

CHAPTER 11

**HAEMODIALYSIS
PRACTICES**

Tan Chwee Choon
Shahnaz Shah Firdaus Khan
Rafidah Abdullah
Norleen Bt Zulkarnain Sim

SECTION 11.1: VASCULAR ACCESS AND ITS COMPLICATIONS

The proportion of patients with native vascular access has remained the same at about 90% for the past 3 years. The percentage of patients on cuffed or non-cuffed central venous catheters has increased over the past 10 years.

Table 11.1.1: Vascular access on haemodialysis, 2002-2011

Access types	2002		2003		2004		2005		2006	
	n	%	n	%	n	%	n	%	n	%
Wrist AVF	4680	77.7	5249	75.2	5891	72.7	6405	69.1	7798	67.7
BCF*	1068	17.7	1359	19.5	1693	20.9	2169	23.4	2856	24.8
Venous graft	14	0.2	23	0.3	41	0.5	30	0.3	22	0.2
Artificial graft	78	1.3	113	1.6	149	1.8	221	2.4	284	2.5
Permanent CVC	43	0.7	61	0.9	99	1.2	179	1.9	235	2
Temporary CVC*	138	2.3	179	2.6	233	2.9	266	2.9	298	2.6
Temporary FVC*	0	0	0	0	0	0	4	0	19	0.2
Total	6021	100	6984	100	8106	100	9274	100	11512	100

Access types	2007		2008		2009		2010		2011	
	n	%	n	%	n	%	n	%	n	%
Wrist AVF	8309	65	9491	62.4	10665	60.6	11130	58.4	12556	56.7
BCF*	3421	26.8	4403	29	5243	29.8	6105	32	7358	33.3
Venous graft	37	0.3	19	0.1	32	0.2	50	0.3	42	0.2
Artificial graft	305	2.4	351	2.3	379	2.2	386	2	378	1.7
Permanent CVC	261	2	298	2	464	2.6	513	2.7	669	3
Temporary CVC*	424	3.3	579	3.8	770	4.4	818	4.3	1039	4.7
Temporary FVC*	25	0.2	59	0.4	46	0.3	71	0.4	86	0.4
Total	12782	100	15200	100	17599	100	19073	100	22128	100

*CVC = central venous catheter, FVC = femoral venous catheter,
BCF = brachiocephalic fistula

Table 11.1.2: Difficulties report with vascular access, 2002-2011

Access types	2002		2003		2004		2005		2006	
	n	%	n	%	n	%	n	%	n	%
Difficulty with needle placement	215	3.9	217	3.3	255	3.4	319	3.5	394	3.5
Difficulty in obtaining desired blood flow rate	235	4.2	243	3.7	301	4	354	3.9	356	3.1
Other difficulties	57	1	60	0.9	67	0.9	58	0.6	45	0.4
No difficulties	5073	90.9	5970	92	6957	91.8	8339	91.9	10592	93
Total	5580	100	6490	100	7580	100	9070	100	11387	100

Access types	2007		2008		2009		2010		2011	
	n	%	n	%	n	%	n	%	n	%
Difficulty with needle placement	478	3.8	417	2.8	522	3	555	2.9	478	2.1
Difficulty in obtaining desired blood flow rate	368	2.9	420	2.8	473	2.7	437	2.3	495	2.2
Other difficulties	57	0.5	81	0.5	101	0.6	78	0.4	72	0.3
No difficulties	11577	92.8	14076	93.9	16482	93.8	18071	94.4	21248	95.3
Total	12480	100	14994	100	17578	100	19141	100	22293	100

No increase in difficulties was reported with vascular access.

Table 11.1.3: Complications reported with vascular access, 2002-2011

Complication	2002		2003		2004		2005		2006	
	n	%	n	%	n	%	n	%	n	%
Thrombosis	202	3.5	220	3.2	284	3.6	289	3.2	317	2.8
Bleed	66	1.1	54	0.8	67	0.8	73	0.8	69	0.6
Aneurysmal dilatation	211	3.6	199	2.9	193	2.4	179	2	246	2.2
Swollen limb	56	1	55	0.8	77	1	84	0.9	89	0.8
Access related infection, local/systemic	52	0.9	43	0.6	70	0.9	63	0.7	78	0.7
Distal limb ischaemia	17	0.3	13	0.2	37	0.5	35	0.4	30	0.3
Venous outflow obstruction	101	1.7	119	1.7	151	1.9	170	1.9	202	1.8
Carpal tunnel	44	0.8	63	0.9	49	0.6	55	0.6	48	0.4
Others	118	2	118	1.7	133	1.7	109	1.2	116	1
No complications	4988	85.2	5963	87.1	6896	86.7	8113	88.5	10154	89.5
Total	5855	100	6847	100	7957	100	9170	100	11349	100

Complication	2007		2008		2009		2010		2011	
	n	%	n	%	n	%	n	%	n	%
Thrombosis	405	3.2	436	2.9	481	2.7	463	2.4	503	2.2
Bleed	58	0.5	76	0.5	72	0.4	78	0.4	78	0.3
Aneurysmal dilatation	385	3.1	396	2.6	452	2.6	319	1.7	398	1.8
Swollen limb	101	0.8	98	0.6	162	0.9	150	0.8	140	0.6
Access related infection, local/systemic	97	0.8	92	0.6	133	0.8	123	0.6	130	0.6
Distal limb ischaemia	27	0.2	31	0.2	25	0.1	33	0.2	25	0.1
Venous outflow obstruction	196	1.6	250	1.7	299	1.7	239	1.2	273	1.2
Carpal tunnel	46	0.4	48	0.3	48	0.3	44	0.2	50	0.2
Others	152	1.2	165	1.1	119	0.7	122	0.6	142	0.6
No complications	11052	88.3	13517	89.5	15866	89.9	17601	91.8	20641	92.2
Total	12519	100	15109	100	17657	100	19172	100	22380	100

Complication rates for vascular access have reduced over the years from 14.8% in 2002 to 7.8% in 2011.

