

CHAPTER 5

HAEMODIALYSIS PRACTICES

**Shahnaz Shah Firdaus Khan
Leong Chong Men (Bryan)**

SECTION 5.1: VASCULAR ACCESS AND ITS COMPLICATIONS

The proportion of patients undergoing haemodialysis (HD) using a fistula has consistently and gradually reducing for the past 10 years. It was 87.5% in year 2011 and was only 78.6% in year 2021. This is most likely caused by a significant proportion of incident dialysis cases did not have a functioning fistula upon initiation of HD and the increasing elderly and diabetic patients with no vascular access dialyzing with dialysis catheter.

The development of interventional nephrology has brought to an increase in patients undergoing HD via a cuffed-HD catheter and non cuff catheter. In fact, the number of patients undergoing HD via cuffed-HD catheters is very near to the number of patients using non-cuffed HD catheter nationwide.

Table 5.1.1: Vascular access on haemodialysis, 2011-2021

Access types	2021		2020		2019		2018		2017		2016	
	n	%	n	%	n	%	n	%	n	%	n	%
Wrist AVF*	19073	37.6	19562	39.5	19657	41.4	19176	42.8	18905	44.1	17997	44.9
BCF*	19093	37.6	18499	37.4	17783	37.5	16751	37.4	16205	37.8	14956	37.3
BBF*	1740	3.4	1615	3.3	1526	3.2	1340	3	1184	2.8	950	2.4
Graft	448	0.9	490	1	527	1.1	567	1.3	576	1.3	557	1.4
HD Catheter – cuffed	5187	10.2	4542	9.2	3812	8	3313	7.4	3028	7.1	2662	6.6
HD Catheter – Non Cuffed	5238	10.3	4810	9.7	4144	8.7	3605	8.1	3011	7	2971	7.4
Total	50779	100	49518	100	47449	100	44752	100	42909	100	40093	100

Access types	2015		2014		2013		2012		2011	
	n	%	n	%	n	%	N	%	n	%
Wrist AVF*	16121	46.9	15540	48.8	14532	50.7	13317	52.1	12340	54.6
BCF*	12546	36.5	11222	35.2	9887	34.5	8672	33.9	7177	31.7
BBF*	784	2.3	665	2.1	538	1.9	380	1.5	271	1.2
Graft	551	1.6	559	1.8	537	1.9	498	1.9	488	2.2
HD Catheter – cuffed	1947	5.7	1672	5.3	1244	4.3	932	3.6	604	2.7
HD Catheter – Non Cuffed	2398	7	2182	6.9	1920	6.7	1759	6.9	1729	7.6
Total	34347	100	31840	100	28658	100	25558	100	22609	100

*AVF = arteriovenous fistula, BBF = Brachioasilic fistula, BCF = brachiocephalic fistula

No increase in difficulties was reported with vascular access.

Table 5.1.2: Difficulties report with vascular access, 2011-2021

Access difficulty	2021		2020		2019		2018		2017		2016	
	n	%	n	%	n	%	n	%	n	%	n	%
Difficulty with needle placement	748	1.5	870	1.8	404	1.1	360	1.2	513	2	547	1.5
Difficulty in obtaining desired blood flow rate	939	1.9	1138	2.4	516	1.4	419	1.4	517	2.1	495	1.4
Other difficulties	242	0.5	274	0.6	68	0.2	49	0.2	71	0.3	82	0.2
No difficulties	47510	96.1	46081	95.3	35036	97.3	29661	97.3	23961	95.6	35230	96.9
Total	49439	100	48363	100	36024	100	30489	100	25062	100	36354	100

Access difficulty	2015		2014		2013		2012		2011	
	n	%	n	%	n	%	n	%	n	%
Difficulty with needle placement	554	1.7	656	2.2	510	1.9	578	2.5	415	2
Difficulty in obtaining desired blood flow rate	470	1.4	488	1.6	450	1.7	516	2.2	429	2.1
Other difficulties	74	0.2	78	0.3	69	0.3	112	0.5	64	0.3
No difficulties	32371	96.7	29288	96	26189	96.2	22364	94.9	19493	95.5
Total	33469	100	30510	100	27218	100	23570	100	20401	100

Complication risk remains less than 8% for the past 6 years and the 3 commonest complications were aneurysmal dilatation, venous outflow obstruction and thrombosis of fistula.

Table 5.1.3: Complications reported with vascular access, 2011-2021

Complication	2021		2020		2019		2018		2017		2016	
	n	%	n	%	n	%	n	%	n	%	n	%
Thrombosis	440	0.9	541	1.1	196	0.5	184	0.6	387	1.5	576	1.6
Bleed	111	0.2	144	0.3	48	0.1	53	0.2	70	0.3	79	0.2
Aneurysmal dilatation	642	1.3	680	1.4	56	0.2	58	0.2	369	1.5	511	1.4
Swollen limb	185	0.4	227	0.5	74	0.2	65	0.2	116	0.5	160	0.4
Access related infection, local/systemic	230	0.5	263	0.5	105	0.3	133	0.4	167	0.7	205	0.6
Distal limb ischaemia	41	0.1	30	0.1	9	0	11	0	24	0.1	37	0.1
Venous outflow obstruction	604	1.2	593	1.2	184	0.5	127	0.4	315	1.3	385	1.1
Carpal tunnel	29	0.1	26	0.1	4	0	2	0	24	0.1	42	0.1
Others	315	0.6	402	0.8	102	0.3	69	0.2	158	0.6	172	0.5
No complications	46995	94.8	45576	94	35128	97.8	29682	97.7	23531	93.5	34267	94.1
Total	49592	100	48482	100	35906	100	30384	100	25161	100	36434	100

Complication	2015		2014		2013		2012		2011	
	n	%	n	%	n	n	%	n	%	n
Thrombosis	551	1.6	552	1.8	507	1.8	550	2.3	467	2.2
Bleed	66	0.2	84	0.3	81	0.3	84	0.3	75	0.4
Aneurysmal dilatation	488	1.4	520	1.7	398	1.4	516	2.1	391	1.9
Swollen limb	159	0.5	200	0.6	145	0.5	192	0.8	128	0.6
Access related infection, local/systemic	189	0.6	181	0.6	164	0.6	173	0.7	122	0.6
Distal limb ischaemia	49	0.1	33	0.1	29	0.1	42	0.2	24	0.1
Venous outflow obstruction	367	1.1	425	1.4	324	1.2	348	1.4	251	1.2
Carpal tunnel	35	0.1	41	0.1	53	0.2	47	0.2	48	0.2
Others	171	0.5	210	0.7	176	0.6	178	0.7	132	0.6
No complications	32206	93.9	28989	92.8	25723	93.2	22068	91.2	19140	92.1
Total	34281	100	31235	100	27600	100	24198	100	20778	100

