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THE RENAL ASSOCIATION
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UK Renal Registry
23rd Annual Report

Data to 31/12/2019

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

UK Renal Registry 23rd Annual Report

Data to 31/12/2019

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Summary of the UKRR 23rd Annual Report – adults

UK Renal Registry (2021) UK Renal Registry Summary of Annual Report – analyses of adult data to the end of 2019, Bristol, UK.
Available from renal.org/audit-research/annual-report

Summary of the UKRR 23rd Annual Report – children and young people

UK Renal Registry (2021) UK Renal Registry Summary of Annual report – analyses of paediatric data to the end of 2019, Bristol, UK.
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Foreword

Professor James Medcalf
Medical director, The Renal Association

It is a pleasure to again write a foreword for the UK Renal Registry (UKRR) Annual Report. It has been a difficult year with COVID-19, but it is a great credit to the renal centres and the staff at the UKRR that this year's report is ready at about the same time as last year.

Report highlights include the inclusion of many of the measures developed in collaboration with Getting It Right First Time (GIRFT) and made possible by the now routine linkage of UKRR data with Hospital Episode Statistics (HES) and Patient Episode Database for Wales (PEDW). Analyses include hospitalisation rates amongst people who are receiving renal replacement therapy (RRT) and the now routine comorbidity-adjusted patient survival. Many more analyses are possible and it is only the cost of HES that precludes more frequent linkage than once a year.

As promised, we have put together a chapter that reports a basic analysis of the chronic kidney disease (CKD) stage 4–5 data from those renal centres that submit usable data. A significant amount of the activity stimulated by GIRFT and the Renal Services Transformation Programme (RSTP) is likely to be in the pre-RRT part of the patient journey. We encourage other centres to start providing these data, because they will be essential to future analyses of the 'conservative management' of people with advanced CKD, in particular.

Over the next few months we will publish an updated dataset that will significantly reduce the number of items that renal centres are asked to send to the UKRR. This reduction is possible because we now routinely link with HES, PEDW and the Public Health England infections databases for some key information. We have also looked critically at what is still routinely required and have consequently removed several items.

The trade-off is that we are again encouraging centres to submit data via the UK Renal Data Collaboration (UKRDC) feed. This is the only practical means to fulfil the frequently voiced phrase 'we want to see timely comparisons of our data'. Two centres are using this routinely and we are currently working with several other system suppliers to design feeds. This change, along with routinely receiving data on any patient with CKD stage 4 or lower under renal centre follow-up, and at the UKRR a commitment to visualise the initial analysis in a slick and largely automated process, will stimulate continued quality improvement.

The annual report of the UKRR provides the opportunity to thank all the renal centres again this year. This is likely to be an important year for us to work together to change our data collection processes to get even more value from the information they share.

Professor James Medcalf
Medical director, The Renal Association, July 2021

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Appendices available from renal.org/audit-research/annual-report

Introduction: The UK Renal Registry's 23rd Annual Report

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

The 23rd Annual Report includes the 8,000 patients who started RRT in 2019, as well as all 68,000 patients who were on RRT at the end of 2019. 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 clinical commissioning group and health board level (appendix B) – renal.org/audit-research/annual-report. Plain English summaries of the annual report have been developed in partnership with the Renal Association's Patient Council and all graphs used in the report are available for use in presentations – renal.org/audit-research/annual-report.

What's new?

The UKRR Annual Report now routinely describes the demographic and clinical features of patients with CKD treated at renal centres who are not on RRT, either because they do not yet require RRT or because they receive conservative care.

Metrics for renal services that were developed by the UKRR in collaboration with the Getting It Right First Time (GIRFT) programme are presented to investigate equity of access to services, outcomes and pathways in nephrology, dialysis and transplantation, and measures of resource use and costs.

This year two renal centres submitted their data via the UK Renal Data Collaboration (UKRDC) daily feed – St Bartholomew's Hospital and The Royal London Hospital, and King's College Hospital. The UKRR is in discussion with one of the big renal IT suppliers to develop a data feed that could be used by other renal IT systems too, which will accelerate the adoption of the UKRDC.

Increasing amounts of data are now available via the data portal – renal.org/audit-research/data-portal. This year 15 measures, including three patient measures, are reported by renal centres grouped by region.

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 more comorbidity data (via linkages) and advanced CKD data are included to understand differences in the transition of patients onto both RRT and conservative non-dialysis pathways. Despite these shortcomings, identifiable centre-specific analyses on the survival of RRT patients are published in the annual report. Although the UKRR has no statutory powers, the UKRR senior management team communicates survival outlier status with renal 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 Renal Association, who then takes action to ensure that the findings are properly investigated.

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Chapter 1

Adults with chronic kidney disease (CKD) and estimated glomerular filtration rate (eGFR) <30mL/min/1.73m^2 in the UK at the end of 2019

Contents

Introduction

From this year onwards, the UKRR will routinely publish data in the annual report about patients with chronic kidney disease (CKD) outside the context of renal replacement therapy (RRT) 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 renal centres at the end of 2019 (figure 1.1). A '2019 prevalent CKD population' is described, comprising individuals who:

- were reported by an adult renal centre as receiving treatment for CKD at the end of 2019, and
- had an eGFR of <30mL/min/1.73m^2 on their last recorded creatinine measurement.

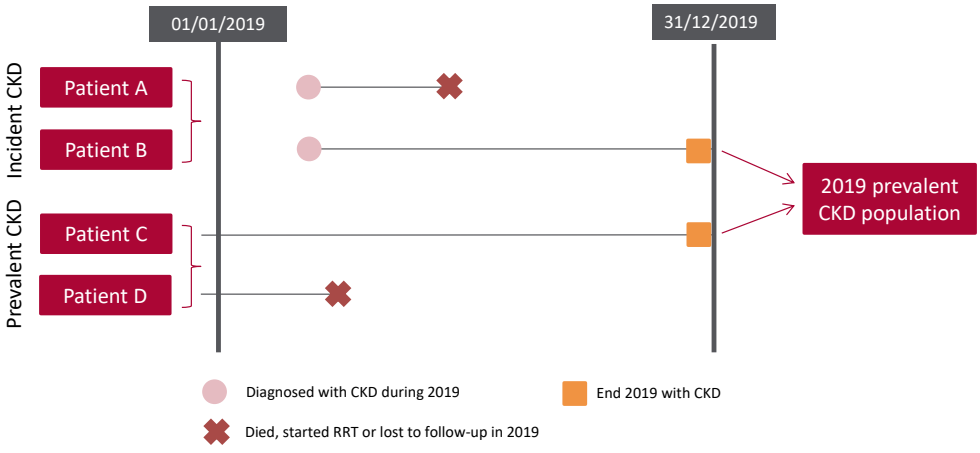

Figure 1.1 Pathways adult patients could follow to be included in the UK 2019 prevalent CKD population

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 15–30mL/min/1.73m^2) using their last recorded creatinine measurement. Patients whose last measurement was over two years old are included, but are reported as 'CKD stage unknown'. 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). The UKRR is developing approaches to combine CKD and AKI reporting systems with HES and will publish these elsewhere. Data relating to survival and initiation of RRT/conservative care (CC) are also being prepared separately.

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 renal centre, particularly those with earlier stages. Furthermore, not all renal 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 renal centres.

Consequently, this first-ever 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, renal 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. Data collection has increased from almost 17,000 patients with CKD stages G4 and 5 at the end of 2016, to more than 34,000 patients at the end of 2019. These numbers will continue to rise – in 2019 the UKRR received data from only 17 of the UK's 70 adult renal centres.

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 Renal Association guidelines (renal.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 renal centres in 2019 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 Renal 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 (renal.org/audit-research/data-portal).

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

The Renal 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 an annual 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 RRT 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.

Key findings

- Data about patients with CKD stages G4 and 5 who were not on RRT were reported by just 17 of the UK's 70 adult renal centres
- The 2019 prevalent CKD population comprised 21,368 patients, with a median age of 78.0 years, compared to a median age of 59.6 years for those on RRT
- CKD prevalence was 1,301 per million population (pmp) overall, but ranged from 149 to 2,793 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 RRT population cannot be addressed until this is achieved.

Analyses

Stage and demographics of adult CKD patients

For the 17 adult renal 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 RRT for the eventuality of kidney failure, and which represent active treatment for an individual who might otherwise have started RRT. 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 31/12/2019, including those on conservative care (CC) by stage and centre; number of CKD and RRT patients as a proportion of the adult catchment population

Centre	N with CKD	N on CC	Total	% stage G4	% stage G5	% stage unknown	Estimated catchment population (millions)	CKD 2019 crude rate (pmp)	RRT 2019 crude rate (pmp)
Bham[1]	805	69	874	70.9	28.7	0.3	2.03	430	1,627
Camb	189	1	190	65.3	28.9	5.8	0.93	205	1,584
Carlis	513	77	590	75.1	15.8	9.2	0.25	2,334	1,199
Covnt	1,588	0	1,588	87.0	12.4	0.6	0.79	2,016	1,366
Derby	1,085	1	1,086	82.1	16.2	1.7	0.56	1,954	1,173
Glouc	1,099	1	1,100	85.5	13.2	1.3	0.51	2,178	1,039
L Rfree	1,961	0	1,961	68.7	27.1	4.2	1.32	1,491	1,782
Leic	3,966	1	3,967	80.5	17.3	2.2	2.07	1,920	1,252
Middlbr	585	0	585	64.3	32.1	3.6	0.80	732	1,188
Oxford	2,166	3	2,169	73.2	22.4	4.4	1.43	1,515	1,375
Plymth	1,076	1	1,077	85.4	13.6	1.0	0.40	2,710	1,336
Ports	2,082	1	2,083	76.6	23.2	0.2	1.73	1,202	1,087
Salford	168	2	170	92.9	7.1	0.0	1.14	149	1,084
Stevng	416	103	519	69.4	28.5	2.1	1.10	472	878
Sthend	491	0	491	81.7	17.5	0.8	0.27	1,812	974
Swanse	2,065	32	2,097	87.2	12.8	0.0	0.75	2,793	1,156
Truro	764	57	821	85.9	14.1	0.0	0.35	2,316	1,266
Total	**21,019**	**349**	**21,368**	**79.0**	**19.0**	**2.0**	**16.42**	**1,301**	**1,302**

[1]The catchment population and 2019 crude rate for RRT reflect the combined Bham population (QEH and Heartlands renal centres), but CKD patients were only reported for QEH.

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 31/12/2019 by centre

				Ethnicity					PRD completeness		
Centre	N with CKD	Median age (yrs)	% male	% White	% Asian	% Black	% Other	% missing	% all stages	% stage G4	% stage G5
Bham	874	69.0	57.2	61.5	24.9	10.1	3.6	10.3	16.6	6.9	39.4
Camb	190	77.1	54.2	95.5	2.2	1.1	1.1	6.3	47.9	31.5	92.7
Carlis	590	78.8	51.2	99.6	0.4	0.0	0.0	20.7	11.2	11.3	14.0
Covnt	1,588	80.0	54.5	90.9	7.9	1.2	0.0	8.0	84.3	83.6	89.8
Derby	1,086	78.3	55.7	92.2	5.3	1.1	1.3	9.9	89.0	88.6	92.6
Glouc	1,100	80.1	59.0	95.5	2.1	1.4	0.9	2.4	55.4	53.8	67.6
L Rfree	1,961	76.0	54.7	57.5	19.9	12.7	10.0	21.7	52.5	51.0	59.8
Leic	3,967	78.8	53.5	82.5	14.5	1.8	1.2	26.4	56.6	54.7	67.2
Middlbr	585	73.3	58.1	93.9	6.1	0.0	0.0	46.5	15.7	12.2	23.9
Oxford	2,169	76.8	57.4	87.2	5.3	3.5	4.0	71.1	15.9	12.0	30.2
Plymth	1,077	80.8	49.9	98.7	0.3	0.1	0.9	4.3	19.8	18.7	26.7
Ports	2,083	76.0	59.3	97.0	2.0	0.4	0.6	34.9	27.4	20.0	52.2
Salford	170	75.6	57.6	82.8	14.1	1.2	1.8	4.1	2.9	1.9	16.7
Stevng	519	81.2	56.1	85.3	9.7	2.5	2.5	46.2	42.8	29.4	77.0
Sthend	491	79.8	56.6	94.1	1.9	1.3	2.7	2.9	39.3	34.2	64.0
Swanse	2,097	79.4	53.3	99.7	0.0	0.3	0.0	81.0	21.9	19.5	38.4
Truro	821	80.2	56.2	99.3	0.4	0.1	0.2	0.1	12.3	8.7	34.5
Total	**21,368**	**78.0**	**55.3**	**86.6**	**8.5**	**2.8**	**2.1**	**30.4**	**40.7**	**38.0**	**53.5**

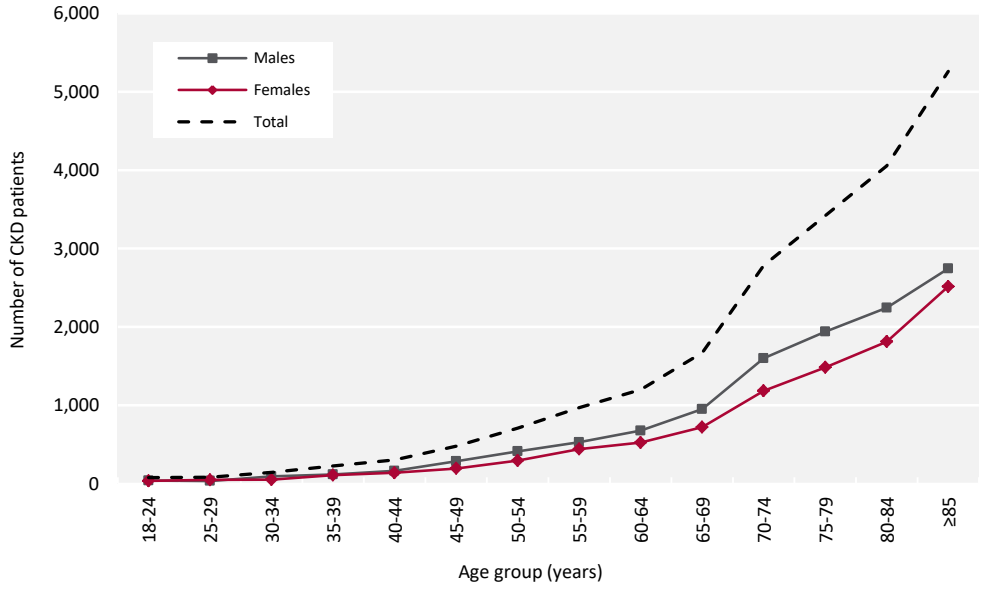

Figure 1.2 Number of adult patients prevalent to CKD stages G4 and 5 on 31/12/2019 by age group and sex

Blood pressure in adult CKD patients

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

Table 1.4 Blood pressures in adult patients prevalent to CKD stages G4 and 5 on 31/12/2019 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	3866 (37.6)	141	75	1706 (44.1)	2749 (33.8)	140	75	1276 (46.4)	1115 (55.7)	145	75	429 (38.5)
Age group (yrs)												
18-29	56 (62.9)	136	82	32 (57.1)	37 (58.7)	130	81	25 (67.6)	19 (73.1)	141	87	7 (36.8)
30-39	92 (50.0)	137	86	44 (47.8)	72 (49.3)	135	85	37 (51.4)	20 (57.1)	142	86	7 (35.0)
40-49	236 (57.7)	137	84	111 (47.0)	177 (56.2)	136	83	89 (50.3)	59 (67.0)	140	86	22 (37.3)
50-59	397 (47.9)	141	81	172 (43.3)	280 (44.8)	139	80.5	131 (46.8)	117 (60.3)	145	81	41 (35.0)
60-64	287 (48.6)	142	78	130 (45.3)	199 (44.9)	139	77	96 (48.2)	88 (65.2)	146	80	34 (38.6)
65-69	348 (43.0)	140	74	166 (47.7)	246 (39.3)	138	74.5	124 (50.4)	102 (58.3)	143.5	73	42 (41.2)
70-74	548 (39.7)	141	74	240 (43.8)	387 (35.2)	140	75	173 (44.7)	161 (58.8)	145	72	67 (41.6)
75-79	652 (38.7)	144	73	268 (41.1)	484 (35.5)	144	73	204 (42.1)	167 (56.0)	146	73	63 (37.7)
80-84	662 (34.8)	140	71	303 (45.8)	473 (30.8)	140	71	230 (48.6)	189 (55.3)	146	72	73 (38.6)
≥85	588 (24.5)	144	70	240 (40.8)	394 (20.5)	142	70	167 (42.4)	193 (44.5)	147	70	73 (37.8)
Sex												
Male	2187 (38.3)	140	75	997 (45.6)	1543 (34.3)	140	75	723 (46.9)	642 (55.5)	142	75	273 (42.5)
Female	1679 (36.8)	142	75	709 (42.2)	1206 (33.0)	140	75	553 (45.9)	473 (56.0)	148	76	156 (33.0)

[1]% <140/90 mmHg of patients with complete blood pressure data.
The total includes the patients with old eGFR measurements who were classed as 'unknown stage'.
DBP – diastolic blood pressure; SBP – systolic blood pressure (both measured in mmHg)

Biochemistry parameters in adult CKD patients

The Renal 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.

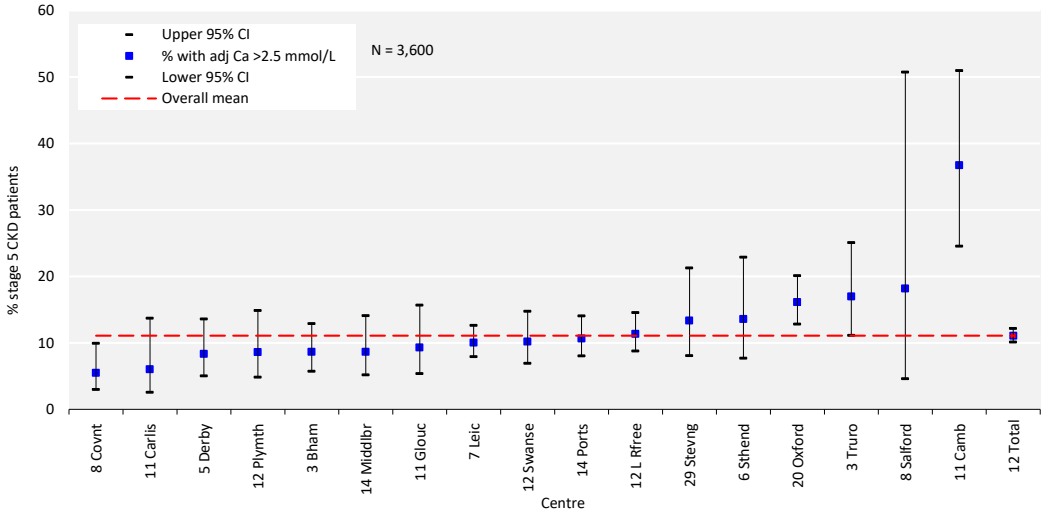

Figure 1.3 Percentage of adult patients prevalent to CKD stage G5 on 31/12/2019 with adjusted serum calcium (Ca) >2.5 mmol/L by centre

Anaemia in adult CKD patients

The percentage of patients with haemoglobin (Hb) 100–120 g/L is presented overall and by CKD stage. Inadequate data completeness in relation to erythropoiesis stimulating agents (ESAs) makes auditing against national guidelines difficult. Completeness of ESA data in the prevalent CKD population with eGFR ≤30 mL/min/1.73m^2 is shown in table 1.5.

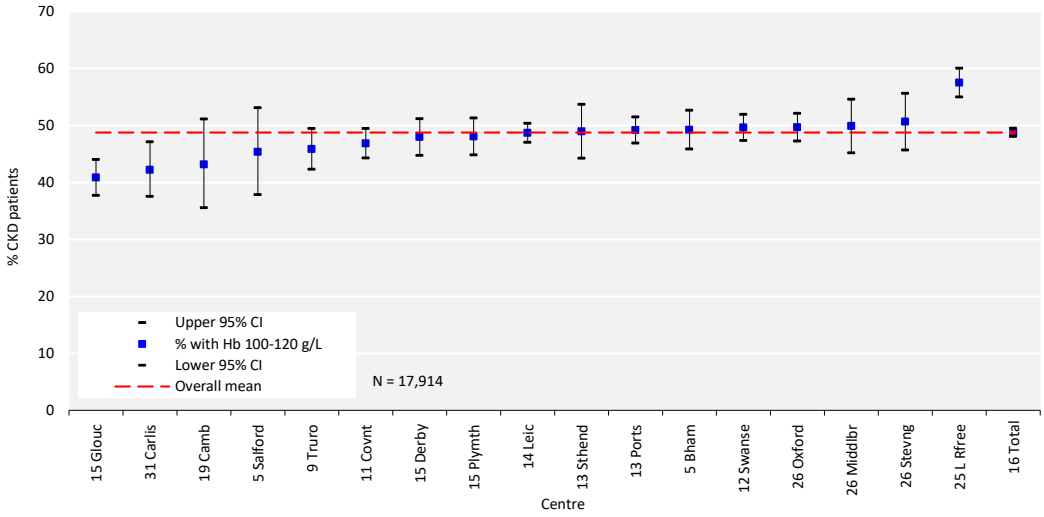

Figure 1.4 Percentage of adult patients prevalent to CKD stages G4 and 5 on 31/12/2019 with haemoglobin (Hb) 100–120 g/L by centre

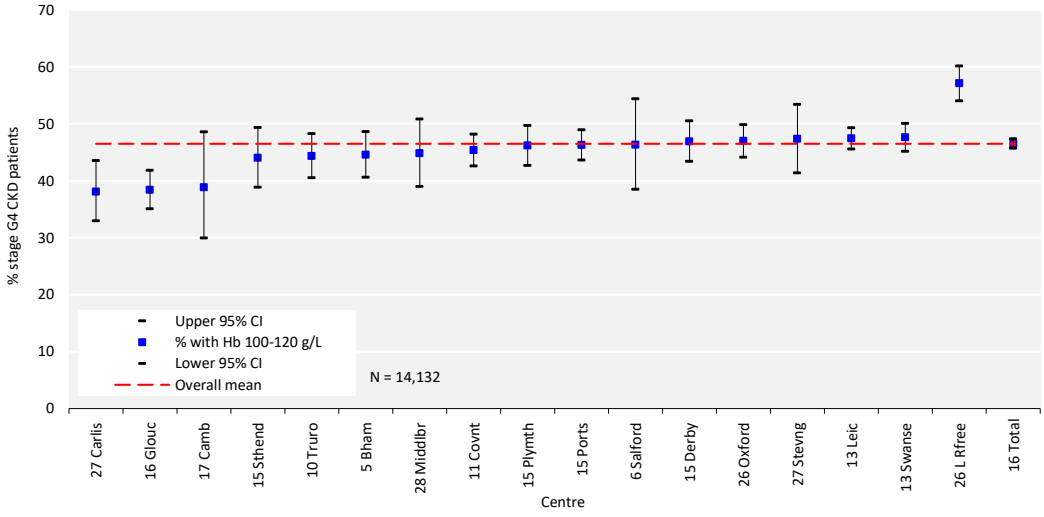

Figure 1.5 Percentage of adult patients prevalent to CKD stage G4 on 31/12/2019 with haemoglobin (Hb) 100–120 g/L by centre

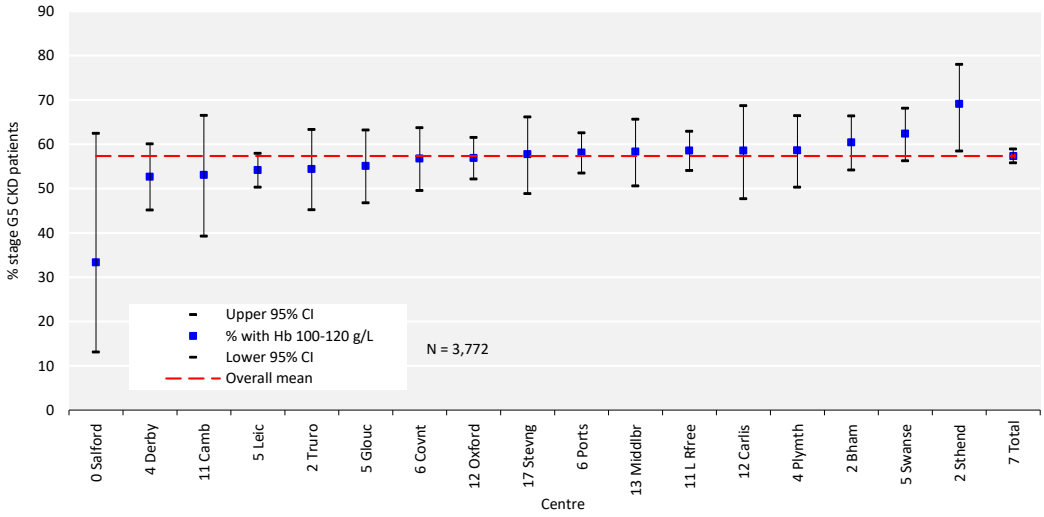

Figure 1.6 Percentage of adult patients prevalent to CKD stage G5 on 31/12/2019 with haemoglobin (Hb) 100-120 g/L by centre

Table 1.5 Completeness of erythropoiesis stimulating agent (ESA) data for adult patients prevalent to CKD stages G4 and 5 on 31/12/2019

	All stages	Stage G4	Stage G5
Number of centres	7	7	7
N on ESA	986	570	412
% on ESA	14.7	10.8	34.1
Range of % on ESA	8.2–21.2	7–15.8	23.4–42.4

The total includes the patients with old eGFR measurements who were classed as 'unknown stage'.

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Chapter 2

Adults starting renal replacement therapy (RRT) for end-stage kidney disease (ESKD) in the UK in 2019

Contents

Introduction

This chapter describes the population of patients who developed end-stage kidney disease (ESKD) and started renal replacement therapy (RRT) in the UK in 2019 (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 renal centre, were only included if their dialysis was subsequently recoded as being for ESKD, when they failed to recover native renal function. Recoding is automatically applied at 90 days for individuals still on RRT (unless advised otherwise by the renal 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 renal function, died or withdrew from dialysis within the first 90 days of treatment are being analysed separately to this report and are therefore 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 renal function are not included if they recovered before 90 days on dialysis.

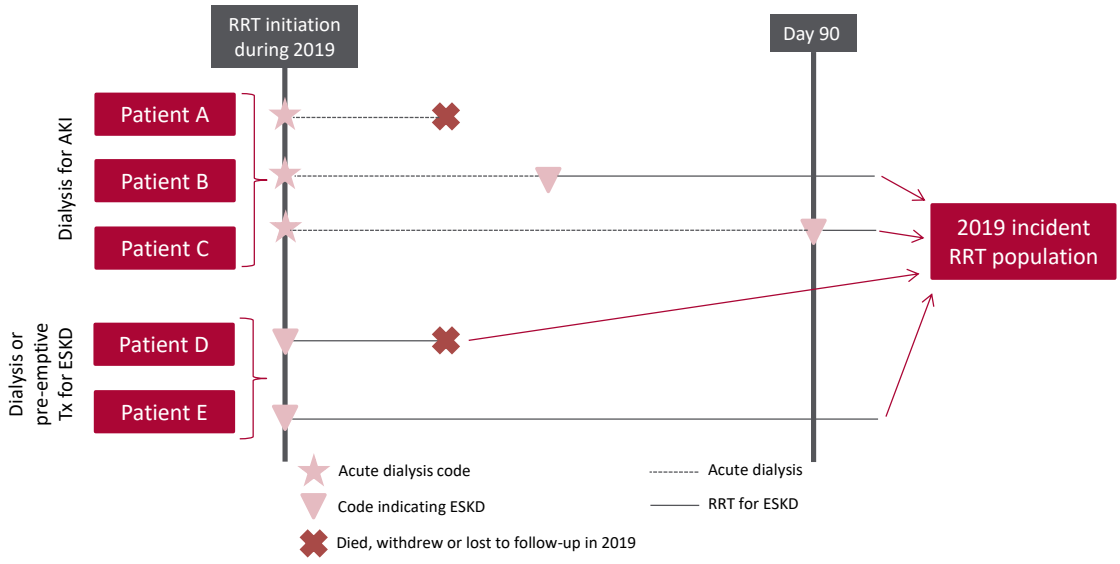

Figure 2.1 Example histories for patients starting RRT, illustrating the use of timeline codes to define dialysis as being 'acute' or for ESKD

Note that patients who recovered renal function before 90 days on dialysis are not included in this chapter, whether they were coded as AKI or ESKD.
Note that patients who followed patterns B–E received RRT for ESKD and are counted as 'incident to RRT' throughout this report. Patients who followed pattern A are not counted as 'incident to RRT' 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. Dialysis access data were collected separately to the main UKRR quarterly data returns via the 2019 Multisite Dialysis Access Audit. This year, fewer data items were collected to reduce the burden on centres and, in future years, the audit will be stopped entirely in centres that provide the data in their regular data returns to the UKRR.

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

- **Modality selection, pre-emptive transplantation and Tx wait-listing:** the percentage of patients starting on each RRT 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 renal services within 90 days of starting RRT 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 2019 incident adult RRT population, including the incident number on RRT per million population (pmp). The inclusion of centre-specific reports on the survival of RRT 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 renal centre data. Comorbidity data have been augmented using Hospital Episode Statistics (HES) for English renal centres and Patient Episode Database for Wales (PEDW) for Welsh renal centres.

The Renal Association guidelines (renal.org/health-professionals/guidelines/guidelines-commentaries) provide audit measures relevant to the care of patients incident to RRT and, where data permit, their attainment by UK renal centres in 2019 is reported in this chapter (table 2.1). 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 is too low. Further detail about the completeness of data returned to the UK Renal Registry (UKRR) is available through the UKRR data portal (renal.org/audit-research/data-portal). 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.

Table 2.1 The Renal Association audit measures relevant to RRT incidence that are reported in this chapter

The Renal Association guideline	Audit criteria	Related analysis/analyses
Planning, initiating and withdrawing RRT (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 RRT	Tables 2.6–2.8, figures 2.6–2.7
	Percentage of patients commencing RRT referred <3 months and <12 months before date of starting RRT	Tables 2.9–2.12, figure 2.8
	Proportion of patients on UK Tx waiting list at RRT initiation	Table 2.3
	Proportion of RRT patients transplanted pre-emptively from living and deceased donors	Table 2.3, figure 2.6 (partly addressed)
	Estimated glomerular filtration rate (eGFR) at start of RRT 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 (2017)	Proportion of patients initiating RRT with haemoglobin <100 g/L not on erythropoiesis stimulating agent (ESA)	Table 2.13, figure 2.11 (ESA data completeness poor so not included)
Chronic kidney disease (CKD) mineral bone disorder (2018)	Percentage of RRT 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)	>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 RRT modality of PD patients at 1 year

AVF – arteriovenous fistula; AVG – arteriovenous graft

Key findings

- 7,945 adult patients started RRT for ESKD in the UK in 2019, a decrease of 1.6% from 2018
- RRT incidence in adults was 151 pmp, comparable to the rate of 152 pmp in 2018
- The median age of incident RRT patients was 64.2 years, but this was dependent on ethnicity (White 66.3 years, Asian 62.3 years and Black 56.3 years)
- 63.5% of incident RRT patients were male
- Diabetes remained the most common identifiable primary renal disease (PRD) for patients starting RRT (30.4%)
- By 90 days, 66.2% of patients were on HD (including HHD), 19.6% on PD, 9.3% had a functioning Tx and 5.0% had died or stopped treatment
- The mean eGFR at the start of RRT was 7.3 mL/min/1.73m^2 (HD 7.1 mL/min/1.73m^2, PD 7.4 mL/min/1.73m^2 and pre-emptive Tx 10.0 mL/min/1.73m^2)
- Late presentation was 16.2%
- Of the 5,890 incident dialysis patients with dialysis access data, 54.4% started dialysis with definitive access (23.1% PD and 31.3% HD with an AVF or AVG), 29.4% with a TL and 16.2% with an NTL
- Short-term (90 day) age-adjusted survival of incident RRT patients in a combined 2 year cohort (2017–2018) was 96.7%, which was the same as in the analysis of the 2016–2017 cohort
- 1 year after 90 day age-adjusted survival for incident RRT patients in a combined 2 year cohort (2017–2018) was 91.0% (compared to 90.9% in the previous analysis of the 2016–2017 cohort)
- There were 8 outlying centres in the funnel plot showing 1 year after 90 day age-adjusted survival for incident RRT patients in a combined 4 year cohort (2015–2018): 4 centres below the lower 95% limit and 4 centres above the upper 95% limit. After further adjustment for sex and comorbidities, only 1 centre (Preston) remained below the lower 95% limit and 2 centres (London King's and London Barts) above the upper 95% limit. It is expected that 3 centres would be outside the limits by chance
- There was no cause of death data available for 42.5% of deaths in the first 90 days of RRT. For those with data, the leading causes of death in the first 90 days were cardiac disease (24.0%) and infection (20.3%).

Analyses

Changes to the incident adult RRT population

For the 70 adult renal centres, the number of incident patients on RRT was calculated as a proportion of the estimated centre catchment population (calculated as detailed in appendix A).

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

Centre	N on RRT					Estimated catchment population (millions)	2019 crude rate (pmp)
	2015	2016	2017	2018	2019		
ENGLAND							
Basldn	53	49	48	50	53	0.34	155
Bham	365	376	386	371	369	2.03	181
Bradfd	91	88	82	71	104	0.49	214
Brightn	142	149	155	177	149	1.07	140
Bristol	145	154	157	167	159	1.21	131
Camb	102	102	86	115	118	0.93	127
Carlis	47	36	42	33	41	0.25	162
Carsh[1]	260	246	231	244	200	1.61	124
Chelms	50	55	43	33	48	0.37	129
Colchr	28	29	45	38	40	0.29	138
Covnt	108	136	119	129	140	0.79	178
Derby	61	87	89	84	89	0.56	160
Donc	39	64	57	52	53	0.37	143
Dorset	75	71	102	106	90	0.72	125
Dudley	51	53	59	53	53	0.34	156
Exeter	138	144	140	134	152	0.94	161
Glouc	72	70	82	72	61	0.51	121
Hull	123	92	106	104	106	0.79	134
Ipswi	67	43	53	58	57	0.31	184
Kent	144	144	140	137	150	1.06	142
L Barts	308	290	343	345	278	1.57	177
L Guys	177	166	167	183	210	1.00	211
L Kings	181	153	170	149	183	0.92	198
L Rfree	238	237	236	244	264	1.32	201
L St.G	115	91	92	84	102	0.66	155
L West	333	386	408	392	391	1.95	201
Leeds	144	166	176	180	161	1.36	118
Leic	269	321	292	312	368	2.07	178
Liv Ain	61	51	55	65	37	0.43	86
Liv Roy	141	111	137	99	68	0.80	85
M RI	197	212	225	187	206	1.32	156
Middlbr	133	100	117	118	109	0.80	136
Newc	124	132	145	136	114	0.94	121
Norwch	118	103	80	82	103	0.68	151
Nottm	124	122	134	125	125	0.92	136
Oxford	192	213	216	217	206	1.43	144
Plymth	53	61	91	64	62	0.40	156
Ports	201	215	220	222	219	1.73	126
Prestn	163	141	167	180	154	1.22	126
Redng	87	95	105	104	117	0.69	169
Salford	173	192	173	162	171	1.14	150

Table 2.2 Continued

Centre	N on RRT 2015	2016	2017	2018	2019	Estimated catchment population (millions)	2019 crude rate (pmp)
Sheff	147	150	159	185	154	1.12	137
Shrew	62	58	64	78	64	0.41	157
Stevng	134	163	141	175	193	1.10	176
Sthend	35	48	50	43	44	0.27	162
Stoke	118	114	98	101	94	0.72	130
Sund	63	94	95	89	86	0.54	159
Truro	70	48	58	61	58	0.35	164
Wirral	63	66	61	62	63	0.47	135
Wolve	87	70	84	94	86	0.54	158
York	60	73	59	52	58	0.48	121
N IRELAND							
Antrim	36	40	47	56	42	0.24	173
Belfast	89	95	77	71	76	0.53	144
Newry	31	28	28	32	25	0.23	107
Ulster	33	31	31	31	25	0.20	124
West NI	41	36	34	41	37	0.25	149
SCOTLAND							
Abrdn	66	52	54	58	29	0.50	58
Airdrie	64	62	66	64	70	0.46	153
D&Gall	12	12	16	18	17	0.12	139
Dundee	46	44	55	36	27	0.37	74
Edinb	96	86	126	106	109	0.84	130
Glasgw	221	198	202	210	203	1.37	148
Inverns	34	20	25	37	17	0.22	76
Klmarnk	39	53	49	38	44	0.29	151
Krkcldy	44	32	41	38	46	0.27	169
WALES							
Bangor	29	23	27	26	19	0.16	117
Cardff	160	165	180	190	166	1.15	145
Clwyd	28	18	24	32	29	0.18	162
Swanse	135	129	132	142	156	0.75	208
Wrexm	45	47	25	29	28	0.21	136
TOTALS							
England	**6,532**	**6,630**	**6,840**	**6,818**	**6,780**	**44.33**	**153**
N Ireland	**230**	**230**	**217**	**231**	**205**	**1.45**	**141**
Scotland	**622**	**559**	**634**	**605**	**562**	**4.43**	**127**
Wales	**397**	**382**	**388**	**419**	**398**	**2.45**	**163**
UK	**7,781**	**7,801**	**8,079**	**8,073**	**7,945**	**52.67**	**151**

Country RRT populations were calculated by summing the RRT 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 renal centre.

Carshalton discovered a problem related to the submission of PD patients after the closing date. As a consequence, 26 incident PD patients are not included in this report. No adjustment has been made this year, but the problem has been resolved and numbers will be correct next year.

pmp – per million population

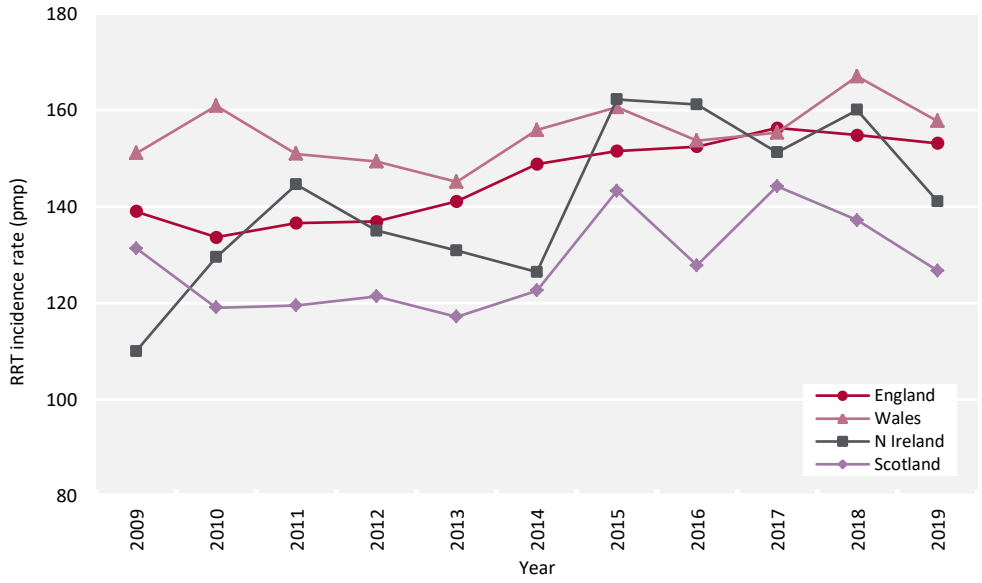

Figure 2.2 Adult RRT incidence rates by country between 2009 and 2019
pmp – per million population

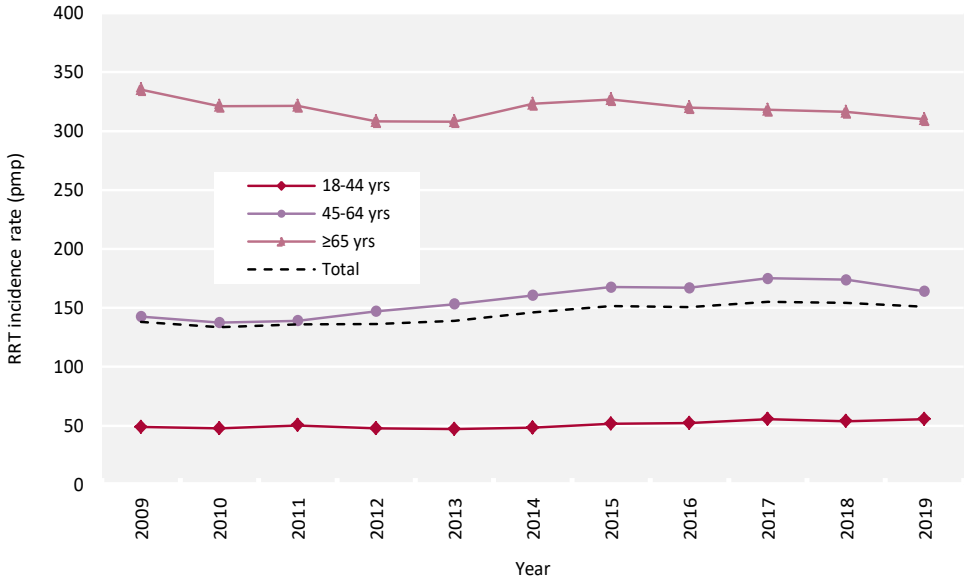

Figure 2.3 Adult RRT incidence rates by age group between 2009 and 2019
pmp – per million population

Demographics and start modality of incident adult RRT patients

The proportion of RRT 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 RRT in 2019 by centre

Centre	N on RRT	% on ICHD	% on PD	% on HHD	% with Tx	% pre-emptive listing/ Tx	Median age (yrs)	% male	Ethnicity				
									% White	% Asian	% Black	% Other	% missing
ENGLAND													
Basldn	53	79.3	17.0	0.0	3.8	9.4	61.7	56.6	86.0	6.0	8.0	0.0	5.7
Bham	369	67.8	26.8	0.0	5.4	18.7	63.0	56.4	58.3	27.5	11.8	2.5	3.3
Bradfd	104	82.7	17.3	0.0	0.0	9.6	62.4	64.4	54.8	41.3	1.0	2.9	0.0
Brightn	149	79.2	14.8	0.0	6.0	14.8	67.2	63.1	91.1	4.0	1.6	3.2	16.8
Bristol	159	75.5	16.4	0.0	8.2	16.4	64.8	69.2	88.9	2.8	6.3	2.1	9.4
Camb	118	60.2	10.2	0.0	29.7	37.3	64.9	66.1	95.2	2.9	1.0	1.0	11.0
Carlis	41	65.9	34.2	0.0	0.0	7.3	67.6	56.1	100.0	0.0	0.0	0.0	0.0
Carsh[1]	200	89.5	5.5	0.5	4.5	10.0	66.9	65.0	69.4	16.7	8.9	5.0	10.0
Chelms	48	70.8	25.0	0.0	4.2	12.5	69.4	70.8	89.5	5.3	2.6	2.6	20.8
Colchr	40	100.0	0.0	0.0	0.0	7.5	72.2	57.5	89.7	2.6	0.0	7.7	2.5
Covnt	140	61.4	30.0	0.7	7.9	23.6	66.1	65.0	75.0	21.4	3.6	0.0	0.0
Derby	89	66.3	24.7	5.6	3.4	14.6	68.5	59.6	80.5	14.9	4.6	0.0	2.2
Donc	53	77.4	22.6	0.0	0.0	11.3	66.6	67.9	94.3	1.9	1.9	1.9	0.0
Dorset	90	80.0	14.4	0.0	5.6	13.3	70.0	72.2	96.5	2.4	0.0	1.2	5.6
Dudley	53	71.7	20.8	0.0	7.6	15.1	71.7	77.4	81.1	13.2	5.7	0.0	0.0
Exeter	152	78.3	17.8	0.7	3.3	10.5	70.4	67.1	98.0	0.0	1.3	0.7	1.3
Glouc	61	82.0	14.8	0.0	3.3	16.4	73.5	77.0	90.2	1.6	4.9	3.3	0.0
Hull	106	73.6	18.9	0.0	7.6	17.9	64.7	71.7	93.4	1.9	2.8	1.9	0.0
Ipswi	57	66.7	28.1	0.0	5.3	12.3	71.3	68.4	75.0	0.0	4.2	20.8	15.8
Kent	150	71.3	20.7	0.7	7.3	14.7	65.5	62.0	95.7	2.9	0.0	1.4	7.3
L Barts	278	57.9	33.8	0.0	8.3	22.3	60.0	60.8	29.8	37.5	21.8	10.9	10.8
L Guys	210	74.8	12.9	0.0	12.4	22.4	60.5	60.5	50.0	10.5	36.3	3.2	9.5
L Kings	183	72.1	24.6	0.0	3.3	8.7	56.4	67.8	43.6	12.7	35.2	8.5	9.8
L Rfree	264	62.5	29.6	0.0	8.0	20.5	60.7	64.8	48.9	20.4	18.6	12.2	16.3
L St.G	102	68.6	24.5	0.0	6.9	13.7	66.9	65.7	29.0	28.0	23.7	19.4	8.8
L West	391	73.7	18.7	0.0	7.7	18.7	63.8	60.6	40.7	41.2	16.4	1.8	0.0
Leeds	161	75.2	17.4	0.0	7.5	26.1	61.0	68.9	74.5	19.9	3.7	1.9	0.0
Leic	368	68.8	20.9	0.0	10.3	26.1	64.8	64.1	73.3	19.8	5.2	1.8	10.6
Liv Ain	37	78.4	16.2	2.7	2.7	18.9	67.4	62.2	100.0	0.0	0.0	0.0	2.7
Liv Roy	68	64.7	14.7	4.4	16.2	22.1	65.3	66.2	93.2	3.4	1.7	1.7	13.2
M RI	206	71.8	20.9	0.5	6.8	15.0	63.0	64.1	62.0	19.8	15.1	3.1	6.8
Middlbr	109	77.1	12.8	0.0	10.1	19.3	60.9	66.1	92.7	7.3	0.0	0.0	0.0
Newc	114	67.5	19.3	0.0	13.2	26.3	62.4	58.8	96.5	1.8	0.9	0.9	0.9
Norwch	103	75.7	20.4	0.0	3.9	9.7	67.6	67.0	97.0	0.0	1.0	2.0	2.9
Nottm	125	60.8	28.8	0.0	10.4	16.8	63.5	63.2	88.8	7.2	2.4	1.6	0.0
Oxford	206	61.2	18.0	0.0	20.9	33.0	63.4	59.7	81.0	10.2	2.7	6.1	28.6
Plymth	62	72.6	17.7	0.0	9.7	21.0	70.7	67.7	98.4	0.0	0.0	1.6	0.0
Ports	219	73.1	17.8	0.9	8.2	21.9	65.4	61.6	92.0	4.0	1.7	2.3	19.6
Prestn	154	69.5	18.2	0.7	11.7	25.3	64.4	57.1	80.4	18.3	1.3	0.0	0.6
Redng	117	59.8	30.8	0.0	9.4	14.5	63.7	68.4	70.3	22.0	5.5	2.2	22.2
Salford	171	62.0	23.4	0.0	14.6	32.2	61.0	70.2	81.2	14.1	3.5	1.2	0.6
Sheff	154	79.9	12.3	3.3	4.6	14.3	62.7	63.6	85.7	7.5	2.7	4.1	4.5
Shrew	64	62.5	29.7	3.1	4.7	14.1	70.4	64.1	88.9	4.8	1.6	4.8	1.6
Stevng	193	80.3	13.0	2.6	4.2	21.2	62.7	67.9	75.2	12.1	8.3	4.5	18.7

Table 2.3 Continued

Centre	N on RRT	% on ICHD	% on PD	% on HHD	% with Tx	% pre-emptive listing/ Tx	Median age (yrs)	% male	Ethnicity				
									% White	% Asian	% Black	% Other	% missing
Sthend	44	59.1	34.1	0.0	6.8	13.6	68.0	68.2	93.2	2.3	0.0	4.5	0.0
Stoke	94	62.8	33.0	0.0	4.3	20.2	67.7	64.9	92.4	5.4	2.2	0.0	2.1
Sund	86	76.7	16.3	0.0	7.0	22.1	62.2	51.2	95.3	4.7	0.0	0.0	1.2
Truro	58	79.3	19.0	0.0	1.7	10.3	70.5	63.8	98.3	1.7	0.0	0.0	0.0
Wirral	63	76.2	20.6	0.0	3.2	14.3	66.9	69.8	96.8	1.6	0.0	1.6	0.0
Wolve	86	75.6	17.4	5.8	1.2	8.1	67.5	59.3	62.8	27.9	5.8	3.5	0.0
York	58	65.5	24.1	0.0	10.3	19.0	70.1	62.1	98.3	0.0	0.0	1.7	0.0
N IRELAND													
Antrim	42	69.1	16.7	0.0	14.3	23.8	69.2	61.9	100.0	0.0	0.0	0.0	2.4
Belfast	76	54.0	15.8	0.0	30.3	47.4	62.7	61.8					34.2
Newry	25	80.0	4.0	0.0	16.0	24.0	60.4	72.0	100.0	0.0	0.0	0.0	12.0
Ulster	25	80.0	8.0	0.0	12.0	12.0	70.8	72.0	92.0	0.0	4.0	4.0	0.0
West NI	37	70.3	21.6	0.0	8.1	24.3	56.3	67.6	100.0	0.0	0.0	0.0	0.0
SCOTLAND													
Abrdn	29	75.9	24.1	0.0	0.0	20.7	61.1	65.5					100.0
Airdrie	70	85.7	14.3	0.0	0.0	15.7	62.6	61.4	94.9	5.1	0.0	0.0	15.7
D&Gall	17	76.5	23.5	0.0	0.0	35.3	66.2	52.9					82.4
Dundee	27	81.5	18.5	0.0	0.0	22.2	59.0	63.0					100.0
Edinb	109	58.7	15.6	0.0	25.7	43.1	58.5	60.6					96.3
Glasgw	203	71.4	13.3	0.0	15.3	35.5	59.4	56.7					70.9
Inverns	17	82.4	17.7	0.0	0.0	29.4	55.0	58.8					100.0
Klmarnk	44	75.0	25.0	0.0	0.0	13.6	72.0	59.1					77.3
Krkcldy	46	78.3	19.6	2.2	0.0	15.2	60.8	65.2					100.0
WALES													
Bangor	19	63.2	36.8	0.0	0.0	5.3	71.5	57.9					47.4
Cardff	166	67.5	22.9	0.0	9.6	18.7	64.5	58.4	89.0	8.4	1.3	1.3	6.6
Clwyd	29	82.8	17.2	0.0	0.0	3.4	66.6	58.6					37.9
Swanse	156	75.0	16.0	0.6	8.3	17.3	67.0	65.4	97.4	1.9	0.6	0.0	0.0
Wrexm	28	75.0	25.0	0.0	0.0	3.6	64.5	67.9	96.2	3.8	0.0	0.0	7.1
TOTALS													
England	**6,780**	**71.1**	**20.5**	**0.5**	**7.9**	**18.9**	**64.5**	**63.9**	**73.6**	**14.9**	**8.1**	**3.4**	**7.3**
N Ireland	**205**	**66.3**	**14.6**	**0.0**	**19.0**	**31.2**	**63.4**	**65.4**	**98.3**	**0.6**	**0.6**	**0.6**	**14.6**
Scotland	**562**	**72.8**	**16.6**	**0.2**	**10.5**	**29.5**	**61.0**	**59.6**					**76.0**
Wales	**398**	**71.9**	**20.6**	**0.3**	**7.3**	**15.3**	**65.5**	**61.8**	**93.4**	**4.9**	**1.1**	**0.5**	**8.3**
UK	**7,945**	**71.1**	**20.1**	**0.5**	**8.3**	**19.8**	**64.2**	**63.5**	**75.6**	**13.8**	**7.4**	**3.1**	**12.4**

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.
Carshalton discovered a problem related to the submission of PD patients after the closing date. As a consequence, 26 incident PD patients are not included in this report. No adjustment has been made this year, but the problem has been resolved and numbers will be correct next year.

PRDs were grouped into categories as shown in table 2.4, with the mapping of disease codes into groups explained in more detail in appendix A. The proportion of RRT 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.

The longitudinal trend of the PRD distribution, showing an increase in diabetes as the PRD, is presented in table 2.5.

Table 2.4 Demographics, primary renal diseases (PRDs), referral time and start modality of adult patients incident to RRT in 2019 by age group

	Age group (yrs)								
Characteristic	18-34	35-44	45-54	55-64	65-74	75-84	≥85	Total	Median age (yrs)
Total									
N	636	646	1,161	1,665	2,025	1,566	246	7,945	64.2
%	8.0	8.1	14.6	21.0	25.5	19.7	3.1		
Sex (%)									
Male	56.0	61.9	60.8	62.2	63.8	68.6	74.0	63.5	65.2
Female	44.0	38.1	39.2	37.8	36.2	31.4	26.0	36.5	62.7
Ethnicity (%)									
White	71.5	65.6	68.7	70.4	80.8	81.8	86.8	75.3	66.3
Asian	14.5	16.3	15.3	16.8	13.0	11.1	8.2	14.0	62.3
Black	9.2	12.8	12.1	9.1	3.9	5.3	3.2	7.5	56.3
Other	4.8	5.4	3.9	3.8	2.3	1.8	1.8	3.2	57.7
Missing	7.3	6.9	7.7	7.7	7.0	8.1	7.6	7.5	64.5
PRD (%)									
Diabetes	21.3	26.2	33.3	38.0	31.8	25.5	17.1	30.4	62.9
Glomerulonephritis	24.1	21.4	15.4	12.9	9.1	9.1	7.6	13.0	57.1
Hypertension	5.2	7.4	8.0	6.8	7.1	8.0	7.6	7.2	64.5
Polycystic kidney disease	3.3	10.3	12.6	9.7	4.5	3.6	0.5	6.9	56.7
Pyelonephritis	7.6	4.1	4.0	4.7	5.7	6.5	6.6	5.4	66.8
Renal vascular disease	0.3	1.9	0.7	2.9	6.8	11.5	18.5	5.4	75.7
Other	24.3	16.4	16.1	13.7	18.9	15.4	16.1	16.8	64.5
Uncertain aetiology	13.9	12.5	9.9	11.3	16.0	20.5	26.1	14.8	69.5
Missing	9.3	9.4	9.0	9.5	10.3	11.0	14.2	10.0	65.8
Referral time (%)									
<90 days	23.0	21.3	15.0	15.1	16.4	13.9	17.3	16.4	63.0
≥90 days	77.0	78.7	85.0	84.9	83.6	86.1	82.7	83.6	64.9
Missing	6.1	10.0	6.8	6.3	5.9	6.3	5.5	6.5	62.4
Start modality (%)									
ICHD	56.6	59.1	61.0	71.2	76.3	80.7	82.5	71.1	66.5
HHD	0.2	0.3	0.8	0.5	0.5	0.2	0.4	0.5	61.0
PD	27.7	26.5	23.7	18.6	17.1	17.7	17.1	20.1	60.6
Tx	15.6	14.1	14.6	9.6	6.0	1.4	0.0	8.3	53.6

Scotland was excluded both from analyses of ethnicity and referral time, because Scottish renal centres had low completeness of ethnicity data and used a different definition of referral time.

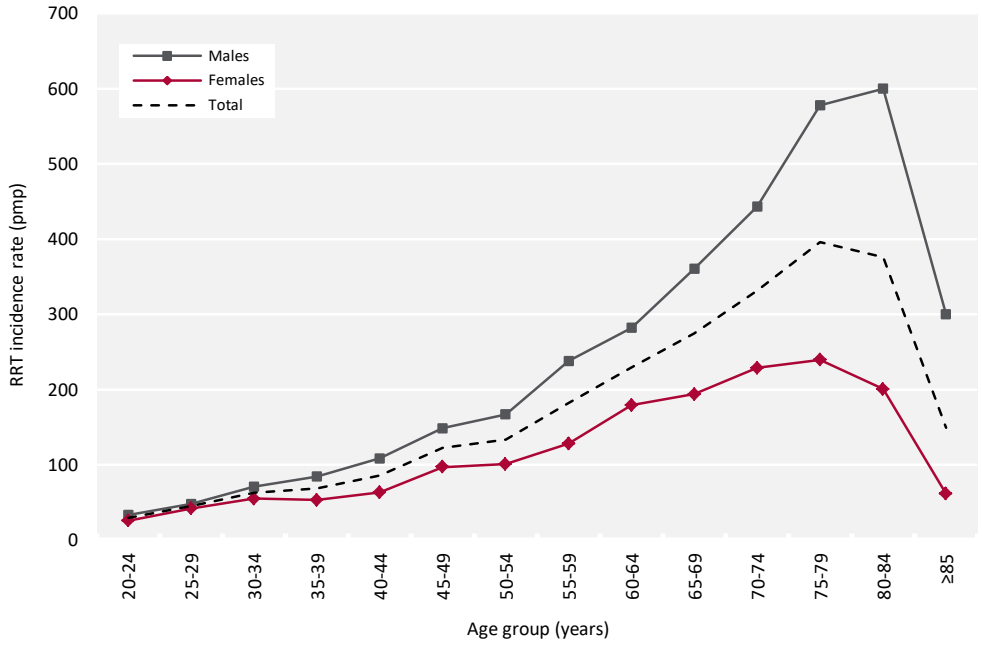

Figure 2.4 Incidence rates for adult patients starting RRT in 2019 by age group and sex
pmp – per million population

Table 2.5 Change in primary renal disease (PRD) of adult patients incident to RRT from 2010 to 2019

	Year of RRT start									
PRD	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Diabetes	23.7	23.9	25.3	25.2	26.2	26.9	27.5	28.5	29.6	30.4
Glomerulonephritis	13.4	12.9	13.7	14.2	13.0	13.4	13.3	13.6	13.0	13.0
Hypertension	6.7	6.9	7.3	7.6	6.3	6.7	6.1	6.3	6.6	7.2
Polycystic kidney disease	6.9	7.4	6.8	7.6	6.5	7.2	6.7	6.8	7.0	6.9
Pyelonephritis	7.2	6.7	6.7	6.6	5.7	6.3	6.2	5.6	5.1	5.4
Renal vascular disease	7.2	6.6	6.2	5.3	6.0	5.9	6.1	5.7	5.6	5.4
Other	15.9	16.7	17.5	18.1	19.8	18.6	18.6	18.9	18.8	16.8
Uncertain aetiology	19.0	18.8	16.5	15.4	16.5	15.1	15.5	14.7	14.4	14.8
Missing	2.9	4.0	2.1	3.7	1.9	2.8	3.5	6.7	5.3	10.0

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 for transplant and transplant 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 RRT treatment in 2019. Please visit the UKRR data portal (renal.org/audit-research/data-portal) to identify individual renal centres.

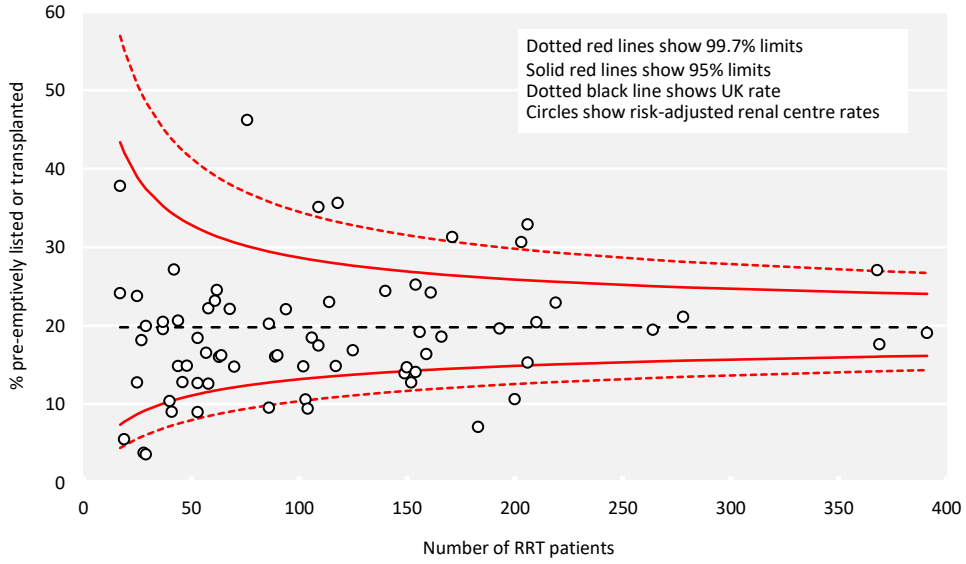

Figure 2.5 Transplant-status (listed or transplanted) at the start of RRT for adult patients incident to RRT in 2019 by centre
Analysis is adjusted for age, sex and PRD (diabetes versus non-diabetes).

Modality changes of incident adult RRT 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-RRT 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 RRT is shown at a UK level (table 2.6), but all HD patients are combined for other analyses.

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

RRT start year	% on ICHD	% on HHD	% on PD	% with Tx
Day 0 modality				
2014	71.4	0.4	19.9	8.3
2015	72.7	0.2	19.2	7.9
2016	71.9	0.4	20.0	7.7
2017	71.6	0.4	19.1	8.9
2018	71.8	0.4	19.6	8.3
2019	71.1	0.5	20.1	8.3
Day 90 modality				
Oct 2013 - Sept 2014	68.7	0.9	20.1	10.3
Oct 2014 - Sept 2015	70.6	0.6	19.2	9.6
Oct 2015 - Sept 2016	68.7	0.9	20.3	10.1
Oct 2016 - Sept 2017	68.6	0.8	20.0	10.6
Oct 2017 - Sept 2018	69.2	0.9	19.8	10.1
Oct 2018 - Sept 2019	68.7	1.0	20.6	9.7

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 RRT modality at 90 days for adult patients incident to RRT between 01/10/2018 and 30/09/2019 by country

		Patients who started RRT					Patients still on RRT at 90 days		
Country	N	% on HD[1]	% on PD	% with Tx	% discontinued[2]	% died	% on HD[1]	% on PD	% with Tx
England	6,510	66.2	19.8	8.8	1.1	4.1	69.8	20.9	9.3
N Ireland	225	58.1	17.5	20.5	1.7	2.1	60.4	18.2	21.3
Scotland	516	65.8	18.7	12.0	0.6	3.0	68.2	19.4	12.4
Wales	398	72.6	18.1	6.9	0.3	2.2	74.4	18.6	7.0
UK	7,649	66.2	19.6	9.3	1.1	3.9	69.7	20.6	9.7

[1]HD included 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 RRT modalities for adult patients incident to RRT in 2014 by time after start

			Time after start (%)			
Start modality	N	Later modality[1]	90 days	1 yr	3 yrs	5 yrs
HD	5,349	HD	91.0	72.5	44.4	25.5
		PD	2.1	2.9	1.3	0.4
		Tx	1.2	5.2	13.9	17.9
		Other[2]	0.5	2.0	2.1	2.2
		Died	5.2	17.5	38.3	54.0
PD	1,481	HD	7.2	18.1	23.2	16.5
		PD	88.0	60.4	20.7	8.0
		Tx	3.0	13.3	30.9	37.2
		Other[2]	0.6	1.1	1.1	1.1
		Died	1.3	7.1	24.1	37.3
Tx	619	HD	0.8	1.3	2.1	4.2
		PD	0.0	0.3	0.3	0.6
		Tx	98.7	95.3	91.0	85.9
		Other[2]	0.2	1.3	1.8	2.1
		Died	0.3	1.8	4.8	7.1

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

The modality at one year after RRT initiation is shown in figure 2.6 for all RRT starters and in figure 2.7 for those starting on PD by centre, using incident patients starting RRT in 2018 to allow one year follow-up time.

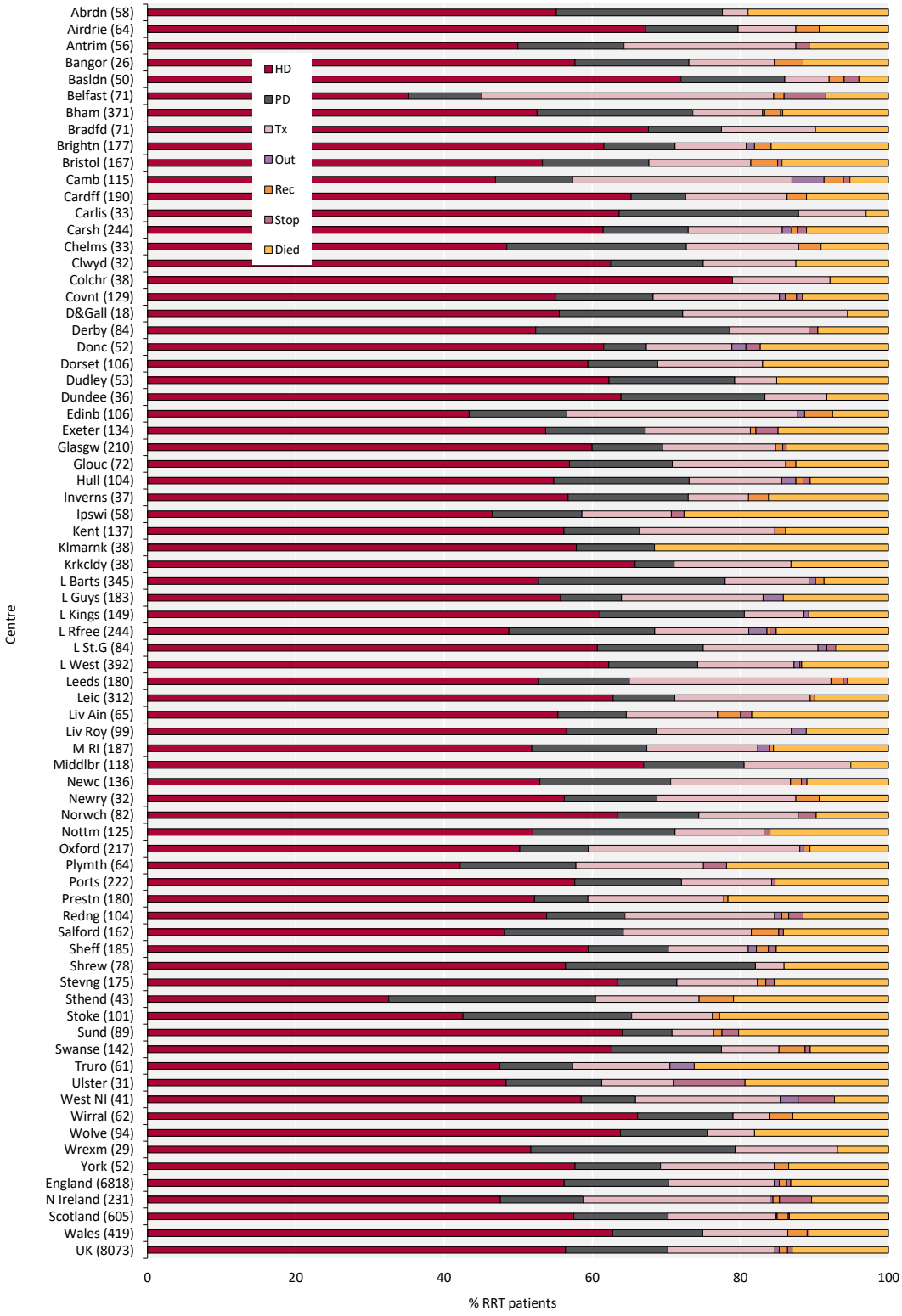

Figure 2.6 RRT modality at 1 year for incident adult RRT patients who started RRT in 2018 by centre

Number of patients in a centre in brackets.

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

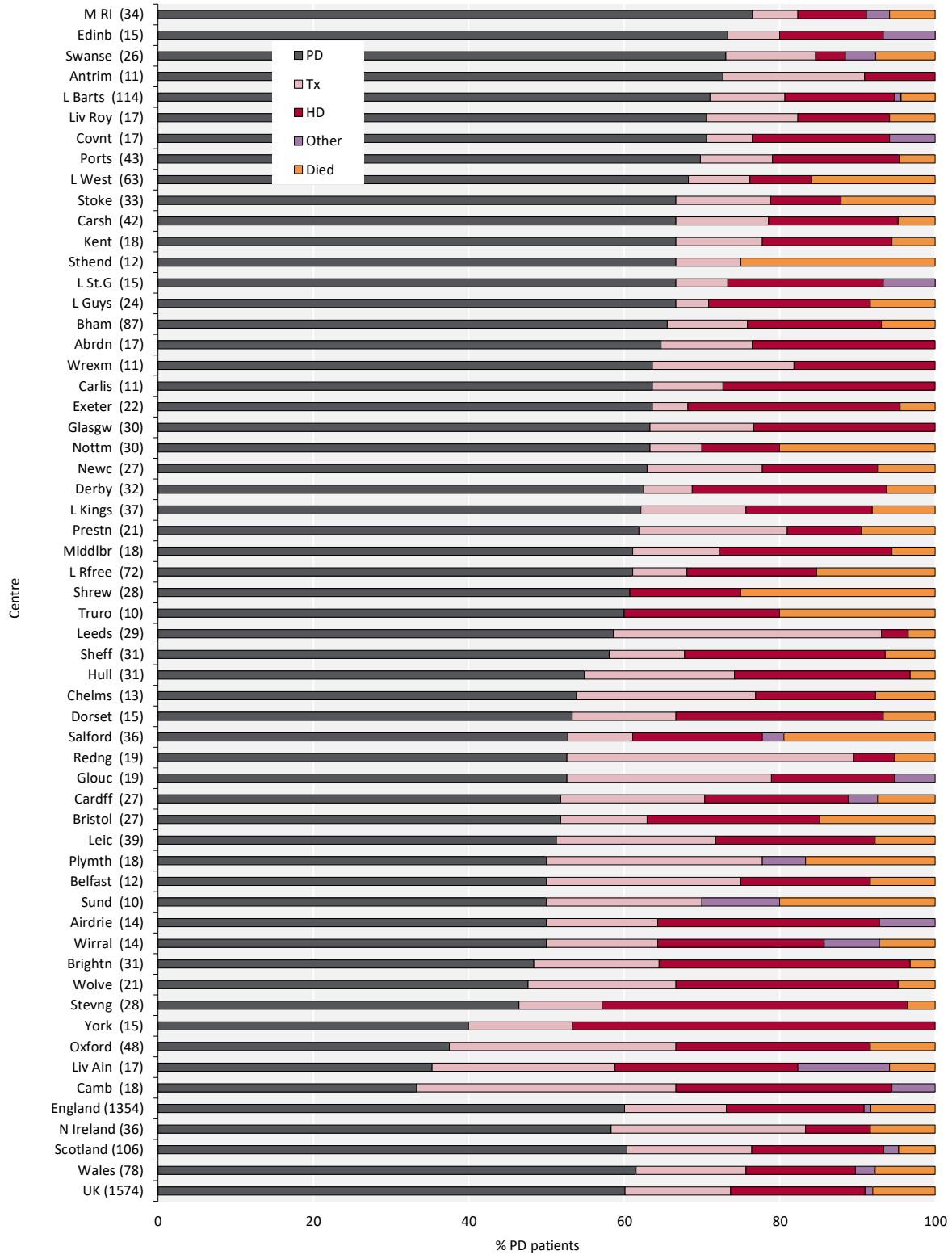

Figure 2.7 RRT modality at 1 year for incident adult PD patients who started RRT in 2018 by centre

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 RRT patients

Late presentation to a nephrologist is defined as a patient being seen by the renal service for the first time within 90 days of starting RRT and is used interchangeably with referral time in this report. However, the Scottish Renal Registry provided date of referral to nephrology by general practitioner (GP) rather than the date first seen by renal services. Scottish centres are included in this section, but late referral will be underestimated compared to the rest of the UK and Scotland was therefore excluded from the totals. Due to small numbers, a two year cohort (2018–2019) was used at a centre level to estimate late referral to a nephrologist and centres with a completeness of <70% were excluded. Scottish referral data are submitted mid-year to mid-year and so the two year cohort is July 2017 to June 2019 – there are therefore descrepencies between tables 2.3 and table 2.9. A seven year cohort was used to show national longitudinal trends (table 2.12).

Table 2.9 Referral times of incident adult RRT patients by centre (2018–2019 2 year cohort)

	N on RRT		N with referral data	% data completeness		% presenting <90 days before RRT start		% presenting <1 yr before RRT start
Centre	2018	2019		2018	2019	All PRDs	Non-diabetes PRDs	All PRDs
ENGLAND								
Basldn	50	53	103	100.0	100.0	18.4	18.8	41.7
Bham	371	369	739	99.7	100.0	18.5	22.6	30.2
Bradfd	71	104	175	100.0	100.0	14.3	20.2	24.6
Brightn	177	149	326	100.0	100.0	21.5	23.4	34.4
Bristol	167	159	166	99.4	63.5	21.1	25.2	30.7
Camb	115	118	233	100.0	100.0	20.2	21.2	33.5
Carlis	33	41	74	100.0	100.0	8.1	12.0	16.2
Carsh	244	200	442	100.0	99.0	20.6	20.4	34.6
Chelms	33	48	81	100.0	100.0	14.8	16.0	38.3
Colchr	38	40	31	81.6	7.5	12.9	11.1	48.4
Covnt	129	140	245	87.6	94.3	14.7	14.3	26.5
Derby	84	89	173	100.0	100.0	19.1	23.0	29.5
Donc	52	53	96	98.1	84.9	9.4	11.9	18.8
Dorset	106	90	194	100.0	97.8	11.9	11.1	22.2
Dudley	53	53	106	100.0	100.0	9.4	11.1	19.8
Exeter	134	152	286	100.0	100.0	18.5	20.8	29.0
Glouc	72	61	133	100.0	100.0	11.3	11.2	21.8
Hull	104	106	210	100.0	100.0	22.9	28.5	34.3
Ipswi	58	57	45	17.2	78.9	20.0		26.7
Kent	137	150	285	99.3	99.3	14.0	15.8	20.4
L Barts	345	278		4.6	1.8			
L Guys	183	210	387	98.4	98.6	17.8	22.6	32.6
L Kings	149	183	330	100.0	98.9	15.8	18.8	24.5
L Rfree	244	264	497	98.0	97.7	14.3	16.9	26.0
L St.G	84	102	167	81.0	97.1	31.7	35.6	50.3
L West	392	391	780	99.5	99.7	16.2	19.1	33.2
Leeds	180	161	341	100.0	100.0	16.4	18.9	31.7
Leic	312	368	679	99.7	100.0	14.7	10.8	23.7
Liv Ain	65	37	101	98.5	100.0	15.8	18.9	27.7
Liv Roy	99	68	159	98.0	91.2	21.4	21.0	32.7
M RI	187	206	386	97.9	98.5	17.9	16.5	31.9
Middlbr	118	109	226	100.0	99.1	15.0	18.1	33.2
Newc	136	114	250	100.0	100.0	16.8	20.6	27.2
Norwch	82	103	167	96.3	85.4	32.9	31.8	46.7
Nottm	125	125	249	99.2	100.0	14.1	17.8	23.7
Oxford	217	206	423	100.0	100.0	14.4	16.5	24.3

Table 2.9 Continued

Centre	N on RRT 2018	N on RRT 2019	N with referral data	% data completeness 2018	% data completeness 2019	% presenting <90 days before RRT start: All PRDs	% presenting <90 days before RRT start: Non-diabetes PRDs	% presenting <1 yr before RRT start: All PRDs
Plymth	64	62	123	98.4	96.8	19.5	19.6	28.5
Ports	222	219	436	99.1	98.6	8.9		25.5
Prestn	180	154	334	100.0	100.0	17.7	21.4	32.0
Redng	104	117	221	100.0	100.0	13.1	16.7	18.6
Salford	162	171	331	99.4	99.4	16.6	20.4	29.0
Sheff	185	154	339	100.0	100.0	19.5	24.5	28.0
Shrew	78	64	142	100.0	100.0	16.2	17.5	31.0
Stevng	175	193	368	100.0	100.0	9.0	10.1	14.1
Sthend	43	44	83	95.3	95.5	25.3	31.6	38.6
Stoke	101	94	177	99.0	81.9	17.5	19.4	33.3
Sund	89	86	175	100.0	100.0	17.1	21.1	32.6
Truro	61	58	118	98.4	100.0	16.9	20.0	34.7
Wirral	62	63	125	100.0	100.0	12.0	15.1	24.8
Wolve	94	86	180	100.0	100.0	12.8	17.5	26.7
York	52	58	110	100.0	100.0	10.0	10.3	26.4
N IRELAND								
Antrim	56	42	93	96.4	92.9	16.1	17.4	25.8
Belfast	71	76	128	88.7	85.5	10.9	15.1	13.3
Newry	32	25	57	100.0	100.0	26.3	28.9	38.6
Ulster	31	25	56	100.0	100.0	16.1	21.4	26.8
West NI	41	37	78	100.0	100.0	19.2	22.0	24.4
SCOTLAND								
Abrdn	54	50	87	90.7	76.0	13.8	16.9	23.0
Airdrie	78	58	131	100.0	91.4	11.5	14.9	22.9
D&Gall	14	20	13	92.9	65.0	15.4	28.6	30.8
Dundee	42	29	60	81.0	89.7	16.7	22.5	38.3
Edinb	114	109	184	85.1	79.8	10.9	13.0	21.2
Glasgw	202	200	356	92.6	84.5	11.2	16.8	17.7
Inverns	31	24	49	96.8	79.2	20.4	30.0	30.6
Klmarnk	45	35	77	97.8	94.3	16.9	21.8	22.1
Krkcldy	41	36	70	92.7	88.9	15.7	19.6	25.7
WALES								
Bangor	26	19	45	100.0	100.0	11.1	14.3	20.0
Cardff	190	166	356	100.0	100.0	9.6	12.4	17.4
Clwyd	32	29	61	100.0	100.0	16.4	21.4	41.0
Swanse	142	156	298	100.0	100.0	9.7	14.0	18.8
Wrexm	29	28	56	100.0	96.4	8.9	8.3	26.8
TOTALS								
England	**6,818**	**6,780**	**12,682**	**93.4**	**93.1**	**16.5**	**18.8**	**28.9**
N Ireland	**231**	**205**	**412**	**95.7**	**93.2**	**16.5**	**20.1**	**23.5**
Scotland	**621**	**561**	**1,040**	**91.8**	**83.8**	**13.1**	**17.6**	**22.4**
Wales	**419**	**398**	**816**	**100.0**	**99.7**	**10.2**	**13.5**	**20.5**
E, W & NI	**7,468**	**7,383**	**13,910**	**93.8**	**93.5**	**16.2**	**18.5**	**28.2**

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

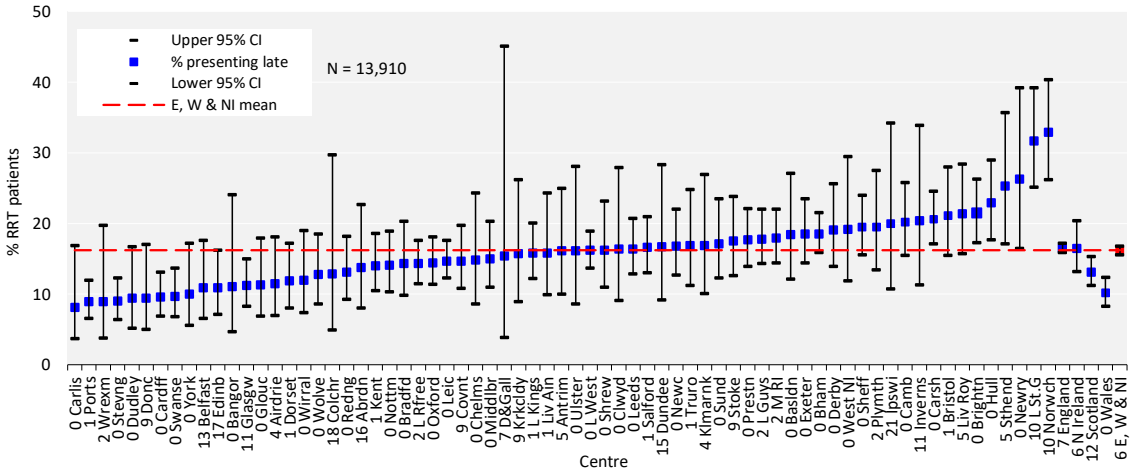

Figure 2.8 Percentage of incident adult RRT patients presenting late (<90 days) to a nephrologist (2018–2019 2 year cohort)
CI – confidence interval

Table 2.10 Characteristics of incident adult RRT patients by referral time (2018–2019 2 year cohort)

	Referral time	
Characteristic	<90 days	≥90 days
Median age (yrs)	63.4	64.5
% male	64.7	63.2
% starting on PD	7.0	21.2
% on PD at 90 days	9.8	21.2
Mean haemoglobin at RRT start (g/L)	92	100
Mean eGFR at RRT start (mL/min/1.73m^2)[1]	6.6	7.5

[1]Data available for approximately 50% of patients.
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 RRT patients by primary renal disease (PRD) (2018–2019 2 year cohort)

		Referral time			
		<90 days		≥90 days	
PRD	N with data	N	%	N	%
Diabetes	4,151	320	7.7	3,831	92.3
Glomerulonephritis	1,823	220	12.1	1,603	87.9
Hypertension	960	135	14.1	825	85.9
Polycystic kidney disease	970	43	4.4	927	95.6
Pyelonephritis	753	111	14.7	642	85.3
Renal vascular disease	771	91	11.8	680	88.2
Other	2,499	859	34.4	1,640	65.6
Uncertain aetiology	2,023	348	17.2	1,675	82.8
Total (with data)	13,950	2,127	15.2	11,823	84.8
Missing	1,000	258	25.8	742	74.2

Table 2.12 Referral time of incident adult RRT patients by year of start (restricted to centres reporting continuous data for 2013–2019)

	RRT start year (%)						
Referral time	2013	2014	2015	2016	2017	2018	2019
<90 days	17.6	16.5	16.0	15.2	15.8	15.6	16.2
3-6 mths	5.0	5.4	4.6	4.6	4.8	4.6	4.2
6-12 mths	7.2	8.2	8.1	8.2	7.0	7.4	7.7
≥12 mths	70.3	69.9	71.3	71.9	72.4	72.4	71.8

Start estimated glomerular filtration rate in incident adult RRT patients

Start eGFR was calculated using the CKD Epidemiology Collaboration method for incident RRT 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 (50% overall), (ii) if the date of RRT start is incorrect, the documented start eGFR may have been taken after the patient had started RRT.

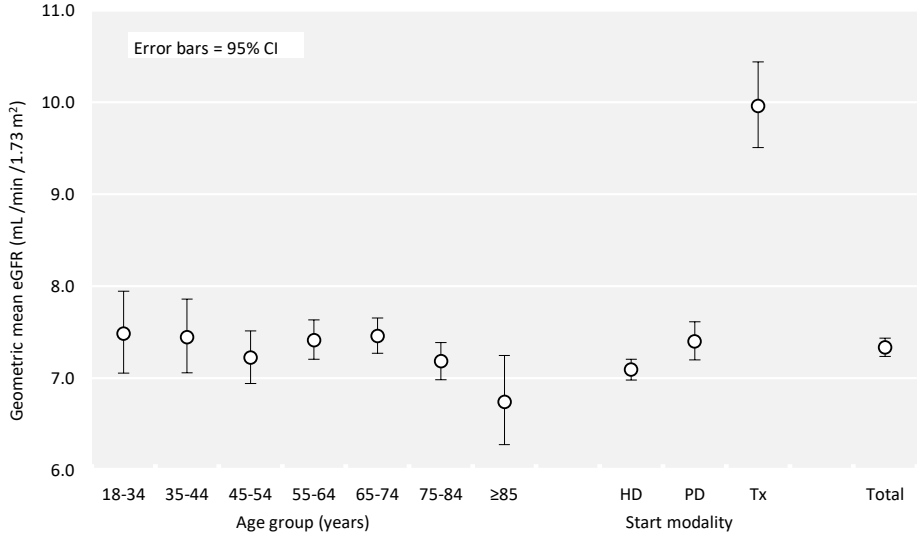

Figure 2.9 Geometric mean estimated glomerular filtration rates (eGFR) for adult patients incident to RRT in 2019 by age group and start modality

CI – confidence interval

Anaemia in incident adult RRT patients

The analyses of haemoglobin by modality and timing of presentation used haemoglobin measurements from after the start of RRT but still within the same quarter. The poor data completeness for ESA data in the incident RRT population limited analysis to the proportion of patients with haemoglobin measurements of ≥100 g/L.

Table 2.13 Haemoglobin (Hb) data for adult patients incident to RRT in 2019 by centre

	All RRT patients		Median Hb (g/L) by modality			Median Hb (g/L) by presentation time		
Centre	Median Hb (g/L)	% Hb ≥100 g/L	Tx	PD	HD	≥90 days	<90 days	% data completeness
ENGLAND								
Basldn	95	34.0			94	95	88	94.3
Bham	98	44.8	113	108	94	100	89	96.8
Bradfd	100	51.6		104	99	101	91	93.3
Brightn	102	54.4	113	112	98	102	96	91.3
Bristol	104	74.7	121	106	103			96.9
Camb	104	58.1	109	104	99	104	100	78.8
Carlis	105	68.3		114	100	105		100.0
Carsh	95	39.1		102	95	96	93	98.5
Chelms	102	57.8		110	98	104		93.8
Colchr								65.0
Covnt	98	45.6	105	108	93	99	88	97.1
Derby	98	45.4		100	96	99	93	96.6
Donc	93	35.4		98	90	96		90.6
Dorset	103	57.8		110	100	104	91	92.2
Dudley	102	56.9		114	98	102		96.2
Exeter	105	78.4		111	103	105	102	97.4
Glouc	103	57.6		112	101	104		96.7
Hull	100	50.0		107	96	101	89	83.0
Ipswi	98	45.6		104	94	96		100.0
Kent	98	46.3	94	108	95	99	90	99.3
L Barts	101	54.0	104	106	95			99.3
L Guys	95	40.0	104	106	92	97	87	97.6
L Kings	98	46.1		104	95	99	95	91.3
L Rfree	99	49.1	109	106	95	100	96	99.6
L St.G	95	41.2		106	89	96	87	95.1
L West	102	58.0	113	104	101	103	100	82.9
Leeds	92	29.3	106	106	88	94	86	93.2
Leic	97	44.6	107	104	94	98	92	92.7
Liv Ain	105	54.3			99	105		94.6
Liv Roy	103	59.1	114		100	106	99	97.1
M RI	92	27.6	102	96	90	94	87	98.5
Middlbr	96	38.3	112	110	93	97	88	98.2
Newc	95	41.8	114	105	88	97	88	96.5
Norwch	98	44.3		113	90	104	89	85.4
Nottm	99	49.1		111	94	101	84	84.8
Oxford	95	39.7	101	104	92	96	85	99.0
Plymth	98	45.0		109	98	98	94	96.8
Ports	102	56.5	119	112	99	102	95	97.7
Prestn	98	46.0	105	112	94	99	93	97.4
Redng	96	42.1	106	108	91	97	86	97.4
Salford	96	40.6	104	104	92	96	95	93.6
Sheff	94	33.6	111	95	91	95	84	96.8
Shrew	101	54.8		109	99	101		96.9

Table 2.13 Continued

Centre	All RRT patients		Median Hb (g/L) by modality			Median Hb (g/L) by presentation time		% data completeness
	Median Hb (g/L)	% Hb ≥100 g/L	Tx	PD	HD	≥90 days	<90 days	
Stevng	92	29.6		103	90	92	87	97.9
Sthend	100	50.0		108	89	102		95.5
Stoke	105	63.3		113	100	105		95.7
Sund	101	51.2		110	98	103	92	95.4
Truro	99	45.6		111	95	100		98.3
Wirral	94	40.4			91	96		82.5
Wolve	99	48.0		110	97	102	82	84.9
York	100	52.9		113	93	102		87.9
N IRELAND								
Antrim	98	42.9			93	98		100.0
Belfast	107	62.0	109	114	95	108		93.4
Newry	94	47.8			94	94		92.0
Ulster	99	47.8			99	99		92.0
West NI	109	66.7			106	110		89.2
SCOTLAND								
Abrdn	97	40.7			91	94		93.1
Airdrie	94	35.7			93	96		80.0
D&Gall	109	75.0			108			94.1
Dundee	100	50.0			99	98		74.1
Edinb	106	67.8	112	112	103	102	88	82.6
Glasgw	97	44.1	101	107	94	94	92	91.6
Inverns	100	53.9			98	103		76.5
Klmarnk	96	29.7		100	96	95		84.1
Krkcldy	102	57.6			99	105		71.7
WALES								
Bangor	110	68.4			99	113		100.0
Cardff	101	55.8	105	106	99	102	92	99.4
Clwyd	96	25.9			96	96		93.1
Swanse	101	55.5	105	116	98	102	91	99.4
Wrexm	98	38.5			93	98		92.9
TOTALS								
England	**98**	**47.4**	**108**	**106**	**95**	**99**	**91**	**94.2**
N Ireland	**104**	**55.2**	**110**	**111**	**97**	**104**	**97**	**93.7**
Scotland	**99**	**48.7**	**104**	**107**	**96**	**98**	**92**	**85.1**
Wales	**100**	**53.1**	**105**	**114**	**98**	**101**	**91**	**98.5**
UK[1]	**99**	**48.0**	**108**	**107**	**95**	**100**	**91**	**93.8**

Blank cells – no data returned by the centre, data completeness (including referral time) <70% or N<10.
[1]Scottish data were not used to calculate the UK average by presentation time because of a difference in definition (see appendix A).

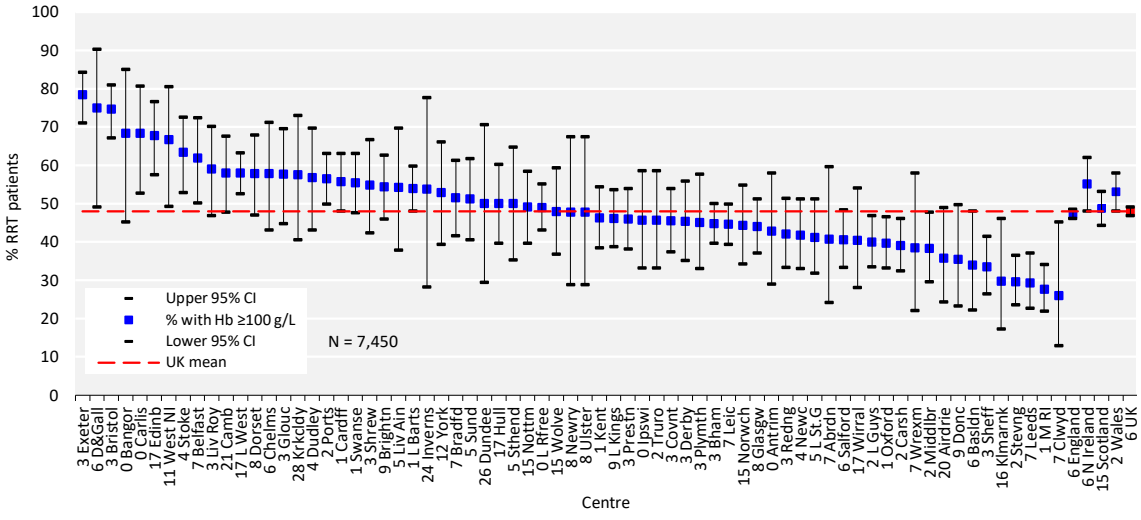

Figure 2.10 Percentage of adult patients incident to RRT in 2019 with haemoglobin (Hb) ≥100 g/L at start of RRT treatment by centre
CI – confidence interval

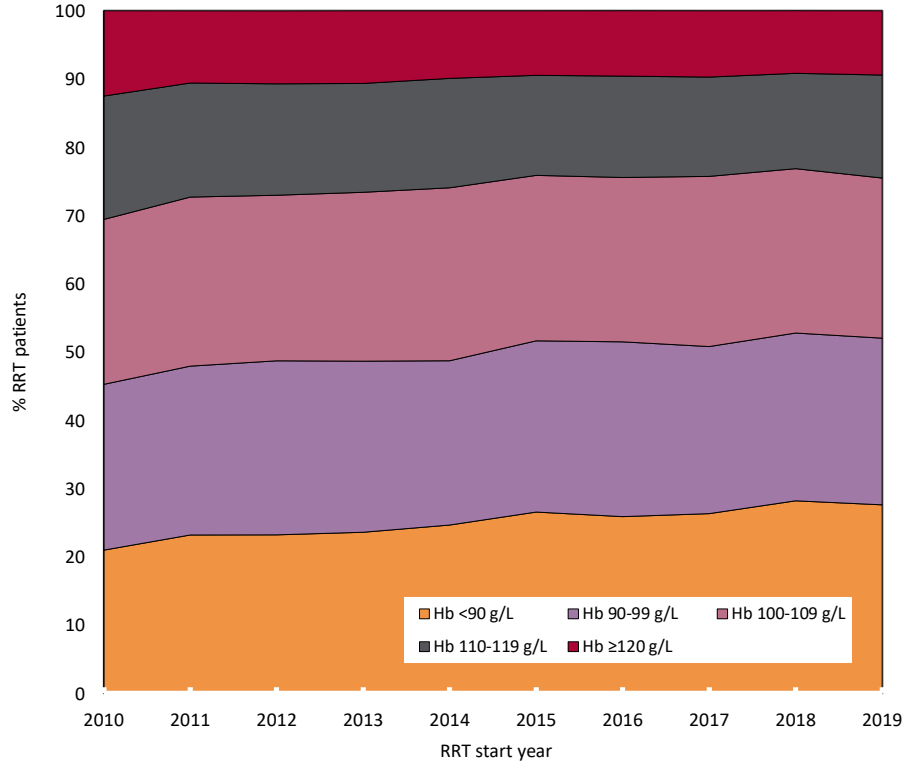

Figure 2.11 Distribution of haemoglobin (Hb) in incident adult RRT patients by year of start between 2010 and 2019

Biochemistry parameters in incident adult RRT patients

The latest Renal Association guideline on CKD mineral bone disease contains only one audit measure, which applies to patients with CKD and patients on RRT. 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 RRT in 2019 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				
Basldn	2.4	84.0	12.0	94.3
Bham	2.3	83.2	7.1	99.7
Bradfd	2.4	79.4	6.2	93.3
Brightn	2.3	77.6	6.8	98.7
Bristol	2.3	89.3	8.8	100.0
Camb	2.4	81.2	12.8	99.2
Carlis	2.2	75.6	2.4	100.0
Carsh	2.3	76.2	4.7	96.5
Chelms	2.3	83.0	4.3	97.9
Colchr	2.3	80.0	5.7	87.5
Covnt	2.3	82.6	3.6	98.6
Derby	2.4	86.5	9.0	100.0
Donc	2.3	86.5	7.7	98.1
Dorset	2.3	83.3	5.6	100.0
Dudley	2.4	88.5	5.8	98.1
Exeter	2.3	86.8	6.0	99.3
Glouc	2.3	83.6	3.3	100.0
Hull	2.4	83.3	10.8	96.2
Ipswi	2.3	84.2	8.8	100.0
Kent	2.3	75.3	12.0	100.0
L Barts	2.3	82.0	3.6	99.6
L Guys	2.4	78.5	12.4	99.5
L Kings	2.2	76.7	5.0	98.4
L Rfree	2.3	84.5	5.7	100.0
L St.G	2.4	82.8	9.1	97.1
L West	2.4	75.3	11.6	81.8
Leeds	2.3	82.6	9.3	100.0
Leic	2.3	82.2	6.7	97.6
Liv Ain	2.3	75.7	10.8	100.0
Liv Roy	2.4	85.3	10.3	100.0
M RI	2.4	74.8	13.6	100.0
Middlbr	2.2	56.9	3.7	100.0
Newc	2.4	83.3	8.8	100.0
Norwch	2.4	78.3	9.8	89.3
Nottm	2.3	73.6	8.0	100.0
Oxford	2.4	78.9	12.8	99.0
Plymth	2.3	85.3	3.3	98.4
Ports	2.3	83.0	7.8	99.1
Prestn	2.3	73.8	2.8	91.6
Redng	2.3	88.9	4.3	100.0
Salford	2.4	84.9	6.0	97.1
Sheff	2.2	74.7	3.9	100.0
Shrew	2.3	92.2	6.3	100.0
Stevng	2.3	82.9	6.7	100.0
Sthend	2.4	86.4	2.3	100.0

Table 2.14 Continued

Centre	Median adj Ca (mmol/L)	% adj Ca 2.2–2.5 mmol/L	% adj Ca >2.5 mmol/L	% data completeness
Stoke	2.4	82.9	9.8	87.2
Sund	2.3	80.0	4.7	98.8
Truro	2.3	87.9	10.3	100.0
Wirral	2.3	79.0	5.3	90.5
Wolve	2.3	75.6	8.5	95.4
York	2.3	89.7	6.9	100.0
N IRELAND				
Antrim	2.3	90.5	2.4	100.0
Belfast	2.3	78.1	6.9	96.1
Newry	2.3	96.0	0.0	100.0
Ulster	2.4	84.0	12.0	100.0
West NI	2.2	75.7	2.7	100.0
SCOTLAND				
Abrdn	2.4	85.2	0.0	93.1
Airdrie	2.3	86.2	10.8	92.9
D&Gall	2.2	76.5	0.0	100.0
Dundee	2.3	87.0	4.4	85.2
Edinb	2.4	76.9	11.5	95.4
Glasgw	2.3	76.4	7.2	96.1
Inverns	2.2	70.6	0.0	100.0
Klmarnk	2.3	77.5	12.5	90.9
Krkcldy	2.3	85.7	7.1	91.3
WALES				
Bangor	2.3	79.0	15.8	100.0
Cardff	2.4	84.2	10.9	99.4
Clwyd	2.5	75.9	24.1	100.0
Swanse	2.3	80.0	8.4	99.4
Wrexm	2.3	81.5	7.4	96.4
TOTALS				
England	**2.3**	**80.8**	**7.6**	**97.3**
N Ireland	**2.3**	**83.2**	**5.0**	**98.5**
Scotland	**2.3**	**79.3**	**7.9**	**94.3**
Wales	**2.4**	**81.5**	**10.9**	**99.3**
UK	**2.3**	**80.8**	**7.7**	**97.2**

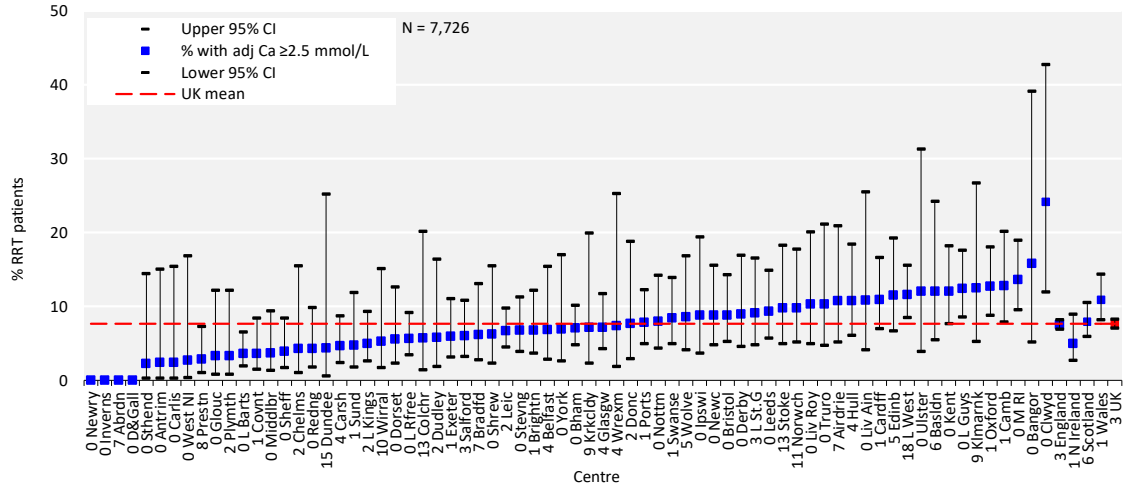

Figure 2.12 Percentage of adult patients incident to RRT in 2019 with adjusted calcium (Ca) above the normal range (>2.5 mmol/L) by centre
CI – confidence interval

Dialysis access in incident adult dialysis patients

Incident dialysis access data were collected separately to the main UKRR quarterly data returns via the 2019 Multisite Dialysis Access Audit (see appendix A). Patients who did not start dialysis for the first time in 2019 based on UKRR quarterly data submissions were excluded.

