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Table S1: Causes of death categorisation

Causes of death - ANZDATA	Death category
Myocardial ischaemia (presumed)	Cardiovascular
Myocardial ischaemia and infarction	Cardiovascular
Pulmonary oedema	Cardiovascular
Hyperkalaemia	Cardiovascular
Haemorrhagic pericarditis	Cardiovascular
Hypertensive cardiac failure	Cardiovascular
Cardiac arrest-cause uncertain	Cardiovascular
Other causes cardiac failure	Cardiovascular
Pulmonary embolus	Cardiovascular
Cerebrovascular accident	Cardiovascular
Aortic aneurysm-rupture	Cardiovascular
Bowel infarction	Cardiovascular
Withdrawal - cardiovascular comorbid conditions	Cardiovascular
Withdrawal - cerebrovascular comorbid conditions	Cardiovascular
Withdrawal - peripheral vascular comorbid conditions	Cardiovascular
Malignant disease Withdrawal - malignancy	Cancer
Withdrawal - malignancy	Cancer
Immunodeficiency due to viral infection	Infection
Sclerosing peritonitis	Infection
Central nervous system infection - bacterial	Infection
Central nervous system infection - viral	Infection
Central nervous system infection - fungal	Infection
Central nervous system infection - protozoa	Infection
Central nervous system infection - other	Infection
Lung infection - bacterial	Infection
Lung infection - viral	Infection
Lung infection - fungal	Infection
Lung infection - protozoa	Infection
Lung infection - other	Infection
Urinary tract infection - bacterial	Infection
Urinary tract infection - fungal	Infection
Urinary tract infection - other	Infection
Wound infection - bacterial	Infection
Wound infection - fungal	Infection
Wound infection - other	Infection
Shunt infection - bacterial	Infection
Shunt infection - fungal	Infection
Peritonitis - bacterial	Infection
Peritonitis - fungal	Infection
Peritonitis - other	Infection
Septicaemia - bacterial	Infection
Septicaemia - viral	Infection
Septicaemia - fungal	Infection
Septicaemia - protozoa	Infection
Septicaemia - other	Infection
Liver - bacterial	Infection
Liver - viral	Infection
Liver - other	Infection
Other site - bacterial	Infection
Other site - viral	Infection
Other site - fungal	Infection
Other site - other	Infection
Gastrointestinal haemorrhage	Other

Haemorrhage from dialysis access site	Other
Haemorrhage from transplant artery	Other
Haemorrhage from elsewhere	Other
Withdrawal - psycho social reasons	Other
Patient refused treatment	Other
Suicide	Other
Therapy ceased other reasons	Other
Accidental death (all causes)	Other
Withdrawal - dialysis access difficulties	Other
Hepatic failure	Other
Uraemia Caused by Graft Failure	Other
Pancreatitis	Other
Bone marrow depression	Other
Cachexia	Other
Chronic respiratory failure	Other
Perforation abdominal viscus	Other
Dialysis dementia (aluminium)	Other
Other	Other
Unknown	Other

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Table S2: Missing baseline data

Parameter	1980-89	1990-99	2000-09	2010-18
	n(%)	n(%)	n(%)	n(%)
Age at transplant	0 (0)	0 (0)	0 (0)	0 (0)
Gender	0 (0)	0 (0)	0 (0)	0 (0)
Ethnicity	0 (0)	1 (0)	1 (0)	220 (3)
Time since first RRT	0 (0)	0 (0)	0 (0)	0 (0)
Primary renal disease	0 (0)	0 (0)	0 (0)	150 (2)
Dialysis modality prior to transplant	0 (0)	0 (0)	0 (0)	0 (0)
Diabetes as comorbidity	1,439 (36)	231 (5)	4 (0)	53 (1)
Chronic lung disease	1,793 (45)	342 (7)	2 (0)	53 (1)
CV disease	1,723 (44)	317 (7)	2 (0)	52 (1)
Non-skin cancer diagnosis prior to transplant	0 (0)	0 (0)	0 (0)	0 (0)
Number of HLA mismatches	245 (6)	12 (0)	23 (0)	167 (2)
Donor type/ischaemia time	1,882 (48)	100 (2)	48 (1)	275 (3)
CNI at transplant	108 (3)	0 (0)	2 (0)	42 (0)
Antimetabolite at transplant	108 (3)	0 (0)	2 (0)	42 (0)
Prednisolone at transplant	108 (3)	0 (0)	2 (0)	42 (0)
mTOR at transplant	108 (3)	0 (0)	2 (0)	42 (0)
Anti-CD25 Rx (basiliximab or daclizumab) and/or T-cell depletion	0 (0)	0 (0)	0 (0)	0 (0)
BMI at transplant	2,770 (76)	977 (22)	12 (0)	453 (6)
Smoking	2,625 (66)	771 (16)	7 (0)	192 (2)
eGFR category 1m after transplant	776 (20)	337 (7)	286 (5)	528 (6)

