

DEATHS

INTRODUCTION

Death rate is now reported as number of patients died / total number of months of treatment of all patients treated at any time during the year (the number of patients treated, multiplied by their months of treatment during the year). It is expressed as deaths per 100 patient years at risk.

For this report, death is attributed to the dialysis modality at the time.

This report (and in the future) contains two forms of reporting the relative incidence of death:

- Rate related to number of treatment years.
- Proportion of all patients treated (as in previous reports).

DEATHS (1993-97)

In the Aboriginal patients, cardiac, infectious and social causes were most prominent in males; cardiac, vascular and social causes being most prominent in the females. The modal age group was 54 years.

In Caucasoid patients, cardiac, social and infectious causes were prominent in both males and females; the modal age group was 65-74 years.

Social was increasingly frequent as a cause of death in the older age groups; infection was more prominent in the younger patients.

In Maori patients, cardiac and infectious causes were dominant; the modal age group was 55-64 years.

In the Pacific Islander patients, cardiac and social causes were most prominent in females; cardiac and infectious causes most prominent in males; the modal age group was 55-64 years females, 65-74 years for males.

For more detail see Appendix.

AUSTRALIA

See Figures 110 to 126.

DIALYSIS DEPENDENT

DEATH RATES PER 100 PATIENT YEARS

The overall dialysis dependent patient death rate has not changed notably in the last few years; the encouraging trend has been the reduction in the death rate of diabetics. The mode of dialysis has not been associated with a marked difference, but peritoneal dialysis death rate has been higher than haemodialysis. The high rate for peritoneal dialysis last year has fallen, especially in the non diabetic patients. There was insignificant difference in the diabetic patient death rate for peritoneal or haemodialysis. See Figures 113-116.

With regard to age, mode of dialysis and diabetic status the adverse effect of diabetes tended to decrease with age, and was not associated with a marked difference between peritoneal and haemodialysis. See Figure 117.

Some years ago, there was a higher death rate amongst young and middle aged diabetics using haemodialysis but more recently it has decreased to levels similar to peritoneal dialysis.

The dialysis patient death rates have fluctuated more in some States than others; New South Wales/ACT and Victoria have remained relatively constant. Queensland has had a higher rate than most States for the past few years. See Figure 111.

In 1996 South Australia reached a markedly higher level than the other States. Review of non-diabetic patients in the age groups 45-64 years and 65-84 years, for 1996, showed the South Australian rate was especially high in the first age group and still excessive in the second age group. See Figure 110.

The number of deaths increased 8% compared to the previous year. There were 794 deaths (15.7 deaths per 100 patient years at risk), representing

12.3% of patients treated at any time during the past year; 59% of patients were 65 years or older, (20) 2.5% were <35 years old. Continuous peritoneal dialysis (17.0 deaths per 100 patients years at risk) 11.4% of patients dialysed, haemodialysis (15.3 deaths per 100 patient years at risk) 10.9% of patients dialysed. See Figures 112 and 120.

DEATHS AS A PROPORTION OF DIALYSIS PATIENTS, 1997

There have been fluctuating results with regard to age and dialysis modality, but no definite trend over the past five years. See Figure 119.

The relative incidence of death in each age group in relation to mode of dialysis treatment at death is shown in Figures 119 to 123.

CAUSE OF DEATH

Details of age, cause of death and method of dialysis are shown in Appendix II.

Forty two percent of deaths (330 cases) were listed as a cardiac cause; 11% myocardial infarction, 11% presumed myocardial ischaemia, 15% "cardiac arrest". See Figure 125.

There were 122 deaths from infection; 57% were bacterial (66% haemodialysis, 34% peritoneal dialysis). Compared to the previous year, there was a fall in the deaths due to peritoneal infections. Three of 19 cases of peritoneal infection were due to candida. There were two cases of staphylococcal endocarditis, one enterobacter and one streptococcal. One was due to candida albicans.

The number of deaths due to cerebrovascular accidents was less than 1996: 55 deaths (35 haemodialysis and 20 peritoneal dialysis).

Malignancy caused 51 deaths (6%), of which 20 (39%) had had the tumour diagnosed before dialysis commenced, a further nine in less than nine months. See Figure 140.

Hepatic failure caused four deaths, one due to amyloid, one bleeding varices, one Hepatitis B cirrhosis and one not specified.

There were less deaths (71) reportedly due to patient refusal of further treatment (77 in 1997). See Figures 141 to 142.

DEATH OF YOUNG ADULTS 15-24, 25-34 YEARS OF AGE

There were four deaths in the age group 15-24 years, the youngest being 22 years; two males and two females, three Caucasoid and one Aboriginal. One had a functioning transplant and three were having haemodialysis. Causes of death were endocarditis, lung infection, aortic valve vegetation and non-compliance.

There were 18 deaths in the age group 25-34 years: 12 males and six females. Ten were Caucasoid, with the others being, six Aboriginal, one Mauritian and one Vietnamese. Four had glomerulonephritis and seven had diabetes. One of these patients had been previously transplanted; three died with a functioning transplant. Nine deaths were patients on hospital haemodialysis. Causes of death were: five cardiac, four treatment withdrawal, three infection, two cerebrovascular accident, two malignancy, one bowel infarction and one accidental drowning.

TRANSPLANT DEPENDENT

The low death rate continued, but there was a rise in the middle aged group (55-64 years) without diabetic nephropathy.

There were 109 deaths (2.4 deaths per 100 patient years at risk) of patients with a functioning transplant; 2.2% of patients with a functioning graft during the year. The death rate in relation to age is shown in Figure 120 and 124. For cause of death in relation to age, see Appendix II.

There was a fall in the deaths due to infection, 15 (16 patients in 1996). Two due to fungi or protozoa. Forty percent of infections were bacterial, and 7% were viral. See Figure 126.

The incidence of death from malignancy increased in 1997 to 32 deaths from 25 the previous year. Most were patients aged 55-74 years. Five deaths were due to lymphoma, two to melanoma, and two to Merkel Cell tumour. There were five SCC's of the skin.

Three deaths were due to hepatic failure, two chronic liver disease and one hepatoma.

NEW ZEALAND

See Figures 127 to 139.

DIALYSIS DEPENDENT

The overall dialysis dependent patient death rate improved markedly during the past two years, particularly amongst diabetics. Peritoneal dialysis death rates improved in the diabetics, but fell only slightly amongst non-diabetics. See Figure 128 to 131.

With regard to only dialysis and diabetic status, non-diabetics in the past year had a higher rate with peritoneal dialysis, while diabetics had a higher rate with haemodialysis.

TRANSPLANT DEPENDENT

The low rate continued, there being no particular change in rates in regard to age or diabetic status.

There was a decrease in the number of deaths (2.9 deaths per 100 patient years at risk) Figure 137: 25 deaths (2.6% at risk) Figure 133: six (24% were due to malignancy and eight (32%) due to myocardial infarction, presumed ischaemia or "cardiac arrest". See Figure 139 and Appendix III.

DEATHS AS A PROPORTION OF DIALYSIS PATIENTS 1997

There has been a reduction in the deaths as a proportion of patients dialysing during each year, occurring mainly in the peritoneal dialysis group which usually exceeds that of the haemodialysis group.

There were 156 deaths (15.8 deaths per 100 patient years at risk) see Figure 127; 12.3% of patients dialysed, see Figure 133; haemodialysis (14.5 deaths per 100 patient years at risk) 8.8% of patients dialysed, peritoneal dialysis (16.7 deaths per 100 patient years at risk) 11.7% of patients dialysed. See Figure 132 to 136, and Appendix III.

