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Chapter 6

Adults on home haemodialysis (HHD) in the UK at the end of 2018

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 2018 (figure 6.1). This population comprises patients who were on HHD at the end of 2017 and remained on HHD throughout 2018, as well as patients who commenced/re-commenced HHD in 2018. This latter group includes both incident renal replacement therapy (RRT) patients who ended 2018 on HHD and prevalent RRT patients who switched to HHD from in-centre haemodialysis (ICHD), peritoneal dialysis (PD), or a transplant (Tx) in 2018. 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.

In previous annual reports, HHD patients have either been described together with ICHD patients or not at all. This is the first time that a chapter dedicated to this treatment modality has been included in the annual report. Although numbers at centre level can be small, it is important to show the characteristics and attainments for these patients, because HHD is an increasingly important treatment option.

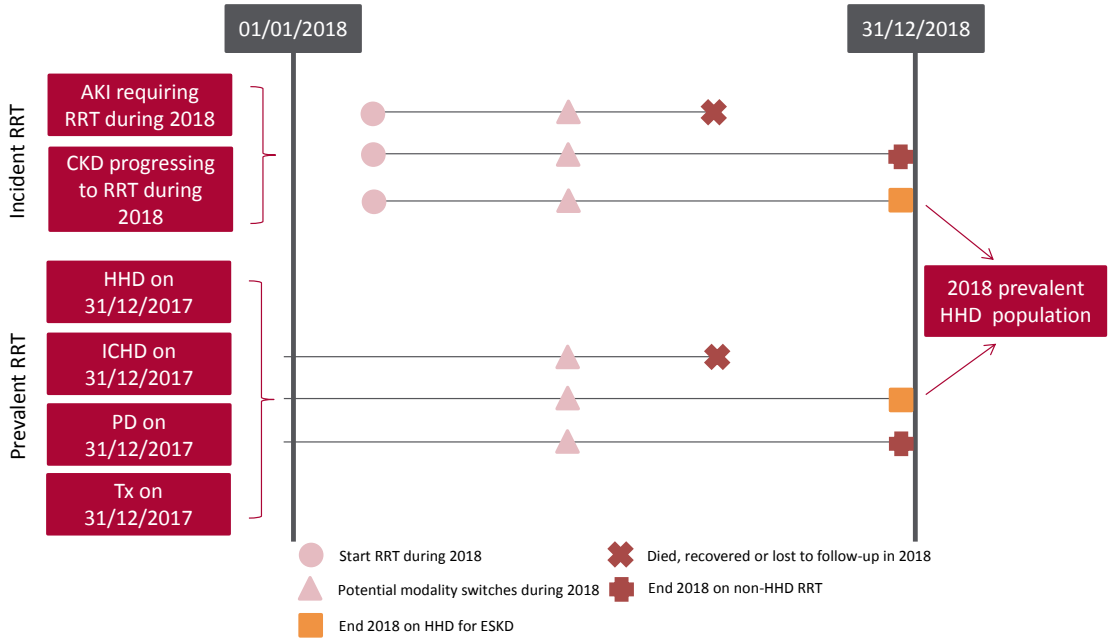

Figure 6.1 Pathways adult patients could follow to be included in the UK 2018 prevalent HHD population

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 2018 or if they had been on RRT for ≥90 days and were on HHD at the end of 2018

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 6.1). 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 4 on a combined ICHD and HHD population.

Rationale for analyses

The analyses begin with a description of the 2018 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 2018 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. Further detail about the completeness of data returned to the UKRR is available through the UKRR data completeness portal (renal.org/audit-research/data-portal/completeness). Audit measures that cannot be reported because the required data items were not collected by the UKRR are omitted.

Table 6.1 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 6.5, figure 6.2
HD (2019)	Proportion of patients with pre-dialysis bicarbonate 18–26 mmol/L	Table 6.6, figure 6.3
	Proportion of patients with pre-dialysis potassium 4.0–6.0 mmol/L	Table 6.6, figure 6.4
Anaemia (2017)	Proportion of patients with serum ferritin <100 µg/L at start of treatment with erythropoiesis stimulating agent (ESA)	Table 6.7, figure 6.7 (the UKRR does not hold treatment with ESA start dates)
	Proportion of patients with haemoglobin <100 g/L not on ESA	Table 6.8
	Proportion of patients on ESA with haemoglobin >120 g/L	Table 6.8, figure 6.9
	Mean (median) ESA dose in patients maintained on ESA therapy	Table 6.8
Planning, initiating and withdrawing RRT (2014)	Number of patients withdrawing from HHD as a proportion of all deaths on HHD	Table 6.9, figure 6.10

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.

Cambridge renal centre (Addenbrooke's Hospital) was unable to submit patient level data for 2017–2018. While data extraction issues have now been resolved, the UKRR and Cambridge are working to load and validate the backlog of data for these years, which should be completed for next year's report. Breakdown of Cambridge HD patients into ICHD and HHD was not available – therefore all HD patients were classed as ICHD (see chapter 4).

Key findings

- 1,323 adult patients were receiving HHD for ESKD in the UK on 31/12/2018, which represented 2.0% of the RRT population
- The median age of HHD patients was 56.0 years and 60.5% were male
- The median adjusted calcium for HHD patients was 2.4 mmol/L and 14.2% were above the target range 2.2–2.5 mmol/L
- The median pre-dialysis bicarbonate for HHD patients was 24 mmol/L and 72.9% were within the target range 18–26 mmol/L
- The median pre-dialysis potassium for HHD patients was 5.0 mmol/L and 79.8% were within the target range 4.0–6.0 mmol/L
- The median haemoglobin and ferritin for HHD patients was 108 g/L and 276 µg/L, respectively, and 89.6% were on an ESA at a median dose of 8,000 IU/week
- 2.6% of HHD patients had a haemoglobin <100 g/L not on an ESA and 13.9% had a haemoglobin >120 g/L on an ESA
- There was no cause of death data available for 29.3% of deaths. For those with data, the leading cause of death in younger patients (<65 years) was cardiac disease (31.8%) and in older patients (≥65 years) were cardiac disease (19.4%) and infection (19.4%).

