

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 and future reports will contain 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).

AUSTRALIA

DIALYSIS DEPENDENT

The number of deaths increased 13% compared to the previous year. There were 731 deaths (15.6 deaths per 100 patient years at risk), representing 12% of patients treated at any time during the past year; 58% of patients were 65 years or older, 1% were less than 35-39 years old. Continuous peritoneal dialysis (19.8 deaths per 100 patient years at risk) 13% of patients dialysed, haemodialysis (13.7 deaths per 100 patient years at risk) 9.7% of patients dialysed. See Table 35 and Figure 41.

The relative incidence of death in each age group in relation to mode of dialysis treatment at death is shown in Tables 35 and 36, and Figures 44-48.

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

Forty four per cent of deaths (324 cases) were listed as a cardiac cause; 15% myocardial infarction, 9% presumed myocardial ischaemia, 14% "cardiac arrest". See Table 38.

Compared to the previous year, there was a rise

in the deaths due to peritoneal infections. There were 105 deaths from infection; 63% were bacterial; 60% were haemodialysis dependent. Five of 32 cases of peritoneal infection were due to candida. There were four cases of staphylococcal endocarditis.

The number of deaths due to cerebrovascular accidents nearly doubled: 58 deaths (37 haemodialysis and 21 peritoneal dialysis).

Malignancy caused 28 deaths (4%), of which 14 (50%) had had the tumour diagnosed before dialysis commenced, a further three in less than nine months.

Hepatic failure caused four deaths, two due to Hepatitis C, one had a liver transplant in 1992, and one from possible complications from malignancy.

There were more deaths (77) reportedly due to patient refusal of further treatment (66 in 1996).

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

There were two deaths in the age group 15-24 years, the youngest being 18 years; both male and Caucasoid. One had a functioning transplant and one was having CAPD. Causes of death were a motor bike accident and therapy ceased due to heart failure.

There were 21 deaths in the age group 25-34 years: 16 males and five females. Ten were Caucasoid, with the others being, seven Aboriginal, one Pacific Islander, one Vietnamese, one Indonesian and one from Papua New Guinea. Ten had glomerulonephritis and four had diabetes. Seven of these patients had been previously transplanted; four died with a functioning transplant. Ten deaths were patients on hospital haemodialysis. Causes of death were: 10 cardiac, four infection, one each accidental, suicide, refused further treatment, pulmonary embolus, malignancy, hepatic failure (liver transplant 1992) and unknown cause.

AUSTRALIA

TRANSPLANT DEPENDENT

There were 109 deaths (2.5 deaths per 100 patient years at risk) of patients with a functioning transplant, less than the previous year; 2.3% of patients with a functioning graft during the year. The death rate in relation to age is shown in Table 36. For cause of death in relation to age, see Appendix II.

There was a fall in the deaths due to infection, 16 (19 patients in 1995), three due to fungi or protozoa. Only 38% of infections were bacterial, and 13% were viral. One death was due to Hepatitis B. There were two deaths from suicide. See Table 39.

The incidence of death from malignancy decreased in 1996 to 25 deaths from 35 the previous year. Most were patients aged 55-74 years. Two deaths were due to lymphoma and two to melanoma. There were no SCC of the skin.

Three deaths were due to hepatic failure, one Hepatitis Non A, B, or C, one post liver biopsy and one not specified.

NEW ZEALAND

DIALYSIS DEPENDENT

There were 133 deaths (14.8 deaths per 100 patient years at risk) See Table 40, 11.5% of patients dialysed, see Table 41; haemodialysis (15.5 deaths per 100 patient years at risk) 10% of patients dialysed, peritoneal dialysis (14.7 deaths per 100 patient years at risk) 10.3% of patients dialysed. See Figures 49-55 and Appendix III.

The majority (44%) of deaths were due to cardiac causes; 14% myocardial infarction, 14% "cardiac arrest", 11% presumed myocardial ischaemia. Four deaths (3%) were due to malignancy. See Table 43.

TRANSPLANT DEPENDENT

There was a slight increase in the number of deaths (3.2 deaths per 100 patient years at risk) Table 42: 26 deaths (2.9% at risk) Table 41: seven (27%) were due to malignancy and eight (31%) due to myocardial infarction, presumed ischaemia or "cardiac arrest". See Table 44 and Appendix III.

Table 35

Australia

**Death Rates Calculated as Deaths Per 100 Patient Years
Dialysis Patients 1996**

| | Age Groups | | | | | | All Ages |
|--------------------------------|-------------|------------|-------------|-------------|-------------|-------------|-------------|
| | 00-14 | 15-24 | 25-44 | 45-64 | 65-84 | 85-94 | |
| All Dialysis | | | | | | | |
| All Patients Death Rate | 14.9 | 0.7 | 4.9 | 13.7 | 24.9 | 60.9 | 15.6 |
| No. of Deaths | 5 | 1 | 48 | 252 | 418 | 7 | 731 |
| No. at Risk | 60 | 184 | 1255 | 2344 | 2179 | 16 | 6038 |
| Non Diabetic Death Rate | 14.9 | 0.7 | 4.2 | 11.7 | 24.8 | 60.9 | 14.7 |
| No. of Deaths | 5 | 1 | 36 | 175 | 370 | 7 | 594 |
| No. at Risk | 60 | 183 | 1079 | 1891 | 1932 | 16 | 5161 |
| Diabetic Death Rate | 0 | 0 | 9.2 | 22.5 | 26.0 | 0 | 20.8 |
| No. of Deaths | 0 | 0 | 12 | 77 | 48 | 0 | 137 |
| No. at Risk | 0 | 1 | 176 | 453 | 247 | 0 | 877 |
| CAPD ★ | | | | | | | |
| All Patients Death Rate | 0 | 3.0 | 5.6 | 16.1 | 29.5 | 84.7 | 19.8 |
| No. of Deaths | 0 | 1 | 13 | 90 | 169 | 5 | 278 |
| No. at Risk | 15 | 54 | 351 | 828 | 876 | 10 | 2134 |
| Non Diabetic Death Rate | 0 | 3.1 | 4.0 | 13.8 | 28.6 | 84.7 | 18.9 |
| No. of Deaths | 0 | 1 | 7 | 55 | 143 | 5 | 211 |
| No. at Risk | 15 | 53 | 262 | 594 | 758 | 10 | 1692 |
| Diabetic Death Rate | 0 | 0 | 10.6 | 22.2 | 35.4 | 0 | 23.2 |
| No. of Deaths | 0 | 0 | 6 | 35 | 26 | 0 | 67 |
| No. at Risk | 0 | 1 | 89 | 234 | 118 | 0 | 442 |
| Haemodialysis ★ | | | | | | | |
| All Patients Death Rate | 16.3 | 0 | 4.6 | 12.6 | 22.0 | 35.9 | 13.6 |
| No. of Deaths | 2 | 0 | 34 | 156 | 237 | 2 | 431 |
| No. at Risk | 27 | 144 | 1007 | 1732 | 1524 | 8 | 4442 |
| Non Diabetic Death Rate | 16.3 | 0 | 4.2 | 10.7 | 22.4 | 35.9 | 12.9 |
| No. of Deaths | 2 | 0 | 28 | 114 | 217 | 2 | 363 |
| No. at Risk | 27 | 144 | 893 | 1451 | 1366 | 8 | 3889 |
| Diabetic Death Rate | 0 | 0 | 8.6 | 23.8 | 18.8 | 0 | 19.3 |
| No. of Deaths | 0 | 0 | 6 | 42 | 20 | 0 | 68 |
| No. at Risk | 0 | 0 | 114 | 281 | 158 | 0 | 553 |

