

CHAPTER 2

DIALYSIS IN MALAYSIA

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SECTION 2.1: PROVISION OF DIALYSIS IN MALAYSIA

2.1.1: Dialysis treatment provision

Table 2.1.1: Stock and flow - Dialysis Patients, Malaysia 2012-2022

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
New Dialysis patients	9592	9352	9465	9496	8552	8089	8111	8046	7628	7000	6698
Died	8018	9094	6358	6495	6153	5949	5402	5003	4728	4013	3647
Transplanted	177	60	139	130	81	101	71	99	90	73	79
Lost to Follow-up	38	35	36	38	57	39	32	35	46	25	34
Dialysing at 31st December	51256	50340	50376	47569	44919	42763	40837	38167	35193	32378	29452

Table 2.1.1(a): Stock and flow - HD Patients, Malaysia 2012-2022

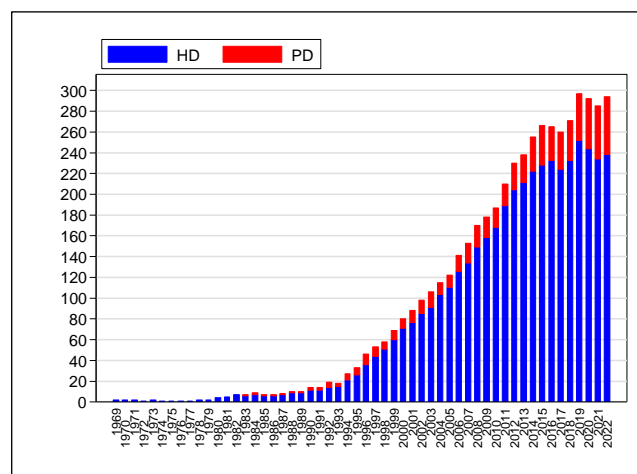
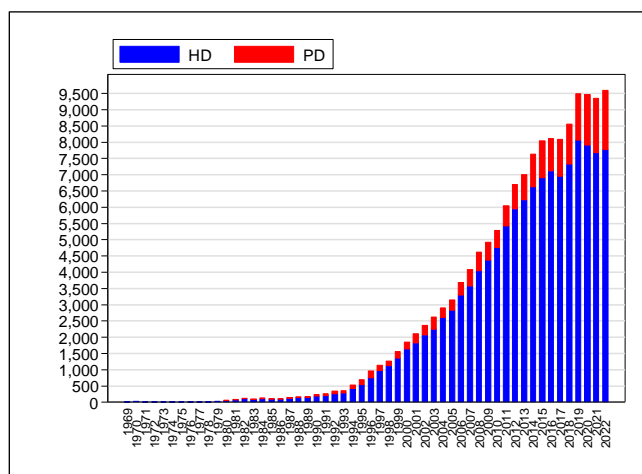
Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
New Dialysis patients	7768	7668	7901	8062	7323	6956	7104	6909	6631	6216	5937
Died	6836	7926	5476	5602	5334	5174	4671	4372	4152	3542	3252
Transplanted	145	52	112	103	56	93	65	89	76	56	65
Lost to Follow-up	36	27	33	35	50	37	30	34	45	25	34
Dialysing at 31st December	45045	44443	44853	42581	40343	38464	36850	34378	31889	29513	26881

Table 2.1.1(b): Stock and flow - PD Patients, Malaysia 2012-2022

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
New Dialysis patients	1824	1684	1564	1434	1229	1133	1007	1137	997	784	761
Died	1182	1168	882	893	819	775	731	631	576	471	395
Transplanted	32	8	27	27	25	8	6	10	14	17	14
Lost to Follow-up	2	8	3	3	7	2	2	1	1	0	0
Dialysing at 31st December	6211	5897	5523	4988	4576	4299	3987	3789	3304	2865	2571

Figure 2.1.1: New Dialysis (Hemodialysis & Chronic PD) Incidence Rate per Million Population, Malaysia 1969-2022

(a) Number of New Dialysis Incidence, Malaysia 1969-2022 (b) New Dialysis Incidence Rates, Malaysia 1969-2022



(For actual numbers refer to Appendix T1.1.1)

2.1.2: Geographic distribution

There was a total of 9,592 new dialysis patients in 2022 comprising 7,768 new HD and 1,824 new PD patients. One state surpassed an acceptance rate (AR) of 400 pmp, 7 states recorded an AR of between 300 to 399, 5 states had an AR of between 200 to 299 pmp and 1 state reported an AR of less than 200 pmp. The state with the highest AR was Melaka (443 pmp) followed by Perak (394 pmp), Negeri Sembilan (368 pmp), Terengganu (349 pmp) and Pulau Pinang (342 pmp). Sabah remains the state with the lowest acceptance rate (153 pmp) followed by Perlis (217 pmp), Kelantan (240 pmp), Selangor (250 pmp) and Sarawak (288 pmp). In general, the west coast states of Peninsular Malaysia had higher AR compared with the east coast states of Peninsular Malaysia followed by East Malaysian states.

Table 2.1.2(a): Dialysis Treatment and Rate by Centre state, per million population 2012-2022

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
Johor	339	335	345	359	332	339	340	311	330	306	297
Kedah	294	346	308	321	302	288	286	267	278	264	232
Kelantan	240	207	243	234	209	178	216	213	136	135	162
Melaka	443	391	363	378	354	307	312	331	329	302	268
Negeri Sembilan	368	404	360	414	395	367	375	346	358	270	303
Pahang	309	313	269	281	237	229	229	254	246	208	219
Perak	394	372	419	398	327	297	287	350	286	274	275
Perlis	217	177	165	193	240	179	167	189	204	182	184
Pulau Pinang	342	344	370	356	315	326	355	311	330	313	333
Sabah WP Labuan	153	143	131	139	112	115	129	113	99	108	99
Sarawak	288	252	248	220	176	194	173	183	177	160	125
Selangor	250	241	255	274	259	226	231	258	251	219	228
Terengganu	349	367	384	347	323	281	286	266	276	267	246
WP Kuala Lumpur	329	324	352	345	346	372	361	346	328	359	317

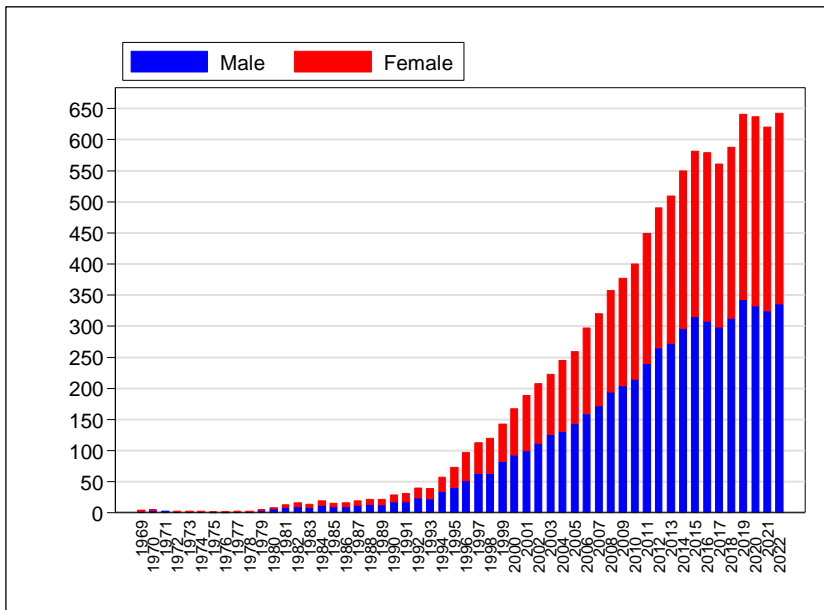
2.1.3: Gender distribution

The acceptance rate for males has remained higher compared with females. However, over the last decade there has been a modest trend toward narrowing of the gap. In the last 2 years the difference in treatment rate has been less than 5% (52%:48% male:female ratio). This ratio is a great improvement when compared to 1970's ratio which was 70:30 and 1980's ratio which was 60:40.

