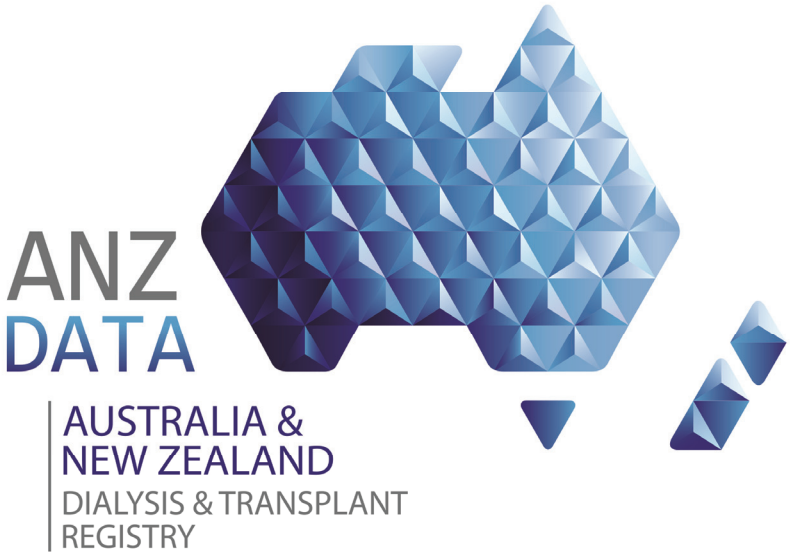
Chapter 12

End Stage Kidney Disease in Indigenous Peoples of Australia and Aotearoa/New Zealand



2016

ANZDATA Registry

39th Annual Report

Data to 31-Dec-2015

Introduction

In this chapter, the rates and practice patterns for end-stage kidney disease in Aboriginal and Torres Strait Islanders living in Australia and New Zealand Māori are reported. Information for Pacific Peoples living in Aotearoa/New Zealand is also displayed. Information for Pacific Peoples living in Aotearoa/New Zealand is also displayed. ANZDATA acknowledges that Pacific peoples are not Indigenous to New Zealand, but have included them here as an ethnic group that is exposed to factors that link to risks of end-stage kidney disease, specific clinical practice patterns and patient outcomes. Self-identified ethnicity is reported by renal units on behalf of patients.

Population statistics are stratified by ethnicity. For example, the incidence of RRT for Indigenous Australians includes the indigenous population of Australia as the denominator. In Aotearoa/New Zealand, the denominator population is derived from the mid-year population (30 June 2015) calculated by Statistics New Zealand from the Census. Denominator populations are not age-standardized. Notably, indigenous and non-indigenous populations possess different age structures: Indigenous populations tend to be younger and demonstrate onset of long-term conditions 10-20 years younger than non-Indigenous communities.

New Patients

A total of 277 Aboriginal and Torres Strait Islanders commenced dialysis in Australia during 2015 (Table 12.1). The majority (87%) were treated with haemodialysis as their initial RRT modality (Figure 12.1.1). Only a single pre-emptive kidney transplant was accessed by Indigenous Australians in 2015.

Haemodialysis incidence was five-fold lower for non-Indigenous Australians (64 pmp) than Indigenous Australians (330 pmp). Only 13% of Indigenous Australians accessed peritoneal dialysis as first treatment compared with nearly one-third of non-Indigenous Australians.

The disparity in incidence of end-stage kidney disease for Māori persists. The rate of haemodialysis commencement for non-Māori, non-Pacific patients was 4.5-fold lower than for Māori. As in Australia, Māori are much more likely to commence dialysis patients with haemodialysis than peritoneal dialysis compared with non-Māori patients (figure 12.1.2). No Māori patient received a pre-emptive kidney transplant during 2015. In the last 5 years, three Māori patients received a pre-emptive kidney transplant compared with 89 non-Māori, non-Pacific patients (a nearly 30-fold difference).

Table 12.1 Number (pmp) of People who commenced Renal Replacement Therapy in Australia and New Zealand 2011-2015

		Australia			New Zealand			
Year	Modality	Non-indigenous	Aboriginal/ TSI	Total	Non-Māori, Non-Pacific	Māori	Pacific People	Total
2011	HD	1632 (75)	226 (337)	1858 (83)	157 (46)	89 (132)	73 (222)	319 (73)
	PD	524 (24)	32 (48)	556 (25)	91 (27)	41 (61)	22 (67)	154 (35)
	Graft	99 (5)	0 (0)	99 (4)	15 (4)	0 (0)	0 (0)	15 (3)
2012	HD	1611 (73)	211 (308)	1822 (80)	134 (40)	119 (174)	77 (229)	330 (75)
	PD	629 (29)	44 (64)	673 (30)	100 (30)	48 (70)	19 (57)	167 (38)
	Graft	80 (4)	0 (0)	80 (4)	16 (5)	1 (1)	1 (3)	18 (4)
2013	HD	1563 (70)	234 (335)	1797 (78)	136 (40)	127 (183)	94 (273)	357 (80)
	PD	667 (30)	42 (60)	709 (31)	95 (28)	60 (87)	24 (70)	179 (40)
	Graft	83 (4)	0 (0)	83 (4)	16 (5)	2 (3)	1 (3)	19 (4)
2014	HD	1556 (68)	247 (346)	1803 (77)	132 (38)	108 (154)	105 (297)	345 (77)
	PD	742 (33)	36 (50)	778 (33)	106 (31)	51 (73)	29 (82)	186 (41)
	Graft	82 (4)	4 (6)	86 (4)	20 (6)	0 (0)	1 (3)	21 (5)
2015	HD	1477 (64)	241 (330)	1718 (72)	119 (34)	110 (154)	62 (171)	291 (63)
	PD	686 (30)	36 (49)	722 (30)	124 (35)	46 (65)	40 (111)	210 (46)
	Graft	81 (4)	1 (1)	82 (3)	22 (6)	0 (0)	2 (6)	24 (5)

Figure 12.1.1

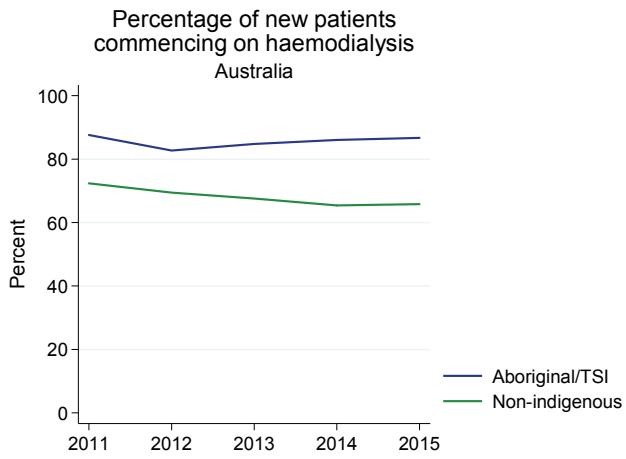
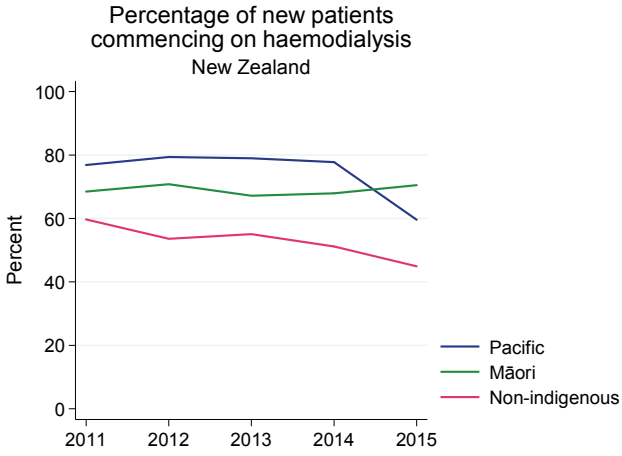


Figure 12.1.2



Primary Renal Disease

The primary renal diseases of new patients over 2011-2015 are shown in table 12.2. Indigenous peoples experience diabetes at a substantially higher rate than non-Indigenous patients in both Australia and New Zealand. Differences in risks of diabetes are likely to account for the substantially higher risks of end-stage kidney disease. Lower incidences of primary renal diseases including adult polycystic kidney disease, reflux nephropathy, and glomerulonephritis may be due to different disease patterns, competing risks due to diabetes, or different diagnostic practices.

