

## Chapter - 11

# **HAEMODIALYSIS PRACTICES**

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## SECTION 11.1: VASCULAR ACCESS AND ITS COMPLICATIONS

The proportion of patients with native vascular access is between 88-90% for the past 3 years. The percentage of patients on cuffed catheters had increased over the years from 1.2% in 2004 to 4.35 in 2013. The percentage of patients with non cuff HD catheter had remained the same at 5% since 2009.

**Table 11.1.1:** Vascular access on haemodialysis, 2004-2013

Access types	2004		2005		2006		2007		2008	
	n	%	n	%	n	%	n	%	n	%
Wrist AVF*	5891	72.7	6404	68.8	7798	67.2	8309	64.3	9494	61.5
BCF*	1692	20.9	2169	23.3	2855	24.6	3421	26.5	4403	28.5
BBF*	0	0	0	0	0	0	0	0	70	0.5
Graft	190	2.3	251	2.7	306	2.6	341	2.6	479	3.1
HD Catheter-cuffed	99	1.2	179	1.9	235	2	261	2	298	1.9
HD Catheter –Non Cuffed	233	2.9	305	3.3	405	3.5	582	4.5	687	4.5
<b>Total</b>	<b>8105</b>	<b>100</b>	<b>9308</b>	<b>100</b>	<b>11599</b>	<b>100</b>	<b>12914</b>	<b>100</b>	<b>15431</b>	<b>100</b>

Access types	2009		2010		2011		2012		2013	
	n	%	n	%	n	%	n	%	n	%
Wrist AVF*	10668	59.7	11130	57.3	12338	55.6	13419	52.8	14628	51.3
BCF*	5246	29.3	6105	31.4	7249	32.7	8823	34.7	10008	35.1
BBF*	133	0.7	191	1	295	1.3	395	1.6	549	1.9
Graft	466	2.6	495	2.5	488	2.2	519	2	543	1.9
HD Catheter-cuffed	464	2.6	513	2.6	569	2.6	947	3.7	1225	4.3
HD Catheter –Non Cuffed	901	5	1000	5.1	1244	5.6	1306	5.1	1567	5.5
<b>Total</b>	<b>17878</b>	<b>100</b>	<b>19434</b>	<b>100</b>	<b>22183</b>	<b>100</b>	<b>25409</b>	<b>100</b>	<b>28520</b>	<b>100</b>

\*AVF = arteriovenous fistula, BBF = Brachio basilic fistula, BCF = brachiocephalic fistula

No increase in difficulties was reported with vascular access.

**Table 11.1.2:** Difficulties report with vascular access, 2004-2013

Access difficulty	2004		2005		2006		2007		2008	
	n	%	n	%	n	%	n	%	n	%
Difficulty with needle placement	255	3.4	319	3.5	394	3.5	478	3.8	417	2.8
Difficulty in obtaining desired blood flow rate	301	4	354	3.9	356	3.1	368	2.9	420	2.8
Other difficulties	67	0.9	58	0.6	45	0.4	57	0.5	81	0.5
No difficulties	6956	91.8	8338	91.9	10591	93	11577	92.8	14080	93.9
<b>Total</b>	<b>7579</b>	<b>100</b>	<b>9069</b>	<b>100</b>	<b>11386</b>	<b>100</b>	<b>12480</b>	<b>100</b>	<b>14998</b>	<b>100</b>

Access difficulty	2009		2010		2011		2012		2013	
	n	%	n	%	n	%	n	%	n	%
Difficulty with needle placement	523	3	555	2.9	473	2.2	635	2.5	539	1.9
Difficulty in obtaining desired blood flow rate	473	2.7	437	2.3	488	2.2	581	2.3	480	1.7
Other difficulties	101	0.6	78	0.4	72	0.3	118	0.5	72	0.3
No difficulties	16489	93.8	18071	94.4	20824	95.3	23841	94.7	27348	96.2
<b>Total</b>	<b>17586</b>	<b>100</b>	<b>19141</b>	<b>100</b>	<b>21857</b>	<b>100</b>	<b>25175</b>	<b>100</b>	<b>28439</b>	<b>100</b>

Complication rates for vascular access had reduced over the years from 13.3% in 2004 to 6.8% in 2013

**Table 11.1.3:** Complications reported with vascular access, 2004-2013

Complication	2004		2005		2006		2007		2008	
	n	%	n	%	n	%	n	%	n	%
Thrombosis	284	3.6	289	3.2	317	2.8	405	3.2	436	2.9
Bleed	67	0.8	73	0.8	69	0.6	58	0.5	76	0.5
Aneurysmal dilatation	193	2.4	179	2	246	2.2	385	3.1	396	2.6
Swollen limb	77	1	84	0.9	89	0.8	101	0.8	98	0.6
Access related infection, local/systemic	70	0.9	63	0.7	78	0.7	97	0.8	92	0.6
Distal limb ischaemia	37	0.5	35	0.4	30	0.3	27	0.2	31	0.2
Venous outflow obstruction	151	1.9	170	1.9	202	1.8	196	1.6	250	1.7
Carpal tunnel	49	0.6	55	0.6	48	0.4	46	0.4	48	0.3
Others	133	1.7	109	1.2	116	1	152	1.2	165	1.1
No complications	6895	86.7	8112	88.5	10153	89.5	11052	88.3	13520	89.5
<b>Total</b>	<b>7956</b>	<b>100</b>	<b>9169</b>	<b>100</b>	<b>11348</b>	<b>100</b>	<b>12519</b>	<b>100</b>	<b>15112</b>	<b>100</b>

Complication	2009		2010		2011		2012		2013	
	n	%	n	%	n	%	n	%	n	%
Thrombosis	481	2.7	463	2.4	491	2.2	589	2.3	513	1.8
Bleed	72	0.4	78	0.4	76	0.3	90	0.4	83	0.3
Aneurysmal dilatation	452	2.6	319	1.7	397	1.8	527	2.1	402	1.4
Swollen limb	162	0.9	150	0.8	140	0.6	202	0.8	154	0.5
Access related infection, local/systemic	133	0.8	123	0.6	127	0.6	187	0.7	177	0.6
Distal limb ischaemia	25	0.1	33	0.2	25	0.1	42	0.2	28	0.1
Venous outflow obstruction	299	1.7	239	1.2	270	1.2	366	1.4	337	1.2
Carpal tunnel	48	0.3	44	0.2	49	0.2	47	0.2	53	0.2
Others	119	0.7	122	0.6	142	0.6	191	0.8	185	0.6
No complications	15874	89.9	17601	91.8	20229	92.2	23119	91.2	26615	93.2
<b>Total</b>	<b>17665</b>	<b>100</b>	<b>19172</b>	<b>100</b>	<b>21946</b>	<b>100</b>	<b>25360</b>	<b>100</b>	<b>28547</b>	<b>100</b>

## SECTION 11.2: HD PRESCRIPTION

There was an increase in the proportion of patients with blood flow rate above 300ml/min from year 2004 at 47.7% to 72.8% in 2013. For the last 3 years the percentage of patients with blood flow rate above 350 ml/min remained the same.

