

## *Chapter 1*

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**Adults with chronic kidney disease (CKD) and estimated glomerular filtration rate (eGFR) <30mL/min/1.73m<sup>2</sup> in the UK at the end of 2020**

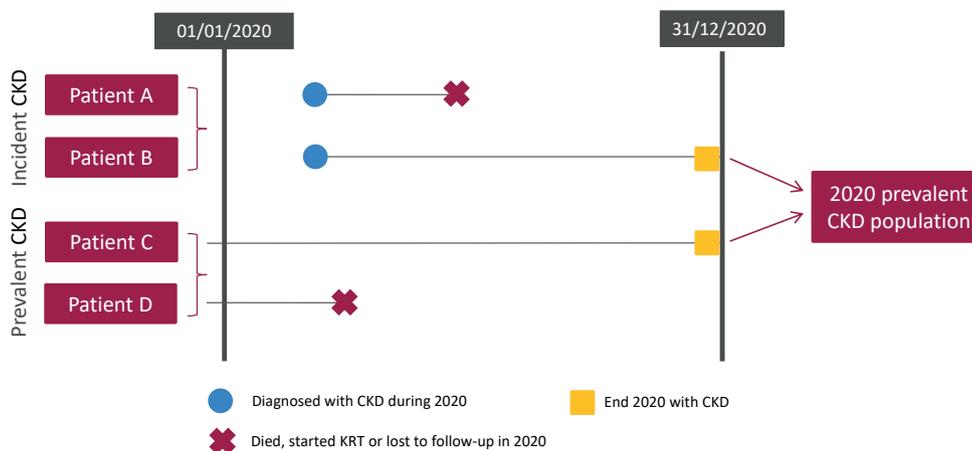
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## Introduction

This is the second year the UKRR has published data in the annual report about patients with chronic kidney disease (CKD) outside the context of kidney replacement therapy (KRT) or acute kidney injury (AKI). The primary aim of this chapter is to present the demographic and clinical features of patients receiving treatment for CKD stages G4 and 5 at UK kidney centres at the end of 2020 (figure 1.1). A ‘2020 prevalent CKD population’ is described, comprising individuals who:

- were reported by an adult kidney centre as receiving treatment for CKD at the end of 2020, and
- had an eGFR of  $<30\text{mL}/\text{min}/1.73\text{m}^2$  on their last recorded creatinine measurement.



**Figure 1.1** Pathways adult patients could follow to be included in the UK 2020 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]  $<15\text{ mL}/\text{min}/1.73\text{m}^2$ ) or CKD stage G4 (eGFR  $15\text{--}29\text{ mL}/\text{min}/1.73\text{m}^2$ ) 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 KRT/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 kidney centre, particularly those with earlier stages. Furthermore, not all kidney centres are yet submitting CKD data to the UKRR. For this reason, it is not appropriate to generalise findings from this chapter to the wider CKD population, even to those cared for in kidney centres.

Consequently, this CKD chapter asks simple questions:

- Which individuals with CKD are currently reported to the UKRR?
- What data are captured and which aspects of CKD care can be audited using them?

## Rationale for analyses

Since 2016, kidney centres in England and Wales have been asked by the National Clinical Reference Group to report individuals with CKD under their care to the UKRR. In 2020 the UKRR received data from 19 units of the 54 adult centres in England and Wales (two more than in 2019).

Reliable estimates of CKD prevalence in secondary care are required to inform CKD management and policy planning. The presented analyses will be performed annually to help clinicians and policy makers in this task and will be expanded as data quality and quantity improve. The UK Kidney Association guidelines ([ukkidney.org/health-professionals/guidelines/guidelines-commentaries](http://ukkidney.org/health-professionals/guidelines/guidelines-commentaries)) provide audit measures relevant to the care of patients with CKD, and where data permit, their attainment by UK kidney centres in 2020 is reported in this chapter (table 1.1). Some audit measures cannot be reported because the completeness of the required data items is too low. Audit measures in guidelines that have been archived are not included. For consistency with other chapters, table 1.1 is provided to outline the addressed UK Kidney Association audit measures. However, data completeness is poor even for the analyses presented, necessitating caution in interpretation. Further detail about the completeness of data returned to the UKRR is available through the UKRR ([data portal ukkidney.org/audit-research/data-portals](http://data.portal.ukkidney.org/audit-research/data-portals)).

