

## *Chapter 7*

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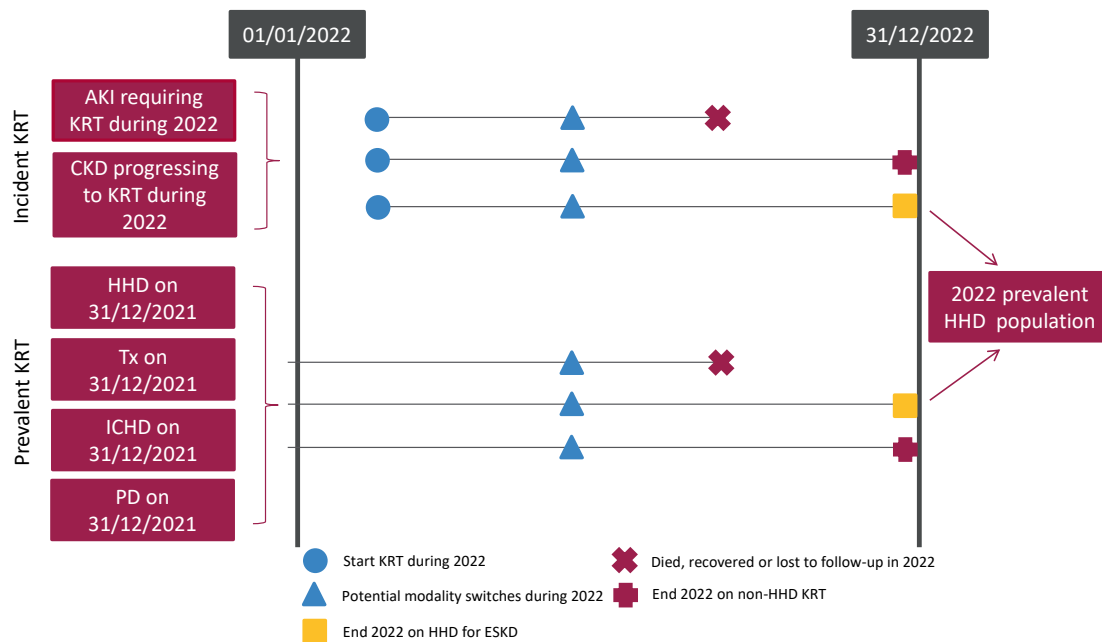
# **Adults on home haemodialysis (HHD) in the UK at the end of 2022**

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# Introduction

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



**Figure 7.1** Pathways adult patients could follow to be included in the UK 2022 prevalent HHD population

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

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

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

## Rationale for analyses

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

The UK Kidney Association guidelines ([ukkidney.org/health-professionals/guidelines/guidelines-commentaries](http://ukkidney.org/health-professionals/guidelines/guidelines-commentaries)) provide audit measures relevant to the care of patients on HHD and, where data permit, their attainment by UK kidney centres in 2022 is reported in this chapter (table 7.1). Audit measures in guidelines that have been archived are not included. Some audit measures – for example, the target for glycated haemoglobin (HbA1c) in those on hypoglycaemia-inducing treatment – cannot be reported because the completeness of the required data items is too low. Further detail about the completeness of data returned to the UKRR is available through the UKRR data portal ([ukkidney.org/audit-research/data-portals](http://ukkidney.org/audit-research/data-portals)). Audit measures that cannot be reported because the required data items were not collected by the UKRR are omitted.

