

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 2004, 2774 patients commenced dialysis, giving a treatment rate of 108 per million population. The increase in dialysis provision rate from 2003 to 2004 was only 5 per million compared to 8 to 12 in the previous years. At year end 2004, a total of 11767 patients were on dialysis treatment giving a prevalence rate of 460 per million per year.

Table 2.1.1: Stock and flow – Dialysis Patients 1996 – 2005

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
New Dialysis patients	952	1135	1250	1543	1835	2078	2333	2573	2774	2636
Died	222	315	373	487	586	810	920	1142	1188	1203
Transplanted	56	59	61	69	106	133	143	122	149	93
Lost to Follow-up	5	5	8	10	10	14	21	37	69	120
Dialysing at 31st Dec	2922	3699	4540	5540	6693	7832	9093	10384	11767	12974

Table 2.1.2: Dialysis Treatment Rate per million population 1996 – 2005

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Acceptance rate	45	52	56	68	78	87	95	103	108	101
Prevalence rate	138	171	205	244	285	326	371	415	460	497

2.1.2. Geographic distribution

The economically advantaged states on the west coast of Peninsular 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 in the northern Peninsular Malaysia states, Kedah and Perlis exceeded 100 per million for the first time in 2003. The East Coast states of Peninsular Malaysia and Sarawak and Sabah still have very much lower treatment rates. Melaka continued to have the highest treatment rate exceeding 200 for the first time and Sabah the lowest at 48 per million in 2004.

Table 2.1.3: Dialysis Treatment Rate by State, per million state population 1996-2005

State	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Pulau Pinang	72	84	112	124	105	122	150	142	197	185
Negeri Sembilan	74	74	92	96	118	112	131	148	157	147
Negeri Melaka	82	95	109	88	150	156	171	180	209	137
Johor Darul Takzim	57	80	71	104	131	138	148	146	150	133
Perak Darul Redzuan	58	62	64	76	106	103	116	129	140	131
Selangor & W. Persekutuan	81	76	91	102	121	119	126	134	140	128
Kedah & Perlis	26	54	47	59	69	68	90	105	96	97
Terengganu Darul Iman	27	36	34	36	37	75	88	68	80	90
Pahang Darul Makmur	16	45	36	46	49	51	53	66	70	73
Kelantan Darul Naim	6	12	15	27	31	59	62	73	64	69
Sarawak	36	46	33	44	51	67	58	62	68	61
Sabah	18	16	24	32	26	36	36	44	48	43

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 2005. 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 2005, there were a total of 12974 dialysis patients. The Ministry of Health (MOH) provided dialysis to 34% of patients, non-governmental organizations (NGO) 32% and the private sector at 31%. Almost all private dialysis patients received centre haemodialysis treatment compared to the MOH sector where patients on chronic peritoneal dialysis (PD) and home haemodialysis comprised about a quarter of all dialysis patients. (table 2.2.1)

Of the 3 main sectors, the private sector had the largest number of dialysis centres but the NGO centres had the largest HD capacity. (fig 2.2.1 a & b) The Ministry of Health had the lowest HD treatment capacity to patient ratio at 1.52 and the NGO sector the highest at 1.7. (fig 2.2.1d)

Table 2.2.1: Number of dialysis centres, HD machines and treatment capacity by sector, December 2005

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	137	1042	5210	3428	1.52	4471
NGO	99	1427	7135	4207	1.7	4169
Private (PRV))	144	1317	6585	4112	1.6	3998
University (UNI)	8	54	270	138	1.96	240
Armed Forces (AF)	8	46	230	102	2.25	96

