TENTH REPORT

OF

THE MALAYSIAN

DIALYSIS AND TRANSPLANT

REGISTRY

2002

edited by

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MX Services

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All who has supported in the Directory of Dialysis Centres in Malaysia 2003

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	Kluang Hospital
	Kota Tinggi Hospital
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	Pontian Hospital
	Segamat Hospital
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	Che Eng Khor Haemodialysis Centre
	JB Lion MAA-Medicare Charity Dialysis Centre
	Kluang Rotary Haemodialysis Centre
	Mersing Rotary Haemodialysis Centre
	Muar Lions Renal Centre
	Persatuan Membaiki Akhlak Che Luan Khor
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	Pathlab Dialysis Centre
	Premier Renal Care
	Pusat Dialisis Penawar
	Pusat Hemodialisis Darul Takzim
	Puteri Specialist Hospital
	Systemic Dialysis Centre

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	Kulim Hospital
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	Sik Hospital
	Sungai Petani Hospital
	Yan Hospital
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	Pertubuhan Bakti Fo En Bandar Kulim
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	Kuala Krai Hospital
	Pasir Mas Hospital
	Tanah Merah Hospital
	Universiti Sains Malaysia Hospital
NGO	KB Rotary-MAA Dialysis Centre
PRIVATE	Renal-Link, Kelantan

	MALACCA
GOVERNMENT	94 Hospital Angkatan Tentera, Terendak
	Melaka Hospital
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	PAHANG
GOVERNMENT	Jerantut Hospital
	Mentakab Hospital
	Raub Hospital
	Tengku Ampuan Afzan Hospital
NGO	Pahang Buddhist Association Haemodialysis Centre
PRIVATE	Kuantan Specialist Centre
	Pusat Hemodialisis Islam Makmur

	PERAK
GOVERNMENT	96 Hospital Angkatan Tentera, Lumut
	Seri Manjung Hospital
	Taiping Hospital
	Tanjung Malim Hospital
	Teluk Intan Hospital
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	Pusat Hemodialisis Manjung-NKF
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	Pusat Dialisis Taiping
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	Lam Wah Ee Hospital
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	Persatuan Buah Pinggang Sabah
	Rotary Club Tawau Tanjung Haemodialysis Centre
	Sandakan Kidney Society
PRIVATE	Sabah Medical Centre
	SARAWAK
GOVERNMENT	801 Rumah Sakit Angkatan Tentera, Kuching
	Bintulu Hospital
	Miri Hospital
	Sarawak General Hospital

	Sarikei Hospital
	Serian Hospital
	Sibu Hospital
	Sri Aman Hospital
NGO	CHKMUS-MAA Medical Charity Dialysis Centre
	KAS-Rotary/NKF Dialysis Centre
	Persatuan Bulan Sabit Merah Cawangan Miri
PRIVATE	Normah Medical Specialist Centre
	Sibu Kidney Foundation Haemodialysis Centre
	Timberland Medical Centre

SELANGOR

GOVERNMENT	819 Rumah Sakit Angkatan Tentera, TUDM
	95 Hospital Angkatan Tentera, Kinrara
	Banting Hospital
	Kajang Hospital
	Selayang Hospital
	Tanjung Karang Hospital
	Tengku Ampuan Rahimah Hospital
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	Haemodialysis Association Klang
	MAA-Medicare Charity Dialysis Centre, Kajang
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	S.P. Menon Dialysis Centre, Petaling Jaya
	Selangor Medical Centre
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	Sri Kota Medical Centre
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	Sunway Medical Centre
	TRENGGANU
GOVERNMENT	Besut Hospital
	Dungun Hospital
	Kemaman Hospital
	Kuala Terengganu Hospital
NGO	TDC-NKF Trengganu Dialysis Centre

National Renal Registry (NRR) Committee

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2002 to 2004

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INTRODUCTION

The National Renal Registry celebrated its 10th anniversary without any fanfare last year. The apprehension that was felt in the initial years regarding long-term viability of the registry gave way to a sense of confidence that we can meet the challenge and manage a registry successfully. The Registry continues to develop, thanks to all the Nephrologists in the country as well as their staff who undertook the arduous task of collecting and sending data. The NRR committee decided last year that in the interest of greater efficiency and lower operational costs the running of the registry be placed under the National Disease and Registry Units of the Clinical Research Centre of the Ministry of Health. The unit which also manages five other registries has a good IT infrastructure and state of the art data security system. The pooling of human and IT resources not only lower operational costs but also optimizes the use of expensive technology.

The Registry must continue to be sensitive to the needs of its subscribers and look into providing information on any new interests that its data can generate. With the imminent introduction of National Health Financing System more detailed data on the financing of dialysis treatment may be required.

The tenth report for the year 2002 saw a drop in the dialysis acceptance rate to 71 per million population. This was due to the decrease in the intake of hemodialysis patients in all the three sectors. The economic climate must have affected the growth in the private and NGO sectors. The Ministry of Health has an ongoing program of opening new centers in the smaller district hospitals. However operational delays may have affected patient intake. In general the dialysis and transplant activities in the country has remained stable and parameters looking at standards of care have shown improvements in general.

There is a need to develop CAPD further. Hemodialysis units are finding it difficult to recruit staff. In the MOH hospitals there are space constraints in developing Hemodialysis units. An expanded CAPD program may address some of these constraints. Current limitations in the use of CAPD include the cost of the treatment.

Finally a concerted effort by primary care physicians, Public Health Departments and other interested parties including NGOs must be made to address the “epidemic” of Diabetes Mellitus. Forty seven percent of all new patients taken in for RRT in 2002 had ESRD due to diabetes. There has to be better control of diabetes and hypertension if any headway is to be made in this direction.

I once again thank all the data contributors and hope we have thus far met the expectations of all parties who use the report from the registry.

Dr Sake Mora Mohammad Zither
Chairman
National Renal Registry.

REPORT SUMMARY

1 ALL RENAL REPLACEMENT THERAPIES

1.1 At 31st December 2002, 9812 patients were on renal replacement therapy, comprising 8418 on dialysis and 1394 with functioning transplants. 1734 new dialysis patients were accepted in 2002.

1.2 The new renal transplant rate was 5 per million population. The overall dialysis acceptance rate decreased to 71 per million population. This reduction was contributed by the decrease in intake of new hemodialysis patients into all three sectors which is not compensated by an increase in CAPD intake. Dialysis prevalence rate however increased to 343 per million population.

2 DIALYSIS IN MALAYSIA

2.1 Dialysis acceptance rate by state ranged from 120 per million state population for Johor to 33 per million per state population in Sabah.

By age group, dialysis acceptance rate ranged between a stable rate of 4 per million child population to 387 per million population for age group 55 to 64 years. Dialysis provision rate for patients older than 65 years was 356 per million population for age.

2.2 Males made up 55% of all new dialysis patients

2.3 Centre Haemodialysis (HD) accounted for 81% of new dialysis acceptance in 2002, 1% in office and very few into home HD. Acceptance into the CAPD programme continued to show increasing trend at 18%.

2.4 One third of new dialysis patients had unknown primary disease. Nearly half of new dialysis patients (47%) had ESRD due to diabetic nephropathy. Chronic glomerulonephritis was only found in 7% of the new dialysis patients.

2.5 Overall death rate on dialysis was 10%; HD death rate was 9%, and CAPD death rate was at 14%. 39% of deaths on dialysis were attributed to cardiovascular causes and 15% to sepsis unrelated to peritonitis. 22% died at home.

2.6 ***Centre survey 2002***: *This survey was again conducted at the end of 2002 to provide up-to-date information on dialysis-patient and centre census in Malaysia. Note that the total number of dialysis patients in this survey differs from that reported to the registry which depends on individual patient reporting from all centres.*

There were a total of 8708 dialysis patients in Malaysia giving a dialysis treatment rate of 360 per million population (pmp). Dialysis treatment rate

from individual patient reporting had given a rate of 343 pmp.

There were a total of 223 centres, an increase of 4 centres from the previous year with a total of 2680 dialysis machines.

By state, dialysis treatment rate ranged from 95 per million state population in Sabah to 675 pmp in Melaka. HD capacity to patient ratio ranged from 1.44 in Sabah to 1.91 in Penang.

Private dialysis centres remained at 74 centers. There were 72 NGO centers - an increase of 11 centres from the previous year and 65 MOH centers. HD capacity for NGO, private and MOH centres were 5035, 4195 and 3725 respectively. There were a total of 3069 patients dialysing in NGO centers, 2596 in private centers and 2873 in MOH centers. Centre HD capacity to patient ratio ranged from 1.51 in MOH centers to 1.98 in centres managed by the armed forces.

3 HAEMODIALYSIS

3.1 Haemodialysis in Government Centres

3.1.1 At 31st December 2002, 450 new patients were accepted into government HD centers. There were 2602 prevalent patients dialysing in government centres.

3.1.2 96% of new patients were accepted into centre HD, 1% into home HD and 2% into office HD. 99% of new patients were funded by the government.

3.1.3 Death rate stood at 10% per year. Cardiovascular disorders, infections and deaths at home were the 3 commonest causes of death at 35%, 21% and 21% respectively

3.1.4 In 2002, there were a total of 77 government HD centres, 8 run by Ministry of Defence, 3 university hospital centres and the rest under the Ministry of Health.

3.1.5 New HD patients in 2002: Modal age-group 55 – 64 years; 58% males, 39% were diabetics, 4% had HBsAg, and 3% had anti-HCV antibodies.

3.1.6 HD patient and technique survival in government centres at 6 months for 2002 were 92% and 89% respectively.

3.1.7 Overall, 42% of HD patients were able to work part or full time. 67% had normal quality of life index.

3.1.8 ***Haemodialysis Practices***: In 2002, 75% were dialysed via wrist AVF, 20% via brachiocephalic fistula. 93% reported no difficulties with their vascular access; only 14% had vascular access complications. Proportion of patients with higher blood flow rates of 300-349 increased from 20% in 1999 to 41% in 2002. Almost all were on thrice-weekly dialysis, 98% on 4 hours per session. Use of cellulosic membrane dialysers decreased further to 14% and synthetic membrane dialyser usage increased to 79%. 99% reuse dialysers - 51% reused their dialysers 12 times or more. Usage of bicarbonate buffer increased to 97%. Median prescribed KT/V decreased to 1.4; and 67% achieved a KT/V of more than 1.3.

3.1.9 ***Dyslipidaemia in haemodialysis patients***: This has remained mostly unchanged over the years. In 2002, 68% of HD patients had serum cholesterol concentration < 5.3 mmol/l with median at 4.9 mmol/l. 88% had serum triglyceride concentration <3.5 mmol/l with median at 1.7 mmol/l; 96% had serum LDL concentration <5 mmol/l with median at 2.9 mmol/l; and 93% had serum HDL concentration of < 2 mmol/l with median at 1.1 mmol/l.

3.1.10 ***Renal bone disease***: In 2002, 92% of patients were on oral calcium carbonate, only 5% were on aluminium hydroxide. Use of vitamin D remained at 24%. 34% achieved serum phosphate concentration <1.6 mmol/l; 55% had serum calcium concentration between 2.2-2.6 mmol/l, and 24% with iPTH

between 100–250 ng/l. Median PTH concentration increased to 125 ng/L.

3.1.11 ***Blood pressure control***: This too has remained fairly constant over the years. In 2002, 67% required anti-hypertensive therapy. Of these, 61% achieved systolic blood pressure(BP) < 160 mmHg, and 64% a diastolic BP< 90 mmHg. Of the 33% not on anti-hypertensive therapy, 83% had systolic BP < 160 mmHg and 80% diastolic BP < 90 mmHg.

3.1.12 ***Management of anaemia****:* In 2002, 89% of patients were on oral iron supplements. Intravenous iron usage has increased to 11%. 66% of HD patients were on recombinant erythropoietin with 56% on 2000-4000 units weekly. 80% of those without erythropoietin and 77% on erythropoietin injections had transferring saturation > 20%. 80% of patients without erythropoietin and 90% of those on erythropoietin supplements had serum ferritin > 100 ng/l. 10% of patients on erythropoietin injections had haemoglobin concentration >12 g/dL, 33% with haemoglobin concentration between 10 and 12g/dL. 51% of those not on erythropoietin therapy had haemoglobin concentration <10 g/dL.

3.1.13 ***Nutritional status:*** 57% of HD patients had serum albumin > 40 g/l with 59% with body mass index of between 18.5 and 25kg/m^2.

3.1.14 ***Anti-HCV and HBsAg status***: In 2002, proportion of patients with anti-HCV antibodies decreased to 23%. Proportion with HbsAg was 5%.

3.2 Haemodialysis in Non-Governmental Organisation (NGO) Centres

3.2.1 At 31st December 2002, 2932 patients were on HD in centres managed by NGOs. 516 new patients were accepted for HD in 2002 compared to 695 in 2001.

3.2.3 Death rate in NGO HD centres was 8% in 2002. Cardiovascular disorders, deaths at home, and infections were the 3 commonest causes of death at 41%, 17% and 14% respectively.

3.2.4 In 2002, there were a total of 69 NGO dialysis centres.

3.2.5 New HD patients in 2002: Modal age-group 55-64 years; 51% were males, more than half (54%) were diabetics, 3% had HBsAg and 2% had anti-HCV antibodies.

3.2.6 HD patient and technique survival in NGO centres at 6 months for 2002 were similar at 97%

3.2.7 Overall, 28% of HD patients were able to work part or full time, 27% were homemakers and 8% pensioners. 55% had normal quality of life index.

3.2.8 ***Haemodialysis Practices***: In 2002, 83% were dialysed via wrist AVF, 14% via brachiocephalic fistulae. 93% reported no difficulties with their vascular access; only 10% had vascular access complications. 58% had blood flow rates between 250 and 299 ml/min, 97% were on thrice-weekly and 3% on

twice weekly HD. 99% had HD for 4 hours per session. Synthetic membrane usage increased to 52% in 2002. 95% reused dialysers - 76% reused their dialysers at least six times, and 13% more than 11 times. Usage of bicarbonate buffer was 100%. Median prescribed Kt/V was 1.5; 79% had Kt/V more than 1.3.

3.2.9 ***Dyslipidaemia in haemodialysis patients***: In 2002, 67% of HD patients had serum cholesterol concentration < 5.3 mmol/l with median at 4.9 mmol/l. 85% had serum triglyceride concentration <3.5 mmol/l with median at 1.7 mmol/l. 96% had serum LDL < 5 mmol/L.

3.2.10 ***Renal bone disease***: In 2002, 93% of HD patients were on oral calcium carbonate, only 1% were on aluminium hydroxide. Proportion on active vitamin D supplements was 22%. 33% achieved serum phosphate concentration <1.6 mmol/l; 58% had serum calcium concentration between 2.2 and 2.6 mmol/l and only 13% with iPTH between 100 – 250 ng/l. Median PTH concentration was 28.6 ng/L.

3.2.11 ***Blood pressure control***: In 2002, 66% required anti-hypertensive therapy. Of these, 57% achieved systolic BP < 160 mmHg, and 68% diastolic BP < 90 mmHg. Of the 34% not on any anti-hypertensive therapy, 78% had systolic BP <160 mmHg and 81% diastolic BP < 90 mmHg.

3.2.12 ***Management of anaemia****:* In 2002, 68% were on recombinant erythropoietin with 48% on 2000 units weekly and 44% on 2000 – 4000 units weekly. 66% on erythropoietin injections had transferring saturation >20%. 90% of those on erythropoietin had serum ferritin of > 100 ug/l. 38% of patients on erythropoietin had haemoglobin concentration >10 g/dL with 8% with haemoglobin concentration >12 g/dL.

3.2.13 ***Nutritional status:*** The proportion of patients with serum albumin concentration of >40 g/l was 40% in 2002. 60% had body mass index of between 18.5 and 25 kg/m^2.

3.2.14 ***Anti-HCV and HBsAg status***: In 2002, a lower proportion (16%) of patients had anti-HCV antibodies, 6% were positive for HBsAg.

3.3 Haemodialysis In Private Centres

3.3.1 At 31st December 2002, 1990 patients were dialysing in private dialysis centres. 470 new patients were accepted for HD in private centers compared to 515 in 2000 and 500 in 2001.

3.3.3 Death rate in private centres was 9% in 2002. Cardiovascular disorders, deaths at home and sepsis were the 3 commonest causes of death at 47%, 28% and 7% each respectively.

3.3.5 New HD patients in 2002: Modal age-group $\geq$ 55 years; 57% were males, 54% were diabetics, 3% had HBsAg, and 3% had anti-HCV antibody

3.3.6 HD patient survival and technique survival in private centres at 6 months for

2002 were similar at 97%.

3.3.7 In 2002, 25% were able to work full or part time, 23% were homemakers. 15% were retirees and 18% were older than 65 years. 56% had a normal quality of life.

3.3.8 ***Haemodialysis Practices***: In 2002, 75% were dialysed via wrist AVF, 18% via brachiocephalic fistula. 88% reported no difficulties with their vascular access; only 14% had vascular access complications. 76% had blood flow rates between 200 and 299 ml/min. Only 74% were on thrice-weekly dialysis, 25% had twice weekly dialysis. 93% had 4 hours per HD session, 7% 4.5-5 hours. Use of synthetic membranes increased to 42%. 6% did not reuse dialysers, 57% reused their dialysers at least six times. Usage of bicarbonate buffer was 94%. Median prescribed KT/V was 1.5; 72% had KT/V more than 1.3.

3.3.9 ***Dyslipidaemia in haemodialysis patients***: In 2002, 71% of HD patients had serum cholesterol concentration < 5.3 mmol/l with median at 4.8 mmol/l. 89% had serum triglyceride concentration <3.5 mmol/l with median at 1.9mmol/l. 98% had serum LDL < 5 mmol/L

3.3.10 ***Renal bone disease***: In 2002, 89% of HD patients were on oral calcium carbonate, only 2% were on aluminium hydroxide and 23% on active vitamin D supplements. 32% achieved serum phosphate concentration <1.6 mmol/l; 57% had serum calcium concentration between 2.2 and 2.6 mmol/l and 17% with iPTH between 100 – 250 ng/l with median at 66.3 ng/L.

3.3.11 ***Blood pressure control***: In 2002, 67% required anti-hypertensive therapy. Of these, 52% achieved systolic BP < 160 mmHg, and 62% diastolic BP < 90 mmHg.

3.3.12 ***Management of anaemia****:* In 2002, 68% were on recombinant erythropoietin with 33% on 2000 units weekly and 56% on 2000 – 4000 units weekly. 45% of patients on erythropoietin had haemoglobin concentration >10 g/dL with 10% with haemoglobin concentration $\geq$12 g/dL. 17% still received blood transfusion.

3.3.13 ***Nutritional status:*** Proportion of patients with serum albumin concentration of >40 g/l was 35% in 2002. 61% had body mass index of between 18.5 and 25 kg/m^2 .

3.3.14 ***Anti-HCV and HBsAg status***: More HD patients were anti-HCV positive over the years unlike those dialysed in NGO and governement centres. In 2002, 26% of patients had anti-HCV antibodies, 3% were positive for HbsAg.

4. CONTINUOUS AMBULATORY PERITONEAL DIALYSIS (CAPD)

4.1 At 31st December 2002, 894 patients were on CAPD. Intake of new CAPD patients was highest at 298 of which 84% were funded by the government.

4.3 In 2002, death rate on CAPD was 14%; transfer to HD 10%. Cardiovascular disorders, death at home and sepsis were the main causes of death accounting for 35%, 28% and 17% respectively. CAPD peritonitis accounted for 8% of deaths. The main cause of transfer was peritonitis at 36%.

4.4 There were 16 government CAPD centers, one NGO and two private CAPD centers.

4.5 New CAPD patients in 2002: Modal age-group 45-54 years; 52% males, 40% were diabetics, 3% had HBsAg, 1% were anti-HCV antibody positive.

4.6 CAPD patient survival was 94% and technique survival was 91% at 6 months for year 2002.

4.7 Overall, 22% of CAPD patients were able to work part or full time. 33% were homemakers and 14% full time students. 71% had normal quality of life index.

4.8 ***CAPD Practices***: In 2002, 99% were on standard CAPD dialysis regime; 86% used the Baxter disconnect system; 11% on a disconnect system by Braun. 95% had 4 exchanges per day and 94% were on 2-litre exchanges

4.9 ***Dyslipidaemia in CAPD patients***: In 2002, 50% of CAPD patients had serum cholesterol concentration < 5.3 mmol/l with median at 5.5 mmol/l. 80% had serum triglyceride concentration <3.5 mmol/l with median at 1.9 mmol/l. 91% had serum LDL concentration of < 5 mmol/L.

4.10 ***Renal bone disease***: In 2002, 80% of CAPD patients were on oral calcium carbonate, only 1% were on aluminium hydroxide and 15% on active vitamin D supplements. 58% achieved serum phosphate concentration <1.6 mmol/l; 58% had serum calcium concentration between 2.2 and 2.6 mmol/l and 23% with iPTH between 100 – 250 ng/l. Median PTH values had increased to 82 ng/L.

4.11 ***Blood pressure control***: In 2002, 81% of CAPD patients required anti-hypertensive therapy. Of these, 76% achieved systolic BP <160 mmHg, and 59% diastolic blood pressure <90 mmHg. Of the 29% not on anti-hypertensive therapy, 91% had systolic BP < 160 mmHg and 79% a diastolic BP <90 mmHg.

4.12 ***Management of anaemia****:* In 2002, 49% of patients on CAPD were on recombinant erythropoietin with 52% on 2000-4000 units weekly and 30% on 2000 units weekly. 11% still received blood transfusions. Only 2% received parenteral iron therapy. 88% of patients on erythropoietin injections had transferring saturation >20%. 92% of all CAPD patients had serum ferritin concentration > 100 ng/l. 53% of CAPD patients not on erythropoietin had

haemoglobin concentration <10 g/l. Of those on erythropoietin therapy, 38% had haemoglobin concentration >10 g/dL with 10% > 12 g/dL.

4.13 ***Nutritional status:*** Only 16% of CAPD patients had serum albumin >40 g/l compared to 58% of government HD patients. 48% had body mass index of between 18.5 and 25 kg/m^2. 31% had body mass index >25 kg/m^2.

4.14 ***Anti-HCV and HBsAg status***: The HbsAg and anti-HCV status of CAPD patients were constant over the years at 2-3% and 3-5% respectively.

5. RENAL TRANSPLANTATION

5.1 At 31st December 2002, there were 1394 functioning renal transplants, and 132 new renal transplant recipients.

5.2 There were 35 renal transplantations done locally in Malaysia in 2002. There were 76 renal transplantation from so-called cadaveric donors and 10 from commercial live donors done overseas.

5.3 In 2002, 19 (1%) of transplant recipients died and 32 (3%) lost their grafts. Cardiovascular diseases and sepsis and were the commonest causes of death accounting for 26% and 16% respectively. Rejection accounted for 59% of graft loss.

5.4 There were 46 centres of follow-up for renal transplant recipients.

5.5 Modal age group for new transplant recipients in 2002 was 35-44 years; 45% were males, 16% diabetics; 6% were HBsAg positive and none had anti-HCV antibodies at the time of transplantation.

5.6 Six month patient survival in 2002 was 96% and graft survival was 95%.

5.7 Overall, 67% of transplant recipients were able to work part or full time, and 17% were homemakers. 95% had normal quality of life index.

METHODS

1. COVERAGE

There were 223 haemodialysis centers and 20 centres with active CAPD services in Malaysia as of December 2002, of which 230 reported data to the Registry. Thus, centre coverage is now to 94.6%. We assessed completeness of patient ascertainment by comparing the number of patients registered on the Registry patient database at end of year 2002 and patient census data obtained independently from the annual centre survey in December 2002. Based on the patient prevalence estimates calculated from these 2 independent sources of data (343 versus 374 patients/million population), we estimated the patient ascertainment rate by the Registry to be 91%.

2. STATISTICAL ANALYSIS

Kaplan Meier method[1] was used to estimate probability of survival and log rank test used to compare survival function. Technique failure is defined as occurrence of death or transfer to another modality of dialysis. Similarly, graft failure is defined as occurrence of death or returned to dialysis.

Annual death rates were calculated by dividing the number of deaths in a year by the estimated mid-year patient population.

For summarizing continuous laboratory data, we have moved away from calculating summary statistics like mean, standard deviation and instead plot the cumulative frequency distribution graph. We are following the approach used by the UK Renal Registry[2]. Cumulative distribution plot shows a listing of the sample values of a variable on the X axis and the proportion of the observations less than or greater than each value on the Y axis. An accompanying table gives the Median (50% of values are above or below it), upper quartile (UQ, 25% of values above and 75% below it) and lower quartile (LQ, 75% of values above and 25% below it). Other percentiles can be read directly off the cumulative distribution plot. The table also shows percent of observations above or below a target value, or with an interval of values; the target value or interval obviously vary with the type of laboratory data.. For example, target value for prescribed KT/V is $\geq$1.3 and that for haemoglobin is $\geq$10 and $\leq$12 g/l. The choice of target value is guided by published clinical practice guidelines, for example, the DOQI guideline; or otherwise they represent consensus of the local dialysis community.

In contrast to other results reported in this report, Tables 2.12 and 2.13 are based on centre survey data rather than individual patient data reported to the Registry. This is to provide a up-to-date information on patient and centre census in the country and thus overcome the inevitable time lag between processing individual patient data and subsequent reporting of results. The survey was conducted in the month of December 2002. Centre response rate to the survey was 100% responded. Standard error estimates are not reported because no sample was taken. Results on distribution by state are also expressed in per million-population since states obviously vary in their population sizes. State population data are based on 2002 census population projection. It is very difficult

to estimate the amount of cross boundary patient flow; this source of error is therefore not accounted for in computing state estimates. However, we minimise the bias by combining states (Selangor and Wilayah Persekutuan, Kedah and Perlis) based on geographical considerations. HD treatment capacity is derived by assuming on average patients underwent 3 HD sessions per week and a centre can maximally operate 2.5 shifts per day. A single HD machine can therefore support 5 patients' treatment. Obviously HD treatment capacity is calculated only for centre HD. The ratio of the number of centre HD capacity to number of centre HD patients is a useful measure of utilisation of available capacity.

***References*:**

1. Kaplan EL, Meier P. Non-parametric estimation from incomplete observations. *J Am Stat Assoc* 1958; 53:457-81
2. UKRENALREG 1999 UK Renal Registry, Bristol, UK.

GLOSSARY

CAPD	Continuous Ambulatory Peritoneal Dialysis
CPD	Continuous Peritoneal Dialysis
ESRD	End Stage Renal Disease
HD	Haemodialysis
LQ	Lower Quartile
MOH	Ministry of Health
NGO	Non-Government Organisation
pmp	per million population
QOL	Quality of Life
rHuEpo	Recombinant Human Erythropoietin
RRT	Renal Replacement Therapy
UQ	Upper Quartile

RENAL REPLACEMENT THERAPY

IN

MALAYSIA

Stock and Flow

Treatment Provision Rate

1. ALL RENAL REPLACEMENT THERAPY IN MALAYSIA

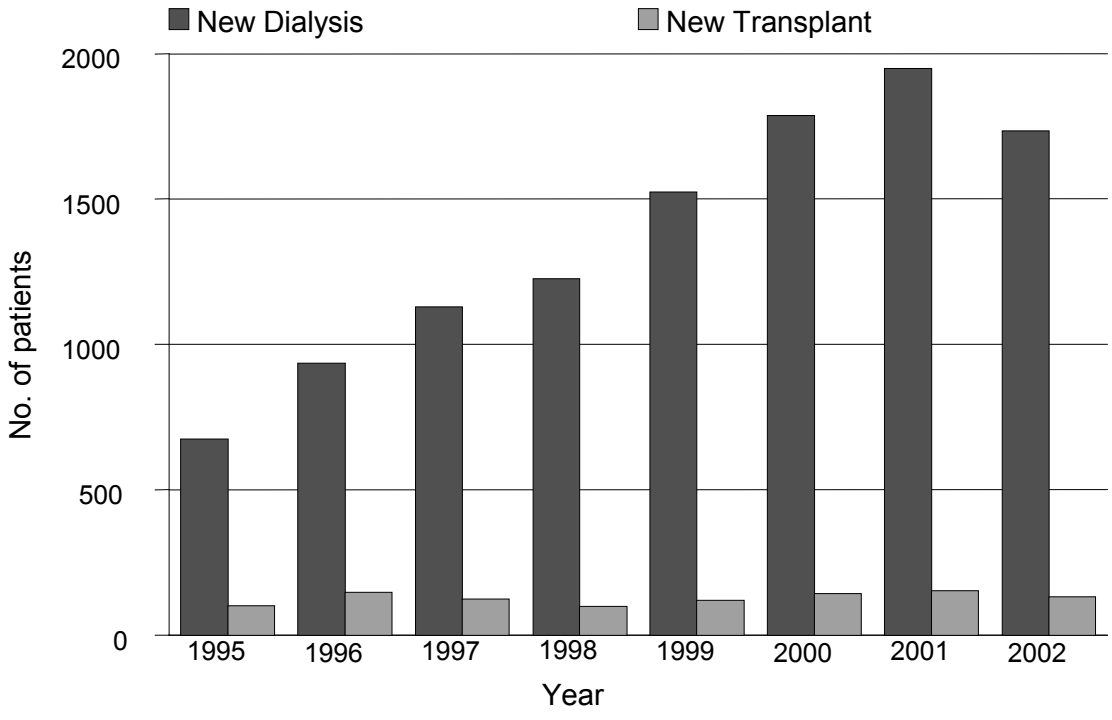
1.1 STOCK AND FLOW

Table 1.01: Stock and Flow of RRT, Malaysia 1995 – 2002

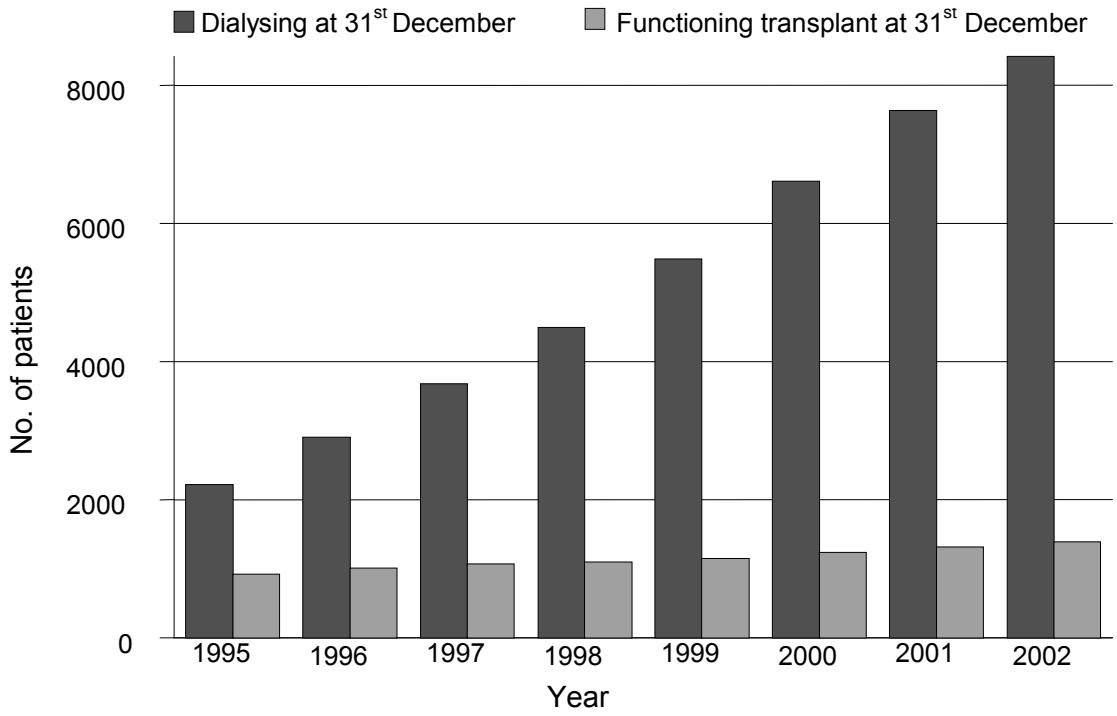
Year	1995	1996	1997	1998	1999	2000	2001	2002
New Dialysis patients	675	936	1129	1225	1525	1787	1949	1734
New Transplants	101	148	124	99	119	143	153	132
Dialysis deaths	178	222	310	372	482	573	770	780
Transplant deaths	16	31	29	23	25	27	30	19
Dialysing at 31st December	2221	2900	3679	4494	5487	6605	7639	8418
Functioning transplant at 31st December	924	1012	1070	1097	1154	1235	1316	1394

Figure 1.01: Stock and Flow of RRT, Malaysia 1995 - 2002

(a) New Dialysis and Transplant patients



(b) Patients Dialysing and with Functioning Transplant at 31st December 1995 – 2002



1.2 TREATMENT PROVISION RATE

Table 1.02: New Dialysis Acceptance Rate and New Transplant Rate per million population 1995 – 2002

Acceptance rate	1995	1996	1997	1998	1999	2000	2001	2002
New Dialysis	33	44	52	55	67	77	82	71
New Transplant	5	7	6	4	5	6	6	5

Figure 1.02: New Dialysis Acceptance and New Transplant Rate 1996 - 2002

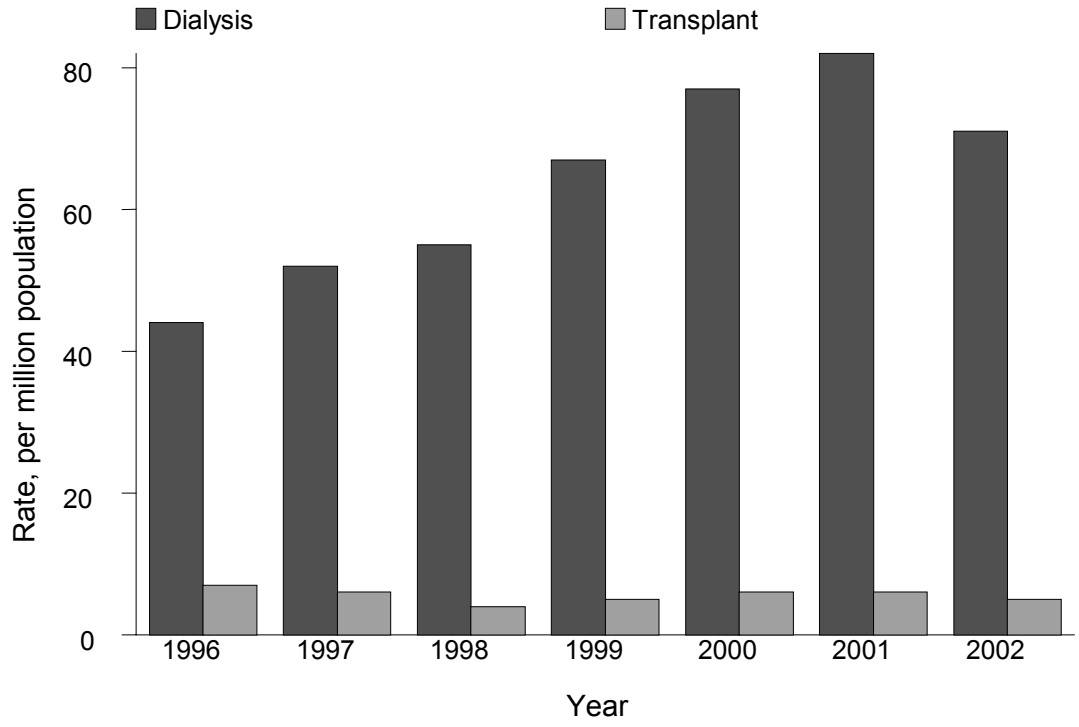
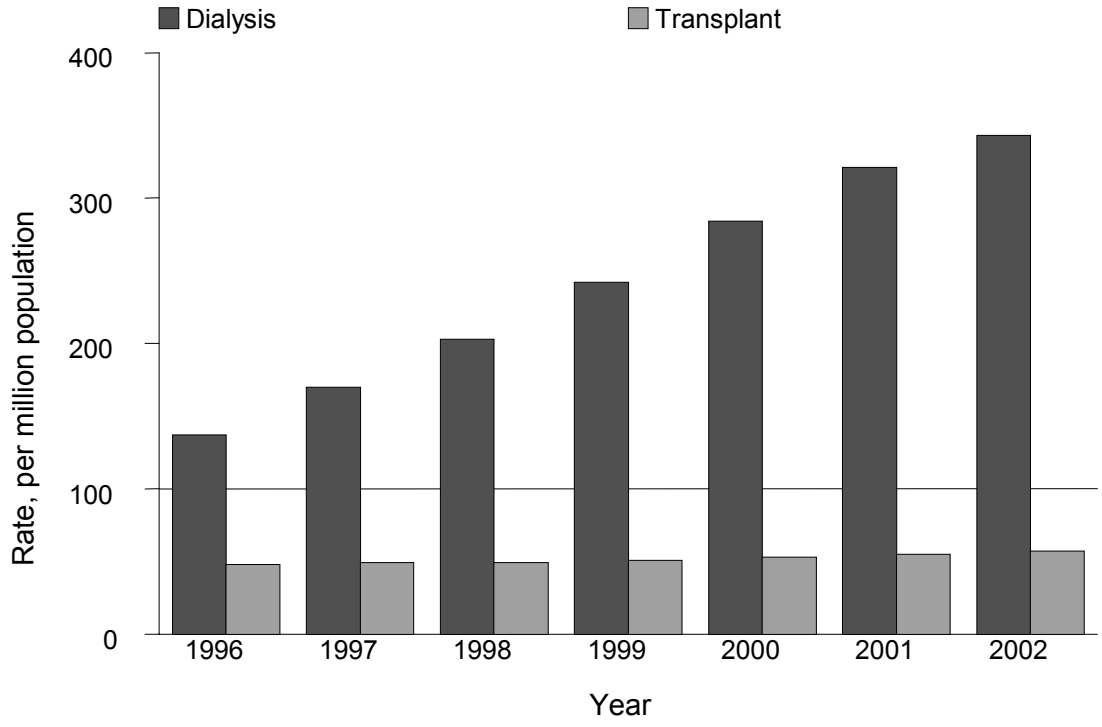


Table 1.03: RRT Prevalence Rate per million population 1995 – 2002

Prevalence rate	1995	1996	1997	1998	1999	2000	2001	2002
Dialysis	107	137	170	203	242	284	321	343
Transplant	45	48	49	49	51	53	55	57

Figure 1.03: Dialysis and Transplant Prevalence Rate per million population 1996 - 2002



DIALYSIS IN MALAYSIA

Dialysis Treatment Provision

Patient Demographics

Method and Location

Primary Renal Disease

Death on Dialysis

2. DIALYSIS IN MALAYSIA

2.1 DIALYSIS TREATMENT PROVISION

Table 2.01: Stock and flow – Dialysis Patients 1995 – 2002

Year	1995	1996	1997	1998	1999	2000	2001	2002
New Dialysis patients	675	936	1129	1225	1525	1787	1949	1734
Died	178	222	310	372	482	573	770	780
Transplanted	36	56	59	60	68	105	133	128
Lost to Follow-up	5	5	6	10	11	13	30	40
Dialysing at 31st December	2221	2900	3679	4494	5487	6605	7639	8418

Table 2.02: Dialysis Treatment Rate per million population 1995 – 2002

Year	1995	1996	1997	1998	1999	2000	2001	2002
Acceptance rate	33	44	52	55	67	77	82	71
Prevalence rate	107	137	170	203	242	284	321	343

Table 2.03: Dialysis Treatment Rate by State, per million state population, 2002

State	Acceptance rate
Johor	120
Negeri Sembilan	100
Selangor & Federal Territory	97
Trengganu	84
Perak	82
Melaka	77
Pulau Pinang	70
Kedah & Perlis	64
Kelantan	57
Sarawak	51
Pahang	42
Sabah	33

Table 2.04: Dialysis Treatment Rate by Gender, per million male or female population 1999– 2002

Gender	1999	2000	2001	2002
Male	81	90	92	82
Female	60	72	84	71

Figure 2.04: Dialysis Treatment by Gender 1999 - 2002

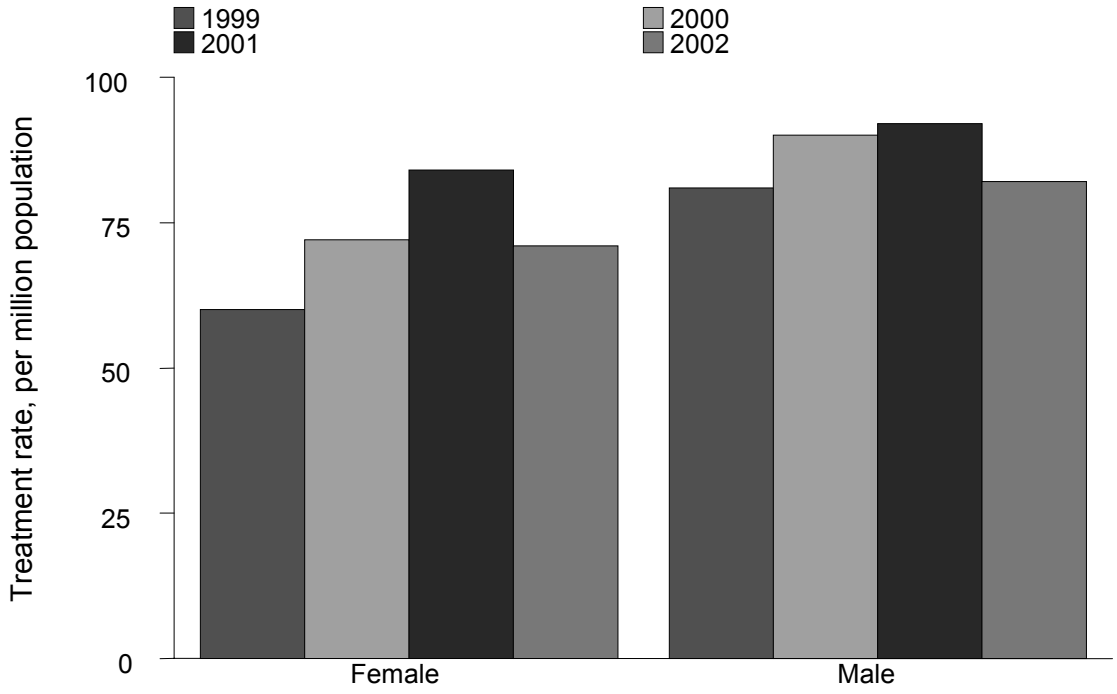
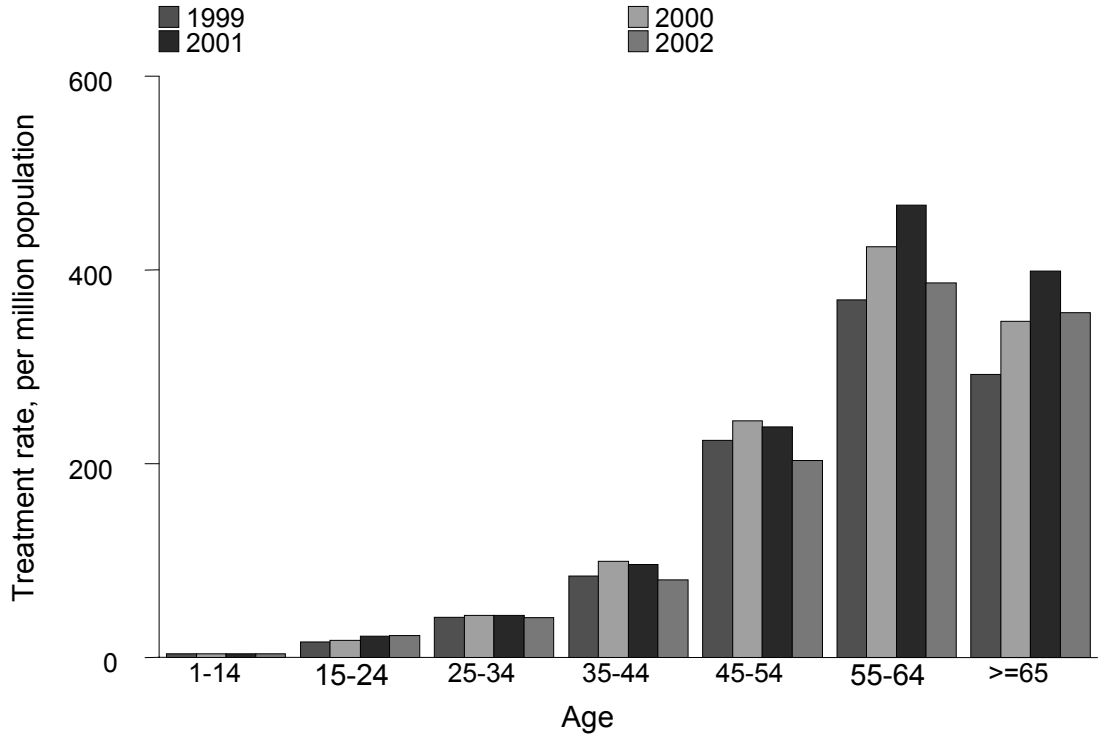


Table 2.05: Dialysis Treatment Rate by Age Group, per million age group population 1999 – 2002

Age groups (years)	1999	2000	2001	2002
1-14	4	4	4	4
15-24	16	18	22	23
25-34	42	44	44	41
35-44	84	99	96	80
45-54	224	244	238	203
55-64	369	424	467	387
≥ 65	292	347	399	356

Figure 2.05: Dialysis Treatment Rate by Age Group 1999 - 2002



2.2 PATIENT DEMOGRAPHICS

Table 2.06: Percentage Age Distribution of Dialysis Patients 1999 – 2002

Year	1999	2000	2001	2002
New dialysis patients	1525	1787	1949	1734
% 1-14 years	2	1	2	2
% 15-24 years	4	4	4	5
% 25-34 years	9	9	7	8
% 35-44 years	16	16	14	14
% 45-54 years	27	27	25	25
% 55-64 years	26	27	29	27
% ≥ 65 years	16	17	19	19
Dialysing at 31st December	5487	6605	7639	8418
% 1-14 years	2	1	1	1
% 15-24 years	5	5	5	5
% 25-34 years	15	14	13	12
% 35-44 years	21	20	20	19
% 45-54 years	25	25	25	25
% 55-64 years	22	22	23	23
% ≥65 years	11	12	12	13

Figure 2.06: Age Distribution of New Dialysis patients 1999 – 2002

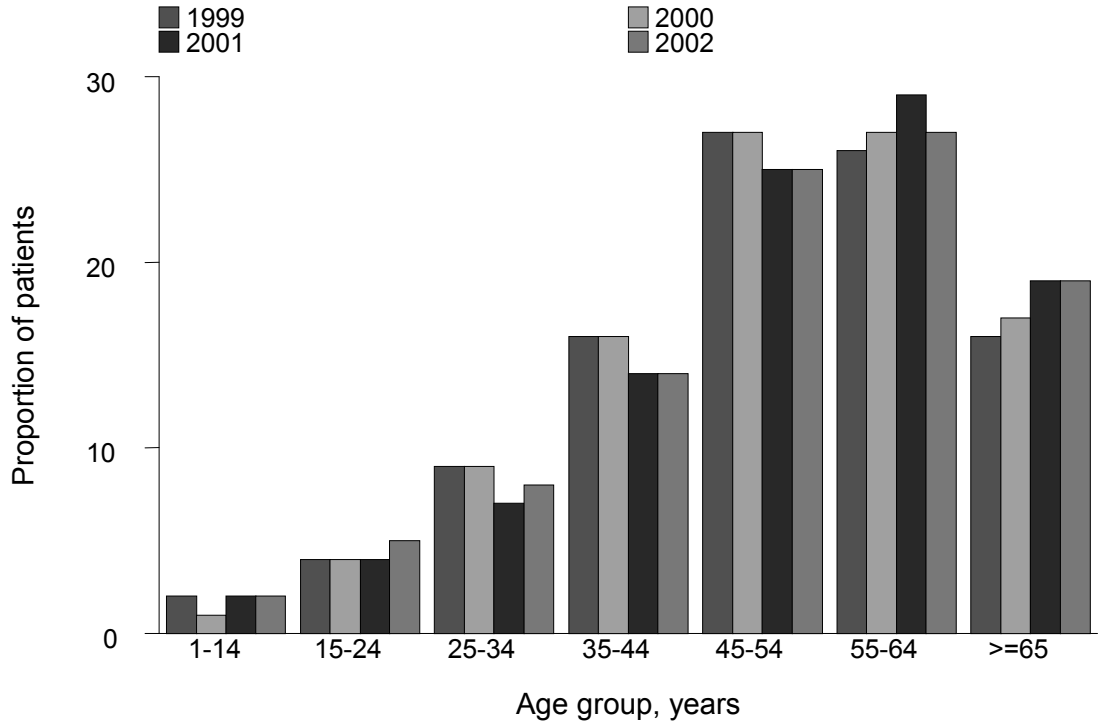
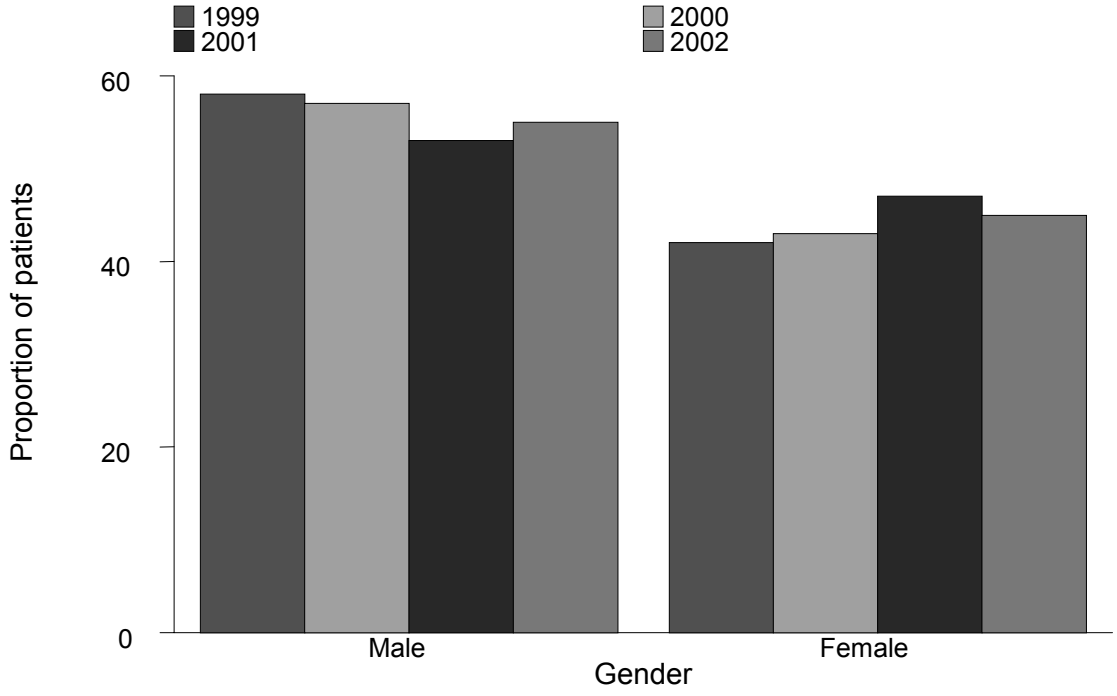


Table 2.07: Gender distribution of Dialysis Patients 1999 – 2002

Year	1999	2000	2001	2002
New Dialysis patients	1525	1787	1949	1734
% Male	58	57	53	55
% Female	42	43	47	45
Dialysing at 31st December	5487	6605	7639	8418
% Male	56	56	55	55
% Female	44	44	45	45

Figure 2.07: Gender Distribution of New Dialysis patients 1999 – 2002

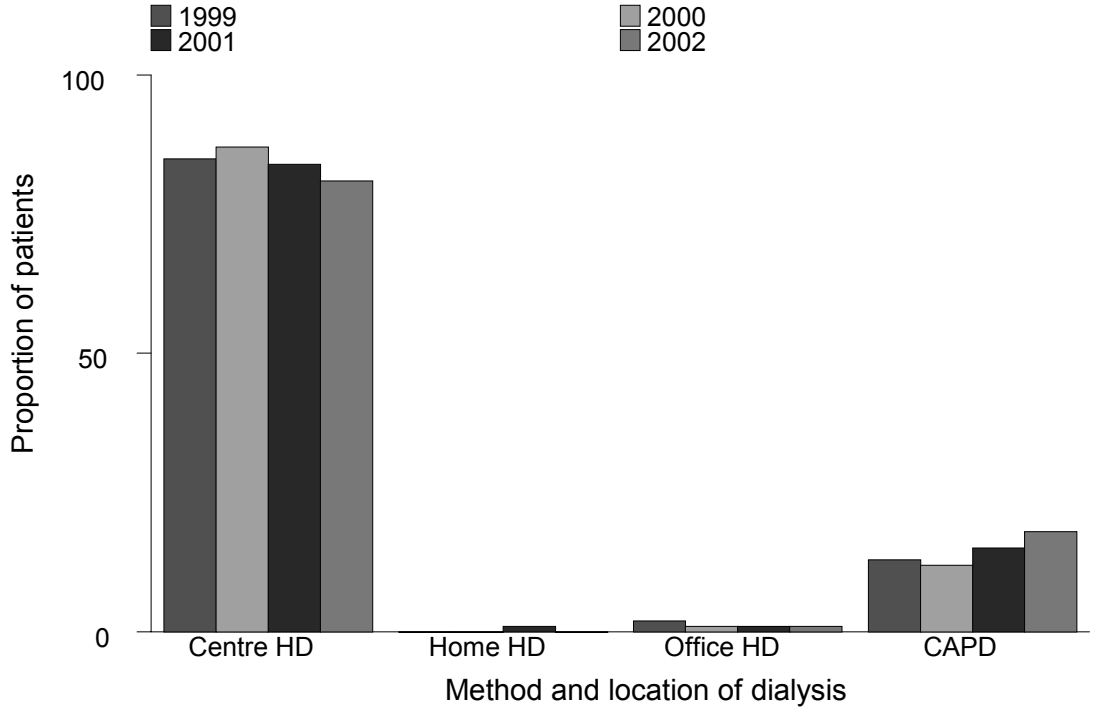


2.3 METHOD AND LOCATION

Table 2.08: Method and Location of Dialysis

Year	1999	2000	2001	2002
New Dialysis patients	1525	1787	1949	1734
% Centre HD	85	87	84	81
% Home HD	0	0	1	0
% Office HD	2	1	1	1
% CAPD	13	12	15	18
Dialysing at 31st December	5487	6605	7639	8418
% Centre HD	84	86	87	86
% Home HD	1	1	1	1
% Office HD	4	3	2	2
% CAPD	11	10	10	11

Figure 2.08: Method and Location of New Dialysis Patients



2.4 PRIMARY RENAL DISEASE

Table 2.09: Primary Renal Disease 1999– 2002

Year	1999	2000	2001	2002
New Dialysis patients	1525	1787	1949	1734
% Unknown cause	30	30	32	33
% Diabetic Nephropathy	40	44	45	47
% Glomerulonephritis	11	10	7	7
% Polycystic kidney	1	1	2	1
% Obstructive Uropathy	4	3	3	2
% Gouty Nephropathy	0	0	1	0
% Toxic Nephropathy	1	0	1	0
% Miscellaneous	12	12	10	9

2.5 DEATH ON DIALYSIS

Table 2.10: Deaths on Dialysis 1995 – 2002

Year	1995	1996	1997	1998	1999	2000	2001	2002
No. of dialysis patients at risk	1980	2561	3290	4087	4991	6046	7122	8029
Dialysis deaths	178	222	310	372	482	573	770	780
Dialysis death rate %	9	9	9	9	10	9	11	10
No. of HD patients at risk	1694	2177	2819	3566	4424	5422	6412	7198
HD deaths	120	160	237	298	382	483	642	667
HD death rate %	7	7	8	8	9	9	10	9
No. of CAPD patients at risk	287	384	471	521	567	625	711	831
CAPD deaths	58	62	73	74	100	90	128	113
CAPD death rate %	20	16	15	14	18	14	18	14

Figure 2.10: Death Rates on Dialysis 1995 – 2002

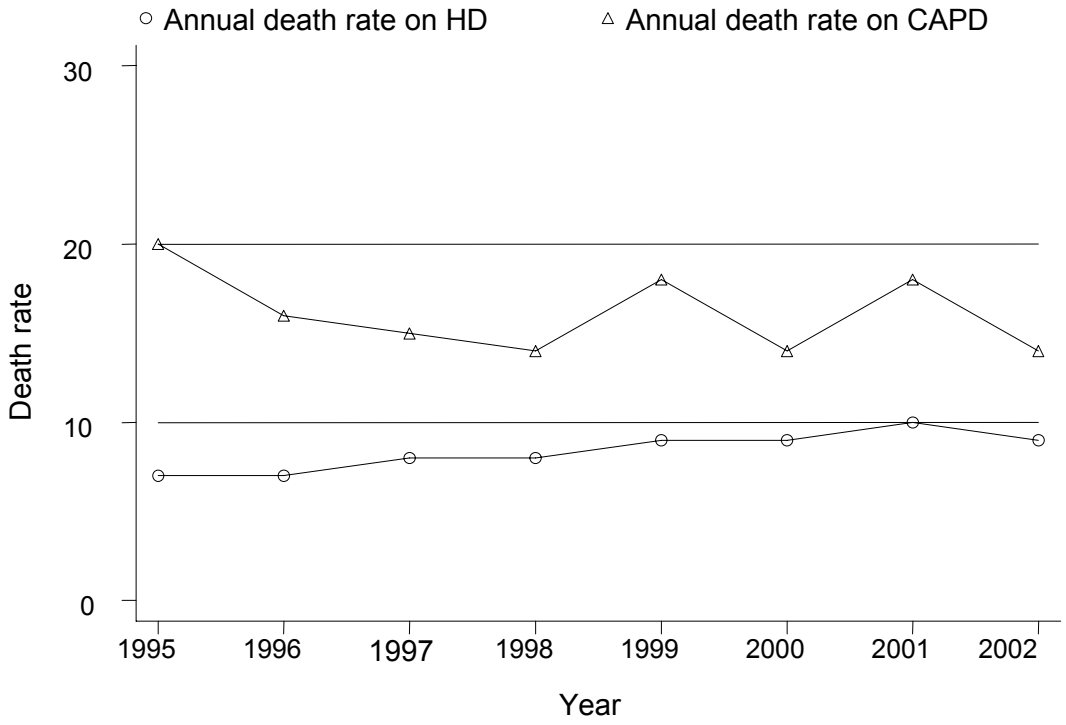


Table 2.11: Causes of Death on Dialysis 1999 - 2002

Year	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
Cardiovascular	157	33	209	36	266	35	305	39
Died at home	107	22	127	22	203	26	175	22
Sepsis	73	15	86	15	119	15	118	15
CAPD peritonitis	8	2	15	3	21	3	10	1
GIT bleed	13	3	10	2	15	2	17	2
Cancer	6	1	10	2	14	2	17	2
Liver disease	8	2	6	1	6	1	7	1
Others	87	18	100	17	93	12	96	12
Unknown	23	5	10	2	33	4	35	4
Total	482	100	573	100	770	100	780	100