**Table 7.1** The UK Kidney Association audit measures relevant to HHD that are reported in this chapter

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

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

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

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

## Key findings

- 1,452 adult patients were receiving HHD for ESKD in the UK on 31/12/2022, compared to 1,411 on 31/12/2021, which represented 2.0% of the KRT population.
- The median age of HHD patients was 55.5 years and 61.3% were male.
- The median adjusted calcium for HHD patients was 2.4 mmol/L and 15.0% were above the target range 2.2–2.5 mmol/L.
- The median pre-dialysis bicarbonate for HHD patients was 23 mmol/L and 76.4% were within the target range 18–26 mmol/L.
- The median pre-dialysis potassium for HHD patients was 4.9 mmol/L and 77.0% were within the target range 4.0–6.0 mmol/L.
- The median ferritin for HHD patients was 359 µg/L and 26.7% had a ferritin <200 µg/L.
- The median haemoglobin for HHD patients was 108 g/L and 28.6% had a haemoglobin <100 g/L.
- This year for the first time, cause of death records from Civil Registration were used where cause of death was missing in the UKRR data. This resulted in improved completeness and changes in proportions of the causes of death. The leading cause of death for patients on HHD was cardiac disease (30.6%) in younger patients (<65 years) and infections (25.4%) in patients ≥ 65 years.

# Analyses

## Changes to the prevalent adult HHD population

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

**Table 7.2** Number of prevalent adult HHD patients and proportion of adult KRT patients on HHD by year and by centre; number of HHD patients as a proportion of the catchment population

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

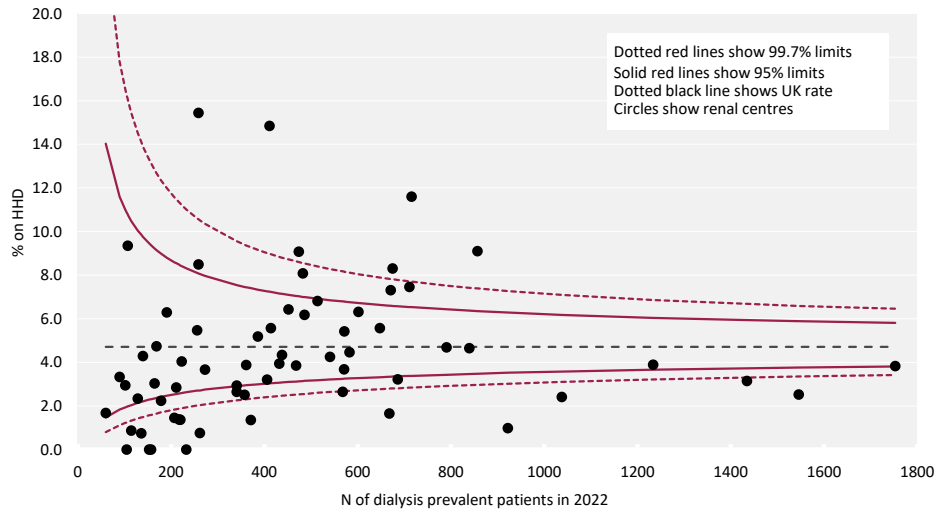
**Table 7.2** Continued

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

Country HHD populations were calculated by summing the HHD patients from centres in each country. Estimated country populations were derived from Office for National Statistics figures (see appendix A for details on estimated catchment population by kidney centre)

Exeter was unable to submit patient level data but provided aggregate numbers of patients on KRT at the end of 2021 and 2022 by treatment modality

pmp – per million population



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



## Demographics of prevalent adult HHD patients

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

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

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

**Table 7.3** Continued

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

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

Breakdown by ethnicity is not shown for centres with <70% data completeness, but these centres were included in national averages  
Exeter was unable to submit patient level data but provided aggregate numbers of patients on KRT at the end of 2022 by treatment modality

