

## **CHAPTER 3**

### **DEATHS**

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## INTRODUCTION

### AUSTRALIA

#### DIALYSIS DEPENDENT

The number of deaths totalled 1,199 (14.5 deaths per 100 pt yrs at risk) in 2005 among dialysis dependent patients.

For those treated with peritoneal dialysis, 274 deaths occurred (15.3 deaths per 100 pt yrs at risk) and for haemodialysis there were 925 deaths (14.2 deaths per 100 pt yrs at risk) (Figure 3.5).

The death rate for each State/Territory per 100 pt yrs 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.

Figure 3.3 shows the age specific mortality rates for patients treated with dialysis or transplantation relative to the Australian population rates for 2005.

#### FUNCTIONING TRANSPLANT

There were 146 deaths (2.3 deaths per 100 pt yrs at risk) of patients with a functioning transplant.

The deceased donor recipient death rate was 125 deaths (2.8 per 100 pt yrs) and the live donor recipient death rate 21 deaths (1.1 per 100 pt yrs).

The death rate in relation to age is shown in Figure 3.6.

### NEW ZEALAND

#### DIALYSIS DEPENDENT

There were 295 deaths (16.4 deaths per 100 pt yrs at risk) in 2005.

For those treated with peritoneal dialysis, 146 deaths occurred (20.0 deaths per 100 pt yrs at risk) and for haemodialysis there were 149 deaths (14.0 deaths per 100 pt yrs at risk) shown in Figure 3.7.

#### FUNCTIONING TRANSPLANT

There were 32 deaths (2.6 deaths per 100 pt yrs at risk) in 2005.

The mortality rate for recipients of deceased donor kidneys was 25 deaths (3.1 per 100 pt yrs) and, live donor recipients 7 deaths (1.7 per 100 pt yrs) shown in Figure 3.8.

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

**Figure 3.1**

**Death Rates by States 1996 - 2005**  
**All Dialysis Patients**  
(per 100 patient years)

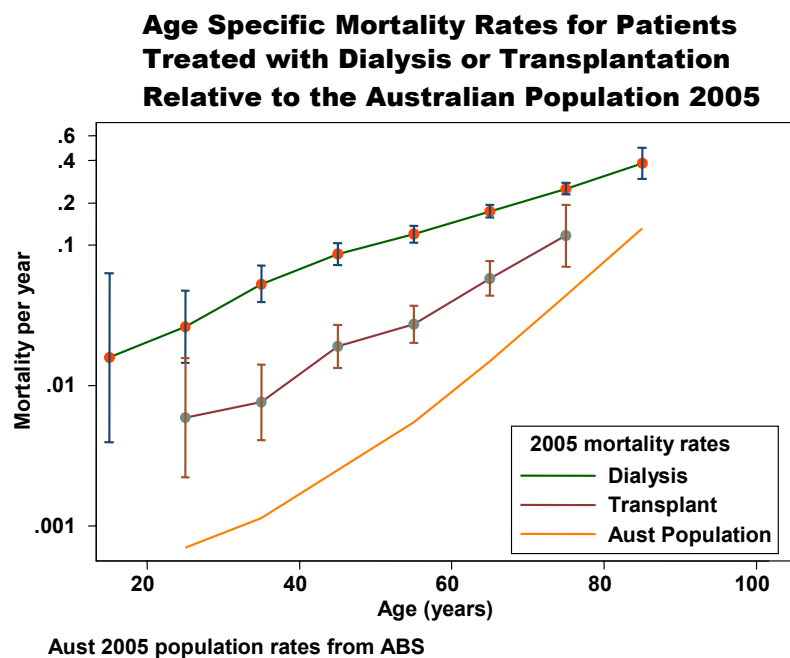
Year	Qld	NSW	ACT	Vic	Tas	SA	NT	WA	Aust	NZ
1996	17.7	14.2	15.4	14.0	14.6	23.5	23.1	14.5	15.6	14.8
1997	16.5	16.7	12.2	12.5	15.3	20.5	18.4	17.1	15.8	15.9
1998	19.3	16.9	15.3	15.8	25.9	15.7	15.8	13.6	16.7	16.6
1999	20.7	16.0	14.7	14.1	23.9	15.2	17.6	17.3	16.5	16.4
2000	16.9	16.5	13.5	14.0	14.7	14.3	20.0	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	14.8	14.4	12.2	13.6	16.4	13.7	13.9	17.4	14.5	16.4

