

Chapter 1

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

Contents

Introduction	2
Rationale for analyses	3
Key findings	4
Analyses	5
Stage and demographics of adult CKD patients	5
Blood pressure in adult CKD patients	7
Biochemistry parameters in adult CKD patients	7
Anaemia in adult CKD patients	8

Introduction

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

- were reported by an adult kidney centre as receiving treatment for CKD at the end of 2022, and
- had an eGFR of $<30\text{mL}/\text{min}/1.73\text{m}^2$ on their last recorded creatinine measurement.

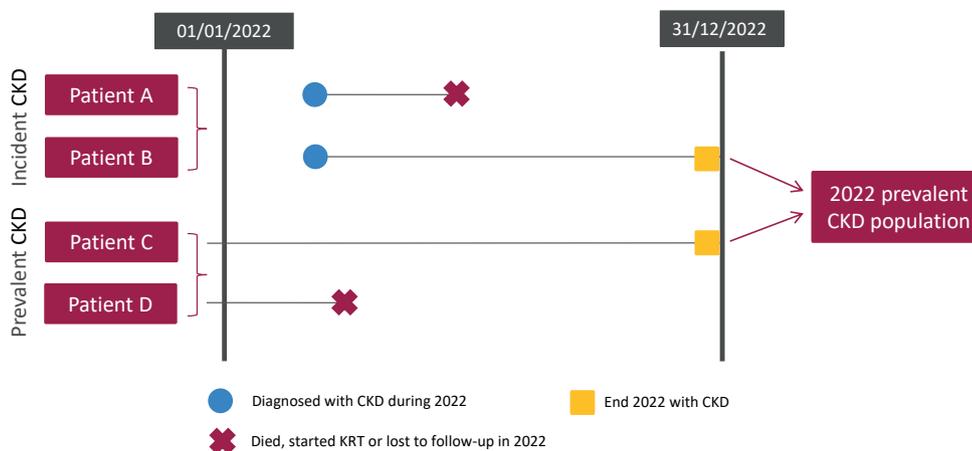


Figure 1.1 Pathways adult patients could follow to be included in the UK 2022 prevalent CKD population

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

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

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

Consequently, this CKD chapter asks simple questions:

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

Rationale for analyses

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

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

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

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

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

Key findings

- Data about patients with CKD stages G4 and 5 who were not on KRT was reported by just 18 of the UK's adult kidney centres.
- The 2022 prevalent CKD population comprised 22,976 patients, with a median age of 77.0 years, compared to a median age of 59.7 years for those on KRT.
- CKD prevalence was 1,240 per million population (pmp) overall, but ranged from 144 to 2,497 pmp between centres. There were also substantial differences in the ages and distribution of disease stages between centres. Such large variation suggests discrepancies in the definitions used for processes of care or reporting of people with CKD between centres.
- The data reported in this chapter highlight the need for improved capture and reporting of CKD data to enable national quality assurance. Concordance with audit measures for the CKD not on KRT population cannot be addressed until this is achieved.

Analyses

Stage and demographics of adult CKD patients

For the 18 adult kidney centres, the number of prevalent patients with CKD and $eGFR \leq 30$ mL/min/1.73m² was calculated as a proportion of the estimated centre catchment population (details in appendix A). Only a few centres reported patients with kidney failure as undergoing conservative care (CC). It is not clear whether a CC code means the same thing at all centres and for each patient. In particular, it is unclear which CC codes represent planned KRT for the eventuality of kidney failure, and which represent active treatment for an individual who might otherwise have started KRT. As such, people coded as receiving CC are included throughout this chapter.

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

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

¹The catchment population and 2022 crude rate for KRT reflect the combined Bham population (QEH and Heartlands kidney centres), but CKD patients were only reported for QEH