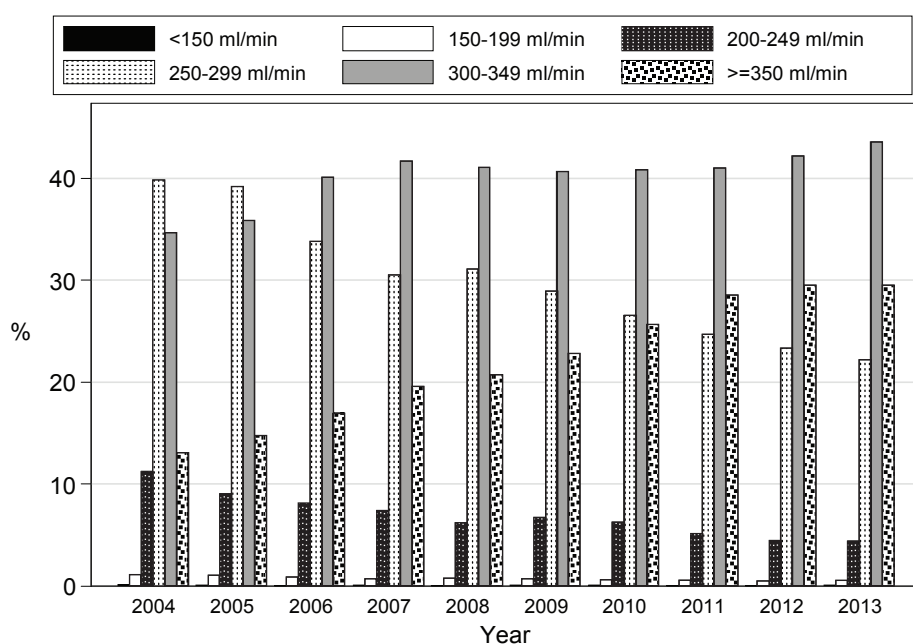
**Table 11.2.1:** Blood flow rates in HD centers, 2004-2013

Blood flow rates (ml/min)	2004		2005		2006		2007		2008	
	n	%	n	%	n	%	n	%	n	%
<150	11	0.1	7	0.1	5	0	10	0.1	10	0.1
150-199	86	1.1	94	1	103	0.9	87	0.7	120	0.8
200-249	879	11.2	814	9.1	923	8.2	929	7.4	929	6.2
250-299	3112	39.8	3523	39.2	3818	33.8	3821	30.5	4639	31.1
300-349	2710	34.7	3225	35.9	4528	40.1	5214	41.7	6127	41.1
>=350	1020	13	1328	14.8	1920	17	2451	19.6	3095	20.7
<b>Total</b>	<b>7818</b>	<b>100</b>	<b>8991</b>	<b>100</b>	<b>11297</b>	<b>100</b>	<b>12512</b>	<b>100</b>	<b>14920</b>	<b>100</b>

Blood flow rates (ml/min)	2009		2010		2011		2012		2013	
	n	%	n	%	n	%	n	%	n	%
<150	14	0.1	16	0.1	13	0.1	15	0.1	21	0.1
150-199	126	0.7	113	0.6	120	0.6	128	0.5	155	0.6
200-249	1178	6.8	1192	6.3	1112	5.1	1109	4.5	1235	4.4
250-299	5050	28.9	5021	26.5	5341	24.7	5810	23.3	6229	22.2
300-349	7097	40.7	7721	40.8	8871	41	10512	42.2	12231	43.5
>=350	3981	22.8	4850	25.6	6167	28.5	7347	29.5	8223	29.3
<b>Total</b>	<b>17446</b>	<b>100</b>	<b>18913</b>	<b>100</b>	<b>21624</b>	<b>100</b>	<b>24921</b>	<b>100</b>	<b>28094</b>	<b>100</b>

**Figure 11.2.1:** Blood flow rates in HD centers, 2004-2013



The majority of patients were on 3 dialysis sessions per week. The number of patients on 4 dialysis sessions had drop from 109 patients in 2012 to 76 patients in 2013.

**Table 11.2.2:** Number of HD sessions per week, 2004-2013

HD sessions per week	2004		2005		2006		2007		2008	
	n	%	n	%	n	%	n	%	n	%
1	11	0.1	7	0.1	25	0.2	14	0.1	5	0
2	281	3.5	265	2.8	273	2.3	256	2	259	1.7
3	7750	96	9010	96.7	11325	97.2	12602	97.7	15058	97.9
4	30	0.4	31	0.3	34	0.3	31	0.2	61	0.4
<b>Total</b>	<b>8072</b>	<b>100</b>	<b>9313</b>	<b>100</b>	<b>11657</b>	<b>100</b>	<b>12903</b>	<b>100</b>	<b>15383</b>	<b>100</b>

HD sessions per week	2009		2010		2011		2012		2013	
	n	%	n	%	n	%	n	%	n	%
1	6	0	9	0	6	0	33	0.1	37	0.1
2	271	1.5	309	1.6	240	1.1	369	1.4	403	1.4
3	17581	98	19089	98.1	22001	98.8	25099	98	28291	98.2
4	88	0.5	47	0.2	26	0.1	109	0.4	76	0.3
<b>Total</b>	<b>17946</b>	<b>100</b>	<b>19454</b>	<b>100</b>	<b>22273</b>	<b>100</b>	<b>25610</b>	<b>100</b>	<b>28807</b>	<b>100</b>

Majority of patients (99.3%) were on 4 hours HD sessions. Longer dialysis session was still uncommon.

**Table 11.2.3:** Duration of HD, 2004-2013

Duration of HD per session (hours)	2004		2005		2006		2007		2008	
	n	%	n	%	n	%	n	%	n	%
<=3	25	0.3	31	0.3	28	0.2	37	0.3	54	0.4
3.5	11	0.1	9	0.1	6	0.1	11	0.1	10	0.1
4	7884	97.6	9174	98.5	11506	98.8	12792	99.2	15204	98.8
4.5	106	1.3	46	0.5	66	0.6	23	0.2	74	0.5
5	45	0.6	52	0.6	42	0.4	31	0.2	42	0.3
>5	3	0	0	0	1	0	1	0	0	0
<b>Total</b>	<b>8074</b>	<b>100</b>	<b>9312</b>	<b>100</b>	<b>11649</b>	<b>100</b>	<b>12895</b>	<b>100</b>	<b>15384</b>	<b>100</b>

Duration of HD per session (hours)	2009		2010		2011		2012		2013	
	n	%	n	%	n	%	n	%	n	%
<=3	67	0.4	77	0.4	65	0.3	115	0.4	123	0.4
3.5	25	0.1	36	0.2	10	0	72	0.3	34	0.1
4	17740	98.8	19231	98.8	22114	99.3	25310	98.8	28604	99.3
4.5	78	0.4	72	0.4	40	0.2	66	0.3	23	0.1
5	42	0.2	50	0.3	38	0.2	47	0.2	32	0.1
>5	1	0	0	0	5	0	3	0	0	0
<b>Total</b>	<b>17953</b>	<b>100</b>	<b>19466</b>	<b>100</b>	<b>22272</b>	<b>100</b>	<b>25613</b>	<b>100</b>	<b>28816</b>	<b>100</b>

Synthetic membrane type was still the preferred choice for most HD centres (85.2%).

