

## **CHAPTER 2**

# **DIALYSIS IN MALAYSIA**

## SECTION 2.1: PROVISION OF DIALYSIS IN MALAYSIA

### 2.1.1: Dialysis treatment provision (refer Chapter 1)

Table 2.1.1: Stock and flow - Dialysis Patients, Malaysia 2008-2018

Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
New Dialysis patients	8431	8031	8090	8037	7618	6994	6696	6037	5276	4923	4606
Died	6135	5945	5400	5005	4726	4012	3647	3292	3050	2600	2192
Transplanted	80	101	70	100	90	73	79	103	98	111	110
Lost to Follow-up	71	42	38	38	48	25	34	35	33	21	7
Dialysing at 31st December	44136	42355	40627	38028	35106	32321	29400	26442	23790	21641	19430

Table 2.1.1(a): Stock and flow - HD Patients, Malaysia 2008-2018

Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
New Dialysis patients	7200	6896	7086	6901	6621	6211	5937	5422	4739	4375	4037
Died	5315	5170	4669	4374	4150	3540	3252	2918	2697	2279	1915
Transplanted	55	93	64	90	76	56	65	86	87	96	89
Lost to Follow-up	64	40	36	37	47	25	34	33	30	20	7
Dialysing at 31st December	39593	38061	36638	34236	31798	29451	26827	24260	21793	19750	17677

Table 2.1.1(b): Stock and flow - PD Patients, Malaysia 2008-2018

Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
New Dialysis patients	1231	1135	1004	1136	997	783	759	615	537	548	569
Died	820	775	731	631	576	472	395	374	353	321	277
Transplanted	25	8	6	10	14	17	14	17	11	15	21
Lost to Follow-up	7	2	2	1	1	0	0	2	3	1	0
Dialysing at 31st December	4543	4294	3989	3792	3308	2870	2573	2182	1997	1891	1753

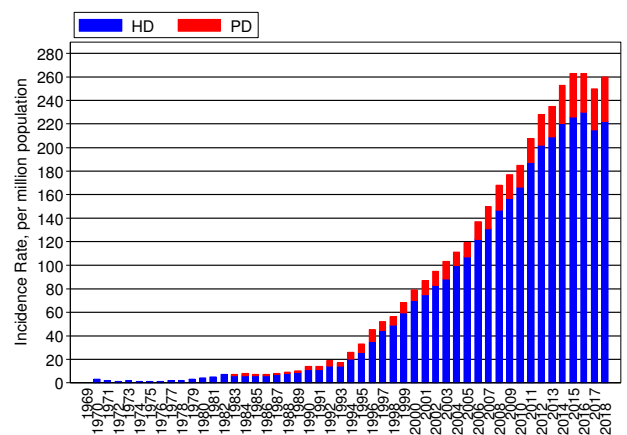
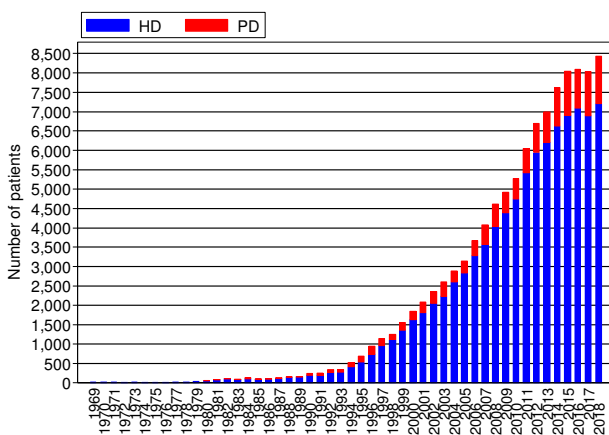
(For actual numbers refer to Appendix T2.1.1)

Figure 2.1.1: New Dialysis (Hemodialysis & Chronic PD) Incidence Rate per Million Population, Malaysia 1969-2018

(For actual numbers refer to Appendix T1.1.1)

(a) Number of New Dialysis Incidence, Malaysia 1969-2018

(b) New Dialysis Incidence Rates, Malaysia 1969-2018



### 2.1.2.: Geographic distribution

There were a total of 8,431 new dialysis patients in 2018 with 7,200 new HD and 1,231 new PD patients. The highest number of new dialysis patients was in Selangor with 1,654 while the lowest was Perlis with only 63 new dialysis patients. However, in terms of dialysis acceptance rate, Negeri Sembilan came up top with 389 pmp, and followed by WP, Melaka, Johor, Terengganu, Perak and Pulau Pinang (>300 pmp). Terengganu has 322 pmp and this is on par with richer west coast states such as Perak, Melaka (Appendix T2.1.2a). For a rich state such as Selangor (even though with the highest number of new dialysis patients), the dialysis acceptance rate was only 255 pmp, which was among the lowest 6 states (Perlis, Pahang Kelantan, Sarawak and Sabah). Sarawak and Sabah were the 2 states with lowest acceptance rate (all below 200 pmp) and Sabah was only 115 pmp (Appendix T2.1.2a)

Table 2.1.2(a): Dialysis Treatment and Rate by Centre state, per million population 2008-2018

Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Johor	330	337	346	317	335	307	298	285	227	227	235
Kedah	294	284	285	269	278	267	232	194	152	146	162
Kelantan	207	177	223	216	138	136	161	128	99	111	94
Melaka	345	301	319	336	332	303	267	273	223	219	226
Negeri Sembilan	389	363	362	343	356	269	300	267	273	249	233
Pahang	235	226	226	250	243	205	223	172	171	130	131
Perak	312	286	282	341	285	276	273	267	240	221	203
Perlis	249	170	169	187	201	182	192	160	102	124	143
Pulau Pinang	303	322	364	323	342	321	338	306	272	252	205
Sabah WP Labuan	115	118	139	121	107	117	104	91	90	91	93
Sarawak	174	193	178	188	181	164	126	124	114	117	117
Selangor	255	227	244	272	262	227	233	207	180	175	165
Terengganu	322	280	286	268	279	265	245	186	180	144	134
WP Kuala Lumpur	369	389	380	368	334	367	320	338	328	277	236

(For actual numbers refer to Appendix T2.1.2a)

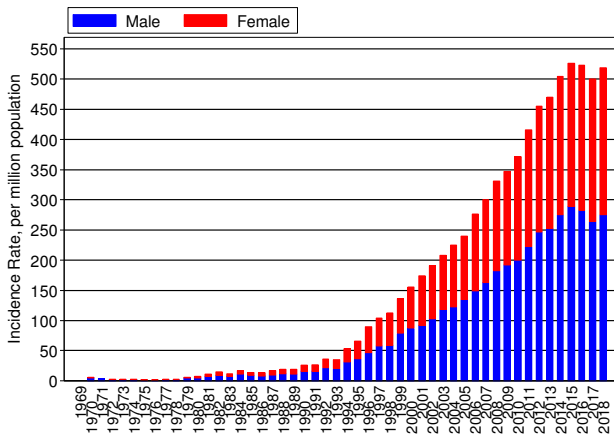
### 2.1.3: Gender distribution

The gap between male and female acceptance rate for dialysis had remained consistent over the last decade. Over the last 10 years, males predominate with the ratio of male to female (both incident and prevalent dialysis ratio) remained at about 55% to 45%. This ratio is a great improvement when compared to 1970's ratio which was 70:30 and 1980's ratio which was 60:40 (Appendix T2.1.3b).

