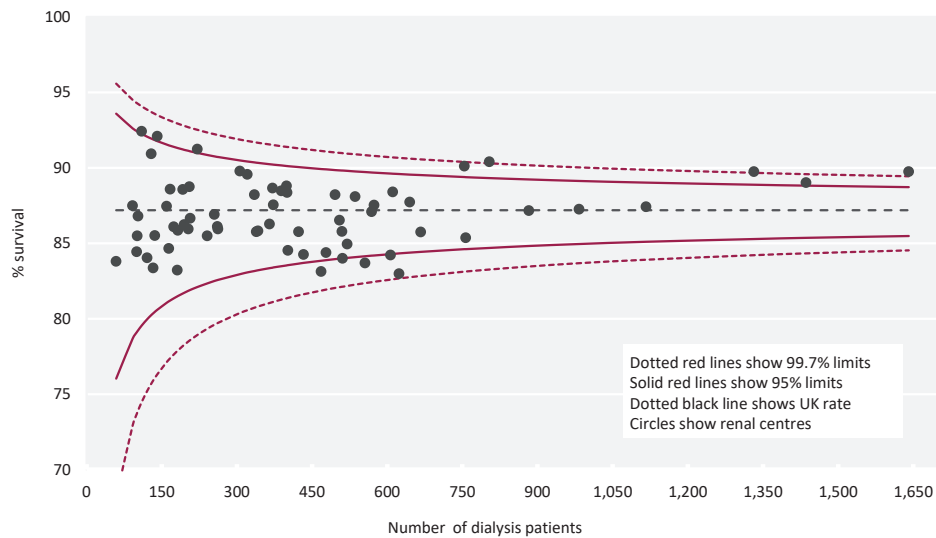
Figure 3.11 1 year survival (adjusted to age 60 years) of adult patients prevalent to dialysis on 31/12/2021 by centre

Adults on KRT in the UK at the end of 2022
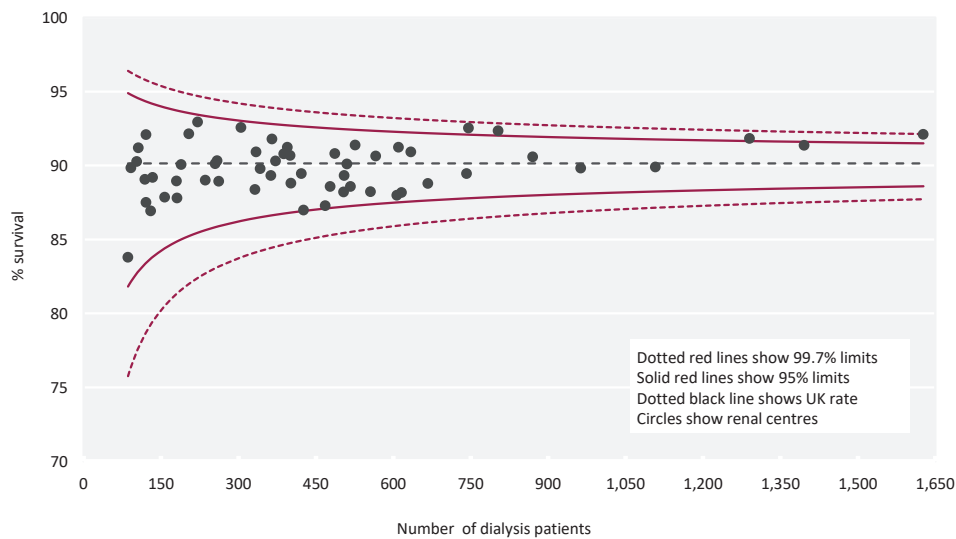
Figure 3.12 1 year survival (adjusted to 60 years, male and median comorbidity score) of adult patients prevalent to dialysis on 31/12/2021 by centre
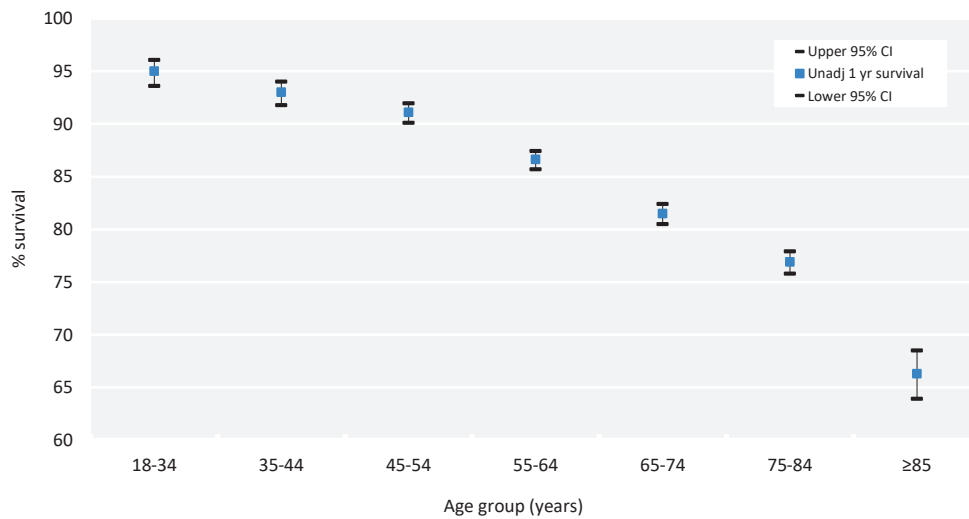

Figure 3.13 1 year survival (unadjusted) of adult patients prevalent to dialysis on 31/12/2021 by age group

CI – confidence interval

Adults on KRT in the UK at the end of 2022
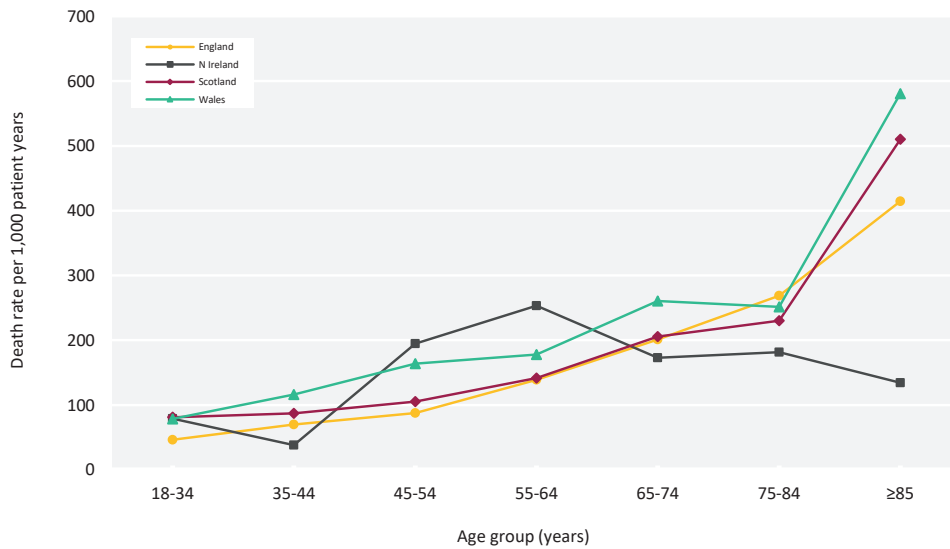
Figure 3.14 1 year death rate per 1,000 patient years for adult patients prevalent to dialysis on 31/12/2021 by country and age group

The serial one year death rate in prevalent adult dialysis patients by country is shown in figure 3.15, adjusted to age 60 years.
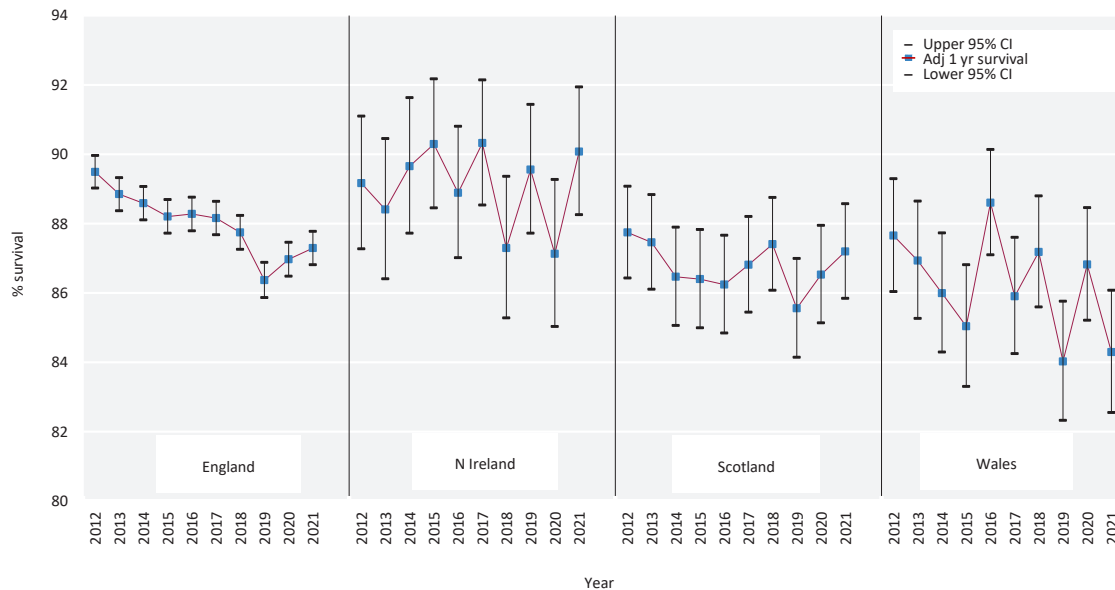
Figure 3.15 1 year survival (adjusted to age 60 years) for prevalent adult dialysis patients by country between 2012 and 2021
CI – confidence interval

The relative risk of death by age group for prevalent KRT patients compared to the general population's risk of death, calculated using Office for National Statistics UK population and deaths data, is shown in table 3.9.

Adults on KRT in the UK at the end of 2022

Table 3.9 Death rate by age group for adult patients prevalent to KRT on 31/12/2021 followed-up for 1 year compared with the general population and with previous analyses in the 1998–2001 cohort

Age group (yrs)	UK population mid-2022 (thousands)	UK deaths in 2022	Death rate per 1,000 population	Expected number of deaths in UKRR population	UKRR deaths in 2022	UKRR death rate per 1,000 prevalent KRT patients	Relative risk of death in 2022	Relative risk of death 1998-2001 cohort
20-24	4,010	1,504	0.4	0	8	8	21.8	41.1
25-29	4,400	2,129	0.5	1	21	13	27.4	41.8
30-34	4,599	3,091	0.7	2	54	21	31.7	31.2
35-39	4,435	4,674	1.1	4	83	24	22.8	26.0
40-44	4,279	6,428	1.5	6	113	27	17.7	22.6
45-49	4,056	9,951	2.5	13	180	34	13.9	19.0
50-54	4,555	15,735	3.5	25	301	42	12.0	12.8
55-59	4,611	24,097	5.2	45	554	65	12.5	10.1
60-64	4,079	31,244	7.7	63	674	83	10.8	10.4
65-69	3,447	43,796	12.7	92	850	118	9.3	7.9
70-74	3,229	62,576	19.4	126	991	153	7.9	7.2
75-79	2,748	89,603	32.6	163	982	196	6.0	5.3
80-84	1,736	102,642	59.1	172	815	280	4.7	4.0
≥85	1,718	255,078	148.5	212	587	412	2.8	3.0
Total	**51,902**	**652,548**	**12.6**	**922**	**6,213**	**96**	**6.7**	**7.7**

Cause of death in adult KRT patients

Cause of death was analysed in prevalent patients receiving KRT on 31/12/2021 and followed-up for one year in 2022. The proportion of 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 3.10 Cause of death in adult patients prevalent to KRT on 31/12/2021 followed-up in 2022 by age group

Cause of death	KRT all ages		KRT <65 yrs		KRT ≥65 yrs	
	N	%	N	%	N	%
Cardiac disease	1,159	20.7	421	24.1	738	19.2
Cerebrovascular disease	203	3.6	72	4.1	131	3.4
Infection	1,092	19.5	300	17.2	792	20.6
Malignancy	479	8.6	148	8.5	331	8.6
Treatment withdrawal	470	8.4	89	5.1	381	9.9
Other	1,773	31.7	567	32.4	1,206	31.4
Uncertain aetiology	416	7.4	152	8.7	264	6.9
Total (with data)	**5,592**	**100.0**	**1,749**	**100.0**	**3,843**	**100.0**
Missing	623	10.0	241	12.1	382	9.0
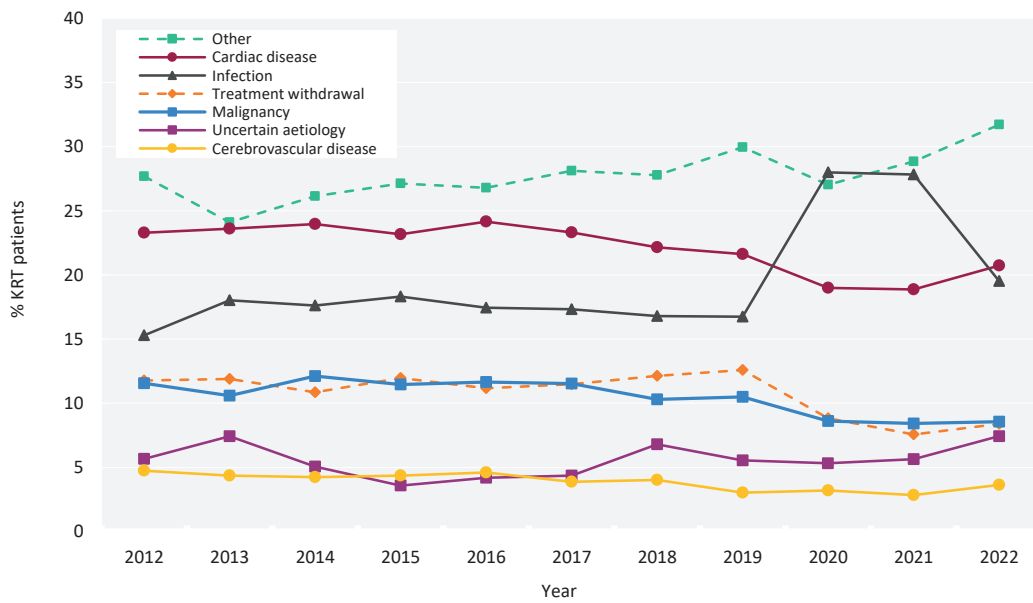
Figure 3.16 Cause of death between 2012 and 2022 for adult patients prevalent to KRT at the beginning of the year

Adults on KRT in the UK at the end of 2022

Chapter 4

Adults with a kidney transplant (Tx) in the UK at the end of 2022

Contents

Introduction

This chapter describes the population of patients with end-stage kidney disease (ESKD) who had a functioning kidney transplant (Tx) in the UK at the end of 2022 (figure 4.1). Patients can receive their first Tx either pre-emptively, i.e. without spending any time on dialysis, or while on dialysis. Donors in both pathways may be either a living kidney donor (LKD) or a deceased kidney donor – receiving a kidney from a donor after brain death (DBD) or a donor after circulatory death (DCD). If a Tx begins to fail a patient may be considered for a second (or subsequent) Tx, which again can come from a living or deceased donor.

Potential Tx recipients who pass rigorous assessments are wait-listed, which can occur before or after they have started dialysis. The majority of kidneys received through wait-listing are from deceased donors. The cohort of patients living with a kidney Tx in a centre not only reflects differences in underlying population case-mix, but also differences in the rates of acceptance onto kidney replacement therapy (KRT).This includes wait-listing rates and live donor programmes, survival of the Tx graft and its recipient, as well as the care and survival of patients on dialysis therapies, as described in other chapters of this report.
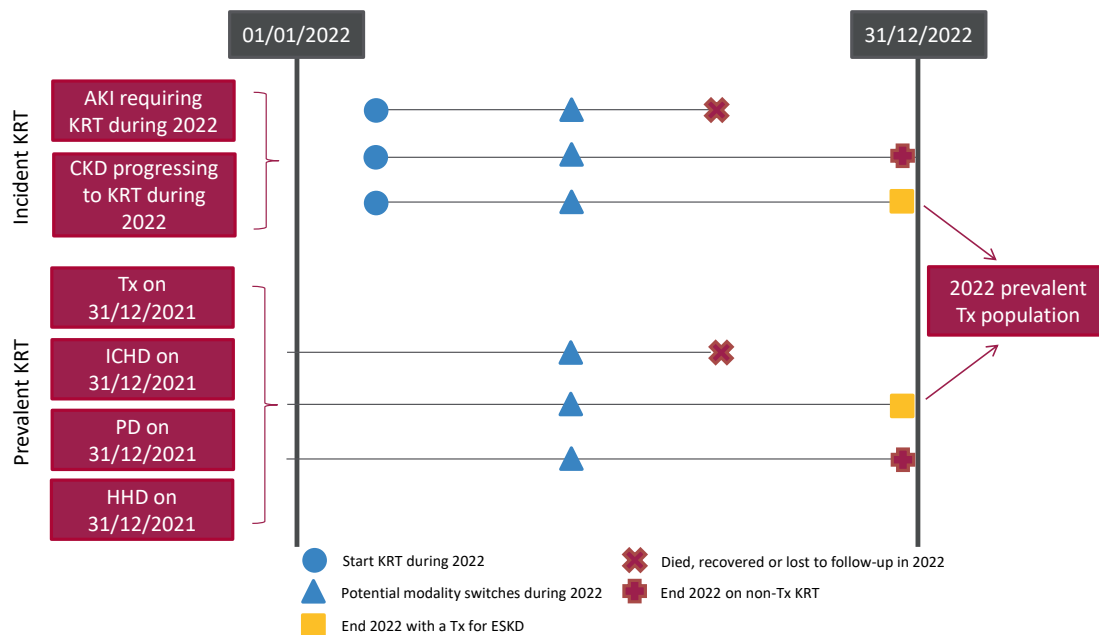
Figure 4.1 Pathways adult patients could follow to be included in the UK 2022 prevalent Tx population

Note that patients receiving dialysis for acute kidney injury (AKI) are only included in this chapter if they had a timeline or KRT modality code for Tx at the end of 2022 or if they had been on KRT for ≥90 days and were on Tx at the end of 2022

AKI – acute kidney injury; CKD – chronic kidney disease; HHD – home haemodialysis; ICHD – in-centre haemodialysis; PD – peritoneal dialysis; Tx - Transplantation

Patient survival, graft survival and cause of death analyses were undertaken on historic incident and prevalent cohorts to allow sufficient follow-up time.

The analyses were undertaken using UK Renal Registry (UKRR) data combined with NHS Blood and Transplant (NHSBT) data through a data sharing agreement.

This chapter addresses the following key aspects of the care of patients with a functioning kidney Tx for which there are UK Kidney Association guidelines (table 4.1):

- **Complications associated with CKD and kidney transplantation:** these include anaemia, mineral bone disorders and dyslipidaemia.

- **Blood pressure:** attainment of blood pressure targets are reported, although data completeness does not allow differentiation based on levels of proteinuria.

Rationale for analyses

The analyses begin with a brief summary of the number and type of kidney Tx undertaken in recent years in the UK as well as early graft and patient survival. More detailed results are available at organdonation.nhs.uk/helping-you-to-decide/about-organ-donation/statistics-about-organ-donation. The 2022 prevalent adult Tx population is described, including the number transplanted per million population (pmp).

The UK Kidney Association guidelines (ukkidney.org/health-professionals/guidelines/guidelines-commentaries) provide audit measures relevant to the care of patients with a Tx, and where data permit, their attainment by UK kidney centres in 2022 is reported in this chapter (table 4.1). Audit measures in guidelines that have been archived are not included.

Some audit measures in current guidelines cannot be reported because the completeness of the required data items 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. The chapter includes analyses carried out by Getting It Right First Time (GIRFT), a national programme designed to reduce unwarranted variation in medical care provided by the NHS by sharing best practice. The GIRFT metrics for kidney services, analysed in collaboration with the UKRR, were based on data derived from multiple sources and included equity of access to services, outcomes and pathways in nephrology, dialysis and transplantation.

Table 4.1 The UK Kidney Association audit measures relevant to Tx that are reported in this chapter

The UK Kidney Association guideline	Audit criteria	Related analysis/analyses
Post-operative care in the kidney Tx recipient (2017)	Proportion of patients receiving a target blood pressure of 140/90 mmHg or 130/80 mmHg in the presence of proteinuria – protein:creatinine ratio >100 mg/mmol or albumin:creatinine ratio >70 mg/mmol	Table 4.9, figures 4.13–4.14 (proteinuria was not adequately collected)
	Proportion of patients achieving dyslipidaemia targets	Table 4.9
	Incidence of hyperparathyroidism	Table 4.9
	Prevalence of anaemia	Table 4.9, figures 4.11–4.12
Anaemia (2020)	Treatment guidelines for anaemia in kidney Tx patients should be similar to those for CKD patients not on dialysis	Table 4.9, figures 4.11–4.12

In 2022, 23 of the 67 adult kidney centres in the UK were Tx centres – 19 in England, two in Scotland and one in each of Northern Ireland and Wales.

For definitions and methods relating to this chapter see appendix A. Centres were excluded from caterpillar plots and cells were blanked in tables where data completeness for a biochemical variable was <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.

As Colchester kidney centre did not have any Tx patients they were excluded from some of the analyses, although their dialysis patients were included in the relevant dialysis population denominators.

Exeter was unable to submit patient level data for 2022. Aggregate numbers by modality were provided, enabling inclusion in Tables 4.6 and 4.7. Exeter is excluded from all other analyses.

Manchester moved to a new Trust IT system, and as a result data were not submitted for the final quarter of 2022. For charts and tables in this chapter that use the December 2022 prevalent cohort, the data for Manchester are for patients who were on KRT as at 30th September 2022, rather than 31st December 2022.

Transplant

Key findings

- 39,874 adult patients had a kidney Tx for ESKD in the UK on 31/12/2022, which represented 56.2% of the KRT population.

- The median age of kidney Tx patients was 56.7 years and 60.8% were male.

- There was a 7% increase in overall kidney Tx performed in 2022 compared to 2021, with a increase in kidney Tx from LKDs by 8%, DCDs by 21% and a 2% decrease in DBDs. Transplant activity has not yet recovered to pre-pandemic levels.

- The median eGFR for kidney Tx patients 1 year after transplantation was 56.6 mL/min/1.73m^2 from LKD, 51.8 mL/min/1.73m^2 from DBD and 46.9 mL/min/1.73m^2 from DCD.

- 16.3% of kidney Tx patients had eGFR <30 mL/min/1.73m^2.

- The median decline in eGFR slope beyond the first year after transplantation was 0.8 mL/min/1.73m^2/year.

- 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 causes of death. The leading cause of death for Tx patients was infection at 26.0%.

Analyses

Kidney Tx activity

NHSBT provided the UKRR with summary data on kidney Tx activity (table 4.2). More detailed results are available at organdonation.nhs.uk/helping-you-to-decide/about-organ-donation/statistics-about-organ-donation. The number of patients receiving a pre-emptive Tx is reported by centre in chapter 2.

Table 4.2 Number of kidney and kidney plus other organ Tx (adult and paediatric) in the UK, 2019-2022 calendar years

Organ	2019	2020	2021	2022	% change 2021-2022
Kidney DBD[1]	1,417	1,220	1,208	1,185	-2
Kidney DCD[2]	1,024	683	845	1020	21
Kidney LKD	1,042	588	801	863	8
Kidney and liver[3]	18	5	9	6	-
Kidney and heart	1	0	2	0	-
Kidney and pancreas[4]	157	97	111	120	8
Kidney and pancreas islets[5]	7	4	7	5	-
Small bowel (inc kidney)	4	0	0	0	-
Total kidney Tx	**3,670**	**2,597**	**2,983**	**3,199**	**7**

[1] Includes en bloc kidney transplants (5 in 2019, 2 in 2020 and 2 in 2021) and double kidney transplants (5 in 2019, 10 in 2020, 10 in 2021 and 12 in 2022)

[2] Includes en bloc kidney transplants (3 in 2019, 2 in 2020, 5 in 2021 and 3 in 2022) and double kidney transplants (24 in 2019, 9 in 2020, 18 in 2021 and 13 in 2022)

[3] Includes DCD transplants (1 in 2020 and 1 in 2022)

[4] Includes DCD transplants (45 in 3019, 23 in 2020, 31 in 2021 and 41 in 2022)

[5] Includes DCD transplants (2 in 2020, 2 in 2021 and 1 in 2022)

DBD - donor after brain death; DCD - donor after circulatory death; LKD - living kidney donor

Variation in the proportion of patients who received an LKD Tx or were on the Tx waiting list within two years of KRT start, is shown for patients incident to KRT in 2020, adjusted by sex, age and primary renal disease (PRD) (figure 4.2). The analysis for LKD transplantation only is shown separately (figure 4.3). Centres can be identified in the funnel plots using the number of patients in the centre in table 4.3.
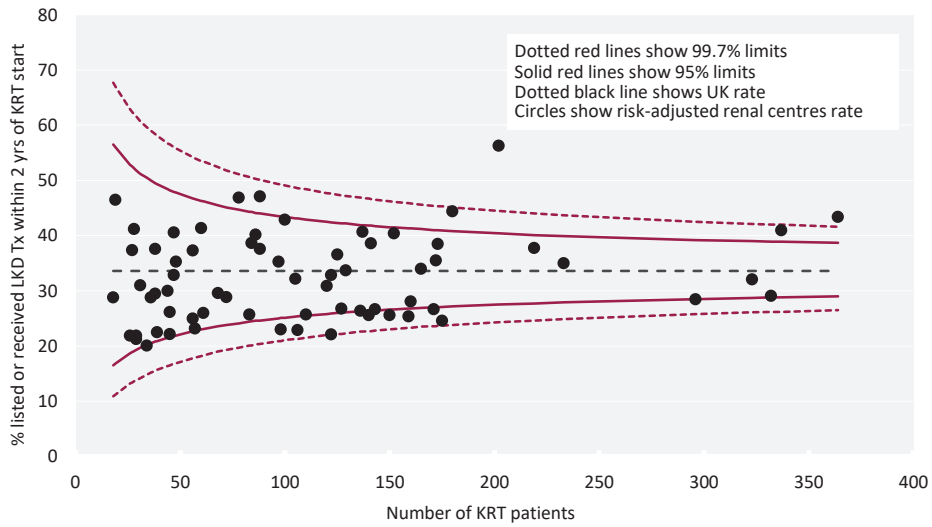
Figure 4.2 Percentage of adult patients incident to KRT in 2020 (adjusted to age 40-49 years, male, non-diabetic primary renal disease) who were waitlisted or received a living kidney donor (LKD) Tx within 2 years of KRT start by centre
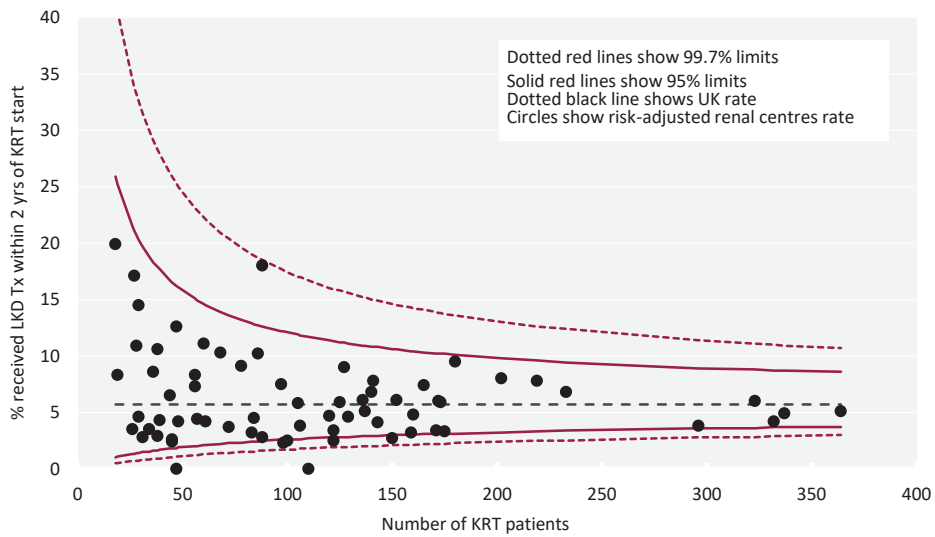
Figure 4.3 Percentage of adult patients incident to KRT in 2020 (adjusted to age 40-49 years, male, non-diabetic primary renal disease) who received a living kidney donor (LKD) Tx within 2 years of KRT start by centre

Adults with a kidney Tx in the UK at the end of 2022

Table 4.3 Percentage of adult patients incident to KRT in 2020 who were waitlisted or received a living kidney donor (LKD) Tx within 2 years of KRT start adjusted by age, sex and primary renal disease by centre

Centre	N on KRT	Listing/LKD Tx by 2 years from KRT start			LKD Tx by 2 years from KRT start		
			Limits for funnel plot			Limits for funnel plot	
		Adjusted percentage	Lower 95% limit	Upper 95% limit	Adjusted percentage	Lower 95% limit	Upper 95% limit
TX CENTRES							
Belfast	78	46.9	24.1	44.7	9.1	2.3	13.2
Bham	332	29.1	28.8	38.9	4.2	3.7	8.7
Bristol	129	33.7	26.1	42.2	4.6	2.8	11.1
Camb	137	40.7	26.3	41.9	5.1	2.9	10.9
Cardff	136	26.4	26.3	41.9	6.1	2.9	10.9
Covnt	141	38.6	26.4	41.8	7.8	2.9	10.8
Edinb	88	47.1	24.6	44	18	2.5	12.6
Glasgw	180	44.4	27.2	40.8	9.5	3.1	10.1
L Barts	323	32.1	28.7	39	6	3.6	8.8
L Guys	160	28.1	26.8	41.3	4.8	3	10.4
L Rfree	233	35	27.9	39.9	6.8	3.4	9.4
L St.G	84	38.7	24.5	44.3	4.5	2.4	12.8
L West	364	43.4	29	38.7	5.1	3.7	8.6
Leeds	152	40.4	26.6	41.5	6.1	3	10.6
Leic	337	41	28.8	38.9	4.9	3.7	8.7
Liv UH	150	25.6	26.6	41.5	2.7	3	10.6
M RI	172	35.5	27	41	6	3.1	10.2
Newc	125	36.6	26	42.3	5.9	2.8	11.2
Nottm	122	32.9	25.9	42.4	2.5	2.8	11.3
Oxford	202	56.3	27.5	40.4	8	3.2	9.8
Plymth	60	41.4	23	46.3	11.1	2.1	14.6
Ports	219	37.8	27.7	40.1	7.8	3.3	9.6
Sheff	175	24.6	27.1	40.9	3.3	3.1	10.2
DIALYSIS CENTRES							
Abrdn	56	25	22.7	46.7	8.3	2	15.1
Airdrie	56	37.3	22.7	46.7	7.3	2	15.1
Antrim	29	21.3	19.3	51.8	4.6	1.4	20.3
Bangor	29	21.9	19.3	51.8	14.5	1.4	20.3
Bradfd	83	25.7	24.4	44.3	3.2	2.4	12.9
Brightn	143	26.7	26.4	41.7	4.1	2.9	10.8
Carlis	34	20.1	20.2	50.5	3.5	1.5	18.8
Carsh	296	28.5	28.5	39.2	3.8	3.6	8.9
Clwyd	26	21.9	18.7	52.8	3.5	1.3	21.5
Colchr	39	22.5	20.9	49.3	4.3	1.7	17.7
D&Gall	19	46.5	16.8	56	8.3	1.1	25.2
Derby	72	28.9	23.8	45.1	3.7	2.3	13.6
Donc	47	32.9	21.8	47.9	0	1.8	16.2
Dorset	88	37.6	24.6	44	2.8	2.5	12.6
Dudley	61	26	23.1	46.2	4.2	2.1	14.5
Dundee	27	37.4	18.9	52.5	17.1	1.3	21.1
EssexMS	127	26.8	26	42.2	9	2.8	11.2
Exeter	105	32.2	25.3	43.1	5.8	2.6	11.9
Glouc	86	40.2	24.6	44.1	10.2	2.4	12.7
Hull	106	22.9	25.4	43.1	3.8	2.6	11.8
Inverns	18	28.8	16.5	56.5	19.9	1	25.9
Ipswi	44	30	21.5	48.4	6.5	1.8	16.7
Kent	140	25.6	26.4	41.8	6.8	2.9	10.8
Klmarnk	57	23.2	22.8	46.6	4.4	2	14.9
Krkcldy	36	28.8	20.5	50	8.6	1.6	18.3
L Kings	159	25.4	26.8	41.3	3.2	3	10.4

Adults with a kidney Tx in the UK at the end of 2022

Table 4.3 Continued

Centre	N on KRT	Listing/LKD Tx by 2 years from KRT start			LKD Tx by 2 years from KRT start		
			Limits for funnel plot			Limits for funnel plot	
		Adjusted percentage	Lower 95% limit	Upper 95% limit	Adjusted percentage	Lower 95% limit	Upper 95% limit
Middlbr	97	35.3	25	43.5	7.5	2.6	12.2
Newry	31	31	19.7	51.2	2.8	1.5	19.7
Norwch	98	23	25.1	43.5	2.3	2.6	12.2
Prestn	165	34	26.9	41.2	7.4	3.1	10.3
Redng	100	42.9	25.1	43.4	2.5	2.6	12.1
Salford	173	38.5	27	41	5.9	3.1	10.2
Shrew	45	22.2	21.6	48.2	2.4	1.8	16.5
Stevng	171	26.7	27	41	3.4	3.1	10.2
Stoke	120	30.9	25.8	42.5	4.7	2.8	11.4
Sund	68	29.6	23.6	45.5	10.3	2.2	13.9
Swanse	122	22.1	25.9	42.4	3.4	2.8	11.3
Truro	45	26.2	21.6	48.2	2.6	1.8	16.5
Ulster	28	41.2	19.1	52.2	10.9	1.4	20.7
West NI	38	37.6	20.8	49.5	10.6	1.6	17.9
Wirral	48	35.3	21.9	47.8	4.2	1.9	16.1
Wolve	110	25.7	25.5	42.9	0	2.7	11.7
Wrexm	38	29.5	20.8	49.5	2.9	1.6	17.9
York	47	40.6	21.8	47.9	12.6	1.8	16.2

LKD - Living kidney donor
Percentage adjusted to age 40-49 years, male, non-diabetic primary renal disease

Transplant

Early kidney Tx outcomes

Kidney Tx recipient outcome data from NHSBT were reported against the Tx centre rather than the referring centre (table 4.4). Note that the survival rates were risk-adjusted and used financial year cohorts as per NHSBT methodology (see table footnote).

Table 4.4 Risk-adjusted first adult kidney-only Tx, graft and patient survival by Tx type and Tx centre[1] (cohorts detailed in footnote)

	Deceased donor				Living donor			
	Adj 1 yr survival (%)		Adj 5 yr survival (%)		Adj 1 yr survival (%)		Adj 5 yr survival (%)	
Centre	Graft	Patient	Graft	Patient	Graft	Patient	Graft	Patient
Bham	94	96	81	88	97	100	94	91
Belfast	94	97	83	88	99	100	92	91
Bristol	97	93	87	86	97	100	92	94
Camb	96	98	89	85	98	100	96	93
Cardff	95	98	86	83	99	100	84	89
Covnt	96	97	85	89	97	100	92	94
Edin	97	98	90	94	98	99	97	100
Glasgw	96	96	83	85	97	99	95	96
L Barts	95	92	82	88	97	98	92	92
L Guy's	98	97	86	90	100	99	95	96
L Rfree	98	97	86	92	99	100	93	97
L St.G	96	97	86	90	99	99	95	96
L West	95	96	88	84	100	99	N/A	N/A
Leeds	96	96	83	87	98	100	91	97
Leic	98	96	88	84	99	100	89	92
Liv UH	92	91	86	86	99	99	91	92
M RI	96	93	86	84	97	98	92	93
Newc	97	98	83	85	99	99	94	93
Nottm	98	94	90	87	98	100	94	93
Oxford	97	96	92	89	98	99	94	95
Plymth	93	89	N/A	N/A	98	95	N/A	N/A
Ports	97	96	N/A	N/A	99	97	100	99
Sheff	96	95	N/A	N/A	97	100	N/A	N/A
UK total	**95**	**96**	**86**	**87**	**98**	**99**	**93**	**94**

Cohorts for survival rate estimation: 1 year survival: 1/4/2018-31/03/2022; 5 year survival: 1/4/2014-31/3/2018; first grafts only – re-grafts excluded for patient survival estimation

Since the cohorts to estimate 1 and 5 year survival are different, some centres may appear to have 5 year survival better than 1 year survival

Centres have been omitted where less than 75% of the data was reported

[1]Information courtesy of NHSBT: number of Tx, patients and 95% confidence intervals (CI) for each estimate; statistical methodology for computing risk-adjusted estimates can be obtained from NHSBT (https://nhsbtdbe.blob.core.windows.net/umbraco-assets-corp/29222/kidney-annual-report-2021-22update.pdf)

Kidney graft function at one year post-Tx was assessed using median eGFR by donor type and by centre using a seven year cohort (patients with graft failure including death with a functioning graft were excluded). The data completeness at one year after Tx (for Tx occurring 2015-2021) was 97.0%.

Adults with a kidney Tx in the UK at the end of 2022
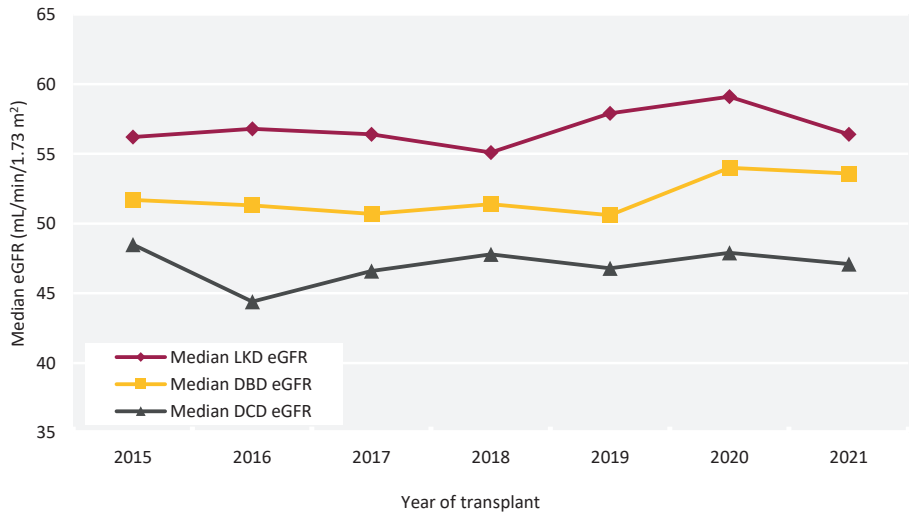
Figure 4.4 Median estimated glomerular filtration rate (eGFR) for kidney Tx at 1 year by donor type and year of transplantation between 2015 and 2021

DBD – donor after brain death; DCD – donor after circulatory death; LKD – living kidney donor
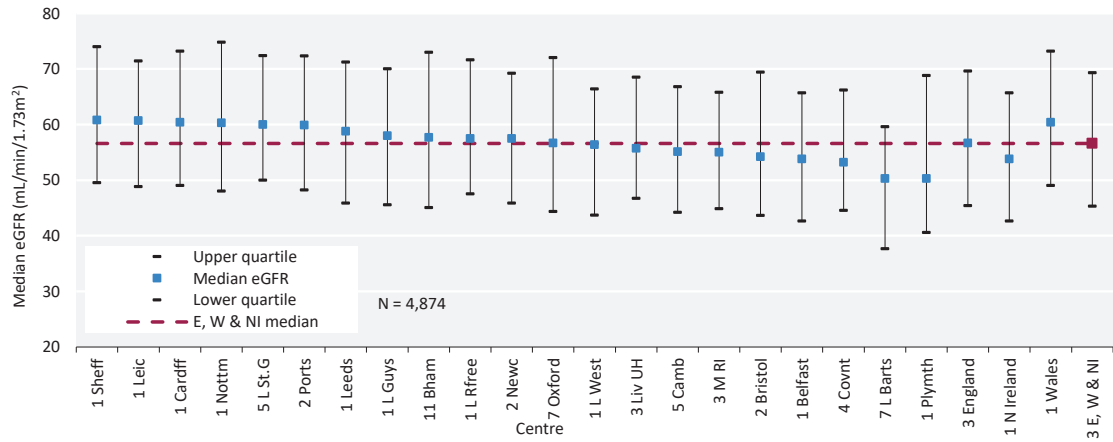
Figure 4.5 Median estimated glomerular filtration rate (eGFR) at 1 year post-living kidney donor (LKD) Tx by transplanting centre for transplantation that occured between 2015 and 2021

Adults with a kidney Tx in the UK at the end of 2022
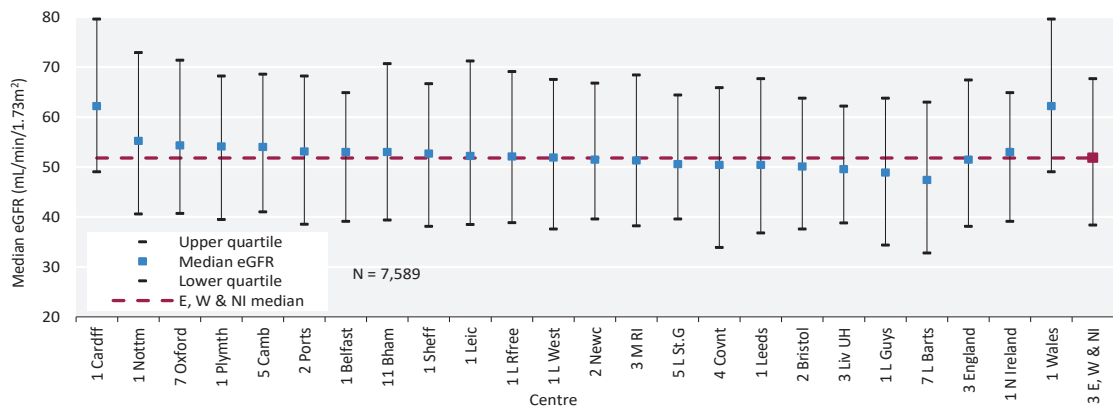
Figure 4.6 Median estimated glomerular filtration rate (eGFR) at 1 year post-donor after brain death (DBD) Tx by transplanting centre for transplantation that occured between 2015 and 2021
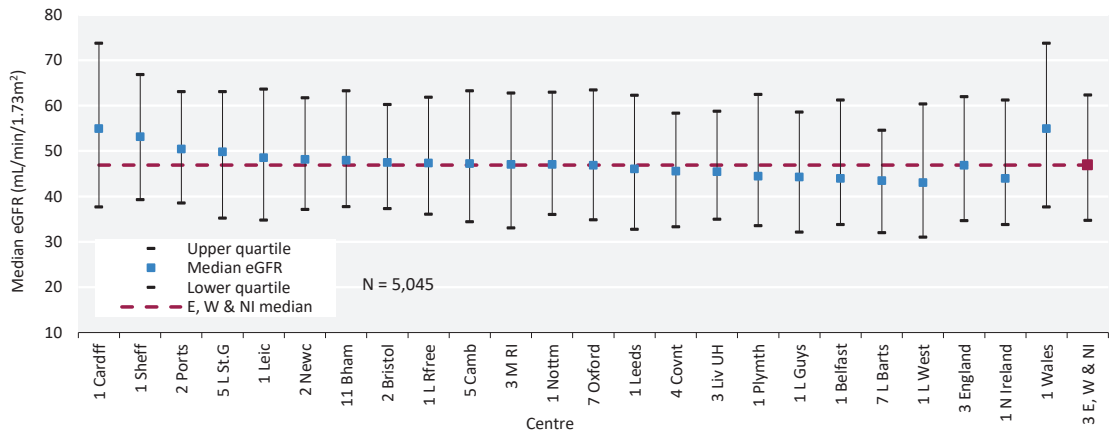
Figure 4.7 Median estimated glomerular filtration rate (eGFR) at 1 year post-donor after circulatory death (DCD) Tx by transplanting centre for transplantation that occured between 2015 and 2021

Transplant

Adults with a kidney Tx in the UK at the end of 2022

Changes to the prevalent adult kidney Tx population

Tx recipients are under the care of a Tx centre around the time of transplantation, but the policy of when to repatriate to the referring centre varies. When data entries for patients were received from more than one centre they were attributed to the referring centre.