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

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

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

## Key findings

- Data about patients with CKD stages G4 and 5 who were not on KRT were reported by just 19 of the UK's adult kidney centres.
- The 2020 prevalent CKD population comprised 21,937 patients, with a median age of 77.6 years, compared to a median age of 59.6 years for those on KRT.
- CKD prevalence was 1,191 per million population (pmp) overall, but ranged from 173 to 2,633 pmp between centres. There were also substantial differences in the ages and distribution of disease stages between centres. Such large variation suggests discrepancies in the definitions used for processes of care or reporting of people with CKD between centres.
- The data reported in this chapter highlight the need for improved capture and reporting of CKD data to enable national quality assurance. Concordance with audit measures for the CKD not on KRT population cannot be addressed until this is achieved.

# Analyses

## Stage and demographics of adult CKD patients

For the 19 adult kidney centres, the number of prevalent patients with CKD and eGFR  $\leq 30$  mL/min/1.73m<sup>2</sup> was calculated as a proportion of the estimated centre catchment population (details in appendix A). Only a few centres reported patients with kidney failure as undergoing conservative care (CC). It is not clear whether a CC code means the same thing at all centres and for each patient. In particular, it is unclear which CC codes represent planned KRT for the eventuality of kidney failure, and which represent active treatment for an individual who might otherwise have started KRT. As such, people coded as receiving CC are included throughout this chapter.

**Table 1.2** Number of adult patients prevalent to CKD stages G4 and 5 on 31/12/2020, including those on conservative care (CC) by stage and centre; number of CKD and KRT patients as a proportion of the adult catchment population

Centre	N with CKD	N on CC	Total	% stage			Estimated catchment population (millions)	CKD 2020 crude rate (pmp)	KRT 2020 crude rate (pmp)
				G4	G5	unknown			
Bham <sup>1</sup>	775	46	821	69.9	29.6	0.5	2.04	403	1,605
Camb	160	1	161	62.7	28.6	8.7	0.93	173	1,641
Carlisle	526	79	605	74.0	13.6	12.4	0.25	2,387	1,172
Covnt	1,584	1	1,585	86.8	12.2	1.0	0.79	2,007	1,388
Derby	1,117	3	1,120	82.1	16.2	1.7	0.56	2,010	1,215
Glouc	1,087	1	1,088	87.8	11.2	1.0	0.51	2,148	1,029
L Guys	859	0	859	70.3	29.6	0.1	1.00	860	2,323
L Kings	277	0	277	40.1	59.2	0.7	0.93	299	1,351
L Rfree	1,654	232	1,886	64.2	26.7	9.1	1.32	1,431	1,773
Leic	3,742	1	3,743	81.0	16.3	2.7	2.07	1,807	1,257
Middlbr	528	0	528	63.3	32.6	4.2	0.80	659	1,176
Oxford	2,039	2	2,041	71.6	21.1	7.3	1.44	1,422	1,408
Plymth	1,046	0	1,046	86.4	11.4	2.2	0.40	2,625	1,365
Ports	1,994	0	1,994	75.0	24.6	0.4	1.74	1,148	1,095
Salford	319	1	320	94.1	5.9	0.0	1.14	280	1,105
Stevng	350	97	447	63.1	31.1	5.8	1.10	405	873
Sthend	506	0	506	79.6	19.0	1.4	0.27	1,862	990
Swanse	2,030	25	2,055	86.1	13.9	0.0	0.78	2,633	1,089
Truro	797	58	855	85.6	14.2	0.2	0.36	2,405	1,252
<b>Total</b>	<b>21,390</b>	<b>547</b>	<b>21,937</b>	<b>77.6</b>	<b>19.5</b>	<b>3.0</b>	<b>18.42</b>	<b>1,191</b>	<b>1,363</b>

<sup>1</sup>The catchment population and 2020 crude rate for KRT reflect the combined Bham population (QEH and Heartlands kidney centres), but CKD patients were only reported for QEH.