Table 2.1.3(a): Dialysis Treatment Rate by Gender, per million male or female population 2008-2018

Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Male	275	264	282	289	275	253	247	222	200	192	182
Female	244	236	241	237	230	217	208	194	171	155	149

Figure 2.1.3(a): Dialysis Treatment Rate by Gender 1969-2018



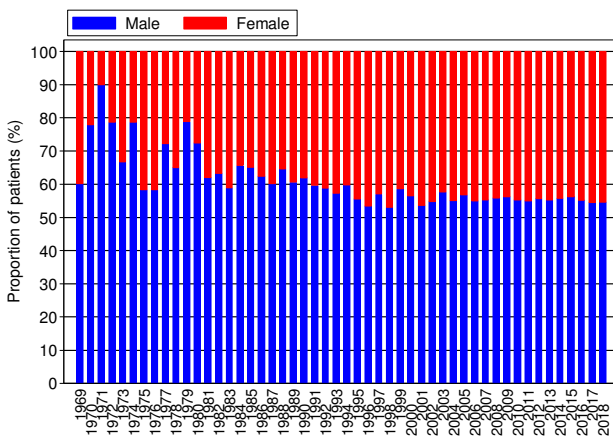
(For actual numbers in Fig 2.1.3a, refer to Appendix T2.1.3a)

Table 2.1.3(b): Gender Distribution of Dialysis Patients 2008-2018

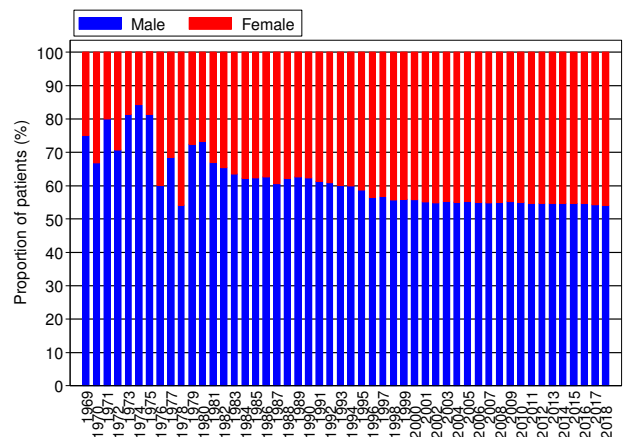
Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
New Dialysis patients	8431	8031	8090	8037	7618	6994	6696	6037	5276	4923	4606
% Male	54.6	54.5	55.2	56.2	55.8	55.3	55.7	54.9	55.3	56.2	55.9
% Female	45.4	45.5	44.8	43.8	44.2	44.7	44.3	45.1	44.7	43.8	44.1
ESKD patients at 31st December	44136	42355	40627	38028	35106	32321	29400	26442	23790	21641	19430
% Male	54.0	54.3	54.7	54.6	54.6	54.6	54.7	54.7	55.0	55.2	55.0
% Female	46.0	45.7	45.3	45.4	45.4	45.4	45.3	45.3	45.0	44.8	45.0

Figure 2.1.3(b): Gender Distribution of Dialysis Patients 1969-2018

(i) New Dialysis patients



(ii) ESKD Patients at 31<sup>st</sup> December



(For actual numbers in Fig 2.1.3b, refer to Appendix T2.1.3b)

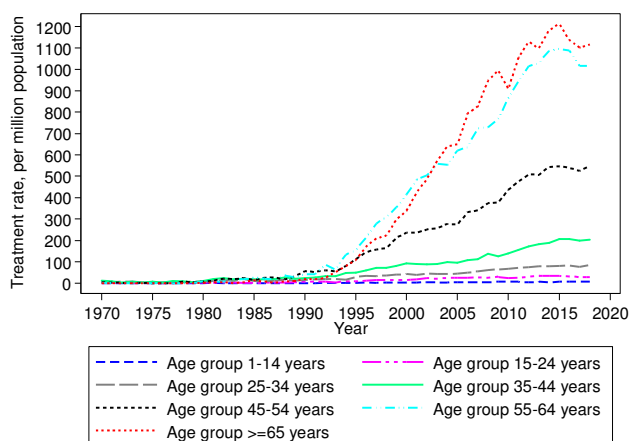
### 2.1.4: Age distribution

The highest treatment rates remain in the 55-64 and  $\geq 65$  years age groups but the overall trend suggests that the rates are beginning to plateau for all the age groups over the last 4 years (Figure 2.1.4a). More than 80% of new patients and 70% of all prevalent patients on dialysis were in the age group of 45 years or older in 2018. The highest percentage of both incident and prevalent patients was in the 55-64 years age group (Figure 2.1.4b).

Table 2.1.4(a): Dialysis Treatment Rate by Age Group, per million age group population 2008-2018

Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
$\leq 14$	6	6	6	6	4	6	5	6	6	7	5
15-24	29	29	31	34	35	35	29	26	23	30	25
25-34	86	77	82	81	79	79	75	71	68	64	62
35-44	204	199	207	207	189	184	172	156	140	127	137
45-54	546	525	540	547	544	507	509	475	436	378	375
55-64	1017	1017	1088	1096	1087	1030	1015	945	865	767	729
$\geq 65$	1116	1102	1138	1213	1183	1098	1130	1055	909	996	947

Figure 2.1.4(a): Dialysis Treatment Rate by Age Group 1969-2018



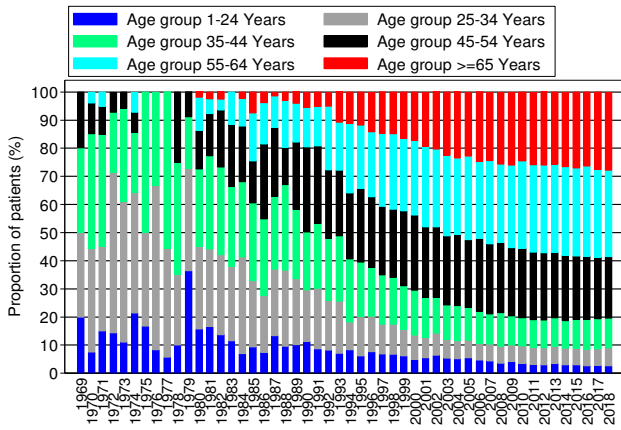
(For actual numbers in Fig 2.1.4a, refer to Appendix T2.1.4a)