SECTION 5.2: HD PRESCRIPTION

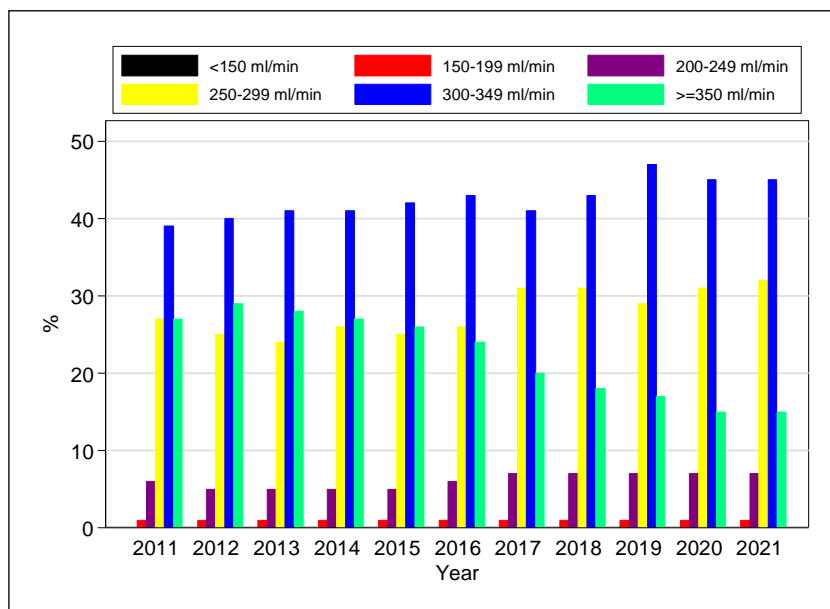
More than 90% of the patients were undergoing HD with the blood flow rate of >250ml/min for the past 11 years. The percentage of patient dialyzing at the blood flow rate of >350ml/min was dropping gradually over the past 6 years.

Table 5.2.1: Blood flow rates in HD centers, 2011-2021

Blood flow rates (ml/min)	2021		2020		2019		2018		2017		2016	
	n	%	n	%	n	%	n	%	n	%	n	%
<150	16	0.1	9	0	14	0.1	18	0.1	30	0.1	51	0.1
150-199	265	0.9	262	1	204	0.8	239	1.2	185	0.8	278	0.8
200-249	2118	6.9	1950	7.4	1601	6.5	1460	7.2	1621	6.9	2133	5.8
250-299	9905	32.2	8247	31.4	7069	28.8	6255	30.8	7206	30.9	9674	26.2
300-349	13960	45.3	11787	44.9	11449	46.6	8788	43.2	9635	41.3	15716	42.6
>=350	4540	14.7	3976	15.2	4220	17.2	3575	17.6	4658	20	9017	24.5
Total	30804	100	26231	100	24557	100	20335	100	23335	100	36869	100

Blood flow rates (ml/min)	2015		2014		2013		2012		2011	
	n	%	n	%	n	n	%	n	%	n
<150	24	0.1	23	0.1	21	0.1	16	0.1	17	0.1
150-199	216	0.6	164	0.5	148	0.5	130	0.5	130	0.6
200-249	1878	5.5	1703	5.4	1509	5.3	1334	5.3	1399	6.4
250-299	8557	25	8088	25.6	6920	24.4	6308	25.2	5814	26.7
300-349	14515	42.4	13081	41.4	11752	41.4	9939	39.8	8442	38.8
>=350	9062	26.5	8532	27	8021	28.3	7264	29.1	5968	27.4
Total	34252	100	31591	100	28371	100	24991	100	21770	100

Figure 5.2.1: Blood flow rates in HD centers, 2011-2021



More than 90% of the HD patients had 3 sessions of HD per week for the past 6 years. Besides, >95% of them were dialyzed for 4 hours during each session, except in year 2017.

Table 5.2.2: Number of HD sessions per week, 2011-2021

HD sessions per week	2021		2020		2019		2018		2017		2016	
	n	%	n	%	n	%	n	%	n	%	n	%
1	39	0.1	88	0.3	122	0.5	62	0.3	75	0.3	67	0.2
2	545	1.8	502	1.9	452	1.8	441	2.2	528	2.3	479	1.3
3	30061	97.6	25555	97.4	23858	97.4	19762	97.3	22644	97	36232	98
4	159	0.5	85	0.3	67	0.3	53	0.3	84	0.4	165	0.4
>=5	0	0	1	0	2	0	1	0	4	0	13	0
Total	30804	100	26231	100	24501	100	20319	100	23335	100	36956	100

HD sessions per week	2015		2014		2013		2012		2011	
	n	%	n	%	n	n	%	n	%	n
1	16	0	33	0.1	30	0.1	29	0.1	6	0
2	466	1.4	528	1.7	378	1.3	340	1.4	216	1
3	33709	98.1	31018	97.7	27998	98.1	24638	97.9	21667	98.7
4	132	0.4	138	0.4	114	0.4	139	0.6	50	0.2
>=5	43	0.1	44	0.1	33	0.1	15	0.1	9	0
Total	34366	100	31761	100	28553	100	25161	100	21948	100

Table 5.2.3: Duration of HD, 2011-2021

Duration of HD per session (hours)	2021		2020		2019		2018		2017		2016	
	n	%	n	%	n	%	n	%	n	%	n	%
<=3	214	0.7	146	0.6	112	0.4	74	0.4	116	0.5	183	0.5
3.5	172	0.6	82	0.3	89	0.4	40	0.2	72	0.3	88	0.2
4	30389	98.7	25959	99	24245	96	20133	96.4	23130	93.7	36604	98.8
4.5	22	0.1	38	0.1	33	0.1	34	0.2	44	0.2	53	0.1
5	7	0	5	0	8	0	9	0	12	0	23	0.1
>5	0	0	1	0	762	3	596	2.9	1322	5.4	89	0.2
Total	30804	100	26231	100	25249	100	20886	100	24696	100	37040	100

