

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 2014-2023

Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
New Dialysis patients	10027	10037	9351	9420	9426	8494	8046	8072	8006	7601
Died	7527	8034	9091	6359	6495	6153	5949	5402	5003	4728
Transplanted	238	179	60	139	130	81	101	71	99	90
Lost to Follow-up	45	37	33	35	38	57	39	32	35	46
Dialysing at 31st December	53210	51481	49995	49992	47212	44625	42521	40634	38003	35068

Table 2.1.1(a): Stock and flow - HD Patients, Malaysia 2014-2023

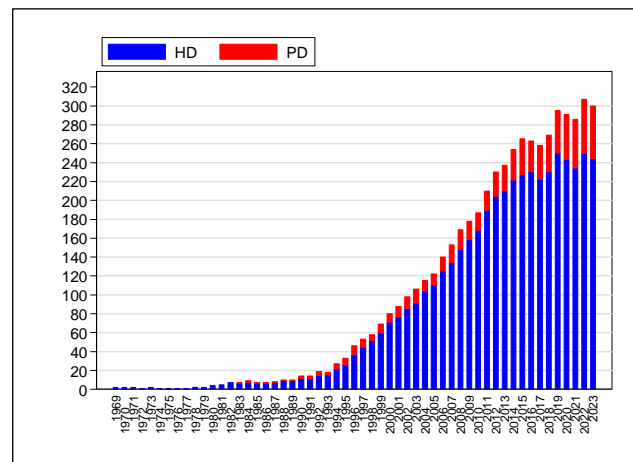
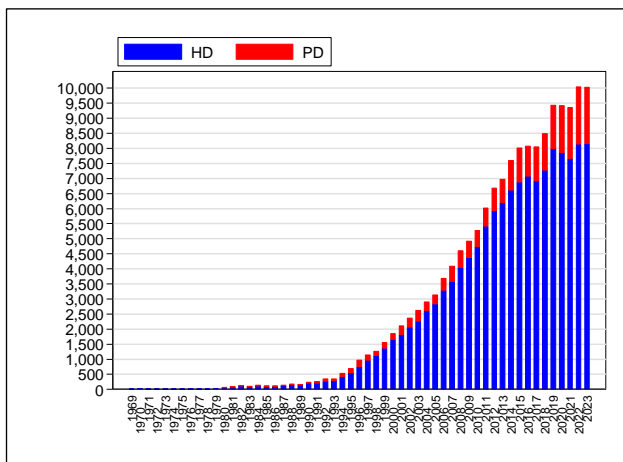
Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
New Dialysis patients	8150	8132	7659	7856	7992	7263	6913	7065	6869	6604
Died	6419	6850	7922	5477	5602	5334	5174	4671	4372	4152
Transplanted	195	147	52	112	103	56	93	65	89	76
Lost to Follow-up	38	34	26	32	35	50	37	30	34	45
Dialysing at 31st December	46659	45147	44074	44457	42219	40045	38219	36645	34212	31763

Table 2.1.1(b): Stock and flow - PD Patients, Malaysia 2014-2023

Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
New Dialysis patients	1877	1905	1692	1564	1434	1231	1133	1007	1137	997
Died	1108	1184	1169	882	893	819	775	731	631	576
Transplanted	43	32	8	27	27	25	8	6	10	14
Lost to Follow-up	7	3	7	3	3	7	2	2	1	1
Dialysing at 31st December	6551	6334	5921	5535	4993	4580	4302	3989	3791	3305

Figure 2.1.1: New Dialysis (Haemodialysis & Chronic PD) Incidence Rate per Million Population, Malaysia 1969-2023

(a) Number of New Dialysis Incidence, Malaysia 1969-2023 (b) New Dialysis Incidence Rates, Malaysia 1969-2023



2.1.2: Geographic distribution

There was a total of 10,027 new dialysis patients in 2023 comprising 8,150 new HD and 1,877 new PD patients. Eight states recorded an AR of between 300 to 399, 4 states had an AR of between 200 to 299 pmp and 2 states reported an AR of less than 200 pmp. The state with the highest AR was Melaka (384 pmp) followed by WP Kuala Lumpur (376 pmp), Kedah (375 pmp), Negeri Sembilan (372 pmp) and Terengganu (351 pmp). Sabah remains the state with the lowest acceptance rate (159 pmp) followed by Perlis (191 pmp), Sarawak (273 pmp), Selangor (274 pmp) and Kelantan (282 pmp). Among the states with lowest acceptance rate, the rate has been increasing over the years. 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 2014-2023

Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
Johor	332	352	336	340	354	326	334	337	305	327
Kedah	375	306	347	306	319	300	286	286	267	278
Kelantan	282	251	210	245	235	208	179	216	213	136
Melaka	384	456	394	367	372	349	302	307	330	327
Negeri Sembilan	372	370	394	356	407	389	366	376	344	357
Pahang	292	333	311	270	281	235	226	230	253	245
Perak	341	407	374	420	396	325	296	284	349	284
Perlis	191	214	146	162	185	233	183	159	177	204
Pulau Pinang	338	371	351	370	353	316	326	355	311	331
Sabah WP Labuan	159	157	143	131	140	113	114	129	113	99
Sarawak	273	302	254	249	221	176	194	173	182	177
Selangor	274	262	238	252	271	258	225	230	257	250
Terengganu	351	365	371	382	347	323	281	286	267	277
WP Kuala Lumpur	376	355	325	348	344	343	371	356	345	325

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. The difference in treatment rate has narrowed from 41ppm in 2014 to 19ppm in 2023 while the ratio of males:females has narrowed from 1.16 in 2014 to 1.06 in 2023.

Table 2.1.3(a): Dialysis Treatment Rate by Gender, per million male or female population 2014-2023

Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
ALL										
Male	342	353	325	332	340	311	296	307	314	295
Female	323	321	297	303	297	273	263	270	265	254
HD										
Male	274	280	259	271	282	263	250	264	266	252
Female	258	254	238	246	246	227	219	228	215	212
PD										
Male	68	73	66	61	58	48	46	43	48	43
Female	65	67	59	57	51	47	44	43	50	42

Figure 2.1.3(a) (i): Dialysis Treatment Rate by Gender 1969-2023

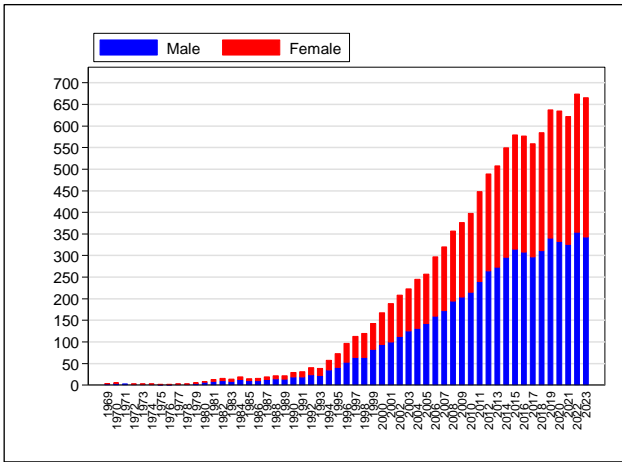


Figure 2.1.3(a) (ii): HD Treatment Rate by Gender 1969-2023

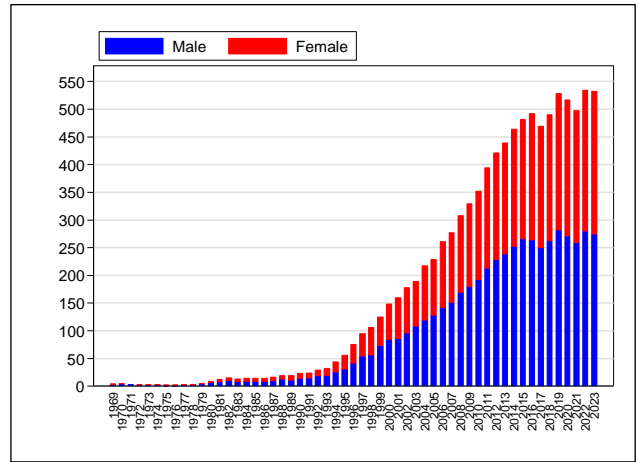


Figure 2.1.3(a) (iii): PD Treatment Rate by Gender 1969-2023

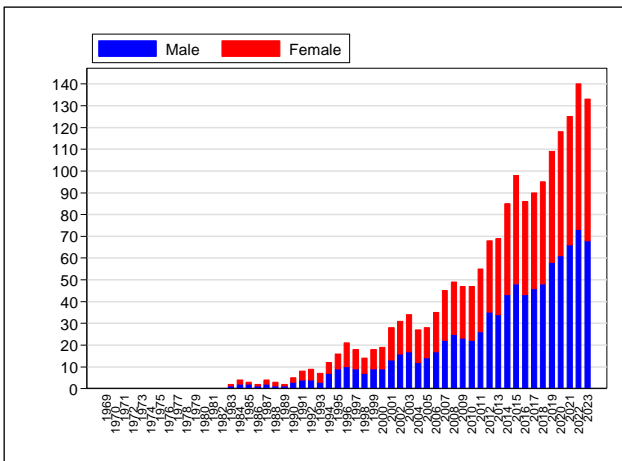
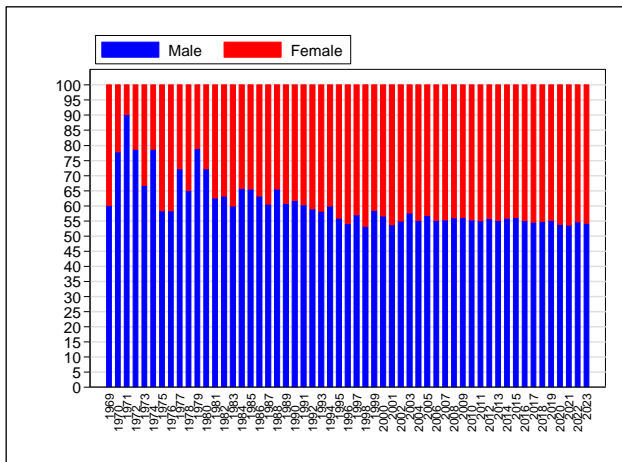