Table 2.1.4(b): Percentage Age Distribution of Dialysis Patients 2008-2018

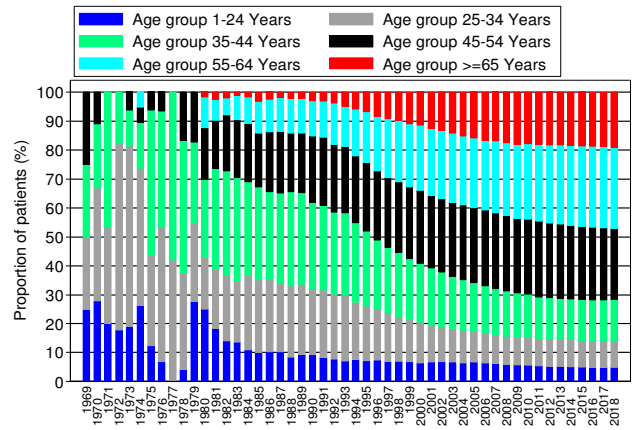
Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
New Dialysis patients	8431	8031	8090	8037	7618	6994	6696	6037	5276	4923	4606
% $\leq 24$	2.7	2.8	2.7	3.0	3.0	3.5	3.1	3.2	3.4	4.1	3.6
% 25-34	6.3	5.8	5.7	5.7	5.8	6.1	5.9	6.0	6.4	6.0	6.1
% 35-44	10.6	10.6	10.7	10.4	9.8	10.2	9.9	9.8	10	10.4	11.9
% 45-54	21.9	22.0	22.5	22.6	23.3	23.2	23.9	24.2	24.7	24.2	24.8
% 55-64	30.7	31.3	32.2	31.4	31.6	31.5	31.2	30.9	31	29.3	28.1
% $\geq 65$	27.7	27.5	26.2	26.9	26.4	25.5	26.1	25.8	24.5	25.9	25.4
ESKD patients at 31st December	44136	42355	40627	38028	35106	32321	29400	26442	23790	21641	19430
% $\leq 24$	4.9	4.9	4.9	5.0	5.1	5.2	5.3	5.4	5.7	5.8	5.9
% 25-34	9.3	9.2	9.2	9.2	9.3	9.3	9.3	9.4	9.5	9.4	9.7
% 35-44	14.0	14.0	14.0	14.0	14.0	14.1	14.2	14.4	14.9	15.2	15.6
% 45-54	24.7	25.0	25.2	25.4	25.6	25.9	26.0	26.2	26.0	26.0	26.1
% 55-64	27.9	27.9	27.9	27.7	27.4	27.1	26.9	26.6	26.2	25.6	25.2
% $\geq 65$	19.2	18.9	18.7	18.8	18.6	18.4	18.4	18.0	17.7	18.0	17.6

Figure 2.1.4(b): Age Distribution of Dialysis Patients 1969-2018

(i) New Dialysis Patients



(ii) ESKD Patients at 31<sup>st</sup> December



(For actual numbers in Fig 2.1.4b, refer to Appendix T2.1.4b)

### 2.1.5: Method and Location of Dialysis

Centre HD predominates with regard to the location and method of dialysis, accounting for 85% and 89% for new and prevalent dialysis patients respectively in 2018. Even though there was an encouraging trend of an increase in new PD patients for the last 4 years, the prevalent PD patients has remained  $\leq 10\%$ . This probably signifies the high dropout rate of PD patients. The percentage of incidence patients on home dialysis (both PD and HD) was 15% in 2018 (Appendix T2.1.5). The golden age for home dialysis (PD+HD) was in the 1980's where at one time it was  $>50\%$  of all dialysis (Appendix T2.1.5 and Figure 2.1.5).

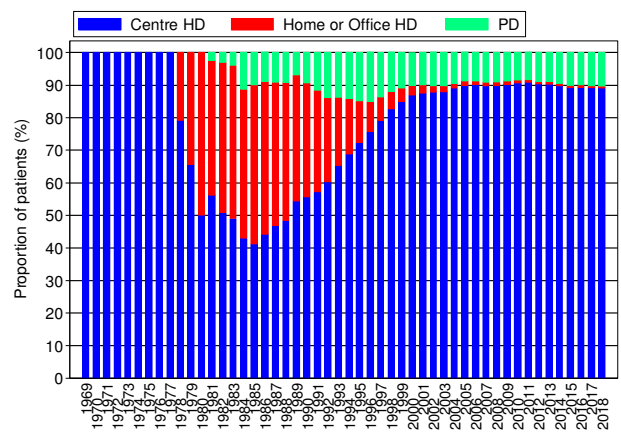
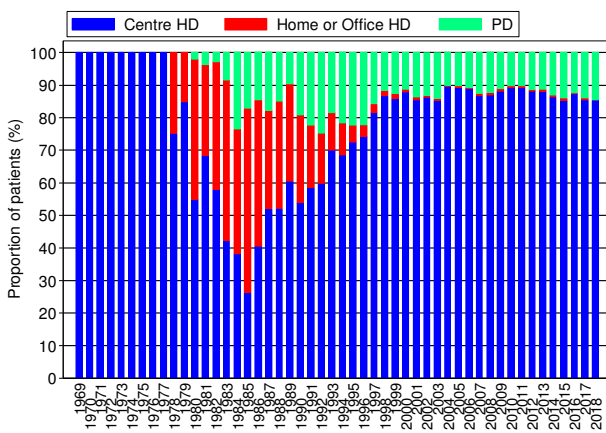
Table 2.1.5: Method and Location of Dialysis Patients 2008-2018

Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
New Dialysis patients	8431	8031	8090	8037	7618	6994	6696	6037	5276	4923	4606
% Centre HD	85.3	85.3	87.2	85.2	86.3	88.1	88.2	89.2	89.2	88.2	86.9
% Home and office HD	0.1	0.6	0.4	0.7	0.6	0.7	0.5	0.6	0.6	0.7	0.8
% PD	14.6	14.1	12.4	14.1	13.1	11.2	11.3	10.2	10.2	11.1	12.4
ESKD patients at 31st December	44136	42355	40627	38028	35106	32321	29400	26442	23790	21641	19430
% Centre HD	89.1	89.2	89.4	89.2	89.8	90.3	90.4	90.9	90.7	90.3	90.0
% Home and office HD	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.9	1.0	1.0
% PD	10.3	10.1	9.8	10.0	9.4	8.9	8.8	8.3	8.4	8.7	9.0

Figure 2.1.5: Method and Location of Dialysis Patients 1969-2018

(i) New Dialysis Patients

(ii) ESKD Patients at 31<sup>st</sup> December



(For actual numbers in Fig 2.1.5, refer to Appendix T2.1.5)

**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 in this country (about >50%). 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 25 to 30%. Funding from NGO bodies had remained at 10-13% over the years (Table & Figure 2.1.6).

Funding from 2016 Data for the time being until further notice.