Table 12.2 Primary Renal Disease of New Patients 2011- 2015

	Australia		New Zealand		
Primary Renal Disease	Non-indigenous	Aboriginal/TSI	Non-Māori, Non-Pacific	Māori	Pacific Peoples
Glomerulonephritis	2481 (22%)	128 (9%)	333 (26%)	110 (14%)	98 (18%)
Analgesic	133 (1%)	2 (<1%)	11 (1%)	2 (<1%)	2 (<1%)
Polycystic	766 (7%)	12 (1%)	106 (8%)	15 (2%)	7 (1%)
Reflux	261 (2%)	16 (1%)	46 (4%)	13 (2%)	7 (1%)
Hypertension	1663 (14%)	114 (8%)	181 (14%)	40 (5%)	30 (5%)
Diabetic Nephropathy	3807 (33%)	952 (70%)	343 (27%)	560 (70%)	369 (67%)
Other	1673 (15%)	55 (4%)	200 (16%)	40 (5%)	28 (5%)
Uncertain	587 (5%)	39 (3%)	55 (4%)	17 (2%)	6 (1%)
Not reported	141 (1%)	36 (3%)	8 (1%)	5 (1%)	3 (1%)
Total	**11512**	**1354**	**1283**	**802**	**550**

Incidence Rates

Overall, the incidence rates (per million of population) of end-stage kidney disease for non-Indigenous Peoples are markedly and persistently lower than those for Indigenous Peoples of Australia and NZ. The disparity is confounded and underestimated by the age distributions of each population - Indigenous populations of both countries are considerably younger.

Although rates fluctuate from year to year, in both countries the incidence rates appear to have stabilised in recent years (figure 12.2). This is similar to the pattern seen in non-indigenous populations. The relative rate differs with age and also (for Aboriginal Australians) with gender - this is illustrated in figures 12.3 and 12.4.

Figure 12.2.1

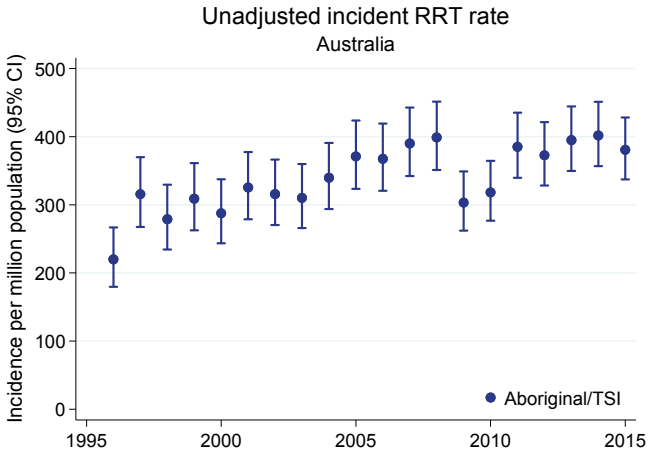
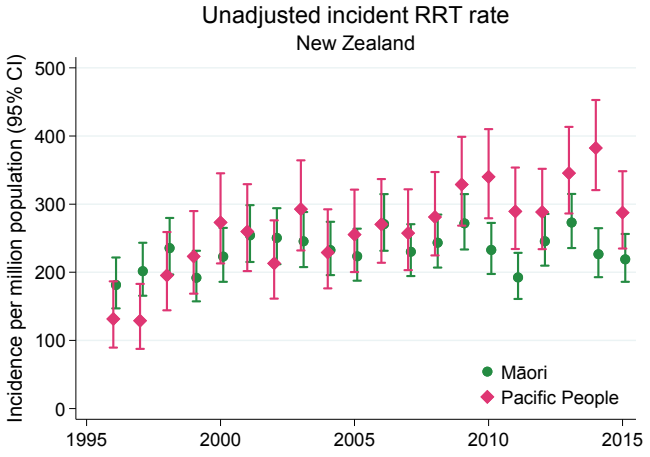


Figure 12.2.2



Aboriginal Australians experience higher rates of end-stage kidney disease at all ages. This disparity is particularly evident for Indigenous women and is also particularly marked even in the second and third decades of life for both men and women (figure 12.3).

Among Māori and Pacific Peoples, disparities in the incidence end-stage kidney disease occur as early as the second decade of life and are evident across all age groups (figure 12.4). There is no indication of gender differences in New Zealand.

Figure 12.3

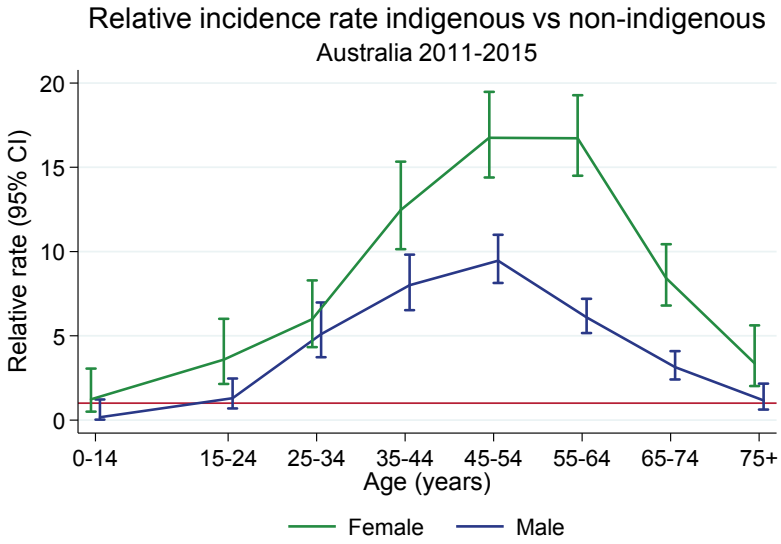
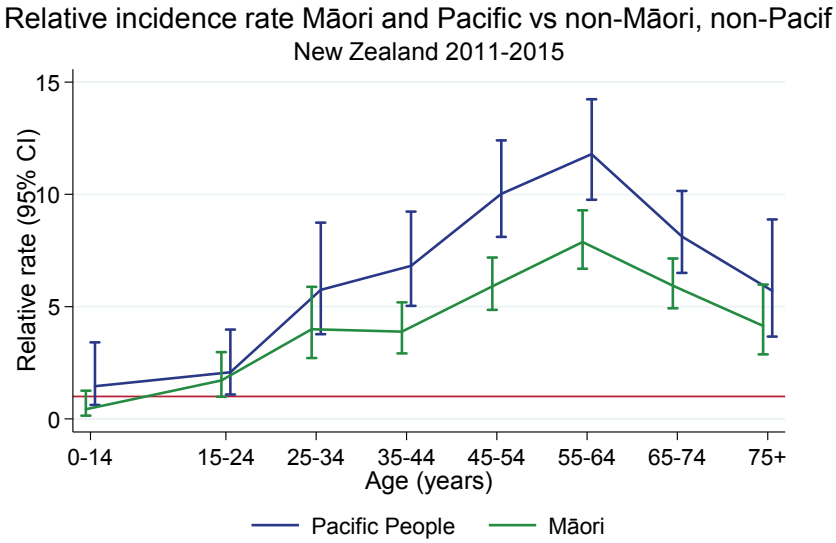


Figure 12.4



There is also considerable variation in the incidence of renal replacement therapy for Indigenous Australians across Australian States and Territories (figure 12.5).