Table S3: Adjusted hazard ratio (using 2015-2018 as the reference year) for all-cause death.

Time post-transplant	Period	HR	95% confidence interval	p-value
0-<3m	2015-18	1		<0.001
	2010-14	0.94	0.46-1.42	
	2005-09	0.71	0.32-1.10	
	2000-04	0.38	0.19-0.56	
	1995-99	0.32	0.16-0.49	
	1990-94	0.28	0.13-0.43	
	1985-89	0.15	0.08-0.23	
	1980-84	0.15	0.07-0.23	
3-<12m	2015-18	1		<0.001
	2010-14	0.75	0.40-1.09	
	2005-09	0.62	0.31-0.93	
	2000-04	0.43	0.22-0.64	
	1995-99	0.38	0.19-0.58	
	1990-94	0.28	0.14-0.42	
	1985-89	0.18	0.09-0.26	
	1980-84	0.14	0.07-0.22	
1-<5yr	2015-18	1		<0.001
	2010-14	0.80	0.63-0.96	
	2005-09	0.87	0.66-1.07	
	2000-04	0.62	0.48-0.77	
	1995-99	0.60	0.45-0.75	
	1990-94	0.42	0.32-0.52	
	1985-89	0.26	0.19-0.32	
	1980-84	0.19	0.13-0.25	
5-<10yr	2015-18	1		<0.001
	2010-14	0.92	0.75-1.08	
	2005-09	0.81	0.66-0.97	
	2000-04	0.56	0.45-0.67	
	1995-99	0.44	0.36-0.53	
	1990-94	0.33	0.26-0.40	
	1985-89	0.31	0.22-0.41	
	1980-84	0.31	0.22-0.41	
10yr+	2015-18	1		<0.001
	2010-14	0.88	0.77-0.99	
	2005-09	0.80	0.69-0.90	
	2000-04	0.76	0.64-0.87	
	1995-99	0.77	0.63-0.91	
	1990-94	0.65	0.46-0.84	

HR – hazard ratio, adjusted for age at transplantation, gender, ethnicity, time on dialysis, donor type and cause of kidney disease, stratified by time-period post-transplant

Table S4: Adjusted hazard ratio (using 2015-2018 as the reference year) for cardiovascular death

Time post-transplant	Era	HR	95% confidence interval	p-value
0-<3m	2015-18	1		<0.001
	2010-14	0.99	0.30-1.68	
	2005-09	0.66	0.18-1.13	
	2000-04	0.63	0.14-1.11	
	1995-99	0.43	0.10-0.76	
	1990-94	0.38	0.08-0.67	
	1985-89	0.16	0.05-0.26	
	1980-84	0.20	0.04-0.37	
3-<12m	2015-18	1		<0.001
	2010-14	0.55	0.06-1.04	
	2005-09	0.43	0.03-0.83	
	2000-04	0.60	0.00-1.24	
	1995-99	0.32	0.01-0.63	
	1990-94	0.19	0.02-0.35	
	1985-89	0.11	0.01-0.21	
	1980-84	0.07	0.01-0.13	
1-<5yr	2015-18	1		<0.001
	2010-14	0.93	0.56-1.29	
	2005-09	0.65	0.38-0.92	
	2000-04	0.51	0.29-0.72	
	1995-99	0.32	0.19-0.45	
	1990-94	0.24	0.14-0.34	
	1985-89	0.13	0.08-0.18	
	1980-84	0.10	0.05-0.15	
5-<10yr	2015-18	1		<0.001
	2010-14	0.87	0.59-1.16	
	2005-09	0.59	0.40-0.78	
	2000-04	0.49	0.32-0.67	
	1995-99	0.32	0.22-0.43	
	1990-94	0.21	0.13-0.28	
	1985-89	0.15	0.09-0.22	
	1980-84	0.10	0.05-0.15	
10yr+	2015-18	1		<0.001
	2010-14	0.73	0.56-0.90	
	2005-09	0.53	0.41-0.66	
	2000-04	0.48	0.36-0.60	
	1995-99	0.43	0.30-0.56	
	1990-94	0.34	0.19-0.49	