Table 4.5 Percentage completeness of estimated glomerular filtration rate (eGFR), blood pressure, haemoglobin, total cholesterol, adjusted calcium, phosphate and parathyroid hormone (PTH) by centre for adult patients prevalent to Tx on 31/12/2022

Centre	N with Tx	Data completeness (%)						
		eGFR	Blood pressure	Haemoglobin	Total cholesterol	Adjusted calcium	Phosphate	PTH
TX CENTRES								
Bham	1,579	93.1	81.3	92.8	86.3	92.5	92.2	2.5
Belfast	735	98.8	93.7	98.5	99.3	97.7	97.4	26.1
Bristol	922	99.5	88.3	99.4	93.8	99.1	98.5	98.3
Camb	1,209	93.1	0.0	93.3	78.4	85.4	84.4	78.3
Cardff	1,053	98.0	93.6	97.9	63.3	97.5	97.5	14.4
Covnt	641	96.6	53.7	95.6	66.3	95.2	39.5	33.1
L Barts	1,362	93.0	0.6	92.4	93.8	92.1	92.1	90.2
L Guys	1,462	92.2	0.0	91.5	58.0	89.1	89.4	32.4
L Rfree	1,448	96.3	80.8	96.0	72.4	94.5	94.6	73.4
L St.G	474	95.6	79.8	95.4	84.8	89.5	89.5	84.8
L West	2,022	91.5	0.0	91.4	47.6	90.9	91.4	55.7
Leeds	1,125	98.7	86.0	98.5	94.8	97.3	90.8	34.2
Leic	1,447	96.3	3.8	96.1	94.5	94.9	94.6	39.7
Liv UH	789	95.1	1.5	94.7	60.3	92.5	93.5	1.4
M RI	1,372	76.5	1.5	76.5	77.6	75.5	75.4	85.6
Newc	779	95.4	81.9	95.0	62.6	95.0	95.0	56.1
Nottm	712	98.5	94.0	98.3	70.4	97.2	96.9	78.7
Oxford	1,428	84.9	0.0	84.8	41.9	82.4	82.2	41.9
Plymth	327	97.3	92.1	96.6	86.9	96.0	93.9	79.2
Ports	1,112	92.1	12.7	92.0	48.8	91.1	84.4	37.5
Sheff	764	97.9	92.0	98.0	51.3	97.3	97.1	17.2
DIALYSIS CENTRES								
Antrim	168	99.4	47.6	98.8	100.0	97.0	96.4	44.6
Bangor	109	95.4	53.2	95.4	99.1	94.5	94.5	34.9
Bradfd	415	99.0	1.5	98.8	91.8	97.1	93.0	88.9
Brightn	566	98.6	24.0	98.6	77.6	97.4	97.5	66.6
Carlis	162	82.7	0.0	82.1	45.1	80.9	77.2	28.4
Carsh	875	77.8	3.9	77.7	42.3	75.1	74.7	26.3
Clwyd	97	99.0	21.7	99.0	99.0	99.0	99.0	94.9
Derby	296	98.0	93.2	97.3	97.3	97.3	97.6	97.3
Donc	146	98.6	93.8	98.6	69.9	98.6	98.6	17.8
Dorset	424	88.2	32.1	88.2	66.5	84.4	75.7	46.2
Dudley	124	96.8	30.7	96.8	87.9	95.2	85.5	55.7
EssexMS	344	96.5	0.3	95.9	71.2	90.4	84.9	14.5
Exeter								
Glouc	278	96.0	51.8	95.7	54.3	92.5	89.6	30.9
Hull	492	98.6	1.6	98.6	41.9	94.5	94.5	23.2
Ipswi	241	93.4	12.9	93.4	68.1	87.6	90.5	55.2
Kent	628	98.9	94.1	98.7	31.1	97.9	97.8	6.5
L Kings	539	98.3	0.0	98.3	80.2	98.1	98.1	81.8
Middlbr	557	82.6	0.0	80.8	44.7	77.6	75.9	11.7
Newry	176	98.3	80.1	97.2	100.0	97.7	97.7	50.6

Adults with a kidney Tx in the UK at the end of 2022

Table 4.5 Continued

Centre	N with Tx	Data completeness (%)						
		eGFR	Blood pressure	Haemoglobin	Total cholesterol	Adjusted calcium	Phosphate	PTH
Norwch	435	95.6	0.0	94.5	94.9	86.9	85.5	20.7
Prestn	774	91.3	0.4	90.3	65.6	86.4	83.3	29.2
Redng	507	98.8	70.0	98.0	60.4	98.0	97.8	34.1
Salford	690	98.0	0.0	98.1	97.0	97.7	97.7	0.0
Shrew	174	91.4	28.2	91.4	85.6	82.8	82.8	18.4
Stevng	400	97.5	80.3	97.0	42.5	94.3	92.0	50.5
Stoke	441	98.0	0.2	97.7	98.4	97.7	98.0	71.2
Sund	281	100.0	0.0	100.0	70.1	100.0	99.6	75.8
Swanse	353	100.0	95.8	99.2	66.0	99.2	99.2	74.8
Truro	244	99.2	0.0	99.2	75.4	99.2	98.8	77.5
Ulster	104	97.1	93.3	97.1	99.0	95.2	94.2	9.6
West NI	234	98.7	70.9	98.3	99.6	97.4	97.0	92.3
Wirral	186	95.2	3.2	95.2	79.6	70.4	79.6	10.2
Wolve	244	95.9	46.7	95.9	85.7	95.1	42.2	57.4
Wrexm	175	96.0	86.9	96.6	98.9	96.0	96.0	98.9
York	345	99.1	52.2	98.3	63.5	96.5	95.4	26.4
				TOTALS				
England	31,782	93.4	31.7	93.1	69.9	91.2	88.7	47.7
N Ireland	1,417	98.7	82.8	98.2	99.5	97.4	97.0	41.1
Wales	1,787	98.1	87.0	97.9	71.5	97.6	97.6	40.2
E, W & NI	**35,124**	**93.9**	**36.6**	**93.6**	**71.2**	**91.8**	**89.5**	**47.1**

Blank cells – no data returned by the centre

Patients who had been on Tx for <3 months were excluded from this analysis, including N with Tx

Exeter was unable to submit patient level data for 2022

For the 66 adult kidney centres, the number of prevalent patients with a Tx was calculated as both a proportion of the prevalent patients on KRT and as a proportion of the estimated centre catchment population (calculated as detailed in appendix A).

Table 4.6 Number of prevalent adult Tx patients and proportion of adult KRT patients with a Tx by year and by centre; number of Tx patients as a proportion of the catchment population

Centre	N with Tx					% with Tx					Estimated catchment population (millions)	2022 crude rate (pmp)
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022		
TX CENTRES												
Belfast	673	692	720	743	757	76.7	78.6	81.0	81.7	81.8	0.53	1,415
Bham	1,575	1,630	1,603	1,608	1,625	48.5	49.2	49.2	48.7	48.1	2.03	802
Bristol	925	939	928	924	956	62.9	63.2	62.9	61.8	62.7	1.25	767
Camb	1,021	1,109	1,183	1,217	1,249	73.5	76.2	78.3	74.8	75.1	0.96	1,306
Cardff	1,073	1,083	1,068	1,061	1,087	62.4	62.6	63.5	62.4	61.8	1.17	927
Covnt	583	624	641	657	657	60.4	57.7	57.8	58.2	58.4	0.84	785
Edinb	522	546	565	604	635	60.6	61.7	63.5	65.1	65.1	0.84	753
Glasgw	1,156	1,216	1,241	1,256	1,253	63.8	65.6	67.1	67.1	65.2	1.37	917
L Barts	1,266	1,379	1,345	1,362	1,416	48.7	51.9	50.3	49.9	49.7	1.61	877
L Guys	1,458	1,550	1,513	1,482	1,518	65.4	66.8	65.3	63.7	65.7	1.00	1,518
L Rfree	1,374	1,426	1,425	1,467	1,496	61.5	60.8	61.0	61.3	61.9	1.33	1,128
L St.G	495	502	479	486	484	59.4	58.9	56.2	55.9	56.6	0.65	742
L West	1,975	2,042	2,026	2,016	2,080	55.5	56.6	57.4	56.7	57.4	1.97	1,057
Leeds	1,054	1,082	1,116	1,136	1,150	62.6	62.7	63.7	63.7	62.6	1.39	828
Leic	1,363	1,442	1,494	1,447	1,485	55.6	55.9	57.0	54.9	54.6	2.11	702
Liv UH	834	842	807	800	804	56.1	56.8	55.8	54.7	54.4	1.26	639
M RI	1,422	1,399	1,327	1,381	1,395	68.8	68.3	66.8	66.7	66.1	1.36	1,028
Newc	732	765	781	798	807	63.5	65.3	65.3	65.2	64.8	0.97	833
Nottm	743	751	732	723	725	62.1	61.7	60.6	59.4	59.9	0.94	770
Oxford	1,408	1,438	1,460	1,458	1,497	72.4	72.8	72.3	72.8	72.0	1.48	1,014
Plymth	362	360	359	345	339	67.0	67.3	66.2	63.5	62.1	0.41	836
Ports	1,070	1,133	1,108	1,116	1,143	60.7	60.2	58.3	57.5	57.2	1.77	646
Sheff	823	835	805	806	777	55.4	56.0	53.9	53.7	52.2	1.15	677
DIALYSIS CENTRES												
Abrdn	328	343	349	370	374	57.3	61.5	61.8	63.8	63.0	0.50	752
Airdrie	274	296	292	281	286	56.2	56.5	56.4	55.6	55.1	0.46	625
Antrim	131	145	161	160	170	47.8	50.9	56.1	54.2	55.6	0.25	689
Bangor	100	106	107	108	112	49.3	52.7	49.5	49.8	50.9	0.20	549
Bradfd	393	413	417	417	423	57.0	56.3	57.5	56.7	54.2	0.50	851
Brightn	510	545	556	568	586	48.3	51.2	51.6	52.1	53.3	1.08	540
Carlis	162	156	152	159	163	55.3	51.7	51.2	52.0	53.8	0.26	635
Carsh	766	834	842	862	898	43.7	46.8	45.5	45.3	46.4	1.64	549
Clwyd	98	104	107	102	97	51.6	50.7	52.5	50.5	47.6	0.18	533
D&Gall	83	87	89	92	88	57.2	58.4	57.1	59.7	59.5	0.12	723
Derby	258	296	299	307	305	44.0	45.3	44.3	44.4	42.6	0.56	548
Donc	119	132	140	146	153	36.1	38.6	41.1	43.1	40.7	0.38	405
Dorset	422	436	449	446	431	55.2	56.4	56.3	56.7	54.4	0.73	587
Dudley	106	111	124	130	127	29.4	30.3	33.2	32.3	33.2	0.34	369
Dundee	254	259	253	240	234	57.1	57.7	58.8	58.4	58.7	0.37	640
EssexMS	331	329	350	355	356	39.2	38.6	39.6	39.7	39.7	1.00	357
Exeter	537	541	535	512	541	49.6	49.7	49.0	47.5	48.0	0.98	553
Glouc	243	269	266	282	292	46.6	50.7	51.0	51.7	52.7	0.52	563
Hull	480	498	498	492	501	54.6	55.1	54.6	53.7	53.7	0.80	626
Inverns	169	171	170	172	178	60.6	60.6	62.7	61.9	63.6	0.23	791
Ipswi	232	240	255	248	242	54.2	56.1	59.9	58.8	61.3	0.31	770
Kent	633	650	639	644	653	56.9	57.0	55.9	54.0	53.4	1.08	606
Klmarnk	167	182	181	181	183	49.1	50.7	49.1	49.2	48.9	0.29	631
Krkcldy	153	144	137	122	113	51.3	48.7	46.9	41.2	38.7	0.27	413
L Kings	480	525	513	529	554	40.6	42.1	40.9	39.7	39.7	0.93	598
Middlbr	539	558	573	572	569	58.0	58.6	60.6	59.7	59.6	0.82	696
Newry	152	162	173	179	179	60.3	64.0	65.5	63.7	66.5	0.24	757
Norwch	445	454	461	450	442	56.5	56.1	56.9	56.0	56.5	0.70	630

Transplant

Table 4.6 Continued

Centre	N with Tx					% with Tx					Estimated catchment population (millions)	2022 crude rate (pmp)
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022		
Prestn	721	745	772	778	798	54.5	55.5	56.4	56.6	57.0	1.25	638
Redng	468	483	501	513	518	57.5	56.0	57.6	58.4	56.1	0.70	736
Salford	621	687	689	688	701	52.9	55.3	54.4	56.5	55.1	1.17	601
Shrew	146	151	166	170	186	34.0	34.6	38.9	38.6	41.8	0.42	444
Stevng	378	382	380	409	418	40.3	39.7	38.8	40.1	39.2	1.12	372
Stoke	419	439	430	433	451	52.0	54.5	52.9	51.3	49.9	0.74	612
Sund	278	280	296	285	289	49.6	49.1	53.2	52.1	51.4	0.55	524
Swanse	346	358	353	359	364	41.9	41.2	41.5	42.1	43.0	0.76	478
Truro	249	261	259	251	254	57.0	58.0	58.2	54.5	53.9	0.37	696
Ulster	75	81	102	102	105	39.3	43.8	50.8	50.3	50.0	0.20	514
West NI	202	207	224	226	241	61.8	63.1	63.8	66.7	67.7	0.25	959
Wirral	170	184	198	199	189	42.4	44.1	47.5	48.0	47.3	0.47	401
Wolve	204	229	239	246	248	33.5	37.3	36.5	35.4	34.4	0.55	451
Wrexm	171	175	177	181	178	54.5	56.3	54.8	59.5	58.0	0.21	858
York	340	349	338	347	349	59.8	60.0	59.1	59.7	57.4	0.50	704
TOTALS												
England	31,133	32,425	32,469	32,667	33,240	55.5	56.3	56.1	55.5	55.4	45.20	735
N Ireland	1,233	1,287	1,380	1,410	1,452	64.2	66.6	69.3	69.6	70.3	1.47	985
Scotland	3,106	3,244	3,277	3,318	3,344	59.3	60.6	61.4	61.5	60.8	4.44	753
Wales	1,788	1,826	1,812	1,811	1,838	55.0	55.1	55.4	55.3	55.1	2.53	727
UK	**37,260**	**38,782**	**38,938**	**39,206**	**39,874**	**56.0**	**56.8**	**56.9**	**56.4**	**56.2**	**53.65**	**743**

Country Tx populations were calculated by summing the Tx 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 but provided aggregate numbers of patients on KRT at the end of each year by treatment modality
pmp – per million population

Transplant

Adults with a kidney Tx in the UK at the end of 2022

Demographics of prevalent adult kidney Tx patients

The proportion of Tx 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 4.7 Demographics of adult patients prevalent to Tx on 31/12/2022 by centre

Centre	N on KRT	N with Tx	% with Tx	Median age (yrs)	% male	Ethnicity % White	% Asian	% Black	% Other	% missing
						TX CENTRES				
Belfast	926	757	81.7	56.3	60.2	97.4	2.1	0.3	0.3	3.3
Bham	3,378	1,625	48.1	53.5	58.3	59.5	29.3	7.8	3.5	0.6
Bristol	1,524	956	62.7	56.3	60.7	89.1	4.0	4.6	2.3	0.3
Camb	1,663	1,249	75.1	56.0	61.5	88.2	7.2	3.1	1.6	0.7
Cardff	1,758	1,087	61.8	56.2	63.2	91.8	5.5	0.9	1.8	2.0
Covnt	1,125	657	58.4	55.4	61.2	77.9	16.9	4.9	0.3	0.2
Edinb	976	635	65.1	57.3	64.4					
Glasgw	1,921	1,253	65.2	57.0	58.2					
L Barts	2,851	1,416	49.7	54.6	58.1	38.6	35.5	19.5	6.4	0.7
L Guys	2,309	1,518	65.7	54.9	60.4	64.7	10.8	19.9	4.7	1.6
L Rfree	2,418	1,496	61.9	56.3	60.5	45.9	23.2	18.5	12.4	4.4
L St.G	855	484	56.6	57.1	54.8	47.8	25.0	19.2	8.0	4.1
L West	3,626	2,080	57.4	58.4	63.1	42.1	35.5	15.0	7.4	0.1
Leeds	1,836	1,150	62.6	56.0	60.4	78.9	15.1	4.6	1.4	0.0
Leic	2,719	1,485	54.6	57.5	58.0	72.6	20.8	4.7	1.8	1.4
Liv UH	1,479	804	54.4	56.4	63.6	92.1	2.9	2.9	2.1	1.2
M RI	2,111	1,395	66.1	55.3	60.4	75.2	14.4	8.0	2.4	0.8
Newc	1,245	807	64.8	57.0	58.5	93.7	4.6	0.9	0.9	0.3
Nottm	1,211	725	59.9	55.8	59.3	84.7	6.8	5.3	3.3	0.1
Oxford	2,080	1,497	72.0	56.9	62.1	80.1	11.4	4.1	4.4	11.2
Plymth	546	339	62.1	58.6	65.8	96.5	1.5	0.3	1.8	0.0
Ports	2,000	1,143	57.2	57.1	56.6	93.1	4.0	0.8	2.1	3.9
Sheff	1,488	777	52.2	56.7	62.4	88.5	6.8	2.1	2.6	1.4
						DIALYSIS CENTRES				
Abrdn	594	374	63.0	53.8	58.6					
Airdrie	519	286	55.1	55.9	58.7	95.8	2.3	0.4	1.5	9.1
Antrim	306	170	55.6	58.0	61.8	99.4	0.0	0.6	0.0	5.9
Bangor	220	112	50.9	57.5	65.2	99.1	0.0	0.0	0.9	4.5
Bradfd	781	423	54.2	52.4	60.8	52.5	43.7	2.8	1.0	0.0
Brightn	1,100	586	53.3	57.5	61.4	90.5	5.7	1.6	2.2	1.0
Carlis	303	163	53.8	58.7	61.4	96.9	3.1	0.0	0.0	0.0
Carsh	1,936	898	46.4	58.5	62.0	68.6	18.4	9.2	3.8	0.3
Colchr	157	0								
Clwyd	204	97	47.5	59.0	61.9	96.8	2.1	1.1	0.0	2.1
D&Gall	148	88	59.5	58.1	63.6	97.0	1.5	0.0	1.5	23.9
Derby	716	305	42.6	58.8	63.3	83.2	10.9	3.3	2.6	0.3
Donc	376	153	40.7	56.5	64.7	94.7	2.6	1.3	1.3	0.7
Dorset	792	431	54.4	60.5	60.8	95.6	2.3	0.5	1.6	0.0
Dudley	383	127	33.2	56.8	66.9	81.1	14.2	3.2	1.6	0.0
Dundee	399	234	58.6	57.2	58.6					
EssexMS	897	356	39.7	58.0	62.9	85.6	5.9	5.4	3.1	0.3
Exeter	1,128	541	48.0							
Glouc	554	292	52.7	60.0	58.6	92.8	4.1	1.4	1.7	0.3
Hull	933	501	53.7	56.5	66.3	96.2	1.4	0.8	1.6	0.4
Inverns	280	178	63.6	56.6	58.4					
Ipswi	395	242	61.3	59.6	62.0	85.1	2.5	4.2	8.3	0.4
Kent	1,224	653	53.3	57.0	58.2	90.9	4.2	1.5	3.4	0.3

Adults with a kidney Tx in the UK at the end of 2022

Table 4.7 Continued

Centre	N on KRT	N with Tx	% with Tx	Median age (yrs)	% male	Ethnicity % White	% Asian	% Black	% Other	% missing
Klmarnk	374	183	48.9	57.7	59.6					
Krkcldy	292	113	38.7	58.9	61.1					
L Kings	1,394	554	39.7	57.5	63.7	47.3	17.2	31.9	3.6	0.4
Middlbr	955	569	59.6	58.4	61.9	94.0	4.2	0.5	1.2	0.0
Newry	269	179	66.5	57.6	60.3	97.7	1.1	0.6	0.6	2.2
Norwch	783	442	56.4	58.9	61.1	97.5	1.1	0.7	0.7	0.0
Prestn	1,400	798	57.0	57.2	60.3	84.3	13.9	0.9	0.9	0.0
Redng	924	518	56.1	58.7	63.3	64.6	23.7	5.8	6.0	6.2
Salford	1,273	701	55.1	57.6	61.5	81.4	14.9	2.0	1.7	0.1
Shrew	445	186	41.8	56.8	61.8	92.4	2.7	1.6	3.2	0.5
Stevng	1,066	418	39.2	56.7	65.8	69.5	19.2	8.4	2.9	0.5
Stoke	903	451	49.9	54.5	63.9	90.7	6.6	1.6	1.1	2.4
Sund	562	289	51.4	56.7	60.2	94.8	3.5	1.0	0.7	0.0
Swanse	847	364	43.0	57.2	61.3	96.7	2.5	0.0	0.8	0.6
Truro	471	254	53.9	58.2	59.1	98.0	0.4	0.0	1.6	0.0
Ulster	210	105	50.0	58.3	60.0	92.4	4.8	2.9	0.0	0.0
West NI	356	241	67.7	56.2	60.6	98.7	0.8	0.4	0.0	0.8
Wirral	400	189	47.3	59.3	63.5	95.2	3.2	0.5	1.1	0.0
Wolve	722	248	34.3	56.4	57.7	65.3	26.2	6.9	1.6	0.0
Wrexm	307	178	58.0	55.1	66.3	95.5	1.7	0.6	2.3	1.1
York	608	349	57.4	58.4	62.8	96.3	1.4	0.3	2.0	0.0
TOTALS										
England	60,045	33,240	55.4	56.7	60.8	74.5	14.8	7.2	3.5	1.5
N Ireland	2,067	1,452	70.2	56.9	60.5	97.5	1.7	0.6	0.2	2.8
Scotland	5,503	3,344	60.8	56.5	59.8					
Wales	3,336	1,838	55.1	56.5	63.2	93.9	4.0	0.7	1.5	1.8
UK	**70,951**	**39,874**	**56.2**	**56.7**	**60.8**	**76.4**	**13.8**	**6.6**	**3.2**	**1.5**

Blank cells – no data returned 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 but provided aggregate numbers of patients on KRT at the end of 2022 by treatment modality

UK ethnicity distribution and completeness does not include Scotland

Adults with a kidney Tx in the UK at the end of 2022
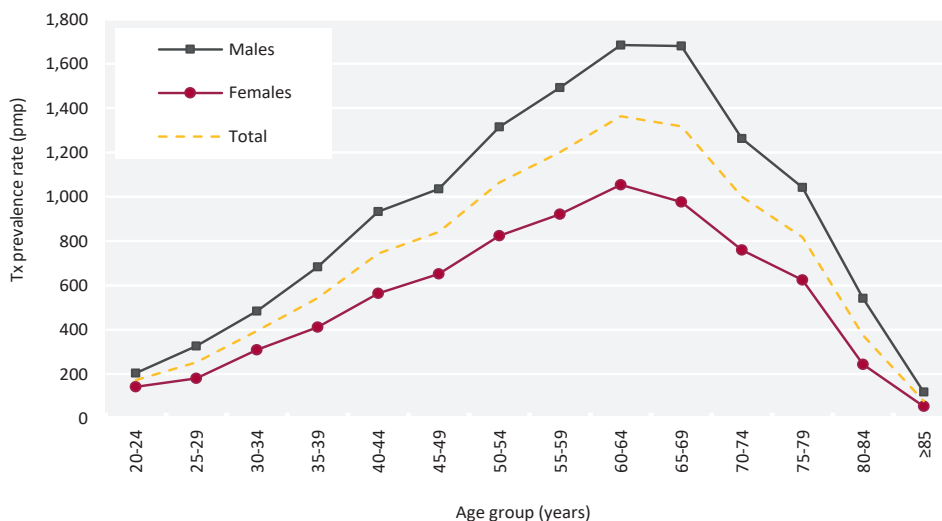
Figure 4.8 Adult Tx prevalence rate on 31/12/2022 by age group and sex
pmp – per million population

The distribution of primary renal diseases (PRDs) as a cause of ESKD in the incident Tx population is compared to the prevalent Tx population (table 4.8). Comparison to dialysis populations is shown in chapter 3. PRDs were grouped into categories, with the mapping of disease codes into groups explained in more detail in appendix A. The proportion of Tx patients with each PRD is shown for patients with PRD data and these total 100% of patients with data. The proportion of patients with no PRD data is shown on a separate line.

Table 4.8 Primary renal diseases (PRDs) of adult patients incident to Tx in 2022 and adult patients prevalent to Tx on 31/12/2022

PRD	Incident Tx		Prevalent Tx	
	N	%	N	%
Diabetes	477	16.7	4,455	11.9
Glomerulonephritis	688	24.1	8,973	24.0
Hypertension	179	6.3	2,071	5.5
Polycystic kidney disease	359	12.6	5,117	13.7
Pyelonephritis	202	7.1	4,108	11.0
Renal vascular disease	44	1.5	466	1.2
Other	555	19.4	7,437	19.9
Uncertain aetiology	356	12.4	4,766	12.7
Total (with data)	**2,860**	**100.0**	**37,393**	**100.0**
Missing	146	4.9	545	1.4

Adults with a kidney Tx in the UK at the end of 2022

Graft function and anaemia in prevalent adult kidney Tx patients

Accepting the limitations of interpreting eGFR in the post-Tx population, analyses by centres were divided into the proportion of patients with eGFR greater than or equal to 30 mL/min/1.73m^2, the proportion with less than 30 mL/min/1.73m^2, and the proportion of patients achieving an adequate haemoglobin level (defined as a haemoglobin ≥100 g/L).
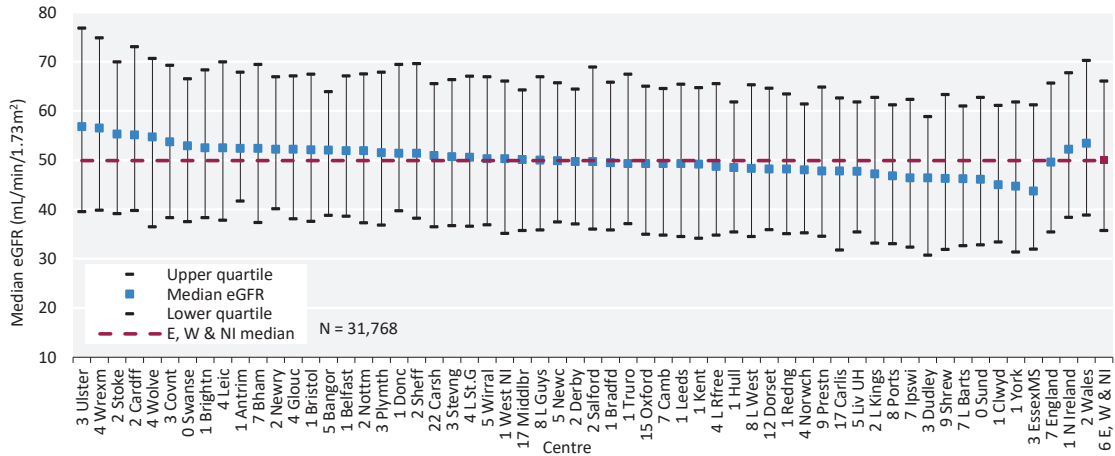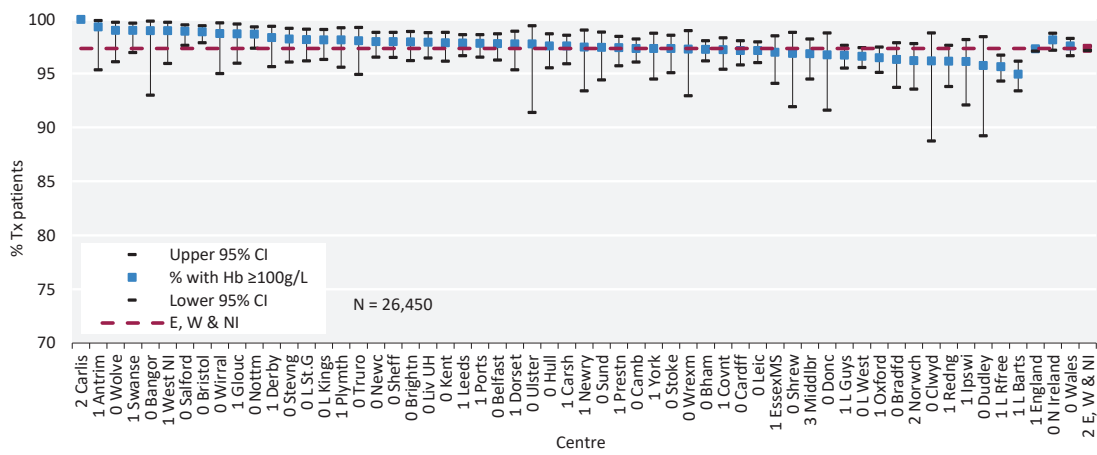

Figure 4.9 Median estimated glomerular filtration rate (eGFR) in adult patients prevalent to Tx on 31/12/2022 by centre
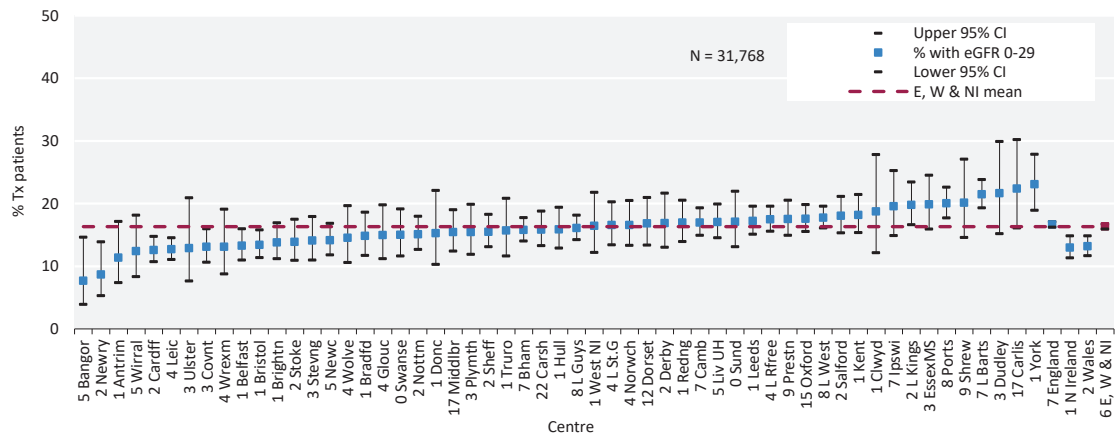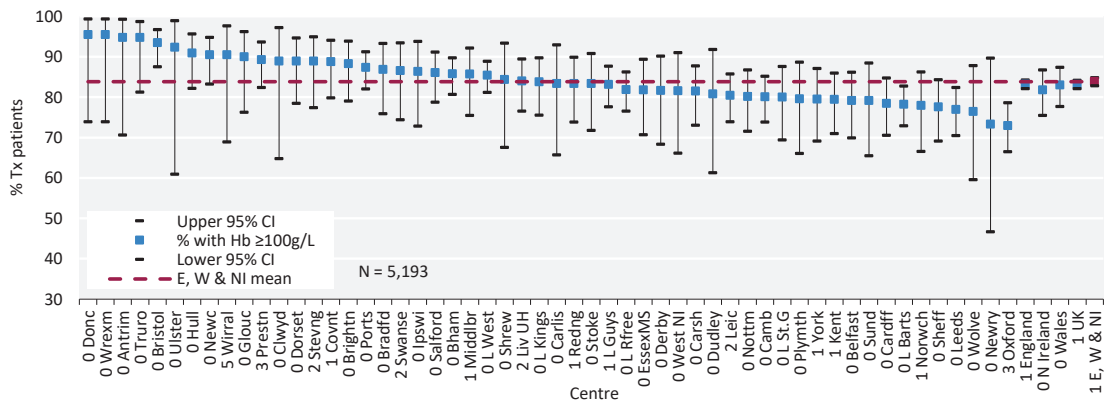

Figure 4.10 Percentage of adult patients prevalent to Tx on 31/12/2022 with an estimated glomerular filtration rate (eGFR) <30mL/min/1.73m^2 by centre
CI – confidence interval

Transplant

Figure 4.11 Percentage of adult patients prevalent to Tx on 31/12/2022 with an estimated glomerular filtration rate (eGFR) ≥30mL/min/1.73m² achieving haemoglobin (Hb) ≥100g/L by centre
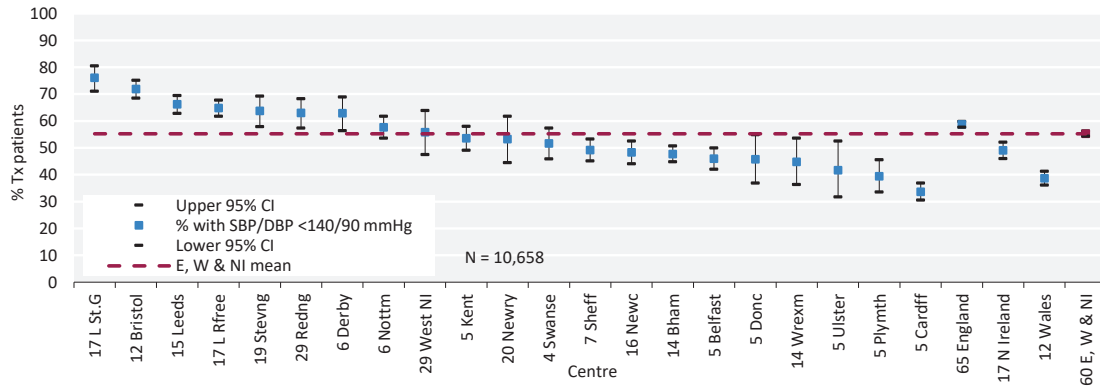
CI – confidence interval

Figure 4.12 Percentage of adult patients prevalent to Tx on 31/12/2022 with an estimated glomerular filtration rate (eGFR) <30mL/min/1.73m² achieving haemoglobin (Hb) ≥100g/L by centre

CI – confidence interval

Adults with a kidney Tx in the UK at the end of 2022

Blood pressure in prevalent adult kidney Tx patients

Blood pressure data completeness was variable (table 4.5) and only centres with ≥70% data completeness were included in the analysis. It is possible that bias may be introduced if blood pressure readings in particular ranges were more frequently reported. A lack of data on proteinuria did not allow differentiation for the purposes of reporting against the audit measure.
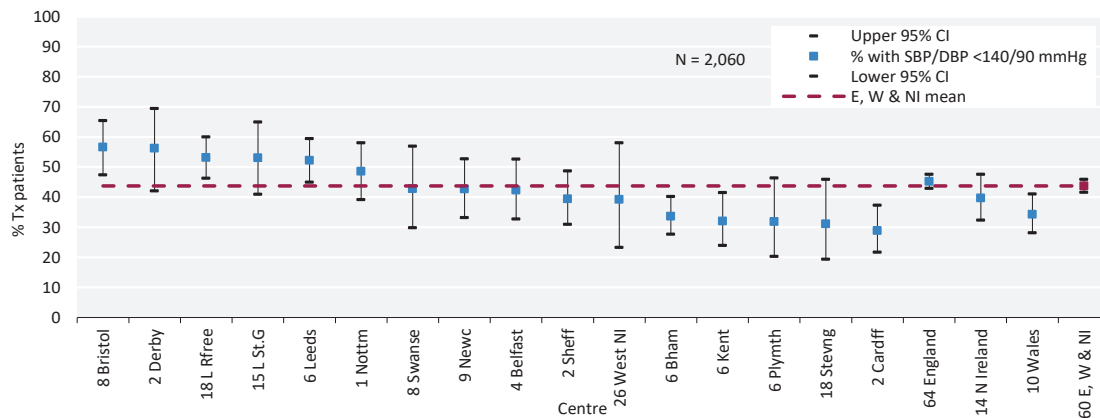

Figure 4.13 Percentage of adult patients prevalent to Tx on 31/12/2022 with estimated glomerular filtration rate (eGFR) ≥30 mL/min/1.73m² achieving blood pressure of <140/90 mmHg by centre
CI – confidence interval; DBP – diastolic blood pressure; SBP – systolic blood pressure

Figure 4.14 Percentage of adult patients prevalent to Tx on 31/12/2022 with estimated glomerular filtration rate (eGFR) <30 mL/min/1.73m² achieving blood pressure of <140/90 mmHg by centre
CI – confidence interval; DBP – diastolic blood pressure; SBP – systolic blood pressure

Biochemistry parameters in prevalent adult kidney Tx patients

The attainment of audit standards is shown by stage of Tx kidney function in the prevalent Tx population and by comparing to the prevalent dialysis population.

Table 4.9 Estimated glomerular filtration rate (eGFR), blood pressure and biochemical parameters in adult patients prevalent to Tx on 31/12/2022 compared with adult patients prevalent to dialysis on 31/12/2022 by CKD stage

Characteristic	Tx CKD stage (eGFR)				Prevalent dialysis Stage 5D
	Stage 1-2T (≥60 mL/min/1.73 m²)	Stage 3T (30-59 mL/min/1.73 m²)	Stage 4T (15-29 mL/min/1.73 m²)	Stage 5T (<15 mL/min/1.73 m²)	
N	10,623	15,971	4,407	783	22,532
%	33.4	50.3	13.9	2.5	
eGFR (mL/min/1.73m²)					
mean ± SD	76.7 ± 13.3	45.1 ± 8.4	23.6 ± 4.2	11.5 ± 2.5	
median	73.6	45.0	24.1	11.9	
SBP (mmHg)					
mean ± SD	136 ± 17	138 ± 18	142 ± 19	145 ± 21	137 ± 25
% ≥140 mmHg	35.6	42.7	51.5	58.8	44.0
DBP (mmHg)					
mean ± SD	81 ± 10	81 ± 11	80 ± 12	82 ± 13	71 ± 15
% ≥90 mmHg	18.9	19.0	19.9	27.7	11.1
Total cholesterol (mmol/L)					
mean ± SD	4.4 ± 1.0	4.4 ± 1.1	4.5 ± 1.2	4.4 ± 1.2	3.8 ± 1.1
% ≥4.0 mmol/L	63.7	65.2	64.9	60.2	39.8
Haemoglobin (g/L)					
mean ± SD	137 ± 16	129 ± 17	116 ± 16	105 ± 16	110 ± 14
% <100 g/L	1.6	3.4	13.7	34.8	21.0
Phosphate (mmol/L)					
mean ± SD	0.9 ± 0.2	1.0 ± 0.2	1.1 ± 0.3	1.4 ± 0.4	1.7 ± 0.5
% >1.7 mmol/L	0.1	0.3	1.8	19.7	43.6
Adjusted Ca (mmol/L)					
mean ± SD	2.4 ± 0.1	2.5 ± 0.1	2.4 ± 0.1	2.4 ± 0.2	2.4 ± 0.2
% >2.5 mmol/L	28.4	29.9	23.4	15.2	17.3
% <2.2 mmol/L	1.8	2.2	4.9	15.2	15.6
PTH (pmol/L)					
median	8.4	10.0	14.9	29.3	34.8
% >72 pmol/L	0.6	0.7	3.8	12.8	20.1

Ca – adjusted calcium; DBP – diastolic blood pressure; PTH – parathyroid hormone; SBP – systolic blood pressure; SD – standard deviation

Transplant

Differences in the median eGFR slope in Tx patients is reported by patient and Tx graft characteristics. All UK patients aged at least 18 years receiving their first kidney Tx between 01/01/2012 and 31/12/2020 were considered for inclusion. A minimum duration of 18 months graft function was required and three or more creatinine measurements from the second year of graft function onwards were used to plot eGFR slope. If a Tx failed, but there were at least three creatinine measurements between one year post-Tx and graft failure, the patient was included, but no creatinine measurements after the quarter preceding the recorded date of Tx failure were analysed.

Table 4.10 Differences in median estimated glomerular filtration rate (eGFR) slope between demographic subgroups of adult patients who received their first kidney Tx between 01/01/2012 and 31/12/2020

Characteristic	N	Median slope	Lower quartile	Upper quartile
Age at Tx (yrs)				
<40	4,819	-1.40	-4.62	0.77
40-55	8,482	-0.71	-3.00	1.09
>55	7,177	-0.67	-3.06	1.09
Ethnicity				
White	14,264	-0.73	-3.11	1.03
Asian	2,912	-1.17	-4.00	0.91
Black	1,625	-1.37	-4.21	0.76
Other	640	-0.79	-3.87	0.81
Sex				
Male	12,646	-0.61	-3.03	1.19
Female	7,832	-1.24	-3.92	0.71
Diabetes				
No Diabetes	16,660	-0.73	-3.18	1.06
Diabetes	3,492	-1.37	-4.31	0.80
Tx donor				
Deceased	14,250	-0.84	-3.41	1.07
Living	6,228	-0.80	-3.23	0.95
Year of Tx				
2012	2,178	-1.08	-3.00	0.25
2013	2,398	-1.06	-3.10	0.44
2014	2,328	-0.89	-2.98	0.59
2015	2,312	-0.78	-2.86	0.74
2016	2,393	-0.80	-3.21	0.97
2017	2,552	-0.77	-3.43	1.19
2018	2,480	-0.52	-3.35	1.88
2019	2,276	-0.59	-4.36	2.34
2020	1,561	-0.63	-5.81	3.89
Status of Tx patients at end of follow-up				
Died	2,398	-1.37	-4.17	0.97
Graft failed	1,912	-6.06	-11.72	-3.01
Re-transplanted	75	-3.39	-7.06	-1.31
Graft functioning	16,168	-0.46	-2.47	1.23
Total	**20,478**	**-0.83**	**-3.36**	**1.02**

Adults with a kidney Tx in the UK at the end of 2022

Survival of adult kidney Tx patients

Survival of incident and prevalent KRT patients is described in detail in chapters 2 and 3, respectively. Survival of incident Tx patients is reported in table 4.4. NHSBT reports the survival of Tx recipients.

# Cause of death in adult kidney Tx patients

Cause of death was analysed in patients prevalent to KRT on 31/12/2021 and followed-up for one year in 2022, with comparisons between Tx and dialysis presented in table 4.11. The proportion of 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 4.11 Cause of death in adult patients prevalent to KRT on 31/12/2021 followed-up in 2022 by modality

Cause of death	All modalities		Dialysis		Tx	
	N	%	N	%	N	%
Cardiac disease	1,159	20.7	933	22.0	226	16.6
Cerebrovascular disease	203	3.6	163	3.9	40	2.9
Infection	1,092	19.5	739	17.5	353	26.0
Malignancy	479	8.6	277	6.5	202	14.9
Treatment withdrawal	470	8.4	447	10.6	23	1.7
Other	1,773	31.7	1,375	32.5	398	29.3
Uncertain aetiology	416	7.4	299	7.1	117	8.6
Total (with data)	**5,592**	**100.0**	**4,233**	**100.0**	**1,359**	**100.0**
Missing	623	10.0	452	9.6	171	11.2
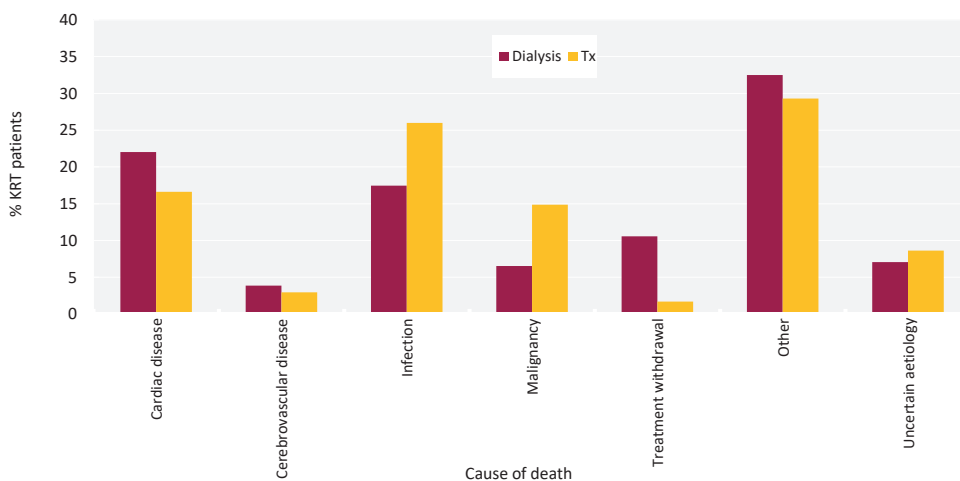
Figure 4.15 Cause of death for adult patients prevalent to KRT on 31/12/2021 followed-up in 2022 by modality

Transplant
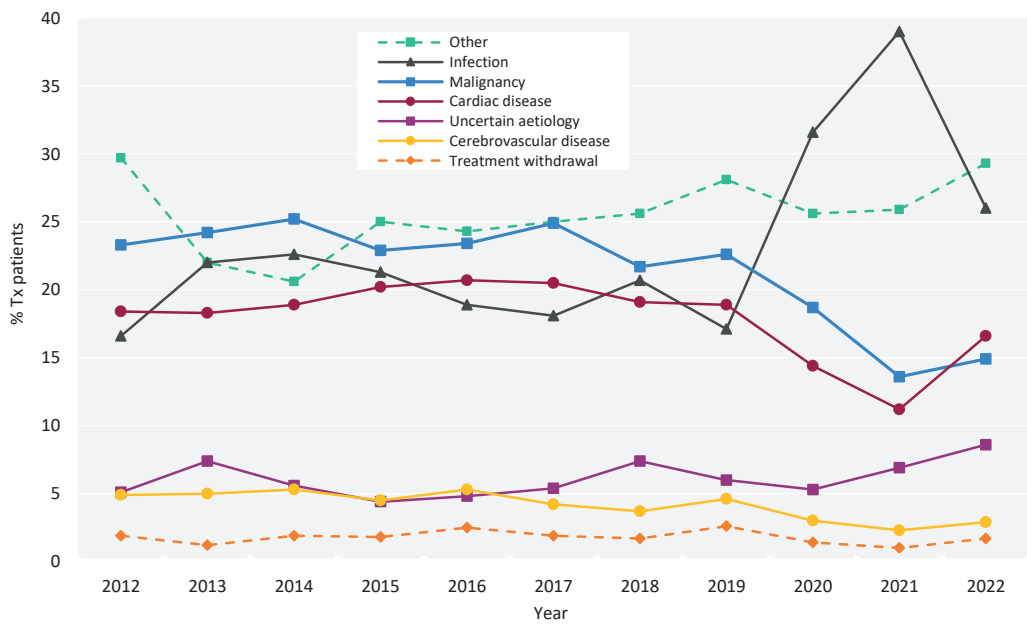
Figure 4.16 Cause of death between 2012 and 2022 for adult patients prevalent to Tx at the beginning of the year

Adults with a kidney Tx in the UK at the end of 2022

Chapter 5

Adults on in-centre haemodialysis (ICHD) in the UK at the end of 2022

Contents

Introduction

This chapter describes the population of adult patients with end-stage kidney disease (ESKD) who were receiving regular in-centre haemodialysis (ICHD) in the UK at the end of 2022 (figure 5.1). This population comprises patients who were on ICHD at the end of 2021 and remained on ICHD throughout 2022, as well as patients who commenced/re-commenced ICHD in 2022. This latter group includes both incident kidney replacement therapy (KRT) patients who ended 2022 on ICHD and prevalent KRT patients who switched to ICHD from home haemodialysis (HHD), peritoneal dialysis (PD), or a transplant (Tx) in 2022. Consequently, the cohort of patients receiving ICHD in a centre not only reflects differences in underlying population case-mix, but also differences in the rates of acceptance onto KRT, survival on ICHD, transplantation and home therapies (HHD and PD), and the care of patients on those other modalities, as described in other chapters of this report.
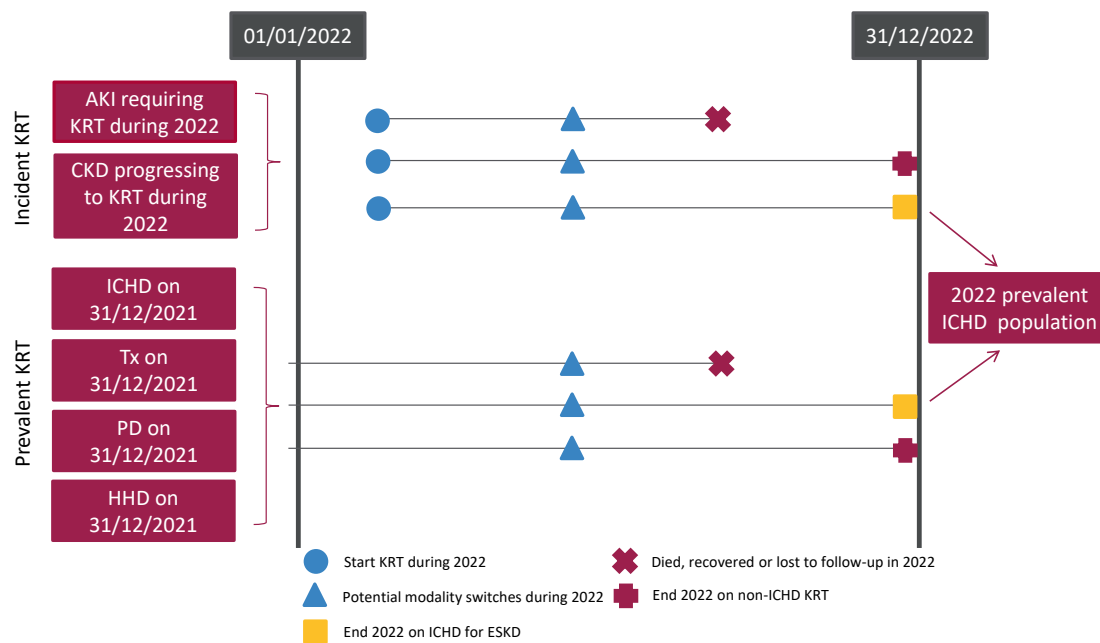
Figure 5.1 Pathways adult patients could follow to be included in the UK 2022 prevalent ICHD population

Note that patients receiving dialysis for acute kidney injury (AKI) are only included in this chapter if they had a timeline or KRT modality code for chronic ICHD at the end of 2022 or if they had been on KRT for ≥90 days and were on ICHD at the end of 2022

CKD – chronic kidney disease

The cause of death analyses were undertaken on historic prevalent cohorts to allow sufficient follow-up time.

