

Chapter 4

CHRONIC PERITONEAL DIALYSIS

IN

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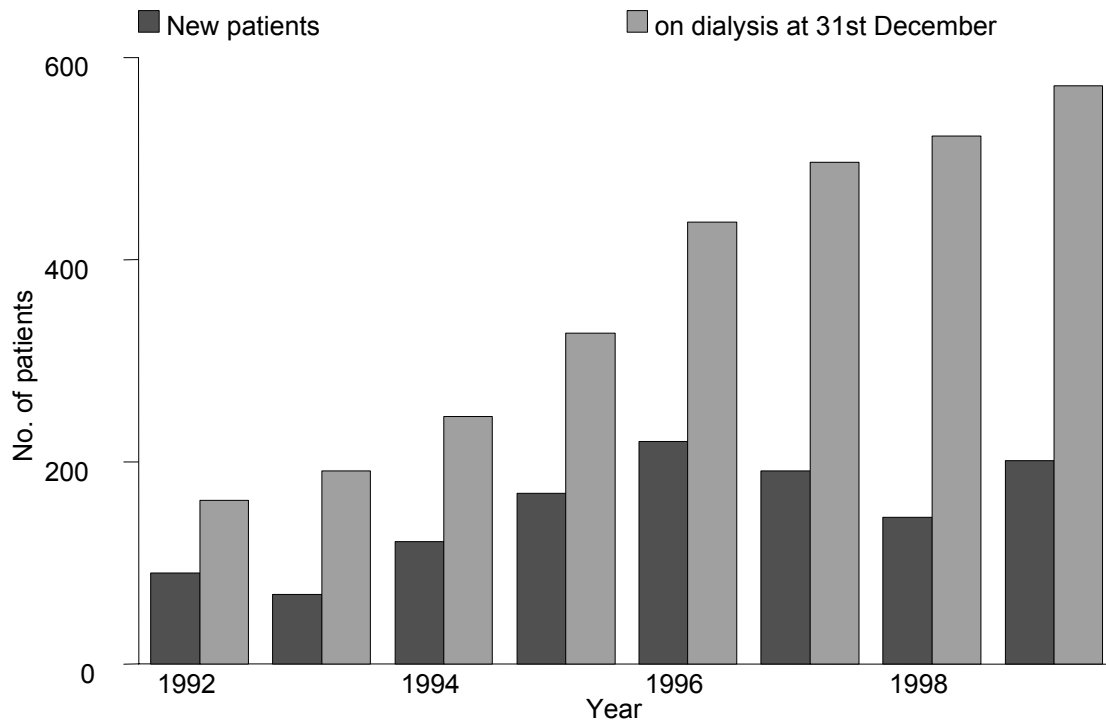
4. CHRONIC PERITONEAL DIALYSIS

4.1 STOCK AND FLOW

Table 4.01 Stock and Flow of Chronic PD Patients, 1992- 1999

Year	1992	1993	1994	1995	1996	1997	1998	1999
New Dialysis patients	90	69	121	169	220	191	145	201
Died	23	23	42	58	60	71	74	98
Transferred to HD	17	14	22	22	37	50	33	37
Transplanted	0	2	3	7	8	10	12	13
Lost to follow up	0	1	0	0	5	1	0	3
Dialysing at 31st December	162	191	245	327	437	496	522	572

Figure 4.01 Stock and Flow of Chronic PD Patients, 1992- 1999

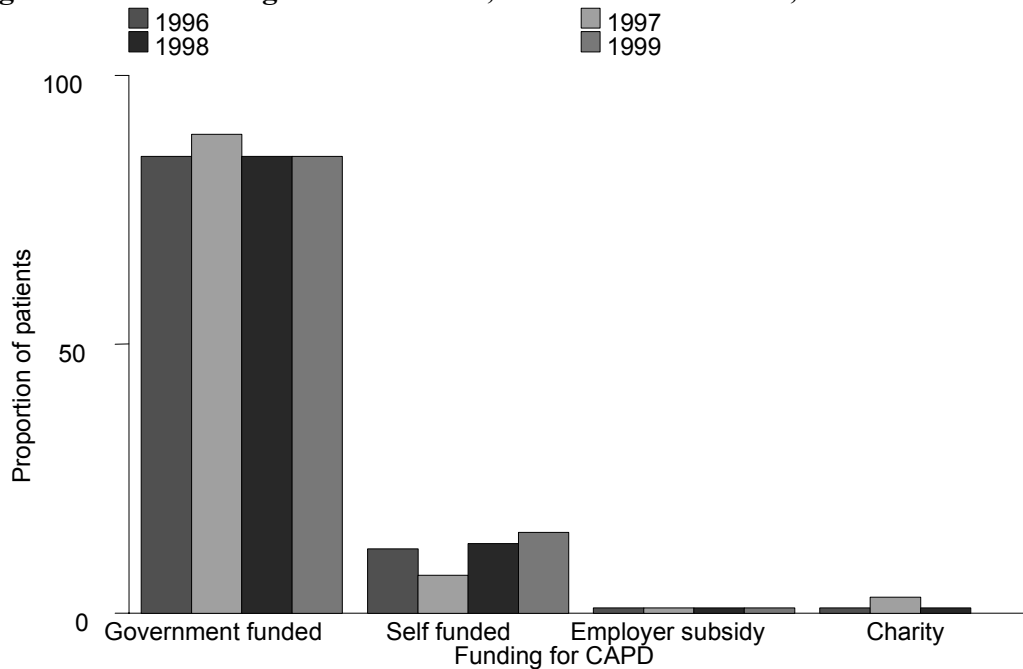


4.2 FUNDING FOR CHRONIC PERITONEAL DIALYSIS

Table 4.03: Funding for CAPD, Government Centres, 1996 – 1999

Year	1996	1997	1998	1999
New Dialysis patients	220	191	145	201
% Government funded	85	89	85	85
% Self funded	12	7	13	15
% Employer subsidised	1	1	1	1
% Charity	1	3	1	0
Dialysing at 31st December	437	496	522	572
% Government funded	82	87	85	86
% Self funded	14	9	12	12
% Employer subsidised	2	1	1	1
% Charity	3	2	2	1

Figure 4.03: Funding for new CAPD, Government Centres, 1996 – 1999



4.3 DEATH ON CAPD AND TRANSFER TO HAEMODIALYSIS

Table 4.04: Death Rate and Transfer to HD Government Centres 1992 - 1999

Year	1992	1993	1994	1995	1996	1997	1998	1999
No. at risk	162	177	218	286	382	467	509	547
Death (No.)	23	23	42	58	60	71	74	98
Death rate %	14	13	19	20	16	15	15	18
No transferred to HD	17	14	22	22	37	50	33	37
Transfer to HD rate %	10	8	10	8	10	11	6	7
All losses	40	37	64	80	97	121	107	135
All losses rate %	25	21	29	28	25	26	21	25

Figure 4.04: Death Rates on CAPD, Government Centres 1992 - 1999

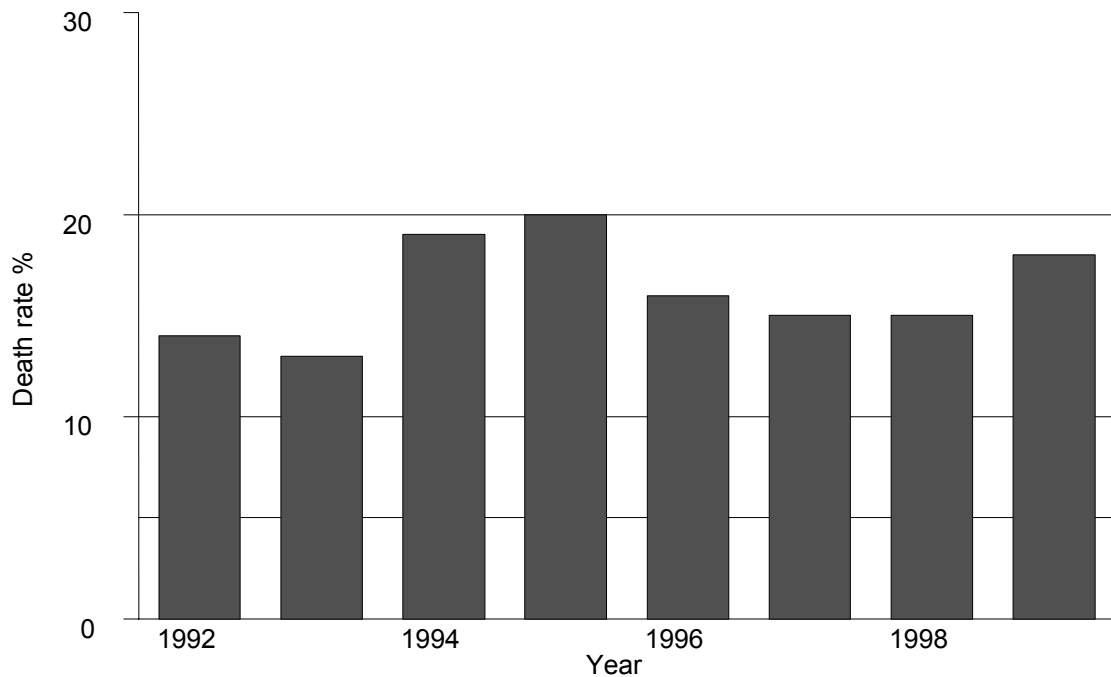


Table 4.05: Causes of Death on CAPD, Government Centres 1996– 1999

Year	1996		1997		1998		1999	
	No	%	No	%	No	%	No	%
Cardiovascular	18	30	21	30	23	31	26	27
Died at home	17	28	18	25	11	15	32	33
Sepsis	20	33	15	21	16	22	15	15
CAPD peritonitis	1	2	4	6	1	1	7	7
GIT bleed	0	0	0	0	0	0	3	3
Cancer	0	0	1	1	0	0	1	1
Liver disease	0	0	0	0	0	0	0	0
Others	0	0	11	15	12	16	11	11
Unknown	4	7	1	1	11	15	3	3
Total	60	100	71	100	74	100	98	100

Table 4.06: Causes of Transfer to CAPD, 1996 - 1999

Year	1996		1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%
Peritonitis	23	62	29	58	17	52	23	62
Catheter related infection	0	0	3	6	0	0	2	5
Technical problem	2	5	0	0	3	9	0	0
Membrane failure	3	8	6	12	3	9	3	8
Patient preference/cannot cope	2	5	0	0	2	6	3	8
Others	0	0	2	4	0	0	3	8
Unknown	7	19	10	20	8	24	3	8
Total no.	37	100	50	100	33	100	37	100

4.4 GOVERNMENT CAPD CENTRES

Table 4.07: Centre Distribution of CAPD patients, 1999

No	Centre	No	Percent
0	No. dialysing at 31st December	572	100
1	Ipoh Hospital	37	6
2	Kota Bharu Hospital	2	0
3	Kuala Lumpur Hospital	163	28
4	Kuala Lumpur Hospital (Paed)	24	4
5	Kuala Terengganu Hospital	15	3
6	Pulau Pinang Hospital	93	16
7	Queen Elizabeth Hospital	11	2
8	Selayang Hospital	4	1
9	Seremban Hospital	46	8
10	Sultanah Aminah Hospital	79	14
11	Tg Ampuan Rahimah	15	3
12	University Hospital	83	15

