

CHAPTER 3

DEATHS

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INTRODUCTION

AUSTRALIA

DIALYSIS DEPENDENT

The total number of deaths was 1,452 (15.4 deaths per 100 patient years at risk) in 2007 among dialysis dependent patients.

For those treated with peritoneal dialysis, 294 deaths occurred (14.3 deaths per 100 patient years at risk) and for haemodialysis there were 1158 deaths (15.7 deaths per 100 patient years at risk) (Figure 3.9).

The death rate for each State/Territory per 100 patient years at risk is shown in Figures 3.1 and 3.2. These figures are crude (not adjusted for age or comorbidity). It can be seen death rates have been constant for several years. It should be noted that direct comparisons between haemodialysis and peritoneal dialysis are subject to considerable confounding by the difference in comorbidity distribution. This comparison is explored in a forthcoming manuscript in *J Am Soc Nephrol* (see Publications section).

FUNCTIONING TRANSPLANT

There were 151 deaths (2.2 deaths per 100 patient years at risk) of patients with a functioning transplant.

The deceased donor recipient death rate was 126 deaths (2.7 per 100 patient years) and the live donor recipient death rate 25 deaths (1.1 per 100 patient years).

Figure 3.3 shows the age specific mortality rates for patients treated with dialysis or transplantation relative to the Australian population rates for 2007.

The death rate in relation to age is shown in Figure 3.10.

NEW ZEALAND

DIALYSIS DEPENDENT

There were 295 deaths (14.5 deaths per 100 patient years at risk) in 2007.

For those treated with peritoneal dialysis, 120 deaths occurred (16.0 deaths per 100 patient years at risk) and for haemodialysis there were 175 deaths (13.7 deaths per 100 patient years at risk) shown in Figure 3.11.

FUNCTIONING TRANSPLANT

There were 44 deaths (3.5 deaths per 100 patient years at risk) in 2007.

The mortality rate for recipients of deceased donor kidneys was 36 deaths (4.5 per 100 patient years) and live donor recipients eight deaths (1.7 per 100 patient years) shown in Figure 3.12.

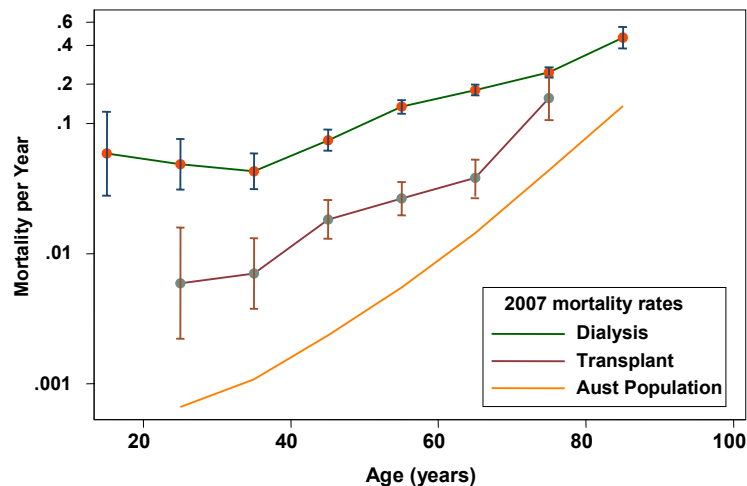
See Appendix III at the Website (www.anzdata.org.au/ANZDATA/AnzdataReport/download.htm)

Figure 3.1

Death Rates by States 1998 - 2007 All Dialysis Patients (per 100 patient years)										
Year	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	Aust	NZ
1998	19.3	16.9	15.3	15.8	25.9	15.7	15.8	13.6	16.7	16.6
1999	20.7	16.0	14.7	14.1	23.9	15.2	17.6	17.3	16.5	16.4
2000	16.9	16.5	13.5	14.0	14.7	14.3	20.0	16.3	15.7	19.2
2001	18.6	15.3	14.2	14.3	23.4	14.3	15.0	21.9	16.2	18.6
2002	17.4	15.1	11.4	13.6	12.0	12.3	14.8	16.6	14.9	15.2
2003	17.0	14.0	9.0	14.9	20.7	14.1	15.1	15.9	15.0	15.8
2004	16.3	16.1	11.6	15.0	18.1	16.2	15.2	12.4	15.4	17.3
2005	14.7	14.3	12.3	13.4	16.9	13.6	14.4	17.4	14.4	16.5
2006	18.0	13.7	11.2	13.2	13.9	13.9	15.9	17.4	14.8	17.3
2007	16.1	14.7	14.6	15.4	18.6	14.5	10.7	18.1	15.4	14.5