2.6. DIALYSIS CENTRE, CAPACITY AND TREATMENT PROVISION

(Up-To- Date Results From Year 2002 Centre Survey, as at December 2002)

Table 2.12: Number of dialysis centres, number of HD machines and treatment capacity, HD capacity to patient ratio By State, December 2002

State	Centres HD (No.)	Centre HD machines	Centre HD machines pmp	Centre HD capacity (No.)	Centre HD capacity pmp	Centre HD patients (No.)	Centre HD patients pmp	HD capacity:patient ratio	All dialysis patients (No.)	Dialysis treatment rate pmp
Melaka (Me)	10	141	209	705	1046	455	675	1.55	460	682
Penang (Pe)	24	310	223	1550	1115	813	585	1.91	832	598
Johor (Jo)	33	391	135	1955	676	1359	470	1.44	1381	478
Perak (Pe)	20	301	139	1505	696	995	460	1.51	1024	474
Selangor & Federal Territory (SF)	62	805	137	4025	686	2499	426	1.61	2606	444
Negeri Sembilan (Ne)	7	119	133	595	663	337	376	1.77	352	392
Sarawak (Sw)	14	171	79	855	395	570	263	1.5	650	300
Kedah & Perlis (KP)	22	162	83	810	414	512	262	1.58	531	271
Trengganu (Tr)	5	55	58	275	292	158	168	1.74	162	172
Pahang (Pa)	7	69	51	345	256	207	154	1.67	217	161
Kelantan (Ke)	8	71	50	355	249	199	140	1.78	205	144
Sabah (Sb)	11	85	30	425	151	266	95	1.6	288	103
Malaysia	223	2680	115	13400	576	8370	360	1.6	8708	374

pmp = per million population

Figure 2.12 (a): Distribution of dialysis centres by State, December 2002

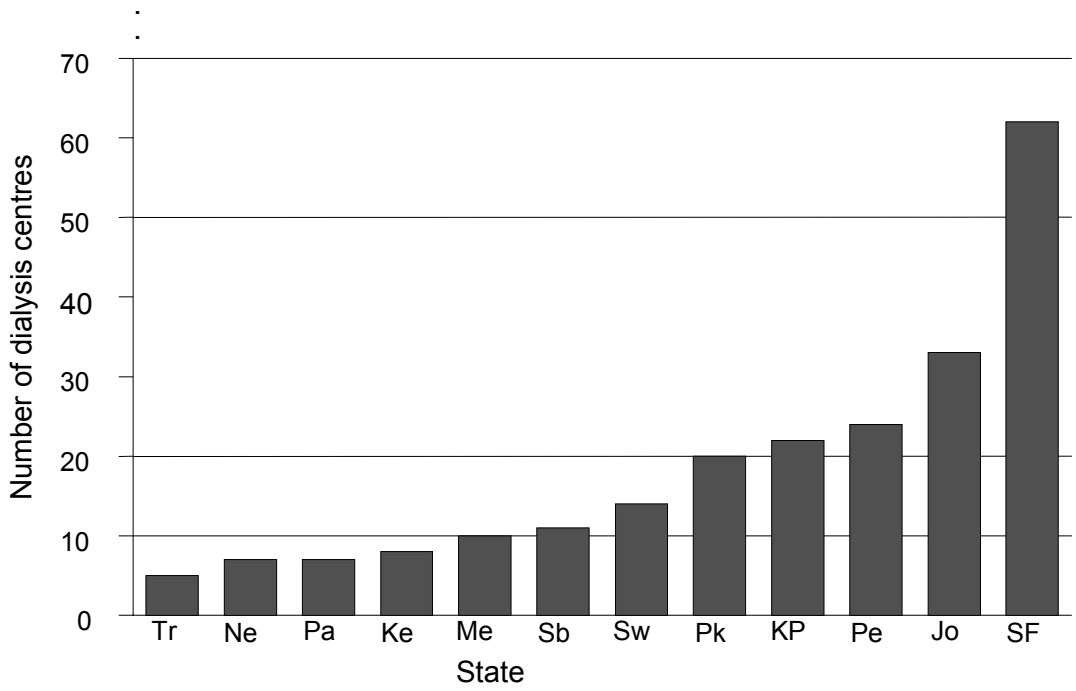
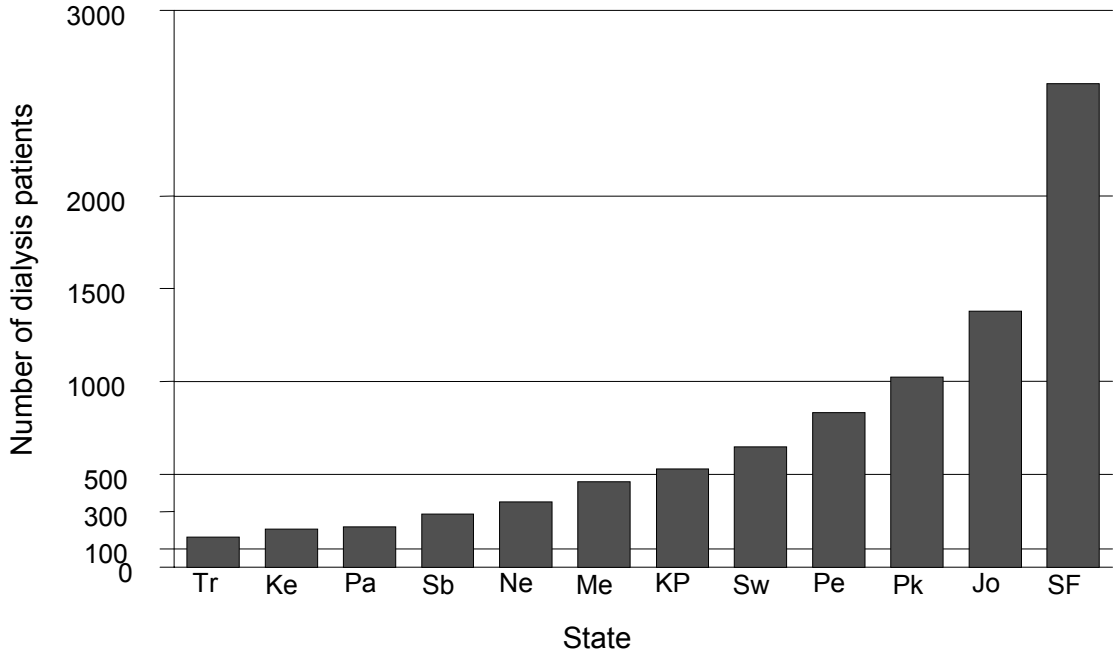


Figure 2.12 (b): Distribution of dialysis patients by State, December 2002



Key: Please refer Table 2.12

Figure 2.12 (c): Distribution of dialysis treatment by State, December 2002

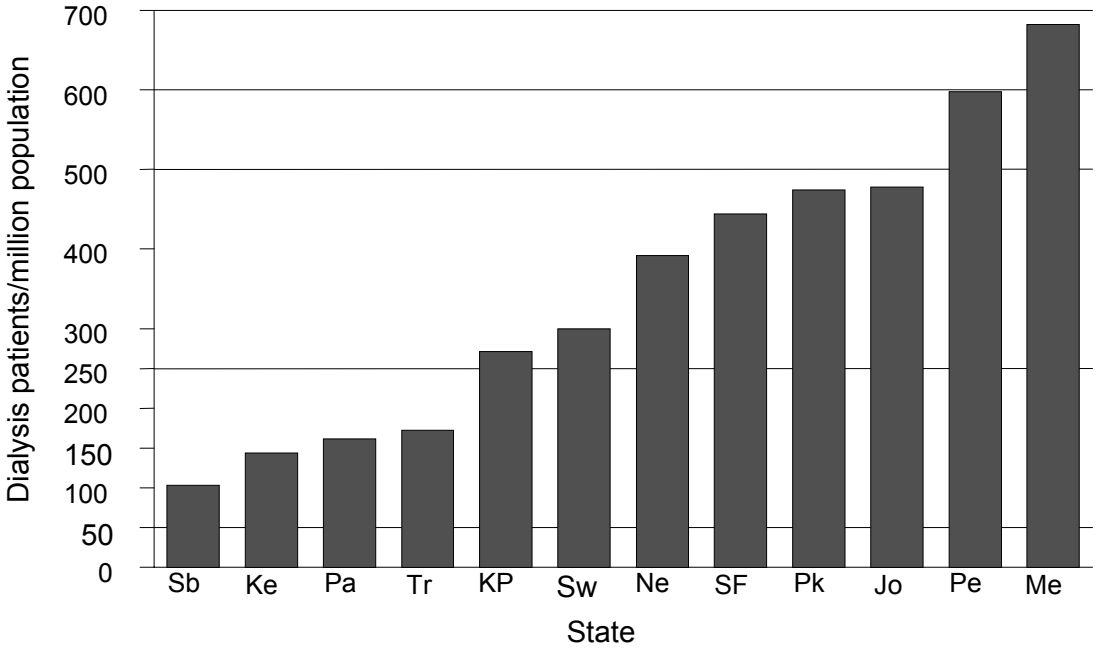
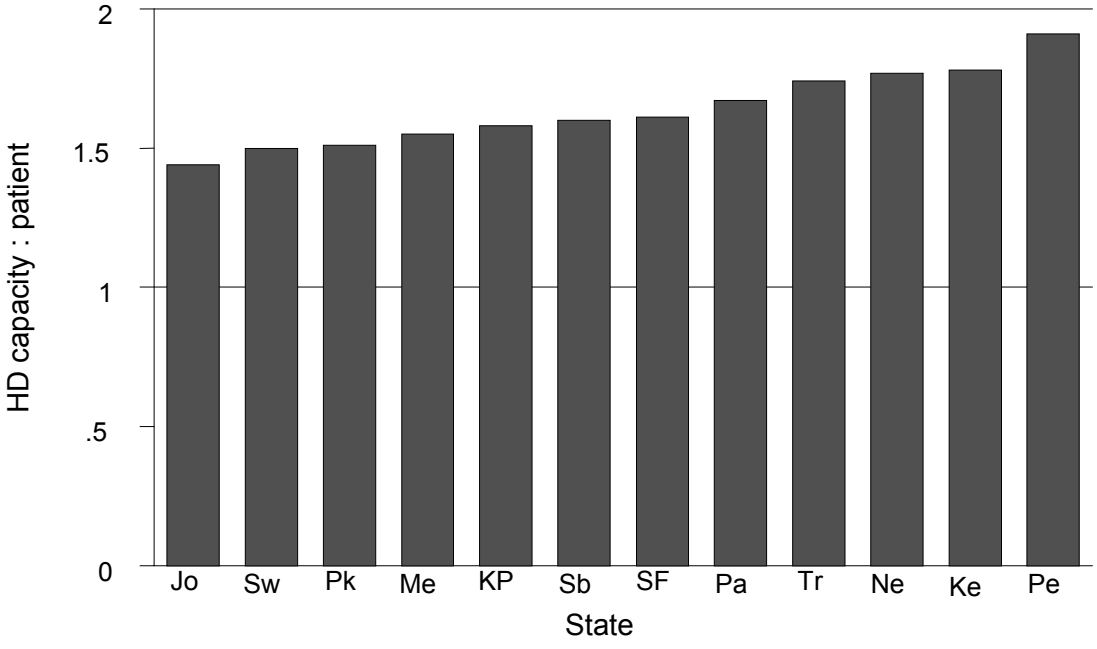


Figure 2.12 (d): HD capacity to patient ratio by State, December 2002



Key: Please refer Table 2.12

Table 2.13: Number of dialysis centres, dialysis patients and HD machines and treatment capacity, by sector December 2002

Sector	Centre (No.)	Centre HD machines (No.)	Centre HD capacity (No.)	Centre HD patients (No.)	Centre HD capacity : patient ratio	All dialysis patients (No.)
NGO	72	1007	5035	3069	1.64	3069
MOH	65	745	3725	2471	1.51	2873
Private	74	839	4195	2596	1.62	2596
University	3	45	225	123	1.83	123
Armed Forces	9	44	220	111	1.98	111

Figure 2.13 (a): Distribution of dialysis centres by Sector, December 2002

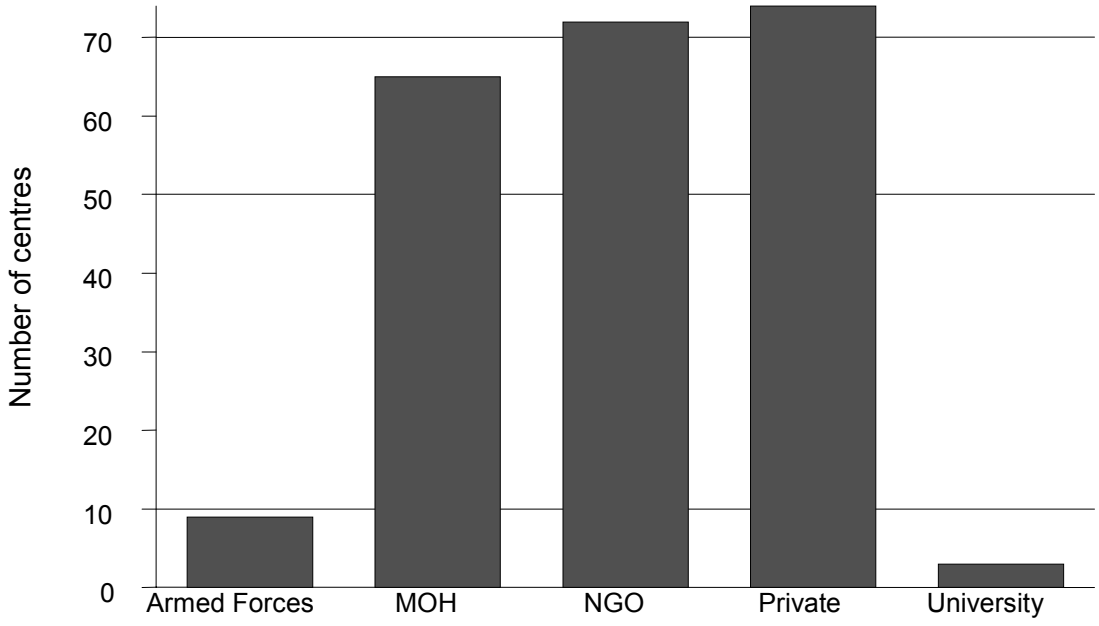


Figure 2.13 (b): Distribution of HD capacity by Sector, December 2002

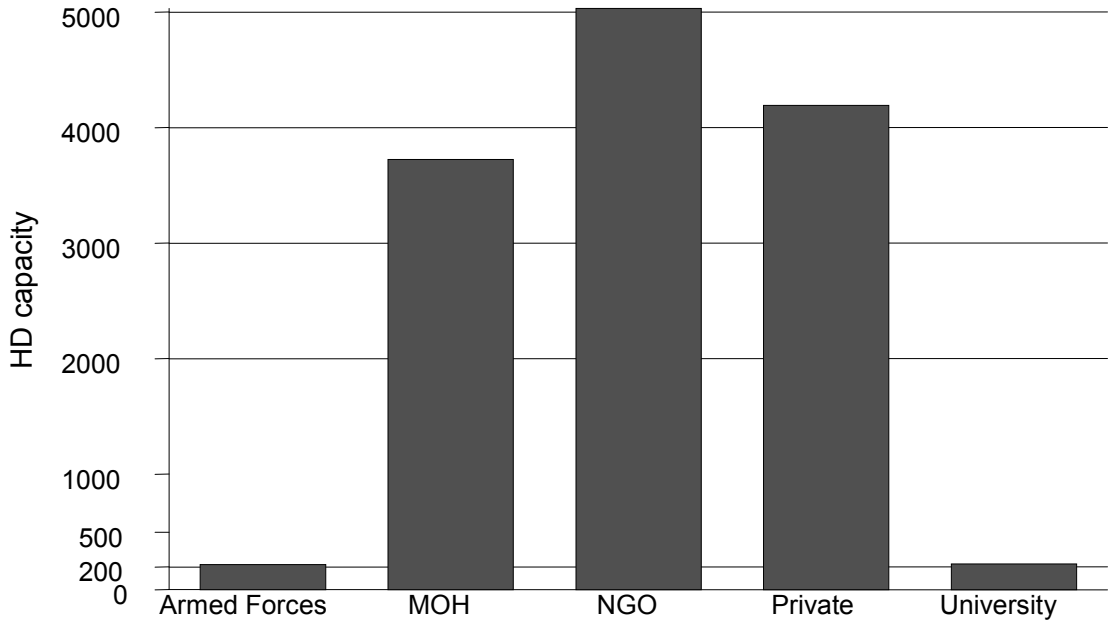


Figure 2.13 (c): Distribution of dialysis patients by Sector, December 2002

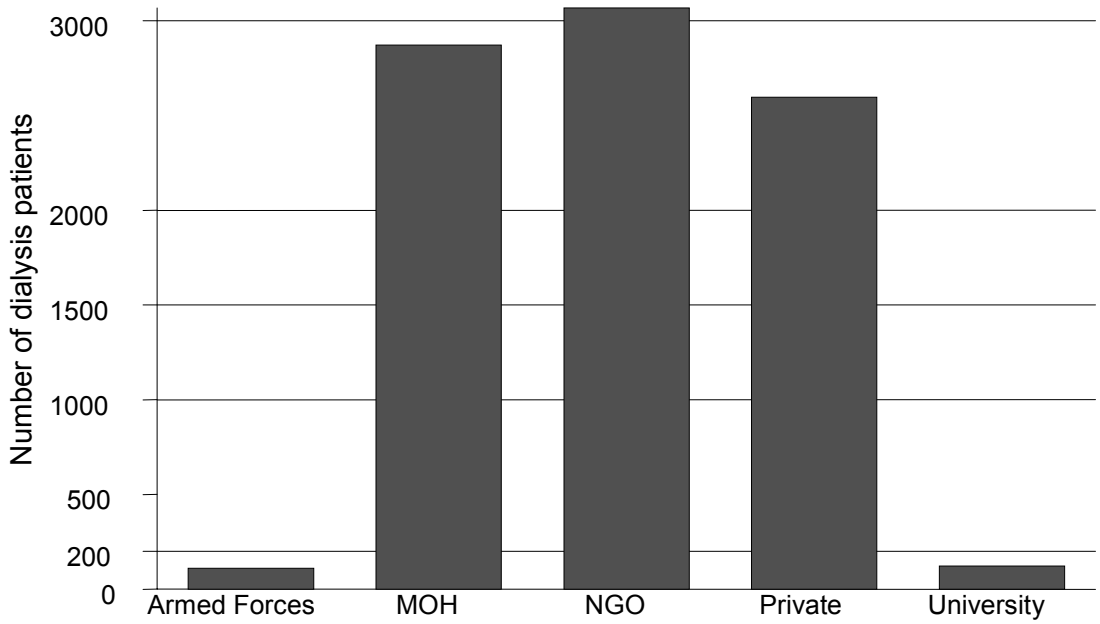
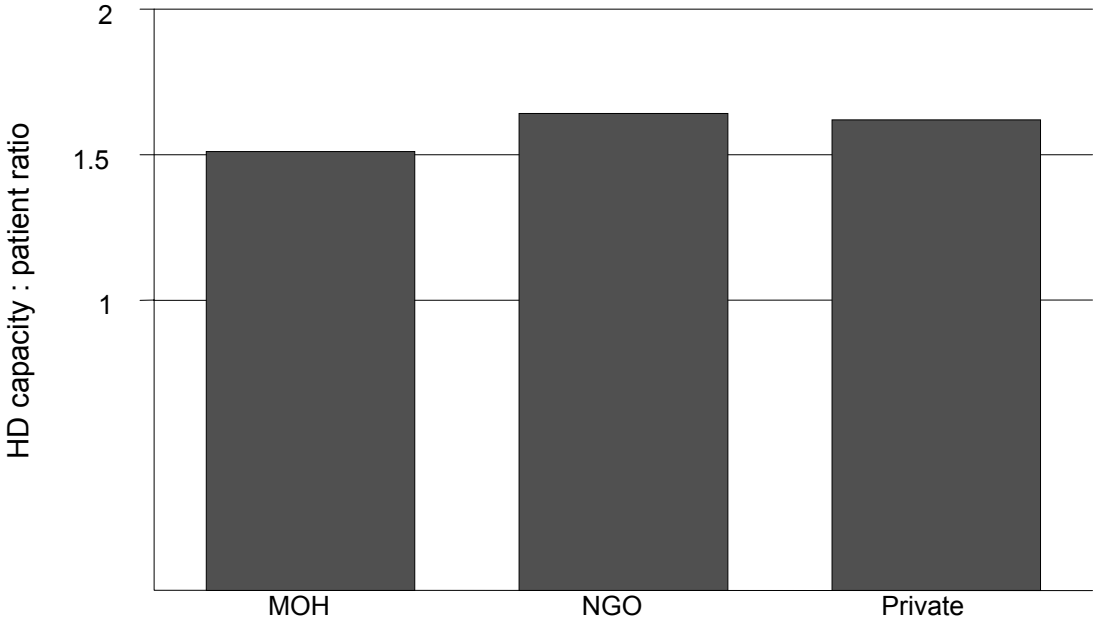


Figure 2.13 (d): HD capacity: patient ratio by Sector, December 2002



HAEMODIALYSIS IN MALAYSIA

HAEMODIALYSIS IN GOVERNMENT CENTRES

HAEMODIALYSIS IN NON-GOVERNMENTAL ORGANISATION (NGO) CENTRES

HAEMODIALYSIS IN PRIVATE CENTRES

HAEMODIALYSIS

IN

GOVERNMENT CENTRES

Stock and Flow

Place of Haemodialysis and its Finance

Death on Haemodialysis and Transfer to PD

Government Haemodialysis Centres

Haemodialysis Patient Characteristics

Survival Analysis

Work related rehabilitation and quality of life

Haemodialysis practices

Dyslipidaemia in HD patients

Treatment of Renal Bone Disease

Management of Blood Pressure

Management of Anaemia

Nutritional status

Prevalence of anti-HCV and HbsAg

3. HAEMODIALYSIS IN MALAYSIA

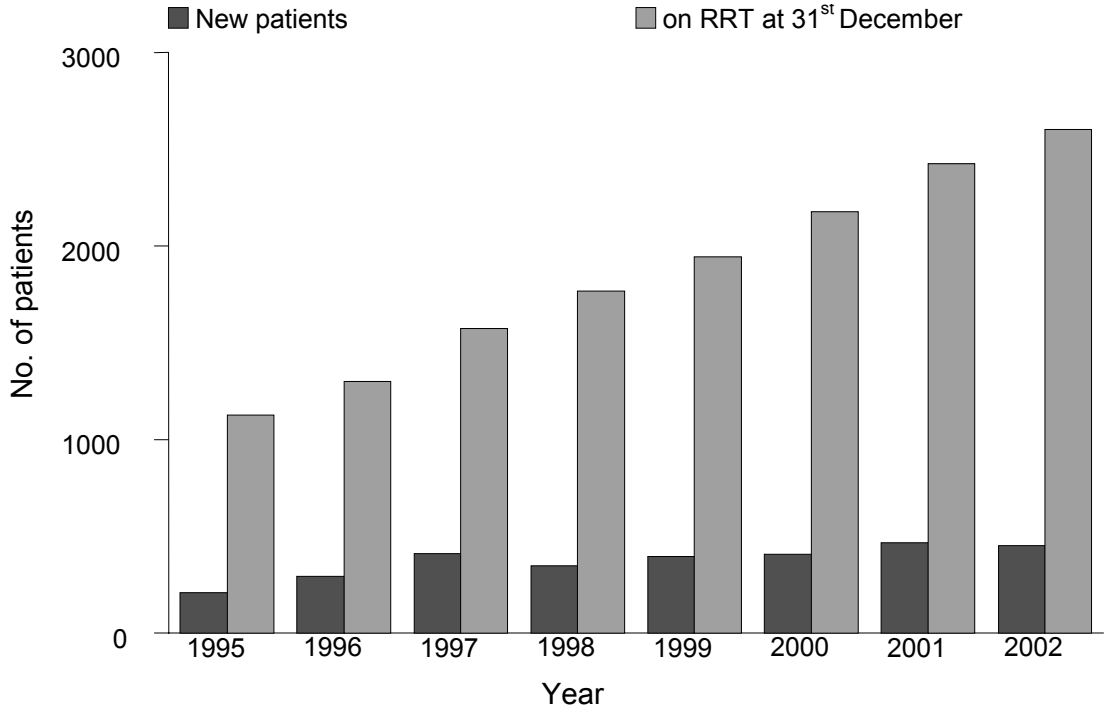
3.1 HAEMODIALYSIS IN GOVERNMENT CENTRES

3.1.1 STOCK AND FLOW

Table 3.1.01: Stock and flow of Haemodialysis Patients, Government Centres 1995 – 2002

Year	1995	1996	1997	1998	1999	2000	2001	2002
New patients	209	293	410	346	393	407	468	450
Died	85	115	139	159	210	198	219	262
Transferred to PD	13	7	9	6	12	6	27	41
Transplanted	25	35	34	30	26	26	41	32
Lost to follow up	5	1	3	7	5	4	3	8
On HD at 31st December	1126	1298	1574	1765	1942	2177	2425	2602

Figure 3.1.01: Stock and Flow HD patients, Government Centres 1995 – 2002



3.1.2 PLACE OF HAEMODIALYSIS AND ITS FINANCE

Table 3.1.02: Place for HD, Government Centres 1999 – 2002

Year	1999	2000	2001	2002
New patients	393	407	468	450
% Centre HD	94	96	94	96
% Home HD	1	1	2	1
% Office HD	5	3	4	2
On HD at 31st December	1942	2177	2425	2602
% Centre HD	88	90	91	92
% Home HD	3	2	2	2
% Office HD	9	8	7	6

Figure 3.1.02: Place of HD, Government Centres 1999- 2002

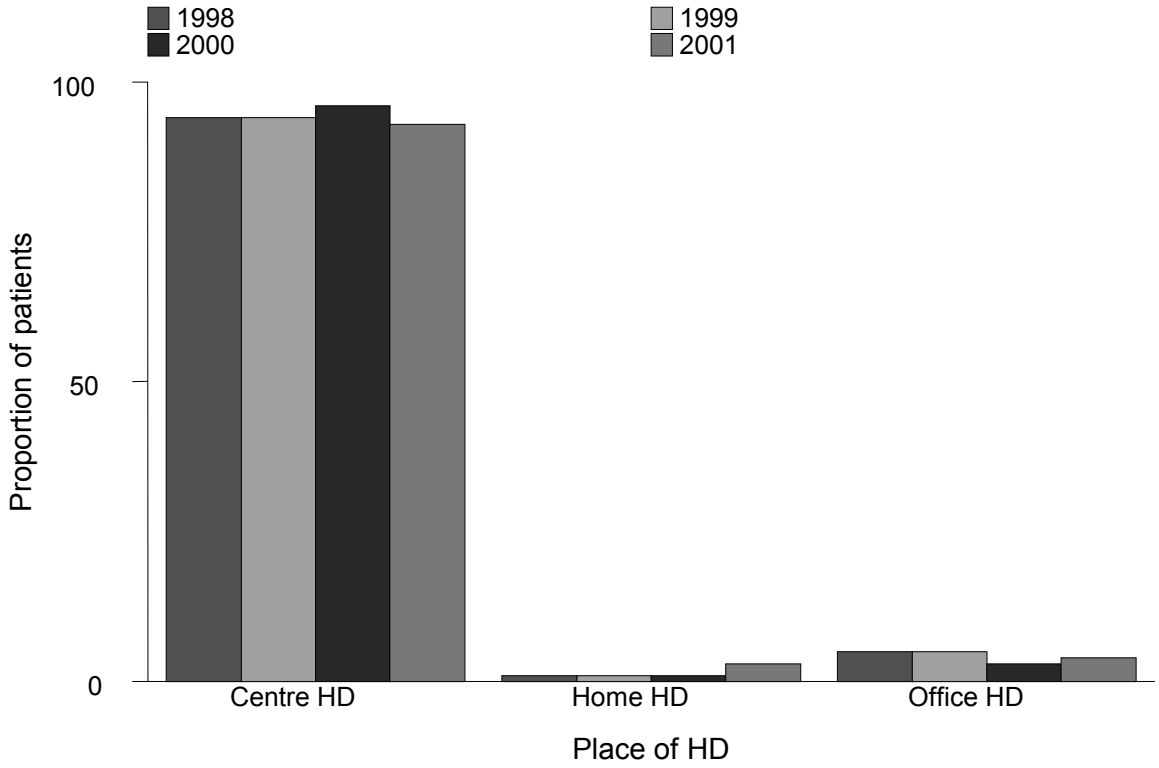
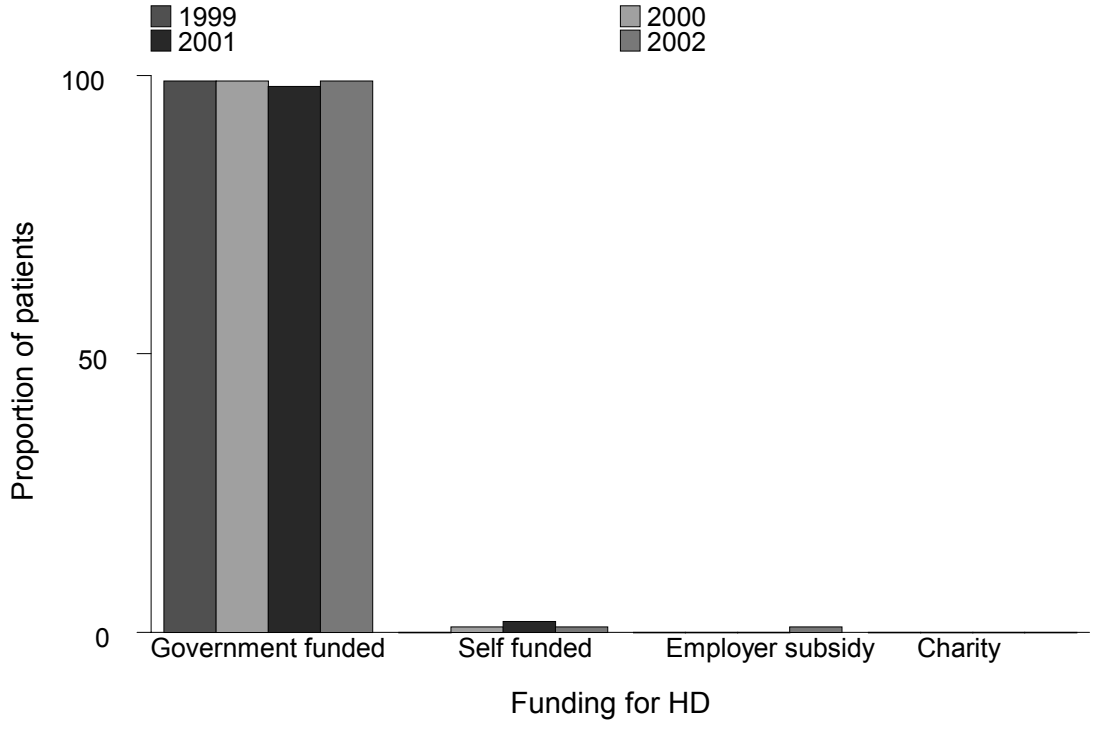


Table 3.1.03: Finance for HD, Government Centres 1999 – 2002

Year	1999	2000	2001	2002
New patients	393	407	468	450
Government funded	99	99	98	99
% Self funded	0	1	2	1
% Employer subsidy	0	0	0	1
% Charity	0	0	0	0
on HD at 31st December	1942	2177	2425	2602
% Government funded	98	98	98	99
% Self funded	1	1	1	1
% Employer subsidy	1	1	0	1
% Charity	0	0	0	0

Figure 3.1.03: Finance for new HD, Government Centres 1999 – 2002



3.1.3 DEATH ON HAEMODIALYSIS AND TRANSFER TO PERITONEAL DIALYSIS

Table 3.1.04: HD Death Rate and Transfer to PD, Government Centres 1995 – 2002

year	1995	1996	1997	1998	1999	2000	2001	2002
No. at risk	1126	1212	1436	1670	1854	2060	2301	2514
Deaths	85	115	139	159	210	198	219	262
Death rate %	8	9	10	10	11	10	10	10
Transfer to PD	13	7	9	6	12	6	27	41
Transfer to PD rate %	1	1	1	0	1	0	1	2
All Losses	98	122	148	165	222	204	246	303
All Losses rate %	9	10	10	10	12	10	11	12

Figure 3.1.04: Death Rate on HD, Government Centres 1995 – 2002

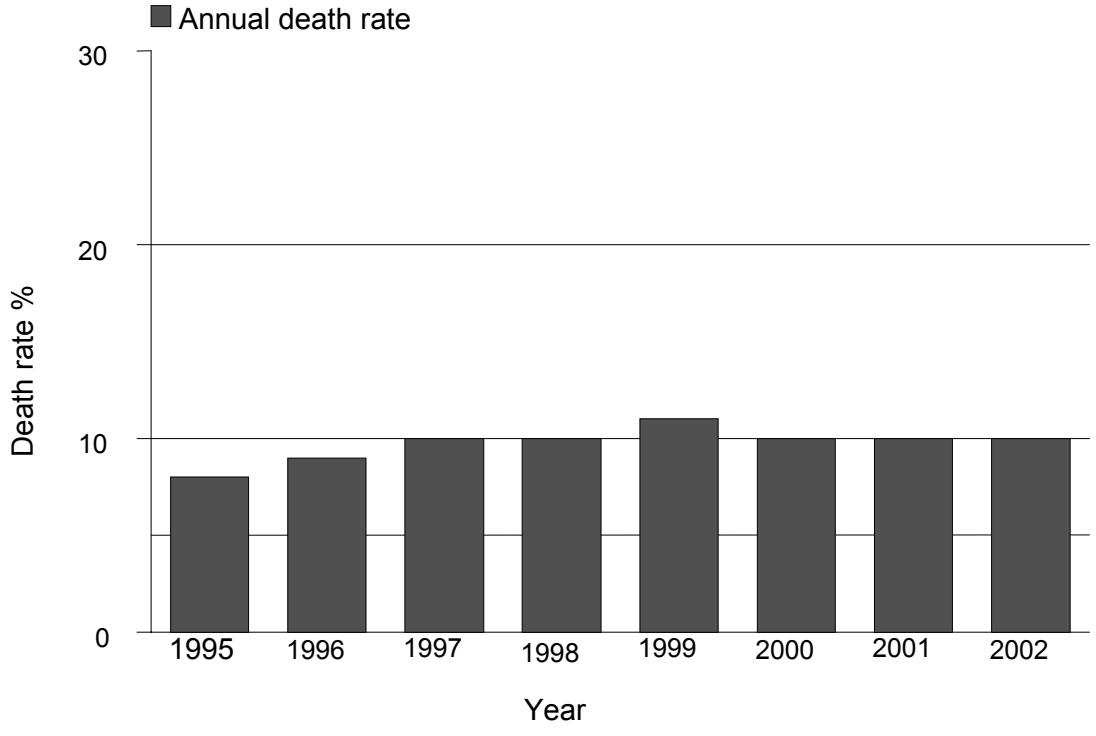


Table 3.1.05: Causes of Death on HD, Government Centres 1999 – 2002

Cause of death	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
Cardiovascular	79	38	73	37	87	40	91	35
Died at home	44	21	33	17	35	16	56	21
Sepsis	37	18	43	22	43	20	56	21
GIT bleed	6	3	6	3	4	2	7	3
Cancer	2	1	6	3	3	1	7	3
Liver disease	2	1	1	1	1	0	2	1
Others	33	16	32	16	34	16	30	11
Unknown	7	3	4	2	12	5	12	5
Total	210	100	198	100	219	100	262	100

3.1.4 GOVERNMENT HAEMODIALYSIS CENTRES

Table 3.1.07: Centre Distribution of HD patients, Government Centres 2002

	Centre	No	percent
	No. on RRT at 31st December	2602	100
1	801 Rumah Sakit Angkatan Tentera, Kuching	7	0
2	807 Rumah Sakit Angkatan Tentera, Sg Petani	9	0
3	810 Rumah Sakit Angkatan Tentera, Majidee	5	0
4	819 Rumah Sakit Angkatan Tentera, TUDM	4	0
5	94 Hospital Angkatan Tentera, Terendak	25	1
6	95 Hospital Angkatan Tentera, Kinrara	21	1
7	96 Hospital Angkatan Tentera, Lumut	18	1
8	Alor Setar Hospital	93	4
9	Baling Hospital	12	0
10	Banting Hospital	24	1
11	Batu Pahat Hospital	40	2
12	Beaufort Hospital	21	1
13	Besut Hospital	21	1
14	Bintulu Hospita	26	1
15	Bukit Mertajam Hospital	39	1
16	Butterworth Hospital	8	0
17	Duchess of Kent Hospital	43	2
18	Dungun Hospital	27	1
19	Ipoh Hospital	101	4
20	Jerantut Hospital	13	0
21	Kajang Hospital	32	1
22	Kangar Hospital	60	2
23	Kemaman Hospital	20	1
24	Keningau Hospital	30	1
25	Kluang Hospital	47	2
26	Kota Bharu Hospital	53	2
27	Kota Tinggi Hospital	15	1
28	Kuala Krai Hospital	10	0
29	Kuala Lumpur Hospital	162	6

30	Kuala Lumpur Hospital (Paed.)	3	0
31	Kuala Nerang Hospital	7	0
32	Kuala Pilah Hospital	33	1
33	Kuala Terengganu Hospital	68	3
34	Kuching Hospital	83	3
35	Kulim Hospital	19	1
36	Labuan Hospital	25	1
37	Lahad Datu Hospital	12	0
38	Langkawi Hospital	18	1
39	Melaka Hospital	53	2
40	Mentakab Hospital	42	2
41	Miri Hospital	66	3
42	Muar Hospital	59	2
43	Pasir Mas Hospital	8	0
44	Pontian Hospital	18	1
45	Port Dickson Hospital	11	0
46	Pulau Pinang Hospital	77	3
47	Pusat Hemodialisis KEMENTAH	14	1
48	Pusat Kesihatan Jitra	12	0
49	Pusat Perubatan Angkatan Tentera (KB)	11	0
50	Putrajaya Hospital	34	1
51	Queen Elizabeth Hospital	74	3
52	Raub Hospital	32	1
53	Sarikei Hospital	13	0
54	Segamat Hospital	37	1
55	Selayang Hospital	54	2
56	Seremban Hospital	49	2
57	Seri Manjung Hospital	7	0
58	Serian Hospital	9	0
59	Sibu Hospital	48	2
60	Sik Hospital	14	1
61	Sri Aman Hospital	19	1
62	Sultanah Aminah Hospital	105	4
63	Sungai Bakap Hospital	6	0

64	Sungai Petani Hospital	36	1
65	Taiping Hospital	38	1
66	Tanah Merah Hospital	20	1
67	Tanjung Karang Hospital	32	1
68	Tanjung Malim Hospital	12	0
69	Tawau Hospital	60	2
70	Teluk Intan Hospital	29	1
71	Tengku Ampuan Jemaah Hospital, Sabak Bernam	11	0
72	Tengku Ampuan Afzan Hospital, Kuantan	57	2
73	Tengku Ampuan Rahimah Hospital, Klang	66	3
74	Universiti Kebangsaan Malaysia Hospital	28	1
75	Universiti Sains Malaysia Hospital	13	0
76	University Malaya Medical Centre	65	2
77	Yan Hospital	9	0

3.1.5 HAEMODIALYSIS PATIENTS' CHARACTERISTICS

Table 3.1.08: Age Distribution of HD patients, Government Centres 1999 – 2002

Year	1999	2000	2001	2002
New patients	393	407	468	450
% 1-14 years	1	0	1	1
% 15-24 years	9	6	7	7
% 25-34 years	10	13	9	10
% 35-44 years	16	19	17	17
% 45-54 years	32	25	31	25
% 55-64 years	24	26	25	26
% ≥65 years	7	10	11	14
Dialysing at 31st December	1942	2177	2425	2602
% 1-14 years	1	1	1	1
% 15-24 years	8	8	8	9
% 25-34 years	18	18	17	16
% 35-44 years	25	24	24	23
% 45-54 years	25	25	26	26
% 55-64 years	18	18	19	19
% ≥65 years	5	5	6	6

Table 3.1.09: HD Patient Characteristics, Government Centres 1999 – 2002

Year	1999	2000	2001	2002
New patients	393	407	468	450
Mean age ± sd	46 ± 14	48 ± 14	49 ±14	49 ± 15
% Male	65	60	58	58
% Diabetic	34	33	40	39
% HbsAg+	8	7	4	4
% Anti-HCV+	6	4	3	3

3.1.6 SURVIVAL ANALYSIS – GOVERNMENT CENTRES

Table 3.1.10: HD patient Survival related to Year of Entry, Government Centres 1997 – 2002

Year	1997			1998			1999		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	93	1	422	94	1	362	92	1	388
12	88	2	393	90	2	339	86	2	359
24	82	2	355	82	2	305	80	2	324
36	75	2	324	75	2	277	73	2	290
48	68	2	291	70	2	244			
60	63	2	261						
Year	2000			2001			2002		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	92	1	429	91	1	472	92	1	250
12	89	1	406	85	2	429			
24	81	2	351						

No. = number at risk *SE = standard error*

Figure 3.1.10: HD patient Survival related to Year of Entry, Government Centres 1998– 2002

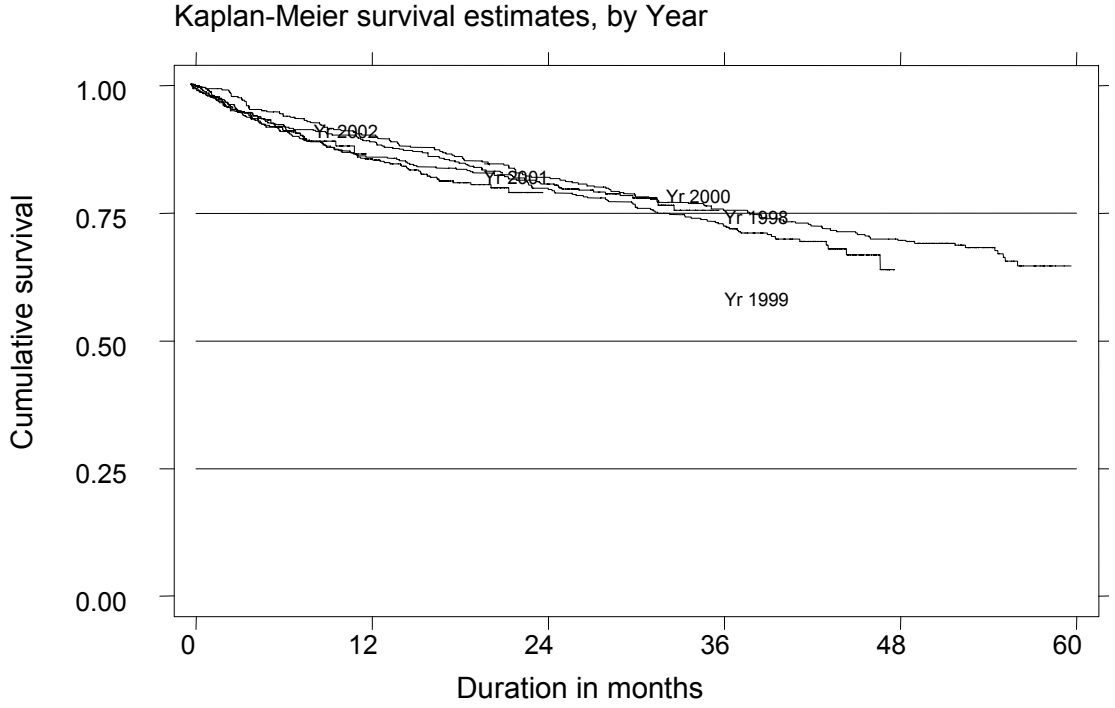


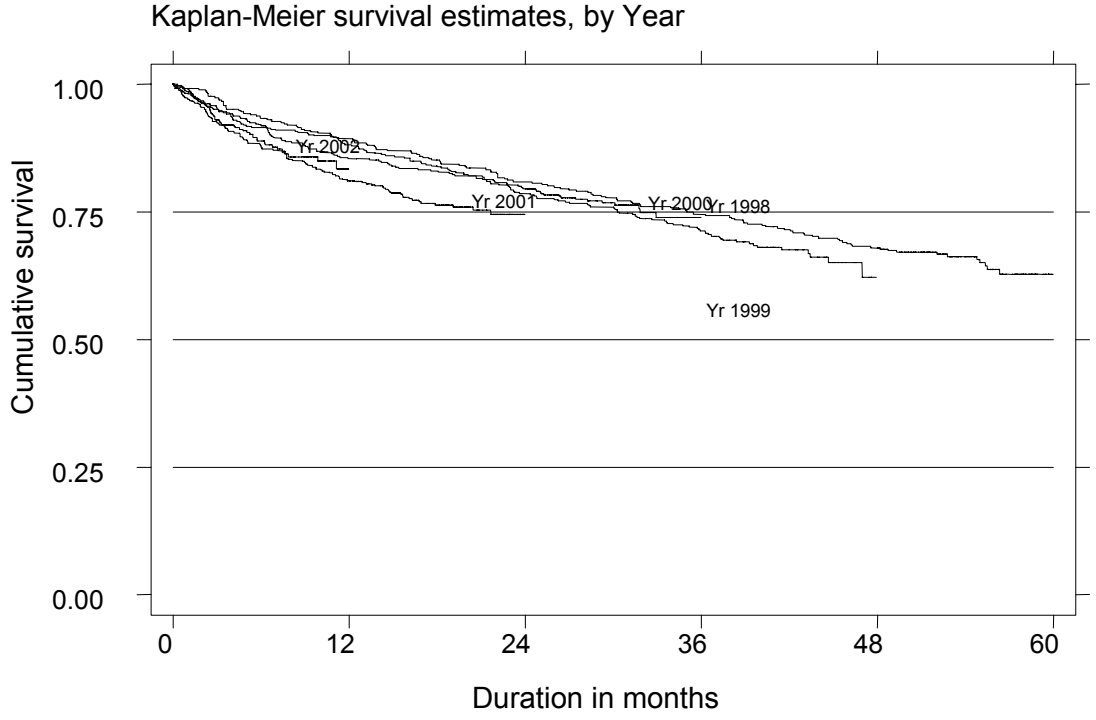
Table 3.1.11: HD Technique Survival related to Year of Entry, Government Centres 1997– 2002

Year	1997			1998			1999		
Interval	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	93	1	422	93	1	362	91	1	388
12	88	2	393	89	2	339	85	2	359
24	81	2	355	81	2	305	79	2	323
36	74	2	324	74	2	277	71	2	290
48	67	2	291	68	2	245			
60	62	2	261						

Year	2000			2001			2002		
Interval	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	92	1	429	88	1	472	89	2	250
12	88	1	406	81	2	429			
24	80	2	351						

No. = number at risk *SE = standard error*

Figure 3.1.11: HD Technique Survival by Year of Entry, Government Centres 1998 – 2002



3.1.7 WORK RELATED REHABILITATION AND QUALITY OF LIFE ON HAEMODIALYSIS, GOVERNMENT CENTRES

Table 3.1.12: Work Related Rehabilitation on HD, Government Centres 1999 – 2002

REHABILITATION	1999		2000		2001		2002	
STATUS	No.	%	No.	%	No.	%	No.	%
Full time work for pay	595	35	617	32	685	32	644	30
Part time work for pay	165	10	230	12	204	10	253	12
Able to work but unable to get a job	48	3	74	4	108	5	87	4
Able to work but not yet due to dialysis schedule	54	3	45	2	51	2	74	3
Able but disinclined to work	30	2	35	2	38	2	42	2
Home maker	358	21	419	22	490	23	493	23
Full time student	24	1	45	2	51	2	44	2
Age<15 years	4	0	6	0	6	0	5	0
Retired	204	12	197	10	205	10	192	9
Age>65 years	101	6	129	7	158	7	172	8
Unable to work due to poor health	138	8	115	6	150	7	168	8
Total	1721	100	1912	100	2146	100	2174	100

Table 3.1.13: Quality of Life on Haemodialysis, Government Centres 1999 – 2002

QOL Index Summated Score	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
0 (Worst QOL)	2	0	1	0	1	0	4	0
1	2	0	2	0	2	0	5	0
2	6	0	7	0	6	0	9	0
3	12	1	10	1	10	0	8	0
4	26	2	32	2	32	1	33	2
5	55	3	55	3	66	3	90	4
6	70	4	74	4	98	5	95	4
7	112	7	122	6	112	5	112	5
8	124	7	146	8	183	9	154	7
9	174	10	187	10	169	8	209	10
10 (Best QOL)	1098	65	1251	66	1462	68	1449	67
Total	1681	100	1887	100	2141	100	2168	100

3.1.8 HAEMODIALYSIS PRACTICES IN GOVERNMENT CENTRES

Table 3.1.14: Vascular Access on Haemodialysis, Government Centres 1999 – 2002

Access types	1999		2000		2001		2002	
	No	%	No	%	No	%	No	%
Wrist AVF	1480	79	1663	79	1762	76	1819	75
BCF*	296	16	366	17	472	20	492	20
Venous graft	2	0	5	0	4	0	3	0
Artificial graft	23	1	10	0	20	1	19	1
PERMCATH	12	1	14	1	15	1	23	1
Temporary CVC*	51	3	43	2	55	2	63	3
Total	1864	100	2101	100	2328	100	2419	100

* *BCF = Brachiocephalic fistula*
* *CVC = Central venous catheter*

Table 3.1.15: Difficulties reported with Vascular Access, Government Centres 1999 – 2002

Access difficulty	1999		2000		2001		2002	
	No	%	No	%	No	%	No	%
Difficulty with needle placement	98	5	78	4	89	4	91	4
Difficulty in obtaining desired blood flow rate	58	3	68	3	79	3	58	2
Other difficulty	28	1	15	1	19	1	21	1
No difficulty	1686	90	1946	92	2153	92	2255	93
Total	1870	100	2107	100	2340	100	2425	100

Table 3.1.16: Complications reported with Vascular Access, Government Centres 1999 – 2002

Complication	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
thrombosis	92	5	79	4	95	4	82	3
bleed	14	1	9	0	16	1	12	0
aneurysmal dilatation	120	6	124	6	107	5	137	6
swollen limb	21	1	18	1	23	1	19	1
access related infection, local/systemic	19	1	31	1	17	1	15	1
distal limb ischaemia	7	0	2	0	5	0	5	0
venous outflow obstruction	29	2	33	2	38	2	24	1
carpal tunnel	23	1	25	1	13	1	18	1
other	21	1	21	1	25	1	26	1
no complication	1524	81	1764	84	2000	86	2086	86
Total	1870	100	2106	100	2339	100	2424	100

Table 3.1.17: Blood Flow Rates in Government HD Units 1999– 2002

Blood flow rates	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
<150 ml/min	4	0	4	0	2	0	6	0
150-199 ml/min	43	2	37	2	23	1	15	1
200-249 ml/min	439	24	392	19	291	13	187	8
250-299 ml/min	944	52	937	46	916	40	828	36
300-349 ml/min	373	20	595	29	878	38	957	41
> 350 ml/min	20	1	76	4	185	8	336	14
Total	1823	100	2041	100	2295	100	2329	100

Table 3.1.18: Number of HD Sessions per week, Government HD Units 1999 – 2002

HD sessions	1999		2000		2001		2002	
Per week	No.	%	No.	%	No.	%	No.	%
1	1	0	1	0	1	0	2	0
2	18	1	22	1	19	1	19	1
3	1845	99	2074	99	2309	99	2372	99
4	1	0	3	0	11	0	11	0
Total	1865	100	2102	100	2340	100	2404	100

Table 3.1.19: Duration of HD in Government Units 1999 – 2002

Duration of HD	1999		2000		2001		2002	
per session	No.	%	No.	%	No.	%	No.	%
≤3 hours	2	0	6	0	1	0	11	0
3.5 hours	0	0	1	0	20	1	0	0
4 hours	1733	93	1983	94	2261	97	2363	98
4.5 hours	107	6	98	5	54	2	26	1
5 hours	23	1	11	1	5	0	2	0
≥5 hours	0	0	1	0	0	0	0	0
Total	1865	100	2100	100	2341	100	2402	100

Table 3.1.20: Dialyser membrane types in Government HD Units 1999 – 2002

Dialyser	1999		2000		2001		2002	
membrane	No.	%	No.	%	No.	%	No.	%
Cellulosic	518	38	505	31	409	23	304	14
Cellulose acetate	316	23	295	18	168	9	145	7
Synthetic	541	39	815	50	1200	68	1678	79
Total	1375	100	1615	100	1777	100	2127	100

Table 3.1.21: Dialyser Reuse Frequency in Government HD Units 1999- 2002

Dialyser reuse frequency	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
1*	15	1	15	1	16	1	22	1
2	5	0	11	1	7	0	21	1
3	117	7	99	5	127	6	73	3
4	94	5	118	6	94	4	56	3
5	120	7	76	4	110	5	39	2
6	928	53	1005	51	747	34	414	19
7	41	2	62	3	67	3	83	4
8	79	5	120	6	135	6	128	6
9	173	10	64	3	84	4	16	1
10	66	4	81	4	223	10	185	8
11	5	0	3	0	37	2	27	1
12	106	6	280	14	375	17	742	34
≥13	0	0	44	2	155	7	382	17
Total	1749	100	1978	100	2177	100	2188	100

1* is single use i.e. no reuse

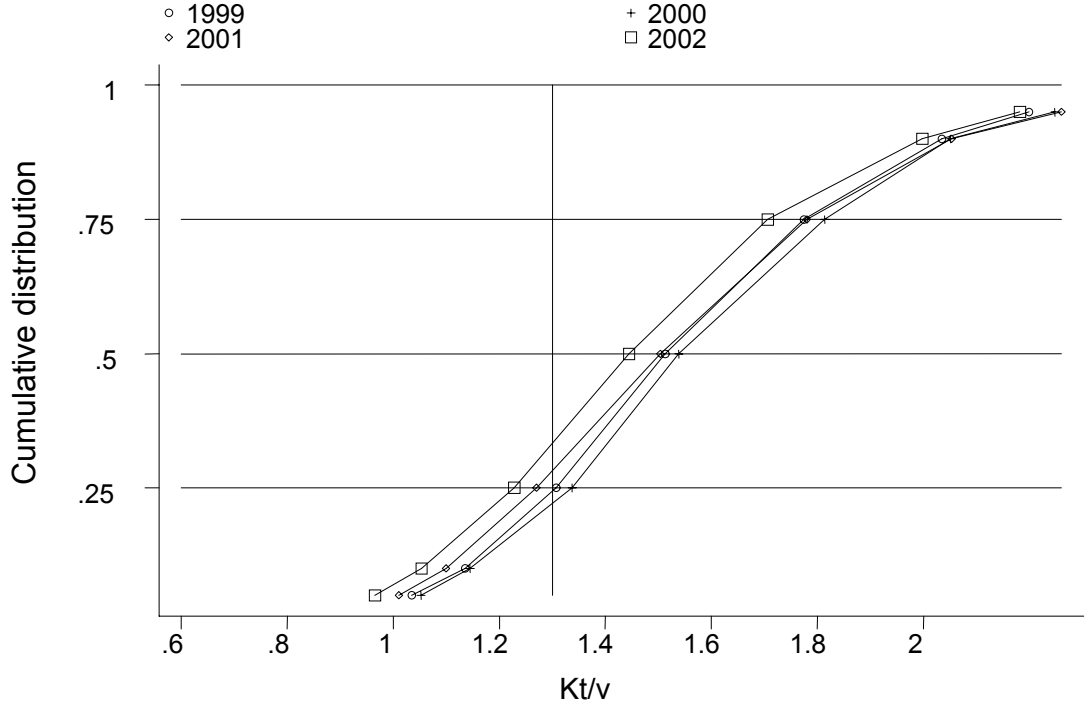
Table 3.1.22: Dialysate Buffer used in Government HD Units 1999 – 2002

Dialysate buffer	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
Acetate	426	23	271	13	162	7	69	3
Bicarbonate	1441	77	1821	87	2171	93	2307	97
Total	1867	100	2092	100	2333	100	2376	100

Table 3.1.23: Distribution of Prescribed KT/V, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% > 1.3
1999	1776	17888	1.5	1.3	1.8	76
2000	1977	20487	1.5	1.3	1.8	79
2001	2234	22816	1.5	1.3	1.8	72
2002	2220	22817	1.4	1.2	1.7	67

Figure 3.1.23: Cumulative distribution of Prescribed KT/V by year



3.1.9 DYSLIPIDAEMIA IN HD PATIENTS, GOVERNMENT CENTRES

Table 3.1.24: Distribution of serum Cholesterol Levels (mmol/L), HD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 5.3 mmol/L
1999	1514	2476	4.8	4	5.7	69
2000	1709	2825	4.9	4.1	5.7	69
2001	2007	3416	4.9	4.2	5.8	67
2002	2096	3669	4.9	4.1	5.7	68

Figure 3.1.24: Cumulative distribution of serum cholesterol concentration by year

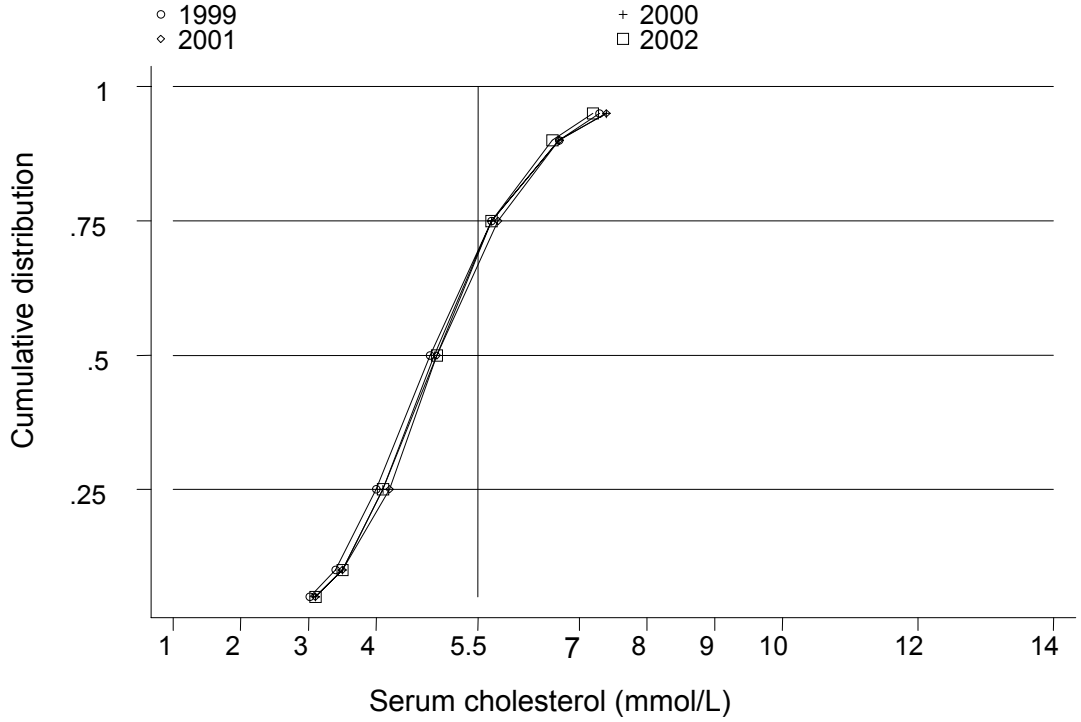


Table 3.1.25: Distribution of serum Triglyceride (mmol/L), HD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 3.5 mmol/L
1999	1400	2221	1.7	1.2	2.5	88
2000	1558	2567	1.7	1.2	2.5	88
2001	1890	3206	1.7	1.2	2.5	87
2002	1990	3475	1.7	1.2	2.5	88