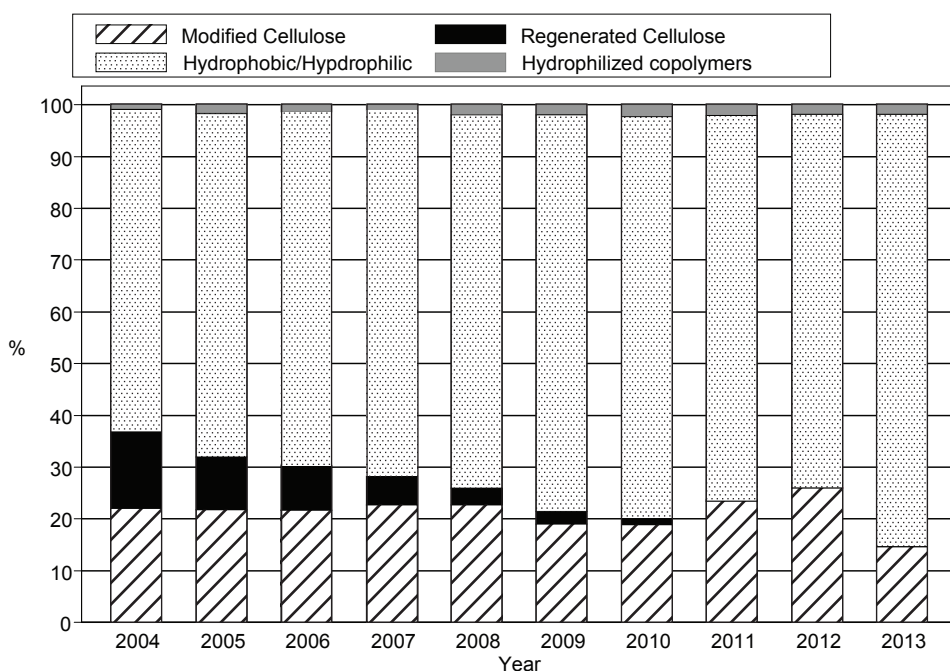
**Table 11.2.4:** Dialyser membrane types in HD centres, 2004-2013

Dialyser Membrane	2004		2005		2006		2007		2008	
	n	%	n	%	n	%	n	%	n	%
Modified Cellulose	1719	22.1	1974	21.8	2489	21.6	2890	22.7	3431	22.7
Regenerated Cellulose	1150	14.8	930	10.3	997	8.7	699	5.5	486	3.2
Hydrophobic/Hydrophilic	4845	62.2	6019	66.3	7859	68.3	8984	70.7	10890	72.2
Hydrophilized copolymers	74	1	150	1.7	161	1.4	137	1.1	286	1.9
<b>Total</b>	<b>7788</b>	<b>100</b>	<b>9073</b>	<b>100</b>	<b>11506</b>	<b>100</b>	<b>12710</b>	<b>100</b>	<b>15093</b>	<b>100</b>

Dialyser Membrane	2009		2010		2011		2012		2013	
	n	%	n	%	n	%	n	%	n	%
Modified Cellulose	3246	19	3306	18.9	3706	23.4	3910	25.9	3586	14.7
Regenerated Cellulose	418	2.5	202	1.2	60	0.4	10	0.1	46	0.2
Hydrophobic/Hydrophilic	13056	76.6	13609	77.7	11771	74.2	10886	72.2	20388	83.3
Hydrophilized copolymers	335	2	409	2.3	323	2	274	1.8	454	1.9
<b>Total</b>	<b>17055</b>	<b>100</b>	<b>17526</b>	<b>100</b>	<b>15860</b>	<b>100</b>	<b>15080</b>	<b>100</b>	<b>24474</b>	<b>100</b>

**Figure 11.2.4:** Dialyser membrane types in HD centres, 2004-2013



Re-use of dialysers was a common practice in most HD centres. In 2013, 83.3% of patients managed to re-use dialysers 9 to 12 times.

**Table 11.2.5:** Dialyser reuse frequency in HD centres, 2004-2013

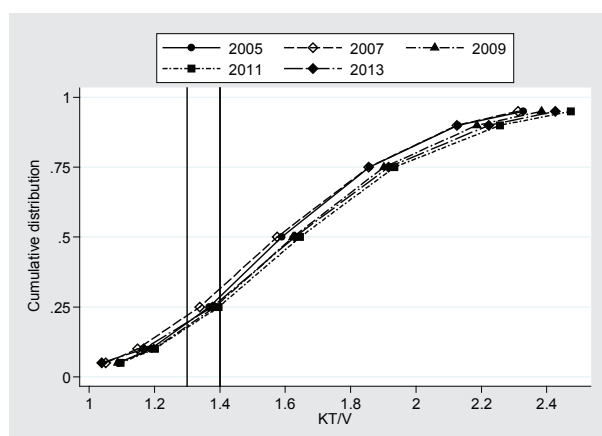
Dialyser reuse frequency	2004		2005		2006		2007		2008	
	n	%	n	%	n	%	n	%	n	%
1	42	0.7	1	0	5	0.1	24	0.3	29	0.2
2	194	3.2	81	1.9	36	0.6	117	1.2	87	0.7
3	192	3.2	85	2	75	1.2	151	1.6	120	1
4	192	3.2	137	3.2	190	3.1	128	1.4	168	1.4
5	806	13.3	554	13.1	593	9.7	809	8.5	699	6
6	89	1.5	44	1	63	1	141	1.5	156	1.3
7	808	13.4	477	11.3	422	6.9	797	8.4	844	7.3
8	50	0.8	46	1.1	115	1.9	107	1.1	248	2.1
9	1160	19.2	770	18.2	959	15.8	1530	16.1	2009	17.3
10	42	0.7	12	0.3	100	1.6	94	1	101	0.9
11	1916	31.7	1353	32	2243	36.8	4075	43	5266	45.3
12	458	7.6	565	13.4	1185	19.5	1440	15.2	1784	15.3
≥ 13	92	1.5	105	2.5	101	1.7	64	0.7	125	1.1
<b>Total</b>	<b>6041</b>	<b>100</b>	<b>4230</b>	<b>100</b>	<b>6087</b>	<b>100</b>	<b>9477</b>	<b>100</b>	<b>11636</b>	<b>100</b>
Dialyser reuse frequency	2009		2010		2011		2012		2013	
	n	%	n	%	n	%	n	%	n	%
1	29	0.2	24	0.2	22	0.1	32	0.2	47	0.2
2	115	0.9	58	0.4	126	0.8	185	1	96	0.5
3	89	0.7	103	0.8	62	0.4	87	0.5	112	0.6
4	184	1.4	100	0.7	184	1.2	133	0.8	142	0.7
5	743	5.7	562	4.1	756	4.8	989	5.6	937	4.8
6	193	1.5	286	2.1	214	1.4	256	1.4	368	1.9
7	774	6	886	6.5	713	4.5	811	4.6	1207	6.2
8	294	2.3	349	2.5	318	2	296	1.7	111	0.6
9	2651	20.5	2449	17.9	3074	19.5	3497	19.7	3698	19
10	61	0.5	121	0.9	110	0.7	66	0.4	99	0.5
11	5691	44	5873	42.8	6955	44.1	6979	39.4	8003	41
12	2010	15.5	2837	20.7	3140	19.9	4229	23.9	4442	22.8
≥ 13	99	0.8	66	0.5	113	0.7	162	0.9	251	1.3
<b>Total</b>	<b>12933</b>	<b>100</b>	<b>13714</b>	<b>100</b>	<b>15787</b>	<b>100</b>	<b>17722</b>	<b>100</b>	<b>19513</b>	<b>100</b>

