

CHAPTER 2

DIALYSIS IN MALAYSIA

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2.1: PROVISION OF DIALYSIS IN MALAYSIA (registry report)**2.1.1 Dialysis treatment provision**

In 2003, 2540 new patients commenced dialysis, giving a treatment rate of 101 per million population, an increase of 7.5% from the year before and slightly more than 3-fold increase over the 9 years shown in table 2.1.2. At year end 2003, a total of 10342 patients were on dialysis treatment giving a prevalence rate of 413 per million per year.

Table 2.1.1: Stock and flow – Dialysis Patients 1995 – 2004

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004*
New Dialysis patients	684	952	1133	1249	1542	1833	2071	2310	2540	2538
Died	178	222	315	373	486	583	801	908	1128	1115
Transplanted	36	56	59	61	69	106	133	143	121	140
Lost to Follow-up	5	5	5	8	7	10	15	23	43	80
Dialysing at 31st Dec	2232	2919	3694	4534	5536	6690	7830	9079	10342	11554

*preliminary results

Table 2.1.2: Dialysis Treatment Rate per million population 1995 – 2004

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004*
Acceptance rate	33	45	52	56	68	78	86	94	101	99
Prevalence rate	108	138	171	204	244	285	326	370	413	452

*preliminary results

2.1.3. Geographic distribution (registry report)

The economically advantaged states of Malaysia – Melaka, Pulau Pinang, Negeri Sembilan, Johor, Selangor and W. Persekutuan of Kuala Lumpur, and Perak - have dialysis treatment rates exceeding 100 per million state population since year 2000. Dialysis provision rate for Kedah was nearly 100 per million in 2003. The East Coast states of West Malaysia and Sabah and Sarawak averaged treatment rates of about 63 per million. Melaka continued to have the highest treatment rate at 180 in 2003 and Sabah the lowest at 45 per million.

Table 2.1.3: Dialysis Treatment Rate by State, per million state population 1995-2004

State	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004*
Negeri Melaka	74	82	95	109	91	150	156	169	180	201
Pulau Pinang	73	72	85	113	124	106	122	147	138	169
Negeri Sembilan	48	74	74	92	94	118	112	131	148	154
Johor Darul Takzim	43	58	79	71	104	131	137	146	145	141
Selangor & W. Persekutuan	62	81	76	91	102	121	118	126	133	128
Perak Darul Redzuan	28	58	61	64	75	106	104	115	125	114
Kedah & Perlis	19	26	54	47	59	69	66	86	99	85
Terengganu Darul Iman	18	27	36	34	36	37	77	88	69	78
Pahang Darul Makmur	21	16	44	36	46	49	52	52	66	66
Sarawak	20	36	46	33	44	51	67	58	62	66
Kelantan Darul Naim	9	6	12	15	26	31	59	61	72	63
Sabah	12	18	16	24	32	25	36	36	45	48

*preliminary results

2.2: DIALYSIS PROVISION IN MALAYSIA (Centre survey report)

2.2.1 Dialysis provision

Data submission of individual dialysis and transplant patients to the National Renal Registry is entirely voluntary and completeness cannot be ascertained. Dialysis centre surveys have been conducted in December of each year since 1999. This annual cross-sectional survey was carried out to describe the most current level and distribution of dialysis provision at the end of each year. This section reports the results of the centre survey carried out in December 2004. Dialysis provision is expressed in terms of number of centres, machines, treatment capacity (one HD machine to 5 patients) and patients.

At the end of 2004, there were a total of 11554 dialysis patients, one third receiving dialysis treatment provided by the Ministry of Health (MOH) hospitals, another third by non-governmental organization (NGO) centres and about 28% by the private sector. Almost all private dialysis patients received centre haemodialysis treatment compared to the MOH sector where chronic PD patients and home haemodialysis comprised 30% of all dialysis patients. (Table 2.2.1)

Table 2.2.1: Number of dialysis centres, HD machines and treatment capacity by sector, December 2004

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	112	920	4600	2791	1.65	3979
NGO	93	1316	6580	3628	1.81	3977
Private (PRV)	124	1105	5525	3681	1.5	3273
University (UNI)	8	30	150	42	3.57	229
Armed Forces (AF)	10	42	210	94	2.23	96

Of the 3 main sectors, the private sector had the largest number of dialysis centres but the NGO centres had the largest HD capacity. (Figure 2.2.1 a & b)