Duration of HD per session (hours)	2015		2014		2013		2012		2011	
	n	%	n	%	n	n	%	n	%	n
<=3	120	0.3	113	0.4	101	0.4	98	0.4	58	0.3
3.5	78	0.2	83	0.3	68	0.2	94	0.4	53	0.2
4	34076	98.9	31469	98.9	28293	98.9	24835	98.5	21722	98.9
4.5	62	0.2	39	0.1	35	0.1	80	0.3	47	0.2
5	27	0.1	40	0.1	25	0.1	41	0.2	35	0.2
>5	82	0.2	83	0.3	92	0.3	63	0.2	50	0.2
Total	34445	100	31827	100	28614	100	25211	100	21965	100

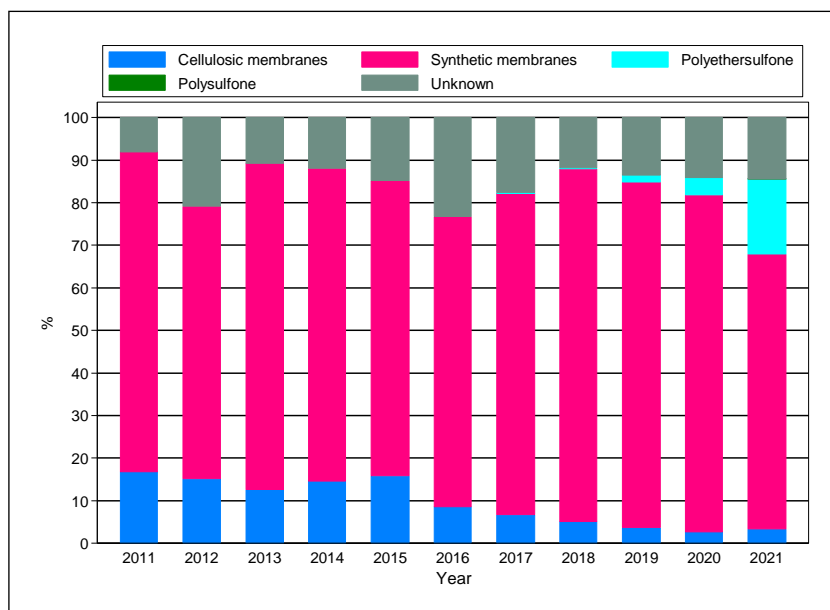
Synthetic membrane type remained the preferred choice for most HD centres compared to other membrane types.

Table 5.2.4: Dialyser membrane types in HD centres, 2011-2021

Dialyser membrane	2021		2020		2019		2018		2017		2016	
	n	%	n	%	n	%	n	%	n	%	n	%
Cellulosic membranes	1021	3.3	717	2.7	914	3.6	1069	5.1	1623	6.6	3194	8.6
Synthetic membranes	19879	64.5	20729	79	20482	81.1	17289	82.8	18688	75.7	25189	68
Polyethersulfone	5466	17.7	1077	4.1	449	1.8	35	0.2	19	0.1	0	0
Polysulfone	4	0	0	0	0	0	0	0	0	0	0	0
Unknown	4434	14.4	3708	14.1	3404	13.5	2493	11.9	4366	17.7	8657	23.4
Total	30804	100	26231	100	25249	100	20886	100	24696	100	37040	100

Dialyser membrane	2015		2014		2013		2012		2011	
	n	%	n	%	n	%	n	%	n	%
Cellulosic membranes	5414	15.7	4641	14.6	3577	12.5	3794	15	3687	16.8
Synthetic membranes	23877	69.3	23367	73.4	21955	76.7	16144	64	16498	75.1
Polyethersulfone	0	0	0	0	0	0	0	0	0	0
Polysulfone	0	0	0	0	0	0	0	0	0	0
Unknown	5154	15	3819	12	3082	10.8	5273	20.9	1780	8.1
Total	34445	100	31827	100	28614	100	25211	100	21965	100

Figure 5.2.4: Dialyser membrane types in HD centres, 2011-2021



Single use dialyzer is getting more popular over the past 10 years, increasing steadily from 9.6% in year 2011 to 23.8% in year 2021.

For centers which practised dialyser reuse, more than 60% of the dialysers were reused for at least 10 times. The finding was quite consistent throughout the past 8 years from 2011 to 2019.

Table 5.2.5: Dialyser reuse frequency in HD centres, 2011-2021

Dialyser reuse frequency	2011		2012		2013		2014		2015		2016	
	n	%	n	%	n	%	n	%	n	%	n	%
Single use	2031	9.6	2515	10.5	3062	11.4	3919	13.1	4711	14.5	4730	13.8
2	22	0.1	31	0.1	48	0.2	34	0.1	51	0.2	136	0.4
3	135	0.6	184	0.8	97	0.4	165	0.6	220	0.7	410	1.2
4	63	0.3	88	0.4	116	0.4	93	0.3	109	0.3	171	0.5
5	184	0.9	131	0.5	153	0.6	180	0.6	270	0.8	517	1.5
6	748	3.5	984	4.1	964	3.6	683	2.3	760	2.3	897	2.6
7	210	1	243	1	355	1.3	582	1.9	436	1.3	459	1.3
8	709	3.3	803	3.4	1197	4.5	1580	5.3	1439	4.4	1632	4.8
9	314	1.5	292	1.2	106	0.4	170	0.6	167	0.5	96	0.3
10	3033	14.3	3417	14.3	3665	13.7	4238	14.1	4630	14.2	4474	13
11	114	0.5	65	0.3	100	0.4	103	0.3	106	0.3	120	0.3
12	6851	32.2	6855	28.7	7888	29.5	9112	30.4	9641	29.6	10038	29.3
≥ 13	6843	32.2	8249	34.6	9007	33.7	9124	30.4	10047	30.8	10611	30.9
Total	21257	100	23857	100	26758	100	29983	100	32587	100	34291	100

Dialyser reuse frequency	2017		2018		2019		2020		2021		Dialyser reuse frequency
	n	%	n	%	n	%	n	%	n	%	
Single use	3662	16.3	3716	19.1	4437	19.5	5583	23.8	6581	23.8	Single use
2	26	0.1	8	0	17	0.1					Reuse
3	137	0.6	92	0.5	85	0.4					
4	58	0.3	41	0.2	42	0.2					
5	159	0.7	85	0.4	142	0.6					
6	339	1.5	379	2	355	1.6					
7	210	0.9	263	1.4	200	0.9	17827	76.2	21056	76.2	
8	1006	4.5	825	4.2	1284	5.6					
9	64	0.3	30	0.2	116	0.5					
10	2945	13.1	2230	11.5	2707	11.9					
11	42	0.2	51	0.3	55	0.2					
12	7112	31.7	4932	25.4	6799	29.9					
≥ 13	6645	29.7	6769	34.9	6508	28.6					
Total	22405	100	19421	100	22747	100	23410	100	27637	100	

The mean and median delivered Kt/V was 1.5 in year 2021. Ninety six percent of the patients had a delivered Kt/V of at least 1.3.

