NINTH REPORT

OF

THE MALAYSIAN

DIALYSIS AND TRANSPLANT

REGISTRY

2001

edited by

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INTRODUCTION

The year 2001 saw a slight decline in the new dialysis acceptance rate despite an improved center coverage where 91% of Haemodialysis (HD) centers report to the Registry. The contraction in acceptance rate was seen in the private and the NGO centers. It may reflect the lingering effects of the recent economic slowdowns. The full beneficial impact of the Government subsidy for NGO centers implemented in 2001 is yet to be realized. Under the subsidy scheme non profit centers get a subsidy of RM50 for each dialysis performed for deserving patients In return patients should not be charged more than RM60. In addition the government will subsidise 50% of the capital cost for machines for new centers to be developed by non profit orgnisations. Renal transplant rate remained unchanged in 2001.

There continues to be a disparity in the level of provision of dialysis services between states in the country. The state with the highest acceptance rate (Johor) accepted 3.4 times as many patients as Sabah which has the lowest rate. Private dialysis centers and Non profit organizations play important roles in this respect. The high prevalence of low income population and the geography of the state do not encourage private sectors or Non profit organizations to set up HD centers in Sabah. The government through the MOH will have to play a bigger role to redress the imbalance in the states with poor acceptance rates. Acceptance rate by age groups did not change significantly with those in the 55-64 years having the highest acceptance rate. Home Hemodialysis and office HD will soon be phased out as more and more HD centers are opened particularly in Peninsular Malaysia.

Major outcome measures have remained stable. It is imperative that we now pay greater attention to improving the quality care for our HD patients. There are still areas in patient management that can be improved. These include management of anaemia, cardiovascular diseases, calcium and phosphate and nutrition of HD patients. More training programs in specific areas of care have to be developed.

Once again the National Renal Registry thank all contributers for their unrelenting support. We hope to improve the report on Renal transplantation to include more data that will prove useful to clinicians.

DR ZAKI MORAD MOHAMAD ZAHER
Chairman
National Renal Registry

REPORT SUMMARY

1 ALL RENAL REPLACEMENT THERAPIES

1.1 At 31st December 2001, 8633 patients were on renal replacement therapy, comprising 7330 on dialysis and 1303 with functioning transplants. 1691 new dialysis patients were accepted in 2001.

1.2 The new renal transplant rate was 6 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 dialysis patients into NGO and private dialysis centers. Dialysis prevalence rate however increased to 308 per million population.

2 DIALYSIS IN MALAYSIA

2.1 Dialysis acceptance rate by state varied between 120 per million state population for Johor Darul Takzim to 35 per million per state population in Sabah.

By age group, dialysis acceptance rate varied between a stable rate of 4 per million child population to a high of 401 per million population for age group 55 to 64 years. Dialysis provision rate for patients older than 65 years was 336 per million population for age, a marginal increase from 331 in 2000..

2.2 Males made up 54% of all new dialysis patients

2.3 Centre Haemodialysis (HD) accounted for 82% of new dialysis acceptance in 2001 and only 1% each in office and home HD. A larger proportion (16%) were accepted into the CAPD programme.

2.4 The proportion of patients with unknown primary disease was 32% in 2001. Diabetic nephropathy remained the commonest cause of ESRD surging to 46% in 2001, chronic glomerulonephritis 8% and obstructive uropathy 2 %.

2.5 Overall death rate on dialysis remained at 10%; HD death rate was 9%, and CAPD death rate was at 18%. 34% of deaths were attributed to cardiovascular causes and 15% to sepsis unrelated to peritonitis. 26% died at home.

2.6 **Centre survey 2001**: A centre survey was carried in December 2001 to provide up-to-date information on patient and centre census in Malaysia.

There were a total of 8179 dialysis patients in Malaysia giving a dialysis treatment rate of 352 per million population (pmp). Dialysis treatment rate from individual patient reporting had given a rate of 308 pmp.

There were a total of 219 centres, an increase of 23 centres from the previous year with a total of 2244 dialysis machines.

By state, dialysis treatment rate ranged from 106 per million state population in Sabah to 624 pmp in Pulau Pinang. HD capacity to patient ratio ranged from 1.26 in Sabah to 2.39 in Kelantan.

There were 74 private dialysis centers, 61 NGO centers and 70 Ministry of Health(MOH) centers giving HD capacity of 3750, 4150 and 2895 respectively. There were a total of 2223 patients dialyzing in private centers, 2620 in NGO centers and 3102 in MOH centers. Centre HD capacity to patient ration ranged from 1.69 in private to 1.37 in MOH centers to 3.9 in university centers.

3 HAEMODIALYSIS

3.1 Haemodialysis in Government Centres

3.1.1 At 31st December 2001, 467 new patients - the highest number noted, were accepted into government HD centers. There were 2324 prevalent patients dialysing in government centres.

3.1.2 93% of new patients were accepted into centre HD, 3% into home HD and 4% into so called officer HD. 97% of new patients were financed by the government.

3.1.3 Death rate was 9% per year. Cardiovascular disorders, infections and deaths at home were the 3 commonest causes of death at 41%, 19% and 14% respectively

3.1.4 In 2001, there were a total of 68 government HD centres, 9 run by Ministry of Defence, 3 university hospital centres and the rest under the Ministry of Health.

3.1.5 New HD patients in 2001: Modal age-group 45 – 64 years; 57% males, 37% were diabetics, 5% had HBsAg, and 3% had anti-HCV antibodies.

3.1.6 HD patient and technique survival in government centres at 6 months for 2001 were 90% and 87% respectively.

3.1.7 Overall, 41% of HD patients were able to work part or full time. 69% had normal quality of life index.

3.1.8 ***Haemodialysis Practices***: In 2001, 76% were dialysed via wrist AVF, 20% via brachiocephalic fistula. 92% reported no difficulties with their vascular access; only 15% had vascular access complications. Proportion of patients with higher blood flow rates of 300-349 increased from 17% in 1998 to 39% in 2001. Almost all were on thrice-weekly dialysis, 97% on 4 hours per session. Use of cellulosic membrane dialysers decreased further to 22% and synthetic membrane dialyser usage increased to 68%; 84% reused their dialysers six times or more, 17% reused 12 times and 7% more than 12 times. Usage of bicarbonate buffer increased to 93%. Median prescribed KT/V remained at 1.5; and a lower proportion of patients (72%) achieved a KT/V of more than

1.3 compared to 79% in year 2000.

3.1.9 ***Dyslipidaemia in haemodialysis patients***: This has remained mostly unchanged over the years. In 2001, 67% of HD patients had serum cholesterol concentration < 5.3 mmol/l with median at 4.9 mmol/l. 87% had serum triglyceride concentration <3.5 mmol/l with median at 1.7 mmol/l; 95% had serum LDL concentration <5 mmol/l with median at 2.9 mmol/l; and 94% had serum HDL concentration of < 2 mmol/l with median at 1.1 mmol/l.

3.1.10 ***Renal bone disease***: In 2001, 93% of HD patients were on oral calcium carbonate, only 4% remained on aluminium hydroxide. Use of vitamin D reduced to 22%. 36% achieved serum phosphate concentration <1.6 mmol/l; 57% had serum calcium concentration between 2.2 and 2.6 mmol/l, and 23% with iPTH between 100 – 250 ng/l. Median PTH concentration was 94 ng/L.

3.1.11 ***Blood pressure control***: In 2001, 67% required anti-hypertensive therapy. Of these, 62% achieved systolic blood pressure(BP) < 160 mmHg, and 62% a diastolic BP< 90 mmHg. Of the 33% not on anti-hypertensive therapy, 85% had systolic BP < 160 mmHg and 80% diastolic BP < 90 mmHg.

3.1.12 ***Management of anaemia****:* In 2001, 92% of patients were on oral iron supplements. Intravenous iron usage has increased further to 8%. 60% of HD patients were on recombinant erythropoietin with 59% on 2000-4000 units weekly. 76% of those without erythropoietin and 71% on erythropoietin injections had serum iron > 10 umol/l. 85% of patients without erythropoietin and 88% of those on erythropoietin supplements had serum ferritin > 100 ng/l. Only 10% of patients on erythropoietin injections had haemoglobin concentration >12 g/dl, 35% with haemoglobin concentration between 10 and 12g/dl.

3.1.13 ***Nutritional status:*** 58% 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 2001, patients with anti-HCV antibodies plateaued at 28%. Proportion with HbsAg remained at 6%.

3.2 Haemodialysis in Non-Governmental Organisation (NGO) Centres

3.2.1 At 31st December 2001, 2554 patients were on HD in centres managed by NGOs. 587 new patients were accepted into the programme in 2001 compared to 587 in year2000.

3.2.3 Death rate in NGO HD centres was 9% in 2001. Deaths at home, cardiovascular disorders and infections were the 3 commonest causes of death at 33%, 26% and 17% respectively.

3.2.4 In 2001, there were a total of 62 NGO dialysis centres.

3.2.5 New HD patients in 2001: Modal age-group 55-64 years; 53% were males, 48% were diabetics, 5% had HBsAg and 3% had anti-HCV antibodies.

3.2.6 HD patient and technique survival in NGO centres at 6 months for 2001 were similar at 96%

3.2.7 Overall, 28% of HD patients were able to work part or full time, 25% were homemakers and 7% pensioners. 48% had normal quality of life index.

3.2.8 ***Haemodialysis Practices***: In 2001, 83% were dialysed via wrist AVF. 92% reported no difficulties with their vascular access; only 12% had vascular access complications. 52% had blood flow rates between 250 and 299 ml/min, 96% 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 2001. 79% reused their dialysers at least six times, 27% reused eight time and 10% more than 12 times. Usage of bicarbonate buffer was almost universal at 99%. Median prescribed Kt/V was 1.5; 74% had Kt/V more than 1.3.

3.2.9 ***Dyslipidaemia in haemodialysis patients***: In 2001, 63% of HD patients had serum cholesterol concentration < 5.3 mmol/l with median at 5 mmol/l. 86% had serum triglyceride concentration <3.5 mmol/l with median at 1.7 mmol/l.

3.2.10 ***Renal bone disease***: In 2001, 95% of HD patients were on oral calcium carbonate, only 1% were on aluminium hydroxide. Proportion on active vitamin D supplements dropped to 20%. A larger proportion - 36% achieved serum phosphate concentration <1.6 mmol/l; 61% 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 29.8 ng/L.

3.2.11 ***Blood pressure control***: In 2001, 66% required anti-hypertensive therapy. Of these, 56% achieved systolic BP < 160 mmHg, and 96% diastolic BP < 90 mmHg. Of the 31% not on any anti-hypertensive therapy, 78% had systolic BP <160 mmHg and 80% diastolic BP < 90 mmHg.

3.2.12 ***Management of anaemia****:* In 2001, 62% were on recombinant erythropoietin with 54% on 2000 units weekly and 39% on 2000 – 4000 units weekly. 77% without erythropoietin and 71% on erythropoietin injections had serum iron > 10 umol/l. 91% of those on erythropoietin had serum ferritin of > 100 ug/l. 33% of patients on erythropoietin had haemoglobin concentration >10 g/dl with only 6% > 12 g/dl.

3.2.13 ***Nutritional status:*** The proportion of patients with serum albumin concentration of >40 g/l was 33% in 2000. 60% had body mass index of between 18.5 and 25 kg/m^2 with 17% with BMI <18.5 kg/m^2.

3.2.14 ***Anti-HCV and HBsAg status***: In 2001, 18% of patients had anti-HCV antibodies, 6% were positive for HBsAg.

3.3 Haemodialysis In Private Centres

3.3.1 At 31st December 2001, 1706 patients were dialysing in private dialysis centres. 455 new patients were accepted for HD in private centers compared

to 519 in the year 2000.

3.3.3 Death rate in private centres was 11% in 2001. Cardiovascular disorders, deaths at home and sepsis were the 3 commonest causes of death at 41%, 35% and 7% each respectively.

3.3.5 New HD patients in 2001: Modal age-group 55-64 years; 56% were males, 52% were diabetics, 4% had HBsAg, 3% had anti-HCV antibody

3.3.6 HD patient survival and technique survival in private centres at 6 months for 2001 were similar at 95%.

3.3.7 In 2001, 25% were able to work full or part time, 22% were homemakers. 14% were retirees and 19% were older than 65 years. 52% had a normal quality of life.

3.3.8 ***Haemodialysis Practices***: In 2001, 77% were dialysed via wrist AVF, 17% via brachiocephalic fistula. 89% reported no difficulties with their vascular access; only 14% had vascular access complications. 80% had blood flow rates between 200 and 299 ml/min. Only 68% were on thrice-weekly dialysis, 27% only had twice weekly dialysis. 88% had 4 hours for session, 10% 4.5-5 hours. The majority – 64% used cellulosic membrane dialysers; only 26% used synthetic membrane dialysers. 7% did not reuse dialysers, 88% reused their dialysers at least three times. Usage of bicarbonate buffer was 94%. Median prescribed KT/V was 1.4; 65% had KT/V more than 1.3.

3.3.9 ***Dyslipidaemia in haemodialysis patients***: In 2001, 65% of HD patients had serum cholesterol concentration < 5.3 mmol/l with median at 5 mmol/l. 89% had serum triglyceride concentration <3.5 mmol/l with median at 1.6mmol/l.

3.3.10 ***Renal bone disease***: In 2001, 89% of HD patients were on oral calcium carbonate, only 2% were on aluminium hydroxide and 27% on active vitamin D supplements. 33% achieved serum phosphate concentration <1.6 mmol/l; 60% had serum calcium concentration between 2.2 and 2.6 mmol/l and 23% with iPTH between 100 – 250 ng/l.

3.3.11 ***Blood pressure control***: In 2001, 68% required anti-hypertensive therapy. Of these, 53% achieved systolic BP < 160 mmHg, and 60% diastolic BP < 90 mmHg.

3.3.12 ***Management of anaemia****:* In 2001, 65% were on recombinant erythropoietin with 30% on 2000 units weekly and 53% on 2000 – 4000 units weekly. 39% of patients on erythropoietin had haemoglobin concentration >.10 g/dl with only 8% with haemoglobin concentration $\geq$12 g/dl. About one-fifth still received blood transfusion.

3.3.13 ***Nutritional status:*** Proportion of patients with serum albumin concentration of >40 g/l was 23% in 2001. 57% had body mass index of between 18.5 and 25 kg/m^2 .

3.3.14 ***Anti-HCV and HBsAg status***: In 2001, 22% of patients had anti-HCV

antibodies, 4% were positive for HbsAg.

4. CONTINUOUS AMBULATORY PERITONEAL DIALYSIS (CAPD)

4.1 At 31st December 2001, 746 patients were on CAPD. Intake of new CAPD patients was highest at 315 of which 91% were funded by the government.

4.3 In 2001, death rate on CAPD was 18%; transfer to HD 12%. Cardiovascular disorders, death at home and sepsis were the main causes of death accounting for 27%, 23% and 20% respectively. CAPD peritonitis accounted for 15% of deaths. The main cause of transfer was peritonitis at 35%.

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

4.5 New CAPD patients in 2001: Modal age-group 55-64 years; 47% males, 41% were diabetics, 4% had HBsAg, 4% were anti-HCV antibody positive.

4.6 CAPD patient survival was 92% and technique survival was 88% at 6 months for year 2001.

4.7 Overall, 22% of CAPD patients were able to work part or full time. 35% were homemakers and 15% full time students. Only 69% had normal quality of life index.

4.8 ***CAPD Practices***: In 2001, 99% were on standard CAPD dialysis regime; 57% used the Baxter disconnect system; 43% 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 2001, 44% of CAPD patients had serum cholesterol concentration < 5.3 mmol/l with median at 5.7 mmol/l. 80% had serum triglyceride concentration <3.5 mmol/l with median at 2mmol/l.

4.10 ***Renal bone disease***: In 2001, 75% of CAPD patients were on oral calcium carbonate, only 1% were on aluminium hydroxide and a lesser proportion - 10% on active vitamin D supplements. 60% achieved serum phosphate concentration < 1.6 mmol/l; 59% had serum calcium concentration between 2.2 and 2.6 mmol/l and 20% with iPTH between 100 – 250 ng/l. Median PTH values was 49.5 ng/L.

4.11 ***Blood pressure control***: In 2001, 77% of CAPD patients required anti-hypertensive therapy. Of these, 75% achieved systolic BP < 160 mmHg, and 58% diastolic blood pressure < 90 mmHg. Of the 23% not on anti-hypertensive therapy, 92% had systolic BP < 160 mmHg and 78% a diastolic BP < 90 mmHg.

4.12 ***Management of anaemia****:* In 2001, 45% of patients on CAPD were on recombinant erythropoietin with 50% on 2000-4000 units weekly and 33% on 2000 units weekly. 11% still received blood transfusions. 80% of patients without erythropoietin and 77% on erythropoietin injections had serum iron concentration of >10 umol/l. 91% of all CAPD patients had serum ferritin

concentration > 100 ng/l. 45% of CAPD patients not on erythropoietin had haemoglobin concentration >10 g/l and 12% had haemoglobin concentration of >12% compared to 38% and 9% respectively for those on erythropoietin.

4.13 ***Nutritional status:*** Only 15% of CAPD patients had serum albumin > 40 g/l compared to 58% of government HD patients. 50% had body mass index of between 18.5 and 25 kg/m^2. 27% had body mass index > 25 kg/m^2.

4.14 ***Anti-HCV and HBsAg status***: The HbsAg status of CAPD patients were constant over the years at 2-3% but the prevalence of antiHCV antibodies had dropped to 3%.

5. RENAL TRANSPLANTATION

5.1 At 31st December 2001, there were 1303 functioning renal transplants

5.2 Of 138 new renal transplants in 2001, 30 were from living related donors, 38 from cadaveric donors done locally- the highest ever, 5 from commercial living non-related donors; and 63 from commercial cadaveric donors.

5.3 In 2001, 2% of transplant recipients died and 3% lost their grafts. Sepsis and cardiovascular diseases were the commonest causes of death accounting for 57% and 21% respectively. Rejection accounted for 38% of graft loss.

5.4 There were 42 centres of follow-up for renal transplant recipients.

5.5 Modal age group for new transplant recipients in 2001 was slightly older at 45-54 years; 59% were males, 12% diabetics; 3% were HBsAg positive and 12% had anti-HCV antibodies at the time of transplantation.

5.6 Six month patient survival in 2001 was 95% and graft survival was 93%.

5.7 Overall, 70% 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 219 dialysis centres in Malaysia as of December 2001, of which 200 reported data to the Registry. Thus, centre coverage is now to 91%. We assessed completeness of patient ascertainment by comparing the number of patients registered on the Registry patient database at end of year 2001 and patient census data obtained independently from the annual centre survey in December 2001. Based on the patient prevalence estimates calculated from these 2 independent sources of data (308 versus 352 patients/million population), we estimated the patient ascertainment rate by the Registry to be 87.5%.

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 an 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 2001. Centre response rate to the survey was 99.5% (218/219 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 2001 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. One centre did not respond to the survey and another 3 responding centres had missing data on number of patients on dialysis at their centres. As the objective of this analysis is to estimate the total amount of dialysis provision in the country, we obviously cannot simply ignore the missing data and confine the analysis to available data. We therefore imputed the missing data based on regression imputation model and guided by the imputation principles described by Little[3]. The imputation model included sector (public, NGO or private), state, year of operation, number of dialysis machine and personnel. These are well known correlates of level of dialysis provision in a centre. The imputations are then drawn by predictive mean matching[3]. Each centre with missing data was match with each respondent on its predicted values. We then use the data of the centre with the closest match to impute the missing data.

***References*:**

1. Kaplan EL, Meier P. Non-parametric estimation from incomplete observations. *J Am Stat Assoc* 1958; 53:457-81
2. UKRENALREG 1998 UK Renal Registry, Bristol, UK.
3. Little RJ. Missing data adjustments in large surveys. J Business Econ statistics 1988;6:287-301

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

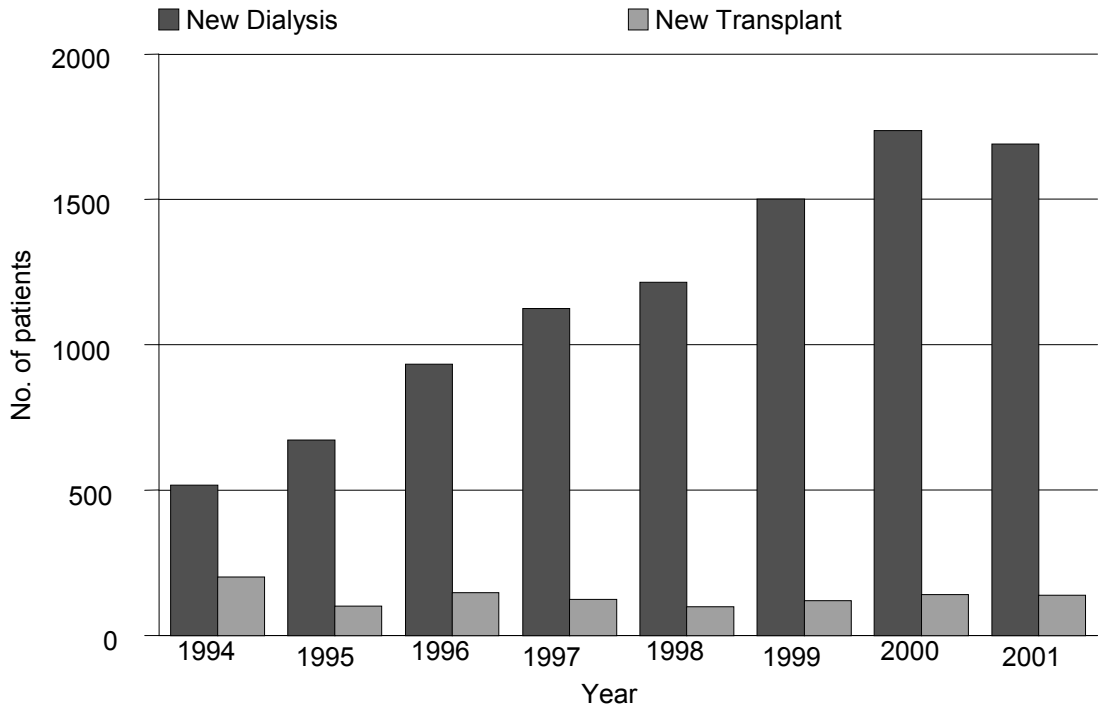
1.1 STOCK AND FLOW

Table 1.01: Stock and Flow of RRT, Malaysia 1994 – 2001

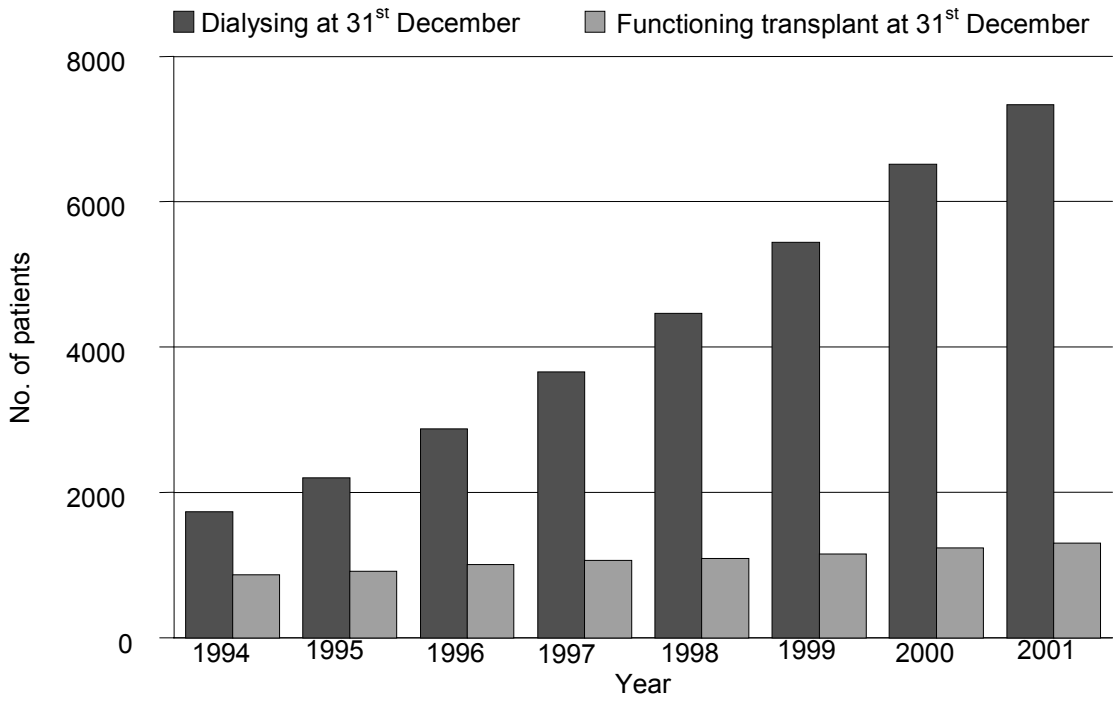
Year	1994	1995	1996	1997	1998	1999	2000	2001
New Dialysis patients	517	673	934	1125	1216	1501	1736	1691
New Transplants	202	101	148	124	99	119	141	138
Dialysis deaths	145	178	220	302	367	476	561	715
Transplant deaths	28	16	31	28	23	25	26	28
Dialysing at 31st December	1730	2204	2878	3655	4465	5440	6518	7330
Functioning transplant at 31st December	864	920	1008	1067	1094	1153	1235	1303

Figure 1.01: Stock and Flow of RRT, Malaysia 1994 - 2001

(a) New Dialysis and Transplant patients



(b) Patients Dialysing and with Functioning Transplant at 31st December 1994 – 2001



1.2 TREATMENT PROVISION RATE

Table 1.02: New Dialysis Acceptance Rate and New Transplant Rate per million population 1994 – 2001

Acceptance rate	1994	1995	1996	1997	1998	1999	2000	2001
New Dialysis	26	33	44	52	55	66	75	71
New Transplant	10	5	7	6	4	5	6	6

Figure 1.02: New Dialysis Acceptance and New Transplant Rate 1995 - 2001

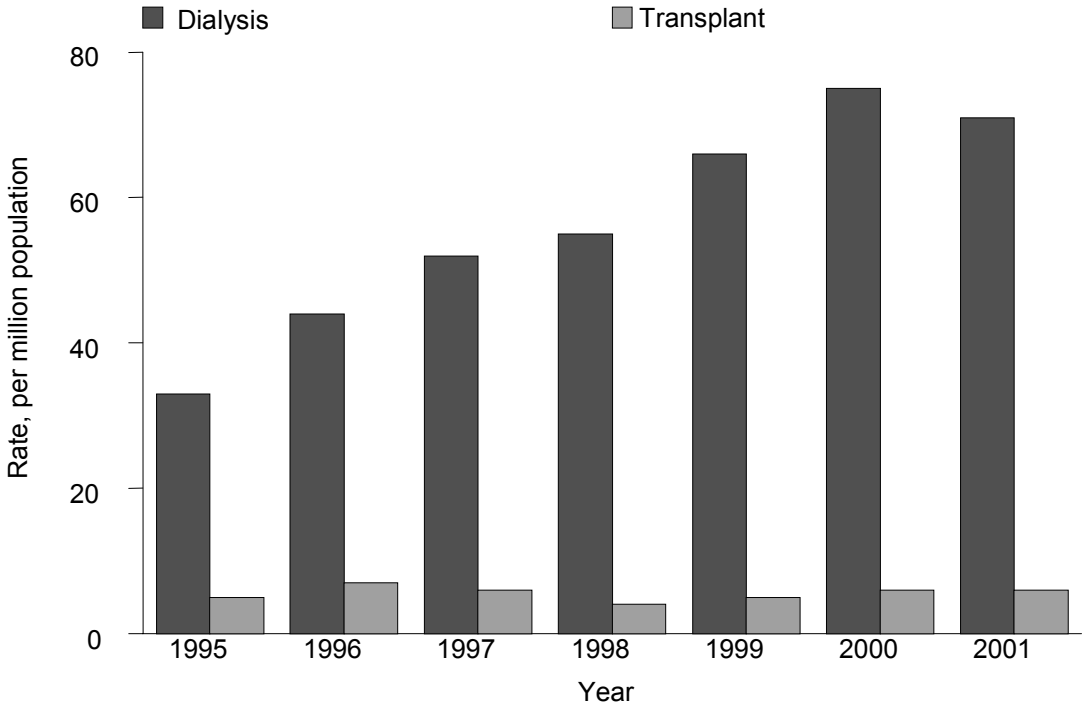
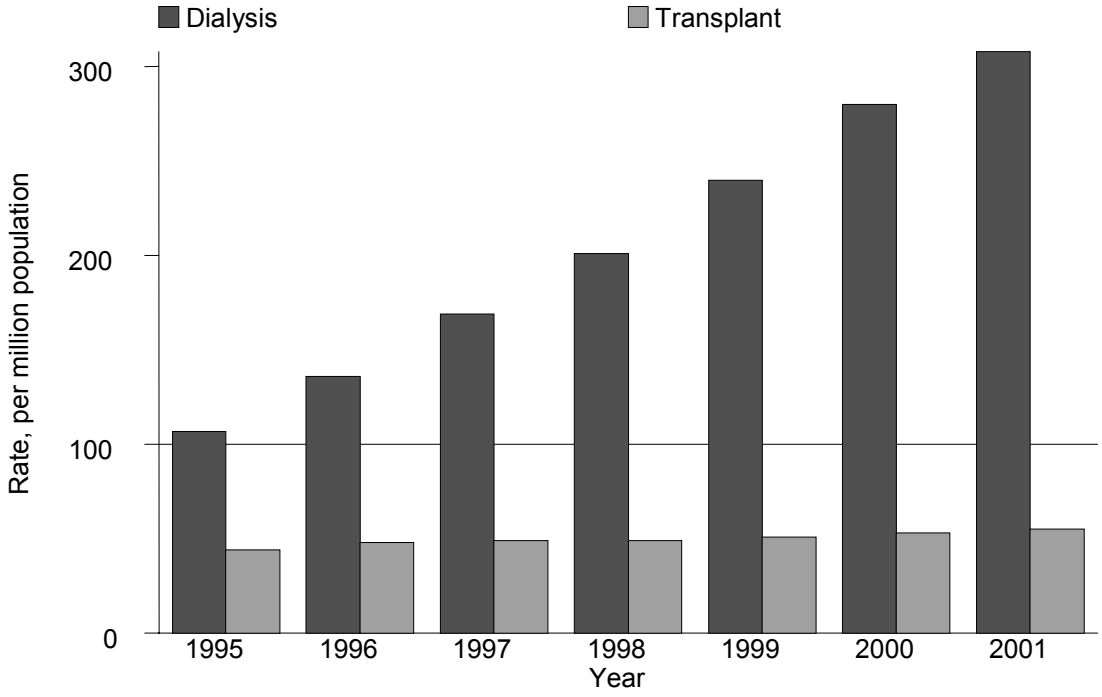


Table 1.03: RRT Prevalence Rate per million population 1994 – 2001

Prevalence rate	1994	1995	1996	1997	1998	1999	2000	2001
Dialysis	88	107	136	169	201	240	280	308
Transplant	44	44	48	49	49	51	53	55

Figure 1.03: Dialysis and Transplant Prevalence Rate per million population 1995 - 2001



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 1994 – 2001

Year	1994	1995	1996	1997	1998	1999	2000	2001
New Dialysis patients	517	673	934	1125	1216	1501	1736	1691
Died	145	178	220	302	367	476	561	715
Transplanted	45	37	56	59	60	68	104	127
Lost to Follow-up	3	10	8	12	12	9	14	39
Dialysing at 31st December	1730	2204	2878	3655	4465	5440	6518	7330

Table 2.02: Dialysis Treatment Rate per million population 1994 – 2001

Year	1994	1995	1996	1997	1998	1999	2000	2001
Acceptance rate	26	33	44	52	55	66	75	71
Prevalence rate	88	107	136	169	201	240	280	308

Table 2.03: Dialysis Treatment Rate by State, per million state population, 2001

State	Acceptance rate
Johor Darul Takzim	120
Negeri Melaka	117
Negeri Sembilan Darul Khusus	104
Selangor & W.Persekutuan	93
Pulau Pinang	81
Perak Darul Redzuan	78
Trengganu Darul Iman	72
Sarawak	60
Kedah & Perlis	55
Kelantan Darul Naim	53
Pahang Darul Makmur	42
Sabah	35

Table 2.04: Dialysis Treatment Rate by Gender, per million male or female population 1998– 2001

Gender	1998	1999	2000	2001
Male	61	79	88	81
Female	55	59	70	73

Figure 2.04: Dialysis Treatment by Gender 1998 - 2001

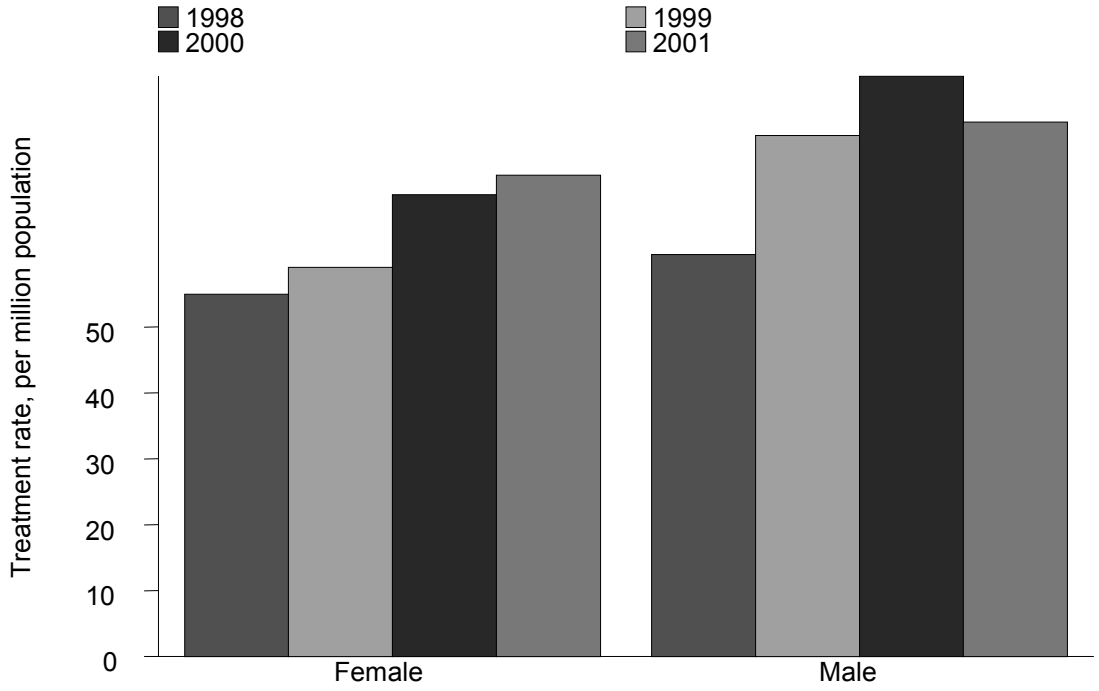
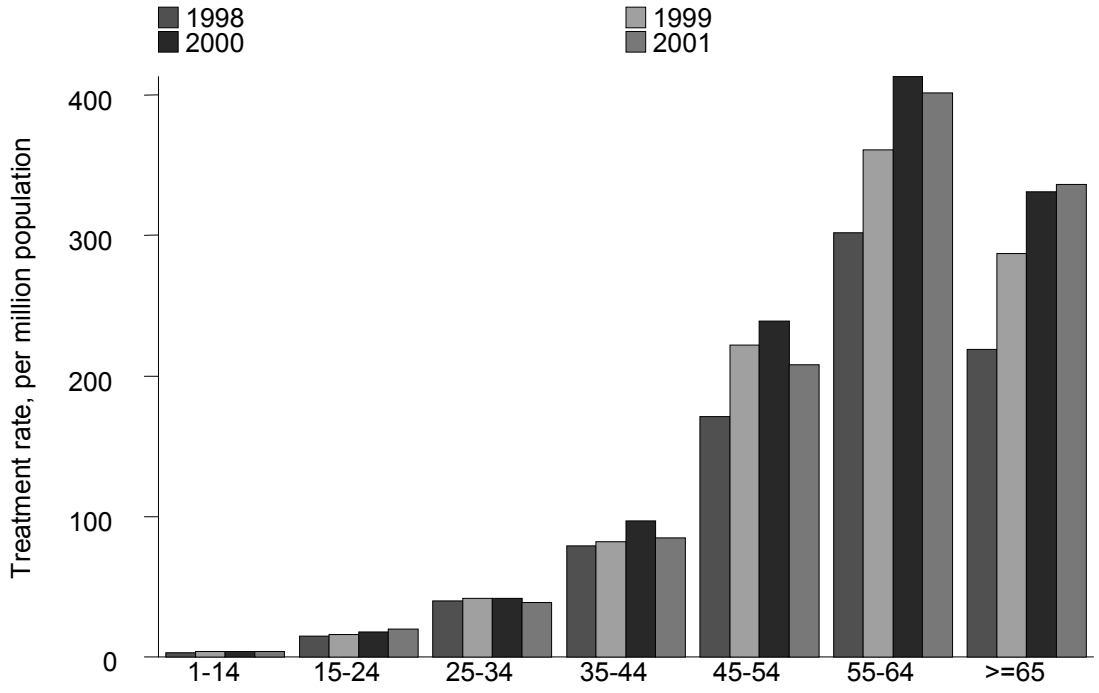


Table 2.05: Dialysis Treatment Rate by Age Group, per million age group population 1998 – 2001

Age groups (years)	1998	1999	2000	2001
1-14	3	4	4	4
15-24	15	16	18	20
25-34	40	42	42	39
35-44	79	82	97	85
45-54	171	222	239	208
55-64	302	361	413	401
≥ 65	219	287	331	336

Figure 2.05: Dialysis Acceptance Rate by Age Group 1998 - 2001



2.2 PATIENT DEMOGRAPHICS

Table 2.06: Percentage Age Distribution of Dialysis Patients 1998 – 2001

Year	1998	1999	2000	2001
New dialysis patients	1216	1501	1736	1691
% 1-14 years	2	2	1	2
% 15-24 years	5	4	4	4
% 25-34 years	11	9	9	8
% 35-44 years	17	15	16	14
% 45-54 years	25	27	27	25
% 55-64 years	27	26	27	28
% ≥ 65 years	15	16	17	18
Dialysing at 31st December	4465	5440	6518	7330
% 1-14 years	2	2	2	2
% 15-24 years	5	5	5	5
% 25-34 years	16	15	14	13
% 35-44 years	22	21	20	20
% 45-54 years	24	25	25	25
% 55-64 years	21	22	22	23
% ≥65 years	10	11	11	12

Figure 2.06: Age Distribution of New Dialysis patients 1998 – 2001

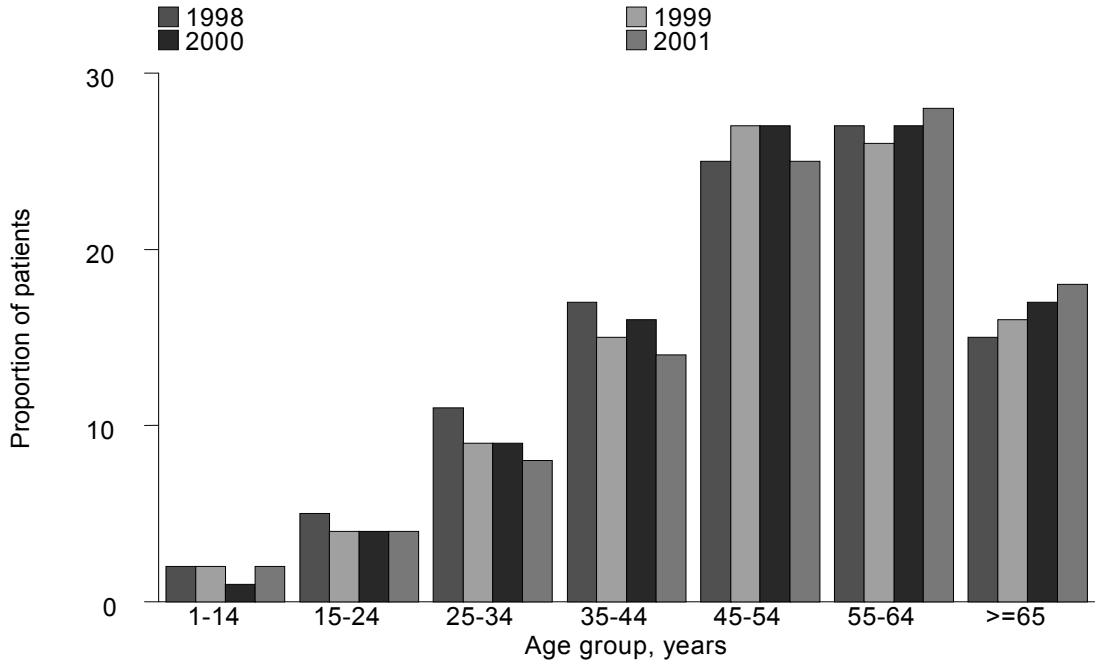
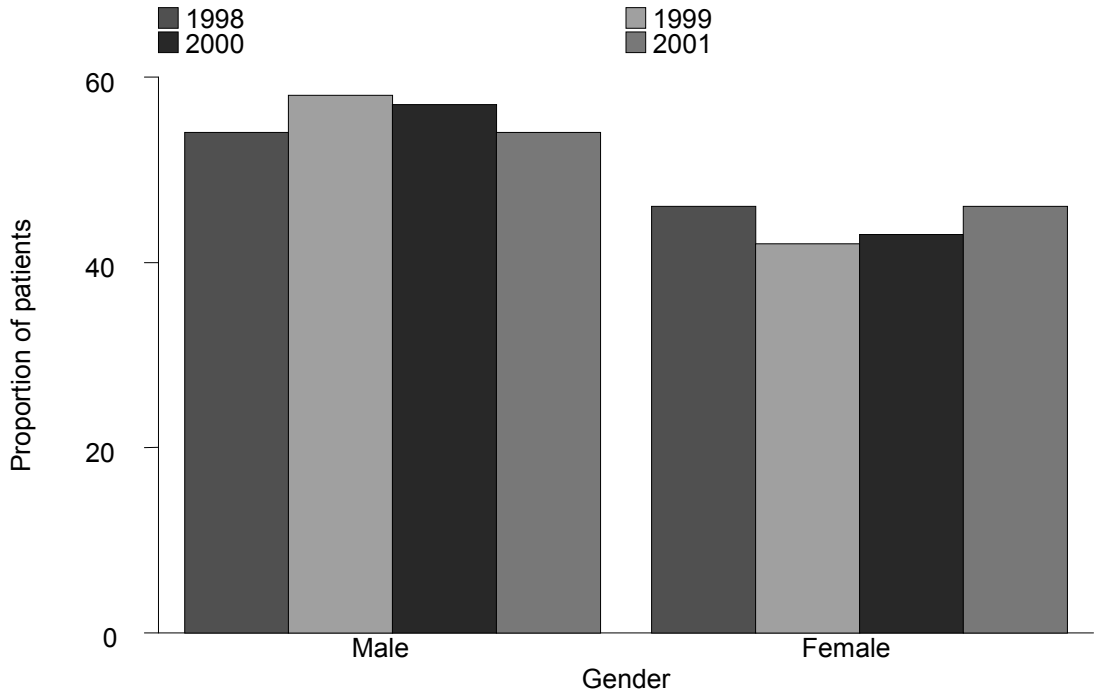


Table 2.07: Gender distribution of Dialysis Patients 1998 – 2001

Year	1998	1999	2000	2001
New Dialysis patients	1216	1501	1736	1691
% Male	54	58	57	54
% Female	46	42	43	46
Dialysing at 31st December	4465	5440	6518	7330
% Male	56	56	56	55
% Female	44	44	44	45

Figure 2.07: Gender Distribution of New Dialysis patients 1998 – 2001

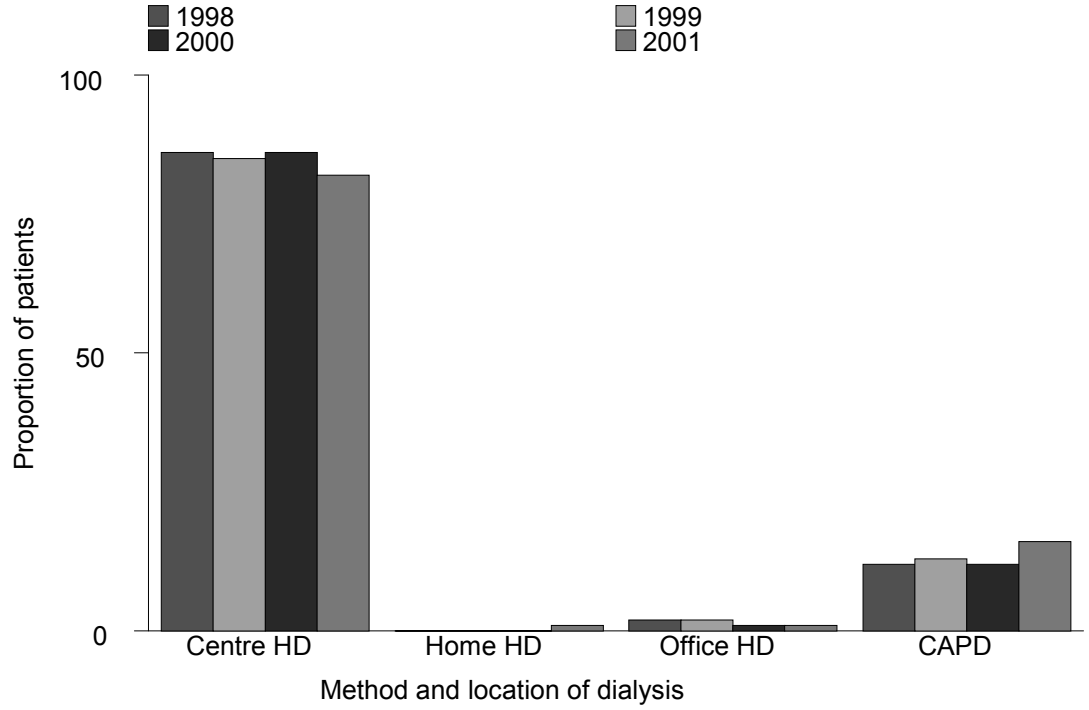


2.3 METHOD AND LOCATION

Table 2.08: Method and Location of Dialysis

Year	1998	1999	2000	2001
New Dialysis patients	1216	1501	1736	1691
% Centre HD	86	85	86	82
% Home HD	0	0	0	1
% Office HD	2	2	1	1
% CAPD	12	13	12	16
Dialysing at 31st December	4465	5440	6518	7330
% Centre HD	81	84	86	86
% Home HD	2	1	1	1
% Office HD	5	4	3	3
% CAPD	12	11	10	10

Figure 2.08: Method and Location of New Dialysis Patients



2.4 PRIMARY RENAL DISEASE

Table 2.09: Primary Renal Disease 1998– 2001

Year	1998	1999	2000	2001
New Dialysis patients	1216	1501	1736	1691
% Unknown cause	33	30	29	32
% Diabetic Nephropathy	41	40	44	46
% Glomerulonephritis	11	11	10	8
% Polycystic kidney	1	1	1	2
% Obstructive Uropathy	4	4	3	2
% Gouty Nephropathy	0	0	0	0
% Toxic Nephropathy	0	1	0	0
% Miscellaneous	9	12	12	9

2.5 DEATH ON DIALYSIS

Table 2.10: Deaths on Dialysis 1994 – 2001

Year	1994	1995	1996	1997	1998	1999	2000	2001
No. of dialysis patients at risk	1559	1967	2541	3267	4060	4953	5979	6924
Dialysis deaths	145	178	220	302	367	476	561	715
Dialysis death rate %	9	9	9	9	9	10	9	10
No. of HD patients at risk	1341	1681	2158	2796	3541	4387	5355	6224
HD deaths	103	120	159	229	293	376	470	589
HD death rate %	8	7	7	8	8	9	9	9
No. of CAPD patients at risk	218	287	384	471	520	566	624	700
CAPD deaths	42	58	61	73	74	100	91	126
CAPD death rate %	19	20	16	16	14	18	15	18

Figure 2.10: Death Rates on Dialysis 1994 – 2001

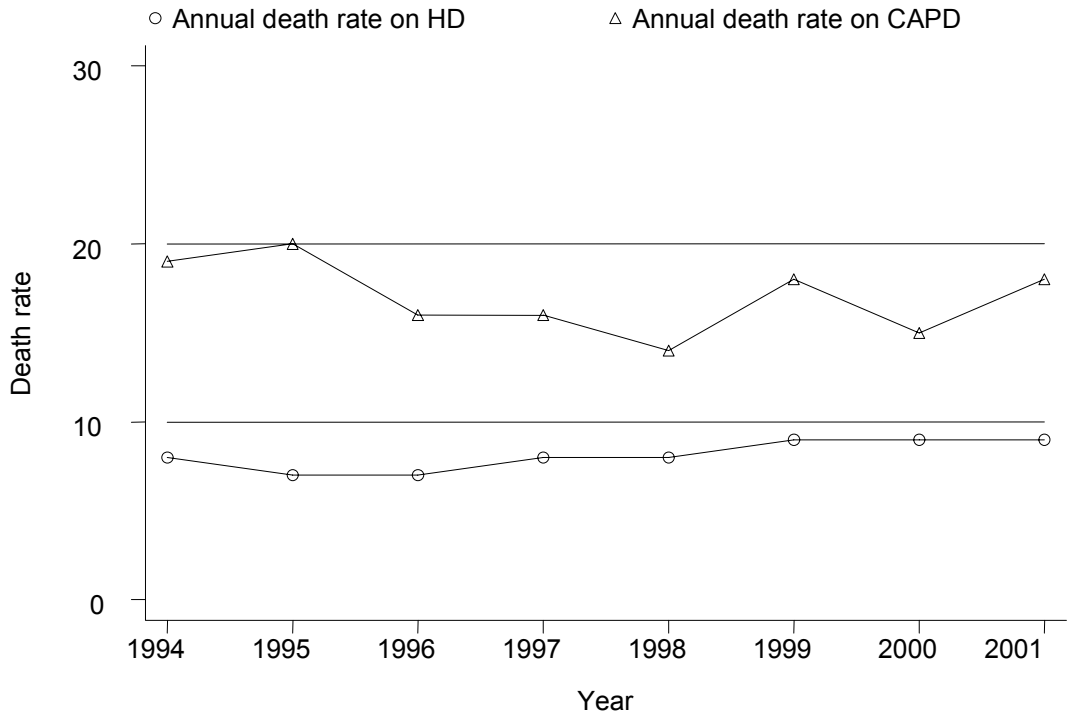


Table 2.11: Causes of Death on Dialysis 1998 - 2001

Year	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
Cardiovascular	122	33	157	33	200	36	244	34
Died at home	61	17	107	22	125	22	188	26
Sepsis	61	17	72	15	85	15	110	15
CAPD peritonitis	1	0	8	2	15	3	21	3
GIT bleed	8	2	13	3	10	2	14	2
Cancer	8	2	6	1	9	2	14	2
Liver disease	2	1	8	2	6	1	5	1
Others	78	21	86	18	101	18	75	10
Unknown	26	7	19	4	10	2	44	6
Total	367	100	476	100	561	100	715	100

2.6. DIALYSIS CENTRE, CAPACITY AND TREATMENT PROVISION

(Up-To- Date Results From Year 2001 Centre Survey, as at December 2001)

Table 2.12: Number of dialysis centres, number of HD machines and treatment capacity, HD capacity to patient ratio By State, December 2001

State	Centres (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
Selangor & F. Territory	66	692	122	3460	610	2253	397	1.54	2722	480
Johor	29	340	122	1700	611	1173	421	1.45	1298	466
Pulau Pinang	22	246	184	1230	920	717	536	1.72	834	624
Perak	20	255	118	1275	591	741	343	1.72	808	374
Kedah & Perlis	19	130	68	650	342	437	230	1.49	450	237
Sarawak	13	130	61	650	307	449	212	1.45	546	258
Melaka	10	135	208	675	1041	370	571	1.82	375	578
Sabah	10	64	24	320	118	253	93	1.26	288	106
Kelantan	9	77	57	385	286	161	120	2.39	169	126
Negeri Sembilan	8	81	92	405	461	242	275	1.67	314	357
Pahang	7	52	39	260	197	186	141	1.4	202	153
Trengganu Darul Iman	6	42	46	210	228	128	139	1.64	173	188
Malaysia	219	2244	96	11220	482	7110	306	1.58	8179	352

pmp = per million population

Figure 2.12 (a): Distribution of dialysis centres by State, December 2001

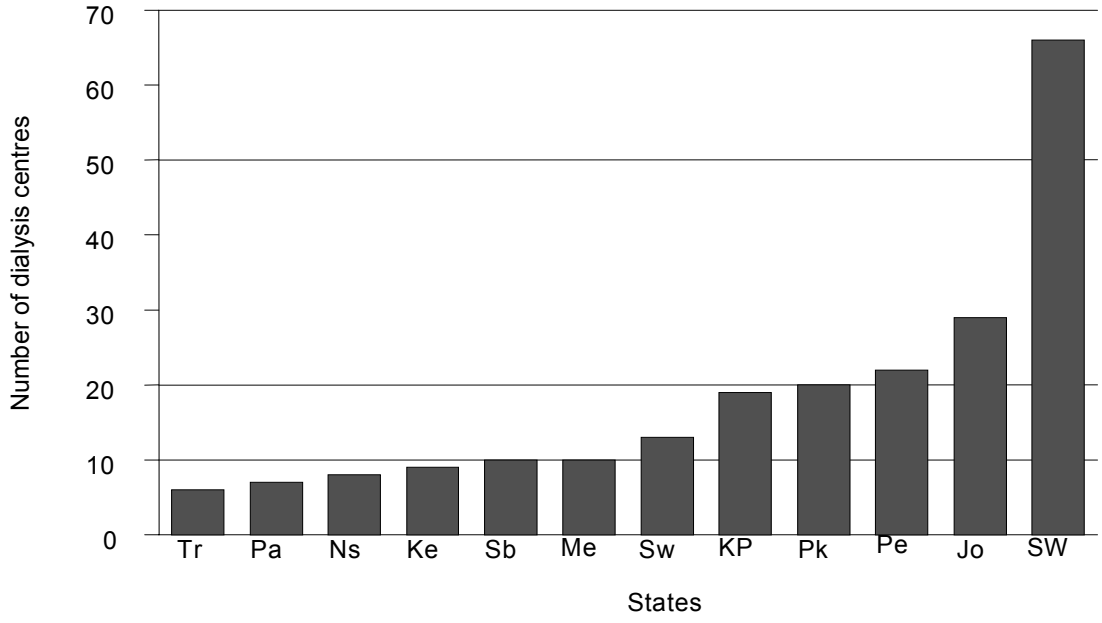


Figure 2.12 (b): Distribution of dialysis patients by State, December 2001

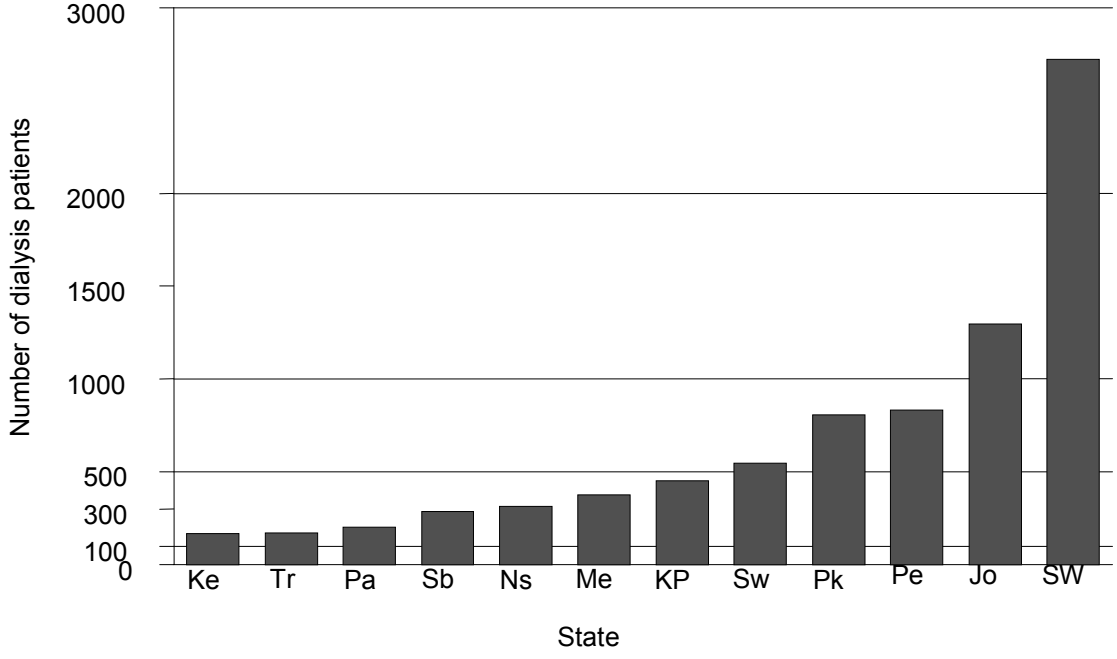


Figure 2.12 (c): Distribution of dialysis patients by State, December 2001

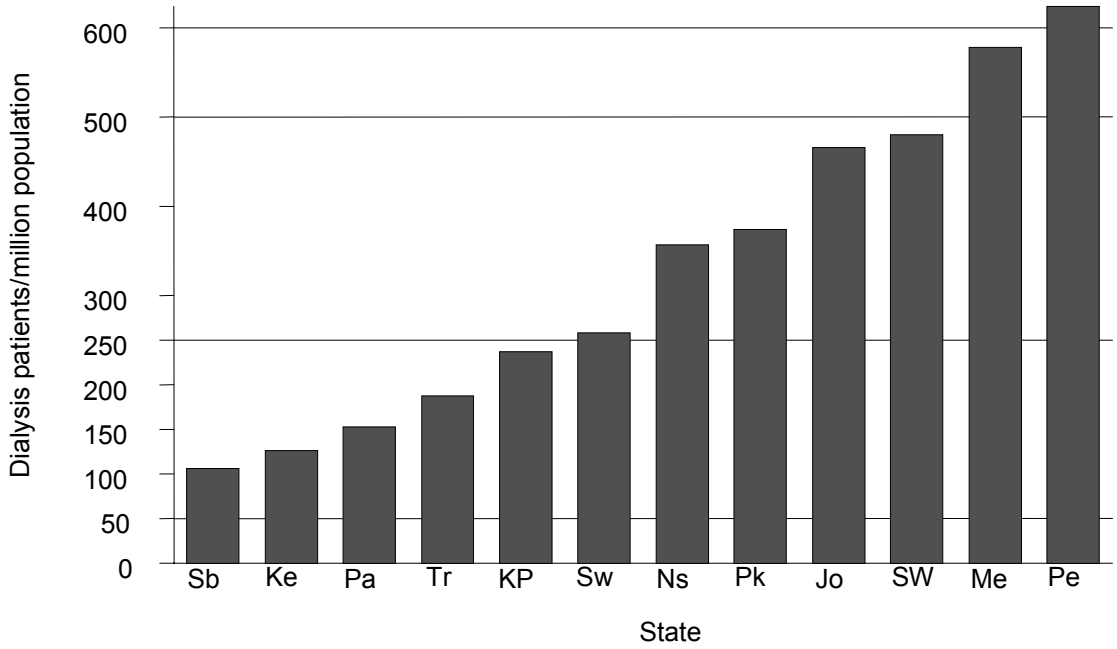


Figure 2.12 (d): HD capacity to patient ratio by State, December 2001

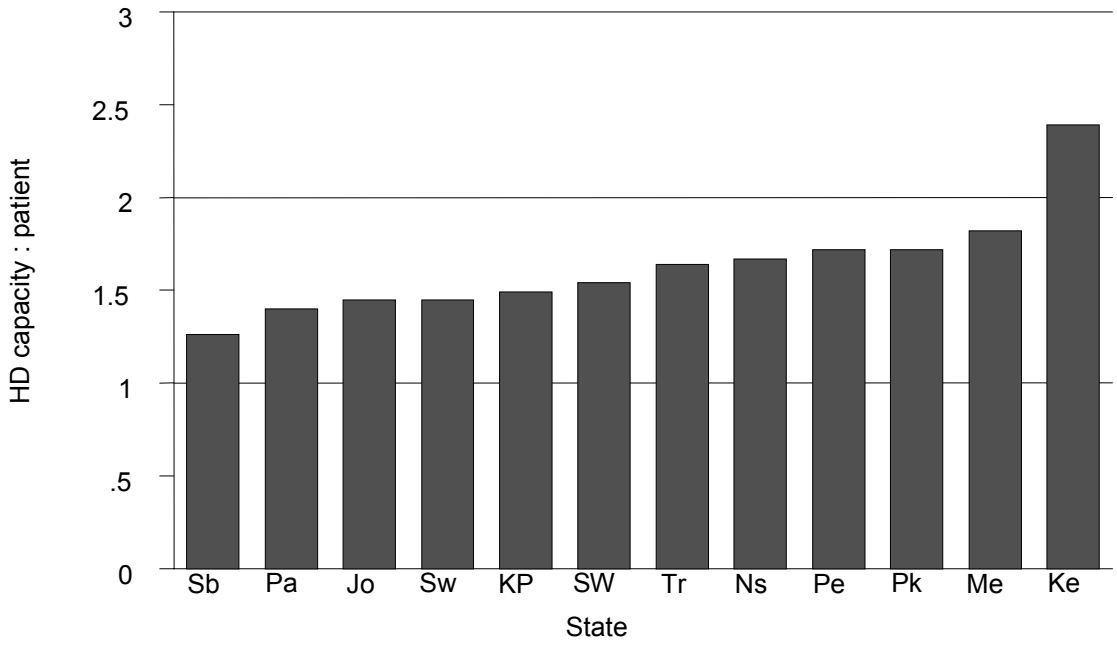


Table 2.13: Number of dialysis centres, dialysis patients and HD machines and treatment capacity, by sector December 2001