The majority (45%) of deaths were due to cardiac causes; 15% myocardial infarction, 18% "cardiac arrest", 10% presumed myocardial ischaemia. Five deaths (3%) were due to malignancy. See Figure 138.

Figure 110

Australia

Death Rates by States, Dialysis Modality and Age Groups 1996

	Qld	NSW/ACT	Vic.	SA	WA
Age 45-64 years					
All Patients	14.8	10.2	7.9	26.3	7.6
Peritoneal Dialysis	25.9	14.8	4.8	17.6	8.4
Haemodialysis	8.6	8.4	8.6	27.6	7.1
Age 65-84 years					
All Patients	29.2	23.4	23.6	29.3	22.8
Peritoneal Dialysis	36.9	25.9	24.3	29.3	38.1
Haemodialysis	24.1	21.8	8.6	28.2	12.3

Figure 111

Australia

Death Rates by States All Dialysis Patients 1993 - 1996

Years	Qld	NSW/ACT	Vic.	SA	WA	Aust.
1993	16.8	14.7	14.6	14.2	17.5	15.6
1994	20.5	13.9	14.0	13.7	14.9	15.3
1995	17.0	13.6	15.5	16.0	13.3	15.0
1996	17.9	14.2	14.1	23.2	14.7	15.6

Figure 112

Australia

Death Rates Calculated as Deaths Per 100 Patient Years Dialysis Patients 1997

	Age Groups						All Ages
	00-14	15-24	25-44	45-64	65-84	85-94	
All Dialysis							
All Patients Death Rate	6.7	2.2	4.5	14.2	24.3	38.3	15.7
No. of Deaths	2	3	47	277	459	6	794
No. at Risk	52	178	1321	2475	2408	20	6454
Non Diabetic Death Rate	6.7	2.2	3.2	13.0	23.9	32.9	14.9
No. of Deaths	2	3	29	204	395	5	638
No. at Risk	52	177	1126	1969	2078	19	5421
Diabetic Death Rate	0	0	12.3	19.0	26.9	212.7	20.3
No. of Deaths	0	0	18	73	64	1	156
No. at Risk	0	1	195	506	330	1	1033
CAPD ★							
All Patients Death Rate	28.0	0	4.5	13.9	24.8	68.0	17.0
No. of Deaths	1	0	11	75	158	3	248
No. at Risk	9	48	364	796	938	6	2161
Non Diabetic Death Rate	28.0	0	2.7	11.6	24.0	68.0	16.1
No. of Deaths	1	0	5	44	131	3	184
No. at Risk	9	47	274	558	790	6	1684
Diabetic Death Rate	0	0	10.2	19.5	29.5	0	20.7
No. of Deaths	0	0	6	31	27	0	64
No. at Risk	0	1	90	238	148	0	477
Haemodialysis ★							
All Patients Death Rate	12.0	3.3	4.6	14.3	23.9	26.6	15.3
No. of Deaths	1	3	35	194	291	3	527
No. at Risk	23	139	1062	1889	1703	15	4829
Non Diabetic Death Rate	12.0	3.3	3.5	13.5	23.7	18.5	14.6
No. of Deaths	1	3	24	154	255	2	439
No. at Risk	23	139	932	1561	1478	14	4147
Diabetic Death Rate	0	0	13.7	18.4	26.1	212.7	20.2
No. of Deaths	0	0	11	40	36	1	88
No. at Risk	0	0	130	328	223	1	682