4.5 CAPD PATIENTS' CHARACTERISTICS

Table 4.08: Percentage Age Distribution of CAPD patients, 1996 – 1999

Year	1996	1997	1998	1999
New Dialysis patients	220	191	145	201
1-14 years	10	8	13	10
15-24 years	4	7	9	7
25-34 years	13	14	14	6
35-44 years	18	16	12	13
45-54 years	22	29	19	21
55-64 years	22	12	25	24
≥65 years	11	14	8	16
Dialysing at 31st December	437	496	522	572
1-14 years	10	10	11	12
15-24 years	4	4	5	6
25-34 years	12	14	16	14
35-44 years	16	16	16	16
45-54 years	26	27	25	24
55-64 years	23	19	18	19
≥65 years	10	10	9	9

Table 4.09: CAPD Patient Characteristics, 1996 - 1999

Year	1996	1997	1998	1999
New Dialysis patients	220	191	145	201
Mean age \pm sd	44 \pm 18	44 \pm 18	42 \pm 19	47 \pm 19
% male	50	52	48	53
% Diabetic	30	42	37	43
% HBsAg+	3	3	0	1
% Anti-HCV+	2	6	3	3

4.6. SURVIVAL ANALYSIS

Table 4.10: CAPD Patient Survival related to Year of Entry, Government Centres 1994 – 1999

Year	1994			1995			1996		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	91	3	106	93	2	152	94	2	200
12	82	4	84	88	3	140	88	2	176
24	64	5	56	71	4	96	77	3	139
36	49	5	35	59	4	70	67	3	105
48	42	6	27	45	4	48			
60	37	6	20						

Year	1997			1998			1999		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	96	1	180	94	2	134	94	2	97
12	91	2	163	86	3	116			
24	78	3	133						

No. = number at risk

SE = standard error

Figure 4.10: CAPD Patient Survival related to Year of Entry, Government Centres 1995 – 1999

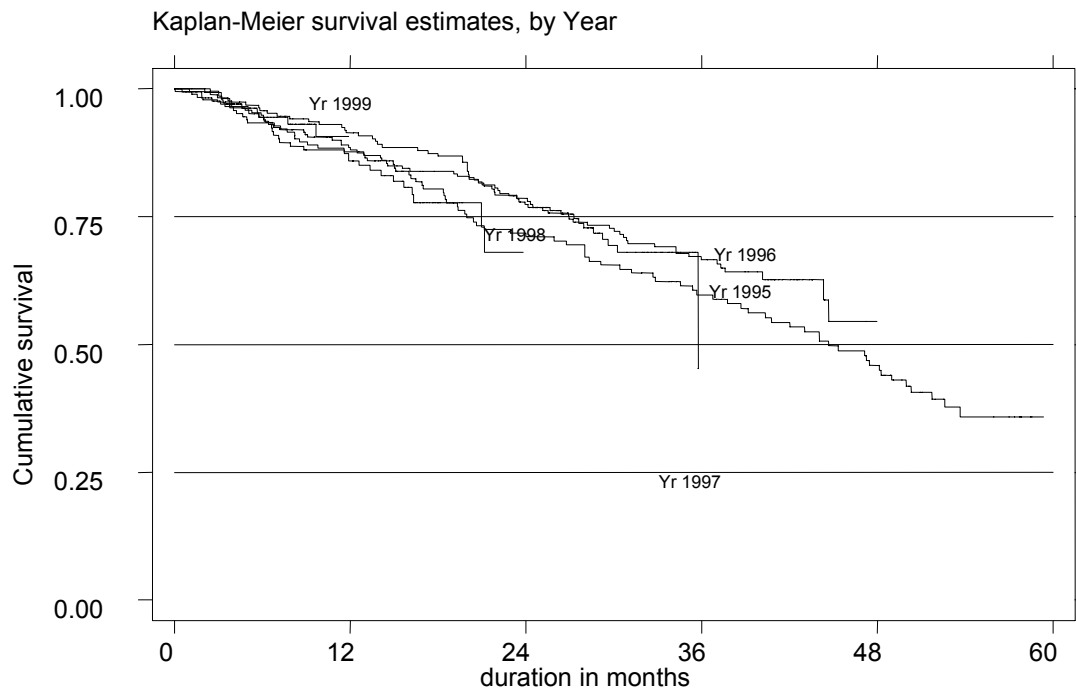


Table 4.11: CAPD Technique Survival related to Year of Entry, Government Centres 1994 – 1999

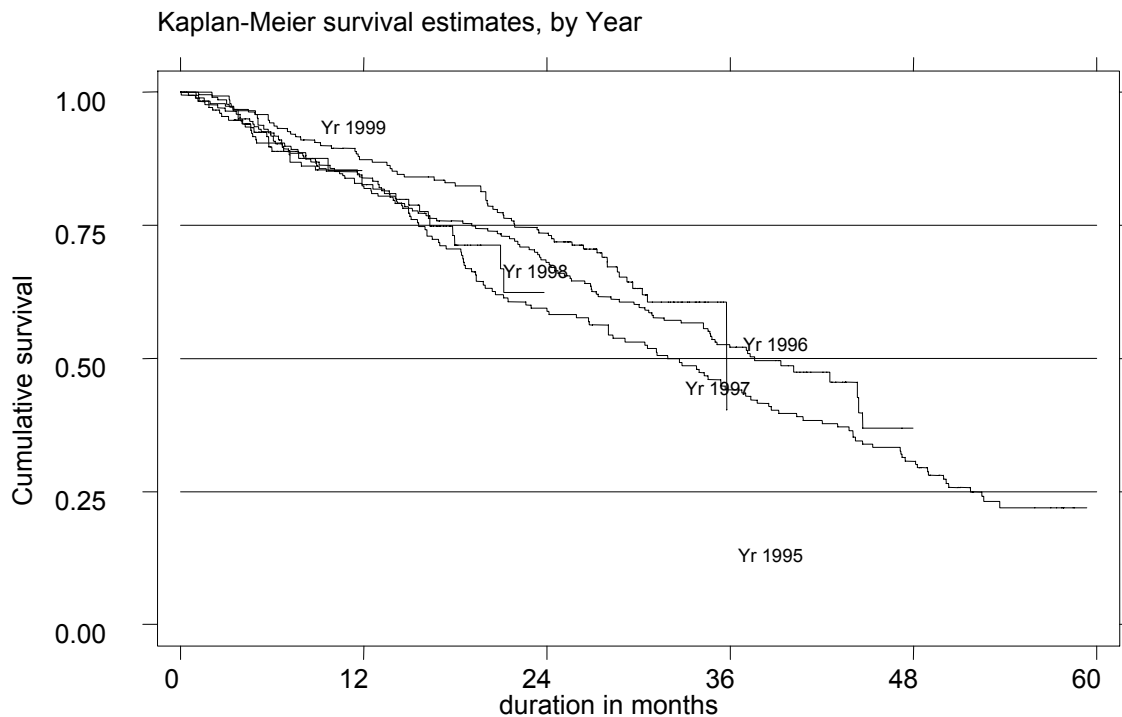
Year	1994			1995			1996		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	87	3	106	91	2	152	91	2	199
12	72	4	84	84	3	140	82	3	176
24	50	5	56	59	4	96	68	3	139
36	31	4	35	44	4	70	52	3	105
48	23	4	27	30	4	48			
60	17	4	19						

Year	19976			1998			1999		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	94	2	180	92	2	134	89	3	96
12	87	2	163	83	3	116			
24	73	3	133						

No. = number at risk

SE = standard error

Figure 4.11 CAPD Technique Survival by Year of Entry Government Centres 1995 – 1999



4.7 WORK RELATED REHABILITATION AND QUALITY OF LIFE ON CAPD

Table 4.12: Work Related Rehabilitation on CAPD, Government Centres, 1996 - 1999

REHABILITATION STATUS	1996		1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%
Full time work for pay	67	21	78	19	83	20	96	19
Part time work for pay	14	4	26	6	23	6	45	9
Able to work but unable to get a job	5	2	15	4	13	3	14	3
Able to work but not yet due to dialysis schedule	1	0	0	0	4	1	3	1
Able but disinclined to work	2	1	7	2	7	2	11	2
Home maker	96	30	126	31	121	29	143	28
Full time student	33	10	43	11	45	11	67	13
Age<15 years	5	2	5	1	11	3	13	3
Retired	46	14	42	10	37	9	38	7
Age>65 years	26	8	38	9	38	9	39	8
Unable to work due to poor health	24	8	26	6	36	9	43	8
Total	319	100	406	100	418	100	512	100

Table 4.13: Quality of Life on CAPD, Government Centres, 1996 – 1999

QOL Index Summated Score	1996		1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%
0 (Worst QOL)	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0
2	1	0	1	0	2	0	1	0
3	4	1	3	1	8	2	3	1
4	8	3	12	3	11	3	16	3
5	11	3	18	4	26	6	19	4
6	16	5	20	5	14	3	25	5
7	32	10	29	7	32	8	26	5
8	36	11	44	11	32	8	37	7
9	38	12	47	11	45	11	46	9
10 (Best QOL)	173	54	236	58	236	58	338	66
Total	320	100	410	100	406	100	511	100

4.8 CAPD PRACTICES

Table 4.14: Chronic Peritoneal Dialysis Regimes, 1996 - 1999

PD regime	1996		1997		1998		1999	
	No	%	No	%	No	%	No	%
Standard CAPD	346	95	440	94	492	93	577	96
DAPD	17	5	26	6	32	6	16	3
Automated PD	2	1	4	1	6	1	6	1
Total	365	100	470	100	530	100	599	100

Table 4.15: CAPD Connectology, 1996 - 1999

CAPD connectology	1996		1997		1998		1999	
	No	%	No	%	No	%	No	%
UVXD	66	18	36	8	11	2	4	1
Baxter disconnect	296	81	426	90	500	95	343	58
Braun disconnect	2	1	10	2	18	3	248	42
Total	364	100	472	100	529	100	595	100

Table 4.16: CAPD Number of Exchanges per day, 1996- 1999

No of Exchanges/day	1996		1997		1998		1999	
	No	%	No	%	No	%	No	%
2	0	0	0	0	2	0	0	0
3	2	1	3	1	4	1	4	1
4	353	97	455	97	508	96	579	97
5	8	2	12	3	16	3	13	2
100	363	100	470	100	531	100	597	100

Table 4.17: CAPD Volume per Exchange, 1996 - 1999

Volume per Exchange (L)	1996		1997		1998		1999	
	No	%	No	%	No	%	No	%
1	22	6	24	5	25	5	19	3
2	338	94	445	95	496	95	557	96
3	0	0	0	0	0	0	2	0
Total	360	100	469	100	521	100	578	100