This chapter addresses the following key aspects of the care of patients on ICHD for which there are UK Kidney Association guidelines (table 5.1):

- **Complications associated with ESKD and ICHD:** these include anaemia and mineral bone disorders.

- **Adequacy of ICHD:** measures of dialysis care include urea clearance and frequency and length of dialysis sessions. Currently, the urea reduction ratio (URR) is the only urea clearance measure routinely reported to the UK Renal Registry (UKRR).

- **Type of ICHD access:** definitive access – either a surgically created arteriovenous fistula (AVF) or arteriovenous graft (AVG). Alternatively, more temporary access can be provided through a central venous catheter – either a tunnelled line (TL) or a non-tunnelled line (NTL).

- **Infections associated with haemodialysis (ICHD and HHD):** analysis of infections is presented for ICHD and HHD combined because kidney centres are not required to submit changes in dialysis modality that last <30 days. It is therefore not possible to attribute accurately an infection to HHD or ICHD. Rates of the four infections subject to mandatory reporting to the UK Health Security Agency (UKHSA) – methicillin-resistant *Staphylococcus aureus* (MRSA), methicillin-sensitive *Staphylococcus aureus* (MSSA), *Escherichia coli* bacteraemia and *Clostridium difficile* - will be added to the UKRR data portal (ukkidney.org/audit-research/data-portals) as new data become available.

ICHD

Rationale for analyses

The analyses begin with a description of the 2022 prevalent adult ICHD population, including the number on ICHD per million population (pmp), dialysis duration and frequency.

The UK Kidney Association guidelines (ukkidney.org/health-professionals/guidelines/guidelines-commentaries) provide audit measures relevant to the care of patients on ICHD and, where data permit, their attainment by UK kidney centres in 2022 is reported in this chapter (table 5.1). Audit measures in guidelines that have been archived are not included.

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 items 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 excluded from caterpillar plots and cells were blanked in tables where data completeness for a biochemical variable was <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.

Exeter was unable to submit patient level data for 2021 and 2022. Aggregate numbers by modality were provided, included by vascular access type as part of the 2022 Multisite Dialysis Access Audit, enabling inclusion in tables 5.2 and 5.3, and figure 5.16. Exeter is excluded from all other analyses.

Manchester moved to a new Trust IT system, and as a result data were not submitted for the final quarter of 2022. Data for Manchester presented in this chapter are for patients receiving ICHD on 30th September 2022, rather than 31st December 2022.

Table 5.1 The UK Kidney Association audit measures relevant to ICHD that are reported in this chapter

The UK Kidney Association guideline	Audit criteria	Related analysis/analyses
CKD mineral bone disorder (2018)	Percentage of patients with serum calcium above the normal reference range of 2.2–2.5 mmol/L	Table 5.6, figure 5.6
HD (2019)	Proportion of patients with pre-dialysis bicarbonate 18–26 mmol/L	Table 5.7, figure 5.8
	Proportion of patients with pre-dialysis potassium 4.0–6.0 mmol/L	Table 5.7, figure 5.9
Anaemia (2020)	Proportion of patients who are not iron replete with a serum ferritin <200 μg/L	Table 5.8, figure 5.13
	Proportion of patients with haemoglobin 100–120 g/L	
Vascular access (2015)[1]	Proportion of prevalent dialysis patients with definitive access (AVF/AVG/PD catheter) – ≥80%	Figure 5.16
Planning, initiating and withdrawing KRT (2014)	Number of patients withdrawing from ICHD as a proportion of all deaths on ICHD	Table 5.9, figure 5.17

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

- 25,825 adult patients were receiving ICHD for ESKD in the UK on 31/12/2022, which represented 36.4% of the KRT population. The number of people on ICHD has increased by 3.2% since 2021.

- The median age of ICHD patients was 65.8 years, and 62.4% were male.

- 81.4% of ICHD patients achieved a dialysis adequacy of URR >65%. This has been declining since 2020.

- 91.9% of ICHD patients had dialysis 3 times a week and a further 1.5% had dialysis more frequently than this.

- 63.5% of ICHD patients had dialysis for 4-5 hours per session compared to 66.6% last year (2021), 66.4% in 2020 and 70.9% in 2019.

- The median adjusted calcium for ICHD patients was 2.3 mmol/L and 11.1% were above the target range 2.2-2.5 mmol/L.

- The median pre-dialysis bicarbonate for ICHD patients was 23 mmol/L and 81.9% were within the target range 18-26 mmol/L.

- The median pre-dialysis potassium for ICHD patients was 4.9 mmol/L and 6.3% had a pre-dialysis potassium of >6 mmol/L.

- The median haemoglobin and ferritin for ICHD patients was 111 g/L and 513 µg/L, respectively.

- 21.3% of ICHD patients had a haemoglobin <100 g/L and 21.5% had a haemoglobin >120 g/L.

- Of the 62 centres that provided adequate data on long term dialysis access, 6 centres achieved the 80% target for definitive access amongst prevalent dialysis patients (AVF/AVG/PD catheter).

- 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 cause of death in patients under 65 years was cardiac disease at 26.3%, with infection accounting for 15.2% of deaths. In those older than 65 years, the leading cause of death was also cardiac disease (20.3%) and infections (18.2%).

ICHD

Analyses

Changes to the prevalent adult ICHD population

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

Table 5.2 Number of prevalent adult ICHD patients and proportion of adult KRT patients on ICHD by year and by centre; number of ICHD patients as a proportion of the catchment population

Centre	N on ICHD					% on ICHD					Estimated catchment population (millions)	2022 crude rate (pmp)
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022		
ENGLAND												
Bham	1,349	1,349	1,314	1,347	1,409	41.5	40.7	40.3	40.8	41.7	2.03	696
Bradfd	261	280	276	275	309	37.9	38.2	38.1	37.4	39.6	0.50	622
Brightn	446	432	426	425	423	42.3	40.6	39.5	39.0	38.5	1.08	390
Bristol	475	469	463	477	491	32.3	31.5	31.4	31.9	32.2	1.25	394
Camb	304	287	276	358	363	21.9	19.7	18.3	22.0	21.8	0.96	380
Carlis	101	111	111	114	106	34.5	36.8	37.4	37.3	35.0	0.26	413
Carsh	858	840	858	883	885	49.0	47.2	46.4	46.4	45.7	1.64	541
Colchr	122	145	150	146	157	100.0	100.0	100.0	100.0	100.0	0.30	528
Covnt	308	357	365	371	370	31.9	33.0	32.9	32.9	32.9	0.84	442
Derby	197	238	244	262	291	33.6	36.4	36.1	37.9	40.6	0.56	523
Donc	179	180	177	175	199	54.2	52.6	51.9	51.6	52.9	0.38	527
Dorset	291	289	299	304	328	38.1	37.4	37.5	38.6	41.4	0.73	447
Dudley	204	207	209	223	212	56.7	56.6	55.9	55.3	55.4	0.34	616
EssexMS	409	414	423	427	436	48.5	48.6	47.8	47.7	48.6	1.00	438
Exeter	450	443	454	476	496	41.6	40.7	41.6	44.2	44.0	0.98	507
Glouc	239	228	222	223	228	45.8	42.9	42.5	40.9	41.2	0.52	439
Hull	350	350	351	361	358	39.8	38.7	38.4	39.4	38.4	0.80	447
Ipswi	151	142	135	138	131	35.3	33.2	31.7	32.7	33.2	0.31	417
Kent	418	420	425	458	476	37.6	36.8	37.2	38.4	38.9	1.08	442
L Barts	1,060	1,029	1,041	1,087	1,158	40.8	38.7	38.9	39.8	40.6	1.61	718
L Guys	692	673	693	733	707	31.0	29.0	29.9	31.5	30.6	1.00	707
L Kings	597	611	617	670	698	50.5	49.0	49.2	50.3	50.1	0.93	753
L Rfree	684	742	722	746	766	30.6	31.7	30.9	31.1	31.7	1.33	578
L St.G	293	301	320	325	305	35.1	35.3	37.5	37.4	35.7	0.65	468
L West	1,430	1,381	1,271	1,292	1,311	40.2	38.3	36.0	36.3	36.2	1.97	667
Leeds	542	552	549	580	610	32.2	32.0	31.4	32.5	33.2	1.39	439
Leic	917	958	957	1,001	1,036	37.4	37.1	36.5	38.0	38.1	2.11	490
Liv UH	514	530	522	549	558	34.6	35.7	36.1	37.6	37.7	1.26	444
M RI	502	497	504	511	542	24.3	24.3	25.4	24.7	25.7	1.36	399
Middlbr	349	344	327	350	344	37.5	36.1	34.6	36.5	36.0	0.82	421
Newc	339	329	355	350	376	29.4	28.1	29.7	28.6	30.2	0.97	388
Norwch	294	296	289	295	293	37.3	36.5	35.7	36.7	37.4	0.70	418
Nottm	350	359	349	363	362	29.2	29.5	28.9	29.8	29.9	0.94	384
Oxford	445	455	474	460	482	22.9	23.0	23.5	23.0	23.2	1.48	327
Plymth	128	126	146	161	159	23.7	23.6	26.9	29.7	29.1	0.41	392
Ports	529	592	608	651	672	30.0	31.5	32.0	33.5	33.6	1.77	380
Prestn	519	505	499	499	513	39.3	37.6	36.5	36.3	36.6	1.25	410
Redng	297	315	300	306	337	36.5	36.5	34.5	34.9	36.5	0.70	479
Salford	402	395	432	414	448	34.3	31.8	34.1	34.0	35.2	1.17	384
Sheff	552	541	552	560	576	37.2	36.3	36.9	37.3	38.7	1.15	502
Shrew	206	204	174	183	172	47.9	46.7	40.7	41.6	38.7	0.42	410
Stevng	489	508	543	534	570	52.1	52.8	55.4	52.4	53.5	1.12	507

ICHD

Table 5.2 Continued

Centre	N on ICHD					% on ICHD					Estimated catchment population (millions)	2022 crude rate (pmp)
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022		
Stoke	281	265	250	263	316	34.9	32.9	30.8	31.2	35.0	0.74	429
Sund	244	252	219	215	227	43.5	44.2	39.4	39.3	40.4	0.55	411
Truro	168	164	159	183	198	38.4	36.4	35.7	39.7	42.0	0.37	542
Wirral	203	207	194	190	190	50.6	49.6	46.5	45.8	47.5	0.47	403
Wolve	317	303	326	347	374	52.1	49.3	49.8	49.9	51.8	0.55	680
York	183	184	192	190	197	32.2	31.6	33.6	32.7	32.4	0.50	397
N IRELAND												
Antrim	119	117	110	115	115	43.4	41.1	38.3	39.0	37.6	0.25	466
Belfast	173	158	144	131	139	19.7	17.9	16.2	14.4	15.0	0.53	260
Newry	82	78	78	86	77	32.5	30.8	29.5	30.6	28.6	0.24	326
Ulster	106	96	96	98	100	55.5	51.9	47.8	48.3	47.6	0.20	490
West NI	114	106	118	105	107	34.9	32.3	33.6	31.0	30.1	0.25	426
SCOTLAND												
Abrdn	214	190	192	188	189	37.4	34.1	34.0	32.4	31.8	0.50	380
Airdrie	192	207	197	195	207	39.3	39.5	38.0	38.6	39.9	0.46	452
D&Gall	55	52	56	53	50	37.9	34.9	35.9	34.4	33.8	0.12	411
Dundee	161	162	158	149	140	36.2	36.1	36.7	36.3	35.1	0.37	383
Edinb	301	296	289	284	294	34.9	33.4	32.5	30.6	30.1	0.84	349
Glasgw	587	576	552	568	620	32.4	31.1	29.8	30.3	32.3	1.37	454
Inverns	90	92	89	93	85	32.3	32.6	32.8	33.5	30.4	0.23	378
Klmarnk	141	139	147	138	148	41.5	38.7	39.8	37.5	39.6	0.29	510
Krkcldy	135	138	146	164	162	45.3	46.6	50.0	55.4	55.5	0.27	592
WALES												
Bangor	70	66	78	76	76	34.5	32.8	36.1	35.0	34.5	0.20	373
Cardff	554	551	512	531	569	32.2	31.8	30.5	31.2	32.4	1.17	485
Clwyd	75	86	78	84	85	39.5	42.0	38.2	41.6	41.7	0.18	467
Swanse	373	389	394	404	392	45.2	44.8	46.4	47.4	46.3	0.76	515
Wrexm	113	106	114	103	105	36.0	34.1	35.3	33.9	34.2	0.21	506
TOTALS												
England	20,638	20,799	20,762	21,451	22,165	36.8	36.1	35.9	36.5	36.9	45.20	490
N Ireland	594	555	546	535	538	30.9	28.7	27.4	26.4	26.0	1.47	365
Scotland	1,876	1,852	1,826	1,832	1,895	35.8	34.6	34.2	34.0	34.4	4.44	427
Wales	1,185	1,198	1,176	1,198	1,227	36.4	36.1	35.9	36.6	36.8	2.53	486
UK	**24,293**	**24,404**	**24,310**	**25,016**	**25,825**	**36.5**	**35.8**	**35.5**	**36.0**	**36.4**	**53.65**	**481**

Country ICHD populations were calculated by summing the ICHD 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 patient level data but provided aggregate numbers of patients on KRT at the end of 2021 and 2022 by treatment modality

pmp – per million population

ICHD

Demographics of prevalent adult ICHD patients

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

Table 5.3 Demographics of adult patients prevalent to ICHD on 31/12/2022 by centre

Centre	N on KRT	N on ICHD	% on ICHD	Median age (yrs)	% male	% White	% Asian	% Black	% Other	% missing
						Ethnicity				
ENGLAND										
Bham	3,378	1,409	41.7	65.3	59.9	49.4	32.3	15.4	2.9	2.7
Bradfd	781	309	39.6	63.4	57.0	47.2	46.6	2.9	3.2	0.0
Brightn	1,100	423	38.5	68.5	59.6	87.4	6.8	3.3	2.5	6.1
Bristol	1,524	491	32.2	63.6	66.2	83.1	5.4	9.8	1.7	2.4
Camb	1,663	363	21.8	72.7	65.6	93.3	3.4	1.5	1.8	9.9
Carlis	303	106	35.0	62.8	58.5	98.1	0.0	1.9	0.0	0.0
Carsh	1,936	885	45.7	67.7	63.1	60.4	17.6	14.5	7.5	5.6
Colchr	157	157	100.0	71.2	66.9	95.3	0.7	2.0	2.0	5.1
Covnt	1,125	370	32.9	70.6	64.9	73.8	18.0	8.2	0.0	0.8
Derby	716	291	40.6	66.8	64.6	81.9	13.0	3.0	2.2	7.2
Donc	376	199	52.9	69.3	64.3	89.8	3.6	3.6	3.0	1.0
Dorset	792	328	41.4	70.3	64.9	94.5	3.0	0.9	1.5	0.0
Dudley	383	212	55.4	71.0	63.7	75.5	17.5	7.1	0.0	0.0
EssexMS	897	436	48.6	67.9	69.3	81.6	6.4	7.4	4.7	6.7
Exeter	1,128	496	44.0							
Glouc	554	228	41.2	70.9	66.2	90.7	2.2	4.0	3.1	1.3
Hull	933	358	38.4	64.8	64.2	95.2	2.8	1.1	0.8	1.1
Ipswi	395	131	33.2	72.3	65.6	78.9	3.1	3.9	14.1	2.3
Kent	1,224	476	38.9	66.5	64.9	92.7	3.0	2.4	1.9	2.7
L Barts	2,851	1,158	40.6	62.3	61.1	23.6	36.6	33.1	6.7	5.1
L Guys	2,309	707	30.6	62.6	58.0	38.7	9.3	46.3	5.7	10.2
L Kings	1,394	698	50.1	63.0	59.5	37.1	12.5	46.5	3.8	2.7
L Rfree	2,418	766	31.7	64.2	60.2	36.9	20.6	30.2	12.3	10.6
L St.G	855	305	35.7	64.0	63.6	26.5	26.8	37.1	9.6	4.6
L West	3,626	1,311	36.2	65.0	61.8	28.0	39.7	25.8	6.6	0.0
Leeds	1,836	610	33.2	62.5	64.8	67.9	22.9	6.9	2.3	0.3
Leic	2,719	1,036	38.1	66.0	66.4	68.3	22.7	6.9	2.0	9.5
Liv UH	1,479	558	37.7	64.0	61.5	88.0	4.2	4.0	3.8	5.7
M RI	2,111	542	25.7	64.3	60.3	39.1	13.8	45.2	1.9	14.2
Middlbr	955	344	36.0	64.5	66.9	89.3	8.0	1.2	1.5	2.3
Newc	1,245	376	30.2	65.3	62.0	91.0	5.6	1.6	1.9	0.0
Norwch	783	293	37.4	70.0	61.8	95.1	1.9	1.1	1.9	10.2
Nottm	1,211	362	29.9	66.0	63.5	73.9	9.8	13.2	3.1	1.7
Oxford	2,080	482	23.2	66.5	57.7	74.3	11.7	9.1	5.0	29.0
Plymth	546	159	29.1	67.1	62.9	96.9	1.3	0.0	1.9	0.0
Ports	2,000	672	33.6	67.0	62.8	90.0	4.8	2.5	2.7	22.5
Prestn	1,400	513	36.6	64.9	62.4	78.3	19.1	1.0	1.6	1.2
Redng	924	337	36.5	67.8	63.2	58.9	26.5	6.3	8.3	10.4
Salford	1,273	448	35.2	62.5	65.2	65.4	25.4	5.4	3.8	0.0
Sheff	1,488	576	38.7	64.8	64.4	82.3	9.6	4.3	3.8	2.8
Shrew	445	172	38.7	67.2	66.9	88.8	3.5	4.1	3.5	1.2
Stevng	1,066	570	53.5	67.4	62.3	70.1	17.6	9.2	3.1	5.1
Stoke	903	316	35.0	69.4	63.9	86.7	6.6	3.3	3.3	4.7
Sund	562	227	40.4	67.2	60.8	96.5	2.2	0.4	0.9	0.0
Truro	471	198	42.0	69.2	63.6	97.5	1.0	0.5	1.0	0.0
Wirral	400	190	47.5	64.6	62.1	97.4	0.5	1.6	0.5	0.0
Wolve	722	374	51.8	64.7	63.9	50.1	32.4	11.8	5.6	0.3

Table 5.3 Continued

Centre	N on KRT	N on ICHD	% on ICHD	Median age (yrs)	% male	Ethnicity				
						% White	% Asian	% Black	% Other	% missing
York	608	197	32.4	72.0	58.4	95.8	1.6	0.0	2.6	2.5
N IRELAND										
Antrim	306	115	37.6	76.2	66.1	98.9	0.0	0.0	1.1	23.5
Belfast	926	139	15.0	65.5	62.6	96.6	2.5	0.0	0.8	15.1
Newry	269	77	28.6	69.5	55.8	98.5	1.5	0.0	0.0	13.0
Ulster	210	100	47.6	76.3	63.0	96.9	3.1	0.0	0.0	2.0
West NI	356	107	30.1	72.0	57.9	98.1	1.9	0.0	0.0	3.7
SCOTLAND										
Abrdn	594	189	31.8	66.8	57.7					
Airdrie	519	207	39.9	63.5	58.5					
D&Gall	148	50	33.8	67.4	68.0					
Dundee	399	140	35.1	68.3	61.4					
Edinb	976	294	30.1	64.7	63.3					
Glasgw	1,921	620	32.3	64.7	58.4					
Inverns	280	85	30.4	71.5	62.4					
Klmarnk	374	148	39.6	66.8	68.9					
Krkcldy	292	162	55.5	68.7	62.3					
WALES										
Bangor	220	76	34.5	70.3	60.5	95.7	0.0	1.4	2.9	9.2
Cardff	1,758	569	32.4	64.9	62.2	87.1	9.2	2.3	1.4	10.2
Clwyd	204	85	41.7	67.7	65.9	96.2	2.5	1.3	0.0	7.1
Swanse	847	392	46.3	69.0	61.7	97.1	1.6	1.0	0.3	1.8
Wrexm	307	105	34.2	66.1	60.0	97.9	0.0	1.0	1.0	8.6
TOTALS										
England	60,045	22,165	36.9	65.6	62.6	65.5	17.0	13.6	3.9	5.3
N Ireland	2,067	538	26.0	72.1	61.5	97.7	1.9	0.0	0.4	11.9
Scotland	5,503	1,895	34.4	65.7	60.9					
Wales	3,336	1,227	36.8	66.6	62.0	92.5	4.8	1.7	1.0	7.1
UK	**70,951**	**25,825**	**36.4**	**65.8**	**62.4**	**67.6**	**16.1**	**12.7**	**3.7**	**5.5**

Blank cells – no data returned 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 patient level data but provided aggregate numbers of patients on KRT at the end of 2022 by treatment modality

UK ethnicity distribution and completeness does not include Scotland

Primary renal diseases (PRDs) were grouped into categories as shown in table 5.4, with the mapping of disease codes into groups explained in more detail in appendix A. The proportion of ICHD patients with each PRD is shown for patients with PRD data and these total 100% of patients with data. The proportion of patients with no PRD data is shown on a separate line.

ICHD

Table 5.4 Primary renal diseases (PRDs) of adult patients prevalent to ICHD on 31/12/2022

PRD	N on ICHD	% ICHD population	Age <65 yrs		Age ≥65 yrs		M/F ratio
			N	%	N	%	
Diabetes	6,878	29.0	3,326	28.9	3,552	29.1	1.7
Glomerulonephritis	3,245	13.7	1,909	16.6	1,336	10.9	2.0
Hypertension	1,898	8.0	958	8.3	940	7.7	2.6
Polycystic kidney disease	1,397	5.9	766	6.6	631	5.2	1.1
Pyelonephritis	1,624	6.8	823	7.1	801	6.6	1.7
Renal vascular disease	1,053	4.4	198	1.7	855	7.0	1.8
Other	4,183	17.6	2,125	18.4	2,058	16.9	1.3
Uncertain aetiology	3,450	14.5	1,417	12.3	2,033	16.7	1.6
Total (with data)	**23,728**	**100.0**	**11,522**	**100.0**	**12,206**	**100.0**	
Missing	1,601	6.3	701	5.7	900	6.9	1.7

Adequacy of dialysis in prevalent adult ICHD patients

URR and session duration were calculated only for patients who were undertaking ICHD three times per week. Patients who had missing data for the number of dialysis sessions per week were assumed to be dialysing three times per week for the purposes of calculating the median URR.

Table 5.5 Median urea reduction ratio (URR) and distribution of session frequency and time for adult patients prevalent to ICHD on 31/12/2022 using end of third quarter data (30/09/2022)

Centre	Median URR (%)	% URR >65%	% session frequency/week			% session time			% data completeness		
			<3 sessions	3 sessions	>3 sessions	<4 hours	4–5 hours	>5 hours	URR	Session frequency	Session time
ENGLAND											
Bham	78	90.8	11.2	87.0	1.8	23.5	76.4	0.1	98.9	98.8	98.4
Bradfd	71	77.7	9.1	89.9	1.0	29.6	70.4	0.0	76.7	100.0	100.0
Brightn	73	90.2	6.2	93.6	0.2	15.3	84.7	0.0	99.2	100.0	100.0
Bristol	72	76.6	5.0	93.8	1.1	25.5	74.5	0.0	100.0	100.0	100.0
Camb			3.6	94.0	2.4	43.0	57.0	0.0	0.0	100.0	100.0
Carlis	69	69.2	8.0	92.0	0.0	23.9	76.1	0.0	98.9	100.0	100.0
Carsh			3.6	96.3	0.1	6.6	93.4	0.0	67.7	99.8	96.0
Colchr	76	92.3	7.6	91.7	0.7	24.8	75.2	0.0	97.7	100.0	100.0
Covnt	75	85.4	9.4	89.8	0.9	51.8	48.2	0.0	97.1	98.8	98.1
Derby	74	79.0	2.0	98.0	0.0				74.4	99.6	9.6
Donc	75	84.0	2.8	96.6	0.6	29.1	70.9	0.0	98.3	100.0	100.0
Dorset	75	91.1	4.9	94.7	0.4	17.5	81.7	0.7	79.2	99.7	99.6
Dudley	74	82.4	3.9	95.6	0.5	14.3	85.7	0.0	96.0	97.6	97.5
EssexMS	71	76.5	18.7	80.3	1.1	71.1	28.9	0.0	99.3	99.2	99.0
Exeter											
Glouc	74	90.0	6.8	92.2	1.0				100.0	100.0	0.0
Hull	78	92.5							93.0	1.8	1.8
Ipswi	71	73.4	14.5	83.9	1.6	13.7	86.3	0.0	75.2	99.2	90.5
Kent	69	67.7	4.5	94.8	0.7	85.7	14.1	0.3	85.4	100.0	100.0
L Barts			8.0	91.7	0.3	72.8	27.2	0.0	0.0	97.4	97.2
L Guys	75	89.6							98.1	0.0	0.0
L Kings	73	81.1	3.8	96.2	0.0	55.6	43.2	1.2	99.7	99.8	99.8
L Rfree			18.3	81.4	0.3	71.1	28.9	0.0	0.0	99.4	99.3
L St.G			1.8	98.2	0.0				6.1	97.5	69.3
L West	76	85.9	13.1	86.4	0.5	39.6	60.1	0.3	91.4	99.6	99.3

Adults on ICHD in the UK at the end of 2022

Table 5.5 Continued

Centre	Median URR (%)	% URR >65%	% session frequency/week			% session time			% data completeness		
			<3 sessions	3 sessions	>3 sessions	<4 hours	4–5 hours	>5 hours	URR	Session frequency	Session time
Leeds	72	76.8	4.5	95.3	0.2	30.2	69.8	0.0	100.0	99.8	99.6
Leic	73	78.0	1.8	97.3	0.8	17.1	80.1	2.8	99.7	99.7	99.8
Liv UH			0.8	95.7	3.5	8.5	91.3	0.2	0.0	99.0	99.0
M RI			3.6	93.2	3.2	4.9	94.6	0.5	63.2	88.1	87.2
Middlbr	72	78.3	2.6	96.8	0.6	37.3	60.9	1.8	97.0	99.4	91.8
Newc	72	80.5	14.0	84.9	1.2	55.5	44.5	0.0	100.0	100.0	100.0
Norwch	73	80.7	5.1	94.1	0.8	63.9	36.1	0.0	78.3	93.8	93.4
Nottm	74	88.4	1.5	94.5	4.0	11.6	88.1	0.3	93.9	99.7	99.7
Oxford	72	76.7	0.0	100.0	0.0	17.6	82.4	0.0	76.7	98.8	98.8
Plymth	72	75.2	1.4	98.6	0.0				97.2	97.9	0.0
Ports			7.3	92.0	0.6	54.6	45.2	0.2	0.0	99.2	99.0
Prestn	71	71.6							91.1	0.0	0.4
Redng	72	83.0	4.1	95.5	0.3	24.2	75.8	0.0	99.6	100.0	98.6
Salford			3.6	78.7	17.7	27.1	72.9	0.0	68.7	100.0	98.7
Sheff	71	76.5	4.8	92.1	3.1	86.4	13.6	0.0	98.8	99.6	98.5
Shrew	75	87.3	0.0	96.3	3.7	15.3	84.7	0.0	98.8	98.8	98.1
Stevng	71	73.0	9.4	88.7	1.9	39.2	60.8	0.0	98.9	99.4	99.4
Stoke	75	86.8	10.8	86.1	3.1	22.1	77.9	0.0	87.7	98.6	99.2
Sund	75	92.1	3.9	91.3	4.8	27.7	72.3	0.0	100.0	100.0	93.7
Truro	72	84.4	2.4	97.6	0.0				98.2	100.0	0.0
Wirral			7.6	90.0	2.4	32.0	68.0	0.0	0.0	98.3	98.1
Wolve	73	82.8	3.0	97.0	0.0				97.3	99.4	63.2
York	78	94.3	1.8	96.4	1.8	20.4	79.6	0.0	95.8	96.5	97.6
N IRELAND											
Antrim	74	87.3	0.9	97.3	1.8	10.2	89.8	0.0	94.4	100.0	100.0
Belfast	74	83.2	2.5	95.0	2.5	18.3	80.9	0.9	98.3	100.0	100.0
Newry	75	82.7	21.8	78.2	0.0	65.6	34.4	0.0	85.3	100.0	100.0
Ulster	68	64.0	3.2	95.7	1.1	25.6	74.4	0.0	98.9	100.0	100.0
West NI	71	74.4	7.1	88.9	4.0	61.4	38.6	0.0	97.7	100.0	100.0
SCOTLAND											
Abrdn	72	81.6							100.0		
Airdrie	69	68.1							95.3		
D&Gall	69	72.7							93.6		
Dundee	73	89.8							89.4		
Edinb	72	84.6							96.7		
Glasgw	69	71.4							93.8		
Inverns	69	71.1							95.4		
Klmarnk	72	78.5							84.1		
Krkcldy	71	78.9							96.7		
WALES											
Bangor	72	69.4	2.9	91.2	5.9	58.1	40.3	1.6	100.0	100.0	100.0
Cardff	74	84.2							98.8	0.0	0.0
Clwyd	72	84.8							100.0	0.0	0.0
Swanse	74	79.5	5.9	93.0	1.1	37.4	62.6	0.0	99.7	100.0	100.0
Wrexm	73	75.9	2.3	97.7	0.0	26.2	73.8	0.0	91.2	92.5	92.3
TOTALS											
England	73	82.0	6.7	91.8	1.4	36.2	63.5	0.3	74.9	91.7	85.5
N Ireland	72	78.5	6.2	91.8	2.0	32.3	67.5	0.2	95.7	100.0	100.0
Scotland	71	76.8							94.2		
Wales	73	81.2	4.9	93.6	1.5	38.1	61.7	0.2	98.6	46.9	45.2
UK	**73**	**81.4**	**6.7**	**91.9**	**1.5**	**36.1**	**63.5**	**0.3**	**78.1**	**89.5**	**83.6**

Blank cells – no data returned by the centre or data completeness <70%

UK National averages for session frequency and time do not include Scotland

Adults on ICHD in the UK at the end of 2022
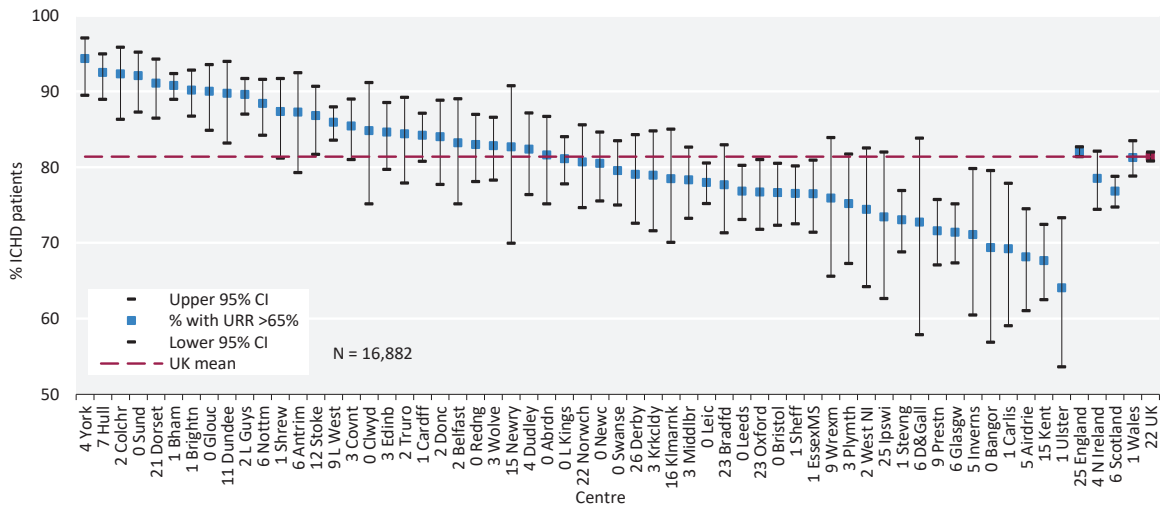
ICHD

Figure 5.2 Percentage of adult patients prevalent to ICHD on 31/12/2022 with urea reduction ratio (URR) >65% by centre

CI – confidence interval
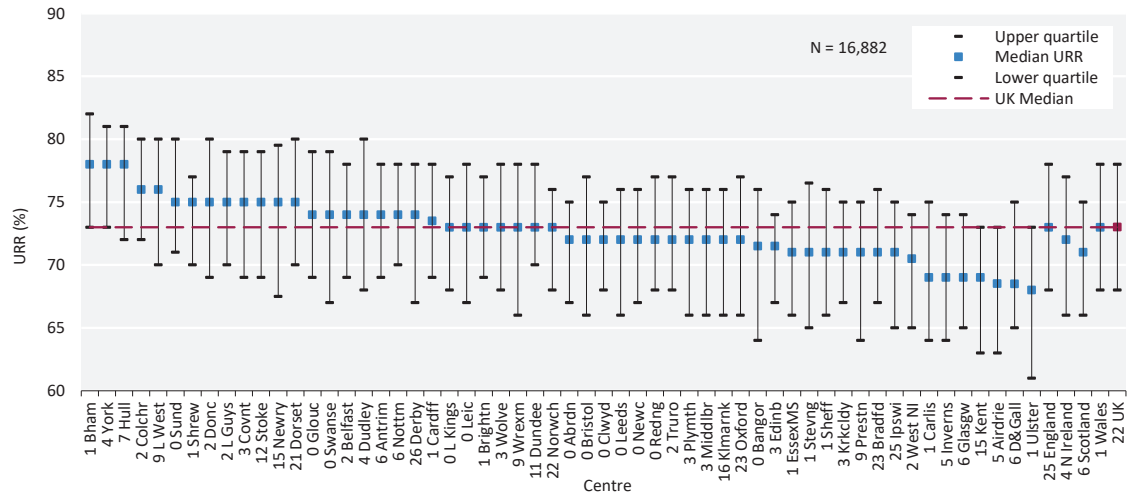
Figure 5.3 Median urea reduction ratio (URR) achieved in adult patients prevalent to ICHD on 31/12/2022 by centre

ICHD

Adults on ICHD in the UK at the end of 2022
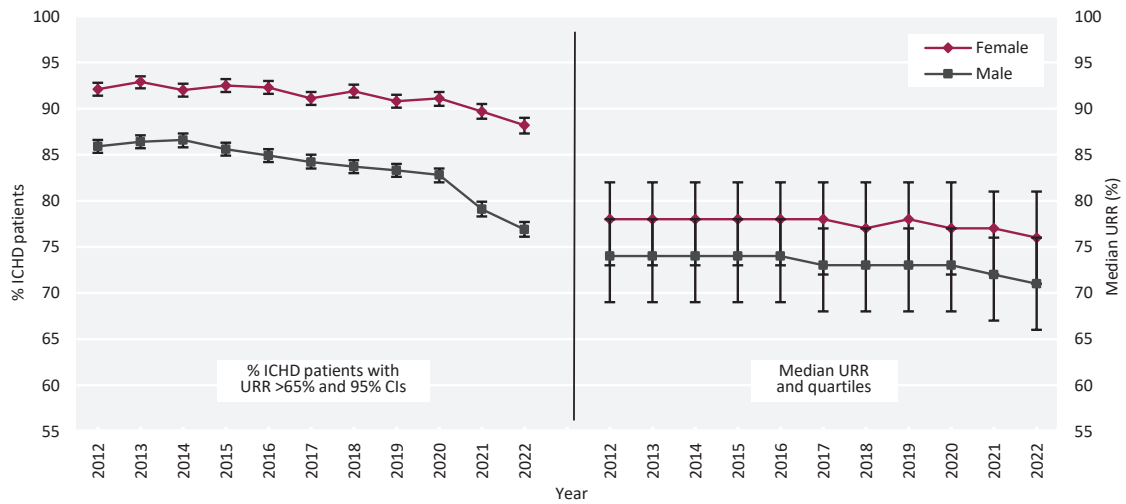
Figure 5.4 Change in the percentage of prevalent adult ICHD patients with urea reduction ratio (URR) >65% and the median URR by sex between 2012 and 2022
CI – confidence interval
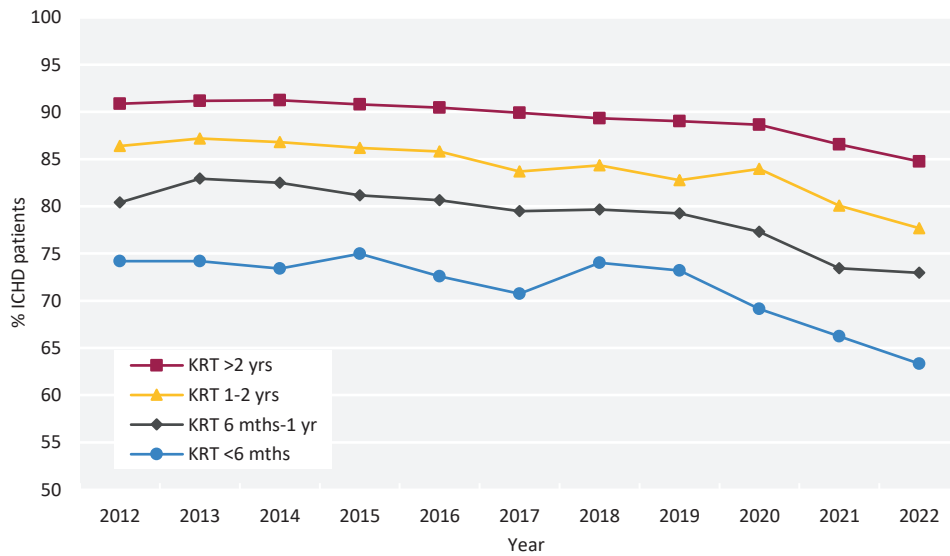
Figure 5.5 Percentage of prevalent adult ICHD patients achieving urea reduction ratio (URR) >65% by time on KRT between 2012 and 2022

Biochemistry parameters in prevalent adult ICHD patients

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

Table 5.6 Median adjusted calcium (Ca) and percentage with adjusted Ca within and above the target range (2.2–2.5 mmol/L) in adult patients prevalent to ICHD on 31/12/2022 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	2.4	73.9	16.2	99.8
Bradfd	2.4	68.2	28.2	100.0
Brightn	2.4	83.7	10.3	99.7
Bristol	2.4	87.1	11.4	100.0
Camb	2.3	80.4	8.0	100.0
Carlis	2.3	82.8	5.1	100.0
Carsh	2.3	77.0	10.1	99.4
Colchr	2.3	81.7	9.2	100.0
Covnt	2.3	79.5	6.1	100.0
Derby	2.4	85.6	9.1	100.0
Donc	2.4	83.4	7.2	100.0
Dorset	2.4	76.8	15.0	100.0
Dudley	2.4	77.8	15.7	100.0
EssexMS	2.3	78.0	10.4	99.2
Exeter				
Glouc	2.4	83.7	13.8	100.0
Hull	2.4	72.6	21.7	100.0
Ipswi	2.3	72.9	16.1	99.2
Kent	2.4	74.1	21.4	99.8
L Barts	2.4	80.6	12.0	99.4
L Guys	2.4	79.5	12.9	100.0
L Kings	2.3	74.3	6.6	99.7
L Rfree	2.3	76.2	9.0	100.0
L St.G	2.4	73.5	17.2	97.1
L West	2.3	74.4	9.3	86.7
Leeds	2.3	84.8	5.6	99.8
Leic	2.3	77.5	9.1	99.8
Liv UH	2.4	76.6	19.4	99.0
M RI	2.4	81.2	13.9	80.5
Middlbr	2.3	74.6	2.3	99.7
Newc	2.3	77.2	7.6	99.7
Norwch	2.4	79.6	12.4	84.3
Nottm	2.4	78.7	18.8	99.7
Oxford	2.3	80.7	7.4	90.9
Plymth	2.3	78.6	2.9	98.6
Ports	2.3	78.8	9.8	99.8
Prestn	2.3	82.5	7.8	99.8
Redng	2.3	85.0	6.7	100.0
Salford	2.4	75.4	14.4	100.0
Sheff	2.3	77.0	3.6	99.2
Shrew	2.4	78.6	18.9	98.8
Stoke	2.4	82.2	13.2	87.5
Sund	2.3	72.5	10.1	100.0
Truro	2.4	79.1	17.5	100.0
Wirral	2.3	77.1	11.4	76.5
Wolve	2.4	81.1	12.3	99.1
York	2.3	87.6	3.9	100.0
N IRELAND				
Antrim	2.4	83.2	15.9	100.0
Belfast	2.4	73.8	18.0	100.0
Newry	2.3	86.5	1.4	100.0
Ulster	2.4	77.2	19.6	100.0
West NI	2.3	82.8	6.1	100.0

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Adults on ICHD in the UK at the end of 2022

Table 5.6 Continued

Centre	Median adj Ca (mmol/L)	% adj Ca 2.2-2.5 mmol/L	% adj Ca >2.5 mmol/L	% data completeness
WALES				
Bangor	2.4	87.9	7.6	100.0
Cardff	2.3	84.1	6.8	99.8
Clwyd	2.3	87.5	6.9	100.0
Swanse	2.4	87.7	6.9	100.0
Wrexm	2.3	81.2	8.2	92.4
TOTALS				
England	2.3	78.4	11.3	97.6
N Ireland	2.4	80.2	13.0	100.0
Wales	2.3	85.5	7.0	99.3
E, W & NI	**2.3**	**78.8**	**11.1**	**97.7**

