Chapter 11

HAEMODIALYSIS PRACTICES

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SECTION 11.1: 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 92.1% in year 2005 and was only 86.8% in year 2014. This is most likely caused by a significant proportion of incident dialysis cases not have a functioning fistula upon initiation of HD.

The development of interventional nephrology has brought to an increase in patients undergoing HD via a cuffed- HD catheter.

Table 11.1.1: Vascular access on haemodialysis,2005-2014

Access types	2005		2006		2007		2008		2009	
	n	%	n	%	n	%	n	%	n	%
Wrist AVF*	6404	68.8	7798	67.2	8309	64.3	9494	61.5	10668	59.7
BCF*	2169	23.3	2855	24.6	3421	26.5	4403	28.5	5246	29.3
BBF*	0	0.0	0	0.0	0	0.0	70	0.5	133	0.7
Graft	251	2.7	306	2.6	341	2.6	479	3.1	466	2.6
HD Catheter-cuffed	179	1.9	235	2.0	261	2.0	298	1.9	464	2.6
HD Catheter –Non Cuffed	305	3.3	405	3.5	582	4.5	687	4.5	901	5.0
TOTAL	**9308**	**100**	**11599**	**100**	**12914**	**100**	**15431**	**100.0**	**17878**	**100**

Access types	2010		2011		2012		2013		2014	
	n	%	n	%	n	%	n	%	n	%
Wrist AVF*	11130	57.3	12338	55.6	13419	52.8	14705	51.2	15791	49.1
BCF*	6105	31.4	7249	32.7	8823	34.7	10119	35.2	11449	35.6
BBF*	191	1.0	295	1.3	395	1.6	553	1.9	689	2.1
Graft	495	2.5	488	2.2	519	2.0	545	1.9	577	1.8
HD Catheter-cuffed	513	2.6	569	2.6	947	3.7	1241	4.3	1728	5.4
HD Catheter **–Non Cuffed**	1000	5.1	1244	5.6	1306	5.1	1581	5.5	1929	6.0
TOTAL	**19434**	**100**	**22183**	**100**	**25409**	**100**	**28744**	**100**	**32163**	**100**

**AVF = arteriovenoous fistula, BBF = Brachiobasilic fistula, BCF = brachiocephalic fistula*

No increase in difficulties was reported with vascular access.

Table 11.1.2: Difficulties report with vascular access, 2005-2014

Access difficulty	2005		2006		2007		2008		2009	
	n	%	n	%	n	%	n	%	n	%
Difficulty with needle placement	319	3.5	394	3.5	478	3.8	417	2.8	523	3.0
Difficulty in obtaining desired blood flow rate	354	3.9	356	3.1	368	2.9	420	2.8	473	2.7
Other difficulties	58	0.6	45	0.4	57	0.5	81	0.5	101	0.6
No difficulties	8338	91.9	10591	93.0	11577	92.8	14080	93.9	16489	93.8
TOTAL	**9069**	**100**	**11386**	**100**	**12480**	**100**	**14998**	**100**	**17586**	**100**

Access difficulty	2010		2011		2012		2013		2014	
	n	%	n	%	n	%	n	%	n	%
Difficulty with needle placement	555	2.9	473	2.2	635	2.5	548	1.9	706	2.2
Difficulty in obtaining desired blood flow rate	437	2.3	488	2.2	581	2.3	488	1.7	543	1.7
Other difficulties	78	0.4	72	0.3	118	0.5	72	0.3	84	0.3
No difficulties	18071	94.4	20824	95.3	23841	94.7	27543	96.1	30631	95.8
TOTAL	**19141**	**100**	**21857**	**100**	**25175**	**100**	**28651**	**100**	**31964**	**100**

Complication risk remains less than 10% for the past 5 years and the 3 commonest complications were thrombosis of fistula, aneurysmal dilatation and venous outflow obstruction.

Table 11.1.3: Complications reported with vascular access, 2005-2014

Complication	2005		2006		2007		2008		2009	
	n	%	n	%	n	%	n	%	n	%
Thrombosis	289	3.2	317	2.8	405	3.2	436	2.9	481	2.7
Bleed	73	0.8	69	0.6	58	0.5	76	0.5	72	0.4
Aneurysmal dilatation	179	2.0	246	2.2	385	3.1	396	2.6	452	2.6
Swollen limb	84	0.9	89	0.8	101	0.8	98	0.6	162	0.9
Access related infection, local/systemic	63	0.7	78	0.7	97	0.8	92	0.6	133	0.8
Distal limb ischaemia	35	0.4	30	0.3	27	0.2	31	0.2	25	0.1
Venous outflow obstruction	170	1.9	202	1.8	196	1.6	250	1.7	299	1.7
Carpal tunnel	55	0.6	48	0.4	46	0.4	48	0.3	48	0.3
Others	109	1.2	116	1.0	152	1.2	165	1.1	119	0.7
No complications	8112	88.5	10153	89.5	11052	88.3	13520	89.5	15874	89.9
Total	**9169**	**100**	**11348**	**100**	**12519**	**100**	**15112**	**100**	**17665**	**100**

Complication	2010		2011		2012		2013		2014	
	n	%	n	%	n	%	n	%	n	%
Thrombosis	463	2.4	491	2.2	589	2.3	522	1.8	571	1.8
Bleed	78	0.4	76	0.3	90	0.4	83	0.3	87	0.3
Aneurysmal dilatation	319	1.7	397	1.8	527	2.1	405	1.4	519	1.6
Swollen limb	150	0.8	140	0.6	202	0.8	156	0.5	207	0.6
Access related infection, local/systemic	123	0.6	127	0.6	187	0.7	178	0.6	192	0.6
Distal limb ischaemia	33	0.2	25	0.1	42	0.2	29	0.1	34	0.1
Venous outflow obstruction	239	1.2	270	1.2	366	1.4	343	1.2	448	1.4
Carpal tunnel	44	0.2	49	0.2	47	0.2	53	0.2	42	0.1
Others	122	0.6	142	0.6	191	0.8	189	0.7	224	0.7
No complications	17601	91.8	20229	92.2	23119	91.2	26810	93.2	29834	92.8
Total	**19172**	**100**	**21946**	**100**	**25360**	**100**	**28768**	**100**	**32158**	**100**

SECTION 11.2: HD PRESCRIPTION

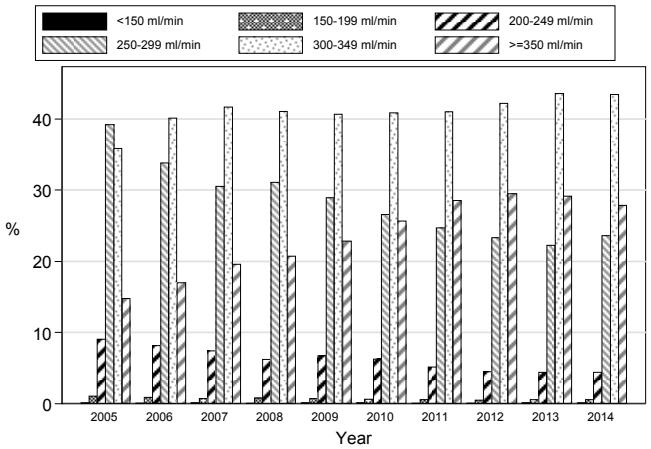
More than 90% of the patients were undergoing HD with the blood flow rate of more than 250ml/min for the past 5 years. More than a quarter of them were dialyzing at the blood flow rate of more than 350ml/min.