CC - conservative care

PCR - protein creatinine ratio

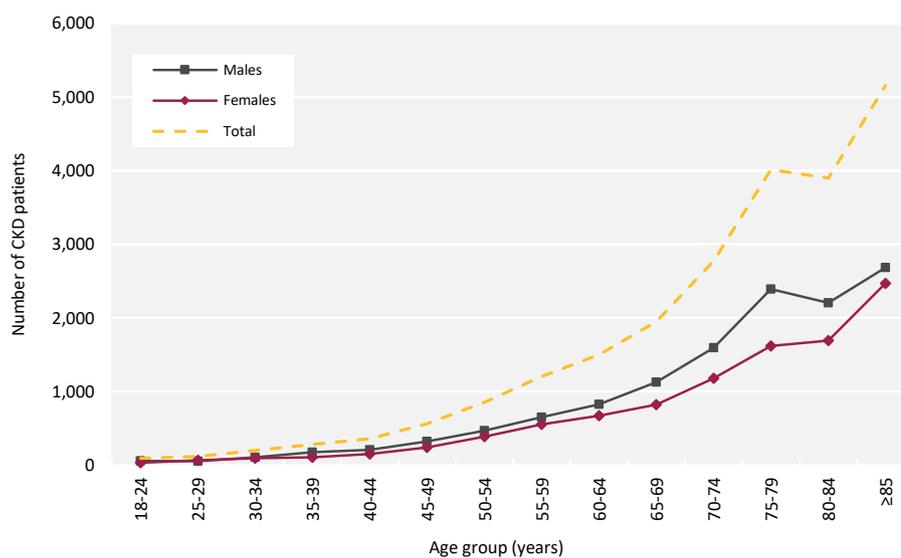
ACR - albumin creatinine ratio

QEH - Queen Elizabeth Hospital

The proportion of patients with CKD and $eGFR \leq 30$ mL/min/1.73m² from each ethnic group is shown for patients with ethnicity data – the proportion of centre patients with no ethnicity is shown separately. The completeness of PRD data varies greatly between centres, making interpretation difficult. PRD completeness is shown for each centre overall and by CKD stage.

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

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

**Figure 1.2** Number of adult patients prevalent to CKD stages G4 and 5 on 31/12/2022 by age group and sex

Blood pressure in adult CKD patients

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

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

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

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

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

Biochemistry parameters in adult CKD patients

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

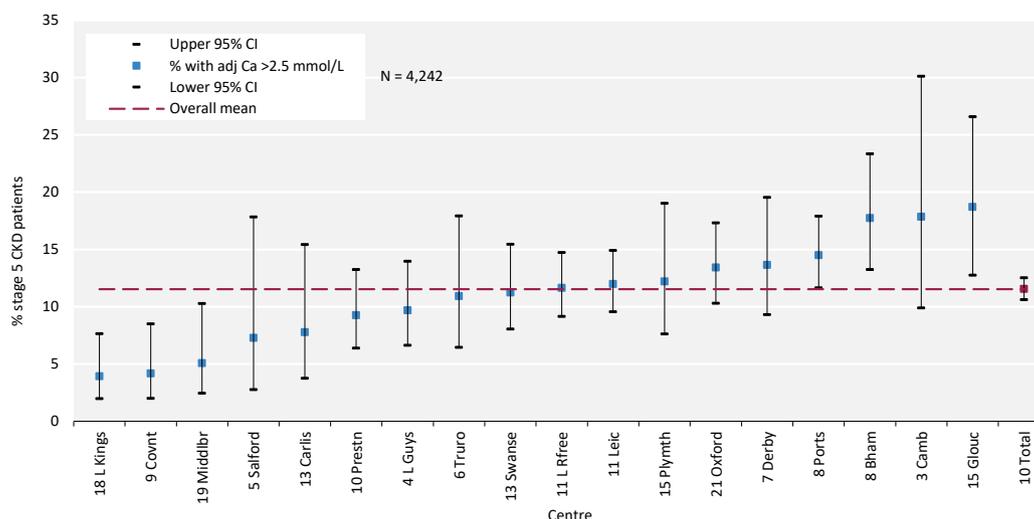


Figure 1.3 Percentage of adult patients prevalent to CKD stage G5 on 31/12/2022 with adjusted serum calcium (Ca) >2.5 mmol/L by centre

CI - confidence interval

Anaemia in adult CKD patients

The percentage of patients with haemoglobin (Hb) 100–120 g/L is presented overall and by CKD stage.