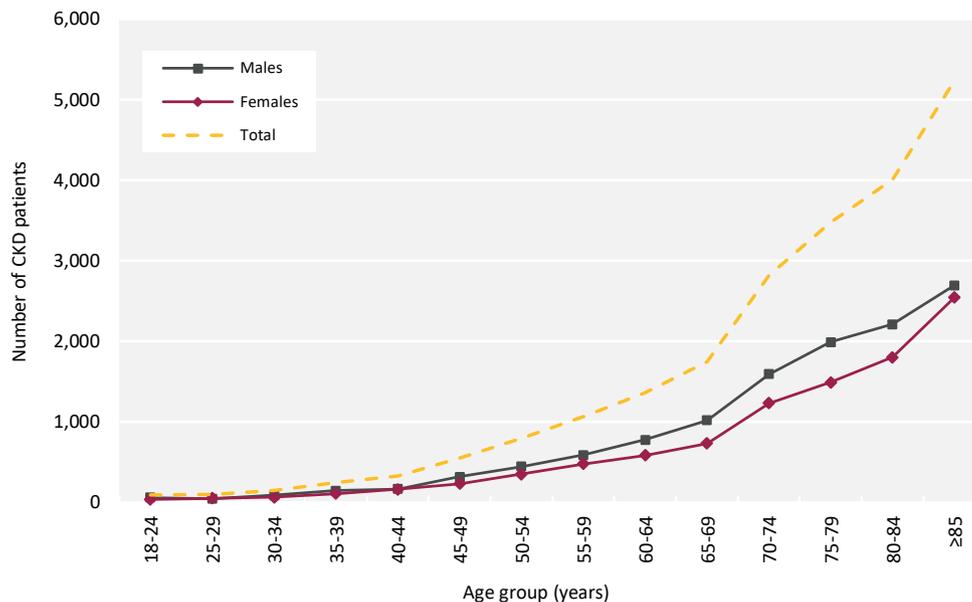
This part of the report includes Southend only (Chelmsford and Basildon do not submit CKD data)

The proportion of patients with CKD and eGFR  $\leq 30$  mL/min/1.73m<sup>2</sup> 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 31/12/2020 by centre

Centre	N with CKD	Median age (yrs)	% male	Ethnicity					PRD completeness		
				% White	% Asian	% Black	% Other	% missing	% all stages	% stage G4	% stage G5
Bham	821	68.0	59.2	60.6	23.8	12.3	3.3	14.1	14.1	5.7	33.3
Camb	161	78.0	51.6	95.4	2.6	0.7	1.3	6.2	49.1	35.6	84.8
Carlisle	605	78.5	50.9	99.6	0.4	0.0	0.0	22.8	14.7	14.7	24.4
Covnt	1,585	79.5	52.4	89.7	8.8	1.5	0.0	7.9	84.4	84.4	84.5
Derby	1,120	77.7	54.4	91.4	5.9	1.4	1.3	12.2	92.6	92.2	96.1
Glouc	1,088	79.8	58.2	94.9	2.5	1.4	1.3	5.2	53.1	51.1	70.5
L Guys	859	71.0	55.6	62.3	7.8	25.0	4.9	23.7	40.9	31.8	62.6
L Kings	277	63.3	56.7	41.7	10.6	44.4	3.2	22.0	22.4	7.2	32.3
L Rfree	1,886	75.8	55.8	57.1	19.6	12.8	10.6	21.7	50.7	49.9	58.6
Leic	3,743	78.8	53.4	81.7	15.3	1.7	1.3	27.8	58.5	56.9	67.7
Middlbr	528	73.5	58.7	94.5	4.7	0.3	0.5	27.5	20.8	17.1	29.7
Oxford	2,041	76.5	58.1	87.6	5.6	2.7	4.1	72.8	15.3	12.4	28.1
Plymth	1,046	80.8	49.2	98.4	0.4	0.1	1.1	4.4	19.3	18.0	28.6
Ports	1,994	76.0	58.1	97.6	1.5	0.4	0.5	37.3	20.0	14.6	36.7
Salford	320	75.9	57.5	85.9	12.7	0.7	0.7	9.1	1.9	1.7	5.3
Stevng	447	82.5	54.1	87.6	7.9	1.7	2.9	45.9	43.2	29.8	70.5
Sthend	506	79.4	56.5	94.6	2.0	1.4	2.0	1.8	33.6	26.6	62.5
Swanse	2,055	79.5	53.9	99.7	0.0	0.3	0.0	83.0	22.3	19.3	40.9
Truro	855	79.8	56.4	98.8	0.4	0.2	0.6	0.2	16.3	12.7	38.0
<b>Total</b>	<b>21,937</b>	<b>77.6</b>	<b>55.2</b>	<b>84.8</b>	<b>8.5</b>	<b>4.4</b>	<b>2.3</b>	<b>30.4</b>	<b>40.0</b>	<b>37.7</b>	<b>51.3</b>