Table 11.2.1: Blood flow rates in HD centers, 2005-2014

Blood flow rates	2005		2006		2007		2008		2009	
(ml/min)	n	%	n	%	n	%	n	%	n	%
<150	7	0.1	5	0.0	10	0.1	10	0.1	14	0.1
150-199	94	1.0	103	0.9	87	0.7	120	0.8	126	0.7
200-249	814	9.1	923	8.2	929	7.4	929	6.2	1178	6.8
250-299	3523	39.2	3818	33.8	3821	30.5	4639	31.1	5050	28.9
300-349	3225	35.9	4528	40.1	5214	41.7	6127	41.1	7097	40.7
>=350	1328	14.8	1920	17.0	2451	19.6	3095	20.7	3981	22.8
Total	**8991**	**100**	**11297**	**100**	**12512**	**100**	**14920**	**100**	**17446**	**100**

Blood flow rates	2010		2011		2012		2013		2014	
(ml/min)	n	%	n	%	n	%	n	%	n	%
<150	16	0.1	13	0.1	15	0.1	21	0.1	24	0.1
150-199	113	0.6	120	0.6	128	0.5	158	0.6	175	0.6
200-249	1192	6.3	1112	5.1	1109	4.5	1245	4.4	1404	4.4
250-299	5021	26.5	5341	24.7	5810	23.3	6301	22.3	7481	23.6
300-349	7721	40.8	8871	41.0	10512	42.2	12324	43.5	13771	43.5
>=350	4850	25.6	6167	28.5	7347	29.5	8259	29.2	8837	27.9
Total	**18913**	**100**	**21624**	**100**	**24921**	**100**	**28308**	**100**	**31692**	**100**

Figure 11.2.1: Blood flow rates in HD centers, 2005-2014



Consistently 97-99% of the HD patients had HD 3 sessions per week for the past 5 years. Similarly, 99% of them were dialyzed for 4 hours during each session.

Table 11.2.2: Number of HD sessions per week, 2005-2014

HD sessions	2005		2006		2007		2008		2009	
per week	n	%	n	%	n	%	n	%	n	%
1	7	0.1	25	0.2	14	0.1	5	0.0	6	0.0
2	265	2.8	273	2.3	256	2.0	259	1.7	271	1.5
3	9010	96.7	11325	97.2	12602	97.7	15059	97.9	17582	98.0
4	31	0.3	34	0.3	31	0.2	61	0.4	88	0.5
Total	**9313**	**100**	**11657**	**100**	**12903**	**100**	**15384**	**100**	**17947**	**100**

HD sessions	2010		2011		2012		2013		2014	
per week	n	%	n	%	n	%	n	%	n	%
1	9	0.0	6	0.0	33	0.1	37	0.1	57	0.2
2	309	1.6	240	1.1	369	1.4	403	1.4	577	1.8
3	19089	98.1	22001	98.8	25099	98.0	28507	98.2	31619	97.8
4	47	0.2	26	0.1	109	0.4	77	0.3	90	0.3
Total	**19454**	**100**	**22273**	**100**	**25610**	**100**	**29024**	**100**	**32343**	**100**

Table 11.2.3: Duration of HD, 2005-2014

Duration of HD	2005		2006		2007		2008		2009	
per session (hours)	n	%	n	%	n	%	n	%	n	%
<=3	31	0.3	28	0.2	37	0.3	54	0.4	67	0.4
3.5	9	0.1	6	0.1	11	0.1	10	0.1	25	0.1
4	9174	98.5	11506	98.8	12792	99.2	15204	98.8	17740	98.8
4.5	46	0.5	66	0.6	23	0.2	74	0.5	78	0.4
5	52	0.6	42	0.4	31	0.2	42	0.3	42	0.2
>5	0	0.0	1	0.0	1	0.0	0	0.0	1	0.0
TOTAL	**9312**	**100**	**11649**	**100**	**12895**	**100**	**15384**	**100**	**17953**	**100**

Duration of HD	2010		2011		2012		2013		2014	
per session	n	%	n	%	n	%	n	%	n	%
<=3	77	0.4	65	0.3	115	0.4	124	0.4	133	0.4
3.5	36	0.2	10	0.0	72	0.3	34	0.1	42	0.1
4	19231	98.8	22114	99.3	25310	98.8	28820	99.3	32084	99.2
4.5	72	0.4	40	0.2	66	0.3	23	0.1	29	0.1
5	50	0.3	38	0.2	47	0.2	32	0.1	46	0.1
5	0	0.0	5	0.0	3	0.0	0	0.0	4	0.0
TOTAL	**19466**	**100**	**22272**	**100**	**25613**	**100**	**29033**	**100**	**32338**	**100**

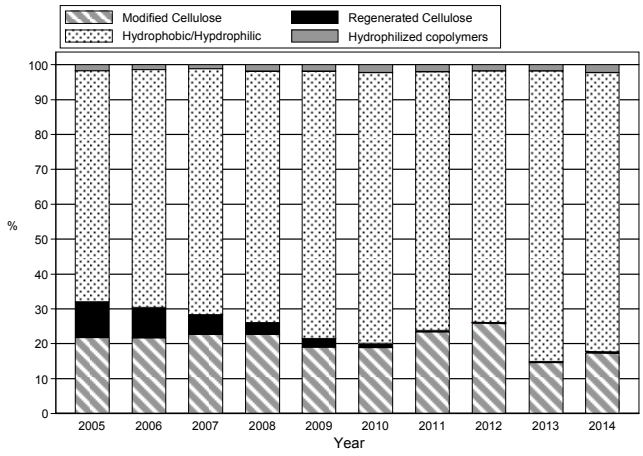
Synthetic membrane type remained the preferred choice for most HD centers as its usage exceeded 80% in year 2013 and 2014.