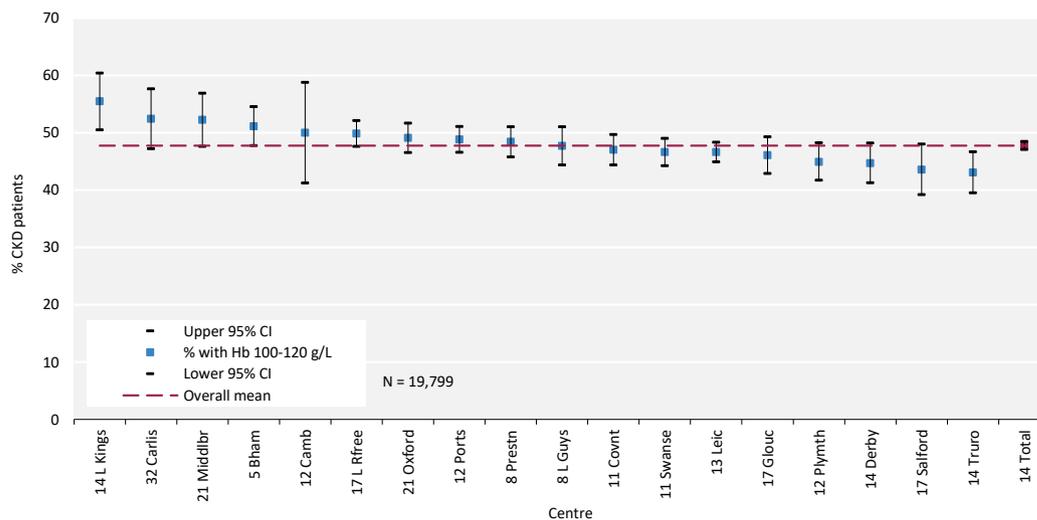


Figure 1.4 Percentage of adult patients prevalent to CKD stages G4 and 5 on 31/12/2022 with haemoglobin (Hb) 100–120 g/L by centre

CI - confidence interval

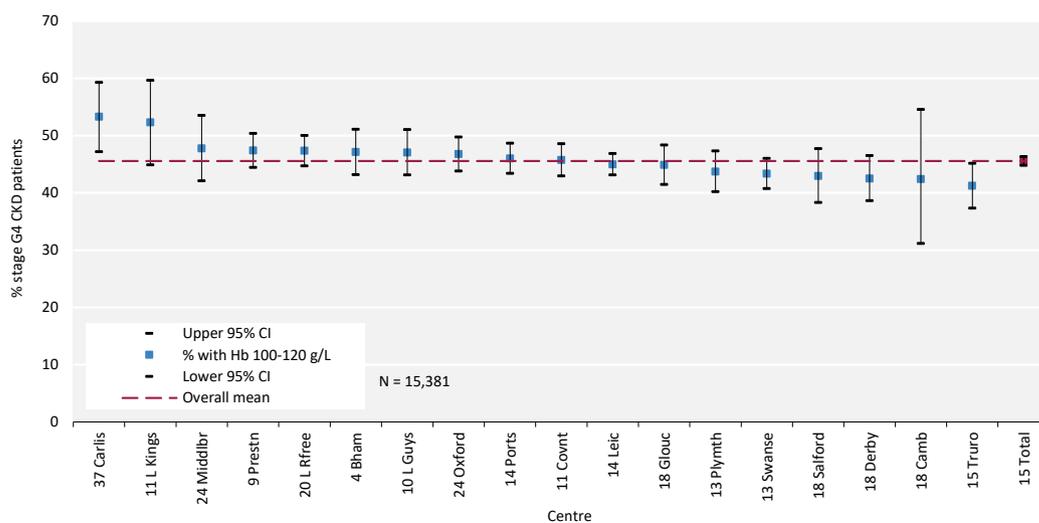


Figure 1.5 Percentage of adult patients prevalent to CKD stage G4 on 31/12/2022 with haemoglobin (Hb) 100–120 g/L by centre

CI - confidence interval

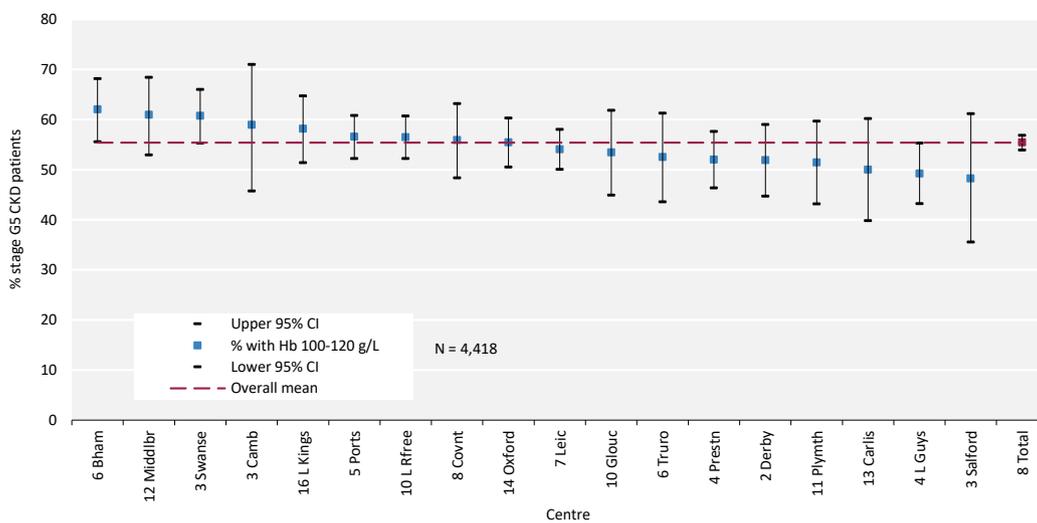


Figure 1.6 Percentage of adult patients prevalent to CKD stage G5 on 31/12/2022 with haemoglobin (Hb) 100-120 g/L by centre

CI - confidence interval