Table 2.15 Demographics and characteristics of patients in the 2019 Multisite Dialysis Access Audit by first dialysis access type

		HD – first dialysis access type				PD	
Characteristic		N	AVF/AVG	TL	NTL	N	Total
Total							
N		4,530	1,842	1,733	955	1,360	5,890
%			40.7	38.3	21.1		
Age (%)	Median (yrs)	66	68	64	67	61	65
	IQR (yrs)	55,75	58,76	51,74	53,75	47,73	53,75
	<45 yrs	571	22.6	53.8	23.6	297	868
	45–54 yrs	583	36.4	40.8	22.8	237	820
	55–64 yrs	965	44.8	37.4	17.8	258	1,223
	65–74 yrs	1,252	42.7	35.3	22.0	293	1,545
	≥75 yrs	1,159	46.1	33.2	20.7	275	1,434
PRD (%)	Diabetes	1,278	43.7	37.9	18.5	335	1,613
	Glomerulonephritis	438	39.7	42.9	17.4	218	656
	Hypertension	293	44.4	37.2	18.4	76	369
	Polycystic kidney disease	200	66.0	27.5	6.5	92	292
	Pyelonephritis	208	43.3	38.5	18.3	46	254
	Renal vascular disease	243	48.6	35.8	15.6	66	309
	Other	684	23.4	42.1	34.5	157	841
	Uncertain aetiology	550	40.0	40.4	19.6	190	740
	Missing	171	36.3	37.4	26.3	38	209
Referral time (%)	<90 days	827	4.0	49.6	46.4	79	906
	90–179 days	194	22.2	54.1	23.7	62	256
	180–364 days	344	37.8	43.6	18.6	116	460
	≥365 days	2,727	53.6	32.6	13.8	992	3,719
	Missing	35	20.0	42.9	37.1	18	53
Sex (%)	Male	2,911	41.6	37.5	20.9	853	3,764
	Female	1,619	39.0	39.7	21.4	507	2,126
Ethnicity (%)	White	2,835	41.8	36.4	21.8	895	3,730
	Asian	525	41.1	39.2	19.6	152	677
	Black	265	34.3	41.9	23.8	73	338
	Other	94	31.9	53.2	14.9	30	124
	Missing	279	31.5	44.4	24.0	66	345
eGFR at start[1]	Median	7	7	7	7	7	7
	IQR (yrs)	6,9	6,9	6,9	5,9	6,9	6,9
Diabetes[2] **(%)**	Yes	635	44.4	34.3	21.3	143	778
	No	771	39.0	35.0	25.9	268	1,039
	Missing	127	28.3	46.5	25.2	21	148

[1]eGFR units are mL/min/1.73m^2.
[2]Diabetes at start of dialysis as per the Multisite Dialysis Access Audit, or 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 RRT, 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 renal services is defined as being within 90 days (3 months) prior to the start of RRT.

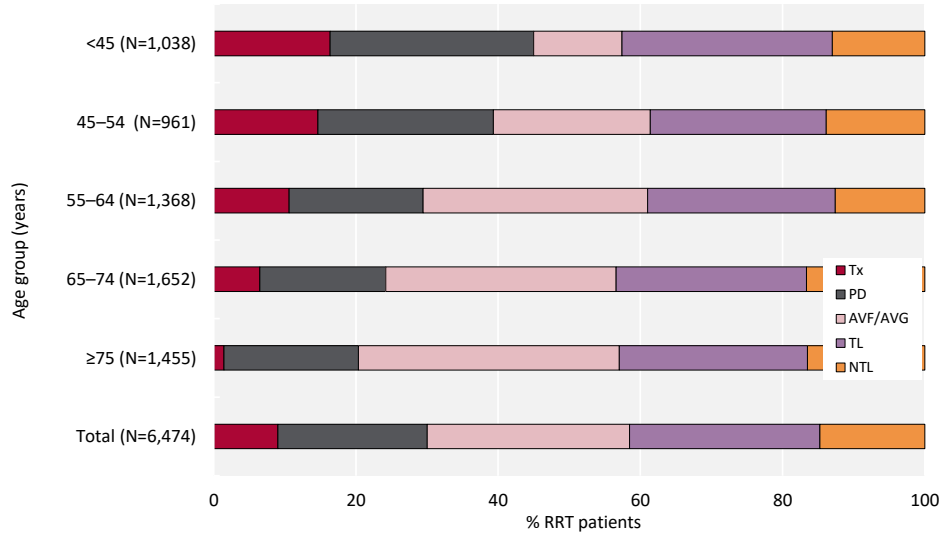

Figure 2.13 Dialysis access used for adult patients incident to RRT in 2019 by age group (2019 Multisite Dialysis Access Audit)
AVF – arteriovenous fistula; AVG – arteriovenous graft; NTL – non-tunnelled line; TL – tunnelled line

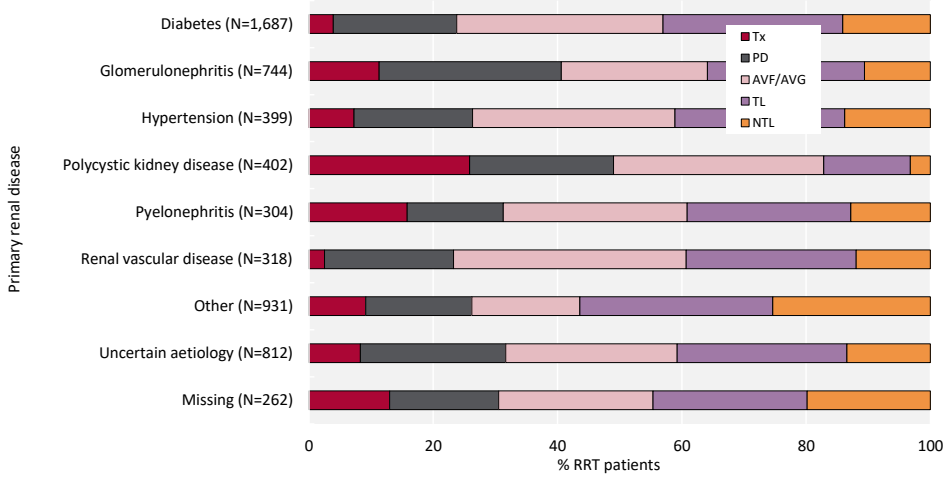

Figure 2.14 Dialysis access used for adult patients incident to RRT in 2019 by primary renal disease (2019 Multisite Dialysis Access Audit)
AVF – arteriovenous fistula; AVG – arteriovenous graft; NTL – non-tunnelled line; TL – tunnelled line

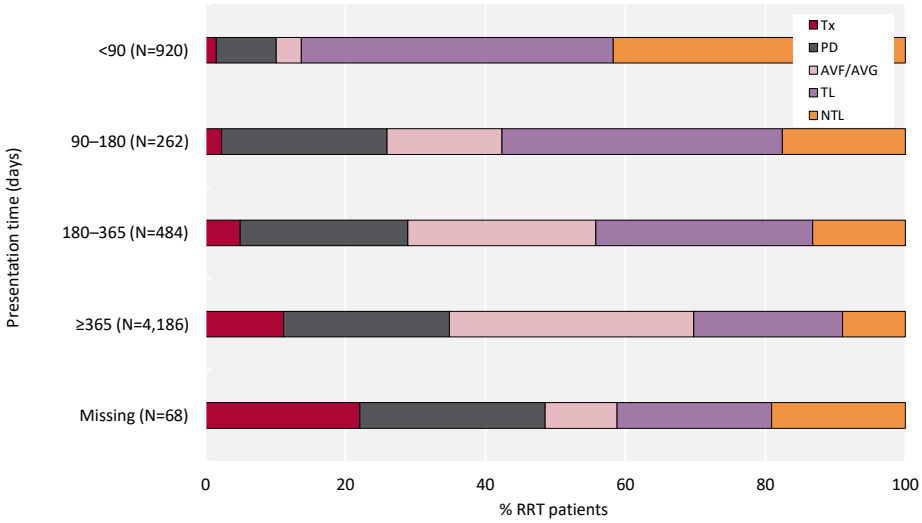

Figure 2.15 Dialysis access used for adult patients incident to RRT in 2019 by presentation time (2019 Multisite Dialysis Access Audit)
AVF – arteriovenous fistula; AVG – arteriovenous graft; NTL – non-tunnelled line; TL – tunnelled line

The audit measures related to dialysis access at RRT start include the proportion of planned starts on RRT 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. West NI is two centres combined, but only one submitted vascular access data. The number of patients on dialyis at West NI is therefore lower than presented elsewhere in the report.

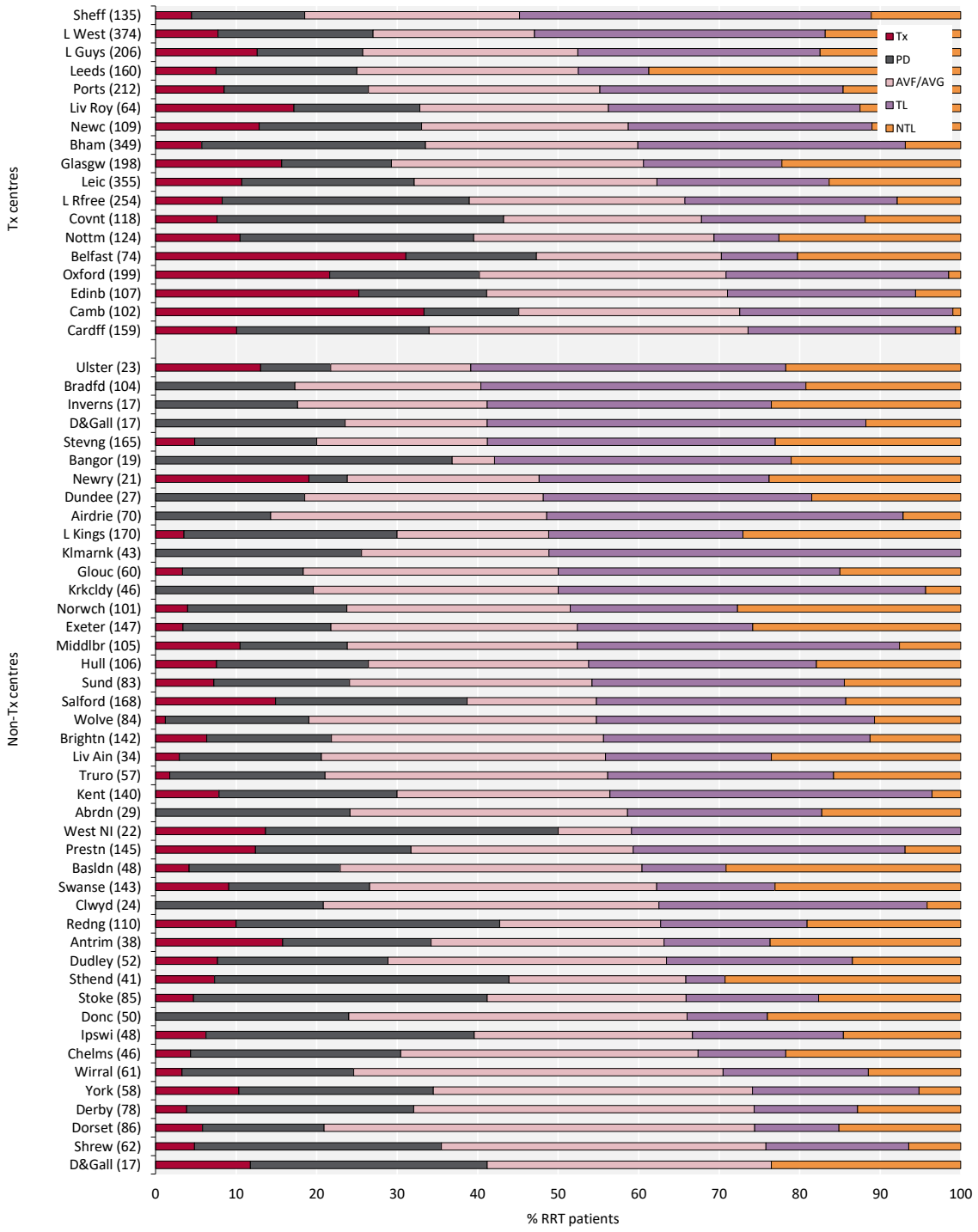

Figure 2.16 First dialysis access used for adult patients incident to RRT in 2019 by centre (2019 Multisite Dialysis Access Audit)

Number of incident patients on RRT 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 2019 by presentation time before start of dialysis by centre (2019 Multisite Dialysis Access Audit)

	Early presenters (≥90 days)(%)					Late presenters (<90 days) (%)					Start modality (%)		
Centre	N	PD	AVF/AVG	TL	NTL	N	PD	AVF/AVG	TL	NTL	HD	PD	Tx
Antrim	27	25.9	40.7	14.8	18.5	5	0.0	0.0	20.0	80.0	65.8	18.4	15.8
Bangor	16	37.5	6.3	43.8	12.5	3	33.3	0.0	0.0	66.7	63.2	36.8	0.0
Basldn	36	25.0	50.0	8.3	16.7	10	0.0	0.0	20.0	80.0	77.1	18.8	4.2
Belfast	39	28.2	38.5	17.9	15.4	6	0.0	0.0	0.0	100.0	52.7	16.2	31.1
Bham	263	35.7	34.2	24.0	6.1	66	4.5	3.0	80.3	12.1	66.5	27.8	5.7
Bradfd	89	20.2	27.0	39.3	13.5	15	0.0	0.0	46.7	53.3	82.7	17.3	0.0
Brightn	108	20.4	44.4	28.7	6.5	25	0.0	0.0	64.0	36.0	78.2	15.5	6.3
Camb	54	16.7	50.0	33.3	0.0	14	21.4	7.1	64.3	7.1	54.9	11.8	33.3
Cardff	130	28.5	48.5	22.3	0.8	13	7.7	0.0	92.3	0.0	66.0	23.9	10.1
Chelms	36	30.6	47.2	8.3	13.9	8	12.5	0.0	25.0	62.5	69.6	26.1	4.3
Clwyd	23	21.7	43.5	30.4	4.3	1	0.0	0.0	100.0	0.0	79.2	20.8	0.0
Covnt	88	42.0	30.7	15.9	11.4	15	13.3	13.3	53.3	20.0	56.8	35.6	7.6
Derby	62	32.3	53.2	11.3	3.2	13	15.4	0.0	23.1	61.5	67.9	28.2	3.8
Donc	42	28.6	47.6	9.5	14.3	8	0.0	12.5	12.5	75.0	76.0	24.0	0.0
Dorset	65	13.8	69.2	6.2	10.8	15	20.0	6.7	33.3	40.0	79.1	15.1	5.8
Dudley	44	25.0	40.9	22.7	11.4	4	0.0	0.0	50.0	50.0	71.2	21.2	7.7
Exeter	116	21.6	37.9	19.0	21.6	26	7.7	3.8	38.5	50.0	78.2	18.4	3.4
Glouc	49	18.4	36.7	32.7	12.2	9	0.0	11.1	55.6	33.3	81.7	15.0	3.3
Hull	77	24.7	37.7	28.6	9.1	21	4.8	0.0	38.1	57.1	73.6	18.9	7.5
Ipswi	33	33.3	36.4	18.2	12.1	8	12.5	12.5	37.5	37.5	60.4	33.3	6.3
Kent	102	26.5	34.3	37.3	2.0	27	14.8	7.4	66.7	11.1	70.0	22.1	7.9
L Guys	143	18.2	38.5	30.1	13.3	37	2.7	0.0	51.4	45.9	74.3	13.1	12.6
L Kings	136	28.7	23.5	22.8	25.0	27	22.2	0.0	33.3	44.4	70.0	26.5	3.5
L Rfree	192	33.9	34.4	28.1	3.6	37	29.7	2.7	35.1	32.4	61.0	30.7	8.3
L West	286	24.1	25.9	39.5	10.5	59	5.1	1.7	37.3	55.9	73.0	19.3	7.8
Leeds	117	21.4	37.6	9.4	31.6	31	9.7	0.0	9.7	80.6	75.0	17.5	7.5
Leic	261	27.2	39.5	19.5	13.8	56	8.9	7.1	44.6	39.3	67.9	21.4	10.7
Liv Ain	24	25.0	50.0	20.8	4.2	9	0.0	0.0	22.2	77.8	79.4	17.6	2.9
Liv Roy	36	27.8	36.1	27.8	8.3	14	0.0	14.3	50.0	35.7	67.2	15.6	17.2
Middlbr	78	17.9	37.2	39.7	5.1	15	0.0	6.7	73.3	20.0	76.2	13.3	10.5
Newc	71	31.0	39.4	19.7	9.9	24	0.0	0.0	79.2	20.8	67.0	20.2	12.8
Newry	10	10.0	50.0	30.0	10.0	7	0.0	0.0	42.9	57.1	76.2	4.8	19.0
Norwch	56	33.9	39.3	17.9	8.9	27	0.0	7.4	25.9	66.7	76.2	19.8	4.0
Nottm	90	36.7	41.1	6.7	15.6	21	14.3	0.0	19.0	66.7	60.5	29.0	10.5
Oxford	134	24.6	45.5	28.4	1.5	22	18.2	0.0	77.3	4.5	59.8	18.6	21.6
Ports	177	20.9	33.9	32.2	13.0	16	6.3	6.3	37.5	50.0	73.6	17.9	8.5
Prestn	98	24.5	39.8	30.6	5.1	29	13.8	3.4	65.5	17.2	68.3	19.3	12.4
Redng	86	40.7	25.6	22.1	11.6	13	7.7	0.0	7.7	84.6	57.3	32.7	10.0
Salford	126	31.0	20.6	35.7	12.7	17	5.9	5.9	41.2	47.1	61.3	23.8	14.9
Sheff	98	19.4	35.7	38.8	6.1	31	0.0	3.2	67.7	29.0	81.5	14.1	4.4
Shrew	57	31.6	43.9	19.3	5.3	2	50.0	0.0	0.0	50.0	64.5	30.6	4.8
Stevng	140	17.9	24.3	39.3	18.6	17	0.0	5.9	23.5	70.6	80.0	15.2	4.8
Sthend	31	48.4	29.0	6.5	16.1	7	0.0	0.0	0.0	100.0	56.1	36.6	7.3
Stoke	65	36.9	30.8	13.8	18.5	4	25.0	25.0	25.0	25.0	58.8	36.5	4.7
Sund	63	20.6	36.5	31.7	11.1	14	7.1	14.3	42.9	35.7	75.9	16.9	7.2
Swanse	114	21.9	43.9	14.9	19.3	16	0.0	6.3	25.0	68.8	73.4	17.5	9.1
Truro	47	21.3	42.6	31.9	4.3	9	11.1	0.0	11.1	77.8	78.9	19.3	1.8
Ulster	17	11.8	23.5	47.1	17.6	3	0.0	0.0	33.3	66.7	78.3	8.7	13.0
West NI	17	41.2	11.8	47.1	0.0	2	50.0	0.0	50.0	0.0	50.0	36.4	13.6
Wirral	55	21.8	50.9	20.0	7.3	4	25.0	0.0	0.0	75.0	75.4	21.3	3.3
Wolve	68	16.2	42.6	33.8	7.4	15	26.7	6.7	40.0	26.7	81.0	17.9	1.2
York	43	27.9	53.5	16.3	2.3	9	22.2	0.0	55.6	22.2	65.5	24.1	10.3
Total	**4,435**	**26.4**	**36.9**	**25.8**	**10.9**	**906**	**8.7**	**3.6**	**45.3**	**42.4**	**69.7**	**21.4**	**8.9**

Centres with <70% access or time of referral data were excluded. Start modality breakdown includes patients with missing referral time.
AVF – arteriovenous fistula; AVG – arteriovenous graft; NTL – non-tunnelled line; TL – tunnelled line

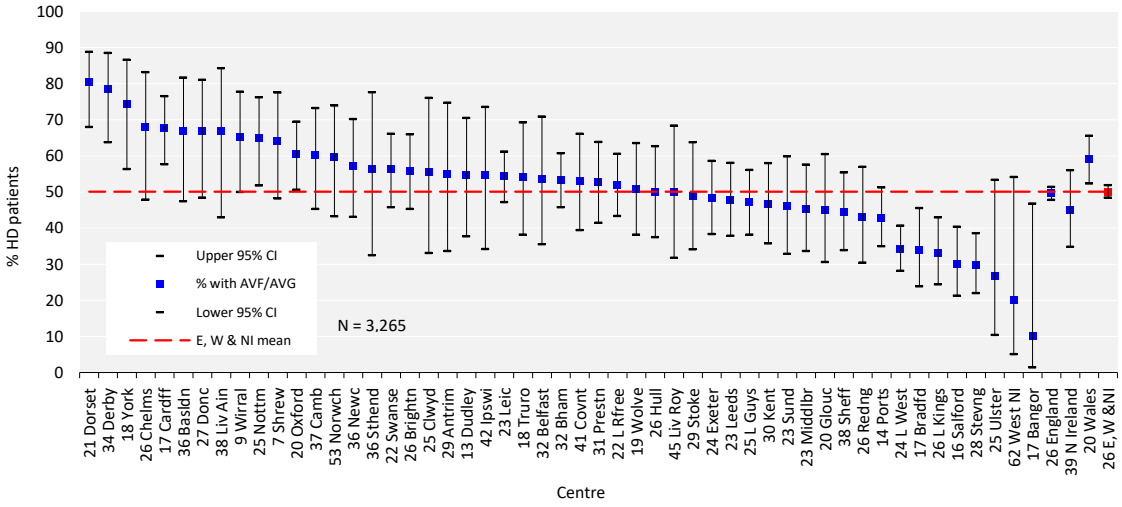

Figure 2.17 Percentage of adult patients incident to HD in 2019 who started dialysis using either an arteriovenous fistula (AVF) or an arteriovenous graft (AVG) by centre, excluding late presenters (2019 Multisite Dialysis Access Audit)

Centres with <70% completeness of access data for all dialysis patients were excluded. No further exclusion for completeness in HD patients was applied. Therefore, data completeness for some centres is less than in other caterpillar plots in this report.
CI – confidence interval

Survival in incident adult RRT patients

The survival of patients who started RRT for ESKD is described, with primary focus on the one year incident to RRT in 2018 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 RRT, but some countries define day 90 of RRT 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 RRT patients (2017–2018 2 year cohort) by country

Interval	England	N Ireland	Scotland	Wales	UK
Survival at 90 days (%)	96.6	98.2	96.6	98.0	96.7
95% CI	96.2-96.9	97.2-99.2	95.7-97.5	97.2-98.8	96.4-97.0
Survival 1 year after 90 days (%)	91.1	93.2	90.5	89.2	91.0
95% CI	90.5-91.6	91.1-95.3	89.0-92.1	87.3-91.2	90.5-91.5

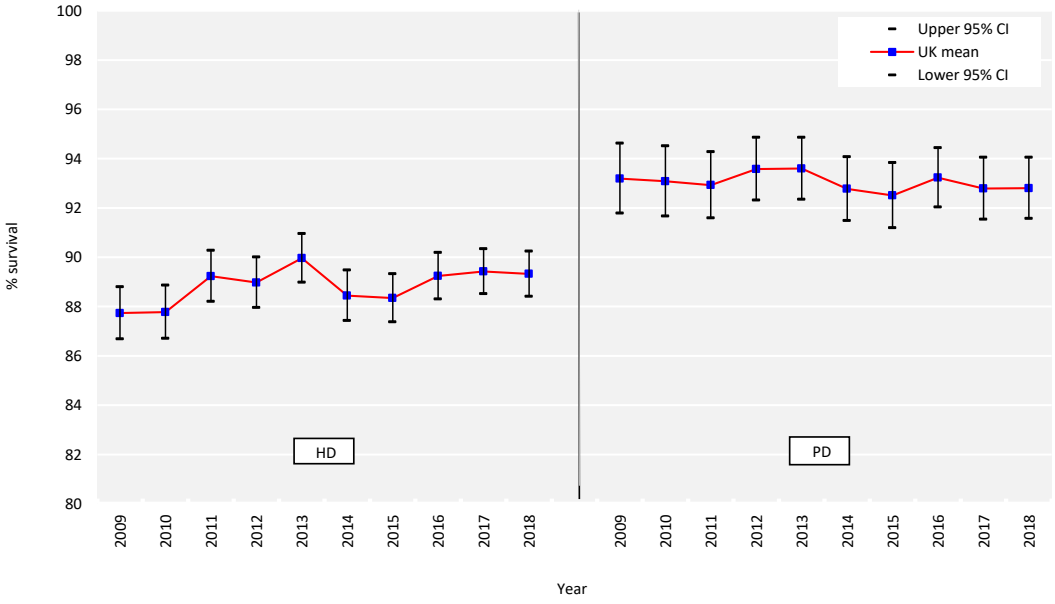

Figure 2.18 1 year after 90 days survival (adjusted to age 60 years) of incident adult RRT patients by start modality between 2009 and 2018
CI – confidence interval

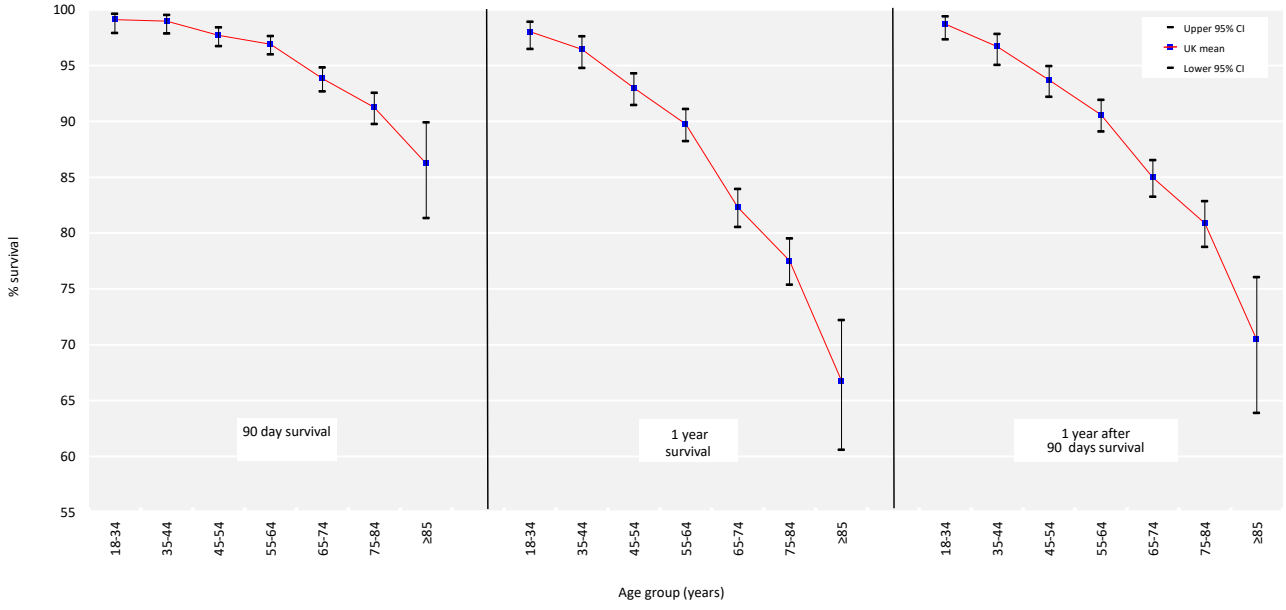

Figure 2.19 90 days, 1 year and 1 year after 90 days survival of incident adult RRT patients by age group (2018 cohort)
CI – confidence interval

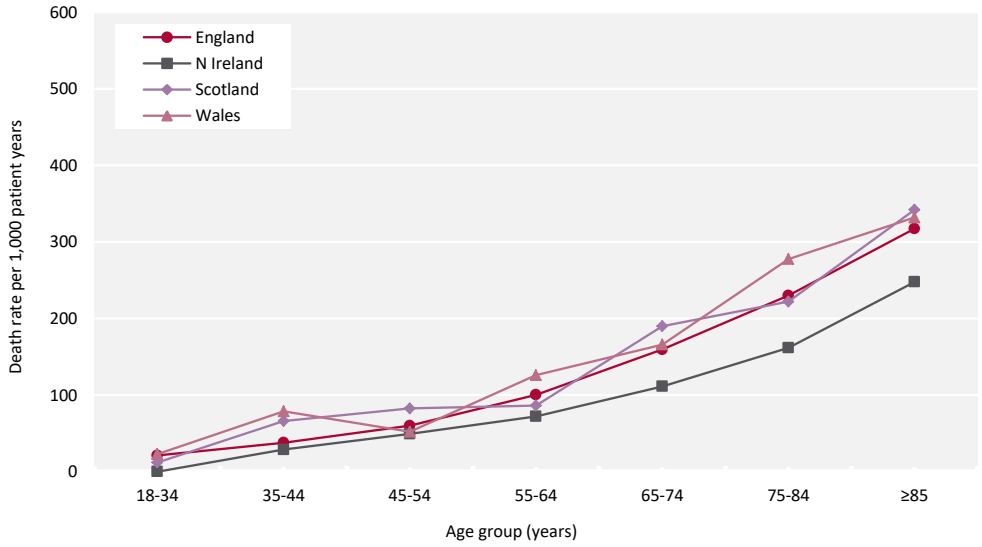

Figure 2.20 1 year after 90 days death rate per 1,000 incident RRT adult patient years by age group and country (2015–2018 4 year cohort)

A ten year rolling cohort was used to analyse the long term survival of incident patients from start of RRT (day 0), according to age at RRT 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 RRT by age group (figures 2.22 and 2.23).

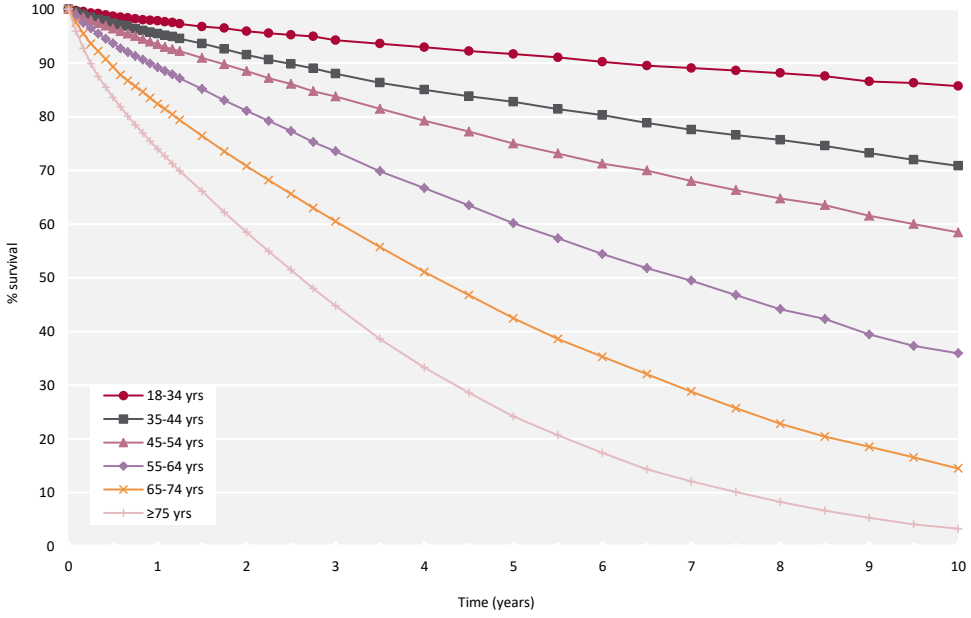

Figure 2.21 Survival (unadjusted) of incident adult RRT patients from day 0 by age group (2009–2018 10 year cohort)

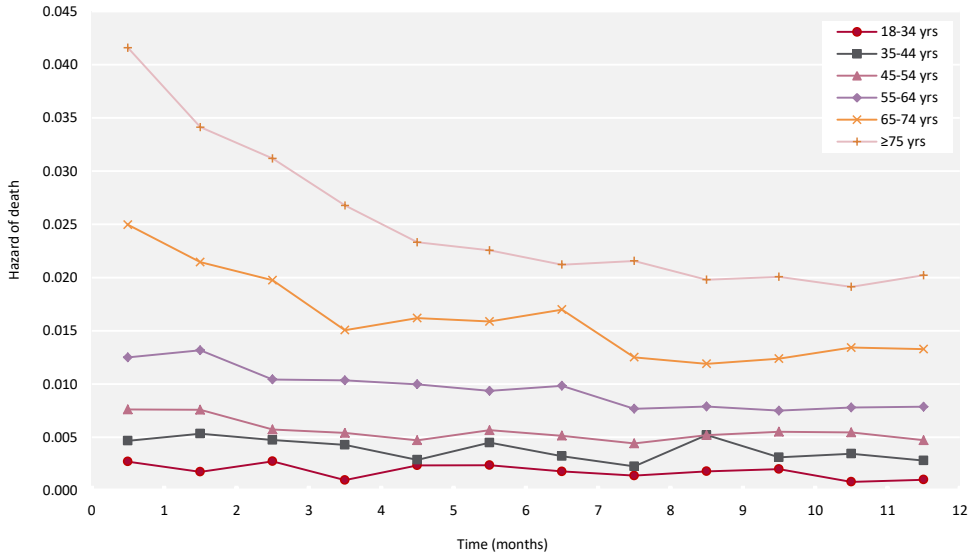

Figure 2.22 Monthly hazard of death (unadjusted) of incident adult RRT patients from day 0 to 1 year by age group (2009–2018 10 year cohort)

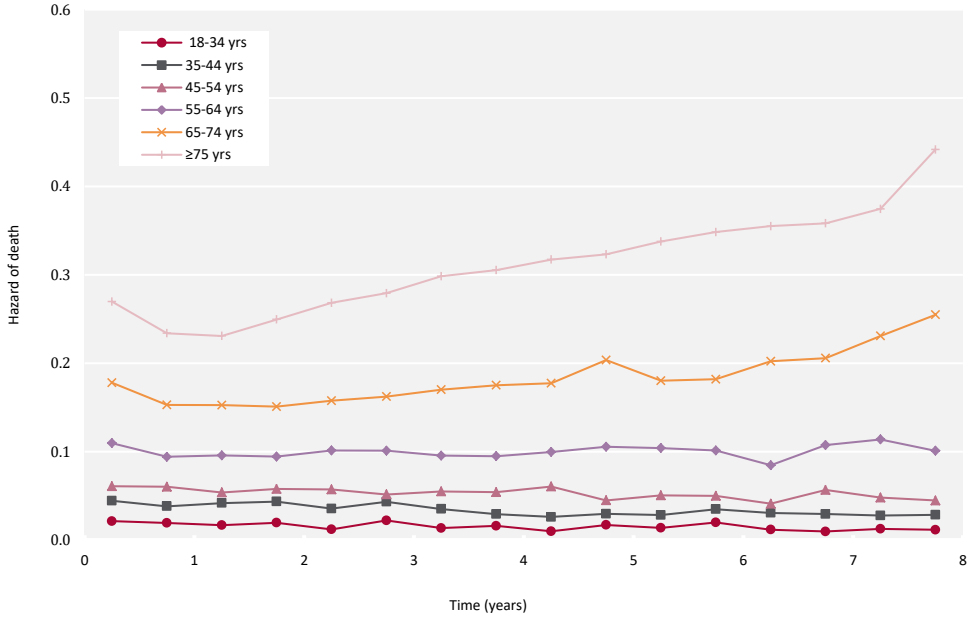

Figure 2.23 6 monthly hazard of death (unadjusted) of incident adult RRT patients from day 0 to 8 years by age group (2008–2017 10 year cohort)

Table 2.18 Survival (unadjusted) of incident adult RRT patients aged <65 years (1999–2018)

Cohort	Unadjusted survival (%)										95% CI for latest year	N
	1 yr	2 yr	3 yr	4 yr	5 yr	6 yr	7 yr	8 yr	9 yr	10 yr		
2018	**92.9**										**92.1-93.6**	**4,253**
2017	93.0	87.2									86.1-88.2	4,230
2016	92.9	87.5	82.1								80.8-83.2	4,007
2015	92.3	86.5	81.4	76.9							75.5-78.2	3,927
2014	92.8	86.8	81.4	76.9	73.3						71.8-74.7	3,673
2013	93.7	88.2	83.1	77.7	73.2	68.6					67.0-70.1	3,573
2012	93.1	87.4	82.0	76.9	72.6	68.6	64.9				63.3-66.4	3,522
2011	93.2	88.6	83.6	79.0	74.5	70.9	67.7	64.7			63.0-66.3	3,341
2010	92.2	86.6	81.7	77.3	72.8	69.6	66.4	62.5	59.5		57.8-61.2	3,362
2009	91.3	85.1	80.4	76.3	71.1	67.0	63.8	60.4	57.4	54.6	52.8-56.3	3,388
2008	91.5	86.0	81.2	76.8	73.2	69.5	65.6	62.3	59.4	56.4	54.7-58.1	3,447
2007	92.5	87.0	81.8	76.8	73.1	69.3	66.0	62.6	59.3	56.3	54.6-58.0	3,327
2006	90.6	85.0	80.1	75.6	71.9	68.1	63.9	61.0	58.0	55.4	53.6-57.1	3,156
2005	89.6	83.5	78.5	73.8	69.1	65.6	62.5	59.5	56.5	53.9	52.0-55.7	2,829
2004	89.6	83.4	78.0	72.5	67.9	64.1	61.0	57.1	54.6	53.0	51.0-55.0	2,548
2003	89.4	82.6	77.2	72.3	67.1	62.9	59.2	56.4	53.8	51.4	49.2-53.5	2,225
2002	88.7	80.9	75.0	69.4	65.3	61.3	57.8	54.8	51.7	49.6	47.4-51.8	1,991
2001	88.0	81.1	75.4	69.9	65.0	60.2	56.3	52.9	50.0	47.8	45.4-50.2	1,694
2000	89.0	80.9	74.0	68.8	63.4	58.6	55.1	52.0	49.6	47.1	44.5-49.6	1,492
1999	87.0	80.8	73.2	67.7	62.1	58.1	53.9	50.9	48.5	46.8	44.1-49.5	1,312

CI – confidence interval

Table 2.19 Survival (unadjusted) of incident adult RRT patients aged ≥65 years (1999–2018)

Cohort	Unadjusted survival (%)										95% CI for latest year	N
	1 yr	2 yr	3 yr	4 yr	5 yr	6 yr	7 yr	8 yr	9 yr	10 yr		
2018	79.3										78.0-80.5	3,816
2017	79.3	67.4									65.9-68.8	3,824
2016	80.0	65.1	52.7								51.1-54.3	3,760
2015	78.2	64.8	52.2	41.9							40.4-43.5	3,809
2014	78.5	64.2	52.2	41.3	32.9						31.3-34.4	3,589
2013	78.5	64.6	53.2	43.0	34.6	27.7					26.2-29.2	3,438
2012	77.2	65.1	54.2	44.0	35.4	27.6	21.8				20.4-23.3	3,326
2011	77.1	62.7	51.2	41.1	32.3	24.7	18.9	14.4			13.2-15.7	3,350
2010	76.0	63.1	51.2	41.8	32.2	25.4	19.7	14.5	11.3		10.2-12.4	3,280
2009	76.4	63.1	52.4	41.4	32.8	26.1	20.0	15.3	11.2	8.2	7.3-9.2	3,374
2008	74.6	61.0	49.7	40.4	32.0	25.6	20.5	16.1	12.1	9.0	8.0-10.0	3,177
2007	74.9	61.1	49.6	40.3	31.8	25.3	20.1	15.4	11.8	9.2	8.2-10.2	3,219
2006	72.0	58.2	46.9	37.2	28.9	23.0	17.5	13.4	10.6	8.5	7.5-9.5	3,113
2005	71.1	57.3	45.4	36.3	27.9	21.2	16.6	12.5	9.9	7.8	6.8-8.8	2,942
2004	68.9	53.9	42.3	33.9	26.7	20.8	16.2	12.8	9.8	7.5	6.5-8.6	2,613
2003	68.3	53.5	41.5	31.6	24.1	18.0	13.9	10.8	8.1	6.4	5.5-7.5	2,260
2002	65.8	50.8	40.4	31.9	24.0	18.4	13.7	10.9	8.1	6.4	5.4-7.5	2,059
2001	66.1	51.6	38.3	28.7	21.5	15.9	11.9	8.7	7.0	5.4	4.4-6.6	1,660
2000	66.2	52.0	39.6	28.8	22.2	17.0	12.9	9.4	7.3	5.4	4.3-6.7	1,441
1999	67.9	51.3	38.8	29.2	21.7	15.6	11.3	8.2	5.9	4.6	3.5-6.0	1,168

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 70 centres with data, it would be expected that three centres would fall outside the 95% (1 in 20) confidence limits, entirely by chance.

Table 2.20 1 year after 90 days adjusted survival (60 years, male and median comorbidity score) of incident adult RRT patients by centre (2015–2018 4 year cohort)

Centre	Age-adjusted survival				Case-mix adjusted surviva[11]			
	N on RRT	1 yr after 90 days (%)	Lower 95% limit	Upper 95% limit	N on RRT	1 yr after 90 days (%)	Lower 95% limit	Upper 95% limit
D&Gall	56	89.2	79.9	96.0				
Clwyd	88	87.3	82.7	95.3	88	87.3	81.5	94.6
Bangor	96	89.4	83.1	95.1	96	89.9	82.0	94.5
Inverns	107	89.6	83.6	95.0				
Newry	108	92.7	83.7	95.0	108	89.4	82.5	94.3
Ulster	124	92.9	84.2	94.7	124	90.6	83.1	94.0
Colchr	133	89.7	84.5	94.6	133	88.5	83.4	93.9
West NI	148	95.6	84.9	94.5	148	93.6	83.8	93.8
Wrexm	150	92.6	85.0	94.5	150	91.2	83.9	93.7
Krkcldy	152	90.6	85.0	94.4				
Sthend	154	93.2	85.1	94.4	154	91.6	83.9	93.7
Carlis	159	92.4	85.2	94.4	156	91.7	84.0	93.7
Antrim	167	92.3	85.3	94.3	159	89.5	84.1	93.6
Klmarnk	167	88.9	85.3	94.3				
Chelms	180	94.5	85.6	94.2	179	93.2	84.5	93.5
Dundee	184	90.2	85.6	94.2				
Basldn	193	91.1	85.8	94.1	192	90.7	84.7	93.4
Ipswi	193	93.1	85.8	94.1	184	92.6	84.5	93.4
Dudley	202	92.4	85.9	94.0	202	92.2	84.8	93.3
Donc	206	90.7	86.0	94.0	204	89.3	84.8	93.3
Abrdn	217	91.0	86.1	94.0				
Liv Ain	218	85.8	86.1	93.9	218	86.0	85.0	93.2
Truro	225	91.0	86.2	93.9	225	90.0	85.1	93.1
Wirral	226	89.2	86.2	93.9	225	89.4	85.1	93.1
York	239	89.7	86.4	93.8	239	89.0	85.3	93.1
Plymth	243	87.5	86.4	93.8	239	86.1	85.3	93.1
Airdrie	247	88.3	86.5	93.8				
Shrew	253	87.7	86.5	93.8	252	86.7	85.4	93.0
Glouc	289	92.4	86.8	93.6	286	91.3	85.7	92.8
Belfast	314	93.4	87.0	93.5				
Derby	317	90.9	87.0	93.5	317	90.1	86.0	92.7
Bradfd	318	89.6	87.0	93.5	318	89.4	86.0	92.7
Wolve	318	86.5	87.0	93.5	318	86.0	86.0	92.7
Sund	322	88.4	87.1	93.5	320	87.6	86.0	92.7
Dorset	333	89.7	87.1	93.4	332	88.2	86.1	92.6
L St.G	352	91.8	87.3	93.4	338	90.9	86.1	92.6
Norwch	356	91.8	87.3	93.4	356	90.4	86.2	92.6
Camb	375	92.8	87.4	93.3	375	91.2	86.3	92.5
Redng	377	91.8	87.4	93.3	377	91.1	86.3	92.5
Hull	388	90.9	87.4	93.3	388	90.0	86.4	92.5
Edinb	400	92.5	87.5	93.2				
Stoke	424	87.5	87.6	93.2	422	86.9	86.5	92.4
Covnt	438	89.8	87.7	93.1	425	87.6	86.6	92.3
Middlbr	453	90.6	87.7	93.1	453	91.2	86.7	92.3

Table 2.20 Continued

Centre	Age-adjusted survival				Case-mix adjusted survival[11]			
	N on RRT	1 yr after 90 days (%)	Lower 95% limit	Upper 95% limit	N on RRT	1 yr after 90 days (%)	Lower 95% limit	Upper 95% limit
Liv Roy	458	90.8	87.7	93.1	446	90.9	86.6	92.3
Nottm	488	90.0	87.8	93.0	488	89.1	86.8	92.2
Swanse	506	88.9	87.9	93.0	506	88.5	86.9	92.2
Newc	509	89.7	87.9	93.0	508	90.0	86.9	92.2
Kent	526	89.4	88.0	93.0	526	87.7	86.9	92.1
Exeter	538	92.0	88.0	92.9	535	91.1	86.9	92.1
Stevng	555	91.7	88.0	92.9	555	90.3	87.0	92.1
Brightn	560	89.6	88.1	92.9	547	88.0	87.0	92.1
Bristol	589	89.5	88.1	92.8	585	88.4	87.1	92.0
Sheff	611	91.3	88.2	92.8	609	90.6	87.1	92.0
L Kings	622	92.9	88.2	92.8	619	92.5	87.2	92.0
Prestn	624	87.5	88.2	92.8	596	86.8	87.1	92.0
Leeds	646	92.4	88.3	92.8	645	91.9	87.2	91.9
L Guys	652	92.4	88.3	92.8	652	91.3	87.2	91.9
Cardff	658	89.7	88.3	92.7	658	88.7	87.3	91.9
Salford	664	90.1	88.3	92.7	659	89.3	87.3	91.9
M RI	756	90.4	88.5	92.6	735	89.7	87.4	91.8
Glasgw	778	89.4	88.5	92.6				
Oxford	780	91.9	88.5	92.6	771	90.7	87.5	91.8
Ports	819	91.1	88.6	92.6	807	89.6	87.5	91.7
L Rfree	906	91.0	88.7	92.5	886	90.2	87.6	91.6
Carsh	920	91.4	88.7	92.5	891	89.8	87.6	91.6
Leic	1,095	91.3	88.9	92.3	1,077	90.4	87.9	91.5
L Barts	1,221	92.8	89.0	92.3	1,183	92.1	88.0	91.4
Bham	1,425	89.7	89.1	92.2	1,420	88.4	88.1	91.3
L West	1,464	91.7	89.2	92.1	1,429	90.5	88.1	91.3

[1]Centres excluded if <85% comorbidity data were available – this included Belfast and all Scottish renal centres.

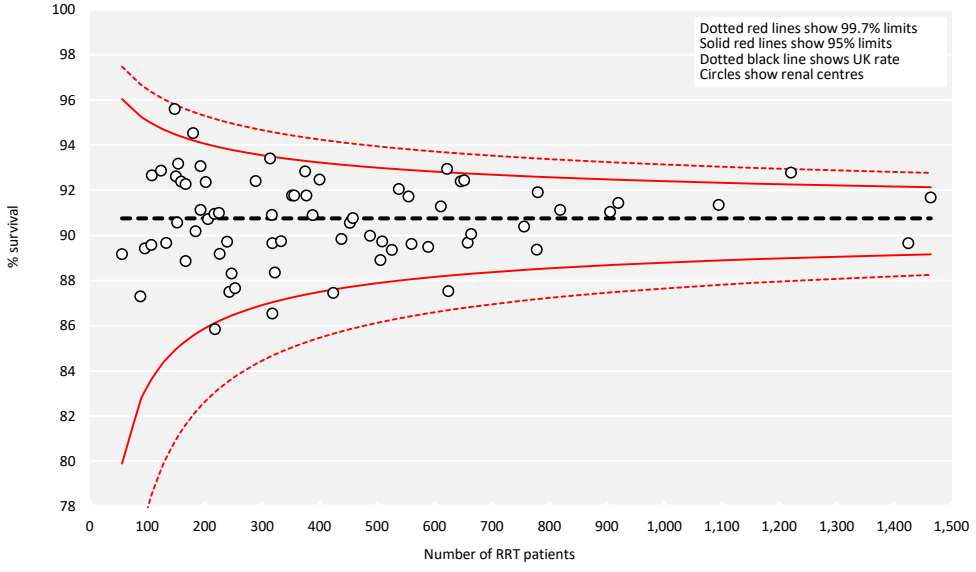

Figure 2.24 1 year after 90 days survival (adjusted to age 60 years) of incident adult RRT patients by centre (2015–2018 4 year cohort)

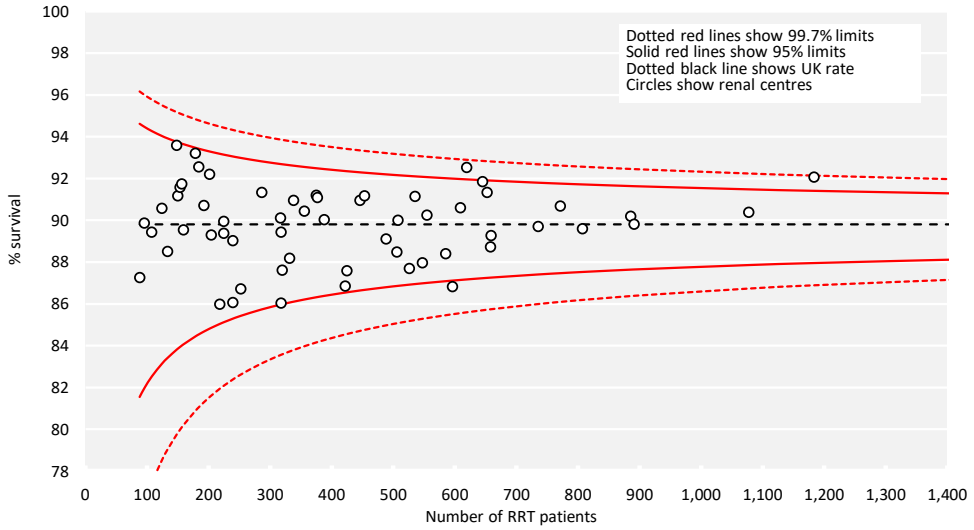

Figure 2.25 1 year after 90 days survival (adjusted to age 60 years, male and median comorbidity score) of incident adult RRT patients by centre (2015–2018 4 year cohort)

Cause of death in incident adult RRT patients

Cause of death was analysed in incident RRT patients using a four year incident cohort followed up for 90 days and 1 year after 90 days. The proportion of incident adult RRT 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.

Table 2.21 Cause of death in the first 90 days and one year after 90 days in incident adult RRT patients by age group (2015–2018 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	211	24.0	25.2	23.7	502	21.5	27.0	19.2
Cerebrovascular disease	27	3.1	4.8	2.5	105	4.5	5.6	4.1
Infection	178	20.3	21.0	20.1	445	19.1	18.9	19.1
Malignancy	74	8.4	11.0	7.6	251	10.7	10.4	10.9
Treatment withdrawal	155	17.7	8.6	20.5	446	19.1	12.6	21.8
Other	180	20.5	23.8	19.5	423	18.1	19.1	17.7
Uncertain aetiology	53	6.0	5.7	6.1	163	7.0	6.5	7.2
Total (with data)	**878**	**100.0**	**100.0**	**100.0**	**2,335**	**100.0**	**100.0**	**100.0**
Missing	649	42.5	42.9	42.9	1,169	33.4	33.3	33.4

THE RENAL ASSOCIATION
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Chapter 3

Adults on renal replacement therapy (RRT) in the UK at the end of 2019

Contents

Introduction

This chapter describes the population of adult patients with end-stage kidney disease (ESKD) who were on renal replacement therapy (RRT) in the UK at the end of 2019 (figure 3.1). Patients may have started RRT prior to 2019 or during 2019. Three RRT 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 RRT modality reflects uptake to the modality by new RRT 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 RRT or die.

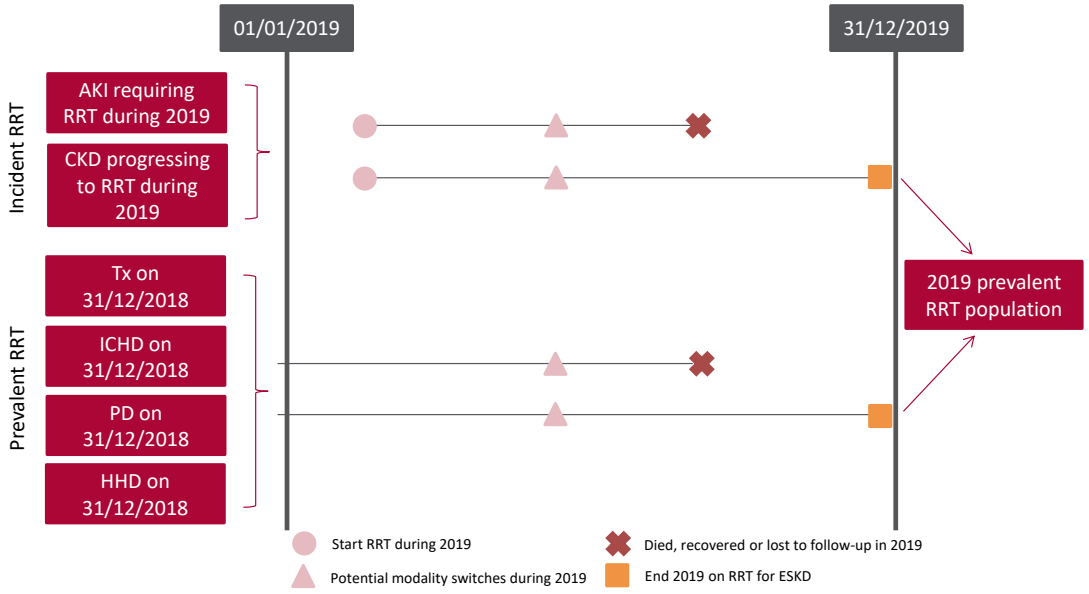

Figure 3.1 Pathways adult patients could follow to be included in the UK 2019 prevalent RRT population

Note that patients receiving dialysis for acute kidney injury (AKI) are only included in this chapter if they had a timeline or RRT modality code for chronic RRT at the end of 2019 or if they had been on RRT for ≥90 days and were on RRT at the end of 2019.

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 2019 prevalent adult RRT population, including the number on RRT per million population (pmp). These analyses are performed annually to help clinicians and policy makers plan future RRT requirements in the UK. Variation in case-mix is also reported to aid understanding of how to improve equity of RRT provision in the UK.

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

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

Key findings

- 68,111 adult patients were receiving RRT for ESKD in the UK on 31/12/2019, an increase of 2.5% from 2018
- RRT prevalence was 1,293 pmp for adults, in trend with a 2.0% increase in recent years
- The median age of RRT patients was 59.6 years (ICHD 67.5 years, HHD 55.2 years, PD 64.4 years and Tx 55.6 years). In 2000 the median age was 54.8 years (HD 63.3 years, PD 58.5 years and Tx 48.6 years)
- 61.2% of RRT patients were male
- Tx continued as the most common treatment modality (56.8%) – ICHD comprised 35.8%, PD 5.4% and HHD 2.0% of the RRT population
- The most common identifiable primary renal disease was glomerulonephritis (19.5%), followed by diabetes (18.3%)
- There were 3 centres above the upper 95% limit in the funnel plots showing 1 year age-, sex- and comorbidity-adjusted survival for patients prevalent to dialysis on 31/12/2018. It is expected that 3 centres would be outside the limits by chance
- There was no cause of death data available for 30.6% of deaths. For those with data, the leading cause of death in younger patients (<65 years) was cardiac disease (22.2%) and in older patients (≥65 years) was treatment withdrawal (20.9%).

Analyses

Changes to the prevalent adult RRT population

For the 70 adult renal centres, the number of prevalent patients on RRT was calculated as a proportion of the estimated centre catchment population (calculated as detailed in appendix A).

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

Centre	N on RRT					Estimated catchment population (millions)	2019 crude rate (pmp)
	2015	2016	2017	2018	2019		
ENGLAND							
Basldn	275	273	301	317	322	0.34	944
Bham	2,896	3,038	3,154	3,234	3,308	2.03	1,627
Bradfd	583	636	673	688	733	0.49	1,507
Brightn	950	992	1,010	1,056	1,059	1.07	992
Bristol	1,477	1,468	1,472	1,469	1,486	1.21	1,228
Camb	1,303	1,322	1,329	1,385	1,469	0.93	1,584
Carlis	281	279	281	293	303	0.25	1,199
Carsh[1]	1,587	1,654	1,692	1,763	1,771	1.61	1,098
Chelms	282	271	276	262	261	0.37	702
Colchr	120	123	129	124	145	0.29	502
Covnt	959	973	964	957	1,076	0.79	1,366
Derby	538	542	555	587	652	0.56	1,173
Donc	302	331	333	332	342	0.37	920
Dorset	681	686	734	764	772	0.72	1,069
Dudley	315	346	369	365	366	0.34	1,075
Exeter	968	1,013	1,058	1,090	1,091	0.94	1,156
Glouc	444	472	508	520	525	0.51	1,039
Hull	856	854	872	881	904	0.79	1,141
Ipswi	401	416	435	428	424	0.31	1,370
Kent	1,041	1,073	1,091	1,113	1,140	1.06	1,077
L Barts	2,279	2,368	2,492	2,599	2,660	1.57	1,689
L Guys	2,012	2,098	2,160	2,228	2,310	1.00	2,319
L Kings	1,084	1,110	1,149	1,185	1,244	0.92	1,345
L Rfree	2,093	2,175	2,192	2,237	2,344	1.32	1,782
L St.G	837	836	829	827	852	0.66	1,294
L West	3,294	3,391	3,472	3,554	3,613	1.95	1,857
Leeds	1,525	1,550	1,618	1,681	1,723	1.36	1,268
Leic	2,172	2,292	2,355	2,452	2,587	2.07	1,252
Liv Ain	222	227	209	216	210	0.43	491
Liv Roy	1,241	1,213	1,249	1,264	1,227	0.80	1,526
M RI	1,880	1,971	2,042	2,065	2,060	1.32	1,559
Middlbr	901	890	905	929	949	0.80	1,188
Newc	1,009	1,050	1,114	1,153	1,175	0.94	1,245
Norwch	720	770	777	785	809	0.68	1,185
Nottm	1,113	1,153	1,177	1,193	1,218	0.92	1,324
Oxford	1,690	1,766	1,874	1,935	1,969	1.43	1,375
Plymth	503	513	540	538	531	0.40	1,336
Ports	1,669	1,691	1,749	1,763	1,883	1.73	1,087
Prestn	1,215	1,204	1,270	1,319	1,341	1.22	1,097
Redng	775	789	795	814	860	0.69	1,245
Salford	974	1,019	1,113	1,174	1,237	1.14	1,084

Table 3.1 Continued

Centre	N on RRT 2015	2016	2017	2018	2019	Estimated catchment population (millions)	2019 crude rate (pmp)
Sheff	1,383	1,421	1,439	1,480	1,491	1.12	1,328
Shrew	369	377	384	428	428	0.41	1,053
Stevng	813	885	883	937	966	1.10	878
Sthend	246	236	254	263	264	0.27	974
Stoke	788	826	810	805	803	0.72	1,108
Sund	459	507	542	557	568	0.54	1,048
Truro	414	426	424	437	449	0.35	1,266
Wirral	281	337	386	395	411	0.47	884
Wolve	582	570	583	608	598	0.54	1,100
York	490	535	555	567	581	0.48	1,208
N IRELAND							
Antrim	241	252	255	274	280	0.24	1,152
Belfast	769	811	836	871	890	0.53	1,686
Newry	225	236	241	250	251	0.23	1,079
Ulster	169	166	182	191	182	0.20	906
West NI	293	307	313	326	328	0.25	1,321
SCOTLAND							
Abrdn	531	555	563	573	558	0.50	1,120
Airdrie	425	439	467	487	524	0.46	1,147
D&Gall	130	131	135	145	149	0.12	1,221
Dundee	419	418	435	445	449	0.37	1,225
Edinb	769	777	824	861	885	0.84	1,057
Glasgw	1,709	1,753	1,773	1,815	1,854	1.37	1,356
Inverns	252	258	262	279	282	0.22	1,267
Klmarnk	310	317	337	339	359	0.29	1,234
Krkcldy	295	294	304	298	295	0.27	1,083
WALES							
Bangor	182	179	195	202	201	0.16	1,238
Cardff	1,613	1,626	1,684	1,720	1,730	1.15	1,511
Clwyd	185	177	180	190	205	0.18	1,143
Swanse	765	774	795	828	868	0.75	1,156
Wrexm	293	310	322	313	311	0.21	1,511
TOTALS							
England	**51,292**	**52,958**	**54,577**	**56,016**	**57,510**	**44.33**	**1,297**
N Ireland	**1,697**	**1,772**	**1,827**	**1,912**	**1,931**	**1.45**	**1,329**
Scotland	**4,840**	**4,942**	**5,100**	**5,242**	**5,355**	**4.43**	**1,209**
Wales	**3,038**	**3,066**	**3,176**	**3,253**	**3,315**	**2.45**	**1,354**
UK	**60,867**	**62,738**	**64,680**	**66,423**	**68,111**	**52.67**	**1,293**

Country RRT populations were calculated by summing the RRT 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 renal centre.
[1]Carshalton discovered a problem related to the submission of PD patients after the closing date. As a consequence, 26 PD patients are not included in this report. No adjustment has been made this year, but the problem has been resolved and numbers will be correct next year.
pmp – per million population

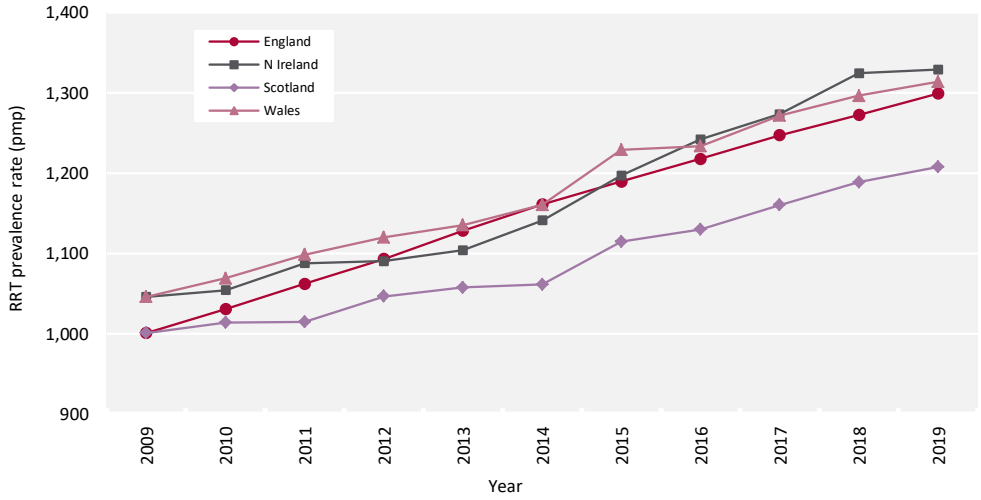

Figure 3.2 Adult RRT prevalence rates by country between 2009 and 2019

pmp – per million population

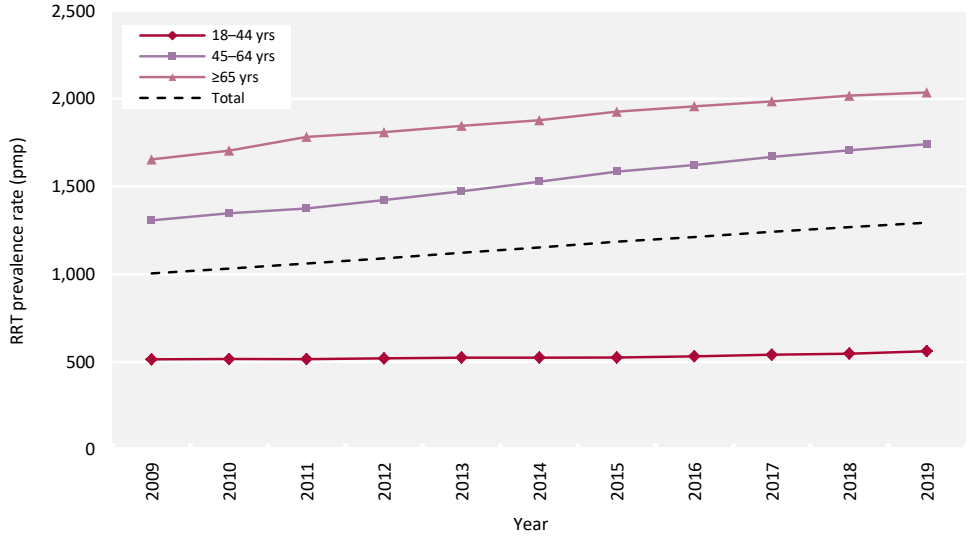

Figure 3.3 Adult RRT prevalence rates by age group between 2009 and 2019

pmp – per million population

Demographics and treatment modality of prevalent adult RRT patients

The proportion of RRT 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 RRT on 31/12/2019 by centre

								Ethnicity				
Centre	N on RRT	% on ICHD	% on PD	% on HHD	% with Tx	Median age (yrs)	% male	% White	% Asian	% Black	% Other	% missing
ENGLAND												
Basldn	322	58.4	6.2	3.1	32.3	61.3	65.5	85.6	6.6	5.0	2.8	0.9
Bham	3,308	40.5	7.8	2.3	49.5	58.7	58.4	57.2	29.3	10.7	2.8	1.5
Bradfd	733	38.2	4.6	0.8	56.3	57.6	60.6	50.9	45.4	2.6	1.1	0.8
Brightn	1,059	40.6	5.2	3.0	51.2	61.5	62.3	89.8	6.4	2.1	1.8	3.4
Bristol	1,486	31.5	4.3	1.1	63.1	59.0	61.7	88.6	4.1	5.6	1.8	0.9
Camb	1,469	19.6	1.9	2.0	76.4	57.7	62.7	90.9	5.9	2.0	1.2	2.0
Carlis	303	36.6	11.9	0.0	51.5	61.5	62.4	99.0	1.0	0.0	0.0	0.0
Carsh[1]	1,771	47.3	3.9	2.0	46.9	62.1	62.9	67.0	17.0	11.3	4.7	2.9
Chelms	261	43.7	11.9	0.0	44.4	65.4	69.3	90.8	3.2	2.8	3.2	3.8
Colchr	145	100.0	0.0	0.0	0.0	72.5	61.4	95.1	1.4	0.7	2.8	0.7
Covnt	1,076	32.9	7.6	1.9	57.6	59.2	61.7	78.6	16.4	5.0	0.0	0.1
Derby	652	36.5	9.5	8.9	45.1	60.8	61.5	83.1	10.9	3.4	2.6	0.3
Donc	342	52.9	7.3	1.5	38.3	65.3	63.5	93.9	2.9	1.2	2.0	0.0
Dorset	772	37.4	4.3	1.9	56.3	65.0	60.5	96.7	1.3	0.1	1.8	1.0
Dudley	366	56.6	9.8	3.3	30.3	64.1	63.1	81.4	12.3	5.5	0.8	0.0
Exeter	1,091	40.6	7.7	1.9	49.8	63.7	62.1	97.0	0.6	0.9	1.5	0.3
Glouc	525	43.0	5.5	0.6	50.9	64.7	63.2	92.6	3.0	2.3	2.1	0.0
Hull	904	38.7	5.4	0.8	55.1	59.1	64.0	96.4	1.9	0.7	1.0	0.4
Ipswi	424	33.3	9.9	0.9	55.9	62.8	64.2	82.9	2.0	3.7	11.5	3.5
Kent	1,140	36.8	4.5	1.7	57.0	61.3	59.8	93.9	3.5	1.1	1.6	1.5
L Barts	2,660	39.0	8.6	0.7	51.7	57.8	60.0	32.6	33.3	22.7	11.5	1.1
L Guys	2,310	28.8	2.3	1.9	67.0	55.5	58.9	58.7	9.9	27.0	4.4	1.9
L Kings	1,244	48.8	7.6	1.4	42.1	59.3	62.0	44.1	13.6	37.6	4.7	1.5
L Rfree	2,344	31.7	7.2	0.5	60.7	58.5	59.8	44.3	22.6	22.7	10.3	4.8
L St.G	852	35.2	5.2	0.7	58.9	60.5	58.7	38.4	25.5	25.1	10.9	3.5
L West	3,613	38.2	4.3	0.8	56.7	60.9	60.9	39.3	35.1	18.8	6.8	0.0
Leeds	1,723	32.0	3.9	1.5	62.6	57.4	61.8	77.1	16.7	4.9	1.3	0.1
Leic	2,587	37.3	4.9	2.1	55.7	60.2	60.6	73.3	20.1	4.8	1.8	3.9
Liv Ain	210	71.9	8.6	6.2	13.3	64.6	62.4	97.6	0.5	1.0	1.0	1.0
Liv Roy	1,227	28.9	2.6	2.9	65.5	57.6	61.7	91.2	2.9	3.3	2.6	1.2
M RI	2,060	24.2	3.7	3.7	68.3	57.0	60.0	68.4	14.9	14.7	2.0	1.5
Middlbr	949	36.2	3.4	2.0	58.4	59.5	64.0	94.0	5.2	0.6	0.2	0.0
Newc	1,175	27.8	5.1	1.6	65.4	59.0	60.3	93.4	4.3	1.0	1.3	0.0
Norwch	809	36.7	5.8	1.7	55.7	62.7	61.6	96.8	1.5	0.9	0.9	0.4
Nottm	1,218	29.6	6.2	2.5	61.7	58.1	60.5	80.9	9.4	6.7	3.0	0.0
Oxford	1,969	23.1	2.9	1.3	72.7	57.8	62.3	80.3	11.6	4.3	3.8	10.8
Plymth	531	23.7	7.9	1.3	67.0	62.0	67.8	96.6	0.8	0.4	2.3	0.0
Ports	1,883	31.4	4.7	3.7	60.2	60.4	61.7	92.2	3.9	1.3	2.5	5.7
Prestn	1,341	37.8	3.1	3.7	55.4	60.5	60.9	83.8	14.9	0.8	0.4	0.0
Redng	860	36.3	6.5	0.9	56.3	62.0	63.1	66.6	24.7	6.5	2.2	8.8
Salford	1,237	31.7	9.7	3.3	55.3	58.7	61.4	79.8	15.8	2.7	1.7	0.0

Table 3.2. Continued

Centre	N on RRT	% on ICHD	% on PD	% on HHD	% with Tx	Median age (yrs)	% male	Ethnicity				
								% White	% Asian	% Black	% Other	% missing
Sheff	1,491	36.2	4.0	3.8	56.1	59.4	62.4	88.0	6.7	2.6	2.7	1.5
Shrew	428	47.7	12.9	6.3	33.2	63.3	65.0	93.0	3.5	1.4	2.1	0.5
Stevng	966	52.5	3.8	3.8	39.9	61.1	63.3	71.1	15.1	8.9	4.9	8.4
Sthend	264	44.7	12.9	2.3	40.2	63.6	60.6	87.1	6.8	3.8	2.3	0.0
Stoke	803	33.3	8.8	3.5	54.4	59.8	63.3	90.6	5.9	1.3	2.3	2.2
Sund	568	44.4	4.6	2.1	48.9	60.8	59.7	95.9	3.2	0.7	0.2	0.2
Truro	449	37.0	4.5	0.9	57.7	62.7	58.6	98.7	0.4	0.0	0.9	0.0
Wirral	411	50.4	4.1	1.9	43.6	62.0	60.8	95.6	2.4	1.0	1.0	0.0
Wolve	598	50.5	8.2	5.4	36.0	60.9	60.4	64.4	24.8	9.4	1.3	0.8
York	581	31.7	5.7	2.8	59.9	61.9	62.5	97.2	1.2	0.3	1.2	1.4
N IRELAND												
Antrim	280	42.1	6.8	1.4	49.6	64.2	64.6	100.0	0.0	0.0	0.0	0.0
Belfast	890	17.6	2.1	1.5	78.8	57.1	59.4	97.4	1.7	0.6	0.4	6.0
Newry	251	31.1	4.4	0.8	63.7	61.1	57.0	98.4	0.8	0.4	0.4	1.2
Ulster	182	53.3	4.4	0.0	42.3	68.6	55.5	95.1	2.7	1.6	0.5	0.0
West NI	328	32.3	4.3	0.3	63.1	57.7	60.7	98.5	1.2	0.3	0.0	0.0
SCOTLAND												
Abrdn	558	34.1	3.9	0.5	61.5	57.6	57.9					66.5
Airdrie	524	39.5	4.0	0.0	56.5	58.5	58.8	96.7	2.2	0.2	0.8	6.7
D&Gall	149	34.9	5.4	1.3	58.4	59.8	61.7					36.9
Dundee	449	36.1	4.7	1.6	57.7	59.0	60.6					66.8
Edinb	885	33.4	4.6	0.2	61.7	58.9	62.4					75.5
Glasgw	1,854	31.0	2.4	1.0	65.6	58.5	59.2					48.8
Inverns	282	32.6	4.3	2.5	60.6	58.8	56.7					47.9
Klmarnk	359	38.7	6.7	3.9	50.7	60.4	59.1					56.5
Krkcldy	295	46.8	4.1	0.7	48.5	61.6	60.3					80.3
WALES												
Bangor	201	32.8	7.0	7.5	52.7	62.5	64.2	98.5	0.0	0.5	1.0	3.5
Cardff	1,730	31.9	3.7	1.9	62.5	58.8	62.2	91.4	6.0	0.8	1.8	0.8
Clwyd	205	42.0	6.3	1.0	50.7	64.7	64.4	97.4	2.1	0.0	0.5	6.3
Swanse	868	44.8	9.0	5.2	41.0	63.8	63.6	97.3	1.6	0.3	0.7	0.8
Wrexm	311	34.1	7.4	2.3	56.3	59.6	64.6	96.4	1.3	1.0	1.3	1.0
TOTALS												
England	**57,510**	**36.1**	**5.5**	**2.1**	**56.3**	**59.6**	**61.3**	**73.2**	**14.5**	**8.9**	**3.4**	**2.0**
N Ireland	**1,931**	**28.8**	**3.7**	**1.0**	**66.5**	**59.2**	**59.7**	**97.9**	**1.3**	**0.5**	**0.3**	**2.9**
Scotland	**5,355**	**34.6**	**3.8**	**1.0**	**60.6**	**58.8**	**59.7**					**54.3**
Wales	**3,315**	**36.2**	**5.8**	**3.1**	**55.0**	**60.7**	**63.0**	**94.2**	**3.8**	**0.6**	**1.3**	**1.3**
UK	**68,111**	**35.8**	**5.4**	**2.0**	**56.8**	**59.6**	**61.2**	**75.6**	**13.3**	**8.0**	**3.1**	**6.1**

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.
[1]Carshalton discovered a problem related to the submission of PD patients after the closing date. As a consequence, 26 PD patients are not included in this report. No adjustment has been made this year, but the problem has been resolved and numbers will be correct next year.

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 RRT 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 RRT on 31/12/2019 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 on RRT	5,389	7,552	13,284	16,696	14,496	8,905	1,789	68,111	59.6
% on RRT	7.9	11.1	19.5	24.5	21.3	13.1	2.6		
Sex (%)									
Male	7.7	10.9	19.1	24.7	21.2	13.5	2.8	61.2	59.9
Female	8.3	11.3	20.1	24.2	21.5	12.4	2.3	38.8	59.2
Ethnicity (%)									
White	7.8	10.5	19.3	23.9	21.9	13.7	2.9	75.6	60.0
Asian	9.0	13.5	18.3	24.7	22.3	10.4	1.7	13.3	59.3
Black	6.0	12.3	25.3	29.4	13.7	11.1	2.3	8.0	57.0
Other	11.2	15.7	20.8	23.4	17.7	9.9	1.3	3.1	56.0
Missing	7.3	9.2	16.6	25.9	23.5	14.8	2.7	6.1	61.7
PRD (%)									
Diabetes	2.7	8.8	19.4	28.3	24.8	13.8	2.2	18.3	61.8
Glomerulonephritis	9.3	13.8	22.3	25.9	18.8	8.7	1.2	19.5	56.8
Hypertension	3.2	8.6	19.1	24.6	21.3	18.9	4.4	6.3	62.4
Polycystic kidney disease	1.7	5.7	20.9	34.2	26.6	10.2	0.8	10.4	61.3
Pyelonephritis	10.4	14.5	24.1	22.1	16.3	10.3	2.3	9.6	55.4
Renal vascular disease	1.6	3.1	5.1	13.2	29.6	36.9	10.5	2.8	74.3
Other	15.8	13.8	18.1	20.3	19.0	10.9	2.1	18.2	56.1
Uncertain aetiology	7.7	11.4	17.5	20.8	21.0	16.9	4.6	14.9	61.5
Missing	15.0	9.6	14.5	20.2	20.6	16.0	4.0	2.5	60.7
Modality (%)									
ICHD	4.4	6.3	13.0	20.9	24.7	24.5	6.3	35.8	67.5
HHD	9.2	13.5	26.8	26.6	16.0	7.5	0.4	2.0	55.2
PD	7.8	8.4	14.1	21.0	24.0	20.7	3.8	5.4	64.4
Tx	10.1	14.3	23.9	27.0	19.1	5.4	0.3	56.8	55.6

Variation between centres in the proportion of patients prevalent to dialysis on 31/12/2019 and on home therapies is shown in figure 3.4 . Please visit the UKRR data portal (renal.org/audit-research/data-portal) to identify individual renal centres.

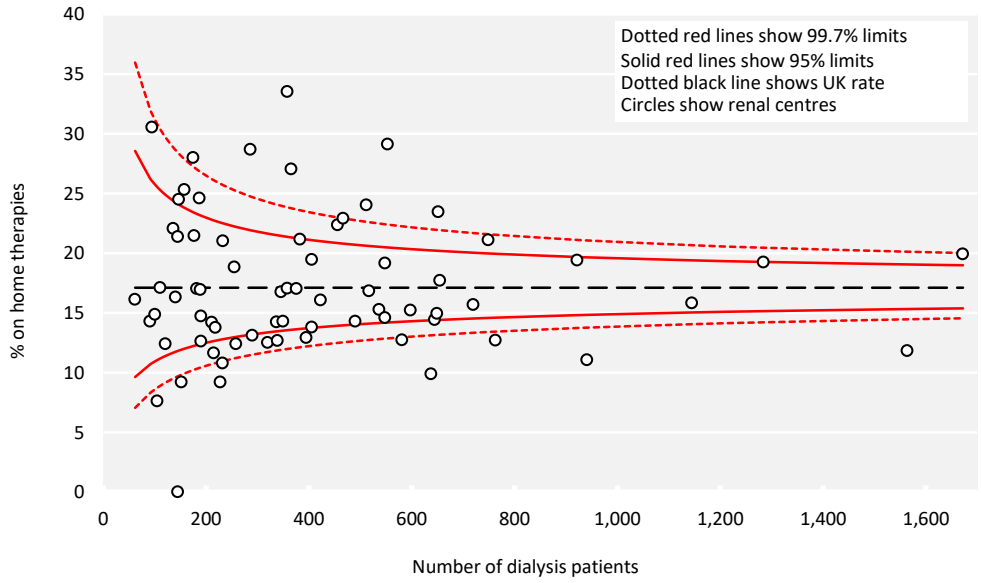

Figure 3.4 Percentage of adult patients prevalent to dialysis on 31/12/2019 on home therapies (PD and HHD) by centre

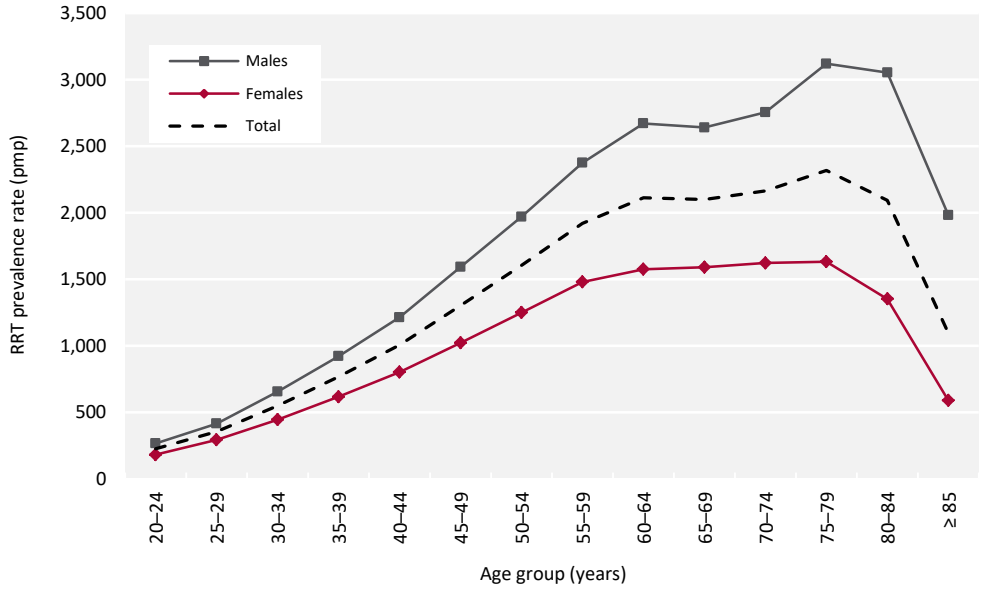

Figure 3.5 Prevalence rates for adult patients on RRT on 31/12/2019 by age group and sex

For each modality, the percentage of patients of each year of age is shown in figure 3.6, with the totals of each modality adding to 100%.

Figure 3.6 Age profile of adult patients prevalent to RRT on 31/12/2019 by RRT modality

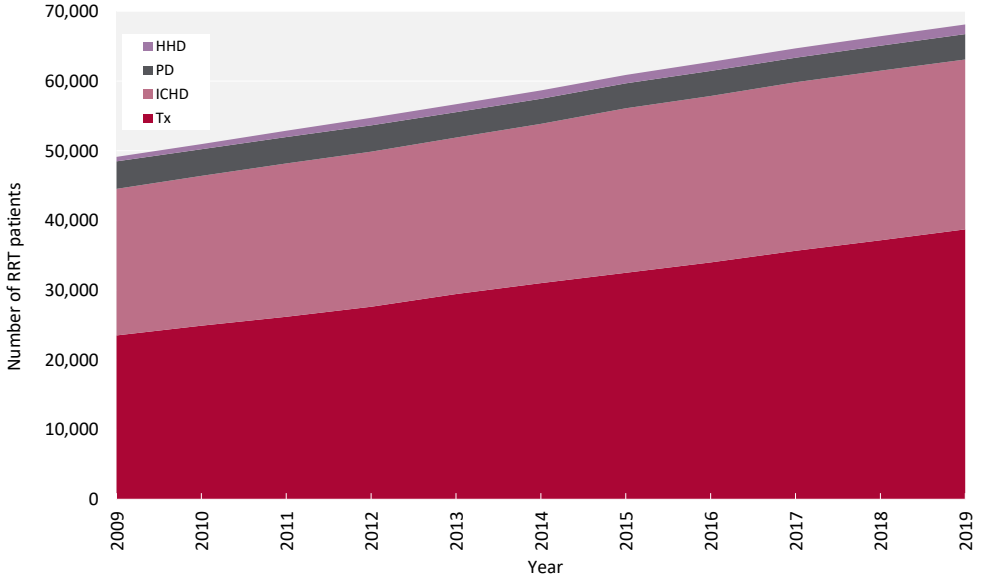

Figure 3.7 Growth in numbers of prevalent adult RRT patients by treatment modality between 2009 and 2019

Table 3.4 Change in adult RRT prevalence rates by modality between 2015 and 2019

	Prevalence (pmp)					% growth in prevalence				
Year	HD	PD	Dialysis	Tx	RRT	HD	PD	Dialysis	Tx	RRT
2015	483	70	553	633	1,186					
2016	486	70	556	656	1,212	0.6	-0.1	0.5	3.7	2.2
2017	490	68	558	684	1,242	0.8	-2.9	0.4	4.3	2.5
2018	491	68	559	709	1,268	0.1	1.3	0.2	3.6	2.1
2019	489	69	558	735	1,293	-0.3	1.1	-0.2	3.7	2.0
Average annual growth 2015-2019						**0.3**	**-0.1**	**0.2**	**3.8**	**2.2**

pmp – per million population

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 2010 and 2019, in particular the increase in diabetes.

Table 3.5 Treatment modality of adult patients prevalent to RRT on 31/12/2019 by primary renal disease (PRD)

PRD	N on RRT	% RRT population	Modality (%)		
			HD	PD	Tx
Diabetes	12,140	18.3	55.5	7.1	37.4
Glomerulonephritis	12,968	19.5	27.4	4.3	68.3
Hypertension	4,200	6.3	44.7	6.5	48.8
Polycystic kidney disease	6,927	10.4	20.5	3.5	76.0
Pyelonephritis	6,355	9.6	29.1	3.4	67.5
Renal vascular disease	1,860	2.8	65.8	10.7	23.5
Other	12,079	18.2	36.0	4.5	59.5
Uncertain aetiology	9,910	14.9	38.6	5.9	55.5
Total (with data)	**66,439**	**100.0**	**37.4**	**5.2**	**57.4**
Missing	1,672	2.5	54.8	9.5	35.6

Table 3.6 Change in primary renal disease (PRD) of adult patients prevalent to RRT between 2010 and 2019

PRD	Year									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Diabetes	15.4	15.8	16.2	16.5	16.7	17.1	17.4	17.7	18.0	18.3
Glomerulonephritis	19.4	19.3	19.4	19.5	19.5	19.4	19.4	19.5	19.4	19.5
Hypertension	6.1	6.1	6.3	6.3	6.3	6.3	6.2	6.2	6.2	6.3
Polycystic kidney disease	9.9	10.0	10.0	10.2	10.2	10.3	10.2	10.3	10.4	10.4
Pyelonephritis	11.8	11.6	11.4	11.2	10.9	10.6	10.4	10.1	9.8	9.6
Renal vascular disease	3.6	3.5	3.3	3.1	3.1	3.0	3.0	3.0	2.9	2.8
Other	16.3	16.4	16.6	16.8	17.2	17.4	17.7	18.0	18.2	18.2
Uncertain aetiology	17.5	17.4	16.8	16.3	16.2	15.9	15.6	15.3	15.0	14.9
Missing	0.4	0.6	0.6	0.9	0.8	0.9	1.0	1.4	1.7	2.5

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 RRT 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).

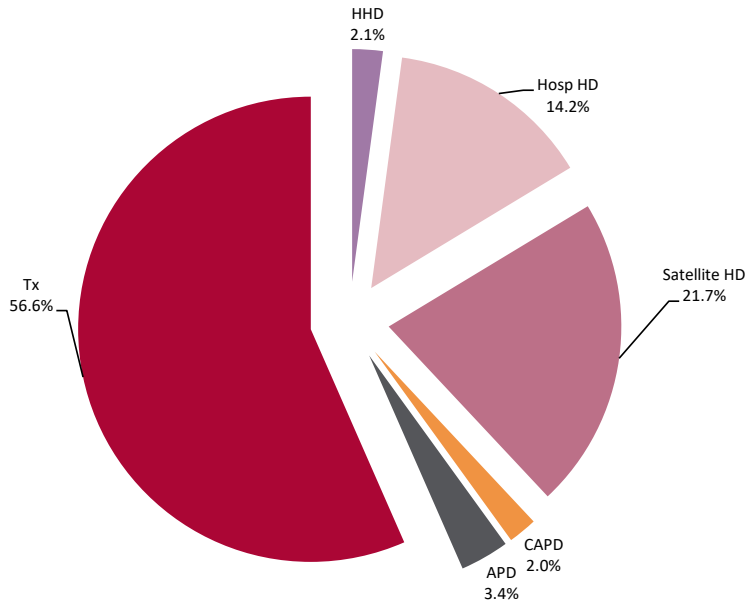

Figure 3.8 Detailed treatment modality of adult patients prevalent to RRT on 31/12/2019

No Scottish centres were included because data on satellite HD were not available.
APD – automated PD; CAPD – continuous ambulatory PD

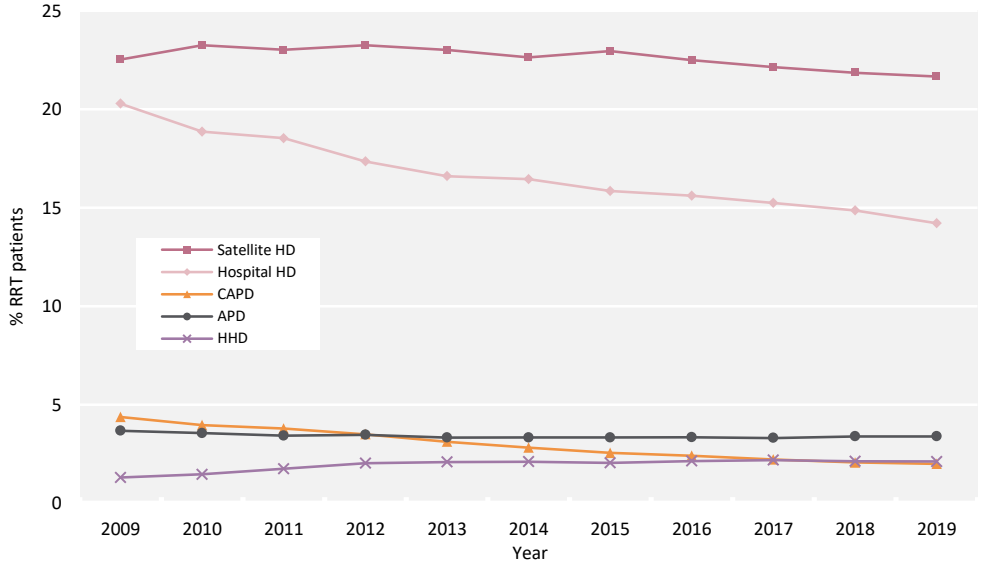

Figure 3.9 Detailed dialysis modality changes in prevalent adult RRT patients between 2009 and 2019

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

Table 3.7 Adult patients prevalent to dialysis on 31/12/2019 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										
Basldn	218	39.0	6.8	90.8	4.6	70.6	15.6	9.2	2.8	6.4
Bham	1,672	30.4	3.0	84.6	4.6	28.3	51.8	15.4	2.3	13.1
Bradfd	320	30.9	4.2	89.4	1.9	74.7	12.8	10.6	6.9	3.8
Brightn	517	28.0	4.4	89.4	6.2	36.8	46.4	10.6	6.6	4.1
Bristol	548	30.1	5.0	88.3	2.9	15.5	69.9	11.7	6.9	4.7
Camb	346	31.7	4.9	91.9	8.7	35.0	48.3	8.1	5.5	2.6
Carlis	147	25.8	5.9	75.5	0.0	47.6	27.9	24.5	3.4	21.1
Carsh	941	32.6	3.9	92.7	3.7	20.2	68.8	7.3	2.1	4.5
Chelms	145	25.5	2.1	78.6	0.0	78.6	0.0	21.4	5.5	15.9
Colchr	145	26.1	2.0	100.0	0.0	78.6	21.4	0.0	0.0	0.0
Covnt	456	36.6	3.6	82.0	4.4	77.6	0.0	18.0	18.0	0.0
Derby	358	28.0	4.1	82.7	16.2	58.9	7.5	17.3	9.2	8.1
Donc	211	35.5	6.7	88.2	2.4	45.5	40.3	11.9	4.3	7.6
Dorset	337	37.2	8.5	90.2	4.5	18.7	67.1	9.8	1.2	8.6
Dudley	255	31.2	4.1	85.9	4.7	32.2	49.0	14.1	7.5	6.7
Exeter	548	30.9	3.8	84.7	3.8	9.9	71.0	15.3	6.6	8.8
Glouc	258	31.3	6.2	88.8	1.2	63.6	24.0	11.2	1.6	9.7
Hull	406	31.4	7.1	87.9	1.7	42.1	44.1	12.1	6.7	5.4
Ipswi	187	24.6	3.4	77.5	2.1	66.8	8.6	22.5	12.8	8.6
Kent	490	23.7	4.9	89.6	3.9	28.6	57.1	10.4	9.6	0.8
L Barts	1,284	37.1	5.7	82.2	1.4	33.8	47.0	17.8	2.4	15.4
L Guys	763	32.6	8.5	93.1	5.8	15.1	72.2	7.0	0.3	6.7
L Kings	720	22.9	6.2	86.8	2.5	19.3	65.0	13.2	4.3	8.9
L Rfree	922	38.8	8.7	81.8	1.2	2.7	77.9	18.2	5.6	12.6
L St.G	350	32.5	9.6	87.4	1.7	25.7	60.0	12.6	2.3	8.6
L West	1,564	51.0	13.3	90.0	1.9	16.1	72.1	10.0	5.8	4.2
Leeds	645	39.5	13.9	89.6	4.0	17.4	68.2	10.4	2.8	7.6
Leic	1,145	35.2	6.9	88.9	4.7	16.9	67.3	11.1	2.4	8.7
Liv Ain	182	31.3	5.1	90.1	7.1	9.3	73.6	9.9	1.7	8.2
Liv Roy	423	24.6	14.7	92.4	8.5	35.0	48.9	7.6	2.4	5.2
M RI	652	40.0	13.9	88.2	11.7	12.7	63.8	11.8	2.5	9.4
Middlbr	395	40.9	8.4	91.9	4.8	23.3	63.8	8.1	8.1	0.0
Newc	406	35.3	11.9	85.2	4.7	60.1	20.4	14.8	1.2	13.6
Norwch	358	22.0	2.6	86.9	3.9	51.7	31.3	13.1	9.8	3.4
Nottm	467	28.6	2.9	83.7	6.6	34.3	42.8	16.3	5.1	11.1
Oxford	537	41.5	6.0	89.4	4.7	30.9	53.8	10.6	3.7	6.7
Plymth	175	31.7	14.8	76.0	4.0	68.0	4.0	24.0	6.3	17.7
Ports	749	32.1	10.3	88.3	9.4	16.4	62.5	11.8	4.4	7.3
Prestn	598	36.4	10.2	93.0	8.2	19.7	65.1	7.0	2.3	4.7
Redng	376	30.4	4.6	85.1	2.1	35.9	47.1	14.9	8.8	6.1
Salford	553	44.6	21.4	78.3	7.4	20.1	50.8	21.7	7.6	14.1
Sheff	655	32.2	7.0	90.8	8.6	46.4	35.9	9.2	2.8	6.3
Shrew	286	26.8	4.0	80.8	9.4	40.6	30.8	19.2	3.5	15.7
Stevng	581	37.7	9.4	93.6	6.4	41.1	46.1	6.4	6.4	0.0
Sthend	158	26.2	2.2	78.5	3.8	74.7	0.0	21.5	21.5	0.0
Stoke	366	34.4	1.9	80.6	7.7	47.5	25.4	19.4	2.5	11.8
Sund	290	31.4	11.1	91.0	4.1	46.9	40.0	9.0	2.8	6.2
Truro	190	30.2	3.9	89.5	2.1	54.7	32.6	10.5	4.2	6.3
Wirral	232	30.4	9.2	92.7	3.5	42.7	46.6	7.3	0.4	6.9
Wolve	383	21.3	5.4	87.2	8.4	66.6	12.3	12.8	2.4	7.3
York	233	34.9	8.7	85.8	6.9	30.0	48.9	14.2	11.6	2.6

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
N IRELAND[1]										
Antrim	141	29.7	4.8	86.5	2.8	83.7	0.0	13.5	2.8	9.9
Belfast	189	35.6	14.1	90.0	6.9	83.1	0.0	10.1	0.0	9.0
Newry	91	19.4	8.3	87.9	2.2	85.7	0.0	12.1	0.0	12.1
Ulster	105	16.0	3.8	92.4	0.0	92.4	0.0	7.6	1.0	3.8
West NI	121	30.2	7.4	88.4	0.8	87.6	0.0	11.6	1.7	9.9
SCOTLAND[2]										
Abrdn	215	37.4	10.3	89.8	1.4	88.4	0.0	10.2	10.2	0.0
Airdrie	228	40.0	16.3	90.8	0.0	90.8	0.0	9.2	4.0	5.3
D&Gall	62	51.9	14.3	87.1	3.2	83.9	0.0	12.9	1.6	11.3
Dundee	190	36.7	1.0	89.0	3.7	85.3	0.0	11.1	0.0	11.1
Edinb	339	33.5	11.3	87.9	0.6	87.3	0.0	12.1	4.1	8.0
Glasgw	638	51.3	12.7	93.0	2.8	90.1	0.0	7.1	1.6	5.5
Inverns	111	46.9	3.2	89.2	6.3	82.9	0.0	10.8	10.8	0.0
Klmarnk	177	36.0	15.4	86.4	7.9	78.5	0.0	13.6	0.0	13.6
Krkcldy	152	27.1	11.0	92.1	1.3	90.8	0.0	7.9	0.7	7.2
WALES										
Bangor	95	32.5	7.3	85.3	15.8	52.6	16.8	14.7	3.2	11.6
Cardff	649	30.6	7.8	90.1	5.1	3.9	81.2	9.9	5.1	4.8
Clwyd	101	27.3	2.9	87.1	2.0	85.2	0.0	12.9	6.9	5.9
Swanse	512	29.1	5.5	84.8	8.8	44.5	31.5	15.2	6.5	8.8
Wrexm	136	23.4	5.6	83.1	5.2	64.0	14.0	16.9	0.7	16.2
TOTALS										
England	**25,143**	**34.1**	**7.3**	**87.4**	**4.8**	**31.4**	**51.2**	**12.6**	**4.7**	**7.8**
N Ireland	**647**	**29.2**	**7.8**	**89.0**	**3.1**	**85.9**	**0.0**	**11.0**	**1.1**	**9.0**
Scotland	**2,112**	**41.1**	**11.1**	**90.3**	**2.6**	**87.6**	**0.0**	**9.8**	**3.3**	**6.5**
Wales	**1,493**	**29.4**	**6.3**	**87.1**	**6.8**	**31.9**	**48.4**	**12.9**	**5.2**	**7.7**
UK	**29,395**	**34.3**	**7.5**	**87.6**	**4.7**	**36.6**	**46.3**	**12.4**	**4.5**	**7.7**

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

The proportion of patients on HHD versus satellite HD is shown in figure 3.10, with the remaining patients on hospital HD.