While rates for the very young (<25 years) and older (>75 years) groups are similar in each State/Territory, the rates for people 25-74 years of age show a clear trend of progressively higher rates from NSW/Victoria to Queensland then South Australia, Western Australia and the Northern Territory. Data are shown for a five-year period given the small numbers in some locations.

The overall stabilisation of rates among Aboriginal Australians is seen consistently across each age group (figure 12.6). There are a number of factors which contribute to incident numbers of RRT (among both indigenous and non-indigenous people). It is not clear whether this stabilisation reflects the underlying rates of diabetes, rates of disease progression, referral patterns, or other diseases, but reflects the overall pattern of RRT incidence in the Australian population.

Figure 12.5

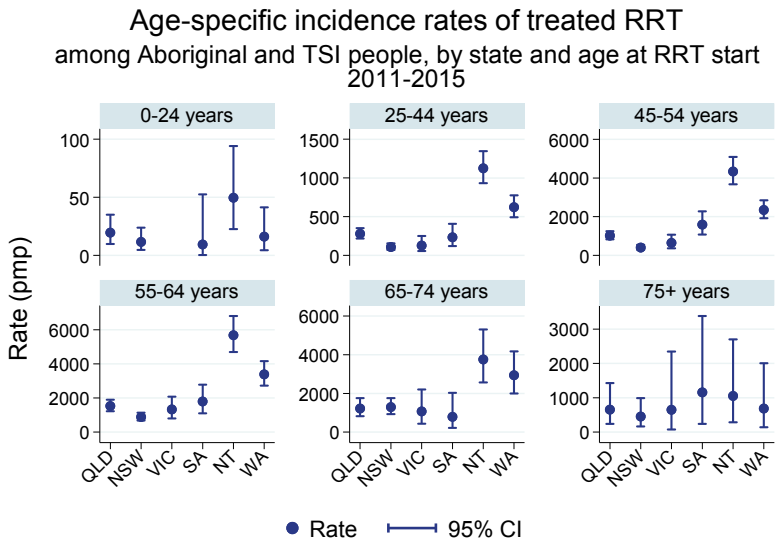


Figure 12.6.1

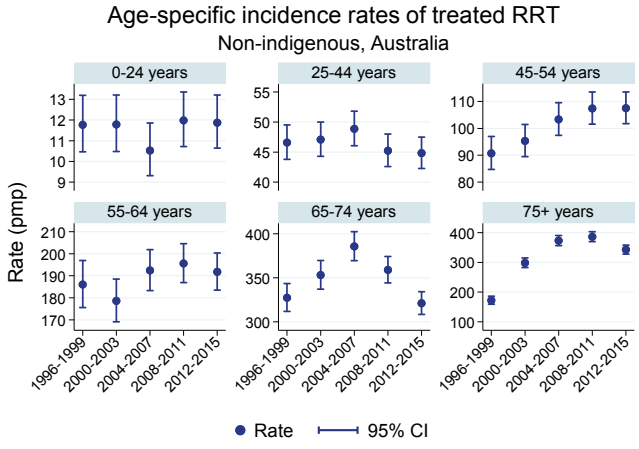
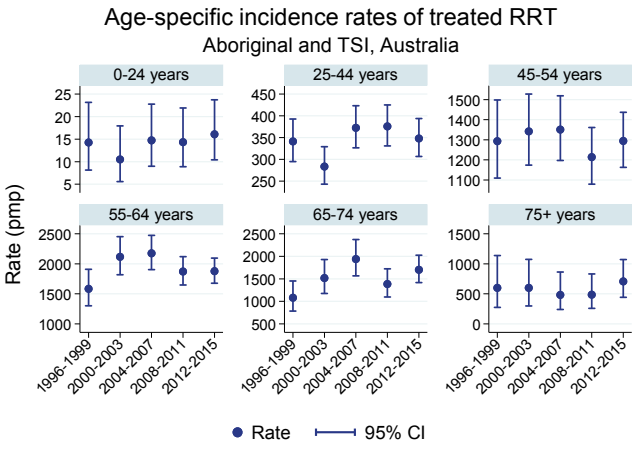


Figure 12.6.2



Age specific trends in renal replacement therapy practices for Māori and Pacific Peoples are shown in figure 12.7. Note that the Y axis scales vary.

Figure 12.7.1

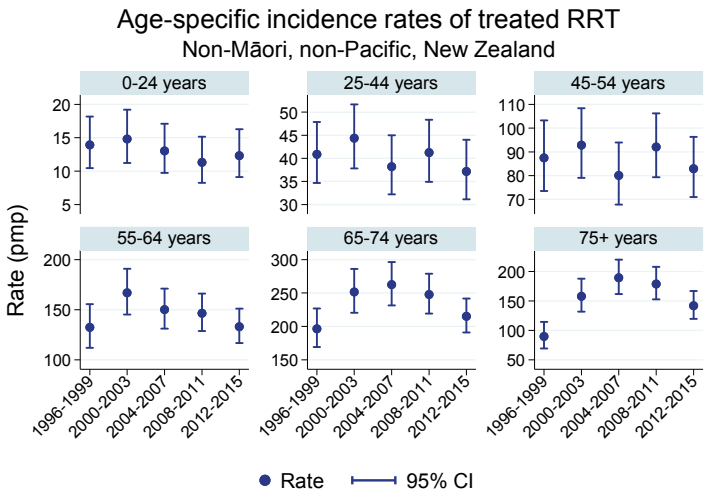


Figure 12.7.2

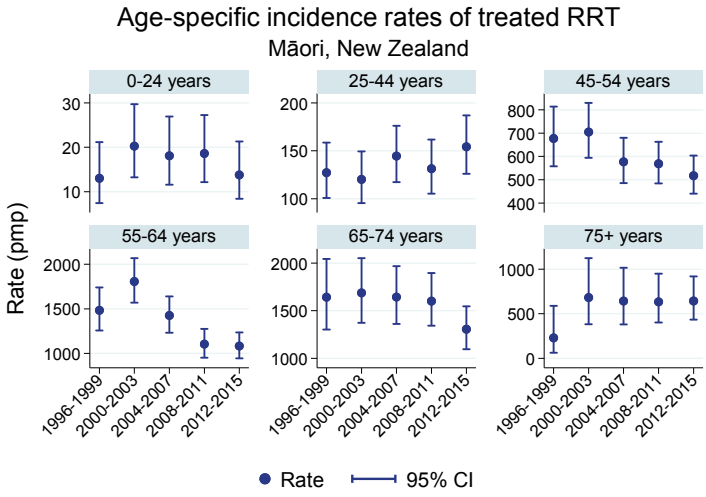
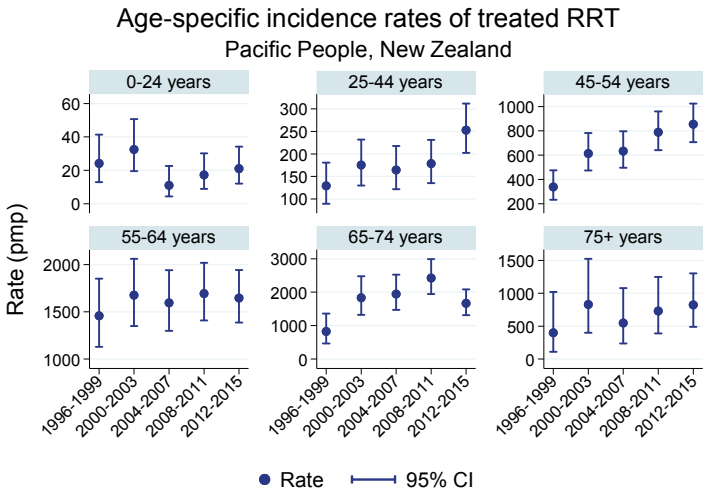


Figure 12.7.3



Treatment of Prevalent Patients

The number of Aboriginal and Torres Strait Islander Peoples with treated end-stage kidney disease at the end of 2015 increased from 1795 in 2014 to 1888. This continues a year-on-year increase of approximately 4% (table 12.3).