Analyses

Changes to the prevalent adult HHD population

For the 71 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 6.2 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)	2018 crude rate (pmp)
Centre	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018		
ENGLAND												
B Heart	18	13	19	21	21	2.8	2.0	2.9	3.2	3.1	0.61	34
B QEH	52	50	56	54	47	2.4	2.2	2.3	2.1	1.8	1.41	33
Basldn	0	5	9	9	10	0.0	1.8	3.3	3.0	3.2	0.34	29
Bradfd	6	7	7	9	9	1.1	1.2	1.1	1.3	1.3	0.54	17
Brightn	51	45	37	40	39	5.6	4.7	3.7	4.0	3.7	1.07	36
Bristol	23	22	19	17	15	1.6	1.5	1.3	1.2	1.0	1.19	13
Camb	22	21	22			1.8	1.6	1.7			0.96	
Carlis	1	0	0	0	0	0.4	0.0	0.0	0.0	0.0	0.27	0
Carsh	26	29	29	27	29	1.7	1.8	1.8	1.6	1.7	1.59	18
Chelms	2	2	3	3	2	0.8	0.7	1.1	1.1	0.7	0.42	5
Colchr	0	0	0	0	0	0	0	0	0	0	0.25	0
Covnt	12	16	12	14	22	1.3	1.7	1.2	1.5	2.3	0.74	30
Derby	35	38	42	52	53	6.8	7.1	7.7	9.4	9.0	0.58	91
Donc	8	10	9	9	9	2.8	3.3	2.7	2.7	2.7	0.34	26
Dorset	6	7	9	10	13	0.9	1.0	1.3	1.4	1.7	0.71	18
Dudley	16	13	14	13	11	5.2	4.1	4.0	3.5	3.0	0.37	30
Exeter	4	5	9	13	21	0.4	0.5	0.9	1.2	1.9	0.90	23
Glouc	4	5	9	5	3	0.9	1.1	1.9	1.0	0.6	0.49	6
Hull	10	8	4	6	5	1.2	0.9	0.5	0.7	0.6	0.85	6
Ipswi	4	1	3	8	5	1.1	0.2	0.7	1.8	1.2	0.33	15
Kent	18	16	22	21	18	1.8	1.5	2.1	1.9	1.6	1.01	18
L Barts	15	23	23	31	36	0.7	1.0	1.0	1.2	1.4	1.52	24
L Guys	54	49	48	41	38	2.8	2.4	2.3	1.9	1.7	0.90	42
L Kings	11	12	18	20	17	1.1	1.1	1.6	1.7	1.4	0.97	18
L Rfree	16	21	20	17	12	0.8	1.0	0.9	0.8	0.5	1.26	10
L St.G	5	4	4	5	6	0.6	0.5	0.5	0.6	0.7	0.66	9
L West	19	18	15	12	19	0.6	0.5	0.4	0.3	0.5	1.99	10
Leeds	19	23	17	23	23	1.3	1.5	1.1	1.4	1.4	1.38	17
Leic	68	60	73	72	64	3.2	2.8	3.2	3.0	2.6	2.02	32
Liv Ain	12	10	13	14	18	5.5	4.5	5.7	6.7	8.3	0.40	45
Liv Roy	32	37	39	39	39	2.5	3.0	3.2	3.1	3.1	0.83	47
M RI	51	49	61	77	73	2.8	2.6	3.1	3.8	3.5	1.27	58
Middlbr	13	15	11	12	13	1.5	1.7	1.2	1.3	1.4	0.83	16
Newc	22	24	24	21	22	2.3	2.4	2.3	1.9	1.9	0.93	24
Norwch	30	25	16	14	13	4.4	3.5	2.1	1.8	1.7	0.65	20
Nottm	33	29	29	34	34	3.1	2.6	2.5	2.9	2.8	0.90	38
Oxford	20	19	19	16	18	1.2	1.1	1.1	0.9	0.9	1.40	13
Plymth	8	8	8	10	10	1.6	1.6	1.6	1.9	1.9	0.39	26
Ports	45	56	75	65	70	2.8	3.4	4.4	3.7	4.0	1.68	42

Table 6.2 Continued

Centre	N on HHD					% on HHD					Estimated catchment population (millions)	2018 crude rate (pmp)
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018		
Prestn	38	41	41	49	43	3.2	3.4	3.4	3.9	3.3	1.24	35
Redng	7	5	7	6	8	0.9	0.6	0.9	0.8	1.0	0.75	11
Salford	17	15	28	41	35	1.8	1.5	2.7	3.7	3.0	1.24	28
Sheff	43	45	54	51	50	3.2	3.3	3.8	3.5	3.4	1.14	44
Shrew	15	23	19	22	20	4.3	6.2	5.0	5.7	4.7	0.41	48
Stevng	28	23	26	30	43	3.6	2.8	2.9	3.4	4.5	1.00	43
Sthend	1	2	3	2	1	0.4	0.8	1.3	0.8	0.4	0.26	4
Stoke	33	33	34	28	22	4.3	4.2	4.1	3.5	2.7	0.74	30
Sund	1	2	6	21	22	0.2	0.4	1.2	3.9	3.9	0.51	43
Truro	9	10	9	9	3	2.4	2.4	2.1	2.1	0.7	0.34	9
Wirral	8	12	10	9	8	2.9	4.3	3.0	2.3	2.0	0.47	17
Wolve	19	23	30	32	33	3.3	4.0	5.3	5.5	5.5	0.55	60
York	11	11	14	13	17	2.4	2.2	2.6	2.3	3.0	0.41	42
N IRELAND												
Antrim	1	2	1	4	4	0.4	0.8	0.4	1.6	1.5	0.23	17
Belfast	13	9	9	8	10	1.7	1.2	1.1	1.0	1.1	0.51	20
Newry	2	3	3	3	2	1.0	1.3	1.3	1.2	0.8	0.21	10
Ulster	4	2	1	1	0	2.7	1.2	0.6	0.5	0.0	0.21	0
West NI	3	4	3	3	2	1.1	1.4	1.0	1.0	0.6	0.28	7
SCOTLAND												
Abrdn	6	5	4	4	4	1.2	0.9	0.7	0.7	0.7	0.50	8
Airdrie	0	0	0	2	0	0.0	0.0	0.0	0.4	0.0	0.46	0
D&Gall	2	3	3	2	1	1.5	2.3	2.3	1.5	0.7	0.12	8
Dundee	4	2	2	2	8	1.0	0.5	0.5	0.5	1.8	0.39	21
Edinb	6	6	6	4	3	0.8	0.8	0.8	0.5	0.3	0.80	4
Glasgw	28	26	23	15	18	1.7	1.5	1.3	0.8	1.0	1.35	13
Inverns	3	3	7	5	7	1.3	1.2	2.7	1.9	2.5	0.22	31
Klmarnk	11	10	8	10	13	3.7	3.2	2.5	3.0	3.8	0.30	43
Krkcldy	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.26	0
WALES												
Bangor	13	15	10	11	13	12.1	8.2	5.6	5.6	6.4	0.19	70
Cardff	35	28	31	38	34	2.2	1.7	1.9	2.3	2.0	1.21	28
Clwyd	5	7	4	2	2	2.9	3.8	2.3	1.1	1.1	0.16	12
Swanse	40	36	39	34	35	5.7	4.7	5.0	4.3	4.2	0.75	47
Wrexm	1	5	8	5	5	0.4	1.7	2.6	1.6	1.6	0.20	25
TOTALS												
England	**1,021**	**1,040**	**1,128**	**1,167**	**1,162**	**2.1**	**2.0**	**2.1**	**2.2**	**2.1**	**44.02**	**26**
N Ireland	**23**	**20**	**17**	**19**	**18**	**1.4**	**1.2**	**1.0**	**1.0**	**0.9**	**1.44**	**12**
Scotland	**60**	**55**	**53**	**44**	**54**	**1.3**	**1.1**	**1.1**	**0.9**	**1.0**	**4.41**	**12**
Wales	**94**	**91**	**92**	**90**	**89**	**3.3**	**3.0**	**3.0**	**2.8**	**2.7**	**2.51**	**35**
UK	**1,198**	**1,206**	**1,290**	**1,320**	**1,323**	**2.0**	**2.0**	**2.1**	**2.1**	**2.0**	**52.38**	**25**

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. Rates appear higher than in previous reports because general population estimates now include only those aged ≥18 years (see appendix B).