Table 11.2.4: Dialyser membrane types in HD centers, 2005-2014

Dialyser membrane	2005		2006		2007		2008		2009	
	n	%	n	%	n	%	n	%	n	%
Modified Cellulose	1974	21.8	2489	21.6	2890	22.7	3431	22.7	3246	19.0
Regenerated Cellulose	930	10.3	997	8.7	699	5.5	486	3.2	418	2.5
Hydrophobic/Hypdrophilic	6019	66.3	7859	68.3	8984	70.7	10890	72.2	13056	76.6
Hydrophilized copolymers	150	1.7	161	1.4	137	1.1	286	1.9	335	2.0
TOTAL	**9073**	**100**	**11506**	**100**	**12710**	**100**	**15093**	**100**	**17055**	**100**

Dialyser membrane	2010		2011		2012		2013		2014	
	n	%	n	%	n	%	n	%	n	%
Modified Cellulose	3306	18.9	3706	23.4	3910	25.9	3607	14.6	4743	17.3
Regenerated Cellulose	202	1.2	60	0.4	10	0.1	46	0.2	28	0.1
Hydrophobic/Hypdrophilic	13609	77.7	11771	74.2	10886	72.2	20565	83.4	21965	80.3
Hydrophilized copolymers	409	2.3	323	2.0	274	1.8	454	1.8	612	2.2
TOTAL	**17526**	**100**	**15860**	**100**	**15080**	**100**	**24672**	**100**	**27348**	**100**

Figure 11.2.4: Dialyser membrane types in HD centers, 2005-2014



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 5 years from 2010 to 2014. Nevertheless, only 0.7% of the dialysers were reused for 13 times or more in year 2013.

Table 11.2.5: Dialyser reuse frequency in HD centers, 2005-2014

Dialyser reuse	2005		2006		2007		2008		2009	
Frequency	n	%	n	%	n	%	n	%	n	%
1	1	0.0	5	0.1	24	0.3	29	0.2	29	0.2
2	81	1.9	36	0.6	117	1.2	87	0.7	115	0.9
3	85	2.0	75	1.2	151	1.6	120	1.0	89	0.7
4	137	3.2	190	3.1	128	1.4	168	1.4	184	1.4
5	554	13.1	593	9.7	809	8.5	699	6.0	743	5.7
6	44	1.0	63	1.0	141	1.5	156	1.3	193	1.5
7	477	11.3	422	6.9	797	8.4	844	7.3	774	6.0
8	46	1.1	115	1.9	107	1.1	248	2.1	294	2.3
9	770	18.2	959	15.8	1530	16.1	2009	17.3	2651	20.5
10	12	0.3	100	1.6	94	1.0	101	0.9	61	0.5
11	1353	32.0	2243	36.8	4075	43.0	5266	45.3	5691	44.0
12	565	13.4	1185	19.5	1440	15.2	1784	15.3	2010	15.5
≥ 13	105	2.5	101	1.7	64	0.7	125	1.1	99	0.8
TOTAL	**4230**	**100**	**6087**	**100**	**9477**	**100**	**11636**	**100**	**12933**	**100**

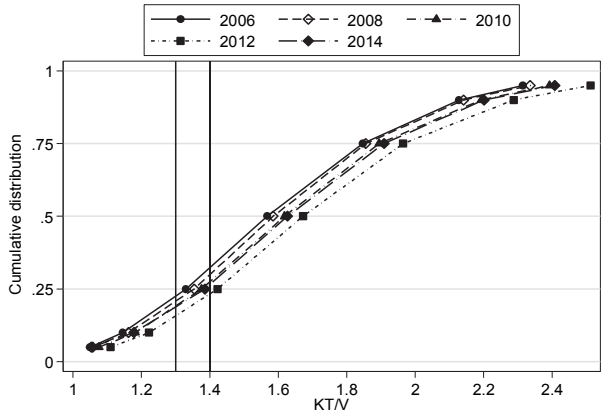
Dialyser reuse	2010		2011		2012		2013		2014	
Frequency	n	%	n	%	n	%	n	%	n	%
1	24	0.2	22	0.1	32	0.2	49	0.2	34	0.2
2	58	0.4	126	0.8	185	1.0	96	0.5	166	0.8
3	103	0.8	62	0.4	87	0.5	112	0.6	93	0.4
4	100	0.7	184	1.2	133	0.8	156	0.8	181	0.8
5	562	4.1	756	4.8	989	5.6	978	5.0	692	3.1
6	286	2.1	214	1.4	256	1.4	368	1.9	588	2.7
7	886	6.5	713	4.5	811	4.6	1207	6.1	1601	7.3
8	349	2.5	318	2.0	296	1.7	111	0.6	174	0.8
9	2449	17.9	3074	19.5	3497	19.7	3734	19.0	4302	19.5
10	121	0.9	110	0.7	66	0.4	101	0.5	109	0.5
11	5873	42.8	6955	44.1	6979	39.4	8017	40.7	9292	42.1
12	2837	20.7	3140	19.9	4229	23.9	4514	22.9	4691	21.3
≥ 13	66	0.5	113	0.7	162	0.9	251	1.3	152	0.7
TOTAL	**13714**	**100**	**15787**	**100**	**17722**	**100**	**19694**	**100**	**22075**	**100**

The mean and median of prescribed Kt/V was 1.7 and 1.6 respectively in year 2014. More than 82% of patients had a prescribed Kt/V of 1.3 and above whereas 74% of them had a prescribed Kt/V of 1.4 and above in year 2014. Similarly, The findings were quite consistent for the past 5 years.

Table 11.2.6(a): Distribution of prescribed Kt/V, HD patients 2005-2014

Year	Number of patients	Mean	SD	Median	LQ	UQ	% patients ≥ 1.3	% patients ≥ 1.4
2005	8748	1.6	0.4	1.6	1.4	1.9	82	72
2006	11091	1.6	0.4	1.6	1.3	1.8	78	68
2007	12354	1.6	0.4	1.6	1.3	1.9	79	69
2008	14755	1.6	0.4	1.6	1.4	1.9	80	70
2009	17258	1.7	0.4	1.6	1.4	1.9	83	74
2010	18726	1.7	0.4	1.6	1.4	1.9	82	73
2011	21470	1.7	0.4	1.7	1.4	1.9	84	75
2012	24710	1.7	0.4	1.7	1.4	2.0	85	77
2013	28053	1.7	0.4	1.6	1.4	1.9	82	74
2014	31339	1.7	0.4	1.6	1.4	1.9	82	74

Figure 11.2.6(a): Cumulative distribution of prescribed Kt/V, HD patients 2005-2014



The mean and median delivered Kt/V was 1.5 and 1.4 respectively in year 2014. These findings were quite consistent for the past 5 years. Sixty five percent of the patients had a delivered Kt/V of at least 1.3. In fact, 81% of the patients achieved a delivered Kt/V of 1.2 and above.

