

CHAPTER 5

Paediatric Renal Replacement Therapy

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SECTION A: RRT PROVISION FOR PAEDIATRIC PATIENTS

The paediatric RRT population in this report is defined as patients less than 20 years of age. This report describes the trend of paediatric RRT over the last 10 years.

The number of new patients commencing on dialysis continued to show an increasing trend from 41 in 1997 to 88 in 2006. The dialysis acceptance rate doubled from 4 per million age related population (pmarp) in 1997 to 8 pmarp in 2006 but had plateau at around 7-8 pmarp over the last 5 years. There has been only a modest increase in the number of new transplants in 2006 and the transplant rate remained low at 2 pmarp. The total renal replacement treatment rate was 8 pmarp.

The number of prevalent dialysis patients continued to rise and by the end of 2006 there were a total of 468 children under 20 on dialysis. The equivalent dialysis prevalence rate increased from 13 pmarp in 1997 to 42 pmarp in 2006. The number of patients with functioning transplants has doubled from 71 in 1997 to 139 in 2006 giving a prevalence rate of 7 and 12 pmarp respectively.

Table 5.01: Stock and Flow of Paediatric Renal Replacement Therapy 1997-2006

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
New HD patients	21	21	23	12	24	28	33	39	34	46
New CAPD patients	20	28	29	37	39	54	39	41	47	42
New Transplants	14	6	11	14	8	11	11	9	17	19
HD deaths	3	3	2	4	1	11	6	10	9	7
CAPD deaths	3	7	2	3	8	8	9	5	9	15
Transplant deaths	0	0	0	1	0	1	1	0	1	1
On HD at 31st Dec	70	90	106	120	144	162	186	218	241	279
On CAPD at 31st Dec	62	73	91	109	123	152	163	176	192	189
Functioning transplant at 31st December	71	74	83	90	94	102	107	114	125	139

Figure 5.01a: Incident cases of RRT by modality in children under 20 years old, 1997-2006

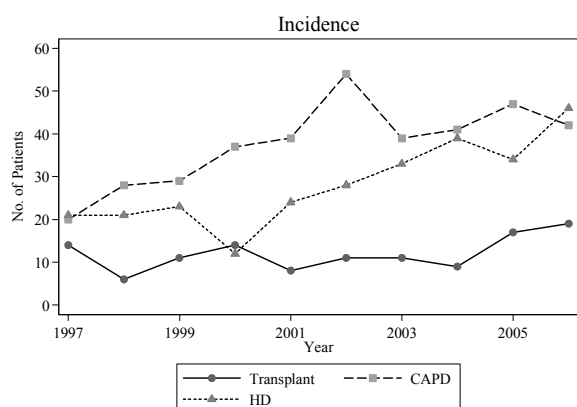


Figure 5.01b: Prevalent cases of RRT by modality in children under 20 years old, 1997-2006

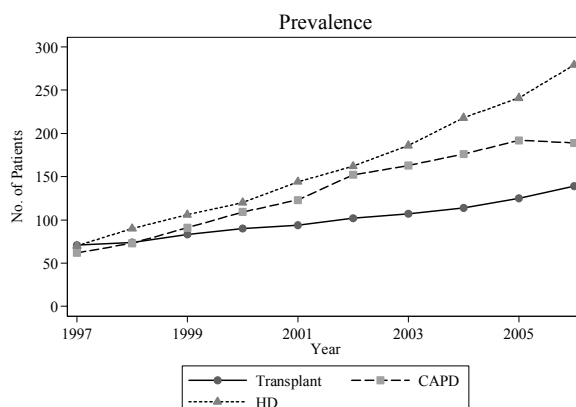
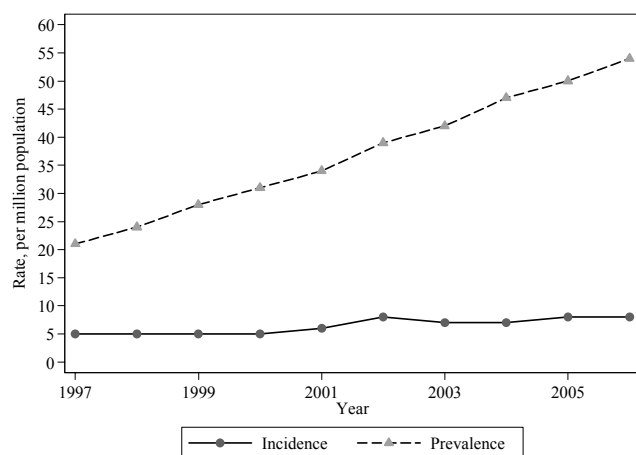