Cambridge submitted only aggregate data for 2017 and 2018. Breakdown of HD patients into ICHD and HHD was not available for these years. Therefore all their HD patients were classed as ICHD.

pmp – per million population

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 6.3 Demographics of adult patients prevalent to HHD on 31/12/2018 by centre

Centre	N on RRT	N on HHD	% on HHD	Median age (yrs)	% male	Ethnicity				
						% White	% South Asian	% Black	% Other	% missing
ENGLAND										
B Heart	679	21	3.1	52.0	85.7	66.7	14.3	19.0	0.0	0.0
B QEH	2,569	47	1.8	52.0	70.2	63.8	17.0	8.5	10.6	0.0
Basldn	314	10	3.2	60.0	30.0	100.0	0.0	0.0	0.0	0.0
Bradfd	686	9	1.3	52.4	55.6	88.9	11.1	0.0	0.0	0.0
Brightn	1,055	39	3.7	66.5	61.5	92.3	5.1	0.0	2.6	0.0
Bristol	1,469	15	1.0	57.9	46.7	100.0	0.0	0.0	0.0	0.0
Camb										
Carlis	293	0	0.0							
Carsh	1,736	29	1.7	64.5	55.2	82.8	3.4	10.3	3.4	0.0
Chelms	270	2	0.7	59.3	100.0	100.0	0.0	0.0	0.0	0.0
Colchr	121	0	0.0							
Covnt	1,042	22	2.1	51.6	68.2	81.8	9.1	9.1	0.0	0.0
Derby	589	53	9.0	60.7	71.7	84.9	13.2	0.0	1.9	0.0
Donc	332	9	2.7	59.0	55.6	88.9	0.0	0.0	11.1	0.0
Dorset	765	13	1.7	66.6	53.8	100.0	0.0	0.0	0.0	0.0
Dudley	361	11	3.0	54.5	72.7	100.0	0.0	0.0	0.0	0.0
Exeter	1,088	21	1.9	55.4	42.9	90.5	0.0	4.8	4.8	0.0
Glouc	510	3	0.6	62.2	33.3	100.0	0.0	0.0	0.0	0.0
Hull	883	5	0.6	52.0	80.0	100.0	0.0	0.0	0.0	0.0
Ipswi	428	5	1.2	66.5	60.0	80.0	0.0	20.0	0.0	0.0
Kent	1,114	18	1.6	53.3	72.2	94.4	0.0	0.0	5.6	0.0
L Barts	2,610	36	1.4	52.3	50.0	38.9	13.9	38.9	8.3	0.0
L Guys	2,225	38	1.7	48.6	44.7	68.4	5.3	23.7	2.6	0.0
L Kings	1,186	17	1.4	57.8	76.5	64.7	5.9	23.5	5.9	0.0
L Rfree	2,234	12	0.5	58.1	66.7	50.0	0.0	50.0	0.0	0.0
L St.G	837	6	0.7	45.2	33.3	83.3	0.0	16.7	0.0	0.0
L West	3,566	19	0.5	54.1	47.4	42.1	26.3	31.6	0.0	0.0
Leeds	1,687	23	1.4	47.4	56.5	87.0	4.3	8.7	0.0	0.0
Leic	2,468	64	2.6	56.2	68.8	88.9	6.3	3.2	1.6	1.6
Liv Ain	218	18	8.3	53.3	55.6	100.0	0.0	0.0	0.0	0.0
Liv Roy	1,277	39	3.1	56.4	56.4	92.3	0.0	5.1	2.6	0.0
M RI	2,073	73	3.5	53.8	61.6	66.7	8.3	20.8	4.2	1.4
Middlbr	925	13	1.4	53.3	46.2	92.3	0.0	0.0	7.7	0.0
Newc	1,155	22	1.9	50.0	54.5	100.0	0.0	0.0	0.0	0.0
Norwch	786	13	1.7	61.0	69.2	100.0	0.0	0.0	0.0	0.0
Nottm	1,196	34	2.8	53.2	47.1	79.4	2.9	11.8	5.9	0.0
Oxford	1,940	18	0.9	60.8	66.7	81.3	12.5	6.3	0.0	11.1
Plymth	539	10	1.9	62.0	40.0	100.0	0.0	0.0	0.0	0.0
Ports	1,764	70	4.0	59.7	68.6	94.3	0.0	1.4	4.3	0.0
Prestn	1,322	43	3.3	58.0	55.8	88.4	11.6	0.0	0.0	0.0
Redng	810	8	1.0	57.0	75.0	75.0	12.5	12.5	0.0	0.0
Salford	1,173	35	3.0	52.6	62.9	82.9	5.7	8.6	2.9	0.0
Sheff	1,481	50	3.4	55.7	48.0	90.0	4.0	4.0	2.0	0.0
Shrew	424	20	4.7	63.0	85.0	100.0	0.0	0.0	0.0	0.0
Stevng	957	43	4.5	54.7	51.2	82.9	9.8	4.9	2.4	4.7

Table 6.3 Continued

Centre	N on RRT	N on HHD	% on HHD	Median age (yrs)	% male	Ethnicity				
						% White	% South Asian	% Black	% Other	% missing
Sthend	260	1	0.4	63.7	100.0	0.0	100.0	0.0	0.0	0.0
Stoke	808	22	2.7	59.2	63.6	100.0	0.0	0.0	0.0	0.0
Sund	557	22	3.9	54.9	50.0	100.0	0.0	0.0	0.0	0.0
Truro	437	3	0.7	70.8	33.3	100.0	0.0	0.0	0.0	0.0
Wirral	395	8	2.0	51.0	75.0	87.5	12.5	0.0	0.0	0.0
Wolve	602	33	5.5	49.5	69.7	72.7	15.2	6.1	6.1	0.0
York	568	17	3.0	53.5	70.6	94.1	0.0	5.9	0.0	0.0
N IRELAND										
Antrim	274	4	1.5	62.3	75.0	100.0	0.0	0.0	0.0	0.0
Belfast	877	10	1.1	49.8	80.0	100.0	0.0	0.0	0.0	0.0
Newry	249	2	0.8	67.4	100.0	100.0	0.0	0.0	0.0	0.0
Ulster	190	0	0.0							
West NI	324	2	0.6	55.5	50.0	100.0	0.0	0.0	0.0	0.0
SCOTLAND										
Abrdn	573	4	0.7	48.8	25.0					50.0
Airdrie	487	0	0.0							
D&Gall	145	1	0.7	53.4	100.0					100.0
Dundee	445	8	1.8	66.0	75.0					75.0
Edinb	862	3	0.3	57.0	100.0					33.3
Glasgw	1,812	18	1.0	54.5	61.1					72.2
Inverns	279	7	2.5	49.3	42.9					42.9
Klmarnk	342	13	3.8	61.4	53.8					84.6
Krkcldy	300	0	0.0							
WALES										
Bangor	202	13	6.4	54.0	76.9	100.0	0.0	0.0	0.0	0.0
Cardff	1,721	34	2.0	55.6	58.8	97.1	2.9	0.0	0.0	0.0
Clwyd	190	2	1.1	59.5	50.0	100.0	0.0	0.0	0.0	0.0
Swanse	824	35	4.2	60.1	57.1	100.0	0.0	0.0	0.0	0.0
Wrexm	315	5	1.6	59.1	20.0	100.0	0.0	0.0	0.0	0.0
TOTALS										
England	**54,784**	**1,162**	**2.1**	**55.9**	**60.4**	**83.0**	**6.2**	**8.0**	**2.8**	**0.5**
N Ireland	**1,914**	**18**	**0.9**	**54.9**	**77.8**	**100.0**	**0.0**	**0.0**	**0.0**	**0.0**
Scotland	**5,245**	**54**	**1.0**	**57.4**	**59.3**					**68.5**
Wales	**3,252**	**89**	**2.7**	**57.5**	**58.4**	**98.9**	**1.1**	**0.0**	**0.0**	**0.0**
UK	**65,195**	**1,323**	**2.0**	**56.0**	**60.5**	**84.4**	**5.8**	**7.3**	**2.5**	**3.3**