Blank cells = No data returned by the centre or data completeness <70%
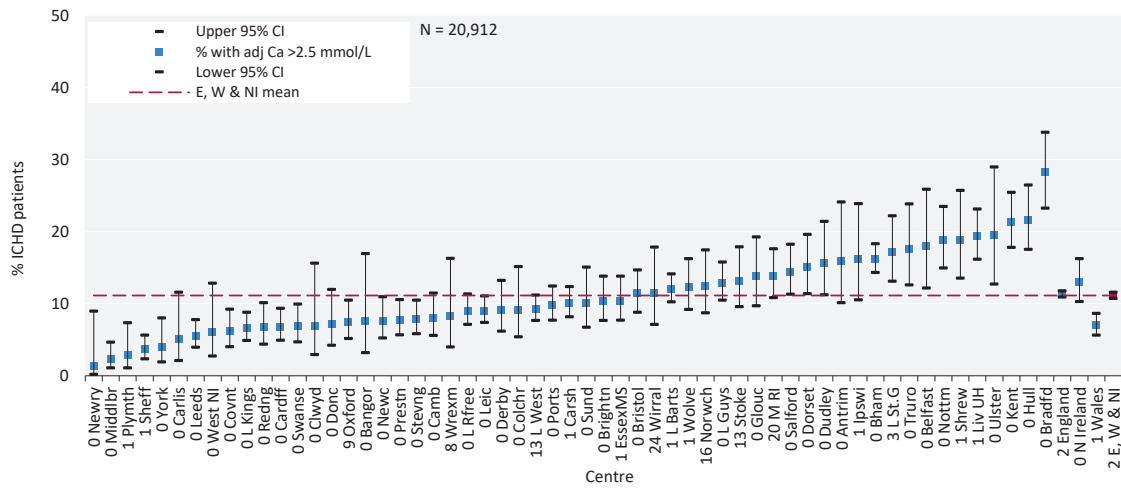
Figure 5.6 Percentage of adult patients prevalent to ICHD on 31/12/2022 with adjusted calcium (Ca) above the target range (>2.5 mmol/L) by centre
CI – confidence interval
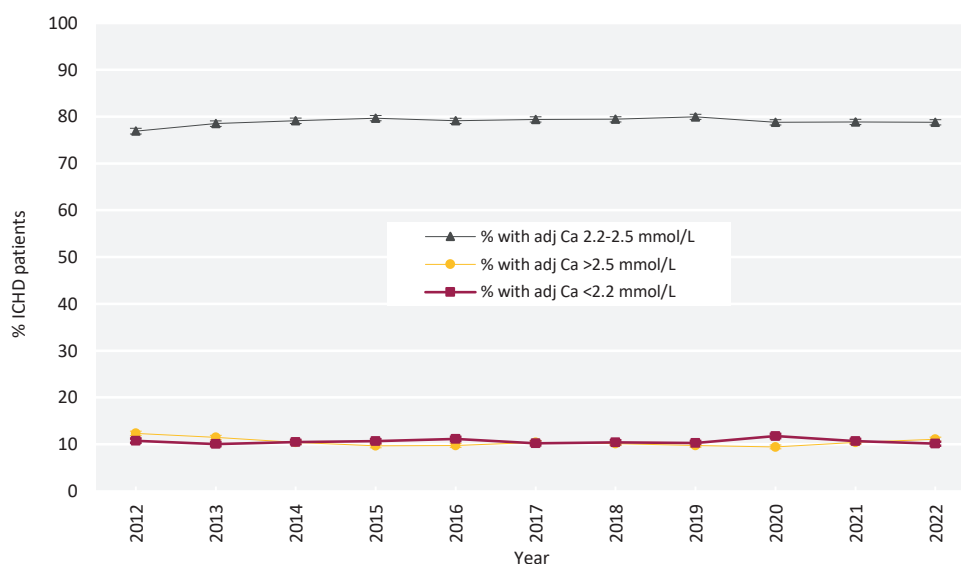
Figure 5.7 Change in percentage of prevalent adult ICHD patients within, above and below the target range for adjusted calcium (Ca 2.2–2.5 mmol/L) between 2012 and 2022

Table 5.7 Median pre-dialysis potassium and bicarbonate and percentage attaining target ranges in adult patients prevalent to ICHD on 31/12/2022 by centre

Centre	Pre-dialysis potassium					Pre-dialysis bicarbonate				
	Median (mmoI/L)	% <4.0 mmol/L	% 4.0–6.0 mmol/L	% >6.0 mmol/L	% data completeness	Median (mmoI/L)	% <18 mmol/L	% 18–26 mmol/L	% >26 mmol/L	% data completeness
ENGLAND										
Bham					48.5	23	4.6	84.3	11.1	99.7
Bradfd	4.9	10.4	80.7	8.9	100.0	24	2.2	73.9	23.9	98.6
Brightn					0.0	24	2.3	81.9	15.8	99.7
Bristol	4.6	20.2	77.0	2.9	100.0	23	4.0	90.6	5.5	100.0
Camb	4.9	4.5	89.6	6.0	100.0					20.2
Carlis					0.0	21	8.1	89.9	2.0	100.0
Carsh					0.0					25.0
Colchr	4.7	20.4	76.1	3.5	100.0	23	2.1	93.0	4.9	100.0
Covnt					0.0	26	0.9	64.0	35.1	100.0
Derby	4.7	18.9	76.9	4.2	100.0	22	5.3	90.9	3.8	100.0
Donc	4.7	11.6	86.2	2.2	100.0	24	3.3	86.7	9.9	100.0
Dorset	4.9	8.5	88.1	3.4	100.0	23	1.7	92.2	6.1	100.0
Dudley	4.7	11.1	84.3	4.6	100.0					53.0
EssexMS	4.8	12.7	83.5	3.9	99.5	23	3.9	86.0	10.1	99.0
Exeter										
Glouc					0.0	23	2.0	88.2	9.9	100.0
Hull	4.8	8.2	85.1	6.7	100.0	24	1.2	88.4	10.4	100.0
Ipswi					0.0	22	8.5	84.8	6.8	99.2
Kent	4.6	24.6	70.9	4.6	99.8	20	16.4	82.3	1.4	99.8
L Barts	4.7	19.5	75.0	5.5	99.5	22	9.0	86.5	4.5	99.1
L Guys	4.6	26.3	69.8	3.9	100.0	22	9.4	84.4	6.3	100.0
L Kings	5.1	8.0	80.3	11.7	99.7	21	5.5	92.8	1.7	99.5
L Rfree	5.0	10.0	80.3	9.7	100.0	22	6.7	88.8	4.5	96.8
L St.G					0.0	26	1.6	57.1	41.3	91.3
L West					0.0					55.2
Leeds	5.1	4.3	88.7	7.0	99.8	23	2.0	91.2	6.8	99.8
Leic	4.9	8.0	85.0	7.1	99.8	23	1.9	87.3	10.8	99.8

Table 5.7 Continued

Centre	Pre-dialysis potassium					Pre-dialysis bicarbonate				
	Median (mmoI/L)	% <4.0 mmol/L	% 4.0–6.0 mmol/L	% >6.0 mmol/L	% data completeness	Median (mmoI/L)	% <18 mmol/L	% 18–26 mmol/L	% >26 mmol/L	% data completeness
Liv UH					0.0	26	0.8	50.9	48.3	98.8
M RI					0.0	22	2.5	92.8	4.7	80.1
Middlbr	4.7	12.9	83.6	3.5	99.7	30	0.0	11.9	88.1	99.7
Newc					0.0	22	3.5	89.2	7.3	100.0
Norwch	5.2	4.2	81.9	13.9	97.4	22	2.5	90.4	7.1	89.9
Nottm	5.0	7.7	84.9	7.4	99.7	23	2.5	88.8	8.7	99.1
Oxford	4.8	6.8	87.4	5.8	91.6	22	7.2	83.5	9.3	90.2
Plymth	4.8	8.6	87.9	3.6	98.6	20	20.3	79.7	0.0	93.7
Ports	4.9	12.1	81.9	6.0	100.0	23	2.8	77.4	19.8	99.7
Prestn	5.0	5.2	89.4	5.4	99.8	24	3.0	84.5	12.5	99.8
Redng					0.0	23	2.0	90.0	8.0	100.0
Salford	4.8	14.4	80.1	5.5	100.0	26	0.3	57.2	42.5	100.0
Sheff	4.9	8.2	82.4	9.4	99.2	22	4.6	88.1	7.3	99.2
Shrew					0.0	22	3.8	93.7	2.5	98.8
Stoke					0.0	25	1.6	71.5	27.0	86.8
Sund					0.0	23	3.9	90.3	5.8	100.0
Truro	4.8	13.6	78.5	7.9	100.0	26	0.0	61.6	38.4	100.0
Wirral					0.0	24	2.3	73.5	24.3	96.7
Wolve	4.9	9.6	84.7	5.7	99.1	21	5.7	92.5	1.8	99.1
York	5.2	3.4	86.0	10.7	100.0	23	2.3	85.4	12.4	100.0
N IRELAND										
Antrim	4.7	10.3	86.9	2.8	100.0	25	0.0	75.7	24.3	100.0
Belfast	5.1	6.6	91.0	2.5	100.0	21	7.4	91.8	0.8	100.0
Newry	4.8	16.2	77.0	6.8	100.0	24	1.4	91.9	6.8	100.0
Ulster	4.8	6.5	90.2	3.3	100.0	24	1.1	84.8	14.1	100.0
West NI	5.1	3.0	95.0	2.0	100.0	22	4.0	88.9	7.1	100.0
WALES										
Bangor					0.0	26	0.0	60.6	39.4	100.0
Cardff					0.0	23	2.8	84.2	13.1	98.1
Clwyd					0.0	22	4.2	94.4	1.4	98.6
Swanse					0.0	24	1.1	86.0	12.9	100.0
Wrexm					0.0	25	0.0	68.2	31.8	92.4
TOTALS										
England	4.9	12.1	81.6	6.4	63.6	23	4.4	81.8	13.9	90.7
N Ireland	4.9	8.1	88.7	3.2	100.0	23	3.0	86.4	10.5	100.0
Wales					0.0	23	1.9	82.8	15.3	98.4
E, W & NI	**4.9**	**11.9**	**81.8**	**6.3**	**61.2**	**23**	**4.2**	**81.9**	**13.9**	**91.4**

Blank cells – no data returned by the centre or data completeness <70%
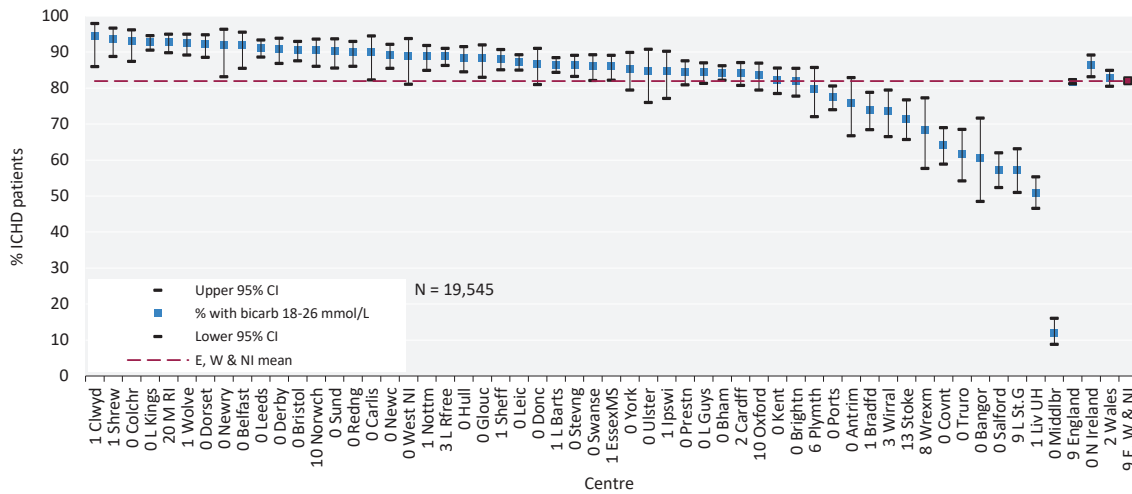
ICHD

Figure 5.8 Percentage of adult patients prevalent to ICHD on 31/12/2022 with pre-dialysis bicarbonate (bicarb) within the target range (18-26 mmol/L) by centre

CI – confidence interval

Bicarb - bicarbonate
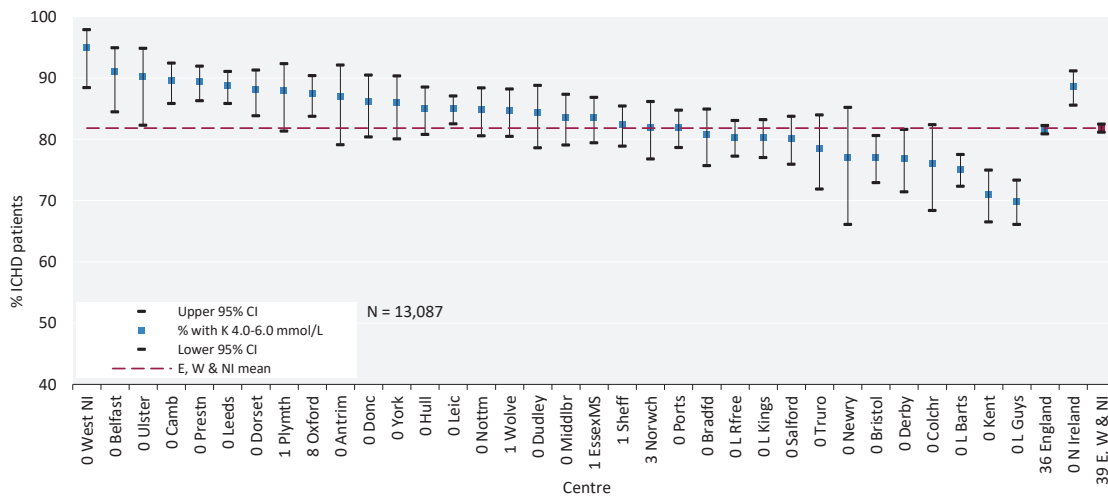
Figure 5.9 Percentage of adult patients prevalent to ICHD on 31/12/2022 with pre-dialysis potassium (K) within the target range (4.0-6.0 mmol/L) by centre

CI – confidence interval

K - Potassium

Pre-dialysis potassium has only been included in the UKRR report in the last few years and therefore longitudinal analyses are not shown.
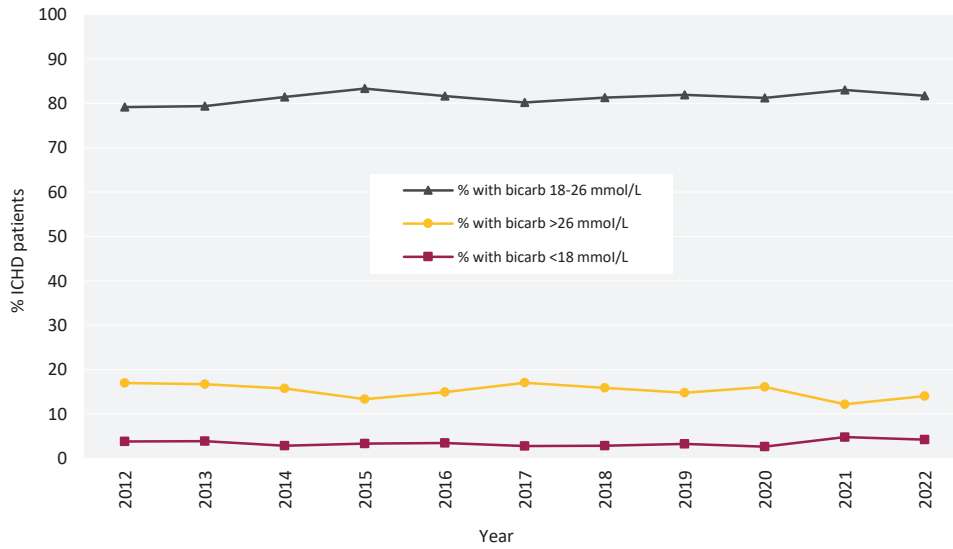
ICHD

Figure 5.10 Change in percentage of prevalent adult ICHD patients within, above and below the target range for pre-dialysis bicarbonate (bicarb 18-26 mmol/L) between 2012 and 2022

Anaemia in prevalent adult ICHD patients

UK Kidney Association anaemia guidelines recommend a target haemoglobin of 100-120 g/L. Data regarding target and median haemoglobin and ferritin levels attained are presented in table 5.8.

Table 5.8 Median haemoglobin and ferritin and percentage attaining target ranges in adult patients prevalent to ICHD on 31/12/2022 by centre

Centre	Haemoglobin				Ferritin		
	Median (g/L)	% <100 g/L	% >120 g/L	% data completeness	Median (µg/L)	% <200 µg/L	% data completeness
ENGLAND							
Bham	110	23.8	18.4	99.8	575	11.7	99.9
Bradfd	116	17.5	36.1	100.0	491	11.5	99.6
Brightn	109	23.5	17.6	99.7	516	5.2	99.0
Bristol	114	5.7	28.9	100.0	505	6.2	99.8
Camb	115	13.9	32.8	98.8	290	27.1	70.2
Carlis	113	16.2	24.2	100.0	584	9.1	100.0
Carsh	109	26.3	20.4	99.5	540	8.2	99.8
Colchr	108	24.6	8.5	100.0	484	7.7	100.0
Covnt	108	28.4	14.7	99.7	429	18.7	100.0
Derby	115	14.8	32.2	100.0	533	6.4	100.0
Donc	107	28.2	16.6	100.0	519	10.1	98.9
Dorset	112	15.0	19.8	100.0	664	5.8	100.0
Dudley	114	14.1	23.2	100.0	225	41.4	100.0
EssexMS	109	21.2	12.9	99.5	471	16.6	99.0
Exeter							
Glouc	110	22.2	21.7	100.0	443	23.5	98.5
Hull	115	16.8	32.3	100.0	585	4.0	99.7
Ipswi	111	25.2	18.5	100.0	461	17.9	98.3
Kent	111	22.3	28.6	99.8	771	7.3	99.3
L Barts	110	22.9	19.5	99.4	659	8.1	99.5
L Guys	110	25.2	18.3	99.8	532	10.2	99.7
L Kings	109	22.1	19.2	99.7	462	12.9	99.5
L Rfree	114	14.9	30.5	100.0	510	15.8	99.6
L St.G	110	28.7	22.4	97.1	652	4.5	97.5
L West	112	14.2	23.4	93.0	394	15.1	93.0
Leeds	109	22.0	15.8	99.8	365	24.7	99.8
Leic	111	20.3	24.3	99.8	439	12.4	99.7
Liv UH	110	22.6	20.4	99.2	549	9.1	98.0
M RI	109	26.6	25.0	87.7	437	12.3	84.5
Middlbr	113	15.4	24.4	99.7	874	5.9	98.4
Newc	111	23.6	25.1	100.0	651	9.0	100.0
Norwch	109	25.4	17.4	88.4	476	18.5	87.3
Nottm	110	18.5	13.0	99.7	441	17.6	99.7
Oxford	112	22.2	22.7	91.9	579	6.0	96.4
Plymth	109	27.1	15.0	98.6	509	21.6	97.9
Ports	108	26.9	17.6	100.0	352	26.9	98.2
Prestn	111	21.3	26.5	100.0	747	7.3	100.0
Redng	108	30.5	14.4	99.7	666	5.4	100.0
Salford	111	23.1	28.6	100.0	379	25.8	99.3
Sheff	107	32.4	17.4	99.2	460	8.8	99.4
Shrew	112	17.6	24.5	98.8	507	5.7	98.8
Stevng	110	17.8	15.9	99.8	400	14.0	99.6
Stoke	112	15.0	26.9	88.1	565	7.4	95.9
Sund	110	17.0	24.3	99.5	656	5.3	100.0
Truro	112	16.9	17.5	100.0	484	7.9	100.0
Wirral	109	28.6	19.4	95.6	563	8.5	96.2

Adults on ICHD in the UK at the end of 2022

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Table 5.8 Continued

Centre	Haemoglobin				Ferritin		
	Median (g/L)	% <100 g/L	% >120 g/L	% data completeness	Median (µg/L)	% <200 µg/L	% data completeness
Wolve	109	24.9	16.8	99.1	646	8.7	99.1
York	110	21.3	13.5	100.0	416	7.3	100.0
N IRELAND							
Antrim	110	18.7	15.9	100.0	629	9.3	100.0
Belfast	111	23.0	19.7	100.0	632	13.9	100.0
Newry	110	21.6	18.9	100.0	486	14.9	100.0
Ulster	113	13.0	27.2	100.0	724	0.0	100.0
West NI	110	19.2	20.2	100.0	756	3.0	100.0
SCOTLAND							
Abrdn	109	19.7	15.6	98.9			
Airdrie	112	16.0	19.1	96.9			
D&Gall	115	11.9	35.7	91.3			
Dundee	111	14.8	16.4	92.8			
Edinb	112	21.1	24.6	94.8			
Glasgw	110	25.1	22.2	97.2			
Inverns	108	22.4	19.4	87.0			
Klmarnk	111	16.7	23.0	96.2			
Krkcldy	110	17.1	17.8	98.1			
WALES							
Bangor	117	16.7	31.8	100.0	567	13.6	100.0
Cardff	111	23.0	22.8	99.8	621	11.1	99.4
Clwyd	114	13.9	25.0	100.0	761	16.7	100.0
Swanse	108	25.5	15.9	100.0	493	15.7	99.7
Wrexm	114	14.3	23.8	91.3	542	13.1	91.3
TOTALS							
England	111	21.4	21.6	98.4	507	12.3	97.9
N Ireland	111	19.2	20.2	100.0	644	8.3	100.0
Scotland	110	20.3	21.0	96.0			0.0
Wales	111	22.2	21.3	99.2	565	13.3	98.9
UK	**111**	**21.3**	**21.5**	**98.3**	**513**	**12.3**	**98.0**

Blank cells – no data returned by the centre or data completeness <70%

UK National average for ferritin does not include Scotland
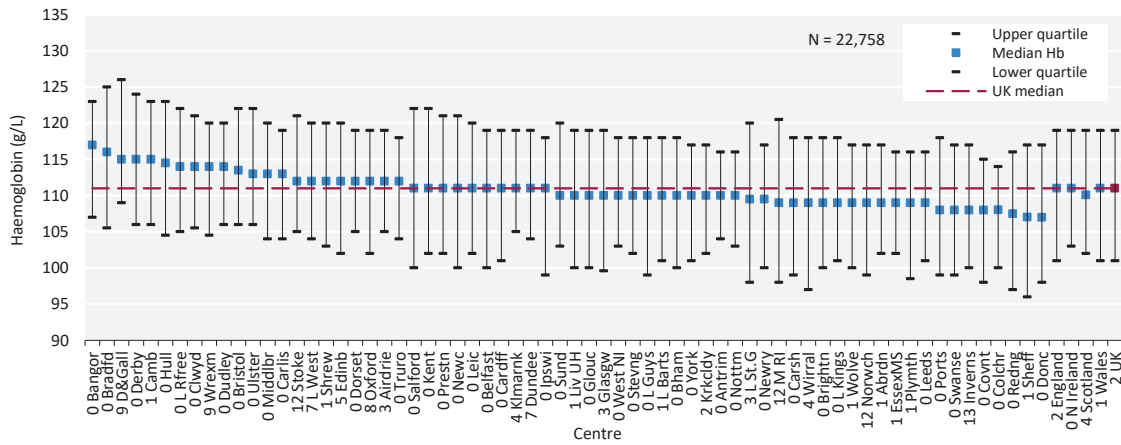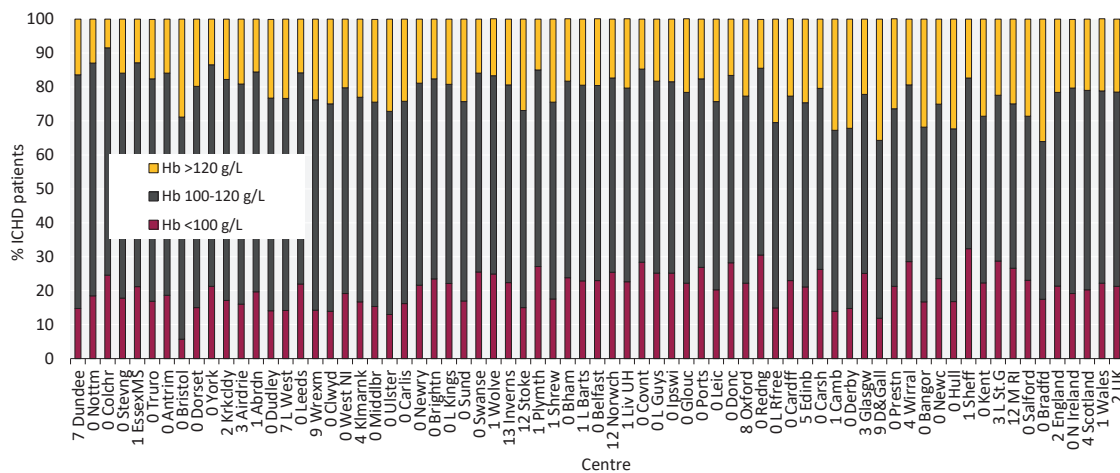
ICHD

Figure 5.11 Median haemoglobin (Hb) in adult patients prevalent to ICHD on 31/12/2022 by centre
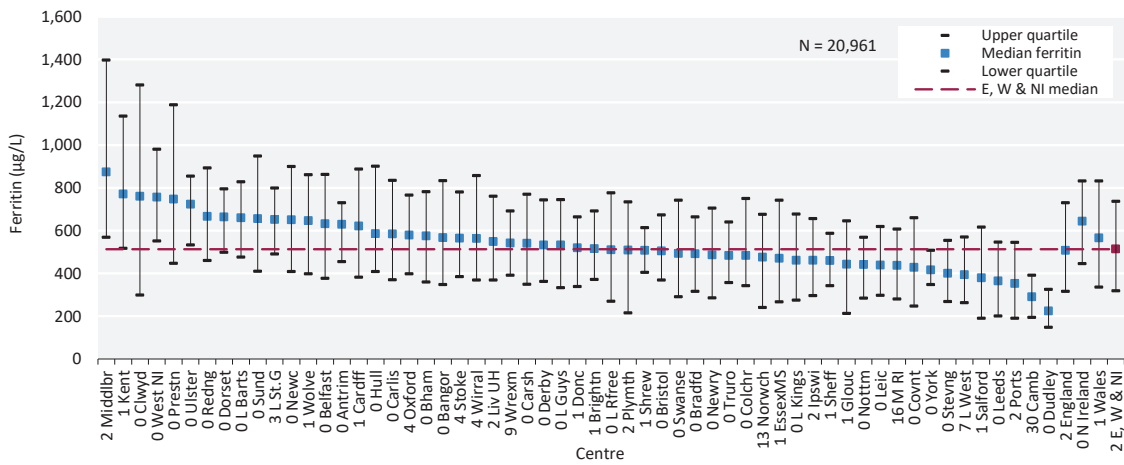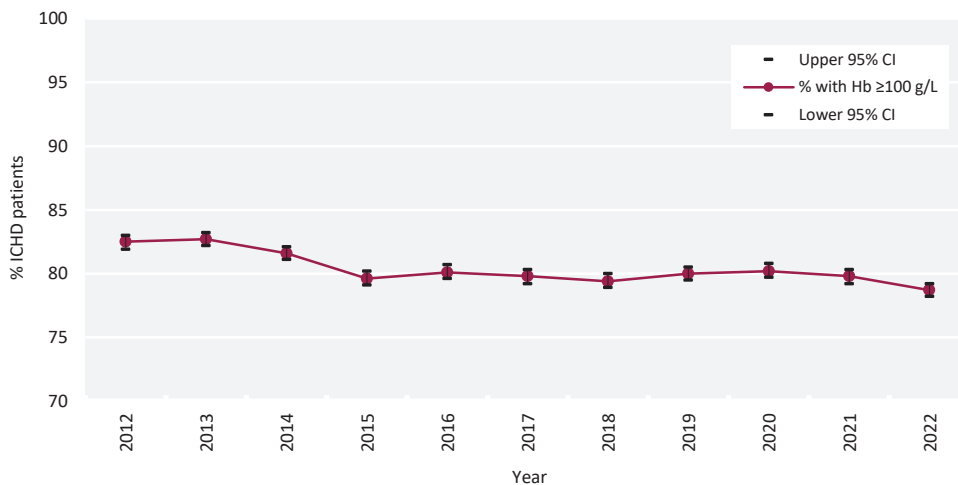

Figure 5.12 Median ferritin in adult patients prevalent to ICHD on 31/12/2022 by centre
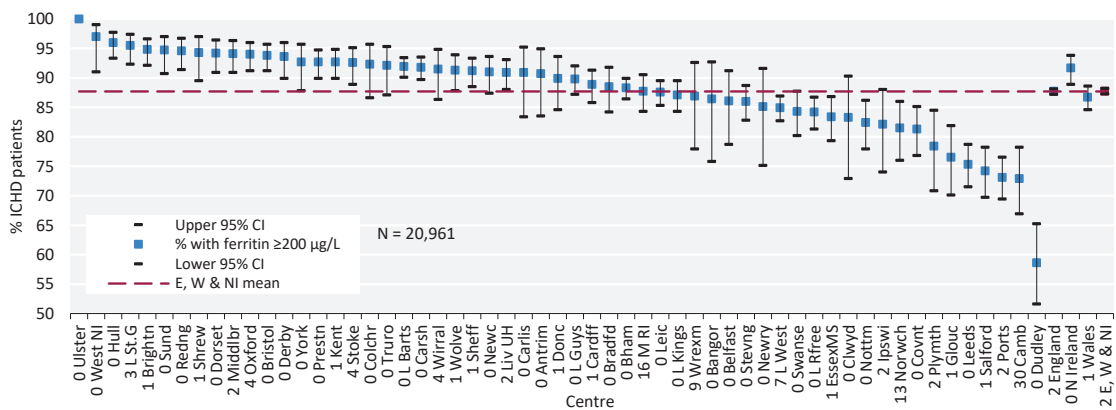
Figure 5.13 Percentage of adult patients prevalent to ICHD on 31/12/2022 with ferritin ≥200 µg/L by centre

CI – confidence interval

Figure 5.14 Distribution of haemoglobin (Hb) in adult patients prevalent to ICHD on 31/12/2022 by centre

Figure 5.15 Percentage of prevalent adult ICHD patients with haemoglobin (Hb) ≥100 g/L between 2012 and 2022
CI – confidence interval

Dialysis access in prevalent adult dialysis patients

The type of prevalent dialysis access is presented in figure 5.16 for the 62 centres that returned vascular access data on ≥70% of their prevalent dialysis patients. Rates of PD may impact the types of vascular access used for ICHD and this is reflected in the combined audit measures for dialysis access
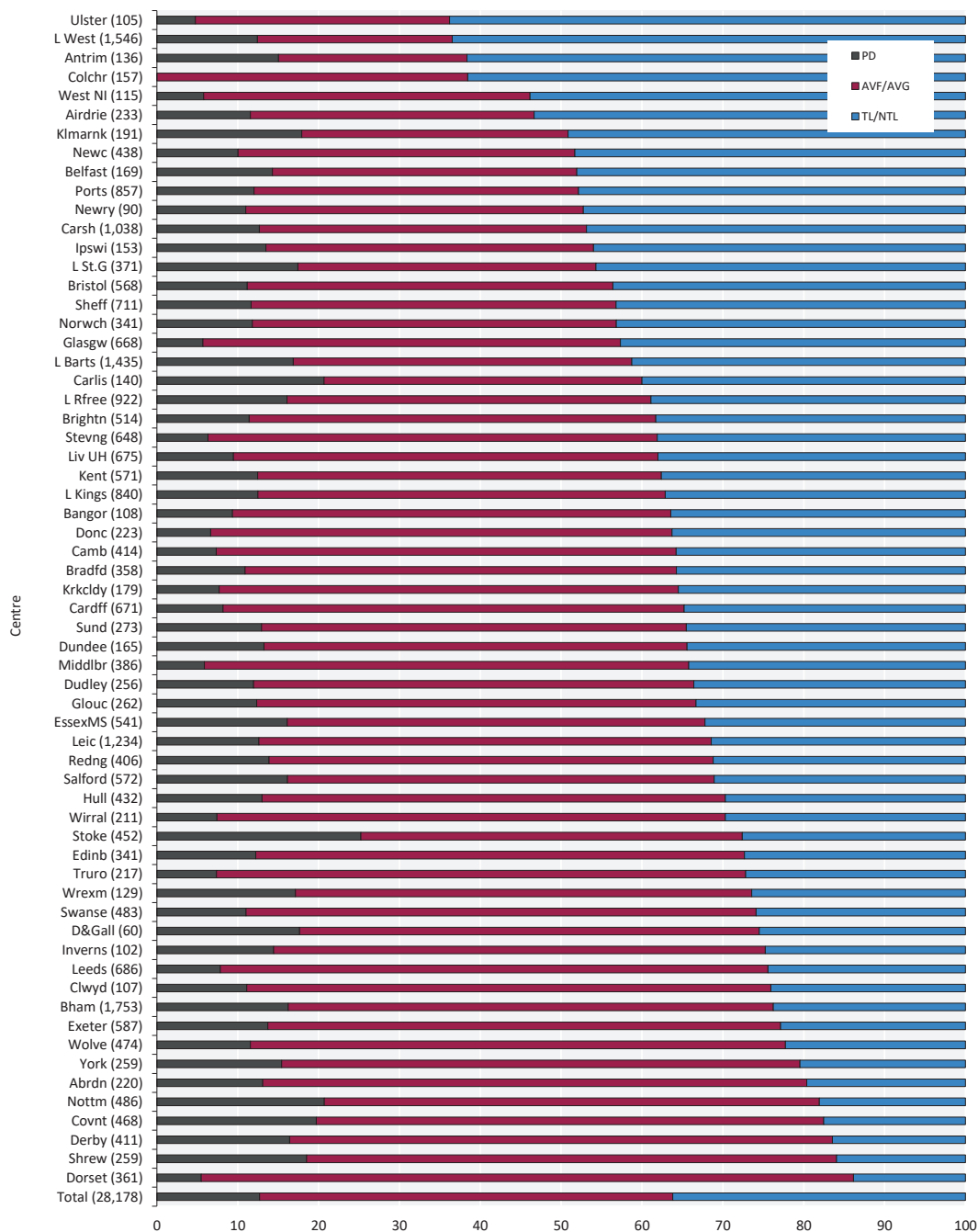
Figure 5.16 Dialysis access in adult patients prevalent to dialysis on 31/12/2022 by centre

Number of patients on dialysis in a centre in brackets (centres with <70% access data for the prevalent dialysis population were excluded)

AVF – arteriovenous fistula; AVG – arteriovenous graft; NTL – non-tunnelled line; TL – tunnelled line

Cause of death in adult ICHD patients

Cause of death was analysed in prevalent patients receiving ICHD on 31/12/2021 and followed-up for one year in 2022. The proportion of ICHD 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 UKRR data, cause of death from Civil Registration records was used. Further detail on the survival of prevalent KRT patients is in chapter 3.

Table 5.9 Cause of death in adult patients prevalent to ICHD on 31/12/2021 followed-up in 2022 by age group

Cause of death	ICHD all ages		ICHD < 65 years		ICHD ≥ 65 years	
	N	%	N	%	N	%
Cardiac disease	803	22.1	276	26.3	527	20.3
Cerebrovascular disease	147	4.0	52	5.0	95	3.7
Infection	631	17.3	159	15.2	472	18.2
Malignancy	237	6.5	45	4.3	192	7.4
Treatment withdrawal	383	10.5	66	6.3	317	12.2
Other	1,180	32.4	357	34.0	823	31.8
Uncertain aetiology	259	7.1	94	9.0	165	6.4
Total (with data)	**3,640**	**100.0**	**1,049**	**100.0**	**2,591**	**100.0**
Missing	397	9.8	147	12.3	250	8.8
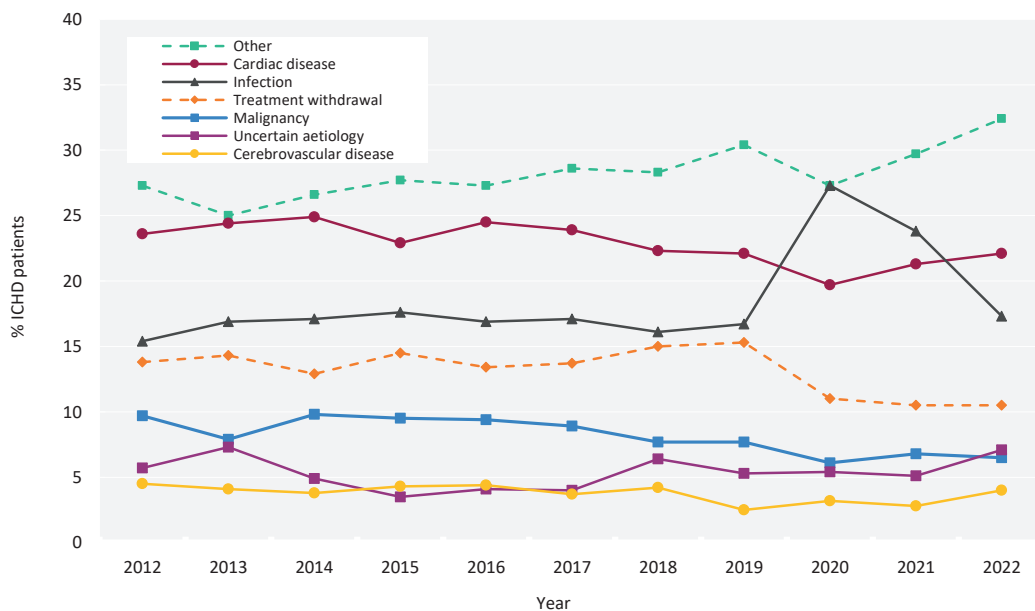
Figure 5.17 Cause of death between 2012 and 2022 for adult patients prevalent to ICHD at the beginning of the year

ICHD

Chapter 6

Adults on peritoneal dialysis (PD) in the UK at the end of 2022

Contents

Introduction

This chapter describes the population of adult patients with end-stage kidney disease (ESKD) who were receiving regular peritoneal dialysis (PD) in the UK at the end of 2022 (figure 6.1). This population comprises patients who were on PD at the end of 2021 and remained on PD throughout 2022, as well as patients who commenced/re-commenced PD in 2022. This latter group includes both incident kidney replacement therapy (KRT) patients who ended 2022 on PD and prevalent KRT patients who switched to PD from in-centre haemodialysis (ICHD), home haemodialysis (HHD) or a transplant (Tx) in 2022. Consequently, the cohort of patients receiving PD in a centre not only reflects differences in underlying population case-mix, but also differences in the rates of acceptance onto KRT, survival on PD, transplantation and haemodialysis (ICHD and HHD), and the care of patients on those other modalities, as described in other chapters of this report.
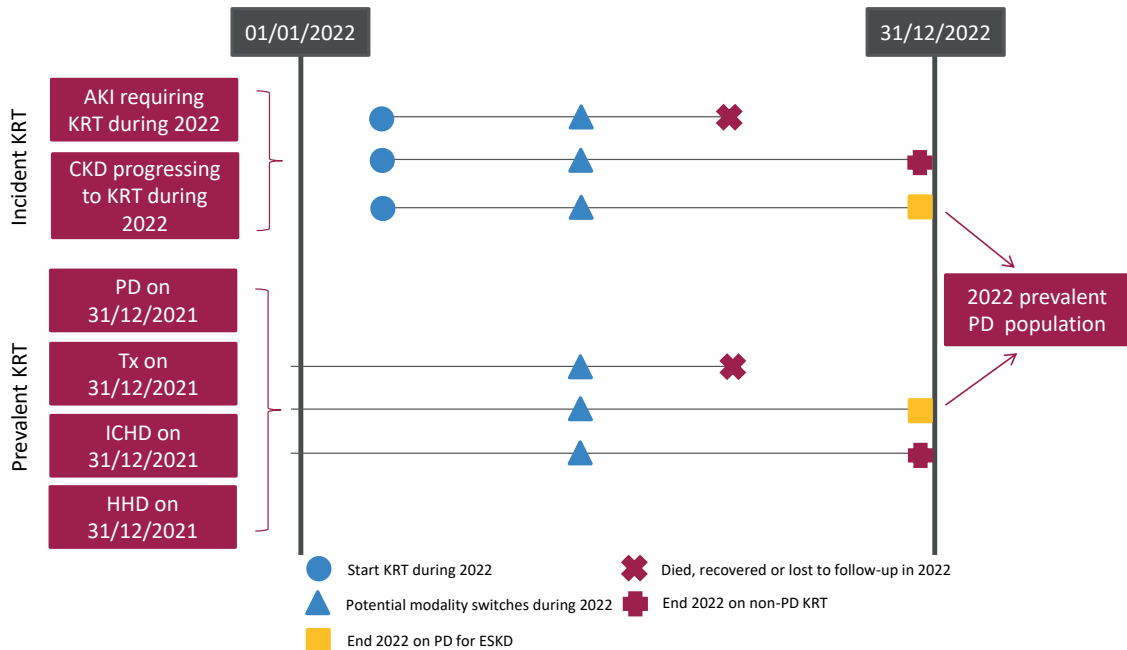
Figure 6.1 Pathways adult patients could follow to be included in the UK 2022 prevalent PD population

Note that patients receiving dialysis for acute kidney injury (AKI) are only included in this chapter if they had a timeline or KRT modality code for chronic PD at the end of 2022 or if they had been on KRT for ≥90 days and were on PD at the end of 2022
CKD – chronic kidney disease

The cause of death analyses were undertaken on historic prevalent cohorts to allow sufficient follow-up time.

This chapter addresses the following key aspects of the care of patients on PD for which there are UK Kidney Association guidelines (table 6.1):

- **Complications associated with ESKD and PD:** these include anaemia, mineral bone disorders and metabolic acidosis.

- **Infections associated with PD:** rates of PD peritonitis are reported in this chapter. The four infections subject to mandatory reporting to the UK Health Security Agency (UKHSA) - methicillin-resistant *Staphylococcus aureus* (MRSA), methicillin-sensitive *Staphylococcus aureus* (MSSA), *Escherichia coli* bacteraemia and *Clostridium difficile* - will be added to the UKRR data portal (ukkidney.org/audit-research/data-portals) as new data become available.

Rationale for analyses

The analyses begin with a description of the 2022 prevalent adult PD population, including the number on PD per million population (pmp).

The UK Kidney Association guidelines (ukkidney.org/health-professionals/guidelines/guidelines-commentaries) provide audit measures relevant to the care of patients on PD and, where data permit, their attainment by UK kidney centres in 2022 is reported in this chapter (table 6.1). Audit measures in guidelines that have been archived are not included.

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 items is too low. 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 was <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.

As Colchester kidney centre did not have any PD patients they were excluded from some of the analyses, although their dialysis patients were included in the relevant dialysis population denominators.

Exeter was unable to submit patient level data for 2022. Aggregate numbers by modality were provided, enabling inclusion in Tables 6.2 and 6.3. Exeter is excluded from all other analyses.

Manchester moved to a new Trust IT system, and as a result data were not submitted for the final quarter of 2022. Data for Manchester presented in this chapter are for patients receiving PD on 30th September 2022, rather than 31st December 2022.

Table 6.1 The UK Kidney Association audit measures relevant to PD that are reported in this chapter

The UK Kidney Association guideline	Audit criteria	Related analysis/analyses
CKD mineral bone disorder (2018)	Percentage of patients with serum calcium above the normal reference range of 2.2–2.5 mmol/L	Table 6.5, figure 6.3
PD (2017)	Plasma bicarbonate should be maintained in the normal reference range 22–30 mmol/L – 100%	Table 6.5, figure 6.5
Anaemia (2020)	Proportion of patients with serum ferritin <100 µg/L at start of treatment with erythropoiesis stimulating agent (ESA)	Table 6.6, figure 6.9 (the UKRR does not hold treatment with ESA start dates)
Planning, initiating and withdrawing KRT (2014)	Number of patients withdrawing from PD as a proportion of all deaths on PD	Table 6.8, figure 6.13

ESA – erythropoiesis stimulating agent

PD

Key findings

- 3,800 adult patients were receiving PD for ESKD in the UK on 31/12/2022, compared to 3,896 in 2021, which represented 5.4% of the KRT population.

- The median age of PD patients was 63.5 years and 59.1% were male.

- The median adjusted calcium for PD patients was 2.4 mmol/L and 15.0% were above the target range of 2.2–2.5 mmol/L.

- The median bicarbonate for PD patients was 24 mmol/L and 77.0% were within the target range of 22–30 mmol/L.

- The median haemoglobin for PD patients was 110 g/L and 10.0% had a ferritin <100 μg/L.

- The PD peritonitis rate in 2022 (England only) was 0.37/1 PD patient-year.

- 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 has resulted in improved completeness and changes in proportions of causes of death. The leading cause of death was cardiac disease in both younger patients and those ≥65 years at 28.6% and 18.2% respectively. Treatment withdrawal accounted for 12.1% of deaths in those ≥65 years, and infection around 18% in both younger and older patients.

