CHAPTER 3

DEATHS

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INTRODUCTION

The format of the deaths chapter continues to evolve in this report, with greater tabular data on the survival of people who commenced renal replacement therapy in the last 10 years.

Observed survival for non-indigenous patients who started in the period 2001-2010 is shown in Figure 3.1. This data is presented as censored at transplantation. Survival after transplantation and survival of indigenous peoples is covered in later chapters.

Crude unadjusted death rates for dialysis and transplantation are shown in Figure 3.2 for various groups and comparisons with the general populations in Figure 3.3. Rates are generally higher with older age, diabetes and coronary artery disease. The comparison between indigenous rates (and some other comparisons) will be subject to several confounders.

Figure 3.1

Survival among People who Commenced Dialysis 2001—2010 (Non-Indigenous) % (95% CI)

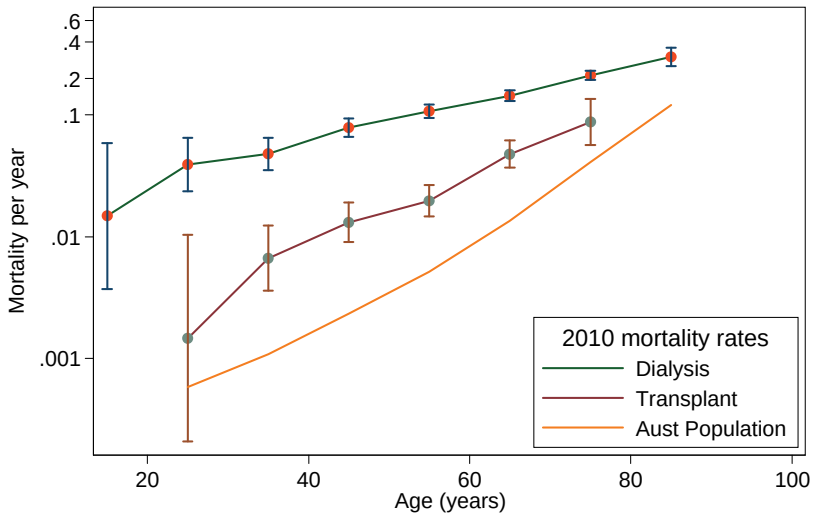
Age at Start	Time Period (Years)	Proportion Surviving Aust (95 % CI)	Proportion Surviving NZ (95 % CI)
0– 24	1	97 (95 - 98)	95 (89 - 98)
	2	93 (90 - 96)	93 (85 - 97)
	5	90 (85 - 93)	75 (50 - 88)
25—44	1	97 (96 - 97)	99 (97 - 100)
	2	91 (90 - 93)	94 (90 - 97)
	5	80 (77 - 83)	74 (64 - 81)
45—64	1	91 (91 - 92)	90 (88 - 92)
	2	84 (83 - 85)	80 (77 - 83)
	5	60 (58 - 61)	52 (47 - 57)
65—74	1	85 (84 - 86)	84 (81 - 87)
	2	72 (71 - 73)	71 (67 - 75)
	5	40 (38 - 42)	34 (29 - 38)
75—84	1	80 (78 - 81)	76 (71 - 80)
	2	63 (61 - 64)	54 (48 - 60)
	5	25 (24 - 27)	20 (15 - 25)
85 +	1	69 (64 - 73)	64 (45 - 78)
	2	49 (43 - 54)	42 (24 - 59)
	5	16 (12 - 22)	19 (7 - 36)

Figure 3.2

Death Rates During Renal Replacement Therapy
All Patients Included who Received Treatment During 2010