Table 2.1.3(a): Dialysis Treatment Rate by Gender, per million male or female population 2012-2022

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
Male	336	324	333	342	313	298	308	315	296	273	265
Female	306	296	304	299	275	263	271	266	254	236	225

Figure 2.1.3(a): Dialysis Treatment Rate by Gender 1969-2022



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

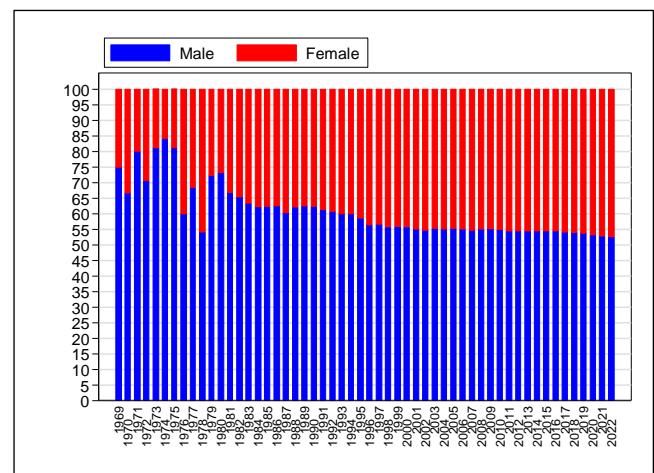
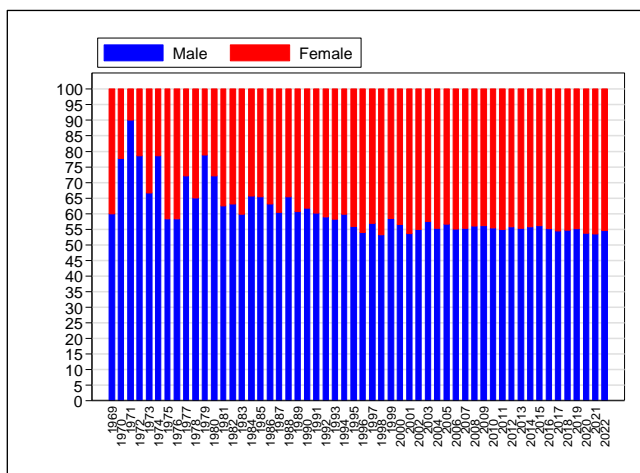
Table 2.1.3(b): Gender Distribution of Dialysis Patients 2012-2022

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
New Dialysis patients	9592	9352	9465	9496	8552	8089	8111	8046	7628	7000	6698
% Male	54.6	53.5	53.7	55.1	54.7	54.5	55.1	56.1	55.7	55.2	55.7
% Female	45.4	46.5	46.3	44.9	45.3	45.5	44.9	43.9	44.3	44.8	44.3
ESKD patients at 31st December	51256	50340	50376	47569	44919	42763	40837	38167	35193	32378	29452
% Male	52.6	52.8	53.2	53.8	54	54.2	54.6	54.6	54.6	54.5	54.6
% Female	47.4	47.2	46.8	46.2	46	45.8	45.4	45.4	45.4	45.5	45.4

Figure 2.1.3(b): Gender Distribution of Dialysis Patients 1969-2022

(i) New Dialysis patients

(ii) ESKD Patients at 31st December



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

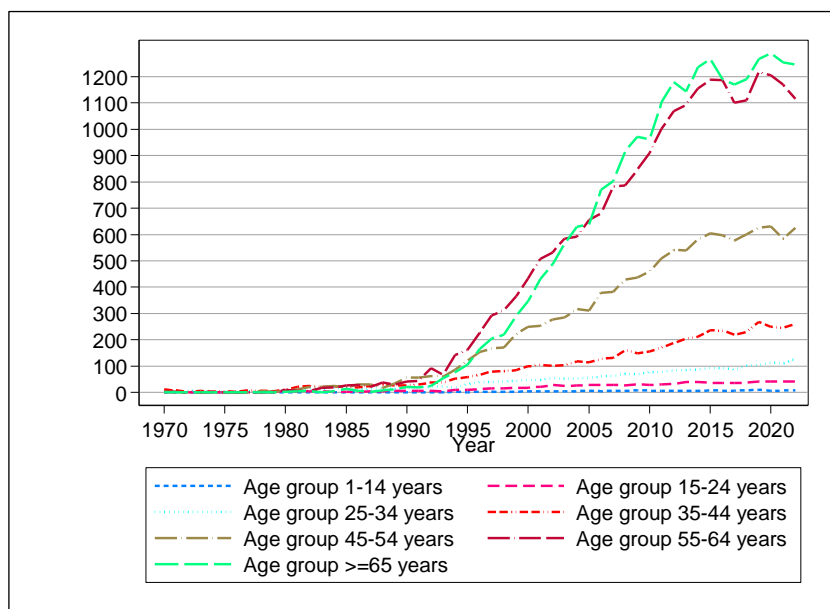
2.1.4: Age distribution

As can be expected, the treatment rate is age dependent with the highest incidence among the elderly (Figure 2.1.4a). The sharpest increase was noted among the elderly (>= 65 years old) and those between 55-64 years old. (Figure 2.1.4a). In 2022 about 79% of new patients and 70% of all prevalent patients on dialysis were in the age group of 45 years or older. (Figure 2.1.4b).