There were marked differences in treatment modalities for Indigenous Australians. Most Indigenous Australians were treated with facility-based haemodialysis (74%), with very few accessing home haemodialysis (6%), long-term peritoneal dialysis (7%), or kidney transplantation (13%). The proportion of Indigenous Australians with a kidney transplant as long-term treatment for end-stage kidney disease was 13% during 2015 compared with nearly half (49%) for non-Indigenous Australians. Only 6% of Indigenous Australians accessed home-based haemodialysis compared with 13% of non-Indigenous Australians. Home-based care (haemodialysis, peritoneal dialysis, or transplantation) was accessed by 26% of Indigenous Australians compared with 73% of non-Indigenous Australians.

The number of prevalent Māori and Pacific Peoples with treated end-stage kidney disease continues to rise year-on-year (table 12.3). In the last 5 years, the number of Māori patients treated with haemodialysis has increased 19% while the number accessing peritoneal dialysis has fallen by 9%. The proportion treated with a kidney transplant has remained largely unchanged for all population groups. The proportion of Pacific patients who undergo home haemodialysis has increased from 16% in 2011 to 22% in 2015.

Table 12.3 Number of People with End Stage Kidney Disease by Treatment Modality 2011 - 2015

		Australia		New Zealand		
Year	Modality	Non-indigenous	Aboriginal/TSI	Non-Māori, Non-Pacific	Māori	Pacific People
2011	HD	7814 (42%)	1176 (78%)	648 (28%)	502 (56%)	448 (68%)
	% HD at home	12%	7%	36%	25%	16%
	PD	1945 (11%)	135 (9%)	429 (18%)	247 (28%)	119 (18%)
	Tx	8670 (47%)	191 (13%)	1254 (54%)	140 (16%)	88 (13%)
2012	HD	7980 (42%)	1277 (79%)	665 (28%)	534 (58%)	491 (71%)
	% HD at home	13%	8%	39%	24%	18%
	PD	2092 (11%)	149 (9%)	425 (18%)	240 (26%)	111 (16%)
	Tx	9058 (47%)	192 (12%)	1284 (54%)	148 (16%)	89 (13%)
2013	HD	8160 (41%)	1326 (79%)	660 (27%)	564 (57%)	533 (72%)
	% HD at home	13%	8%	35%	25%	20%
	PD	2146 (11%)	156 (9%)	436 (18%)	286 (29%)	111 (15%)
	Tx	9433 (48%)	205 (12%)	1329 (55%)	146 (15%)	94 (13%)
2014	HD	8218 (40%)	1424 (79%)	680 (28%)	606 (59%)	572 (72%)
	% HD at home	13%	7%	34%	24%	21%
	PD	2324 (11%)	151 (8%)	431 (17%)	270 (26%)	116 (15%)
	Tx	9827 (48%)	220 (12%)	1356 (55%)	156 (15%)	105 (13%)
2015	HD	8319 (40%)	1513 (80%)	686 (27%)	623 (61%)	568 (70%)
	% HD at home	13%	6%	31%	23%	22%
	PD	2334 (11%)	134 (7%)	437 (17%)	226 (22%)	127 (16%)
	Tx	10240 (49%)	241 (13%)	1404 (56%)	170 (17%)	118 (15%)

New Transplants

In both Australia and New Zealand, the proportion of Indigenous patients who receive a kidney transplant is very low (table 12.4). Information on donor source is shown in figures 12.8 to 12.10 and trends are shown in figure 12.11 . There are substantially lower rates of living donation for Indigenous Australians. Living donor rates have increased for Māori patients since 2013, with increases in living unrelated donors..

Table 12.4 Number of Transplant Recipients by Indigenous Status 2006 - 2015

		Australia		New Zealand		
Year	Donor type	Non-indigenous	Aboriginal/TSI	Non-Māori, Non-Pacific	Māori	Pacific People
2006	DD	344 (17)	24 (40)	31 (9)	6 (10)	4 (14)
	LD	270 (14)	3 (5)	42 (13)	4 (6)	3 (10)
	Total	614 (31)	27 (45)	73 (22)	10 (16)	7 (24)
2007	DD	330 (16)	14 (23)	55 (17)	8 (13)	2 (7)
	LD	267 (13)	4 (7)	45 (14)	9 (14)	4 (13)
	Total	597 (30)	18 (29)	100 (30)	17 (27)	6 (20)
2008	DD	435 (21)	24 (38)	42 (13)	5 (8)	6 (20)
	LD	347 (17)	7 (11)	58 (18)	7 (11)	4 (13)
	Total	782 (38)	31 (49)	100 (30)	12 (19)	10 (33)
2009	DD	426 (20)	20 (31)	38 (11)	11 (17)	5 (16)
	LD	323 (15)	4 (6)	58 (17)	8 (12)	1 (3)
	Total	749 (36)	24 (37)	96 (29)	19 (29)	6 (19)
2010	DD	522 (24)	28 (43)	32 (10)	13 (20)	5 (16)
	LD	296 (14)	0 (0)	49 (15)	7 (11)	4 (12)
	Total	818 (38)	28 (43)	81 (24)	20 (30)	9 (28)
2011	DD	544 (25)	26 (39)	40 (12)	14 (21)	7 (21)
	LD	253 (12)	2 (3)	49 (14)	6 (9)	2 (6)
	Total	797 (37)	28 (42)	89 (26)	20 (30)	9 (27)
2012	DD	586 (27)	20 (29)	37 (11)	11 (16)	6 (18)
	LD	230 (10)	0 (0)	49 (14)	4 (6)	1 (3)
	Total	816 (37)	20 (29)	86 (25)	15 (22)	7 (21)
2013	DD	598 (27)	30 (43)	45 (13)	5 (7)	6 (17)
	LD	249 (11)	1 (1)	53 (16)	4 (6)	2 (6)
	Total	847 (38)	31 (44)	98 (29)	9 (13)	8 (23)
2014	DD	604 (27)	37 (52)	44 (13)	13 (19)	9 (25)
	LD	252 (11)	4 (6)	56 (16)	9 (13)	7 (20)
	Total	856 (38)	41 (57)	100 (29)	22 (31)	16 (45)
2015	DD	663 (29)	33 (45)	44 (12)	13 (18)	16 (44)
	LD	217 (9)	3 (4)	54 (15)	15 (21)	5 (14)
	Total	880 (38)	36 (49)	98 (28)	28 (39)	21 (58)