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 6.4, 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 6.4 Primary renal diseases (PRDs) of adult patients prevalent to HHD on 31/12/2018

PRD	N on HHD	% HHD population	Age <65 yrs		Age ≥65 yrs		M/F ratio
			N	%	N	%	
Diabetes	190	14.8	134	14.0	56	17.2	1.5
Glomerulonephritis	326	25.4	268	28.0	58	17.8	1.8
Hypertension	65	5.1	45	4.7	20	6.2	2.6
Polycystic kidney disease	110	8.6	77	8.0	33	10.2	1.2
Pyelonephritis	136	10.6	114	11.9	22	6.8	1.1
Renal vascular disease	29	2.3	13	1.4	16	4.9	2.6
Other	251	19.6	186	19.4	65	20.0	1.3
Uncertain aetiology	175	13.7	120	12.5	55	16.9	1.8
Total (with data)	**1,282**	**100.0**	**957**	**100.0**	**325**	**100.0**	
Missing	41	3.1	28	2.8	13	3.8	1.3

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. For the first time the Scottish Renal Registry sent pre-dialysis potassium and bicarbonate data to the UKRR.

Table 6.5 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 31/12/2018 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				
B Heart	2.4	57.9	26.3	100.0
B QEH	2.3	66.7	8.9	100.0
Basldn	2.4	80.0	10.0	100.0
Bradfd				100.0
Brightn	2.3	76.9	20.5	100.0
Bristol	2.4	93.3	6.7	100.0
Camb				
Carlis				
Carsh	2.4	78.6	10.7	100.0
Chelms				100.0
Colchr				
Covnt	2.3	81.0	4.8	95.5
Derby	2.4	71.7	20.8	100.0
Donc				100.0
Dorset	2.2	76.9	0.0	100.0
Dudley	2.5	72.7	18.2	100.0
Exeter	2.3	84.2	10.5	100.0
Glouc				100.0
Hull				100.0
Ipswi				100.0
Kent	2.4	58.8	35.3	100.0
L Barts	2.3	85.3	5.9	100.0
L Guys	2.35	71.1	13.2	100.0
L Kings	2.3	58.8	11.8	100.0
L Rfree		83.3	8.3	100.0
L St.G				100.0
L West				68.4

Table 6.5 Continued

Centre	Median adj Ca (mmol/L)	% adj Ca 2.2-2.5 mmoI/L	% adj Ca >2.5 mmoI/L	% data completeness
Leeds	2.3	78.3	8.7	100.0
Leic	2.4	79.7	10.9	100.0
Liv Ain	2.4	62.5	31.3	100.0
Liv Roy	2.4	79.0	13.2	100.0
M RI	2.5	64.3	31.4	95.9
Middlbr	2.2	53.9	0.0	100.0
Newc	2.3	68.2	9.1	100.0
Norwch	2.3	76.9	15.4	100.0
Nottm	2.4	82.4	5.9	100.0
Oxford	2.3	77.8	0.0	100.0
Plymth	2.3	50.0	30.0	100.0
Ports	2.4	78.5	16.9	98.5
Prestn	2.3	69.8	11.6	100.0
Redng				100.0
Salford	2.4	79.4	17.7	100.0
Sheff	2.3	76.0	4.0	100.0
Shrew	2.4	70.0	15.0	100.0
Stevng	2.3	70.7	17.1	100.0
Sthend				100.0
Stoke	2.4	81.8	13.6	100.0
Sund	2.4	95.5	4.6	100.0
Truro				100.0
Wirral				100.0
Wolve	2.4	72.7	21.2	100.0
York	2.4	88.2	11.8	100.0
N IRELAND				
Antrim				100.0
Belfast				100.0
Newry				100.0
Ulster				
West NI				100.0
SCOTLAND				
Abrdn				100.0
Airdrie				
D&Gall				100.0
Dundee				100.0
Edinb				100.0
Glasgw	2.4	77.8	16.7	100.0
Inverns				100.0
Klmarnk	2.4	84.6	15.4	100.0
Krkcldy				
WALES				
Bangor	2.3	69.2	15.4	100.0
Cardff	2.4	67.7	23.5	100.0
Clwyd				100.0
Swanse	2.3	80.0	2.9	100.0
Wrexm				100.0
TOTALS				
England	**2.4**	**74.8**	**14.3**	**99.0**
N Ireland	**2.3**	**82.4**	**5.9**	**100.0**
Scotland	**2.4**	**75.5**	**17.0**	**100.0**
Wales	**2.4**	**75.3**	**12.4**	**100.0**
UK	**2.4**	**75.0**	**14.2**	**99.2**

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

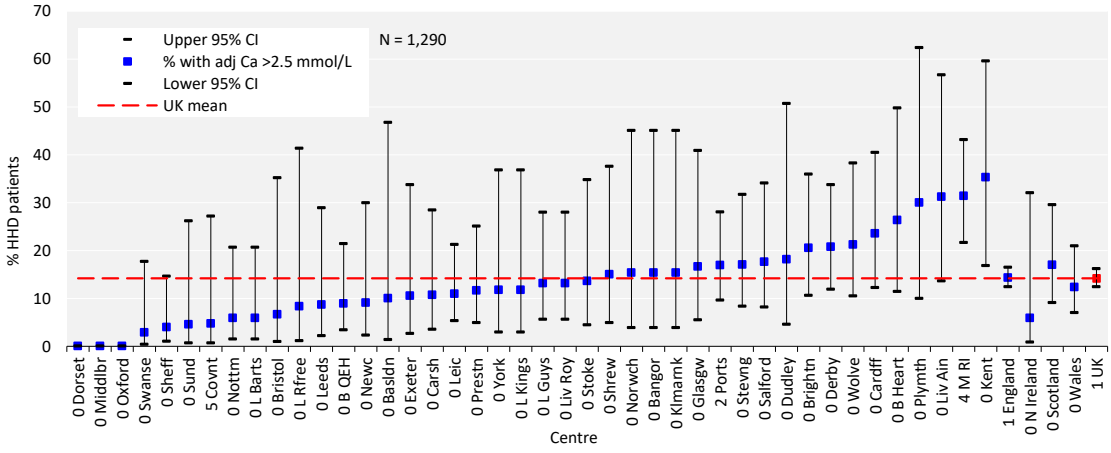

Figure 6.2 Percentage of adult patients prevalent to HHD on 31/12/2018 with adjusted calcium (Ca) above the target range (>2.5 mmol/L) by centre