Figure 2.2.1(a): Distribution of dialysis centres by Sector, December 2005

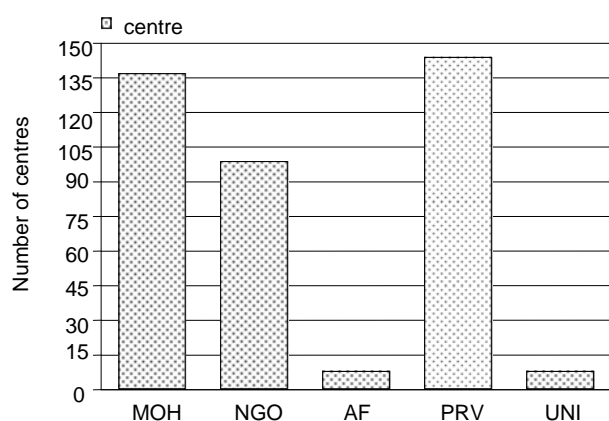


Figure 2.2.1(b): Distribution of HD capacity by Sector, December 2005

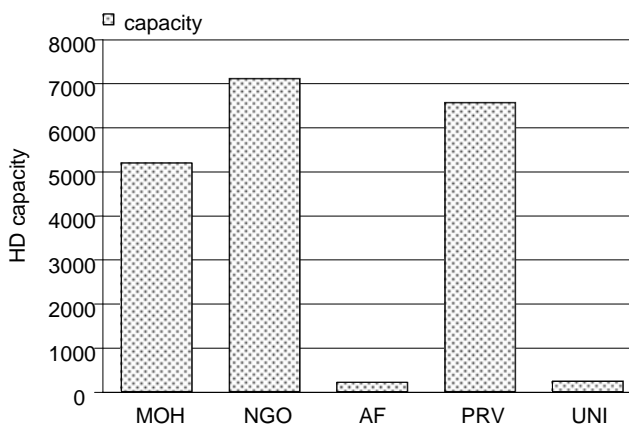


Figure 2.2.1(c): Distribution of dialysis patients by Sector, December 2005

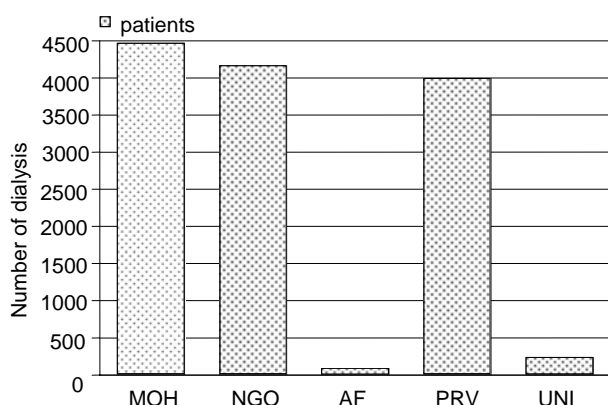
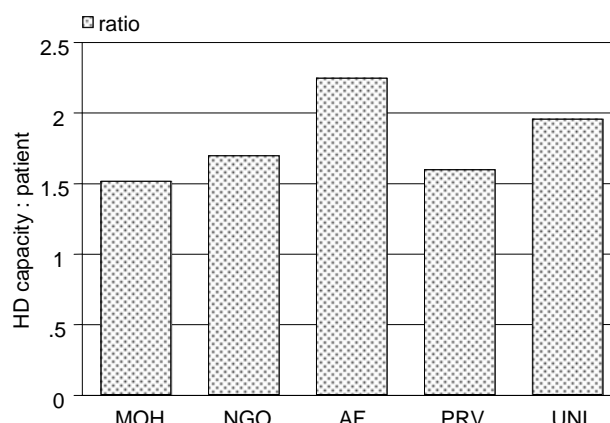


Figure 2.2.1(d): HD capacity: patient ratio by Sector,



2.2.2. Geographic distribution

The economically advantaged states have the highest number of dialysis centres, treatment capacity, patients and treatment rate. However, other than Pahang, which had the highest HD capacity to patient ratio at 1.99, the HD capacity to patient ratio did not vary too widely between the various states. (table and fig 2.2.2.). This is unlike previous years when HD capacity to patient ratio was higher in the economically disadvantaged states compared to the advanced states. Although the number of HD machines has increased, the intake of patients was more than the increase in number of new machines. This increased intake may be partly the result of the availability of more nephrologists serving in the underserved areas.

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 2005.

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
Penang (Pe)	36	373	254	1865	1270	1128	768	1.65	1156	787
Melaka (Me)	15	188	264	940	1318	547	767	1.72	530	743
Johor (Jo)	54	570	184	2850	919	1900	613	1.5	2060	664
Selangor & Federal Territory (SF)	111	1174	187	5870	933	3546	564	1.66	3864	614
Perak (Pe)	47	431	191	2155	955	1292	573	1.67	1364	605
Negeri Sembilan (Ne)	12	136	144	680	719	577	610	1.18	559	591
Kedah & Perlis (KP)	28	279	135	1395	673	796	384	1.75	935	451
Sarawak (Sw)	25	218	94	1090	471	729	315	1.5	821	355
Trengganu (Tr)	10	79	78	395	389	271	267	1.46	325	320
Pahang (Pa)	15	141	99	705	494	354	248	1.99	436	306
Kelantan (Ke)	16	117	78	585	389	364	242	1.61	411	273
Sabah (Sb)	27	180	60	900	298	483	160	1.86	513	170
Malaysia	396	3886	149	19430	744	11987	459	1.62	12974	497

