

# **CHAPTER 3**

## **DEATHS**

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## INTRODUCTION

Death rate is reported as number of patients died/total number of years of treatment of all patients treated at any time during the year. It is expressed as deaths per 100 patient years (pt yrs) at risk.

**In this report, as in previous years, death is attributed to the renal replacement modality at the time of death.**

This report contains two forms of reporting the incidence of death:

- \* Rate related to number of treatment years.
- \* Proportion of all patients treated.

## AUSTRALIA

### DIALYSIS DEPENDENT

The number of deaths totalled 1079, 16.2 deaths per 100 pt yrs at risk, 12.8% of patients treated at any time during the past year. For those treated with peritoneal dialysis, 310 deaths occurred, 17.7 deaths per 100 pt yrs at risk, 11.8% of patients dialysed. For haemodialysis there were 769 deaths, 15.8 deaths per 100 pt yrs at risk, 11.7% of patients dialysed (fig 3.5 and 3.6).

### TRANSPLANT DEPENDENT

There were 149 deaths (2.8 deaths per 100 pt yrs at risk) of patients with a functioning transplant; 2.5% of patients with a functioning graft during the year. The cadaver donor recipient death rate was 3.4 per 100 pt yrs, and the living donor recipient rate 1.0 per 100 pt yrs. The death rate in relation to age is shown in Figures 3.5 and 3.7.

## NEW ZEALAND

### DIALYSIS DEPENDENT

There were 261 deaths, 18.6 deaths per 100 pt yrs at risk which was 14.3% of patients dialysed during 2001. For those treated with haemodialysis there were 126 deaths, 17.6 deaths per 100 pt yrs at risk, 11.9 % of patients dialysed, peritoneal dialysis (19.5 deaths per 100 pt yrs at risk) 13.8 % of patients dialysed (fig 3.5 and 3.8). See Appendix III at Website ([www.anzdata.org.au](http://www.anzdata.org.au)).

### TRANSPLANT DEPENDENT

There were 23 deaths (2.2 deaths per 100 pt yrs at risk) (2% at risk). Cadaver donor recipient death rate was 2.6 per 100 pt yrs, living donors 1.4 per 100 pt yrs (fig 3.5 and 3.9).

**Figure 3.1**

**Death Rates by States 1995 - 2001**  
**All Dialysis Patients**  
(per 100 patient years)

Year	Qld	NSW	ACT	Vic.	Tas.	SA	NT	WA	Aust.	N. Z.
1995	16.8	13.8	11.4	15.4	18.6	16.2	20.2	13.1	<b>15.0</b>	<b>19.0</b>
1996	17.7	14.2	15.4	14.0	14.6	23.5	23.1	14.5	<b>15.6</b>	<b>14.8</b>
1997	16.5	16.7	12.2	12.5	15.3	20.5	18.4	17.1	<b>15.8</b>	<b>15.9</b>
1998	19.3	16.9	15.3	15.8	25.9	15.7	15.8	13.6	<b>16.7</b>	<b>16.6</b>
1999	20.7	16.0	14.7	14.1	23.9	15.2	17.6	17.3	<b>16.5</b>	<b>16.4</b>
2000	16.9	16.5	13.5	14.0	14.7	14.3	20.0	16.3	<b>15.7</b>	<b>19.2</b>
2001	18.6	15.3	14.2	14.3	23.4	14.3	15.0	21.9	<b>16.2</b>	<b>18.6</b>

**Figure 3.2**

**Death Rates by States**  
**Dialysis Modality & Age Groups 2001**  
(per 100 patient years)

Age Group	Treatment	Qld	NSW	ACT	Vic.	Tas.	SA	NT	WA	Aust.	N.Z.
<b>45-64 yrs</b>	All Patients	14.1	11.5	6.3	11.1	18.8	9.7	17.2	16.5	<b>12.5</b>	<b>17.3</b>
	PD	13.0	11.4	0.0	11.3	0.0	13.6	60.2	14.2	<b>12.4</b>	<b>19.6</b>
	HD	14.6	11.5	9.0	11.1	21.4	9.0	12.1	17.5	<b>12.5</b>	<b>15.1</b>
<b>65-84 yrs</b>	All Patients	27.3	23.6	28.2	20.7	36.2	21.6	18.2	34.0	<b>24.4</b>	<b>30.8</b>
	PD	22.8	28.1	30.3	21.4	22.0	29.6	30.9	38.9	<b>23.6</b>	<b>26.3</b>
	HD	29.3	21.4	26.6	20.5	39.7	19.2	16.5	32.0	<b>26.6</b>	<b>36.7</b>