SECTION 11.2: HD PRESCRIPTION

Table 11.2.1: Blood flow rates in HD centers, 2002-2011

Blood flow rates (ml/min)	2002		2003		2004		2005		2006	
	n	%	n	%	n	%	n	%	n	%
<150	9	0.2	4	0.1	11	0.1	7	0.1	5	0
150-199	69	1.2	84	1.2	86	1.1	94	1	103	0.9
200-249	973	16.7	882	13	879	11.2	814	9.1	923	8.2
250-299	2692	46.1	2865	42.3	3112	39.8	3523	39.2	3818	33.8
300-349	1590	27.2	2241	33.1	2711	34.7	3226	35.9	4529	40.1
≥350	505	8.7	690	10.2	1020	13	1328	14.8	1920	17
Total	5838	100	6766	100	7819	100	8992	100	11298	100

Blood flow rates (ml/min)	2007		2008		2009		2010		2011	
	n	%	n	%	n	%	n	%	n	%
<150	10	0.1	10	0.1	14	0.1	16	0.1	14	0.1
150-199	87	0.7	120	0.8	126	0.7	113	0.6	122	0.6
200-249	929	7.4	928	6.2	1178	6.8	1192	6.3	1303	5.9
250-299	3821	30.5	4638	31.1	5050	29	5021	26.5	5514	25
300-349	5214	41.7	6127	41.1	7093	40.7	7721	40.8	8935	40.5
≥350	2451	19.6	3094	20.7	3977	22.8	4850	25.6	6172	28
Total	12512	100	14917	100	17438	100	18913	100	22060	100

There is an increase in proportion of patients with blood flow rate above 350mls from year 2002 at 8.7% to 28% in 2011. There were 14 patients probably children with blood flow rate of less than 150mls/min.

Figure 11.2.1: Blood flow rates in HD centers, 2002-2011

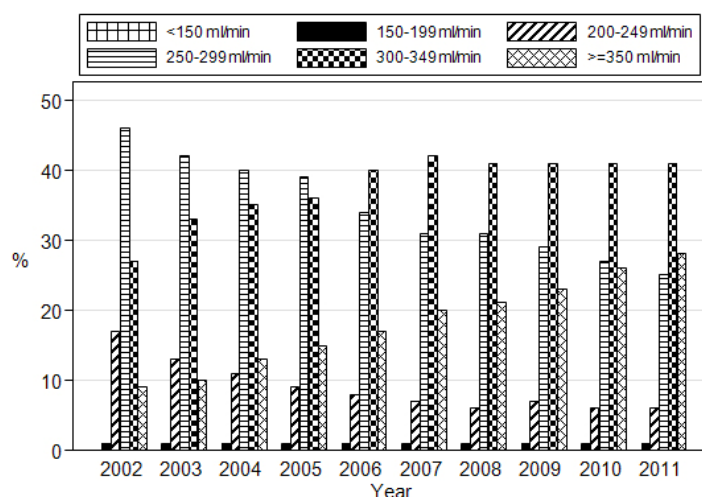


Table 11.2.2: Number of HD sessions per week, 2002-2011

HD sessions per week	2002		2003		2004		2005		2006	
	n	%	n	%	n	%	n	%	n	%
1	10	0.2	15	0.2	11	0.1	7	0.1	25	0.2
2	369	6.2	343	4.9	281	3.5	265	2.8	273	2.3
3	5603	93.4	6585	94.7	7751	96	9011	96.7	11326	97.2
4	18	0.3	9	0.1	30	0.4	31	0.3	34	0.3
Total	6000	100	6952	100	8073	100	9314	100	11658	100

HD sessions per week	2007		2008		2009		2010		2011	
	n	%	n	%	n	%	n	%	n	%
1	14	0.1	5	0	6	0	9	0	6	0
2	256	2	259	1.7	269	1.5	309	1.6	242	1.1
3	12602	97.7	15054	97.9	17574	98	19089	98.1	22437	98.8
4	31	0.2	61	0.4	88	0.5	47	0.2	31	0.1
Total	12903	100	15379	100	17937	100	19454	100	22716	100

The majority of patients (98.8%) were on 3 dialysis sessions per week. There were 31 patients that were haemodialyzed 4 dialysis sessions per week. Two hundred and forty eight patients are haemodialyzed less than 3 dialysis sessions per week.

Table 11.2.3: Duration of HD, 2002-2011

Duration of HD per session (hours)	2002		2003		2004		2005		2006	
	n	%	n	%	n	%	n	%	n	%
≤3	18	0.3	14	0.2	25	0.3	31	0.3	28	0.2
3.5	15	0.3	3	0	11	0.1	9	0.1	6	0.1
4	5854	97.7	6798	97.9	7885	97.6	9175	98.5	11507	98.8
4.5	60	1	66	1	106	1.3	46	0.5	66	0.6
5	47	0.8	63	0.9	45	0.6	52	0.6	42	0.4
>5	0	0	0	0	3	0	0	0	1	0
Total	5994	100	6944	100	8075	100	9313	100	11650	100

Duration of HD per session (hours)	2007		2008		2009		2010		2011	
	n	%	n	%	n	%	n	%	n	%
≤3	37	0.3	54	0.4	66	0.4	77	0.4	70	0.3
3.5	11	0.1	10	0.1	25	0.1	36	0.2	10	0
4	12792	99.2	15200	98.8	17732	98.8	19231	98.8	22552	99.3
4.5	23	0.2	74	0.5	78	0.4	72	0.4	40	0.2
5	31	0.2	42	0.3	42	0.2	50	0.3	39	0.2
>5	1	0	0	0	1	0	0	0	5	0
Total	12895	100	15380	100	17944	100	19466	100	22716	100

Majority of patients (99.3%) were on 4 hours per HD session.

Table 11.2.4: Dialyser membrane types in HD centres, 2002-2011

Dialyser membrane	2002		2003		2004		2005		2006	
	n	%	n	%	n	%	n	%	n	%
Modified Cellulose	1377	24.2	1150	17.4	1719	22.1	1974	21.8	2489	21.6
Regenerated Cellulose	1474	26	1599	24.1	1150	14.8	930	10.2	997	8.7
Hydrophobic/Hypdrophilic	2828	49.8	3841	58	4846	62.2	6020	66.3	7860	68.3
Hydrophilized copolymers	1	0	35	0.5	74	1	150	1.7	161	1.4
Total	5680	100	6625	100	7789	100	9074	100	11507	100

Dialyser membrane	2007		2008		2009		2010		2011	
	n	%	n	%	n	%	n	%	n	%
Modified Cellulose	2890	22.7	3431	22.7	3241	19	3306	18.9	3903	24
Regenerated Cellulose	699	5.5	486	3.2	418	2.5	202	1.2	60	0.4
Hydrophobic/Hypdrophilic	8984	70.7	10886	72.1	13052	76.6	13609	77.7	11995	73.7
Hydrophilized copolymers	137	1.1	286	1.9	335	2	409	2.3	323	2
Total	12710	100	15089	100	17046	100	17526	100	16281	100

Seventy four percent used synthetic membrane dialysers. There was an increase in modified cellulose dialyser membrane usage from 18.9% in 2010 to 24% in 2011.