Figure 2.2.1(a): Distribution of dialysis centres by Sector, December 2004

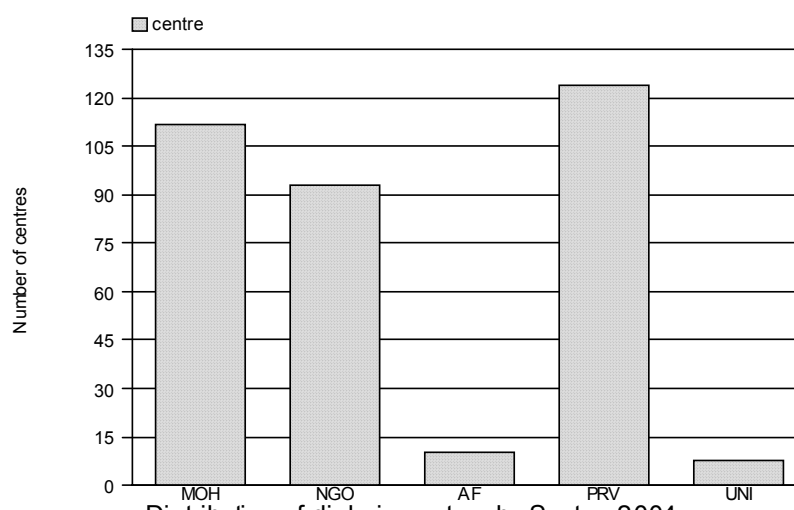


Figure 2.2.1(b): Distribution of HD capacity by Sector, December 2004

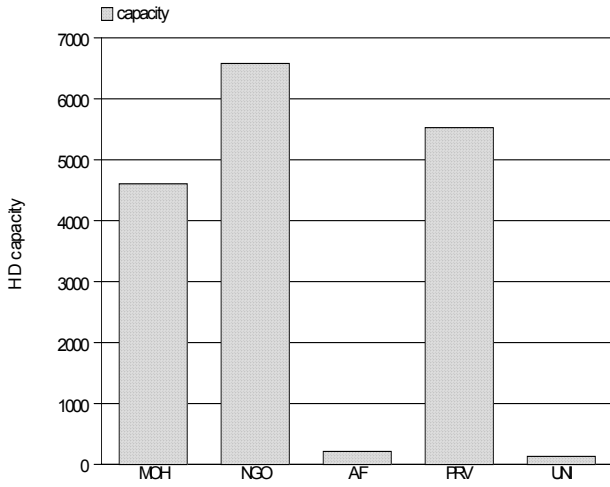
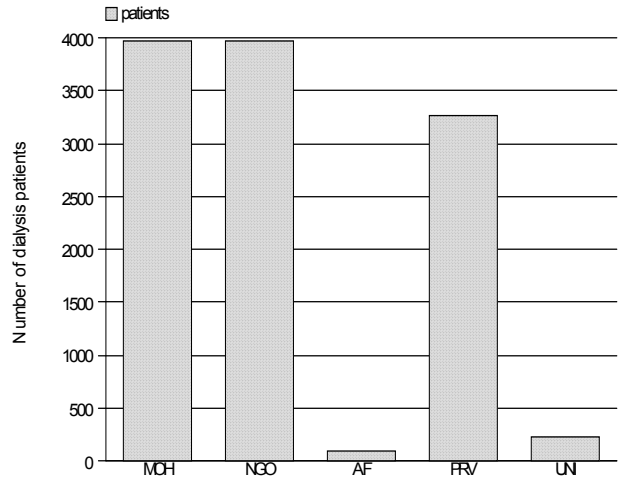
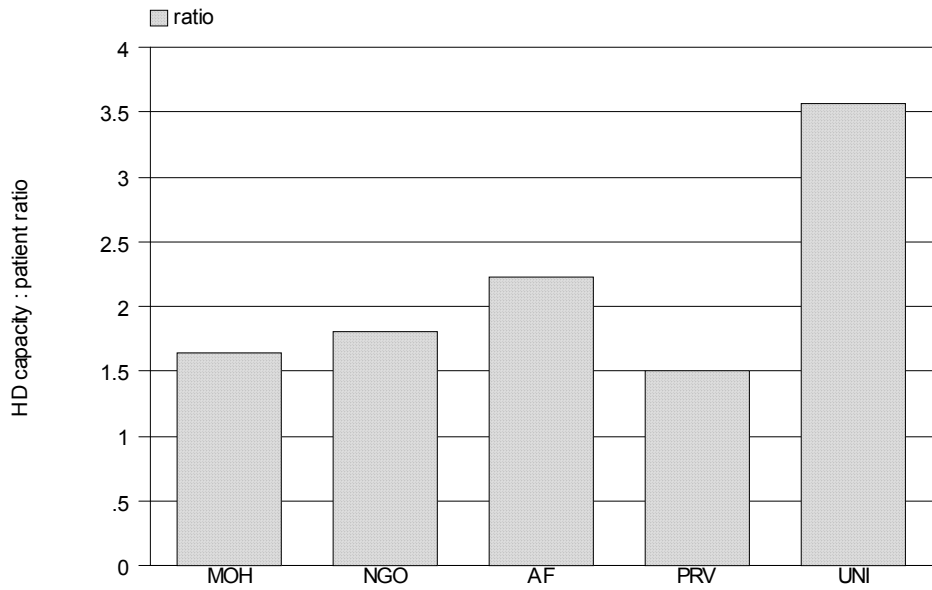


Figure 2.2.1(c): Distribution of dialysis patients by Sector, December 2004



The private sector had the lowest HD treatment capacity to patient ratio at 1.5 and the NGO sector the highest at 1.81. (Figure 2.2.1d)

Figure 2.2.1(d): HD capacity: patient ratio by Sector, December 2004



2.2.2. Geographic distribution (centre survey)

The economically advantaged states have the highest number of dialysis centres, treatment capacity, patients and treatment rate. However, other than Perak which had the highest HD capacity to patient ratio at 2.01, the less economically developed states of Terengganu, Sabah and Pahang had capacity to patient ratios > 1.8, higher than many of the economically developed states. (Table and Figure 2.2.2.).