Table 2.1.4(a): Dialysis Treatment Rate by Age Group, per million age group population 2012-2022

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
≤14	8	7	7	10	8	7	7	8	6	7	6
15-24	41	42	41	42	37	36	37	37	40	40	33
25-34	127	110	113	104	102	87	93	92	88	85	84
35-44	260	245	250	269	230	219	235	236	212	205	188
45-54	625	584	632	625	602	576	598	605	581	540	541
55-64	1115	1170	1205	1218	1111	1100	1186	1189	1155	1093	1069
≥ 65	1247	1255	1289	1267	1191	1170	1190	1268	1235	1143	1179

Figure 2.1.4(a): Dialysis Treatment Rate by Age Group 1969-2022



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

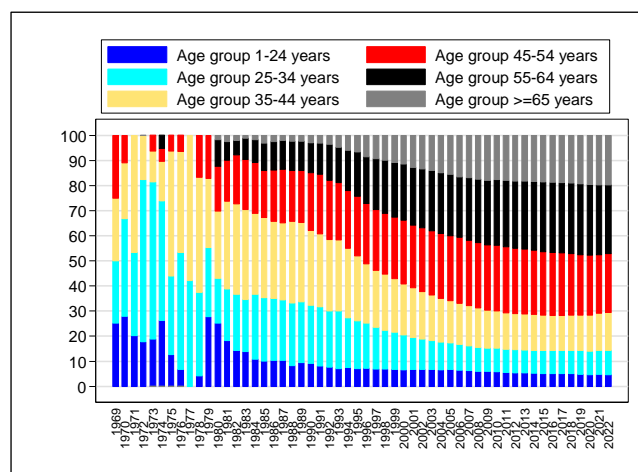
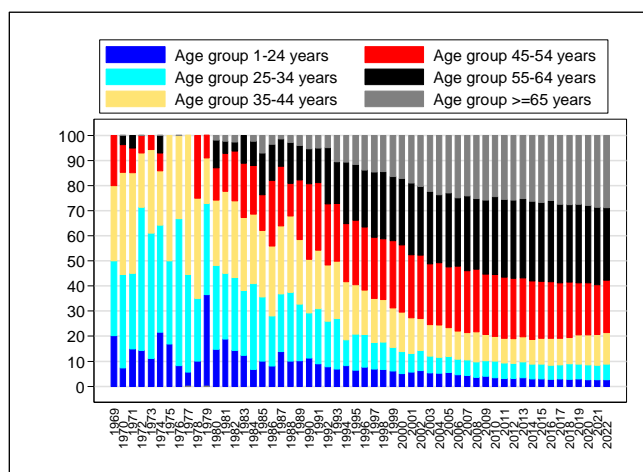
Table 2.1.4(b): Percentage Age Distribution of Dialysis Patients 2012-2022

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
New Dialysis patients	9592	9352	9465	9496	8552	8089	8111	8046	7628	7000	6698
% ≤24	2.5	2.6	2.5	2.9	2.7	2.8	2.7	3	3	3.5	3.1
% 25-34	6.3	5.8	6.1	5.9	6.2	5.8	5.7	5.7	5.8	6.1	6
% 35-44	12.5	12.1	11.7	11.6	10.6	10.6	10.7	10.4	9.9	10.2	9.9
% 45-54	21	19.9	21	20.8	22	22.1	22.6	22.7	23.3	23.3	23.9
% 55-64	28.9	30.9	30.8	31.3	30.9	31.3	32.2	31.4	31.6	31.5	31.2
% ≥ 65	28.8	28.7	27.9	27.5	27.6	27.4	26.1	26.8	26.4	25.4	25.9
ESKD patients at 31st December	51256	50340	50376	47569	44919	42763	40837	38167	35193	32378	29452
% ≤24	4.7	4.8	4.7	4.8	4.9	4.9	4.9	5	5.1	5.2	5.3
% 25-34	9.7	9.5	9.2	9.3	9.3	9.2	9.2	9.2	9.3	9.3	9.3
% 35-44	15.1	14.7	14.4	14.1	14	14	14	14	14.1	14.2	14.2
% 45-54	23.4	23.5	24	24.3	24.7	25.1	25.2	25.4	25.6	25.9	26
% 55-64	27.4	27.8	28.1	28.1	27.9	27.9	27.9	27.7	27.4	27.1	26.9
% ≥ 65	19.7	19.7	19.6	19.4	19.2	18.9	18.8	18.7	18.5	18.3	18.3

Figure 2.1.4(b): Age Distribution of Dialysis Patients 1969-2022

(i) New Dialysis Patients

(ii) ESKD Patients at 31st 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 continues to dominate over other methods and location of dialysis accounting for 81% and 86% for new and prevalent dialysis patients respectively in 2022. Even though there was an encouraging trend of an increase in new PD patients for the last 6 years, the prevalent PD patients has remained low (12%). The percentage of incidence patients on home dialysis (both PD and HD) was 19% in 2022.

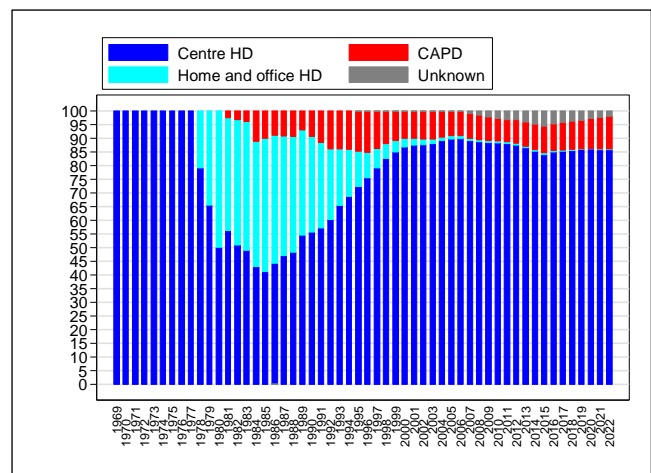
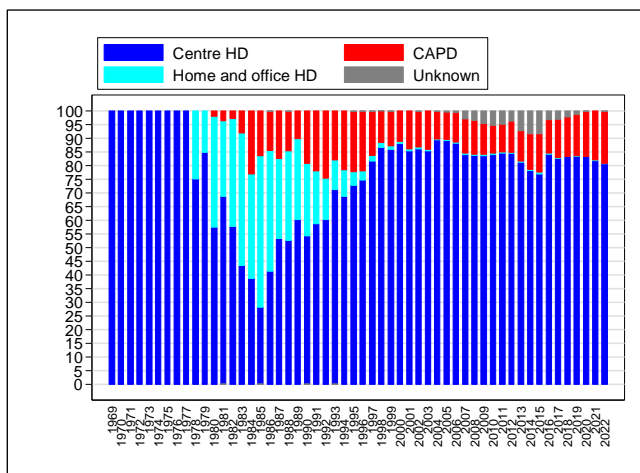
Table 2.1.5: Method and Location of Dialysis Patients 2012-2022

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
New Dialysis patients	9592	9352	9465	9496	8552	8089	8111	8046	7628	7000	6698
% Centre HD	80.7	81.9	83.3	83.5	83.3	82.6	84.2	77	78.1	81.1	84.5
% Home and office HD	0.2	0.1	0.1	0.1	0.1	0.4	0.3	0.5	0.4	0.4	0.3
% PD	19	18	16.5	15.1	14.4	14	12.4	14.1	13.1	11.2	11.4
% Unknown	0.1	0	0.1	1.3	2.2	3	3.1	8.4	8.4	7.3	3.8
ESKD patients at 31st December	51256	50340	50376	47569	44919	42763	40837	38167	35193	32378	29452
% Centre HD	85.8	85.8	86	85.8	85.5	85.1	84.9	84.1	85.2	86.5	87.5
% Home and office HD	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.6	0.6
% PD	12.1	11.7	11	10.5	10.2	10.1	9.8	9.9	9.4	8.8	8.7
% Unknown	1.9	2.3	2.7	3.4	3.9	4.3	4.8	5.5	4.9	4.1	3.2