Table 2.1.3(b): Gender Distribution of Dialysis Patients 2014-2023

Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
New Dialysis patients	10027	10037	9351	9420	9426	8494	8046	8072	8006	7601
% Male	54.1	54.6	53.5	53.7	55.1	54.7	54.5	55	56.1	55.8
% Female	45.9	45.4	46.5	46.3	44.9	45.3	45.5	45	43.9	44.2
ESKD patients at 31st December	53210	51481	49995	49992	47212	44625	42521	40634	38003	35068
% Male	52.5	52.7	52.8	53.2	53.8	53.9	54.2	54.5	54.5	54.6
% Female	47.5	47.3	47.2	46.8	46.2	46.1	45.8	45.5	45.5	45.4
New HD patients	8150	8132	7659	7856	7992	7263	6913	7065	6869	6604
% Male	54	54.7	53.2	53.8	55.1	55.1	54.9	55.5	56.9	56.2
% Female	46	45.3	46.8	46.2	44.9	44.9	45.1	44.5	43.1	43.8
HD patients at 31st December	46659	45147	44074	44457	42219	40045	38219	36645	34212	31763
% Male	52.7	52.9	53.1	53.5	54.1	54.4	54.7	55.1	55.2	55.1
% Female	47.3	47.1	46.9	46.5	45.9	45.6	45.3	44.9	44.8	44.9
New PD patients	1877	1905	1692	1564	1434	1231	1133	1007	1137	997
% Male	54.2	54.2	54.6	53.5	55.2	52	52.1	51.6	51.2	53
% Female	45.8	45.8	45.4	46.5	44.8	48	47.9	48.4	48.8	47
PD patients at 31st December	6551	6334	5921	5535	4993	4580	4302	3989	3791	3305
% Male	51.4	50.8	50.7	50.7	50.9	49.8	50	49.5	48.9	49.4
% Female	48.6	49.2	49.3	49.3	49.1	50.2	50	50.5	51.1	50.6

Figure 2.1.3(b) (i): Gender Distribution of Dialysis Patients 1969-2023

(i) New Dialysis patients



(ii) ESKD Patients at 31st December

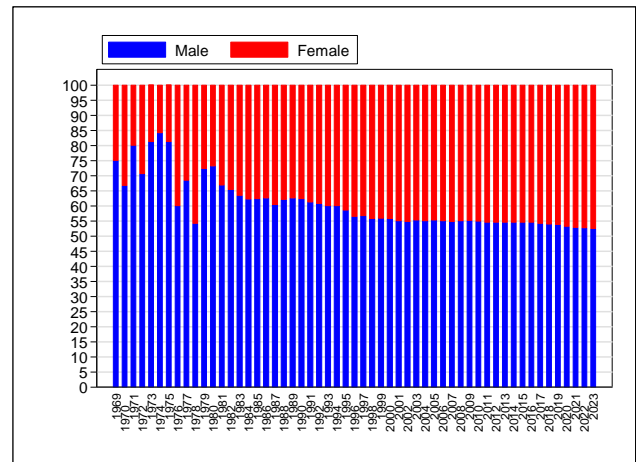
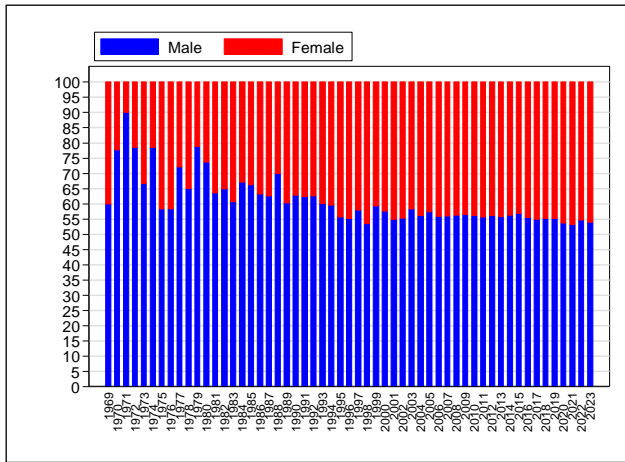


Figure 2.1.3(b) (ii): Gender Distribution of HD Patients 1969-2023

(i) New HD patients



(ii) HD Patients at 31st December

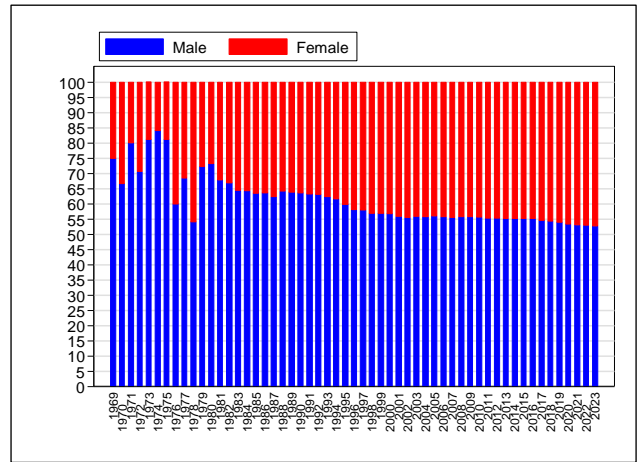
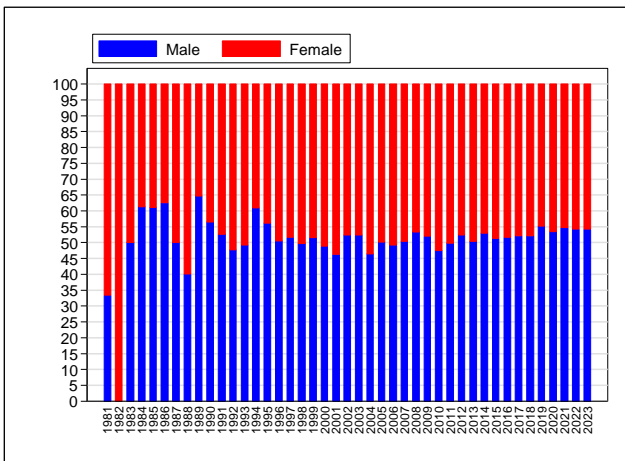
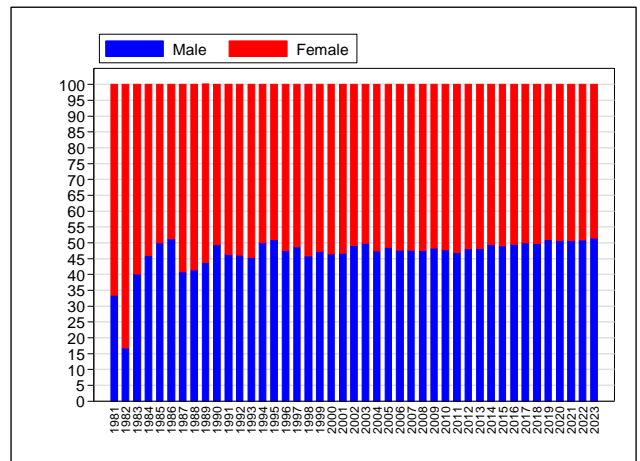


Figure 2.1.3(b) (iii): Gender Distribution of PD Patients 1969-2023

(i) New PD patients



(ii) PD Patients at 31st December



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 mean and median age have not changed substantially over the last 10 years. The mean age of patients on PD is 5 years younger than HD (Table 2.1.4(a)).

Table 2.1.4(a): Dialysis Treatment Rate by Age Group, per million age group population 2014-2023

Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
New Dialysis patients	10027	10037	9351	9420	9426	8494	8046	8072	8006	7601
≤14	9	8	7	7	10	8	7	7	8	6
15-24	40	44	43	41	42	37	36	37	37	40
25-34	125	132	112	114	103	101	87	92	91	88
35-44	274	275	245	248	267	228	218	234	236	211
45-54	641	655	587	628	620	597	574	595	600	580
55-64	1176	1165	1171	1199	1209	1108	1095	1182	1182	1153
≥ 65	1232	1308	1256	1287	1262	1184	1166	1187	1267	1234
Overall Mean age (yrs)	55.1	55.2	55.4	55.4	55.2	55.2	55.4	55.1	55.2	55.1
Overall SD age	14.2	14.4	14.3	14.1	14.3	14.3	14.1	14.1	14.2	14.2
Overall Median age (yrs)	57	57	58	57	57	57	57	57	57	57
HD										
≤14	2	3	2	2	4	2	3	4	2	3
15-24	22	26	24	23	26	25	23	25	24	29
25-34	88	91	76	81	79	77	65	71	70	69
35-44	212	206	185	196	215	187	176	194	196	179
45-54	514	519	474	522	521	501	487	511	504	502
55-64	949	943	959	992	1007	943	943	1030	1013	972
≥ 65	1055	1108	1063	1098	1103	1038	1012	1042	1068	1058
HD Mean age (yrs)	56.2	56.3	56.5	56.3	56.1	56	56.2	55.7	55.8	55.5
HD SD age	13.7	13.8	13.5	13.5	13.7	13.7	13.4	13.6	13.5	13.8
HD Median age (yrs)	58	58	58	58	58	58	58	57	57	57
PD										
≤14	6	5	5	5	7	5	5	3	5	3
15-24	18	18	18	19	16	12	13	12	13	11
25-34	37	41	36	33	24	24	22	22	21	18
35-44	62	69	60	52	51	41	42	40	40	31
45-54	127	136	112	106	99	96	87	84	96	78
55-64	228	222	212	207	202	165	152	152	169	181
≥ 65	177	200	193	189	158	146	154	145	198	176
PD Mean age (yrs)	51.1	51	51.1	51.3	51.1	51.3	51	51.4	52.1	52.9
PD SD age	15.8	15.7	16.2	16	16.3	16.2	16.5	16.1	16.8	15.8
PD Median age (yrs)	54	53	54	55	55	54	54	54	55	56

Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
ESKD patients at 31st December	53210	51481	49995	49992	47212	44625	42521	40634	38003	35068
≤14	48	49	47	46	45	43	41	38	35	33
15-24	354	365	361	351	322	303	293	281	267	255
25-34	871	872	833	795	710	671	642	623	594	567
35-44	1533	1511	1458	1453	1487	1421	1397	1371	1308	1237
45-54	3393	3398	3373	3490	3368	3253	3167	3077	2936	2768
55-64	5260	5192	5199	5370	5064	4885	4801	4749	4563	4317
≥ 65	4323	4341	4304	4494	4196	4109	4026	3990	3924	3767
Overall Mean age (yrs)	51.8	51.7	51.7	51.9	51.8	51.8	51.7	51.7	51.7	51.5
Overall SD age	14.7	14.7	14.7	14.6	14.6	14.6	14.6	14.6	14.6	14.7
Overall Median age (yrs)	54	53	54	54	54	54	53	53	53	53
HD										
≤14	20	21	21	21	21	19	19	17	14	14
15-24	275	286	283	278	260	248	238	229	218	210
25-34	734	732	707	685	617	584	560	549	526	504
35-44	1336	1312	1278	1293	1333	1277	1258	1244	1195	1135
45-54	3015	3030	3032	3160	3057	2960	2890	2816	2689	2558
55-64	4668	4623	4632	4813	4573	4445	4388	4341	4141	3929
≥ 65	3911	3912	3890	4078	3820	3735	3647	3623	3546	3435
HD Mean age (yrs)	52.3	52.2	52.2	52.3	52.2	52.2	52.1	52	52	51.9
HD SD age	14.3	14.4	14.3	14.3	14.3	14.3	14.2	14.2	14.2	14.3
HD Median age (yrs)	54	54	54	54	54	54	54	54	53	53
PD										
≤14	28	28	27	25	25	23	22	20	20	19
15-24	79	79	78	72	62	56	54	52	49	45
25-34	138	139	126	110	93	87	82	74	68	63
35-44	197	200	180	160	155	144	139	127	113	102
45-54	379	368	340	331	311	293	277	261	247	210
55-64	592	569	566	557	491	440	413	408	422	387
≥ 65	412	429	413	416	376	374	380	367	379	332
PD Mean age (yrs)	47.9	47.8	47.9	48.3	48.2	48.2	48.1	48.3	48.7	48.2
PD SD age	16.5	16.6	16.8	16.8	17	17.1	17.2	17.3	17.5	17.6
PD Median age (yrs)	50	50	51	52	51	51	51	51	52	51

Figure 2.1.4(a) (i): New Dialysis Treatment Rate by Age Group 1969-2023

(i) New Dialysis Patients

(ii) ESKD Patients at 31st December

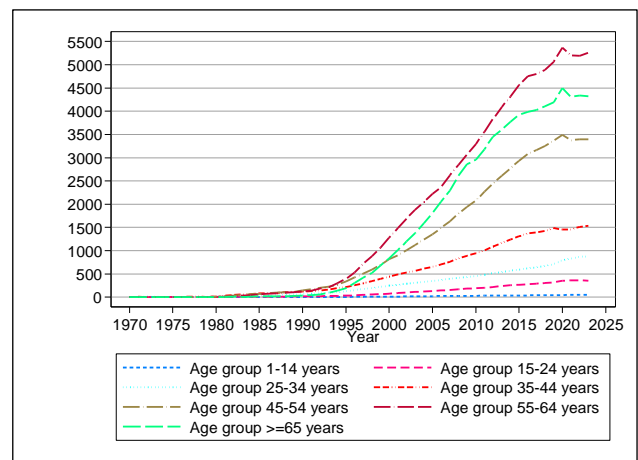
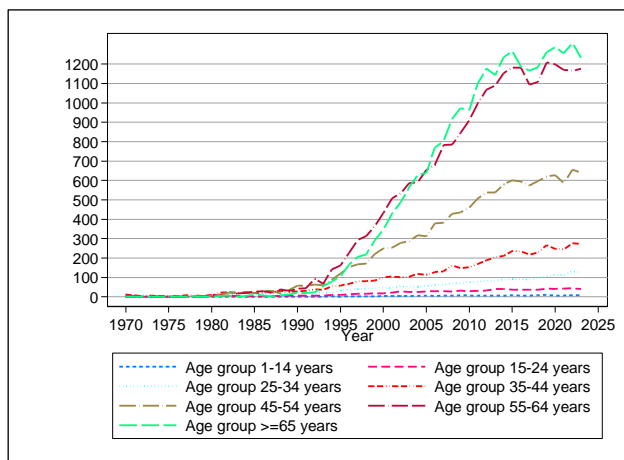


Figure 2.1.4(a) (ii): HD Treatment Rate by Age Group 1969-2023

(i) New HD Patients

(ii) HD Patients at 31st December

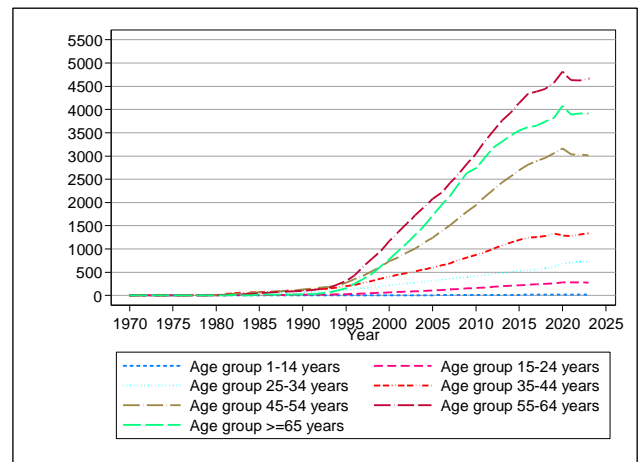
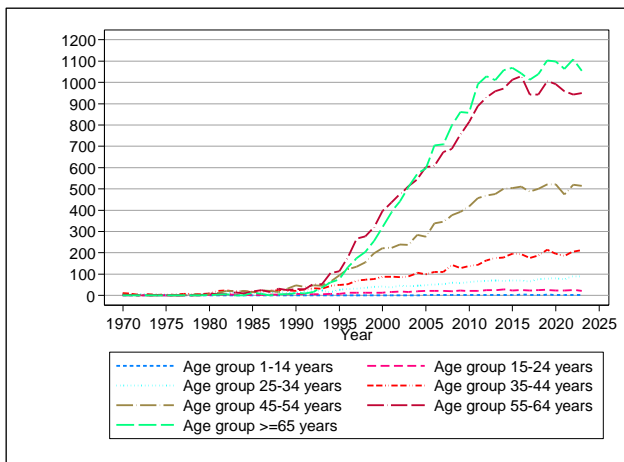


Figure 2.1.4(a) (iii): PD Treatment Rate by Age Group 1969-2023

(i) New PD Patients

(ii) PD Patients at 31st December

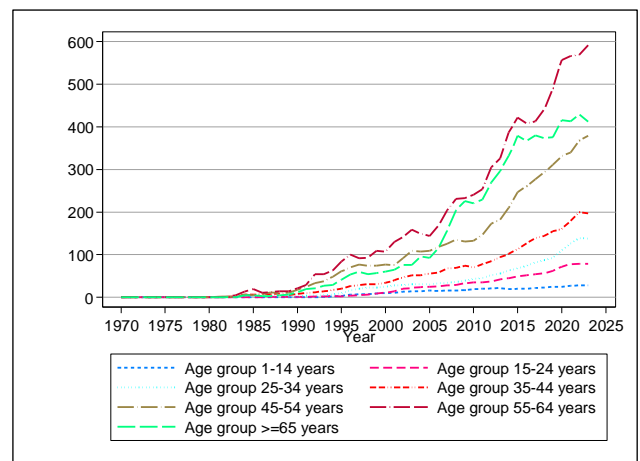
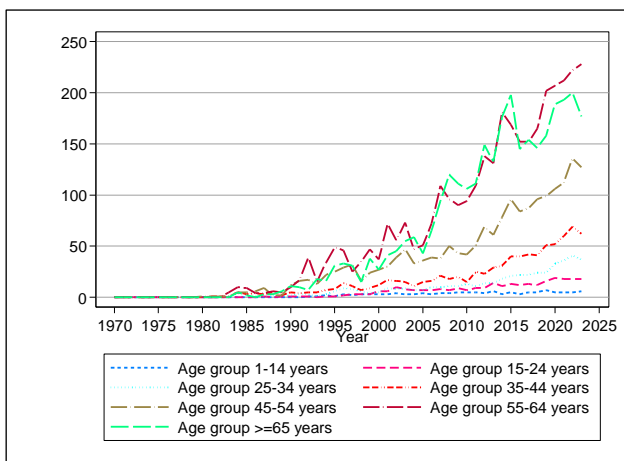
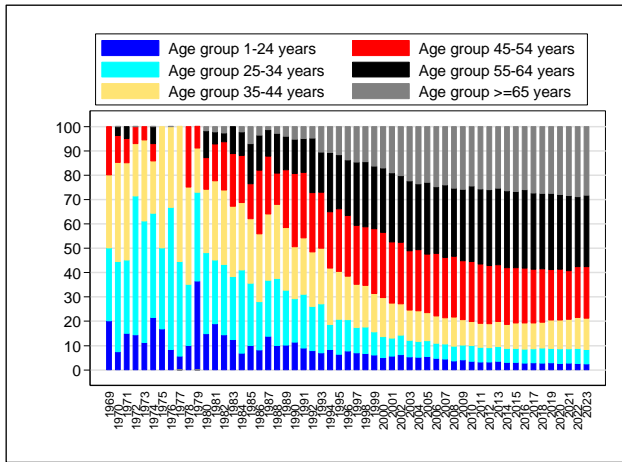