PD

Analyses

Changes to the prevalent adult PD population

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

Table 6.2 Number of prevalent adult PD patients and proportion of adult KRT patients on PD by year and by centre; number of PD patients as a proportion of the catchment population

Centre	N on PD					% on PD					Estimated catchment population (millions)	2022 crude rate (pmp)
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022		
ENGLAND												
Bham	257	257	268	276	277	7.9	7.8	8.2	8.4	8.2	2.03	137
Bradfd	26	34	26	37	40	3.8	4.6	3.6	5.0	5.1	0.50	81
Brightn	60	55	65	68	56	5.7	5.2	6.0	6.2	5.1	1.08	52
Bristol	56	63	68	77	62	3.8	4.2	4.6	5.1	4.1	1.25	50
Camb	32	28	26	29	28	2.3	1.9	1.7	1.8	1.7	0.96	29
Carlis	30	35	32	30	28	10.2	11.6	10.8	9.8	9.2	0.26	109
Carsh	99	72	121	132	128	5.7	4.0	6.5	6.9	6.6	1.64	78
Colchr	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.30	0
Covnt	52	81	83	80	80	5.4	7.5	7.5	7.1	7.1	0.84	96
Derby	78	62	69	67	59	13.3	9.5	10.2	9.7	8.2	0.56	106
Donc	23	25	19	13	15	7.0	7.3	5.6	3.8	4.0	0.38	40
Dorset	38	33	34	23	19	5.0	4.3	4.3	2.9	2.4	0.73	26
Dudley	38	36	32	40	30	10.6	9.8	8.6	9.9	7.8	0.34	87
EssexMS	87	85	83	92	82	10.3	10.0	9.4	10.3	9.1	1.00	82
Exeter	77	84	84	73	75	7.1	7.7	7.7	6.8	6.6	0.98	77
Glouc	37	31	30	36	32	7.1	5.8	5.7	6.6	5.8	0.52	62
Hull	45	49	57	52	57	5.1	5.4	6.2	5.7	6.1	0.80	71
Ipswi	40	42	33	34	22	9.3	9.8	7.7	8.1	5.6	0.31	70
Kent	43	50	62	72	74	3.9	4.4	5.4	6.0	6.0	1.08	69
L Barts	237	228	265	255	232	9.1	8.6	9.9	9.3	8.1	1.61	144
L Guys	43	53	64	70	47	1.9	2.3	2.8	3.0	2.0	1.00	47
L Kings	89	95	101	98	103	7.5	7.6	8.1	7.4	7.4	0.93	111
L Rfree	163	165	179	172	147	7.3	7.0	7.7	7.2	6.1	1.33	111
L St.G	40	43	48	53	61	4.8	5.0	5.6	6.1	7.1	0.65	94
L West	135	155	200	214	196	3.8	4.3	5.7	6.0	5.4	1.97	100
Leeds	64	67	64	52	54	3.8	3.9	3.7	2.9	2.9	1.39	39
Leic	108	126	120	138	150	4.4	4.9	4.6	5.2	5.5	2.11	71
Liv UH	82	57	57	56	61	5.5	3.8	3.9	3.8	4.1	1.26	49
M RI	69	76	84	96	91	3.3	3.7	4.2	4.6	4.3	1.36	67
Middlbr	29	32	28	20	22	3.1	3.4	3.0	2.1	2.3	0.82	27
Newc	60	59	46	58	43	5.2	5.0	3.8	4.7	3.5	0.97	44
Norwch	36	46	47	48	38	4.6	5.7	5.8	6.0	4.9	0.70	54
Nottm	70	76	95	103	94	5.8	6.2	7.9	8.5	7.8	0.94	100
Oxford	70	58	68	66	75	3.6	2.9	3.4	3.3	3.6	1.48	51
Plymth	40	42	33	34	45	7.4	7.9	6.1	6.3	8.2	0.41	111
Ports	94	87	101	90	107	5.3	4.6	5.3	4.6	5.4	1.77	60
Prestn	39	43	50	55	51	3.0	3.2	3.7	4.0	3.6	1.25	41
Redng	40	56	61	50	56	4.9	6.5	7.0	5.7	6.1	0.70	80
Salford	115	120	106	84	93	9.8	9.7	8.4	6.9	7.3	1.17	80
Sheff	61	60	77	80	82	4.1	4.0	5.2	5.3	5.5	1.15	71
Shrew	58	55	51	50	47	13.5	12.6	11.9	11.4	10.6	0.42	112
Stevng	28	37	25	36	42	3.0	3.8	2.6	3.5	3.9	1.12	37

Table 6.2 Continued

Centre	N on PD					% on PD					Estimated catchment population (millions)	2022 crude rate (pmp)
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022		
Stoke	81	71	94	107	107	10.0	8.8	11.6	12.7	11.8	0.74	145
Sund	17	26	32	37	36	3.0	4.6	5.8	6.8	6.4	0.55	65
Truro	17	21	23	22	16	3.9	4.7	5.2	4.8	3.4	0.37	44
Wirral	20	18	18	20	15	5.0	4.3	4.3	4.8	3.8	0.47	32
Wolve	54	49	59	64	57	8.9	8.0	9.0	9.2	7.9	0.55	104
York	29	33	24	27	40	5.1	5.7	4.2	4.6	6.6	0.50	81
N IRELAND												
Antrim	20	19	12	18	20	7.3	4.2	6.1	6.5	6.5	0.25	81
Belfast	22	18	15	27	22	2.5	2.0	1.7	3.0	2.4	0.53	41
Newry	16	11	9	13	10	6.3	4.3	3.4	4.6	3.7	0.24	42
Ulster	10	8	3	3	5	5.2	4.3	1.5	1.5	2.4	0.20	24
West NI	9	14	7	6	7	2.8	4.3	2.0	1.8	2.0	0.25	28
SCOTLAND												
Abrdn	26	22	22	20	28	4.5	3.9	3.9	3.4	4.7	0.50	56
Airdrie	22	21	29	29	26	4.5	4.0	5.6	5.7	5.0	0.46	57
D&Gall	6	8	10	8	9	4.1	5.4	6.4	5.2	6.1	0.12	74
Dundee	22	21	13	16	20	4.9	4.7	3.0	3.9	5.0	0.37	55
Edinb	36	41	33	33	38	4.2	4.6	3.7	3.6	3.9	0.84	45
Glasgw	52	45	46	39	37	2.9	2.4	2.5	2.1	1.9	1.37	27
Inverns	13	12	9	11	14	4.7	4.3	3.3	4.0	5.0	0.23	62
Klmarnk	19	24	27	33	31	5.6	6.7	7.3	9.0	8.3	0.29	107
Krkcldy	10	12	6	7	13	3.4	4.1	2.1	2.4	4.5	0.27	48
WALES												
Bangor	20	14	18	12	10	9.9	7.0	8.3	5.5	4.5	0.20	49
Cardff	59	63	67	58	53	3.4	3.6	4.0	3.4	3.0	1.17	45
Clwyd	15	13	13	11	12	7.9	6.3	6.4	5.4	5.9	0.18	66
Swanse	70	77	59	49	52	8.5	8.9	6.9	5.8	6.1	0.76	68
Wrexm	24	23	25	17	21	7.6	7.4	7.7	5.6	6.8	0.21	101
TOTALS												
England	3,106	3,176	3,412	3,486	3,372	5.5	5.5	5.9	5.9	5.6	45.20	75
N Ireland	77	70	46	67	64	4.0	3.6	2.3	3.3	3.1	1.47	43
Scotland	206	206	195	196	216	3.9	3.8	3.7	3.6	3.9	4.44	49
Wales	188	190	182	147	148	5.8	5.7	5.6	4.5	4.4	2.53	59
UK	**3,577**	**3,642**	**3,835**	**3,896**	**3,800**	**5.4**	**5.3**	**5.6**	**5.6**	**5.4**	**53.65**	**71**

Country PD populations were calculated by summing the PD 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)
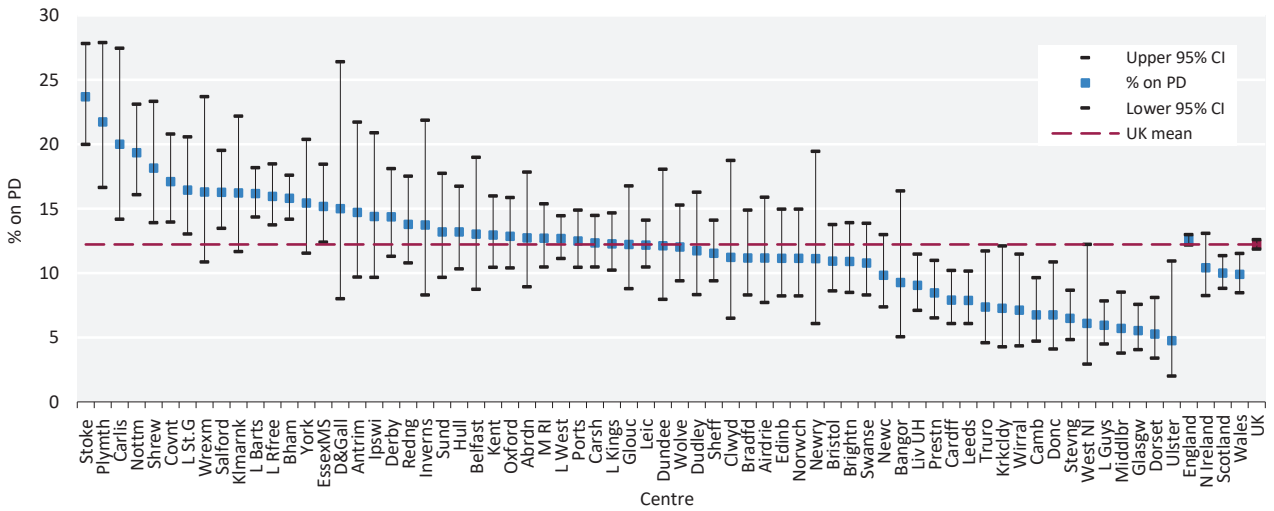
Exeter was unable to submit 2021 and 2022 patient level data, but provided aggregate numbers of patients on KRT at the end of each year, by treatment modality

pmp – per million population

PD
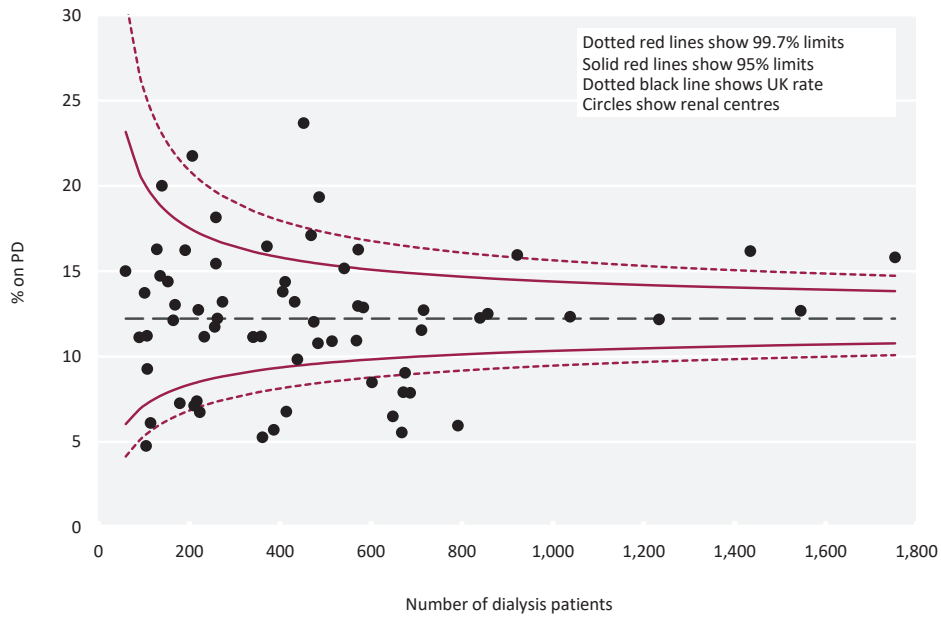
Figure 6.2a Percentage of adult patients prevalent to dialysis on 31/12/2022 who were on PD by centre

Figure 6.2b Percentage of adult patients prevalent to dialysis on 31/12/2022 who were on PD by centre

CI - confidence interval

Adults on PD in the UK at the end of 2022

Demographics of prevalent adult PD patients

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

Table 6.3 Demographics of adult patients prevalent to PD on 31/12/2022 by centre

Centre	N on KRT	N on PD	% on PD	Median age (yrs)	% male	Ethnicity				% missing
						% White	% Asian	% Black	% Other	
ENGLAND										
Bham	3,378	277	8.2	63.1	59.9	58.4	26.6	14.6	0.4	3.6
Bradfd	781	40	5.1	60.1	50.0	65.0	32.5	0.0	2.5	0.0
Brightn	1,100	56	5.1	67.7	60.7	94.2	5.8	0.0	0.0	7.1
Bristol	1,524	62	4.1	64.6	58.1	93.4	1.6	3.3	1.6	1.6
Camb	1,663	28	1.7	66.5	67.9	92.6	7.4	0.0	0.0	3.6
Carlis	303	28	9.2	67.0	57.1	100.0	0.0	0.0	0.0	0.0
Carsh	1,936	128	6.6	64.7	59.4	66.9	17.4	8.3	7.4	5.5
Colchr	157	0	0.0							
Covnt	1,125	80	7.1	67.1	63.8	80.0	13.8	6.3	0.0	0.0
Derby	716	59	8.2	69.2	62.7	92.7	7.3	0.0	0.0	6.8
Donc	376	15	4.0	61.3	53.3	92.3	0.0	7.7	0.0	13.3
Dorset	792	19	2.4	66.5	52.6	94.7	0.0	0.0	5.3	0.0
Dudley	383	30	7.8	65.5	53.3	70.0	20.0	10.0	0.0	0.0
EssexMS	897	82	9.1	70.9	63.4	86.7	5.3	6.7	1.3	8.5
Exeter	1,128	75	6.6							
Glouc	554	32	5.8	61.6	59.4	80.0	6.7	0.0	13.3	6.3
Hull	933	57	6.1	68.0	63.2	96.4	1.8	1.8	0.0	1.8
Ipswi	395	22	5.6	75.8	59.1	88.2	0.0	5.9	5.9	22.7
Kent	1,224	74	6.0	59.7	59.5	87.3	2.8	5.6	4.2	4.1
L Barts	2,851	232	8.1	60.5	57.8	26.8	38.4	29.9	4.9	3.4
L Guys	2,309	47	2.0	58.0	48.9	46.3	22.0	24.4	7.3	12.8
L Kings	1,394	103	7.4	59.0	58.3	45.1	14.7	36.3	3.9	1.0
L Rfree	2,418	147	6.1	64.8	57.8	38.8	22.3	23.0	15.8	5.4
L St.G	855	61	7.1	63.3	59.0	40.4	26.9	15.4	17.3	14.8
L West	3,626	196	5.4	67.0	54.1	38.8	40.3	12.8	8.2	0.0
Leeds	1,836	54	2.9	59.8	51.9	66.0	20.8	9.4	3.8	1.9
Leic	2,719	150	5.5	66.3	58.0	83.2	12.4	1.5	2.9	8.7
Liv UH	1,479	61	4.1	59.6	54.1	87.5	5.4	3.6	3.6	8.2
M RI	2,111	91	4.3	62.2	54.9					38.5
Middlbr	955	22	2.3	61.1	50.0	95.5	0.0	0.0	4.5	0.0
Newc	1,245	43	3.5	58.4	55.8	86.0	4.7	7.0	2.3	0.0
Norwch	783	38	4.9	73.2	78.9	100.0	0.0	0.0	0.0	7.9
Nottm	1,211	94	7.8	64.6	67.0	78.7	14.6	6.7	0.0	5.3
Oxford	2,080	75	3.6	64.0	57.3					33.3
Plymth	546	45	8.2	65.7	60.0	97.8	2.2	0.0	0.0	0.0
Ports	2,000	107	5.4	64.5	58.9					38.3
Prestn	1,400	51	3.6	60.3	52.9	76.5	19.6	2.0	2.0	0.0
Redng	924	56	6.1	60.7	62.5	66.7	22.2	4.4	6.7	19.6
Salford	1,273	93	7.3	55.2	57.0	80.6	15.1	3.2	1.1	0.0
Sheff	1,488	82	5.5	65.7	59.8	87.5	7.5	3.8	1.3	2.4
Shrew	445	47	10.6	65.7	59.6	90.5	2.4	2.4	4.8	10.6
Stevng	1,066	42	3.9	61.5	59.5	60.0	30.0	10.0	0.0	4.8
Stoke	903	107	11.8	64.8	62.6	90.6	4.2	2.1	3.1	10.3
Sund	562	36	6.4	60.2	50.0	94.4	5.6	0.0	0.0	0.0
Truro	471	16	3.4	55.8	56.3	100.0	0.0	0.0	0.0	0.0
Wirral	400	15	3.8	70.5	53.3	100.0	0.0	0.0	0.0	0.0
Wolve	722	57	7.9	56.3	54.4	56.1	21.1	21.1	1.8	0.0

Adults on PD in the UK at the end of 2022

PD

Table 6.3 Continued

Centre	N on KRT	N on PD	% on PD	Median age (yrs)	% male	Ethnicity				
						% White	% Asian	% Black	% Other	% missing
York	608	40	6.6	59.8	65.0	100.0	0.0	0.0	0.0	7.5
N IRELAND										
Antrim	306	20	6.5	76.7	70.0					65.0
Belfast	926	22	2.4	75.8	68.2					45.5
Newry	269	10	3.7	75.0	50.0	100.0	0.0	0.0	0.0	20.0
Ulster	210	5	2.4	65.0	40.0	75.0	25.0	0.0	0.0	20.0
West NI	356	7	2.0	69.5	71.4	100.0	0.0	0.0	0.0	14.3
SCOTLAND										
Abrdn	594	28	4.7	60.1	67.9					
Airdrie	519	26	5.0	71.0	38.5					
D&Gall	148	9	6.1	70.0	44.4					
Dundee	399	20	5.0	58.9	80.0					
Edinb	976	38	3.9	56.8	63.2					
Glasgw	1,921	37	1.9	59.8	75.7					
Inverns	280	14	5.0	67.6	64.3					
Klmarnk	374	31	8.3	62.3	54.8					
Krkcldy	292	13	4.5	51.2	69.2					
WALES										
Bangor	220	10	4.5	71.8	70.0					40.0
Cardff	1,758	53	3.0	64.3	50.9	96.0	4.0	0.0	0.0	5.7
Clwyd	204	12	5.9	62.5	83.3					33.3
Swanse	847	52	6.1	65.5	69.2	96.2	1.9	0.0	1.9	0.0
Wrexm	307	21	6.8	56.4	61.9	88.9	5.6	5.6	0.0	14.3
TOTALS										
England	60,045	3,372	5.6	63.6	58.6	69.3	16.8	10.2	3.8	7.3
N Ireland	2,067	64	3.1	75.5	64.1					42.2
Scotland	5,503	216	3.9	60.7	63.0					
Wales	3,336	148	4.4	63.6	62.8	95.5	3.0	0.7	0.7	9.5
UK	**70,951**	**3,800**	**5.4**	**63.5**	**59.1**	**70.7**	**16.1**	**9.7**	**3.6**	**8.0**

Blank cells – no data returned 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, but provided aggregate numbers of patients on KRT at the end of 2022, by treatment modality

UK ethnicity distribution and completeness does not include Scotland

Primary renal diseases (PRDs) were grouped into categories as shown in table 6.4, with the mapping of disease codes into groups explained in more detail in appendix A. The proportion of PD patients with each PRD is shown for patients with PRD data and these total 100% of patients with data. The proportion of patients with no PRD data is shown on a separate line.

PD

Adults on PD in the UK at the end of 2022

Table 6.4 Primary renal diseases (PRDs) of adult patients prevalent to PD on 31/12/2022

PRD	N on PD	% PD population	Age <65 yrs N	Age <65 yrs %	Age ≥65 yrs N	Age ≥65 yrs %	M/F ratio
Diabetes	810	24.0	417	22.9	393	25.3	1.7
Glomerulonephritis	545	16.1	364	20.0	181	11.6	1.6
Hypertension	261	7.7	142	7.8	119	7.6	1.9
Polycystic kidney disease	270	8.0	173	9.5	97	6.2	0.8
Pyelonephritis	209	6.2	106	5.8	103	6.6	1.5
Renal vascular disease	143	4.2	30	1.6	113	7.3	2.3
Other	561	16.6	319	17.5	242	15.6	1.0
Uncertain aetiology	578	17.1	270	14.8	308	19.8	1.4
Total (with data)	**3,377**	**100.0**	**1,821**	**100.0**	**1,556**	**100.0**	
Missing	348	9.3	178	8.9	170	9.8	1.7

Biochemistry parameters in prevalent adult PD patients

The UK Kidney Association guideline on CKD mineral bone disease contains only one audit measure, which is the percentage of patients with adjusted calcium above the target range. The UK Kidney Association guideline on PD contains one biochemical audit measure, which is the proportion of patients with bicarbonate in the target range.

Table 6.5 Median adjusted calcium (Ca) and percentage with adjusted Ca within and above the target range (2.2–2.5 mmol/L); and median bicarbonate and percentage with bicarbonate below, within and above the target range (22–30 mmol/L) in adult patients prevalent to PD on 31/12/2022 by centre

Centre	Adjusted calcium Median (mmoI/L)	% 2.2-2.5 mmoI/L	% >2.5 mmoI/L	% data completeness	Bicarbonate Median (mmoI/L)	% <22 (mmoI/L)	% 22-30 (mmoI/L)	% >30 (mmoI/L)	% data completeness
				ENGLAND					
Bham	2.4	78.2	16.9	99.2					55.5
Bradfd	2.5	80.0	17.1	100.0	26	11.4	80.0	8.6	100.0
Brightn	2.4	68.8	25.0	100.0	26	20.8	77.1	2.1	100.0
Bristol	2.4	80.0	20.0	100.0	23	20.0	80.0	0.0	100.0
Camb	2.4	88.0	12.0	100.0	27	8.0	92.0	0.0	100.0
Carlis	2.3	88.0	0.0	100.0	24	32.0	68.0	0.0	100.0
Carsh	2.3	71.7	16.0	96.4					0.0
Colchr									
Covnt	2.3	77.4	6.5	92.5	26	10.2	81.4	8.5	88.1
Derby	2.4	80.4	17.7	100.0	23	13.7	84.3	2.0	100.0
Donc	2.4	90.0	10.0	100.0	23	30.0	70.0	0.0	100.0
Dorset	2.4	76.5	17.7	100.0	22	41.2	58.8	0.0	100.0
Dudley	2.4	75.9	13.8	100.0	25	3.5	96.6	0.0	100.0
EssexMS	2.4	85.3	6.7	98.7	26	8.0	86.7	5.3	98.7
Exeter									
Glouc	2.4	72.0	12.0	89.3	23	28.0	72.0	0.0	89.3
Hull	2.4	81.8	15.9	100.0	25	13.6	79.6	6.8	100.0
Ipswi				63.6					59.1
Kent	2.4	69.7	22.7	98.5	25	10.9	85.9	3.1	95.5
L Barts	2.4	83.9	10.1	97.1	24	28.8	70.2	1.0	96.6
L Guys	2.4	76.9	18.0	100.0	23	23.1	74.4	2.6	100.0
L Kings	2.35	81.1	6.7	100.0	24	22.2	77.8	0.0	100.0
L Rfree	2.4	80.2	11.5	99.2	25	14.2	82.7	3.2	96.2
L St.G	2.5	72.6	23.5	94.4	23	24.0	76.0	0.0	92.6

PD

Table 6.5 Continued

Centre	Adjusted calcium				Bicarbonate				
	Median (mmoI/L)	% 2.2-2.5 mmoI/L	% >2.5 mmoI/L	% data completeness	Median (mmoI/L)	% <22 (mmoI/L)	% 22-30 (mmoI/L)	% >30 (mmoI/L)	% data completeness
L West				29.0					25.4
Leeds	2.4	82.7	7.7	100.0	26	11.5	86.5	1.9	100.0
Leic	2.4	75.9	14.3	99.3	24	18.2	78.8	3.0	98.5
Liv UH	2.5	74.5	23.5	96.2	26	9.8	88.2	2.0	96.2
M RI	2.4	84.7	11.1	90.0	24	20.8	79.2	0.0	90.0
Middlbr	2.3	82.4	5.9	94.4	27	5.9	94.1	0.0	94.4
Newc	2.4	71.8	12.8	100.0	22	40.5	56.8	2.7	94.9
Norwch	2.4	80.6	19.4	100.0	21	55.6	44.4	0.0	100.0
Nottm	2.4	81.0	16.5	100.0					29.1
Oxford	2.4	76.0	16.0	82.0	22	44.2	55.8	0.0	70.5
Plymth	2.4	82.9	12.2	100.0	22	50.0	50.0	0.0	97.6
Ports	2.4	81.4	8.1	100.0	24	17.9	81.0	1.2	97.7
Prestn	2.3	81.3	12.5	96.0	26	10.4	85.4	4.2	96.0
Redng	2.4	83.3	10.4	100.0	25	6.3	91.7	2.1	100.0
Salford	2.4	72.2	21.5	100.0	27	3.8	83.5	12.7	100.0
Sheff	2.3	76.8	5.8	98.6	22	33.3	66.7	0.0	98.6
Shrew	2.3	70.3	13.5	97.4	22	46.0	54.1	0.0	97.4
Stoke	2.4	73.3	22.2	100.0	26	15.7	80.9	3.4	98.9
Sund	2.4	67.7	25.8	96.9					0.0
Truro	2.45	78.6	21.4	100.0	24	14.3	85.7	0.0	100.0
Wirral	2.4	80.0	20.0	100.0	27	0.0	86.7	13.3	100.0
Wolve	2.4	76.9	19.2	96.3	23	26.9	73.1	0.0	96.3
York	2.5	74.2	25.8	96.9	26	3.2	87.1	9.7	96.9
N IRELAND									
Antrim	2.4	94.4	5.6	100.0	26	11.1	83.3	5.6	100.0
Belfast	2.4	79.0	10.5	100.0	26	5.3	89.5	5.3	100.0
Newry				100.0					100.0
Ulster				100.0					100.0
West NI				100.0					100.0
WALES									
Bangor	2.5	80.0	20.0	100.0	28	10.0	70.0	20.0	100.0
Cardff	2.4	76.6	23.4	100.0					57.5
Clwyd				100.0					100.0
Swanse	2.4	67.4	30.2	100.0	25	11.6	83.7	4.7	100.0
Wrexm	2.4	94.7	5.3	95.0	26	5.3	94.7	0.0	95.0
TOTALS									
England	2.4	78.2	14.7	93.6	24	21.0	76.5	2.6	81.9
N Ireland	2.4	81.8	14.6	100.0	26	9.1	85.5	5.5	100.0
Wales	2.4	78.0	21.3	99.2	25	12.2	84.1	3.7	83.6
E, W & NI	**2.4**	**78.2**	**15.0**	**93.9**	**24**	**20.3**	**77.0**	**2.7**	**82.3**

Blank cells – no data returned by the centre or <10 patients in the centre or data completeness <70%

PD
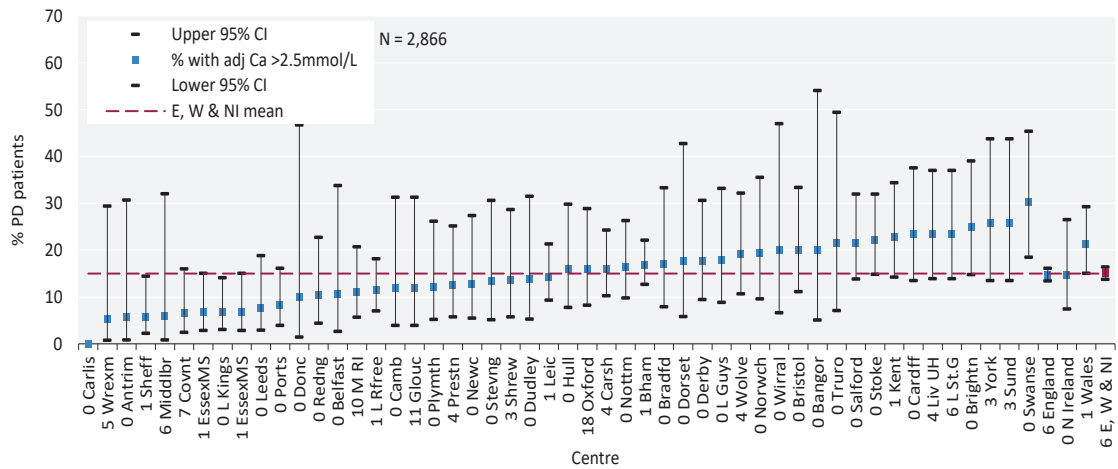
Figure 6.3 Percentage of adult patients prevalent to PD on 31/12/2022 with adjusted calcium (Ca) above the target range (>2.5 mmol/L) by centre

CI – confidence interval
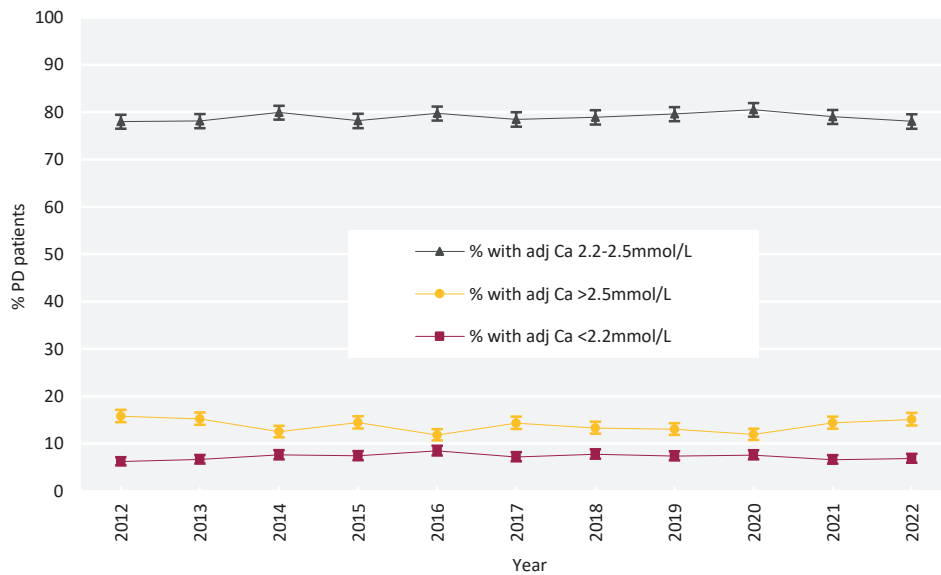
Figure 6.4 Change in percentage of prevalent adult PD patients within, above and below the target range for adjusted calcium (Ca 2.2–2.5 mmol/L) between 2012 and 2022

PD
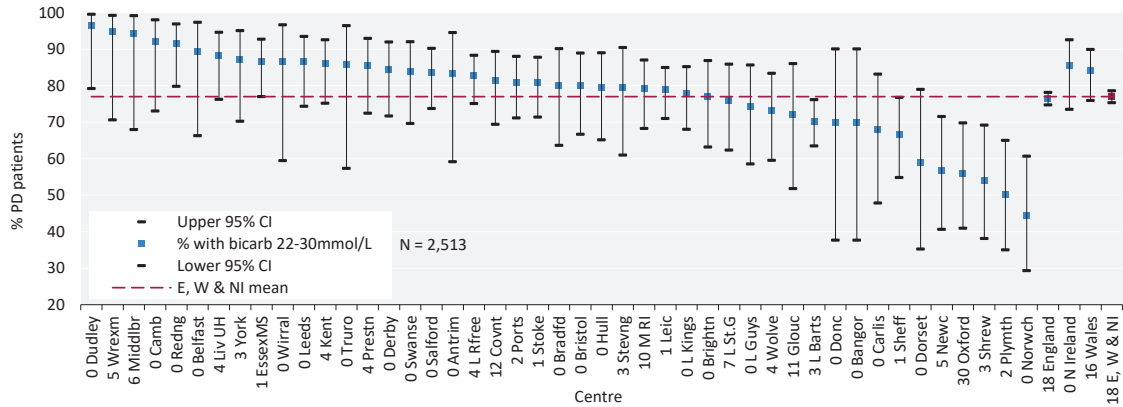
Figure 6.5 Percentage of adult patients prevalent to PD on 31/12/2022 with bicarbonate (bicarb) within the target range (22–30 mmol/L) by centre

CI – confidence interval
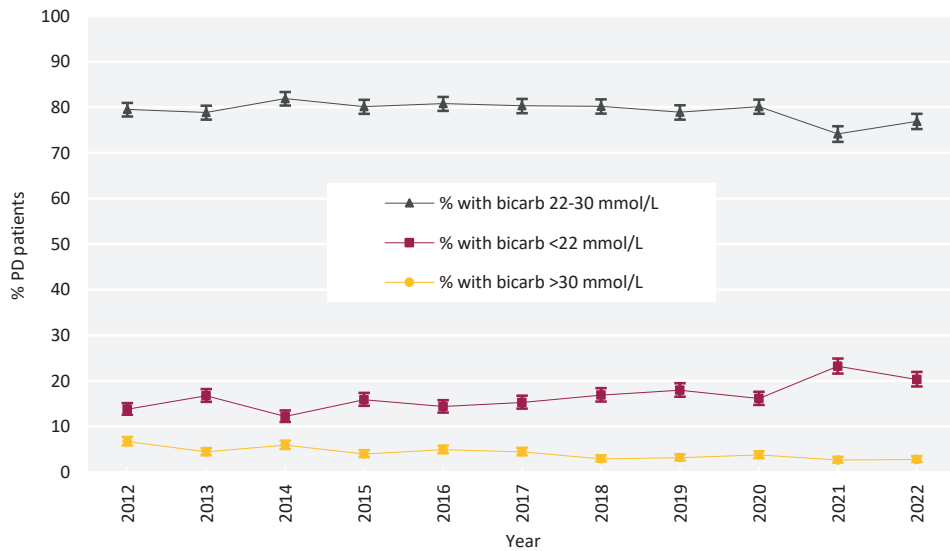
Figure 6.6 Percentage of prevalent adult PD patients within, above and below the target range for bicarbonate (bicarb 22–30 mmol/L) between 2012 and 2022

Anaemia in prevalent adult PD patients

UK Kidney Association anaemia guidelines recommend a target haemoglobin of 100-120 g/L. Data regarding target and median haemoglobin and ferritin levels attained are presented in table 6.6.

Table 6.6 Median haemoglobin and ferritin and percentage attaining target ranges in adult patients prevalent to PD on 31/12/2022 by centre

Centre	Haemoglobin				Ferritin		
	Median (g/L)	% <100 g/L	% >120 g/L	% data completeness	Median (µg/L)	% <100 µg/L	% data completeness
ENGLAND							
Bham	109	26.7	16.9	99.2	345	4.9	99.6
Bradfd	117	0.0	45.7	100.0	337	5.7	100.0
Brightn	111	12.5	27.1	100.0	324	4.3	95.8
Bristol	111	8.0	22.0	100.0	217	16.0	100.0
Camb	117	8.0	32.0	100.0	315	0.0	100.0
Carlis	109	20.0	24.0	100.0	237	21.7	92.0
Carsh	104	29.2	10.4	96.4	293	4.7	97.3
Colchr							
Covnt	112	20.3	31.3	95.5	167	28.1	95.5
Derby	116	7.8	47.1	100.0	446	2.0	98.0
Donc	114	30.0	20.0	100.0	299	0.0	100.0
Dorset	108	23.5	17.6	100.0	438	11.8	100.0
Dudley	111	20.7	20.7	100.0	228	21.4	96.6
EssexMS	113	13.3	26.7	98.7	247	24.0	98.7
Exeter							
Glouc	106	34.6	11.5	92.9	311	4.0	89.3
Hull	114	11.4	29.5	100.0	467	4.5	100.0
Ipswi				63.6			63.6
Kent	110	11.9	28.4	100.0	410	6.1	98.5
L Barts	111	22.5	28.0	97.6	289	19.1	91.7
L Guys	105	33.3	12.8	100.0	336	2.6	97.4
L Kings	115	15.7	33.7	98.9	235	13.4	91.1
L Rfree	111	22.9	21.4	99.2	616	6.1	100.0
L St.G	109	35.3	21.6	94.4	358	5.9	94.4
L West				29.0			26.0
Leeds	109	28.8	21.2	100.0	423	7.7	100.0
Leic	113	21.1	25.6	99.3	290	8.5	97.0
Liv UH	110	21.6	13.7	96.2	365	9.8	96.2
M RI	106	36.7	25.3	98.8	339	11.5	97.5
Middlbr	114	5.9	29.4	94.4	382	13.3	83.3
Newc	109	23.1	15.4	100.0	549	2.6	100.0
Norwch	116	13.9	36.1	100.0	381	8.3	100.0
Nottm	108	32.9	16.5	100.0	382	2.6	98.7
Oxford	108	29.8	15.8	93.4	383	8.5	96.7
Plymth	115	14.6	31.7	100.0	245	9.8	100.0
Ports	113	16.3	24.4	100.0	500	9.6	96.5
Prestn	108	20.4	24.5	98.0	564	12.8	94.0
Redng	107	27.1	12.5	100.0	420	4.2	100.0
Salford	112	20.3	26.6	100.0	474	6.3	100.0
Sheff	112	21.7	29.0	98.6	682	7.2	98.6
Shrew	109	18.9	8.1	97.4	289	18.4	100.0
Stevng	110	26.7	20.0	100.0	201	24.1	96.7
Stoke	112	14.4	24.4	100.0	409	2.2	98.9
Sund	110	31.3	18.8	100.0	315	6.9	90.6
Truro	112	21.4	7.1	100.0	214	14.3	100.0
Wirral	111	20.0	26.7	100.0	469	0.0	100.0
Wolve	114	21.2	32.7	96.3	174	28.8	96.3
York	105	22.6	19.4	96.9	295	6.3	100.0
N IRELAND							
Antrim	115	5.6	38.9	100.0	489	0.0	100.0
Belfast	110	21.1	21.1	100.0	419	10.5	100.0
Newry				88.9			100.0
Ulster				100.0			100.0

PD

Table 6.6 Continued

Centre	Haemoglobin				Ferritin		
	Median (g/L)	% <100 g/L	% >120 g/L	% data completeness	Median (µg/L)	% <100 µg/L	% data completeness
West NI				100.0			100.0
SCOTLAND							
Abrdn	109	21.7	13.0	92.0			
Airdrie	115	5.3	26.3	86.4			
D&Gall				87.5			
Dundee	103	28.6	7.1	77.8			
Edinb				0.0			
Glasgw	108	29.6	40.7	93.1			
Inverns				72.7			
Klmarnk	103	38.5	11.5	96.3			
Krkcldy				0.0			
WALES							
Bangor	122	0.0	50.0	100.0	179	30.0	100.0
Cardff	115	10.6	29.8	100.0	193	27.9	91.5
Clwyd				100.0			100.0
Swanse	111	23.3	30.2	100.0	286	11.6	100.0
Wrexm	112	10.5	5.3	95.0	308	10.5	95.0
TOTALS							
England	110	21.9	23.3	94.3	358	9.7	92.8
N Ireland	113	13.0	31.5	98.2	485	3.6	100.0
Scotland	109	24.2	22.6	70.0			
Wales	113	14.2	28.3	99.2	254	17.9	96.1
UK	**110**	**21.5**	**23.7**	**93.2**	**356**	**10.0**	**93.0**

Blank cells – no data returned by the centre or <10 patients in the centre or data completeness <70%
Ferritin total for UK represents E, W and NI only
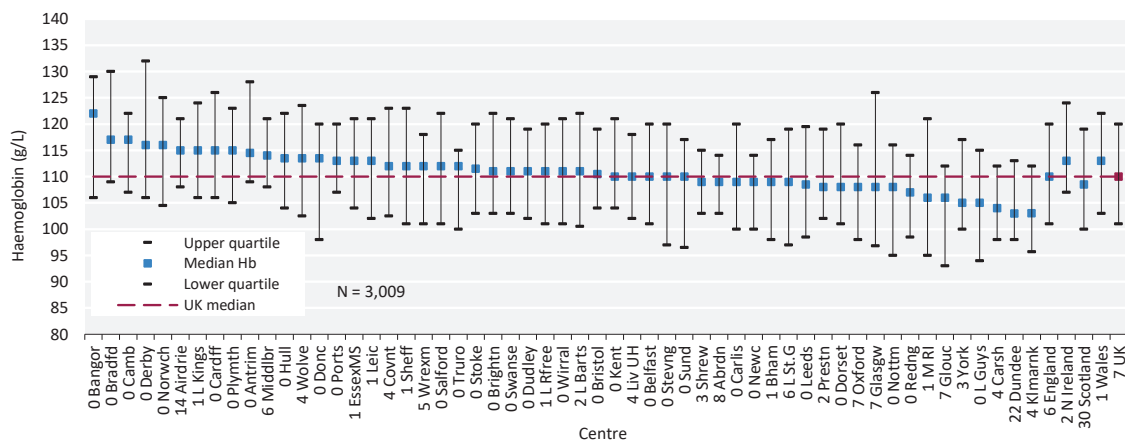
Figure 6.7 Median haemoglobin (Hb) in adult patients prevalent to PD on 31/12/2022 by centre
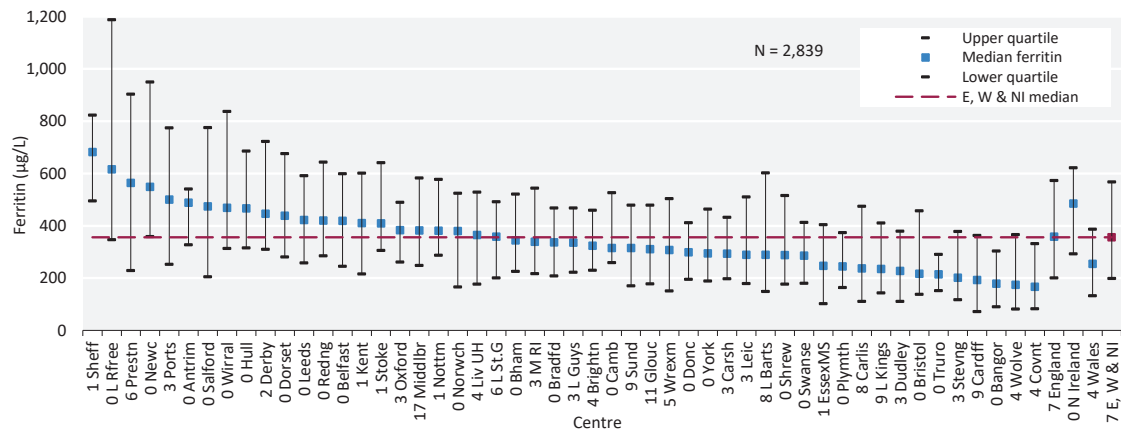
Figure 6.8 Median ferritin in adult patients prevalent to PD on 31/12/2022 by centre
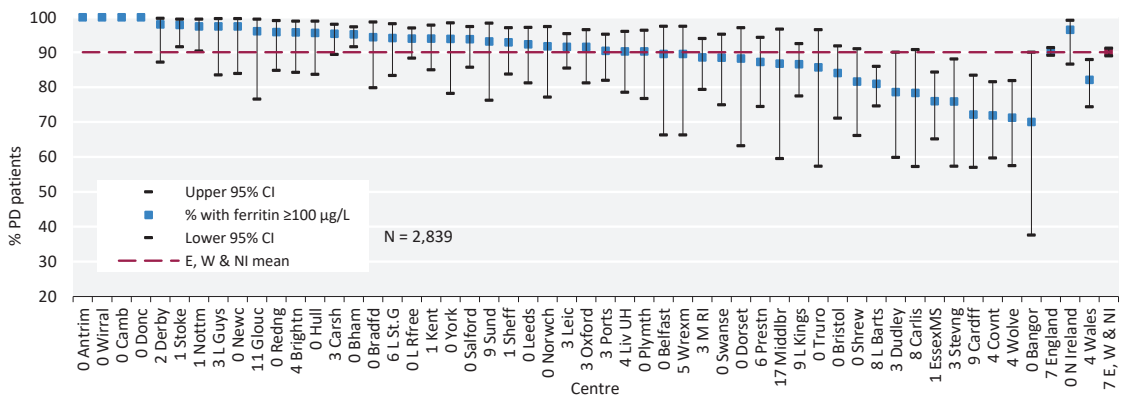
Figure 6.9 Percentage of adult patients prevalent to PD on 31/12/2022 with ferritin ≥100 µg/L by centre

CI – confidence interval
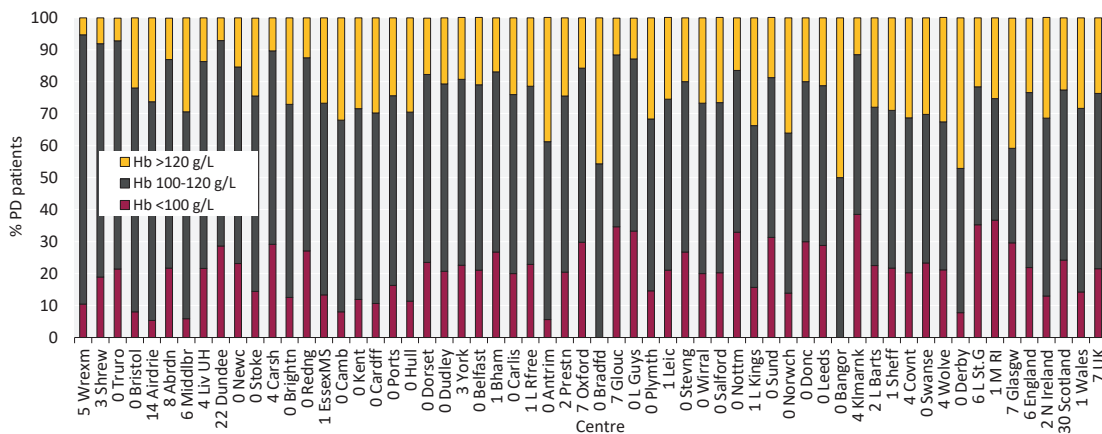
Figure 6.10 Distribution of haemoglobin (Hb) in adult patients prevalent to PD on 31/12/2022 by centre
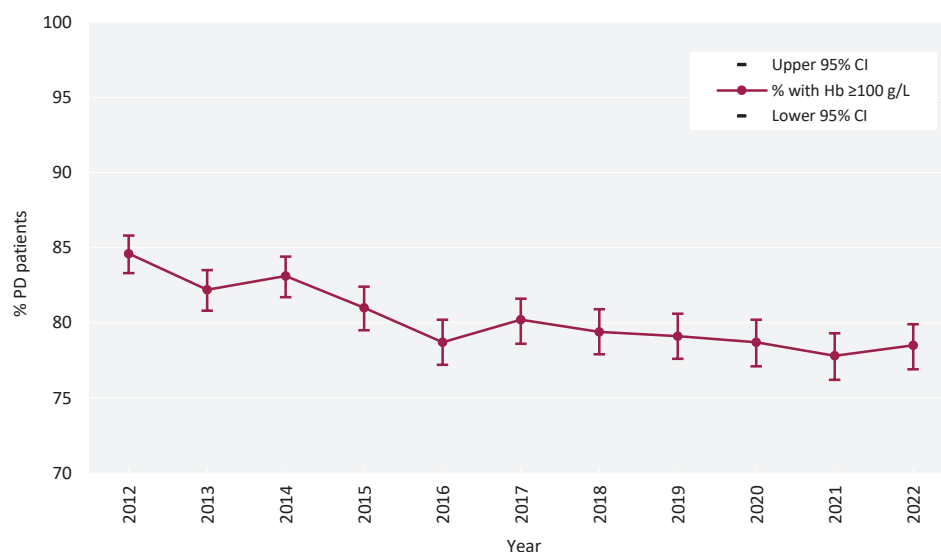
Figure 6.11 Percentage of prevalent adult PD patients with haemoglobin (Hb) ≥100 g/L between 2012 and 2022
CI – confidence interval

Peritonitis in prevalent adult PD patients

PD peritonitis infection rates are collected for English kidney centres by the UKRR in collaboration with NHS England for the Renal Dialysis Quality Dashboard (ukkidney.org/audit-research/data-permissions/data/ukrr-nhs-england-quality-dashboard-dataset) and are listed in the table below. The funnel plot (figure 6.12) shows each centre's 2022 peritonitis rate per one PD patient-year against the number of patient-years at risk to take into account the greater variation expected as centre size decreases.