Figure 3.1.25: Cumulative distribution of serum triglyceride concentration by year

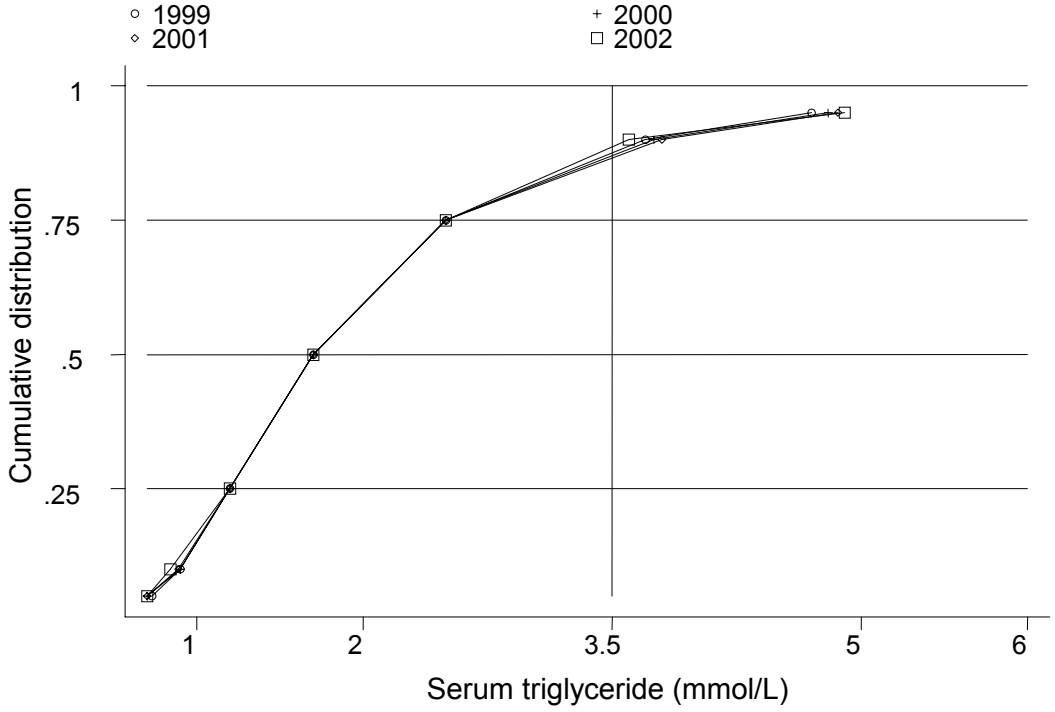


Table 3.1.26: Distribution of serum LDL (mmol/L), HD patient, Government Centres 1999– 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients <5 mmol/L
1999	717	1013	3	2.3	3.9	93
2000	924	1496	2.9	2.2	3.7	94
2001	1304	2091	2.9	2.2	3.7	95
2002	1408	2364	2.9	2.2	3.6	96

Figure 3.1.26 : Cumulative distribution of serum LDL concentration by year

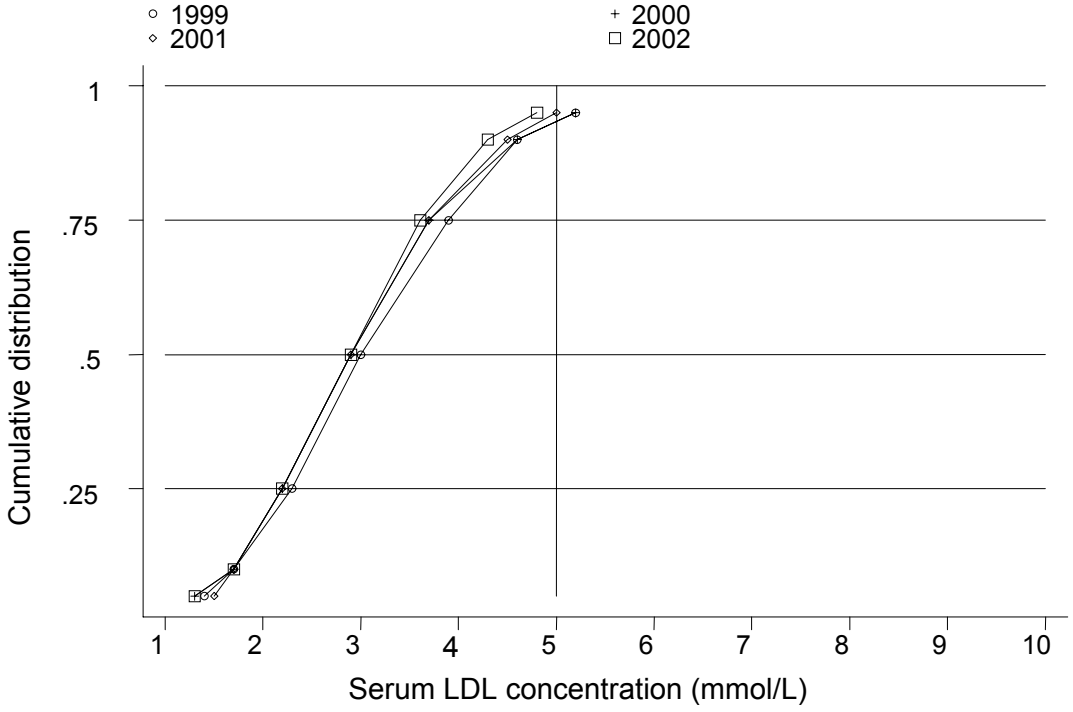
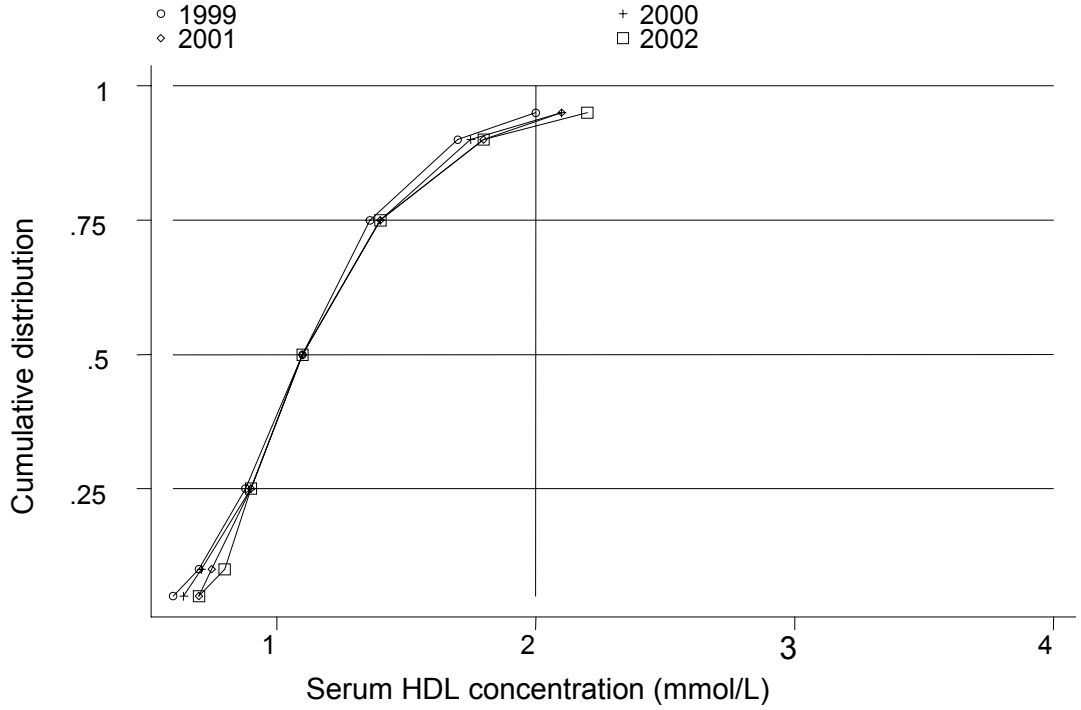


Table 3.1.27: Distribution of serum HDL (mmol/L), HD patient, Government Centres 1999- 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 2mmol/L
1999	732	1045	1.1	0.9	1.4	95
2000	950	1532	1.1	0.9	1.4	94
2001	1298	2102	1.1	0.9	1.4	93
2002	1414	2395	1.1	0.9	1.4	93

Figure 3.1.27: Cumulative distribution of serum HDL by year



3.1.10 MANAGEMENT OF RENAL BONE DISEASE, GOVERNMENT CENTRES

Table 3.1.28: Treatment for Renal Bone Disease, HD patients, Government Centres 1999 – 2002

Year	No of subjects	% on $CaCO_3$	% on $Al(OH)_3$	% on Vit D
1999	1881	91	9	24
2000	2114	92	8	23
2001	2358	92	4	21
2002	2436	92	5	24

Table 3.1.29: Distribution of serum Phosphate (mmol/l), HD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients <1.6 mmol/L
1999	1821	5830	1.8	1.4	2.3	36
2000	2046	6600	1.8	1.4	2.3	36
2001	2264	7348	1.8	1.4	2.3	36
2002	2316	7602	1.8	1.4	2.3	34

Figure 3.1.29: Cumulative distribution of serum Phosphate by year

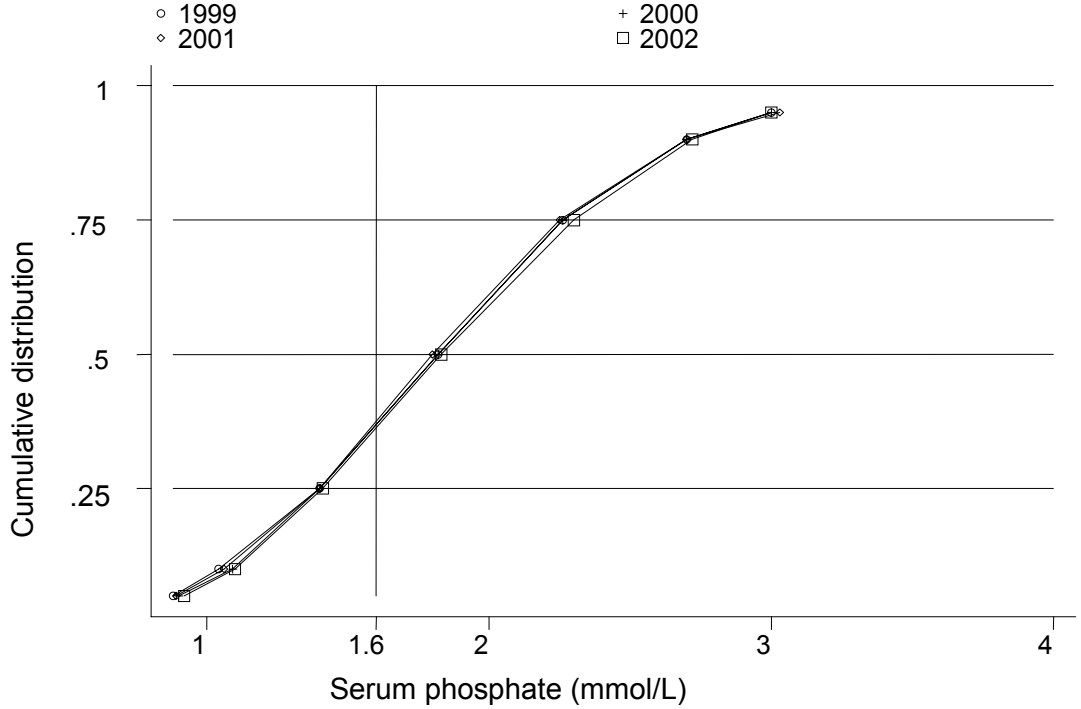


Table 3.1.30: Distribution of serum Calcium (mmol/l), HD patients, Government Centres 1999– 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients ≥ 2.2 & ≤2.6 mmol/L
1999	1835	5957	2.3	2.1	2.5	52
2000	2058	6707	2.3	2.2	2.5	56
2001	2294	7500	2.4	2.2	2.5	57
2002	2354	7811	2.3	2.1	2.5	55

Figure 3.1.30: Cumulative distribution of serum Calcium by year

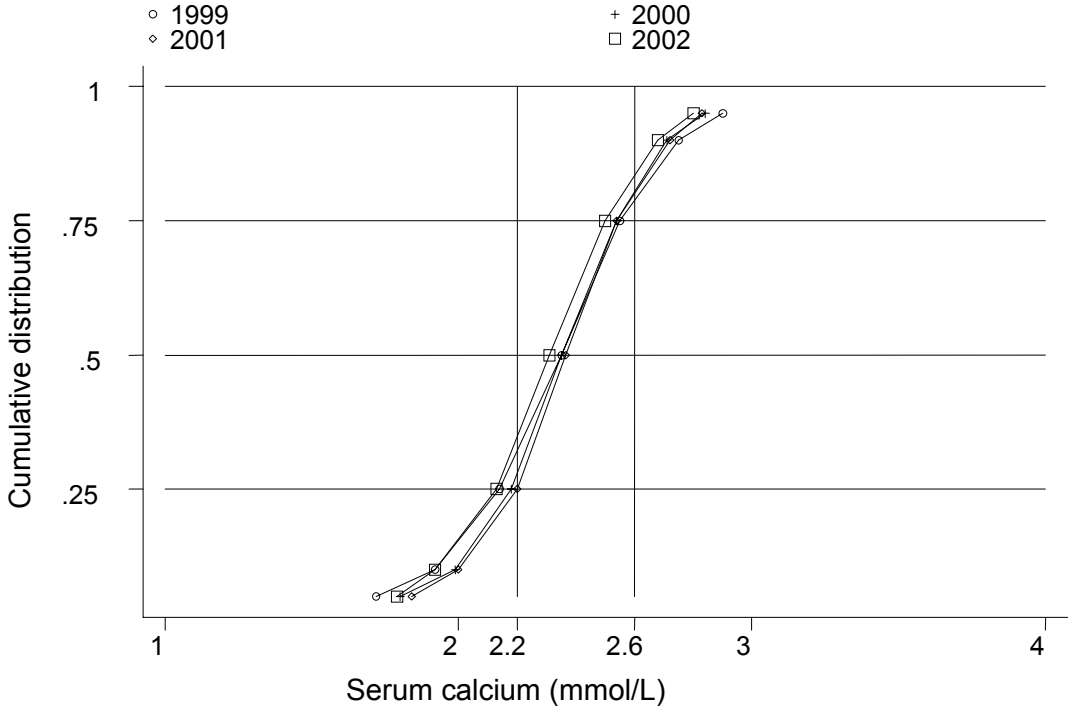
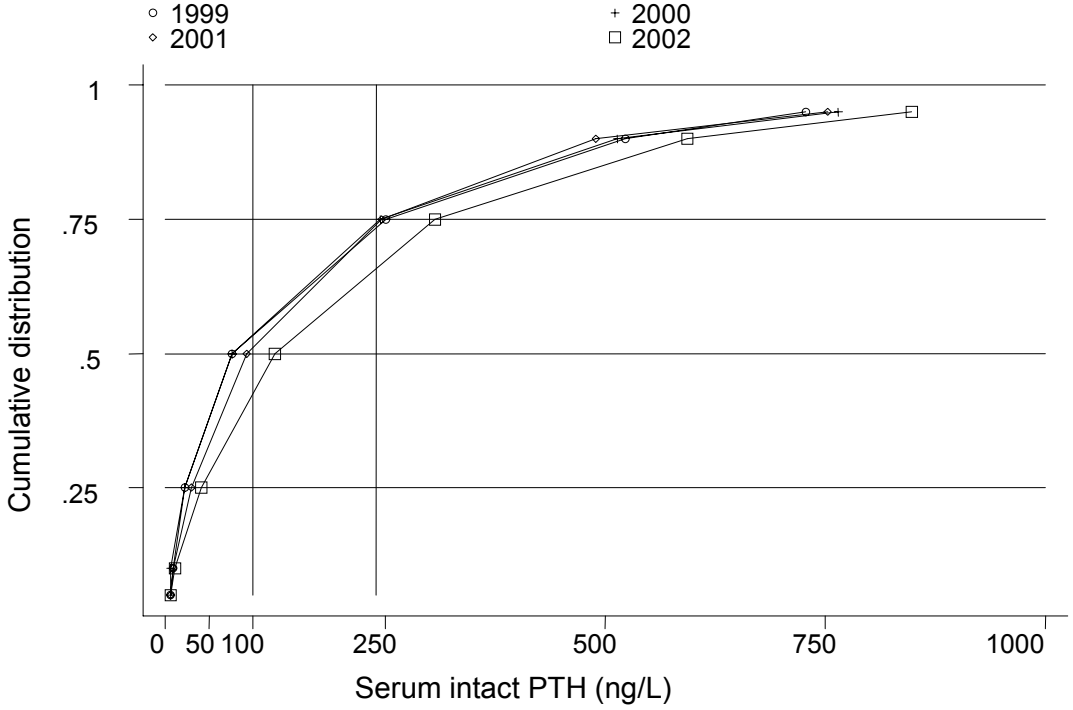


Table 3.1.31: Distribution of serum iPTH (ng/L), HD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients ≥ 100 & ≤ 250 ng/L
1999	1194	1799	76	22	251	19
2000	1533	2361	76	22	245	18
2001	1714	2734	93	30	246	23
2002	1755	2847	125	41	307	24

Figure 3.1.31: Cumulative distribution of serum iPTH by year



3.1.11 MANAGEMENT OF BLOOD PRESSURE, GOVERNMENT CENTRES

Table 3.1.32: Treatment for hypertension, HD patients, Government Centres 1999 – 2002

Year	No.	% on anti-hypertensives	% on 1 anti-hypertensives	% on 2 anti-hypertensives	% on 3 anti-hypertensives
1999	1881	67	35	24	8
2000	2114	67	37	22	8
2001	2358	67	34	24	9
2002	2436	67	33	25	10

Table 3.1.33: Distribution of Systolic BP without anti-hypertensives, HD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 160 mmHg
1999	613	6252	130	118	148	88
2000	696	7346	131	118	148	86
2001	771	7905	133	120	150	84
2002	782	8253	135	120	151	83

Figure 3.1.33: Cumulative distribution of Systolic BP without anti-hypertensives by year

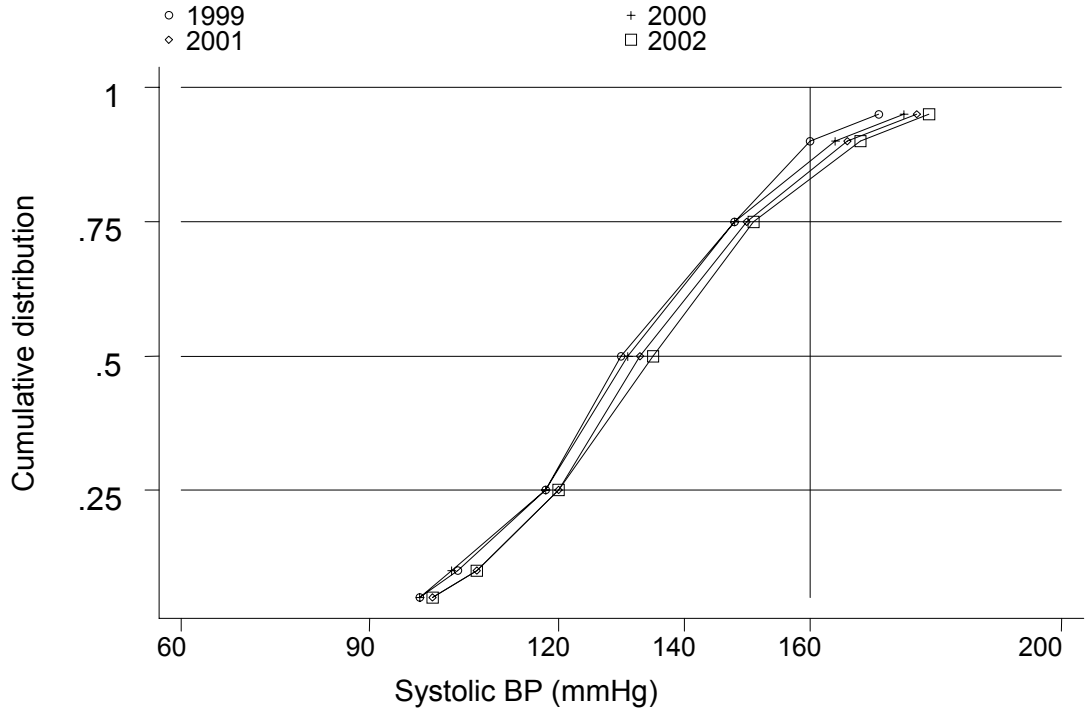


Table 3.1.34: Distribution of Diastolic BP without anti-hypertensives HD patients Government Centres 1999– 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 90 mmHg
1999	613	6249	79	70	86	80
2000	696	7349	79	70	87	79
2001	770	7902	78	70	86	80
2002	782	8244	79	69	87	80

Figure 3.1.34: Cumulative distribution of Diastolic BP without anti hypertensives by year

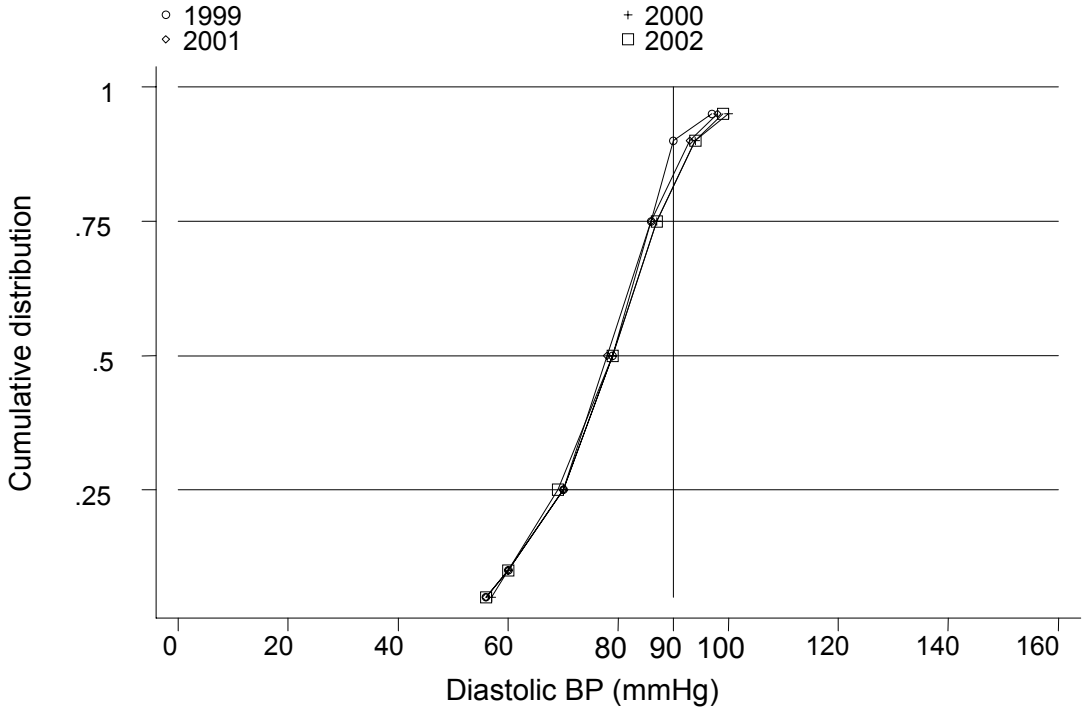


Table 3.1.35: Distribution of systolic BP on anti-hypertensives, HD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 160 mmHg
1999	1252	12467	150	137	168	61
2000	1401	14289	150	134	169	63
2001	1571	15917	150	135	169	62
2002	1615	16280	150	136	169	61

Figure 3.1.35: Cumulative distribution of systolic BP on anti-hypertensives by year

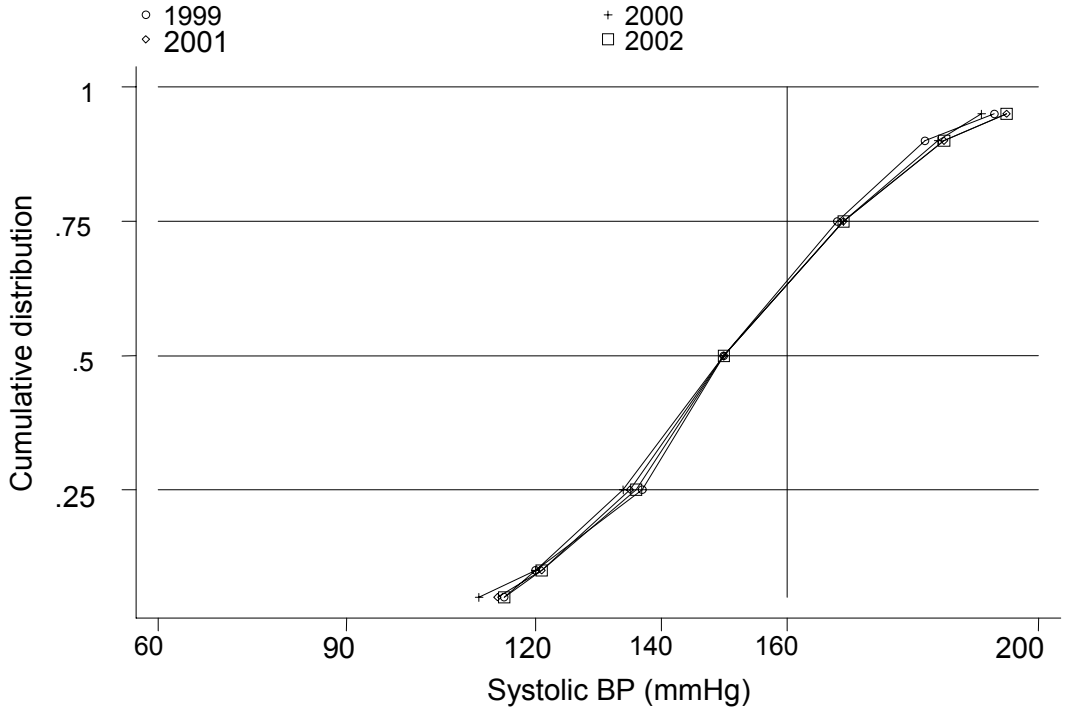
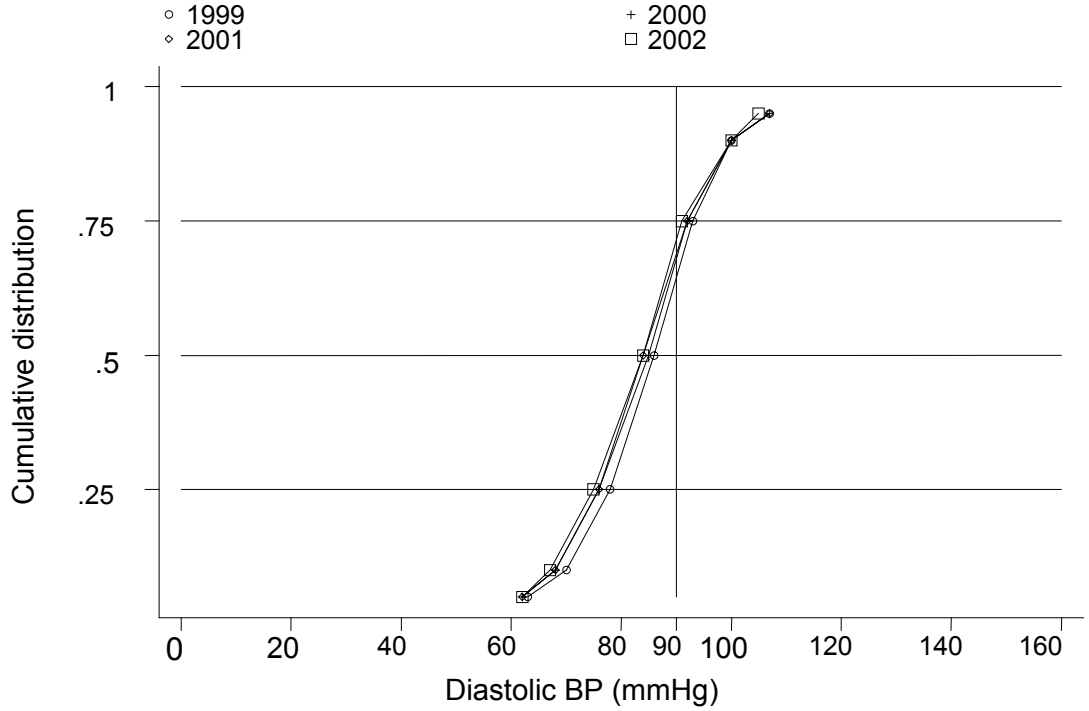


Table 3.1.36: Distribution of diastolic BP on anti-hypertensives, HD patients, Government Centres 1999– 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 90 mmHg
1999	1252	12467	86	78	93	56
2000	1401	14297	85	76	92	59
2001	1571	15927	84	76	92	62
2002	1614	16298	84	75	91	64

Figure 3.1.36: Cumulative distribution of diastolic BP on anti-hypertensives by year



3.1.12 TREATMENT OF ANAEMIA, GOVERNMENT HD CENTRES

Table 3.1.37: Treatment for Anaemia, HD patients, Government Centres 1999 – 2002

Year	No	% on rHuEpo	% received blood transfusion	% on oral Iron	% received parenteral Iron
1999	1881	49	16	94	5
2000	2114	54	15	92	7
2001	2358	60	13	91	7
2002	2436	66	11	89	11

Table 3.1.38: Distribution of rHuEpo dose per week, HD patients, Government Centres 1999 – 2002

Year	1999	2000	2001	2002
No. of patients	872	1085	1386	1575
% on 2000 u/week	20	21	20	18
% on 2-4000 u/week	60	57	58	56
% on 4-6000 u/week	6	7	8	10
% on 6-8000 u/week	14	11	12	12
% on 8-12000 u/week	2	4	3	3
% on >12000 u/week	0	0	0	0

Table 3.1.39: Distribution of serum Iron without rHuEpo, HD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 10 umol/L
1999	636	1498	14.1	10	23	71
2000	665	1638	14	9.8	20	70
2001	684	1591	15	10.3	23.4	76
2002	614	1531	14	9.8	21	72

Figure 3.1.39: Cumulative Distribution of serum Iron without rHuEpo by year

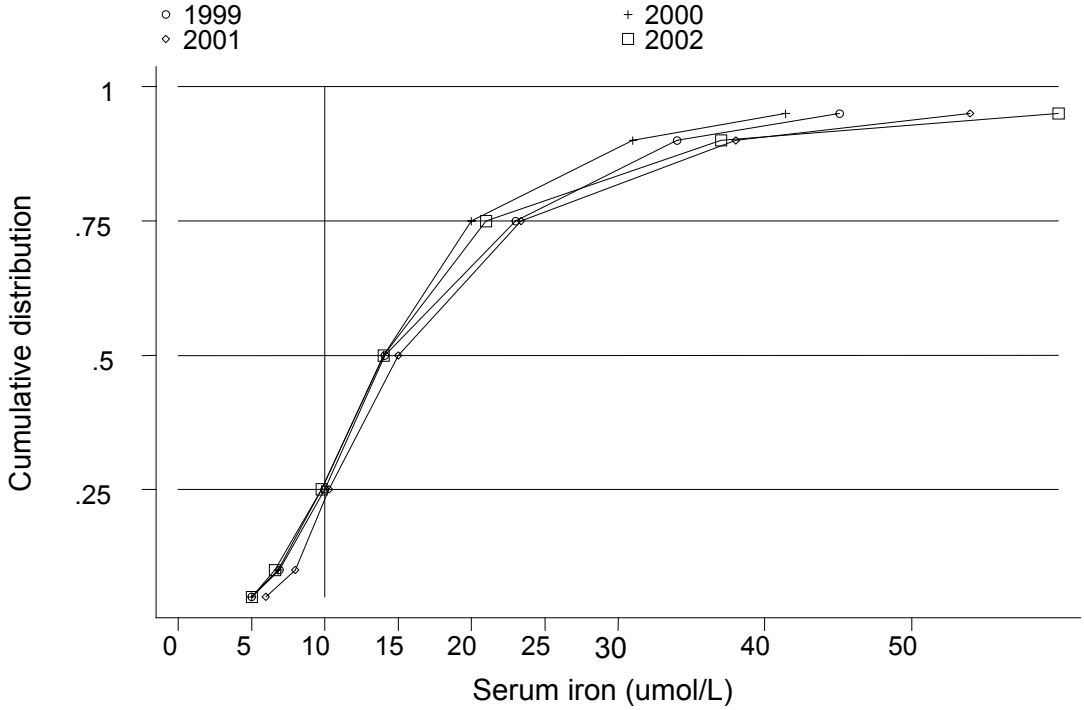


Table 3.1.40: Distribution of serum Iron on rHuEpo,HD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 10 umol/L
1999	639	1851	14	10	23	74
2000	915	2634	13.3	9.6	20.2	69
2001	1165	3341	14	10	22.6	71
2002	1366	4150	13	9	19.2	66

Figure 3.1.40: Cumulative Distribution of serum Iron on rHuEpo by year

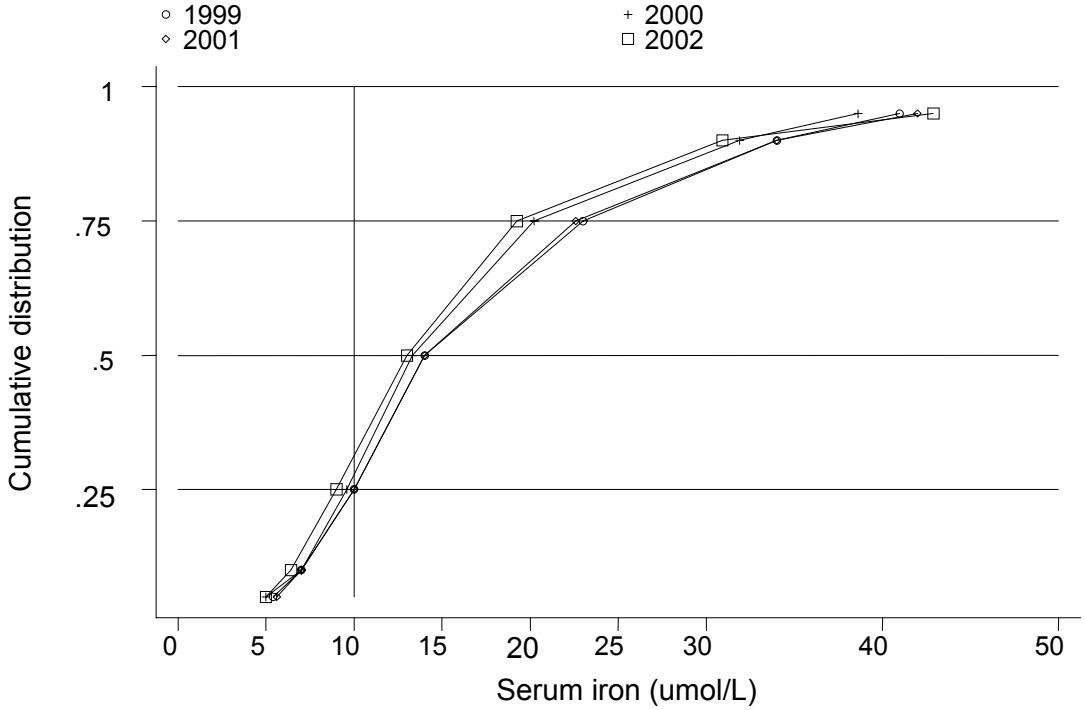


Table 3.1.41: Distribution of Transferrin Saturation without rHuEpo, HD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 20%
1999	381	1524	27.2	18.3	41.6	69
2000	559	2236	29.2	19.4	43.4	72
2001	594	2376	30.8	22.5	44.2	80
2002	522	2088	32.3	21.9	48.4	80

Figure 3.1.41: Cumulative distribution of serum Transferrin Saturation without rHuEpo by year

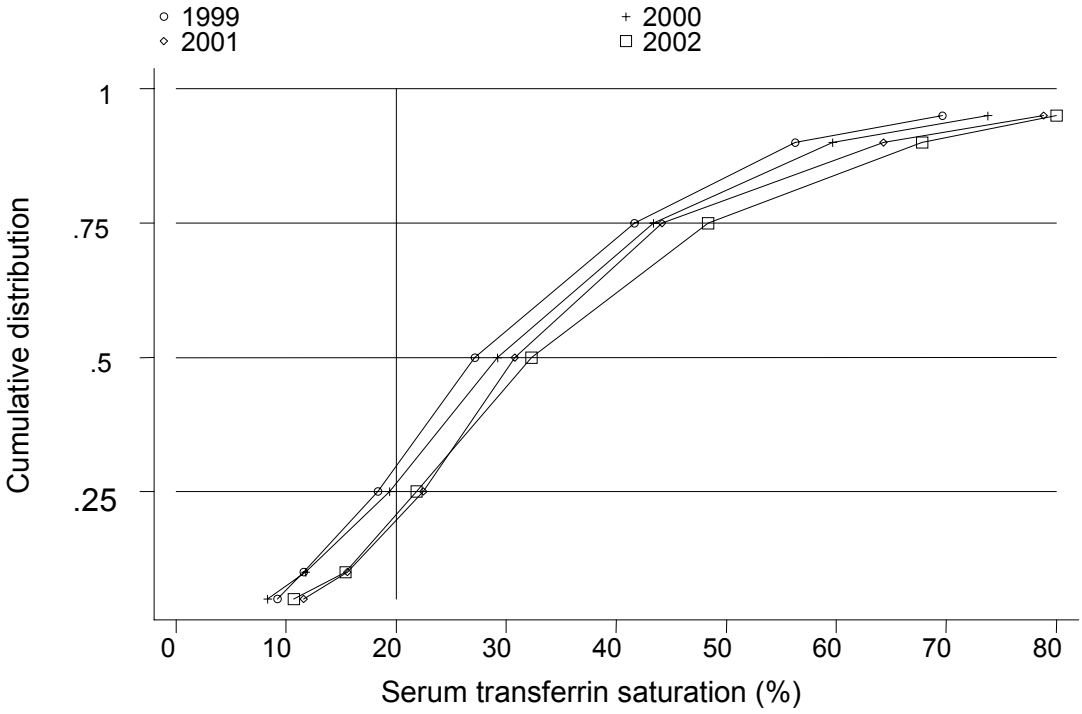


Table 3.1.42: Distribution of Transferrin Saturation on rHuEpo, HD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 20%
1999	481	1924	30.2	21	42.4	78
2000	854	3416	29.8	20.1	42.9	75
2001	1071	4284	31.9	22.6	47.9	80
2002	1204	4816	30.9	21.1	46.8	77

Figure 3.1.42: Cumulative distribution of serum Transferrin Saturation on rHuEpo by year

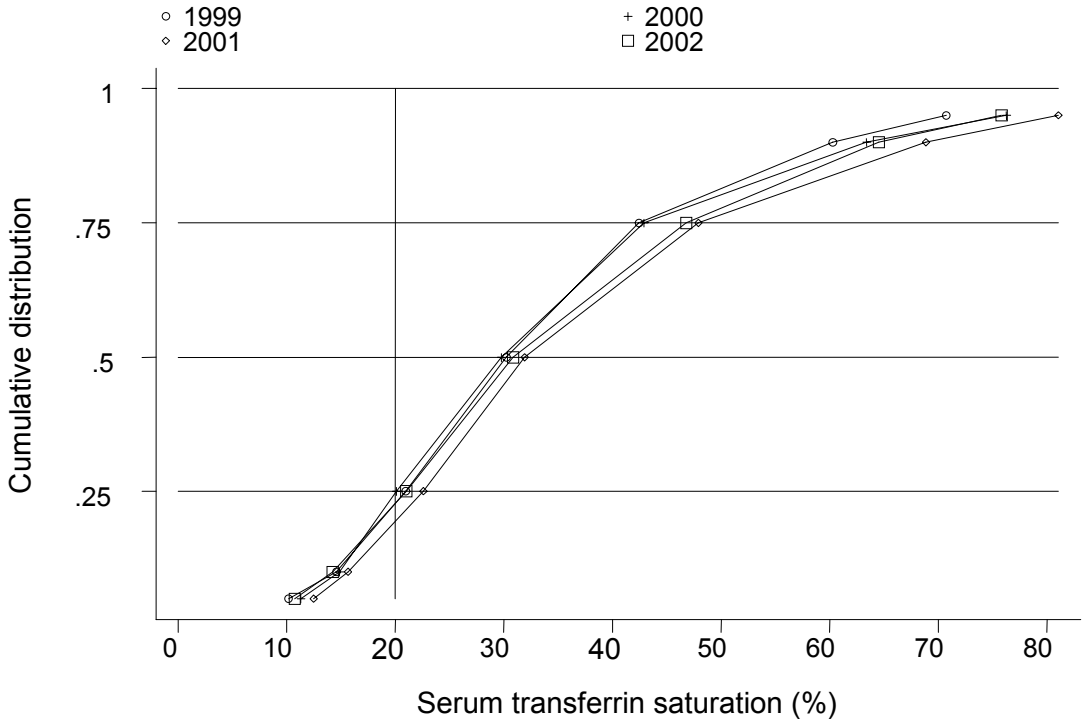


Table 3.1.43: Distribution of serum Ferritin without rHuEpo, HD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 100 ug/L
1999	288	433	385	157	828	85
2000	379	578	317.5	131.7	743	80
2001	454	719	355.8	157.3	779	86
2002	418	673	353	132	728	80

Figure 3.1.43:Cumulative distribution of serum Ferritin without rHuEpo by year

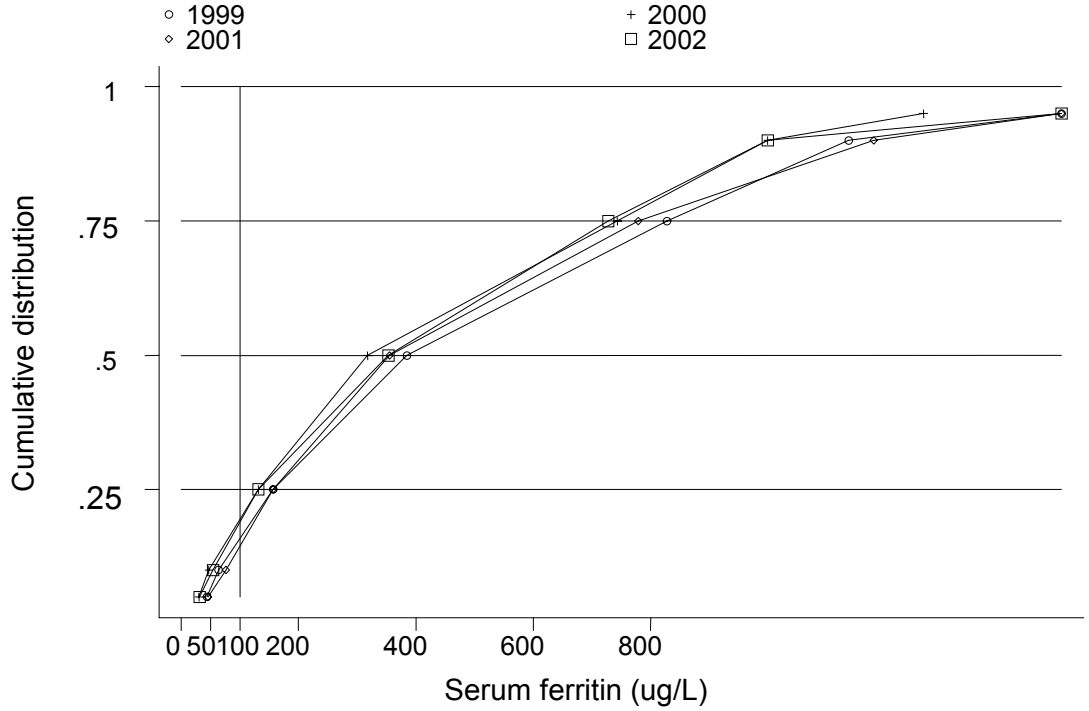


Table 3.1.44: Distribution of serum Ferritin on rHuEpo, HD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 100 ug/L
1999	442	691	430.6	210.7	840.7	91
2000	711	1167	413	184	836	88
2001	892	1531	435	207	876.9	88
2002	1076	1830	420	207	857	90

Figure 3.1.44: Cumulative distribution of serum Ferritin on rHuEpo by year

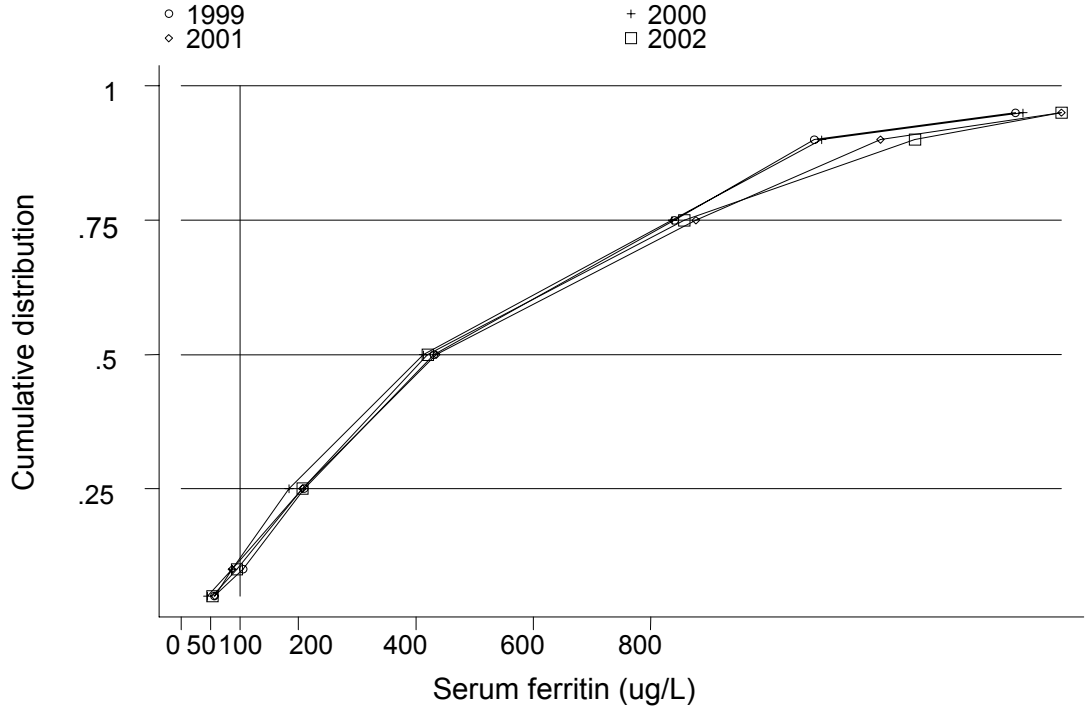


Table 3.1.45: Distribution of Haemoglobin concentration without rHuEpo, HD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients <10 g/dL	% Patients ≥10 & ≤12 g/dL	% Patients >12 g/dL
1999	944	2882	9.2	7.7	10.6	64	27	10
2000	939	2836	9.5	8	11	59	27	14
2001	908	2734	9.6	8.3	11.2	54	31	15
2002	783	2380	9.9	8.4	11.4	51	32	17

Figure 3.1.45: Cumulative distribution of Haemoglobin concentration without rHuEpo by year

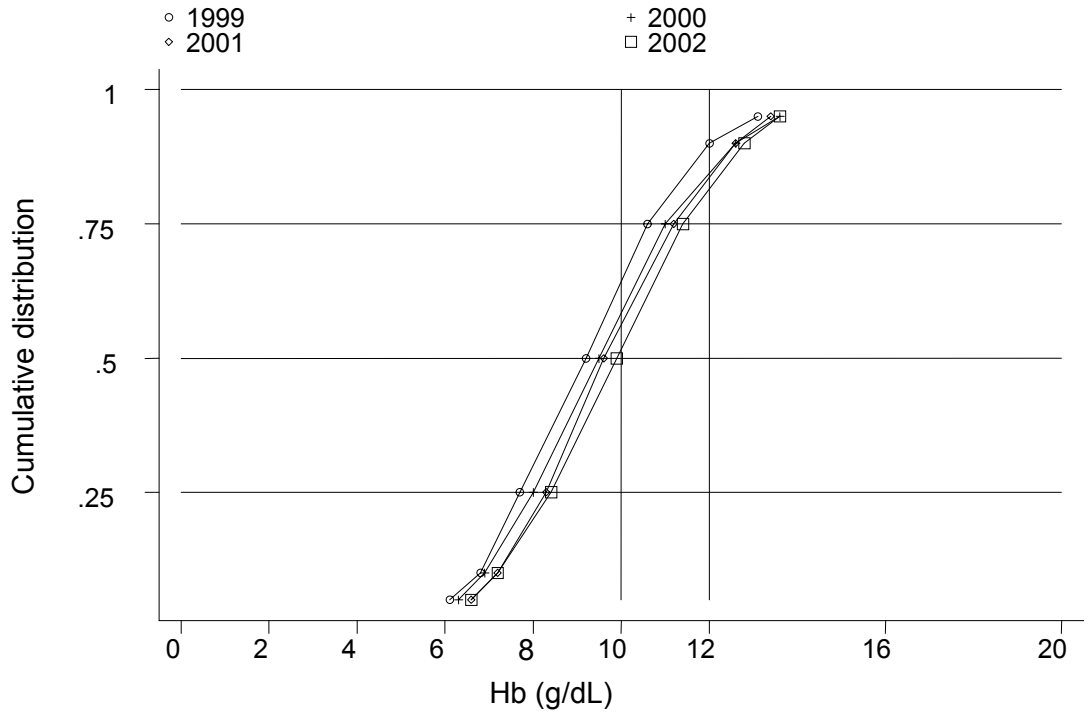
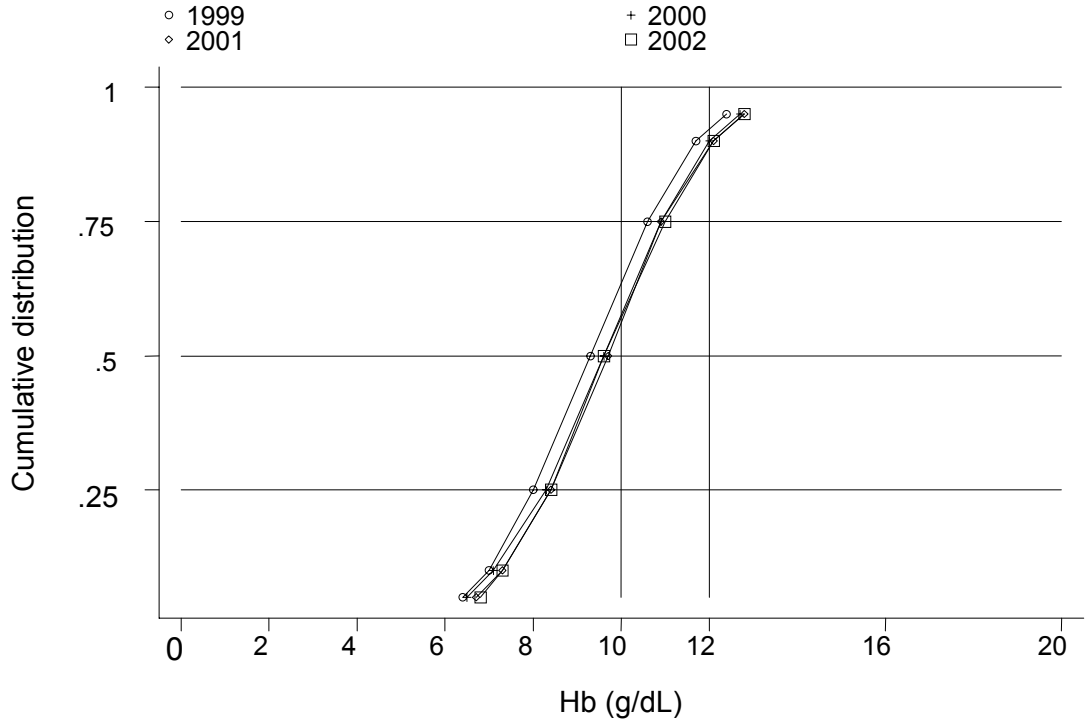


Table 3.1.46: Distribution of Haemoglobin concentrationon rHuEpo, HD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients <10 g/dL	% Patients ≥10 & ≤12 g/dL	% Patients >12 g/dL
1999	907	3223	9.3	8	10.6	63	30	8
2000	1125	4043	9.6	8.3	10.9	56	34	10
2001	1393	4924	9.7	8.4	10.9	55	35	10
2002	1569	5595	9.6	8.4	11	56	33	10

Figure 3.1.46: Cumulative distribution of Haemoglobin concentration on rHuEpo, by year



3.1.13 NUTRITIONAL STATUS OF HD PATIENTS GOVERNMENT CENTRES

Table 3.1.47: Distribution of serum Albumin (g/L), HD patients, Government Centres 1999 - 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients >40g/L
1999	1822	5908	41	37	44	59
2000	2013	6520	40	37	44	56
2001	2279	7503	40.5	37	44	57
2002	2343	7808	40.1	37	44	57

Figure 3.1.47: Cumulative distribution of serum Albumin by year

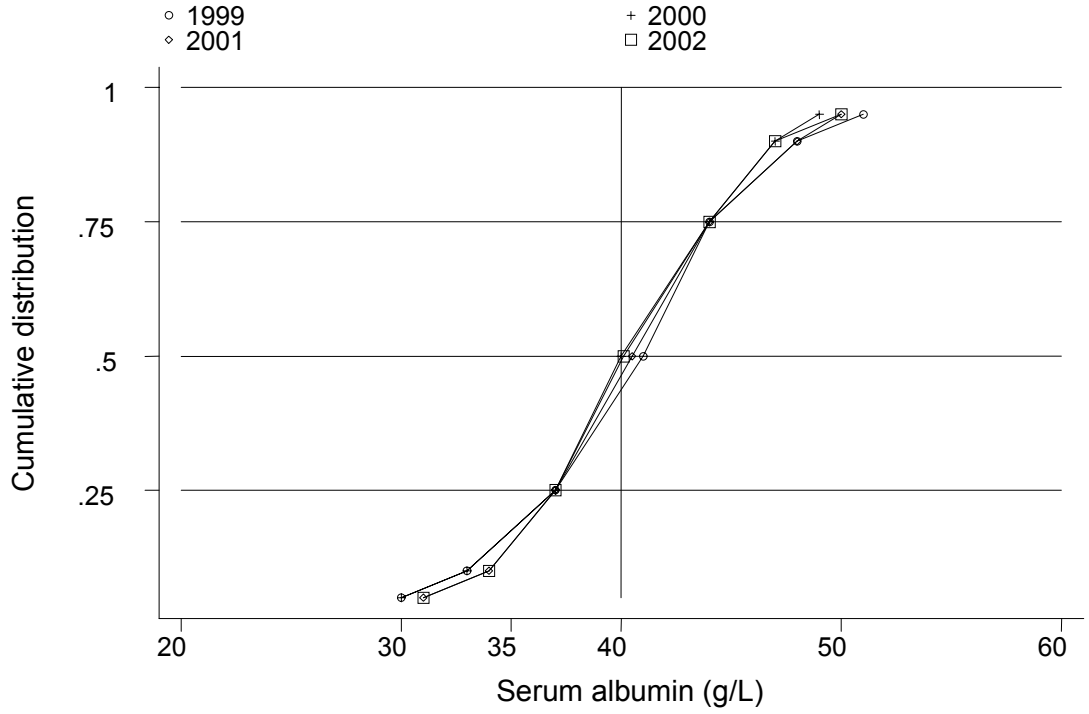
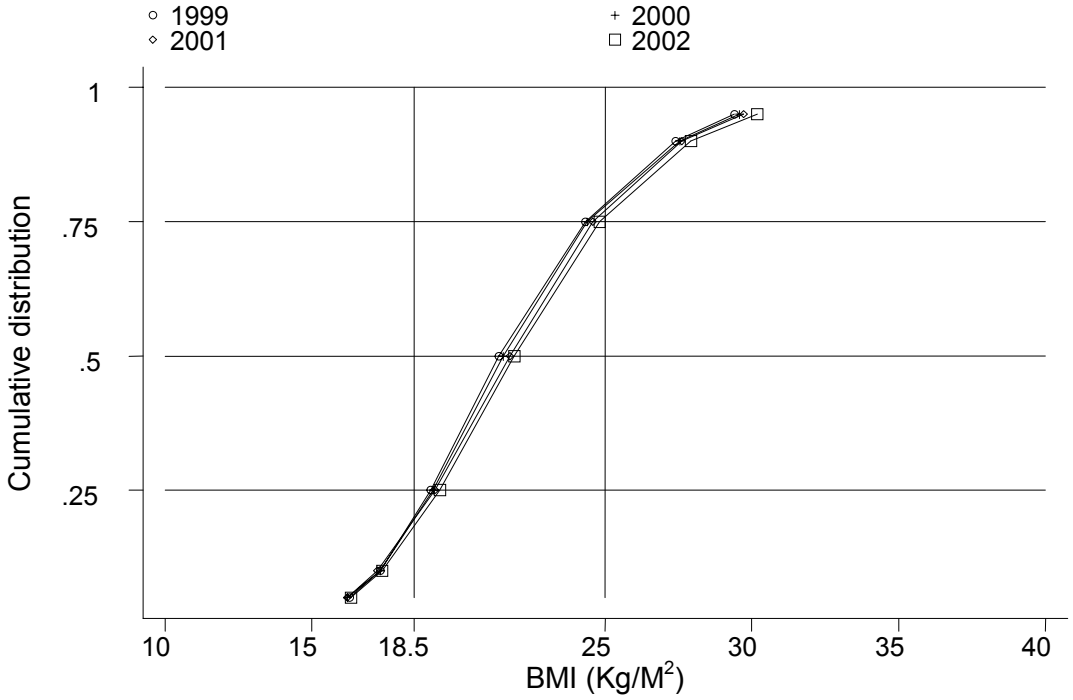