Table 2.1.4(b): Percentage Age Distribution of Dialysis Patients 2014-2023

Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
New Dialysis patients	10027	10037	9351	9420	9426	8494	8046	8072	8006	7601
% ≤24	2.4	2.5	2.7	2.5	2.9	2.7	2.8	2.7	3	3
% 25-34	5.9	6.3	5.9	6.1	5.9	6.2	5.8	5.7	5.7	5.7
% 35-44	12.9	12.6	12.1	11.7	11.5	10.6	10.6	10.7	10.5	9.8
% 45-54	21.1	20.9	19.9	20.9	20.8	21.9	22.1	22.6	22.6	23.3
% 55-64	29.4	28.8	30.9	30.8	31.3	31	31.3	32.2	31.4	31.6
% ≥ 65	28.3	28.9	28.5	28	27.6	27.6	27.4	26.1	26.8	26.6
New HD patients	8150	8132	7659	7856	7992	7263	6913	7070	6872	6609
% ≤24	1.3	1.5	1.5	1.3	1.7	1.8	1.7	1.9	1.9	2.5
% 25-34	5	5.3	4.8	5.1	5.2	5.5	5.2	5.1	5.2	5.4
% 35-44	12.3	11.8	11.3	11.3	11.1	10.3	10.1	10.5	10.4	9.8
% 45-54	21	20.8	19.9	21.4	21	22.1	22.4	22.8	22.8	23.6
% 55-64	30	29.6	31.9	31.4	31.7	31.5	32.3	32.8	32.4	31.7
% ≥ 65	30.4	31	30.6	29.5	29.3	28.8	28.3	26.9	27.3	27
New PD patients	1877	1905	1692	1564	1434	1231	1133	1007	1137	997
% ≤24	7.5	6.8	7.7	8.2	9.6	8	9.7	8.6	9.3	7.1
% 25-34	9.8	10.6	10.8	11.3	9.4	10.2	9.7	10	8.7	7.9
% 35-44	15.4	16	15.5	13.6	13.7	12.3	13.5	11.8	10.7	9.6
% 45-54	21.3	21.4	19.9	18.7	19.9	21.2	20.3	21.2	21.3	21.3
% 55-64	26.9	25.3	26	27.5	29.1	27.9	25.3	27.6	25.3	31.1
% ≥ 65	19.1	19.9	20.1	20.7	18.3	20.4	21.5	20.8	24.7	23
ESKD patients at 31st December	53210	51481	49995	49992	47212	44625	42521	40634	38003	35068
% ≤24	4.6	4.8	4.8	4.7	4.9	4.9	5	4.9	5	5.1
% 25-34	9.5	9.6	9.5	9.2	9.2	9.3	9.2	9.2	9.2	9.3
% 35-44	15.3	15.1	14.7	14.3	14.1	14	14	14	14	14
% 45-54	23.2	23.3	23.4	23.9	24.3	24.7	25	25.2	25.4	25.6
% 55-64	27.3	27.3	27.8	28.1	28.1	27.9	27.9	27.9	27.7	27.4
% ≥ 65	20.1	19.9	19.8	19.8	19.4	19.2	18.9	18.8	18.7	18.6
HD patients at 31st December	46659	45147	44074	44457	42219	40045	38219	36645	34212	31763
% ≤24	3.8	4	4	3.9	4.1	4.2	4.2	4.2	4.2	4.3
% 25-34	9.1	9.2	9.2	8.9	9	9	8.9	9	9	9.1
% 35-44	15.2	14.9	14.6	14.4	14.2	14	14	14.1	14.2	14.2
% 45-54	23.5	23.7	23.9	24.4	24.6	25	25.4	25.6	25.8	26.1
% 55-64	27.6	27.7	28.1	28.3	28.3	28.3	28.3	28.3	27.9	27.5
% ≥ 65	20.8	20.5	20.2	20.1	19.8	19.5	19.2	18.8	18.9	18.8
PD patients at 31st December	6551	6334	5921	5535	4993	4580	4302	3989	3791	3305
% ≤24	10.2	10.4	11	11	11.3	11.3	11.6	11.9	12.1	12.8
% 25-34	12.2	12.5	12.2	11.5	11.4	11.7	11.6	11.1	10.5	10.9
% 35-44	16	16.2	15.3	14.3	13.9	13.8	13.8	13.2	12.1	12.3
% 45-54	21	20.5	20	20.5	21.2	21.7	21.6	21.7	21.4	20.6
% 55-64	24.9	24.3	25.5	26.3	25.7	24.5	23.7	24.4	25.6	26.1
% ≥ 65	15.7	16.1	16	16.4	16.5	17	17.7	17.7	18.3	17.3

Figure 2.1.4(b) (i): Age Distribution of Dialysis Patients 1969-2023

(i) New Dialysis Patients



(ii) ESKD Patients at 31st December

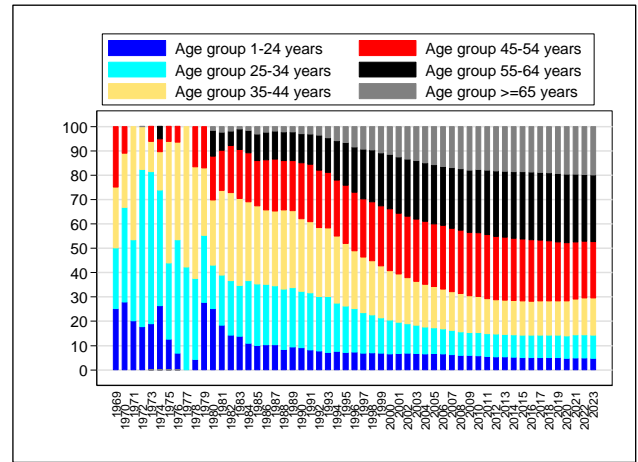
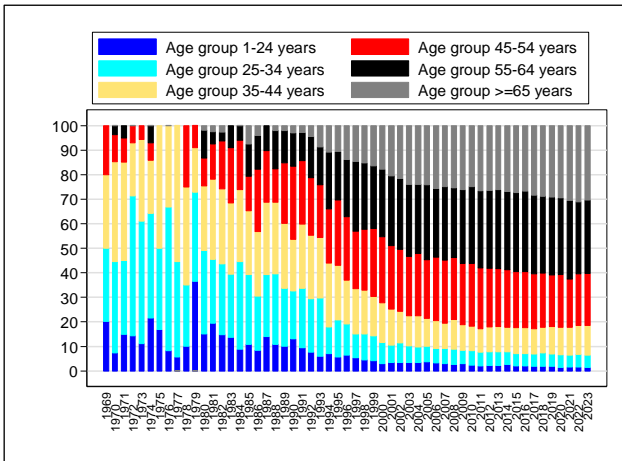


