

## **CHAPTER 3**

# **DEATH AND SURVIVAL ON DIALYSIS**

Wong Hin Seng  
Ong Loke Meng  
Wan Shaariah Md Yusuf

3.1: Death On Dialysis

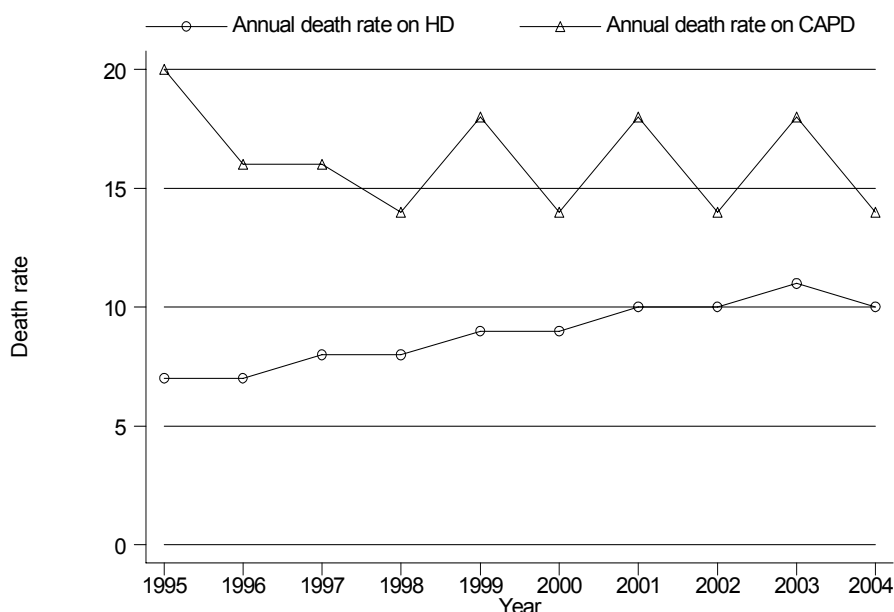
The number of death in dialysis patients for 2004 was 1115 (annual death rate of 10%). Nine hundred and sixty four died on haemodialysis (annual rate of 10%) while 151 died on continuous ambulatory peritoneal dialysis (annual death rate of 14%).

Table 3.1.1: Deaths on Dialysis 1995 – 2004

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
No. of dialysis patients at risk	1989	2576	3307	4114	5035	6113	7260	8455	9711	10948
Dialysis deaths	178	222	315	373	486	583	801	908	1128	1115
Dialysis death rate %	9	9	10	9	10	10	11	11	12	10
No. of HD patients at risk	1703	2193	2836	3594	4469	5487	6548	7614	8727	9870
HD deaths	120	160	241	299	386	493	671	793	950	964
HD death rate %	7	7	8	8	9	9	10	10	11	10
No. of CAPD patients at risk	286	383	471	520	567	626	712	841	984	1078
CAPD deaths	58	62	74	74	100	90	130	115	178	151
CAPD death rate %	20	16	16	14	18	14	18	14	18	14

Figure 3.1.1 shows the annual death rate on dialysis from 1995 till 2004. The annual death rate for those on CAPD in 2004 remained relatively unchanged over the last 10 years while there was an upward trend in the annual death rate for those on haemodialysis. The annual death rate for those on haemodialysis has increased by 43% over the last 10 years (from 7% in 1995 to 10% in 2004). This has narrowed the difference in the annual death rate between the two modalities of dialysis (from 13% in 1995 to 4% in 2004). The reasons for the marked change in the annual death rate for those treated with haemodialysis remained unclear. This may be partly contributed by changes in demographics of patients starting dialysis in recent years with a higher proportion of diabetics (26% in 1995 to 51% in 2003) and elderly patients (in 1995, 34% were aged more than 55 years compared with 50% in 2003).

Figure 3.1.1: Death Rates on Dialysis 1995 – 2004



The causes of death on dialysis are showed in Table 3.1.2. Cardiovascular disease remained the main cause of death in 2003; accounting for 26%. This has remained unchanged over the last 10 years. Death at home accounted for another 26% and a majority of these deaths were probably secondary to cardiovascular events. Death due to sepsis has gradually decreased over the last 10 years but still remained an important cause of death (13%).