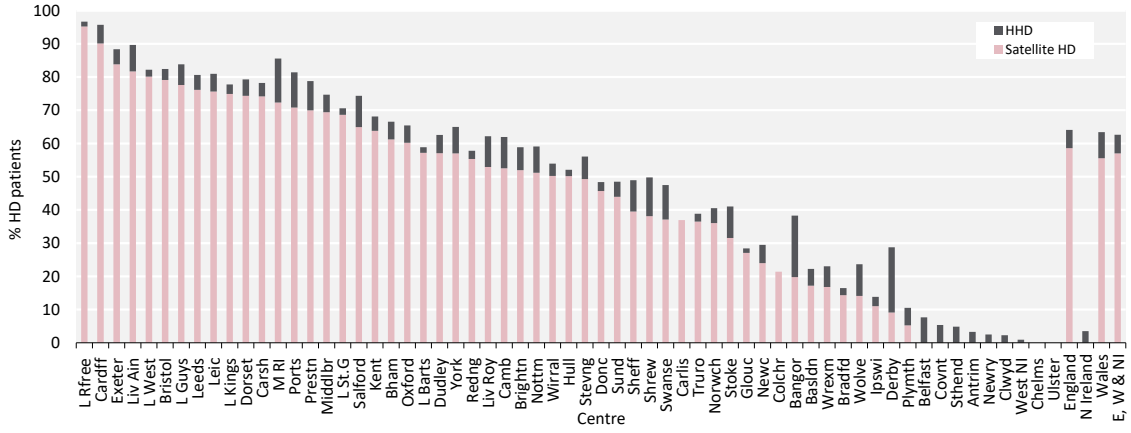

Figure 3.10 Adult patients prevalent to HD on 31/12/2019 treated with satellite HD or HHD by centre

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 31/12/2018 and followed-up for one year in 2019. 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 31/12/2018 by centre

	Age-adjusted survival				Case-mix adjusted survival1			
Centre	N on dialysis	1 yr (%)	Lower 95% limit	Upper 95% limit	N on dialysis	1 yr (%)	Lower 95% limit	Upper 95% limit
D&Gall	57	86.1	76.4	94.0				
Clwyd	84	92.5	78.8	93.2	84	94.1	81.6	94.9
Newry	89	83.9	79.1	93.0	88	82.4	81.9	94.8
Bangor	95	85.6	79.4	92.9	95	89.0	82.3	94.7
Inverns	104	90.7	79.9	92.7				
Colchr	119	86.9	80.5	92.5	119	89.9	83.3	94.3
Ulster	124	88.4	80.6	92.4	122	86.4	83.4	94.3
Carlis	128	91.0	80.8	92.3	124	92.0	83.5	94.2
West NI	131	88.1	80.9	92.3	121	83.6	83.4	94.3
Wrexm	136	86.4	81.0	92.2	136	87.9	83.8	94.1
Sthend	141	89.7	81.2	92.2	141	90.5	84.0	94.0
Krkcldy	141	87.1	81.2	92.2				
Antrim	143	86.7	81.2	92.1	134	85.3	83.8	94.1
Chelms	149	83.8	81.4	92.1	148	87.1	84.1	94.0
Klmarnk	164	84.0	81.7	91.9				
Plymth	166	83.3	81.7	91.9	164	87.4	84.5	93.8
Truro	180	87.9	82.0	91.7	180	91.0	84.8	93.7
Ipswi	188	85.8	82.2	91.7	181	88.8	84.8	93.7
Liv Ain	189	84.3	82.2	91.7	189	88.8	84.9	93.6
Dundee	191	92.1	82.2	91.6				
Basldn	204	90.6	82.4	91.5	203	92.9	85.2	93.5
Airdrie	207	87.6	82.5	91.5				
York	211	90.1	82.5	91.5	211	92.2	85.3	93.5
Donc	213	87.9	82.5	91.5	210	89.9	85.3	93.5
Belfast	218	87.6	82.6	91.4				
Wirral	224	86.1	82.7	91.4	223	89.9	85.4	93.4
Abrdn	226	87.2	82.7	91.4				
Dudley	250	86.6	83.0	91.2	250	89.8	85.7	93.2
Sund	263	88.0	83.1	91.1	261	90.6	85.8	93.2
Glouc	264	86.0	83.1	91.1	260	88.4	85.8	93.2
Shrew	267	89.2	83.2	91.1	267	90.8	85.9	93.1
Bradfd	279	86.3	83.3	91.0	278	89.7	86.0	93.1
Derby	312	86.7	83.5	90.9	312	89.1	86.2	92.9
L St.G	327	90.0	83.6	90.8	316	91.9	86.3	92.9
Redng	328	88.6	83.7	90.8	328	91.5	86.4	92.9
Dorset	329	88.8	83.7	90.8	329	90.3	86.4	92.9
Edinb	330	89.4	83.7	90.8				
Norwch	336	88.5	83.7	90.8	336	90.0	86.4	92.9
Middlbr	360	87.8	83.9	90.7	360	91.3	86.5	92.8
Stoke	366	83.9	83.9	90.7	364	87.2	86.6	92.8
Hull	379	84.9	84.0	90.6	378	87.8	86.6	92.7
Wolve	382	86.1	84.0	90.6	382	89.0	86.7	92.7
Camb	395	89.2	84.0	90.6	379	90.0	86.7	92.7
Newc	399	86.4	84.1	90.6	399	90.4	86.7	92.7
Covnt	415	88.9	84.1	90.5	408	90.4	86.8	92.6
Nottm	432	86.7	84.2	90.5	431	89.6	86.9	92.6
Swanse	442	86.5	84.3	90.4	442	89.6	86.9	92.5
Liv Roy	444	87.8	84.3	90.4	439	91.7	86.9	92.6
Kent	450	86.1	84.3	90.4	450	88.2	87.0	92.5
Oxford	488	86.2	84.4	90.3	477	89.0	87.1	92.5
Brightn	509	85.6	84.5	90.3	497	88.5	87.1	92.4
Salford	510	84.7	84.5	90.3	510	88.7	87.2	92.4
Bristol	511	87.1	84.5	90.3	510	90.4	87.2	92.4
Exeter	531	87.0	84.6	90.2	528	89.4	87.2	92.4
Stevng	534	85.3	84.6	90.2	532	87.7	87.2	92.4

Table 3.8 Continued

Centre	Age-adjusted survival				Case-mix adjusted survival1			
	N on dialysis	1 yr (%)	Lower 95% limit	Upper 95% limit	N on dialysis	1 yr (%)	Lower 95% limit	Upper 95% limit
Prestn	571	86.9	84.7	90.1	550	89.9	87.3	92.3
Leeds	592	90.1	84.8	90.1	591	92.3	87.4	92.3
Cardff	602	87.4	84.8	90.1	602	90.4	87.4	92.2
M RI	607	85.1	84.8	90.1	599	88.5	87.4	92.2
Glasgw	609	85.4	84.8	90.1				
Sheff	624	86.9	84.9	90.0	624	89.3	87.5	92.2
L Kings	658	89.5	84.9	90.0	656	91.9	87.6	92.2
Ports	681	86.1	85.0	89.9	672	89.1	87.6	92.1
L Guys	719	89.2	85.1	89.9	718	91.2	87.7	92.1
L Rfree	810	87.3	85.2	89.8	799	90.1	87.8	92.0
Carsh	944	88.8	85.4	89.6	930	90.3	88.0	91.9
Leic	1,012	88.3	85.5	89.6	1,006	90.1	88.1	91.8
L Barts	1,242	90.0	85.7	89.4	1,228	92.1	88.3	91.6
L West	1,530	88.9	85.9	89.2	1,470	90.9	88.5	91.5
Bham	1,615	89.9	86.0	89.2	1,610	91.8	88.5	91.5
Total	**27,870**	**87.7**			**25,351**	**90.1**		

Centres are ordered by increasing number of patients.
[1]Centres excluded if <85% comorbidity data were available – this included Belfast and all Scottish renal centres.

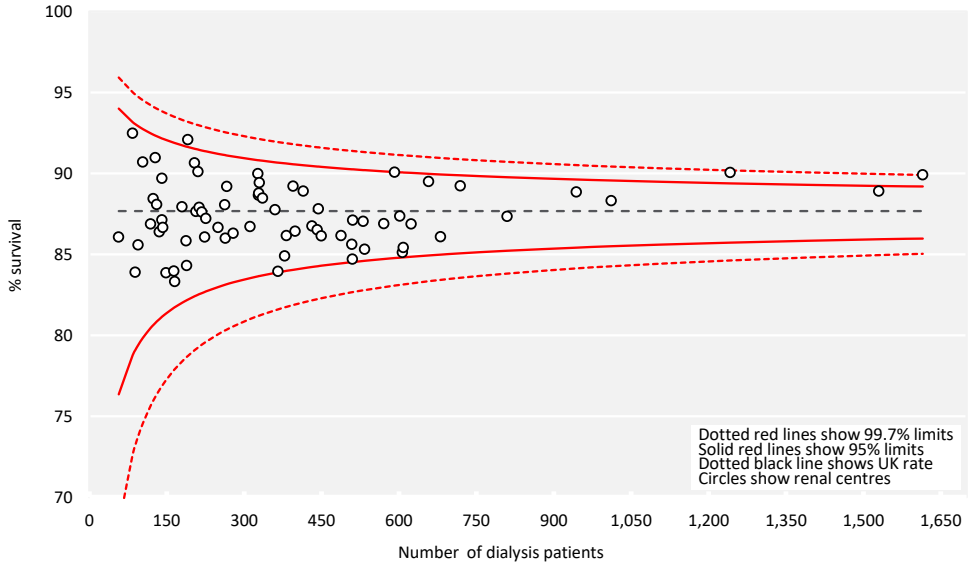

Figure 3.11 1 year survival (adjusted to age 60 years) of adult patients prevalent to dialysis on 31/12/2018 by centre

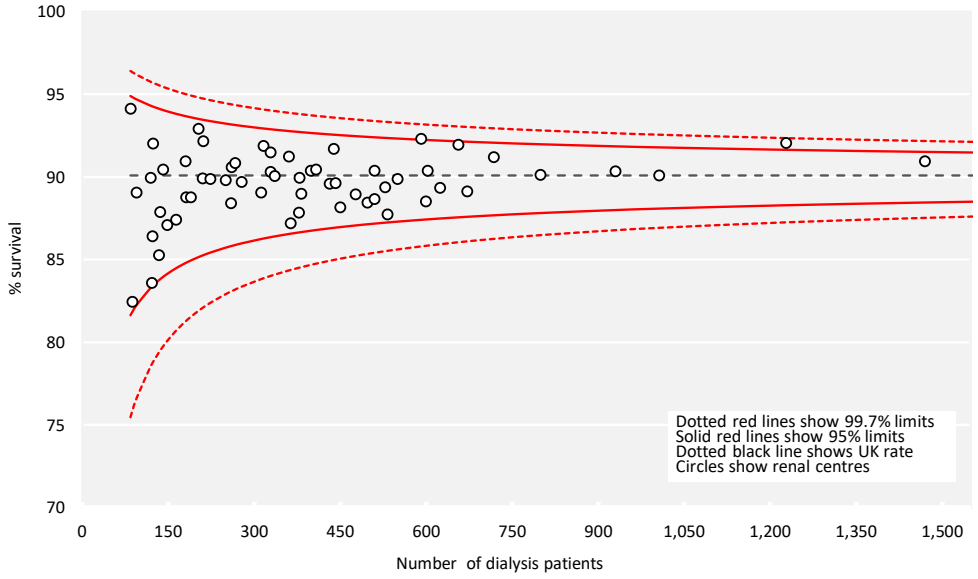

Figure 3.12 1 year survival (adjusted to 60 years, male and median comorbidity score) of adult patients prevalent to dialysis on 31/12/2018 by centre

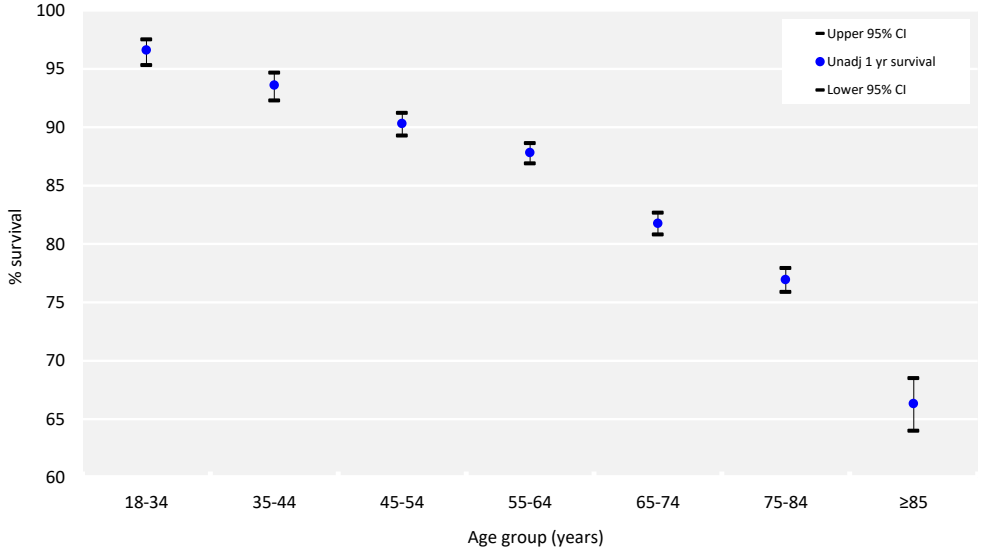

Figure 3.13 1 year survival (unadjusted) of adult patients prevalent to dialysis on 31/12/2018 by age group

CI – confidence interval

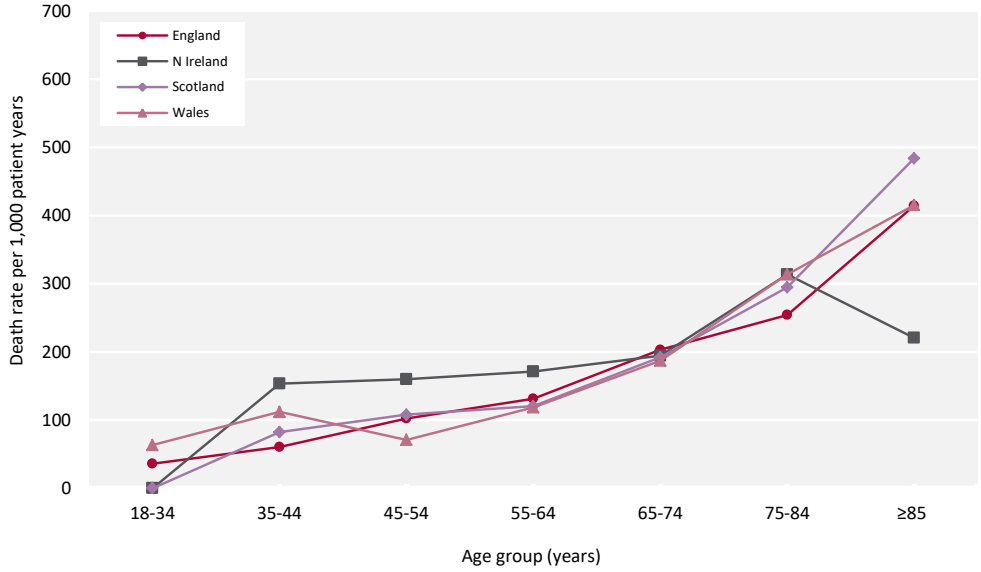

Figure 3.14 1 year death rate per 1,000 patient years for adult patients prevalent to dialysis on 31/12/2018 by country and age group

The serial one year death rate in prevalent adult dialysis patients by country is shown in figure 3.15, adjusted to age 60 years.

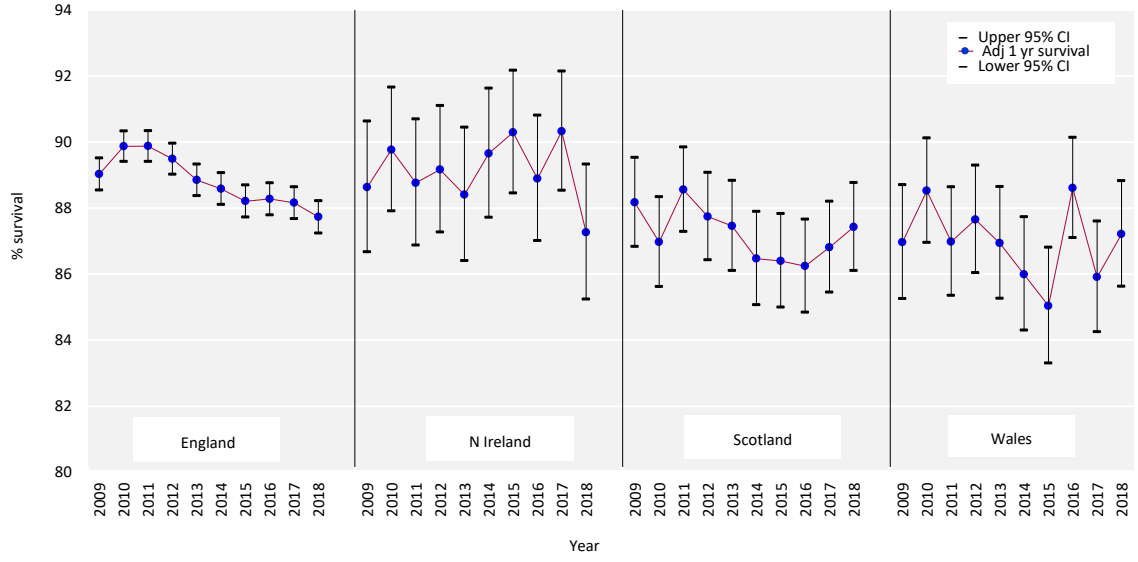

Figure 3.15 1 year survival (adjusted to age 60 years) for prevalent adult dialysis patients by country between 2009 and 2018

CI – confidence interval

The relative risk of death by age group for prevalent RRT 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.

Table 3.9 Death rate by age group for adult patients prevalent to RRT on 31/12/2018 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-2019 (thousands)	UK deaths in 2019	Death rate per 1,000 population	Expected number of deaths in UKRR population	UKRR deaths in 2019	UKRR death rate per 1,000 prevalent RRT patients	Relative risk of death in 2019	Relative risk of death 1998-2001 cohort
20-24	4,153	1,623	0.4	0	6	6	16.3	41.1
25-29	4,514	2,186	0.5	1	9	6	11.6	41.8
30-34	4,497	3,010	0.7	2	40	16	24.5	31.2
35-39	4,396	4,278	1.0	3	65	20	20.1	26.0
40-44	4,020	5,758	1.4	6	85	22	15.0	22.6
45-49	4,402	9,669	2.2	13	200	35	15.8	19.0
50-54	4,661	14,985	3.2	24	321	44	13.7	12.8
55-59	4,406	21,071	4.8	38	437	55	11.4	10.1
60-64	3,755	28,273	7.5	56	551	74	9.9	10.4
65-69	3,368	39,706	11.8	80	688	102	8.6	7.9
70-74	3,319	61,516	18.5	120	962	148	8.0	7.2
75-79	2,325	74,392	32.0	149	960	206	6.4	5.3
80-84	1,715	98,126	57.2	176	834	271	4.7	4.0
≥85	1,647	235,357	142.9	207	597	412	2.9	3.0
Total	**51,178**	**599,950**	**11.7**	**874**	**5,755**	**91**	**6.6**	**7.7**

Cause of death in adult RRT patients

Cause of death was analysed in prevalent patients receiving RRT on 31/12/2018 and followed-up for one year in 2019. The proportion of RRT 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.

Table 3.10 Cause of death in adult patients prevalent to RRT on 31/12/2018 followed-up in 2019 by age group

	RRT all ages		RRT <65 yrs		RRT ≥65 yrs	
Cause of death	N	%	N	%	N	%
Cardiac disease	780	19.5	260	22.2	520	18.4
Cerebrovascular disease	114	2.9	44	3.8	70	2.5
Infection	732	18.3	212	18.1	520	18.4
Malignancy	351	8.8	126	10.8	225	8.0
Treatment withdrawal	709	17.8	118	10.1	591	20.9
Other	1,003	25.1	315	27.0	688	24.4
Uncertain aetiology	306	7.7	94	8.0	212	7.5
Total (with data)	**3,995**	**100.0**	**1,169**	**100.0**	**2,826**	**100.0**
Missing	1,760	30.6	545	31.8	1,215	30.1

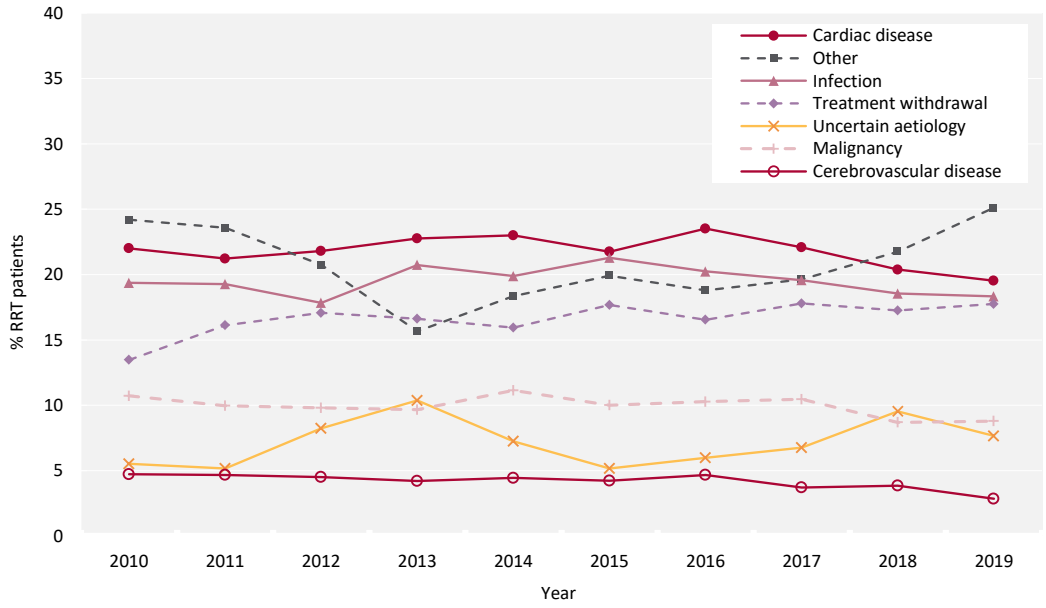

Figure 3.16 Cause of death between 2010 and 2019 for adult patients prevalent to RRT at the beginning of the year

THE RENAL ASSOCIATION
founded 1950

Chapter 4

Adults with a kidney transplant (Tx) in the UK at the end of 2019

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 2019 (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 renal replacement therapy (RRT).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.

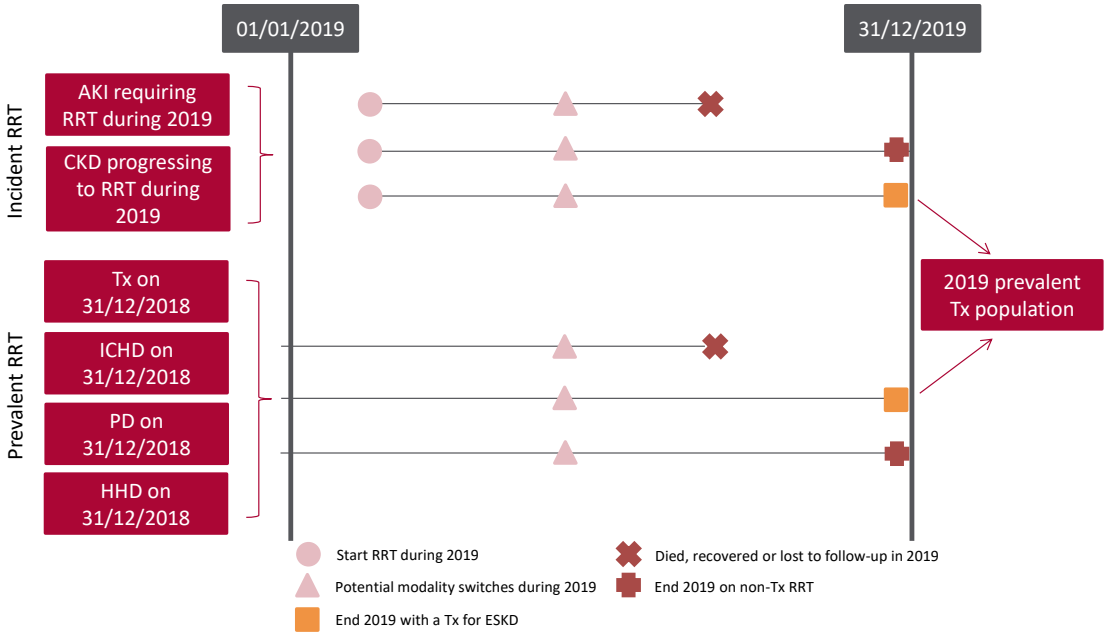

Figure 4.1 Pathways adult patients could follow to be included in the UK 2019 prevalent Tx population

Note that patients receiving dialysis for acute kidney injury (AKI) are only included in this chapter if they had a timeline or RRT modality code for chronic ICHD at the end of 2019 or if they had been on RRT for ≥90 days and were on ICHD at the end of 2019.
AKI – acute kidney injury; CKD – chronic kidney disease; HHD – home haemodialysis; ICHD – in-centre haemodialysis; PD – peritoneal dialysis

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 Renal 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 2019 prevalent adult Tx population is described, including the number transplanted per million population (pmp).

The Renal Association guidelines (renal.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 renal centres in 2019 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 (renal.org/audit-research/data-portal). 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 renal 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 Renal Association audit measures relevant to Tx that are reported in this chapter

The Renal 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 4.8, figures 4.13–4.14 (proteinuria was not adequately collected)
	Proportion of patients achieving dyslipidaemia targets	Table 4.8
	Incidence of hyperparathyroidism	Table 4.8
	Prevalence of anaemia	Table 4.8, figures 4.11–4.12
Anaemia (2017)	Treatment guidelines for anaemia in kidney Tx patients should be similar to those for CKD patients not on dialysis	Table 4.8, figures 4.11–4.12

In 2019, 23 of the 70 adult renal 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 renal 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.

Key findings

- 38,716 adult patients had a kidney Tx for ESKD in the UK on 31/12/2019, which represented 56.8% of the RRT population
- The median age of kidney Tx patients was 55.6 years and 60.8% were male
- There was a 1% increase in overall kidney Tx performed in 2019 compared to 2018, with a decrease in kidney Tx from DBDs (-3%), but an increase in Tx from DCDs (9%). Tx from LKDs have remained the same
- The median eGFR for kidney Tx patients 1 year after transplantation was 56.2 mL/min/1.73m^2 from LKD, 51.9 mL/min/1.73m^2 from DBD and 49.5 mL/min/1.73m^2 from DCD
- 15.7% 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
- There was no cause of death data available for 33.2% of deaths on Tx. For those Tx patients with data, the leading cause of death was malignancy (22.2%), followed by infection (18.7%), which was previously the most common cause of death for these patients.

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, 2017–2019 calendar years

Organ	2017	2018	2019	% change 2018-2019
Kidney DBD[1]	1,362	1,466	1,417	-3
Kidney DCD[2]	894	940	1024	9
Kidney LKD	1,016	1,036	1,038	0
Kidney and liver	14	18	18	0
Kidney and heart	0	0	1	-
Kidney and pancreas[3]	172	174	157	-10
Kidney and pancreas islets[4]	4	7	7	0
Small bowel (inc kidney)	1	3	4	33
Total kidney Tx	**3,463**	**3,644**	**3,666**	**1**

[1]Includes en bloc kidney Tx (3 in 2017, 6 in 2018 and 5 in 2019) and double kidney Tx (14 in 2017, 14 in 2018 and 18 in 2019).
[2]Includes en bloc kidney Tx (7 in 2017, 8 in 2018 and 3 in 2019) and double kidney Tx (26 in 2017, 15 in 2018 and 24 in 2019).
[3]Includes DCD Tx (48 in 2017, 48 in 2018 and 45 in 2019).
[4]Includes DCD Tx (1 kidney and pancreas islet transplant in 2017 and 3 kidney and pancreas islet transplants in 2018).
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 RRT start, is shown for patients incident to RRT in 2017, adjusted by sex, age and primary renal disease (PRD) (figure 4.2). The analysis for LKD transplantation only is shown separately (figure 4.3).

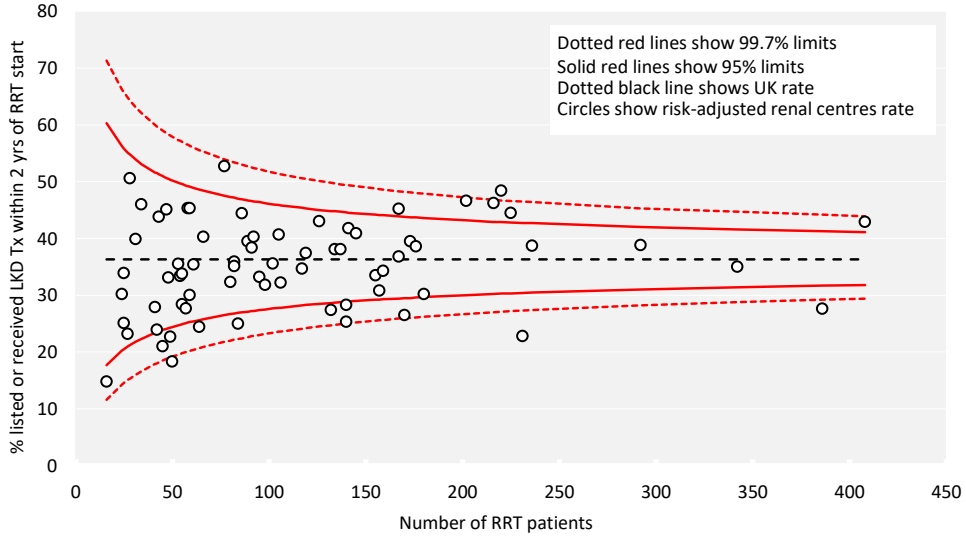

Figure 4.2 Percentage of adult patients incident to RRT in 2017 who were waitlisted or received a living kidney donor (LKD) Tx within 2 years of RRT start adjusted by age, sex and primary renal disease by centre

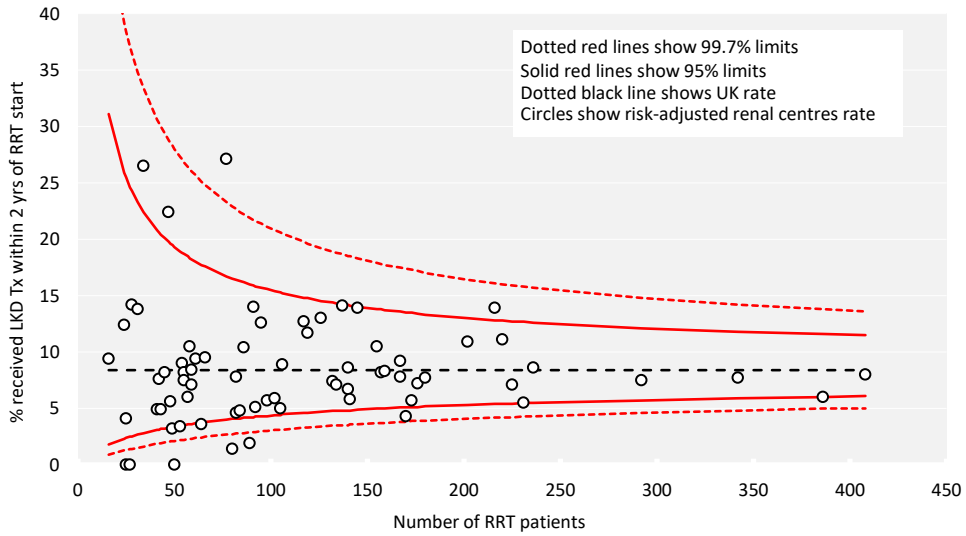

Figure 4.3 Percentage of adult patients incident to RRT in 2017 who received a living kidney donor (LKD) Tx within 2 years of RRT start adjusted by age, sex and primary renal disease by centre

Early kidney Tx outcomes

Kidney Tx recipient outcome data from NHSBT were reported against the Tx centre rather than the referring centre (table 4.3). Note that the survival rates were risk-adjusted and used financial year cohorts as per NHSBT methodology (see table footnote).

Table 4.3 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	91	97	83	88	99	99	93	92
Belfast	92	98	88	84	98	99	93	95
Bristol	93	95	89	83	99	100	92	92
Camb	97	98	91	89	99	99	95	95
Cardff	96	95	89	86	96	97	91	91
Covnt	90	97	81	82	100	100	93	98
Edin	97	100	86	93	100	100	92	99
Glasgw	93	97	86	84	98	100	89	90
L Barts	92	97	81	80	98	99	88	96
L Guy's	94	97	86	91	98	99	93	93
L Rfree	94	98	85	91	100	100	94	98
L St.G	93	97	88	94	99	100	95	97
L West	95	97	86	88	96	97	90	93
Leeds	93	97	87	89	98	100	89	94
Leic	96	96	87	94	98	99	91	92
Liv Roy	95	97	85	80	97	100	93	96
M RI	95	96	90	87	98	99	95	94
Newc	93	94	84	82	99	100	91	96
Nottm	96	96	88	89	96	96	92	91
Oxford	97	98	88	88	98	100	92	94
Plymth	92	95	78	90	97	100	88	94
Ports	95	99	85	84	100	99	96	98
Sheff	92	99	90	85	99	98	95	100
UK total	**94**	**97**	**87**	**87**	**98**	**99**	**92**	**94**

Cohorts for survival rate estimation: 1 year survival: 1/4/2014–31/03/2018; 5 year survival: 1/4/2010–31/3/2014; 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.

[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 (nhsbtdbe.blob.core.windows.net/umbraco-assets-corp/17289/kidney-annual-report-2018-19-november19.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 2012–2018) was 97.1%.

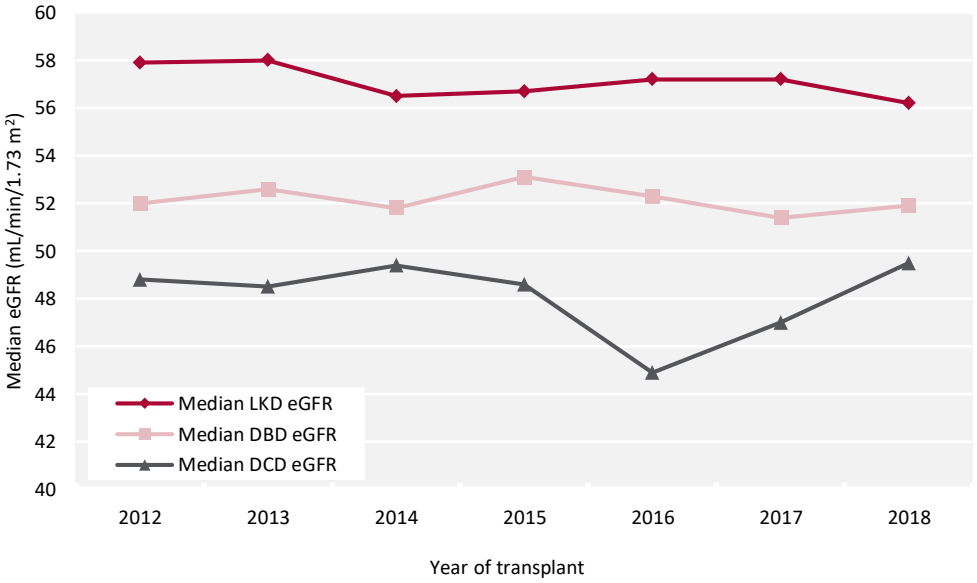

Figure 4.4 Median estimated glomerular filtration rate (eGFR) for kidney Tx at 1 year by donor type and year of transplantation between 2012 and 2018

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

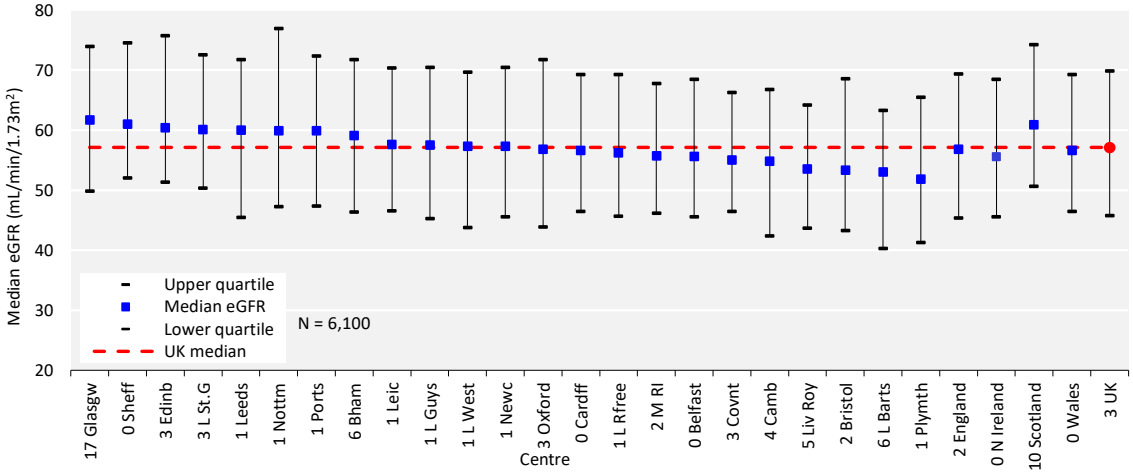

Figure 4.5 Median estimated glomerular filtration rate (eGFR) at 1 year post-living kidney donor (LKD) Tx by transplanting centre and year of transplantation between 2012 and 2018

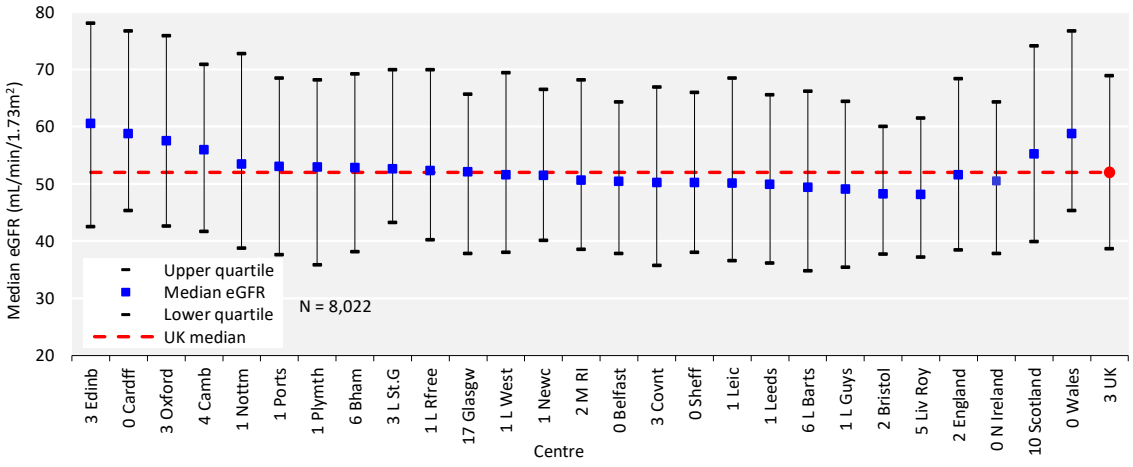

Figure 4.6 Median estimated glomerular filtration rate (eGFR) at 1 year post-donor after brain death (DBD) Tx by transplanting centre and by year of transplantation between 2012 and 2018

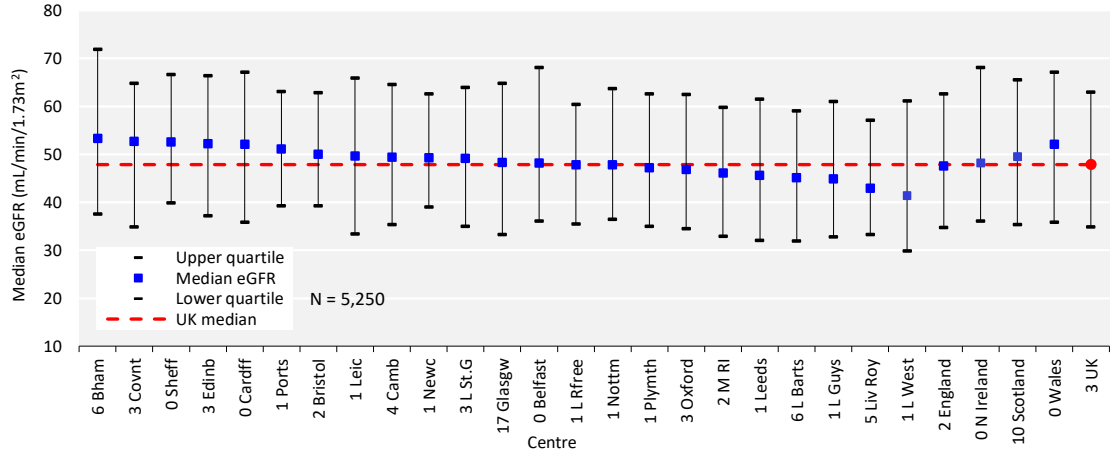

Figure 4.7 Median estimated glomerular filtration rate (eGFR) at 1 year post-donor after circulatory death (DCD) Tx by transplanting centre and by year of transplantation between 2012 and 2018

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 4.4 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 31/12/2019

		Data completeness (%)						
Centre	N with Tx	eGFR	Blood pressure	Haemoglobin	Total cholesterol	Adjusted calcium	Phosphate	PTH
TX CENTRES								
Bham	1,582	93.2	84.0	93.2	86.4	92.9	91.5	2.6
Belfast	676	99.3	96.2	98.5	99.6	98.7	98.4	31.4
Bristol	911	99.5	82.3	99.3	94.4	99.0	98.6	99.0
Camb	1,066	94.5	0.0	94.3	89.9	93.5	93.4	90.5
Cardff	1,052	98.8	96.6	98.8	83.3	98.0	97.9	27.6
Covnt	601	96.5	85.4	96.3	72.6	95.3	42.4	41.3
Edinb	526	88.4		97.0		89.5	87.8	
Glasgw	1,155	99.3		99.1		98.4	98.4	
L Barts	1,319	98.1	0.5	98.0	98.7	97.9	97.9	98.3
L Guys	1,496	98.7	0.0	98.7	49.0	96.2	96.3	38.8
L Rfree	1,376	98.2	87.5	98.2	59.9	97.2	97.2	68.5
L St.G	488	96.3	85.0	96.3	71.5	95.7	95.7	37.9
L West	1,980	97.0	0.0	97.1	45.2	96.3	97.0	40.1
Leeds	1,055	99.8	95.6	99.5	98.4	97.8	92.6	33.9
Leic	1,397	96.6	11.7	96.5	94.9	95.8	95.4	36.1
Liv Roy	778	96.5	2.2	96.4	54.5	95.4	95.8	0.5
M RI	1,346	95.0	3.3	95.0	52.6	95.0	95.0	44.4
Newc	745	97.7	94.8	97.6	63.6	97.3	96.9	76.9
Nottm	729	98.5	96.2	97.9	64.1	97.5	97.3	86.6
Oxford	1,377	86.0	1.5	86.4	51.3	84.5	84.4	41.7
Plymth	338	96.8	93.8	95.9	56.5	95.3	95.0	38.5
Ports	1,112	94.6	12.6	94.7	55.3	93.7	90.1	30.9
Sheff	814	98.5	96.8	98.4	53.4	98.2	97.2	18.2
DIALYSIS CENTRES								
Abrdn	336	99.4		99.1		97.0	96.4	
Airdrie	287	98.3		98.3		97.9	97.9	
Antrim	134	99.3	72.4	99.3	99.3	95.5	96.3	97.8
Bangor	106	100.0	80.2	98.1	97.2	100.0	100.0	22.6
Basldn	102	92.2	56.9	92.2	81.4	92.2	70.6	21.6
Bradfd	400	98.0	31.5	98.0	78.0	92.5	88.8	56.5
Brightn	523	98.3	26.0	97.9	76.5	97.1	95.6	53.7
Carlis	154	89.0	0.0	89.0	63.0	88.3	85.7	41.6
Carsh	811	84.5	4.7	84.3	42.9	83.0	82.9	27.5
Chelms	115	89.6	89.6	87.8	75.7	86.1	84.4	7.8
Clwyd	104	97.1	36.5	97.1	97.1	95.2	95.2	76.9
D&Gall	84	98.8		98.8		95.2	95.2	
Derby	284	97.5	95.4	97.5	93.0	97.2	95.8	89.4
Donc	129	96.9	91.5	96.9	63.6	96.9	96.9	20.9
Dorset	426	88.5	59.2	87.1	66.9	86.6	72.1	49.1
Dudley	109	96.3	53.2	95.4	82.6	87.2	96.3	0.9
Dundee	252	98.8		98.4		98.0	96.4	

Table 4.4 Continued

Centre	N with Tx	Data completeness (%)						
		eGFR	Blood pressure	Haemoglobin	Total cholesterol	Adjusted calcium	Phosphate	PTH
Exeter	530	97.4	86.0	97.0	90.6	96.4	95.7	73.4
Glouc	254	96.9	76.4	96.9	54.7	89.8	87.0	22.1
Hull	486	97.5	2.9	96.3	37.0	94.7	94.7	22.0
Inverns	168	84.5		89.3		87.5	88.1	
Ipswi	233	97.9	94.0	97.9	72.1	97.4	97.4	57.9
Kent	633	98.6	97.3	98.4	71.6	98.0	97.8	15.2
Klmarnk	174	98.3		98.3		96.6	96.6	
Krkcldy	139	95.0		98.6		98.6	98.6	
L Kings	506	97.8	0.2	97.8	77.9	97.8	97.8	80.6
Liv Ain	27	96.3	7.4	96.3	51.9	96.3	96.3	0.0
Middlbr	532	90.4	8.8	90.2	40.0	89.1	88.7	11.5
Newry	155	99.4	83.9	97.4	100.0	96.8	97.4	98.1
Norwch	443	98.4	4.1	96.6	98.4	94.4	93.5	25.1
Prestn	732	97.1	0.0	96.9	67.9	95.9	94.4	39.1
Redng	468	99.6	95.5	99.6	68.0	98.9	79.3	50.4
Salford	668	98.8	0.0	98.7	77.8	98.4	98.4	0.2
Shrew	140	79.3	14.3	78.6	70.0	78.6	78.6	17.1
Stevng	373	97.9	0.0	99.2	40.2	94.4	92.5	55.0
Sthend	105	98.1	91.4	98.1	51.4	97.1	94.3	24.8
Stoke	426	99.3	0.9	99.3	99.8	98.4	98.4	63.6
Sund	273	96.0	0.0	96.3	61.9	96.0	96.0	96.3
Swanse	346	99.7	98.3	98.8	62.1	99.1	99.1	67.9
Truro	252	99.2	0.4	98.8	92.9	98.0	98.0	89.3
Ulster	77	97.4	96.1	97.4	96.1	96.1	97.4	6.5
West NI	204	94.6	94.6	96.6	99.0	89.2	96.6	88.2
Wirral	174	92.0	1.2	89.7	46.6	81.0	79.9	6.3
Wolve	214	84.6	67.3	80.4	67.3	82.2	12.6	22.9
Wrexm	173	98.8	91.9	99.4	99.4	98.8	98.8	99.4
York	340	98.8	79.4	97.9	79.1	96.8	95.9	24.4
TOTALS								
England	**31,372**	**95.90**	**37.72**	**95.71**	**68.83**	**94.66**	**92.00**	**45.18**
N Ireland	**1,246**	**98.39**	**91.81**	**98.07**	**99.28**	**96.39**	**97.67**	**54.57**
Scotland	**3,121**	**96.28**		**97.98**		**95.93**	**95.48**	
Wales	**1,781**	**98.93**	**91.97**	**98.71**	**82.37**	**98.26**	**98.20**	**44.97**
UK	**37,520**	**96.16**	**38.96**	**96.12**	**64.75**	**95.00**	**92.77**	**41.98**

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.
Scottish centres were excluded from blood pressure, cholesterol and PTH analyses because data were not provided by the Scottish Renal Registry. UK completeness excludes Scotland for these analyses.
Patients with missing ethnicity were classed as White for the eGFR calculation.

For the 70 adult renal centres, the number of prevalent patients with a Tx was calculated as both a proportion of the prevalent patients on RRT and as a proportion of the estimated centre catchment population (calculated as detailed in appendix A).

Table 4.5 Number of prevalent adult Tx patients and proportion of adult RRT 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)	2019 crude rate (pmp)
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019		
TX CENTRES												
Belfast	562	593	632	665	701	73.1	73.1	75.6	76.4	78.8	0.53	1,328
Bham	1,279	1,400	1,509	1,566	1,636	44.2	46.1	47.8	48.4	49.5	2.03	805
Bristol	895	907	906	923	938	60.6	61.8	61.6	62.8	63.1	1.21	775
Camb	919	950	972	1,017	1,123	70.5	71.9	73.1	73.4	76.5	0.93	1,211
Cardff	1,036	1,034	1,045	1,071	1,081	64.2	63.6	62.1	62.3	62.5	1.15	944
Covnt	518	528	565	577	620	54.0	54.3	58.6	60.3	57.6	0.79	787
Edinb	458	453	482	522	546	59.6	58.3	58.5	60.6	61.7	0.84	652
Glasgw	1,049	1,105	1,136	1,156	1,216	61.4	63.0	64.1	63.7	65.6	1.37	889
L Barts	1,067	1,138	1,195	1,265	1,376	46.8	48.1	48.0	48.7	51.7	1.57	874
L Guys	1,302	1,366	1,413	1,456	1,547	64.7	65.1	65.4	65.4	67.0	1.00	1,553
L Rfree	1,224	1,287	1,344	1,372	1,422	58.5	59.2	61.3	61.3	60.7	1.32	1,081
L St.G	456	458	479	487	502	54.5	54.8	57.8	58.9	58.9	0.66	763
L West	1,784	1,823	1,894	1,972	2,049	54.2	53.8	54.6	55.5	56.7	1.95	1,053
Leeds	954	977	997	1,051	1,078	62.6	63.0	61.6	62.5	62.6	1.36	793
Leic	1,149	1,242	1,288	1,361	1,442	52.9	54.2	54.7	55.5	55.7	2.07	698
Liv Roy	792	778	788	808	804	63.8	64.1	63.1	63.9	65.5	0.80	1,000
M RI	1,293	1,382	1,396	1,420	1,408	68.8	70.1	68.4	68.8	68.4	1.32	1,066
Newc	647	678	709	732	769	64.1	64.6	63.6	63.5	65.5	0.94	815
Nottm	644	678	720	738	751	57.9	58.8	61.2	61.9	61.7	0.92	816
Oxford	1,164	1,223	1,341	1,400	1,432	68.9	69.3	71.6	72.4	72.7	1.43	1,000
Plymth	332	328	339	360	356	66.0	63.9	62.8	66.9	67.0	0.40	896
Ports	928	979	1,052	1,067	1,134	55.6	57.9	60.2	60.5	60.2	1.73	654
Sheff	728	752	784	819	836	52.6	52.9	54.5	55.3	56.1	1.12	744
DIALYSIS CENTRES												
Abrdn	287	303	311	329	343	54.1	54.6	55.2	57.4	61.5	0.50	688
Airdrie	214	230	257	274	296	50.4	52.4	55.0	56.3	56.5	0.46	648
Antrim	99	112	120	131	139	41.1	44.4	47.1	47.8	49.6	0.24	572
Bangor	83	89	94	99	106	45.6	49.7	48.2	49.0	52.7	0.16	653
Basldn	75	79	99	107	104	27.3	28.9	32.9	33.8	32.3	0.34	305
Bradfd	329	360	375	391	413	56.4	56.6	55.7	56.8	56.3	0.49	849
Brightn	451	472	486	510	542	47.5	47.6	48.1	48.3	51.2	1.07	508
Carlis	162	148	155	161	156	57.7	53.1	55.2	55.0	51.5	0.25	617
Carsh	643	681	721	765	830	40.5	41.2	42.6	43.4	46.9	1.61	515
Chelms	112	107	116	118	116	39.7	39.5	42.0	45.0	44.4	0.37	312
Clwyd	81	89	94	98	104	43.8	50.3	52.2	51.6	50.7	0.18	580
D&Gall	65	71	76	83	87	50.0	54.2	56.3	57.2	58.4	0.12	713
Derby	213	223	233	258	294	39.6	41.1	42.0	44.0	45.1	0.56	529
Donc	97	110	117	120	131	32.1	33.2	35.1	36.1	38.3	0.37	352
Dorset	347	368	394	422	435	51.0	53.6	53.7	55.2	56.4	0.72	602
Dudley	84	94	95	106	111	26.7	27.2	25.8	29.0	30.3	0.34	326
Dundee	216	219	232	254	259	51.6	52.4	53.3	57.1	57.7	0.37	706
Exeter	446	477	513	539	543	46.1	47.1	48.5	49.5	49.8	0.94	575
Glouc	178	186	214	242	267	40.1	39.4	42.1	46.5	50.9	0.51	529
Hull	423	454	459	479	498	49.4	53.2	52.6	54.4	55.1	0.79	628
Inverns	146	154	164	169	171	57.9	59.7	62.6	60.6	60.6	0.22	768
Ipswi	221	232	235	232	237	55.1	55.8	54.0	54.2	55.9	0.31	766
Kent	555	584	594	633	650	53.3	54.4	54.5	56.9	57.0	1.06	614
Klmarnk	137	143	159	166	182	44.2	45.1	47.2	49.0	50.7	0.29	626
Krkcldy	125	132	149	153	143	42.4	44.9	49.0	51.3	48.5	0.27	525

Table 4.5 Continued

Centre	N with Tx					% with Tx					Estimated catchment population (millions)	2019 crude rate (pmp)
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019		
L Kings	428	434	459	481	524	39.5	39.1	40.0	40.6	42.1	0.92	567
Liv Ain	15	14	14	20	28	6.8	6.2	6.7	9.3	13.3	0.43	65
Middlbr	524	532	536	538	554	58.2	59.8	59.2	57.9	58.4	0.80	693
Newry	115	126	138	151	160	51.1	53.4	57.3	60.4	63.8	0.23	688
Norwch	346	391	418	442	451	48.1	50.8	53.8	56.3	55.8	0.68	660
Prestn	588	601	670	718	743	48.4	49.9	52.8	54.4	55.4	1.22	608
Redng	409	431	447	468	484	52.8	54.6	56.2	57.5	56.3	0.69	700
Salford	478	510	568	620	684	49.1	50.1	51.0	52.8	55.3	1.14	600
Shrew	136	133	137	143	142	36.9	35.3	35.7	33.4	33.2	0.41	349
Stevng	295	337	365	377	385	36.3	38.1	41.3	40.2	39.9	1.10	350
Sthend	103	92	97	104	106	41.9	39.0	38.2	39.5	40.2	0.27	391
Stoke	380	402	408	418	437	48.2	48.7	50.4	51.9	54.4	0.72	603
Sund	220	239	262	275	278	47.9	47.1	48.3	49.4	48.9	0.54	513
Swanse	329	328	334	346	356	43.0	42.4	42.0	41.8	41.0	0.75	474
Truro	231	239	242	249	259	55.8	56.1	57.1	57.0	57.7	0.35	730
Ulster	55	58	66	75	77	32.5	34.9	36.3	39.3	42.3	0.20	383
West NI	158	169	188	202	207	53.9	55.1	60.1	62.0	63.1	0.25	834
Wirral	74	117	156	165	179	26.3	34.7	40.4	41.8	43.6	0.47	385
Wolve	185	185	193	201	215	31.8	32.5	33.1	33.1	36.0	0.54	396
Wrexm	144	155	170	170	175	49.2	50.0	52.8	54.3	56.3	0.21	850
York	301	304	324	338	348	61.4	56.8	58.4	59.6	59.9	0.48	723
TOTALS												
England	**27,124**	**28,410**	**29,793**	**31,031**	**32,367**	**52.9**	**53.7**	**54.6**	**55.4**	**56.3**	**44.33**	**730**
N Ireland	**989**	**1,058**	**1,144**	**1,224**	**1,284**	**58.3**	**59.7**	**62.6**	**64.0**	**66.5**	**1.45**	**884**
Scotland	**2,697**	**2,810**	**2,966**	**3,106**	**3,243**	**55.7**	**56.9**	**58.2**	**59.3**	**60.6**	**4.43**	**732**
Wales	**1,673**	**1,695**	**1,737**	**1,784**	**1,822**	**55.1**	**55.3**	**54.7**	**54.8**	**55.0**	**2.45**	**744**
UK	**32,483**	**33,973**	**35,640**	**37,145**	**38,716**	**53.4**	**54.2**	**55.1**	**55.9**	**56.8**	**52.67**	**735**

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 renal centre.
pmp – per million population

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 4.6 Demographics of adult patients prevalent to Tx on 31/12/2019 by centre

Centre	N on RRT	N with Tx	% with Tx	Median age (yrs)	% male	Ethnicity				
						% White	% Asian	% Black	% Other	% missing
TX CENTRES										
Belfast	890	701	78.8	55.5	58.5	97.4	1.8	0.7	0.2	2.6
Bham	3,308	1,636	49.5	53.1	58.4	63.1	27.5	7.1	2.3	0.6
Bristol	1,486	938	63.1	55.6	60.5	90.1	4.3	4.0	1.7	0.2
Camb	1,469	1,123	76.4	54.7	62.4	90.8	6.2	1.9	1.1	0.2
Cardff	1,730	1,081	62.5	55.5	63.1	92.9	4.6	0.4	2.0	0.4
Covnt	1,076	620	57.6	55.0	61.9	80.5	15.7	3.9	0.0	0.2
Edinb	885	546	61.7	56.3	63.4					71.6
Glasgw	1,854	1,216	65.6	55.5	59.4					40.6
L Barts	2,660	1,376	51.7	53.8	60.3	39.4	32.4	18.9	9.3	0.2
L Guys	2,310	1,547	67.0	53.0	59.3	66.2	10.2	19.2	4.4	0.8
L Rfree	2,344	1,422	60.7	54.8	58.7	48.2	21.9	19.3	10.6	2.8
L St.G	852	502	58.9	56.9	57.6	48.1	24.9	17.5	9.7	3.0
L West	3,613	2,049	56.7	57.5	63.1	44.1	32.7	14.6	8.5	0.0
Leeds	1,723	1,078	62.6	55.3	60.5	80.7	14.8	3.4	1.1	0.0
Leic	2,587	1,442	55.7	56.6	58.4	73.2	21.4	4.0	1.3	1.5
Liv Roy	1,227	804	65.5	55.0	62.2	92.8	2.7	2.4	2.1	0.3
M RI	2,060	1,408	68.3	54.8	60.4	76.7	15.0	6.6	1.7	1.1
Newc	1,175	769	65.4	56.5	59.6	94.4	4.4	0.7	0.5	0.0
Nottm	1,218	751	61.7	54.5	60.6	84.3	8.0	4.9	2.8	0.0
Oxford	1,969	1,432	72.7	55.5	62.8	81.5	11.8	3.2	3.5	7.8
Plymth	531	356	67.0	58.4	67.1	96.4	1.1	0.3	2.3	0.0
Ports	1,883	1,134	60.2	56.4	59.5	93.5	4.1	0.7	1.7	2.2
Sheff	1,491	836	56.1	55.2	62.1	89.8	5.9	1.8	2.5	0.7
DIALYSIS CENTRES										
Abrdn	558	343	61.5	51.9	57.1					53.6
Airdrie	524	296	56.5	55.2	59.5	96.1	2.1	0.4	1.4	3.7
Antrim	280	139	49.6	55.8	63.3	100.0	0.0	0.0	0.0	0.0
Bangor	201	106	52.7	56.0	61.3	98.1	0.0	1.0	1.0	0.9
Basldn	322	104	32.3	53.0	65.4	87.5	4.8	3.9	3.9	0.0
Bradfd	733	413	56.3	52.3	61.5	54.0	43.3	2.2	0.5	0.0
Brightn	1,059	542	51.2	55.5	62.0	90.0	6.3	2.0	1.7	0.4
Carlis	303	156	51.5	56.2	66.7	98.1	1.9	0.0	0.0	0.0
Carsh	1,771	830	46.9	57.0	63.3	70.8	17.1	8.6	3.5	0.6
Chelms	261	116	44.4	58.1	69.0	88.8	2.6	3.5	5.2	0.0
Colchr	145	0								
Clwyd	205	104	50.7	57.0	60.6	97.1	1.9	0.0	1.0	1.0
D&Gall	149	87	58.4	56.5	60.9	97.2	1.4	0.0	1.4	18.4
Derby	652	294	45.1	56.7	61.9	83.7	10.5	2.7	3.1	0.0
Donc	342	131	38.3	58.4	67.9	95.4	2.3	0.8	1.5	0.0
Dorset	772	435	56.3	59.5	58.2	97.7	0.9	0.2	1.2	0.2
Dudley	366	111	30.3	58.6	67.6	79.3	14.4	3.6	2.7	0.0
Dundee	449	259	57.7	56.0	60.6					54.4
Exeter	1,091	543	49.8	56.3	57.6	98.5	0.6	0.6	0.4	0.0
Glouc	525	267	50.9	58.1	60.7	93.6	3.8	1.1	1.5	0.0
Hull	904	498	55.1	55.1	64.1	97.0	1.4	0.6	1.0	0.2

Table 4.6 Continued

Centre	N on RRT	N with Tx	% with Tx	Median age (yrs)	% male	Ethnicity				
						% White	% Asian	% Black	% Other	% missing
Inverns	282	171	60.6	54.5	57.3	95.0	2.5	2.5	0.0	29.2
Ipswi	424	237	55.9	58.3	64.1	85.1	2.6	2.6	9.8	0.8
Kent	1,140	650	57.0	57.0	58.8	92.5	4.8	0.9	1.9	0.0
Klmarnk	359	182	50.7	56.9	60.4					42.3
Krkcldy	295	143	48.5	57.5	62.2					70.6
L Kings	1,244	524	42.1	57.2	62.4	49.7	15.4	30.1	4.8	0.6
Liv Ain	210	28	13.3	50.9	50.0	100.0	0.0	0.0	0.0	0.0
Middlbr	949	554	58.4	56.4	61.6	95.1	4.3	0.4	0.2	0.0
Newry	251	160	63.7	56.1	54.4	98.1	0.6	0.6	0.6	0.0
Norwch	809	451	55.7	57.5	59.7	96.9	2.0	0.9	0.2	0.0
Prestn	1,341	743	55.4	55.8	61.6	86.3	12.7	0.7	0.4	0.0
Redng	860	484	56.3	57.6	62.2	67.0	25.3	5.7	2.0	6.0
Salford	1,237	684	55.3	55.8	58.9	82.5	14.6	1.9	1.0	0.0
Shrew	428	142	33.2	55.7	61.3	93.7	2.8	2.1	1.4	0.0
Stevng	966	385	39.9	56.0	62.6	69.4	18.9	8.4	3.4	0.8
Sthend	264	106	40.2	54.6	55.7	86.8	7.6	1.9	3.8	0.0
Stoke	803	437	54.4	54.4	62.7	91.0	6.0	1.2	1.9	1.1
Sund	568	278	48.9	56.4	60.8	96.0	2.9	1.1	0.0	0.0
Swanse	868	356	41.0	57.7	61.2	97.2	1.7	0.0	1.1	0.6
Truro	449	259	57.7	56.5	56.4	98.1	0.4	0.0	1.5	0.0
Ulster	182	77	42.3	55.3	54.6	94.8	1.3	3.9	0.0	0.0
West NI	328	207	63.1	53.5	61.8	98.1	1.5	0.5	0.0	0.0
Wirral	411	179	43.6	58.1	63.7	95.5	2.8	1.1	0.6	0.0
Wolve	598	215	36.0	54.4	57.7	70.8	22.6	6.6	0.0	1.4
Wrexm	311	175	56.3	52.7	67.4	96.0	1.7	0.0	2.3	0.0
York	581	348	59.9	56.4	58.9	97.4	1.5	0.0	1.2	0.6
TOTALS										
England	**57,510**	**32,367**	**56.3**	**55.6**	**60.8**	**76.3**	**13.9**	**6.6**	**3.2**	**1.0**
N Ireland	**1,931**	**1,284**	**66.5**	**55.4**	**58.8**	**97.7**	**1.3**	**0.8**	**0.2**	**1.4**
Scotland	**5,355**	**3,243**	**60.6**	**55.3**	**60.0**					**45.2**
Wales	**3,315**	**1,822**	**55.0**	**55.6**	**62.9**	**94.6**	**3.4**	**0.3**	**1.8**	**0.4**
UK	**68,111**	**38,716**	**56.8**	**55.6**	**60.8**	**78.5**	**12.6**	**6.0**	**2.9**	**4.7**

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.

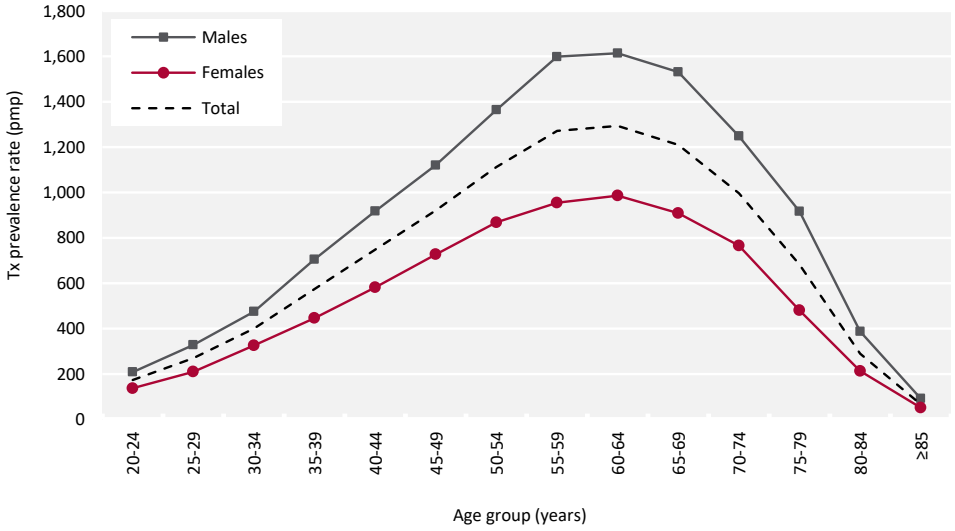

Figure 4.8 Adult Tx prevalence rate on 31/12/2019 by age group and sex
pmp – per million population

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 4.7). 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 4.7 Primary renal diseases (PRDs) of adult patients incident to Tx in 2019 and adult patients prevalent to Tx on 31/12/2019

	Incident Tx		Prevalent Tx	
PRD	N	%	N	%
Diabetes	565	16.7	4,543	11.9
Glomerulonephritis	788	23.3	8,851	23.2
Hypertension	240	7.1	2,049	5.4
Polycystic kidney disease	403	11.9	5,266	13.8
Pyelonephritis	233	6.9	4,287	11.2
Renal vascular disease	59	1.7	437	1.1
Other	638	18.9	7,187	18.9
Uncertain aetiology	456	13.5	5,500	14.4
Total (with data)	**3,382**	**100.0**	**38,120**	100.0
Missing	147	4.2	596	1.5

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 or 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).

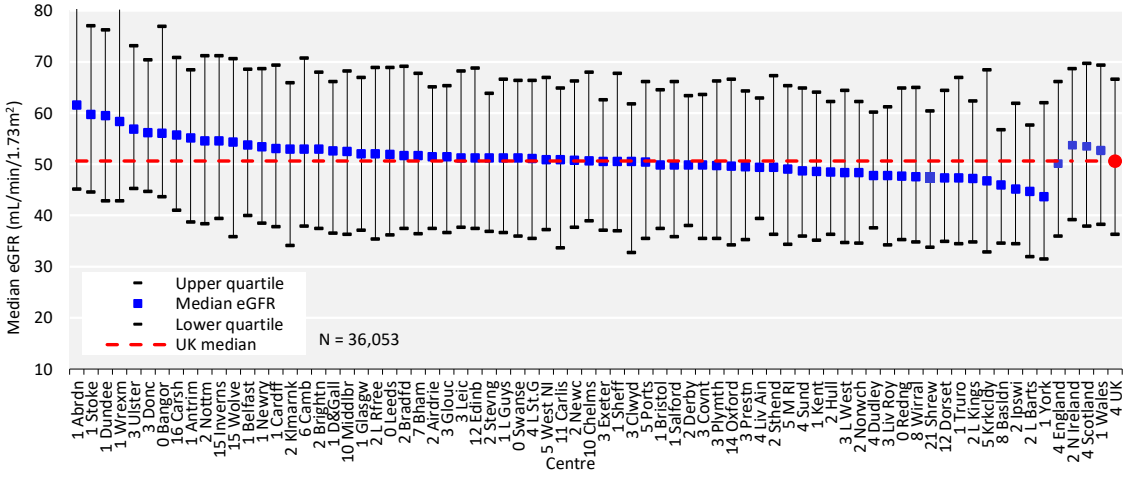

Figure 4.9 Median estimated glomerular filtration rate (eGFR) in adult patients prevalent to Tx on 31/12/2019 by centre

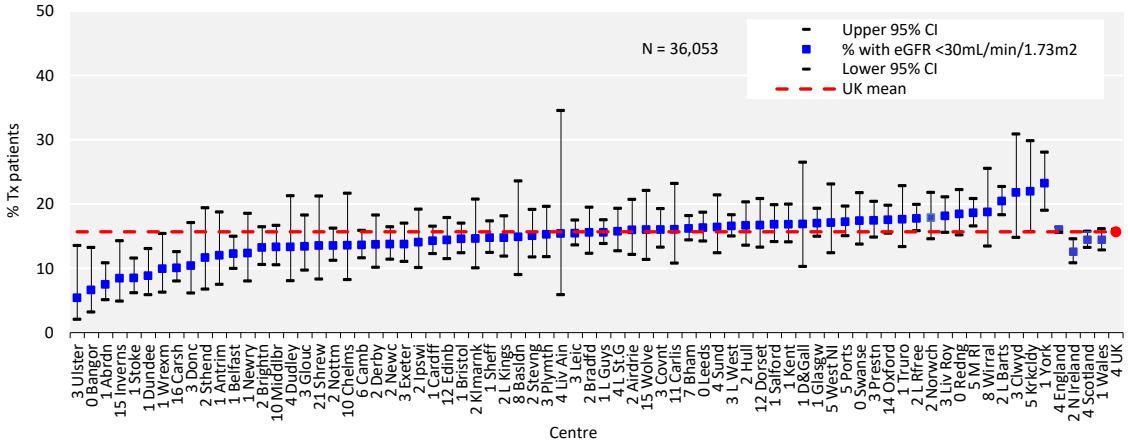

Figure 4.10 Percentage of adult patients prevalent to Tx on 31/12/2019 with an estimated glomerular filtration rate (eGFR) <30mL/min/1.73m^2 by centre
CI – confidence interval

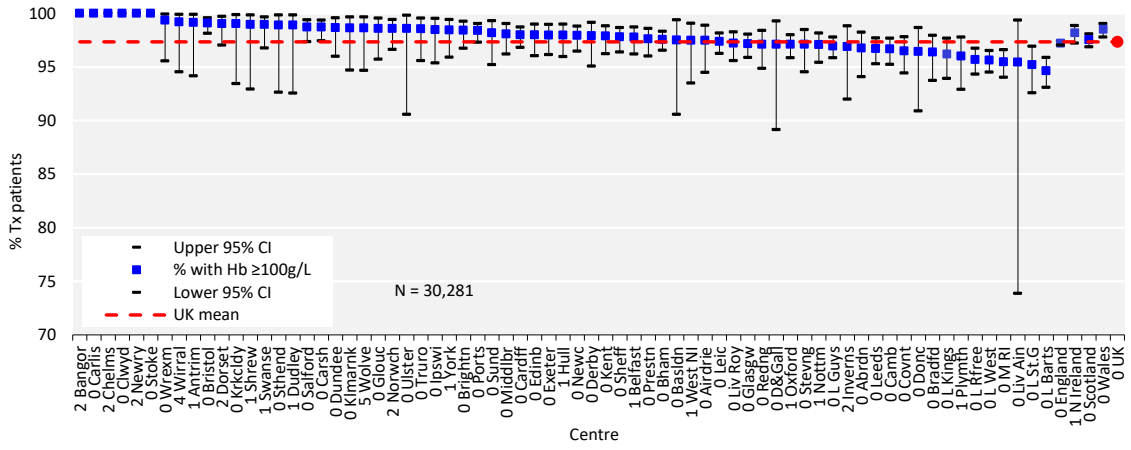

Figure 4.11 Percentage of adult patients prevalent to Tx on 31/12/2019 with an estimated glomerular filtration rate (eGFR) ≥30mL/min/1.73m^2 achieving haemoglobin (Hb) ≥100g/L by centre
CI – confidence interval

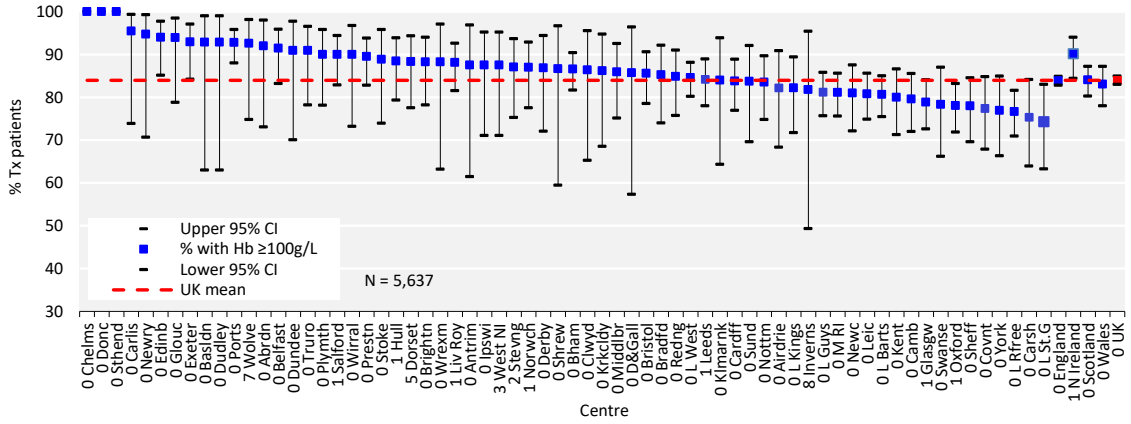

Figure 4.12 Percentage of adult patients prevalent to Tx on 31/12/2019 with an estimated glomerular filtration rate (eGFR) <30mL/min/1.73m^2 achieving haemoglobin (Hb) ≥100g/L by centre
CI – confidence interval

Blood pressure in prevalent adult kidney Tx patients

Blood pressure data completeness was variable (table 4.4) 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.

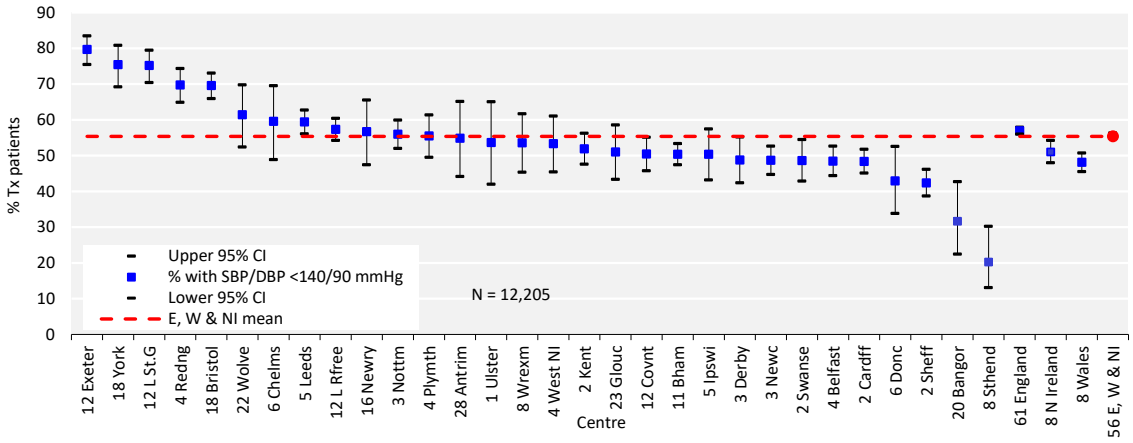

Figure 4.13 Percentage of adult patients prevalent to Tx on 31/12/2019 with estimated glomerular filtration rate (eGFR) ≥30 mL/min/1.73m^2 achieving blood pressure of <140/90 mmHg by centre
CI – confidence interval; DBP – diastolic blood pressure; SBP – systolic blood pressure

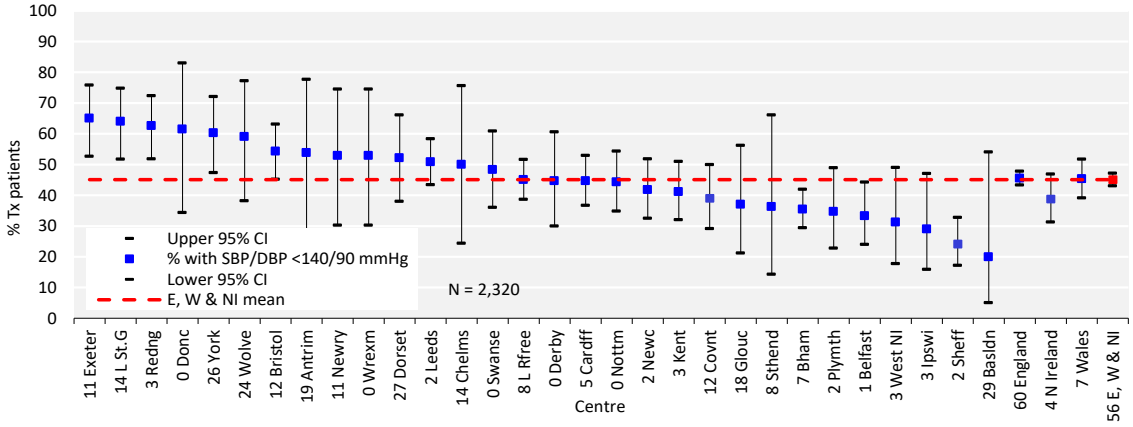

Figure 4.14 Percentage of adult patients prevalent to Tx on 31/12/2019 with estimated glomerular filtration rate (eGFR) <30 mL/min/1.73m^2 achieving blood pressure of <140/90 mmHg by centre
CI – confidence interval; DBP – diastolic blood pressure; SBP – systolic blood pressure

Biochemistry parameters in prevalent adult kidney Tx patients

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

Table 4.8 Estimated glomerular filtration rate (eGFR), blood pressure and biochemical parameters in adult patients prevalent to Tx on 31/12/2019 compared with adult patients prevalent to dialysis on 31/12/2019 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	12,346	18,073	4,801	858	22,475
%	34.2	50.1	13.3	2.4	
eGFR (mL/min/1.73m²)					
mean ± SD	76.9 ± 13.5	45.3 ± 8.4	23.6 ± 4.1	11.8 ± 2.4	
median	73.5	45.4	24.2	12.3	
SBP (mmHg)					
mean ± SD	135 ± 17	138 ± 18	141 ± 19	143 ± 20	136 ± 25
% ≥140 mmHg	35.6	42.8	49.7	57.9	41.5
DBP (mmHg)					
mean ± SD	80 ± 11	80 ± 11	80 ± 12	80 ± 14	69 ± 15
% ≥90 mmHg	17.1	18.3	18.9	24.2	9.6
Total cholesterol (mmol/L)					
mean ± SD	4.3 ± 1.1	4.4 ± 1.1	4.5 ± 1.2	4.6 ± 1.3	3.8 ± 1.1
% ≥4.0 mmol/L	63.8	64.4	63.3	70.4	40.2
Haemoglobin (g/L)					
mean ± SD	137 ± 16	129 ± 17	116 ± 16	107 ± 16	110 ± 14
% <100 g/L	1.4	3.5	12.9	33.5	19.8
Phosphate (mmol/L)					
mean ± SD	0.9 ± 0.2	1.0 ± 0.2	1.1 ± 0.2	1.4 ± 0.4	1.7 ± 0.4
% >1.7 mmol/L	0.1	0.2	1.8	19.8	40.4
Adjusted Ca (mmol/L)					
mean ± SD	2.4 ± 0.1	2.4 ± 0.1	2.4 ± 0.2	2.4 ± 0.2	2.4 ± 0.2
% >2.5 mmol/L	26.2	25.8	21.4	14.2	16.2
% <2.2 mmol/L	2.4	3.2	7.0	13.6	15.8
PTH (pmol/L)					
median	8.4	9.8	15.8	27.2	31.6
% >72 pmol/L	0.2	0.6	2.8	13.0	16.7

Scottish centres were excluded from blood pressure, cholesterol and PTH analyses because data were not provided by the Scottish Renal Registry.

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

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 01/01/2009 and 31/12/2017 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 4.9 Differences in median estimated glomerular filtration rate (eGFR) slope between demographic subgroups of adult patients who received their first kidney Tx between 01/01/2009 and 31/12/2017

Characteristic	N	Median slope	Lower quartile	Upper quartile
Age at Tx (yrs)				
<40	4,875	-1.38	-4.63	0.83
40-55	7,715	-0.64	-2.94	1.18
>55	7,340	-0.66	-3.06	1.10
Ethnicity				
White	14,398	-0.66	-3.06	1.12
Asian	2,583	-1.34	-4.19	0.85
Black	1,361	-1.62	-5.08	0.69
Other	310	-0.95	-4.09	0.97
Sex				
Male	12,290	-0.54	-2.95	1.28
Female	7,640	-1.26	-3.98	0.75
Diabetes				
No Diabetes	16,571	-0.71	-3.19	1.10
Diabetes	3,145	-1.34	-4.22	0.85
Tx donor				
Deceased	13,162	-0.81	-3.42	1.14
Living	6,768	-0.80	-3.21	1.00
Year of Tx				
2009	1,904	-0.93	-2.72	0.33
2010	1,995	-0.87	-2.65	0.51
2011	1,971	-0.78	-3.02	0.67
2012	2,175	-0.97	-3.14	0.63
2013	2,391	-0.97	-3.22	0.77
2014	2,326	-0.70	-3.23	1.13
2015	2,313	-0.60	-3.28	1.59
2016	2,366	-0.60	-3.90	2.38
2017	2,489	-0.45	-5.96	4.01
Status of Tx patients at end of follow-up				
Died	1,715	-1.20	-4.29	1.07
Graft failed	1,662	-6.33	-12.38	-3.32
Re-transplanted	82	-3.70	-7.31	-1.66
Graft functioning	16,553	-0.49	-2.58	1.27
Total	**19,930**	**-0.80**	**-3.35**	**1.09**

Survival of adult kidney Tx patients

Survival of incident and prevalent RRT patients is described in detail in chapters 2 and 3, respectively. Survival of incident Tx patients is reported in table 4.3. NHSBT reports the survival of Tx recipients.

Cause of death in adult kidney Tx patients

Cause of death was analysed in patients prevalent to RRT on 31/12/2018 and followed-up for one year in 2019, with comparisons between Tx and dialysis presented in table 4.10. Work is being undertaken to better understand and code the cause of death in Tx recipients. The proportion of RRT 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.

Table 4.10 Cause of death in adult patients prevalent to RRT on 31/12/2018 followed-up in 2019 by modality

	All modalities		Dialysis		Tx	
Cause of death	N	%	N	%	N	%
Cardiac disease	780	19.5	665	20.5	115	15.3
Cerebrovascular disease	114	2.9	79	2.4	35	4.6
Infection	732	18.3	591	18.2	141	18.7
Malignancy	351	8.8	184	5.7	167	22.2
Treatment withdrawal	709	17.7	680	21.0	29	3.9
Other	1,003	25.1	801	24.7	202	26.8
Uncertain aetiology	306	7.7	242	7.5	64	8.5
Total (with data)	**3,995**	**100.0**	**3,242**	**100.0**	**753**	**100.0**
Missing	1,760	30.6	1,386	29.9	374	33.2

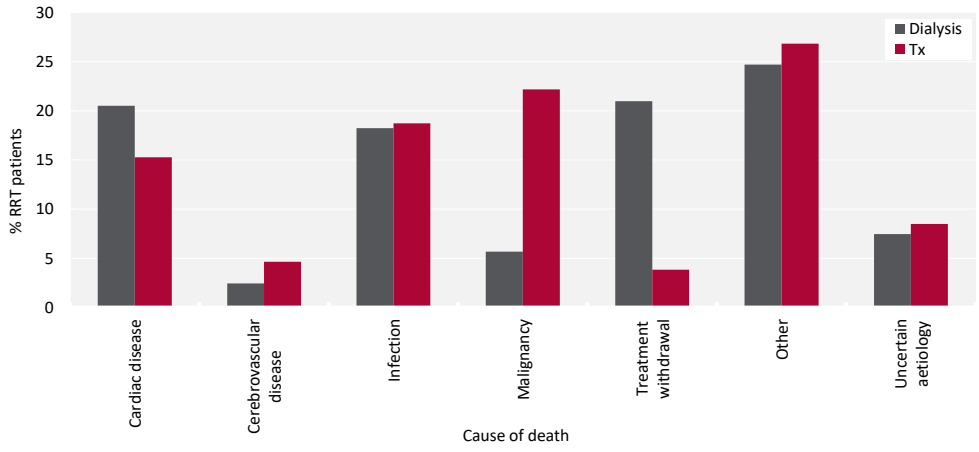

Figure 4.15 Cause of death for adult patients prevalent to RRT on 31/12/2018 followed-up in 2019 by modality

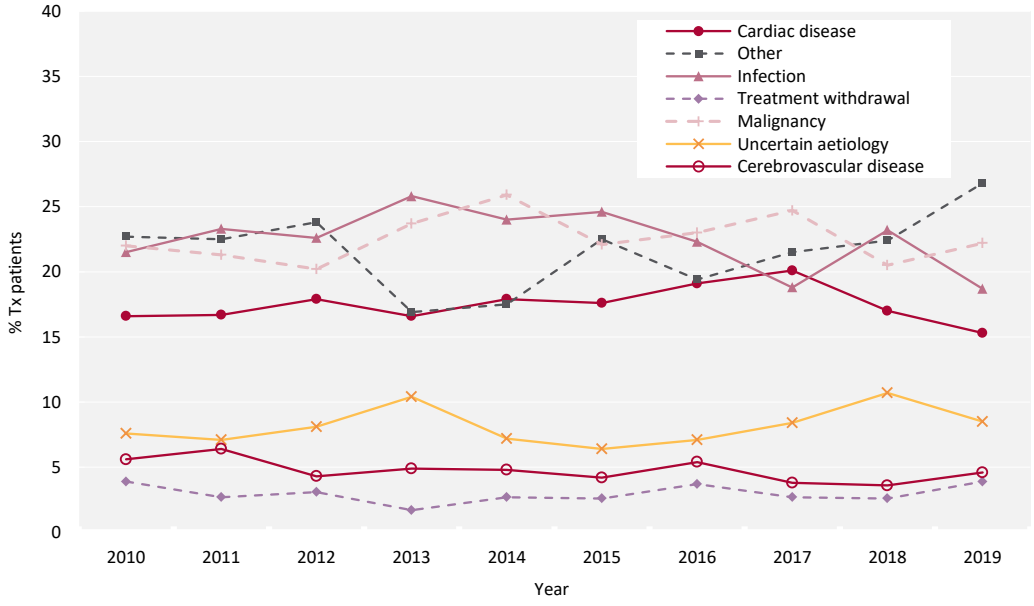

Figure 4.16 Cause of death for adult patients prevalent to RRT on 31/12/2018 followed-up in 2019 by modality

Hospitalisation of Tx patients

Hospital Episodes Statistics (HES) and Patient Episode Database for Wales (PEDW) data for prevalent RRT patients on 31/12/2018 were used to compare emergency admission hospitalisation amongst Tx patients (figure 4.17). The y-axis displays the total number of hospitalised days following an emergency admission for Tx patients divided by the total number of Tx patient-years at that centre for 2019. The average rate in England and Wales was 4.2 days per patient-year, compared to 14.3 days for ICHD patients and 13.2 days for PD patients. HES and PEDW data were also used to calculate the length of stay (LoS) following transplantation in England and Wales. The median LoS for each centre is presented in figure 4.18 and varied from 5 to 11 days. The median for England and Wales was 7 days.

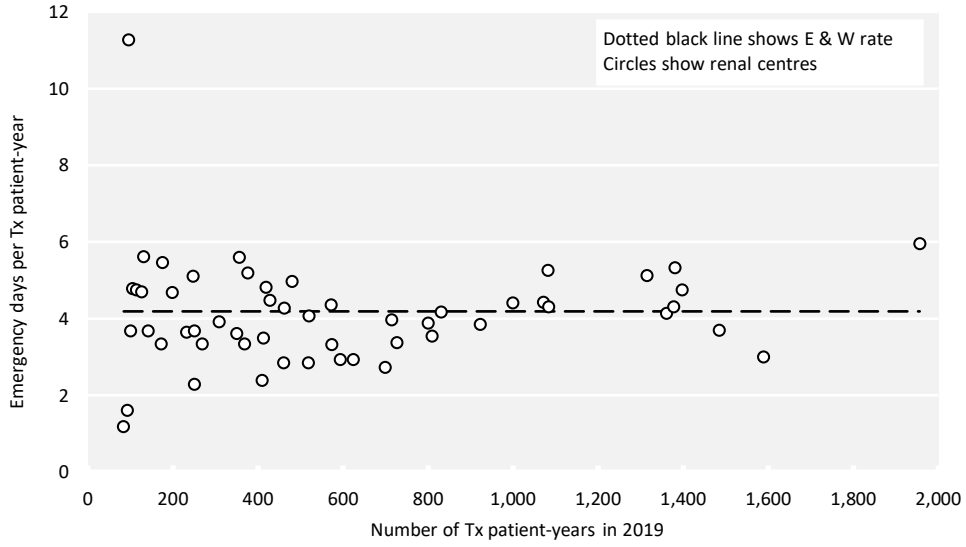

Figure 4.17 Emergency inpatient days per Tx patient-year in 2019 for patients prevalent to RRT in England and Wales on 31/12/2018 by centre

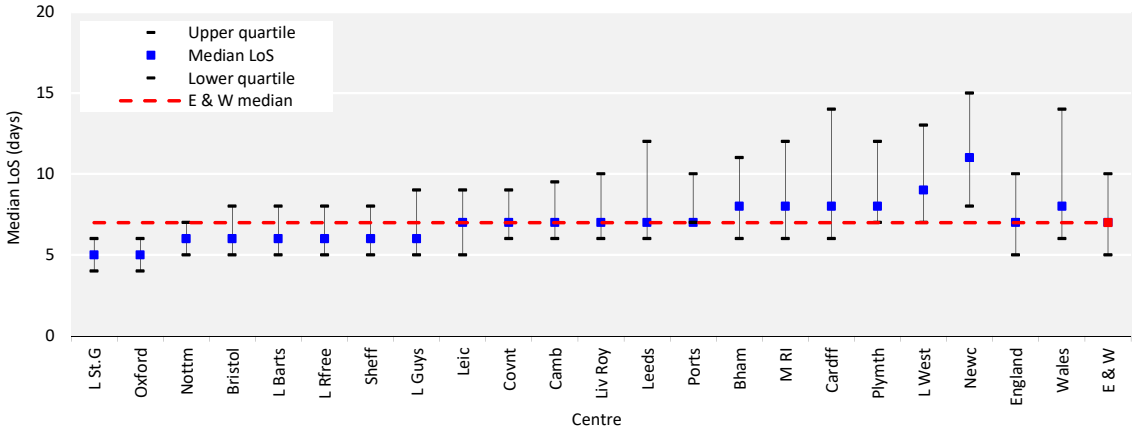

Figure 4.18 Median length of stay (LoS) after transplantation for patients who received a Tx in England and Wales in 2019 by centre

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Chapter 5

Adults on in-centre haemodialysis (ICHD) in the UK at the end of 2019

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 2019 (figure 5.1). This population comprises patients who were on ICHD at the end of 2018 and remained on ICHD throughout 2019, as well as patients who commenced/re-commenced ICHD in 2019. This latter group includes both incident renal replacement therapy (RRT) patients who ended 2019 on ICHD and prevalent RRT patients who switched to ICHD from home haemodialysis (HHD), peritoneal dialysis (PD), or a transplant (Tx) in 2019. 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 RRT, 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.

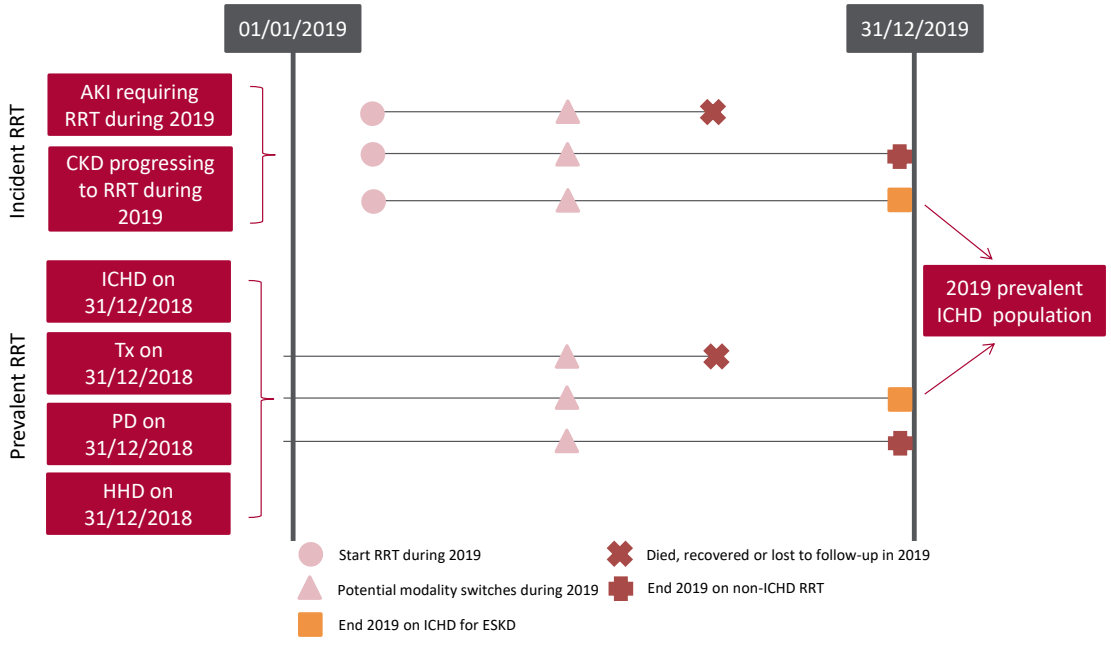

Figure 5.1 Pathways adult patients could follow to be included in the UK 2019 prevalent ICHD population

Note that patients receiving dialysis for acute kidney injury (AKI) are only included in this chapter if they had a timeline or RRT modality code for chronic ICHD at the end of 2019 or if they had been on RRT for ≥90 days and were on ICHD at the end of 2019.

CKD – chronic kidney disease

The infection analyses used a rolling two year cohort as per the audit measures (table 5.1). 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 Renal 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 renal 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 Public Health England (PHE) will be reported in this chapter once PHE data are received – methicillin-resistant *Staphylococcus aureus* (MRSA), methicillin-sensitive *Staphylococcus aureus* (MSSA), *Escherichia coli* bacteraemia and *Clostridium difficile*.

Rationale for analyses

The analyses begin with a description of the 2019 prevalent adult ICHD population, including the number on ICHD per million population (pmp), dialysis duration and frequency.

The Renal Association guidelines (renal.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 renal centres in 2019 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 (renal.org/audit-research/data-portal). 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 renal 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.

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.

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

The Renal 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 (2017)	Proportion of patients with serum ferritin <100 µg/L at start of treatment with erythropoiesis stimulating agent (ESA)	Table 5.8, figure 5.13 (the UKRR does not hold treatment with ESA start dates)
	Proportion of patients with haemoglobin <100 g/L not on ESA	Table 5.9
	Proportion of patients on ESA with haemoglobin >120 g/L	Table 5.9, figure 5.15
	Mean (median) ESA dose in patients maintained on ESA therapy	Table 5.9
Vascular access (2015)	Proportion of prevalent dialysis patients with definitive access (AVF/AVG/PD catheter) – ≥80%	Figure 5.17
	Annual rate of MRSA <1 episode/100 patient-years (measured over 2 years)	Table 5.10, figures 5.18, 5.20
	Annual rate of MSSA <2.5 episodes/100 patient-years (measured over 2 years)	Table 5.10, figures 5.19, 5.21
Planning, initiating and withdrawing RRT (2014)	Number of patients withdrawing from ICHD as a proportion of all deaths on ICHD	Table 5.11, figure 5.22

AVF – arteriovenous fistula; AVG – arteriovenous graft; ESA – erythropoiesis stimulating agent; MRSA – methicillin-resistant *Staphylococcus aureus*; MSSA – methicillin-sensitive *Staphylococcus aureus*

Key findings

- 24,365 adult patients were receiving ICHD for ESKD in the UK on 31/12/2019, which represented 35.8% of the RRT population
- The median age of ICHD patients was 67.5 years and 62.1% were male
- 86.0% of ICHD patients achieved a dialysis adequacy of URR >65%
- 93.0% of ICHD patients had dialysis 3 times a week
- 70.9% of ICHD patients had dialysis for 4–5 hours per session
- The median adjusted calcium for ICHD patients was 2.3 mmol/L and 10.0% were above the target range 2.2–2.5 mmol/L
- The median pre-dialysis bicarbonate for ICHD patients was 23 mmol/L and 82.2% were within the target range 18–26 mmol/L
- The median haemoglobin and ferritin for ICHD patients was 111 g/L and 445 µg/L, respectively, and 91.2% were on an ESA at a median dose of 8,000 IU/week
- 1.2% of ICHD patients had a haemoglobin <100 g/L and not on an ESA and 18.1% had a haemoglobin >120 g/L and on an ESA
- Of the 43 centres that provided adequate data on long term dialysis access in England, Northern Ireland and Wales, 9 centres achieved the 80% target for definitive access amongst prevalent dialysis patients (AVF/AVG/PD catheter)
- There was no cause of death data available for 29.5% of deaths. For those with data, the leading cause of death in younger patients (<65 years) was cardiac disease (24.2%) and in older patients (≥65 years) was treatment withdrawal (24.2%).

