

CHAPTER 4

MANAGEMENT OF ANAEMIA IN PATIENTS ON DIALYSIS

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SECTION 4.1: TREATMENT FOR ANAEMIA IN PATIENTS ON DIALYSIS

The use of Erythropoiesis Stimulating Agents (ESAs) has been consistently $\geq 90\%$ since 2011. Higher percentage (92%) of patients on haemodialysis received ESAs compared to 80% of patients on peritoneal dialysis. National scheme for ESA subsidy for patients in NGO centres has been introduced by the Ministry of Health since 2009. The percentage of patients receiving blood transfusion has reduced significantly both for HD (6%) and PD (3%).

Over the last 10 years, percentage of patients receiving oral iron have significantly reduced to 18% in HD patients and 15% in PD patients. In 2021, 40% of HD patients received parenteral iron compared to 16% in PD patients.

Table 4.1.1: Treatment for anaemia, HD patients 2011-2021

Year	Number of patients	% on ESAs	% received blood transfusion	% on oral iron	% received parenteral iron
2021	49829	92	6	18	40
2020	47835	93	8	19	39
2019	44780	91	11	22	32
2018	41796	84	12	25	34
2017	40260	88	11	32	37
2016	36505	92	12	52	37
2015	33953	93	13	53	38
2014	31353	92	12	54	38
2013	28251	92	12	54	35
2012	24808	92	14	57	31
2011	21623	92	14	55	29

Table 4.1.2: Treatment for anaemia, PD patients 2011-2021

Year	Number of patients	% on ESAs	% received blood transfusion	% on oral iron	% received parenteral iron
2021	7182	84	3	15	16
2020	6475	84	5	15	18
2019	5885	85	7	24	16
2018	5389	80	8	32	17
2017	5021	81	7	39	18
2016	4564	84	13	65	15
2015	4235	82	15	67	17
2014	3644	83	18	71	20
2013	3188	81	17	70	14
2012	2800	81	18	69	11
2011	2487	79	18	73	10

In 2021, the percentage of patients on ESAs among HD centres varied. The variation in percentage of patients using ESAs among HD centres at the 5th centile has changed considerably over the last 5 years. However, at the 95th centile, the percentage of patients on ESA has remained at 100% over the last 10 years (table 4.1.3). The median usage of ESAs is at 94% for the last 10 years. For PD patients at the 5th centile, there have been a great variation in ESA utilization over the years (18 -73%). (Table 4.1.4).

Table 4.1.3: Variation in Erythropoiesis-Stimulating Agents (ESAs) utilization (% patients) among HD centres, 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	818	0	80	89	94	98	100	100
2020	780	51	81	89.5	94	98	100	100
2019	756	15	67	88	95	99	100	100
2018	739	0	58	80	88	93	100	100
2017	721	0	69	84	90	95	100	100
2016	696	21	79	89	94	98	100	100
2015	672	0	80	90	95	98	100	100
2014	643	65	81	89	94	98	100	100
2013	607	31	78	89	94	98	100	100
2012	551	39	78	89	94	98	100	100
2011	491	3	77	89	94	100	100	100

Figure 4.1.3: Variation in ESAs utilization (% patients) among HD centres, 2021

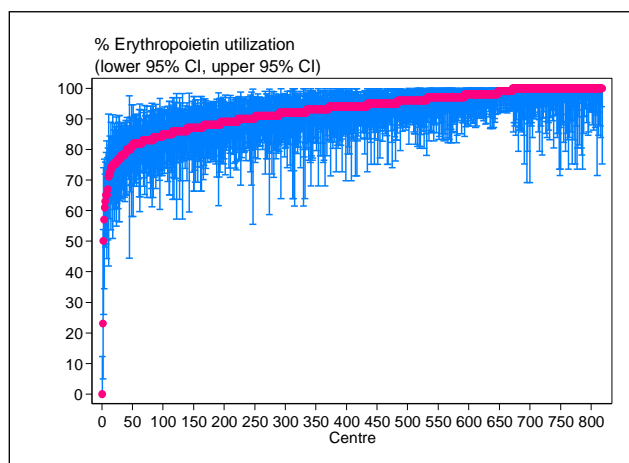


Figure 4.1.4: Variation in ESAs utilization (% patients) among PD centres, 2021

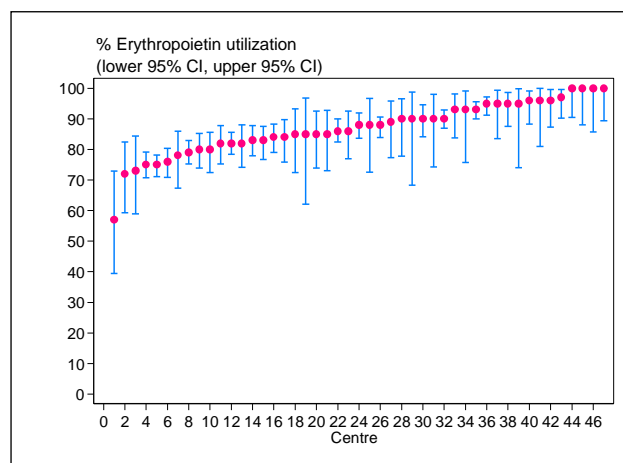


Table 4.1.4: Variation in ESAs utilization (% patients) among PD centres, 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	47	57	73	82	88	95	100	100
2020	43	66	69	83	90	94	100	100
2019	40	5	18	81.5	89	93.5	100	100
2018	39	8	38	69	80	88	100	100
2017	38	40	64	76	81	90	97	100
2016	36	71	73	80	84.5	93	100	100
2015	35	70	72	77	87	94	100	100
2014	32	59	64	81	88	94	100	100
2013	28	61	63	81	88	96.5	100	100
2012	27	52	71	84	89	95	100	100
2011	26	44	72	81	89	95	100	100

Since 2011, the median weekly dose of ESA for HD patients has remained at 5000 units. In 2021, the minimum and maximum weekly ESA dose was at 2000 IU and 10,000 IU respectively. The median weekly ESA dose in PD patients was slightly less compared to HD patients at 4000 units per week. In 2021, the minimum and maximum weekly ESA dose for PD patients was at 2000 units and 5500 units respectively. This variation is significantly less as compared to HD patients (Table 4.1.5 & 4.1.6).

Table 4.1.5: Variation in mean weekly ESAs dose (u/week) among HD centres, 2011-2021

Year	Number of centres	Mean	SD	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	715	4934	1181	2000	3412	4111	4776	5592	7113	10087
2020	695	4880	1180	1952	3158	4100	4708	5583	6973	9400
2019	738	4826	1112	2000	3226	4064	4667	5517	6868	8864
2018	718	5004	1165	2000	3375	4221	4787	5727	7182	9227
2017	712	5148	1199	1773	3600	4311	4939	5868	7435	9500
2016	686	5278	1344	1225	3597	4421	5060	6040	7481	18000
2015	663	5394	1321	1188	3595	4474	5250	6167	7758	9769
2014	627	5228	1249	1184	3463	4363	5125	5982	7624	9308
2013	590	5259	1327	1125	3455	4357	5110	6081	7614	11944
2012	535	5175	1192	1083	3405	4357	5091	5972	7400	8974
2011	478	5088	1169	1177	3296	4342	5070	5750	7177	8898