**Figure 3.2**

**Death Rates by States**  
**Dialysis Modality and Age Groups 2005**  
(per 100 patient years)

Age Group	Treatment	Qld	NSW/ACT	Vic	Tas	SA	NT	WA	Aust	NZ
45-64 yrs	All Dx Patients	10.6	9.2	9.7	14.4	9.0	14.5	16.2	10.6	14.5
	PD	6.4	9.9	7.6	48.7	11.0	10.8	22.8	10.9	19.6
	HD	11.8	9.0	10.2	8.5	8.5	14.9	13.8	10.6	11.7
65-84 yrs	All Dx Patients	20.7	20.3	19.0	18.6	19.1	23.4	25.4	20.4	22.8
	PD	23.0	21.9	21.4	-	22.9	-	22.7	21.9	23.2
	HD	20.0	19.7	18.5	21.8	18.1	24.0	26.1	20.0	22.4

**Figure 3.3**





## CAUSE OF DEATHS

### AUSTRALIA

#### DIALYSIS DEPENDENT

Cardiac events (39%) were the most common cause of death reported, followed by "social causes" (27%), infection (13%), miscellaneous (11%) and vascular (10%). Myocardial infarction (20%) and "cardiac arrest" (16%) formed the majority of the cardiac group.

The site of infection was most commonly reported as "septicaemia", followed by lung 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](http://www.anzdata.org.au/ANZDATA/AnzdataReport/download.htm)).

Withdrawal from treatment was reported as the cause for 26% of deaths, mostly in the older age groups.

Twenty four percent were diabetics. There were two patients  $\leq$  30 years of age and 83 patients were  $\geq$  80 years of age; the oldest was 93 years.

There were 82 patients (7%) who died from malignancy compared to 63 patients in 2004. A further 50 patients (4%) withdrew from dialysis due to malignancy.

#### FUNCTIONING TRANSPLANT

Among those with a functioning transplant, cardiac was the most common cause of death (36%), followed by malignancy (29%), then infection (12%), vascular (7%) and "social causes" (4%).

### DEATHS OF YOUNG ADULTS

#### 15-24 YEARS OF AGE

There were two deaths in the age group 15-24 years; both females and haemodialysis dependent. One died from bacterial septicaemia and one from a drug overdose.

#### 25-34 YEARS OF AGE

There were 15 deaths in this age group; eight males and seven females. Four died with a functioning transplant, nine were treated with haemodialysis (six hospital, two satellite and one home) and two with home automated peritoneal dialysis. Two of the haemodialysis patients had previous failed transplants.

Causes of death were: cardiac, five (including three hospital, two home and one satellite haemodialysis); malignancy, two (one functioning transplant and one home peritoneal dialysis); fungal lung infection, two (one functioning transplant and one hospital haemodialysis); other causes, six (two functioning transplants, two hospital and one satellite haemodialysis and one home automated peritoneal dialysis).

### NEW ZEALAND

#### DIALYSIS DEPENDENT

Cardiac events comprised the most common cause of death (40%). Other causes were "social" (27%), infection (15%), vascular and miscellaneous both (9%). Treatment withdrawal was reported in 80 patients (27%). Thirty three percent were diabetics. There were three patients under 35 years of age and ten patients  $\geq$  80 years of age; the oldest was 87 years.

#### FUNCTIONING TRANSPLANT

Amongst the 13 deaths of functioning transplant patients, the causes were cardiac (38%), malignancy (31%), infection and "social causes" both (9%) and vascular (3%).

### DEATHS OF YOUNG ADULTS

#### 15-24 YEARS OF AGE

Three patients between 15-24 years of age died: two females and one male: one Caucasoid, one Maori and one Asian. Two were having home automated peritoneal dialysis and one hospital haemodialysis. Two died from withdrawal from dialysis due to psycho-social reasons and one from Kearns-Sayer disease. One was a Type 1 diabetic.

#### 25-34 YEARS OF AGE

Eight patients between 25-34 years of age died: six males and two females. Five were Caucasoid, two Maori and one Pacific People. Four were from cardiac causes (two hospital, one home continuous ambulatory peritoneal dialysis and one home automated peritoneal dialysis), two were cerebrovascular events (one hospital haemodialysis and one automated home peritoneal dialysis) and two from other causes (one hospital haemodialysis and one home continuous ambulatory peritoneal dialysis). Three of the dialysis patients had previously been transplanted. Three were Type 1 diabetics.