This part of the report includes Southend only (Chelmsford and Basildon do not submit CKD data)

**Figure 1.2** Number of adult patients prevalent to CKD stages G4 and 5 on 31/12/2020 by age group and sex

## Blood pressure in adult CKD patients

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

**Table 1.4** Blood pressures in adult patients prevalent to CKD stages G4 and 5 on 31/12/2020 by stage

	All stages				Stage G4				Stage G5			
	N (%) complete)	Median SBP	Median DBP	N (%) <140/90 <sup>1</sup>	N (%) complete)	Median SBP	Median DBP	N (%) <140/90 <sup>1</sup>	N (%) complete)	Median SBP	Median DBP	N (%) <140/90 <sup>1</sup>
<b>All</b>	2594 (25.9)	143	76	1057 (40.7)	1716 (21.9)	141	77	734 (42.8)	877 (45.1)	146	76	323 (36.8)
<b>Age group (yrs)</b>												
18-29	29 (39.2)	130	79	21 (72.4)	17 (34.7)	130	79	13 (76.5)	12 (50)	130.5	82.5	8 (66.7)
30-39	73 (41.5)	137	87	37 (50.7)	52 (41.6)	136.5	84	27 (51.9)	21 (52.5)	137	90	10 (47.6)
40-49	183 (43.8)	141	84	77 (42.1)	130 (41.7)	140.5	82.5	57 (43.8)	53 (53)	145	85	20 (37.7)
50-59	323 (38.8)	142	82	134 (41.5)	211 (34.8)	140	82	92 (43.6)	112 (53.3)	145	82	42 (37.5)
60-64	224 (36.4)	142	79	90 (40.2)	142 (31.5)	140	78	62 (43.7)	81 (55.9)	145	80	28 (34.6)
65-69	274 (34.9)	146	78	101 (36.9)	188 (31)	146	78	71 (37.8)	86 (53.8)	146.5	76	30 (34.9)
70-74	360 (27)	143	75	148 (41.1)	239 (22.6)	140	76	107 (44.8)	121 (46)	147	74	41 (33.9)
75-79	416 (25.5)	144	73	167 (40.1)	278 (21.2)	141	73	118 (42.4)	138 (48.3)	146.5	72	49 (35.5)
80-84	387 (21.4)	144	72	159 (41.1)	260 (17.8)	143	73	112 (43.1)	127 (42.2)	145	70	47 (37)
≥85	325 (13.9)	145	71	123 (37.8)	199 (10.8)	144.5	70	75 (37.7)	126 (30.3)	147	71	48 (38.1)
<b>Sex</b>												
Male	1504 (27)	144	77	600 (39.9)	1003 (23)	142	77	419 (41.8)	501 (46)	147	76	181 (36.1)
Female	1090 (24.5)	142	76	457 (41.9)	713 (20.5)	141	76	315 (44.2)	376 (43.9)	145	76	142 (37.8)