Table 2.2.2: Number of dialysis centres, number of HD machines and treatment capacity, HD capacity to patients ratio and number of dialysis patients by state in December 2004

State	Centre (No.)	Centre HD machines	Centre HD machines pmp	Centre HD capacity (No.)	Centre HD capacity pmp	Centre HD patients (No.)	Centre HD patients pmp	HD capacity: patient ratio	All dialysis patients (No.)	Dialysis treatment rate pmp
Melaka (Me)	13	184	263	920	1314	549	784	1.68	521	744
Penang (Pe)	37	347	241	1735	1203	1056	732	1.64	1010	700
Johor (Jo)	50	535	177	2675	883	1671	552	1.6	1862	615
Selangor & Federal Territory (SF)	96	1004	163	5020	817	2983	486	1.68	3467	564
Negeri Sembilan (Ne)	13	128	138	640	688	386	415	1.66	500	538
Perak (Pe)	40	386	173	1930	867	961	432	2.01	1184	532
Kedah & Perlis (KP)	27	235	116	1175	578	854	420	1.38	786	386
Sarawak (Sw)	17	187	83	935	413	647	286	1.45	732	324
Trengganu (Tr)	9	76	77	380	384	197	199	1.93	277	280
Pahang (Pa)	13	97	69	485	347	268	191	1.81	385	275
Kelantan (Ke)	15	104	70	520	351	311	210	1.67	355	240
Sabah (Sb)	17	130	45	650	227	353	123	1.84	475	166
Malaysia	347	3413	133	17065	667	10236	400	1.67	11554	452