Figure 2.2.2(a): Distribution of dialysis centres by State, December 2005

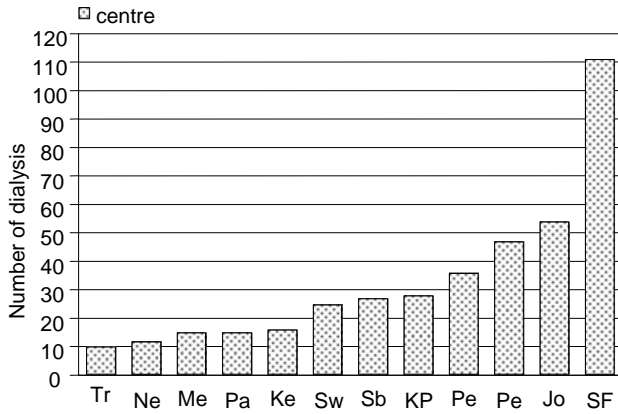


Figure 2.2.2(b): Distribution of dialysis patients by State, December 2005

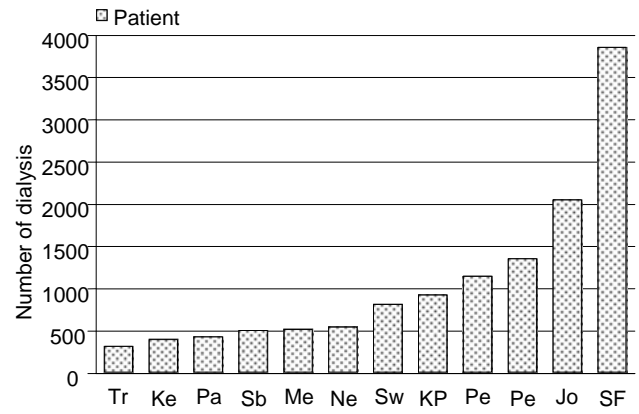


Figure 2.2.2(c): Distribution of dialysis treatment by State, December 2005

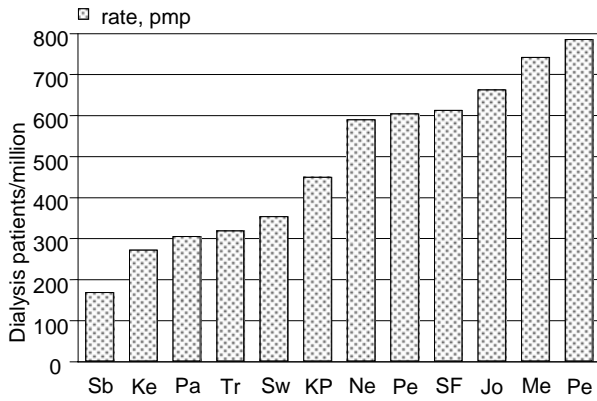
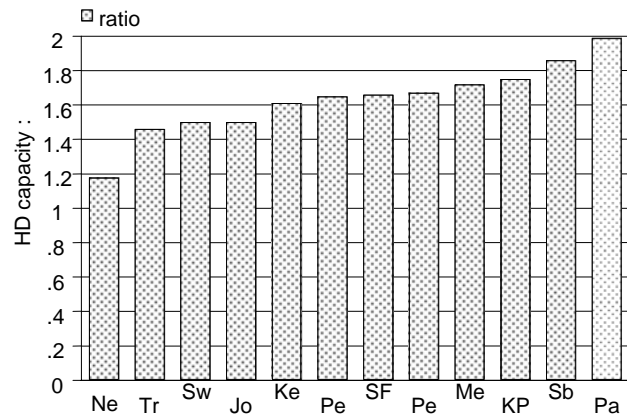


Figure 2.2.2(d): HD capacity to patient ratio by State,



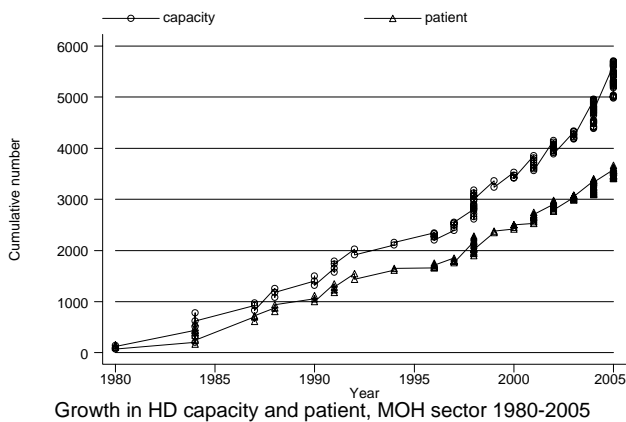
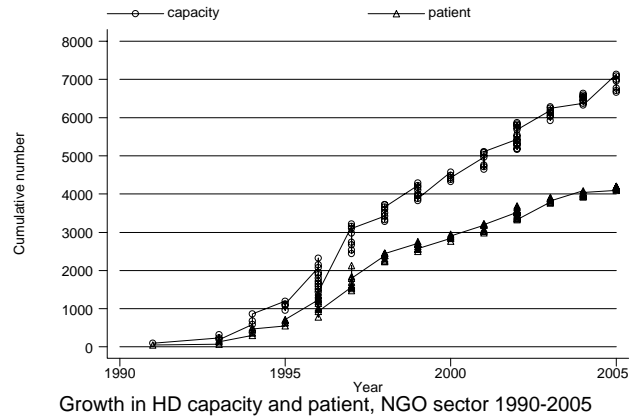
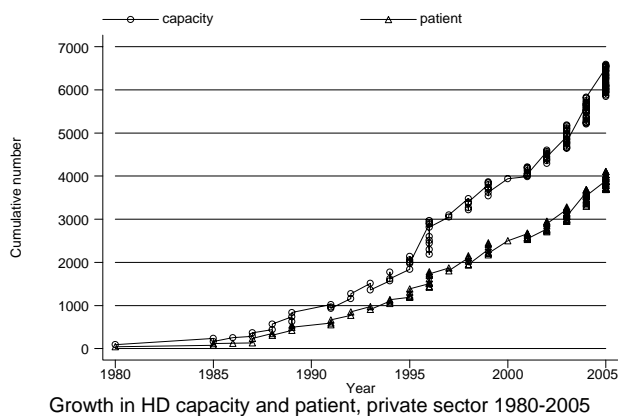
2.2.3 Growth in dialysis provision by sector