★ Treatment at Death

Figure 113

**Annual Death Rate Per 100 Dialysis Patient Years
Australia 1993 - 1997**

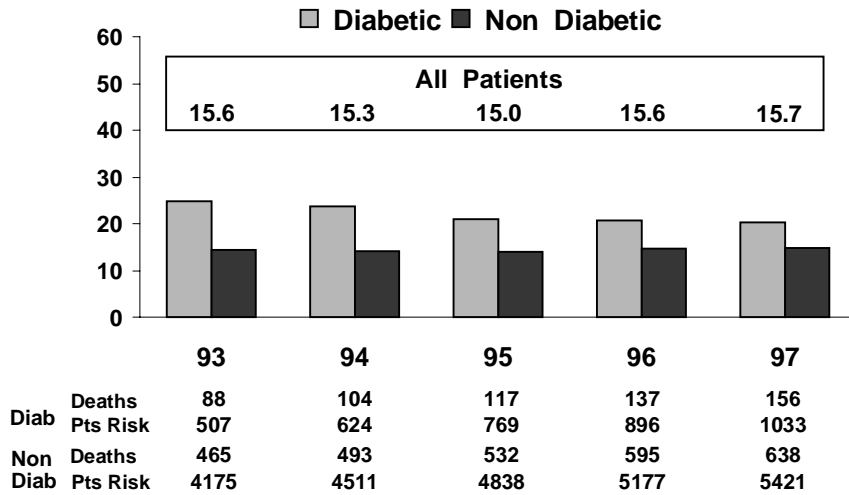


Figure 114

**Annual Death Rate Per 100 Patient Years
Mode of Dialysis Australia 1993 - 1997**

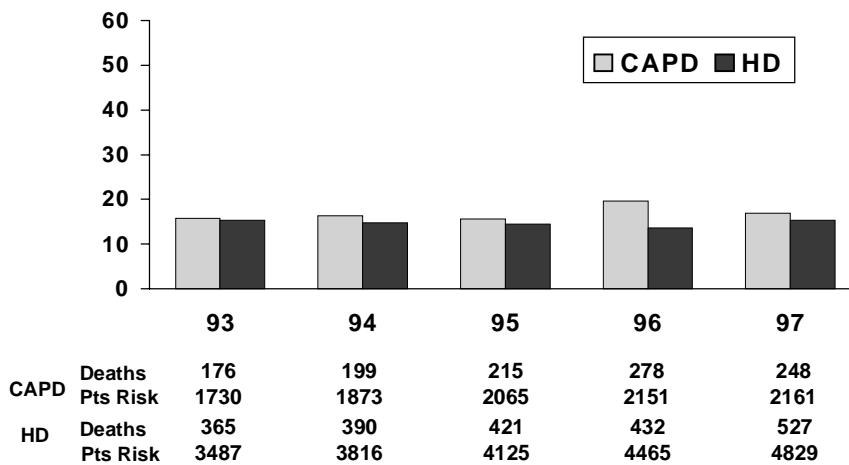


Figure 115

**Annual Death Rate Per 100 Patient Years
Mode of Dialysis Australia 1993 - 1997**

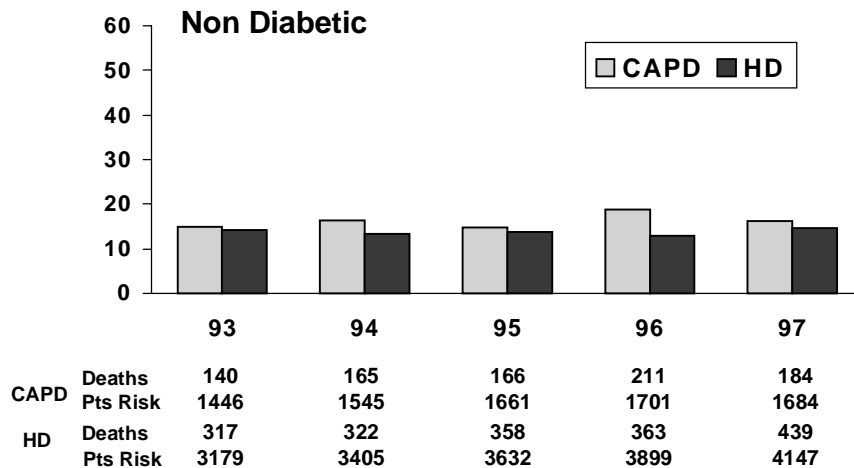


Figure 116

**Annual Death Rate Per 100 Patient Years
Mode of Dialysis Australia 1993 - 1997**

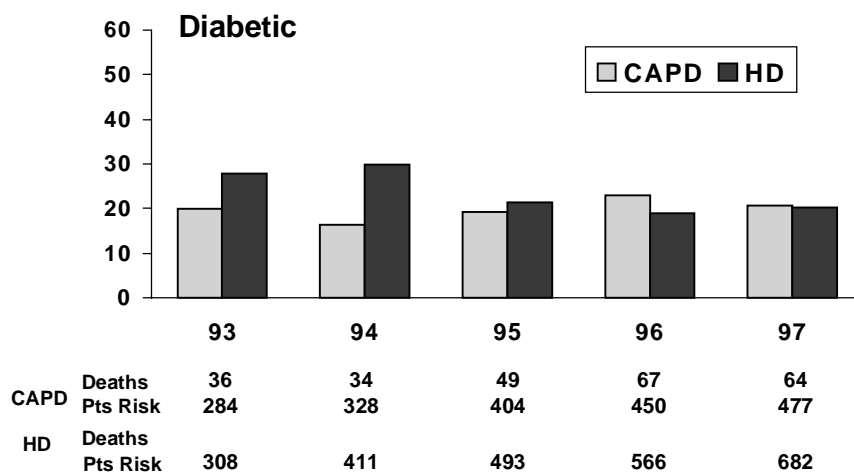


Figure 117

**Annual Death Rate Per 100 Patient Years
Mode of Dialysis Australia 1993 - 1997**

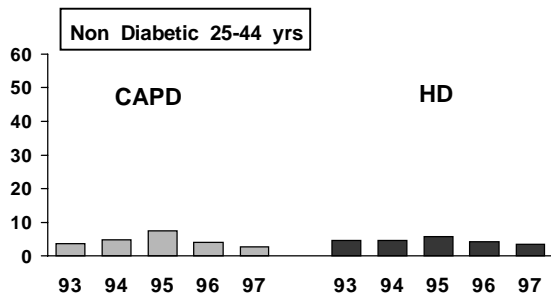
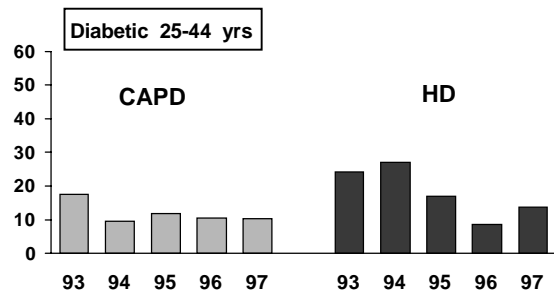
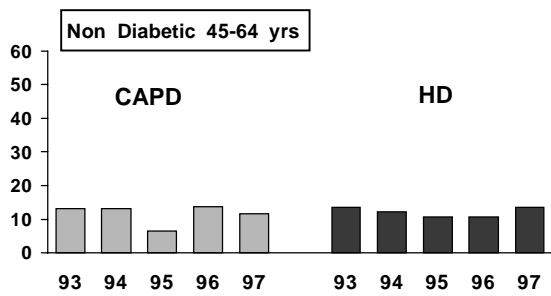


Figure 118

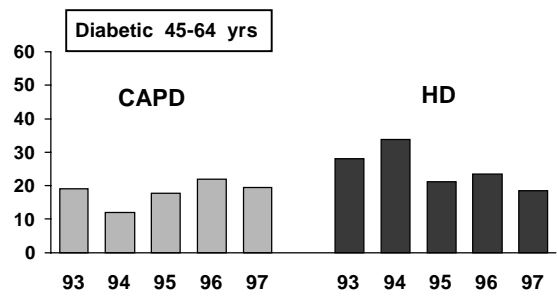
**Annual Death Rate Per 100 Patient Years
Mode of Dialysis Australia 1993 - 1997**



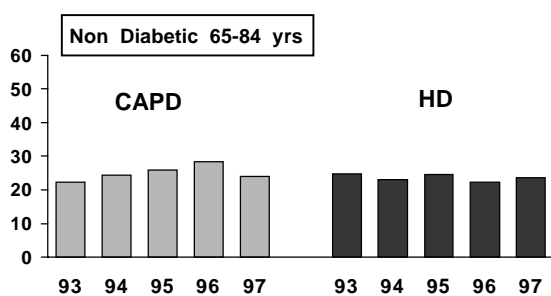
**Annual Death Rate Per 100 Patient Years
Mode of Dialysis Australia 1993 - 1997**



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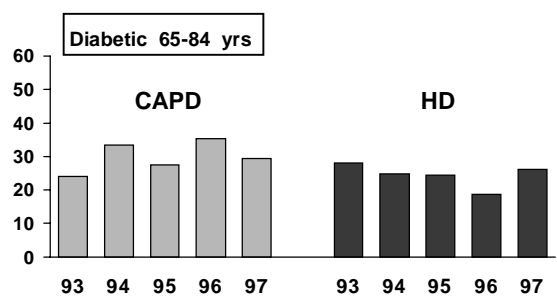


Figure 119

Australia

Deaths as a Proportion of Dialysis Patients 1993 - 1997

	1993	1994	1995	1996	1997
All Dialysis	12%	11.7%	11.6%	12.1%	12.3%
Peritoneal Dialysis	10%	10.6%	10.4%	13.0%	11.4%
Haemodialysis	10.5%	10.3%	10.2%	9.7%	10.9%
All Patients 55-64 years	14%	14%	10%	13%	14%
Peritoneal Dialysis	12%	11%	8%	14%	12%
Haemodialysis	12%	12%	10%	10%	13%
All Patients 65-74 years	17%	18%	18%	18%	18%
Peritoneal Dialysis	15%	17%	17%	18%	16%
Haemodialysis	15%	16%	16%	14%	17%

Figure 120

Australia

Dialysis and Transplant Patient Death Rates * 1997

All Patients

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	85-94	
Haemodialysis	4829	0%	5%	2%	3%	4%	8%	13%	17%	18%	20%	10.9% (527)
CAPD	2161	0%	14%	0%	4%	4%	6%	12%	16%	18%	50%	11.4% (248)
All Dialysis Pts ★	6454	0%	5%	2%	3%	4%	8%	14%	18%	21%	30%	12.3% (794)
Transplant Pts	4912	0%	1%	<1%	<1%	<1%	1%	4%	8%	9%	0%	2.2% (109)

★ Includes (19) patients having PD at death

Non Diabetic Patients

Haemodialysis	4147	0%	5%	2%	2%	3%	6%	13%	17%	18%	14%	10.5% (439)
CAPD	1684	0%	14%	0%	1%	2%	4%	11%	16%	18%	50%	10.9% (184)
Non Diabetic Pts ★	5421	0%	5%	2%	2%	3%	6%	14%	18%	21%	26%	11.7% (638)
Non Diabetic Tx	4623	0%	1%	<1%	<1%	<1%	1%	4%	8%	9%	0%	2.1% (98)