Figure 2.2.2(a): Distribution of dialysis centres by State, December 2004

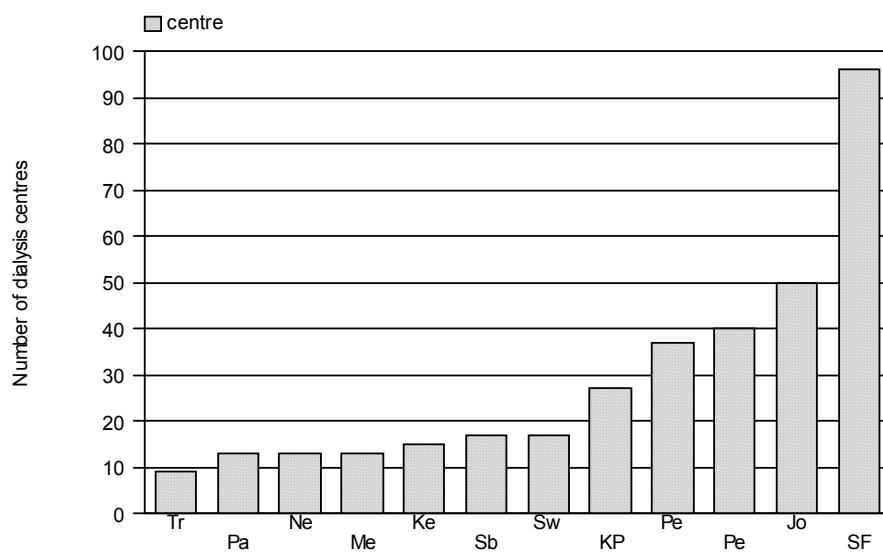


Figure 2.2.2(b): Distribution of dialysis patients by State, December 2004

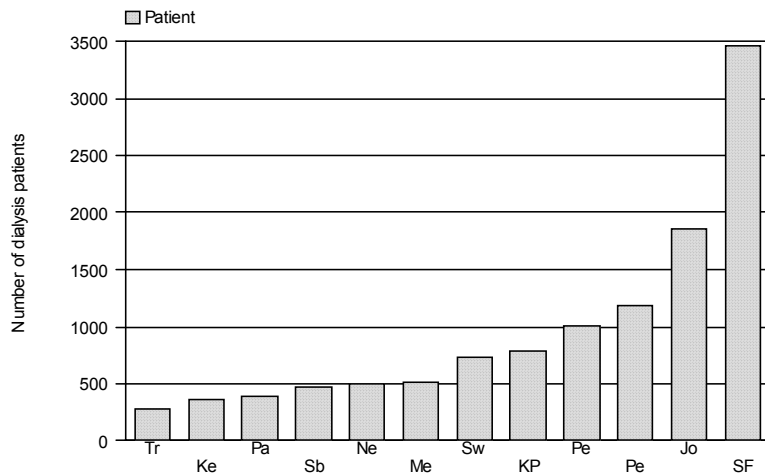


Figure 2.2.2(c): Distribution of dialysis treatment by State, December 2004

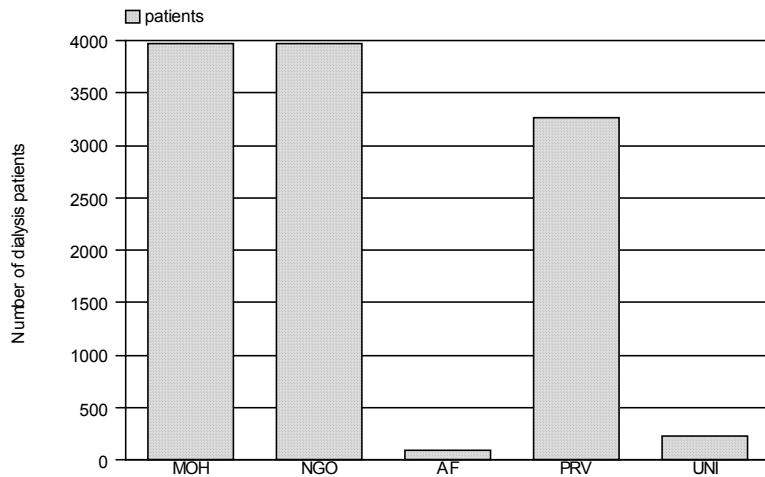
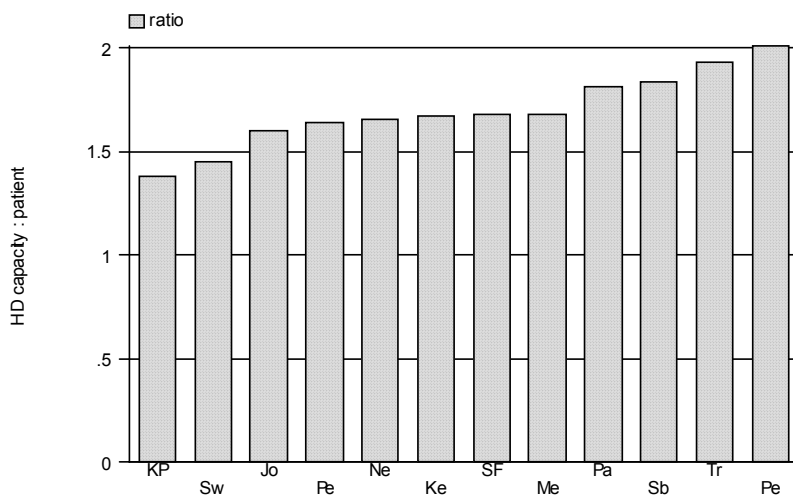


Figure 2.2.2(d): HD capacity to patient ratio by State, December 2004



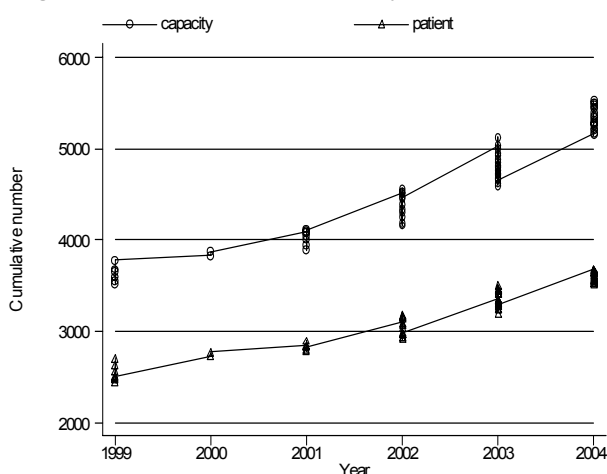
2.2.3 Growth in dialysis provision by sector (centre survey)

In the private sector, the number of patients paralleled the increase in HD capacity. HD capacity has increased rapidly in the MOH sector in line with official policy that every MOH hospital will have a HD centre by 2005. There was also a larger increase in HD capacity compared to patient numbers in the NGO sector.

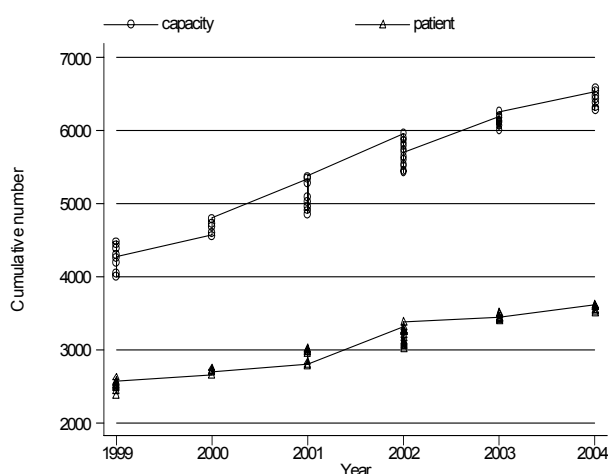
Table 2.2.3: Growth in HD capacity and HD patients in Private, NGO and MOH sectors, 1999-2004

Sector	Private		NGO		MOH	
	Cumulative HD capacity	Cumulative HD patients	Cumulative HD capacity	Cumulative HD patients	Cumulative HD capacity	Cumulative HD patients
1999	3780	2702	4485	2630	3070	2078
2000	3875	2772	4800	2756	3285	2221
2001	4125	2900	5370	3020	4020	2451
2002	4560	3184	5960	3385	4290	2656
2003	5130	3497	6260	3507	4470	2743
2004	5525	3681	6580	3628	4960	2927

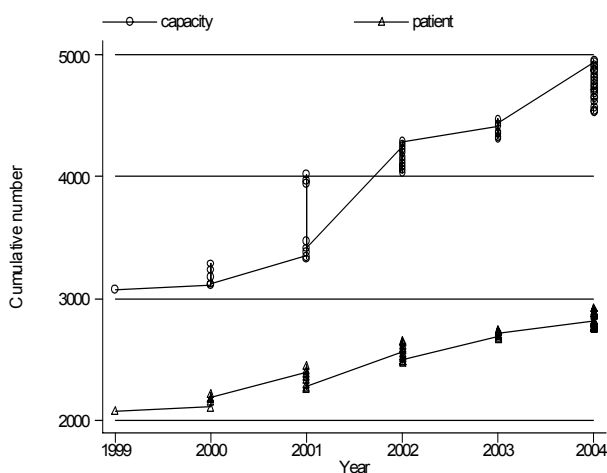
Figure 2.2.3: Growth in HD capacity and HD patients in Private, NGO and MOH sectors, 1999-2004