Figure 12.8

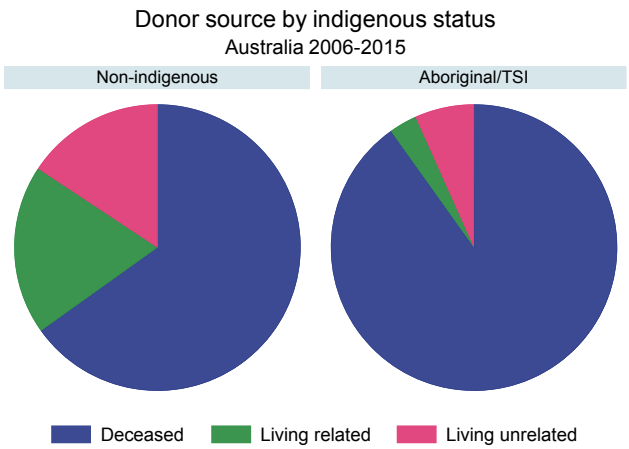


Figure 12.9

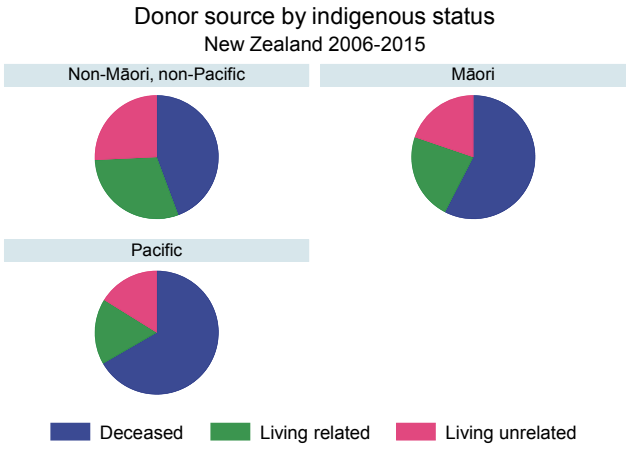


Figure 12.10

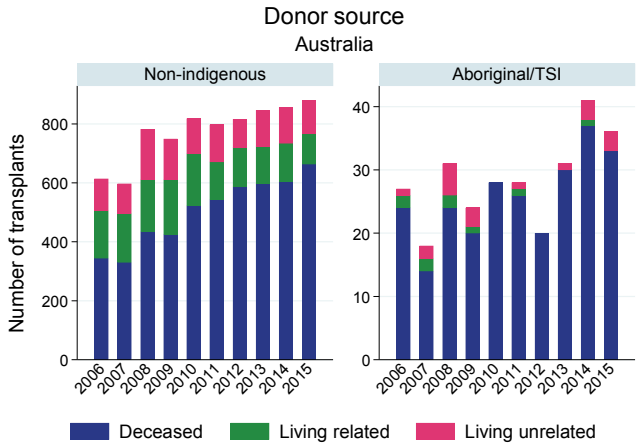
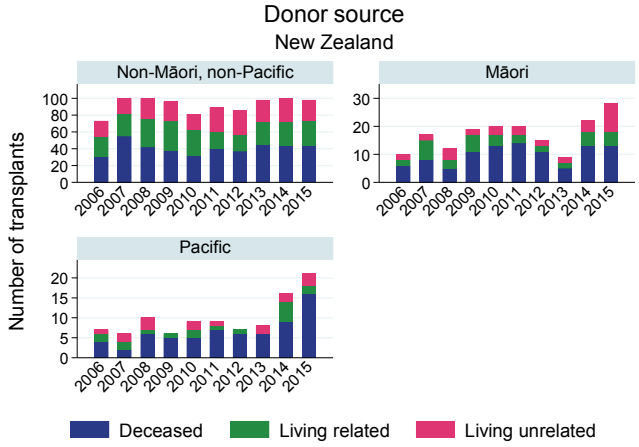


Figure 12.11



Over the period 2006-2015 there has been a gradual, but small, increase in the number of deceased donor transplants overall, but this trend is less clear in the Australian Indigenous Patients. Numbers from living donors remain extremely low.

The number of transplants to Māori and Pacific Peoples recipients increased in 2014-15. In contrast to the situation in Australia, there is a higher proportion of transplants from living donors.

Transplant Outcomes graphs update scheme

There is a difference in survival after kidney transplantation from a deceased donation between non-Indigenous and ATSI recipients, which is apparent from 1.5 years after transplantation. At 5 years post transplant, 82% of ATSI persons and 91% of non-Indigenous persons were alive 5 years after kidney transplantation from a deceased donation

Figure 12.12.1

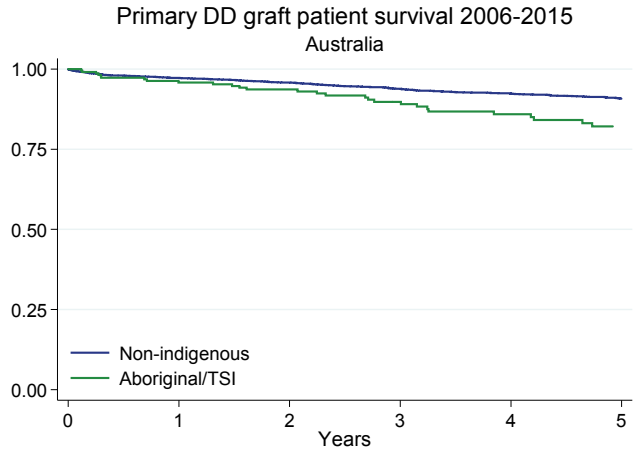
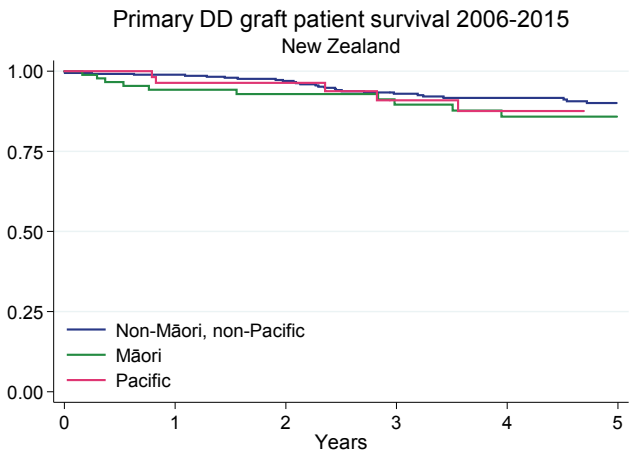


Figure 12.12.2



Every year, over the first 5 years after kidney transplant from a deceased donation, some kidney transplants have been lost either through the transplant failing or the patient dying with a functioning kidney. In the first year, there was no difference in the proportion of ATSI recipients and non-Indigenous recipients who experienced graft loss. Transplant kidney function at 5 years post transplant, was recorded in 67% of ATSI recipients compared with 83% of non-Indigenous persons.

Figure 12.13.1

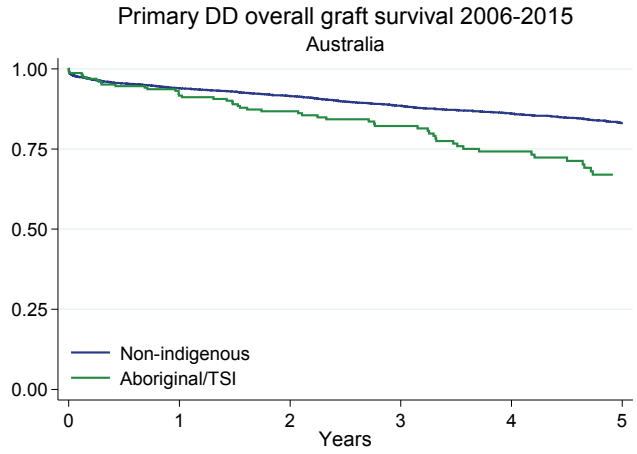
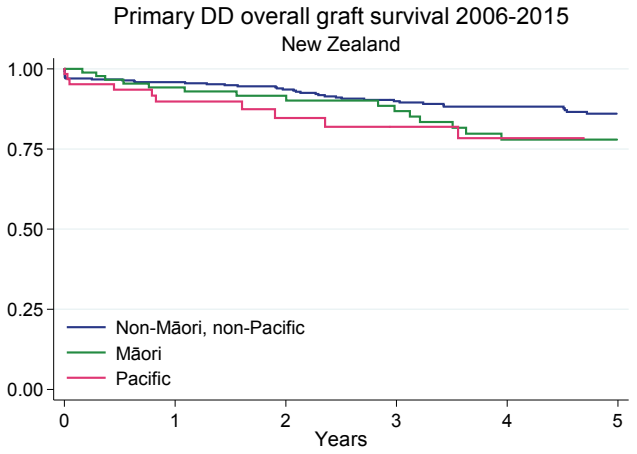