★ Treatment at Death

Figure 40

**Annual Death Rate Per 100 Dialysis Patient Years
Australia 1992 - 1996**

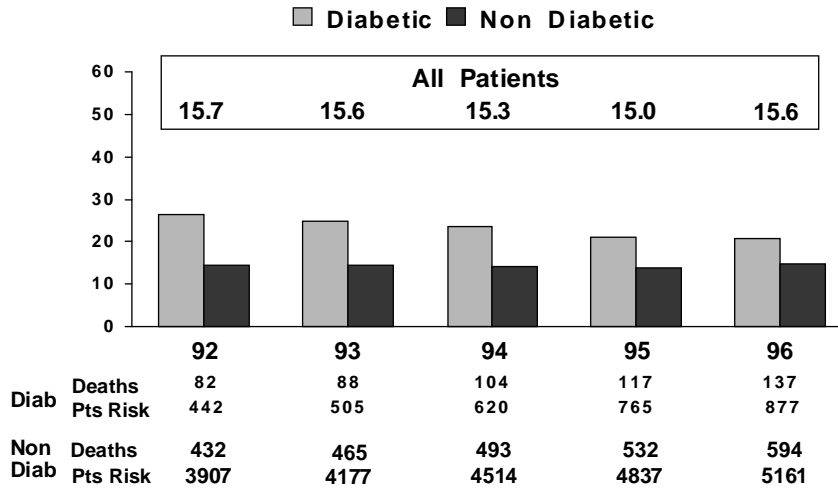


Figure 41

**Annual Death Rate Per 100 Patient Years
Mode of Dialysis Australia 1992 - 1996**

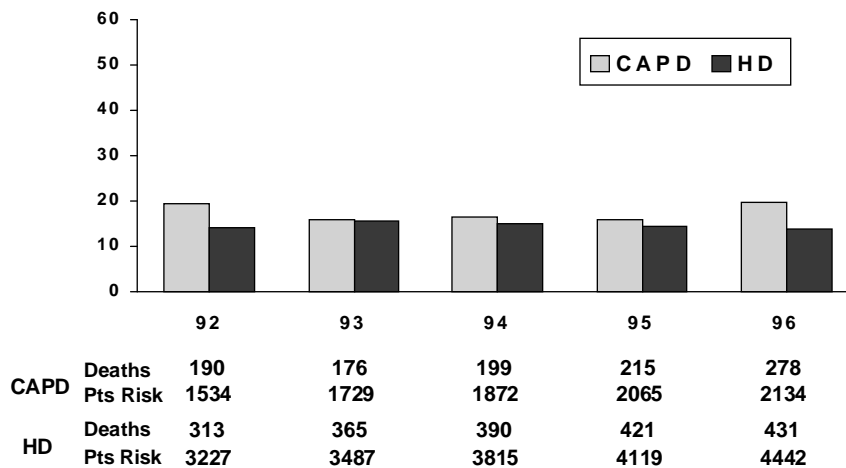


Figure 42

**Annual Death Rate Per 100 Patient Years
Mode of Dialysis Australia 1992 - 1996**

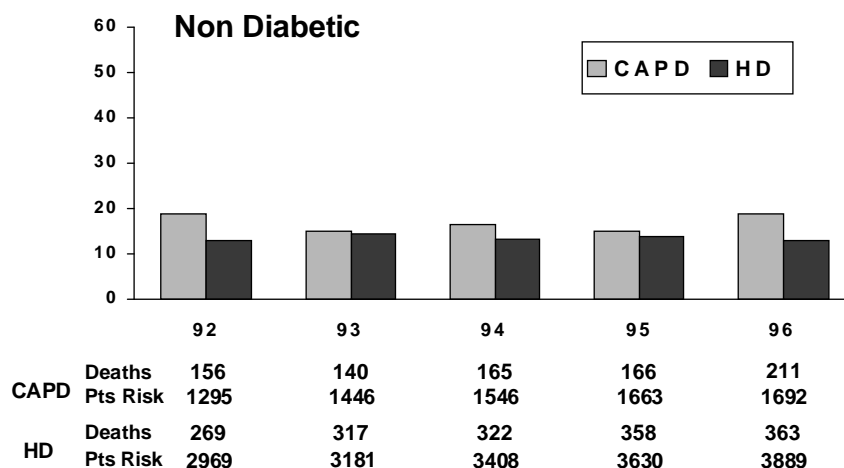


Figure 43

**Annual Death Rate Per 100 Patient Years
Mode of Dialysis Australia 1992 - 1996**

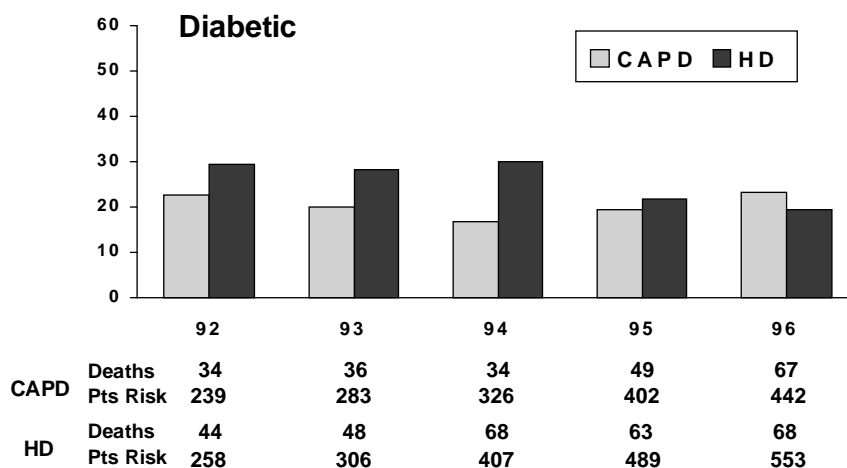


Figure 44

**Annual Death Rate Per 100 Patient Years
Mode of Dialysis Australia 1991 - 1996**

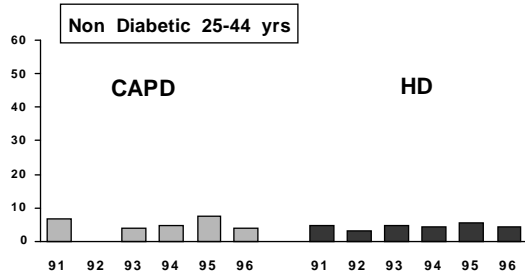
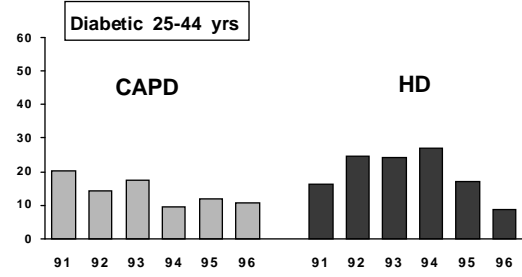
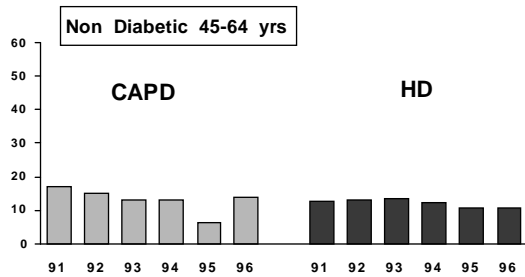


Figure 45

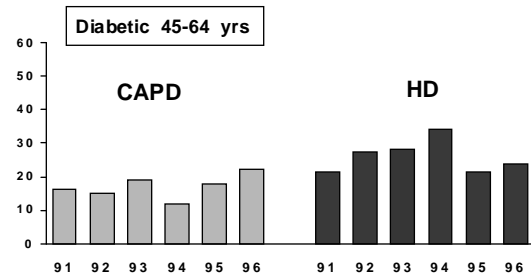
**Annual Death Rate Per 100 Patient Years
Mode of Dialysis Australia 1991 - 1996**



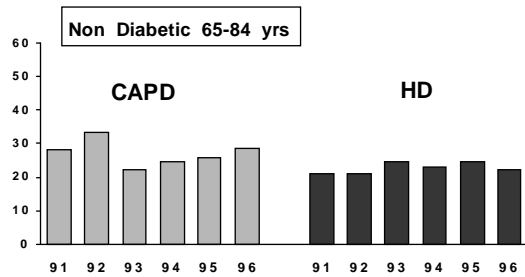
**Annual Death Rate Per 100 Patient Years
Mode of Dialysis Australia 1991 - 1996**