**Table 3.1.2:** Causes of Death on Dialysis 1995 - 2004

Year	1995		1996		1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%
Cardiovascular	45	25	50	23	85	27	110	29	129	27
Died at home	23	13	40	18	52	17	72	19	107	22
Sepsis	35	20	45	20	53	17	66	18	84	17
CAPD peritonitis	0	0	1	0	5	2	2	1	11	2
GIT bleed	2	1	3	1	4	1	7	2	18	4
Cancer	5	3	2	1	9	3	8	2	6	1
Liver disease	1	1	2	1	3	1	5	1	7	1
Others	29	16	30	14	31	10	52	14	73	15
Unknown	38	21	49	22	73	23	51	14	51	10
TOTAL	178	100	222	100	315	100	373	100	486	100

Year	2000		2001		2002		2003		2004	
	No.	%	No.	%	No.	%	No.	%	No.	%
Cardiovascular	177	30	209	26	304	33	320	28	290	26
Died at home	133	23	227	28	208	23	282	25	288	26
Sepsis	85	15	128	16	138	15	180	16	145	13
CAPD peritonitis	21	4	29	4	16	2	11	1	13	1
GIT bleed	18	3	18	2	23	3	28	2	23	2
Cancer	8	1	18	2	18	2	26	2	19	2
Liver disease	13	2	11	1	16	2	23	2	20	2
Others	84	14	102	13	121	13	182	16	279	25
Unknown	44	8	59	7	64	7	76	7	38	3
TOTAL	583	100	801	100	908	100	1128	100	1115	100

## 3.2: Patient Survival On Dialysis

### 3.2.1 Patient survival by type of dialysis modality

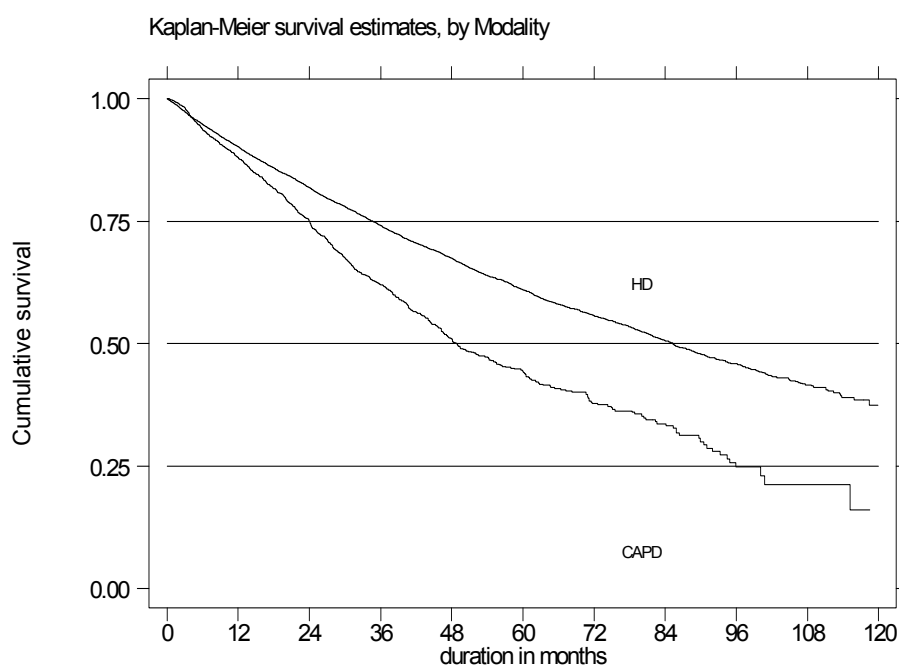
Patient survival by dialysis modalities is shown in Table 3.2.1 and Figure 3.2.1. The overall unadjusted 5 years and 10 years patient survival on dialysis were 59% and 35% respectively. Patient survival was superior in those on haemodialysis compared to those on CAPD and this survival difference widens as the duration on dialysis increases. At 5 years the patient survival on haemodialysis was 61% compared 44% in those on CAPD.

**Table 3.2.1:** Unadjusted patient survival by Dialysis modality, 1995-2004

Dialysis modality Interval (months)	CAPD			HD			All Dialysis		
	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE
6	2227	94	0	13206	95	0	15433	95	0
12	1853	88	1	11250	90	0	13103	90	0
24	1144	75	1	8199	82	0	9340	81	0
36	673	62	1	5846	74	0	6519	72	0
48	380	51	1	4112	67	0	4492	65	0
60	236	44	2	2803	61	1	3039	59	1
72	140	38	2	1834	56	1	1973	54	1
84	79	34	2	1103	51	1	1181	49	1
96	30	25	3	577	46	1	605	44	1
108	11	21	3	241	42	1	251	39	1
120	-	-	-	20	37	2	20	35	2

\* No. = Number at risk      SE=standard error

**Figure 3.2.1:** Unadjusted patient survival by Dialysis modality, 1995-2004



### 3.2.2 Patient survival by year of starting dialysis

Table 3.2.2 shows the unadjusted patient survival by year of entry. The unadjusted 6 months survival of those starting dialysis in 2004 was 95%. Despite a progressive increase in the number of older people starting dialysis in recent years, the unadjusted patient survival remained constant over the last 10 years with a 1-year survival of 90%.

