

## **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 2007-2017

Year	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
New Dialysis patients	7996	8083	8033	7621	6993	6695	6039	5277	4924	4607	4076
Died	5943	5401	5004	4726	4011	3648	3292	3050	2599	2192	1985
Transplanted	101	71	100	90	73	79	103	98	111	110	90
Lost to Follow-up	49	41	42	48	27	34	35	33	21	7	10
Dialysing at 31 <sup>st</sup> December	42109	40508	37954	35058	32283	29375	26422	23776	21633	19420	17110

Table 2.1.1(a): Stock and flow - HD Patients, Malaysia 2007-2017

Year	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
New Dialysis patients	6862	7080	6901	6625	6209	5936	5424	4740	4375	4038	3559
Died	5168	4670	4373	4150	3539	3252	2918	2697	2278	1915	1755
Transplanted	93	65	90	76	56	65	86	87	96	89	72
Lost to Follow-up	47	39	41	47	27	34	33	30	20	7	9
Dialysing at 31 <sup>st</sup> December	37832	36530	34170	31755	29417	26804	24242	21782	19744	17669	15560

Table 2.1.1(b): Stock and flow - PD Patients, Malaysia 2007-2017

Year	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
New Dialysis patients	1134	1003	1132	996	784	759	615	537	549	569	517
Died	775	731	631	576	472	396	374	353	321	277	230
Transplanted	8	6	10	14	17	14	17	11	15	21	18
Lost to Follow-up	2	2	1	1	0	0	2	3	1	0	1
Dialysing at 31 <sup>st</sup> December	4277	3978	3784	3303	2866	2571	2180	1994	1889	1751	1550

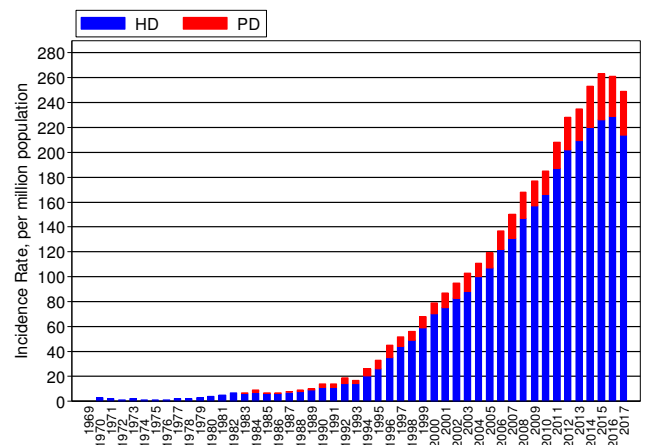
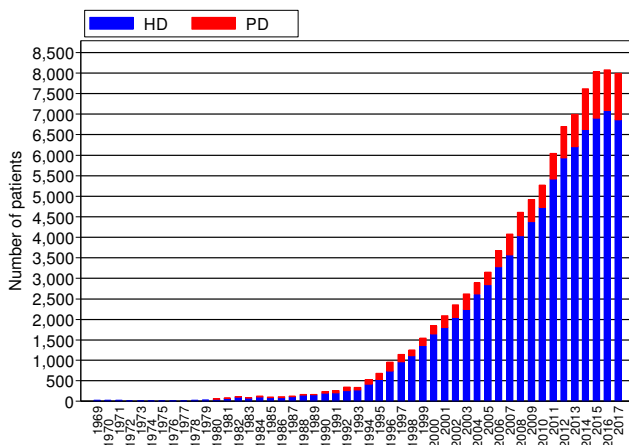
(For actual numbers refer to Appendix T2.1.1)

Figure 2.1.1: New Dialysis (Hemodialysis & Chronic PD) Incidence Rate per Million Population, Malaysia 1969-2017

(For actual numbers refer to Appendix T1.1.1)

(a) Number of New Dialysis Incidence, Malaysia 1969-2017

(b) New Dialysis Incidence Rates, Malaysia 1969-2017



### 2.1.2.: Geographic distribution

There were a total of 7,996 new dialysis patients in 2017 with 6,862 new HD and 1,134 new PD patients. The highest number of new dialysis patients was in Selangor with 1,439 while the lowest was Perlis with only 42 new dialysis patients. However, in terms of dialysis acceptance rate, WP came up top with 392 pmp, and followed by Negeri Sembilan, Johor and Pulau Pinang (>300 pmp). Terengganu has 282 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 226 pmp, which was among the lowest 6 states. Perlis, Sarawak, Kelantan and Sabah were the 4 states with lowest acceptance rate (all below 200 pmp) and Sabah was only 118 pmp (Appendix T2.1.2a)

Table 2.1.2(a): Dialysis Treatment and Rate by Centre state, per million population 2007-2017

Year	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Johor	336	346	317	335	307	299	285	228	227	235	192
Kedah	283	285	271	277	266	233	195	152	146	161	129
Kelantan	174	222	213	138	136	162	128	98	111	94	90
Melaka	297	312	333	332	303	267	273	222	219	226	202
Negeri Sembilan	361	359	343	355	266	299	267	271	249	234	202
Pahang	225	224	248	242	206	222	174	172	130	131	113
Perak	282	283	341	286	276	273	266	240	221	203	188
Perlis	167	177	191	205	182	192	156	102	129	143	97
Pulau Pinang	324	364	321	342	322	338	307	273	252	206	214
Sabah WP Labuan	118	139	121	107	117	104	91	89	91	93	66
Sarawak	193	179	188	181	164	126	124	115	118	117	107
Selangor	226	244	271	263	227	233	207	179	175	164	150
Terengganu	282	287	269	278	265	245	185	180	144	134	165
WP Kuala Lumpur	392	384	373	337	367	320	338	330	277	240	248