**Figure 3.4**

Cause of Death		Australia		New Zealand	
		Dialysis	Transplant	Dialysis	Transplant
<b>Cardiac</b>	Cardiac arrest	187	27	34	2
	Hyperkalaemia	7	-	1	1
	Hypertensive cardiac failure	2	-	2	-
	Myocardial infarction	142	14	29	5
	Myocardial infarction (presumed)	99	10	45	4
	Other causes of cardiac failure	19	1	7	-
	Pulmonary oedema	9	1	1	-
	<b>Sub Total</b>	<b>465 (39%)</b>	<b>53 (36%)</b>	<b>119 (40%)</b>	<b>12 (38%)</b>
<b>Infection</b>	CNS - viral	1 (a)	1 (h)	1 (f)	-
	CNS - other	1 (b)	-	-	-
	Lung - bacterial	20	4	4	2
	Lung - viral	-	1 (i)	-	-
	Lung - fungal	3 (c,d)	3 (c,e,g)	-	-
	Lung - protozoa	-	1 (j)	-	-
	Lung - other	7 (b)	-	-	-
	Urinary tract - bacterial	2	-	1	-
	Urinary tract - fungal	1 (e)	-	-	-
	Wound - bacterial	19	-	3	-
	Shunt - bacterial	5	-	-	-
	Peritoneum - bacterial	14	-	15	-
	Peritoneum - viral	1 (f)	-	-	-
	Peritoneum - fungal	8 (e)	-	3 (e)	-
	Peritoneum - other	-	-	1 (b)	-
	Septicaemia - bacterial	47	5	8	-
	Septicaemia - fungal	2 (e,g)	-	-	-
	Septicaemia - other	6 (b)	-	-	-
	Liver - bacterial	1	-	-	-
	Other site - bacterial	13	2	7	-
	Other site - viral	-	-	-	1 (l)
	Other site - fungal	-	1 (k)	-	-
Other site - other	1 (b)	-	1 (b)	-	
<b>Sub Total</b>	<b>152 (13%)</b>	<b>18 (12%)</b>	<b>44 (15%)</b>	<b>3 (9%)</b>	
<b>Vascular</b>	Bowel infarction	23	2	5	-
	Cerebrovascular accident	64	4	14	1
	Gastrointestinal haemorrhage	13	2	2	-
	Haemorrhage - dialysis access site	6	-	-	-
	Haemorrhage - elsewhere	4	-	3	-
	Pulmonary embolus	6	1	1	-
	Ruptured aortic aneurysm	8	1	1	-
	<b>Sub Total</b>	<b>124 (10%)</b>	<b>10 (7%)</b>	<b>26 (9%)</b>	<b>1 (3%)</b>
<b>Social</b>	Accident	7	-	1	1
	Patient refused further treatment	-	1	1	-
	Suicide	3	1	-	-
	Therapy ceased	1	-	3	-
	Withdrawal - access problems	24	1	-	-
	Withdrawal - cardiovascular	59	-	12	-
	Withdrawal - cerebrovascular	31	-	13	-
	Withdrawal - malignancy	50	-	7	-
	Withdrawal - peripheral vascular	43	2	12	1
	Withdrawal - psychosocial	103	-	32	1
	<b>Sub Total</b>	<b>321 (27%)</b>	<b>5 (4%)</b>	<b>81 (27%)</b>	<b>3 (9%)</b>
<b>Miscellaneous</b>	Cachexia	10	1	5	-
	Chronic respiratory failure	11	5	1	1
	Hepatic failure	7	3	-	-
	Immunodeficiency	1	-	-	-
	<b>Malignancy</b>	<b>82</b>	<b>43</b>	<b>15</b>	<b>10</b>
	Other	8	2	2	-
	Pancreatitis	7	-	-	-
	Perforation abdominal viscus	10	3	1	-
	Uraemia caused by graft failure	-	-	-	1
	Unknown	6	3	1	1
<b>Sub Total</b>	<b>137 (11%)</b>	<b>60 (41%)</b>	<b>25 (9%)</b>	<b>13 (41%)</b>	
<b>Total</b>	<b>1199 (100%)</b>	<b>146 (100%)</b>	<b>295 (100%)</b>	<b>32 (100%)</b>	

(a) virus not known (b) organism not isolated (c) aspergillus (d) cunninghamella (e) candida (f) cmv (g) cryptococcus  
 (h) herpes zoster (i) influenza (j) pneumocystis carinii (k) fungus not specified (l) dengue fever

