

Chapter - 2

DIALYSIS IN MALAYSIA

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SECTION 2.1: PROVISION OF DIALYSIS IN MALAYSIA (Registry report)

2.1.1: Dialysis treatment provision

In 2013, 5491 new haemodialysis (HD) cases were reported representing an acceptance rate of 185 per million population (pmp) (Tables 2.1.1a & c), while new peritoneal dialysis cases totaled 731, representing an acceptance rate of 25 pmp (Tables 2.1.1b & d). The total number of HD and PD patients in 2013 increased to 28,822 and 2815 respectively, giving a prevalence rate of 970 pmp and 95 pmp respectively (Tables 2.1.1a-d). Over the last 10 years, both the acceptance and prevalence rate had increased by almost two-fold (Tables 2.1.1c & d).

(Data for 2013 were preliminary since at the time of writing this report there was still many new patients yet to be notified to the registry.)

Table 2.1.1(a): Stock and flow-HD Patients 2004-2013

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
New haemodialysis patients	2610	2839	3284	3554	4035	4372	4715	5394	5789	5491
Died	1166	1333	1643	1756	1914	2279	2692	2915	3201	3014
Transplanted	146	100	96	72	90	96	87	87	64	54
Lost to Follow-up	12	13	35	15	10	25	39	64	61	116
Dialysing at 31 st December	10718	12181	13761	15532	17634	19698	21703	24098	26525	28822

Table 2.1.1(b): Stock and flow-Chronic PD Patients 2004-2013

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
New PD patients	291	316	397	516	569	548	537	615	752	731
Died	156	182	177	231	277	321	353	372	397	423
Transplanted	13	22	25	18	21	15	12	17	14	17
Lost to Follow-up	1	4	3	5	3	4	6	3	0	6
Dialysing at 31 st December	1124	1174	1317	1549	1750	1886	1989	2174	2546	2815

Table 2.1.1(c): Haemodialysis Treatment Rate per million population 2004-2013

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Acceptance rate	101	107	122	131	147	157	167	189	197	185
Prevalence rate	414	460	513	571	640	706	768	844	904	970

Table 2.1.1(d): Chronic PD Treatment Rate per million population 2004-2013

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Acceptance rate	11	12	15	19	21	20	19	22	26	25
Prevalence rate	43	44	49	57	64	68	70	76	87	95

2.1.2: Geographic distribution

The dialysis treatment rate exceeded 100 per million population for all states in Malaysia in 2013 with the lowest rate in Perlis. Those with dialysis treatment rate of more than 240 pmp were mostly from economically more advantaged states in the west coast of Peninsula Malaysia with the exception of Terengganu (which is in East Coast) (Table 2.1.2).

Table 2.1.2: Dialysis Treatment Rate by state, per million population 2004-2013

State	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Pulau Pinang	211	196	212	216	200	248	265	303	323	303
Melaka	206	167	197	207	231	227	258	314	271	291
Johor	155	167	214	199	255	249	240	307	297	289
Perak	148	168	187	181	205	222	241	258	281	257
Selangor & Putrajaya	123	136	155	173	182	207	230	265	266	241
WP Kuala Lumpur	202	191	212	245	258	281	309	290	323	326
Negeri Sembilan	155	157	151	218	251	270	279	299	309	274
Kedah	98	111	119	134	173	161	160	209	233	230
Perlis	94	102	127	130	141	127	142	169	163	104
Terengganu	81	105	107	179	148	157	197	196	248	255
Pahang	75	90	124	119	145	142	179	182	249	191
Kelantan	65	78	78	94	85	112	99	124	163	130
Sarawak	73	72	86	106	118	123	118	130	134	159
Sabah & WP Labuan	47	45	61	68	96	94	94	104	108	106

2.1.3: Gender distribution

The treatment gap between men and women accepted for dialysis had remained consistent over the years. Over last 10 years, the ratio of male to female incident and prevalent dialysis patients had remained the same at about 55 to 45% (Table 2.1.3b).

Table 2.1.3(a): Dialysis Treatment Rate by Gender, per million male or female population 2004-2013

Gender	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Male	128	139	156	171	193	205	216	242	257	242
Female	110	111	133	144	159	169	181	207	216	207

Figure 2.1.3(a): Dialysis Treatment Rate by Gender 2004-2013

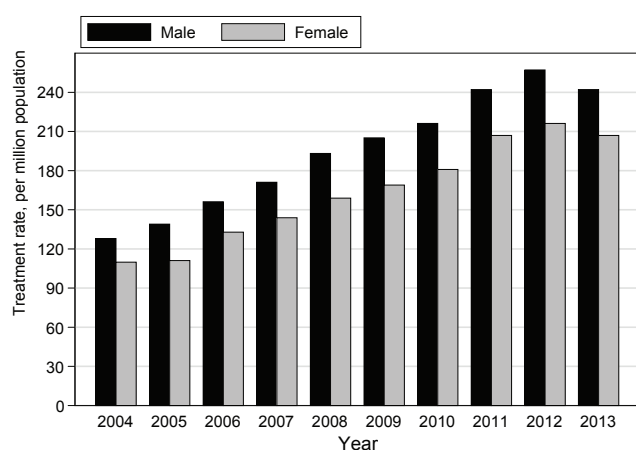
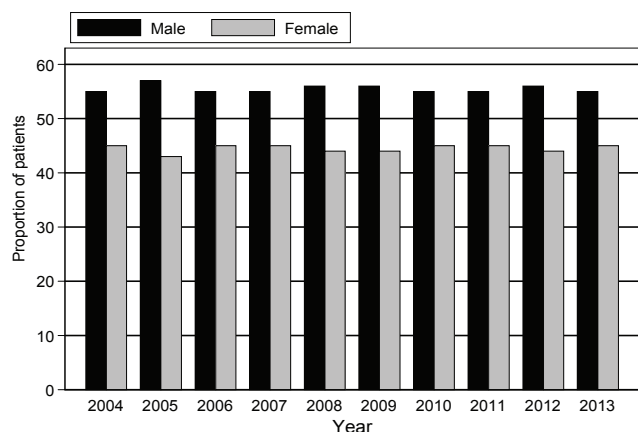
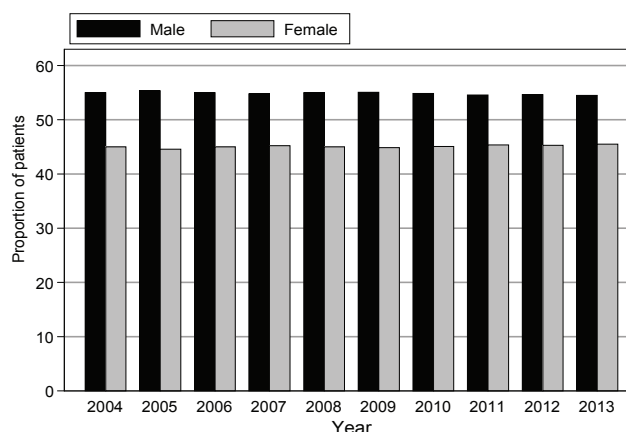


Table 2.1.3(b): Gender Distribution of Dialysis Patients 2004-2013

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
New Dialysis patients	2901	3155	3681	4070	4604	4920	5252	6009	6541	6222
% Male	55	57	55	55	56	56	55	55	56	55
% Female	45	43	45	45	44	44	45	45	44	45
Dialysing at 31 st December	11842	13355	15078	17081	19384	21584	23692	26272	29071	31637
% Male	55	55.4	55	54.8	55	55.1	54.9	54.6	54.7	54.5
% Female	45	44.6	45	45.2	45	44.9	45.1	45.4	45.3	45.5

Figure 2.1.3(b): Gender Distribution of Dialysis Patients 2004-2013

(i) New Dialysis patients

(ii) Dialysing patients at 31st December**2.1.4: Age distribution**

New dialysis treatment rates in the age-groups younger than 55 years have remained relatively unchanged in the last few years, suggesting that almost all patients with ESRD who required dialysis treatment in these age groups had access to therapy. The treatment rate for patients 65 years and older have continued to show progressive increase up to 1191 per million age related population in 2011 before showing a gradual decrease in the subsequent 2 years (Table 2.1.4a). Interestingly 57% of new dialysis patients were 55 years or older at the onset of dialysis

Table 2.1.4(a): Dialysis Treatment Rate by Age Group, per million age group population 2004-2013