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

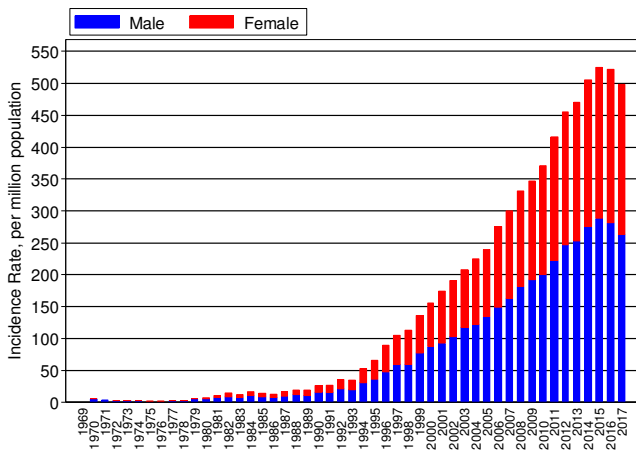
### 2.1.3: Gender distribution

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 2007-2017

Year	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Male	263	281	288	275	253	247	222	200	192	182	163
Female	235	241	237	230	217	208	194	171	155	149	137

Figure 2.1.3(a): Dialysis Treatment Rate by Gender 1969-2017



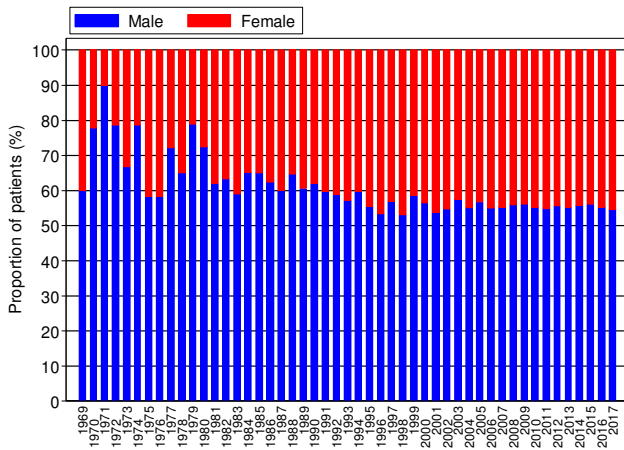
(For actual numbers in Fig 2.1.3a, refer to Appendix T2.1.3a)

Table 2.1.3(b): Gender Distribution of Dialysis Patients 2007-2017

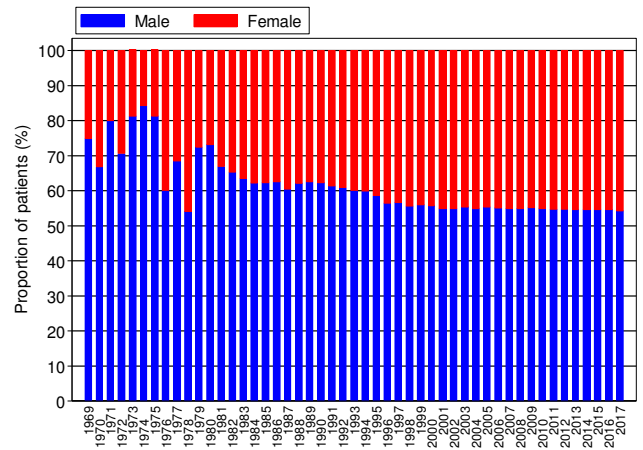
Year	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
New Dialysis patients	7996	8083	8033	7621	6993	6695	6039	5277	4924	4607	4076
% Male	54.5	55.2	56.2	55.8	55.3	55.7	54.9	55.3	56.2	55.9	55.3
% Female	45.5	44.8	43.8	44.2	44.7	44.3	45.1	44.7	43.8	44.1	44.7
ESKD patients at 31st December	42109	40508	37954	35058	32283	29375	26422	23776	21633	19420	17110
% Male	54.3	54.6	54.6	54.6	54.6	54.7	54.7	55	55.2	55	54.9
% Female	45.7	45.4	45.4	45.4	45.4	45.3	45.3	45	44.8	45	45.1

Figure 2.1.3(b): Gender Distribution of Dialysis Patients 1969-2017

(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)

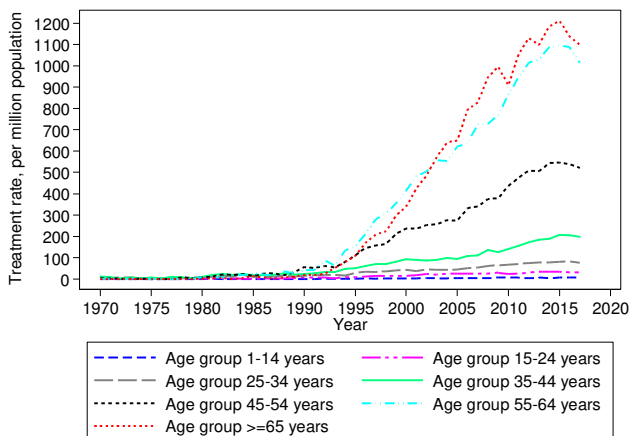
### 2.1.4: Age distribution

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 2017. 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 2007-2017

Year	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
$\leq 14$	6	6	6	4	6	5	6	6	7	5	5
15-24	30	31	34	35	35	29	26	23	30	25	26
25-34	77	82	81	79	79	75	71	68	64	62	55
35-44	198	206	207	189	184	172	156	140	126	137	111
45-54	521	539	546	544	507	509	475	436	379	375	341
55-64	1014	1087	1096	1087	1030	1015	946	865	767	729	725
$\geq 65$	1099	1138	1212	1184	1098	1130	1055	908	996	947	828

Figure 2.1.4(a): Dialysis Treatment Rate by Age Group 1969-2017



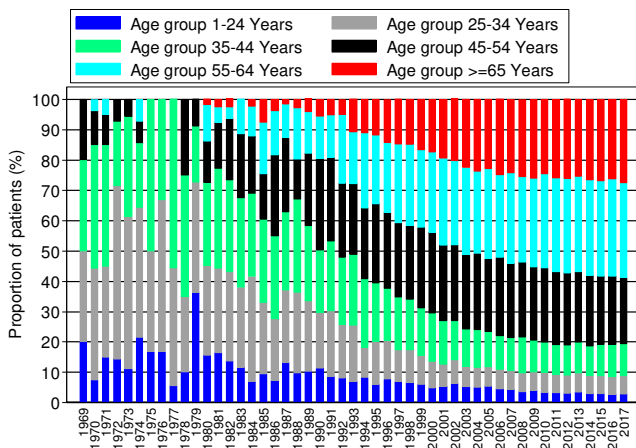
(For actual numbers in Fig 2.1.4a, refer to Appendix T2.1.4a)