4.9. DYSLIPIDAEMIA IN CAPD PATIENTS, GOVERNMENT CENTRES

Table 4.24: Distribution of Serum Cholesterol Concentrations (mmol/l), CAPD patients, Government Centres 1996 – 1999

year	No of subjects	No of observations	median	LQ	UQ	% patients < 5.3 mmol/l
1996	318	582	5.9	4.9	6.9	38
1997	421	795	6	5.1	7	35
1998	348	519	5.9	5	6.8	39
1999	434	619	5.5	4.8	6.5	48

Figure 4.24: Cumulative distribution of serum cholesterol concentration by year

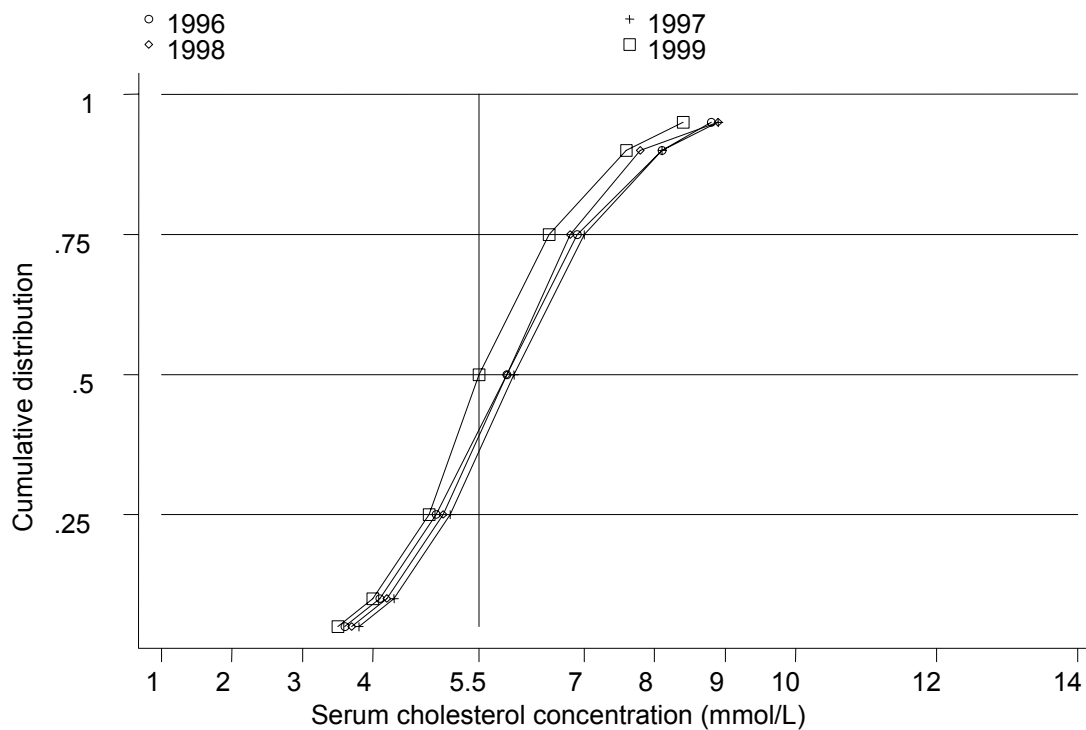


Table 4.25: Distribution of Serum Triglyceride (mmol/l), CAPD patients, Government Centres 1996 - 1999

year	No of subjects	No of observations	median	LQ	UQ	% patients < 3.5 mmol/l
1996	318	581	2	1.3	3.2	78
1997	414	782	2	1.4	3.1	79
1998	344	511	1.8	1.2	3	81
1999	421	602	1.9	1.3	2.9	82

Figure 4.25: Cumulative distribution of serum triglyceride concentration by year

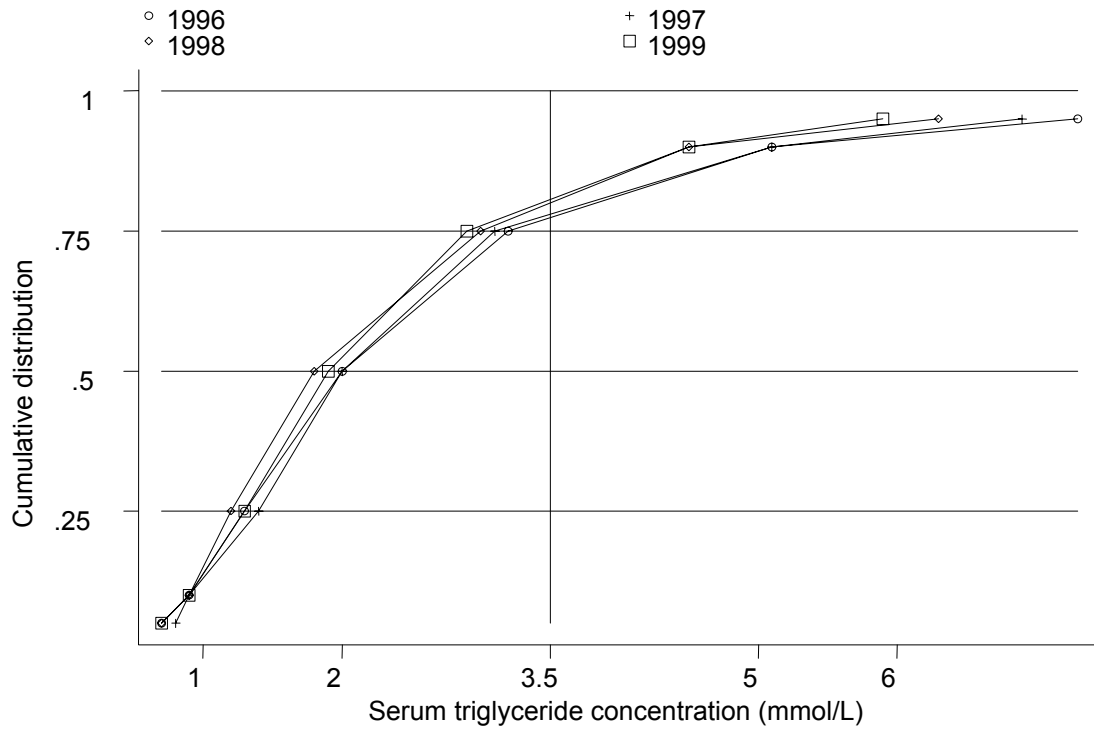


Table 4.26: Distribution of serum LDL (mmol/l), CAPD patient, Government Centres 1996 – 1999

year	No of subjects	No of observations	median	LQ	UQ	% patients <5 mmol/l
1996	180	325	3.8	2.9	4.7	78
1997	259	456	3.7	2.8	4.7	80
1998	146	187	3.9	3.1	4.6	84
1999	198	263	3.4	2.8	4.4	82

Figure 4.26 : Cumulative distribution of serum LDL by year

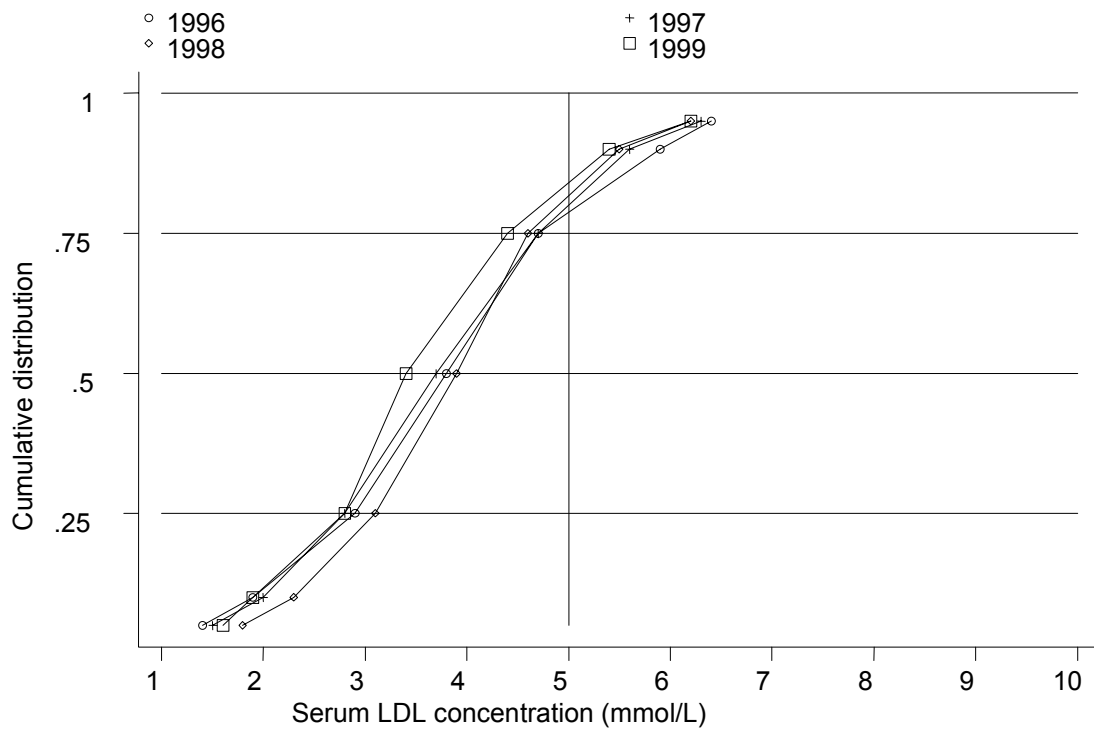
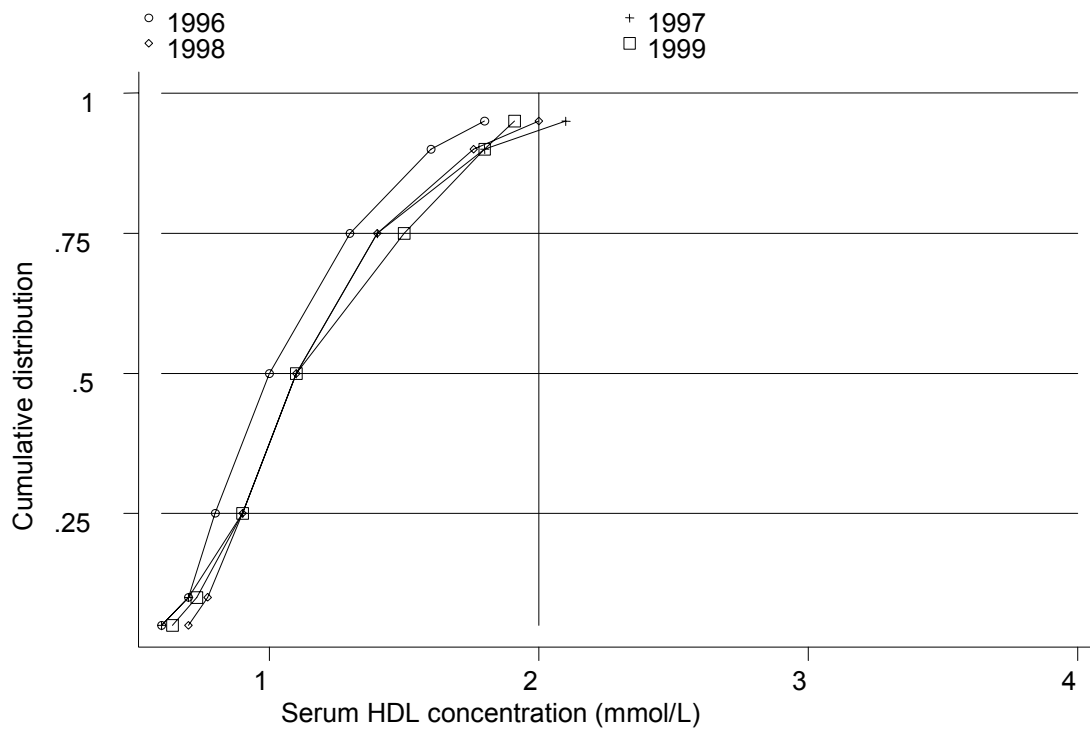