Age groups (years)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
≤14	5	6	5	6	6	8	8	7	6	6
15-24	27	30	32	32	30	35	35	33	33	38
25-34	47	51	60	60	70	71	71	84	82	78
35-44	109	104	131	119	146	134	134	154	184	179
45-54	300	290	452	352	393	400	400	463	522	468
55-64	579	641	663	759	759	813	813	940	1038	979
≥ 65	659	673	815	853	975	1032	1032	1191	1175	1053

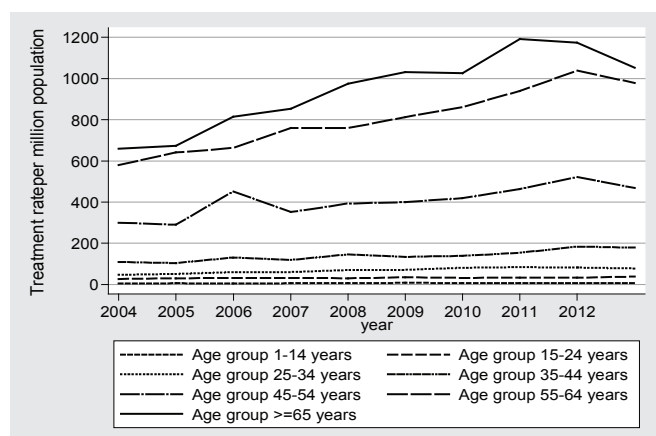
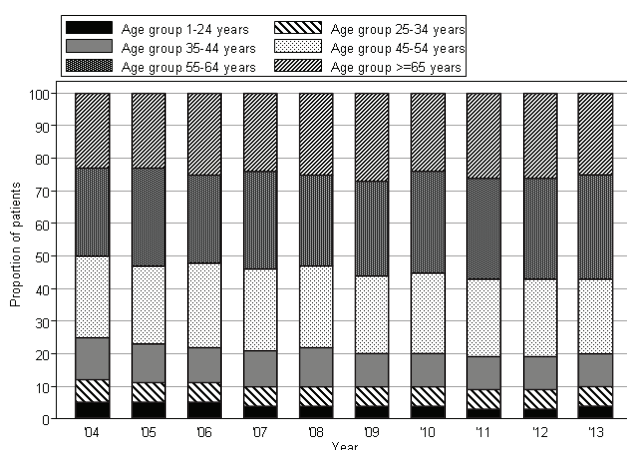
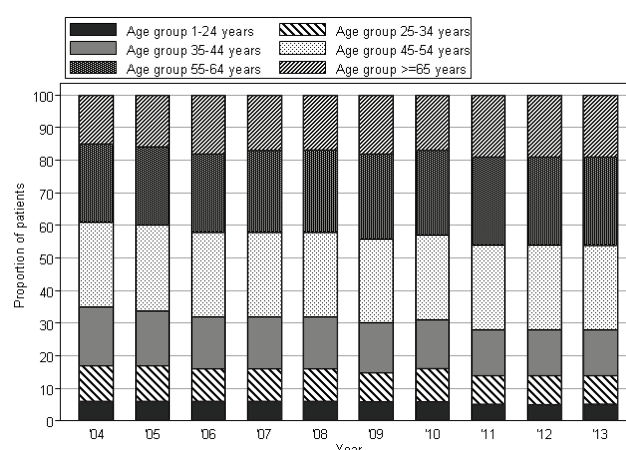
Figure 2.1.4(a): Dialysis Treatment Rate by Age Group 2004-2013

Table 2.1.4(b): Percentage Age Distribution of Dialysis Patients 2004-2013

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
New Dialysis patients	2901	3155	3681	4070	4604	4920	5252	6009	6541	6222
% 1-14 years	1	1	1	1	1	1	1	1	1	1
% 15-24 years	4	4	4	3	3	3	3	2	2	3
% 25-34 years	7	6	6	6	6	6	6	6	6	6
% 35-44 years	13	12	11	11	12	10	10	10	10	10
% 45-54 years	25	24	26	25	25	24	25	24	24	23
% 55-64 years	27	30	27	30	28	29	31	31	31	32
% >=65 years	23	23	25	24	25	27	24	26	26	25
Dialysing at 31 st December	11842	13355	15078	17081	19384	21584	23692	26272	29071	31637
% 1-14 years	1	1	1	1	1	1	1	1	1	1
% 15-24 years	5	5	5	5	5	5	5	4	4	4
% 25-34 years	11	11	10	10	10	9	10	9	9	9
% 35-44 years	18	17	16	16	16	15	15	14	14	14
% 45-54 years	26	26	26	26	26	26	26	26	26	26
% 55-64 years	24	24	24	25	25	26	26	27	27	27
% >=65 years	15	16	18	17	17	18	17	19	19	19

Figure 2.1.4(b): Age Distribution of New Dialysis Patients 2004-2013

(i) New Dialysis Patients

(ii) Dialysing patients at 31st December

2.1.5: Method and location of dialysis

Eighty to 90% of all new dialysis patients were accepted into centre haemodialysis program over the last 10 years while the proportion of new patients accepted into chronic PD program had remained static at about 10-12%. PD only accounted for 10% of all prevalent dialysis patients. This was due to a small number of PD patients in the private sector and none in the NGO sector. There were still a handful of new patients accepted into home and office HD programme (Table & Figure 2.1.5).

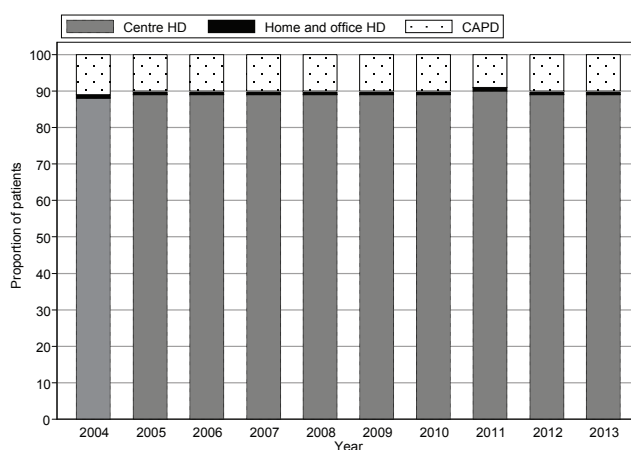
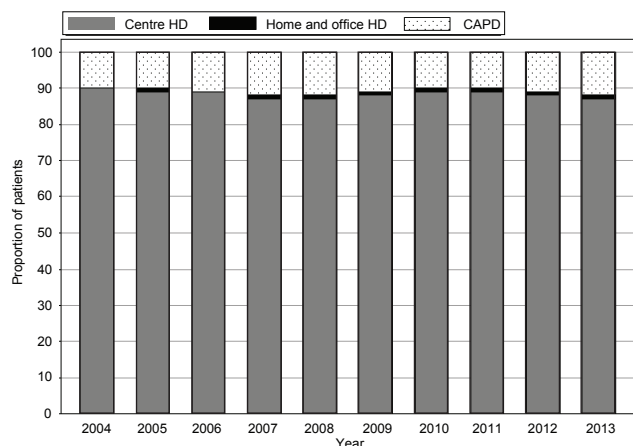
Table 2.1.5: Dialysis Treatment Rate by Age Group, per million age group population 2004-2013

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
New Dialysis patients	2901	3155	3681	4070	4604	4920	5252	6009	6541	6222
% Centre HD	90	89	89	87	87	88	89	89	88	87
% Home and office HD	0	1	0	1	1	1	1	1	1	1
% PD	10	10	11	12	12	11	10	10	11	12
Dialysing at 31 st December	12516	14010	16129	18105	20473	23235	25243	27934	27999	33885
% Centre HD	88	89	89	89	89	89	89	90	89	89
% Home and office HD	1	1	1	1	1	1	1	1	1	1
% PD	11	10	10	10	10	10	10	9	10	10

Figure 2.1.5: Method and Location of Dialysis Patients 2004-2013

(i) New Dialysis patients

(ii) Dialysing patients at 31st December



2.1.6: Funding for dialysis treatment

The government continued to be the main source of funding for dialysis therapy for new and existing patients. These funds were channeled not only to the government dialysis centres but also as subsidies to NGO centres and payment of dialysis treatment for public pensioners, civil servants, and their dependents in private centres. Out of pocket payment i.e. self-funding for dialysis, was about 26 to 30%. Funding from NGO bodies had remained at 11-13% over the years (Table & Figure 2.1.6).