UK ethnicity distribution and completeness does not include Scotland

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

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

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

## Biochemistry parameters in prevalent adult HHD patients

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

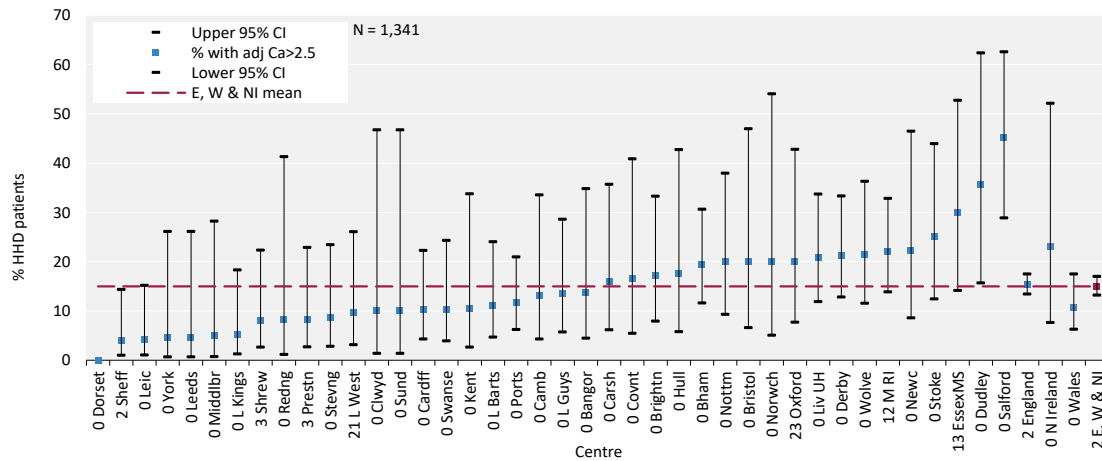
**Table 7.5** Median adjusted calcium (Ca) and percentage with adjusted Ca within and above the target range (2.2–2.5 mmol/L) in adult patients prevalent to HHD on 31/12/2022 by centre

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

**Table 7.5** Continued

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

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 31/12/2022 with adjusted calcium (Ca) above the target range (>2.5 mmol/L) by centre  
CI – confidence interval

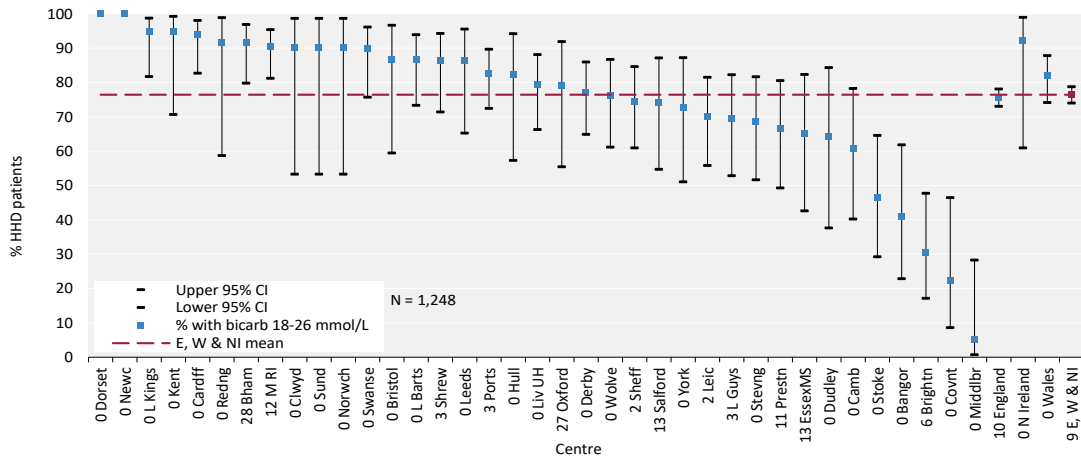
**Table 7.6** Median pre-dialysis potassium and bicarbonate and percentage attaining target ranges in adult patients prevalent to HHD on 31/12/2022 by centre