Table 4.27: Distribution of serum HDL (mmol/l), CAPD patient, Government Centres 1996 - 1999

year	No of subjects	No of observations	median	LQ	UQ	% patients < 2mmol/l
1996	174	322	1	.8	1.3	98
1997	259	465	1.1	.9	1.4	92
1998	152	198	1.1	.9	1.4	93
1999	210	279	1.1	.9	1.5	96

Figure 4.27: Cumulative distribution of serum HDL by year



4.10 MANAGEMENT OF RENAL BONE DISEASE, GOVERNMENT CENTRES

Table 4.28: Treatment for Renal Bone Disease, CAPD patients, Government Centres 1996- 1999

year	No of subjects	% on CaCO ₃	% on Al(OH) ₃	% on Vitamin D
1996	371	84	18	41
1997	477	83	12	24
1998	541	79	9	20
1999	610	74	6	12

Table 4.29: Distribution of serum Phosphate concentration (mmol/l), CAPD patients, Government Centres 1996 – 1999

year	No of subjects	No of observations	median	LQ	UQ	% patients < 1.6 mmol/l
1996	359	1121	1.5	1.2	1.9	56
1997	471	1562	1.5	1.2	1.9	56
1998	537	1680	1.6	1.3	1.9	52
1999	583	1783	1.6	1.3	2	51

Figure 4.29 Cumulative Distribution of serum Phosphate by year

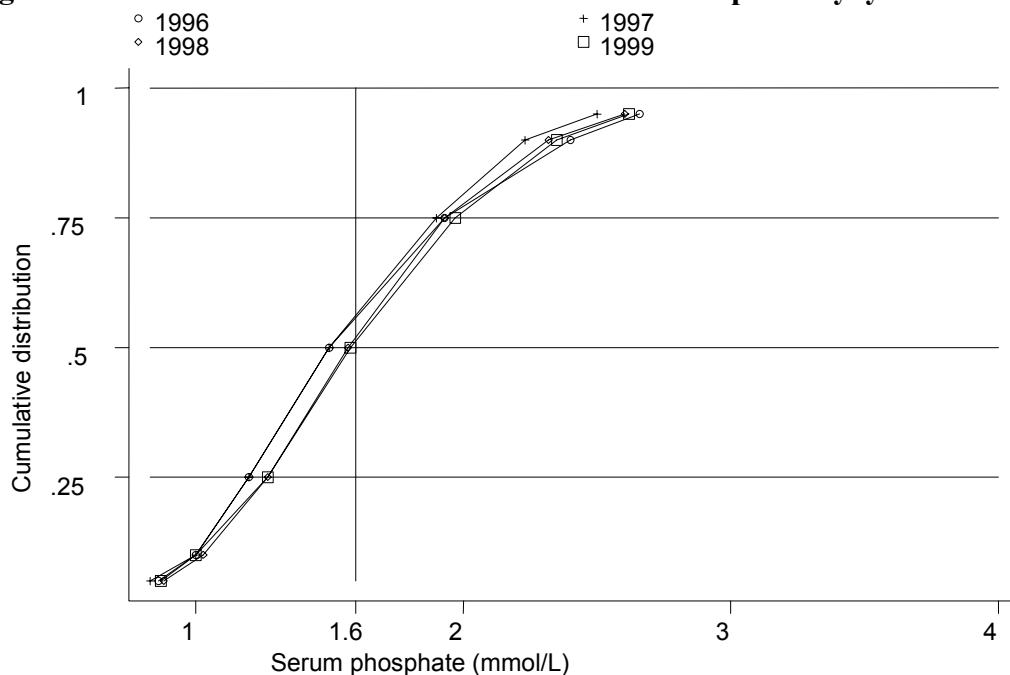


Table 4.30: Distribution of serum Calcium concentration (mmol/l), CAPD patients, Government Centres 1996 – 1999

year	No of subjects	No of observations	median	LQ	UQ	% patients ≥ 2.2 & ≤ 2.6 mmol/l
1996	359	1137	2.4	2.2	2.6	55
1997	472	1577	2.4	2.2	2.6	55
1998	539	1707	2.3	2.2	2.5	52
1999	594	1830	2.4	2.2	2.5	55

Figure 4.30: Cumulative distribution of Serum Calcium concentration by year

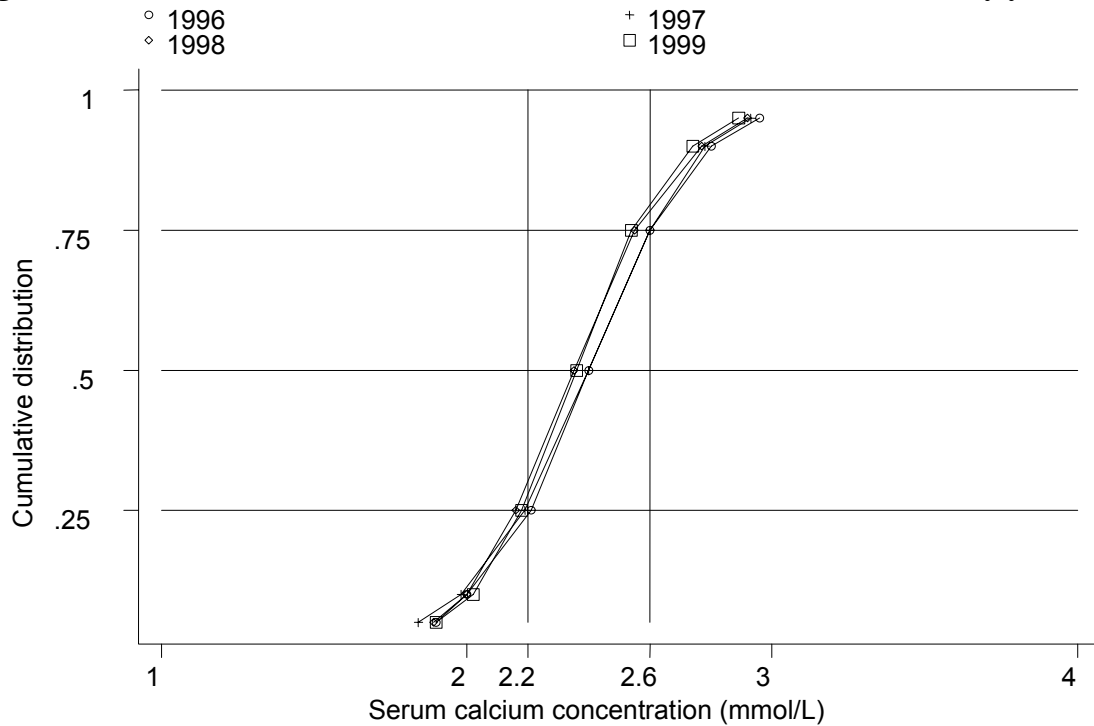
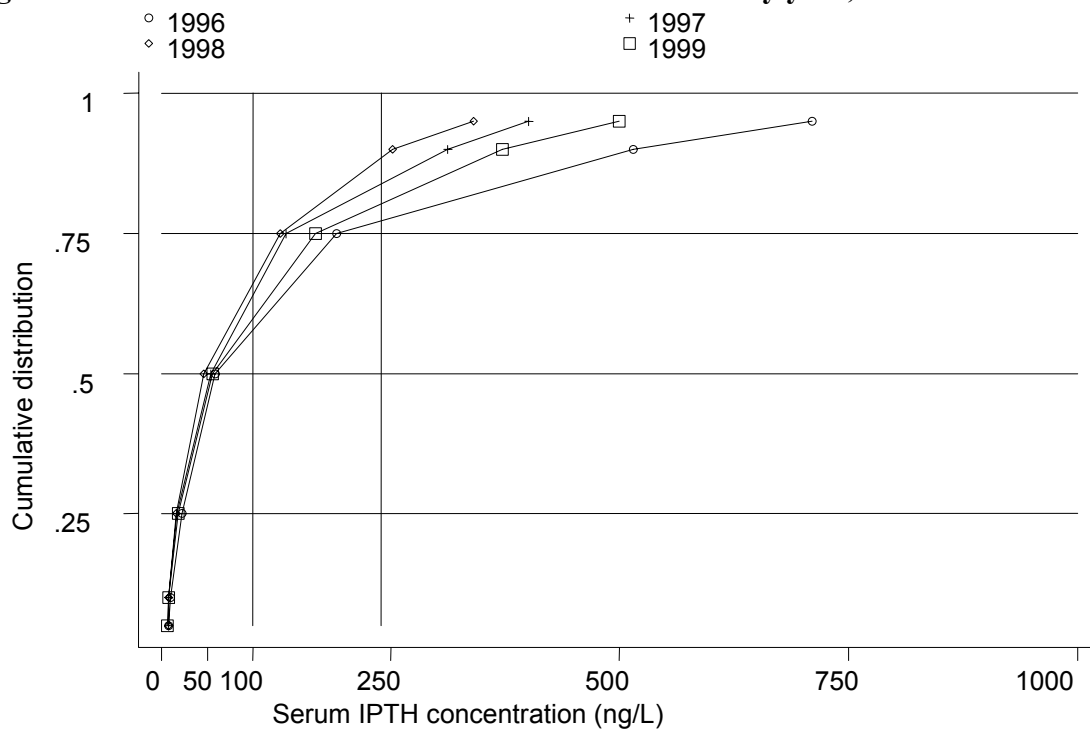


Table 4.31: Distribution of serum iPTH(ng/L) concentration, CAPD patients, Government Centres 1996 – 1999

year	No of subjects	No of observations	median	LQ	UQ	% patients ≥ 100 & ≤ 250 ng/l
1996	111	122	58.5	22	191	20
1997	293	428	53.5	17	136	19
1998	280	346	46	16	130	19
1999	365	482	56	18	168	17