Analyses

Changes to the prevalent adult ICHD population

For the 70 adult renal centres, the number of prevalent patients on ICHD was calculated as both a proportion of the prevalent patients on RRT 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 RRT patients on ICHD by year and by centre; number of ICHD patients as a proportion of the catchment population

	N on ICHD					% on ICHD					Estimated catchment population (millions)	2019 crude rate (pmp)
Centre	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019		
ENGLAND												
Basldn	160	151	165	172	188	58.2	55.3	54.8	54.3	58.4	0.34	551
Bham	1,361	1,332	1,321	1,346	1,339	47.0	43.8	41.9	41.6	40.5	2.03	659
Bradfd	229	244	269	262	280	39.3	38.4	40.0	38.1	38.2	0.49	576
Brightn	387	419	425	447	430	40.7	42.2	42.1	42.3	40.6	1.07	403
Bristol	503	489	491	475	468	34.1	33.3	33.4	32.3	31.5	1.21	387
Camb	332	328	305	304	288	25.5	24.8	22.9	21.9	19.6	0.93	311
Carlis	81	95	98	101	111	28.8	34.1	34.9	34.5	36.6	0.25	439
Carsh	802	831	848	870	837	50.5	50.2	50.1	49.3	47.3	1.61	519
Chelms	142	129	126	112	114	50.4	47.6	45.7	42.7	43.7	0.37	306
Colchr	120	123	129	124	145	100.0	100.0	100.0	100.0	100.0	0.29	502
Covnt	347	366	333	306	354	36.2	37.6	34.5	32.0	32.9	0.79	450
Derby	209	200	191	197	238	38.8	36.9	34.4	33.6	36.5	0.56	428
Donc	172	185	178	179	181	57.0	55.9	53.5	53.9	52.9	0.37	487
Dorset	285	273	295	291	289	41.9	39.8	40.2	38.1	37.4	0.72	400
Dudley	161	188	206	210	207	51.1	54.3	55.8	57.5	56.6	0.34	608
Exeter	435	443	457	455	443	44.9	43.7	43.2	41.7	40.6	0.94	469
Glouc	224	235	244	238	226	50.5	49.8	48.0	45.8	43.0	0.51	447
Hull	350	324	351	352	350	40.9	37.9	40.3	40.0	38.7	0.79	442
Ipswi	143	147	147	151	141	35.7	35.3	33.8	35.3	33.3	0.31	456
Kent	410	409	424	418	420	39.4	38.1	38.9	37.6	36.8	1.06	397
L Barts	982	1,005	1,030	1,061	1,037	43.1	42.4	41.3	40.8	39.0	1.57	659
L Guys	628	645	667	691	666	31.2	30.7	30.9	31.0	28.8	1.00	669
L Kings	554	567	573	597	607	51.1	51.1	49.9	50.4	48.8	0.92	656
L Rfree	694	709	686	687	743	33.2	32.6	31.3	30.7	31.7	1.32	565
L St.G	329	330	308	294	300	39.3	39.5	37.2	35.6	35.2	0.66	456
L West	1,422	1,453	1,446	1,428	1,379	43.2	42.8	41.6	40.2	38.2	1.95	709
Leeds	491	509	539	543	552	32.2	32.8	33.3	32.3	32.0	1.36	406
Leic	856	889	899	919	964	39.4	38.8	38.2	37.5	37.3	2.07	467
Liv Ain	159	173	160	153	151	71.6	76.2	76.6	70.8	71.9	0.43	353
Liv Roy	345	325	352	360	355	27.8	26.8	28.2	28.5	28.9	0.80	442
M RI	473	465	497	501	499	25.2	23.6	24.3	24.3	24.2	1.32	378
Middlbr	340	321	334	349	344	37.7	36.1	36.9	37.6	36.2	0.80	431
Newc	292	295	326	339	327	28.9	28.1	29.3	29.4	27.8	0.94	346
Norwch	311	315	302	294	297	43.2	40.9	38.9	37.5	36.7	0.68	435
Nottm	358	365	354	351	360	32.2	31.7	30.1	29.4	29.6	0.92	391
Oxford	412	429	450	445	455	24.4	24.3	24.0	23.0	23.1	1.43	318
Plymth	129	136	142	128	126	25.6	26.5	26.3	23.8	23.7	0.40	317
Ports	614	562	548	532	591	36.8	33.2	31.3	30.2	31.4	1.73	341
Prestn	533	522	517	520	507	43.9	43.4	40.7	39.4	37.8	1.22	415
Redng	295	295	303	297	312	38.1	37.4	38.1	36.5	36.3	0.69	452

Table 5.2 Continued

Centre	N on ICHD					% on ICHD					Estimated catchment population (millions)	2019 crude rate (pmp)
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019		
Salford	387	375	387	404	392	39.7	36.8	34.8	34.4	31.7	1.14	344
Sheff	546	560	549	550	539	39.5	39.4	38.2	37.2	36.2	1.12	480
Shrew	178	186	183	207	204	48.2	49.3	47.7	48.4	47.7	0.41	502
Stevng	480	501	465	489	507	59.0	56.6	52.7	52.2	52.5	1.10	461
Sthend	124	111	121	128	118	50.4	47.0	47.6	48.7	44.7	0.27	435
Stoke	300	311	302	284	267	38.1	37.7	37.3	35.3	33.3	0.72	369
Sund	219	245	243	243	252	47.7	48.3	44.8	43.6	44.4	0.54	465
Truro	150	160	158	168	166	36.2	37.6	37.3	38.4	37.0	0.35	468
Wirral	174	188	202	202	207	61.9	55.8	52.3	51.1	50.4	0.47	445
Wolve	295	286	304	320	302	50.7	50.2	52.1	52.6	50.5	0.54	556
York	149	184	183	183	184	30.4	34.4	33.0	32.3	31.7	0.48	382
N IRELAND												
Antrim	120	123	117	119	118	49.8	48.8	45.9	43.4	42.1	0.24	485
Belfast	174	185	179	173	157	22.6	22.8	21.4	19.9	17.6	0.53	297
Newry	85	86	77	81	78	37.8	36.4	32.0	32.4	31.1	0.23	335
Ulster	106	101	109	106	97	62.7	60.8	59.9	55.5	53.3	0.20	483
West NI	119	125	113	113	106	40.6	40.7	36.1	34.7	32.3	0.25	427
SCOTLAND												
Abrdn	213	227	226	214	190	40.1	40.9	40.1	37.3	34.1	0.50	381
Airdrie	195	185	192	192	207	45.9	42.1	41.1	39.4	39.5	0.46	453
D&Gall	51	47	51	55	52	39.2	35.9	37.8	37.9	34.9	0.12	426
Dundee	184	176	183	161	162	43.9	42.1	42.1	36.2	36.1	0.37	442
Edinb	279	282	305	300	296	36.3	36.3	37.0	34.8	33.4	0.84	354
Glasgw	579	571	574	589	575	33.9	32.6	32.4	32.5	31.0	1.37	420
Inverns	90	86	83	90	92	35.7	33.3	31.7	32.3	32.6	0.22	413
Klmarnk	126	133	144	141	139	40.6	42.0	42.7	41.6	38.7	0.29	478
Krkcldy	149	144	144	135	138	50.5	49.0	47.4	45.3	46.8	0.27	507
WALES												
Bangor	69	64	73	70	66	37.9	35.8	37.4	34.7	32.8	0.16	407
Cardff	470	486	529	555	552	29.1	29.9	31.4	32.3	31.9	1.15	482
Clwyd	77	69	72	75	86	41.6	39.0	40.0	39.5	42.0	0.18	480
Swanse	338	340	353	376	389	44.2	43.9	44.4	45.4	44.8	0.75	518
Wrexm	107	115	120	113	106	36.5	37.1	37.3	36.1	34.1	0.21	515
TOTALS												
England	**20,072**	**20,328**	**20,533**	**20,677**	**20,759**	**39.1**	**38.4**	**37.6**	**36.9**	**36.1**	**44.33**	**468**
N Ireland	**604**	**620**	**595**	**592**	**556**	**35.6**	**35.0**	**32.6**	**31.0**	**28.8**	**1.45**	**383**
Scotland	**1,866**	**1,851**	**1,902**	**1,877**	**1,851**	**38.6**	**37.5**	**37.3**	**35.8**	**34.6**	**4.43**	**418**
Wales	**1,061**	**1,074**	**1,147**	**1,189**	**1,199**	**34.9**	**35.0**	**36.1**	**36.6**	**36.2**	**2.45**	**490**
UK	**23,603**	**23,873**	**24,177**	**24,335**	**24,365**	**38.8**	**38.1**	**37.4**	**36.6**	**35.8**	**52.67**	**463**

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 renal centre.
pmp – per million population

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 31/12/2019 by centre

Centre	N on RRT	N on ICHD	% on ICHD	Median age (yrs)	% male	Ethnicity				
						% White	% Asian	% Black	% Other	% missing
ENGLAND										
Basldn	322	188	58.4	67.0	67.0	83.2	8.1	6.5	2.2	1.6
Bham	3,308	1,339	40.5	66.7	57.1	49.6	32.7	14.7	3.0	1.9
Bradfd	733	280	38.2	64.3	60.7	44.7	50.5	3.3	1.5	1.8
Brightn	1,059	430	40.6	71.4	62.6	89.7	6.0	2.3	2.0	7.2
Bristol	1,486	468	31.5	69.2	64.3	85.1	4.4	8.5	2.0	2.4
Camb	1,469	288	19.6	72.5	63.5	91.2	5.4	1.9	1.5	9.4
Carlis	303	111	36.6	68.2	58.6	100.0	0.0	0.0	0.0	0.0
Carsh	1,771	837	47.3	69.8	63.1	62.2	17.4	14.0	6.3	5.5
Chelms	261	114	43.7	71.5	71.9	90.6	4.7	2.8	1.9	7.0
Colchr	145	145	100.0	72.5	61.4	95.1	1.4	0.7	2.8	0.7
Covnt	1,076	354	32.9	69.7	61.0	73.7	19.5	6.8	0.0	0.0
Derby	652	238	36.5	68.3	61.8	81.8	10.2	5.1	3.0	0.8
Donc	342	181	52.9	70.6	61.9	91.7	3.9	1.7	2.8	0.0
Dorset	772	289	37.4	72.6	63.7	95.4	2.1	0.0	2.5	1.7
Dudley	366	207	56.6	69.9	60.4	80.7	12.6	6.8	0.0	0.0
Exeter	1,091	443	40.6	73.6	67.7	96.1	0.7	1.6	1.6	0.5
Glouc	525	226	43.0	74.2	67.7	91.2	2.7	3.5	2.7	0.0
Hull	904	350	38.7	66.2	63.4	95.4	2.9	0.9	0.9	0.9
Ipswi	424	141	33.3	71.3	63.8	79.9	1.5	4.5	14.2	5.0
Kent	1,140	420	36.8	68.8	61.9	96.3	1.0	1.5	1.2	3.6
L Barts	2,660	1,037	39.0	62.7	60.2	24.1	33.3	28.5	14.1	1.8
L Guys	2,310	666	28.8	63.2	58.6	41.4	8.6	45.6	4.4	4.5
L Kings	1,244	607	48.8	63.0	61.8	38.0	12.5	45.3	4.2	2.1
L Rfree	2,344	743	31.7	65.4	62.6	38.4	23.6	28.4	9.6	7.5
L St.G	852	300	35.2	67.1	61.7	22.3	27.8	38.5	11.3	3.0
L West	3,613	1,379	38.2	67.0	59.1	31.2	39.4	24.4	4.9	0.0
Leeds	1,723	552	32.0	63.4	64.5	69.5	21.8	7.1	1.6	0.2
Leic	2,587	964	37.3	67.2	64.1	72.0	19.5	6.1	2.5	7.5
Liv Ain	210	151	71.9	71.0	64.9	96.6	0.7	1.3	1.3	1.3
Liv Roy	1,227	355	28.9	63.8	61.4	86.9	3.8	5.8	3.5	3.4
M RI	2,060	499	24.2	65.0	59.7	46.0	13.8	37.6	2.7	2.4
Middlbr	949	344	36.2	67.9	69.5	91.9	7.0	1.2	0.0	0.0
Newc	1,175	327	27.8	65.8	61.5	90.8	4.0	2.1	3.1	0.0
Norwch	809	297	36.7	72.9	63.6	96.6	0.7	1.0	1.7	1.0
Nottm	1,218	360	29.6	67.4	62.5	74.2	11.7	10.6	3.6	0.0
Oxford	1,969	455	23.1	70.0	61.1	75.5	11.6	8.1	4.8	18.2
Plymth	531	126	23.7	72.5	67.5	97.6	0.0	0.8	1.6	0.0
Ports	1,883	591	31.4	67.5	64.5	89.6	4.4	2.3	3.7	12.0
Prestn	1,341	507	37.8	68.0	60.4	79.3	18.9	1.2	0.6	0.0
Redng	860	312	36.3	69.6	63.8	64.3	26.4	7.2	2.2	11.2
Salford	1,237	392	31.7	63.9	65.6	70.9	21.4	4.3	3.3	0.0
Sheff	1,491	539	36.2	68.3	63.1	84.6	8.2	4.0	3.2	2.6
Shrew	428	204	47.7	72.3	67.2	93.1	3.9	0.5	2.5	0.5
Stevng	966	507	52.5	66.8	63.5	71.0	12.9	10.0	6.1	12.8
Sthend	264	118	44.7	69.3	63.6	83.9	8.5	6.8	0.8	0.0

Table 5.3 Continued

Centre	N on RRT	N on ICHD	% on ICHD	Median age (yrs)	% male	Ethnicity				
						% White	% Asian	% Black	% Other	% missing
Stoke	803	267	33.3	70.9	65.5	89.9	5.4	1.2	3.5	3.4
Sund	568	252	44.4	67.5	59.5	96.0	3.2	0.4	0.4	0.4
Truro	449	166	37.0	73.1	60.8	99.4	0.6	0.0	0.0	0.0
Wirral	411	207	50.4	65.7	58.0	96.1	1.9	0.5	1.4	0.0
Wolve	598	302	50.5	66.0	62.3	59.3	26.7	12.3	1.7	0.7
York	581	184	31.7	72.0	65.8	96.7	1.1	0.6	1.7	2.2
N IRELAND										
Antrim	280	118	42.1	73.5	64.4	100.0	0.0	0.0	0.0	0.0
Belfast	890	157	17.6	68.4	63.7	97.0	1.5	0.0	1.5	14.6
Newry	251	78	31.1	68.7	61.5	98.7	1.3	0.0	0.0	3.8
Ulster	182	97	53.3	77.7	53.6	95.9	4.1	0.0	0.0	0.0
West NI	328	106	32.3	69.4	58.5	99.1	0.9	0.0	0.0	0.0
SCOTLAND										
Abrdn	558	190	34.1	67.0	60.0					86.8
Airdrie	524	207	39.5	63.0	58.5	97.3	2.7	0.0	0.0	10.6
D&Gall	149	52	34.9	71.8	67.3					61.5
Dundee	449	162	36.1	66.7	59.3					82.1
Edinb	885	296	33.4	62.4	61.5					80.4
Glasgw	1,854	575	31.0	65.4	59.8					65.7
Inverns	282	92	32.6	70.5	58.7					77.2
Klmarnk	359	139	38.7	67.3	59.7					71.9
Krkcldy	295	138	46.8	66.8	58.0					88.4
WALES										
Bangor	201	66	32.8	73.5	65.2	98.4	0.0	0.0	1.6	6.1
Cardff	1,730	552	31.9	66.3	62.1	88.5	8.8	1.3	1.5	0.9
Clwyd	205	86	42.0	70.4	68.6	98.7	1.3	0.0	0.0	10.5
Swanse	868	389	44.8	70.6	65.8	97.2	1.6	0.8	0.5	0.8
Wrexm	311	106	34.1	68.2	63.2	98.1	1.0	1.0	0.0	1.9
TOTALS										
England	**57,510**	**20,759**	**36.1**	**67.5**	**62.2**	**67.7**	**16.0**	**12.5**	**3.8**	**3.4**
N Ireland	**1,931**	**556**	**28.8**	**72.2**	**60.8**	**98.1**	**1.5**	**0.0**	**0.4**	**4.7**
Scotland	**5,355**	**1,851**	**34.6**	**65.4**	**59.9**					**68.1**
Wales	**3,315**	**1,199**	**36.2**	**68.4**	**64.1**	**93.4**	**4.8**	**0.9**	**0.9**	**1.9**
UK	**68,111**	**24,365**	**35.8**	**67.5**	**62.1**	**70.3**	**14.8**	**11.4**	**3.5**	**8.3**

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.

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.

Table 5.4 Primary renal diseases (PRDs) of adult patients prevalent to ICHD on 31/12/2019

PRD	N on ICHD	% ICHD population	Age <65 yrs		Age ≥65 yrs		M/F ratio
			N	%	N	%	
Diabetes	6,540	27.8	3,023	28.9	3,517	27.0	1.6
Glomerulonephritis	3,222	13.7	1,806	17.3	1,416	10.9	2.1
Hypertension	1,816	7.7	775	7.4	1,041	8.0	2.3
Polycystic kidney disease	1,297	5.5	680	6.5	617	4.7	1.1
Pyelonephritis	1,706	7.3	803	7.7	903	6.9	1.6
Renal vascular disease	1,196	5.1	167	1.6	1,029	7.9	2.0
Other	4,065	17.3	1,914	18.3	2,151	16.5	1.3
Uncertain aetiology	3,646	15.5	1,284	12.3	2,362	18.1	1.6
Total (with data)	**23,488**	**100.0**	**10,452**	**100.0**	**13,036**	**100.0**	
Missing	877	3.6	402	3.7	475	3.5	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. These analyses were undertaken on the 2019 prevalent ICHD population, using data collected at the end of the third quarter, because of better data completeness compared to the fourth quarter of the year.

Table 5.5 Median urea reduction ratio (URR) and distribution of session frequency and time for adult patients prevalent to ICHD on 31/12/2019 using end of third quarter data (30/09/2019)

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											
Basldn	71	80.0	11.3	85.1	3.6	42.0	58.0	0.0	97.9	100.0	100.0
Bham	79	91.4	5.8	92.6	1.6	16.9	82.9	0.2	99.7	97.0	96.7
Bradfd	71	69.9	9.1	89.3	1.6	27.6	72.4	0.0	75.9	99.2	98.7
Brightn	74	86.8	1.0	99.0	0.0	8.4	91.6	0.0	90.9	99.8	99.5
Bristol	72	81.1	3.2	96.8	0.0	23.4	76.6	0.0	99.8	99.8	100.0
Camb			2.5	90.3	7.2	46.0	54.0	0.0	0.0	98.9	98.4
Carlis	72	70.4	4.3	95.7	0.0	16.9	83.1	0.0	99.0	90.3	89.9
Carsh	78	89.9	2.3	97.2	0.5	5.9	93.7	0.4	86.4	99.8	99.2
Chelms	71	83.2	0.0	96.7	3.3	34.1	65.9	0.0	96.7	95.8	95.7
Colchr	79	98.1	1.5	98.5	0.0	3.0	96.2	0.8	80.5	100.0	100.0
Covnt	77	90.4	8.3	89.9	1.8	29.9	70.1	0.0	95.3	99.4	97.6
Derby	76	87.2	2.9	95.2	1.9				86.9	100.0	19.7
Donc	75	83.0	1.3	98.1	0.6	28.4	71.6	0.0	97.6	95.2	95.1
Dorset	76	94.8	2.3	97.0	0.8	7.8	92.2	0.0	89.1	99.6	100.0
Dudley	78	87.9	2.7	96.2	1.1	14.2	85.2	0.6	96.8	94.3	94.1
Exeter	75	89.3	1.4	97.8	0.7	49.9	50.1	0.0	99.3	100.0	100.0
Glouc	76	93.2	5.5	94.5	0.0				100.0	99.5	0.0
Hull	78	93.5							98.8	0.0	1.2
Ipswi			13.1	86.2	0.8	17.0	83.0	0.0	0.0	99.2	93.8
Kent	71	76.6	1.5	96.4	2.1	76.5	23.5	0.0	94.7	99.2	100.0
L Barts			10.8	89.0	0.2	44.3	55.7	0.0	0.0	97.5	97.2
L Guys	75	89.4	8.0	91.7	0.3	24.1	75.9	0.0	97.9	98.1	97.9

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
L Kings	73	84.1	6.6	93.1	0.4	56.6	43.4	0.0	99.6	99.1	99.0
L Rfree			19.8	79.6	0.6	61.4	38.4	0.2	0.0	97.0	96.3
L St.G	80	95.1	0.4	99.6	0.0	6.7	93.3	0.0	83.0	98.2	94.1
L West	78	90.8	8.6	90.6	0.8	26.5	73.0	0.5	91.3	92.1	91.5
Leeds	73	84.5	9.1	89.9	1.0	22.5	77.5	0.0	99.6	98.6	99.4
Leic	75	85.9	2.6	96.9	0.5	13.8	83.3	3.0	99.5	99.2	99.4
Liv Ain			1.5	96.2	2.3	16.7	83.3	0.0	0.0	100.0	100.0
Liv Roy			0.0	90.9	9.1	7.1	92.9	0.0	0.0	99.7	99.7
M RI	75	83.5	4.6	94.4	1.0	6.7	93.3	0.0	79.0	91.2	90.7
Middlbr	73	80.7	2.8	96.0	1.2	33.8	64.3	1.9	99.4	99.7	99.7
Newc			7.0	91.7	1.3	26.0	74.0	0.0	16.3	100.0	100.0
Norwch	75	86.7	2.2	96.3	1.5	63.5	36.5	0.0	85.3	99.3	99.3
Nottm	75	87.5	0.6	94.6	4.8	7.6	91.8	0.6	94.0	100.0	100.0
Oxford	75	86.1	0.0	100.0	0.0	28.5	71.5	0.0	81.0	99.5	99.5
Plymth	76	89.3	2.6	96.5	0.9				100.0	99.1	0.0
Ports			9.6	89.8	0.6	48.1	51.9	0.0	0.0	99.2	99.2
Prestn	73	75.9							82.1	0.0	0.2
Redng	75	90.0	0.7	98.9	0.4	22.5	77.5	0.0	100.0	96.5	98.2
Salford			2.5	79.2	18.3	27.1	72.5	0.4	69.3	99.2	96.9
Sheff	74	87.0	2.8	95.1	2.2	83.1	16.9	0.0	99.2	99.0	99.0
Shrew	75	91.4	1.0	96.4	2.6	13.4	86.6	0.0	97.9	98.5	98.4
Stevng	72	74.1	15.9	80.2	4.0	68.9	31.1	0.0	97.9	78.6	74.7
Sthend	72	86.5	1.9	98.1	0.0	30.8	69.2	0.0	100.0	100.0	100.0
Stoke	74	87.1	6.8	89.6	3.6	14.8	85.2	0.0	86.6	100.0	100.0
Sund			4.4	86.8	8.8	27.0	73.0	0.0	1.0	98.3	88.6
Truro	74	87.6	2.0	98.0	0.0				97.3	99.3	0.0
Wirral	74	83.5	0.5	95.7	3.8	29.1	70.9	0.0	98.3	99.5	100.0
Wolve	76	89.1	2.9	96.7	0.4				98.2	98.2	61.8
York	77	93.7	3.2	89.8	7.0	15.9	84.1	0.0	100.0	89.7	91.2
N IRELAND											
Antrim	71	70.0	0.9	99.1	0.0	9.0	91.0	0.0	99.1	99.1	100.0
Belfast	75	89.6	0.7	97.3	2.0	15.2	84.1	0.7	99.3	99.3	100.0
Newry	72	81.5	13.9	86.1	0.0	60.3	39.7	0.0	84.4	97.3	98.4
Ulster	72	77.9	4.4	93.4	2.2	18.6	81.4	0.0	98.9	97.9	98.9
West NI	70	71.4	6.3	86.5	7.3	66.3	33.7	0.0	98.8	98.0	97.7
SCOTLAND											
Abrdn	72	82.7	0.5	93.7	5.8	7.3	90.4	2.2	100.0	99.5	99.4
Airdrie	69	71.4	0.6	96.5	2.9	15.5	81.0	3.6	100.0	97.7	100.0
D&Gall	70	75.0	11.8	84.3	3.9	22.7	70.5	6.8	100.0	98.1	100.0
Dundee	75	89.4	0.0	95.9	4.1	5.7	94.3	0.0	97.9	96.7	96.6
Edinb	72	87.9	0.0	98.0	2.0	35.5	64.5	0.0	100.0	92.6	92.5
Glasgw	71	75.1	2.6	95.5	2.0	8.8	88.6	2.5	100.0	94.6	99.4
Inverns	72	90.2	0.0	95.3	4.7	25.6	74.4	0.0	100.0	100.0	100.0
Klmarnk	71	81.7	2.3	97.7	0.0				100.0	99.3	31.3
Krkcldy	71	79.4	1.7	98.3	0.0	25.4	74.6	0.0	100.0	93.0	93.7
WALES											
Bangor	74	89.1	5.0	90.0	5.0				100.0	98.4	0.0
Cardff	75	92.2							99.8	0.0	0.0
Clwyd	72	80.8	0.0	100.0	0.0				100.0	100.0	0.0
Swanse	75	85.1	5.8	91.9	2.2	34.4	65.6	0.0	99.1	99.7	99.7
Wrexm	74	82.8	4.8	94.2	1.0				100.0	99.1	0.0

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
TOTALS											
England	**75**	**86.7**	**5.5**	**92.7**	**1.8**	**29.7**	**70.0**	**0.3**	**77.1**	**93.4**	**88.7**
N Ireland	**72**	**78.9**	**4.2**	**93.4**	**2.3**	**28.9**	**70.9**	**0.2**	**97.2**	**98.5**	**99.2**
Scotland	**71**	**80.4**	**1.6**	**95.8**	**2.6**	**15.7**	**82.0**	**2.2**	**99.8**	**95.9**	**92.3**
Wales	**75**	**88.3**	**4.9**	**93.1**	**2.0**	**34.4**	**65.6**	**0.0**	**99.6**	**53.0**	**30.5**
UK	**75**	**86.0**	**5.1**	**93.0**	**1.9**	**28.6**	**70.9**	**0.4**	**80.5**	**91.7**	**86.3**

Blank cells – no data returned by the centre or data completeness <70%.
Data for Scotland refer to patients prevalent to ICHD on 31/05/2019 due to data availability.

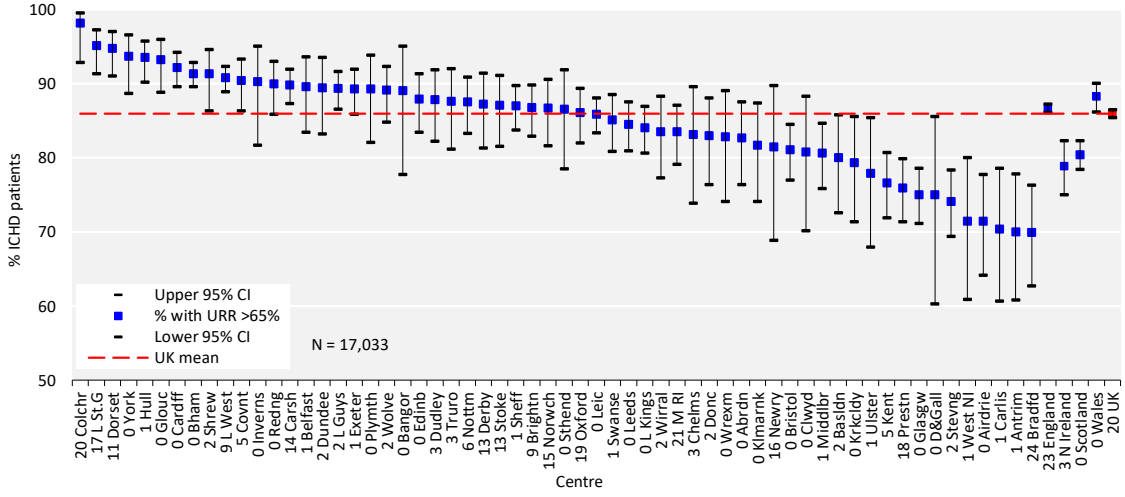

Figure 5.2 Percentage of adult patients prevalent to ICHD on 31/12/2019 with urea reduction ratio (URR) >65% by centre
CI – confidence interval

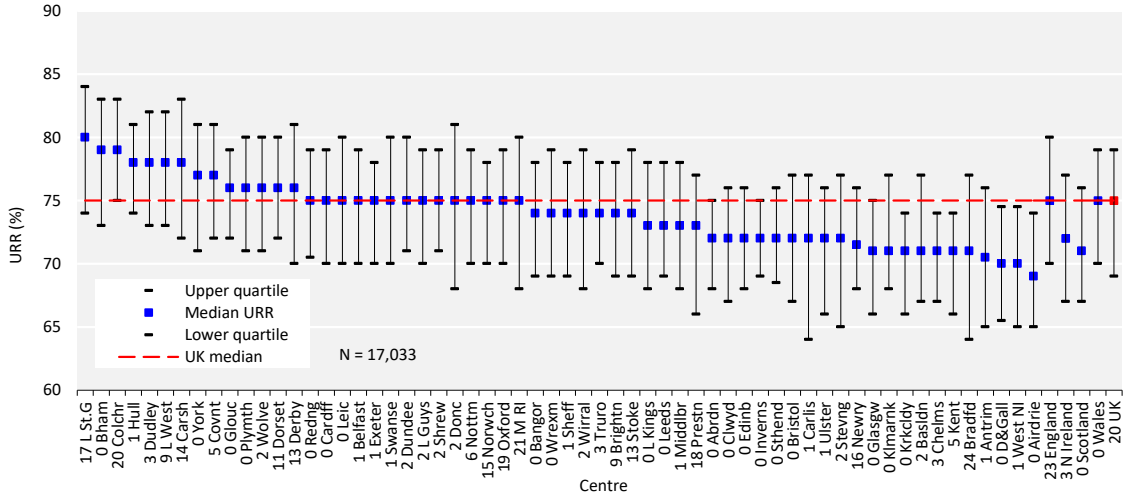

Figure 5.3 Median urea reduction ratio (URR) achieved in adult patients prevalent to ICHD on 31/12/2019 by centre

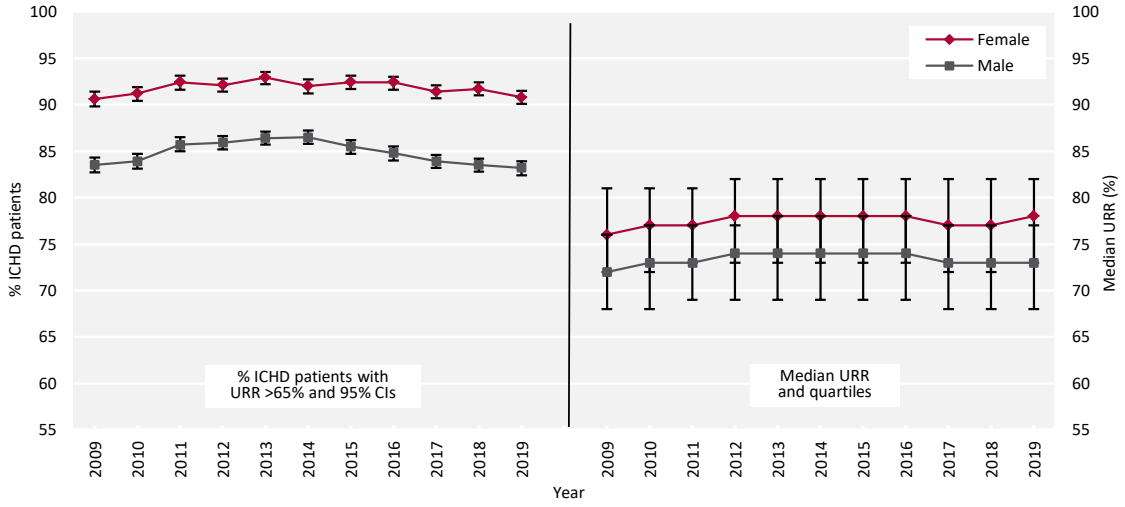

Figure 5.4 Change in the percentage of prevalent adult ICHD patients with urea reduction ratio (URR) >65% and the median URR by sex between 2009 and 2019

CI – confidence interval

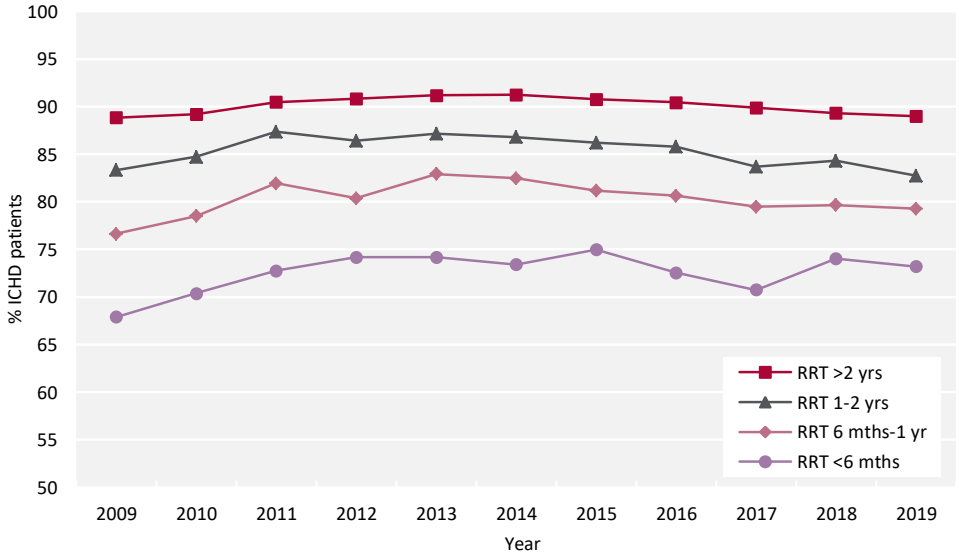

Figure 5.5 Percentage of prevalent adult ICHD patients achieving urea reduction ratio (URR) >65% by time on RRT between 2009 and 2019

Biochemistry parameters in prevalent adult ICHD patients

The Renal 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 31/12/2019 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				
Basldn	2.4	81.5	13.3	100.0
Bham	2.4	80.7	10.6	99.8
Bradfd	2.4	74.2	21.5	98.8
Brightn	2.3	79.4	7.5	99.8
Bristol	2.4	85.3	11.7	99.8
Camb	2.4	77.4	17.2	98.6
Carlis	2.3	77.9	8.7	100.0
Carsh	2.3	77.2	7.9	99.9
Chelms	2.3	86.0	3.2	100.0
Colchr	2.3	84.7	3.8	94.2
Covnt	2.3	78.6	7.1	100.0
Derby	2.4	87.3	5.4	100.0
Donc	2.3	86.7	2.4	100.0
Dorset	2.3	85.2	7.6	100.0
Dudley	2.4	81.4	13.3	99.5
Exeter	2.3	89.4	9.2	100.0
Glouc	2.4	87.1	5.7	100.0
Hull	2.4	76.5	18.3	100.0
Ipswi	2.4	76.6	8.1	100.0
Kent	2.4	75.7	15.3	99.7
L Barts	2.3	78.5	8.3	99.6
L Guys	2.4	83.0	10.2	100.0
L Kings	2.3	79.7	6.7	99.5
L Rfree	2.3	79.4	7.9	100.0
L St.G	2.4	80.4	11.4	97.5
L West	2.3	74.3	11.5	87.0
Leeds	2.4	81.0	10.9	100.0
Leic	2.3	77.9	7.0	100.0
Liv Ain	2.4	81.2	15.9	99.3
Liv Roy	2.4	80.4	12.2	99.4
M RI	2.4	77.0	13.9	92.7
Middlbr	2.2	69.7	3.5	99.7
Newc	2.4	74.7	10.7	100.0
Norwch	2.3	84.0	10.2	93.8
Nottm	2.4	84.5	8.2	100.0
Oxford	2.3	78.3	9.1	87.9
Plymth	2.3	83.6	4.6	100.0
Ports	2.3	80.9	8.2	100.0
Prestn	2.3	80.7	4.8	92.8
Redng	2.4	81.3	11.3	100.0
Salford	2.4	78.9	11.6	100.0
Sheff	2.3	76.3	3.9	99.4
Shrew	2.4	82.8	13.4	98.9
Stevng	2.3	84.2	6.5	100.0
Sthend	2.4	75.9	17.6	100.0
Stoke	2.4	85.4	10.8	98.4
Sund	2.3	75.7	12.8	99.1
Truro	2.5	70.7	29.3	100.0
Wirral	2.3	85.3	6.3	100.0
Wolve	2.3	82.7	8.3	99.3
York	2.4	86.9	9.7	100.0

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
N IRELAND				
Antrim	2.3	89.3	4.9	99.0
Belfast	2.3	80.3	7.5	100.0
Newry	2.4	87.7	5.5	100.0
Ulster	2.5	67.1	31.8	100.0
West NI	2.3	78.4	7.2	98.0
SCOTLAND				
Abrdn	2.4	83.2	11.2	100.0
Airdrie	2.4	86.5	10.3	100.0
D&Gall	2.3	79.2	6.3	98.0
Dundee	2.4	77.8	16.3	99.4
Edinb	2.4	76.0	12.2	100.0
Glasgw	2.4	78.5	14.9	100.0
Inverns	2.3	80.9	7.9	100.0
Klmarnk	2.3	87.5	6.3	100.0
Krkcldy	2.4	74.2	21.1	100.0
WALES				
Bangor	2.3	82.3	1.6	100.0
Cardff	2.3	80.2	8.3	99.8
Clwyd	2.5	75.7	23.0	100.0
Swanse	2.4	83.9	8.9	100.0
Wrexm	2.3	88.7	7.2	99.0
TOTALS				
England	**2.3**	**79.9**	**9.7**	**98.1**
N Ireland	**2.4**	**80.5**	**10.8**	**99.4**
Scotland	**2.4**	**79.9**	**12.9**	**99.9**
Wales	**2.3**	**82.0**	**9.0**	**99.8**
UK	**2.3**	**80.0**	**10.0**	**98.4**

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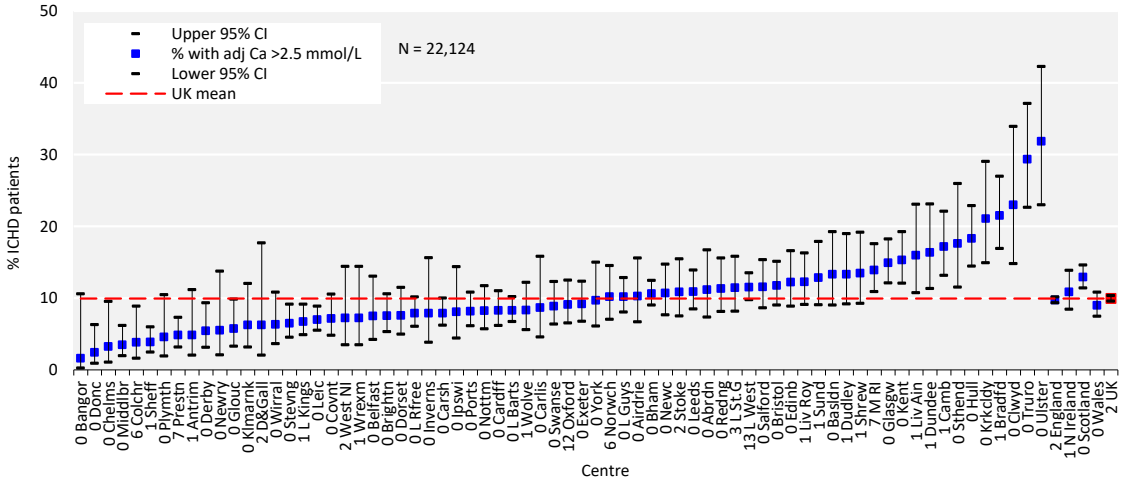

Figure 5.6 Percentage of adult patients prevalent to ICHD on 31/12/2019 with adjusted calcium (Ca) above the target range (>2.5 mmol/L) by centre
CI – confidence interval

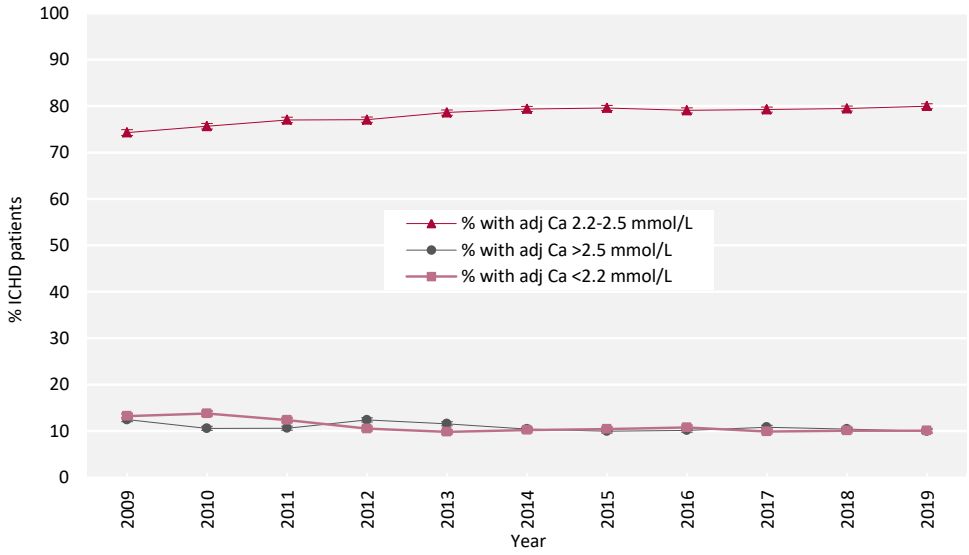

Figure 5.7 Change in percentage of prevalent adult ICHD patients within, above and below the target range for adjusted calcium (Ca 2.2–2.5 mmol/L) between 2009 and 2019

Table 5.7 Median pre-dialysis potassium and bicarbonate and percentage attaining target ranges in adult patients prevalent to ICHD on 31/12/2019 by centre

	Pre-dialysis potassium					Pre-dialysis bicarbonate				
Centre	Median (mmoI/L)	% <4.0 mmol/L	% 4.0–6.0 mmol/L	% >6.0 mmol/L	% data complete-ness	Median (mmoI/L)	% <18 mmol/L	% 18–26 mmol/L	% >26 mmol/L	% data complete-ness
ENGLAND										
Basldn	4.7	11.0	85.6	7.1	100.0	22	2.3	95.4	2.3	100.0
Bham	4.8	10.9	81.9	9.3	99.8	23	2.1	88.0	9.9	99.7
Bradfd	4.5	21.8	75.5	17.2	99.2	24	1.6	88.3	10.2	98.8
Brightn					0.0	24	1.5	77.1	21.4	99.8
Bristol	4.6	17.9	77.8	14.6	100.0	23	2.3	92.4	5.3	99.8
Camb	4.9	5.1	91.6	3.1	98.6					19.8
Carlis					0.0	21	14.4	83.7	1.9	100.0
Carsh					0.0	25	0.2	67.9	31.9	71.7
Chelms	5.0	9.7	83.9	5.1	100.0	23	1.1	90.3	8.6	100.0
Colchr	4.9	10.7	87.8	6.4	94.2	21	3.1	96.2	0.8	94.2
Covnt					0.0	23	4.0	80.4	15.5	100.0
Derby					0.0	22	0.9	95.0	4.1	100.0
Donc	4.8	10.9	86.1	7.0	100.0	24	1.8	84.2	13.9	100.0
Dorset	4.8	6.8	88.6	4.3	100.0	21	9.1	87.8	3.0	99.6
Dudley	4.7	12.2	83.1	8.2	100.0					57.1
Exeter	4.6	20.2	77.8	16.7	100.0	21	5.1	94.7	0.2	100.0
Glouc					0.0	23	1.4	91.9	6.7	100.0
Hull	4.8	10.8	84.5	7.9	100.0	24	1.9	79.9	18.3	100.0
Ipswi					0.0	24	1.6	83.1	15.3	100.0
Kent	4.2	40.9	54.9	36.1	99.7	22	2.1	90.4	7.5	99.7
L Barts	4.8	15.1	80.3	13.0	99.6	21	14.5	79.0	6.5	99.6
L Guys	4.7	25.4	69.9	22.1	100.0	24	1.1	87.2	11.7	99.8
L Kings	5.3	6.9	79.9	5.1	99.5	22	5.3	92.0	2.7	99.5
L Rfree	4.9	12.2	80.6	9.9	100.0	23	3.6	87.1	9.3	95.7
L St.G					0.0	24	2.3	72.8	24.9	92.5

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
L West					0.0					53.6
Leeds	5.0	3.5	89.3	2.2	100.0	23	1.6	89.9	8.5	100.0
Leic	4.9	9.5	83.9	7.7	100.0	24	1.1	77.0	21.9	99.9
Liv Ain					0.0	23	2.2	87.7	10.1	99.3
Liv Roy					0.0	27	0.6	43.6	55.8	99.7
M RI					0.0	22	2.4	84.6	13.0	92.0
Middlbr	4.8	8.5	86.1	5.9	99.7	26	0.6	59.0	40.4	99.7
Newc					0.0	22	4.0	88.0	8.0	100.0
Norwch	5.2	6.2	84.6	3.9	100.0	23	3.1	88.4	8.5	94.9
Nottm	4.8	11.9	82.7	8.8	100.0	24	0.6	76.0	23.4	100.0
Oxford	4.9	7.7	85.6	5.4	87.4	24	3.3	87.5	9.2	86.7
Plymth	4.6	12.7	81.8	7.7	100.0	28	0.0	36.4	63.6	100.0
Ports	4.7	9.3	88.1	7.1	100.0	24	1.9	80.5	17.6	100.0
Prestn					0.0	23	4.1	86.3	9.6	99.8
Redng					0.0	23	1.4	88.3	10.3	100.0
Salford	4.6	20.3	78.0	16.4	100.0					0.0
Sheff	5.0	6.3	85.2	4.5	99.4	23	1.8	88.2	9.9	99.4
Shrew					0.0	25	3.2	64.9	31.9	98.4
Stevng	4.9	9.4	86.9	7.0	100.0	24	1.1	82.4	16.5	100.0
Sthend	4.7	10.2	84.3	5.7	100.0	25	0.9	63.9	35.2	100.0
Stoke					0.0	26	0.0	62.0	38.0	99.2
Sund					0.0	27	0.4	41.0	58.6	99.6
Truro	4.8	5.3	90.7	2.7	100.0	26	0.0	62.7	37.3	100.0
Wirral					0.0	25	1.1	76.2	22.8	99.5
Wolve	4.9	6.9	85.6	4.4	99.3	23	2.9	92.8	4.3	99.3
York	5.3	5.1	82.4	2.7	100.0	23	2.3	90.3	7.4	100.0
N IRELAND										
Antrim	4.7	11.5	86.5	6.7	100.0	26	1.0	58.7	40.4	100.0
Belfast	5.2	3.4	86.4	1.4	100.0	21	4.1	91.2	4.8	100.0
Newry	4.8	13.7	79.5	7.5	100.0					19.2
Ulster	4.9	11.4	84.1	6.2	100.0	24	0.0	89.8	10.2	100.0
West NI	4.9	8.1	85.9	4.1	100.0	22	1.0	97.0	2.0	100.0
SCOTLAND										
Abrdn	4.9	12.9	81.6	8.7	100.0					5.6
Airdrie	4.3	26.5	70.8	20.6	100.0	20	9.8	88.5	1.6	98.9
D&Gall	4.9	8.3	87.5	3.2	98.0	23.5	2.1	89.6	8.3	98.0
Dundee	5.0	7.8	85.6	4.5	99.4	25	0.7	80.7	18.7	97.4
Edinb	4.9	13.4	79.8	9.8	99.3					47.3
Glasgw	4.9	9.2	85.9	7.0	99.0	21	7.7	89.0	3.3	93.0
Inverns	5.1	2.6	80.8	0.6	87.6	25	1.3	67.5	31.2	86.5
Klmarnk	4.8	12.6	80.3	7.9	99.2	22	5.4	90.1	4.5	86.7
Krkcldy	4.8	7.9	86.6	4.3	99.2	24	1.6	89.8	8.7	99.2
WALES										
Bangor					0.0	25.5	1.6	66.1	32.3	100.0
Cardff					0.0	23	3.0	90.0	7.1	99.8
Clwyd					0.0	22	2.7	93.2	4.1	100.0
Swanse					0.0	24	1.7	84.5	13.9	100.0
Wrexm					0.0	27	2.1	36.1	61.9	99.0

Table 5.7 Continued

Centre	Pre-dialysis potassium					Pre-dialysis bicarbonate				
	Median (mmol/L)	% <4.0 mmol/L	% 4.0–6.0 mmol/L	% >6.0 mmol/L	% data completeness	Median (mmol/L)	% <18 mmol/L	% 18–26 mmol/L	% >26 mmol/L	% data completeness
TOTALS										
England	**4.8**	**12.4**	**81.8**	**11.9**	**65.4**	**23**	**3.3**	**81.9**	**14.8**	**91.2**
N Ireland	**4.9**	**8.8**	**84.9**	**6.6**	**100.0**	**23**	**1.8**	**84.5**	**13.7**	**88.5**
Scotland	**4.8**	**11.9**	**82.2**	**10.4**	**98.7**	**22**	**5.4**	**85.9**	**8.7**	**77.2**
Wales					**0.0**	**23**	**2.4**	**82.3**	**15.3**	**99.8**
UK	**4.8**	**12.3**	**82.0**	**11.7**	**65.5**	**23**	**3.4**	**82.2**	**14.4**	**90.5**

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

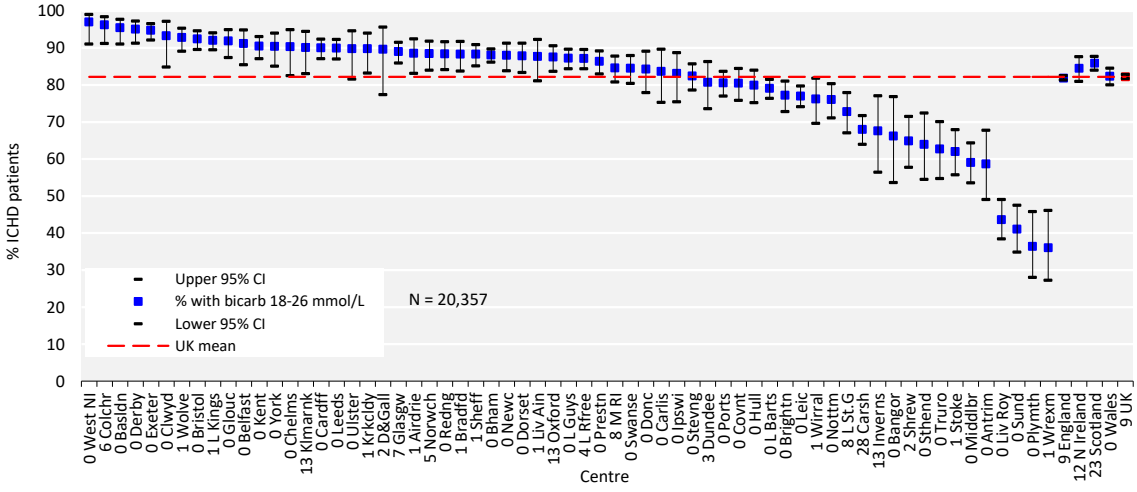

Figure 5.8 Percentage of adult patients prevalent to ICHD on 31/12/2019 with pre-dialysis bicarbonate (bicarb) within the target range (18–26 mmol/L) by centre

CI – confidence interval

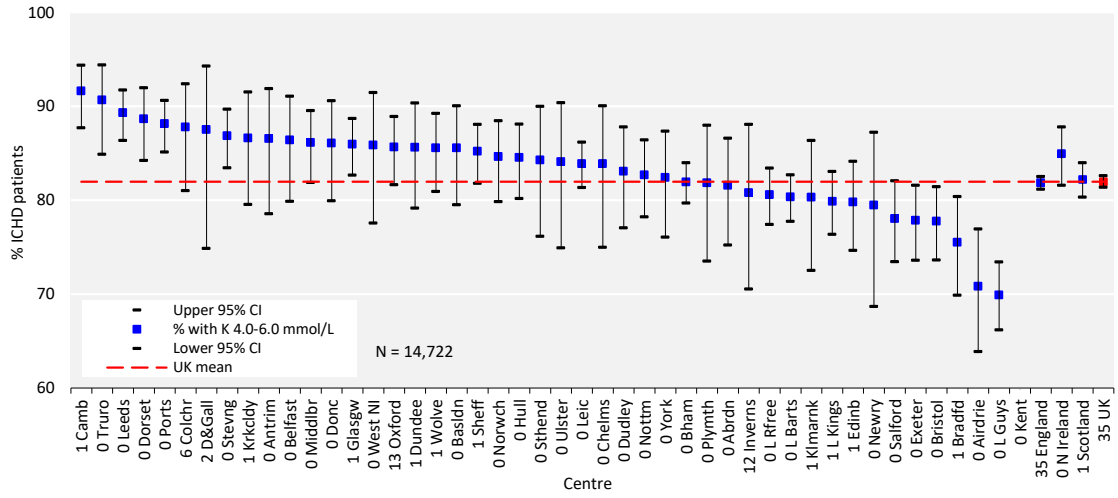

Figure 5.9 Percentage of adult patients prevalent to ICHD on 31/12/2019 with pre-dialysis potassium (K) within the target range (4.0–6.0 mmol/L) by centre

CI – confidence interval

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

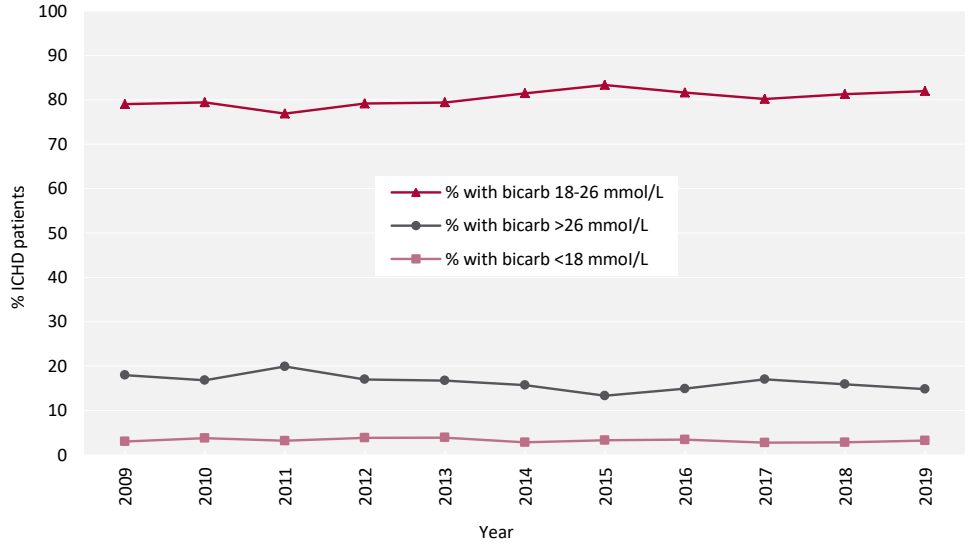

Figure 5.10 Change in percentage of prevalent adult ICHD patients within, above and below the target range for pre-dialysis bicarbonate (bicarb 18–26 mmol/L) between 2009 and 2019

Anaemia in prevalent adult ICHD patients

Inadequate data completeness in relation to ESAs makes auditing against national guidelines difficult to interpret. An important assumption is that patients for whom no ESA data have been submitted to the UKRR are not on ESA treatment, provided the centre has submitted ESA data for other patients on ICHD. The weekly ESA dose is reported, but there are some uncertainties surrounding the accuracy of this measure (see appendix A).

Table 5.8 Median haemoglobin and ferritin and percentage attaining target ranges in adult patients prevalent to ICHD on 31/12/2019 by centre

	Haemoglobin				Ferritin		
Centre	Median (g/L)	% <100 g/L	% >120 g/L	% data completeness	Median (µg/L)	% <100 µg/L	% data completeness
ENGLAND							
Basldn	111	17.9	22.5	100.0	678	5.8	99.4
Bham	111	20.4	18.1	99.8	335	9.1	99.1
Bradfd	114	18.1	35.1	100.0	452	7.0	99.2
Brightn	111	20.1	22.6	99.8	513	3.0	99.5
Bristol	111	10.6	20.0	100.0	622	1.4	99.8
Camb	114	15.2	27.9	96.8			52.9
Carlis	114	14.4	24.0	100.0	609	5.8	100.0
Carsh	111	18.9	21.1	100.0	419	5.7	98.2
Chelms	116	8.6	35.5	100.0	318	18.3	100.0
Colchr	110	17.4	16.7	95.0	546	3.0	96.4
Covnt	108	27.3	11.5	100.0	433	3.8	99.4
Derby	113	14.9	33.9	100.0	536	1.4	98.6
Donc	110	23.0	18.2	100.0	430	1.2	100.0
Dorset	114	14.2	27.1	90.9	596	1.1	100.0
Dudley	116	10.2	28.9	98.9	224	11.4	74.1
Exeter	112	9.4	21.0	100.0	311	6.0	100.0
Glouc	111	17.7	20.1	100.0	464	7.4	97.6
Hull	113	18.9	25.1	100.0	429	2.8	100.0
Ipswi	109	29.0	12.1	100.0	420	12.1	100.0
Kent	112	19.9	24.6	99.7	457	7.5	99.7
L Barts	109	24.3	18.2	99.6	617	3.5	99.7
L Guys	109	25.1	16.2	100.0	486	3.7	99.7
L Kings	110	19.4	16.5	99.5	547	1.8	99.3
L Rfree	109	25.1	15.9	100.0	454	6.0	99.1
L St.G	109	28.1	23.4	98.6	359	10.0	93.2
L West	113	14.1	17.8	94.8	352	4.8	93.6
Leeds	108	24.7	10.1	100.0	363	6.4	100.0
Leic	113	18.7	27.1	100.0	392	6.9	99.9
Liv Ain	111	15.3	16.8	98.6	636	2.2	100.0
Liv Roy	113	18.0	28.1	99.4	449	4.0	99.1
M RI	110	25.2	22.3	92.5	390	3.1	79.4
Middlbr	111	20.5	19.6	99.7	871	4.8	98.4
Newc	110	24.0	23.3	100.0	563	4.3	99.7
Norwch	110	25.8	22.3	95.2	417	8.7	93.0
Nottm	114	14.3	27.1	99.7	385	5.8	100.0
Oxford	108	27.1	21.9	88.2	387	3.7	99.0
Plymth	110	20.9	21.8	100.0	370	5.5	100.0
Ports	112	19.5	25.4	100.0	394	4.7	99.1
Prestn	111	20.1	26.3	99.8	698	2.4	96.0
Redng	112	17.7	25.1	100.0	627	2.8	99.7

Table 5.8 Continued

Centre	Haemoglobin				Ferritin		
	Median (g/L)	% <100 g/L	% >120 g/L	% data completeness	Median (µg/L)	% <100 µg/L	% data completeness
Salford	110	27.3	21.4	100.0	362	12.4	100.0
Sheff	109	28.4	18.5	99.4	442	1.6	99.6
Shrew	115	14.0	33.9	98.9	598	1.1	98.9
Stevng	108	29.6	14.0	100.0	467	4.3	98.9
Sthend	109	18.5	11.1	100.0	348	1.9	100.0
Stoke	113	12.0	28.5	99.2	483	2.5	98.4
Sund	114	16.3	25.1	99.6	384	4.0	99.6
Truro	108	20.7	17.3	100.0	397	0.7	100.0
Wirral	114	13.2	26.8	100.0	629	6.3	100.0
Wolve	114	17.0	26.0	99.3	535	5.4	99.3
York	110	21.6	18.8	100.0	395	4.5	100.0
N IRELAND							
Antrim	106	32.7	13.5	100.0	350	4.8	100.0
Belfast	112	15.0	27.9	100.0	470	2.7	100.0
Newry	109	17.8	16.4	100.0	495	4.1	100.0
Ulster	109	19.3	19.3	100.0	704	0.0	100.0
West NI	114	17.3	24.5	99.0	742	1.0	100.0
SCOTLAND							
Abrdn	110	25.1	16.2	100.0	557	5.9	95.0
Airdrie	112	16.8	14.6	100.0	629	1.6	100.0
D&Gall	115	25.0	31.3	98.0	852	2.1	98.0
Dundee	110	17.6	22.2	99.4	421	9.8	99.4
Edinb	115	13.3	34.4	100.0	475	7.2	99.6
Glasgw	110	20.9	22.6	100.0	525	2.9	98.5
Inverns	112	7.9	23.6	100.0	535	3.8	87.6
Klmarnk	111	25.8	17.2	100.0	292	5.5	100.0
Krkcldy	115	13.3	34.4	100.0	428	8.7	99.2
WALES							
Bangor	116	12.9	30.6	100.0	387	1.6	100.0
Cardff	110	21.0	22.8	99.8	393	3.5	99.8
Clwyd	122	4.1	52.7	100.0	427	2.7	100.0
Swanse	111	23.0	16.9	100.0	394	9.7	99.7
Wrexm	109	24.7	11.3	99.0	526	1.0	99.0
TOTALS							
England	**111**	**20.1**	**21.2**	**98.8**	**441**	**5.1**	**97.3**
N Ireland	**111**	**20.2**	**21.2**	**99.8**	**547**	**2.5**	**100.0**
Scotland	**112**	**18.6**	**23.7**	**99.9**	**510**	**5.1**	**98.1**
Wales	**111**	**20.4**	**22.3**	**99.8**	**405**	**5.2**	**99.7**
UK	**111**	**20.0**	**21.5**	**98.9**	**445**	**5.0**	**97.6**

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

Table 5.9 Distribution of haemoglobin and erythropoiesis stimulating agent (ESA) dose values in adult patients prevalent to ICHD on 31/12/2019 by centre

Centre	ESA		Haemoglobin and ESA	
	% on ESA	Median dose (IU/week)	% <100 g/L and not on ESA	% >120 g/L and on ESA
ENGLAND				
Basldn	91.3	5,000	0.0	18.5
Bham	23.3			
Bradfd	92.7	8,000	0.0	30.9
Brightn	95.2	6,600	0.5	20.6
Bristol	94.5	8,000	0.2	17.4
Camb	43.5			
Carlis	83.7	4,000	0.0	17.3
Carsh	1.0			
Chelms	96.8	12,000	0.0	33.3
Colchr	0.0			
Covnt	88.2	8,000	1.6	8.4
Derby	0.0			
Donc	97.0	6,000	0.0	17.0
Dorset	92.0	6,000	0.4	21.7
Dudley	87.8	10,000	0.5	25.1
Exeter	92.3	6,000	0.0	18.1
Glouc	89.5		0.0	17.2
Hull	40.6			
Ipswi	33.9			
Kent	95.9	9,000	0.3	23.1
L Barts	92.8	8,000	1.4	15.1
L Guys	0.2			
L Kings	89.7	6,000	0.7	11.4
L Rfree	0.0			
L St.G	0.0			
L West	0.1			
Leeds	96.9	8,000	0.4	9.1
Leic	88.5	6,000	0.8	20.7
Liv Ain	0.0			
Liv Roy	0.3			
M RI	0.2			
Middlbr	61.6			
Newc	92.3	6,000	1.0	21.3
Norwch	90.8	9,000	1.2	18.8
Nottm	97.0	6,000	0.0	25.6
Oxford	83.1	9,000	4.4	17.0
Plymth	0.0			
Ports	63.8			
Prestn	93.2		0.4	22.4
Redng	94.0	13,500	3.2	23.0
Salford	20.8			
Sheff	86.9	6,000	4.3	15.8
Shrew	0.5			
Stevng	96.2	10,000	0.9	12.7
Sthend	94.4	12,000	0.0	9.3
Stoke	0.0			
Sund	92.1	6,900	0.9	22.5
Truro	0.0			
Wirral	91.1	9,000	0.5	22.1
Wolve	86.4	8,000	1.4	21.7
York	90.3	5,000	1.7	12.5

Table 5.9 Continued

Centre	ESA		Haemoglobin and ESA	
	% on ESA	Median dose (IU/week)	% <100 g/L and not on ESA	% >120 g/L and on ESA
N IRELAND				
Antrim	93.3	4,000	1.0	10.6
Belfast	97.3	6,000	0.7	25.9
Newry	97.3	6,000	0.0	15.1
Ulster	93.2	6,000	0.0	17.0
West NI	98.0	6,000	0.0	23.5
SCOTLAND				
Abrdn	93.2		0.5	13.6
Airdrie	97.1		1.1	12.6
D&Gall	82.7		0.0	19.2
Dundee	72.8		4.0	14.0
Edinb	76.7		4.4	26.3
Glasgw	90.1		1.7	17.2
Inverns	82.6		1.3	10.7
Klmarnk	95.5		1.5	14.9
Krkcldy	86.7		3.1	25.0
WALES				
Bangor	83.9		4.8	9.7
Cardff	41.4			
Clwyd	27.0			
Swanse	66.5			
Wrexm	57.1			
TOTAL[1]				
UK	**91.2**	**8,000**	**1.2**	**18.1**

Blank cells – no data returned by the centre or data completeness <70% (or <70% patients were on an ESA).
Data for Scotland refer to patients prevalent to ICHD on 31/05/2019 due to ESA data availability.
[1]This is the total of only those centres with at least 70% of ICHD patients on an ESA.

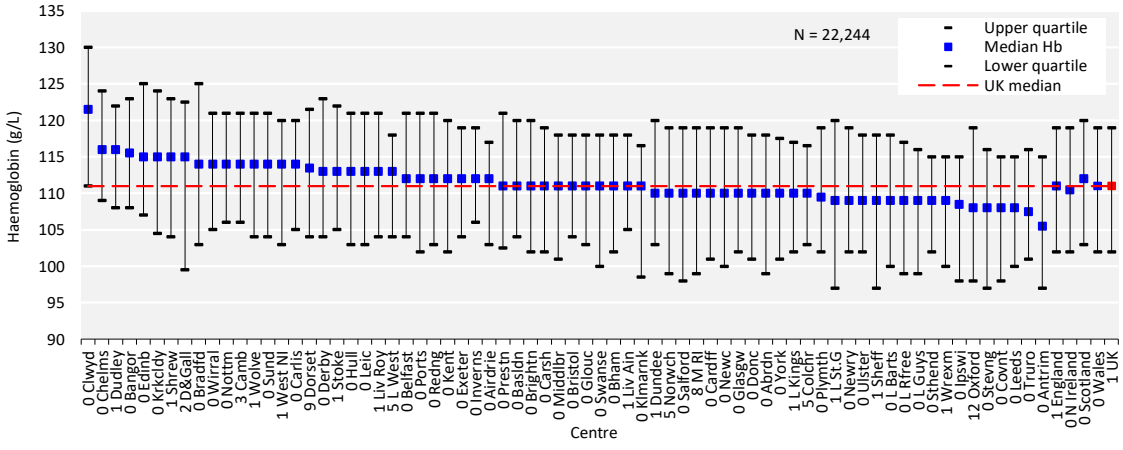

Figure 5.11 Median haemoglobin (Hb) in adult patients prevalent to ICHD on 31/12/2019 by centre

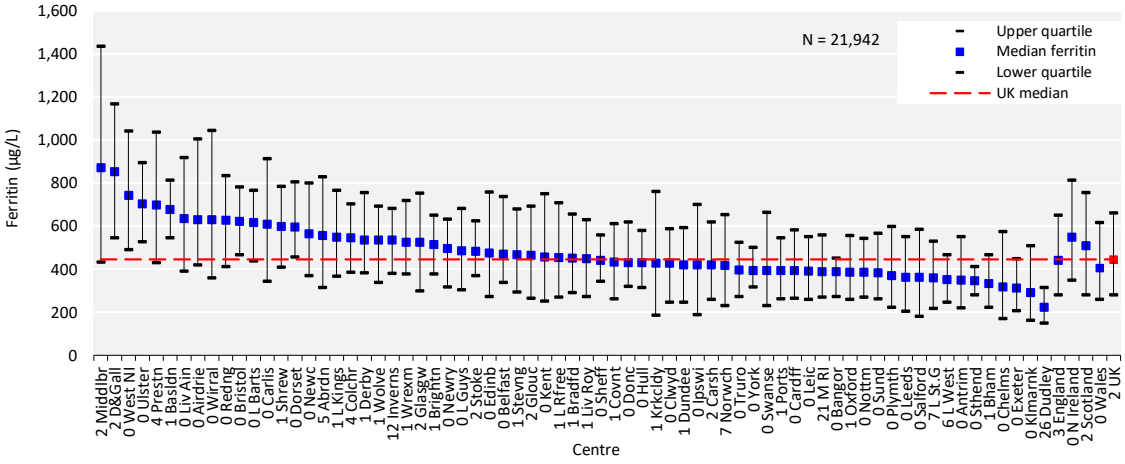

Figure 5.12 Median ferritin in adult patients prevalent to ICHD on 31/12/2019 by centre

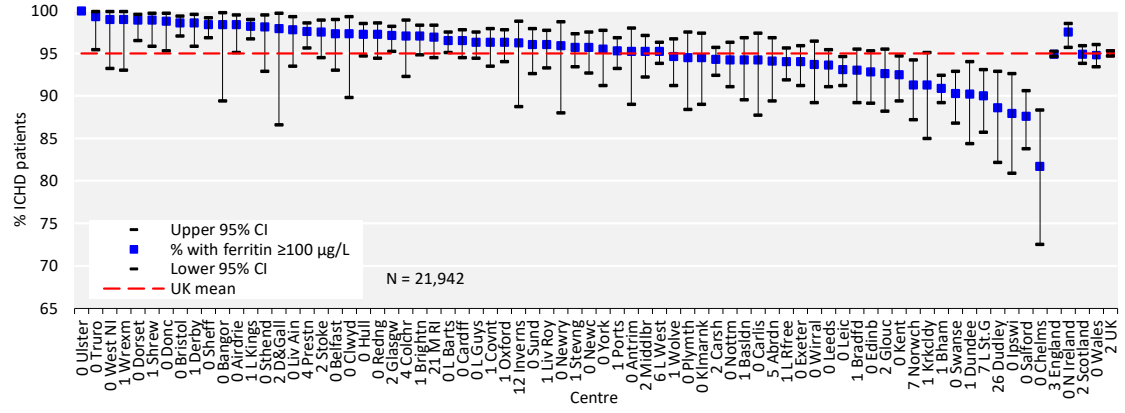

Figure 5.13 Percentage of adult patients prevalent to ICHD on 31/12/2019 with ferritin ≥100 µg/L by centre
CI – confidence interval

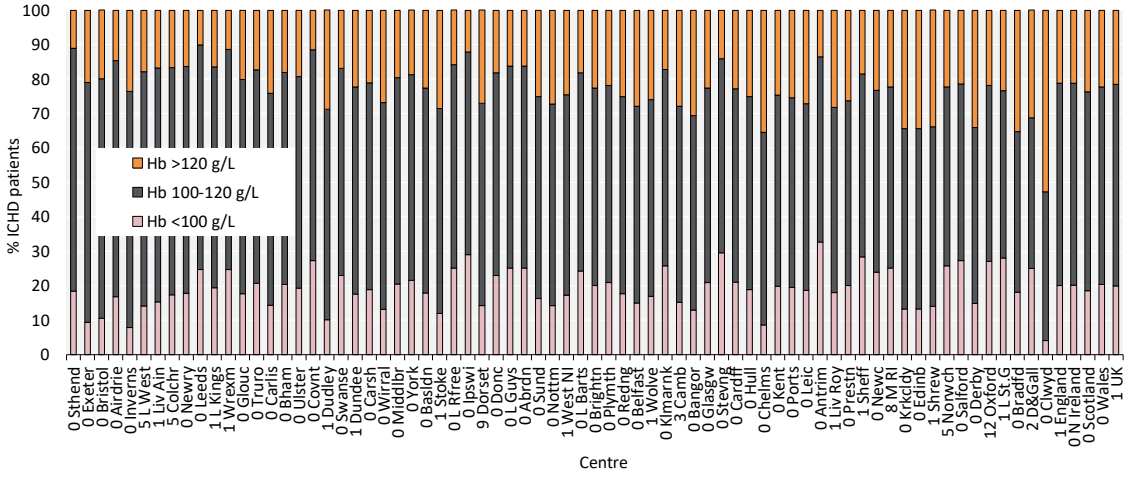

Figure 5.14 Distribution of haemoglobin (Hb) in adult patients prevalent to ICHD on 31/12/2019 by centre

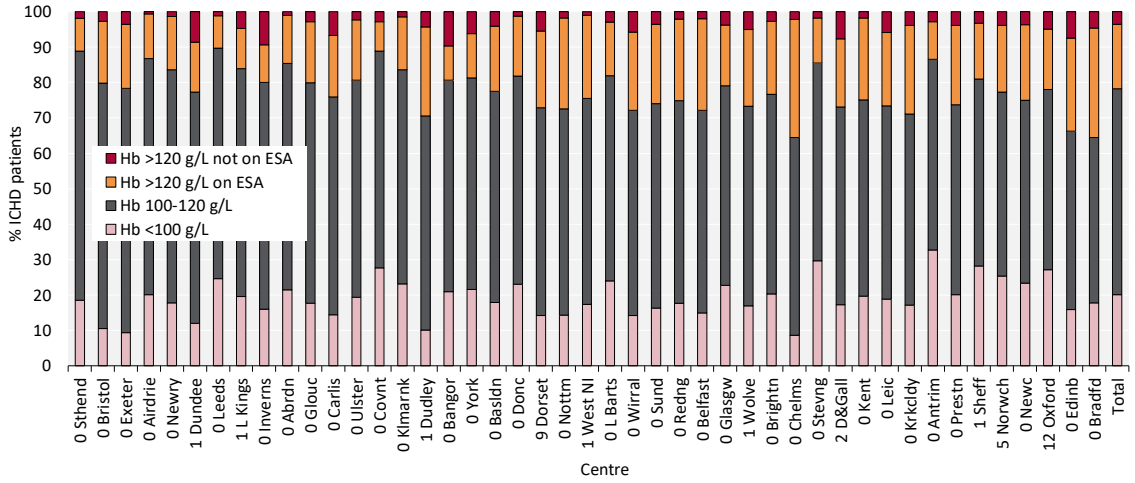

Figure 5.15 Distribution of haemoglobin (Hb) in adult patients prevalent to ICHD on 31/12/2019 and the proportion with haemoglobin >120 g/L receiving erythropoiesis stimulating agent (ESA) by centre

Figure (including total) does not include centres with <70% data completeness (or <70% ESA use).
Data for Scotland refer to patients prevalent to ICHD on 31/5/2019 due to ESA data availability.

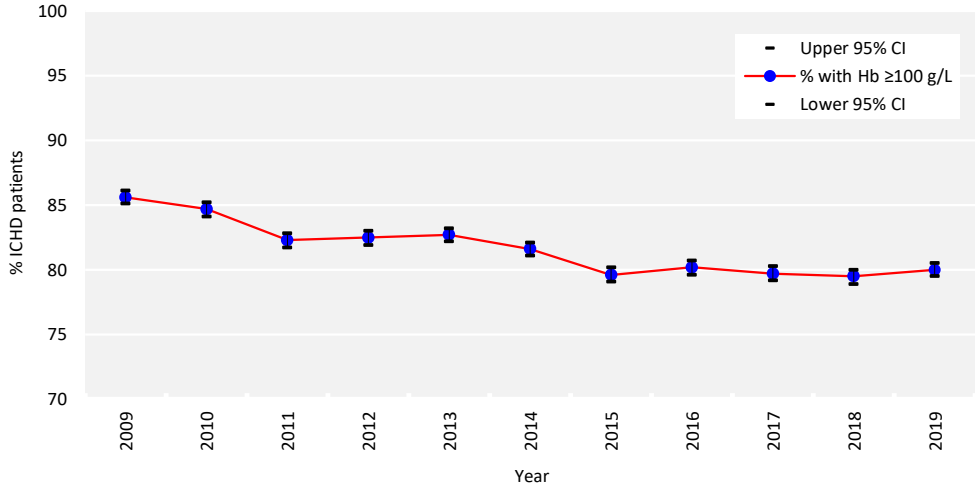

Figure 5.16 Percentage of prevalent adult ICHD patients with haemoglobin (Hb) ≥100 g/L between 2009 and 2019
CI – confidence interval

Dialysis access in prevalent adult dialysis patients

Prevalent dialysis access data were collected separately to the main UKRR quarterly data returns via the 2019 Multisite Dialysis Access Audit (see appendix A). Although Scotland do not contribute data via the audit they submit access data for incident patients separately (see chapter 2). The type of prevalent dialysis access is presented in figure 5.17 for the 43 of 61 centres in England, Northern Ireland and Wales 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. West NI is two centres combined, but only one submitted vascular access data. The number of patients on dialysis at West NI is therefore lower than presented elsewhere in the report.

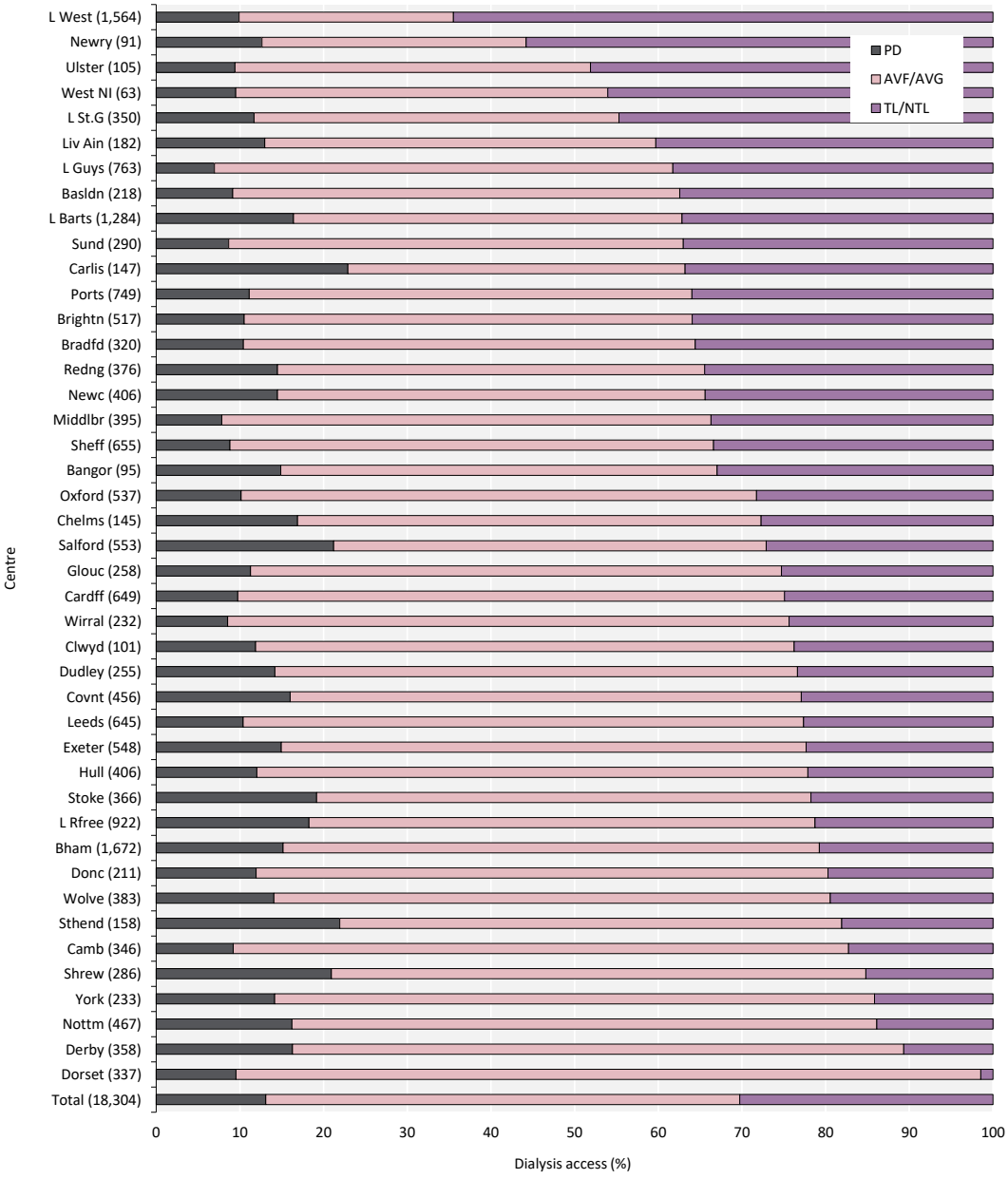

Figure 5.17 Dialysis access in adult patients prevalent to dialysis on 31/12/2019 by centre (2019 Multisite Dialysis Access Audit)

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

Infections in adult haemodialysis patients

PHE has carried out mandatory enhanced surveillance of MRSA bacteraemia since October 2005 and of MSSA bacteraemia since January 2011 for NHS acute trusts, with the subsequent addition of *E. coli* bacteraemia and *C. difficile* reporting. Patient-level infection data are reported in real time to PHE. Wales provides infection data extracted locally from the renal and hospital IT systems. The data from PHE were not received in time for this year's annual report and the analyses will therefore be added later.

The definition of each type of infectious episode is detailed in appendix A.

A rolling two year cohort is reported in line with Renal Association guidelines. These analyses included all patients on HD, whether on HHD or ICHD.

Table 5.10 Rate of infection episodes per 100 HD patient-years in prevalent adult HD patients in England and Wales from January 2018 to December 2019 by centre TO BE UPDATED ONCE PHE DATA ARE RECEIVED

		Rate per 100 HD patient-years			
Centre	HD patient-years	MRSA	MSSA	*C.difficile*	*E.coli*
ENGLAND					
Basldn					
Birm					
Bradfd					
Brightn					
Bristol					
Camb					
Carlis					
Carsh					
Chelms					
Colchr					
Covnt					
Derby					
Donc					
Dorset					
Dudley					
Exeter					
Glouc					
Hull					
Ipswi					
Kent					
L Barts					
L Guys					
L Kings					
L Rfree					
L St.G					
L West					
Leeds					
Leic					
Liv Ain					
Liv Roy					
M RI					
Middlbr					
Newc					
Norwch					
Nottm					

Table 5.10 Continued

Centre	HD patient-years	Rate per 100 HD patient-years			
		MRSA	MSSA	*C.difficile*	*E.coli*
Oxford					
Plymth					
Ports					
Prestn					
Redng					
Salford					
Sheff					
Shrew					
Stevng					
Sthend					
Stoke					
Sund					
Truro					
Wirral					
Wolve					
York					
WALES					
Bangor					
Cardff					
Clwyd					
Swanse					
Wrexm					
TOTALS					
England					
Wales					
E & W					

Blank cells – no data returned by the centre.
C. difficile – Clostridium difficile; E. coli – Escherichia coli; MRSA – methicillin-resistant *Staphylococcus aureus*; MSSA – methicillin-sensitive *Staphylococcus aureus*

Funnel plots show each centre's estimated infection rate per 100 HD patient-years for MRSA and MSSA against the number of patient-years at risk to take into account the greater variation expected as centre size decreases.

Figure 5.18 Methicillin-resistant *Staphylococcus aureus* (MRSA) rates by centre per 100 HD adult patient-years (2018–2019 data) compared to audit targe TO BE UPDATED ONCE PHE DATA ARE RECEIVED

Figure 5.19 Methicillin-sensitive *Staphylococcus aureus* (MSSA) rates by centre per 100 HD adult patient-years (2018–2019 data) compared to audit target TO BE UPDATED ONCE PHE DATA ARE RECEIVED

Trends in MRSA and MSSA rates are displayed using box and whisker plots, displaying the median, interquartile range and range of centre rates (more detail is available in appendix A).

Figure 5.20 Distribution of methicillin-resistant *Staphylococcus aureus* (MRSA) centre rates per 100 HD adult patient-years by rolling 2 calendar year cohort (Wales included from 2016 onwards) TO BE UPDATED ONCE PHE DATA ARE RECEIVED

Figure 5.21 Distribution of methicillin-sensitive *Staphylococcus aureus* (MSSA) centre rates per 100 HD adult patient-years by rolling 2 calendar year cohort (Wales included from 2016 onwards) TO BE UPDATED ONCE PHE DATA ARE RECEIVED

Cause of death in adult ICHD patients

Cause of death was analysed in prevalent patients receiving ICHD on 31/12/2018 and followed-up for one year in 2019. 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. Further detail on the survival of prevalent RRT patients is in chapter 3.

Table 5.11 Cause of death in adult patients prevalent to ICHD on 31/12/2018 followed-up in 2019 by age group

	ICHD all ages		ICHD <65 years		ICHD ≥65 years	
Cause of death	N	%	N	%	N	%
Cardiac disease	566	20.1	172	24.2	394	18.7
Cerebrovascular disease	64	2.3	20	2.8	44	2.1
Infection	516	18.4	129	18.2	387	18.4
Malignancy	165	5.9	37	5.2	128	6.1
Treatment withdrawal	597	21.2	89	12.5	508	24.2
Other	700	24.9	202	28.5	498	23.7
Uncertain aetiology	204	7.3	61	8.6	143	6.8
Total (with data)	**2,812**	**100.0**	**710**	**100.0**	**2,102**	**100.0**
Missing	1,177	29.5	315	30.7	862	29.1

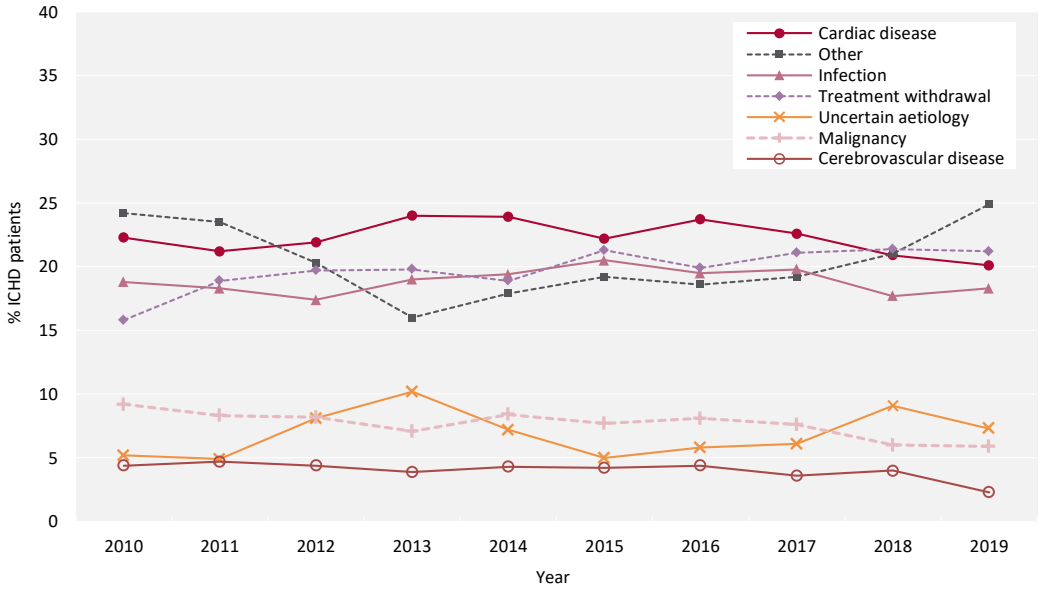

Figure 5.22 Cause of death between 2010 and 2019 for adult patients prevalent to ICHD at the beginning of the year

Hospitalisation of ICHD patients

Hospital Episodes Statistics (HES) and Patient Episode Database for Wales (PEDW) data for prevalent RRT patients on 31/12/2018 were used to compare emergency admission hospitalisation amongst ICHD patients (figure 5.23). The y-axis displays the total number of hospitalised days following an emergency admission for ICHD patients divided by the total number of ICHD patient-years at that centre for 2019. The average rate in England and Wales was 14.3 days per patient-year, compared to 4.2 days for Tx patients and 13.2 days for PD patients. Please visit the UKRR data portal (renal.org/audit-research/data-portal) to identify individual renal centres.

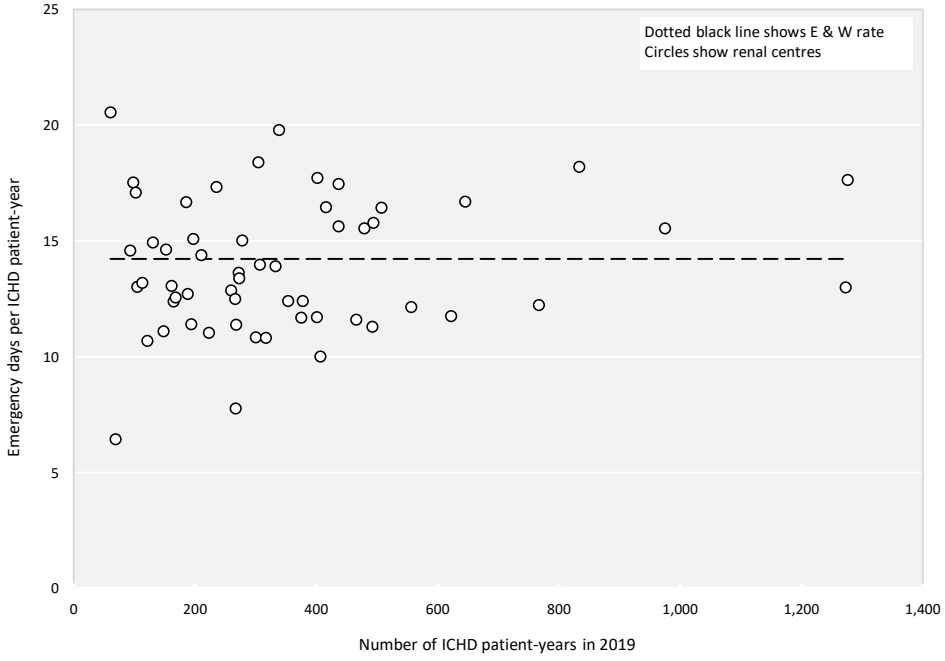

Figure 5.23 Emergency inpatient days per ICHD patient-year in 2019 for patients prevalent to RRT in England and Wales on 31/12/2018 by centre

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Chapter 6

Adults on peritoneal dialysis (PD) in the UK at the end of 2019

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 2019 (figure 6.1). This population comprises patients who were on PD at the end of 2018 and remained on PD throughout 2019, as well as patients who commenced/re-commenced PD in 2019. This latter group includes both incident renal replacement therapy (RRT) patients who ended 2019 on PD and prevalent RRT patients who switched to PD from in-centre haemodialysis (ICHD), home haemodialysis (HHD) or a transplant (Tx) in 2019. 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 RRT, 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.

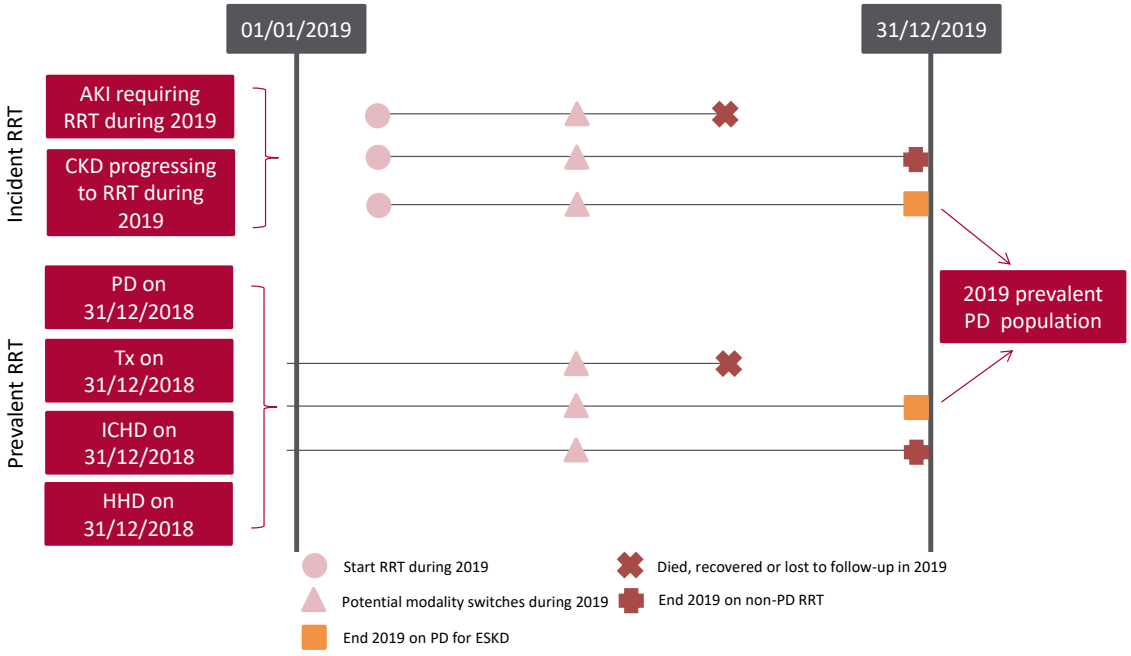

Figure 6.1 Pathways adult patients could follow to be included in the UK 2019 prevalent PD population

Note that patients receiving dialysis for acute kidney injury (AKI) are only included in this chapter if they had a timeline or RRT modality code for chronic PD at the end of 2019 or if they had been on RRT for ≥90 days and were on PD at the end of 2019.
CKD – chronic kidney disease

The infection analyses, except for peritonitis, used a rolling two year cohort to be consistent with the reporting of infections in chapter 5. 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 Renal 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 and the four infections subject to mandatory reporting to Public Health England (PHE) will be reported once PHE data are received– methicillin-resistant *Staphylococcus aureus* (MRSA), methicillin-sensitive *Staphylococcus aureus* (MSSA), *Escherichia coli* bacteraemia and *Clostridium difficile*.

Rationale for analyses

The analyses begin with a description of the 2019 prevalent adult PD population, including the number on PD per million population (pmp).

The Renal Association guidelines (renal.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 renal centres in 2019 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 (renal.org/audit-research/data-portal) 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 renal 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.

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 renal 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.

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

The Renal 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 (2017)	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)
	Proportion of patients with haemoglobin <100 g/L not on ESA	Table 6.7
	Proportion of patients on ESA with haemoglobin >120 g/L	Table 6.7, figure 6.11
	Mean (median) ESA dose in patients maintained on ESA therapy	Table 6.7
Peritoneal access (2009)	>80% of PD catheters should be patent at 1 year (censoring for death and elective modality change)	See chapter 2
	Peritonitis within 2 weeks of PD catheter insertion <5%	For peritonitis in prevalent patients see table 6.9 and figure 6.13
Planning, initiating and withdrawing RRT (2014)	Number of patients withdrawing from PD as a proportion of all deaths on PD	Table 6.10, figure 6.14

ESA – erythropoiesis stimulating agent

Key findings

- 3,644 adult patients were receiving PD for ESKD in the UK on 31/12/2019, which represented 5.4% of the RRT population
- The median age of PD patients was 64.4 years and 59.5% were male
- The median adjusted calcium for PD patients was 2.4 mmol/L and 13.2% were above the target range of 2.2–2.5 mmol/L
- The median bicarbonate for PD patients was 24 mmol/L and 79.1% were within the target range of 22–30 mmol/L
- The median haemoglobin and ferritin for PD patients was 111 g/L and 335 µg/L, respectively, and 77.3% were on an ESA at a median dose of 4,800 IU/week
- The PD peritonitis rate in 2019 (England only) was 0.38/1 PD patient-year
- There was no cause of death data available for 32.3% of deaths. For those with data, the leading cause of death in younger patients (<65 years) was cardiac disease (24.7%) and in older patients (≥65 years) was treatment withdrawal (23.1%).