Table 3.1.48: Distribution of Body Mass Index, HD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients <18.5	% Patients ≥18.5 & ≤25	% Patients >25
1999	1776	17783	21.4	19.1	24.3	19	60	20
2000	1993	20559	21.5	19.1	24.4	19	60	21
2001	2214	22468	21.7	19.2	24.6	19	59	22
2002	2232	22909	21.9	19.4	24.8	18	59	23

Figure 3.1.48: Cumulative distribution of BMI by year

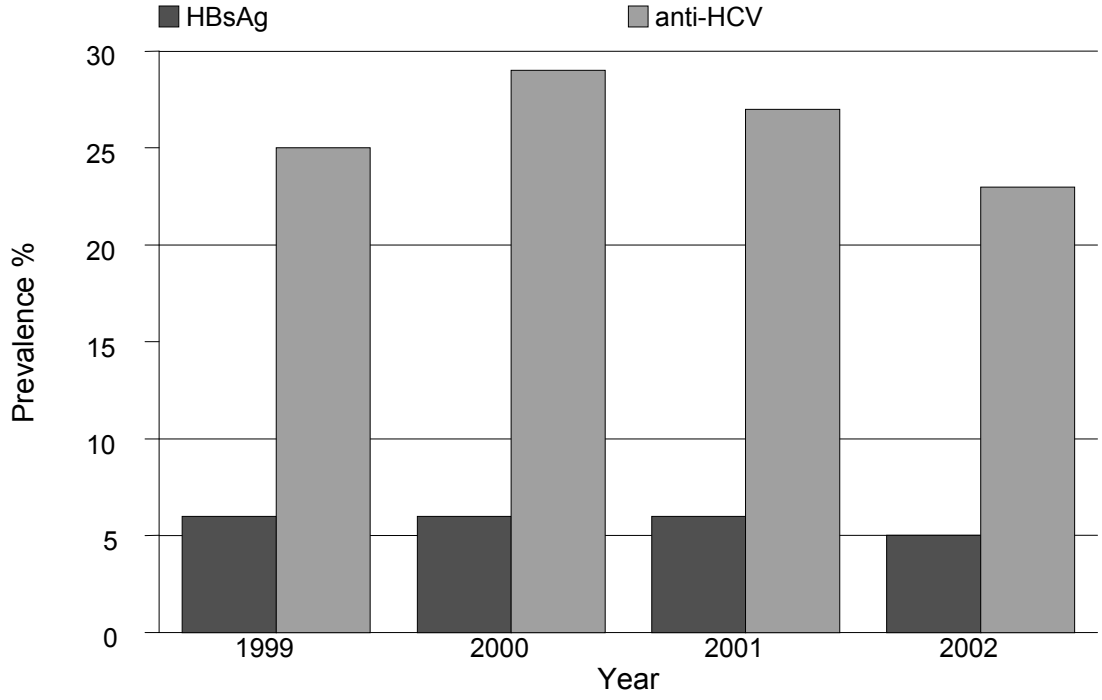


3.1.14 SEROLOGICAL STATUS, HD PATIENTS GOVERNMENT CENTRES

Table 3.1.49: Prevalence of positive anti-HCV and HbsAg, HD patients, Government Centres 1999– 2002

Year	No	% HbsAg positive	% anti-HCV positive
1999	1881	6	25
2000	2114	6	29
2001	2358	6	27
2002	2436	5	23

Figure 3.1.49: Prevalence of positive anti-HCV and HbsAg, HD patients, Government Centres 1999 – 2002



HAEMODIALYSIS

IN

NON-GOVERNMENTAL ORGANISATION (NGO)

CENTRES

Stock and Flow

Death on Haemodialysis and Transfer to PD

NGO Haemodialysis Centres

Haemodialysis Patient Characteristics

Survival Analysis

Work related rehabilitation and quality of life

Haemodialysis practices

Dyslipidaemia in HD patients

Treatment of Renal Bone Disease

Management of Blood Pressure

Management of Anaemia

Nutritional status

Prevalence of anti-HCV antibodies and HBsAg

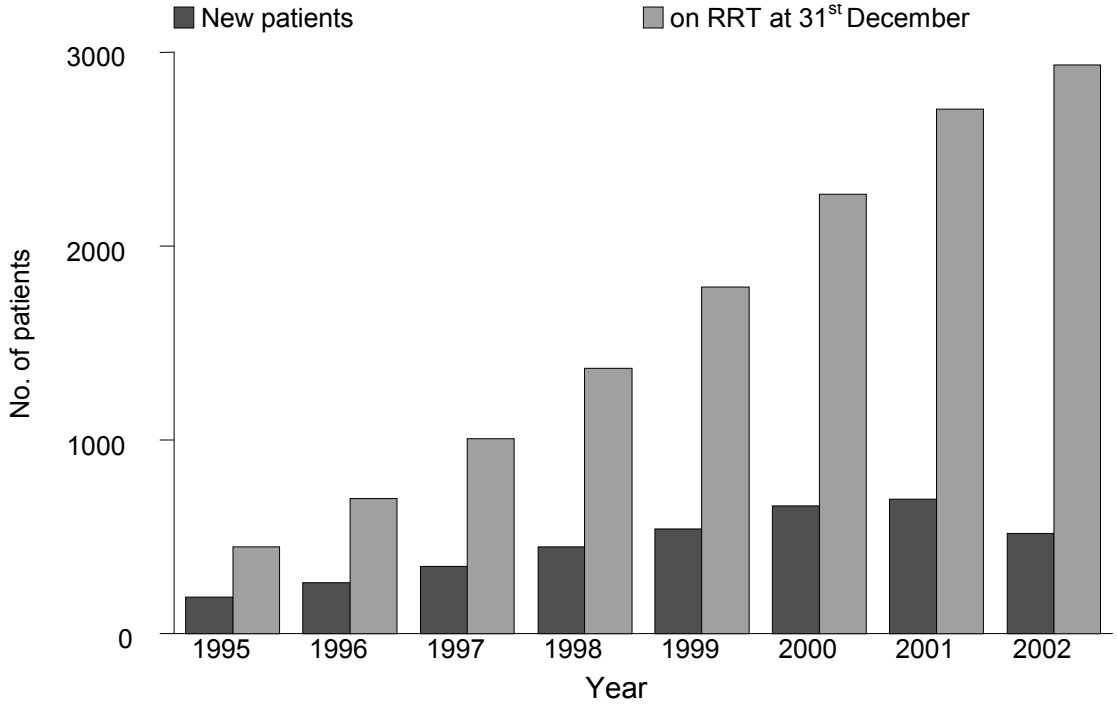
3.2 HAEMODIALYSIS IN NON-GOVERNMENTAL ORGANISATION (NGO) CENTRES

3.2.1 STOCK AND FLOW

Table 3.2.01: Stock and Flow HD patients, NGO Centres 1995 – 2002

Year	1995	1996	1997	1998	1999	2000	2001	2002
New patients	188	261	347	449	540	658	695	516
Died	15	20	44	86	117	155	220	233
Transferred to PD	0	0	0	1	4	8	10	8
Transplanted	2	5	8	13	15	28	35	46
Lost to Follow up	0	1	0	1	3	2	7	15
On HD at 31st December	448	698	1007	1368	1788	2267	2705	2932

Figure 3.2.01: Stock and Flow HD patients, NGO Centres 1995 – 2002



3.2.3 DEATH ON HAEMODIALYSIS, NGO CENTRES

Table 3.2.04: Death Rate on HD and Transfer to PD, NGO Centres 1995 – 2002

Year	1995	1996	1997	1998	1999	2000	2001	2002
No. of patients at risk	448	573	853	1188	1578	2028	2486	2819
Deaths	15	20	44	86	117	155	220	233
Death rate %	3	3	5	7	7	8	9	8
Transfer to PD	0	0	0	1	4	8	10	8
Transfer to PD rate %	0	0	0	0	0	0	0	0
All Losses	15	20	44	87	121	163	230	241
All Losses rate %	3	3	5	7	8	8	9	9

Figure 3.2.04: Death Rate on HD, NGO Centres, 1995 – 2002

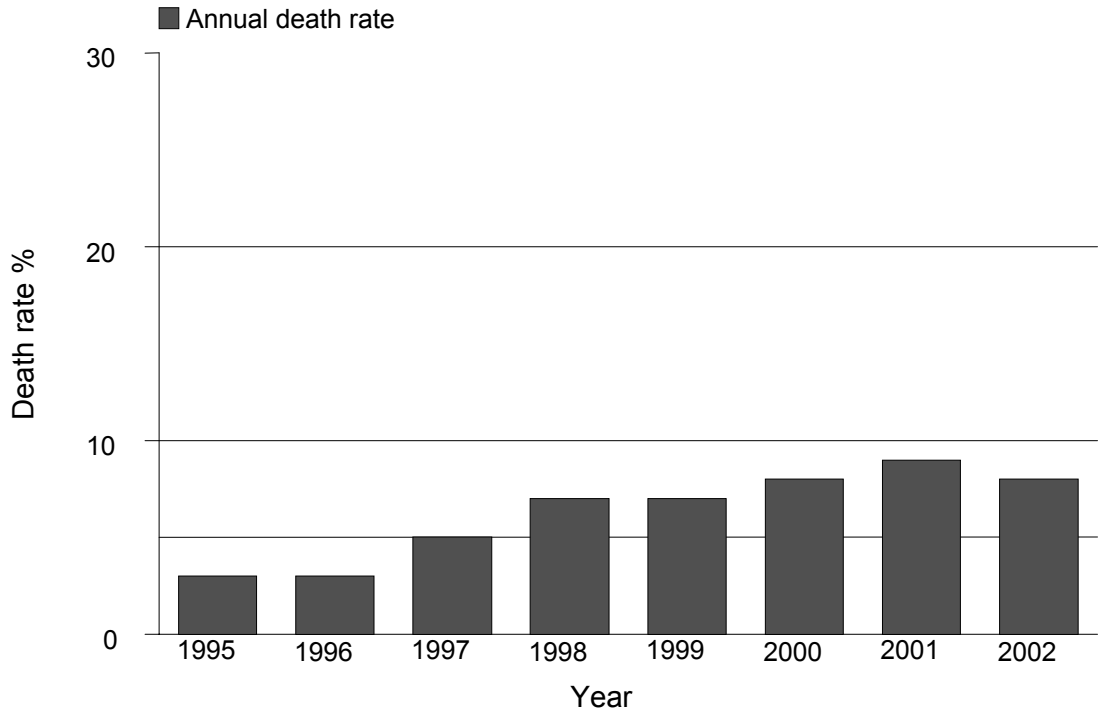


Table 3.2.05: Causes of Death, NGO Centres 1999 – 2002

	1999		2000		2001		2002	
Causes of death	No.	%	No.	%	No.	%	No.	%
Cardiovascular	38	32	58	37	61	28	95	41
Died at home	17	15	38	25	70	32	39	17
Sepsis	12	10	16	10	35	16	33	14
GIT bleed	3	3	1	1	3	1	6	3
Cancer	2	2	1	1	6	3	6	3
Liver disease	4	3	3	2	3	1	3	1
Others	32	27	37	24	29	13	37	16
Unknown	9	8	1	1	13	6	14	6
Total	117	100	155	100	220	100	233	100

3.2.4 NGO HAEMODIALYSIS CENTRES

Table 3.2.07: Centre Distribution of HD patients, NGO Centres, 2002

	Centre	No	percent
	No.on RRT at 31st December	2932	100
1	AMD Rotary Dialysis Centre, Penang	9	0
2	Aixin-NKF Dialysis Centre	13	0
3	Amitabha Haemodialysis Centre	25	1
4	Bakti-NKF Dialysis Centre, Kelang	53	2
5	Batu Pahat Rotary Haemodialysis Centre	54	2
6	Berjaya NKF Dialysis Centre, Petaling Jaya	55	2
7	Buddhist Tzu Chi Dialysis Centre, Butterworth	8	0
8	Buddhist Tzu-Chi Dialysis Centre, Jitra	7	0
9	Buddhist Tzu-Chi Dialysis Centre, Penang	39	1
10	CHKMUS-MAA Medicare Charity Dialysis Centre	83	3
11	Charis-NKF Dialysis Centre, Cheras	83	3
12	Che Eng Khor Haemodialysis Centre	33	1
13	Fo Yi Haemodialysis Centre	30	1
14	Haemodialysis Association Klang	43	1
15	JB Lion MAA-Medicare Charity Dialysis	89	3
16	KAS-Rotary/NKF Dialysis Centre, Sarawak	26	1
17	KB Rotary-MAA Dialysis Centre	27	1
18	Kluang Rotary Haemodialysis Centre	33	1
19	Kuala Lumpur Lions Renal Centre	7	0
20	Lion Club of Alor Setar-NKF Dialysis Centre	32	1
21	MAA-Medicare Charity Dialysis Centre, Butterworth	52	2
22	MAA-Medicare Charity Dialysis Centre, Cheras	55	2
23	MAA-Medicare Charity Dialysis Centre, Kajang	48	2
24	MAA-Medicare Charity Dialysis Centre, Kuala Lumpur	100	3
25	MAA-Medicare Charity Dialysis Centre, Teluk Intan	50	2
26	MAA-Medicare Kidney Charity Fund, Kota Kinabalu	19	1
28	Mersing Rotary Haemodialysis Centre	5	0
28	Moral Uplifting-NKF Dialysis Centre, Ipoh	57	2
29	Muar Lions Renal Centre	97	3
30	NKF Dialysis Centre, Kuala Lumpur	54	2
31	Pahang Buddhist Association Haemodialysis Centre	25	1

32	Penang Caring Dialysis Centre	8	0
33	Persatuan Buah Pinggang Sabah	28	1
34	Persatuan Bulan Sabit Merah Cawangan Miri	58	2
35	Persatuan Dialisis Kurnia PJ	17	1
36	Persatuan Membaiki Akhlak Che Luan Khor	42	1
37	Pertubohan Hemodialisis Pasar Meru	4	0
38	Pertubuhan Bakti Fo En Bandar Kulim	25	1
39	Pertubuhan Hemodialisis Seberang Perai Selatan	31	1
40	Pontian Rotary Haemodialysis Centre	55	2
41	Province Wellesley Renal Medifund Dialysis Centre	15	1
42	Pusat Dialisis Klinik Waqaf An-nur	40	1
43	Pusat Dialisis Terengganu/NKF	32	1
44	Pusat Hemodialisis Darul Iltizam	45	2
45	Pusat Hemodialisis Manjung-NKF	48	2
46	Pusat Hemodialisis Mawar N. Sembilan, Bahau	25	1
47	Pusat Hemodialisis Mawar N. Sembilan, Lukut	26	1
48	Pusat Hemodialisis Mawar N. Sembilan, Seremban	126	4
49	Pusat Hemodialisis Rotary Kota Tinggi	22	1
50	Pusat Hemodialisis Rotary Kulai	76	3
51	Pusat Hemodialisis SJAM Bacang Melaka	116	4
52	Pusat Hemodialisis Yayasan Felda	60	2
53	Pusat Hemodialisis Zakat	15	1
54	Pusat Muhibah Hemodialisis Pesatuan Tionghua Segamat	77	3
55	Pusat Rawatan Dialisis Yayasan Pembangunan Keluarga Johor-NKF	23	1
56	Pusat Rawatan Islam, Kuala Lumpur	49	2
57	Pusat Rawatan Islam, Petaling Jaya	12	0
58	Rotary Club Damansara-NKF Dialysis Centre, Kepong	53	2
59	Rotary Club Tawau Tanjung Haemodialysis Centre	7	0
60	Rotary Haemodialysis Centre, Johor Bahru	35	1
61	SJAM-KPS Haemodialysis, Kelang	57	2
62	Sibu Kidney Foundation Haemodialysis Centre	43	1
63	Superkids Trinity-NKF Dialysis Centre, Alor Setar	22	1
64	The Nayang-NKF Dialysis Centre, Setapak	50	2
65	The Penang Community Haemodialysis Society	34	1
66	Woh Peng Cheang Seah Dialysis Centre	41	1

67	Yayasan Dialisis Pertubohan Pendidikan Akhlak-NKF, Taiping	29	1
68	Yayasan Hemodialisis Kebajikan Southern Melaka	59	2
69	Yayasan Kebajikan SSL Heamodialisis	116	4

3.2.5 HAEMODIALYSIS PATIENTS' CHARACTERISTICS, NGO CENTRES

Table 3.2.08: Age Distribution of Dialysis Patients, NGO Centres 1999 – 2002

Year	1999	2000	2001	2002
New Dialysis patients	540	658	695	516
1-14 years	0	0	0	0
15-24 years	1	2	3	2
25-34 years	12	9	8	6
35-44 years	17	16	16	13
45-54 years	29	31	27	25
55-64 years	27	26	28	32
≥65 years	13	16	19	21
Dialysing at 31st December	1788	2267	2705	2932
1-14 years	0	0	0	0
15-24 years	4	3	3	3
25-34 years	14	13	12	11
35-44 years	22	21	21	20
45-54 years	28	29	29	28
55-64 years	23	23	23	24
≥65 years	10	11	12	13

Table 3.2.09: Patients' Characteristics, NGO Centres 1999 – 2002

Year	1999	2000	2001	2002
New Dialysis patients	540	658	695	516
Mean age ± sd	50 ± 13	52 ± 13	53 ± 14	54 ± 13
% Male	58	59	51	51
% Diabetic	41	47	47	54
% HbsAg+	4	5	4	3
% Anti-HCV+	6	3	4	2

3.2.6 SURVIVAL ANALYSIS, NGO CENTRES

Table 3.2.10: HD Patient Survival, NGO Centres 1997 – 2002

Year	1997			1998			1999		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	95	1	344	97	1	444	97	1	539
12	92	1	325	93	1	421	94	1	513
24	83	2	292	86	2	378	87	1	468
36	77	2	269	78	2	335	78	2	411
48	73	2	246	71	2	293			
60	67	3	217						
Year	2000			2001			2002		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	97	1	642	97	1	680	97	1	304
12	92	1	602	92	1	632			
24	83	1	515						

No. = number at risk SE = standard error

Figure 3.2.10: HD Patient Survival, NGO Centres 1998 –2002

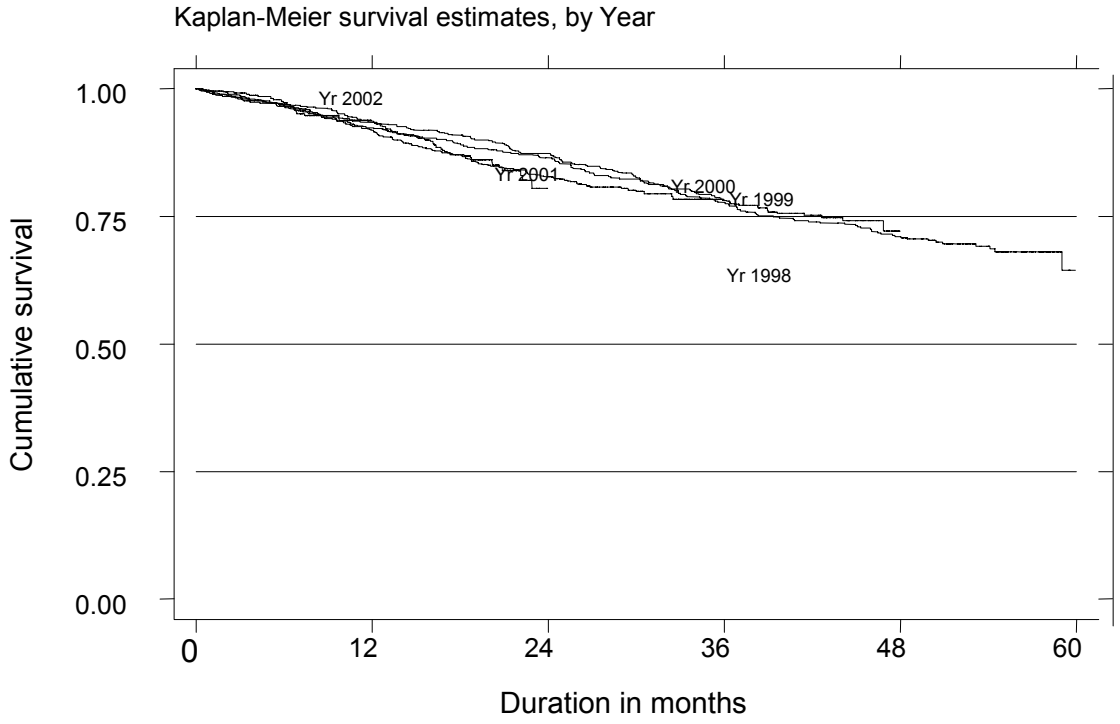
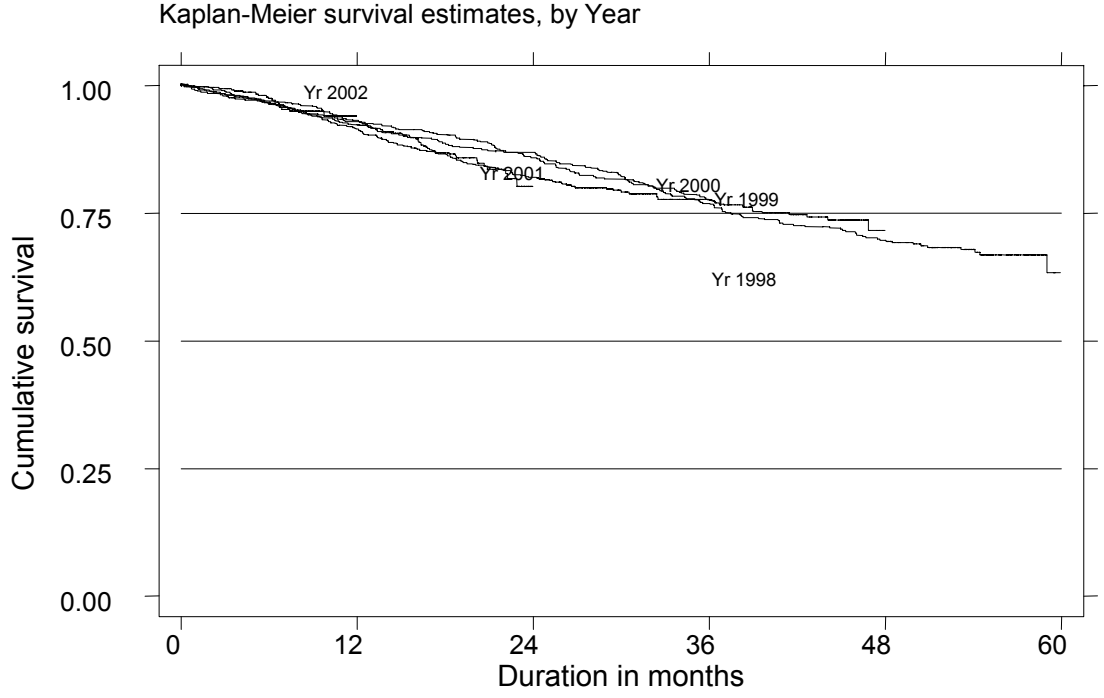


Table 3.2.11: HD Technique Survival, NGO Centres 1997-2002

Year	1997			1998			1999		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	95	1	344	97	1	444	97	1	539
12	92	1	325	93	1	421	93	1	513
24	83	2	292	86	2	378	87	1	468
36	77	2	269	77	2	335	77	2	411
48	73	2	246	70	2	293			
60	67	3	217						
Year	2000			2001			2002		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	96	1	642	97	1	680	97	1	304
12	91	1	602	92	1	632			
24	82	2	515						

No. = number at risk SE = standard error

Figure 3.2.11 HD Technique Survival by year of entry, NGO centres 1998 –2002



3.2.7 WORK RELATED REHABILITATION AND QUALITY OF LIFE ON HAEMODIALYSIS, NGO CENTRES

Table 3.2.12: Work Related Rehabilitation on HD, NGO centres 1999-2002

REHABILITATION STATUS	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
Full time work for pay	128	19	211	18	199	12	229	12
Part time work for pay	106	16	179	15	261	16	314	16
Able to work but unable to get a job	28	4	64	5	88	5	79	4
Able to work but not yet due to dialysis schedule	35	5	28	2	58	4	83	4
Able but disinclined to work	22	3	34	3	27	2	28	1
Home maker	190	29	315	26	397	24	526	27
Full time student	1	0	1	0	2	0	4	0
Age<15 years	0	0	0	0	0	0	0	0
Retired	42	6	112	9	125	8	160	8
Age>65 years	33	5	124	10	218	13	252	13
Unable to work due to poor health	76	11	129	11	255	16	303	15
Total	661	100	1197	100	1630	100	1978	100

Table 3.2.13: Quality of Life on Haemodialysis, NGO Centres 1999 – 2002

QOL Index Summated Score	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
0 (Worst QOL)	0	0	0	0	3	0	4	0
1	0	0	2	0	3	0	5	0
2	2	0	4	0	4	0	9	0
3	4	1	20	2	27	2	24	1
4	15	2	27	2	54	3	43	2
5	25	4	39	3	91	6	91	5
6	30	5	75	6	117	7	122	6
7	56	9	87	7	144	9	156	8
8	75	11	101	8	151	9	199	10
9	70	11	138	11	232	14	214	11
10 (Best QOL)	380	58	722	59	801	49	1062	55
Total	657	100	1215	100	1627	100	1929	100

3.2.8 HAEMODIALYSIS PRACTICES IN NGO CENTRES

Table 3.2.14: Vascular Access on Haemodialysis, NGO Centres 1999 – 2002

Access types	1999		2000		2001		2002	
	No	%	No	%	No	%	No	%
Wrist AVF	610	84	1299	86	1569	83	1830	83
BCF*	92	13	176	12	275	15	309	14
Venous graft	2	0	3	0	8	0	7	0
Artificial graft	5	1	11	1	17	1	23	1
PERMCATH	3	0	2	0	4	0	8	0
Temporary CVC*	11	2	19	1	14	1	22	1
Total	723	100	1510	100	1887	100	2199	100

* *BCF = Brachiocephalic fistula*
* *CVC = Central venous catheter*

Table 3.2.15: Difficulties reported with Vascular Access, NGO Centres 1999 – 2002

Access	1999		2000		2001		2002	
difficulty	No	%	No	%	No	%	No	%
Difficulty with needle placement	23	3	42	3	71	4	56	3
Difficulty in obtaining desired blood flow rate	20	3	37	2	72	4	71	3
Other difficulty	12	2	8	1	14	1	17	1
No difficulty	672	92	1430	94	1734	92	2062	93
Total	727	100	1517	100	1891	100	2206	100

Table 3.2.16: Complications reported with Vascular Access, NGO Centres 1999 – 2002

Complication	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
Thrombosis	27	4	46	3	75	4	47	2
Bleed	3	0	5	0	19	1	26	1
Aneurysmal dilatation	18	2	41	3	34	2	40	2
Swollen limb	8	1	15	1	15	1	10	0
Access related infection, local/Systemic	3	0	9	1	5	0	5	0
Distal Limb ischaemia	0	0	14	1	13	1	4	0
Venous outflow obstruction	17	2	16	1	22	1	31	1
Carpal tunnel	1	0	5	0	11	1	5	0
Other	14	2	9	1	31	2	52	2
No complication	636	87	1361	89	1667	88	1986	90
Total	727	100	1521	100	1892	100	2206	100

Table 3.2.17: Blood Flow Rates in NGO HD Units 1999 – 2002

Blood flow rates	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
<150 ml/min	1	0	3	0	0	0	1	0
150-199 ml/min	13	2	33	2	27	1	23	1
200-249 ml/min	333	47	516	35	581	32	408	19
250-299 ml/min	293	42	762	52	951	52	1252	58
300-349 ml/min	59	8	141	10	239	13	347	16
> 350 ml/min	3	0	11	1	23	1	117	5
Total	702	100	1466	100	1821	100	2148	100

Table 3.2.18: Number of HD Sessions per week, NGO HD Units 1999 – 2002

HD sessions	1999		2000		2001		2002	
Per week	No.	%	No.	%	No.	%	No.	%
1	1	0	4	0	1	0	3	0
2	22	3	104	7	86	5	55	3
3	699	97	1391	92	1801	95	2134	97
4	1	0	5	0	3	0	5	0
Total	723	100	1512	100	1891	100	2198	100

Table 3.2.19: Duration of HD in NGO HD Units 1999 – 2002

Duration of HD	1999		2000		2001		2002	
per session	No.	%	No.	%	No.	%	No.	%
≤3 hours	1	0	2	0	2	0	4	0
3.5 hours	1	0	2	0	2	0	15	1
4 hours	715	99	1472	97	1876	99	2163	99
4.5 hours	2	0	23	2	7	0	8	0
5 hours	3	0	12	1	4	0	2	0
≥5 hours	0	0	2	0	0	0	0	0
Total	722	100	1513	100	1891	100	2192	100

Table 3.2.20: Dialyser membrane types in NGO HD Units 1999 – 2002

Dialyser	1999		2000		2001		2002	
membrane	No.	%	No.	%	No.	%	No.	%
Cellulosic	328	55	449	39	406	30	343	19
Cellulose acetate	161	27	193	17	269	20	513	29
Synthetic	108	18	514	44	670	50	936	52
Total	597	100	1156	100	1345	100	1792	100

Table 3.2.21: Dialyser Reuse Frequency in NGO HD Units 1999 – 2002

Dialyser reuse	1999		2000		2001		2002	
frequency	No.	%	No.	%	No.	%	No.	%
1*	7	1	43	3	76	4	102	5
2	2	0	4	0	7	0	9	0
3	47	7	74	5	61	3	98	5
4	30	4	66	5	95	5	104	5
5	101	15	162	12	158	9	168	8
6	394	59	576	41	462	26	467	22
7	3	0	3	0	15	1	34	2
8	40	6	196	14	470	26	515	25
9	6	1	37	3	48	3	38	2
10	30	4	144	10	141	8	259	12
11	0	0	0	0	2	0	4	0
12	11	2	50	4	72	4	70	3
≥13	0	0	47	3	172	10	216	10
Total	671	100	1402	100	1779	100	2084	100

1* is single use i.e. no reuse

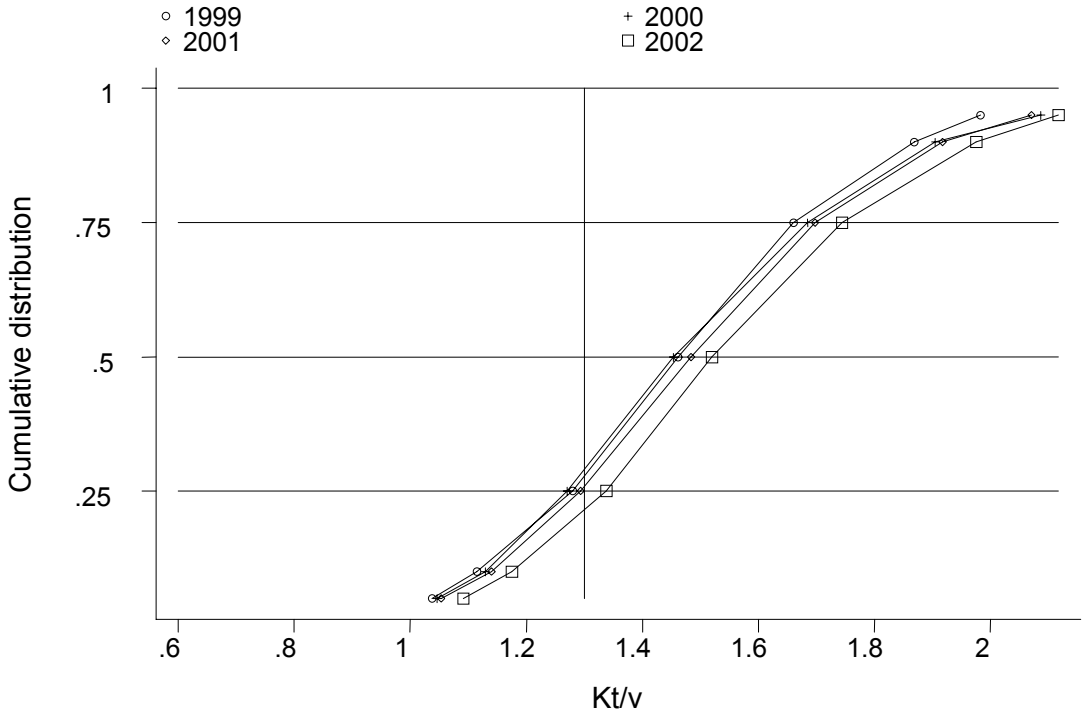
Table 3.2.22: Dialysate Buffer used in NGO HD Units 1999 – 2002

Dialysate buffer	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
Acetate	58	8	33	2	16	1	7	0
Bicarbonate	654	92	1471	98	1858	99	2174	100
Total	712	100	1504	100	1874	100	2181	100

Table 3.2.23: Distribution of Prescribed KT/V, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% > 1.3
1999	668	6656	1.5	1.3	1.7	72
2000	1301	13078	1.5	1.3	1.7	71
2001	1710	17323	1.5	1.3	1.7	74
2002	2049	21264	1.5	1.3	1.7	79

Figure 3.2.23: Cumulative distribution of Prescribed KT/V by year



3.2.9 DYSLIPIDAEMIA IN HD PATIENTS, NGO CENTRES

Table 3.2.24: Distribution of serum Cholesterol Concentrations (mmol/L), HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 5.3 mmol/L
1999	171	285	5	4.1	5.7	68
2000	911	1446	5	4.2	5.9	65
2001	1487	2295	5	4.3	5.9	63
2002	1827	3027	4.9	4.2	5.7	67

Figure 3.2.24: Cumulative distribution of serum cholesterol concentration by year

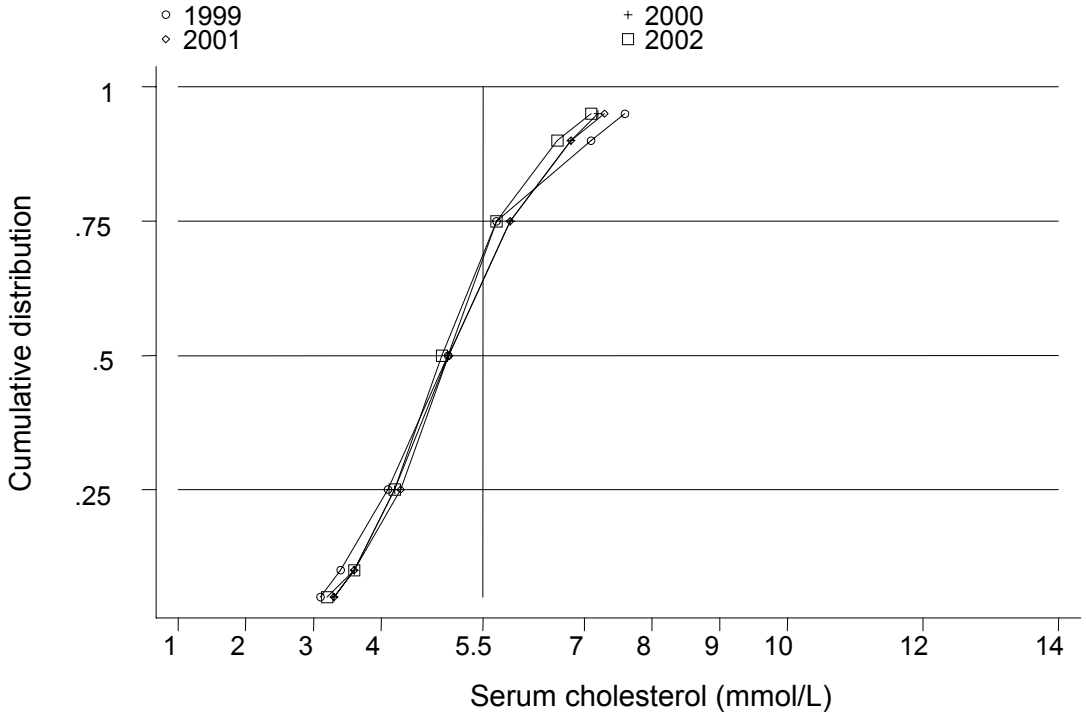


Table 3.2.25: Distribution of serum Triglyceride (mmol/L), HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 3.5 mmol/L
1999	148	243	1.8	1.3	2.6	86
2000	584	904	1.8	1.3	2.7	87
2001	987	1349	1.7	1.1	2.6	86
2002	1279	1948	1.7	1.2	2.6	85

Figure 3.2.25: Cumulative distribution of serum triglyceride concentration by year

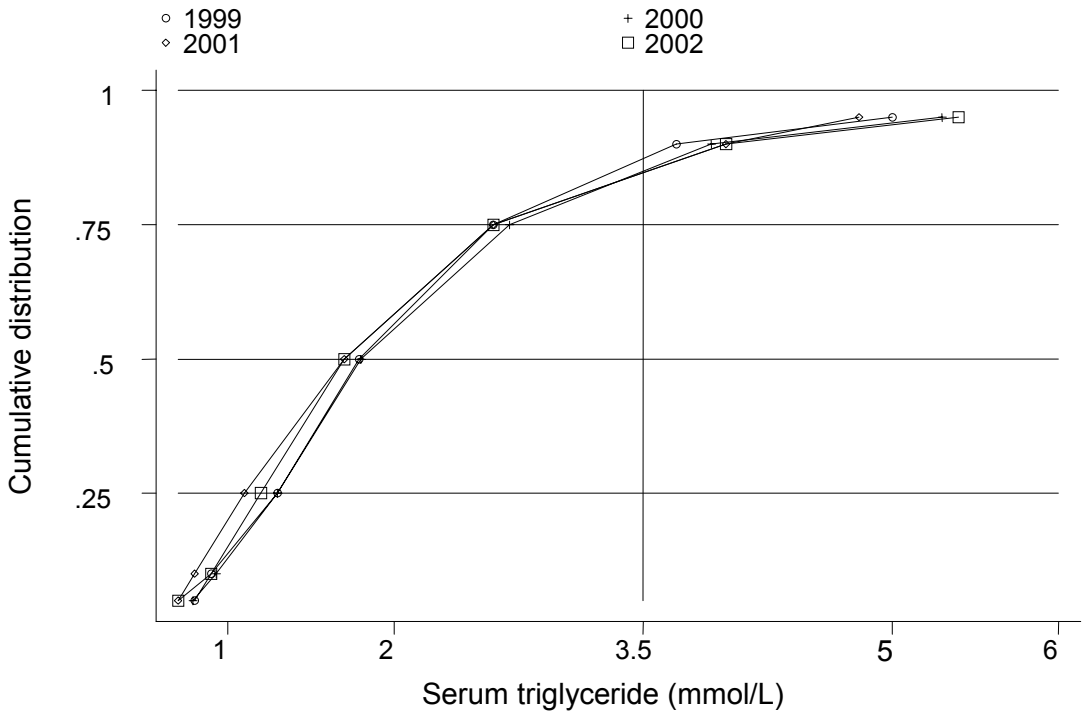


Table 3.2.26: Distribution of serum LDL (mmol/L), HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients <5 mmol/L
1999	39	50	3	2.5	3.7	92
2000	441	631	2.9	2.2	3.6	96
2001	793	1064	2.9	2.3	3.7	96
2002	1001	1468	2.9	2.3	3.6	96

Figure 3.2.26 : Cumulative distribution of serum LDL by year

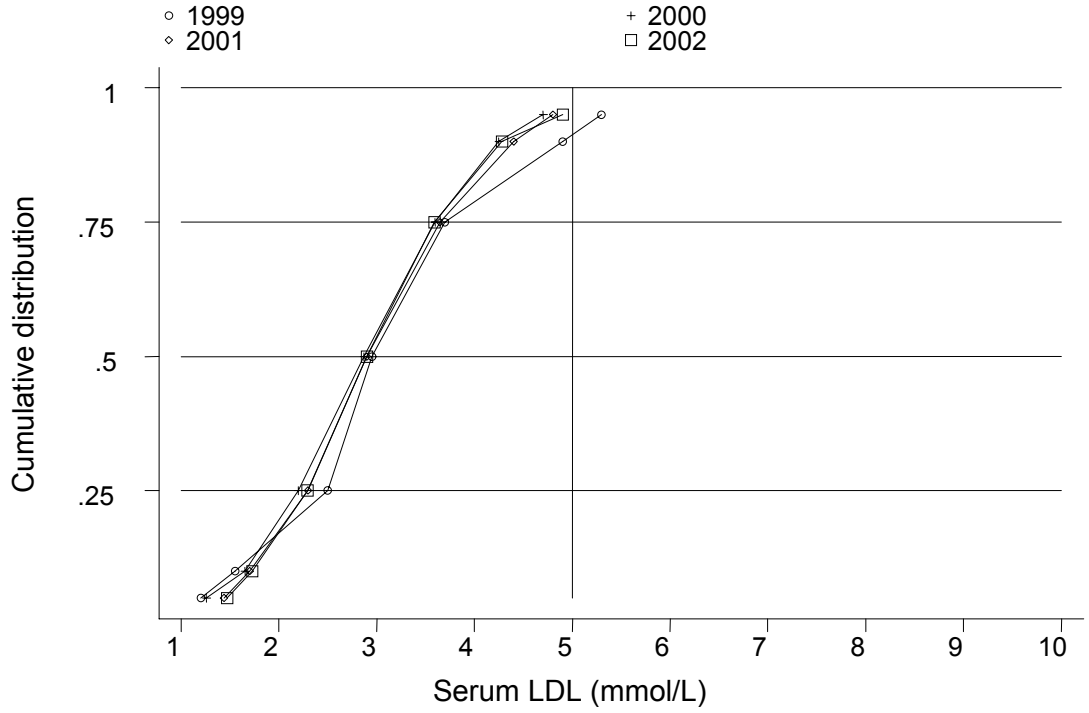
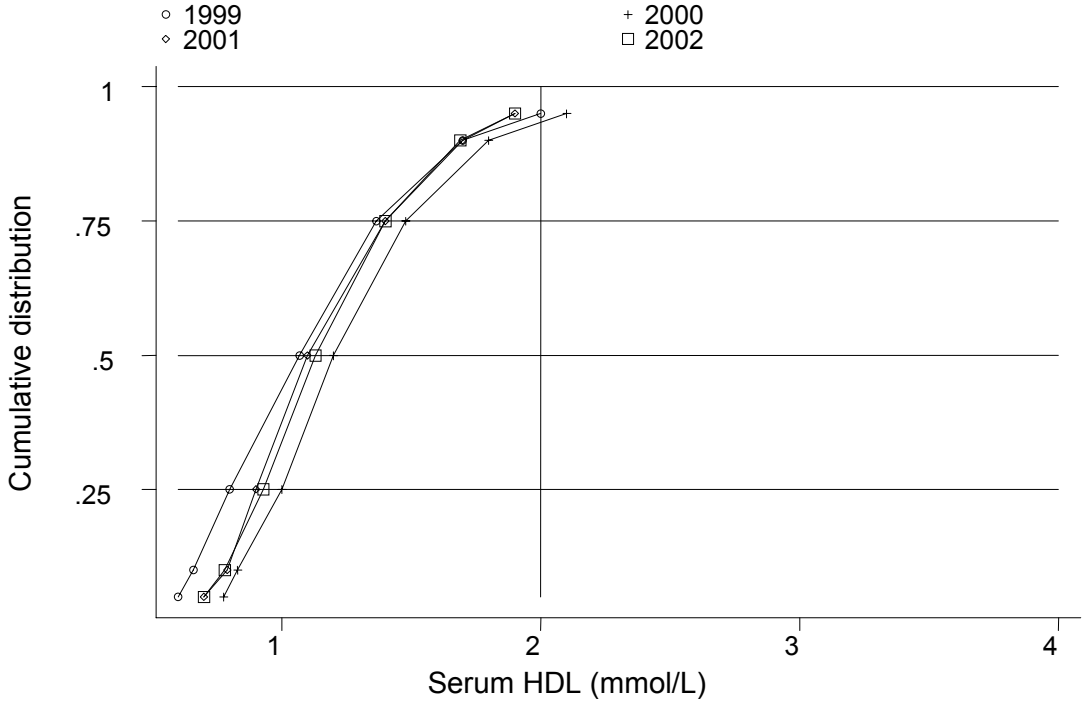


Table 3.2.27: Distribution of serum HDL (mmol/L), HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 2mmol/L
1999	41	52	1.1	0.8	1.4	94
2000	466	680	1.2	1	1.5	93
2001	819	1102	1.1	0.9	1.4	96
2002	1036	1544	1.1	0.9	1.4	96

Figure 3.2.27: Cumulative distribution of serum HDL by year



3.2.10 MANAGEMENT OF RENAL BONE DISEASE, NGO CENTRES

Table 3.2.28: Treatment for Renal Bone Disease, HD patients, NGO Centres 1999 – 2002

Year	No of subjects	% on $CaCO_3$	% on $Al(OH)_3$	% on Vitamin D
1999	728	90	6	29
2000	1531	91	4	23
2001	1905	95	1	21
2002	2223	93	1	22

Table 3.2.29: Distribution of serum Phosphate (mmol/l), HD patients, NGO Centres 1999– 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 1.6 mmol/L
1999	690	1927	1.9	1.5	2.3	30
2000	1380	3675	1.8	1.5	2.2	32
2001	1723	4642	1.8	1.4	2.2	36
2002	2107	5975	1.8	1.5	2.3	33

Figure 3.2.29: Cumulative distribution of serum Phosphate by year

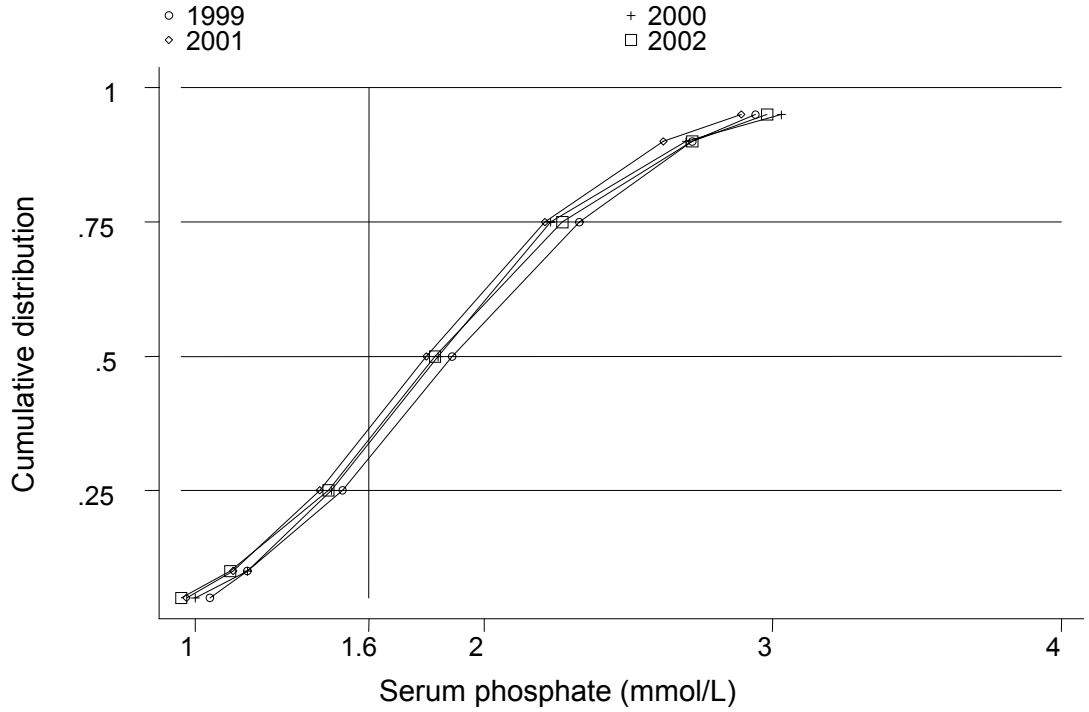


Table 3.2.30: Distribution of serum Calcium (mmol/l), HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients ≥ 2.2 & ≤2.6 mmol/L
1999	699	1948	2.3	2.2	2.5	56
2000	1377	3705	2.3	2.2	2.5	61
2001	1733	4709	2.3	2.2	2.5	61
2002	2114	6001	2.3	2.2	2.5	58

Figure 3.2.30: Cumulative distribution of serum Calcium by year

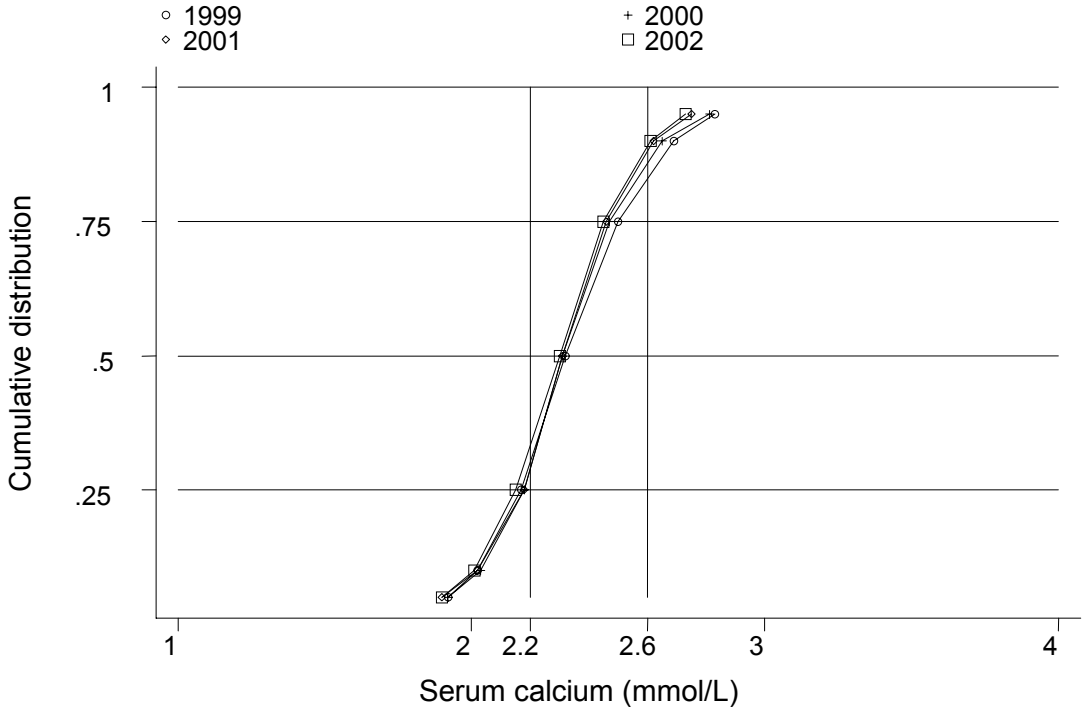
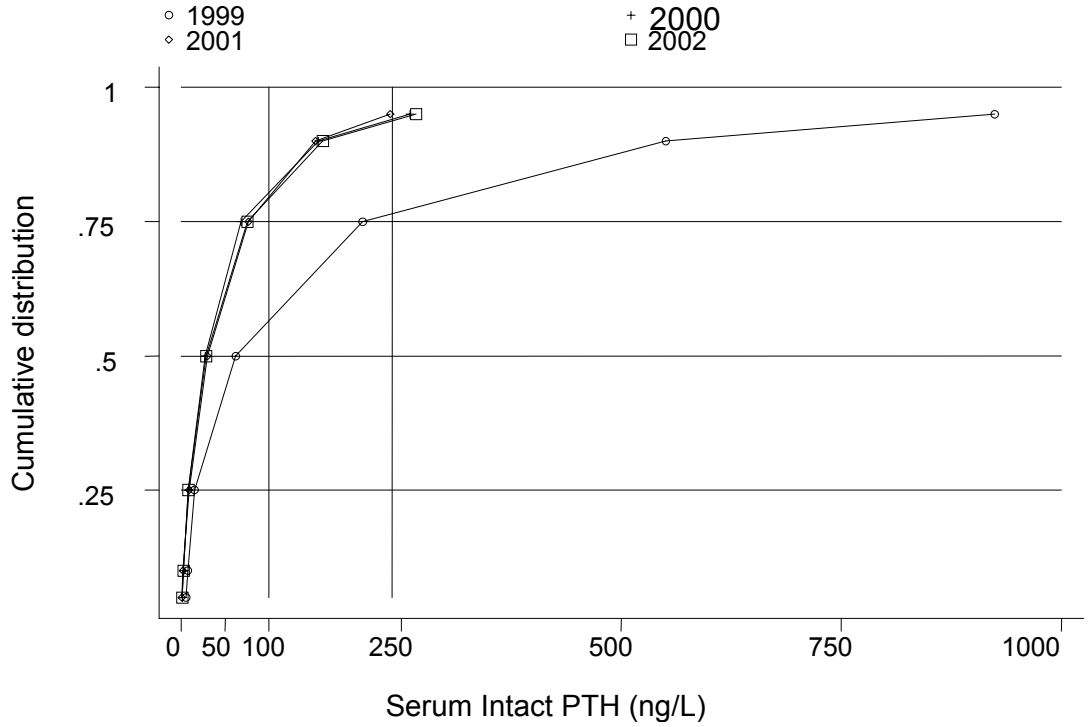


Table 3.2.31: Distribution of serum iPTH (ng/L), HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients ≥ 100 & ≤ 250 ng/L
1999	279	331	62.2	15.1	206	18
2000	627	846	27	8.3	68	11
2001	950	1269	29.8	9	76.9	13
2002	1275	1752	28.6	8.7	75.3	13

Figure 3.2.31: Cumulative distribution of serum iPTH by year



3.2.11 MANAGEMENT OF BLOOD PRESSURE, NGO CENTRES

Table 3.2.32: Treatment for hypertension, HD patients, NGO Centres 1999 – 2002

Year	No.	% on anti-hypertensives	% on 1 anti-hypertensives	% on 2 anti-hypertensives	% on 3 anti-hypertensives
1999	728	68	39	21	9
2000	1531	67	40	21	6
2001	1905	67	39	22	6
2002	2223	66	37	22	7

Table 3.2.33: Distribution of Systolic BP without anti-hypertensives, HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 160 mmHg
1999	229	2349	141	125	160	75
2000	490	4960	140	123	159	75
2001	628	6287	140	121	156	78
2002	747	7642	138.5	120	156	78

Figure 3.2.33: Cumulative distribution of Systolic BP without anti-hypertensives by year

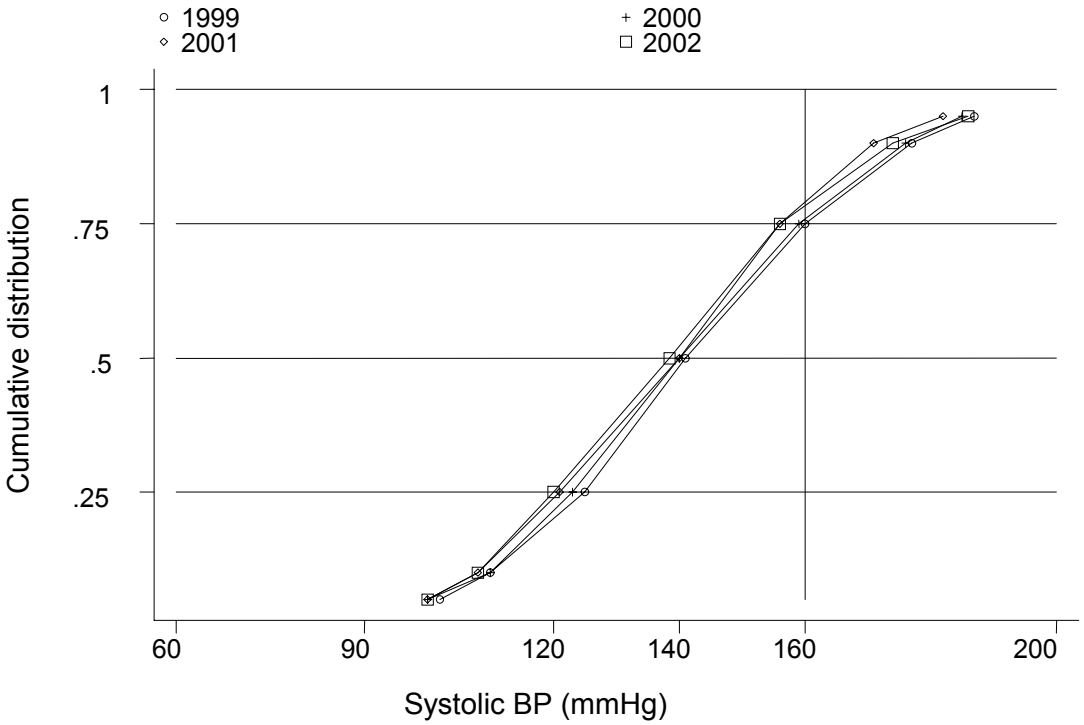


Table 3.2.34: Distribution of Diastolic BP without anti-hypertensives, HD patients, NGO Centres 1999 – 2002

Year	No. of subjects	No. of observations	Median	LQ	UQ	% Patients < 90 mmHg
1999	229	2346	80	70	90	72
2000	490	4961	80	70	88	77
2001	628	6289	80	70	87	80
2002	747	7642	78	70	85	81

Figure 3.2.34: Cumulative distribution of Diastolic BP without anti-hypertensives by year