Figure 3.2

Death Rates by States Dialysis Modality and Age Groups 2007 (per 100 patient years)											
Age Group	Treatment	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	Aust	NZ
45-64 years	All Dx Patients	10.6	10.8	11.5	11.0	14.5	10.4	9.4	13.3	11.1	12.7
	PD	10.4	11.9	8.4	10.2	11.2	5.9	11.5	11.9	10.8	10.9
	HD	10.7	10.5	12.1	11.2	15.7	11.9	9.2	13.7	11.2	13.7
65-84 years	All Dx Patients	21.7	19.4	22.7	20.4	26.3	18.8	21.8	24.9	20.8	21.8
	PD	15.0	19.6	4.6	25.0	24.4	18.2	47.0	16.3	19.2	25.5
	HD	23.8	19.4	27.6	19.6	27.1	19.0	19.7	27.7	21.2	18.9

Figure 3.3
Age Specific Mortality Rates for Patients Treated with Dialysis or Transplantation Relative to the Australian Population 2007


Aust 2007 population rates from ABS



TRENDS IN MORTALITY DURING THE FIRST AND SECOND YEAR OF DIALYSIS

Trends in mortality during the first and second year of dialysis has been of particular interest internationally.

Figures 3.4 and 3.5 show the Australian and New Zealand experience by age groups over the past five years.

Overall, there are no clear trends to be seen (in contrast to US data).

Figure 3.4

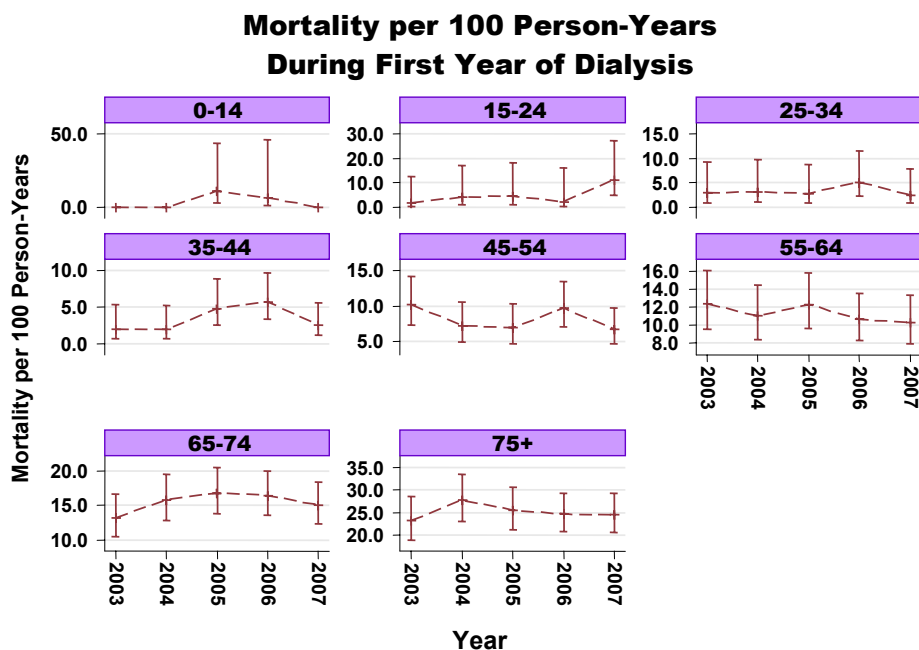
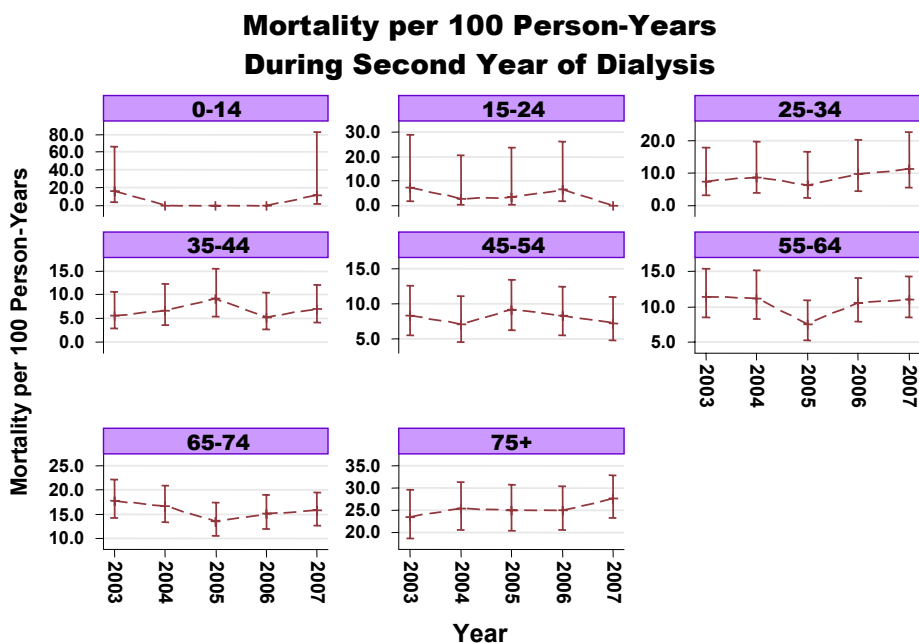