Figure 12.13.2



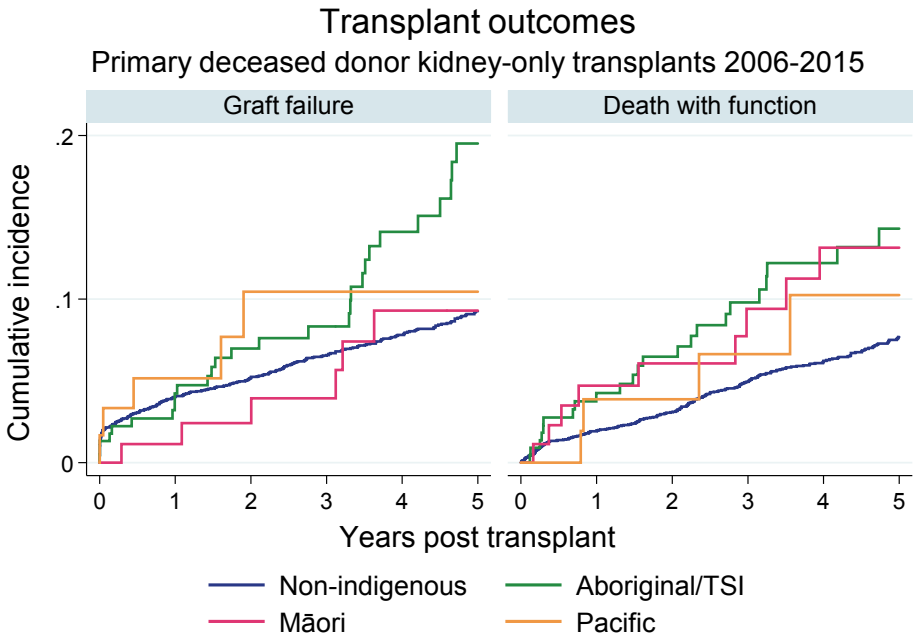
Non-Māori-non-Pacific patients experienced better graft and patient 5-year survival after deceased kidney donation

Cumulative incidence curves (utilising competing risk techniques to account for the effects of both components of graft failure) are shown for indigenous transplant outcomes in figure 12.14.

For Aboriginal and Torres Strait Islanders, there are markedly higher rates of transplant loss, particularly evident at 3 years after transplantation. Indigenous Australians experience higher mortality rates throughout the first five years after transplantation. The difference in survival worsens over time.

For Māori, mortality is increased immediately after transplantation, while graft survival, at least in the first 3 years, appears to be comparable with non-Māori, non-Pacific patients. Pacific patients experience graft loss at a higher rate particularly after 18 months of transplantation.

Figure 12.14



Dialysis Modality

The distribution of dialysis modality is shown graphically in figure 12.12. For Indigenous Australians (figure 12.15.1), the predominant modality is satellite haemodialysis. Access to home-based dialysis care including both haemodialysis and peritoneal dialysis is proportionally much lower. Aboriginal Australians experience particularly lower rates of automated peritoneal dialysis.

Data are shown for New Zealand in figure 12.15.2. Māori and Pacific patients have a higher use of facility dialysis as the principal modality of care. For Māori, there is lower use of CAPD. Home based haemodialysis rates appear similar for all populations. For Pacific patients, peritoneal dialysis is used much less frequently than home and facility-based haemodialysis. For non-Māori, non-Pacific patients, over half have home-based care. The proportion of Māori and Pacific patients receiving home-based dialysis is approximately 10-20% lower.

Figure 12.15.1

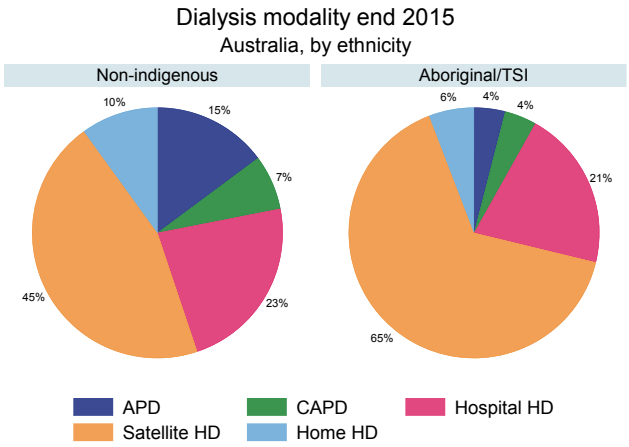
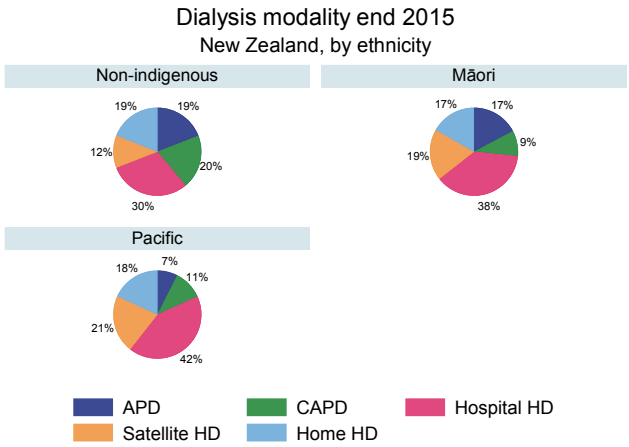


Figure 12.15.2



Half of the people who start dialysis were alive 5 years later. This was a similar result for ATSI and non-Indigenous patients. Non-Māori-non-Pacific and Māori cohorts experienced similar survival over 5 years after starting dialysis, although it is possible that differences between populations including age distribution and access to competing treatments (transplantation) may have impacted mortality estimates.

Figure 12.16.1

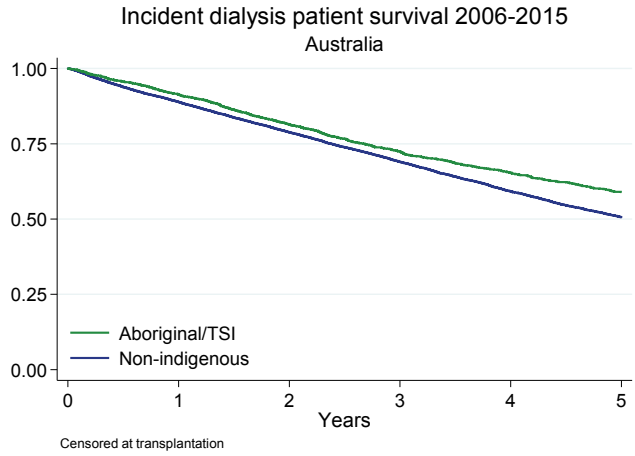
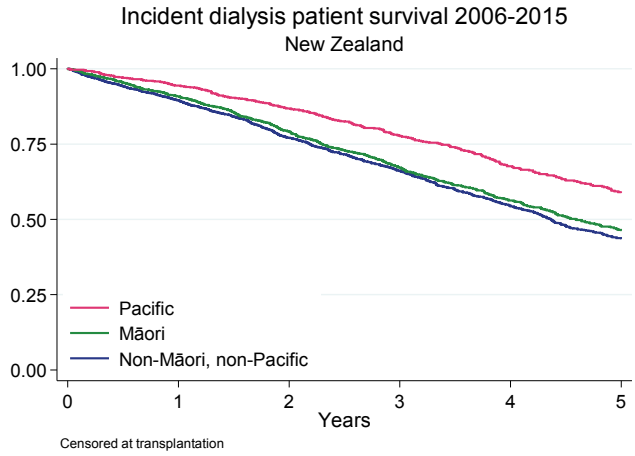


Figure 12.16.2



Timing of Renal Replacement Therapy Initiation

In Australia, the level of kidney function at which dialysis is commenced ranges between eGFR 5-6 ml/min/1.73 m^2 for Indigenous Australians while the kidney function at dialysis commencement for non-Indigenous Australians is approximately 7 ml/min/1.73 m^2. For Aotearoa/New Zealand, the estimated GFR at dialysis commencement is approximately 4-5 ml/min/1.73 m^2 for Pacific patients, 6-7 ml/min/1.73 m^2 for Māori patients and 7 ml/min/1.73 m^2 for non-Māori, non-Pacific patients.