Table 5.2.6(a): Distribution of delivered Kt/V, HD patients 2017-2021

Year	Number of patients	Mean	SD	Median	LQ	UQ	% patients ≥1.2	% patients ≥1.3
2021	47980	1.5	0.3	1.5	1.3	1.7	110	96
2020	45758	1.5	0.3	1.5	1.3	1.7	114	101
2019	42764	1.6	1.4	1.5	1.3	1.7	118	106
2018	39759	1.7	7.4	1.5	1.3	1.7	117	104
2017	38313	1.6	2.4	1.5	1.3	1.8	123	110

Figure 5.2.6(a): Cumulative distribution of delivered Kt/V, HD patients 2017-2021

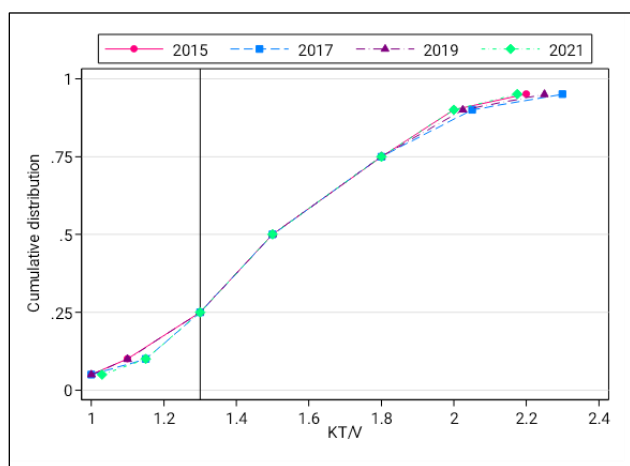
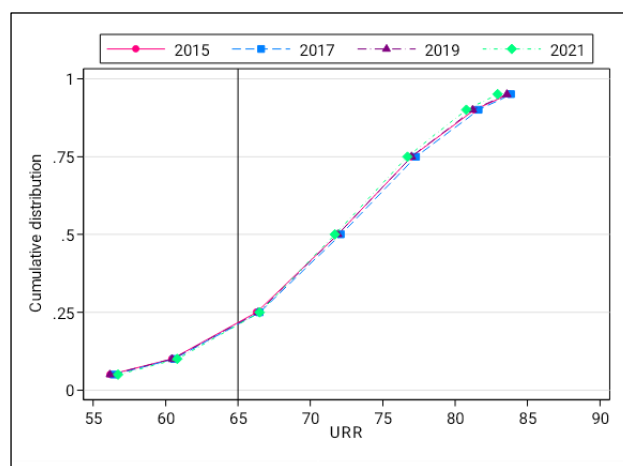


Figure 5.2.6(b): Cumulative distribution of URR, HD patients 2017-2021



The mean and median Urea reduction ratio (URR) was 69.9 and 70.6 respectively. Fifty three percent of patient achieved URR at 70%.

Table 5.2.6(b): Distribution of URR, HD patients 2017-2021

Year	Number of patients	Mean	SD	Median	LQ	UQ	% patients ≥ 65%	% patients ≥ 70%
2021	47980	69.9	8	70.6	65.2	75.5	76	53
2020	45758	70.6	7.9	71.3	65.9	76.2	78	56
2019	42747	71.1	8	71.7	66.4	76.6	80	59
2018	39596	70.9	8	71.6	66.3	76.4	79	58
2017	38041	71.1	8.3	71.7	66.5	76.7	80	59

The median blood flow rates in HD centers remain the same for the past 10 years, i.e. 300ml/min. However, there was a trend of minimal blood flow rate of 150ml/min for the past 2 years.

Table 5.2.7(a): Variation in median blood flow rates in HD patients, HD centres, 2011-2021

Year	Number of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2021	725	150	250	260	300	300	350	400
2020	662	150	250	260	300	300	350	400
2019	633	200	250	280	300	300	350	400
2018	591	200	250	250	300	300	350	400
2017	631	200	250	280	300	300	350	400
2016	699	180	250	300	300	320	350	400
2015	677	150	250	300	300	330	350	400
2014	647	170	250	300	300	335	375	400
2013	610	250	250	300	300	350	380	500
2012	559	180	250	300	300	350	355	500
2011	495	200	250	300	300	350	350	500

Figure 5.2.7(a): Variation in median blood flow rates in HD patients among centres 2021

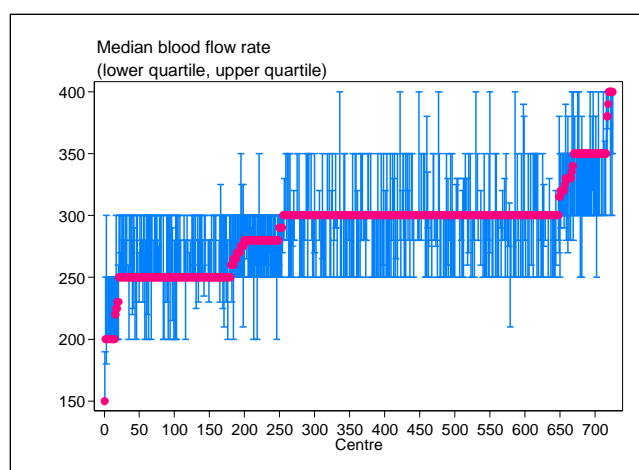
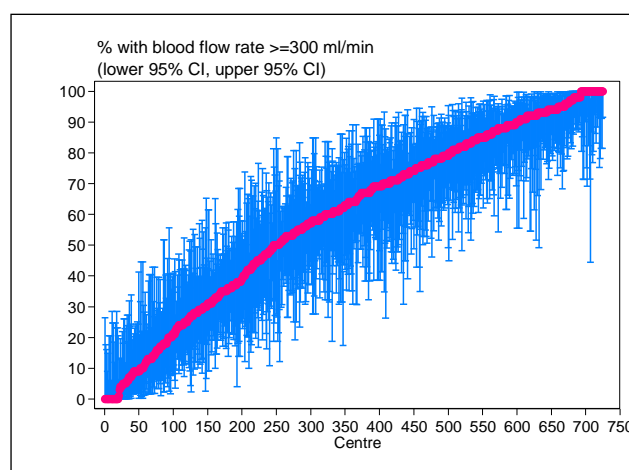