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

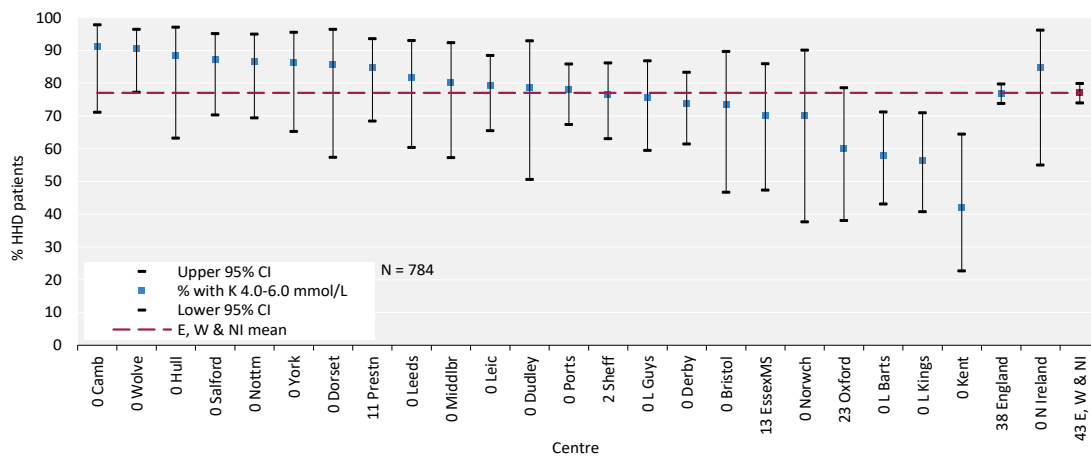
**Table 7.6** Continued

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

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 31/12/2022 with pre-dialysis bicarbonate (bicarb) within the target range (18-26 mmol/L) by centre  
 CI – confidence interval



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

## Anaemia in prevalent adult HHD patients

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

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

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

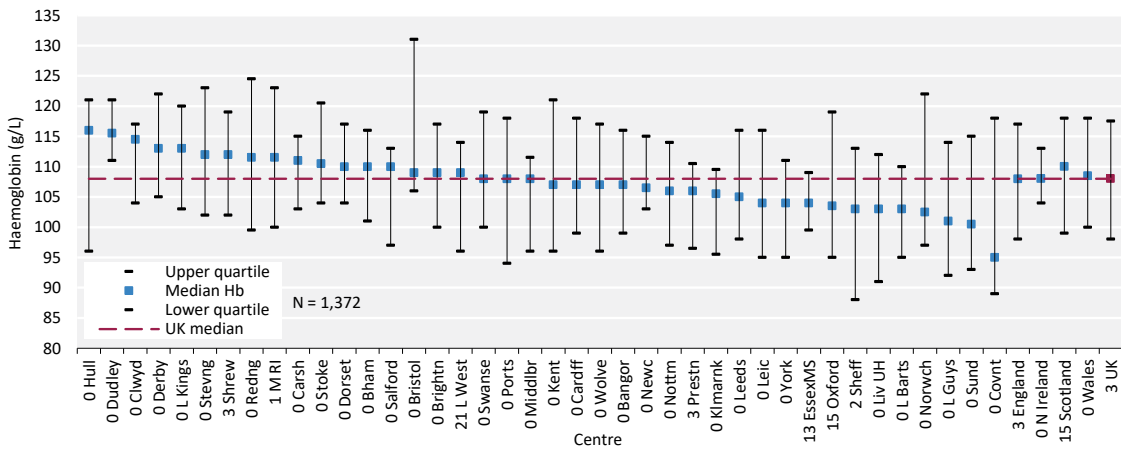


**Table 7.7** Continued

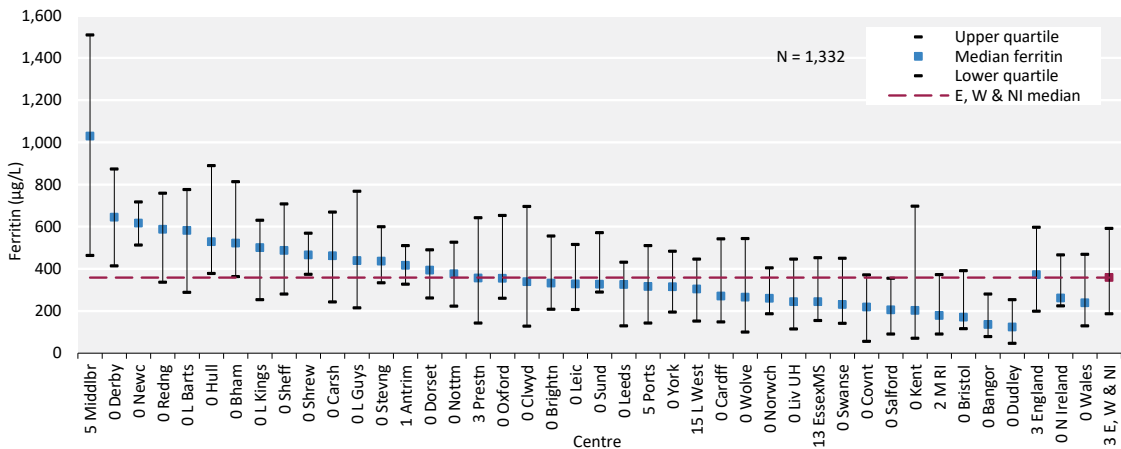
Centre	Haemoglobin				Ferritin		
	Median (g/L)	% <100 g/L	% >120 g/L	% data completeness	Median (µg/L)	% <200 µg/L	% data completeness
York	104	36.4	4.5	100.0	315	27.3	100.0
N IRELAND							
Antrim				100.0			100.0
Belfast				100.0			100.0
Newry				100.0			100.0
Ulster							
West NI				100.0			100.0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