**Annual Death Rate Per 100 Patient Years
Mode of Dialysis Australia 1991 - 1996**



**Annual Death Rate Per 100 Patient Years
Mode of Dialysis Australia 1991 - 1996**



**Annual Death Rate Per 100 Patient Years
Mode of Dialysis Australia 1991 - 1996**

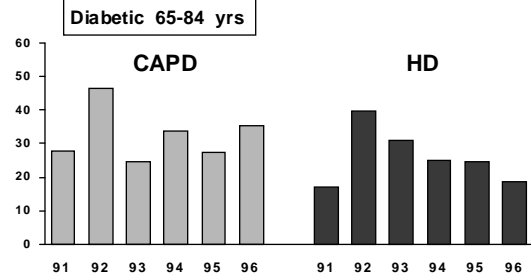


Table 36

Australia

Dialysis and Transplant Patient Death Rates * 1996

All Patients

| Mode of Treatment | | 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 | n=4442 | 33% | 4% | 0% | 4% | 3% | 7% | 10% | 14% | 19% | 25% | 9.7% | (431) |
| CAPD | n=2134 | 0% | 0% | 2% | 2% | 5% | 6% | 14% | 18% | 25% | 50% | 13% | (278) |
| All Dialysis Patients ☆ | n=6038 | 17% | 5% | <1% | 4% | 4% | 8% | 13% | 18% | 24% | 44% | 12.1% | (731) |
| Transplant Patients | n=4675 | 6% | 1% | <1% | <1% | 1% | 2% | 3% | 9% | 7% | 0% | 2.3% | (109) |

* Expressed as (%) of patients treated by dialysis or with a functioning transplant in 1996

☆ Includes (22) patients having IPD at death

Non Diabetic Patients

| Mode of Treatment | | 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 | n=3889 | 33% | 4% | 0% | 3% | 3% | 6% | 10% | 15% | 20% | 25% | 9.3% | (363) |
| CAPD | n=1692 | 0% | 0% | 2% | 1% | 3% | 6% | 12% | 17% | 24% | 50% | 12.4% | (211) |
| Non Diabetic P'ts ☆ | n=5161 | 17% | 5% | <1% | 3% | 4% | 6% | 11% | 17% | 24% | 44% | 11.5% | (594) |
| Non Diabetic Tx | n=4416 | 5.8% | 1% | <1% | <1% | 1% | 1% | 3% | 8% | 7% | 0% | 2.2% | (98) |

* Expressed as (%) of non diabetic patients treated by dialysis or with a functioning transplant in 1996

☆ Includes (20) patients having IPD at death

Diabetic Patients

| Mode of Treatment | | 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 | n=553 | 0% | 0% | 0% | 9% | 4% | 15% | 15% | 13% | 12% | 0% | 12.2% | (68) |
| CAPD | n=442 | 0% | 0% | 0% | 4% | 8% | 7% | 21% | 22% | 22% | 0% | 15.1% | (67) |
| All Diabetic Dx ☆ | n=877 | 0% | 0% | 0% | 8% | 6% | 13% | 20% | 19% | 18% | 0% | 15.6% | 137 |
| Diabetic Tx | n=223 | 0% | 0% | 0% | 0% | 1% | 7% | 5% | 29% | 0% | 0% | 4.2% | (11) |

* Expressed as (%) of diabetic patients treated by dialysis or with a functioning transplant in 1996

☆ Includes two patients having IPD at death.