Table 6.7 Number of patient-years and peritonitis rate in adult patients receiving PD in 2022 by centre in England

Centre	PD patient years	Peritonitis rate per 1 PD patient year
Bham	282	0.45
Bradfd	36	0.33
Brightn	61	0.13
Bristol	76	0.41
Camb	30	0.37
Carlis		
Carsh	132	0.40
Covnt	82	0.57
Derby	69	0.49
Donc	13	0.77
Dorset	22	0.67
Dudley	33	0.43
EssexMS		
Exeter	74	0.31
Glouc		
Hull	51	0.49
Ipswi	33	0.18
Kent	78	0.14
L Barts	255	0.40
L Guys	60	0.32
L Kings	105	0.27
L Rfree	166	0.35

Table 6.7 Continued

Centre	PD patient years	Peritonitis rate per 1 PD patient year
L St.G	63	0.30
L West	209	0.28
Leeds	55	0.31
Leic	130	0.29
Liv UH	61	0.38
M RI	94	0.55
Middlbr		
Newc	55	0.42
Norwch	53	0.83
Nottm	98	0.12
Oxford	56	0.59
Plymth	44	0.05
Ports	96	0.31
Prestn	55	0.42
Redng	64	0.46
Salford		
Sheff	77	0.10
Shrew	55	0.40
Stevng	37	0.59
Stoke	103	0.33
Sund	37	0.14
Truro	19	0.89
Wirral	22	0.36
Wolve	56	0.46
York	34	0.09
TOTAL		
England	**3,232**	**0.37**
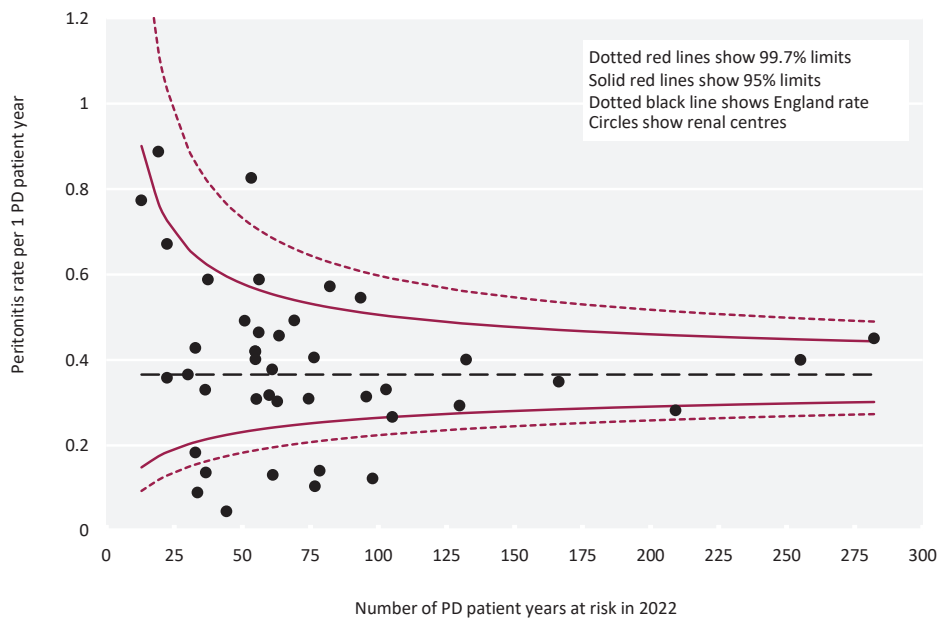
Figure 6.12 PD peritonitis rates in adult patients receiving PD in 2022 per 1 PD patient-year by centre in England
Please visit the UKRR data portal (ukkidney.org/audit-research/data-portals) to identify individual kidney centres

Cause of death in adult PD patients

Cause of death was analysed in prevalent patients receiving PD on 31/12/2021 and followed-up for one year in 2022. The proportion of PD 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 cause of death was missing in UKRR data, cause of death from Civil Registration records was used. Further detail on the survival of prevalent KRT patients is in chapter 3.

Table 6.8 Cause of death in adult patients prevalent to PD on 31/12/2021 followed-up in 2022 by age group

	PD all ages		PD < 65 years		PD ≥ 65 years	
Cause of death	N	%	N	%	N	%
Cardiac disease	95	20.7	32	28.6	63	18.2
Cerebrovascular disease	14	3.1	3	2.7	11	3.2
Infection	83	18.1	21	18.8	62	17.9
Malignancy	25	5.5	2	1.8	23	6.7
Treatment withdrawal	53	11.6	11	9.8	42	12.1
Other	162	35.4	36	32.1	126	36.4
Uncertain aetiology	26	5.7	7	6.3	19	5.5
Total (with data)	**458**	**100.0**	**112**	**100.0**	**346**	**100.0**
Missing	47	9.3	17	13.2	30	8.0
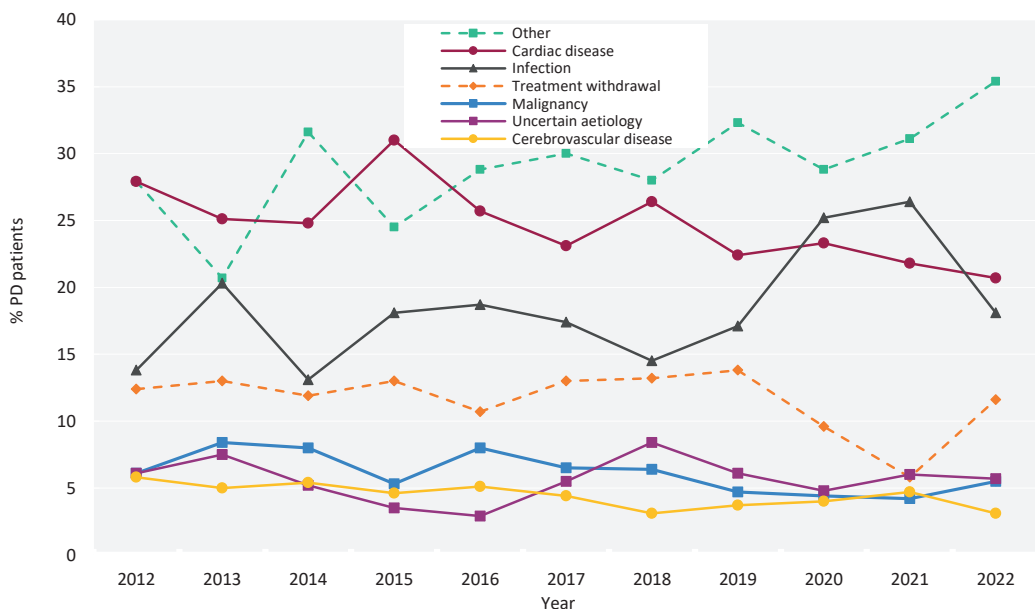
Figure 6.13 Cause of death between 2012 and 2022 for adult patients prevalent to PD at the beginning of the year

PD

Chapter 7

Adults on home haemodialysis (HHD) in the UK at the end of 2022

Contents

Introduction

This chapter describes the population of adult patients with end-stage kidney disease (ESKD) who were receiving regular home haemodialysis (HHD) in the UK at the end of 2022 (figure 7.1). This population comprises patients who were on HHD at the end of 2021 and remained on HHD throughout 2022, as well as patients who commenced/re-commenced HHD in 2022. This latter group includes both incident kidney replacement therapy (KRT) patients who ended 2022 on HHD and prevalent KRT patients who switched to HHD from in-centre haemodialysis (ICHD), peritoneal dialysis (PD), or a transplant (Tx) in 2022. Consequently, the cohort of patients receiving HHD in a centre not only reflects differences in underlying population case-mix, but also differences in the rates of acceptance onto KRT, survival on HHD, transplantation and other dialysis therapies (ICHD and PD), and the care of patients on those other modalities, as described in other chapters of this report.
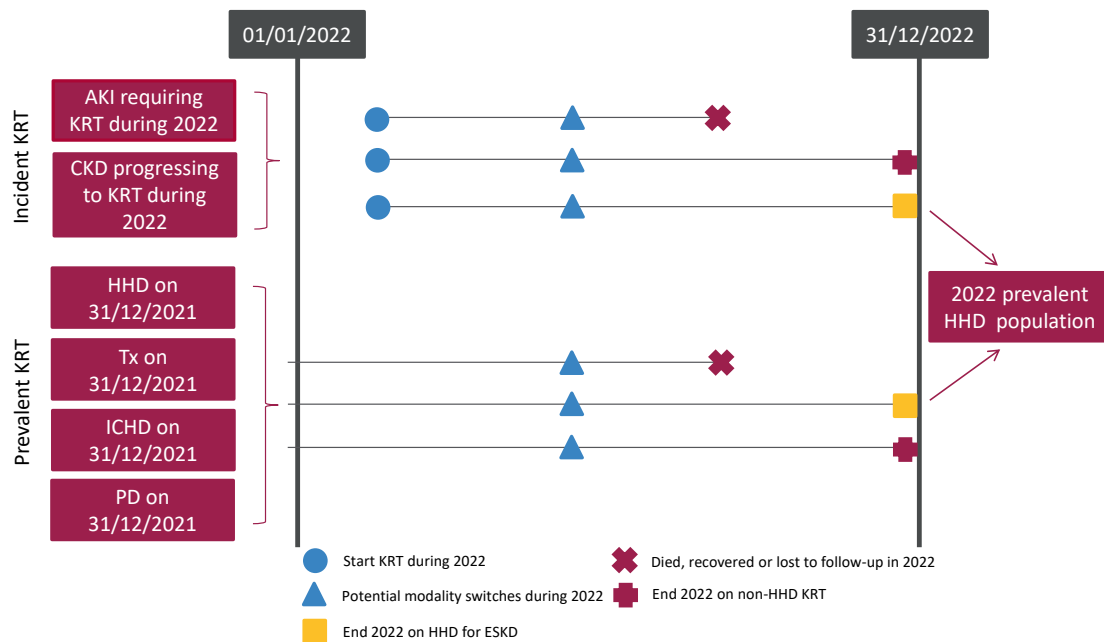
Figure 7.1 Pathways adult patients could follow to be included in the UK 2022 prevalent HHD population

Note that patients receiving dialysis for acute kidney injury (AKI) are only included in this chapter if they had a timeline or KRT modality code for chronic HHD at the end of 2022 or if they had been on KRT for ≥90 days and were on HHD at the end of 2022

CKD – chronic kidney disease

Where possible, the chapter addresses key aspects of the care of patients on HHD for which there are UK Kidney Association guidelines (table 7.1). This includes complications associated with ESKD and HHD, for example anaemia and mineral bone disorders.

Data on infections associated with haemodialysis (HD) are available through the UKRR data portal (ukkidney. org/audit-research/data-portals).

HHD

Rationale for analyses

The analyses begin with a description of the 2022 prevalent adult HHD population, including the number on HHD per million population (pmp).

The UK Kidney Association guidelines (ukkidney.org/health-professionals/guidelines/guidelines-commentaries) provide audit measures relevant to the care of patients on HHD and, where data permit, their attainment by UK kidney centres in 2022 is reported in this chapter (table 7.1). Audit measures in guidelines that have been archived are not included. 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 items 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.

Table 7.1 The UK KidneyAssociation audit measures relevant to HHD that are reported in this chapter

The UK Kidney Association guideline	Audit criteria	Related analysis/analyses
CKD mineral bone disorder (2018)	Percentage of patients with serum calcium above the normal reference range of 2.2–2.5 mmol/L	Table 7.5, figure 7.3
HD (2019)	Proportion of patients with pre-dialysis bicarbonate 18–26 mmol/L	Table 7.6, figure 7.4
	Proportion of patients with pre-dialysis potassium 4.0–6.0 mmol/L	Table 7.6, figure 7.5
Anaemia (2020)	Proportion of patients who are not iron replete with a serum ferritin <200 μg/L	Table 7.7
	Proportion of patients with haemoglobin 100–120 g/L	
Planning, initiating and withdrawing KRT (2014)	Number of patients withdrawing from HHD as a proportion of all deaths on HHD	Table 7.9, figure 7.10

For definitions and methods relating to this chapter see appendix A. Centres were excluded from caterpillar plots and cells were blanked in tables where data completeness for a biochemical variable was <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.

Exeter was unable to submit patient level data for 2022. Aggregate numbers by modality were provided, enabling inclusion in Tables 7.2 and 7.3. Exeter is excluded from all other analyses.

Manchester moved to a new Trust IT system, and as a result data were not submitted for the final quarter of 2022. Data for Manchester presented in this chapter are for patients receiving HHD on 30th September 2022, rather than 31st December 2022.

Key findings

- 1,452 adult patients were receiving HHD for ESKD in the UK on 31/12/2022, compared to 1,411 on 31/12/2021, which represented 2.0% of the KRT population.

- The median age of HHD patients was 55.5 years and 61.3% were male.

- The median adjusted calcium for HHD patients was 2.4 mmol/L and 15.0% were above the target range 2.2–2.5 mmol/L.

- The median pre-dialysis bicarbonate for HHD patients was 23 mmol/L and 76.4% were within the target range 18–26 mmol/L.

- The median pre-dialysis potassium for HHD patients was 4.9 mmol/L and 77.0% were within the target range 4.0–6.0 mmol/L.

- The median ferritin for HHD patients was 359 μg/L and 26.7% had a ferritin <200 μg/L.

- The median haemoglobin for HHD patients was 108 g/L and 28.6% had a haemoglobin<100 g/L.

- This year for the first time, cause of death records from Civil Registration were used where 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 cause of death for patients on HHD was cardiac disease (30.6%) in younger patients (<65 years) and infections (25.4%) in patients ≥ 65 years.

HHD

Analyses

Changes to the prevalent adult HHD population

For the 67 adult kidney centres, the number of prevalent patients on HHD was calculated as both a proportion of the prevalent patients on KRT and as a proportion of the estimated centre catchment population (calculated as detailed in appendix A).
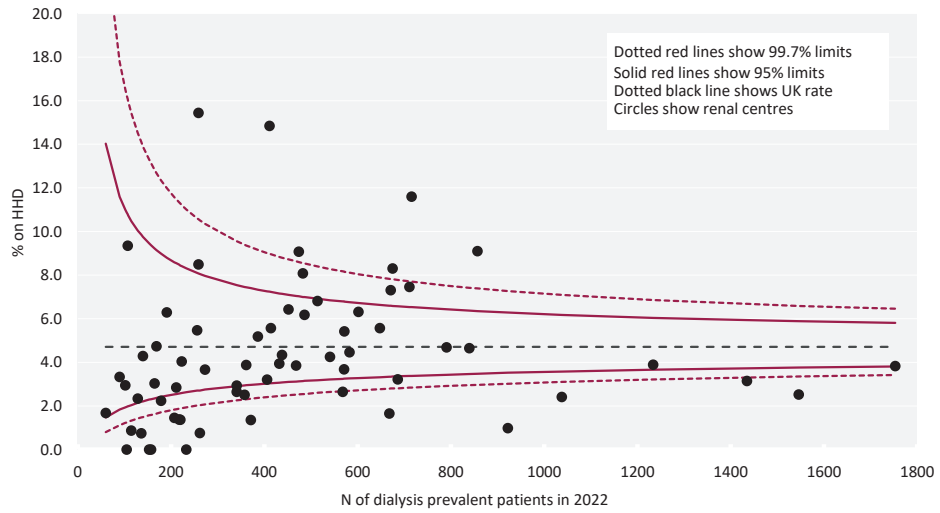
Table 7.2 Number of prevalent adult HHD patients and proportion of adult KRT patients on HHD by year and by centre; number of HHD patients as a proportion of the catchment population

Centre	N on HHD					% on HHD					Estimated catchment population (millions)	2022 crude rate (pmp)
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022		
ENGLAND												
Bham	68	76	76	71	67	2.1	2.3	2.3	2.2	2.0	2.03	33
Bradfd	9	6	6	7	9	1.3	0.8	0.8	1.0	1.2	0.50	18
Brightn	39	32	31	30	35	3.7	3.0	2.9	2.7	3.2	1.08	32
Bristol	15	16	17	18	15	1.0	1.1	1.2	1.2	1.0	1.25	12
Camb	32	32	26	24	23	2.3	2.2	1.7	1.5	1.4	0.96	24
Carlis	0	0	2	3	6	0.0	0.0	0.7	1.0	2.0	0.26	23
Carsh	29	35	28	28	25	1.7	2.0	1.5	1.5	1.3	1.64	15
Colchr	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.30	0
Covnt	22	20	20	21	18	2.3	1.8	1.8	1.9	1.6	0.84	22
Derby	53	58	63	55	61	9.0	8.9	9.3	8.0	8.5	0.56	110
Donc	9	5	5	5	9	2.7	1.5	1.5	1.5	2.4	0.38	24
Dorset	13	15	16	14	14	1.7	1.9	2.0	1.8	1.8	0.73	19
Dudley	12	12	9	10	14	3.3	3.3	2.4	2.5	3.7	0.34	41
EssexMS	17	24	29	21	23	2.0	2.8	3.3	2.3	2.6	1.00	23
Exeter	19	21	19	16	16	1.8	1.9	1.7	1.5	1.4	0.98	16
Glouc	3	3	4	4	2	0.6	0.6	0.8	0.7	0.4	0.52	4
Hull	5	7	7	12	17	0.6	0.8	0.8	1.3	1.8	0.80	21
Ipswi	5	4	3	2	0	1.2	0.9	0.7	0.5	0.0	0.31	0
Kent	18	20	18	18	21	1.6	1.8	1.6	1.5	1.7	1.08	19
L Barts	36	20	25	25	45	1.4	0.8	0.9	0.9	1.6	1.61	28
L Guys	38	45	48	41	37	1.7	1.9	2.1	1.8	1.6	1.00	37
L Kings	17	17	22	34	39	1.4	1.4	1.8	2.6	2.8	0.93	42
L Rfree	12	11	10	10	9	0.5	0.5	0.4	0.4	0.4	1.33	7
L St.G	6	6	6	6	5	0.7	0.7	0.7	0.7	0.6	0.65	8
L West	20	29	35	36	39	0.6	0.8	1.0	1.0	1.1	1.97	20
Leeds	23	26	22	16	22	1.4	1.5	1.3	0.9	1.2	1.39	16
Leic	64	54	50	48	48	2.6	2.1	1.9	1.8	1.8	2.11	23
Liv UH	57	54	60	57	56	3.8	3.6	4.1	3.9	3.8	1.26	45
M RI	74	75	71	84	83	3.6	3.7	3.6	4.1	3.9	1.36	61
Middlbr	13	19	18	17	20	1.4	2.0	1.9	1.8	2.1	0.82	24
Newc	22	19	15	18	19	1.9	1.6	1.3	1.5	1.5	0.97	20
Norwch	13	14	13	10	10	1.6	1.7	1.6	1.2	1.3	0.70	14
Nottm	34	31	32	28	30	2.8	2.5	2.6	2.3	2.5	0.94	32
Oxford	21	25	17	19	26	1.1	1.3	0.8	0.9	1.3	1.48	18
Plymth	10	7	4	3	3	1.9	1.3	0.7	0.6	0.5	0.41	7
Ports	70	70	83	85	78	4.0	3.7	4.4	4.4	3.9	1.77	44
Prestn	43	49	47	42	38	3.3	3.7	3.4	3.1	2.7	1.25	30
Redng	9	8	8	9	13	1.1	0.9	0.9	1.0	1.4	0.70	18
Salford	35	41	40	31	31	3.0	3.3	3.2	2.5	2.4	1.17	27
Sheff	49	55	61	56	53	3.3	3.7	4.1	3.7	3.6	1.15	46
Shrew	20	27	36	37	40	4.7	6.2	8.4	8.4	9.0	0.42	95

HHD

Table 7.2 Continued

Centre	N on HHD					% on HHD					Estimated catchment population (millions)	2022 crude rate (pmp)
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022		
Stevng	43	36	32	41	36	4.6	3.7	3.3	4.0	3.4	1.12	32
Stoke	25	31	39	41	29	3.1	3.8	4.8	4.9	3.2	0.74	39
Sund	22	12	9	10	10	3.9	2.1	1.6	1.8	1.8	0.55	18
Truro	3	4	4	5	3	0.7	0.9	0.9	1.1	0.6	0.37	8
Wirral	8	8	7	6	6	2.0	1.9	1.7	1.4	1.5	0.47	13
Wolve	34	33	31	38	43	5.6	5.4	4.7	5.5	6.0	0.55	78
York	17	16	18	17	22	3.0	2.7	3.1	2.9	3.6	0.50	44
N IRELAND												
Antrim	4	4	4	2	1	1.5	1.4	1.4	0.7	0.3	0.25	4
Belfast	10	13	10	8	8	1.1	1.5	1.1	0.9	0.9	0.53	15
Newry	2	2	4	3	3	0.8	0.8	1.5	1.1	1.1	0.24	13
Ulster	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.20	0
West NI	2	1	2	2	1	0.6	0.3	0.6	0.6	0.3	0.25	4
SCOTLAND												
Abrdn	4	3	2	2	3	0.7	0.5	0.4	0.3	0.5	0.50	6
Airdrie	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.46	0
D&Gall	1	2	1	1	1	0.7	1.3	0.6	0.6	0.7	0.12	8
Dundee	8	7	6	6	5	1.8	1.6	1.4	1.5	1.3	0.37	14
Edinb	3	2	3	7	9	0.3	0.2	0.3	0.8	0.9	0.84	11
Glasgw	18	18	11	10	11	1.0	1.0	0.6	0.5	0.6	1.37	8
Inverns	7	7	3	2	3	2.5	2.5	1.1	0.7	1.1	0.23	13
Klmarnk	13	14	14	16	12	3.8	3.9	3.8	4.3	3.2	0.29	41
Krkcldy	0	2	3	3	4	0.0	0.7	1.0	1.0	1.4	0.27	15
WALES												
Bangor	13	15	13	21	22	6.4	7.5	6.0	9.7	10.0	0.20	108
Cardff	34	33	34	51	49	2.0	1.9	2.0	3.0	2.8	1.17	42
Clwyd	2	2	6	5	10	1.1	1.0	2.9	2.5	4.9	0.18	55
Swanse	36	45	44	40	39	4.4	5.2	5.2	4.7	4.6	0.76	51
Wrexm	6	7	7	3	3	1.9	2.3	2.2	1.0	1.0	0.21	14
TOTALS												
England	1,206	1,228	1,242	1229	1268	2.2	2.1	2.2	2.1	2.1	45.20	28
N Ireland	18	20	20	15	13	0.9	1.0	1.0	0.7	0.6	1.47	9
Scotland	54	55	43	47	48	1.0	1.0	0.8	0.9	0.9	4.44	11
Wales	91	102	104	120	123	2.8	3.1	3.2	3.7	3.7	2.53	49
UK	**1,369**	**1,405**	**1,409**	**1411**	**1452**	**2.1**	**2.1**	**2.1**	**2.0**	**2.0**	**53.65**	**27**

Country HHD populations were calculated by summing the HHD 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 patient level data but provided aggregate numbers of patients on KRT at the end of 2021 and 2022 by treatment modality

pmp – per million population

Figure 7.2 Percentage of adult patients prevalent to dialysis on 31/12/2022 who were on HHD by centre

HHD

Demographics of prevalent adult HHD patients

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

Table 7.3 Demographics of adult patients prevalent to HHD on 31/12/2022 by centre

Centre	N on KRT	N on HHD	% on HHD	Median age (yrs)	% male	Ethnicity				
						% White	% Asian	% Black	% Other	% missing
ENGLAND										
Bham	3,378	67	2.0	55.4	76.1	59.1	16.7	18.2	6.1	1.5
Bradfd	781	9	1.2	46.7	44.4	88.9	11.1	0.0	0.0	0.0
Brightn	1,100	35	3.2	60.9	68.6	97.1	2.9	0.0	0.0	2.9
Bristol	1,524	15	1.0	59.9	26.7	100.0	0.0	0.0	0.0	0.0
Camb	1,663	23	1.4	61.6	69.6	91.3	0.0	8.7	0.0	0.0
Carlis	303	6	2.0	49.0	83.3	100.0	0.0	0.0	0.0	0.0
Carsh	1,936	25	1.3	59.8	72.0	79.2	8.3	12.5	0.0	4.0
Colchr	157	0	0.0							
Covnt	1,125	18	1.6	53.0	77.8	83.3	11.1	5.6	0.0	0.0
Derby	716	61	8.5	61.3	62.3	77.0	16.4	4.9	1.6	0.0
Donc	376	9	2.4	63.0	44.4	100.0	0.0	0.0	0.0	0.0
Dorset	792	14	1.8	63.5	71.4	100.0	0.0	0.0	0.0	0.0
Dudley	383	14	3.7	59.0	64.3	92.9	7.1	0.0	0.0	0.0
EssexMS	897	23	2.6	58.5	65.2	95.5	4.5	0.0	0.0	4.3
Exeter	1,128	16	1.4							
Glouc	554	2	0.4	65.3	50.0	100.0	0.0	0.0	0.0	0.0
Hull	933	17	1.8	44.0	58.8	82.4	0.0	11.8	5.9	0.0
Ipswi	395	0	0.0							
Kent	1,224	21	1.7	56.4	52.4	90.5	0.0	0.0	9.5	0.0
L Barts	2,851	45	1.6	52.7	55.6	40.9	18.2	34.1	6.8	2.2
L Guys	2,309	37	1.6	48.8	51.4	62.2	5.4	32.4	0.0	0.0
L Kings	1,394	39	2.8	53.9	66.7	47.4	5.3	44.7	2.6	2.6
L Rfree	2,418	9	0.4	57.5	77.8	55.6	11.1	33.3	0.0	0.0
L St.G	855	5	0.6	48.4	60.0	60.0	0.0	40.0	0.0	0.0
L West	3,626	39	1.1	57.9	56.4	35.9	25.6	33.3	5.1	0.0
Leeds	1,836	22	1.2	49.7	63.6	81.8	9.1	4.5	4.5	0.0
Leic	2,719	48	1.8	57.6	70.8	89.4	6.4	4.3	0.0	2.1
Liv UH	1,479	56	3.8	52.9	50.0	92.7	0.0	0.0	7.3	1.8
M RI	2,111	83	3.9	53.3	63.9	62.7	9.3	24.0	4.0	9.6
Middlbr	955	20	2.1	51.2	40.0	84.2	0.0	5.3	10.5	5.0
Newc	1,245	19	1.5	58.5	63.2	89.5	5.3	0.0	5.3	0.0
Norwch	783	10	1.3	57.5	60.0	100.0	0.0	0.0	0.0	0.0
Nottm	1,211	30	2.5	53.5	30.0	83.3	3.3	13.3	0.0	0.0
Oxford	2,080	26	1.3	53.9	46.2	92.0	4.0	4.0	0.0	3.8
Plymth	546	3	0.5	45.4	0.0	100.0	0.0	0.0	0.0	0.0
Ports	2,000	78	3.9	54.7	67.9	91.0	6.0	1.5	1.5	14.1
Prestn	1,400	38	2.7	55.1	52.6	89.2	8.1	2.7	0.0	2.6
Redng	924	13	1.4	52.5	46.2	63.6	9.1	18.2	9.1	15.4
Salford	1,273	31	2.4	56.0	54.8	87.1	0.0	9.7	3.2	0.0
Sheff	1,488	53	3.6	56.3	52.8	88.7	5.7	3.8	1.9	0.0
Shrew	445	40	9.0	65.8	67.5	90.0	7.5	0.0	2.5	0.0
Stevng	1,066	36	3.4	58.8	55.6	77.8	11.1	8.3	2.8	0.0
Stoke	903	29	3.2	55.5	58.6	89.3	0.0	7.1	3.6	3.4
Sund	562	10	1.8	59.8	40.0	100.0	0.0	0.0	0.0	10.0
Truro	471	3	0.6	56.2	33.3	100.0	0.0	0.0	0.0	0.0
Wirral	400	6	1.5	54.8	83.3	83.3	16.7	0.0	0.0	0.0
Wolve	722	43	6.0	53.3	81.4	76.7	14.0	4.7	4.7	0.0

Table 7.3 Continued

Centre	N on KRT	N on HHD	% on HHD	Median age (yrs)	% male	Ethnicity				
						% White	% Asian	% Black	% Other	% missing
York	608	22	3.6	53.6	72.7	95.5	0.0	4.5	0.0	0.0
N IRELAND										
Antrim	306	1	0.3	63.1	100.0	100.0	0.0	0.0	0.0	0.0
Belfast	926	8	0.9	58.4	62.5	100.0	0.0	0.0	0.0	0.0
Newry	269	3	1.1	68.8	100.0	100.0	0.0	0.0	0.0	0.0
Ulster	210	0	0.0							
West NI	356	1	0.3	54.5	0.0	100.0	0.0	0.0	0.0	0.0
SCOTLAND										
Abrdn	594	3	0.5	58.5	0.0					
Airdrie	519	0	0.0							
D&Gall	148	1	0.7	57.3	0.0					
Dundee	399	5	1.3	67.7	60.0					
Edinb	976	9	0.9	53.6	77.8					
Glasgw	1,921	11	0.6	56.5	72.7					
Inverns	280	3	1.1	57.6	100.0					
Klmarnk	374	12	3.2	64.1	66.7					
Krkcldy	292	4	1.4	71.2	50.0					
WALES										
Bangor	220	22	10.0	51.6	72.7	100.0	0.0	0.0	0.0	9.1
Cardff	1,758	49	2.8	58.9	63.3	93.9	2.0	4.1	0.0	0.0
Clwyd	204	10	4.9	54.9	90.0	100.0	0.0	0.0	0.0	10.0
Swanse	847	39	4.6	58.5	59.0	100.0	0.0	0.0	0.0	0.0
Wrexm	307	3	1.0	64.8	0.0	100.0	0.0	0.0	0.0	0.0
TOTALS										
England	60,045	1,268	2.1	55.3	60.8	79.1	7.6	10.6	2.8	2.7
N Ireland	2,067	13	0.6	58.6	69.2	100.0	0.0	0.0	0.0	0.0
Scotland	5,503	48	0.9	59.5	64.6					
Wales	3,336	123	3.7	57.5	64.2	97.5	0.8	1.7	0.0	2.4
UK	**70,951**	**1,452**	**2.0**	**55.5**	**61.3**	**80.9**	**6.9**	**9.7**	**2.5**	**2.7**

Blank cells – no data returned 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 patient level data but provided aggregate numbers of patients on KRT at the end of 2022 by treatment modality

UK ethnicity distribution and completeness does not include Scotland

Primary renal diseases (PRDs) were grouped into categories as shown in table 7.4, with the mapping of disease codes into groups explained in more detail in appendix A. The proportion of HHD patients with each PRD is shown for patients with PRD data and these total 100% of patients with data. The proportion of patients with no PRD data is shown on a separate line.

HHD

Table 7.4 Primary renal diseases (PRDs) of adult patients prevalent to HHD on 31/12/2022

PRD	N on HHD	% HHD population	Age <65 yrs		Age ≥65 yrs		M/F ratio
			N	%	N	%	
Diabetes	193	14.0	136	13.0	57	17.2	1.3
Glomerulonephritis	361	26.2	309	29.5	52	15.7	2.3
Hypertension	82	5.9	53	5.1	29	8.8	3.6
Polycystic kidney disease	143	10.4	104	9.9	39	11.8	1.3
Pyelonephritis	152	11.0	116	11.1	36	10.9	1.2
Renal vascular disease	16	1.2	6	0.6	10	3.0	3.0
Other	276	20.0	209	19.9	67	20.2	1.2
Uncertain aetiology	156	11.3	115	11.0	41	12.4	1.6
Total (with data)	**1,379**	**100.0**	**1,048**	**100.0**	**331**	**100.0**	
Missing	57	4.0	41	3.8	16	4.6	2.0

Biochemistry parameters in prevalent adult HHD patients

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

Table 7.5 Median adjusted calcium (Ca) and percentage with adjusted Ca within and above the target range (2.2–2.5 mmol/L) in adult patients prevalent to HHD on 31/12/2022 by centre

Centre	Median adj Ca (mmoI/L)	% adj Ca 2.2-2.5 mmoI/L	% adj Ca >2.5 mmoI/L	% data completeness
ENGLAND				
Bham	2.4	77.6	19.4	100.0
Bradfd				100.0
Brightn	2.4	82.9	17.1	100.0
Bristol	2.4	73.3	20.0	100.0
Camb	2.3	69.6	13.0	100.0
Carlis				100.0
Carsh	2.3	84.0	16.0	100.0
Colchr				
Covnt	2.3	77.8	16.7	100.0
Derby	2.4	77.1	21.3	100.0
Donc				100.0
Dorset	2.4	85.7	0.0	100.0
Dudley	2.5	64.3	35.7	100.0
EssexMS	2.4	65.0	30.0	87.0
Exeter				
Glouc				100.0
Hull	2.5	76.5	17.7	100.0
Ipswi				
Kent	2.4	63.2	10.5	100.0
L Barts	2.4	73.3	11.1	100.0
L Guys	2.4	73.0	13.5	100.0
L Kings	2.3	74.4	5.1	100.0
L Rfree				100.0
L St.G				100.0
L West	2.3	77.4	9.7	79.5
Leeds	2.3	90.9	4.6	100.0
Leic	2.3	66.7	4.2	100.0
Liv UH	2.4	71.7	20.8	100.0
M RI	2.5	76.7	21.9	88.0
Middlbr	2.3	75.0	5.0	100.0

Table 7.5 Continued

Centre	Median adj Ca (mmoI/L)	% adj Ca 2.2-2.5 mmoI/L	% adj Ca >2.5 mmoI/L	% data completeness
Newc	2.4	66.7	22.2	100.0
Norwch	2.3	70.0	20.0	100.0
Nottm	2.5	80.0	20.0	100.0
Oxford	2.4	50.0	20.0	76.9
Plymth				100.0
Ports	2.4	81.8	11.7	100.0
Prestn	2.4	86.1	8.3	97.3
Redng	2.4	91.7	8.3	100.0
Salford	2.5	51.6	45.2	100.0
Sheff	2.4	78.4	3.9	98.1
Shrew	2.4	89.2	8.1	97.4
Stoke	2.5	71.4	25.0	100.0
Sund	2.3	80.0	10.0	100.0
Truro				100.0
Wirral				100.0
Wolve	2.4	71.4	21.4	100.0
York	2.3	81.8	4.6	100.0
N IRELAND				
Antrim				100.0
Belfast				100.0
Newry				100.0
Ulster				
West NI				100.0
WALES				
Bangor	2.4	77.3	13.6	100.0
Cardff	2.3	79.6	10.2	100.0
Clwyd	2.3	80.0	10.0	100.0
Swanse	2.4	82.1	10.3	100.0
Wrexm				100.0
TOTALS				
England	2.4	75.9	15.3	97.6
N Ireland	2.5	76.9	23.1	100.0
Wales	2.4	80.3	10.7	100.0
E, W & NI	**2.4**	**76.3**	**15.0**	**97.8**

Blank cells – no data returned by the centre or <10 patients in the centre or data completeness <70%

Adults on HHD in the UK at the end of 2022

HHD
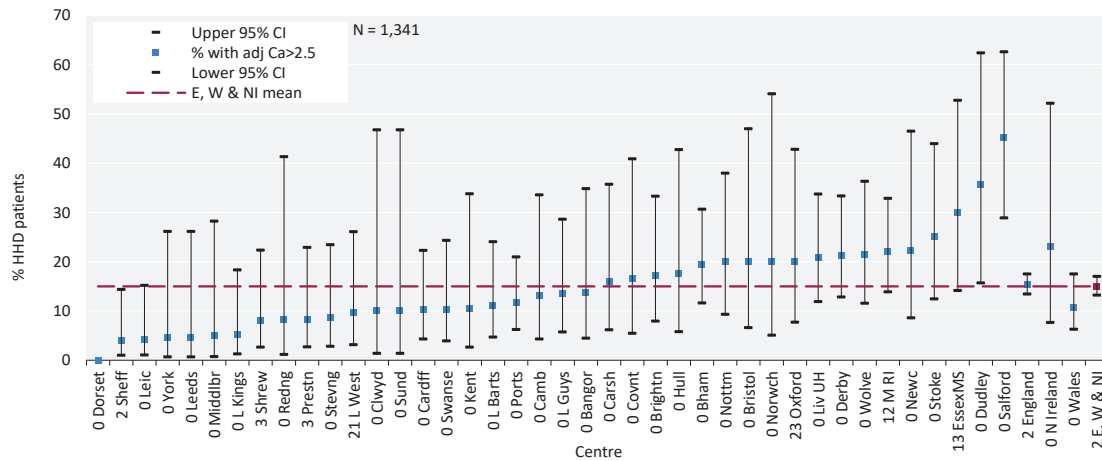
Figure 7.3 Percentage of adult patients prevalent to HHD on 31/12/2022 with adjusted calcium (Ca) above the target range (>2.5 mmol/L) by centre
CI – confidence interval

Table 7.6 Median pre-dialysis potassium and bicarbonate and percentage attaining target ranges in adult patients prevalent to HHD on 31/12/2022 by centre

Centre	Pre-dialysis potassium					Pre-dialysis bicarbonate				
	Median (mmoI/L)	% <4.0 mmol/L	% 4.0–6.0 mmol/L	% >6.0 mmol/L	% data completeness	Median (mmoI/L)	% <18 mmol/L	% 18–26 mmol/L	% >26 mmol/L	% data completeness
ENGLAND										
Bham					43.3	23	2.1	91.7	6.3	71.6
Bradfd					100.0					100.0
Brightn					0.0	28	0.0	30.3	69.7	94.3
Bristol	4.6	26.7	73.3	0.0	100.0	23	6.7	86.7	6.7	100.0
Camb	4.9	4.4	91.3	4.4	100.0	25	4.4	60.9	34.8	100.0
Carlis					0.0					100.0
Carsh					0.0					0.0
Colchr										
Covnt					0.0	27.5	11.1	22.2	66.7	100.0
Derby	4.4	23.0	73.8	3.3	100.0	23	0.0	77.1	23.0	100.0
Donc					100.0					100.0
Dorset	5.0	0.0	85.7	14.3	100.0	23	0.0	100.0	0.0	100.0
Dudley	5.3	0.0	78.6	21.4	100.0	24.5	7.1	64.3	28.6	100.0
EssexMS	4.5	30.0	70.0	0.0	87.0	25	0.0	65.0	35.0	87.0
Exeter										
Glouc					0.0					100.0
Hull	4.8	5.9	88.2	5.9	100.0	24	0.0	82.4	17.7	100.0
Ipswi										
Kent	3.9	52.6	42.1	5.3	100.0	22	5.3	94.7	0.0	100.0
L Barts	5.0	20.0	57.8	22.2	100.0	22	6.7	86.7	6.7	100.0
L Guys	4.8	13.5	75.7	10.8	100.0	24	0.0	69.4	30.6	97.3
L Kings	5.8	2.6	56.4	41.0	100.0	21	5.1	94.9	0.0	100.0
L Rfree					100.0					100.0
L St.G					0.0					60.0
L West					0.0					38.5
Leeds	5.4	4.6	81.8	13.6	100.0	24	4.6	86.4	9.1	100.0
Leic	4.9	6.3	79.2	14.6	100.0	24	2.1	70.2	27.7	97.9
Liv UH					0.0	24	5.7	79.3	15.1	100.0
M RI					0.0	23	1.4	90.4	8.2	88.0
Middlbr	5.3	10.0	80.0	10.0	100.0	32	0.0	5.0	95.0	100.0

Adults on HHD in the UK at the end of 2022

HHD

Table 7.6 Continued

Centre	Pre-dialysis potassium					Pre-dialysis bicarbonate				
	Median (mmoI/L)	% <4.0 mmol/L	% 4.0–6.0 mmol/L	% >6.0 mmol/L	% data completeness	Median (mmoI/L)	% <18 mmol/L	% 18–26 mmol/L	% >26 mmol/L	% data completeness
Newc					0.0	22.5	0.0	100.0	0.0	100.0
Norwch	5.4	10.0	70.0	20.0	100.0	22	10.0	90.0	0.0	100.0
Nottm	5.1	3.3	86.7	10.0	100.0					43.3
Oxford	5.2	10.0	60.0	30.0	76.9	22	5.3	79.0	15.8	73.1
Plymth					100.0					100.0
Ports	4.7	16.9	77.9	5.2	100.0	23	1.3	82.7	16.0	97.4
Prestn	5.1	9.1	84.9	6.1	89.2	24	6.1	66.7	27.3	89.2
Redng					0.0	24.5	0.0	91.7	8.3	100.0
Salford	5.1	9.7	87.1	3.2	100.0	24	0.0	74.1	25.9	87.1
Sheff	5.3	9.8	76.5	13.7	98.1	23	7.8	74.5	17.7	98.1
Shrew					0.0	22	8.1	86.5	5.4	97.4
Sthend										
Stoke					0.0	27	0.0	46.4	53.6	100.0
Sund					0.0	24	10.0	90.0	0.0	100.0
Truro					100.0					100.0
Wirral					0.0					100.0
Wolve	4.8	7.1	90.5	2.4	100.0	21	14.3	76.2	9.5	100.0
York	5.2	0.0	86.4	13.6	100.0	24	4.6	72.7	22.7	100.0
N IRELAND										
Antrim					100.0					100.0
Belfast					100.0					100.0
Newry					100.0					100.0
Ulster										
West NI					100.0					100.0
WALES										
Bangor					0.0	27	0.0	40.9	59.1	100.0
Cardff					0.0	23	0.0	93.9	6.1	100.0
Clwyd					0.0	24	0.0	90.0	10.0	100.0
Swanse					0.0	23	2.6	89.7	7.7	100.0
Wrexm					0.0					100.0
TOTALS										
England	4.9	11.9	76.9	11.2	62.4	23	3.5	75.7	20.8	90.1
N Ireland	5.4	7.7	84.6	7.7	100.0	24	0.0	92.3	7.7	100.0
Wales					0.0	23	0.8	82.0	17.2	100.0
E, W & NI	**4.9**	**11.9**	**77.0**	**11.1**	**57.2**	**23**	**3.2**	**76.4**	**20.4**	**91.0**

Blank cells – no data returned by the centre or <10 patients in the centre or data completeness <70%

HHD
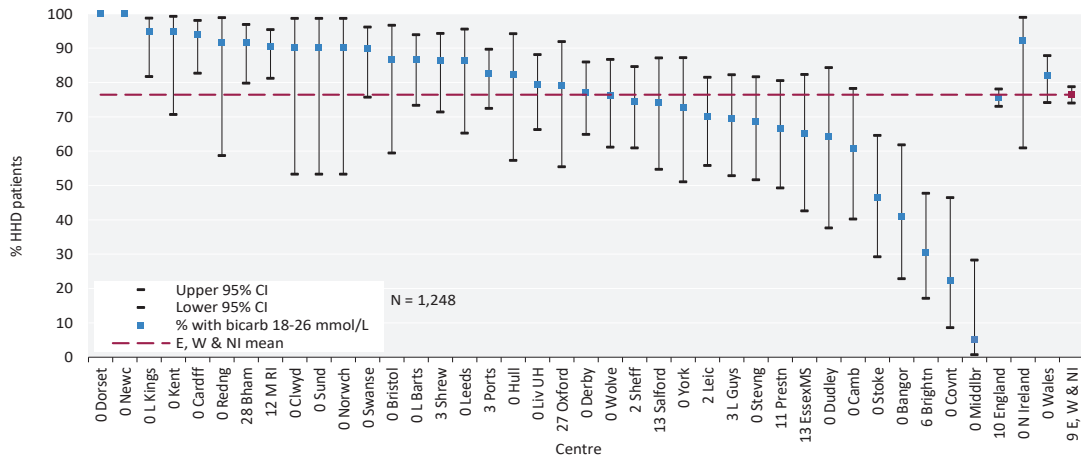
Figure 7.4 Percentage of adult patients prevalent to HHD on 31/12/2022 with pre-dialysis bicarbonate (bicarb) within the target range (18-26 mmol/L) by centre

CI – confidence interval
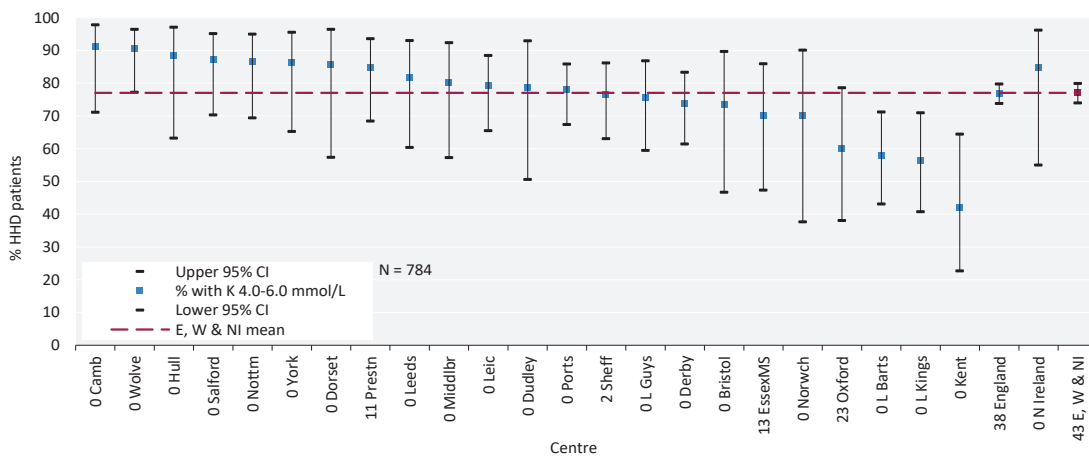
Figure 7.5 Percentage of adult patients prevalent to HHD on 31/12/2022 with pre-dialysis potassium (K) within the target range (4.0-6.0 mmol/L) by centre

CI – confidence interval

Adults on HHD in the UK at the end of 2022

Anaemia in prevalent adult HHD patients

UK Kidney Association anaemia guidelines recommend a target haemoglobin of 100-120 g/L. Data are presented in table 7.7 regarding target and median haemoglobin and ferritin levels attained.