<b>Figure 3.5</b>		<b>Australia</b>						
<b>Death Rates, Dialysis Patients 2005 (per 100 patient years)</b>								
<b>* Treatment at Death</b>								
<b>Age Groups</b>	<b>00-14</b>	<b>15-24</b>	<b>25-44</b>	<b>45-64</b>	<b>65-84</b>	<b>&gt;=85</b>	<b>All Ages</b>	
<b>All Dialysis</b>								
<b>All Patients Death Rate</b>	<b>7.1</b>	<b>1.7</b>	<b>4.5</b>	<b>10.6</b>	<b>20.4</b>	<b>32.1</b>	<b>14.5</b>	
No. of Deaths	2	2	54	322	761	58	<b>1199</b>	
Years of Risk	28	119	1208	3023	3724	181	<b>8283</b>	
<b>Diabetic Death Rate</b>	<b>-</b>	<b>-</b>	<b>11.5</b>	<b>15.1</b>	<b>20.5</b>	<b>25.1</b>	<b>17.1</b>	
No. of Deaths	-	-	23	142	177	5	<b>347</b>	
Years of Risk	-	1	200	942	863	20	<b>2025</b>	
<b>Non Diabetic Death Rate</b>	<b>7.1</b>	<b>1.7</b>	<b>3.1</b>	<b>8.6</b>	<b>20.4</b>	<b>32.9</b>	<b>13.6</b>	
No. of Deaths	2	2	31	180	584	53	<b>852</b>	
Years of Risk	28	119	1008	2082	2860	161	<b>6258</b>	
<b>Peritoneal Dialysis *</b>								
<b>All Patients Death Rate</b>	<b>5</b>	<b>-</b>	<b>3.4</b>	<b>10.9</b>	<b>21.9</b>	<b>43.0</b>	<b>15.3</b>	
No. of Deaths	1	-	8	70	184	11	<b>274</b>	
Years of Risk	20	27	235	645	840	26	<b>1793</b>	
<b>Diabetic Death Rate</b>	<b>-</b>	<b>-</b>	<b>7.4</b>	<b>18.7</b>	<b>22.0</b>	<b>32.2</b>	<b>18.9</b>	
No. of Deaths	-	-	4	40	45	1	<b>90</b>	
Years of Risk	-	1	54	214	204	3	<b>476</b>	
<b>Non Diabetic Death Rate</b>	<b>5</b>	<b>-</b>	<b>2.2</b>	<b>7.0</b>	<b>21.8</b>	<b>44.5</b>	<b>14.0</b>	
No. of Deaths	1	-	4	30	139	10	<b>184</b>	
Years of Risk	20	26	182	431	636	22	<b>1317</b>	
<b>Haemodialysis *</b>								
<b>All Patients Death Rate</b>	<b>12.1</b>	<b>2.2</b>	<b>4.7</b>	<b>10.6</b>	<b>20.0</b>	<b>30.3</b>	<b>14.2</b>	
No. of Deaths	1	2	46	252	577	47	<b>925</b>	
Years of Risk	8	93	972	2378	2883	155	<b>6490</b>	
<b>Diabetic Death Rate</b>	<b>-</b>	<b>-</b>	<b>13.0</b>	<b>14.0</b>	<b>20.0</b>	<b>23.8</b>	<b>16.6</b>	
No. of Deaths	-	-	19	102	132	4	<b>257</b>	
Years of Risk	-	-	146	728	659	17	<b>1549</b>	
<b>Non Diabetic Death Rate</b>	<b>12.1</b>	<b>2.2</b>	<b>3.3</b>	<b>9.1</b>	<b>20.0</b>	<b>31.1</b>	<b>13.5</b>	
No. of Deaths	1	2	27	150	445	43	<b>668</b>	
Years of Risk	8	93	826	1651	2224	138	<b>4941</b>	