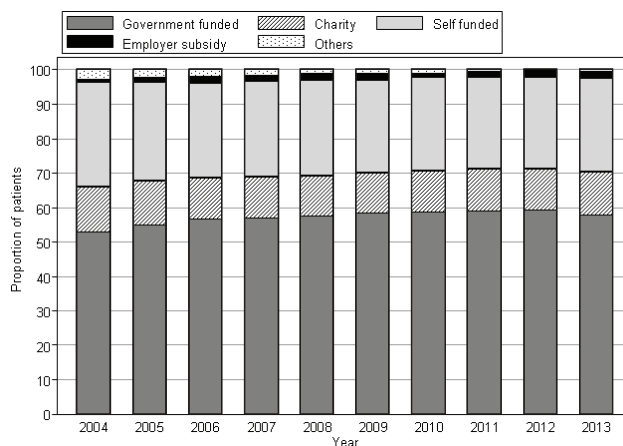
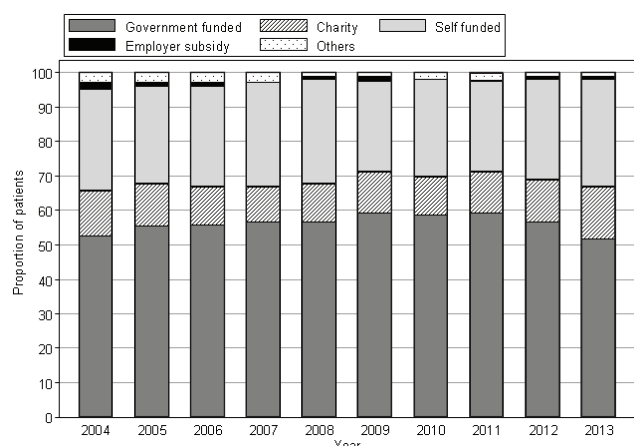
Table 2.1.6: Funding for Dialysis Treatment 2004-2013

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
New Dialysis patients	2879	3140	3669	4049	4585	4884	5190	5984	6463	6139
% by Government	53	56	56	57	57	60	59	60	57	52
% by Charity	13	12	11	10	11	12	11	12	12	15
% self funded	29	28	29	30	30	26	28	26	29	31
% subsidized by Employer	2	1	1	0	1	1	0	0	1	1
% Others	3	3	3	3	1	1	2	2	1	1
Dialysing at 31 st December	12516	14010	16129	18105	20473	23235	25243	27934	27999	33885
% by Government	53.4	55.3	57.1	57.4	58.1	58.9	59.3	59.6	59.7	58.2
% by Charity	12.9	12.9	11.9	11.8	11.5	11.6	11.7	12	12	12.7
% self funded	30.1	28.3	27.4	27.6	27.6	26.8	26.7	26.2	26.4	27
% subsidized by Employer	1	1.2	1.7	1.6	1.7	1.7	1.4	1.6	1.7	1.7
% Others	2.6	2.3	1.9	1.6	1.1	1.0	0.9	0.6	0.2	0.4

Figure 2.1.6: Funding for Dialysis Treatment 2004-2013

(i) New Dialysis patients

(ii) Dialysing patients at 31st December



2.1.7: Distribution of dialysis patients by sector

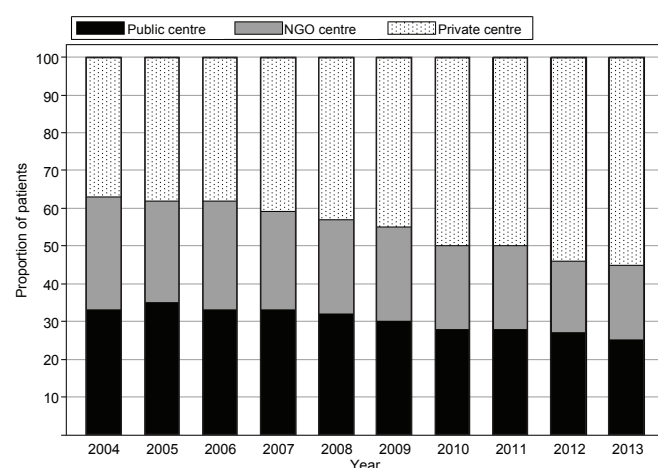
The proportion of new dialysis patients accepted into private dialysis centres continue to increase while that in MOH and NGO centres declined over the years. Since 2008 the private sector was the largest provider of dialysis. In 2013, the private sector provided dialysis to 55% of new patients and 47% of prevalent patients.

Table 2.1.7: Distribution of Dialysis Patients by Sector 2004-2013

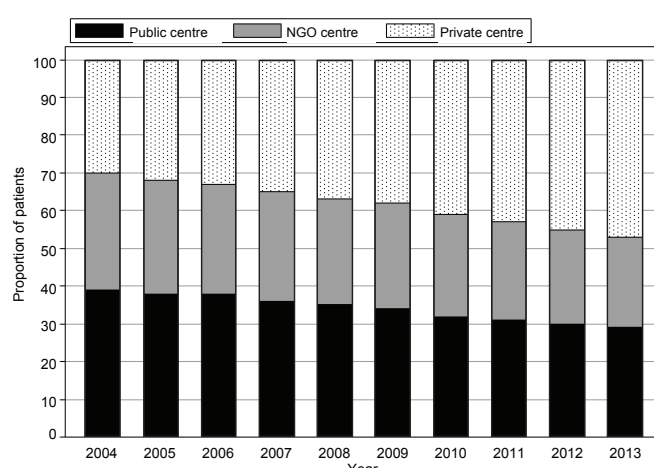
Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
New Dialysis patients	2900	3152	3677	4069	4604	4918	5249	6002	6541	6210
% Government centre	33	35	33	33	32	30	28	28	27	25
% NGO centre	30	27	29	26	25	25	22	22	19	20
% Private centre	37	38	38	41	43	45	50	50	54	55
Dialysing at 31 st December	11842	13355	15078	17081	19384	21584	23692	26272	29071	31637
% Government centre	39	38	38	36	35	34	32	31	30	29
% NGO centre	31	30	29	29	28	28	27	26	25	24
% Private centre	30	32	33	35	37	38	41	43	45	47

Figure 2.1.7: Distribution of Dialysis Patients by Sector 2004-2013

(i) New Dialysis patients



(ii) Dialysing patients at 31st December

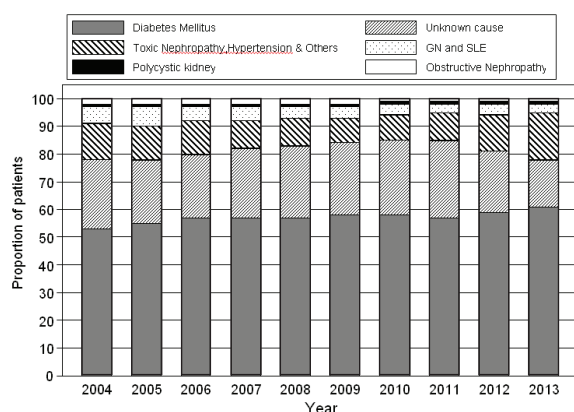


2.1.8: Primary renal disease

Diabetes mellitus accounted for more than half of the primary renal disease in new dialysis patients for the last 10 years. In 2013, 61% of new patients had diabetes mellitus as the primary renal disease. Hypertension was the primary renal disease in 16% of new patients. Glomerulonephritis and SLE were reported as the primary renal disease in only 3% of new patients. Although the percentage of patients with unknown primary renal disease remains high at 17%, the last two years showed an encouraging decreasing trend.

Table 2.1.8: Primary Renal Diseases 2004-2013

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
New Dialysis patients	2901	3155	3681	4070	4604	4920	5252	6009	6541	6222
% Unknown cause	25	23	23	25	26	26	27	28	22	17
% Diabetes Mellitus	53	55	57	57	57	58	58	57	59	61
% GN/SLE	6	7	5	5	4	4	4	3	4	3
% Polycystic kidney	1	1	1	1	1	1	1	1	1	1
% Obstructive Nephropathy	2	2	2	2	2	2	1	1	1	1
% Toxic Nephropathy	0	0	0	0	0	0	0	0	0	0
% Hypertension	10	9	9	9	9	9	9	8	12	16
% Others	3	3	3	1	1	0	0	2	1	1

Figure 2.1.8: Primary Renal Diseases for New Dialysis Patients 2004-2013

SECTION 2.2: DIALYSIS PROVISION IN MALAYSIA (Centre survey report)

Dialysis centre surveys had 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 for both haemodialysis and peritoneal dialysis at the end of each year. This section reported the results of the centre survey carried out in December 2013. This survey also collected data on available manpower in the dialysis centres. Dialysis provision was expressed in terms of number of centres, HD machines, treatment capacity (one HD machine to 5 patients) and number of patients.