HR – hazard ratio, adjusted for age at transplantation, gender, ethnicity, time on dialysis, donor type and cause of kidney disease, stratified by time-period post-transplant

Table S5: Adjusted hazard ratio (using 2015-2018 as the reference year) for cancer death

Time post-transplant <sup>1</sup>	Era	HR	95% confidence interval	p-value
3-<12m	2015-18	1		<0.001
	2010-14	0.95	0.00-2.28	
	2005-09	0.37	0.00-0.83	
	2000-04	0.39	0.00-0.92	
	1995-99	0.33	0.00-0.78	
	1990-94	0.33	0.00-0.79	
	1985-89	0.25	0.00-0.59	
	1980-84	0.35	0.00-0.98	
1-<5yr	2015-18	1		<0.001
	2010-14	0.75	0.48-1.01	
	2005-09	0.95	0.55-1.34	
	2000-04	0.65	0.39-0.92	
	1995-99	0.70	0.39-1.02	
	1990-94	0.70	0.37-1.03	
	1985-89	0.61	0.28-0.94	
	1980-84	0.69	0.05-1.34	
5-<10yr	2015-18	1		<0.001
	2010-14	0.74	0.50-0.99	
	2005-09	0.69	0.45-0.93	
	2000-04	0.43	0.28-0.58	
	1995-99	0.40	0.26-0.54	
	1990-94	0.36	0.21-0.51	
	1985-89	0.47	0.16-0.78	
10yr+	2015-18	1		<0.001
	2010-14	0.80	0.62-0.98	
	2005-09	0.72	0.54-0.89	
	2000-04	0.74	0.54-0.94	
	1995-99	0.92	0.59-1.26	
	1990-94	1.26	0.36-2.17	

HR – hazard ratio, adjusted for age at transplantation, gender, ethnicity, time on dialysis, donor type and cause of kidney disease, stratified by time-period post-transplant. <sup>Note 1</sup> HRs for 0 to 3 months post-transplant are not estimable due to a lack of observations

Table S6: Adjusted hazard ratio (using 2015-2018 as the reference year) for infection-related death

Time post-transplant	Era	HR	95% confidence interval	p-value
0-<3m	2015-18	1		<0.001
	2010-14	0.58	0.00-1.19	
	2005-09	0.46	0.00-0.97	
	2000-04	0.15	0.01-0.29	
	1995-99	0.19	0.00-0.40	
	1990-94	0.16	0.00-0.34	
	1985-89	0.08	0.00-0.16	
	1980-84	0.08	0.00-0.16	
3-<12m	2015-18	1		<0.001
	2010-14	0.66	0.14-1.19	
	2005-09	0.53	0.08-0.98	
	2000-04	0.23	0.05-0.41	
	1995-99	0.26	0.04-0.47	
	1990-94	0.20	0.04-0.36	
	1985-89	0.13	0.02-0.24	
	1980-84	0.15	0.00-0.29	
1-<5yr	2015-18	1		<0.001
	2010-14	0.50	0.24-0.76	
	2005-09	0.55	0.23-0.86	
	2000-04	0.45	0.18-0.71	
	1995-99	0.71	0.20-1.22	
	1990-94	0.32	0.13-0.52	
	1985-89	0.23	0.08-0.39	
	1980-84	0.16	0.02-0.29	
5-<10yr	2015-18	1		<0.001
	2010-14	0.80	0.40-1.20	
	2005-09	0.63	0.31-0.96	
	2000-04	0.47	0.22-0.72	
	1995-99	0.36	0.17-0.55	
	1990-94	0.58	0.16-1.01	
	1985-89	0.40	0.01-0.79	
	1980-84	0.40	0.01-0.79	
10yr+	2015-18	1		<0.001
	2010-14	0.79	0.52-1.05	
	2005-09	0.74	0.47-1.02	
	2000-04	0.82	0.48-1.16	
	1995-99	0.64	0.34-0.95	
	1990-94	0.64	0.13-1.14	