Figure 2.1.4(b) (ii): Age Distribution of HD Patients 1969-2023

(i) New HD patients



(ii) HD Patients at 31st December

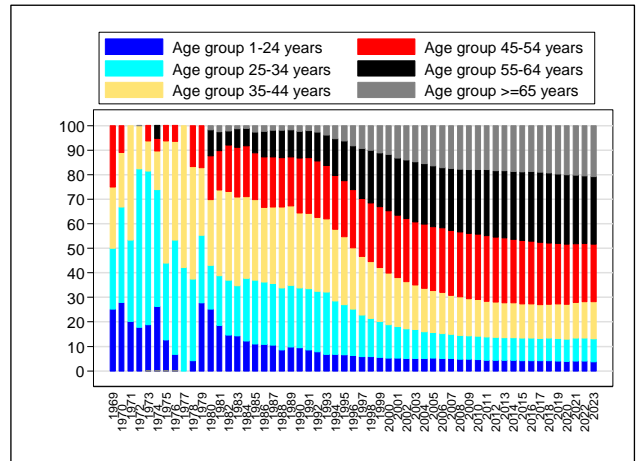
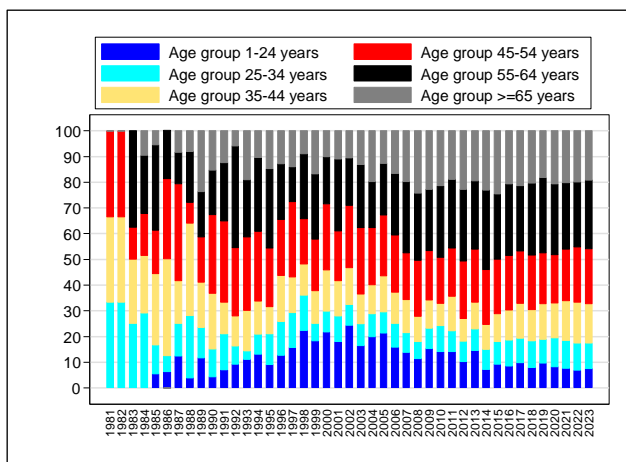
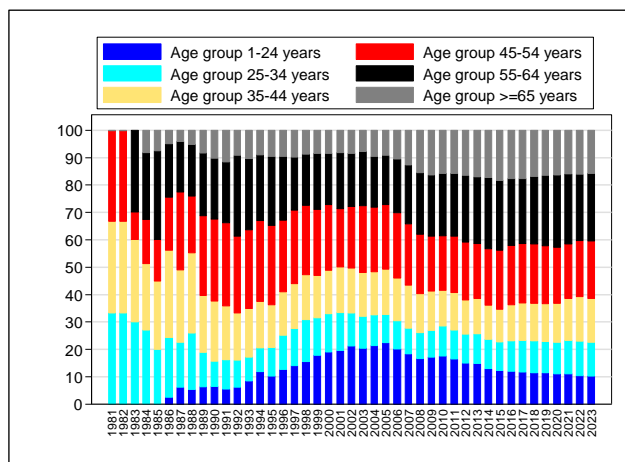


Figure 2.1.4(b) (iii): Age Distribution of PD Patients 1969-2023

(i) New PD Patients



(ii) PD Patients at 31st December



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 2023. Despite an encouraging trend of an increase in new PD patients for the last 5 years, the prevalent PD patients has remained low (12%). The percentage of incidence patients on home dialysis (both PD and HD) was 18.8% in 2023.

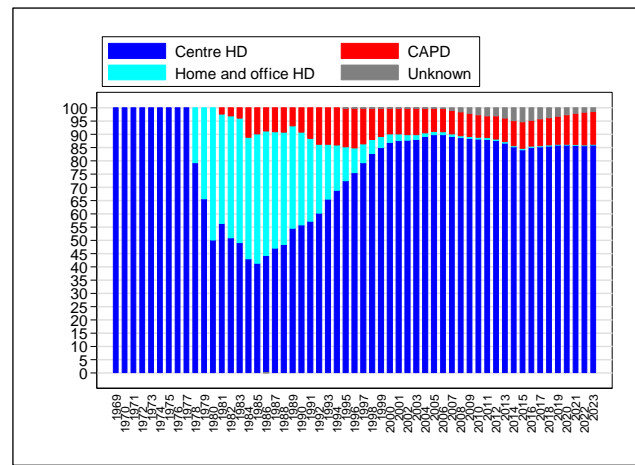
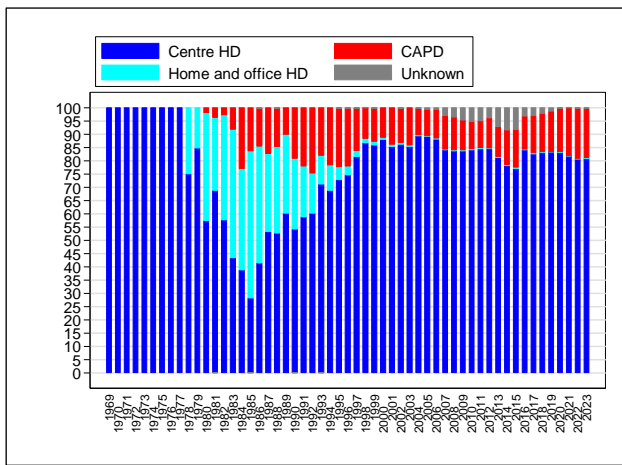
Table 2.1.5: Method and Location of Dialysis Patients 2014-2023

Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
New Dialysis patients	10027	10037	9351	9420	9426	8494	8046	8072	8006	7601
% Centre HD	81	80.7	81.8	83.2	83.3	83.2	82.5	84.1	77	78.1
% Home and office HD	0.1	0.2	0.1	0.1	0.1	0.1	0.4	0.3	0.5	0.4
% PD	18.7	19	18.1	16.6	15.2	14.5	14.1	12.5	14.2	13.1
% Unknown	0.2	0.1	0.1	0.1	1.4	2.2	3.0	3.1	8.3	8.4
ESKD patients at 31st December	53210	51481	49995	49992	47212	44625	42521	40634	38003	35068
% Centre HD	86	85.7	85.7	85.9	85.8	85.5	85.1	84.9	84.1	85.1
% Home and office HD	0.2	0.2	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.5
% PD	12.3	12.3	11.8	11.1	10.6	10.3	10.1	9.8	10	9.4
% Unknown	1.5	1.8	2.2	2.7	3.3	3.8	4.3	4.8	5.4	5.0

Figure 2.1.5: Method and Location of Dialysis Patients 1969-2023

(i) New Dialysis Patients

(ii) ESKD Patients at 31st December



2.1.6: Funding for dialysis treatment

The government continued to be the main source of funding for dialysis therapy for new and existing patients in this country. These funds were channelled 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 (self-funding) for new and prevalent dialysis in 2023 were 20% and 11% respectively. Funding from NGO bodies was 1.5% in 2023 (Table & Figure 2.1.6).

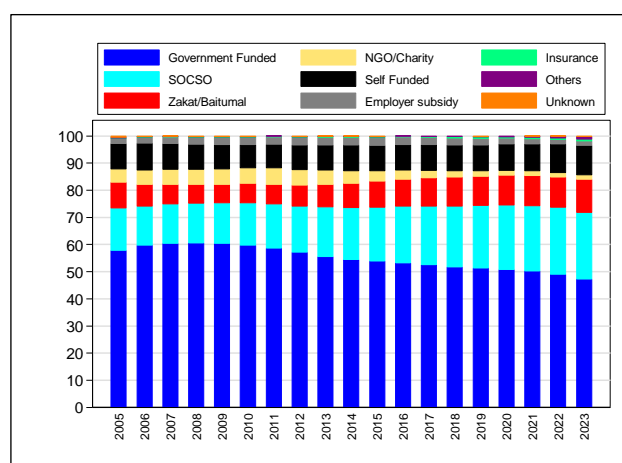
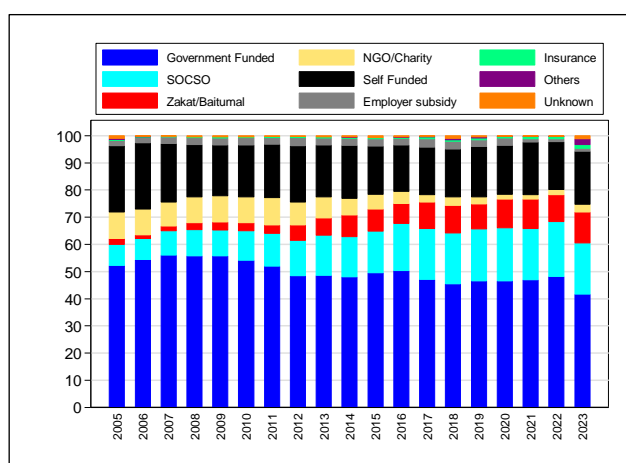
Table 2.1.6: Funding for Dialysis Treatment 2014-2023

Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
New Dialysis patients	10027	10037	9351	9420	9426	8494	8046	8072	8006	7601
% Government Funded	41.6	48.1	46.8	46.5	46.4	45.3	47	50.2	49.4	47.9
% SOCSO	18.8	20.2	18.9	19.4	19.1	18.8	18.7	17.4	15.4	14.8
% Zakat/Baitumal	11.4	9.9	10.8	10.6	9.3	10.1	9.8	7.3	8.1	8
% NGO/Charity	2.8	1.9	1.7	1.8	2.5	3.1	2.7	4.5	5.4	6.1
% Self Funded	19.6	17.6	19.3	18	18.6	17.7	17.5	17	17.7	19.5
% Employer Subsidized	1.1	1.1	1.3	2.7	2.5	2.8	3.1	2.5	2.8	2.6
% Insurance	1.3	0.9	0.8	0.6	0.6	0.6	0.7	0.5	0.4	0.5
% Others	2.2	0.2	0.2	0.3	0.5	0.5	0.2	0.1	0	0.1
% Unknown	1.2	0.1	0.2	0.1	0.5	1.1	0.3	0.5	0.8	0.5
Dialysing at 31st December	53210	51481	49995	49992	47212	44625	42521	40634	38003	35068
% Government Funded	47	48.9	50	50.6	51.2	51.6	52.2	53	53.6	54
% SOCSO	24.5	24.6	24	23.5	22.9	22.3	21.6	20.9	19.8	19.1
% Zakat/Baitumal	12.2	11.3	11.1	10.9	10.7	10.5	10.3	9.8	9.6	9.1
% NGO/Charity	1.5	1.5	1.6	1.8	2	2.3	2.7	3.3	3.9	4.6
% Self Funded	11	10.6	10.2	10	10	9.9	9.7	9.6	9.5	9.6
% Employer Subsidized	1.6	1.7	1.9	2.2	2.4	2.5	2.7	2.8	2.8	2.9
% Insurance	0.8	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4
% Others	1	0.7	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.1
% Unknown	0.4	0.1	0.1	0.1	0	0.1	0.1	0	0.2	0.2

Figure 2.1.6: Funding for Dialysis Treatment 1969-2023

(i) New Dialysis Patients

(ii) Dialysis Patients at 31st December



2.1.7: Distribution of dialysis patients by sector

Private centres remained the largest provider of dialysis. Among new patients, 59% were accepted to private dialysis centres followed by government centres (28%) and NGO centres (13%). The proportion of patients dialysing at the private sector has been steadily increasing over the last 30 years, accounting for more than half of prevalent patients since 2018.