Figure 11.2.4: Dialyser membrane types in HD centres, 2002-2011

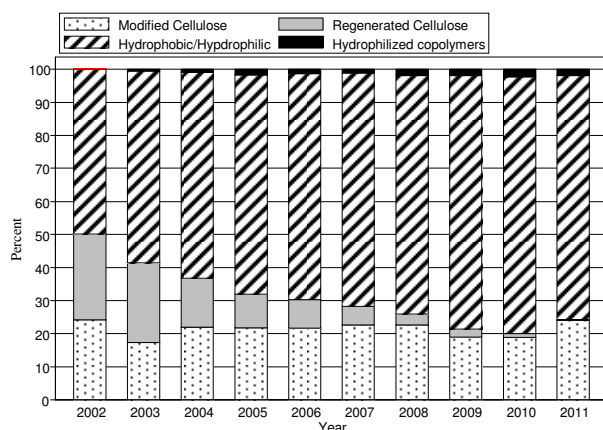


Table 11.2.5: Dialyser reuse frequency in HD centres, 2002-2011

Dialyser reuse frequency	2002		2003		2004		2005		2006	
	n	%	n	%	n	%	n	%	n	%
1	197	3.9	251	4.3	319	5.1	196	4.5	400	6.3
2	41	0.8	19	0.3	42	0.7	1	0	5	0.1
3	316	6.2	349	6	194	3.1	81	1.9	36	0.6
4	337	6.6	339	5.8	192	3.1	85	2	75	1.2
5	318	6.2	267	4.6	192	3.1	137	3.2	190	3
6	1216	23.8	915	15.7	806	12.9	555	12.8	593	9.3
7	124	2.4	71	1.2	89	1.4	44	1	63	1
8	866	17	852	14.6	809	12.9	477	11	422	6.6
9	59	1.2	87	1.5	50	0.8	46	1.1	115	1.8
10	538	10.5	880	15.1	1160	18.5	770	17.8	959	15
11	36	0.7	25	0.4	42	0.7	12	0.3	100	1.6
12	879	17.2	1511	25.8	1916	30.6	1353	31.3	2243	35.1
≥ 13	175	3.4	280	4.8	458	7.3	565	13.1	1185	18.6
Total	5102	100	5846	100	6269	100	4322	100	6386	100

Dialyser reuse frequency	2007		2008		2009		2010		2011	
	n	%	n	%	n	%	n	%	n	%
1	568	5.7	810	6.6	1175	8.4	1494	9.9	2073	11.6
2	24	0.2	29	0.2	29	0.2	24	0.2	22	0.1
3	117	1.2	87	0.7	115	0.8	58	0.4	126	0.7
4	151	1.5	120	1	89	0.6	103	0.7	62	0.3
5	128	1.3	168	1.4	184	1.3	100	0.7	187	1
6	809	8.1	699	5.7	743	5.3	562	3.7	757	4.2
7	141	1.4	156	1.3	193	1.4	286	1.9	214	1.2
8	797	8	844	6.9	774	5.5	886	5.9	713	4
9	107	1.1	247	2	294	2.1	349	2.3	318	1.8
10	1530	15.3	2009	16.3	2651	18.9	2449	16.2	3244	18.1
11	94	0.9	101	0.8	58	0.4	121	0.8	110	0.6
12	4075	40.8	5266	42.7	5690	40.6	5873	38.8	6965	38.8
≥ 13	1440	14.4	1783	14.5	2010	14.4	2837	18.7	3141	17.5
Total	9981	100	12319	100	14005	100	15142	100	17932	100

Re-use of dialysers is a common practice whereby 88.4% re-used the dialyser. Seventeen point five percent of patients re-used at least 13 times. The practice of single use dialyser is growing over the years from 3.9% in 2002 to 11.6% in 2011.

Table 11.2.6(a): Distribution of prescribed Kt/V, HD patients 2002-2011

Year	Number of patients	Mean	SD	Median	LQ	UQ	% patients ≥ 1.3
2002	5496	1.5	0.4	1.5	1.3	1.7	73
2003	6525	1.6	0.4	1.6	1.3	1.8	79
2004	7457	1.6	0.4	1.6	1.4	1.8	82
2005	8749	1.6	0.4	1.6	1.4	1.9	81
2006	11092	1.6	0.4	1.6	1.3	1.8	77
2007	12354	1.6	0.4	1.6	1.3	1.8	78
2008	14752	1.6	0.4	1.6	1.3	1.8	79
2009	17252	1.7	0.4	1.6	1.4	1.9	82
2010	18726	1.6	0.4	1.6	1.4	1.9	81
2011	21895	1.7	0.4	1.6	1.4	1.9	82

Figure 11.2.6(a): Cumulative distribution of prescribed Kt/V, HD patients 2002-2011

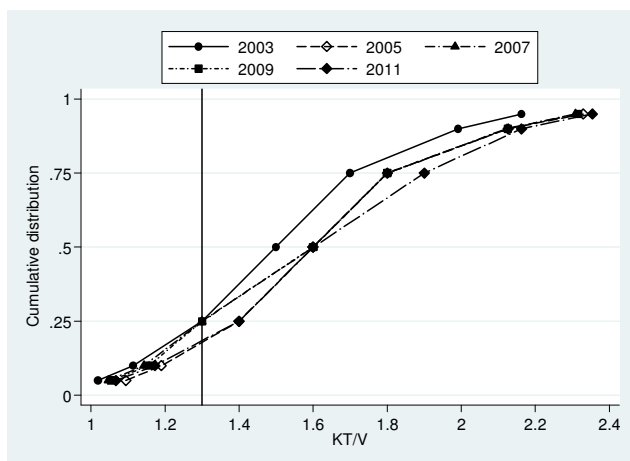
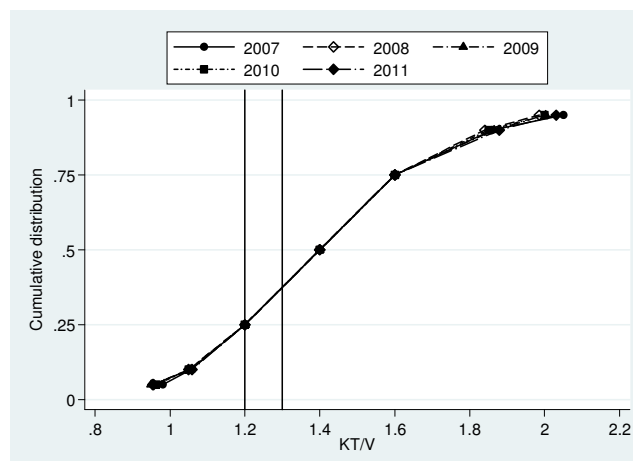


Figure 11.2.6 (b): Cumulative distribution of delivered Kt/V, HD patients 2007-2011



The mean and median prescribed Kt/V is 1.7 and 1.6 respectively. The percentage of patients with prescribed Kt/V > 1.3 is increasing over the years and has remained above 80% in the last 3 years.

