UK Kidney Association
UK Renal Registry

Chapter 1

Adults with chronic kidney disease (CKD) and estimated glomerular filtration rate (eGFR) <30mL/min/1.73m^2 in the UK at the end of 2023

Contents

Introduction

This is the fifth year the UK Renal Registry (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 2023 (figure 1.1). A '2023 prevalent CKD population' is described, comprising individuals who:

- were reported by an adult kidney centre as receiving treatment for CKD at the end of 2023, and
- had an eGFR of <30mL/min/1.73m^2 on their last recorded creatinine measurement.

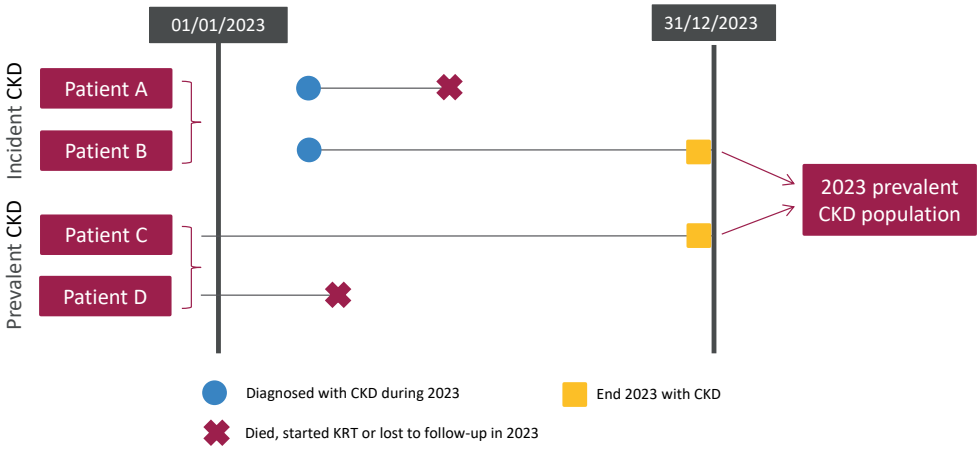

Figure 1.1 Pathways adult patients could follow to be included in the UK 2023 prevalent CKD population

Auditable aspects of care for this population are highlighted and described. For the purpose of this chapter, individuals are categorised as having CKD stage G5 (estimated glomerular filtration rate [eGFR] <15 mL/min/1.73m^2) or CKD stage G4 (eGFR 15–29mL/min/1.73m^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 2023 the UKRR received data from 24 of the 53 adult centres in England and Wales (six more than in 2022).

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) provide audit measures relevant to the care of patients with CKD, and where data permit, their attainment by UK kidney centres in 2023 is reported in this chapter (table 1.1). Audit measures in guidelines that have been archived are not included. Some audit measures cannot be reported because the completeness of the required data items is too low. However, data completeness is poor even for some of 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).

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 (number next to the centre name in x-axis indicates the % missing)	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 24 of the UK's adult kidney centres.
- The 2023 prevalent CKD population comprised 26,273 patients, with a median age of 76.8 years, compared to a median age of 60.0 years for those on KRT.
- CKD prevalence was 1,168 per million population (pmp) overall, but ranged from 76 to 2,794 pmp between centres. There were also substantial differences in the median 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 24 adult kidney centres, the number of prevalent patients with CKD and eGFR ≤30 mL/min/1.73m^2 was calculated as a proportion of the estimated centre catchment population (details in appendix A). Only a few centres reported patients with kidney failure as undergoing conservative care (CC). It is not clear whether a CC code means the same thing at all centres and for each patient. In particular, it is unclear which CC codes represent planned 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 31/12/2023, including those on conservative care (CC) by stage and centre; completeness of proteinuria, number of CKD 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 2023 crude rate (pmp)	KRT 2023 crude rate (pmp)
Bangor	12	0	12	58.3	41.7	25.0	0.16	76	1,380
Bham[1]	1,222	6	1,228	71.4	28.6	0.2	2.10	586	1,630
Camb	110	0	110	62.7	37.3	0.9	0.99	111	1,648
Cardff	989	35	1,024	77.0	23.1	40.9	1.16	885	1,581
Carlis	475	52	527	79.9	20.1	66.4	0.26	2,035	1,178
Clwyd	17	2	19	47.4	52.6	79.0	0.18	105	1,221
Derby	716	0	716	79.8	20.3	0.0	0.58	1,243	1,276
Glouc	1,162	2	1,164	87.9	12.1	0.1	0.53	2,211	1,064
L Guys	957	0	957	71.5	28.5	43.1	1.01	950	2,302
L Kings	412	0	412	43.0	57.0	23.5	0.94	436	1,471
L Rfree	2,346	347	2,693	74.3	25.7	59.1	1.27	2,113	1,942
Leic	4,146	0	4,146	83.3	16.7	62.3	2.18	1,903	1,294
Middlbr	594	0	594	69.2	30.8	0.0	0.82	725	1,185
Nottm	529	0	529	43.9	56.1	33.8	0.93	567	1,282
Oxford	1,523	0	1,523	75.1	25.0	60.7	1.54	989	1,384
Plymth	948	1	949	84.8	15.2	45.2	0.41	2,295	1,327
Ports	2,126	1	2,127	73.7	26.3	46.4	1.79	1,191	1,136
Prestn	2,798	26	2,824	81.8	18.2	62.1	1.27	2,222	1,130
Redng	443	0	443	57.1	42.9	25.3	0.74	596	1,338
Salford	760	14	774	87.2	12.8	64.9	1.19	652	1,154
Sheff	378	18	396	55.8	44.2	48.2	1.12	353	1,316
Swanse	2,048	54	2,102	84.1	15.9	45.7	0.75	2,794	1,197
Truro	818	51	869	85.4	14.6	56.2	0.37	2,380	1,282
Wrexm	129	6	135	72.6	27.4	33.3	0.21	646	1,564
Total	**25,658**	**615**	**26,273**	**77.3**	**22.7**	**45.9**	**22.49**	**1,168**	**1,413**