Figure 2.1.5: Method and Location of Dialysis Patients 1969-2022

(i) New Dialysis Patients

(ii) ESKD Patients at 31st December



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

2.1.6: Funding for dialysis treatment

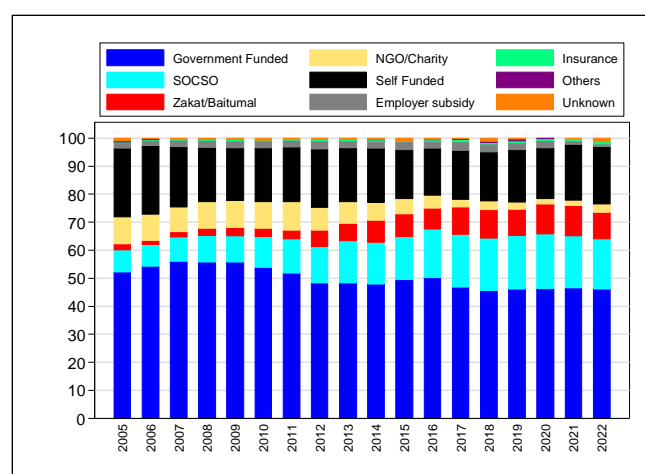
The government continued to be the main source of funding for dialysis therapy for new and existing patients in this country. These funds were channeled not only to the government dialysis centres, but also as subsidies to NGO centres and payment of dialysis treatment for public pensioners, civil servants, and their dependents in private centres. Out of pocket payment i.e., self-funding for prevalent dialysis, was 11% in 2022. Funding from NGO bodies was 1.7% in 2022 (Table & Figure 2.1.6).

Table 2.1.6: Funding for Dialysis Treatment 2013-2022

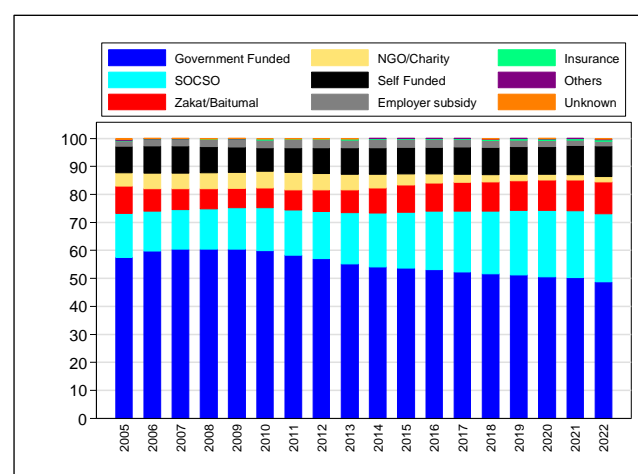
Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
New Dialysis patients	9592	9352	9465	9496	8552	8089	8111	8046	7628	7000
% Government Funded	46.1	46.4	46.2	46.1	45.5	46.9	50.2	49.4	47.9	48.4
% SOCSO	17.9	18.7	19.5	19.2	18.9	18.7	17.4	15.5	14.8	14.8
% Zakat/Baitumal	9.4	10.8	10.7	9.3	10.1	9.8	7.4	8	8	6.3
% NGO/Charity	3	2	2	2.5	3.1	2.8	4.5	5.5	6.2	7.8
% Self Funded	20.5	19.9	18.1	18.8	17.5	17.5	16.8	17.5	19.4	19.2
% Employer Subsidized	1	1.3	2.7	2.5	2.8	3.1	2.6	2.8	2.6	2.6
% Insurance	0.9	0.8	0.6	0.7	0.6	0.7	0.5	0.4	0.5	0.4
% Others	0	0	0.2	0.5	0.4	0.2	0.1	0	0.1	0
% Unknown	1.2	0.1	0	0.4	1.1	0.3	0.5	0.9	0.5	0.5
Dialysing at 31st December	51256	50340	50376	47569	44919	42763	40837	38167	35193	32378
% Government Funded	48.7	50.1	50.6	51.2	51.6	52.2	53	53.6	54.1	55.2
% SOCSO	24.2	24.1	23.7	23.1	22.5	21.8	21	19.9	19.1	18.1
% Zakat/Baitumal	11.6	11	10.9	10.6	10.4	10.3	9.9	9.7	9.1	8.3
% NGO/Charity	1.7	1.7	1.8	2.1	2.4	2.8	3.3	4	4.8	5.4
% Self Funded	11	10.5	10	9.9	9.8	9.7	9.5	9.5	9.5	9.5
% Employer Subsidized	1.8	2	2.3	2.5	2.6	2.7	2.8	2.9	2.9	2.9
% Insurance	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3
% Others	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0
% Unknown	0.3	0	0.1	0	0.2	0	0	0	0	0.3

Figure 2.1.6: Funding for Dialysis Treatment 1969-2022

(i) New Dialysis Patients



(ii) Dialysis Patients at 31st December



2.1.7: Distribution of dialysis patients by sector

In 2022, private centres remained the largest provider of dialysis. Among new patients, 58% were accepted to private dialysis centres followed by government centres (29%) and NGO centres (13%). A similar pattern is seen among prevalent patients with the private centre providing dialysis to a majority of patients since 2018 (Table 2.1.7).

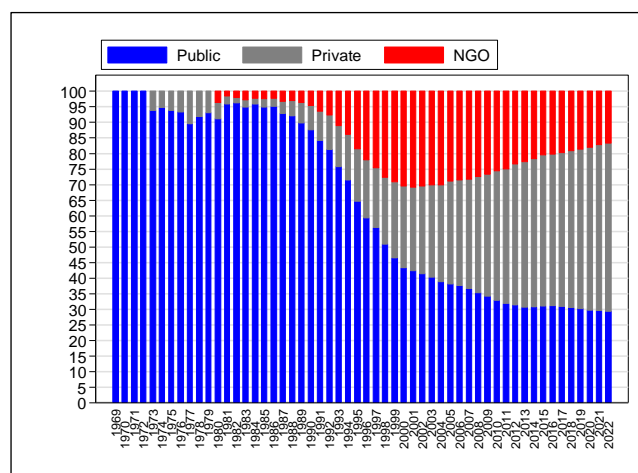
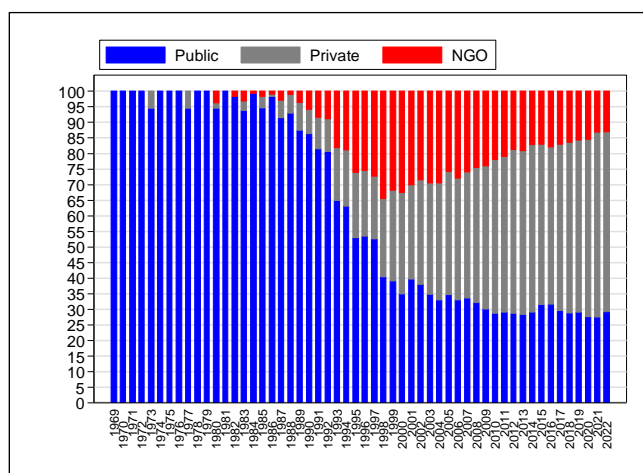
Table 2.1.7: Distribution of Dialysis Patients by Sector 2012-2022