<b>Figure 3.6</b>		<b>Australia</b>									
<b>Death Rates, Transplant Patients 2005 (per 100 patient years)</b>											
<b>Age Groups</b>	<b>00-04</b>	<b>05-14</b>	<b>15-24</b>	<b>25-34</b>	<b>35-44</b>	<b>45-54</b>	<b>55-64</b>	<b>65-74</b>	<b>75-84</b>	<b>All Ages</b>	
<b>All Transplants</b>											
<b>All Patients Death Rate</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.6</b>	<b>0.7</b>	<b>1.8</b>	<b>2.8</b>	<b>5.9</b>	<b>15.5</b>	<b>2.3</b>	
No. of Deaths	-	-	-	4	9	30	41	46	16	<b>146</b>	
Years of Risk	14	128	254	699	1315	1620	1463	782	103	<b>6378</b>	
<b>Diabetic Death Rate</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2.4</b>	<b>-</b>	<b>6.2</b>	<b>3.0</b>	<b>-</b>	<b>-</b>	<b>3.0</b>	
No. of Deaths	-	-	-	1	-	11	3	-	-	<b>15</b>	
Years of Risk	-	-	-	41	161	177	101	29	-	<b>509</b>	
<b>Non Diabetic Death Rate</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.5</b>	<b>0.8</b>	<b>1.3</b>	<b>2.8</b>	<b>6.1</b>	<b>15.5</b>	<b>2.2</b>	
No. of Deaths	-	-	-	3	9	19	38	46	16	<b>131</b>	
Years of Risk	14	128	254	658	1154	1444	1363	753	103	<b>5870</b>	
<b>Deceased Donor Transplants</b>											
<b>All Patients Death Rate</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.9</b>	<b>0.6</b>	<b>1.9</b>	<b>3.3</b>	<b>6.5</b>	<b>14.6</b>	<b>2.8</b>	
No. of Deaths	-	-	-	3	5	22	38	43	14	<b>125</b>	
Years of Risk	2	43	94	338	867	1149	1167	664	96	<b>4421</b>	
<b>Diabetic Death Rate</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>3.2</b>	<b>-</b>	<b>5.6</b>	<b>2.4</b>	<b>-</b>	<b>-</b>	<b>2.7</b>	
No. of Deaths	-	-	-	1	-	8	2	-	-	<b>11</b>	
Years of Risk	-	-	-	31	140	136	82	22	-	<b>410</b>	
<b>Non Diabetic Death Rate</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.6</b>	<b>0.7</b>	<b>1.4</b>	<b>3.3</b>	<b>6.7</b>	<b>14.6</b>	<b>2.8</b>	
No. of Deaths	-	-	-	2	5	14	36	43	14	<b>114</b>	
Years of Risk	2	43	94	307	727	1013	1086	642	96	<b>4010</b>	
<b>Live Donor Transplants</b>											
<b>All Patients Death Rate</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.3</b>	<b>0.9</b>	<b>1.7</b>	<b>1.0</b>	<b>2.5</b>	<b>27.4</b>	<b>1.1</b>	
No. of Deaths	-	-	-	1	4	8	3	3	2	<b>21</b>	
Years of Risk	12	85	160	361	449	471	296	118	7	<b>1958</b>	
<b>Diabetic Death Rate</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>7.4</b>	<b>5.3</b>	<b>-</b>	<b>4.1</b>	
No. of Deaths	-	-	-	-	-	3	1	-	-	<b>4</b>	
Years of Risk	-	-	-	10	21	41	19	8	-	<b>98</b>	
<b>Non Diabetic Death Rate</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.3</b>	<b>0.9</b>	<b>1.2</b>	<b>0.7</b>	<b>2.7</b>	<b>27.4</b>	<b>0.9</b>	
No. of Deaths	-	-	-	1	4	5	2	3	2	<b>17</b>	
Years of Risk	12	85	160	350	428	430	277	110	7	<b>1859</b>	

<b>Figure 3.7</b>		<b>New Zealand</b>						
<b>Death Rates, Dialysis Patients 2005 (per 100 patient years)</b>								
<b>* Treatment at Death</b>								
Age Groups	00-14	15-24	25-44	45-64	65-84	>=85	All Ages	
<b>All Dialysis</b>								
<b>All Patients Death Rate</b>	-	<b>6.2</b>	<b>10.4</b>	<b>14.5</b>	<b>22.8</b>	<b>28.9</b>	<b>16.4</b>	
No. of Deaths	-	3	32	118	138	4	<b>295</b>	
Years of Risk	9	48	307	812	604	14	<b>1795</b>	
<b>Diabetic Death Rate</b>	-	<b>90.1</b>	<b>26.8</b>	<b>18.0</b>	<b>23.3</b>	<b>76.9</b>	<b>20.6</b>	
No. of Deaths	-	1	15	74	54	1	<b>145</b>	
Years of Risk	-	1	56	412	232	1	<b>702</b>	
<b>Non Diabetic Death Rate</b>	-	<b>4.2</b>	<b>6.8</b>	<b>11.0</b>	<b>22.6</b>	<b>23.9</b>	<b>13.7</b>	
No. of Deaths	-	2	17	44	84	3	<b>150</b>	
Years of Risk	9	47	251	401	372	13	<b>1093</b>	
<b>Peritoneal Dialysis *</b>								
<b>All Patients Death Rate</b>	-	<b>10.3</b>	<b>14.6</b>	<b>19.6</b>	<b>23.2</b>	<b>19.2</b>	<b>20.0</b>	
No. of Deaths	-	2	14	57	71	2	<b>146</b>	
Years of Risk	8	19	96	291	305	10	<b>730</b>	
<b>Diabetic Death Rate</b>	-	<b>90.1</b>	<b>44.5</b>	<b>21.5</b>	<b>25.2</b>	<b>333.3</b>	<b>24.9</b>	
No. of Deaths	-	1	8	34	27	1	<b>71</b>	
Years of Risk	-	1	18	158	107	0	<b>285</b>	
<b>Non Diabetic Death Rate</b>	-	<b>5.5</b>	<b>7.7</b>	<b>17.3</b>	<b>22.2</b>	<b>9.9</b>	<b>16.8</b>	
No. of Deaths	-	1	6	23	44	1	<b>75</b>	
Years of Risk	8	18	78	133	198	10	<b>445</b>	
<b>Haemodialysis *</b>								
<b>All Patients Death Rate</b>	-	<b>3.5</b>	<b>8.5</b>	<b>11.7</b>	<b>22.4</b>	<b>58.3</b>	<b>14.0</b>	
No. of Deaths	-	1	18	61	67	2	<b>149</b>	
Years of Risk	2	29	211	521	299	3	<b>1065</b>	
<b>Diabetic Death Rate</b>	-	-	<b>18.4</b>	<b>15.8</b>	<b>21.7</b>	-	<b>17.7</b>	
No. of Deaths	-	-	7	40	27	-	<b>74</b>	
Years of Risk	-	-	38	254	125	1	<b>417</b>	
<b>Non Diabetic Death Rate</b>	-	<b>3.5</b>	<b>6.4</b>	<b>7.8</b>	<b>23.0</b>	<b>82.3</b>	<b>11.6</b>	
No. of Deaths	-	1	11	21	40	2	<b>75</b>	
Years of Risk	2	29	173	268	174	2	<b>648</b>	