Table 7.7 Median haemoglobin and ferritin and percentage attaining target ranges in adult patients prevalent to HHD on 31/12/2022 by centre

Centre	Haemoglobin				Ferritin		
	Median (g/L)	% <100 g/L	% >120 g/L	% data completeness	Median (µg/L)	% <200 µg/L	% data completeness
ENGLAND							
Bham	110	20.9	16.4	100.0	521	7.5	100.0
Bradfd				100.0			100.0
Brightn	109	20.0	22.9	100.0	332	22.9	100.0
Bristol	109	13.3	33.3	100.0	170	53.3	100.0
Camb				8.7			8.7
Carlis				100.0			100.0
Carsh	111	16.0	12.0	100.0	462	20.0	100.0
Colchr							
Covnt	95	55.6	22.2	100.0	218	44.4	100.0
Derby	113	14.8	27.9	100.0	645	4.9	100.0
Donc				100.0			100.0
Dorset	110	21.4	14.3	100.0	394	7.1	100.0
Dudley	116	14.3	28.6	100.0	123	71.4	100.0
EssexMS	104	25.0	15.0	87.0	244	40.0	87.0
Exeter							
Glouc				100.0			100.0
Hull	116	29.4	35.3	100.0	528	5.9	100.0
Ipswi							
Kent	107	36.8	26.3	100.0	203	42.1	100.0
L Barts	103	40.0	4.4	100.0	582	24.4	100.0
L Guys	101	48.6	10.8	100.0	439	21.6	100.0
L Kings	113	15.4	23.1	100.0	500	17.9	100.0
L Rfree				100.0			100.0
L St.G				100.0			100.0
L West	109	35.5	9.7	79.5	304	30.3	84.6
Leeds	105	31.8	9.1	100.0	326	40.9	100.0
Leic	104	31.3	18.8	100.0	328	22.9	100.0
Liv UH	103	37.7	11.3	100.0	244	41.5	100.0
M RI	112	22.0	30.5	98.8	178	54.3	97.6
Middlbr	108	35.0	15.0	100.0	1029	0.0	95.0
Newc	107	22.2	11.1	100.0	617	5.6	100.0
Norwch	103	40.0	30.0	100.0	261	30.0	100.0
Nottm	106	33.3	13.3	100.0	376	23.3	100.0
Oxford	104	36.4	22.7	84.6	355	11.5	100.0
Plymth				100.0			100.0
Ports	108	32.5	18.2	100.0	316	34.2	94.8
Prestn	106	36.1	5.6	97.3	356	36.1	97.3
Redng	112	25.0	33.3	100.0	587	16.7	100.0
Salford	110	32.3	12.9	100.0	205	48.4	100.0
Sheff	103	39.2	17.6	98.1	487	11.5	100.0
Shrew	112	18.9	18.9	97.4	466	0.0	100.0
Stevng	112	17.1	34.3	100.0	436	11.4	100.0
Stoke	111	10.7	25.0	100.0	416	7.4	96.4
Sund	101	50.0	20.0	100.0	327	10.0	100.0
Truro				100.0			100.0
Wirral				100.0			100.0
Wolve	107	35.7	9.5	100.0	265	38.1	100.0

Table 7.7 Continued

Centre	Haemoglobin				Ferritin		
	Median (g/L)	% <100 g/L	% >120 g/L	% data completeness	Median (µg/L)	% <200 µg/L	% data completeness
York	104	36.4	4.5	100.0	315	27.3	100.0
N IRELAND							
Antrim				100.0			100.0
Belfast				100.0			100.0
Newry				100.0			100.0
Ulster							
West NI				100.0			100.0
SCOTLAND							
Abrdn				100.0			0.0
Airdrie							
D&Gall				100.0			0.0
Dundee				60.0			0.0
Edinb				88.9			0.0
Glasgw				72.7			0.0
Inverns				100.0			0.0
Klmarnk	106	33.3	8.3	100.0			0.0
Krkcldy				75.0			0.0
WALES							
Bangor	107	27.3	22.7	100.0	135	63.6	100.0
Cardff	107	26.5	18.4	100.0	270	38.8	100.0
Clwyd	115	20.0	10.0	100.0	339	30.0	100.0
Swanse	108	23.1	17.9	100.0	230	38.5	100.0
Wrexm				100.0			100.0
TOTALS							
England	108	29.3	18.3	96.8	372	25.2	96.8
N Ireland	108	15.4	15.4	100.0	261	23.1	100.0
Scotland	110	26.8	14.6	85.4			
Wales	109	24.6	18.9	100.0	238	41.8	100.0
UK	**108**	**28.6**	**18.2**	**96.7**	**359**	**26.7**	**97.2**

Blank cells – no data returned by the centre or <10 patients in the centre or data completeness <70%

UK National average for ferritin does not include Scotland

HHD
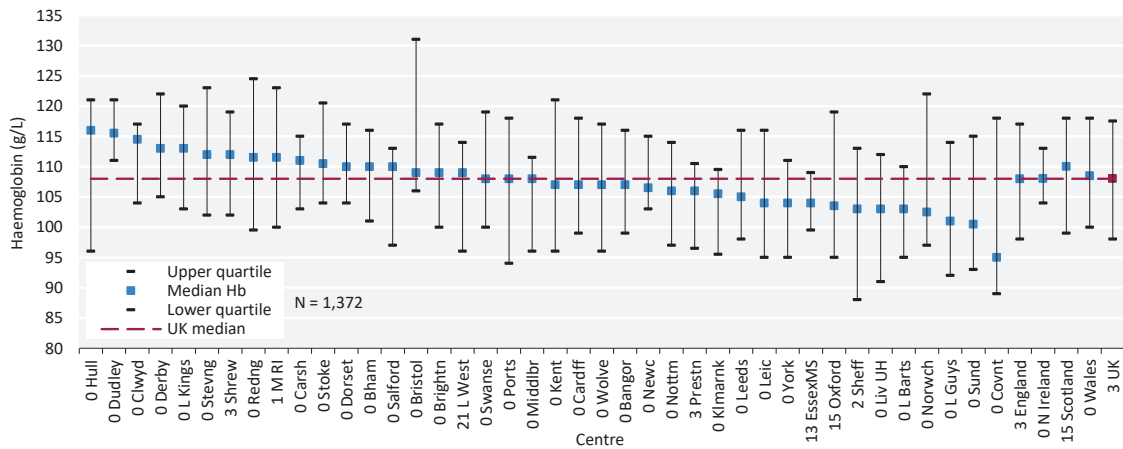
Figure 7.6 Median haemoglobin (Hb) in adult patients prevalent to HHD on 31/12/2022 by centre
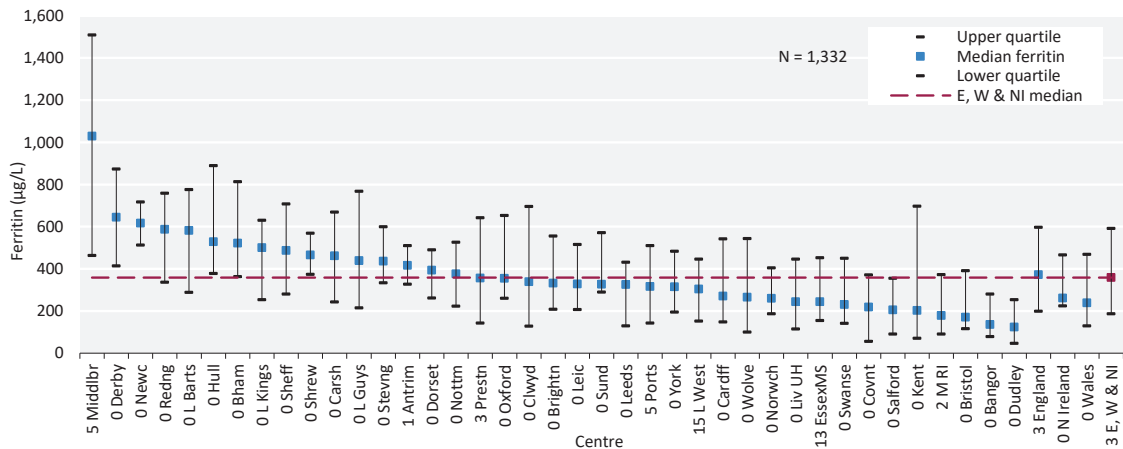
Figure 7.7 Median ferritin in adult patients prevalent to HHD on 31/12/2022 by centre
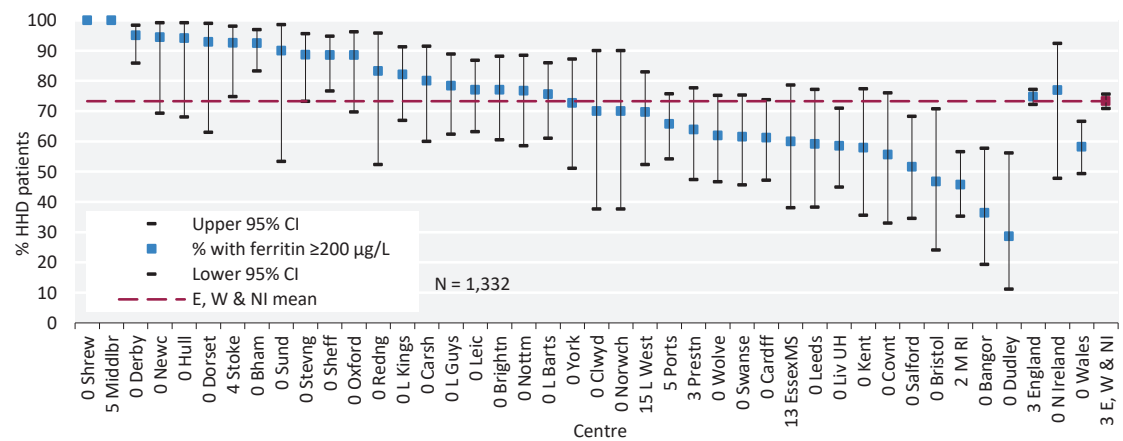
Figure 7.8 Percentage of adult patients prevalent to HHD on 31/12/2022 with ferritin <200 μg/L by centre

CI – confidence interval

HHD
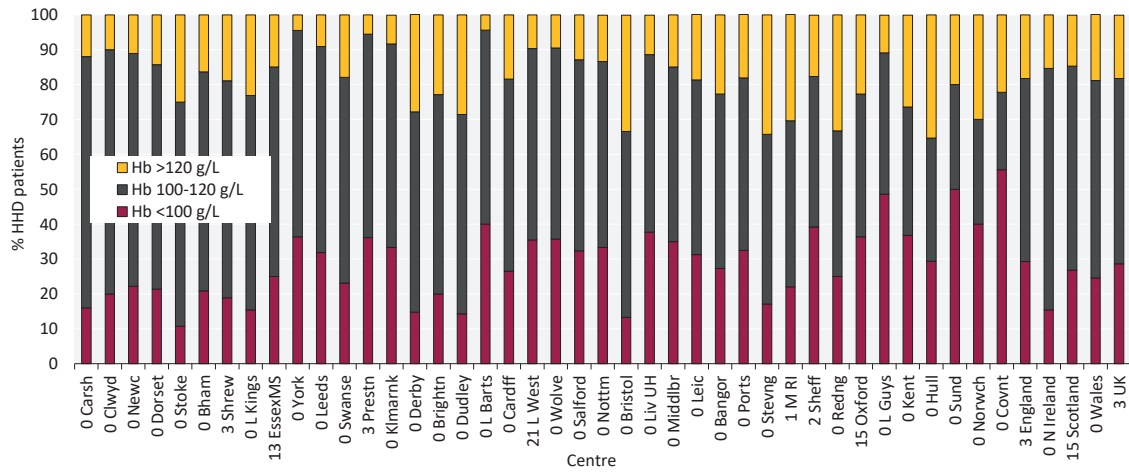
Figure 7.9 Distribution of haemoglobin (Hb) in adult patients prevalent to HHD on 31/12/2022 by centre

Cause of death in adult HHD patients

Cause of death was analysed in prevalent patients receiving HHD on 31/12/2021 and followed-up for one year in 2022. The proportion of HHD 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. Further detail on the survival of prevalent KRT patients is in chapter 3.

Table 7.8 Cause of death in adult patients prevalent to HHD on 31/12/2021 followed-up in 2022 by age group

	HHD all ages		HHD < 65 years		HHD ≥ 65 years	
Cause of death	N	%	N	%	N	%
Cardiac disease	35	25.9	22	30.6	13	20.6
Cerebrovascular disease	2	0.0	1	0.0	1	0.0
Infection	25	18.5	9	12.5	16	25.4
Malignancy	15	11.1	8	11.1	7	11.1
Treatment withdrawal	11	8.2	3	4.2	8	12.7
Other	33	24.4	21	29.2	12	19.1
Uncertain aetiology	14	10.4	8	11.1	6	9.5
Total (with data)	**135**	**98.5**	**72**	**98.6**	**63**	**98.4**
Missing	8	5.6	4	5.3	4	6.0
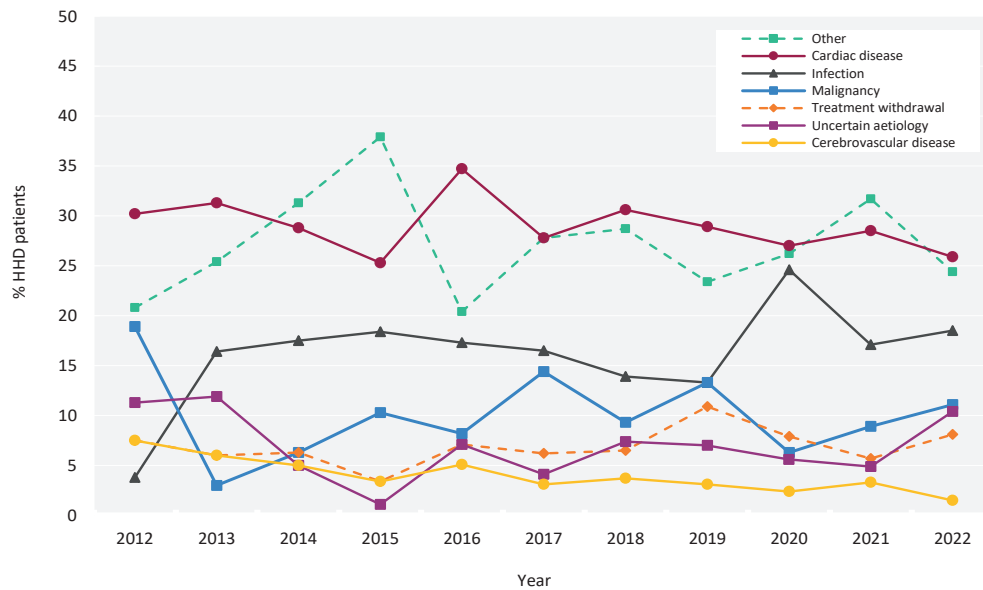
Figure 7.10 Cause of death between 2012 and 2022 for adult patients prevalent to HHD at the beginning of the year

HHD

Chapter 8

Children and young people on kidney replacement therapy (KRT) for end-stage kidney disease (ESKD) in the UK in 2022

Contents

Introduction

This chapter describes the population of children and young people aged <18 years with end-stage kidney disease (ESKD) who were on kidney replacement therapy (KRT) in the UK for at least 90 days in 2022 (figure 8.1). This included patients with a transplant (Tx) and patients on dialysis – in-centre haemodialysis (ICHD), home haemodialysis (HHD) and peritoneal dialysis (PD). Patients coded as acute kidney injury (AKI) or ESKD who recovered within the first 90 days of KRT were excluded from the analyses.

There are 13 paediatric kidney centres in the UK, all of which are equipped to provide both haemodialysis (HD) and PD. Ten of these centres also perform kidney transplantation. Children aged 16 to <18 years may be managed in either paediatric or adult services. This is variable across the UK and dependent on local practices, social factors and patient/family wishes. Children (aged <16 years) and young people (aged 16 to <18 years) are reported separately. Data about young people also include those managed in adult centres, to provide a more complete epidemiological picture for this population.
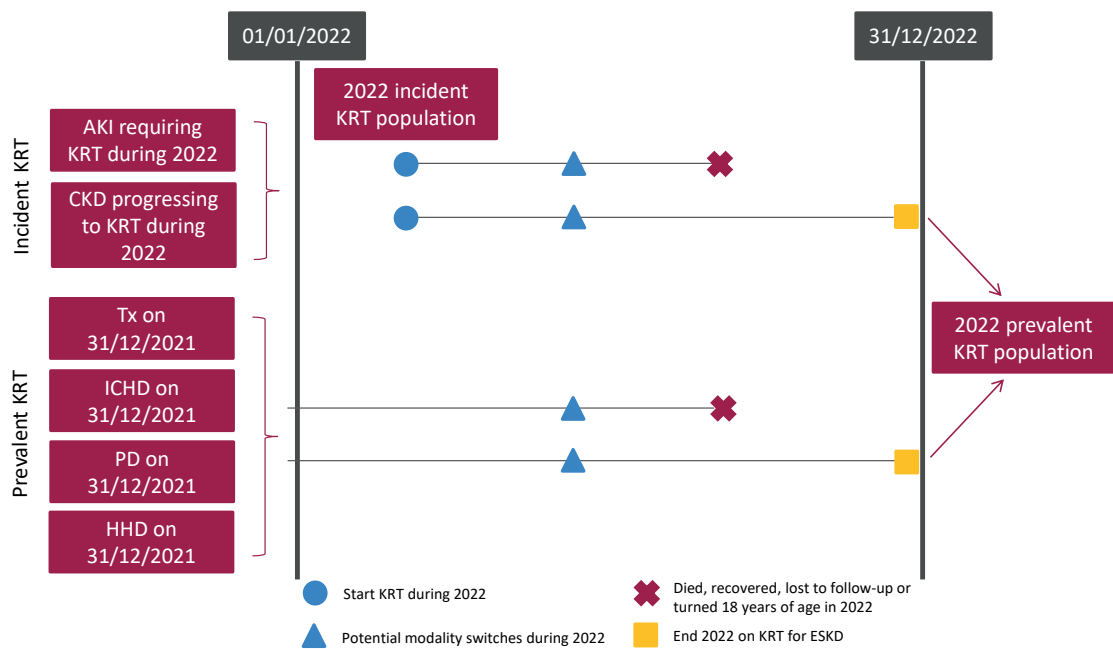
Figure 8.1 Pathways children and young people could follow to be included in the UK 2022 incident and/or prevalent KRT populations

Note that patients who recovered kidney function before 90 days on dialysis are not included in this chapter

CKD – chronic kidney disease

For children aged <16 years, the following populations included in this chapter are:

- **Incident population:** patients who started KRT during 2022 and remained on KRT for at least 90 days.
- **Prevalent population:** patients who were on KRT at the end of 2022 and still under the care of a paediatric kidney centre.
- **Five-year populations:** patients who started KRT and remained on KRT for at least 90 days in the periods 2008-2012, 2013-2017 and 2018-2022.

Children and young people on KRT in the UK in 2022

For young people aged 16 to <18 years, the following populations included in this chapter are:

- **Incident population:** patients who started KRT during 2022 in either an adult or paediatric centre and remained on KRT for at least 90 days.
- **Prevalent population:** patients who were on KRT at the end of 2022 in either an adult or paediatric centre.

This chapter addresses the following key aspects of the care of children incident to or on KRT for which there are evidence-based guidelines (table 8.1):

- **Growth:** this includes age- and sex-adjusted heights and weights.
- **Cardiovascular risk factors:** these include age-adjusted blood pressure, cholesterol and body mass index (BMI).
- **Complications associated with KRT:** these include anaemia and mineral and bone disorders.

The sections for these aspects (and tables 8.3 and 8.4) use a restricted prevalent cohort. Children who have moved centre, or changed or started treatment in the quarter are not included.

For young people, the following aspects of care are addressed:

- **Cardiovascular risk factors:** these include blood pressure using raw systolic and diastolic values which are audited against European Society of Hypertension guidelines for the management of high blood pressure in children and adolescents (2016).
- **Complications associated with KRT:** these include anaemia and mineral and bone disorders. Paediatric reference ranges for children and young people up to 18 years are used as the standard measure.

Paediatrics

Rationale for analyses

For both the children and young people sections, the analyses begin with a description of the 2022 incident and prevalent KRT populations, including the number on KRT per million age-related population (pmarp).

For children, height and weight are measures of healthy growth, which may be affected by kidney disease as well as its treatment. These measures are therefore presented for each centre in comparison to the UK median for this cohort.

The published guidelines listed below provide audit measures relevant to the care of children and young people on KRT and, where data permit, their attainment by UK paediatric kidney centres in 2022 is reported in this chapter (table 8.1). Due to the small numbers of young people identified, we have omitted reporting by centre for this population.

For children, reporting estimated glomerular filtration rate (eGFR) is dependent on the completeness of both creatinine and height data. For young people, the Full Age Spectrum (FAS) equation was used to calculate eGFR – height data for young people managed in adult centres were incomplete and therefore a height-free calculation was used to standardise reporting and enable direct comparison within this population.

Table 8.1 Audit measures relevant to KRT incidence and prevalence that are reported in this chapter

Audit guideline	Audit criteria	Related analysis/analyses
The UK Kidney Association: Treatment of adults and children with kidney failure: standards and audit measures (2002)	Height and weight to be monitored at each clinic visit and plotted on the growth charts of healthy children and adolescents	Figures 8.6–8.13
	Blood pressure during PD or after HD to be maintained at <90th percentile for age, sex and height. Blood pressure in Tx patients to be maintained at <90th percentile for age, sex and height	Tables 8.15–8.16, figures 8.14–8.15
	Serum phosphate and calcium should be kept within the normal range. Parathyroid hormone (PTH) levels should be maintained within twice the upper limit of the normal range but, contrary to adult standards, may be kept within the normal range if growth is normal	Table 8.18
	Serum bicarbonate concentrations should be 20–26 mmol/L	Table 8.18
	Typically maintain the aspirational haemoglobin range 100–120 g/L for young people and children aged ≥2 years and 95–115 g/L for children <2 years, reflecting the lower normal range in that age group	Table 8.18
National Heart Lung and Blood Institute and Kidney Disease Improving Global Outcomes (KDIGO) (2013)	Screening children at risk of secondary dyslipidaemias including those with CKD is recommended	Tables 8.3-8.4, 8.16

Paediatrics

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). The completeness of both transferrin saturation and percentage hypochromic red cells was too low to be reported as measures of iron stores. Audit measures that cannot be reported because the required data items were not collected by the UKRR are omitted – this includes reticulocyte haemoglobin content.

For children, data for height, weight, BMI and blood pressure vary with age, sex and size and are therefore presented as z-scores. Z-scores are a way of expressing the deviation of a given measurement from the age and size-specific population mean. This relies on the completeness of height data during the period in question.

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 was <70% and/or the number of patients reported was <10. 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'.

Key findings

Children

- 109 patients aged <16 years started KRT for ESKD in the UK in 2022 compared to 110 patients in 2021.

- KRT incidence in patients aged <16 years was 8.8 pmarp compared to 8.9 pmarp in 2021.

- 844 patients aged <16 years were receiving KRT at UK paediatric kidney centres on 31/12/2022, similar to the number in 2021.

- KRT prevalence in patients aged <16 years was 68.0 pmarp. 76.8% had a functioning Tx (50.4% living donor and 26.4% deceased donor), 12.0% were receiving HD and 11.3% were receiving PD.

- Tubulointerstitial disease accounted for approximately 50% of all primary renal diseases (PRDs) in prevalent paediatric patients, with a high male:female ratio (3:1).

- Between 2008 and 2022, about a third of patients aged <16 years who were referred early received a pre-emptive Tx.

- At the time of transfer to adult services, 73.7% of paediatric patients had a functioning kidney Tx.

- The median height z-score for children on dialysis was -1.4 compared with -0.9 for those with a functioning Tx.

- The median weight z-score for children on dialysis was -0.7 compared with -0.2 for those with a functioning Tx.

- The overall median eGFR of the 628 children with a kidney transplant on 31/12/2022 was 61 mL/min/1.73m^2 and 6.6% had an eGFR of <30 mL/min/1.73m^2.

- Of those with complete data, 71.7% of the prevalent paediatric KRT population had 1 or more risk factors for cardiovascular disease; 7.1% had 3 risk factors.

- 57.1% and 58.6% of prevalent HD patients achieved systolic blood pressure (SBP) and diastolic blood pressure (DBP) values <90th percentile, respectively.

- 66.7% and 66.7% of prevalent PD patients achieved SBP and DBP values <90th percentile, respectively.

- 79.8% and 82.1% of prevalent Tx patients achieved SBP and DBP values <90th percentile, respectively.

Young people

- 28 patients aged 16 to <18 years started KRT for ESKD in the UK in 2022.

- KRT incidence in young people was 18.1 pmarp.

- 243 patients aged 16 to <18 years were receiving KRT on 31/12/2022, of whom the majority (85.6%) were managed in paediatric kidney centres.

- KRT prevalence in patients aged 16 to <18 years was 157.4 pmarp.

- Tubulointerstital disease accounted for 43.8% of all PRDs in prevalent young people, followed by familial/hereditary nephropathies (21.7%) and glomerular disease (15.0%).

- The overall median eGFR of young people with a kidney transplant on 31/12/2022 was 66 mL/min/1.73m^2 and 6.0% had an eGFR of <30 mL/min/1.73m^2.

- Of prevalent young people managed in paediatric kidney centres, 60.6% of those on dialysis and 72.4% of those transplanted had a blood pressure in the 'normal' range (<130/80 mmHg).

Paediatrics

Analyses – children

Changes to the prevalent paediatric KRT population

For the 13 paediatric kidney centres, the number of prevalent children on KRT was calculated as a proportion of the estimated centre catchment population (calculated as detailed in appendix A).

Table 8.2 Number of prevalent paediatric KRT patients by year and by centre; number of KRT patients as a proportion of the catchment population

Centre	N on KRT					Estimated catchment population <16 (millions)	2022 crude rate (pmarp)
	2018	2019	2020	2021	2022		
Bham_P	97	87	105	98	103	1.22	84
Blfst_P	29	29	27	25	25	0.39	64
Brstl_P	54	53	50	52	50	0.91	55
Cardf_P	28	30	29	28	26	0.39	67
Glasg_P	57	54	58	56	58	0.89	65
L Eve_P	80	77	78	82	86	1.54	56
L GOSH_P	148	150	155	157	159	2.55	62
Leeds_P	58	56	57	59	59	0.78	75
Livpl_P	40	30	39	42	46	0.59	79
Manch_P	82	87	87	86	82	0.94	88
Newc_P	36	37	35	34	30	0.52	57
Nottm_P	70	73	86	83	79	1.24	64
Soton_P	30	30	34	43	41	0.45	90
UK	**809**	**793**	**840**	**845**	**844**	**12.41**	**68**

pmarp – per million age-related population

Paediatrics

Data completeness for prevalent paediatric KRT patients

Data returns of key variables for Tx and dialysis patients <16 years old at the end of 2022 are shown in tables 8.3 and 8.4, respectively, with further detail available through the UKRR data portal (ukkidney.org/audit-research/data-portals).

Table 8.3 Data completeness for paediatric patients (<16 years old) prevalent to Tx on 31/12/2022 by centre

Centre	N with Tx	Data completeness (%)											
		Height	Weight	BMI	SBP	DBP	Hb	Creat	Chol	Bicarb	PTH	Ca	Phos
Bham_P	72	97.2	98.6	97.2	97.2	95.8	98.6	98.6	98.6	98.6	97.2	98.6	98.6
Blfst_P	20	20.0	95.0	20.0	20.0	20.0	100.0	100.0	90.0	100.0	95.0	100.0	100.0
Brstl_P	35	0.0	97.1	0.0	94.3	82.9	97.1	97.1	31.4	97.1	71.4	97.1	97.1
Cardf_P	18	0.0	94.4	0.0	94.4	0.0	94.4	94.4	5.6	94.4	16.7	94.4	94.4
Glasg_P	44	100.0	100.0	100.0	97.7	97.7	88.6	90.9	56.8	97.7	86.4	90.9	90.9
L Eve_P	64	0.0	100.0	0.0	100.0	100.0	100.0	100.0	46.9	100.0	98.4	100.0	100.0
L GOSH_P	125	28.8	35.2	28.8	22.4	22.4	91.2	37.6	4.8	4.0	19.2	0.0	37.6
Leeds_P	43	97.7	100.0	97.7	100.0	65.1	100.0	100.0	7.0	100.0	97.7	100.0	100.0
Livpl_P	28	0.0	7.1	0.0	7.1	3.6	96.4	96.4	64.3	96.4	89.3	96.4	96.4
Manch_P	64	0.0	0.0	0.0	100.0	98.4	100.0	100.0	70.3	100.0	76.6	100.0	100.0
Newc_P	25	0.0	0.0	0.0	100.0	4.0	100.0	100.0	52.0	100.0	80.0	100.0	100.0
Nottm_P	54	90.7	98.2	90.7	92.6	83.3	98.2	100.0	64.8	100.0	74.1	100.0	100.0
Soton_P	36	100.0	100.0	100.0	86.1	75.0	88.9	88.9	0.0	88.9	86.1	88.9	88.9
UK	**628**	**44.8**	**68.0**	**44.8**	**75.5**	**64.0**	**96.0**	**85.7**	**44.0**	**79.5**	**71.5**	**78.2**	**85.7**

Bicarb – bicarbonate; BMI – body mass index; Ca – calcium; Chol – cholesterol; Creat – creatinine; DBP – diastolic blood pressure; Hb – haemoglobin; Phos – phosphate; PTH – parathyroid hormone; SBP – systolic blood pressure
Children who have moved centre, or changed or started treatment in the quarter are not included

Table 8.4 Data completeness for paediatric patients (<16 years old) prevalent to dialysis on 31/12/2022 by centre

Centre	N on dialysis	Data completeness (%)											
		Height	Weight	BMI	SBP	DBP	Hb	Chol	Bicarb	PTH	Ca	Phos
Bham_P	27	92.6	92.6	92.6	88.9	70.4	96.3	96.3	96.3	96.3	96.3	96.3
Blfst_P	3	33.3	66.7	33.3	33.3	33.3	66.7	0.0	66.7	66.7	66.7	66.7
Brstl_P	11	0.0	90.9	0.0	90.9	54.6	90.9	63.6	90.9	81.8	90.9	90.9
Cardf_P	6	0.0	66.7	0.0	33.3	0.0	100.0	33.3	100.0	100.0	100.0	100.0
Glasg_P	13	100.0	100.0	100.0	100.0	84.6	100.0	61.5	100.0	100.0	92.3	92.3
L Eve_P	15	0.0	100.0	0.0	100.0	100.0	93.3	73.3	93.3	93.3	93.3	93.3
L GOSH_P	22	72.7	86.4	72.7	77.3	77.3	90.9	45.5	18.2	72.7	0.0	81.8
Leeds_P	9	100.0	100.0	77.8	100.0	0.0	100.0	77.8	100.0	100.0	100.0	100.0
Livpl_P	14	0.0	0.0	0.0	0.0	0.0	92.9	35.7	92.9	92.9	92.9	92.9
Manch_P	15	0.0	33.3	0.0	100.0	26.7	93.3	60.0	93.3	93.3	93.3	93.3
Newc_P	5	0.0	0.0	0.0	100.0	0.0	100.0	40.0	100.0	80.0	100.0	100.0
Nottm_P	20	65.0	90.0	65.0	65.0	40.0	100.0	40.0	100.0	100.0	100.0	100.0
Soton_P	3	100.0	100.0	100.0	100.0	66.7	100.0	33.3	100.0	100.0	100.0	100.0
UK	**163**	**49.1**	**75.5**	**47.9**	**77.9**	**50.9**	**95.1**	**58.9**	**85.3**	**91.4**	**82.2**	**93.3**

Bicarb – bicarbonate; BMI – body mass index; Ca – calcium; Chol – cholesterol; Creat – creatinine; DBP – diastolic blood pressure; Hb – haemoglobin; Phos – phosphate; PTH – parathyroid hormone; SBP – systolic blood pressure
Children who have moved centre, or changed or started treatment in the quarter are not included

Paediatrics

Changes to the incident paediatric KRT population

The number of incident patients on KRT <16 years old was used to calculate age-related rates per million population and were grouped by age, sex, five year time period, ethnicity, centre and PRD.

Table 8.5 Paediatric patients (<16 years old) incident to KRT in 2022 by age and sex

Age group (yrs)	All patients		Male		Female	
	N	pmarp	N	pmarp	N	pmarp
0-<2	13	9.4	7	9.9	6	8.9
2-<4	10	6.9	6	8.1	4	5.6
4-<8	13	4.2	7	4.5	6	4.0
8-<12	36	11.1	17	10.2	19	12.0
12-<16	37	11.4	24	14.4	13	8.2
<16 yrs	**109**	**8.8**	**61**	**9.6**	**48**	**7.9**

pmarp – per million age-related population

Table 8.6 Paediatric patients (<16 years old) incident to KRT by age and 5 year time period

Age group (yrs)	2008-2012		2013-2017		2018-2022	
	N	pmarp	N	pmarp	N	pmarp
0-<2	95	12.1	116	14.8	87	12.1
2-<4	59	7.6	74	9.0	56	7.3
4-<8	90	6.3	121	7.5	81	5.0
8-<12	121	8.6	134	9.0	157	9.4
12-<16	205	13.6	171	12.1	189	12.0
<16 yrs	**570**	**9.6**	**616**	**10.1**	**570**	**9.0**

pmarp – per million age-related population

Table 8.7 Paediatric patients (<16 years old) incident to KRT by ethnicity and 5 year time period

Ethnicity	2008-2012		2013-2017		2018-2022	
	N	%	N	%	N	%
White	408	72.0	423	69.0	339	67.7
Asian	98	17.3	117	19.1	97	19.4
Black	26	4.6	33	5.4	32	6.4
Other	35	6.2	40	6.5	33	6.6
<16 yrs	**567**	**100.0**	**613**	**100.0**	**501**	**100.0**

3 children in 2008-2012, 3 in 2013-2017 and 69 in 2018-2022 with no ethnicity recorded were excluded

Paediatrics

Table 8.8 Paediatric patients (<16 years old) incident to KRT by centre and 5 year time period

Centre	2008-2012		2013-2017		2018-2022	
	N	%	N	%	N	%
Bham_P	68	11.9	79	12.8	68	11.9
Blfst_P	27	4.7	12	1.9	10	1.8
Brstl_P	32	5.6	35	5.7	33	5.8
Cardf_P	16	2.8	21	3.4	20	3.5
Glasg_P	44	7.7	44	7.1	42	7.4
L Eve_P	62	10.9	70	11.4	64	11.2
L GOSH_P	113	19.8	100	16.2	94	16.5
Leeds_P	43	7.5	49	8.0	40	7.0
Livpl_P	18	3.2	32	5.2	43	7.5
Manch_P	51	8.9	71	11.5	55	9.6
Newc_P	21	3.7	32	5.2	19	3.3
Nottm_P	55	9.6	52	8.4	53	9.3
Soton_P	20	3.5	19	3.1	29	5.1
<16 yrs	**570**	**100.0**	**616**	**100.0**	**570**	**100.0**

PRDs were grouped into categories as shown in table 8.9, with the mapping of disease codes into groups explained in more detail in appendix A.

Table 8.9 Paediatric patients (<16 years old) incident to KRT by primary renal disease (PRD) and 5 year time period

PRD	2008-2012		2013-2017		2018-2022	
	N	%	N	%	N	%
Tubulointerstitial disease	271	48.0	300	48.8	201	42.1
- CAKUT	262	46.5	291	47.3	190	39.8
- Non-CAKUT	9	1.6	9	1.5	11	2.3
Glomerular disease	71	12.6	103	16.7	97	20.3
Familial/hereditary nephropathies	111	19.7	101	16.4	77	16.1
Systemic diseases affecting the kidney	33	5.9	17	2.8	23	4.8
Miscellaneous renal disorders	78	13.8	94	15.3	79	16.6

6 children in 2008-2012, 1 in 2013-2017 and 93 in 2018-2022 with no PRD recorded were excluded
CAKUT – congenital anomalies of the kidneys and urinary tract

Start modality of incident paediatric KRT patients

Start modality used by patients <16 years old starting KRT between 2008 and 2022 was grouped by five year time periods.
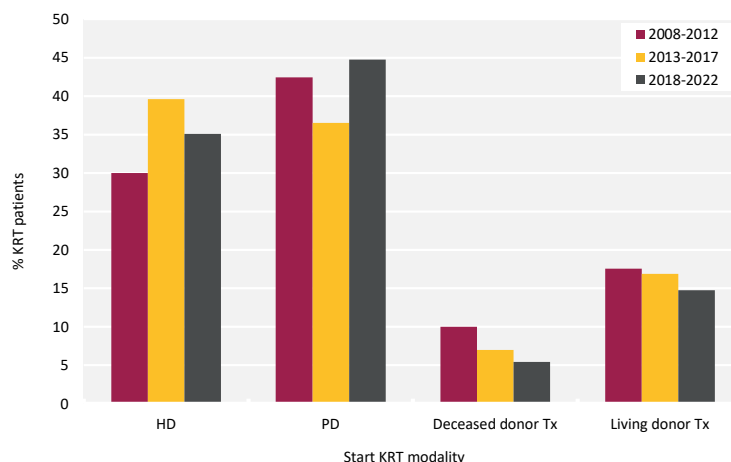
Paediatrics

Figure 8.2 Start KRT modality for paediatric patients (<16 years old) incident to KRT by 5 year time period

Pre-emptive transplantation in incident paediatric KRT patients

The analysis of pre-emptive transplantation excluded patients starting KRT aged <3 months and patients known to have presented late.

Table 8.10 Pre-emptive transplantation in the incident paediatric KRT population aged 3 months to 16 years by 5 year time period, sex, ethnicity, age at start of KRT and primary renal disease (PRD)

	N on KRT	N (%) with pre-emptive Tx
Total cohort analysed (2008-2022)	1,310	413 (31.5)
Time period		
2008-2012	413	156 (37.8)
2013-2017	456	143 (31.4)
2018-2022	441	114 (25.9)
Sex		
Male	833	288 (34.6)
Female	477	125 (26.2)
Ethnicity		
White	867	318 (36.7)
Asian	234	48 (20.5)
Black	63	10 (15.9)
Other	81	19 (23.5)
Age at start of KRT (yrs)		
3 mths-<2	156	6 (3.8)
2-<4	163	52 (31.9)
4-<8	231	99 (42.9)
8-<12	324	101 (31.2)
12-<16	436	155 (35.6)
PRD		
Tubulointerstitial disease	630	269 (42.7)
Glomerular disease	191	6 (3.1)
Familial/hereditary nephropathies	219	58 (26.5)
Miscellaneous renal disorders	143	38 (26.6)
Systemic diseases affecting the kidney	41	17 (41.5)

85 children were excluded because they were aged <3 months; 361 children were excluded because they presented late

Paediatrics

Demographics of prevalent paediatric KRT patients

The number of prevalent patients on KRT <16 years old was used to calculate age-related rates per million population and were grouped by age, sex and ethnicity.

Table 8.11 Age and sex breakdown of paediatric patients (<16 years old) prevalent to KRT on 31/12/2022

Age group (yrs)	All patients		Male		Female		M/F pmarp ratio
	N	pmarp	N	pmarp	N	pmarp	
0-<2	18	13.0	10	14.1	8	11.8	1.2
2-<4	34	23.4	20	26.9	14	19.8	1.4
4-<8	141	45.9	92	58.5	49	32.7	1.8
8-<12	262	80.6	176	105.8	86	54.2	2.0
12-<16	389	119.8	222	133.5	167	105.4	1.3
<16 yrs	**844**	**68.0**	**520**	**81.9**	**324**	**53.5**	**1.5**

pmarp – per million age-related population

Table 8.12 Age and ethnicity breakdown of paediatric patients (<16 years old) prevalent to KRT on 31/12/2022

Age group (yrs)	N			
	White	Asian	Black	Other
0-<4	34	5	0	4
4-<8	91	22	12	8
8-<12	174	40	11	26
12-<16	234	78	20	29
<16 yrs	**533**	**145**	**43**	**67**

56 children with no ethnicity recorded were excluded

Treatment modality in prevalent paediatric KRT patients

The current and start KRT modalities for prevalent KRT patients aged <16 years are shown in figures 8.3 and 8.4, respectively. Table 8.13 breaks down current modality for prevalent patients by age group.

Table 8.13 KRT modality used by paediatric patients (<16 years old) prevalent to KRT on 31/12/2022 by age group

Age group (yrs)	Total N	HD		PD		Living donor Tx		Deceased donor Tx	
		N	%	N	%	N	%	N	%
0-<2	18	4	22.2	14	77.8	0	0.0	0	0.0
2-<4	34	7	20.6	12	35.3	13	38.2	2	5.9
4-<8	141	17	12.1	13	9.2	85	60.3	26	18.4
8-<12	262	26	9.9	25	9.5	140	53.4	71	27.1
12-<16	389	47	12.1	31	8.0	187	48.1	124	31.9
<16 yrs	**844**	**101**	**12.0**	**95**	**11.3**	**425**	**50.4**	**223**	**26.4**
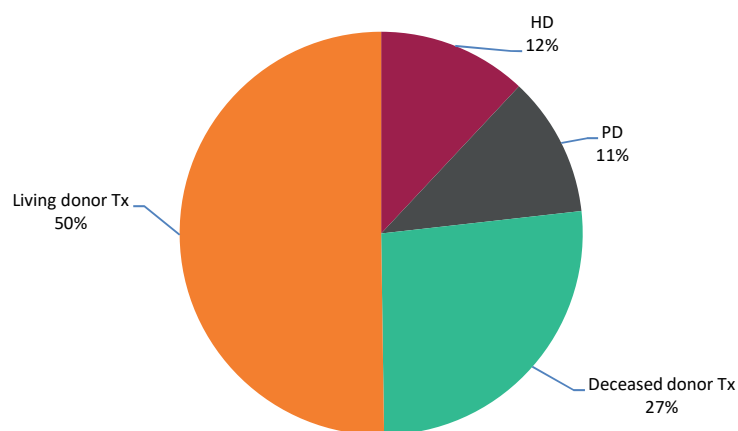
Paediatrics

Figure 8.3 KRT modality used by paediatric patients (<16 years old) prevalent to KRT on 31/12/2022
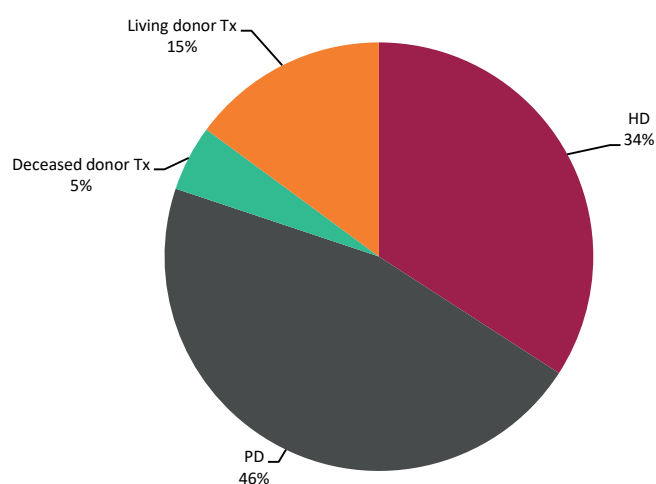
Figure 8.4 KRT modality used at the start of KRT by paediatric patients (<16 years old) prevalent to KRT on 31/12/2022

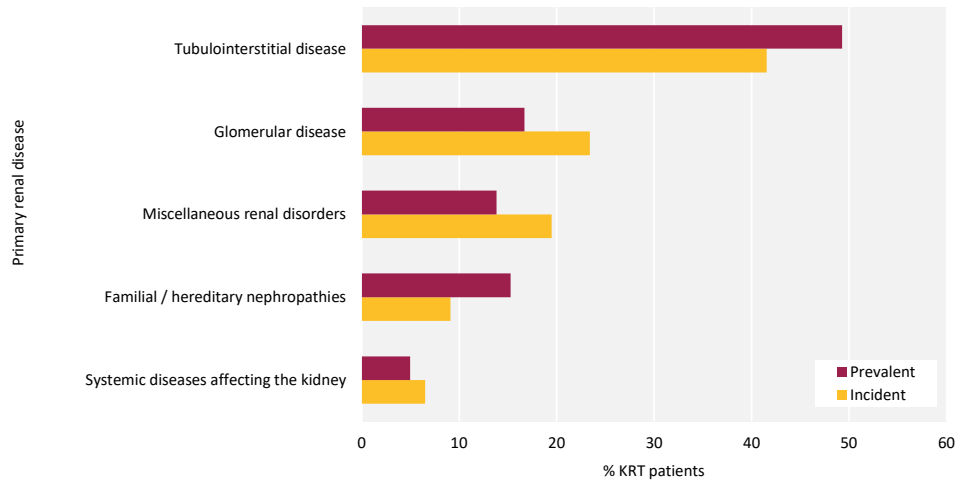## Causes of ESKD in prevalent paediatric KRT patients

PRDs were grouped into categories as shown in table 8.14.