Figure 12.17.1

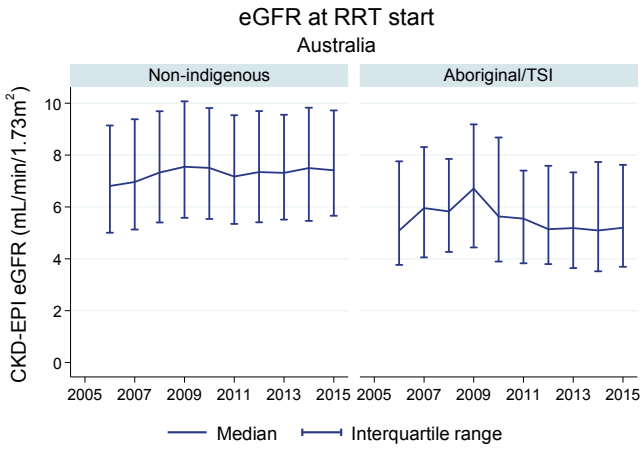
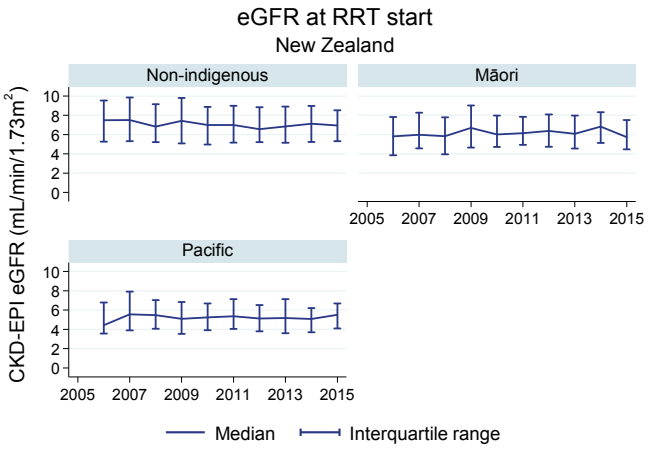


Figure 12.17.2



Incidence and Prevalence by State/Territory/Country

The next two pages show a variety of figures that summarise various key rates (incidence, prevalence, transplant rates) for Indigenous Peoples in Australia and by ethnicity in New Zealand. In large part they show information from previous pages, in a series of differing formats.

State Incidence

There is marked variation in the incidence of renal replacement therapy between States and Territories in Australia. The Northern Territory had the highest national incidence for Indigenous Australians treated for end-stage kidney disease at 1402 per million of population in 2015; the next highest was in Western Australia (772 pmp) (figure 12.18). The incidence in renal replacement therapy appears to be increasing in the Northern Territory and Western Australia, and decreasing in Queensland, New South Wales/ACT, Victoria/Tasmania, and South Australia.

There is also marked State/Territory variation in the incidence of kidney transplantation in Australia and between years. There appears to be a decreasing incidence of transplantation for Indigenous Australians in Western Australia, and possibly increased incidences over time in New South Wales/ACT, South Australia, and the Northern Territory.

Figure 12.18

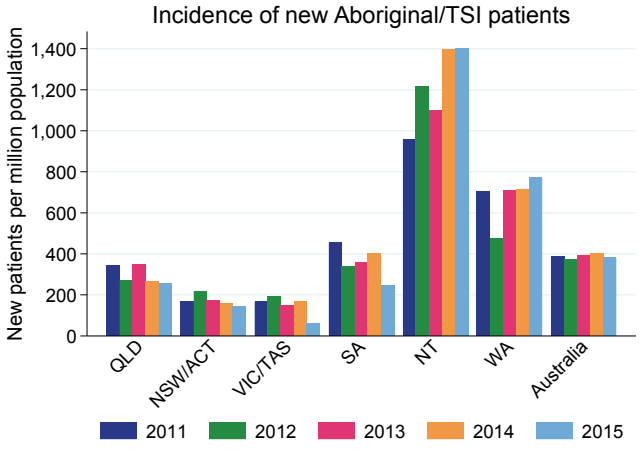
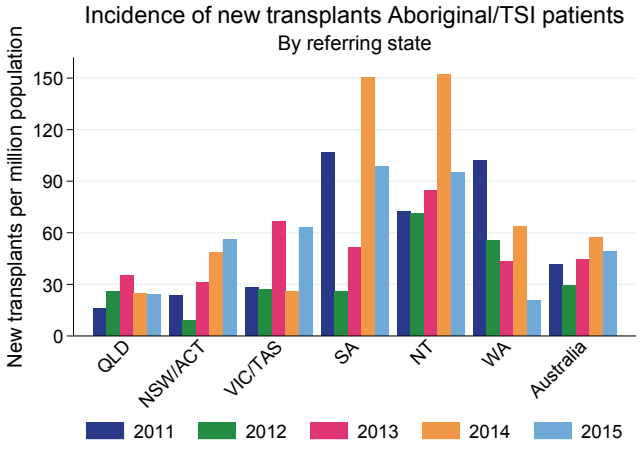


Figure 12.19



Dialysis by Resident State

Treatment patterns for Aboriginal and Torres Strait Islander People vary by State. The highest rates for hemodialysis are in the Northern Territory, Western Australia and South Australia. The highest rates for peritoneal dialysis are in the Queensland, Western Australia and Northern Territory.

Figure 12.20

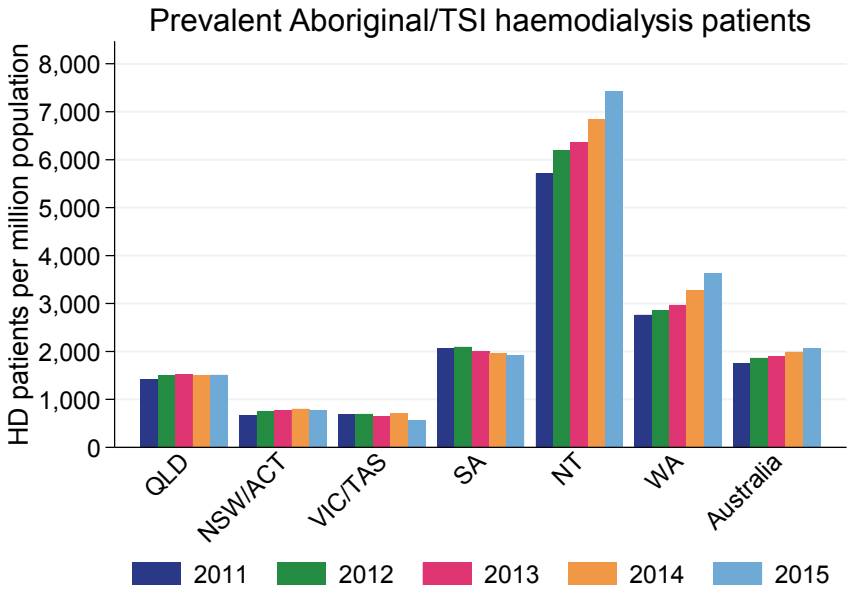
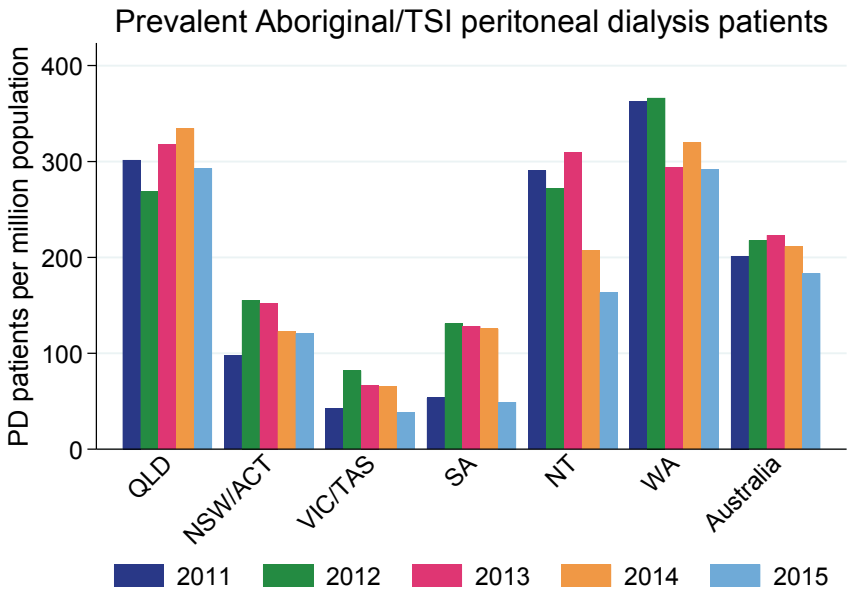