Similar good results were observed if the adequacy of dialysis were to be assessed by urea reduction ratio (URR). The mean and median URR was 71.2 and 71.9 respectively. Sixty percent of patient achieved URR at 70%.

Table 11.2.6(b): Distribution of delivered Kt/V, HD patients 2010-2014

Year	Number of patients	Mean	SD	Median	LQ	UQ	% patients ≥1.2	% patients ≥1.3	Variance*
2010	11697	1.5	0.5	1.4	1.2	1.6	79	63	0.1
2011	13622	1.5	1.2	1.4	1.2	1.7	81	64	0.1
2012	15814	1.5	0.5	1.5	1.3	1.7	82	67	0.1
2013	19147	1.5	0.4	1.4	1.2	1.7	80	64	0.1
2014	21170	1.5	0.5	1.4	1.2	1.7	81	65	0.1

**Variance = (prescribed KT/V – delivered KT/V)/ Prescribed KT/V*

Figure 11.2.6(b): Cumulative distribution of delivered Kt/V, HD patients 2010-2014

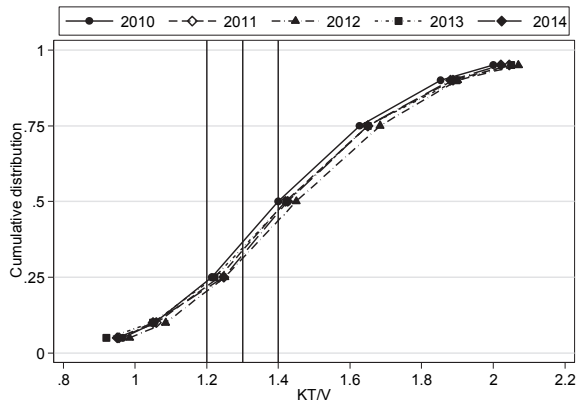


Figure 11.2.6 (c): Cumulative distribution of URR, HD patients 2010-2014

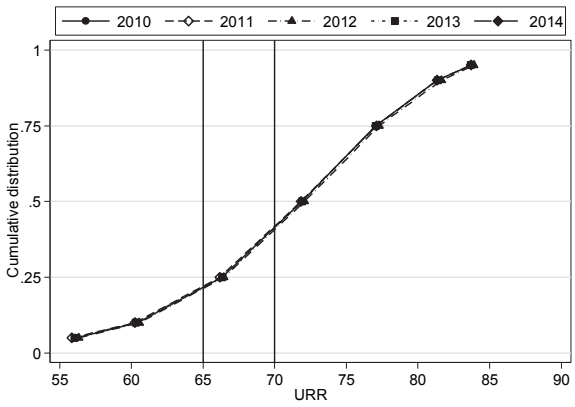


Table 11.2.6(c): Distribution of URR, HD patients 2010-2014

Year	Number of patients	Mean	SD	Median	LQ	UQ	% patients ≥ 65%	% patients ≥ 70%
2010	16734	71.1	8.6	71.6	66.3	76.8	80	58
2011	19222	71.2	8.8	71.9	66.3	77.0	80	60
2012	22561	71.1	9.0	71.8	66.2	77.1	79	59
2013	26023	71.4	8.8	72.1	66.5	77.3	80	60
2014	29262	71.2	8.9	71.9	66.3	77.1	79	60

The median blood flow rates in HD centers remained the same for the past 10 years, i.e. 300ml/min. However, there was a decreasing trend of minimal blood flow rate of below 200ml/min for the past 3 years.

Fifty percent of centers had 77% of their patients with blood flow rates of >= 300 ml/min. However, is still a wide variation in the proportion of patients with a blood flow rate of >= 300ml/min. There is a centre with none of their patients with blood flow rates >= 300 ml/min among HD centers. (Table & Figure 11.2.7 b)

Table 11.2.7(a): Variation in median blood flow rates in HD patients, HD centers, 2005-2014

Year	Number of centers	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
2005	228	200	250	260	300	300	350	400
2006	283	200	250	270	300	300	350	400
2007	302	200	250	280	300	300	350	400
2008	355	200	250	280	300	300	350	400
2009	404	180	250	280	300	320	350	400
2010	435	150	250	280	300	320	350	400
2011	495	200	250	300	300	330	350	400
2012	553	165	250	300	300	350	350	400
2013	603	140	250	300	300	345	370	400
2014	644	160	250	300	300	330	350	400

Figure 11.2.7 (a): Variation in median blood flow rates in HD patients among centers 2014

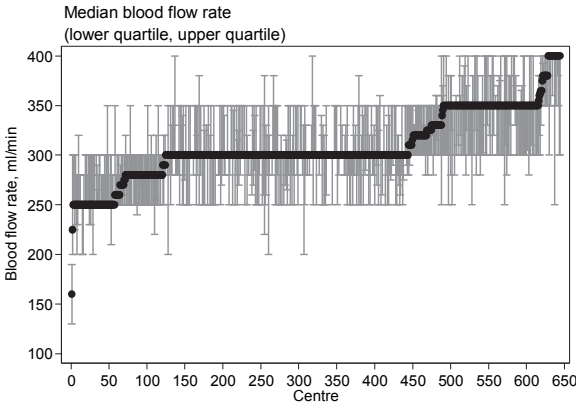


Figure 11.2.7 (b): Variation in Proportion of patients with blood flow rates >= 300 ml/min among HD centers 2014

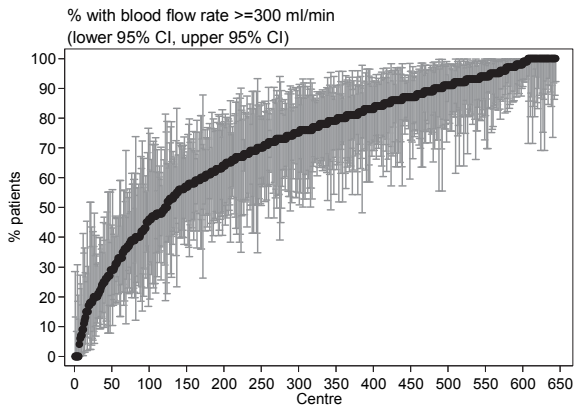


Table 11.2.7 (b): Proportion of patients with blood flow rates > 300 ml/min, HD centers 2005-2014