[1]The catchment population and 2023 crude rate for KRT reflect the combined Bham population (QEH and Heartlands kidney centres), but CKD patients were only reported from QEH (although the extracts include some Heartlands patients)
CC - conservative care
PCR - protein creatinine ratio
ACR - albumin creatinine ratio
QEH - Queen Elizabeth Hospital

The proportion of patients with CKD and eGFR ≤30 mL/min/1.73m^2 from each ethnic group is shown for patients with ethnicity data – the proportion of centre patients with no ethnicity is shown separately. The completeness of PRD data varies greatly between centres, making interpretation difficult. PRD completeness is shown for each centre overall and by CKD stage.

Table 1.3 Demographics and completeness of primary renal disease (PRD) data of adult patients prevalent to CKD stages G4 and 5 on 31/12/2023 by centre

				Ethnicity					PRD completeness		
Centre	N with CKD	Median age (yrs)	% male	% White	% Asian	% Black	% Other	% missing	% all stages	% stage G4	% stage G5
Bangor	12	66.4	33.3	100.0	0.0	0.0	0.0	66.7	25.0	14.3	40.0
Bham	1,228	70.3	53.7	59.5	26.7	11.4	2.5	11.1	13.9	6.0	33.6
Camb	110	73.4	60.9	93.4	1.9	2.8	1.9	3.6	43.6	31.9	63.4
Cardff	1,024	74.6	58.8	93.2	4.0	1.7	1.2	35.8	71.5	66.9	86.9
Carlis	527	78.8	56.2	100.0	0.0	0.0	0.0	39.3	15.9	11.9	32.1
Clwyd	19	79.4	68.4	100.0	0.0	0.0	0.0	47.4	42.1	33.3	50.0
Derby	716	78.8	54.6	91.0	5.6	2.7	0.6	13.3	96.8	96.5	97.9
Glouc	1,164	79.3	57.9	95.0	2.0	1.7	1.3	7.2	48.5	46.8	61.0
L Guys	957	72.6	55.8	58.0	7.6	29.2	5.2	11.9	93.1	91.1	98.2
L Kings	412	68.8	61.4	41.1	8.2	47.2	3.6	31.6	5.6	5.1	6.0
L Rfree	2,693	76.7	56.8	55.5	17.9	12.5	14.2	11.4	41.3	37.4	52.7
Leic	4,146	78.1	54.4	77.6	17.5	3.4	1.6	27.3	55.6	53.8	64.4
Middlbr	594	73.0	57.6	94.5	3.0	0.9	1.7	20.9	25.3	19.0	39.3
Nottm	529	72.7	58.2	84.8	5.9	4.6	4.7	4.4	83.9	83.2	84.5
Oxford	1,523	75.1	60.7	85.6	7.8	3.4	3.2	19.6	20.7	16.5	33.4
Plymth	949	79.1	54.5	98.7	0.1	0.2	1.0	6.4	13.7	13.5	14.6
Ports	2,127	76.3	59.3	97.7	1.3	0.4	0.7	43.9	8.4	6.5	13.6
Prestn	2,824	78.4	54.6	89.6	7.4	2.0	1.0	51.8	3.4	2.8	6.0
Redng	443	75.5	64.6	67.4	13.5	2.5	16.7	44.7	73.1	55.7	96.3
Salford	774	75.1	56.7	83.7	10.5	4.4	1.4	35.8	8.1	7.7	11.1
Sheff	396	67.5	57.1	84.6	8.1	3.9	3.4	3.3	99.2	99.1	99.4
Swanse	2,102	79.3	54.3	98.3	0.7	0.6	0.4	42.9	34.6	31.9	49.3
Truro	869	79.6	57.3	99.3	0.5	0.1	0.1	0.5	22.7	18.3	48.0
Wrexm	135	78.2	60.0	100.0	0.0	0.0	0.0	63.0	21.5	14.3	40.5
Total	**26,273**	**76.8**	**56.5**	**81.5**	**9.3**	**5.7**	**3.5**	**26.6**	**36.8**	**33.4**	**48.5**