HR – hazard ratio, adjusted for age at transplantation, gender, ethnicity, time on dialysis, donor type and cause of kidney disease, stratified by time-period post-transplant



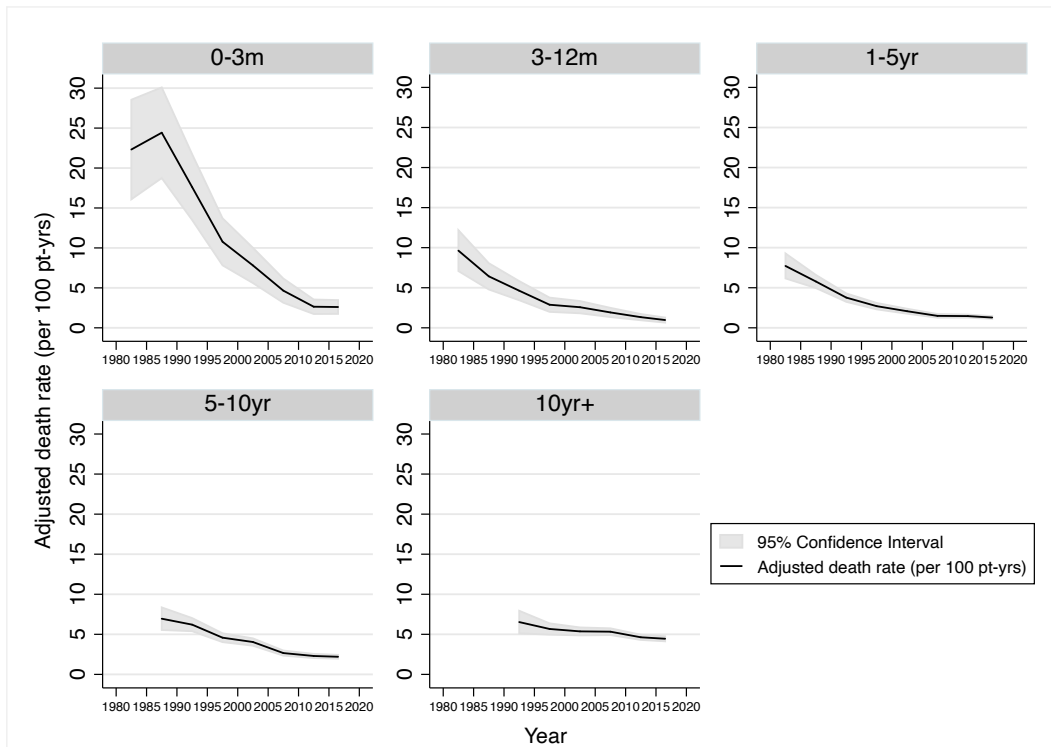
Table S7: Death after graft failure, adjusted death rates by time (<1 year or 1+years) post graft failure

Period	Time interval post graft failure	Adjusted death rates (per 100 patient-years)				
		All-cause	CV	Cancer	Infection- related	Other
1980-84	0-1yr	23.38	11.11	0.34	4.94	6.77
	1yr+	8.75	5.77	0.22	1.23	1.59
1985-89	0-1yr	30.18	13.60	1.37	7.56	7.13
	1yr+	11.20	6.98	0.28	3.01	1.11
1990-94	0-1yr	31.44	12.04	0.58	8.34	9.95
	1yr+	12.48	7.73	0.47	1.99	2.37
1995-99	0-1yr	21.59	10.72	1.52	4.41	5.17
	1yr+	11.48	6.81	0.53	2.27	1.92
2000-04	0-1yr	15.77	6.34	0.65	4.75	4.19
	1yr+	10.53	6.53	0.34	1.40	2.27
2005-09	0-1yr	15.78	6.94	1.63	3.71	3.56
	1yr+	8.14	4.50	0.63	1.38	1.62
2010-14	0-1yr	11.19	4.85	0.65	2.78	2.99
	1yr+	6.61	3.55	0.49	0.92	1.67
2015-18	0-1yr	12.06	3.69	0.91	2.53	4.91
	1yr+	7.96	3.51	0.69	1.07	2.73

Table S8. Causes of “other” deaths after first graft failure.