The mean prescribed Kt/V was 1.7 and median prescribed Kt/V was 1.6 in 2013. The percentage of patients with prescribed Kt/V  $\geq 1.4$  had drop to 73% in 2013 compared to 76% in 2012.

**Table 11.2.6(a):** Distribution of prescribed Kt/V, HD patients 2004-2013

Year	Number of patients	Mean	SD	Median	LQ	UQ	% patients $\geq 1.3$	% patients $\geq 1.4$
2004	7456	1.6	0.4	1.6	1.4	1.9	82	72
2005	8748	1.6	0.4	1.6	1.4	1.9	81	72
2006	11091	1.6	0.4	1.6	1.3	1.8	78	67
2007	12354	1.6	0.4	1.6	1.3	1.9	78	68
2008	14755	1.6	0.4	1.6	1.4	1.8	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	81	72
2011	21470	1.7	0.4	1.6	1.4	1.9	83	75
2012	24710	1.7	0.4	1.7	1.4	2	84	76
2013	27846	1.7	0.4	1.6	1.4	1.9	82	73

**Figure 11.2.6(a):** Cumulative distribution of prescribed Kt/V, HD patients 2004-2013



The mean delivered Kt/V was 1.5 and median delivered Kt/V is 1.4 in 2013. The percentage of patients with delivered Kt/V  $\geq 1.3$  had dropped to 64% in 2013 compared to 67% in 2012. The delivered Kt/V was calculated based on the single pool model. The delivered Kt/V results were provided by the dialysis centres.

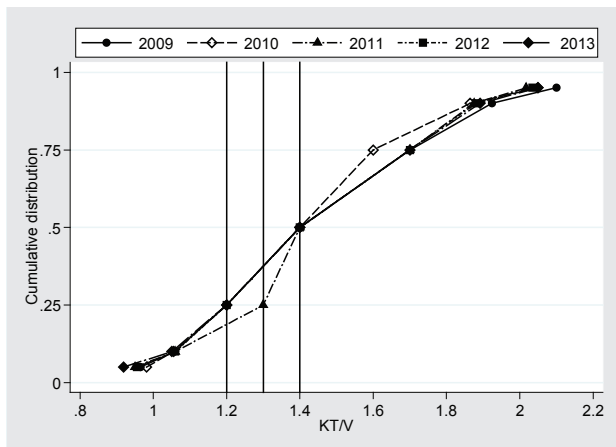
**Table 11.2.6(b):** Distribution of delivered Kt/V, HD patients 2009-2013

Year	Number of patients	Mean	SD	Median	LQ	UQ	% patients $\geq 1.2$	% patients $\geq 1.3$	Variance*
2009	10468	1.5	0.7	1.4	1.3	1.7	81	65	0.1
2010	11697	1.4	0.5	1.4	1.2	1.6	79	63	0.1
2011	13622	1.5	1.2	1.4	1.2	1.7	80	64	0.1
2012	15817	1.5	0.5	1.5	1.3	1.7	82	67	0.1
2013	18956	1.5	0.4	1.4	1.2	1.7	80	64	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 2009-2013

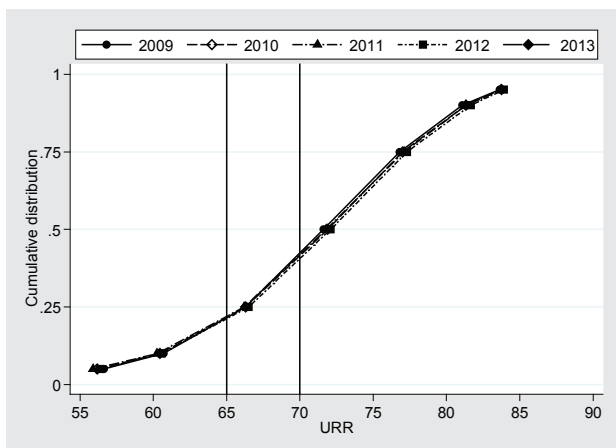


The median URR in 2013 was 72.1% and the mean URR was 71.4%. The percentage of patients with URR > 70% was 60%. The percentage had remained similar for the past 5 years. The URR results were calculated based on the pre and post blood urea for individual patient provided by the dialysis centres.

**Table 11.2.6(c):** Distribution of URR, HD patients 2009-2013

Year	Number of patients	Mean	SD	Median	LQ	UQ	% patients ≥65%	% patients ≥ 70%
2009	14953	71	9	71.7	66.1	76.9	79	58
2010	16727	71.1	8.6	71.6	66.3	76.8	80	58
2011	19209	71.2	8.8	71.9	66.3	77	80	60
2012	22527	71.1	8.9	71.8	66.2	77.1	79	59
2013	25832	71.4	8.8	72.1	66.5	77.3	80	60