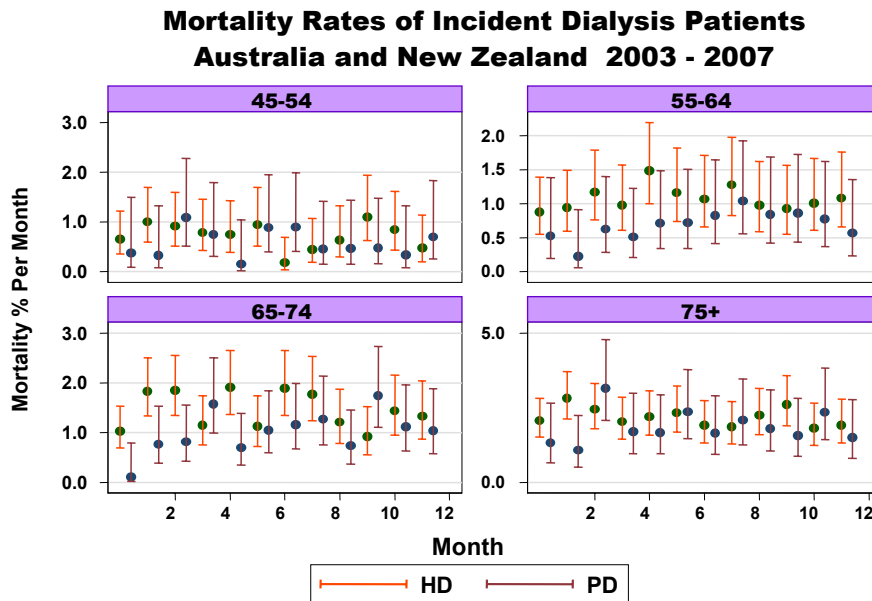
Figure 3.5



Within the first year of dialysis, there is some variation in death rates. There are a number of possible influences on this; these relate both to the disease process and treatment (one might expect mortality rates to be highest during earlier treatment) to epidemiological considerations. Specifically, there may be an under-reporting of early deaths in ANZDATA if the clinical judgment were that people were not actually in end-stage kidney failure.

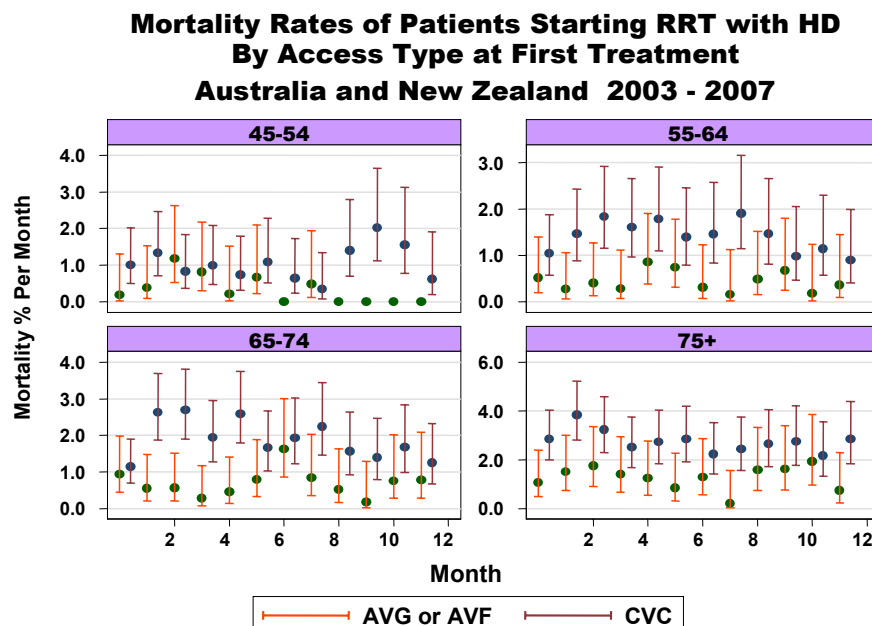
Death rates do vary between age groups; for several age groups the rates appear lower among those receiving peritoneal dialysis treatment than haemodialysis treatment.

Figure 3.6



A contributor to this may be the effect of central venous dialysis catheters; Figure 3.7 shows the difference in mortality among those who received haemodialysis as a first treatment. It can be seen that, among those whose first RRT was haemodialysis, those who start with a CVC experience higher mortality rates.

Figure 3.7





CAUSE OF DEATHS

AUSTRALIA

DIALYSIS DEPENDENT

The most common causes of death were cardiac and “social causes” both (36%), followed by vascular and infection both (10%) and miscellaneous (8%). Myocardial infarction (18%) and “cardiac arrest” (15%) formed the majority of the cardiac group. Of the “social” causes, most were withdrawal related to psychosocial causes, followed by cardiovascular and peripheral vascular comorbidities and malignancy.

The site of infection was most commonly reported as “septicaemia”, followed by lung, peritoneum, other sites and wound infection.

The details of the site and identity of the organisms can be found at the Website (www.anzdata.org.au/ANZDATA/AnzdataReport/download.htm).

Withdrawal from treatment was reported as the cause for 35% of deaths, mostly in the older age groups. Thirty one percent were diabetics. There were five patients < 40 years of age (the youngest two were both 30 years of age) and 132 patients were ≥ 80 years of age; the oldest was 94 years.