Table 8.14 Primary renal diseases (PRDs) of paediatric patients (<16 years old) prevalent to KRT on 31/12/2022 by sex and ethnicity

PRD	N	%	N male	N female	% White
Tubulointerstitial disease	378	49.3	284	94	70.0
- CAKUT	369	48.1	278	91	70.6
- Non-CAKUT	9	1.2	6	3	44.4
Glomerular disease	128	16.7	60	68	62.9
Familial/hereditary nephropathies	117	15.3	55	62	64.9
Systemic diseases affecting the kidney	38	5.0	21	17	83.8
Miscellaneous renal disorders	106	13.8	51	55	66.3
Total (with data)	**767**	**100.0**	**471**	**296**	**68.2**
Missing	77	9.1	49	28	55.6

CAKUT – congenital anomalies of the kidneys and urinary tract

Children and young people on KRT in the UK in 2022

Figure 8.5 Comparison of primary renal diseases for paediatric patients (<16 years old) incident and prevalent to KRT in 2022 with no missing data

Growth of prevalent paediatric KRT patients

The height and weight of children receiving KRT were compared to the age- and sex-matched general childhood population. The UK median score for each measure is represented by a red dotted line.
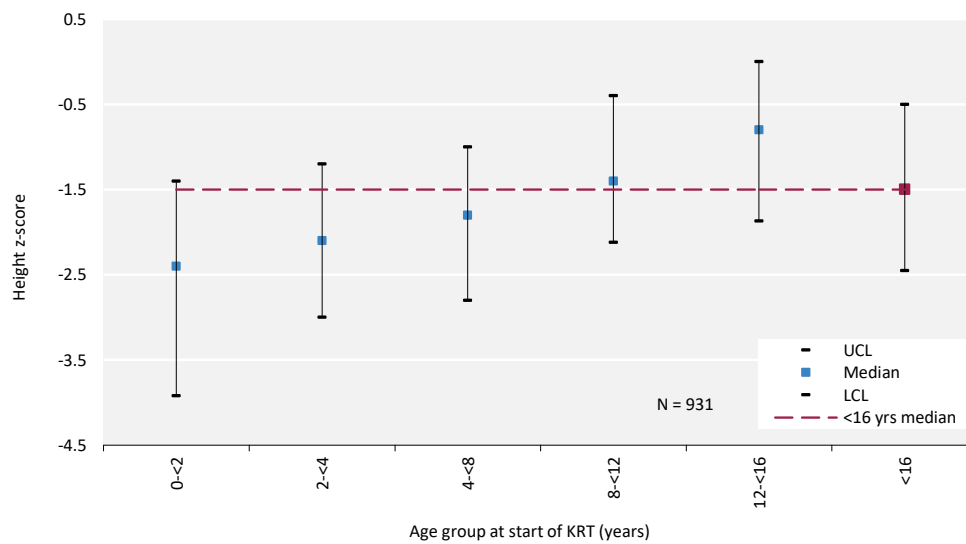
Height of paediatric KRT patients
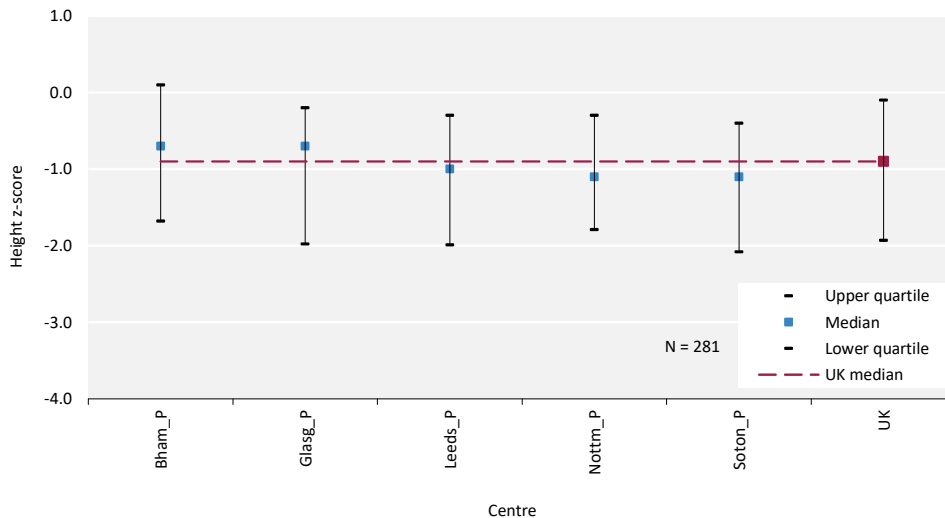
Figure 8.6 Median height z-scores for paediatric patients (<16 years old) prevalent to Tx on 31/12/2022 by centre
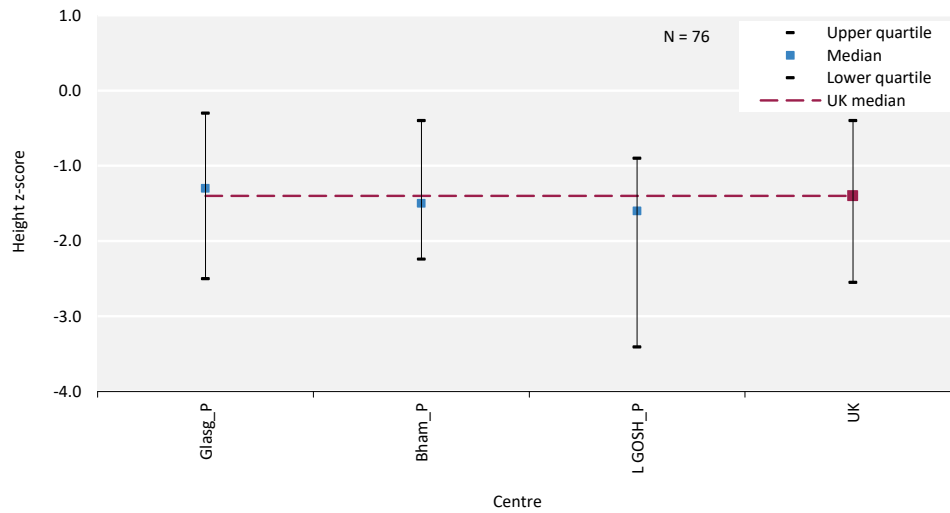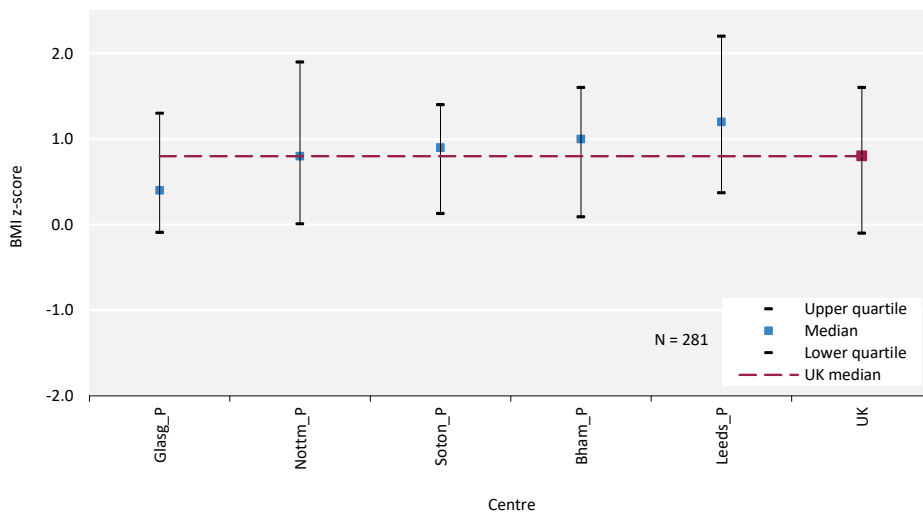
Paediatrics

Figure 8.7 Median height z-scores for paediatric patients (<16 years old) prevalent to dialysis on 31/12/2022 by centre

**Figure 8.8** Median height z-scores at start of KRT for incident paediatric KRT patients (<16 years old) between 2008 and 2022 by age group at start of KRT

Paediatrics

Weight of paediatric KRT patients
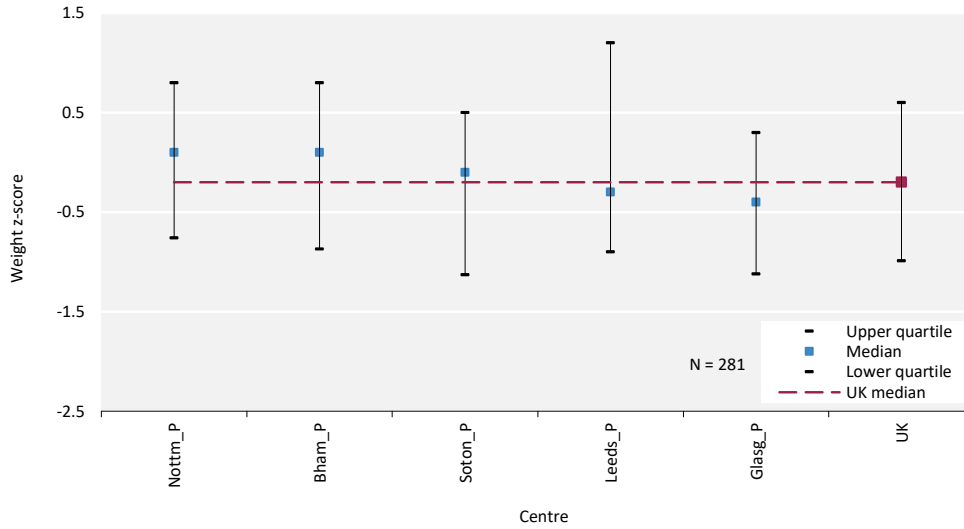
Figure 8.9 Median weight z-scores for paediatric patients (<16 years old) prevalent to Tx on 31/12/2022 by centre
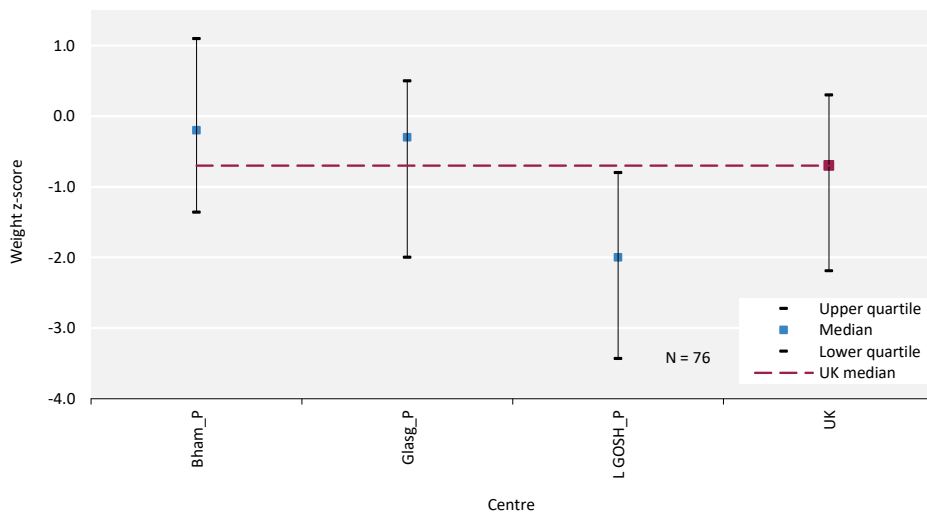
Figure 8.10 Median weight z-scores for paediatric patients (<16 years old) prevalent to dialysis on 31/12/2022 by centre

Cardiovascular risk factor evaluation in prevalent paediatric KRT patients
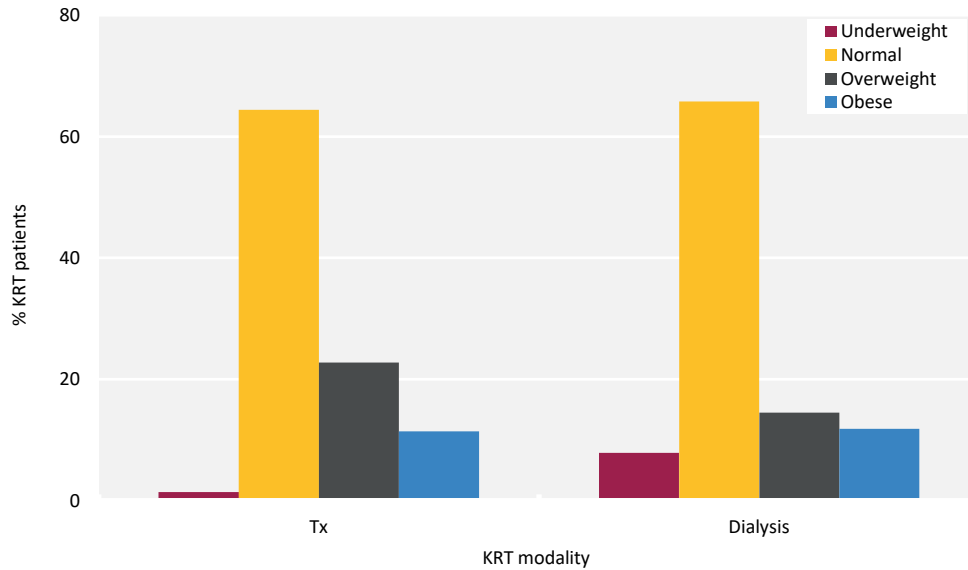
Obesity in paediatric KRT patients

BMI was calculated using the formula BMI = weight (kg)/height^2 (m). Height and weight were adjusted for age. To account for discrepancies in linear growth secondary to kidney disease, BMI was expressed according to height age, rather than chronological age. Height age corresponds to the age when a child's height is plotted at the 50th percentile on a UK growth chart.

Figure 8.11 Median body mass index (BMI) z-scores for paediatric patients (<16 years old) prevalent to Tx on 31/12/2022 by centre
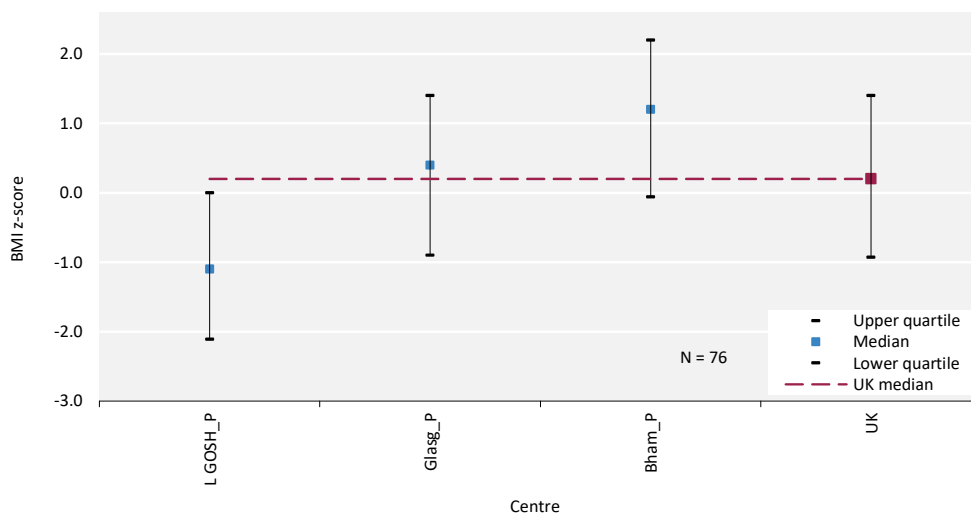

Figure 8.12 Median body mass index (BMI) z-scores for paediatric patients (<16 years old) prevalent to dialysis on 31/12/2022 by centre

Children and young people on KRT in the UK in 2022
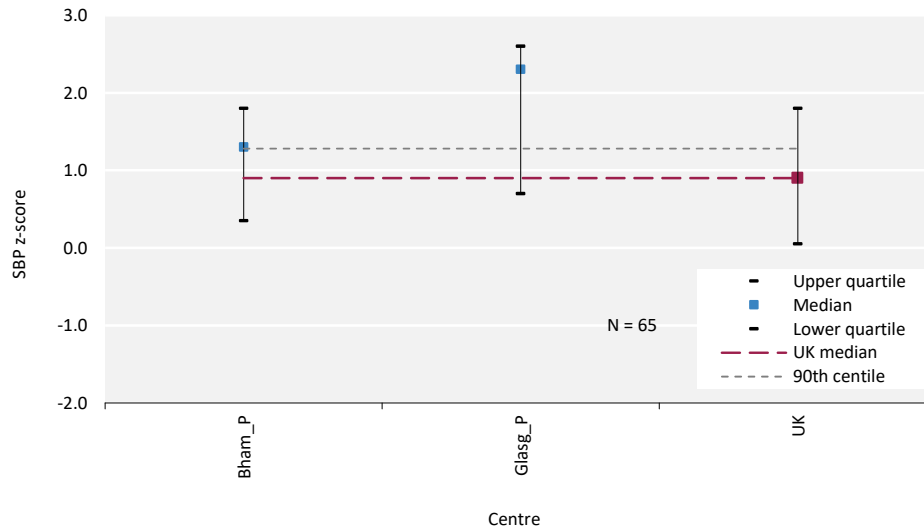
Paediatrics

Figure 8.13 Body mass index categorisation of paediatric patients (<16 years old) prevalent to KRT on 31/12/2022 by KRT modality

Hypertension in paediatric KRT patients

In paediatric KRT patients, the systolic blood pressure should be maintained at <90th percentile for age, sex and height.
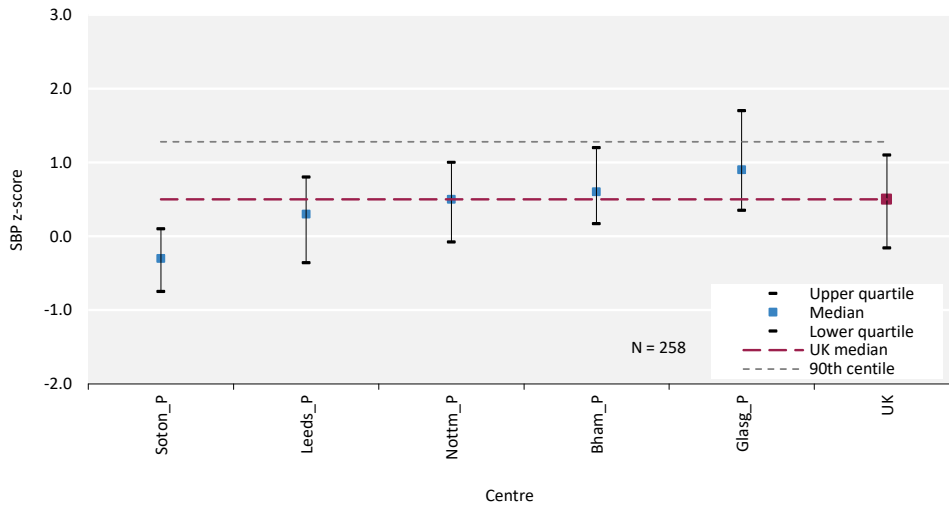
Figure 8.14 Median systolic blood pressure (SBP) z-scores for paediatric patients (<16 years old) prevalent to Tx on 31/12/2022 by centre

Paediatrics

Figure 8.15 Median systolic blood pressure (SBP) z-scores for paediatric patients (<16 years old) prevalent to dialysis on 31/12/2022 by centre

Table 8.15 Percentage of paediatric patients (<16 years old) prevalent to KRT on 31/12/2022 achieving the standards for blood pressures

Characteristic	SBP		DBP	
	N	% <90th percentile	N	% <90th percentile
Total	323	76.2	276	78.3
Age group (yrs)				
0-<5	28	71.4	16	87.5
5-<12	138	74.6	113	76.1
12-<16	157	78.3	147	78.9
Sex				
Male	208	77.9	180	78.3
Female	115	73.0	96	78.1
Ethnicity				
White	199	74.9	173	80.9
Asian	59	84.8	47	78.7
Black	11	81.8	10	70.0
Other	18	72.2	16	68.8
Modality				
HD	35	57.1	29	58.6
PD	30	66.7	24	66.7
Tx	258	79.8	223	82.1

DBP – diastolic blood pressure; SBP – systolic blood pressure
HD – haemodialysis; PD – peritoneal dialysis; Tx – transplant

Paediatrics

Cardiovascular risk factors in paediatric KRT patients

The analysis of the percentage of prevalent KRT patients with identified cardiovascular risk factors was restricted to the 184 of the 791 patients (23.3%) with data for all three risk factors.

Table 8.16 Frequency of number of cardiovascular risk factors in paediatric patients (<16 years old) prevalent to KRT on 31/12/2022

N cardiovascular risk factors	Hypertensive	Overweight/Obese	Hypercholesterolaemic	N	%	Total %
0	No	No	No	52	28.3	28.3
1	Yes	No	No	32	17.4	
	No	Yes	No	26	14.1	42.4
	No	No	Yes	20	10.9	
2	Yes	Yes	No	11	6.0	
	Yes	No	Yes	15	8.2	22.3
	No	Yes	Yes	15	8.2	
3	Yes	Yes	Yes	13	7.1	7.1
				184		100.0
Total N with the risk factor	**71**	**65**	**63**			
Total % with the risk factor	**38.6**	**35.3**	**34.2**			

Biochemistry parameters in prevalent paediatric KRT patients

The median values and the percentage with eGFR <30 mL/min/1.73m² for prevalent 2022 paediatric Tx patients are presented in table 8.17.

Table 8.17 Median estimated glomerular filtration rate (eGFR) and percentage with eGFR <30 mL/min/1.73m² in paediatric patients (<16 years old) prevalent to Tx on 31/12/2022 by centre

Centre	N with Tx	Median eGFR (mL/min/1.73m²)	% eGFR <30 mL/min/1.73m²	% data completeness
Bham_P	72	50	5.8	95.8
Blfst_P	20			20.0
Brstl_P	35			0.0
Cardf_P	18			0.0
Glasg_P	44	76	0.0	100.0
L Eve_P	64			0.0
L GOSH_P	125			28.0
Leeds_P	43	71	2.4	97.7
Livpl_P	28			0.0
Manch_P	64			0.0
Newc_P	25			0.0
Nottm_P	54	51	12.2	90.7
Soton_P	36	69	3.1	88.9
UK	**628**	**61**	**6.6**	**43.8**

Blank cells – centres with <70% data completeness or <10 patients
For most of the centres with missing data, completeness of creatinine data was good. Height data completeness was very low (heights are needed to calculate eGFRs from creatinine)

Paediatrics

Table 8.18 Attainment of targets for haemoglobin, calcium, phosphate, parathyroid hormone and bicarbonate in paediatric patients (<16 years old) (a) prevalent to dialysis on 31/12/2022 by centre and (b) prevalent to Tx on 31/12/2022 with estimated glomerular filtration rate (eGFR) <30 mL/min/1.73 m² in the UK

Centre	N	% Hb below target	% Hb within target	% Ca below target	% Ca within target	% phos below target	% phos within target	% PTH within target	% bicarb below target	% bicarb within target
DIALYSIS PATIENTS										
Bham_P	27	11.5	50.0	0.0	57.7	0.0	46.2	46.2	7.7	73.1
Blfst_P	3									
Brstl_P	11	0.0	80.0	0.0	80.0	0.0	40.0		40.0	40.0
Cardf_P	6									
Glasg_P	13	0.0	46.2	0.0	91.7	50.0	33.3	30.8	0.0	84.6
L Eve_P	15	42.9	35.7	0.0	78.6	0.0	50.0	42.9	21.4	78.6
L GOSH_P	22	20.0	50.0			5.6	38.9	62.5		
Leeds_P	9									
Livpl_P	14	15.4	38.5	0.0	84.6	7.7	69.2	15.4	0.0	100.0
Manch_P	15	14.3	57.1	0.0	35.7	50.0	50.0	42.9	0.0	57.1
Newc_P	5									
Nottm_P	20	30.0	40.0	0.0	55.0	0.0	35.0	25.0	5.0	85.0
Soton_P	3									
UK	**163**	**17.4**	**47.7**	**0.0**	**66.4**	**11.8**	**44.7**	**40.3**	**9.4**	**77.0**
TX PATIENTS WITH EGFR <30 ML/MIN/1.73 M²										
UK	**18**	**27.8**	**72.2**	**0.0**	**100.0**	**0.0**	**100.0**	**30.8**	**8.3**	**91.7**

Blank cells – centres with <70% data completeness or <10 patients

See appendix A for biochemical target ranges

Bicarb – bicarbonate; Ca – calcium; Hb – haemoglobin; Phos – phosphate; PTH – parathyroid hormone

Table 8.19 Median estimated glomerular filtration rate (eGFR) in paediatric patients (<16 years old) prevalent to Tx on 31/12/2022 by time since transplantation and age group

	Age group (yrs)					
	0-<5		5-<12		12-<16	
Time since transplantation	N	Median eGFR (mL/min/1.73 m²)	N	Median eGFR (mL/min/1.73 m²)	N	Median eGFR (mL/min/1.73 m²)
<3 months						
0.25–<2 years	14	89	36	80	34	61
2–<4 years	1		31	65	16	59
4–<7 years			49	65	26	54
≥7 years			11	60	56	48
Total (IQR)	**15**	**87 (66-97)**	**127**	**66 (48-84)**	**132**	**52 (40-70)**

IQR – interquartile range

As seen in table 8.17, completeness of eGFR is 44% of N=628

Transfer to adult kidney services for prevalent paediatric KRT patients

One-hundred and sixteen paediatric patients transitioned to adult kidney centres in 2022. The median age of patients at transfer was 18.0 years with an IQR of 17.6-18.2 years. Overall, the demographics of this population reflected those of the prevalent paediatric KRT population.
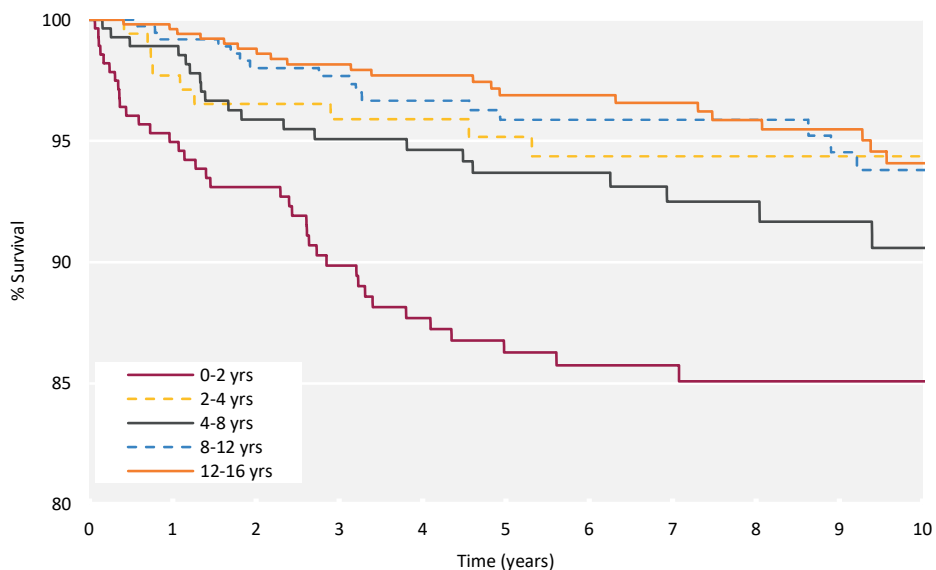
Paediatrics

Survival in paediatric KRT patients

Of patients aged <16 years, 1,628 started KRT between 2008 and 2021 at paediatric kidney centres and were included in survival analyses, to allow at least one year follow-up. At the end of 2022, 112 deaths had been reported in these children. Patients included in the analysis must have been alive on KRT for 90 days. The median follow-up time (beyond day 90) was 7.3 years (range 1 day to 14.8 years).

Table 8.20 Unadjusted Kaplan-Meier survival (from day 90) of incident paediatric KRT patients (<16 years old) between 2008 and 2021 by age group at start of KRT

	Age group (yrs)				
	0-<2	2-<4	4-<8	8-<12	12-<16
Survival at 1 year (%)	95.0	97.7	98.9	99.2	99.6
95% CI	91.6-97.0	94.0-99.1	96.7-99.6	97.5-99.7	98.5-99.9
Survival at 2 years (%)	93.1	96.5	95.9	98.0	98.8
95% CI	89.4-95.5	92.4-98.4	92.7-97.7	95.9-99.0	97.4-99.5
Survival at 3 years (%)	89.9	95.9	95.1	97.7	98.2
95% CI	85.5-92.9	91.6-98.0	91.7-97.1	95.4-98.8	96.5-99.0
Survival at 5 years (%)	86.3	95.2	93.7	95.9	96.9
95% CI	81.4-90.0	90.5-97.6	89.9-96.1	93.0-97.6	94.8-98.1
Survival at 10 years (%)	85.1	94.4	90.6	93.8	94.1
95% CI	79.9-89.0	89.4-97.0	85.3-94.0	89.7-96.3	90.9-96.2

CI – confidence interval

Figure 8.16 Unadjusted Kaplan-Meier survival (from day 90) of incident paediatric KRT patients (<16 years old) between 2008 and 2021 by age group at start of KRT

Paediatrics

Analyses – young people

KRT incidence and prevalence in young people

Table 8.21 reports the numbers of young people (16-<18 years old) who started KRT in 2022 (incidence) as well as those on KRT as of 31/12/2022 (prevalence) in both paediatric and adult centres, as an estimated total pmarp and grouped by sex, ethnicity and PRD. For incident young people, start modality is reported; current treatment modality is reported for prevalent patients.

Table 8.21 Demographics of young people (16-<18 years) incident to KRT in 2022 and/or prevalent to KRT on 31/12/2022, by care setting

Characteristic	Incident			Prevalent		
	Paediatric centres	Adult centres	All	Paediatric centres	Adult centres	All
N	15	13	28	208	35	243
pmarp			18.1			157.4
Median age (yrs)	16.7	17.1	16.8	16.9	17.5	17.0
% male	80.0	46.2	64.3	60.6	71.4	62.1
Ethnicity[1] (%)						
White	57.1	54.6	56.0	67.0	67.7	67.1
Asian	28.6	18.2	24.0	21.8	17.7	21.2
Black	14.3	18.2	16.0	5.6	8.8	6.1
Other	0.0	9.1	4.0	5.6	5.9	5.6
Missing ethnicity	6.7	15.4	10.7	5.3	2.9	4.9
PRD[1] (%)						
Tubulointerstitial disease	42.9	18.2	32.0	43.6	45.2	43.8
Glomerular disease	14.3	27.3	20.0	15.4	12.9	15.0
Familial/hereditary nephropathies	7.1	18.2	12.0	19.5	35.5	21.7
Systemic diseases affecting the kidney	7.1	18.2	12.0	3.1	3.2	3.1
Diabetes	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous renal disorders	28.6	18.2	24.0	18.5	3.2	16.4
Missing PRD	6.7	15.4	10.7	6.3	11.4	7.0
Modality (%)						
HD	60.0	46.2	53.6	12.0	20.0	13.2
PD	26.7	46.2	35.7	8.2	25.7	10.7
Tx	13.3	7.7	10.7	79.8	54.3	76.1

[1]Percentages by ethnicity and PRD were calculated for those with data (excluding patients with missing data)

pmarp – per million age-related population; PRD – primary renal disease

HD – haemodialysis; PD – peritoneal dialysis; Tx – transplant

Paediatrics

Table 8.22 details the number and type of centres (adult or paediatric) that have contributed to the incident and prevalent numbers reported. The small proportion of adult centres identified may reflect that young people are often directed to centres with an established transition programme for early adult care; however, under-reporting of young people may also account for this finding.

Table 8.22 Number of centres that submitted data for young people (16-<18 years) incident to KRT in 2022 and/or prevalent to KRT on 31/12/2022, by care setting

	Incident	Prevalent
Paediatric centres	7 out of 13	13 out of 13
Adult centres	10 out of 67	20 out of 67

Transplant parameters in young people

The median values for age, creatinine and eGFR, and the proportion with an eGFR <30 mL/min/1.73 m^2 for young people prevalent to Tx on 31/12/2022 are presented by care setting (adult or paediatric centre).

Table 8.23 Measures of graft function in young people (16–<18 years) prevalent to Tx on 31/12/2022, by care setting

	N on Tx	Median age (yrs)	N with creatinine data	Median creatinine (µmol/L)	Median FAS-eGFR (mL/min/1.73m2)	% FAS-eGFR <30 mL/min/1.73m2	% creatinine completeness
Paediatric centres	166	17.0	150	109	67	5.3	90.4
Adult centres	19	17.5	17	134	59	11.8	89.5

Table 8.24 reports the median eGFR for all young people prevalent to Tx on 31/12/2022 by time since transplantation. Small numbers preclude further analysis by care setting (adult or paediatric centre).

Table 8.24 Estimated glomerular filtration rate (eGFR) in young people (16-<18 years) prevalent to Tx on 31/12/2022 by time since transplantation

Time since transplantation	N	Median FAS-eGFR (mL/min/1.73m2)
< 3 months	6	
0.25–<2 years	34	63
2–<4 years	26	65
4–<7 years	37	74
≥ 7 years	62	65
Total (IQR)	**165**	**66 (53-81)**

eGFR – estimated glomerular filtration rate; FAS – Full Age Spectrum

Biochemical and blood pressure measures in young people

Table 8.25 shows attainment of biochemical and blood pressure measures for young people prevalent to dialysis and transplant on 31/12/2022 for the total population and by care setting (adult or paediatric). Attainment of targets including haemoglobin, calcium, phosphate and bicarbonate are shown; median systolic and diastolic blood pressure values and the percentage of young people with blood pressure values within 'normal' range or that are 'high' are also reported.

Table 8.25 Attainment of biochemical and blood pressure measures in young people (16-<18 years) prevalent to KRT on 31/12/2022, by modality and care setting

Characteristic	Dialysis			Tx		
	Paediatric centres	Adult centres	All	Paediatric centres	Adult centres	All
N	42	16	58	166	19	185
Median (IQR) Hb (g/L)	110 (95-127)	108 (97-124)	109 (96-126)	126 (114-138)	136 (118-147)	126.5 (114-139)
% Hb <100g/L	29.5	26.7	28.8	7.9	13.3	8.3
Median (IQR) Ca (mmol/L)	2.5 (2.4-2.6)	2.4 (2.2-2.5)	2.5 (2.3-2.6)	2.5 (2.4-2.5)	2.4 (2.4-2.5)	2.5 (2.4-2.5)
% Ca in range	69.4	62.5	67.3	87.5	87.5	87.5
Median (IQR) Phos (mmol/L)	1.8 (1.4-2.0)	2.2 (1.8-2.7)	1.8 (1.5-2.2)	1.1 (1.0-1.3)	1.1 (1.0-1.2)	1.1 (1.0-1.3)
% phos in range	43.9	13.3	35.7	61.6	50.0	60.6
Median (IQR) bicarb (mmol/L)	24 (22-27)	23 (19-25)	23 (21-26)	23 (21-25)	23 (20-25)	23 (21-25)
% bicarb in range	59.0	66.7	61.1	74.3	66.7	73.5
Median (IQR) SBP (mmHg)	121 (109-130)			118 (110-125)		
Median (IQR) DBP (mmHg)	74 (68-80)			70 (63-79)		
% 'normal' BP range (<130/80 mmHg)	60.6			72.4		
% high BP (≥140/90 mmHg)	15.2			4.1		

See appendix A for biochemical target ranges
bicarb – bicarbonate; BP – blood pressure; Ca – calcium; DBP – diastolic blood pressure; Hb – haemoglobin; IQR – inter-quartile range; phos – phosphate; SBP – systolic blood pressure

Paediatrics

Abbreviations

UK kidney centre abbreviations and other shortened forms used in the 26th Annual Report

UK kidney centre abbreviations

Adult kidney centres

Abbreviation	City	Hospital
		ENGLAND
Bham	Birmingham	Heartlands Hospital and Queen Elizabeth Hospital
Bradfd	Bradford	St Luke's Hospital
Brightn	Brighton	Royal Sussex County Hospital
Bristol	Bristol	Southmead Hospital
Camb	Cambridge	Addenbrooke's Hospital
Carlis	Carlisle	Cumberland Infirmary
Carsh	Carshalton	St Helier Hospital
Colchr	Colchester	Colchester General Hospital
Covnt	Coventry	University Hospital Coventry and Warwick
Derby	Derby	Royal Derby Hospital
Donc	Doncaster	Doncaster Royal Infirmary
Dorset	Dorchester	Dorset County Hospital
Dudley	Dudley	Russells Hall Hospital
EssexMS	Essex	Basildon Hospital, Broomfield Hospital and Southend Hospital
Exeter	Exeter	Royal Devon and Exeter Hospital
Glouc	Gloucester	Gloucestershire Royal Hospital
Hull	Hull	Hull Royal Infirmary
Ipswi	Ipswich	Ipswich Hospital
Kent	Kent	Kent and Canterbury Hospital
L Barts	London	St Bartholomew's Hospital and The Royal London Hospital
L Guys	London	Guy's Hospital and St Thomas' Hospital
L Kings	London	King's College Hospital
L Rfree	London	Royal Free, Middlesex and UCL Hospitals
L St.G	London	St George's Hospital and Queen Mary's Hospital
L West	London	Hammersmith, Charing Cross and St Mary's Hospitals
Leeds	Leeds	St James's University Hospital and Leeds General Infirmary
Leic	Leicester	Leicester General Hospital
Liv UH	Liverpool	Aintree University Hospital and Royal Liverpool University Hospital
M RI	Manchester	Manchester Royal Infirmary
Middlbr	Middlesbrough	The James Cook University Hospital
Newc	Newcastle	Freeman Hospital and Royal Victoria Infirmary
Norwch	Norwich	Norfolk and Norwich University Hospital
Nottm	Nottingham	Nottingham City Hospital
Oxford	Oxford	Oxford Radcliffe Hospital
Plymth	Plymouth	Derriford Hospital
Ports	Portsmouth	Queen Alexandra Hospital
Prestn	Preston	Royal Preston Hospital
Redng	Reading	Royal Berkshire Hospital
Salford	Salford	Salford Royal Hospital
Sheff	Sheffield	Northern General Hospital
Shrew	Shrewsbury	Royal Shrewsbury Hospital
Stevng	Stevenage	Lister Hospital
Stoke	Stoke	University Hospital of North Staffordshire
Sund	Sunderland	Sunderland Royal Hospital
Truro	Truro	Royal Cornwall Hospital
Wirral	Birkenhead	Arrowe Park Hospital
Wolve	Wolverhampton	New Cross Hospital
York	York	York District General Hospital

Adult kidney centres Continued

Abbreviation	City	Hospital
NORTHERN IRELAND		
Antrim	Antrim	Antrim Hospital (Northern Trust)
Belfast	Belfast	Belfast City Hospital
Newry	Newry	Daisy Hill Hospital (Southern Trust)
Ulster	Belfast	Ulster Hospital
West NI	Londonderry and Omagh	Tyrone County Hospital (Western Trust)
SCOTLAND		
Abrdn	Aberdeen	Aberdeen Royal Infirmary
Airdrie	Airdrie	University Hospital Monklands
D&Gall	Dumfries	Mountainhall Treatment Centre
Dundee	Dundee	Ninewells Hospital
Edinb	Edinburgh	Royal Infirmary of Edinburgh
Glasgw	Glasgow	Queen Elizabeth University Hospital
Inverns	Inverness	Raigmore Hospital
Klmarnk	Kilmarnock	University Hospital Crosshouse
Krkcldy	Kirkcaldy	Victoria Hospital
WALES		
Bangor	Bangor	Ysbyty Gwynedd
Cardff	Cardiff	University Hospital of Wales
Clwyd	Clwyd	Ysbyty Glan Clwyd Hospital
Swanse	Swansea	Morriston Hospital
Wrexm	Wrexham	Wrexham Maelor Hospital

Paediatric kidney centres

Abbreviation	City	Hospital
ENGLAND		
Bham_P	Birmingham	Birmingham Children's Hospital
Brstl_P	Bristol	Bristol Royal Hospital for Children
L Eve_P	London	Evelina London Children's Hospital
L GOSH_P	London	Great Ormond Street Hospital for Children
Leeds_P	Leeds	Leeds Children's Hospital
Livpl_P	Liverpool	Alder Hey Children's Hospital
Manch_P	Manchester	Royal Manchester Children's Hospital
Newc_P	Newcastle	Great North Children's Hospital
Nottm_P	Nottingham	Nottingham Children's Hospital
Soton_P	Southampton	Southampton Children's Hospital
NORTHERN IRELAND		
Blfst_P	Belfast	Royal Belfast Hospital for Sick Children
SCOTLAND		
Glasg_P	Glasgow	Royal Hospital for Children Glasgow
WALES		
Cardf_P	Cardiff	Children's Kidney Centre University Hospital Wales

Other shortened forms

ACR	albumin creatinine ratio
AKI	acute kidney injury
APD	automated peritoneal dialysis
AVF	arteriovenous fistula
AVG	arteriovenous graft
Bicarb	bicarbonate
BMI	body mass index
Ca	calcium
CAKUT	congenital abnormalities of the kidneys and urinary tract
CAPD	continuous ambulatory peritoneal dialysis
CC	conservative care
CKD-EPI	CKD Epidemiology Collaboration
Chol	cholesterol
CI	confidence interval
CKD	chronic kidney disease
CL	confidence limit
COVID-19	coronavirus disease 2019
Creat	creatinine
DBD	donor after brain death
DBP	diastolic blood pressure
DCD	donor after circulatory death
E	England
eGFR	estimated glomerular filtration rate
ESA	erythropoiesis stimulating agent
ESKD	end-stage kidney disease
FAS	Full Age Spectrum
Ferr	ferritin
GIRFT	Getting It Right First Time
Hb	haemoglobin
HbA1c	glycated haemoglobin
HD	haemodialysis
HES	Hospital Episode Statistics
HHD	home haemodialysis
ICHD	in-centre haemodialysis
IQR	interquartile range
K	potassium
KDIGO	Kidney Disease: Improving Global Outcomes
KRT	kidney replacement therapy
LKD	living kidney donor
MRSA	methicillin-resistant *Staphylococcus aureus*

MSSA	methicillin-sensitive *Staphylococcus aureus*
NHS	National Health Service
NHSBT	NHS Blood and Transplant
NI	Northern Ireland
NICE	National Institute for Clinical Excellence
NTL	non-tunnelled line
PCR	protein creatinine ratio
PD	peritoneal dialysis
PEDW	Patient Episode Database for Wales
Phos	phosphate
pmarp	per million age-related population
pmp	per million population
PRD	primary renal disease
PTH	parathyroid hormone
SBP	systolic blood pressure
SD	standard deviation
SRR	Scottish Renal Registry
TL	tunnelled line
Tx	transplant
UK	United Kingdom
UKHSA	UK Health Security Agency
UKKA	UK Kidney Association
UKRDC	UK Renal Data Collaboration
UKRR	UK Renal Registry
URR	urea reduction ratio
W	Wales

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UK Renal Registry 26th Annual Report

Data to 31/12/2022

The UK Renal Registry

The UKRR was established by the Renal Association in 1995 (now the UK Kidney Association after merging with the British Renal Society in 2020) to collate data centrally from all adult UK kidney centres to improve the care of patients with end-stage kidney disease. Although originally limited to patients on kidney replacement therapies (KRT) – dialysis treatments and kidney transplant recipients – the UKRR now collects cases of acute kidney injury in primary and secondary care and cases of advanced chronic kidney disease in secondary care not on dialysis. Data on children on KRT have been collated by the UKRR since 2009. The UKRR team manages data collection, analysis and reporting on both new and existing patients on KRT each year. The UK Kidney Assciation has an active and involved Patient Council. Each year the UKRR publishes an annual report comprising centre comparisons, attainment of the UK Kidney Association audit standards, national averages and long term trends.

UKKA

UK Kidney Association
UK Renal Registry