Sector	Centre (No.)	Centre HD machines (No.)	Centre HD capacity (No.)	Centre HD patients (No.)	Centre HD capacity : patient ratio	All dialysis patients (No.)
MOH	70	579	2895	2108	1.37	3102
NGO	61	830	4150	2620	1.58	2620
Private	74	750	3750	2216	1.69	2223
University	5	39	195	50	3.9	172
Armed Forces	9	46	230	116	1.98	116

Figure 2.13 (a): Distribution of dialysis centres by Sector, December 2001

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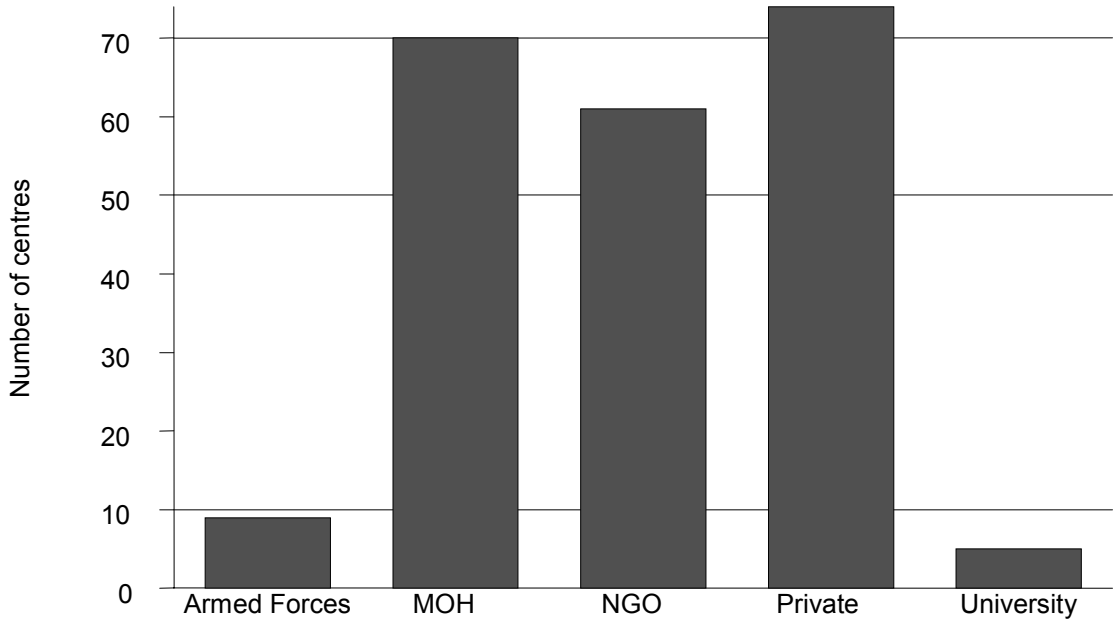


Figure 2.13 (b): Distribution of HD capacity by Sector, December 2001

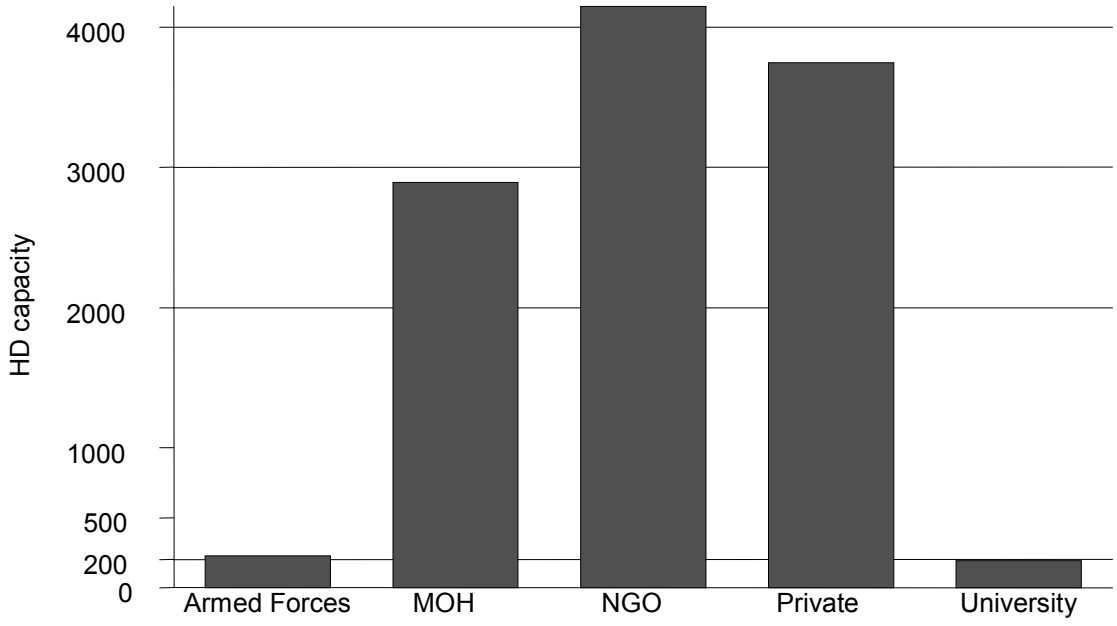


Figure 2.13 (c): Distribution of dialysis patients by Sector, December 2001

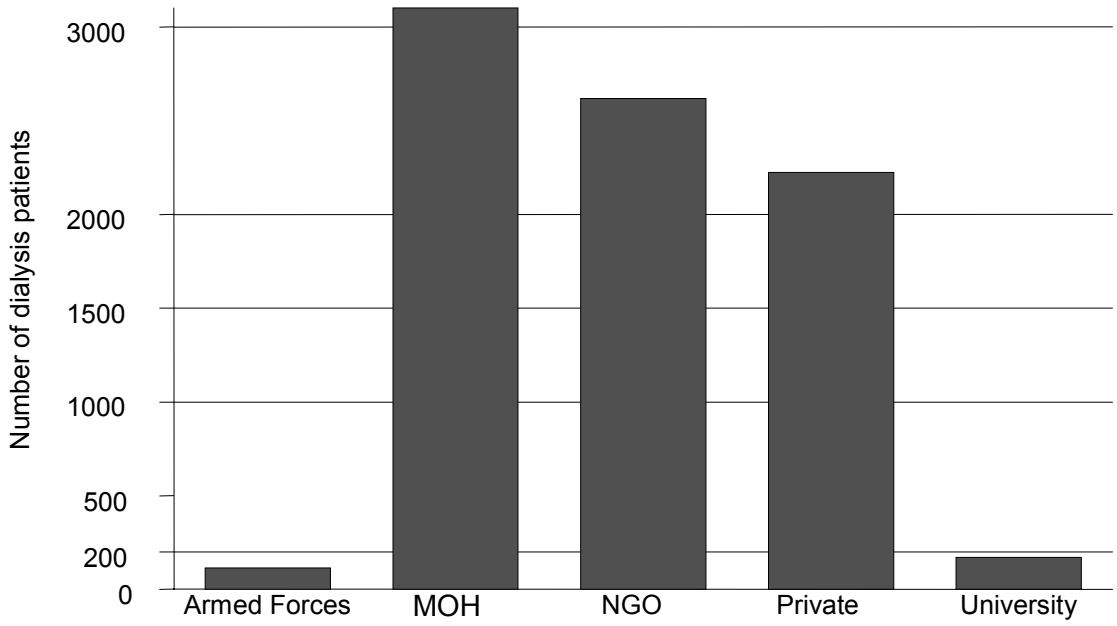
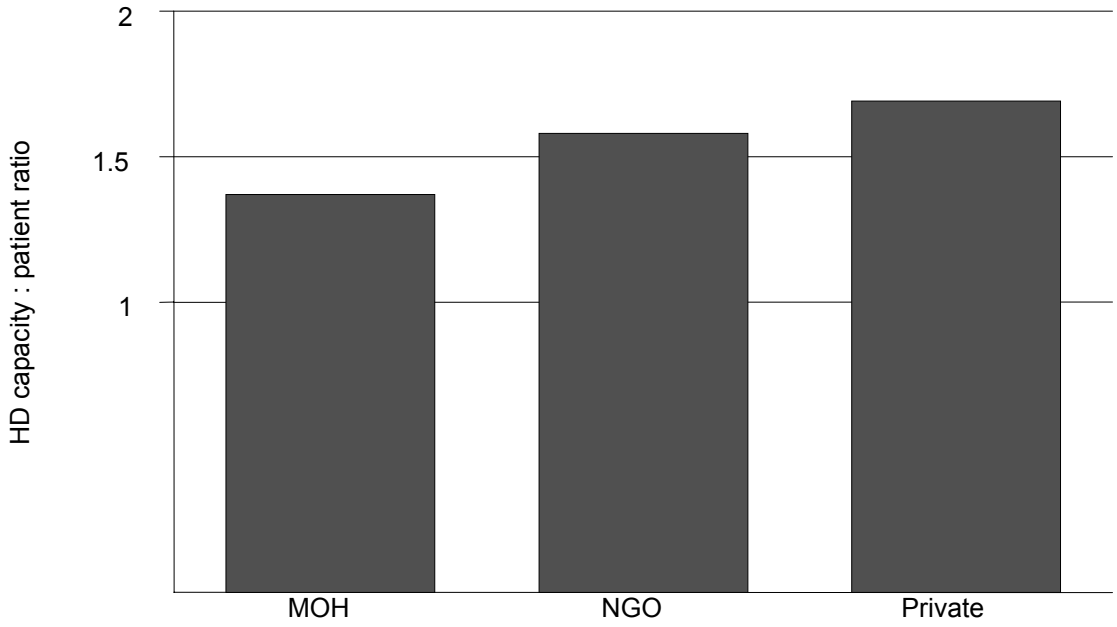


Figure 2.13 (d): HD capacity: patient ratio by Sector, December 2001



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

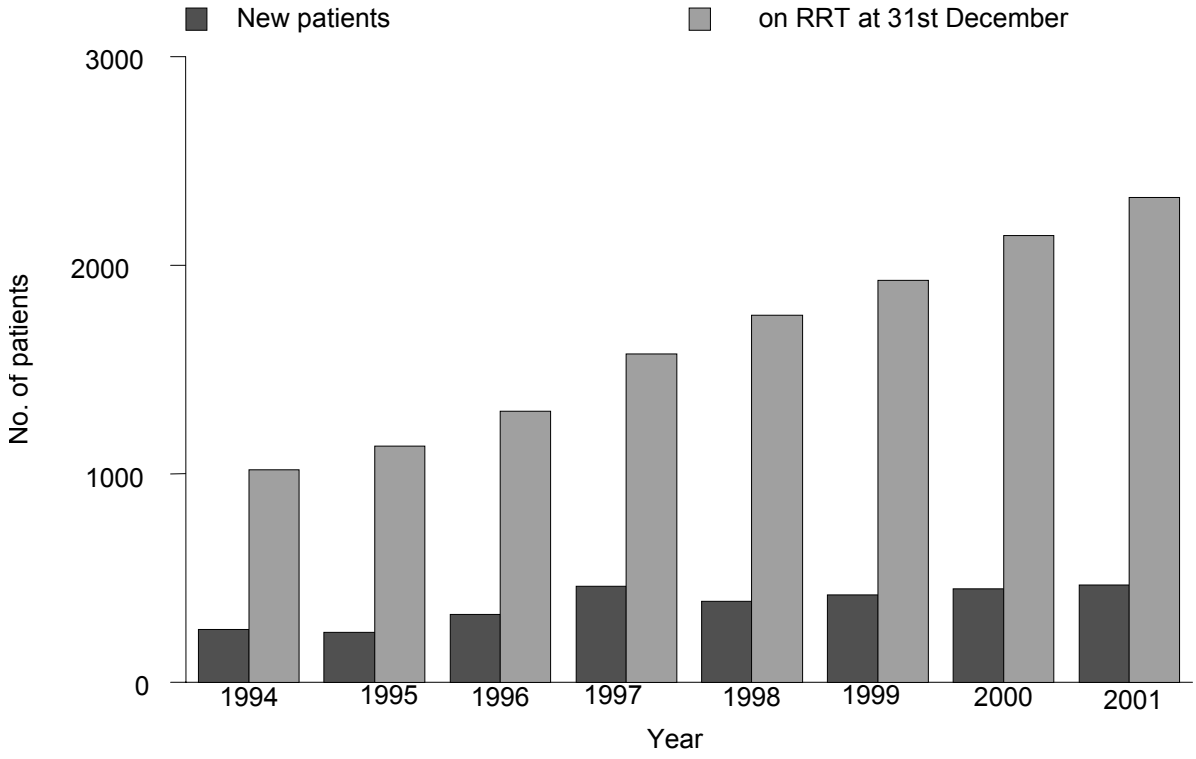
3.1 HAEMODIALYSIS IN GOVERNMENT CENTRES

3.1.1 STOCK AND FLOW

Table 3.1.01: Stock and flow of Haemodialysis Patients, Government Centres 1994 – 2001

Year	1994	1995	1996	1997	1998	1999	2000	2001
New patients	253	241	325	460	389	419	447	467
Died	79	85	115	138	159	208	198	205
Transferred to PD	7	13	7	9	6	12	7	28
Transplanted	30	26	35	34	30	26	26	41
Lost to follow up	0	6	1	4	7	5	3	9
On HD at 31st December	1020	1131	1298	1573	1760	1928	2140	2324

Figure 3.1.01: Stock and Flow HD patients, Government Centres 1994 – 2001



3.1.2 PLACE OF HAEMODIALYSIS AND ITS FINANCE

Table 3.1.02: Place for HD, Government Centres 1998 – 2001

Year	1998	1999	2000	2001
New patients	389	419	447	467
% Centre HD	94	94	96	93
% Home HD	1	1	1	3
% Office HD	5	5	3	4
On HD at 31st December	1760	1928	2140	2324
% Centre HD	86	87	89	90
% Home HD	4	3	2	2
% Office HD	11	10	8	8

Figure 3.1.02: Place of HD, Government Centres 1998- 2001

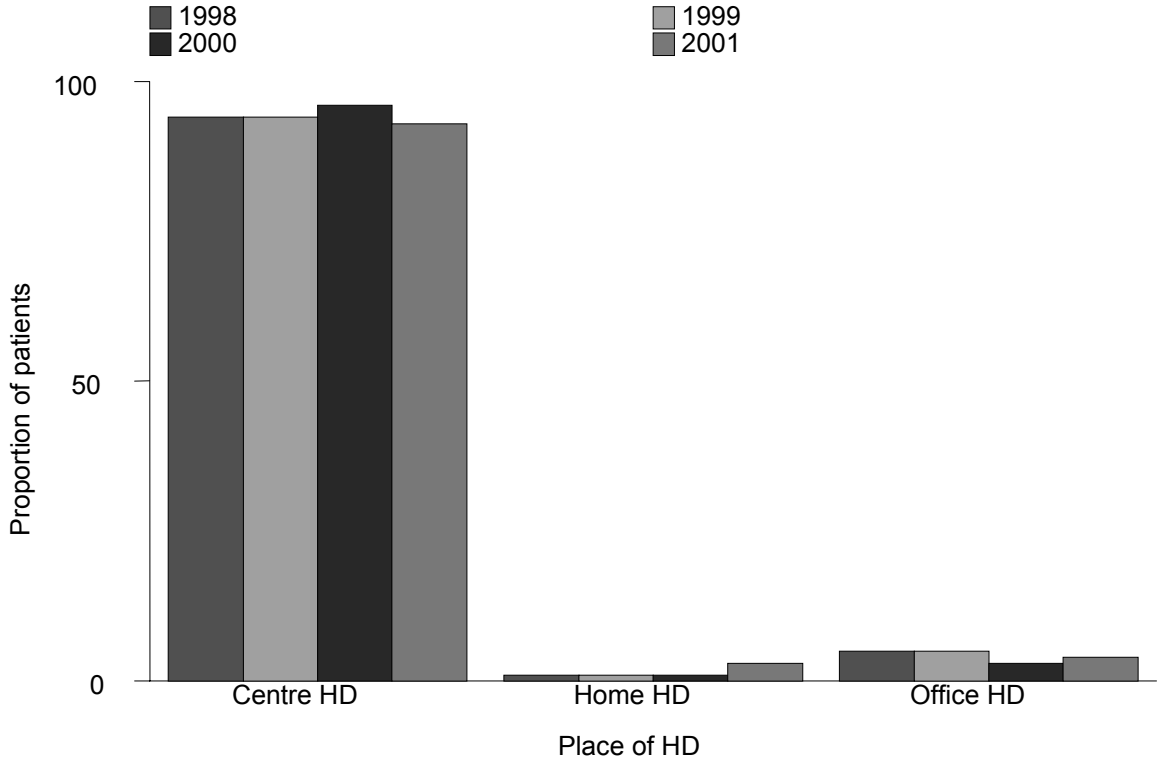
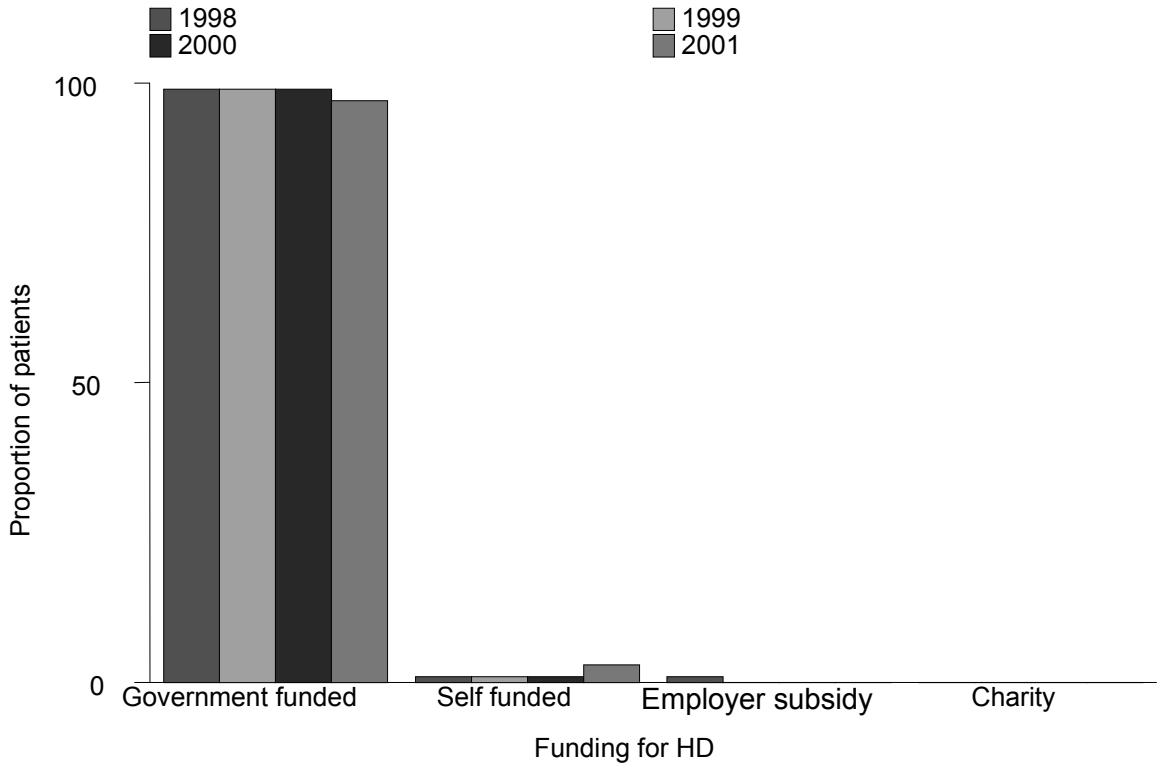


Table 3.1.03: Finance for HD, Government Centres 1998 – 2001

Year	1998	1999	2000	2001
New patients	389	419	447	467
Government funded	99	99	99	97
% Self funded	1	1	1	3
% Employer subsidy	1	0	0	0
% Charity	0	0	0	0
on HD at 31st December	1760	1928	2140	2324
% Government funded	97	98	98	98
% Self funded	2	2	1	1
% Employer subsidy	1	1	1	1
% Charity	0	0	0	0

Figure 3.1.03: Finance for new HD, Government Centres 1998 – 2001



3.1.3 DEATH ON HAEMODIALYSIS AND TRANSFER TO PERITONEAL DIALYSIS

Table 3.1.04: HD Death Rate and Transfer to PD, Government Centres 1994 – 2001

year	1994	1995	1996	1997	1998	1999	2000	2001
No. at risk	1020	1076	1215	1436	1667	1844	2034	2232
Deaths	79	85	115	138	159	208	198	205
Death rate %	8	8	9	10	10	11	10	9
Transfer to PD	7	13	7	9	6	12	7	28
Transfer to PD rate %	1	1	1	1	0	1	0	1
All Losses	86	98	122	147	165	220	205	233
All Losses rate %	8	9	10	10	10	12	10	10

Figure 3.1.04: Death Rate on HD, Government Centres 1994 – 2001

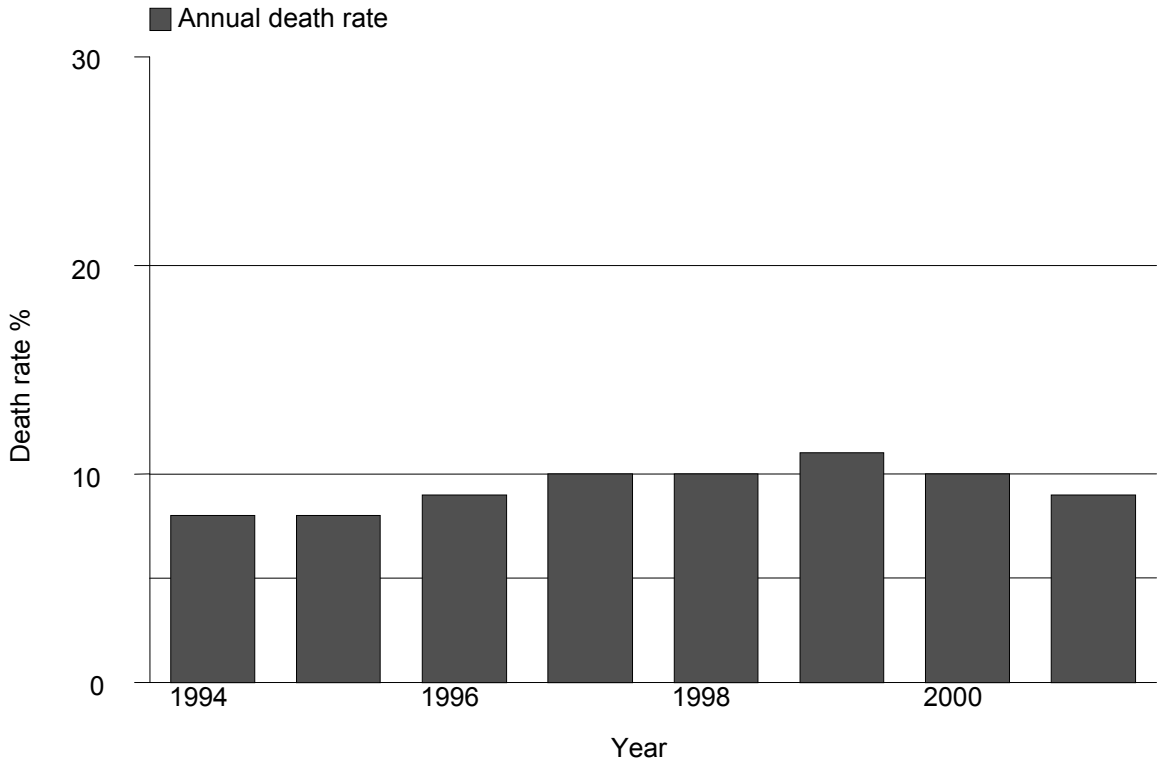


Table 3.1.05: Causes of Death on HD, Government Centres 1998 – 2001

Cause of death	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
Cardiovascular	50	31	79	38	72	36	84	41
Died at home	34	21	44	21	32	16	29	14
Sepsis	34	21	37	18	43	22	38	19
GIT bleed	5	3	6	3	6	3	4	2
Cancer	4	3	2	1	6	3	3	1
Liver disease	1	1	2	1	1	1	0	0
Others	22	14	33	16	34	17	27	13
Unknown	9	6	5	2	4	2	20	10
Total	159	100	208	100	198	100	205	100

3.1.4 GOVERNMENT HAEMODIALYSIS CENTRES

Table 3.1.07: Centre Distribution of HD patients, Government Centres 2001

	Centre	No	percent
	No. on RRT at 31st December	2324	100
1	801 Rumah Sakit Angkatan Tentera, Kuching	9	0
2	807 Rumah Sakit Angkatan Tentera, Sg Petani	7	0
3	810 Rumah Sakit Angkatan Tentera, Majidee	8	0
4	819 Rumah Sakit Angkatan Tentera, TUDM	4	0
5	94 Hospital Angkatan Tentera, Terendak	28	1
6	95 Hospital Angkatan Tentera, Kinrara	25	1
7	96 Hospital Angkatan Tentera, Lumut	14	1
8	Alor Setar Hospital	92	4
9	Baling Hospital	9	0
10	Banting Hospital	22	1
11	Batu Pahat Hospital	28	1
12	Beaufort Hospital	15	1
13	Besut Hospital	11	0
14	Bintulu Hospital	21	1
15	Bukit Mertajam Hospital	42	2
16	Butterworth Hospital	6	0
17	Duchess of Kent Hospital	35	2
18	Dungun Hospital	15	1
19	Ipoh Hospital	113	5
20	Kajang Hospital	25	1
21	Kangar Hospital	60	3
22	Kemaman Hospital	12	1
23	Keningau Hospital	26	1
24	Kluang Hospital	24	1
25	Kota Bharu Hospital	57	2
26	Kuala Krai Hospital	11	0
27	Kuala Lumpur Hospital	164	7
28	Kuala Lumpur Hospital (Paed.)	1	0
29	Kuala Nerang Hospital	6	0
30	Kuala Pilah Hospital	30	1
31	Kuala Terengganu Hospital	63	3
32	Kuching Hospital	97	4
33	Kulim Hospital	16	1
34	Labuan Hospital	24	1
35	Langkawi Hospital	15	1

36	Melaka Hospital	44	2
37	Mentakab Hospital	41	2
38	Miri Hospital	66	3
39	Muar Hospital	56	2
40	Pontian Hospital	11	0
41	Pulau Pinang Hospital	68	3
42	Pusat Hemodialisis KEMENTAH	14	1
43	Pusat Rawatan Angkatan Tentera Kota Bharu	11	0
44	Putrajaya Hospital	28	1
45	Queen Elizabeth Hospital	88	4
46	Raub Hospital	27	1
47	Segamat Hospital	31	1
48	Selayang Hospital	35	2
49	Seremban Hospital	60	3
50	Sg Bakap Hospital	3	0
51	Sibu Hospital	52	2
52	Sik Hospital	9	0
53	Sri Aman Hospital	12	1
54	Sultanah Aminah Hospital	114	5
55	Sungai Petani Hospital	35	2
56	Taiping Hospital	34	1
57	Tanah Merah Hospital	14	1
58	Tanjung Karang Hospital	11	0
59	Tanjung Malim Hospital	9	0
60	Tawau Hospital	64	3
61	Teluk Intan Hospital	26	1
62	Tengku Ampuan Afzan Hospital, Kuantan	50	2
63	Tengku Ampuan Rahimah Hospital, Klang	70	3
64	Tg. Ampuan Jemaah Hospital, Sabak Bernam	11	0
65	Universiti Kebangsaan Malaysia Hospital	24	1
66	Universiti Sains Malaysia Hospital	6	0
67	University Malaya Medical Centre	56	2
68	Yan Hospital	9	0

3.1.5 HAEMODIALYSIS PATIENTS' CHARACTERISTICS

Table 3.1.08: Age Distribution of HD patients, Government Centres 1998 – 2001

Year	1998	1999	2000	2001
New patients	389	419	447	467
% 1-14 years	1	1	2	1
% 15-24 years	8	9	8	7
% 25-34 years	13	12	13	10
% 35-44 years	21	16	18	19
% 45-54 years	27	32	24	29
% 55-64 years	22	23	26	23
% ≥65 years	8	7	9	10
Dialysing at 31st December	1760	1928	2140	2324
% 1-14 years	1	1	1	1
% 15-24 years	8	8	8	8
% 25-34 years	19	18	18	17
% 35-44 years	26	25	24	24
% 45-54 years	24	25	25	25
% 55-64 years	18	18	18	18
% ≥65 years	5	5	5	5

Table 3.1.09: HD Patient Characteristics, Government Centres 1998 – 2001

Year	1998	1999	2000	2001
New patients	389	419	447	467
Mean age ± sd	46±14	46±15	46±15	47±14
% Male	61	64	59	56
% Diabetic	32	32	31	37
% HbsAg+	6	7	7	5
% Anti-HCV+	11	6	5	3

3.1.6 SURVIVAL ANALYSIS – GOVERNMENT CENTRES

Table 3.1.10: HD patient Survival related to Year of Entry, Government Centres 1996 – 2001

Year	1996			1997			1998		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	95	1	299	93	1	420	94	1	358
12	91	2	277	88	2	391	90	2	335
24	86	2	246	82	2	354	81	2	301
36	77	2	217	75	2	323	75	2	268
48	69	3	191	68	2	279			
60	64	3	163						
Year	1999			2000			2001		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	91	1	377	92	1	406	90	2	233
12	85	2	348	89	1	380			
24	80	2	313						

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

Figure 3.1.10: HD patient Survival related to Year of Entry, Government Centres 1997– 2001

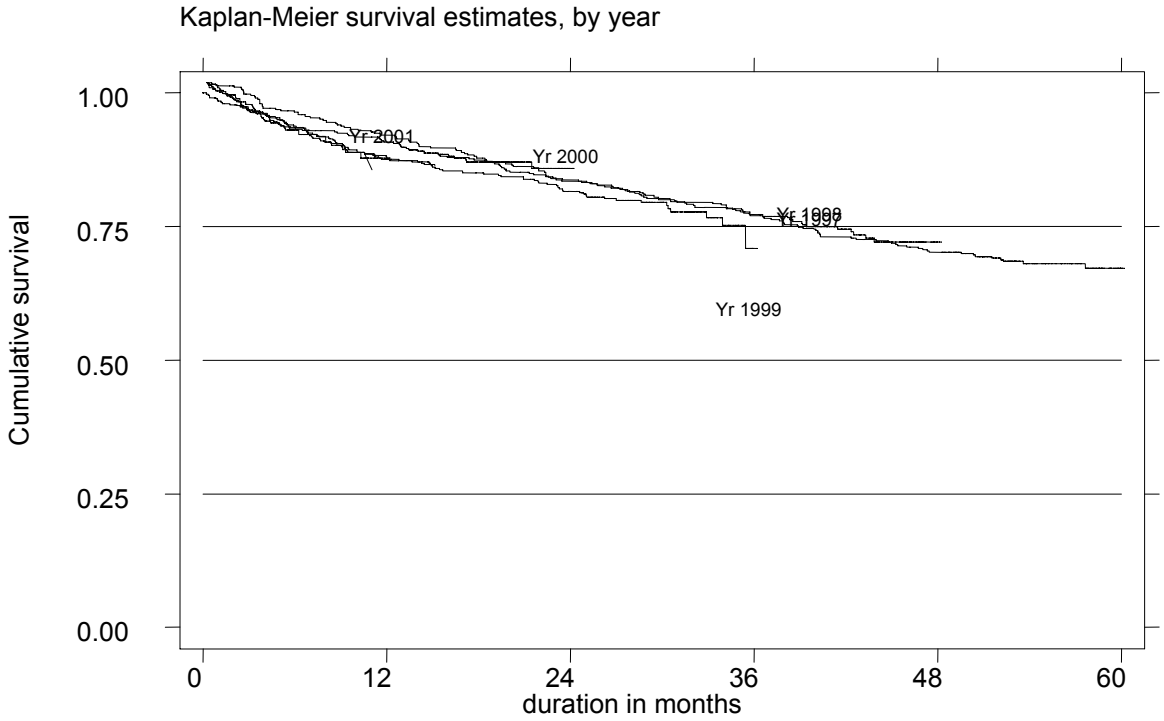
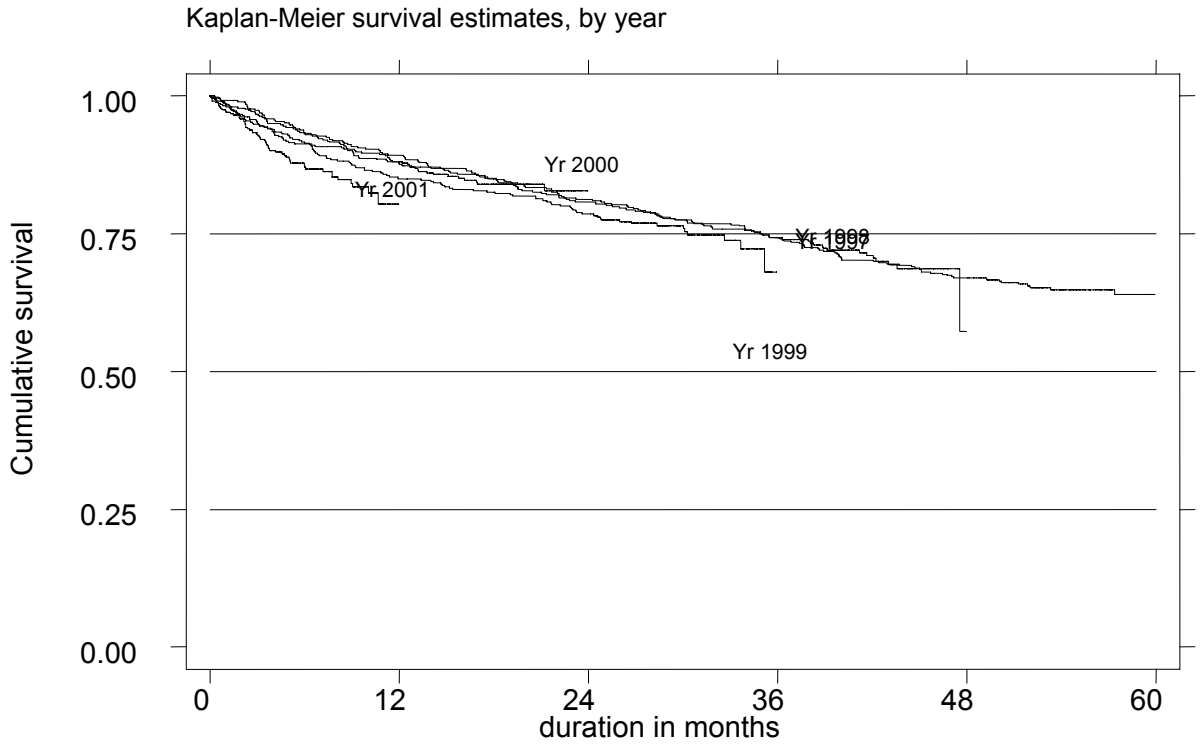


Table 3.1.11: HD Technique Survival related to Year of Entry, Government Centres 1996– 2001

Year	1996			1997			1998		
Interval	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	95	1	299	93	1	420	93	1	358
12	91	2	277	88	2	391	89	2	335
24	84	2	246	81	2	354	81	2	301
36	75	3	217	74	2	323	74	2	268
48	67	3	191	67	2	279			
60	62	3	163						
Year	1999			2000			2001		
Interval	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	91	1	377	91	1	406	87	2	233
12	85	2	348	88	2	380			
24	79	2	312						

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

Figure 3.1.11: HD Technique Survival by Year of Entry, Government Centres 1997 – 2001



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 1998 – 2001

REHABILITATION	1998		1999		2000		2001	
STATUS	No.	%	No.	%	No.	%	No.	%
Full time work for pay	513	40	604	35	624	33	682	32
Part time work for pay	116	9	160	9	222	12	196	9
Able to work but unable to get a job	45	3	48	3	75	4	105	5
Able to work but not yet due to dialysis schedule	19	1	53	3	44	2	51	2
Able but disinclined to work	9	1	30	2	35	2	38	2
Home maker	262	20	357	21	413	22	482	23
Full time student	15	1	24	1	44	2	49	2
Age<15 years	3	0	4	0	6	0	6	0
Retired	156	12	202	12	197	10	202	10
Age>65 years	84	7	98	6	126	7	152	7
Unable to work due to poor health	68	5	138	8	115	6	142	7
Total	1290	100	1718	100	1901	100	2105	100

Table 3.1.13: Quality of Life on Haemodialysis, Government Centres 1998 – 2001

QOL Index Summated Score	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
0 (Worst QOL)	1	0	2	0	1	0	1	0
1	1	0	2	0	2	0	2	0
2	5	0	6	0	7	0	6	0
3	8	1	12	1	10	1	10	0
4	21	2	26	2	32	2	31	1
5	36	3	55	3	54	3	65	3
6	59	5	70	4	75	4	93	4
7	57	5	110	7	122	7	108	5
8	89	7	125	7	145	8	180	9
9	95	8	172	10	182	10	165	8
10 (Best QOL)	890	71	1099	65	1246	66	1440	69
Total	1262	100	1679	100	1876	100	2101	100

3.1.8 HAEMODIALYSIS PRACTICES IN GOVERNMENT CENTRES

Table 3.1.14: Vascular Access on Haemodialysis, Government Centres 1998 – 2001

Access types	1998		1999		2000		2001	
	No	%	No	%	No	%	No	%
Wrist AVF	1352	83	1481	80	1655	79	1727	76
BCF*	224	14	294	16	361	17	460	20
Venous graft	3	0	2	0	5	0	4	0
Artificial graft	17	1	23	1	10	0	20	1
PERMCATH	8	0	12	1	14	1	13	1
Temporary CVC*	32	2	49	3	43	2	53	2
Total	1636	100	1861	100	2088	100	2277	100

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

Table 3.1.15: Difficulties reported with Vascular Access, Government Centres 1998 – 2001

Access difficulty	1998		1999		2000		2001	
	No	%	No	%	No	%	No	%
Difficulty with needle placement	67	4	98	5	78	4	90	4
Difficulty in obtaining desired blood flow rate	36	2	59	3	69	3	76	3
Other difficulty	18	1	28	1	14	1	19	1
No difficulty	1524	93	1682	90	1934	92	2104	92
Total	1645	100	1867	100	2095	100	2289	100

Table 3.1.16: Complications reported with Vascular Access, Government Centres 1998 – 2001

Complication	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
thrombosis	59	4	91	5	79	4	92	4
bleed	26	2	14	1	9	0	15	1
aneurysmal dilatation	118	7	123	7	122	6	108	5
swollen limb	20	1	21	1	19	1	23	1
access related infection, local/systemic	13	1	19	1	31	1	16	1
distal limb ischaemia	4	0	7	0	2	0	5	0
venous outflow obstruction	25	2	29	2	33	2	38	2
carpal tunnel	11	1	23	1	26	1	14	1
other	28	2	22	1	21	1	24	1
no complication	1342	82	1518	81	1752	84	1953	85
Total	1646	100	1867	100	2094	100	2288	100

Table 3.1.17: Blood Flow Rates in Government HD Units 1998– 2001

Blood flow rates	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
<150 ml/min	4	0	4	0	4	0	2	0
150-199 ml/min	28	2	43	2	38	2	17	1
200-249 ml/min	503	31	433	24	387	19	271	12
250-299 ml/min	786	49	950	52	933	46	894	40
300-349 ml/min	268	17	374	21	595	29	875	39
> 350 ml/min	27	2	20	1	76	4	185	8
Total	1616	100	1824	100	2033	100	2244	100

Table 3.1.18: Number of HD Sessions per week, Government HD Units 1998 – 2001

HD sessions	1998		1999		2000		2001	
Per week	No.	%	No.	%	No.	%	No.	%
1	1	0	1	0	1	0	0	0
2	2	0	16	1	17	1	10	0
3	1638	100	1844	99	2068	99	2268	99
4	2	0	1	0	3	0	11	0
Total	1643	100	1862	100	2091	100	2289	100

Table 3.1.19: Duration of HD in Government Units 1998 – 2001

Duration of HD	1998		1999		2000		2001	
per session	No.	%	No.	%	No.	%	No.	%
≤3 hours	3	0	2	0	6	0	1	0
3.5 hours	16	1	0	0	1	0	20	1
4 hours	1523	93	1732	93	1973	94	2212	97
4.5 hours	87	5	106	6	96	5	52	2
5 hours	8	0	22	1	12	1	5	0
≥5 hours	3	0	0	0	1	0	0	0
Total	1640	100	1862	100	2089	100	2290	100

Table 3.1.20: Dialyser membrane types in Government HD Units 1998 – 2001

Dialyser	1998		1999		2000		2001	
membrane	No.	%	No.	%	No.	%	No.	%
Cellulosic	784	53	514	37	491	31	390	22
Cellulose acetate	318	22	319	23	300	19	168	10
Synthetic	369	25	542	39	812	51	1189	68
Total	1471	100	1375	100	1603	100	1747	100

Table 3.1.21: Dialyser Reuse Frequency in Government HD Units 1998- 2001

Dialyser reuse	1998		1999		2000		2001	
frequency	No.	%	No.	%	No.	%	No.	%
1*	13	1	15	1	14	1	13	1
2	4	0	5	0	11	1	7	0
3	170	11	117	7	100	5	125	6
4	99	7	96	5	116	6	89	4
5	102	7	121	7	75	4	107	5
6	748	50	925	53	998	51	730	34
7	36	2	41	2	63	3	67	3
8	63	4	79	5	122	6	122	6
9	108	7	173	10	63	3	83	4
10	70	5	66	4	76	4	223	10
11	23	2	5	0	3	0	38	2
12	63	4	106	6	280	14	372	17
≥13	0	0	0	0	44	2	153	7
Total	1499	100	1749	100	1965	100	2129	100

1* is single use i.e. no reuse

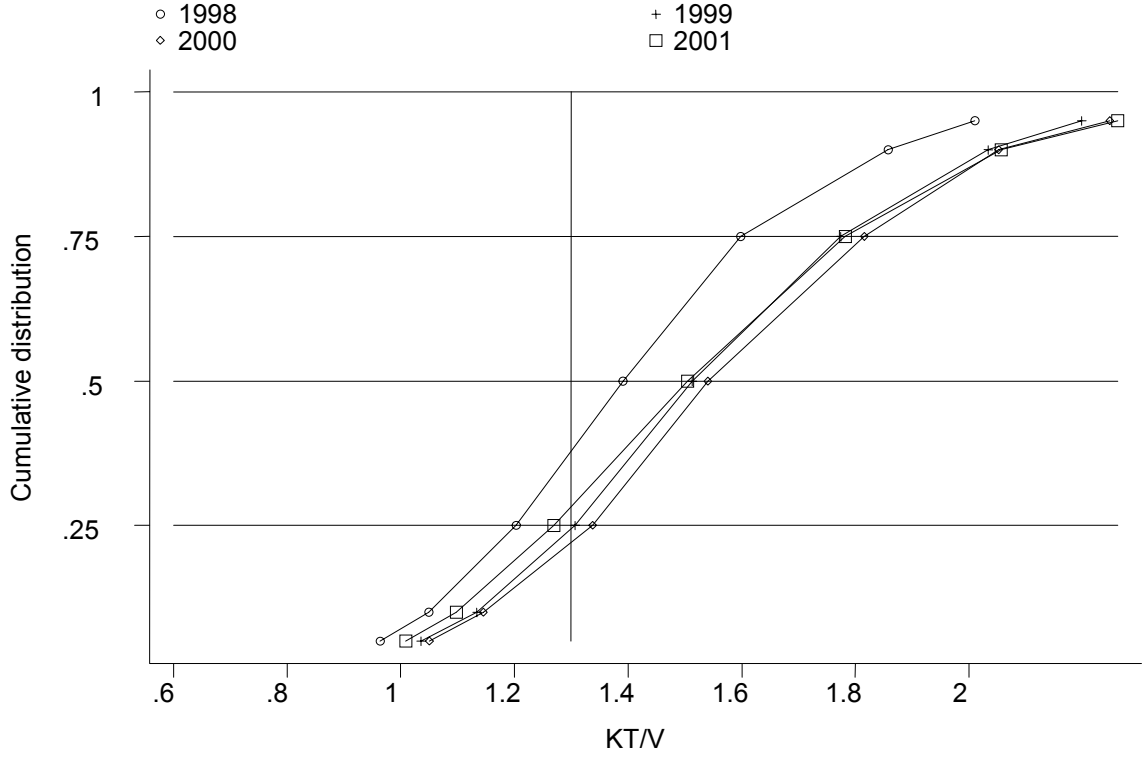
Table 3.1.22: Dialysate Buffer used in Government HD Units 1998 – 2001

Dialysate buffer	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
Acetate	536	33	434	23	273	13	165	7
Bicarbonate	1082	67	1429	77	1806	87	2118	93
Total	1618	100	1863	100	2079	100	2283	100

Table 3.1.23: Distribution of Prescribed KT/V, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% > 1.3
1998	1580	16347	1.4	1.2	1.6	63
1999	1778	17940	1.5	1.3	1.8	76
2000	1973	20477	1.5	1.3	1.8	79
2001	2196	22541	1.5	1.3	1.8	72

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 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients < 5.3 mmol/l
1998	1040	1698	5	4.2	5.9	64
1999	1526	2499	4.8	4	5.7	69
2000	1708	2832	4.8	4.1	5.7	69
2001	1979	3386	4.9	4.2	5.8	67

Figure 3.1.24: Cumulative distribution of serum cholesterol concentration by year

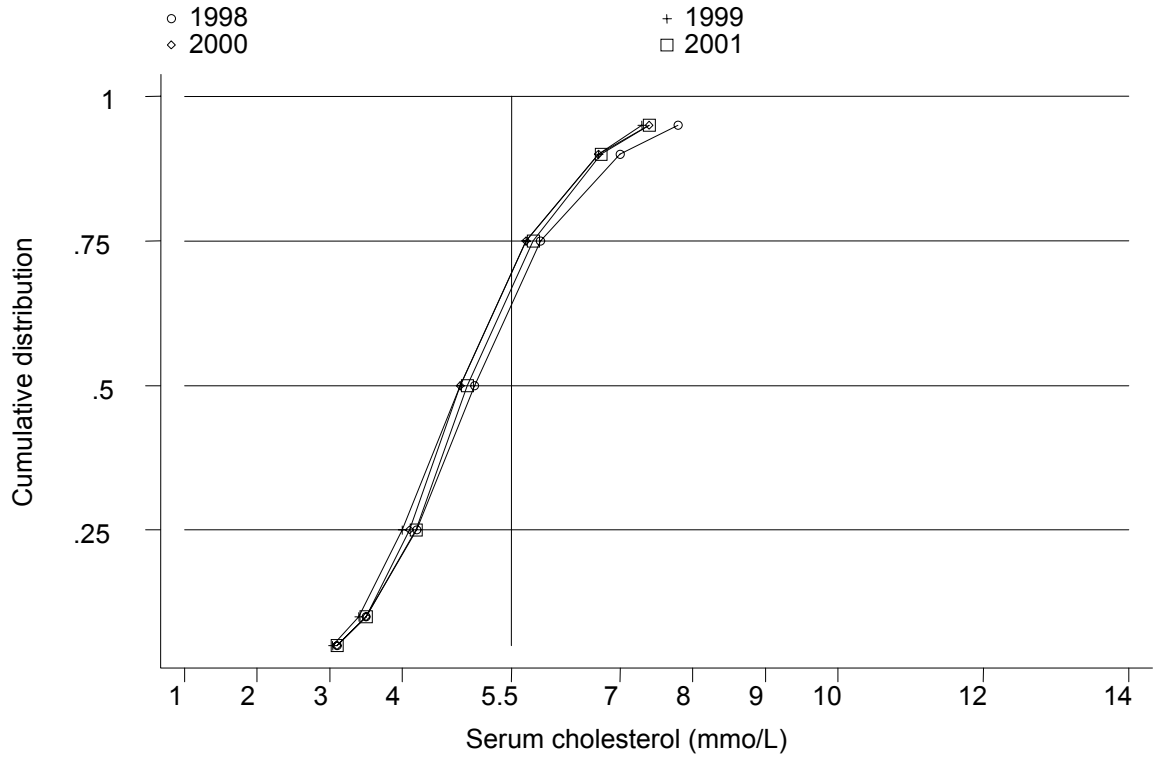


Table 3.1.25: Distribution of serum Triglyceride (mmol/l), HD patients, Government Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients < 3.5 mmol/l
1998	979	1579	1.8	1.2	2.6	86
1999	1415	2248	1.7	1.2	2.5	88
2000	1565	2583	1.7	1.2	2.5	88
2001	1871	3191	1.7	1.2	2.5	87

Figure 3.1.25: Cumulative distribution of serum triglyceride concentration by year

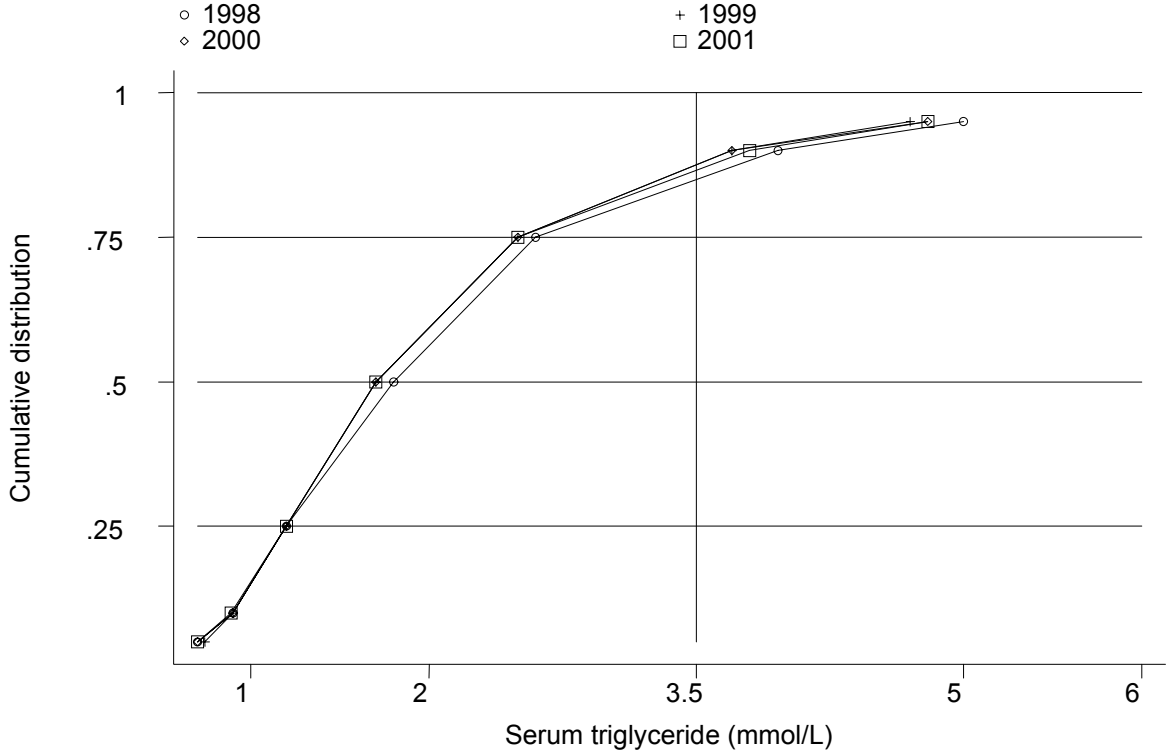


Table 3.1.26: Distribution of serum LDL (mmol/l), HD patient, Government Centres 1998– 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients <5 mmol/l
1998	468	723	3	2.2	3.9	92
1999	722	1020	3	2.3	3.9	93
2000	921	1496	2.9	2.2	3.7	94
2001	1281	2064	2.9	2.2	3.7	95

Figure 3.1.26 : Cumulative distribution of serum LDL concentration by year

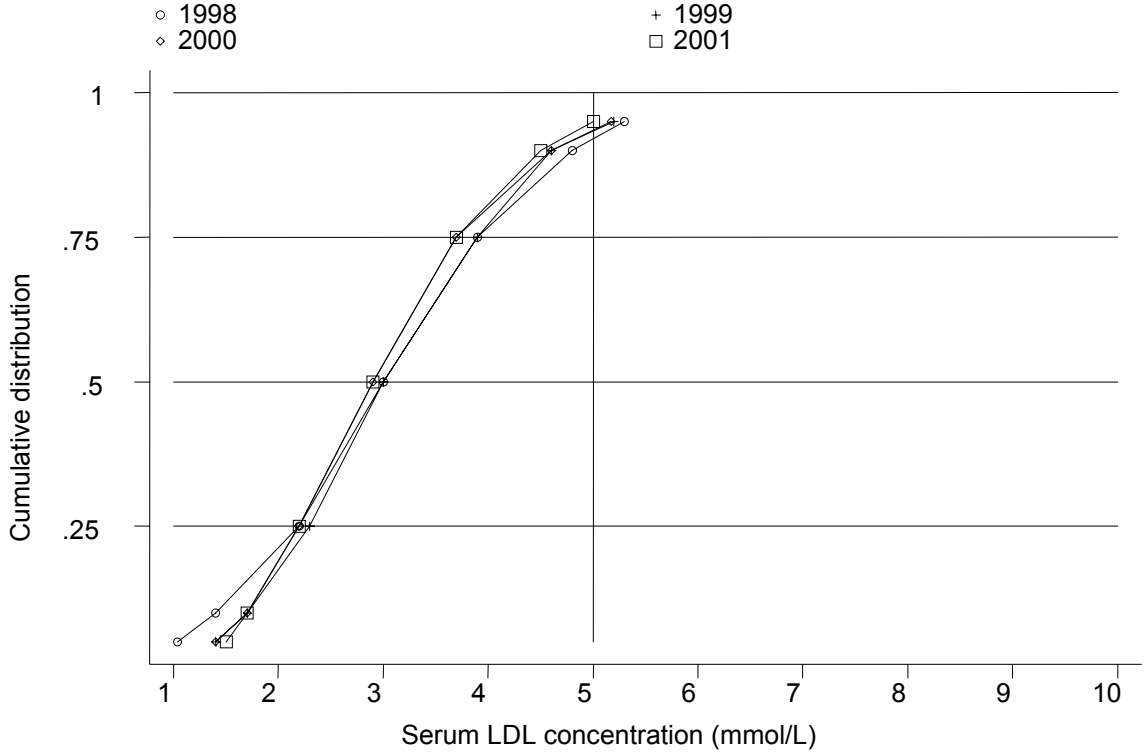
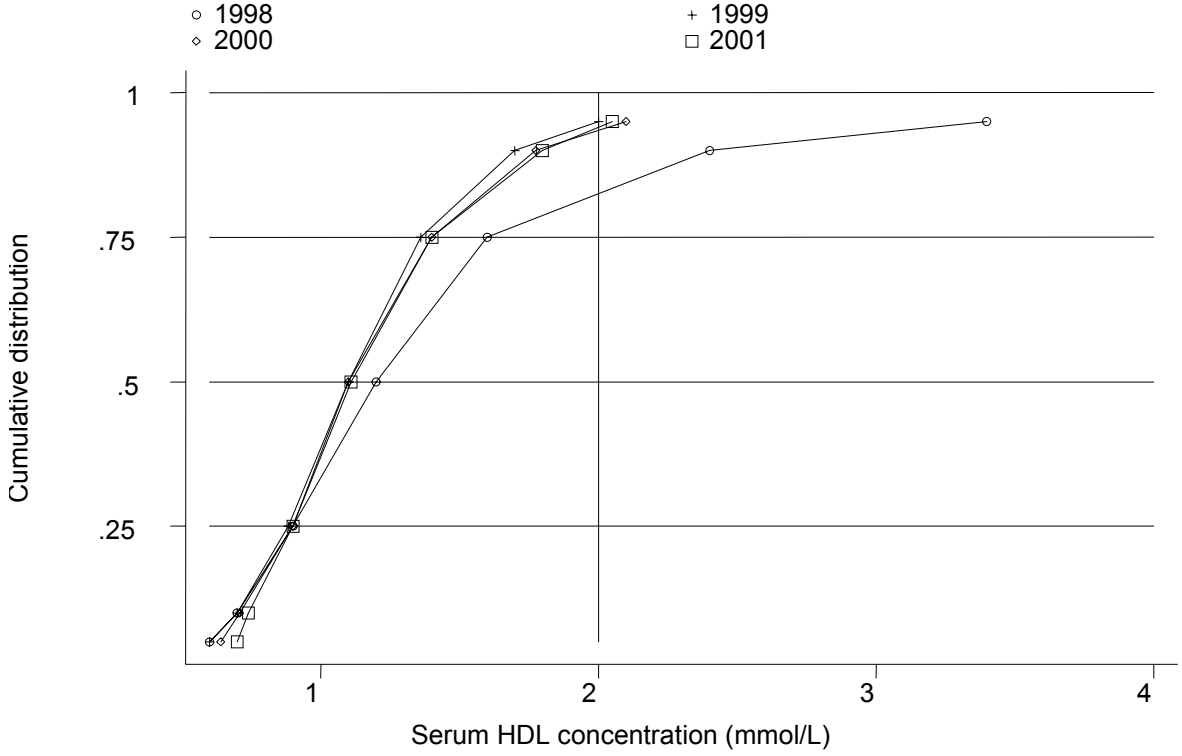