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

Figure 46

**Death Rate of Dialysis Patients
Australia 1996**

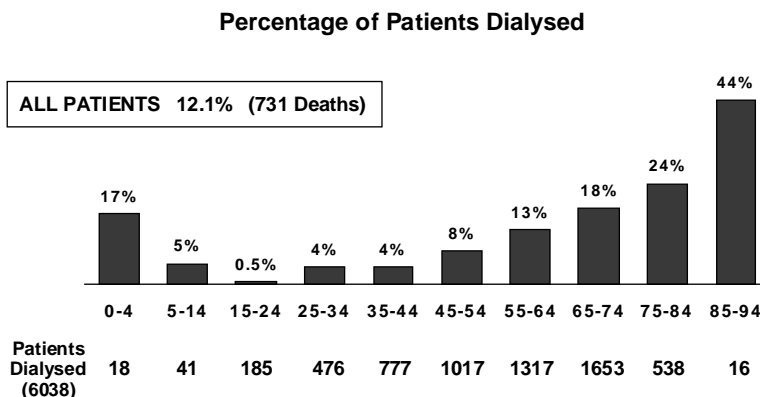


Figure 47

**Death Rate Diabetic and Non Diabetic Patients
Australia 1996**

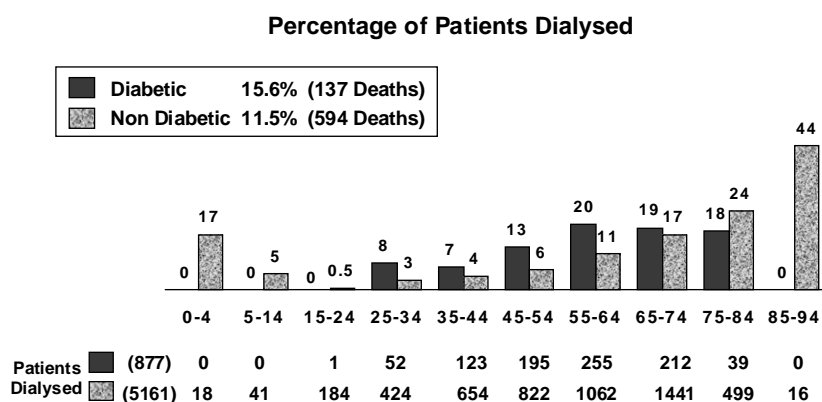


Figure 48

**Death Rate of HD and C.A.P.D Patients
Australia 1996**

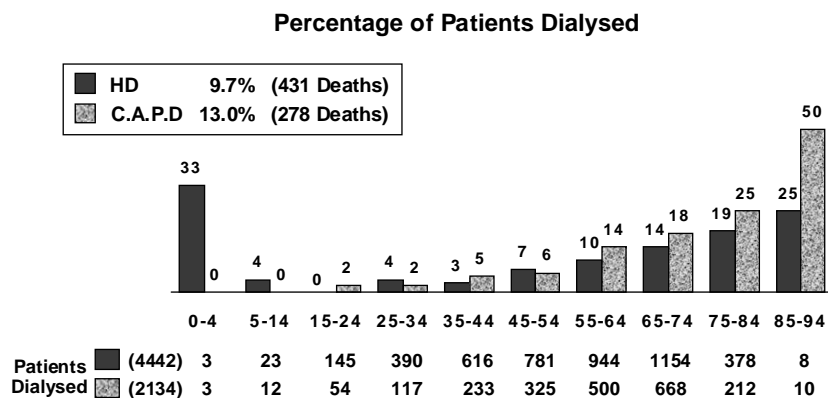


Table 37

Australia

**Death Rates Calculated as Deaths Per 100 Patient Years
Transplant Patients 1996**

| | 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 | 8.5 | 1.2 | 0.4 | 0.6 | 1.2 | 1.9 | 3.5 | 9.4 | 2.5 |
| No. of Deaths | 1 | 1 | 1 | 4 | 11 | 20 | 34 | 36 | 109 |
| No. at Risk | 17 | 97 | 274 | 710 | 975 | 1135 | 1032 | 414 | 4669 |
| Non Diabetic Death Rate | 8.5 | 1.2 | 0.4 | 0.6 | 1.2 | 1.4 | 3.4 | 9.03 | 2.4 |
| No. of Deaths | 1 | 1 | 1 | 4 | 10 | 14 | 32 | 34 | 98 |
| No. at Risk | 17 | 97 | 272 | 669 | 890 | 1052 | 991 | 407 | 4395 |
| Diabetic Death Rate | 0 | 0 | 0 | 0 | 1.2 | 8.1 | 5.4 | 31.1 | 4.7 |
| No. of Deaths | 0 | 0 | 0 | 0 | 1 | 6 | 2 | 2 | 11 |
| No. at Risk | 0 | 0 | 2 | 41 | 85 | 83 | 41 | 7 | 259 |
| Cadaver Transplants ★ | | | | | | | | | |
| All Patients Death Rate | 0 | 3.1 | 0 | 0.4 | 1.2 | 2.1 | 3.7 | 9.7 | 2.8 |
| No. of Deaths | 0 | 1 | 0 | 2 | 9 | 20 | 34 | 36 | 103 |
| No. at Risk | 8 | 39 | 151 | 526 | 782 | 1025 | 977 | 400 | 3923 |
| Non Diabetic Death Rate | 0 | 3.1 | 0 | 0.4 | 1.2 | 1.5 | 3.6 | 9.3 | 2.6 |
| No. of Deaths | 0 | 1 | 0 | 2 | 8 | 14 | 32 | 34 | 92 |
| No. at Risk | 8 | 39 | 150 | 490 | 712 | 948 | 943 | 393 | 3701 |
| Diabetic Death Rate | 0 | 0 | 0 | 0 | 1.5 | 8.8 | 6.4 | 31.1 | 5.4 |
| No. of Deaths | 0 | 0 | 0 | 0 | 1 | 6 | 2 | 2 | 11 |
| No. at Risk | 0 | 0 | 1 | 36 | 70 | 77 | 34 | 7 | 225 |
| Living Donor Transplant ★ | | | | | | | | | |
| All Patients Death Rate | 18.2 | 0 | 0.8 | 1.2 | 1.1 | 0 | 0 | 0 | 0.8 |
| No. of Deaths | 1 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 6 |
| No. at Risk | 9 | 58 | 123 | 185 | 193 | 110 | 55 | 15 | 748 |
| Non Diabetic Death Rate | 18.2 | 0 | 0.8 | 1.2 | 1.2 | 0 | 0 | 0 | 0.9 |
| No. of Deaths | 1 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 6 |
| No. at Risk | 9 | 58 | 122 | 180 | 178 | 104 | 48 | 15 | 714 |
| 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 | 1 | 5 | 15 | 6 | 7 | 0 | 34 |

★ Functioning Transplant at Death

Table 38

Australia

Cause of Death - Dialysis Dependent 1996

| | | | |
|---------------------------------|------------------|---------------------------------|-------------------|
| Cardiac | | Vascular | |
| Myocardial Ischaemia (presumed) | 68 | Pulmonary Embolus | 4 |
| Myocardial Infarction | 109 | Cerebrovascular Accident | 58 |
| Pulmonary Oedema | 14 | Gastrointestinal Haemorrhage | 3 |
| Hyperkalaemia | 7 | Haemorrhage from Dx Access Site | 2 |
| Haemorrhagic Pericarditis | 1 | Ruptured Aortic Aneurysm | 3 |
| Hypertensive Cardiac Failure | 3 | Haemorrhage from elsewhere | 5 |
| Cardiac Arrest | 105 | Bowel Infarction | 12 |
| Other Causes of Cardiac Failure | 17 | | |
| Total | 324 (44%) | Total | 87 (12%) |
| Infection | | Social | |
| CNS - fungal | 1 (a) | Patient Refused Treatment | 77 |
| Lung - bacterial | 8 | Therapy Ceased | 47 |
| Lung - viral | 1 (b) | Accidental | 3 |
| Lung - fungal | 3(a,c,d) | Suicide | 2 |
| Lung - other | 9 (e) | Total | 129 (18%) |
| Wound - bacterial | 8 | | |
| Wound - other | 1 (e) | Miscellaneous | |
| Shunt - fungal | 1 (f) | Hepatic Failure | 4 |
| Peritoneum - bacterial | 23 | Cachexia | 14 |
| Peritoneum - fungal | 5 (d,f) | Unknown | 7 |
| Peritoneum - other | 4 (e) | Malignancy | 28 |
| Septicaemia - bacterial | 10 | Perforation Abdominal Viscus | 10 |
| Septicaemia - fungal | 1 (d) | Other | 12 |
| Septicaemia - other | 7 (e) | Chronic Respiratory Failure | 10 |
| Liver - viral | 1 (g) | Immunodeficiency - infection | 1 |
| Other site - bacterial | 17 | Total | 86 (12%) |
| Other site - other | 5 (e) | Total Deaths | 731 (100%) |
| Total | 105 (14%) | | |

| | |
|------------------|---------------------------|
| (a) Cryptococcus | (d) Candida |
| (b) CMV | (e) Organism not Isolated |
| (c) Aspergillus | (f) Candida Parapsilosis |
| | (g) Hepatitis B and C |

Table 39

Australia

Cause of Death - Transplant Dependent 1996

| | | | |
|---------------------------------|-----------------|-----------------------------|-------------------|
| Cardiac | | Vascular | |
| Myocardial Ischaemia (presumed) | 8 | Pulmonary Embolus | 6 |
| Myocardial Infarction | 19 | Cerebrovascular Accident | 8 |
| Cardiac Arrest | 8 | Bowel Infarction | 2 |
| Pulmonary Oedema | 1 | Ruptured Aortic Aneurysm | 1 |
| Total | 36 (33%) | Total | 17 (16%) |
| Infection | | Social | |
| CNS - fungal | 1 (a) | Suicide | 2 |
| Lung - bacterial | 1 | Patient Refused Treatment | 1 |
| Lung - viral | 1 (b) | Therapy Ceased | 2 |
| Lung - fungal | 1 (a) | Accidental | 3 |
| Lung - protozoa | 1 (c) | Total | 8 (7%) |
| Lung - other | 2 (d) | | |
| Wound - bacterial | 1 | Miscellaneous | |
| Septicaemia - bacterial | 3 | Hepatic Failure | 3 |
| Septicaemia - viral | 1 (e) | Unknown | 1 |
| Septicaemia - other | 2 (d) | Malignancy | 25 |
| Liver - bacterial | 1 | Other | 1 |
| Liver - viral | 1 (f) | Chronic Respiratory Failure | 1 |
| Total | 16 (15%) | Bone Marrow Depression | 1 |
| | | Total | 32 (29%) |
| | | Total Deaths | 109 (100%) |

| | |
|--------------------------|----------------------------|
| (a) Cryptococcus | (d) Organism not Isolated |
| (b) CMV | (e) Disseminated Varicella |
| (c) Pneumocystis Carinii | (f) Hepatitis B |