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

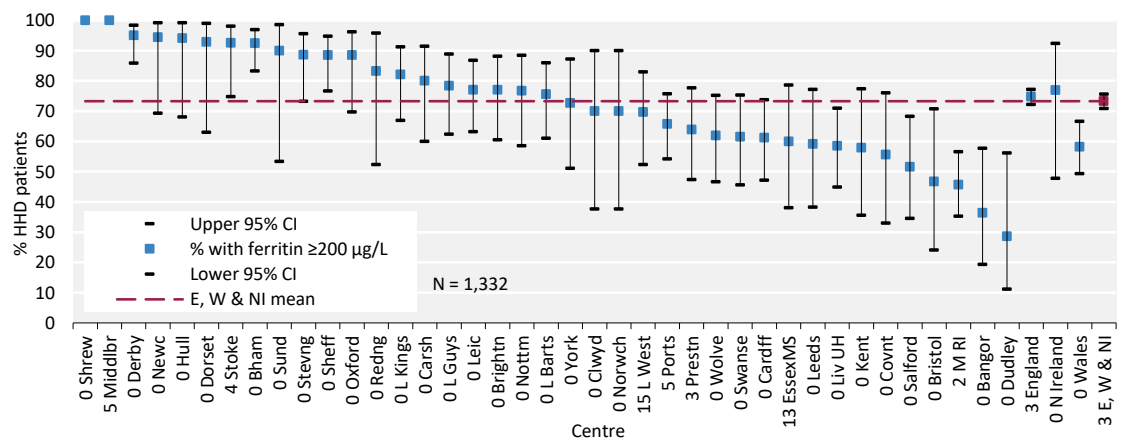
UK National average for ferritin does not include Scotland



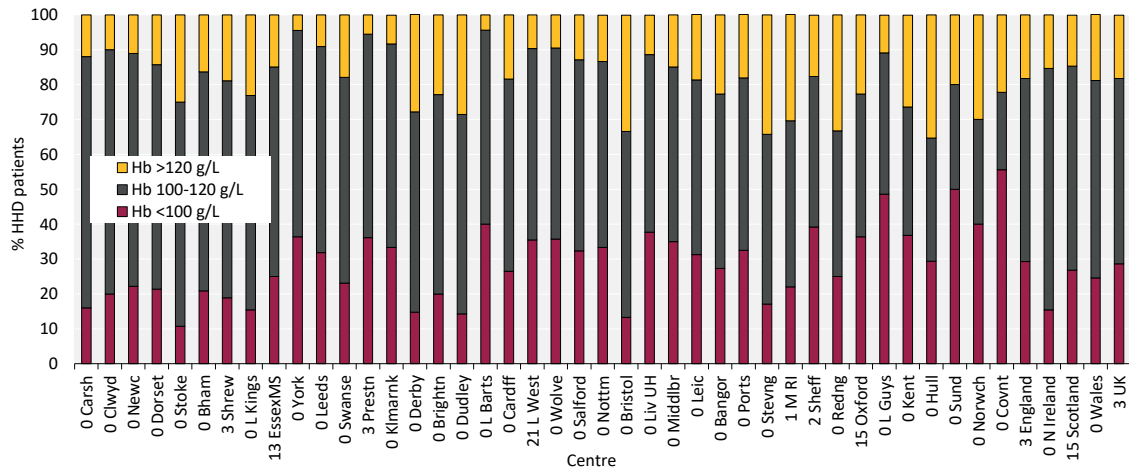
**Figure 7.6** Median haemoglobin (Hb) in adult patients prevalent to HHD on 31/12/2022 by centre