**Figure 3.3**
**Cause of Death Dialysis and Transplant Dependent  
1-Jan-2001 to 31-Dec-2001**

Cause of Death	Australia		New Zealand	
	Dialysis	Transplant	Dialysis	Transplant
<b>Cardiac</b>				
Cardiac Arrest	176	14	28	3
Haemorrhagic Pericarditis	2	0	0	0
Hyperkalaemia	10	0	1	0
Hypertensive Cardiac Failure	6	1	1	0
Myocardial Infarction	128	21	28	3
Myocardial Infarction (presumed)	119	7	45	0
Other Causes of Cardiac Failure	33	4	4	0
Pulmonary Oedema	6	0	3	0
<b>Sub Total</b>	<b>480 (44%)</b>	<b>50 (34%)</b>	<b>110 (42%)</b>	<b>6 (26%)</b>
<b>Infection</b>				
CNS - fungal	0	2 (g)	0	0
Lung - bacterial	24	2	4	0
Lung - viral	2 (a,b)	1 (e)	0	0
Lung - fungal	1 (c)	5 (c,g)	0	0
Lung - other	7 (j)	0	1 (j)	0
Urinary Tract - bacterial	1	0	0	0
Wound - bacterial	8	0	4	0
Shunt - bacterial	3	0	0	0
Peritoneum - bacterial	18	0	6	0
Peritoneum - fungal	3 (d)	0	1 (d)	0
Peritoneum - other	1 (j)	0	1 (j)	0
Septicaemia - bacterial	29	5	6	0
Septicaemia - viral	2 (e,f)	1 (e)	0	0
Septicaemia - fungal	2 (c,d)	1 (d)	1 (c)	0
Septicaemia - protozoa	0	0	0	1 (i)
Septicaemia - other	9 (j)	2 (j)	5 (j)	0
Liver - bacterial	1	1	0	0
Other Site - bacterial	22	2	1	1
Other Site - viral	0	1 (h)	0	0
Other Site - other	2 (j)	0	1 (j)	1 (j)
<b>SubTotal</b>	<b>135 (13%)</b>	<b>23 (15%)</b>	<b>31 (12%)</b>	<b>3 (13%)</b>
<b>Vascular</b>				
Bowel Infarction	25	2	2	2
Cerebrovascular Accident	69	9	24	0
Gastrointestinal Haemorrhage	8	0	3	0
Haemorrhage - dialysis access site	1	0	1	0
Haemorrhage - elsewhere	2	0	1	0
Haemorrhage - transplant artery	0	1	0	0
Pulmonary Embolus	1	1	1	0
Ruptured Aortic Aneurysm	0	1	2	0
<b>Sub Total</b>	<b>106 (10%)</b>	<b>14 (9%)</b>	<b>34 (13%)</b>	<b>2 (9%)</b>
<b>Social</b>				
Accident	5	2	4	0
Patient refused further treatment	152	2	40	1
Suicide	2	0	0	0
Therapy ceased	86	0	12	0
<b>Sub Total</b>	<b>245 (23%)</b>	<b>4 (3%)</b>	<b>56 (21%)</b>	<b>1 (4%)</b>
<b>Miscellaneous</b>				
Cachexia	10	1	2	0
Chronic Respiratory Failure	8	3	1	0
Hepatic Failure	5	3	1	0
<b>Malignancy</b>	<b>63</b>	<b>37</b>	<b>16</b>	<b>6</b>
Other	15	4	2	0
Pancreatitis	1	1	0	1
Perforation Abdominal Viscus	8	3	7	3
Sclerosing Peritonitis	1	0	0	0
Unknown	2	4	1	0
Uraemia - graft failure	0	2	0	1
<b>Sub Total</b>	<b>113 (10%)</b>	<b>58 (39%)</b>	<b>30 (12%)</b>	<b>11 (48%)</b>
<b>Total</b>	<b>1079 (100%)</b>	<b>149 (100%)</b>	<b>261 (100%)</b>	<b>23 (100%)</b>

(a) Herpes Zoster (b) Virus not isolated (c) Aspergillus (d) Candida (e) CMV  
(f) Varicella (g) Cryptococcus (h) Rotavirus (i) Toxoplasmosis (j) Organism not isolated

## CAUSE OF DEATHS

### AUSTRALIA

#### DIALYSIS DEPENDENT

Cardiac events (44%) were the most common cause of death reported followed by “social causes” (23%), infection (13%), miscellaneous (10%) and vascular (10%). Myocardial infarction (23%) and “cardiac arrest” (16%) formed the great majority of the cardiac group.

The site of infection was most commonly septicaemia followed by the peritoneum and the lung. The detail of the site and identity of the organisms can be found at Website ([www.anzdata.org.au](http://www.anzdata.org.au)).