Table 2.1.4(b): Percentage Age Distribution of Dialysis Patients 2007-2017

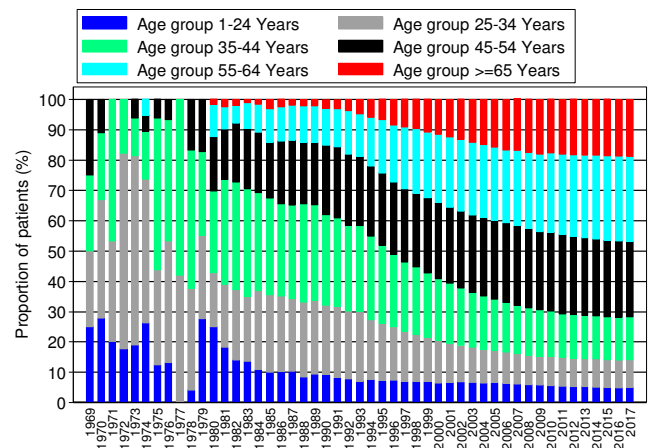
Year	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
New Dialysis patients	7996	8083	8033	7621	6993	6695	6039	5277	4924	4607	4076
% ≤24	2.9	2.7	3	3	3.5	3.1	3.2	3.4	4.1	3.6	4.3
% 25-34	5.8	5.8	5.7	5.8	6.1	5.9	6	6.4	6	6.1	6.2
% 35-44	10.6	10.6	10.4	9.8	10.2	9.9	9.8	10	10.4	11.9	10.8
% 45-54	21.9	22.6	22.6	23.3	23.3	23.9	24.1	24.7	24.2	24.8	24.7
% 55-64	31.3	32.1	31.4	31.6	31.5	31.2	31	31	29.3	28.1	29.8
% ≥ 65	27.5	26.2	26.9	26.4	25.4	26.1	25.8	24.5	25.9	25.4	24.2
ESKD patients at 31st December	42109	40508	37954	35058	32283	29375	26422	23776	21633	19420	17110
% ≤24	5	4.9	5	5.1	5.2	5.3	5.4	5.7	5.8	5.9	6.2
% 25-34	9.2	9.2	9.2	9.3	9.3	9.3	9.4	9.5	9.4	9.7	10
% 35-44	14	14	14	14	14.1	14.2	14.4	14.9	15.2	15.6	15.9
% 45-54	25	25.2	25.4	25.6	25.8	26	26.2	26.1	26	26.1	26.1
% 55-64	27.9	27.9	27.7	27.4	27.1	26.9	26.6	26.2	25.6	25.2	25
% ≥ 65	18.9	18.7	18.8	18.6	18.4	18.4	18	17.7	18	17.6	17

Figure 2.1.4(b): Age Distribution of Dialysis Patients 1969-2017

(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 2017. 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 patients on home dialysis (both PD and HD) was 15% in 2017 (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).

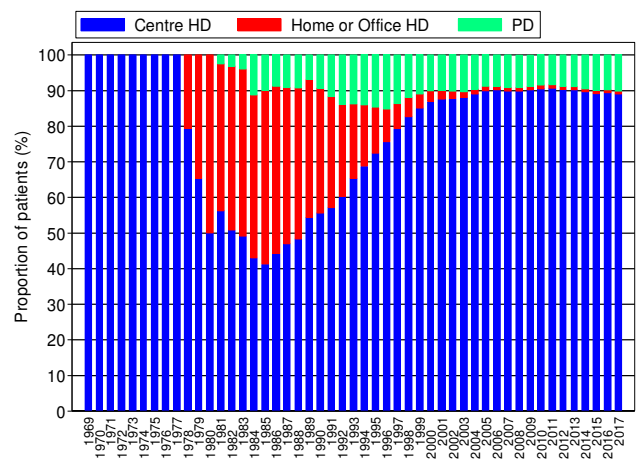
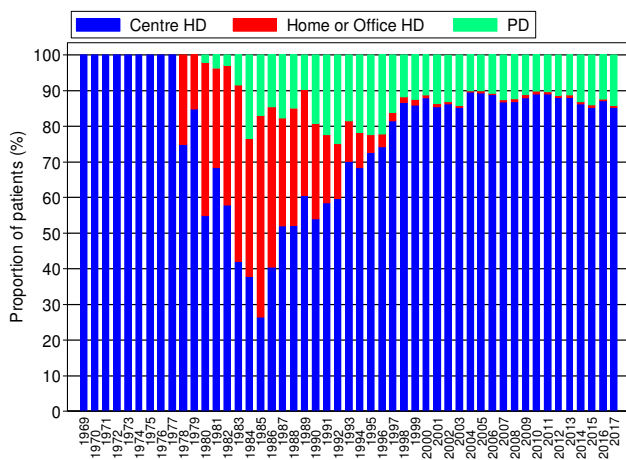
Table 2.1.5: Method and Location of Dialysis Patients 2007-2017

Year	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
New Dialysis patients	7996	8083	8033	7621	6993	6695	6039	5277	4924	4607	4076
% Centre HD	85.2	87.1	85.2	86.2	88.1	88.1	89	89	87.9	86.9	86.7
% Home and office HD	0.6	0.5	0.7	0.7	0.7	0.6	0.8	0.9	1	0.8	0.6
% PD	14.2	12.4	14.1	13.1	11.2	11.3	10.2	10.2	11.1	12.4	12.7
ESKD patients at 31st December	42109	40508	37954	35058	32283	29375	26422	23776	21633	19420	17110
% Centre HD	89.1	89.4	89.2	89.7	90.2	90.3	90.7	90.6	90.2	89.9	89.9
% Home and office HD	0.8	0.8	0.9	0.9	0.9	0.9	1	1	1	1	1
% PD	10.2	9.8	10	9.4	8.9	8.8	8.3	8.4	8.7	9	9.1