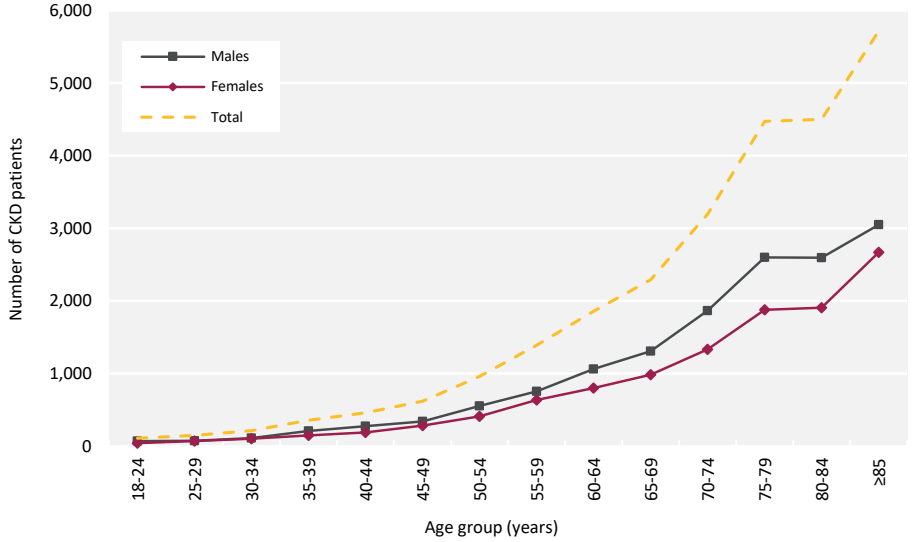

Figure 1.2 Number of adult patients prevalent to CKD stages G4 and 5 on 31/12/2023 by age group and sex

Blood pressure in adult CKD patients

Only 14 centres submitted sufficient blood pressure data for analysis. This was the seven from 2022 (Bham, Derby, Glouc, L Rfree, Plymth, Ports, Swansea) and a further seven (Bangor, Cardff, Nottm, Oxford, Redng, Sheff, Wrexm).

Table 1.4 Blood pressures in adult patients prevalent to CKD stages G4 and 5 on 31/12/2023 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	7629 (50.7)	142	75	3359 (44.0)	5180 (45.6)	140	75	2433 (47.0)	2449 (66.4)	145	75	926 (37.8)
Age group (yrs)												
18-29	115 (70.6)	135	84	62 (53.9)	82 (66.1)	136	82	47 (57.3)	33 (84.6)	134	85	15 (45.5)
30-39	218 (65.3)	136	85	105 (48.2)	147 (63.1)	133	85	75 (51.0)	71 (70.3)	140	84	30 (42.3)
40-49	431 (64.9)	137	83	210 (48.7)	272 (61.1)	136	82	146 (53.7)	159 (72.6)	142	85	64 (40.3)
50-59	844 (61.2)	139	81	401 (47.5)	520 (55.4)	138	80	259 (49.8)	324 (73.5)	142	81	142 (43.8)
60-64	648 (59.0)	142	77	294 (45.4)	413 (52.9)	139	77	201 (48.7)	235 (74.1)	146	76	93 (39.6)
65-69	765 (56.3)	142	76	331 (43.3)	523 (52.3)	140	76	248 (47.4)	242 (67.2)	148	75	83 (34.3)
70-74	993 (54.1)	141	74	444 (44.7)	688 (49.4)	140	74	324 (47.1)	305 (68.8)	145	75	120 (39.3)
75-79	1273 (49.6)	142	73	562 (44.1)	898 (44.8)	140	73	417 (46.4)	375 (66.4)	145	72	145 (38.7)
80-84	1192 (47.2)	145	71	482 (40.4)	879 (43.8)	144	71	366 (41.6)	313 (60.7)	147	70	116 (37.1)
≥85	1150 (36.9)	144	70	468 (40.7)	758 (31.2)	141	70	350 (46.2)	392 (57.1)	148	70	118 (30.1)
Sex												
Male	4408 (51.2)	141	75	2007 (45.5)	2955 (45.9)	140	75	1432 (48.5)	1453 (67.0)	144	74	575 (39.6)
Female	3221 (50.0)	143	75	1352 (42.0)	2225 (45.2)	141	75	1001 (45.0)	996 (65.6)	146	75	351 (35.2)