Withdrawal of treatment was reported as the cause for 22% of deaths, similar to last year; mostly in the older age group. Twenty one percent were diabetics. Four patients under 35 years of age withdrew from treatment.

The proportion of deaths from malignancy (5.8%) was similar to last year.

#### TRANSPLANT DEPENDENT

Cardiac events were the most common cause of death followed by malignancy (25%) then infection (15%).

### DEATH OF YOUNG ADULTS

#### 15-24 YEARS OF AGE

There were six deaths in the age group 15-24 years; three females and three males. Two were haemodialysis dependent, two peritoneal dialysis dependent, and two had functioning transplants.

Causes of death were: motor vehicle accidents, hyperkalaemia, presumed myocardial infarction,

dilated cardiomyopathy, pancreatitis and probable heroin overdose.

#### 25-34 YEARS OF AGE

There were 17 deaths in this age group; twelve males and five females.

Two died with a functioning transplant, eleven were haemodialysis dependent (five hospital, four satellite and two home) and four peritoneal dialysis dependent (three continuous ambulatory peritoneal dialysis and one automated peritoneal dialysis).

Causes of death were cardiac five, refusal or withdrawal of treatment four, vascular two, infection two, and one each of malignancy, perforation of abdominal viscus, calciphylaxis and unknown.

### NEW ZEALAND

#### DIALYSIS DEPENDENT

There was a 7% increase in deaths (261 in 2001) from 246 in 2000. Cardiac causes comprised 42%, “social” 21%, vascular 13%, infection and miscellaneous 12%. Treatment withdrawal was reported as cause in 52 patients (20%).

#### TRANSPLANT DEPENDENT

There were 11 deaths among transplant dependent patients, with cardiac disease and malignancy the major cause. Notably, 13% of deaths occurred following a perforated viscus, a larger proportion to the dialysis group (3%) or either group in Australia.

**Figure 3.4**

#### Death as a Proportion of Dialysis Treated Patients 1997 - 2001

		1997	1998	1999	2000	2001
<b>Australia</b>	<b>All Dialysis</b>	12.3%	12.9%	12.9%	12.3%	12.8%
	PD	11.4%	11.9%	12.3%	11.4%	11.8%
	HD	10.9%	11.3%	11.2%	11.3%	11.7%
	<b>All Patients 55-64 years</b>	14%	12%	12.5%	10.4%	11.3%
	PD	12%	9%	9%	9.9%	8.7%
	HD	13%	11%	12%	9.1%	10.9%
	<b>All Patients 65-74 years</b>	18%	18%	19%	16.7%	16.6%
	PD	16%	16%	16%	14.1%	15.8%
	HD	17%	16%	17%	15.6%	14.9%
<b>New Zealand</b>	<b>All Dialysis</b>	12.3%	12.7%	12.6%	14.8%	14.3%
	PD	11.7%	12.1%	10.6%	14.7%	13.8%
	HD	8.8%	9.7%	11.3%	10.9%	11.9%