Figure 4.1.5: Variation in mean weekly ESAs dose (u/week) among HD centres, 2021

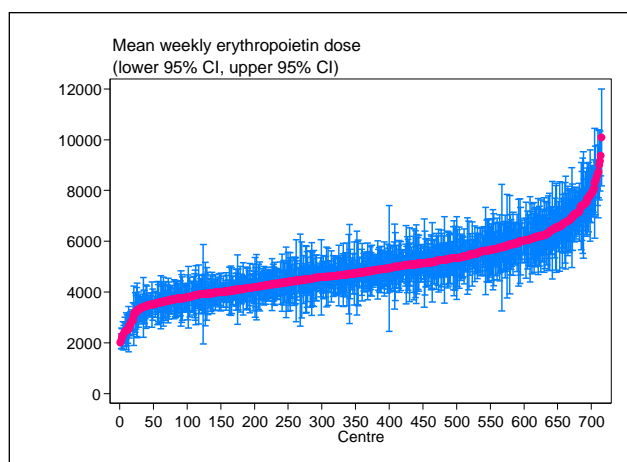


Figure 4.1.6: Variation in mean weekly ESAs dose (u/week) among PD centres, 2021

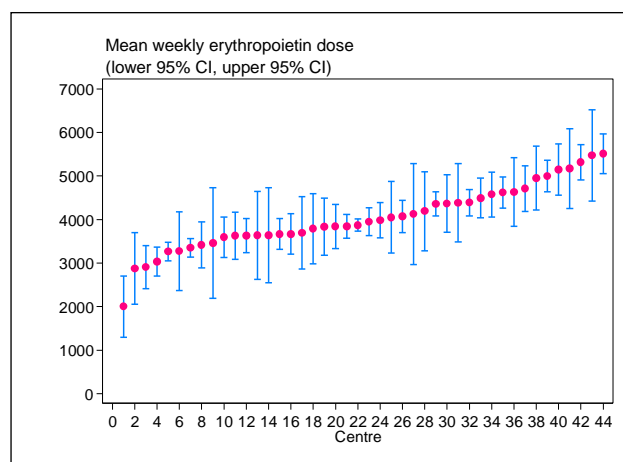


Table 4.1.6: Variation in mean weekly ESAs dose (u/week) among PD centres, 2011-2021

Year	Number of centres	Mean	SD	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	44	4031	746	2000	2905	3629	3911	4535	5316	5513
2020	41	4071	785	2500	2818	3700	3924	4711	5528	5594
2019	36	4017	713	2429	2829	3662	3813	4438	5500	5558
2018	35	4253	694	3110	3300	3679	4095	4842	5687	5891
2017	35	4455	782	3282	3375	3809	4343	4927	6293	6333
2016	34	4734	809	3333	3529	4217	4754	5012	6667	6722
2015	34	4709	1076	2000	2875	4114	4606	5380	6465	7057
2014	31	4687	1099	1829	2453	4056	4509	5376	6330	7056
2013	28	4471	996	2091	2663	3922	4547	5285	5721	6313
2012	27	4630	900	2636	2727	4222	4667	5237	5840	6394
2011	26	4431	1207	1885	1947	3905	4513	5021	6764	6870

The median requirement of blood transfusion in HD and PD centres was at 10% and 6% respectively in 2021. For the past 3 years, in HD, the variation in blood transfusion usage remained the same (0% to 37%). In contrast, the variation among PD centres has dropped (1% to 27%) (Table 4.1.7 & 4.1.8).

Table 4.1.7: Variation in use of blood transfusion (% patients) among HD centres, 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	819	0	0	5	10	18	33	61
2020	783	0	0	6	13	21	37	67
2019	757	0	0	5	10	19	37	65
2018	741	0	0	6	12	22	40	87
2017	721	0	0	5	12	21	36	65
2016	695	0	0	6	12	18	33	83
2015	670	0	0	6	12	19	33	80
2014	640	0	0	6	11	19	33	63
2013	606	0	0	6	11	19	37	100
2012	550	0	0	7	13	21	45	100
2011	491	0	0	7	13	21	38	89

Figure 4.1.7: Variation in use of blood transfusion (% patients) among HD centres, 2021

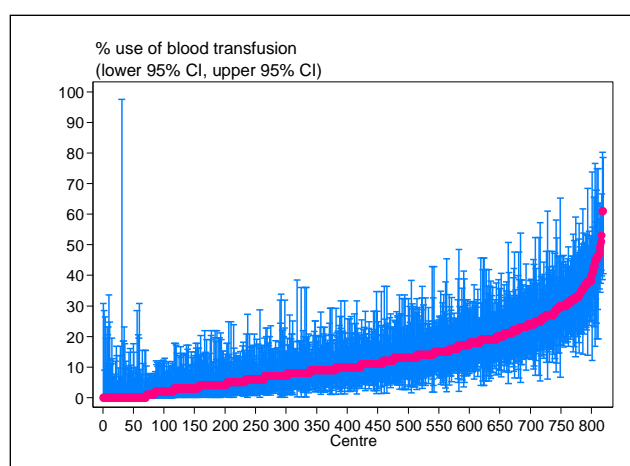


Figure 4.1.8: Variation in use of blood transfusion (% patients) among PD centres, 2021

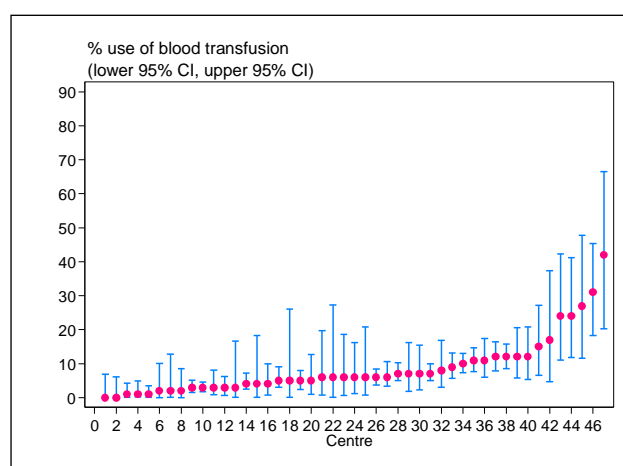


Table 4.1.8: Variation in use of blood transfusion (% patients) among PD centres, 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	47	0	1	3	6	11	27	42
2020	43	0	1	5	8	14	22	46
2019	40	0	1	4.5	7	13	27	48
2018	39	0	3	5	10	18	30	32
2017	39	0	0	5	11	19	42	67
2016	37	0	0	7	10	17	28	30
2015	35	3	3	9	14	17	33	59
2014	31	0	4	10	18	23	39	44
2013	28	5	7	10.5	14.5	24.5	37	44
2012	27	0	0	9	17	27	40	75
2011	26	3	5	12	19.5	24	100	100

SECTION 4.2: IRON STATUS ON DIALYSIS

The median serum ferritin for HD and PD patients not on ESAs was at 250 ng/ml and 450 ng/ml respectively in 2021. The target ferritin for HD and PD patients are ≥ 200 ng/ml and ≥ 100 ng/ml respectively. 56% of HD patients and 92% of PD patients achieved their target (Table 4.2.1 & 4.2.2).

The median serum ferritin for HD and PD patients on ESAs was at 450 ng/ml and 550 ng/ml respectively in 2021. 77% of HD patients and 96% of PD patients achieved their target (Table 4.2.3 & 4.2.4).

Table 4.2.1: Distribution of serum ferritin without ESAs, HD patients 2011-2021

Year	Number of patients	Mean	SD	Median	LQ	UQ	% Patients ≥ 100 ng/ml	% Patients ≥ 200 ng/ml
2021	3533	423	485.9	244.8	100	575.4	75	56
2020	3241	411.8	449.4	255.3	104.5	565.3	76	57
2019	3444	499.8	500.2	350.9	142.1	684.2	83	67
2018	5856	526.9	514.7	361.3	161.7	714.2	85	70
2017	4328	508.2	500.7	344.9	151.3	689.1	84	67
2016	2486	505.1	522.9	325.4	138.5	691.3	81	66
2015	2043	477.6	501.7	307.8	120.5	659.5	79	63
2014	1954	460.5	467.2	315.3	121.7	633.5	80	63
2013	1743	499.6	521.3	320	135.5	675	81	65
2012	1506	520.7	538.2	341	143	700	82	66
2011	1358	545.5	559.8	369.7	163.2	740.2	83	70

Figure 4.2.1: Cumulative Distribution of serum ferritin without ESAs, HD patients 2011-2021