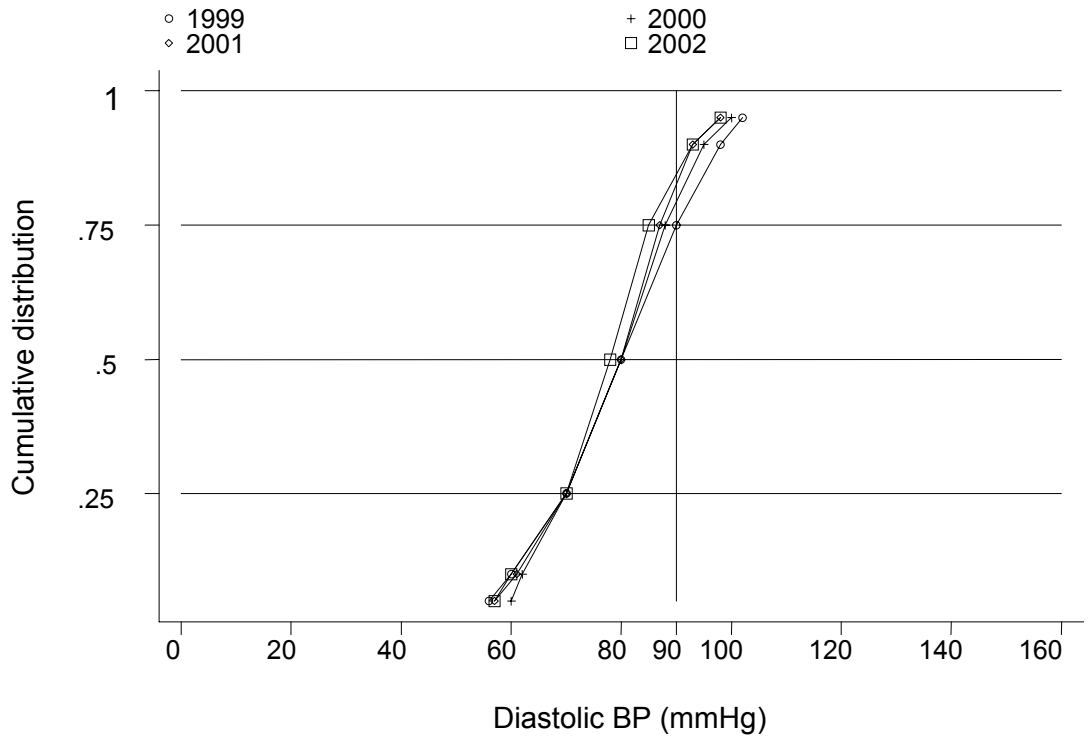


Table 3.2.35: Distribution of systolic BP on anti-hypertensives, HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 160 mmHg
1999	496	4861	159	141	178	50
2000	1000	9870	152	140	171	56
2001	1261	12644	154	140	172	55
2002	1463	15122	153	138	170	57

Figure 3.2.35: Cumulative distribution of systolic BP on anti-hypertensives by year

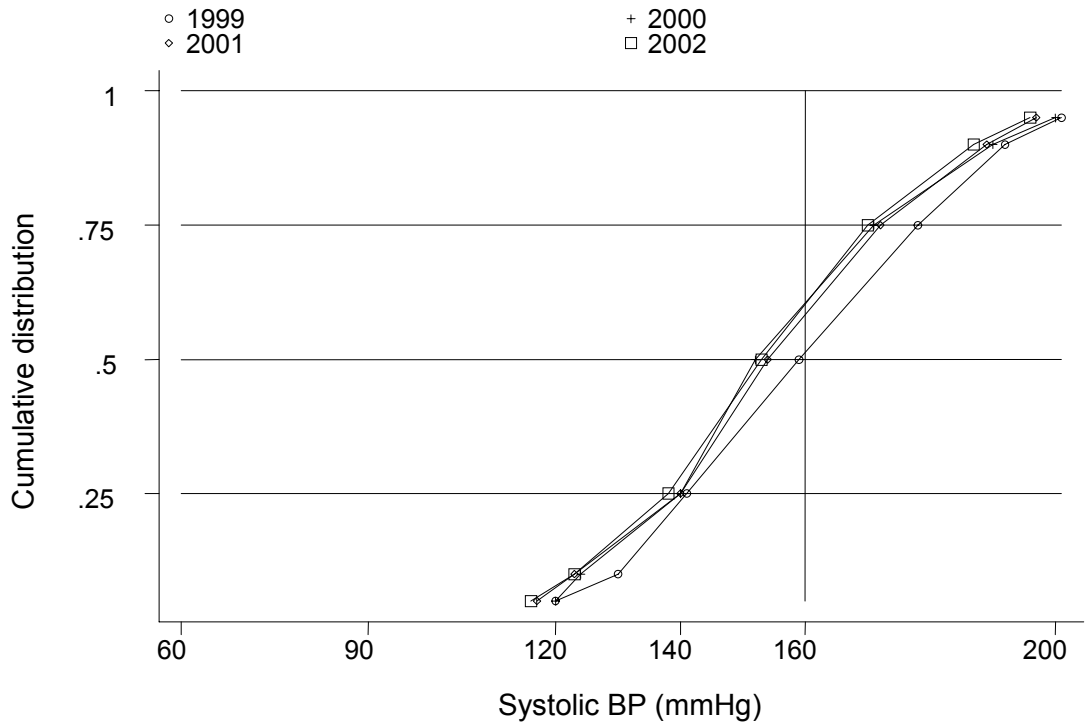
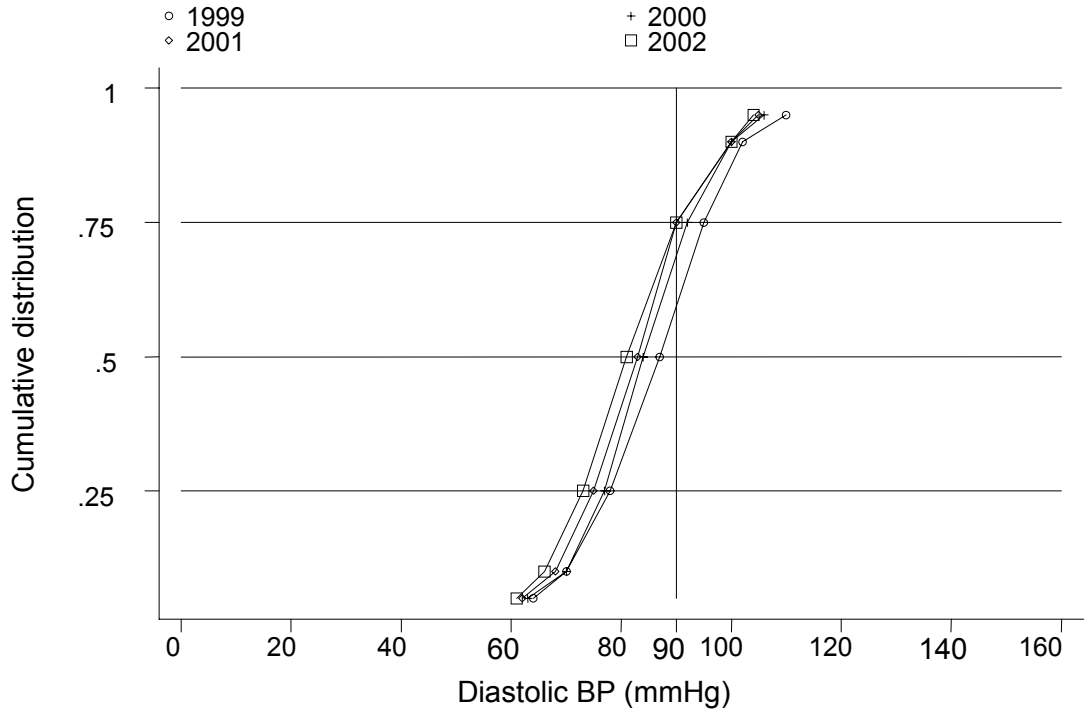


Table 3.2.36: Distribution of diastolic BP on anti-hypertensives, HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 90 mmHg
1999	496	4866	87	78	95	56
2000	999	9855	84	77	92	59
2001	1261	12639	83	75	90	63
2002	1461	15113	81	73	90	68

Figure 3.2.36: Cumulative distribution of diastolic BP on anti-hypertensives by year



3.2.12 TREATMENT OF ANAEMIA, NGO HD CENTRES

Table 3.2.37: Treatment for Anaemia, HD patients, NGO Centres 1999 – 2002

Year	No	% on rHuEpo	% received blood transfusion	% received oral iron	% received parenteral iron
1999	728	54	9	87	1
2000	1531	56	12	88	3
2001	1905	62	11	88	3
2002	2223	68	7	88	5

Table 3.2.38: Distribution of rHuEpo dose per week, HD patients, NGO Centres 1999 – 2002

Year	1999	2000	2001	2002
No. of patients	377	816	1153	1466
% on 2000 u/week	66	56	55	48
% on 2-4000 u/week	28	38	39	44
% on 4-6000 u/week	5	4	5	7
% on 6-8000 u/week	1	1	1	1
% on 8-12000 u/week	1	0	0	0
% on >12000 u/week	0	0	0	0

Table 3.2.39: Distribution of serum Iron without rHuEpo, HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 10 umol/L
1999	41	105	14	10.5	17.6	79
2000	194	338	15.5	10.7	25	78
2001	280	451	14.9	10.5	22.5	77
2002	271	594	13	9	18.4	69

Figure 3.2.39: Cumulative distribution of serum Iron without rHuEpo by year

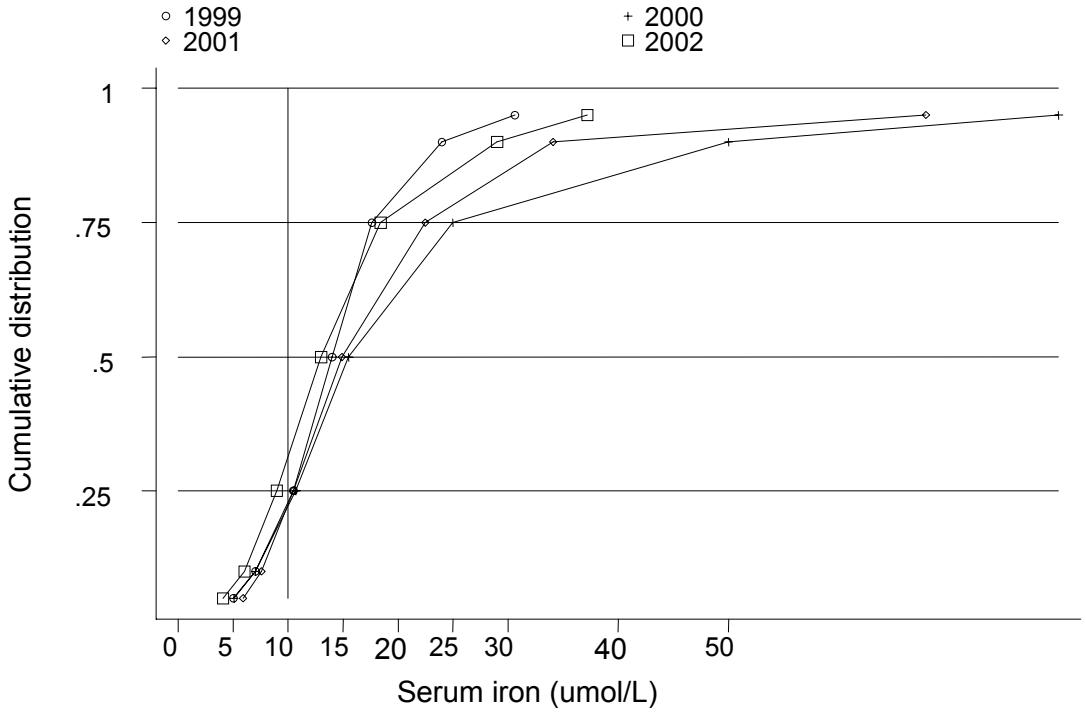


Table 3.2.40: Distribution of serum Iron on rHuEpo,HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 10 umol/L
1999	48	128	15.1	11	23	79
2000	377	746	14.7	10.6	21	77
2001	572	1027	13.3	9.7	19.3	71
2002	679	1505	11.2	8	16.6	58

Figure 3.2.40: Cumulative distribution of serum Iron on rHuEpo by year

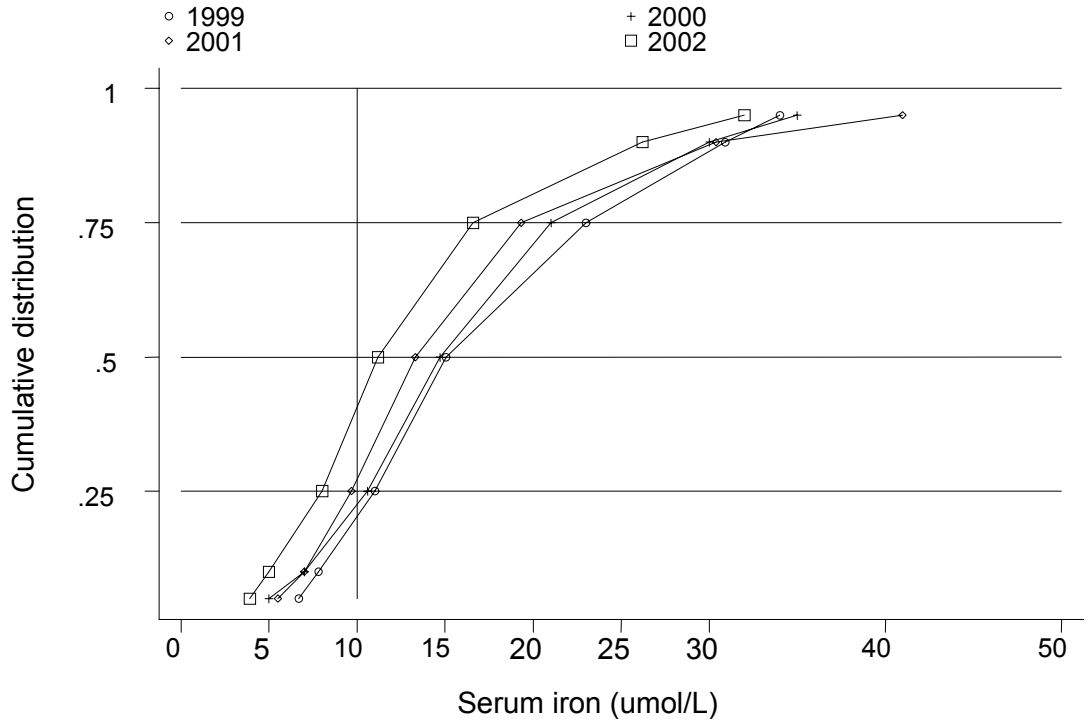


Table 3.2.41: Distribution of serum Transferrin Saturation without rHuEpo, HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 20%
1999	29	116	26.9	21.7	37.7	83
2000	143	572	28.3	19.2	45.1	72
2001	196	784	31.1	21.5	46.7	78
2002	181	724	26.4	16.9	41.9	65

Figure 3.2.41: Cumulative distribution of serum Transferrin Saturation without rHuEpo by year

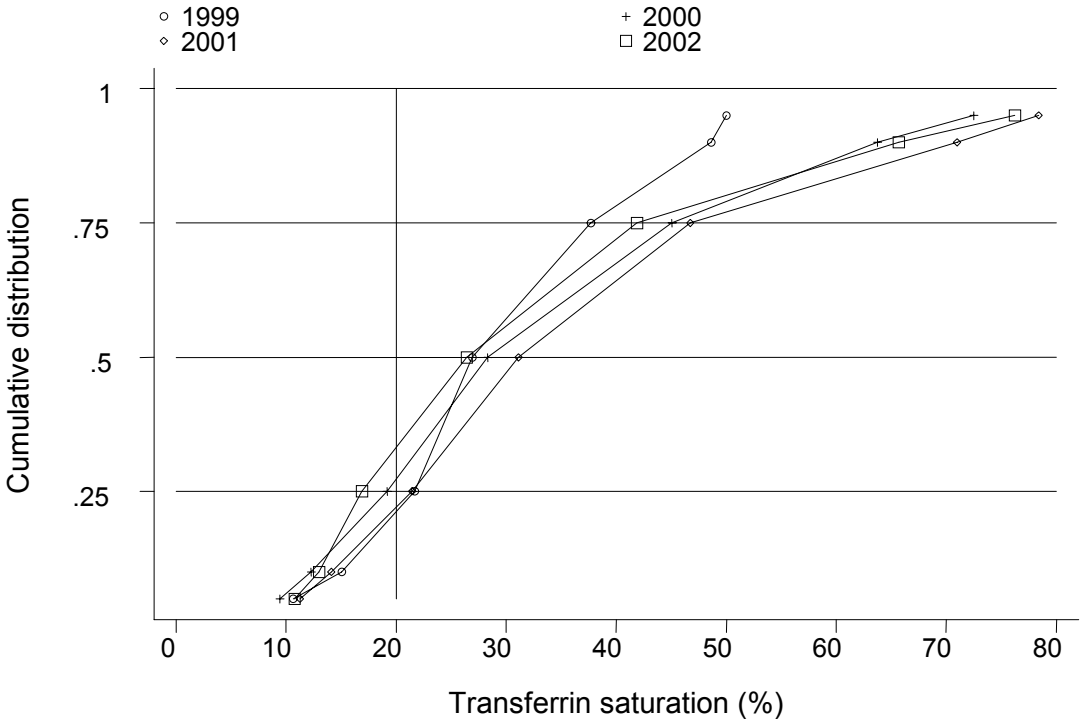


Table 3.2.42: Distribution of serum Transferrin Saturation on rHuEpo, HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 20%
1999	35	140	29.8	20	43.2	74
2000	289	1156	31.3	21.2	45.3	78
2001	429	1716	29.5	21.5	41.4	78
2002	552	2208	25.3	16.6	39.2	66

Figure 3.2.42: Cumulative distribution of serum Transferrin Saturation on rHuEpo by year

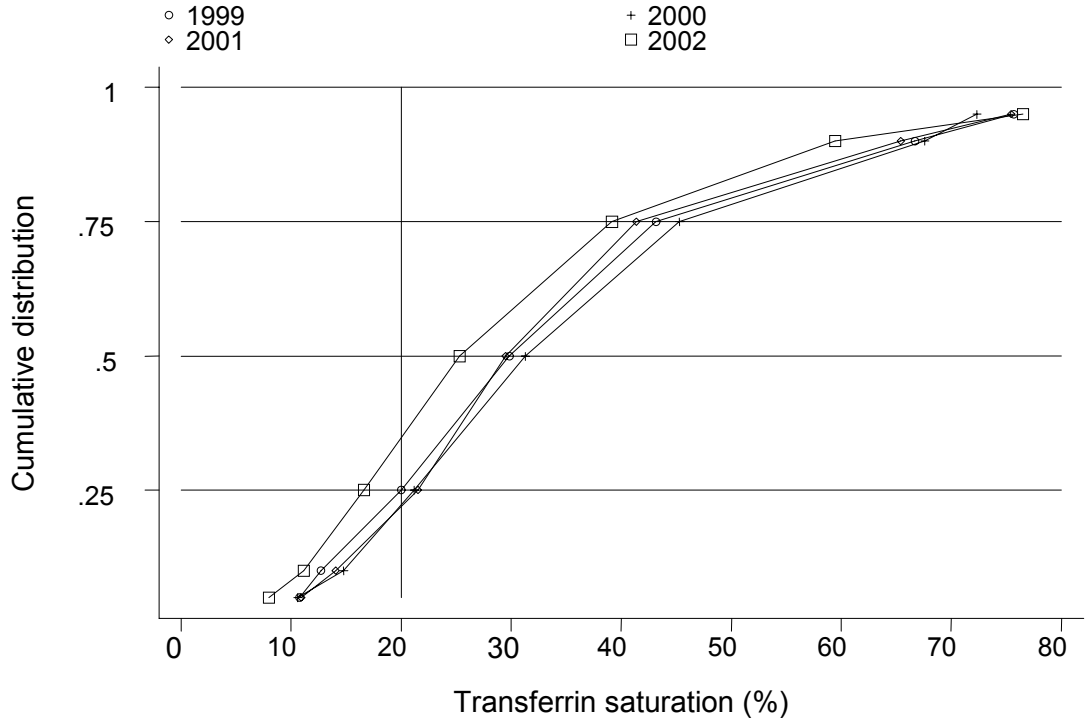


Table 3.2.43: Distribution of serum Ferritin without rHuEpo, HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 100 ug/L
1999	28	46	462.5	222.6	745	89
2000	161	212	432.5	182.5	860	87
2001	271	358	423	177	845	86
2002	305	429	365	173	785	86

Figure 3.2.43: Cumulative distribution of serum Ferritin without rHuEpo by year

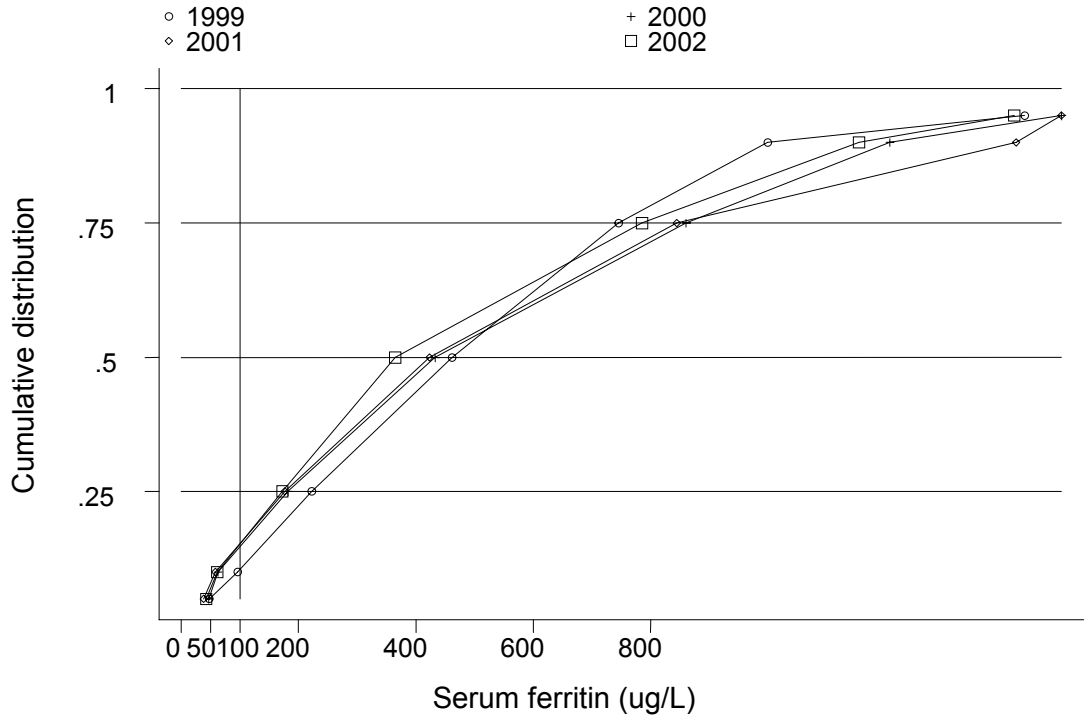


Table 3.2.44: Distribution of serum Ferritin on rHuEpo, HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 100 ug/L
1999	39	63	392	176	1000	94
2000	361	514	509.5	240	971	90
2001	589	870	489.5	227	903	91
2002	823	1263	482	236	895	90

Figure 3.2.44: Cumulative distribution of serum Ferritin on rHuEpo by year

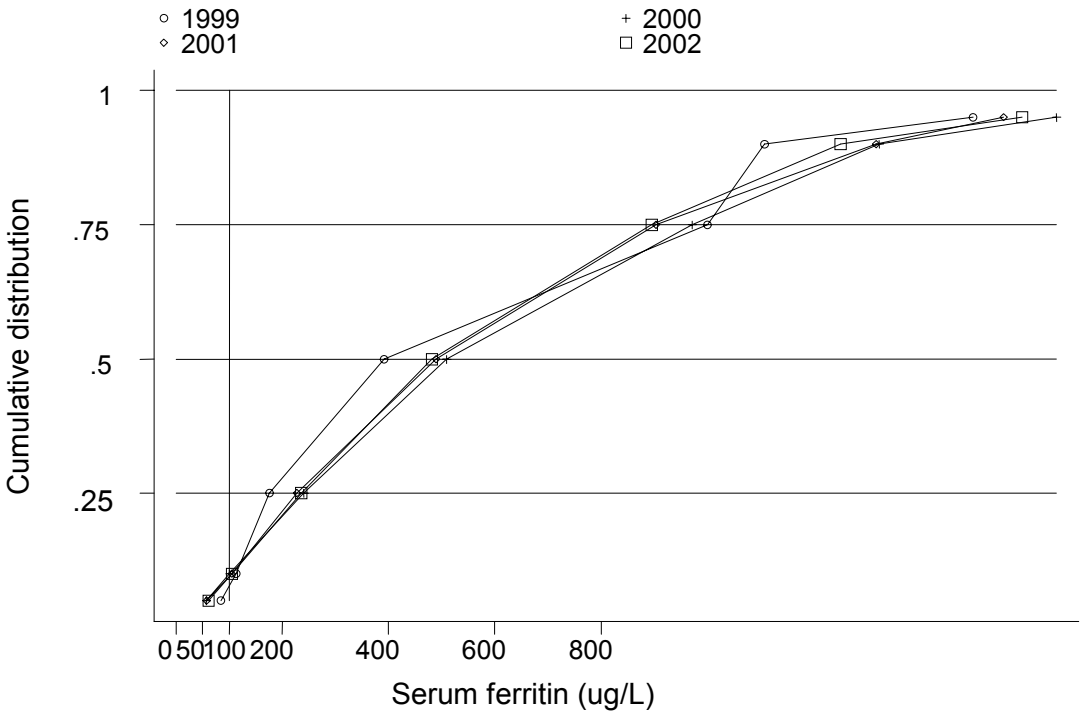


Table 3.2.45: Distribution of Haemoglobin without rHuEpo, HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients <10 g/dL	% Patients ≥10 & ≤12 g/dL	% Patients >12 g/dL
1999	318	856	9.1	7.9	10.4	65	26	9
2000	574	1472	9.1	7.9	10.9	63	24	13
2001	644	1688	9.3	8	10.6	63	25	11
2002	661	1858	9.5	8.1	11	59	27	14

Figure 3.2.45: Cumulative Distribution of Haemoglobin without rHuEpo by year

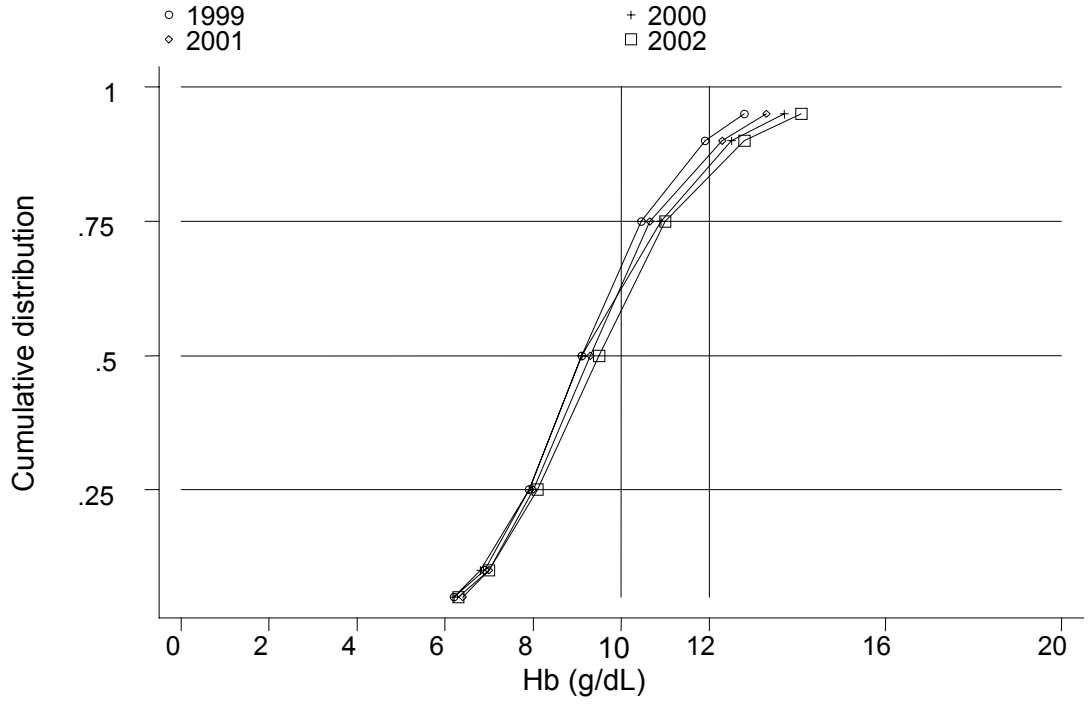
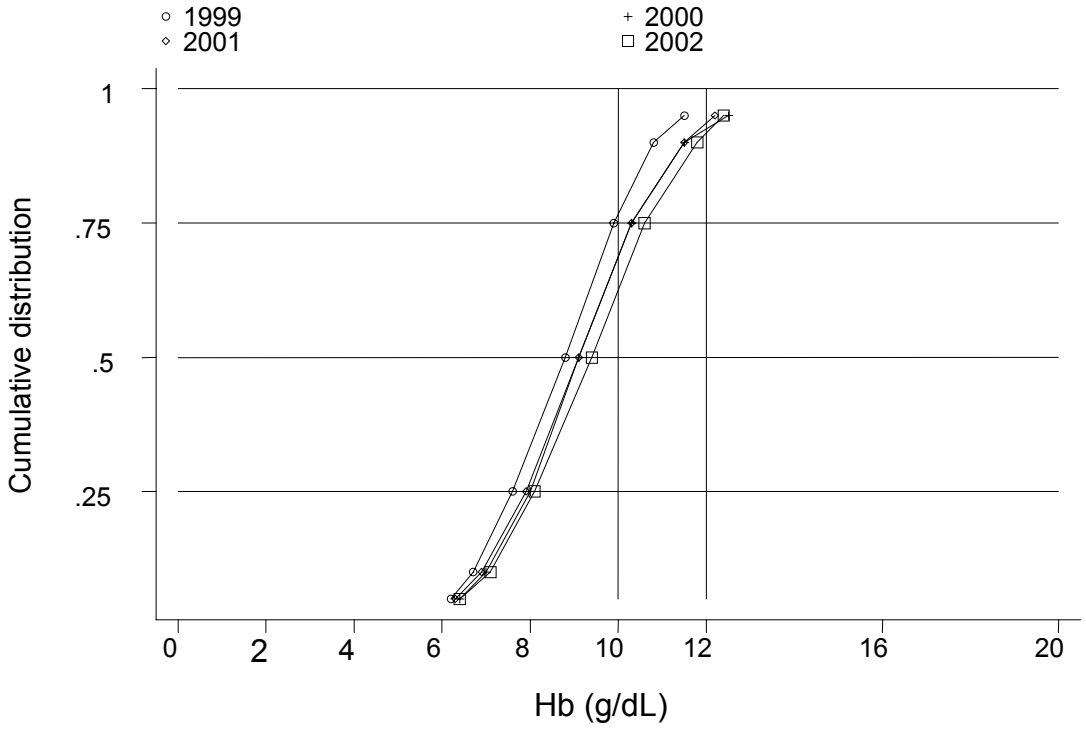


Table 3.2.46: Distribution of Haemoglobin on rHuEpo, HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients <10 g/dL	% Patients ≥10 & ≤12 g/dL	% Patients >12 g/dL
1999	378	1123	8.8	7.6	9.9	76	22	3
2000	759	2177	9.1	8	10.3	67	26	7
2001	1092	3307	9.1	7.9	10.3	67	27	6
2002	1415	4291	9.4	8.1	10.6	62	30	8

Figure 3.2.46: Cumulative distribution of Haemoglobin on rHuEpo by year



3.2.13 NUTRITIONAL STATUS OF HD PATIENTS, NGO CENTRES

Table 3.2.47: Distribution of serum Albumin (g/L), HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients >40g/L
1999	647	1502	39	36	42	44
2000	1220	3311	39	36	41	39
2001	1721	4641	38	35	41	33
2002	2095	5938	39	36	41	44

Figure 3.2.47: Cumulative distribution of serum Albumin by year

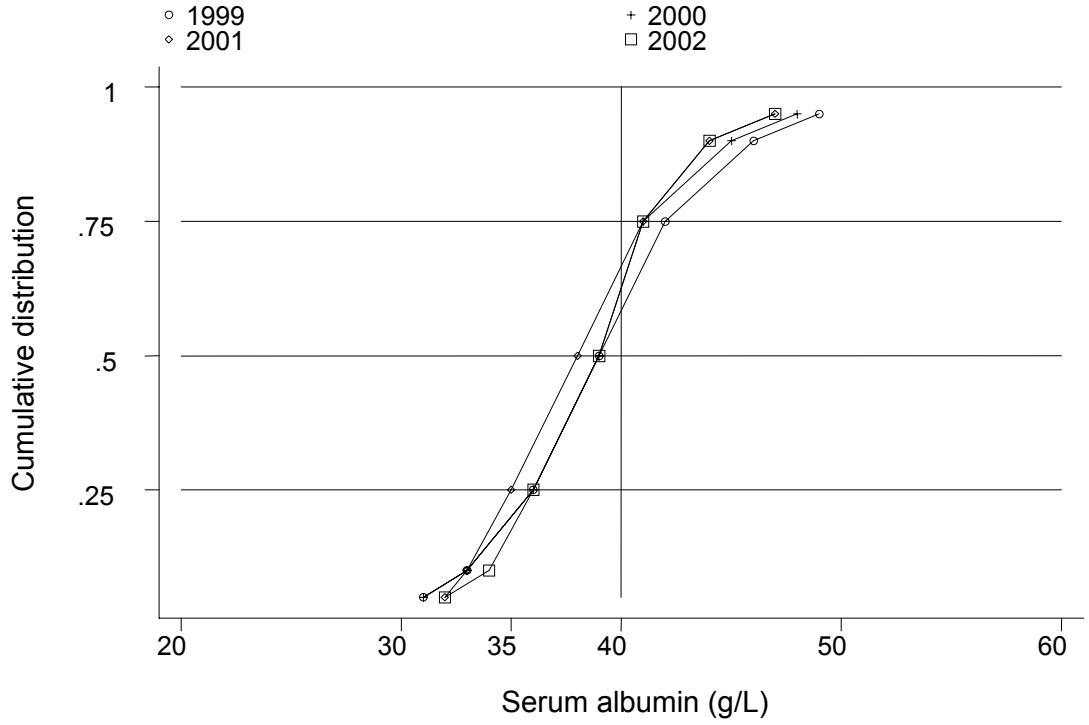
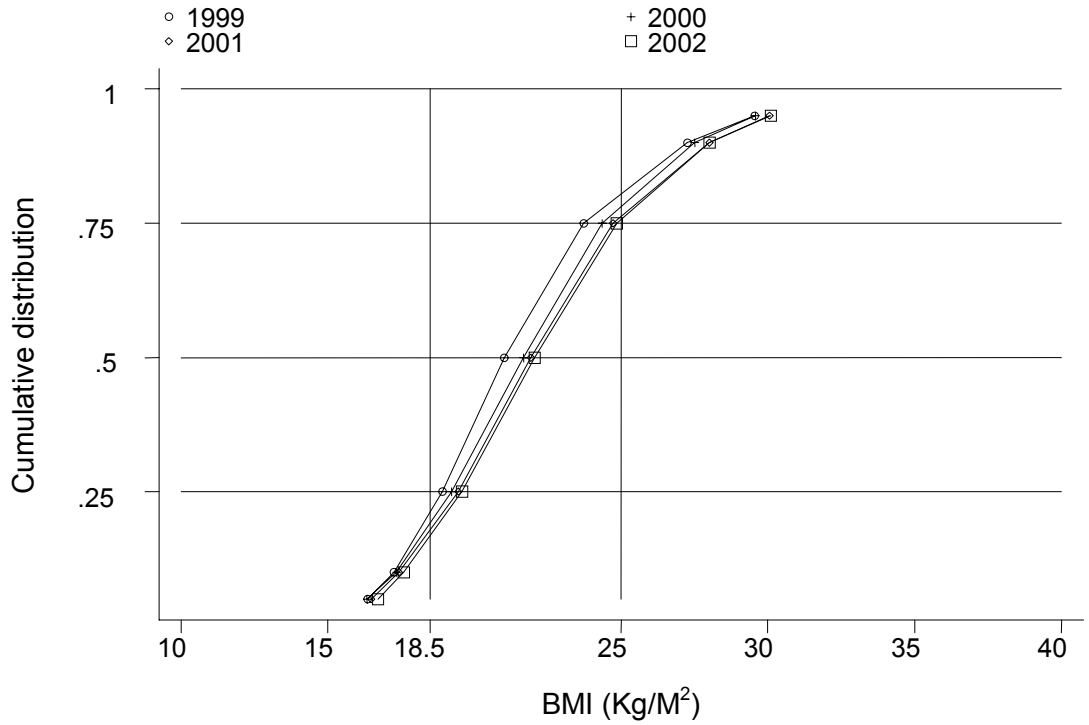


Table 3.2.48: Distribution of Body Mass Index, HD patients, NGO Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients <18.5	% Patients ≥18.5 & ≤25	% Patients >25
1999	607	5957	21	18.9	23.7	20	62	18
2000	1217	12077	21.7	19.2	24.3	19	60	21
2001	1532	15266	21.9	19.5	24.7	17	60	23
2002	1820	18849	22	19.6	24.8	16	60	24

Figure 3.2.48: Cumulative distribution of BMI by year

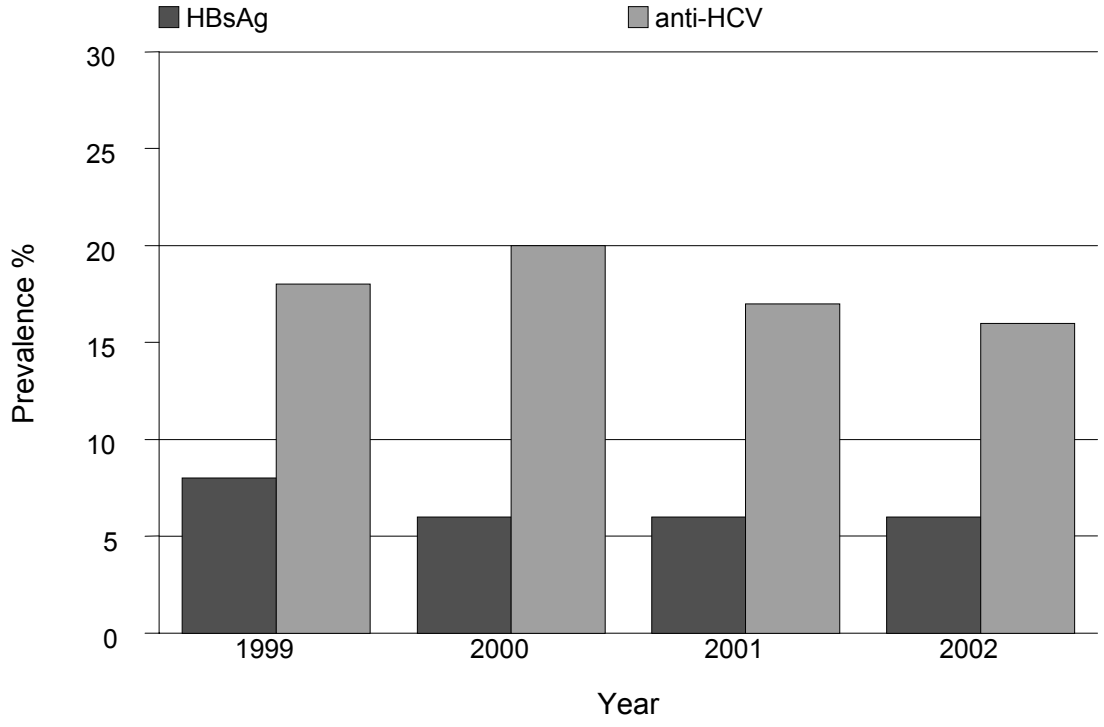


3.2.14 SEROLOGICAL STATUS, HD PATIENTS , NGO CENTRES

Table 3.2.49: Prevalence of positive anti-HCV and HbsAg, HD patients, NGO Centres 1999 – 2002

Year	No	% HBsAg positive	% anti-HCV positive
1999	728	8	18
2000	1531	6	20
2001	1905	6	17
2002	2223	6	16

Figure 3.2.49: Prevalence of positive anti-HCV and HbsAg HD patients, NGO Centres 1999 – 2002



HAEMODIALYSIS

IN

PRIVATE CENTRES

Stock and Flow

Death on Haemodialysis and Transfer to PD

Haemodialysis Patient Characteristics

Survival Analysis

Work related rehabilitation and quality of life

Haemodialysis practices

Dyslipidaemia in HD patients

Treatment of Renal Bone Disease

Management of Blood Pressure

Management of Anaemia

Nutritional status

Prevalence of anti-HCV antibodies and HbsAg

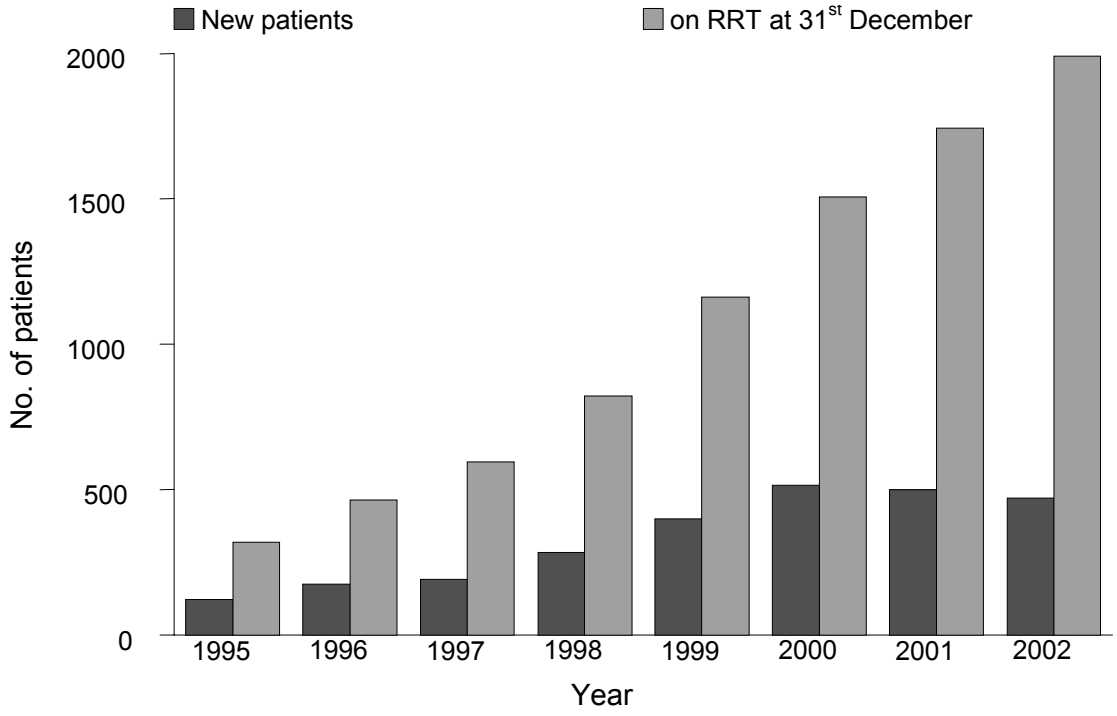
3.3: HAEMODIALYSIS IN PRIVATE CENTRES

3.3.1 STOCK AND FLOW

Table 3.3.01: Stock and Flow HD Patient, Private Centres 1995 – 2002

Year	1995	1996	1997	1998	1999	2000	2001	2002
New patients	122	174	192	284	400	515	500	470
Died	20	25	54	53	55	130	203	172
Transferred to PD	1	2	3	1	0	7	8	12
Transplanted	2	8	7	5	14	39	45	32
Lost to Follow up	0	2	3	2	2	5	18	14
Dialysing at 31st December	319	465	595	823	1162	1507	1742	1990

Figure 3.3.01: Stock and Flow HD Patient, Private Centres 1995 – 2002



3.3.3 DEATH ON HAEMODIALYSIS, PRIVATE CENTRES

Table 3.3.04: HD Death Rate and Transfer to PD, Private Centres 1995 – 2002

	1995	1996	1997	1998	1999	2000	2001	2002
No. at risk	319	392	530	709	993	1335	1625	1866
Deaths	20	25	54	53	55	130	203	172
Death rate %	6	6	10	7	6	10	12	9
Transfer to PD	1	2	3	1	0	7	8	12
Transfer to PD rate %	0	1	1	0	0	1	0	1
All Losses	21	27	57	54	55	137	211	184
All Losses rate %	7	7	11	8	6	10	13	10

Figure 3.3.04: Death Rate on HD, Private Centres 1995 – 2002

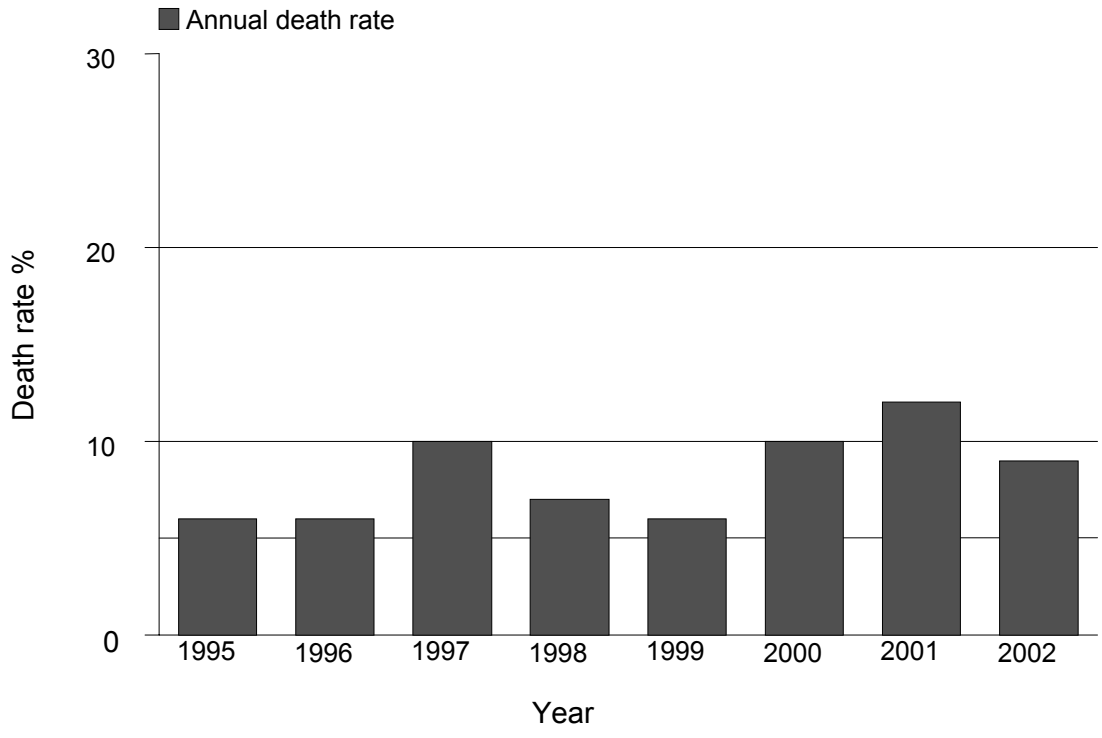


Table 3.3.05: Causes of Death HD Patient, Private Centres 1999 – 2002

	1999		2000		2001		2002	
Causes of death	No.	%	No.	%	No.	%	No.	%
Cardiovascular	13	24	50	38	84	41	80	47
Died at home	14	25	34	26	68	33	48	28
Sepsis	8	15	12	9	15	7	10	6
GIT bleed	1	2	2	2	4	2	3	2
Cancer	1	2	3	2	3	1	4	2
Liver disease	2	4	2	2	2	1	2	1
Others	12	22	22	17	19	9	19	11
Unknown	4	7	5	4	6	3	6	3
Total	55	100	130	100	203	100	172	100

3.3.5 HAEMODIALYSIS PATIENTS' CHARACTERISTICS, PRIVATE CENTRES

Table 3.3.08: Age Distribution of Dialysis Patients, Private Centres 1999 – 2002

Year	1999	2000	2001	2002
New Dialysis patients	400	515	500	470
1-14 years	0	0	0	0
15-24 years	2	1	2	1
25-34 years	6	6	4	8
35-44 years	15	13	10	10
45-54 years	21	22	21	24
55-64 years	28	32	33	28
≥65 years	29	27	30	28
Dialysing at 31st December	1162	1507	1742	1990
1-14 years	0	0	0	0
15-24 years	3	2	2	2
25-34 years	11	9	9	8
35-44 years	17	16	15	15
45-54 years	19	20	20	22
55-64 years	27	29	30	30
≥65 years	23	23	24	23

Table 3.3.09: Patients' Characteristics, Private Centres 1999 – 2002

Year	1999	2000	2001	2002
New Dialysis patients (No)	400	515	500	470
Mean age ± sd (years)	56 ± 14	56 ± 13	57 ± 13	55 ± 14
% Male	55	54	56	57
% Diabetic	47	53	52	54
% HbsAg+	4	4	3	3
% Anti-HCV+	11	6	4	3

3.3.6 SURVIVAL ANALYSIS, PRIVATE HD CENTRES

Table 3.3.10: HD Patient Survival, Private Centres 1997 – 2002

Year	1997			1998			1999		
Interval	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	92	2	179	94	1	268	96	1	387
12	89	2	173	92	2	260	91	1	360
24	84	3	164	84	2	233	81	2	303
36	76	3	147	76	3	206	73	2	261
48	68	3	128	69	3	176			
60	60	4	103						
Year	2000			2001			2002		
Interval	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	95	1	485	94	1	474	97	1	271
12	89	1	439	89	1	419			
24	81	2	374						

No. = number at risk SE = standard error

Figure 3.3.10: HD Patient Survival by year of entry, Private Centres

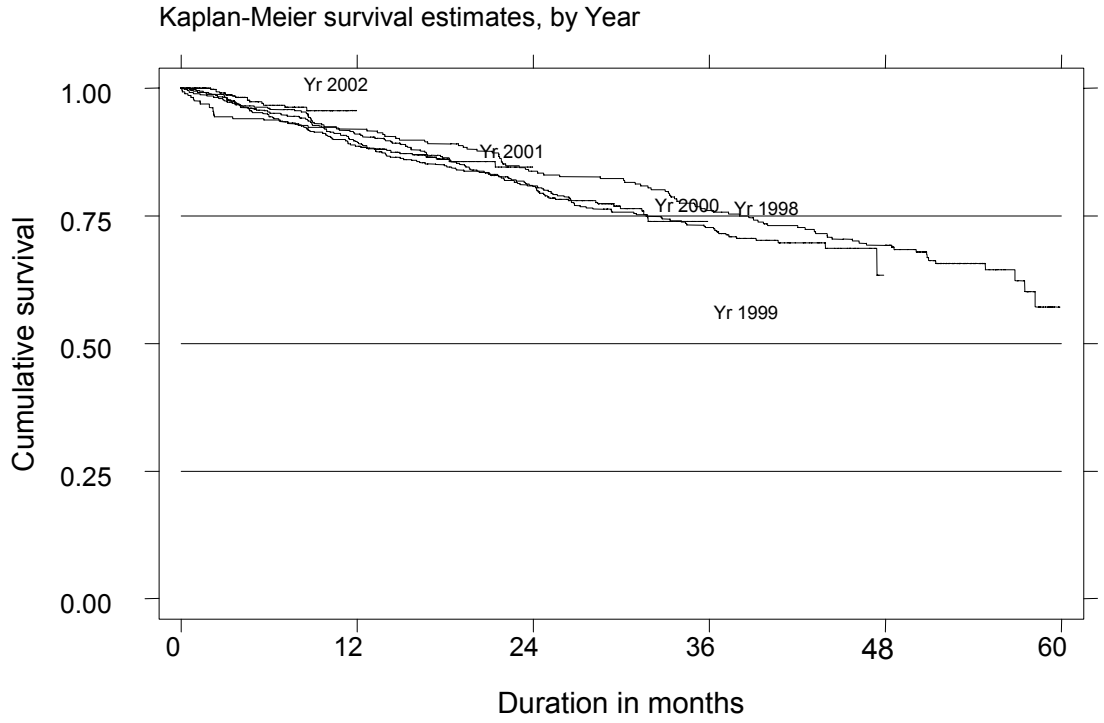
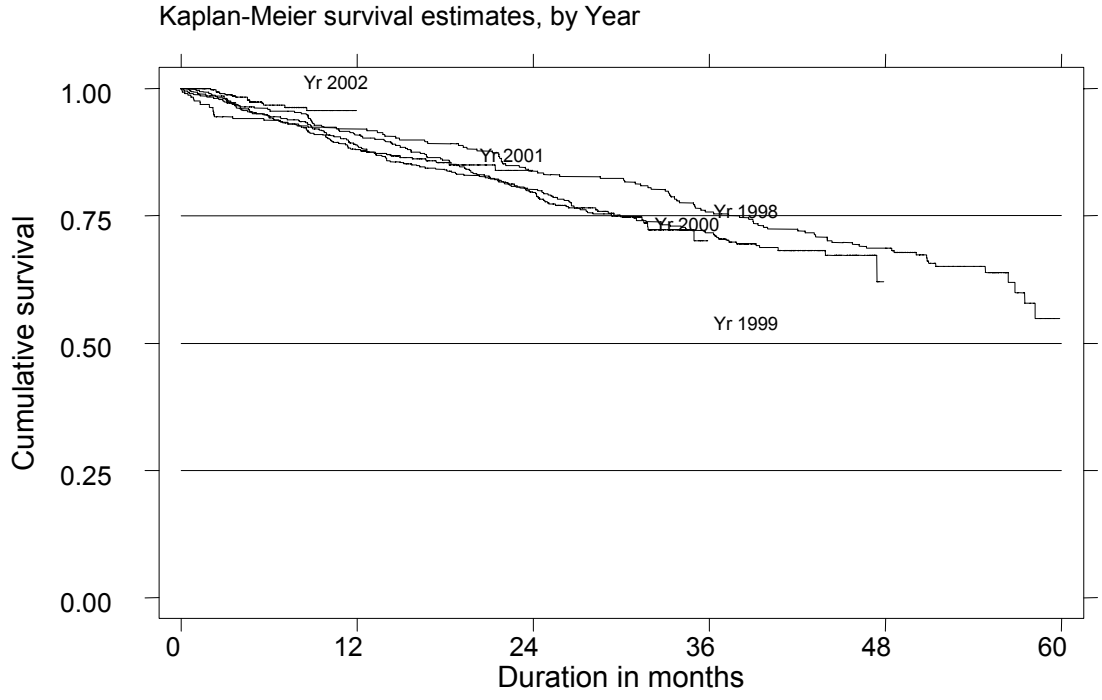


Table 3.3.11: HD Technique Survival, Private Centres

Year	1997			1998			1999		
Interval	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	92	2	179	94	1	268	96	1	387
12	88	2	173	92	2	260	91	1	360
24	84	3	164	84	2	233	80	2	303
36	76	3	147	76	3	206	72	2	261
48	67	3	128	69	3	176			
60	58	4	103						
Year	2000			2001			2002		
Interval	% survival	SE	No						
6	95	1	485	94	1	474	97	1	271
12	89	1	439	88	1	419			
24	80	2	374						

No. = number at risk SE = standard error

Figure 3.3.11: HD Technique Survival by year of entry, Private Centres



3.3.7 WORK RELATED REHABILITATION AND QUALITY OF LIFE ON HAEMODIALYSIS, PRIVATE CENTRES

Table 3.3.12: Work Related Rehabilitation on HD, Private centres 1999-2002

REHABILITATION STATUS	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
Full time work for pay	110	30	152	24	159	20	158	18
Part time work for pay	23	6	28	4	41	5	60	7
Able to work but unable to get a job	4	1	7	1	19	2	20	2
Able to work but not yet due to dialysis schedule	4	1	9	1	12	1	15	2
Able but disinclined to work	2	1	5	1	8	1	17	2
Home maker	86	23	173	27	191	23	200	23
Full time student	1	0	1	0	1	0	2	0
Age<15 years	0	0	0	0	0	0	0	0
Retired	46	13	79	12	111	14	134	15
Age>65 years	59	16	119	18	150	18	160	18
Unable to work due to poor health	32	9	72	11	122	15	122	14
Total	367	100	645	100	814	100	888	100

Table 3.3.13: Quality of Life on Haemodialysis, Private Centres 1999-2002

QOL Index Summated Score	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
0 (Worst QOL)	1	0	1	0	0	0	2	0
1	0	0	0	0	2	0	5	1
2	2	1	1	0	4	0	4	0
3	0	0	10	1	11	1	11	1
4	3	1	19	3	36	4	41	5
5	21	6	48	7	46	6	51	6
6	25	7	54	8	64	8	83	9
7	40	11	52	8	78	10	94	11
8	30	8	65	10	82	10	100	11
9	47	13	62	9	68	8	96	11
10 (Best QOL)	194	53	355	53	423	52	397	45
Total	363	100	667	100	814	100	884	100

3.3.8 HAEMODIALYSIS PRACTICES IN PRIVATE CENTRES

Table 3.3.14: Vascular Access on Haemodialysis, Private Centres 1999 - 2002

Access types	1999		2000		2001		2002	
	No	%	No	%	No	%	No	%
Wrist AVF	318	82	602	81	720	77	750	75
BCF*	43	11	113	15	150	16	183	18
Venous graft	4	1	3	0	7	1	4	0
Artificial graft	6	2	10	1	27	3	27	3
PERMCATH	2	1	3	0	6	1	10	1
Temporary CVC*	15	4	15	2	21	2	26	3
Total	388	100	746	100	931	100	1000	100

* *BCF = Brachiocephalic fistula*
* *CVC = Central venous catheter*

Table 3.3.15: Difficulties reported with Vascular Access, Private Centres 1999 - 2002

Access difficulty	1999		2000		2001		2002	
	No	%	No	%	No	%	No	%
Difficulty with needle placement	12	3	26	3	57	6	47	5
Difficulty in obtaining desired blood flow rate	7	2	23	3	36	4	63	6
Other difficulty	6	2	4	1	3	0	8	1
No difficulty	363	94	694	93	836	90	888	88
Total	388	100	747	100	932	100	1006	100

Table 3.3.16: Complications reported with Vascular Access, Private Centres 1999 - 2002

Complication	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
Thrombosis	10	3	22	3	39	4	59	6
Bleed	2	1	3	0	4	0	2	0
Aneurysmal dilatation	12	3	39	5	54	6	14	1
Swollen limb	6	2	3	0	5	1	11	1
Access related infection, local/Systemic	1	0	2	0	4	0	7	1
Distal Limb ischaemia	1	0	8	1	2	0	3	0
Venous outflow obstruction	1	0	6	1	14	2	10	1
Carpal tunnel	2	1	3	0	4	0	12	1
Other	6	2	5	1	11	1	22	2
No complication	347	89	656	88	796	85	866	86
Total	388	100	747	100	933	100	1006	100

Table 3.3.17: Blood Flow Rates in Private HD Units 1999 - 2002

Blood flow rates	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
<150 ml/min	1	0	2	0	5	1	2	0
150-199 ml/min	9	2	15	2	19	2	25	3
200-249 ml/min	191	53	375	52	362	40	322	33
250-299 ml/min	131	36	241	34	363	40	422	43
300-349 ml/min	23	6	78	11	159	17	182	19
> 350 ml/min	8	2	7	1	8	1	26	3
Total	363	100	718	100	916	100	979	100