Figure 4.31: Cumulative Distribution of serum iPTH by year,



4.11 MANAGEMENT OF BLOOD PRESSURE, GOVERNMENT CENTRES

Table 4.32: Treatment for hypertension, CAPD patients, Government Centres 1996 - 1999

year	No.	% on anti-hypertensives	% on 1 anti-hypertensives	% on 2 anti-hypertensives	% on 3 anti-hypertensives
1996	371	82	38	25	20
1997	477	83	32	33	18
1998	541	88	34	31	23
1999	610	82	30	33	19

Table 4.33: Distribution of Systolic BP without anti-hypertensives, CAPD patients, Government Centres 1996– 1999

year	No of subjects	No of observations	median	LQ	UQ	% patients < 160 mmHg
1996	66	516	123	110	140	88
1997	78	608	120	110	140	87
1998	63	491	120	110	145	86
1999	98	699	120	110	142	87

Figure 4.33: Cumulative Distribution of Systolic BP without anti-hypertensives by year

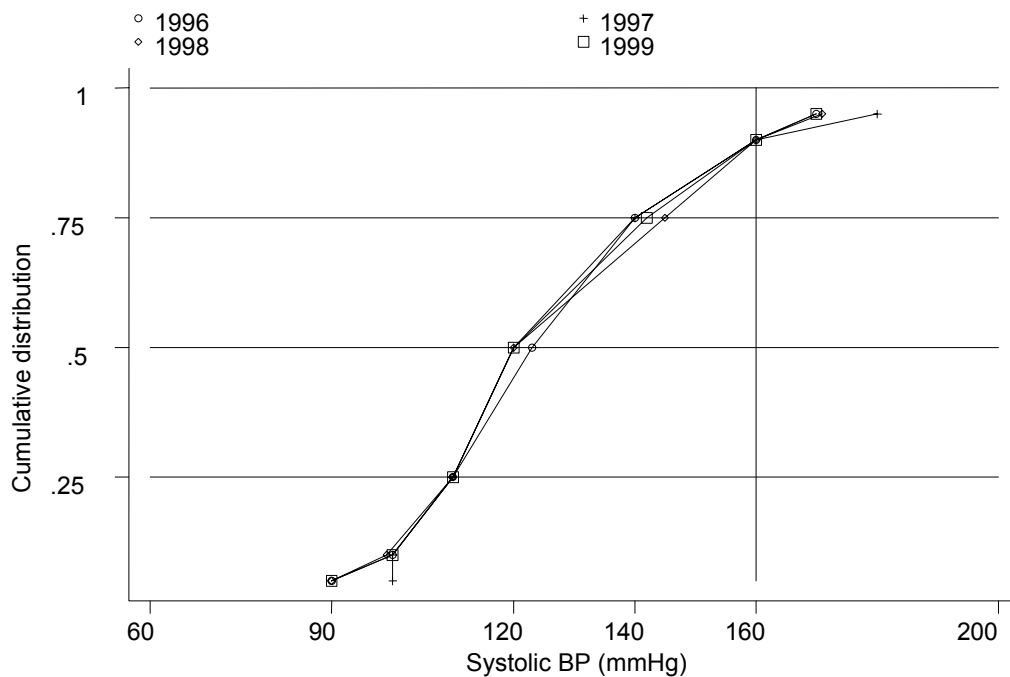


Table 4.34: Distribution of Diastolic BP without anti-hypertensives, CAPD patients, Government Centres 1996 – 1999

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 90 mmHg
1996	66	516	77	70	85.5	77
1997	78	606	80	70	90	73
1998	63	492	80	70	89	76
1999	98	700	76.5	67	87.5	76

Figure 4.34: Cumulative Distribution of Diastolic BP without anti-hypertensives by year

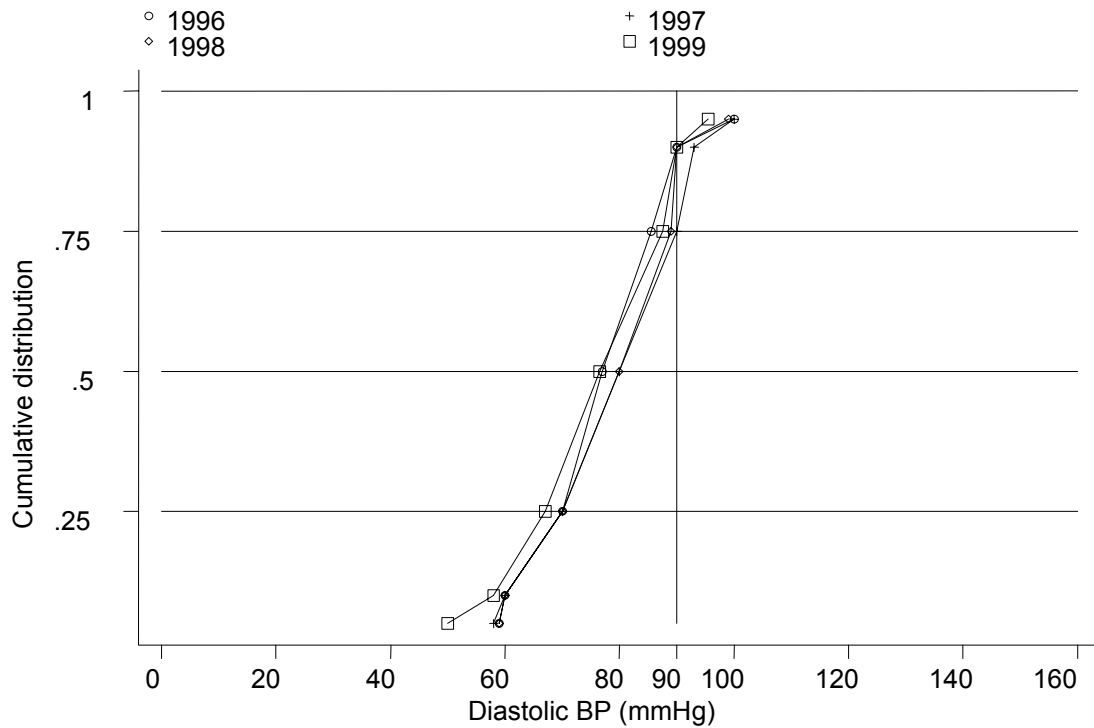


Table 4.35: Distribution of systolic BP on anti-hypertensives CAPD patients, Government Centres 1996 – 1999

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 160 mmHg
1996	292	2271	142	130	160	67
1997	391	3303	140	130	160	69
1998	456	3900	140	124	160	72
1999	478	3833	140	130	160	72

Table 4.35: Cumulative Distribution of systolic BP on anti-hypertensives, by year

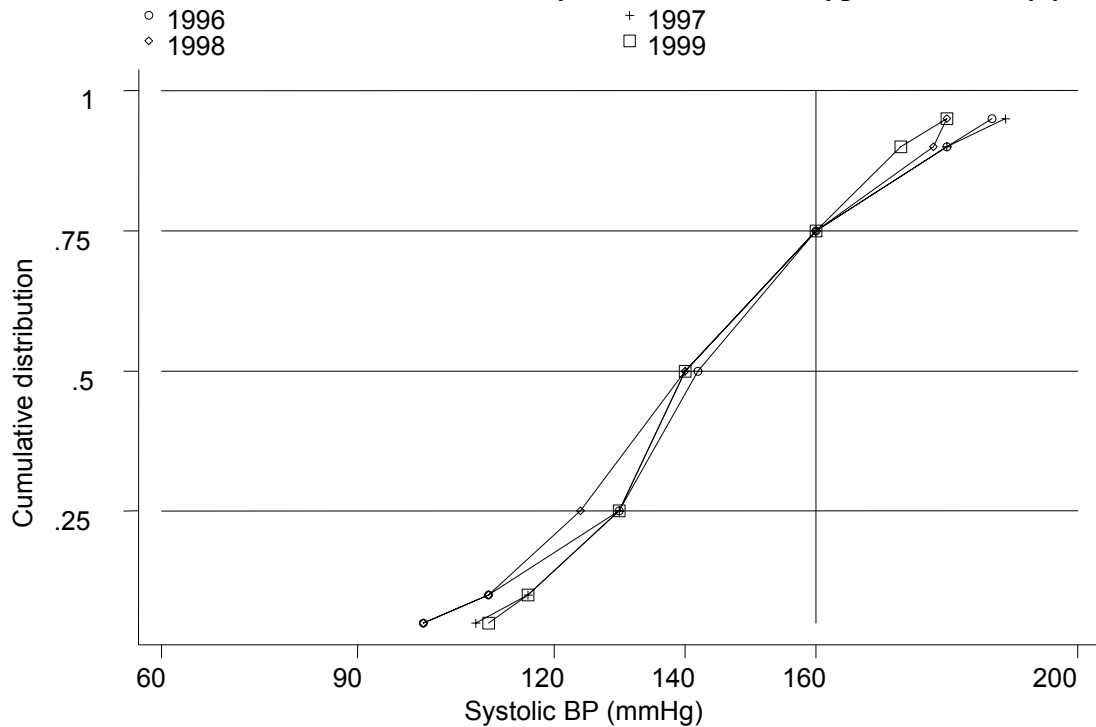
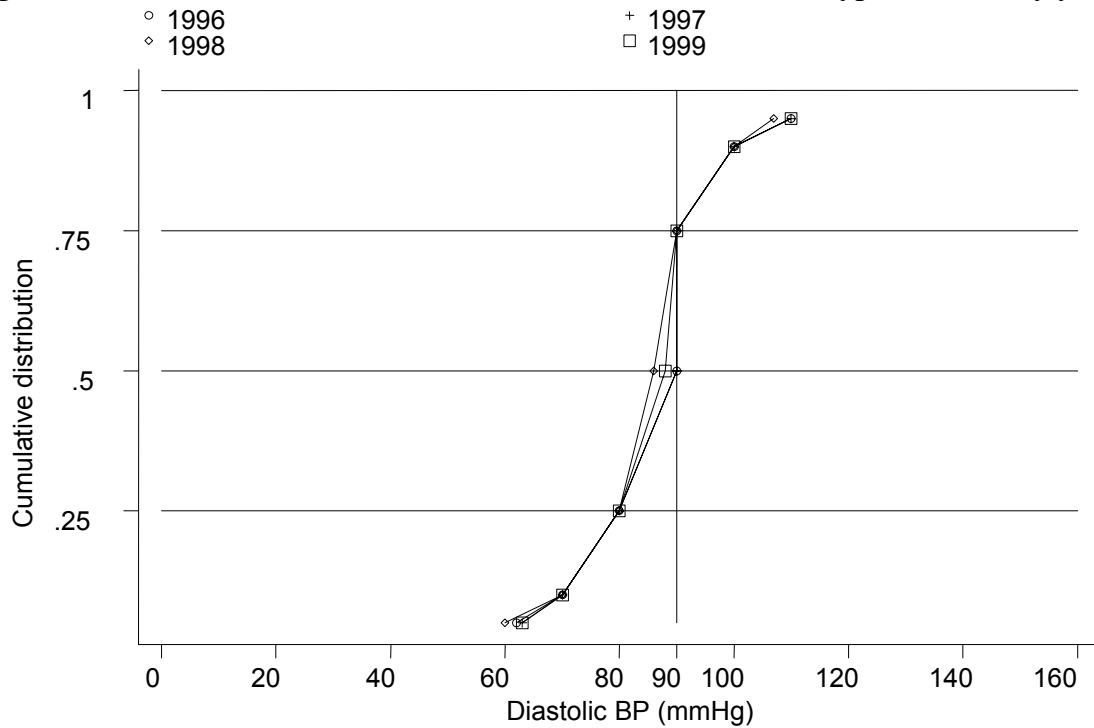