Group	Dialysis Mortality Rate (per 100 patient years, 95% CI)	Dialysis Number of Deaths Included in Analysis	Transplant Mortality Rate (per 100 patient years, 95% CI)	Transplant Number of Deaths Included in Analysis
OVERALL				
Australia	13.42 (12.70 - 14.19)	1401	1.11 (0.96 - 1.29)	173
New Zealand	13.68 (12.15 - 15.40)	319	1.36 (0.99 - 1.86)	39
AGES (YEARS)				
< 25	1.13 (0.28 - 4.51)	2	0.30 (0.13 - 0.67)	6
25—44	4.64 (3.55 - 6.06)	54	0.43 (0.29 - 0.63)	26
45—64	9.79 (8.89 - 10.79)	410	1.46 (1.22 - 1.74)	125
65—84	17.61 (16.50 - 18.81)	892	3.00 (2.30 - 3.91)	55
≥ 85	30.37 (25.43 - 36.26)	122	-	-
DIABETES (AT RRT START)				
Non-diabetic	11.50 (10.66 - 12.40)	672	0.90 (0.76 - 1.06)	141
Type 1	12.90 (9.29 - 17.85)	36	1.55 (1.03 - 2.34)	23
Type 2	15.86 (14.78 - 17.01)	772	3.57 (2.70 -4.74)	48
CORONARY ARTERTY DISEASE (AT RRT START)				
No	9.71 (8.99 - 10.48)	659	0.96 (0.82 - 1.12)	163
Yes	19.53 (18.24- 20.91)	821	3.26 (2.46 - 4.31)	49
INDIGENOUS				
Non-Indigenous (Australia)	13.60 (12.80 - 14.45)	1045	1.03 (0.88 - 1.20)	156
Non-Indigenous (New Zealand)	15.60 (13.22 - 18.43)	139	1.30 (0.92 - 1.84)	32
Aboriginal /Torres Strait Islanders	13.11 (11.07 - 15.52)	135	5.27 (3.28 - 8.48)	17
Maori (in New Zealand)	14.13 (11.53 - 17.32)	93	2.90 (1.38 - 6.08)	7
Pacific People (in New Zealand)	9.17 (6.75 - 12.45)	41	-	-

Figure 3.3



Aust 2010 death and population data from ABS

In response to requests to include more data about the survival expectations of patients at various ages, figure 3.4 table gives the median survival of people who started dialysis treatment from 1 January 2001.

These survival data are censored at the time of transplantation. In addition to the median, the 25 and 75th centiles are included to give an indication of the range of observed survivals. Some figure are not able to be calculated - for example if half of a group have not yet died it is not possible to observe a median survival.

The survival amongst younger people are likely to be strongly affected by the selection bias (fitter people will be transplanted and not be included in the analysis from that point).

Figure 3.5 shows the survival figures in more detail, categorised by the presence or absence of any vascular comorbidity and diabetes.

Figure 3.4

Survival of Dialysis Patients by age

Age Groups at start of treatment	Median (25th and 75th centiles), years
Australia	
0-24 years	-
25-44 years	(5.15 -)
45-64 years	6.06 (2.93 -)
65-74 years	3.99 (1.80 - 6.86)
75-84 years	2.87 (1.27 - 5.03)
85-89 years	1.94 (0.73 - 3.76)
New Zealand	
0-24 years	(7.12 -)
25-44 years	7.83 (4.10 -)
45-64 years	4.78 (2.60 -7.82)
65-74 years	3.41 (1.72 - 5.88)
75-84 years	2.37 (1.05 - 4.31)
85-89 years	1.69 (0.85 - 3.10)

Figure 3.5

Survival by Age & Comorbidity amongst older age groups

Median (25th and 75th centiles)