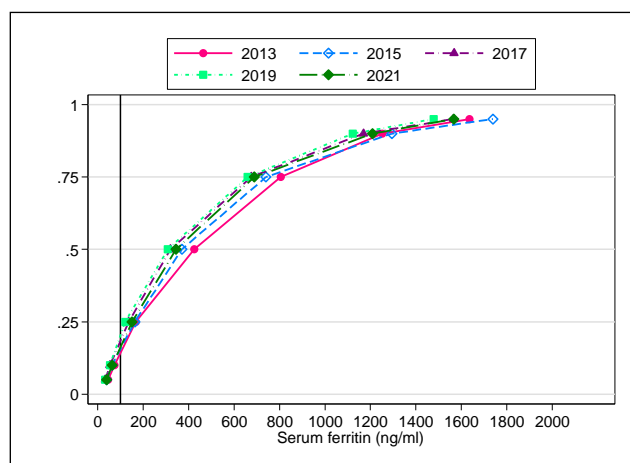


Figure 4.2.2: Distribution of serum ferritin without ESAs, PD patients 2011-2021

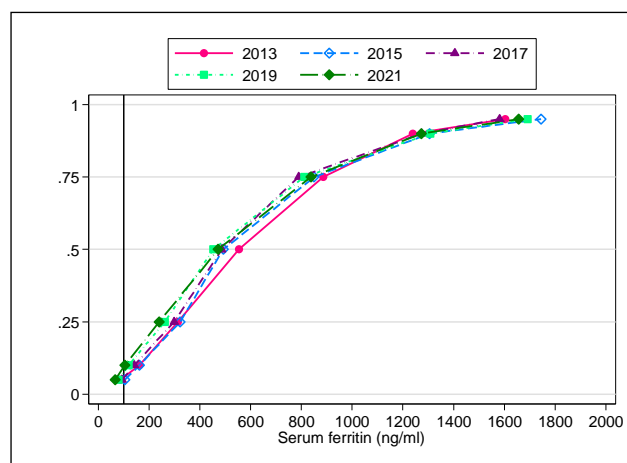


Table 4.2.2: Distribution of serum ferritin without ESAs, PD patients 2011-2021

Year	Number of patients	Mean	SD	Median	LQ	UQ	% Patients ≥ 100 ng/ml	% Patients ≥ 200 ng/ml
2021	894	592.7	489.9	463.6	240.7	801.7	92	80
2020	852	579.2	483.9	439.3	223.9	772.8	93	78
2019	719	540	418.2	418.3	229	723.1	94	79
2018	913	632.8	540.1	482	255.5	825.8	93	81
2017	785	619.8	551.1	471.7	239.5	838.1	91	81
2016	592	655	574.4	513.5	261.4	856.8	93	81
2015	609	609.3	528.7	452.5	261	811	92	81
2014	476	586	476.4	441.3	246.2	805.3	93	82
2013	485	632.3	512.2	486	298.3	789.6	94	83
2012	443	575	454	457.6	253.6	746.9	95	83
2011	428	640.8	494.3	491.7	321.8	850.1	95	86

Table 4.2.3: Distribution of serum ferritin on ESAs, HD patients 2011-2021

Year	Number of patients	Mean	SD	Median	LQ	UQ	% Patients ≥ 100 ng/ml	% Patients ≥ 200 ng/ml
2021	43161	614.2	543.1	464.7	218.4	837.4	90	77
2020	41717	607.3	530.9	462.4	216.9	831.4	90	77
2019	38014	627.4	544.4	475.3	229.2	861.1	91	78
2018	32453	638.7	546.5	488.4	239	877.8	91	79
2017	32036	655.7	548.5	506	249.9	906.5	92	80
2016	29249	689	571.9	538.3	270	945.5	92	82
2015	26775	649.1	529.8	516.2	261	884.7	92	82
2014	24566	654.9	536.2	512.4	265.3	884.8	92	82
2013	21299	653.1	541.2	509.2	262.6	879.3	92	82
2012	18514	679.6	551.7	538	280	923	93	83
2011	16227	706.2	558.7	562	298.5	959.2	94	85

Figure 4.2.3: Cumulative distribution of serum ferritin on ESAs, HD patients 2011-2021

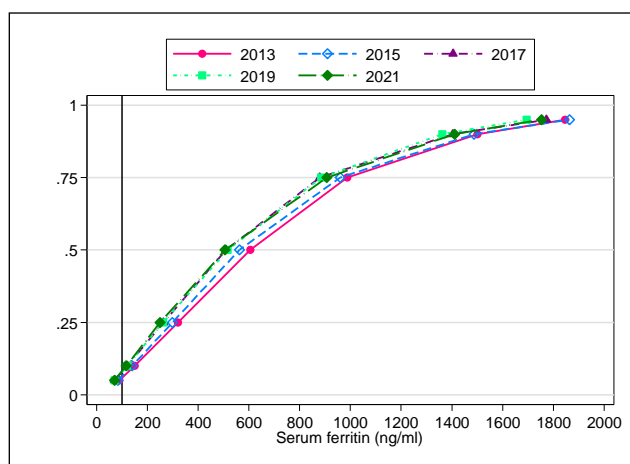


Figure 4.2.4: Cumulative distribution of serum ferritin on ESAs, PD patients 2011-2021

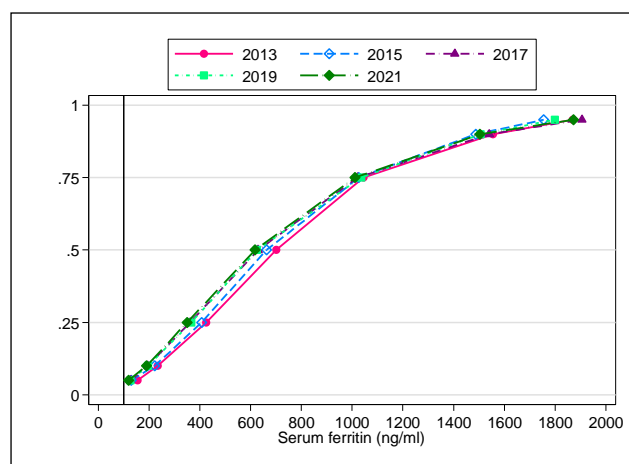


Table 4.2.4: Distribution of serum ferritin on ESAs, PD patients 2011-2021

Year	Number of patients	Mean	SD	Median	LQ	UQ	% Patients ≥100 ng/ml	% Patients ≥200 ng/ml
2021	5180	703.5	530.9	571.6	323.1	932.5	96	87
2020	4791	718.5	526.9	581.2	324.8	979	96	89
2019	4407	745.2	552.2	615	354.2	993	96	89
2018	3700	736.9	548.4	605	351.1	984.6	96	89
2017	3466	755.7	562.2	617.6	349.1	1011.7	96	89
2016	3230	772.5	569.7	633.1	375.5	1013.8	96	90
2015	2946	761.9	538.6	625.1	365.8	1035.8	96	90
2014	2604	761.7	551.9	638.6	367	1016.3	96	89
2013	2197	767.7	562.8	629.3	360.7	1021.3	97	89
2012	1974	777.7	575.4	652.8	376.1	1019.2	96	89
2011	1675	775.1	531.3	662.7	406.7	1026.2	96	91

For the past 10 years, the median transferrin saturation for HD and PD patients on ESAs remained the same, at 28% and 32% respectively.

In 2021, the percentage of patients achieving transferrin saturation ≥20% for HD and PD patients was 82% and 86% respectively.