Table 40

New Zealand

**Death Rates Calculated as Deaths Per 100 Patient Years
Dialysis Patients 1996**

| | Age Groups | | | | | All Ages |
|--------------------------------|------------|------------|-------------|-------------|-------------|-------------|
| | 00-14 | 15-24 | 25-44 | 45-64 | 65-84 | |
| All Dialysis | | | | | | |
| All Patients Death Rate | 0 | 3.0 | 9.1 | 14.0 | 26.7 | 14.8 |
| No. of Deaths | 0 | 1 | 20 | 64 | 48 | 133 |
| No. at Risk | 18 | 46 | 286 | 562 | 235 | 1147 |
| Non Diabetic Death Rate | 0 | 3.0 | 7.5 | 10.3 | 24.4 | 12.0 |
| No. of Deaths | 0 | 1 | 14 | 28 | 34 | 77 |
| No. at Risk | 18 | 46 | 235 | 323 | 179 | 801 |
| Diabetic Death Rate | 0 | 0 | 17.4 | 19.5 | 34.3 | 21.6 |
| No. of Deaths | 0 | 0 | 6 | 36 | 14 | 56 |
| No. at Risk | 0 | 0 | 51 | 239 | 56 | 346 |
| CAPD ★ | | | | | | |
| All Patients Death Rate | 0 | 0 | 10.8 | 12.7 | 25.0 | 14.8 |
| No. of Deaths | 0 | 0 | 11 | 35 | 30 | 76 |
| No. at Risk | 13 | 25 | 155 | 379 | 162 | 732 |
| Non Diabetic Death Rate | 0 | 0 | 7.6 | 9.2 | 21.0 | 11.5 |
| No. of Deaths | 0 | 0 | 6 | 14 | 19 | 39 |
| No. at Risk | 13 | 25 | 114 | 204 | 120 | 476 |
| Diabetic Death Rate | 0 | 0 | 21.2 | 17.0 | 37.4 | 21.0 |
| No. of Deaths | 0 | 0 | 5 | 21 | 11 | 37 |
| No. at Risk | 0 | 0 | 41 | 173 | 42 | 256 |
| Haemodialysis ★ | | | | | | |
| All Patients Death Rate | 0 | 6.3 | 7.9 | 16.8 | 28.8 | 15.6 |
| No. of Deaths | 0 | 1 | 9 | 29 | 17 | 56 |
| No. at Risk | 0 | 30 | 161 | 263 | 103 | 557 |
| Non Diabetic Death Rate | 0 | 6.3 | 7.8 | 12.1 | 29.3 | 13.1 |
| No. of Deaths | 0 | 1 | 8 | 14 | 14 | 37 |
| No. at Risk | 0 | 30 | 138 | 159 | 84 | 411 |
| Diabetic Death Rate | 0 | 0 | 9.4 | 26.3 | 26.8 | 24.1 |
| No. of Deaths | 0 | 0 | 1 | 15 | 3 | 19 |
| No. at Risk | 0 | 0 | 23 | 104 | 19 | 146 |

★ Treatment at Death

Figure 49

**Annual Death Rate Per 100 Dialysis Patient Years
New Zealand 1992 - 1996**

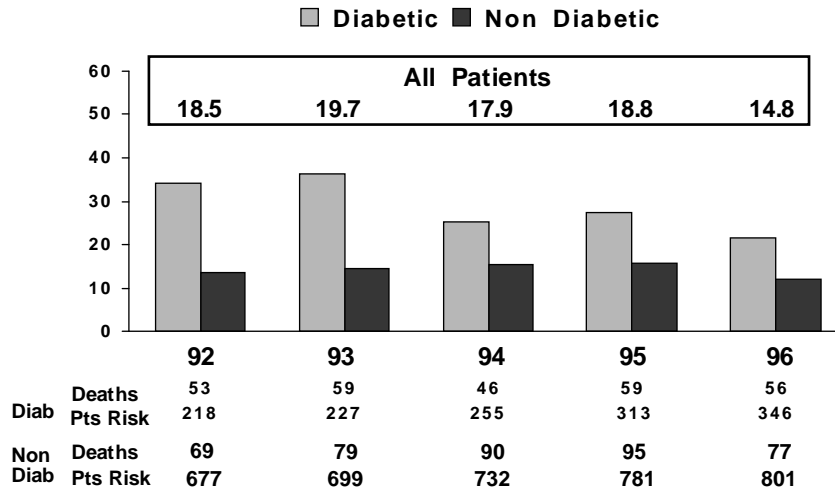


Figure 50

**Annual Death Rate Per 100 Patient Years
Mode of Dialysis New Zealand 1992 - 1996**

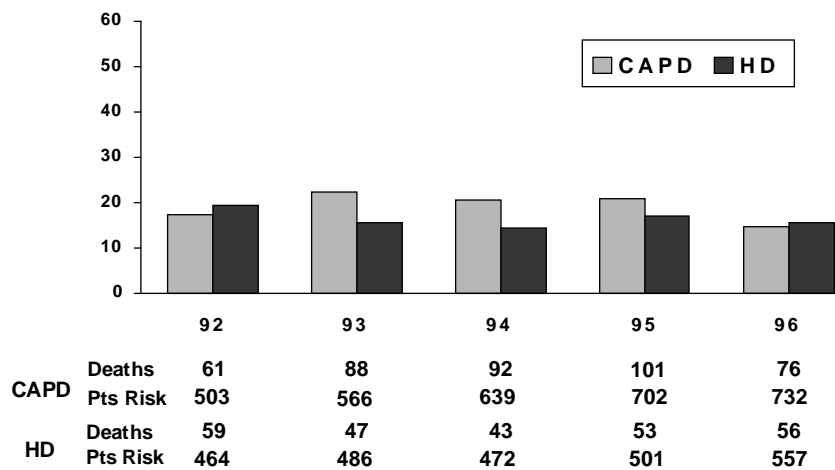


Figure 51

**Annual Death Rate Per 100 Patient Years
Mode of Dialysis New Zealand 1992 - 1996**

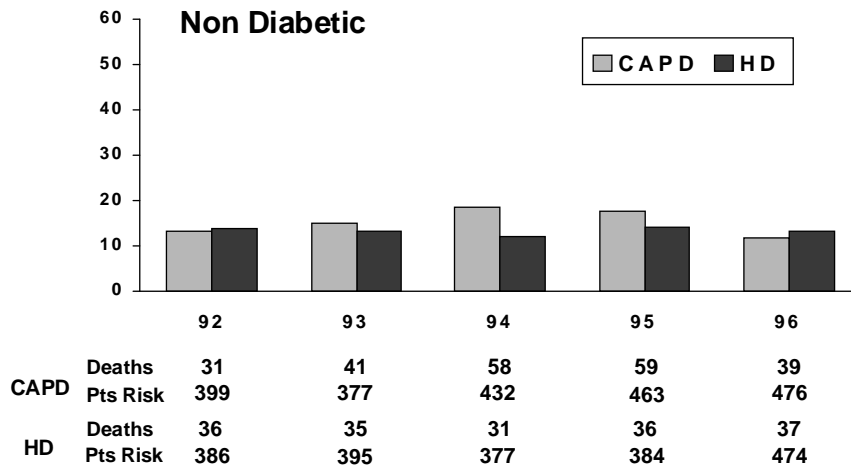


Figure 52

**Annual Death Rate Per 100 Patient Years
Mode of Dialysis New Zealand 1992 - 1996**

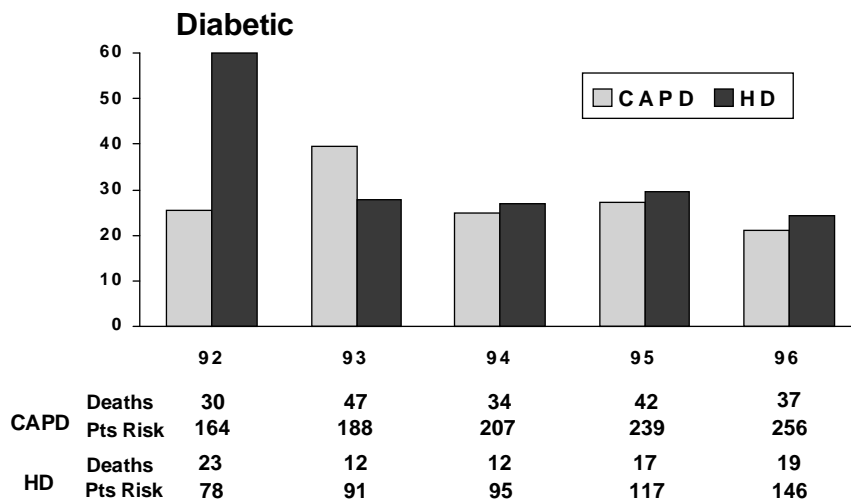


Table 41

New Zealand

Dialysis and Transplant Patient Death Rates * 1996

All Patients

| Mode of Treatment | | Age Groups | | | | | | | | | | Total | |
|-------------------------------|---------------|------------|-----------|-----------|-----------|---------------|-----------|------------|------------|------------|-----------|--------------|--------------|
| | | 00-04 | 05-14 | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85-94 | Deaths | |
| Haemodialysis | n=557 | 0% | 0% | 3% | 6% | 5% | 8% | 14% | 14% | 31% | 0% | 10.0% | (56) |
| CAPD | n=732 | 0% | 0% | 0% | 6% | 8% | 8% | 10% | 17% | 26% | 0% | 10.3% | (76) |
| All Dialysis Patients☆ | n=1147 | 0% | 0% | 2% | 6% | 8% | 9% | 13% | 18% | 31% | 0% | 11.5% | (133) |
| Transplant Patients | n=878 | 0% | 0% | 0% | 1% | <1% | 3% | 5% | 14% | 25% | 0% | 2.9% | (26) |