There has been a very rapid increase in the number of HD patients from 198 in 1980 to 11987 in 2005. (table 2.2.3). However as shown in figures 2.2.3, there is a divergence between HD capacity and number of dialysis patients over the years indicating that gap between HD capacity and patient intake is widening. This divergence was widest in the NGO sector.

Table 2.2.3: Growth in HD capacity and HD patients in Private, NGO and MOH sectors, 1980-2005

Sector	Private		NGO		MOH	
	Cumulative HD capacity	Cumulative HD patients	Cumulative HD capacity	Cumulative HD patients	Cumulative HD capacity	Cumulative HD patients
1980	95	43	-	-	145	155
1985	235	119	-	-	975	724
1990	1020	666	95	50	1500	1118
1995	2140	1383	1200	716	2345	1758
2000	3940	2497	4575	2953	3525	2505
2005	6585	4112	7135	4207	5710	3668

Figure 2.2.3: Growth in HD capacity and HD patients in Private, NGO and MOH sectors, 1980-2005



2.3: DISTRIBUTION OF DIALYSIS TREATMENT

2.3.1 Gender distribution

The treatment gap between men and women accepted for dialysis 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. However, figure 2.3.1(b) shows a convergence in the proportion of prevalent male and female patients. This is probably because of the survival advantage in female patients.

Table 2.3.1(a): Dialysis Treatment Rate by Gender, per million male or female population 1996– 2005

Gender	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Male	51	63	62	81	92	97	110	122	125	118
Female	45	50	57	61	73	88	94	95	106	95

Figure 2.3.1 (a): Dialysis Treatment by Gender 1996 – 2005

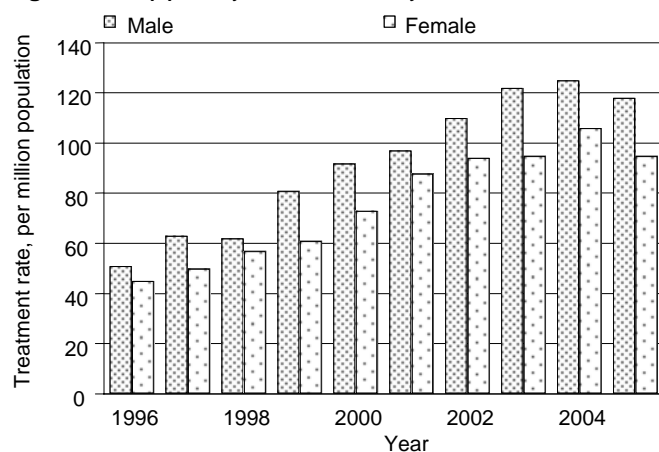
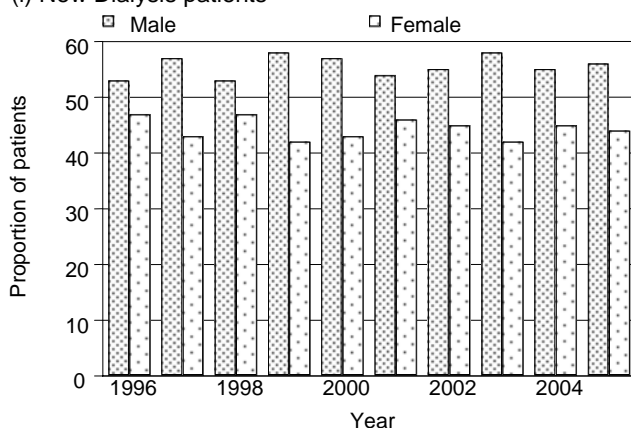