CI – confidence interval

Table 6.6 Median pre-dialysis potassium and bicarbonate and percentage attaining target ranges in adult patients prevalent to HHD on 31/12/2018 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 complete-ness	Median (mmol/L)	% <18 mmol/L	% 18–26 mmol/L	% >26 mmol/L	% data complete-ness
ENGLAND										
B Heart	5.0	15.8	73.7	10.5	100.0	21	5.3	89.5	5.3	100.0
B QEH	5.3	13.3	75.6	11.1	100.0					51.1
Basldn	4.6	0.0	100.0	0.0	100.0	24	0.0	80.0	20.0	100.0
Bradfd					100.0					100.0
Brightn					0.0	24	5.3	76.3	18.4	97.4
Bristol	4.9	6.7	80.0	13.3	100.0	22	0.0	86.7	13.3	100.0
Camb										
Carlis										
Carsh					0.0					3.6
Chelms					100.0					100.0
Colchr										
Covnt	4.4	33.3	61.9	4.8	95.5	24	4.8	71.4	23.8	95.5
Derby					0.0	23	0.0	94.3	5.7	100.0
Donc					100.0					100.0
Dorset	5.4	7.7	69.2	23.1	100.0	23	0.0	100.0	0.0	100.0
Dudley	5.5	0.0	81.8	18.2	100.0	26	0.0	63.6	36.4	100.0
Exeter	5.0	5.3	89.5	5.3	100.0	24	10.5	73.7	15.8	100.0
Glouc					0.0					100.0
Hull					100.0					100.0
Ipswi					0.0					100.0
Kent	4.7	11.8	88.2	0.0	100.0	24	0.0	76.5	23.5	100.0
L Barts					0.0	24	5.9	76.5	17.7	100.0
L Guys	4.7	21.1	76.3	2.6	100.0	26	0.0	54.1	46.0	97.4
L Kings	4.2	35.3	58.8	5.9	100.0	22	5.9	88.2	5.9	100.0
L Rfree		0.0	83.3	16.7	100.0		9.1	81.8	9.1	91.7

Table 6.6 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 complete-ness	Median (mmol/L)	% <18 mmol/L	% 18–26 mmol/L	% >26 mmol/L	% data complete-ness
L St.G					0.0					100.0
L West					0.0					31.6
Leeds	5.4	0.0	87.0	13.0	100.0	25	0.0	73.9	26.1	100.0
Leic	5.3	4.7	81.3	14.1	100.0	25	1.6	72.6	25.8	96.9
Liv Ain					0.0	26	0.0	62.5	37.5	100.0
Liv Roy					0.0	25	2.6	57.9	39.5	100.0
M RI					0.0	24	0.0	75.7	24.3	95.9
Middlbr	5.3	0.0	84.6	15.4	100.0	25	0.0	53.9	46.2	100.0
Newc					0.0	23	0.0	100.0	0.0	100.0
Norwch	5.3	0.0	76.9	23.1	100.0	24	0.0	100.0	0.0	100.0
Nottm	5.2	2.9	94.1	2.9	100.0					41.2
Oxford	5.1	0.0	83.3	16.7	100.0	24	0.0	72.2	27.8	100.0
Plymth	5.0	10.0	70.0	20.0	100.0	27	10.0	40.0	50.0	100.0
Ports	4.9	9.1	87.9	3.0	100.0	24	6.4	73.0	20.6	95.5
Prestn					0.0	23	0.0	74.4	25.6	90.7
Redng					0.0					100.0
Salford	4.9	14.7	82.4	2.9	100.0					2.9
Sheff	5.2	4.0	84.0	12.0	100.0	25	2.0	76.0	22.0	100.0
Shrew					0.0	24	10.0	65.0	25.0	100.0
Stevng	4.9	9.8	73.2	17.1	100.0	25	0.0	62.9	37.1	85.4
Sthend					100.0					100.0
Stoke					0.0	29	0.0	31.8	68.2	100.0
Sund					0.0	24	9.1	77.3	13.6	100.0
Truro					100.0					100.0
Wirral					0.0					100.0
Wolve	4.5	18.2	75.8	6.1	100.0	21	6.1	84.9	9.1	100.0
York	5.4	0.0	64.7	35.3	100.0	25	5.9	64.7	29.4	100.0
N IRELAND										
Antrim					100.0					100.0
Belfast					100.0					100.0
Newry					100.0					100.0
Ulster										
West NI					100.0					100.0
SCOTLAND										
Abrdn					75.0					25.0
Airdrie										
D&Gall					100.0					100.0
Dundee					100.0					100.0
Edinb					100.0					0.0
Glasgw					55.6					44.4
Inverns					100.0					100.0
Klmarnk	4.5	23.1	76.9	0.0	100.0	25	0.0	80.0	20.0	76.9
Krkcldy										
WALES										
Bangor					0.0	26	0.0	61.5	38.5	100.0
Cardff					0.0	24	2.9	70.6	26.5	100.0
Clwyd					0.0					100.0
Swanse					0.0	26	0.0	57.1	42.9	100.0
Wrexm					0.0					100.0

Table 6.6 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	**5.0**	**9.5**	**79.9**	**10.6**	**59.7**	**24**	**2.9**	**73.8**	**23.3**	**88.0**
N Ireland	**5.3**	**5.9**	**70.6**	**23.5**	**100.0**	**23**	**0.0**	**82.4**	**17.7**	**100.0**
Scotland	**4.9**	**9.1**	**81.8**	**9.1**	**83.0**	**25**	**0.0**	**73.5**	**26.5**	**64.2**
Wales					**0.0**	**26**	**1.1**	**60.7**	**38.2**	**100.0**
UK	**5.0**	**9.4**	**79.8**	**10.8**	**57.1**	**24**	**2.6**	**72.9**	**24.5**	**88.0**

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

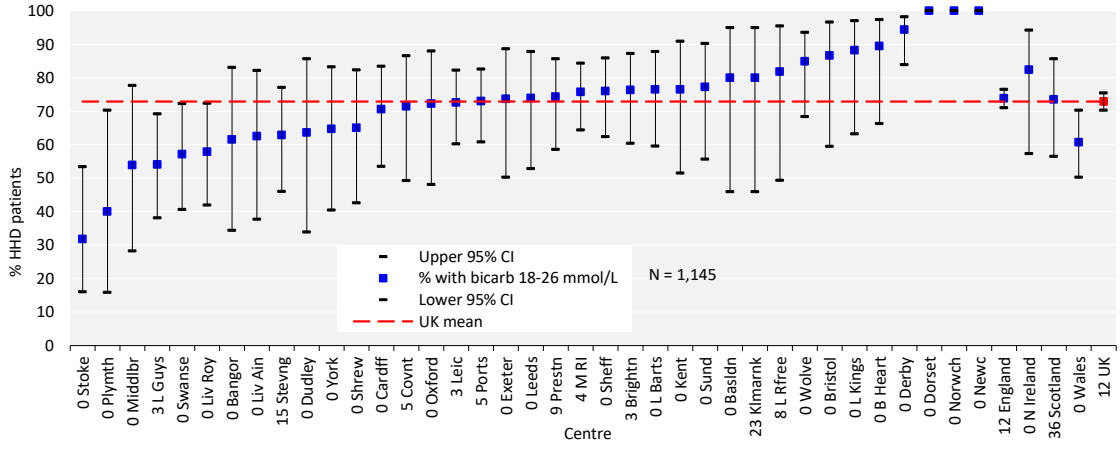

Figure 6.3 Percentage of adult patients prevalent to HHD on 31/12/2018 with pre-dialysis bicarbonate (bicarb) within the target range (18–26 mmol/L) by centre