* Expressed as (%) of patients treated by dialysis or with a functioning transplant in 1996

☆ Includes one patient having IPD at death

Non Diabetic Patients

| Mode of Treatment | | Age Groups | | | | | | | | | | Total | |
|----------------------------|--------------|------------|-----------|-----------|-----------|---------------|-----------|------------|------------|------------|-----------|-------------|-------------|
| | | 00-04 | 05-14 | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85-94 | Deaths | |
| Haemodialysis | n=411 | 0% | 0% | 3% | 7% | 5% | 6% | 12% | 14% | 27% | 0% | 9.0% | (37) |
| CAPD | n=476 | 0% | 0% | 0% | 4% | 6% | 5% | 8% | 13% | 27% | 0% | 8.1% | (39) |
| Non Diabetic P'ts ☆ | n=801 | 0% | 0% | 2% | 6% | 6% | 6% | 11% | 16% | 30% | 0% | 9.6% | (77) |
| Non Diabetic Tx | n=812 | 0% | 0% | 0% | 1% | <1% | 4% | 5% | 14% | 25% | 0% | 3.2% | (26) |

* Expressed as (%) of non diabetic patients treated by dialysis or with a functioning transplant in 1996

☆ Includes one patient having IPD at death

Diabetic Patients

| Mode of Treatment | | Age Groups | | | | | | | | | | Total | |
|------------------------|--------------|------------|-----------|-----------|-----------|------------|------------|------------|------------|------------|-----------|--------------|-------------|
| | | 00-04 | 05-14 | 15-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85-94 | Deaths | |
| Haemodialysis | n=146 | 0% | 0% | 0% | 0% | 5% | 13% | 16% | 11% | 100% | 0% | 13.0% | (19) |
| CAPD | n=256 | 0% | 0% | 0% | 11% | 13% | 12% | 12% | 26% | 0% | 0% | 14.4% | (37) |
| All Diabetic Dx | n=346 | 0% | 0% | 0% | 9% | 13% | 14% | 16% | 24% | 50% | 0% | 16.1% | (56) |
| Diabetic Tx | n=66 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | (0) |

* Expressed as (%) of diabetic patients treated by dialysis or with a functioning transplant in 1996

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

Figure 53

**Death Rate of Dialysis Patients
New Zealand 1996**

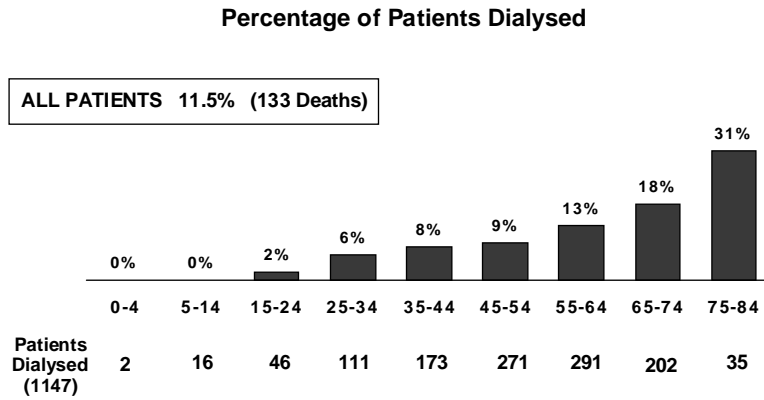


Figure 54

**Death Rate Diabetic and Non Diabetic Patients
New Zealand 1996**

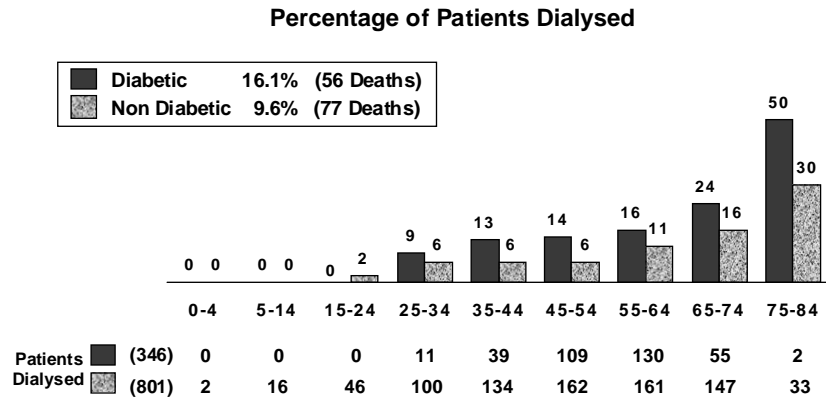


Figure 55

**Death Rate of HD and C.A.P.D Patients
New Zealand 1996**

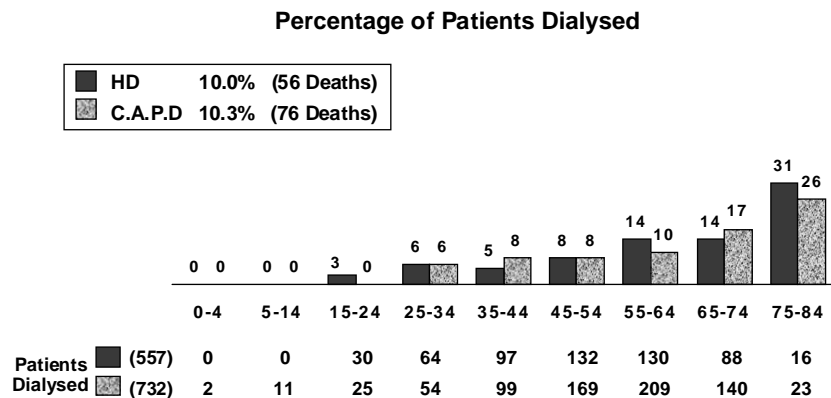


Table 42

New Zealand

**Death Rates Calculated as Deaths Per 100 Patient Years
Transplant Patients 1996**

| | 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 | 1.1 | 0.5 | 3.8 | 5.4 | 15.2 | 3.2 |
| No. of Deaths | 0 | 0 | 0 | 2 | 1 | 7 | 7 | 8 | 26 |
| No. at Risk | 3 | 21 | 46 | 191 | 209 | 203 | 140 | 59 | 876 |
| Non Diabetic Death Rate | 0 | 0 | 0 | 1.1 | 0.5 | 4.4 | 5.9 | 15.5 | 3.5 |
| No. of Deaths | 0 | 0 | 0 | 2 | 1 | 7 | 7 | 8 | 26 |
| No. at Risk | 3 | 21 | 46 | 183 | 191 | 176 | 128 | 58 | 810 |
| 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 | 8 | 18 | 27 | 12 | 1 | 66 |
| Cadaver Transplants ★ | | | | | | | | | |
| All Patients Death Rate | 0 | 0 | 0 | 1.8 | 0.6 | 3.7 | 6.1 | 16.1 | 4.1 |
| No. of Deaths | 0 | 0 | 0 | 2 | 1 | 6 | 7 | 8 | 25 |
| No. at Risk | 1 | 6 | 15 | 120 | 163 | 178 | 126 | 56 | 669 |
| Non Diabetic Death Rate | 0 | 0 | 0 | 1.9 | 0.7 | 4.3 | 6.7 | 16.4 | 4.5 |
| No. of Deaths | 0 | 0 | 0 | 2 | 1 | 6 | 7 | 8 | 25 |
| No. at Risk | 1 | 6 | 15 | 112 | 147 | 155 | 114 | 55 | 609 |
| 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 | 8 | 16 | 23 | 12 | 1 | 60 |
| Living Donor Transplants ★ | | | | | | | | | |
| All Patient Death Rate | 0 | 0 | 0 | 0 | 0 | 4.3 | 0 | 0 | 0.5 |
| No. of Deaths | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| No. at Risk | 2 | 15 | 31 | 72 | 46 | 25 | 14 | 3 | 208 |
| Non Diabetic Death Rate | 0 | 0 | 0 | 0 | 0 | 5.2 | 0 | 0 | 0.5 |
| No. of Deaths | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| No. at Risk | 2 | 15 | 31 | 72 | 44 | 21 | 14 | 3 | 202 |
| 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 | 0 | 2 | 4 | 0 | 0 | 6 |