**Figure 3.5**

**Dialysis and Transplant Patient Deaths \*  
Deaths as a Proportion of All Patients Treated During the Year 2001**

Mode of Treatment	No. of Pts.	Age Groups										Total Deaths
		00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	> 85	
<b>Australia</b>												
<b>All Patients</b>												
Peritoneal Dialysis	2614	0%	0%	3%	3%	5%	8%	9%	16%	21%	29%	<b>11.8% (310)</b>
Haemodialysis	6568	0%	0%	2%	2%	5%	7%	11%	15%	21%	40%	<b>11.7% (769)</b>
<b>All Dialysis Pts</b>	<b>8406</b>	<b>0%</b>	<b>0%</b>	<b>2%</b>	<b>3%</b>	<b>5%</b>	<b>8%</b>	<b>11%</b>	<b>17%</b>	<b>23%</b>	<b>40%</b>	<b>12.8% (1079)</b>
<b>Transplant Pts</b>	<b>5784</b>	<b>5.5%</b>	<b>1%</b>	<b>1%</b>	<b>&lt;1%</b>	<b>&lt;1%</b>	<b>1%</b>	<b>5%</b>	<b>8%</b>	<b>17%</b>	<b>0%</b>	<b>2.5% (149)</b>
<b>Diabetic Patients</b>												
Peritoneal Dialysis	641	0%	0%	0%	3%	6%	15%	12%	19%	28%	0%	<b>15.1% (97)</b>
Haemodialysis	1224	0%	0%	0%	2%	12%	12%	15%	15%	20%	0%	<b>14.0% (172)</b>
<b>All Diabetic Dx</b>	<b>1671</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>3%</b>	<b>11%</b>	<b>15%</b>	<b>16%</b>	<b>18%</b>	<b>25%</b>	<b>0%</b>	<b>16.0% (269)</b>
<b>Diabetic Tx</b>	<b>419</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>2%</b>	<b>3%</b>	<b>9%</b>	<b>8%</b>	<b>0%</b>	<b>0%</b>	<b>3.5% (15)</b>
<b>Non Diabetic Patients</b>												
Peritoneal Dialysis	1973	0%	0%	3%	2%	4%	5%	7%	15%	19%	33%	<b>10.7% (213)</b>
Haemodialysis	5344	0%	0%	2%	2%	4%	6%	10%	15%	21%	41%	<b>11.1% (597)</b>
<b>Non Diabetic Pts</b>	<b>6735</b>	<b>0%</b>	<b>0%</b>	<b>2%</b>	<b>3%</b>	<b>4%</b>	<b>6%</b>	<b>10%</b>	<b>16%</b>	<b>23%</b>	<b>42%</b>	<b>12.0% (810)</b>
<b>Non Diabetic Tx</b>	<b>5365</b>	<b>5.5%</b>	<b>1%</b>	<b>&lt;1%</b>	<b>&lt;1%</b>	<b>&lt;1%</b>	<b>1%</b>	<b>4%</b>	<b>7%</b>	<b>17.5%</b>	<b>0%</b>	<b>2.4% (134)</b>
<b>New Zealand</b>												
<b>All Patients</b>												
Peritoneal Dialysis	974	0%	0%	3%	6%	4%	10%	17%	18%	17%	36%	<b>13.8% (135)</b>
Haemodialysis	1055	0%	0%	0%	6%	3%	8%	13%	17%	36%	0%	<b>11.9% (126)</b>
<b>All Dialysis Pts</b>	<b>1823</b>	<b>0%</b>	<b>10%</b>	<b>31%</b>	<b>7%</b>	<b>4%</b>	<b>10%</b>	<b>17%</b>	<b>20%</b>	<b>30%</b>	<b>38%</b>	<b>14.3% (261)</b>
<b>Transplant Pts</b>	<b>1130</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>&lt;1%</b>	<b>1%</b>	<b>9%</b>	<b>7.5%</b>	<b>8%</b>	<b>0%</b>	<b>2.0% (23)</b>
<b>Diabetic Patients</b>												
Peritoneal Dialysis	377	0%	0%	0%	13%	10%	13%	22%	20%	27%	0%	<b>18.5% (70)</b>
Haemodialysis	338	0%	0%	0%	11%	4%	12%	13%	17%	54%	0%	<b>14.4% (49)</b>
<b>All Diabetic Dx</b>	<b>637</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>13%</b>	<b>8%</b>	<b>14%</b>	<b>20%</b>	<b>21%</b>	<b>48%</b>	<b>0%</b>	<b>18.6% (119)</b>
<b>Diabetic Tx</b>	<b>102</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>3%</b>	<b>3%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>1.9% (2)</b>
<b>Non Diabetic Patients</b>												
Peritoneal Dialysis	597	0%	0%	3%	5%	2%	7%	11%	17%	16%	36%	<b>10.8% (65)</b>
Haemodialysis	717	0%	25%	2%	6%	3%	5%	12%	17%	33%	33%	<b>10.7% (77)</b>
<b>Non Diabetic Pts</b>	<b>1186</b>	<b>0%</b>	<b>10%</b>	<b>3%</b>	<b>6%</b>	<b>2%</b>	<b>6%</b>	<b>13%</b>	<b>19%</b>	<b>28%</b>	<b>38%</b>	<b>11.9% (142)</b>
<b>Non Diabetic Tx</b>	<b>1028</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>&lt;1%</b>	<b>&lt;1%</b>	<b>5%</b>	<b>8%</b>	<b>8%</b>	<b>0%</b>	<b>2.0% (21)</b>

\* Expressed as (%) of all patients, non diabetic, and diabetic patients treated by dialysis or with a functioning transplant in 2001

Note: some patients will have been treated by both peritoneal dialysis and haemodialysis