Growth in HD capacity and patient, private sector 1999-2004



Growth in HD capacity and patient, NGO sector 1999-2004



Growth in HD capacity and patient, MOH sector 1999-2004

2.3: DISTRIBUTION OF DIALYSIS TREATMENT

2.3.1 Gender distribution

The treatment gap between men and women has remained consistent over the years, suggesting this is a true reflection of the difference in ESRD incidence between the 2 sexes rather than any conscious or unconscious bias in treatment allocation.

Table 2.3.1 (a): Dialysis Treatment Rate by Gender, per million male or female population 1995– 2004

Gender	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Male	39	51	63	63	81	92	97	109	120	114
Female	32	45	49	57	61	73	88	93	93	98

Figure 2.3.1 (a): Dialysis Treatment by Gender 1995 – 2004

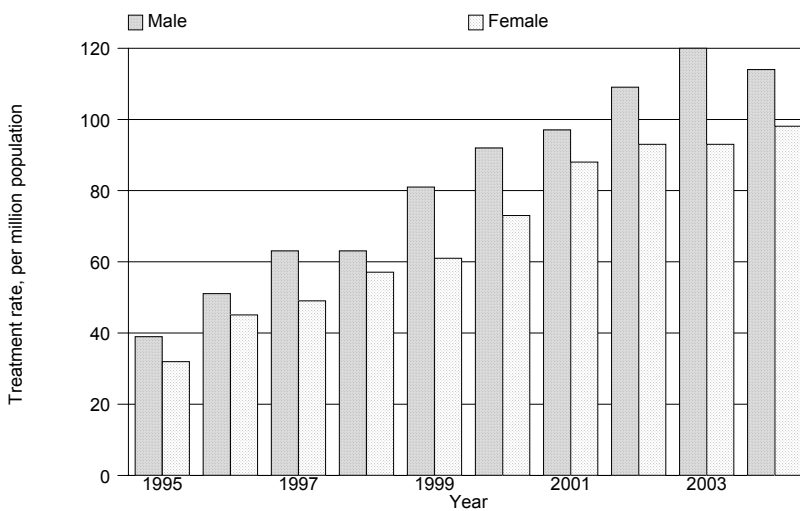


Table 2.3.2: Gender distribution of Dialysis Patients 1995-2004

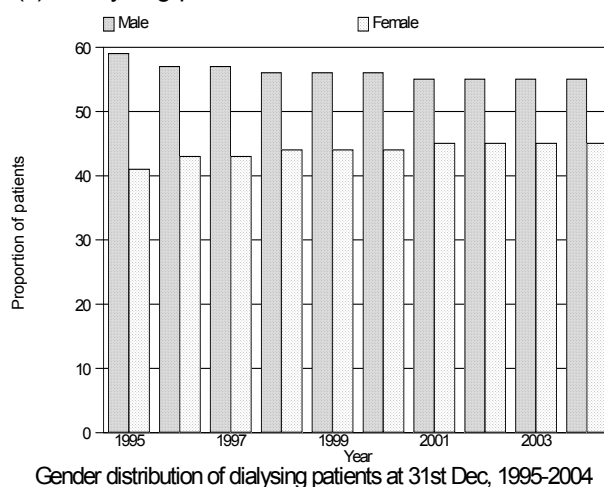
Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
New Dialysis patients	684	952	1133	1249	1542	1833	2071	2310	2540	2538
% Male	56	53	57	53	58	57	54	55	58	55
% Female	44	47	43	47	42	43	46	45	42	45
Dialysing at 31st December	2232	2919	3694	4534	5536	6690	7830	9079	10342	11554
% Male	59	57	57	56	56	56	55	55	55	55
% Female	41	43	43	44	44	44	45	45	45	45

Figure 2.3.1 (b): Gender Distribution of Dialysis patients 1995 – 2004

(i) New Dialysis patients



(ii) Dialysing patients at 31st December



2.3.2 Age distribution

Dialysis treatment rates for those < 55 years of age have plateaued in the last few years, suggesting that almost all patients with ESRD in those age groups who were in need of dialysis were able to access treatment. However, the age groups 55-64 and >65 years continue to register increase in treatment rates, with the most rapid increase seen in those > 65 years. The treatment rate for patients 55 years and older has exceeded 550 per million since 2003. 51% of new dialysis patients were at least 55 years old

Table 2.3.2(a): Dialysis Treatment Rate by Age Group, per million age group population 1995 – 2004

Age groups (years)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
1-14	1	3	3	3	3	4	4	5	4	4
15-24	10	13	15	15	16	18	22	28	25	25
25-34	31	39	39	41	42	46	47	53	50	47
35-44	59	67	80	81	86	98	102	100	99	104
45-54	120	153	166	173	224	247	249	268	273	270
55-64	158	230	289	310	369	430	508	530	576	522
>=65	110	169	214	228	300	348	434	493	567	573