Figure 2.1.5: Method and Location of Dialysis Patients 1969-2017

(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 1969-2017 (To be updated later)**

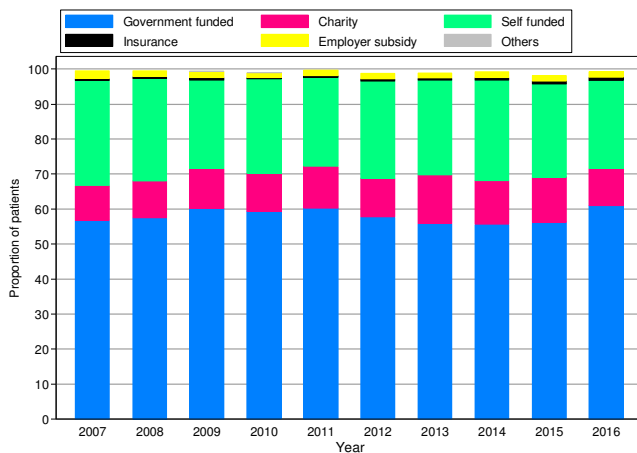
Table 2.1.6: Funding for Dialysis Treatment 2007-2016

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

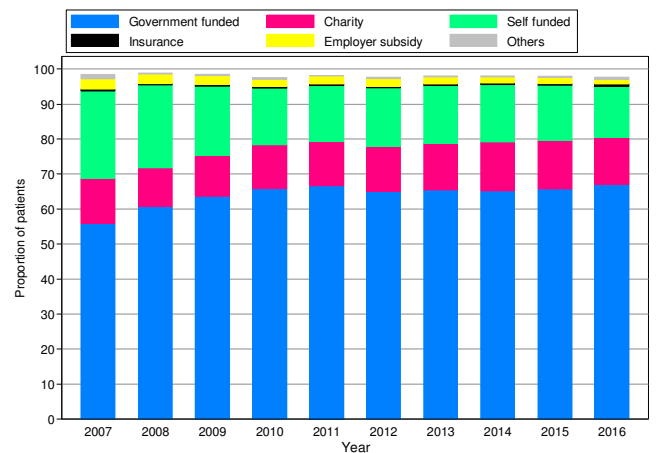
**Figure 2.1.6: Funding for Dialysis Treatment 1969-2017 (To be updated later)**

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

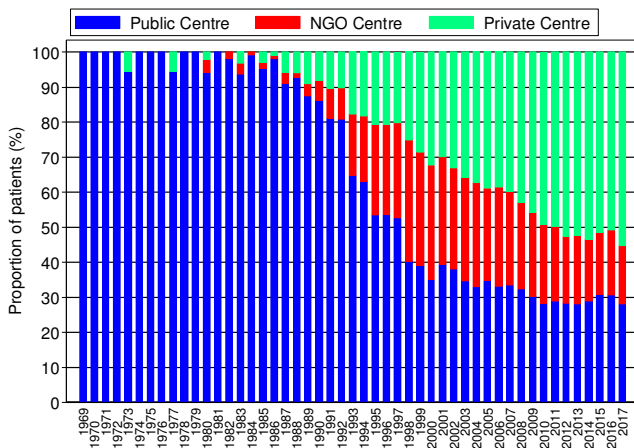
The proportion of new dialysis patients accepted into private dialysis centres continue to increase, NGO centres declined, while MOH remained at 28-30% since 2009. In 2017, the private sector provided dialysis to 55.2% of new patients and 49.2% of prevalent dialysis patients, while the government centres only account for 28% of incident and 30% of prevalent dialysis patients (Table 2.1.7) .

Table 2.1.7: Distribution of Dialysis Patients by Sector 2007-2017

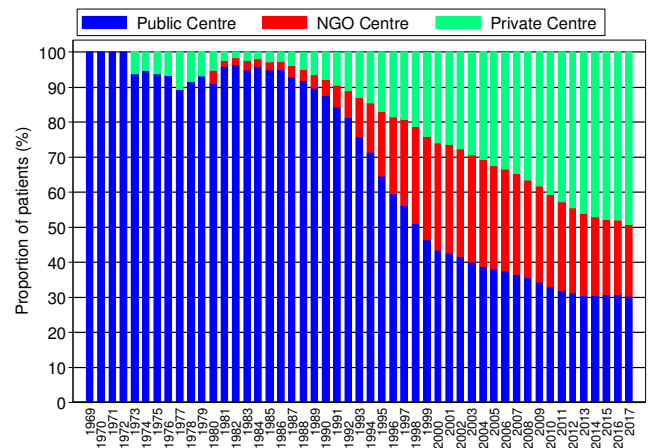
Year	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
New Dialysis patients	7996	8083	8033	7621	6993	6695	6039	5277	4924	4607	4076
% Government centre	28.1	30.7	30.9	28.9	28.1	28.4	28.9	28.4	30.2	32.3	33.4
% NGO centre	16.7	18.5	17.7	17.7	19.6	19	21.3	22.3	24.1	24.9	26.8
% Private centre	55.2	50.8	51.4	53.4	52.3	52.6	49.8	49.2	45.7	42.8	39.8
ESKD patients at 31st December	42109	40508	37954	35058	32283	29375	26422	23776	21633	19420	17110
Government centre	30.3	30.8	30.8	30.6	30.6	31.3	31.8	32.9	34.3	35.5	36.6
% NGO centre	20.5	21.1	21.4	22.3	23.4	24.2	25.5	26.3	27.3	28	28.8
% Private centre	49.2	48.1	47.8	47.1	46	44.5	42.7	40.8	38.4	36.5	34.6