Table 3.1.27: Distribution of serum HDL (mmol/l), HD patient, Government Centres 1998- 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients < 2mmol/l
1998	473	738	1.2	.9	1.6	84
1999	737	1052	1.1	.9	1.4	95
2000	945	1530	1.1	.9	1.4	93
2001	1273	2071	1.1	.9	1.4	94

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 1998 – 2001

year	No of subjects	% on $CaCO_3$	% on $Al(OH)_3$	% on Vit D
1998	1657	90	18	28
1999	1878	91	9	24
2000	2102	92	8	24
2001	2305	93	4	22

Table 3.1.29: Distribution of serum Phosphate (mmol/l), HD patients, Government Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients <1.6 mmol/l
1998	1591	5236	1.9	1.5	2.3	30
1999	1821	5846	1.8	1.4	2.3	36
2000	2037	6594	1.8	1.4	2.3	36
2001	2219	7284	1.8	1.4	2.3	36

Figure 3.1.29: Cumulative distribution of serum Phosphate by year

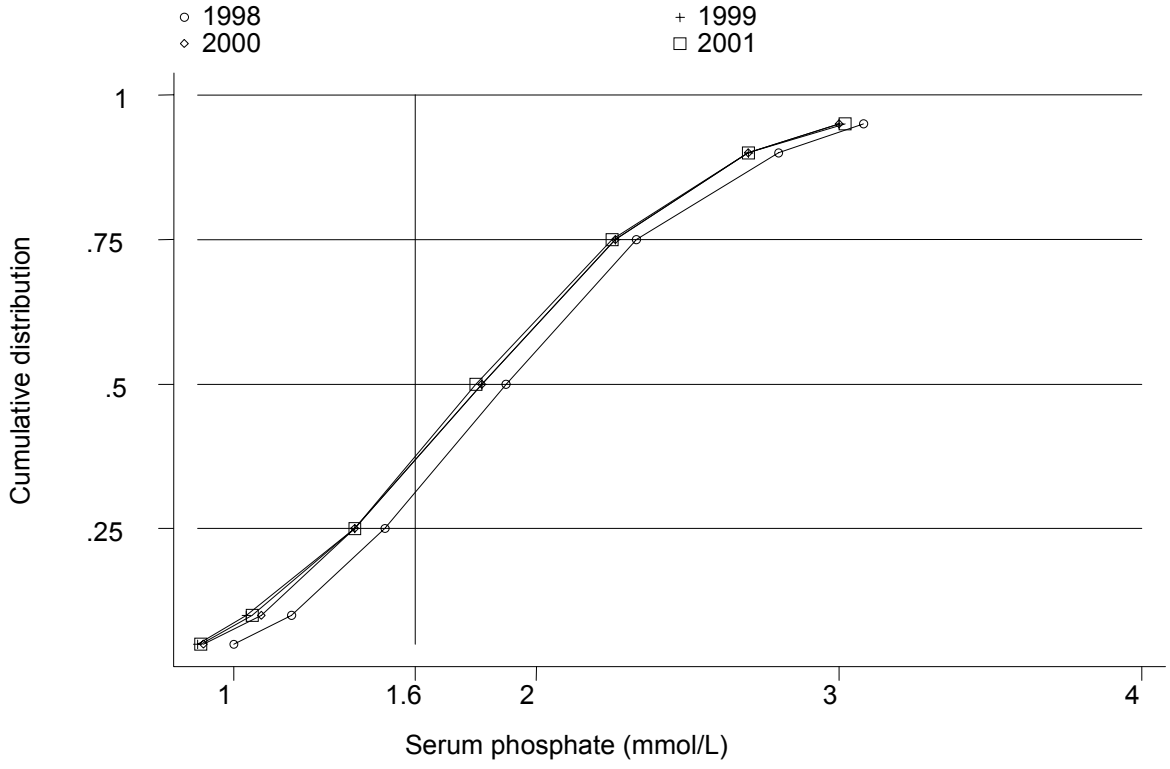


Table 3.1.30: Distribution of serum Calcium (mmol/l), HD patients, Government Centres 1998– 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients ≥ 2.2 & ≤2.6 mmol/l
1998	1621	5342	2.3	2.2	2.5	53
1999	1835	5972	2.3	2.1	2.5	52
2000	2049	6698	2.3	2.2	2.5	56
2001	2249	7437	2.4	2.2	2.5	57

Figure 3.1.30: Cumulative distribution of serum Calcium by year

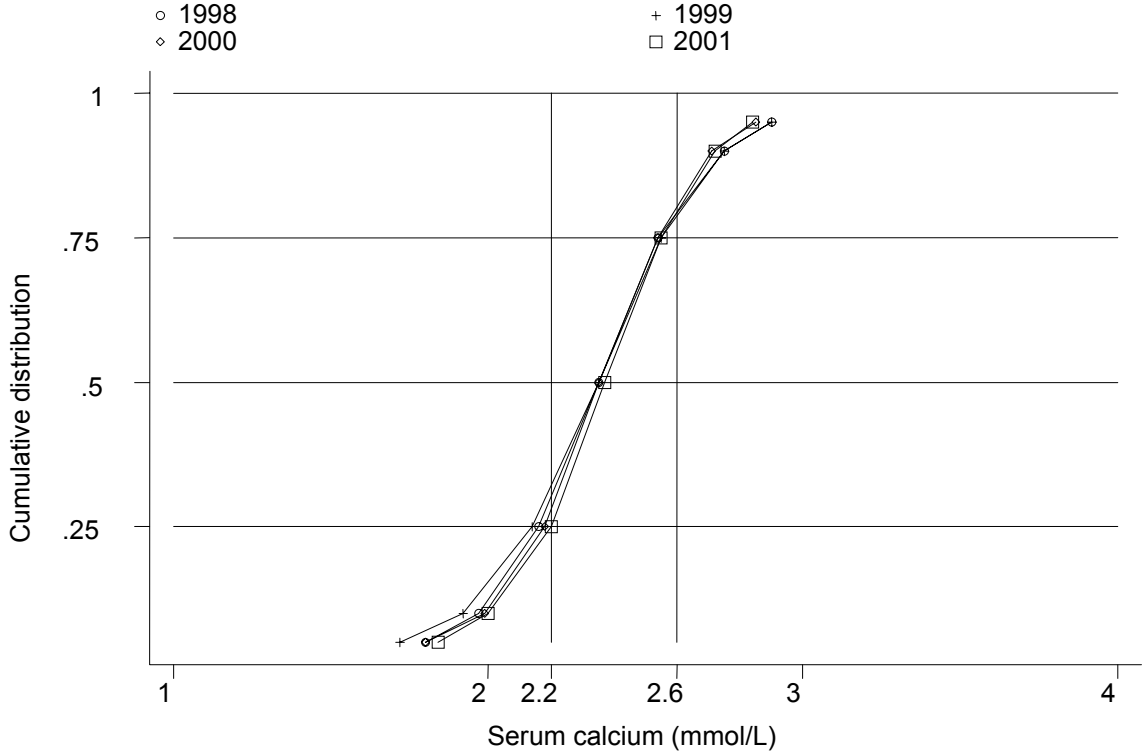
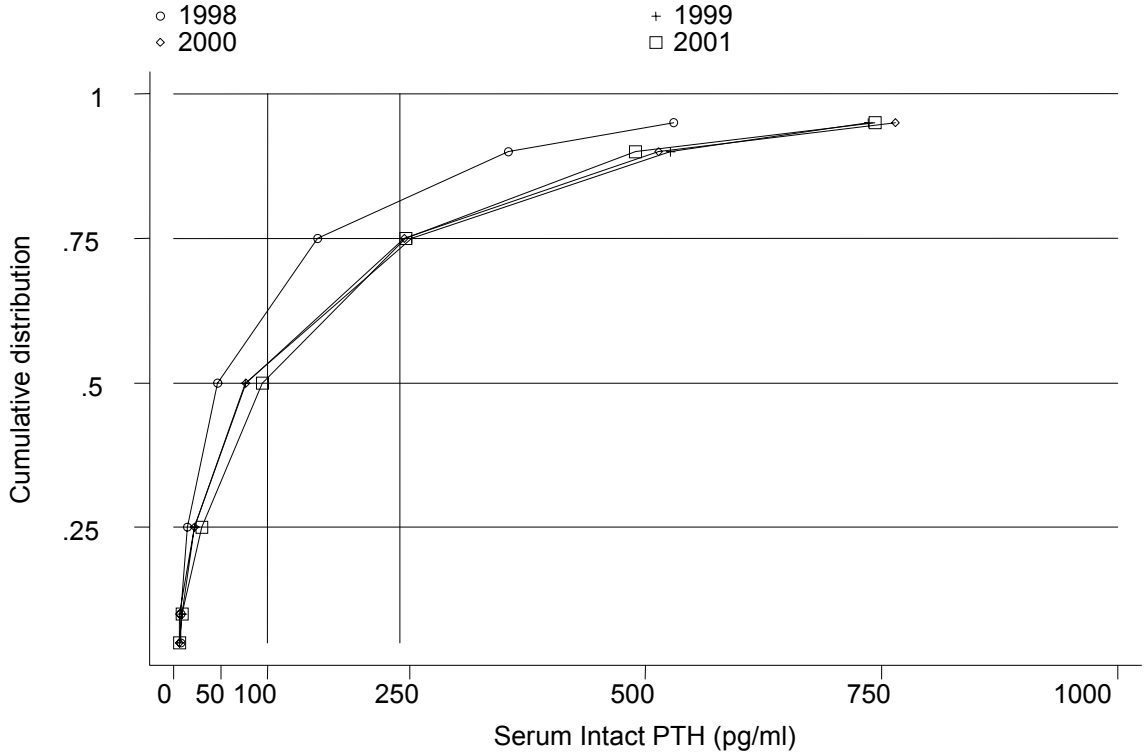


Table 3.1.31: Distribution of serum iPTH(ng/L), HD patients, Government Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients ≥ 100 & ≤ 250 ng/l
1998	736	994	47	15	153	16
1999	1201	1814	76.2	22	252	19
2000	1534	2367	77	22	245	18
2001	1704	2724	94	30	246	23

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 1998 – 2001

year	No.	% on anti-hypertensives	% on 1 anti-hypertensives	% on 2 anti-hypertensives	% on 3 anti-hypertensives
1998	1657	63	36	20	7
1999	1878	67	35	24	8
2000	2102	67	37	22	8
2001	2305	67	34	24	9

Table 3.1.33: Distribution of Systolic BP without anti-hypertensives, HD patients, Government Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients < 160 mmHg
1998	599	6370	130	117	148	86
1999	613	6285	130	118	148	88
2000	695	7358	131	118	148	86
2001	759	7824	133	120	150	85

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

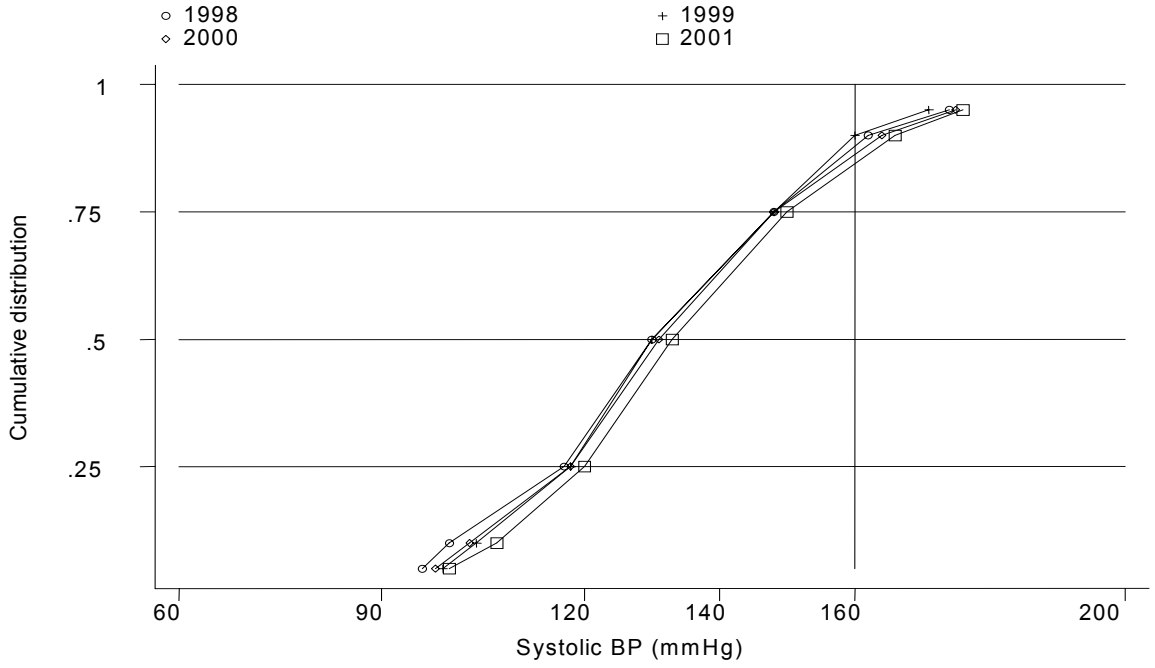


Table 3.1.34: Distribution of Diastolic BP without anti-hypertensives HD patients Government Centres 1998– 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 90 mmHg
1998	599	6368	80	70	88	77
1999	613	6282	79	70	86	81
2000	695	7362	79	70	87	78
2001	758	7821	78	70	86	80

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

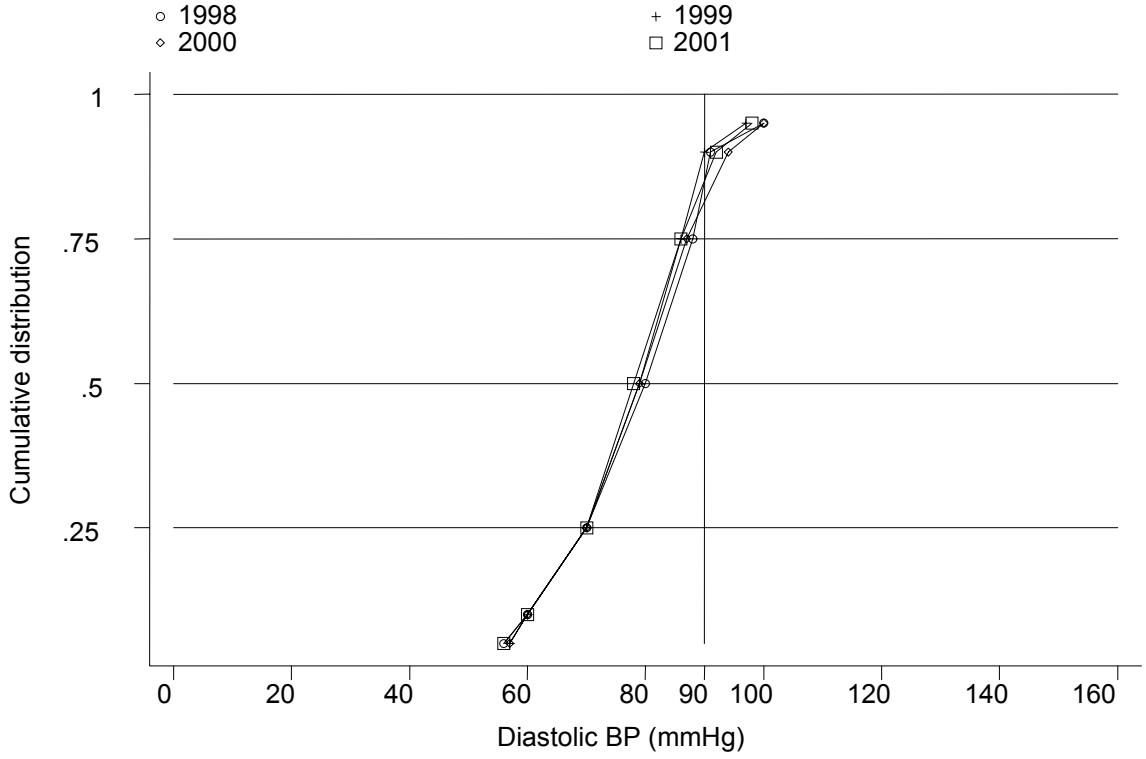


Table 3.1.35: Distribution of systolic BP on anti-hypertensives, HD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 160 mmHg
1998	1038	10542	150	137	167	62
1999	1249	12458	150	137	168	62
2000	1390	14196	150	134	169	63
2001	1532	15646	150	135	169	62

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

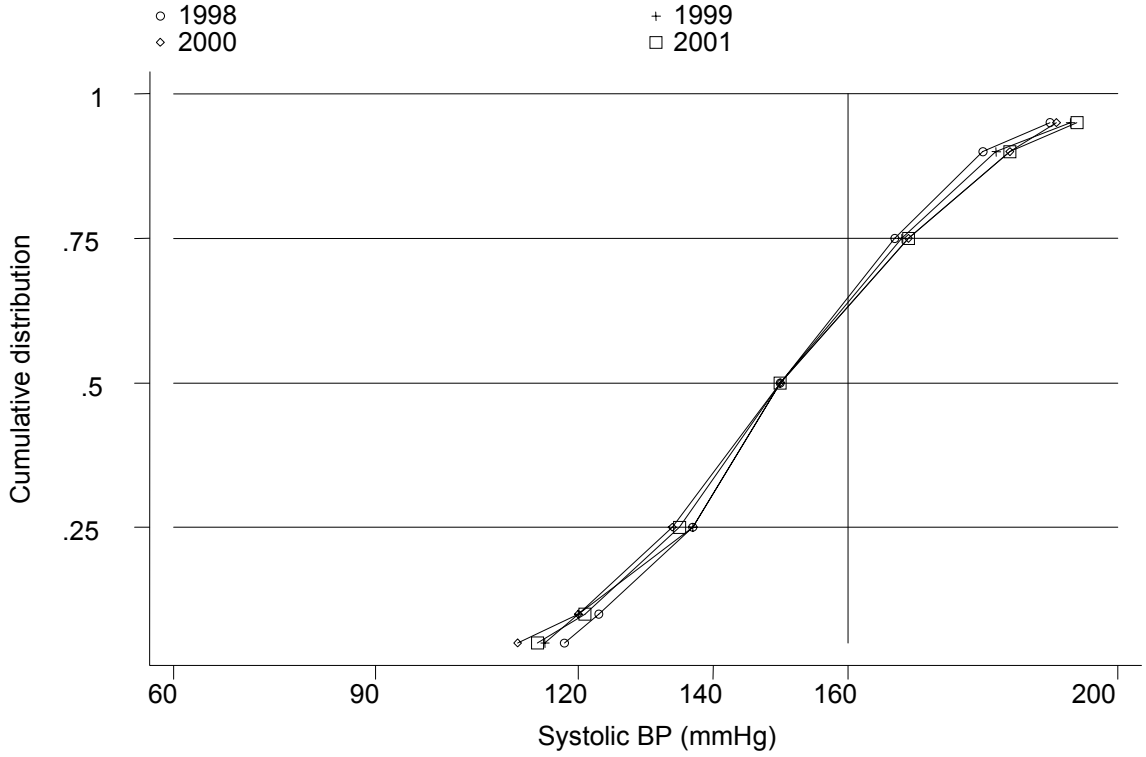
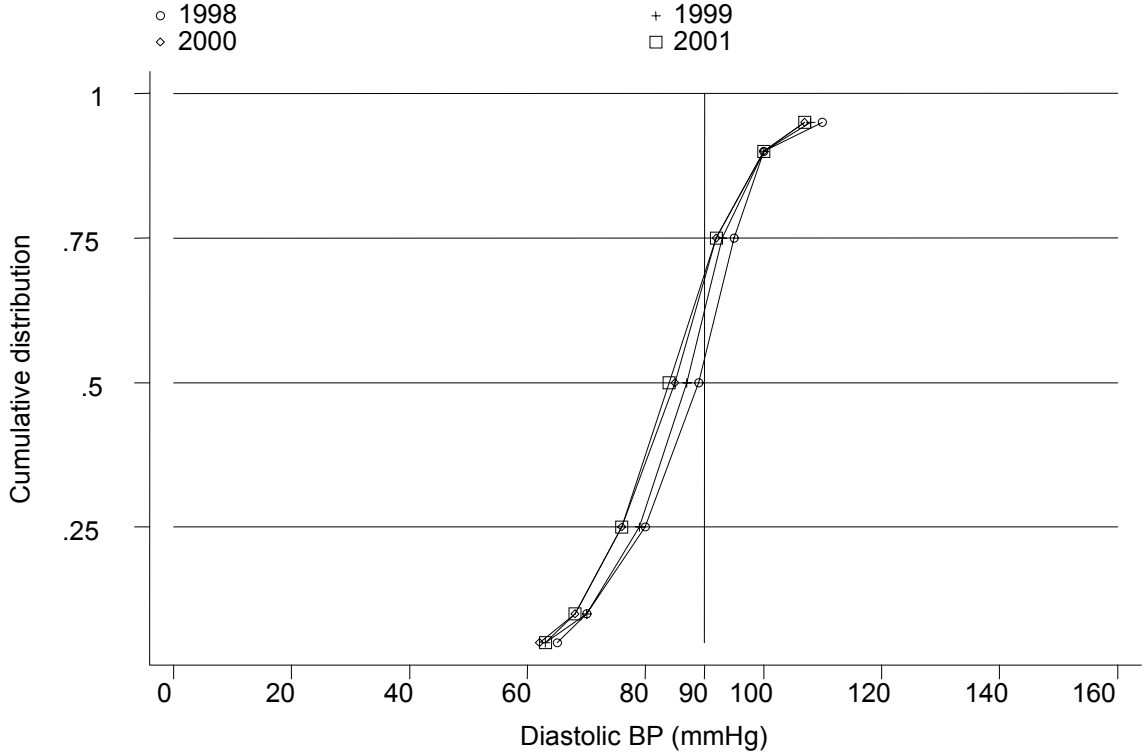


Table 3.1.36: Distribution of diastolic BP on anti-hypertensives, HD patients, Government Centres 1998– 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients < 90 mmHg
1998	1038	10547	89	80	95	51
1999	1249	12459	87	79	93	55
2000	1390	14206	85	76	92	58
2001	1532	15656	84	76	92	62

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 1998 – 2001

year	No	% on rHuEpo	% received blood transfusion	% on oral Iron	% received parenteral Iron
1998	1657	45	14	92	5
1999	1878	48	16	94	5
2000	2102	54	15	92	7
2001	2305	60	13	92	8

Table 3.1.38: Distribution of rHuEpo dose per week, HD patients, Government Centres 1998 – 2001

Year	1998	1999	2000	2001
No. of patients	691	864	1077	1355
% on 2000 u/week	17	19	21	19
% on 2-4000 u/week	61	60	57	59
% on 4-6000 u/week	7	6	7	7
% on 6-8000 u/week	13	14	11	12
% on 8-12000 u/week	2	2	4	3
% on >12000 u/week	0	0	0	0

Table 3.1.39: Distribution of serum Iron without rHuEpo, HD patients, Government Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients > 10 umol/l
1998	588	1451	14	10	21	73
1999	647	1527	14.1	9.9	22.7	71
2000	671	1665	14	9.8	20	70
2001	673	1584	15	10.3	23.1	76

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

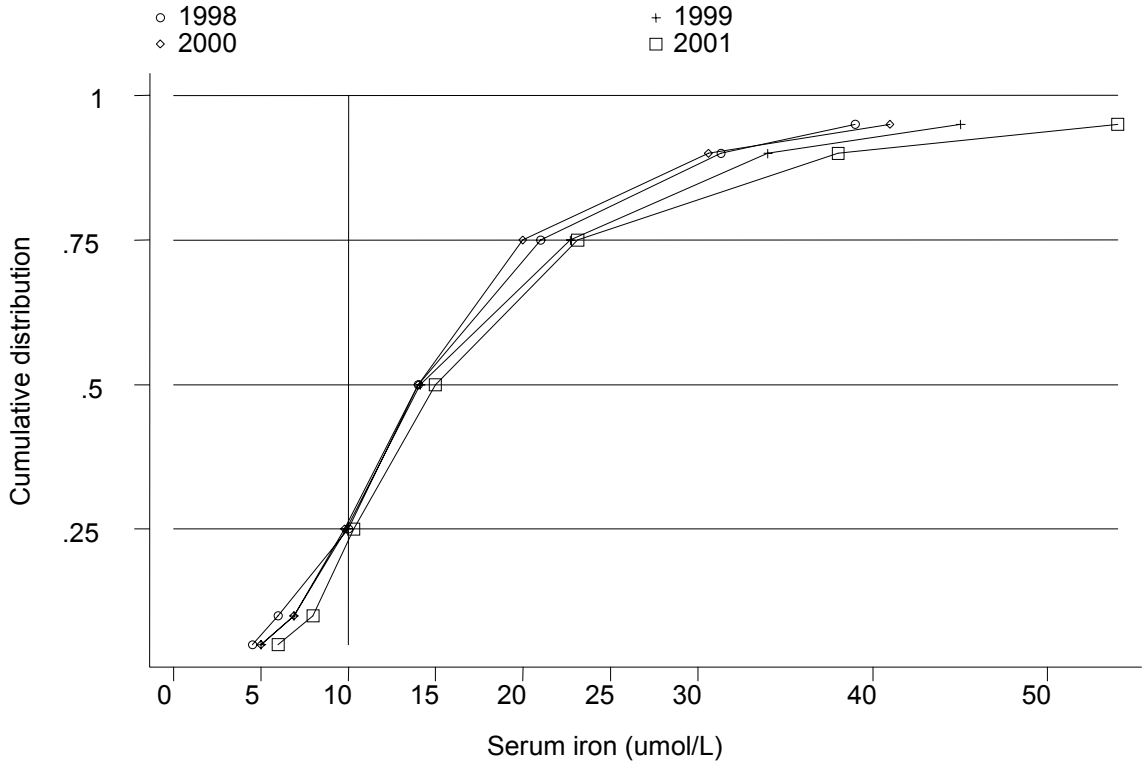


Table 3.1.40: Distribution of serum Iron on rHuEpo,HD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 10 umol/l
1998	522	1544	14.6	10	22	73
1999	638	1853	14	10	23	74
2000	909	2636	13.3	9.7	20.2	69
2001	1154	3323	14	10	22.6	71

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

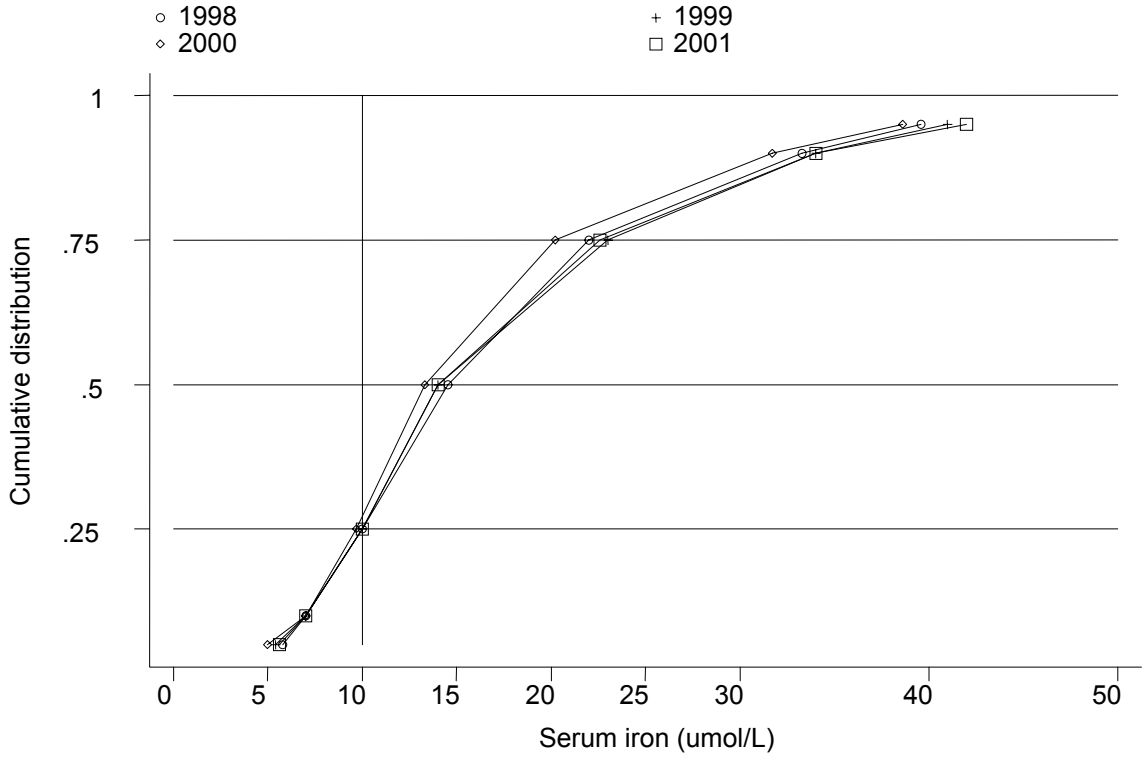


Table 3.1.41: Distribution of Transferrin Saturation without rHuEpo, HD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 20%
1998	411	1644	29.5	17.9	43.3	69
1999	389	1556	27.2	18.3	41.3	69
2000	567	2268	29.2	19.4	43.7	71
2001	586	2344	30.6	22.2	43.8	80

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

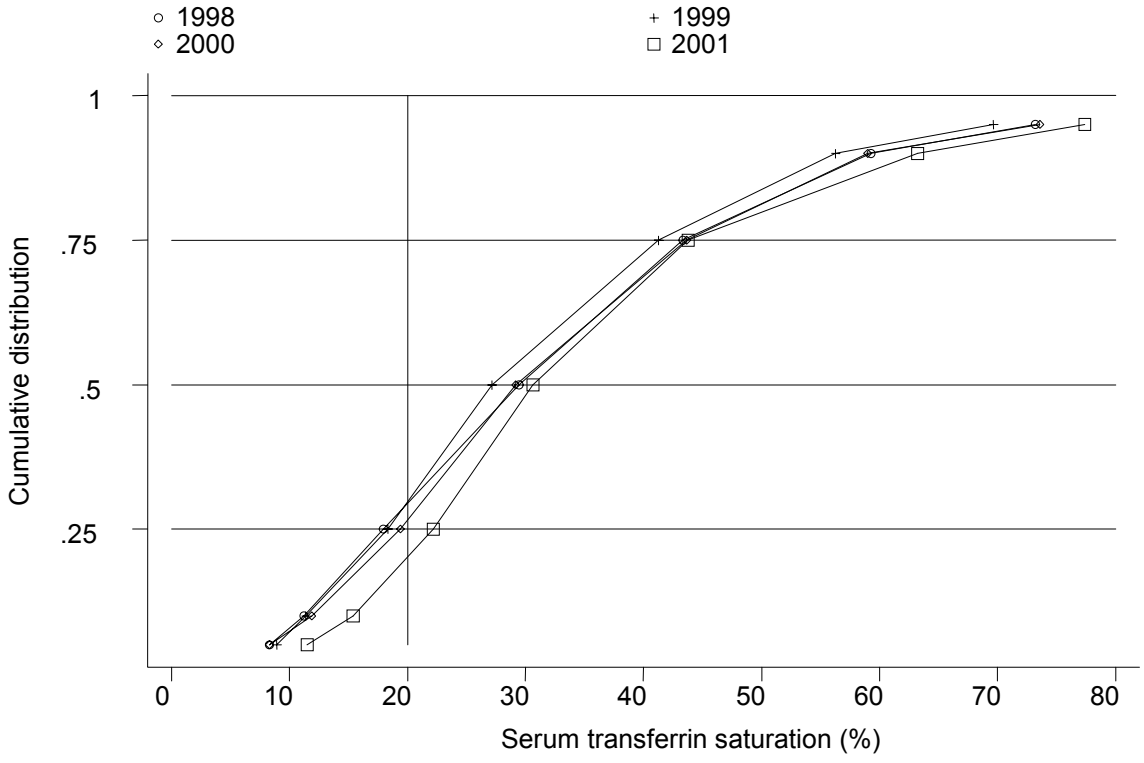


Table 3.1.42: Distribution of Transferrin Saturation on rHuEpo, HD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 20%
1998	416	1664	31.2	21.9	44.8	81
1999	481	1924	30.2	21	42.4	78
2000	850	3400	29.7	20.1	42.9	75
2001	1061	4244	31.9	22.7	48	80

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

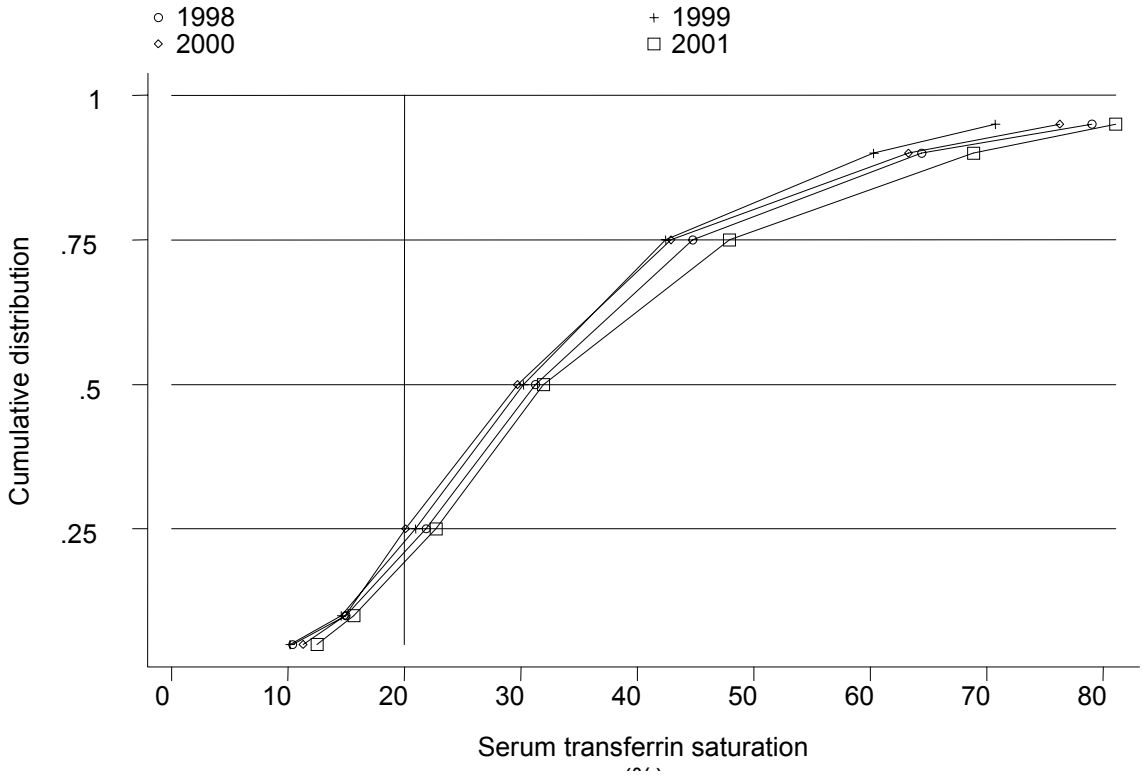


Table 3.1.43: Distribution of serum Ferritin without rHuEpo, HD patients, Government Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients > 100 ug/l
1998	187	252	249.5	117.5	594.9	79
1999	292	441	385	157.9	828	85
2000	380	580	314.9	131.4	742	80
2001	448	714	352.1	154	775.9	85

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

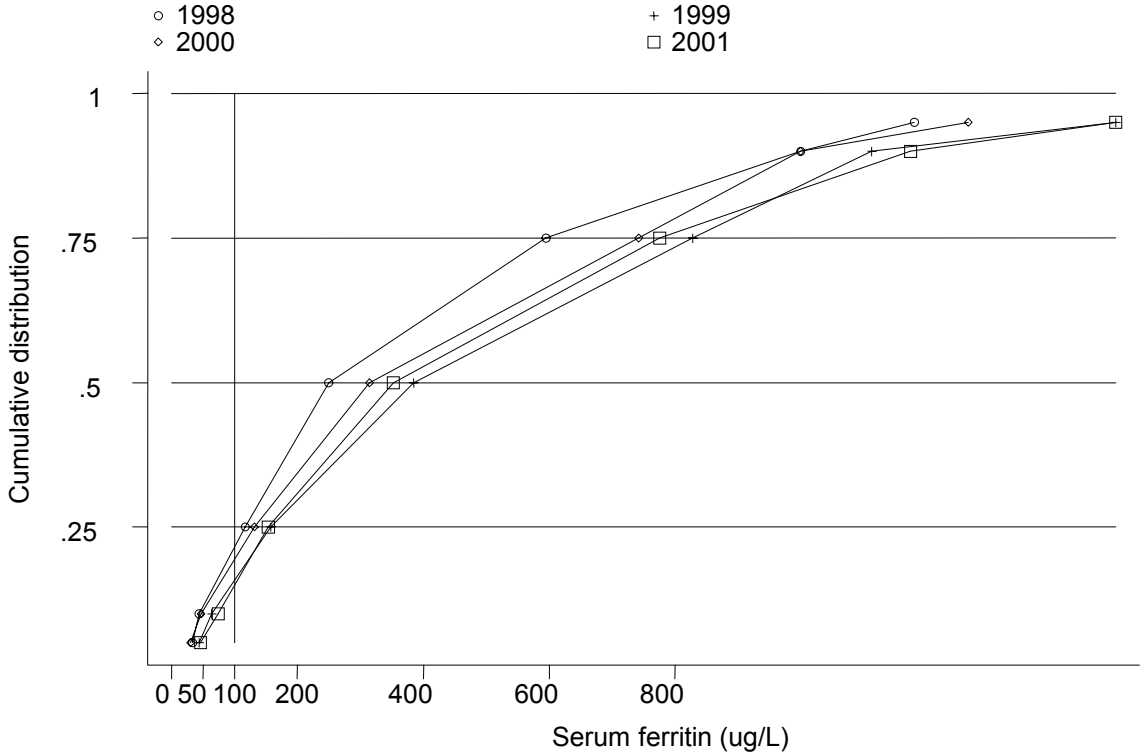


Table 3.1.44: Distribution of serum Ferritin on rHuEpo, HD patients, Government Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients > 100 ug/l
1998	288	436	478.8	221.5	841.5	91
1999	442	693	431	211	844	91
2000	705	1160	405.1	185	835	89
2001	883	1520	433.3	206.8	887.5	88

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

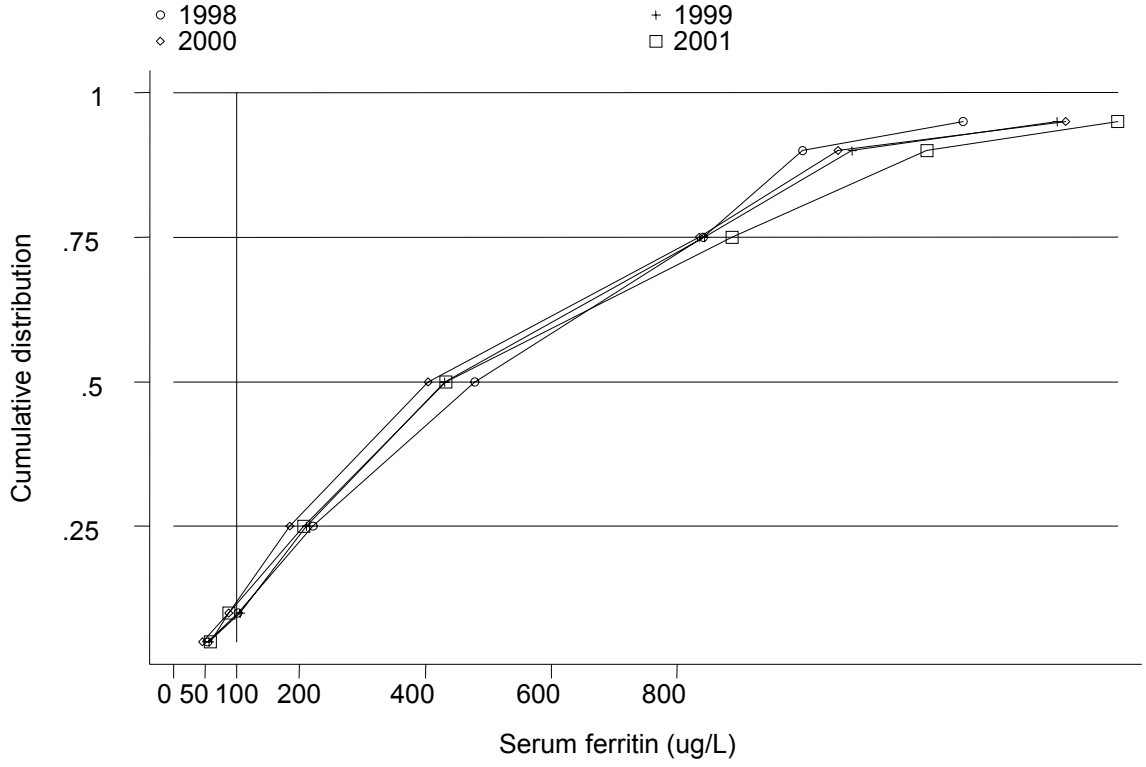


Table 3.1.45: Distribution of Haemoglobin concentration without rHuEpo, HD patients, Government Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients <10 g/dl	% patients ≥10 & ≤12 g/dl	% patients >12 g/dl
1998	887	2781	9	7.8	10.6	66	23	10
1999	951	2911	9.2	7.7	10.7	63	27	10
2000	938	2843	9.5	8	11	58	27	15
2001	889	2700	9.7	8.3	11.2	54	31	15

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

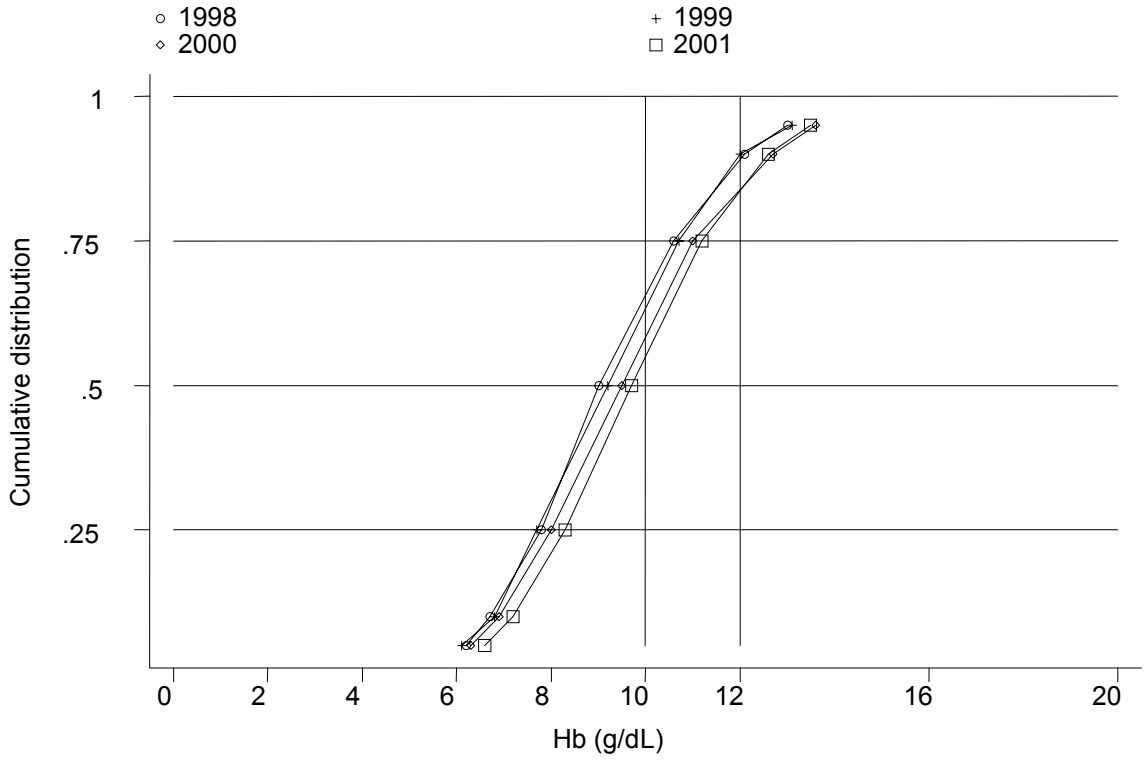
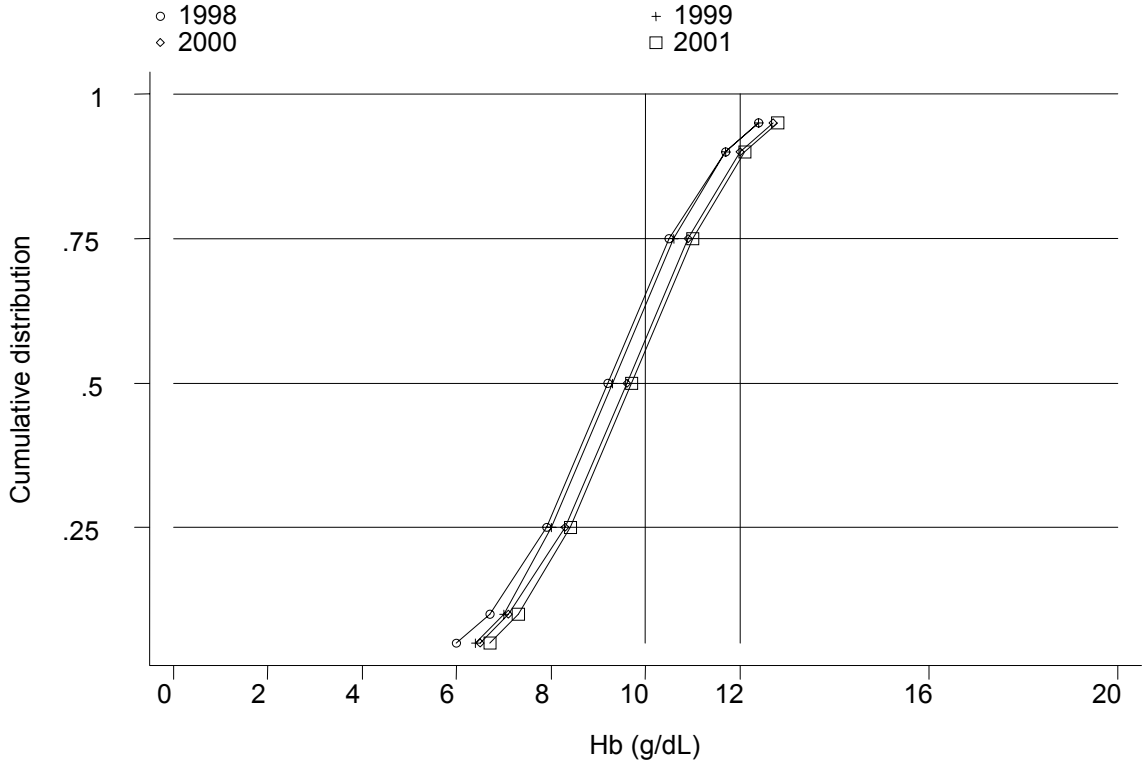


Table 3.1.46: Distribution of Haemoglobin concentrationon rHuEpo, HD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients <10 g/dl	% patients ≥10 & ≤12 g/dl	% patients >12 g/dl
1998	742	2675	9.2	7.9	10.5	64	29	7
1999	900	3208	9.3	8	10.6	63	30	8
2000	1118	4030	9.6	8.3	10.9	56	34	10
2001	1367	4873	9.7	8.4	11	55	35	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 1998 - 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients >40g/l
1998	1620	5354	42	38	45	65
1999	1823	5933	41	37	44	60
2000	2007	6519	40	37	44	56
2001	2239	7448	40.8	37	44	58

Figure 3.1.47: Cumulative distribution of serum Albumin by year

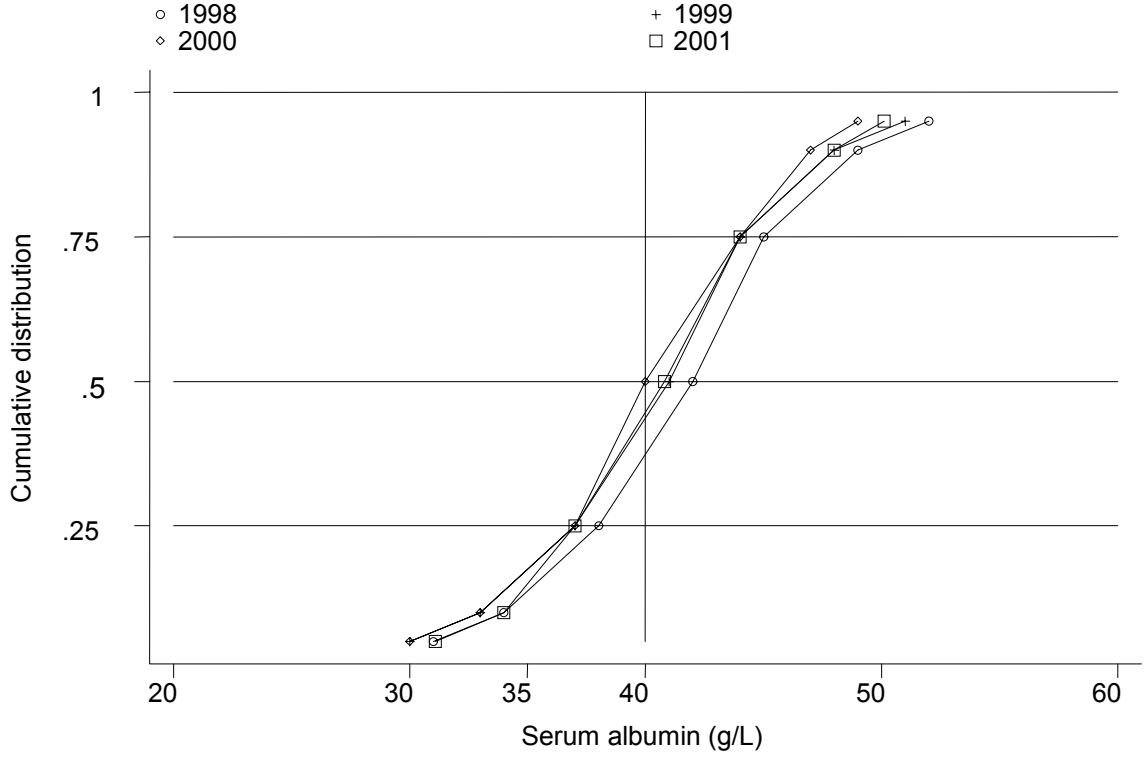
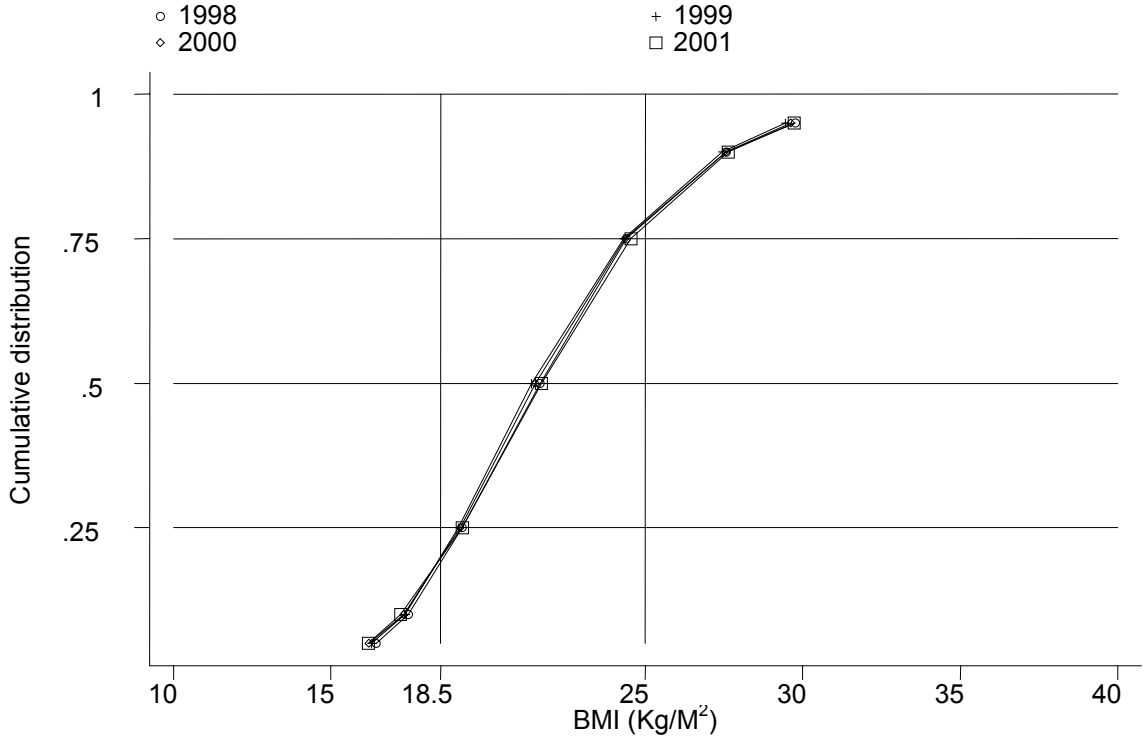


Table 3.1.48: Distribution of Body Mass Index, HD patients, Government Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients <18.5	% patients ≥18.5 & ≤25	% patients >25
1998	1559	16089	21.6	19.2	24.4	18	61	21
1999	1774	17814	21.4	19.1	24.3	19	60	20
2000	1977	20447	21.5	19.1	24.3	19	60	21
2001	2161	22090	21.7	19.2	24.5	19	59	22

Figure 3.1.48: Cumulative distribution of BMI by year

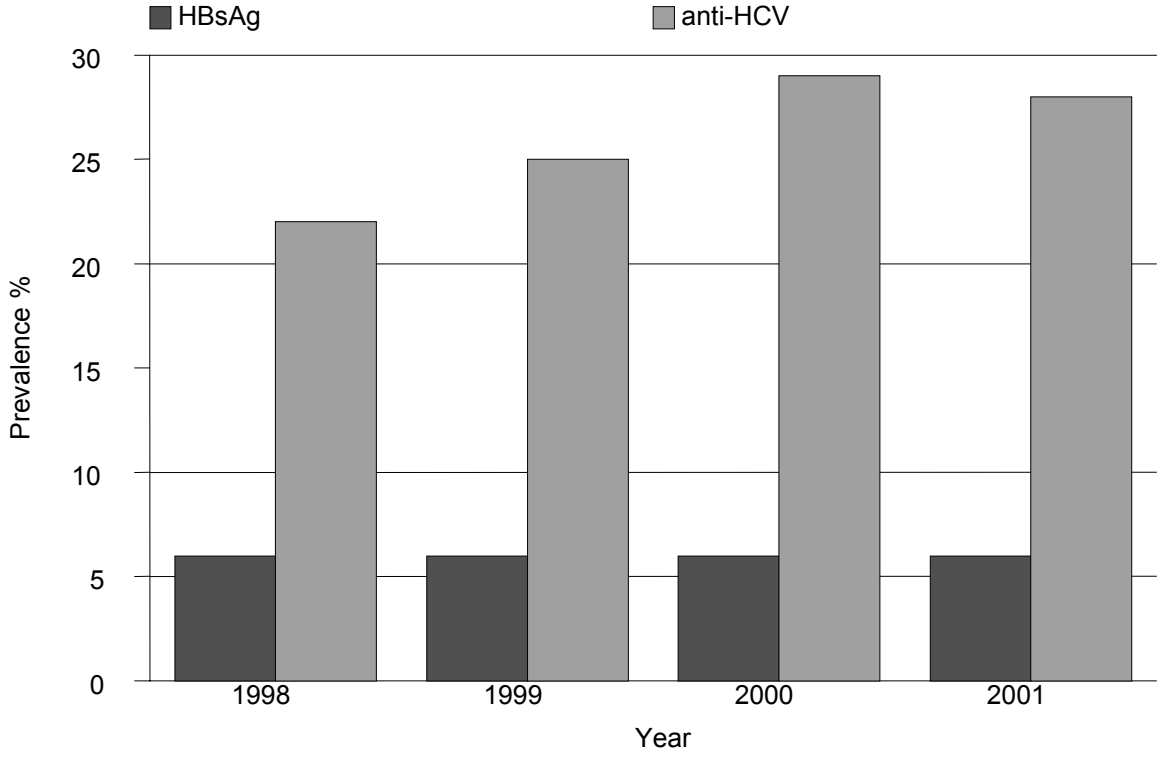


3.1.14 SEROLOGICAL STATUS, HD PATIENTS GOVERNMENT CENTRES

Table 3.1.49: Prevalence of positive anti-HCV and HbsAg, HD patients, Government Centres 1998– 2001

year	No	% HbsAg positive	% anti-HCV positive
1998	1657	6	22
1999	1878	6	25
2000	2102	6	29
2001	2305	6	28