Figure 2.3.2(a): Dialysis Treatment Rate by Age Group 1995 - 2004

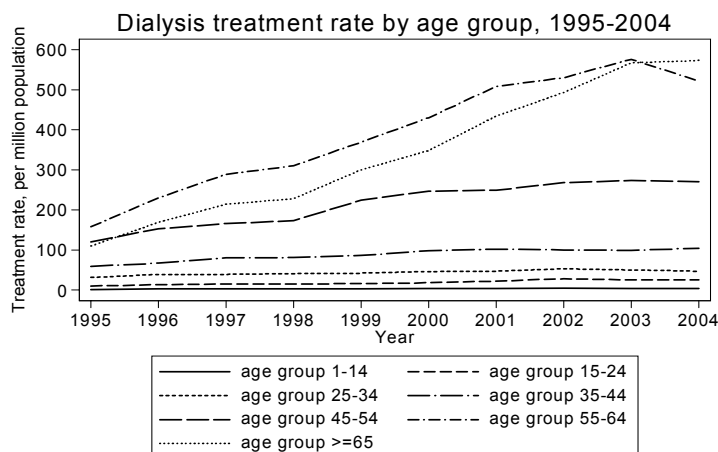
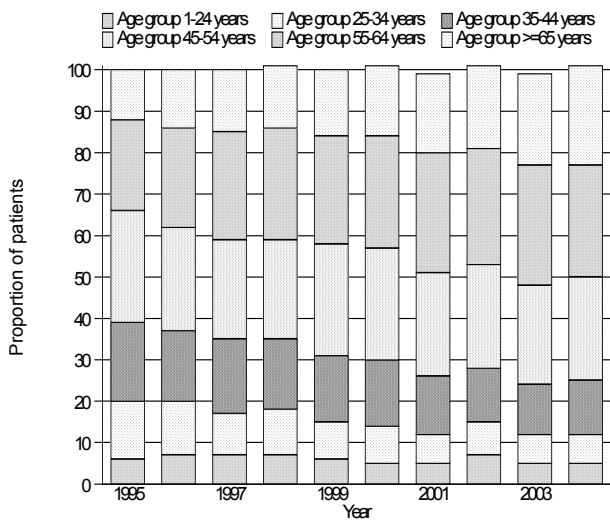


Table 2.3.2.(b): Percentage Age Distribution of Dialysis Patients 1995 – 2004

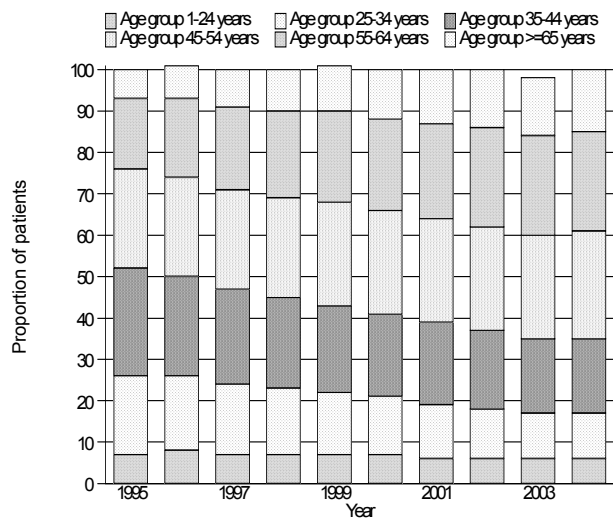
Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
New Dialysis patients	684	952	1133	1249	1542	1833	2071	2310	2540	2538
% 1-14 years	1	2	2	2	2	1	1	2	1	1
% 15-24 years	5	5	5	5	4	4	4	5	4	4
% 25-34 years	14	13	10	11	9	9	7	8	7	7
% 35-44 years	19	17	18	17	16	16	14	13	12	13
% 45-54 years	27	25	24	24	27	27	25	25	24	25
% 55-64 years	22	24	26	27	26	27	29	28	29	27
% >=65 years	12	14	15	15	16	17	19	20	22	24
Dialysing at 31st December	2232	2919	3694	4534	5536	6690	7830	9079	10342	11554
% 1-14 years	1	2	2	2	2	2	1	1	1	1
% 15-24 years	6	6	5	5	5	5	5	5	5	5
% 25-34 years	19	18	17	16	15	14	13	12	11	11
% 35-44 years	26	24	23	22	21	20	20	19	18	18
% 45-54 years	24	24	24	24	25	25	25	25	25	26
% 55-64 years	17	19	20	21	22	22	23	24	24	24
% >=65 years	7	8	9	10	11	12	13	14	14	15

Figure 2.3.2(b): Age Distribution of New Dialysis patients 1995 – 2004

(i) New Dialysis patients



(ii) Dialysing patients at 31st December



2.3.3 Method and Location of dialysis

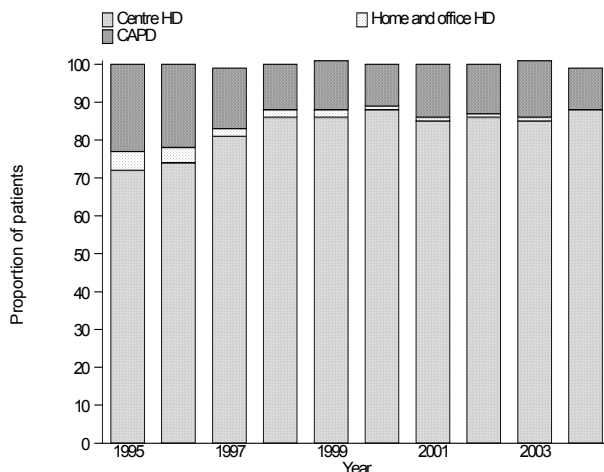
At least 85% of new patients were accepted into centre haemodialysis. The year 2004 finally saw the demise of home/office HD - a programme introduced at a time when dialysis treatment was not easily available. Chronic PD continued to account for about 10% of new and current dialysis patients. (Table & Figure 2.3.3)