★ Includes (15) patients having PD at death

Diabetic Patients

Haemodialysis	682	0%	0%	0%	12%	7%	14%	11%	15%	20%	100%	12.9% (88)
CAPD	477	0%	0%	0%	4%	8%	9%	17%	19%	12%	0%	13.4% (64)
All Diabetic Dx ★	1033	0%	0%	0%	12%	8%	14%	15%	19%	19%	100%	15.1% (156)
Diabetic Tx	289	0%	0%	0%	2%	2%	3%	10%	0%	0%	0%	3.8% (11)

★ Includes (4) patients having PD at death

* Expressed as (%) of patients, treated by dialysis or with a functioning transplant in 1997

Note: Some patients will have been treated by both CAPD and haemodialysis

Figure 121

Death Rate of Dialysis Patients Australia 1997

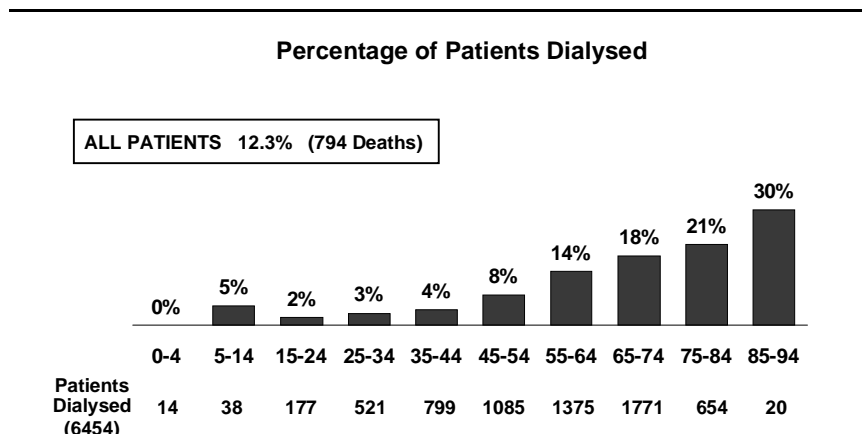


Figure 122

Death Rate Diabetic and Non Diabetic Patients Australia 1997

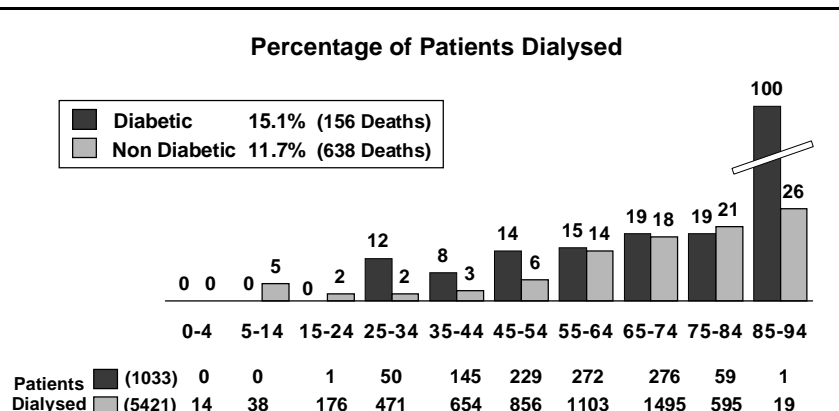


Figure 123

Death Rate of HD and CAPD Patients Australia 1997

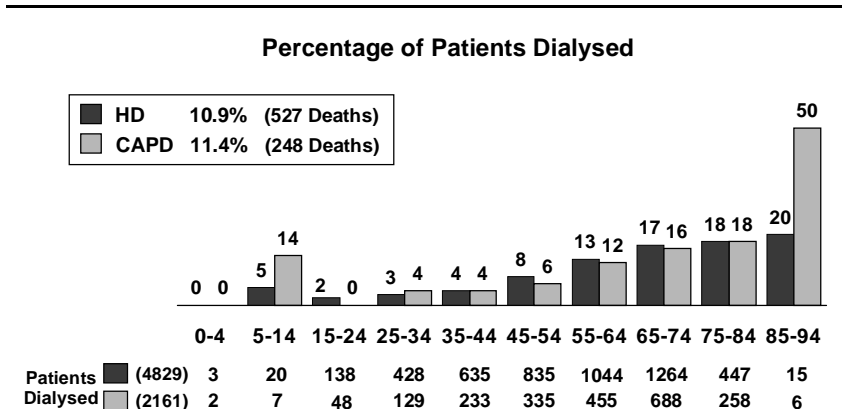


Figure 124

Australia

**Death Rates Calculated as Deaths Per 100 Patient Years
Transplant Patients 1997**

	Age Groups								All Ages
	00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	
All Transplants									
All Patients Death Rate	0	1.1	0.3	0.4	0.4	1.5	4.6	7.9	2.4
No. of Deaths	0	1	1	3	4	17	46	35	109
No. at Risk	17	97	283	732	1024	1198	1071	464	4908
Non Diabetic Death Rate	0	1.1	0.3	0.3	0.2	1.3	4.3	8.0	2.2
No. of Deaths	0	1	1	2	2	14	41	35	98
No. at Risk	17	97	280	691	927	1106	1022	457	4619
Diabetic Death Rate	0	0	0	2.8	2.2	3.7	11.6	0	4.3
No. of Deaths	0	0	0	1	2	3	5	0	11
No. at Risk	0	0	3	41	97	92	49	7	289
Cadaver Transplants ★									
All Patients Death Rate	0	2.7	0.7	0.4	0.5	1.6	4.7	8.0	2.7
No. of Deaths	0	1	1	2	4	17	44	34	105
No. at Risk	5	40	146	510	808	1067	1002	446	4047
Non Diabetic Death Rate	0	2.7	0.7	0.2	0.2	1.5	4.3	8.1	2.6
No. of Deaths	0	1	1	1	2	14	39	34	94
No. at Risk	5	40	143	475	731	984	960	439	3800
Diabetic Death Rate	0	0	0	3.3	2.8	4.0	13.8	0	5.0
No. of Deaths	0	0	0	1	2	3	5	0	11
No. at Risk	0	0	3	35	77	83	42	7	247
Living Donor Transplants ★									
All Patients Death Rate	0	0	0	0.5	0	0	3.2	5.9	0.5
No. of Deaths	0	0	0	1	0	0	2	1	4
No. at Risk	12	57	137	222	218	131	69	18	864
Non Diabetic Death Rate	0	0	0	0.5	0	0	3.6	5.9	0.5
No. of Deaths	0	0	0	1	0	0	2	1	4
No. at Risk	12	57	137	216	198	122	62	18	822
Diabetic Death Rate	0	0	0	0	0	0	0	0	0
No. of Deaths	0	0	0	0	0	0	0	0	0
No. at Risk	0	0	0	6	20	9	7	0	42