Table 4.36: Distribution of diastolic BP on anti-hypertensives, CAPD patients, Government Centres 1996 – 1999

year	No of subjects	No of observations	median	LQ	UQ	% patients < 90 mmHg
1996	292	2269	90	80	90	49
1997	390	3293	90	80	90	50
1998	456	3899	86	80	90	53
1999	478	3838	88	80	90	51

Figure 4.36: Cumulative Distribution of diastolic BP on anti-hypertensives by year



4.12 TREATMENT OF ANAEMIA, GOVERNMENT CAPD CENTRES

Table 4.37: Treatment for Anaemia, CAPD patients, Government Centres 1996 - 1999

year	No	% on rHuEpo	% received blood transfusion	% received oral iron	% received parenteral iron
1996	371	25	8	97	1
1997	477	37	12	96	3
1998	541	44	16	96	3
1999	610	44	14	94	0

Table 4.38: Distribution of rHuEpo dose per week, CAPD patients, Government Centres 1996 - 1999

Year	1996	1997	1998	1999
No. of patients	86	170	225	259
% on 2000 u/week	28	19	25	35
% on 2-4000 u/week	63	66	56	50
% on 4-6000 u/week	0	2	6	3
% on 6-8000 u/week	7	11	12	9
% on 8-12000 u/week	2	1	1	2
% on >12000 u/week	0	0	0	0

Table 4.39: Distribution of serum Iron concentration without rHuEpo, CAPD patients, Government Centres 1996 – 1999

year	No of subjects	No of observations	median	LQ	UQ	% patients > 10 umol/l
1996	246	633	13	9.5	19	68
1997	254	627	14	10	20	75
1998	190	446	15	11	24	76
1999	202	470	15	11	26	78

Figure 4.39: Cumulative Distribution of serum Iron without rHuEpo by year

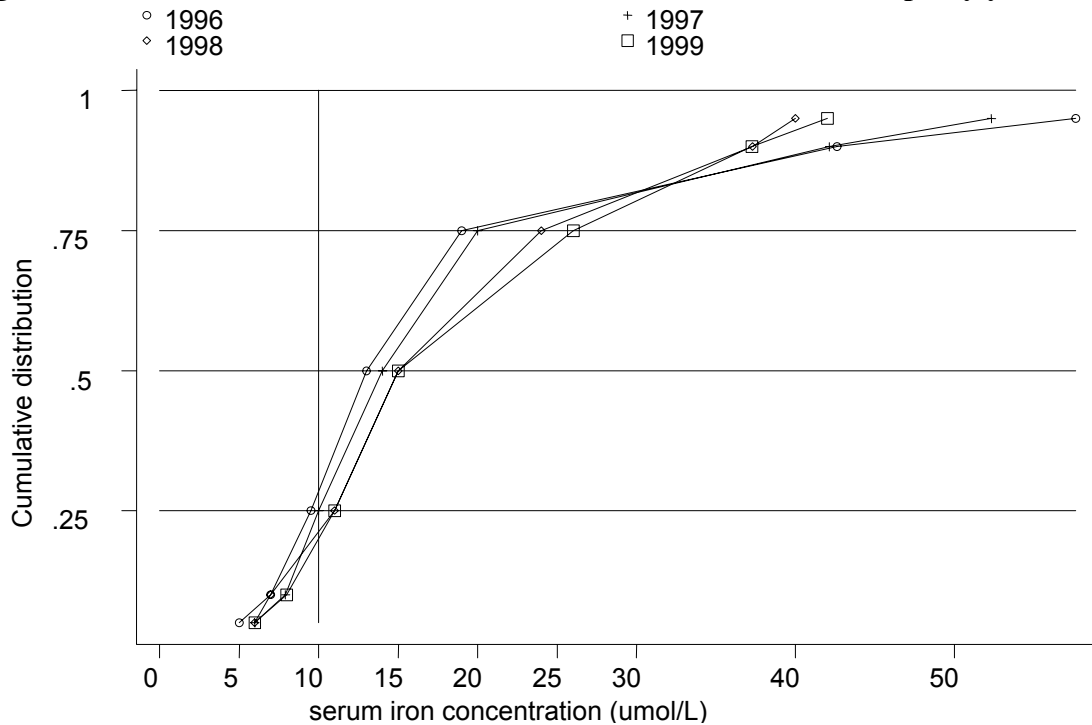


Table 4.40: Distribution of serum Iron concentration on rHuEpo, CAPD patients, Government Centres 1996 – 1999

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 10 umol/l
1996	89	277	15.1	10	31	74
1997	153	424	15	10	30.9	72
1998	113	323	16	11	30.3	79
1999	143	392	18	11	28	81

Figure 4.40: Cumulative Distribution of serum Iron concentration on rHuEpo, by year.

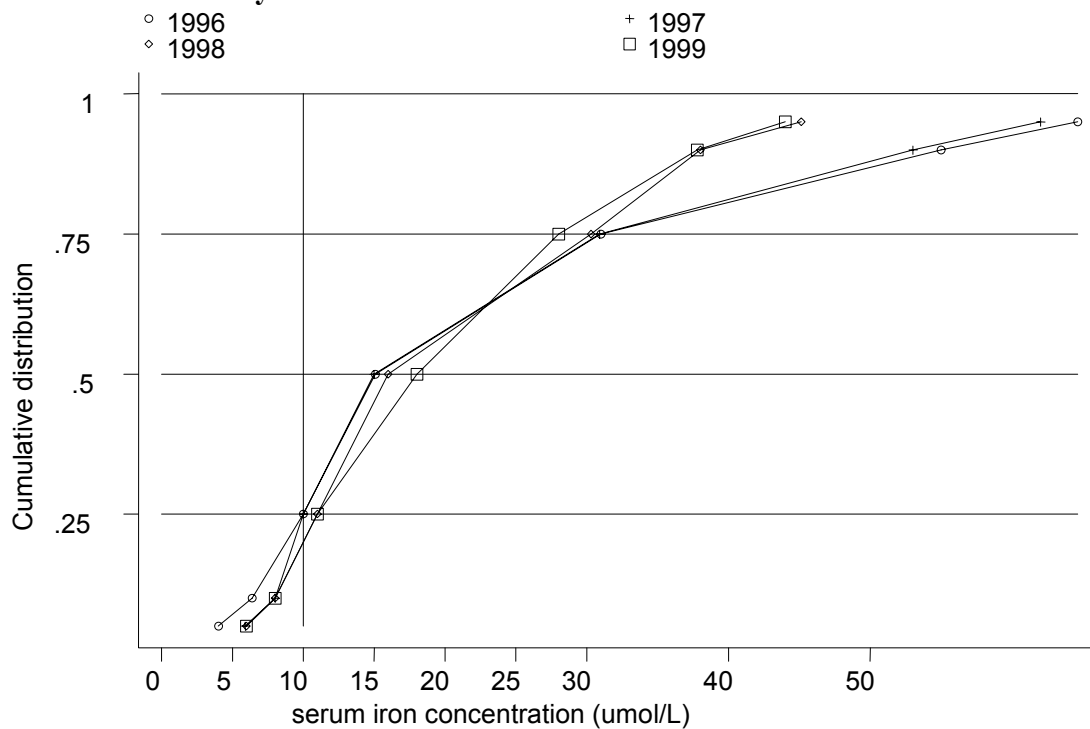


Table 4.41: Distribution of serum Transferrin Saturation without rHuEpo, CAPD patients, Government Centres 1996 – 1999

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 20%
1996	241	964	30.8	22.2	45	79
1997	246	984	33.3	21.8	47.8	80
1998	158	632	35.6	22.9	49.1	78
1999	134	536	34.2	23.3	45.1	85

Figure 4.41: Cumulative Distribution of serum Transferrin Saturation without rHuEpo by year

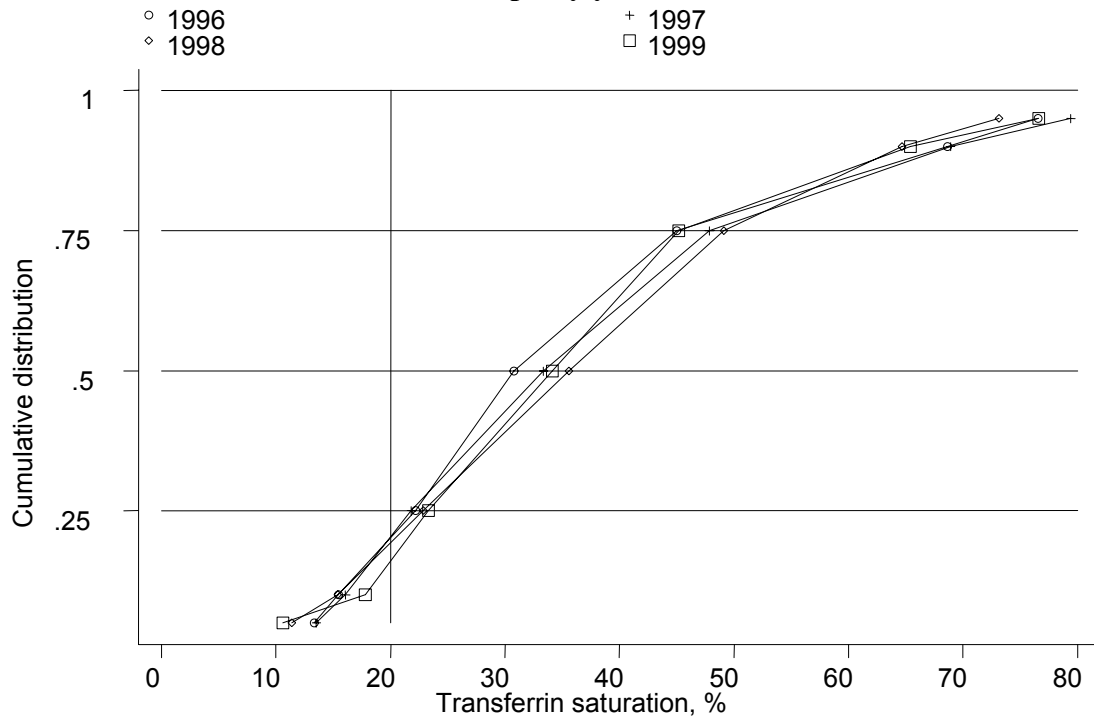


Table 4.42: Distribution of serum Transferrin Saturation on rHuEpo, CAPD patients, Government Centres 1996– 1999