Figure 5.2.7(b): Variation in Proportion of patients with blood flow rates ≥ 300 ml/min among HD centres 2021



There was one centre with median blood flow rate of ≤ 200 mls/min. There was a wide variation in the proportion of patients with a blood flow rate of ≥ 300 ml/min.

The median for the proportion of patients with blood flow rates of ≥ 300 ml/min in centres had been dropping since 2017

Table 5.2.7 (b): Proportion of patients with blood flow rates > 300 ml/min, HD centres 2011-2021

Year	Number of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2021	725	0	7	36	64	85	98	100
2020	662	0	9	39	66	84	98	100
2019	633	0	11	42	69	86	100	100
2018	591	0	6	39	66	87	100	100
2017	631	0	11	47	70	88	100	100
2016	699	0	19	55	78	92	100	100
2015	677	0	22	58	78	91	100	100
2014	647	0	21	58	77	90	100	100
2013	610	0	24	59	80	92	100	100
2012	559	0	20	57	79	91	100	100
2011	495	0	14	55	78	91	100	100

The majority of centres had 100% of their patients with 3 HD sessions/ week. There were three centers with less than 50% of their patients on 3 HD sessions per week.

Table 5.2.7(c): Proportion of patients with 3 HD sessions per week, HD centres 2011-2021

Year	Number of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2021	725	6	86	98	100	100	100	100
2020	662	34	88	98	100	100	100	100
2019	632	0	87	98	100	100	100	100
2018	591	30	86	99	100	100	100	100
2017	629	39	88	97	100	100	100	100
2016	699	17	92	98	100	100	100	100
2015	677	50	92	98	100	100	100	100
2014	647	20	90	98	100	100	100	100
2013	613	50	92	98	100	100	100	100
2012	561	17	89	98	100	100	100	100
2011	496	50	92	100	100	100	100	100

Figure 5.2.7(c): Variation in proportion of patients with 3 HD sessions per week among HD centres 2021

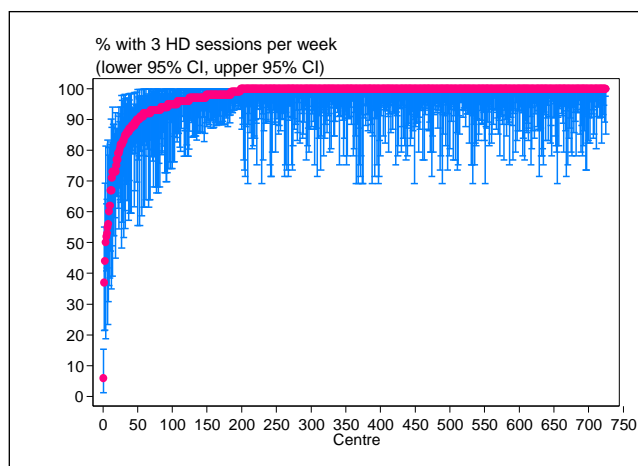
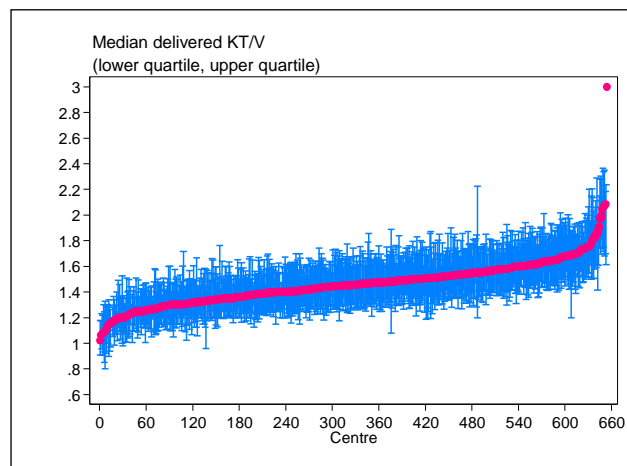


Figure 5.2.7(d): Variation in median delivered Kt/V in HD patients among HD centres 2021



The median delivered Kt/V was 1.5. The median delivered Kt/V in HD patients among HD centres in 2021 range from 1-2. Half of the centres had 85% of their patients with a delivered Kt/V ≥ 1.2 in 2021. The proportion of patients with a delivered Kt/V ≥ 1.2 had dropped since 2019.

Table 5.2.7(d): Median delivered Kt/V in HD patients, HD centres 2017-2021

Year	Number of centers	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2021	654	1	1.2	1.4	1.5	1.6	1.7	3
2020	611	1.1	1.2	1.4	1.5	1.6	1.8	2.1
2019	580	1.1	1.3	1.4	1.5	1.6	1.8	2.4
2018	565	1	1.3	1.4	1.5	1.6	1.8	2.1
2017	528	1	1.3	1.4	1.5	1.6	1.8	2.4

Table 5.2.7(e): Proportion of patients with delivered Kt/V ≥1.2, HD centres 2017-2021

Year	Number of centers	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2021	654	24	53	77	85	93	100	100
2020	611	26	58	79	88	94	100	100
2019	580	20	63	81	90	95	100	100
2018	565	23	65	82	89	95	100	100
2017	528	26	67	83	90	95	100	100

Figure 5.2.7(e): Variation in proportion of patients with delivered Kt/V ≥1.2, HD centres 2021