There were 67 patients (5%) who died from malignancy compared to 86 patients in 2006. A further 68 patients (5%) withdrew from dialysis due to malignancy.

FUNCTIONING TRANSPLANT

Among those with a functioning transplant, malignancy was the most common cause of death (25%), followed by cardiac (33%), then infection (17%), vascular (10%) and “social causes” (5%).

DEATHS OF YOUNG ADULTS

15-24 YEARS OF AGE

There were seven deaths in the age group 15-24 years; five males and two females; six hospital haemodialysis dependent and one having hospital automated peritoneal dialysis. Three of the six haemodialysis deaths were due to infection (lung, peritoneum and shunt), one cardiac arrest and one from hyperkalaemia. The hospital automated peritoneal dialysis patient died from lung transplant rejection.

25-34 YEARS OF AGE

There were 23 deaths in this age group; nine males and fourteen females. Three died with a functioning transplant and one with a failed transplant. Thirteen were treated with haemodialysis (eight hospital, three satellite and two home haemodialysis) three with home automated peritoneal dialysis and three on home CAPD. Three of the dialysis patients had previous failed transplants.

Causes of death were: cardiac, nine (including three satellite, three hospital, one home haemodialysis and two home CAPD): four CVA (one each home and hospital haemodialysis, home PD and home CAPD).

25-34 YEARS OF AGE (Continued)

There were four deaths from withdrawal from dialysis (three hospital and one home APD), one from infection (home APD) and one cachexia (hospital haemodialysis). Of the functioning transplant deaths, two were from cardiac causes and one from infection. The failed transplant patient died from bacterial endocarditis.

There were six were Type 1 and two Type 2 diabetics.

NEW ZEALAND

DIALYSIS DEPENDENT

Cardiac events comprised the most common cause of death (41%). Other causes were “social” (23%), infection (16%), miscellaneous (13%) and vascular (7%).

Treatment withdrawal was reported in 67 patients (23%). Thirty seven percent were diabetics. There were two patients under 40 years of age; the youngest was 30 years and eight patients ≥ 80 years of age; the oldest was 94 years.

There were 18 patients (6%) who died from malignancy compared to 21 patients (5%) in 2006. A further eleven patients (4%) withdrew from dialysis in 2007 due to malignancy.

FUNCTIONING TRANSPLANT

Amongst the 44 deaths of patients with a functioning transplant, the causes were malignancy (36%), cardiac (32%), infection (20%), “social causes” and vascular both (4.5%).

DEATHS OF YOUNG ADULTS

15-24 YEARS OF AGE

Three patients between 15-24 years of age died: all males: two Maoris and one Pacific Person. Two were having hospital haemodialysis and both died from hyperkalaemia, the other patient died from endocarditis whilst home haemodialysis dependent.

25-34 YEARS OF AGE

Eight patients between 25-34 years of age died: four males and four females. Five were Caucasoid, and three were Maoris. Seven dialysis dependent and one with a functioning transplant.

Four were from cardiac causes (one hospital, two home haemodialysis and one functioning transplant), one from a pulmonary embolus and one from calciphylaxis (hospital haemodialysis), one from lung infection (home haemodialysis) and one withdrew due to psychosocial causes (home CAPD).

One dialysis patient had previously been transplanted. Two were Type 1 diabetics.