<b>Figure 3.6</b>		<b>Australia</b>						
<b>Death Rates, Dialysis Patients 2001</b>								
<b>(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>0</b>	<b>3.0</b>	<b>5.4</b>	<b>12.5</b>	<b>24.4</b>	<b>60.3</b>	<b>16.2</b>	
No. of Deaths	0	4	66	306	673	30	<b>1079</b>	
No. at Risk	49	171	1504	3080	3531	71	<b>8406</b>	
<b>Diabetic Death Rate</b>	<b>0</b>	<b>0</b>	<b>12.2</b>	<b>20.3</b>	<b>26.4</b>	<b>0</b>	<b>21.3</b>	
No. of Deaths	0	0	23	120	126	0	<b>269</b>	
No. at Risk	0	4	254	785	626	2	<b>1671</b>	
<b>Non Diabetic Death Rate</b>	<b>0</b>	<b>3.0</b>	<b>4.2</b>	<b>10.0</b>	<b>24.0</b>	<b>62.1</b>	<b>15.1</b>	
No. of Deaths	0	4	43	186	547	30	<b>810</b>	
No. at Risk	49	167	1250	2295	2905	69	<b>6735</b>	
<b>Peritoneal Dialysis ★</b>								
<b>All Patients Death Rate</b>	<b>0</b>	<b>4.8</b>	<b>5.5</b>	<b>12.5</b>	<b>26.6</b>	<b>49.4</b>	<b>17.7</b>	
No. of Deaths	0	2	15	78	208	7	<b>310</b>	
No. at Risk	36	63	396	1916	1180	23	<b>2614</b>	
<b>Diabetic Death Rate</b>	<b>0</b>	<b>0</b>	<b>8.0</b>	<b>20.5</b>	<b>36.1</b>	<b>0</b>	<b>24.3</b>	
No. of Deaths	0	0	5	38	54	0	<b>97</b>	
No. at Risk	0	2	97	293	247	2	<b>641</b>	
<b>Non Diabetic Death Rate</b>	<b>0</b>	<b>4.9</b>	<b>4.7</b>	<b>9.2</b>	<b>24.3</b>	<b>55.0</b>	<b>15.7</b>	
No. of Deaths	0	2	10	40	154	7	<b>213</b>	
No. at Risk	36	61	299	623	933	21	<b>1973</b>	
<b>Haemodialysis ★</b>								
<b>All Patients Death Rate</b>	<b>0</b>	<b>2.2</b>	<b>5.4</b>	<b>12.4</b>	<b>23.6</b>	<b>64.66</b>	<b>15.8</b>	
No. of Deaths	0	2	51	228	465	23	<b>769</b>	
No. at Risk	17	124	1245	2454	2675	53	<b>6568</b>	
<b>Diabetic Death Rate</b>	<b>0</b>	<b>0</b>	<b>14.4</b>	<b>20.2</b>	<b>21.9</b>	<b>0</b>	<b>20.0</b>	
No. of Deaths	0	0	18	82	72	0	<b>172</b>	
No. at Risk	0	2	188	592	442	0	<b>1224</b>	
<b>Non Diabetic Death Rate</b>	<b>0</b>	<b>2.2</b>	<b>4.0</b>	<b>10.2</b>	<b>23.9</b>	<b>64.7</b>	<b>14.8</b>	
No. of Deaths	0	2	33	146	393	23	<b>597</b>	
No. at Risk	17	122	1057	1862	2233	53	<b>5344</b>	