The mean delivered Kt/V was 1.5 in 2011. The percentage of patients with delivered Kt/V > 1.3 have increased in 2011 to 64% from 62% in 2010. Although the reporting of delivered Kt/V data set has increased over the years but the method used to calculate the delivered Kt/V was not standardized in all these patients.

Table 11.2.6(b): Distribution of delivered Kt/V, HD patients 2007-2011

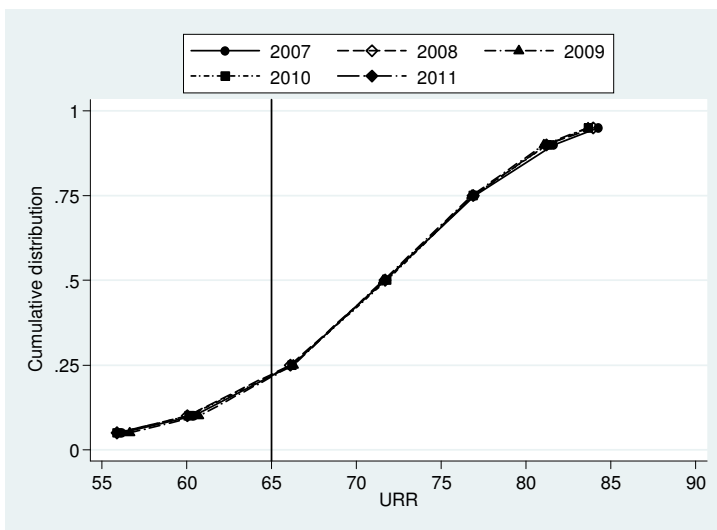
Year	Number of patients	Mean	SD	Median	LQ	UQ	% patients ≥ 1.2	% patients ≥ 1.3	Variance*
2007	6360	1.5	0.6	1.4	1.2	1.6	78	62	0.1
2008	8529	1.4	0.3	1.4	1.2	1.6	78	61	0.1
2009	10467	1.5	0.7	1.4	1.2	1.6	81	64	0.1
2010	11697	1.4	0.5	1.4	1.2	1.6	79	62	0.1
2011	13622	1.5	1.2	1.4	1.2	1.6	80	64	0.1

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

Table 11.2.6(c): Distribution of URR, HD patients 2007-2011

Year	Number of patients	Mean	SD	Median	LQ	UQ	% patients ≥ 65%
2007	9945	71.3	9.2	71.9	66.3	77.2	79
2008	12601	71.2	9	71.7	66.2	77	79
2009	14947	71	9	71.7	66.1	76.9	79
2010	16727	71.1	8.6	71.6	66.3	76.8	80
2011	19635	71.1	8.8	71.8	66.2	76.9	79

Figure 11.2.6 (c): Cumulative distribution of URR, HD patients 2007-2011



The median URR in 2011 was 71.8. The percentage of patients with URR > 65% was 79% in 2011.

The median blood flow rates among centres had remained the same since 2005 at 300mls/min. There is still a wide variation in practices with regards to median blood flow rates among centres. But no centres with median blood flow rates of less than 200mls/min in 2011.

Fifty percent of centres had 77% of their patients with blood flow rates of > 300 ml/min in 2011 compared to only 33% in 2002.

Table 11.2.7: Variation in HD prescription among HD centres, 2002-2011

Table 11.2.7(a): Median blood flow rates in HD patients, HD centres, 2002-2011

Year	Number of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2002	137	200	230	250	280	300	300	350
2003	155	200	240	250	280	300	325	350
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	500	200	250	300	300	330	350	400

Figure 11.2.7 (a): Variation in median blood flow rates in HD patients among centres 2011

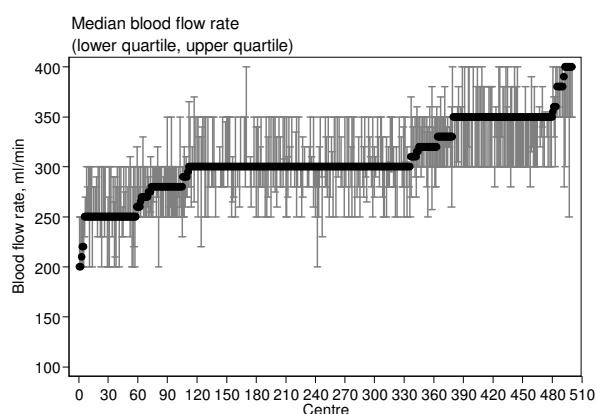


Figure 11.2.7 (b): Variation in Proportion of patients with blood flow rates ≥ 300 ml/min among HD centres 2011

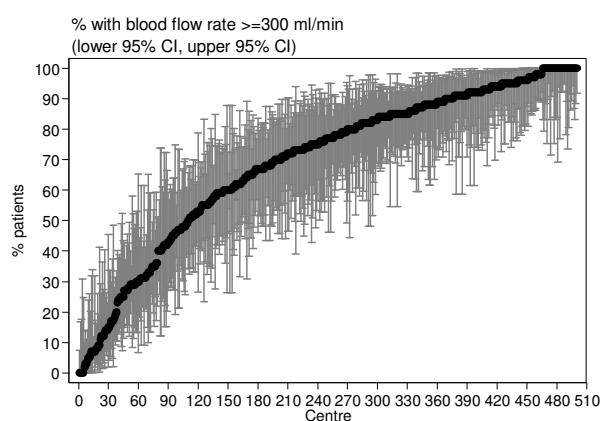


Table 11.2.7 (b) Proportion of patients with blood flow rates ≥ 300 ml/min, HD centres 2002-2011

Year	Number of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2002	137	0	0	13	33	61	90	100
2003	155	0	0	21	45	69	91	100
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	500	0	12.5	55	77	90	100	100

The majority of centres had 100% of their patients with 3 HD sessions/ week.