Table 2.3.1(b): Gender distribution of Dialysis Patients 1996-2005

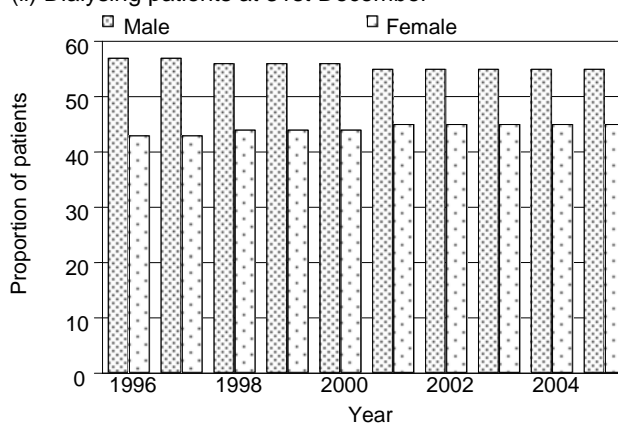
Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
New Dialysis patients	952	1135	1250	1543	1835	2078	2333	2573	2774	2636
% Male	53	57	53	58	57	54	55	58	55	56
% Female	47	43	47	42	43	46	45	42	45	44
Dialysing at 31st December	2922	3699	4540	5540	6693	7832	9093	10384	11767	12974
% Male	57	57	56	56	56	55	55	55	55	55
% Female	43	43	44	44	44	45	45	45	45	45

Figure 2.3.1(b): Gender Distribution of Dialysis patients 1996 – 2005

(i) New Dialysis patients



(ii) Dialysing patients at 31st December



2.3.2 Age distribution

Except for the age group 65 years and older which continued to register increase in treatment rates, dialysis treatment rates in the other age groups 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. The treatment rate for patients 65 years and older had exceeded 600 per million in 2004. 52% 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 1996 – 2005

Age groups (years)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
1-14	3	3	3	3	4	4	5	4	5	5
15-24	13	15	15	16	18	22	28	25	27	27
25-34	38	39	40	42	46	47	55	51	50	48
35-44	68	80	81	85	98	102	101	101	111	93
45-54	154	166	174	225	248	250	272	276	297	257
55-64	227	290	311	370	430	508	532	583	575	544
>=65	172	213	228	300	347	434	495	575	628	565

Figure 2.3.2(a): Dialysis Treatment Rate by Age Group 1996 - 2005

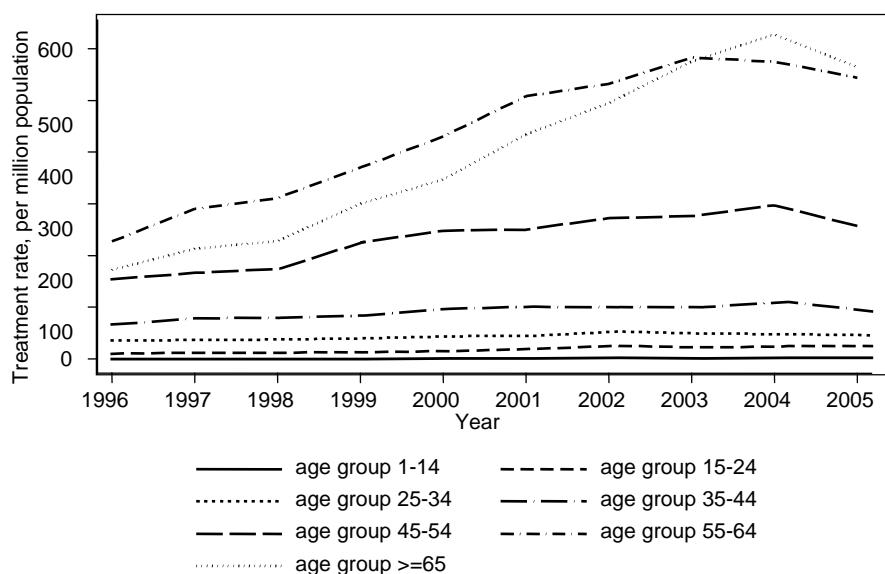
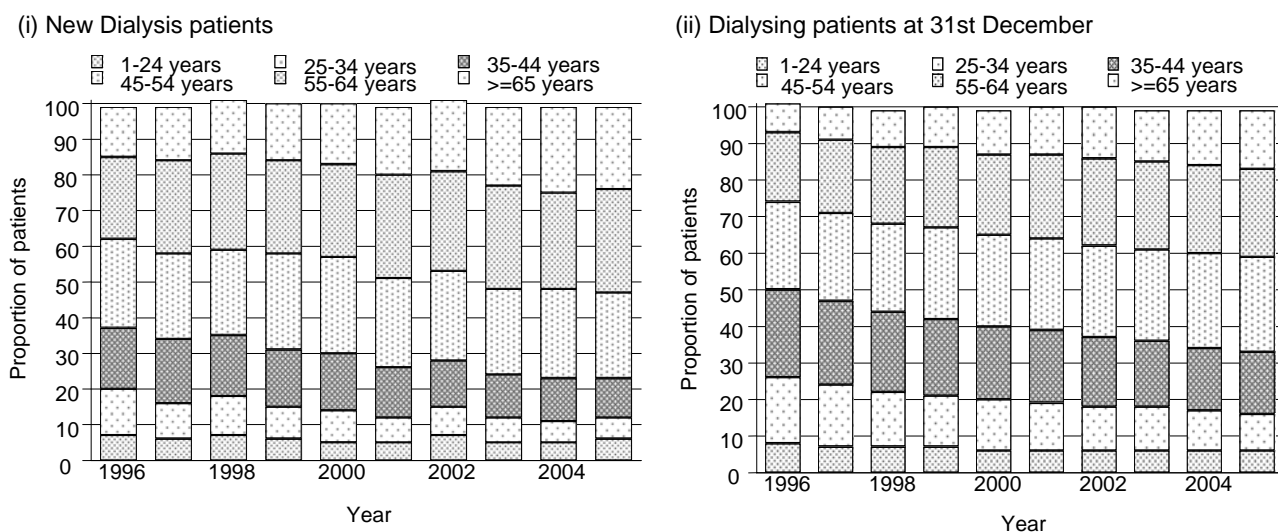