CI – confidence interval

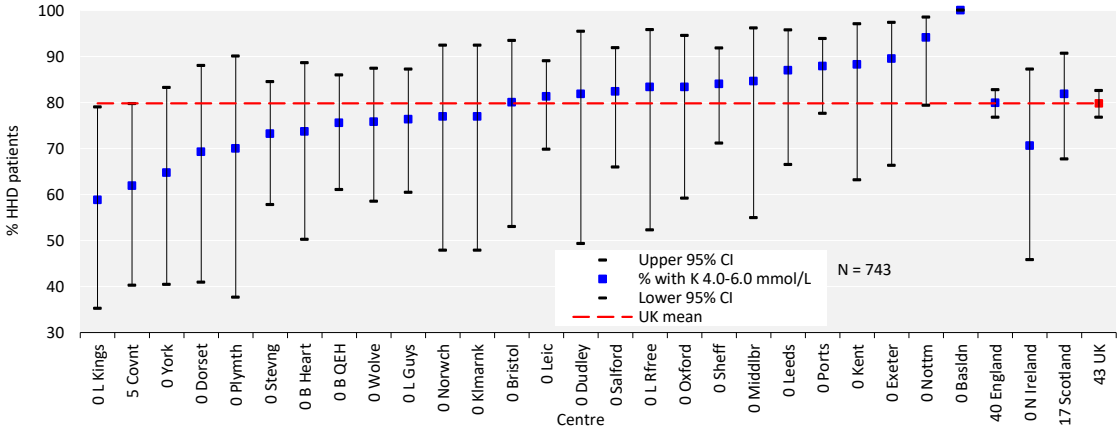

Figure 6.4 Percentage of adult patients prevalent to HHD on 31/12/2018 with pre-dialysis potassium (K) within the target range (4.0–6.0 mmol/L) by centre.

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 6.7 Median haemoglobin and ferritin and percentage attaining target ranges in adult patients prevalent to HHD on 31/12/2018 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							
B Heart	103	21.1	5.3	100.0	123	41.2	89.5
B QEH	109	37.8	8.9	100.0	276	8.9	100.0
Basldn	102	50.0	20.0	100.0	101	50.0	100.0
Bradfd				100.0			100.0
Brightn	109	13.2	13.2	97.4	403	10.3	100.0
Bristol	111	6.7	26.7	100.0	265	6.7	100.0
Camb							
Carlis							
Carsh	103	35.7	3.6	100.0	164	25.0	100.0
Chelms				100.0			100.0
Colchr							
Covnt	102	33.3	9.5	95.5	305	14.3	95.5
Derby	119	7.5	45.3	100.0	477	1.9	100.0
Donc				100.0			100.0
Dorset	109	15.4	7.7	100.0	413	15.4	100.0
Dudley	117	9.1	36.4	100.0			0.0
Exeter	110	5.3	26.3	100.0	184	21.1	100.0
Glouc				100.0			100.0
Hull				100.0			100.0
Ipswi				100.0			80.0
Kent	111	35.3	11.8	100.0	348	18.8	94.1
L Barts	108	20.6	8.8	100.0	596	8.8	100.0
L Guys	108	36.8	10.5	100.0	259	18.9	97.4
L Kings	112	23.5	17.6	100.0	219	17.6	100.0
L Rfree	106	33.3	16.7	100.0	442	8.3	100.0
L St.G				100.0			100.0
L West	111	28.6	21.4	73.7			68.4
Leeds	99	52.2	8.7	100.0	336	4.3	100.0
Leic	107	23.4	23.4	100.0	289	10.9	100.0
Liv Ain	101	43.8	6.3	100.0	253	12.5	100.0
Liv Roy	105	34.2	23.7	100.0	115	44.7	100.0
M RI	109	25.7	14.3	95.9	199	26.1	94.5
Middlbr	112	38.5	30.8	100.0	596	7.7	100.0
Newc	108	31.8	18.2	100.0	334	18.2	100.0
Norwch	108	23.1	23.1	100.0	213	30.8	100.0
Nottm	111	20.6	23.5	100.0	277	8.8	100.0
Oxford	112	22.2	27.8	100.0	329	5.6	100.0
Plymth	119	20.0	50.0	100.0	394	10.0	100.0
Ports	110	25.8	31.8	100.0	186	20.0	98.5
Prestn	106	34.9	9.3	100.0	361	16.3	100.0

Table 6.7 Continued

Centre	Haemoglobin				Ferritin		
	Median (g/L)	% <100 g/L	% >120 g/L	% data completeness	Median (µg/L)	% <100 µg/L	% data completeness
Redng				100.0			100.0
Salford	105	35.3	8.8	100.0	335	9.7	91.2
Sheff	103	44.0	16.0	100.0	458	8.2	98.0
Shrew	120	0.0	40.0	100.0	330	5.0	100.0
Stevng	104	36.6	12.2	100.0	441	10.3	95.1
Sthend				100.0			100.0
Stoke	116	18.2	27.3	100.0	323	4.8	95.5
Sund	110	22.7	18.2	100.0	274	0.0	100.0
Truro				100.0			100.0
Wirral				100.0			100.0
Wolve	101	45.5	15.2	100.0	243	24.2	100.0
York	108	23.5	5.9	100.0	320	11.8	100.0
N IRELAND							
Antrim				100.0			100.0
Belfast				100.0			100.0
Newry				100.0			100.0
Ulster							
West NI				50.0			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	107	27.8	22.2	100.0	180	44.4	100.0
Inverns				100.0			100.0
Klmarnk	104	15.4	23.1	100.0	164	30.8	100.0
Krkcldy							
WALES							
Bangor	115	23.1	30.8	100.0	66	69.2	100.0
Cardff	101	47.1	8.8	100.0	148	38.2	100.0
Clwyd				100.0			100.0
Swanse	105	31.4	8.6	100.0	173	40.0	100.0
Wrexm				100.0			80.0
TOTALS							
England	**108**	**27.3**	**19.3**	**99.1**	**284**	**15.3**	**96.9**
N Ireland	**112**	**25.0**	**25.0**	**94.1**	**310**	**11.8**	**100.0**
Scotland	**104**	**32.1**	**17.0**	**100.0**	**210**	**28.3**	**100.0**
Wales	**106**	**34.8**	**11.2**	**100.0**	**157**	**42.0**	**98.9**
UK	**108**	**28.0**	**18.7**	**99.2**	**276**	**17.6**	**97.2**