2.2.1: Growth in dialysis in Malaysia by state and sector

The number of dialysis centres for the whole of Malaysia increased from 340 in 2004 to 521 in 2008 and 697 in 2013 giving a rate of 13 pmp in 2004 and 29 pmp in 2013. The increase in dialysis centres was mainly contributed by the private dialysis centres which had tripled from 5 pmp in 2004 to 15 pmp in 2013. NGO centres had increased from 4 pmp in 2004 to 6 pmp in 2013. In contrast, the rate of growth was lowest in the public sector increasing from 5 pmp in 2004 to 7 pmp in 2013. Most of the increases in the private dialysis centres occurred in the more economically developed west coast states of Malaysian Peninsula. Public sectors still provides most of the dialysis centres in the economically disadvantage states (Table & Figures 2.2.1).

Table 2.2.1: Number and density of Dialysis Centres in Malaysia by State and Sector, Year 2004 to 2013

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
Malaysia	Public	132	5	177	6	179	6
	Private	117	5	219	8	375	13
	NGO	91	4	125	5	143	5
	Total	340	13	521	19	697	24
Perlis	Public	1	4	1	4	1	4
	Private	-	-	-	-	2	8
	NGO	-	-	1	4	1	4
	Total	1	4	2	9	4	17
Kedah	Public	10	6	11	6	10	5
	Private	10	6	17	9	31	15
	NGO	4	2	6	3	7	3
	Total	24	13	34	18	48	24
Kedah & Perlis	Public	11	5	12	6	11	5
	Private	10	5	17	8	33	15
	NGO	4	2	7	3	8	4
	Total	25	12	36	17	52	23
Pulau Pinang	Public	8	5	10	6	9	6
	Private	11	7	17	11	35	21
	NGO	14	10	19	12	22	14
	Total	33	22	46	29	66	41
Perak	Public	14	6	19	8	18	7
	Private	13	6	23	10	37	15
	NGO	11	5	12	5	13	5
	Total	38	17	54	23	68	28
Selangor & WP Putrajaya	Public	12	3	19	4	18	3
	Private	22	5	56	11	102	18
	NGO	16	3	22	4	26	5
	Total	50	11	97	20	146	26

Table 2.2.1: Number and density of Dialysis Centres in Malaysia by State and Sector, Year 2004 to 2013

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
WP Kuala Lumpur	Public	14	9	14	8	11	6
	Private	20	13	20	12	31	18
	NGO	9	6	14	8	15	9
	Total	43	27	48	29	57	33
Selangor & WP Putrajaya & WP KL	Public	26	4	33	5	29	4
	Private	42	7	76	11	133	18
	NGO	25	4	36	5	41	5
	Total	93	15	145	22	203	27
Negeri Sembilan	Public	6	6	8	8	10	9
	Private	3	3	10	10	19	18
	NGO	4	4	5	5	8	7
	Total	13	14	23	23	37	35
Melaka	Public	3	4	4	5	5	6
	Private	7	10	15	20	17	20
	NGO	3	4	4	5	5	6
	Total	13	18	23	31	27	32
Johor	Public	16	5	16	5	16	5
	Private	17	6	35	11	52	15
	NGO	18	6	23	7	22	6
	Total	51	17	74	23	90	26
Pahang	Public	8	6	13	9	14	9
	Private	3	2	6	4	16	10
	NGO	3	2	5	3	5	3
	Total	14	10	24	16	35	22
Terengganu	Public	6	6	6	6	8	7
	Private	2	2	3	3	5	4
	NGO	1	1	2	2	3	3
	Total	9	9	11	11	16	14
Kelantan	Public	11	7	13	8	12	7
	Private	3	2	6	4	9	5
	NGO	1	1	2	1	3	2
	Total	15	10	21	13	24	14
Sabah & WP Labuan	Public	13	4	22	7	24	7
	Private	2	1	5	2	7	2
	NGO	4	1	5	2	5	1
	Total	19	6	32	10	36	11
Sarawak	Public	10	4	21	9	23	9
	Private	4	2	6	2	12	5
	NGO	3	1	5	2	8	3
	Total	17	7	32	13	43	17

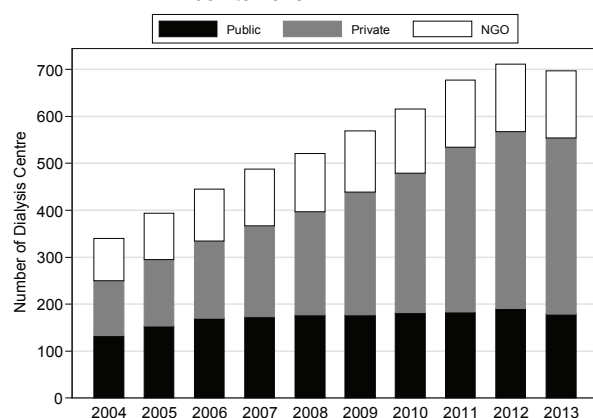
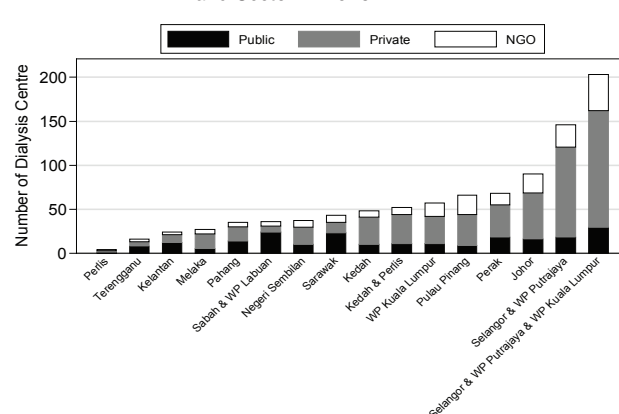
Figure 2.2.1(a): Number of Dialysis Centre in Malaysia by Sector, 2004 to 2013**Figure 2.2.1(b):** Number of Dialysis Centre in Malaysia by State and Sector in 2013

Table 2.2.2: Number and density of HD centres in Malaysia by State and Sector, 2004-2013

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
Malaysia	Public	112	4	150	5	150	5
	Private	114	4	213	8	366	12
	NGO	91	4	125	5	143	5
	Total	317	12	488	18	659	22
Perlis	Public	1	4	1	4	1	4
	Private	-	-	-	-	2	8
	NGO	-	-	1	4	1	4
	Total	1	4	2	9	4	17
Kedah	Public	10	6	10	5	9	4
	Private	10	6	17	9	31	15
	NGO	4	2	6	3	7	3
	Total	24	13	33	17	47	23
Kedah & Perlis	Public	11	5	11	5	10	4
	Private	10	5	17	8	33	15
	NGO	4	2	7	3	8	4
	Total	25	12	35	16	51	23
Pulau Pinang	Public	7	5	8	5	7	4
	Private	11	7	17	11	34	21
	NGO	14	10	19	12	22	14
	Total	32	22	44	28	63	39
Perak	Public	12	5	17	7	16	7
	Private	13	6	23	10	37	15
	NGO	11	5	12	5	13	5
	Total	36	16	52	22	66	27
Selangor & WP Putrajaya	Public	10	2	15	3	14	2
	Private	22	5	55	11	101	18
	NGO	16	3	22	4	26	5
	Total	48	10	92	19	141	25
WP Kuala Lumpur	Public	10	6	10	6	7	4
	Private	20	13	20	12	29	17
	NGO	9	6	14	8	15	9
	Total	39	25	44	26	51	29
Selangor & WP Putrajaya & WP KL	Public	20	3	25	4	21	3
	Private	42	7	75	11	130	17
	NGO	25	4	36	5	41	5
	Total	87	14	136	20	192	26

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
Negeri Sembilan	Public	5	5	6	6	8	7
	Private	3	3	10	10	19	18
	NGO	4	4	5	5	8	7
	Total	12	13	21	21	35	33
Melaka	Public	2	3	3	4	4	5
	Private	6	8	14	19	17	20
	NGO	3	4	4	5	5	6
	Total	11	16	21	28	26	31
Johor	Public	13	4	13	4	13	4
	Private	16	5	32	10	49	14
	NGO	18	6	23	7	22	6
	Total	47	15	68	21	84	24
Pahang	Public	7	5	11	7	12	8
	Private	3	2	6	4	16	10
	NGO	3	2	5	3	5	3
	Total	13	9	22	15	33	21
Terengganu	Public	5	5	5	5	6	5
	Private	2	2	3	3	5	4
	NGO	1	1	2	2	3	3
	Total	8	8	10	10	14	13
Kelantan	Public	9	6	11	7	10	6
	Private	3	2	6	4	9	5
	NGO	1	1	2	1	3	2
	Total	13	9	19	12	22	13
Sabah & WP Labuan	Public	12	4	20	6	21	6
	Private	1	0	4	1	6	2
	NGO	4	1	5	2	5	1
	Total	17	6	29	9	32	9
Sarawak	Public	9	4	20	8	22	9
	Private	4	2	6	2	11	4
	NGO	3	1	5	2	8	3
	Total	16	7	31	13	41	16

The proliferation of haemodialysis centres accounted for most of the increase in dialysis centres. PD centre rate remained at 1 pmp throughout the last 10 years while HD centres which had increased from 12 to 27 pmp over the same period. Of the 38 PD centres, 9 were private centre. There were no NGO PD centres. (Table 2.2.3).