Table 11.2.7 (c): Proportion of patients with 3 HD sessions per week, HD centres 2002-2011

Year	Number of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2002	137	28	48	94	99	100	100	100
2003	160	36	55	97	100	100	100	100
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	502	50	93	100	100	100	100	100

Figure 11.2.7 (c): Variation in proportion of patients with 3 HD sessions per week among HD centres 2011

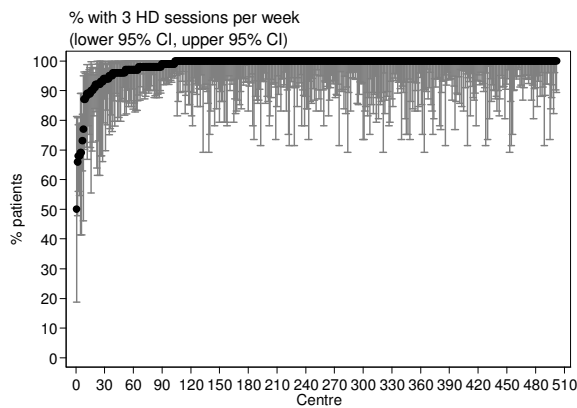
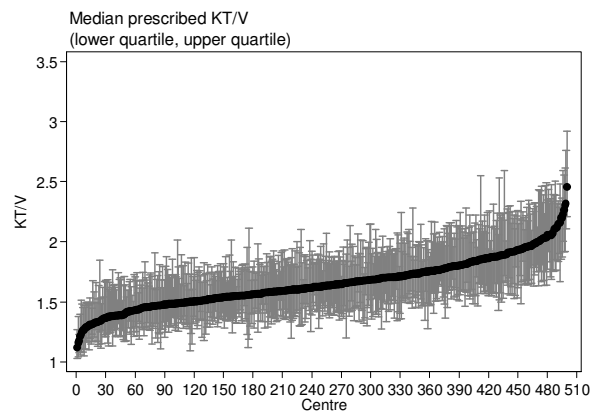


Figure 11.2.7 (d): Variation in median prescribed Kt/V in HD patients among HD centres 2011



The median prescribed Kt/V was 1.6. In 2011, half the centres had 85% of their patients with a prescribed Kt/V > 1.3. However there was still a wide variation in proportion of patients with Kt/V > 1.3 among the centres. Three centres were noted to have less than 40% of their patients with a prescribed Kt/V > 1.3.

Table 11.2.7 (d): Median prescribed Kt/V in HD patients, HD centres 2002-2011

Year	Number of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2002	132	1.2	1.3	1.4	1.5	1.6	1.7	1.8
2003	150	1.1	1.3	1.4	1.6	1.7	1.9	2
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	2.1
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	500	1.1	1.3	1.5	1.6	1.8	2	2.5

Table 11.2.7 (e): Proportion of patients with prescribed Kt/V ≥ 1.3 , 2002-2011

Year	Number of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2002	132	26	43	65	74.5	83	92	98
2003	150	30	48	71	81	89	96	100
2004	181	28	58	74	83	91	98	100
2005	224	32	58	73	82	90	98	100
2006	281	0	46	67	79	88	96	100
2007	302	21	50	67	80	89	96	100
2008	353	14	47	69	83	90	98	100
2009	400	26	53	74.5	85	91	97	100
2010	434	6	50	74	84	91	100	100
2011	500	15	55	76	85	93	100	100

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

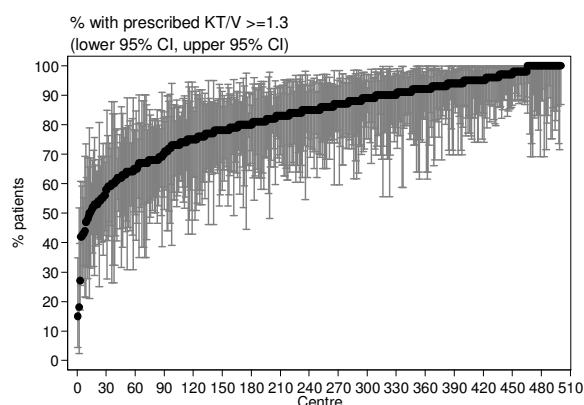


Figure 11.2.7 (f): Variation in median delivered Kt/V in HD patients among HD centres 2011

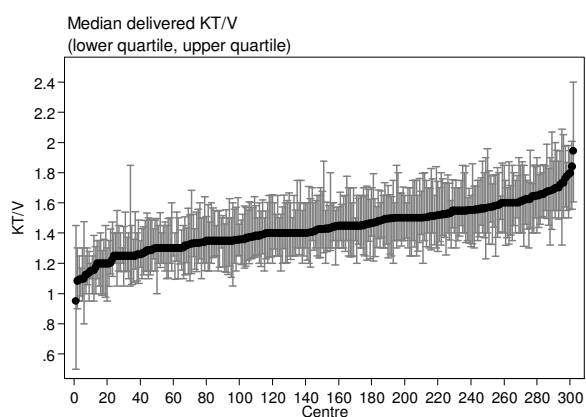


Table 11.2.7 (f): Median delivered Kt/V in HD patients, HD centres 2007-2011

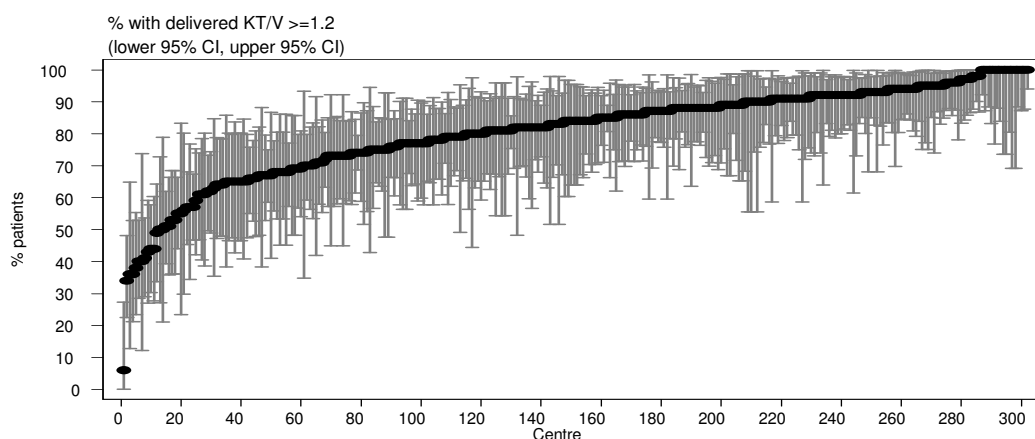
Year	Number of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2007	157	1.1	1.2	1.3	1.4	1.5	1.7	1.8
2008	199	1	1.2	1.3	1.4	1.5	1.7	1.8
2009	239	1	1.2	1.3	1.4	1.5	1.6	2
2010	253	0.8	1.1	1.3	1.4	1.5	1.6	2
2011	302	0.9	1.2	1.3	1.4	1.5	1.7	1.9

The number of centres reporting delivered Kt/v has increased to 302. The median delivered Kt/V was 1.4. Half of the centres had 84% of their patients with a delivered Kt/V of ≥ 1.2 . There was one centre with less than 10% of its patients with a delivered Kt/V ≥ 1.2 in 2011.