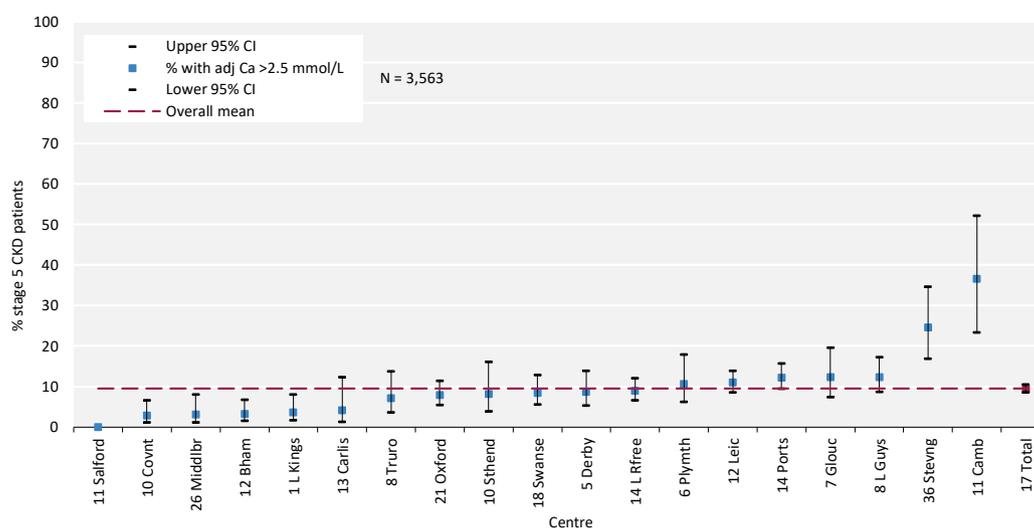
<sup>1</sup>% <140/90 mmHg of patients with complete blood pressure data.

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

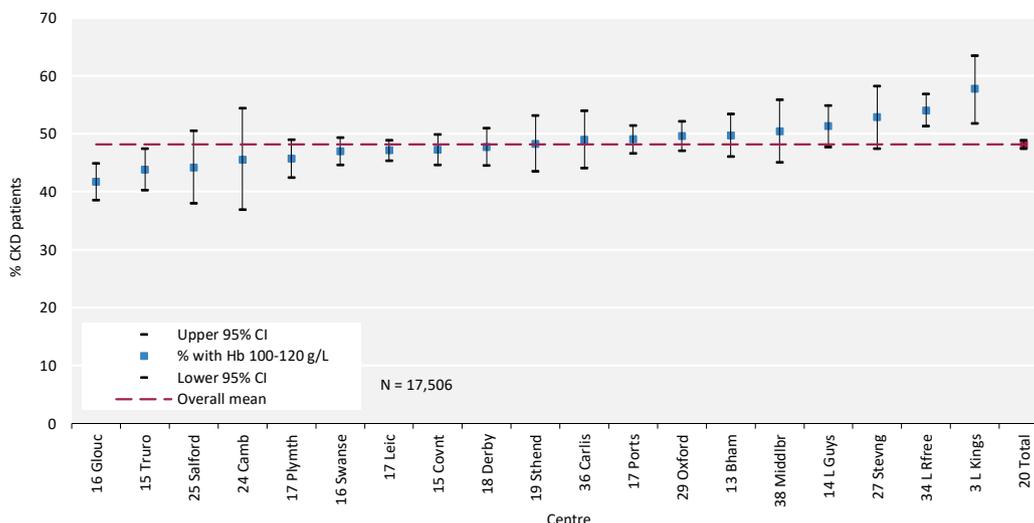
The UK Kidney Association guideline on CKD mineral bone disease contains only one audit measure, which is the percentage of patients with adjusted calcium above the target range.