★ Functioning Transplant at Death

Table 43

New Zealand

Cause of Death - Dialysis Dependent 1996

| | | | |
|---------------------------------|-----------------|------------------------------|-------------------|
| Cardiac | | Vascular | |
| Myocardial Ischaemia (presumed) | 14 | Pulmonary Embolus | 2 |
| Myocardial Infarction | 19 | Cerebrovascular Accident | 8 |
| Hyperkalaemia | 1 | Gastrointestinal Haemorrhage | 2 |
| Hypertensive Cardiac Failure | 1 | Haemorrhage from elsewhere | 2 |
| Cardiac Arrest | 18 | Ruptured Aortic Aneurysm | 1 |
| Other Causes Cardiac Failure | 4 | Bowel Infarction | 1 |
| Pulmonary oedema | 1 | Total | 14 (11%) |
| Total | 58 (44%) | Social | |
| Infection | | Patient Refused Treatment | 18 |
| Lung - bacterial | 1 | Therapy Ceased | 13 |
| Lung - fungal | 1 (a) | Accidental | 1 |
| Lung - other | 4 (b) | Total | 32 (24%) |
| Peritoneum - bacterial | 6 | Miscellaneous | |
| Peritoneum - fungal | 2 (a,c) | Pancreatitis | 1 |
| Septicaemia - bacterial | 1 | Cachexia | 3 |
| Septicaemia - viral | 1 (d) | Sclerosing Peritonitis | 1 |
| Septicaemia - other | 2 (b) | Malignancy | 4 |
| Other site - bacterial | 1 | Perforation Abdominal Viscus | 1 |
| Total | 19 (14%) | Total | 10 (7%) |
| | | Total Deaths | 133 (100%) |

| | |
|---------------------------|------------------------|
| (a) Candida | (c) Nocardia |
| (b) Organism not Isolated | (d) Virus not Isolated |

Table 44

New Zealand

Cause of Death - Transplant Dependent 1996

| | | | |
|---------------------------------|----------------|---------------------------|------------------|
| Cardiac | | Vascular | |
| Myocardial Ischaemia (presumed) | 3 | Cerebrovascular Accident | 1 |
| Myocardial Infarction | 3 | Pulmonary Embolus | 1 |
| Cardiac Arrest | 2 | Total | 2 (7%) |
| Total | 8 (31%) | Social | |
| Infection | | Patient Refused Treatment | 1 |
| Lung - bacterial | 2 | Total | 1 (4%) |
| Lung - viral | 1 (a) | Miscellaneous | |
| Septicaemia - bacterial | 2 | Malignancy | 7 |
| Liver - other | 1 (b) | Cachexia | 1 |
| Other site- bacterial | 1 | Total | 8 (31%) |
| Total | 7 (27%) | Total Deaths | 26 (100%) |

| | |
|---------|---------------------------|
| (a) CMV | (b) Organism not isolated |
|---------|---------------------------|

DEATHS FROM MALIGNANCY

AUSTRALIA

There was a total of 53 fatal malignancies in patients with a functioning transplant (25) or dialysis dependent (28), during 1996 as shown in Table 45.

DIALYSIS DEPENDENT

Fourteen of the 28 patients had cancer diagnosed before their first dialysis and a further three in less than nine months of first dialysis. Five patients had dialysed for more than five years.

Five patients had had a previous unsuccessful transplant.

There were four tumours of the lung, three of the urinary tract, seven with myeloma and one with lymphoma.

Myeloma patients had a median survival from diagnosis of 7 months (range 0 - 90 months).

TRANSPLANT DEPENDENT

There were 25 deaths (35, 1995) in this group of patients.

There were three tumours of the kidney and lung.

There were two deaths from lymphoma.

One patient died from a skin melanoma. Twenty four patients died from non skin cancer, median period since transplant 139.5 months (range 20 – 275 months).

NEW ZEALAND

DIALYSIS DEPENDENT

There were four deaths due to malignancy, none had been previously transplanted and none diagnosed before dialysis. See Table 45.

TRANSPLANT DEPENDENT

There were seven deaths: six non skin, two pancreas and one breast, lung, microglioma and craniopharyngioma of the brain and one skin cancer (SCC). See Table 45.

Table 45

Australia and New Zealand

Deaths from Malignancy 1996
Dialysis Dependent and Transplant Dependent

| | Dialysis | Transplant | Total |
|---|------------|------------|-----------|
| Australia | | | |
| Adenocarcinoma | | | |
| Breast | 2 (1★) | 1 | 3 |
| Bladder | 1 (1★) | - | 1 |
| Colon | 1 | 2 | 3 |
| Kidney | 1 (1★) | 3 | 4 |
| Lung | 1 (1★) | 2 | 3 |
| Oesophagus | - | 1 | 1 |
| Ovaries | 2 (1★) | - | 2 |
| Prostate | 2 (2★) | - | 2 |
| Rectum | 1 | 1 | 1 |
| Spine | 1 (★) | 1 | 1 |
| Stomach | - | 1 | 1 |
| Unknown Site | - | 5 | 5 |
| Leukaemia | - | 1 | 1 |
| Lymphoma | | | |
| L.Supraclavicular | - | 1 | 1 |
| Bone Marrow | 1 (1★) | 1 | 2 |
| Melanoma | | | |
| L.Retina | - | 1 | 1 |
| Scalp | - | 1 | 1 |
| Myeloma | 7 (1★)(7★) | - | 7 |
| Squamous Cell Carcinoma | | | |
| Anus | - | 1 | 1 |
| Cervix | 1 | - | 1 |
| Lung | 1 | - | 1 |
| Transitional Cell Carcinoma | | | |
| Bladder | 2 | - | 2 |
| Renal Pelvis | 1 (1★) | - | 1 |
| Urinary System | 1 (1★) | - | 1 |
| Other | | | |
| Cholangiocarcinoma - Biliary Tract | - | 1 | 1 |
| Hepatocellular - Liver | - | 1 | 1 |
| Meningioma - Brain | - | 1 | 1 |
| Poorly differentiated periampullary - pancreas | - | 1 | 1 |
| Small cell - Lung | 2 | - | 2 |
| Total Deaths from Malignancy | 28 | 25 | 53 |
| (5★) Previously Transplanted (14★) Diagnosis before Dialysis Commenced | | | |
| New Zealand | | | |
| Adenocarcinoma | | | |
| Breast | - | 1 | 1 |
| Colon | 1 | - | 1 |
| Oesophagus | 1 | - | 1 |
| Pancreas | - | 1 | 1 |
| Uterus | 1 | - | 1 |
| Unknown Primary | 1 | - | 1 |
| Microglioma | - | 1 | 1 |
| Squamous Cell Carcinoma | | | |
| Pancreas | - | 1 | 1 |
| Skin | - | 1 | 1 |
| Other | | | |
| Craniopharyngioma - Brain | - | 1 | 1 |
| Small Cell - Lung | - | 1 | 1 |
| Total Deaths from Malignancy | 4 | 7 | 11 |
| (0) Previously Transplanted (0) Diagnosis before Dialysis Commenced | | | |

WITHDRAWAL FROM DIALYSIS TREATMENT

AUSTRALIA

The number of deaths continued to rise substantially from 106 (1995) to 124 in 1996; the majority were again reportedly due to patient refusal. The majority of deaths were aged 65-94 years (66%).