Table 2.3.2(b): Percentage Age Distribution of Dialysis Patients 1996 – 2005

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
New Dialysis patients	952	1135	1250	1543	1835	2078	2333	2573	2774	2636
% 1-14 years	2	1	2	2	1	1	2	1	1	2
% 15-24 years	5	5	5	4	4	4	5	4	4	4
% 25-34 years	13	10	11	9	9	7	8	7	6	6
% 35-44 years	17	18	17	16	16	14	13	12	12	11
% 45-54 years	25	24	24	27	27	25	25	24	25	24
% 55-64 years	23	26	27	26	26	29	28	29	27	29
% >=65 years	14	15	15	16	17	19	20	22	24	23
Dialysing at 31st December	2922	3699	4540	5540	6693	7832	9093	10384	11767	12974
% 1-14 years	2	2	2	2	1	1	1	1	1	1
% 15-24 years	6	5	5	5	5	5	5	5	5	5
% 25-34 years	18	17	15	14	14	13	12	12	11	10
% 35-44 years	24	23	22	21	20	20	19	18	17	17
% 45-54 years	24	24	24	25	25	25	25	25	26	26
% 55-64 years	19	20	21	22	22	23	24	24	24	24
% >=65 years	8	9	10	11	12	13	14	14	15	16

Figure 2.3.2(b): Age Distribution of New Dialysis patients 1996 – 2005



2.3.3 Method and Location of dialysis

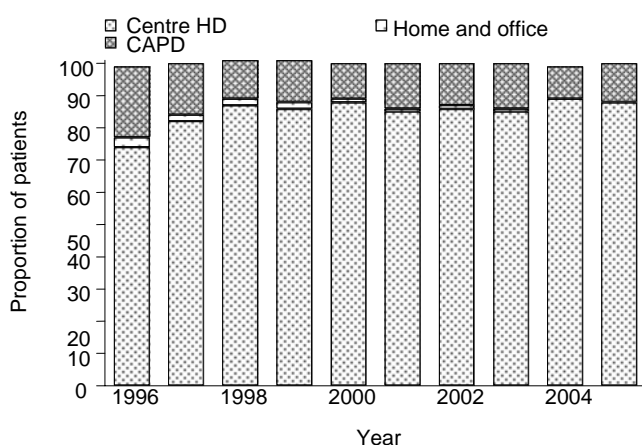
88% of new patients were accepted into centre haemodialysis in 2005. The year 2004 finally saw the demise of home/office HD - a programme introduced at a time when dialysis treatment was not easily available. Chronic PD accounted for about 12% of new dialysis patients but only 9% of prevalent dialysis patients in 2005. (table & fig 2.3.5)