Table 2.1.6: Funding for Dialysis Treatment 1969-2018 (To be updated later)

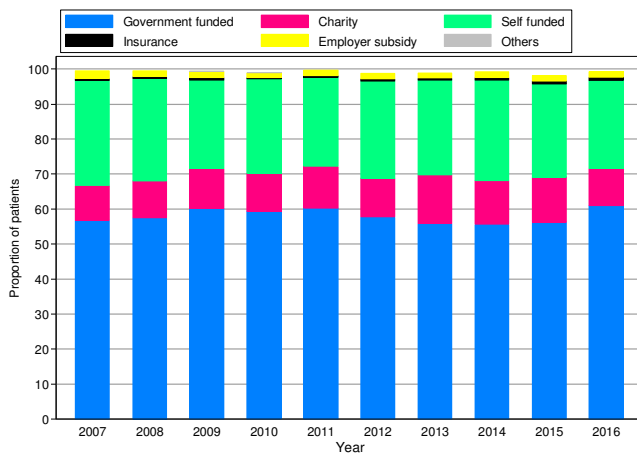
Table 2.1.6: Funding for Dialysis Treatment 2007-2016

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
New Dialysis patients	4104	4641	4954	5311	6074	6715	7036	7633	7967	7663
% by Government	56.7	57.4	60.2	59.4	60.3	57.7	55.8	55.6	56.2	61
% by Charity	10	10.7	11.4	10.9	11.8	11.1	14	12.6	12.9	10.5
% self funded	30.1	29.2	25.3	26.8	25.5	27.7	27.1	28.7	26.7	25.3
% Insurance	0.5	0.5	0.6	0.4	0.5	0.6	0.5	0.6	0.7	0.8
% subsidized by Employer	2.3	1.8	1.8	1.4	1.6	1.7	1.5	1.7	1.7	1.6
% Others	0	0	0.1	0.1	0	0	0	0	0	0
% NA	0.5	0.3	0.7	1.1	0.4	1.2	1	0.9	1.7	0.8
Dialysing at 31st December	17097	19403	21610	23740	26373	29309	32201	34953	37729	39711
% by Government	55.8	60.8	63.6	65.8	66.6	65	65.4	65.1	65.7	67.1
% by Charity	13	10.9	11.6	12.6	12.7	12.9	13.3	14.1	14	13.2
% self funded	25	23.8	20	16.2	16	16.8	16.6	16.4	15.7	14.9
% Insurance	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
% subsidized by Employer	2.8	2.6	2.4	2	2.2	2.1	2	1.6	1.6	1.3
% Others	1.3	0.4	0.5	0.6	0.1	0.5	0.4	0.4	0.4	0.7
% NA	1.5	1.1	1.5	2.4	2	2.2	1.9	1.8	2	2.3

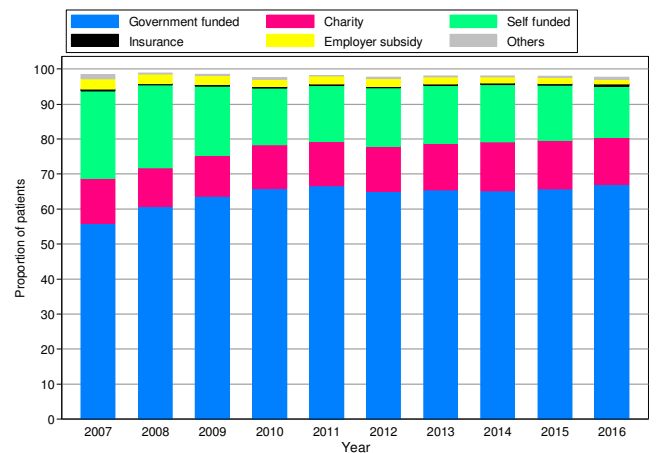
Figure 2.1.6: Funding for Dialysis Treatment 1969-2018 (To be updated later)

Figure 2.1.6: Funding for Dialysis Treatment 2007-2016

(i) New Dialysis Patients



(ii) Dialysis Patients at 31<sup>st</sup> December





### 2.1.7: Distribution of dialysis patients by sector

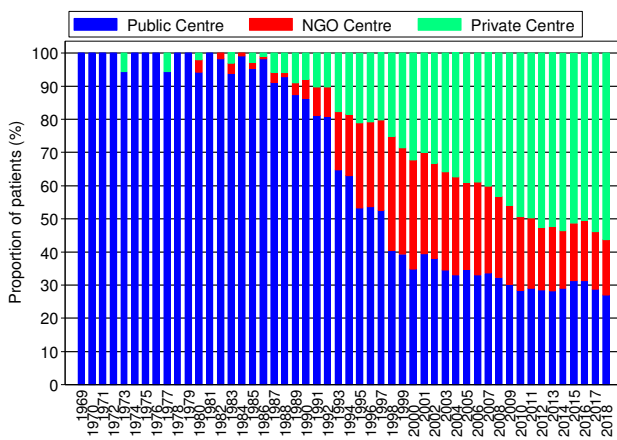
The proportion of new dialysis patients accepted into private dialysis centres continue to increase, NGO centres declined, while MOH remained at 27-30% since 2009. In 2018, the private sector provided dialysis to 56.2% of new patients and 50.2% of prevalent dialysis patients, while the government centres only account for 27% of incident and 30% of prevalent dialysis patients (Table 2.1.7) .

Table 2.1.7: Distribution of Dialysis Patients by Sector 2008-2018

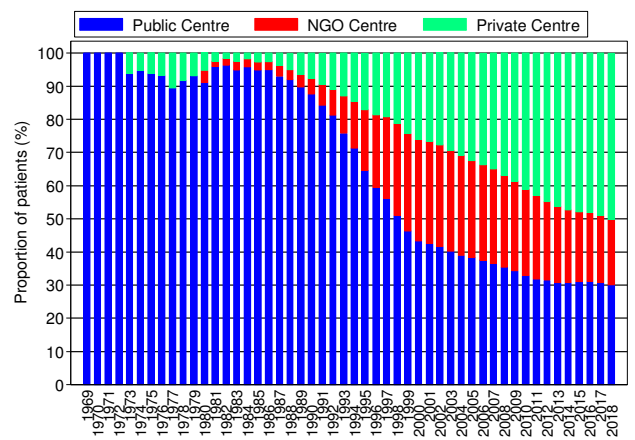
Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
New Dialysis patients	8431	8031	8090	8037	7618	6994	6696	6037	5276	4923	4606
% Government centre	27.1	28.8	31.3	31.3	29.1	28.3	28.6	29.0	28.5	30.1	32.2
% NGO centre	16.7	17.3	18.2	17.3	17.4	19.4	18.8	21.1	22.1	24.1	24.6
% Private centre	56.2	53.9	50.5	51.3	53.4	52.4	52.6	49.9	49.4	45.8	43.2
ESKD patients at 31st December	44136	42355	40627	38028	35106	32321	29400	26442	23790	21641	19430
% Government centre	30.0	30.7	31.1	31.0	30.7	30.7	31.4	31.8	32.9	34.3	35.5
% NGO centre	19.7	20.3	20.7	21.0	22.0	23.1	23.9	25.2	26.0	27.0	27.7
% Private centre	50.2	49.0	48.2	48.0	47.3	46.2	44.7	43.0	41.1	38.7	36.8