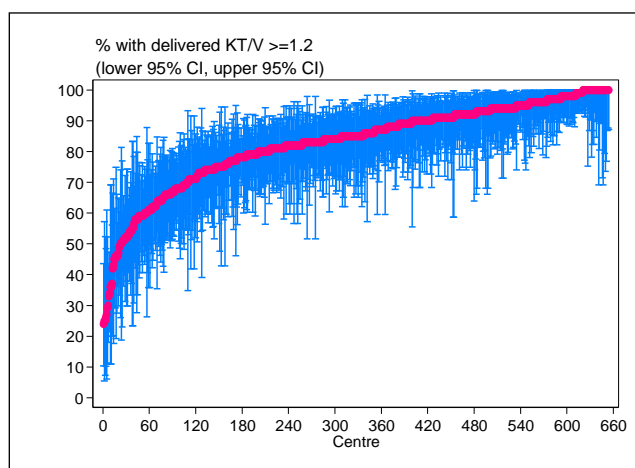
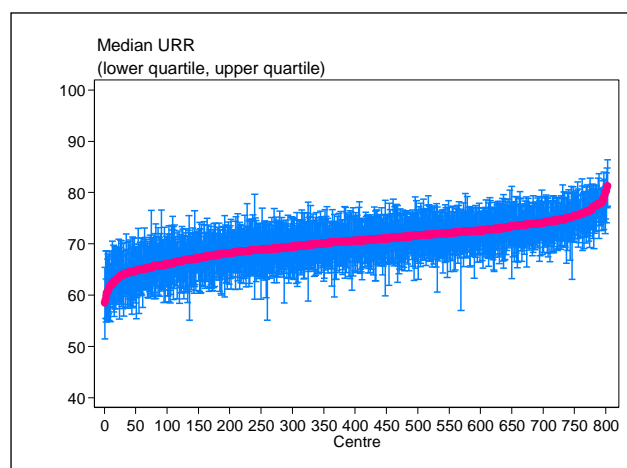


Figure 5.2.7(f): Variation in median URR among HD patients, HD centres 2021



The median URR for 2021 was 70.6%. Half of the centers had 78% of their patients with URR ≥65%. There were two centres with less 25% of their patients with URR ≥65%.

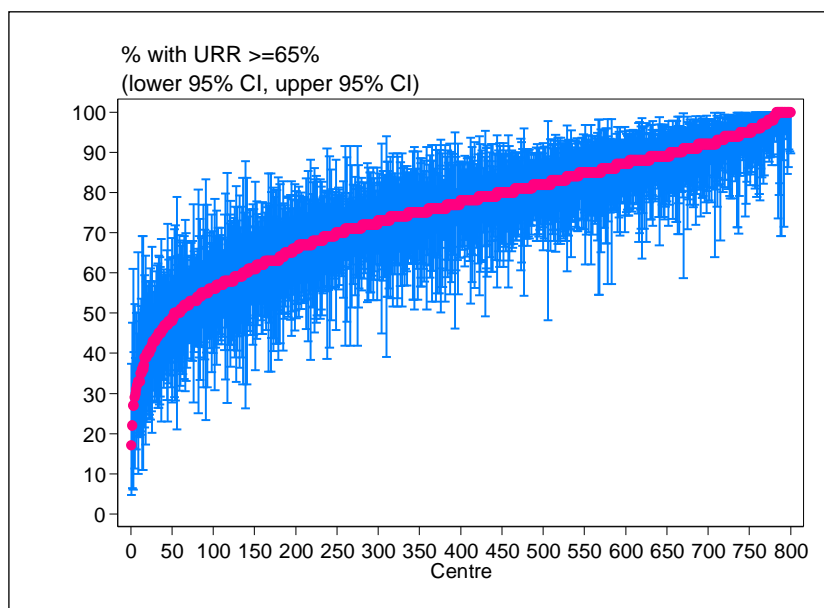
Table 5.2.7(f): Median URR among HD patients, HD centres 2017-2021

Year	Number of centers	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2021	803	58.6	64.4	68.2	70.6	72.6	76	81.3
2020	765	58.8	64.6	68.7	71.1	73.7	76.8	81.3
2019	742	60	66	69.5	71.6	73.9	76.9	95.8
2018	726	58.6	65.3	69.2	71.6	73.8	76.6	89.9
2017	706	53.9	65.6	69.6	71.8	74	76.6	92

Table 5.2.7(g): Proportion of HD patients with URR ≥65%, HD centres 2017-2021

Year	Number of centers	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2021	803	17	46.5	66	78	87	96	100
2020	765	21	48	68	80	88	98	100
2019	742	7	54.5	72	82	90	98	100
2018	726	14	51	71	82	89	97	100
2017	706	14	52	72	82	90	97	100

Figure 5.2.7(g): Variation in proportion of patients with URR ≥ 65% among HD centres 2021



SECTION 5.3: TECHNIQUE SURVIVAL ON DIALYSIS

There was no apparent difference in the unadjusted technique survival by years of starting dialysis for the years 2002 to 2021 even after censoring for death and transplant.

Table 5.3.1(a): Unadjusted technique survival by era, 2002-2021

Year Interval (month)	2002-2006			2007-2011			2012-2016			2017-2021		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	13634	100		23173	100		34552	100		39894	100	
6	12650	94	0	21464	94	0	31942	94	0	34033	94	0
12	11733	88	0	19985	88	0	29605	88	0	27854	88	0
24	10222	79	0	17383	77	0	25536	77	0	17991	77	0
36	8965	69	0	15221	68	0	22213	68	0	10096	67	0
48	7882	62	0	13240	60	0	19153	59	0	4290	57	0
60	6905	54	0	11535	53	0	16332	51	0	179	48	1
72	6056	48	0	9955	46	0	11068	43	0	1		
84	5212	42	0	8439	39	0	6867	37	0	1		
96	4531	36	0	7171	34	0	3752	31	0	1		
108	3950	32	0	6162	29	0	1575	26	0	1		
120	3424	28	0	5249	25	0	105	22	0	1		