Year	Number of centers	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
2005	228	0	0	28	53	77	94	100
2006	283	0	5	30	63	83	94	100
2007	302	0	7	37	68	84	96	100
2008	355	0	9	40	70	86	99	100
2009	404	0	11	42.5	72	88	99	100
2010	435	0	9	46	75	90	100	100
2011	495	0	14	55	77	91	100	100
2012	553	0	22	58	80	91	100	100
2013	603	0	23	59	79	92	100	100
2014	644	0	21	58.5	77	90	100	100

Table 11.2.7(c): Proportion of patients with 3 HD sessions per week, HD centers 2005-2014

Year	Number of centers	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
2005	231	40	75	99	100	100	100	100
2006	287	52	83	98	100	100	100	100
2007	309	51	87	98	100	100	100	100
2008	359	51	89	98	100	100	100	100
2009	404	18	88	100	100	100	100	100
2010	437	20	90	100	100	100	100	100
2011	497	50	92	100	100	100	100	100
2012	559	17	90	98	100	100	100	100
2013	611	48	92	99	100	100	100	100
2014	645	20	91	98	100	100	100	100

The majority of centers had 100% of their patients with 3 HD sessions per week. There were 4 centers with less than 60% of their patients dialyzing 3 HD sessions per week. One of these centers had only 20% of their patients performing 3 HD sessions per week.

Figure 11.2.7(c): Variation in proportion of patients with 3 HD sessions per week among HD centers 2014

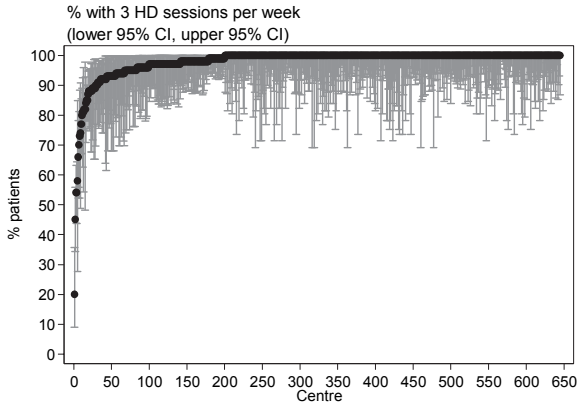
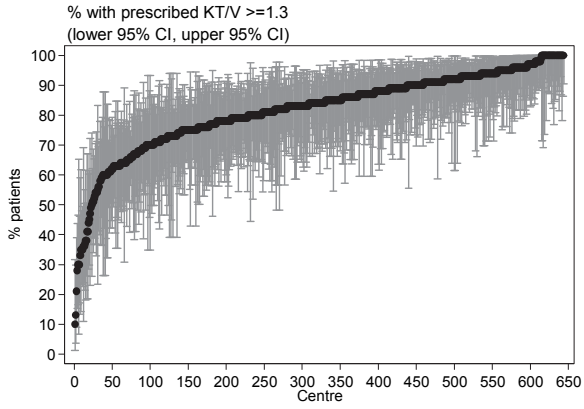


Figure 11.2.7(d): Variation in median prescribed Kt/V in HD patients among HD centers 2014



The median prescribed Kt/V remained the same for the past 10 years, i.e. 1.6-1.7. However, that there is a trend of minimal prescribed Kt/V of below 1.0 for the past 2 years.

Table 11.2.7(d): Median prescribed Kt/V in HD patients, HD centers 2005-2014

Year	Number of centers	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
2005	224	1.2	1.3	1.5	1.6	1.7	1.9	2
2006	281	1	1.3	1.4	1.6	1.7	1.8	2.1
2007	302	1.1	1.3	1.4	1.6	1.7	1.9	2.2
2008	353	1.1	1.3	1.5	1.6	1.7	1.9	2.1
2009	400	1.1	1.3	1.5	1.6	1.8	1.9	2.2
2010	434	0.8	1.3	1.5	1.6	1.7	1.9	2.9
2011	495	1.1	1.3	1.5	1.7	1.8	2	2.5
2012	552	1.1	1.4	1.5	1.7	1.8	2	2.8
2013	602	0.8	1.3	1.5	1.6	1.7	2	2.5
2014	644	0.8	1.3	1.5	1.6	1.7	1.9	2.7

Fifty percent of centers had 84% of their patients with a prescribed Kt/V ≥ 1.3. There were 3 centers with the median prescribed Kt/V <= 1. The median of proportion of patients with prescribed Kt/V ≥ 1.3 has dropped since 2013.

Table 11.2.7(e): Proportion of patients with prescribed Kt/V ≥ 1.3, 2005-2014

Year	Number of centers	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
2005	224	32	58	73.5	82.5	91	98	100
2006	281	0	46	68	80	88	97	100
2007	302	21	50	67	81	90	97	100
2008	353	14	48	69	84	90	98	100
2009	400	26	53.5	75	86	92	100	100
2010	434	6	50	75	85	92	100	100
2011	495	15	58	78	87	94	100	100
2012	552	29	60	79	87	94	100	100
2013	602	4	55	75	85	92	100	100
2014	644	10	56	75	84	91	98	100

Figure 11.2.7(e): Variation in proportion of patients with prescribed Kt/V ≥ 1.3 among HD centers 2014

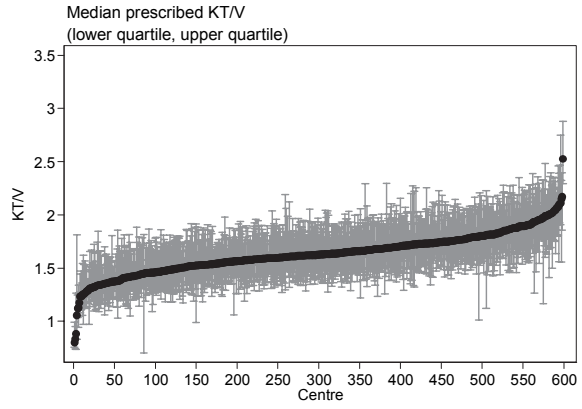
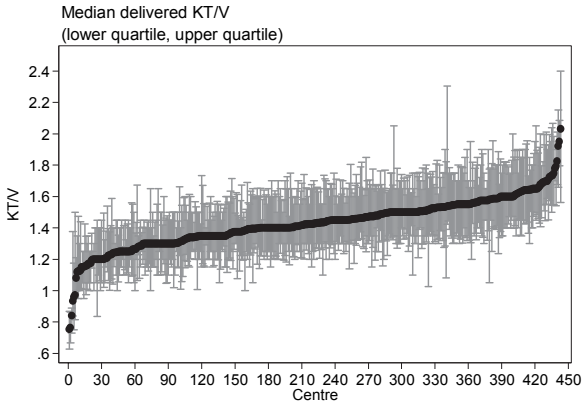


Figure 11.2.7(f): Variation in median delivered Kt/V in HD patients among HD centers 2014



The median delivered Kt/V remained the same for the past 5 years, i.e. 1.4-1.5. The number of centers reporting delivered Kt/V has increased. There were four centers with median delivered Kt/V of less than 1. Half of the centers had 83% of their patients with a delivered Kt/V ≥ 1.2 in 2014. There were seven centers with less than 30% of its patients with a delivered Kt/V ≥1.2 in 2014.