Figure 2.1.7: Distribution of Dialysis Patients by Sector 1969-2018

(i) New Dialysis Patients



(ii) ESKD Patients at 31<sup>st</sup> December



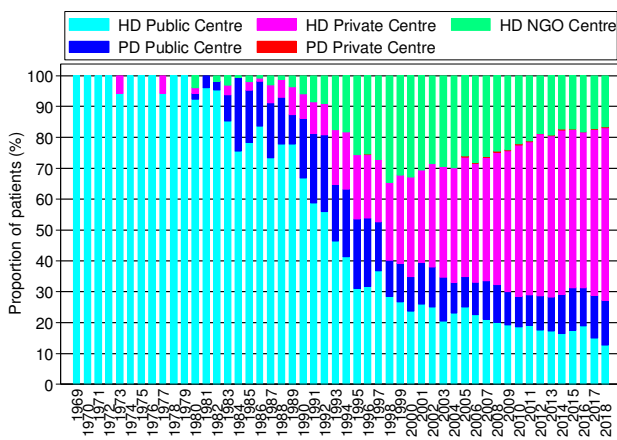
(For actual numbers in Fig 2.1.7, refer to Appendix T2.1.7)

Table 2.1.7(a): Distribution of Dialysis Patients by Modality and Sector 2008-2018

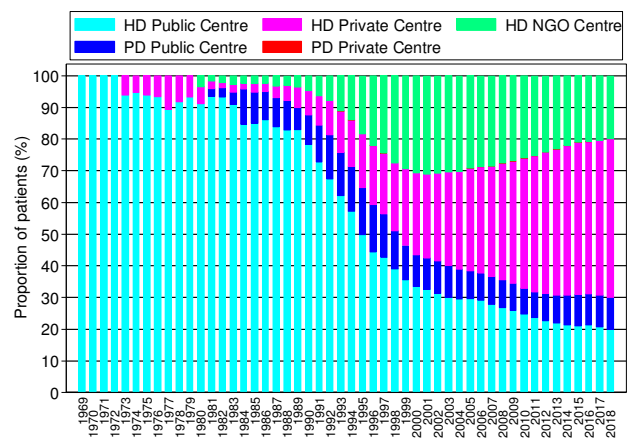
Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
New Dialysis patients	8431	8031	8090	8037	7618	6994	6696	6037	5276	4923	4606
% Public Centre	27.1	28.8	31.3	31.3	29.1	28.3	28.6	29	28.5	30.1	32.2
% HD Public Centre	12.7	14.9	19.0	17.3	16.3	17.2	17.5	19.1	18.6	19.2	20.1
% PD Public Centre	14.4	13.9	12.3	14.0	12.8	11.0	11.1	9.9	9.9	10.9	12.1
% NGO	16.7	17.3	18.2	17.3	17.4	19.4	18.8	21.1	22.1	24.1	24.6
% Private Centre	56.2	53.9	50.5	51.3	53.4	52.4	52.6	49.9	49.4	45.8	43.2
% HD Private Centre	56.0	53.7	50.3	51.2	53.2	52.2	52.4	49.6	49.1	45.6	43.0
%PD Private Centre	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.3
ESKD patients at 31st December	44136	42355	40627	38028	35106	32321	29400	26442	23790	21641	19430
% Public Centre	30.0	30.7	31.1	31.0	30.7	30.7	31.4	31.8	32.9	34.3	35.5
% HD Public Centre	19.8	20.7	21.4	21.1	21.4	21.9	22.7	23.7	24.7	25.8	26.7
% PD Public Centre	10.2	10.0	9.7	9.9	9.3	8.8	8.6	8.1	8.2	8.6	8.8
% NGO	19.7	20.3	20.7	21.0	22.0	23.1	23.9	25.2	26.0	27.0	27.7
% Private Centre	50.2	49.0	48.2	48.0	47.3	46.2	44.7	43.0	41.1	38.7	36.8
% HD Private Centre	50.1	48.9	48.1	47.9	47.2	46.1	44.6	42.8	40.9	38.5	36.6
%PD Private Centre	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2

Figure 2.1.7(a): Distribution of Dialysis Patients by Modality and Sector 1969-2018

(i) New Dialysis Patients



(ii) ESKD Patients at 31<sup>st</sup> December



(For actual numbers in Fig 2.1.7a, refer to Appendix T2.1.7a)

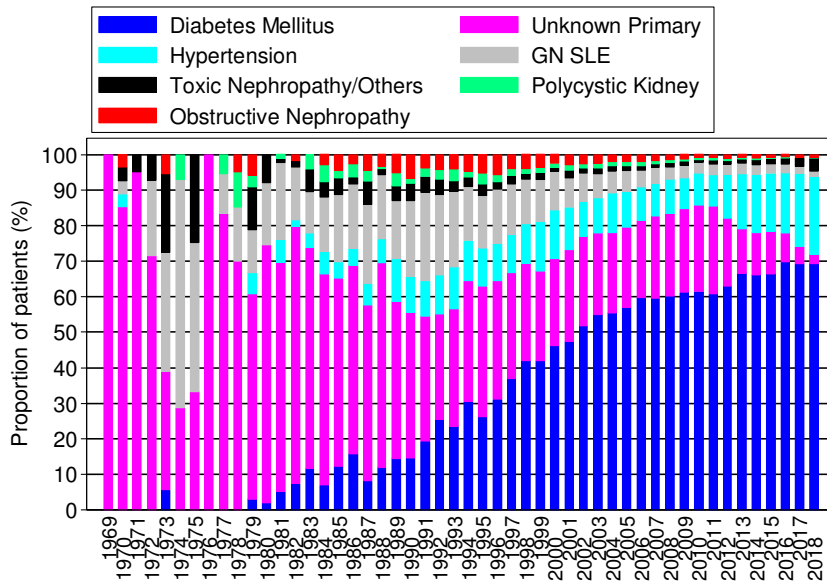
**2.1.8: Primary renal disease**

Diabetes mellitus remained the number one cause of ESKD in new dialysis patients while hypertension was the second commonest cause of ESKD for the last 2 decades. Glomerulonephritis and SLE were reported as the primary renal disease in only  $\leq 3.5\%$  of new patients for the last decade. The percentage of patients with unknown primary renal disease continues to see a positive declining trend over the years reaching a low of 2.6% in 2018 (Figure 2.1.8).

Table 2.1.8: Primary Renal Diseases for New Dialysis Patients 2008-2018

Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
New Dialysis patients	8431	8031	8090	8037	7618	6994	6696	6037	5276	4923	4606
% Unknown cause	2.6	4.8	8.0	11.9	11.9	12.5	19.3	24.8	24.3	23.6	23.3
% Diabetes Mellitus	69.2	69.2	69.9	66.5	66.1	66.6	62.8	60.6	61.4	61.0	60.0
% GN/SLE	1.6	1.9	2.4	2.7	2.7	3.0	2.8	3.0	3.2	3.5	3.4
% Polycystic kidney	0.3	0.2	0.4	0.4	0.5	0.5	0.5	0.7	0.5	0.6	0.8
% Obstructive Nephropathy	0.7	0.8	0.8	0.8	1.0	1.0	1.2	1.0	1.1	1.5	1.5
% Toxic Nephropathy	0.6	0.4	0.5	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.3
% Hypertension	21.8	20.6	16.8	16.2	16.3	15.3	12.2	8.7	8.8	8.7	9.7
% Others	3.2	2.1	1.3	1.2	1.0	0.9	0.8	0.9	0.6	0.9	0.9

Figure 2.1.8: Primary Renal Diseases for New Dialysis Patients 1969-2018



(For actual numbers in Fig 2.1.8, refer to Appendix T2.1.8)

## SECTION 2.2: GROWTH OF DIALYSIS IN MALAYSIA

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 status 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 2018.