Seventeen percent of all deaths 65-74 years, 20% of these 75-84 years were due to withdrawal of treatment: mainly patients who refused further treatment.

Most CAPD and HD cases were males. See Table 46.

Amongst diabetics, males were almost equally represented.

Sixty percent of patients were haemodialysis dependent (70% in 1995). See Table 47.

NEW ZEALAND

The number of deaths rose to 31 in 1996 (24 in 1995): 22% of all deaths of patients 65-74 years, 64% of those 75-84 years of age. Nine of 31 patients had diabetic nephropathy. Thirty two percent were haemodialysis dependent. See Table 48.

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

Table 46

Australia and New Zealand

Age Group Related Treatment Withdrawal 1996

| Mode of Treatment | Gender | Age Groups | | | | | | | | Total |
|-------------------|--------|------------|----------|--------------|---------------|---------------|---------------|-----------|----------|-----------------|
| | | 00-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85-94 | |
| AUSTRALIA | | | | | | | | | | |
| IPD | Female | 1 | - | - | - | 1 | - | - | - | 2 |
| | Male | 1 | - | - | - | - | - | - | - | 1 |
| Haemodialysis | Female | - | - | 1 (1) | 6 (2) | 7 (1) | 13 | 8 | 1 | 36 (4) |
| | Male | - | 1 | - | 6 (2) | 8 (1) | 14 | 9 | 1 | 39 (3) |
| CAPD | Female | - | - | 1 (1) | 1 (1) | 6 (5) | 11 (2) | 3 | - | 22 (9) |
| | Male | 1 | - | 1 | - | 2 (2) | 12 (6) | 6 | 2 | 24 (8) |
| Total | | 3 | 1 | 3 (2) | 13 (5) | 24 (9) | 50 (8) | 26 | 4 | 124 (24) |

| | | | | | | | | | | |
|--------------------|--------|----------|----------|----------|--------------|---------------|--------------|--------------|----------|---------------|
| NEW ZEALAND | | | | | | | | | | |
| Haemodialysis | Female | - | - | - | 1 | 3 (1) | 1 | 2 | - | 7 (1) |
| | Male | - | - | - | - | 1 | 1 (1) | 1 (1) | - | 3 (2) |
| CAPD | Female | - | - | - | 2 (1) | 4 (1) | 4 | 2 | - | 12 (2) |
| | Male | - | 1 | - | 2 (2) | 2 (2) | 2 | 2 | - | 9 (4) |
| Total | | - | 1 | - | 5 (3) | 10 (4) | 8 (1) | 7 (1) | - | 31 (9) |

() Diabetics

Table 47

Australia

Treatment Withdrawal 1989 - 1996

| Year | Treatment | Age Groups | | | | | | | | Total |
|--------------|-------------|------------|---------------|---------------|----------------|----------------|-----------------|---------------|----------|-----------------|
| | | 00-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85-94 | |
| 1989 | CAPD | - | - | - | 2 (1) | 8 (3) | 14 (1) | 3 | - | 27 (5) |
| | HD | - | 1 | 1 | 4 (1) | 8 (1) | 10 | 3 | - | 27 (2) |
| 1990 | CAPD | - | - | 2 (2) | 2 (2) | 5 (2) | 11 (1) | 6 | - | 26 (7) |
| | HD | - | 1 | - | 1 (1) | 8 (3) | 12 | 5 | - | 27 (4) |
| 1991 | CAPD | - | - | 2 (2) | 2 (2) | 1 | 12 | 5 | - | 22 (4) |
| | HD | 1 | 1 (1) | 2 (1) | 6 (1) | 6 | 23 (1) | 3 | - | 42 (4) |
| 1992 | CAPD | - | - | - | - | 5 (3) | 15 (2) | 6 | - | 26 (5) |
| | HD | - | - | 2 (1) | 7 (3) | 7 (2) | 26 (2) | 7 (1) | - | 49 (9) |
| 1993 | CAPD | 1 | 1 | - | 1 | 3 (1) | 13 (1) | 5 | - | 24 (2) |
| | HD | 1 | 2 | 4 | 3 (1) | 15 (1) | 34 (2) | 12 | - | 71 (4) |
| 1994 | CAPD | - | - | 1 (1) | 2 (1) | 4 (2) | 16 (1) | 3 | - | 26 (5) |
| | HD | - | - | 2 (2) | 4 (2) | 10 (3) | 28 (2) | 7 (1) | - | 51 (10) |
| 1995 | CAPD | - | - | - | 1 | 5 (3) | 20 (4) | 4 (1) | 1 | 31 (8) |
| | HD | 1 | 4 | 4 (1) | 6 (2) | 12 (4) | 29 (1) | 18 (1) | - | 74 (9) |
| 1996 | CAPD | 1 | - | 2 (1) | 1 (1) | 8 (7) | 23 (8) | 9 | 2 | 46 (17) |
| | HD | - | 1 | 1 (1) | 12 (4) | 15 (2) | 27 | 17 | 2 | 75 (7) |
| Total | CAPD | 2 | 1 | 7 (6) | 11 (7) | 39 (21) | 124 (18) | 41 (1) | 3 | 228 (53) |
| | HD | 3 | 10 (1) | 16 (6) | 43 (15) | 81 (16) | 189 (8) | 72 (3) | 2 | 416 (49) |

() Diabetics

Table 48

New Zealand

Treatment Withdrawal 1989 - 1996

| Year | Treatment | Age Groups | | | | | | | | Total |
|--------------|-------------|------------|----------|--------------|---------------|----------------|---------------|--------------|----------|----------------|
| | | 00-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65-74 | 75-84 | 85-94 | |
| 1989 | CAPD | 1 | - | - | 1 (1) | 2 (1) | 1 | - | - | 5 (2) |
| | HD | - | - | 1 | 3 (2) | - | 2 (1) | - | - | 6 (3) |
| 1990 | CAPD | - | - | 2 (2) | - | - | 1 | 1 | - | 4 (2) |
| | HD | - | - | 1 (1) | 1 | - | 2 | - | - | 4 (1) |
| 1991 | CAPD | - | - | - | - | 2 | 3 | - | - | 5 |
| | HD | - | - | 1 | - | 1 | 2 | 1 | - | 5 |
| 1992 | CAPD | - | - | - | 1 (1) | 2 (2) | 2 | - | - | 5 (3) |
| | HD | - | - | - | - | 5 (3) | 1 | 1 | - | 7 (3) |
| 1993 | CAPD | - | - | - | 2 (1) | 4 (3) | 5 (1) | 3 | - | 14 (5) |
| | HD | - | - | 1 | - | 4 (2) | 1 | - | - | 6 (2) |
| 1994 | CAPD | - | - | - | 3 (3) | 2 (1) | 6 (1) | 1 | - | 12 (5) |
| | HD | - | - | - | - | 3 | 2 | 1 | - | 6 |
| 1995 | CAPD | - | - | - | - | 5 (4) | 8 (2) | 5 | - | 18 (6) |
| | HD | - | - | 1 | - | 4 (1) | 1 | - | - | 6 (1) |
| 1996 | CAPD | - | 1 | - | 4 (3) | 6 (3) | 6 | 4 | - | 21 (6) |
| | HD | - | - | - | 1 | 4 (1) | 2 (1) | 3 (1) | - | 10 (3) |
| Total | CAPD | 1 | 1 | 2 (2) | 11 (9) | 23 (14) | 32 (4) | 14 | - | 84 (29) |
| | HD | - | - | 5 (1) | 5 (2) | 21 (7) | 13 (2) | 6 (1) | - | 50 (13) |

() Diabetics