Figure 3.8

Cause of Death by RRT Modality 1-Jan-2007 to 31-Dec-2007

Cause of Death		Australia		New Zealand	
		Dialysis	Transplant	Dialysis	Transplant
Cardiac	Cardiac arrest	223	23	24	2
	Haemorrhagic Pericarditis	1	-	-	-
	Hyperkalaemia	6	-	3	-
	Hypertensive cardiac failure	5	-	-	-
	Myocardial infarction	127	9	32	4
	Myocardial infarction (presumed)	135	14	54	8
	Other causes of cardiac failure	22	4	5	-
	Pulmonary oedema	11	-	3	-
	Sub Total	530 (36%)	50 (33%)	121 (41%)	14 (32%)
Infection	CNS - bacterial	1	-	-	-
	CNS - viral	1 (a)	-	-	-
	CNS - fungal	1 (b)	-	-	-
	CNS - protozoa	-	1 (j)	-	-
	CNS - other	1 (c)	-	-	-
	Lung - bacterial	19	3	10	1
	Lung - viral	1 (d)	1 (k)	-	-
	Lung - fungal	3 (b) (e)	1 (e)	-	-
	Lung - protozoa	-	1 (l)	-	-
	Lung - other	5 (c)	1 (c)	3 (c)	1 (c)
	Urinary tract - bacterial	3	1	1	1
	Urinary tract - other	-	1 (c)	-	-
	Wound - bacterial	14	2	4	2
	Shunt - bacterial	1	-	-	-
	Peritoneum - bacterial	14	-	8	-
	Peritoneum - fungal	2 (e)	-	1 (e)	-
	Septicaemia - bacterial	45	6	8	1
	Septicaemia - viral	2 (f) (g)	-	-	1 (m)
	Septicaemia - fungal	2 (e)	1 (b)	-	-
	Septicaemia - other	7 (c)	-	3 (c)	-
	Liver - viral	1 (h)	-	-	-
	Other site - bacterial	15	6	8	2
	Other site - viral	1 (i)	-	-	-
Other site - other	1 (c)	-	2 (c)	-	
	Sub Total	140 (10%)	25 (17%)	48 (16%)	9 (20%)
Vascular	Bowel infarction	26	3	2	-
	Cerebrovascular accident	77	9	10	2
	Gastrointestinal haemorrhage	11	1	4	-
	Haemorrhage - dialysis access site	4	-	-	-
	Haemorrhage - elsewhere	11	-	1	-
	Pulmonary embolus	7	1	1	-
	Ruptured aortic aneurysm	4	1	2	-
	Sub Total	140 (10%)	15 (10%)	20 (7%)	2 (4.5%)
Social	Accident	12	1	2	1
	Suicide	1	3	-	-
	Therapy ceased	7	-	5	-
	Withdrawal - access problems	29	-	3	-
	Withdrawal - cardiovascular	83	2	13	-
	Withdrawal - cerebrovascular	60	-	7	-
	Withdrawal - malignancy	68	-	11	-
	Withdrawal - peripheral vascular	79	1	7	-
	Withdrawal - psychosocial	181	1	21	1
	Sub Total	520 (36%)	8 (5%)	69 (23%)	2 (4.5%)
Miscellaneous	Bone marrow depression	-	-	1	-
	Cachexia	16	4	3	-
	Chronic respiratory failure	13	-	4	-
	Hepatic failure	6	-	2	-
	Malignancy	67	38	18	16
	Other	7	2	3	-
	Pancreatitis	2	1	1	1
	Perforation abdominal viscus	9	-	1	-
	Sclerosing peritonitis	1	-	3	-
	Uraemia caused by graft failure	-	4	-	-
	Unknown	1	4	1	-
		Sub Total	122 (8%)	53 (35%)	37 (13%)
	Total	1452 (100%)	151 (100%)	295 (100%)	44 (100%)

(a) herpes (b) aspergillus (c) organism not isolated (d) haemophilus influenzae (e) candida (f) arena virus (g) cmv
 (h) hepatitis C (i) virus not specified (j) cryptosporidium (k) polyoma virus (l) pneumocystis (m) human herpes virus 6

Figure 3.9		Australia						
Death Rates, Dialysis Patients 2007 (per 100 patient years)								
* Treatment at Death								
Age Groups	00-14	15-24	25-44	45-64	65-84	>=85	All Ages	
All Dialysis								
All Patients Death Rate	3.1	6.4	4.7	11.1	20.8	39.2	15.4	
No. of Deaths	1	7	59	384	893	108	1452	
Years of Risk	32	110	1263	3467	4304	275	9453	
Diabetic Death Rate	-	0	11.0	14.3	23.5	38.4	18.4	
No. of Deaths	-	0	26	170	271	14	481	
Years of Risk	-	1	236	1187	1151	37	2612	
Non Diabetic Death Rate	3.1	6.4	3.2	9.4	19.7	39.4	14.2	
No. of Deaths	1	7	33	214	622	94	971	
Years of Risk	32	109	1027	2280	3153	239	6841	
Peritoneal Dialysis *								
All Patients Death Rate	3.6	4.0	3.8	10.8	19.2	49.9	14.3	
No. of Deaths	1	1	10	82	182	18	294	
Years of Risk	28	25	261	759	948	36	2058	
Diabetic Death Rate	-	0	9.0	18.2	23.0	0	19.4	
No. of Deaths	-	0	4	52	60	0	116	
Years of Risk	-	1	44	285	261	6	597	
Non Diabetic Death Rate	3.6	4.1	2.8	6.3	17.8	60.2	12.2	
No. of Deaths	1	1	6	30	122	18	178	
Years of Risk	28	24	217	474	687	30	1461	
Haemodialysis *								
All Patients Death Rate	0	7.1	4.9	11.2	21.2	37.6	15.7	
No. of Deaths	0	6	49	302	711	90	1158	
Years of Risk	5	85	1002	2708	3356	239	7395	
Diabetic Death Rate	-	0	11.5	13.1	23.7	46.1	18.1	
No. of Deaths	-	0	22	118	211	14	365	
Years of Risk	-	0	192	902	891	30	2015	
Non Diabetic Death Rate	0	7.1	3.3	10.2	20.3	36.4	14.7	
No. of Deaths	0	6	27	184	500	76	793	
Years of Risk	5	85	811	1806	2466	209	5380	