Figure 3.1.49: Prevalence of positive anti-HCV and HbsAg, HD patients, Government Centres 1998 – 2001



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

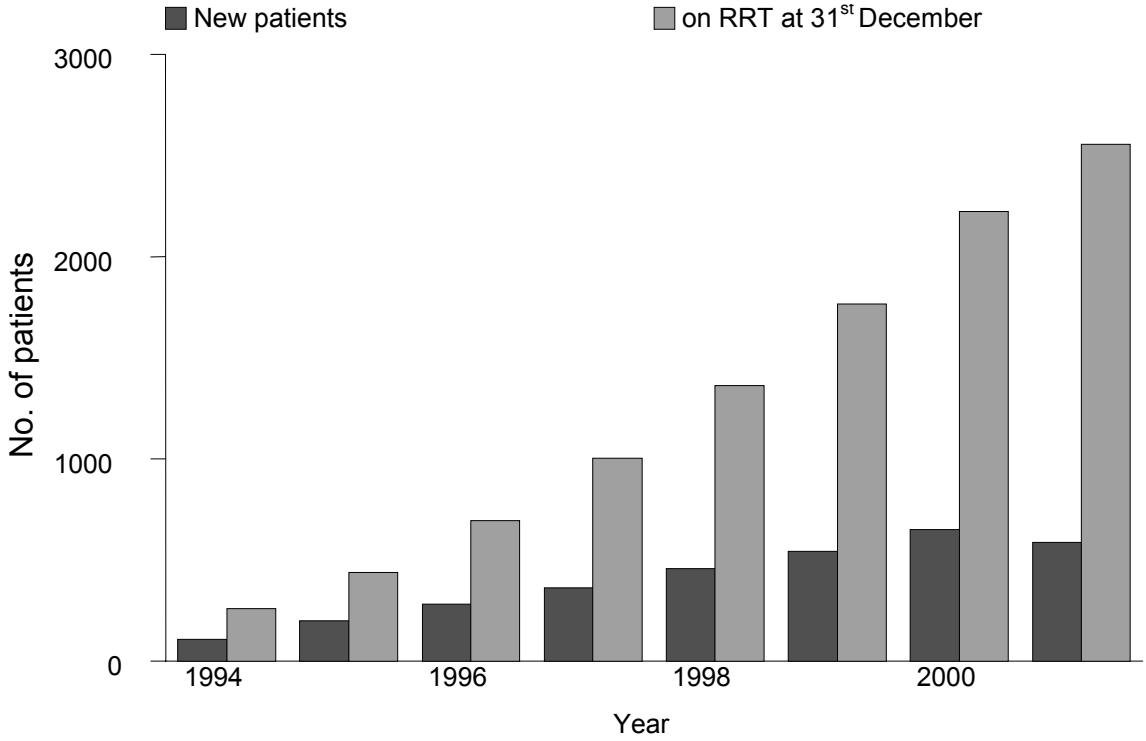
3.2 HAEMODIALYSIS IN NON-GOVERNMENTAL ORGANISATION (NGO) CENTRES

3.2.1 STOCK AND FLOW

Table 3.2.01: Stock and Flow HD patients, NGO Centres 1994 – 2001

Year	1994	1995	1996	1997	1998	1999	2000	2001
New patients	107	198	280	362	457	542	650	587
Died	8	15	20	43	84	116	154	205
Transferred to PD	0	0	0	0	1	4	8	10
Transplanted	6	2	5	8	13	15	28	33
Lost to Follow up	1	1	1	1	1	2	3	9
On HD at 31st December	260	440	694	1004	1362	1767	2224	2554

Figure 3.2.01: Stock and Flow HD patients, NGO Centres 1994 – 2001



3.2.3 DEATH ON HAEMODIALYSIS, NGO CENTRES

Table 3.2.04: Death Rate on HD and Transfer to PD, NGO Centres 1994 – 2001

Year	1994	1995	1996	1997	1998	1999	2000	2001
No. of patients at risk	260	350	567	849	1183	1565	1996	2389
Deaths	8	15	20	43	84	116	154	205
Death rate %	3	4	4	5	7	7	8	9
Transfer to PD	0	0	0	0	1	4	8	10
Transfer to PD rate %	0	0	0	0	0	0	0	0
All Losses	8	15	20	43	85	120	162	215
All Losses rate %	3	4	4	5	7	8	8	9

Figure 3.2.04: Death Rate on HD, NGO Centres, 1994 – 2001

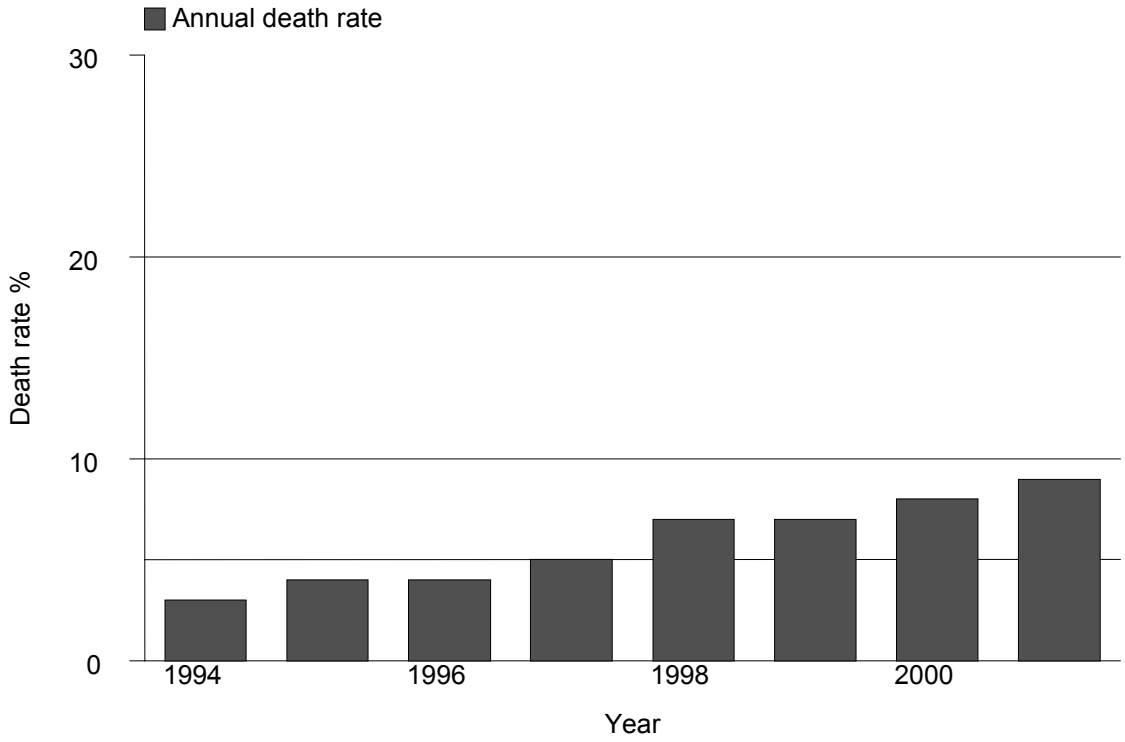


Table 3.2.05: Causes of Death, NGO Centres 1998 – 2001

	1998		1999		2000		2001	
Causes of death	No.	%	No.	%	No.	%	No.	%
Cardiovascular	38	45	38	33	58	38	53	26
Died at home	6	7	17	15	38	25	67	33
Sepsis	7	8	12	10	16	10	34	17
GIT bleed	2	2	3	3	1	1	3	1
Cancer	1	1	2	2	1	1	6	3
Liver disease	1	1	4	3	3	2	3	1
Others	25	30	31	27	36	23	25	12
Unknown	4	5	9	8	1	1	14	7
Total	84	100	116	100	154	100	205	100

3.2.4 NGO HAEMODIALYSIS CENTRES

Table 3.2.07: Centre Distribution of HD patients, NGO Centres, 2001

	Centre	No	percent
	No.on RRT at 31st December	2554	100
1	AMD Rotary Dialysis Centre, Penang	9	0
2	Amitabha Haemodialysis Centre	21	1
3	Bakti-NKF Dialysis Centre, Kelang	53	2
4	Batu Pahat Rotary Haemodialysis Centre	54	2
5	Berjaya NKF Dialysis Centre, Petaling Jaya	57	2
6	Buddhist Tzu-Chi Dialysis Centre	50	2
7	Buddhist Tzu-Chi Dialysis Centre	2	0
8	CHKMUS-MAA Medical Charity Dialysis Centre, Kuching	70	3
9	Charis-NKF Dialysis Centre, Cheras	79	3
10	Che Eng Khor Haemodialysis Centre	41	2
11	Fo Yi Haemodialysis Centre	27	1
12	Haemodialysis Association Klang	38	1
13	JB Lion MAA-Medicare Charity Dialysis	78	3
14	KAS-Rotary/NKF Dialysis Centre, Sarawak	22	1
15	KB Rotary-MAA Dialysis Centre	21	1
16	Kluang Rotary Haemodialysis Centre	30	1
17	Lion Club of Alor Setar-NKF Dialysis Centre	39	2
18	MAA-Medicalre Charity Dialysis Centre, Butterworth	52	2
19	MAA-Medicare Charity Dialysis Centre, Cheras	54	2
20	MAA-Medicare Charity Dialysis Centre, Kajang	43	2
21	MAA-Medicare Charity Dialysis Centre, Kuala Lumpur	93	4
22	MAA-Medicare Charity Dialysis Centre, Teluk Intan	50	2
23	Mersing Rotary Haemodialysis Centre	2	0
24	Moral Uplifting-NKF Dialysis Centre, Ipoh	60	2
25	Muar Lions Renal Centre	82	3
26	NKF Dialysis Centre, Kuala Lumpur	48	2
28	Pahang Buddhist Association Haemodialysis Centre	26	1
28	Persatuan Buah Pinggang Sabah	24	1
29	Persatuan Bulan Sabit Merah Cawangan Miri	44	2
30	Persatuan Membaiki Akhlak Che Luan Khor	41	2
31	Pertubuhan Bakti Fo En Bandar Kulim	4	0

32	Pertubuhan Hemodialisis Seberang Perai Selatan	31	1
33	Pontian Rotary Haemodialysis Centre	49	2
34	Pusat Dialisis Klinik Waqaf An-nur	30	1
35	Pusat Hemodialisis Darul Iltizam	51	2
36	Pusat Hemodialisis MCA Pasar Meru	4	0
37	Pusat Hemodialisis Manjung-NKF	45	2
38	Pusat Hemodialisis Mawar N. Sembilan, Bahau	23	1
39	Pusat Hemodialisis Mawar N. Sembilan, Lukut	25	1
40	Pusat Hemodialisis Mawar N. Sembilan, Seremban	106	4
41	Pusat Hemodialisis Rotary Kota Tinggi	20	1
42	Pusat Hemodialisis Rotary Kulai	70	3
43	Pusat Hemodialisis SJAM Bacang Melaka	104	4
44	Pusat Hemodialisis Yayasan Felda	56	2
45	Pusat Hemodialisis Zakat	3	0
46	Pusat Muhibah Hemodialisis Pesatuan Tionghua Segamat	77	3
47	Pusat Rawatan Dialisis Yayasan Pembangunan Keluarga Johor-NKF	13	1
48	Pusat Rawatan Islam, Kuala Lumpur	31	1
49	Pusat Rawatan Islam, Petaling Jaya	12	0
50	Rotary Club Damansara-NKF Dialysis Centre, Kepong	56	2
51	Rotary Club Tawau Tanjung Haemodialysis Centre	7	0
52	Rotary Haemodialysis Centre, Johor Bahru	33	1
53	SJAM-KPS Haemodialysis, Kelang	51	2
54	Sibu Kidney Foundation Haemodialysis Centre	45	2
55	Superkids Trinity-NKF Dialysis Centre, Alor Setar	14	1
56	TDC-NKF Trengganu Dialysis Centre	29	1
57	The Nayang-NKF Dialysis Centre, Setapak	14	1
58	The Penang Community Haemodialysis Society	28	1
59	Woh Peng Cheang Seah Dialysis Centre	36	1
60	Yayasan Dialisis Pertubohan Pendidikan Akhlak-NKF, Taiping	23	1
61	Yayasan Hemodialisis Kebajikan Southern Melaka	53	2
62	Yayasan Kebajikan SSL Heamodialisis	100	4

3.2.5 HAEMODIALYSIS PATIENTS' CHARACTERISTICS, NGO CENTRES

Table 3.2.08: Age Distribution of Dialysis Patients, NGO Centres 1998 – 2001

Year	1998	1999	2000	2001
New Dialysis patients	457	542	650	587
1-14 years	0	0	0	0
15-24 years	3	2	2	3
25-34 years	12	12	9	9
35-44 years	19	16	17	16
45-54 years	28	30	32	27
55-64 years	26	27	24	28
≥65 years	13	13	16	17
Dialysing at 31st December	1362	1767	2224	2554
1-14 years	0	0	0	0
15-24 years	4	3	3	3
25-34 years	14	14	13	12
35-44 years	23	22	21	21
45-54 years	28	28	29	29
55-64 years	22	23	23	23
≥65 years	9	10	11	12

Table 3.2.09: Patients' Characteristics, NGO Centres 1998 – 2001

Year	1998	1999	2000	2001
New Dialysis patients	457	542	650	587
Mean age±sd	50±13	50±13	51±13	52±14
% male	53	59	58	53
% Diabetic	45	41	47	48
% HbsAg+	4	4	4	5
% Anti-HCV+	5	6	3	3

3.2.6 SURVIVAL ANALYSIS, NGO CENTRES

Table 3.2.10: HD Patient Survival, NGO Centres 1996 – 2001

Year	1996			1997			1998		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	97	1	272	95	1	345	96	1	439
12	96	1	264	92	1	326	93	1	415
24	91	2	248	83	2	293	86	2	373
36	78	3	214	77	2	271	78	2	331
48	73	3	201	73	2	248	96	1	439
60	67	3	178	95	1	345	93	1	415

Year	1999			2000			2001		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	97	1	522	97	1	619	96	1	281
12	94	1	497	92	1	578			
24	87	1	449						

No. = number at risk SE = standard error

Figure 3.2.10: HD Patient Survival, NGO Centres 1997 –2001

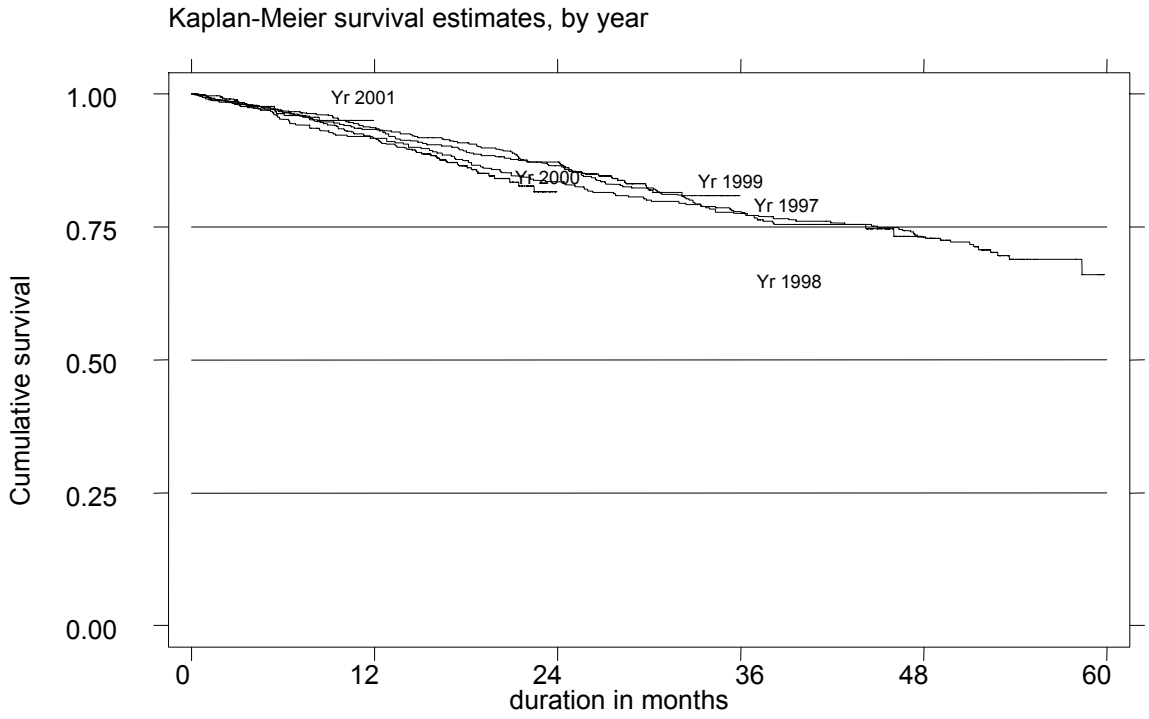


Table 3.2.11: HD Technique Survival, NGO Centres 1996-2001

Year	1996			1997			1998		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	97	1	272	95	1	345	96	1	439
12	96	1	264	92	1	326	93	1	415
24	91	2	248	83	2	293	86	2	373
36	78	3	214	77	2	271	77	2	331
48	73	3	201	73	2	248			
60	66	3	178						
Year	1999			2000			2001		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	97	1	522	96	1	619	96	1	281
12	93	1	497	91	1	578			
24	87	1	449						

No. = number at risk SE = standard error

Figure 3.2.11 HD Technique Survival by year of entry, NGO centres 1997 –2001

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 1998-2001

REHABILITATION STATUS	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
Full time work for pay	78	21	119	18	203	17	175	11
Part time work for pay	53	14	110	17	184	15	264	17
Able to work but unable to get a job	15	4	28	4	64	5	81	5
Able to work but not yet due to dialysis schedule	10	3	35	5	29	2	56	4
Able but disinclined to work	3	1	22	3	33	3	26	2
Home maker	115	31	190	29	319	27	380	25
Full time student	0	0	1	0	1	0	2	0
Age<15 years	0	0	0	0	0	0	0	0
Retired	25	7	44	7	110	9	115	7
Age>65 years	23	6	34	5	124	10	194	13
Unable to work due to poor health	46	13	76	12	131	11	256	17
Total	368	100	659	100	1198	100	1549	100

Table 3.2.13: Quality of Life on Haemodialysis, NGO Centres 1998 – 2001

QOL Index Summated Score	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
0 (Worst QOL)	0	0	0	0	0	0	3	0
1	0	0	0	0	2	0	3	0
2	0	0	2	0	4	0	4	0
3	4	1	4	1	21	2	27	2
4	12	3	16	2	26	2	53	3
5	9	3	24	4	39	3	87	6
6	21	6	30	5	72	6	113	7
7	18	5	58	9	88	7	141	9
8	36	10	74	11	100	8	146	9
9	29	8	70	11	138	11	226	15
10 (Best QOL)	225	64	377	58	723	60	741	48
Total	354	100	655	100	1213	100	1544	100

3.2.8 HAEMODIALYSIS PRACTICES IN NGO CENTRES

Table 3.2.14: Vascular Access on Haemodialysis, NGO Centres 1998 – 2001

Access types	1998		1999		2000		2001	
	No	%	No	%	No	%	No	%
Wrist AVF	364	87	605	84	1302	86	1513	83
BCF*	43	10	94	13	179	12	255	14
Venous graft	3	1	2	0	3	0	8	0
Artificial graft	3	1	5	1	11	1	17	1
PERMCATH	0	0	3	0	2	0	5	0
Temporary CVC*	5	1	11	2	16	1	14	1
Total	418	100	720	100	1513	100	1812	100

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

Table 3.2.15: Difficulties reported with Vascular Access, NGO Centres 1998 – 2001

Access	1998		1999		2000		2001	
difficulty	No	%	No	%	No	%	No	%
Difficulty with needle placement	12	3	23	3	41	3	66	4
Difficulty in obtaining desired blood flow rate	11	3	19	3	36	2	61	3
Other difficulty	5	1	12	2	10	1	14	1
No difficulty	401	93	670	93	1432	94	1674	92
Total	429	100	724	100	1519	100	1815	100

Table 3.2.16: Complications reported with Vascular Access, NGO Centres 1998 – 2001

Complication	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
Thrombosis	9	2	26	4	46	3	71	4
Bleed	8	2	3	0	5	0	15	1
Aneurysmal dilatation	6	1	16	2	44	3	33	2
Swollen limb	1	0	8	1	14	1	14	1
Access related infection, local/Systemic	3	1	3	0	8	1	6	0
Distal Limb ischaemia	2	0	0	0	15	1	13	1
Venous outflow obstruction	8	2	17	2	16	1	20	1
Carpal tunnel	0	0	1	0	5	0	10	1
Other	8	2	13	2	9	1	32	2
No complication	384	90	637	88	1361	89	1601	88
Total	429	100	724	100	1523	100	1815	100

Table 3.2.17: Blood Flow Rates in NGO HD Units 1998 – 2001

Blood flow rates	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
<150 ml/min	0	0	1	0	3	0	0	0
150-199 ml/min	8	2	13	2	31	2	28	2
200-249 ml/min	209	52	335	48	513	35	544	31
250-299 ml/min	156	39	288	41	762	52	911	52
300-349 ml/min	28	7	59	8	143	10	242	14
> 350 ml/min	1	0	2	0	13	1	23	1
Total	402	100	698	100	1465	100	1748	100

Table 3.2.18: Number of HD Sessions per week, NGO HD Units 1998 – 2001

HD sessions	1998		1999		2000		2001	
Per week	No.	%	No.	%	No.	%	No.	%
1	0	0	1	0	4	0	2	0
2	3	1	20	3	91	6	60	3
3	418	99	700	97	1405	93	1751	96
4	0	0	1	0	5	0	2	0
Total	421	100	722	100	1513	100	1815	100

Table 3.2.19: Duration of HD in NGO HD Units 1998 – 2001

Duration of HD	1998		1999		2000		2001	
per session	No.	%	No.	%	No.	%	No.	%
≤3 hours	0	0	1	0	2	0	2	0
3.5 hours	0	0	1	0	2	0	2	0
4 hours	418	99	715	99	1480	98	1805	99
4.5 hours	4	1	2	0	20	1	4	0
5 hours	0	0	2	0	8	1	2	0
≥5 hours	0	0	0	0	2	0	0	0
Total	422	100	721	100	1514	100	1815	100

Table 3.2.20: Dialyser membrane types in NGO HD Units 1998 – 2001

Dialyser	1998		1999		2000		2001	
membrane	No.	%	No.	%	No.	%	No.	%
Cellulosic	261	68	331	55	460	39	401	31
Cellulose acetate	87	23	160	27	189	16	213	17
Synthetic	38	10	107	18	523	45	676	52
Total	386	100	598	100	1172	100	1290	100

Table 3.2.21: Dialyser Reuse Frequency in NGO HD Units 1998 – 2001

Dialyser reuse	1998		1999		2000		2001	
frequency	No.	%	No.	%	No.	%	No.	%
1*	1	0	6	1	44	3	77	5
2	0	0	2	0	4	0	7	0
3	30	8	47	7	75	5	41	2
4	12	3	26	4	65	5	92	5
5	30	8	101	15	165	12	148	9
6	302	77	397	59	573	41	424	25
7	1	0	3	0	2	0	14	1
8	3	1	40	6	191	14	460	27
9	1	0	6	1	38	3	42	2
10	14	4	30	4	155	11	138	8
11	0	0	0	0	0	0	0	0
12	0	0	11	2	51	4	87	5
≥13	0	0	0	0	47	3	173	10
Total	394	100	669	100	1410	100	1703	100

1* is single use i.e. no reuse

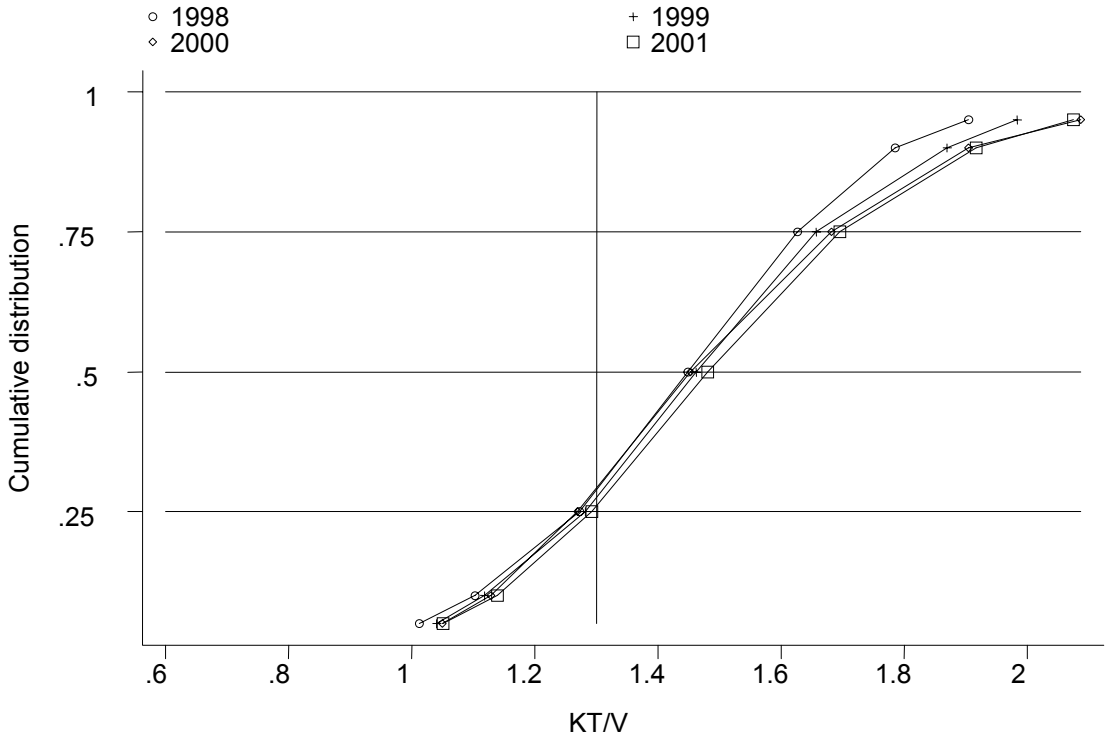
Table 3.2.22: Dialysate Buffer used in NGO HD Units 1998 – 2001

Dialysate buffer	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
Acetate	52	13	51	7	24	2	9	1
Bicarbonate	362	87	659	93	1483	98	1788	99
Total	414	100	710	100	1507	100	1797	100

Table 3.2.23: Distribution of Prescribed KT/V, NGO Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% > 1.3
1998	380	3764	1.4	1.3	1.6	72
1999	667	6629	1.5	1.3	1.7	73
2000	1313	13206	1.5	1.3	1.7	71
2001	1668	16916	1.5	1.3	1.7	74

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 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients < 5.3 mmol/l
1998	101	160	4.8	4.1	5.6	71
1999	159	261	5	4.1	5.7	67
2000	925	1461	5	4.2	5.9	64
2001	1434	2220	5	4.2	5.9	63

Figure 3.2.24: Cumulative distribution of serum cholesterol concentration by year

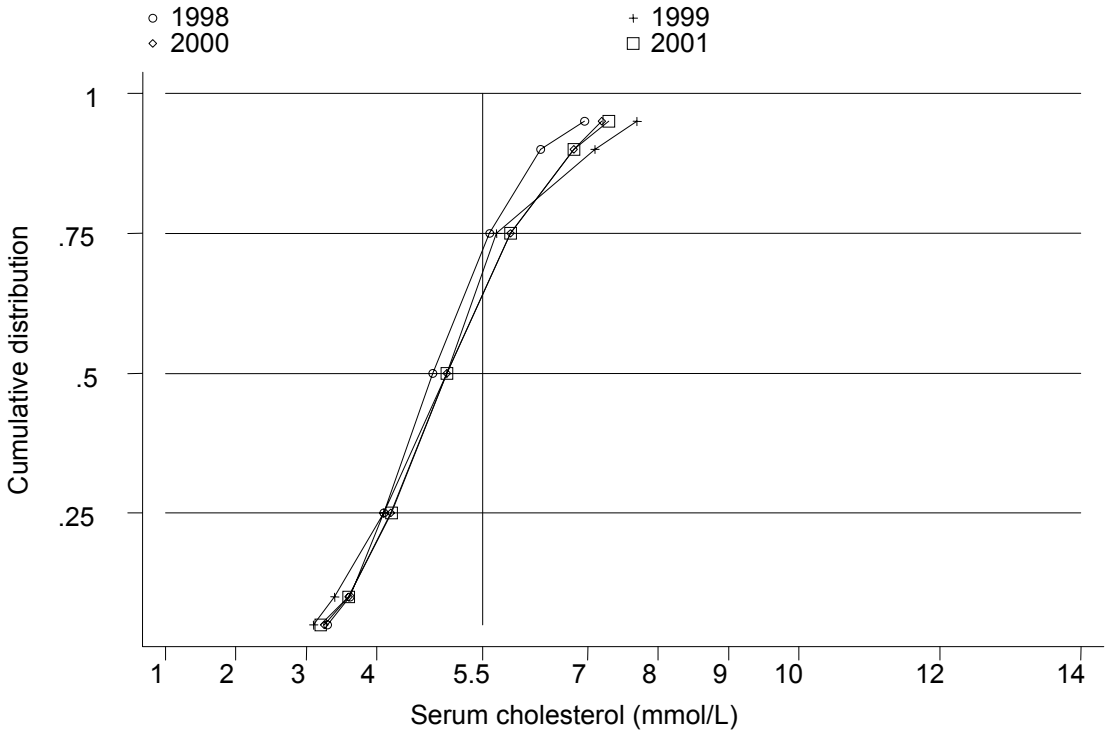


Table 3.2.25: Distribution of serum Triglyceride (mmol/l), HD patients, NGO Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 3.5 mmol/l
1998	88	135	1.8	1.3	2.8	87
1999	137	222	1.8	1.3	2.6	85
2000	586	902	1.8	1.3	2.7	86
2001	936	1274	1.7	1.1	2.6	86

Figure 3.2.25: Cumulative distribution of serum triglyceride concentration by year

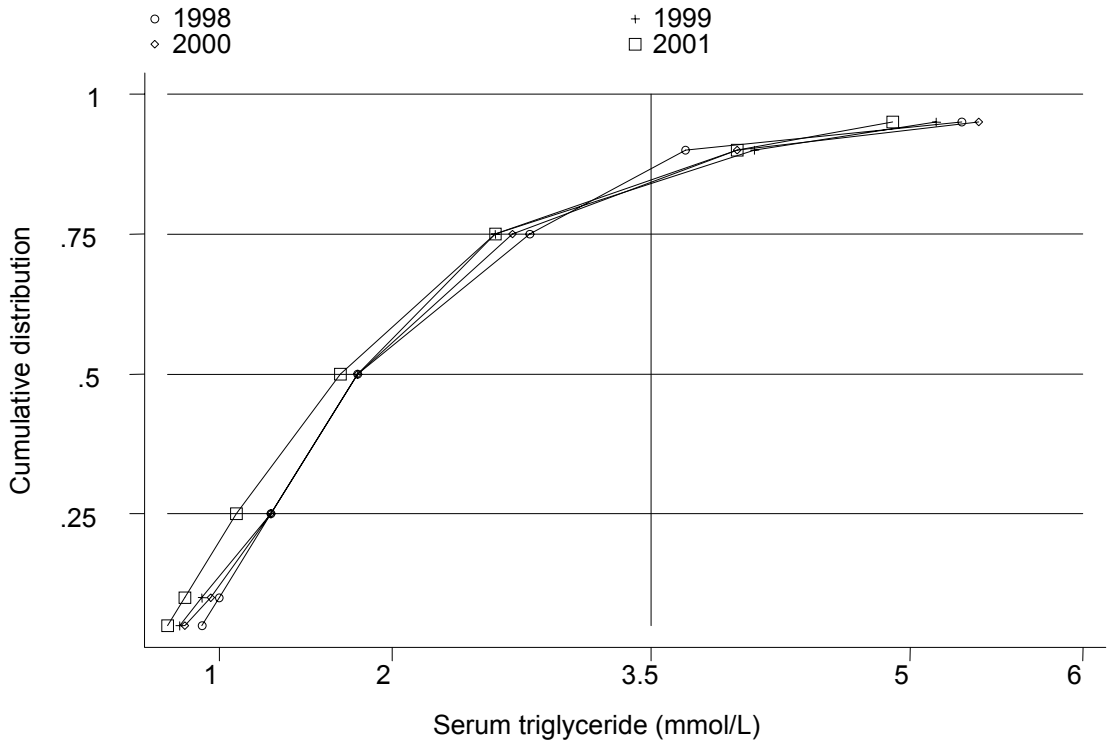


Table 3.2.26: Distribution of serum LDL (mmol/l), HD patients, NGO Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients <5 mmol/l
year	n	obs	M	LQ	UQ	pct
1998	32	47	2.6	1.4	3.3	96
1999	37	47	2.8	2.4	3.5	94
2000	448	638	2.9	2.2	3.6	96

Figure 3.2.26 : Cumulative distribution of serum LDL by year

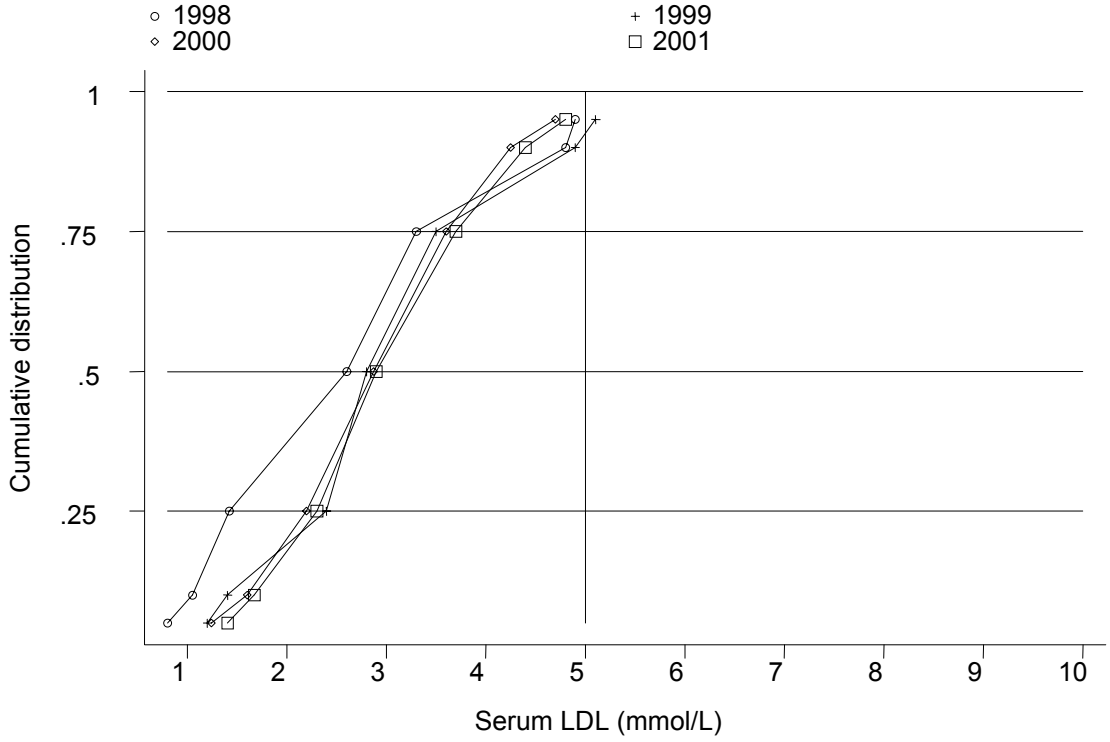
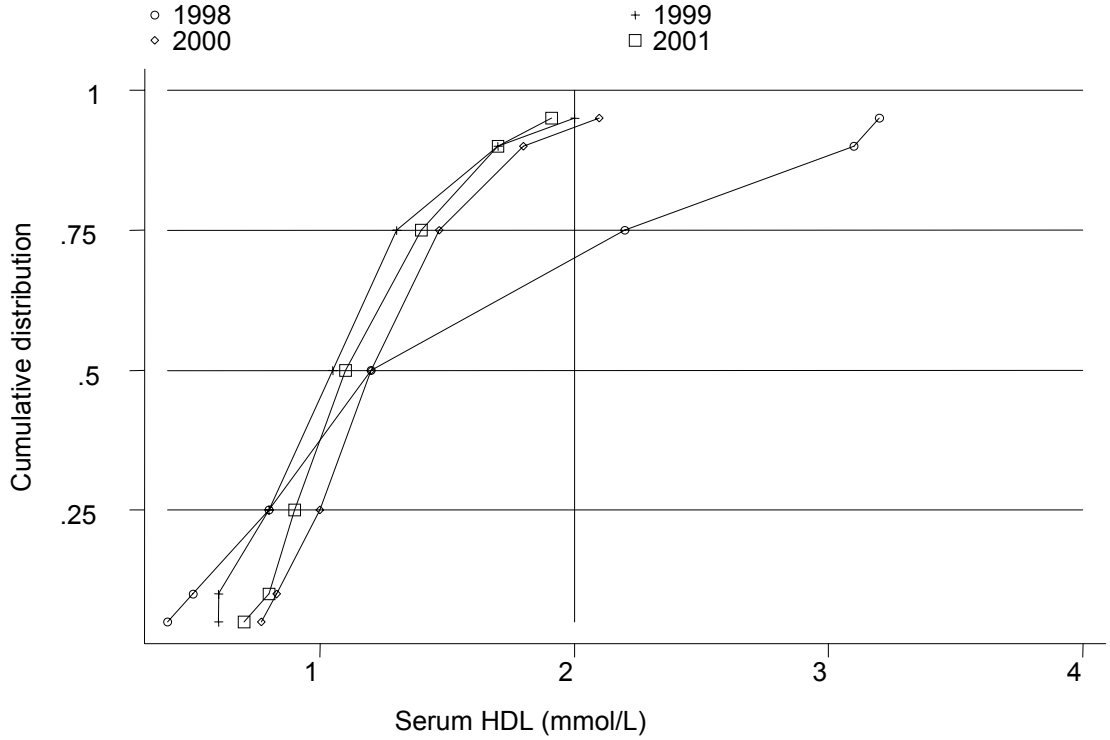


Table 3.2.27: Distribution of serum HDL (mmol/l), HD patients, NGO Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients < 2mmol/l
1998	33	49	1.2	.8	2.2	73
1999	39	49	1	.8	1.3	94
2000	475	689	1.2	1	1.5	93
2001	769	1031	1.1	.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 1998 – 2001

year	No of subjects	% on $CaCO_3$	% on $Al(OH)_3$	% on Vitamin D
1998	430	96	9	38
1999	726	90	6	29
2000	1533	91	3	22
2001	1828	95	1	20

Table 3.2.29: Distribution of serum Phosphate (mmol/l), HD patients, NGO Centres 1998– 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 1.6 mmol/l
1998	406	1130	1.9	1.5	2.3	29
1999	688	1905	1.9	1.5	2.3	30
2000	1390	3686	1.8	1.5	2.2	32
2001	1655	4478	1.8	1.4	2.2	36

Figure 3.2.29: Cumulative distribution of serum Phosphate by year

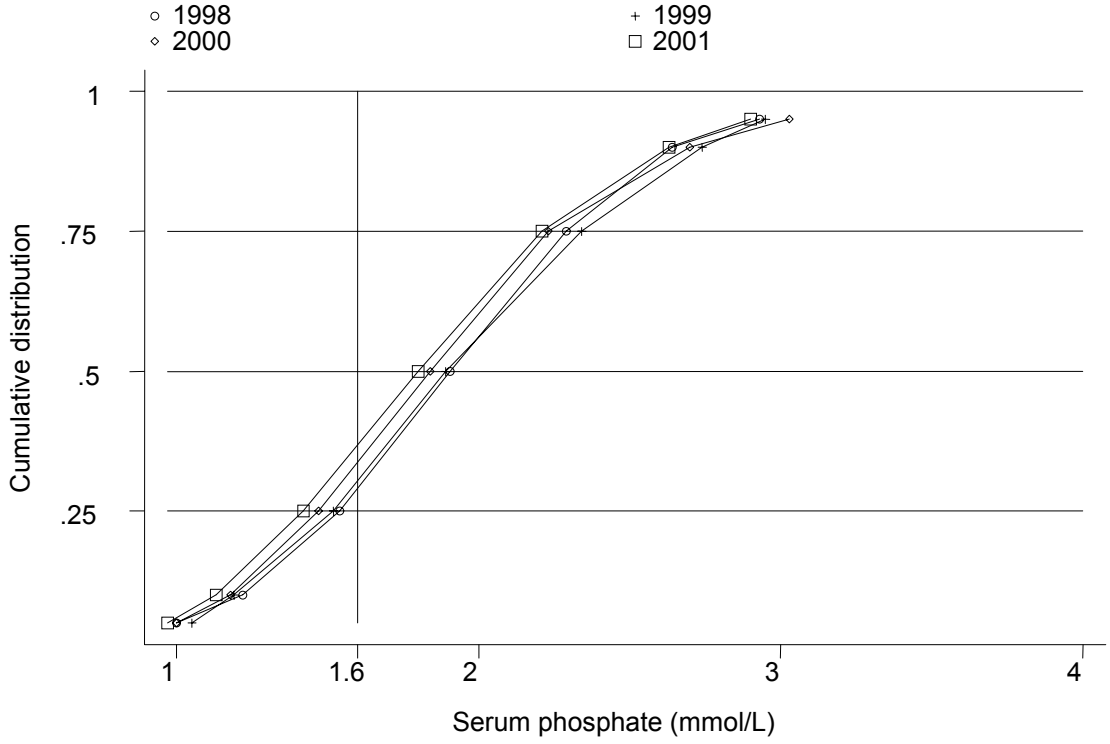


Table 3.2.30: Distribution of serum Calcium (mmol/l), HD patients, NGO Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients ≥ 2.2 & ≤2.6 mmol/l
1998	412	1144	2.3	2.2	2.5	56
1999	696	1925	2.3	2.2	2.5	56
2000	1386	3717	2.3	2.2	2.5	61
2001	1663	4536	2.3	2.2	2.5	61

Figure 3.2.30: Cumulative distribution of serum Calcium by year

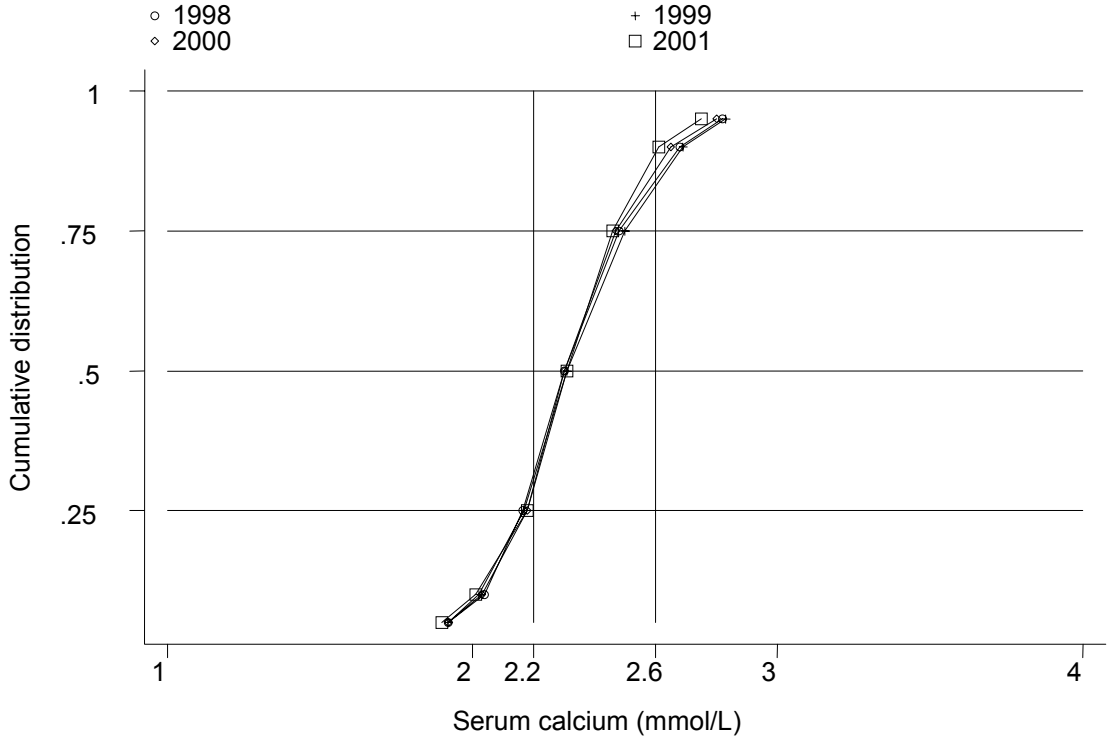
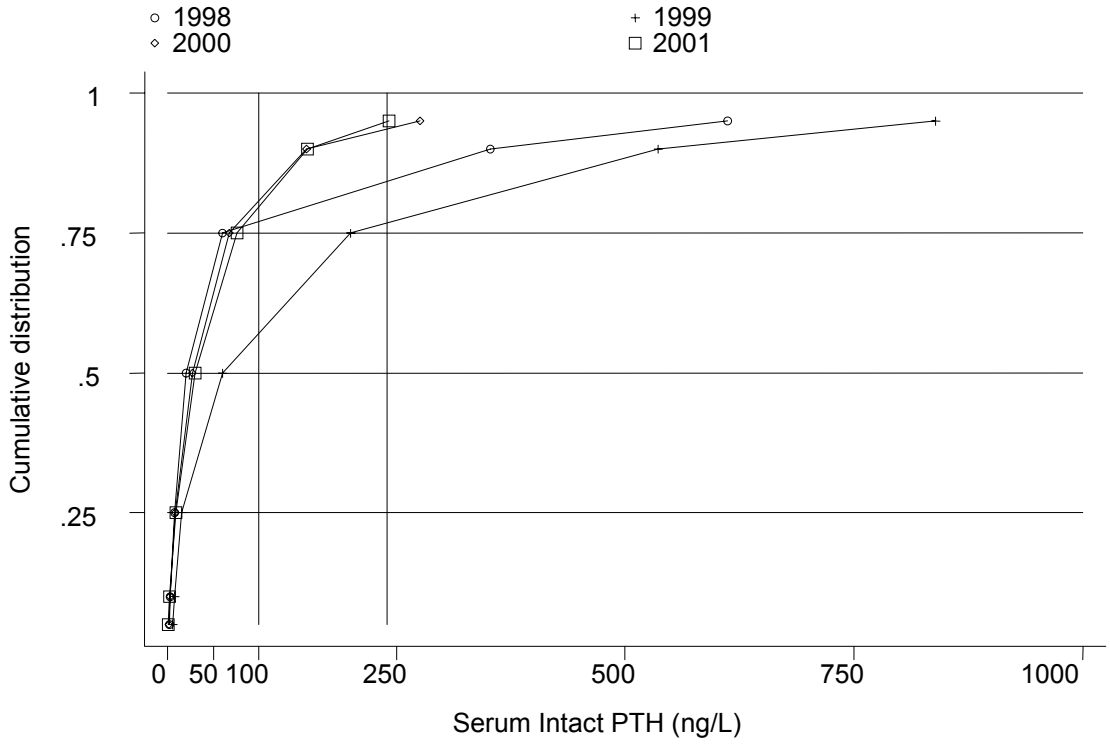


Table 3.2.31: Distribution of serum iPTH (ng/L), HD patients, NGO Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients ≥ 100 & ≤ 250 ng/l
1998	175	190	20	8	60	6
1999	277	325	60.1	15.1	200	18
2000	628	844	27	8.3	67.7	10
2001	918	1235	29.8	8.9	76.2	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 1998 – 2001

Year	No.	% on anti-hypertensives	% on 1 anti-hypertensives	% on 2 anti-hypertensives	% on 3 anti-hypertensives
1998	430	63	34	21	7
1999	726	69	39	21	9
2000	1533	67	39	21	6
2001	1828	66	38	22	6

Table 3.2.33: Distribution of Systolic BP without anti-hypertensives, HD patients, NGO Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients < 160 mmHg
1998	158	1620	140	125	157	77
1999	225	2313	142	125	160	74
2000	497	5010	140	123	159	76
2001	605	6127	140	121	156	78

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

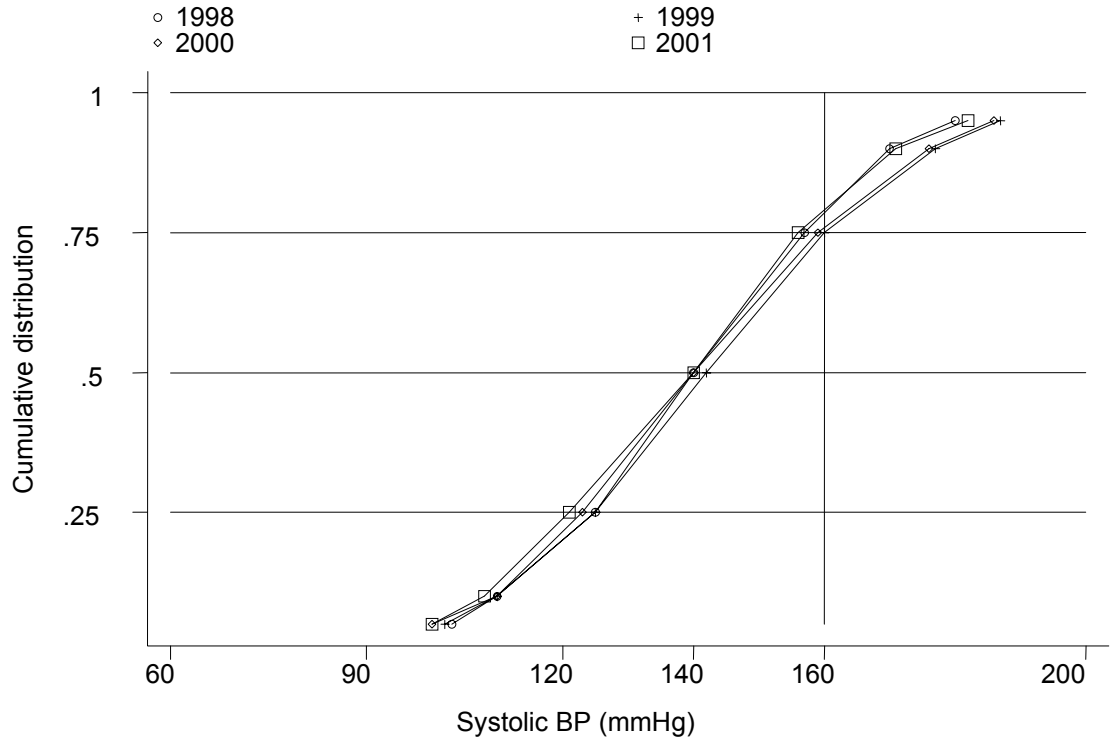


Table 3.2.34: Distribution of Diastolic BP without anti-hypertensives, HD patients, NGO Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 90 mmHg
1998	158	1621	80	70	90	74
1999	225	2310	80	70	90	72
2000	497	5010	80	70	88	77
2001	605	6127	80	70	86	80

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

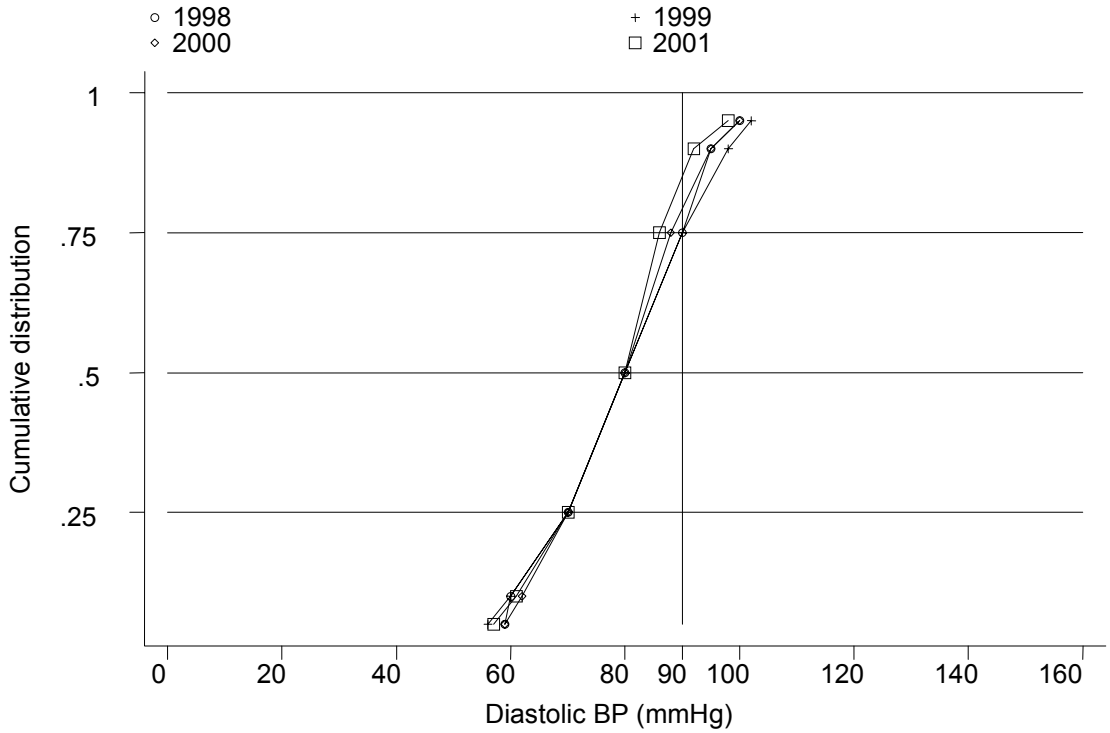


Table 3.2.35: Distribution of systolic BP on anti-hypertensives, HD patients, NGO Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 160 mmHg
1998	260	2555	156	140	172	54
1999	498	4864	160	141	178	49
2000	997	9884	153	140	171	56
2001	1210	12184	154	139	171	56

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

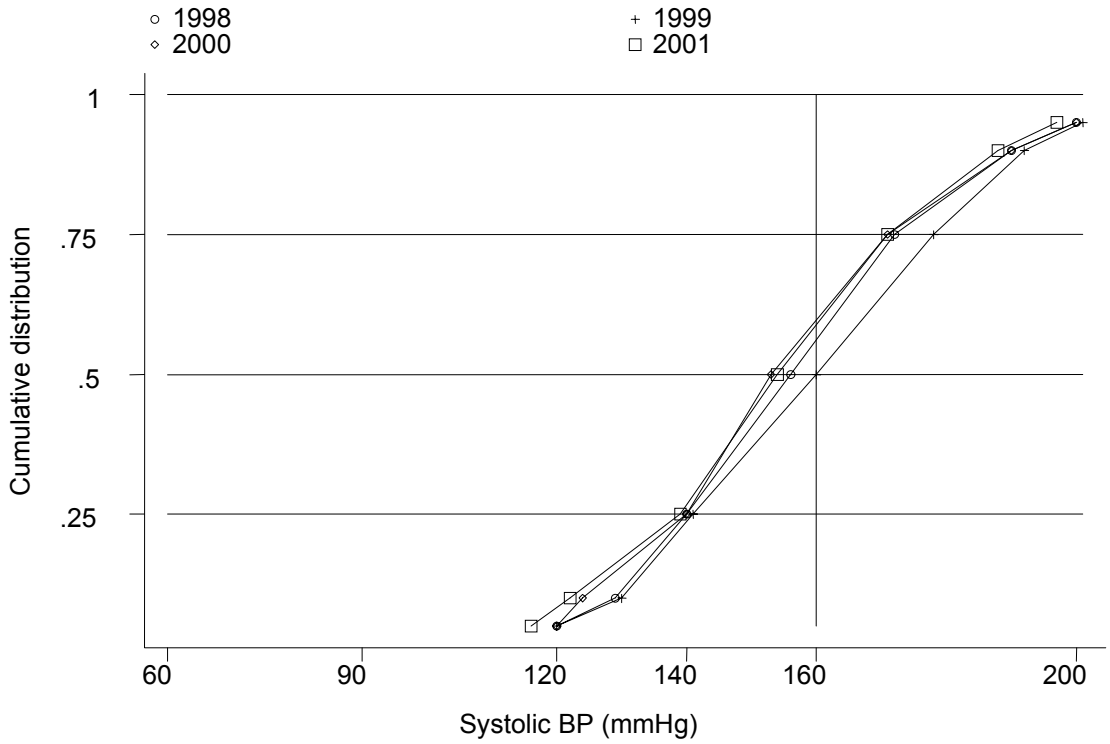
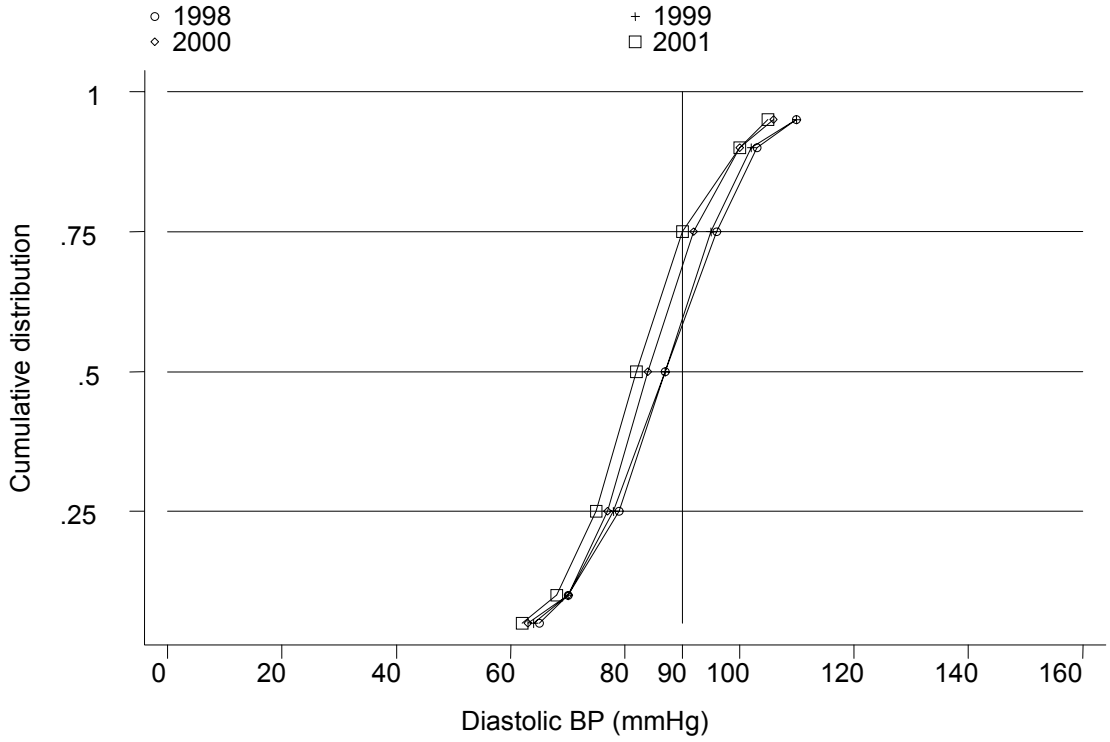