Table 2.1.7: Distribution of Dialysis Patients by Sector 2014-2023

Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
New Dialysis patients	10027	10037	9351	9420	9426	8494	8046	8072	8006	7601
% Government centre	27.9	29.9	28	28	29.5	29.2	29.9	31.9	31.6	29.2
% NGO centre	12.7	12.5	12.9	15.1	15.7	16.4	17	17.7	17	17.2
% Private centre	59.4	57.6	59.1	56.9	54.8	54.4	53.1	50.4	51.4	53.6
ESKD patients at 31st December	53210	51481	49995	49992	47212	44625	42521	40634	38003	35068
% Government centre	29.1	29.9	30.1	30.2	30.6	30.8	31.1	31.3	31.1	30.8
% NGO centre	15.9	16.4	17	17.8	18.4	19	19.6	20.1	20.5	21.5
% Private centre	55	53.7	52.9	52	51	50.2	49.3	48.6	48.4	47.7

Figure 2.1.7: Distribution of Dialysis Patients by Sector 1969-2023

(i) New Dialysis Patients

(ii) Dialysis Patients at 31st December

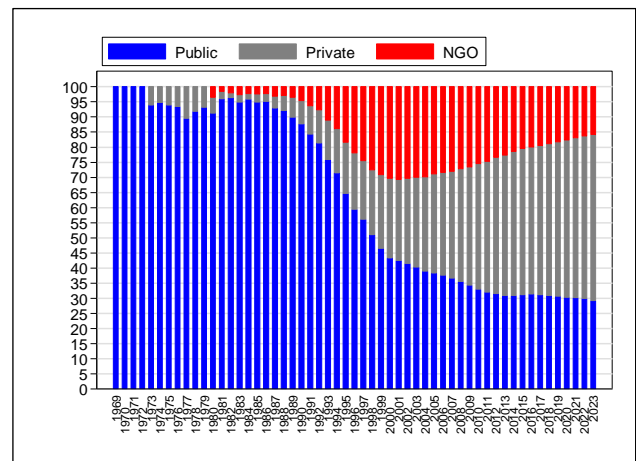
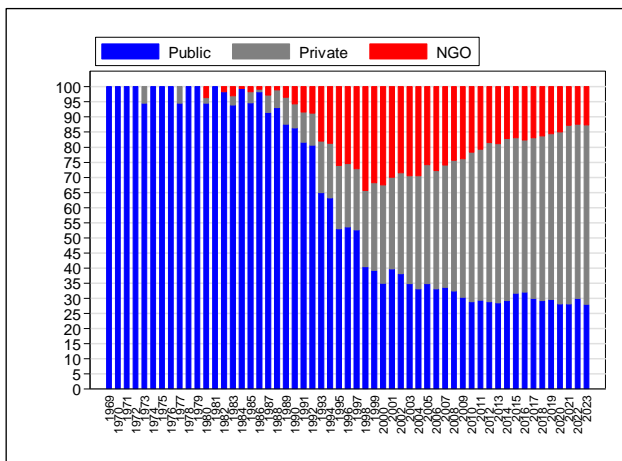


Table 2.1.7(a): Distribution of Dialysis Patients by Modality and Sector 2014-2023

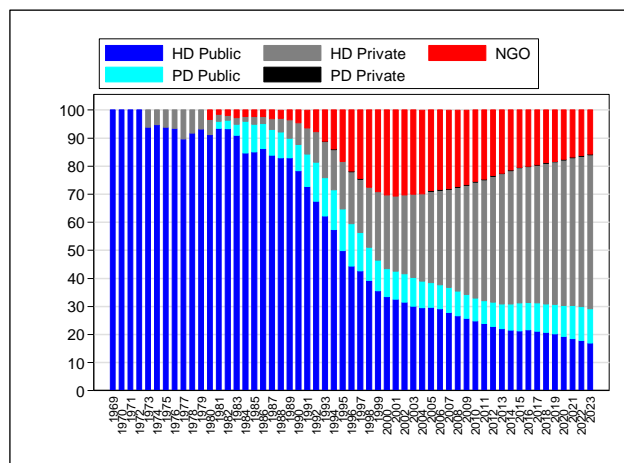
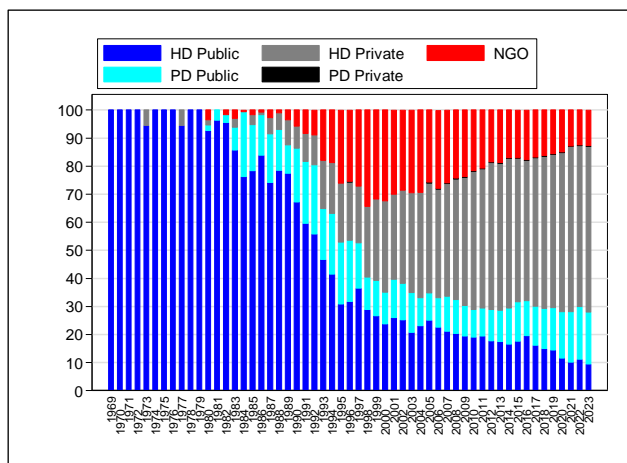
Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
New Dialysis patients	10027	10037	9351	9420	9426	8494	8046	8072	8006	7601
% Public Centre	27.9	29.9	28.0	28.0	29.5	29.2	30.0	31.9	31.6	29.3
% HD Public Centre	9.3	11.1	10.0	11.5	14.4	14.9	16.1	19.5	17.5	16.4
% PD Public Centre	18.6	18.8	18.0	16.5	15.1	14.3	13.9	12.4	14.1	12.9
% NGO	12.8	12.5	12.9	15.1	15.7	16.4	16.9	17.8	17.1	17.2
% Private Centre	59.3	57.6	59.1	56.9	54.8	54.4	53.1	50.3	51.3	53.5
% HD Private Centre	59.2	57.4	59.0	56.8	54.7	54.2	52.9	50.2	51.2	53.3
% PD Private Centre	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.2
ESKD patients at 31st December	53210	51481	49995	49992	47212	44625	42521	40634	38003	35068
% Public Centre	29.1	29.9	30.2	30.2	30.6	30.8	31.1	31.3	31.1	30.8
% HD Public Centre	16.9	17.7	18.4	19.2	20.1	20.6	21.1	21.6	21.2	21.5
% PD Public Centre	12.2	12.2	11.8	11.0	10.5	10.2	10.0	9.7	9.9	9.3
% NGO	15.9	16.4	16.9	17.7	18.4	18.9	19.6	20.1	20.5	21.5
% Private Centre	55.0	53.7	52.9	52.1	51.0	50.3	49.3	48.6	48.4	47.7
% HD Private Centre	54.9	53.6	52.8	52.0	50.9	50.2	49.2	48.5	48.3	47.6
% PD Private Centre	0.1	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 0.1% of new and prevalent patients. The public sector continued to provide an increasing proportion of PD to new patients accounting for 18.6% in 2023 while the proportion of new HD patients in public HD centres declined to 9.3%. 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 1969-2023

(i) New Dialysis Patients

(ii) Dialysis Patients at 31st December



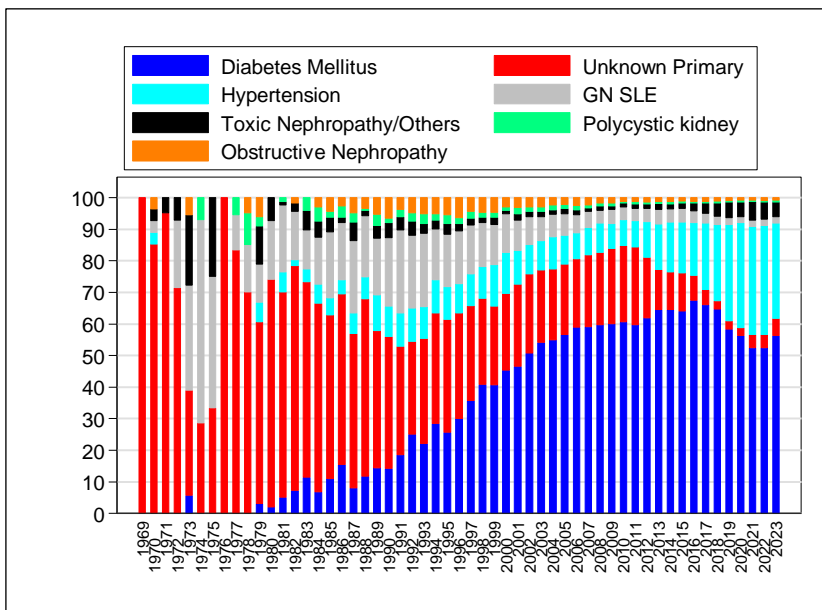
2.1.8: Primary renal disease

Diabetes mellitus remained the main cause of ESKD in new dialysis patients (56%) followed by hypertension (30%), 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 2014-2023

Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
New Dialysis patients	10027	10037	9351	9420	9426	8494	8046	8072	8006	7601
% Unknown cause	5.4	4.2	4.2	2.5	2.7	2.6	4.8	8	12.1	11.9
% Diabetes Mellitus	56.3	52.4	52.4	56.2	58.2	64.6	66	67.3	64	64.4
% GN/SLE	2.1	2	1.9	1.8	2.2	2.6	3.1	3.8	4.3	4.2
% Polycystic kidney	0.6	0.5	0.4	0.6	0.4	0.6	0.5	0.5	0.7	0.7
% Obstructive Nephropathy	0.9	1	0.9	0.9	1.1	1.2	1.4	1.4	1.2	1.4
% Toxic Nephropathy	0.4	0.4	0.4	0.5	0.8	0.9	1	0.8	0.5	0.5
% Hypertension	30.1	34.5	34.2	33.3	30.5	24.2	21	16.6	16	15.8
% Others	4.2	5.0	5.6	4.2	4.1	3.3	2.2	1.6	1.2	1.1

Figure 2.1.8: Primary Renal Diseases for New Dialysis Patients 1969-2023



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 has exceeded 1,000 in 2023. The number of dialysis centres has grown steadily from 759 in 2014 to 1,040 in 2023. The increase in number of dialysis centres was mainly contributed by the private dialysis centres, which grew from 410 in 2014 to 638 in 2023. During the same period, the number of NGO centres increased from 159 to 165 while the number of public dialysis centres increased from 190 to 237. The number of private dialysis centres predominates in the west coast of Peninsula Malaysia. The number of public PD centres has increased from 36 to 58 from 2014 to 2023 while the number of private PD centres has remained below 10.

Table 2.2.1: Number of Dialysis, HD and PD Centres in Malaysia by Sector, Year 2014-2023

Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
Public Centres	237	230	227	222	217	210	207	206	196	190
NGO Centres	165	163	159	156	157	162	161	160	159	159
Private Centres	638	593	533	489	467	447	447	433	419	410
HD Centres										
Public HD Centres	179	176	177	176	173	169	169	168	159	154
NGO HD Centres	165	163	159	156	157	162	161	160	159	159
Private HD Centres	629	584	526	482	460	440	437	423	411	402
PD Centres										
Public PD Centres	58	54	50	46	44	41	38	38	37	36
NGO PD Centres	0	0	0	0	0	0	0	0	0	0
Private PD Centres	9	9	7	7	7	7	10	10	8	8

Figure 2.2.1(a): Number of Dialysis Centre in Malaysia by Sector, 1969-2023

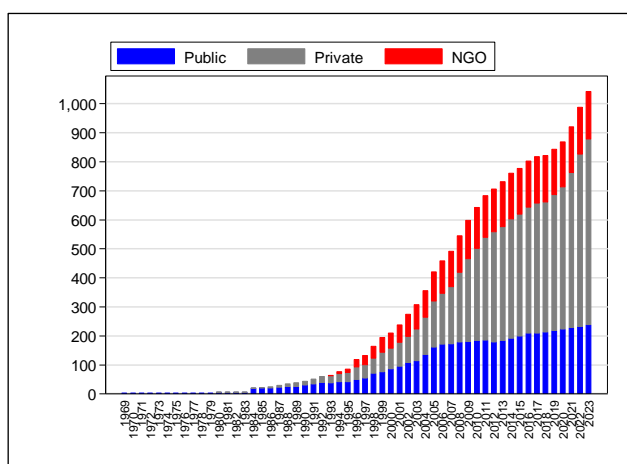
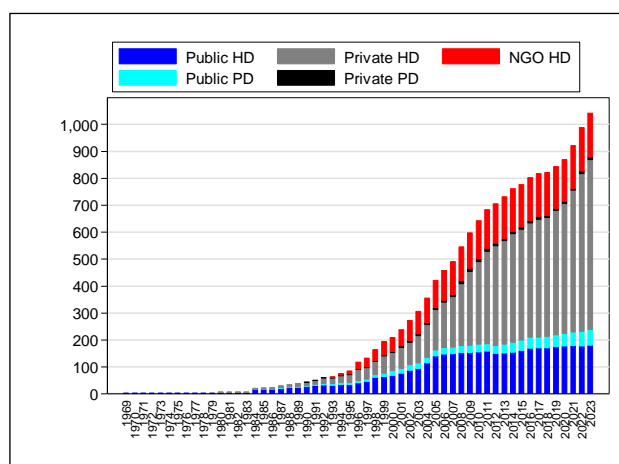


Figure 2.2.1(b): Number of HD and PD Centre in Malaysia by Sector, 1969-2023



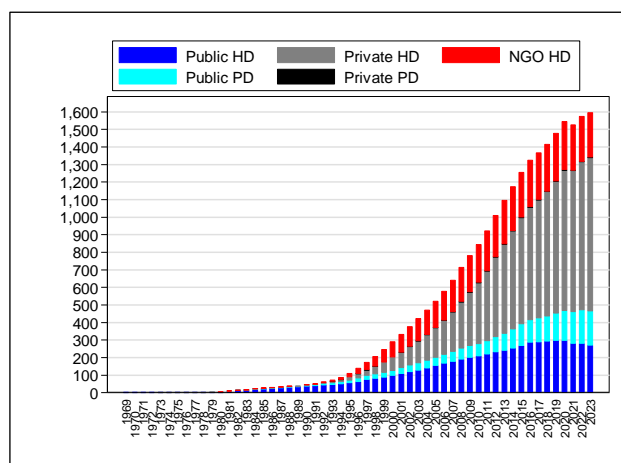
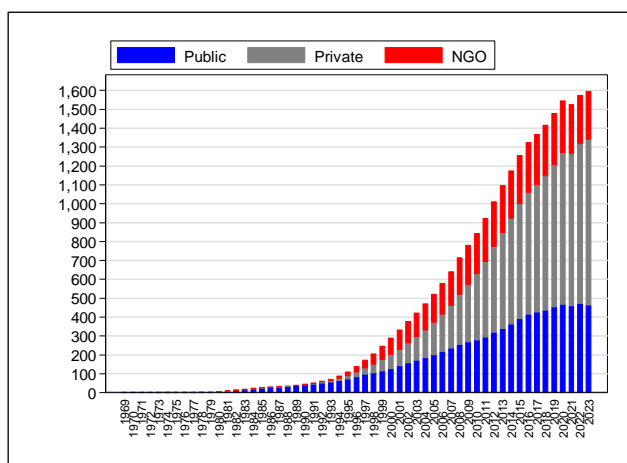
The private sector is the largest provider of dialysis for providing HD to 875 pmp while the public sector dominates the PD services with a prevalence rate of 195 pmp. The private sector contributed only 2 pmp of patients on PD.

Table 2.2.2: Prevalence Rate of Dialysis (HD+PD), HD and PD Patients in Malaysia by Sector, 2014-2023

Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
Dialysis patients, pmp										
Public	463	471	459	466	452	435	425	415	391	362
NGO	254	257	259	275	273	269	268	266	257	252
Private	877	846	807	804	753	711	674	643	607	560
HD patients, pmp										
Public	269	279	280	296	297	291	288	286	267	252
NGO	254	257	259	275	273	269	268	266	257	252
Private	875	844	805	803	752	710	673	642	607	559
PD patients, pmp										
Public	195	192	179	170	155	144	137	129	124	110
NGO	0	0	0	0	0	0	0	0	0	0
Private	2	2	1	1	1	1	1	1	1	1

Figure 2.2.2(a): Prevalence Rate of Dialysis Patient (HD+PD) Malaysia by Sector, 1969-2023

Figure 2.2.2(b): Prevalence Rate of HD and PD Patient in Malaysia by Sector, 1969-2023



2.2.3: Growth in dialysis in Malaysia by region

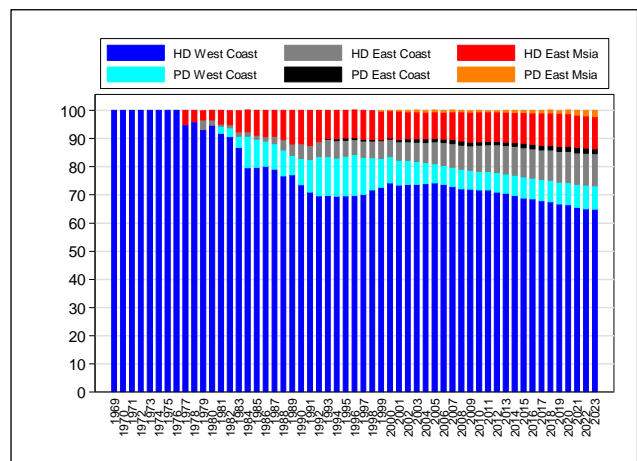
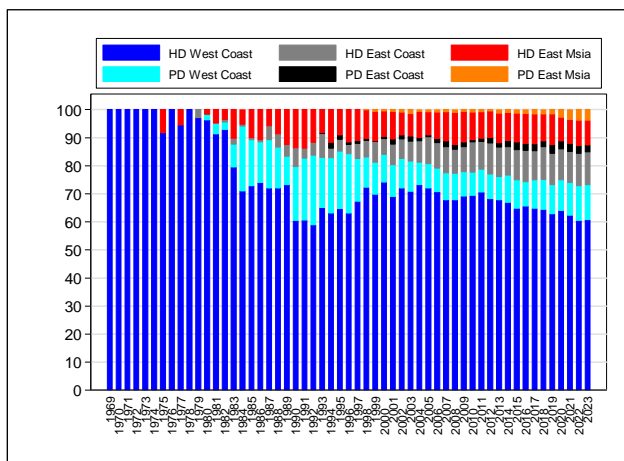
Table 2.2.3: Distribution of Dialysis Patients by Modality and Region 2014-2023