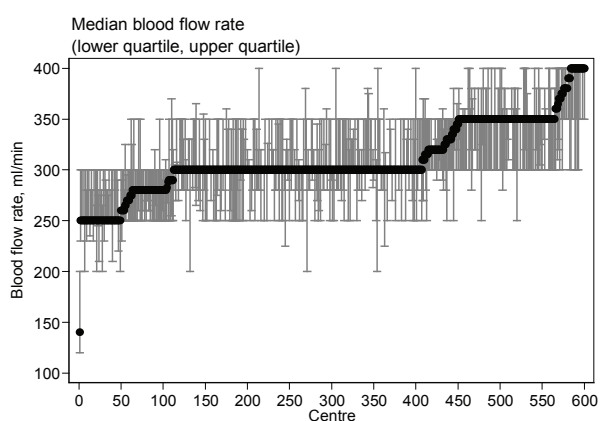
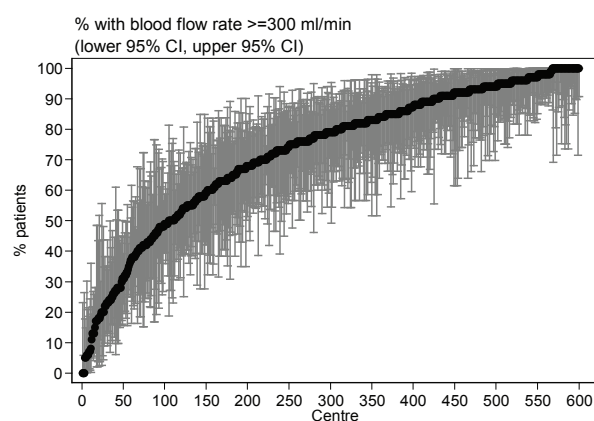
**Figure 11.2.6(c):** Cumulative distribution of URR, HD patients 2009-2013



The median blood flow rate among centres had remained the same since 2005 at 300ml/min. There was still a wide variation in practices with regards to median blood flow rate among centres. There was one centre with median blood flow rates of less than or equal to 200ml/min in 2013 compared to 2 in 2012 (Table & Figure 11.2.7 a). Half of the centres had 79% of their patients with blood flow rate of ≥300 ml/min in 2013 compared to only 48.5% in 2004 (Table 11.2.7b).

**Table 11.2.7(a):** Variation in median blood flow rates in HD patients, HD centres, 2004-2013

Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2004	184	220	250	257.5	287.5	300	350	400
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	600	140	250	300	300	347.5	370	400

**Figure 11.2.7(a):** Variation in median blood flow rates in HD patients among centres 2013**Figure 11.2.7(b):** Variation in Proportion of patients with blood flow rates  $\geq 300$  ml/min among HD centres 2013**Table 11.2.7(b):** Proportion of patients with blood flow rates  $\geq 300$  ml/min, HD centres 2004-2013

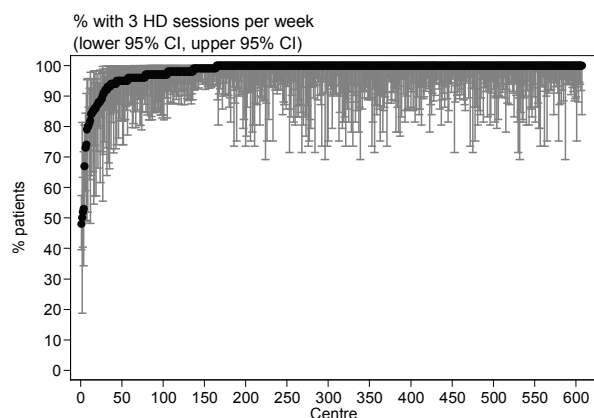
Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2004	184	0	4	23.5	48.5	73	93	100
2005	228	0	0	28	53	77	94	100
2006	283	0	5	30	63	83	94	100
2007	302	0	7	37	68	84	96	100
2008	355	0	9	40	70	86	99	100
2009	404	0	11	42.5	72	88	99	100
2010	435	0	9	46	75	90	100	100
2011	495	0	14	55	77	91	100	100
2012	553	0	22	58	80	91	100	100
2013	600	0	23	59	79	92	100	100

The majority of centres had 100% of their patients with 3 HD sessions/ week. There were four centres with less than 60% of their patients on 3 HD sessions per week.

**Table 11.2.7(c):** Proportion of patients with 3 HD sessions per week, HD centres 2004-2013

Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2004	188	37	70	98	100	100	100	100
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	607	48	92	99	100	100	100	100

**Figure 11.2.7(c):** Variation in proportion of patients with 3 HD sessions per week among HD centres 2013



The median prescribed Kt/V was 1.6. In 2013, half of the centres had 85% of their patients with a prescribed Kt/V  $\geq 1.3$ . However there was still a wide variation in proportion of patients with Kt/V  $\geq 1.3$  among the centres. There were 4 centres with less than 40% of their patients with prescribed Kt/V  $\geq 1.3$ .

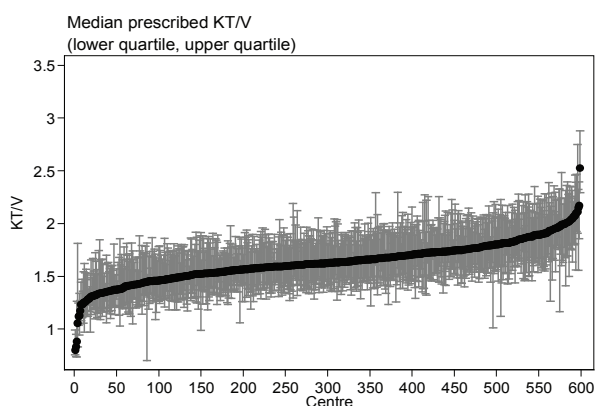
**Table 11.2.7(d):** Median prescribed Kt/V in HD patients, HD centres 2004-2013

Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2004	181	1.2	1.4	1.5	1.6	1.7	1.9	2.2
2005	224	1.2	1.3	1.5	1.6	1.7	1.8	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	1.8	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	1.7	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	1.6	1.8	2	2.5
2012	552	1.1	1.4	1.5	1.7	1.8	2	2.8
2013	599	0.8	1.3	1.5	1.6	1.7	2	2.5

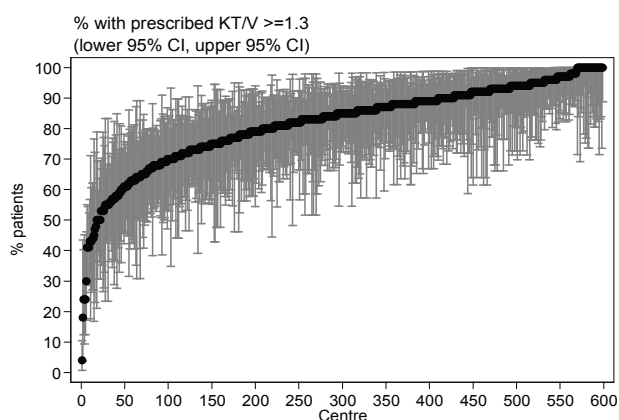
**Table 11.2.7(e):** Proportion of patients with prescribed Kt/V  $\geq 1.3$ , 2004-2013

Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2004	181	28	58	74	83	91	98	100
2005	224	32	58	73	82	90.5	98	100
2006	281	0	46	68	80	88	97	100
2007	302	21	50	67	80	89	97	100
2008	353	14	48	69	84	90	98	100
2009	400	26	53.5	75	86	92	98	100
2010	434	6	50	74	85	91	100	100
2011	495	15	58	77	87	93	100	100
2012	552	29	58	77.5	86	93	100	100
2013	599	4	55	75	85	92	100	100