Table 2.2.3: Number and density of PD centres in Malaysia by State and Sector, 2004-2013

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
Malaysia	Public	20	1	27	1	29	1
	Private	3	0	6	0	9	0
	NGO	-	-	-	-	-	-
	Total	23	1	33	1	38	1
Perlis	Public	-	-	-	-	-	-
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	-	-	-	-	-	-
Kedah	Public	-	-	1	1	1	0
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	-	-	1	1	1	0
Kedah & Perlis	Public	-	-	1	0	1	0
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	-	-	1	0	1	0
Pulau Pinang	Public	1	1	2	1	2	1
	Private	-	-	-	-	1	1
	NGO	-	-	-	-	-	-
	Total	1	1	2	1	3	2
Perak	Public	2	1	2	1	2	1
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	2	1	2	1	2	1
Selangor & WP Putrajaya	Public	2	0	4	1	4	1
	Private	-	-	1	0	1	0
	NGO	-	-	-	-	-	-
	Total	2	0	5	1	5	1
WP Kuala Lumpur	Public	4	3	4	2	4	2
	Private	-	-	-	-	2	1
	NGO	-	-	-	-	-	-
	Total	4	3	4	2	6	3
Selangor & WP Putrajaya & WP KL	Public	6	1	8	1	8	1
	Private	-	-	1	0	3	0
	NGO	-	-	-	-	-	-
	Total	6	1	9	1	11	1

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
Negeri Sembilan	Public	1	1	2	2	2	2
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	1	1	2	2	2	2
Melaka	Public	1	1	1	1	1	1
	Private	1	1	1	1	-	-
	NGO	-	-	-	-	-	-
	Total	2	3	2	3	1	1
Johor	Public	3	1	3	1	3	1
	Private	1	0	3	1	3	1
	NGO	-	-	-	-	-	-
	Total	4	1	6	2	6	2
Pahang	Public	1	1	2	1	2	1
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	1	1	2	1	2	1
Terengganu	Public	1	1	1	1	2	2
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	1	1	1	1	2	2
Kelantan	Public	2	1	2	1	2	1
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	2	1	2	1	2	1
Sabah & WP Labuan	Public	1	0	2	1	3	12
	Private	1	0	1	0	1	4
	NGO	-	-	-	-	-	-
	Total	2	1	3	1	4	16
Sarawak	Public	1	0	1	0	1	2
	Private	-	-	-	-	1	2
	NGO	-	-	-	-	-	-
	Total	1	0	1	0	2	3

Table 2.2.4: Number and density of HD machines in Malaysia by State and Sector, 2004-2013

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
Malaysia	Public	1012	39	1452	53	1714	58
	Private	1183	46	2046	74	3897	132
	NGO	1376	53	1887	69	2311	78
	Total	3571	138	5385	196	7922	268
Perlis	Public	25	112	21	90	25	104
	Private	-	-	-	-	14	58
	NGO	-	-	15	64	17	70
	Total	25	112	36	154	56	232
Kedah	Public	73	40	87	45	110	54
	Private	84	46	138	72	255	126
	NGO	56	31	84	44	105	52
	Total	213	118	309	161	470	233
Kedah & Perlis	Public	98	48	108	50	135	60
	Private	84	41	138	64	269	119
	NGO	56	28	99	46	122	54
	Total	238	117	345	160	526	232
Pulau Pinang	Public	63	43	73	47	66	41
	Private	165	112	228	146	375	230
	NGO	142	97	223	143	279	171
	Total	370	252	524	335	720	442
Perak	Public	110	50	145	61	162	66
	Private	155	70	242	101	478	196
	NGO	158	72	196	82	206	85
	Total	423	192	583	243	846	347
Selangor & WP Putrajaya	Public	119	26	215	43	159	28
	Private	217	47	517	104	1057	185
	NGO	265	57	355	72	415	72
	Total	601	130	1087	219	1631	285
WP Kuala Lumpur	Public	97	61	129	77	87	50
	Private	214	135	254	151	316	182
	NGO	127	80	224	133	232	134
	Total	438	277	607	361	635	367
Selangor & WP Putrajaya & WP KL	Public	216	35	344	52	246	33
	Private	431	69	771	116	1373	184
	NGO	392	63	579	87	647	87
	Total	1039	167	1694	255	2266	304

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
Negeri Sembilan	Public	43	46	50	51	70	65
	Private	22	23	66	67	136	127
	NGO	75	80	113	114	164	153
	Total	140	149	229	232	370	346
Melaka	Public	24	34	37	49	50	59
	Private	63	89	112	149	191	224
	NGO	97	137	86	114	80	94
	Total	184	259	235	313	321	377
Johor	Public	107	35	125	39	160	46
	Private	152	50	291	90	647	186
	NGO	300	98	346	107	416	120
	Total	559	183	762	236	1223	352
Pahang	Public	60	42	111	74	153	97
	Private	16	11	34	23	128	81
	NGO	32	23	56	37	81	52
	Total	108	76	201	134	362	230
Terengganu	Public	55	57	79	77	107	96
	Private	6	6	15	15	48	43
	NGO	15	15	23	22	36	32
	Total	76	78	117	114	191	172
Kelantan	Public	56	37	87	54	111	67
	Private	38	25	45	28	98	59
	NGO	10	7	21	13	37	22
	Total	104	69	153	95	246	148
Sabah & WP Labuan	Public	108	35	159	49	250	73
	Private	4	1	25	8	47	14
	NGO	31	10	35	11	61	18
	Total	143	47	219	67	358	104
Sarawak	Public	72	32	134	55	204	79
	Private	47	21	79	32	107	42
	NGO	68	30	110	45	182	71
	Total	187	82	323	133	493	191

Figure 2.2.4(a): Number of HD machines in Malaysia by Sector from Year 2004 to 2013

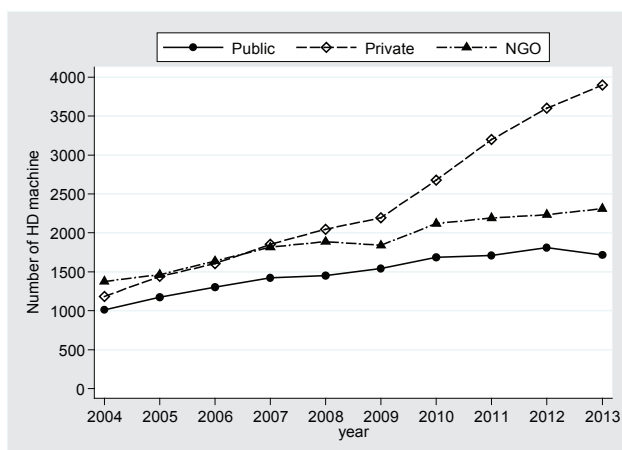
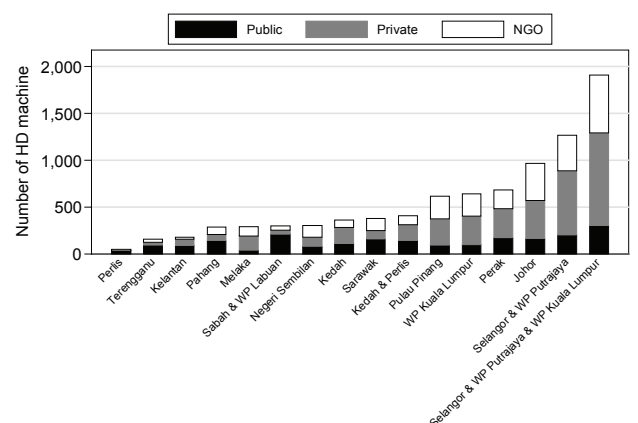


Figure 2.2.4(b): Number of HD machines in Malaysia by State and Sector in Year 2013



Over the last 10 years, the total number of dialysis (HD and PD) patients had increased from 11,368 (440 pmp) in 2004 to 30,106 (1235 pmp) in 2013. The increase was steepest in the private sector. The number of patients in the private sector had increased 4 fold compared to about 2 fold in the public and NGO sectors over the same period. The proportion of patients dialysing in private centres had increased from 32% in 2004 to 47% in 2013. Public sector provision was 28% and NGO centres 24% in 2013 (Table 2.2.5).