Analyses

Changes to the prevalent adult PD population

For the 70 adult renal centres, the number of prevalent patients on PD was calculated as both a proportion of the prevalent patients on RRT 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 RRT patients on PD by year and by centre; number of PD patients as a proportion of the catchment population

	N on PD					% on PD					Estimated catchment population (millions)	2019 crude rate (pmp)
Centre	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019		
ENGLAND												
Basldn	35	34	28	27	20	12.7	12.5	9.3	8.5	6.2	0.34	59
Bham	193	231	249	256	257	6.7	7.6	7.9	7.9	7.8	2.03	126
Bradfd	18	25	20	26	34	3.1	3.9	3.0	3.8	4.6	0.49	70
Brightn	67	64	59	60	55	7.1	6.5	5.8	5.7	5.2	1.07	52
Bristol	57	53	58	56	64	3.9	3.6	3.9	3.8	4.3	1.21	53
Camb	31	22	26	32	28	2.4	1.7	2.0	2.3	1.9	0.93	30
Carlis	38	36	28	31	36	13.5	12.9	10.0	10.6	11.9	0.25	142
Carsh[1]	113	113	96	99	69	7.1	6.8	5.7	5.6	3.9	1.61	43
Chelms	26	32	31	30	31	9.2	11.8	11.2	11.5	11.9	0.37	83
Colchr	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.29	0
Covnt	78	67	52	52	82	8.1	6.9	5.4	5.4	7.6	0.79	104
Derby	78	77	79	79	62	14.5	14.2	14.2	13.5	9.5	0.56	112
Donc	23	27	29	24	25	7.6	8.2	8.7	7.2	7.3	0.37	67
Dorset	42	36	35	38	33	6.2	5.2	4.8	5.0	4.3	0.72	46
Dudley	57	50	55	37	36	18.1	14.5	14.9	10.1	9.8	0.34	106
Exeter	82	84	75	77	84	8.5	8.3	7.1	7.1	7.7	0.94	89
Glouc	37	42	45	37	29	8.3	8.9	8.9	7.1	5.5	0.51	57
Hull	75	72	56	45	49	8.8	8.4	6.4	5.1	5.4	0.79	62
Ipswi	36	34	45	40	42	9.0	8.2	10.3	9.3	9.9	0.31	136
Kent	60	58	52	44	51	5.8	5.4	4.8	4.0	4.5	1.06	48
L Barts	207	202	236	237	229	9.1	8.5	9.5	9.1	8.6	1.57	145
L Guys	33	39	39	43	53	1.6	1.9	1.8	1.9	2.3	1.00	53
L Kings	90	91	97	90	95	8.3	8.2	8.4	7.6	7.6	0.92	103
L Rfree	154	159	145	166	168	7.4	7.3	6.6	7.4	7.2	1.32	128
L St.G	48	44	37	40	44	5.7	5.3	4.5	4.8	5.2	0.66	67
L West	70	100	120	135	156	2.1	2.9	3.5	3.8	4.3	1.95	80
Leeds	57	47	59	64	67	3.7	3.0	3.6	3.8	3.9	1.36	49
Leic	107	88	96	108	127	4.9	3.8	4.1	4.4	4.9	2.07	61
Liv Ain	38	27	21	25	18	17.1	11.9	10.0	11.6	8.6	0.43	42
Liv Roy	67	71	70	57	32	5.4	5.9	5.6	4.5	2.6	0.80	40
M RI	65	63	72	70	77	3.5	3.2	3.5	3.4	3.7	1.32	58
Middlbr	22	26	23	29	32	2.4	2.9	2.5	3.1	3.4	0.80	40
Newc	46	53	58	60	60	4.6	5.0	5.2	5.2	5.1	0.94	64
Norwch	38	48	43	36	47	5.3	6.2	5.5	4.6	5.8	0.68	69
Nottm	82	81	69	70	76	7.4	7.0	5.9	5.9	6.2	0.92	83
Oxford	95	95	67	69	57	5.6	5.4	3.6	3.6	2.9	1.43	40
Plymth	34	41	49	40	42	6.8	8.0	9.1	7.4	7.9	0.40	106
Ports	71	75	84	94	88	4.3	4.4	4.8	5.3	4.7	1.73	51
Prestn	53	40	34	38	42	4.4	3.3	2.7	2.9	3.1	1.22	34

Table 6.2 Continued

Centre	N on PD					% on PD					Estimated catchment population (millions)	2019 crude rate (pmp)
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019		
Redng	66	56	39	40	56	8.5	7.1	4.9	4.9	6.5	0.69	81
Salford	94	106	117	115	120	9.7	10.4	10.5	9.8	9.7	1.14	105
Sheff	64	55	55	61	60	4.6	3.9	3.8	4.1	4.0	1.12	53
Shrew	32	39	42	58	55	8.7	10.3	10.9	13.6	12.9	0.41	135
Stevng	15	21	23	28	37	1.8	2.4	2.6	3.0	3.8	1.10	34
Sthend	17	30	34	30	34	6.9	12.7	13.4	11.4	12.9	0.27	125
Stoke	75	79	72	81	71	9.5	9.6	8.9	10.1	8.8	0.72	98
Sund	18	17	16	17	26	3.9	3.4	3.0	3.1	4.6	0.54	48
Truro	23	18	15	17	20	5.6	4.2	3.5	3.9	4.5	0.35	56
Wirral	21	22	19	20	17	7.5	6.5	4.9	5.1	4.1	0.47	37
Wolve	79	69	54	54	49	13.6	12.1	9.3	8.9	8.2	0.54	90
York	29	33	35	29	33	5.9	6.2	6.3	5.1	5.7	0.48	69
N IRELAND												
Antrim	20	16	14	20	19	8.3	6.3	5.5	7.3	6.8	0.24	78
Belfast	24	24	17	23	19	3.1	3.0	2.0	2.6	2.1	0.53	36
Newry	22	21	23	16	11	9.8	8.9	9.5	6.4	4.4	0.23	47
Ulster	6	6	6	10	8	3.6	3.6	3.3	5.2	4.4	0.20	40
West NI	12	10	9	9	14	4.1	3.3	2.9	2.8	4.3	0.25	56
SCOTLAND												
Abrdn	26	21	22	26	22	4.9	3.8	3.9	4.5	3.9	0.50	44
Airdrie	16	24	16	21	21	3.8	5.5	3.4	4.3	4.0	0.46	46
D&Gall	11	10	6	6	8	8.5	7.6	4.4	4.1	5.4	0.12	66
Dundee	17	21	18	22	21	4.1	5.0	4.1	4.9	4.7	0.37	57
Edinb	26	36	33	36	41	3.4	4.6	4.0	4.2	4.6	0.84	49
Glasgw	55	54	48	52	45	3.2	3.1	2.7	2.9	2.4	1.37	33
Inverns	13	11	10	13	12	5.2	4.3	3.8	4.7	4.3	0.22	54
Klmarnk	37	33	24	19	24	11.9	10.4	7.1	5.6	6.7	0.29	83
Krkcldy	21	18	11	10	12	7.1	6.1	3.6	3.4	4.1	0.27	44
WALES												
Bangor	15	16	17	20	14	8.2	8.9	8.7	9.9	7.0	0.16	86
Cardff	79	75	72	60	64	4.9	4.6	4.3	3.5	3.7	1.15	56
Clwyd	20	15	12	15	13	10.8	8.5	6.7	7.9	6.3	0.18	72
Swanse	62	67	74	70	78	8.1	8.7	9.3	8.5	9.0	0.75	104
Wrexm	37	32	27	24	23	12.6	10.3	8.4	7.7	7.4	0.21	112
TOTALS												
England	**3,056**	**3,092**	**3,058**	**3,111**	**3,175**	**6.0**	**5.8**	**5.6**	**5.6**	**5.5**	**44.33**	**72**
N Ireland	**84**	**77**	**69**	**78**	**71**	**4.9**	**4.3**	**3.8**	**4.1**	**3.7**	**1.45**	**49**
Scotland	**222**	**228**	**188**	**205**	**206**	**4.6**	**4.6**	**3.7**	**3.9**	**3.8**	**4.43**	**47**
Wales	**213**	**205**	**202**	**189**	**192**	**7.0**	**6.7**	**6.4**	**5.8**	**5.8**	**2.45**	**78**
UK	**3,575**	**3,602**	**3,517**	**3,583**	**3,644**	**5.9**	**5.7**	**5.4**	**5.4**	**5.4**	**52.67**	**69**

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 renal centre.
[1]Carshalton discovered a problem related to the submission of PD patients after the closing date. As a consequence, 26 PD patients are not included in this report. No adjustment has been made this year, but the problem has been resolved and numbers will be correct next year.
pmp – per million population

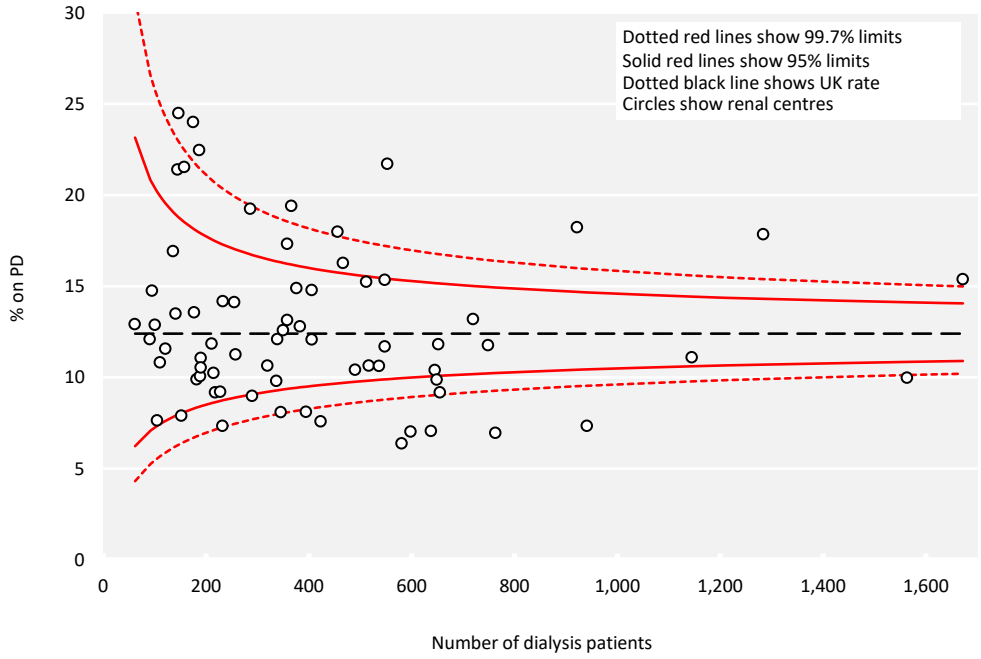

Figure 6.2 Percentage of adult patients prevalent to dialysis on 31/12/2019 who were on PD by centre

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 31/12/2019 by centre

Centre	N on RRT	N on PD	% on PD	Median age (yrs)	% male	Ethnicity				
						% White	% Asian	% Black	% Other	% missing
ENGLAND										
Basldn	322	20	6.2	71.8	75.0	90.0	5.0	0.0	5.0	0.0
Bham	3,308	257	7.8	61.0	60.3	56.6	27.0	13.1	3.3	5.1
Bradfd	733	34	4.6	58.7	47.1	54.5	36.4	3.0	6.1	2.9
Brightn	1,059	55	5.2	67.2	60.0	84.6	11.5	1.9	1.9	5.5
Bristol	1,486	64	4.3	60.3	64.1	90.5	0.0	7.9	1.6	1.6
Camb	1,469	28	1.9	72.7	67.9	92.6	3.7	3.7	0.0	3.6
Carlis	303	36	11.9	68.5	55.6	100.0	0.0	0.0	0.0	0.0
Carsh[1]	1,771	69	3.9	65.3	56.5	67.6	17.6	14.7	0.0	1.4
Chelms	261	31	11.9	67.1	61.3	100.0	0.0	0.0	0.0	6.5
Colchr	145	0	0.0							
Covnt	1,076	82	7.6	62.8	63.4	84.1	8.5	7.3	0.0	0.0
Derby	652	62	9.5	70.3	56.5	87.1	11.3	1.6	0.0	0.0
Donc	342	25	7.3	66.5	52.0	100.0	0.0	0.0	0.0	0.0
Dorset	772	33	4.3	67.5	60.6	93.5	0.0	0.0	6.5	6.1
Dudley	366	36	9.8	64.2	61.1	86.1	8.3	5.6	0.0	0.0
Exeter	1,091	84	7.7	70.6	61.9	90.4	1.2	0.0	8.4	1.2
Glouc	525	29	5.5	69.0	51.7	93.1	0.0	3.4	3.4	0.0
Hull	904	49	5.4	65.4	65.3	100.0	0.0	0.0	0.0	0.0
Ipswi	424	42	9.9	72.8	69.0	77.8	0.0	8.3	13.9	14.3
Kent	1,140	51	4.5	60.4	52.9	91.8	8.2	0.0	0.0	3.9
L Barts	2,660	229	8.6	61.5	57.6	28.8	40.5	18.0	12.6	3.1
L Guys	2,310	53	2.3	54.4	50.9	48.0	14.0	32.0	6.0	5.7
L Kings	1,244	95	7.6	55.6	58.9	47.8	13.0	31.5	7.6	3.2
L Rfree	2,344	168	7.2	63.0	56.0	35.1	27.2	26.5	11.3	10.1
L St.G	852	44	5.2	67.8	54.5	31.6	21.1	21.1	26.3	13.6
L West	3,613	156	4.3	66.8	53.2	46.8	31.4	19.9	1.9	0.0
Leeds	1,723	67	3.9	58.0	62.7	82.1	10.4	6.0	1.5	0.0
Leic	2,587	127	4.9	62.8	55.9	78.5	13.2	6.6	1.7	4.7
Liv Ain	210	18	8.6	68.4	66.7	100.0	0.0	0.0	0.0	0.0
Liv Roy	1,227	32	2.6	63.8	56.3	93.5	0.0	0.0	6.5	3.1
M RI	2,060	77	3.7	63.2	58.4	65.8	21.9	9.6	2.7	5.2
Middlbr	949	32	3.4	62.6	56.3	96.9	3.1	0.0	0.0	0.0
Newc	1,175	60	5.1	63.6	63.3	93.3	5.0	0.0	1.7	0.0
Norwch	809	47	5.8	70.6	63.8	95.7	2.1	0.0	2.1	0.0
Nottm	1,218	76	6.2	61.7	57.9	77.6	15.8	5.3	1.3	0.0
Oxford	1,969	57	2.9	60.4	59.6	81.4	7.0	7.0	4.7	24.6
Plymth	531	42	7.9	68.2	76.2	95.2	0.0	0.0	4.8	0.0
Ports	1,883	88	4.7	68.0	69.3	92.6	2.5	1.2	3.7	8.0
Prestn	1,341	42	3.1	62.3	52.4	85.7	14.3	0.0	0.0	0.0
Redng	860	56	6.5	68.4	66.1	75.6	13.3	6.7	4.4	19.6
Salford	1,237	120	9.7	64.5	61.7	90.0	8.3	1.7	0.0	0.0
Sheff	1,491	60	4.0	68.7	68.3	89.7	10.3	0.0	0.0	3.3
Shrew	428	55	12.9	72.1	63.6	88.9	3.7	3.7	3.7	1.8
Stevng	966	37	3.8	68.1	67.6	85.2	11.1	0.0	3.7	27.0
Sthend	264	34	12.9	75.5	70.6	97.1	0.0	0.0	2.9	0.0

Table 6.3 Continued

Centre	N on RRT	N on PD	% on PD	Median age (yrs)	% male	Ethnicity				
						% White	% Asian	% Black	% Other	% missing
Stoke	803	71	8.8	65.5	53.5	89.6	9.0	1.5	0.0	5.6
Sund	568	26	4.6	50.1	38.5	92.3	7.7	0.0	0.0	0.0
Truro	449	20	4.5	66.5	65.0	100.0	0.0	0.0	0.0	0.0
Wirral	411	17	4.1	62.0	58.8	94.1	0.0	5.9	0.0	0.0
Wolve	598	49	8.2	61.3	57.1	61.2	28.6	8.2	2.0	0.0
York	581	33	5.7	72.0	81.8	100.0	0.0	0.0	0.0	6.1
N IRELAND										
Antrim	280	19	6.8	70.9	68.4	100.0	0.0	0.0	0.0	0.0
Belfast	890	19	2.1	68.4	52.6					63.2
Newry	251	11	4.4	79.5	54.5	100.0	0.0	0.0	0.0	0.0
Ulster	182	8	4.4	69.4	87.5	87.5	0.0	0.0	12.5	0.0
West NI	328	14	4.3	59.3	64.3	100.0	0.0	0.0	0.0	0.0
SCOTLAND										
Abrdn	558	22	3.9	60.8	59.1					90.9
Airdrie	524	21	4.0	63.5	52.4	100.0	0.0	0.0	0.0	9.5
D&Gall	149	8	5.4	47.0	37.5					75.0
Dundee	449	21	4.7	66.0	66.7					100.0
Edinb	885	41	4.6	67.2	53.7					95.1
Glasgw	1,854	45	2.4	58.0	51.1					60.0
Inverns	282	12	4.3	61.0	41.7					91.7
Klmarnk	359	24	6.7	62.3	45.8					66.7
Krkcldy	295	12	4.1	61.2	66.7					100.0
WALES										
Bangor	201	14	7.0	65.3	64.3	100.0	0.0	0.0	0.0	14.3
Cardff	1,730	64	3.7	62.6	51.6	88.3	6.7	3.3	1.7	6.3
Clwyd	205	13	6.3	68.7	69.2	90.0	10.0	0.0	0.0	23.1
Swanse	868	78	9.0	65.5	66.7	97.4	2.6	0.0	0.0	2.6
Wrexm	311	23	7.4	59.9	56.5	90.9	0.0	9.1	0.0	4.3
TOTALS										
England	**57,510**	**3,175**	**5.5**	**64.3**	**59.8**	**72.7**	**14.6**	**8.8**	**3.9**	**4.1**
N Ireland	**1,931**	**71**	**3.7**	**71.4**	**63.4**	**98.3**	**0.0**	**0.0**	**1.7**	**16.9**
Scotland	**5,355**	**206**	**3.8**	**63.0**	**53.4**					**74.8**
Wales	**3,315**	**192**	**5.8**	**64.6**	**60.4**	**93.3**	**3.9**	**2.2**	**0.6**	**6.3**
UK	**68,111**	**3,644**	**5.4**	**64.4**	**59.5**	**74.5**	**13.6**	**8.2**	**3.7**	**8.5**

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.
[1]Carshalton discovered a problem related to the submission of PD patients after the closing date. As a consequence, 26 PD patients are not included in this report. No adjustment has been made this year, but the problem has been resolved and numbers will be correct next year.

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.

Table 6.4 Primary renal diseases (PRDs) of adult patients prevalent to PD on 31/12/2019

PRD	N on PD	% PD population	Age <65 yrs		Age ≥65 yrs		M/F ratio
			N	%	N	%	
Diabetes	862	24.7	479	26.7	383	22.7	1.7
Glomerulonephritis	560	16.1	348	19.4	212	12.6	1.7
Hypertension	272	7.8	119	6.6	153	9.1	2.1
Polycystic kidney disease	244	7.0	154	8.6	90	5.3	0.9
Pyelonephritis	216	6.2	105	5.8	111	6.6	1.5
Renal vascular disease	199	5.7	41	2.3	158	9.4	2.3
Other	546	15.7	301	16.8	245	14.5	1.0
Uncertain aetiology	586	16.8	249	13.9	337	20.0	1.4
Total (with data)	**3,485**	**100.0**	**1,796**	**100.0**	**1,689**	**100.0**	
Missing	159	4.4	78	4.2	81	4.6	1.6

Biochemistry parameters in prevalent adult PD patients

The Renal 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 Renal 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 31/12/2019 by centre

Centre	Adjusted calcium				Bicarbonate				
	Median (mmol/L)	% 2.2-2.5 mmol/L	% >2.5 mmol/L	% data completeness	Median (mmol/L)	% <22 mmol/L	% 22-30 mmol/L	% >30 mmol/L	% data completeness
ENGLAND									
Basldn	2.4	94.4	5.6	100.0	27	5.6	77.8	16.7	100.0
Bham	2.4	85.0	9.7	100.0	22	37.5	62.0	0.5	95.2
Bradfd	2.5	73.1	26.9	100.0	25	19.2	73.1	7.7	100.0
Brightn	2.4	70.0	14.0	100.0	25	12.0	88.0	0.0	100.0
Bristol	2.4	87.5	10.7	100.0	24	26.8	73.2	0.0	100.0
Camb	2.4	78.3	13.0	100.0	26	4.4	87.0	8.7	100.0
Carlis	2.3	88.9	3.7	90.0	24	22.2	74.1	3.7	90.0
Carsh	2.3	69.8	13.2	82.8					0.0
Chelms	2.3	78.6	7.1	100.0	24	21.4	78.6	0.0	100.0
Colchr									
Covnt	2.3	80.0	5.0	96.8	25	10.5	89.5	0.0	91.9
Derby	2.4	74.1	20.7	100.0	24	12.1	84.5	3.5	100.0
Donc	2.3	85.7	9.5	100.0	24	14.3	85.7	0.0	100.0
Dorset	2.4	93.6	3.2	93.9	22	46.9	53.1	0.0	97.0
Dudley	2.5	72.7	24.2	97.1	24	14.7	85.3	0.0	100.0
Exeter	2.4	84.9	13.7	100.0	23	28.8	71.2	0.0	100.0
Glouc	2.4	68.4	10.5	90.5	25	5.3	94.7	0.0	90.5
Hull	2.4	76.3	21.1	100.0	26	10.5	79.0	10.5	100.0
Ipswi	2.3	68.6	11.4	97.2	26	11.8	88.2	0.0	94.4
Kent	2.4	74.3	20.0	89.7	24	21.1	76.3	2.6	97.4
L Barts	2.3	76.3	7.7	93.7	24	23.8	71.5	4.7	93.2
L Guys	2.4	85.4	12.2	100.0	25	19.5	80.5	0.0	100.0
L Kings	2.3	81.6	9.2	98.7	25	25.0	73.7	1.3	98.7

Table 6.5 Continued

Centre	Adjusted calcium				Bicarbonate				
	Median (mmol/L)	% 2.2-2.5 mmol/L	% >2.5 mmol/L	% data completeness	Median (mmol/L)	% <22 mmol/L	% 22-30 mmol/L	% >30 mmol/L	% data completeness
L Rfree	2.4	78.3	16.8	100.0	24	13.6	85.7	0.7	97.9
L St.G	2.5	69.7	27.3	91.7	23	21.2	78.8	0.0	91.7
L West				54.5					53.7
Leeds	2.4	78.2	20.0	98.2	26	5.4	80.4	14.3	100.0
Leic	2.4	91.2	5.9	99.0	26	11.8	85.3	2.9	99.0
Liv Ain	2.4	93.3	0.0	100.0	26	0.0	86.7	13.3	100.0
Liv Roy	2.4	86.7	10.0	100.0	25	3.3	93.3	3.3	100.0
M RI	2.4	74.6	20.3	98.3	24	8.6	91.4	0.0	96.7
Middlbr	2.3	59.3	11.1	96.4	25	7.4	92.6	0.0	96.4
Newc	2.4	62.8	19.6	98.1	23	27.5	66.7	5.9	98.1
Norwch	2.4	75.6	12.2	100.0	24	29.3	70.7	0.0	100.0
Nottm	2.3	83.6	9.8	100.0					47.5
Oxford	2.4	77.5	12.5	83.3					62.5
Plymth	2.4	89.5	2.6	100.0	25	7.9	84.2	7.9	100.0
Ports	2.4	86.3	11.3	100.0	26	10.0	87.5	2.5	100.0
Prestn	2.3	81.3	3.1	97.0	25	3.2	87.1	9.7	93.9
Redng	2.4	76.1	17.4	100.0	25	8.7	87.0	4.4	100.0
Salford	2.4	76.9	18.3	99.1					0.0
Sheff	2.3	81.1	3.8	100.0	23	35.9	64.2	0.0	100.0
Shrew	2.4	70.0	24.0	98.0	25	14.0	82.0	4.0	98.0
Stevng	2.4	75.9	17.2	100.0	25	10.3	89.7	0.0	100.0
Sthend	2.4	86.7	13.3	100.0	25	6.9	86.2	6.9	96.7
Stoke	2.4	80.4	16.1	96.6	27	1.8	87.5	10.7	96.6
Sund	2.4	66.7	27.8	100.0					11.1
Truro	2.5	70.6	29.4	100.0	24	5.9	76.5	17.7	100.0
Wirral	2.3	92.3	7.7	92.9	23	23.1	76.9	0.0	92.9
Wolve	2.4	88.6	6.8	95.7	25	9.1	90.9	0.0	95.7
York	2.4	89.7	10.3	96.7	27	3.3	90.0	6.7	100.0
N IRELAND									
Antrim	2.4	81.3	12.5	100.0	23	12.5	87.5	0.0	100.0
Belfast	2.4	75.0	18.8	94.1	23	12.5	87.5	0.0	94.1
Newry	2.4	72.7	27.3	100.0	26	9.1	90.9	0.0	100.0
Ulster				100.0					100.0
West NI	2.4	85.7	0.0	100.0	25	14.3	78.6	7.1	100.0
SCOTLAND									
Abrdn	2.4	77.3	18.2	100.0					0.0
Airdrie	2.4	84.2	15.8	100.0	24	10.5	89.5	0.0	100.0
D&Gall				100.0					100.0
Dundee	2.5	81.3	18.8	100.0	28	0.0	100.0	0.0	93.8
Edinb	2.4	84.2	10.5	100.0					60.5
Glasgw	2.4	70.3	24.3	100.0	25	8.1	89.2	2.7	100.0
Inverns				90.0					90.0
Klmarnk	2.4	76.2	19.1	100.0	23	15.8	84.2	0.0	90.5
Krkcldy	2.4	90.9	9.1	100.0	24	27.3	72.7	0.0	100.0
WALES									
Bangor	2.3	76.9	7.7	100.0	27	0.0	92.3	7.7	100.0
Cardff	2.4	77.4	15.1	98.2	25	12.8	82.1	5.1	72.2
Clwyd				100.0					100.0
Swanse	2.4	90.3	6.9	98.6	26	8.3	87.5	4.2	98.6
Wrexm	2.3	89.5	5.3	100.0	28	0.0	73.7	26.3	100.0

Table 6.5 Continued

Centre	Adjusted calcium				Bicarbonate				
	Median (mmol/L)	% 2.2-2.5 mmol/L	% >2.5 mmol/L	% data completeness	Median (mmol/L)	% <22 mmol/L	% 22-30 mmol/L	% >30 mmol/L	% data completeness
TOTALS									
England	**2.4**	**79.5**	**13.1**	**95.4**	**24**	**18.9**	**78.1**	**2.9**	**86.9**
N Ireland	**2.4**	**76.6**	**15.6**	**98.5**	**24**	**10.9**	**87.5**	**1.6**	**98.5**
Scotland	**2.4**	**79.9**	**15.6**	**99.4**	**25**	**13.7**	**85.6**	**0.7**	**77.2**
Wales	**2.4**	**82.5**	**12.1**	**98.8**	**26**	**7.9**	**84.9**	**7.2**	**90.5**
UK	**2.4**	**79.6**	**13.2**	**95.9**	**24**	**17.9**	**79.1**	**3.0**	**86.7**

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

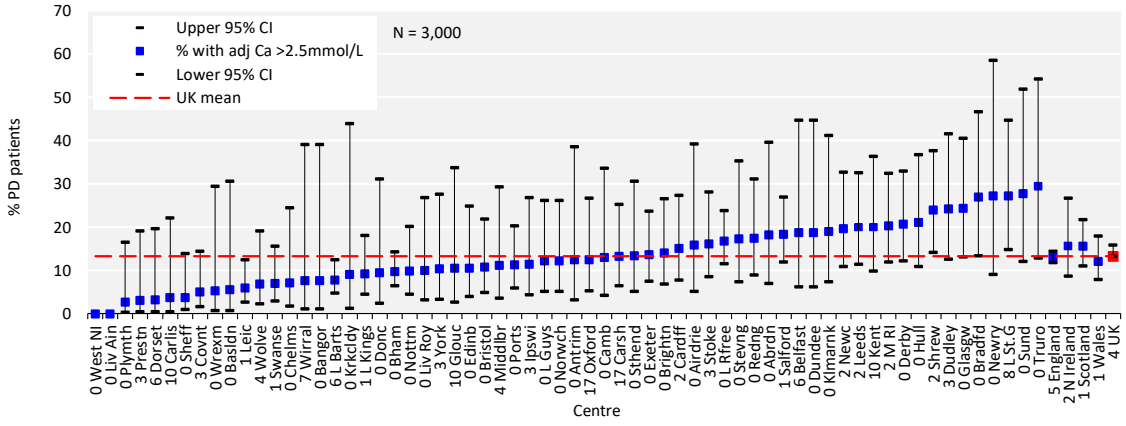

Figure 6.3 Percentage of adult patients prevalent to PD on 31/12/2019 with adjusted calcium (Ca) above the target range (>2.5 mmol/L) by centre
CI – confidence interval

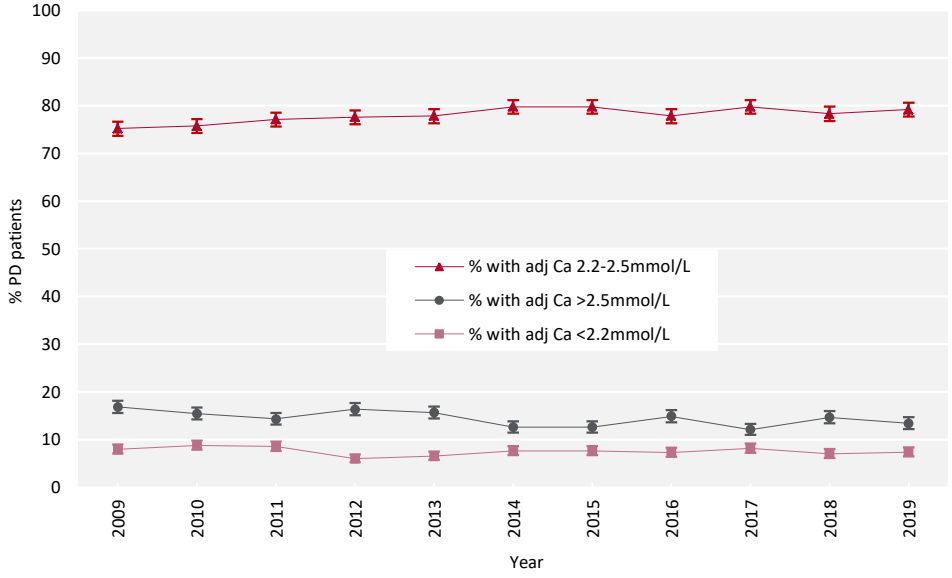

Figure 6.4 Change in percentage of prevalent adult PD patients within, above and below the target range for adjusted calcium (Ca 2.2–2.5 mmol/L) between 2009 and 2019

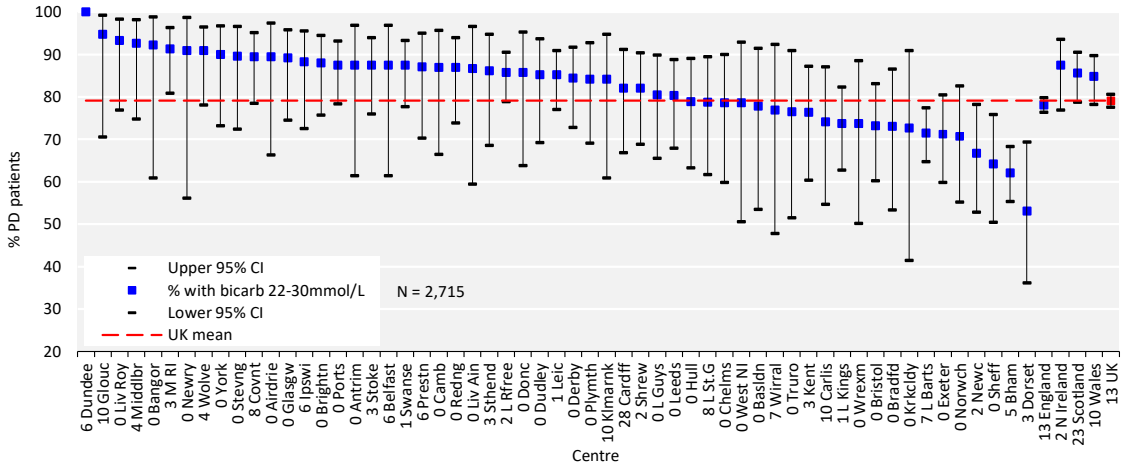

Figure 6.5 Percentage of adult patients prevalent to PD on 31/12/2019 with bicarbonate (bicarb) within the target range (22–30 mmol/L) by centre

CI – confidence interval

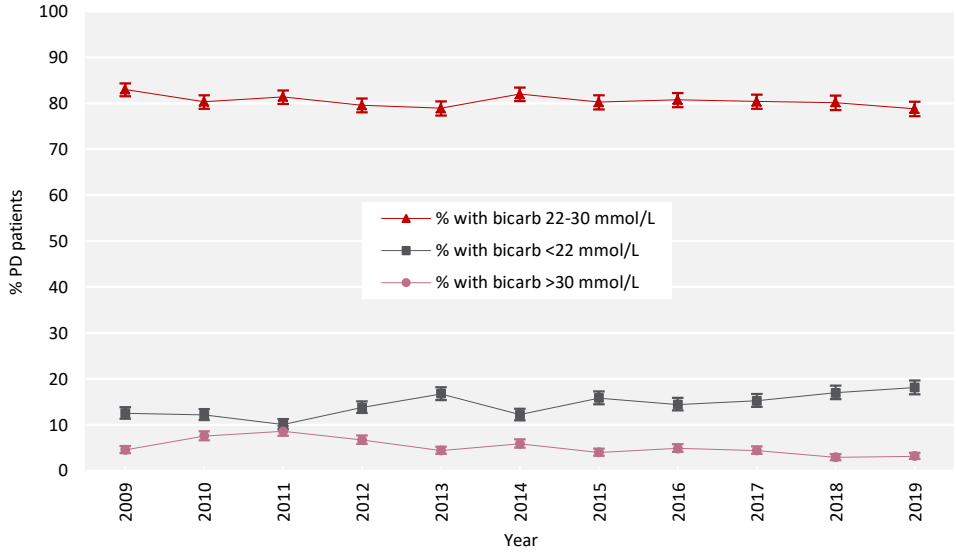

Figure 6.6 Percentage of prevalent adult PD patients within, above and below the target range for bicarbonate (bicarb 22–30 mmol/L) between 2009 and 2019

Anaemia in prevalent adult PD patients

Inadequate data completeness in relation to ESAs makes auditing against national guidelines difficult to interpret. An important assumption is that patients for whom no ESA data have been submitted to the UKRR are not on ESA treatment, provided the centre has submitted ESA data for other patients on PD. The weekly ESA dose is reported, but there are some uncertainties surrounding the accuracy of this measure (see appendix A). The Scottish Renal Registry does not submit ESA data for PD patients.

Table 6.6 Median haemoglobin and ferritin and percentage attaining target ranges in adult patients prevalent to PD on 31/12/2019 by centre

	Haemoglobin				Ferritin		
Centre	Median (g/L)	% <100 g/L	% >120 g/L	% data completeness	Median (µg/L)	% <100 µg/L	% data completeness
ENGLAND							
Basldn	116	5.6	44.4	100.0	168	27.8	100.0
Bham	110	22.6	18.6	99.6	280	8.0	99.1
Bradfd	116	3.8	34.6	100.0	371	4.0	96.2
Brightn	115	10.0	28.0	100.0	440	10.0	100.0
Bristol	117	5.4	37.5	100.0	335	1.8	98.2
Camb	115	13.0	43.5	100.0	399	0.0	100.0
Carlis	111	14.8	18.5	90.0	331	18.5	90.0
Carsh	114	22.2	20.4	84.4	205	21.8	85.9
Chelms	116	32.1	17.9	100.0	163	22.2	96.4
Colchr							
Covnt	111	26.2	19.7	98.4	289	16.4	98.4
Derby	108	27.6	15.5	100.0	556	1.7	100.0
Donc	118	4.8	38.1	100.0	211	19.0	100.0
Dorset	111	21.9	6.3	97.0	326	12.9	93.9
Dudley	116	11.8	29.4	100.0			2.9
Exeter	112	4.1	19.2	100.0	272	12.5	98.6
Glouc	107	28.6	28.6	100.0	279	5.3	90.5
Hull	114	7.9	36.8	100.0	474	5.3	100.0
Ipswi	110	17.1	11.4	97.2	367	14.7	94.4
Kent	111	25.0	38.9	92.3	236	16.2	94.9
L Barts	108	29.7	24.6	94.2	333	12.9	89.9
L Guys	104	41.5	7.3	100.0	211	26.8	100.0
L Kings	113	19.7	23.7	98.7	321	9.6	94.8
L Rfree	105	32.2	17.5	100.0	534	5.7	98.6
L St.G	108	30.3	9.1	91.7	312	3.0	91.7
L West				56.0			44.8
Leeds	108	23.6	14.5	98.2	430	7.3	98.2
Leic	111	17.6	18.6	99.0	276	21.8	98.1
Liv Ain	115	6.7	40.0	100.0	491	0.0	100.0
Liv Roy	113	23.3	10.0	100.0	345	0.0	100.0
M RI	107	25.4	15.3	98.3	252	6.8	98.3
Middlbr	110	18.5	25.9	96.4	448	11.5	92.9
Newc	115	11.5	26.9	100.0	382	6.3	92.3
Norwch	113	12.2	36.6	100.0	250	19.5	100.0
Nottm	111	16.4	24.6	100.0	522	0.0	100.0
Oxford	106	23.9	17.4	95.8	296	2.1	100.0
Plymth	110	15.8	21.1	100.0	301	23.7	100.0
Ports	114	13.8	27.5	100.0	394	6.7	93.8
Prestn	113	21.9	28.1	97.0	760	3.1	97.0
Redng	111	23.9	28.3	100.0	418	8.7	100.0
Salford	113	13.3	29.5	100.0	635	3.8	99.1
Sheff	108	24.5	22.6	100.0	475	1.9	100.0
Shrew	107	26.0	10.0	98.0	422	4.1	96.1
Stevng	106	31.0	17.2	100.0	135	39.3	96.6
Sthend	114	16.7	33.3	100.0	333	6.7	100.0
Stoke	112	12.5	19.6	96.6	425	1.9	93.1
Sund	118	11.1	38.9	100.0	363	31.3	88.9
Truro	114	11.8	29.4	100.0	167	21.4	82.4
Wirral	106	15.4	15.4	92.9	448	7.7	92.9
Wolve	109	29.5	18.2	95.7	153	38.6	95.7

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
York	107	30.0	26.7	100.0	311	6.7	100.0
N IRELAND							
Antrim	109	18.8	25.0	100.0	437	6.3	100.0
Belfast	120	0.0	47.1	100.0	396	0.0	100.0
Newry	110	27.3	9.1	100.0	240	18.2	100.0
Ulster				100.0			100.0
West NI	117	14.3	35.7	100.0	316	14.3	100.0
SCOTLAND							
Abrdn	116	9.1	27.3	100.0	365	0.0	100.0
Airdrie	107	21.1	10.5	100.0	279	26.3	100.0
D&Gall				100.0			100.0
Dundee	117	25.0	37.5	100.0	262	25.0	100.0
Edinb	113	18.4	34.2	100.0	271	20.0	92.1
Glasgw	107	27.0	21.6	100.0	245	25.7	94.6
Inverns	110	40.0	30.0	100.0			80.0
Klmarnk	109	28.6	14.3	100.0	363	9.5	100.0
Krkcldy	122	0.0	54.5	100.0	153	40.0	90.9
WALES							
Bangor	112	15.4	30.8	100.0	248	0.0	100.0
Cardff	113	18.9	26.4	98.2	156	36.5	96.3
Clwyd				100.0			100.0
Swanse	111	23.3	23.3	100.0	264	14.1	97.3
Wrexm	117	5.3	36.8	100.0	278	0.0	100.0
TOTALS							
England	**111**	**20.9**	**22.4**	**96.0**	**343**	**10.4**	**92.8**
N Ireland	**116**	**12.3**	**32.3**	**100.0**	**360**	**7.7**	**100.0**
Scotland	**112**	**21.1**	**27.2**	**100.0**	**287**	**18.6**	**95.6**
Wales	**112**	**18.0**	**26.3**	**99.4**	**237**	**18.3**	**97.6**
UK	**111**	**20.6**	**23.1**	**96.5**	**335**	**11.3**	**93.4**

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

Table 6.7 Distribution of haemoglobin and erythropoiesis stimulating agent (ESA) dose values in adult patients prevalent to PD on 31/12/2019 by centre

Centre	ESA		Haemoglobin and ESA	
	% on ESA	Median dose (IU/week)	% <100g/L and not on ESA	% >120g/L and on ESA
ENGLAND				
Basldn	61.1			
Bham	16.7			
Bradfd	80.8	5,000	0.0	19.2
Brightn	8.0			
Bristol	71.4	4,000	0.0	23.2
Camb	60.9			
Carlis	60.0			
Carsh	1.6			
Chelms	78.6	5,000	0.0	10.7
Colchr				
Covnt	66.1			
Derby	0.0			
Donc	71.4	4,000	0.0	14.3
Dorset	81.8	4,000	0.0	3.1

Table 6.7 Continued

	ESA		Haemoglobin and ESA	
Centre	% on ESA	Median dose (IU/week)	% <100g/L and not on ESA	% >120g/L and on ESA
Dudley	76.5	6,000	0.0	17.6
Exeter	71.2	4,000	0.0	8.2
Glouc	66.7			
Hull	63.2			
Ipswi	0.0			
Kent	48.7			
L Barts	70.0	6,000	5.1	12.8
L Guys	0.0			
L Kings	85.7	6,000	1.3	21.1
L Rfree	0.0			
L St.G	0.0			
L West	0.0			
Leeds	75.0	3,000	1.8	9.1
Leic	73.8	3,000	3.9	11.8
Liv Ain	0.0			
Liv Roy	0.0			
M RI	0.0			
Middlbr	82.1	3,000	0.0	18.5
Newc	3.8			
Norwch	53.7			
Nottm	85.2	4,000	1.6	19.7
Oxford	79.2	6,000	6.5	15.2
Plymth	0.0			
Ports	60.0			
Prestn	81.8		0.0	21.9
Redng	10.9			
Salford	83.8	8,000	0.0	19.0
Sheff	75.5	5,000	5.7	20.8
Shrew	2.0			
Stevng	62.1			
Sthend	53.3			
Stoke	0.0			
Sund	55.6			
Truro	0.0			
Wirral	100.0	6,000	0.0	15.4
Wolve	65.2			
York	53.3			
N IRELAND				
Antrim	56.3			
Belfast	82.4	3,000	0.0	35.3
Newry	81.8		0.0	9.1
Ulster	100.0			
West NI	71.4	3,000	0.0	14.3
WALES				
Bangor	46.2			
Cardff	31.5			
Clwyd	44.4			
Swanse	23.3			
Wrexm	21.1			
TOTAL[1]				
UK	**77.3**	**4,800**	**2.1**	**15.8**

Blank cells – no data returned by the centre or <10 patients in the centre or data completeness <70% (or <70% patients were on an ESA).
[1]This is the total of only those centres with at least 70% of PD patients on an ESA.

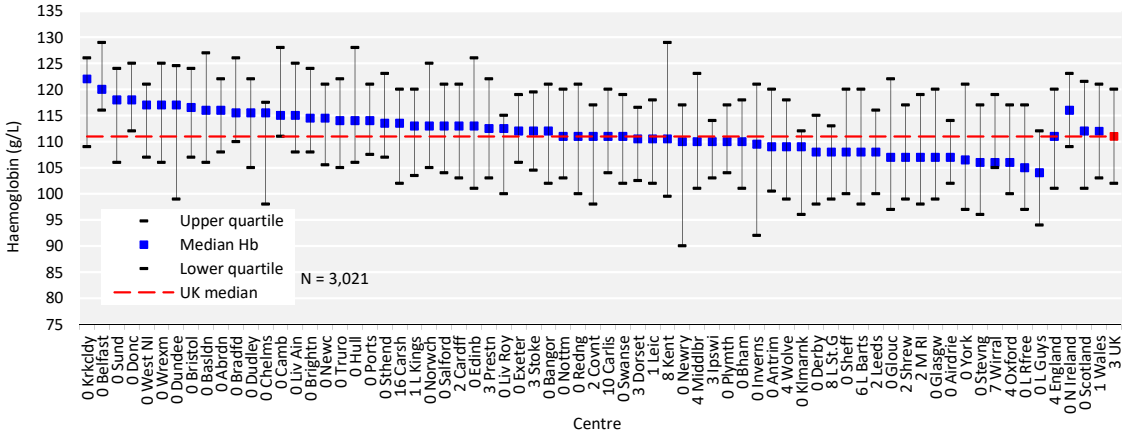

Figure 6.7 Median haemoglobin (Hb) in adult patients prevalent to PD on 31/12/2019 by centre

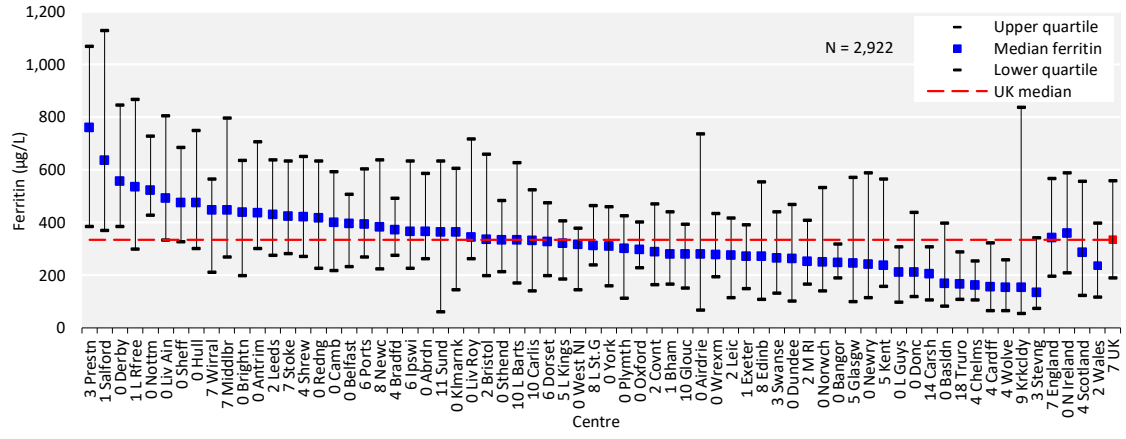

Figure 6.8 Median ferritin in adult patients prevalent to PD on 31/12/2019 by centre

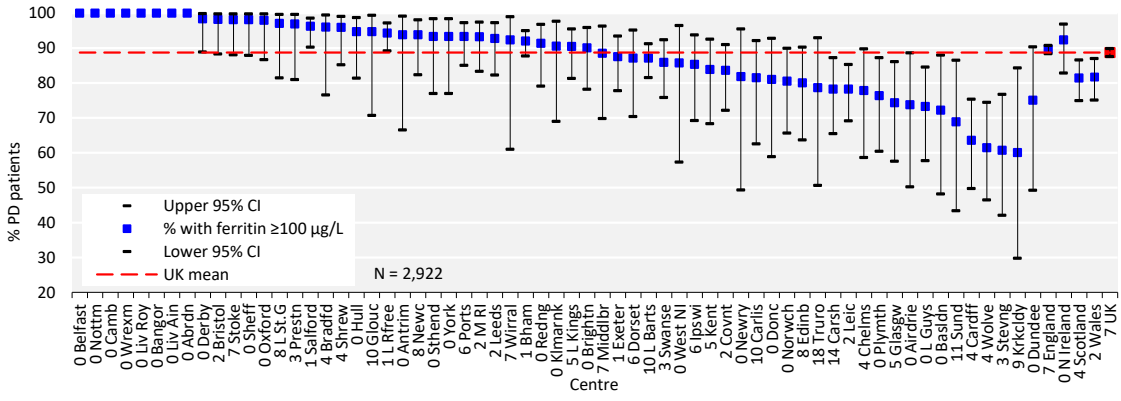

Figure 6.9 Percentage of adult patients prevalent to PD on 31/12/2019 with ferritin ≥100 µg/L by centre
CI – confidence interval

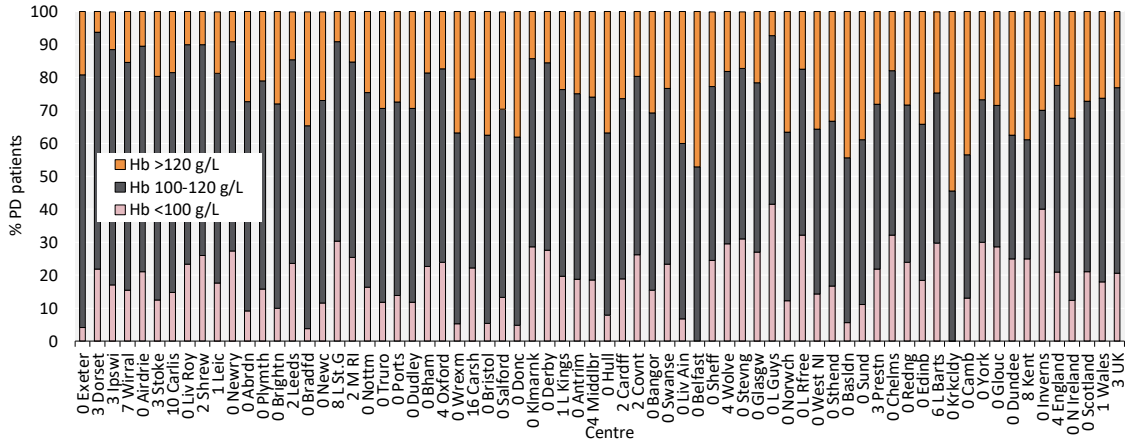

Figure 6.10 Distribution of haemoglobin (Hb) in adult patients prevalent to PD on 31/12/2019 by centre

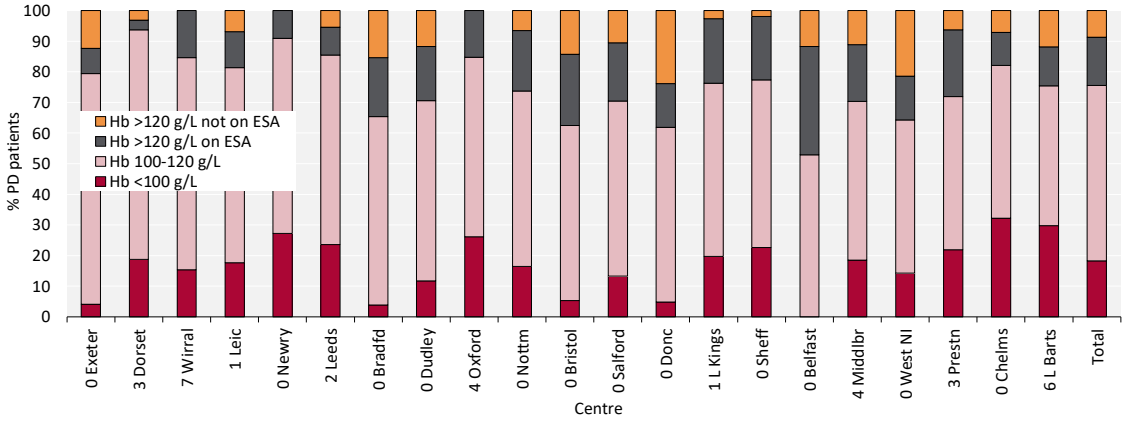

Figure 6.11 Distribution of haemoglobin (Hb) in adult patients prevalent to PD on 31/12/2019 and the proportion with haemoglobin >120 g/L receiving erythropoiesis stimulating agent (ESA) by centre
Figure (including total) does not include centres with <70% data completeness (or <70% ESA use).

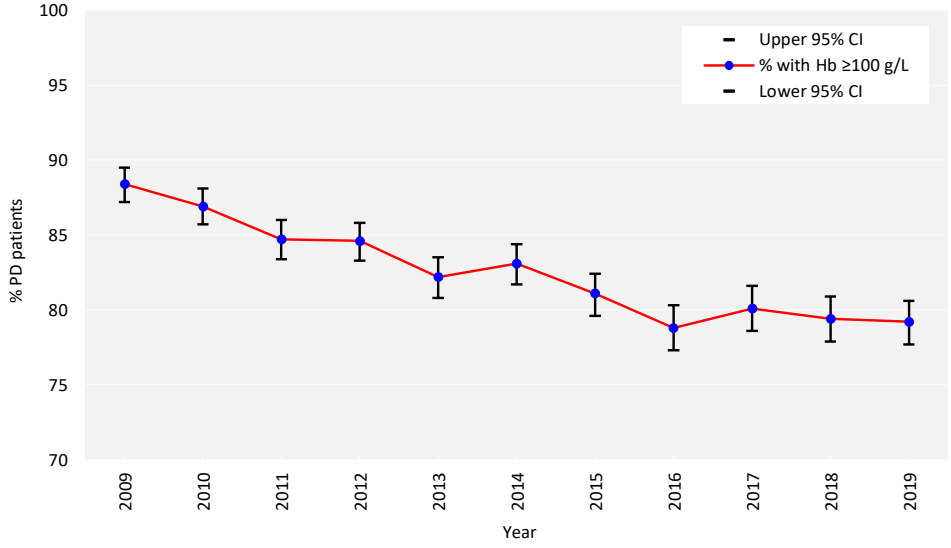

Figure 6.12 Percentage of prevalent adult PD patients with haemoglobin (Hb) ≥100 g/L between 2009 and 2019
CI – confidence interval

Infections in adult PD patients

PHE has carried out mandatory enhanced surveillance of MRSA bacteraemia since October 2005 and of MSSA bacteraemia since January 2011 for NHS acute trusts, with the subsequent addition of *E. coli* bacteraemia and *C. difficile* reporting. Patient-level infection data are reported in real time to PHE. Wales provides infection data extracted locally from the renal and hospital IT systems. The data from PHE were not received in time for this year's annual report and the analyses will therefore be added later.

Given the small numbers of infections in PD patients, data are only shown at the national level and are compared to infection rates in haemodialysis (HD) patients. The definition of each type of infectious episode is detailed in appendix A.

A rolling two year cohort is reported to be consistent with the reporting of infections in chapter 5. These analyses included all patients on HD, whether on HHD or ICHD.

Table 6.8 Number and rate of infection episodes per 100 patient-years in prevalent adult PD patients in England and Wales compared to prevalent adult HD patients in England and Wales from January 2018 to December 2019 TO BE UPDATED ONCE PHE DATA RECEIVED

	Infection			
	MRSA	MSSA	*C. difficile*	*E.coli*
Number of episodes				
HD				
PD				
Rate per 100 patient-years (with range between centres)				
HD				
PD				

C. difficile – Clostridium difficile; *E. coli – Escherichia coli;* MRSA – methicillin-resistant *Staphylococcus aureus*; MSSA – methicillin-sensitive *Staphylococcus aureus*

PD peritonitis infection rates are collected for English renal centres by the UKRR in collaboration with NHS England for the Renal Dialysis Quality Dashboard (renal.org/audit-research/data-permissions/data/ukrr-nhs-england-quality-dashboard-dataset) and are listed in the table below. The funnel plot (figure 6.13) shows each centre's 2019 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 6.9 Number of patient-years and peritonitis rate in adult patients receiving PD in 2019 by centre in England

Centre	PD patient-years	Peritonitis rate per 1 PD patient-year
Basldn	27	0.22
Birm	249	0.45
Bradfd	29	0.24
Brightn	53	0.36
Bristol	71	0.42
Camb	30	0.39
Carlis	24	0.17
Carsh	102	0.46
Chelms	32	0.06
Covnt	78	0.45
Derby	66	0.46
Donc	24	0.34
Dorset	38	0.49
Dudley	41	0.36
Exeter	80	0.28
Glouc	39	0.47
Hull	43	0.33
Ipswi	45	0.31
Kent	59	0.34
L Barts	244	0.32
L Guys	47	0.38
L Kings	95	0.41
L Rfree	166	0.35
L St.G	49	0.37
L West	153	0.37
Leeds	63	0.27
Leic	115	0.24
Liv Ain	31	0.49
Liv Roy*	50	0.36
M RI	75	0.41
Middlbr	27	0.37
Newc	56	0.92
Norwch	42	0.31
Nottm	76	0.47
Oxford	61	0.30
Plymth	38	0.21
Ports	88	0.45
Prestn	44	0.41
Redng	50	0.55
Salford	124	0.51
Sheff	59	0.02
Shrew	68	0.50
Stevng	32	0.37
Sthend	25	0.04
Stoke	76	0.53
Sund	21	0.24
Truro	20	0.41
Wirral	20	0.30
Wolve	58	0.45
York	30	0.23
	TOTAL	
England	**3,232**	**0.38**

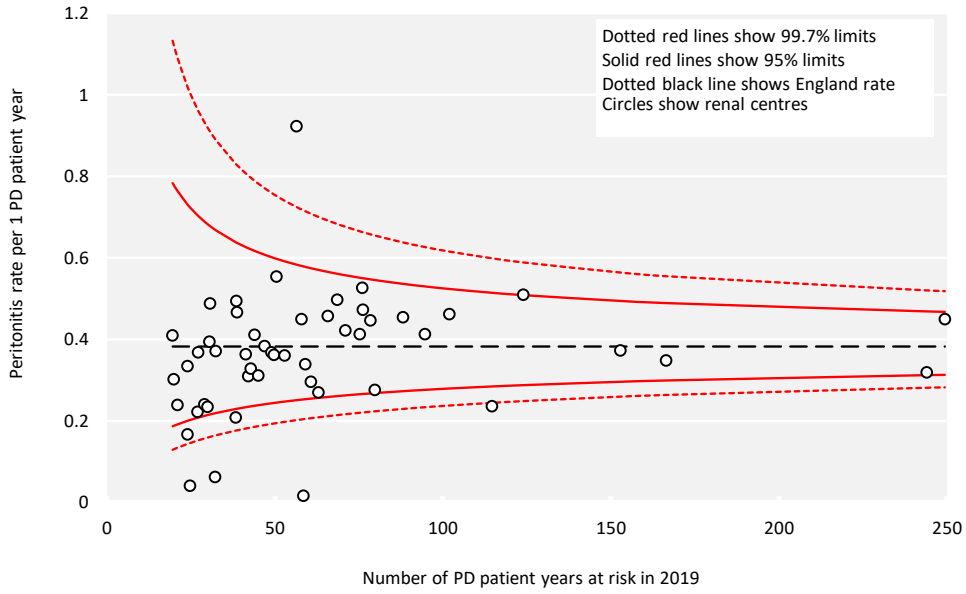

Figure 6.13 PD peritonitis rates in adult patients receiving PD in 2019 per 1 PD patient-year by centre in England
Please visit the UKRR data portal (renal.org/audit-research/data-portal) to identify individual renal centres.

Cause of death in adult PD patients

Cause of death was analysed in prevalent patients receiving PD on 31/12/2018 and followed-up for one year in 2019. 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. Further detail on the survival of prevalent RRT patients is in chapter 3.

Table 6.10 Cause of death in adult patients prevalent to PD on 31/12/2018 followed-up in 2019 by age group

	PD all ages		PD <65 years		PD ≥65 years	
Cause of death	N	%	N	%	N	%
Cardiac disease	75	21.8	24	24.7	51	20.7
Cerebrovascular disease	11	3.2	7	7.2	4	1.6
Infection	64	18.6	21	21.7	43	17.4
Malignancy	10	2.9	1	1.0	9	3.6
Treatment withdrawal	69	20.1	12	12.4	57	23.1
Other	86	25.0	24	24.7	62	25.1
Uncertain aetiology	29	8.4	8	8.3	21	8.5
Total (with data)	**344**	**100.0**	**97**	**100.0**	**247**	**100.0**
Missing	164	32.3	38	28.2	126	33.8

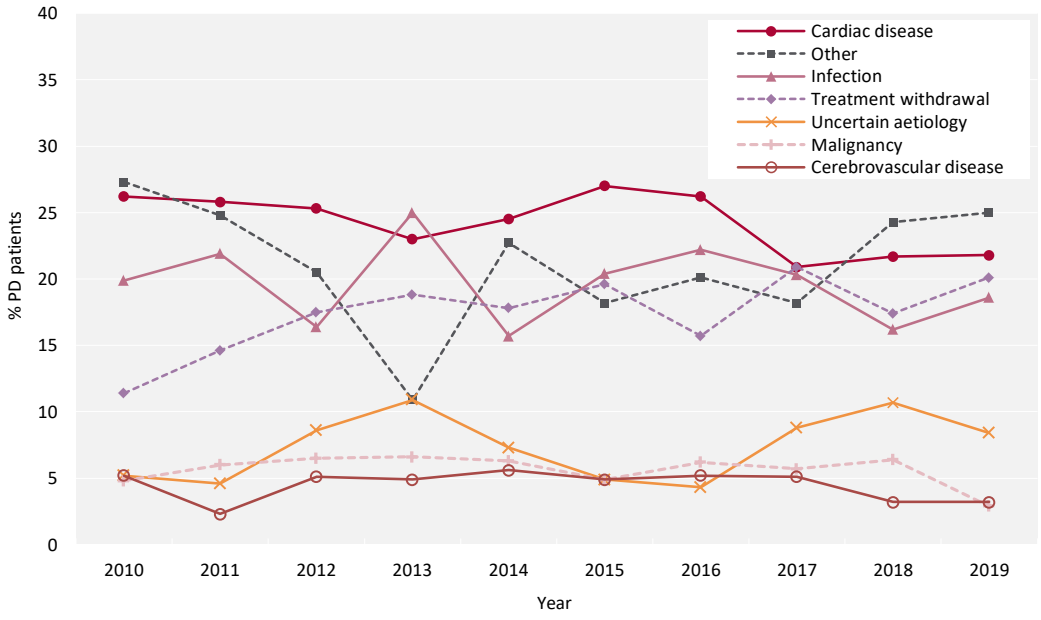

Figure 6.14 Cause of death between 2010 and 2019 for adult patients prevalent to PD at the beginning of the year

Hospitalisation of PD patients

Hospital Episodes Statistics (HES) and Patient Episode Database for Wales (PEDW) data for prevalent RRT patients on 31/12/2018 were used to compare emergency admission hospitalisation amongst PD patients (figure 6.15). The y-axis displays the total number of hospitalised days following an emergency admission for PD patients divided by the total number of PD patient-years at that centre for 2019. The average rate in England and Wales was 13.2 days per patient-year, compared to 4.2 days for Tx patients and 14.3 days for ICHD patients.

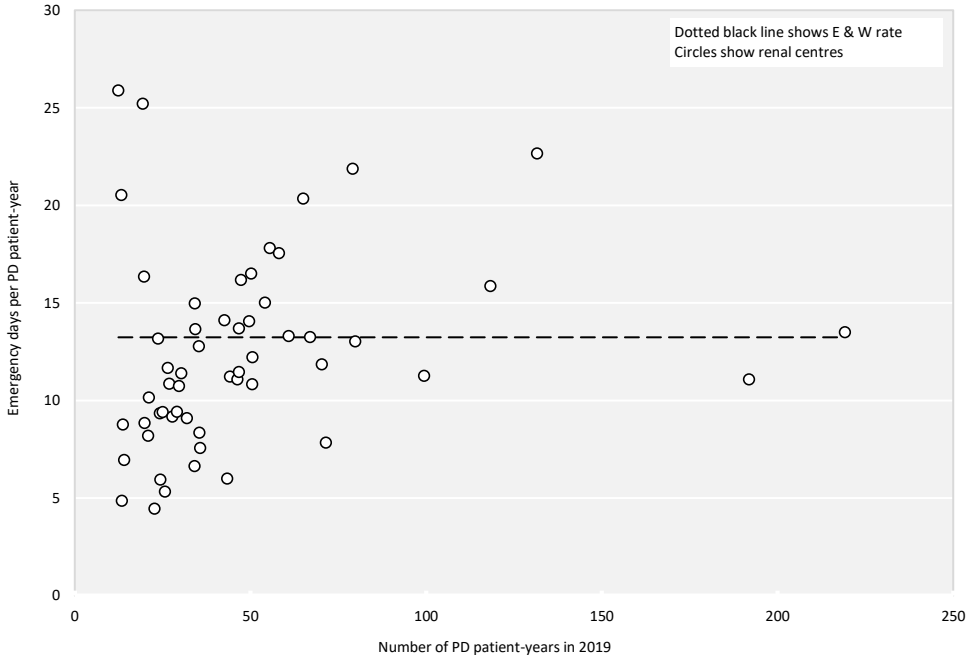

Figure 6.15 Emergency inpatient days per PD patient-year in 2019 for patients prevalent to RRT in England and Wales on 31/12/2018 by centre

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Chapter 7

Adults on home haemodialysis (HHD) in the UK at the end of 2019

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 2019 (figure 7.1). This population comprises patients who were on HHD at the end of 2018 and remained on HHD throughout 2019, as well as patients who commenced/re-commenced HHD in 2019. This latter group includes both incident renal replacement therapy (RRT) patients who ended 2019 on HHD and prevalent RRT patients who switched to HHD from in-centre haemodialysis (ICHD), peritoneal dialysis (PD), or a transplant (Tx) in 2019. 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 RRT, 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.

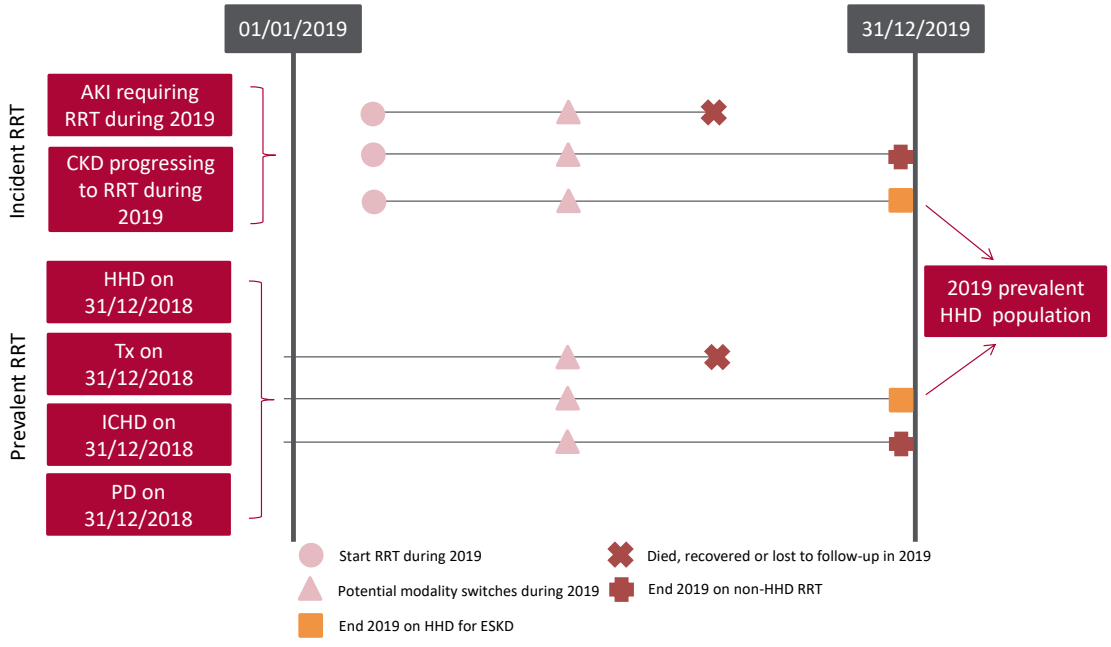

Figure 7.1 Pathways adult patients could follow to be included in the UK 2019 prevalent HHD population

Note that patients receiving dialysis for acute kidney injury (AKI) are only included in this chapter if they had a timeline or RRT modality code for chronic HHD at the end of 2019 or if they had been on RRT for ≥90 days and were on HHD at the end of 2019

CKD – chronic kidney disease

Where possible, the chapter addresses key aspects of the care of patients on HHD for which there are Renal 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 described in chapter 5 on a combined ICHD and HHD population.

Rationale for analyses

The analyses begin with a description of the 2019 prevalent adult HHD population, including the number on HHD per million population (pmp).

The Renal Association guidelines (renal.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 renal centres in 2019 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 (renal.org/audit-research/data-portal). Audit measures that cannot be reported because the required data items were not collected by the UKRR are omitted.

Table 7.1 The Renal Association audit measures relevant to HHD that are reported in this chapter

The Renal 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 (2017)	Proportion of patients with serum ferritin <100 µg/L at start of treatment with erythropoiesis stimulating agent (ESA)	Table 7.7, figure 7.8 (the UKRR does not hold treatment with ESA start dates)
	Proportion of patients with haemoglobin <100 g/L not on ESA	Table 7.8
	Proportion of patients on ESA with haemoglobin >120 g/L	Table 7.8, figure 7.10
	Mean (median) ESA dose in patients maintained on ESA therapy	Table 7.8
Planning, initiating and withdrawing RRT (2014)	Number of patients withdrawing from HHD as a proportion of all deaths on HHD	Table 7.9, figure 7.11

ESA – erythropoiesis stimulating agent

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.

Key findings

- 1,386 adult patients were receiving HHD for ESKD in the UK on 31/12/2019, which represented 2.0% of the RRT population
- The median age of HHD patients was 55.2 years and 61.0% were male
- The median adjusted calcium for HHD patients was 2.4 mmol/L and 12.8% were above the target range 2.2–2.5 mmol/L
- The median pre-dialysis bicarbonate for HHD patients was 24 mmol/L and 77.2% were within the target range 18–26 mmol/L
- The median pre-dialysis potassium for HHD patients was 5.0 mmol/L and 81.1% were within the target range 4.0–6.0 mmol/L
- The median haemoglobin and ferritin for HHD patients was 108 g/L and 297 µg/L, respectively, and 90.0% were on an ESA at a median dose of 8,000 IU/week
- 2.0% of HHD patients had a haemoglobin <100 g/L not on an ESA and 13.2% had a haemoglobin >120 g/L on an ESA
- There was no cause of death data available for 34.4% of deaths. For those with data, the leading cause of death in both younger (<65 years) and older (≥65 years) patients was cardiac disease (28.3% and 27.5%, respectively).

Analyses

Changes to the prevalent adult HHD population

For the 70 adult renal centres, the number of prevalent patients on HHD was calculated as both a proportion of the prevalent patients on RRT 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 RRT patients on HHD by year and by centre; number of HHD patients as a proportion of the catchment population

	N on HHD					% on HHD					Estimated catchment population (millions)	2019 crude rate (pmp)
Centre	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019		
ENGLAND												
Basldn	5	9	9	11	10	1.8	3.3	3.0	3.5	3.1	0.34	29
Bham	63	75	75	66	76	2.2	2.5	2.4	2.0	2.3	2.03	37
Bradfd	7	7	9	9	6	1.2	1.1	1.3	1.3	0.8	0.49	12
Brightn	45	37	40	39	32	4.7	3.7	4.0	3.7	3.0	1.07	30
Bristol	22	19	17	15	16	1.5	1.3	1.2	1.0	1.1	1.21	13
Camb	21	22	26	32	30	1.6	1.7	2.0	2.3	2.0	0.93	32
Carlis	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.25	0
Carsh	29	29	27	29	35	1.8	1.8	1.6	1.6	2.0	1.61	22
Chelms	2	3	3	2	0	0.7	1.1	1.1	0.8	0.0	0.37	0
Colchr	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.29	0
Covnt	16	12	14	22	20	1.7	1.2	1.5	2.3	1.9	0.79	25
Derby	38	42	52	53	58	7.1	7.7	9.4	9.0	8.9	0.56	104
Donc	10	9	9	9	5	3.3	2.7	2.7	2.7	1.5	0.37	13
Dorset	7	9	10	13	15	1.0	1.3	1.4	1.7	1.9	0.72	21
Dudley	13	14	13	12	12	4.1	4.0	3.5	3.3	3.3	0.34	35
Exeter	5	9	13	19	21	0.5	0.9	1.2	1.7	1.9	0.94	22
Glouc	5	9	5	3	3	1.1	1.9	1.0	0.6	0.6	0.51	6
Hull	8	4	6	5	7	0.9	0.5	0.7	0.6	0.8	0.79	9
Ipswi	1	3	8	5	4	0.2	0.7	1.8	1.2	0.9	0.31	13
Kent	16	22	21	18	19	1.5	2.1	1.9	1.6	1.7	1.06	18
L Barts	23	23	31	36	18	1.0	1.0	1.2	1.4	0.7	1.57	11
L Guys	49	48	41	38	44	2.4	2.3	1.9	1.7	1.9	1.00	44
L Kings	12	18	20	17	18	1.1	1.6	1.7	1.4	1.4	0.92	19
L Rfree	21	20	17	12	11	1.0	0.9	0.8	0.5	0.5	1.32	8
L St.G	4	4	5	6	6	0.5	0.5	0.6	0.7	0.7	0.66	9
L West	18	15	12	19	29	0.5	0.4	0.3	0.5	0.8	1.95	15
Leeds	23	17	23	23	26	1.5	1.1	1.4	1.4	1.5	1.36	19
Leic	60	73	72	64	54	2.8	3.2	3.1	2.6	2.1	2.07	26
Liv Ain	10	13	14	18	13	4.5	5.7	6.7	8.3	6.2	0.43	30
Liv Roy	37	39	39	39	36	3.0	3.2	3.1	3.1	2.9	0.80	45
M RI	49	61	77	74	76	2.6	3.1	3.8	3.6	3.7	1.32	58
Middlbr	15	11	12	13	19	1.7	1.2	1.3	1.4	2.0	0.80	24
Newc	24	24	21	22	19	2.4	2.3	1.9	1.9	1.6	0.94	20
Norwch	25	16	14	13	14	3.5	2.1	1.8	1.7	1.7	0.68	20
Nottm	29	29	34	34	31	2.6	2.5	2.9	2.8	2.5	0.92	34
Oxford	19	19	16	21	25	1.1	1.1	0.9	1.1	1.3	1.43	17
Plymth	8	8	10	10	7	1.6	1.6	1.9	1.9	1.3	0.40	18
Ports	56	75	65	70	70	3.4	4.4	3.7	4.0	3.7	1.73	40
Prestn	41	41	49	43	49	3.4	3.4	3.9	3.3	3.7	1.22	40

Table 7.2 Continued

Centre	N on HHD					% on HHD					Estimated catchment population (millions)	2019 crude rate (pmp)
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019		
Redng	5	7	6	9	8	0.6	0.9	0.8	1.1	0.9	0.69	12
Salford	15	28	41	35	41	1.5	2.7	3.7	3.0	3.3	1.14	36
Sheff	45	54	51	50	56	3.3	3.8	3.5	3.4	3.8	1.12	50
Shrew	23	19	22	20	27	6.2	5.0	5.7	4.7	6.3	0.41	66
Stevng	23	26	30	43	37	2.8	2.9	3.4	4.6	3.8	1.10	34
Sthend	2	3	2	1	6	0.8	1.3	0.8	0.4	2.3	0.27	22
Stoke	33	34	28	22	28	4.2	4.1	3.5	2.7	3.5	0.72	39
Sund	2	6	21	22	12	0.4	1.2	3.9	3.9	2.1	0.54	22
Truro	10	9	9	3	4	2.4	2.1	2.1	0.7	0.9	0.35	11
Wirral	12	10	9	8	8	4.3	3.0	2.3	2.0	1.9	0.47	17
Wolve	23	30	32	33	32	4.0	5.3	5.5	5.4	5.4	0.54	59
York	11	14	13	17	16	2.2	2.6	2.3	3.0	2.8	0.48	33
N IRELAND												
Antrim	2	1	4	4	4	0.8	0.4	1.6	1.5	1.4	0.24	16
Belfast	9	9	8	10	13	1.2	1.1	1.0	1.1	1.5	0.53	25
Newry	3	3	3	2	2	1.3	1.3	1.2	0.8	0.8	0.23	9
Ulster	2	1	1	0	0	1.2	0.6	0.5	0.0	0.0	0.20	0
West NI	4	3	3	2	1	1.4	1.0	1.0	0.6	0.3	0.25	4
SCOTLAND												
Abrdn	5	4	4	4	3	0.9	0.7	0.7	0.7	0.5	0.50	6
Airdrie	0	0	2	0	0	0.0	0.0	0.4	0.0	0.0	0.46	0
D&Gall	3	3	2	1	2	2.3	2.3	1.5	0.7	1.3	0.12	16
Dundee	2	2	2	8	7	0.5	0.5	0.5	1.8	1.6	0.37	19
Edinb	6	6	4	3	2	0.8	0.8	0.5	0.3	0.2	0.84	2
Glasgw	26	23	15	18	18	1.5	1.3	0.8	1.0	1.0	1.37	13
Inverns	3	7	5	7	7	1.2	2.7	1.9	2.5	2.5	0.22	31
Klmarnk	10	8	10	13	14	3.2	2.5	3.0	3.8	3.9	0.29	48
Krkcldy	0	0	0	0	2	0.0	0.0	0.0	0.0	0.7	0.27	7
WALES												
Bangor	15	10	11	13	15	8.2	5.6	5.6	6.4	7.5	0.16	92
Cardff	28	31	38	34	33	1.7	1.9	2.3	2.0	1.9	1.15	29
Clwyd	7	4	2	2	2	3.8	2.3	1.1	1.1	1.0	0.18	11
Swanse	36	39	34	36	45	4.7	5.0	4.3	4.3	5.2	0.75	60
Wrexm	5	8	5	6	7	1.7	2.6	1.6	1.9	2.3	0.21	34
TOTALS												
England	**1,040**	**1,128**	**1,193**	**1,197**	**1,209**	**2.0**	**2.1**	**2.2**	**2.1**	**2.1**	**44.33**	**27**
N Ireland	**20**	**17**	**19**	**18**	**20**	**1.2**	**1.0**	**1.0**	**0.9**	**1.0**	**1.45**	**14**
Scotland	**55**	**53**	**44**	**54**	**55**	**1.1**	**1.1**	**0.9**	**1.0**	**1.0**	**4.43**	**12**
Wales	**91**	**92**	**90**	**91**	**102**	**3.0**	**3.0**	**2.8**	**2.8**	**3.1**	**2.45**	**42**
UK	**1,206**	**1,290**	**1,346**	**1,360**	**1,386**	**2.0**	**2.1**	**2.1**	**2.0**	**2.0**	**52.67**	**26**

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 renal centre.
pmp – per million population

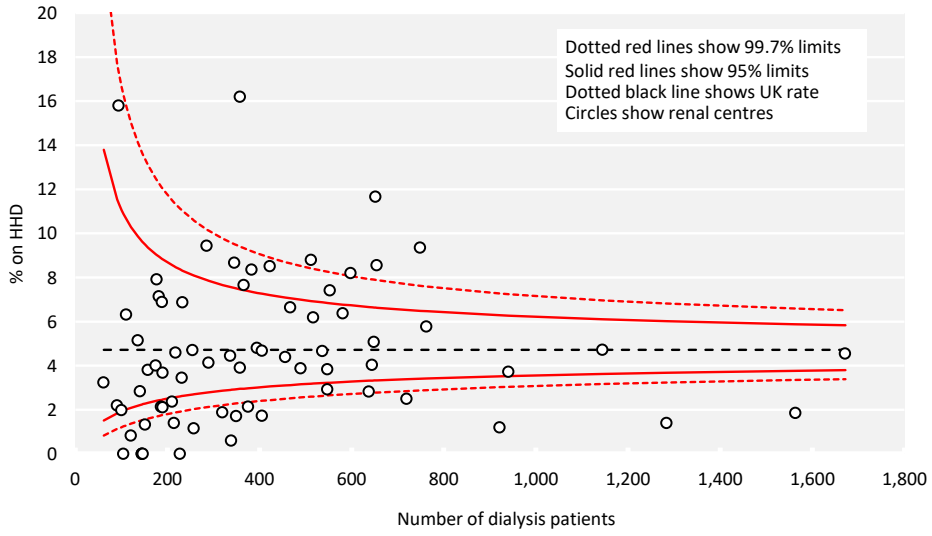

Figure 7.2 Percentage of adult patients prevalent to dialysis on 31/12/2019 who were on HHD by centre

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 31/12/2019 by centre

Centre	N on RRT	N on HHD	% on HHD	Median age (yrs)	% male	Ethnicity				
						% White	% Asian	% Black	% Other	% missing
ENGLAND										
Basldn	322	10	3.1	63.6	20.0	100.0	0.0	0.0	0.0	0.0
Bham	3,308	76	2.3	53.0	73.7	65.3	17.3	9.3	8.0	1.3
Bradfd	733	6	0.8	47.8	66.7	100.0	0.0	0.0	0.0	0.0
Brightn	1,059	32	3.0	66.3	68.8	96.9	3.1	0.0	0.0	0.0
Bristol	1,486	16	1.1	58.1	50.0	93.8	0.0	6.3	0.0	0.0
Camb	1,469	30	2.0	59.5	60.0	90.0	0.0	6.7	3.3	0.0
Carlis	303	0	0.0							
Carsh	1,771	35	2.0	59.2	62.9	82.9	5.7	8.6	2.9	0.0
Chelms	261	0	0.0							
Colchr	145	0	0.0							
Covnt	1,076	20	1.9	52.3	60.0	85.0	15.0	0.0	0.0	0.0
Derby	652	58	8.9	60.9	63.8	81.0	15.5	1.7	1.7	0.0
Donc	342	5	1.5	58.7	60.0	100.0	0.0	0.0	0.0	0.0
Dorset	772	15	1.9	67.6	66.7	100.0	0.0	0.0	0.0	0.0
Dudley	366	12	3.3	56.4	75.0	100.0	0.0	0.0	0.0	0.0
Exeter	1,091	21	1.9	49.5	61.9	100.0	0.0	0.0	0.0	0.0
Glouc	525	3	0.6	56.2	66.7	100.0	0.0	0.0	0.0	0.0
Hull	904	7	0.8	66.0	85.7	85.7	0.0	0.0	14.3	0.0
Ipswi	424	4	0.9	54.5	25.0	100.0	0.0	0.0	0.0	0.0
Kent	1,140	19	1.7	57.0	68.4	94.7	0.0	0.0	5.3	0.0
L Barts	2,660	18	0.7	54.4	50.0	38.9	5.6	44.4	11.1	0.0
L Guys	2,310	44	1.9	47.5	59.1	61.4	11.4	27.3	0.0	0.0
L Kings	1,244	18	1.4	55.1	72.2	61.1	5.6	27.8	5.6	0.0
L Rfree	2,344	11	0.5	60.0	63.6	54.5	0.0	45.5	0.0	0.0
L St.G	852	6	0.7	52.9	33.3	83.3	0.0	16.7	0.0	0.0
L West	3,613	29	0.8	54.0	31.0	41.4	20.7	34.5	3.4	0.0
Leeds	1,723	26	1.5	51.0	53.8	76.9	7.7	15.4	0.0	0.0
Leic	2,587	54	2.1	57.2	68.5	84.9	9.4	1.9	3.8	1.9
Liv Ain	210	13	6.2	53.5	53.8	100.0	0.0	0.0	0.0	0.0
Liv Roy	1,227	36	2.9	55.2	58.3	94.4	0.0	2.8	2.8	0.0
M RI	2,060	76	3.7	54.0	57.9	63.2	14.5	21.1	1.3	0.0
Middlbr	949	19	2.0	52.8	47.4	94.7	0.0	0.0	5.3	0.0
Newc	1,175	19	1.6	53.4	57.9	94.7	5.3	0.0	0.0	0.0
Norwch	809	14	1.7	58.4	71.4	100.0	0.0	0.0	0.0	0.0
Nottm	1,218	31	2.5	53.7	41.9	83.9	3.2	6.5	6.5	0.0
Oxford	1,969	25	1.3	60.6	64.0	85.7	9.5	4.8	0.0	16.0
Plymth	531	7	1.3	72.7	57.1	100.0	0.0	0.0	0.0	0.0
Ports	1,883	70	3.7	53.3	62.9	90.8	0.0	3.1	6.2	7.1
Prestn	1,341	49	3.7	56.1	61.2	91.8	8.2	0.0	0.0	0.0
Redng	860	8	0.9	51.7	75.0	71.4	0.0	28.6	0.0	12.5
Salford	1,237	41	3.3	51.9	63.4	90.2	2.4	4.9	2.4	0.0
Sheff	1,491	56	3.8	55.4	55.4	92.9	1.8	3.6	1.8	0.0
Shrew	428	27	6.3	59.8	70.4	96.3	3.7	0.0	0.0	0.0
Stevng	966	37	3.8	55.8	62.2	79.4	5.9	8.8	5.9	8.1
Sthend	264	6	2.3	55.5	33.3	100.0	0.0	0.0	0.0	0.0

Table 7.3 Continued

Centre	N on RRT	N on HHD	% on HHD	Median age (yrs)	% male	Ethnicity				
						% White	% Asian	% Black	% Other	% missing
Stoke	803	28	3.5	54.2	75.0	92.9	0.0	3.6	3.6	0.0
Sund	568	12	2.1	55.5	83.3	100.0	0.0	0.0	0.0	0.0
Truro	449	4	0.9	56.5	75.0	100.0	0.0	0.0	0.0	0.0
Wirral	411	8	1.9	52.0	75.0	87.5	12.5	0.0	0.0	0.0
Wolve	598	32	5.4	49.4	65.6	75.0	15.6	3.1	6.3	0.0
York	581	16	2.8	54.0	62.5	93.8	0.0	6.3	0.0	0.0
N IRELAND										
Antrim	280	4	1.4	63.3	100.0	100.0	0.0	0.0	0.0	0.0
Belfast	890	13	1.5	50.7	69.2	100.0	0.0	0.0	0.0	0.0
Newry	251	2	0.8	68.4	100.0	100.0	0.0	0.0	0.0	0.0
Ulster	182	0	0.0							
West NI	328	1	0.3	51.5	0.0	100.0	0.0	0.0	0.0	0.0
SCOTLAND										
Abrdn	558	3	0.5	58.7	0.0					66.7
Airdrie	524	0	0.0							
D&Gall	149	2	1.3	54.3	50.0					50.0
Dundee	449	7	1.6	64.7	71.4					71.4
Edinb	885	2	0.2	43.1	100.0	50.0	50.0	0.0	0.0	0.0
Glasgw	1,854	18	1.0	54.5	50.0					33.3
Inverns	282	7	2.5	50.3	42.9					42.9
Klmarnk	359	14	3.9	60.2	57.1					71.4
Krkcldy	295	2	0.7	64.0	50.0					100.0
WALES										
Bangor	201	15	7.5	55.9	80.0	100.0	0.0	0.0	0.0	0.0
Cardff	1,730	33	1.9	55.6	54.5	97.0	3.0	0.0	0.0	0.0
Clwyd	205	2	1.0	60.5	50.0	100.0	0.0	0.0	0.0	0.0
Swanse	868	45	5.2	58.5	57.8	100.0	0.0	0.0	0.0	0.0
Wrexm	311	7	2.3	60.1	42.9	100.0	0.0	0.0	0.0	0.0
TOTALS										
England	**57,510**	**1,209**	**2.1**	**54.8**	**61.4**	**82.8**	**6.5**	**7.9**	**2.8**	**1.2**
N Ireland	**1,931**	**20**	**1.0**	**54.5**	**75.0**	**100.0**	**0.0**	**0.0**	**0.0**	**0.0**
Scotland	**5,355**	**55**	**1.0**	**56.6**	**52.7**					**52.7**
Wales	**3,315**	**102**	**3.1**	**57.4**	**58.8**	**99.0**	**1.0**	**0.0**	**0.0**	**0.0**
UK	**68,111**	**1,386**	**2.0**	**55.2**	**61.0**	**84.6**	**6.0**	**7.0**	**2.5**	**3.2**

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.

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.

Table 7.4 Primary renal diseases (PRDs) of adult patients prevalent to HHD on 31/12/2019

PRD	N on HHD	% HHD population	Age <65 yrs		Age ≥65 yrs		M/F ratio
			N	%	N	%	
Diabetes	195	14.5	144	14.0	51	15.9	1.7
Glomerulonephritis	335	24.9	274	26.7	61	19.0	1.7
Hypertension	63	4.7	45	4.4	18	5.6	2.9
Polycystic kidney disease	120	8.9	87	8.5	33	10.3	1.4
Pyelonephritis	146	10.8	122	11.9	24	7.5	1.1
Renal vascular disease	28	2.1	12	1.2	16	5.0	2.1
Other	281	20.9	216	21.1	65	20.2	1.2
Uncertain aetiology	178	13.2	125	12.2	53	16.5	2.0
Total (with data)	**1,346**	**100.0**	**1,025**	**100.0**	**321**	**100.0**	
Missing	40	2.9	29	2.8	11	3.3	1.4

Biochemistry parameters in prevalent adult HHD patients

The Renal 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 31/12/2019 by centre

Centre	Median adj Ca (mmol/L)	% adj Ca 2.2-2.5 mmoI/L	% adj Ca >2.5 mmoI/L	% data completeness
ENGLAND				
Basldn				100.0
Bham	2.4	77.0	16.2	100.0
Bradfd				100.0
Brightn	2.4	87.5	3.1	100.0
Bristol	2.4	87.5	12.5	100.0
Camb	2.4	80.0	13.3	100.0
Carlis				
Carsh	2.3	81.3	3.1	97.0
Chelms				
Colchr				
Covnt	2.3	75.0	10.0	100.0
Derby	2.4	82.5	10.5	100.0
Donc				100.0
Dorset	2.2	80.0	6.7	100.0
Dudley	2.4	83.3	16.7	100.0
Exeter	2.3	95.2	0.0	100.0
Glouc				100.0
Hull				100.0
Ipswi				100.0
Kent	2.4	68.4	21.1	100.0
L Barts	2.3	83.3	11.1	100.0
L Guys	2.4	70.5	13.6	100.0
L Kings	2.3	77.8	5.6	100.0
L Rfree	2.5	54.6	27.3	100.0
L St.G				100.0
L West	2.3	78.3	0.0	82.1
Leeds	2.3	88.5	11.5	100.0
Leic	2.4	85.2	1.9	100.0
Liv Ain	2.4	69.2	23.1	100.0

Table 7.5 Continued

Centre	Median adj Ca (mmol/L)	% adj Ca 2.2-2.5 mmoI/L	% adj Ca >2.5 mmoI/L	% data completeness
Liv Roy	2.4	76.5	17.7	100.0
M RI	2.5	70.8	29.2	96.0
Middlbr	2.2	63.2	5.3	100.0
Newc	2.4	73.7	5.3	100.0
Norwch	2.3	92.9	0.0	100.0
Nottm	2.3	87.1	3.2	100.0
Oxford	2.4	72.2	16.7	72.0
Plymth				100.0
Ports	2.3	80.6	7.5	100.0
Prestn	2.4	66.0	17.0	100.0
Redng				100.0
Salford	2.4	69.2	25.6	100.0
Sheff	2.3	63.6	10.9	100.0
Shrew	2.4	80.8	15.4	100.0
Stevng	2.3	71.9	9.4	100.0
Sthend				100.0
Stoke	2.5	80.0	20.0	92.6
Sund	2.3	80.0	10.0	83.3
Truro				100.0
Wirral				100.0
Wolve	2.4	66.7	16.7	100.0
York	2.3	87.5	6.3	100.0
N IRELAND				
Antrim				100.0
Belfast	2.4	83.3	8.3	100.0
Newry				100.0
Ulster				
West NI				100.0
SCOTLAND				
Abrdn				100.0
Airdrie				
D&Gall				100.0
Dundee				100.0
Edinb				
Glasgw	2.4	88.9	5.6	100.0
Inverns				100.0
Klmarnk	2.3	92.9	7.1	100.0
Krkcldy				100.0
WALES				
Bangor	2.4	86.7	6.7	100.0
Cardff	2.4	65.6	18.8	100.0
Clwyd				100.0
Swanse	2.4	88.9	6.7	100.0
Wrexm				100.0
TOTALS				
England	**2.4**	**76.6**	**12.9**	**98.3**
N Ireland	**2.4**	**84.2**	**10.5**	**100.0**
Scotland	**2.4**	**84.9**	**11.3**	**98.2**
Wales	**2.4**	**78.2**	**12.9**	**100.0**
UK	**2.4**	**77.1**	**12.8**	**98.5**

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

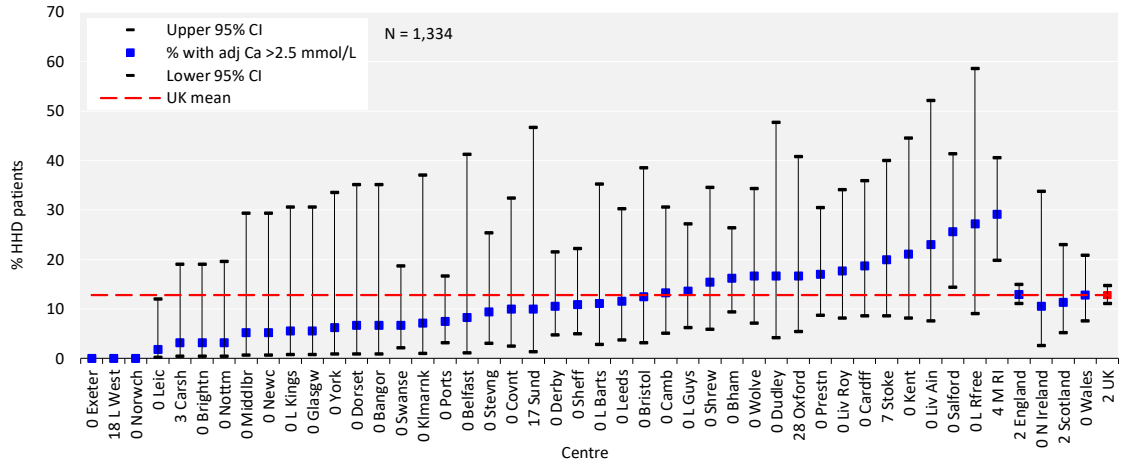

Figure 7.3 Percentage of adult patients prevalent to HHD on 31/12/2019 with adjusted calcium (Ca) above the target range (>2.5 mmol/L) by centre

CI – confidence interval

Table 7.6 Median pre-dialysis potassium and bicarbonate and percentage attaining target ranges in adult patients prevalent to HHD on 31/12/2019 by centre

	Pre-dialysis potassium					Pre-dialysis bicarbonate				
Centre	Median (mmol/L)	% <4.0 mmol/L	% 4.0–6.0 mmol/L	% >6.0 mmol/L	% data completeness	Median (mmol/L)	% <18 mmol/L	% 18–26 mmol/L	% >26 mmol/L	% data completeness
ENGLAND										
Basldn					100.0					100.0
Bham	5.1	5.4	81.1	13.5	100.0					63.5
Bradfd					100.0					100.0
Brightn					0.0	23	0.0	93.6	6.5	96.9
Bristol	4.7	6.3	87.5	6.3	100.0	24	6.3	75.0	18.8	100.0
Camb	5.3	0.0	80.0	20.0	100.0	25	0.0	73.3	26.7	100.0
Carlis										
Carsh					0.0					0.0
Chelms										
Colchr										
Covnt					0.0	23	5.0	80.0	15.0	100.0
Derby					0.0	25	0.0	82.5	17.5	100.0
Donc					100.0					100.0
Dorset	4.8	0.0	93.3	6.7	100.0	23	6.7	86.7	6.7	100.0
Dudley	5.6	0.0	91.7	8.3	100.0	24	0.0	91.7	8.3	100.0
Exeter	4.6	4.8	95.2	0.0	100.0	23	9.5	90.5	0.0	100.0
Glouc					0.0					100.0
Hull					100.0					100.0
Ipswi					0.0					100.0
Kent	3.9	52.6	36.8	10.5	100.0	23	0.0	94.7	5.3	100.0
L Barts	5.1	0.0	88.9	11.1	100.0	25	0.0	77.8	22.2	100.0
L Guys	4.7	25.0	68.2	6.8	100.0	25	0.0	68.2	31.8	100.0
L Kings	3.8	55.6	44.4	0.0	100.0	22	16.7	72.2	11.1	100.0
L Rfree	5.5	18.2	63.6	18.2	100.0	23	9.1	90.9	0.0	100.0
L St.G					0.0					100.0
L West					0.0					50.0
Leeds	5.2	7.7	88.5	3.9	100.0	24	0.0	92.3	7.7	100.0
Leic	5.1	7.4	83.3	9.3	100.0	24	3.8	79.3	17.0	98.2
Liv Ain					0.0	23	7.7	76.9	15.4	100.0

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 complete-ness	Median (mmoI/L)	% <18 mmol/L	% 18–26 mmol/L	% >26 mmol/L	% data complete-ness
Liv Roy					0.0	22	5.9	73.5	20.6	100.0
M RI					0.0	24	1.4	75.0	23.6	96.0
Middlbr	5.4	5.3	84.2	10.5	100.0	27	0.0	36.8	63.2	100.0
Newc					0.0	22	5.3	94.7	0.0	100.0
Norwch	5.2	7.1	64.3	28.6	100.0	24	0.0	92.9	7.1	100.0
Nottm	5.0	6.5	93.6	0.0	100.0					48.4
Oxford					68.0	24	5.6	77.8	16.7	72.0
Plymth					100.0					100.0
Ports	4.7	10.5	83.6	6.0	100.0	24	3.0	74.6	22.4	100.0
Prestn					0.0	24	4.8	81.0	14.3	89.4
Redng					0.0					100.0
Salford	4.9	12.8	79.5	7.7	100.0					0.0
Sheff	5.0	3.6	89.1	7.3	100.0	24	1.8	85.5	12.7	100.0
Shrew					0.0	23	0.0	84.6	15.4	100.0
Stevng	5.1	6.3	87.5	6.3	100.0	25	0.0	68.8	31.3	100.0
Sthend					100.0					100.0
Stoke					0.0	28	0.0	37.0	63.0	100.0
Sund					0.0	25	0.0	70.0	30.0	83.3
Truro					100.0					100.0
Wirral					0.0					100.0
Wolve	4.8	10.0	83.3	6.7	100.0	21	3.3	86.7	10.0	100.0
York	5.4	0.0	68.8	31.3	100.0	23	0.0	87.5	12.5	100.0
N IRELAND										
Antrim					100.0					100.0
Belfast	5.6	8.3	83.3	8.3	100.0	23	0.0	91.7	8.3	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					100.0
Dundee					100.0					100.0
Edinb					100.0					0.0
Glasgw	5.0	0.0	92.3	7.7	72.2					50.0
Inverns					100.0					100.0
Klmarnk	4.8	7.1	92.9	0.0	100.0	23	8.3	91.7	0.0	85.7
Krkcldy					100.0					100.0
WALES										
Bangor					0.0	26	0.0	60.0	40.0	100.0
Cardff					0.0	26	0.0	62.5	37.5	100.0
Clwyd					0.0					100.0
Swanse					0.0	25	0.0	77.8	22.2	100.0
Wrexm					0.0					100.0
TOTALS										
England	**4.9**	**10.7**	**80.6**	**8.7**	**61.1**	**24**	**2.7**	**77.7**	**19.6**	**87.5**
N Ireland	**5.2**	**10.5**	**84.2**	**5.3**	**100.0**	**23**	**0.0**	**84.2**	**15.8**	**100.0**
Scotland	**5.1**	**6.1**	**87.8**	**6.1**	**90.7**	**24**	**2.6**	**81.6**	**15.8**	**70.4**
Wales					**0.0**	**26**	**0.0**	**68.3**	**31.7**	**100.0**
UK	**5.0**	**10.4**	**81.1**	**8.5**	**58.2**	**24**	**2.4**	**77.2**	**20.4**	**87.9**

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

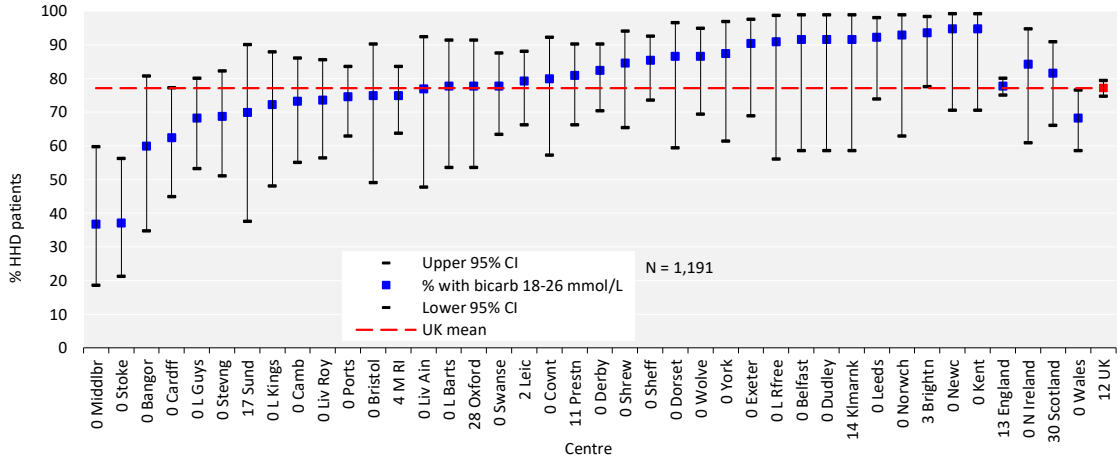

Figure 7.4 Percentage of adult patients prevalent to HHD on 31/12/2019 with pre-dialysis bicarbonate (bicarb) within the target range (18–26 mmol/L) by centre

CI – confidence interval

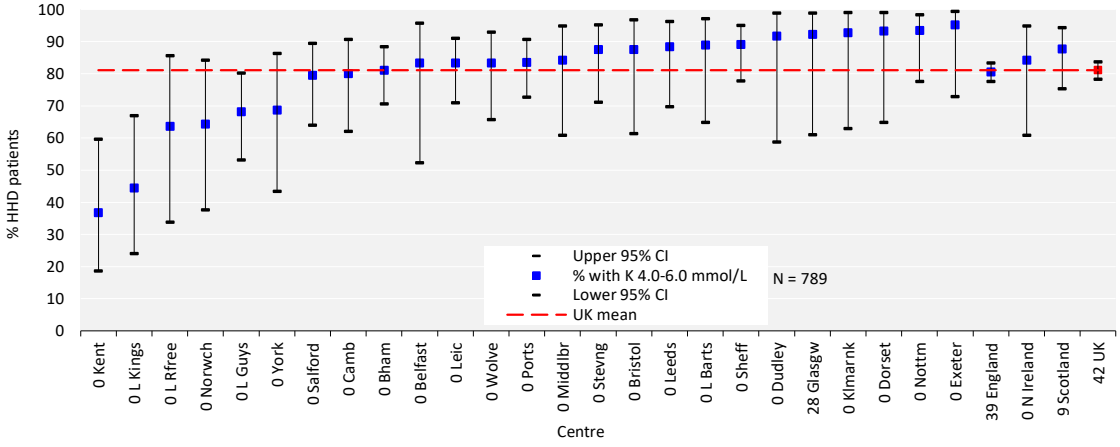

Figure 7.5 Percentage of adult patients prevalent to HHD on 31/12/2019 with pre-dialysis potassium (K) within the target range (4.0–6.0 mmol/L) by centre

CI – confidence interval

Anaemia in prevalent adult HHD patients

Inadequate data completeness in relation to ESAs makes auditing against national guidelines difficult to interpret. An important assumption is that patients for whom no ESA data have been submitted to the UKRR are not on ESA treatment, provided the centre has submitted ESA data for other patients on HHD. The weekly ESA dose is reported, but there are some uncertainties surrounding the accuracy of this measure (see appendix A).