Table 3.2.36: Distribution of diastolic BP on anti-hypertensives, HD patients, NGO Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients < 90 mmHg
1998	32	47	2.6	1.4	3.3	96
1999	37	47	2.8	2.4	3.5	94
2000	448	638	2.9	2.2	3.6	96
2001	744	993	2.9	2.3	3.7	96

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 1998 – 2001

year	No	% on rHuEpo	% received blood transfusion	% received oral iron	% received parenteral iron
1998	430	50	7	92	1
1999	726	54	9	87	1
2000	1533	56	12	88	3
2001	1828	62	12	89	3

Table 3.2.38: Distribution of rHuEpo dose per week, HD patients, NGO Centres 1998 – 2001

Year	1998	1999	2000	2001
No. of patients	207	380	821	1105
% on 2000 u/week	60	67	57	54
% on 2-4000 u/week	33	27	38	39
% on 4-6000 u/week	4	4	4	5
% on 6-8000 u/week	2	1	1	1
% on 8-12000 u/week	0	1	0	0
% on >12000 u/week	0	0	0	0

Table 3.2.39: Distribution of serum Iron without rHuEpo, HD patients, NGO Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 10 umol/l
1998	28	71	15	10	22.9	69
1999	32	81	14	11	17	83
2000	194	324	15.6	10.4	26	77
2001	285	448	14.9	10.5	22.9	77

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

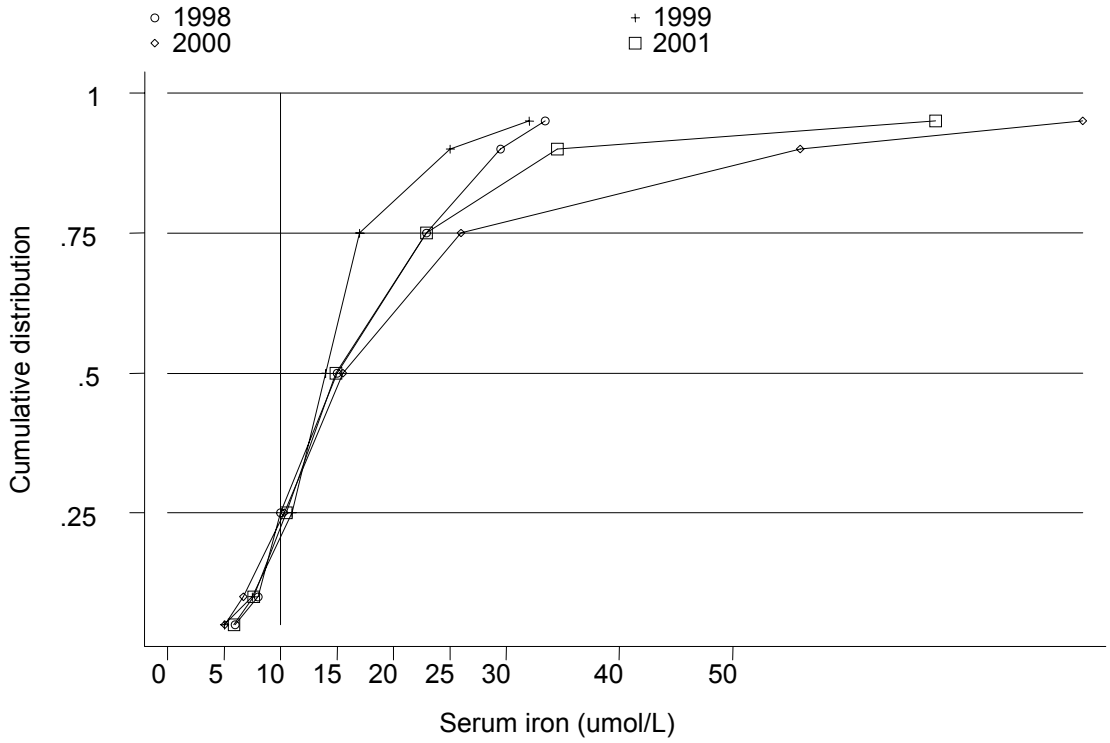


Table 3.2.40: Distribution of serum Iron on rHuEpo,HD patients, NGO Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 10 umol/l
1998	50	127	14.3	10	21.7	74
1999	46	123	15.1	11	23.3	78
2000	383	743	14.7	10.5	21	76
2001	545	966	13.3	9.7	19.4	71

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

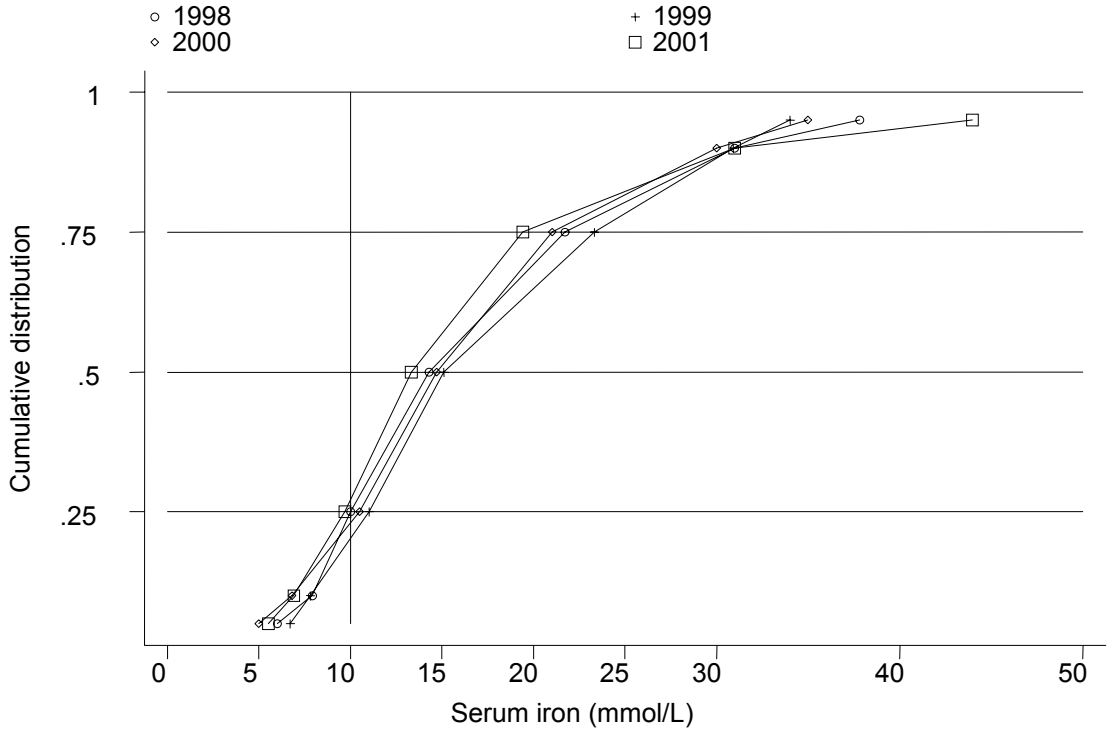


Table 3.2.41: Distribution of serum Transferrin Saturation without rHuEpo, HD patients, NGO Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 20%
1998	23	92	25	20.7	43.4	78
1999	23	92	26.9	20.7	41	83
2000	140	560	28.4	18.7	44.8	71
2001	198	792	32.1	22.7	48.9	79

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

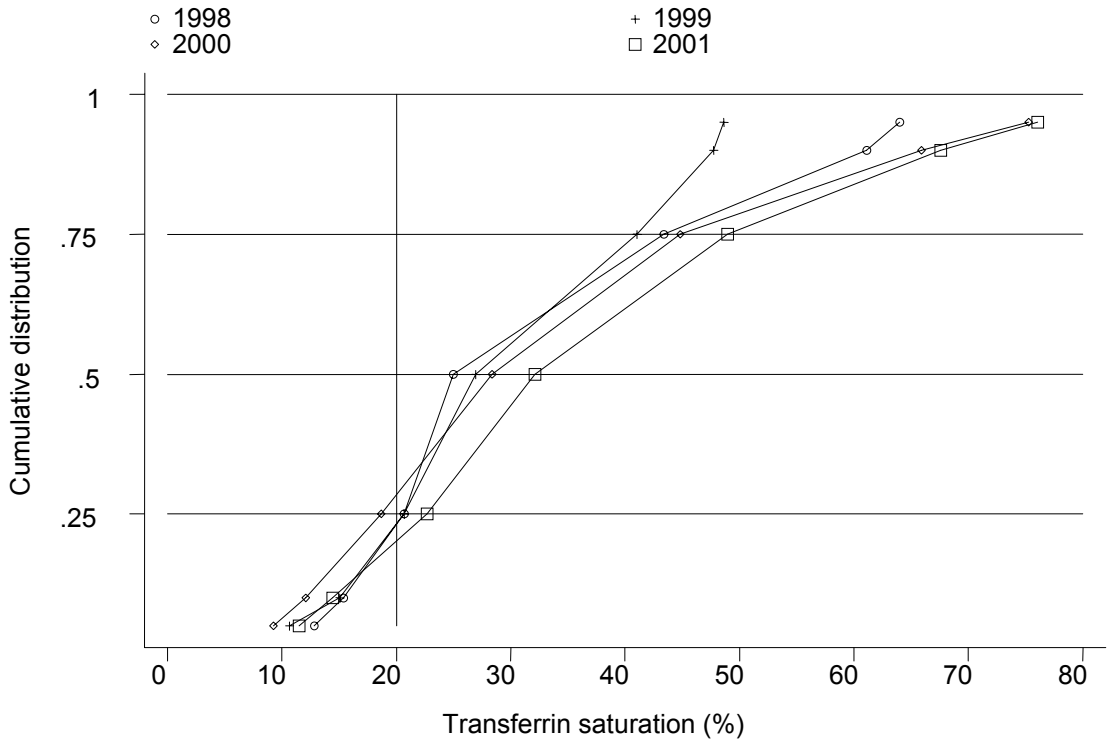


Table 3.2.42: Distribution of serum Transferrin Saturation on rHuEpo, HD patients, NGO Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 20%
1998	30	120	23.7	16.7	38.7	57
1999	34	136	30.5	20	43.2	74
2000	293	1172	31.3	21.1	45.3	77
2001	409	1636	29.9	21.5	41.4	78

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

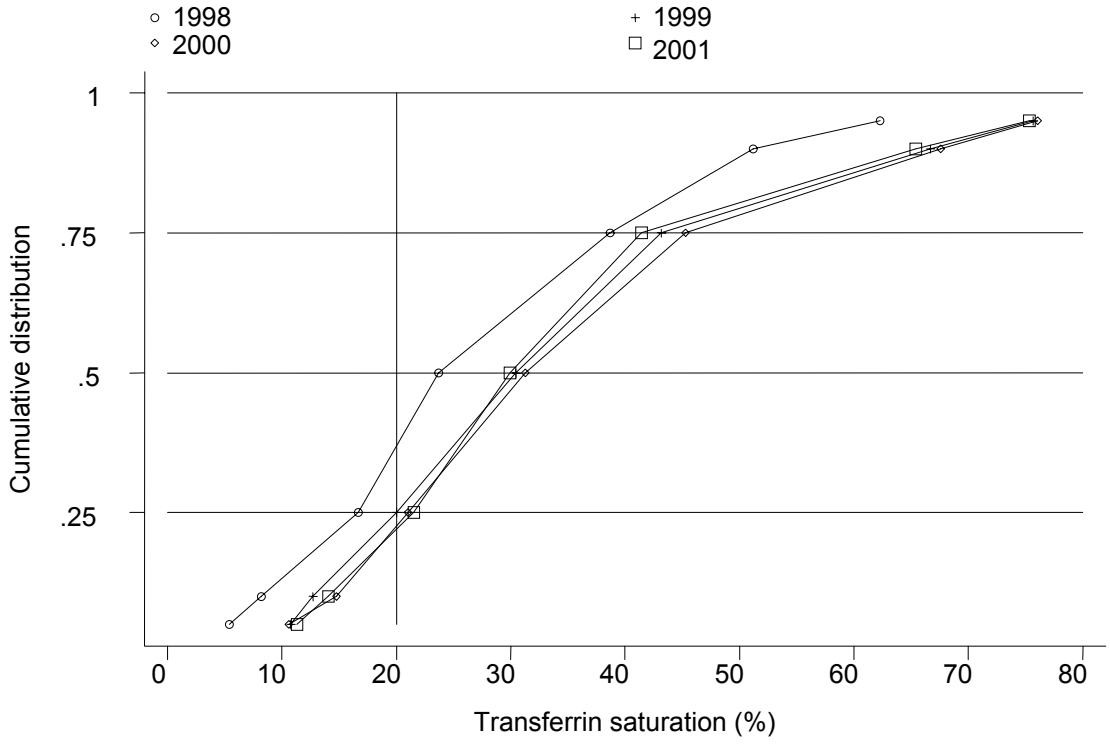


Table 3.2.43: Distribution of serum Ferritin without rHuEpo, HD patients, NGO Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients > 100 ug/l
1998	29	49	433	212.6	804	92
1999	24	38	505	200	688	87
2000	160	213	439	186	874	88
2001	273	357	426	194	846	87

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

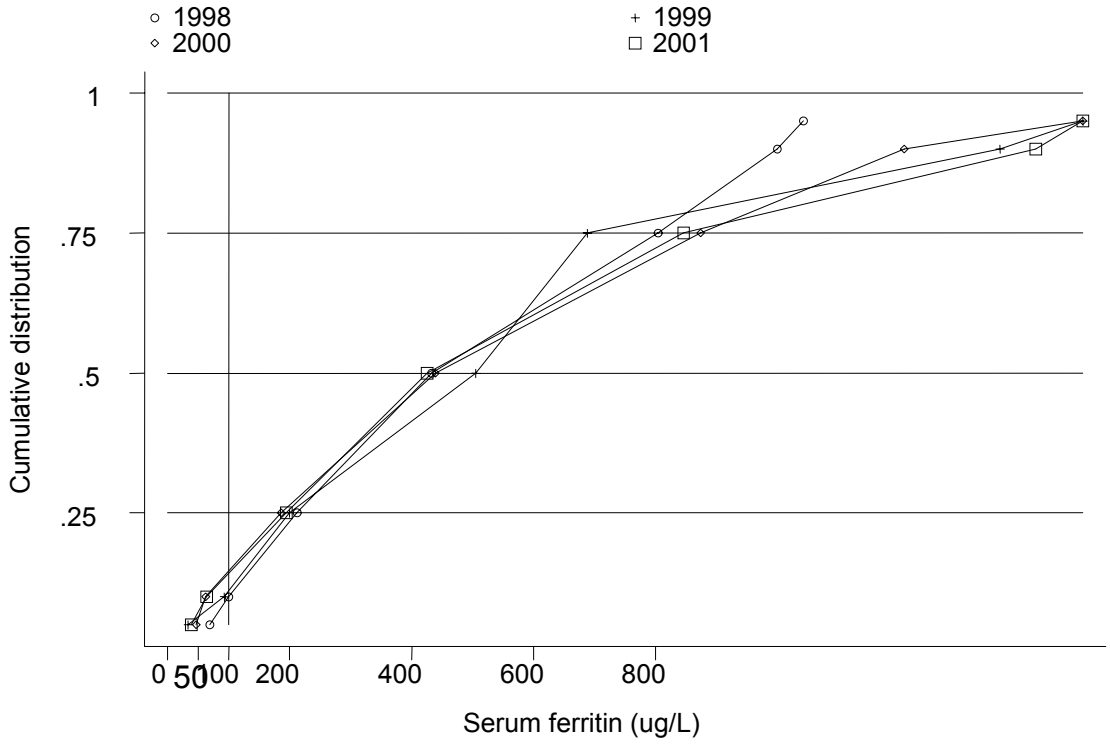


Table 3.2.44: Distribution of serum Ferritin on rHuEpo, HD patients, NGO Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients > 100 ug/l
1998	31	51	373.6	226.8	756	94
1999	36	59	382.5	175	1000	93
2000	368	523	514	239	982	90
2001	558	820	486	226	878	91

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

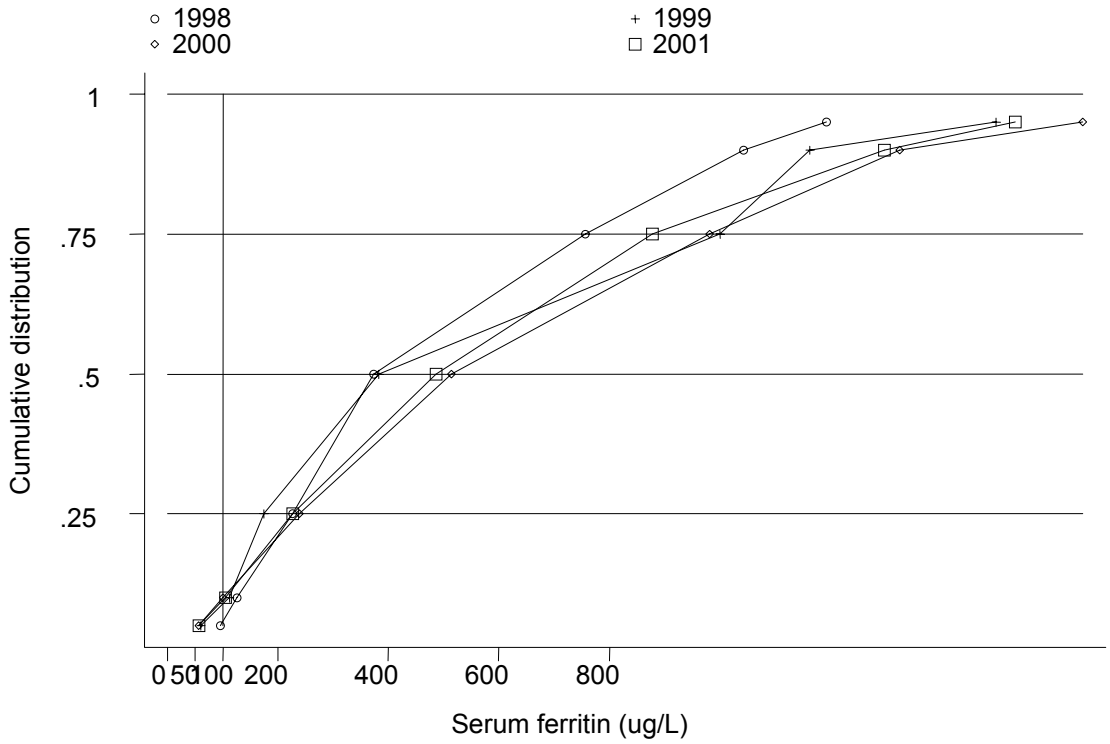


Table 3.2.45: Distribution of Haemoglobin without rHuEpo, HD patients, NGO Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients <10 g/dl	% patients ≥10 & ≤12 g/dl	% patients >12 g/dl
1998	201	566	8.8	7.6	10.3	70	19	10
1999	313	836	9.1	7.9	10.4	66	25	8
2000	573	1462	9.1	7.9	10.9	63	25	12
2001	630	1655	9.3	8	10.6	64	24	11

Figure 3.2.45: Cumulative Distribution of Haemoglobin without rHuEpo by year

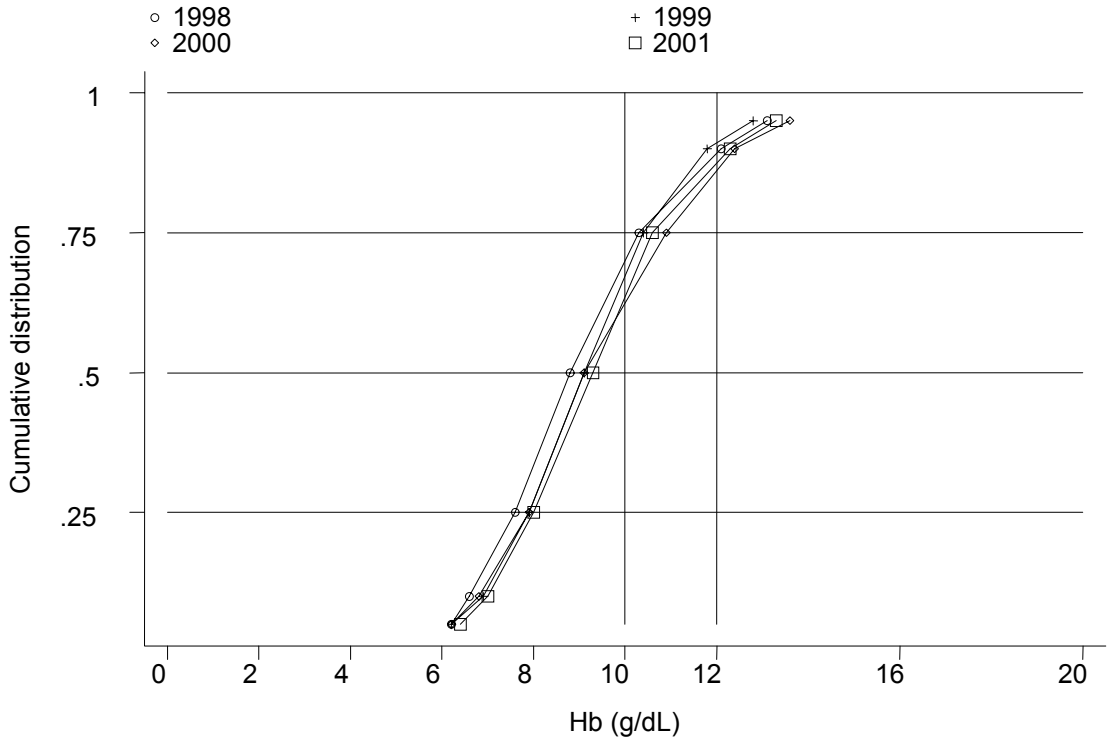
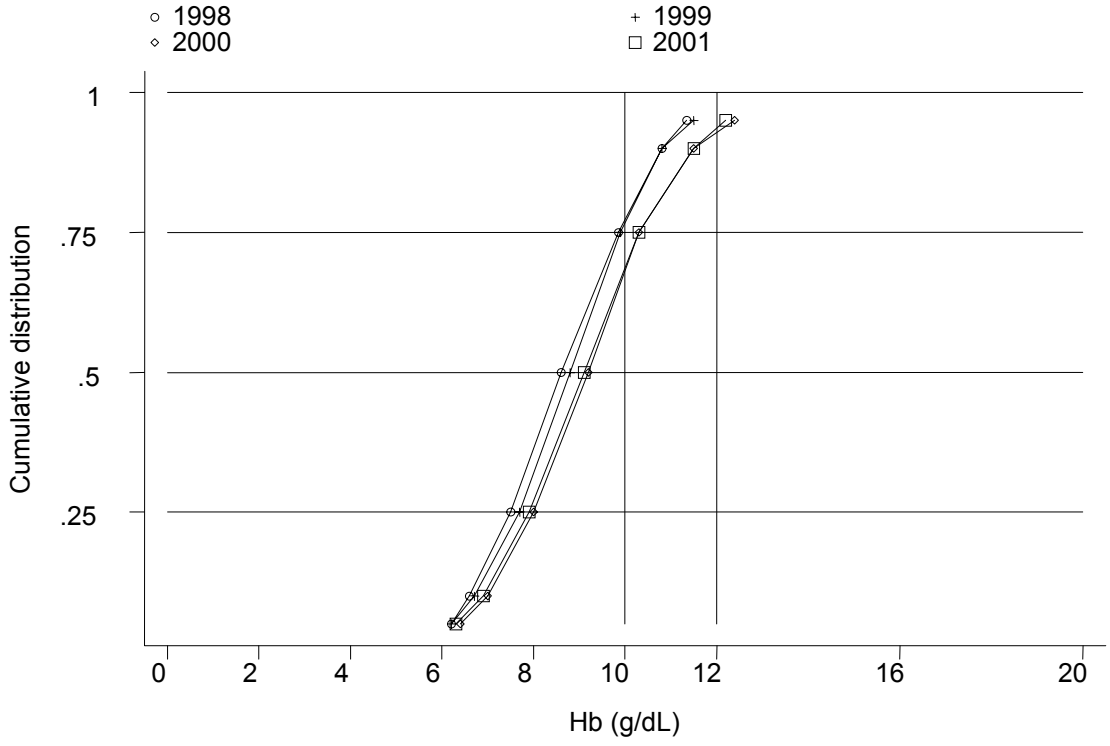


Table 3.2.46: Distribution of Haemoglobin on rHuEpo, HD patients, NGO Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients <10 g/dl	% patients ≥10 & ≤12 g/dl	% patients >12 g/dl
1998	207	600	8.6	7.5	9.8	78	19	3
1999	381	1123	8.8	7.7	9.9	76	22	3
2000	766	2187	9.2	8	10.3	67	27	6
2001	1071	3247	9.1	7.9	10.3	67	27	6

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 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients >40g/l
1998	401	1065	39	37	43	48
1999	645	1471	39	36	42	44
2000	1225	3310	39	36	41	40
2001	1660	4478	38	35	40.8	33

Figure 3.2.47: Cumulative distribution of serum Albumin by year

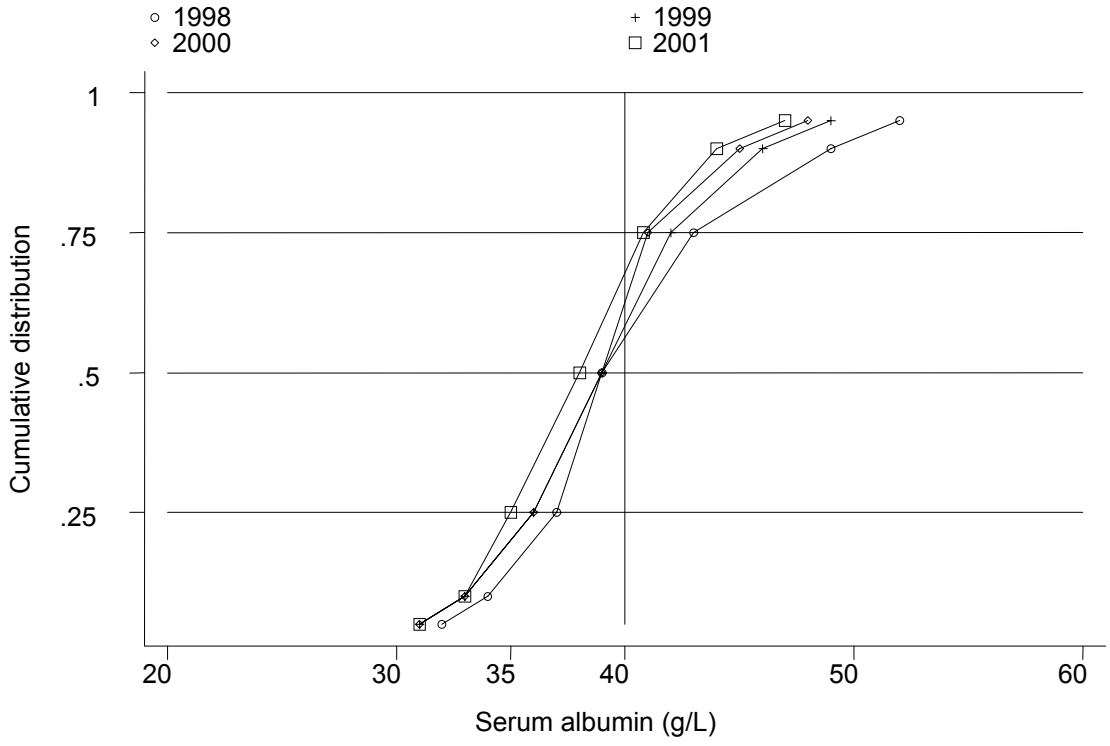
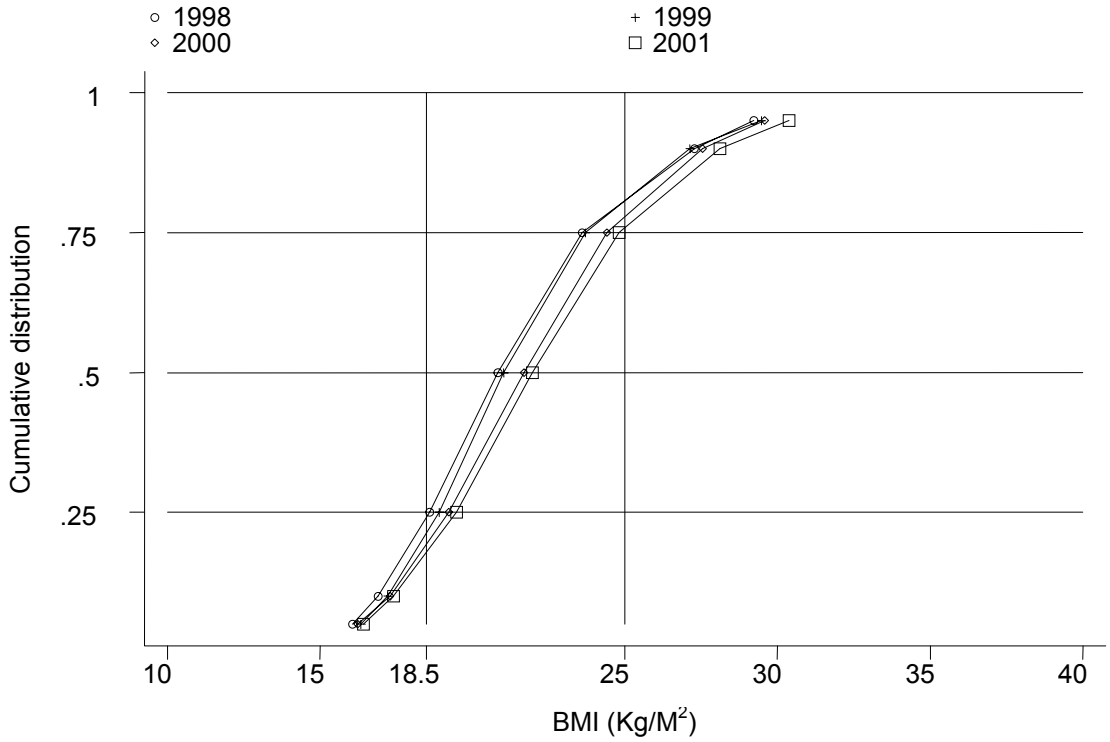


Table 3.2.48: Distribution of Body Mass Index, HD patients, NGO Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients <18.5	% patients ≥18.5 & ≤25	% patients >25
1998	326	3279	20.8	18.6	23.6	24	59	17
1999	602	5894	21	18.9	23.7	20	63	17
2000	1212	12031	21.7	19.2	24.4	19	59	22
2001	1490	14988	22	19.5	24.8	17	60	24

Figure 3.2.48: Cumulative distribution of BMI by year

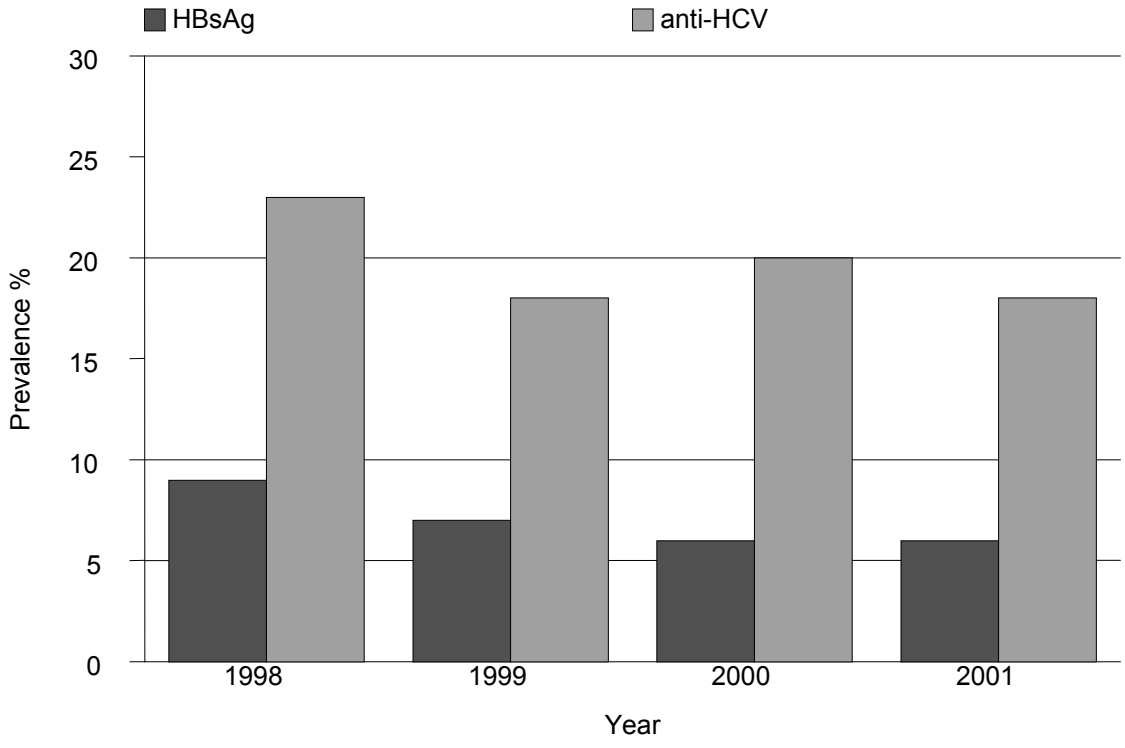


3.2.14 SEROLOGICAL STATUS, HD PATIENTS , NGO CENTRES

Table 3.2.49: Prevalence of positive anti-HCV and HbsAg, HD patients, NGO Centres 1998 – 2001

Year	No	% HBsAg positive	% anti-HCV positive
1998	430	9	23
1999	726	7	18
2000	1533	6	20
2001	1828	6	18

Figure 3.2.49: Prevalence of positive anti-HCV and HbsAg HD patients, NGO Centres 1998 – 2001



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

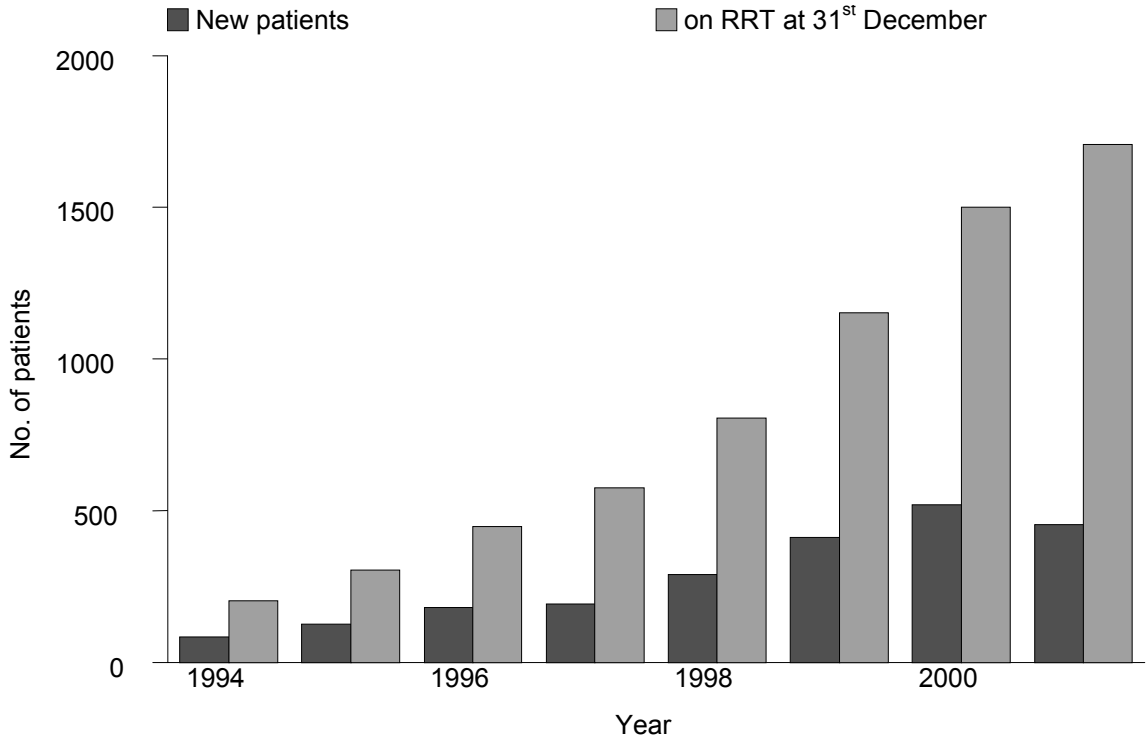
3.3: HAEMODIALYSIS IN PRIVATE CENTRES

3.3.1 STOCK AND FLOW

Table 3.3.01: Stock and Flow HD Patient, Private Centres 1994 – 2001

Year	1994	1995	1996	1997	1998	1999	2000	2001
New patients	84	126	180	193	290	412	519	455
Died	16	20	24	48	50	52	118	179
Transferred to PD	0	1	2	2	1	0	7	8
Transplanted	6	2	8	7	5	14	39	42
Lost to Follow up	2	3	4	7	4	1	6	20
Dialysing at 31st December	205	305	447	576	806	1151	1500	1706

Figure 3.3.01: Stock and Flow HD Patient, Private Centres 1994 – 2001



3.3.3 DEATH ON HAEMODIALYSIS, PRIVATE CENTRES

Table 3.3.04: HD Death Rate and Transfer to PD, Private Centres 1994 – 2001

	1994	1995	1996	1997	1998	1999	2000	2001
No. at risk	205	255	376	512	691	979	1326	1603
Deaths	16	20	24	48	50	52	118	179
Death rate %	8	8	6	9	7	5	9	11
Transfer to PD	0	1	2	2	1	0	7	8
Transfer to PD rate %	0	0	1	0	0	0	1	0
All Losses	16	21	26	50	51	52	125	187
All Losses rate %	8	8	7	10	7	5	9	12

Figure 3.3.04: Death Rate on HD, Private Centres 1994 – 2001

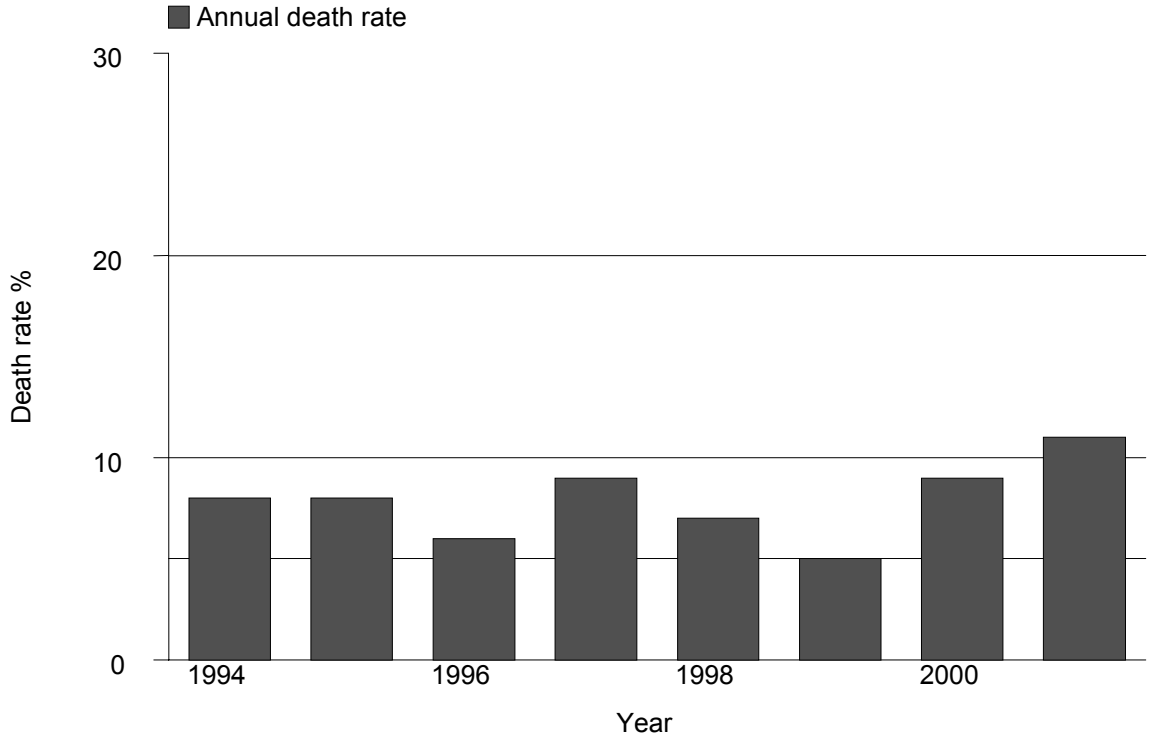


Table 3.3.05: Causes of Death HD Patient, Private Centres 1998 – 2001

	1998		1999		2000		2001	
Causes of death	No.	%	No.	%	No.	%	No.	%
Cardiovascular	11	22	13	25	42	36	73	41
Died at home	10	20	14	27	33	28	63	35
Sepsis	4	8	8	15	11	9	13	7
GIT bleed	1	2	1	2	2	2	3	2
Cancer	3	6	1	2	2	2	3	2
Liver disease	0	0	2	4	2	2	2	1
Others	19	38	11	21	21	18	15	8
Unknown	2	4	2	4	5	4	5	3
Total	50	100	52	100	118	100	179	100

3.3.5 HAEMODIALYSIS PATIENTS' CHARACTERISTICS, PRIVATE CENTRES

Table 3.3.08: Age Distribution of Dialysis Patients, Private Centres 1998 – 2001

Year	1998	1999	2000	2001
New Dialysis patients	290	412	519	455
1-14 years	0	0	0	0
15-24 years	3	2	1	2
25-34 years	6	6	5	4
35-44 years	14	15	14	10
45-54 years	18	21	22	22
55-64 years	31	28	32	31
≥65 years	27	28	26	30
Dialysing at 31st December	806	1151	1500	1706
1-14 years	0	0	0	0
15-24 years	2	3	2	2
25-34 years	12	10	9	8
35-44 years	18	17	16	15
45-54 years	18	19	20	21
55-64 years	28	28	30	30
≥65 years	21	23	23	24

Table 3.3.09: Patients' Characteristics, Private Centres 1998 – 2001

Year	1998	1999	2000	2001
New Dialysis patients (No)	290	412	519	455
Mean age±sd (years)	55±14	55±14	56±13	57±13
% male	47	55	57	56
% Diabetic	47	46	52	52
% HbsAg+	3	4	4	4
% Anti-HCV+	12	9	5	3

3.3.6 SURVIVAL ANALYSIS, PRIVATE HD CENTRES

Table 3.3.10: HD Patient Survival, Private Centres 1996 – 2001

Year	1996			1997			1998		
Interval	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	90	2	155	93	2	175	94	1	269
12	87	3	144	90	2	169	92	2	261
24	81	3	130	85	3	159	84	2	234
36	75	3	118	78	3	144	79	2	207
48	67	4	105	71	3	129			
60	61	4	93						
Year	1999			2000			2001		
Interval	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	96	1	389	95	1	478	95	1	213
12	91	1	362	90	1	435			
24	82	2	305						

No. = number at risk SE = standard error

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

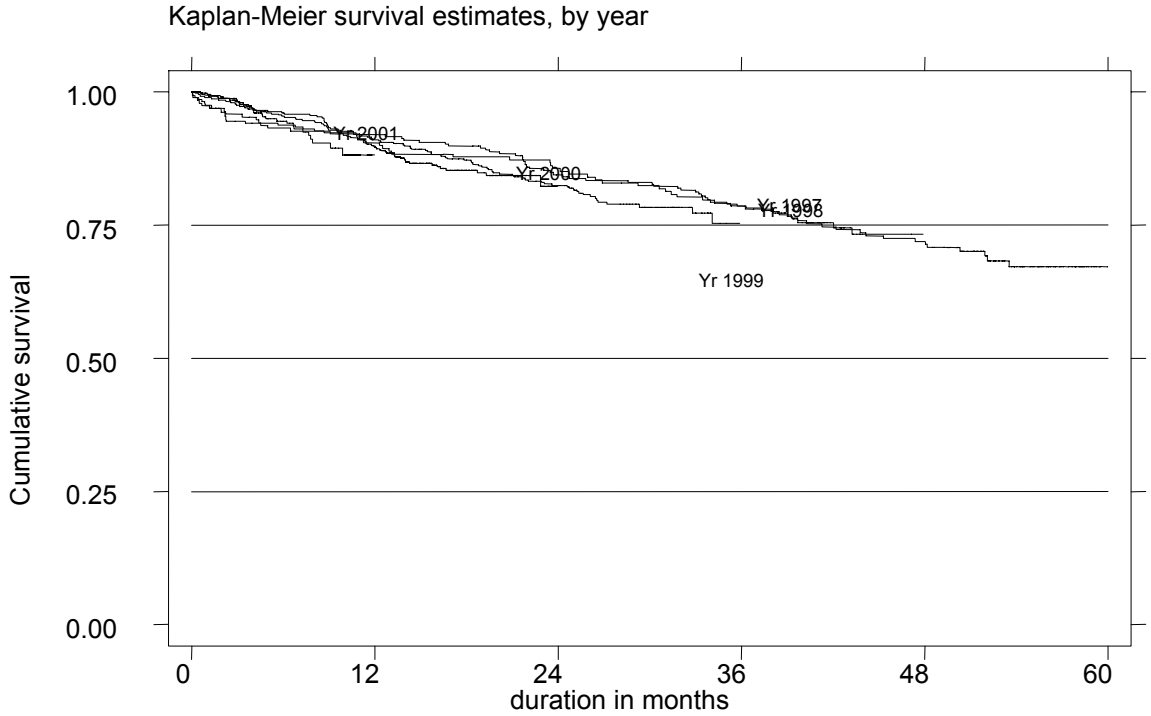


Table 3.3.11: HD Technique Survival, Private Centres

Year	1996			1997			1998		
Interval	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	89	2	155	92	2	175	94	1	269
12	86	3	144	90	2	169	92	2	261
24	79	3	130	85	3	159	84	2	234
36	73	3	118	78	3	144	78	2	207
48	65	4	105	71	3	129			
60	60	4	93						

Year	1999			2000			2001		
Interval	% survival	SE	No						
6	96	1	389	94	1	478	95	1	213
12	91	1	362	89	1	435			
24	82	2	305						

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 1999-2001

REHABILITATION	1999		2000		2001	
STATUS	No.	%	No.	%	No.	%
Full time work for pay	110	29	153	23	168	20
Part time work for pay	24	6	31	5	43	5
Able to work but unable to get a job	4	1	6	1	23	3
Able to work but not yet due to dialysis schedule	5	1	9	1	11	1
Able but disinclined to work	2	1	6	1	7	1
Home maker	87	23	175	27	188	22
Full time student	1	0	2	0	3	0
Age<15 years	0	0	0	0	0	0
Retired	46	12	81	12	121	14
Age>65 years	61	16	122	19	161	19
Unable to work due to poor health	33	9	71	11	120	14
Total	373	100	656	100	845	100

Table 3.3.13: Quality of Life on Haemodialysis, Private Centres 1999-2001

QOL Index Summated Score	1999		2000		2001	
	No.	%	No.	%	No.	%
0 (Worst QOL)	1	0	1	0	0	0
1	0	0	0	0	2	0
2	2	1	1	0	4	0
3	0	0	10	1	11	1
4	3	1	20	3	36	4
5	22	6	49	7	46	5
6	25	7	56	8	67	8
7	40	11	51	7	79	9
8	30	8	67	10	86	10
9	49	13	67	10	72	9
10 (Best QOL)	196	53	359	53	444	52
Total	368	100	681	100	847	100

3.3.8 HAEMODIALYSIS PRACTICES IN PRIVATE CENTRES

Table 3.3.14: Vascular Access on Haemodialysis, Private Centres 1999 - 2001

Access types	1999		2000		2001	
	No	%	No	%	No	%
Wrist AVF	322	82	609	80	743	77
BCF*	43	11	115	15	160	17
Venous graft	4	1	3	0	7	1
Artificial graft	6	2	10	1	27	3
PERMCATH	2	1	3	0	6	1
Temporary CVC*	17	4	18	2	20	2
Total	394	100	758	100	963	100

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

Table 3.3.15: Difficulties reported with Vascular Access, Private Centres 1999 - 2001

Access difficulty	1999		2000		2001	
	No	%	No	%	No	%
Difficulty with needle placement	12	3	27	4	60	6
Difficulty in obtaining desired blood flow rate	7	2	23	3	44	5
Other difficulty	6	2	3	0	3	0
No difficulty	369	94	706	93	857	89
Total	394	100	759	100	964	100

Table 3.3.16: Complications reported with Vascular Access, Private Centres 1999 - 2001

Complication	1999		2000		2001	
	No.	%	No.	%	No.	%
thrombosis	12	3	22	3	41	4
bleed	2	1	3	0	6	1
aneurysmal dilatation	11	3	38	5	52	5
swollen limb	6	2	3	0	5	1
access related infection, local/systemic	1	0	3	0	4	0
distal limb ischaemia	1	0	7	1	2	0
venous outflow obstruction	1	0	6	1	15	2
carpal tunnel	2	1	2	0	4	0
other	6	2	5	1	11	1
no complication	352	89	670	88	826	86
Total	394	100	759	100	966	100

Table 3.3.17: Blood Flow Rates in Private HD Units 1998 - 2001

Blood flow rates	1999		2000		2001	
	No.	%	No.	%	No.	%
<150 ml/min	1	0	2	0	5	1
150-199 ml/min	9	2	16	2	23	2
200-249 ml/min	195	53	384	53	382	40
250-299 ml/min	130	36	246	34	376	40
300-349 ml/min	22	6	76	10	154	16
> 350 ml/min	9	2	5	1	8	1
Total	366	100	729	100	948	100

Table 3.3.18: Number of HD Sessions per week, Private HD Units 1999 - 2001

HD sessions	1999		2000		2001	
Per week	No.	%	No.	%	No.	%
1	2	1	3	0	6	1
2	117	30	233	31	264	27
3	270	69	514	68	654	68
4	1	0	2	0	35	4
Total	390	100	754	100	962	100

Table 3.3.19: Duration of HD in Private HD Units, 1999 - 2001

Duration of HD	1999		2000		2001	
per session	No.	%	No.	%	No.	%
≤3 hours	1	0	0	0	3	0
3.5 hours	8	2	9	1	11	1
4 hours	291	75	605	80	846	88
4.5 hours	52	13	73	10	50	5
5 hours	37	10	57	8	52	5
≥5 hours	0	0	10	1	0	0
Total	389	100	754	100	962	100

Table 3.3.20: Dialyser membrane types in Private HD Units 1999 - 2001

Dialyser	1999		2000		2001	
membrane	No.	%	No.	%	No.	%
Cellulosic	143	81	321	77	343	64
Cellulose acetate	10	6	15	4	56	10
Synthetic	23	13	80	19	139	26
Total	176	100	416	100	538	100

Table 3.3.21: Dialyser Reuse Frequency in Private HD Units 1999 - 2001

Dialyser reuse	1999		2000		2001	
frequency	No.	%	No.	%	No.	%
1*	44	13	59	9	62	7
2	6	2	2	0	1	0
3	28	8	30	4	46	5
4	128	37	296	43	232	25
5	42	12	74	11	96	10
6	94	27	160	23	215	23
7	2	1	4	1	4	0
8	3	1	44	6	209	23
9	0	0	0	0	0	0
10	0	0	15	2	36	4
11	1	0	1	0	5	1
12	1	0	2	0	6	1
≥13	0	0	0	0	4	0
Total	349	100	687	100	916	100

* 1 is single use i.e. no reuse

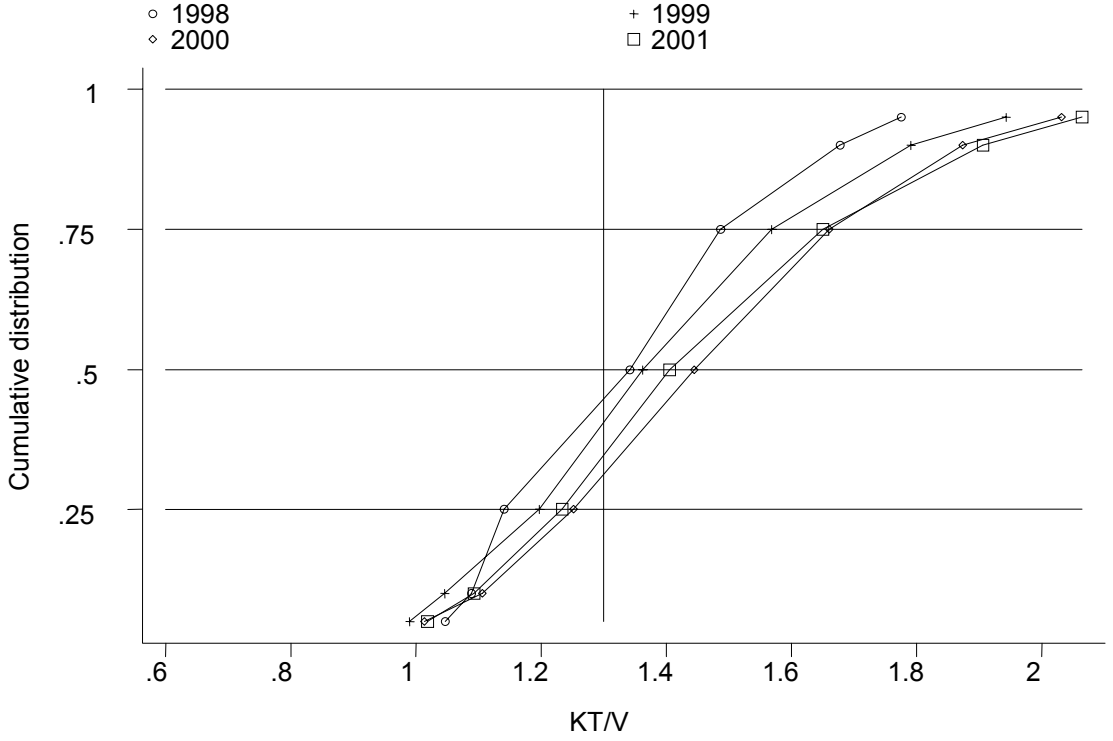
Table 3.3.22: Dialysate Buffer used in Private HD Units 1999 – 2001

Dialysate buffer	1999		2000		200	
	No.	%	No.	%	No.	%
Acetate	64	16	84	11	59	6
Bicarbonate	330	84	668	89	899	94
Total	394	100	752	100	958	100

Table 3.3.23: Distribution of Prescribed KT/V, Private Centres 1999 - 2001

Year	No of subjects	No of observations	median	LQ	UQ	% > 1.3
1999	235	1700	1.4	1.2	1.6	60
2000	472	4480	1.4	1.3	1.7	68
2001	605	5808	1.4	1.2	1.6	65

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- 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients < 5.3 mmol/l
1999	188	284	5	4.3	5.7	68
2000	328	522	4.9	4.1	5.7	66
2001	400	615	5	4.2	5.8	65

Figure 3.3.24: Cumulative distribution of serum cholesterol concentration by year

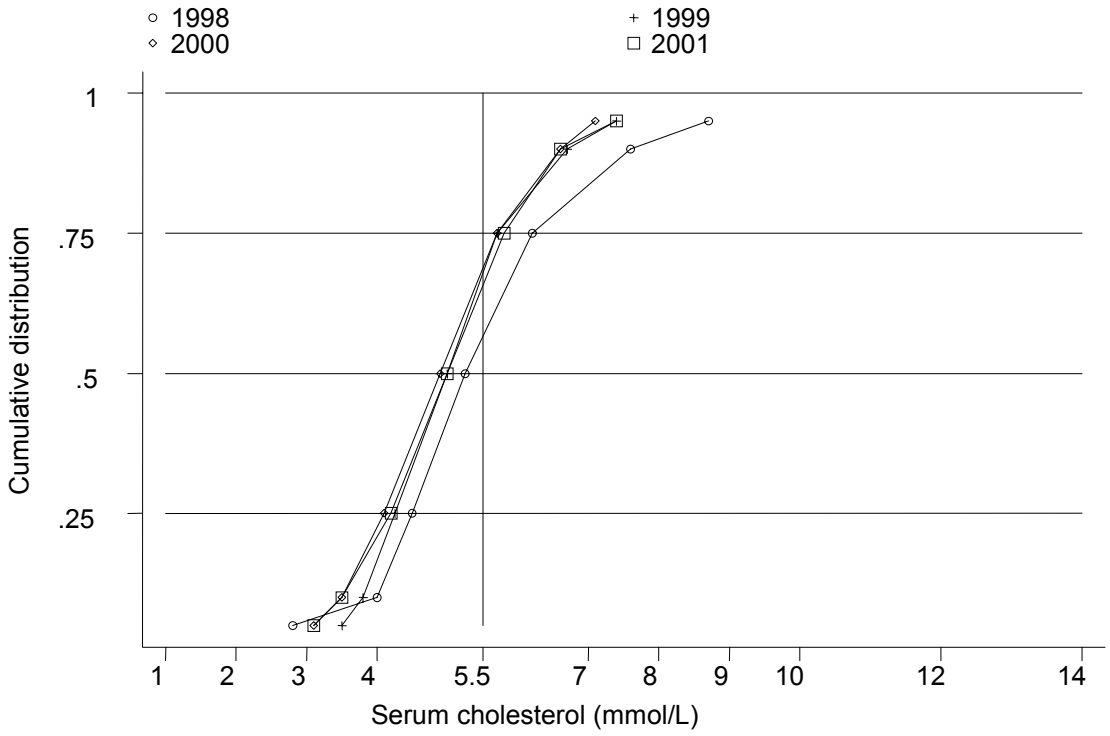


Table 3.3.25: Distribution of serum Triglyceride (mmol/l), HD patients, Private Centres 1999-2001

year	No of subjects	No of observations	median	LQ	UQ	% patients < 3.5 mmol/l
1999	83	107	1.8	1.2	2.7	86
2000	246	374	1.7	1.1	2.5	86
2001	282	410	1.6	1.1	2.5	89