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

Table 6.8 Distribution of haemoglobin and erythropoiesis stimulating agent (ESA) dose values in adult patients prevalent to HHD on 31/12/2018 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				
B Heart	52.6			
B QEH	0.0			
Basldn	100.0	11,000	0.0	20.0
Bradfd	100.0			
Brightn	51.3			
Bristol	93.3	9,000	0.0	26.7
Camb				
Carlis				
Carsh	7.1			
Chelms	100.0			
Colchr				
Covnt	86.4	8,000	4.8	4.8
Derby	0.0			
Donc	100.0			
Dorset	92.3	8,000	0.0	7.7
Dudley	100.0	11,000	0.0	36.4
Exeter	100.0	6,000	0.0	21.1
Glouc	100.0			
Hull	20.0			
Ipswi	0.0			
Kent	94.1	12,000	0.0	5.9
L Barts	0.0			
L Guys	0.0			
L Kings	88.2	12,000	5.9	17.6
L Rfree	0.0			
L St.G	0.0			
L West	0.0			
Leeds	100.0	8,000	0.0	8.7
Leic	89.1	6,000	3.1	15.6
Liv Ain	0.0			
Liv Roy	0.0			
M RI	0.0			
Middlbr	84.6	6,000	7.7	23.1
Newc	40.9			
Norwch	76.9	8,000	0.0	7.7
Nottm	85.3	10,000	0.0	17.6
Oxford	94.4	15,000	0.0	22.2
Plymth	0.0			
Ports	12.1			
Prestn	93.0		0.0	9.3
Redng	12.5			
Salford	76.5	8,000	14.7	8.8
Sheff	78.0	4,000	6.0	14.0
Shrew	0.0			
Stevng	92.7	11,000	2.4	12.2
Sthend	100.0			
Stoke	0.0			
Sund	63.6			
Truro	0.0			
Wirral	87.5			
Wolve	90.9	11,000	3.0	12.1
York	94.1	5,500	0.0	5.9

Table 6.8 Continued

	ESA		Haemoglobin and ESA	
Centre	% on ESA	Median dose (IU/week)	% <100g/L and not on ESA	% >120g/L and on ESA
N IRELAND				
Antrim	100.0			
Belfast	88.9			
Newry	100.0			
Ulster				
West NI	100.0			
SCOTLAND				
Abrdn	100.0			
Airdrie				
D&Gall	0.0			
Dundee	50.0			
Edinb	100.0			
Glasgw	4.8			
Inverns	100.0			
Klmarnk	9.1			
Krkcldy				
WALES				
Bangor	38.5			
Cardff	58.8			
Clwyd	50.0			
Swanse	85.7		2.9	5.7
Wrexm	80.0			
TOTAL[1]				
UK	**89.6**	**8,000**	**2.6**	**13.9**

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 31/05/2018 due to ESA data availability.
[1]This is the total of only those centres with at least 70% of HHD patients on an ESA.

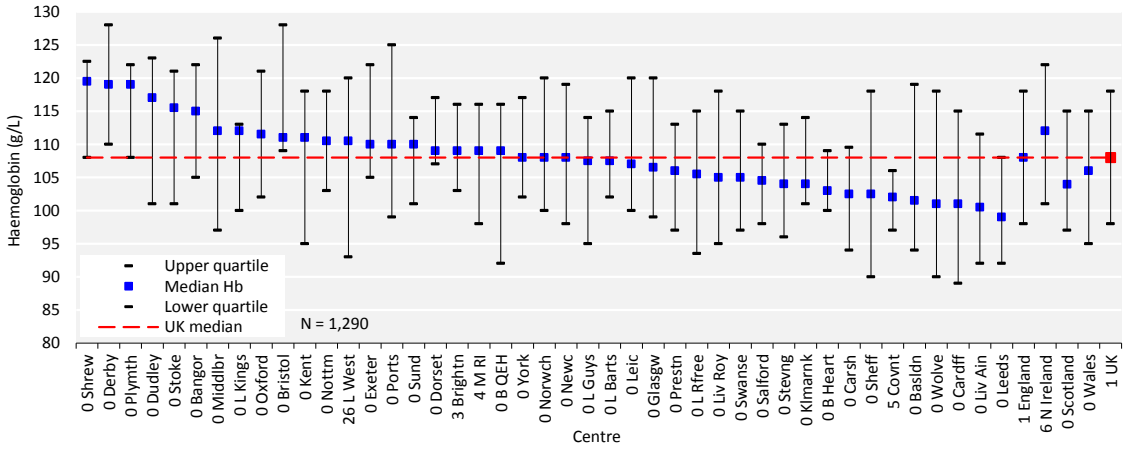

Figure 6.5 Median haemoglobin (Hb) in adult patients prevalent to HHD on 31/12/2018 by centre

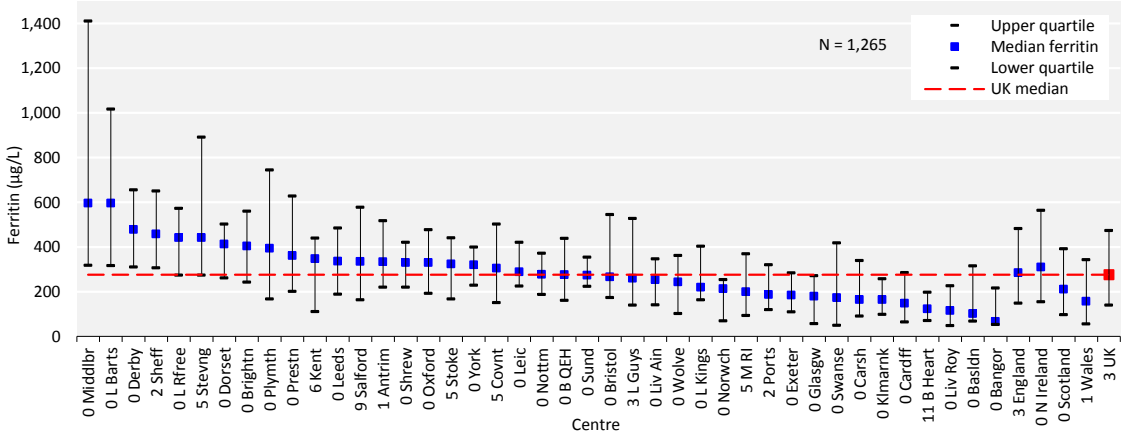

Figure 6.6 Median ferritin in adult patients prevalent to HHD on 31/12/2018 by centre

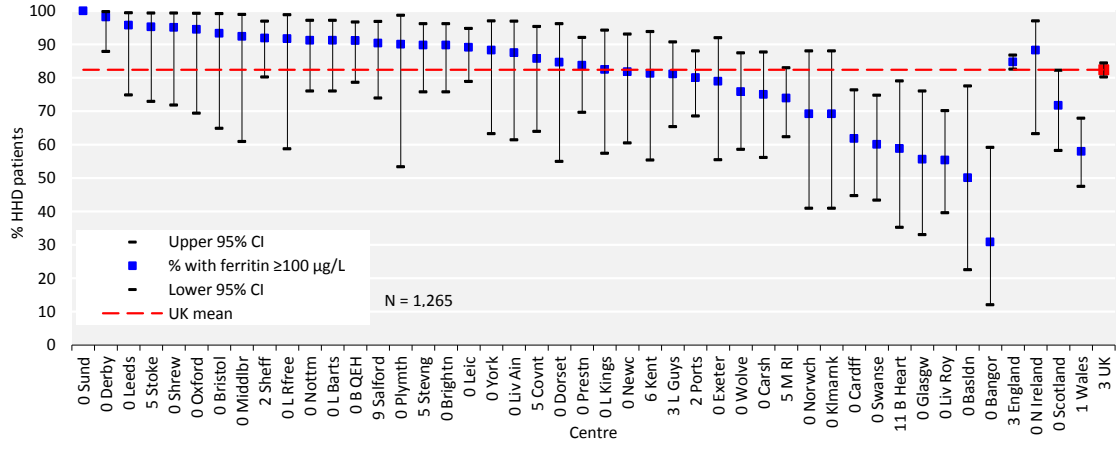

Figure 6.7 Percentage of adult patients prevalent to HHD on 31/12/2018 with ferritin ≥100 µg/L by centre
CI – confidence interval