### 2.2.1: Growth in dialysis in Malaysia by sector

The number of dialysis centres (PD and HD Centres combined) for the whole of Malaysia increased slightly (5.5%) from 928 in 2008 to 979 in 2018. However, the density rate has declined from 34 dialysis centres pmp in 2008 and 30 pmp in 2018 (Appendix T2.2.1). The increase in number of dialysis centres was mainly contributed by the private dialysis centres, grew from 506 in 2008 to 548 in 2018 (8.3%) (Appendix T2.2.1). Number of NGO centres in the same interval increased from 183 to 191 (4.4%) while the number of public dialysis centres' increased from 222 in 2008 to 231 (4%) in 2018 (Appendix T2.2.1). The number of private dialysis centres predominates in the west coast of Peninsula Malaysia (Appendix T2.2.3).

Table 2.2.1: Number and density of Dialysis, HD and PD Centres in Malaysia by State and Sector, Year 2008-2018

Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Public Centres	231	230	230	228	228	228	228	227	227	226	222
NGO Centres	191	191	191	190	190	188	188	188	186	184	183
Private Centres	557	552	550	548	547	549	547	545	543	537	523
<b>HD Centres</b>											
Public HD Centres	189	188	188	188	188	188	188	188	188	188	188
NGO HD Centres	191	191	191	190	190	188	188	188	186	184	183
Private HD Centres	548	543	541	540	538	538	535	532	529	523	509
<b>PD Centres</b>											
Public PD Centres	42	42	42	40	40	40	40	39	39	38	34
NGO PD Centres	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Private PD Centres	9	9	9	8	9	11	12	13	14	14	14

Figure 2.2.1(a): Number of Dialysis Centre in Malaysia by Sector, 1969-2018

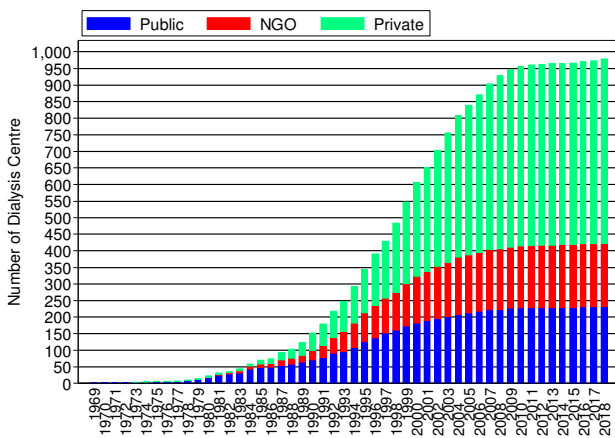
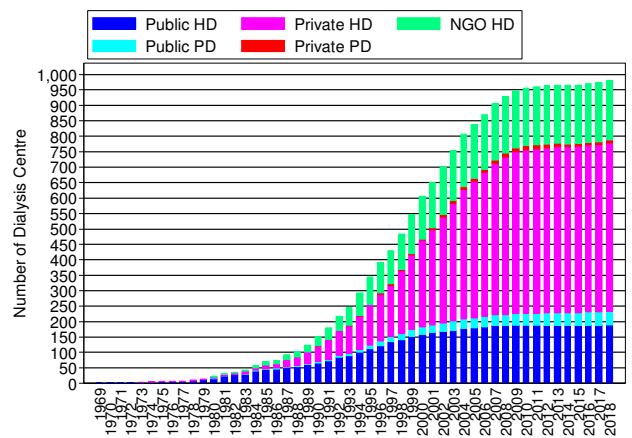


Figure 2.2.1(b): Number of HD and PD Centre in Malaysia by Sector, 1969-2018



(For actual numbers in Fig 2.2.1, refer to Appendix T2.2.1)

The proliferation of haemodialysis centres accounted for most of the increase in dialysis centres. PD centre density rate remained at 1 pmp over the past 10 years while HD centre density rate had decreased from 32 pmp in 2008 to 29 pmp in 2018. Of the 51 PD centres recorded in 2018, 42 were in the public sector while 9 were in the private sector. To date, no PD centre was operated by the NGO sector (Appendix T2.2.1).

Over the last 10 years, the total number of dialysis (HD and PD) patients had increased from 19,450 (705 pmp) in 2008 to 44,136 (1,363 pmp) in 2018. While the increase in the number of patients in the NGO and public sectors were roughly double from 2008 to 2018, the number of patients in the private centres increased almost 3 folds. (Appendix T2.2.2).

In contrast to the economically advantaged West Coast states, where most of the patients were dialysing in the private sector, 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 advantaged states (Appendix T2.2.2).

Table 2.2.2: Number and Prevalence Rate of Dialysis (HD+PD), HD and PD Patients in Malaysia by State and Sector, 2008-2018

Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
Dialysis patients, pmp											
Public	409	406	409	387	358	334	314	290	274	266	250
NGO	269	268	272	262	256	252	239	230	216	209	195
Private	685	648	634	598	552	502	448	392	342	300	260
HD patients, pmp											
Public	270	273	281	263	249	238	228	216	205	200	188
NGO	269	268	272	262	256	252	239	230	216	209	195
Private	684	647	633	598	551	501	447	391	341	299	258
PD patients, pmp											
Public	139	133	128	123	109	95	86	74	69	66	62
NGO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Private	1	1	1	1	1	1	1	1	1	1	1

Figure 2.2.2(a): Prevalence Rate of Dialysis Patient (HD+PD) Malaysia by Sector, 1969-2018

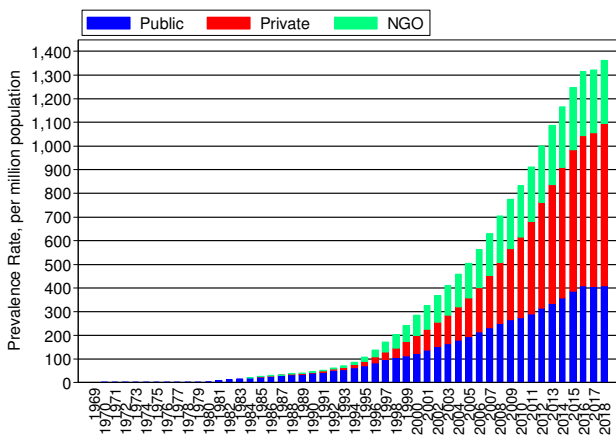
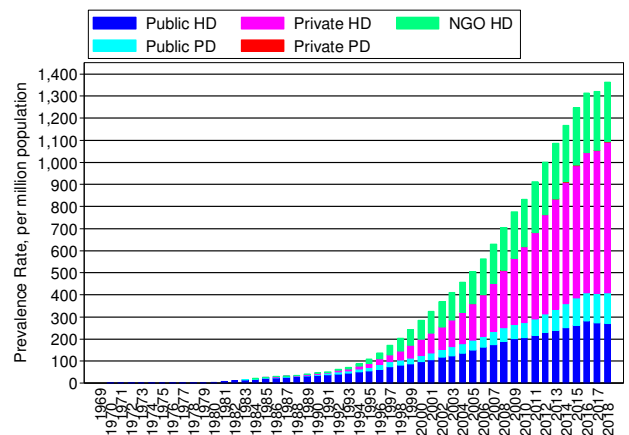