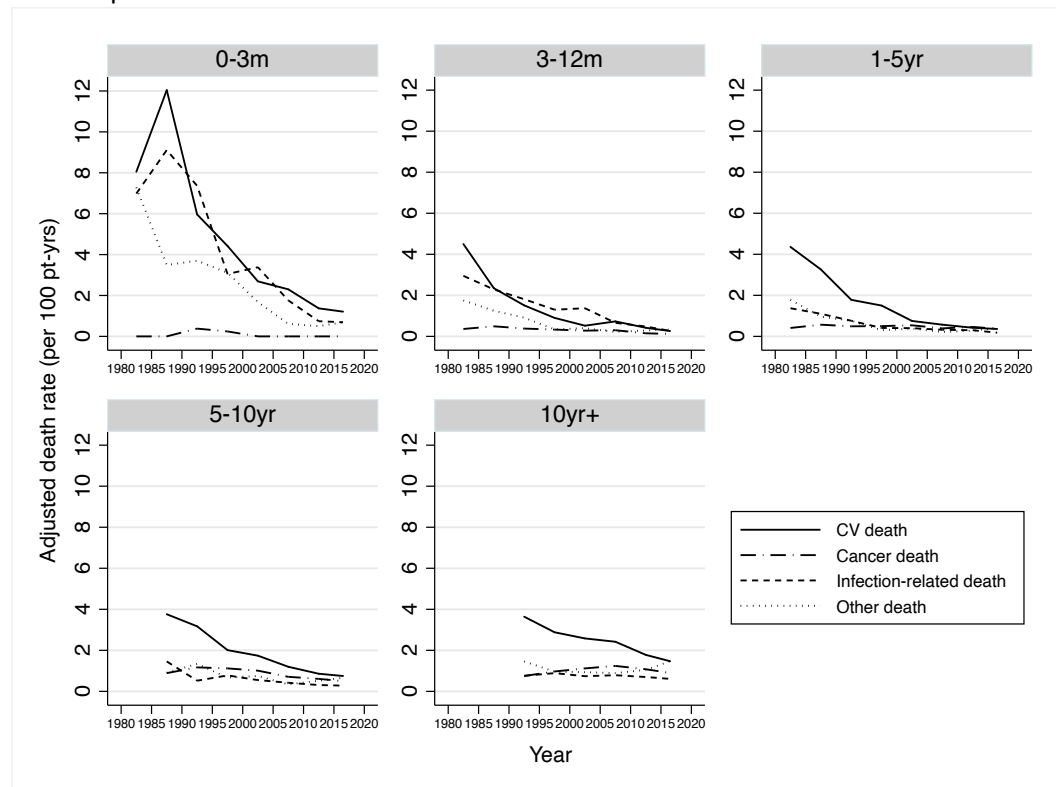
Causes of death – other deaths	Timing of death post graft failure		
	<1 year	1 year +	Total
Gastrointestinal haemorrhage	6	15	21
Haemorrhage from dialysis access site	2	4	6
Haemorrhage from transplant artery	7	0	7
Haemorrhage from elsewhere	12	13	25
Withdrawal-psycho social reasons	38	82	120
Patient refused treatment	23	52	75
Suicide	4	1	5
Therapy ceased other reasons	31	49	80
Accidental death (all causes)	3	13	16
Withdrawal-dialysis access difficulties	5	12	17
Hepatic failure (specify)	7	7	14
Uraemia caused by graft failure	16	0	16
Pancreatitis	14	1	15
Bone marrow depression	1	0	1
Cachexia	7	11	18
Unknown	29	49	78
Perforation abdominal viscus	9	5	14
Dialysis dementia (aluminium)	1	2	3
Other	31	46	77
<b>Total</b>	<b>246</b>	<b>362</b>	<b>608</b>

Figure S1: Sensitivity analysis for death after transplantation. Adjusted all-cause death rate by time periods post-transplant (per 100 patient-years), censored at retransplant and date of last follow-up.



Rates adjusted for: age at transplant, gender ethnicity, duration of dialysis, donor-type, cause of kidney disease and stratified by time period post-transplant

Figure S2: Sensitivity analysis for death after transplantation. Adjusted cause-specific death rates by time periods post-transplant (per 100 patient-years), censored at retransplant and date of last follow-up



Rates adjusted for: age at transplant, gender ethnicity, duration of dialysis, donor-type, cause of kidney disease and stratified by time period post-transplant