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
New Dialysis patients	9592	9352	9465	9496	8552	8089	8111	8046	7628	7000	6698
% Government centre	29.3	27.5	27.6	29.1	28.8	29.6	31.6	31.5	29.1	28.3	28.7
% NGO centre	13	13.1	15.4	15.7	16.5	17.1	17.9	17.1	17.3	19.1	18.7
% Private centre	57.7	59.4	57	55.2	54.7	53.3	50.5	51.4	53.6	52.6	52.6
ESKD patients at 31st December	51256	50340	50376	47569	44919	42763	40837	38167	35193	32378	29452
% Government centre	29.4	29.7	29.8	30.3	30.5	30.8	31.1	31	30.7	30.6	31.4
% NGO centre	16.8	17.3	18	18.6	19.1	19.8	20.3	20.6	21.6	22.8	23.5
% Private centre	53.8	53	52.2	51.1	50.4	49.4	48.6	48.4	47.7	46.6	45.1

Figure 2.1.7: Distribution of Dialysis Patients by Sector 1969-2022

(i) New Dialysis Patients

(ii) Dialysis Patients at 31st 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 2012-2022

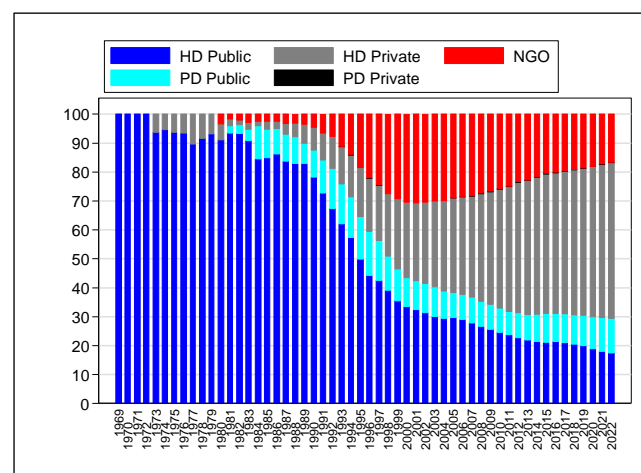
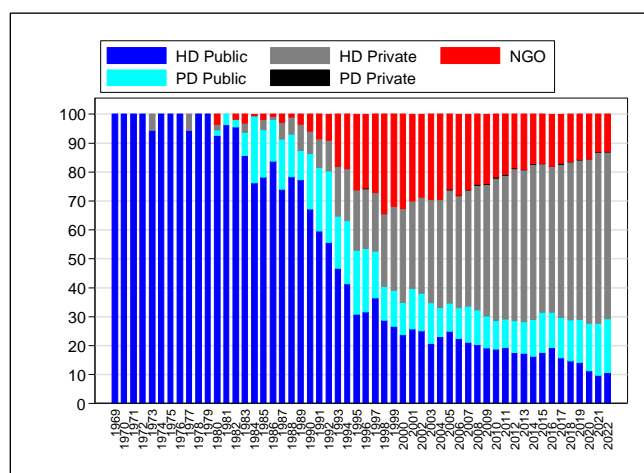
Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
New Dialysis patients	9592	9352	9465	9496	8552	8089	8111	8046	7628	7000	6698
% Public Centre	29.3	27.5	27.6	29.1	28.8	29.6	31.6	31.5	29.1	28.3	28.7
% HD Public Centre	10.5	9.7	11.2	14.1	14.7	15.8	19.3	17.5	16.3	17.3	17.5
% PD Public Centre	18.8	17.8	16.4	15	14.1	13.8	12.3	14	12.8	11	11.2
% NGO	13	13.1	15.4	15.7	16.5	17.1	17.9	17.1	17.3	19.1	18.7
% Private Centre	57.7	59.4	57	55.2	54.7	53.3	50.5	51.4	53.6	52.6	52.6
% HD Private Centre	57.5	59.2	56.9	55.1	54.5	53	50.3	51.3	53.4	52.4	52.5
% PD Private Centre	0.2	0.2	0.1	0.1	0.2	0.3	0.2	0.1	0.2	0.2	0.1
ESKD patients at 31st December	51256	50340	50376	47569	44919	42763	40837	38167	35193	32378	29452
% Public Centre	29.4	29.7	29.8	30.3	30.5	30.8	31.1	31	30.7	30.6	31.4
% HD Public Centre	17.4	18	18.9	19.9	20.4	20.9	21.5	21.1	21.4	21.9	22.8
% PD Public Centre	12	11.7	10.9	10.4	10.1	9.9	9.6	9.9	9.3	8.7	8.6
% NGO	16.8	17.3	18	18.6	19.1	19.8	20.3	20.6	21.6	22.8	23.5
% Private Centre	53.8	53	52.2	51.1	50.4	49.4	48.6	48.4	47.7	46.6	45.1
% HD Private Centre	53.8	53	52.1	51	50.3	49.3	48.5	48.3	47.6	46.5	45
% PD Private Centre	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

PD is almost exclusively provided by the public sector with the private providing only 0.2% of new patients and less than 0.1% of prevalent patients. The public sector continued to provide an increasing proportion of PD to new patients accounting for 19% in 2022 while the proportion of new HD patients in public HD centres declined to 10%. A similar trend is reflected in prevalent patients. (Table 2.1.7 (a) & Figure 2.1.7(a))

Figure 2.1.7(a): Distribution of Dialysis Patients by Modality and Sector 1969-2022

(i) New Dialysis Patients

(ii) Dialysis Patients at 31st December



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

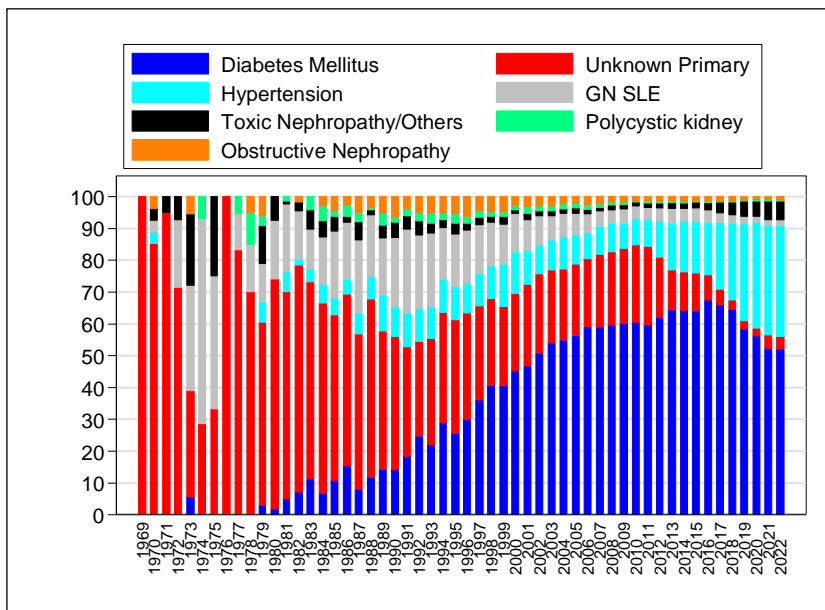
2.1.8: Primary renal disease

Diabetes mellitus remained the main cause of ESKD in new dialysis patients (52%) followed by hypertension (35%), unknown (5%) and glomerulonephritis/SLE (2%) (Table & Figure 2.1.8). Although the proportion of diabetes appeared to have declined, this was probably artifactual due to changes in the classification of diabetes as the primary renal disease from 2019. Other reasons include reminders to sites to check their patients’ status of diabetes and verification with sites prior to migration to a new kidney transplant allocation system (MyKAS).