**Figure 7.7** Median ferritin in adult patients prevalent to HHD on 31/12/2022 by centre



**Figure 7.8** Percentage of adult patients prevalent to HHD on 31/12/2022 with ferritin <200 µg/L by centre  
CI – confidence interval



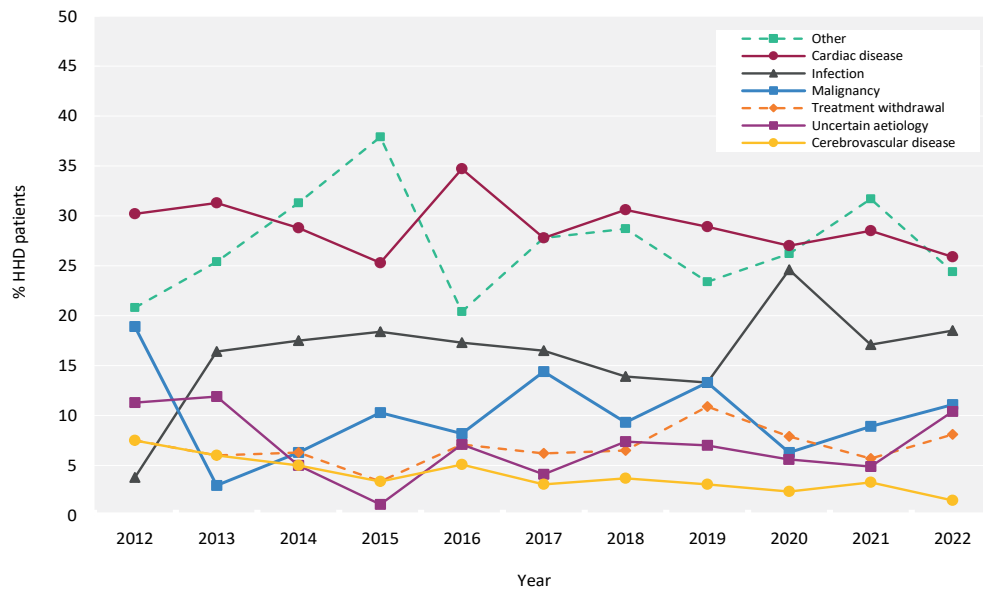
**Figure 7.9** Distribution of haemoglobin (Hb) in adult patients prevalent to HHD on 31/12/2022 by centre

## Cause of death in adult HHD patients

Cause of death was analysed in prevalent patients receiving HHD on 31/12/2021 and followed-up for one year in 2022. The proportion of HHD patients with each cause of death is shown for patients with cause of death data and these total 100% of patients with data. The proportion of patients with no cause of death data is shown on a separate line. Where the cause of death was missing in the UKRR data, cause of death from Civil Registration records was used. Further detail on the survival of prevalent KRT patients is in chapter 3.

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

Cause of death	HHD all ages		HHD < 65 years		HHD ≥ 65 years	
	N	%	N	%	N	%
Cardiac disease	35	25.9	22	30.6	13	20.6
Cerebrovascular disease	2	0.0	1	0.0	1	0.0
Infection	25	18.5	9	12.5	16	25.4
Malignancy	15	11.1	8	11.1	7	11.1
Treatment withdrawal	11	8.2	3	4.2	8	12.7
Other	33	24.4	21	29.2	12	19.1
Uncertain aetiology	14	10.4	8	11.1	6	9.5
<b>Total (with data)</b>	<b>135</b>	<b>98.5</b>	<b>72</b>	<b>98.6</b>	<b>63</b>	<b>98.4</b>
Missing	8	5.6	4	5.3	4	6.0



**Figure 7.10** Cause of death between 2012 and 2022 for adult patients prevalent to HHD at the beginning of the year