★ Functioning Transplant at Death

Figure 125

Australia

Cause of Death - Dialysis Dependent 1997

Cardiac		Vascular	
Cardiac Arrest	121	Bowel Infarction	24
Hyperkalaemia	12	Cerebrovascular Accident	55
Hypertensive Cardiac Failure	5	Gastrointestinal Haemorrhage	5
Myocardial Infarction	87	Haemorrhage from elsewhere	7
Myocardial Ischaemia (presumed)	84	Pulmonary Embolus	1
Other Causes of Cardiac Failure	19	Ruptured Aortic Aneurysm	4
Pulmonary Oedema	2		
Total	330 (42%)	Total	96 (12%)
Infection		Social	
CNS - bacterial	4	Accidental	4
CNS - fungal	1	Patient Refused Treatment	71
Lung - bacterial	12	Suicide	1
Lung - fungal	2 (a)	Therapy Ceased	66
Lung - other	20 (b)	Total	142 (18%)
Other site - bacterial	21		
Other site - fungal	1 (c)	Miscellaneous	
Other site - other	6 (d)	Cachexia	17
Peritoneum - bacterial	12	Chronic Respiratory Failure	8
Peritoneum - fungal	4 [3c/1d]	Hepatic Failure	4
Peritoneum - other	3 (b)	Malignancy	51
Septicaemia - bacterial	14	Other	12
Septicaemia - other	14 (d)	Pancreatitis	1
Shunt - bacterial	1	Perforation Abdominal Viscus	11
Wound - bacterial	5	Total	104 (13%)
Wound - other	2 (b)	Total Deaths	794 (100%)
Total	122 (15%)		

- (a) Aspergillus
- (b) Organism not isolated
- (c) Candida Albicans
- (d) Torulopsis Glabra

Figure 126

Australia

Cause of Death - Transplant Dependent 1997

Cardiac		Vascular	
Cardiac Arrest	11	Bowel Infarction	1
Hypertensive Cardiac Failure	1	Cerebrovascular Accident	10
Myocardial Infarction	7	Gastrointestinal Haemorrhage	3
Myocardial Ischaemia (presumed)	5	Other Haemorrhage	4
Other causes of Cardiac Failure	3	Ruptured Aortic Aneurysm	2
Pulmonary Oedema	2		
Total	29 (27%)	Total	20 (18%)
Infection		Social	
Lung - fungal	1 (b)	Accidental	1
Lung - viral	1 (a)	Total	1 (1%)
Lung - other	3 (c)		
Other site - bacterial	4	Miscellaneous	
Septicaemia - bacterial	2	Cachexia	2
Septicaemia - protozoa	1 (d)	Chronic Respiratory Failure	4
Septicaemia - other	2 (c)	Hepatic Failure	3
Wound - bacterial	1	Malignancy	32
Total	15 (14%)	Perforation Abdominal Viscus	1
		Uraemia - graft failure	2
		Total	44 (40%)
		Total Deaths	109 (100%)

- (a) CMV
- (b) Candida Albicans
- (c) Organism not isolated
- (d) Pneumocystis

Figure 127

New Zealand

**Death Rates Calculated as Deaths Per 100 Patient Years
Dialysis Patients 1997**

	Age Groups						All Ages
	00-14	15-24	25-44	45-64	65-84	85-94	
All Dialysis							
All Patients Death Rate	8.5	0	7.8	14.8	30.0	0	15.8
No. of Deaths	1	0	18	73	64	0	156
No. at Risk	17	49	296	619	286	1	1268
Non Diabetic Death Rate	8.5	0	6.3	12.3	30.0	0	13.9
No. of Deaths	1	0	12	34	47	0	94
No. at Risk	17	49	239	345	210	1	861
Diabetic Death Rate	0	0	14.5	17.9	30.2	0	19.7
No. of Deaths	0	0	6	39	17	0	62
No. at Risk	0	0	57	274	76	0	407
CAPD ★							
All Patients Death Rate	0	0	9.2	14.1	29.3	0	16.7
No. of Deaths	0	0	9	40	41	0	90
No. at Risk	1	25	132	394	212	1	765
Non Diabetic Death Rate	0	0	8.2	13.7	28.9	0	16.2
No. of Deaths	0	0	6	19	29	0	54
No. at Risk	1	25	96	199	151	1	473
Diabetic Death Rate	0	0	12.3	14.6	30.2	0	17.3
No. of Deaths	0	0	3	21	12	0	36
No. at Risk	0	0	36	195	61	0	292
Haemodialysis ★							
All Patients Death Rate	0	0	7.1	15.7	28.2	0	14.5
No. of Deaths	0	0	9	32	20	0	61
No. at Risk	2	28	187	334	138	0	689
Non Diabetic Death Rate	0	0	5.4	10.5	28.9	0	11.3
No. of Deaths	0	0	6	14	16	0	36
No. at Risk	2	28	157	198	102	0	487
Diabetic Death Rate	0	0	20.2	25.4	25.9	0	24.7
No. of Deaths	0	0	3	18	4	0	25
No. at Risk	0	0	30	136	36	0	202