Table 4.2.5: Distribution of transferrin saturation without ESAs, HD patients, 2011-2021

Year	Number of patients	Mean	SD	Median	LQ	UQ	% Patients ≥20
2021	3574	30.3	13.5	28	21.1	36.7	78
2020	3315	30	13.4	27.8	20.9	36.3	78
2019	3416	29.5	13.2	27.2	20.8	35.4	78
2018	5932	29.4	14.1	26.7	20.1	35.3	75
2017	4384	29.6	14.1	26.9	20.2	35.5	76
2016	2629	30.8	14.1	28.6	21.3	37.1	79
2015	2150	30.9	14.3	28	21.5	37	79
2014	2053	31.6	14.3	28.7	22	38.5	81
2013	1841	31.8	14.7	29.5	21.8	38.2	80
2012	1620	32.7	15.1	30.1	22.7	38.6	82
2011	1343	32.5	14.9	29.8	22.7	39.3	83

Figure 4.2.5: Cumulative distribution of transferrin saturation without ESAs, HD patients 2011-2021

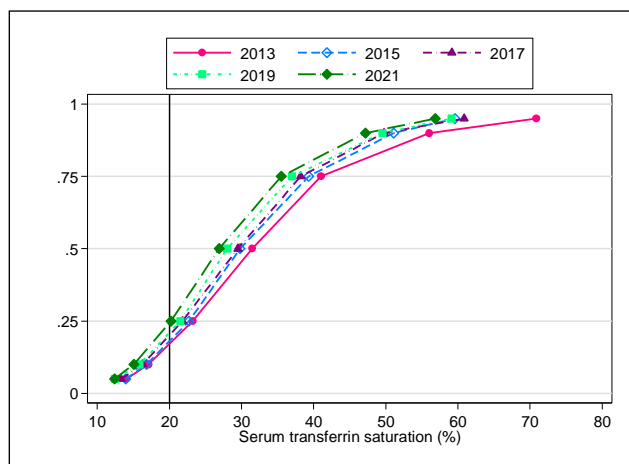


Figure 4.2.6: Cumulative distribution of transferrin saturation without ESAs, PD patients 2011-2021

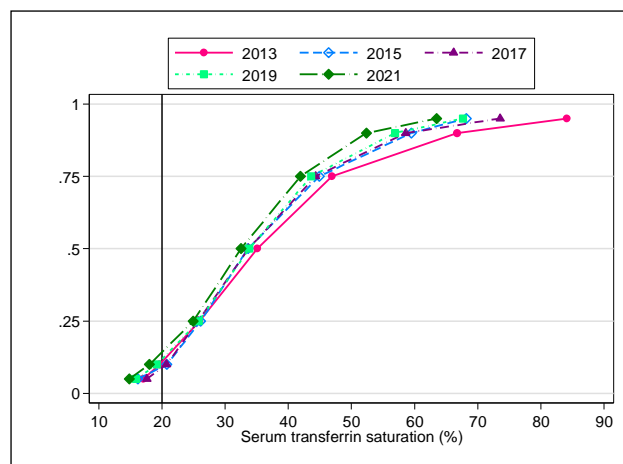


Table 4.2.6: Distribution of transferrin saturation without ESAs, PD patients, 2011-2021

Year	Number of patients	Mean	SD	Median	LQ	UQ	% Patients ≥20 %
2021	911	35.2	13.9	32.9	25.7	41.7	90
2020	871	34.1	14.3	31.6	24.3	40.3	89
2019	717	33.6	13.7	30.7	24.5	40.3	87
2018	924	33.2	13.8	31.2	23.6	39.9	86
2017	784	34.7	14.6	32.5	24.9	41.9	86
2016	626	37.3	15.2	34	26.3	45.2	93
2015	649	36.5	16.1	33.8	25.8	43.6	88
2014	517	36.2	16.6	33.7	24	43.6	86
2013	455	37.3	16.3	33.7	25.7	44.3	91
2012	465	36.4	16.5	33.9	24.8	45.1	85
2011	407	37	15.8	33.6	26.1	44.9	92

Table 4.2.7: Distribution of transferrin saturation on ESAs, HD patients, 2011-2021

Year	Number of patients	Mean	SD	Median	LQ	UQ	% Patients ≥20 %
2021	43122	30.8	13.4	28.3	21.9	36.8	82
2020	41746	30.3	13.5	27.7	21.3	36.3	79
2019	38309	30.5	13.6	27.8	21.4	36.4	80
2018	32901	30.2	13.3	27.7	21.4	36.1	80
2017	32300	30.3	13.3	27.8	21.4	36.2	80
2016	30639	30.4	13.5	27.9	21.4	36.1	80
2015	27649	30.6	13.6	28	21.6	36.3	81
2014	24808	31.3	13.8	28.6	22.2	37.3	82
2013	21837	31.2	13.8	28.6	22	37.2	82
2012	18837	32	14.4	29	22.5	38	83
2011	16123	32.7	15.1	29.5	22.5	39	83

Figure 4.2.7: Cumulative distribution of transferrin saturation on ESAs, HD patients 2011-2021

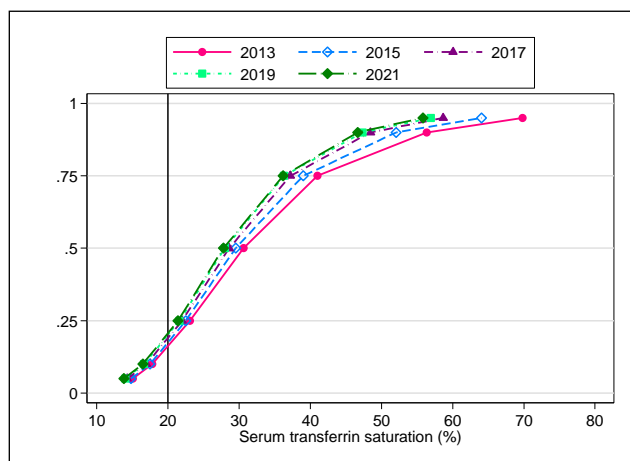


Figure 4.2.8: Cumulative distribution of transferrin saturation on ESAs, PD patients 2011-2021

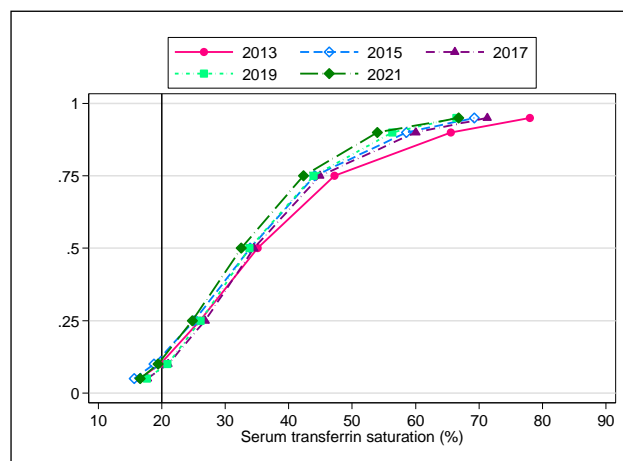


Table 4.2.8: Distribution of transferrin saturation on ESAs, PD patients, 2011-2021

Year	Number of patients	Mean	SD	Median	LQ	UQ	% Patients $\geq 20\%$
2021	4804	34.3	15.1	31.2	24	41.1	86
2020	4468	34.7	15.5	31.4	23.8	41.7	86
2019	3818	34.4	15.2	31.2	24	40.8	87
2018	3417	35.3	15.2	32.5	24.8	42.3	88
2017	3264	36.2	15.5	33.1	25.3	43.8	90
2016	2963	36.6	14.9	33.8	26.1	43.9	92
2015	2487	36.6	15.6	33.5	25.7	43.3	91
2014	1983	37.8	15.9	34.5	26.8	44.9	92
2013	1935	36.3	15.3	33.6	25.6	43.6	90
2012	1669	36.5	16.2	33.9	25.1	44.1	88
2011	4804	34.3	15.1	31.2	24	41.1	86

There was a wide variation in ferritin levels ranging from 190 to 1000 ng/ml between HD centres in 2021. A similar trend was seen in the PD centres, 300 ng/ml to 900 ng/ml (Table 4.2.9 & 4.2.10)