Table 7.7 Median haemoglobin and ferritin and percentage attaining target ranges in adult patients prevalent to HHD on 31/12/2019 by centre

	Haemoglobin				Ferritin		
Centre	Median (g/L)	% <100 g/L	% >120 g/L	% data completeness	Median (µg/L)	% <100 µg/L	% data completeness
ENGLAND							
Basldn				100.0			100.0
Bham	106	31.1	20.3	100.0	304	17.6	100.0
Bradfd				100.0			100.0
Brightn	112	15.6	12.5	100.0	422	9.4	100.0
Bristol	105	12.5	18.8	100.0	298	6.3	100.0
Camb				10.0			10.0
Carlis							
Carsh	107	31.3	18.8	97.0	236	9.1	100.0
Chelms							
Colchr							
Covnt	104	40.0	15.0	100.0	198	10.0	100.0
Derby	114	15.8	26.3	100.0	542	0.0	100.0
Donc				100.0			100.0
Dorset	109	21.4	21.4	93.3	374	0.0	100.0
Dudley	116	16.7	16.7	100.0			8.3
Exeter	104	28.6	0.0	100.0	199	19.0	100.0
Glouc				100.0			100.0
Hull				100.0			100.0
Ipswi				100.0			100.0
Kent	105	31.6	26.3	100.0	270	15.8	100.0
L Barts	109	33.3	22.2	100.0	636	5.6	100.0
L Guys	103	43.2	20.5	100.0	283	20.9	97.7
L Kings	105	27.8	0.0	100.0	514	0.0	100.0
L Rfree	103	27.3	27.3	100.0	269	9.1	100.0
L St.G				100.0			100.0
L West	102	37.5	8.3	85.7	357	16.7	85.7
Leeds	110	19.2	15.4	100.0	309	15.4	100.0
Leic	106	33.3	16.7	100.0	291	14.8	100.0
Liv Ain	111	7.7	30.8	100.0	178	15.4	100.0
Liv Roy	102	44.1	11.8	100.0	157	35.3	100.0
M RI	106	29.2	19.4	96.0	259	25.0	96.0
Middlbr	106	26.3	21.1	100.0	728	0.0	89.5
Newc	111	10.5	5.3	100.0	392	5.3	100.0
Norwch	111	28.6	7.1	100.0	194	7.1	100.0
Nottm	110	16.7	16.7	96.8	383	9.7	100.0
Oxford	119	20.0	30.0	80.0	308	8.0	100.0
Plymth				100.0			100.0
Ports	116	21.2	42.4	98.5	255	12.1	98.5
Prestn	108	27.7	12.8	100.0	197	14.9	100.0
Redng				100.0			100.0

Table 7.7 Continued

Centre	Haemoglobin				Ferritin		
	Median (g/L)	% <100 g/L	% >120 g/L	% data completeness	Median (µg/L)	% <100 µg/L	% data completeness
Salford	102	43.6	15.4	100.0	194	33.3	100.0
Sheff	102	40.0	16.4	100.0	390	20.4	98.2
Shrew	111	7.7	15.4	100.0	494	11.5	100.0
Stevng	107	31.3	28.1	100.0	508	10.0	93.8
Sthend				100.0			100.0
Stoke	112	18.5	40.7	100.0	309	4.0	92.6
Sund	111	18.2	18.2	91.7	546	9.1	91.7
Truro				100.0			100.0
Wirral				100.0			100.0
Wolve	110	43.3	20.0	100.0	257	23.3	100.0
York	111	18.8	18.8	100.0	320	6.3	100.0
N IRELAND							
Antrim				100.0			100.0
Belfast	114	16.7	25.0	100.0	105	41.7	100.0
Newry				100.0			100.0
Ulster							
West NI				100.0			100.0
SCOTLAND							
Abrdn				100.0			100.0
Airdrie							
D&Gall				100.0			100.0
Dundee				100.0			100.0
Edinb				100.0			100.0
Glasgw	109	16.7	27.8	100.0	209	16.7	100.0
Inverns				100.0			100.0
Klmarnk	96	71.4	7.1	100.0	309	14.3	100.0
Krkcldy				100.0			100.0
WALES							
Bangor	116	0.0	33.3	100.0	170	20.0	100.0
Cardff	100	50.0	6.3	100.0	156	34.4	100.0
Clwyd				100.0			100.0
Swanse	106	22.2	22.2	100.0	144	40.0	100.0
Wrexm				100.0			100.0
TOTALS							
England	**108**	**27.5**	**19.3**	**96.3**	**313**	**14.8**	**95.3**
N Ireland	**114**	**10.5**	**26.3**	**100.0**	**107**	**36.8**	**100.0**
Scotland	**108**	**37.0**	**16.7**	**100.0**	**282**	**18.5**	**100.0**
Wales	**106**	**26.7**	**18.8**	**100.0**	**159**	**32.7**	**100.0**
UK	**108**	**27.6**	**19.3**	**96.8**	**297**	**16.7**	**95.9**

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

Table 7.8 Distribution of haemoglobin and erythropoiesis stimulating agent (ESA) dose values in adult patients prevalent to HHD on 31/12/2019 by centre

	ESA		Haemoglobin and ESA	
Centre	% on ESA	Median dose (IU/week)	% <100g/L and not on ESA	% >120g/L and on ESA
ENGLAND				
Basldn	88.9			
Bham	31.1			
Bradfd	100.0			
Brightn	53.1			
Bristol	100.0	12,000	0.0	18.8
Camb	80.0			
Carlis				
Carsh	6.1			
Chelms				
Colchr				
Covnt	95.0	8,000	0.0	10.0
Derby	0.0			
Donc	100.0			
Dorset	100.0	5,400	0.0	28.6
Dudley	100.0	10,000	0.0	16.7
Exeter	95.2	7,000	0.0	0.0
Glouc	66.7			
Hull	0.0			
Ipswi	0.0			
Kent	94.7	13,500	0.0	21.1
L Barts	83.3	8,000	0.0	11.1
L Guys	0.0			
L Kings	77.8	9,000	5.6	0.0
L Rfree	0.0			
L St.G	0.0			
L West	0.0			
Leeds	100.0	10,000	0.0	15.4
Leic	90.7	8,000	1.9	9.3
Liv Ain	0.0			
Liv Roy	0.0			
M RI	0.0			
Middlbr	89.5	6,000	0.0	10.5
Newc	36.8			
Norwch	85.7	9,000	0.0	7.1
Nottm	83.9	13,500	3.3	10.0
Oxford	96.0	9,000	0.0	30.0
Plymth	0.0			
Ports	55.2			
Prestn	95.7		2.1	10.6
Redng	37.5			
Salford	84.6	10,000	10.3	12.8
Sheff	67.3			
Shrew	0.0			
Stevng	90.6	6,000	0.0	18.8
Sthend	83.3			
Stoke	0.0			
Sund	33.3			
Truro	0.0			
Wirral	100.0			
Wolve	83.3	8,000	3.3	6.7

Table 7.8 Continued

	ESA		Haemoglobin and ESA	
Centre	% on ESA	Median dose (IU/week)	% <100g/L and not on ESA	% >120g/L and on ESA
York	100.0	5,500	0.0	18.8
N IRELAND				
Antrim	100.0			
Belfast	91.7	8,000	0.0	16.7
Newry	50.0			
Ulster				
West NI	100.0			
SCOTLAND				
Abrdn	75.0			
Airdrie				
D&Gall	50.0			
Dundee	50.0			
Edinb	100.0			
Glasgw	83.3		0.0	16.7
Inverns	100.0			
Klmarnk	81.8		9.1	9.1
Krkcldy	0.0			
WALES				
Bangor	40.0			
Cardff	56.3			
Clwyd	50.0			
Swanse	82.2	6,000	4.4	13.3
Wrexm	28.6			
TOTAL[1]				
UK	**90.0**	**8,000**	**2.0**	**13.2**

Blank cells – no data returned by the centre or <10 patients in the centre or data completeness <70% (or <70% patients were on an ESA).
Data for Scotland refer to patients prevalent to HHD on 31/05/2019 due to ESA data availability.
[1]This is the total of only those centres with at least 70% of HHD patients on an ESA.

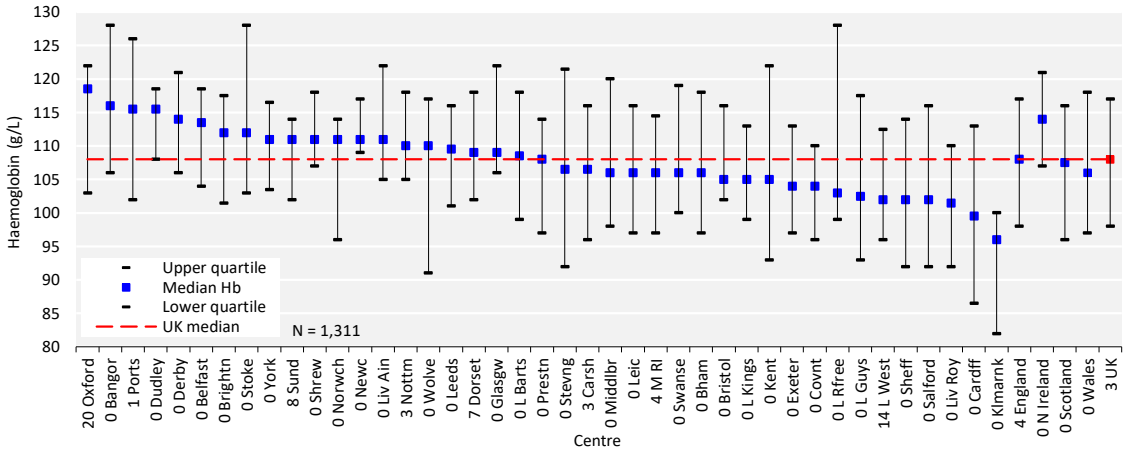

Figure 7.6 Median haemoglobin (Hb) in adult patients prevalent to HHD on 31/12/2019 by centre

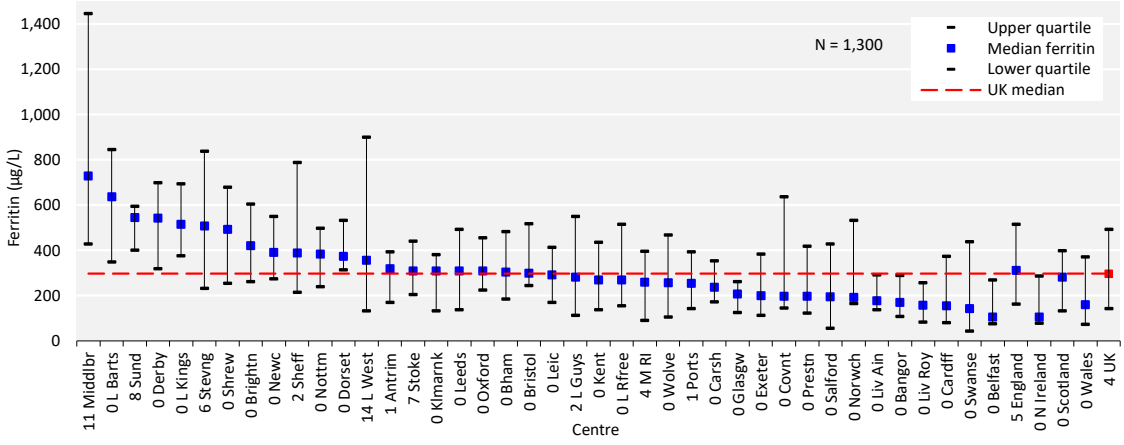

Figure 7.7 Median ferritin in adult patients prevalent to HHD on 31/12/2019 by centre

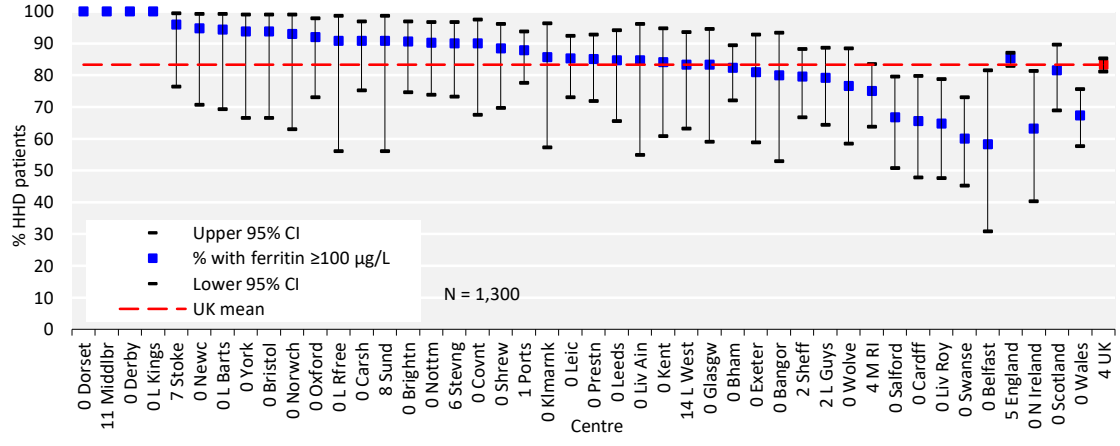

Figure 7.8 Percentage of adult patients prevalent to HHD on 31/12/2019 with ferritin ≥100 µg/L by centre
CI – confidence interval

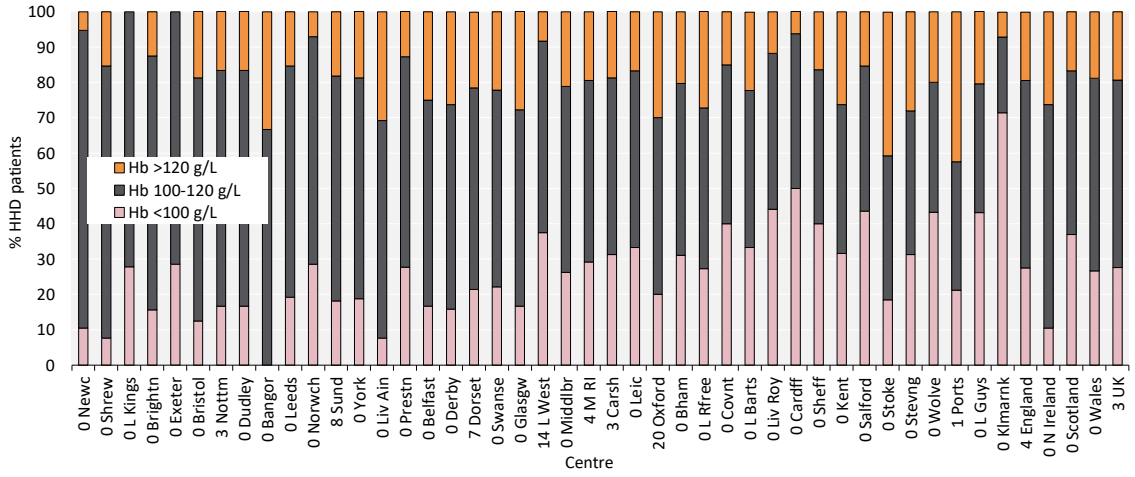

Figure 7.9 Distribution of haemoglobin (Hb) in adult patients prevalent to HHD on 31/12/2019 by centre

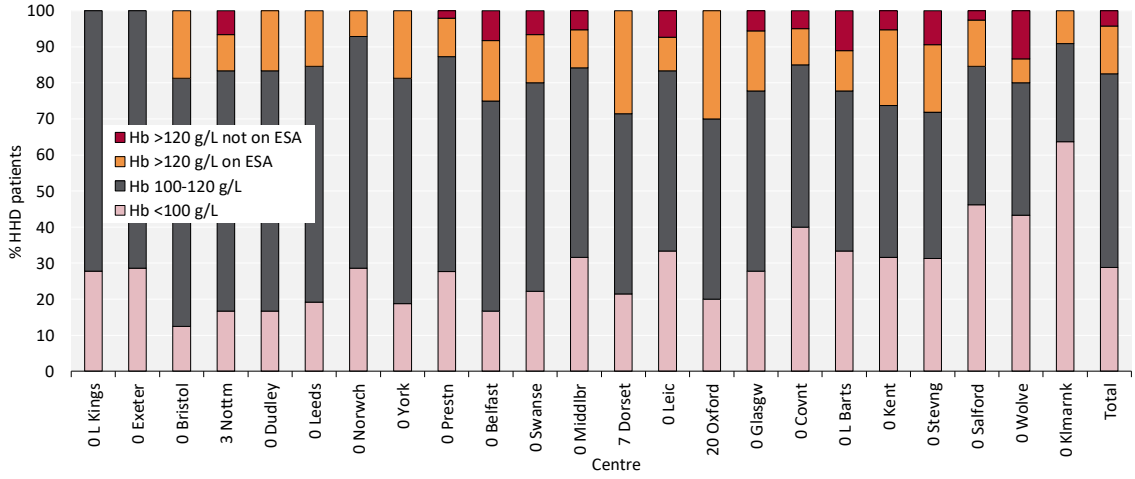

Figure 7.10 Distribution of haemoglobin (Hb) in adult patients prevalent to HHD on 31/12/2019 and the proportion with haemoglobin >120 g/L receiving erythropoiesis stimulating agent (ESA) by centre

Figure (including total) does not include centres with <70% data completeness (or <70% ESA use).

Cause of death in adult HHD patients

Cause of death was analysed in prevalent patients receiving HHD on 31/12/2018 and followed-up for one year in 2019. 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. Further detail on the survival of prevalent RRT patients is in chapter 3.

Table 7.9 Cause of death in adult patients prevalent to HHD on 31/12/2018 followed-up in 2019 by age group

	HHD all ages		HHD <65 yrs		HHD ≥65 yrs	
Cause of death	N	%	N	%	N	%
Cardiac disease	24	27.9	13	28.3	11	27.5
Cerebrovascular disease	4	4.7	3	6.5	1	2.5
Infection	11	12.8	6	13.0	5	12.5
Malignancy	9	10.5	6	13.0	3	7.5
Treatment withdrawal	14	16.3	7	15.2	7	17.5
Other	15	17.4	6	13.0	9	22.5
Uncertain aetiology	9	10.5	5	10.9	4	10.0
Total (with data)	**86**	**100.0**	**46**	**100.0**	**40**	**100.0**
Missing	45	34.4	28	37.8	17	29.8

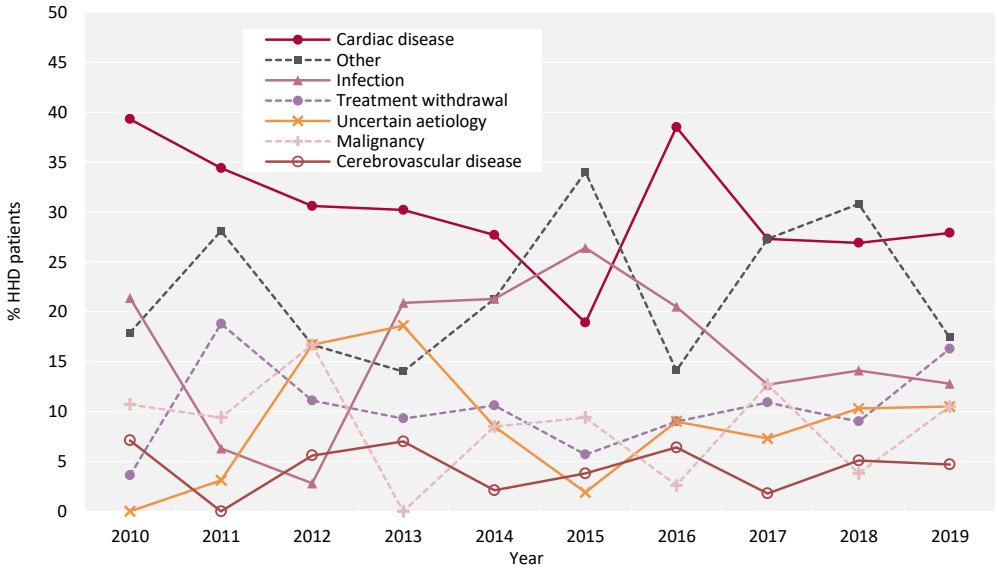

Figure 7.11 Cause of death between 2010 and 2019 for adult patients prevalent to HHD at the beginning of the year

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Chapter 8

Children and young people on renal replacement therapy (RRT) for end-stage kidney disease (ESKD) in the UK in 2019

Contents

Introduction

This chapter describes the population of children and young people aged <18 years with end-stage kidney disease (ESKD) who were on renal replacement therapy (RRT) in the UK for at least 90 days in 2019 (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 died or recovered within the first 90 days of RRT were excluded from the analyses.

There are 13 paediatric renal 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.

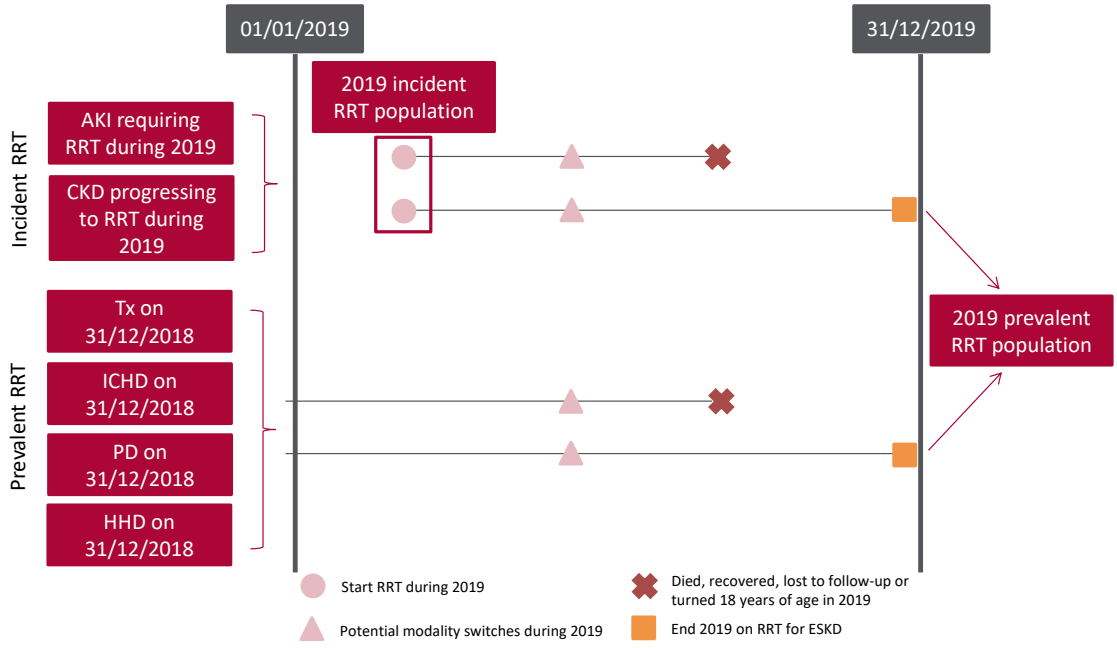

Figure 8.1 Pathways children and young people could follow to be included in the UK 2019 incident and/or prevalent RRT populations

Note that patients starting RRT in 2019 are only included in this chapter if they remained on RRT for ≥90 days.

CKD – chronic kidney disease

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

- **Incident population:** patients who started RRT during 2019 and remained on RRT for at least 90 days.
- **Prevalent population:** patients who were on RRT at the end of 2019 and still under the care of a paediatric renal centre.
- **Five-year populations:** patients who started RRT and remained on RRT for at least 90 days in the periods 2005–2009, 2010–2014 and 2015–2019.

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

- **Incident population:** patients who started RRT during 2019 in either an adult or paediatric centre and remained on RRT for at least 90 days.
- **Prevalent population:** patients who were on RRT at the end of 2019 in either an adult or paediatric centre.

This chapter addresses the following key aspects of the care of children incident to or on RRT 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 RRT:** these include anaemia and mineral and bone disorders.

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 RRT:** 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.

Rationale for analyses

For both the children and young people sections, the analyses begin with a description of the 2019 incident and prevalent RRT populations, including the number on RRT 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 RRT and, where data permit, their attainment by UK paediatric renal centres in 2019 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 RRT incidence and prevalence that are reported in this chapter

Audit guideline	Audit criteria	Related analysis/analyses
The Renal Association: Treatment of adults and children with renal 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 8.14–8.15, 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 8.17
	Serum bicarbonate concentrations should be 20–26 mmol/L	Table 8.17
	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 8.17
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 8.2–8.3, 8.15

Detail about the completeness of data returned to the UK Renal Registry (UKRR) is available through the UKRR data portal (renal.org/audit-research/data-portal). 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. This suppression of small numbers to minimise risk of patient re-identification limits in-depth analysis of centre-level data. A patient first seen by renal services within 90 days of starting RRT for ESKD is defined as a 'late presentation'. In this report 'late presentation' is used interchangeably with 'late referral'.

Key findings

Children

- 101 patients aged <16 years started RRT for ESKD in the UK in 2019 compared to 115 patients in 2018
- RRT incidence in patients aged <16 years was 8.0 pmarp compared to 9.1 pmarp in 2018
- 832 patients aged <16 years were receiving RRT at UK paediatric renal centres on 31/12/2019, an increase from 826 patients in 2018
- RRT prevalence in patients aged <16 years was 65.5 pmarp. 78.4% had a functioning Tx (48.6% living donor and 29.8% deceased donor), 10.8% were receiving HD and 10.7% were receiving PD
- Tubulointerstitial disease accounted for >50% of all primary renal diseases (PRDs) in prevalent paediatric patients, with a high male:female ratio (3.4:1)
- Between 2005 and 2019, 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, 78.7% of paediatric patients had a functioning kidney Tx
- The median height z-score for children on dialysis was −2.1 compared with -1.1 for those with a functioning Tx
- The median weight z-score for children on dialysis was -1.3 compared with −0.1 for those with a functioning Tx
- The overall median eGFR of the 652 children with a kidney transplant on 31/12/2019 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, 74.1% of the prevalent paediatric RRT population had 1 or more risk factors for cardiovascular disease; 3.7% had 3 risk factors
- 55.1% and 64.3% of prevalent HD patients achieved systolic blood pressure (SBP) and diastolic blood pressure (DBP) values <90th percentile, respectively
- 62.0% and 64.0% of prevalent PD patients achieved SBP and DBP values <90th percentile, respectively
- 74.4% and 78.6% of prevalent Tx patients achieved SBP and DBP values <90th percentile, respectively.

Young people

- 31 patients aged 16 to <18 years started RRT for ESKD in the UK in 2019
- RRT incidence in young people was 21.7 pmarp
- 219 patients aged 16 to <18 years were receiving RRT on 31/12/2019, of whom the majority (86.8%) were managed in paediatric renal centres
- RRT prevalence in patients aged 16 to <18 years was 153.6 pmarp
- Tubulointerstital disease accounted for 49.8% of all PRDs in prevalent young people, followed by familial/hereditary nephropathies (18.5%) and glomerular disease (18.5%). Diabetic nephropathy was seen in 0.5%
- The overall median eGFR of young people with a kidney transplant on 31/12/2019 was 67 mL/min/1.73m^2 and 2.5% had an eGFR of <30 mL/min/1.73m^2
- The proportion of young people prevalent to RRT on 31/12/2019 with a blood pressure within the 'normal' range (<130/80 mmHg) was 47.4% of dialysis and 72.1% of transplanted patients.

Analyses – children

Data completeness for prevalent paediatric RRT patients

Data returns of key variables for Tx and dialysis patients <16 years old at the end of 2019 are shown in tables 8.2 and 8.3, respectively, with further detail available through the UKRR data portal (renal.org/audit-research/data-portal).

Table 8.2 Data completeness for paediatric patients (<16 years old) prevalent to Tx on 31/12/2019 by centre

		Data completeness (%)														
Centre	N with Tx	Height at start	Weight at start	BMI	SBP	DBP	Hb	Creat at start	GH	ESA	IV iron	Chol	Bicarb	PTH	Ca	Phos
Bham_P	67	91.0	95.5	97.0	97.0	97.0	98.5	91.0	0.0	0.0	0.0	92.5	97.0	9.0	98.5	97.0
Blfst_P	25	84.0	92.0	96.0	100.0	96.0	100.0	96.0	92.0	96.0	92.0	72.0	100.0	100.0	100.0	100.0
Brstl_P	41	85.4	95.1	97.6	95.1	75.6	100.0	100.0	0.0	100.0	0.0	26.8	97.6	82.9	100.0	100.0
Cardf_P	26	92.3	92.3	11.5	92.3	46.2	96.2	96.2	0.0	15.4	0.0	96.2	96.2	96.2	96.2	96.2
Glasg_P	43	95.4	97.7	97.7	97.7	97.7	100.0	97.7	97.7	100.0	95.4	27.9	100.0	97.7	100.0	100.0
L Eve_P	68	72.1	73.5	100.0	100.0	100.0	100.0	75.0	0.0	0.0	0.0	58.8	100.0	98.5	100.0	100.0
L GOSH_P	125	84.0	91.2	98.4	53.6	53.6	95.2	92.8	96.0	99.2	99.2	39.2	90.4	88.0	90.4	95.2
Leeds_P	45	91.1	97.8	100.0	100.0	93.3	100.0	97.8	100.0	100.0	100.0	13.3	100.0	100.0	100.0	100.0
Livpl_P	27	66.7	77.8	0.0	0.0	0.0	92.6	88.9	0.0	0.0	0.0	63.0	92.6	92.6	92.6	92.6
Manch_P	69	95.7	97.1	98.6	100.0	100.0	100.0	97.1	98.6	100.0	1.5	43.5	100.0	97.1	100.0	100.0
Newc_P	27	81.5	85.2	92.6	92.6	0.0	100.0	74.1	0.0	0.0	0.0	85.2	100.0	85.2	100.0	100.0
Nottm_P	65	80.0	98.5	90.8	86.2	84.6	93.9	98.5	0.0	98.5	98.5	89.2	93.9	92.3	93.9	93.9
Soton_P	24	75.0	75.0	100.0	100.0	100.0	100.0	87.5	83.3	100.0	100.0	79.2	100.0	100.0	100.0	100.0
UK	**652**	**84.8**	**91.0**	**89.9**	**84.2**	**76.5**	**97.9**	**92.0**	**48.8**	**67.2**	**49.4**	**56.8**	**96.6**	**84.8**	**96.9**	**97.7**

Bicarb – bicarbonate; BMI – body mass index; Ca – calcium; Chol – cholesterol; Creat – creatinine; DBP – diastolic blood pressure; ESA – erythropoiesis stimulating agent; GH – growth hormone; Hb – haemoglobin; IV – intravenous; Phos – phosphate; PTH – parathyroid hormone; SBP – systolic blood pressure

Table 8.3 Data completeness for paediatric patients (<16 years old) prevalent to dialysis on 31/12/2019 by centre

		Data completeness (%)													
Centre	N on dialysis	Height at start	Weight at start	BMI	SBP	DBP	Hb	GH	ESA	IV iron	Chol	Bicarb	PTH	Ca	Phos
Bham_P	31	67.7	74.2	93.6	93.6	93.6	96.8	0.0	0.0	0.0	96.8	96.8	6.5	96.8	96.8
Blfst_P	4	100.0	100.0	75.0	75.0	0.0	100.0	75.0	100.0	100.0	75.0	100.0	100.0	100.0	100.0
Brstl_P	15	73.3	93.3	100.0	100.0	14.3	100.0	0.0	100.0	0.0	71.4	100.0	100.0	100.0	100.0
Cardf_P	6	66.7	50.0	0.0	83.3	0.0	83.3	0.0	0.0	0.0	50.0	83.3	83.3	83.3	83.3
Glasg_P	12	91.7	91.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	75.0	100.0	100.0	100.0	100.0
L Eve_P	11	90.9	90.9	100.0	100.0	100.0	100.0	0.0	0.0	0.0	9.1	100.0	100.0	100.0	100.0
L GOSH_P	30	66.7	70.0	100.0	83.3	83.3	96.7	23.3	23.3	23.3	43.3	56.7	96.7	56.7	96.7
Leeds_P	10	80.0	100.0	60.0	100.0	80.0	100.0	60.0	100.0	100.0	50.0	100.0	100.0	90.0	100.0
Livpl_P	10	80.0	80.0	0.0	0.0	0.0	80.0	0.0	0.0	0.0	20.0	80.0	80.0	80.0	80.0
Manch_P	20	100.0	100.0	95.0	95.0	45.0	100.0	95.0	95.0	0.0	55.0	100.0	90.0	100.0	100.0
Newc_P	10	70.0	70.0	50.0	50.0	0.0	100.0	0.0	0.0	0.0	30.0	100.0	100.0	100.0	100.0
Nottm_P	16	75.0	81.3	87.5	81.3	62.5	100.0	0.0	100.0	100.0	62.5	100.0	100.0	100.0	100.0
Soton_P	5	100.0	100.0	100.0	100.0	80.0	100.0	80.0	100.0	100.0	60.0	100.0	100.0	100.0	100.0
UK	**180**	**78.3**	**82.8**	**82.7**	**84.4**	**61.5**	**97.2**	**28.3**	**48.6**	**30.2**	**57.5**	**90.5**	**80.5**	**89.9**	**97.2**

Bicarb – bicarbonate; BMI – body mass index; Ca – calcium; Chol – cholesterol; DBP – diastolic blood pressure; ESA – erythropoiesis stimulating agent; GH – growth hormone; Hb – haemoglobin; IV – intravenous; Phos – phosphate; PTH – parathyroid hormone; SBP – systolic blood pressure

Changes to the incident paediatric RRT population

The number of incident patients on RRT <16 years old was calculated as an estimated age-related rate per million population (calculated as detailed in appendix A) and grouped by age, sex, five year time period, ethnicity, centre and PRD.

Table 8.4 Paediatric patients (<16 years old) incident to RRT in 2019 by age and sex

	All patients		Male		Female	
Age group (yrs)	N	pmarp	N	pmarp	N	pmarp
0-<2	14	9.5	5	6.6	9	12.5
2-<4	12	7.6	7	8.6	5	6.5
4-<8	16	4.9	10	5.9	6	3.7
8-<12	27	8.2	11	6.5	16	10.0
12-<16	32	10.5	19	12.1	13	8.7
<16 yrs	**101**	**8.0**	**52**	**8.0**	**49**	**7.9**

pmarp – per million age-related population

Table 8.5 Paediatric patients (<16 years old) incident to RRT by age and 5 year time period

	2005-2009		2010-2014		2015-2019	
Age group (yrs)	N	pmarp	N	pmarp	N	pmarp
0-<2	104	14.0	99	12.2	103	13.3
2-<4	45	6.3	74	9.4	63	7.9
4-<8	100	7.4	91	6.0	117	7.1
8-<12	127	8.8	128	9.2	128	8.1
12-<16	221	14.6	174	11.7	173	12.0
<16 yrs	**597**	**10.4**	**566**	**9.4**	**584**	**9.3**

pmarp – per million age-related population

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

	2005-2009		2010-2014		2015-2019	
Ethnicity	N	%	N	%	N	%
White	443	75.2	400	70.7	376	67.1
Asian	101	17.1	101	17.8	110	19.6
Black	26	4.4	26	4.6	37	6.6
Other	19	3.2	39	6.9	37	6.6
<16 yrs	**589**	**100.0**	**566**	**100.0**	**560**	**100.0**

8 children in 2005–2009, 0 in 2010–2014 and 24 in 2015–2019 with no ethnicity recorded were excluded.

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

	2005-2009		2010-2014		2015-2019	
Centre	N	%	N	%	N	%
Blfst_P	17	2.8	21	3.7	10	1.7
Bham_P	66	11.1	62	11.0	81	13.9
Brstl_P	32	5.4	38	6.7	30	5.1
Cardf_P	21	3.5	21	3.7	20	3.4
Glasg_P	49	8.2	33	5.8	47	8.0
L Eve_P	65	10.9	56	9.9	65	11.1
L GOSH_P	121	20.3	104	18.4	103	17.6
Leeds_P	56	9.4	52	9.2	41	7.0
Livpl_P	26	4.4	30	5.3	23	3.9
Manch_P	47	7.9	56	9.9	63	10.8
Newc_P	23	3.9	22	3.9	32	5.5
Nottm_P	61	10.2	51	9.0	47	8.0
Soton_P	13	2.2	20	3.5	22	3.8
<16 yrs	**597**	**100.0**	**566**	**100.0**	**584**	**100.0**

PRDs were grouped into categories as shown in table 8.8, with the mapping of disease codes into groups explained in more detail in appendix A.

Table 8.8 Paediatric patients (<16 years old) incident to RRT by primary renal disease (PRD) and 5 year time period

	2005-2009		2010-2014		2015-2019	
PRD	N	%	N	%	N	%
Tubulointerstitial disease	282	47.8	303	53.6	263	48.0
- CAKUT	260	44.1	286	50.6	256	46.7
- Non-CAKUT	22	3.7	17	3.0	7	1.3
Glomerular disease	128	21.7	93	16.5	109	19.9
Familial/hereditary nephropathies	95	16.1	98	17.3	78	14.2
Systemic diseases affecting the kidney	28	4.7	21	3.7	22	4.0
Miscellaneous renal disorders	57	9.7	50	8.8	76	13.9

7 children in 2005–2009, 1 in 2010–2014 and 36 in 2015–2019 with no PRD recorded were excluded.
CAKUT – congenital anomalies of the kidneys and urinary tract

Start modality of incident paediatric RRT patients

Start modality used by patients <16 years old starting RRT between 2005 and 2019 was grouped by five year time periods.

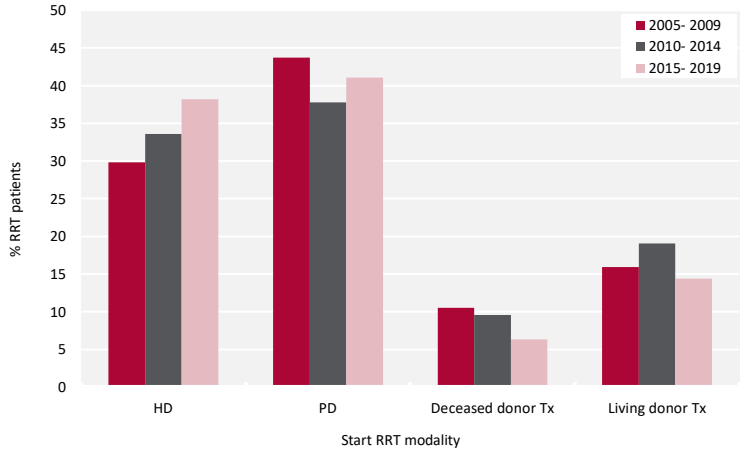

Figure 8.2 Start RRT modality for paediatric patients (<16 years old) incident to RRT by 5 year time period

Pre-emptive transplantation in incident paediatric RRT patients

The analysis of pre-emptive transplantation excluded patients starting RRT aged <3 months and patients presenting late.

Table 8.9 Pre-emptive transplantation in the incident paediatric RRT population aged 3 months to 16 years by 5 year time period, sex, ethnicity, age at start of RRT and primary renal disease (PRD)

	N on RRT	N (%) with pre-emptive Tx
Total cohort analysed (2005-2019)	1,277	416 (32.6)
Time period		
2005-2009	422	151 (35.8)
2010-2014	419	153 (36.5)
2015-2019	436	112 (25.7)
Sex		
Male	812	287 (35.3)
Female	465	129 (27.7)
Ethnicity		
White	887	329 (37.1)
Asian	235	49 (20.9)
Black	61	9 (14.8)
Other	68	19 (28.0)
Age at start of RRT (yrs)		
3 mths-<2	146	6 (4.1)
2-<4	157	45 (28.7)
4-<8	248	104 (42)
8-<12	294	102 (34.7)
12-<16	432	159 (36.8)
PRD		
Tubulointerstitial disease	676	285 (42.2)
Glomerular disease	237	14 (5.9)
Familial/hereditary nephropathies	190	64 (33.7)
Miscellaneous renal disorders	98	28 (28.6)
Systemic diseases affecting the kidney	39	16 (41)

98 children were excluded because they were aged <3 months; 372 children were excluded because they presented late.

Demographics of prevalent paediatric RRT patients

The number of prevalent patients on RRT <16 years old was calculated as an estimated age-related rate per million population (calculated as detailed in appendix A) and grouped by age, sex and ethnicity.

Table 8.10 Age and sex breakdown of paediatric patients (<16 years old) prevalent to RRT on 31/12/2019

	All patients		Male		Female		
Age group (yrs)	N	pmarp	N	pmarp	N	pmarp	M/F ratio
0-<2	15	10.2	6	7.9	9	12.5	0.6
2-<4	53	33.6	33	40.7	20	26.0	1.6
4-<8	160	48.6	113	67.0	47	29.3	2.3
8-<12	258	78.3	159	94.2	99	61.6	1.5
12-<16	346	113.2	207	132.1	139	93.3	1.4
<16 yrs	**832**	**65.5**	**518**	**79.6**	**314**	**50.7**	**1.6**

pmarp – per million age-related population

Table 8.11 Age and ethnicity breakdown of paediatric patients (<16 years old) prevalent to RRT on 31/12/2019

	N			
Age group (yrs)	White	Asian	Black	Other
0-<4	49	5	4	6
4-<8	105	30	10	13
8-<12	178	48	9	17
12-<16	238	66	18	17
<16 yrs	**570**	**149**	**41**	**53**

The 2011 Office for National Statistics census was used to estimate the proportion of White, South Asian, Black and Other ethnicity which was then applied to the population estimate for 2019.
19 children with no ethnicity recorded were excluded.
pmarp – per million age-related population

Treatment modality in prevalent paediatric RRT patients

The current and start RRT modalities for prevalent RRT patients aged <16 years are shown in figures 8.3 and 8.4, respectively. Table 8.12 breaks down current modality for prevalent patients by age group.

Table 8.12 RRT modality used by paediatric patients (<16 years old) prevalent to RRT on 31/12/2019 by age group

		HD		PD		Living donor Tx		Deceased donor Tx	
Age group (yrs)	Total N	N	%	N	%	N	%	N	%
0-<2	15	6	40.0	9	60.0	0	0.0	0	0.0
2-<4	53	15	28.3	20	37.7	13	24.5	5	9.4
4-<8	160	21	13.1	22	13.8	82	51.3	35	21.9
8-<12	258	17	6.6	15	5.8	147	57.0	79	30.6
12-<16	345	31	9.0	23	6.7	162	47.0	129	37.4
<16 yrs	**831**	**90**	**10.8**	**89**	**10.7**	**404**	**48.6**	**248**	**29.8**

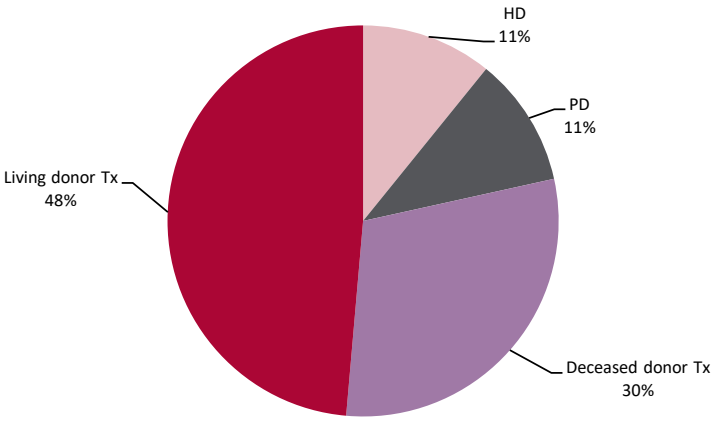

Figure 8.3 RRT modality used by paediatric patients (<16 years old) prevalent to RRT on 31/12/2019

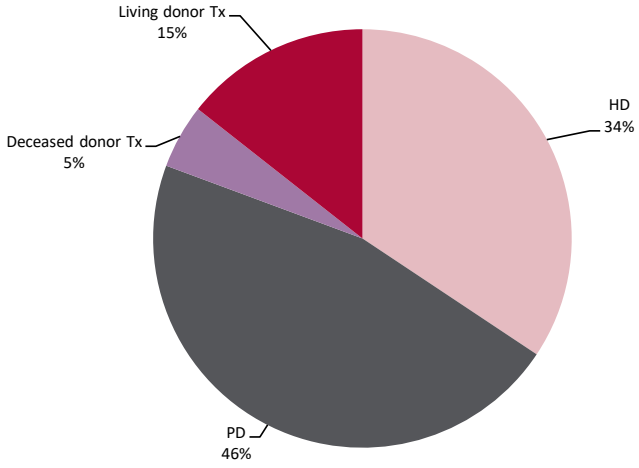

Figure 8.4 RRT modality used at the start of RRT by paediatric patients (<16 years old) prevalent to RRT on 31/12/2019

Causes of ESKD in prevalent paediatric RRT patients

PRDs were grouped into categories as shown in table 8.13.

Table 8.13 Primary renal diseases (PRDs) of paediatric patients (<16 years old) prevalent to RRT on 31/12/2019 by sex and ethnicity

PRD	N	%	N male	N female	% non-White
Tubulointerstitial disease	425	53.1	326	99	28.2
- CAKUT	415	51.8	320	95	27.6
- Non-CAKUT	10	1.2	6	4	40.0
Glomerular disease	155	19.4	83	72	34.0
Familial/hereditary nephropathies	105	13.1	38	67	38.8
Systemic diseases affecting the kidney	38	4.7	17	21	10.5
Miscellaneous renal disorders	78	9.7	42	36	25.6
Total (with data)	**801**	**100.0**	**506**	**295**	**29.4**
Missing	31	3.9	12	19	47.6

CAKUT – congenital anomalies of the kidneys and urinary tract

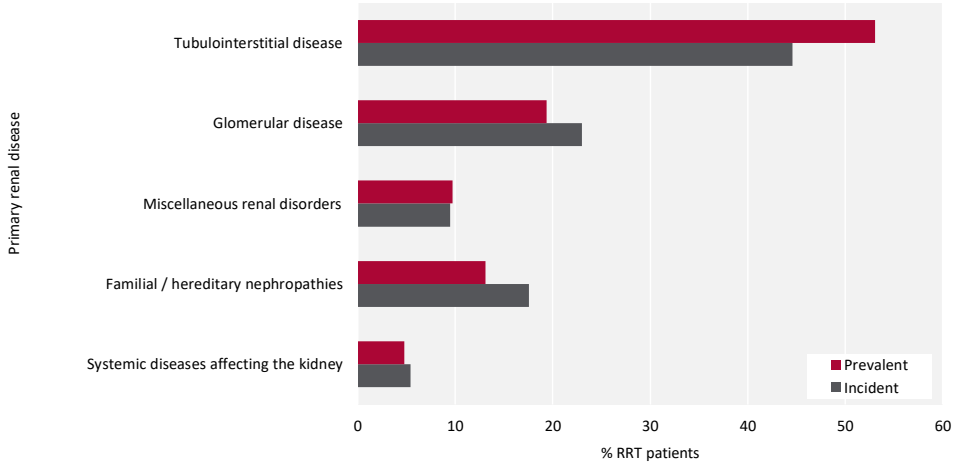

Figure 8.5 Comparison of primary renal diseases for paediatric patients (<16 years old) incident and prevalent to RRT in 2019 with no missing data

Growth of prevalent paediatric RRT patients

The height and weight of children receiving RRT 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 RRT patients

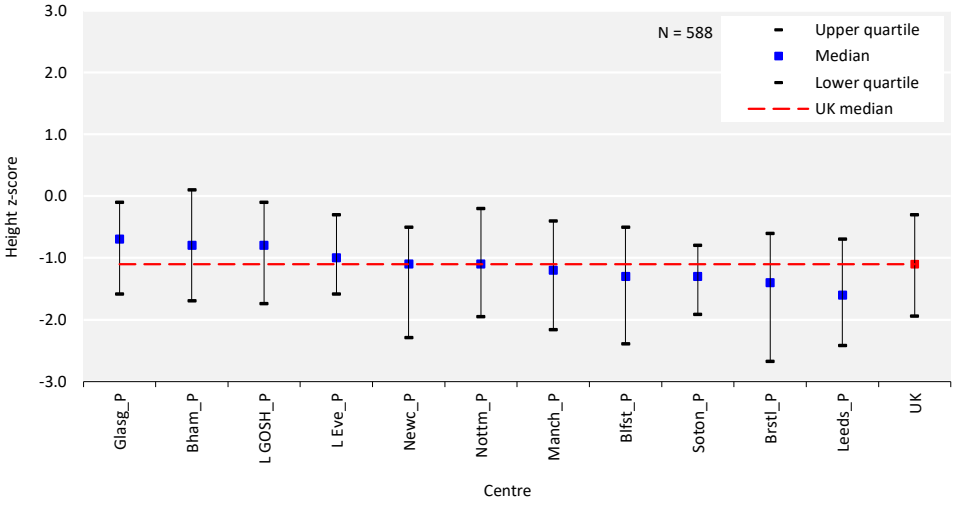

Figure 8.6 Median height z-scores for paediatric patients (<16 years old) prevalent to Tx on 31/12/2019 by centre

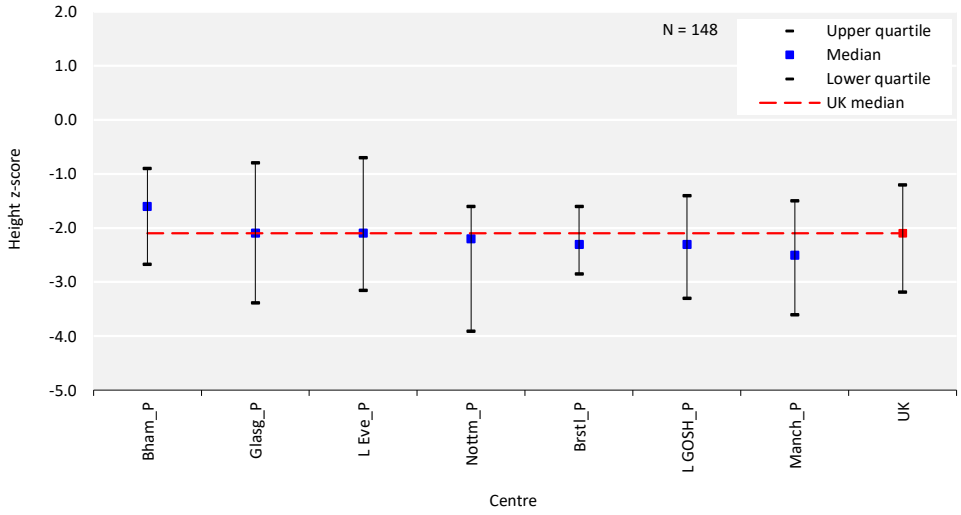

Figure 8.7 Median height z-scores for paediatric patients (<16 years old) prevalent to dialysis on 31/12/2019 by centre

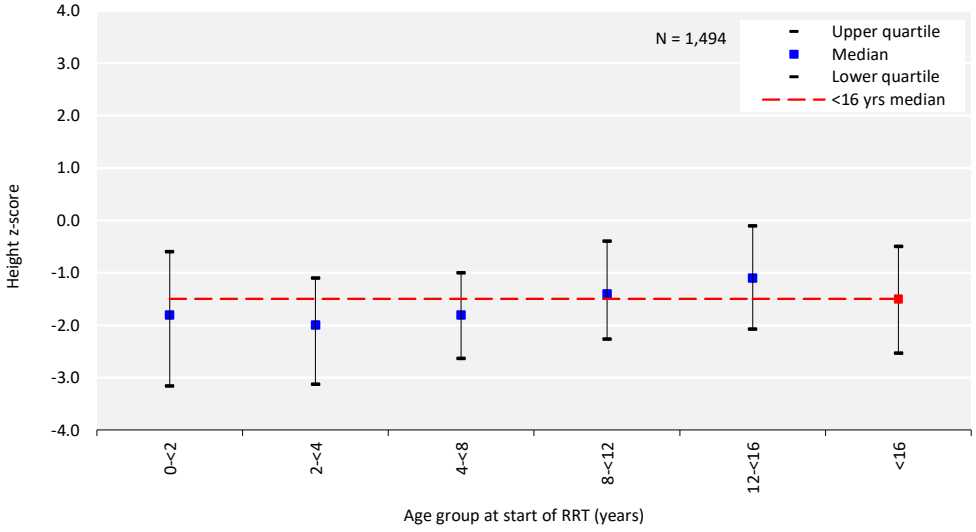

Figure 8.8 Median height z-scores at start of RRT for incident paediatric RRT patients (<16 years old) between 2005 and 2019 by age group at start of RRT

Weight of paediatric RRT patients

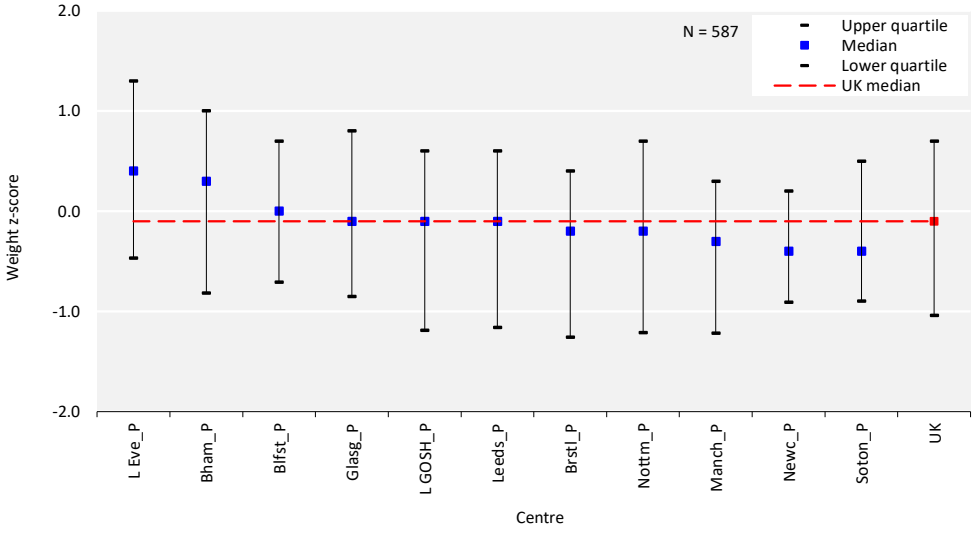

Figure 8.9 Median weight z-scores for paediatric patients (<16 years old) prevalent to Tx on 31/12/2019 by centre

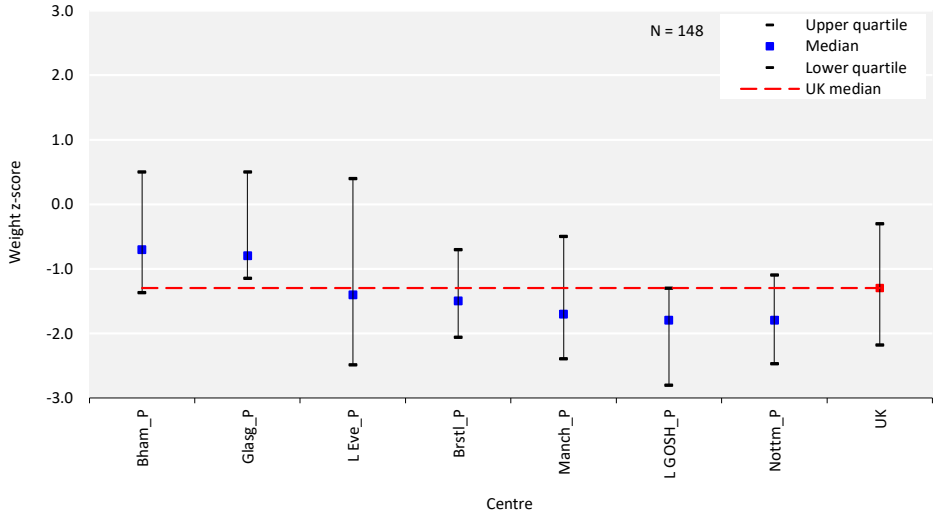

Figure 8.10 Median weight z-scores for paediatric patients (<16 years old) prevalent to dialysis on 31/12/2019 by centre

Cardiovascular risk factor evaluation in prevalent paediatric RRT patients

Obesity in paediatric RRT 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 renal 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.

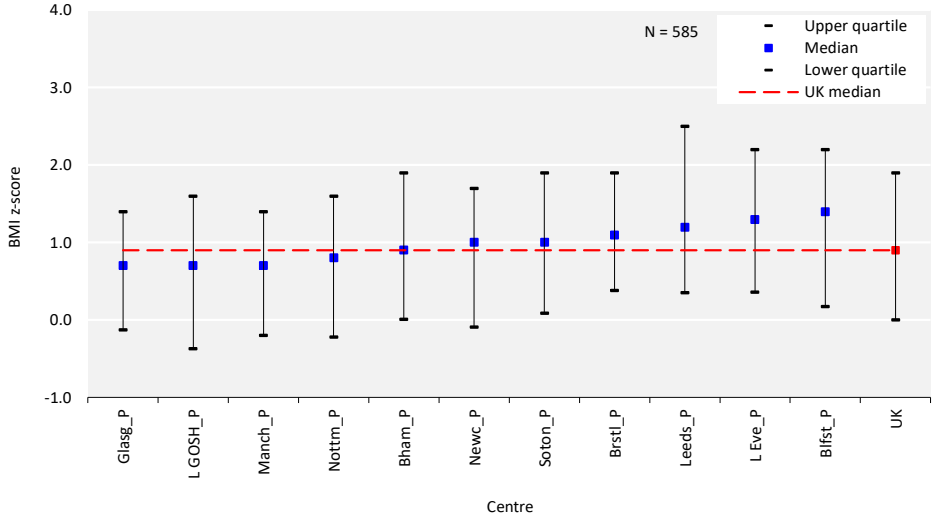

Figure 8.11 Median body mass index (BMI) z-scores for paediatric patients (<16 years old) prevalent to Tx on 31/12/2019 by centre

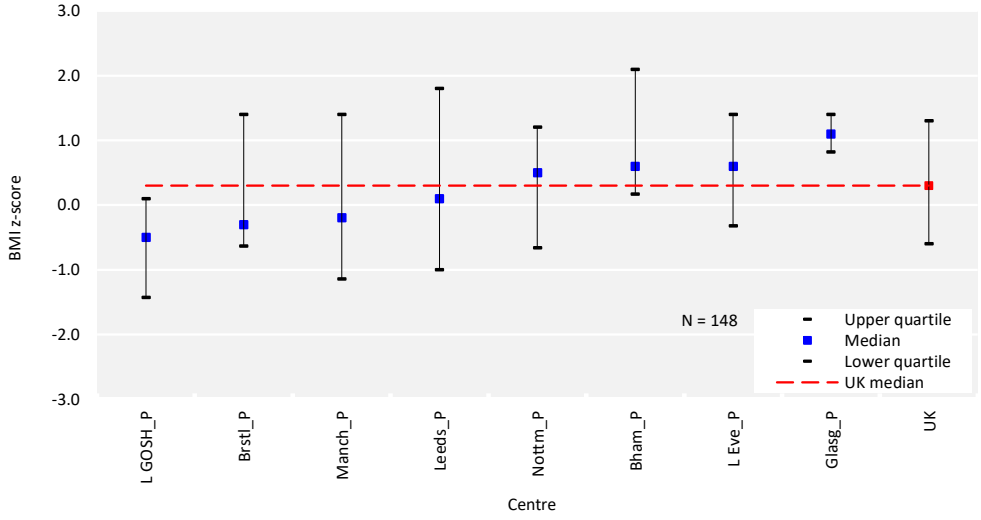

Figure 8.12 Median body mass index (BMI) z-scores for paediatric patients (<16 years old) prevalent to dialysis on 31/12/2019 by centre

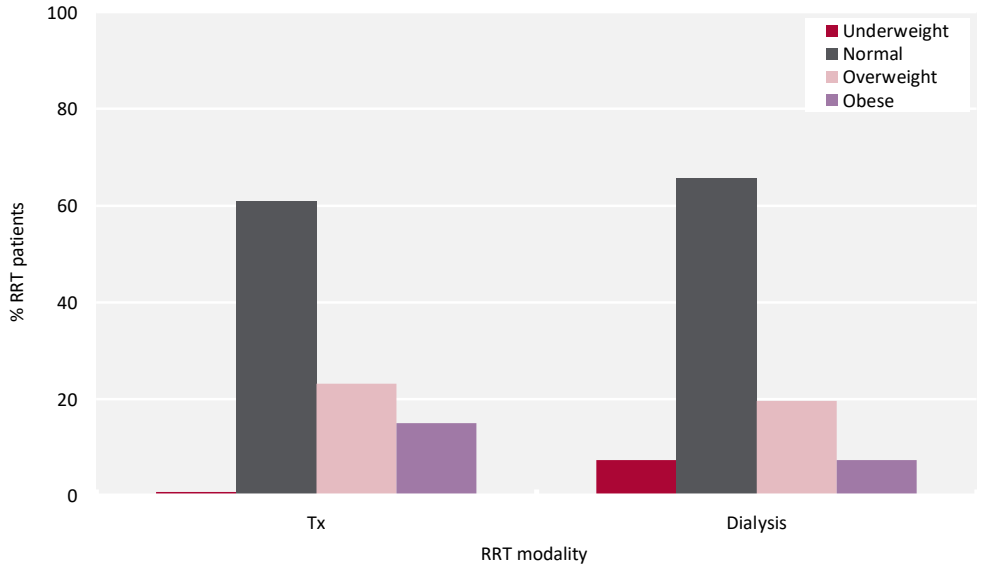

Figure 8.13 Body mass index categorisation of paediatric patients (<16 years old) prevalent to RRT on 31/12/2019 by RRT modality

Hypertension in paediatric RRT patients

In paediatric RRT patients, the systolic blood pressure should be maintained at <90th percentile for age, sex and height.

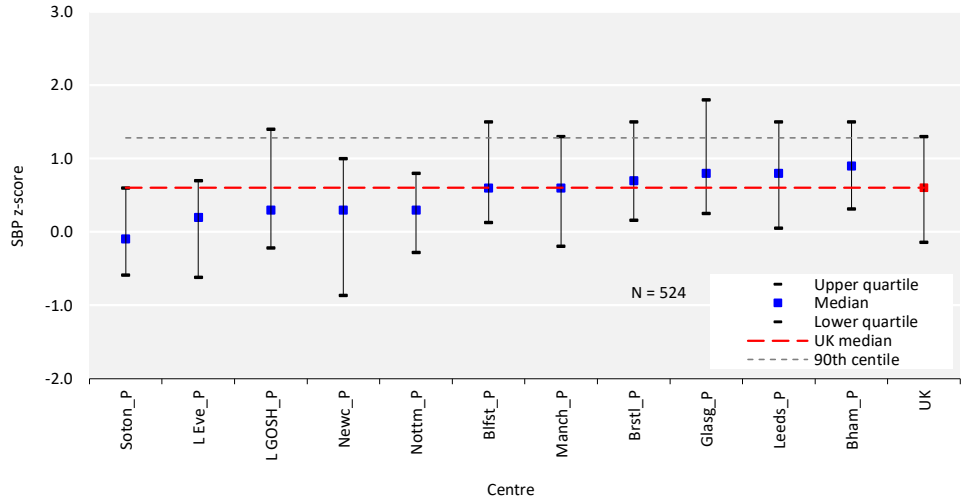

Figure 8.14 Median systolic blood pressure (SBP) z-scores for paediatric patients (<16 years old) prevalent to Tx on 31/12/2019 by centre

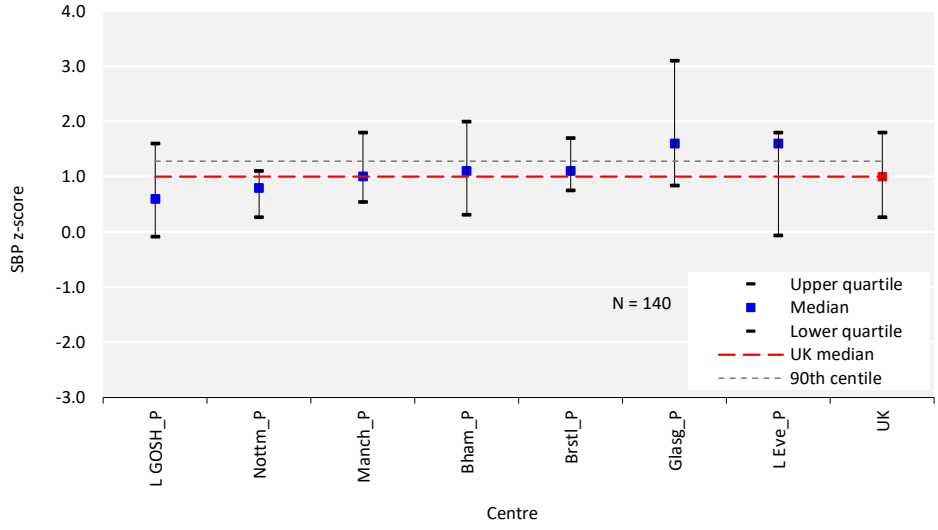

Figure 8.15 Median systolic blood pressure (SBP) z-scores for paediatric patients (<16 years old) prevalent to dialysis on 31/12/2019 by centre

Table 8.14 Percentage of paediatric patients (<16 years old) prevalent to RRT on 31/12/2019 achieving the standards for blood pressures

	SBP		DBP	
Characteristic	N	% <90th percentile	N	% <90th percentile
Total	665	71.1	584	76.0
Age group (yrs)				
0-<5	82	64.6	58	70.7
5-<12	314	68.5	278	75.9
12-<16	269	76.2	248	77.4
Sex				
Male	415	70.6	369	74.0
Female	250	72.0	215	79.5
Ethnicity				
White	447	73.4	389	78.9
Asian	126	62.7	116	68.1
Black	37	70.3	33	75.8
Other	41	78.1	36	80.6
Modality				
HD	69	55.1	56	64.3
PD	71	62.0	50	64.0
Tx	524	74.4	477	78.6

DBP – diastolic blood pressure; SBP – systolic blood pressure

Cardiovascular risk factors in paediatric RRT patients

The analysis of the percentage of prevalent RRT patients with identified cardiovascular risk factors was restricted to the 402 of the 832 patients (48.3%) with data for all three risk factors.

Table 8.15 Frequency of number of cardiovascular risk factors in paediatric patients (<16 years old) prevalent to RRT on 31/12/2019

N cardiovascular risk factors	Hypertensive	Overweight/Obese	Hypercholesterolaemic	N	%	Total %
0	No	No	No	104	25.9	25.9
1	Yes	No	No	61	15.2	
	No	Yes	No	67	16.7	43.8
	No	No	Yes	48	11.9	
2	Yes	Yes	No	45	11.2	
	Yes	No	Yes	31	7.7	26.6
	No	Yes	Yes	31	7.7	
3	Yes	Yes	Yes	15	3.7	3.7
Total N	**152**	**158**	**125**	**402**		
Total %	**37.8**	**39.3**	**31.1**			**100.0**

Biochemistry parameters in prevalent paediatric RRT patients

The median values and the percentage with eGFR <30 mL/min/1.73m^2 for prevalent 2019 paediatric Tx patients are presented in table 8.16.

Table 8.16 Median estimated glomerular filtration rate (eGFR) and percentage with eGFR <30 mL/min/1.73m^2 in paediatric patients (<16 years old) prevalent to Tx on 31/12/2019 by centre

Centre	N with Tx	Median eGFR (mL/min/1.73m^2)	% eGFR <30 mL/min/1.73m^2	% data completeness
Bham_P	67	55	9.2	97.0
Blfst_P	25	75	8.3	96.0
Brstl_P	41	64	2.6	92.7
Cardf_P[1]	26			15.4
Glasg_P	43	87	0.0	97.7
L Eve_P	68	56	4.4	100.0
L GOSH_P	125			68.0
Leeds_P	45	72	2.2	100.0
Livpl_P[1]	27			0.0
Manch_P	69	67	5.9	98.6
Newc_P	27	79	0.0	88.9
Nottm_P	65	50	8.5	90.8
Soton_P	24	68	4.2	100.0
UK	**652**	**61**	**6.6**	**83.7**

Blank cells – centres with <70% data completeness or <10 patients.
[1]Although completeness of creatinine data was good, height data completeness was very low – heights are needed to calculate eGFRs from creatinine.

Table 8.17 Attainment of targets for haemoglobin, calcium, phosphate, parathyroid hormone and bicarbonate in paediatric patients (<16 years old) (a) prevalent to dialysis on 31/12/2019 by centre and (b) prevalent to Tx on 31/12/2019 with estimated glomerular filtration rate (eGFR) <30 mL/min/1.73 m^2 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	31	3.3	60.0	0.0	73.3	10.0	63.3		0.0	80.0
Blfst_P	4									
Brstl_P	15	28.6	57.1	0.0	78.6	21.4	50.0	42.9	7.1	71.4
Cardf_P	6									
Glasg_P	12	8.3	50.0	8.3	83.3	41.7	41.7	16.7	0.0	75.0
L Eve_P	11	18.2	63.6	0.0	90.9	0.0	45.5	36.4	9.1	90.9
L GOSH_P	30	20.7	34.5			0.0	58.6	62.1		
Leeds_P	10	50.0	40.0	0.0	77.8	10.0	50.0	30.0	0.0	70.0
Livpl_P	10	12.5	62.5	0.0	50.0	25.0	37.5	50.0	0.0	50.0
Manch_P	20	20.0	50.0	10.0	55.0	20.0	40.0	44.4	5.0	75.0
Newc_P	10	30.0	60.0	0.0	70.0	30.0	30.0	60.0	0.0	90.0
Nottm_P	16	31.3	37.5	0.0	81.3	6.3	25.0	25.0	0.0	81.3
Soton_P	5									
UK	**180**	**20.1**	**49.4**	**4.4**	**70.2**	**13.8**	**47.1**	**44.4**	**3.1**	**75.9**
TX PATIENTS WITH EGFR <30 ML/MIN/1.73 M^2										
UK	**36**	**41.7**	**58.3**	**4.0**	**84.0**	**11.1**	**69.4**	**54.2**	**47.2**	**52.8**

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 8.18 Median estimated glomerular filtration rate (eGFR) in paediatric patients (<16 years old) prevalent to Tx on 31/12/2019 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 m^2)	N	Median eGFR (mL/min/1.73 m^2)	N	Median eGFR (mL/min/1.73 m^2)
3 mths	12	92	20	67	22	66
1 yr	16	74	35	72	23	59
3 yrs	12	83	73	68	46	65
5 yrs	0	0	98	61	55	55
≥7 yrs	0	0	48	56	86	54
Total (IQR)	**40**	**87 (64-110)**	**274**	**64 (47-83)**	**232**	**56 (44-73)**

IQR – interquartile range

The percentage of patients with haemoglobin above target range on ESA is shown by renal centre.

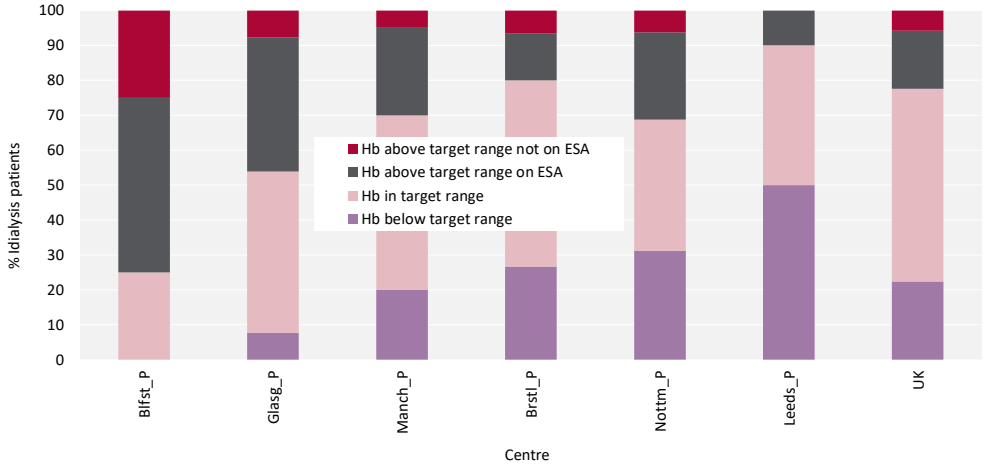

Figure 8.16 Proportion of paediatric patients (<16 years old) prevalent to dialysis on 31/12/2019 with haemoglobin (Hb) below, within and above target by centre; for those above target the proportion on erythropoiesis stimulating agent (ESA) therapy is shown

Transfer to adult renal services for prevalent paediatric RRT patients

Seventy-five paediatric patients transitioned to adult renal centres in 2019. The median age of patients at transfer was 17.8 years with an IQR of 17.4–18.2 years. Overall, the demographics of this population reflected those of the prevalent paediatric RRT population.

Survival in paediatric RRT patients

Of patients aged <16 years, 1,616 started RRT between 2005 and 2018 at paediatric renal centres and were included in survival analyses, to allow at least one year follow-up. At the end of 2019, 90 deaths had been reported in these children before they reached 16 years of age and when still under the care of a paediatric renal centre. Patients included in the analysis must have been alive on RRT for 90 days. The median follow-up time (beyond day 90) was 3.8 years (range three days to 14.7 years).

Table 8.19 Survival of incident paediatric RRT patients (<16 years old) at 1 year intervals of RRT by age at start of RRT

	Age group (yrs)				
Survival	0-<2	2-<4	4-<8	8-<12	12-<16
Survival at 1 year (%)	93.8	98.2	98.6	99.4	99.2
95% CI	90.4-96.1	94.6-99.4	96.4-99.5	97.8-99.9	97.5-99.7
Survival at 2 years (%)	92.4	96.3	95.3	98.5	97.6
95% CI	88.6-94.9	92-98.3	92.1-97.3	96.5-99.4	95-98.9
Survival at 3 years (%)	90.0	94.9	94.6	97.9	97.6
95% CI	85.8-93	90.1-97.4	91.1-96.7	95.6-99	95-98.9
Survival at 4 years (%)	87.9	94.2	94.6	97.2	
95% CI	83.3-91.2	89-96.9	91.1-96.7	94.7-98.5	
Survival at 5 years (%)	86.9	93.3	93.5	96.7	
95% CI	82.2-90.5	87.8-96.4	89.8-96	93.9-98.2	

CI – confidence interval

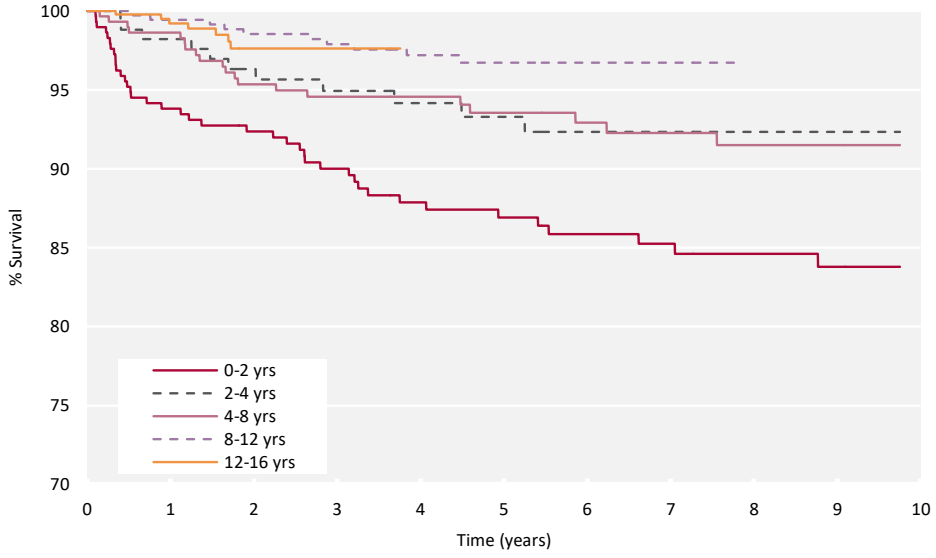

Figure 8.17 Unadjusted Kaplan-Meier survival (from day 90) of incident paediatric RRT patients (<16 years old) between 2005 and 2018 by age group at start of RRT

The 8–12 yrs and 12–16 yrs lines stop before 10 years, because the analysis was censored at age 16 years. The UKRR is combining the paediatric and adult databases and so in future will be able to report survival extended into adulthood.

Analyses – young people

RRT incidence and prevalence in young people

Table 8.20 reports the numbers of young people who started RRT in 2019 (incidence) as well as those on RRT as of 31/12/2019 (prevalence) in both paediatric and adult centres, as an estimated total pmarp and grouped by sex, ethnicity and PRD. Diabetes is reported as a separate disease entity. For incident young people, start modality is reported; current treatment modality is reported for prevalent patients.

Table 8.20 Demographics of young people (16–<18 years) incident to RRT in 2019 and/or prevalent to RRT on 31/12/2019, by care setting

	Incident			Prevalent		
Characteristic	Paediatric centres	Adult centres	All	Paediatric centres	Adult centres	All
N	21	10	31	190	29	219
pmarp			21.7			153.6
Median age (yrs)	16.7	17.5	17.0	16.9	17.7	17.0
% male	57.1	60.0	58.1	61.6	72.4	63.0
Ethnicity[1] (%)						
White	52.9	77.8	61.5	65.2	65.4	65.2
Asian	23.5	11.1	19.2	21.0	11.5	19.8
Black	11.8	11.1	11.5	9.4	15.4	10.1
Other	11.8	0.0	7.7	4.4	7.7	4.8
Missing	19.0	10.0	16.1	4.7	10.3	5.5
PRD[1] (%)						
Tubulointerstitial disease	35.3	33.3	34.6	50.6	44.0	49.8
Glomerular disease	29.4	44.4	34.6	18.9	16.0	18.5
Familial/hereditary nephropathies	23.5	11.1	19.2	17.8	24.0	18.5
Systemic diseases affecting the kidney	0.0	0.0	0.0	1.7	4.0	2.0
Diabetes	0.0	0.0	0.0	0.0	4.0	0.5
Miscellaneous renal disorders	11.8	11.1	11.5	11.1	8.0	10.7
Missing	19.0	10.0	16.1	5.3	13.8	6.4
Modality (%)						
HD	42.9	60.0	48.4	12.1	31.0	14.6
PD	38.1	30.0	35.5	6.8	10.3	7.3
Tx	19.1	10.0	16.1	81.1	58.6	78.1

[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

Table 8.21 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 8.21 Number of centres that submitted data for young people (16–<18 years) incident to RRT in 2019 and/or prevalent to RRT on 31/12/2019, by care setting

Setting	Incident	Prevalent
Paediatric centres	10 out of 13	13 out of 13
Adult centres	10 out of 70	18 out of 70

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 31/12/2019 are presented by care setting (adult or paediatric centre).

Table 8.22 Measures of graft function in young people (16–<18 years) prevalent to Tx on 31/12/2019, by care setting

Setting	N on Tx	Median age (yrs)	N with creatinine data	Creatinine (µmol/L)	Median FAS-eGFR (mL/min/1.73m^2)	% FAS-eGFR <30 mL/min/1.73m^2	% creatinine completeness
Paediatric centres	154	16.9	141	107	67	2.1	94.1
Adult centres	17	17.8	16	122	60	6.3	91.6

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

Table 8.23 reports the median eGFR for all young people prevalent to Tx on 31/12/2019 by time since transplantation. Small numbers preclude further analysis by care setting (adult or paediatric centre).

Table 8.23 Estimated glomerular filtration rate (eGFR) in young people (16–<18 years) prevalent to Tx on 31/12/2019 by time since transplantation

Time since transplantation	N	Median FAS-eGFR (mL/min/1.73m^2)
3 months	12	55
1 year	25	70
3 years	33	65
5 years	30	71
≥7 years	57	68
Total (IQR)	**157**	**67 (52-83)**

FAS – Full Age Spectrum; IQR – interquartile range

Biochemical and blood pressure measures in young people

Table 8.24 shows attainment of biochemical and blood pressure measures for young people prevalent to dialysis and transplant on 31/12/2019 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. Data completeness was satisfactory (>70%) for all biochemical parameters, although a higher proportion of incomplete blood pressure data was noted among young people managed in adult centres. As a result, we advise caution when making inferences from the unadjusted data.

Table 8.24 Attainment of biochemical and blood pressure measures in young people (16–<18 years) prevalent to RRT on 31/12/2019, by modality and care setting

	Dialysis			Tx		
Characteristic	Paediatric centres	Adult centres	All	Paediatric centres	Adult centres	All
N	36	12	48	154	17	171
Median (IQR) Hb (g/L)	118 (103-126)	117 (104-126)	117 (103-126)	122 (112-135)	122 (116-149)	122 (112-135)
% Hb <100g/L	16.7	9.1	14.9	11.3	0.0	10.2
Median (IQR) Ca (mmol/L)	2.4 (2.3-2.6)	2.4 (2.3-2.5)	2.4 (2.3-2.5)	2.4 (2.3-2.5)	2.3 (2.3-2.5)	2.4 (2.3-2.5)
% Ca in range	60.0	88.9	65.9	87.1	93.8	87.7
Median (IQR) Phos (mmol/L)	1.7 (1.2-2.0)	1.7 (1.3-2.3)	1.7 (1.3-2.1)	1.2 (1.0-1.3)	1.1 (1.0-1.4)	1.1 (1.0-1.3)
% phos in range	44.4	54.6	46.8	71.3	37.5	68.1
Median (IQR) bicarb (mmol/L)	25 (23-29)	24 (23-27)	25 (23-29)	24 (22-26)	24 (22-26)	24 (22-26)
% bicarb in range	54.3	66.7	56.8	72.1	86.7	73.5
Median (IQR) SBP (mmHg)	118 (113-128)	126 (117-139)	121 (113-130)	117 (108-122)	126 (118-135)	117 (108-125)
Median (IQR) DBP (mmHg)	76 (70-80)	80 (76-82)	77 (70-82)	71 (61-78)	74 (69-83)	71 (62-79)
% 'normal' BP range (<130/80 mmHg)	55.2	22.2	47.4	73.7	54.6	72.1
% high BP (≥140/90 mmHg)	10.3	22.2	13.2	9.3	18.2	10.1

bicarb – bicarbonate; BP – blood pressure; Ca – calcium; DBP – diastolic blood pressure; Hb – haemoglobin; IQR – inter-quartile range; phos – phosphate; SBP – systolic blood pressure

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founded 1950

Abbreviations

UK renal centre abbreviations and other shortened forms used in the 23rd Annual Report

UK renal centre abbreviations

Adult renal centres

Abbreviation	City	Hospital
	ENGLAND	
Bham	Birmingham	Heartlands Hospital and Queen Elizabeth Hospital
Basldn	Basildon	Basildon 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
Chelms	Chelmsford	Broomfield 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
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 Ain	Liverpool	Aintree University Hospital
Liv Roy	Liverpool	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
Sthend	Southend	Southend Hospital
Stoke	Stoke	University Hospital of North Staffordshire
Sund	Sunderland	Sunderland Royal Hospital
Truro	Truro	Royal Cornwall Hospital
Wirral	Birkenhead	Arrowe Park Hospital

Adult renal centres Continued

Abbreviation	City	Hospital
Wolve	Wolverhampton	New Cross Hospital
York	York	York District General 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	Monklands Hospital
D&Gall	Dumfries	Dumfries and Galloway Royal Infirmary
Dundee	Dundee	Ninewells Hospital
Edinb	Edinburgh	Royal Infirmary of Edinburgh
Glasgw	Glasgow	Queen Elizabeth University, Glasgow Royal Infirmary and Stobhill Hospitals
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 renal 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

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
C. difficile	*Clostridium difficile*
Chol	cholesterol
CI	confidence interval
CKD	chronic kidney disease
Creat	creatinine
DBD	donor after brain death
DBP	diastolic blood pressure
DCD	donor after circulatory death
E	England
E. coli	*Escherichia coli*
eGFR	estimated glomerular filtration rate
ESA	erythropoiesis stimulating agent
ESKD	end-stage kidney disease
FAS	Full Age Spectrum
Ferr	ferritin
Hb	haemoglobin
HbA1c	glycated haemoglobin
HD	haemodialysis
HES	Hospital Episode Statistics
HHD	home haemodialysis
ICHD	in-centre haemodialysis
IQR	interquartile range
IV	intravenous
K	potassium
KDIGO	Kidney Disease: Improving Global Outcomes
LKD	living kidney donor
MRSA	methicillin-resistant *Staphylococcus aureus*
MSSA	methicillin-sensitive *Staphylococcus aureus*
NHSBT	NHS Blood and Transplant
NI	Northern Ireland

NTL	non-tunnelled line
PD	peritoneal dialysis
PEDW	Patient Episode Database for Wales
PHE	Public Health England
Phos	phosphate
pmarp	per million age-related population
pmp	per million population
PRD	primary renal disease
PTH	parathyroid hormone
RRT	renal replacement therapy
SBP	systolic blood pressure
SD	standard deviation
TL	tunnelled line
Tx	transplant
UKRDC	UK Renal Data Collaboration
UKRR	UK Renal Registry
URR	urea reduction ratio
W	Wales

THE RENAL ASSOCIATION
founded 1950

Appendix A

Definitions and methodologies used in the 23rd Annual Report – data to the end of 2019

Contents

1. The UK Renal Registry (UKRR) Annual Report

The UKRR was established by the Renal Association in 1995 with the primary aim of collating data centrally from all adult UK renal centres to improve the care of patients with end-stage kidney disease (ESKD). Children on renal replacement therapy (RRT) were initially captured by a separate registry established by the British Association for Paediatric Nephrology, but this activity passed over to the UKRR from 2009. The Renal Association has an active and involved patient council.

Although originally limited to patients on RRT – dialysis treatments and kidney transplant (Tx) recipients – the UKRR now collects all episodes of acute kidney injury (AKI) in primary and secondary care (in England only) and some cases of chronic kidney disease (CKD) in secondary care not on dialysis. Collecting and reporting AKI and CKD data will in time allow the UKRR to report the journeys of patients who go on to start RRT, as well as those who choose conservative care instead of RRT. The UKRR also collects data about patient measures, including patient activation, patient reported outcomes and patient reported experiences.

The UKRR Annual Report includes analyses of clinical data to benchmark each of the UK's 70 adult and 13 paediatric renal centres against the Renal Association audit standards. The report comprises centre comparisons, attainment of audit standards, national averages and long term trends for measures of renal care and patient outcomes. AKI episodes and patient measures data are published separately to the annual report.

The report focuses predominantly on patients with ESKD who are on RRT, but from this year includes a chapter in which patients who have CKD but are not receiving RRT, either because they do not yet require it, or because they are receiving conservative care, will routinely be reported. Each chapter of the report presents analyses about a subset of kidney patients, as detailed in section 7.

2. Data flows to the UKRR and data completeness

2.1 Data flows

Patient data for the annual report flows to the UKRR from different sources, in different ways and with varying frequency, but primarily via quarterly electronic returns from the UK's 83 renal centres (adult and paediatric) (figure A1). English, Welsh and Northern Irish renal centres send their data directly to the UKRR, where data are cleaned and validated prior to analysis. Data from centres in Scotland are collected, validated and published by the Scottish Renal Registry before they are shared with the UKRR.

Most data are collected without patient consent under permissions granted through section 251 of the NHS Act (2006) as detailed in the Renal Association patient privacy notice. The current CKD/AKI clinical dataset (version 4.2) – the data variables which the UKRR has permission to collect and are used in the annual report – is available here. In reality, many variables are currently not well reported to the UKRR – see the data portal. A condensed version of the dataset (version 5) will soon be rolled out.

The UK Renal Data Collaboration (UKRDC) is an ongoing development which allows clinical data to flow daily from renal centres to the UKRR. So far only a handful of renal centres send their full data submissions via the UKRDC, but submission of data in version 5 of the dataset will only be permitted via this pathway, opening up the potential for near real time reporting.

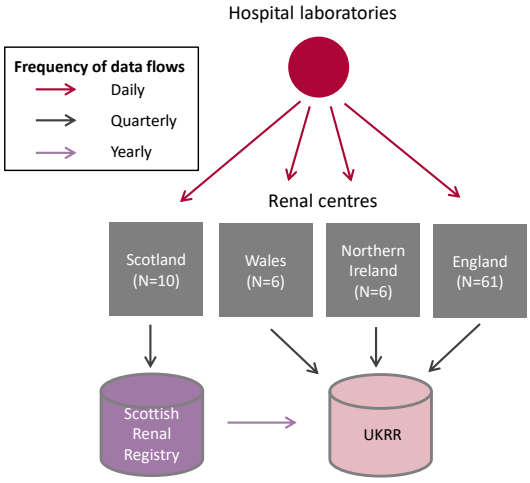

Figure A1 Frequencies and directions of patient data flows to the UKRR for the annual report

The UKRR database includes the British Association for Paediatric Nephrology database.
With the ongoing adoption of the UKRDC, data flows between renal centres and the UKRR will move to a daily frequency.

Data from the following sources are also included in the annual report:

NHS Blood and Transplant (NHSBT) – the UKRR and NHSBT share a dataset on patients who are wait-listed for or who have received a kidney Tx.

Public Health England (PHE) – PHE sends the UKRR a dataset on patients on dialysis in England who have had specific types of blood stream or gut infections in a 12 month period. The equivalent data on patients with infections in Wales is collected from the Welsh national renal IT database which links to the Welsh national information reporting system.

NHS Digital Hospital Episode Statistics (HES) and Civil Registration Mortality Data for England and the NHS Wales Informatics Service Patient Episode Database for Wales (PEDW) – these datasets include information on patient comorbidities, hospital admissions and lengths of stay, surgical procedures and causes of death. These linkages enhance UKRR data by:

- enabling adjustment for case-mix in centre survival comparisons
- providing information about differences in rates of hospital admission between renal centres
- making it possible to study equity of access to other non-renal services, such as cardiology, stroke and orthopaedics.

2.2 Data completeness

Unless otherwise stated, the data completeness threshold for a data item is ≥70%, i.e. where a renal centre's data completeness for a data item falls below 70%, the individual centre will be excluded from an analysis, but the national total will include the centre's available data. Centres providing relevant data from <10 patients are also excluded from funnel and caterpillar plots for biochemistry and dialysis access analyses. While poor completeness may reflect a failure to accurately record patient data, other contributing factors include the incompatibility of local renal information technology (IT) systems and the loss of data during the transfer and validation processes on account of coding issues. Data completeness is likely to improve with the development

of the UKRDC and increasing uptake of the most current UKRR CKD/AKI clinical dataset. The dataset has evolved and expanded over time in response to audit guidelines, with an understandable variable lag in the ability of local renal IT systems to respond to those changes.

Completeness of data items for patients receiving RRT varies between renal centres as detailed within each chapter. Seventeen renal centres submitted CKD data as part of their quarterly extract in 2019, with varying completeness of data items. Since this first analysis of CKD data aimed to simply describe the current data, all 17 centres were included regardless of data completeness.

Comorbidity data derived from diagnostic and procedure codes in HES and PEDW are used to augment comorbidity data for adults submitted by renal centres to the UKRR. A corresponding analysis of paediatric patients will soon be published. Where UKRR comorbidities are absent (meaning the patient does not have the comorbid condition), but the comorbidity in HES/PEDW is present (meaning the patient has the comorbid condition), the UKRR 'absent' comorbidity is overwritten with the HES/PEDW 'present' comorbidity. Enriching the 2018 dataset with comorbidities from HES/PEDW increased comorbidity completeness from 61% to 98% and all renal centres in England and Wales had ≥85% comorbidity completeness.

3. How the UKRR looks after patient data

3.1 Data governance

The UKRR continues to receive support under section 251 of the NHS Act (2006) to collect data without individual patient consent. This ensures the robustness and validity of analyses. The fair processing of patient data remains a key principle of the General Data Protection Regulation (2016) and the Data Protection Act (2018). This requires organisations to be clear and open with individuals about how their information is used. The UKRR publishes this information on the Renal Association website as well as in patient information leaflets and posters, which are distributed to all renal centres. Each year the UKRR completes NHS Digital's Data Security and Protection Toolkit. Further information on data governance is available on the Renal Association website.

3.2 Small numbers

From time to time, due to the rarity of a condition or other factors, data for only a small number of patients (<5) will be available for analysis and inclusion in the UKRR's annual report. With so few patients the risk of re-identification is increased. To assess this risk, the UKRR conducts an assessment on each chapter of the annual report, identifying the level of risk of re-identification for each cell containing a small number and balancing this with the benefits of publication. Where the risk of re-identification is deemed too high, or the benefits of publication fail to outweigh that risk then the cell is supressed. Where small numbers are included in this report, it was deemed that the risk of re-identification was low, because no one cell can provide insight into an individual patient, unless that patient is already known to the reader.

4. How the UKRR codes and organises data prior to analysis or categorisation

The data collected by the UKRR are organised onto a chronological timeline of events and treatments for each patient. Some key dates are detailed below. For patients receiving haemodialysis (HD), the treatment element of the timeline can be validated against data supplied each time the patient has a dialysis treatment – this is termed 'session data'. UKRR data managers check timeline entries and liaise with renal centres to identify discrepancies

within timelines, and between timeline and session data.

4.1 Key dates – the renal 'treatment timeline'

4.1.1 Date first seen by a nephrologist

For England, Wales and Northern Ireland, this is the date the patient first attended clinic or was an inpatient under the care of a nephrologist (whichever is the earlier). If a patient transfers into a renal centre from another renal centre then this date should be left blank by the new renal centre. For the purposes of this report, referral date is defined as the same as date first seen by a nephrologist.

The Scottish Renal Registry has provided date of referral to nephrology by general practitioner (GP) for people starting RRT in adult renal centres. This clearly differs from date first seen by a nephrologist, because of the delay between a GP referral letter being issued and the actual appointment with the nephrologist.

4.1.2 Late presentation

First seen date and date of RRT start (see below) are used to define late presentation, with a 90 day cut-off differentiating early versus late presentation. Scottish centres are included in some of the analyses on time of presentation, acknowledging the difference in definition described in 4.1.1 and the consequent underestimation in late presentation compared to the rest of the UK. Centre and national level data for Scotland are shown, but UK results are not calculated. Two year cohorts may be used for analyses to make the late presentation percentages more reliably estimated and to allow these to be shown for subgroups of patients. Only data from those centres with ≥70% completeness for the relevant year are used. This data item is investigated with centres, and possibly excluded, if an unexplained large proportion of patients are reported to have started RRT on the same date as the first presentation, because this is likely due to incorrect recording of data.

4.1.3 Date of RRT start

A patient with ESKD starting RRT on 'chronic' HD (or PD or pre-emptive Tx) should be entered as such on the UKRR timeline on the date of the first HD (or PD) episode.

If a patient starts RRT with an episode of AKI in which it was felt that kidney function had potential to recover, then 'acute' HD (or acute HD or renal filtration) or acute PD (where appropriate) should be entered on the UKRR timeline. If subsequently it is felt that kidney function is no longer likely to recover, a timeline modality should be added of 'chronic dialysis' at the time when this becomes apparent (accepting that the timing of this change will vary by clinician practice and interpretation). The UKRR will interrogate the timeline of patients starting 'chronic' RRT and if there is evidence of recent 'acute' RRT, will backdate the date of start of RRT to the first episode of 'acute' RRT, provided there has been <90 days recovery of kidney function between acute and chronic episodes.

If a patient was started on dialysis and dialysis was temporarily stopped for <90 days for any reason (including access failure and awaiting the formation of further access), the date of start of RRT in UKRR analyses remains the date of first dialysis. If a patient recovers for ≥90 days, subsequent RRT start dates are used.

The date of start of PD is defined as the date of first PD fluid exchange given with the intention of causing solute or fluid clearance. This is in contrast with a flush solely for confirming or maintaining PD catheter patency. In general, exchanges which are part of PD training should be considered as the start of PD (unless earlier exchanges have already been given). However, if it is not planned that the patient starts RRT until a later date, exchanges as part of PD training need not be considered the start of RRT.

4.1.4 Change of modality date

Renal centres are requested to log in their timeline changes between PD and HD if the modality switch is for >30 days.

4.1.5 Date of death

See section 8.1.

4.2 Allocation of patients to a renal centre

The default method for allocating a patient to a renal centre is based on the centre sending their quarterly data.

Where applicable, pre-emptive Tx patients are allocated to their work-up centre rather than their Tx centre. This is not possible for all patients because some centres do not supply the 'transfer out for pre-emptive Tx' timeline code. Consequently, some patients remain allocated to their transplanting centre.

More generally, there are centre-specific variations in the repatriation of Tx recipients. Some Tx centres continue to follow-up and report on all patients they transplant, whereas others refer patients back to non-transplanting centres at some point post-Tx. Some Tx centres only refer back patients when their graft is failing. The time post-transplantation that a patient is referred back to their local centre varies between Tx centres, but the UKRR can detect patients being reported from both Tx and referring centres and in such situations care is usually attributed to the referring centre (see section 7.2).

5. Variables used to categorise patients

5.1 Demographics

5.1.1 Location

This includes renal centre, country and CCG.

5.1.2 Sex

Patients are defined as male or female as reported by the renal centre.

5.1.3 Age

Age-adjusted analyses allow comparisons between centres with differing age distributions by adjusting the analysis as if all the patients were the same chosen age.

5.1.4 Biometrics

Height, weight, body mass index (BMI) – these variables are only used for paediatric analyses. Data for height, weight, BMI and systolic blood pressure (SBP) vary with age, sex and size in children under 16 years and are therefore presented as z-scores as described in the relevant chapter. See section 7.8 for definitions.

5.1.5 Ethnicity

Most centres electronically upload ethnicity coding to their renal IT system from the hospital patient administration system (PAS). Ethnicity coding in PAS is based on self-reported ethnicity. For the remaining centres, ethnicity coding is performed by clinical staff and recorded directly into the renal IT system (using a variety of coding systems). The details of regrouping the PAS codes into these ethnic categories are detailed below.

Tables A1 and A2 show the old and new groupings of ethnicity information used in this report as centres transition to the new codes. Ethnic categories are condensed into five groups (White, Asian, Black, Mixed and Other). Ethnic categories have been updated to be consistent with the categories used in the 2021 census.

Table A1 Old ethnicity groupings

Code	Ethnic category	Assigned group
9S1..	White	White
9SA9.	Irish (NMO)	White
9SAA.	Greek Cypriot (NMO)	White
9SAB.	Turkish Cypriot (NMO)	White
9SAC.	Other European (NMO)	White
9S6..	Indian	Asian
9S7..	Pakistani	Asian
9S8..	Bangladeshi	Asian
9SA6.	East African Asian	Asian
9SA7.	Indian Subcontinent	Asian
9SA8.	Other Asian	Asian
9S2..	Black Caribbean	Black
9S3..	Black African	Black
9S4..	Black/Other/NMO	Black
9S41.	Black British	Black
9S42.	Black Caribbean	Black
9S43.	Black North African	Black
9S44.	Black other African country	Black
9S45.	Black East African Asian	Black
9S46.	Black Indian subcontinent	Black
9S47.	Black Other Asian	Black
9S48.	Black Black Other	Black
9S5..	Black other/mixed	Mixed
9S51.	Other Black – Black/White origin	Mixed
9S52.	Other Black – Black/Asian origin	Mixed
9S9..	Chinese	Asian
9T1C.	Chinese	Asian
9SA..	Other ethnic non-mixed (NMO)	Other
9SA1.	British ethnic minority specified (NMO)	Other
9SA2.	British ethnic minority unspecified (NMO)	Other
9SA3.	Caribbean Island (NMO)	Other
9SA4.	North African Arab (NMO)	Other
9SA5.	Other African countries (NMO)	Other
9SAD.	Other ethnic NEC (NMO)	Other
9SB..	Other ethnic/mixed origin	Mixed
9SB1.	Other ethnic/Black/White origin	Mixed
9SB2.	Other ethnic/Asian/White origin	Mixed
9SB3.	Other ethnic/mixed White origin	White
9SB4.	Other ethnic/Other mixed origin	Mixed

NEC – not elsewhere contained; NMO – non-mixed origin

Table A2 New ethnicity groupings

Code	Ethnic category	Assigned group
A	White – British	White
B	White – Irish	White
C	Other White background	White
D	Mixed – White and Black Caribbean	Mixed
E	Mixed – White and Black African	Mixed
F	Mixed – White and Asian	Mixed
G	Other Mixed background	Mixed
H	Asian or Asian British – Indian	Asian
J	Asian or Asian British – Pakistani	Asian
K	Asian or Asian British – Bangladeshi	Asian
L	Other Asian background	Asian
M	Black Caribbean	Black
N	Black African	Black
P	Other Black background	Black
R	Chinese	Asian
S	Other ethnic background	Other

5.2 Health

5.2.1 Primary renal disease (PRD)

Patients should be allocated a code for the PRD based on the histological or clinical picture, with codes available for where the cause is unknown. New PRD codes were produced by the European Renal Association – European Dialysis and Transplant Association (ERA-EDTA) in 2012. The data used for this report include a mixture of old and new ERA-EDTA codes. Old codes cannot be mapped to new codes, but the reverse mapping is possible. Therefore, the old codes are used where available, and for those people without an old code, new codes (where available) are mapped back to old codes, using the mapping available on the ERA-EDTA website. As recommended in the notes for users in the ERA-EDTA's PRD code list document, the mapping of new to old codes is provided for guidance only and has not been validated. Therefore, care must be taken not to over interpret data from this mapping. The old codes (both those received from centres and those mapped back from new codes) are then grouped into the same eight categories as in previous reports as shown in table A3.