Figure 5.3.1(a): Unadjusted technique survival by year of entry, 2011-2021

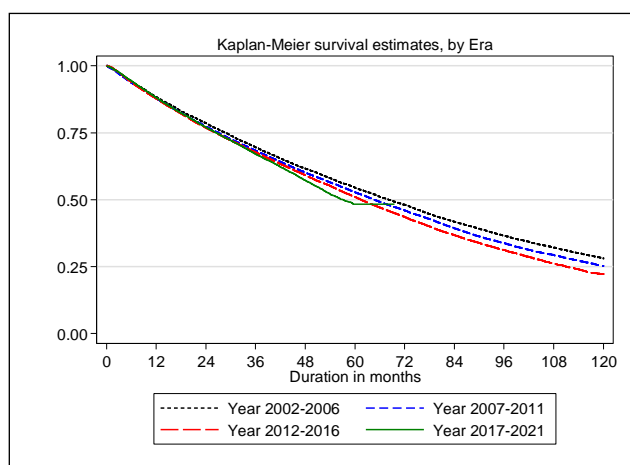


Figure 5.3.1(b): Unadjusted technique survival by year of entry (censored for death & transplant), 2011-2021

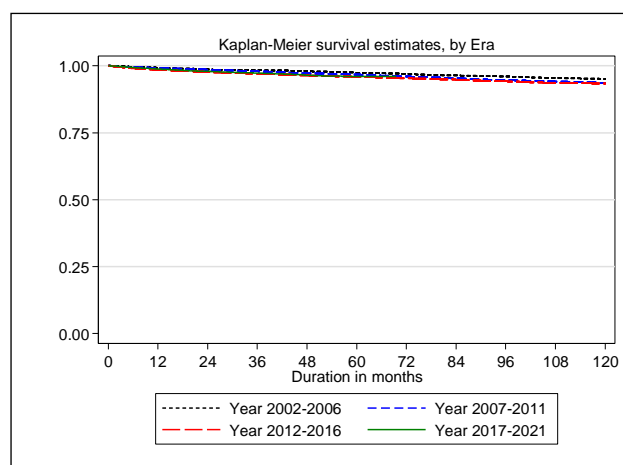


Table 5.3.1(b): Unadjusted technique survival by year of entry (censored for death & transplant), 2002-2021

Year Interval (month)	2002-2006			2007-2011			2012-2016			2017-2021		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	13634	100		23173	100		34552	100		39894	100	
6	12650	100	0	21464	99	0	31942	99	0	34033	99	0
12	11733	99	0	19985	99	0	29605	98	0	27854	99	0
24	10222	99	0	17383	99	0	25536	98	0	17991	98	0
36	8965	98	0	15221	98	0	22213	97	0	10096	97	0
48	7882	98	0	13240	97	0	19153	96	0	4290	96	0
60	6905	97	0	11535	97	0	16332	96	0	179	96	0
72	6056	97	0	9955	96	0	11068	95	0	1		
84	5212	96	0	8439	95	0	6867	95	0	1		
96	4531	96	0	7171	95	0	3752	94	0	1		
108	3950	95	0	6162	94	0	1575	94	0	1		
120	3424	95	0	5249	94	0	105	93	0	1		

There was no apparent difference in the unadjusted technique survival by age once censored for death & transplant except for those less than 15 years old. Patients who were less than 15 years old had poorer technique survival compared to all other age group. The 10 years unadjusted technique survival (censored for death & transplant) for the age groups of ≤ 14 , 15-24, 25-34, 35-44, 44-54, 55-64 and ≥ 65 years old were 86%, 92%, 94%, 94%, 93%, 93% and 95% respectively.

Table 5.3.2(a): Unadjusted technique survival by age, 2011-2021

Age group (year) Interval (month)	≤ 14			15-24			25-34			35-44		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	217	100		1602	100		4592	100		8629	100	
6	197	97	1	1470	97	0	4150	97	0	7784	96	0
12	177	94	2	1309	93	1	3774	94	0	6947	92	0
24	147	88	2	1119	89	1	3067	88	1	5506	85	0
36	112	80	3	935	86	1	2499	84	1	4265	78	1
48	93	74	3	770	83	1	1982	80	1	3336	72	1
60	71	70	4	616	80	1	1618	76	1	2578	66	1
72	47	69	4	488	77	1	1243	72	1	1913	61	1
84	38	65	4	372	74	1	917	68	1	1352	55	1
96	21	58	5	251	71	2	630	64	1	889	50	1
108	17	55	6	149	69	2	371	60	1	523	45	1
120	9	51	7	71	67	2	190	57	1	238	40	1

Age group (year) Interval (month)	45-54			55-64			≥ 65		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	17946	100		25197	100		21947	100	
6	16183	95	0	22424	94	0	19001	92	0
12	14379	89	0	19585	88	0	16144	84	0
24	11343	80	0	14948	76	0	11631	69	0
36	8874	72	0	11208	66	0	8116	56	0
48	6838	64	0	8205	57	0	5411	45	0
60	5100	57	0	5799	48	0	3507	35	0
72	3686	50	0	3918	40	0	2134	26	0
84	2496	43	1	2462	32	0	1234	19	0
96	1545	37	1	1464	26	0	676	15	0
108	859	31	1	781	21	0	332	11	0
120	374	26	1	311	17	1	131	8	0

Figure 5.3.2(a): Unadjusted technique survival by age, 2011-2021

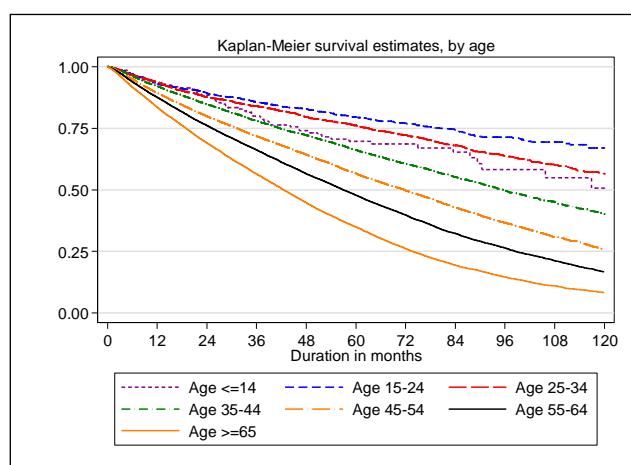


Figure 5.3.2(b): Unadjusted technique survival by age (censored for death & transplant), 2011-2021