Table 3.3.18: Number of HD Sessions per week, Private HD Units 1999 - 2002

HD sessions	1999		2000		2001		2002	
Per week	No.	%	No.	%	No.	%	No.	%
1	2	1	3	0	6	1	4	0
2	113	29	215	29	232	25	251	25
3	269	70	520	70	653	70	744	74
4	1	0	2	0	36	4	1	0
Total	385	100	742	100	930	100	1002	100

Table 3.3.19: Duration of HD in Private HD Units, 1999 - 2002

Duration of HD	1999		2000		2001		2002	
per session	No.	%	No.	%	No.	%	No.	%
≤3 hours	1	0	0	0	3	0	3	0
3.5 hours	8	2	9	1	11	1	0	0
4 hours	289	75	601	81	821	88	928	93
4.5 hours	51	13	68	9	45	5	29	3
5 hours	35	9	54	7	50	5	42	4
≥5 hours	0	0	10	1	0	0	0	0
Total	384	100	742	100	930	100	1002	100

Table 3.3.20: Dialyser membrane types in Private HD Units 1999 - 2002

Dialyser	1999		2000		2001		2002	
membrane	No.	%	No.	%	No.	%	No.	%
Cellulosic	141	80	316	76	330	61	211	42
Cellulose acetate	12	7	16	4	56	10	82	16
Synthetic	23	13	86	21	152	28	212	42
Total	176	100	418	100	538	100	505	100

Table 3.3.21: Dialyser Reuse Frequency in Private HD Units 1999 - 2002

Dialyser reuse	1999		2000		2001		2002	
frequency	No.	%	No.	%	No.	%	No.	%
1*	43	12	59	9	60	7	59	6
2	6	2	2	0	1	0	4	0
3	28	8	32	5	44	5	76	8
4	126	36	293	43	227	26	171	18
5	43	12	75	11	89	10	97	10
6	93	27	150	22	206	23	240	25
7	2	1	4	1	3	0	6	1
8	3	1	41	6	188	21	207	22
9	0	0	0	0	0	0	1	0
10	0	0	21	3	36	4	38	4
11	1	0	1	0	4	0	5	1
12	1	0	3	0	23	3	19	2
≥13	0	0	0	0	4	0	20	2
Total	346	100	681	100	885	100	943	100

1* is single use i.e. no reuse

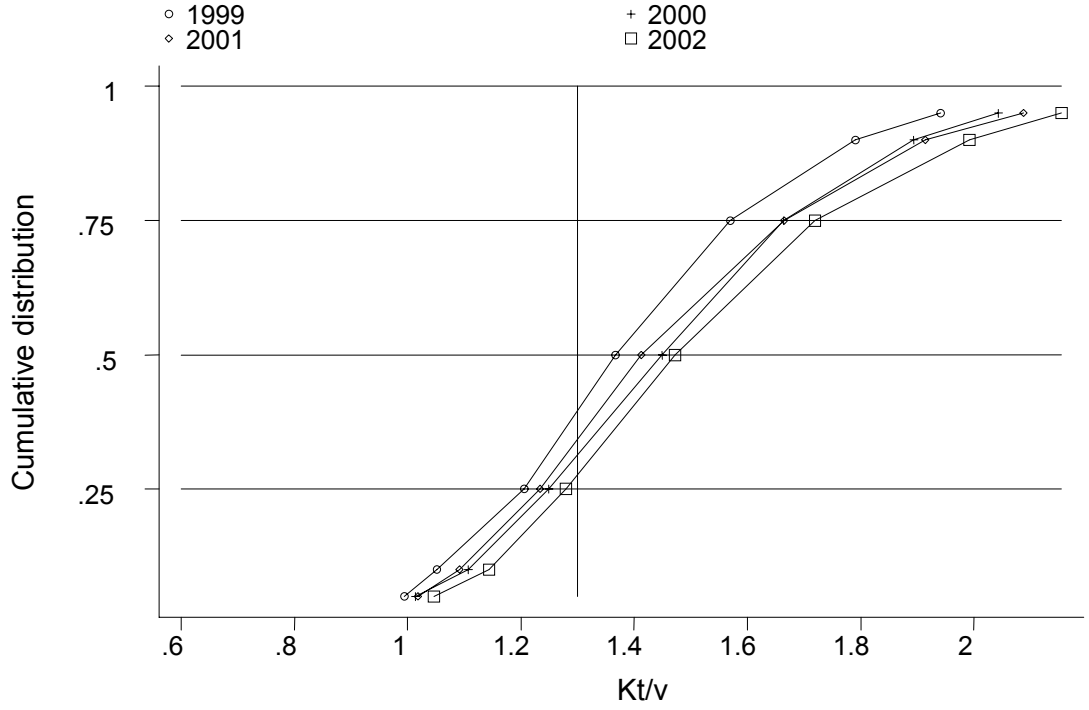
Table 3.3.22: Dialysate Buffer used in Private HD Units 1999 – 2002

Dialysate buffer	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
Acetate	65	17	77	10	55	6	36	4
Bicarbonate	322	83	663	90	871	94	955	96
Total	387	100	740	100	926	100	991	100

Table 3.3.23: Distribution of Prescribed KT/V, Private Centres 1999 - 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% > 1.3
1999	236	1725	1.4	1.2	1.6	61
2000	478	4584	1.4	1.2	1.7	68
2001	608	5892	1.4	1.2	1.7	65
2002	665	5914	1.5	1.3	1.7	72

Figure 3.3.23: Cumulative distribution of Prescribed KT/V by Year



3.3.9 DYSLIPIDAEMIA IN HD PATIENTS, PRIVATECENTRES

Table 3.3.24: Distribution of Serum Cholesterol Levels (mmol/L), HD patients, Private Centres 1999- 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 5.3 mmol/L
1999	188	283	5.1	4.3	5.7	66
2000	339	542	4.9	4.1	5.7	66
2001	406	626	5	4.2	5.8	64
2002	494	765	4.8	4.1	5.6	71

Figure 3.3.24: Cumulative distribution of serum cholesterol concentration by year

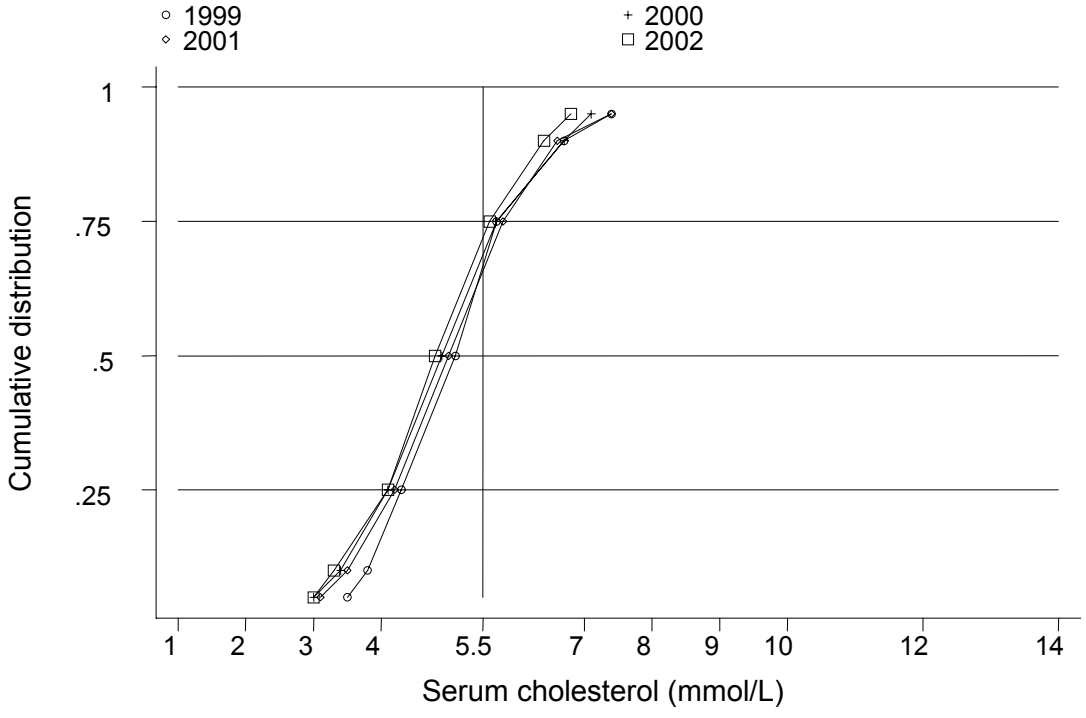


Table 3.3.25: Distribution of serum Triglyceride (mmol/L), HD patients, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% patients < 3.5 mmol/L
1999	87	113	1.8	1.2	2.7	86
2000	254	387	1.7	1.1	2.5	86
2001	287	419	1.6	1.1	2.5	89
2002	326	485	1.9	1.3	2.6	89

Figure 3.3.25: Cumulative distribution of serum triglyceride concentration by year

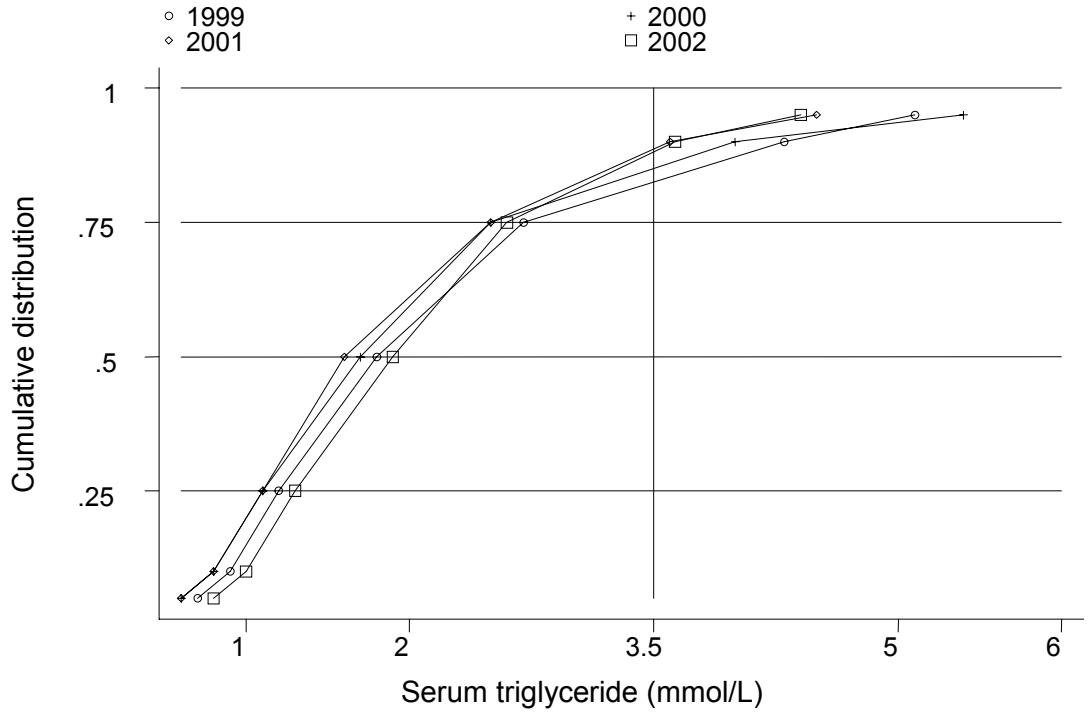


Table 3.3.26: Distribution of serum LDL (mmol/L), HD patient, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% patients <5 mmol/L
1999	76	97	3	2.5	3.9	96
2000	226	340	2.9	2.2	3.5	98
2001	276	398	3	2.3	3.6	97
2002	327	474	2.7	2	3.4	98

Figure 3.3.26: Cumulative distribution of serum LDL by year

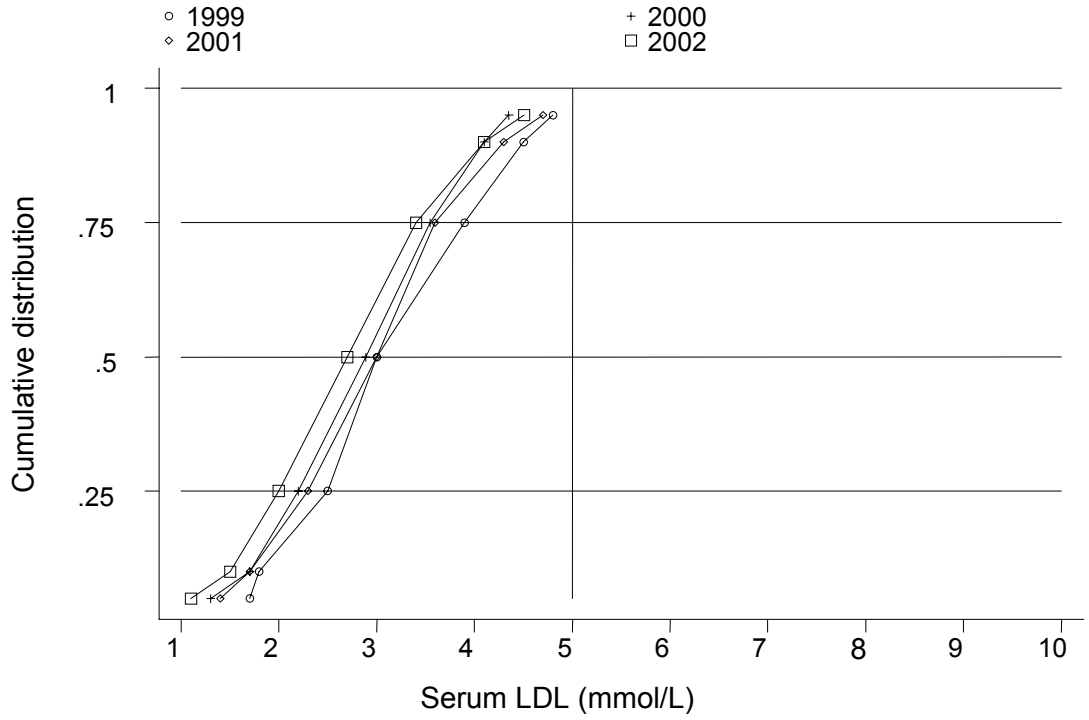
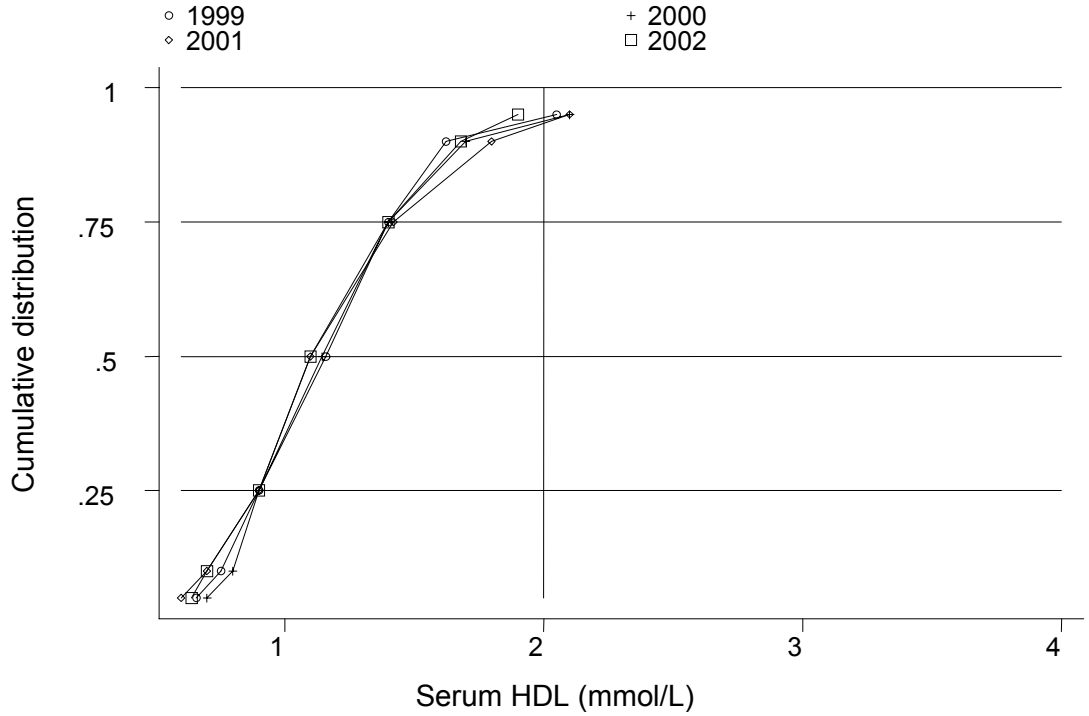


Table 3.3.27: Distribution of serum HDL (mmol/L), HD patient, Private Centres 1999 –2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 2mmol/L
1999	78	100	1.2	.9	1.4	95
2000	226	348	1.1	.9	1.4	94
2001	283	407	1.1	.9	1.4	93
2002	330	485	1.1	.9	1.4	96

Figure 3.3.27: Cumulative distribution of serum HDL by year



3.3.10 MANAGEMENT OF RENAL BONE DISEASE, PRIVATE CENTRES

Table 3.3.28: Treatment for Renal Bone Disease, HD patients, Private Centres 1999–2002

Year	No of subjects	% on $CaCO_3$	% on $Al(OH)_3$	% on Vitamin D
1999	389	82	6	30
2000	750	84	3	33
2001	933	89	2	27
2002	1015	89	2	23

Table 3.3.29: Distribution of serum Phosphate (mmol/l), HD patients, Private Centres 1999 –2002

Year	No of subjects	No of observations	Median	LQ	UQ	% patients < 1.6 mmol/L
1999	352	946	1.9	1.6	2.3	26
2000	657	1656	1.9	1.5	2.3	31
2001	780	1912	1.8	1.4	2.3	34
2002	872	2052	1.8	1.5	2.3	32

Figure 3.3.29: Cumulative distribution of serum Phosphate by year

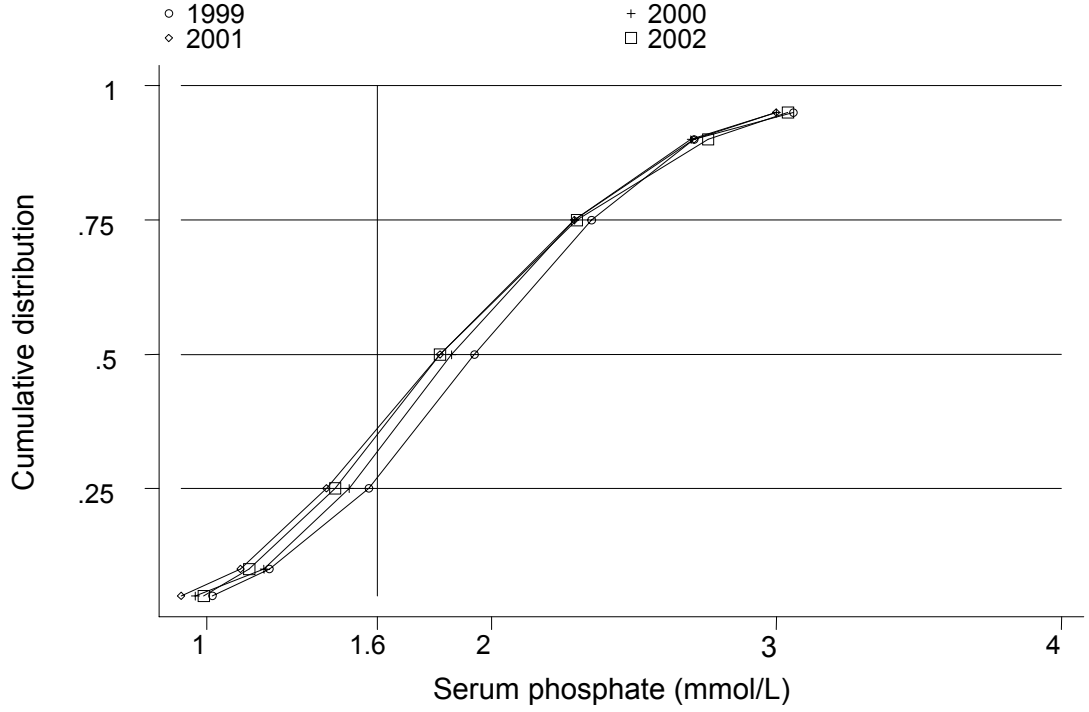


Table 3.3.30: Distribution of serum Calcium (mmol/l), HD patients, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients ≥ 2.2 & ≤2.6 mmol/L
1999	353	969	2.3	2.1	2.5	52
2000	663	1687	2.3	2.2	2.5	56
2001	790	1947	2.3	2.2	2.5	60
2002	878	2101	2.3	2.1	2.5	57

Figure 3.3.30: Cumulative distribution of serum Calcium by year

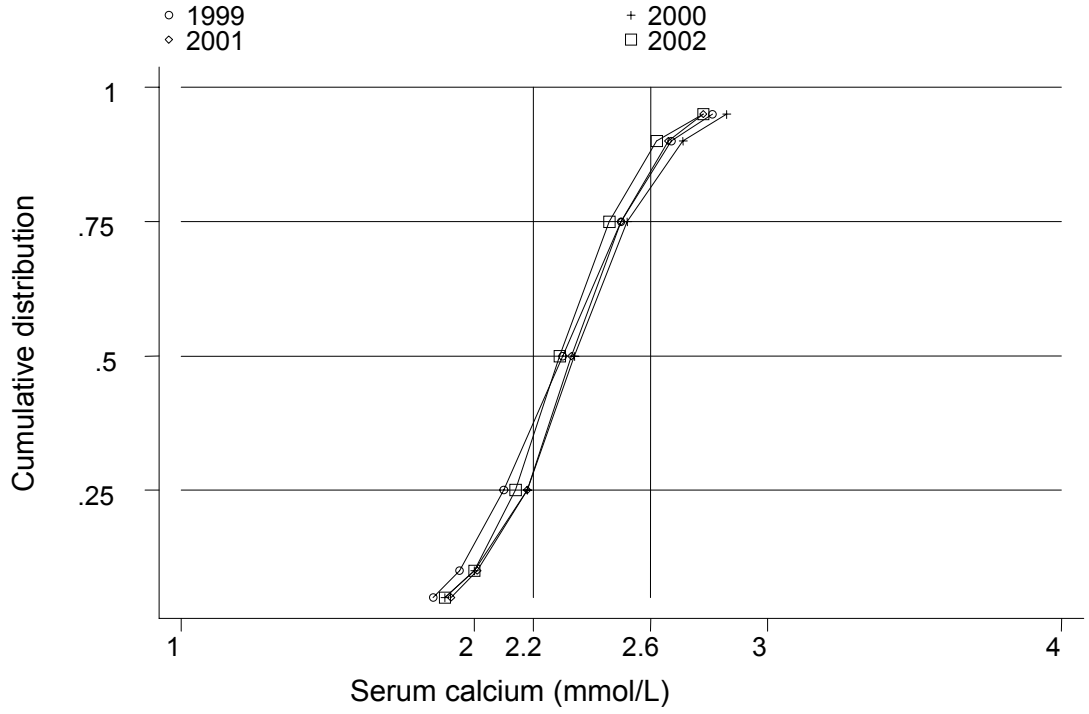
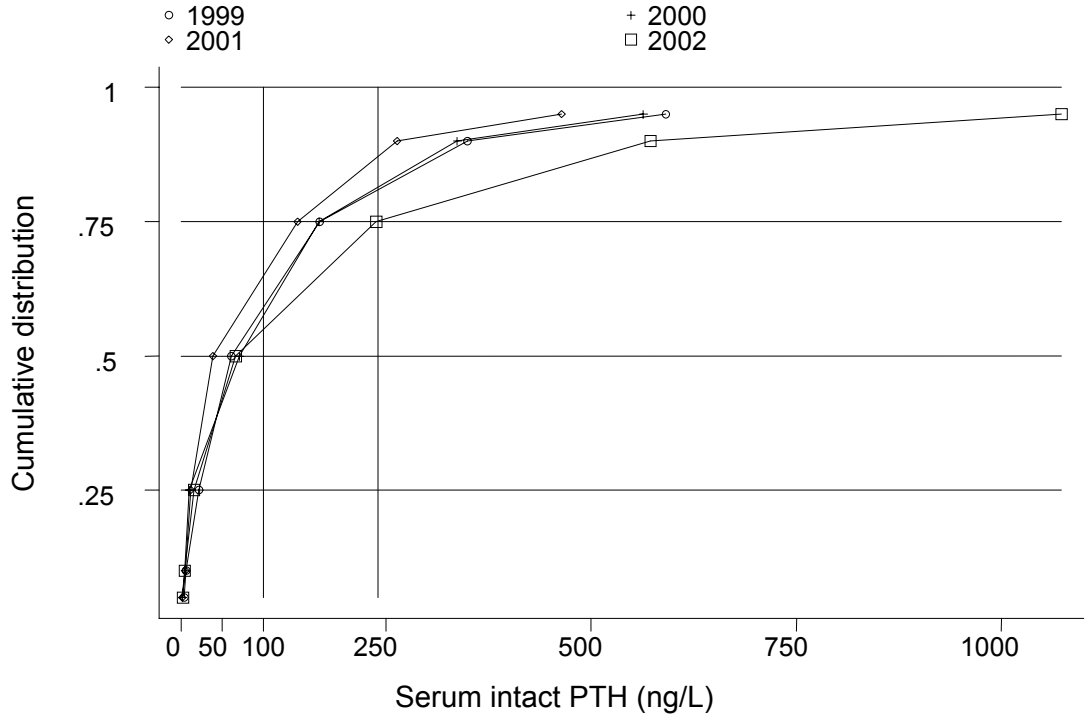


Table 3.3.31: Distribution of serum iPTH (ng/L), HD patients, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% patients ≥ 100 & ≤ 250 ng/L
1999	62	85	61	22	168.8	24
2000	87	110	71	10	168	22
2001	98	133	39.3	12	142	22
2002	159	190	66.3	16	238	17

Figure 3.3.31: Cumulative distribution of serum iPTH by year,



3.3.11 MANAGEMENT OF BLOOD PRESSURE, PRIVATE CENTRES

Table 3.3.32: Treatment for hypertension, HD patients, Private Centres 1999-2002

Year	No.	% on anti-hypertensives	% on 1 anti-hypertensives	% on 2 anti-hypertensives	% on 3 anti-hypertensives
1999	389	64	39	20	6
2000	750	66	41	21	5
2001	933	68	41	23	5
2002	1015	67	38	24	5

Table 3.3.33: Distribution of Systolic BP without anti-hypertensives, HD patients Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 160 mmHg
1999	131	833	142	130	160	69
2000	244	2287	140	125	160	73
2001	287	2633	140	120	151	80
2002	328	2704	140	128	160	73

Figure 3.3.33: Cumulative distribution of Systolic BP without anti-hypertensives by year

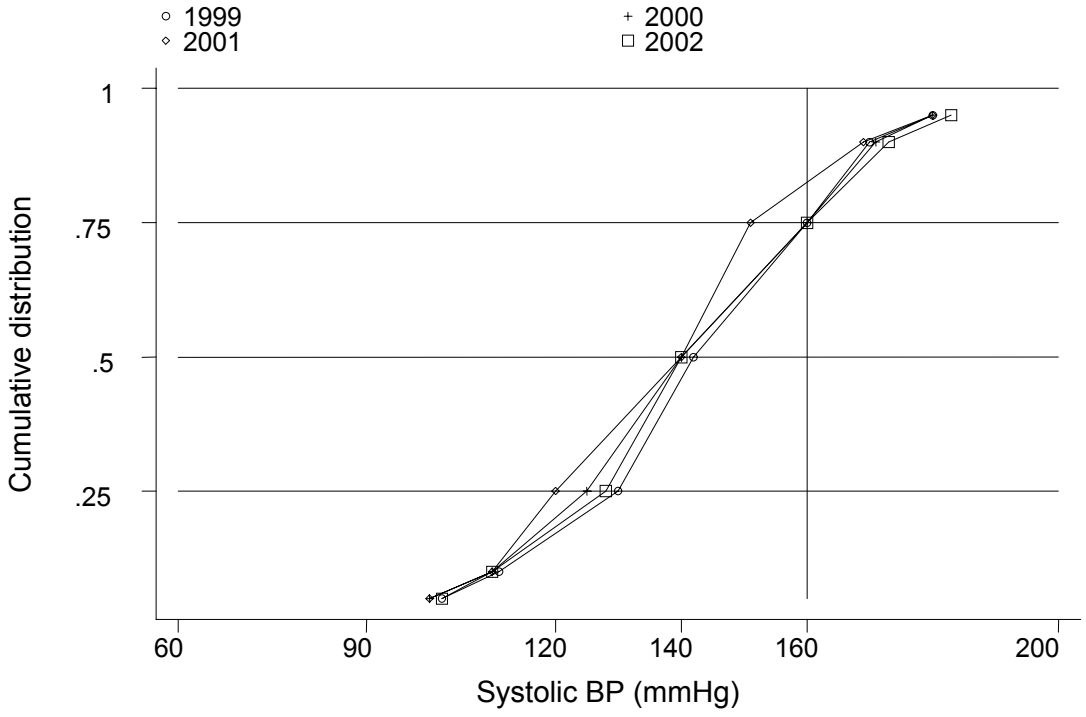


Table 3.3.34: Distribution of Diastolic BP without anti-hypertensives, HD patients, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 90 mmHg
1999	131	835	80	73	90	67
2000	244	2287	80	70	87	77
2001	287	2639	80	70	83	82
2002	328	2705	80	70	88	77

Figure 3.3.34: Cumulative distribution of Diastolic BP without anti-hypertensives by year

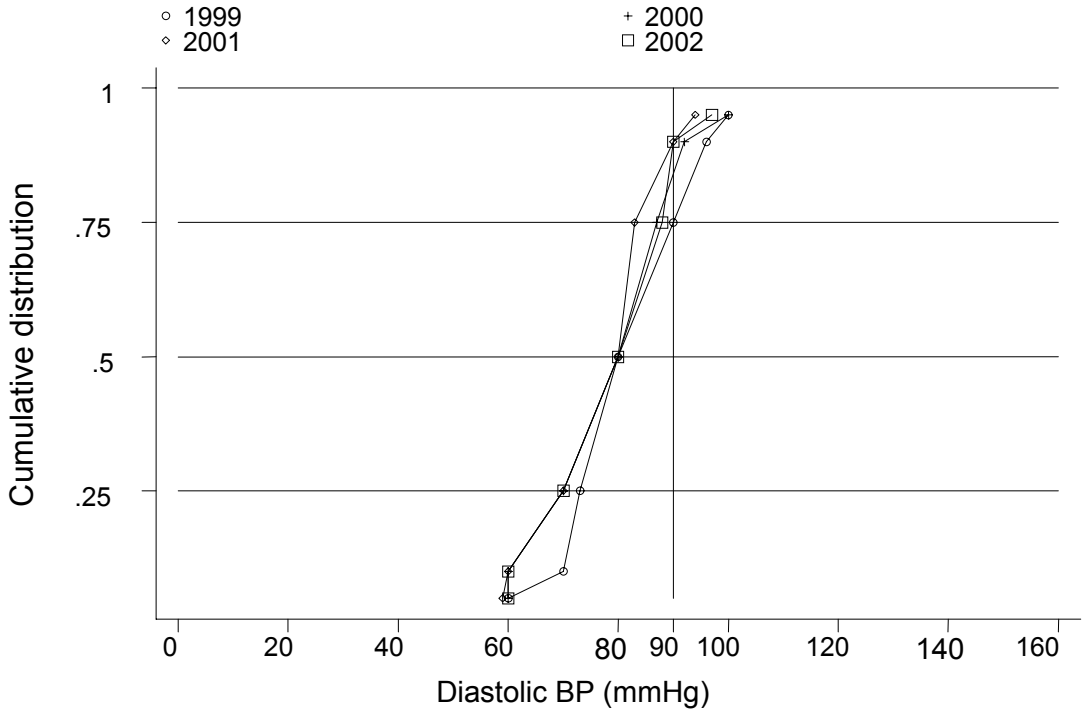


Table 3.3.35: Distribution of systolic BP on anti-hypertensives, HD patients, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 160 mmHg
1999	246	1838	153	140	170	53
2000	482	4392	156	140	171	52
2001	631	5879	155	140	172	53
2002	659	5389	156	140	170	52

Figure 3.3.35: Cumulative distribution of systolic BP on anti-hypertensives by year

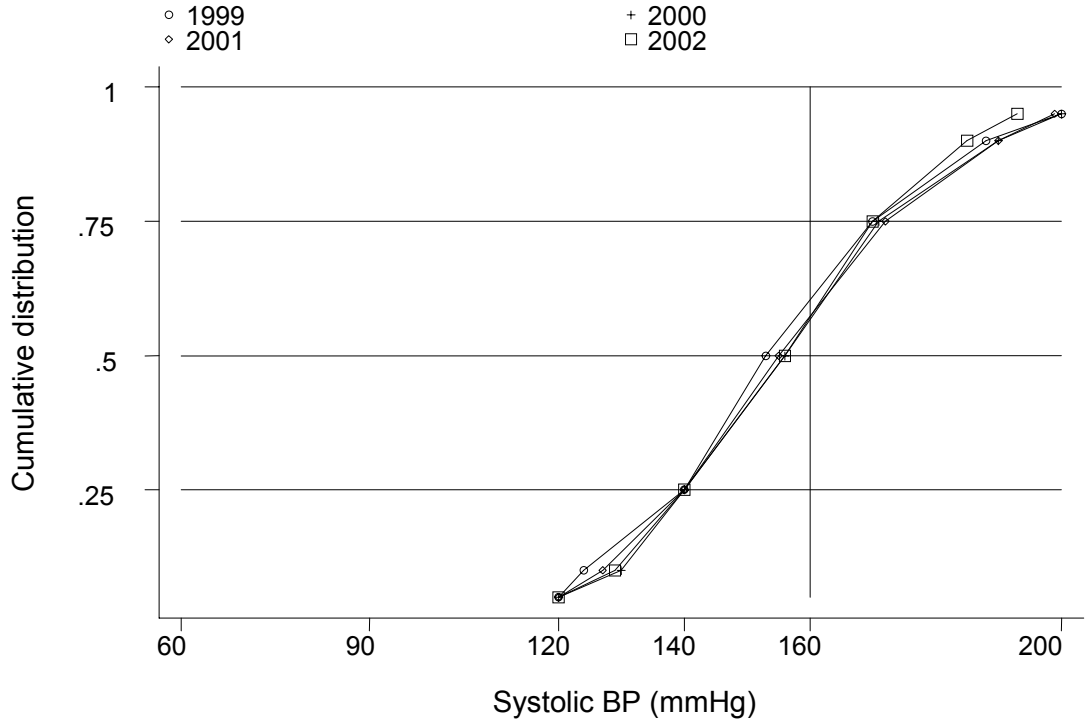
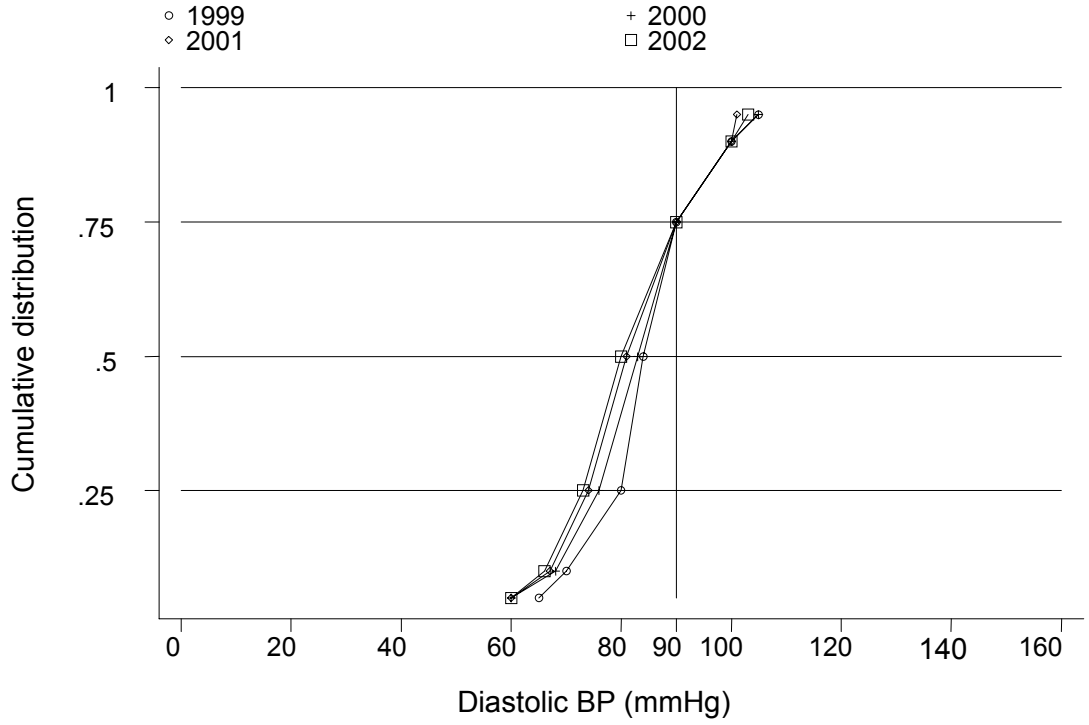


Table 3.3.36: Distribution of diastolic BP on anti-hypertensives, HD patients, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 90 mmHg
1999	246	1839	84	80	90	56
2000	482	4394	83	76	90	59
2001	631	5880	81	74	90	61
2002	658	5386	80	73	90	62

Figure 3.3.36: Cumulative distribution of diastolic BP on anti-hypertensives by year



3.3.12 TREATMENT OF ANAEMIA, PRIVATE HD CENTRES

Table 3.3.37: Treatment for Anaemia, HD patients, Private Centres 1999-2002

Year	No	% on rHuEpo	% received blood transfusion	% received oral iron	% received parenteral iron
1999	389	60	23	81	13
2000	750	64	20	75	3
2001	933	66	20	80	5
2002	1015	68	17	75	4

Table 3.3.38: Distribution of rHuEpo dose per week, HD patients, Private Centres 1999-2002

Year	1999	2000	2001	2002
No. of patients	225	464	595	645
% on 2000 u/week	29	31	29	33
% on 2-4000 u/week	62	58	54	56
% on 4-6000 u/week	4	7	11	8
% on 6-8000 u/week	3	2	2	2
% on 8-12000 u/week	2	2	3	1
% on >12000 u/week	0	0	1	0

Table 3.3.39: Distribution of serum Iron without rHuEpo, HD patients, PrivateCentres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 10 umol/L
1999	16	26	10.9	9.1	14.4	58
2000	28	45	12.2	9	17.1	64
2001	27	40	14.6	10	21	73
2002	24	39	12	6	19.4	54

Figure 3.3.39: Cumulative distribution of serum Iron without rHuEpo by year

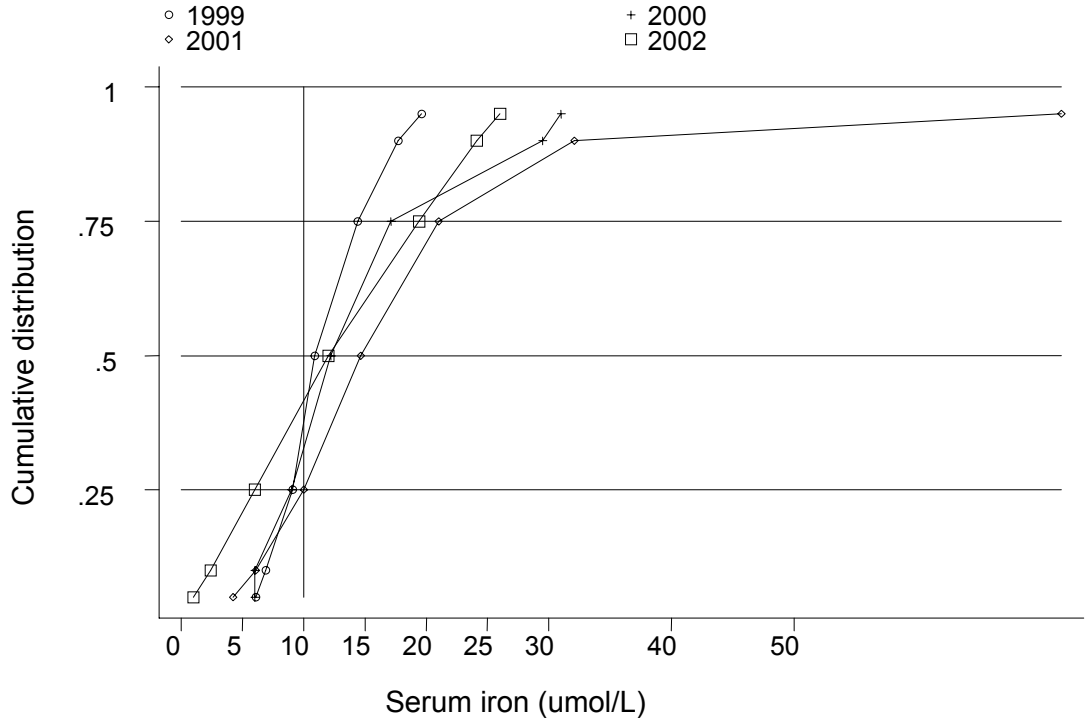


Table 3.3.40: Distribution of serum Iron on rHuEpo, HD patients, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 10 umol/L
1999	67	85	12.7	9.1	18.3	69
2000	62	84	13.1	9.1	21.1	67
2001	95	108	13.9	9.6	17.9	72
2002	134	157	12.2	8.4	18.8	61

Figure 3.3.40: Cumulative distribution of serum Iron on rHuEpo by year

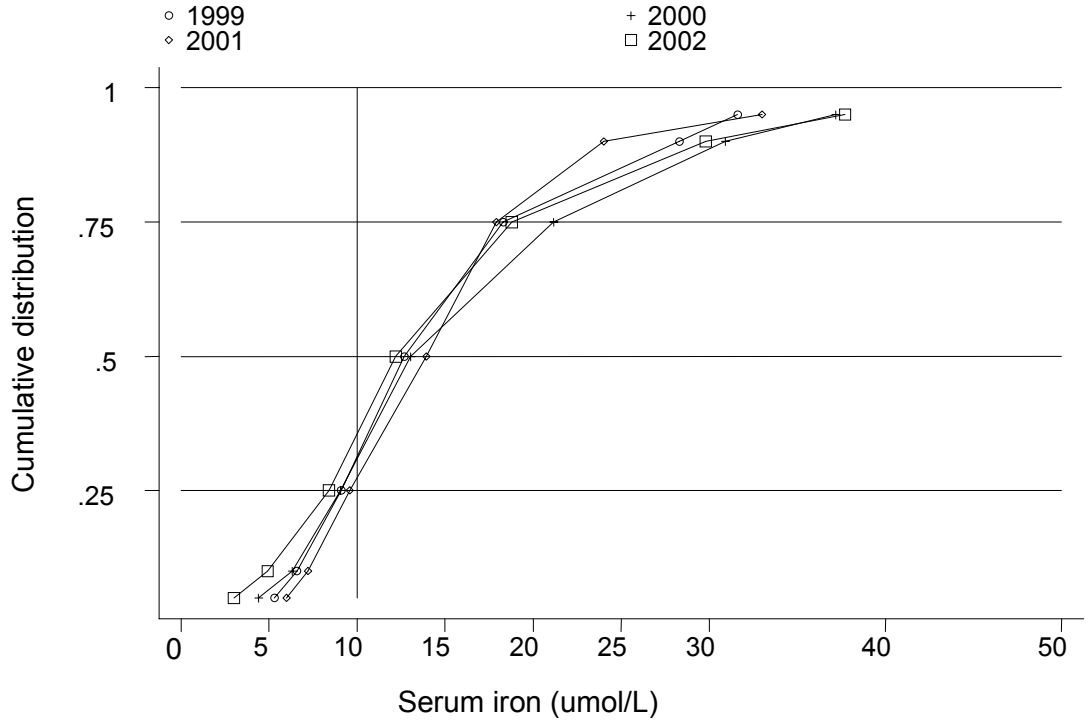


Table 3.3.41: Distribution of serum Transferrin Saturation without rHuEpo, HD patients, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 20%
1999	9	36	25.1	19.1	29.7	67
2000	24	96	23.6	16.9	35.7	63
2001	21	84	38	25.6	60.1	76
2002	15	60	23.3	14.2	36.6	67

Figure 3.3.41: Cumulative distribution of serum Transferrin Saturation without rHuEpo by year

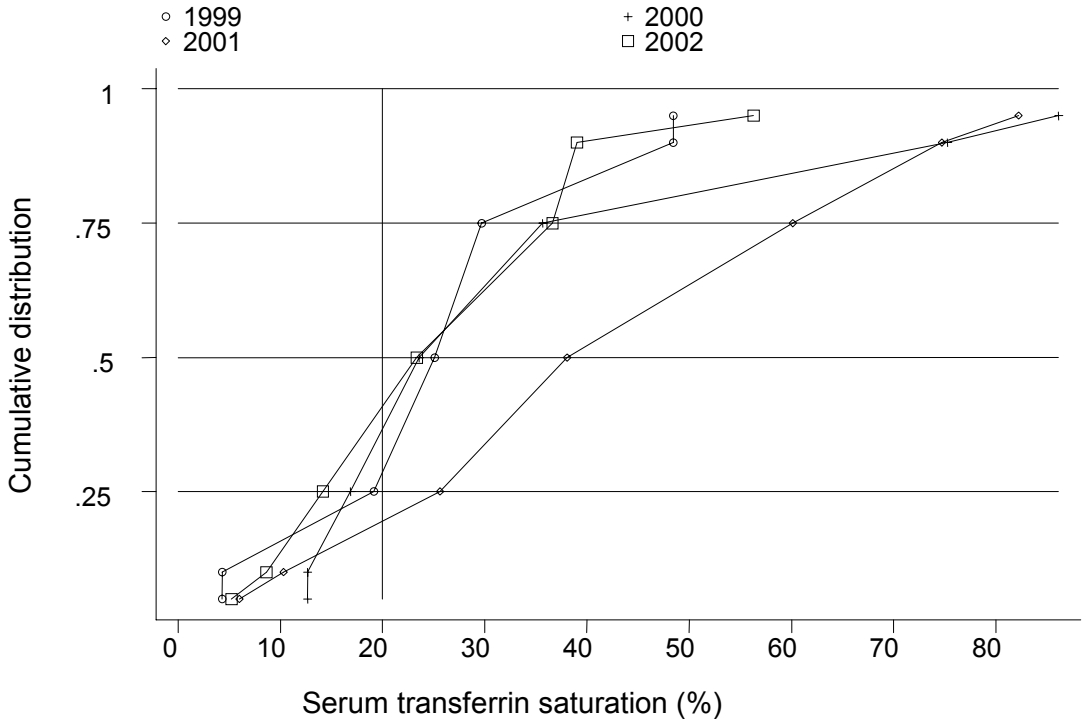


Table 3.3.42: Distribution of serum Transferrin Saturation on rHuEpo, HD patients, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 20%
1999	43	172	31.6	21.6	49.8	84
2000	52	208	35.2	23.3	52.1	83
2001	89	356	32.6	21.8	47	79
2002	82	328	29.4	20.6	47.2	76

Figure 3.3.42: Cumulative distribution of serum Transferrin Saturation on rHuEpo by year

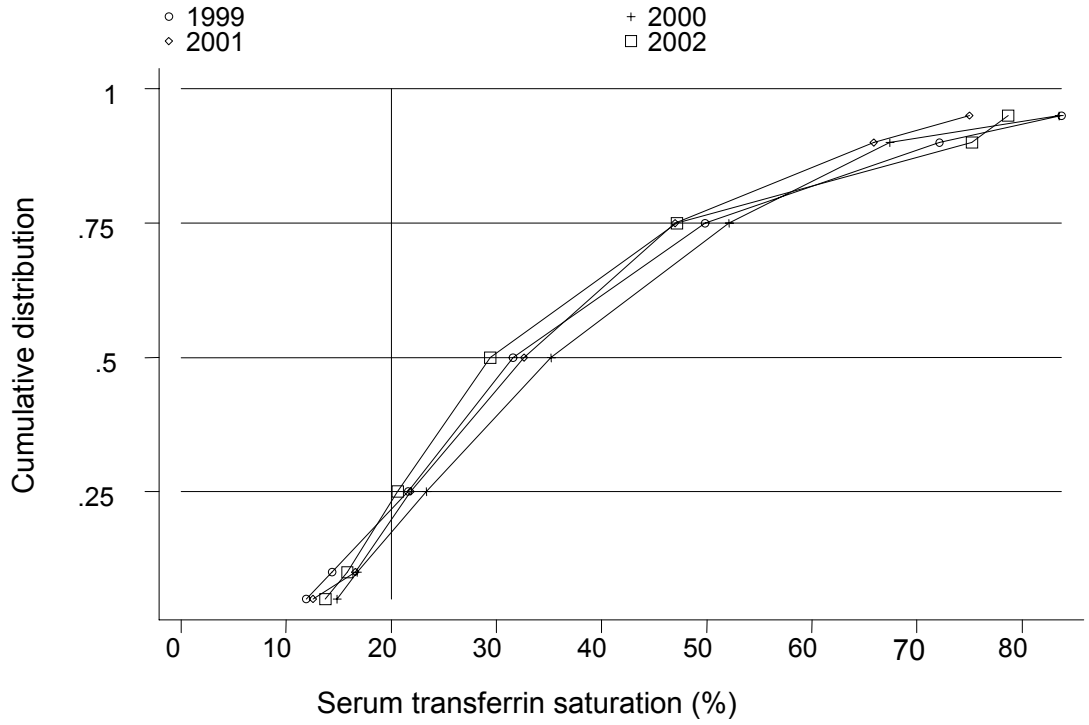


Table 3.3.43: Distribution of serum Ferritin without rHuEpo, HD patients, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 100 ug/L
1999	21	27	323	90	776	70
2000	31	46	284.6	122	463.7	83
2001	33	45	403	176	831	84
2002	32	45	464.1	228.1	993.7	87

Figure 3.3.43: Cumulative distribution of serum Ferritin without rHuEpo by year

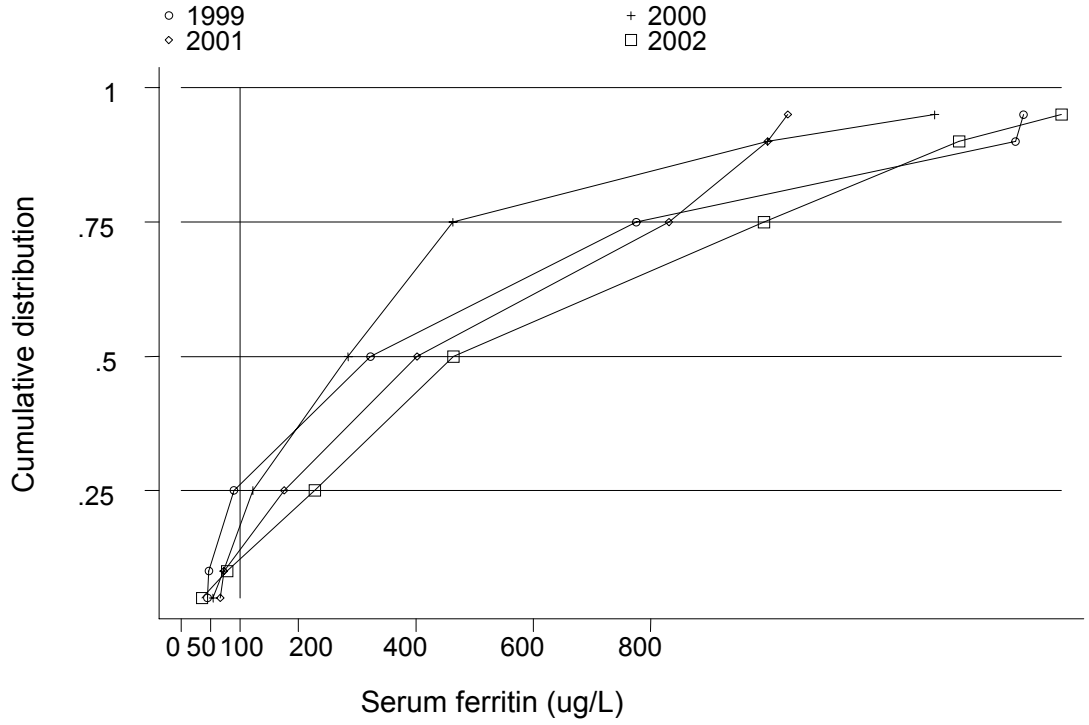


Table 3.3.44: Distribution of serum Ferritin on rHuEpo, HD patients, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% patients > 100 ug/L
1999	106	149	476.4	309	876	95
2000	105	142	508	229	978	92
2001	158	211	566	288	926	91
2002	172	208	554	256.1	997.5	91

Figure 3.3.44: Cumulative distribution of serum Ferritin on rHuEpo by year

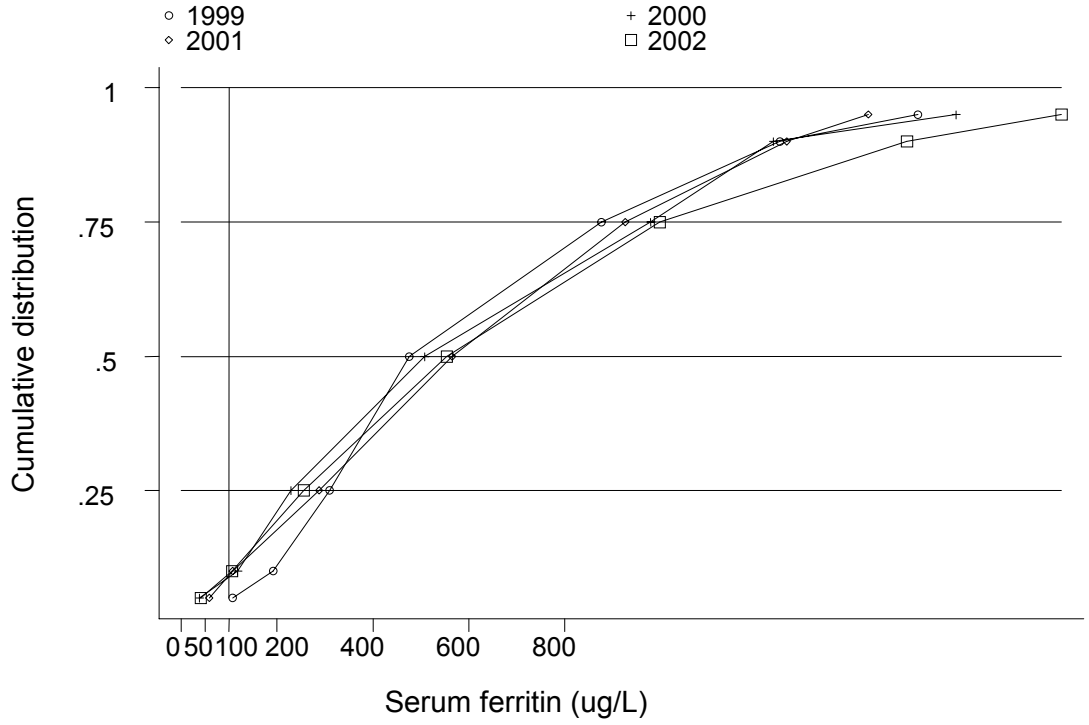


Table 3.3.45: Distribution of Haemoglobin concentration without rHuEpo, HD patients, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients <10 g/dL	% Patients ≥10 & ≤12 g/dL	% Patients >12 g/dL
1999	139	381	8.7	7.7	10.3	70	20	10
2000	241	620	8.8	7.6	10.3	70	22	8
2001	257	627	8.9	7.7	10.2	69	22	9
2002	266	627	9	7.7	10.5	66	22	12

Figure 3.3.45: Cumulative distribution of Hb without rHuEpo by year

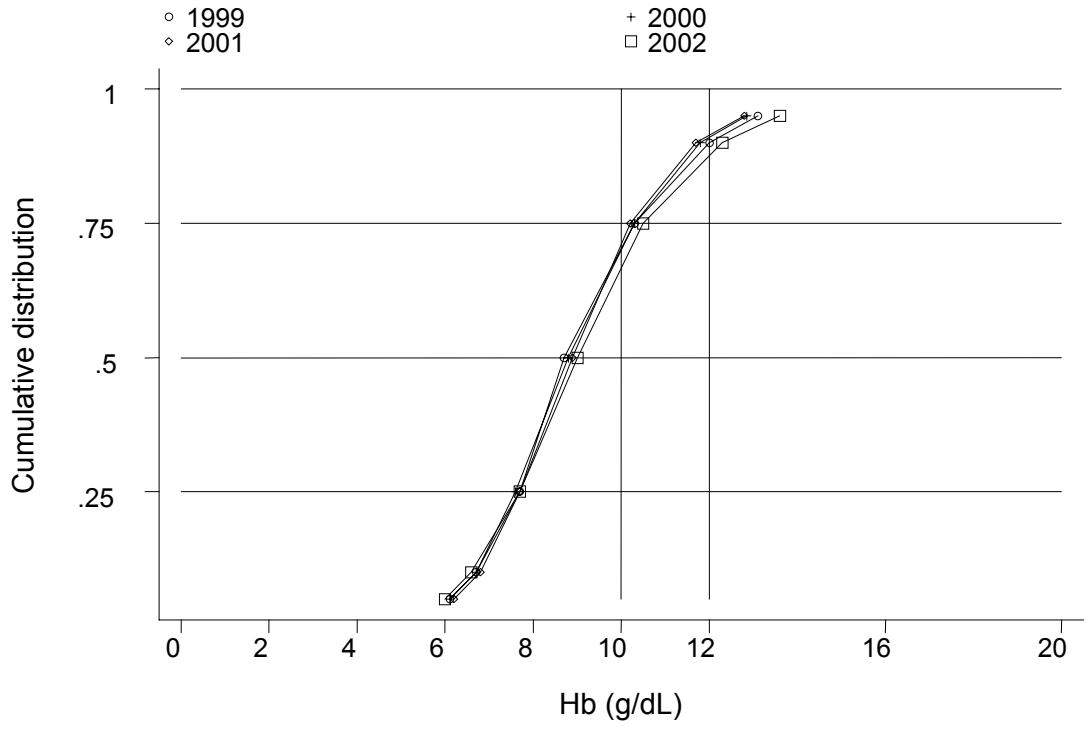
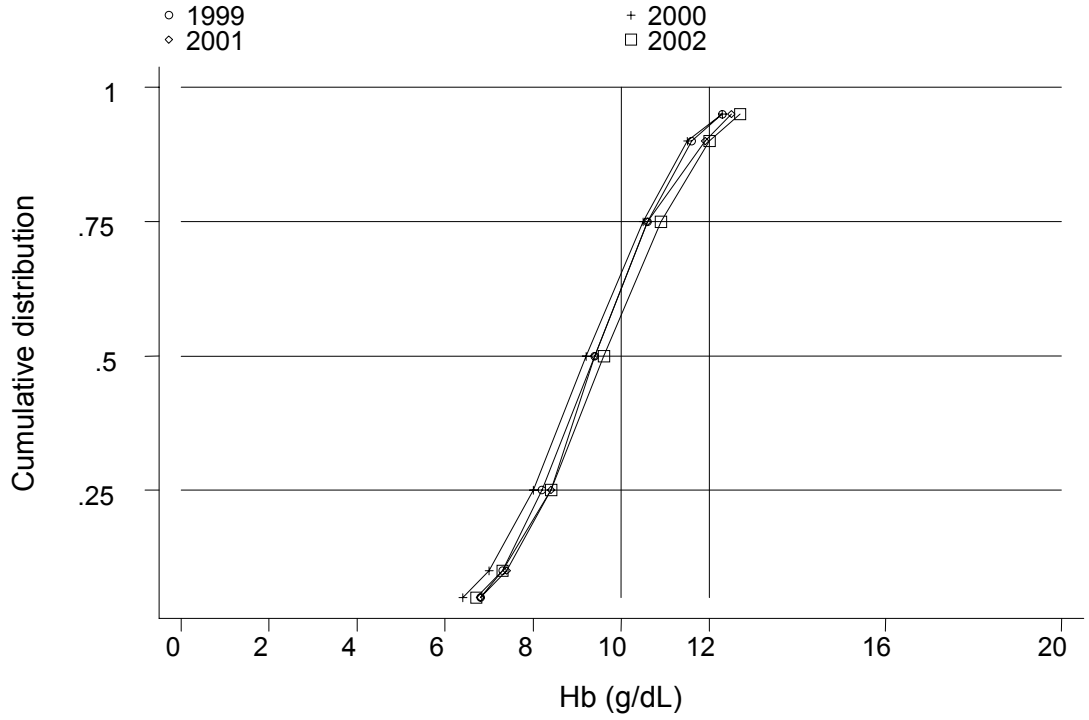