Table 11.2.7 (g): Proportion of patients with delivered Kt/V ≥ 1.2 , HD centres 2007-2011

Year	Number of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2007	157	34	46	70	79	89	97	100
2008	199	21	49	68	81	89	100	100
2009	239	16	51	74	84	90	97	100
2010	253	0	47	71	83	89	98	100
2011	302	6	51	73	84	91	100	100

Figure 11.2.7 (g): Variation in proportion of patients with delivered Kt/V ≥ 1.2 , HD centres 2011



The median URR for 2011 was 71.7%. In 2011, 50% of centres had 82% of their patients with URR >65%. There were 2 centres with less than 30% of their patients with URR > 65%.

Table 11.2.7 (h): Median URR among HD patients, HD centres 2007-2011

Year	Number of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2007	245	56.1	65.3	69.6	71.8	74.8	78	95.5
2008	310	40.4	63.5	68.5	71.7	74.4	77.9	93.6
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	464	45.2	64.6	68.8	71.7	74.3	77.9	96.8

Table 11.2.7 (i): Proportion of HD patients with URR $\geq 65\%$, HD centres 2007-2011

Year	Number of centres	Min	5 th Centile	LQ	Median	UQ	95 th Centile	Max
2007	245	15	51	71	82	89	97	100
2008	310	0	43	69	82.5	90	98	100
2009	350	22	45	69	81	89	97	100
2010	397	13	48	69	82	90	98	100
2011	464	0	49	69	82	90	100	100

Figure 11.2.7 (h): Variation in median URR among HD patients, HD centres 2011

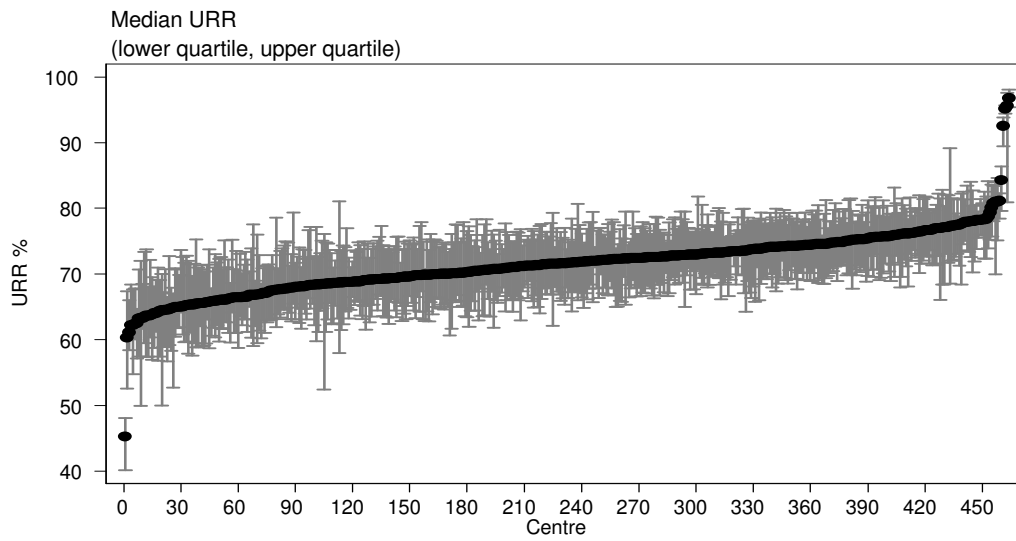
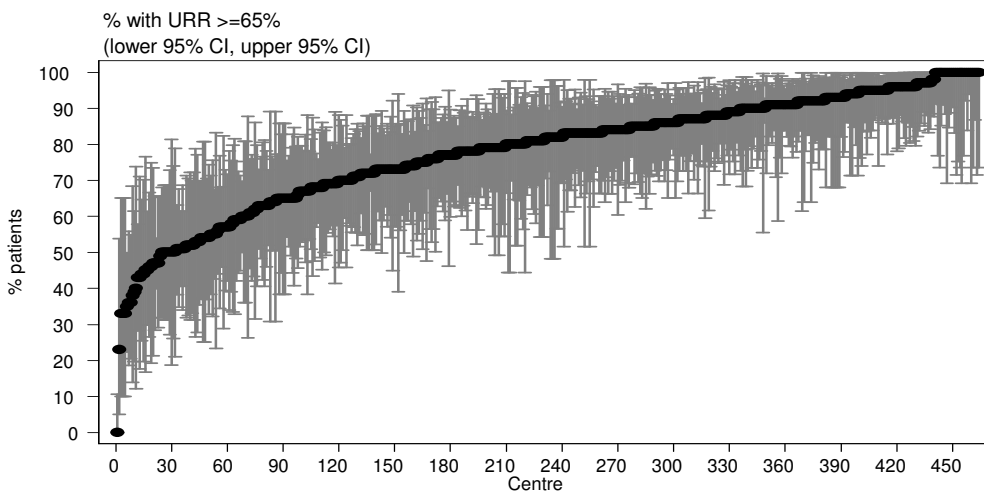


Figure 11.2.7 (i): Variation in proportion of patients with URR \geq 65% among HD centres 2011



SECTION 11.3: TECHNIQUE SURVIVAL ON DIALYSIS

Table 11.3.1(a): Unadjusted technique survival by year of entry, 2002-2011

Year Interval (month)	2002			2003			2004		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	2153	100		2338	100		2744	100	
6	2018	94	0	2170	94	0	2568	94	0
12	1885	89	1	2004	88	1	2371	88	1
24	1615	78	1	1755	78	1	2069	78	1
36	1429	70	1	1532	69	1	1788	68	1
48	1257	61	1	1344	61	1	1565	60	1
60	1100	54	1	1181	53	1	1363	52	1
72	960	47	1	1030	47	1	1198	46	1
84	840	41	1	875	40	1	1040	40	1
96	745	37	1	781	36	1	2	-	-
108	644	32	1	8	-	-	-	-	-
120	2	-	-	-	-	-	-	-	-

Year Interval (month)	2005			2006			2007			2008		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	2957	100		3417	100		3686	100		4192	100	
6	2728	93	0	3138	93	0	3455	94	0	3910	94	0
12	2519	87	1	2913	87	1	3209	88	1	3650	88	1
24	2183	76	1	2557	77	1	2813	78	1	3166	77	1
36	1924	68	1	2248	68	1	2474	69	1	2804	69	1
48	1669	59	1	2005	61	1	2172	61	1	98	-	-
60	1459	52	1	1775	54	1	36	-	-	-	-	-
72	1294	46	1	31	-	-	-	-	-	-	-	-
84	15	-	-	-	-	-	-	-	-	-	-	-

Year Interval (month)	2009			2010			2011		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	4519	100		4845	100		4828	100	
6	4220	94	0	4406	92	0	2430	93	0
12	3929	88	0	4113	86	0	159	-	-
24	3434	78	1	73	-	-	-	-	-
36	85	-	-	-	-	-	-	-	-

Figure 11.3.1(a): Unadjusted technique survival by year of entry, 2002-2011

There was no apparent difference in the unadjusted technique survival by years of starting dialysis for the years 2002 to 2011.