Table 2.1.8: Primary Renal Diseases for New Dialysis Patients 2012-2022

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
New Dialysis patients	9592	9352	9465	9496	8552	8089	8111	8046	7628	7000	6698
% Unknown cause	4.1	4.1	2.4	2.7	2.7	4.8	8.0	12.0	12.0	12.5	19.1
% Diabetes Mellitus	52.0	52.4	56.2	58.4	64.6	66.0	67.4	64.1	64.3	64.5	61.9
% GN/SLE	1.9	1.9	1.8	2.2	2.6	3.1	3.8	4.3	4.2	4.7	4.1
% Polycystic kidney	0.5	0.4	0.6	0.4	0.6	0.5	0.5	0.7	0.7	0.6	0.6
% Obstructive Nephropathy	1.0	0.9	0.9	1.1	1.2	1.4	1.5	1.2	1.4	1.4	1.6
% Toxic Nephropathy	0.4	0.4	0.5	0.8	0.9	1.0	0.8	0.5	0.5	0.5	0.5
% Hypertension	34.8	34.3	33.3	30.4	24.3	21.0	16.6	16.1	15.8	14.6	11.4
% Others	5.3	5.6	4.3	4.0	3.1	2.2	1.4	1.1	1.1	1.2	0.8

Figure 2.1.8: Primary Renal Diseases for New Dialysis Patients 1969-2022



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

SECTION 2.2: GROWTH OF DIALYSIS IN MALAYSIA

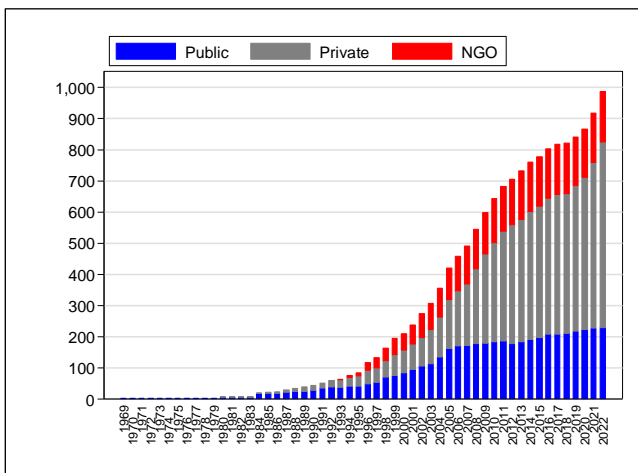
2.2.1: Growth in dialysis in Malaysia by sector

The number of dialysis centres (PD and HD Centres combined) for the whole of Malaysia increased from 706 in 2012 to 987 in 2022. The increase in number of dialysis centres was mainly contributed by the private dialysis centres, which grew from 380 in 2012 to 595 in 2022. The number of NGO centres in the same interval increased from 148 to 163 while the number of public dialysis centres increased from 178 in 2012 to 229 in 2022. The number of private dialysis centres predominates in the west coast of Peninsula Malaysia.

Table 2.2.1: Number of Dialysis, HD and PD Centres in Malaysia by Sector, Year 2012-2022

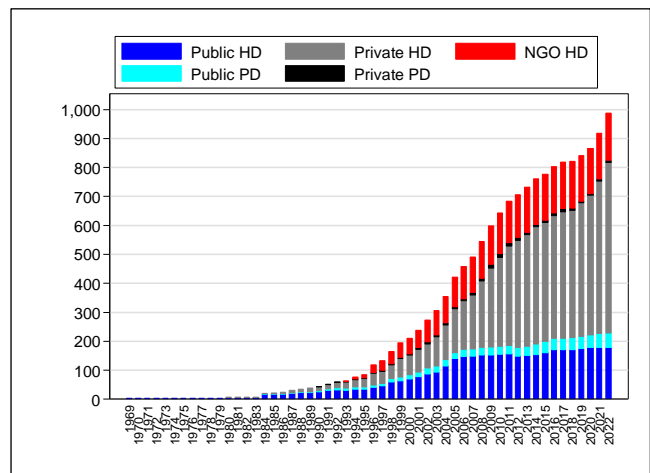
Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
Public Centres	229	227	222	217	211	209	209	198	191	183	178
NGO Centres	163	159	156	157	162	161	160	159	159	156	148
Private Centres	595	532	488	467	448	448	434	420	411	393	380
HD Centres											
Public HD Centres	177	178	177	174	170	170	169	160	154	151	149
NGO HD Centres	163	159	156	157	162	161	160	159	159	156	148
Private HD Centres	588	526	482	461	441	438	424	412	403	384	370
PD Centres											
Public PD Centres	52	49	45	43	41	39	40	38	37	32	29
NGO PD Centres	0	0	0	0	0	0	0	0	0	0	0
Private PD Centres	7	6	6	6	7	10	10	8	8	9	10

Figure 2.2.1(a): Number of Dialysis Centre in Malaysia by Sector, 1969-2022



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

Figure 2.2.1(b): Number of HD and PD Centre in Malaysia by Sector, 1969-2022

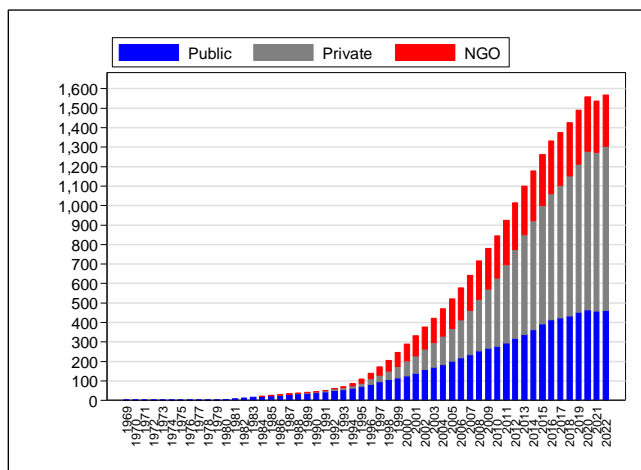


The proliferation of haemodialysis centres accounted for most of the increase in dialysis centres. Over the last 10 years, the total number of dialysis (HD and PD) patients had increased from 29,452 (1,014 pmp) in 2012 to 51,256 (1,568 pmp) in 2022.