**Figure 11.2.7(d):** Variation in median prescribed Kt/V in HD patients among HD centres 2013



**Figure 11.2.7(e):** Variation in proportion of patients with prescribed Kt/V  $\geq 1.3$  among HD centres 2013

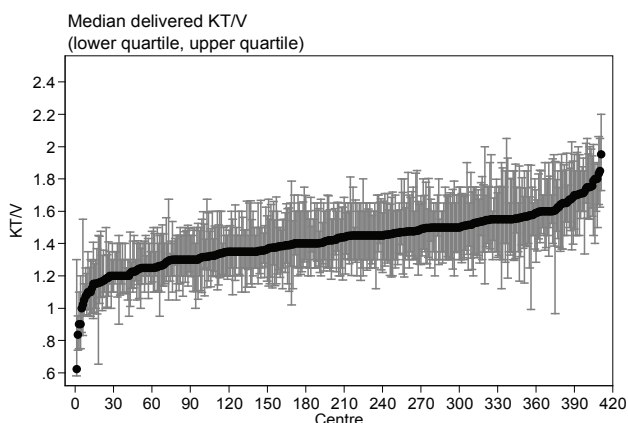


The median delivered Kt/V was 1.4. There were three centres with median delivered Kt/V of less than 1. Half of the centres had 82% of their patients with a delivered Kt/V  $\geq 1.2$  in 2013. There were two centres with less than 20% of its patients with a delivered Kt/V  $\geq 1.2$  in 2013.

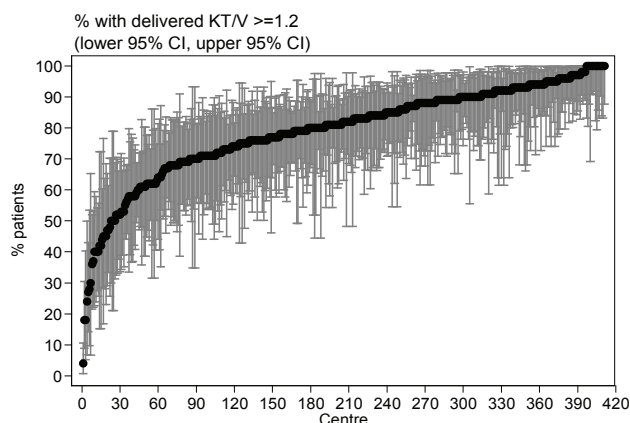
**Table 11.2.7(f):** Median delivered Kt/V in HD patients, HD centres 2009-2013

Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2009	239	1	1.2	1.3	1.4	1.5	1.6	2
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	411	0.6	1.2	1.3	1.4	1.5	1.7	2

**Figure 11.2.7(f):** Variation in median delivered Kt/V in HD patients among HD centres 2013



**Figure 11.2.7(g):** Variation in proportion of patients with delivered Kt/V  $\geq 1.2$ , HD centres 2013



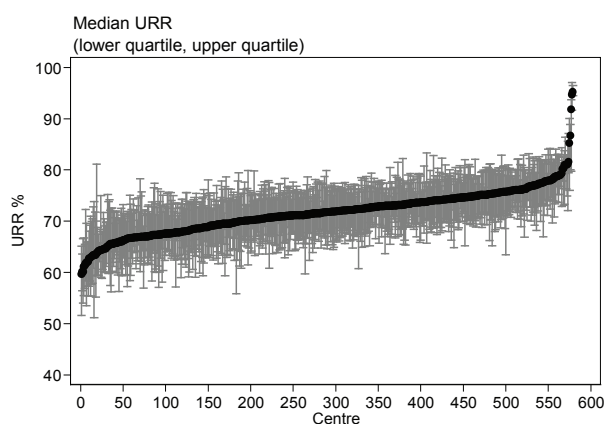
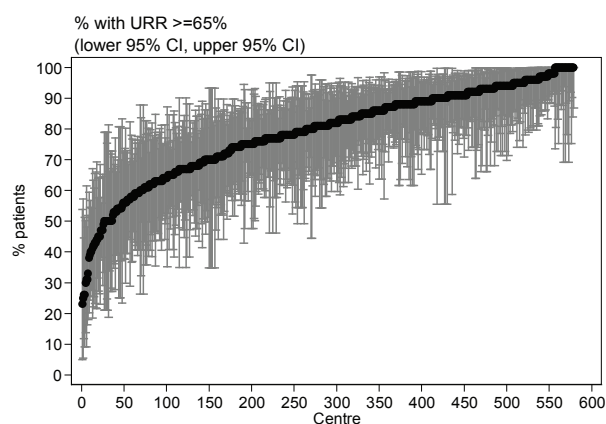
**Table 11.2.7(g):** Proportion of patients with delivered Kt/V  $\geq 1.2$ , HD centres 2009-2013

Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2009	239	18	51	74	84	90	97	100
2010	253	0	47	71	83	89	98	100
2011	302	6	51	74	84	91	100	100
2012	355	26	49	74	85	92	98	100
2013	411	4	47	71	82	90	97	100

The median URR for 2013 was 71.7%. Half of the centres had 81% of their patients with URR  $\geq 65\%$ . There were four centres with less than or equal to 30% of their patients with URR  $\geq 65\%$  (similar to last year). A higher number of centres i.e. 579 centres provided data on URR compared to only 411 centres that had provided data on delivered Kt/V.

**Table 11.2.7(h):** Median URR among HD patients, HD centres 2009-2013

Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2009	350	60	64.4	68.7	71.8	74.1	77	93.3
2010	397	54.6	64.8	69	71.3	73.8	76.7	94
2011	459	45.2	64.8	68.8	71.7	74.3	77.9	96.8
2012	523	56.3	65.2	68.7	71.8	74	77.5	96
2013	579	59.6	64.6	68.8	71.7	74.4	77.9	95.2

**Figure 11.2.7(h):** Variation in median URR among HD patients, HD centres 2013**Figure 11.2.7(i):** Variation in proportion of patients with URR  $\geq 65\%$  among HD centres 2013**Table 11.2.7(i):** Proportion of HD patients with URR  $\geq 65\%$ , HD centres 2009-2013

Year	Number of centres	Min	5 <sup>th</sup> Centile	LQ	Median	UQ	95 <sup>th</sup> Centile	Max
2009	350	22	45	69	81	89	97	100
2010	397	13	48	69	82	90	98	100
2011	459	0	50	70	82	91	100	100
2012	523	17	50	69	81	89	98	100
2013	579	23	50	70	81	91	98	100

### SECTION 11.3: TECHNIQUE SURVIVAL ON DIALYSIS

There was no apparent difference in the unadjusted technique survival by years of starting dialysis for the years 2004 to 2013 even after censoring for death and transplant.