<b>Figure 3.8</b>		<b>New Zealand</b>									
<b>Death Rates, Transplant Patients 2005 (per 100 patient years)</b>											
Age Groups	00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	All Ages	
<b>All Transplants</b>											
<b>All Patients Death Rate</b>	-	-	-	-	<b>0.4</b>	<b>1.9</b>	<b>4.0</b>	<b>8.3</b>	<b>20.0</b>	<b>2.6</b>	
No. of Deaths	-	-	-	-	1	6	10	11	4	<b>32</b>	
Years of Risk	2	28	56	135	282	319	253	133	20	<b>1227</b>	
<b>Diabetic Death Rate</b>	-	-	-	-	-	<b>3.1</b>	<b>2.9</b>	<b>34.2</b>	-	<b>5.5</b>	
No. of Deaths	-	-	-	-	-	1	1	4	-	<b>6</b>	
Years of Risk	-	-	-	3	28	32	34	12	-	<b>109</b>	
<b>Non Diabetic Death Rate</b>	-	-	-	-	<b>0.4</b>	<b>1.7</b>	<b>4.1</b>	<b>5.8</b>	<b>20.0</b>	<b>2.3</b>	
No. of Deaths	-	-	-	-	1	5	9	7	4	<b>26</b>	
Years of Risk	2	28	56	132	254	287	219	121	20	<b>1118</b>	
<b>Deceased Donor Transplants</b>											
<b>All Patients Death Rate</b>	-	-	-	-	<b>0.6</b>	<b>1.8</b>	<b>3.5</b>	<b>7.8</b>	<b>21.0</b>	<b>3.1</b>	
No. of Deaths	-	-	-	-	1	4	7	9	4	<b>25</b>	
Years of Risk	-	8	21	57	176	223	199	115	19	<b>818</b>	
<b>Diabetic Death Rate</b>	-	-	-	-	-	-	-	<b>34.2</b>	-	<b>4.7</b>	
No. of Deaths	-	-	-	-	-	-	-	4	-	<b>4</b>	
Years of Risk	-	-	-	3	24	23	24	12	-	<b>86</b>	
<b>Non Diabetic Death Rate</b>	-	-	-	-	<b>0.7</b>	<b>2.0</b>	<b>4.0</b>	<b>4.8</b>	<b>21.0</b>	<b>2.9</b>	
No. of Deaths	-	-	-	-	1	4	7	5	4	<b>21</b>	
Years of Risk	-	8	21	54	152	200	175	103	19	<b>732</b>	
<b>Live Donor Transplants</b>											
<b>All Patients Death Rate</b>	-	-	-	-	-	<b>2.1</b>	<b>5.6</b>	<b>11.0</b>	-	<b>1.7</b>	
No. of Deaths	-	-	-	-	-	2	3	2	-	<b>7</b>	
Years of Risk	2	20	35	78	106	95	54	18	1	<b>409</b>	
<b>Diabetic Death Rate</b>	-	-	-	-	-	<b>11.3</b>	<b>9.8</b>	-	-	<b>8.7</b>	
No. of Deaths	-	-	-	-	-	1	1	-	-	<b>2</b>	
Years of Risk	-	-	-	-	4	9	10	-	-	<b>23</b>	
<b>Non Diabetic Death Rate</b>	-	-	-	-	-	<b>1.2</b>	<b>4.6</b>	<b>11.0</b>	-	<b>1.3</b>	
No. of Deaths	-	-	-	-	-	1	2	2	-	<b>5</b>	
Years of Risk	2	20	35	78	102	87	44	18	1	<b>386</b>	