Table 5.02: Paediatric Dialysis and Transplant Rates per million age-group population 1997-2006

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Incidence Rate										
New HD	2	2	2	1	2	3	3	4	3	4
New CAPD	2	3	3	4	4	5	4	4	4	4
New Transplant	1	1	1	1	1	1	1	1	2	2
All RRT	5	5	5	5	6	8	7	7	8	8
Prevalence Rate at 31st December										
On HD	7	9	11	12	14	15	17	20	22	25
On CAPD	6	7	9	11	12	14	15	16	17	17
Functioning Graft	7	8	8	9	9	10	10	10	11	12
All RRT	20	24	28	32	35	39	42	46	50	54

Figure 5.02: Incidence and prevalence rate per million age related population years old on RRT, 1997-2006



SECTION B: DISTRIBUTION OF PAEDIATRIC DIALYSIS

Table 5.03 shows that the treatment rate is consistently higher for states in the west coast of West Malaysia compared to the east coast or East Malaysia.

Table 5.03a: Dialysis Treatment Rate by State, per million state age group population, 1997-2006

State	1997-2001	2002-2006
Melaka	7	15
Pulau Pinang	6	15
Negeri Sembilan	10	11
Johor Takzim	8	10
Perak Darul Redzuan	3	10
Terengganu Darul Iman	7	9
Kedah & Perlis	8	8
Kelantan Darul Naim	2	8
Pahang Darul Makmur	6	8
Selangor & W. Persekutuan	8	8
Sarawak	5	7
Sabah	2	6

Table 5.03b: New Dialysis Patients by State, 1997-2006

State	1997-2001	2002-2006
Selangor & W. Persekutuan	80	95
Johor Darul Takzim	45	60
Perak Darul Redzuan	15	47
Pulau Pinang	15	40
Sabah	13	38
Kedah & Perlis	34	36
Sarawak	21	36
Kelantan Darul Naim	9	31
Pahang Darul Makmur	18	25
Negeri Melaka	9	23
Negeri Sembilan	18	22
Terengganu Darul Iman	17	21

Figure 5.04 shows persistent trend of male predominance amongst the new dialysis and transplant patients. This may be consistent with higher incidence of ESRD among males. However this trend appears more marked among the transplant patients

Figure 5.04: Number of New Dialysis and Transplant Patients by gender 1997-2006

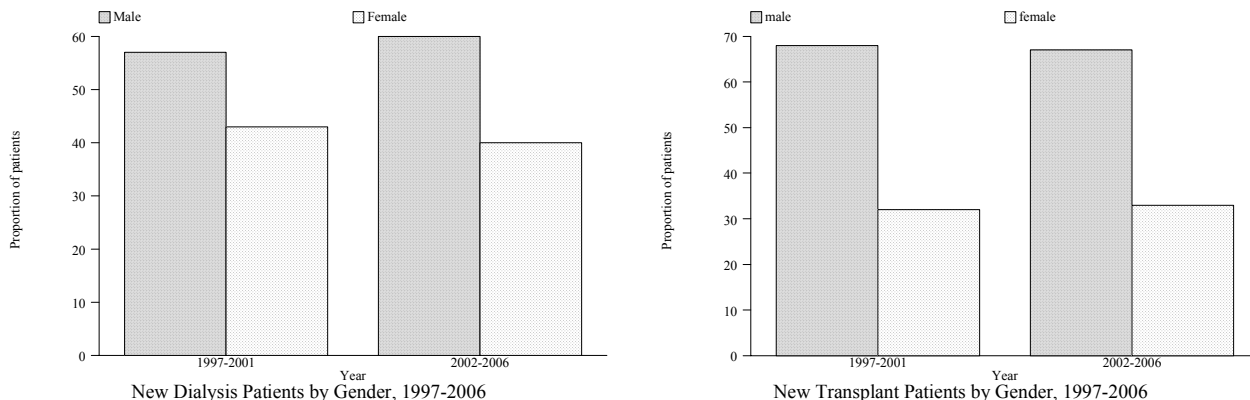


Figure 5.05 shows that except for the age group 15-19 years old which still showed an increasing trend; the treatment rate has begun to level off for all the other age groups. The number of 0-4 year olds provided chronic dialysis treatment remained very low at around 1 pmarp.