Table 2.3.3: Method and Location of Dialysis 1996 – 2005

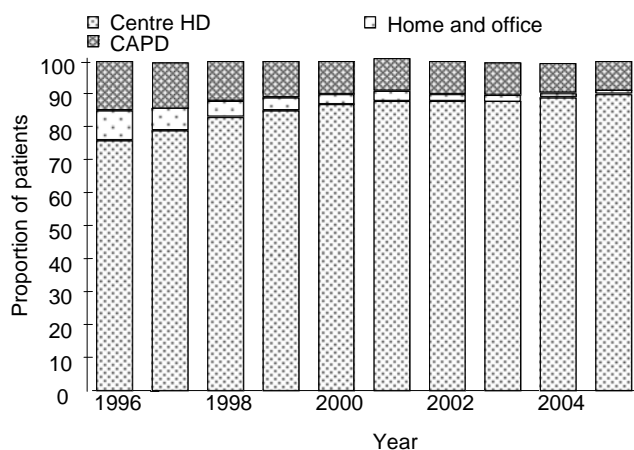
Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
New Dialysis patients	952	1135	1250	1543	1835	2078	2333	2573	2774	2636
% Centre HD	74	82	87	86	88	85	86	85	89	88
% Home and office HD	3	2	2	2	1	1	1	1	0	0
% CAPD	22	16	12	13	11	14	13	14	10	12
Dialysing at 31st December	2922	3699	4540	5540	6693	7832	9093	10384	11767	12974
% Centre HD	76	79	83	85	87	88	88	88	89	90
% Home and office HD	9	7	5	4	3	3	2	2	1	1
% CAPD	15	14	12	11	10	10	10	10	9	9

Figure 2.3.3: Method and Location of Dialysis Patients 1996 – 2005

(a) New Dialysis patients



(b) Dialysing patients at 31st December



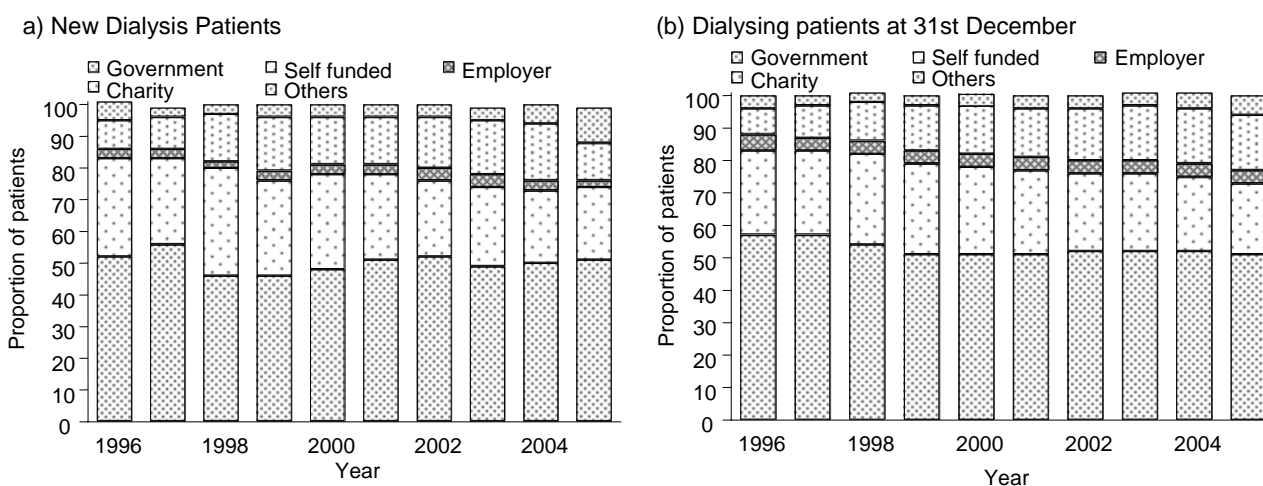
2.3.4 Funding for Dialysis Treatment

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 23% in the last 3 years. The proportion of patients funded by charity organizations appeared to have decreased in 2005 to 12% from an average of 16% since 2000. (table & fig 2.3.4)

Table 2.3.4: Funding for Dialysis Treatment 1996 – 2005

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
New Dialysis patients	952	1135	1250	1543	1835	2078	2333	2573	2774	2636
% by Government	52	56	46	46	48	51	52	49	50	51
% self funded	31	27	34	30	30	27	24	25	23	23
% subsidized by Employer	3	3	2	3	3	3	4	4	3	2
% by Charity	9	10	15	17	15	15	16	17	18	12
% Others	6	3	3	4	4	4	4	4	6	11
Dialysing at 31st December	2922	3699	4540	5540	6693	7832	9093	10384	11767	12974
% by Government	57	57	54	51	51	51	52	52	52	51
% self funded	26	26	28	28	27	26	24	24	23	22
% subsidized by Employer	5	4	4	4	4	4	4	4	4	4
% by Charity	8	10	12	14	15	15	16	17	17	17
% Others	4	3	3	3	4	4	4	4	5	6