Table 11.2.7(f): Median delivered Kt/V in HD patients, HD centers 2010-2014

Year	Number of centers	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
2010	253	0.8	1.1	1.3	1.4	1.5	1.6	2
2011	302	0.9	1.2	1.3	1.4	1.5	1.7	2
2012	355	1	1.2	1.3	1.5	1.5	1.7	2.2
2013	415	0.6	1.2	1.3	1.4	1.5	1.7	2
2014	443	0.8	1.2	1.3	1.4	1.5	1.7	2

Table 11.2.7(g): Proportion of patients with delivered Kt/V ≥1.2, HD centers 2010-2014

Year	Number of centers	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
2010	253	0	47	71	83	90	98	100
2011	302	6	51	74	84	92	100	100
2012	355	26	49	74	85	92	98	100
2013	415	4	47	71	82	90	98	100
2014	443	0	50	72	83	91	98	100

Figure 11.2.7(g): Variation in proportion of patients with delivered Kt/V ≥1.2, HD centers 2014

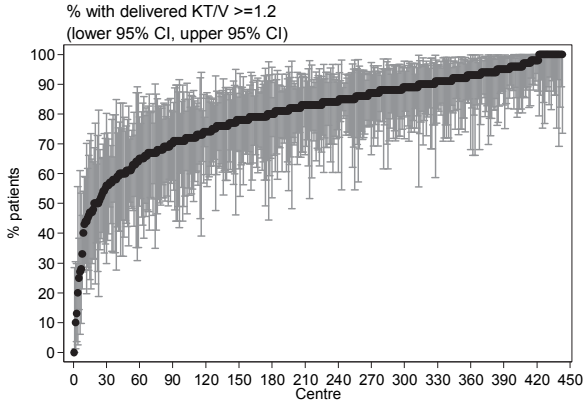
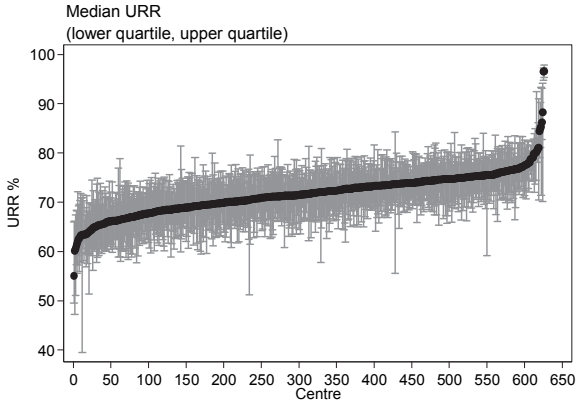


Figure 11.2.7(h): Variation in median URR among HD patients, HD centers 2014



Median URR was 71.7% in year 2014. Half of the centers had 81% of their patients with URR ≥ 65%. There was one centre with ≤30% of their patients with URR ≥ 65% compared to four centers last year. A higher number of centers i.e. 626 centers provided data on URR compared to only 443 centers that had provided data on delivered Kt/V.

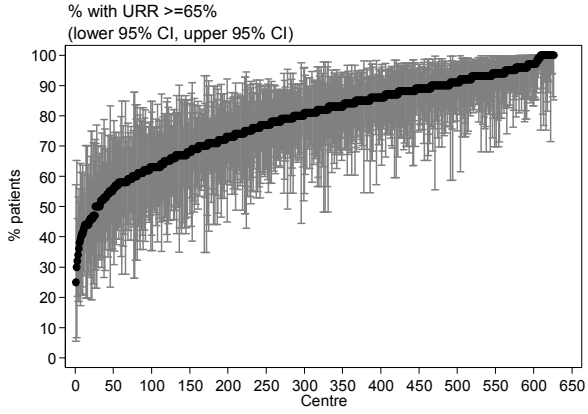
Table 11.2.7(h): Median URR among HD patients, HD centers 2010-2014

Year	Number of centers	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
2010	397	54.6	64.8	69	71.3	73.8	76.9	94
2011	459	45.2	64.8	68.8	71.7	74.3	77.9	96.8
2012	524	56.3	65.2	68.6	71.7	74	77.5	96
2013	583	59.6	64.6	68.7	71.7	74.4	77.9	95.2
2014	626	55.1	65.2	69.1	71.7	74.3	77.1	96.6

Table 11.2.7(i): Proportion of HD patients with URR ≥65%, HD centers 2010-2014

Year	Number of centers	Min	5th Centile	LQ	Median	UQ	95th Centile	Max
2010	397	13	48	69	82	90	98	100
2011	459	0	50	70	82	91	100	100
2012	524	17	50	69	81	89	98	100
2013	583	23	50	69	81	91	98	100
2014	626	25	50	69	81	90	97	100

Figure 11.2.7(i): Variation in proportion of patients with URR ≥ 65% among HD centers 2014



SECTION 11.3: TECHNIQUE SURVIVAL ON DIALYSIS

Table 11.3.1(a): Unadjusted technique survival by year of entry, 2005-2014

Year	2005			2006			2007			2008			2009		
Interval (month)	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	2959	100		3421	100		3691	100		4207	100		4573	100	
6	2730	93	0	3142	93	0	3464	94	0	3931	94	0	4275	94	0
12	2524	87	1	2918	87	1	3219	88	1	3674	88	1	3979	88	0
24	2188	76	1	2562	77	1	2828	78	1	3179	77	1	3443	76	1
36	1929	68	1	2252	68	1	2472	68	1	2794	68	1	3004	67	1
48	1676	59	1	2003	61	1	2151	60	1	2429	59	1	2640	59	1
60	1459	52	1	1756	53	1	1892	53	1	2097	51	1	2306	52	1
72	1290	46	1	1543	47	1	1646	46	1	1825	45	1	56		
84	1110	39	1	1320	40	1	1404	39	1	55					
96	957	34	1	1134	35	1	25								
108	840	30	1	24											
120	8														

Year	2010			2011			2012			2013			2014		
Interval (month)	n	% Survival	SE	n.	% Survival	SE	n.	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	4960	100		5657	100		6109	100		6423	100		6353	100	
6	4510	91	0	5196	93	0	5633	93	0	5946	93	0	3281	93	0
12	4193	85	1	4820	86	0	5250	87	0	5547	87	0	271		
24	3633	74	1	4195	75	1	4560	76	1	159					
36	3179	65	1	3682	66	1	137								
48	2777	57	1	115											
60	48														

There was no apparent difference in the unadjusted technique survival by years of starting dialysis from 2005 to 2014 even after censoring for death and transplant.