Age Groups	Any Vascular Disease	Diabetes	Australia	New Zealand
65-69 years	No	No	5.75 (3.2 -)	4.77 (2.44 -)
	No	Yes	5.57 (3.23 - 8.94)	4.75 (2.85 - 9.20)
	Yes	No	4.18 (1.61 - 7.10)	3.32 (1.84 - 6.37)
	Yes	Yes	3.49 (1.72 - 5.90)	3.03 (1.42 - 4.78)
70-74 years	No	No	4.65 (2.11 - 7.36)	4.58 (1.98 - 7.53)
	No	Yes	4.87 (2.72 - 7.02)	3.09 (1.91 - 5.71)
	Yes	No	3.56 (1.58 - 5.93)	2.65 (1.05 - 4.39)
	Yes	Yes	2.80 (1.25 - 5.29)	2.77 (1.19 - 4.12)
75-79 years	No	No	3.99 (1.77 - 6.04)	3.27 (1.10 - 5.78)
	No	Yes	3.27 (1.80 - 5.69)	3.82 (2.06 - 5.82)
	Yes	No	2.85 (1.28 - 5.14)	2.05 (0.62 - 3.68)
	Yes	Yes	2.68 (1.13 - 4.84)	1.85 (0.78 - 3.93)
80-84 years	No	No	3.19 (1.79 - 5.13)	2.67 (1.05 - 4.36)
	No	Yes	2.69 (1.70 - 4.57)	3.27 (1.23 - 3.75)
	Yes	No	2.36 (1.01 - 4.22)	1.71 (1.2 - 2.98)
	Yes	Yes	2.12 (0.84 - 4.40)	3.32 (2.25 - 4.93)
85-89 years	No	No	3.07 (1.18 - 5.53)	1.30 (0.63 - 3.58)
	No	Yes	4.02 (1.55 - 4.68)	
	Yes	No	1.82 (0.73 - 3.58)	1.70 (0.96 - 3.10)
	Yes	Yes	1.49 (0.44 - 2.97)	1.20 (0.78 - 2.74)

CAUSE OF DEATHS

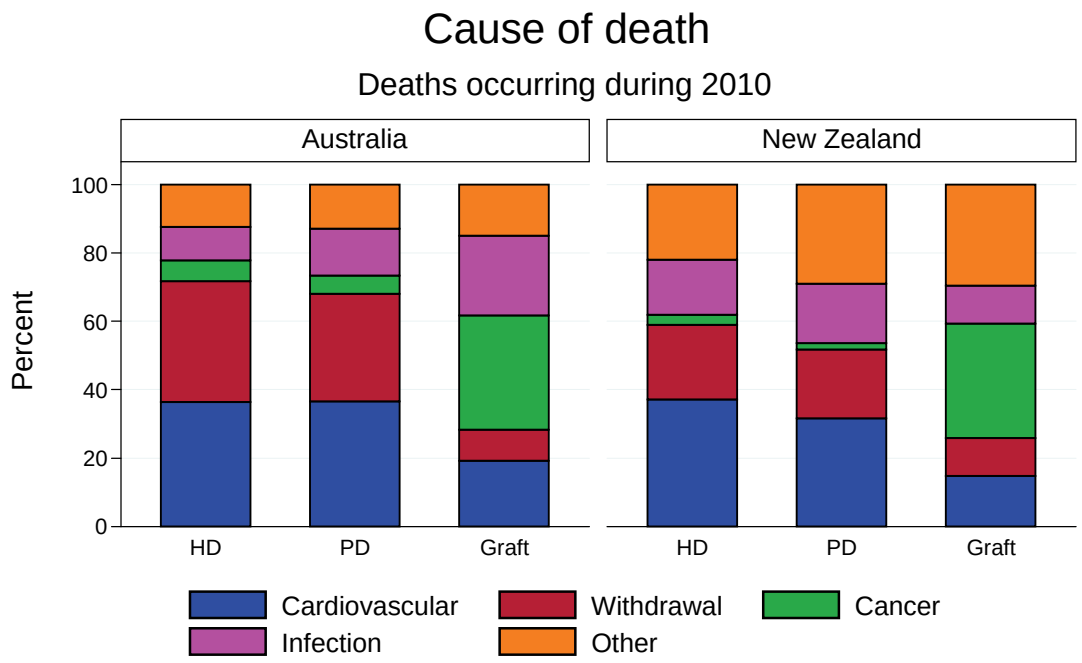
The content of this section has been revised this year. Rather than the previous extensive tabulation of numbers of deaths, the emphasis is on describing recent trends in groups of deaths. Detailed information about the number of deaths from specific causes can be found in the appendices 2 and 3 (available at www.anzdata.org.au).

The focus on this section is on deaths reported during 2010. The cause of death reported to ANZDATA is not necessarily the same as that reported on the death certificate. In particular, ANZDATA specifically records a range of reasons for "withdrawal from treatment". Clearly, the actual cause of death in these instances is uraemia, however the key issues presented here are the "cause" of the withdrawal.