★ Treatment at Death

Figure 128

**Annual Death Rate Per 100 Dialysis Patient Years
New Zealand 1993 - 1997**

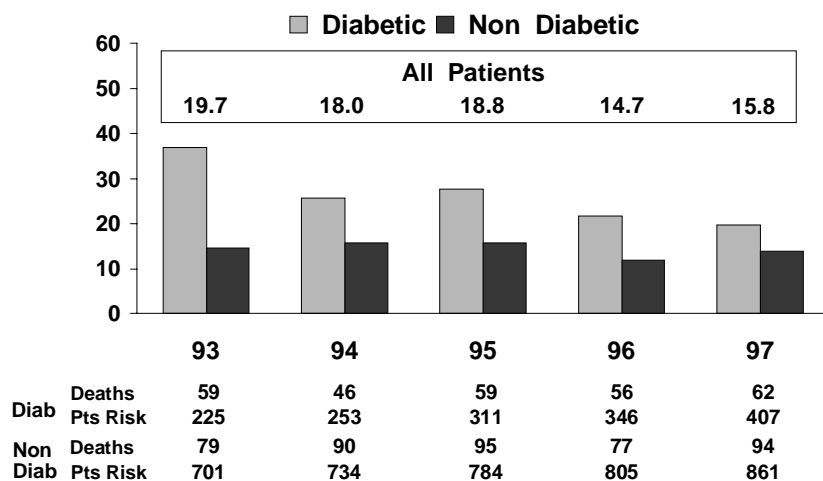


Figure 129

**Annual Death Rate Per 100 Patient Years
Mode of Dialysis New Zealand 1993 - 1997**

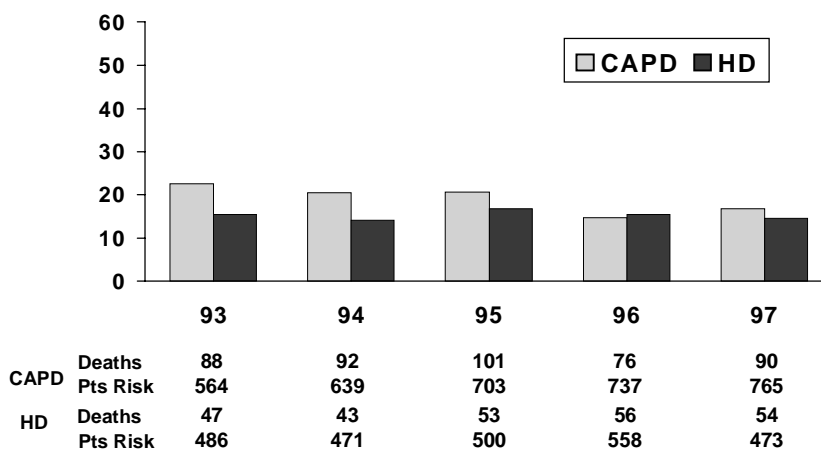


Figure 130

**Annual Death Rate Per 100 Patient Years
Mode of Dialysis New Zealand 1993 - 1997**

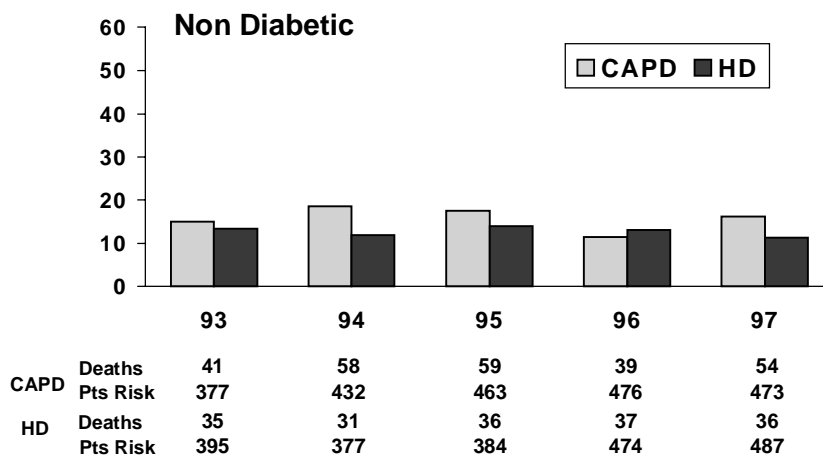


Figure 131

**Annual Death Rate Per 100 Patient Years
Mode of Dialysis New Zealand 1993 - 1997**

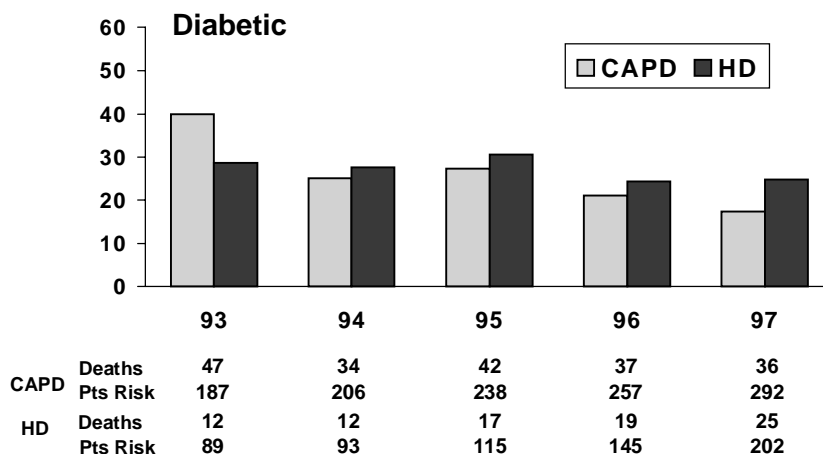


Figure 132

New Zealand

Deaths as a Proportion of Dialysis Patients 1993 - 1997

	1993	1994	1995	1996	1997
All Dialysis	15%	13.7%	14%	11.5%	12.3%
Peritoneal Dialysis	15.6%	14.3%	14.3%	10.3%	11.7%
Haemodialysis	9.7%	9.1%	10.6%	10%	8.8%

Figure 133

New Zealand

Dialysis and Transplant Patient Death Rates * 1997

All Patients

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	85-94	
Haemodialysis	689	0%	0%	0%	1%	7%	9%	10%	15%	12%	0%	8.8% (61)
CAPD	765	0%	0%	0%	6%	7%	7%	13%	19%	21%	0%	11.7% (90)
All Dialysis Pts ★	1268	33%	0%	0%	3%	8%	9%	14%	22%	22%	0%	12.3% (156)
Transplant Pts	934	0%	0%	0%	<1%	1%	4%	6%	6%	0%	0%	2.6% (25)

★ Includes (5) patients having PD at death

Non Diabetic Patients

Haemodialysis	487	0%	0%	0%	1%	6%	7%	7%	16%	13%	0%	7.3% (36)
CAPD	473	0%	0%	0%	5%	7%	7%	12%	19%	19%	0%	11.4% (54)
Non Diabetic Pts ★	861	33%	0%	0%	3%	7%	8%	12%	22%	21%	0%	10.9% (94)
Non Diabetic Tx	863	0%	0%	0%	0%	<1%	3%	6%	5%	0%	0%	2.2% (19)

★ Includes (4) patients having PD at death

Diabetic Patients

Haemodialysis	202	0%	0%	0%	0%	12%	12%	14%	11%	0%	0%	12.3% (25)
CAPD	292	0%	0%	0%	9%	8%	8%	13%	18%	50%	0%	12.3% (36)
All Diabetic Dx ★	407	0%	0%	0%	7%	12%	12%	16%	21%	50%	0%	15.2% (62)
Diabetic Tx	71	0%	0%	0%	14%	5%	7%	7%	50%	0%	0%	8.4% (6)

★ Includes (1) patient having PD at death

* Expressed as (%) of patients, treated by dialysis or with a functioning transplant in 1997