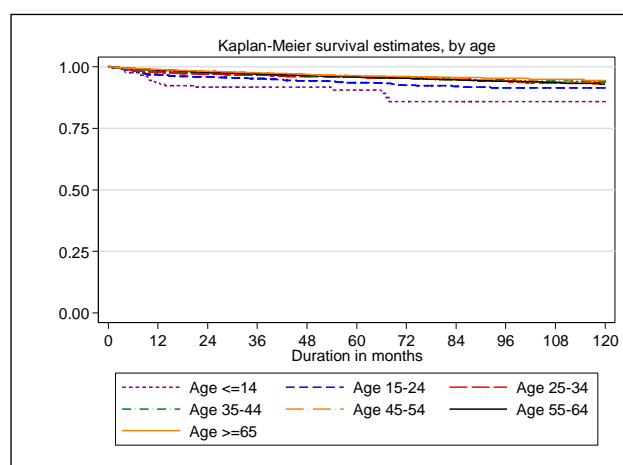


Table 5.3.2(b): Unadjusted technique survival by age (censored for death & transplant), 2011-2021

Age group (year) Interval (month)	≤ 14			15-24			25-34			35-44		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	217	100		1602	100		4592	100		8629	100	
6	197	98	1	1470	99	0	4150	99	0	7784	99	0
12	177	93	2	1309	97	0	3774	98	0	6947	99	0
24	147	92	2	1119	96	1	3067	97	0	5506	98	0
36	112	92	2	935	95	1	2499	97	0	4265	97	0
48	93	92	2	770	94	1	1982	96	0	3336	96	0
60	71	91	2	616	94	1	1618	96	0	2578	96	0
72	47	86	3	488	93	1	1243	95	0	1913	95	0
84	38	86	3	372	92	1	917	95	0	1352	95	0
96	21	86	3	251	92	1	630	94	1	889	94	0
108	17	86	3	149	92	1	371	94	1	523	94	0
120	9	86	3	71	92	1	190	94	1	238	94	0

Age group (year) Interval (month)	45-54			55-64			≥ 65		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	17946	100		25197	100		21947	100	
6	16183	99	0	22424	99	0	19001	99	0
12	14379	99	0	19585	99	0	16144	99	0
24	11343	98	0	14948	98	0	11631	98	0
36	8874	97	0	11208	97	0	8116	98	0
48	6838	97	0	8205	96	0	5411	97	0
60	5100	96	0	5799	96	0	3507	96	0
72	3686	95	0	3918	95	0	2134	96	0
84	2496	95	0	2462	95	0	1234	96	0
96	1545	94	0	1464	94	0	676	95	0
108	859	94	0	781	94	0	332	95	0
120	374	93	1	311	93	0	131	95	1

Unadjusted technique survival in non-diabetics at 1, 5 and 10 years was 87%, 52% and 27% respectively. Unadjusted technique survival for diabetics was worse than non-diabetics; 89% at 1 year, 50% at 5 years and only 19% at 10 years. There was no apparent difference in the unadjusted technique survival by diabetes status when censored for death & transplant.

Table 5.3.3(a): Unadjusted technique survival by diabetes status, 2011-2021

Diabetes status Interval (month)	Non-Diabetic			Diabetic		
	n	% Survival	SE	n	% Survival	SE
0	37540	100		42590	100	
6	32355	93	0	38850	95	0
12	27510	87	0	34803	89	0
24	20804	76	0	26956	78	0
36	15592	67	0	20415	68	0
48	11446	59	0	15180	59	0
60	8421	52	0	10866	50	0
72	6075	45	0	7354	42	0
84	4181	40	0	4690	34	0
96	2667	35	0	2782	28	0
108	1567	31	0	1464	23	0
120	729	27	0	594	19	0

Figure 5.3.3(a): Unadjusted technique survival by diabetes status, 2011-2021

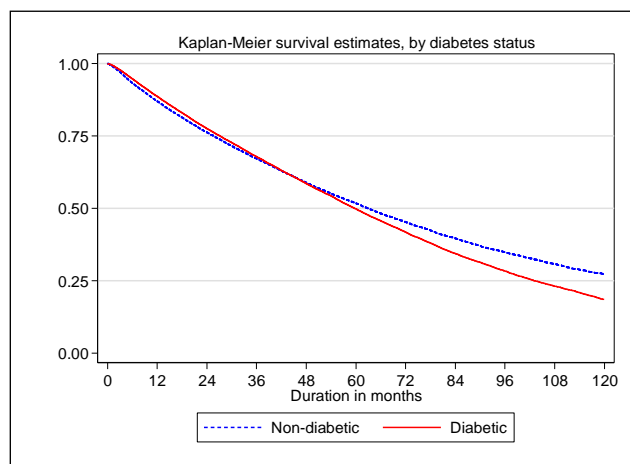


Figure 5.3.3(b): Unadjusted technique survival by diabetes status (censored for death & transplant), 2011-2021

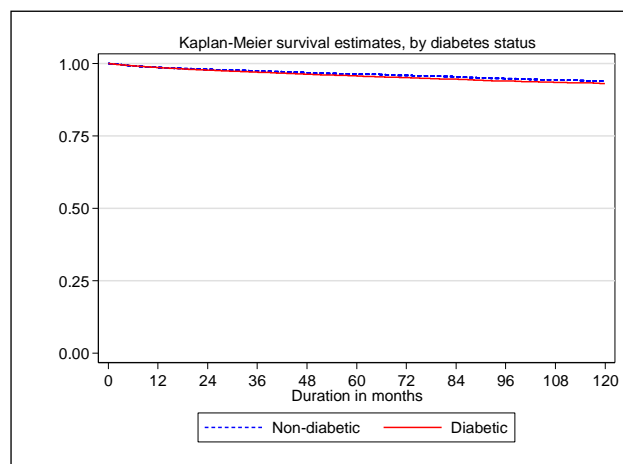


Table 5.3.3(b): Unadjusted technique survival by diabetes status (censored for death & transplant), 2011-2021

Diabetes status Interval (month)	Non-Diabetic			Diabetic		
	n	% Survival	SE	n	% Survival	SE
0	37540	100		42590	100	
6	32355	99	0	38850	99	0
12	27510	99	0	34803	99	0
24	20804	98	0	26956	98	0
36	15592	97	0	20415	97	0
48	11446	97	0	15180	96	0
60	8421	96	0	10866	96	0
72	6075	96	0	7354	95	0
84	4181	95	0	4690	95	0
96	2667	95	0	2782	94	0
108	1567	94	0	1464	94	0
120	729	94	0	594	93	0