<b>Figure 3.7</b>		<b>Australia</b>									
<b>Death Rates, Transplant Patients 2001</b>											
<b>(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>7.4</b>	<b>1.0</b>	<b>0.9</b>	<b>0.3</b>	<b>0.7</b>	<b>1.6</b>	<b>5.0</b>	<b>7.9</b>	<b>18.2</b>	<b>2.8</b>	
No. of Deaths	1	1	2	2	8	22	57	46	10	<b>149</b>	
No. at Risk	18	108	265	778	1202	1494	1235	621	60	<b>5784</b>	
<b>Diabetic Death Rate</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2.5</b>	<b>3.2</b>	<b>11.1</b>	<b>7.7</b>	<b>0</b>	<b>4.0</b>	
No. of Deaths	0	0	0	0	3	4	7	1	0	<b>15</b>	
No. at Risk	0	0	0	56	134	139	76	13	1	<b>419</b>	
<b>Non Diabetic Death Rate</b>	<b>7.4</b>	<b>1.0</b>	<b>0.9</b>	<b>0.3</b>	<b>0.5</b>	<b>1.4</b>	<b>4.6</b>	<b>7.9</b>	<b>18.6</b>	<b>2.7</b>	
No. of Deaths	1	1	2	2	5	18	50	45	10	<b>134</b>	
No. at Risk	18	108	265	722	1068	1355	1159	608	59	<b>5365</b>	
<b>Cadaver Transplants</b>											
<b>All Patients Death Rate</b>	<b>0</b>	<b>2.8</b>	<b>1.1</b>	<b>0.2</b>	<b>1.0</b>	<b>1.8</b>	<b>5.3</b>	<b>8.4</b>	<b>14.9</b>	<b>3.4</b>	
No. of Deaths	0	1	1	1	8	20	53	45	8	<b>137</b>	
No. at Risk	1	38	105	478	856	1198	1064	571	58	<b>4369</b>	
<b>Diabetic Death Rate</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3.1</b>	<b>3.8</b>	<b>11.3</b>	<b>9.1</b>	<b>0</b>	<b>4.5</b>	
No. of Deaths	0	0	0	0	3	4	6	1	0	<b>14</b>	
No. at Risk	0	0	0	47	108	115	62	11	1	<b>344</b>	
<b>Non Diabetic Death Rate</b>	<b>0</b>	<b>2.8</b>	<b>1.0</b>	<b>0.2</b>	<b>0.7</b>	<b>1.6</b>	<b>5.0</b>	<b>8.4</b>	<b>15.2</b>	<b>3.3</b>	
No. of Deaths	0	1	1	1	5	16	47	44	8	<b>123</b>	
No. at Risk	1	38	105	431	748	1083	1002	560	57	<b>4025</b>	
<b>Living Donor Transplants</b>											
<b>All Patients Death Rate</b>	<b>7.4</b>	<b>0</b>	<b>0.7</b>	<b>0.4</b>	<b>0</b>	<b>0.8</b>	<b>2.6</b>	<b>2.2</b>	<b>158.7</b>	<b>1.0</b>	
No. of Deaths	1	0	1	1	0	2	4	1	2	<b>12</b>	
No. at Risk	17	70	160	300	348	297	171	50	2	<b>1415</b>	
<b>Diabetic Death Rate</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9.7</b>	<b>0</b>	<b>0</b>	<b>1.6</b>	
No. of Deaths	0	0	0	0	0	0	1	0	0	<b>1</b>	
No. at Risk	0	0	0	9	26	24	14	2	0	<b>75</b>	
<b>Non Diabetic Death Rate</b>	<b>7.4</b>	<b>0</b>	<b>0.7</b>	<b>0.4</b>	<b>0</b>	<b>0.8</b>	<b>2.1</b>	<b>2.3</b>	<b>158.7</b>	<b>0.9</b>	
No. of Deaths	1	0	1	1	0	2	3	1	2	<b>11</b>	
No. at Risk	17	70	160	291	322	273	157	48	2	<b>1340</b>	

**Figure 3.8** **New Zealand**

**Death Rates, Dialysis Patients 2001**  
(per 100 patient years)  
★ Treatment at Death

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>9.8</b>	<b>3.9</b>	<b>6.0</b>	<b>17.3</b>	<b>30.8</b>	<b>59.7</b>	<b>18.6</b>
No. of Deaths	1	2	16	117	120	5	<b>261</b>
No. at Risk	16	67	340	862	526	12	<b>1823</b>
<b>Diabetic Death Rate</b>	<b>0</b>	<b>0</b>	<b>11.4</b>	<b>23.4</b>	<b>34.7</b>	<b>0</b>	<b>24.6</b>
No. of Deaths	0	0	6	75	38	0	<b>119</b>
No. at Risk	0	0	66	422	149	0	<b>637</b>
<b>Non Diabetic Death Rate</b>	<b>9.8</b>	<b>3.9</b>	<b>4.6</b>	<b>11.8</b>	<b>29.2</b>	<b>59.7</b>	<b>15.4</b>
No. of Deaths	1	2	10	42	82	5	<b>142</b>
No. at Risk	16	67	274	440	377	12	<b>1186</b>
<b>Peritoneal Dialysis ★</b>							
<b>All Patients Death Rate</b>	<b>0</b>	<b>4.8</b>	<b>6.8</b>	<b>19.6</b>	<b>26.3</b>	<b>53.0</b>	<b>19.5</b>
No. of Deaths	0	1	7	64	59	4	<b>135</b>
No. at Risk	13	29	147	448	326	11	<b>974</b>
<b>Diabetic Death Rate</b>	<b>0</b>	<b>0</b>	<b>14.8</b>	<b>26.3</b>	<b>33.3</b>	<b>0</b>	<b>26.7</b>
No. of Deaths	0	0	4	46	20	0	<b>70</b>
No. at Risk	0	0	39	246	92	0	<b>377</b>
<b>Non Diabetic Death Rate</b>	<b>0</b>	<b>4.8</b>	<b>3.9</b>	<b>11.8</b>	<b>23.8</b>	<b>53.0</b>	<b>15.2</b>
No. of Deaths	0	1	3	18	39	4	<b>65</b>
No. at Risk	13	29	108	202	234	11	<b>597</b>
<b>Haemodialysis ★</b>							
<b>All Patients Death Rate</b>	<b>47.6</b>	<b>3.3</b>	<b>5.4</b>	<b>15.1</b>	<b>36.7</b>	<b>120.5</b>	<b>17.6</b>
No. of Deaths	1	1	9	53	61	1	<b>126</b>
No. at Risk	6	44	227	508	268	2	<b>1055</b>
<b>Diabetic Death Rate</b>	<b>0</b>	<b>0</b>	<b>7.9</b>	<b>19.8</b>	<b>36.4</b>	<b>0</b>	<b>22.1</b>
No. of Deaths	0	0	2	29	18	0	<b>49</b>
No. at Risk	0	0	37	225	76	0	<b>338</b>
<b>Non Diabetic Death Rate</b>	<b>47.6</b>	<b>3.3</b>	<b>5.0</b>	<b>11.8</b>	<b>36.9</b>	<b>120.5</b>	<b>15.6</b>
No. of Deaths	1	1	7	24	43	1	<b>77</b>
No. at Risk	6	44	190	283	192	2	<b>717</b>