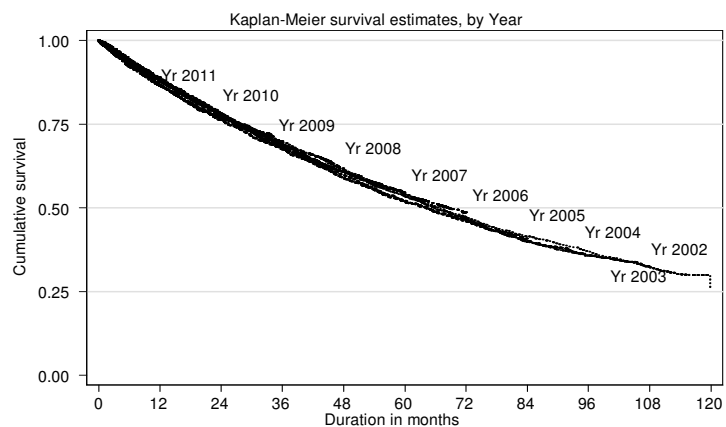


Table 11.3.1(b): Unadjusted technique survival by year of entry (censored for death & transplant), 2002-2011

Year Interval (month)	2002			2003			2004		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	2153	100		2338	100		2744	100	
6	2018	99	0	2170	100	0	2568	100	0
12	1885	99	0	2004	100	0	2371	99	0
24	1615	98	0	1755	99	0	2069	99	0
36	1429	98	0	1532	99	0	1788	99	0
48	1257	98	0	1344	98	0	1565	98	0
60	1100	97	0	1181	98	0	1363	97	0
72	960	97	0	1030	98	0	1198	96	0
84	840	96	1	875	97	0	1040	96	1
96	745	96	1	781	97	0	2	-	-
108	644	95	1	8	-	-	-	-	-
120	2	-	-	-	-	-	-	-	-

Year Interval (month)	2005			2006			2007			2008		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	2957	100		3417	100		3686	100		4192	100	
6	2728	100	0	3138	100	0	3455	100	0	3910	100	0
12	2519	99	0	2913	99	0	3209	99	0	3650	99	0
24	2183	99	0	2557	99	0	2813	99	0	3166	99	0
36	1924	99	0	2248	98	0	2474	98	0	2804	98	0
48	1669	98	0	2005	98	0	2172	97	0	98	-	-
60	1459	98	0	1775	97	0	36	-	-	-	-	-
72	1294	97	0	31	-	-	-	-	-	-	-	-
84	15	-	-	-	-	-	-	-	-	-	-	-

Year Interval (month)	2009			2010			2011		
	n	% Survival	SE	n	% Survival	SE	n	% Survival	SE
0	4519	100		4845	100		4828	100	
6	4220	100	0	4406	99	0	2430	99	0
12	3929	99	0	4113	99	0	159	-	-
24	3434	99	0	73	-	-	-	-	-
36	85	-	-	-	-	-	-	-	-

Figure 11.3.1(b): Unadjusted technique survival by year of entry (censored for death & transplant), 2002-2011

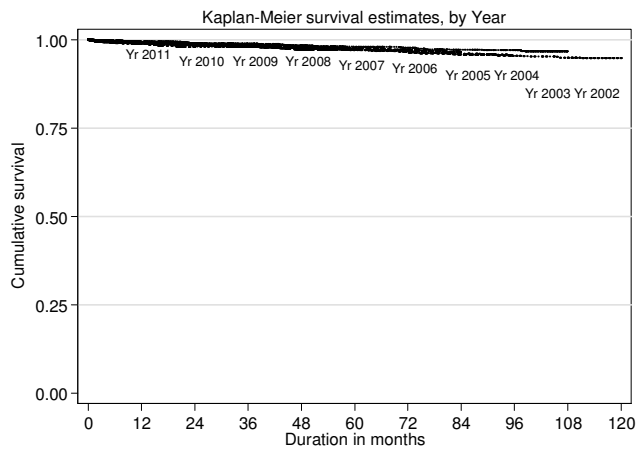


Table 11.3.2(a): Unadjusted technique survival by age, 2002-2011

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	130	100		1057	100		2305	100		4006	100	
6	117	94	2	963	96	1	2057	96	0	3586	95	0
12	106	90	3	864	93	1	1811	93	1	3142	91	0
24	82	81	4	676	87	1	1414	89	1	2443	85	1
36	59	78	4	529	83	1	1126	86	1	1934	80	1
48	38	72	5	424	81	1	867	82	1	1437	76	1
60	27	69	5	327	80	1	641	78	1	1102	71	1
72	20	66	6	237	77	2	463	74	1	773	67	1
84	15	62	7	164	73	2	338	72	1	506	61	1
96	8	62	7	99	73	2	215	69	2	297	58	1
108	4	62	7	44	70	3	102	66	2	143	54	2
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	8919	100		10492	100		8770	100	
6	7883	95	0	9089	93	0	7338	90	0
12	6834	90	0	7751	87	0	6088	82	0
24	5158	81	0	5583	76	0	4238	68	1
36	3868	73	1	3932	66	1	2777	55	1
48	2764	66	1	2716	57	1	1769	44	1
60	1944	59	1	1783	48	1	1077	35	1
72	1254	53	1	1123	41	1	615	28	1
84	768	46	1	646	35	1	328	21	1
96	435	42	1	330	29	1	147	16	1
108	197	37	1	109	23	1	47	13	1
120	2	-	-	1	-	-	1	-	-

The unadjusted technique survival was better in the younger age groups than the older age group. At 9 years unadjusted technique survival in the age group of <14, 15-24, 25-34, 35-44, 44-54, 55-64 and > 65 years old were 62%, 70%, 66%, 54 %, 37%, 23% and 13% respectively.