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 20%
1996	84	336	35.3	24.7	63.2	89
1997	141	564	37.1	25	61.4	86
1998	103	412	39.3	28.1	55	88
1999	92	368	37.2	25.3	48.1	85

Figure 4.42: Cumulative Distribution of serum Transferrin Saturation on rHuEpo by year

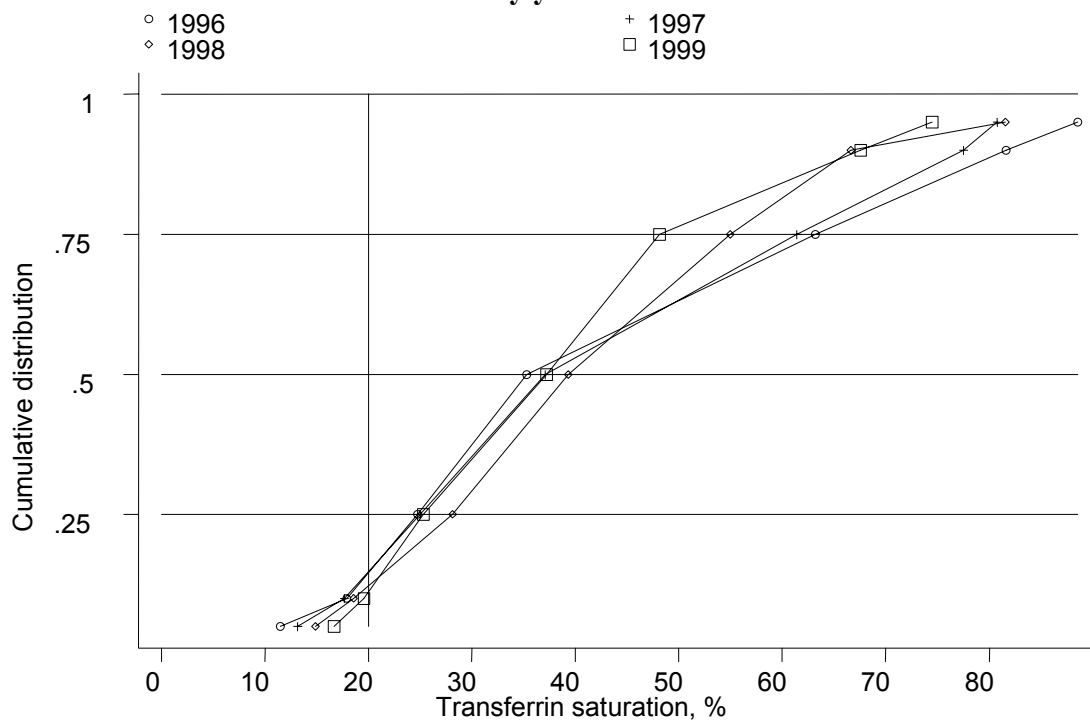


Table 4.43: Distribution of serum Ferritin without rHuEpo, CAPD patients, Government Centres 1996 – 1999

year	No of subjects	No of observations	median	LQ	UQ	% patients > 100 ug/l
1996	40	42	351	190	588	88
1997	133	193	407	217	749	86
1998	92	105	394	196	686	86
1999	124	154	482	259.7	729	93

Figure 4.43: Cumulative Distribution of serum Ferritin without rHuEpo by year

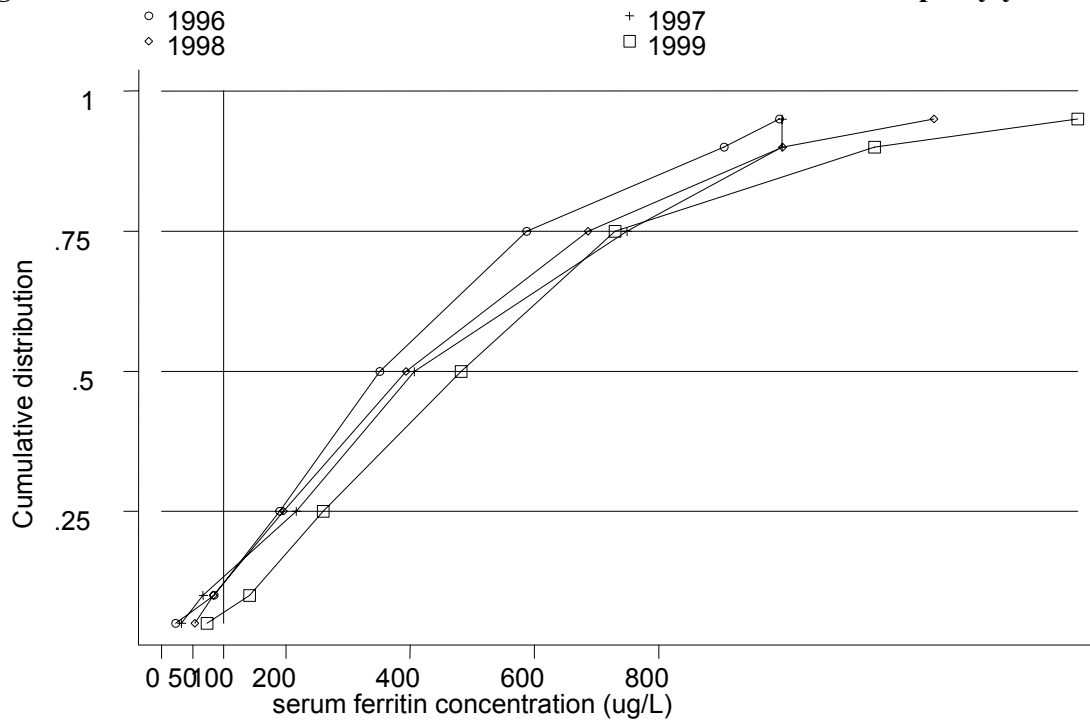


Table 4.44: Distribution of serum Ferritin concentration on rHuEpo, CAPD patients, Government Centres 1996 – 1999

year	No of subjects	No of observations	median	LQ	UQ	% patients > 100 ug/l
1996	49	73	655	383	999	95
1997	129	216	495.5	260	994	92
1998	135	185	518	246	851	92
1999	136	201	553.3	254	857.3	93

Figure 4.44: Cumulative Distribution of serum Ferritin concentration on rHuEpo, by year

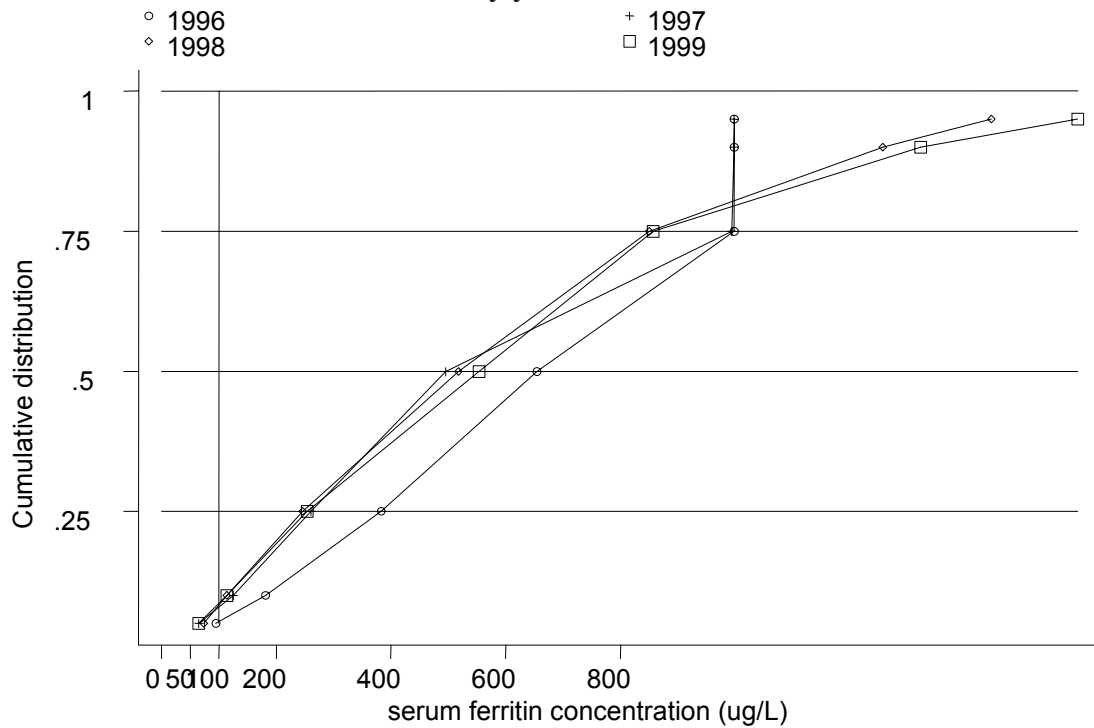


Table 4.45: Distribution of Haemoglobin concentration without rHuEpo, CAPD patients, Government Centres 1996 – 1999

year	No of subjects	No of observations	median	LQ	UQ	% patients <10 g/dl	% patients ≥ 10 & ≤ 12 g/dl	% patients >12 g/dl
1996	274	843	9.1	7.8	10.5	67	24	8
1997	298	981	9.1	8	10.4	67	26	7
1998	301	915	9.2	8	10.5	65	26	9
1999	336	967	9.4	8.3	10.7	61	32	7

Figure 4.45: Cumulative Distribution of haemoglobin concentration without rHuEpo by year