Figure 2.1.7: Distribution of Dialysis Patients by Sector 1969-2017

(i) New Dialysis Patients



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



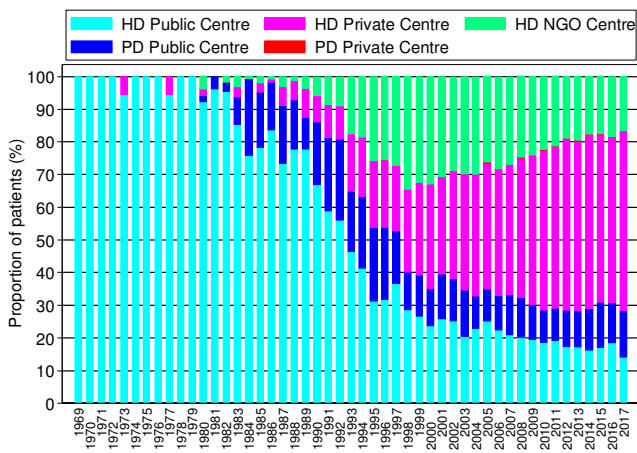
(For actual numbers in Fig 2.1.7, refer to Appendix T2.1.7)

Table 2.1.7(a): Distribution of Dialysis Patients by Modality and Sector 2007-2017

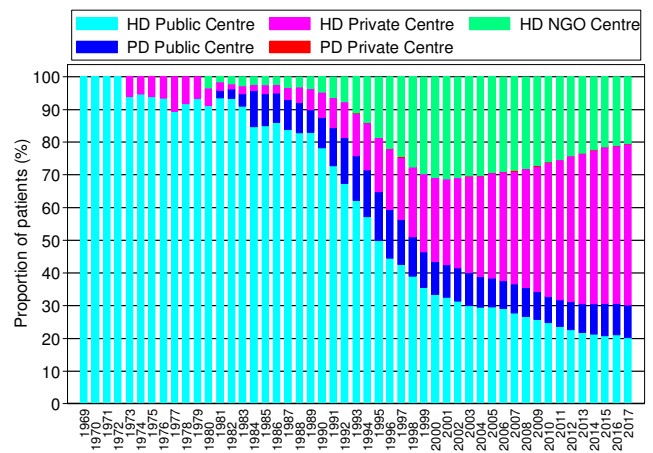
Year	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
New Dialysis patients	7996	8083	8033	7621	6993	6695	6039	5277	4924	4607	4076
% Public Centre	28.1	30.7	30.9	28.9	28.1	28.4	28.9	28.4	30.2	32.3	33.4
% HD Public Centre	14.1	18.4	17	16.1	17.1	17.3	19.1	18.5	19.3	20.2	21
% PD Public Centre	14	12.3	14	12.8	11	11.1	9.9	9.9	10.9	12.1	12.4
% NGO	16.7	18.5	17.7	17.7	19.6	19	21.3	22.3	24.1	24.9	26.8
% Private Centre	55.2	50.8	51.4	53.4	52.3	52.6	49.8	49.2	45.7	42.8	39.8
% HD Private Centre	55	50.7	51.3	53.2	52.1	52.4	49.5	49	45.5	42.6	39.5
%PD Private Centre	0.2	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.3	0.2
ESKD patients at 31st December	42109	40508	37954	35058	32283	29375	26422	23776	21633	19420	17110
% Public Centre	30.3	30.8	30.8	30.6	30.6	31.3	31.8	32.9	34.3	35.5	36.6
% HD Public Centre	20.2	21.1	20.9	21.3	21.8	22.7	23.7	24.7	25.7	26.6	27.7
% PD Public Centre	10.1	9.7	9.9	9.3	8.8	8.6	8.1	8.2	8.5	8.8	8.9
% NGO	20.5	21.1	21.4	22.3	23.4	24.2	25.5	26.3	27.3	28	28.8
% Private Centre	49.2	48.1	47.8	47.1	46	44.5	42.7	40.8	38.4	36.5	34.6
% HD Private Centre	49.1	48	47.7	47	45.9	44.4	42.6	40.7	38.3	36.3	34.4
%PD Private Centre	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2

Figure 2.1.7(a): Distribution of Dialysis Patients by Modality and Sector 1969-2017

(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)

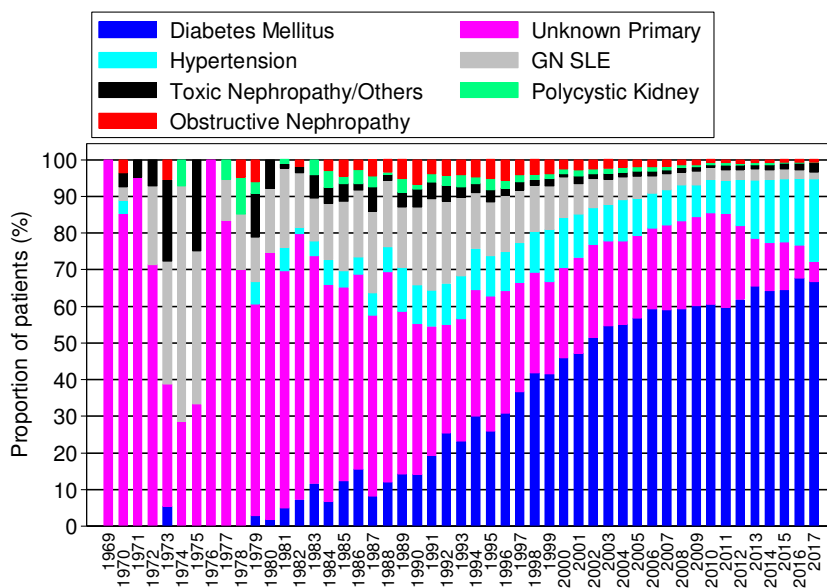
### 2.1.8: Primary renal disease

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 3% of new patients. The percentage of patients with unknown primary renal disease continues to see a positive declining trend over the years reaching a low of <10% in 2017 (Figure 2.1.8).