Figure 3.10		Australia									
Death Rates, Transplant Patients 2007 (per 100 patient years)											
Age Groups	00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	All Ages	
All Transplants											
All Patients Death Rate	0	0	0	0.6	0.6	1.8	2.7	4.1	17.2	2.2	
No. of Deaths	0	0	0	4	9	32	45	37	24	151	
Years of Risk	11	123	274	699	1406	1759	1658	894	139	6963	
Diabetic Death Rate	-	-	-	2.2	2.4	4.5	3.7	8.3	0	3.8	
No. of Deaths	-	-	-	1	4	9	5	3	0	22	
Years of Risk	-	-	-	45	164	200	134	36	1	579	
Non Diabetic Death Rate	0	0	0	0.5	0.4	1.5	2.6	4.0	17.4	2.0	
No. of Deaths	0	0	0	3	5	23	40	34	24	129	
Years of Risk	11	123	274	654	1242	1559	1525	858	138	6385	
Deceased Donor Transplants											
All Patients Death Rate	0	0	0	1.3	0.6	1.7	3.1	4.7	19.6	2.7	
No. of Deaths	0	0	0	4	5	20	39	34	24	126	
Years of Risk	-	39	97	308	878	1180	1269	724	122	4617	
Diabetic Death Rate	-	-	-	2.6	2.1	3.9	4.7	3.9	0	3.4	
No. of Deaths	-	-	-	1	3	6	5	1	0	16	
Years of Risk	-	-	-	39	142	155	107	26	1	470	
Non Diabetic Death Rate	0	0	0	1.1	0.3	1.4	2.9	4.7	19.8	2.7	
No. of Deaths	0	0	0	3	2	14	34	33	24	110	
Years of Risk	-	39	97	269	736	1025	1161	698	121	4147	
Live Donor Transplants											
All Patients Death Rate	0	0	0	0	0.8	2.1	1.6	1.8	0	1.1	
No. of Deaths	0	0	0	0	4	12	6	3	0	25	
Years of Risk	11	84	177	391	528	579	389	170	17	2347	
Diabetic Death Rate	-	-	-	0	4.6	6.8	0	19.1	-	5.5	
No. of Deaths	-	-	-	0	1	3	0	2	-	6	
Years of Risk	-	-	-	6	22	44	26	10	-	109	
Non Diabetic Death Rate	0	0	0	0	0.6	1.7	1.7	0.6	0	0.8	
No. of Deaths	0	0	0	0	3	9	6	1	0	19	
Years of Risk	11	84	177	385	506	534	363	160	17	2238	

Figure 3.11		New Zealand						
Death Rates, Dialysis Patients 2007 (per 100 patient years)								
* Treatment at Death								
Age Groups	00-14	15-24	25-44	45-64	65-84	>=85	All Ages	
All Dialysis								
All Patients Death Rate	0	5.2	6.4	12.7	21.8	10.9	14.5	
No. of Deaths	0	3	21	116	152	3	295	
Years of Risk	8	58	327	911	699	28	2030	
Diabetic Death Rate	-	-	13.7	16.6	22.2	0	18.2	
No. of Deaths	-	-	9	76	60	0	145	
Years of Risk	-	-	66	458	271	2	796	
Non Diabetic Death Rate	0	5.2	4.6	8.8	21.5	11.5	12.2	
No. of Deaths	0	3	12	40	92	3	150	
Years of Risk	8	58	262	453	428	26	1234	
Peritoneal Dialysis *								
All Patients Death Rate	0	0	7.6	10.9	25.5	6.9	16.0	
No. of Deaths	0	0	7	34	78	1	120	
Years of Risk	6	23	91.9	311	306	14	1278	
Diabetic Death Rate	-	-	23.6	13.4	30.0	0	20.3	
No. of Deaths	-	-	5	21	32	0	58	
Years of Risk	-	-	21	157	106	1	285	
Non Diabetic Death Rate	0	0	2.8	8.5	23.0	7.1	13.3	
No. of Deaths	0	0	2	13	46	1	62	
Years of Risk	6	23	71	154	200	14	467	
Haemodialysis *								
All Patients Death Rate	0	8.6	6.0	13.7	18.9	15.3	13.7	
No. of Deaths	0	3	14	82	74	2	175	
Years of Risk	2	35	235	600	392	13	1278	
Diabetic Death Rate	-	-	9.0	18.3	17.0	0	17.0	
No. of Deaths	-	-	4	55	28	0	87	
Years of Risk	-	-	44	301	164	1	510	
Non Diabetic Death Rate	0	8.6	5.2	9.0	20.2	16.7	11.5	
No. of Deaths	0	3	10	27	46	2	88	
Years of Risk	2	35	191	299	228	12	767	