Table 4.2.9(a): Variation in median serum ferritin among patients on ESAs, HD centres, 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	790	74	189.3	323.2	467.7	631.7	1009.8	1800.4
2020	759	58	180.7	322	453.2	618.8	960.5	2244.2
2019	727	47	198.9	332.5	466.6	646.9	1034.1	1902.8
2018	691	61.4	188.8	339.1	468.7	636.5	1005.8	1872
2017	669	42.8	202.9	370	495.3	660.4	1071.8	2353.1
2016	653	112.4	223.6	383.4	529.7	702.4	1053.4	1552.4
2015	619	61.4	205.4	375.4	511	663	933.3	1318
2014	585	131.4	231.4	366.5	501	656.5	978.4	1494.6
2013	529	125.6	228.1	375	501	641.6	910.5	1305
2012	488	88	245.1	388.5	525.1	679.9	940	1475
2011	429	26	250.9	412.3	543.5	706.2	1013.7	1413.6

Figure 4.2.9(a): Variation in median serum ferritin among patients on ESAs, HD centres 2021

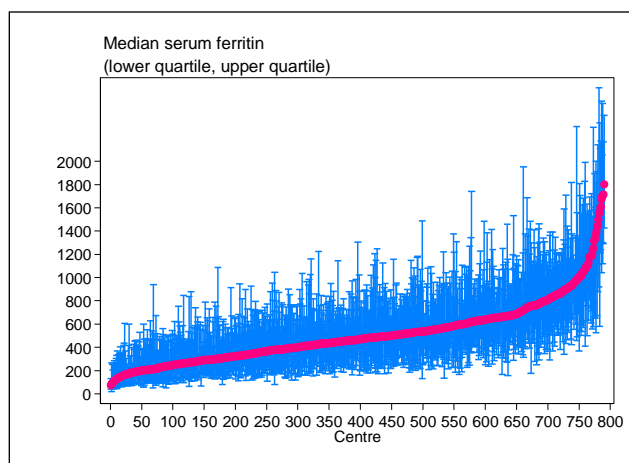


Figure 4.2.9(b): Variation in proportion of patients on ESAs with serum ferritin ≥100 ng/ml, HD centres 2021

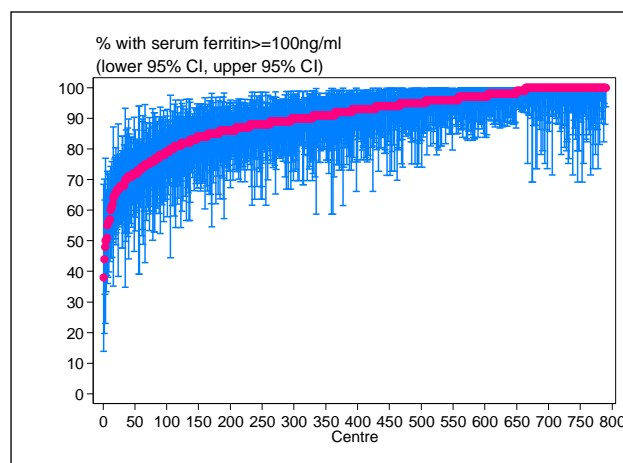


Table 4.2.9(b): Proportion of patients on ESAs with serum ferritin ≥100 ng/ml, HD centres, 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	790	38	71	86	93	97	100	100
2020	759	33	71	85	92	97	100	100
2019	727	18	73	86	93	98	100	100
2018	691	38	70	86	94	98	100	100
2017	669	13	74	88	94	98	100	100
2016	653	53	76	89	94	98	100	100
2015	619	33	73	88	94	98	100	100
2014	585	55	74	88	94	98	100	100
2013	529	60	76	88	94	98	100	100
2012	488	45	76	89	95	100	100	100
2011	429	6	76	90	95	100	100	100

Table 4.2.9(c): Median transferrin saturation among patients on ESAs, HD centres, 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	790	17	22.2	25.7	28	30.9	35.9	52.7
2020	760	17.8	21.1	24.6	27.7	30.5	35.6	58.1
2019	728	15.6	21.3	24.8	27.6	30.8	35.9	46.9
2018	694	16.8	21	24.9	27.7	30.5	34.9	43.8
2017	675	17	21.2	24.6	27.5	30.7	35.2	49.5
2016	661	15.2	21.5	24.9	27.7	30.7	35.3	67.9
2015	620	13.9	21.4	24.9	27.9	30.7	35.1	62.8
2014	583	18.2	21.7	25.6	28.3	31.5	37	68.9
2013	532	16.5	22.3	25.3	28.1	31.3	36.1	70.6
2012	479	15.5	22.5	25.8	28.5	32	37.1	46.3
2011	421	15.1	22.2	26.2	29.3	32.1	39.3	69.1

Figure 4.2.9(c): Variation in median transferrin saturation among patients on ESAs HD centres 2021

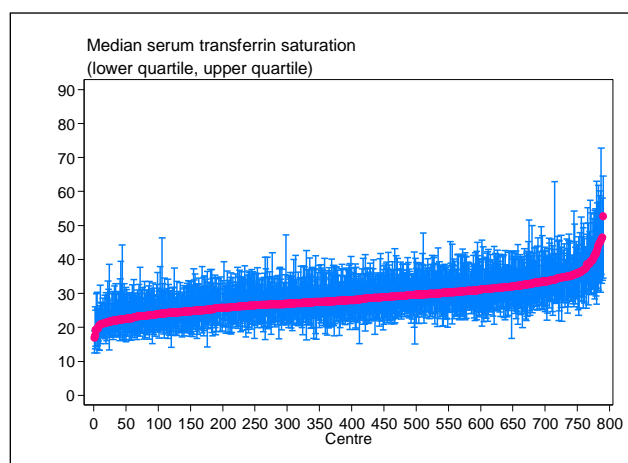


Figure 4.2.9(d): Variation in proportion of patients on ESAs with transferrin saturation ≥ 20%, HD centres 2021

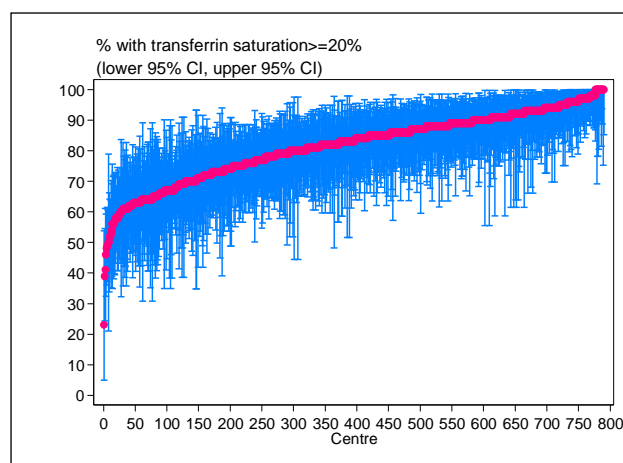


Table 4.2.9(d): Proportion of patients on ESAs with transferrin saturation ≥ 20%, HD centres, 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	790	23	62	74	83	90	97	100
2020	760	30	56.5	71	81	89	96	100
2019	728	27	59	72	81	89	97	100
2018	694	34	55	72	82	89	96	100
2017	675	34	56	72	81	89	96	100
2016	661	18	58	73	82	89	97	100
2015	620	26	55.5	72	82	90	97	100
2014	583	38	59	74	84	92	98	100
2013	532	29	60	74	84	91	98	100
2012	479	31	58	74	85	92	98	100
2011	421	23	59	77	85	91	100	100

Table 4.2.10(a): Variation in median serum ferritin among patients on ESAs, PD centres, 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	45	299.9	322	403.6	509.1	607	868.7	1066.6
2020	41	236.9	297.6	395	489.6	600.1	956.9	1119.6
2019	34	251.3	274.7	449	543.3	688.9	930.2	1167.6
2018	35	207.6	244.9	456.1	548.3	657.7	891.5	1188.6
2017	33	123.6	282.4	481	566.6	668	950.6	1302.5
2016	34	33.5	246.7	486.4	570.2	680	1142.9	1170.9
2015	33	154.9	365.2	500.4	602.8	683.4	938.4	1007
2014	29	170.8	286	486.9	591.6	712	1110.4	1298.4
2013	27	189.5	318	486.8	625.7	808.6	929.5	1022.6
2012	26	151	205.7	527.5	640.7	767.6	954	1126.2
2011	25	195.4	280.5	522.9	673.1	760.8	829.7	1039.3