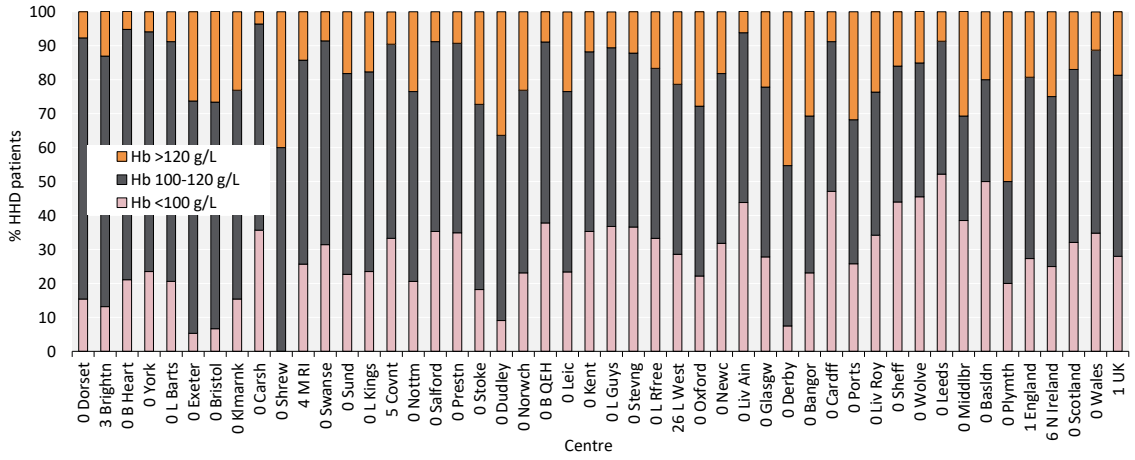

Figure 6.8 Distribution of haemoglobin (Hb) in adult patients prevalent to HHD on 31/12/2018 by centre

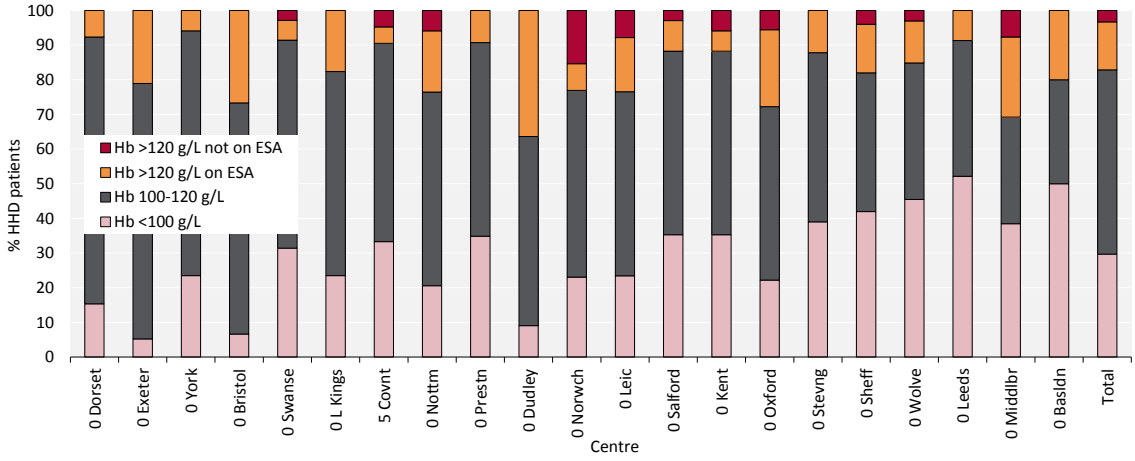

Figure 6.9 Distribution of haemoglobin (Hb) in adult patients prevalent to HHD on 31/12/2018 and the proportion with haemoglobin >120 g/L receiving erythropoiesis stimulating agent (ESA) by centre

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 31/12/2017 and followed-up for one year in 2018. 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 2.

Table 6.9 Cause of death in adult patients prevalent to HHD on 31/12/2017 followed-up in 2018 by age group

	HHD all ages		HHD <65 yrs		HHD ≥65 yrs	
Cause of death	N	%	N	%	N	%
Cardiac disease	20	26.7	14	31.8	6	19.4
Cerebrovascular disease	4	5.3	2	4.6	2	6.5
Infection	11	14.7	5	11.4	6	19.4
Malignancy	3	4.0	2	4.6	1	3.2
Treatment withdrawal	7	9.3	3	6.8	4	12.9
Other	22	29.3	12	27.3	10	32.3
Uncertain aetiology	8	10.7	6	13.6	2	6.5
Total (with data)	**75**	**100.0**	**44**	**100.0**	**31**	**100.0**
Missing	31	29.3	23	34.3	8	20.5

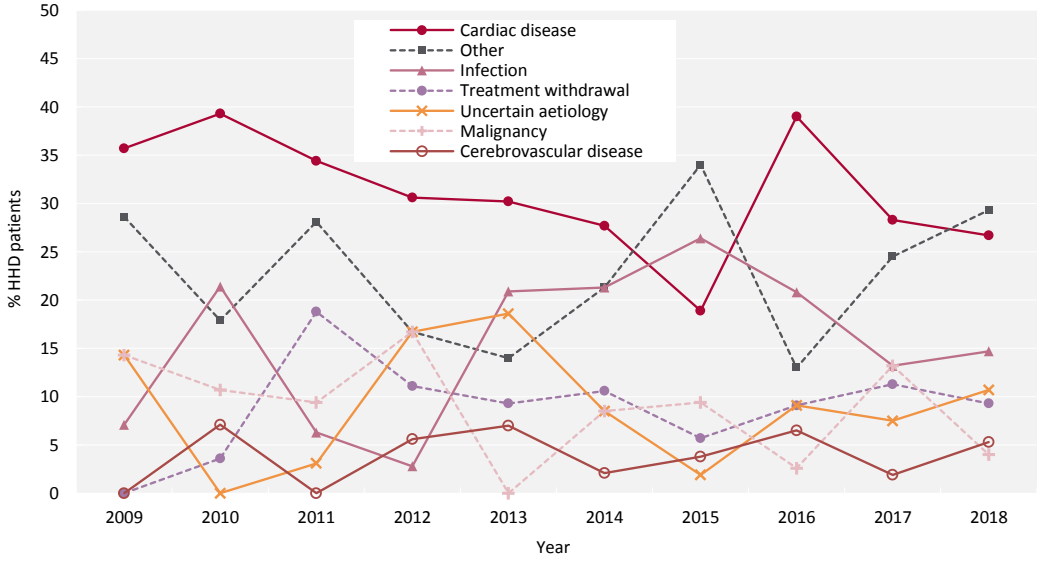

Figure 6.10 Cause of death between 2009 and 2018 for adult patients prevalent to HHD at the beginning of the year