Year	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
New Dialysis patients	10027	10037	9351	9420	9426	8494	8046	8072	8006	7601
% West Coast	73.1	72.8	73.9	74.7	73.3	75.1	74.8	74.2	74.8	76.5
% East Coast	14.2	14.2	14	13.9	14.2	13.8	12.9	13.6	13.6	12.4
% East Msia	12.7	13	12.1	11.4	12.5	11.1	12.3	12.2	11.6	11.1
New HD patients	8150	8132	7659	7856	7992	7263	6913	7065	6869	6604
% West Coast	74.7	74.6	76	76.6	74.1	75.2	75.4	75	75.5	77
% East Coast	14.5	14.2	13.6	13.3	13.1	13.6	12.1	12.8	12.6	11.6
% East Msia	10.8	11.2	10.4	10.1	12.8	11.2	12.5	12.2	11.9	11.4
New PD patients	1877	1905	1692	1564	1434	1231	1133	1007	1137	997
% West Coast	66.1	65.1	64.3	65.5	68.5	74.1	71.1	69.2	70.6	73.2
% East Coast	13.3	14.3	16.2	16.9	20.8	15.4	17.7	19.5	19.9	17.6
% East Msia	20.6	20.6	19.5	17.6	10.7	10.5	11.2	11.3	9.5	9.2
Dialysing at 31st Dec	53210	51481	49995	49992	47212	44625	42521	40634	38003	35068
% West Coast	73.1	73.3	73.6	74.2	74.4	74.9	75.3	75.8	76.3	76.9
% East Coast	13.1	13.2	13.1	12.8	12.6	12.4	12.1	12	11.9	11.6
% East Msia	13.8	13.5	13.3	13	13	12.7	12.6	12.2	11.8	11.5
HD Dialysing at 31st Dec	46659	45147	44074	44457	42219	40045	38219	36645	34212	31763
% West Coast	73.9	74.1	74.3	74.6	74.5	75.1	75.5	76	76.4	76.9
% East Coast	13	12.9	12.7	12.4	12.2	12	11.7	11.6	11.5	11.3
% East Msia	13.1	13	13	13	13.3	12.9	12.8	12.4	12.1	11.8
PD Dialysing at 31st Dec	6551	6334	5921	5535	4993	4580	4302	3989	3791	3305
% West Coast	67.6	67.6	68.6	70.9	73	73.6	73.7	74.1	75.3	76.3
% East Coast	13.9	15.2	16.4	16.5	16.3	15.7	16.2	16.2	15.9	14.4
% East Msia	18.5	17.2	15	12.6	10.7	10.7	10.1	9.7	8.8	9.3

Figure 2.2.3: Distribution of Dialysis Patients by Modality and Region 1969-2023

(i) New Dialysis Patients

(ii) ESKD Patients at 31st December



Most new dialysis patients are from the West Coast comprising 73% in 2023. Compared to 2014, there has been a slight increase (about 2%) in proportion of patients from East Coast and East Malaysia. There is an increase in provision of peritoneal dialysis in East Malaysia. The proportion of new PD patients from East Malaysia has doubled from 9.2% in 2014 to 20.6% in 2023. This is also reflected in the increase in the proportion of prevalent patients on PD from East Malaysia, increasing from 9.3% in 2014 to 18.5% in 2023. (Table 2.2.3 & Figures 2.2.3 (i) & (ii)).

Table 2.2.4: Number and Prevalence Rate of Dialysis Patients (HD & PD) in Malaysia by State and Sector, 2019-2023

State	Sector	Year 2023		Year 2022		Year 2021		Year 2020		Year 2019	
		N	PMP	N	PMP	N	PMP	N	PMP	N	PMP
Malaysia	Public	15469	463	15406	471	15059	459	15082	466	14454	452
	Private	29263	877	27657	846	26439	807	26017	804	24052	753
	NGO	8478	254	8418	257	8497	259	8893	275	8706	272
	Total	53210	1594	51481	1574	49995	1525	49992	1545	47212	1478
Johor	Public	1454	355	1413	351	1332	331	1350	337	1300	346
	Private	5106	1245	4968	1233	4815	1198	4645	1158	4316	1148
	NGO	1476	360	1533	381	1589	395	1694	422	1696	451
	Total	8036	1960	7914	1965	7736	1924	7689	1918	7312	1944
Kedah	Public	1135	519	1155	534	1177	547	1122	526	1056	486
	Private	2248	1028	2019	933	2010	934	1969	924	1853	852
	NGO	358	164	360	166	374	174	407	191	417	192
	Total	3741	1710	3534	1634	3561	1655	3498	1641	3326	1530
Kelantan	Public	915	493	911	498	903	498	936	522	891	473
	Private	1034	557	903	493	840	463	859	479	771	409
	NGO	246	132	231	126	225	124	221	123	201	107
	Total	2195	1182	2045	1117	1968	1086	2016	1125	1863	989
Melaka	Public	395	384	393	390	386	384	390	391	372	401
	Private	1462	1423	1397	1385	1268	1262	1190	1192	1099	1184
	NGO	226	220	234	232	230	229	223	223	204	220
	Total	2083	2027	2024	2007	1884	1875	1803	1806	1675	1804
Negeri Sembilan	Public	799	653	797	660	789	655	810	675	789	701
	Private	1139	930	1047	867	1008	837	959	799	922	819
	NGO	552	451	575	476	596	495	581	484	533	473
	Total	2490	2034	2419	2002	2393	1987	2350	1958	2244	1993
Pahang	Public	953	580	1009	625	990	618	967	608	940	562
	Private	1313	799	1215	753	1137	710	1031	648	953	570
	NGO	317	193	312	193	315	197	326	205	324	194
	Total	2583	1572	2536	1571	2442	1525	2324	1460	2217	1326
Perak	Public	1311	516	1296	515	1298	516	1307	524	1223	487
	Private	3186	1254	3212	1277	3112	1237	3089	1237	2788	1111
	NGO	671	264	642	255	641	255	646	259	639	255
	Total	5168	2034	5150	2048	5051	2008	5042	2020	4650	1853

State	Sector	Year 2023		Year 2022		Year 2021		Year 2020		Year 2019	
		N	PMP	N	PMP	N	PMP	N	PMP	N	PMP
Perlis	Public	133	454	129	445	107	372	97	341	90	354
	Private	113	386	105	362	102	355	107	376	108	425
	NGO	38	130	37	128	39	136	51	179	53	209
	Total	284	970	271	935	248	862	255	895	251	988
Pulau Pinang	Public	463	261	479	275	485	279	477	274	468	265
	Private	2194	1238	2126	1221	2028	1166	2010	1155	1852	1047
	NGO	849	479	875	503	918	528	937	538	933	527
	Total	3506	1979	3480	1999	3431	1972	3424	1967	3253	1839
Sabah	Public	1919	534	1853	543	1773	520	1772	518	1730	443
	Private	602	168	584	171	576	169	571	167	552	141
	NGO	296	82	287	84	288	84	303	89	291	75
	Total	2817	784	2724	798	2637	773	2646	774	2573	659
Sarawak	Public	1878	748	1817	735	1686	684	1619	660	1512	539
	Private	1212	483	1116	451	1037	421	972	396	893	318
	NGO	1288	513	1210	489	1153	468	1133	462	1047	373
	Total	4378	1745	4143	1675	3876	1572	3724	1518	3452	1230
Selangor	Public	1889	262	1938	275	1923	274	2018	289	1957	301
	Private	6711	931	6191	878	5840	833	5996	857	5602	861
	NGO	1185	164	1168	166	1175	168	1325	189	1311	202
	Total	9785	1358	9297	1319	8938	1274	9339	1335	8870	1363
Terengganu	Public	1114	921	1145	965	1158	989	1158	1007	1081	869
	Private	805	666	763	643	709	606	628	546	521	419
	NGO	286	236	281	237	278	237	292	254	288	231
	Total	2205	1823	2189	1845	2145	1832	2078	1808	1890	1519
WP Labuan	Public	117	1176	110	1135	113	1178	104	1095	100	1007
	Private	0	0	0	0	0	0	0	0	0	0
	NGO	0	0	0	0	0	0	0	0	0	0
	Total	117	1176	110	1135	113	1178	104	1095	100	1007
WP Putrajaya	Public	84	705	60	512	46	399	46	421	51	492
	Private	33	277	33	282	34	295	32	293	28	270
	NGO	0	0	0	0	0	0	0	0	0	0
	Total	117	982	93	794	80	693	78	714	79	763
WP Kuala Lumpur	Public	910	455	901	459	893	455	909	459	894	502
	Private	2105	1053	1978	1009	1923	979	1959	988	1794	1006
	NGO	690	345	673	343	676	344	754	380	769	431
	Total	3705	1854	3552	1811	3492	1778	3622	1827	3457	1939

The private sector is the main provider of dialysis on the West Coast (58%) while the public sector is the main provider in East Malaysia (54%) and on the East Coast (43%). NGO provides dialysis to 22% of patients in East Malaysia followed by 15% on the West Coast, and 12% on the East Coast (Table 2.2.4).

Among the states with the highest acceptance rate (at least 300 pmp), the private sector provided dialysis to the majority of patients (i.e. more than 50%) with the exception of Terengganu where the public sector is the largest sector providing dialysis to 50.5% of patients. In contrast, public sector is the main provider of dialysis in the states with the lowest acceptance rate (less than 200 pmp). This is exemplified by Sabah where public sector provided dialysis to 68% of patients with the private and NGO sectors contributing 21% and 11% respectively.

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