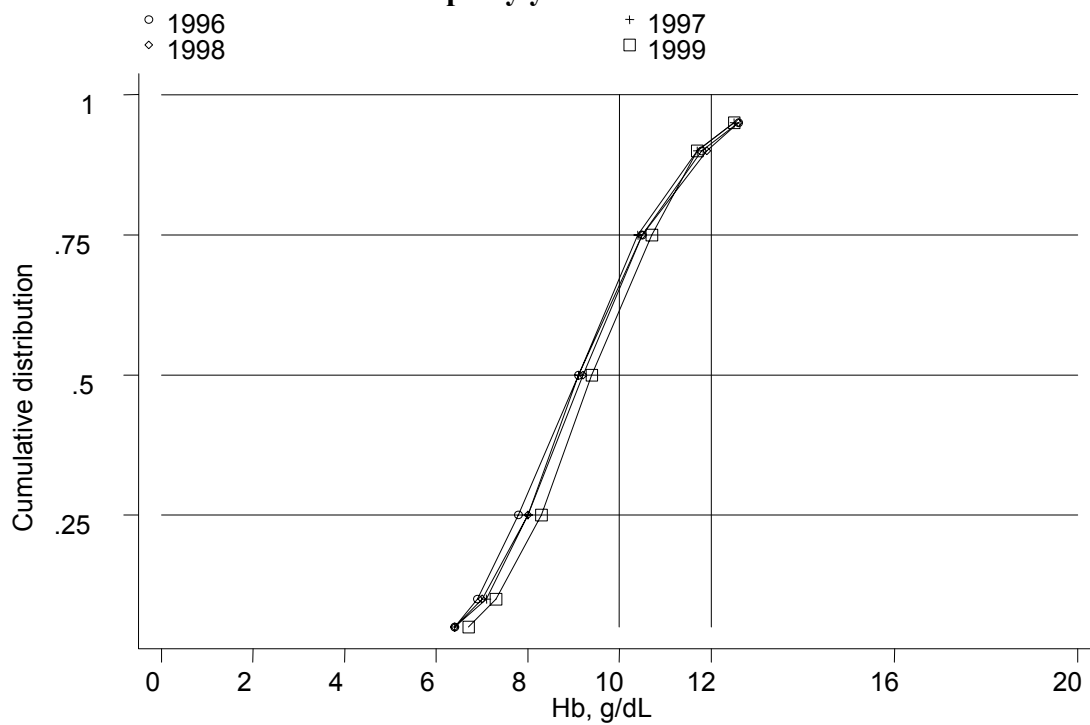
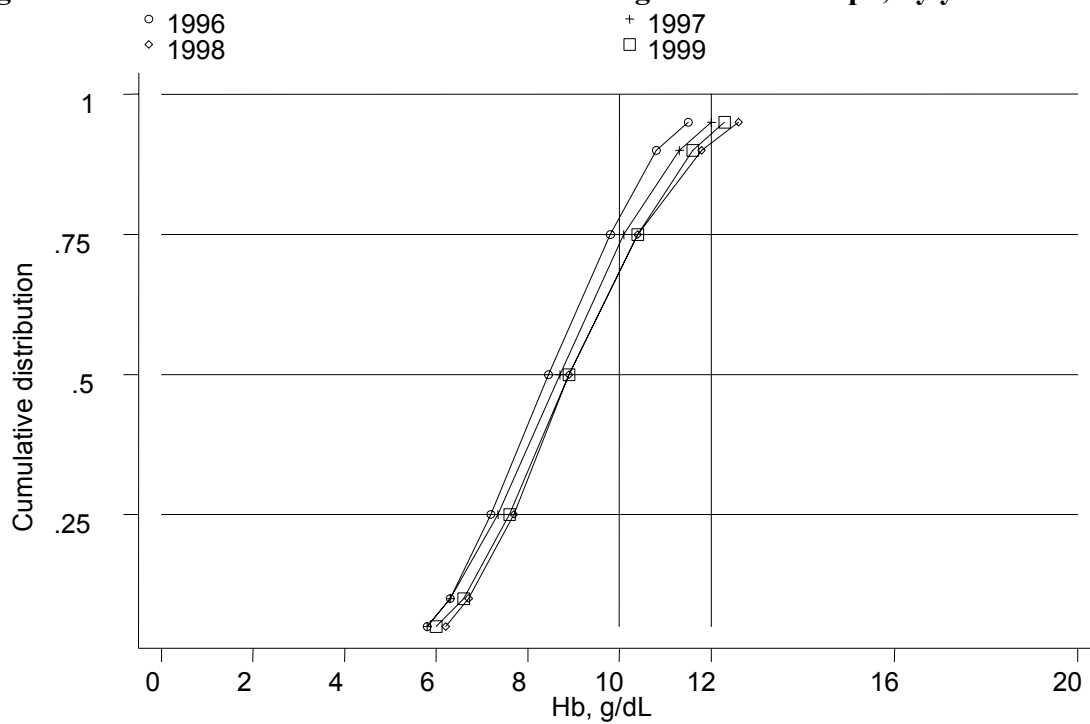


Table 4.46: Distribution of Haemoglobin concentration on rHuEpo, CAPD patients, Government Centres 1996 – 1999

year	No of subjects	No of observations	median	LQ	UQ	% patients <10 g/dl	% patients ≥ 10 & ≤ 12 g/dl	% patients >12 g/dl
1996	92	330	8.4	7.2	9.8	78	19	3
1997	175	652	8.7	7.3	10.1	73	22	5
1998	238	826	8.9	7.7	10.4	69	23	8
1999	262	906	8.9	7.6	10.4	69	25	6

Figure 4.46: Cumulative Distribution of Haemoglobin on rHuEpo, by year

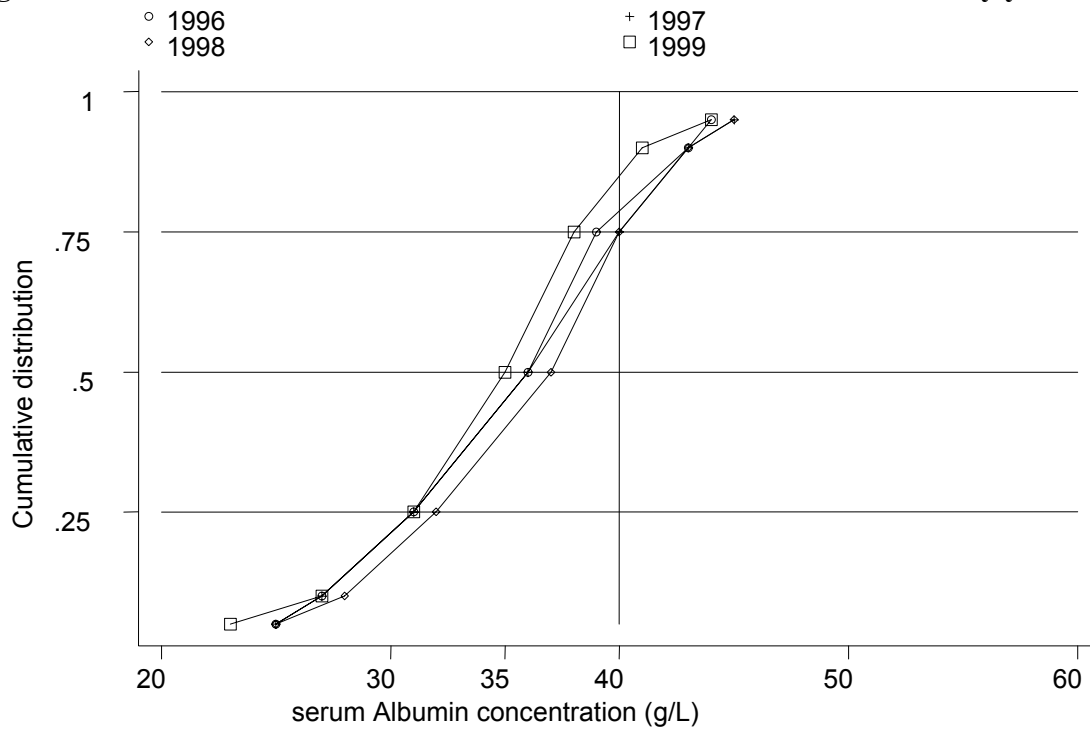


4.13 NUTRITIONAL STATUS OF CAPD PATIENTS, GOVERNMENT CENTRES

Table 4.47: Distribution of serum Albumin concentration(g/L), CAPD patients, Government Centres 1996 – 1999

year	No of subjects	No of observations	median	LQ	UQ	% patients >40g/l
1996	360	1134	36	31	39	24
1997	472	1572	36	31	40	28
1998	536	1692	37	32	40	29
1999	597	1872	35	31	38	18

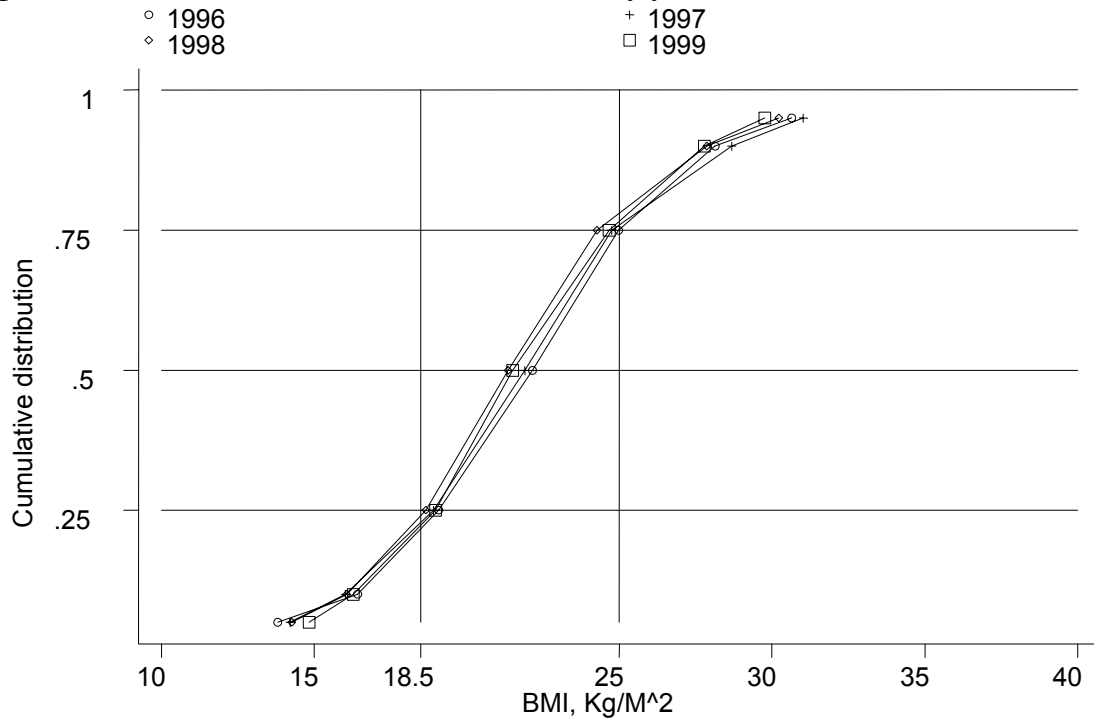
Figure 4.47: Cumulative Distribution of serum Albumin concentration by year



**Table 4.48: Distribution of Body Mass Index
CAPD patients, Government Centres 1996 – 1999**

year	No of subjects	No of observations	median	LQ	UQ	% patients <18.5	% patients ≥ 18.5 & ≤ 25	% patients >25
1996	281	2215	22.2	19.1	25	21	54	25
1997	419	3579	21.9	18.9	24.7	22	55	24
1998	489	4243	21.4	18.7	24.3	23	55	21
1999	550	4316	21.5	19	24.7	22	56	23

Figure 4.48: Cumulative Distribution of BMI by year



4.14 SEROLOGICAL STATUS, CAPD PATIENTS, GOVERNMENT CENTRES

Table 4.49: Prevalence of positive anti-HCV and HBsAg APD patients, Government Centres 1996 – 1999

year	No	% HBsAg positive	% anti-HCV positive
1996	371	4	6
1997	477	3	5
1998	541	3	6
1999	610	2	5

Figure 4.49: Prevalence of positive anti-HCV and HBsAg CAPD patients, Government Centres 1996 – 1999