Table 2.1.8: Primary Renal Diseases for New Dialysis Patients 2007-2017

Year	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
New Dialysis patients	7996	8083	8033	7621	6993	6695	6039	5277	4924	4607	4076
% Unknown cause	5.3	8.9	13	13	13.1	20.1	25.4	24.9	24	23.8	23.1
% Diabetes Mellitus	66.8	67.7	64.4	64.2	65.4	61.9	59.8	60.5	60.3	59.4	59.1
% GN/SLE	1.9	2.4	2.8	2.7	3	2.7	3	3.3	3.5	3.4	4.3
% Polycystic kidney	0.3	0.4	0.4	0.5	0.5	0.5	0.7	0.5	0.6	0.8	0.9
% Obstructive Nephropathy	0.8	0.8	0.8	1	1	1.2	1	1.1	1.5	1.5	1.9
% Toxic Nephropathy	0.5	0.5	0.3	0.4	0.3	0.3	0.3	0.2	0.3	0.3	0.2
% Hypertension	22.5	18.1	17.2	17.2	15.8	12.4	8.9	9	8.9	9.9	9.6
% Others	2.1	1.3	1.2	1	0.9	0.8	0.9	0.6	0.9	0.9	0.8

Figure 2.1.8: Primary Renal Diseases for New Dialysis Patients 1969-2017



(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 2017.

### 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 from 865 in 2007 to 943 in 2017 giving a density rate of 32 dialysis centres pmp in 2007 and 29 pmp in 2017 (Appendix T2.2.1). The increase in dialysis centres was mainly contributed by the private dialysis centres with density of 16 pmp in 2017 (Appendix T2.2.1). However, the trend seemed to be declining since 2007 (18 pmp). Density of NGO centres in the same interval decreased from 7 pmp to 6 pmp while public dialysis centres' density decreased from 8 pmp in 2007 to 7 pmp in 2017 (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 2007-2017

Year	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Public Centres	227	227	226	226	226	225	224	224	223	219	219
NGO Centres	188	187	186	186	184	184	184	183	182	181	180
Private Centres	528	518	514	511	512	506	503	503	499	487	466
HD Centres											
Public HD Centres	187	187	187	187	187	186	186	186	186	186	186
NGO HD Centres	188	187	186	186	184	184	184	183	182	181	180
Private HD Centres	519	509	506	502	501	494	490	489	485	473	454
PD Centres											
Public PD Centres	40	40	39	39	39	39	38	38	37	33	33
Private PD Centres	9	9	8	9	11	12	13	14	14	14	12

Figure 2.2.1(a): Number of Dialysis Centre in Malaysia by Sector, 1969-2017

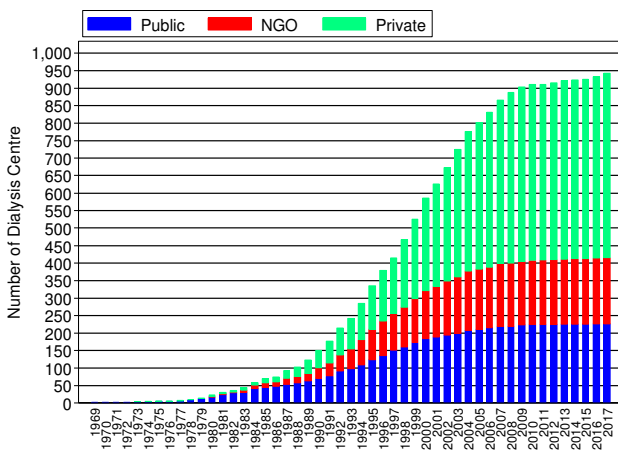
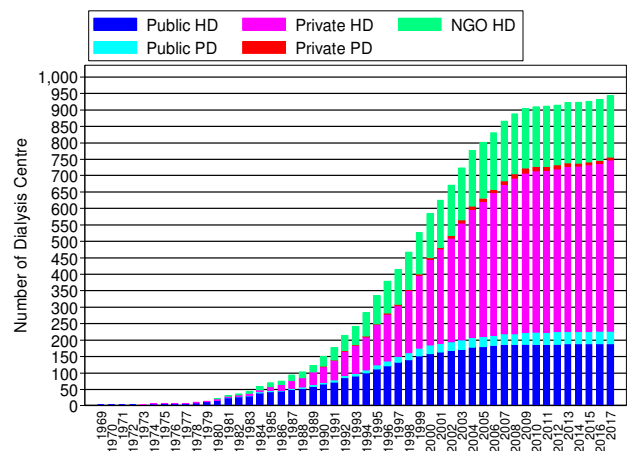


Figure 2.2.1(b): Number of HD and PD Centre in Malaysia by Sector, 1969-2017



(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 31 pmp in 2007 to 28 pmp in 2017. Of the 49 PD centres recorded in 2017, 40 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 17,110 (629 pmp) in 2007 to 42,109 (1,314 pmp) in 2017. While the increase in the number of patients in the NGO and public sectors were roughly double from 2007 to 2017, the number of patients in the private centres increased almost 4 folds. (Appendix T2.2.2).

In contrast to the economically advantaged West Coast states (except Kedah), 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). There are proportionally more PD patients in the East Coast compare to the West Coast. Proportion of new PD patients was 19.5% in the East Coast compare to 13.5% in the West Coast (Appendix T2.2.3). This is likely due to the government policy of increasing access to dialysis in the rural area.