**Table 11.3.1(a):** Correlation of blood pressure profile and death, cardiovascular death and ischaemic heart disease, dialysis patients 2004-2013

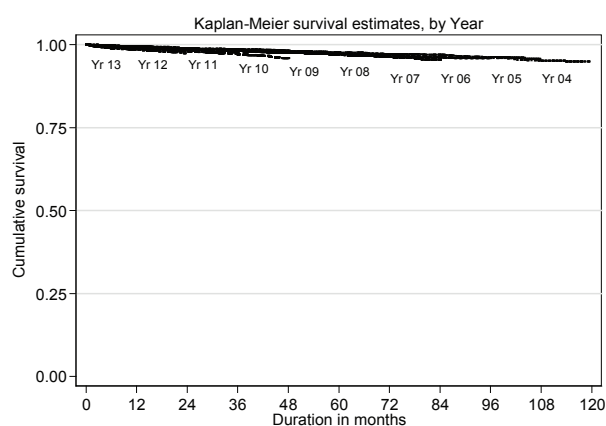
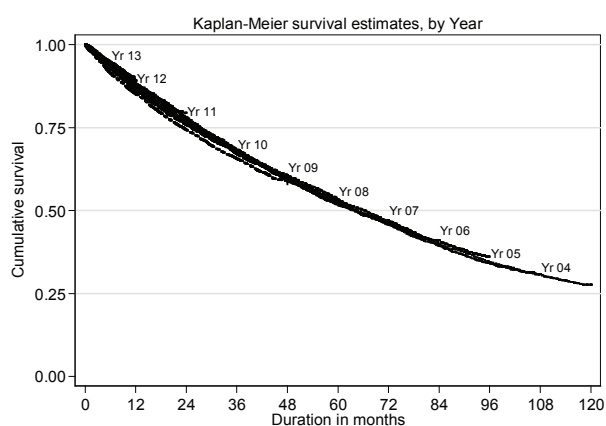
Year Interval (month)	2004			2005			2006			2007			2008		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	2745	100		2959	100		3421	100		3691	100		4207	100	
6	2570	94	0	2731	93	0	3143	93	0	3464	94	0	3931	94	0
12	2375	88	1	2524	87	1	2918	87	1	3219	88	1	3674	88	1
24	2073	78	1	2189	76	1	2562	77	1	2827	78	1	3178	77	1
36	1791	68	1	1930	68	1	2252	68	1	2472	68	1	2793	68	1
48	1568	60	1	1676	59	1	2004	61	1	2151	60	1	2429	59	1
60	1370	52	1	1459	52	1	1756	53	1	1891	53	1	2121	52	1
72	1200	46	1	1289	46	1	1542	47	1	1656	46	1	62		
84	1035	40	1	1109	39	1	1326	40	1	30					
96	893	34	1	958	34	1	26								
108	787	31	1	9											
120	2														

Year Interval (month)	2009			2010			2011			2012			2013		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	4573	100		4950	100		5633	100		5996	100		5737	100	
6	4274	94	0	4501	91	0	5176	93	0	5575	94	0	2983	95	0
12	3976	88	0	4185	85	1	4799	86	0	5226	88	0	176		
24	3439	76	1	3620	74	1	4200	76	1	148					
36	2997	67	1	3183	66	1	126								
48	2638	59	1	60											
60	62														

**Figure 11.3.1(a):** Unadjusted technique survival by year of entry, 2004-2013

**Figure 11.3.1(b):** Unadjusted technique survival by year of entry (censored for death & transplant), 2004-2013



**Table 11.3.1(b):** Unadjusted technique survival by year of entry (censored for death & transplant), 2004-2013

Year Interval (month)	2004			2005			2006			2007			2008		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	2745	100		2959	100		3421	100		3691	100		4207	100	
6	2570	100	0	2731	100	0	3143	100	0	3464	100	0	3931	100	0
12	2375	100	0	2524	99	0	2918	99	0	3219	99	0	3674	99	0
24	2073	99	0	2189	99	0	2562	99	0	2827	99	0	3178	99	0
36	1791	99	0	1930	99	0	2252	98	0	2472	98	0	2793	98	0
48	1568	98	0	1676	98	0	2004	98	0	2151	98	0	2429	98	0
60	1370	97	0	1459	98	0	1756	97	0	1891	97	0	2121	97	0
72	1200	97	0	1289	97	0	1542	97	0	1656	96	0	62		
84	1035	96	0	1109	97	0	1326	96	0	30					
96	893	96	0	958	96	0	26								
108	787	95	1	9											
120	2														

Year Interval (month)	2009			2010			2011			2012			2013		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	4573	100		4950	100		5633	100		5996	100		5737	100	
6	4274	100	0	4501	99	0	5176	99	0	5575	99	0	2983	99	0
12	3976	99	0	4185	99	0	4799	99	0	5226	99	0	176		
24	3439	99	0	3620	98	0	4200	98	0	148					
36	2997	98	0	3183	97	0	126								
48	2638	98	0	60											
60	62														

The unadjusted technique survival was better in the younger age groups than the older age group. The 8-year unadjusted technique survival for the age groups of ≤14, 15-24, 25-34, 35-44, 44-54, 55-64 and ≥65 years old were 60%, 73%, 69%, 56%, 40%, 28% and 15% 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 two years and subsequently maintained at 90%.

**Table 11.3.2(a):** Unadjusted technique survival by age, 2004-2013

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	147	100		1200	100		2734	100		4752	100	
6	134	94	2	1087	96	1	2457	96	0	4254	95	0
12	120	89	3	958	93	1	2146	93	1	3702	91	0
24	90	79	4	765	88	1	1693	88	1	2872	84	1
36	66	75	4	619	84	1	1334	85	1	2257	79	1
48	51	69	4	501	83	1	1020	81	1	1735	75	1
60	36	65	5	381	81	1	757	77	1	1306	70	1
72	24	63	5	293	78	2	540	74	1	916	65	1
84	17	60	6	197	75	2	360	71	1	615	60	1
96	12	60	6	121	73	2	217	69	1	355	56	1
108	7	53	9	59	71	2	105	67	2	168	52	1
120	1			1			1			1		

Age group (year) Interval (month)	45-54			55-64			≥ 65		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	10793	100		13194	100		11092	100	
6	9552	95	0	11470	93	0	9388	90	0
12	8352	89	0	9812	87	0	7804	82	0
24	6364	80	0	7112	76	0	5335	68	0
36	4750	73	0	5002	65	0	3513	55	1
48	3441	65	1	3435	56	1	2290	44	1
60	2453	59	1	2298	48	1	1398	35	1
72	1673	53	1	1483	41	1	815	27	1
84	1025	46	1	865	34	1	420	20	1
96	516	40	1	451	28	1	191	15	1
108	223	37	1	156	22	1	79	12	1
120	2			1			1		

Figure 11.3.2(a): Unadjusted technique survival by age, 2004-2013

Figure 11.3.2(b): Unadjusted technique survival by age (censored for death & transplant), 2004-2013