Table 11.3.2(b): Unadjusted technique survival by age (censored for death & transplant), 2002-2011

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	130	100		1057	100		2305	100		4006	100	
6	117	98	1	963	99	0	2057	99	0	3586	100	0
12	106	95	2	864	98	0	1811	99	0	3142	99	0
24	82	94	2	676	97	1	1414	98	0	2443	99	0
36	59	94	2	529	97	1	1126	98	0	1934	99	0
48	38	94	2	424	96	1	867	98	0	1437	99	0
60	27	94	2	327	96	1	641	97	0	1102	98	0
72	20	94	2	237	96	1	463	97	1	773	98	0
84	15	94	2	164	96	1	338	96	1	506	97	1
96	8	94	2	99	96	1	215	96	1	297	96	1
108	4	94	2	44	96	1	102	96	1	143	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	8919	100		10492	100		8770	100	
6	7883	100	0	9089	100	0	7338	99	0
12	6834	99	0	7751	99	0	6088	99	0
24	5158	99	0	5583	99	0	4238	99	0
36	3868	98	0	3932	98	0	2777	98	0
48	2764	98	0	2716	98	0	1769	97	0
60	1944	98	0	1783	97	0	1077	97	0
72	1254	97	0	1123	96	0	615	96	0
84	768	97	0	646	95	0	328	96	1
96	435	96	0	330	95	1	147	96	1
108	197	96	0	109	95	1	47	95	1
120	2	-	-	1	-	-	1	-	-

Figure 11.3.2(a): Unadjusted technique survival by age, 2002-2011

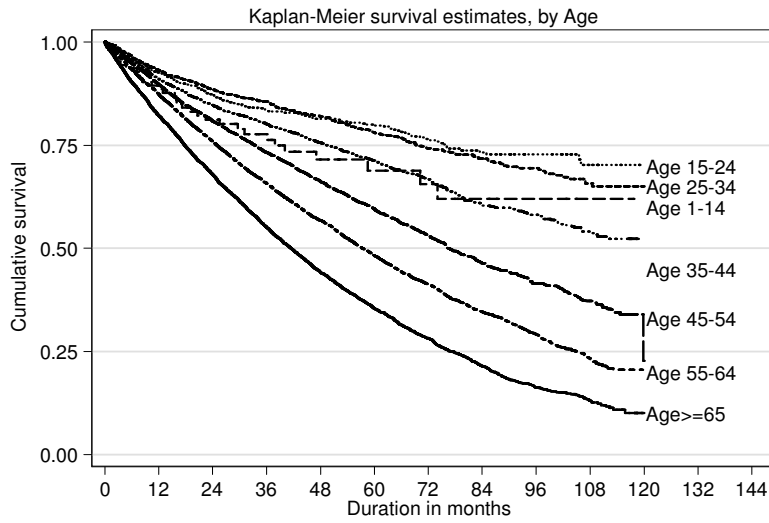
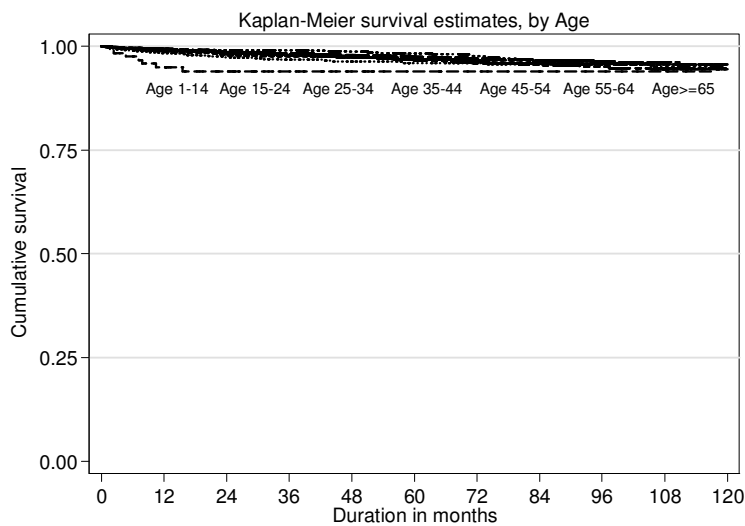


Figure 11.3.2(b): Unadjusted technique survival by age (censored for death & transplant), 2002-2011

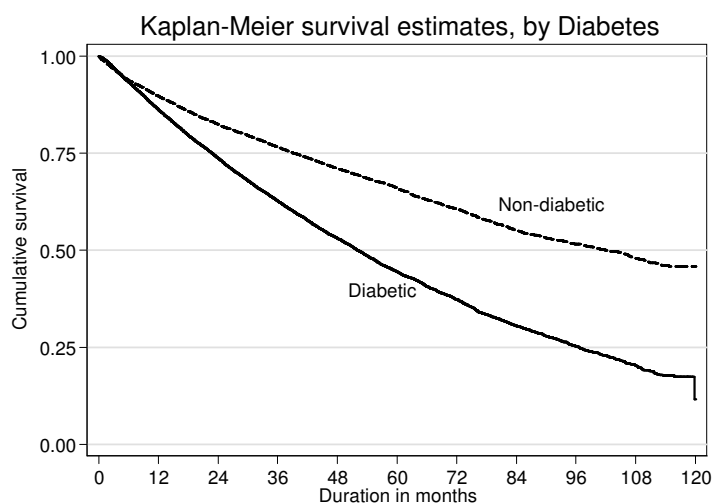


There was no apparent difference in the unadjusted technique survival by age once censored for death & transplantation.

Table 11.3.3(a): Unadjusted technique survival by diabetes status, 2002-2011

Diabetes status Interval (month)	Non-Diabetic			Diabetic		
	n	% Survival	SE	n	% Survival	SE
0	15111	100		20568	100	
6	13130	94	0	17900	93	0
12	11406	90	0	15186	86	0
24	8771	82	0	10815	74	0
36	6738	77	0	7458	63	0
48	5009	71	0	4998	53	0
60	3674	66	0	3201	44	0
72	2572	61	1	1908	37	1
84	1682	55	1	1072	30	1
96	988	52	1	538	25	1
108	444	48	1	200	20	1
120	1	-	-	1	-	-

Figure 11.3.3(a): Unadjusted technique survival by diabetes status, 2002-2011



Unadjusted technique survival in non-diabetics at 1, 5, and 9 years were 90%, 66% and 48% respectively. Unadjusted technique survival for diabetics was worse than non-diabetics; 86% at 1 year, 44% at 5 years and only 20% at 9 years.

However, there was no apparent difference in the unadjusted technique survival by diabetes status when censored for death & transplantation.

Table 11.3.3(b): Unadjusted technique survival by diabetes status (censored for death & transplant), 2002-2011

Diabetes status Interval (month)	Non-Diabetic			Diabetic		
	n	% Survival	SE	n	% Survival	SE
0	15111	100		20568	100	
6	13130	99	0	17900	100	0
12	11406	99	0	15186	99	0
24	8771	99	0	10815	99	0
36	6738	98	0	7458	98	0
48	5009	98	0	4998	98	0
60	3674	97	0	3201	97	0
72	2572	97	0	1908	96	0
84	1682	96	0	1072	96	0
96	988	96	0	538	96	0
108	444	95	0	200	95	1
120	1	-	-	1	-	-

Figure 11.3.3(b): Unadjusted technique survival by diabetes status (censored for death & transplant), 2002-2011