For the purposes of Figures 3.6 - 3.8, deaths were attributed to the modality in use at the time of death.

In both Australia and New Zealand, similar trends are seen although there is a larger proportion of deaths coded as "other" from New Zealand (Figure 3.6). In particular there are a greater proportion o deaths due to cancer among patients with kidney transplant, whereas among dialysis patients deaths to cardiovascular and infective causes predominate.

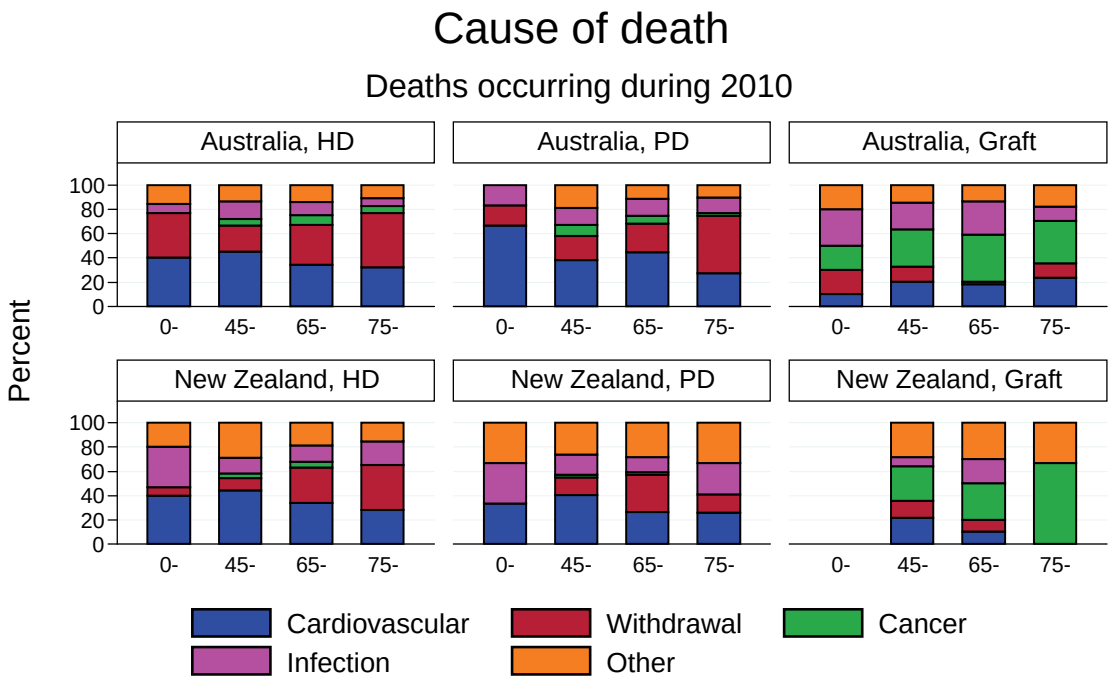
Figure 3.6



Graph by country and dialysis modality at time of death

The distribution of types of death changes with different age groups. Although one might expect the numbers to increase with age, the proportion of deaths reported as related to withdrawal of dialysis is still substantial in a number of the younger age groups (among dialysis patients) (Figure 3.8)

Figure 3.7



Graph by country and dialysis modality at time of death

Figure 3.8

Modality at time of death and Age at death –2010

Cause of Death	Haemodialysis				Peritoneal Dialysis				Transplant			
	0 - 44	45 - 64	65 - 74	≥75	0 - 44	45 - 64	65 - 74	≥75	0 - 44	45 - 64	65 - 74	≥75
Australia												
Cardiovascular	21	133	100	160	4	30	35	27	1	10	8	4
Withdrawal	19	64	97	223	1	16	19	47	2	6	1	2
Cancer	-	16	23	29	-	7	5	2	2	15	17	6
Infection	4	43	32	33	1	11	11	13	3	11	12	2
Other	8	39	41	53	-	15	9	10	2	7	6	3
New Zealand												
Cardiovascular	6	35	22	13	1	17	11	7	-	3	1	-
Withdrawal	1	8	19	17	-	6	13	4	-	2	1	-
Cancer	-	3	3	-	-	1	1	-	-	4	3	2
Infection	5	10	9	9	1	7	5	7	-	1	2	-
Other	3	23	12	7	1	11	12	9	-	4	3	1