In contrast to the economically advantaged west coast states where most of the patients were dialysing in the private sector (except Kedah), the public sector provided dialysis to most patients in the economically disadvantaged East Coast states and East Malaysia. Paradoxically, the NGO sector also provided higher number of dialysis treatment in the economically advantaged states compared to the less disadvantaged states (Table 2.2.5).

Table 2.2.5: Number and Prevalence Rate of Dialysis Patients (HD & PD) in Malaysia by State and Sector, 2004-2013

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
Malaysia	Public	4045	157	6551	238	8574	290
	Private	3663	142	7072	257	14191	480
	NGO	3660	142	5659	205	7341	249
	Total	11368	440	19282	700	30106	1019
Perlis	Public	81	364	98	419	92	381
	Private	-	-	-	-	38	157
	NGO	-	-	40	171	50	207
	Total	81	364	138	589	180	746
Kedah	Public	243	134	387	202	523	259
	Private	407	225	469	245	913	452
	NGO	123	68	261	136	352	174
	Total	773	427	1117	582	1788	885
Kedah & Perlis	Public	324	159	485	225	615	272
	Private	407	200	469	218	951	420
	NGO	123	60	301	140	402	178
	Total	854	420	1255	583	1968	870
Pulau Pinang	Public	252	171	403	258	450	276
	Private	559	380	665	426	1314	807
	NGO	373	254	601	385	718	441
	Total	1184	805	1669	1069	2482	1524
Perak	Public	315	143	468	195	607	249
	Private	331	150	955	399	1826	749
	NGO	360	163	609	254	588	241
	Total	1006	457	2032	848	3021	1240
Selangor & WP Putrajaya	Public	433	93	910	183	945	165
	Private	709	153	1831	369	3396	593
	NGO	582	126	933	188	1169	204
	Total	1724	372	3674	740	5510	962
WP Kuala Lumpur	Public	502	317	545	324	742	428
	Private	764	483	844	501	1218	703
	NGO	417	263	625	371	785	453
	Total	1683	1063	2014	1197	2745	1585
Selangor & WP Putrajaya & WP KL	Public	935	150	1455	219	1687	226
	Private	1473	237	2675	403	4614	619
	NGO	999	161	1558	234	1954	262
	Total	3407	548	5688	856	8255	1107

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
Negeri Sembilan	Public	191	203	244	247	374	350
	Private	31	33	228	231	418	391
	NGO	229	244	424	429	596	557
	Total	451	480	896	906	1388	1297
Melaka	Public	102	144	153	203	256	300
	Private	204	288	338	450	630	739
	NGO	263	371	233	310	235	276
	Total	569	802	724	963	1121	1315
Johor	Public	600	197	771	239	785	226
	Private	384	126	1173	363	2775	798
	NGO	857	281	1139	352	1482	426
	Total	1841	603	3083	954	5042	1450
Pahang	Public	200	141	490	327	628	399
	Private	40	28	60	40	431	274
	NGO	65	46	127	85	250	159
	Total	305	215	677	452	1309	832
Terengganu	Public	223	230	427	418	705	634
	Private	2	2	46	45	195	175
	NGO	36	37	73	71	109	98
	Total	261	269	546	534	1009	907
Kelantan	Public	222	148	389	242	459	276
	Private	98	65	154	96	407	244
	NGO	33	22	65	40	115	69
	Total	353	236	608	378	981	589
Sabah & WP Labuan	Public	365	120	696	214	1122	327
	Private	1	0	77	24	190	55
	NGO	80	26	85	26	189	55
	Total	446	146	858	264	1501	438
Sarawak	Public	316	139	570	234	886	344
	Private	133	58	232	95	440	171
	NGO	242	106	444	182	703	273
	Total	691	303	1246	512	2029	788

Figure 2.2.5(a): Number of Dialysis Patient (HD+PD) in Malaysia by Sector from 2004-2013

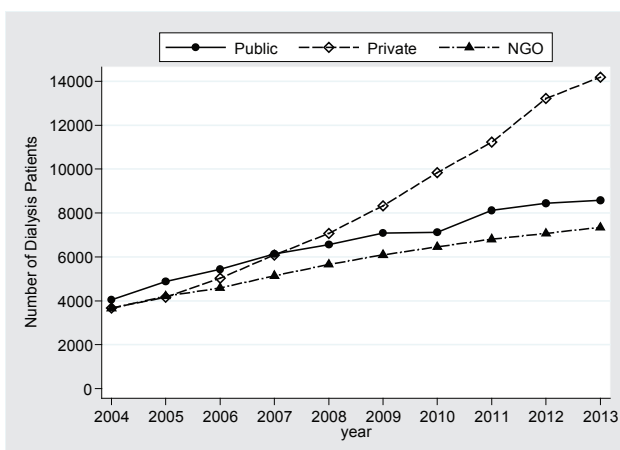


Figure 2.2.5(b): Number of Dialysis Patient (HD+PD) in Malaysia by State and Sector in 2013

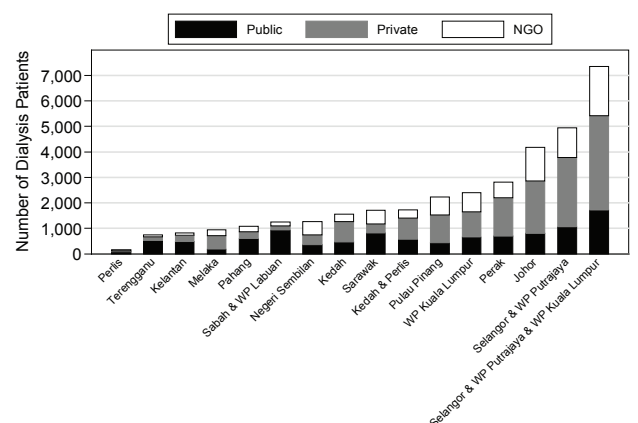


Table 2.2.6: Number and Prevalence Rate of Hemodialysis Patients in Malaysia by State and Sector, 2004-2013

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
Malaysia	Public	2940	114	4836	176	6058	205
	Private	3658	142	7043	256	14180	480
	NGO	3660	142	5659	205	7341	249
	Total	10258	397	17538	637	27579	934
Perlis	Public	81	364	98	419	92	381
	Private	-	-	-	-	38	157
	NGO	-	-	40	171	50	207
	Total	81	364	138	589	180	746
Kedah	Public	243	134	349	182	412	204
	Private	407	225	469	245	913	452
	NGO	123	68	261	136	352	174
	Total	773	427	1079	563	1677	830
Kedah & Perlis	Public	324	159	447	208	504	223
	Private	407	200	469	218	951	420
	NGO	123	60	301	140	402	178
	Total	854	420	1217	565	1857	821
Pulau Pinang	Public	124	84	212	136	201	123
	Private	559	380	665	426	1313	806
	NGO	373	254	601	385	718	441
	Total	1056	718	1478	946	2232	1371
Perak	Public	270	123	388	162	495	203
	Private	331	150	955	399	1826	749
	NGO	360	163	609	254	588	241
	Total	961	436	1952	815	2909	1194
Selangor & WP Putrajaya	Public	337	73	564	114	450	79
	Private	709	153	1831	369	3394	593
	NGO	582	126	933	188	1169	204
	Total	1628	351	3328	671	5013	876
WP Kuala Lumpur	Public	142	90	248	147	259	150
	Private	764	483	844	501	1214	701
	NGO	417	263	625	371	785	453
	Total	1323	836	1717	1020	2258	1304
Selangor & WP Putrajaya & WP KL	Public	479	77	812	122	709	95
	Private	1473	237	2675	403	4608	618
	NGO	999	161	1558	234	1954	262
	Total	2951	475	5045	759	7271	975