Table 2.2.2: Number and Prevalence Rate of Dialysis (HD+PD), HD and PD Patients in Malaysia by State and Sector, 2007-2017

Year	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Dialysis patients, pmp											
Public	398	404	384	356	332	313	290	274	266	250	230
NGO	269	276	266	260	255	242	233	219	212	198	181
Private	647	632	595	549	500	446	390	340	298	257	218
HD patients, pmp											
Public	266	277	260	248	237	227	216	205	200	188	174
NGO	269	276	266	260	255	242	233	219	212	198	181
Private	645	630	594	548	498	445	388	338	297	256	217
PD patients, pmp											
Public	132	128	123	109	95	86	74	68	66	62	56
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, 1969-2017

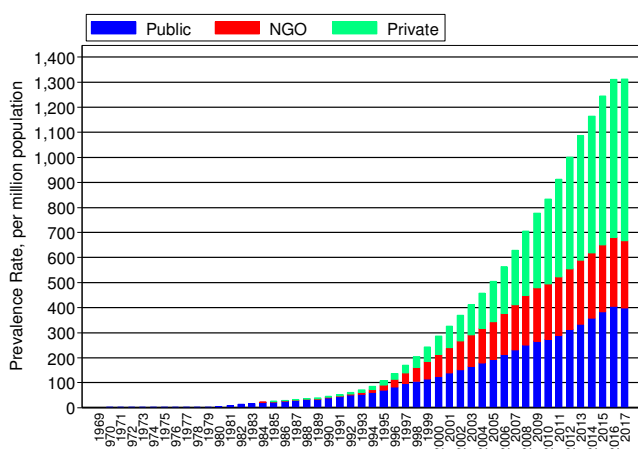
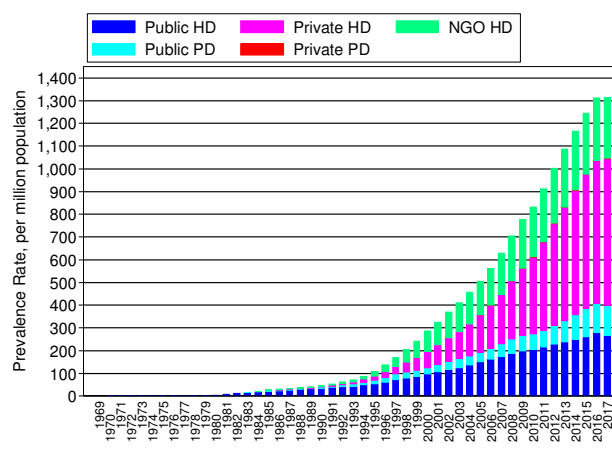


Figure 2.2.2(b): Prevalence Rate of HD and PD Patient in Malaysia by Sector, 1969-2017



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

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

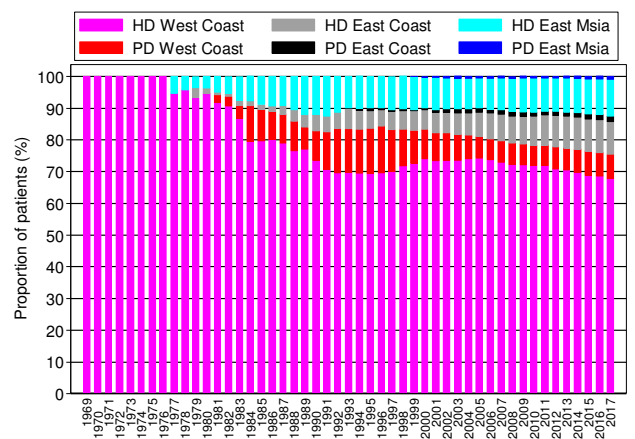
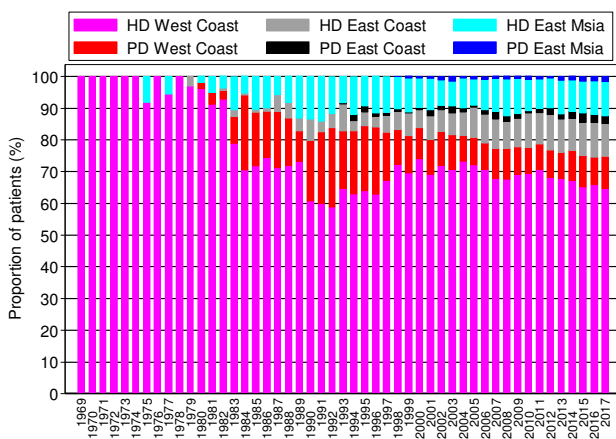
Table 2.2.3: Distribution of Dialysis Patients by Modality and Region 2007-2017

Year	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
New Dialysis patients	7996	8083	8033	7621	6993	6695	6039	5277	4924	4607	4076
West Coast	74.7	74.4	75.1	76.7	76.1	76.9	78.7	77.7	77.8	77.3	77.4
East Coast	12.9	13.5	13.4	12.3	12.1	13.1	11.1	11.4	10.5	10.3	11.5
East Msia	12.4	12.1	11.5	11.1	11.8	10	10.2	10.8	11.8	12.4	11.2
New HD patients	6862	7080	6901	6625	6209	5936	5424	4740	4375	4038	3559
West Coast	64.6	65.8	65.1	67.1	67.8	68.1	70.6	69.4	69.1	67.7	67.8
East Coast	10.4	11.1	10.6	10	10.5	11.1	9.9	10.7	8.9	8.5	9.2
East Msia	10.8	10.7	10.1	9.9	10.5	9.4	9.3	9.8	10.9	11.5	10.3
New PD patients	1134	1003	1132	996	784	759	615	537	549	569	517
West Coast	10.1	8.6	9.9	9.6	8.3	8.7	8.1	8.3	8.7	9.6	9.6
East Coast	2.5	2.4	2.8	2.3	1.6	2	1.2	0.8	1.6	1.8	2.3
East Msia	1.6	1.4	1.4	1.2	1.3	0.6	0.9	1.1	0.9	1	0.9
Dialysing at 31st Dec	42109	40508	37954	35058	32283	29375	26422	23776	21633	19420	17110
West Coast	75.3	75.9	76.4	76.9	77.3	77.8	78.3	78.3	78.6	79	79.6
East Coast	12.6	12.2	11.8	11.5	11.3	11.1	11.2	11.3	11.3	11.1	10.6
East Msia	67.8	68.6	68.9	69.8	70.5	70.9	71.8	71.8	72	72.1	72.8
HD Dialysing at 31st Dec	37832	36530	34170	31755	29417	26804	24242	21782	19744	17669	15560
West Coast	10.4	10.4	10.2	10.2	10.1	9.9	9.5	9.2	8.7	8.5	8.4
East Coast	11.6	11.2	10.9	10.6	10.6	10.4	10.5	10.6	10.6	10.3	9.8
East Msia	7.5	7.3	7.5	7.2	6.9	6.9	6.5	6.5	6.7	6.9	6.9
PD Dialysing at 31st Dec	4277	3978	3784	3303	2866	2571	2180	1994	1889	1751	1550
West Coast	1.7	1.6	1.6	1.4	1.2	1.2	1.1	1.2	1.4	1.4	1.4
East Coast	1	1	0.9	0.9	0.8	0.6	0.6	0.7	0.7	0.7	0.8
East Msia	12.1	12	11.8	11.6	11.3	11.2	10.6	10.4	10	9.9	9.7