Figure 3.3.25: Cumulative distribution of serum triglyceride concentration by year

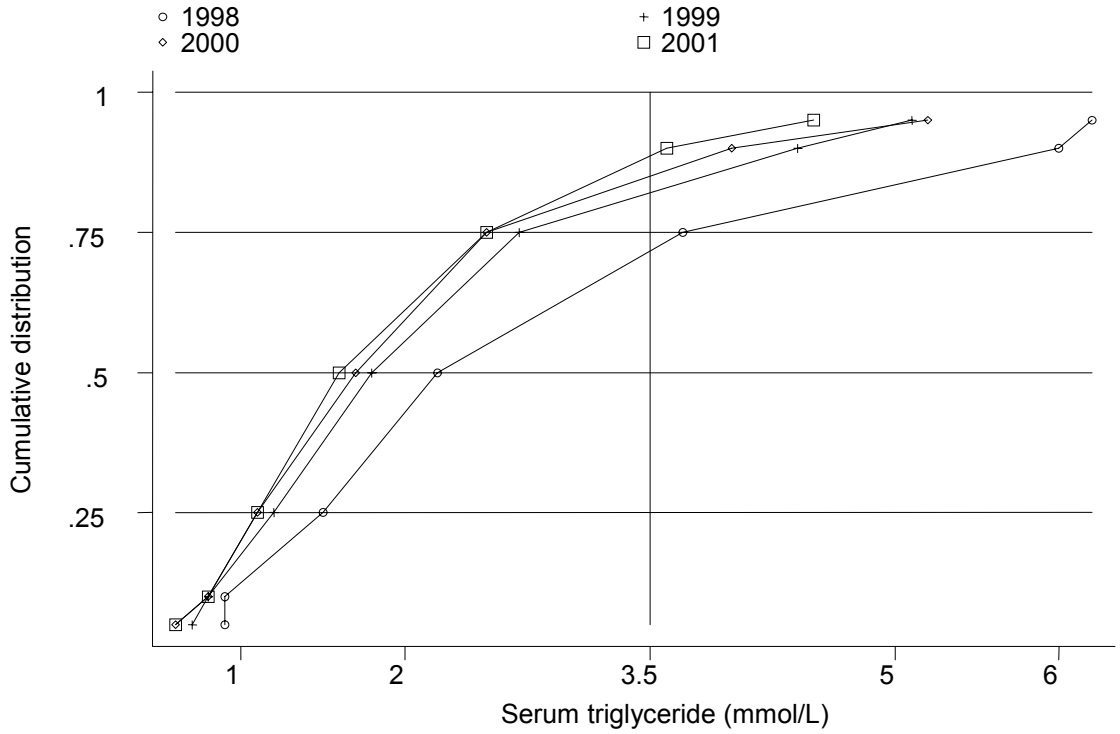


Table 3.3.26: Distribution of serum LDL (mmol/l), HD patient, Private Centres 1999-2001

year	No of subjects	No of observations	median	LQ	UQ	% patients <5 mmol/l
1999	73	93	3	2.5	3.9	96
2000	223	334	2.9	2.2	3.5	98
2001	276	398	3	2.3	3.6	97

Figure 3.3.26: Cumulative distribution of serum LDL by year

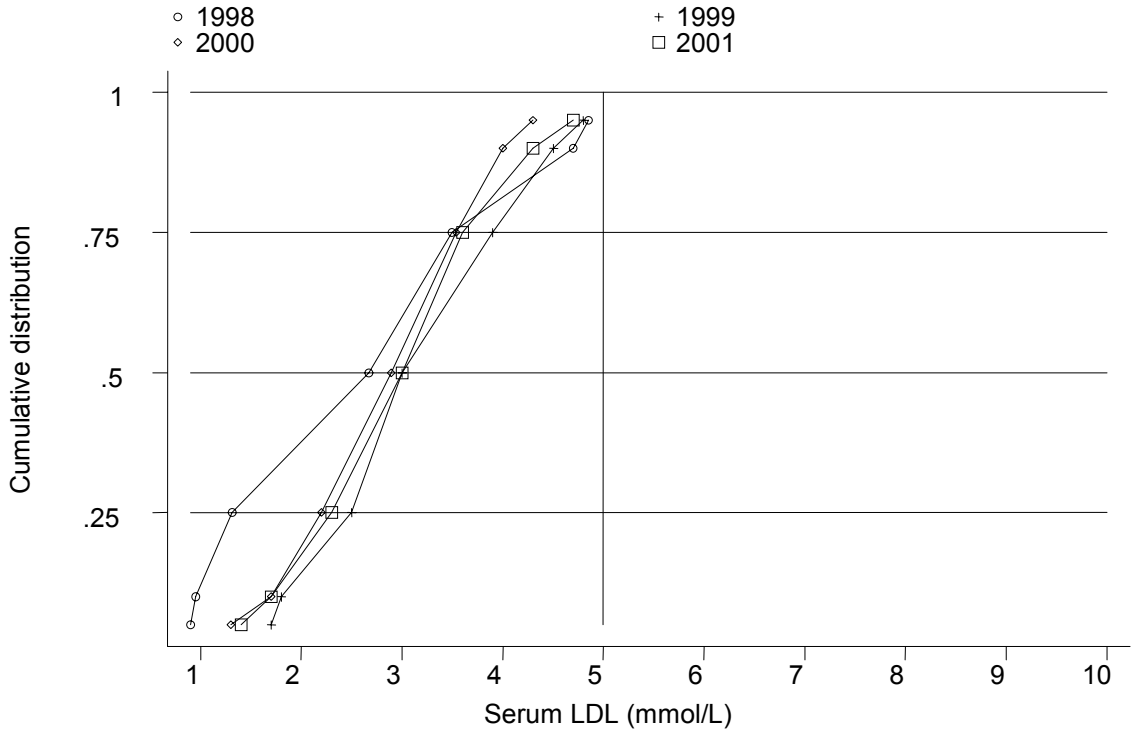
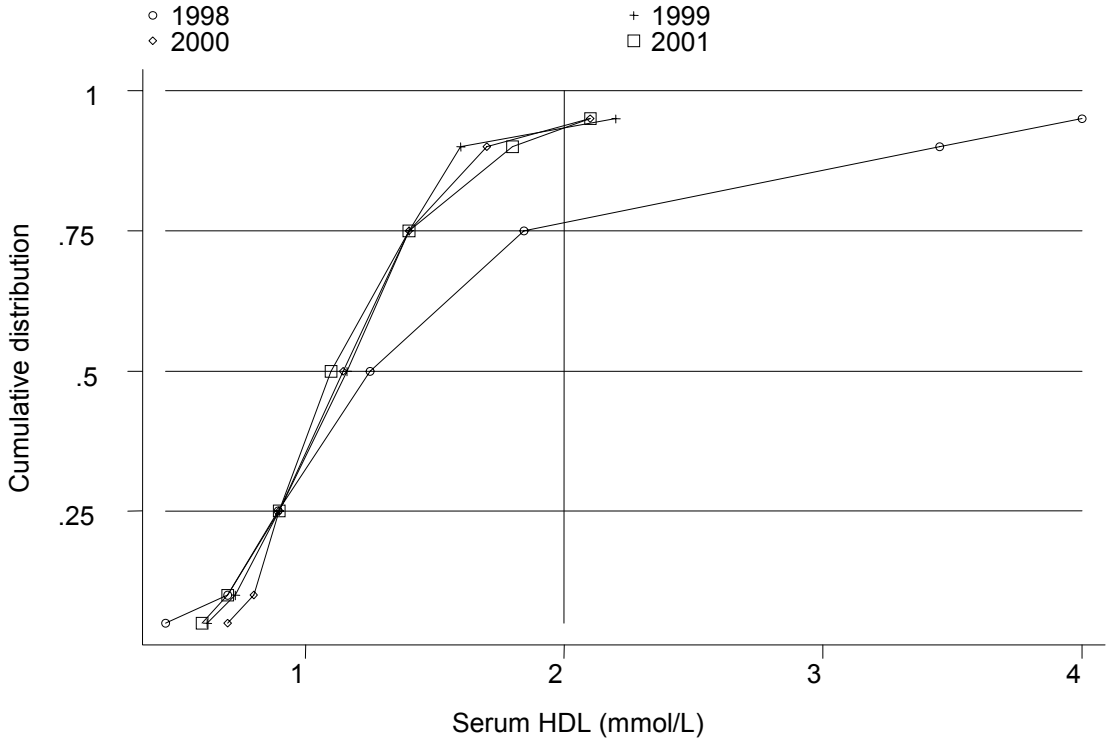


Table 3.3.27: Distribution of serum HDL (mmol/l), HD patient, Private Centres 1999 –2001

year	No of subjects	No of observations	median	LQ	UQ	% patients < 2mmol/l
1999	75	96	1.2	.9	1.4	95
2000	223	342	1.1	.9	1.4	94
2001	283	406	1.1	.9	1.4	94

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 1999–2001

year	No of subjects	% on CaCO3	% on Al(OH)3	% on Vit D
1999	395	82	6	28
2000	762	84	3	33
2001	966	89	2	27

Table 3.3.29: Distribution of serum Phosphate (mmol/l), HD patients, Private Centres 1999 –2001

year	No of subjects	No of observations	median	LQ	UQ	% patients <1.6 mmol/l
1999	355	954	1.9	1.6	2.3	26
2000	657	1653	1.9	1.5	2.3	31
2001	808	1956	1.8	1.4	2.3	33

Figure 3.3.29: Cumulative distribution of serum Phosphate by year

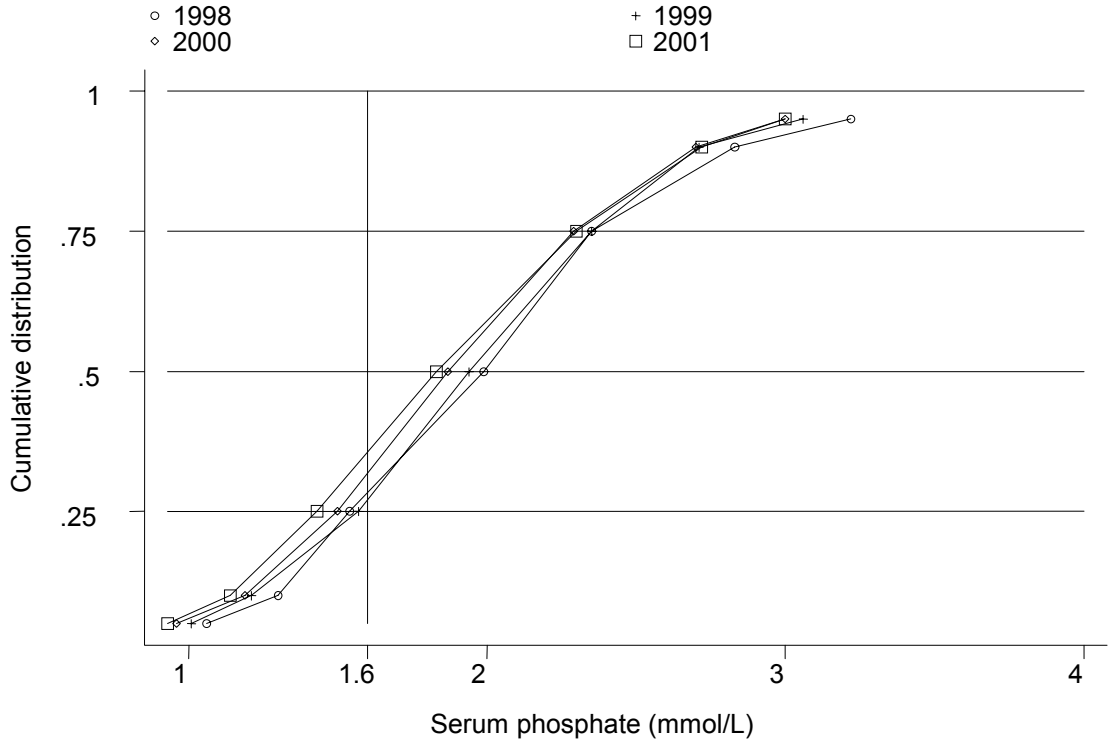


Table 3.3.30: Distribution of serum Calcium (mmol/l), HD patients, Private Centres 1999-2001

year	No of subjects	No of observations	median	LQ	UQ	% patients ≥ 2.2 & ≤2.6 mmol/l
1999	357	979	2.3	2.1	2.5	52
2000	665	1687	2.3	2.2	2.5	56
2001	818	1995	2.3	2.2	2.5	60

Figure 3.3.30: Cumulative distribution of serum Calcium by year

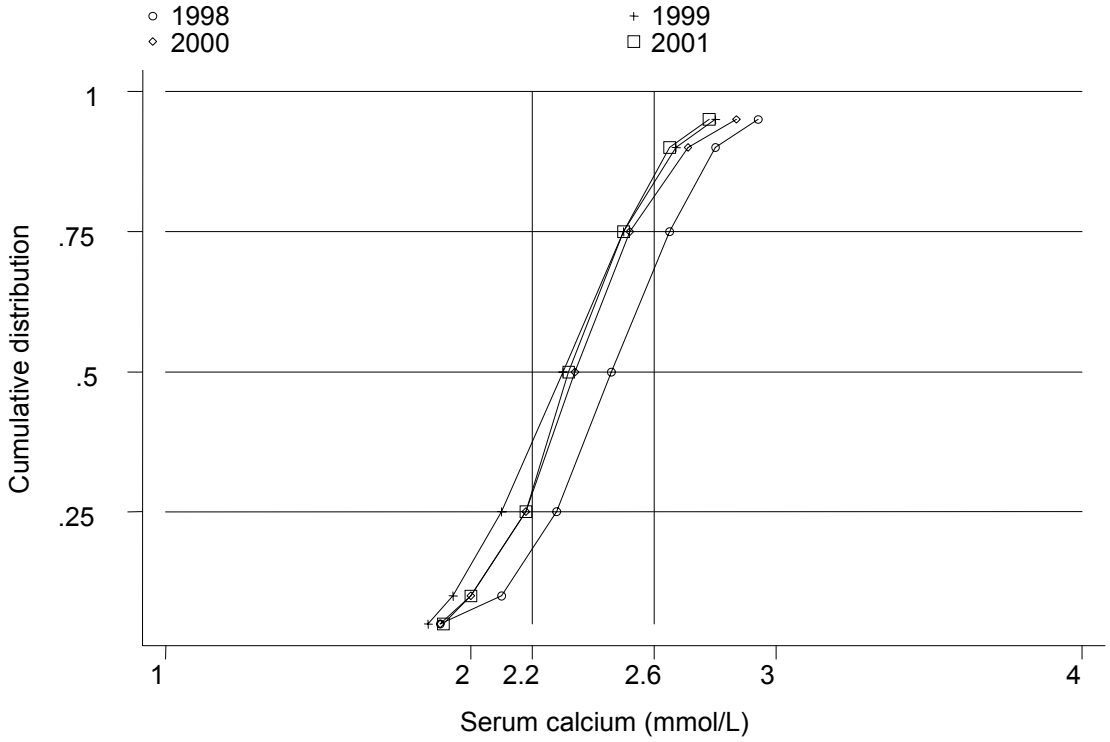
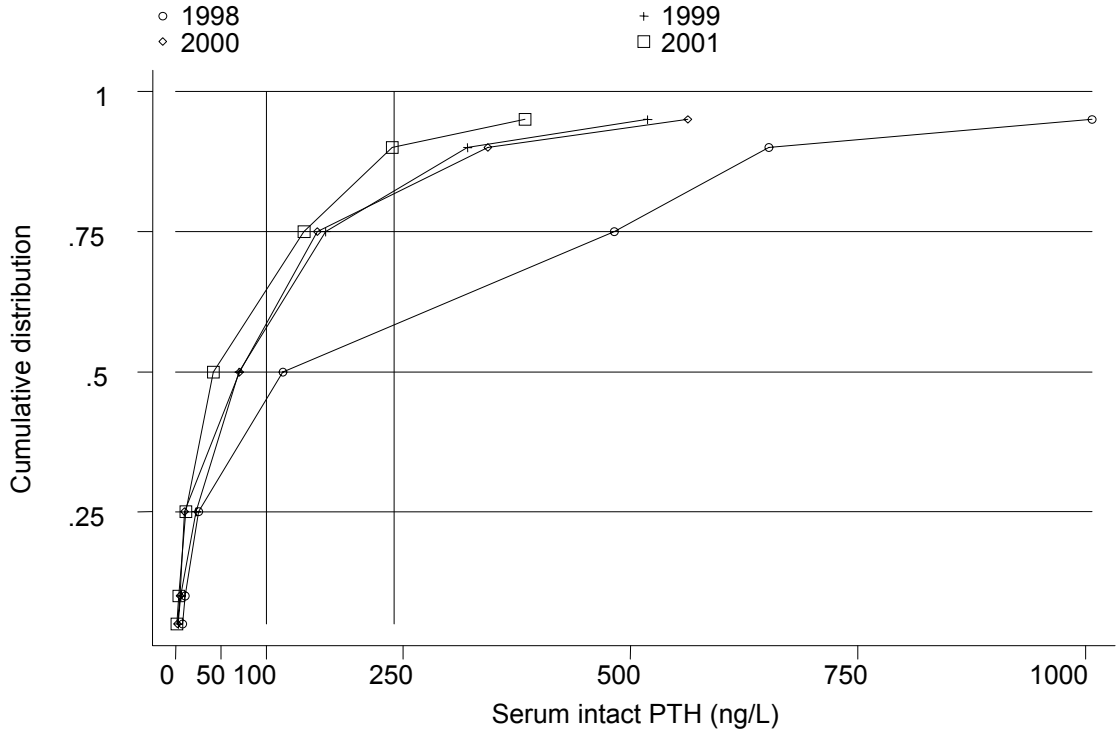


Table 3.3.31: Distribution of serum iPTH (ng/L), HD patients, Private Centres 1999-2001

year	No of subjects	No of observations	median	LQ	UQ	% patients ≥ 100 & ≤ 250 ng/l
1999	57	76	69.5	22.6	164.9	25
2000	86	107	70	9.9	156	22
2001	94	128	41.7	10.9	141	23

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 1999-2001

year	No.	% on anti-hypertensives	% on 1 anti-hypertensives	% on 2 anti-hypertensives	% on 3 anti-hypertensives
1999	395	64	39	20	5
2000	762	67	42	21	4
2001	966	68	40	23	5

Table 3.3.33: Distribution of Systolic BP without anti-hypertensives, HD patients Private Centres 1999-2001

year	No of subjects	No of observations	median	LQ	UQ	% patients < 160 mmHg
1999	135	836	142	130	160	68
2000	239	2228	140	128	160	72
2001	301	2702	140	120	151	80

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

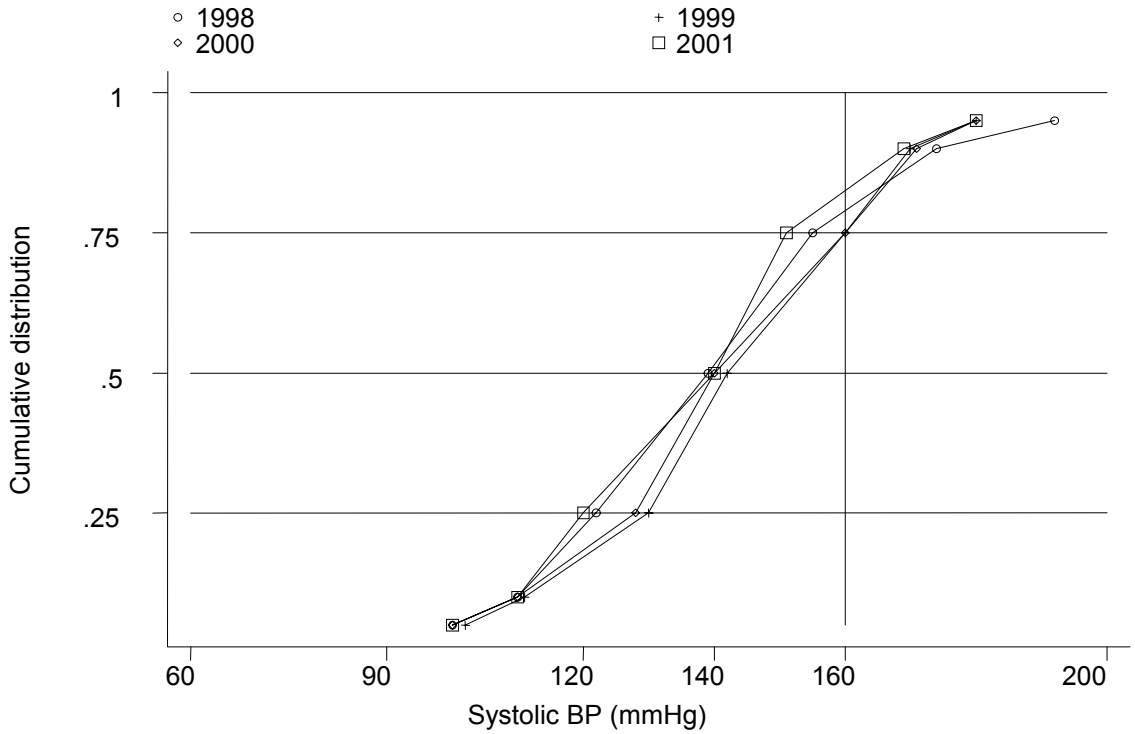


Table 3.3.34: Distribution of Diastolic BP without anti-hypertensives, HD patients, Private Centres 1999-2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 90 mmHg
1999	135	838	80	73	90	67
2000	239	2228	80	70	88	76
2001	301	2708	80	70	84	80

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

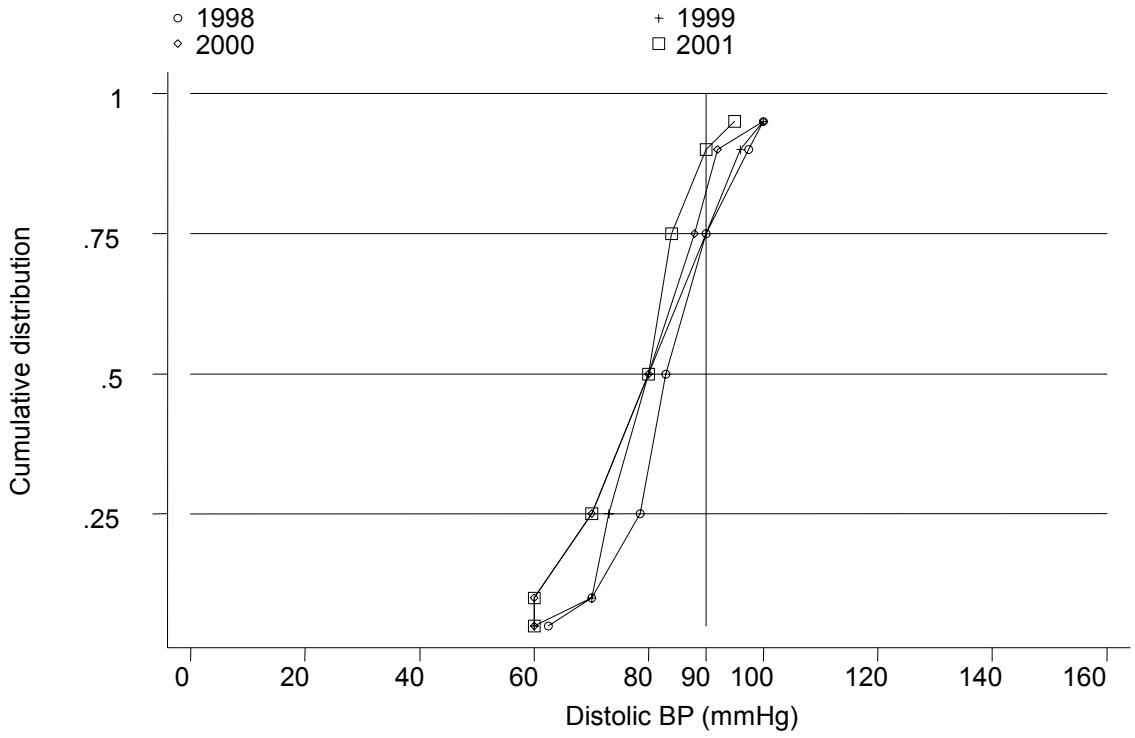


Table 3.3.35: Distribution of systolic BP on anti-hypertensives, HD patients, Private Centres 1999-2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 160 mmHg
1999	248	1856	154	140	170	52
2000	497	4483	155	140	170	53
2001	649	5951	155	140	171	53

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

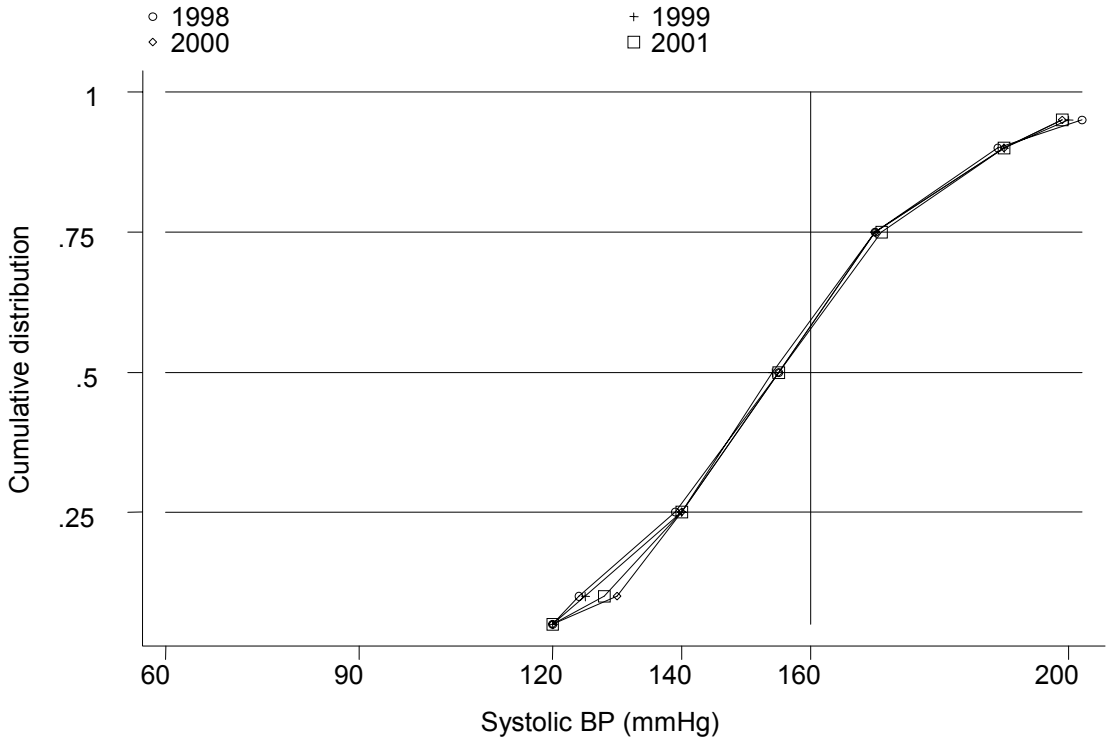
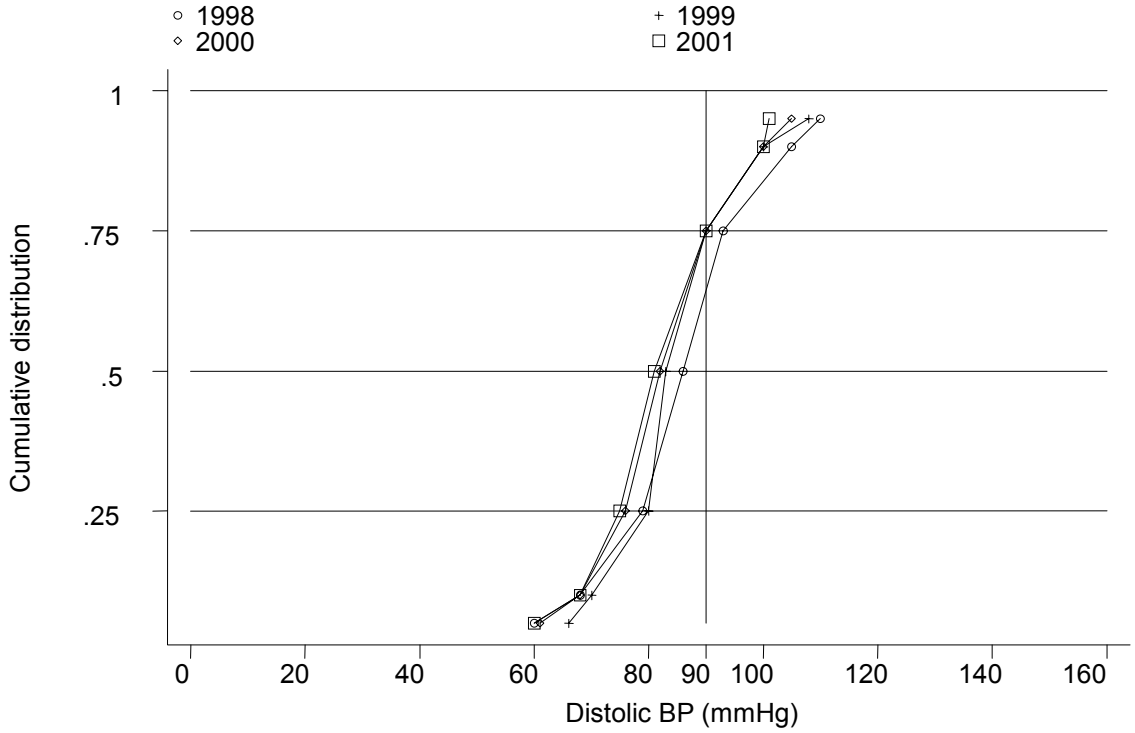


Table 3.3.36: Distribution of diastolic BP on anti-hypertensives, HD patients, Private Centres 1999-2001

year	No of subjects	No of observations	median	LQ	UQ	% patients < 90 mmHg
1999	248	1856	83	80	90	56
2000	497	4485	82	76	90	60
2001	649	5952	81	75	90	60

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 1999-2001

year	No	% on rHuEpo	% received blood transfusion	% on oral Iron	% received parenteral Iron
1999	395	61	23	81	13
2000	762	63	21	75	3
2001	966	65	19	80	5

Table 3.3.38: Distribution of rHuEpo dose per week, HD patients, Private Centres 1999-2001

Year	1999	2000	2001
No. of patients	231	468	613
% on 2000 u/week	28	30	30
% on 2-4000 u/week	63	58	53
% on 4-6000 u/week	4	7	11
% on 6-8000 u/week	2	1	2
% on 8-12000 u/week	2	2	3
% on >12000 u/week	0	0	1

Table 3.3.39: Distribution of serum Iron without rHuEpo, HD patients, PrivateCentres 1999-2001

year	No of subjects	No of observations	median	LQ	UQ	% patients > 10 umol/l
1999	14	21	11	9.1	14.4	62
2000	22	32	13.8	9.8	17.5	72
2001	27	39	15	11.5	20.8	85

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

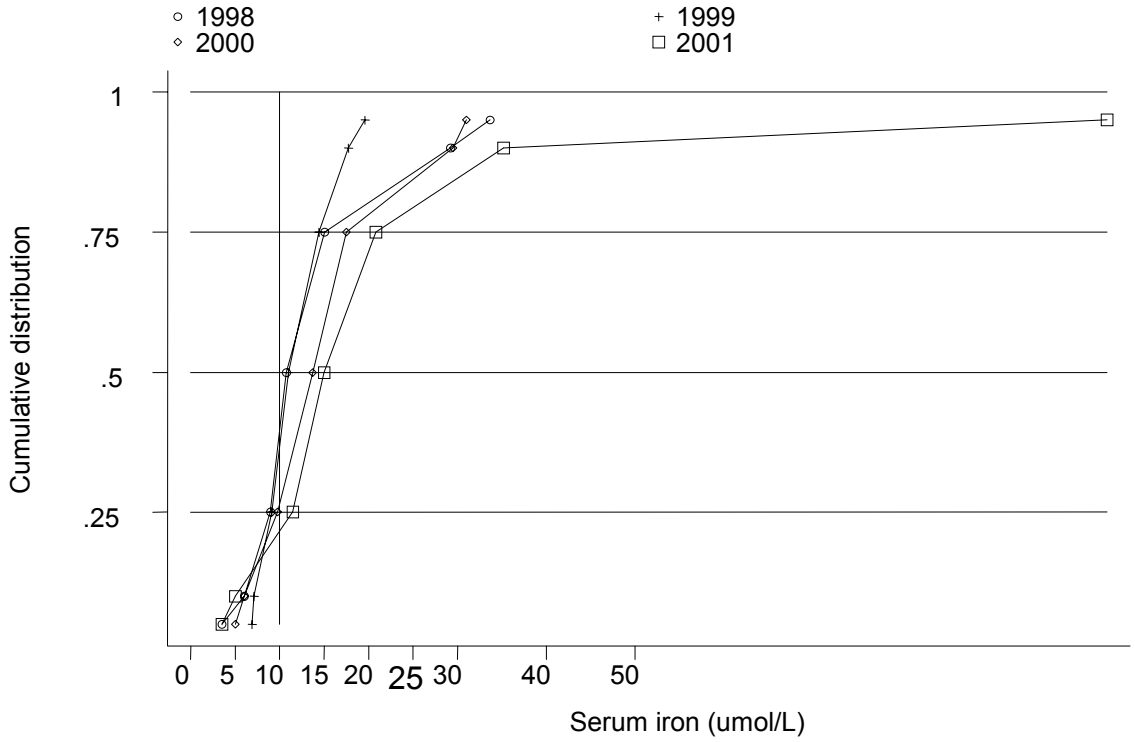


Table 3.3.40: Distribution of serum Iron on rHuEpo, HD patients, Private Centres 1999-2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 10 umol/l
1999	70	88	12.8	9	18.8	69
2000	62	85	13.1	9.3	21	67
2001	95	108	13.9	9.3	17.3	71

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

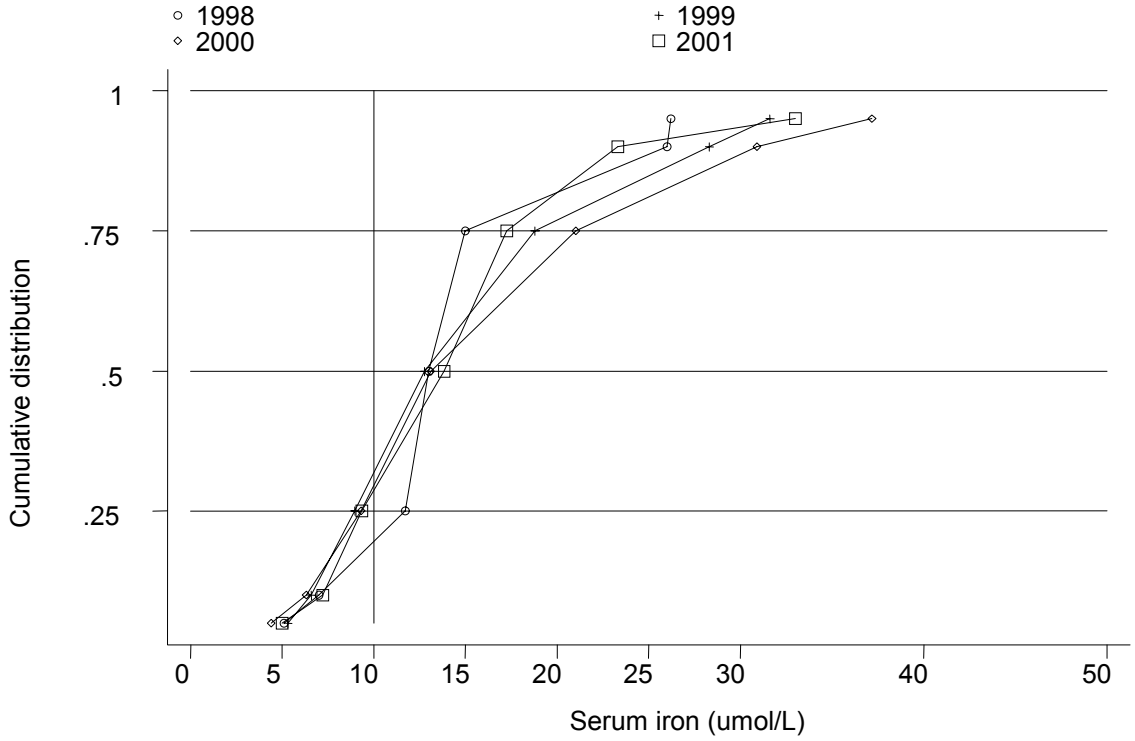


Table 3.3.41: Distribution of serum Transferrin Saturation without rHuEpo, HD patients, Private Centres 1999-2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 20%
1999	7	28	25.1	19.1	29.7	71
2000	19	76	24	16.2	34.6	68
2001	22	88	38.7	31.5	61.5	86

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

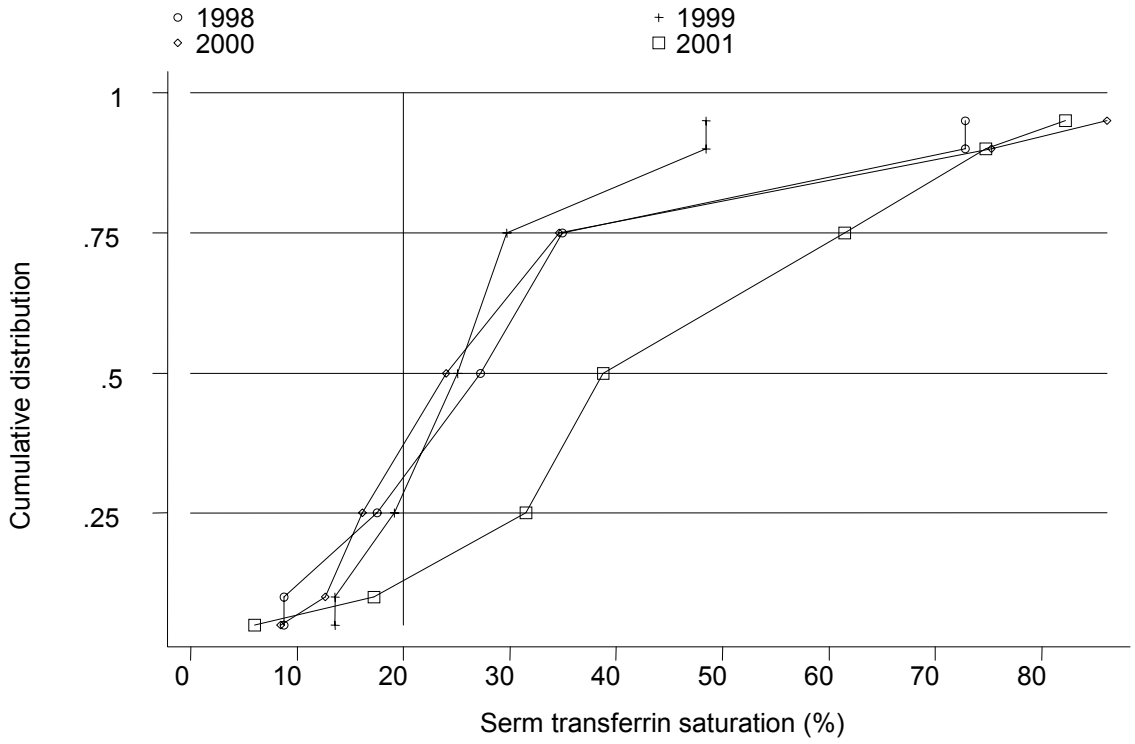


Table 3.3.42: Distribution of serum Transferrin Saturation on rHuEpo, HD patients, Private Centres 1999-2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 20%
1999	44	176	31.5	22.5	49.2	84
2000	52	208	36.2	23.8	52.1	85
2001	88	352	32.6	21.5	46.6	77

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

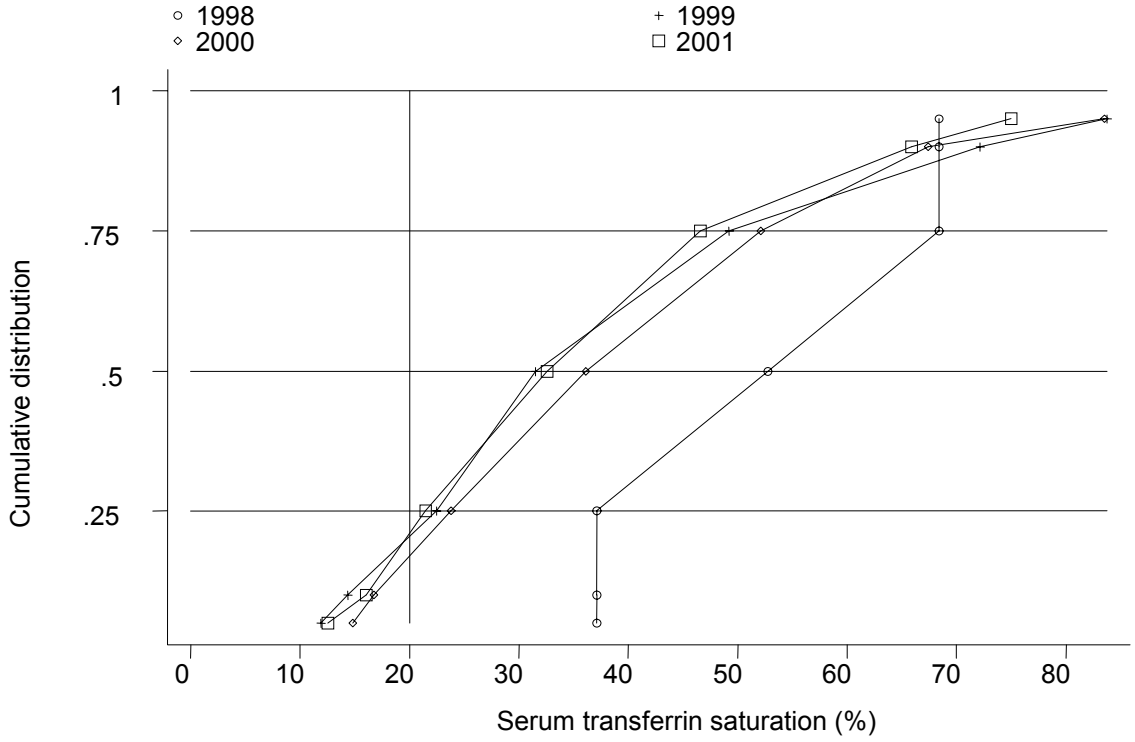


Table 3.3.43: Distribution of serum Ferritin without rHuEpo, HD patients, Private Centres 1999-2001

year	No of subjects	No of observations	median	LQ	UQ	% patients > 100 ug/l
1999	21	27	323	90	776	70
2000	32	44	273.1	124.3	455	84
2001	34	47	415.2	176	831	89

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

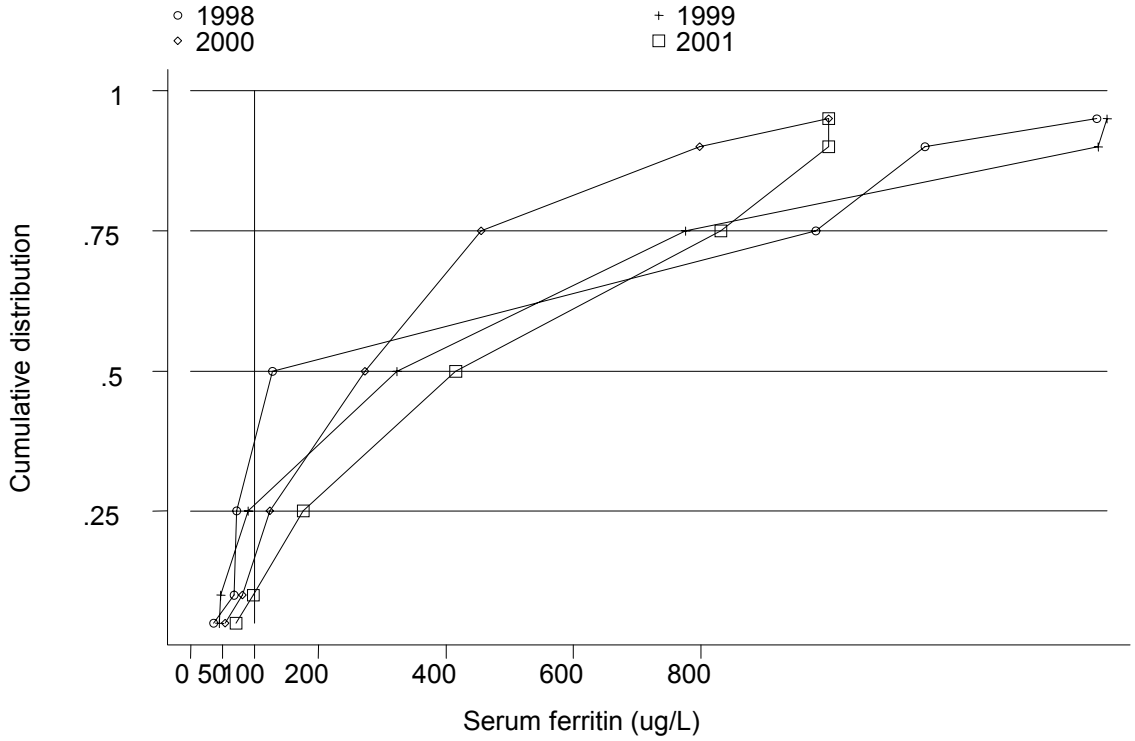


Table 3.3.44: Distribution of serum Ferritin on rHuEpo, HD patients, Private Centres 1999-2001

year	No of subjects	No of observations	median	LQ	UQ	% patients > 100 ug/l
1999	109	151	476.4	300	876	95
2000	104	140	508	227	970	91
2001	162	217	566	288	888	91

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

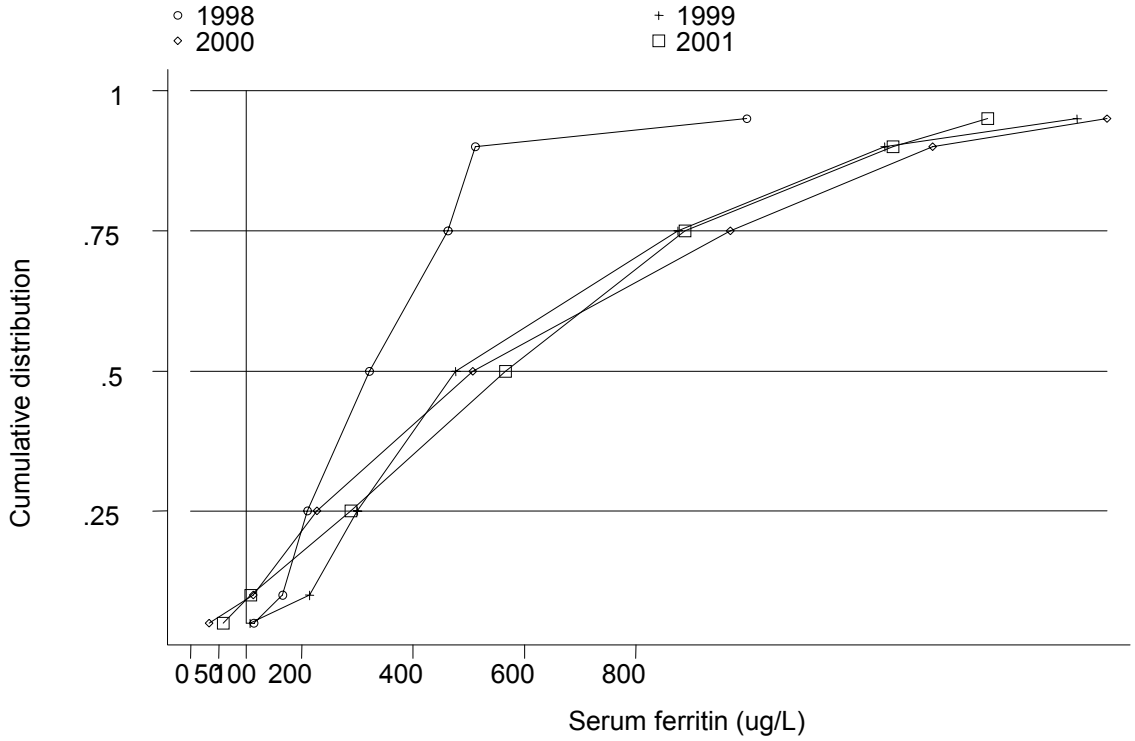


Table 3.3.45: Distribution of Haemoglobin concentration without rHuEpo, HD patients, Private Centres 1999-2001

year	No of subjects	No of observations	median	LQ	UQ	% patients <10 g/dl	% patients ≥10 & ≤12 g/dl	% patients >12 g/dl
1999	137	372	8.7	7.7	10.3	71	20	9
2000	244	626	8.7	7.6	10.2	72	21	7
2001	271	651	8.9	7.7	10.2	70	22	8

Figure 3.3.45: Cumulative distribution of Hb without rHuEpo by year

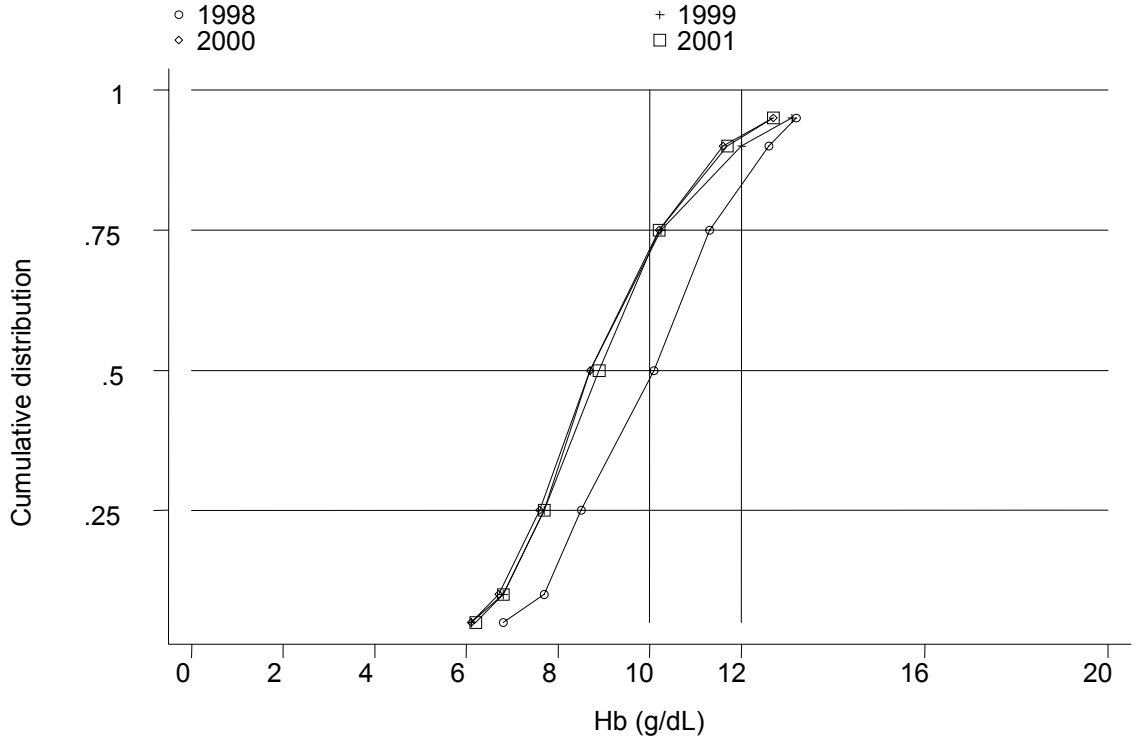
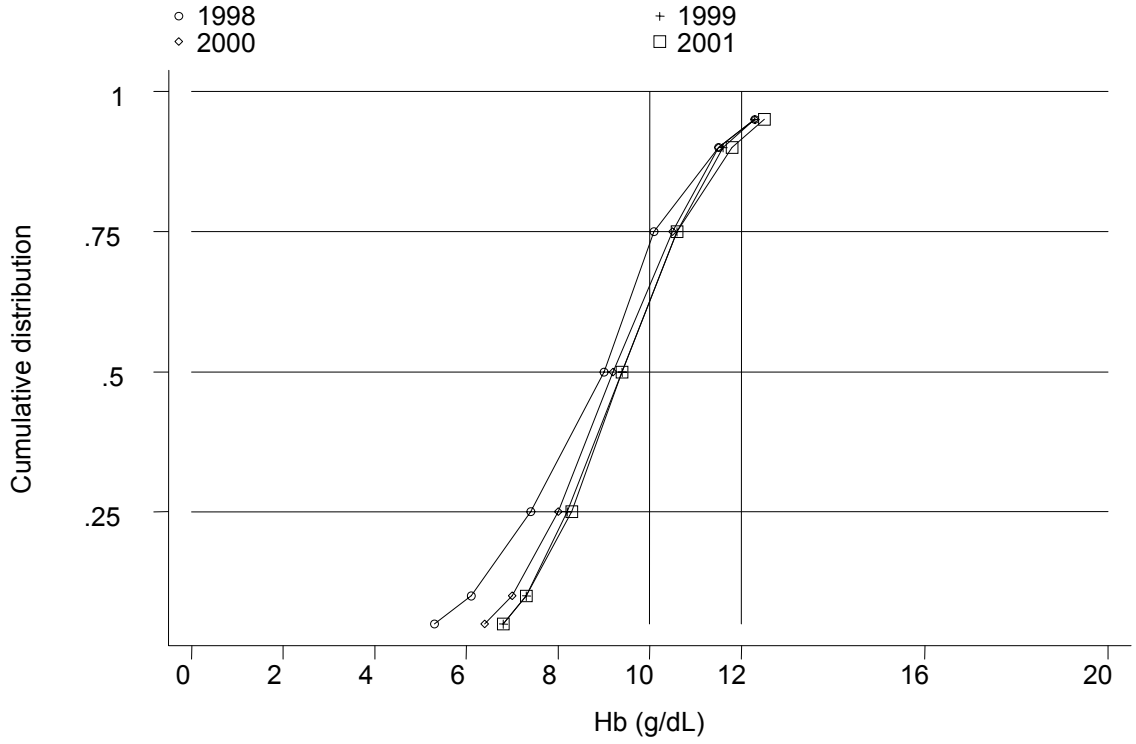


Table 3.3.46: Distribution of haemoglobin concentration on rHuEpo, HD patients, Private Centres 1999-2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients <10 g/dl	% patients ≥10 & ≤12 g/dl	% patients >12 g/dl
1999	224	704	9.4	8.2	10.6	64	29	6
2000	453	1336	9.2	8	10.5	66	28	7
2001	581	1624	9.4	8.3	10.6	61	31	8

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 1999-2001

year	No of subjects	No of observations	median	LQ	UQ	% patients >40g/l
1999	290	805	37	34	40	30
2000	507	1232	37	35	40	31
2001	682	1684	37	34	39	23

Figure 3.3.47: Cumulative distribution of serum Albumin by year

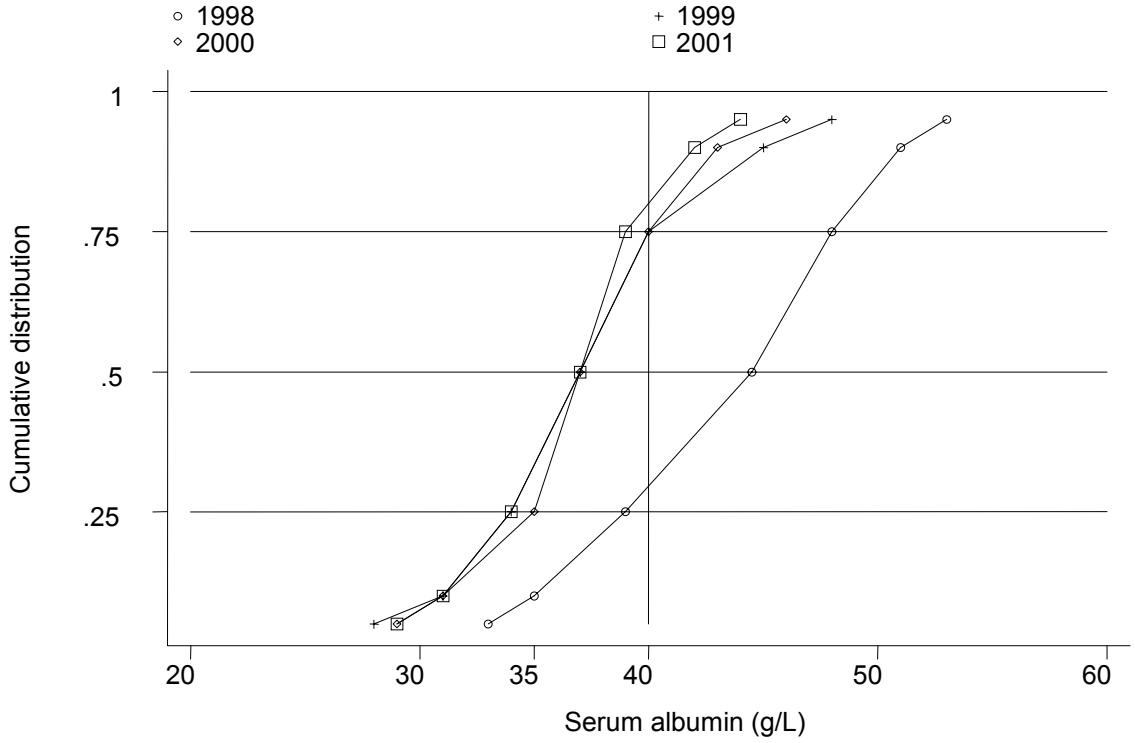
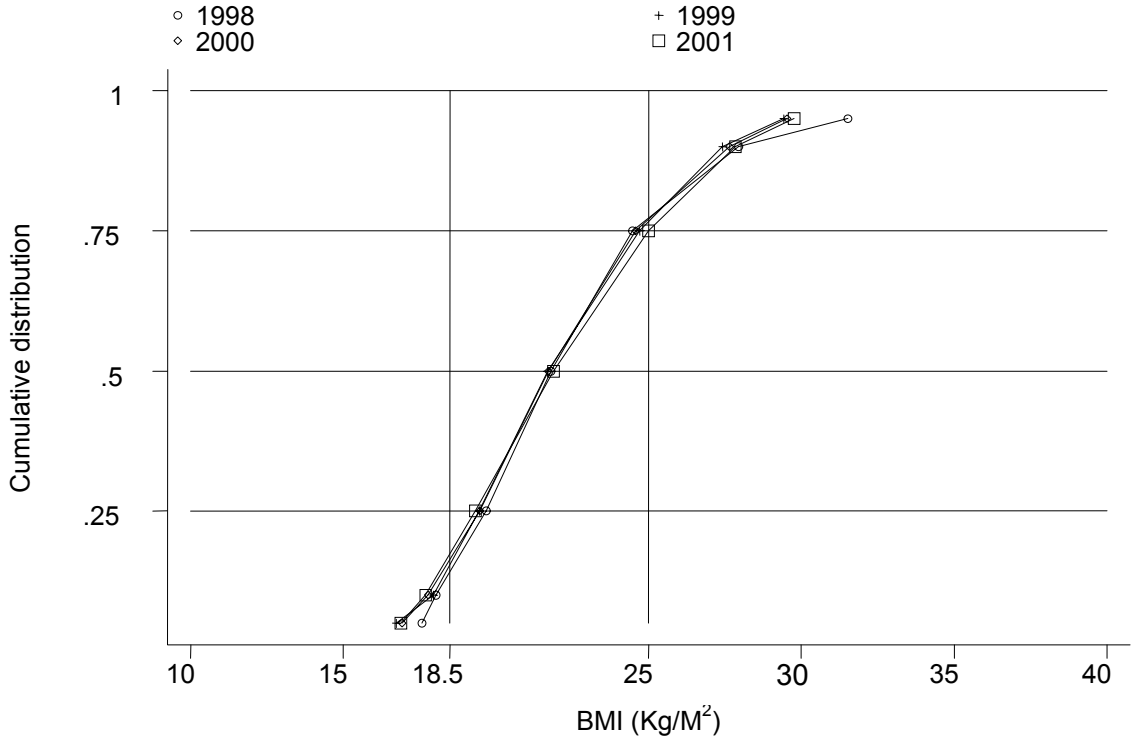