Figure 2.3.4: Funding for Dialysis Treatment 1996 – 2005



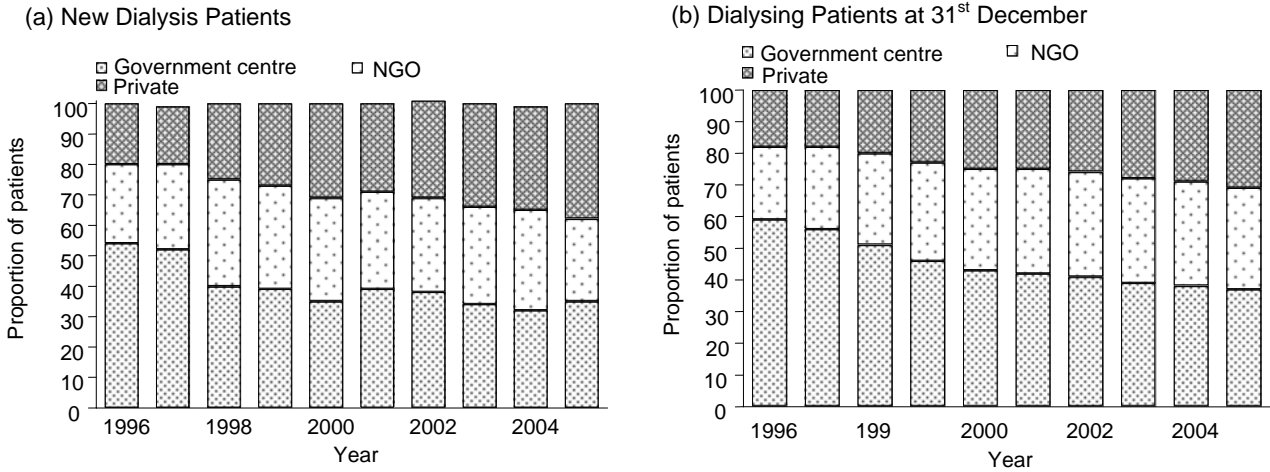
2.3.5 Distribution of dialysis patients by sector

The proportion of new patients dialysed in private centres continued to increase. The proportion of new patients admitted to NGO centres in 2005 at 27% was the lowest in the last few years while the proportion dialysing in government centres increased to 35%. Over the last few years, because of a ministry of health (MOH) policy that all MOH hospitals will have a haemodialysis unit, this resulted in an increase intake into MOH centres and hence a reduction in the number of new dialysis patients referred for dialysis in NGO centres. This situation may change once these new MOH centres are filled.

Table 2.3.5: Distribution of Dialysis Patients by Sector 1996 – 2005

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
New Dialysis patients	952	1135	1250	1543	1835	2078	2333	2573	2774	2636
% Government centre	54	52	40	39	35	39	38	34	32	35
% NGO centre	26	28	35	34	34	32	31	32	33	27
% Private centre	20	19	25	27	31	29	32	34	34	38
Dialysing at 31st December	2922	3699	4540	5540	6693	7832	9093	10384	11767	12974
% Government centre	59	56	51	46	43	42	41	39	38	37
% NGO centre	23	26	29	31	32	33	33	33	33	32
% Private centre	18	18	20	23	25	25	26	28	29	31

Figure 2.3.5: Distribution of Dialysis Patients by Sector 1996 – 2005



2.4: PRIMARY RENAL DISEASE

Diabetes mellitus continues to be the commonest cause of ESRD. Malaysia has the dubious honour of being the country with the highest percentage of diabetes mellitus in incident dialysis patients. However, for the first time in the last 10 years, the proportion of new dialysis patients with diabetes mellitus showed a decline rather than a rise although 52% of new ESRD was due to diabetes mellitus. Hypertension was the second commonest cause of ESRD at about 7%. The proportion of patients with unknown primary renal disease was still very high at 20% in 2005. Only 4% of ESRD was attributable to chronic glomerulonephritis (GN), 1% to systemic lupus erythematosus(SLE).

Table 2.4.1: Primary Renal Disease 1996– 2005

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
New Dialysis patients	952	1135	1250	1543	1835	2078	2333	2573	2774	2636
% Unknown cause	37	33	32	29	28	30	30	28	28	30
% Diabetes Mellitus	30	36	41	41	45	46	50	53	54	52
% GN	13	13	10	10	9	6	6	5	4	4
% SLE	2	1	1	2	2	1	1	1	1	1
% Polycystic kidney	2	2	1	1	1	2	1	1	1	1
% Obstructive Nephropathy	6	5	5	4	3	3	3	3	2	2
% Toxic Nephropathy	1	0	0	1	0	1	0	0	0	0
% Hypertension	9	9	8	11	11	9	7	7	7	7
% Others	2	1	1	1	1	1	1	1	1	1

Figure 2.4.1: Primary Renal Disease for New Dialysis Patients 1996– 2005