Note: Some patients will have been treated by both CAPD and haemodialysis

Figure 134

**Death Rate of Dialysis Patients
New Zealand 1997**

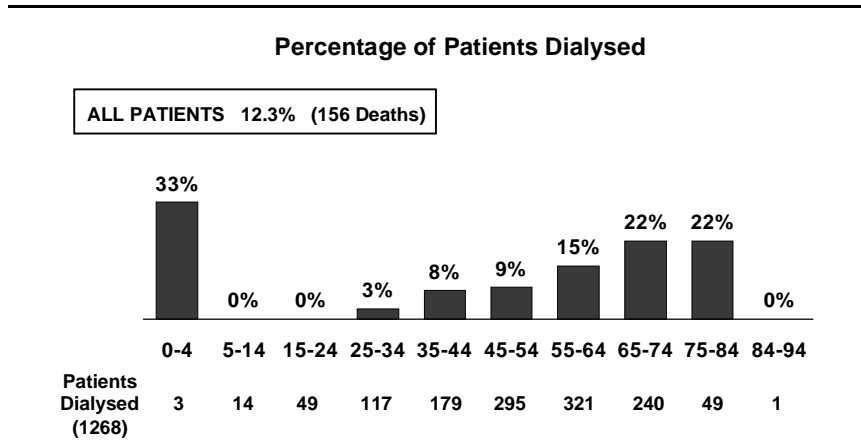


Figure 135

**Death Rate Diabetic and Non Diabetic Patients
New Zealand 1997**

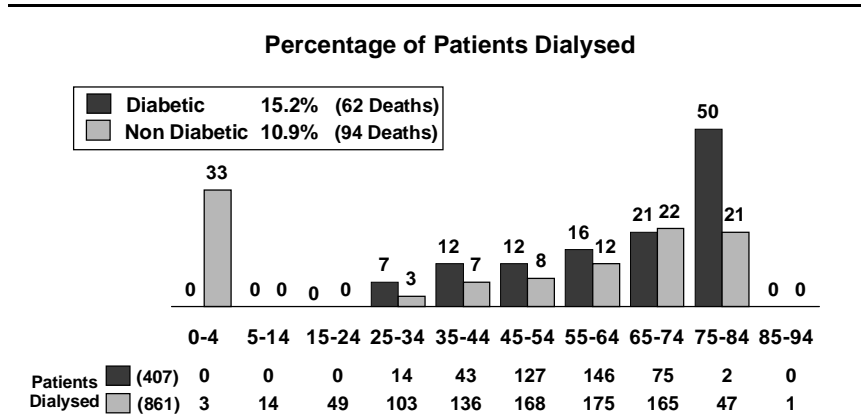


Figure 136

**Death Rate of HD and CAPD Patients
New Zealand 1997**

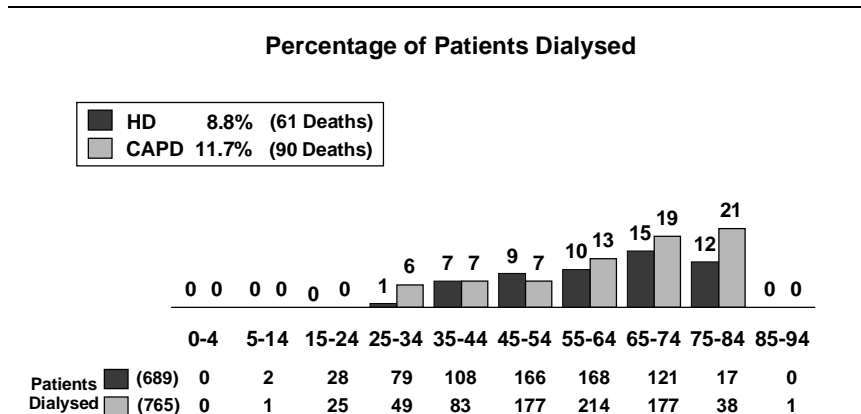


Figure 137

New Zealand

**Death Rates Calculated as Deaths Per 100 Patient Years
Transplant Patients 1997**

	Age Groups								All Ages
	00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	
All Transplants									
All Patients Death Rate	0	0	0	0.5	0.9	4.2	6.8	6.8	2.9
No. of Deaths	0	0	0	1	2	9	9	4	25
No. at Risk	1	23	51	185	218	235	149	64	933
Non Diabetic Death Rate	0	0	0	0	0.5	3.7	6.6	5.2	2.4
No. of Deaths	0	0	0	0	1	7	8	3	19
No. at Risk	1	23	51	178	198	207	135	62	862
Diabetic Death Rate	0	0	0	17.3	5.5	8.0	8.0	90.9	9.6
No. of Deaths	0	0	0	1	1	2	1	1	6
No. at Risk	0	0	0	7	20	28	14	2	71
Cadaver Transplants ★									
All Patients Death Rate	0	0	0	0.9	1.3	3.7	6.8	7.1	3.4
No. of Deaths	0	0	0	1	2	7	8	4	22
No. at Risk	0	7	17	112	163	205	131	62	703
Non Diabetic Death Rate	0	0	0	0	0.7	3.6	6.7	5.4	2.9
No. of Deaths	0	0	0	0	1	6	7	3	17
No. at Risk	0	7	17	106	145	182	117	60	640
Diabetic Death Rate	0	0	0	18.6	6.2	4.7	8.0	90.9	8.9
No. of Deaths	0	0	0	1	1	1	1	1	5
No. at Risk	0	0	0	6	18	23	14	2	63
Living Donor Transplants ★									
All Patients Death Rate	0	0	0	0	0	7.8	6.2	0	1.4
No. of Deaths	0	0	0	0	0	2	1	0	3
No. at Risk	1	16	34	73	55	30	18	2	230
Non Diabetic Death Rate	0	0	0	0	0	4.6	6.2	0	0.9
No. of Deaths	0	0	0	0	0	1	1	0	2
No. at Risk	1	16	34	72	53	25	18	2	222
Diabetic Death Rate	0	0	0	0	0	25.2	0	0	15.7
No. of Deaths	0	0	0	0	0	1	0	0	1
No. at Risk	0	0	0	1	2	5	0	0	8

★ Functioning Transplant at Death

Figure 138

New Zealand

Cause of Death - Dialysis Dependent 1997

Cardiac		Vascular	
Cardiac Arrest	28	Cerebrovascular Accident	8
Hypertensive Cardiac Failure	1	Gastrointestinal Haemorrhage	2
Myocardial Infarction	24	Haemorrhage from Dialysis Access Site	1
Myocardial Ischaemia (presumed)	15	Pulmonary Embolus	2
Other Causes of Cardiac Failure	3	Ruptured Aortic Aneurysm	1
Total	71 (45%)	Total	14 (9%)
Infection		Social	
CNS - fungal	1 (a)	Accidental	1
Lung - bacterial	1	Patient Refused Treatment	13
Lung - other	5 (b)	Suicide	1
Other site - bacterial	7	Therapy Ceased	8
Peritoneum - bacterial	7	Total	23 (15%)
Peritoneum - fungal	4 [3c/1d]	Miscellaneous	
Peritoneum - other	1 (b)	Cachexia	4
Septicaemia - bacterial	3	Hepatic failure	1
Septicaemia - other	3 (b)	Malignancy	5
Wound - other	1 (b)	Other Causes	1
Total	33 (21%)	Perforation Abdominal Viscus	2
		Sclerosing Peritonitis	1
		Unknown	1
		Total	15 (10%)
		Total Deaths	156 (100%)

(a) Cryptococcus
(b) Organism not isolated

(c) Candida
(d) Candida albicans

Figure 139

New Zealand

Cause of Death - Transplant Dependent 1997

Cardiac		Vascular	
Cardiac Arrest	2	Bowel Infarction	1
Myocardial infarction	1	Pulmonary Embolus	1
Myocardial Ischaemia (presumed)	5		
Total	8 (32%)	Total	2 (8%)
Infection		Miscellaneous	
Lung - bacterial	1	Hepatic Failure	1
Other site - bacterial	1	Malignancy	6
Other site - other	1 (a)	Other Causes	1
Septicaemia - bacterial	1	Pancreatitis	1
Septicaemia - other	1 (a)	Sclerosing Peritonitis	1
Total	5 (20%)	Total	10 (40%)
		Total Deaths	25 (100%)

(a) Organism not isolated

DEATHS FROM MALIGNANCY

Figure 140 Australia and New Zealand

AUSTRALIA See Figure 140.

There were 83 fatal malignancies in patients with a functioning transplant (32) or dialysis dependent (51), during 1997.

DIALYSIS DEPENDENT

Twenty of the 51 patients had cancer diagnosed before their first dialysis and a further nine in less than nine months of first dialysis. Nine patients had dialysed for more than five years.

Four patients had had a previous unsuccessful transplant.

There were eight tumours of the lung, twelve of the urinary tract, four with myeloma, two with lymphoma and one with lymphoproliferative disease.

The myeloma patients had had a median survival from diagnosis of 33 months (range 0-74 months).

TRANSPLANT DEPENDENT

There were 32 deaths (25, 1996) in this group of patients.

There was one tumour of the kidney, two of the liver and three of the lung.

Nine patients died from skin cancer, two melanoma, two Merkel Cell and five SCC's. Twenty three patients died from non skin cancer.

NEW ZEALAND See Figure 140.

DIALYSIS DEPENDENT

There were five deaths due to malignancy, none had been previously transplanted and only one was diagnosed before dialysis.

TRANSPLANT DEPENDENT

There were six deaths, two non skin, one lymphoma and one SCC of the mouth, and four skin cancers, three melanoma and one SCC.