Figure 4.2.10(a): Variation in median serum ferritin among patients on ESAs, PD centres 2021

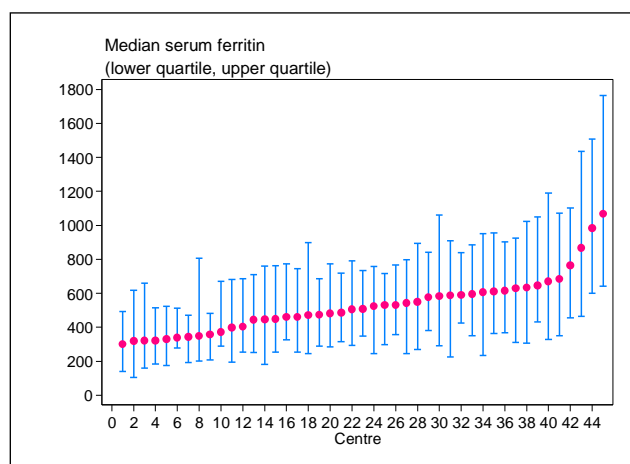


Figure 4.2.10(b): Variation in proportion of patients on ESAs with serum ferritin ≥ 100ng/ml, PD centres 2021

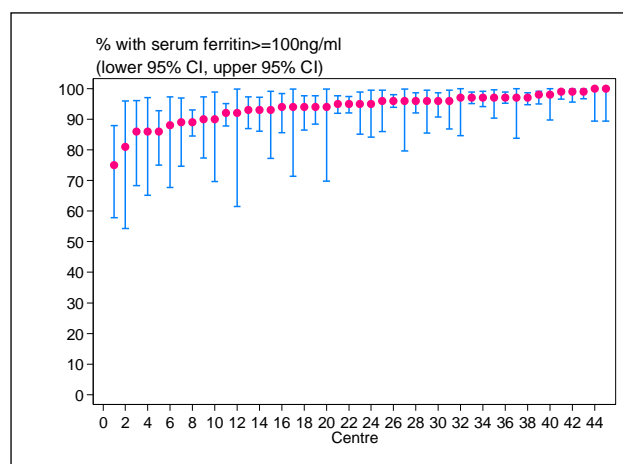


Table 4.2.10(b): Proportion of patients on ESAs with serum ferritin ≥100 ng/ml, PD centres, 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	45	75	86	92	95	97	99	100
2020	41	67	83	90	94	98	100	100
2019	34	85	85	89	95.5	98	100	100
2018	35	80	81	92	94	98	100	100
2017	33	71	82	92	95	98	100	100
2016	34	33	81	90	96	98	100	100
2015	33	73	85	93	96	98	100	100
2014	29	78	78	92	95	99	100	100
2013	27	79	88	92	97	99	100	100
2012	26	69	83	93	96.5	98	100	100
2011	25	77	81	92	98	100	100	100

Table 4.2.10(c): Median transferrin saturation among patients on ESAs, PD centres, 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	43	25.3	27	28.9	31	33.9	36.8	47.8
2020	39	22.8	25.4	28.5	29.9	32.3	40.1	47.4
2019	32	25.5	26.2	28.1	29.7	33.1	38.6	45.5
2018	32	25.1	26.8	27.6	30.9	33.9	38.4	40.3
2017	31	23.6	25	28.3	30.7	34.4	40.1	43.1
2016	33	21.5	23.4	30.5	32.9	35.7	40	53.4
2015	31	27.2	28.4	30.1	34.4	36.4	38	38.1
2014	26	25	27.6	29.4	32.4	37.4	39.2	46.2
2013	23	28.2	29.3	32	34.3	37.2	39.5	52.3
2012	25	25.6	25.6	30.4	33.8	36.1	43.3	44.7
2011	23	23.9	24.6	31	34.8	37.6	47.6	57.6

Figure 4.2.10(c): Variation in median transferrin saturation among patients on ESAs, PD centres 2021

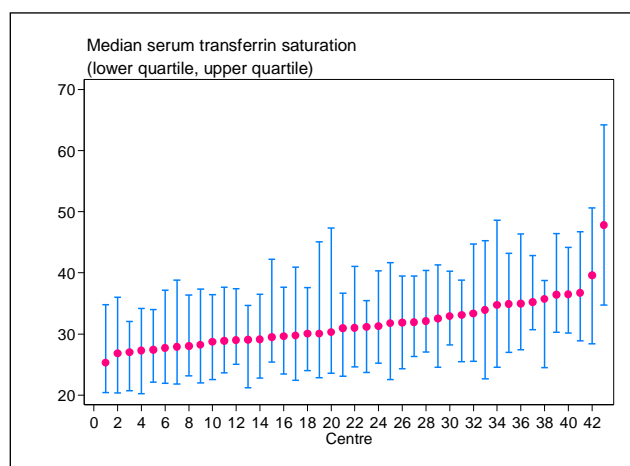


Figure 4.2.10(d): Variation in proportion of patients on ESAs with transferrin saturation ≥20 %, PD centres 2021

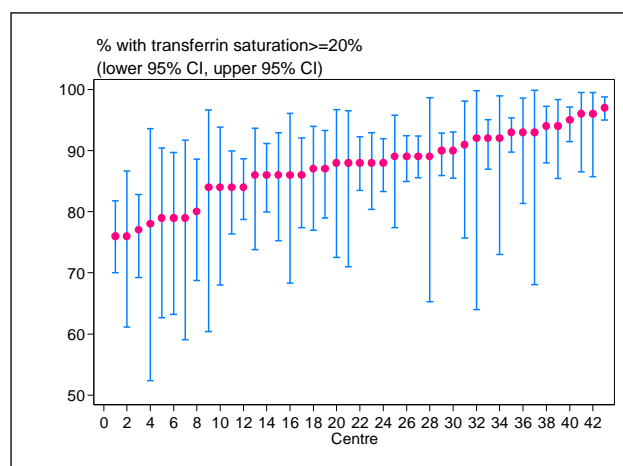


Table 4.2.10(d): Proportion of patients on ESAs with transferrin saturation ≥20%, PD centres, 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	43	76	77	84	88	92	96	97
2020	39	63	65	79	85	91	96	97
2019	32	71	74	80	84.5	90.5	98	100
2018	32	68	73	83.5	88	92	96	97
2017	31	69	70	83	88	91	96	97
2016	33	62	64	86	91	93	100	100
2015	31	76	78	87	92	97	100	100
2014	26	75	84	86	92	96	99	100
2013	23	79	81	87	92	96	100	100
2012	25	65	67	83	93	96	100	100
2011	23	65	68	86	92	96	100	100

SECTION 4.3: HAEMOGLOBIN OUTCOMES ON DIALYSIS

In 2021, median haemoglobin in HD and PD patients without ESA was 10.5 g/dl and 10.4 g/dl respectively. (Table 4.3.1 & 4.3.2).