Table 2.2.2: Prevalence Rate of Dialysis (HD+PD), HD and PD Patients in Malaysia by Sector, 2012-2022

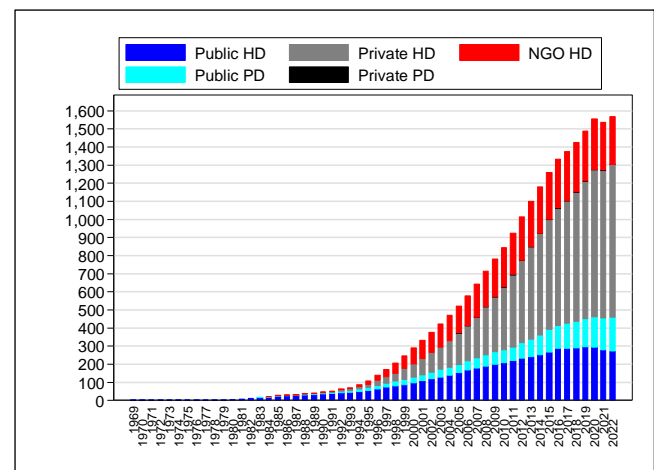
Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
Dialysis patients, pmp											
Public	460	456	464	451	434	424	414	391	361	337	318
NGO	263	265	280	277	273	272	270	260	255	250	239
Private	844	815	813	761	718	679	647	610	562	512	457
HD patients, pmp											
Public	272	277	294	296	291	287	286	266	252	241	231
NGO	263	265	280	277	273	272	270	260	255	250	239
Private	843	814	811	760	716	678	646	609	561	511	456
PD patients, pmp											
Public	188	179	169	155	144	137	129	124	110	96	87
NGO	0	0	0	0	0	0	0	0	0	0	0
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, 1969-2022



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

Figure 2.2.2(b): Prevalence Rate of HD and PD Patient in Malaysia by Sector, 1969-2022



The private sector is the main provider of dialysis on the West Coast (61%) while the public sector is the main provider in East Malaysia (54%) and on the East Coast (46%). NGO provides dialysis to 21% of patients in East Malaysia followed by 17% on the West Coast and 13% on the East Coast.

2.2.3: Growth in dialysis in Malaysia by region

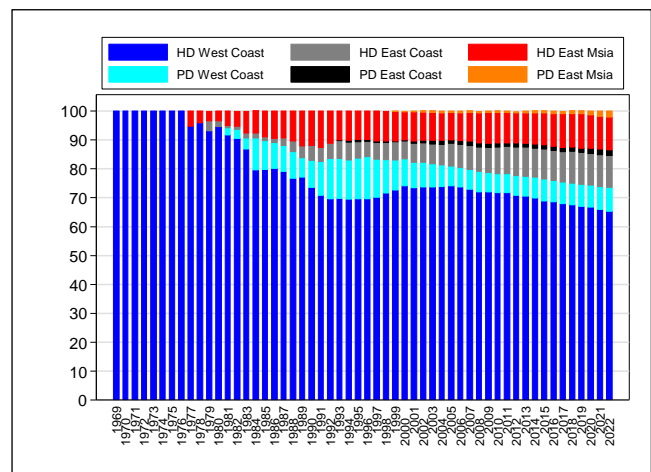
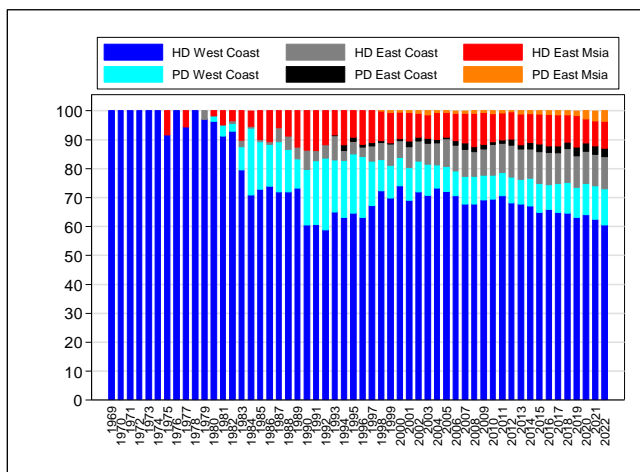
Table 2.2.3: Distribution of Dialysis Patients by Modality and Region 2012-2022

Year	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
New Dialysis patients	9592	9352	9465	9496	8552	8089	8111	8046	7628	7000	6698
% West Coast	72.9	74	74.9	73.5	75.2	74.9	74.4	74.9	76.6	76.1	76.9
% East Coast	14.1	14	13.8	14.1	13.8	12.9	13.5	13.6	12.3	12.2	13.1
% East Msia	13	12	11.3	12.4	11	12.2	12.1	11.5	11.1	11.7	10
New HD patients	7768	7668	7901	8062	7323	6956	7104	6909	6631	6216	5937
% West Coast	74.5	76.1	76.8	74.4	75.4	75.5	75.1	75.6	77.1	76.4	76.9
% East Coast	14	13.5	13.2	12.9	13.5	12.1	12.7	12.5	11.5	11.8	12.5
% East Msia	11.5	10.4	10.0	12.7	11.1	12.4	12.2	11.9	11.4	11.8	10.6
New PD patients	1824	1684	1564	1434	1229	1133	1007	1137	997	784	761
% West Coast	65.7	64.3	65.6	68.4	74	71.1	69.3	70.6	73.2	74	77.1
% East Coast	14.5	16.3	16.9	20.9	15.5	17.7	19.5	19.9	17.6	14.7	17.2
% East Msia	19.8	19.4	17.5	10.7	10.5	11.2	11.2	9.5	9.2	11.3	5.7
Dialysing at 31st Dec	51256	50340	50376	47569	44919	42763	40837	38167	35193	32378	29452
% West Coast	73.5	73.8	74.4	74.6	75.1	75.4	75.9	76.4	76.9	77.4	77.8
% East Coast	13	13	12.7	12.6	12.4	12.1	12	11.9	11.6	11.3	11.2
% East Msia	13.5	13.2	12.9	12.8	12.5	12.5	12.1	11.7	11.5	11.3	11
HD Dialysing at 31st Dec	45045	44443	44853	42581	40343	38464	36850	34378	31889	29513	26881
% West Coast	74.3	74.5	74.8	74.7	75.2	75.6	76.1	76.5	77	77.3	77.7
% East Coast	12.6	12.5	12.3	12.1	12	11.6	11.5	11.4	11.3	11.1	10.9
% East Msia	13.1	13	12.9	13.2	12.8	12.8	12.4	12.1	11.7	11.6	11.4
PD Dialysing at 31st Dec	6211	5897	5523	4988	4576	4299	3987	3789	3304	2865	2571
% West Coast	67.8	68.6	70.9	73	73.6	73.6	74	75.2	76.3	77.5	78.5
% East Coast	15.3	16.5	16.6	16.4	15.7	16.3	16.2	15.9	14.4	13.9	14.2
% East Msia	16.9	14.9	12.5	10.6	10.7	10.1	9.8	8.9	9.3	8.6	7.3

Figure 2.2.3: Distribution of Dialysis Patients by Modality and Region 1969-2022

(i) New Dialysis Patients

(ii) ESKD Patients at 31st 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 & PD) in Malaysia by State and Sector, 2018-2022