**Table 3.2.2:** Unadjusted patient survival by year of entry, 1995-2004

Year Interval (months)	1995			1996			1997			1998		
	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE
6	685	94	1	934	95	1	1130	94	1	1240	95	1
12	643	91	1	869	91	1	1059	90	1	1173	91	1
24	548	83	1	768	84	1	950	82	1	1035	83	1
36	481	75	2	657	74	1	836	74	1	911	75	1
48	431	69	2	568	67	2	736	67	1	800	68	1
60	381	63	2	498	60	2	646	61	1	709	61	1
72	347	58	2	430	54	2	560	55	2	638	56	1
84	315	54	2	379	49	2	488	49	2	-	-	-
96	278	48	2	328	43	2	-	-	-	-	-	-
108	251	45	2	-	-	-	-	-	-	-	-	-
120	20	40	2	-	-	-	-	-	-	-	-	-

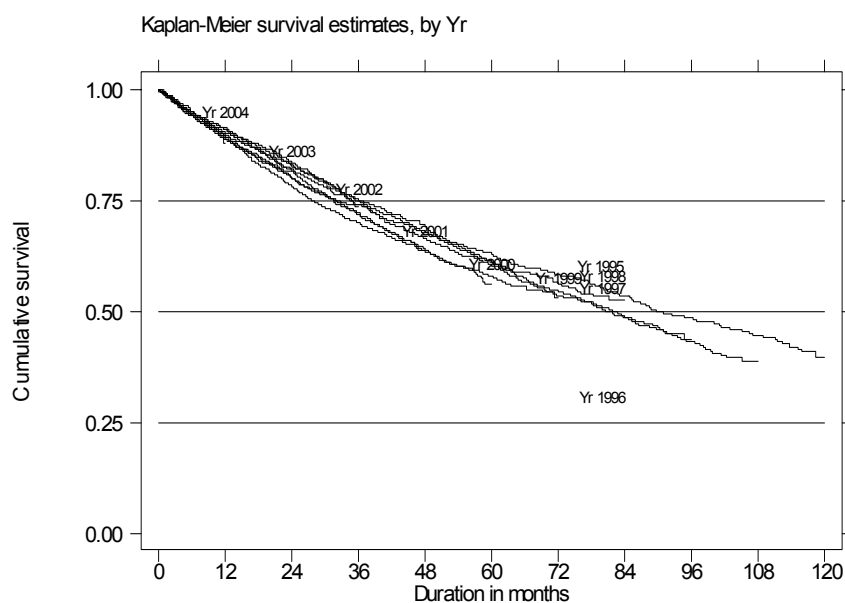
Year Interval (months)	1999			2000			2001			2002		
	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE
6	1507	95	1	1801	95	1	2052	94	1	2320	95	0
12	1411	90	1	1661	90	1	1867	89	1	2147	90	1
24	1216	82	1	1412	80	1	1585	78	1	1824	80	1
36	1041	72	1	1222	72	1	1371	70	1	-	-	-
48	900	64	1	1061	64	1	-	-	-	-	-	-
60	805	58	1	-	-	-	-	-	-	-	-	-

Year Interval (months)	2003			2004		
	No.	% Survival	SE	No.	% Survival	SE
6	2463	94	0	1309	95	1
12	2273	89	1	-	-	-

\* No. = Number at risk      SE=standard error

**Figure 3.2.2:** Unadjusted patient survival by year of entry, 1995-2004



**3.2.3 Patient survival by age at starting dialysis**

The unadjusted survival for age groups  $\leq 14$  years, 15-24 years and 25-34 years at the start of dialysis were similar, with a 5-year survival of more than 80% as shown in Table 3.2.3. Beyond the age of 34 years old the unadjusted survival progressively worsened as the age on starting dialysis increases. The 9-year unadjusted survival for those who started dialysis at the age of less than 15 years was 76 % compared with 13% in those more than 64 years of age at the time of initiation of dialysis.