Table 3.3.46: Distribution of haemoglobin concentration on rHuEpo, HD patients, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients <10 g/dL	% Patients ≥10 & ≤12 g/dL	% Patients >12 g/dL
1999	219	687	9.4	8.2	10.6	64	30	6
2000	452	1331	9.2	8	10.5	65	28	6
2001	566	1584	9.4	8.4	10.6	61	32	8
2002	633	1692	9.6	8.4	10.9	55	35	10

Figure 3.3.46: Cumulative distribution of Haemoglobin on rHuEpo by year



3.3.13 NUTRITIONAL STATUS OF HD PATIENTS PRIVATE CENTRES

Table 3.3.47: Distribution of serum Albumin (g/L), HD patients, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients >40g/L
1999	288	798	37	34	41	31
2000	504	1227	37	35	40.6	32
2001	668	1655	37	34	39	22
2002	756	1694	38	35	41	35

Figure 3.3.47: Cumulative distribution of serum Albumin by year

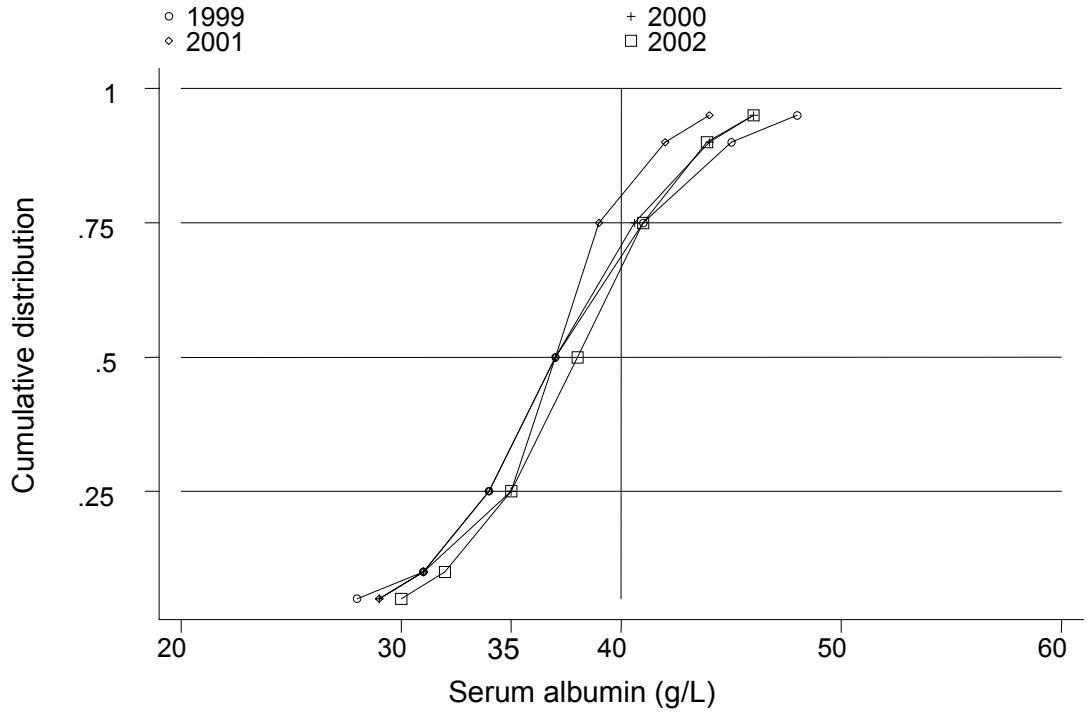
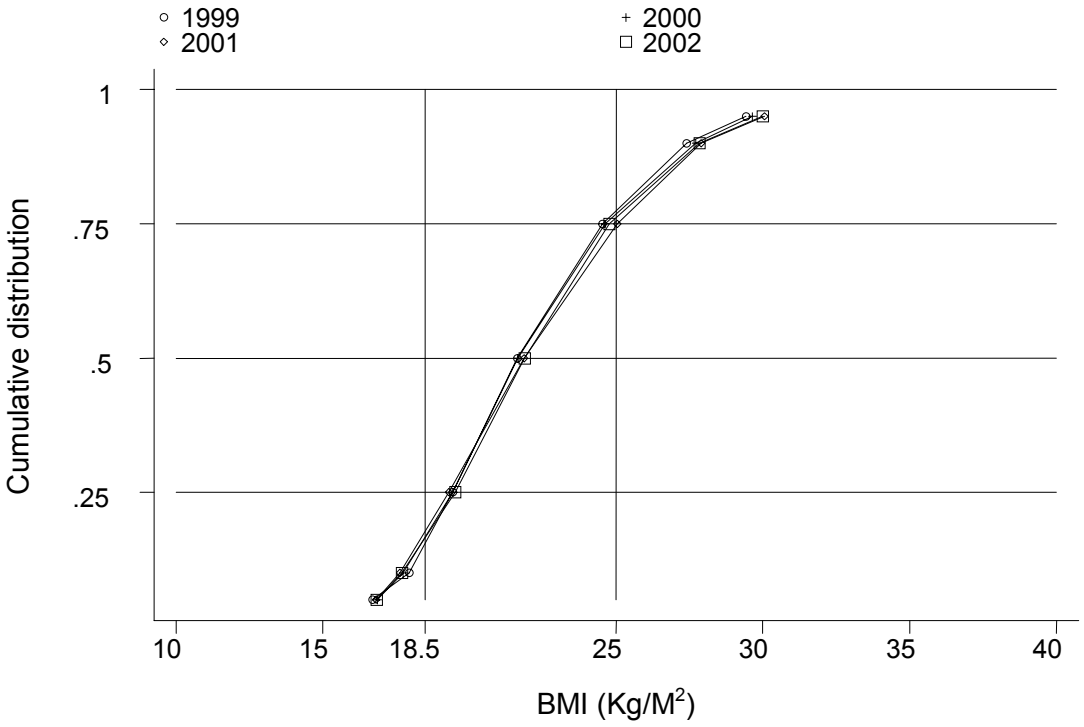


Table 3.3.48: Distribution of Body Mass Index HD patients, Private Centres 1999-2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients <18.5	% Patients ≥18.5 & ≤25	% Patients >25
1999	272	1917	21.6	19.4	24.5	14	64	22
2000	567	5440	21.6	19.4	24.6	17	60	22
2001	689	6684	21.8	19.3	25	18	57	25
2002	639	5571	21.9	19.5	24.8	16	61	23

Figure 3.3.48: Cumulative distribution of body mass index by year

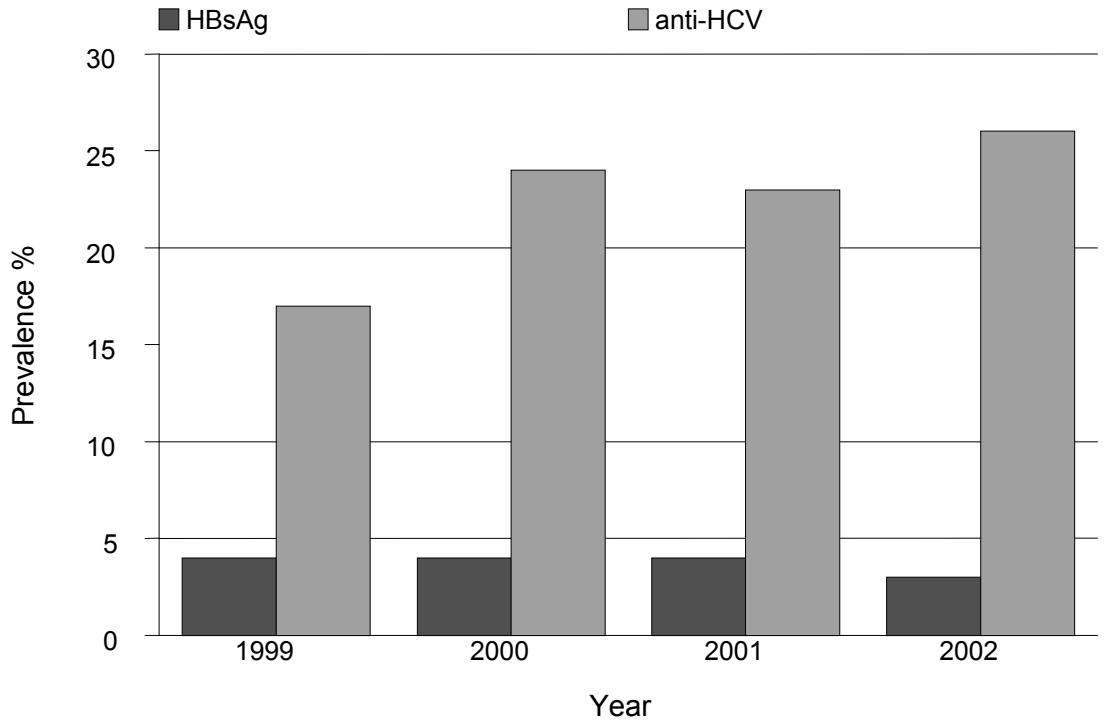


3.3.14 SEROLOGICAL STATUS, HD PATIENTS PRIVATECENTRES

Table 3.3.49: Prevalence of positive anti-HCV antibody and HbsAg, HD patients, Private Centres 1999-2002

Year	No	% HBsAg positive	% anti-HCV positive
1999	389	4	17
2000	750	4	24
2001	933	4	23
2002	1015	3	26

Figure 3.3.49: Prevalence of positive anti-HCV antibody and HbsAg HD patients, Private Centres 1999 – 2002



CHRONIC PERITONEAL DIALYSIS

IN

GOVERNMENT CENTRES

Stock and Flow

Funding for CPD

Death on CPD and Transfer to HD

Government CAPD Centres

CAPD Patients' Characteristics

Survival Analysis

Work related rehabilitation and quality of life

CAPD practices

Dyslipidaemia in CAPD patients

Treatment of Renal Bone Disease

Management of Blood Pressure

Management of Anaemia

Nutritional status

Serological Status on CAPD

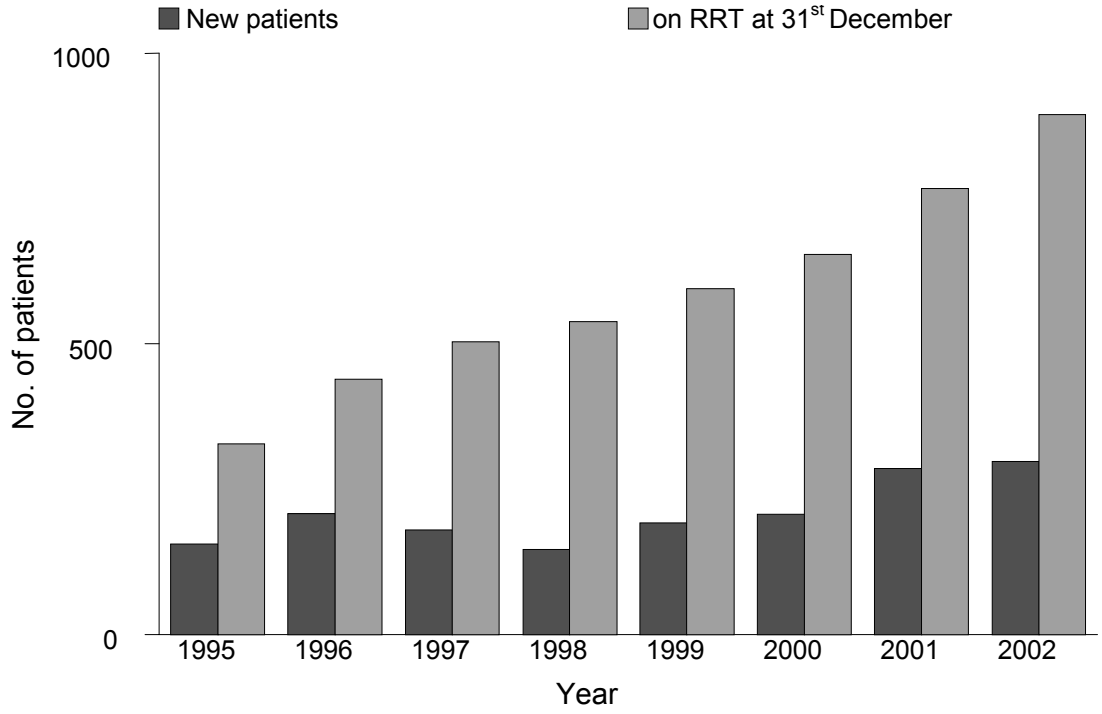
4. CHRONIC PERITONEAL DIALYSIS

4.1 STOCK AND FLOW

Table 4.01: Stock and Flow of Chronic PD Patients 1995 – 2002

Year	1995	1996	1997	1998	1999	2000	2001	2002
New Dialysis patients	156	208	180	146	192	207	286	298
Died	58	62	73	74	100	90	128	113
Transferred to HD	22	38	50	33	38	63	84	85
Transplanted	7	8	10	12	13	12	12	18
Lost to follow up	0	1	0	0	1	2	2	3
Dialysing at 31st December	328	439	503	538	595	654	767	894

Figure 4.01: Stock and Flow of Chronic PD Patients 1995 – 2002

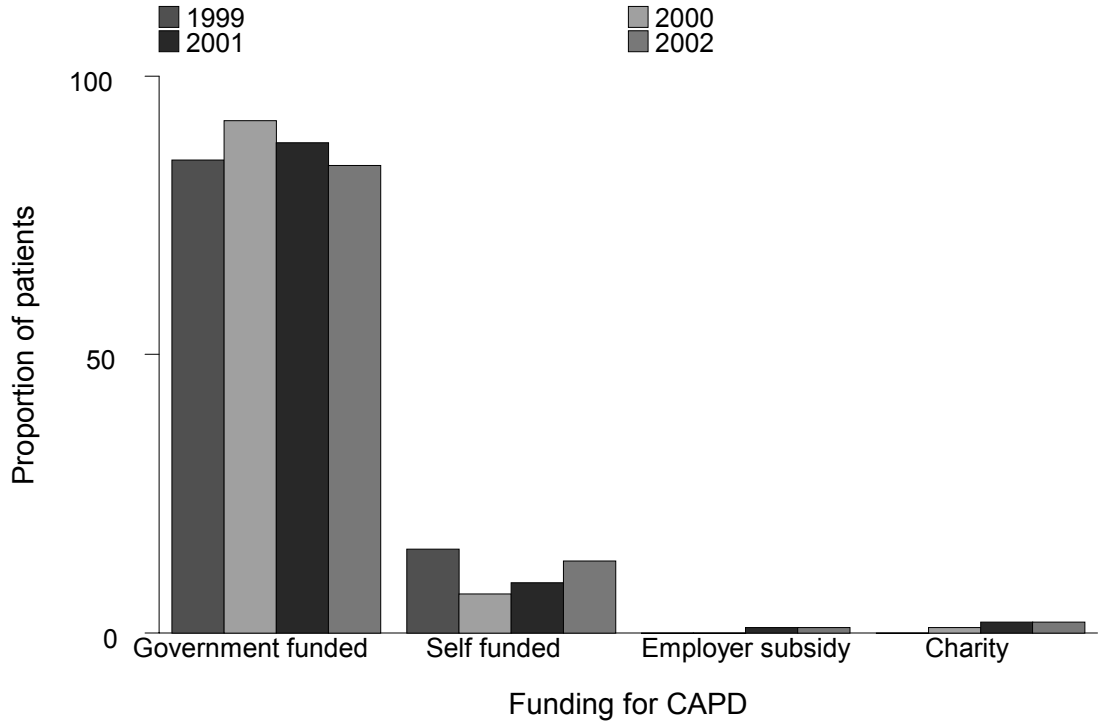


4.2 FUNDING FOR CHRONIC PERITONEAL DIALYSIS

Table 4.03: Funding for CAPD, Government Centres 1999 – 2002

Year	1999	2000	2001	2002
New Dialysis patients	192	207	286	298
% Government funded	85	92	88	84
% Self funded	15	7	9	13
% Employer subsidised	0	0	1	1
% Charity	0	1	2	2
Dialysing at 31st December	595	654	767	894
% Government funded	86	88	88	87
% Self funded	12	10	9	10
% Employer subsidised	1	1	1	1
% Charity	1	1	2	2

Figure 4.03: Funding for new CAPD, Government Centres 1999 – 2002



4.3 DEATH ON CAPD AND TRANSFER TO HAEMODIALYSIS

Table 4.04: Death Rate and Transfer to HD Government Centres 1995 – 2002

Year	1995	1996	1997	1998	1999	2000	2001	2002
No. at risk	328	384	471	521	567	625	711	831
Death (No.)	58	62	73	74	100	90	128	113
Death rate %	18	16	15	14	18	14	18	14
No transferred to HD	22	38	50	33	38	63	84	85
Transfer to HD rate %	7	10	11	6	7	10	12	10
All losses	80	100	123	107	138	153	212	198
All losses rate %	24	26	26	21	24	24	30	24

Figure 4.04: Death Rates on CAPD, Government Centres 1995 – 2002

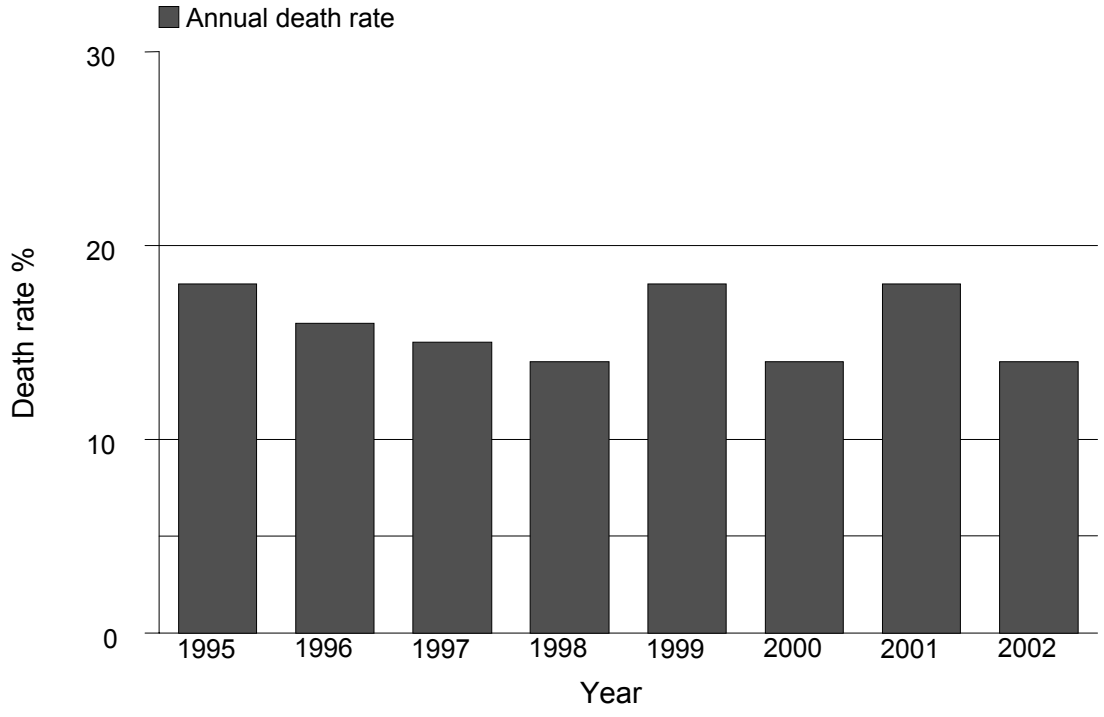


Table 4.05: Causes of Death on CAPD, Government Centres 1999 – 2002

Year	1999		2000		2001		2002	
	No	%	No	%	No	%	No	%
Cardiovascular	27	27	28	31	34	27	39	35
Died at home	32	32	22	24	30	23	32	28
Sepsis	16	16	15	17	26	20	19	17
CAPD peritonitis	8	8	15	17	19	15	9	8
GIT bleed	3	3	1	1	4	3	1	1
Cancer	1	1	0	0	2	2	0	0
Liver disease	0	0	0	0	0	0	0	0
Others	10	10	9	10	11	9	10	9
Unknown	3	3	0	0	2	2	3	3
Total	100	100	90	100	128	100	113	100

Table 4.06: Causes of Transfer to CAPD 1999 – 2002

Year	1999		1999		2000		2002	
	No.	%	No.	%	No.	%	No.	%
Peritonitis	23	61	39	62	51	61	31	36
Cather related infection	2	5	1	2	0	0	4	5
Technical problem	0	0	3	5	1	1	5	6
Membrane failure	3	8	10	16	7	8	11	13
Patient preference/cannot cope	3	8	4	6	3	4	9	11
Others	5	13	3	5	7	8	7	8
Unknown	2	5	3	5	15	18	18	21
Total	38	100	63	100	84	100	85	100

4.4 GOVERNMENT CAPD CENTRES

Table 4.07: Centre Distribution of CAPD patients, 2002

	Centre	No	Percent
	Number on RRT at 31st December	894	100
1	Berjaya NKF Dialysis Centre, Petaling Jaya	3	0
2	Ipoh Hospital	42	5
3	Kota Bharu Hospital	18	2
4	Kuala Lumpur Hospital	167	19
5	Kuala Lumpur Hospital (Paed.)	31	3
6	Kuala Terengganu Hospital	47	5
7	Kuching Hospital	23	3
8	Melaka Hospital	6	1
9	Pulau Pinang Hospital	99	11
10	Queen Elizabeth Hospital	34	4
11	Sabah Medical Centre	1	0
12	Selayang Hospital	32	4
13	Seremban Hospital	70	8
14	Sultanah Aminah Hospital	138	15
15	Tengku Ampuan Afzan Hospital, Kuantan	16	2
16	Tengku Ampuan Rahimah Hospital, Klang	36	4
17	Universiti Kebangsaan Malaysia Hospital	24	3
18	Universiti Sains Malaysia Hospital	1	0
19	University Malaya Medical Centre	106	12

4.5 CAPD PATIENTS' CHARACTERISTICS

Table 4.08: Percentage Age Distribution of CAPD patients 1999 – 2002

Year	1999	2000	2001	2002
New Dialysis patients	192	207	286	298
1-14 years	11	10	9	9
15-24 years	8	11	7	13
25-34 years	7	8	10	9
35-44 years	13	17	14	15
45-54 years	20	26	20	24
55-64 years	26	18	29	18
≥65 years	16	11	12	10
Dialysing at 31st December	595	654	767	894
1-14 years	12	11	11	11
15-24 years	6	7	8	10
25-34 years	14	14	14	12
35-44 years	15	16	17	17
45-54 years	24	24	21	23
55-64 years	20	19	21	19
≥65 years	8	8	8	8

Table 4.09: CAPD Patient Characteristics 1999- 2002

Year	1999	2000	2001	2002
New Dialysis patients	192	207	286	298
Mean age ± sd	47 ± 19	43 ± 18	46 ± 18	42 ± 19
% Male	51	50	47	52
% Diabetic	45	38	41	40
% HBsAg+	2	4	4	3
% Anti-HCV+	3	3	2	1

4.6 SURVIVAL ANALYSIS

Table 4.10: CAPD Patient Survival related to Year of Entry, Government Centres 1997– 2002

Year	1997			1998			1999		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	96	1	186	94	2	142	94	2	188
12	92	2	169	86	3	126	90	2	173
24	79	3	140	72	4	94	73	3	115
36	65	4	101	61	4	73	55	4	74
48	56	4	77	53	4	51			
60	49	4	56						
Year	2000			2001			2002		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	94	2	205	93	1	302	94	2	163
12	88	2	182	88	2	258			
24	76	3	136						

No. = number at risk *SE = standard error*

Figure 4.10: CAPD Patient Survival related to Year of Entry, Government Centres 1998 – 2002

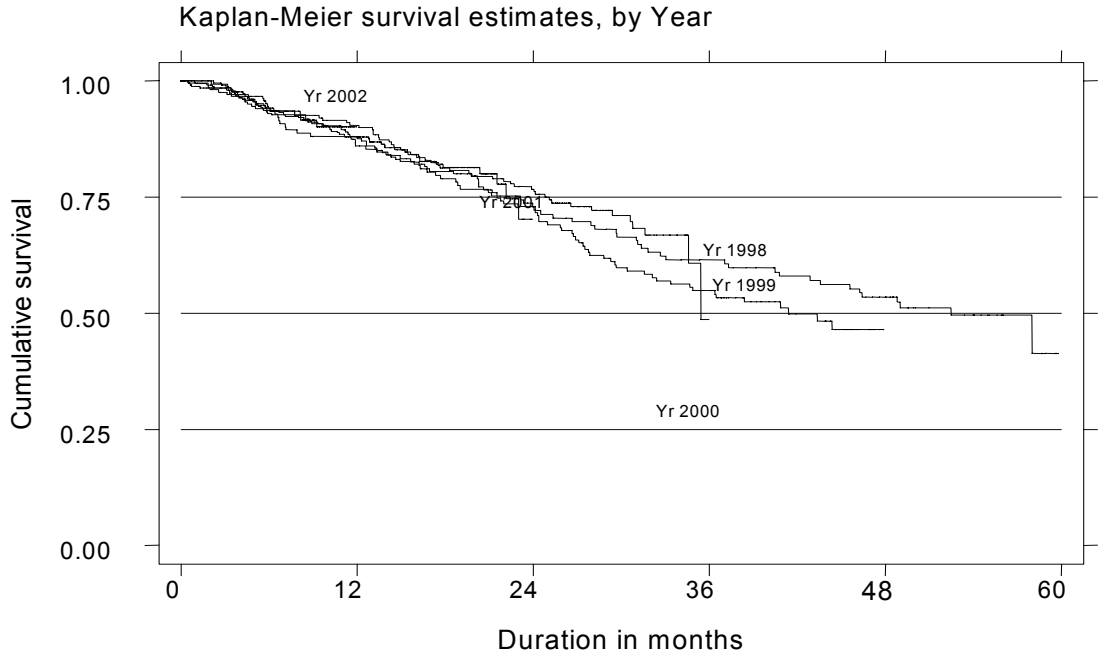
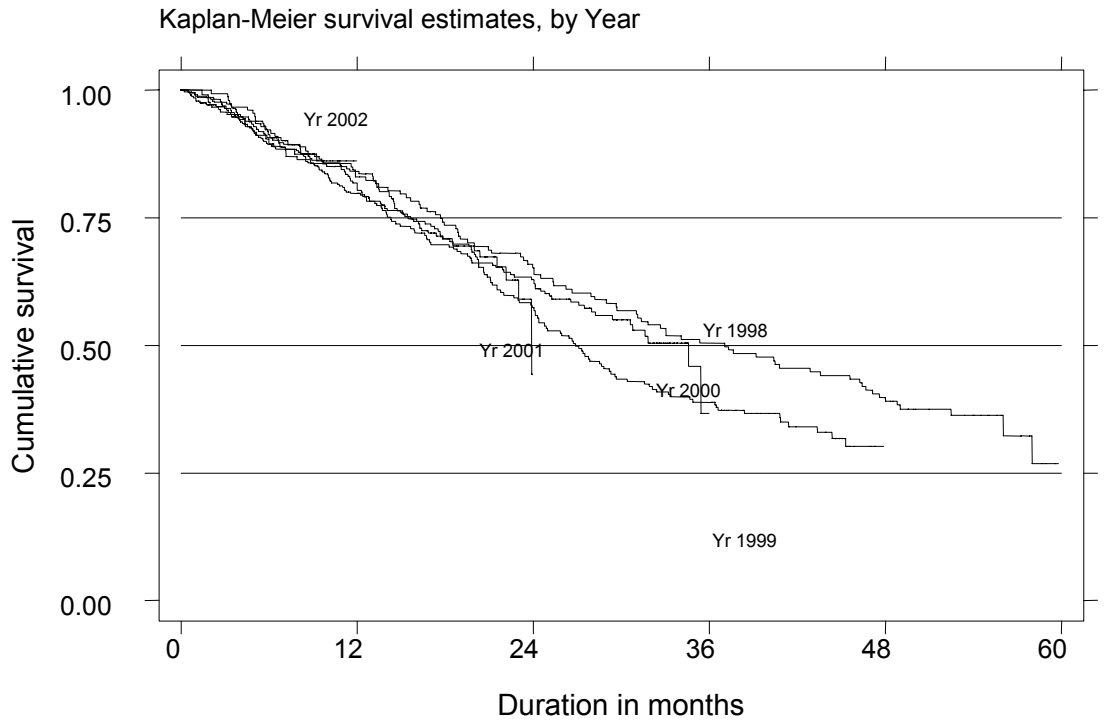


Table 4.11: CAPD Technique Survival related to Year of Entry, Government Centres 1997 – 2002

Year	1997			1998			1999		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	94	2	186	92	2	142	89	2	188
12	88	2	169	83	3	126	84	3	173
24	74	3	140	65	4	94	57	3	115
36	55	4	101	50	4	73	39	3	74
48	42	4	76	39	4	56			
60	32	3	56						
Year	2000			200			2002		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	91	2	205	89	2	302	91	2	163
12	81	3	183	80	2	260			
24	62	3	136						

No. = number at risk *SE = standard error*

Figure 4.11: CAPD Technique Survival by Year of Entry Government Centres 1998 – 2002



4.7 WORK RELATED REHABILITATION AND QUALITY OF LIFE ON CAPD

Table 4.12: Work Related Rehabilitation on CAPD, Government Centres 1999 – 2002

REHABILITATION STATUS	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
Full time work for pay	96	19	92	17	102	16	120	16
Part time work for pay	45	9	27	5	37	6	41	6
Able to work but unable to get a job	14	3	25	5	23	4	23	3
Able to work but not yet due to dialysis schedule	3	1	7	1	9	1	8	1
Able but disinclined to work	11	2	10	2	11	2	10	1
Home maker	143	28	166	31	215	35	243	33
Full time student	67	13	81	15	89	14	104	14
Age<15 years	13	3	8	2	11	2	20	3
Retired	38	7	45	8	48	8	52	7
Age>65 years	39	8	42	8	49	8	64	9
Unable to work due to poor health	43	8	29	5	26	4	51	7
Total	512	100	532	100	620	100	736	100

Table 4.13: Quality of Life on CAPD, Government Centres 1999 – 2002

QOL Index Summated Score	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
0 (Worst QOL)	0	0	1	0	0	0	0	0
1	0	0	1	0	0	0	2	0
2	1	0	1	0	0	0	3	0
3	3	1	1	0	7	1	4	1
4	16	3	13	3	11	2	10	1
5	19	4	17	3	19	3	22	3
6	25	5	22	4	21	3	25	3
7	26	5	37	7	38	6	36	5
8	37	7	29	6	36	6	56	8
9	46	9	30	6	62	10	53	7
10 (Best QOL)	338	66	366	71	431	69	529	71
Total	511	100	518	100	625	100	740	100

4.8 CAPD PRACTICES

Table 4.14: Chronic Peritoneal Dialysis Regimes 1999 – 2002

PD regime	1999		2000		2001		2002	
	No	%	No	%	No	%	No	%
Standard CAPD	582	96	644	98	767	99	875	99
DAPD	19	3	12	2	7	1	6	1
Automated PD	4	1	4	1	2	0	4	0
Total	605	100	660	100	776	100	885	100

Table 4.15: CAPD Connectology 1999 – 2002

CAPD	1999		2000		2001		2002	
Connectology	No	%	No	%	No	%	No	%
UVXD	4	1	2	0	0	0	19	2
Baxter disconnect	343	58	233	39	436	57	709	86
B Braun disconnect	248	42	370	61	324	43	93	11
Total	595	100	605	100	760	100	821	100

Table 4.16: CAPD Number of Exchanges per day 1999 – 2002

No of	1999		2000		2001		2002	
Exchanges/day	No	%	No	%	No	%	No	%
2	0	0	2	0	1	0	0	0
3	4	1	1	0	5	1	11	1
4	579	97	624	96	735	95	832	95
5	13	2	23	4	31	4	28	3
100	597	100	650	100	772	100	872	100

Table 4.17: CAPD Volume per Exchange 1999 – 2002

Volume per	1999		2000		2001		2002	
Exchange (L)	No	%	No	%	No	%	No	%
1	19	3	25	4	32	4	37	4
2	557	96	595	95	711	95	791	94
3	2	0	7	1	9	1	14	2
Total	578	100	627	100	752	100	842	100

4.9. DYSLIPIDAEMIA IN CAPD PATIENTS, GOVERNMENT CENTRES

Table 4.24: Distribution of serum Cholesterol Concentrations (mmol/L), CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 5.3 mmol/L
1999	434	619	5.5	4.8	6.5	48
2000	526	833	5.8	4.9	6.8	40
2001	581	902	5.7	4.8	6.6	44
2002	764	1286	5.5	4.6	6.5	50

Figure 4.24: Cumulative distribution of serum cholesterol concentration by year

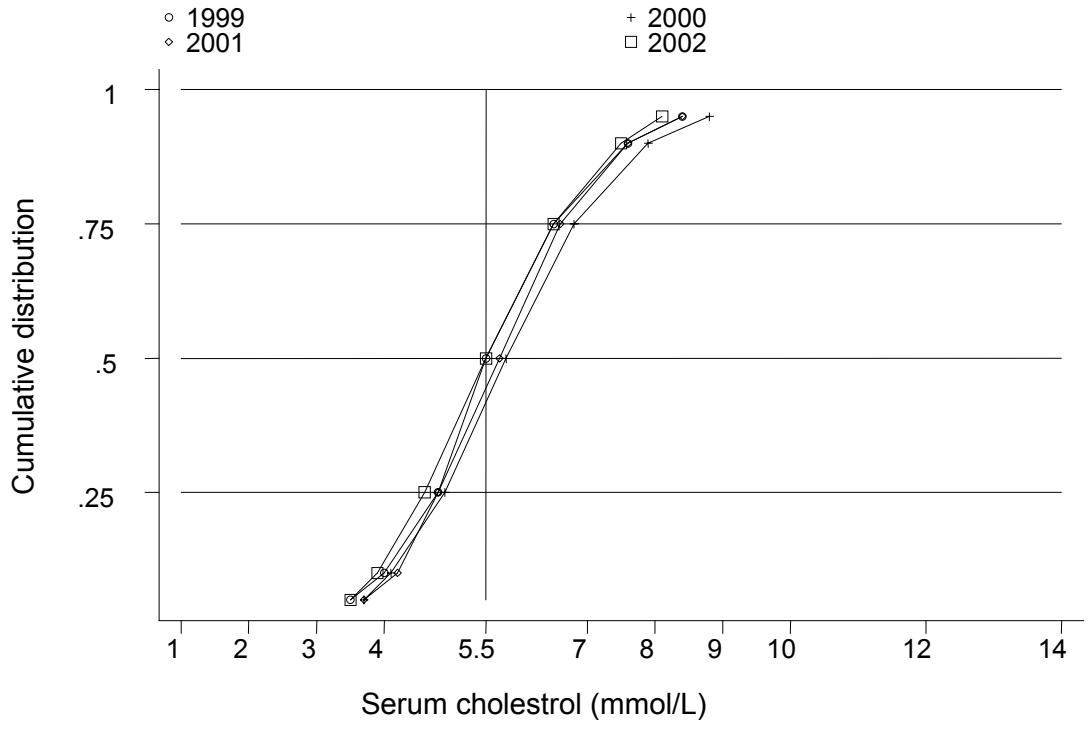


Table 4.25: Distribution of serum Triglyceride (mmol/L), CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 3.5 mmol/L
1999	421	602	1.9	1.3	2.9	82
2000	520	819	2.1	1.4	3.1	79
2001	576	897	2	1.4	3.1	80
2002	765	1286	1.9	1.3	3.1	80

Figure 4.25: Cumulative distribution of serum triglyceride concentration by year

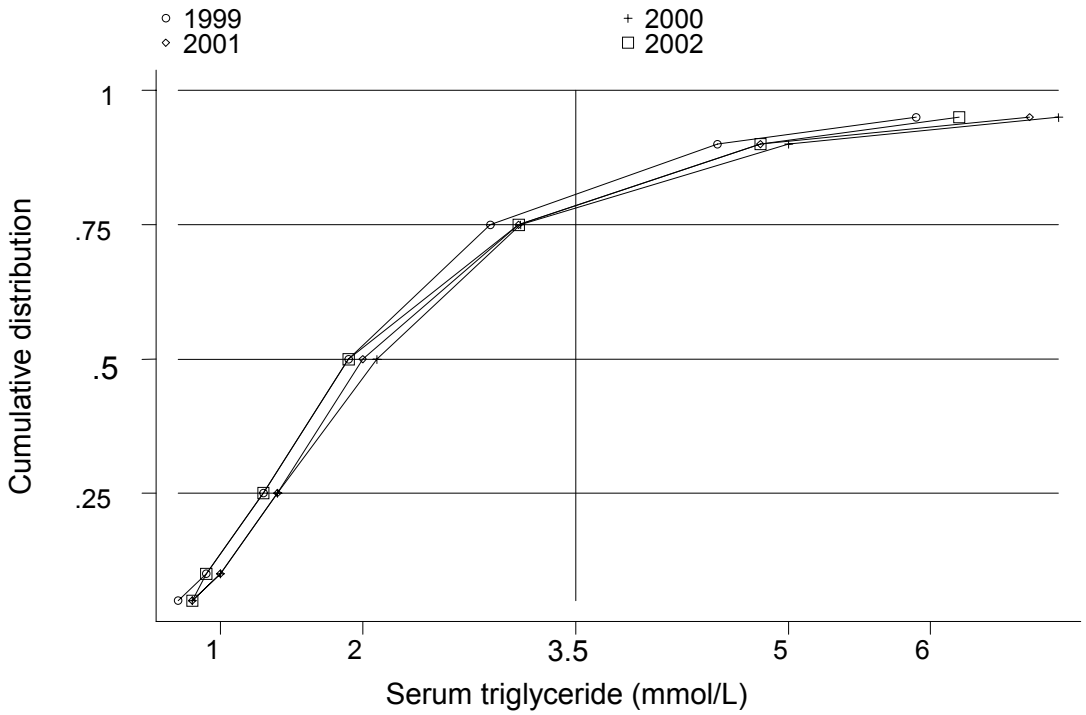


Table 4.26: Distribution of serum LDL (mmol/L), CAPD patient, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients <5 mmol/L
1999	198	263	3.4	2.8	4.4	82
2000	271	392	3.6	2.7	4.3	88
2001	411	592	3.3	2.6	4.2	89
2002	661	1076	3.2	2.5	4.1	91

Figure 4.26: Cumulative distribution of serum LDL by year

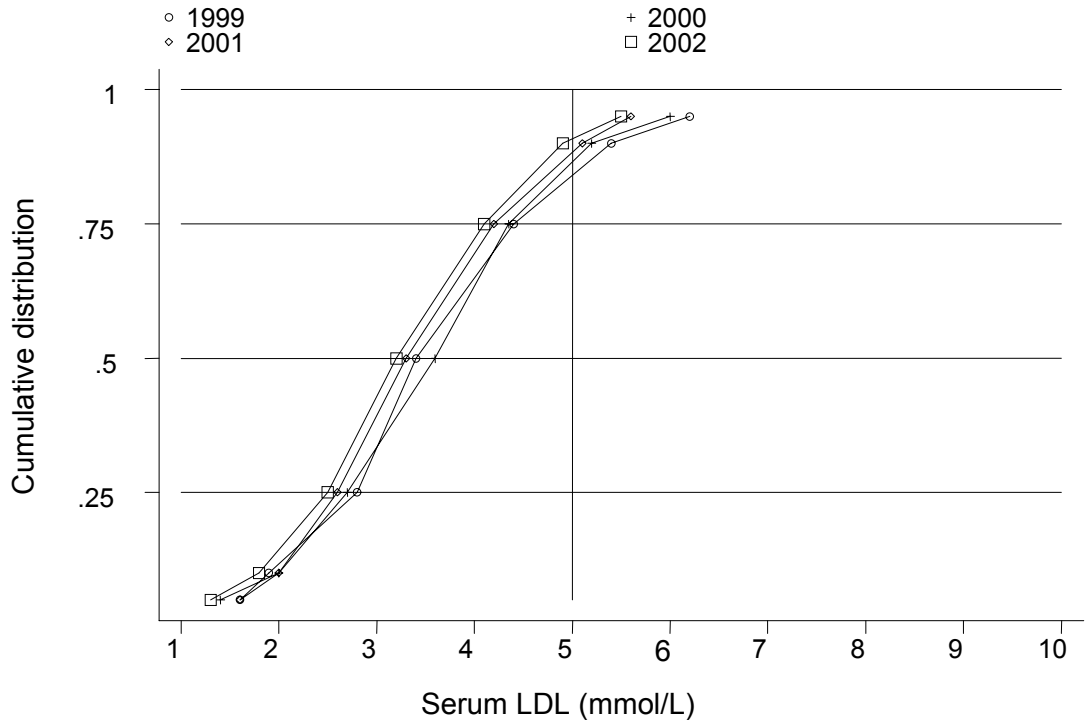
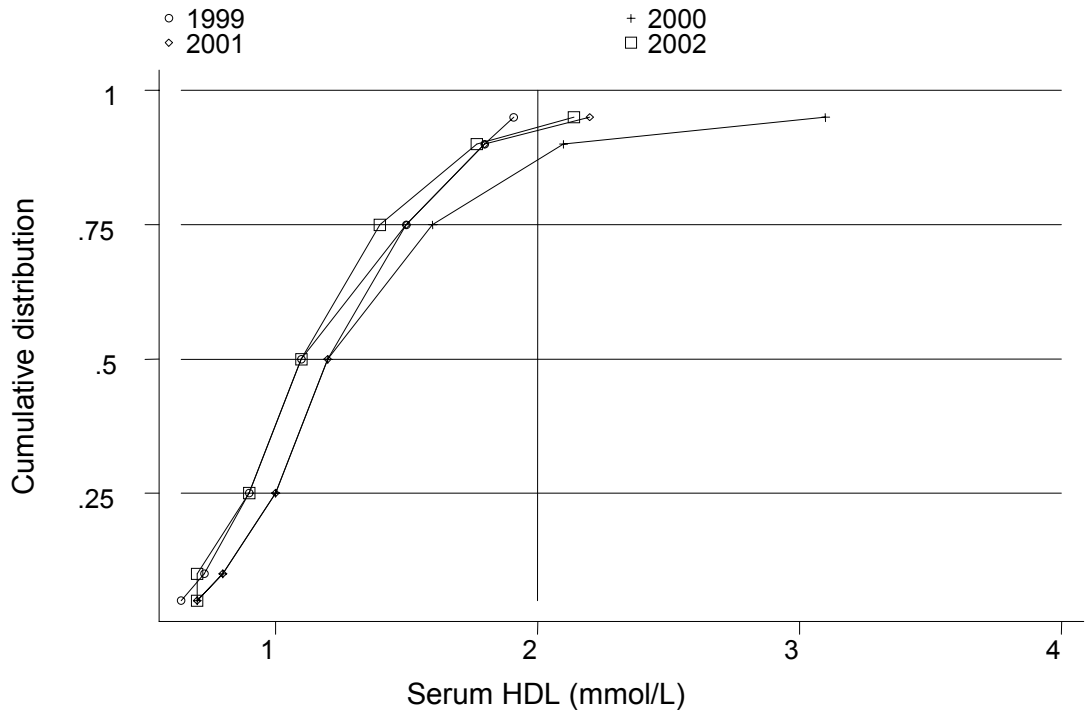


Table 4.27: Distribution of serum HDL (mmol/L), CAPD patient, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 2mmol/L
1999	210	279	1.1	0.9	1.5	96
2000	283	415	1.2	1	1.6	88
2001	421	615	1.2	1	1.5	94
2002	673	1113	1.1	0.9	1.4	94

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 1999 – 2002

Year	No of subjects	% on CaCO3	% on Al(OH)3	% on Vitamin D
1999	610	74	6	12
2000	662	79	2	15
2001	781	75	1	11
2002	889	80	1	15

Table 4.29: Distribution of serum Phosphate concentration (mmol/L), CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 1.6 mmol/L
1999	583	1783	1.6	1.3	2	51
2000	633	1879	1.5	1.2	1.9	56
2001	732	2206	1.5	1.1	1.8	60
2002	860	2706	1.5	1.2	1.9	58

Figure 4.29: Cumulative distribution of serum Phosphate by year

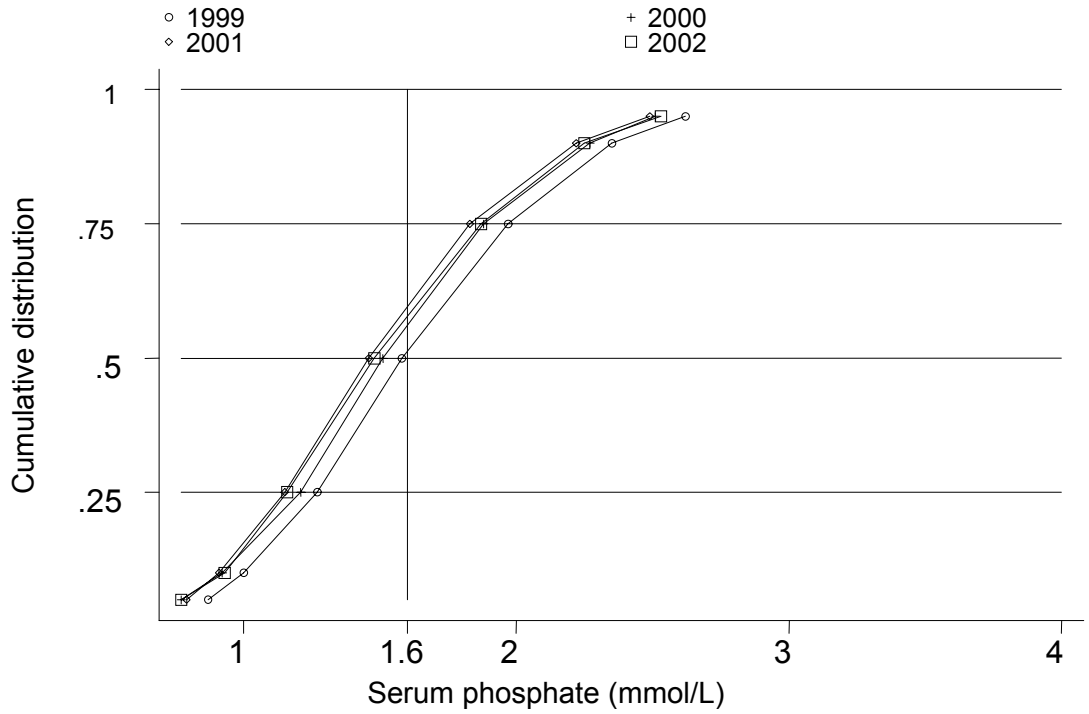


Table 4.30: Distribution of serum Calcium concentration (mmol/L), CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients ≥ 2.2 & ≤2.6 mmol/L
1999	594	1830	2.4	2.2	2.5	55
2000	642	1954	2.4	2.2	2.5	58
2001	749	2282	2.4	2.2	2.5	59
2002	864	2753	2.3	2.2	2.5	58

Figure 4.30: Cumulative distribution of serum Calcium concentration by year

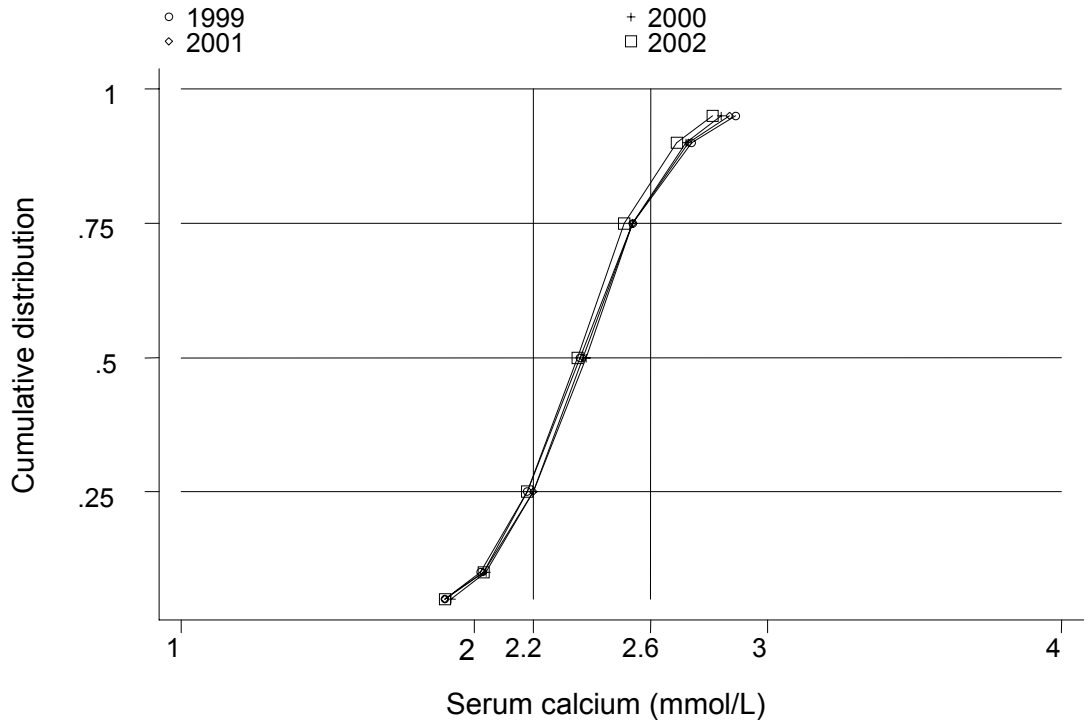
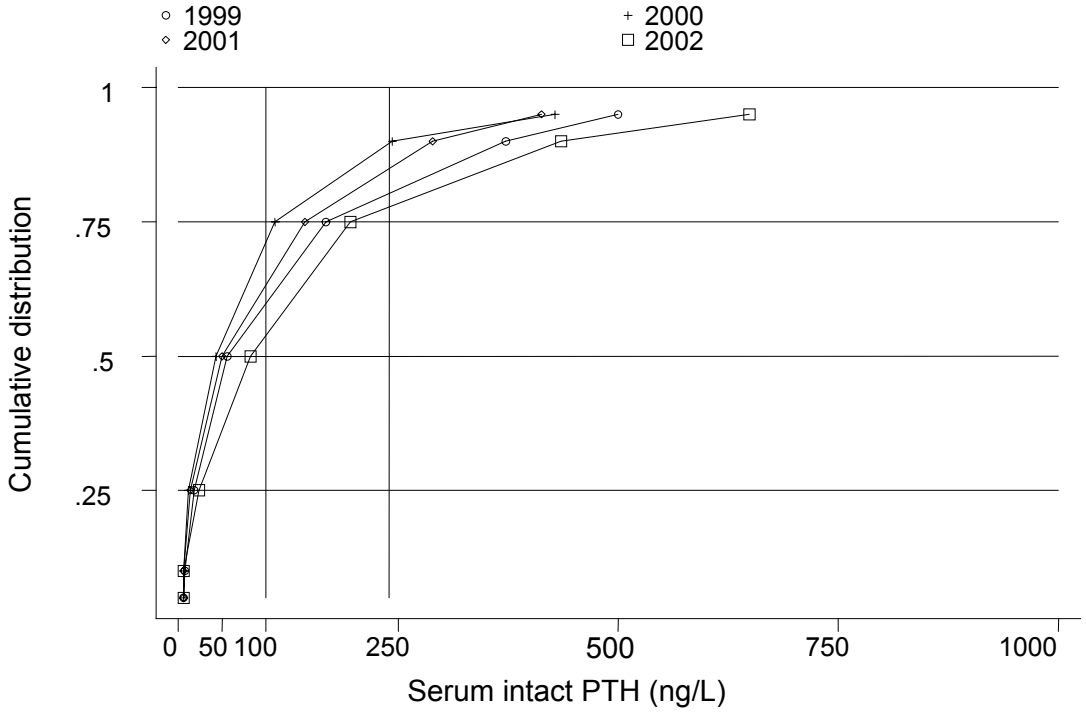


Table 4.31: Distribution of serum iPTH (ng/L) concentration, CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients ≥ 100 & ≤ 250 ng/L
1999	365	482	56	18	168	17
2000	406	555	43	11.8	110	18
2001	531	740	50	14	144	20
2002	679	997	82	24	196	23

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 1999 – 2002

Year	No.	% on anti-hypertensives	% on 1 anti-hypertensives	% on 2 anti-hypertensives	% on 3 anti-hypertensives
1999	610	82	30	33	19
2000	662	78	31	27	20
2001	781	76	31	28	18
2002	889	81	31	31	19

Table 4.33: Distribution of Systolic BP without anti-hypertensives, CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 160 mmHg
1999	98	699	120	110	142	87
2000	141	1114	120	110	138	91
2001	165	1322	127	110	140	92
2002	156	1191	123	110	140	91

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

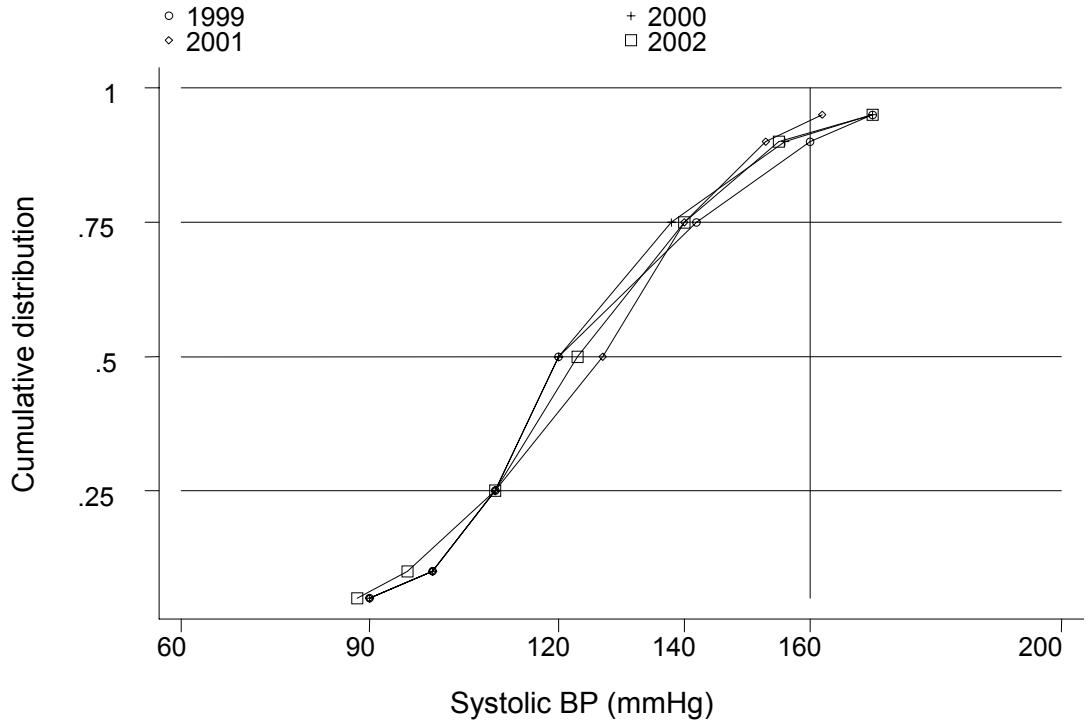


Table 4.34: Distribution of Diastolic BP without anti-hypertensives, CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 90 mmHg
1999	98	700	76.5	67	87.5	76
2000	141	1116	80	70	88	76
2001	165	1321	80	70	86	78
2002	156	1194	80	70	86	79

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

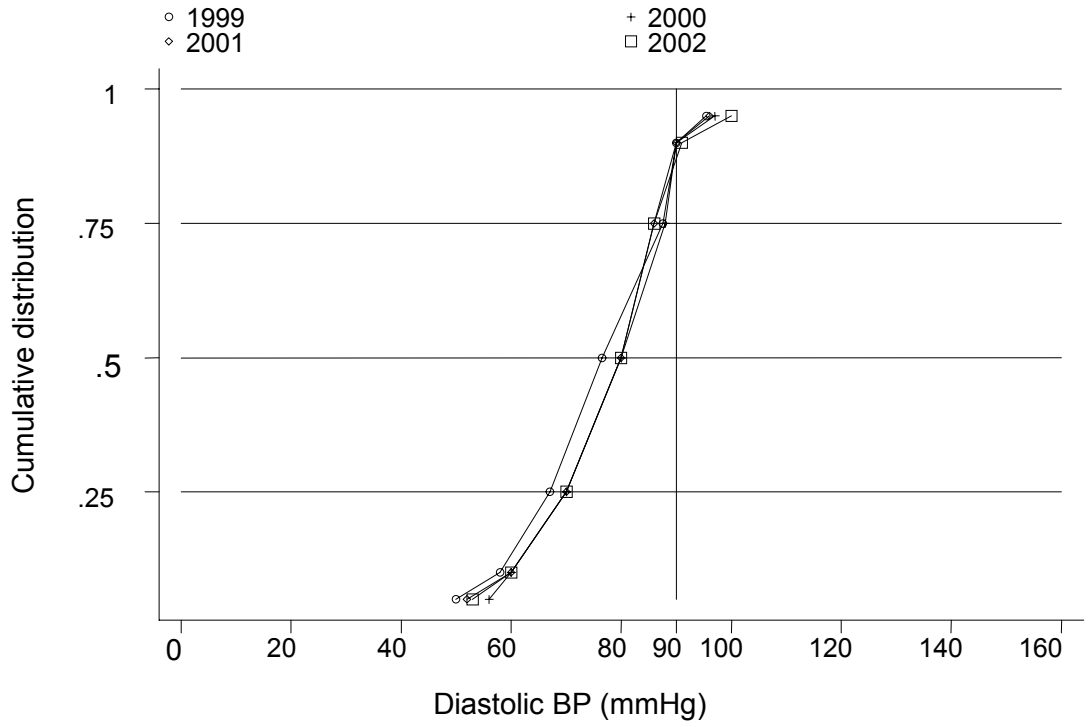


Table 4.35: Distribution of systolic BP on anti-hypertensives CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 160 mmHg
1999	478	3833	140	130	160	72
2000	497	4188	140	123	158	76
2001	574	4669	140	124	159	75
2002	685	5759	140	128	157	76