Figure 2.2.2(b): Prevalence Rate of HD and PD Patient in Malaysia by Sector, 1969-2018



(For actual numbers in Fig 2.2.2, refer to Appendix T2.2.2)

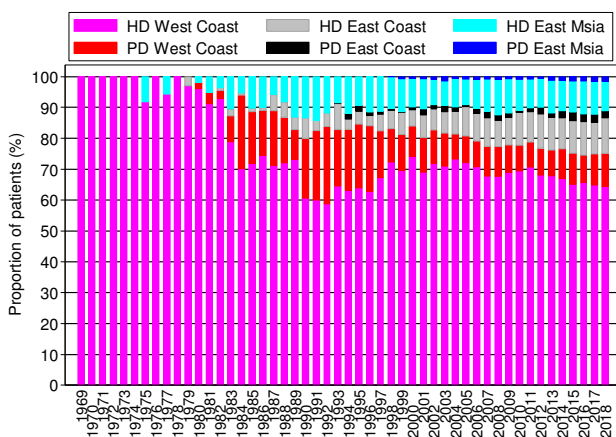
### 2.2.3: Growth in dialysis in Malaysia by region

Table 2.2.3: Distribution of Dialysis Patients by Modality and Region 2008-2018

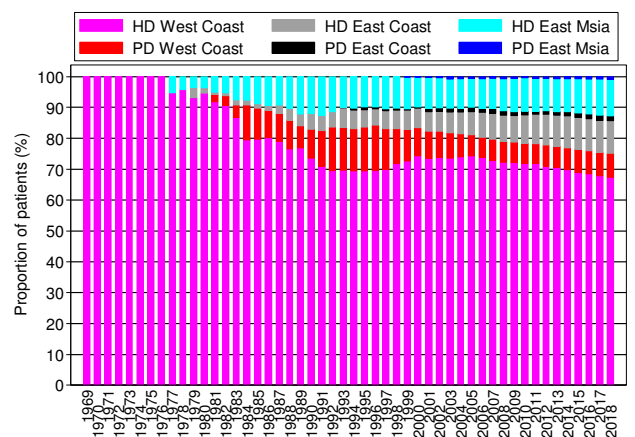
Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
New Dialysis patients	8431	8031	8090	8037	7618	6994	6696	6037	5276	4923	4606
% West Coast	75.0	74.8	74.4	75.0	76.6	76.2	76.9	78.7	77.7	77.8	77.3
% East Coast	13.9	12.9	13.6	13.5	12.3	12.1	13.1	11.1	11.4	10.5	10.3
% East Msia	11.1	12.3	12.1	11.5	11.1	11.8	10.0	10.2	10.8	11.7	12.4
New HD patients	7200	6896	7086	6901	6621	6211	5937	5422	4739	4375	4037
% West Coast	64.2	64.7	65.8	65.0	67.0	67.9	68.1	70.6	69.4	69.1	67.7
% East Coast	11.6	10.4	11.1	10.7	10.0	10.5	11.1	9.9	10.7	8.9	8.5
% East Msia	9.6	10.8	10.7	10.1	9.9	10.5	9.4	9.3	9.8	10.9	11.4
New PD patients	1231	1135	1004	1136	997	783	759	615	537	548	569
% West Coast	10.8	10.1	8.6	10.0	9.6	8.3	8.7	8.1	8.3	8.7	9.6
% East Coast	2.3	2.5	2.4	2.8	2.3	1.6	2.0	1.2	0.8	1.6	1.8
% East Msia	1.5	1.5	1.4	1.3	1.2	1.3	0.6	0.9	1.1	0.9	1.0
Dialysing at 31st Dec	44136	42355	40627	38028	35106	32321	29400	26442	23790	21641	19430
% West Coast	74.9	75.3	75.9	76.4	76.9	77.4	77.8	78.3	78.3	78.7	79.0
% East Coast	12.4	12.1	12.0	11.9	11.6	11.3	11.2	10.6	10.4	10.1	9.9
% East Msia	12.7	12.6	12.2	11.8	11.5	11.3	11.1	11.2	11.3	11.3	11.1
HD Dialysing at 31st Dec	39593	38061	36638	34236	31798	29451	26827	24260	21793	19750	17677
% West Coast	67.4	67.9	68.6	68.9	69.8	70.5	70.9	71.7	71.8	72.0	72.1
% East Coast	10.7	10.4	10.4	10.3	10.2	10.1	9.9	9.5	9.3	8.7	8.5
% East Msia	11.6	11.6	11.2	10.9	10.6	10.5	10.4	10.5	10.6	10.6	10.3
PD Dialysing at 31st Dec	4543	4294	3989	3792	3308	2870	2573	2182	1997	1891	1753
% West Coast	7.6	7.5	7.3	7.5	7.2	6.9	6.9	6.5	6.5	6.7	6.9
% East Coast	1.6	1.7	1.6	1.6	1.4	1.2	1.2	1.1	1.2	1.3	1.4
% East Msia	1.1	1.0	0.9	0.9	0.9	0.8	0.6	0.6	0.7	0.7	0.7

Figure 2.2.3: Distribution of Dialysis Patients by Modality and Region 1969-2018

(i) New Dialysis Patients



(ii) ESKD Patients at 31<sup>st</sup> December



(For actual numbers in Fig 2.2.3, refer to Appendix T2.2.3)

Table 2.2.3(a): Distribution of Dialysis Patients by Modality and Region 2008-2018

Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008
New Dialysis patients	8431	8031	8090	8037	7618	6994	6696	6037	5276	4923	4607
% West Coast	75	74.8	74.4	75	76.6	76.2	76.9	78.7	77.7	77.8	77.3
% East Coast	13.9	12.9	13.6	13.5	12.3	12.1	13.1	11.1	11.4	10.5	10.3
% East Msia	11.1	12.3	12.1	11.5	11.1	11.8	10	10.2	10.8	11.7	12.4
New HD patients	7200	6896	7086	6901	6621	6211	5937	5422	4739	4375	4038
% West Coast	75.2	75.4	75.1	75.7	77.1	76.4	76.9	78.6	77.2	77.8	77.3
% East Coast	13.6	12.1	12.7	12.4	11.5	11.8	12.6	11	11.9	10	9.7
% East Msia	11.2	12.6	12.2	11.8	11.4	11.8	10.6	10.4	10.9	12.2	13.1
New PD patients	1231	1135	1004	1136	997	783	759	615	537	548	569
% West Coast	73.7	71.5	69.1	70.5	73.4	74.1	77.1	79.7	81.9	77.7	77.5
% East Coast	15.8	17.6	19.6	20	17.5	14.6	17.3	11.9	7.6	14.4	14.6
% East Msia	10.6	10.9	11.3	9.5	9.1	11.4	5.7	8.5	10.4	7.8	7.9
Dialysing at 31st Dec	44136	42355	40627	38028	35106	32321	29400	26442	23790	21641	19430
% West Coast	74.9	75.3	75.9	76.4	76.9	77.4	77.8	78.3	78.3	78.7	79
% East Coast	12.4	12.1	12	11.9	11.6	11.3	11.2	10.6	10.4	10.1	9.9
% East Msia	12.7	12.6	12.2	11.8	11.5	11.3	11.1	11.2	11.3	11.3	11.1
HD Dialysing at 31st Dec	39593	38061	36638	34236	31798	29451	26827	24260	21793	19750	17677
% West Coast	75.1	75.5	76.1	76.5	77	77.3	77.7	78.2	78.3	78.9	79.3
% East Coast	12	11.6	11.5	11.4	11.3	11.1	10.9	10.3	10.1	9.5	9.4
% East Msia	12.9	12.9	12.4	12.1	11.7	11.6	11.4	11.5	11.6	11.6	11.3
PD Dialysing at 31st Dec	4543	4294	3989	3792	3308	2870	2573	2182	1997	1891	1753
% West Coast	73.7	73.8	74.1	75.3	76.3	77.5	78.5	79.1	77.7	76.5	76.4
% East Coast	15.8	16.3	16.3	16	14.4	13.9	14.2	13.2	13.8	15.4	15.4
% East Msia	10.6	9.9	9.6	8.8	9.2	8.6	7.3	7.7	8.5	8.1	8.2

(For actual numbers refer to Appendix T2.2.3a)

Table 2.2.4: Number and Prevalence Rate of Dialysis Patients (HD &amp; PD) in Malaysia by State and Sector, 2014-2018

State	Sector	Year 2014		Year 2015		Year 2016		Year 2017		Year 2018	
		N	PMP	N	PMP	N	PMP	N	PMP	N	PMP
Malaysia	Public	10784	358	11791	387	12641	409	13008	406	13253	409
	Private	16603	552	18245	598	19575	634	20763	648	22178	685
	NGO	7719	256	7992	262	8411	272	8584	268	8705	269
	Total	35106	1166	38028	1247	40627	1315	42355	1322	44136	1363
Johor	Public	1018	290	1108	312	1195	333	1214	328	1234	329
	Private	3091	879	3348	942	3642	1014	3969	1073	4167	1111
	NGO	1617	460	1666	469	1706	475	1709	462	1719	458
	Total	5726	1629	6122	1723	6543	1822	6892	1863	7120	1898
Kedah	Public	756	369	805	389	856	408	885	412	884	409
	Private	1285	628	1383	668	1501	715	1604	747	1712	791
	NGO	338	165	371	179	421	201	424	198	462	214
	Total	2379	1162	2559	1236	2778	1324	2913	1357	3058	1414
Kelantan	Public	590	349	708	412	788	452	805	440	843	453
	Private	454	268	515	300	550	315	602	329	660	355
	NGO	125	74	137	80	148	85	169	92	194	104
	Total	1169	691	1360	792	1486	852	1576	861	1697	912
Melaka	Public	325	377	338	387	355	402	332	363	334	362
	Private	737	854	791	906	831	940	894	977	980	1062
	NGO	187	217	198	227	220	249	224	245	232	252
	Total	1249	1448	1327	1520	1406	1591	1450	1585	1546	1676
Negeri Sembilan	Public	470	434	545	496	622	559	676	605	697	621
	Private	582	537	654	595	711	639	735	658	780	695
	NGO	586	541	580	528	578	519	583	522	599	533
	Total	1638	1512	1779	1619	1911	1717	1994	1785	2076	1849
Pahang	Public	781	489	833	513	870	527	880	534	894	537
	Private	554	347	628	387	686	416	745	452	834	501
	NGO	340	213	356	219	372	226	356	216	350	210
	Total	1675	1049	1817	1119	1928	1169	1981	1202	2078	1248
Perak	Public	871	355	989	399	1036	414	1028	412	1038	415
	Private	2016	821	2243	905	2348	939	2427	972	2576	1029
	NGO	515	210	530	214	531	212	543	218	553	221
	Total	3402	1386	3762	1518	3915	1565	3998	1602	4167	1665
Perlis	Public	105	431	106	431	100	402	94	373	89	351
	Private	82	337	100	407	100	402	110	436	119	469
	NGO	50	205	45	183	47	189	57	226	60	237
	Total	237	973	251	1021	247	993	261	1035	268	1057
Pulau Pinang	Public	475	289	483	290	493	293	478	274	452	256
	Private	1487	904	1551	933	1681	1001	1726	988	1764	1001
	NGO	786	478	808	486	868	517	891	510	870	494
	Total	2748	1671	2842	1709	3042	1811	3095	1772	3086	1751
Sarawak	Public	1026	394	1113	422	1252	469	1367	494	1429	512
	Private	478	183	556	211	596	223	672	243	749	268
	NGO	816	313	898	341	944	354	988	357	1008	361
	Total	2320	890	2567	974	2792	1046	3027	1094	3186	1141



State	Sector	Year 2014		Year 2015		Year 2016		Year 2017		Year 2018	
		N	PMP	N	PMP	N	PMP	N	PMP	N	PMP
Terengganu	Public	794	701	858	744	926	788	963	797	1014	826
	Private	224	198	256	222	274	233	318	263	391	318
	NGO	199	176	216	187	255	217	276	229	280	228
	Total	1217	1075	1330	1153	1455	1238	1557	1289	1685	1372
WP Labuan	Public	71	747	80	826	84	851	91	931	93	939
	Private	0	0	0	0	0	0	0	0	0	0
	NGO	0	0	0	0	0	0	0	0	0	0
	Total	71	747	80	826	84	851	91	931	93	939
WP Putrajaya	Public	16	187	17	193	21	231	21	242	19	195
	Private	18	211	21	238	22	242	26	299	29	298
	NGO	0	0	0	0	0	0	0	0	0	0
	Total	34	398	38	431	43	473	47	541	48	493
WP Kuala Lumpur	Public	760	434	818	463	874	490	917	512	909	507
	Private	1337	764	1490	843	1592	892	1663	928	1765	985
	NGO	771	441	771	436	828	464	825	461	792	442
	Total	2868	1639	3079	1742	3294	1846	3405	1901	3466	1934
Selangor	Public	1553	268	1701	290	1725	290	1753	275	1760	272
	Private	3995	689	4381	746	4648	782	4815	755	5153	796
	NGO	1183	204	1206	205	1268	213	1290	202	1326	205
	Total	6731	1161	7288	1241	7641	1285	7858	1232	8239	1273
Sabah	Public	1173	337	1289	364	1444	401	1504	389	1564	401
	Private	263	75	328	93	393	109	457	118	499	128
	NGO	206	59	210	59	225	62	249	64	260	67
	Total	1642	471	1827	516	2062	572	2210	571	2323	596

(For actual numbers refer to Appendix T2.2.2)