Table 4.3.1: Distribution of haemoglobin concentration without ESAs, HD patients 2011-2021

Year	Number of patients	Mean	SD	Median	LQ	UQ	% Patients <10g/dL	% Patients 10-<12g/dL	% Patients >=12g/dL
2021	3861	10.4	1.7	10.5	9.3	11.6	2	3	95
2020	3550	10.5	1.8	10.6	9.3	11.7	2	3	95
2019	3880	10.4	1.7	10.4	9.2	11.5	4	4	92
2018	6496	10.3	1.7	10.4	9.2	11.5	8	6	86
2017	4937	10.3	1.7	10.4	9.2	11.5	6	5	89
2016	2928	10.4	1.7	10.5	9.3	11.5	2	3	95
2015	2484	10.4	1.7	10.4	9.2	11.5	2	3	95
2014	2429	10.4	1.7	10.4	9.2	11.5	2	3	95
2013	2241	10.4	1.7	10.5	9.3	11.6	2	3	95
2012	1992	10.4	1.7	10.4	9.3	11.6	2	3	95
2011	1758	10.4	1.7	10.5	9.2	11.6	3	3	94

Figure 4.3.1: Cumulative distribution of haemoglobin concentration without ESAs, HD patients 2011-2021

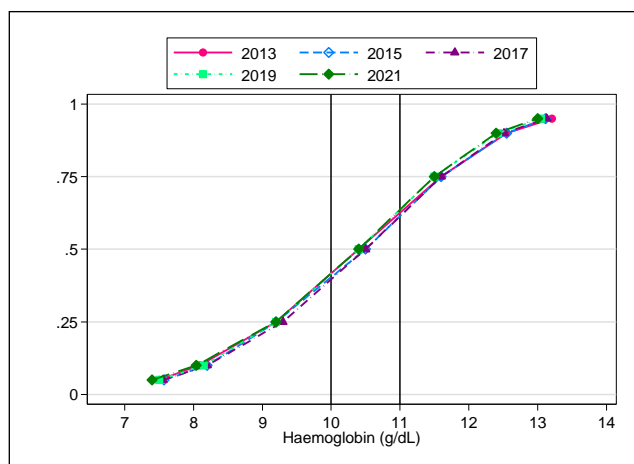


Figure 4.3.2: Cumulative distribution of haemoglobin concentration without ESAs, PD patients 2011-2021

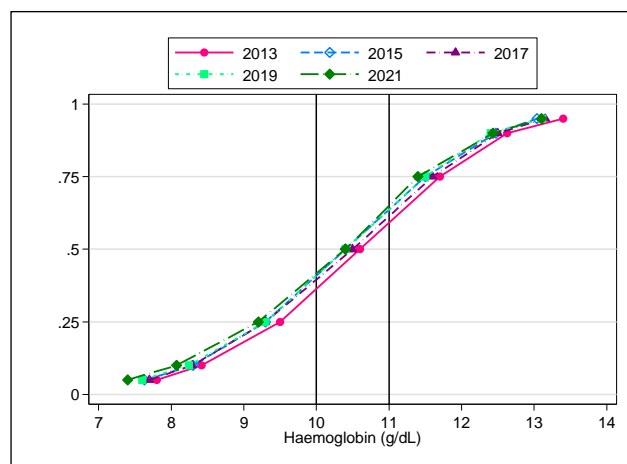


Table 4.3.2: Distribution of haemoglobin concentration without ESAs, PD patients 2011-2021

Year	Number of patients	Mean	SD	Median	LQ	UQ	% Patients <10g/dL	% Patients 10-<12g/dL	% Patients >=12g/dL
2021	1139	10.4	1.7	10.4	9.3	11.5	3	8	89
2020	1004	10.4	1.7	10.4	9.3	11.5	3	8	89
2019	862	10.4	1.7	10.4	9.3	11.4	4	8	88
2018	1054	10.3	1.7	10.4	9.3	11.4	6	10	84
2017	933	10.3	1.7	10.4	9.2	11.4	5	9	86
2016	745	10.4	1.7	10.4	9.3	11.4	3	9	88
2015	754	10.4	1.7	10.4	9.3	11.5	4	11	85
2014	610	10.3	1.7	10.4	9.2	11.4	5	9	86
2013	594	10.5	1.7	10.5	9.3	11.6	4	11	85
2012	532	10.5	1.7	10.5	9.5	11.6	6	10	84
2011	527	10.4	1.7	10.4	9.3	11.5	7	11	82

Figure 4.3.3(a): Cumulative distribution of haemoglobin concentration on ESAs, diabetes HD patients 2011-2021

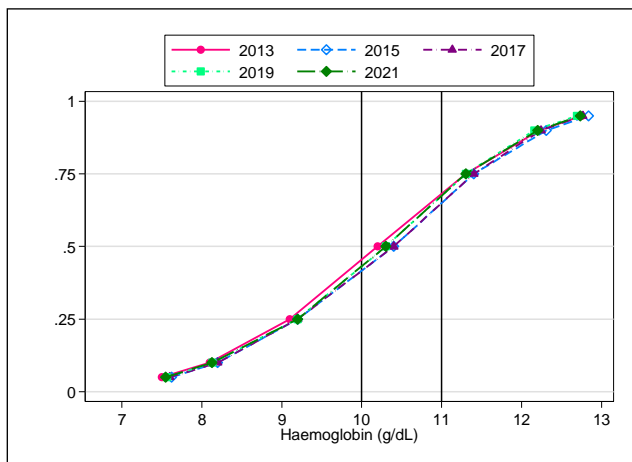


Figure 4.3.3(b): Cumulative distribution of haemoglobin concentration on ESAs, non-diabetes HD patients 2011-2021

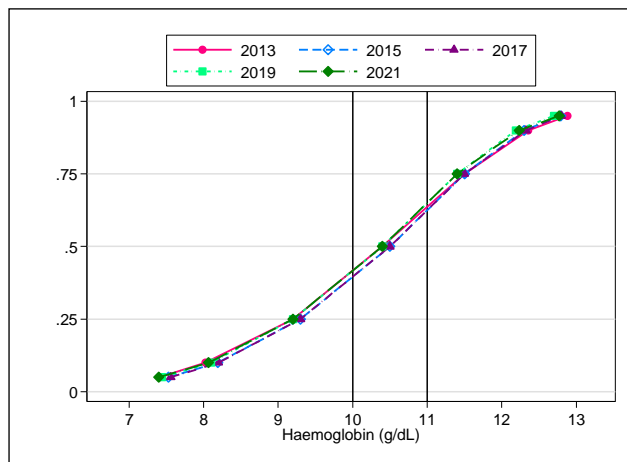


Figure 4.3.4(a): Cumulative distribution of haemoglobin concentration on ESAs, diabetes PD patients 2011-2021

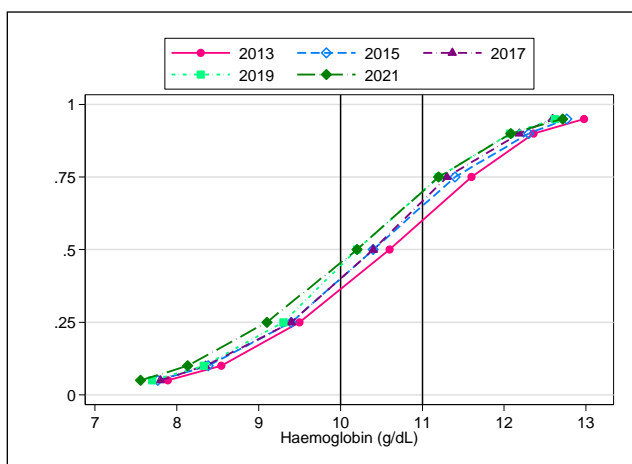
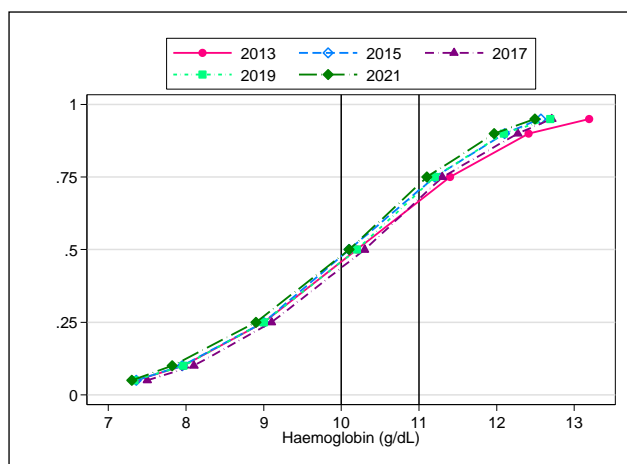


Figure 4.3.4(b): Cumulative distribution of haemoglobin concentration on ESAs, non-diabetes PD patients 2011-2021



In 2021, for HD patients on ESAs, the Hb ranged 9.2 to 11.3 gm/dl with the median at 10.4 gm/dl. For PD patients, the median hemoglobin was similar at 10.2g/dl, with a lesser variation among PD centres compared to HD centres.