Figure 4.35: Cumulative distribution of systolic BP on anti-hypertensives by year

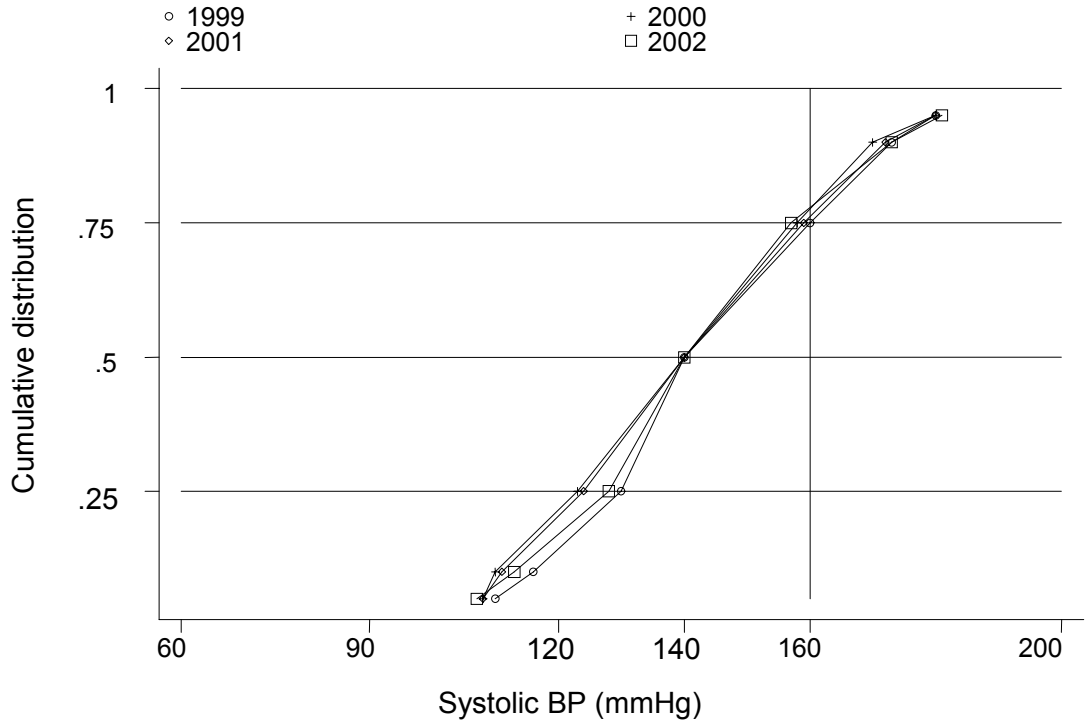
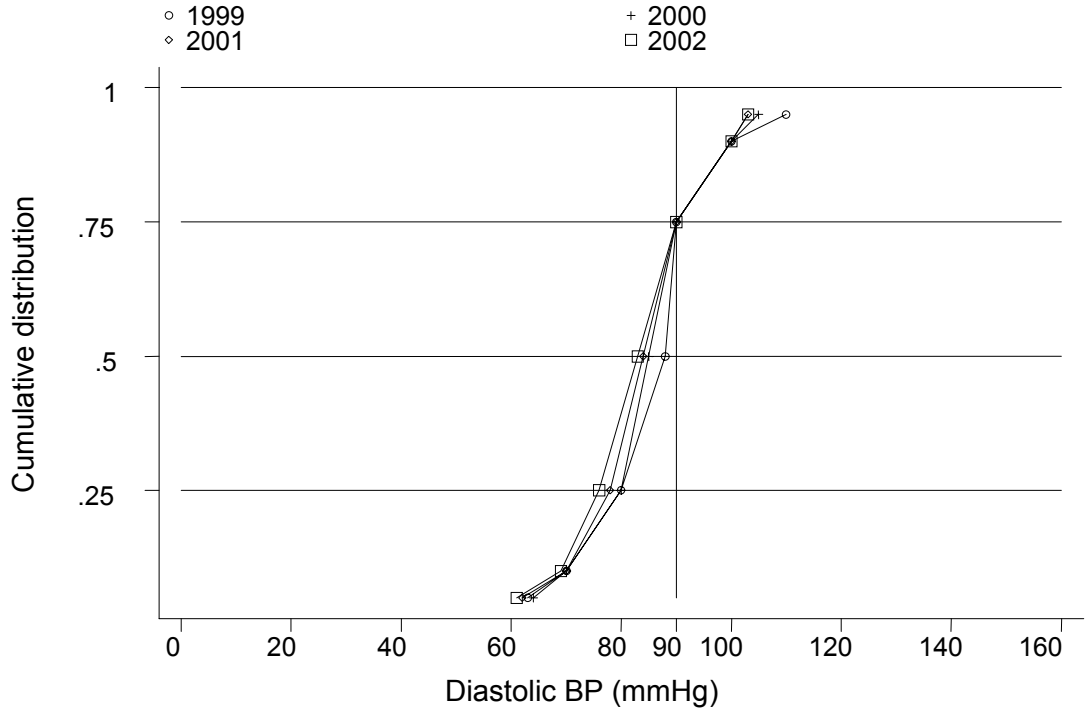


Table 4.36: Distribution of diastolic BP on anti-hypertensives, CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients < 90 mmHg
1999	478	3838	88	80	90	51
2000	497	4191	85	80	90	56
2001	574	4693	84	78	90	58
2002	685	5759	83	76	90	59

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 1999 – 2002

Year	No	% on rHuEpo	% received blood transfusion	% received oral iron	% received parenteral iron
1999	610	44	14	94	0
2000	662	46	11	92	4
2001	781	45	11	91	2
2002	889	49	11	93	2

Table 4.38: Distribution of rHuEpo dose per week, CAPD patients, Government Centres 1999 – 2002

Year	1999	2000	2001	2002
No. of patients	259	287	336	427
% on 2000 u/week	35	31	32	30
% on 2-4000 u/week	50	53	51	52
% on 4-6000 u/week	3	5	7	6
% on 6-8000 u/week	9	9	7	10
% on 8-12000 u/week	2	3	2	3
% on >12000 u/week	0	0	0	0

Table 4.39: Distribution of serum Iron concentration without rHuEpo, CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 10 umol/L
1999	202	470	15	11	26	78
2000	255	549	15.8	10	23	75
2001	314	652	17	11	33	80
2002	361	804	15.3	10	23	74

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

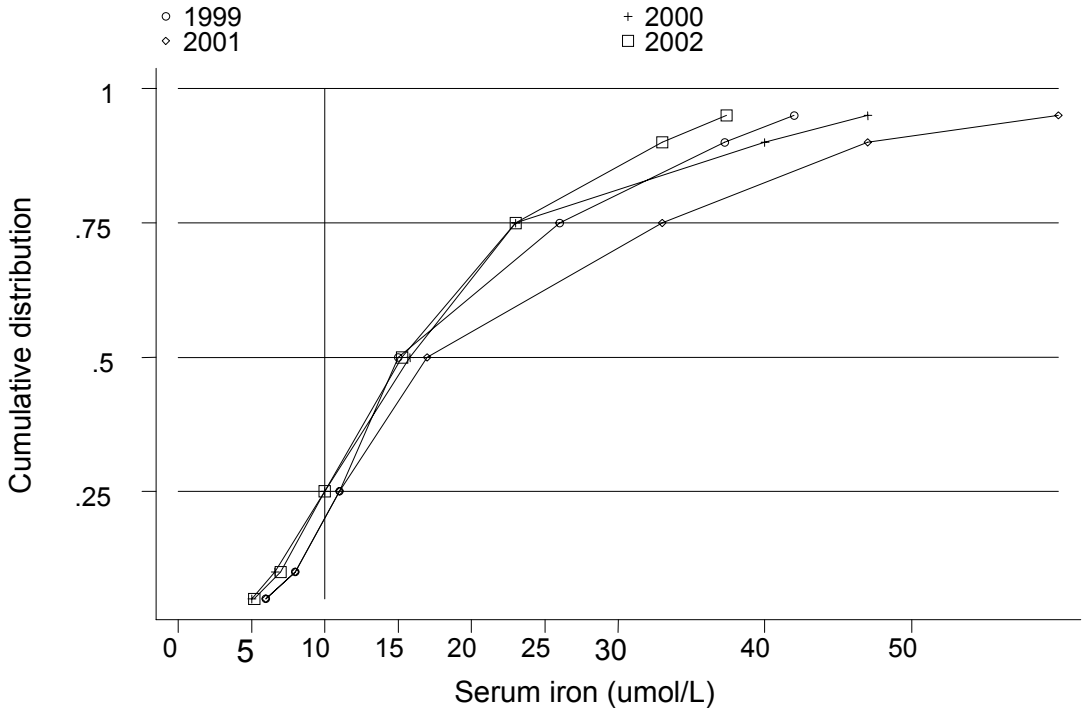


Table 4.40: Distribution of serum Iron concentration on rHuEpo, CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 10 umol/L
1999	143	392	18	11	28	81
2000	244	557	15	10	25	73
2001	306	718	17	11	32	77
2002	376	994	15	10.8	23	77

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

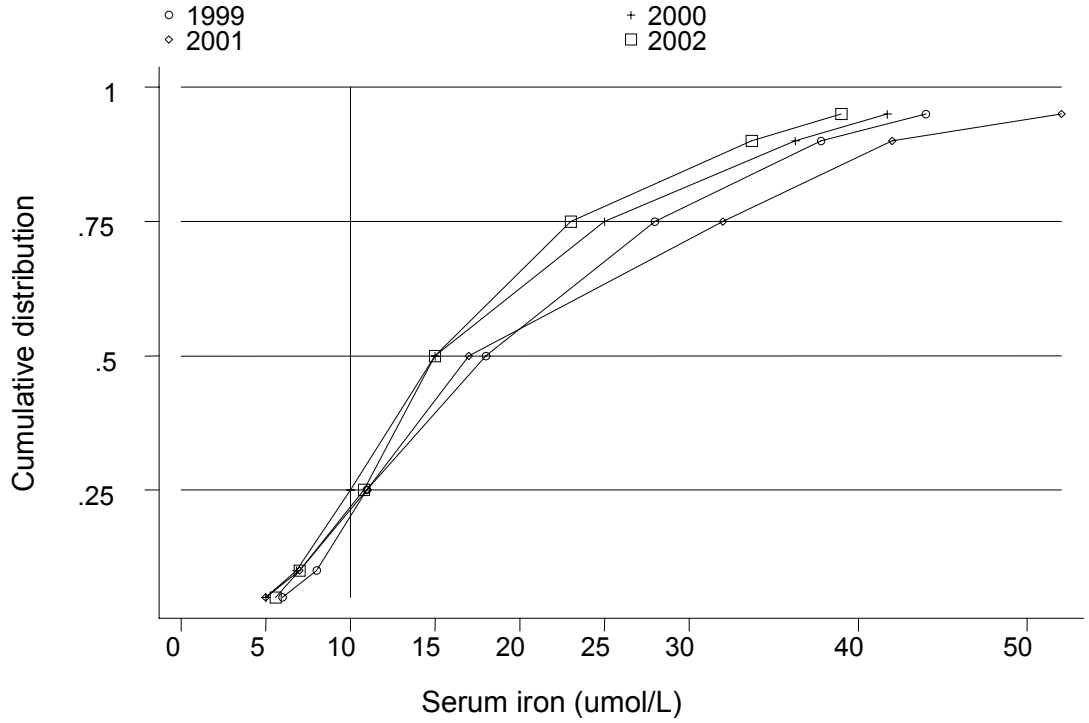


Table 4.41: Distribution of serum Transferrin Saturation without rHuEpo, CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 20%
1999	134	536	34.2	23.3	45.1	85
2000	234	936	35.3	22.4	50	80
2001	262	1048	38.7	26.8	60	88
2002	309	1236	36.4	24.8	57.4	85

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

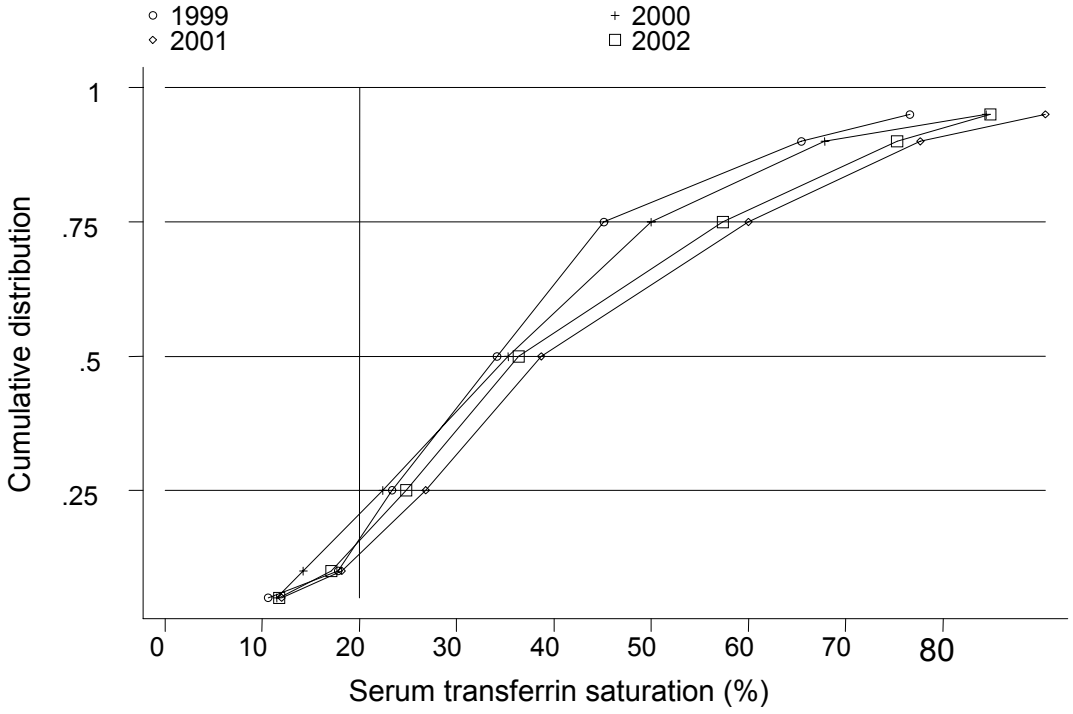


Table 4.42: Distribution of serum Transferrin Saturation on rHuEpo, CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 20%
1999	92	368	37.2	25.3	48.1	85
2000	233	932	34.1	22	49.4	82
2001	266	1064	42.2	29.4	58.3	91
2002	336	1344	37.9	26.2	57.3	88

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

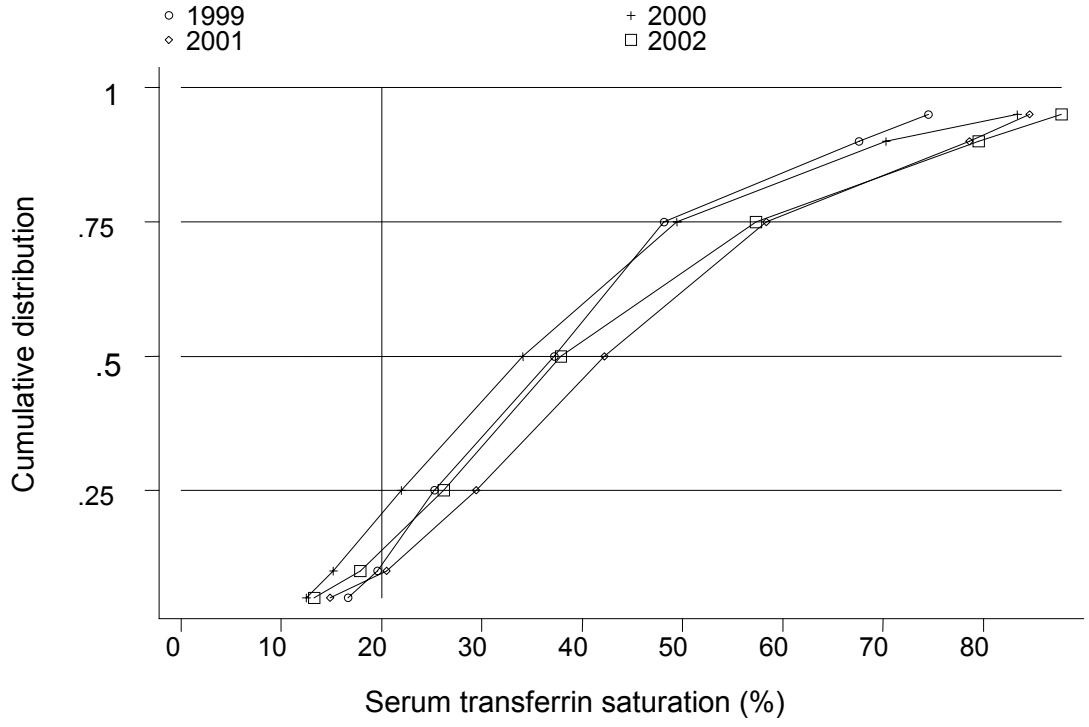


Table 4.43: Distribution of serum Ferritin without rHuEpo, CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 100 ug/L
1999	124	154	482	259.7	729	93
2000	144	204	462	167.5	726.3	86
2001	223	317	432	225.5	763	91
2002	235	364	485.6	209.3	905.6	92

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

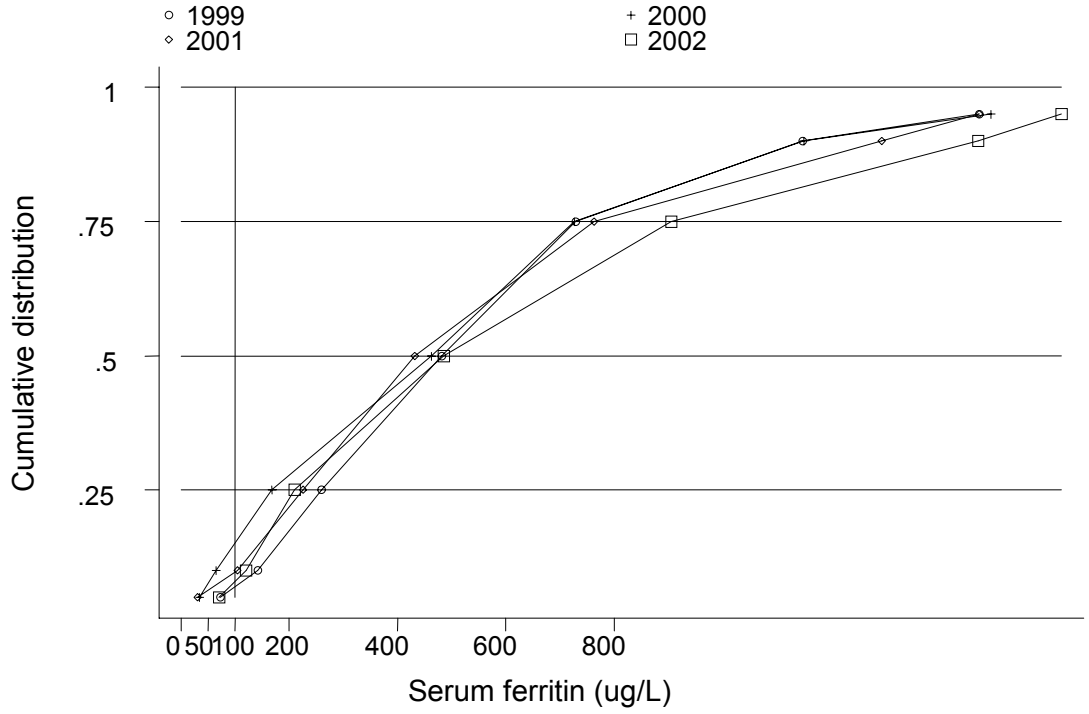


Table 4.44: Distribution of serum Ferritin concentration on rHuEpo, CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients > 100 ug/L
1999	136	201	553.3	254	857.3	93
2000	180	271	545	292.9	839.5	90
2001	261	418	548.1	266.8	902	91
2002	344	587	542.3	271	927	93

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

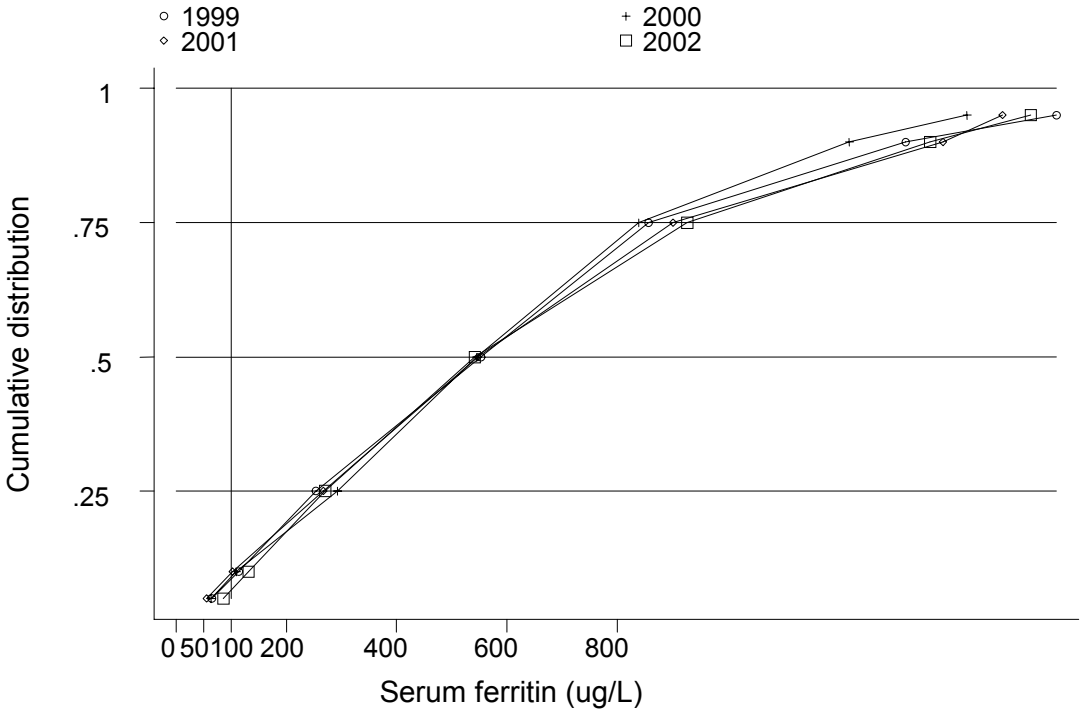


Table 4.45: Distribution of Haemoglobin concentration without rHuEpo, CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients <10 g/dL	% Patients ≥10 & ≤12 g/dL	% Patients >12 g/dL
1999	336	967	9.4	8.3	10.7	61	32	7
2000	342	960	9.8	8.6	11	53	35	12
2001	405	1084	9.8	8.6	11.1	55	33	12
2002	433	1206	9.8	8.7	11.1	53	34	13

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

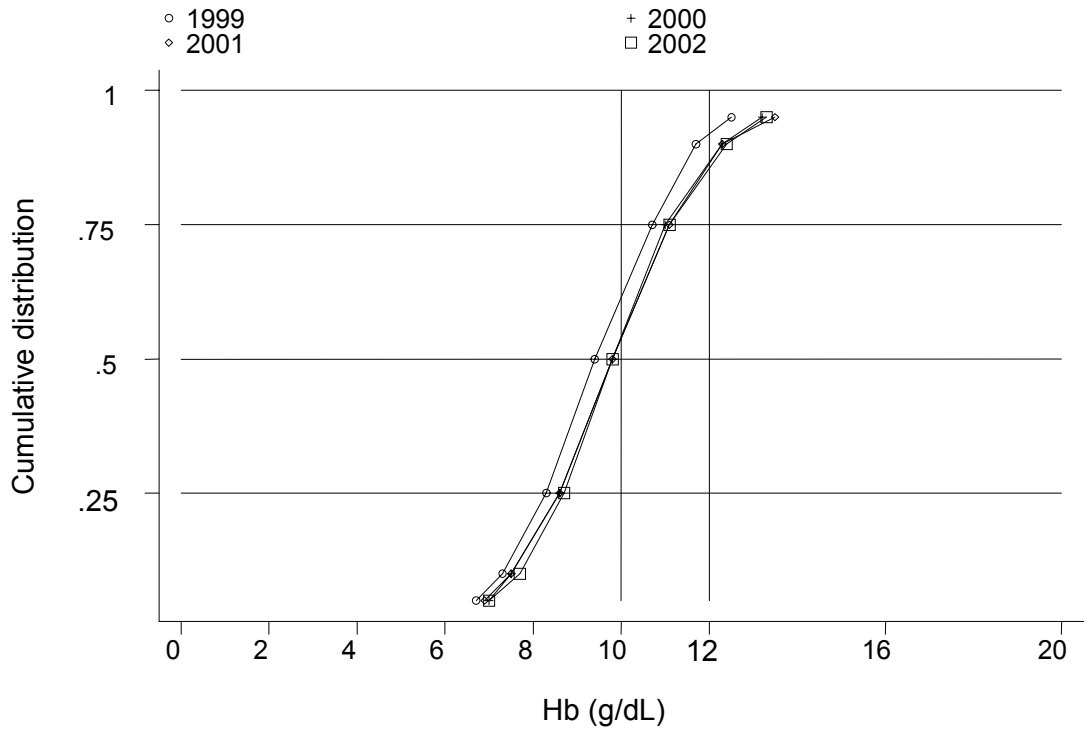
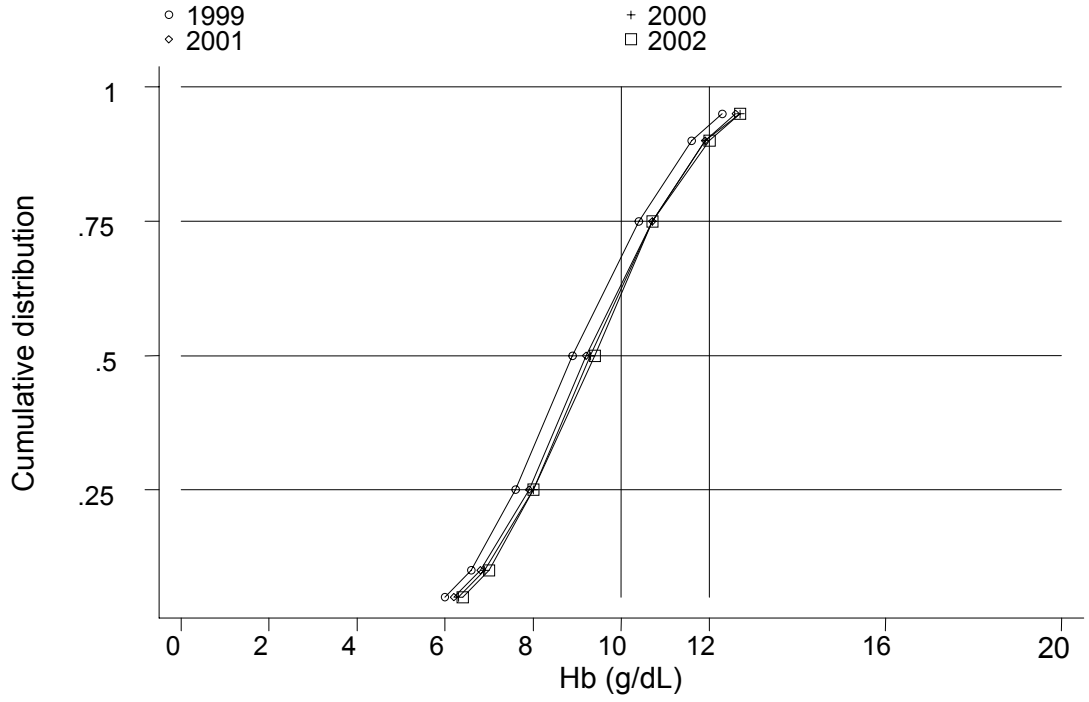


Table 4.46: Distribution of Haemoglobin concentration on rHuEpo, CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% patients <10 g/dL	% patients ≥10 & ≤12 g/dL	% patients >12 g/dL
1999	262	906	8.9	7.6	10.4	69	25	6
2000	299	1013	9.3	8	10.7	62	30	9
2001	345	1195	9.2	7.9	10.7	63	28	9
2002	431	1543	9.4	8	10.7	63	28	10

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 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients >40g/L
1999	597	1872	35	31	38	18
2000	640	1970	35	31	39	19
2001	750	2301	34	30	38	15
2002	860	2772	34	31	38	16

Figure 4.47: Cumulative distribution of serum Albumin concentration by year

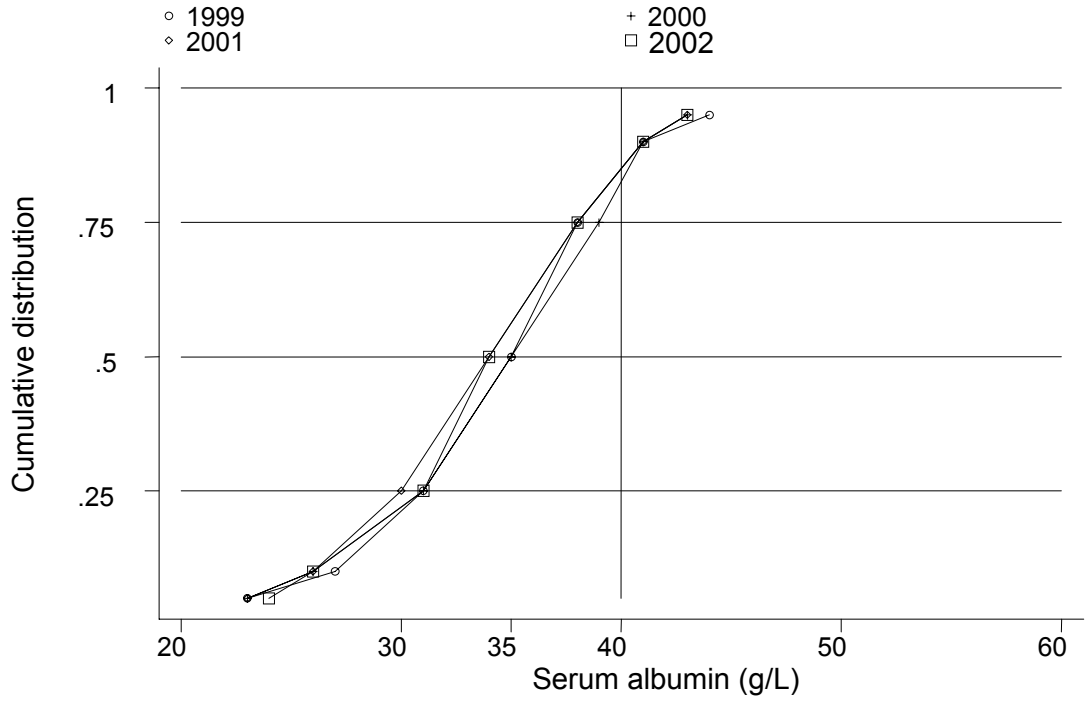
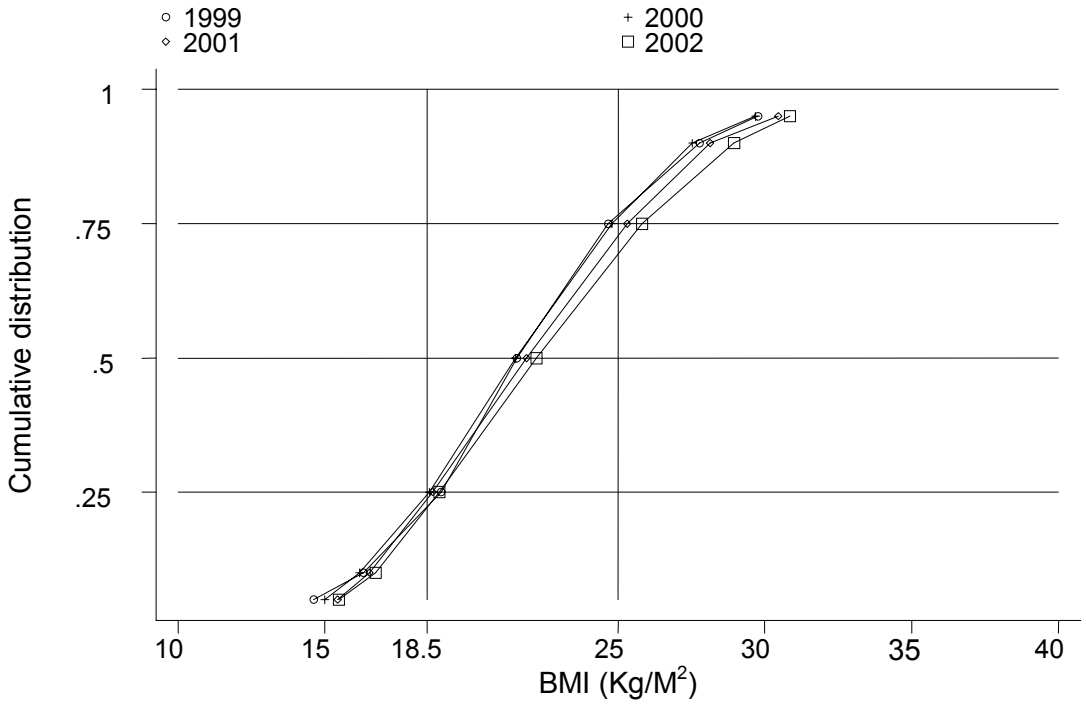


Table 4.48: Distribution of Body Mass Index CAPD patients, Government Centres 1999 – 2002

Year	No of subjects	No of observations	Median	LQ	UQ	% Patients <18.5	% Patients ≥18.5 & ≤25	% Patients >25
1999	550	4316	21.5	19	24.7	22	56	23
2000	599	4990	21.5	18.6	24.8	25	53	23
2001	655	5525	21.9	18.7	25.3	23	50	27
2002	738	6240	22.2	18.9	25.8	22	48	31

Figure 4.48: Cumulative distribution of BMI by year

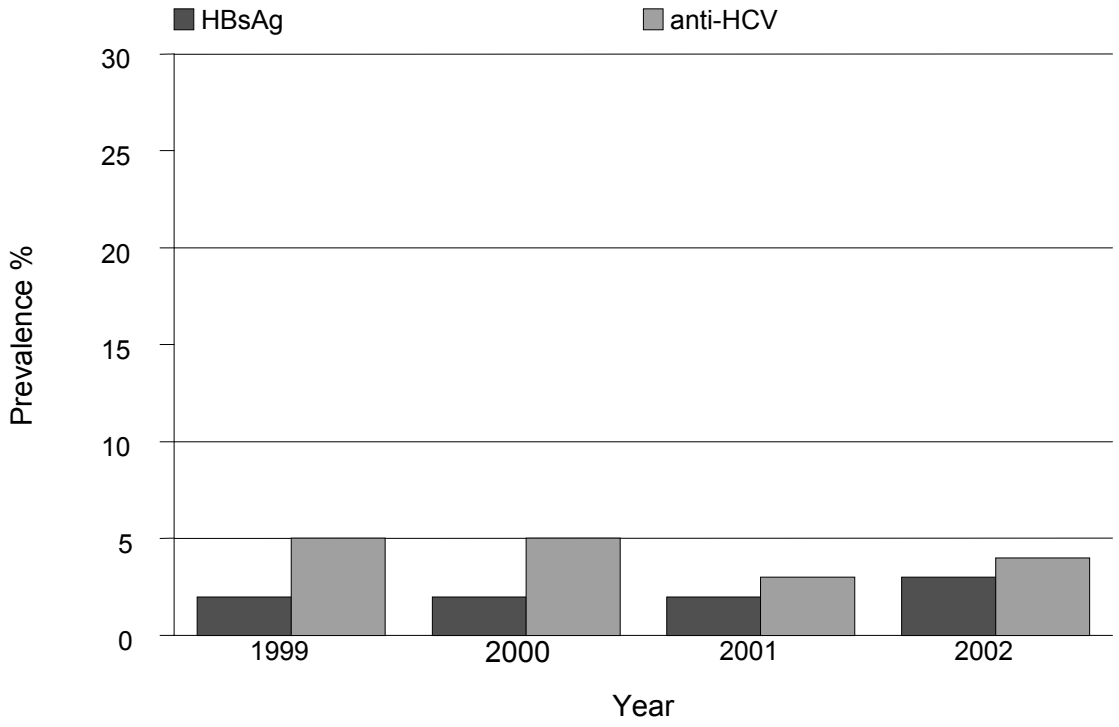


4.14 SEROLOGICAL STATUS, CAPD PATIENTS, GOVERNMENT CENTRES

Table 4.49: Prevalence of positive anti-HCV and HBsAg CAPD patients, Government Centres 1999 – 2002

Year	No	% HBsAg positive	% anti-HCV positive
1999	610	2	5
2000	662	2	5
2001	781	2	3
2002	889	3	4

Figure 4.49: Prevalence of positive anti-HCV and HBsAg CAPD patients, Government Centres 1999 – 2002



RENAL TRANSPLANTATION

Stock and Flow

Place and Type of Transplant

Death after Transplantation and Graft Failure

Centres of Follow-up

Characteristics of Transplant Patients

Survival Analysis

Work related Rehabilitation and Quality of Life

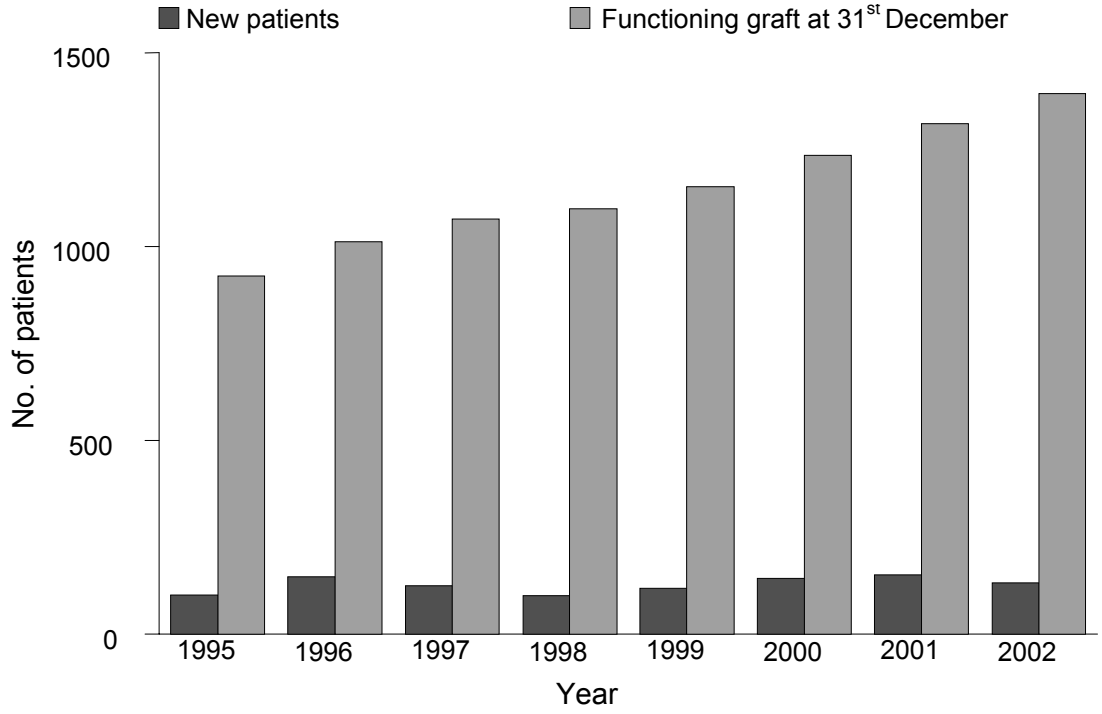
5. RENAL TRANSPLANTATION

5.1 STOCK AND FLOW

Table 5.01 Stock and Flow of Renal Transplant Patients 1995 – 2002

Year	1995	1996	1997	1998	1999	2000	2001	2002
New transplant patients	101	148	124	99	119	143	153	132
Died	16	31	29	23	25	27	30	19
Returned to dialysis	28	28	37	47	34	32	38	32
Lost to Follow Up	3	1	0	2	3	3	3	3
Functioning graft at 31st December	924	1012	1070	1097	1154	1235	1316	1394

Figure 5.01: Stock and Flow Renal Transplant Patients, 1995 – 2002



5.2 PLACE AND TYPE OF RENAL TRANSPLANT

Table 5.02: Place of Renal Transplantation 1995 – 2002

Year	1995		1996		1997		1998	
	No.	%	No.	%	No.	%	No.	%
HKL	36	36	33	22	29	23	33	33
UMMC	10	10	6	4	6	5	7	7
Other local	0	0	0	0	0	0	0	0
India	21	21	5	3	7	6	6	6
China	33	33	103	70	80	65	50	51
Other overseas	1	1	1	1	2	2	3	3
Total	101	100	148	100	124	100	99	100
Year	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
HKL	35	29	28	20	32	21	22	17
UMMC	16	13	19	13	22	14	13	10
Other local	1	1	1	1	2	1	0	0
India	5	4	9	6	8	5	9	7
China	60	50	80	56	76	50	84	64
Other overseas	2	2	0	0	10	7	2	2
Total	119	100	143	100	153	100	132	100

Table 5.03: Type of Renal Transplantation 1995 – 2002

Year	1995		1996		1997		1998	
	No.	%	No.	%	No.	%	No.	%
Commercial Cadaver	33	33	103	70	80	65	50	51
Commercial Live donor	18	18	4	3	7	6	4	4
Live donor	45	45	39	26	29	23	28	28
Live donor (emotionally related)	0	0	0	0	0	0	2	2
Cadaver	5	5	2	1	8	6	15	15
Total	101	100	148	100	124	100	99	100
Year	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
Commercial Cadaver	55	46	76	53	75	49	81	61
Commercial Live donor	4	3	10	7	6	4	11	8
Live donor	40	34	19	13	32	21	24	18
Live donor (emotionally related)	5	4	8	6	2	1	1	1
Cadaver	14	12	30	21	38	25	15	11
Total	119	100	143	100	153	100	132	100

5.3 DEATH AFTER TRANSPLANTATION AND GRAFT FAILURE

Table 5.04: Transplant Patients Death Rate and Graft Loss 1995 – 2002

Year	1995	1996	1997	1998	1999	2000	2001	2002
No. at risk	924	968	1041	1084	1126	1195	1276	1355
Transplant death	16	31	29	23	25	27	30	19
Transplant death rate %	2	3	3	2	2	2	2	1
Graft loss	28	28	37	47	34	32	38	32
Graft loss %	3	3	4	4	3	3	3	2
All losses	44	59	66	70	59	59	68	51
All losses rate %	5	6	6	6	5	5	5	4

Figure 5.04: Transplant Recipient Death Rate 1995– 2002

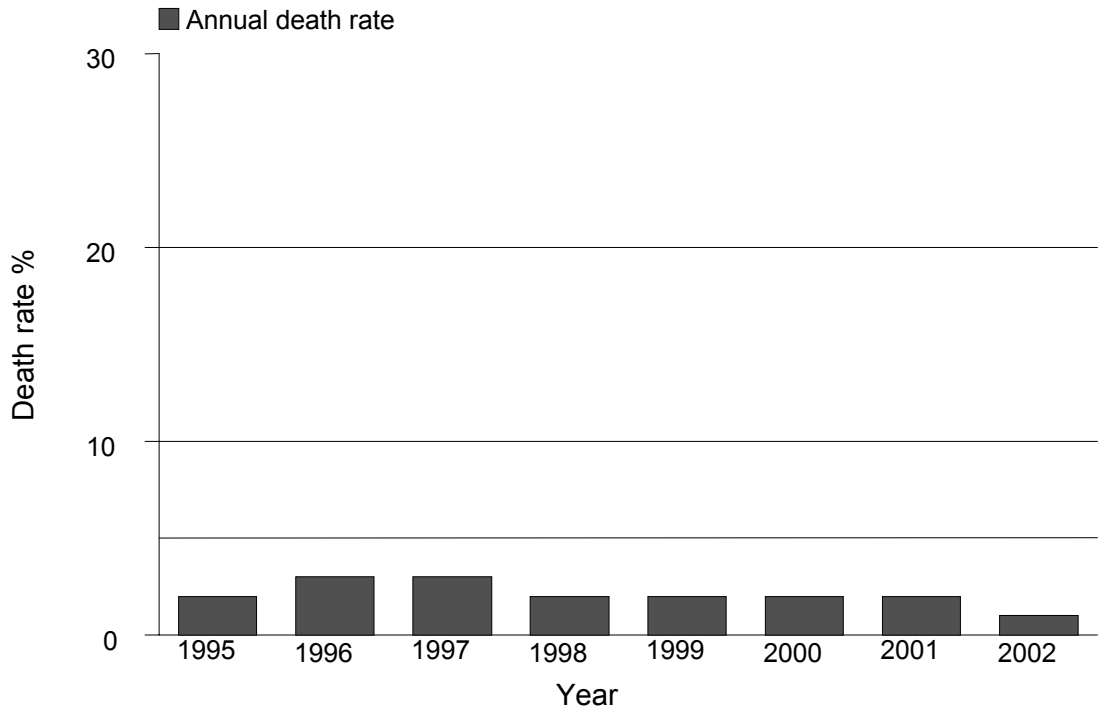


Table 5.05: Causes of Death in Transplant Recipients 1999 – 2002

Year	1999		2000		2001		2002	
	No	%	No	%	No	%	No	%
Cardiovascular	3	12	10	37	6	20	5	26
Died at home	4	16	0	0	4	13	3	16
Sepsis	7	28	9	33	17	57	3	16
GIT bleeding	1	4	1	4	0	0	0	0
Cancer	3	12	2	7	2	7	4	21
Liver disease	1	4	1	4	0	0	1	5
Others	3	12	4	15	1	3	3	16
Unknown	3	12	0	0	0	0	0	0
Total	25	100	27	100	30	100	19	100

Table 5.06: Causes of Graft Failure 1999 – 2002

Year	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
Rejection	22	65	19	59	22	58	19	59
Cyclosporine/ drug toxicity	0	0	0	0	0	0	1	3
Ureteric obstruction	0	0	0	0	0	0	0	0
Vascular causes(stenosis / thrombosis)	1	3	3	9	1	3	0	0
Renal disease, recurrent/de novo	0	0	0	0	2	5	1	3
Technical complication	0	0	3	9	1	3	0	0
Others	0	0	3	9	1	3	1	3
Unknown	11	32	4	13	11	29	10	31
Total	34	100	32	100	38	100	32	100

5.4 CENTRES OF FOLLOW-UP

Table 5.07: Distribution of Centres of Follow-up of Transplant Recipients, 20002

	Centre	No	Percent
	Number with function graft at 31st December	1394	100
1	Alor Setar Hospital	3	0
2	Ampang Puteri Specialist Hospital	4	0
3	Batu Pahat Hospital	11	1
4	Bintulu Hospital	4	0
5	C.S. Loo Kidney & Medical Specialist Centre	3	0
6	Duchess of Kent Hospital	4	0
7	Healthcare Dialysis Centre, Petaling Jaya	19	1
8	Ipoh Hospital	48	3
9	Kemaman Hospital	2	0
10	Kluang Hospital	12	1
11	Kota Bharu Hospital	5	0
12	Kuala Lumpur Hospital	351	25
13	Kuala Lumpur Hospital (Paed.)	2	0
14	Kuala Terengganu Hospital	12	1
15	Kuching Hospital	57	4
16	Labuan Hospital	1	0
17	Mahkota Medical Centre	6	0
18	Melaka Hospital	40	3
19	Mentakab Hospital	2	0
20	Miri Hospital	16	1
21	Muar Hospital	16	1
22	Normah Medical Specialist Centre	1	0
23	Pantai Mutiara Hospital, Penang	1	0
24	Pulau Pinang Hospital	164	12
25	Pusat Pakar Tawakal	7	1
26	Queen Elizabeth Hospital	48	3
27	Renal Dialysis Centre, Gleneagles Intan Medical Centre	7	1
28	Renal Healthcare, Kuala Lumpur	1	0
29	Sabah Medical Centre	1	0

30	Segamat Hospital	10	1
31	Selangor Medical Centre	2	0
32	Selayang Hospital	29	2
33	Seremban Hospital	34	2
34	Sibu Hospital	30	2
35	Subang Jaya Medical Centre	18	1
36	Sultanah Aminah Hospital	149	11
37	Sunway Medical Centre	1	0
38	Taiping Hospital	2	0
39	Tawau Hospital	5	0
40	Teluk Intan Hospital	1	0
41	Tengku Ampuan Afzan Hospital, Kuantan	30	2
42	Tengku Ampuan Rahimah Hospital, Klang	55	4
43	Timberland Medical Centre	13	1
44	Universiti Kebangsaan Malaysia Hospital	7	1
45	Universiti Sains Malaysia Hospital	3	0
46	University Malaya Medical Centre	157	11

5.5 TRANSPLANT RECIPIENTS' CHARACTERISTICS

Table 5.08: Percentage age distribution of transplant recipients 1999 – 2002

Year	1999	2000	2001	2002
New transplant patients	119	143	153	132
1-14 years	2	0	5	3
15-24 years	9	9	14	6
25-34 years	22	13	22	6
35-44 years	28	24	27	39
45-54 years	28	40	14	23
55-64 years	12	7	16	19
≥65 years	0	7	3	3
Functioning graft at 31st December	1154	1235	1316	1394
1-14 years	3	3	3	3
15-24 years	14	13	13	13
25-34 years	31	31	29	29
35-44 years	30	30	30	30
45-54 years	16	17	18	19
55-64 years	5	5	5	6
≥65 years	0	0	1	1

Table 5.09: Renal Transplant Recipients' Characteristics 1999 – 2002

Year	1999	2000	2001	2002
New transplant patients	119	143	153	132
Mean age ± sd	40 ± 12	43 ± 13	39 ± 15	44 ± 13
% Male	71	60	73	45
% Diabetic	17	20	16	16
% HBsAg+	3	4	0	6
% Anti-HCV+	3	2	8	0

5.6 SURVIVAL ANALYSIS

Table 5.10: Transplant Patient Survival related to Year of Transplant 1997 – 2002

Year	1997			1998			1999		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	97	2	116	95	2		99	1	117
12	95	2	113	95	2		99	1	116
24	94	2	110	95	2		98	1	113
36	91	3	101	95	2		97	2	
48	88	3	96	95	2				
60	87	3	92						
Year	2000			2001			2002		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	95	2	130	96	2	145	96	2	
12	94	2	128	95	2				
24	92	2							

No. = number at risk SE = standard error

Figure 5.10: Transplant Patient Survival by Year of Transplant 1997 – 2002

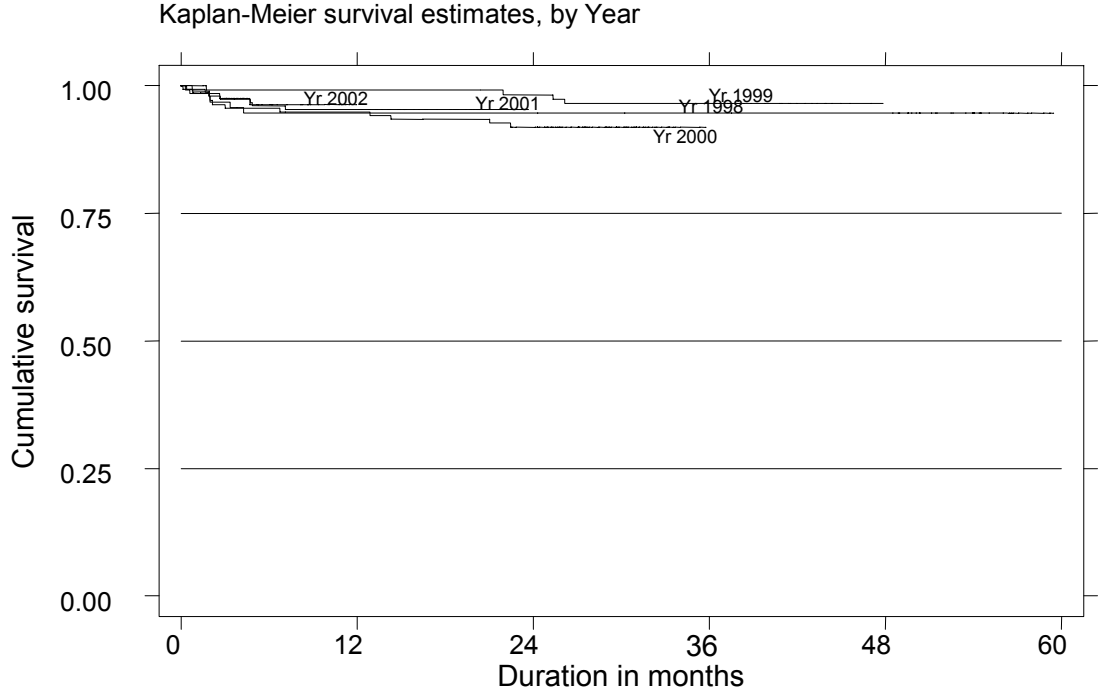
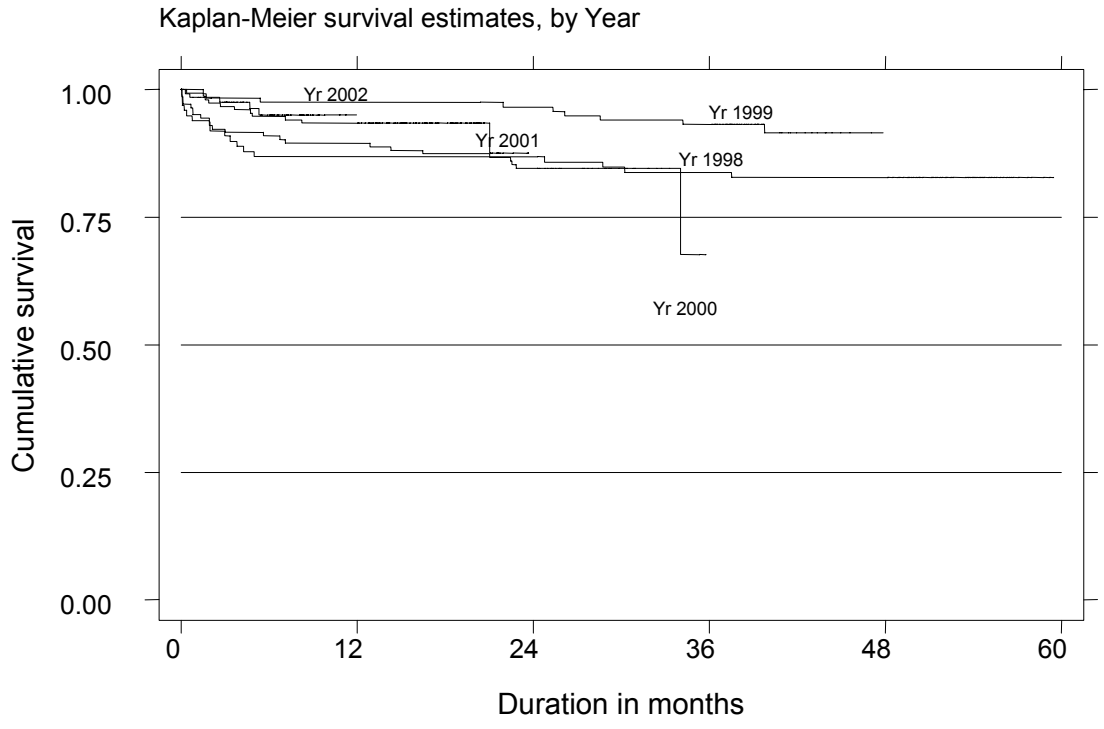


Table 5.11:Transplant Allograft Survival related to Year of Transplant 1997 – 2002

Year	1997			1998			1999		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	93	2	116	87	3	87	97	1	116
12	90	3	113	87	3	86	97	1	115
24	87	3	109	87	3	85	96	2	113
36	81	3	101	83	4	82	93	2	93
48	77	4	96	83	4				
60	76	4	92						
Year	2000			2001			2002		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	91	2	131	94	2	145	95	2	
12	89	3	128	93	2	106			
24	85	3	110						

No. = number at risk *SE = standard error*

Figure 5.11: Transplant Allograft Survival by Year of Transplant 1997-2002



5.7 WORK RELATED REHABILITATION AND QUALITY OF LIFE IN TRANSPLANT RECIPIENTS

Table 5.12: Work Related Rehabilitation in Transplant Recipients 1999 – 2002

REHABILITATION	1999		2000		2001		2002	
STATUS	No.	%	No.	%	No.	%	No.	%
Full time work for pay	543	62	548	66	611	63	645	60
Part time work for pay	62	7	60	7	65	7	73	7
Able to work but unable to get a job	8	1	10	1	15	2	28	3
Able to work but not yet due to dialysis schedule	0	0	1	0	1	0	0	0
Able but disinclined to work	6	1	7	1	11	1	5	0
Home maker	174	20	138	17	163	17	178	17
Full time student	32	4	30	4	46	5	49	5
Age<15 years	3	0	3	0	5	1	2	0
Retired	32	4	31	4	25	3	44	4
Age>65 years	7	1	5	1	17	2	33	3
Unable to work due to poor health	11	1	2	0	13	1	11	1
Total	878	100	835	100	972	100	1068	100

Table 5.13: Quality of Life, Transplant recipients 1999 – 2002

QOL Index Summated Score	1999		2000		2001		2002	
	No.	%	No.	%	No.	%	No.	%
0 (Worst QOL)	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	4	0	1	0
4	0	0	2	0	0	0	1	0
5	1	0	0	0	4	0	2	0
6	4	0	2	0	4	0	2	0
7	8	1	1	0	5	1	13	1
8	5	1	12	1	16	2	21	2
9	9	1	23	3	19	2	15	1
10 (Best QOL)	852	97	780	95	914	95	1022	95
Total	879	100	820	100	966	100	1077	100