Figure 5.05: Dialysis and Transplant Treatment Rate by Age group 1997-2006

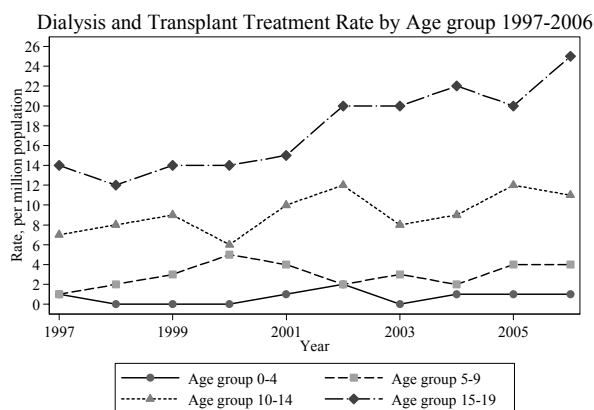


Figure 5.06 shows that CAPD was the preferred mode of initial dialysis modality; however over the last 2 years a significant proportion of children were also started on automated PD as the first modality of dialysis.

Figure 5.06: New Dialysis by treatment modality 1997-2006

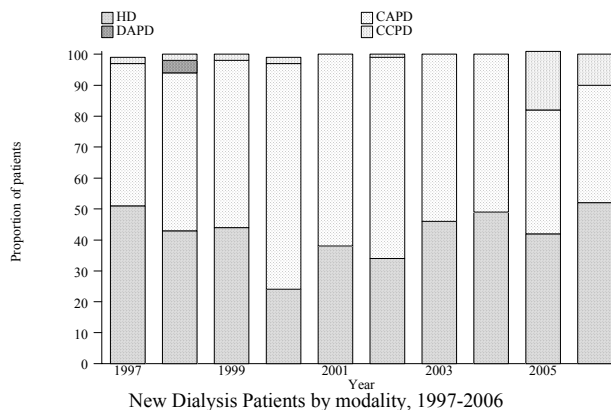
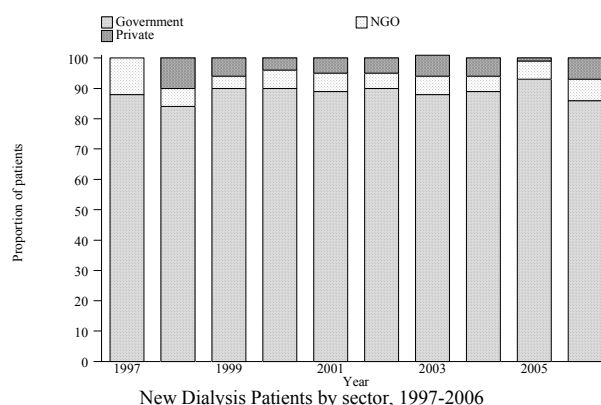


Figure 5.07 shows that up to 90% of children less than 20 years of age received their dialysis treatment from government centres and hence were government funded.

Figure 5.07: New Dialysis by sector 1997-2006



SECTION C: PRIMARY RENAL DISEASE AND TYPES OF RENAL TRANSPLANTATION

Figure 5.08 shows that glomerulonephritis was the commonest known cause of ESRD accounting for 24% of patients. FSGS on its own accounted for 10% of ESRD. The number of children presenting with ESRD of unknown aetiology was still high at 39%.

Table 5.08: Primary renal disease by sex, 1997-2006

Primary Renal Disease	Male		Female		All	
	N	%	N	%	N	%
Glomerulonephritis	99	25	64	23	163	24
FSGS	38	10	27	10	65	10
Refux nephropathy	23	6	7	3	30	4
SLE	13	3	39	14	52	8
Obstructive uropathy	33	8	9	3	42	6
Renal dysplasia	12	3	6	2	18	3
Others	9	2	10	4	19	3
Hereditary nephritis	11	3	1	0	12	2
Cystic kidney disease	4	1	4	1	8	1
Drug induced nephropathy	0	0	1	0	1	0
Metabolic	3	1	1	0	4	1
Unknown	154	39	108	39	262	39
Total	399	100	277	100	676	100

Table 5.09 shows that living related renal transplantation was still the commonest type of transplantation done accounting for 53% of the transplant done among children under 20 years of age. The second commonest source was cadaveric transplant; up to 24%. Another quarter (23%) of renal transplantation was done overseas under the commercial cadaver and living donor programs.