Figure 3.12		New Zealand									
Death Rates, Transplant Patients 2007 (per 100 patient years)											
Age Groups	00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	All Ages	
All Transplants											
All Patients Death Rate	0	0	0	0.8	0.7	1.9	4.6	12.1	17.3	3.5	
No. of Deaths	0	0	0	1	2	6	14	16	5	44	
Years of Risk	2	23	65	118	276	314	307	132	29	1266	
Diabetic Death Rate	-	-	0	0	0	0	5.9	23.9	120.5	5.5	
No. of Deaths	-	-	0	0	0	0	2	3	1	6	
Years of Risk	-	-	1	2	26	33	34	13	1	109	
Non Diabetic Death Rate	0	0	0	0.9	0.8	2.1	4.4	10.9	14.2	3.3	
No. of Deaths	0	0	0	1	2	6	12	13	4	38	
Years of Risk	2	23	64	116	250	282	273	120	28	1158	
Deceased Donor Transplants											
All Patients Death Rate	-	0	0	0	1.3	2.0	4.4	14.5	18.6	4.5	
No. of Deaths	-	0	0	0	2	4	10	15	5	36	
Years of Risk	-	5	24	55	152	203	229	104	27	799	
Diabetic Death Rate	-	-	0	0	0	0	8.9	28.4	120.5	7.3	
No. of Deaths	-	-	0	0	0	0	2	3	1	6	
Years of Risk	-	-	1	2	22	23	23	11	1	82	
Non Diabetic Death Rate	-	0	0	0	1.5	2.2	3.9	12.9	15.3	4.2	
No. of Deaths	-	0	0	0	2	4	8	12	4	30	
Years of Risk	-	5	23	53	129	180	207	93	261	717	
Live Donor Transplants											
All Patients Death Rate	0	0	0	1.6	0	1.8	5.1	3.5	0	1.7	
No. of Deaths	0	0	0	1	0	2	4	1	0	8	
Years of Risk	2	18	41	63	124	111	78	28	2	467	
Diabetic Death Rate	-	-	-	-	0	0	0	0	-	0	
No. of Deaths	-	-	-	-	0	0	0	0	-	0	
Years of Risk	-	-	-	-	3	9	12	2	-	26	
Non Diabetic Death Rate	0	0	0	1.6	0	2.0	6.0	3.8	0	1.8	
No. of Deaths	0	0	0	1	0	2	4	1	0	8	
Years of Risk	2	18	41	63	121	101	66	26	2	441	

DEATHS FROM MALIGNANCY

Figure 3.13

Deaths from Malignancy 2007 By RRT Modality at Time of Death

Australia	Dialysis	Transplant	Total
Adenocarcinoma			
Breast	2	1	3
Colon	3 (#1)	5	8
Kidney	6 (#5)	-	6
Lung	3	1	4
Oesophagus	4 (#1)	2	6
Pancreas	2	1	3
Rectum	-	2	2
Stomach	-	1	1
Unknown site	3	2	5
Upper gastro intestinal tract	1	-	1
Leukaemia	2	-	2
Lymphoma			
Chest wall	-	1	1
Lymphoproliferative			
(L) axillary	-	1	1
Melanoma - Skin	-	2	2
Merkel Cell	-	2	2
Myeloma	26 (#25)	-	26
Squamous Cell Carcinoma			
Lung	1	2	3
Oesophagus	1	-	1
Skin	2	8	10
Tongue	2	-	2
Unknown site	1	-	1
Ureter	1	-	1
Vagina	-	1	1
Transitional Cell Carcinoma			
Bladder	1	-	1
Other			
Glioblastoma - brain	-	1	1
Hepatoma - liver	1 (*1)	-	1
Hodgkins Disease - nodes	1 (#1)	-	1
Large cell - lung	1	-	1
Non small cell - lung	-	1	1
Poorly differentiated - bronchus	-	1	1
Poorly differentiated - chest wall	-	1	1
Small cell neuroendocrine - kidney	-	1	1
Unknown - lung	1	1	2
Unknown - primary unknown	1	-	1
Vipoma - pancreas	1 (#1)	-	1
Total Deaths	67	38	105

(34 patients) diagnosed pre dialysis or within one month of commencing

* (One patient) had previously been transplanted

AUSTRALIA

During 2007 there were 105 deaths directly due to malignancies (67 among dialysis dependent and 38 among functioning transplant patients). Deaths were attributed by modality at time of death.

DIALYSIS DEPENDENT

Thirty four patients had cancer diagnosed before or within one month of starting their first dialysis. A further two tumours were identified between two and eight months after the first dialysis.

There were eleven patients (never transplanted) who had dialysed for more than five years. One patient had a previous renal transplant.

The myeloma patients had a median survival of 16 months from diagnosis (range < 0-168 months).

FUNCTIONING TRANSPLANT

There were 38 deaths in 2007 in this group, compared to 48 deaths in 2006.

Twenty six died from non-skin cancer: fifteen from adenocarcinoma, three from squamous cell carcinoma (two lung, one vagina), two from poorly differentiated carcinoma (bronchus and chest wall), one each from non small cell (lung), glioblastoma (brain), lymphoma, lymphoproliferative disease, small cell neuroendocrine (kidney) and unknown type (lung).

Twelve died from skin cancer: eight from squamous cell carcinoma and two each from melanoma and Merkel Cell.

DEATHS FROM MALIGNANCY

NEW ZEALAND

DIALYSIS DEPENDENT

There were 18 deaths due to malignancy, seven were diagnosed before or within one month of starting dialysis.

Three patients who were never transplanted, had dialysed for five or more years. No patient had a previous renal transplant.

Eight were diagnosed with adenocarcinoma, three myeloma, one squamous cell carcinoma (cervix), one TCC (bladder), one small cell (lung), one undifferentiated (site unknown) and three unknown types (oesophagus, lung and pancreas).