Table 3.3.48: Distribution of Body Mass Index HD patients, Private Centres 1999-2001

year	No of subjects	No of observations	median	LQ	UQ	% patients <18.5	% patients ≥18.5 & ≤25	% patients >25
1999	275	1916	21.7	19.4	24.7	14	63	23
2000	574	5461	21.7	19.5	24.6	17	61	22
2001	717	6821	21.9	19.3	25	17	57	25

Figure 3.3.48: Cumulative distribution of body mass index by year

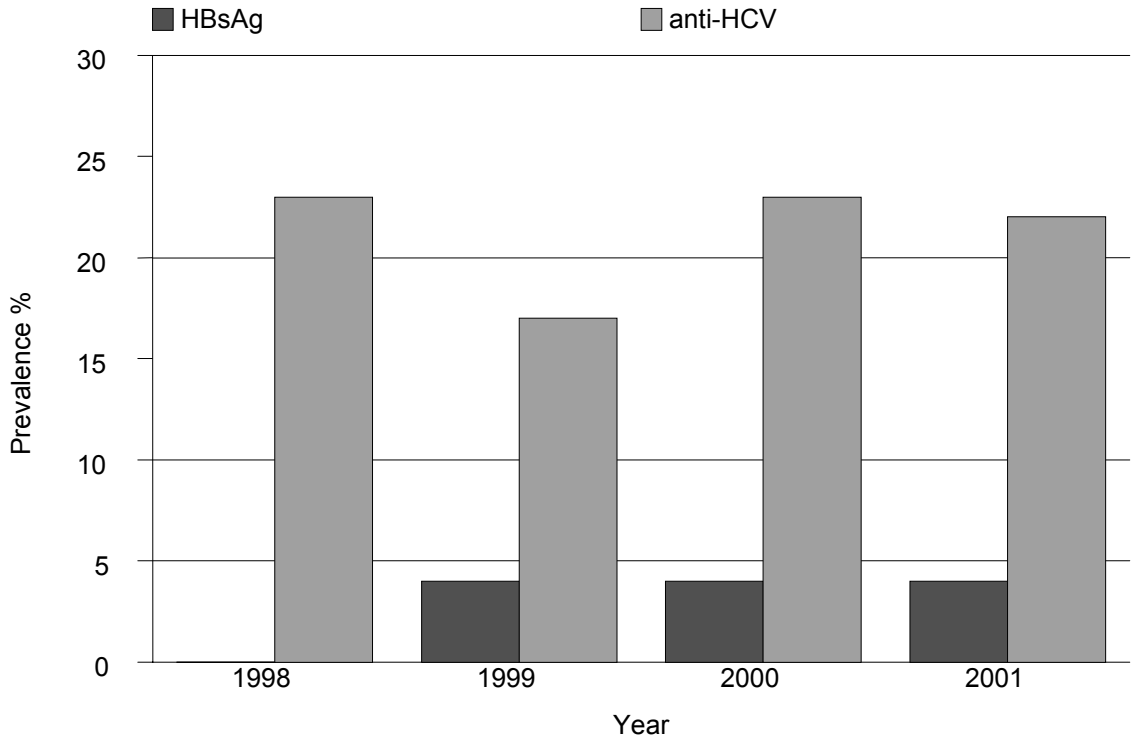


3.3.14 SEROLOGICAL STATUS, HD PATIENTS PRIVATECENTRES

Table 3.3.49: Prevalence of positive anti-HCV antibody and HbsAg, HD patients, Private Centres 1999-2001

year	No	% HbsAg positive	% anti-HCV positive
1999	395	4	17
2000	762	4	23
2001	966	4	22

Figure 3.3.49: Prevalence of positive anti-HCV antibody and HbsAg HD patients, Private Centres 1998 – 2001



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

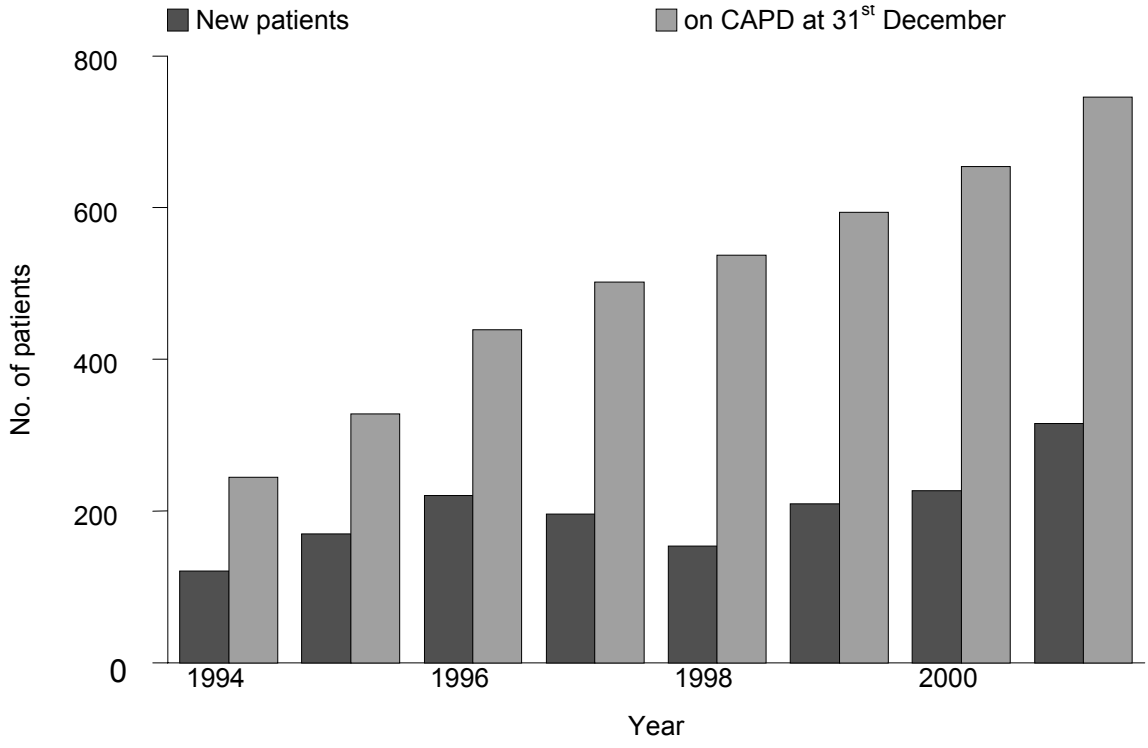
4. CHRONIC PERITONEAL DIALYSIS

4.1 STOCK AND FLOW

Table 4.01: Stock and Flow of Chronic PD Patients 1994 – 2001

Year	1994	1995	1996	1997	1998	1999	2000	2001
New Dialysis patients	121	170	220	196	154	209	227	315
Died	42	58	61	73	74	100	91	126
Transferred to HD	22	22	38	50	33	38	63	85
Transplanted	3	7	8	10	12	13	11	11
Lost to follow up	0	0	2	0	0	1	2	1
Dialysing at 31st December	245	328	439	502	537	594	654	746

Figure 4.01: Stock and Flow of Chronic PD Patients 1994 – 2001

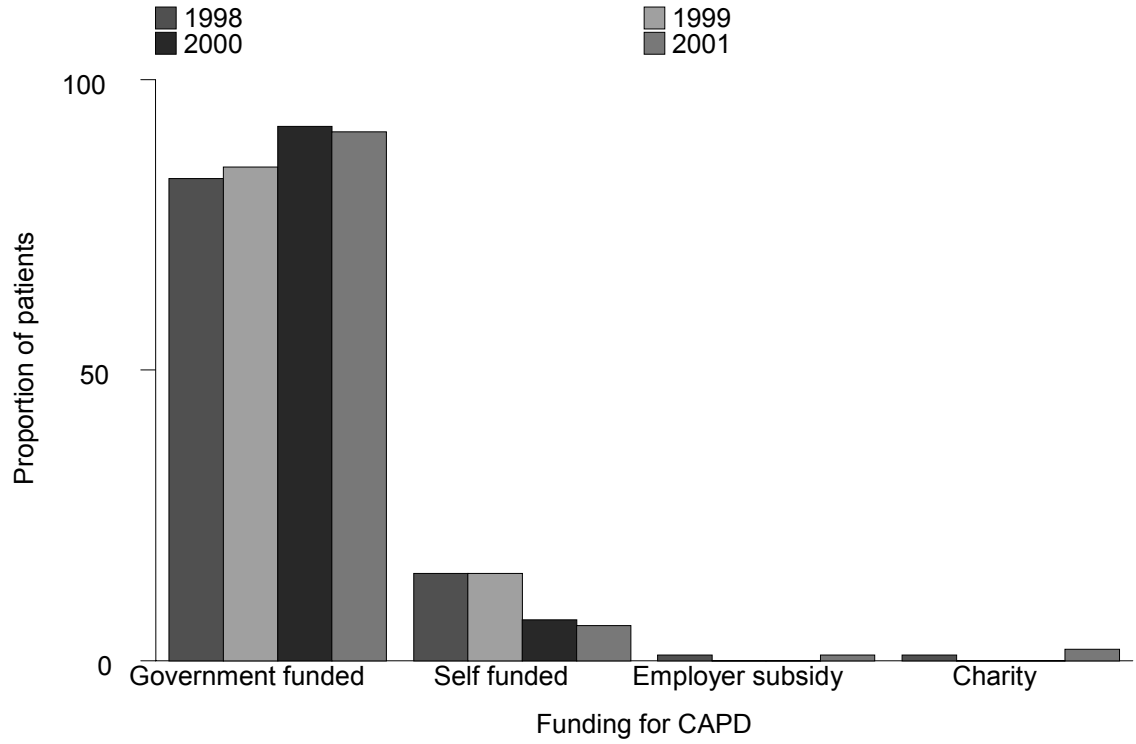


4.2 FUNDING FOR CHRONIC PERITONEAL DIALYSIS

Table 4.03: Funding for CAPD, Government Centres 1998 – 2001

Year	1998	1999	2000	2001
New Dialysis patients	154	209	227	315
% Government funded	83	85	92	91
% Self funded	15	15	7	6
% Employer subsidised	1	0	0	1
% Charity	1	0	0	2
Dialysing at 31st December	537	594	654	746
% Government funded	85	86	88	89
% Self funded	12	12	10	9
% Employer subsidised	1	1	1	1
% Charity	2	1	1	2

Figure 4.03: Funding for new CAPD, Government Centres 1998 – 2001



4.3 DEATH ON CAPD AND TRANSFER TO HAEMODIALYSIS

Table 4.04: Death Rate and Transfer to HD Government Centres 1994 – 2001

Year	1994	1995	1996	1997	1998	1999	2000	2001
No. at risk	245	287	384	471	520	566	624	700
Death (No.)	42	58	61	73	74	100	91	126
Death rate %	17	20	16	16	14	18	15	18
No transferred to HD	22	22	38	50	33	38	63	85
Transfer to HD rate %	9	8	10	11	6	7	10	12
All losses	64	80	99	123	107	138	154	211
All losses rate %	26	28	26	26	21	24	25	30

Figure 4.04: Death Rates on CAPD, Government Centres 1994 – 2001

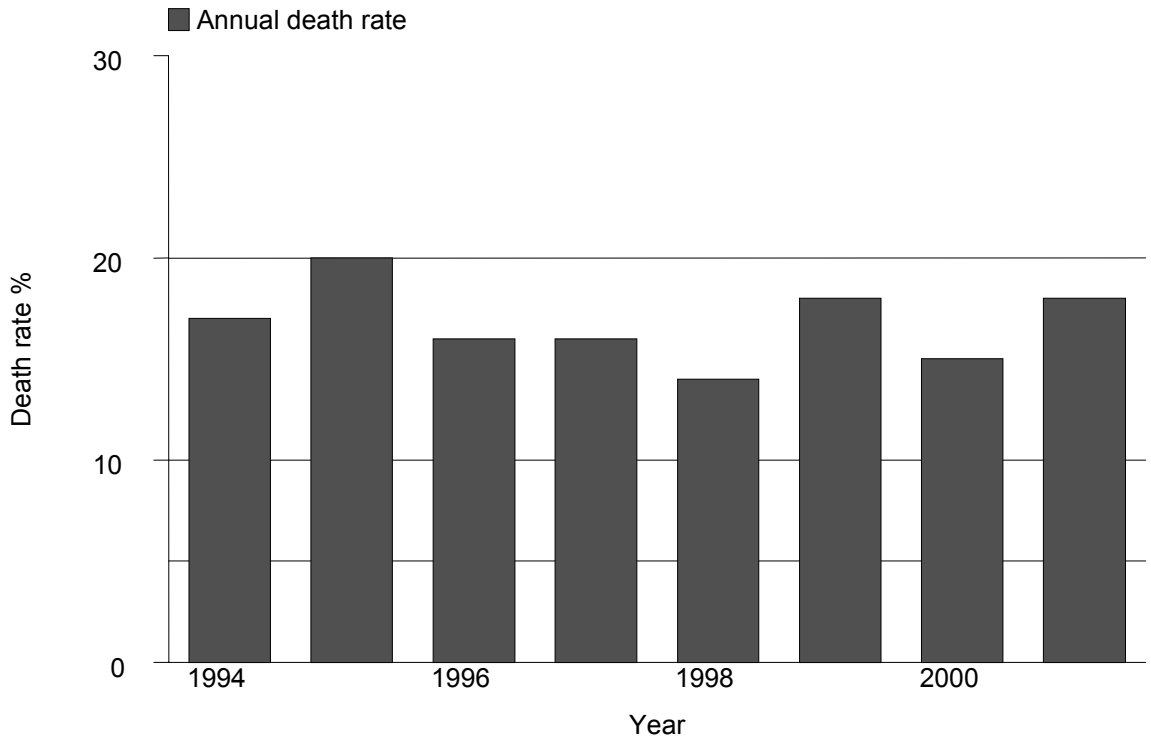


Table 4.05: Causes of Death on CAPD, Government Centres 1998 – 2001

Year	1998		1999		2000		2001	
	No	%	No	%	No	%	No	%
Cardiovascular	23	31	27	27	28	31	34	27
Died at home	11	15	32	32	22	24	29	23
Sepsis	16	22	15	15	15	16	25	20
CAPD peritonitis	1	1	8	8	15	16	19	15
GIT bleed	0	0	3	3	1	1	4	3
Cancer	0	0	1	1	0	0	2	2
Liver disease	0	0	0	0	0	0	0	0
Others	12	16	11	11	10	11	8	6
Unknown	11	15	3	3	0	0	5	4
Total	74	100	100	100	91	100	126	100

Table 4.06: Causes of Transfer to CAPD 1998 – 2001

Year	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
Peritonitis	17	52	23	61	39	62	30	35
Cather related infection	0	0	2	5	1	2	1	1
Technical problem	3	9	0	0	3	5	0	0
Membrane failure	3	9	3	8	9	14	5	6
Patient preference/cannot cope	2	6	3	8	4	6	4	5
Others	0	0	3	8	3	5	4	5
Unknown	8	24	4	11	4	6	41	48
Total	33	100	38	100	63	100	85	100

4.4 GOVERNMENT CAPD CENTRES

Table 4.07: Centre Distribution of CAPD patients, 2001

	Centre	No	Percent
	Number on RRT at 31st December	746	100
1	Berjaya NKF Dialysis Centre, Petaling Jaya	3	0
2	Ipoh Hospital	40	5
3	Kota Bharu Hospital	10	1
4	Kuala Lumpur Hospital	169	23
5	Kuala Lumpur Hospital (Paed.)	24	3
6	Kuala Terengganu Hospital	41	5
7	Kuching Hospital	10	1
8	Melaka Hospital	1	0
9	Pulau Pinang Hospital	93	12
10	Queen Elizabeth Hospital	18	2
11	Sabah Medical Centre	1	0
12	Selayang Hospital	22	3
13	Seremban Hospital	63	8
14	Sultanah Aminah Hospital	103	14
15	Tengku Ampuan Afzan Hospital, Kuantan	8	1
16	Tengku Ampuan Rahimah Hospital, Klang	29	4
17	Universiti Kebangsaan Malaysia Hospital	5	1
18	University Malaya Medical Centre	106	14

4.5 CAPD PATIENTS' CHARACTERISTICS

Table 4.08: Percentage Age Distribution of CAPD patients 1998 – 2001

Year	1998	1999	2000	2001
New Dialysis patients	154	209	227	315
1-14 years	13	10	9	8
15-24 years	9	7	11	9
25-34 years	14	7	8	10
35-44 years	13	12	16	14
45-54 years	18	22	25	19
55-64 years	25	25	19	27
≥65 years	8	16	11	12
Dialysing at 31st December	537	594	654	746
1-14 years	11	12	11	11
15-24 years	5	6	7	8
25-34 years	15	14	14	14
35-44 years	17	15	16	16
45-54 years	25	24	24	21
55-64 years	19	20	19	21
≥65 years	9	8	8	8

Table 4.09: CAPD Patient Characteristics 1998- 2001

Year	1998	1999	2000	2001
New Dialysis patients	154	209	227	315
Mean age ± sd	42±19	47±19	43±18	46±18
% male	49	51	49	47
% Diabetic	36	44	37	41
% HBsAg+	0	1	4	4
% Anti-HCV+	3	4	4	3

4.6 SURVIVAL ANALYSIS

Table 4.10: CAPD Patient Survival related to Year of Entry, Government Centres 1996– 2001

Year	1996			1997			1998		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	94	2	200	96	1	185	94	2	142
12	88	2	177	92	2	168	86	3	126
24	77	3	139	79	3	139	72	4	94
36	66	3	105	65	4	100	62	4	64
48	52	4	67	55	4	74			
60	48	4	53						
Year	1999			2000			2001		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	94	2	188	94	2	206	92	2	147
12	90	2	173	88	2	183			
24	73	3	115						

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

Figure 4.10: CAPD Patient Survival related to Year of Entry, Government Centres 1997 – 2001

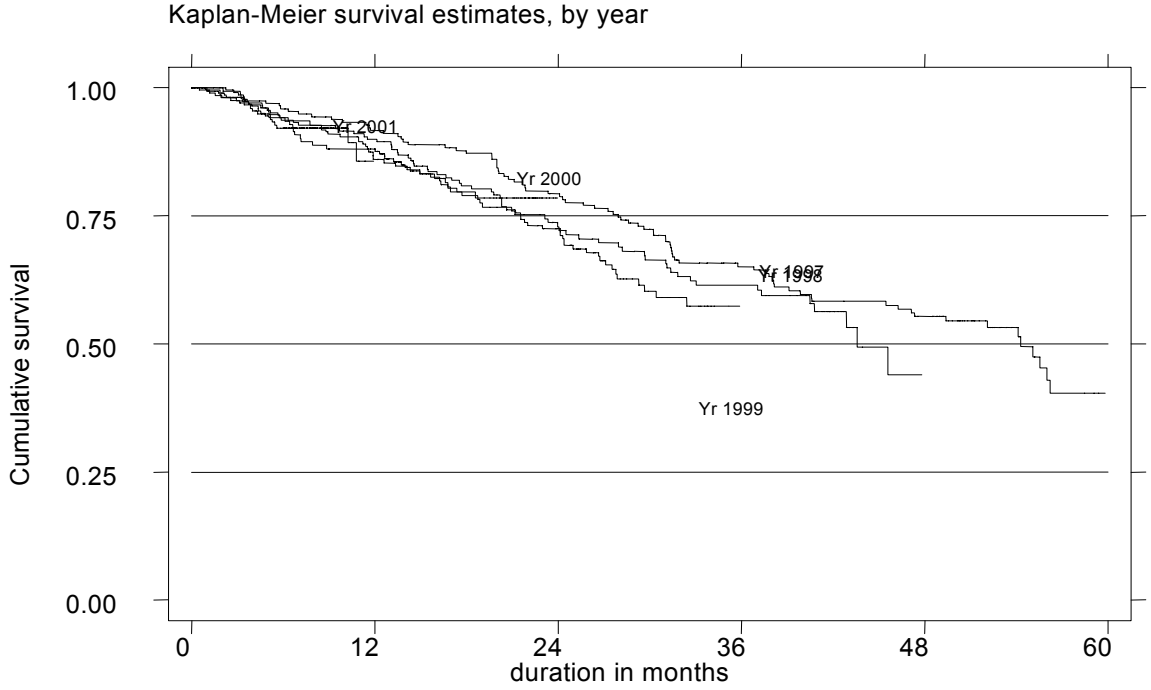
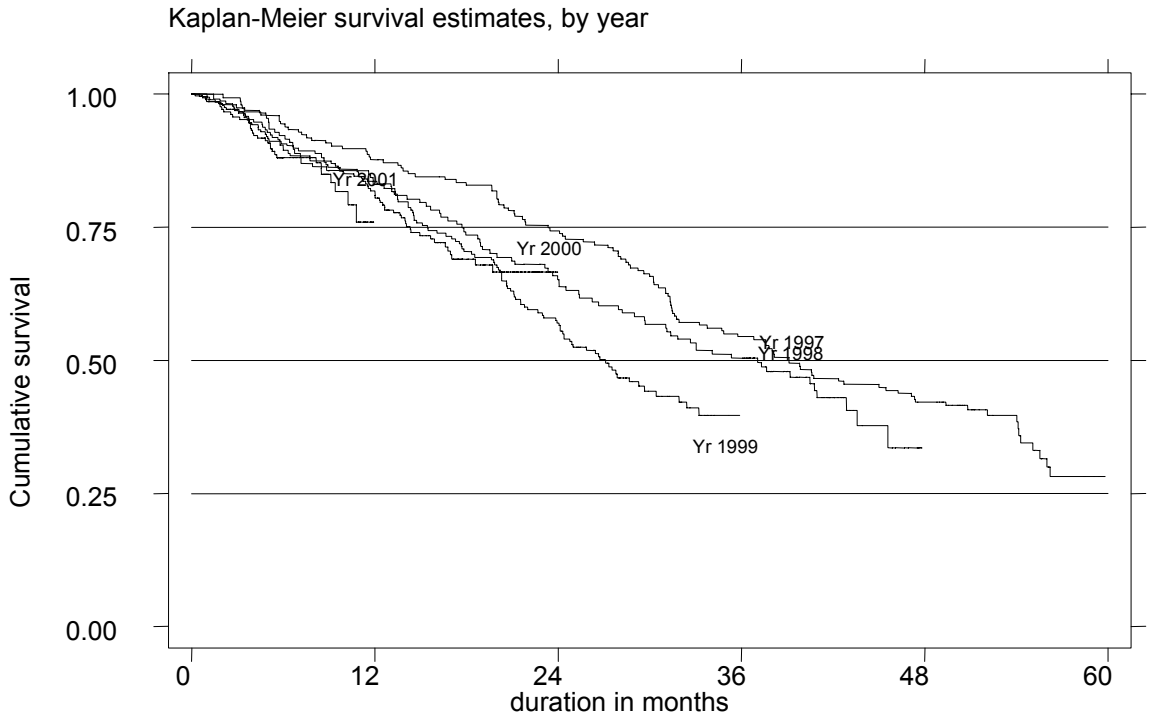


Table 4.11: CAPD Technique Survival related to Year of Entry, Government Centres 1996 – 2001

Year	1996			1997			1998		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	91	2	199	94	2	185	92	2	142
12	82	3	177	88	2	168	83	3	126
24	67	3	139	74	3	139	65	4	94
36	52	3	105	54	4	100	50	4	68
48	34	3	67	42	4	74			
60	28	3	53						
Year	1999			2000			2001		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	89	2	188	91	2	206	88	2	146
12	83	3	173	81	3	184			
24	57	3	115						

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

Figure 4.11: CAPD Technique Survival by Year of Entry Government Centres 1997 – 2001



4.7 WORK RELATED REHABILITATION AND QUALITY OF LIFE ON CAPD

Table 4.12: Work Related Rehabilitation on CAPD, Government Centres 1998 – 2001

REHABILITATION STATUS	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
Full time work for pay	83	20	96	19	92	17	99	16
Part time work for pay	23	6	45	9	27	5	35	6
Able to work but unable to get a job	13	3	14	3	25	5	22	4
Able to work but not yet due to dialysis schedule	4	1	3	1	7	1	9	1
Able but disinclined to work	7	2	11	2	10	2	11	2
Home maker	121	29	143	28	166	31	213	35
Full time student	45	11	67	13	81	15	89	15
Age<15 years	11	3	13	3	8	2	11	2
Retired	37	9	38	7	45	8	47	8
Age>65 years	38	9	39	8	42	8	49	8
Unable to work due to poor health	36	9	43	8	29	5	26	4
Total	418	100	512	100	532	100	611	100

Table 4.13: Quality of Life on CAPD, Government Centres 1998 – 2001

QOL Index Summated Score	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
0 (Worst QOL)	0	0	0	0	1	0	0	0
1	0	0	0	0	1	0	0	0
2	2	0	1	0	1	0	0	0
3	8	2	3	1	1	0	7	1
4	11	3	16	3	13	3	11	2
5	26	6	19	4	17	3	19	3
6	14	3	25	5	22	4	21	3
7	32	8	26	5	37	7	37	6
8	32	8	37	7	29	6	35	6
9	45	11	46	9	30	6	62	10
10 (Best QOL)	236	58	338	66	366	71	425	69
Total	406	100	511	100	518	100	617	100

4.8 CAPD PRACTICES

Table 4.14: Chronic Peritoneal Dialysis Regimes 1998 – 2001

PD regime	1998		1999		2000		2001	
	No	%	No	%	No	%	No	%
Standard CAPD	504	95	580	96	637	98	745	99
DAPD	22	4	19	3	12	2	7	1
Automated PD	6	1	4	1	4	1	2	0
Total	532	100	603	100	653	100	754	100

Table 4.15: CAPD Connectology 1998 – 2001

CAPD	1998		1999		2000		2001	
connectology	No	%	No	%	No	%	No	%
UVXD	11	2	4	1	2	0	0	0
Baxter disconnect	500	95	343	58	233	39	435	57
Braun disconnect	18	3	248	42	370	61	323	43
Total	529	100	595	100	605	100	758	100

Table 4.16: CAPD Number of Exchanges per day 1998 – 2001

No of	1998		1999		2000		2001	
Exchanges/day	No	%	No	%	No	%	No	%
2	2	0	0	0	2	0	1	0
3	4	1	4	1	1	0	5	1
4	508	96	579	97	624	96	726	95
5	16	3	13	2	23	4	31	4
100	531	100	597	100	650	100	763	100

Table 4.17: CAPD Volume per Exchange 1998 – 2001

Volume per	1998		1999		2000		2001	
Exchange (L)	No	%	No	%	No	%	No	%
1	25	5	19	3	25	4	32	4
2	496	95	557	96	595	95	703	94
3	0	0	2	0	7	1	9	1
Total	521	100	578	100	627	100	744	100

4.9. DYSLIPIDAEMIA IN CAPD PATIENTS, GOVERNMENT CENTRES

Table 4.24: Distribution of serum Cholesterol Concentrations (mmol/l), CAPD patients, Government Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients < 5.3 mmol/l
1998	348	519	5.9	5	6.8	39
1999	434	619	5.5	4.8	6.5	48
2000	526	833	5.8	4.9	6.8	40
2001	577	896	5.7	4.8	6.6	44

Figure 4.24: Cumulative distribution of serum cholesterol concentration by year

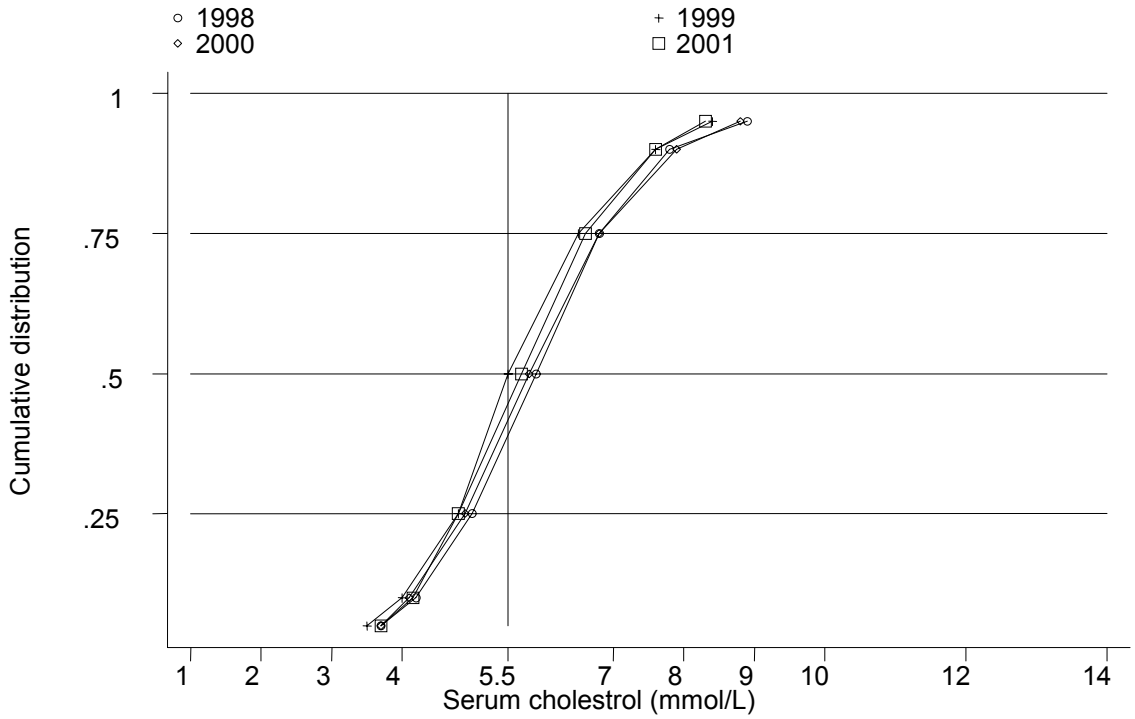


Table 4.25: Distribution of serum Triglyceride (mmol/l), CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 3.5 mmol/l
1998	344	511	1.8	1.2	3	81
1999	421	602	1.9	1.3	2.9	82
2000	520	819	2.1	1.4	3.1	79
2001	571	890	2	1.4	3.1	80

Figure 4.25: Cumulative distribution of serum triglyceride concentration by year

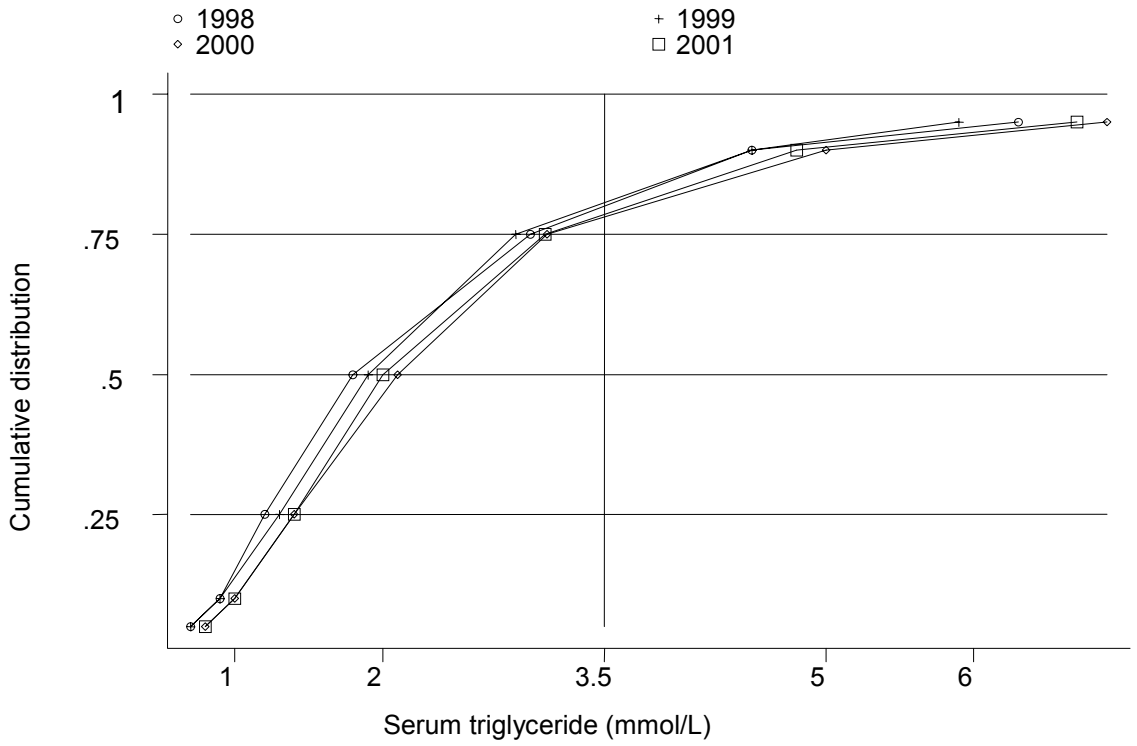


Table 4.26: Distribution of serum LDL (mmol/l), CAPD patient, Government Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients <5 mmol/l
1998	146	187	3.9	3.1	4.6	84
1999	198	263	3.4	2.8	4.4	82
2000	271	392	3.6	2.7	4.3	88
2001	407	587	3.3	2.6	4.2	89

Figure 4.26: Cumulative distribution of serum LDL by year

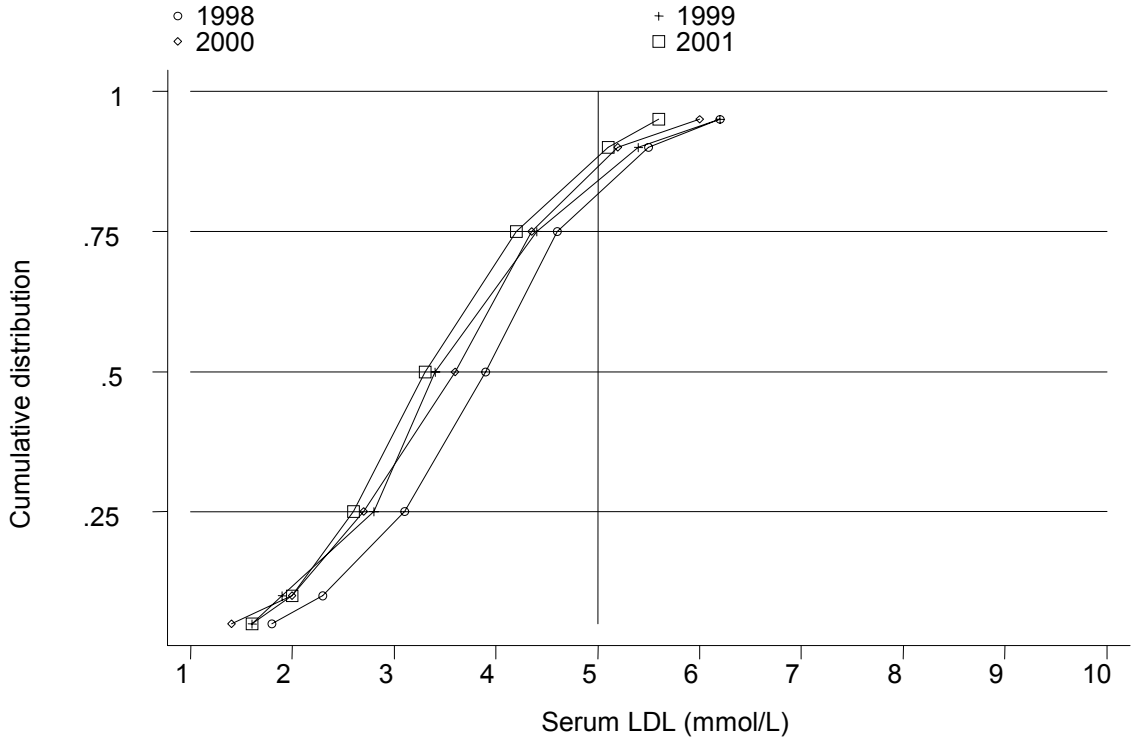
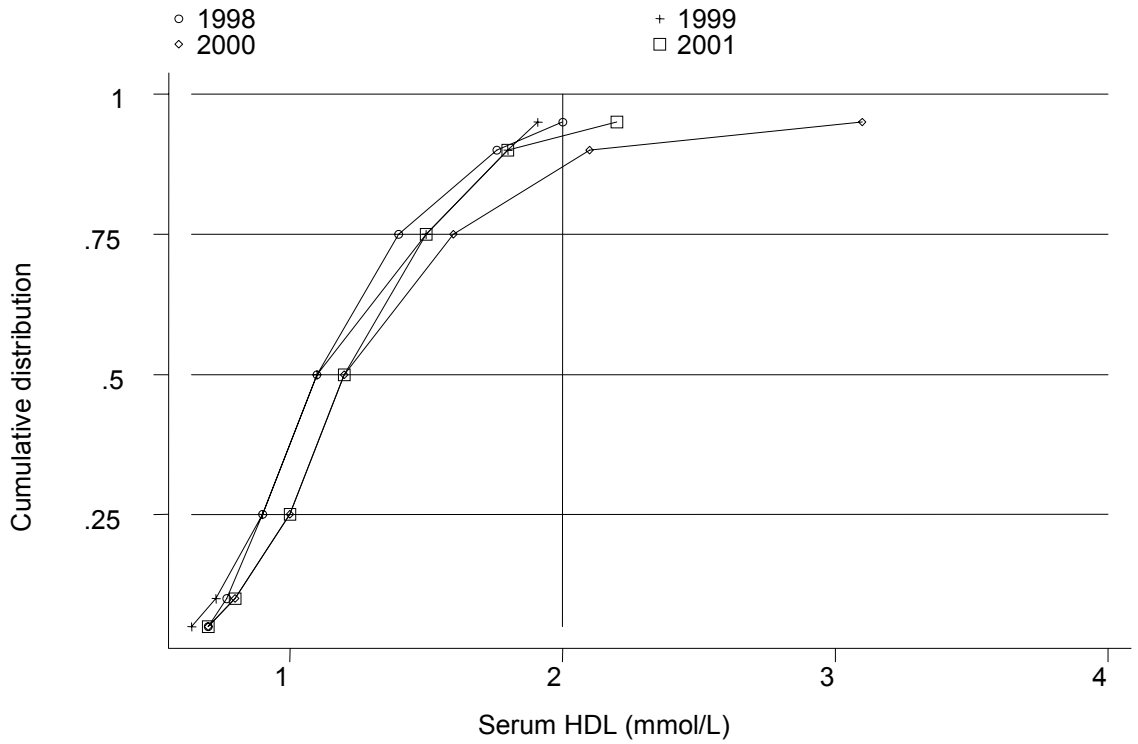


Table 4.27: Distribution of serum HDL (mmol/l), CAPD patient, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 2mmol/l
1998	152	198	1.1	.9	1.4	93
1999	210	279	1.1	.9	1.5	96
2000	283	415	1.2	1	1.6	88
2001	417	610	1.2	1	1.5	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 1998 – 2001

Year	No of subjects	% on CaCO3	% on Al(OH)3	% on Vitamin D
1998	541	79	9	20
1999	610	74	6	12
2000	662	79	2	15
2001	772	75	1	10

Table 4.29: Distribution of serum Phosphate concentration (mmol/l), CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 1.6 mmol/l
1998	537	1680	1.6	1.3	1.9	52
1999	583	1783	1.6	1.3	2	51
2000	633	1879	1.5	1.2	1.9	56
2001	722	2179	1.5	1.1	1.8	60

Figure 4.29: Cumulative distribution of serum Phosphate by year

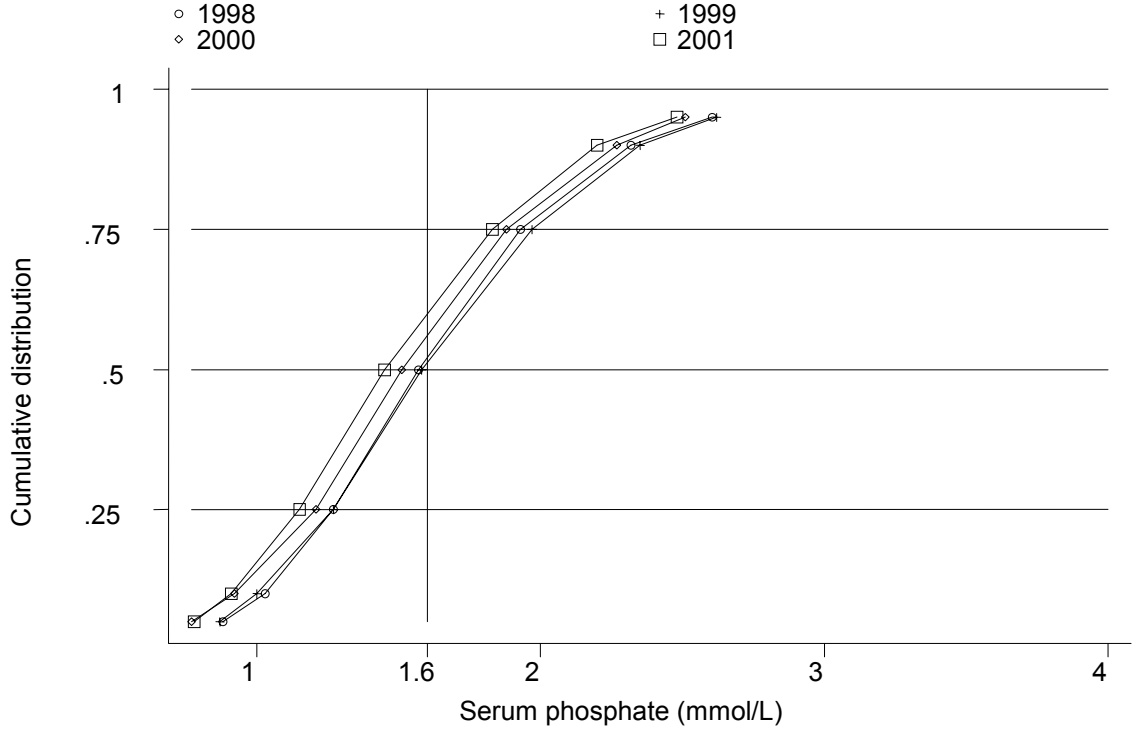


Table 4.30: Distribution of serum Calcium concentration (mmol/l), CAPD patients, Government Centres 1998 – 2001

year	No of subjects	No of observations	median	LQ	UQ	% patients ≥ 2.2 & ≤2.6 mmol/l
1998	539	1707	2.3	2.2	2.5	52
1999	594	1830	2.4	2.2	2.5	55
2000	642	1954	2.4	2.2	2.5	58
2001	739	2255	2.4	2.2	2.5	59

Figure 4.30: Cumulative distribution of serum Calcium concentration by year

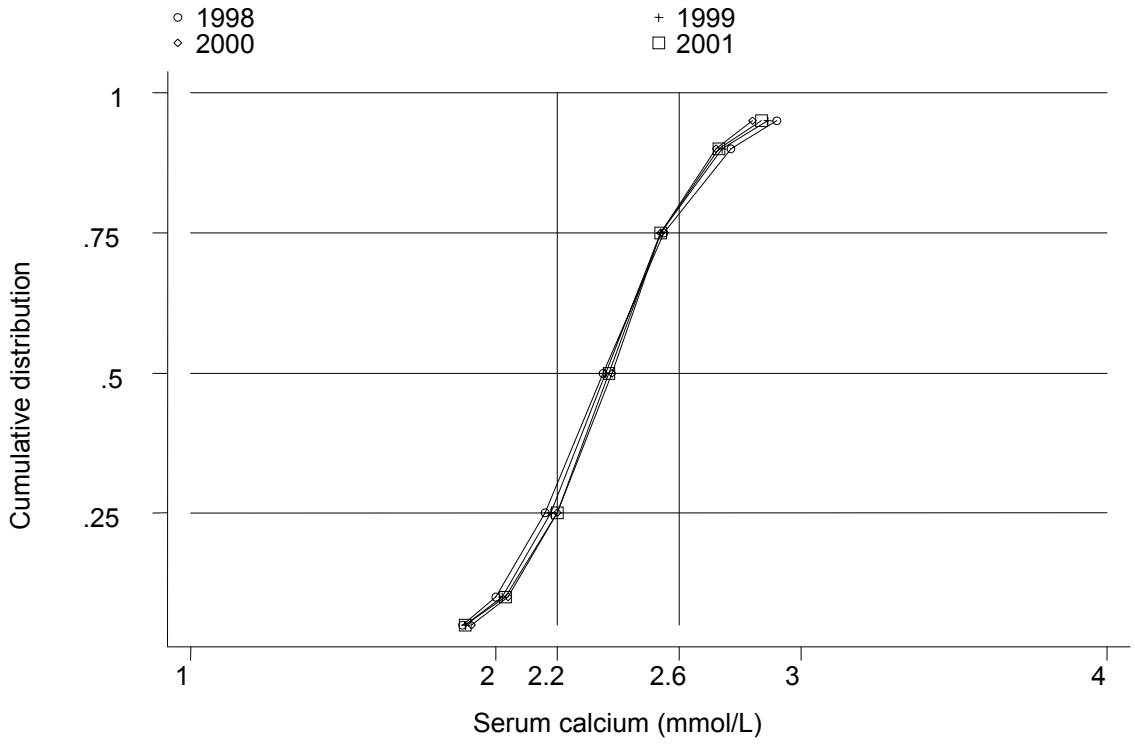
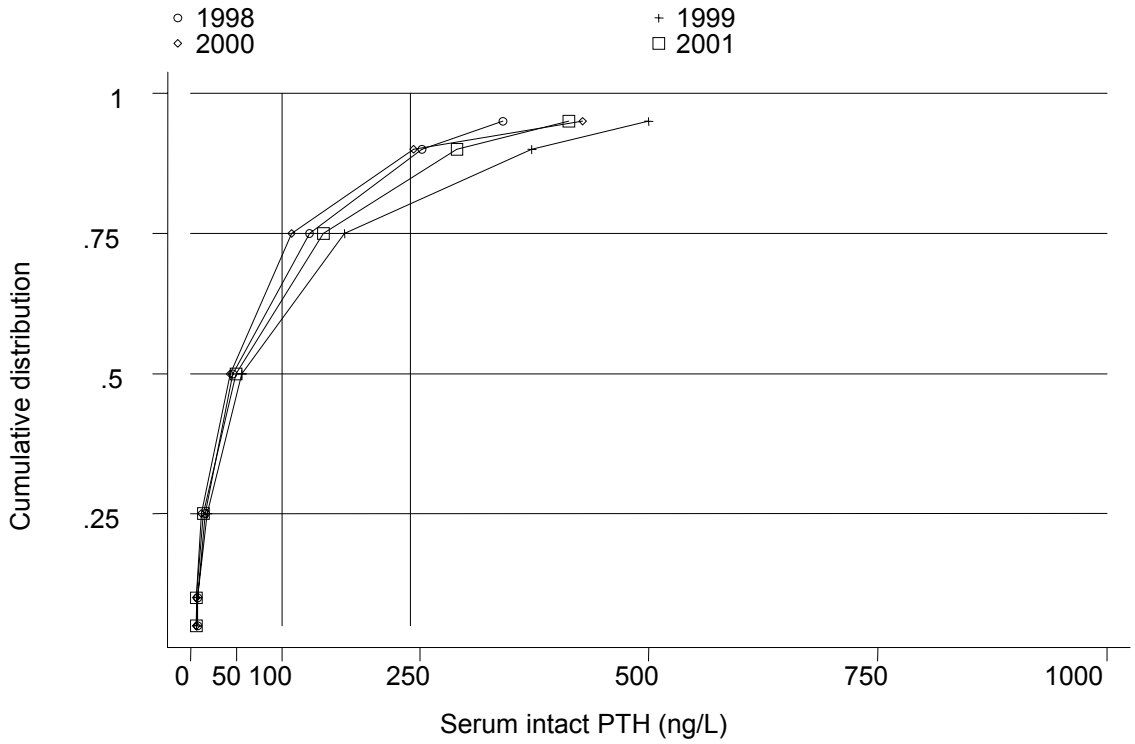


Table 4.31: Distribution of serum intact PTH (ng/L) concentration, CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients ≥ 100 & ≤ 250 ng/l
1998	280	346	46	16	130	19
1999	365	482	56	18	168	17
2000	406	555	43	11.8	110	18
2001	527	736	49.5	14	145	20

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 1998 – 2001

year	No.	% on anti-hypertensives	% on 1 anti-hypertensives	% on 2 anti-hypertensives	% on 3 anti-hypertensives
1998	541	88	34	31	23
1999	610	82	30	33	19
2000	662	78	31	27	20
2001	772	77	31	28	18

Table 4.33: Distribution of Systolic BP without anti-hypertensives, CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 160 mmHg
1998	63	491	120	110	145	86
1999	98	699	120	110	142	87
2000	141	1114	120	110	138	91
2001	162	1316	127	110	140	92

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

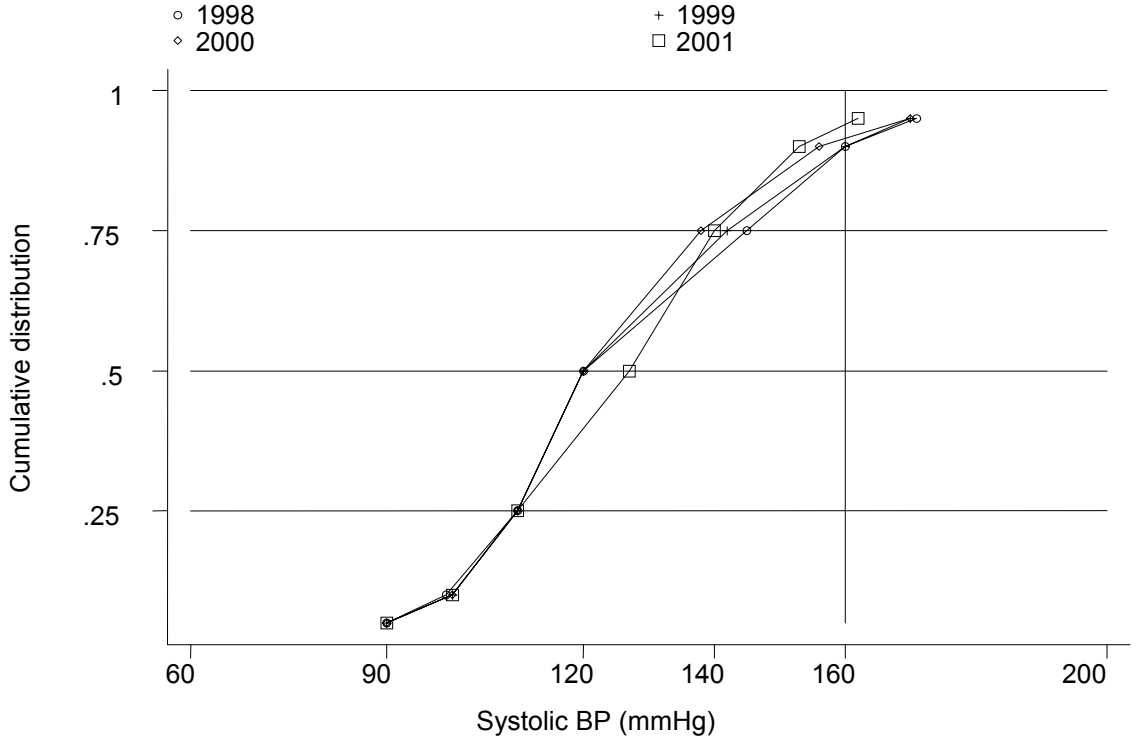


Table 4.34: Distribution of Diastolic BP without anti-hypertensives, CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 90 mmHg
1998	63	492	80	70	89	76
1999	98	700	76.5	67	87.5	76
2000	141	1116	80	70	88	76
2001	162	1315	80	70	86	78

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

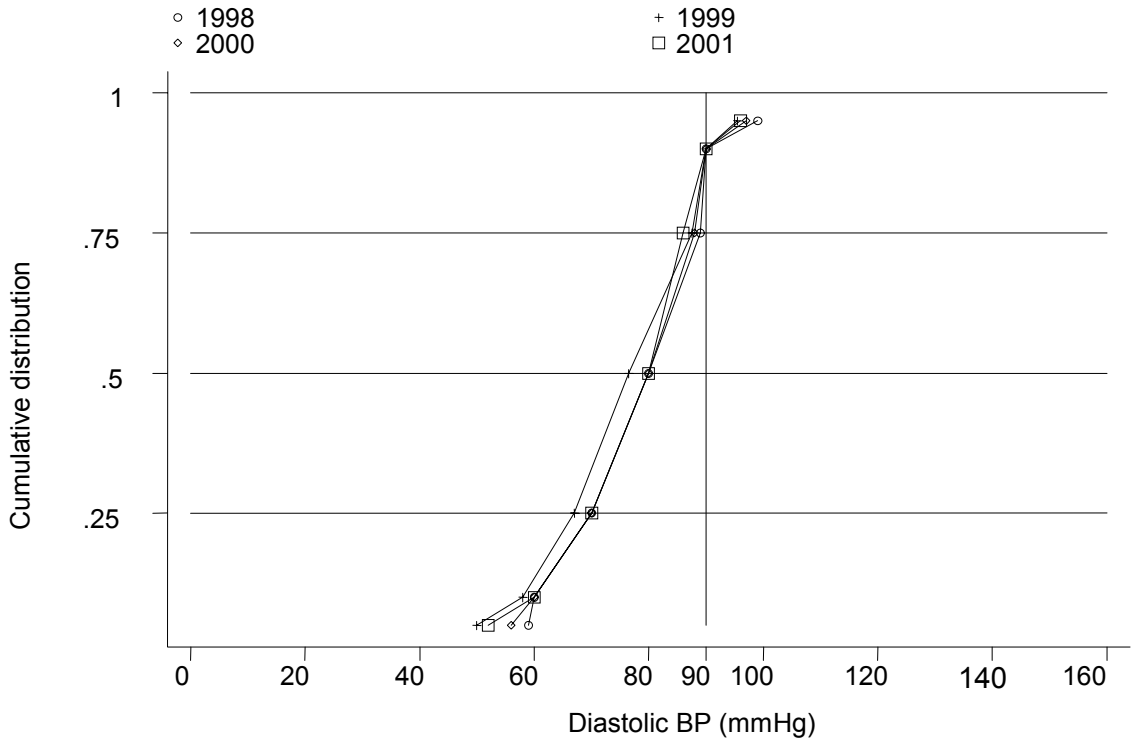


Table 4.35: Distribution of systolic BP on anti-hypertensives CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 160 mmHg
1998	456	3900	140	124	160	72
1999	478	3833	140	130	160	72
2000	497	4188	140	123	158	76
2001	569	4647	140	124	159	75