Table A3 Old primary renal disease (PRD) groupings

Code	Old PRD grouping	Assigned group
0	Chronic renal failure; aetiology uncertain unknown/unavailable	Uncertain aetiology
10	Glomerulonephritis; histologically NOT examined	Glomerulonephritis*
11	Focal segmental glomerulosclerosis with nephrotic syndrome in children	Glomerulonephritis
12	IgA nephropathy (proven by immunofluorescence, not code 76 and not 85)	Glomerulonephritis
13	Dense deposit disease; membrano-proliferative glomerulonephritis; type II (proven by immunofluorescence and/or electron microscopy)	Glomerulonephritis
14	Membranous nephropathy	Glomerulonephritis
15	Membrano-proliferative glomerulonephritis; type I (proven by immunofluorescence and/or electron microscopy – not code 84 or 89)	Glomerulonephritis
16	Crescentic (extracapillary) glomerulonephritis (type I, II, III)	Glomerulonephritis
17	Focal segmental glomerulosclerosis with nephrotic syndrome in adults	Glomerulonephritis
19	Glomerulonephritis; histologically examined, not given above	Glomerulonephritis
20	Pyelonephritis – cause not specified	Pyelonephritis
21	Pyelonephritis associated with neurogenic bladder	Pyelonephritis
22	Pyelonephritis due to congenital obstructive uropathy with/without vesico-ureteric reflux	Pyelonephritis
23	Pyelonephritis due to acquired obstructive uropathy	Pyelonephritis
24	Pyelonephritis due to vesico-ureteric reflux without obstruction	Pyelonephritis

Table A3 Continued

Code	Old PRD grouping	Assigned group
25	Pyelonephritis due to urolithiasis	Pyelonephritis
29	Pyelonephritis due to other cause	Pyelonephritis
30	Interstitial nephritis (not pyelonephritis) due to other cause, or unspecified (not mentioned above)	Other
31	Nephropathy (interstitial) due to analgesic drugs	Other
32	Nephropathy (interstitial) due to cis-platinum	Other
33	Nephropathy (interstitial) due to cyclosporin A	Other
34	Lead induced nephropathy (interstitial)	Other
39	Drug induced nephropathy (interstitial) not mentioned above	Other
40	Cystic kidney disease – type unspecified	Polycystic kidney
41	Polycystic kidneys; adult type (dominant)	Polycystic kidney
42	Polycystic kidneys; infantile (recessive)	Polycystic kidney
43	Medullary cystic disease; including nephronophthisis	Other
49	Cystic kidney disease – other specified type	Other
50	Hereditary/Familial nephropathy – type unspecified	Other
51	Hereditary nephritis with nerve deafness (Alport's syndrome)	Other
52	Cystinosis	Other
53	Primary oxalosis	Other
54	Fabry's disease	Other
59	Hereditary nephropathy – other specified type	Other
60	Renal hypoplasia (congenital) – type unspecified	Other
61	Oligomeganephronic hypoplasia	Other
63	Congenital renal dysplasia with or without urinary tract malformation	Other
66	Syndrome of agenesis of abdominal muscles (Prune Belly)	Other
70	Renal vascular disease – type unspecified	Renal vascular disease
71	Renal vascular disease due to malignant hypertension	Hypertension
72	Renal vascular disease due to hypertension	Hypertension
73	Renal vascular disease due to polyarteritis	Renal vascular disease
74	Wegener's granulomatosis	Other
75	Ischaemic renal disease/cholesterol embolism	Renal vascular disease
76	Glomerulonephritis related to liver cirrhosis	Other
78	Cryoglobulinemic glomerulonephritis	Other
79	Renal vascular disease – due to other cause (not given above and not code 84–88)	Renal vascular disease
80	Type 1 diabetes with diabetic nephropathy	Diabetes
81	Type 2 diabetes with diabetic nephropathy	Diabetes
82	Myelomatosis/light chain deposit disease	Other
83	Amyloid	Other
84	Lupus erythematosus	Other
85	Henoch-Schoenlein purpura	Other
86	Goodpasture's syndrome	Other
87	Systemic sclerosis (scleroderma)	Other
88	Haemolytic ureaemic syndrome (including Moschcowitz syndrome)	Other
89	Multi-system disease – other (not mentioned above)	Other
90	Tubular necrosis (irreversible) or cortical necrosis (different from 88)	Other
91	Tuberculosis	Other
92	Gout nephropathy (urate)	Other
93	Nephrocalcinosis and hypercalcaemic nephropathy	Other
94	Balkan nephropathy	Other
95	Kidney tumour	Other
96	Traumatic or surgical loss of kidney	Other
98	Not known	Missing
99	Other identified renal disorders	Other
199	Code not sent	Missing

*Prior to the 15th UKRR Annual Report categorised as 'uncertain aetiology'.
IgA – immunoglobulin A

5.2.2 Cause of death

ERA-EDTA codes for cause of death are grouped as shown. Patients with a cause of death code 107 (advanced CKD not on dialysis) with no other information to determine the group were assigned to missing cause of death.

Table A4 Cause of death groupings

Code	Cause of death grouping	Assigned group
0	Cause of death uncertain/not determined	Uncertain aetiology
11	Myocardial ischaemia and infarction	Cardiac disease
12	Hyperkalaemia	Other
13	Haemorrhagic pericarditis	Other
14	Other causes of cardiac failure	Cardiac disease
15	Cardiac arrest/sudden death; other cause or unknown	Cardiac disease
16	Hypertensive cardiac failure	Cardiac disease
17	Hypokalaemia	Other
18	Fluid overload/pulmonary oedema	Cardiac disease
19	Elevated PVR/pulmonary hypertension	Other
21	Pulmonary embolus	Other
22	Cerebro-vascular accident, other cause or unspecified	Cerebrovascular disease
23	Gastro-intestinal haemorrhage (digestive)	Other
24	Haemorrhage from graft site	Other
25	Haemorrhage from vascular access or dialysis circuit	Other
26	Haemorrhage from ruptured vascular aneurysm (not codes 22, 23)	Other
27	Haemorrhage from surgery (not codes 23, 24, 26)	Other
28	Other haemorrhage	Other
29	Mesenteric infarction	Other
31	Pulmonary infection bacterial (not code 73)	Infection
32	Pulmonary infection (viral)	Infection
33	Pulmonary infection (fungal or protozoal; parasitic)	Infection
34	Infections elsewhere except viral hepatitis	Infection
35	Septicaemia	Infection
36	Tuberculosis (lung)	Infection
37	Tuberculosis (elsewhere)	Infection
38	Generalised viral infection	Infection
39	Peritonitis (all causes except for PD)	Infection
41	Liver disease due to hepatitis B virus	Other
42	Liver disease due to other viral hepatitis	Other
43	Liver disease due to drug toxicity	Other
44	Cirrhosis – not viral (alcoholic or other cause)	Other
45	Cystic liver disease	Other
46	Liver failure – cause unknown	Other
51	Patient refused further treatment for ESKD	Treatment withdrawal
52	Suicide	Other
53	ESKD treatment ceased for any other reason	Treatment withdrawal
54	ESKD treatment withdrawn for medical reasons	Treatment withdrawal
61	Uraemia caused by graft failure	Treatment withdrawal
62	Pancreatitis	Other
63	Bone marrow depression (aplasia)	Other
64	Cachexia	Other
66	Malignant disease in patient treated by immunosuppressive therapy	Malignancy
67	Malignant disease: solid tumours (except code 66)	Malignancy
68	Malignant disease: lymphoproliferative disorders (except code 66)	Malignancy
69	Dementia	Other
70	Peritonitis (sclerosing, with PD)	Other
71	Perforation of peptic ulcer	Other
72	Perforation of colon	Other

Table A4 Continued

Code	Cause of death grouping	Assigned group
73	Chronic obstructive pulmonary disease	Other
79	Multi-system failure	Other
81	Accident related to ESKD treatment (not code 25)	Other
82	Accident unrelated to ESKD treatment	Other
99	Other identified cause of death	Other
100	Peritonitis (bacterial, with PD)	Infection
101	Peritonitis (fungal, with PD)	Infection
102	Peritonitis (due to other cause, with PD)	Infection
103	Peripheral vascular disease	Other
104	Calciphylaxis	Other
105	Ischaemic bowel	Other
106	Ruptured abdominal aortic aneurysm	Other
108	Acute kidney injury	Other
109	*Clostridium difficile* colitis	Infection
110	Line related sepsis	Infection

5.2.3 Infections

Patients on dialysis are susceptible to infections because of an impaired immune system and the need to regularly access the vascular system in HD or use of a catheter in PD. PHE carries out mandatory enhanced surveillance of methicillin-resistant *Staphylococcus aureus* (MRSA) bacteraemia, methicillin-sensitive *Staphylococcus aureus* (MSSA) bacteraemia, *Escherichia coli* bacteraemia and *Clostridium difficile* reporting for NHS acute trusts. A data sharing agreement exists between the UKRR and PHE to identify infections in dialysis patients in England in a given year through data linkage. In the 21st UKRR Annual Report, Wales provided data for the first time, which were extracted locally from the renal and hospital IT systems.

Until the 21st Annual Report, infection data were validated by securely emailing individual renal centres to confirm that infections were related to dialysis patients. Historically, this has resulted in only a small number of alterations in cases and was discontinued from the 21st report onwards.

PHE reports individual blood culture results. However, the annual report details individual infection episodes – repeated positive blood cultures within a two week timeframe are treated as a single infection episode for MSSA/MRSA/*E. coli* bacteraemia; beyond two weeks they are treated as a new episode or re-infection. Four weeks, rather than two weeks, is used as the cut-off for repeated *C. difficile* infections. Centre-specific rates for each infection are presented per 100 dialysis patient-years. The denominator for this rate is calculated for each centre by summing the number of days that each dialysis patient contributes between 1 January and 31 December of the year in question. When calculating the modality specific rates, the number of days that every dialysis patient spends on each modality during the collection period is totalled.

To illustrate the variation in precision of the estimated infection rate, the rate of bacteraemia (MRSA and MSSA) per 100 dialysis patient-years is plotted against the centre size in a funnel plot. This is plotted for each infection type.

5.2.4 Comorbidity

The comorbidity data items collected in the UKRR dataset are listed below.

At the time of each patient starting RRT, clinical staff in each centre are responsible for recording, in yes/no format on their renal IT system, the presence or absence of the following comorbid conditions and information on current smoking status. Patients are classified as having complete comorbidity data if there is at least one

entry (yes/no) for any one or more of the comorbid conditions, excluding smoking.

'Ischaemic heart disease' is defined as the presence of one or more of the following conditions: angina, myocardial infarction (MI) in the three months prior to starting RRT, MI more than three months prior to starting RRT or coronary artery bypass graft (CABG)/angioplasty.

Where peripheral vascular disease (PVD) is not submitted, PVD is defined as the presence of one or more of the following conditions: claudication, ischaemic or neuropathic ulcers, non-coronary angioplasty, vascular graft, aneurysm or amputation for PVD

'Non-coronary vascular disease' is defined as the presence of cerebrovascular disease or any of the data items that comprise 'peripheral vascular disease'.

Specific consideration needs to be made regarding diabetes coding. The UKRR also collects data on PRD and uses these data alongside the comorbidity data to determine which patients have diabetes mellitus. The comorbidity screen is intended to capture those patients who have diabetes only when it is not the PRD, but some clinicians enter 'yes' in the comorbidity field in such cases. Prior to statistical analyses, these fields are examined together to identify these cases and to ensure diabetes is only counted as either the PRD or a comorbid condition for a certain individual.

Several renal centres submit an expanded list of comorbidities (non-ST segment elevation MI; atrial fibrillation; transient ischemic attack; cerebrovascular event/stroke; PVD; and dementia) with associated dates as specified in the current dataset (version 4.2). Comorbidities at start of RRT are subsequently derived from the date of the comorbidity and the date of starting RRT.

Angina – history of chest pain on exercise with or without electrocardiogram (ECG) changes, exercise tolerance test, radionucleotide imaging or angiography.

Previous MI within last three months – detection of rise and/or fall of a biomarker (creatinine kinase [CK], CK-MB or troponin) with at least one value above the 99th percentile, together with evidence of myocardial ischaemia with at least one of either:

- ischaemic symptoms
- ECG changes indicative of new ischaemia (new ST-T changes or new left bundle branch block)
- development of pathological Q waves
- imaging evidence of new loss of viable myocardium or new regional wall motion abnormality.

Previous MI more than three months ago – any previous MI at least three months prior to start of RRT.

Previous CABG or coronary angioplasty.

Previous episode of heart failure – whether or not due to fluid overload.

Cerebrovascular disease – any history of strokes (whatever cause) and including transient ischaemic attacks caused by carotid disease.

Diabetes (not causing ESKD, i.e. diabetic nephropathy not as the PRD) – type 1 and type 2 diabetes are coded separately and diet controlled diabetics are included in type 1.

Chronic obstructive pulmonary disease (COPD) – this is characterised by airflow obstruction. The airflow obstruction is usually progressive, not fully reversible and does not change markedly over several months:.

- airflow obstruction is defined as a reduced forced expiratory volume in one second (FEV1) and a reduced FEV1/FVC ratio (where FVC is forced vital capacity), such that FEV1 is <80% predicted and FEV1/FVC is <0.7
- the airflow obstruction is due to a combination of airway and parenchymal damage
- the damage is the result of chronic inflammation that differs from that seen in asthma and which is usually the result of tobacco smoke.

There is no single diagnostic test for COPD. Making a diagnosis relies on clinical judgement based on a combination of history (exertional breathlessness, chronic cough, regular sputum production, frequent winter 'bronchitis', wheeze), physical examination and confirmation of the presence of airflow obstruction using spirometry (source: British Thoracic Society guidelines).

Liver disease – persistent enzyme evidence of hepatic dysfunction or biopsy evidence or hepatitis B antigen or hepatitis C antigen (polymerase chain reaction) positive serology.

Malignancy – defined as any history of malignancy (even if curative) e.g. removal of melanoma, excludes basal cell carcinoma.

Claudication – current claudication based on a history, with or without Doppler or angiographic evidence.

Ischaemic/neuropathic ulcers – current presence of these ulcers.

Angioplasty, stenting, vascular graft (all non-coronary) – this category now includes vascular grafts (e.g. aortic bifurcation graft) and renal artery stents.

Amputation for PVD.

Smoking – current smoker or history of smoking within the last year.

Atrial fibrillation – whether the patient has atrial fibrillation; irregular, often abnormally fast heart rate.

PVD – usually lower limb; claudication, angioplasty (non-coronary) and amputation for PVD separately coded.

Dementia – any form of dementia: dementia, vascular dementia, Alzheimer's disease, memory loss (short or long term).

5.2.5 Hypo/hypertension

Hypertension is analysed for Tx and paediatric patients using the relevant targets described in the chapters. Hypotension during dialysis is not currently routinely analysed.

5.2.6 Diabetes/non-diabetes

In general, where the UKRR report refers to diabetes it refers to patients with diabetes as a PRD, but excludes patients with diabetes as a comorbidity. Non-diabetes, by contrast, includes patients with diabetes as a comorbidity.

5.3 Treatment

5.3.1 Referral time

Time of presentation, the time a patient first sees a nephrology specialist and referral time are interchangeable for the purposes of this report.

5.3.2 RRT modality

The RRT treatment modalities available are a Tx, home haemodialysis (HHD), in-centre haemodialysis (ICHD) and PD – these are defined in the relevant chapters of the report. Paediatric patients on ICHD or HHD are reported in a combined HD group.

5.3.3 Dialysis access

AVF, AVG, PD catheter, central venous catheter (CVC) – non-tunnelled line (NTL) and tunnelled line (TL) – are defined in chapter 2.

5.3.4 HD session frequency and length

For patients on ICHD, the length and frequency of HD sessions are described in chapter 5. Patients on HHD are reported in chapter 7.

5.3.5 Tx type

Donor after brain death (DBD), donor after circulatory death (DCD) and living kidney donor (LKD) Tx are defined in chapter 4.

5.3.6 Tx wait-listing

Pre-emptive Tx wait-listing is presented in chapter 2, while Tx wait-listing in the dialysis population is presented in chapter 3. Listing status before start of RRT for incident patients (analysis in chapter 2) or at end of year for the prevalent dialysis cohort (analysis in chapter 3) are obtained using NHSBT data regularly matched to the UKRR database.

5.3.7 Laboratory data items

The UKRR does not currently collect data regarding different assay methods, mainly because a single dialysis centre may process samples in several different laboratories.

The UKRR dataset contains a number of laboratory variables, many of which are not currently returned by renal centres. It is planned to expand this work as part of an ongoing data completeness exercise.

The collection methods and statistical analyses undertaken on the core laboratory data items of the annual report are as follows.

5.3.7.1 RRT incident biochemical and haematology variables

For the analyses of biochemical variables for incident patients (with the exception of start estimated glomerular filtration rate [eGFR] – see below), those patients commencing RRT (HD/PD/Tx) are included. Measurements for variables taken from after starting dialysis, but still within the same quarter of RRT start are used. Therefore, depending on when in the quarter a patient starts RRT, the data could be from zero to 90 days later. Due to possible deficiencies with extract routines it is possible that a small number of the values extracted electronically

may actually be from before the person started dialysis. This problem will not occur for Scottish data. Results are also shown with the cohort subdivided into early and late presenters (date first seen by a nephrologist ≥90 days and <90 days before starting dialysis, respectively). For these analyses only centres with at least 70% completeness of presentation time data are included.

eGFR at RRT start – eGFR is calculated from serum creatinine. The start eGFR is studied amongst patients with eGFR data within 14 days before the start of RRT. In line with the National Institute for Clinical Excellence advice and for consistency across the UKRR Annual Report, the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) creatinine equation is used to calculate eGFR. In previous years, up to the 19th Annual Report, the Modification of Diet in Renal Disease equation was used. In light of this change, the UKRR advises caution in comparing eGFR results with previous UKRR annual reports.

A wide variety of creatinine assays are in use in clinical biochemistry laboratories in the UK and it is not possible to ensure that all measurements of creatinine concentration collected by the UKRR are harmonised.

For the purpose of the eGFR calculation, patients who have missing ethnicity data but a valid serum creatinine measurement are classed as White. The eGFR values are log transformed due to their skewed distribution and geometric means are calculated.

In children, eGFR is calculated using the updated 'bedside' Schwartz formula, using centre-specific individual correction factors submitted to the UKRR. For young adults (16–18 years old), the Full Age Spectrum (FAS) creatinine equation is used because of low completeness of height in young adults managed in adult centres.

5.3.7.2 RRT prevalent biochemical and haematology variables

Haemoglobin (Hb) and ferritin – for the analyses of prevalent dialysis patients, those patients receiving dialysis on 31 December at the end of the analysis year are included if they have been on the same dialysis modality in the same centre for at least three months. To improve completeness, the last available measurement for each patient from the last two quarters of the year are used for Hb and from the last three quarters for ferritin.

Erythropoiesis stimulating agents (ESA) – ESA data from the last quarter of the year of analysis are used to define which patients are receiving ESAs, with the exception of Scottish data, for which the second quarter is used because the Scottish Renal Registry submit ESA data only for the second quarter of each year. Scotland is included in the ESA analysis for ICHD patients, but not PD patients, because Scotland does not submit ESA data for PD patients. Each individual is defined as being on an ESA if a drug type and/or a dose is present in the data. Centres reporting <70% of HD or PD patients being treated with ESAs, respectively, are considered to have incomplete data and are excluded from further analysis. The percentage of patients on ESAs is calculated from these data and incomplete data returns risk seriously impacting on any conclusions drawn.

For analyses of ESA dose, values are presented as weekly ESA dose. Doses of <150 IU/week (assumed to be darbepoietin or methoxy polyethylene glycol–epoetin beta) are harmonised with ESA data by calculating a weekly dose and multiplying by 200. No adjustments are made with respect to route of administration. Patients who are not receiving ESAs are not included in analyses of dose (rather than being included with a dose of zero). Many centres provide data on ESA dose but not on ESA frequency. The ESA dose field is defined as the weekly dose and the dose is presumed to have been converted accordingly on submission to the UKRR, unless otherwise indicated from the centre. This may be an incorrect assumption for a number of patients, and this needs to be considered when interpreting the ESA information.

The ESA data are collected electronically from renal IT systems, but in contrast to laboratory linked variables the ESA data require manual data entry. The reliability depends upon the data source – whether the entry is linked to the prescription or whether the prescriptions are provided by the primary care physician. In the latter case,

doses may not be as reliably updated because the link between data entry and prescription is indirect. It is worth noting that ESA data are the only medication that is reported by the UKRR, because of data completeness (iron replacement is also not included).

Quarterly values are extracted from the database for the last two quarters for calcium, phosphate, bicarbonate and potassium and the last three quarters for parathyroid hormone (PTH). Patients who do not have these data are excluded from the analyses.

Calcium – the adjusted calcium is calculated by adjusting for the binding of albumin to a proportion of the calcium in the blood depending on albumin levels. Not all centres return adjusted calcium. For centres providing adjusted calcium values, these data are analysed directly because it is these values on which clinical decisions within centres are based. For centres providing unadjusted calcium values, the formula provided by each centre (or, if this is not available, the standard formula in widespread use) is used to calculate adjusted calcium.

PTH and phosphate – these variables no longer have target ranges in the most recent adult Renal Association audit guidelines and are therefore not currently reported in the UKRR Annual Report for the adult dialysis population. However, they are reported in paediatric patients and at the national level for the adult transplant population.

Bicarbonate – the audit measures used for serum bicarbonate in the HD cohort and PD cohort differ as per the most recent guidelines. For children and young people aged <18 years, the paediatric reference range has been used (see section 7.8)

Potassium – centres are requested to send pre-dialysis potassium levels for HD patients, which like all biochemical samples should be collected from a short-gap session (i.e. a gap of one day between HD sessions rather than the longer two day gap). Outlying centres are contacted and if it is identified that post-dialysis potassium data have inadvertently been submitted, these centres are excluded from the analysis. However, post-dialysis samples may remain within the analysis for some centres. Future data extracts will aim to ensure that only pre-dialysis results are submitted.

Urea reduction ratio (URR), session duration and frequency – the prevalent adult ICHD patient population for a given year is analysed using URR data taken from the third quarter of the year, unless that data point is missing, in which case data from the second quarter are taken. The use of URR data from the third quarter is preferred over the fourth quarter due to better data completeness.

Since 2015, centres have been submitting quarterly HD sessional data as specified in version 4.2 of the UKRR dataset. These data are used to augment the quarterly data on the frequency and duration of dialysis sessions across all centres, for those centres with poor completeness on those two items.

Data from patients known to be receiving more than or less than thrice weekly HD are omitted from the analysis. Patients who have missing data for the number of dialysis sessions per week are assumed to be dialysing thrice weekly. However, because not all centres report frequency of HD, it is possible that data from a small number of patients receiving HD at a different frequency are included in the analyses. HHD patients are excluded from the analysis.

The URR is calculated as the percentage fall in urea during a dialysis session by taking a urea sample before and after the dialysis session. Post-dialysis blood samples should be collected either by the slow-flow method, the simplified stop-flow method, or the stop dialysate flow method. The method used should remain consistent within renal centres and should be reported to the UKRR.

5.3.7.3 CKD data

The data presented for CKD patients not on RRT in chapter 1 are given below; for further description of the measures see the previous sections for RRT patients.

eGFR – eGFR is calculated in the same way as for incident adult RRT patients, using the CKD-EPI creatinine equation. Patients are grouped into CKD stage G5 (eGFR <15 mL/min/1.73m^2) and stage G4 (eGFR 15–30 mL/min/1.73m^2) using their last recorded creatinine measurement. Patients whose last measurement was over two years old were still included, but reported as 'CKD stage unknown'. Almost all patients had a measurement within the last four years.

Hb and calcium – the last available measurement from the last two quarters of the year was used.

ESA – ESA data were too incomplete to present meaningful analyses, but data completeness is described in chapter 1.

Blood pressure – SBP and DBP measurements from the last quarter of the year were reported. Normal range is considered to be where SBP is <140 mmHg and DBP is <90 mmHg.

6. Statistical methods and analyses used

SAS version 9.4 software (sas.com) is used for all analyses.

6.1 Estimation of renal centre catchment populations

Estimates of each adult renal centre's catchment population are needed to calculate incidence and prevalence rates of CKD and RRT at renal centre level. This year's annual report uses an updated methodology as described below.

For England, Wales and Scotland, the UKRR database comprising the incident ICHD population between 1 January 2010 and 31 December 2019, supplemented with data from the prevalent ICHD population alive at the end of 2019, was used to estimate the size of each renal centre's catchment population. Patients who started RRT with a pre-emptive Tx were excluded to avoid potential inflation of Tx centres' catchment populations, because this group of patients is only correctly assigned to the referring centre (rather than the Tx centre) when the coding of transfer out for pre-emptive Tx is used. Only the ICHD population was used, rather than the entire dialysis cohort, because ICHD patients are more likely to attend their closest or 'geographically most appropriate' centre than patients on home therapies (HHD or PD).

Following consultation with renal experts in Northern Ireland, the entire RRT population was used, because the smaller size of this nation means that treatment patterns differ. While in England, Wales and Scotland the incident ICHD patients define the catchment, and pre-emptive Tx patients are predominantly from the same area, there is much more movement of a smaller number of people in NI, such that no population is ideal.

For England and Wales, data at the middle super output area (MSOA) level (of which there are 7,201) were used to assign populations to each renal centre. The MSOA was determined for each incident ICHD patient using the postcode data held by the UKRR and the proportions of patients residing in that MSOA who were treated at each centre were calculated. These proportions were then applied to the overall adult mid-2019 population estimates for each MSOA published by the Office for National Statistics (ONS). If there were zero incident ICHD patients in an MSOA, the prevalent ICHD cohort was used instead. If there were also zero prevalent ICHD patients, information from neighbouring MSOAs was used to allocate people to renal centres.

For Scotland and Northern Ireland, intermediate zones (IZs) and electoral wards, respectively, were used to assign populations to each renal centre. The General Register Office for Scotland has published 2011 population estimates for 1,279 IZs and the Northern Ireland Statistics and Research Agency (NISRA) has published 2011 population estimates for 582 electoral wards. In instances where an area was neither covered by the incident or prevalent ICHD cohorts, information from the neighbouring covered areas or from larger geographies was used.

Finally, the total catchment population for each centre was determined by summing the populations assigned to each renal centre as described above. Given that all geographies were assigned to a centre, the sum of all centres' catchment populations was equal to the total 2019 adult population estimate for the UK. While the sum of centres' catchment populations in Scotland and Northern Ireland was exactly the same as the total national populations, there was a small difference for England and Wales, because some patients residing in MSOAs in the border region were treated at renal centres across the national border.

It is noted that this methodology has its limitations. The allocation of MSOAs in England and Wales and IZs in Scotland to each renal centre was based upon ICHD patients only and so it is possible that non-ICHD patients may come from a different catchment population. This is more likely where a renal centre provides specialist services and especially likely for patients undergoing kidney transplantation.

6.2 Adjusted analyses

Most analyses presented in this report are unadjusted. However, a few analyses are adjusted to take into account the difference in baseline characteristics between groups that may influence the outcome, thereby allowing better comparisons between renal centres. See each chapter for more details.

6.3 Graphs

Percentages achieving The Renal Association guidelines and other standards are displayed in several ways in the UKRR Annual Report.

6.3.1 Caterpillar plots

Caterpillar plots show the percentage meeting the targets along with 95% confidence intervals (CIs) for each centre, country and overall.

6.3.2 Funnel plots

Funnel plots show the percentage meeting the target plotted against the size of the centre (the number of people with a measurement, or the number of patient-years at risk). A 'funnel' is plotted either around the average percentage meeting the target or the target itself as specified in the plot title. There is evidence that any centres which fall outside the funnel are significantly different from the average or the target. The funnel shape of the limits reflects the fact that for smaller centres, for which the percentage meeting the target is less reliably estimated, a greater observed difference from the average/target is required for it to be statistically significantly different.

In each funnel plot, the lines (see legends) indicate the national mean and the 95% and 99.7% CIs as stated, corresponding to two and three standard deviations from the mean, respectively. Each point on the plot represents one renal centre. For each outcome measure, if no significant inter-centre variation was present, three of 70 adult renal centres would be expected to fall between the 95% and 99.7% CIs and no centre should fall outside the 99.7% CI. In survival analysis the funnel plot methodology is similar except that the funnel plots show the percentage survival plotted against the size of the centre (the number of patients in the cohort) and a 'funnel' is plotted around the average survival in the UK. Survival for any centres falling outside the 95% CIs is

therefore significantly different from the average survival in the UK.

6.3.3 Box and whisker plots

These are only used to report MSSA and MRSA infection rates. The box shows the median in the middle and the upper and lower quartiles, i.e. 25th and 75th centiles. The whiskers show the full measured range of that variable.

6.3.4 Kaplan-Meier (KM) method/plots

In the KM method, the probability of surviving more than a given time period can be estimated for all members of a cohort of patients overall (or by subgroup such as age group). Its estimator is a series of declining horizontal steps that approaches the true survival function for the given population with a large enough sample size. The declining step function (i.e. the KM curve) takes the censoring of data into account (right-censoring in the UKRR analysis), which occurs if the patient is lost to follow-up or is alive without the event occurrence at last follow-up. The KM method can also estimate median time to event in conjunction with right-censoring information; median time is when 50% of patients within the population experienced the event (see section 8.1 for further discussion of the KM methods used in the survival analysis).

6.4 How to interpret centre-specific analyses and outlying centres

The UKRR continues to advise caution in the interpretation of the comparisons of centre-specific attainment of clinical audit measures provided in this report. As in previous reports, the UKRR does not test for 'significant difference' between centres and arbitrary 95% and 99.7% CIs are created from the data to show compliance with an audit standard.

For a number of years de-anonymised centre-specific reports on survival of RRT patients have been published in the annual report. Centres are contacted if survival is lower than expected in patients starting dialysis and for prevalent RRT patients

The UKRR has no statutory powers. However, because the UKRR provides centre-specific de-anonymised analyses of important clinical outcomes, including survival, it is important to define how the UKRR responds to apparent under-performance. The UKRR senior management team communicates survival outlier status with the renal 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 inform the president of the Renal Association, who then takes action to ensure that the findings are properly investigated.

7. Populations and analyses by annual report chapter

Analyses in the report are presented on cohorts of patients who share either the time at which they initiated RRT e.g. incident population, or share a treatment modality e.g. PD patients.

7.1 Prevalent adult CKD population (chapter 1)

The prevalent adult CKD population is all patients aged 18 years and over with an eGFR <30mL/min/1.73m^2 at their last creatinine measurement, who are reported to the UKRR as receiving specialist treatment for CKD (excluding RRT or treatment for AKI) in an adult renal centre on 31 December 2019. It includes both patients who started treatment for CKD in 2019 and those who had been receiving treatment for longer. Any patients who were treated for CKD earlier in the year, but by the end of 2019 were on RRT for ESKD, would be part of the prevalent RRT population instead (there is no overlap between these two populations). Also excluded are patients who died before the end of 2019.

Patients who were recorded as receiving conservative care (and therefore might have clinical need for RRT, but not be in receipt of it) are included in this population, provided they meet the other criteria previously described. However, patients in receipt of conservative care are not analysed as a separate subgroup, because of the wide variation across centres in the proportions reported.

CKD data were submitted by 17 of the 70 adult renal centres: Birmingham, Cambridge, Carlisle, Coventry, Derby, Gloucester, London Royal Free, Leicester, Middlesbrough, Oxford, Plymouth, Portsmouth, Salford, Stevenage, Southend, Swansea and Truro. Birmingham consists of two centres (QEH and Heartlands) but only QEH submitted CKD data. Allocations to renal centres follow the same pattern as described for the prevalent RRT population.

7.2 Incident adult renal replacement therapy (RRT) population (chapter 2)

The incident adult RRT population is all patients aged 18 years and over with ESKD who started RRT (dialysis or pre-emptive Tx) at a UK renal centre for the first time in the calendar year applicable to the analyses. It excludes patients who recover their renal function for >90 days within 90 days of starting dialysis. Furthermore, patients restarting dialysis after a failed Tx are not counted as incident patients. A patient can therefore appear only once in the incident cohort.

The treatment timeline is used to define incident patients. If a patient has timeline entries from more than one centre these are combined and sorted by date. The first RRT treatment entry from any centre is used to determine the first date they commenced RRT. This is defined as a 'start date'. However, in the following situations there is evidence that the patient was already receiving RRT before this 'start date' and consequently these people are not classed as incident patients:

- those with an initial entry on the timeline of transferred in (modality codes 39 to 69)
- those with an initial entry of transferred out (modality code 38)
- those with an initial treatment of lost to follow-up (modality code 95)
- those who had an initial graft acute rejection (modality code 31) and did not have a Tx on the same day
- those with an initial entry of transfer to adult nephrology (modality code 37)
- those with an initial entry of graft functioning (modality code 72)
- those with an initial entry of nephrectomy Tx (modality code 76).

Where none of the above apply, the patient is defined as an incident patient, providing there is no recovery of >90 days starting within 90 days of the start date. If there is a recovery lasting >90 days, modality codes after this date would indicate that the patient restarted RRT. If they did, this second (or third etc.) starting point is defined as their start date, providing that they did not have a recovery lasting >90 days starting within 90 days of start.

Provided the UKRR received a modality code 36 (pre-emptive Tx) from the work-up centre, pre-emptive Tx are allocated as incident patients of the work-up centre and not of the centre where the Tx took place.

NHS England mandates the collection of data regarding acute HD sessions. However, sessional HD data carry no information about whether the HD was for AKI or ESKD. Distinguishing between these two indications depends entirely upon the accuracy of timeline data provided by centres.

Patients who receive acute HD are only reported if their dialysis is subsequently recoded as being for ESKD, when they fail to recover native renal function. Recoding to RRT is automatically applied at 90 days for individuals still on RRT, unless the centre confirms a patient was on an unusually long period of dialysis for acute renal failure, but can also be applied at any point between zero and 90 days by the reporting centre. Individuals who commence HD for AKI (i.e. acute HD by definition) and subsequently recover renal function or die within the first 90 days of treatment without receiving an ESKD code are the focus of a separate piece of work.

Differences in RRT incidence can be seen in the most recent years when compared with previous publications because of retrospective updating of data in collaboration with renal centres. In addition, patients with AKI requiring dialysis may be coded in the subsequent year as having developed ESKD, allowing the UKRR to backdate the start date of RRT.

7.3 Prevalent adult RRT population (chapter 3)

The prevalent adult RRT population is all patients on RRT for ESKD aged 18 years and over at a UK renal centre who were alive on 31 December of the year applicable to the analyses. It includes both incident patients for that year (who remained on RRT until the end of the year) and patients who have been on RRT for longer. Excluded are patients who had transferred out, recovered renal function, stopped treatment without recovery of function, died or were lost to follow-up before the end of the year. Patients who had transferred out, then transferred in to another centre before the end of the year would be included at the incoming centre. Also excluded are any patients aged 18 years and over still being treated at a paediatric renal centre.

When quarterly data are received from more than one centre (often when there is joint care of kidney Tx recipients between the referring centre and the Tx centre) the patient is only included under one of these. The allocated centre is defined by the steps below (as many steps as necessary are followed in this order until data are only left from one centre):

- the treatment timeline is used to eliminate any centre(s) which the patient was not still attending, at the end of the quarter
- a centre with biochemistry data (at least one of the six fields: creatinine, Hb, albumin, aluminium, serum potassium, urea) is favoured over one without
- a centre with quarterly modality of Tx is favoured over one without
- non-Tx centres are favoured over Tx centres
- the centre with the highest number of the six biochemistry fields (listed above) populated is favoured
- if the above steps do not decide between centres (unusual) then the choice is made based on the order

in which the centres appear in the data.

In some situations (generally where timeline data are seen to be inaccurate/incomplete) the centre used is set manually on an ad hoc basis.

There are exclusions for analyses of quarterly biochemistry or blood pressure data:

- patients who had 'transferred in' to the centre in that particular quarter are excluded
- patients who had changed treatment modality in that particular quarter are excluded
- patients who had been on RRT for <90 days are excluded.

Note the length of time on RRT is calculated from the most recent start date (i.e. the point at which they are defined as an incident patient using the definition detailed above). So if a patient starts, then recovers and then starts again, this second start date is used. Also, for patients who are not defined as incident patients because their start date is unknown (for example, if their first timeline entry is a transfer in code) it is assumed that they have been on RRT for ≥90 days and they are included for every quarter.

7.4 Prevalent adult transplant (Tx) population (chapter 4)

There are 23 UK adult renal Tx centres – 19 in England, two in Scotland and one each in Northern Ireland and Wales.

Annual organ-specific updates with comprehensive data concerning the number of patients on the Tx waiting-list, percentage of pre-emptive listing, the number of transplants performed, the number of deceased kidney donors (DBD and DCD), LKDs, patient survival and graft survival are available on the NHSBT website.

Where joint care of kidney Tx recipients between the referring centre and the Tx centre occurs, the patient is usually allocated to the referring centre (see section 7.3). Thus, the number of patients allocated to a Tx centre is often lower than that recorded by the centre itself and conversely, pre-emptively transplanted patients are sometimes allocated to the transplanting centre rather than the referring centre if no transfer out code is submitted to the UKRR. Queries and updated information are welcomed by the UKRR at any point during the year if this has occurred.

The median PTH by CKD stages is reported nationally, despite poor PTH completeness across all centres – therefore this has to be interpreted with caution. PTH is submitted to the UKRR in two different units from different centres (pmol/L or pg/mL). We assume each centre submits PTH using the same unit for all patients within their centre. During our data cleaning process, we convert the data to pmol/L if the overall median PTH of the centre suggested they had used pg/mL.

In the eGFR slope analysis, a minimum duration of 18 months graft function is required and three or more creatinine measurements from the second year of graft function onwards are used to plot the eGFR slope. If a Tx failed but there are at least three creatinine measurements between one year post-Tx and graft failure, the patient is included, but no creatinine measurements after the quarter preceding the recorded date of Tx failure are analysed. Slopes are calculated using linear regression, assuming linear change in eGFR over time and the effect of age, ethnicity, sex, diabetes, donor type, year of Tx and current Tx status are analysed.

7.5 Prevalent adult in-centre haemodialysis (ICHD) population (chapter 5)

This chapter describes the population of adult patients with ESKD who were receiving ICHD in the UK at the end of the year applicable to the analyses. Throughout this chapter, ICHD refers to all modes of ICHD treatment, including haemodiafiltration (HDF). Several centres reported significant numbers of patients on

HDF, but other centres did not differentiate this treatment type in their UKRR returns. Analyses in this chapter exclude patients on HHD unless stated – HHD patients are analysed in a separate chapter.

7.6 Prevalent adult peritoneal dialysis (PD) population (chapter 6)

The PD chapter includes analyses of prevalent patients on continuous ambulatory PD (CAPD) and automated PD (APD).

7.7 Prevalent adult home haemodialysis (HHD) population (chapter 7)

The HHD chapter includes analyses of prevalent patients on home haemodialysis. Due to small numbers, haematological and biochemical results are not shown for many of the UK renal centres. Renal centres are not required to submit changes in dialysis modality that last <30 days, so it is difficult to correctly attribute an infection to HHD or ICHD. Therefore analysis of infections is presented in the ICHD chapter for ICHD and HHD combined.

7.8 Paediatric RRT population (chapter 8)

This chapter describes the population of children (aged <18 years) with ESKD who received RRT in the year applicable to the analyses. Definitions of 'incident' and 'prevalent' cohorts are equivalent to those used in the analysis of adult RRT patients. However, by contrast to adult chapters, paediatric patients treated in paediatric renal centres and coded as ESKD who died within the first 90 days of RRT are excluded from the paediatric analyses.

In the UK, RRT for children is managed by 13 paediatric renal centres, all of which are equipped to provide both HD and PD. Ten of these centres also perform kidney transplantation. Young people aged 16–18 years may be managed in either paediatric or adult renal centres. This is variable across the UK and dependent on local practices, social factors and patient/family wishes.

In this chapter, data are reported separately for patients aged <16 years who are managed within UK paediatric renal centres and for young people aged 16–18 years (including both young adults managed by paediatric renal centres and those who received nephrology care from adult renal centres).

The populations used to calculate incidence and prevalence are obtained from the ONS. The mid-current-year population estimate produced by the ONS, based on the 2011 census, is used to calculate the current year incidence and prevalence rates. For analyses performed using historic years, an incident 15 year cohort is divided into three five year periods – with the mid-year estimate for each five year period being used as the population estimate. Incidence and prevalence for 16–18 year olds are also reported, however these are possibly under-estimated because adult centres are not currently required to send data on young people aged <18 years.

PRD is coded according to 2012 diagnostic groupings used by the ERA-EDTA: these include tubulointerstitial disease, glomerular disease, familial and hereditary nephropathies, systemic disease affecting the kidney and miscellaneous. Further details on how PRDs are coded and grouped can be found on the ERA-EDTA website.

Data for height, weight, BMI and blood pressure vary with age, sex and size and are therefore presented as z-scores as described in the chapter.

Analysis of cardiovascular risk factors is shown in children <16 years old. Risk factors considered are hypertension (SBP and/or DBP over the 90th percentile), BMI (overweight or obese, defined as an height-age z-score ≥1.3 in male and ≥1.19 in female) and hypercholesterolaemia (cholesterol >5.2 mmol/L, and/or high

triglycerides, defined as triglycerides >1.13 mmol/L for those aged under 9 years and >1.46 mmol/L for those aged 9 years and over).

Table A5 Summary of age-specific biochemical clinical audit measures for children

	Age (years)			
Parameter	<1	1–5	6–12	>12
Hb (g/L)	Maintain 95–115 if aged <2 years	Maintain 100–120 if aged ≥2 years	100–120	100–120
Adjusted calcium (mmol/L)	2.24–2.74	2.19–2.69	2.19–2.69	2.15–2.55
Phosphate (mmol/L)	1.10–1.95	1.05–1.75	1.05–1.75	1.05–1.75
PTH (individual centre)	Within twice the normal range			
Bicarbonate* (mmol/L)	Levels may be maintained within normal range if growing appropriately Reported as either within or outside centre reference range			

*In young adults, the range of 20–26 mmol/L was used.
Hb – haemoglobin; PTH – parathyroid hormone

8. Specific analyses for adults

8.1 Survival and cause of death analyses

The unadjusted survival probabilities (with 95% CIs) are calculated using the KM method, in which the probability of surviving more than a given time can be estimated for all members of a cohort of patients overall or by subgroup such as age group, but without any adjustment for confounding factors such as age that affect the chances of survival. Where centres are small, or the survival probabilities are >90%, the CIs are only approximate.

To estimate the difference in survival of different subgroups of patients within the cohort, a stratified proportional hazards model (Cox) is used where appropriate. The results from the Cox model are interpreted using a hazard ratio. When comparing two groups, the hazard ratio is the ratio of the estimated hazard for group A relative to group B, where the hazard is the risk of dying at time *t* given that the individual has survived until this time. The underlying assumption of a proportional hazards model is that the hazard ratio remains constant throughout the period under consideration. Whenever used, the assumptions of the proportional hazards model are tested.

To allow for comparisons between centres with differing age distributions, survival analyses are adjusted for age and reported as survival adjusted to age 60 years. This gives an estimate of what the survival would have been if all patients in that centre had been aged 60 years at the start of RRT. This age was chosen because it was approximately the average age of patients starting RRT 17 years ago at the start of the UKRR's data collection. The average age of patients commencing RRT in the UK has recently stabilised around 64 years, but the UKRR has maintained age adjustment to 60 years for comparability with all previous years' analyses.

For some analyses, further adjustment was carried out for not only age, but also sex and comorbidities. Comorbidity data derived from diagnostic and procedure codes in HES and PEDW were used to augment comorbidity data submitted by renal centres to the UKRR. A comorbidity score was derived from a multivariable Cox proportional hazards model including all the comorbidities. A score was allocated for each comorbidity determined by the size of the hazard ratios estimated from the model. A score for each patient was calculated by summing the scores of the individual comorbidities present for the patient.

Defining when a patient starts RRT (day zero) is reliant on centres following consistently the methodology

described in section 4.1.3. Previous work suggests that is not always the case. As well as variability in defining start date within the UK, there is international variability when patient data are collected by national registries (often for financial reimbursement or administrative reasons). Some countries define the 90th day after starting RRT as day zero, whilst others collect data only on those who have survived 90 days and report as zero the number of patients dying within the first 90 days.

Therefore, as many other national registries do not include reports on patients who do not survive the first 90 days, survival from 90 days onwards is also reported to allow international comparisons. This distinction is important, as there is a much higher death rate in the first 90 days, which would distort comparisons.

8.1.1 Methodology for incident patient survival

Patients incident to RRT are analysed over a number of years as stated in each analysis to help more readily identify differences between the survival of the populations being compared. Two years' incidence data is used to identify differences between the four UK countries. One year after 90 day survival using a rolling four year combined incident RRT cohort is used to compare survival between centres. A 10 year rolling cohort is used when analysing trends over time and for long term survival.

The incident survival cohort is not censored at the time of transplantation and therefore includes the survival of the subset of patients who start RRT with a pre-emptive Tx. An additional reason for not censoring is to facilitate comparison between centres. Centres with a high proportion of patients of South Asian and Black origin are likely to have a healthier dialysis population, because South Asian and Black patients are less likely to undergo early transplantation and centres with a high pre-emptive Tx rate are likely to have a less healthy dialysis population because transplantation selectively removes fitter patients.

The one year incident survival is for patients who started RRT from 1 October or two years earlier until the 30 September of the previous year and followed-up for one full year (e.g. patients starting RRT on 1 December 2016 are followed through to 30 November 2017). Using the same example, for analysis of one year after 90 day survival, patients who started RRT from 1 October 2016 until 30 September 2017 are included in the cohort and are followed-up for a full year after the first 90 days of RRT.

The death rate per 1,000 patient-years is calculated by dividing the number of deaths by the person years exposed. Person years exposed are the total years at risk for each patient (until death, recovery or lost to follow-up). The death rate is presented by age group.

Case-mix adjustment of one year after 90 day survival for the effect of age, sex and comorbidity is undertaken using a rolling four year combined incident RRT cohort. Data on age and sex are 100% complete. Only those centres returning ≥85% of comorbidity data (after augmentation from HES and PEDW) for patients in the combined cohort are included. A Cox proportional hazards model with statistical frailty was fitted to account for heterogeneity and random effects between renal centres.

8.1.2 Methodology for prevalent dialysis patient survival

The prevalent dialysis patient group is defined as all adults, alive and receiving dialysis at the start of the given year who had been on dialysis for at least 90 days at one of the UK adult renal centres. It does not include patients coded as being on chronic dialysis but yet to reach 90 days, unlike other definitions of the prevalent population. Prevalent dialysis patients on 31 December of the previous year are followed-up in the current year and are censored at transplantation. When a patient is censored at transplantation, this means that the patient is considered alive up to the point of transplantation, but the patient's status post-Tx is not considered.

Case-mix adjusted 1 year survival for prevalent dialysis patients at the end of 2018 is reported. The methodology

followed is the same as described in section 8.1.1.

As discussed in previous reports, comparison of survival of prevalent dialysis patients between centres is complex. Survival of prevalent dialysis patients can be studied with or without censoring at transplantation and it is common practice in some registries to censor at transplantation. Censoring could cause apparent differences in survival between those renal centres with a high Tx rate and those with a low Tx rate, especially in younger patients where the Tx rate is highest. Censoring at transplantation systematically removes younger, fitter patients from the survival data. The differences are likely to be small due to the relatively small proportion of patients being transplanted in a given year compared to the whole dialysis population (about 10% of the dialysis population aged <65 years and about 2% of the population aged ≥65 years). To allow comparisons with other registries, the survival results for prevalent dialysis patients censored for transplantation are quoted.

8.1.3 Methodology for comparing mortality in prevalent RRT patients with mortality in the general population

Data on the UK population in mid-2019 and the number of deaths in each age group in 2019 were obtained from the ONS. The age-specific UK death rate was calculated as the number of deaths in the UK per 1,000 people in the population. The age-specific expected number of deaths in the RRT population was calculated by applying the UK age-specific death rate to the total of years exposed for RRT patients in that age group. This is expressed as deaths per 1,000 patient-years. The age-specific number of RRT deaths is the actual number of deaths observed in 2019 in RRT patients. The RRT observed death rate was calculated as number of deaths observed in 2019 per 1,000 patient-years exposed. Relative risk of death was calculated as the ratio of the observed and expected death rates for RRT patients. The death rate was calculated for the UK general population by age group and compared with the same age group for prevalent patients on RRT on 31 December 2019.

8.1.4 Methodology of cause of death

Completeness of cause of death data is calculated for all prevalent patients on RRT who died in a specific year with cause of death data completed for that year. Patients who were lost to follow-up or who recovered are not included in the cause of death completeness calculation.

Adult patients from England, Wales, Scotland and Northern Ireland are included in the analyses of cause of death. The incident patient analysis included all patients starting RRT in the years 2015–2018. Analysis of prevalent patients included all those aged ≥18 years and receiving RRT on 31 December 2018 and followed-up for one year in 2019.

8.2 Dialysis access

Each year, all adult renal centres in England, Wales and Northern Ireland are asked to provide vascular access data for incident and prevalent dialysis patients. The Scottish Renal Registry provides a separate dataset including access at start for all incident patients. Scottish patients are not included in any subgroup analysis by early/late presentation because of differences in definition (see section 4.1.1 and 4.1.2). Access data for incident patients are collected at patient level, whereas centre level data are submitted for prevalent patients. Records are validated against the UKRR database to confirm that the population collected at each centre for the audit was representative of the incident/prevalent population at that centre collected via the routine quarterly return.

The vascular access data are collected separately to the main quarterly returns and so present a considerable burden for the renal centres. This year the scope of the audit was reduced to reflect the guidelines that could be reasonably addressed with this data collection.

For the purposes of this audit, patients categorised as having AKI are excluded from the analyses as well as those

with missing information for access at start. Patients who did not start dialysis for the first time in 2019 based on UKRR quarterly data submissions were excluded, as were those aged <18 years. If a centre returns audit data for less than 70% of the incident or prevalent patients, it is excluded from analyses of that centre.

Patients starting HD are grouped by type of first vascular access: AVF, AVG, TL and NTL. Referral time is defined as the number of days between the date of first being seen by a renal physician (as an inpatient or outpatient) and the date of commencing dialysis. A patient is classified as presenting 'late' if they have a referral time of <90 days.

Dialysis access is best interpreted in the context of all patients starting RRT, thus data for pre-emptive Tx recipients are included and sourced from the UKRR database to augment the dialysis access audit data. This reflects the amended (2014) Renal Association guidelines for planned RRT initiation, which include Tx in the audit standard. Tx and non-Tx centres work together to prepare patients for Tx, but for the purpose of these analyses, patients are allocated to their most likely treatment centre (Tx or non-Tx).

8.3 Emergency hospitalisations for prevalent patients in England and Wales

All prevalent patients on 31 December 2018 were identified and the number of days spent on each modality (ICHD, PD and Tx) and at each renal centre during 2019 were calculated. For each renal centre and modality, the total number of days from all prevalent patients were summed and divided by 365 to get the number of patient-years during 2019.

For the same prevalent patients all emergency admissions in HES and PEDW during 2019 were identified and linked to the UKRR timeline to determine which modality was in use at the time of the admission. Emergency in-patient days were calculated by summing all of the lengths of stay (with an admission and discharge on the same day counted as one) by renal centre and modality. If a continuous inpatient spell extended beyond 31 December 2019, then only the days during 2019 were counted and the days in 2020 were excluded.

Emergency in-patient days per patient-years is calculated by dividing the emergency in-patient days by the number of patient-years, for each renal centre and modality.

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Appendix B

Clinical commissioning group (CCG) and health board (HB) adult incidence and prevalence numbers, rates and standardised ratios – data to the end of 2019

Contents

Introduction

This appendix gives the numbers and crude population rates of adult patients incident to renal replacement therapy (RRT) and the prevalent numbers and crude prevalent rates by treatment modality: in-centre haemodialysis (ICHD), home therapies – peritoneal dialysis (PD) and home haemodialysis (HHD) – and transplant (Tx). Standardised incidence ratios for the incident UK RRT cohort, the standardised prevalence ratios for the total UK RRT cohort and the standardised ratios for prevalent Tx patients were calculated using the methods described below.

Methods

Patients included in the CCG/HB analyses

For the incidence rate analyses, all new cases recorded by the UK Renal Registry (UKRR) as starting RRT in each year were included. For the prevalence rate analyses, prevalent patients at the end of the year were included.

Years included in the CCG/HB analyses

Analyses have been completed for each of the last six years. Combined analyses over the six years have also been done for the incidence rates and incidence rate ratio analyses, because there can be small numbers of incident patients in some areas.

Areas covered in the CCG/HB analyses

The areas used were the 135 English Clinical Commissioning Groups (CCGs) valid from April 2020, the seven Welsh Local Health Boards, the 14 Scottish Health Boards and the five Health and Social Care Trusts in Northern Ireland. In this appendix these different types of area are collectively called CCGs and health boards (HBs). Patients were allocated to CCG/HB using the patient's postcode (rather than their GP's postcode). For the incidence rate analyses, the patient's postcode at the start of RRT was used. For the prevalence rate analyses, the postcode at the end of the latest year was used. Each postcode was linked to the Office for National Statistics (ONS) postcode directory to give the CCG/HB code.

Population data used for the CCG/HB analyses

Mid-2019 population estimates by CCG/HB, sex and age group were obtained from the ONS website (ons.gov.uk), the Northern Ireland Statistics and Research Agency (NISRA) website (nisra.gov.uk) and the National Records of Scotland website (nrscotland.gov.uk). These mid-2019 population estimates are projections based on the 2011 census data. The CCG/HB populations aged 18 years and over ranged from 18,200 (Orkney) to 1,451,300 (Kent and Medway).

The analysis for each year used this mid-2019 population data. As the analyses cover only six years this was a reasonable approximation.

Calculation of rates and rate ratios for the CCG/HB analyses

Crude rates

The crude rates, per million population (pmp), were calculated for each CCG/HB for each year:

$$1{,}000{,}000 \times (\text{observed number})/(\text{population size})$$

For the combined years analyses the observed cases were summed over the available years and the population

was multiplied by the number of years that the area has been covered. This is a rate pmp **per year**. It is an average over the available years.

Confidence intervals (CIs) have not been calculated for these (single or combined years) rates but, if required, an assessment can be made of whether the rate for a given area is consistent with the rate in the whole covered population. This can be done by using figures B1-B4 which show the CIs around the overall average rates for a range of CCG/HB population sizes.

Note that when using the CI figures to assess how different an area's combined years' crude incidence rate is from the overall average, the population looked up on the x-axis should be the area's population multiplied by the number of years of data that has been used (i.e. generally six). In doing this, the CIs obtained become narrower, consistent with the analysis now being based on more than one year of data.

These CIs have been obtained using the normal approximation to the Poisson distribution. For the incident analyses, CIs have only been calculated around the overall average for populations of >80,000. This is because below this level the number of cases expected per area is low - with low expected numbers the Poisson distribution is skewed and the normal approximation to it is not appropriate. Due to prevalence rates being higher, CIs can be obtained using this method for lower population sizes.

Denominator for adult rates

For reports up to the 21st Annual Report, the full general population was used to calculate national and CCG/HB crude rates of RRT. Only in the text were the corrected UK crude rates, including paediatric patients in addition to adult RRT patients, given. Starting from the 22nd Annual Report, adult crude rates are shown, excluding the general population aged <18 years old from the denominator. This explains the apparent increase in crude rate observed when comparing to the 2017 rates shown in the 21st UKRR Annual Report.

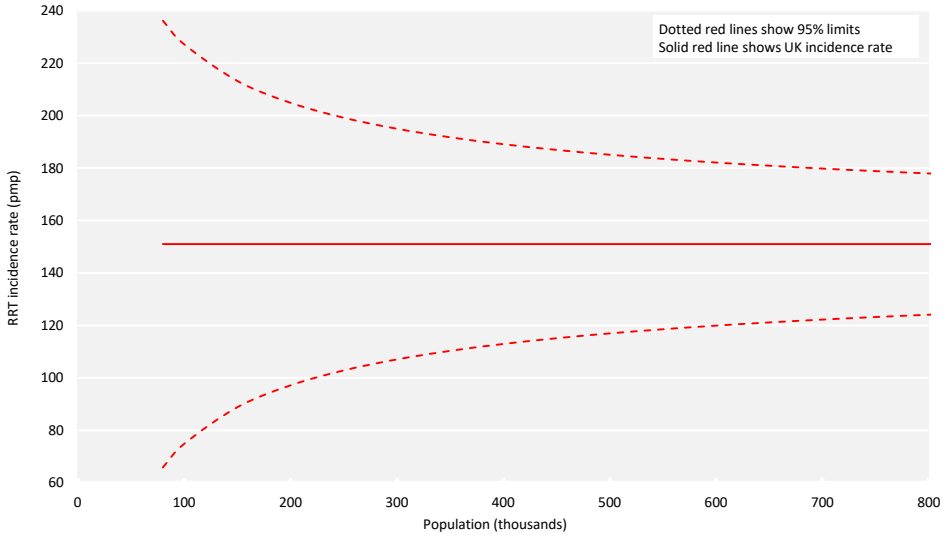

Figure B1 95% confidence limits for adult RRT incidence rate of 151 pmp in 2019 for population size 80,000–800,000
pmp – per million population

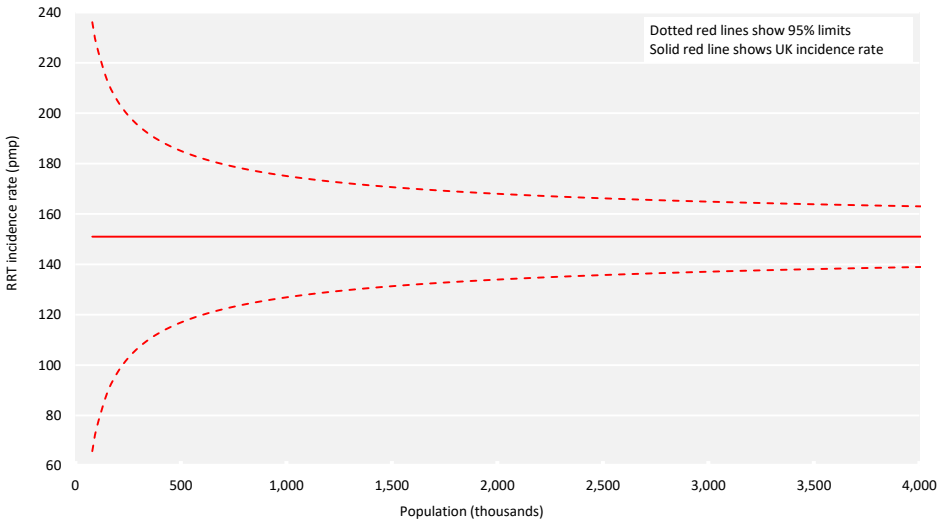

Figure B2 95% confidence limits for adult RRT incidence rate of 151 pmp in 2019 for population size 80,000–4 million
pmp – per million population

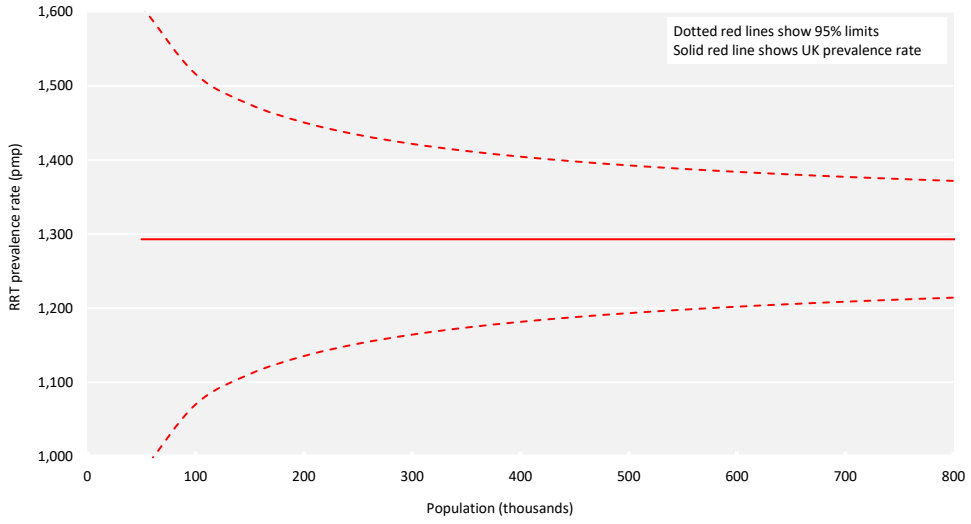

Figure B3 95% confidence limits for adult RRT prevalence rate of 1,293 pmp on 31/12/2019 for population size 50,000–800,000
pmp – per million population

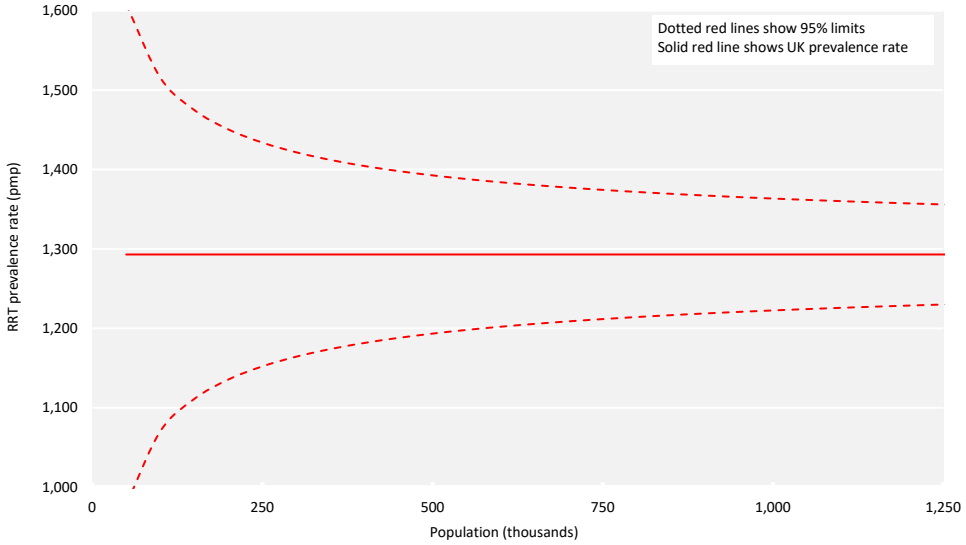

Figure B4 95% confidence limits for adult RRT prevalence rate of 1,293 pmp on 31/12/2019 for population size 50,000–1.25 million
pmp – per million population

Standardised incidence/prevalence ratios

There were large differences in incidence and prevalence rates for RRT between age and sex groups. As there are also differences in the age/sex breakdowns of the different areas, it is useful to produce estimates standardised for age and sex. The method used is *indirect* standardisation.

Observed cases (O_i) were calculated by summing all cases in all age and sex bands for each CCG/HB. Expected cases (E_i) for each CCG/HB were calculated as follows:

> Overall crude rates (for each year) were calculated for the whole covered population (the *standard population*) by summing the observed numbers, over the CCGs/HBs, for each age/sex band and dividing this by the total covered population in that age/sex band. These crude rates (by age/sex band) were then multiplied by the population each CCG/HB had in each band to give the number of cases expected in that band if that CCG/HB had the same rates as the standard population.

These expected numbers were then summed over the age/sex bands to give an expected total number of cases in each CCG/HB. The age/sex standardised ratio (SR) for CCG/HB_i is then $O_i/E_{i.}$

The expected number of cases is the number seen if the rates in the standard population are applied to that individual CCG's/HB's age/sex breakdown. CIs were calculated for each area using an error factor (EF) as follows:

> Lower 95% confidence limit = SR/EF
>
> Upper 95% confidence limit = SR × EF

Where $EF = \exp(1.96/\mathrm{sqrt}(O_i))$

SR = 1 indicates that the area's rate was as expected if the age/sex rates found in the total covered population applied to the CCG/HB area's population structure; a value above one indicates that the observed rate was greater than expected given the area's population structure - if the lower confidence limit was above one this was

statistically significant at the 5% level. The converse applies to SRs below one.

The combined years analyses are the same as the above except that the observed and expected numbers are summed over the years.

Remaining variability between rates

Even after standardisation there remained a large amount of variability between CCGs/HBs, as can be seen by the large numbers of notably low or high SRs. This is partly because these ratios have only been adjusted for age and sex and not for ethnicity or any other factors. Higher rates are expected in populations with a high percentage of patients from South Asian or Black backgrounds.

Trends by CCG/HB between 2014 and 2019

Table B1 Number of adult patients incident to RRT by year of RRT start and CCG/HB (2014–2019)

	Number of observations (incident)					
CCG/HB	2014	2015	2016	2017	2018	2019
NHS ENGLAND NORTH (CHESHIRE AND MERSEYSIDE)						
NHS Cheshire CCG	69	75	64	84	65	67
NHS Halton CCG	15	20	15	17	12	6
NHS Knowsley CCG	28	15	14	25	20	9
NHS Liverpool CCG	59	60	47	53	49	31
NHS South Sefton CCG	25	21	23	16	14	13
NHS Southport and Formby CCG	13	9	12	15	18	12
NHS St Helens CCG	21	22	21	22	18	16
NHS Warrington CCG	24	19	16	24	16	10
NHS Wirral CCG	28	45	37	37	39	39
NHS ENGLAND NORTH (YORKSHIRE AND HUMBER)						
NHS Barnsley CCG	40	24	36	31	32	18
NHS Bassetlaw CCG	13	8	14	12	14	15
NHS Bradford District and Craven CCG	80	89	87	81	69	92
NHS Calderdale CCG	15	18	23	15	18	24
NHS Doncaster CCG	49	31	44	36	35	33
NHS East Riding of Yorkshire CCG	32	37	33	37	31	41
NHS Greater Huddersfield CCG	28	22	18	18	22	30
NHS Hull CCG	27	37	27	29	26	33
NHS Leeds CCG	67	61	69	81	86	58
NHS North East Lincolnshire CCG	19	20	10	20	21	10
NHS North Kirklees CCG	17	16	21	18	25	19
NHS North Lincolnshire CCG	11	22	18	12	23	21
NHS North Yorkshire CCG	51	47	50	36	43	39
NHS Rotherham CCG	28	34	24	31	37	35
NHS Sheffield CCG	61	58	58	72	87	63
NHS Vale of York CCG	35	27	41	35	24	33
NHS Wakefield CCG	39	25	36	49	31	43
NHS ENGLAND NORTH (GREATER MANCHESTER)						
NHS Bolton CCG	21	35	36	45	38	34
NHS Bury CCG	25	27	25	25	18	16
NHS Heywood, Middleton and Rochdale CCG	32	25	36	31	30	33
NHS Manchester CCG	64	79	72	83	74	72
NHS Oldham CCG	31	28	36	21	23	33
NHS Salford CCG	22	22	31	31	28	28
NHS Stockport CCG	30	30	37	38	29	24
NHS Tameside and Glossop CCG	24	31	38	37	33	37
NHS Trafford CCG	22	24	28	23	22	33
NHS Wigan Borough CCG	35	37	41	30	27	34
NHS ENGLAND NORTH (CUMBRIA AND NORTH EAST)						
NHS County Durham CCG	47	57	62	74	65	66
NHS Newcastle Gateshead CCG	45	58	51	64	64	43
NHS North Cumbria CCG	37	46	39	41	32	44
NHS North Tyneside CCG	16	20	25	20	19	20
NHS Northumberland CCG	40	28	38	41	36	34
NHS South Tyneside CCG	11	18	27	22	28	17
NHS Sunderland CCG	30	34	43	39	29	35
NHS Tees Valley CCG	66	93	63	81	84	74

Table B1 Continued

CCG/HB	Number of observations (incident)					
	2014	2015	2016	2017	2018	2019
NHS ENGLAND NORTH (LANCASHIRE AND SOUTH CUMBRIA)						
NHS Blackburn with Darwen CCG	12	25	16	14	24	23
NHS Blackpool CCG	20	16	13	13	14	19
NHS Chorley and South Ribble CCG	18	24	14	21	20	11
NHS East Lancashire CCG	47	30	39	29	43	51
NHS Fylde and Wyre CCG	25	22	23	31	23	13
NHS Greater Preston CCG	21	23	16	29	20	16
NHS Morecambe Bay CCG	27	26	22	32	41	30
NHS West Lancashire CCG	9	18	9	9	15	2
NHS ENGLAND MIDLANDS AND EAST (CENTRAL MIDLANDS)						
NHS Bedfordshire CCG	47	43	60	40	54	54
NHS East and North Hertfordshire CCG	64	69	62	61	48	74
NHS East Leicestershire and Rutland CCG	32	39	32	32	32	41
NHS Herts Valleys CCG	72	56	67	65	64	61
NHS Leicester City CCG	38	48	69	50	60	76
NHS Lincolnshire CCG	57	75	71	75	74	93
NHS Luton CCG	30	27	37	30	38	40
NHS Milton Keynes CCG	31	34	35	29	37	25
NHS Northamptonshire CCG	73	75	75	77	94	87
NHS West Leicestershire CCG	44	30	41	39	45	44
NHS ENGLAND MIDLANDS AND EAST (EAST)						
NHS Basildon and Brentwood CCG	30	38	38	33	26	24
NHS Cambridgeshire and Peterborough CCG	76	75	96	85	91	99
NHS Castle Point and Rochford CCG	17	22	21	29	29	26
NHS Ipswich and East Suffolk CCG	37	59	43	49	56	56
NHS Mid Essex CCG	39	36	42	39	31	54
NHS Norfolk and Waveney CCG	103	132	127	92	95	120
NHS North East Essex CCG	45	34	35	51	48	47
NHS Southend CCG	15	21	29	23	19	22
NHS Thurrock CCG	20	19	15	21	21	25
NHS West Essex CCG	37	39	32	35	43	30
NHS West Suffolk CCG	18	19	15	13	17	20
NHS ENGLAND MIDLANDS AND EAST (NORTH MIDLANDS)						
NHS Cannock Chase CCG	13	15	18	17	10	17
NHS Derby and Derbyshire CCG	103	97	113	126	104	133
NHS East Staffordshire CCG	13	9	9	15	16	16
NHS North Staffordshire CCG	28	29	32	23	22	18
NHS Nottingham and Nottinghamshire CCG	100	112	114	119	108	109
NHS Shropshire CCG	38	38	35	40	45	41
NHS South East Staffordshire and Seisdon Peninsula CCG	22	22	28	23	19	21
NHS Stafford and Surrounds CCG	17	27	27	15	18	18
NHS Stoke on Trent CCG	43	35	35	28	35	32
NHS Telford and Wrekin CCG	24	27	19	23	37	30
NHS ENGLAND MIDLANDS AND EAST (WEST MIDLANDS)						
NHS Birmingham and Solihull CCG	163	176	190	171	183	173
NHS Coventry and Rugby CCG	52	48	71	63	69	72
NHS Dudley CCG	36	34	36	40	30	38
NHS Herefordshire and Worcestershire CCG	95	86	83	88	78	85
NHS Sandwell and West Birmingham CCG	79	91	94	103	100	99
NHS South Warwickshire CCG	28	27	32	27	23	35
NHS Walsall CCG	31	41	30	36	39	43
NHS Warwickshire North CCG	36	26	31	27	28	27

Table B1 Continued

CCG/HB	Number of observations (incident)					
	2014	2015	2016	2017	2018	2019
NHS Wolverhampton CCG	43	37	31	44	50	26
NHS ENGLAND LONDON						
NHS Barking and Dagenham CCG	31	33	29	35	41	32
NHS Brent CCG	75	69	67	72	68	68
NHS Central London (Westminster) CCG	19	18	20	20	24	11
NHS City and Hackney CCG	46	26	42	41	43	32
NHS Ealing CCG	57	77	60	79	74	71
NHS Hammersmith and Fulham CCG	23	19	30	32	28	30
NHS Harrow CCG	40	38	46	53	47	52
NHS Havering CCG	26	32	22	38	39	37
NHS Hillingdon CCG	29	33	34	38	41	50
NHS Hounslow CCG	32	33	42	54	50	46
NHS Newham CCG	57	62	64	55	63	60
NHS North Central London CCG	183	207	192	195	223	235
NHS Redbridge CCG	40	42	50	48	47	47
NHS South East London CCG	229	277	233	257	257	292
NHS South West London CCG	205	217	196	188	195	183
NHS Tower Hamlets CCG	48	52	41	55	57	25
NHS Waltham Forest CCG	50	43	37	50	38	41
NHS West London CCG	33	15	29	23	32	29
NHS ENGLAND SOUTH EAST (HAMPSHIRE, ISLE OF WIGHT AND THAMES VALLEY)						
NHS Berkshire West CCG	50	38	52	52	45	51
NHS Buckinghamshire CCG	49	49	60	58	65	71
NHS East Berkshire CCG	54	48	51	56	58	66
NHS Fareham and Gosport CCG	26	24	25	23	31	23
NHS Isle of Wight CCG	17	14	15	9	15	18
NHS North East Hampshire and Farnham CCG	20	24	21	22	18	21
NHS North Hampshire CCG	26	20	15	22	24	22
NHS Oxfordshire CCG	62	64	60	78	75	66
NHS Portsmouth CCG	20	23	23	23	27	22
NHS South Eastern Hampshire CCG	30	21	19	22	19	17
NHS Southampton CCG	23	23	27	29	31	19
NHS Surrey Heath CCG	5	11	6	23	6	7
NHS West Hampshire CCG	55	43	44	60	43	59
NHS ENGLAND SOUTH EAST (KENT, SURREY AND SUSSEX)						
NHS Brighton and Hove CCG	30	30	44	32	30	19
NHS East Sussex CCG	57	74	63	69	77	89
NHS Kent and Medway CCG	209	198	203	193	192	210
NHS Surrey Heartlands CCG	117	122	114	107	105	84
NHS West Sussex CCG	106	86	106	85	105	91
NHS ENGLAND SOUTH WEST (SOUTH WEST NORTH)						
NHS Bath and North East Somerset, Swindon and Wiltshire CCG	91	85	98	104	88	108
NHS Bristol, North Somerset and South Gloucestershire CCG	99	101	105	109	116	100
NHS Gloucestershire CCG	71	70	71	83	74	64
NHS ENGLAND SOUTH WEST (SOUTH WEST SOUTH)						
NHS Devon CCG	139	143	143	161	147	143
NHS Dorset CCG	73	65	61	85	94	80
NHS Kernow CCG	59	79	67	87	81	82
NHS Somerset CCG	65	50	67	57	59	72
N IRELAND (HEALTH AND SOCIAL CARE TRUSTS)						
Belfast	32	48	56	44	58	47

Table B1 Continued

CCG/HB	Number of observations (incident)					
	2014	2015	2016	2017	2018	2019
Northern	53	49	58	64	70	66
South Eastern	31	53	44	45	30	36
Southern	29	36	34	34	33	27
Western	33	39	36	30	35	31
SCOTLAND (HEALTH BOARDS)						
Ayrshire and Arran	38	45	60	54	43	47
Borders	9	11	5	18	13	13
Dumfries and Galloway	25	14	12	20	21	21
Fife	41	49	33	45	42	52
Forth Valley	33	38	23	26	51	31
Grampian	51	62	56	57	60	39
Greater Glasgow and Clyde	114	152	144	146	124	147
Highland	21	41	27	32	51	26
Lanarkshire	68	75	77	82	76	85
Lothian	71	70	70	92	81	69
Orkney	0	5	0	1	2	2
Shetland	3	3	2	1	3	0
Tayside	49	51	45	58	38	29
Western Isles	6	6	4	4	3	1
WALES (LOCAL HEALTH BOARDS)						
Aneurin Bevan University Health Board	81	71	66	79	81	87
Betsi Cadwaladr University Health Board	96	99	89	81	90	78
Cardiff and Vale University Health Board	47	49	64	49	71	56
Cwm Taf Morgannwg University Health Board	50	51	57	71	59	46
Hywel Dda University Health Board	60	56	42	55	56	73
Powys Teaching Health Board	11	18	18	17	20	12
Swansea Bay University Health Board	49	62	58	52	61	58

CCG/HB – Clinical Commissioning Group (England), Health and Social Care Trust (Northern Ireland), Health Board (Scotland) and Local Health Board (Wales)

Table B2 Number of adult patients prevalent to ICHD by year and CCG/HB (2014–2019)

CCG/HB	Number of observations (ICHD)					
	2014	2015	2016	2017	2018	2019
NHS ENGLAND NORTH (CHESHIRE AND MERSEYSIDE)						
NHS Cheshire CCG	223	220	194	198	198	199
NHS Halton CCG	43	43	49	47	44	46
NHS Knowsley CCG	48	46	50	56	62	56
NHS Liverpool CCG	161	164	160	171	184	184
NHS South Sefton CCG	58	61	62	51	44	46
NHS Southport and Formby CCG	44	39	41	44	38	35
NHS St Helens CCG	48	52	49	59	56	63
NHS Warrington CCG	61	61	51	51	47	44
NHS Wirral CCG	102	94	99	108	112	122
NHS ENGLAND NORTH (YORKSHIRE AND HUMBER)						
NHS Barnsley CCG	101	99	106	104	102	94
NHS Bassetlaw CCG	42	40	38	37	37	38
NHS Bradford District and Craven CCG	214	222	242	273	259	268
NHS Calderdale CCG	47	51	57	59	65	74
NHS Doncaster CCG	110	106	117	114	117	118
NHS East Riding of Yorkshire CCG	80	82	86	99	96	98
NHS Greater Huddersfield CCG	81	79	78	69	74	74
NHS Hull CCG	80	92	97	107	109	106
NHS Leeds CCG	208	213	209	231	233	218
NHS North East Lincolnshire CCG	59	61	54	58	63	61
NHS North Kirklees CCG	72	63	76	69	72	79
NHS North Lincolnshire CCG	68	74	67	69	69	73
NHS North Yorkshire CCG	116	120	121	121	126	126
NHS Rotherham CCG	101	106	111	105	107	113
NHS Sheffield CCG	243	249	244	250	253	235
NHS Vale of York CCG	89	92	100	103	101	100
NHS Wakefield CCG	103	101	108	114	108	120
NHS ENGLAND NORTH (GREATER MANCHESTER)						
NHS Bolton CCG	70	76	75	82	84	89
NHS Bury CCG	52	55	53	51	48	35
NHS Heywood, Middleton and Rochdale CCG	73	77	73	81	82	77
NHS Manchester CCG	200	203	192	214	233	231
NHS Oldham CCG	64	65	65	62	57	62
NHS Salford CCG	52	43	49	51	51	55
NHS Stockport CCG	69	67	76	84	75	64
NHS Tameside and Glossop CCG	62	64	63	73	78	74
NHS Trafford CCG	67	60	56	49	47	57
NHS Wigan Borough CCG	94	87	82	80	92	79
NHS ENGLAND NORTH (CUMBRIA AND NORTH EAST)						
NHS County Durham CCG	167	189	187	180	174	188
NHS Newcastle Gateshead CCG	116	129	127	145	155	150
NHS North Cumbria CCG	70	79	95	99	103	115
NHS North Tyneside CCG	50	50	54	61	61	65
NHS Northumberland CCG	72	85	82	87	90	85
NHS South Tyneside CCG	39	45	56	54	60	60
NHS Sunderland CCG	98	96	114	112	109	105
NHS Tees Valley CCG	214	221	208	227	238	226
NHS ENGLAND NORTH (LANCASHIRE AND SOUTH CUMBRIA)						
NHS Blackburn with Darwen CCG	74	78	78	72	71	72
NHS Blackpool CCG	62	62	58	57	56	54

Table B2 Continued

CCG/HB	Number of observations (ICHD)					
	2014	2015	2016	2017	2018	2019
NHS Chorley and South Ribble CCG	60	54	53	59	65	54
NHS East Lancashire CCG	127	125	119	113	111	112
NHS Fylde and Wyre CCG	74	79	77	73	77	67
NHS Greater Preston CCG	60	62	66	67	63	68
NHS Morecambe Bay CCG	75	76	69	75	75	79
NHS West Lancashire CCG	32	35	39	37	38	34
NHS ENGLAND MIDLANDS AND EAST (CENTRAL MIDLANDS)						
NHS Bedfordshire CCG	124	130	140	134	142	148
NHS East and North Hertfordshire CCG	177	184	164	146	140	159
NHS East Leicestershire and Rutland CCG	82	85	81	81	83	84
NHS Herts Valleys CCG	191	196	204	204	192	185
NHS Leicester City CCG	185	191	214	217	205	206
NHS Lincolnshire CCG	219	238	226	229	225	245
NHS Luton CCG	94	99	112	96	107	109
NHS Milton Keynes CCG	78	75	84	77	73	62
NHS Northamptonshire CCG	204	202	218	216	242	250
NHS West Leicestershire CCG	102	105	104	106	105	105
NHS ENGLAND MIDLANDS AND EAST (EAST)						
NHS Basildon and Brentwood CCG	102	92	93	95	89	96
NHS Cambridgeshire and Peterborough CCG	278	276	285	279	291	285
NHS Castle Point and Rochford CCG	54	58	51	59	64	60
NHS Ipswich and East Suffolk CCG	130	151	154	147	146	137
NHS Mid Essex CCG	110	121	123	119	111	122
NHS Norfolk and Waveney CCG	343	364	380	360	345	356
NHS North East Essex CCG	119	124	125	139	137	146
NHS Southend CCG	66	70	62	69	72	62
NHS Thurrock CCG	57	59	54	65	74	81
NHS West Essex CCG	103	100	105	95	96	89
NHS West Suffolk CCG	59	64	53	44	49	48
NHS ENGLAND MIDLANDS AND EAST (NORTH MIDLANDS)						
NHS Cannock Chase CCG	42	48	44	47	49	44
NHS Derby and Derbyshire CCG	297	324	319	302	300	325
NHS East Staffordshire CCG	34	28	27	24	27	31
NHS North Staffordshire CCG	59	68	75	75	68	54
NHS Nottingham and Nottinghamshire CCG	301	325	341	331	335	331
NHS Shropshire CCG	103	101	106	109	110	120
NHS South East Staffordshire and Seisdon Peninsula CCG	76	77	73	69	70	69
NHS Stafford and Surrounds CCG	49	56	65	53	49	42
NHS Stoke on Trent CCG	113	98	99	96	89	91
NHS Telford and Wrekin CCG	77	74	78	76	94	89
NHS ENGLAND MIDLANDS AND EAST (WEST MIDLANDS)						
NHS Birmingham and Solihull CCG	652	670	658	619	627	634
NHS Coventry and Rugby CCG	189	174	179	162	150	181
NHS Dudley CCG	105	106	108	121	126	124
NHS Herefordshire and Worcestershire CCG	258	286	282	295	297	311
NHS Sandwell and West Birmingham CCG	343	362	385	407	425	433
NHS South Warwickshire CCG	77	87	97	87	68	75
NHS Walsall CCG	146	146	135	130	141	146
NHS Warwickshire North CCG	80	77	78	75	74	80
NHS Wolverhampton CCG	119	122	122	136	140	126

Table B2 Continued

CCG/HB	Number of observations (ICHD)					
	2014	2015	2016	2017	2018	2019
NHS ENGLAND LONDON						
NHS Barking and Dagenham CCG	84	88	89	102	108	105
NHS Brent CCG	288	296	308	311	311	304
NHS Central London (Westminster) CCG	67	64	63	66	60	55
NHS City and Hackney CCG	137	128	133	131	146	150
NHS Ealing CCG	250	266	266	274	268	258
NHS Hammersmith and Fulham CCG	87	90	101	108	98	91
NHS Harrow CCG	159	162	163	168	175	171
NHS Havering CCG	79	86	82	80	87	98
NHS Hillingdon CCG	147	148	142	143	146	151
NHS Hounslow CCG	152	156	166	168	181	175
NHS Newham CCG	212	219	228	222	222	219
NHS North Central London CCG	646	647	653	622	622	661
NHS Redbridge CCG	122	132	134	140	139	140
NHS South East London CCG	903	962	975	999	1,056	1,053
NHS South West London CCG	669	699	736	714	707	702
NHS Tower Hamlets CCG	142	158	153	169	170	158
NHS Waltham Forest CCG	133	140	154	163	167	163
NHS West London CCG	102	100	103	94	96	100
NHS ENGLAND SOUTH EAST (HAMPSHIRE, ISLE OF WIGHT AND THAMES VALLEY)						
NHS Berkshire West CCG	126	131	138	150	129	135
NHS Buckinghamshire CCG	132	122	123	130	136	152
NHS East Berkshire CCG	143	152	154	154	160	171
NHS Fareham and Gosport CCG	57	67	65	69	69	67
NHS Isle of Wight CCG	57	48	40	37	40	46
NHS North East Hampshire and Farnham CCG	65	77	58	70	72	72
NHS North Hampshire CCG	45	47	49	51	53	63
NHS Oxfordshire CCG	160	137	138	151	157	157
NHS Portsmouth CCG	65	77	68	66	66	66
NHS South Eastern Hampshire CCG	71	72	63	59	50	58
NHS Southampton CCG	58	65	65	61	72	78
NHS Surrey Heath CCG	21	25	21	34	37	29
NHS West Hampshire CCG	144	140	118	120	119	138
NHS ENGLAND SOUTH EAST (KENT, SURREY AND SUSSEX)						
NHS Brighton and Hove CCG	78	75	85	81	75	70
NHS East Sussex CCG	168	176	186	194	206	211
NHS Kent and Medway CCG	565	579	586	612	600	594
NHS Surrey Heartlands CCG	296	306	328	332	329	311
NHS West Sussex CCG	233	257	267	268	265	264
NHS ENGLAND SOUTH WEST (SOUTH WEST NORTH)						
NHS Bath and North East Somerset, Swindon and Wiltshire CCG	231	234	226	222	213	224
NHS Bristol, North Somerset and South Gloucestershire CCG	341	339	331	337	335	326
NHS Gloucestershire CCG	211	221	233	242	234	222
NHS ENGLAND SOUTH WEST (SOUTH WEST SOUTH)						
NHS Devon CCG	422	433	439	448	440	420
NHS Dorset CCG	238	248	240	245	245	241
NHS Kernow CCG	174	180	188	192	198	197
NHS Somerset CCG	178	180	192	194	191	192
N IRELAND (HEALTH AND SOCIAL CARE TRUSTS)						
Belfast	136	126	136	136	133	128
Northern	185	169	168	158	160	155

Table B2 Continued

CCG/HB	Number of observations (ICHD)					
	2014	2015	2016	2017	2018	2019
South Eastern	92	107	104	116	107	92
Southern	106	99	100	88	92	93
Western	90	97	107	91	90	82
SCOTLAND (HEALTH BOARDS)						
Ayrshire and Arran	128	132	139	149	147	145
Borders	37	41	34	36	34	37
Dumfries and Galloway	47	51	48	52	56	51
Fife	153	158	151	156	145	147
Forth Valley	96	97	89	87	103	101
Grampian	189	208	221	217	199	180
Greater Glasgow and Clyde	386	422	425	423	425	412
Highland	71	89	94	91	99	101
Lanarkshire	215	230	219	226	226	238
Lothian	226	235	246	263	260	257
Orkney	6	8	6	5	5	3
Shetland	4	7	7	9	11	8
Tayside	157	176	170	179	156	155
Western Isles	9	13	9	13	14	12
WALES (LOCAL HEALTH BOARDS)						
Aneurin Bevan University Health Board	204	201	198	224	236	251
Betsi Cadwaladr University Health Board	259	238	236	250	249	248
Cardiff and Vale University Health Board	130	132	141	160	172	167
Cwm Taf Morgannwg University Health Board	138	151	155	165	169	164
Hywel Dda University Health Board	135	144	140	159	161	170
Powys Teaching Health Board	46	54	56	59	59	55
Swansea Bay University Health Board	136	166	175	157	170	171

CCG/HB – Clinical Commissioning Group (England), Health and Social Care Trust (Northern Ireland), Health Board (Scotland) and Local Health Board (Wales)

Table B3 Number of adult patients prevalent to home therapies by year and CCG/HB (2014–2019)

	Number of observations (HHD+PD)					
CCG/HB	2014	2015	2016	2017	2018	2019
NHS ENGLAND NORTH (CHESHIRE AND MERSEYSIDE)						
NHS Cheshire CCG	61	51	56	61	53	53
NHS Halton CCG	11	14	11	16	15	8
NHS Knowsley CCG	18	23	14	15	13	15
NHS Liverpool CCG	37	37	42	42	37	25
NHS South Sefton CCG	20	23	20	18	17	12
NHS Southport and Formby CCG	9	11	10	6	7	8
NHS St Helens CCG	16	14	22	21	22	15
NHS Warrington CCG	18	19	20	16	16	11
NHS Wirral CCG	12	19	15	13	20	13
NHS ENGLAND NORTH (YORKSHIRE AND HUMBER)						
NHS Barnsley CCG	19	17	16	17	23	23
NHS Bassetlaw CCG	10	8	9	9	8	9
NHS Bradford District and Craven CCG	30	28	30	27	33	35
NHS Calderdale CCG	15	15	12	16	11	14
NHS Doncaster CCG	27	27	27	28	21	17
NHS East Riding of Yorkshire CCG	21	26	24	20	16	25
NHS Greater Huddersfield CCG	13	15	9	12	12	18
NHS Hull CCG	17	14	15	11	10	11
NHS Leeds CCG	17	18	24	28	36	37
NHS North East Lincolnshire CCG	12	14	14	11	9	5
NHS North Kirklees CCG	10	9	9	11	10	8
NHS North Lincolnshire CCG	24	18	20	15	16	12
NHS North Yorkshire CCG	25	27	30	29	31	35
NHS Rotherham CCG	16	21	23	27	30	28
NHS Sheffield CCG	33	35	38	32	34	38
NHS Vale of York CCG	22	20	24	27	26	29
NHS Wakefield CCG	23	18	13	17	18	24
NHS ENGLAND NORTH (GREATER MANCHESTER)						
NHS Bolton CCG	21	18	27	28	34	28
NHS Bury CCG	18	19	15	17	16	17
NHS Heywood, Middleton and Rochdale CCG	27	20	24	25	24	31
NHS Manchester CCG	36	33	49	55	56	60
NHS Oldham CCG	13	18	24	25	22	26
NHS Salford CCG	13	14	20	29	27	20
NHS Stockport CCG	25	27	19	22	22	29
NHS Tameside and Glossop CCG	20	21	23	24	25	25
NHS Trafford CCG	12	10	14	20	16	22
NHS Wigan Borough CCG	25	21	26	30	27	31
NHS ENGLAND NORTH (CUMBRIA AND NORTH EAST)						
NHS County Durham CCG	23	19	21	31	39	40
NHS Newcastle Gateshead CCG	27	25	27	30	29	34
NHS North Cumbria CCG	27	38	36	27	29	33
NHS North Tyneside CCG	13	12	19	16	15	7
NHS Northumberland CCG	27	24	21	23	27	26
NHS South Tyneside CCG	5	4	6	8	8	9
NHS Sunderland CCG	6	13	10	14	13	9
NHS Tees Valley CCG	16	27	28	26	26	28
NHS ENGLAND NORTH (LANCASHIRE AND SOUTH CUMBRIA)						
NHS Blackburn with Darwen CCG	2	3	5	9	7	12
NHS Blackpool CCG	7	9	9	8	8	7

Table B3 Continued

CCG/HB	Number of observations (HHD+PD)					
	2014	2015	2016	2017	2018	2019
NHS Chorley and South Ribble CCG	12	12	10	5	6	8
NHS East Lancashire CCG	28	22	23	28	23	32
NHS Fylde and Wyre CCG	17	15	13	12	12	13
NHS Greater Preston CCG	16	17	12	9	10	9
NHS Morecambe Bay CCG	20	23	16	18	19	16
NHS West Lancashire CCG	7	8	4	3	6	7
NHS ENGLAND MIDLANDS AND EAST (CENTRAL MIDLANDS)						
NHS Bedfordshire CCG	20	21	24	25	31	26
NHS East and North Hertfordshire CCG	32	30	33	36	41	43
NHS East Leicestershire and Rutland CCG	23	26	22	23	23	24
NHS Herts Valleys CCG	22	18	18	17	18	23
NHS Leicester City CCG	25	25	18	19	26	28
NHS Lincolnshire CCG	72	68	61	57	56	60
NHS Luton CCG	13	6	7	6	12	9
NHS Milton Keynes CCG	16	15	19	13	16	15
NHS Northamptonshire CCG	52	45	43	47	43	50
NHS West Leicestershire CCG	26	25	26	27	29	22
NHS ENGLAND MIDLANDS AND EAST (EAST)						
NHS Basildon and Brentwood CCG	19	28	26	28	26	19
NHS Cambridgeshire and Peterborough CCG	44	35	36	40	43	43
NHS Castle Point and Rochford CCG	13	12	19	21	20	22
NHS Ipswich and East Suffolk CCG	29	28	30	40	39	41
NHS Mid Essex CCG	22	19	24	24	23	23
NHS Norfolk and Waveney CCG	71	71	71	62	54	68
NHS North East Essex CCG	14	12	15	20	15	16
NHS Southend CCG	11	11	19	20	16	19
NHS Thurrock CCG	9	8	11	9	12	10
NHS West Essex CCG	18	21	22	25	27	26
NHS West Suffolk CCG	12	13	12	14	17	13
NHS ENGLAND MIDLANDS AND EAST (NORTH MIDLANDS)						
NHS Cannock Chase CCG	26	22	26	24	20	21
NHS Derby and Derbyshire CCG	127	117	119	132	126	119
NHS East Staffordshire CCG	21	22	19	25	24	23
NHS North Staffordshire CCG	34	27	22	20	20	18
NHS Nottingham and Nottinghamshire CCG	106	104	101	91	93	100
NHS Shropshire CCG	35	38	37	39	49	50
NHS South East Staffordshire and Seisdon Peninsula CCG	21	21	28	26	22	22
NHS Stafford and Surrounds CCG	24	21	21	20	22	25
NHS Stoke on Trent CCG	29	26	32	27	34	27
NHS Telford and Wrekin CCG	18	29	26	28	33	36
NHS ENGLAND MIDLANDS AND EAST (WEST MIDLANDS)						
NHS Birmingham and Solihull CCG	84	94	131	135	150	156
NHS Coventry and Rugby CCG	48	43	43	37	39	51
NHS Dudley CCG	61	57	57	56	38	26
NHS Herefordshire and Worcestershire CCG	84	78	84	88	77	68
NHS Sandwell and West Birmingham CCG	69	73	74	87	81	93
NHS South Warwickshire CCG	28	22	16	15	18	26
NHS Walsall CCG	41	48	45	40	35	33
NHS Warwickshire North CCG	25	27	20	22	21	27
NHS Wolverhampton CCG	40	43	39	33	36	32

Table B3 Continued

CCG/HB	Number of observations (HHD+PD)					
	2014	2015	2016	2017	2018	2019
NHS ENGLAND LONDON						
NHS Barking and Dagenham CCG	30	29	27	35	41	42
NHS Brent CCG	18	19	18	17	23	29
NHS Central London (Westminster) CCG	10	9	11	6	6	8
NHS City and Hackney CCG	15	15	16	22	24	22
NHS Ealing CCG	14	17	16	22	26	26
NHS Hammersmith and Fulham CCG	5	5	10	9	13	19
NHS Harrow CCG	10	9	10	13	21	28
NHS Havering CCG	21	22	26	34	35	37
NHS Hillingdon CCG	11	11	17	18	13	17
NHS Hounslow CCG	13	17	20	24	24	28
NHS Newham CCG	38	49	45	48	53	43
NHS North Central London CCG	130	142	142	135	159	160
NHS Redbridge CCG	42	40	44	49	43	35
NHS South East London CCG	127	128	138	144	137	150
NHS South West London CCG	99	94	94	93	107	100
NHS Tower Hamlets CCG	26	20	23	22	26	27
NHS Waltham Forest CCG	40	33	29	37	31	28
NHS West London CCG	7	8	10	7	12	14
NHS ENGLAND SOUTH EAST (HAMPSHIRE, ISLE OF WIGHT AND THAMES VALLEY)						
NHS Berkshire West CCG	40	37	37	31	30	31
NHS Buckinghamshire CCG	23	28	30	15	19	19
NHS East Berkshire CCG	37	31	28	23	20	28
NHS Fareham and Gosport CCG	22	25	22	20	20	20
NHS Isle of Wight CCG	9	12	11	3	5	8
NHS North East Hampshire and Farnham CCG	16	10	14	9	9	9
NHS North Hampshire CCG	15	15	10	7	8	10
NHS Oxfordshire CCG	40	38	35	26	27	23
NHS Portsmouth CCG	9	8	15	11	15	15
NHS South Eastern Hampshire CCG	8	6	12	18	23	18
NHS Southampton CCG	11	15	18	17	18	17
NHS Surrey Heath CCG	9	7	3	5	2	2
NHS West Hampshire CCG	31	30	32	47	49	41
NHS ENGLAND SOUTH EAST (KENT, SURREY AND SUSSEX)						
NHS Brighton and Hove CCG	20	15	21	19	19	15
NHS East Sussex CCG	50	60	44	44	40	43
NHS Kent and Medway CCG	130	115	117	105	93	100
NHS Surrey Heartlands CCG	82	80	72	70	69	61
NHS West Sussex CCG	72	66	78	65	67	58
NHS ENGLAND SOUTH WEST (SOUTH WEST NORTH)						
NHS Bath and North East Somerset, Swindon and Wiltshire CCG	52	57	59	58	59	64
NHS Bristol, North Somerset and South Gloucestershire CCG	57	47	39	42	38	45
NHS Gloucestershire CCG	51	41	49	44	38	30
NHS ENGLAND SOUTH WEST (SOUTH WEST SOUTH)						
NHS Devon CCG	88	93	98	98	100	102
NHS Dorset CCG	54	46	42	45	46	46
NHS Kernow CCG	50	47	43	41	36	40
NHS Somerset CCG	44	34	45	40	43	50
N IRELAND (HEALTH AND SOCIAL CARE TRUSTS)						
Belfast	11	20	17	12	17	13
Northern	21	28	20	19	27	32

Table B3 Continued

CCG/HB	Number of observations (HHD+PD)					
	2014	2015	2016	2017	2018	2019
South Eastern	14	16	20	19	21	17
Southern	22	24	23	25	19	14
Western	15	14	12	11	10	14
SCOTLAND (HEALTH BOARDS)						
Ayrshire and Arran	48	52	42	38	33	39
Borders	5	4	5	5	4	5
Dumfries and Galloway	17	14	13	8	6	9
Fife	17	22	21	12	12	15
Forth Valley	13	12	8	8	14	11
Grampian	33	28	23	23	28	24
Greater Glasgow and Clyde	42	47	50	41	36	38
Highland	22	22	20	17	26	23
Lanarkshire	15	25	35	25	31	29
Lothian	25	28	37	32	35	38
Orkney	2	2	2	2	1	0
Shetland	1	2	1	1	0	0
Tayside	25	20	22	20	29	27
Western Isles	3	3	6	3	3	2
WALES (LOCAL HEALTH BOARDS)						
Aneurin Bevan University Health Board	47	55	61	59	46	41
Betsi Cadwaladr University Health Board	77	97	83	73	73	69
Cardiff and Vale University Health Board	26	23	24	22	21	32
Cwm Taf Morgannwg University Health Board	37	32	30	44	39	43
Hywel Dda University Health Board	41	50	51	43	44	46
Powys Teaching Health Board	14	11	12	13	22	17
Swansea Bay University Health Board	44	37	40	45	43	51

CCG/HB – Clinical Commissioning Group (England), Health and Social Care Trust (Northern Ireland), Health Board (Scotland) and Local Health Board (Wales)

Table B4 Number of adult patients prevalent to Tx by year and CCG/HB (2014–2019)

CCG/HB	Number of observations (Tx)					
	2014	2015	2016	2017	2018	2019
NHS ENGLAND NORTH (CHESHIRE AND MERSEYSIDE)						
NHS Cheshire CCG	329	338	363	371	374	381
NHS Halton CCG	62	65	65	70	70	73
NHS Knowsley CCG	58	61	62	68	69	74
NHS Liverpool CCG	216	217	219	226	240	241
NHS South Sefton CCG	70	71	77	83	84	85
NHS Southport and Formby CCG	43	46	45	48	49	47
NHS St Helens CCG	80	82	77	83	85	84
NHS Warrington CCG	97	96	101	110	116	120
NHS Wirral CCG	120	130	141	150	152	157
NHS ENGLAND NORTH (YORKSHIRE AND HUMBER)						
NHS Barnsley CCG	119	124	132	136	133	136
NHS Bassetlaw CCG	45	53	56	58	58	59
NHS Bradford District and Craven CCG	313	342	360	374	394	414
NHS Calderdale CCG	106	109	115	119	121	119
NHS Doncaster CCG	135	146	154	155	162	169
NHS East Riding of Yorkshire CCG	167	170	173	176	190	191
NHS Greater Huddersfield CCG	123	131	139	133	136	145
NHS Hull CCG	119	132	139	142	144	147
NHS Leeds CCG	352	367	374	385	407	429
NHS North East Lincolnshire CCG	67	71	75	77	76	78
NHS North Kirklees CCG	118	124	122	127	137	138
NHS North Lincolnshire CCG	59	63	70	72	80	87
NHS North Yorkshire CCG	216	231	230	236	251	254
NHS Rotherham CCG	140	141	146	148	158	163
NHS Sheffield CCG	242	246	253	269	285	297
NHS Vale of York CCG	183	189	192	203	201	206
NHS Wakefield CCG	143	149	161	173	188	188
NHS ENGLAND NORTH (GREATER MANCHESTER)						
NHS Bolton CCG	157	167	171	186	184	198
NHS Bury CCG	88	98	106	112	114	128
NHS Heywood, Middleton and Rochdale CCG	91	103	122	124	129	135
NHS Manchester CCG	211	234	250	267	276	286
NHS Oldham CCG	108	116	122	127	142	141
NHS Salford CCG	108	114	115	118	128	144
NHS Stockport CCG	132	140	149	152	160	155
NHS Tameside and Glossop CCG	131	136	153	158	162	168
NHS Trafford CCG	104	110	115	123	134	132
NHS Wigan Borough CCG	170	177	182	193	192	188
NHS ENGLAND NORTH (CUMBRIA AND NORTH EAST)						
NHS County Durham CCG	256	257	262	282	282	281
NHS Newcastle Gateshead CCG	212	214	232	244	269	271
NHS North Cumbria CCG	152	161	153	160	166	160
NHS North Tyneside CCG	107	111	115	117	117	125
NHS Northumberland CCG	154	151	156	167	169	179
NHS South Tyneside CCG	76	75	82	89	89	95
NHS Sunderland CCG	144	144	155	160	163	172
NHS Tees Valley CCG	353	365	373	374	382	403
NHS ENGLAND NORTH (LANCASHIRE AND SOUTH CUMBRIA)						
NHS Blackburn with Darwen CCG	70	72	71	82	90	90
NHS Blackpool CCG	71	72	75	74	76	82
NHS Chorley and South Ribble CCG	80	88	93	99	102	102