FUNCTIONING TRANSPLANT

There were 16 deaths: five from squamous cell carcinoma (four skin, one primary site unknown), three adenocarcinoma (two colon, one rectal stump) three lymphoma (frontal lobe, lung, and inguinal), one each lymphoproliferative (liver), leukaemia, Merkel Cell, neuroendocrine (unknown site) and an unknown primary in an unknown site.

Figure 3.14

Deaths from Malignancy 2007 By RRT Modality at Time of Death

New Zealand	Dialysis	Transplant	Total
Adenocarcinoma			
Breast	2 (#2)	-	2
Colon	-	2	2
Kidney	1	-	1
Lung	2	-	2
Ovary	1	-	1
Primary unknown	1	-	1
Prostate	1 (#1)	-	1
Rectal stump	-	1	1
Leukaemia	-	1	1
Lymphoma			
Frontal lobe	-	1	1
Inguinal	-	1	1
Lung	-	1	1
Lymphoproliferative			
Liver	-	1	1
Merkel Cell	-	1	1
Myeloma	3 (#2)	-	3
Squamous Cell Carcinoma			
Cervix	1 (#1)	-	1
Primary unknown	-	1	1
Skin	-	4	4
TCC			
Bladder	1 (#1)	-	1
Other			
Neuroendocrine - unknown	-	1	1
Small cell - lung	1	-	1
Undifferentiated - unknown	1	-	1
Unknown - lung	1	-	1
Unknown - oesophagus	1	-	1
Unknown - pancreas	1	-	1
Unknown - primary unknown	-	1	1
Total Deaths	18	16	34

(Seven patients) diagnosed pre dialysis or within one month of commencing
No dialysis patients had previously been transplanted

DEATHS FROM WITHDRAWAL FROM TREATMENT RELATED TO MALIGNANCY

Figure 3.15

Deaths from Withdrawal from Treatment Due to Malignancy 2007 By RRT Modality at Time of Death

Dialysis Dependent	Australia	New Zealand
Adenocarcinoma		
Breast	3 (#2)	2 (*1)
Colon	3 (#3)	-
Gall bladder	1	-
Kidney	3 (#2)	-
Lung	3 (#1)	-
Myometrium	1 (#1)	-
Oesophagus	1	-
Prostate	3 (#1)	-
Primary unknown	1 (#1)	-
Stomach	3	-
Leukaemia	2 (#1)	-
Lymphoma		
Tonsil	-	1
Lymphoproliferative		
Bone marrow	1 (#1)	-
Melanoma		
	1	-
Myeloma	14 (*1) (#14)	4 (#4)
Squamous Cell Carcinoma		
Cervix	1 (#1)	-
Lung	2	-
Penis	1	-
Transitional Cell Carcinoma		
Bladder	6 (#3)	-
Kidney	4 (#4)	-
Urethra	1 (#1)	-
Other		
Carcinoid - small bowel	1 (#1)	-
Glioblastoma - brain	1	-
Mesothelioma - pleura	1	-
Non small cell - lung	1 (#1)	-
Poorly differentiated - nasopharynx	-	1
Small cell - lung	-	1
Spindle cell - duodenum	1	-
Tubulovillous - colon	1	-
Unknown - lung	2 (*1)	1
Unknown - pancreas	1	1
Unknown - prostate	1 (#1)	-
Unknown - primary unknown	3	-
Total Deaths	68	11
Australia		
# (39) patients diagnosed pre dialysis or within two months of commencing		
* (Two patients) had been previously transplanted		
New Zealand		
# (Four) patients diagnosed pre dialysis or within two months of commencing		
* (One patient) had been previously transplanted		

AUSTRALIA

During 2007 there were 68 deaths among dialysis patients attributed to withdrawal from treatment related to malignancy.

DIALYSIS DEPENDENT

Thirty nine of the 68 patients had cancer diagnosed before their first dialysis or within two months of commencing treatment. Three further tumours were identified less than twelve months after the first dialysis.

There were ten patients who had dialysed for more than five years. Two of those patients had a previous renal transplant.

Two patients dialysed for less than two months and five patients dialysed between two and six months before treatment was withdrawn.

There were 22 cases with adenocarcinoma, 14 with myeloma, eleven transitional cell carcinomas, four with squamous cell carcinoma, two with leukaemia, one lymphoproliferative disease, one melanoma and thirteen other types of malignancies.

The myeloma patients had a median survival from diagnosis of 35.0 months (range 2-186 months).

FUNCTIONING TRANSPLANT

There were no patients in this group in 2007.

NEW ZEALAND

DIALYSIS DEPENDENT

Eleven patients had withdrawal of treatment related to malignancy in 2007.

Four of the eleven patients had cancer diagnosed before their first dialysis. There were four myeloma, two adenocarcinoma, one lymphoma and four other types of malignancies.

Three patients dialysed for more than five years, including one with a previous renal transplant.

FUNCTIONING TRANSPLANT

There were no patients in this group in 2007.