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
Negeri Sembilan	Public	126	134	161	163	233	218
	Private	31	33	228	231	418	391
	NGO	229	244	424	429	596	557
	Total	386	411	813	822	1247	1165
Melaka	Public	83	117	113	150	158	185
	Private	203	286	338	450	630	739
	NGO	263	371	233	310	235	276
	Total	549	774	684	910	1023	1200
Johor	Public	442	145	551	170	609	175
	Private	381	125	1144	354	2773	797
	NGO	857	281	1139	352	1482	426
	Total	1680	550	2834	877	4864	1399
Pahang	Public	166	117	393	262	554	352
	Private	40	28	60	40	431	274
	NGO	65	46	127	85	250	159
	Total	271	191	580	387	1235	785
Terengganu	Public	159	164	314	307	443	398
	Private	2	2	46	45	195	175
	NGO	36	37	73	71	109	98
	Total	197	203	433	424	747	671
Kelantan	Public	180	120	321	199	391	235
	Private	98	65	154	96	407	244
	NGO	33	22	65	40	115	69
	Total	311	208	540	336	913	548
Sabah & WP Labuan	Public	315	103	631	194	971	283
	Private	-	-	77	24	190	55
	NGO	80	26	85	26	189	55
	Total	395	129	793	244	1350	394
Sarawak	Public	272	119	493	202	790	307
	Private	133	58	232	95	438	170
	NGO	242	106	444	182	703	273
	Total	647	284	1169	480	1931	750

Table 2.2.7: Number and Prevalence Rate of PD Patients in Malaysia by State and Sector, 2004-2013

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
Malaysia	Public	1105	43	1715	62	2516	103
	Private	5	0	29	1	11	0
	NGO	-	-	-	-	-	-
	Total	1110	43	1744	63	2527	104
Perlis	Public	-	-	-	-	-	-
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	-	-	-	-	-	-
Kedah	Public	-	-	38	20	111	55
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	-	-	38	20	111	55
Kedah & Perlis	Public	-	-	38	18	111	49
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	-	-	38	18	111	49
Pulau Pinang	Public	128	87	191	122	249	153
	Private	-	-	-	-	1	1
	NGO	-	-	-	-	-	-
	Total	128	87	191	122	250	154
Perak	Public	45	20	80	33	112	46
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	45	20	80	33	112	46
Selangor & WP Putrajaya	Public	96	21	346	70	495	86
	Private	-	-	-	-	2	0
	NGO	-	-	-	-	-	-
	Total	96	21	346	70	497	87
WP Kuala Lumpur	Public	360	227	297	176	483	279
	Private	-	-	-	-	4	2
	NGO	-	-	-	-	-	-
	Total	360	227	297	176	487	281
Selangor & WP Putrajaya & WP KL	Public	456	73	643	97	978	131
	Private	-	-	-	-	6	1
	NGO	-	-	-	-	-	-
	Total	456	73	643	97	984	132

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
Negeri Sembilan	Public	65	69	83	84	141	132
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	65	69	83	84	141	132
Melaka	Public	19	27	40	53	98	115
	Private	1	1	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	20	28	40	53	98	115
Johor	Public	158	52	220	68	176	51
	Private	3	1	29	9	2	1
	NGO	-	-	-	-	-	-
	Total	161	53	249	77	178	51
Pahang	Public	34	24	97	65	74	47
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	34	24	97	65	74	47
Terengganu	Public	64	66	113	111	262	236
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	64	66	113	111	262	236
Kelantan	Public	42	28	68	42	68	41
	Private	-	-	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	42	28	68	42	68	41
Sabah & WP Labuan	Public	50	16	65	20	151	44
	Private	1	0	-	-	-	-
	NGO	-	-	-	-	-	-
	Total	51	17	65	20	151	44
Sarawak	Public	44	19	77	32	96	161
	Private	-	-	-	-	2	3
	NGO	-	-	-	-	-	-
	Total	44	19	77	32	98	164

Utilisation of available HD capacity was reflected by HD capacity to patient ratio. A lower ratio represents a more efficient or better utilization. It was commendable that the HD capacity to patient ratio had decreased over the last 10 years. The private sector had the lowest ratio followed by public sector and NGO. There was slightly better utilisation of HD capacity in economically disadvantaged states compared with the economically advantaged states in 2013 (Table 2.2.8 and Figure 2.2.8a).

Table 2.2.8: HD Capacity to Patient Ratio among HD Centres in Malaysia by State and Sector, 2004-2013

State	Sector	Year 2004			Year 2008			Year 2013		
		Centre HD Capacity n (Patient)	HD Capacity n (Machine)	HD Capacity : Patients ratio	Centre HD Capacity n (Patient)	HD Capacity n (Machine)	HD Capacity : Patients ratio	Centre HD Capacity n (Patient)	HD Capacity n (Machine)	HD Capacity : Patients ratio
Malaysia	Public	2940	1012	1.72	4836	1452	1.5	6058	1714	1.41
	Private	3658	1183	1.62	7043	2046	1.45	14180	3897	1.37
	NGO	3660	1376	1.88	5659	1887	1.67	7341	2311	1.57
	Total	10258	3571	1.74	17538	5385	1.54	27579	7922	1.44
Perlis	Public	81	25	1.54	98	21	1.07	92	25	1.36
	Private	-	-	-	-	-	-	38	14	1.84
	NGO	-	-	-	40	15	1.88	50	17	1.7
	Total	81	25	1.54	138	36	1.3	180	56	1.56
Kedah	Public	243	73	1.5	349	87	1.25	412	110	1.33
	Private	407	84	1.03	469	138	1.47	913	255	1.4
	NGO	123	56	2.28	261	84	1.61	352	105	1.49
	Total	773	213	1.38	1079	309	1.43	1677	470	1.4
Kedah & Perlis	Public	324	98	1.51	447	108	1.21	504	135	1.34
	Private	407	84	1.03	469	138	1.47	951	269	1.41
	NGO	123	56	2.28	301	99	1.64	402	122	1.52
	Total	854	238	1.39	1217	345	1.42	1857	526	1.42
Pulau Pinang	Public	124	63	2.54	212	73	1.72	201	66	1.64
	Private	559	165	1.48	665	228	1.71	1313	375	1.43
	NGO	373	142	1.9	601	223	1.86	718	279	1.94
	Total	1056	370	1.75	1478	524	1.77	2232	720	1.61
Perak	Public	270	110	2.04	388	145	1.87	495	162	1.64
	Private	331	155	2.34	955	242	1.27	1826	478	1.31
	NGO	360	158	2.19	609	196	1.61	588	206	1.75
	Total	961	423	2.2	1952	583	1.49	2909	846	1.45
Selangor & WP Putrajaya	Public	337	119	1.77	564	215	1.91	450	159	1.77
	Private	709	217	1.53	1831	517	1.41	3394	1057	1.56
	NGO	582	265	2.28	933	355	1.9	1169	415	1.78
	Total	1628	601	1.85	3328	1087	1.63	5013	1631	1.63
WP Kuala Lumpur	Public	142	97	3.42	248	129	2.6	259	87	1.68
	Private	764	214	1.4	844	254	1.5	1214	316	1.3
	NGO	417	127	1.52	625	224	1.79	785	232	1.48
	Total	1323	438	1.66	1717	607	1.77	2258	635	1.41
Selangor & WP Putrajaya & WP KL	Public	479	216	2.25	812	344	2.12	709	246	1.73
	Private	1473	431	1.46	2675	771	1.44	4608	1373	1.49
	NGO	999	392	1.96	1558	579	1.86	1954	647	1.66
	Total	2951	1039	1.76	5045	1694	1.68	7271	2266	1.56

State	Sector	Year 2004			Year 2008			Year 2013		
		Centre HD Capacity		HD Capacity : Patients ratio	Centre HD Capacity		HD Capacity : Patients ratio	Centre HD Capacity		HD Capacity : Patients ratio
		n (Patient)	n (Machine)		n (Patient)	n (Machine)		n (Patient)	n (Machine)	
Negeri Sembilan	Public	126	43	1.71	161	50	1.55	233	70	1.5
	Private	31	22	3.55	228	66	1.45	418	136	1.63
	NGO	229	75	1.64	424	113	1.33	596	164	1.38
	Total	386	140	1.81	813	229	1.41	1247	370	1.48
Melaka	Public	83	24	1.45	113	37	1.64	158	50	1.58
	Private	203	63	1.55	338	112	1.66	630	191	1.52
	NGO	263	97	1.84	233	86	1.85	235	80	1.7
	Total	549	184	1.68	684	235	1.72	1023	321	1.57
Johor	Public	442	107	1.21	551	125	1.13	609	160	1.31
	Private	381	152	1.99	1144	291	1.27	2773	647	1.17
	NGO	857	300	1.75	1139	346	1.52	1482	416	1.4
	Total	1680	559	1.66	2834	762	1.34	4864	1223	1.26
Pahang	Public	166	60	1.81	393	111	1.41	554	153	1.38
	Private	40	16	2	60	34	2.83	431	128	1.48
	NGO	65	32	2.46	127	56	2.2	250	81	1.62
	Total	271	108	1.99	580	201	1.73	1235	362	1.47
Terengganu	Public	159	55	1.73	314	79	1.26	443	107	1.21
	Private	2	6	15	46	15	1.63	195	48	1.23
	NGO	36	15	2.08	73	23	1.58	109	36	1.65
	Total	197	76	1.93	433	117	1.35	747	191	1.28
Kelantan	Public	180	56	1.56	321	87	1.36	391	111	1.42
	Private	98	38	1.94	154	45	1.46	407	98	1.2
	NGO	33	10	1.52	65	21	1.62	115	37	1.61
	Total	311	104	1.67	540	153	1.42	913	246	1.35
Sabah & WP Labuan	Public	315	108	1.71	631	159	1.26	971	250	1.29
	Private	0	4	-	77	25	1.62	190	47	1.24
	NGO	80	31	1.94	85	35	2.06	189	61	1.61
	Total	395	143	1.81	793	219	1.38	1350	358	1.33
Sarawak	Public	272	72	1.32	493	134	1.36	790	204	1.29
	Private	133	47	1.77	232	79	1.7	438	107	1.22
	NGO	242	68	1.4	444	110	1.24	703	182	1.29
	Total	647	187	1.45	1169	323	1.38	1931	493	1.28