**Figure 3.9** **New Zealand**

**Death Rates, Transplant Patients 2001**  
(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
<b>All Transplants</b>										
<b>All Patients Death Rate</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.8</b>	<b>1.1</b>	<b>5.2</b>	<b>8.0</b>	<b>8.0</b>	<b>2.2</b>
No. of Deaths	0	0	0	0	2	3	9	8	1	<b>23</b>
No. at Risk	4	22	57	173	272	290	191	103	13	<b>1130</b>
<b>Diabetic Death Rate</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3.3</b>	<b>3.8</b>	<b>0</b>	<b>0</b>	<b>2.2</b>
No. of Deaths	0	0	0	0	0	1	1	0	0	<b>2</b>
No. at Risk	0	0	0	5	29	34	29	5	0	<b>102</b>
<b>Non Diabetic Death Rate</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.9</b>	<b>0.8</b>	<b>5.4</b>	<b>8.4</b>	<b>8.0</b>	<b>2.2</b>
No. of Deaths	0	0	0	0	2	2	8	8	1	<b>21</b>
No. at Risk	4	22	57	168	243	256	162	102	13	<b>1027</b>
<b>Cadaver Transplants</b>										
<b>All Patients Death Rate</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1.1</b>	<b>0.9</b>	<b>5.4</b>	<b>7.7</b>	<b>0</b>	<b>2.6</b>
No. of Deaths	0	0	0	0	2	2	8	7	0	<b>19</b>
No. at Risk	2	8	18	87	190	228	163	98	12	<b>806</b>
<b>Diabetic Death Rate</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4.4</b>	<b>4.1</b>	<b>0</b>	<b>0</b>	<b>2.5</b>
No. of Deaths	0	0	0	0	0	1	1	0	0	<b>2</b>
No. at Risk	0	0	0	5	26	25	27	5	0	<b>88</b>
<b>Non Diabetic Death Rate</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1.3</b>	<b>0.5</b>	<b>5.6</b>	<b>8.1</b>	<b>0</b>	<b>2.6</b>
No. of Deaths	0	0	0	0	2	1	7	7	0	<b>17</b>
No. at Risk	2	8	18	82	164	203	136	93	12	<b>718</b>
<b>Living Donor Transplants</b>										
<b>All Patients Death Rate</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1.8</b>	<b>4.0</b>	<b>11.4</b>	<b>217.4</b>	<b>1.4</b>
No. of Deaths	0	0	0	0	0	1	1	1	1	<b>4</b>
No. at Risk	2	14	39	86	82	62	28	9	1	<b>323</b>
<b>Diabetic Death Rate</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
No. of Deaths	0	0	0	0	0	0	0	0	0	<b>0</b>
No. at Risk	0	0	0	0	3	9	2	0	0	<b>14</b>
<b>Non Diabetic Death Rate</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2.1</b>	<b>4.4</b>	<b>11.4</b>	<b>217.4</b>	<b>1.4</b>
No. of Deaths	0	0	0	0	0	1	1	1	1	<b>4</b>
No. at Risk	2	14	39	86	79	53	26	9	1	<b>309</b>