[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.

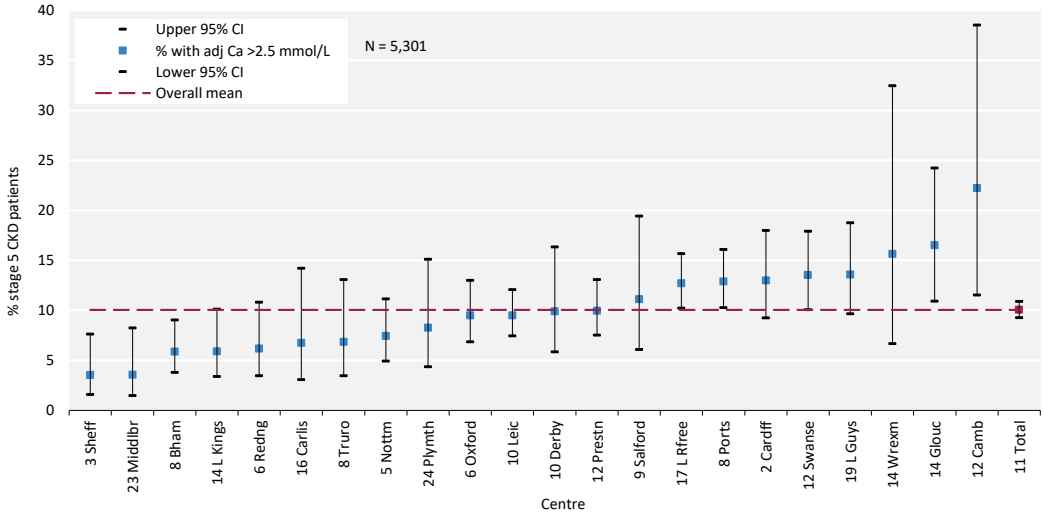

Figure 1.3 Percentage of adult patients prevalent to CKD stage G5 on 31/12/2023 with adjusted serum calcium (Ca) >2.5 mmol/L by centre
CI - confidence interval

Anaemia in adult CKD patients

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

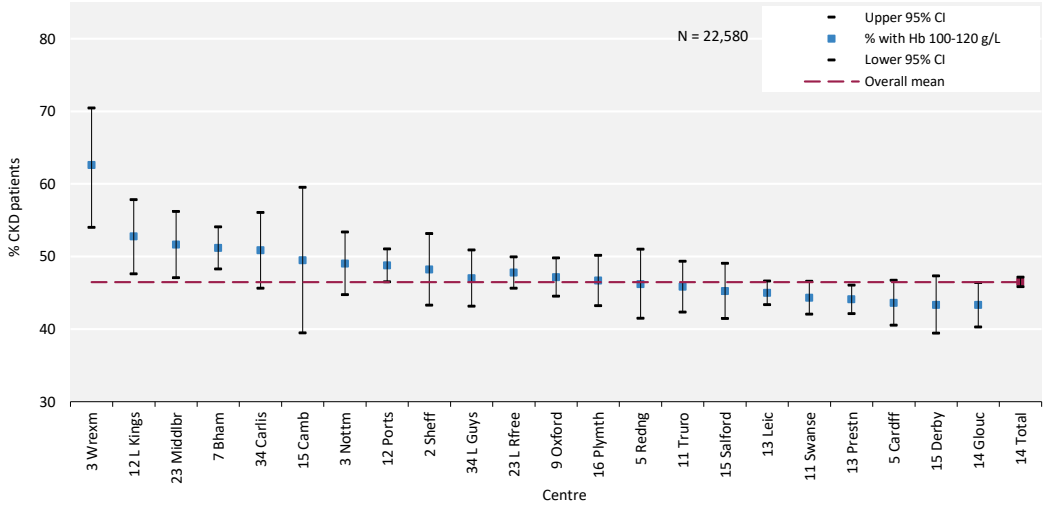

Figure 1.4 Percentage of adult patients prevalent to CKD stages G4 and 5 on 31/12/2023 with haemoglobin (Hb) 100–120 g/L by centre