Table 2.3.3: Method and Location of Dialysis 1995 – 2004

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
New Dialysis patients	684	952	1133	1249	1542	1833	2071	2310	2540	2538
% Centre HD	72	74	81	86	86	88	85	86	85	88
% Home and office HD	5	4	2	2	2	1	1	1	1	0
% CAPD	23	22	16	12	13	11	14	13	15	11
Dialysing at 31st December	2232	2919	3694	4534	5536	6690	7830	9079	10342	11554
% Centre HD	72	75	79	83	85	87	87	88	88	89
% Home and office HD	13	9	7	6	4	3	3	2	2	2
% CAPD	15	15	14	12	11	10	10	10	10	10

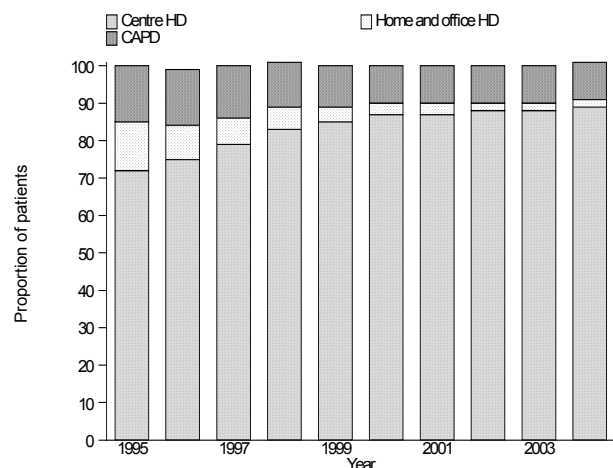
Figure 2.3.3: Method and Location of Dialysis Patients 1995 – 2004

(a) New Dialysis patients



Method and Location of New Dialysis Patients, 1995-2004

(b) Dialysing patients at 31st December



Method and Location of Dialysing Patients at 31st Dec, 1995-2004

2.3.4 Funding for Dialysis Treatment

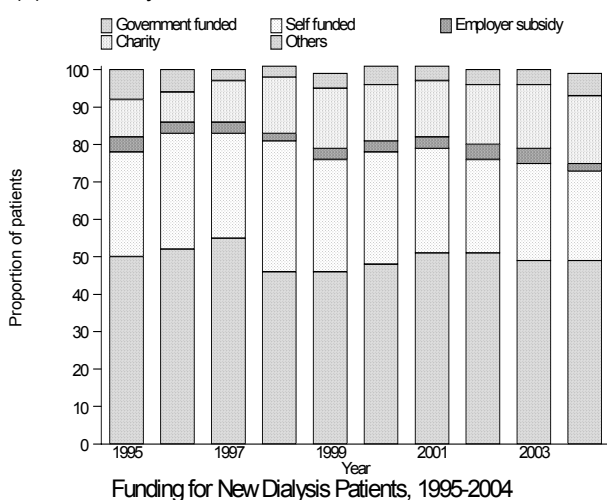
The government continued to provide almost fully subsidised dialysis treatment to about 50% of dialysis patients. The proportion of new patients who paid for their dialysis treatment shows a gradual decline over the years from about 30% in the late 1990's to about 24-26% in the last 3 years. There appear to be a corresponding increase in funding provided by NGO centres. (Table and Figure 2.3.6)

Table 2.3.4: Funding for Dialysis Treatment 1995 – 2004

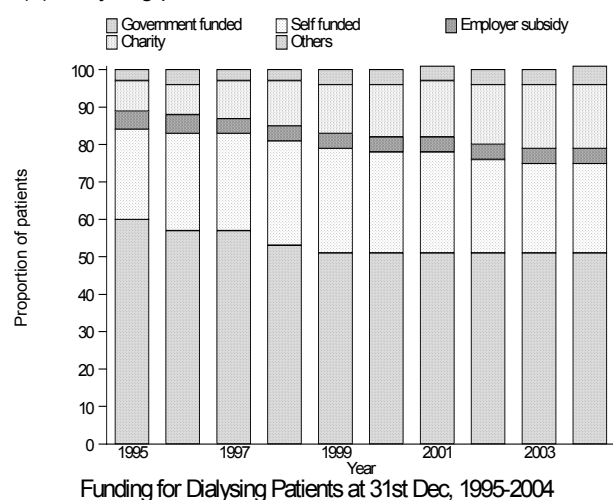
Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
New Dialysis patients	684	952	1133	1249	1542	1833	2071	2310	2540	2538
% by Government	50	52	55	46	46	48	51	51	49	49
% self funded	28	31	28	35	30	30	28	25	26	24
% subsidized by Employer	4	3	3	2	3	3	3	4	4	2
% by Charity	10	8	11	15	16	15	15	16	17	18
% Others	8	6	3	3	4	5	4	4	4	6
Dialysing at 31st December	2232	2919	3694	4534	5536	6690	7830	9079	10342	11554
% by Government	60	57	57	53	51	51	51	51	51	51
% self funded	24	26	26	28	28	27	27	25	24	24
% subsidized by Employer	5	5	4	4	4	4	4	4	4	4
% by Charity	8	8	10	12	13	14	15	16	17	17
% Others	3	4	3	3	4	4	4	4	4	5