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

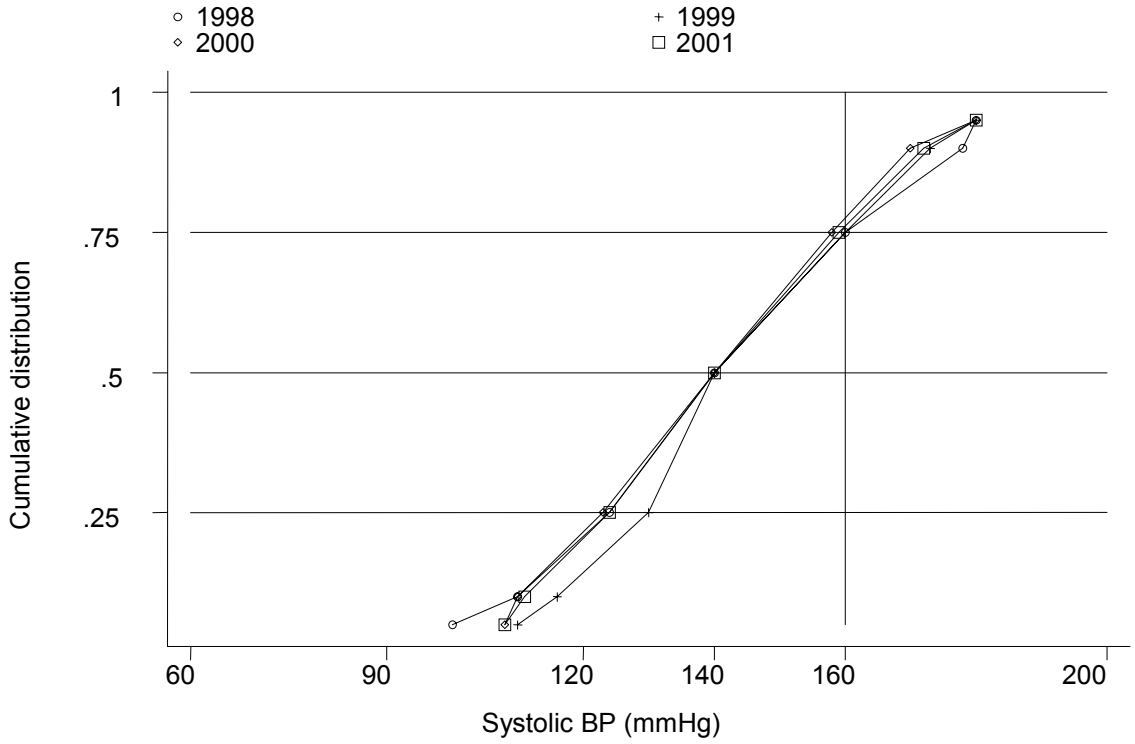
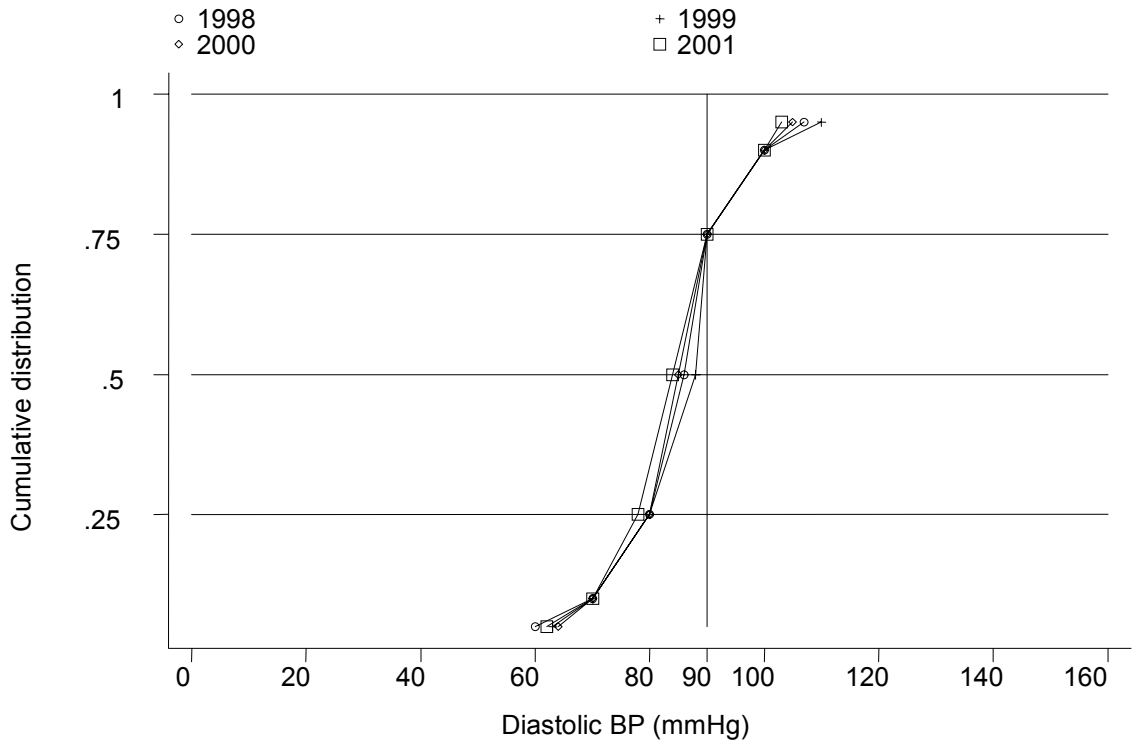


Table 4.36: Distribution of diastolic BP on anti-hypertensives, CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients < 90 mmHg
1998	456	3899	86	80	90	53
1999	478	3838	88	80	90	51
2000	497	4191	85	80	90	56
2001	569	4671	84	78	90	58

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 1998 – 2001

Year	No	% on rHuEpo	% received blood transfusion	% received oral iron	% received parenteral iron
1998	541	44	16	96	3
1999	610	44	14	94	0
2000	662	46	11	92	4
2001	772	45	11	91	2

Table 4.38: Distribution of rHuEpo dose per week, CAPD patients, Government Centres 1998 – 2001

Year	1998	1999	2000	2001
No. of patients	225	259	287	331
% on 2000 u/week	25	35	31	33
% on 2-4000 u/week	56	50	53	50
% on 4-6000 u/week	6	3	5	7
% on 6-8000 u/week	12	9	9	7
% on 8-12000 u/week	1	2	3	2
% on >12000 u/week	0	0	0	0

Table 4.39: Distribution of serum Iron concentration without rHuEpo, CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 10 umol/l
1998	190	446	15	11	24	76
1999	202	470	15	11	26	78
2000	255	549	15.8	10	23	75
2001	311	649	17	11	33	80

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

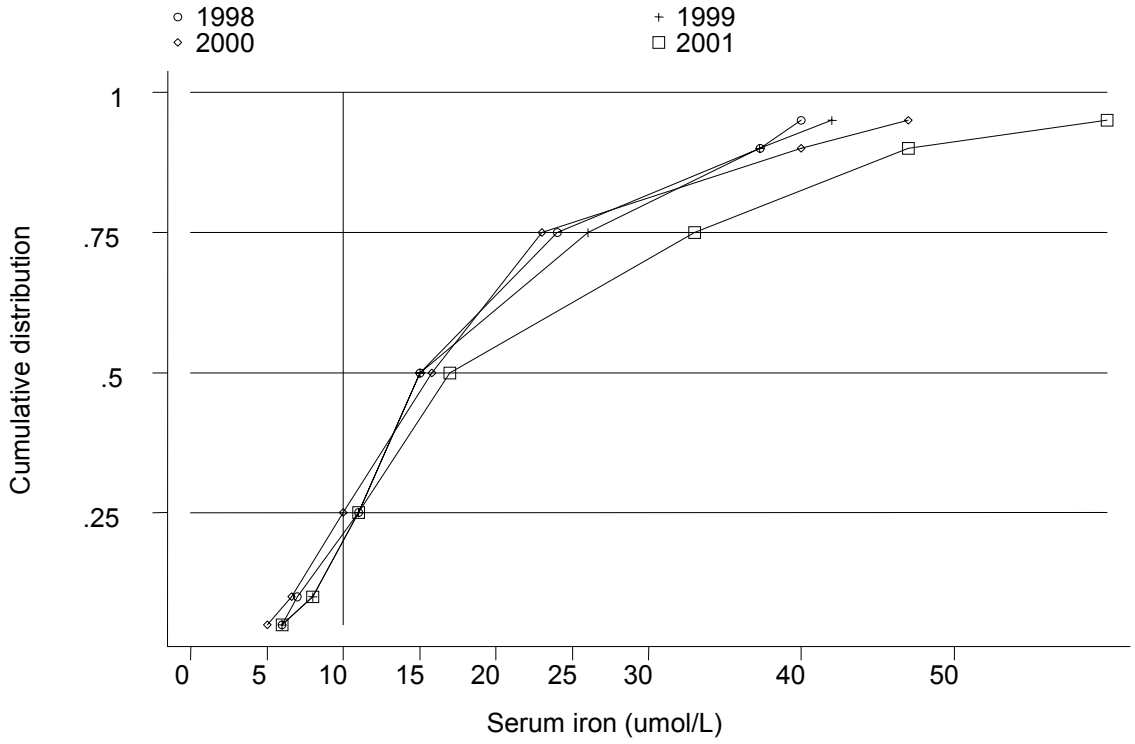


Table 4.40: Distribution of serum Iron concentration on rHuEpo, CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 10 umol/l
1998	113	323	16	11	30.3	79
1999	143	392	18	11	28	81
2000	244	557	15	10	25	73
2001	301	712	17	11	32	77

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

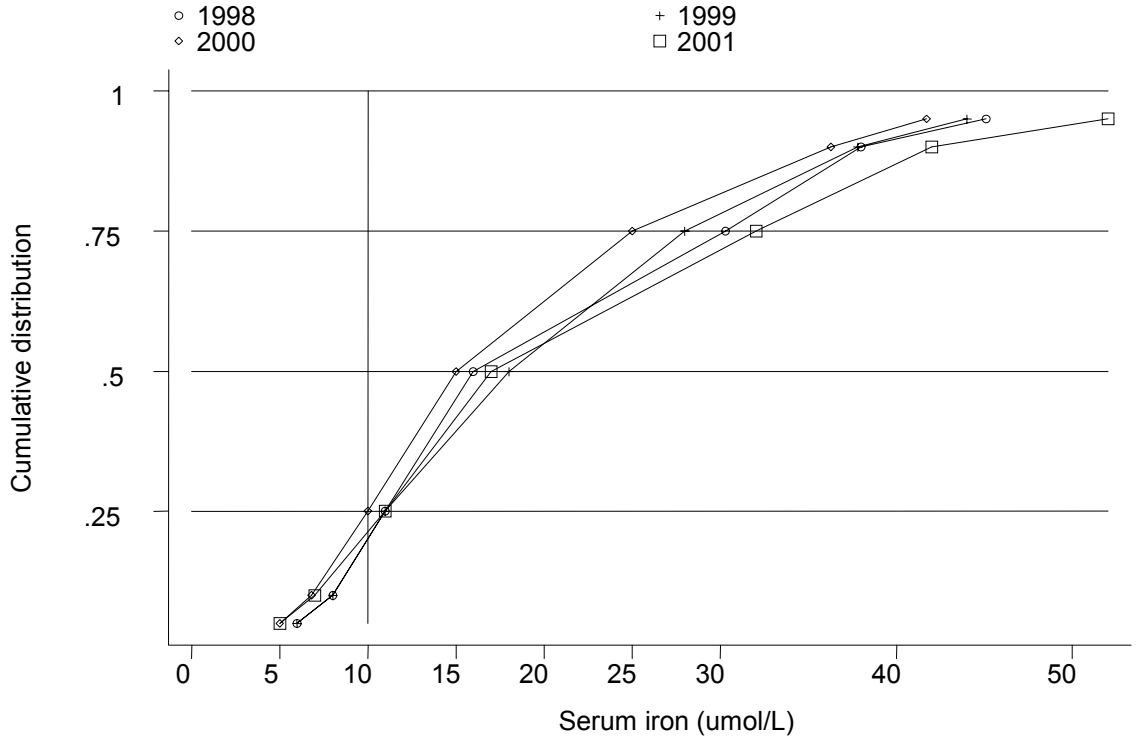


Table 4.41: Distribution of serum Transferrin Saturation without rHuEpo, CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 20%
1998	158	632	35.6	22.9	49.1	78
1999	134	536	34.2	23.3	45.1	85
2000	234	936	35.3	22.4	50	80
2001	259	1036	39	26.8	60.4	88

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

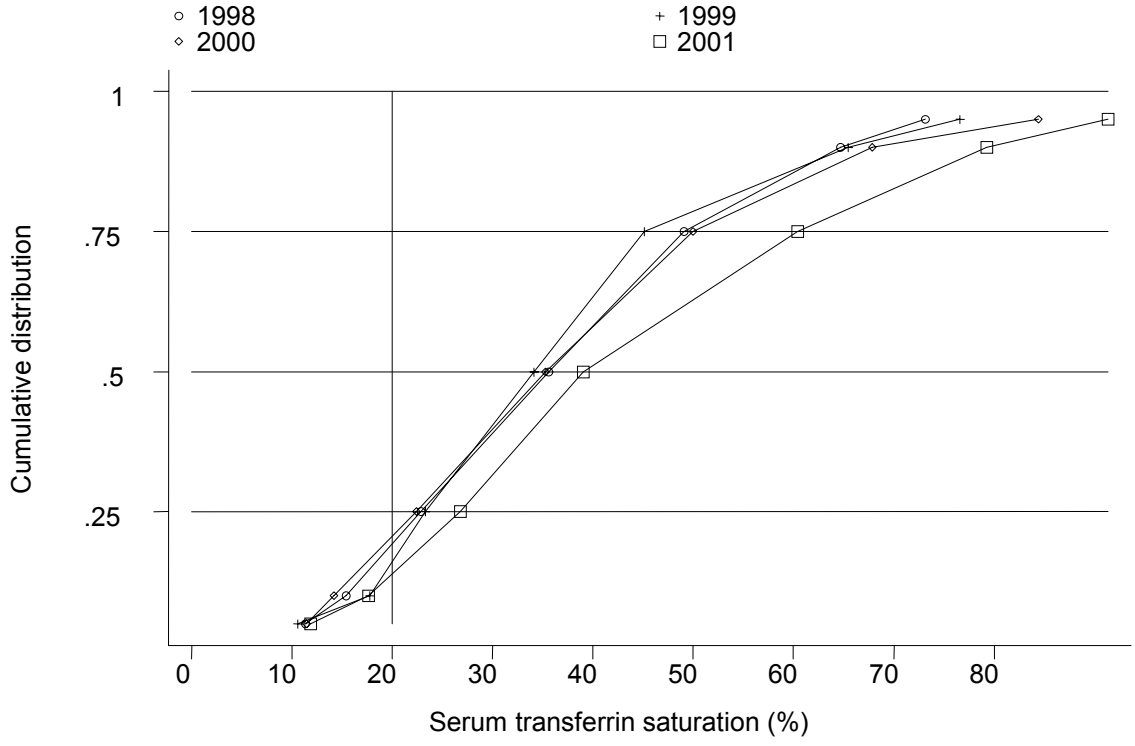


Table 4.42: Distribution of serum Transferrin Saturation on rHuEpo, CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 20%
1998	103	412	39.3	28.1	55	88
1999	92	368	37.2	25.3	48.1	85
2000	233	932	34.1	22	49.4	82
2001	261	1044	42.2	29.4	58.3	91

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

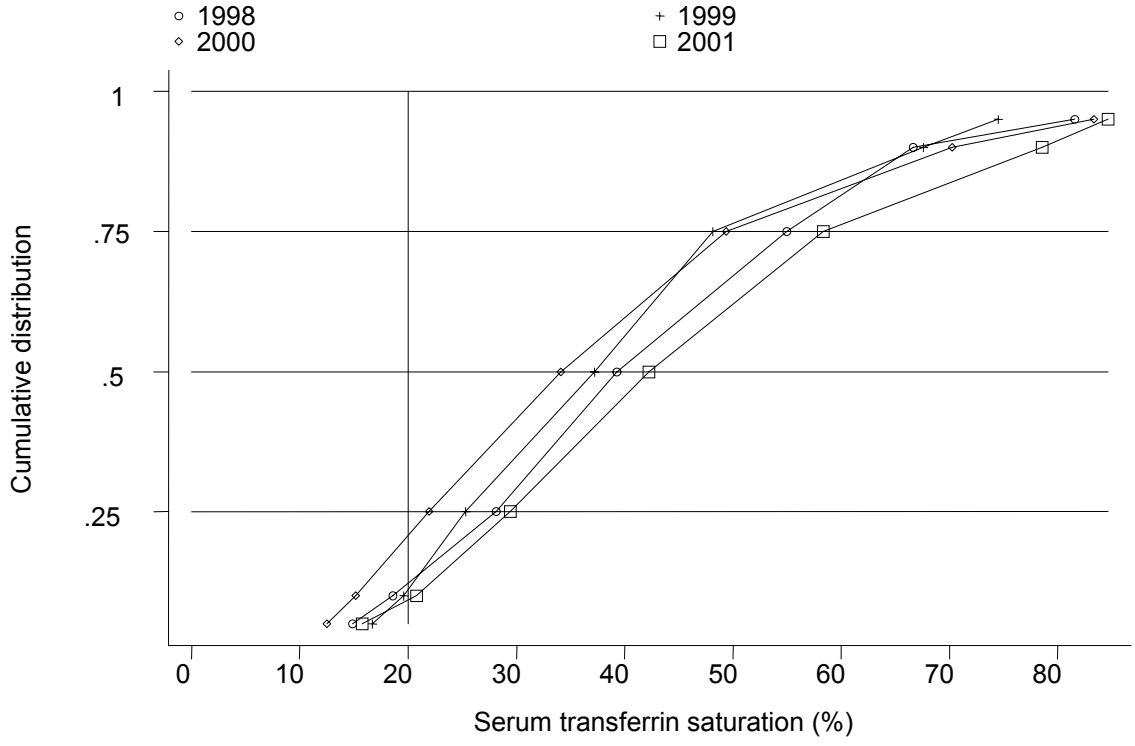


Table 4.43: Distribution of serum Ferritin without rHuEpo, CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 100 ug/l
1998	92	105	394	196	686	86
1999	124	154	482	259.7	729	93
2000	144	204	462	167.5	726.3	86
2001	219	313	436	226.6	774.2	91

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

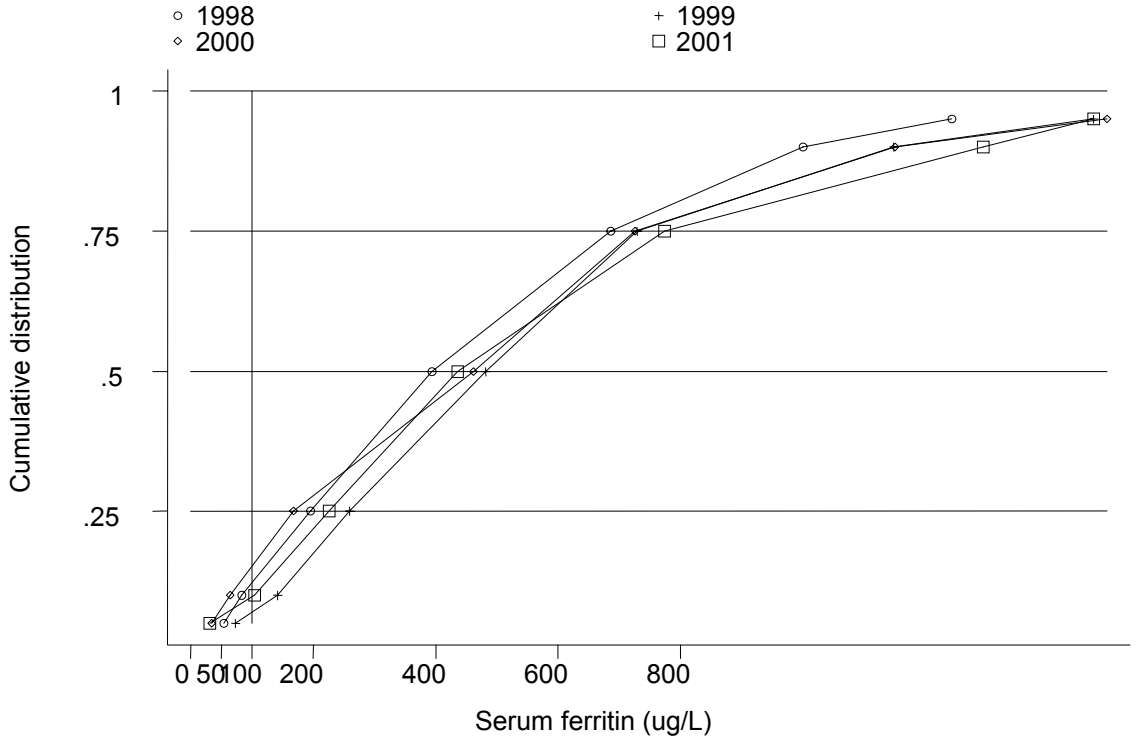


Table 4.44: Distribution of serum Ferritin concentration on rHuEpo, CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients > 100 ug/l
1998	135	185	518	246	851	92
1999	136	201	553.3	254	857.3	93
2000	180	271	545	292.9	839.5	90
2001	258	415	546	264	908.1	91

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

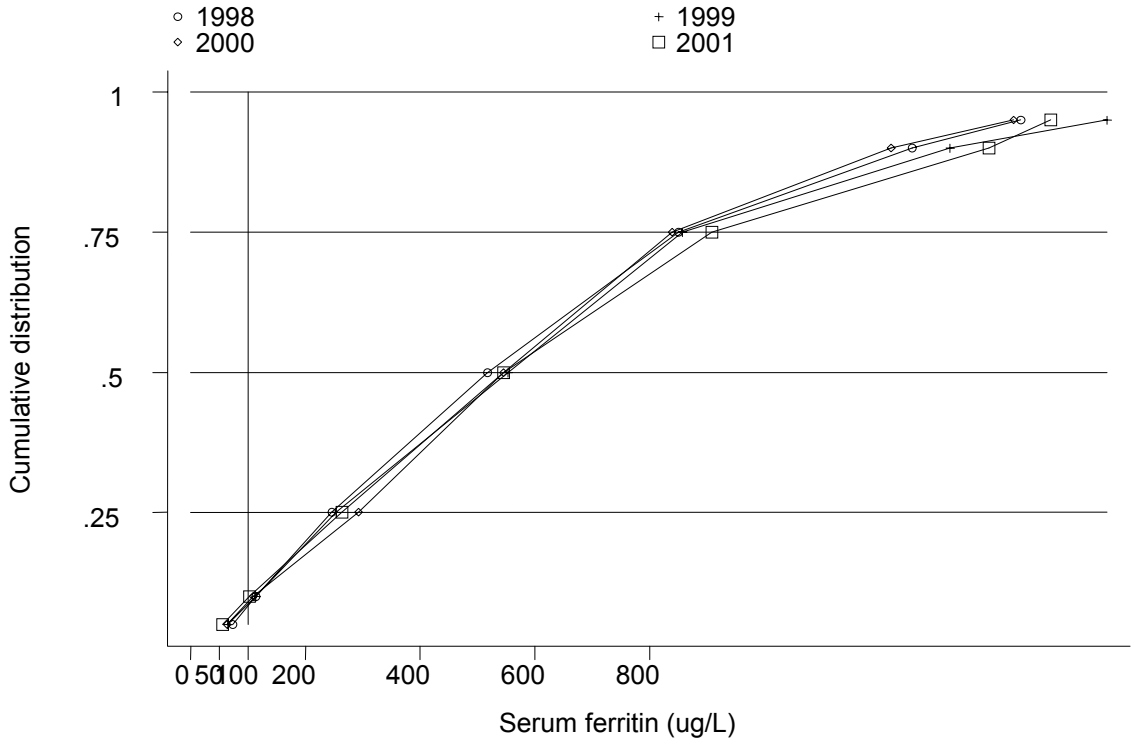


Table 4.45: Distribution of Haemoglobin concentration without rHuEpo, CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients <10 g/dl	% patients ≥10 & ≤12 g/dl	% patients >12 g/dl
1998	301	915	9.2	8	10.5	65	26	9
1999	336	967	9.4	8.3	10.7	61	32	7
2000	342	960	9.8	8.6	11	53	35	12
2001	400	1073	9.8	8.6	11.1	55	33	12

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

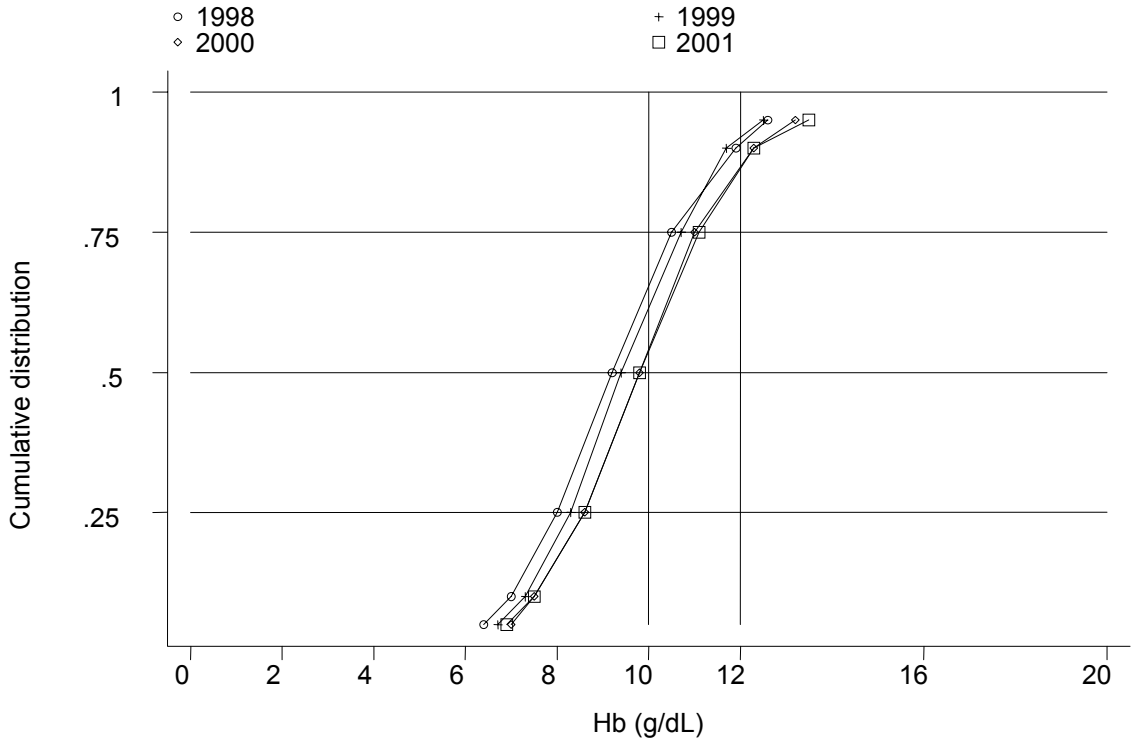
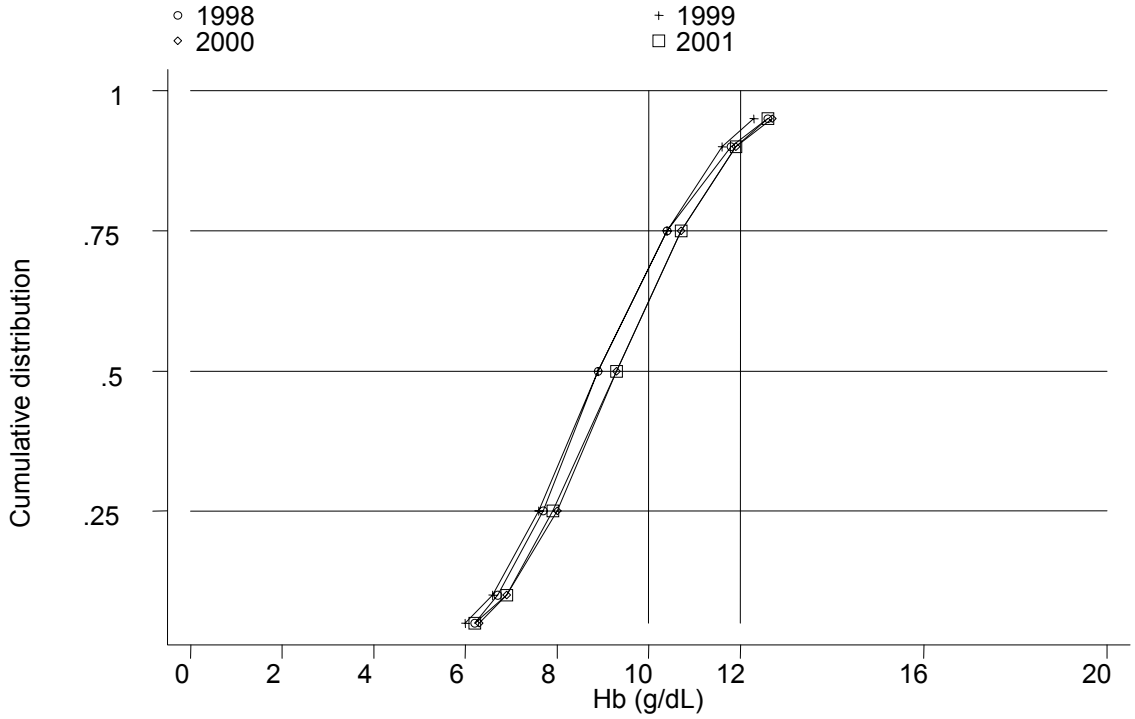


Table 4.46: Distribution of Haemoglobin concentration on rHuEpo, CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients <10 g/dl	% patients ≥10 & ≤12 g/dl	% patients >12 g/dl
1998	238	826	8.9	7.7	10.4	69	23	8
1999	262	906	8.9	7.6	10.4	69	25	6
2000	299	1013	9.3	8	10.7	62	30	9
2001	340	1179	9.3	7.9	10.7	62	28	9

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 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients >40g/l
1998	536	1692	37	32	40	29
1999	597	1872	35	31	38	18
2000	640	1970	35	31	39	19
2001	740	2275	34	30	38	15

Figure 4.47: Cumulative distribution of serum Albumin concentration by year

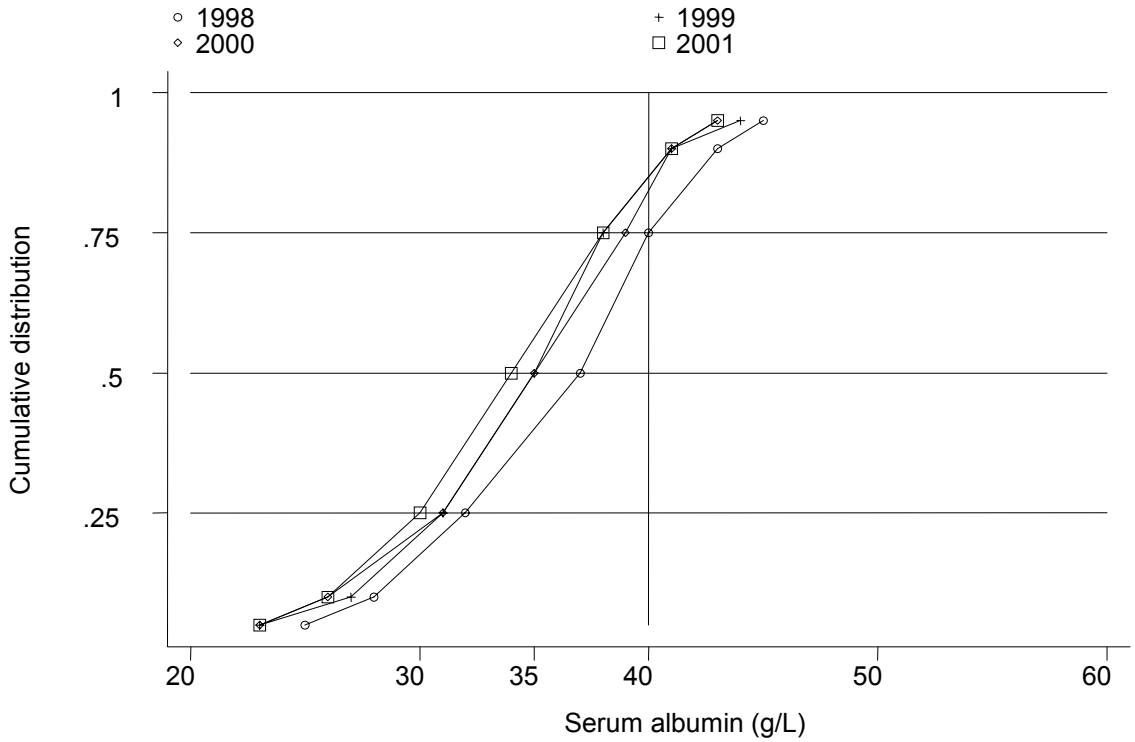
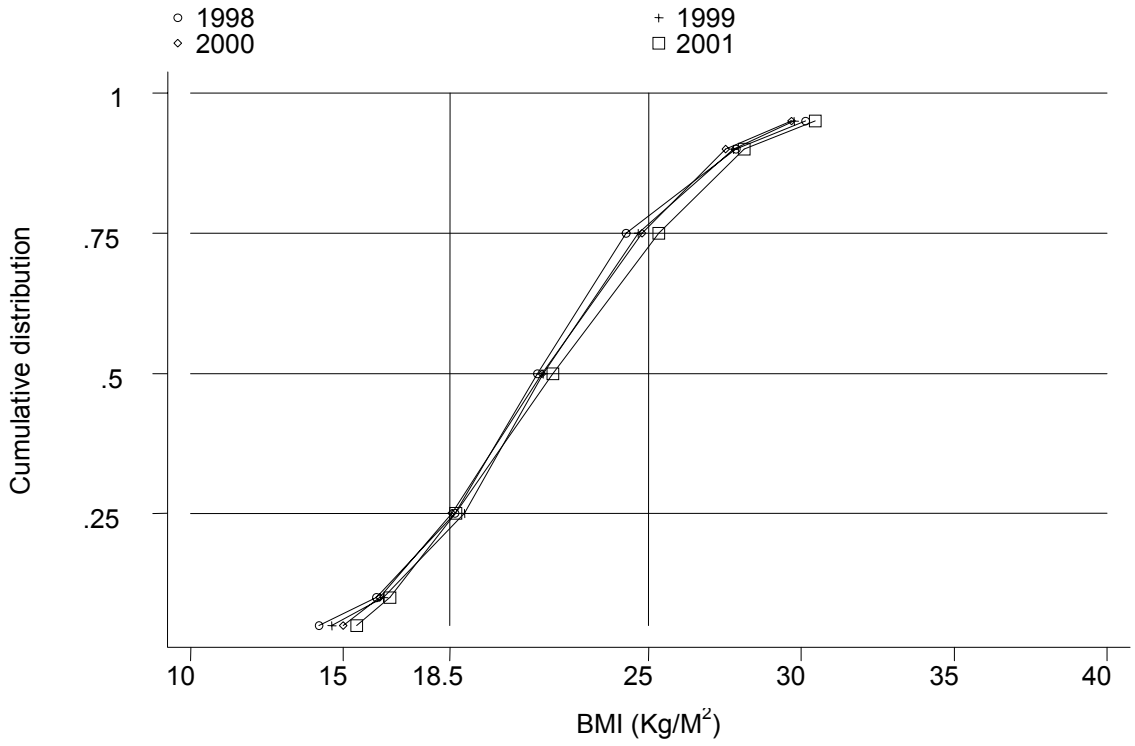


Table 4.48: Distribution of Body Mass Index CAPD patients, Government Centres 1998 – 2001

Year	No of subjects	No of observations	median	LQ	UQ	% patients <18.5	% patients ≥18.5 & ≤25	% patients >25
1998	489	4243	21.4	18.7	24.3	23	55	21
1999	550	4316	21.5	19	24.7	22	56	23
2000	599	4990	21.5	18.6	24.8	25	53	23
2001	646	5502	21.9	18.7	25.3	23	50	27

Figure 4.48: Cumulative distribution of BMI by year

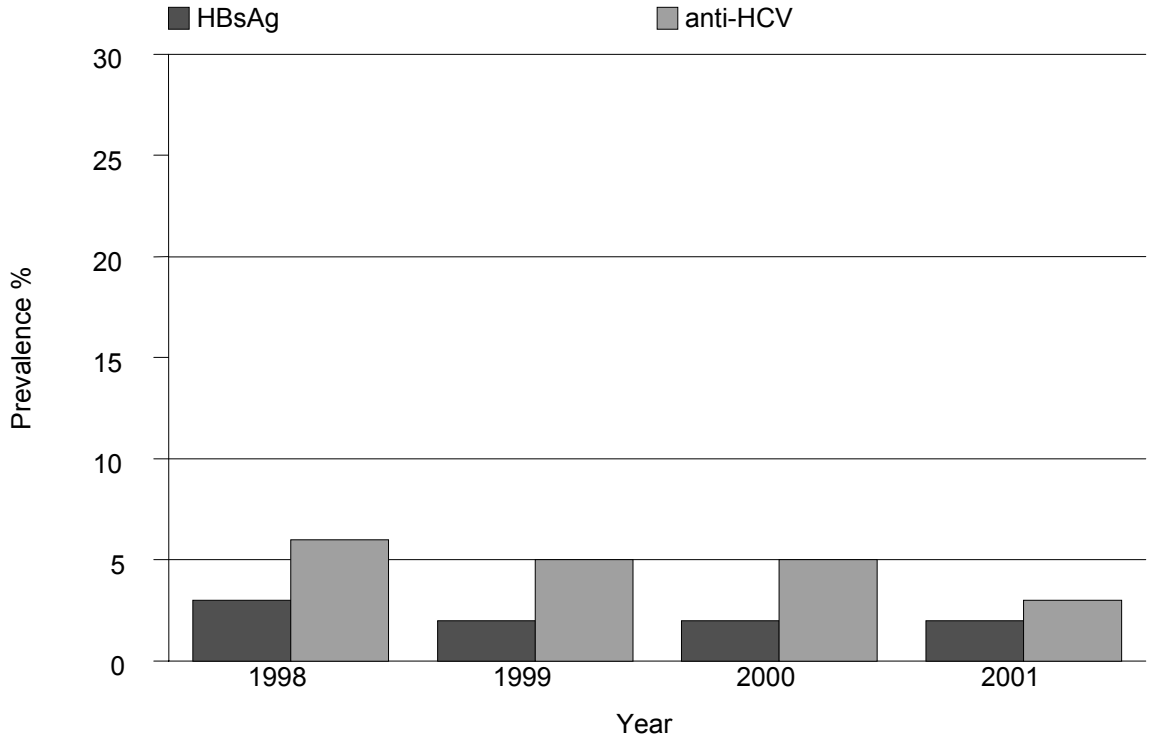


4.14 SEROLOGICAL STATUS, CAPD PATIENTS, GOVERNMENT CENTRES

Table 4.49: Prevalence of positive anti-HCV and HBsAg CAPD patients, Government Centres 1998 – 2001

Year	No	% HBsAg positive	% anti-HCV positive
1998	541	3	6
1999	610	2	5
2000	662	2	5
2001	772	2	3

Figure 4.49: Prevalence of positive anti-HCV and HBsAg CAPD patients, Government Centres 1998 – 2001



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

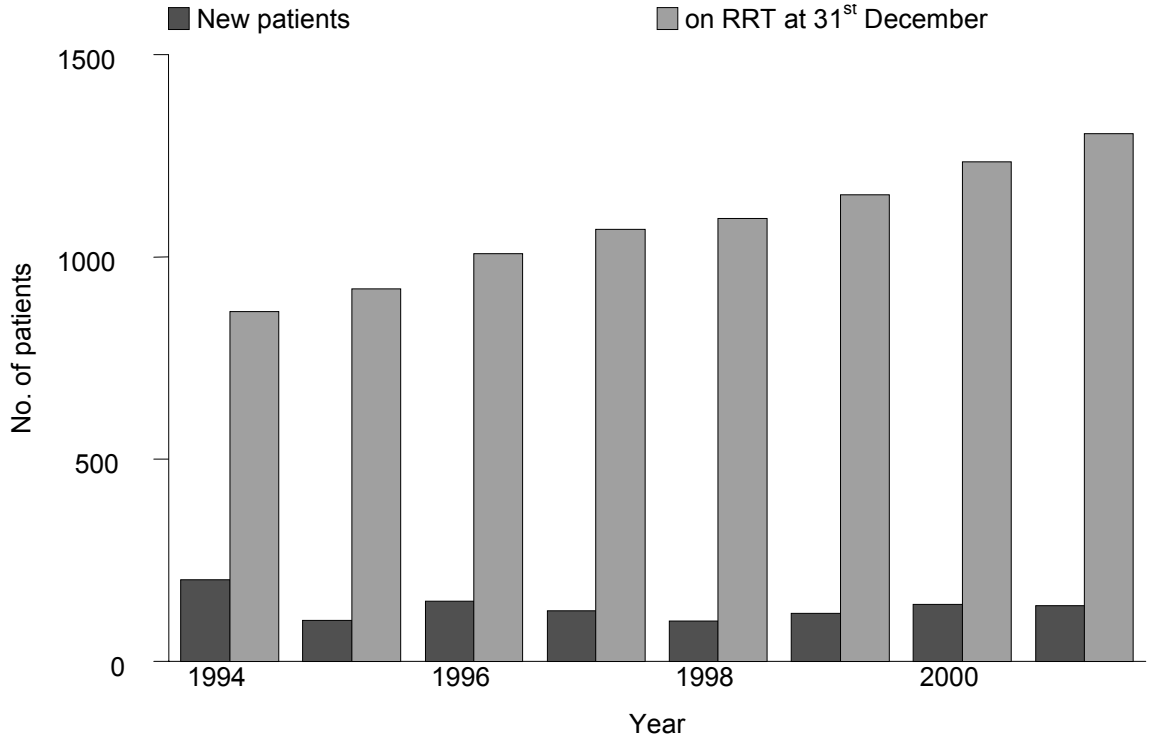
5. RENAL TRANSPLANTATION

5.1 STOCK AND FLOW

Table 5.01 Stock and Flow of Renal Transplant Patients 1994 – 2001

Year	1994	1995	1996	1997	1998	1999	2000	2001
New transplant patients	202	101	148	124	99	119	141	138
Died	28	16	31	28	23	25	26	28
Returned to dialysis	21	28	28	37	47	34	31	37
Lost to Follow Up	3	1	1	0	2	1	2	4
Functioning graft at 31st December	864	920	1008	1067	1094	1153	1235	1303

Figure 5.01: Stock and Flow Renal Transplant Patients, 1994 – 2001



5.2 PLACE AND TYPE OF RENAL TRANSPLANT

Table 5.02: Place of Renal Transplantation 1994 – 2001

Year	1994		1995		1996		1997	
	No.	%	No.	%	No.	%	No.	%
HKL	33	16	36	36	33	22	29	23
UMMC	5	2	9	9	6	4	6	5
Other local	0	0	0	0	0	0	0	0
India	142	70	22	22	5	3	7	6
China	21	10	33	33	103	70	80	65
Other overseas	1	0	1	1	1	1	2	2
Total	137	100	202	100	101	100	146	100
Year	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
HKL	33	33	35	29	28	20	31	22
UMMC	7	7	16	13	17	12	22	16
Other local	0	0	1	1	1	1	2	1
India	6	6	5	4	9	6	7	5
China	51	52	60	50	80	57	64	46
Other overseas	2	2	2	2	0	0	9	7
Total	99	100	119	100	141	100	138	100

Table 5.03: Type of Renal Transplantation 1994 – 2001

Year	1994		1995		1996		1997	
	No.	%	No.	%	No.	%	No.	%
Commercial Cadaver	21	10	33	33	103	70	80	65
Commercial Live donor	141	70	19	19	4	3	7	6
Live donor	38	19	44	44	39	26	29	23
Cadaver	2	1	5	5	2	1	8	6
Total	202	100	101	100	148	100	124	100
Year	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
Commercial Cadaver	51	52	55	46	76	54	63	46
Commercial Live donor	4	4	4	3	10	7	5	4
Live donor	27	27	40	34	18	13	30	22
Cadaver	15	15	14	12	30	21	38	28
Total	99	100	119	100	141	100	138	100

5.3 DEATH AFTER TRANSPLANTATION AND GRAFT FAILURE

Table 5.04: Transplant Patients Death Rate and Graft Loss 1994 – 2001

Year	1994	1995	1996	1997	1998	1999	2000	2001
No. at risk	864	892	964	1038	1081	1124	1194	1269
Transplant death	28	16	31	28	23	25	26	28
Transplant death rate %	3	2	3	3	2	2	2	2
Graft loss	21	28	28	37	47	34	31	37
Graft loss %	2	3	3	4	4	3	3	3
All losses	49	44	59	65	70	59	57	65
All losses rate %	6	5	6	6	6	5	5	5

Figure 5.04: Transplant Recipient Death Rate 1994– 2001

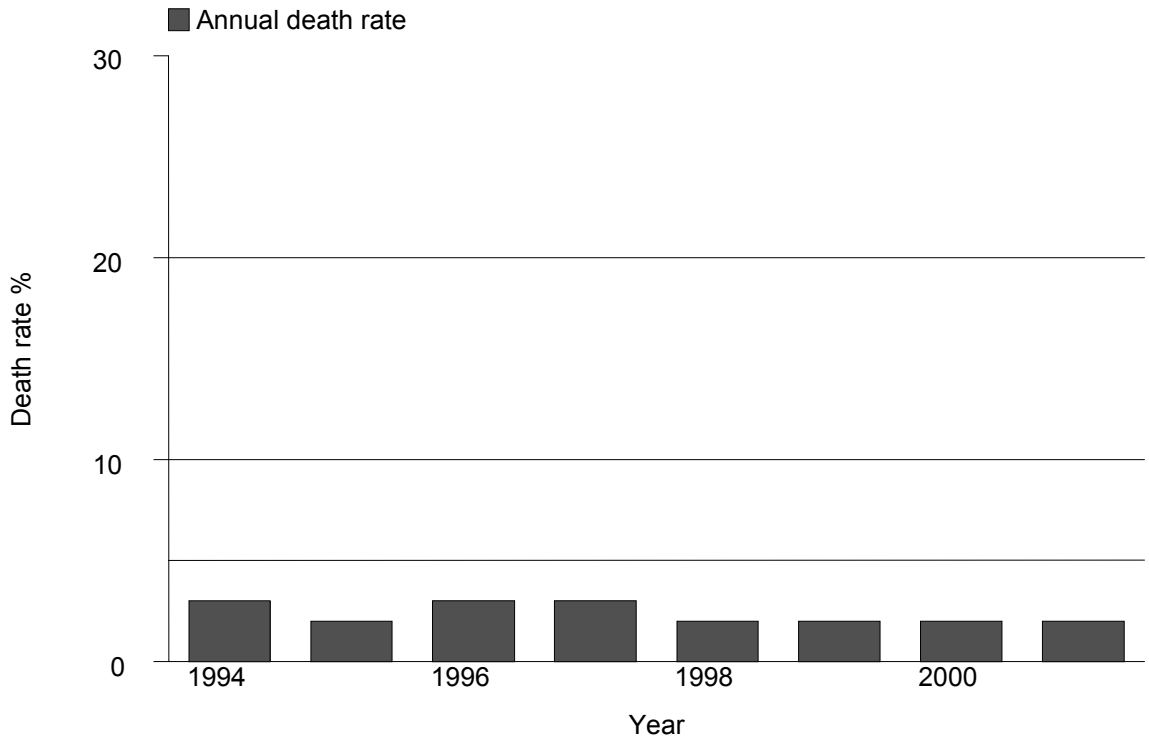


Table 5.05: Causes of Death in Transplant Recipients 1998 – 2001

Year	1998		1999		2000		2001	
	No	%	No	%	No	%	No	%
Cardiovascular	3	13	3	12	10	38	6	21
Died at home	4	17	4	16	0	0	3	11
Sepsis	9	39	7	28	9	35	16	57
GIT bleeding	1	4	1	4	1	4	0	0
Cancer	3	13	3	12	2	8	2	7
Liver disease	1	4	1	4	1	4	0	0
Others	0	0	3	12	3	12	1	4
Unknown	2	9	3	12	0	0	0	0
Total	23	100	25	100	26	100	28	100

Table 5.06: Causes of Graft Failure 1998 – 2001

Year	1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%
Rejection	24	51	21	62	19	61	14	38
Cyclosporine/ drug toxicity	0	0	0	0	0	0	0	0
Ureteric obstruction	0	0	0	0	0	0	0	0
Vascular causes(stenosis / thrombosis)	1	2	1	3	3	10	1	3
Renal disease, recurrent/de novo	1	2	0	0	0	0	2	5
Technical complication	0	0	0	0	2	6	1	3
Others	4	9	0	0	2	6	0	0
Unknown	17	36	12	35	5	16	19	51
Total	47	100	34	100	31	100	37	100

5.4 CENTRES OF FOLLOW-UP

Table 5.07: Distribution of Centres of Follow-up of Transplant Recipients, 20001

	Centre	No	Percent
	Number with function graft at 31st December	1303	100
1	Alor Setar Hospital	5	0
2	Ampang Puteri Specialist Hospital	5	0
3	Batu Pahat Hospital	11	1
4	Bintulu Hospital	4	0
5	C.S. Loo Kidney & Medical Specialist Centre	2	0
6	Duchess of Kent Hospital	4	0
7	Healthcare Dialysis Centre, Petaling Jaya	17	1
8	Ipoh Hospital	49	4
9	Kluang Hospital	11	1
10	Kota Bharu Hospital	4	0
11	Kuala Lumpur Hospital	348	27
12	Kuala Lumpur Hospital (Paed.)	1	0
13	Kuala Terengganu Hospital	6	0
14	Kuching Hospital	50	4
15	Labuan Hospital	1	0
16	Mahkota Medical Centre	11	1
17	Melaka Hospital	40	3
18	Mentakab Hospital	1	0
19	Miri Hospital	15	1
20	Muar Hospital	16	1
21	Pantai Mutiara Hospital, Penang	1	0
22	Pulau Pinang Hospital	164	13
23	Pusat Pakar Tawakal	8	1
24	Queen Elizabeth Hospital	42	3
25	Renal Dialysis Centre, Gleneagles Intan Medical Centre	3	0
26	Renal Healthcare, Kuala Lumpur	2	0
27	Segamat Hospital	7	1
28	Selangor Medical Centre	2	0
29	Selayang Hospital	31	2
30	Seremban Hospital	32	2
31	Sibu Hospital	24	2
32	Subang Jaya Medical Centre	15	1
33	Sultanah Aminah Hospital	142	11
34	Taiping Hospital	2	0
35	Tawau Hospital	5	0
36	Teluk Intan Hospital	1	0
37	Tengku Ampuan Afzan Hospital, Kuantan	24	2
38	Tengku Ampuan Rahimah Hospital, Klang	47	4
39	Timberland Medical Centre	20	2
40	Universiti Kebangsaan Malaysia Hospital	2	0
41	Universiti Sains Malaysia Hospital	3	0
42	University Malaya Medical Centre	125	10

5.5 TRANSPLANT RECIPIENTS' CHARACTERISTICS

Table 5.08: Percentage age distribution of transplant recipients 1998 – 2001

Year	1998	1999	2000	2001
New transplant patients	99	119	141	138
1-14 years	4	5	6	3
15-24 years	6	12	7	11
25-34 years	29	25	21	18
35-44 years	29	29	26	27
45-54 years	25	23	30	28
55-64 years	6	7	9	11
≥65 years	0	0	3	2
Functioning graft at 31st December	1094	1153	1235	1303
1-14 years	3	3	3	3
15-24 years	14	14	13	13
25-34 years	32	31	31	29
35-44 years	30	30	30	30
45-54 years	16	17	17	18
55-64 years	5	5	5	6
≥65 years	0	0	1	1

Table 5.09: Renal Transplant Recipients' Characteristics 1998 – 2001

Year	1998	1999	2000	2001
New transplant patients	99	119	141	138
Mean age± sd	37± 12	36± 13	39± 14	40± 14
% male	61	62	64	59
% Diabetic	10	10	13	12
% HBsAg+	6	3	4	3
% Anti-HCV+	15	8	6	12

5.6 SURVIVAL ANALYSIS

Table 5.10: Transplant Patient Survival related to Year of Transplant 1996 – 2001

Year	1996			1997			1998		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	94	2	138	98	1	117	95	2	
12	92	2	135	96	2	114	95	2	
24	91	2	132	95	2	111	95	2	
36	89	3	127	91	3	102	95	2	
48	87	3	124	89	3				
60	85	3							
Year	1999			2000			2001		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	99	1	117	96	2	130	95	2	
12	99	1	116	96	2	119			
24	98	1	104						

No. = number at risk SE = standard error

Figure 5.10: Transplant Patient Survival by Year of Transplant 1997 – 2001

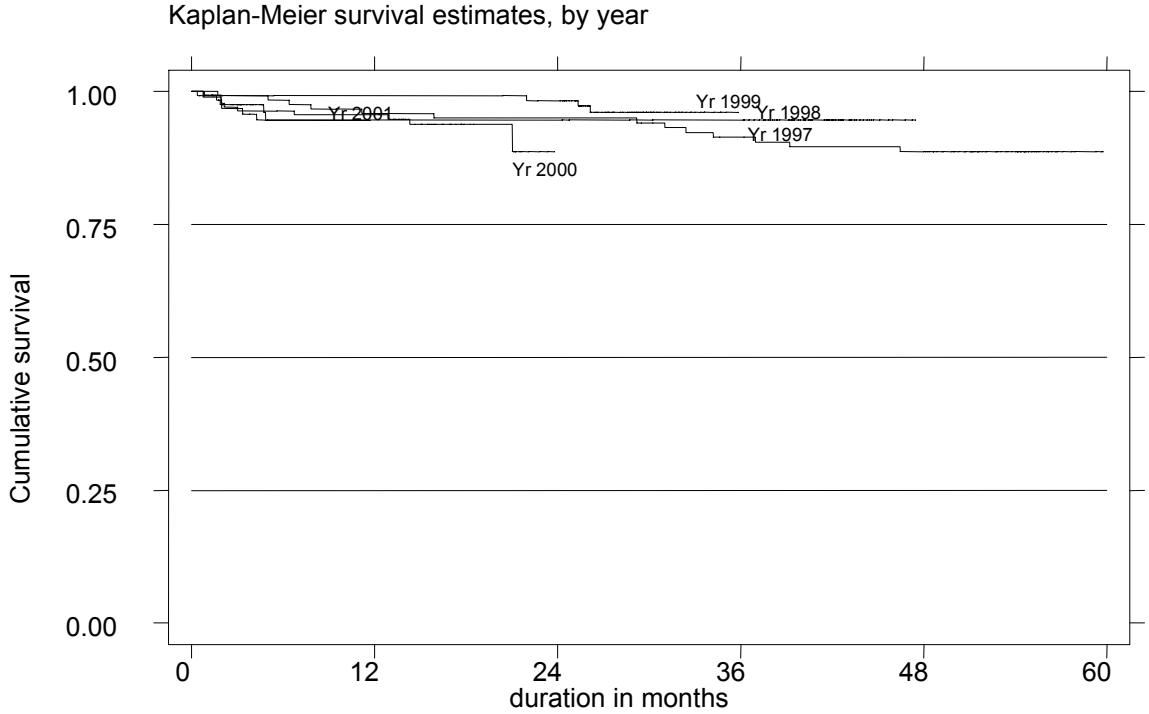
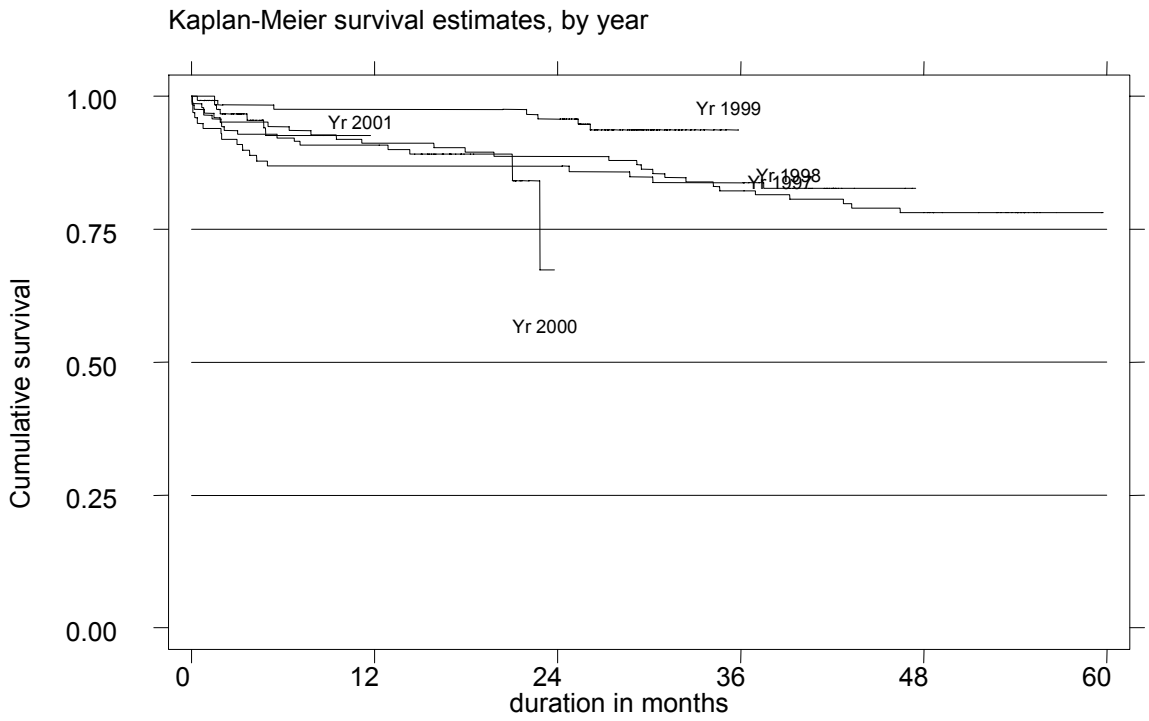


Table 5.11:Transplant Allograft Survival related to Year of Transplant 1996 – 2001

Year	1996			1997			1998		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	92	2	138	94	2	117	87	3	87
12	91	2	135	91	3	114	87	3	86
24	89	3	132	88	3	110	87	3	85
36	85	3	127	82	3	102	84	4	75
48	82	3	124	78	4				
60	78	3							
Year	1999			2000			2001		
Interval (months)	% survival	SE	No	% survival	SE	No	% survival	SE	No
6	97	1	116	92	2	131	93	3	
12	97	1	115	91	2	119			
24	96	2	105						

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

Figure 5.11: Transplant Allograft Survival by Year of Transplant 1997-2001



5.7 WORK RELATED REHABILITATION AND QUALITY OF LIFE IN TRANSPLANT RECIPIENTS

Table 5.12: Work Related Rehabilitation in Transplant Recipients 1998 – 2001

REHABILITATION	1998		1999		2000		2001	
STATUS	No.	%	No.	%	No.	%	No.	%
Full time work for pay	420	68	543	62	548	66	610	63
Part time work for pay	36	6	62	7	60	7	65	7
Able to work but unable to get a job	20	3	8	1	10	1	15	2
Able to work but not yet due to dialysis schedule	0	0	0	0	1	0	1	0
Able but disinclined to work	10	2	6	1	7	1	11	1
Home maker	94	15	174	20	138	17	163	17
Full time student	14	2	32	4	30	4	46	5
Age<15 years	3	0	3	0	3	0	5	1
Retired	10	2	32	4	31	4	25	3
Age>65 years	6	1	7	1	5	1	17	2
Unable to work due to poor health	9	1	11	1	2	0	12	1
Total	622	100	878	100	835	100	970	100

Table 5.13: Quality of Life, Transplant recipients 1998 – 2001

QOL Index Summated	1998		1999		2000		2001	
Score	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	0	0	4	0
4	1	0	0	0	2	0	0	0
5	0	0	1	0	0	0	4	0
6	5	1	4	0	2	0	4	0
7	9	2	8	1	1	0	5	1
8	11	2	5	1	12	1	15	2
9	31	5	9	1	23	3	19	2
10 (Best QOL)	532	90	852	97	780	95	913	95
Total	589	100	879	100	820	100	964	100