State	Sector	Year 2018		Year 2019		Year 2020		Year 2021		Year 2022	
		N	PMP	N	PMP	N	PMP	N	PMP	N	PMP
Malaysia	Public	13694	434	14408	451	15008	464	14936	456	15056	460
	Private	22626	718	24311	761	26298	813	26709	815	27606	844
	NGO	8599	273	8850	277	9070	280	8695	265	8594	263
	Total	44919	1425	47569	1489	50376	1556	50340	1536	51256	1568
Johor	Public	1238	330	1290	343	1338	334	1321	329	1382	343
	Private	4184	1116	4422	1176	4761	1187	4905	1220	5008	1243
	NGO	1756	468	1767	470	1775	443	1679	418	1622	403
	Total	7178	1914	7479	1988	7874	1964	7905	1966	8012	1989
Kedah	Public	1001	463	1050	483	1110	521	1155	537	1122	519
	Private	1743	806	1866	858	1984	931	2026	942	2012	930
	NGO	407	188	422	194	417	196	388	180	378	175
	Total	3151	1457	3338	1535	3511	1647	3569	1659	3512	1623
Kelantan	Public	817	439	890	472	935	522	899	496	885	483
	Private	715	384	769	408	852	475	832	459	890	486
	NGO	191	103	200	106	220	123	224	124	225	123
	Total	1723	926	1859	987	2007	1120	1955	1079	2000	1092
Melaka	Public	348	377	370	399	386	387	381	379	384	381
	Private	1010	1095	1102	1187	1185	1187	1255	1249	1371	1359
	NGO	231	250	222	239	245	245	260	259	262	260
	Total	1589	1722	1694	1825	1816	1819	1896	1887	2017	2000
Negeri Sembilan	Public	758	675	791	702	812	677	790	656	788	652
	Private	861	767	939	834	978	815	1036	860	1076	891
	NGO	534	476	540	480	591	492	610	507	593	491
	Total	2153	1918	2270	2016	2381	1984	2436	2023	2457	2034
Pahang	Public	917	551	939	562	968	608	992	619	997	618
	Private	851	511	951	569	1021	642	1121	700	1166	722
	NGO	344	207	345	206	350	220	343	214	336	208
	Total	2112	1269	2235	1337	2339	1470	2456	1533	2499	1548
Perak	Public	1138	455	1210	482	1291	517	1268	504	1233	490
	Private	2602	1039	2828	1127	3125	1252	3153	1253	3244	1290
	NGO	590	236	642	256	653	262	649	258	658	262
	Total	4330	1730	4680	1865	5069	2031	5070	2015	5135	2042
Perlis	Public	96	378	88	346	94	330	103	358	125	431
	Private	113	445	120	472	121	425	127	442	130	449
	NGO	61	240	55	216	53	186	41	143	39	135
	Total	270	1064	263	1035	268	941	271	942	294	1015
Pulau Pinang	Public	456	259	468	265	476	273	482	277	473	272
	Private	1787	1014	1848	1045	2007	1153	2012	1156	2044	1174
	NGO	881	500	937	530	939	540	917	527	872	501
	Total	3124	1772	3253	1839	3422	1966	3411	1961	3389	1947
Sabah	Public	1612	414	1728	443	1772	518	1771	519	1845	540
	Private	481	123	553	142	570	167	577	169	580	170
	NGO	256	66	291	75	303	89	288	84	286	84
	Total	2349	603	2572	659	2645	774	2636	772	2711	794
Sarawak	Public	1429	512	1507	537	1613	657	1683	683	1779	719
	Private	750	269	893	318	972	396	1036	420	1118	452
	NGO	1023	366	1051	375	1135	463	1150	466	1193	482
	Total	3202	1147	3451	1230	3720	1516	3869	1569	4090	1653

State	Sector	Year 2018		Year 2019		Year 2020		Year 2021		Year 2022	
		N	PMP	N	PMP	N	PMP	N	PMP	N	PMP
Selangor	Public	1834	283	1945	299	1994	285	1891	270	1886	267
	Private	5285	816	5662	870	6082	870	5938	846	6215	881
	NGO	1290	199	1309	201	1326	190	1179	168	1165	165
	Total	8409	1299	8916	1370	9402	1344	9008	1284	9266	1314
Terengganu	Public	990	806	1085	872	1163	1012	1159	990	1142	962
	Private	451	367	513	412	618	538	696	594	724	610
	NGO	272	221	288	231	294	256	280	239	281	237
	Total	1713	1394	1886	1515	2075	1805	2135	1824	2147	1809
WP Labuan	Public	96	971	101	1017	104	1095	113	1178	111	1146
	Private	0	0	0	0	0	0	0	0	0	0
	NGO	0	0	0	0	0	0	0	0	0	0
	Total	96	971	101	1017	104	1095	113	1178	111	1146
WP Putrajaya	Public	49	504	50	483	45	412	44	381	56	478
	Private	28	288	28	270	33	302	34	295	33	282
	NGO	0	0	0	0	0	0	0	0	0	0
	Total	77	792	78	753	78	714	78	676	89	760
WP Kuala Lumpur	Public	915	511	896	503	907	458	884	450	848	432
	Private	1765	986	1817	1019	1989	1004	1961	998	1995	1017
	NGO	763	426	781	438	769	388	687	350	684	349
	Total	3443	1924	3494	1960	3665	1849	3532	1798	3527	1798

(For actual numbers refer to Appendix T2.2.2)

Data Definition for Diabetes as the Primary Renal Disease

1. Prior to 2017 when data was submitted in paper form, primary and secondary causes of renal disease were allowed. The National Renal Registry (NRR) office adjudicated discrepancies in the data submitted to determine the primary renal disease (PRD).
 - If the PRD was recorded as unknown and patient has diabetes as the secondary cause or diabetes was included as a co-morbidity, the PRD was amended to diabetes.
 - If there was a discrepancy in PRD reported between centres, one as unknown and the other as diabetes, the PRD was amended to diabetes
2. In 2017 data collection migrated to eNRR, an online electronic form. From 2017 and 1st February 2021, the system allowed more than one PRD. The determination of PRD was based on the following algorithm:
 - If both unknown and diabetes were selected as PRD, diabetes was recorded as the PRD
 - If the PRD was recorded as unknown and diabetes was included as a co-morbidity, the PRD was amended to diabetes.
 - If there was a discrepancy in PRD reported between centres, the PRD at first notification was used
 - If multiple PRDs were entered, the order for PRD determination is as follows:
 - 1 ADPKD
 - 2 Hereditary nephritis, specify
 - 3 Glomerulonephritis, specify
 - 4 Obstructive uropathy, specify
 - 5 Drugs / toxic nephropathy
 - 6 Diabetes Mellitus
 - 7 Hypertension
 - 8 Others, specify
 - 9 Unknown

Examples:

 - If 'Unknown' & 'diabetes' were selected as PRD then PRD is diabetes
 - If 'diabetes' & 'ADPKD' were selected as PRD then PRD is ADPKD
 - If 'Unknown' was selected as PRD and Comorbidities include diabetes then PRD is diabetes
 - If 'Unknown' was selected as PRD and Comorbidities include hypertension then PRD is hypertension
 - Change in PRD is permitted with written request and documentation from the source data providers to NRR
3. From 2nd February 2021 onwards
 - Only a single entry for PRD is permitted
 - If there was a discrepancy in PRD reported between centres, the PRD at first notification was used
 - If PRD is unknown and diabetes is included in comorbidity at notification, "Unknown" PRD is maintained
 - Change in PRD is permitted with written request and documentation from the source data providers to NRR