Figure 3.9

### Deaths from Malignancy 2005 By RRT Modality at Time of Death

Australia	Dialysis	Transplant	Total
<b>Adenocarcinoma</b>			
Breast	4 (#1)	1	5
Colon	6 (#5)	3	9
Kidney	4 (#4)	1	5
Kidney and Sarcoma	-	1	1
Lung	2	2	4
Ovary	2 (#1)	1	3
Pancreas	1 (#1)	-	1
Prostate	5 (#3)	-	5
Recto-sigmoid and rectum	3 (#1)	-	3
Unknown	-	1	1
<b>Leukaemia</b>	3 (#1)	1	4
<b>Leukaemia and Merkel Cell</b>	-	1	1
<b>Lymphoma</b>			
Cervical node	-	1	1
Gastric	-	1	1
Liver	1	-	1
Mediastinum	1	-	1
Retroperitoneal	1	-	1
<b>Melanoma - Skin</b>	2 (#1)	2	4
<b>Merkel Cell</b>	-	3	3
<b>Myeloma</b>	18 (#17)	-	18
<b>Squamous Cell Carcinoma</b>			
Bladder	-	1	1
Cervix	1 (#1)	-	1
Larynx	-	1	1
Lung	4 (#1)	1	5
Mouth	-	2	2
Oesophagus	1	-	1
Penis	-	1	1
Retropharynx	-	1	1
Skin	1	7	8
<b>Transitional Cell Carcinoma</b>			
Bladder	4 (#2)	1	5
Kidney	4 (#3)	1	5
<b>Other</b>			
Astrocytoma - brain	-	1	1
Carcinoid - appendix	1 (*1)	-	1
Follicular - thyroid	-	1	1
Glioblastoma - brain	1	1	2
Haemangiopericytoma - cerebellum	1	-	1
Hepatocellular - liver	1 (#1)	1	2
Large cell - lung	1 (*1)	-	1
Leiomyosarcoma - stomach	1	-	1
Mesothelioma - pleura	1 (*1)	-	1
Small cell - lung	2	1	3
Undifferentiated - lung	-	1	1
Unknown - lung	3	1	4
Unknown - primary unknown	2	1	3
<b>Total Deaths</b>	<b>82</b>	<b>43</b>	<b>125</b>
# (43 pts) diagnosed pre dialysis * (3 patients) had previously been transplanted			
<b>New Zealand</b>			
<b>Adenocarcinoma</b>			
Breast	1 (#1)	1	2
Colon	-	1	1
Kidney	3 (*1) (#2)	2	5
Lung	1 (#1)	-	1
Pancreas	1	-	1
<b>Leukaemia</b>	1 (#1)	-	1
<b>Lymphoma - Transplant kidney</b>	1 (*1)	-	1
<b>Myeloma</b>	2 (#2)	-	2
<b>Squamous Cell Carcinoma</b>			
Skin	-	3	3
Tonsil	-	1	1
<b>Other</b>			
Leiomyosarcoma - femoral groin	1 (*1)	-	1
Non small cell - lung	-	1	1
Small cell - lung	1	-	1
Spindle Cell - skin	-	1	1
Unknown - brain	1	-	1
Unknown - lung	2	-	2
<b>Total Deaths</b>	<b>15</b>	<b>10</b>	<b>25</b>
# (7 pts) diagnosed pre dialysis * (3 patients) had previously been transplanted			

## DEATHS FROM MALIGNANCY

### AUSTRALIA

During 2005 there were 125 deaths directly attributed to malignancies (82 among dialysis dependent and 43 among functioning transplant patients). Deaths were attributed by modality at time of death.

#### DIALYSIS DEPENDENT

Forty three of the 63 patients had cancer diagnosed before or within one month of starting their first dialysis.

A further seven tumours were identified between one and nine months after the first dialysis. There were thirteen patients who had been dialysed for more than five years. Three patients had a previous renal transplant.

There were eighteen cases with myeloma, twelve tumours of the lung, eight of the kidney, six colon, five prostate, four breast and bladder, three recto-sigmoid and rectum, two ovary and one pancreas. There were three lymphomas (liver, mediastinum, retroperitoneal) and three leukaemias. There were two melanoma of the skin, one each SCC of the cervix, oesophagus and skin, carcinoid of the appendix, glioblastoma of the brain, haemangiopericytoma of the cerebellum, hepatocellular of the liver, leiomyosarcoma of the stomach, mesothelioma of the pleura and two unknown primary tumours.

The myeloma patients had a median survival of 10.5 months from diagnosis (range 2-82 months).

#### FUNCTIONING TRANSPLANT

There were 43 deaths in 2005 (51 in 2004) in this group.

Thirty one died from non-skin cancer: ten from adenocarcinoma, seven squamous cell carcinoma, two lymphoma, two transitional cell carcinoma, two with leukaemia (one also with Merkel Cell) one follicular cancer of the thyroid, one hepatocellular of the liver, one each astrocytoma and glioblastoma of the brain, one small cell, one undifferentiated, one unknown of the lung and one unknown primary.