Table B4 Continued

CCG/HB	Number of observations (Tx)					
	2014	2015	2016	2017	2018	2019
NHS East Lancashire CCG	187	201	214	226	237	248
NHS Fylde and Wyre CCG	80	90	93	103	111	117
NHS Greater Preston CCG	81	84	85	106	111	107
NHS Morecambe Bay CCG	136	145	156	159	171	180
NHS West Lancashire CCG	48	52	52	54	58	56
NHS ENGLAND MIDLANDS AND EAST (CENTRAL MIDLANDS)						
NHS Bedfordshire CCG	211	218	229	242	249	263
NHS East and North Hertfordshire CCG	261	269	290	317	319	320
NHS East Leicestershire and Rutland CCG	152	157	170	178	185	197
NHS Herts Valleys CCG	261	282	304	320	336	348
NHS Leicester City CCG	220	233	252	266	287	309
NHS Lincolnshire CCG	310	312	333	338	355	373
NHS Luton CCG	118	131	139	152	144	158
NHS Milton Keynes CCG	123	135	144	161	171	182
NHS Northamptonshire CCG	323	340	366	379	388	391
NHS West Leicestershire CCG	199	205	216	219	226	250
NHS ENGLAND MIDLANDS AND EAST (EAST)						
NHS Basildon and Brentwood CCG	110	113	123	135	139	139
NHS Cambridgeshire and Peterborough CCG	395	404	432	449	460	504
NHS Castle Point and Rochford CCG	85	85	87	91	93	107
NHS Ipswich and East Suffolk CCG	179	192	201	204	209	212
NHS Mid Essex CCG	191	195	201	213	226	231
NHS Norfolk and Waveney CCG	482	515	538	554	574	583
NHS North East Essex CCG	154	169	171	177	192	191
NHS Southend CCG	80	81	83	86	86	90
NHS Thurrock CCG	62	64	63	65	65	73
NHS West Essex CCG	133	140	146	163	174	185
NHS West Suffolk CCG	99	101	104	100	96	107
NHS ENGLAND MIDLANDS AND EAST (NORTH MIDLANDS)						
NHS Cannock Chase CCG	50	49	53	62	65	61
NHS Derby and Derbyshire CCG	418	443	480	507	536	556
NHS East Staffordshire CCG	43	49	57	53	58	62
NHS North Staffordshire CCG	91	97	103	100	99	106
NHS Nottingham and Nottinghamshire CCG	466	479	499	532	552	559
NHS Shropshire CCG	122	135	133	138	137	139
NHS South East Staffordshire and Seisdon Peninsula CCG	96	100	104	111	115	121
NHS Stafford and Surrounds CCG	67	72	72	76	78	83
NHS Stoke on Trent CCG	120	125	129	132	139	146
NHS Telford and Wrekin CCG	55	64	60	67	67	69
NHS ENGLAND MIDLANDS AND EAST (WEST MIDLANDS)						
NHS Birmingham and Solihull CCG	506	528	568	604	617	639
NHS Coventry and Rugby CCG	209	220	228	241	254	269
NHS Dudley CCG	107	116	124	130	138	152
NHS Herefordshire and Worcestershire CCG	304	314	338	358	368	386
NHS Sandwell and West Birmingham CCG	208	216	246	273	297	309
NHS South Warwickshire CCG	128	137	134	140	150	161
NHS Walsall CCG	139	139	150	161	161	181
NHS Warwickshire North CCG	92	97	101	108	112	121
NHS Wolverhampton CCG	98	99	108	111	116	122

Table B4 Continued

CCG/HB	Number of observations (Tx)					
	2014	2015	2016	2017	2018	2019
NHS ENGLAND LONDON						
NHS Barking and Dagenham CCG	88	91	97	101	107	125
NHS Brent CCG	224	238	253	269	293	310
NHS Central London (Westminster) CCG	86	92	96	98	106	107
NHS City and Hackney CCG	109	118	135	137	141	149
NHS Ealing CCG	221	231	246	254	270	292
NHS Hammersmith and Fulham CCG	83	84	84	97	104	117
NHS Harrow CCG	188	195	214	224	229	240
NHS Havering CCG	95	103	109	119	126	136
NHS Hillingdon CCG	188	188	195	192	202	214
NHS Hounslow CCG	157	165	167	177	185	189
NHS Newham CCG	142	154	159	180	202	232
NHS North Central London CCG	790	847	889	935	956	1,009
NHS Redbridge CCG	154	161	175	180	202	219
NHS South East London CCG	906	968	1,015	1,056	1,109	1,197
NHS South West London CCG	655	696	727	780	816	865
NHS Tower Hamlets CCG	102	110	119	133	149	159
NHS Waltham Forest CCG	142	156	169	174	182	205
NHS West London CCG	110	109	104	115	116	120
NHS ENGLAND SOUTH EAST (HAMPSHIRE, ISLE OF WIGHT AND THAMES VALLEY)						
NHS Berkshire West CCG	243	249	261	272	284	298
NHS Buckinghamshire CCG	278	288	310	329	341	357
NHS East Berkshire CCG	266	278	283	298	315	324
NHS Fareham and Gosport CCG	105	106	110	116	122	126
NHS Isle of Wight CCG	49	55	56	60	62	69
NHS North East Hampshire and Farnham CCG	90	96	105	106	110	116
NHS North Hampshire CCG	81	90	93	101	111	120
NHS Oxfordshire CCG	343	361	376	416	436	447
NHS Portsmouth CCG	81	82	85	99	101	111
NHS South Eastern Hampshire CCG	115	119	124	126	124	126
NHS Southampton CCG	114	118	121	130	126	137
NHS Surrey Heath CCG	46	46	49	53	48	52
NHS West Hampshire CCG	240	248	263	274	270	279
NHS ENGLAND SOUTH EAST (KENT, SURREY AND SUSSEX)						
NHS Brighton and Hove CCG	105	116	119	128	138	141
NHS East Sussex CCG	221	226	238	245	255	272
NHS Kent and Medway CCG	908	938	972	998	1,041	1,074
NHS Surrey Heartlands CCG	432	440	453	470	484	503
NHS West Sussex CCG	358	369	384	402	419	442
NHS ENGLAND SOUTH WEST (SOUTH WEST NORTH)						
NHS Bath and North East Somerset, Swindon and Wiltshire CCG	381	413	445	476	494	513
NHS Bristol, North Somerset and South Gloucestershire CCG	477	491	497	506	522	526
NHS Gloucestershire CCG	260	278	287	319	351	366
NHS ENGLAND SOUTH WEST (SOUTH WEST SOUTH)						
NHS Devon CCG	616	635	657	671	705	699
NHS Dorset CCG	342	356	371	386	417	433
NHS Kernow CCG	312	325	324	339	348	361
NHS Somerset CCG	243	248	250	257	266	269
N IRELAND (HEALTH AND SOCIAL CARE TRUSTS)						
Belfast	187	196	206	216	238	250
Northern	221	235	250	276	295	315

Table B4 Continued

CCG/HB	Number of observations (Tx)					
	2014	2015	2016	2017	2018	2019
South Eastern	167	182	199	214	227	241
Southern	174	199	218	232	244	257
Western	157	172	182	200	212	214
SCOTLAND (HEALTH BOARDS)						
Ayrshire and Arran	183	189	207	213	218	221
Borders	61	60	67	69	75	74
Dumfries and Galloway	71	76	78	85	91	97
Fife	159	165	163	176	186	195
Forth Valley	138	147	158	164	170	176
Grampian	257	274	290	298	318	331
Greater Glasgow and Clyde	646	660	692	732	754	797
Highland	173	183	187	199	204	212
Lanarkshire	355	364	375	406	414	443
Lothian	352	361	366	387	420	429
Orkney	6	6	6	7	7	12
Shetland	7	7	9	7	7	9
Tayside	194	203	207	211	229	235
Western Isles	11	11	13	15	15	16
WALES (LOCAL HEALTH BOARDS)						
Aneurin Bevan University Health Board	348	352	359	355	370	378
Betsi Cadwaladr University Health Board	251	310	333	351	370	382
Cardiff and Vale University Health Board	241	258	266	271	281	289
Cwm Taf Morgannwg University Health Board	297	301	299	304	309	310
Hywel Dda University Health Board	192	194	191	190	198	205
Powys Teaching Health Board	60	61	59	60	61	65
Swansea Bay University Health Board	232	230	224	229	224	219

CCG/HB – Clinical Commissioning Group (England), Health and Social Care Trust (Northern Ireland), Health Board (Scotland) and Local Health Board (Wales)

Table B5 Crude adult incidence rates of RRT and age/sex standardised incidence ratios (2014–2019 by individual year and 6 year average)

		O/E					2019		2014-2019				
CCG/HB	Population	2014	2015	2016	2017	2018	O/E	Crude rate pmp	O/E	95% LCL	95% UCL	Crude rate pmp	% non-White
NHS ENGLAND NORTH (CHESHIRE AND MERSEYSIDE)													
NHS Cheshire CCG	*581,300*	*0.76*	*0.79*	*0.67*	*0.86*	*0.66*	*0.69*	*115*	*0.74*	*0.67*	*0.81*	*122*	*2.5*
NHS Halton CCG	100,600	1.03	1.32	0.99	1.08	0.76	0.39	60	0.93	0.75	1.14	141	2.2
NHS Knowsley CCG	117,100	1.73	0.88	0.82	1.42	1.13	0.52	77	1.08	0.90	1.30	158	2.8
NHS Liverpool CCG	402,000	1.21	1.18	0.92	1.00	0.93	0.59	77	0.97	0.86	1.08	124	11.1
NHS South Sefton CCG	127,600	1.31	1.05	1.15	0.77	0.67	0.64	102	0.93	0.77	1.11	146	2.2
NHS Southport and Formby CCG	*94,700*	*0.82*	*0.55*	*0.73*	*0.88*	*1.06*	*0.72*	*127*	*0.79*	*0.64*	*0.99*	*139*	*3.1*
NHS St Helens CCG	143,700	0.97	0.98	0.93	0.94	0.77	0.70	111	0.88	0.74	1.05	139	2.0
NHS Warrington CCG	*165,600*	*0.99*	*0.75*	*0.63*	*0.91*	*0.61*	*0.39*	*60*	*0.71*	*0.59*	*0.86*	*110*	*4.1*
NHS Wirral CCG	256,500	0.71	1.10	0.90	0.87	0.92	0.93	152	0.91	0.79	1.03	146	3.0
NHS ENGLAND NORTH (YORKSHIRE AND HUMBER)													
NHS Barnsley CCG	195,800	1.39	0.80	1.19	0.99	1.02	0.59	92	0.99	0.86	1.15	154	2.1
NHS Bassetlaw CCG	94,000	0.88	0.52	0.91	0.75	0.88	0.96	160	0.82	0.65	1.02	135	2.6
NHS Bradford District and Craven CCG	**439,200**	**1.34**	**1.43**	**1.39**	**1.25**	**1.06**	**1.44**	**209**	**1.32**	**1.21**	**1.44**	**189**	**30.2**
NHS Calderdale CCG	*165,300*	*0.62*	*0.71*	*0.91*	*0.57*	*0.69*	*0.93*	*145*	*0.74*	*0.62*	*0.89*	*114*	*10.3*
NHS Doncaster CCG	245,000	1.37	0.83	1.18	0.93	0.90	0.87	135	1.01	0.89	1.15	155	4.7
NHS East Riding of Yorkshire CCG	*259,600*	*0.73*	*0.81*	*0.72*	*0.78*	*0.66*	*0.88*	*158*	*0.77*	*0.67*	*0.88*	*135*	*1.9*
NHS Greater Huddersfield CCG	*193,800*	*1.01*	*0.76*	*0.62*	*0.60*	*0.74*	*1.02*	*155*	*0.79*	*0.67*	*0.94*	*119*	*17.4*
NHS Hull CCG	202,400	1.04	1.37	0.99	1.03	0.92	1.19	163	1.09	0.94	1.26	147	5.9
NHS Leeds CCG	*623,700*	*0.86*	*0.75*	*0.84*	*0.95*	*1.02*	*0.69*	*93*	*0.85*	*0.78*	*0.94*	*113*	*14.9*
NHS North East Lincolnshire CCG	125,000	1.01	1.02	0.51	0.98	1.03	0.50	80	0.84	0.69	1.03	133	2.6
NHS North Kirklees CCG	145,900	0.84	0.76	0.99	0.82	1.14	0.88	130	0.91	0.75	1.09	133	25.3
NHS North Lincolnshire CCG	*136,700*	*0.52*	*1.00*	*0.82*	*0.53*	*1.01*	*0.94*	*154*	*0.81*	*0.67*	*0.97*	*130*	*4.0*
NHS North Yorkshire CCG	*347,000*	*0.90*	*0.79*	*0.84*	*0.59*	*0.70*	*0.65*	*112*	*0.74*	*0.66*	*0.84*	*128*	*3.0*
NHS Rotherham CCG	207,900	0.91	1.06	0.75	0.93	1.11	1.07	168	0.97	0.84	1.12	152	6.4
NHS Sheffield CCG	467,100	1.03	0.94	0.94	1.12	1.36	1.00	135	1.07	0.97	1.18	142	16.3
NHS Vale of York CCG	*299,200*	*0.82*	*0.61*	*0.92*	*0.76*	*0.52*	*0.72*	*110*	*0.72*	*0.63*	*0.83*	*109*	*4.0*
NHS Wakefield CCG	274,500	0.98	0.60	0.86	1.13	0.72	1.01	157	0.88	0.77	1.01	135	4.6
NHS ENGLAND NORTH (GREATER MANCHESTER)													
NHS Bolton CCG	219,200	0.68	1.09	1.12	1.35	1.14	1.04	155	1.07	0.94	1.23	159	18.1
NHS Bury CCG	147,700	1.18	1.23	1.13	1.09	0.79	0.71	108	1.02	0.86	1.20	153	10.8
NHS Heywood, Middleton and Rochdale CCG	**169,100**	**1.38**	**1.03**	**1.48**	**1.23**	**1.19**	**1.33**	**195**	**1.28**	**1.11**	**1.47**	**184**	**18.3**
NHS Manchester CCG	**429,900**	**1.50**	**1.77**	**1.60**	**1.78**	**1.59**	**1.56**	**167**	**1.63**	**1.49**	**1.79**	**172**	**33.5**
NHS Oldham CCG	177,500	1.28	1.11	1.43	0.80	0.88	1.28	186	1.13	0.97	1.31	161	22.5
NHS Salford CCG	201,400	0.89	0.85	1.19	1.14	1.04	1.05	139	1.03	0.88	1.20	134	9.9
NHS Stockport CCG	229,900	0.88	0.84	1.03	1.03	0.78	0.66	104	0.87	0.75	1.00	136	7.9
NHS Tameside and Glossop CCG	202,700	0.83	1.02	1.25	1.17	1.05	1.19	183	1.09	0.95	1.25	164	8.2
NHS Trafford CCG	180,800	0.86	0.90	1.04	0.83	0.79	1.21	182	0.94	0.80	1.10	140	14.5
NHS Wigan Borough CCG	*259,700*	*0.92*	*0.93*	*1.03*	*0.72*	*0.65*	*0.83*	*131*	*0.84*	*0.74*	*0.97*	*131*	*2.7*
NHS ENGLAND NORTH (CUMBRIA AND NORTH EAST)													
NHS County Durham CCG	428,600	0.74	0.86	0.93	1.07	0.94	0.97	154	0.92	0.83	1.02	144	1.9
NHS Newcastle Gateshead CCG	407,000	0.87	1.07	0.94	1.13	1.14	0.77	106	0.99	0.89	1.10	133	10.1
NHS North Cumbria CCG	259,400	0.89	1.06	0.90	0.91	0.71	0.99	170	0.91	0.80	1.03	154	1.5
NHS North Tyneside CCG	*166,100*	*0.65*	*0.78*	*0.97*	*0.75*	*0.71*	*0.77*	*120*	*0.77*	*0.65*	*0.93*	*120*	*3.4*
NHS Northumberland CCG	*263,400*	*0.93*	*0.62*	*0.84*	*0.88*	*0.77*	*0.74*	*129*	*0.80*	*0.70*	*0.91*	*137*	*1.6*
NHS South Tyneside CCG	120,800	0.62	0.97	1.44	1.14	1.45	0.89	141	1.09	0.91	1.30	170	4.1
NHS Sunderland CCG	222,900	0.93	1.01	1.27	1.11	0.83	1.01	157	1.03	0.90	1.18	157	4.1
NHS Tees Valley CCG	529,100	0.86	1.16	0.78	0.97	1.01	0.90	140	0.95	0.86	1.04	145	5.2

Table B5 Continued

CCG/HB	Population	O/E 2014	O/E 2015	O/E 2016	O/E 2017	O/E 2018	2019 O/E	2019 Crude rate pmp	2014-2019 O/E	2014-2019 95% LCL	2014-2019 95% UCL	2014-2019 Crude rate pmp	% non-White
NHS ENGLAND NORTH (LANCASHIRE AND SOUTH CUMBRIA)													
NHS Blackburn with Darwen CCG	**111,000**	**0.82**	**1.63**	**1.04**	**0.87**	**1.50**	**1.46**	**207**	**1.22**	**1.02**	**1.47**	**171**	**30.8**
NHS Blackpool CCG	110,200	1.20	0.92	0.75	0.72	0.78	1.07	172	0.90	0.74	1.11	144	3.3
NHS Chorley and South Ribble CCG	*141,500*	*0.86*	*1.09*	*0.64*	*0.92*	*0.88*	*0.49*	*78*	*0.81*	*0.67*	*0.98*	*127*	*2.9*
NHS East Lancashire CCG	*296,700*	*1.07*	*0.66*	*0.85*	*0.61*	*0.91*	*1.09*	*172*	*0.86*	*0.76*	*0.98*	*134*	*11.9*
NHS Fylde and Wyre CCG	*160,000*	*0.92*	*0.78*	*0.81*	*1.06*	*0.78*	*0.45*	*81*	*0.80*	*0.67*	*0.94*	*143*	*2.1*
NHS Greater Preston CCG	159,800	0.95	1.00	0.69	1.21	0.84	0.68	100	0.90	0.75	1.07	130	14.7
NHS Morecambe Bay CCG	*271,800*	*0.64*	*0.59*	*0.50*	*0.70*	*0.90*	*0.67*	*110*	*0.67*	*0.58*	*0.78*	*109*	*4.0*
NHS West Lancashire CCG	*92,200*	*0.64*	*1.23*	*0.62*	*0.60*	*0.99*	*0.13*	*22*	*0.70*	*0.55*	*0.90*	*112*	*1.9*
NHS ENGLAND MIDLANDS AND EAST (CENTRAL MIDLANDS)													
NHS Bedfordshire CCG	357,600	0.92	0.80	1.12	0.72	0.97	0.99	151	0.92	0.82	1.03	139	11.2
NHS East and North Hertfordshire CCG	445,600	1.04	1.07	0.96	0.91	0.72	1.13	166	0.97	0.88	1.07	141	10.4
NHS East Leicestershire and Rutland CCG	*269,400*	*0.77*	*0.90*	*0.73*	*0.71*	*0.71*	*0.93*	*152*	*0.79*	*0.69*	*0.90*	*129*	*9.8*
NHS Herts Valleys CCG	455,800	1.13	0.84	1.00	0.94	0.93	0.90	134	0.95	0.86	1.06	141	14.6
NHS Leicester City CCG	**270,100**	**1.24**	**1.50**	**2.15**	**1.50**	**1.81**	**2.31**	**281**	**1.75**	**1.58**	**1.95**	**210**	**49.5**
NHS Lincolnshire CCG	*614,800*	*0.59*	*0.74*	*0.70*	*0.71*	*0.70*	*0.90*	*151*	*0.72*	*0.66*	*0.79*	*121*	*2.4*
NHS Luton CCG	**155,600**	**1.56**	**1.34**	**1.83**	**1.43**	**1.82**	**1.94**	**257**	**1.66**	**1.44**	**1.90**	**216**	**45.3**
NHS Milton Keynes CCG	205,800	1.14	1.19	1.23	0.98	1.25	0.86	122	1.11	0.96	1.28	155	19.6
NHS Northamptonshire CCG	568,400	0.89	0.88	0.88	0.87	1.06	1.00	153	0.93	0.85	1.02	141	8.6
NHS West Leicestershire CCG	*327,000*	*0.93*	*0.61*	*0.83*	*0.76*	*0.88*	*0.87*	*135*	*0.81*	*0.72*	*0.92*	*124*	*6.9*
NHS ENGLAND MIDLANDS AND EAST (EAST)													
NHS Basildon and Brentwood CCG	204,200	1.04	1.26	1.26	1.05	0.83	0.78	118	1.04	0.90	1.19	154	7.1
NHS Cambridgeshire and Peterborough CCG	*696,300*	*0.77*	*0.73*	*0.93*	*0.79*	*0.85*	*0.94*	*142*	*0.84*	*0.77*	*0.91*	*125*	*9.5*
NHS Castle Point and Rochford CCG	143,400	0.74	0.92	0.88	1.17	1.17	1.07	181	1.00	0.85	1.17	167	3.0
NHS Ipswich and East Suffolk CCG	328,300	0.71	1.09	0.79	0.88	1.00	1.02	171	0.92	0.82	1.03	152	5.6
NHS Mid Essex CCG	*313,200*	*0.83*	*0.73*	*0.85*	*0.76*	*0.61*	*1.07*	*172*	*0.81*	*0.71*	*0.92*	*128*	*4.4*
NHS Norfolk and Waveney CCG	*831,900*	*0.77*	*0.95*	*0.91*	*0.64*	*0.66*	*0.85*	*144*	*0.80*	*0.74*	*0.86*	*134*	*3.4*
NHS North East Essex CCG	274,000	1.08	0.79	0.81	1.14	1.07	1.06	172	0.99	0.88	1.12	158	5.5
NHS Southend CCG	143,400	0.72	0.97	1.33	1.02	0.84	0.99	153	0.98	0.82	1.16	150	8.4
NHS Thurrock CCG	129,700	1.19	1.09	0.85	1.15	1.15	1.40	193	1.14	0.95	1.36	155	14.1
NHS West Essex CCG	240,100	1.07	1.08	0.88	0.93	1.15	0.81	125	0.99	0.86	1.13	150	8.2
NHS West Suffolk CCG	*183,600*	*0.64*	*0.65*	*0.51*	*0.43*	*0.56*	*0.66*	*109*	*0.57*	*0.47*	*0.69*	*93*	*4.6*
NHS ENGLAND MIDLANDS AND EAST (NORTH MIDLANDS)													
NHS Cannock Chase CCG	110,300	0.79	0.88	1.05	0.96	0.56	0.98	154	0.87	0.71	1.07	136	2.4
NHS Derby and Derbyshire CCG	*819,000*	*0.84*	*0.76*	*0.88*	*0.95*	*0.79*	*1.02*	*162*	*0.87*	*0.81*	*0.94*	*138*	*6.9*
NHS East Staffordshire CCG	101,900	0.86	0.57	0.57	0.91	0.97	0.99	157	0.81	0.65	1.02	128	9.0
NHS North Staffordshire CCG	179,600	1.02	1.02	1.12	0.78	0.74	0.62	100	0.88	0.75	1.03	141	3.5
NHS Nottingham and Nottinghamshire CCG	*830,500*	*0.88*	*0.95*	*0.96*	*0.97*	*0.88*	*0.90*	*131*	*0.93*	*0.86*	*1.00*	*133*	*12.3*
NHS Shropshire CCG	*263,100*	*0.89*	*0.85*	*0.78*	*0.86*	*0.97*	*0.90*	*156*	*0.88*	*0.77*	*1.00*	*150*	*2.0*
NHS SE Staffordshire & Seisdon Peninsula CCG	*183,000*	*0.77*	*0.74*	*0.94*	*0.74*	*0.61*	*0.69*	*115*	*0.75*	*0.63*	*0.89*	*123*	*3.6*
NHS Stafford and Surrounds CCG	127,700	0.84	1.28	1.28	0.69	0.82	0.84	141	0.96	0.80	1.14	159	4.7
NHS Stoke on Trent CCG	**205,400**	**1.51**	**1.18**	**1.17**	**0.90**	**1.13**	**1.05**	**156**	**1.15**	**1.01**	**1.32**	**169**	**11.0**
NHS Telford and Wrekin CCG	**138,700**	**1.23**	**1.33**	**0.93**	**1.09**	**1.75**	**1.44**	**216**	**1.30**	**1.11**	**1.52**	**192**	**7.3**
NHS ENGLAND MIDLANDS AND EAST (WEST MIDLANDS)													
NHS Birmingham and Solihull CCG	**892,200**	**1.44**	**1.49**	**1.60**	**1.39**	**1.49**	**1.43**	**194**	**1.47**	**1.39**	**1.57**	**197**	**31.7**
NHS Coventry and Rugby CCG	**376,100**	**1.13**	**1.00**	**1.47**	**1.26**	**1.38**	**1.46**	**191**	**1.28**	**1.16**	**1.42**	**166**	**22.2**
NHS Dudley CCG	252,100	0.96	0.87	0.92	0.98	0.74	0.95	151	0.90	0.79	1.03	142	10.0
NHS Herefordshire and Worcestershire CCG	*633,700*	*0.95*	*0.83*	*0.79*	*0.81*	*0.72*	*0.80*	*134*	*0.82*	*0.75*	*0.89*	*135*	*3.7*
NHS Sandwell & West Birmingham CCG	**377,100**	**1.71**	**1.88**	**1.94**	**2.04**	**1.99**	**2.00**	**263**	**1.93**	**1.78**	**2.10**	**250**	**45.3**
NHS South Warwickshire CCG	*221,800*	*0.84*	*0.78*	*0.92*	*0.75*	*0.64*	*0.99*	*158*	*0.82*	*0.70*	*0.95*	*129*	*7.0*

Table B5 Continued

CCG/HB	Population	O/E 2014	O/E 2015	O/E 2016	O/E 2017	O/E 2018	2019 O/E	2019 Crude rate pmp	2014-2019 O/E	2014-2019 95% LCL	2014-2019 95% UCL	2014-2019 Crude rate pmp	% non-White
NHS Walsall CCG	**216,500**	**1.02**	**1.30**	**0.95**	**1.10**	**1.19**	**1.33**	**199**	**1.15**	**1.01**	**1.31**	**169**	**21.1**
NHS Warwickshire North CCG	**154,000**	**1.56**	**1.08**	**1.29**	**1.08**	**1.12**	**1.10**	**175**	**1.20**	**1.04**	**1.39**	**189**	**6.5**
NHS Wolverhampton CCG	**201,100**	**1.57**	**1.30**	**1.08**	**1.48**	**1.69**	**0.89**	**129**	**1.34**	**1.17**	**1.52**	**191**	**32.0**
NHS ENGLAND LONDON													
NHS Barking and Dagenham CCG	**149,400**	**1.86**	**1.90**	**1.66**	**1.92**	**2.27**	**1.80**	**214**	**1.90**	**1.66**	**2.18**	**224**	**41.7**
NHS Brent CCG	**252,100**	**2.45**	**2.15**	**2.08**	**2.15**	**2.04**	**2.07**	**270**	**2.15**	**1.96**	**2.37**	**277**	**63.7**
NHS Central London (Westminster) CCG	155,700	1.02	0.93	1.03	0.99	1.19	0.55	71	0.95	0.79	1.14	120	36.2
NHS City and Hackney CCG	**225,400**	**2.04**	**1.10**	**1.75**	**1.64**	**1.74**	**1.30**	**142**	**1.59**	**1.40**	**1.81**	**170**	**44.6**
NHS Ealing CCG	**259,600**	**1.75**	**2.26**	**1.75**	**2.22**	**2.09**	**2.04**	**273**	**2.02**	**1.84**	**2.22**	**268**	**51.0**
NHS Hammersmith and Fulham CCG	**148,100**	**1.41**	**1.11**	**1.74**	**1.79**	**1.57**	**1.71**	**203**	**1.56**	**1.34**	**1.82**	**182**	**31.9**
NHS Harrow CCG	**191,800**	**1.55**	**1.41**	**1.70**	**1.89**	**1.68**	**1.89**	**271**	**1.69**	**1.50**	**1.90**	**240**	**57.8**
NHS Havering CCG	201,200	0.94	1.11	0.76	1.26	1.30	1.25	184	1.11	0.96	1.27	161	12.3
NHS Hillingdon CCG	**232,800**	**0.99**	**1.08**	**1.11**	**1.19**	**1.30**	**1.60**	**215**	**1.22**	**1.07**	**1.39**	**161**	**39.4**
NHS Hounslow CCG	**206,300**	**1.27**	**1.25**	**1.58**	**1.95**	**1.82**	**1.70**	**223**	**1.60**	**1.42**	**1.81**	**208**	**48.6**
NHS Newham CCG	**267,100**	**2.13**	**2.20**	**2.25**	**1.86**	**2.14**	**2.06**	**225**	**2.11**	**1.90**	**2.33**	**225**	**71.0**
NHS North Central London CCG	**1,178,100**	**1.33**	**1.44**	**1.33**	**1.30**	**1.49**	**1.60**	**199**	**1.42**	**1.34**	**1.50**	**175**	**36.2**
NHS Redbridge CCG	**229,000**	**1.42**	**1.43**	**1.69**	**1.56**	**1.54**	**1.56**	**205**	**1.54**	**1.37**	**1.73**	**199**	**57.5**
NHS South East London CCG	**1,422,200**	**1.39**	**1.60**	**1.34**	**1.42**	**1.43**	**1.65**	**205**	**1.47**	**1.40**	**1.55**	**181**	**34.8**
NHS South West London CCG	**1,164,200**	**1.43**	**1.44**	**1.30**	**1.20**	**1.25**	**1.19**	**157**	**1.30**	**1.23**	**1.38**	**170**	**30.4**
NHS Tower Hamlets CCG	**252,500**	**2.09**	**2.16**	**1.68**	**2.17**	**2.27**	**1.00**	**99**	**1.89**	**1.68**	**2.13**	**184**	**54.8**
NHS Waltham Forest CCG	**210,200**	**2.07**	**1.70**	**1.46**	**1.89**	**1.44**	**1.58**	**195**	**1.69**	**1.49**	**1.91**	**205**	**47.8**
NHS West London CCG	184,100	1.44	0.63	1.21	0.92	1.29	1.18	158	1.11	0.95	1.29	146	33.4
NHS ENGLAND SOUTH EAST (HAMPSHIRE, ISLE OF WIGHT AND THAMES VALLEY)													
NHS Berkshire West CCG	*378,300*	*0.96*	*0.70*	*0.95*	*0.92*	*0.80*	*0.92*	*135*	*0.87*	*0.78*	*0.98*	*127*	*14.2*
NHS Buckinghamshire CCG	*420,300*	*0.79*	*0.76*	*0.92*	*0.86*	*0.97*	*1.08*	*169*	*0.90*	*0.81*	*1.00*	*140*	*13.4*
NHS East Berkshire CCG	**328,800**	**1.25**	**1.06**	**1.12**	**1.19**	**1.24**	**1.43**	**201**	**1.21**	**1.09**	**1.35**	**169**	**26.7**
NHS Fareham and Gosport CCG	161,700	1.04	0.93	0.96	0.85	1.15	0.87	142	0.97	0.82	1.13	157	3.4
NHS Isle of Wight CCG	*117,000*	*0.84*	*0.67*	*0.71*	*0.42*	*0.69*	*0.84*	*154*	*0.69*	*0.56*	*0.85*	*125*	*2.7*
NHS North East Hampshire and Farnham CCG	164,500	0.85	0.98	0.85	0.86	0.71	0.84	128	0.85	0.71	1.01	128	9.7
NHS North Hampshire CCG	*176,100*	*1.01*	*0.75*	*0.56*	*0.79*	*0.86*	*0.81*	*125*	*0.79*	*0.67*	*0.94*	*122*	*6.4*
NHS Oxfordshire CCG	*533,500*	*0.83*	*0.82*	*0.77*	*0.96*	*0.93*	*0.83*	*124*	*0.86*	*0.78*	*0.95*	*127*	*9.3*
NHS Portsmouth CCG	171,100	0.98	1.08	1.07	1.03	1.22	1.00	129	1.06	0.90	1.26	134	11.6
NHS South Eastern Hampshire CCG	*173,900*	*1.09*	*0.73*	*0.66*	*0.74*	*0.64*	*0.58*	*98*	*0.74*	*0.62*	*0.88*	*123*	*3.1*
NHS Southampton CCG	201,200	1.00	0.96	1.12	1.16	1.25	0.77	94	1.04	0.89	1.22	126	14.1
NHS Surrey Heath CCG	76,100	0.44	0.93	0.51	1.88	0.49	0.58	92	0.81	0.63	1.05	127	9.3
NHS West Hampshire CCG	*456,300*	*0.76*	*0.57*	*0.58*	*0.77*	*0.55*	*0.77*	*129*	*0.67*	*0.60*	*0.75*	*111*	*3.9*
NHS ENGLAND SOUTH EAST (KENT, SURREY AND SUSSEX)													
NHS Brighton and Hove CCG	240,600	1.08	1.03	1.51	1.06	0.99	0.64	79	1.05	0.91	1.21	128	10.9
NHS East Sussex CCG	450,900	0.77	0.96	0.82	0.87	0.96	1.13	197	0.92	0.84	1.01	159	4.0
NHS Kent and Medway CCG	*1,451,300*	*0.98*	*0.89*	*0.91*	*0.84*	*0.83*	*0.93*	*145*	*0.90*	*0.85*	*0.95*	*138*	*6.9*
NHS Surrey Heartlands CCG	*815,900*	*0.98*	*0.98*	*0.92*	*0.83*	*0.82*	*0.67*	*103*	*0.86*	*0.80*	*0.93*	*133*	*9.7*
NHS West Sussex CCG	*682,700*	*0.99*	*0.77*	*0.95*	*0.74*	*0.91*	*0.80*	*133*	*0.86*	*0.79*	*0.93*	*141*	*6.2*
NHS ENGLAND SOUTH WEST (SOUTH WEST NORTH)													
NHS Bath & NE S'set, Swindon & Wilts CCG	*727,700*	*0.85*	*0.76*	*0.88*	*0.90*	*0.76*	*0.95*	*148*	*0.85*	*0.78*	*0.92*	*131*	*5.5*
NHS Bristol, N Somerset & S Gloucs CCG	766,400	0.98	0.96	0.99	1.00	1.06	0.93	130	0.99	0.91	1.07	137	9.8
NHS Gloucestershire CCG	*508,200*	*0.91*	*0.86*	*0.87*	*0.99*	*0.88*	*0.77*	*126*	*0.88*	*0.80*	*0.97*	*142*	*4.6*
NHS ENGLAND SOUTH WEST (SOUTH WEST SOUTH)													
NHS Devon CCG	*975,400*	*0.91*	*0.90*	*0.89*	*0.97*	*0.89*	*0.88*	*147*	*0.91*	*0.85*	*0.97*	*150*	*2.8*
NHS Dorset CCG	*630,400*	*0.72*	*0.61*	*0.57*	*0.78*	*0.86*	*0.74*	*127*	*0.71*	*0.65*	*0.78*	*121*	*4.0*
NHS Kernow CCG	463,000	0.78	1.01	0.85	1.07	0.99	1.02	177	0.96	0.87	1.05	164	1.8

Table B5 Continued

CCG/HB	Population	O/E 2014	O/E 2015	O/E 2016	O/E 2017	O/E 2018	2019 O/E	2019 Crude rate pmp	2014-2019 O/E	2014-2019 95% LCL	2014-2019 95% UCL	2014-2019 Crude rate pmp	% non-White
NHS Somerset CCG	*451,000*	*0.88*	*0.65*	*0.87*	*0.72*	*0.74*	*0.92*	*160*	*0.80*	*0.72*	*0.88*	*137*	*2.0*
N IRELAND (HEALTH AND SOCIAL CARE TRUSTS)													
Belfast HSC Trust	**282,400**	**0.89**	**1.28**	**1.49**	**1.13**	**1.49**	**1.22**	**166**	**1.25**	**1.11**	**1.41**	**168**	**3.2**
Northern HSC Trust	370,400	1.01	0.89	1.05	1.12	1.23	1.18	178	1.08	0.98	1.20	162	1.2
South Eastern HSC Trust	281,900	0.76	1.24	1.03	1.01	0.67	0.82	128	0.92	0.81	1.05	141	1.3
Southern HSC Trust	*288,100*	*0.75*	*0.89*	*0.84*	*0.81*	*0.79*	*0.65*	*94*	*0.79*	*0.68*	*0.91*	*112*	*1.2*
Western HSC Trust	230,200	1.04	1.17	1.08	0.87	1.01	0.91	135	1.01	0.88	1.16	148	1.0
SCOTLAND (HEALTH BOARDS)													
Ayrshire and Arran	300,700	0.81	0.92	1.22	1.06	0.84	0.94	156	0.97	0.86	1.09	159	1.2
Borders	*94,200*	*0.58*	*0.68*	*0.31*	*1.07*	*0.77*	*0.78*	*138*	*0.70*	*0.55*	*0.89*	*122*	*1.3*
Dumfries and Galloway	122,700	1.22	0.66	0.56	0.91	0.95	0.96	171	0.87	0.73	1.05	154	1.2
Fife	301,500	0.92	1.05	0.71	0.93	0.87	1.09	172	0.93	0.82	1.05	145	2.4
Forth Valley	247,700	0.92	1.01	0.61	0.67	1.31	0.81	125	0.89	0.77	1.02	136	2.2
Grampian	*473,800*	*0.76*	*0.89*	*0.80*	*0.79*	*0.83*	*0.55*	*82*	*0.77*	*0.69*	*0.86*	*114*	*4.0*
Greater Glasgow and Clyde	962,500	0.90	1.15	1.09	1.06	0.90	1.09	153	1.03	0.97	1.11	143	7.3
Highland	*263,100*	*0.50*	*0.94*	*0.62*	*0.71*	*1.12*	*0.58*	*99*	*0.75*	*0.65*	*0.86*	*125*	*1.3*
Lanarkshire	529,300	0.90	0.95	0.97	0.99	0.92	1.05	161	0.96	0.88	1.06	146	2.0
Lothian	*738,800*	*0.74*	*0.70*	*0.69*	*0.88*	*0.78*	*0.67*	*93*	*0.74*	*0.68*	*0.82*	*102*	*5.6*
Orkney	*18,200*	*0.00*	*1.61*	*0.00*	*0.31*	*0.62*	*0.63*	*110*	*0.53*	*0.29*	*0.99*	*91*	*0.7*
Shetland	18,200	1.07	1.03	0.68	0.33	0.99	0.00	0	0.68	0.38	1.19	110	1.5
Tayside	*341,500*	*0.97*	*0.97*	*0.85*	*1.06*	*0.69*	*0.54*	*85*	*0.85*	*0.75*	*0.95*	*132*	*3.2*
Western Isles	21,900	1.63	1.57	1.04	1.01	0.75	0.26	46	1.04	0.69	1.54	182	0.9
WALES (LOCAL HEALTH BOARDS)													
Aneurin Bevan University Health Board	470,500	1.16	0.98	0.91	1.05	1.07	1.17	185	1.06	0.96	1.16	165	3.9
Betsi Cadwaladr University Health Board	560,700	1.09	1.08	0.96	0.85	0.94	0.83	139	0.96	0.88	1.04	158	2.5
Cardiff and Vale University Health Board	397,900	0.93	0.93	1.21	0.90	1.30	1.04	141	1.05	0.95	1.17	141	12.2
Cwm Taf Morgannwg University Health Board	356,300	0.97	0.95	1.05	1.27	1.05	0.83	129	1.02	0.92	1.14	156	2.6
Hywel Dda University Health Board	313,700	1.18	1.06	0.79	1.00	1.02	1.35	233	1.07	0.96	1.19	182	2.2
Powys Teaching Health Board	*108,500*	*0.59*	*0.93*	*0.92*	*0.85*	*0.99*	*0.61*	*111*	*0.82*	*0.67*	*1.00*	*147*	*1.6*
Swansea Bay University Health Board	**315,300**	**1.09**	**1.32**	**1.23**	**1.07**	**1.25**	**1.21**	**184**	**1.20**	**1.08**	**1.33**	**180**	**3.9**

Crude rates for the combined 2014–2019 analysis are pmp per year.
Only the ≥18 years general population was included in the denominator (see methods section 'Denominator for adult rates').
Areas with notably low incidence ratios in the combined years analysis are italicised in greyed areas; those with notably high incidence ratios are bold in greyed areas.
Confidence intervals (CIs) are not given for the crude rates pmp, but figures B1–B4 can be used to determine if a CCG/HB falls within the 95% CI around the national average rate.
Mid-2019 populations from the Office for National Statistics, the Northern Ireland Statistics and Research Agency and the National Records of Scotland are based on the 2011 census.
% non-White is the % of the CCG/HB population that was non-White (from 2011 census).
CCG/HB – Clinical Commissioning Group (England), Health and Social Care Trust (Northern Ireland), Health Board (Scotland) and Local Health Board (Wales); LCL – lower confidence limit; O/E - standardised incidence ratio; pmp – per million population; UCL – upper confidence limit

Table B6 Crude adult prevalence rates of RRT and age/sex standardised prevalence ratios (2014–2019)

		O/E					2019				
CCG/HB	Population	2014	2015	2016	2017	2018	O/E	95% LCL	95% UCL	Crude rate pmp	% non-White
NHS ENGLAND NORTH (CHESHIRE AND MERSEYSIDE)											
NHS Cheshire CCG	*581,300*	*0.88*	*0.84*	*0.82*	*0.82*	*0.79*	*0.78*	*0.72*	*0.84*	*1089*	*2.5*
NHS Halton CCG	100,600	1.01	1.02	1.02	1.05	0.99	0.95	0.80	1.13	1262	2.2
NHS Knowsley CCG	117,100	0.96	0.97	0.91	0.97	0.98	0.96	0.82	1.13	1239	2.8
NHS Liverpool CCG	402,000	1.05	1.02	1.00	1.01	1.04	0.99	0.90	1.08	1119	11.1
NHS South Sefton CCG	*127,600*	*1.00*	*1.00*	*1.00*	*0.92*	*0.86*	*0.82*	*0.70*	*0.97*	*1120*	*2.2*
NHS Southport and Formby CCG	*94,700*	*0.82*	*0.79*	*0.76*	*0.75*	*0.70*	*0.65*	*0.53*	*0.80*	*950*	*3.1*
NHS St Helens CCG	*143,700*	*0.86*	*0.85*	*0.83*	*0.88*	*0.86*	*0.83*	*0.71*	*0.97*	*1127*	*2.0*
NHS Warrington CCG	*165,600*	*0.92*	*0.89*	*0.84*	*0.84*	*0.83*	*0.79*	*0.68*	*0.91*	*1057*	*4.1*
NHS Wirral CCG	*256,500*	*0.77*	*0.77*	*0.78*	*0.81*	*0.82*	*0.83*	*0.74*	*0.93*	*1138*	*3.0*
NHS ENGLAND NORTH (YORKSHIRE AND HUMBER)											
NHS Barnsley CCG	195,800	1.06	1.02	1.05	1.03	1.00	0.96	0.85	1.09	1292	2.1
NHS Bassetlaw CCG	*94,000*	*0.86*	*0.86*	*0.85*	*0.83*	*0.80*	*0.80*	*0.66*	*0.97*	*1128*	*2.6*
NHS Bradford District and Craven CCG	**439,200**	**1.16**	**1.19**	**1.23**	**1.28**	**1.27**	**1.29**	**1.20**	**1.39**	**1633**	**30.2**
NHS Calderdale CCG	165,300	0.88	0.88	0.90	0.92	0.91	0.93	0.81	1.07	1252	10.3
NHS Doncaster CCG	245,000	0.97	0.96	0.99	0.96	0.94	0.93	0.83	1.04	1241	4.7
NHS East Riding of Yorkshire CCG	*259,600*	*0.82*	*0.81*	*0.80*	*0.81*	*0.81*	*0.82*	*0.73*	*0.91*	*1210*	*1.9*
NHS Greater Huddersfield CCG	193,800	1.00	1.00	0.97	0.89	0.90	0.94	0.82	1.06	1223	17.4
NHS Hull CCG	202,400	1.03	1.09	1.12	1.13	1.11	1.09	0.96	1.23	1304	5.9
NHS Leeds CCG	623,700	0.92	0.92	0.91	0.94	0.96	0.95	0.88	1.02	1097	14.9
NHS North East Lincolnshire CCG	*125,000*	*0.95*	*0.97*	*0.92*	*0.91*	*0.89*	*0.85*	*0.72*	*1.00*	*1152*	*2.6*
NHS North Kirklees CCG	**145,900**	**1.24**	**1.17**	**1.20**	**1.16**	**1.20**	**1.20**	**1.05**	**1.37**	**1542**	**25.3**
NHS North Lincolnshire CCG	136,700	0.93	0.92	0.90	0.87	0.89	0.90	0.78	1.05	1259	4.0
NHS North Yorkshire CCG	*347,000*	*0.83*	*0.84*	*0.82*	*0.81*	*0.83*	*0.82*	*0.75*	*0.91*	*1196*	*3.0*
NHS Rotherham CCG	207,900	1.07	1.08	1.09	1.06	1.08	1.09	0.97	1.22	1462	6.4
NHS Sheffield CCG	467,100	1.10	1.09	1.07	1.07	1.08	1.05	0.97	1.14	1220	16.3
NHS Vale of York CCG	*299,200*	*0.89*	*0.87*	*0.89*	*0.91*	*0.87*	*0.87*	*0.78*	*0.97*	*1120*	*4.0*
NHS Wakefield CCG	274,500	0.86	0.82	0.84	0.87	0.88	0.91	0.81	1.01	1210	4.6
NHS ENGLAND NORTH (GREATER MANCHESTER)											
NHS Bolton CCG	219,200	1.02	1.03	1.05	1.10	1.09	1.11	1.00	1.24	1437	18.1
NHS Bury CCG	147,700	0.95	0.99	0.97	0.98	0.94	0.93	0.80	1.07	1219	10.8
NHS Heywood, Middleton and Rochdale CCG	169,100	1.03	1.04	1.11	1.13	1.12	1.13	1.00	1.28	1437	18.3
NHS Manchester CCG	**429,900**	**1.22**	**1.25**	**1.27**	**1.35**	**1.39**	**1.38**	**1.27**	**1.50**	**1342**	**33.5**
NHS Oldham CCG	177,500	0.96	0.99	1.02	1.01	1.01	1.02	0.90	1.17	1290	22.5
NHS Salford CCG	201,400	0.86	0.82	0.85	0.89	0.90	0.94	0.82	1.07	1087	9.9
NHS Stockport CCG	*229,900*	*0.85*	*0.84*	*0.85*	*0.88*	*0.85*	*0.80*	*0.71*	*0.90*	*1079*	*7.9*
NHS Tameside and Glossop CCG	202,700	0.93	0.93	0.97	1.00	1.01	1.00	0.88	1.12	1317	8.2
NHS Trafford CCG	180,800	0.89	0.84	0.84	0.85	0.85	0.89	0.78	1.02	1167	14.5
NHS Wigan Borough CCG	*259,700*	*0.96*	*0.91*	*0.90*	*0.91*	*0.91*	*0.85*	*0.76*	*0.96*	*1147*	*2.7*
NHS ENGLAND NORTH (CUMBRIA AND NORTH EAST)											
NHS County Durham CCG	*428,600*	*0.90*	*0.91*	*0.89*	*0.90*	*0.88*	*0.88*	*0.81*	*0.96*	*1188*	*1.9*
NHS Newcastle Gateshead CCG	407,000	0.86	0.86	0.88	0.92	0.97	0.95	0.87	1.04	1118	10.1
NHS North Cumbria CCG	*259,400*	*0.78*	*0.84*	*0.83*	*0.81*	*0.82*	*0.83*	*0.74*	*0.93*	*1187*	*1.5*
NHS North Tyneside CCG	166,100	0.88	0.86	0.91	0.91	0.88	0.88	0.76	1.01	1186	3.4
NHS Northumberland CCG	*263,400*	*0.77*	*0.77*	*0.74*	*0.76*	*0.77*	*0.76*	*0.67*	*0.85*	*1101*	*1.6*
NHS South Tyneside CCG	120,800	0.86	0.86	0.96	0.98	0.99	1.01	0.86	1.17	1358	4.1
NHS Sunderland CCG	222,900	0.98	0.96	1.03	1.02	0.99	0.97	0.86	1.09	1283	4.1
NHS Tees Valley CCG	529,100	0.97	0.98	0.94	0.94	0.94	0.94	0.87	1.01	1242	5.2
NHS ENGLAND NORTH (LANCASHIRE AND SOUTH CUMBRIA)											
NHS Blackburn with Darwen CCG	**111,000**	**1.22**	**1.24**	**1.21**	**1.24**	**1.25**	**1.26**	**1.09**	**1.46**	**1568**	**30.8**
NHS Blackpool CCG	110,200	1.09	1.07	1.03	0.97	0.95	0.95	0.81	1.12	1297	3.3

Table B6 Continued

CCG/HB	Population	O/E					2019				
		2014	2015	2016	2017	2018	O/E	95% LCL	95% UCL	Crude rate pmp	% non-White
NHS Chorley and South Ribble CCG	*141,500*	*0.92*	*0.90*	*0.88*	*0.89*	*0.92*	*0.85*	*0.73*	*1.00*	*1159*	*2.9*
NHS East Lancashire CCG	296,700	1.00	0.98	0.97	0.97	0.95	0.98	0.89	1.08	1321	11.9
NHS Fylde and Wyre CCG	*160,000*	*0.85*	*0.87*	*0.84*	*0.84*	*0.87*	*0.83*	*0.72*	*0.95*	*1232*	*2.1*
NHS Greater Preston CCG	159,800	0.90	0.90	0.88	0.95	0.93	0.91	0.79	1.05	1151	14.7
NHS Morecambe Bay CCG	*271,800*	*0.73*	*0.74*	*0.70*	*0.71*	*0.73*	*0.74*	*0.66*	*0.83*	*1012*	*4.0*
NHS West Lancashire CCG	*92,200*	*0.82*	*0.86*	*0.83*	*0.80*	*0.84*	*0.78*	*0.64*	*0.95*	*1053*	*1.9*
NHS ENGLAND MIDLANDS AND EAST (CENTRAL MIDLANDS)											
NHS Bedfordshire CCG	357,600	0.87	0.87	0.90	0.89	0.91	0.92	0.84	1.01	1222	11.2
NHS East and North Hertfordshire CCG	*445,600*	*0.95*	*0.95*	*0.93*	*0.92*	*0.90*	*0.91*	*0.84*	*1.00*	*1171*	*10.4*
NHS East Leicestershire and Rutland CCG	*269,400*	*0.80*	*0.80*	*0.79*	*0.79*	*0.80*	*0.81*	*0.73*	*0.91*	*1132*	*9.8*
NHS Herts Valleys CCG	455,800	0.92	0.93	0.96	0.96	0.94	0.94	0.86	1.02	1220	14.6
NHS Leicester City CCG	**270,100**	**1.70**	**1.71**	**1.80**	**1.81**	**1.82**	**1.86**	**1.71**	**2.03**	**2010**	**49.5**
NHS Lincolnshire CCG	*614,800*	*0.82*	*0.81*	*0.78*	*0.76*	*0.76*	*0.79*	*0.73*	*0.85*	*1103*	*2.4*
NHS Luton CCG	**155,600**	**1.41**	**1.43**	**1.52**	**1.46**	**1.47**	**1.51**	**1.34**	**1.69**	**1774**	**45.3**
NHS Milton Keynes CCG	205,800	0.97	0.97	1.03	1.02	1.03	1.00	0.88	1.13	1259	19.6
NHS Northamptonshire CCG	*568,400*	*0.89*	*0.87*	*0.90*	*0.90*	*0.92*	*0.92*	*0.85*	*0.99*	*1216*	*8.6*
NHS West Leicestershire CCG	*327,000*	*0.89*	*0.87*	*0.88*	*0.86*	*0.86*	*0.88*	*0.79*	*0.97*	*1153*	*6.9*
NHS ENGLAND MIDLANDS AND EAST (EAST)											
NHS Basildon and Brentwood CCG	204,200	1.01	0.98	0.99	1.02	0.98	0.96	0.85	1.08	1244	7.1
NHS Cambridgeshire and Peterborough CCG	*696,300*	*0.92*	*0.88*	*0.90*	*0.89*	*0.90*	*0.92*	*0.86*	*0.99*	*1195*	*9.5*
NHS Castle Point and Rochford CCG	143,400	0.88	0.86	0.84	0.89	0.90	0.93	0.81	1.08	1318	3.0
NHS Ipswich and East Suffolk CCG	*328,300*	*0.86*	*0.90*	*0.91*	*0.89*	*0.88*	*0.85*	*0.77*	*0.93*	*1188*	*5.6*
NHS Mid Essex CCG	*313,200*	*0.88*	*0.88*	*0.88*	*0.88*	*0.86*	*0.88*	*0.79*	*0.97*	*1200*	*4.4*
NHS Norfolk and Waveney CCG	*831,900*	*0.90*	*0.92*	*0.92*	*0.88*	*0.86*	*0.86*	*0.81*	*0.92*	*1210*	*3.4*
NHS North East Essex CCG	274,000	0.91	0.93	0.92	0.96	0.96	0.96	0.87	1.07	1288	5.5
NHS Southend CCG	143,400	0.96	0.95	0.93	0.97	0.94	0.90	0.77	1.04	1193	8.4
NHS Thurrock CCG	129,700	0.92	0.91	0.87	0.91	0.97	1.03	0.88	1.20	1265	14.1
NHS West Essex CCG	240,100	0.93	0.92	0.93	0.94	0.96	0.94	0.84	1.05	1249	8.2
NHS West Suffolk CCG	*183,600*	*0.79*	*0.79*	*0.73*	*0.66*	*0.66*	*0.67*	*0.57*	*0.78*	*915*	*4.6*
NHS ENGLAND MIDLANDS AND EAST (NORTH MIDLANDS)											
NHS Cannock Chase CCG	110,300	0.92	0.90	0.90	0.94	0.92	0.85	0.71	1.01	1142	2.4
NHS Derby and Derbyshire CCG	*819,000*	*0.88*	*0.89*	*0.90*	*0.89*	*0.89*	*0.90*	*0.85*	*0.96*	*1221*	*6.9*
NHS East Staffordshire CCG	101,900	0.83	0.80	0.81	0.78	0.81	0.84	0.70	1.01	1139	9.0
NHS North Staffordshire CCG	*179,600*	*0.88*	*0.88*	*0.89*	*0.84*	*0.78*	*0.73*	*0.63*	*0.84*	*991*	*3.5*
NHS Nottingham and Nottinghamshire CCG	830,500	0.98	0.98	0.99	0.97	0.97	0.96	0.90	1.02	1192	12.3
NHS Shropshire CCG	*263,100*	*0.80*	*0.81*	*0.79*	*0.80*	*0.80*	*0.81*	*0.73*	*0.91*	*1174*	*2.0*
NHS SE Staffordshire & Seisdon Peninsula CCG	*183,000*	*0.88*	*0.87*	*0.87*	*0.85*	*0.83*	*0.83*	*0.73*	*0.95*	*1158*	*3.6*
NHS Stafford and Surrounds CCG	*127,700*	*0.91*	*0.93*	*0.96*	*0.87*	*0.85*	*0.83*	*0.71*	*0.98*	*1175*	*4.7*
NHS Stoke on Trent CCG	205,400	1.16	1.07	1.08	1.03	1.03	1.01	0.89	1.14	1285	11.0
NHS Telford and Wrekin CCG	138,700	0.97	1.04	0.99	1.00	1.10	1.08	0.94	1.24	1398	7.3
NHS ENGLAND MIDLANDS AND EAST (WEST MIDLANDS)											
NHS Birmingham and Solihull CCG	**892,200**	**1.37**	**1.37**	**1.40**	**1.36**	**1.36**	**1.36**	**1.29**	**1.43**	**1602**	**31.7**
NHS Coventry and Rugby CCG	**376,100**	**1.20**	**1.14**	**1.14**	**1.08**	**1.06**	**1.17**	**1.08**	**1.28**	**1332**	**22.2**
NHS Dudley CCG	*252,100*	*0.94*	*0.92*	*0.93*	*0.96*	*0.92*	*0.89*	*0.80*	*1.00*	*1198*	*10.0*
NHS Herefordshire and Worcestershire CCG	*633,700*	*0.85*	*0.86*	*0.86*	*0.88*	*0.86*	*0.86*	*0.80*	*0.92*	*1207*	*3.7*
NHS Sandwell and West Birmingham CCG	**377,100**	**1.63**	**1.65**	**1.74**	**1.84**	**1.88**	**1.91**	**1.78**	**2.04**	**2215**	**45.3**
NHS South Warwickshire CCG	*221,800*	*0.91*	*0.93*	*0.90*	*0.86*	*0.81*	*0.88*	*0.78*	*0.99*	*1181*	*7.0*
NHS Walsall CCG	**216,500**	**1.37**	**1.34**	**1.29**	**1.26**	**1.25**	**1.30**	**1.17**	**1.44**	**1663**	**21.1**
NHS Warwickshire North CCG	154,000	1.10	1.08	1.04	1.03	1.02	1.09	0.96	1.24	1481	6.5
NHS Wolverhampton CCG	201,100	1.18	1.17	1.16	1.17	1.19	1.11	0.99	1.25	1392	32.0

Table B6 Continued

CCG/HB	Population	O/E					2019				
		2014	2015	2016	2017	2018	O/E	95% LCL	95% UCL	Crude rate pmp	% non-White
NHS ENGLAND LONDON											
NHS Barking and Dagenham CCG	**149,400**	**1.40**	**1.40**	**1.39**	**1.52**	**1.59**	**1.65**	**1.47**	**1.86**	**1821**	**41.7**
NHS Brent CCG	**252,100**	**2.07**	**2.09**	**2.12**	**2.13**	**2.18**	**2.18**	**2.02**	**2.36**	**2551**	**63.7**
NHS Central London (Westminster) CCG	155,700	1.05	1.03	1.03	1.00	0.99	0.95	0.82	1.11	1092	36.2
NHS City and Hackney CCG	**225,400**	**1.30**	**1.26**	**1.34**	**1.33**	**1.39**	**1.40**	**1.26**	**1.57**	**1424**	**44.6**
NHS Ealing CCG	**259,600**	**1.78**	**1.82**	**1.82**	**1.84**	**1.85**	**1.84**	**1.70**	**2.00**	**2219**	**51.0**
NHS Hammersmith and Fulham CCG	**148,100**	**1.25**	**1.24**	**1.31**	**1.40**	**1.37**	**1.42**	**1.24**	**1.61**	**1533**	**31.9**
NHS Harrow CCG	**191,800**	**1.71**	**1.69**	**1.74**	**1.77**	**1.81**	**1.82**	**1.66**	**2.00**	**2289**	**57.8**
NHS Havering CCG	201,200	0.89	0.93	0.92	0.96	1.00	1.06	0.94	1.20	1347	12.3
NHS Hillingdon CCG	**232,800**	**1.44**	**1.39**	**1.38**	**1.34**	**1.34**	**1.38**	**1.25**	**1.53**	**1641**	**39.4**
NHS Hounslow CCG	**206,300**	**1.51**	**1.54**	**1.56**	**1.59**	**1.64**	**1.61**	**1.45**	**1.77**	**1900**	**48.6**
NHS Newham CCG	**267,100**	**1.64**	**1.72**	**1.71**	**1.73**	**1.80**	**1.82**	**1.67**	**1.99**	**1850**	**71.0**
NHS North Central London CCG	**1,178,100**	**1.36**	**1.37**	**1.37**	**1.34**	**1.34**	**1.38**	**1.32**	**1.45**	**1553**	**36.2**
NHS Redbridge CCG	**229,000**	**1.36**	**1.37**	**1.41**	**1.44**	**1.46**	**1.46**	**1.32**	**1.61**	**1721**	**57.5**
NHS South East London CCG	**1,422,200**	**1.38**	**1.42**	**1.43**	**1.43**	**1.47**	**1.49**	**1.43**	**1.55**	**1688**	**34.8**
NHS South West London CCG	**1,164,200**	**1.19**	**1.20**	**1.22**	**1.21**	**1.21**	**1.21**	**1.15**	**1.27**	**1432**	**30.4**
NHS Tower Hamlets CCG	**252,500**	**1.30**	**1.34**	**1.34**	**1.44**	**1.50**	**1.46**	**1.31**	**1.62**	**1363**	**54.8**
NHS Waltham Forest CCG	**210,200**	**1.52**	**1.54**	**1.60**	**1.65**	**1.64**	**1.67**	**1.51**	**1.84**	**1884**	**47.8**
NHS West London CCG	184,100	1.15	1.10	1.07	1.04	1.05	1.07	0.94	1.22	1271	33.4
NHS ENGLAND SOUTH EAST (HAMPSHIRE, ISLE OF WIGHT AND THAMES VALLEY)											
NHS Berkshire West CCG	378,300	0.98	0.96	0.97	0.98	0.94	0.96	0.87	1.05	1226	14.2
NHS Buckinghamshire CCG	420,300	0.89	0.86	0.88	0.88	0.90	0.93	0.85	1.01	1256	13.4
NHS East Berkshire CCG	**328,800**	**1.25**	**1.25**	**1.23**	**1.22**	**1.24**	**1.28**	**1.17**	**1.39**	**1591**	**26.7**
NHS Fareham and Gosport CCG	161,700	0.96	1.00	0.96	0.97	0.97	0.95	0.83	1.09	1318	3.4
NHS Isle of Wight CCG	*117,000*	*0.77*	*0.74*	*0.67*	*0.61*	*0.63*	*0.70*	*0.59*	*0.84*	*1051*	*2.7*
NHS North East Hampshire and Farnham CCG	164,500	0.91	0.94	0.88	0.89	0.90	0.91	0.79	1.04	1198	9.7
NHS North Hampshire CCG	*176,100*	*0.69*	*0.72*	*0.70*	*0.71*	*0.75*	*0.82*	*0.71*	*0.94*	*1096*	*6.4*
NHS Oxfordshire CCG	*533,500*	*0.92*	*0.88*	*0.87*	*0.92*	*0.93*	*0.92*	*0.85*	*0.99*	*1175*	*9.3*
NHS Portsmouth CCG	171,100	0.93	0.97	0.95	0.97	0.97	1.00	0.87	1.15	1122	11.6
NHS South Eastern Hampshire CCG	*173,900*	*0.93*	*0.90*	*0.88*	*0.87*	*0.82*	*0.82*	*0.72*	*0.95*	*1162*	*3.1*
NHS Southampton CCG	201,200	0.98	1.02	1.02	1.01	1.03	1.08	0.95	1.23	1153	14.1
NHS Surrey Heath CCG	*76,100*	*0.86*	*0.85*	*0.77*	*0.94*	*0.86*	*0.81*	*0.65*	*1.00*	*1091*	*9.3*
NHS West Hampshire CCG	*456,300*	*0.76*	*0.73*	*0.70*	*0.73*	*0.70*	*0.71*	*0.65*	*0.78*	*1004*	*3.9*
NHS ENGLAND SOUTH EAST (KENT, SURREY AND SUSSEX)											
NHS Brighton and Hove CCG	*240,600*	*0.88*	*0.86*	*0.92*	*0.90*	*0.90*	*0.85*	*0.75*	*0.97*	*939*	*10.9*
NHS East Sussex CCG	*450,900*	*0.79*	*0.80*	*0.78*	*0.78*	*0.79*	*0.81*	*0.74*	*0.88*	*1167*	*4.0*
NHS Kent and Medway CCG	*1,451,300*	*0.97*	*0.95*	*0.94*	*0.94*	*0.92*	*0.92*	*0.87*	*0.96*	*1218*	*6.9*
NHS Surrey Heartlands CCG	*815,900*	*0.86*	*0.85*	*0.85*	*0.84*	*0.83*	*0.80*	*0.75*	*0.86*	*1072*	*9.7*
NHS West Sussex CCG	*682,700*	*0.81*	*0.81*	*0.83*	*0.81*	*0.81*	*0.80*	*0.75*	*0.86*	*1119*	*6.2*
NHS ENGLAND SOUTH WEST (SOUTH WEST NORTH)											
NHS Bath & NE S'set, Swindon & Wilts CCG	*727,700*	*0.80*	*0.81*	*0.82*	*0.82*	*0.81*	*0.82*	*0.77*	*0.88*	*1101*	*5.5*
NHS Bristol, N Somerset & S Gloucs CCG	766,400	1.09	1.06	1.01	1.01	0.99	0.97	0.91	1.03	1170	9.8
NHS Gloucestershire CCG	*508,200*	*0.87*	*0.87*	*0.88*	*0.91*	*0.91*	*0.88*	*0.82*	*0.96*	*1216*	*4.6*
NHS ENGLAND SOUTH WEST (SOUTH WEST SOUTH)											
NHS Devon CCG	*975,400*	*0.97*	*0.96*	*0.96*	*0.95*	*0.94*	*0.90*	*0.85*	*0.95*	*1252*	*2.8*
NHS Dorset CCG	*630,400*	*0.83*	*0.82*	*0.80*	*0.80*	*0.81*	*0.81*	*0.75*	*0.87*	*1142*	*4.0*
NHS Kernow CCG	*463,000*	*0.94*	*0.93*	*0.91*	*0.91*	*0.90*	*0.90*	*0.83*	*0.97*	*1292*	*1.8*
NHS Somerset CCG	*451,000*	*0.84*	*0.80*	*0.82*	*0.80*	*0.79*	*0.79*	*0.72*	*0.86*	*1133*	*2.0*
N IRELAND (HEALTH AND SOCIAL CARE TRUSTS)											
Belfast HSC Trust	**282,400**	**1.15**	**1.14**	**1.16**	**1.14**	**1.18**	**1.16**	**1.05**	**1.28**	**1384**	**3.2**
Northern HSC Trust	370,400	1.02	1.00	0.98	0.98	1.02	1.04	0.95	1.13	1355	1.2

Table B6 Continued

CCG/HB	Population	O/E					2019				
		2014	2015	2016	2017	2018	O/E	95% LCL	95% UCL	Crude rate pmp	% non-White
South Eastern HSC Trust	281,900	0.85	0.91	0.93	0.98	0.97	0.93	0.84	1.03	1241	1.3
Southern HSC Trust	288,100	0.96	0.99	1.02	1.00	1.00	1.00	0.90	1.11	1263	1.2
Western HSC Trust	230,200	1.02	1.07	1.10	1.07	1.08	1.04	0.93	1.17	1347	1.0
SCOTLAND (HEALTH BOARDS)											
Ayrshire and Arran	300,700	1.00	0.99	1.00	1.00	0.97	0.96	0.87	1.06	1347	1.2
Borders	94,200	0.87	0.85	0.83	0.84	0.84	0.84	0.70	1.00	1232	1.3
Dumfries and Galloway	122,700	0.88	0.88	0.84	0.85	0.87	0.87	0.74	1.02	1280	1.2
Fife	*301,500*	*0.94*	*0.95*	*0.90*	*0.89*	*0.87*	*0.88*	*0.79*	*0.97*	*1184*	*2.4*
Forth Valley	*247,700*	*0.87*	*0.87*	*0.84*	*0.83*	*0.89*	*0.87*	*0.78*	*0.98*	*1163*	*2.2*
Grampian	*473,800*	*0.90*	*0.93*	*0.94*	*0.92*	*0.91*	*0.87*	*0.80*	*0.94*	*1129*	*4.0*
Greater Glasgow and Clyde	962,500	1.06	1.07	1.07	1.07	1.06	1.06	1.00	1.12	1296	7.3
Highland	*263,100*	*0.83*	*0.88*	*0.87*	*0.86*	*0.90*	*0.89*	*0.80*	*0.99*	*1277*	*1.3*
Lanarkshire	529,300	0.97	0.99	0.97	0.98	0.98	1.01	0.94	1.09	1341	2.0
Lothian	*738,800*	*0.78*	*0.78*	*0.78*	*0.80*	*0.82*	*0.81*	*0.75*	*0.87*	*980*	*5.6*
Orkney	*18,200*	*0.62*	*0.68*	*0.58*	*0.56*	*0.50*	*0.57*	*0.34*	*0.94*	*822*	*0.7*
Shetland	18,200	0.55	0.71	0.73	0.70	0.73	0.67	0.41	1.07	933	1.5
Tayside	341,500	0.96	0.98	0.95	0.95	0.93	0.92	0.83	1.01	1221	3.2
Western Isles	21,900	0.83	0.93	0.94	1.00	1.01	0.92	0.64	1.32	1368	0.9
WALES (LOCAL HEALTH BOARDS)											
Aneurin Bevan University Health Board	470,500	1.10	1.08	1.06	1.06	1.06	1.06	0.98	1.14	1424	3.9
Betsi Cadwaladr University Health Board	*560,700*	*0.87*	*0.92*	*0.91*	*0.91*	*0.91*	*0.89*	*0.83*	*0.96*	*1247*	*2.5*
Cardiff and Vale University Health Board	397,900	0.98	0.99	1.00	1.02	1.04	1.05	0.96	1.14	1226	12.2
Cwm Taf Morgannwg University Health Board	**356,300**	**1.17**	**1.15**	**1.12**	**1.15**	**1.13**	**1.10**	**1.01**	**1.20**	**1451**	**2.6**
Hywel Dda University Health Board	313,700	0.97	0.98	0.93	0.93	0.93	0.94	0.86	1.04	1342	2.2
Powys Teaching Health Board	*108,500*	*0.87*	*0.87*	*0.85*	*0.86*	*0.90*	*0.84*	*0.71*	*1.00*	*1263*	*1.6*
Swansea Bay University Health Board	315,300	1.18	1.19	1.17	1.12	1.10	1.08	0.99	1.19	1399	3.9

Only the ≥18 years general population was included in the denominator (see methods section 'Denominator for adult rates').
Areas with notably low prevalence ratios in 2019 are italicised in greyed areas; those with notably high prevalence ratios are bold in greyed areas.
Confidence intervals (CIs) are not given for the crude rates pmp, but figures B1–B4 can be used to determine if a CCG/HB falls within the 95% CI around the national average rate.
Mid-2019 populations from the Office for National Statistics, the Northern Ireland Statistics and Research Agency and the National Records of Scotland are based on the 2011 census.
% non-White is the % of the CCG/HB population that was non-White (from 2011 census).
CCG/HB – Clinical Commissioning Group (England), Health and Social Care Trust (Northern Ireland), Health Board (Scotland) and Local Health Board (Wales); LCL – lower confidence limit; O/E - standardised incidence ratio; pmp – per million population; UCL – upper confidence limit

Table B7 Crude adult prevalent Tx rates and age/sex standardised prevalent Tx ratios (2014–2019)

CCG / HB	Population	O/E					2019				% non-White
		2014	2015	2016	2017	2018	O/E	95% LCL	95% UCL	Crude rate pmp	
NHS ENGLAND NORTH (CHESHIRE AND MERSEYSIDE)											
NHS Cheshire CCG	*581,300*	*0.92*	*0.90*	*0.92*	*0.90*	*0.87*	*0.85*	*0.76*	*0.93*	*524*	*2.5*
NHS Halton CCG	100,600	1.01	1.01	0.97	0.99	0.95	0.95	0.76	1.20	725	2.2
NHS Knowsley CCG	117,100	0.84	0.84	0.82	0.85	0.83	0.85	0.68	1.07	632	2.8
NHS Liverpool CCG	402,000	1.00	0.96	0.93	0.92	0.94	0.91	0.80	1.03	600	11.1
NHS South Sefton CCG	127,600	0.91	0.88	0.91	0.93	0.90	0.87	0.71	1.08	666	2.2
NHS Southport and Formby CCG	*94,700*	*0.76*	*0.77*	*0.71*	*0.72*	*0.70*	*0.64*	*0.48*	*0.86*	*496*	*3.1*
NHS St Helens CCG	*143,700*	*0.92*	*0.90*	*0.81*	*0.83*	*0.81*	*0.77*	*0.62*	*0.95*	*584*	*2.0*
NHS Warrington CCG	165,600	0.96	0.90	0.91	0.94	0.95	0.95	0.79	1.13	725	4.1
NHS Wirral CCG	*256,500*	*0.77*	*0.80*	*0.82*	*0.83*	*0.81*	*0.80*	*0.68*	*0.93*	*612*	*3.0*
NHS ENGLAND NORTH (YORKSHIRE AND HUMBER)											
NHS Barnsley CCG	195,800	1.00	0.99	1.01	0.99	0.93	0.91	0.77	1.08	695	2.1
NHS Bassetlaw CCG	94,000	0.77	0.87	0.87	0.86	0.82	0.80	0.62	1.03	628	2.6
NHS Bradford District and Craven CCG	**439,200**	**1.21**	**1.26**	**1.27**	**1.26**	**1.28**	**1.29**	**1.17**	**1.42**	**943**	**30.2**
NHS Calderdale CCG	165,300	1.04	1.02	1.03	1.02	0.99	0.93	0.78	1.12	720	10.3
NHS Doncaster CCG	245,000	0.92	0.94	0.95	0.91	0.91	0.91	0.78	1.06	690	4.7
NHS East Riding of Yorkshire CCG	259,600	1.03	0.99	0.96	0.93	0.95	0.92	0.80	1.06	736	1.9
NHS Greater Huddersfield CCG	193,800	1.06	1.08	1.10	1.00	0.98	1.00	0.85	1.18	748	17.4
NHS Hull CCG	202,400	1.04	1.10	1.11	1.08	1.06	1.04	0.88	1.22	726	5.9
NHS Leeds CCG	623,700	1.04	1.04	1.01	1.00	1.01	1.03	0.93	1.13	688	14.9
NHS North East Lincolnshire CCG	125,000	0.89	0.90	0.91	0.89	0.84	0.82	0.66	1.03	624	2.6
NHS North Kirklees CCG	**145,900**	**1.36**	**1.36**	**1.28**	**1.28**	**1.32**	**1.28**	**1.08**	**1.51**	**946**	**25.3**
NHS North Lincolnshire CCG	136,700	0.70	0.71	0.75	0.74	0.78	0.82	0.66	1.01	637	4.0
NHS North Yorkshire CCG	347,000	1.00	1.02	0.96	0.94	0.95	0.92	0.82	1.04	732	3.0
NHS Rotherham CCG	207,900	1.12	1.07	1.06	1.02	1.05	1.03	0.89	1.21	784	6.4
NHS Sheffield CCG	467,100	0.96	0.94	0.92	0.94	0.96	0.96	0.85	1.07	636	16.3
NHS Vale of York CCG	299,200	1.07	1.05	1.02	1.02	0.97	0.95	0.83	1.09	689	4.0
NHS Wakefield CCG	274,500	0.86	0.85	0.88	0.90	0.94	0.90	0.78	1.04	685	4.6
NHS ENGLAND NORTH (GREATER MANCHESTER)											
NHS Bolton CCG	**219,200**	**1.21**	**1.22**	**1.20**	**1.24**	**1.18**	**1.22**	**1.06**	**1.40**	**903**	**18.1**
NHS Bury CCG	147,700	1.00	1.06	1.09	1.10	1.08	1.16	0.97	1.38	867	10.8
NHS Heywood, Middleton & Rochdale CCG	169,100	0.91	0.98	1.11	1.08	1.08	1.09	0.92	1.28	798	18.3
NHS Manchester CCG	429,900	0.99	1.05	1.08	1.11	1.11	1.11	0.99	1.25	665	33.5
NHS Oldham CCG	177,500	1.04	1.07	1.07	1.07	1.15	1.09	0.93	1.29	794	22.5
NHS Salford CCG	201,400	0.97	0.98	0.95	0.93	0.97	1.05	0.89	1.24	715	9.9
NHS Stockport CCG	229,900	0.95	0.96	0.98	0.95	0.96	0.89	0.76	1.04	674	7.9
NHS Tameside and Glossop CCG	202,700	1.07	1.06	1.13	1.12	1.10	1.09	0.94	1.27	829	8.2
NHS Trafford CCG	180,800	0.94	0.95	0.96	0.98	1.02	0.97	0.82	1.15	730	14.5
NHS Wigan Borough CCG	259,700	1.07	1.06	1.04	1.05	1.00	0.94	0.82	1.09	724	2.7
NHS ENGLAND NORTH (CUMBRIA AND NORTH EAST)											
NHS County Durham CCG	*428,600*	*1.00*	*0.96*	*0.93*	*0.95*	*0.91*	*0.87*	*0.77*	*0.98*	*656*	*1.9*
NHS Newcastle Gateshead CCG	407,000	0.96	0.93	0.96	0.97	1.02	0.99	0.88	1.12	666	10.1
NHS North Cumbria CCG	*259,400*	*0.95*	*0.95*	*0.86*	*0.85*	*0.85*	*0.78*	*0.67*	*0.91*	*617*	*1.5*
NHS North Tyneside CCG	166,100	1.06	1.04	1.03	1.00	0.96	0.98	0.82	1.17	753	3.4
NHS Northumberland CCG	*263,400*	*0.94*	*0.87*	*0.86*	*0.87*	*0.84*	*0.85*	*0.74*	*0.99*	*680*	*1.6*
NHS South Tyneside CCG	120,800	1.04	0.98	1.02	1.05	1.01	1.03	0.84	1.26	786	4.1
NHS Sunderland CCG	222,900	1.09	1.03	1.06	1.04	1.02	1.03	0.89	1.20	772	4.1
NHS Tees Valley CCG	529,100	1.12	1.10	1.08	1.03	1.01	1.02	0.92	1.12	762	5.2
NHS ENGLAND NORTH (LANCASHIRE AND SOUTH CUMBRIA)											
NHS Blackburn with Darwen CCG	111,000	1.07	1.05	0.99	1.09	1.15	1.11	0.90	1.36	811	30.8
NHS Blackpool CCG	110,200	1.06	1.03	1.02	0.96	0.94	0.97	0.78	1.21	744	3.3

Table B7 Continued

CCG / HB	Population	O/E					2019				% non-White
		2014	2015	2016	2017	2018	O/E	95% LCL	95% UCL	Crude rate pmp	
NHS Chorley and South Ribble CCG	141,500	0.92	0.96	0.97	0.99	0.97	0.93	0.77	1.13	721	2.9
NHS East Lancashire CCG	296,700	1.04	1.06	1.08	1.09	1.09	1.10	0.97	1.24	836	11.9
NHS Fylde and Wyre CCG	160,000	0.82	0.87	0.85	0.89	0.92	0.92	0.77	1.11	731	2.1
NHS Greater Preston CCG	159,800	0.88	0.87	0.84	1.00	1.00	0.93	0.77	1.12	669	14.7
NHS Morecambe Bay CCG	271,800	0.85	0.86	0.88	0.85	0.88	0.88	0.76	1.02	662	4.0
NHS West Lancashire CCG	92,200	0.89	0.92	0.87	0.86	0.88	0.82	0.63	1.06	608	1.9
NHS ENGLAND MIDLANDS AND EAST (CENTRAL MIDLANDS)											
NHS Bedfordshire CCG	357,600	0.97	0.96	0.96	0.97	0.96	0.97	0.86	1.10	735	11.2
NHS East and North Hertfordshire CCG	445,600	0.99	0.98	1.01	1.05	1.02	0.98	0.88	1.09	718	10.4
NHS East Leicestershire and Rutland CCG	269,400	0.92	0.91	0.94	0.93	0.93	0.95	0.82	1.09	731	9.8
NHS Herts Valleys CCG	455,800	0.95	0.98	1.01	1.01	1.02	1.02	0.92	1.13	763	14.6
NHS Leicester City CCG	**270,100**	**1.55**	**1.57**	**1.63**	**1.65**	**1.72**	**1.78**	**1.59**	**1.99**	**1144**	**49.5**
NHS Lincolnshire CCG	*614,800*	*0.84*	*0.80*	*0.81*	*0.78*	*0.79*	*0.79*	*0.71*	*0.87*	*607*	*2.4*
NHS Luton CCG	**155,600**	**1.33**	**1.41**	**1.44**	**1.51**	**1.38**	**1.46**	**1.25**	**1.70**	**1016**	**45.3**
NHS Milton Keynes CCG	**205,800**	**0.98**	**1.03**	**1.06**	**1.13**	**1.15**	**1.18**	**1.02**	**1.37**	**885**	**19.6**
NHS Northamptonshire CCG	*568,400*	*0.93*	*0.94*	*0.96*	*0.95*	*0.93*	*0.90*	*0.82*	*1.00*	*688*	*8.6*
NHS West Leicestershire CCG	327,000	1.03	1.01	1.02	0.98	0.97	1.03	0.91	1.17	765	6.9
NHS ENGLAND MIDLANDS AND EAST (EAST)											
NHS Basildon and Brentwood CCG	204,200	0.91	0.89	0.93	0.97	0.96	0.92	0.78	1.09	681	7.1
NHS Cambridgeshire and Peterborough CCG	696,300	0.96	0.93	0.96	0.95	0.93	0.98	0.90	1.07	724	9.5
NHS Castle Point and Rochford CCG	143,400	0.98	0.93	0.91	0.90	0.88	0.97	0.80	1.17	746	3.0
NHS Ipswich and East Suffolk CCG	*328,300*	*0.90*	*0.91*	*0.91*	*0.88*	*0.86*	*0.84*	*0.73*	*0.96*	*646*	*5.6*
NHS Mid Essex CCG	313,200	1.00	0.97	0.96	0.96	0.98	0.96	0.84	1.09	737	4.4
NHS Norfolk and Waveney CCG	831,900	0.98	0.99	0.98	0.96	0.95	0.92	0.85	1.00	701	3.4
NHS North East Essex CCG	274,000	0.97	1.01	0.98	0.96	1.00	0.95	0.82	1.09	697	5.5
NHS Southend CCG	143,400	0.93	0.90	0.88	0.87	0.83	0.84	0.68	1.03	628	8.4
NHS Thurrock CCG	*129,700*	*0.80*	*0.79*	*0.75*	*0.74*	*0.71*	*0.77*	*0.61*	*0.97*	*563*	*14.1*
NHS West Essex CCG	240,100	0.92	0.92	0.92	0.98	1.00	1.02	0.88	1.18	770	8.2
NHS West Suffolk CCG	*183,600*	*0.91*	*0.88*	*0.86*	*0.79*	*0.72*	*0.77*	*0.64*	*0.93*	*583*	*4.6*
NHS ENGLAND MIDLANDS AND EAST (NORTH MIDLANDS)											
NHS Cannock Chase CCG	*110,300*	*0.75*	*0.70*	*0.72*	*0.80*	*0.80*	*0.72*	*0.56*	*0.93*	*553*	*2.4*
NHS Derby and Derbyshire CCG	*819,000*	*0.84*	*0.85*	*0.88*	*0.89*	*0.90*	*0.89*	*0.82*	*0.97*	*679*	*6.9*
NHS East Staffordshire CCG	101,900	0.69	0.75	0.83	0.74	0.77	0.79	0.62	1.02	609	9.0
NHS North Staffordshire CCG	*179,600*	*0.85*	*0.86*	*0.87*	*0.81*	*0.76*	*0.78*	*0.65*	*0.95*	*590*	*3.5*
NHS Nottingham and Nottinghamshire CCG	830,500	0.98	0.97	0.96	0.98	0.97	0.95	0.87	1.03	673	12.3
NHS Shropshire CCG	*263,100*	*0.75*	*0.79*	*0.74*	*0.73*	*0.69*	*0.67*	*0.57*	*0.79*	*528*	*2.0*
NHS SE Staffordshire & Seisdon Peninsula CCG	183,000	0.86	0.85	0.85	0.86	0.85	0.86	0.72	1.02	661	3.6
NHS Stafford and Surrounds CCG	127,700	0.86	0.88	0.84	0.84	0.82	0.84	0.68	1.04	650	4.7
NHS Stoke on Trent CCG	205,400	1.00	1.00	0.98	0.96	0.97	0.98	0.83	1.15	711	11.0
NHS Telford and Wrekin CCG	*138,700*	*0.66*	*0.73*	*0.66*	*0.70*	*0.67*	*0.67*	*0.53*	*0.84*	*497*	*7.3*
NHS ENGLAND MIDLANDS AND EAST (WEST MIDLANDS)											
NHS Birmingham and Solihull CCG	892,200	1.03	1.03	1.06	1.08	1.06	1.06	0.98	1.14	716	31.7
NHS Coventry and Rugby CCG	376,100	1.04	1.05	1.04	1.05	1.07	1.09	0.97	1.23	715	22.2
NHS Dudley CCG	*252,100*	*0.71*	*0.74*	*0.75*	*0.75*	*0.76*	*0.81*	*0.69*	*0.94*	*603*	*10.0*
NHS Herefordshire and Worcestershire CCG	*633,700*	*0.79*	*0.77*	*0.79*	*0.80*	*0.79*	*0.79*	*0.71*	*0.87*	*609*	*3.7*
NHS Sandwell and West Birmingham CCG	**377,100**	**0.98**	**0.98**	**1.07**	**1.14**	**1.19**	**1.19**	**1.07**	**1.33**	**820**	**45.3**
NHS South Warwickshire CCG	221,800	0.98	1.00	0.94	0.93	0.95	0.98	0.84	1.14	726	7.0
NHS Walsall CCG	216,500	1.10	1.05	1.09	1.11	1.07	1.15	1.00	1.33	836	21.1
NHS Warwickshire North CCG	154,000	0.98	0.99	0.98	1.00	0.99	1.03	0.86	1.23	786	6.5
NHS Wolverhampton CCG	201,100	0.84	0.81	0.85	0.83	0.84	0.85	0.71	1.01	607	32.0

Table B7 Continued

CCG / HB	Population	O/E 2014	O/E 2015	O/E 2016	O/E 2017	O/E 2018	2019 O/E	2019 95% LCL	2019 95% UCL	2019 Crude rate pmp	% non-White
NHS ENGLAND LONDON											
NHS Barking and Dagenham CCG	**149,400**	**1.04**	**1.04**	**1.07**	**1.07**	**1.09**	**1.23**	**1.04**	**1.47**	**837**	**41.7**
NHS Brent CCG	**252,100**	**1.55**	**1.58**	**1.61**	**1.64**	**1.72**	**1.75**	**1.57**	**1.96**	**1230**	**63.7**
NHS Central London (Westminster) CCG	155,700	0.98	1.01	1.01	0.99	1.03	1.00	0.83	1.21	687	36.2
NHS City and Hackney CCG	225,400	0.90	0.94	1.04	1.01	1.01	1.03	0.88	1.21	661	44.6
NHS Ealing CCG	**259,600**	**1.44**	**1.44**	**1.48**	**1.46**	**1.50**	**1.56**	**1.39**	**1.75**	**1125**	**51.0**
NHS Hammersmith and Fulham CCG	148,100	1.02	0.99	0.95	1.06	1.10	1.19	1.00	1.43	790	31.9
NHS Harrow CCG	**191,800**	**1.66**	**1.65**	**1.74**	**1.74**	**1.71**	**1.72**	**1.52**	**1.95**	**1251**	**57.8**
NHS Havering CCG	201,200	0.82	0.85	0.86	0.89	0.91	0.94	0.79	1.11	676	12.3
NHS Hillingdon CCG	**232,800**	**1.41**	**1.35**	**1.34**	**1.27**	**1.28**	**1.31**	**1.15**	**1.50**	**919**	**39.4**
NHS Hounslow CCG	**206,300**	**1.29**	**1.31**	**1.27**	**1.29**	**1.30**	**1.28**	**1.11**	**1.48**	**916**	**48.6**
NHS Newham CCG	**267,100**	**0.98**	**1.03**	**1.03**	**1.12**	**1.22**	**1.35**	**1.19**	**1.54**	**869**	**71.0**
NHS North Central London CCG	**1,178,100**	**1.20**	**1.24**	**1.25**	**1.26**	**1.24**	**1.27**	**1.19**	**1.35**	**856**	**36.2**
NHS Redbridge CCG	**229,000**	**1.16**	**1.17**	**1.22**	**1.20**	**1.30**	**1.36**	**1.19**	**1.55**	**956**	**57.5**
NHS South East London CCG	**1,422,200**	**1.13**	**1.16**	**1.17**	**1.16**	**1.18**	**1.23**	**1.16**	**1.30**	**842**	**34.8**
NHS South West London CCG	1,164,200	0.97	0.99	0.99	1.02	1.03	1.05	0.98	1.12	743	30.4
NHS Tower Hamlets CCG	252,500	0.79	0.83	0.86	0.93	1.01	1.05	0.90	1.23	630	54.8
NHS Waltham Forest CCG	**210,200**	**1.18**	**1.25**	**1.30**	**1.29**	**1.30**	**1.42**	**1.23**	**1.62**	**975**	**47.8**
NHS West London CCG	184,100	1.03	0.98	0.90	0.95	0.93	0.92	0.77	1.11	652	33.4
NHS ENGLAND SOUTH EAST (HAMPSHIRE, ISLE OF WIGHT AND THAMES VALLEY)											
NHS Berkshire West CCG	378,300	1.07	1.05	1.05	1.05	1.05	1.06	0.95	1.19	788	14.2
NHS Buckinghamshire CCG	**420,300**	**1.08**	**1.07**	**1.10**	**1.11**	**1.11**	**1.11**	**1.00**	**1.23**	**849**	**13.4**
NHS East Berkshire CCG	**328,800**	**1.35**	**1.35**	**1.32**	**1.33**	**1.36**	**1.34**	**1.20**	**1.50**	**985**	**26.7**
NHS Fareham and Gosport CCG	161,700	1.08	1.03	1.02	1.03	1.03	1.02	0.86	1.21	779	3.4
NHS Isle of Wight CCG	*117,000*	*0.68*	*0.72*	*0.70*	*0.71*	*0.70*	*0.74*	*0.59*	*0.94*	*590*	*2.7*
NHS North East Hampshire & Farnham CCG	164,500	0.90	0.92	0.96	0.92	0.92	0.93	0.78	1.12	705	9.7
NHS North Hampshire CCG	176,100	0.75	0.79	0.78	0.81	0.86	0.89	0.74	1.06	682	6.4
NHS Oxfordshire CCG	**533,500**	**1.11**	**1.12**	**1.11**	**1.17**	**1.18**	**1.16**	**1.06**	**1.27**	**838**	**9.3**
NHS Portsmouth CCG	171,100	0.89	0.86	0.86	0.95	0.94	0.99	0.82	1.19	649	11.6
NHS South Eastern Hampshire CCG	173,900	1.09	1.07	1.06	1.03	0.97	0.94	0.79	1.12	725	3.1
NHS Southampton CCG	201,200	1.10	1.09	1.08	1.11	1.03	1.08	0.91	1.28	681	14.1
NHS Surrey Heath CCG	76,100	0.99	0.94	0.96	0.99	0.86	0.89	0.68	1.17	683	9.3
NHS West Hampshire CCG	*456,300*	*0.87*	*0.86*	*0.86*	*0.86*	*0.81*	*0.80*	*0.71*	*0.90*	*611*	*3.9*
NHS ENGLAND SOUTH EAST (KENT, SURREY AND SUSSEX)											
NHS Brighton and Hove CCG	240,600	0.81	0.86	0.85	0.88	0.91	0.90	0.76	1.06	586	10.9
NHS East Sussex CCG	*450,900*	*0.81*	*0.78*	*0.79*	*0.77*	*0.76*	*0.78*	*0.69*	*0.88*	*603*	*4.0*
NHS Kent and Medway CCG	1,451,300	1.05	1.03	1.02	1.00	1.00	0.99	0.93	1.05	740	6.9
NHS Surrey Heartlands CCG	*815,900*	*0.88*	*0.85*	*0.84*	*0.83*	*0.82*	*0.82*	*0.75*	*0.89*	*617*	*9.7*
NHS West Sussex CCG	*682,700*	*0.87*	*0.85*	*0.84*	*0.84*	*0.84*	*0.84*	*0.77*	*0.93*	*647*	*6.2*
NHS ENGLAND SOUTH WEST (SOUTH WEST NORTH)											
NHS Bath & NE S'set, Swindon & Wilts CCG	727,700	0.87	0.90	0.93	0.95	0.94	0.94	0.86	1.02	705	5.5
NHS Bristol, N Somerset & S Gloucs CCG	766,400	1.12	1.10	1.07	1.04	1.03	1.00	0.91	1.08	686	9.8
NHS Gloucestershire CCG	508,200	0.84	0.86	0.84	0.89	0.94	0.94	0.85	1.04	720	4.6
NHS ENGLAND SOUTH WEST (SOUTH WEST SOUTH)											
NHS Devon CCG	975,400	1.06	1.04	1.03	1.00	1.00	0.95	0.88	1.02	717	2.8
NHS Dorset CCG	*630,400*	*0.91*	*0.90*	*0.89*	*0.88*	*0.91*	*0.90*	*0.82*	*0.99*	*687*	*4.0*
NHS Kernow CCG	463,000	1.10	1.09	1.03	1.03	1.00	1.00	0.90	1.10	780	1.8
NHS Somerset CCG	*451,000*	*0.88*	*0.85*	*0.82*	*0.80*	*0.79*	*0.76*	*0.68*	*0.86*	*596*	*2.0*
N IRELAND (HEALTH AND SOCIAL CARE TRUSTS)											
Belfast HSC Trust	**282,400**	**1.18**	**1.19**	**1.20**	**1.20**	**1.27**	**1.28**	**1.13**	**1.45**	**885**	**3.2**
Northern HSC Trust	**370,400**	**0.99**	**1.01**	**1.03**	**1.08**	**1.11**	**1.14**	**1.02**	**1.27**	**851**	**1.2**

Table B7 Continued

CCG / HB	Population	O/E 2014	O/E 2015	O/E 2016	O/E 2017	O/E 2018	2019 O/E	2019 95% LCL	2019 95% UCL	2019 Crude rate pmp	% non-White
South Eastern HSC Trust	281,900	0.98	1.02	1.06	1.09	1.11	1.13	0.99	1.28	855	1.3
Southern HSC Trust	**288,100**	**1.01**	**1.11**	**1.16**	**1.18**	**1.19**	**1.21**	**1.07**	**1.37**	**892**	**1.2**
Western HSC Trust	**230,200**	**1.13**	**1.18**	**1.20**	**1.26**	**1.28**	**1.24**	**1.08**	**1.42**	**930**	**1.0**
SCOTLAND (HEALTH BOARDS)											
Ayrshire and Arran	300,700	0.99	0.97	1.02	0.99	0.97	0.94	0.83	1.08	735	1.2
Borders	94,200	1.03	0.96	1.02	0.99	1.03	0.97	0.77	1.22	786	1.3
Dumfries and Galloway	122,700	0.93	0.95	0.92	0.95	0.97	0.99	0.81	1.21	791	1.2
Fife	*301,500*	*0.88*	*0.87*	*0.82*	*0.84*	*0.85*	*0.85*	*0.74*	*0.98*	*647*	*2.4*
Forth Valley	247,700	0.92	0.93	0.96	0.95	0.94	0.93	0.81	1.08	710	2.2
Grampian	473,800	0.91	0.92	0.93	0.91	0.94	0.94	0.84	1.04	699	4.0
Greater Glasgow and Clyde	**962,500**	**1.17**	**1.14**	**1.15**	**1.16**	**1.15**	**1.16**	**1.08**	**1.25**	**828**	**7.3**
Highland	263,100	1.06	1.06	1.03	1.04	1.02	1.02	0.89	1.16	806	1.3
Lanarkshire	529,300	1.10	1.07	1.06	1.09	1.07	1.09	1.00	1.20	837	2.0
Lothian	*738,800*	*0.83*	*0.82*	*0.79*	*0.80*	*0.84*	*0.82*	*0.75*	*0.90*	*581*	*5.6*
Orkney	18,200	0.53	0.50	0.47	0.53	0.50	0.82	0.47	1.45	658	0.7
Shetland	18,200	0.61	0.58	0.72	0.53	0.51	0.63	0.33	1.20	494	1.5
Tayside	341,500	0.97	0.96	0.94	0.91	0.94	0.93	0.82	1.05	688	3.2
Western Isles	21,900	0.79	0.75	0.84	0.92	0.88	0.90	0.55	1.47	730	0.9
WALES (LOCAL HEALTH BOARDS)											
Aneurin Bevan University Health Board	470,500	1.23	1.19	1.15	1.09	1.08	1.06	0.96	1.17	803	3.9
Betsi Cadwaladr University Health Board	*560,700*	*0.74*	*0.87*	*0.89*	*0.89*	*0.90*	*0.89*	*0.80*	*0.98*	*681*	*2.5*
Cardiff and Vale University Health Board	397,900	1.11	1.13	1.12	1.09	1.09	1.07	0.96	1.20	726	12.2
Cwm Taf Morgannwg University Health Board	**356,300**	**1.40**	**1.36**	**1.29**	**1.24**	**1.21**	**1.17**	**1.04**	**1.30**	**870**	**2.6**
Hywel Dda University Health Board	*313,700*	*1.02*	*0.97*	*0.91*	*0.86*	*0.86*	*0.85*	*0.74*	*0.97*	*653*	*2.2*
Powys Teaching Health Board	*108,500*	*0.89*	*0.86*	*0.79*	*0.76*	*0.73*	*0.75*	*0.58*	*0.95*	*599*	*1.6*
Swansea Bay University Health Board	315,300	1.28	1.21	1.12	1.09	1.02	0.96	0.84	1.10	695	3.9

Only the ≥18 years general population was included in the denominator (see methods section 'Denominator for adult rates').
Areas with notably low prevalence ratios in 2019 are italicised in greyed areas; those with notably high prevalence ratios are bold in greyed areas.
Confidence intervals (CIs) are not given for the crude rates pmp, but figures B1–B4 can be used to determine if a CCG/HB falls within the 95% CI around the national average rate.
Mid-2019 populations from the Office for National Statistics, the Northern Ireland Statistics and Research Agency and the National Records of Scotland are based on the 2011 census.
% non-White is the % of the CCG/HB population that was non-White (from 2011 census).
CCG/HB – Clinical Commissioning Group (England), Health and Social Care Trust (Northern Ireland), Health Board (Scotland) and Local Health Board (Wales); LCL – lower confidence limit; O/E - standardised incidence ratio; pmp – per million population; UCL – upper confidence limit

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UK Renal Registry 23rd Annual Report

Data to 31/12/2019

The UK Renal Registry

The UKRR was established by the Renal Association in 1995 to collate data centrally from all adult UK renal centres to improve the care of patients with end-stage kidney disease. Although originally limited to patients on renal replacement therapies (RRT) – 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 RRT have been collated by the UKRR since 2009. The UKRR team manages data collection, analysis and reporting on approximately 8,000 new patients and 68,000 existing patients on RRT each year. The Renal Association has an active and involved patient council. Each year the UKRR publishes an annual report comprising centre comparisons, attainment of the Renal Association audit standards, national averages and long term trends.

The UK Renal Registry is part of the Renal Association, a registered charity (company registration 2229663, charity number 800733)