CI - confidence interval

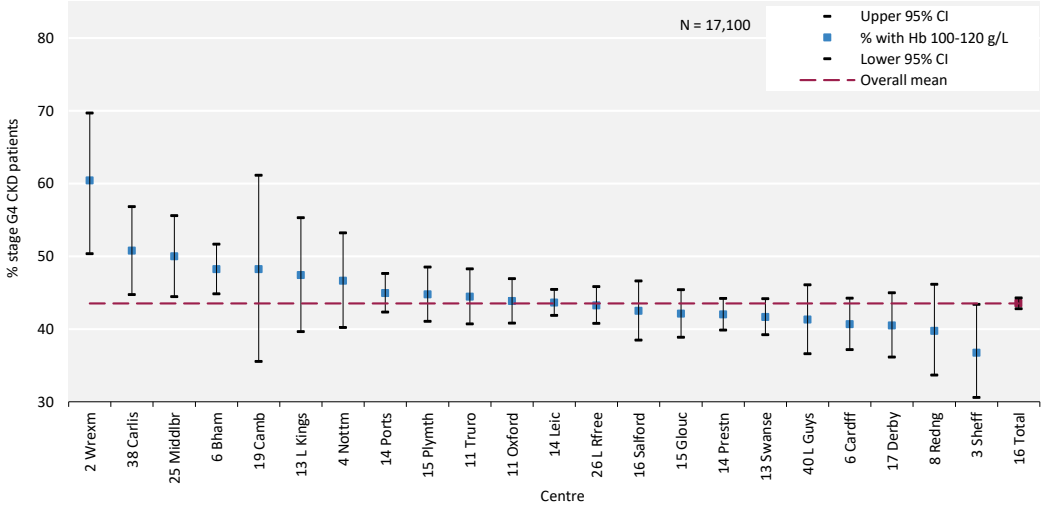

Figure 1.5 Percentage of adult patients prevalent to CKD stage G4 on 31/12/2023 with haemoglobin (Hb) 100–120 g/L by centre

CI - confidence interval

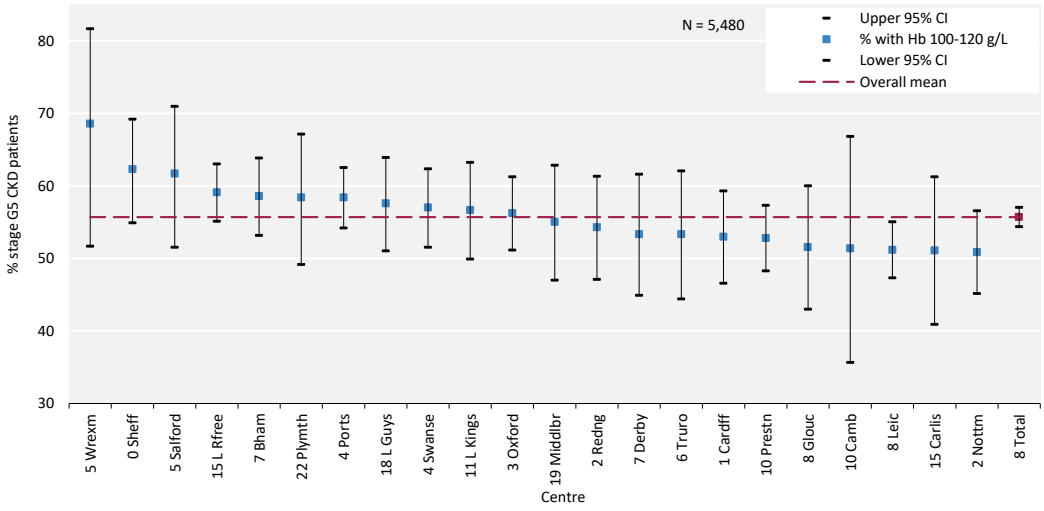

Figure 1.6 Percentage of adult patients prevalent to CKD stage G5 on 31/12/2023 with haemoglobin (Hb) 100-120 g/L by centre

CI - confidence interval