Figure 2.2.3: Distribution of Dialysis Patients by Modality and Region 1969-2017

(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 2.2.4: Number and Prevalence Rate of Dialysis Patients (HD &amp; PD) in Malaysia by State and Sector, 2013-2017

State	Sector	Year 2013		Year 2014		Year 2015		Year 2016		Year 2017	
		N	PMP	N	PMP	N	PMP	N	PMP	N	PMP
Malaysia	Public	9870	332	10721	356	11693	384	12478	404	12751	398
	Private	14847	500	16519	549	18153	595	19500	632	20725	647
	NGO	7566	255	7818	260	8108	266	8530	276	8633	269
	Total	32283	1087	35058	1165	37954	1245	40508	1312	42109	1314
Johor	Public	948	273	1006	286	1092	307	1174	327	1176	318
	Private	2732	786	3094	880	3352	943	3660	1019	4000	1081
	NGO	1551	446	1618	460	1668	469	1695	472	1680	454
	Total	5231	1505	5718	1626	6112	1719	6529	1818	6856	1853
Kedah	Public	663	328	747	365	791	382	826	394	836	390
	Private	1145	567	1277	624	1379	666	1499	714	1610	750
	NGO	331	164	347	170	385	186	443	211	450	210
	Total	2139	1059	2371	1159	2555	1234	2768	1319	2896	1350
Kelantan	Public	558	335	589	348	700	407	774	444	791	432
	Private	433	260	453	268	513	299	551	316	600	328
	NGO	118	71	126	74	140	81	152	87	171	93
	Total	1109	666	1168	690	1353	787	1477	847	1562	853
Melaka	Public	295	346	323	374	337	386	353	399	325	355
	Private	653	766	737	854	788	903	822	930	886	969
	NGO	194	228	186	216	195	223	216	244	217	237
	Total	1142	1340	1246	1444	1320	1512	1391	1573	1428	1561
Negeri Sembilan	Public	421	393	467	431	540	492	612	550	648	580
	Private	514	480	581	536	656	597	711	639	742	664
	NGO	544	508	583	538	576	524	576	517	587	525
	Total	1479	1381	1631	1505	1772	1613	1899	1706	1977	1769
Pahang	Public	720	458	776	486	824	508	860	521	861	522
	Private	451	287	552	345	626	386	682	413	748	454
	NGO	308	196	342	214	358	221	371	225	355	215
	Total	1479	941	1670	1045	1808	1115	1913	1159	1964	1191
Perak	Public	764	314	857	349	965	389	1001	400	986	395
	Private	1865	765	1982	807	2205	890	2305	922	2381	954
	NGO	566	232	560	228	582	235	594	238	604	242
	Total	3195	1311	3399	1384	3752	1514	3900	1560	3971	1591
Perlis	Public	104	431	105	431	106	431	100	402	92	365
	Private	65	269	83	341	101	411	102	410	114	452
	NGO	45	186	50	205	45	183	48	193	56	222
	Total	214	886	238	977	252	1025	250	1005	262	1039
Pulau Pinang	Public	454	279	471	286	478	287	484	288	465	266
	Private	1363	837	1491	906	1552	933	1681	1001	1740	996
	NGO	779	478	789	479	810	487	872	519	875	501
	Total	2596	1594	2751	1671	2840	1707	3037	1808	3080	1763
Sarawak	Public	913	354	1024	393	1111	421	1249	468	1363	492
	Private	407	158	473	182	553	210	595	223	677	245
	NGO	740	287	823	316	903	343	950	356	984	356
	Total	2060	799	2320	891	2567	974	2794	1047	3024	1093

State	Sector	Year 2013		Year 2014		Year 2015		Year 2016		Year 2017	
		N	PMP	N	PMP	N	PMP	N	PMP	N	PMP
Terengganu	Public	705	634	793	700	858	744	924	786	963	797
	Private	204	183	222	196	255	221	273	232	318	263
	NGO	167	150	200	177	217	188	259	220	278	230
	Total	1076	967	1215	1073	1330	1153	1456	1238	1559	1290
WP Labuan	Public	60	643	70	736	78	806	82	831	89	911
	Private	0	0	0	0	0	0	0	0	0	0
	NGO	0	0	0	0	0	0	0	0	0	0
	Total	60	643	70	736	78	806	82	831	89	911
WP Putrajaya	Public	14	170	16	187	16	181	20	220	19	219
	Private	13	158	16	187	19	215	20	220	23	265
	NGO	0	0	0	0	0	0	0	0	0	0
	Total	27	328	32	374	35	396	40	440	42	484
WP Kuala Lumpur	Public	743	429	758	433	818	463	874	490	914	510
	Private	1250	722	1351	772	1514	856	1624	910	1693	945
	NGO	793	458	771	441	768	434	821	460	814	454
	Total	2786	1609	2880	1646	3100	1753	3319	1860	3421	1909
Selangor	Public	1405	245	1544	266	1687	287	1703	286	1719	269
	Private	3520	615	3942	680	4308	733	4576	770	4731	741
	NGO	1231	215	1220	210	1255	214	1314	221	1325	208
	Total	6156	1075	6706	1156	7250	1234	7593	1277	7775	1218
Sabah	Public	1103	322	1175	337	1292	365	1442	400	1504	389
	Private	232	68	265	76	332	94	399	111	462	119
	NGO	199	58	203	58	206	58	219	61	237	61
	Total	1534	448	1643	471	1830	517	2060	572	2203	569

(For actual numbers in Table 2.2.4, refer to Appendix T2.2.2)