Figure 2.2.8(a): HD Capacity to Patient Ratio among HD Centres in Malaysia by State and Sector, 2004-2013

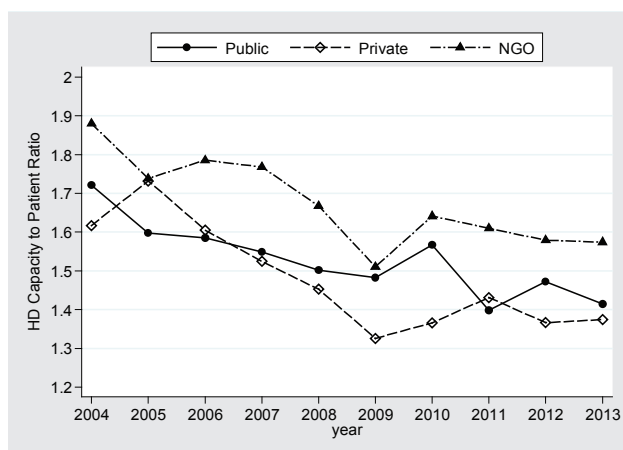
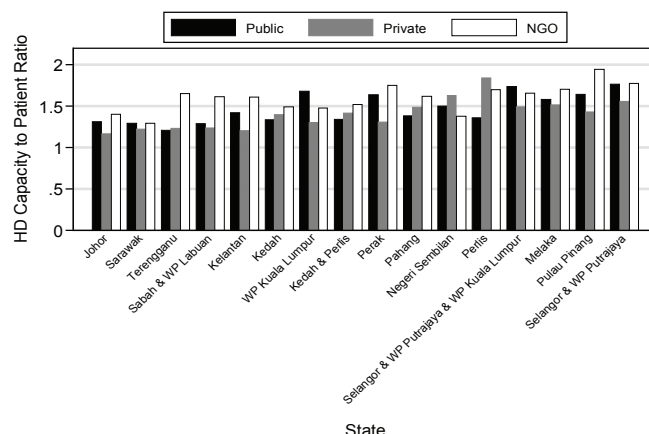


Figure 2.2.8(b): HD Capacity to Patient Ratio among HD Centres in Malaysia by State and sector, 2013



2.2.9: Manpower in dialysis centres

The number of registered dialysis nurses/medical technicians in Malaysia increased from 1260 (49 pmp) in 2004 to 2421 (99 pmp) in 2013. Overall, the public sector had consistently higher dialysis technician/nurse to population ratio followed by the private sector. Despite its gradual improvement, the NGO sector continued to have the lowest dialysis staff to population ratio compared to the other two sectors.

In 2013, the highest density of certified staff was recorded in Negeri Sembilan, Melaka, Kuala Lumpur and Pulau Pinang. Public sector had the highest density of staff in all states except Selangor, Kuala Lumpur, Pulau Pinang and Melaka where private centres dominate (Table 2.2.9).

Table 2.2.9: Number & density of Certified Dialysis Nurses/ Medical technicians in Malaysia by State and Sector, 2004-2013

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
Malaysia	Public	755	29	1023	37	1162	39
	Private	309	12	488	18	905	31
	NGO	196	8	259	9	354	12
	Total	1260	49	1770	64	2421	82
Perlis	Public	11	49	11	47	12	50
	Private	-	-	-	-	3	12
	NGO	-	-	3	13	3	12
	Total	11	49	14	60	18	75
Kedah	Public	59	33	65	34	72	36
	Private	25	14	37	19	62	31
	NGO	8	4	12	6	17	8
	Total	92	51	114	59	151	75
Kedah & Perlis	Public	70	34	76	35	84	37
	Private	25	12	37	17	65	29
	NGO	8	4	15	7	20	9
	Total	103	51	128	59	169	75
Pulau Pinang	Public	50	34	61	39	70	43
	Private	43	29	56	36	79	49
	NGO	23	16	29	19	44	27
	Total	116	79	146	93	193	119
Perak	Public	74	34	102	43	111	46
	Private	29	13	45	19	91	37
	NGO	15	7	23	10	31	13
	Total	118	54	170	71	233	96
Selangor & WP Putrajaya	Public	63	14	105	21	101	18
	Private	61	13	123	25	245	43
	NGO	39	8	48	10	57	10
	Total	163	35	276	56	403	70
WP Kuala Lumpur	Public	75	47	79	47	55	32
	Private	56	35	59	35	97	56
	NGO	18	11	33	20	34	20
	Total	149	94	171	102	186	107
Selangor & WP Putrajaya & WP KL	Public	138	22	184	28	156	21
	Private	117	19	182	27	342	46
	NGO	57	9	81	12	91	12
	Total	312	50	447	67	589	79

State	Sector	Year 2004		Year 2008		Year 2013	
		n	pmp	n	pmp	n	pmp
Negeri Sembilan	Public	44	47	60	61	76	71
	Private	7	7	18	18	40	37
	NGO	13	14	19	19	23	21
	Total	64	68	97	98	139	130
Melaka	Public	15	21	21	28	39	46
	Private	20	28	33	44	40	47
	NGO	17	24	12	16	15	18
	Total	52	73	66	88	94	110
Johor	Public	81	27	83	26	95	27
	Private	33	11	63	19	127	37
	NGO	37	12	40	12	61	18
	Total	151	49	186	58	283	81
Pahang	Public	46	32	78	52	94	60
	Private	5	4	8	5	33	21
	NGO	4	3	8	5	13	8
	Total	55	39	94	63	140	89
Terengganu	Public	42	43	45	44	60	54
	Private	6	6	8	8	14	13
	NGO	4	4	5	5	12	11
	Total	52	54	58	57	86	77
Kelantan	Public	58	39	74	46	85	51
	Private	10	7	15	9	26	16
	NGO	2	1	4	2	2	1
	Total	70	47	93	58	113	68
Sabah & WP Labuan	Public	76	25	120	37	160	47
	Private	1	0	5	2	14	4
	NGO	6	2	6	2	10	3
	Total	83	27	131	40	184	54
Sarawak	Public	61	27	119	49	132	51
	Private	13	6	18	7	34	13
	NGO	10	4	17	7	32	12
	Total	84	37	154	63	198	77

Figure 2.2.9(a): Number of Certified Dialysis Nurses/ Medical technicians in Malaysia by Sector, 2004-2013

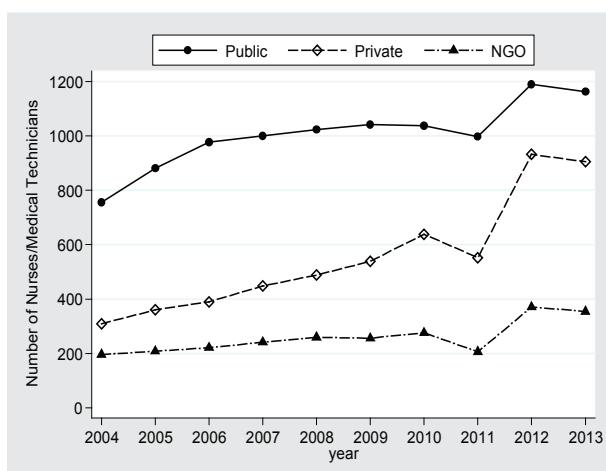


Figure 2.2.9(b): Number of Certified Dialysis Nurses/ Medical technicians in Malaysia by State and Sector, 2013