At the median, proportions of patients on ESA with Hb > 10 gm/dl was 54% for PD patients.

Table 4.3.5(a): Variation in median haemoglobin level among patients on ESAs, HD centres 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	813	8.1	9.2	9.9	10.4	10.8	11.3	11.9
2020	780	7.8	9.2	10	10.4	10.8	11.3	12.2
2019	748	7.8	9.2	9.9	10.3	10.7	11.2	12
2018	720	7.8	9.1	9.9	10.3	10.7	11.3	12.3
2017	706	7	9.2	9.9	10.3	10.7	11.2	12
2016	692	7.8	9.1	9.9	10.3	10.7	11.2	12.6
2015	666	8	9.3	9.9	10.3	10.7	11.2	12.1
2014	635	8.3	9.2	9.9	10.3	10.7	11.3	11.8
2013	592	8.2	9.1	9.9	10.3	10.8	11.3	12.1
2012	540	7.8	9.1	9.9	10.4	10.8	11.3	11.8
2011	481	8	9.2	9.9	10.4	10.8	11.3	12.1

Figure 4.3.5(a): Variation in median haemoglobin level among patients on ESAs, HD centres 2021

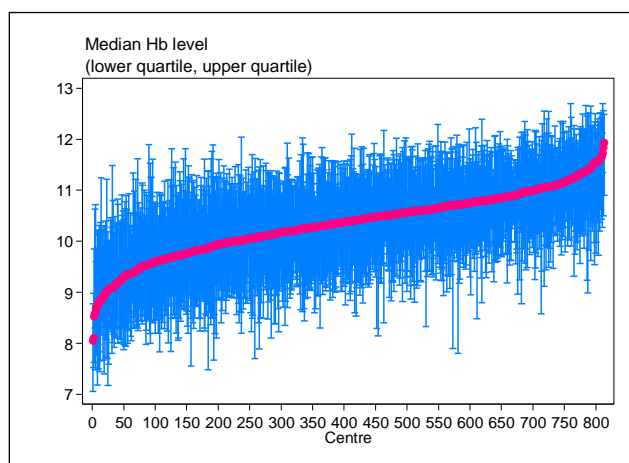


Figure 4.3.5(b): Variation in proportion of patients on ESAs with haemoglobin level > 10g/dL, HD centres 2021

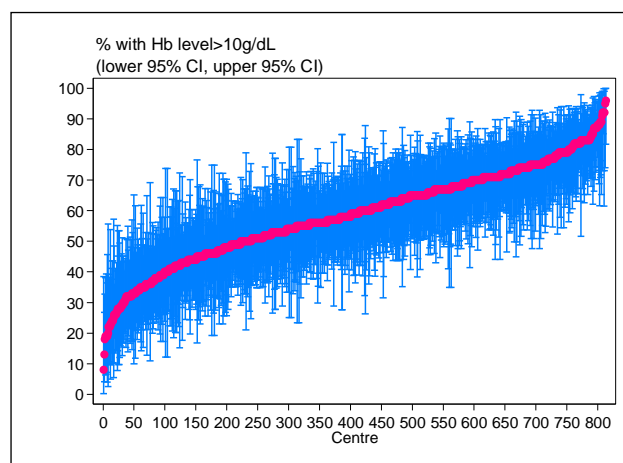


Table 4.3.5(b): Proportion of patients on ESAs with haemoglobin level > 10g/dL, HD centres, 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	813	8	32	48	59	70	83	96
2020	780	9	33	49	60	70	82	100
2019	748	0	30	48	59	68	81	92
2018	720	8	31	47	59	70	83	100
2017	706	0	31	47	57	69	81	100
2016	692	6	30	47	59	69	81	100
2015	666	7	31	47	58	68	80	97
2014	635	12	30	48	58	69	82	94
2013	592	9	28	48	59	70	84	96
2012	540	5	25.5	46	59	70	82	100
2011	481	6	29	47	60	71	86	94

Table 4.3.6(a): Variation in median haemoglobin level among patients on ESAs, PD centres, 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	47	9	9.5	10	10.2	10.5	10.8	11.4
2020	43	8.9	9.2	9.6	10.2	10.4	10.8	11.3
2019	36	9.2	9.3	9.8	10.2	10.4	10.8	11.1
2018	36	8.8	8.9	9.8	10.1	10.4	10.9	10.9
2017	36	9	9.1	9.6	10	10.4	10.9	11
2016	36	8.8	8.8	9.7	10.2	10.4	10.9	11
2015	35	8.6	9	9.7	10.1	10.4	10.8	11
2014	31	8.7	8.8	9.8	10	10.4	10.6	10.7
2013	28	9.3	9.4	10	10.3	10.5	11.4	11.6
2012	27	9	9.2	9.9	10.3	10.7	11	11.5
2011	26	8.8	9.1	10	10.3	10.6	11	11.3

Figure 4.3.6(a): Variation in median haemoglobin level among patients on ESAs, PD centres 2021

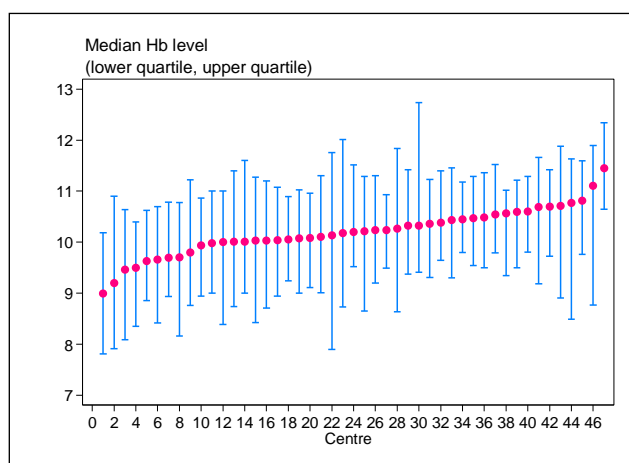


Figure 4.3.6(b): Variation in proportion of patients on ESAs with haemoglobin level >10g/dL, PD centres, 2021

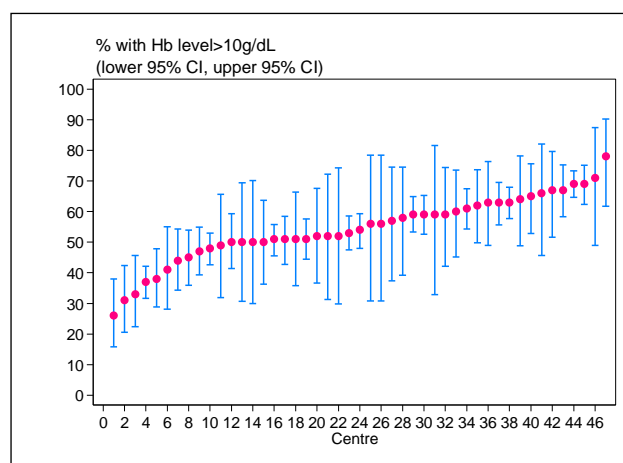


Table 4.3.6(b): Proportion of patients on ESAs with haemoglobin level >10g/dL, PD centres, 2011-2021

Year	Number of centres	Min	5 th centile	LQ	Median	UQ	95 th centile	Max
2021	47	26	33	50	54	63	69	78
2020	43	27	32	41	53	62	75	77
2019	36	29	32	45	56.5	62	71	82
2018	36	25	27	44	50.5	63	72	78
2017	36	21	25	40	48	59.5	70	72
2016	36	17	22	43.5	54	62	77	83
2015	35	29	32	41	52	64	79	82
2014	31	24	27	43	51	62	70	71
2013	28	35	44	49.5	56.5	62.5	70	79
2012	27	36	37	48	56	66	82	86
2011	26	24	24	51	57	65	79	80