Figure 11.3.1(a): Unadjusted technique survival by year of entry, 2005-2014

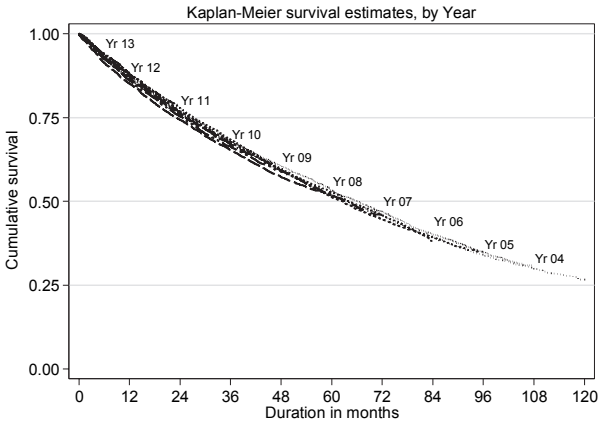


Figure 11.3.1(b): Unadjusted technique survival by year of entry (censored for death & transplant), 2005-2014

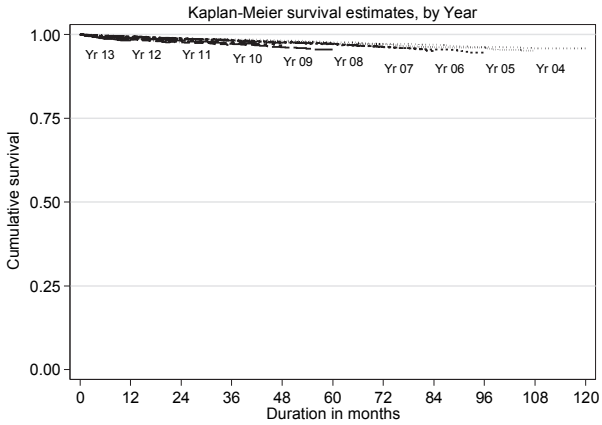


Table 11.3.1(b): Unadjusted technique survival by year of entry (censored for death & transplant), 2005-2014

Year Interval (month)	2005			2006			2007			2008			2009		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	2959	100		3421	100		3691	100		4207	100		4573	100	
6	2730	100	0	3142	100	0	3464	100	0	3931	100	0	4275	100	0
12	2524	99	0	2918	99	0	3219	99	0	3674	99	0	3979	99	0
24	2188	99	0	2562	99	0	2828	99	0	3179	99	0	3443	99	0
36	1929	99	0	2252	98	0	2472	98	0	2794	98	0	3004	98	0
48	1676	98	0	2003	98	0	2151	98	0	2429	98	0	2640	98	0
60	1459	98	0	1756	97	0	1892	97	0	2097	97	0	2306	97	0
72	1290	97	0	1543	97	0	1646	96	0	1825	96	0	56		
84	1110	97	0	1320	96	0	1404	96	0	55					
96	957	96	0	1134	96	0	25								
108	840	96	1	24											
120	8														

Year Interval (month)	2010			2011			2012			2013			2014		
	n	% Survival	SE	n.	% Survival	SE	n.	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	4960	100		5657	100		6109	100		6423	100		6353	100	
6	4510	99	0	5196	99	0	5633	99	0	5946	99	0	3281	99	0
12	4193	99	0	4820	99	0	5250	99	0	5547	99	0	271		
24	3633	98	0	4195	98	0	4560	98	0	159					
36	3179	97	0	3682	98	0	137								
48	2777	96	0	115											
60	48														

The unadjusted technique survival was better in the younger age groups than the older age group.
The 9-year unadjusted technique survival for the age groups of <14, 15-24, 25-34, 35-44, 45-54, 55-64 and >65 years old were 37%, 68%, 63%, 52%, 35%, 23% and 12% respectively. 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 14 years old had poorer technique survival for the first five years and subsequently maintained at 87%.

Table 11.3.2(a): Unadjusted technique survival by age, 2005-2014

Age group (year)	≤ 14			15-24			25-34			35-44		
Interval (month)	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	154	100		1279	100		2948	100		5143	100	
6	136	94	2	1156	96	1	2625	96	0	4554	95	0
12	118	90	3	1013	92	1	2346	93	0	4008	91	0
24	91	81	3	798	87	1	1847	88	1	3102	84	1
36	66	75	4	640	83	1	1467	84	1	2421	79	1
48	48	67	5	525	82	1	1118	80	1	1857	74	1
60	38	64	5	410	79	1	830	76	1	1389	70	1
72	27	57	6	300	77	2	597	72	1	1001	65	1
84	17	52	6	216	74	2	407	69	1	645	60	1
96	11	52	6	128	73	2	230	66	1	396	56	1
108	4	37	10	58	68	3	106	63	2	163	52	1
120	1			1			1			3		

Age group (year)	45-54			55-64			≥ 65		
Interval (month)	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	11812	100		14685	100		12332	100	
6	10462	94	0	12765	93	0	10404	90	0
12	9113	89	0	10939	87	0	8595	82	0
24	6921	80	0	7907	75	0	5916	67	0
36	5243	72	0	5646	65	0	3964	55	1
48	3793	65	1	3831	56	1	2534	44	1
60	2703	58	1	2561	48	1	1585	35	1
72	1884	52	1	1643	40	1	895	27	1
84	1163	45	1	970	33	1	469	20	1
96	633	39	1	503	27	1	209	15	1
108	243	35	1	206	23	1	72	12	1
120	1			2			1		