Table 5.09: Types of Renal Transplant 1997-2006

Year	1997-2001		2002-2006	
	No.	%	No.	%
Commercial Cadaver	8	15	17	20
Commercial Living donor	3	6	2	3
Living related donor	29	55	42	53
Cadaver	13	25	19	24
Living emotionally related	0	0	0	0
TOTAL	53	100	67	100

SECTION D: SURVIVAL ANALYSIS

Table and figure 5.10 show that renal transplantation has the best patient survival; 98%, 94% and 92% at 1 year, 5 years and 10 years respectively. Patient survival for HD was 95% at 1 year, 84% at 5 years and 75% at 10 years. CAPD patients showed the worst survival; 95% at 1 year and 79% at 5 years. There were too few CAPD patients at 10 years for meaningful analysis. Figure 5.10 shows that patient survival for CAPD and HD were quite comparable up till 3-5 years into dialysis.

Table 5.10: Patient Survival by Modality of RRT, 1997-2006

Modality Interval (years)	Transplant			CAPD			HD		
	No.	% survival	SE	No.	% survival	SE	No.	% survival	SE
1	91	98	1	306	95	1	272	95	1
5	41	94	3	64	79	3	81	84	2
10	2	92	4	-	-	-	2	75	5

* No. = Number at risk SE = Standard Error

Figure 5.10: Patient Survival by Modality of RRT, 1997-2006

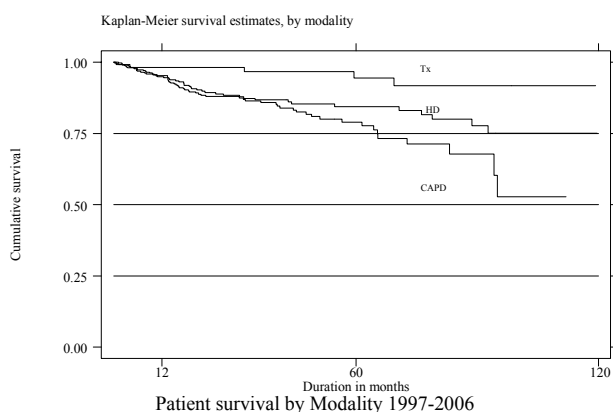


Figure 5.11: Dialysis Technique Survival by Modality, 1997-2006

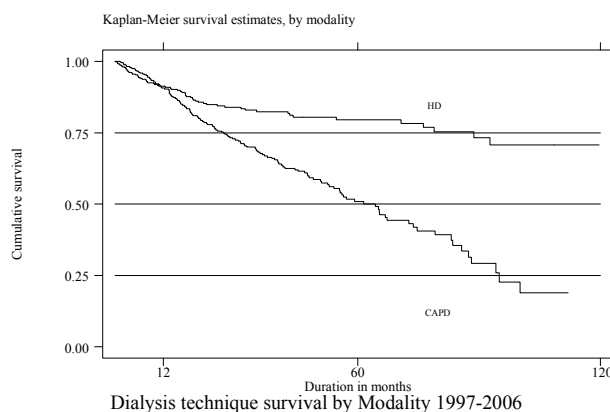


Table and figure 5.11 show comparable technique survival for both HD and CAPD in the first 2 years of dialysis. After that CAPD showed a progressive deterioration in technique survival compared to HD.

Table 5.11: Dialysis Technique Survival by Modality, 1997-2006

Modality Interval (years)	CAPD			HD		
	No.	% survival	SE	No.	% survival	SE
1	306	91	2	272	91	2
5	64	51	3	81	80	3
10	-	-	-	2	71	5

* No. = Number at risk SE = Standard Error

Table and Figure 5.12 below show that the graft survival was 89% at 1 year, 81% at 5 years and 66% at 10 years.

Table 5.12: Transplant Graft Survival 1997-2006

Interval (years)	No.	% survival	SE
1	91	89	3
5	41	81	4
10	2	66	7

* No. = Number at risk SE = Standard Error

Figure 5.12: Transplant Graft Survival 1997-2006