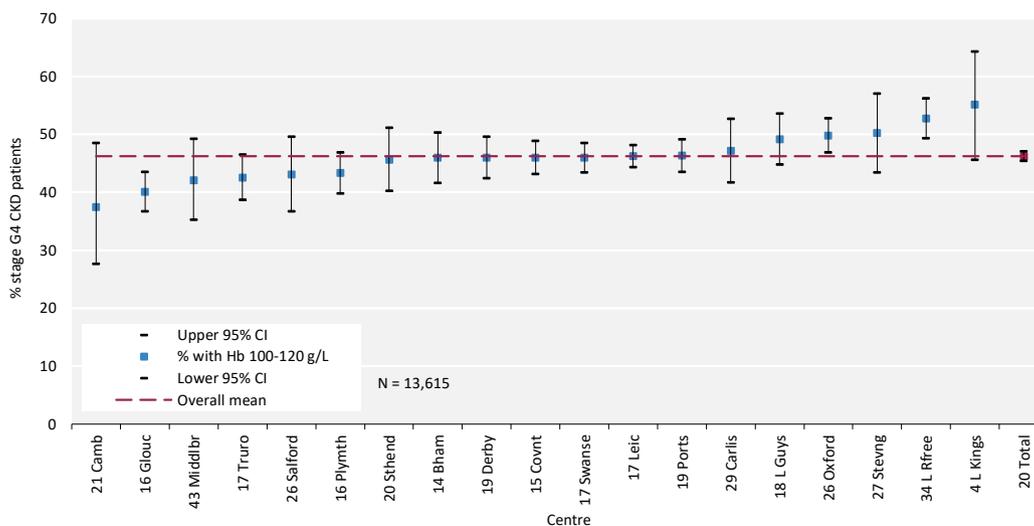
**Figure 1.3** Percentage of adult patients prevalent to CKD stage G5 on 31/12/2020 with adjusted serum calcium (Ca) >2.5 mmol/L by centre

## Anaemia in adult CKD patients

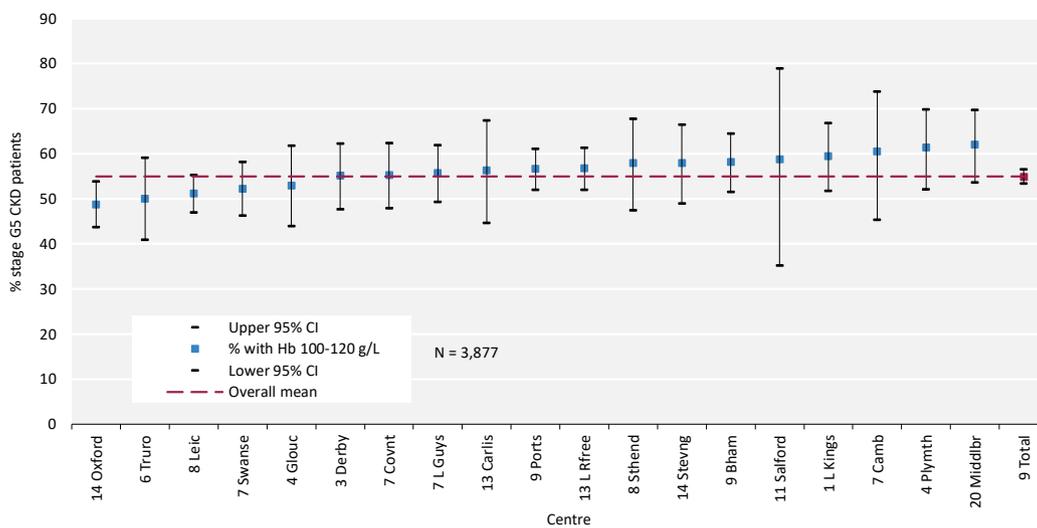
The percentage of patients with haemoglobin (Hb) 100–120 g/L is presented overall and by CKD stage. Inadequate data completeness in relation to erythropoiesis stimulating agents (ESAs) makes auditing against national guidelines difficult.



**Figure 1.4** Percentage of adult patients prevalent to CKD stages G4 and 5 on 31/12/2020 with haemoglobin (Hb) 100–120 g/L by centre



**Figure 1.5** Percentage of adult patients prevalent to CKD stage G4 on 31/12/2020 with haemoglobin (Hb) 100–120 g/L by centre



**Figure 1.6** Percentage of adult patients prevalent to CKD stage G5 on 31/12/2020 with haemoglobin (Hb) 100-120 g/L by centre