Deaths from Malignancy 1997 Dialysis and Transplant Dependent

	Dialysis	Tx	Total
Australia			
Adenocarcinoma			
Breast	2	2	4
Caecum	0	1	1
Colon	2 (★1)	2	4
Gall Bladder	0	1	1
Kidney	4 (*3)	1	5
Lung	1	1	2
Ovary	2	0	2
Pancreas	1	0	1
Prostate	3 (*2)	1	4
Rectum	2 (*)	0	2
Small Bowel	1	0	1
Stomach	0	1	1
Unknown Site	0	2	2
Lymphoma			
Axillary Lymph Node	1 (★)	0	1
Bone Marrow	0	1	1
Bronchus (+ adenoca. bladder)	0	1	1
Cervical nodes	1 (*)	0	1
Mesentery	0	1	1
Retroperitoneal	0	1	1
Inguinal	0	1	1
Transplant Kidney	1 (★)	0	1
Melanoma	0	2	2
Merkel Cell	0	2	2
Myeloma	4 (*)	0	4
Squamous Cell Carcinoma			
Lung	2 (*1)	1	3
Oesophagus	0	1	1
Skin	1	5	6
Tongue	1	0	1
Tonsil	0	1	1
Transitional Cell Carcinoma			
Bladder	5 (*3)	0	5
Kidney	3 (*1)	0	3
Other			
Carcinoid bowel	1 (*)	0	1
Glioblastoma - L Ventricle	1	0	1
Haemangioblastoma - brain	1 (*)	0	1
Hepatocellular - liver	1	2	3
Large cell - lung	3 (★1)	0	3
Serous - peritoneum	0	1	1
Small cell - lung	2	0	2
Small cell - unknown site	1	0	1
Undifferentiated - unknown site	1	0	1
Unknown - breast	1 (*)	0	1
Unknown - unknown site	2	0	2
Total Deaths from Malignancy	51	32	83

★ Previous transplant (4 patients)

* Diagnosed pre dialysis (20 patients)

New Zealand			
Adenocarcinoma			
Breast	1	0	1
Colon	1 (*)	0	1
Lung	1	0	1
Lymphoma - duodenum	0	1	1
Melanoma	0	3	3
Myeloma	1	0	1
Squamous Cell Carcinoma			
Floor of Mouth	0	1	1
Skin	0	1	1
Other - Hepatoma	1	0	1
Total Deaths from Malignancy	5	6	11

* Diagnosed pre dialysis (1 patient)

WITHDRAWAL FROM DIALYSIS TREATMENT

AUSTRALIA

The number of deaths continued to rise substantially from 125 (1996) to 137 in 1997; the majority were again reportedly due to patient refusal. The majority of deaths were aged 65-94 years (66%).

Eighteen percent of all deaths 65-74 years, 24% of these 75-84 years were due to withdrawal of treatment: mainly patients who refused further treatment.

Most CAPD and HD cases were male. See Figure 141.

Amongst diabetics, males were almost equally represented.

Sixty six percent of patients were haemodialysis dependent (61% in 1996). See Figure 142.

NEW ZEALAND

The number of deaths fell to 21 in 1997 (31 in 1996): 17% of all deaths of patients 65-74 years, 36% of those 75-84 years of age. Eight of 21 patients had diabetic nephropathy. Thirty three percent were haemodialysis dependent. See Figure 143.

A large proportion of patients <65 years of age were diabetic.

Figure 141

Australia and New Zealand

Age Group Related Treatment Withdrawal 1997

Mode of Treatment	Gender	Age Groups								Total
		00-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	
Australia										
PD	Female	0	0	0	0	1	0	1	0	2
	Male	0	1 (1)	0	0	1 (1)	0	2	0	4 (2)
Haemodialysis	Female	0	1	1	4	9 (1)	17 (3)	6	2	40 (4)
	Male	0	1	2 (1)	1	8 (1)	24 (4)	14 (2)	0	50 (8)
CAPD	Female	0	0	0	2 (2)	5 (2)	12 (2)	1	0	20 (6)
	Male	0	1 (1)	1	0	7 (5)	4 (1)	8	0	21 (7)
Total		0	4 (2)	4 (1)	7 (2)	31 (10)	57 (10)	32 (2)	2	137 (27)
New Zealand										
PD	Female	0	0	0	0	0	0	0	0	0
	Male	0	0	0	0	0	0	1	0	1
Haemodialysis	Female	0	0	0	0	0	2 (2)	0	0	2 (2)
	Male	0	0	0	1 (1)	2 (1)	1	1	0	5 (2)
CAPD	Female	0	0	1 (1)	0	2	1 (1)	1	0	5 (2)
	Male	0	0	0	1	1 (1)	5 (1)	1	0	8 (2)
Total		0	0	1 (1)	2 (1)	5 (2)	9 (4)	4	0	21 (8)

() Diabetics

Figure 142

Australia

Treatment Withdrawal 1992 - 1997

Year	Treatment	Age Groups								Total
		00-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	
1992	CAPD	0	0	0	0	5 (3)	15 (2)	6	0	26 (5)
	HD	0	0	2 (1)	7 (3)	7 (2)	26 (2)	7 (1)	0	49 (9)
1993	CAPD	1	1	0	1	3 (1)	13 (1)	5	0	24 (2)
	HD	1	2	4	3 (1)	15 (1)	34 (2)	12	0	71 (4)
1994	CAPD	0	0	1 (1)	2 (1)	4 (2)	16 (1)	3	0	26 (5)
	HD	0	0	2 (2)	4 (2)	10 (3)	28 (2)	7 (1)	0	51 (10)
1995	CAPD	0	0	0	1	5 (3)	20 (4)	4 (1)	1	31 (8)
	HD	1	4	4 (1)	6 (2)	12 (4)	29 (1)	18 (1)	0	74 (9)
1996	CAPD	1	0	2 (1)	1 (1)	8 (7)	23 (8)	9	2	46 (17)
	HD	0	1	2 (1)	12 (4)	15 (2)	27	17	2	76 (7)
1997	CAPD	0	1 (1)	1	2 (2)	12 (7)	16 (3)	9	0	41 (13)
	HD	0	2	3 (1)	5	17 (2)	41 (7)	20 (2)	2	90 (12)
Total	CAPD	2	2 (1)	4 (2)	7 (4)	37 (23)	103 (19)	36 (1)	3	194 (50)
	HD	2	9	17 (6)	37 (12)	76 (14)	185 (14)	81 (5)	4	411 (51)

() Diabetics

Figure 143

New Zealand

Treatment Withdrawal 1992 - 1997

Year	Treatment	Age Groups								Total
		00-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	
1992	CAPD	0	0	0	1 (1)	2 (2)	2	0	0	5 (3)
	HD	0	0	0	0	5 (3)	1	1	0	7 (3)
1993	CAPD	0	0	0	2 (1)	4 (3)	5 (1)	3	0	14 (5)
	HD	0	0	1	0	4 (2)	1	0	0	6 (2)
1994	CAPD	0	0	0	3 (3)	2 (1)	6 (1)	1	0	12 (5)
	HD	0	0	0	0	3	2	1	0	6
1995	CAPD	0	0	0	0	5 (4)	8 (2)	5	0	18 (6)
	HD	0	0	1	0	4 (1)	1	0	0	6 (1)
1996	CAPD	0	1	0	4 (3)	6 (3)	6	4	0	21 (6)
	HD	0	0	0	1	4 (1)	2 (1)	3 (1)	0	10 (3)
1997	CAPD	0	0	1 (1)	1	3 (1)	6 (2)	2	0	13 (4)
	HD	0	0	0	1 (1)	2 (1)	3 (2)	1	0	7 (4)
Total	CAPD	0	1	1 (1)	11 (8)	22 (14)	33 (6)	15	0	83 (29)
	HD	0	0	2	2 (1)	22 (8)	10 (3)	6 (1)	0	42 (13)

() Diabetics