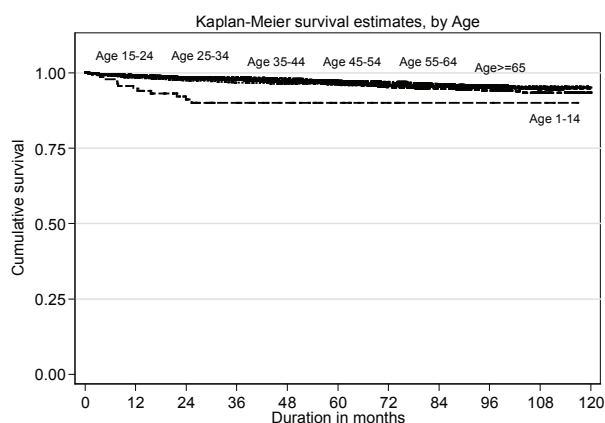
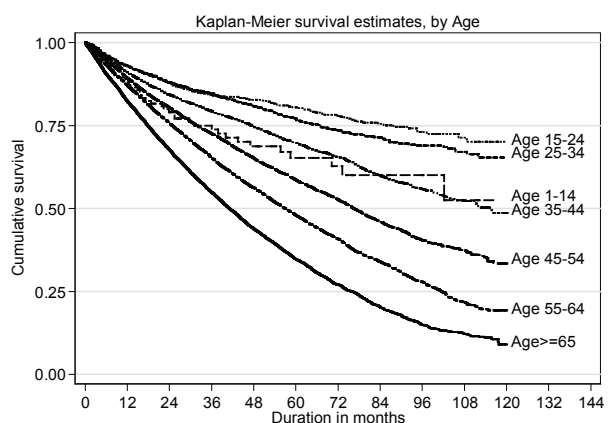


Table 11.3.2(b): Unadjusted technique survival by age (censored for death & transplant), 2004-2013

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	147	100		1200	100		2734	100		4752	100	
6	134	98	1	1087	99	0	2457	99	0	4254	99	0
12	120	95	2	958	98	0	2146	99	0	3702	99	0
24	90	91	3	765	97	0	1693	98	0	2872	99	0
36	66	90	3	619	97	1	1334	98	0	2257	98	0
48	51	90	3	501	96	1	1020	97	0	1735	98	0
60	36	90	3	381	96	1	757	97	0	1306	97	0
72	24	90	3	293	96	1	540	96	1	916	97	0
84	17	90	3	197	96	1	360	95	1	615	96	0
96	12	90	3	121	96	1	217	95	1	355	96	1
108	7	90	3	59	96	1	105	95	1	168	95	1
120	1			1			1			1		



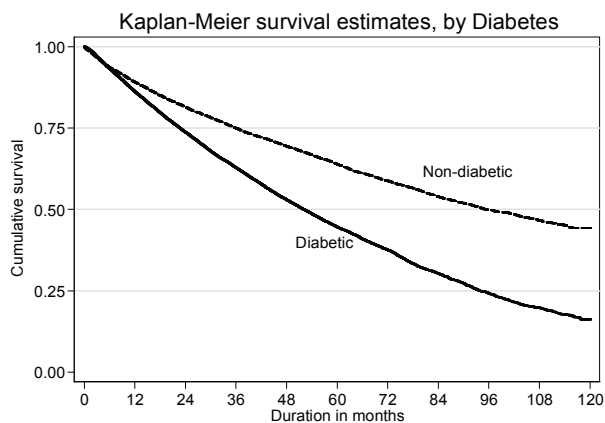
Age group (year) Interval (month)	45-54			55-64			≥ 65		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	10793	100		13194	100		11092	100	
6	9552	100	0	11470	99	0	9388	99	0
12	8352	99	0	9812	99	0	7804	99	0
24	6364	99	0	7112	98	0	5335	98	0
36	4750	98	0	5002	98	0	3513	98	0
48	3441	98	0	3435	97	0	2290	97	0
60	2453	97	0	2298	97	0	1398	96	0
72	1673	97	0	1483	95	0	815	96	0
84	1025	96	0	865	95	0	420	96	0
96	516	96	0	451	94	1	191	95	1
108	223	95	1	156	93	1	79	95	1
120	2			1			1		

Unadjusted technique survival in non-diabetics at 1, 5 and 8 years was 89%, 64% and 50% respectively. Unadjusted technique survival for diabetics was worse than non-diabetics; 86% at 1 year, 45% at 5 years and only 24% at 8 years. There was no apparent difference in the unadjusted technique survival by diabetes status when censored for death & transplant.

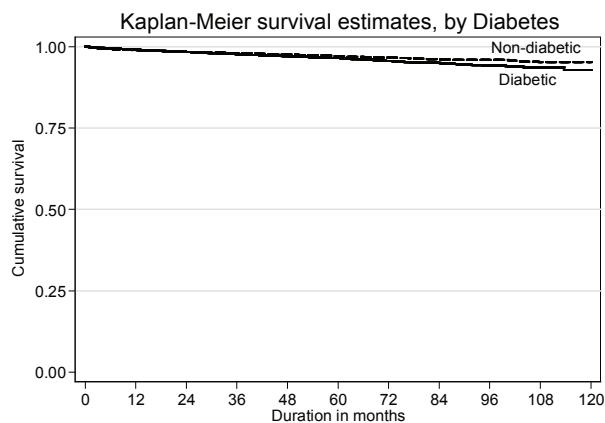
**Table 11.3.3(a):** Unadjusted technique survival by diabetes status, 2004-2013

Diabetes status Interval (month)	Non-Diabetic			Diabetic		
	n	% Survival	SE	n	% Survival	SE
0	17699	100		26213	100	
6	15544	94	0	22795	93	0
12	13567	89	0	19326	86	0
24	10455	81	0	13774	74	0
36	7917	75	0	9623	63	0
48	5922	69	0	6539	53	0
60	4317	64	0	4277	45	0
72	3020	59	1	2723	38	0
84	1980	54	1	1518	30	0
96	1146	50	1	704	24	1
108	519	47	1	270	20	1
120	2			2		

**Figure 11.3.3(a):** Unadjusted technique survival by diabetes status, 2004-2013



**Figure 11.3.3(b):** Unadjusted technique survival by diabetes status (censored for death & transplant), 2004-2013



**Table 11.3.3(b):** Unadjusted technique survival by diabetes status (censored for death & transplant), 2004-2013

Diabetes status Interval (month)	Non-Diabetic			Diabetic		
	n	% Survival	SE	n	% Survival	SE
0	17699	100		26213	100	
6	15544	99	0	22795	99	0
12	13567	99	0	19326	99	0
24	10455	98	0	13774	98	0
36	7917	98	0	9623	98	0
48	5922	98	0	6539	97	0
60	4317	97	0	4277	97	0
72	3020	97	0	2723	96	0
84	1980	96	0	1518	95	0
96	1146	96	0	704	94	0
108	519	95	0	270	94	1
120	2			2		