Figure 11.3.2(a): Unadjusted technique survival by age, 2005-2014

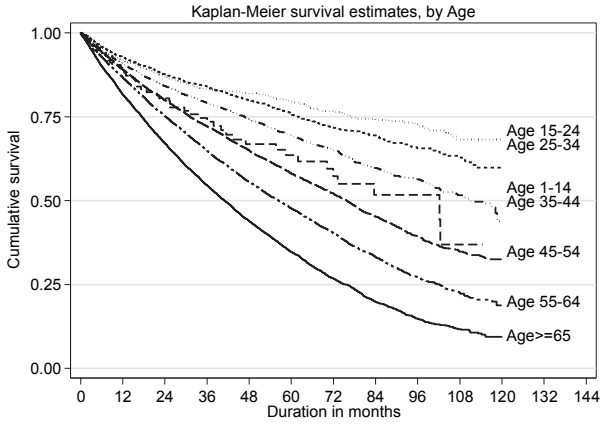


Figure 11.3.2(b): Unadjusted technique survival by age (censored for death & transplant), 2005-2014

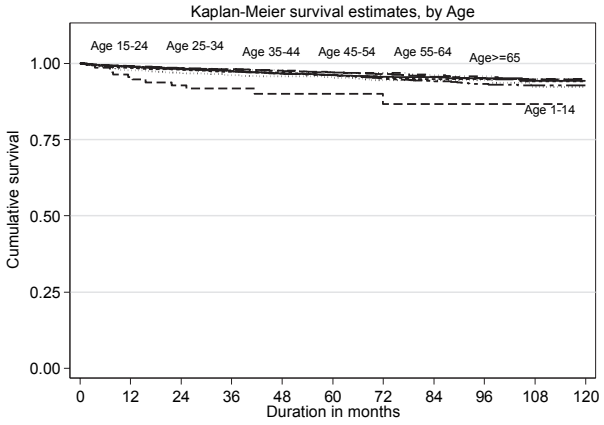


Table 11.3.2(b): Unadjusted technique survival by age (censored for death & transplant), 2005-2014

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	154	100		1279	100		2948	100		5143	100	
6	136	99	1	1156	99	0	2625	99	0	4554	99	0
12	118	96	2	1013	98	0	2346	98	0	4008	99	0
24	91	93	2	798	97	1	1847	98	0	3102	98	0
36	66	92	3	640	96	1	1467	97	0	2421	98	0
48	48	90	3	525	96	1	1118	97	0	1857	98	0
60	38	90	3	410	96	1	830	96	0	1389	97	0
72	27	87	4	300	94	1	597	96	1	1001	97	0
84	17	87	4	216	94	1	407	95	1	645	96	0
96	11	87	4	128	94	1	230	95	1	396	96	1
108	4	87	4	58	92	2	106	94	1	163	95	1
120	1			1			1			3		

Age group (year) Interval (month)	45-54			55-64			≥ 65		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	11812	100		14685	100		12332	100	
6	10462	99	0	12765	99	0	10404	99	0
12	9113	99	0	10939	99	0	8595	99	0
24	6921	98	0	7907	98	0	5916	98	0
36	5243	98	0	5646	98	0	3964	97	0
48	3793	98	0	3831	97	0	2534	97	0
60	2703	97	0	2561	96	0	1585	96	0
72	1884	96	0	1643	95	0	895	96	0
84	1163	96	0	970	94	0	469	96	0
96	633	95	0	503	93	1	209	95	0
108	243	95	0	206	93	1	72	94	1
120	1			2			1		

Table 11.3.3(a): Unadjusted technique survival by diabetes status, 2005-2014

Diabetes status	Non-Diabetic			Diabetic		
Interval (month)	n	% Survival	SE	n	%Survival	SE
0	19024	100		29329	100	
6	16613	93	0	25487	93	0
12	14452	88	0	21669	86	0
24	11192	81	0	15389	74	0
36	8598	74	0	10848	63	0
48	6335	68	0	7336	53	0
60	4625	63	0	4883	45	0
72	3245	57	0	3054	38	0
84	2142	52	1	1744	30	0
96	1252	49	1	856	24	0
108	545	45	1	295	19	1
120	7			1		

Figure 11.3.3(a): Unadjusted technique survival by diabetes status, 2005-2014

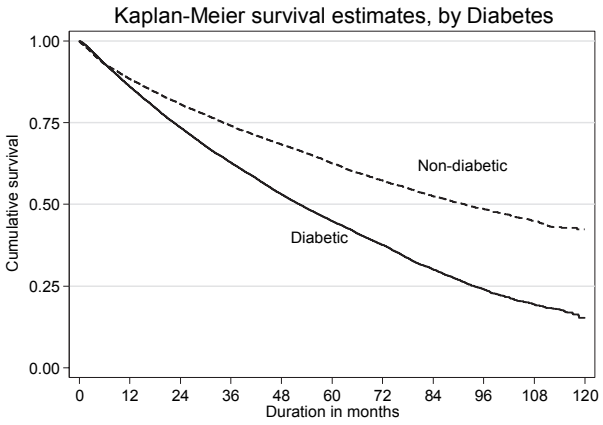


Figure 11.3.3(b): Unadjusted technique survival by diabetes status (censored for death & transplant), 2005-2014

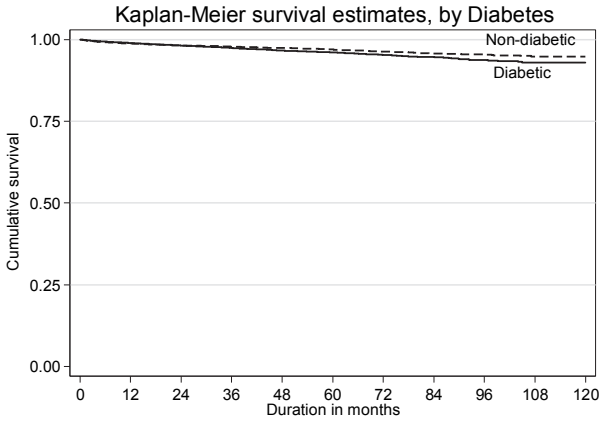


Table 11.3.3(b): Unadjusted technique survival by diabetes status (censored for death & transplant), 2005-2014

Diabetes status	Non-Diabetic			Diabetic		
Interval (month)	n	% Survival	SE	n	%Survival	SE
0	19024	100		29239	100	
6	16613	99	0	25487	99	0
12	14452	99	0	21669	99	0
24	11192	98	0	15389	98	0
36	8598	98	0	10848	97	0
48	6335	97	0	7336	97	0
60	4625	97	0	4883	96	0
72	3245	96	0	3054	95	0
84	2142	96	0	1744	95	0
96	1252	96	0	856	94	0
108	545	95	0	295	93	1
120	7			1		

Unadjusted technique survival in non-diabetics at 1, 5 and 9 years was 88%, 63% and 45% respectively. Unadjusted technique survival for diabetics was worse than non-diabetics; 86% at 1 year, 45% at 5 years and only 19% at 9 years.

There was no apparent difference in the unadjusted technique survival by diabetes status when censored for death & transplant.