Figure 3.10

<b>Deaths from Malignancy 2001 Dialysis and Transplant Dependent</b>			
	<b>Dx</b>	<b>Tx</b>	<b>Total</b>
<b>Australia</b>			
<b>Adenocarcinoma</b>			
Breast	7 (#6)	0	7
Caecum	0	1	1
Colon	2	1	3
Kidney	4 (#4)	1	5
Lung	5 (#1)	2	7
Oesophagus	1	0	1
Ovary	1 (#1)	1	2
Rectosigmoid	1	0	1
Rectum	1	0	1
Stomach	1 (*1)	1	2
<b>Leukaemia</b>			
	1 (#1)	1	2
<b>Lymphoproliferative Disease</b>			
Transplant kidney	0	1	1
<b>Lymphoma</b>			
Bone Marrow	0	1	1
Groin node	1 (#1)	1	2
Neck node	0	1	1
Node - other	1 (#1)	0	1
Peritoneum	0	1	1
<b>Melanoma</b>			
Forehead	1	0	1
Eye	0	1	1
<b>Merkel Cell</b>			
	0	2	2
<b>Myeloma</b>			
	11 (#10)	0	11
<b>Squamous Cell Carcinoma</b>			
Cervix	0	1	1
Iliac fossa	0	1	1
Lung	1	0	1
Oesophagus	0	1	1
Skin	2	8	10
Tonsils	0	1	1
<b>Transitional Cell Carcinoma</b>			
Bladder	2 (*1)(#1)	0	2
Kidney	2 (#2)	0	2
Ureter	1	0	1
<b>Other</b>			
Adrenocortical - adrenal gland	1 (#1)	0	1
Ewing's Sarcoma - kidney	1 (#1)	0	1
Fibroanthoma - skin	0	1	1
Glioblastoma - brain	1	0	1
Hepatoma - liver	1	2	3
Large Cell - lung	1	0	1
Mesothelioma - lung	1	0	1
Mucinous - colon	0	1	1
Myxoid Liposarcoma - thigh	1 (#1)	0	1
Neuro-endocrine - lung	0	1	1
Non Small Cell - lung	0	1	1
Small Cell - lung	2	2	4
Spindle Cell - lung	0	1	1
Unknown - basal ganglia	1	0	1
Unknown - lung	5	0	5
Unknown - unknown site	2	0	2
<b>Total Deaths from Malignancy</b>	<b>63</b>	<b>37</b>	<b>100</b>
* (2 patients) previous transplants			
# (31 patients) diagnosed pre dialysis or within two months of commencing			
<b>New Zealand</b>			
<b>Adenocarcinoma</b>			
Breast	3 (#1)	1	4
Colon	1	1	2
Gastro-oesophageal	1	0	1
Kidney	2 (#2)	0	2
Lung	2	0	2
Pancreas	0	1	1
Unknown site	1	0	1
<b>Lymphoma</b>			
Ethmoid sinus	0	1	1
<b>Melanoma</b>			
Jaw	0	1	1
Post Auricular	0	1	1
<b>Myeloma</b>			
	1 (#1)	0	1
<b>Squamous Cell Carcinoma</b>			
Bronchus	1	0	1
<b>Other</b>			
Papillary - omentum	1 (#1)	0	1
Small Cell - lung	2	0	2
Unknown - lung	1	0	1
<b>Total Deaths from Malignancy</b>	<b>16</b>	<b>6</b>	<b>22</b>
No dialysis patients had a previous transplant			
# (5 patients) diagnosed pre dialysis or within two months of commencing			

## DEATHS FROM MALIGNANCY

### AUSTRALIA

During 2001 there were 100 fatal malignancies in patients (67 among dialysis dependent patients and 37 among transplant dependent patients).

#### DIALYSIS DEPENDENT

Thirty three of the 67 patients had cancer diagnosed before or within days of their first dialysis. A further eight tumours were identified less than nine months after the first dialysis. Five patients had been dialysed for more than five years. Two patients had a previous renal transplant.

There were ten tumours of the urinary tract, eleven cases with myeloma, fifteen tumours of the lung, one hepatoma, one adrenocortical, one glioblastoma and one myxoid liposarcoma.

The myeloma patients had a median survival from diagnosis of 15 months (range 1-57 months).

#### TRANSPLANT DEPENDENT

There were 37 deaths (45 in 2000) in this group of patients. Twelve died from skin cancer: eight squamous cell carcinoma, two Merkel cell, one fibroxanthoma and one melanoma.

Twenty nine died from non-skin cancer: seven adenocarcinoma, four lymphoma, four squamous cell carcinoma, two hepatoma, two small cell carcinoma and one each of lymphoproliferative disease, leukaemia, mucinous carcinoma of the colon, neuroendocrine, spindle cell and non small cell carcinoma of the lung.

### NEW ZEALAND

#### DIALYSIS DEPENDENT

There were sixteen deaths due to malignancy; five were diagnosed before dialysis or within days of commencement; none had received a previous transplant.

#### TRANSPLANT DEPENDENT

There were six deaths; three from adenocarcinoma, one lymphoma and two melanomas.