Figure 2.3.4: Funding for Dialysis Treatment 1995 – 2004

(a) New Dialysis Patients



(b) Dialysing patients at 31st December



2.3.5 Distribution of dialysis patients by sector

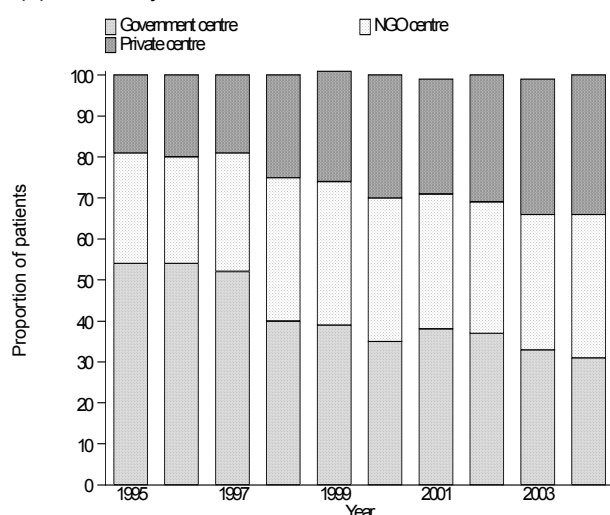
The proportion of new patients dialysed in private and NGO centres continued to increase while the proportion dialyzing in government centres has progressively declined. In 2003, intake of new dialysis patients was distributed equally between the 3 sectors. The year 2004 may perhaps be the first year that the proportion of new patients accepted for dialysis into government centres was lower than the other 2 sectors.

Table 2.3.5: Distribution of Dialysis Patients by Sector 1995 – 2004

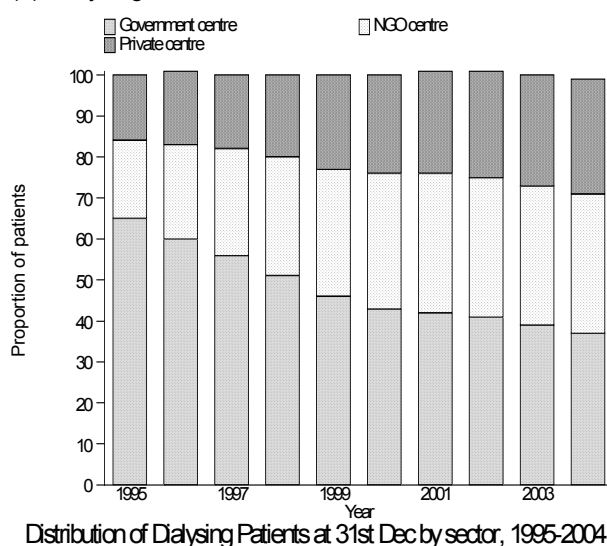
Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
New Dialysis patients	684	952	1133	1249	1542	1833	2071	2310	2540	2538
% Government centre	54	54	52	40	39	35	38	37	33	31
% NGO centre	27	26	29	35	35	35	33	32	33	35
% Private centre	19	20	19	25	27	30	28	31	33	34
Dialysing at 31st December	2232	2919	3694	4534	5536	6690	7830	9079	10342	11554
% Government centre	65	60	56	51	46	43	42	41	39	37
% NGO centre	19	23	26	29	31	33	34	34	34	34
% Private centre	16	18	18	20	23	24	25	26	27	28

Figure 2.3.5: Distribution of Dialysis Patients by Sector 1995 – 2004

(a) New Dialysis Patients



(b) Dialysing Patients at 31st December



2.4: PRIMARY RENAL DISEASE

Diabetes mellitus continues to be the commonest cause of ESRD. Alarminglly the percentage continued to increase and accounted for 54% of all new ESRD patients in 2004. Hypertension as a cause of primary renal disease has been included in this report and was the second commonest cause of ESRD at about 7-12%. The proportion of patients with unknown primary renal disease was still very high at 28% in 2004. Only 4% ESRD was attributable to chronic glomerulonephritis excluding SLE nephritis.

Table 2.4.1: Primary Renal Disease 1995– 2004

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
New Dialysis patients	684	952	1133	1249	1542	1833	2071	2310	2540	2538
% Unknown cause	40	37	33	32	29	28	30	30	29	28
% Diabetes Mellitus	26	29	36	41	40	45	46	50	52	54
% GN	13	13	13	10	10	9	6	6	5	4
% SLE	1	2	2	1	2	2	1	1	1	1
% Polycystic kidney	3	2	2	1	1	1	2	1	1	1
% Obstructive Nephropathy	7	7	5	5	4	3	3	3	3	3
% Toxic Nephropathy	0	1	0	0	1	0	1	0	0	1
% Hypertension	8	9	9	8	11	12	9	7	7	8
% Others	2	2	1	1	1	1	1	1	1	1

Figure 2.4.1: Primary Renal Disease for New Dialysis Patients 1995– 2004