WITHDRAWAL FROM DIALYSIS

During 2010 there were 476 deaths in Australia and 69 in New Zealand attributed to withdrawal from therapy. The vast majority of these were among patient receiving dialysis therapy. In the transplant group, malignancy figure prominently as a cause for the withdrawal decision.

The pattern differed between patients by the modality of treatment prior to death. Psychosocial reasons were more commonly cited among patient receiving PD prior to death than among HD patients

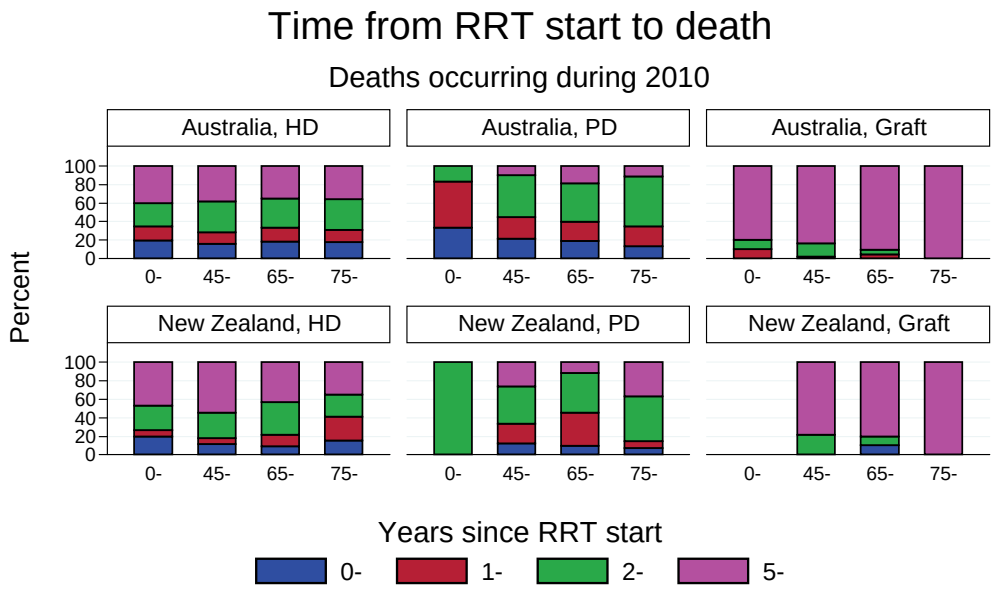
There was some variation in the time from dialysis start to withdrawal. Among older people, there was general a shorter time period to withdrawal. Patients receiving PD therapy who withdrew from treatment tended to do so after a lesser period of treatment than those who were receiving HD

Figure 3.9

Death due to withdrawal-2010

Withdrawal	Haemodialysis	Peritoneal Dialysis	Transplant	Total
Australia				
Psychosocial	148	38	2	**188**
Patient refused further	2	0	0	**2**
Suicide	0	0	1	**1**
Cardiovascular comorbidity	76	12	1	**89**
Cerebrovascular comorbidity	34	7	0	**41**
Peripheral vascular comorbidity	39	14	0	**53**
Malignancy related withdrawal	68	5	5	**78**
Withdrawal due to dia	21	3	0	**24**
Total	**388**	**79**	**9**	**476**
New Zealand				
Psychosocial	10	10	1	**21**
Suicide	1	0	0	**1**
Cardiovascular comorbidity	17	4	0	**21**
Cerebrovascular comorbidity	3	2	1	**6**
Peripheral vascular comorbidity	7	4	0	**11**
Malignancy related withdrawal	6	2	1	**9**
Total	**44**	**22**	**3**	**69**

Figure 3.10



Graph by country at time of death
Time period from first renal replacement treatment to date of death