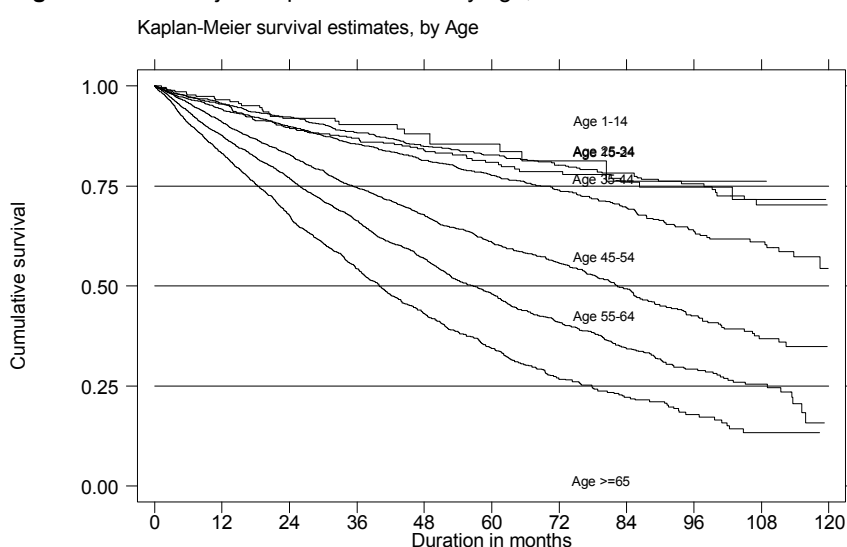
**Table 3.2.3:** Unadjusted patient survival by age, 1995-2004

Age group (years) Interval (months)	$\leq 14$			15-24			25-34			35-44		
	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE
6	244	98	1	730	97	1	1432	97	0	2397	97	0
12	218	96	1	614	95	1	1274	95	1	2080	94	0
24	160	92	2	424	89	1	978	92	1	1616	90	1
36	105	90	2	307	87	1	748	88	1	1248	86	1
48	72	88	3	223	84	2	575	85	1	942	81	1
60	45	86	3	158	81	2	436	83	1	685	78	1
72	24	81	4	109	79	2	314	80	1	478	74	1
84	12	76	6	73	76	3	211	78	2	306	70	1
96	4	76	6	37	75	3	122	76	2	175	64	2
108	2	76	6	14	72	4	53	70	3	85	61	2
120	-	-	-	2	72	4	3	70	3	12	54	4

Age group (years) Interval (months)	45-54			55-64			$\geq 65$		
	No.	% Survival	SE	No.	% Survival	SE	No.	% Survival	SE
6	3923	96	0	4063	94	0	2646	91	1
12	3351	91	0	3413	88	1	2156	83	1
24	2442	83	1	2377	77	1	1346	68	1
36	1724	75	1	1579	66	1	811	54	1
48	1207	68	1	1021	57	1	461	43	1
60	809	61	1	646	48	1	264	34	1
72	521	56	1	387	41	1	147	27	1
84	301	49	1	214	34	1	70	22	2
96	149	42	2	95	29	1	30	18	2
108	54	37	2	39	25	2	10	13	2
120	4	35	2	3	16	4	-	-	-

\* No. = Number at risk SE=standard error

**Figure 3.2.3:** Unadjusted patient survival by age, 1995-2004

### 3.2.4 Patient survival by Diabetic status

The unadjusted patient survival among diabetic and non diabetic patients are showed in Table 3.2.4 and Figure 3.2.4. The presence of diabetes mellitus has major impact on patient survival. The difference in the unadjusted patient survival appeared as early as 6 months after initiation of dialysis and increased with the time on dialysis. The 10 years unadjusted patient survival among diabetics and non diabetics were 48% and 14% respectively.

**Table 3.2.4:** Unadjusted patient survival by Diabetes status, 1995-2004

Diabetes status Interval (months)	Non-Diabetic			Diabetic		
	No.	% Survival	SE	No.	% Survival	SE
6	8715	96	0	6718	93	0
12	7629	93	0	5474	86	0
24	5789	87	0	3551	73	1
36	4325	82	0	2194	60	1
48	3150	76	1	1344	50	1
60	2250	71	1	789	41	1
72	1520	67	1	453	34	1
84	972	62	1	209	28	1
96	524	58	1	82	21	1
108	219	53	1	33	18	1
120	18	48	2	3	14	2

\* No. = Number at risk      SE=standard error

**Figure 3.2.4:** Unadjusted patient survival by Diabetes status, 1995-2004