Twelve died from skin cancer: seven from squamous cell carcinoma, three from Merkel Cell and two from melanoma.

### NEW ZEALAND

#### DIALYSIS DEPENDENT

There were fifteen deaths due to malignancy, seven were diagnosed before dialysis. Three had received a previous transplant. Two patients had dialysed for more than five years. Six were adenocarcinoma, two myeloma, one each leukaemia, lymphoma and five other.

#### FUNCTIONING TRANSPLANT

There were ten deaths; four from adenocarcinoma, four squamous cell carcinoma (three skin and one of the tonsil) and one each non small cell of the lung and spindle cell of the skin.



## DEATHS FROM WITHDRAWAL FROM TREATMENT RELATED TO MALIGNANCY

### AUSTRALIA

From October 2003, six new categories were introduced to provide more detail regarding treatment withdrawal (principally withdrawal from dialysis). One of these new categories was withdrawal from treatment related to malignancy.

During 2005 there were 50 deaths among dialysis patients attributed to withdrawal from treatment related to malignancy.

#### DIALYSIS DEPENDENT

Twenty seven of the fifty patients had cancer diagnosed before their first dialysis or within two months of commencing treatment.

Four further tumours were identified less than twelve months after the first dialysis. There were twelve patients who had been dialysed for more than five years. Three had a previous renal transplant. Ten patients dialysed between two and six months before treatment was withdrawn.

There were nineteen cases with adenocarcinoma, ten with myeloma, six each with transitional cell and squamous cell carcinoma, two lymphomas, one merkel cell, one leukaemia and five other types of malignancy.

The myeloma patients had a median survival from diagnosis of 35.5 months (range 2-130 months).

#### FUNCTIONING TRANSPLANT

There were no patients in this group in 2005.

### NEW ZEALAND

#### DIALYSIS DEPENDENT

Seven patients had withdrawal of treatment related to malignancy in 2005.

Two of the seven patients had cancer diagnosed before their first dialysis. One each had adenocarcinoma of the colon, kidney, lung; squamous cell carcinoma of the tongue; unknown tumour of the lung; merkel cell and myeloma. One had been transplanted previously.

#### FUNCTIONING TRANSPLANT

There were no patients in this group in 2005.

**Figure 3.10**

### Deaths from Withdrawal from Treatment Due to Malignancy 2005 By RRT Modality at Time of Death

Australia	Dialysis	Tx	Total
<b>Adenocarcinoma</b>			
Breast	1	-	<b>1</b>
Colon	5 (*1) (#1)	-	<b>5</b>
Kidney	7 (#6)	-	<b>7</b>
Lung	1	-	<b>1</b>
Prostate	3 (#1)	-	<b>3</b>
Stomach	2	-	<b>2</b>
<b>Leukaemia</b>	1 (#1)	-	<b>1</b>
<b>Lymphoma</b>			
Paratracheal	1	-	<b>1</b>
Stomach	1 (*1)	-	<b>1</b>
<b>Merkel Cell</b>	1	-	<b>1</b>
<b>Myeloma</b>	10 (#10)	-	<b>10</b>
<b>Squamous Cell Carcinoma</b>			
Lung	1	-	<b>1</b>
Primary Unknown	1	-	<b>1</b>
Rectum	1	-	<b>1</b>
Skin	3 (#3)	-	<b>3</b>
<b>Transitional Cell Carcinoma</b>			
Bladder	2 (#1)	-	<b>2</b>
Kidney	4 (#4)	-	<b>4</b>
<b>Other</b>			
Hepatocellular - Liver	1	-	<b>1</b>
Large cell - Lung	1 (*1)	-	<b>1</b>
Small cell - Lung	1	-	<b>1</b>
Unknown - Lung	1	-	<b>1</b>
Unknown - Primary Unknown	1	-	<b>1</b>
<b>Total Deaths</b>	<b>50</b>	<b>-</b>	<b>50</b>

#(27) patients diagnosed pre dialysis or within two months of commencing  
\* (3 patients) had previously been transplanted

### New Zealand

<b>Adenocarcinoma</b>			
Colon	1	-	<b>1</b>
Kidney	1	-	<b>1</b>
Lung	1	-	<b>1</b>
<b>Merkel Cell</b>	1 (*1)	-	<b>1</b>
<b>Myeloma</b>	1 (#1)	-	<b>1</b>
<b>Squamous Cell Carcinoma</b>			
Tongue	1	-	<b>1</b>
<b>Other</b>			
Unknown - Lung	1 (#1)	-	<b>1</b>
<b>Total Deaths</b>	<b>7</b>	<b>-</b>	<b>7</b>

# (2) patients diagnosed pre dialysis or within two months of commencing  
\* (1 patient) had been previously transplanted