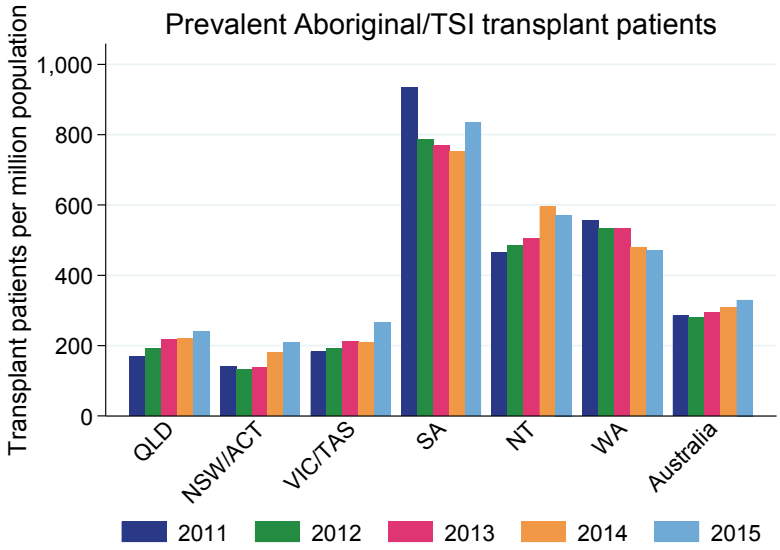
Figure 12.21



Transplant by Referring State

Rates of prevalent transplants vary substantially between States with the highest rates in South Australia Western Australian and Northern Territory. These rates are per population, not per dialysis patient, and they reflect both background rates of kidney disease and transplant practices. Transplant rates per dialysis patient are presented in Chapter 8 of this Report. Transplantation prevalence appears to be decreasing in South Australia and Western Australia.

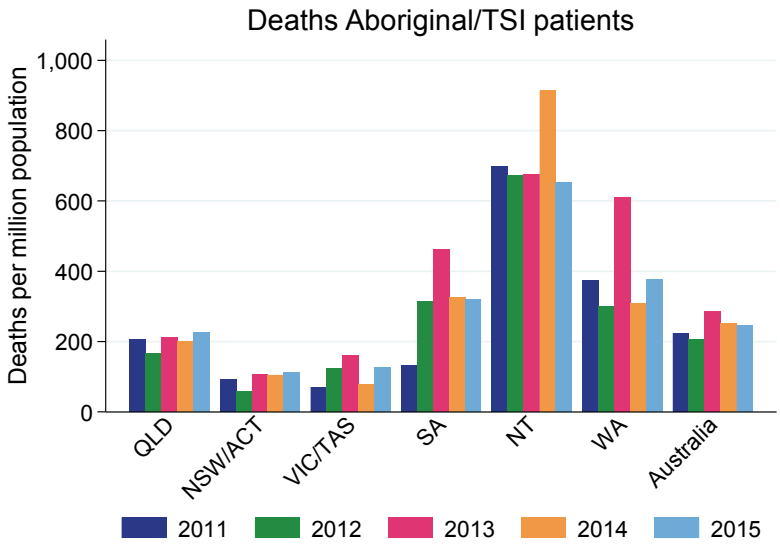
Figure 12.22



Deaths by Resident State

State based mortality rates for Indigenous Australians on renal replacement therapy are shown in Figure 12.19. The differences in death rates between states are likely to reflect a combination of the differences in ESKD prevalence, practice patterns and patient factors.

Figure 12.23



Aotearoa/New Zealand

Figure 12.24

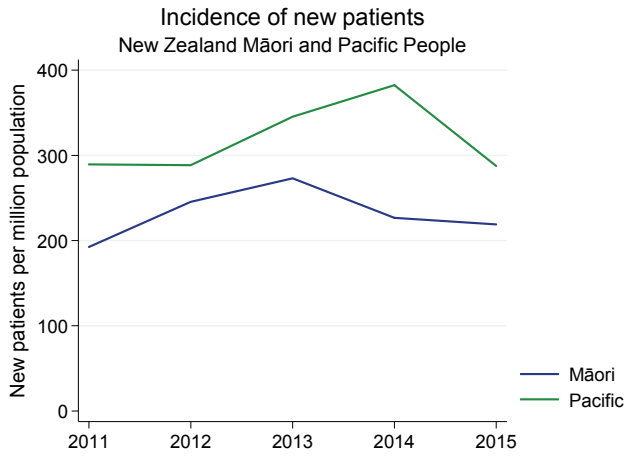


Figure 12.25

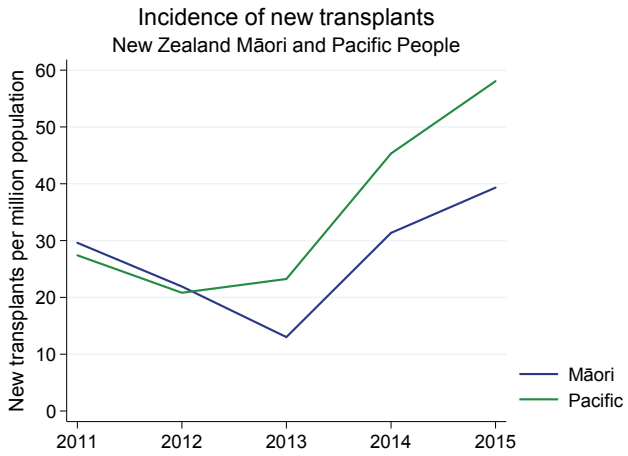


Figure 12.26

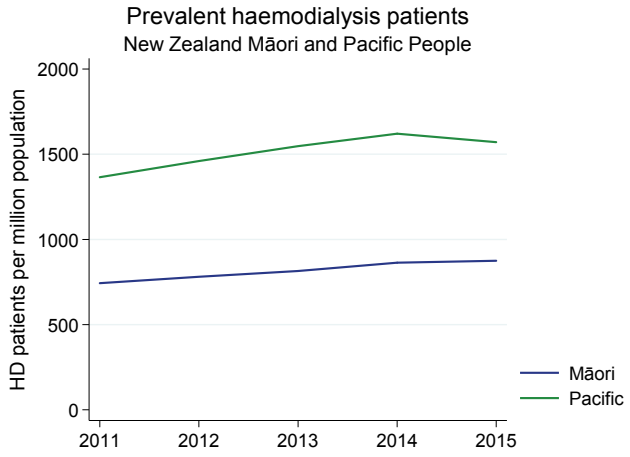


Figure 12.27

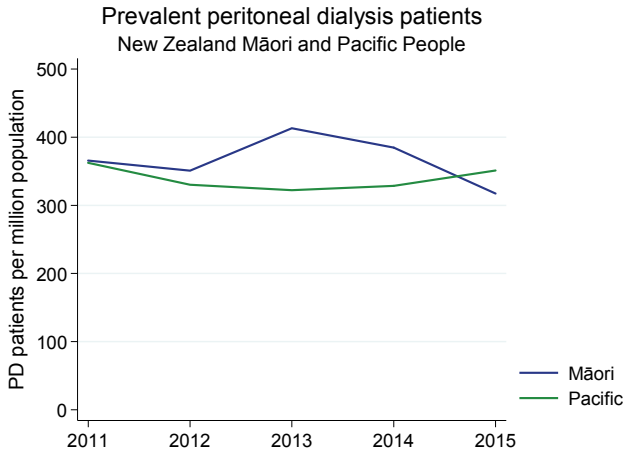


Figure 12.28

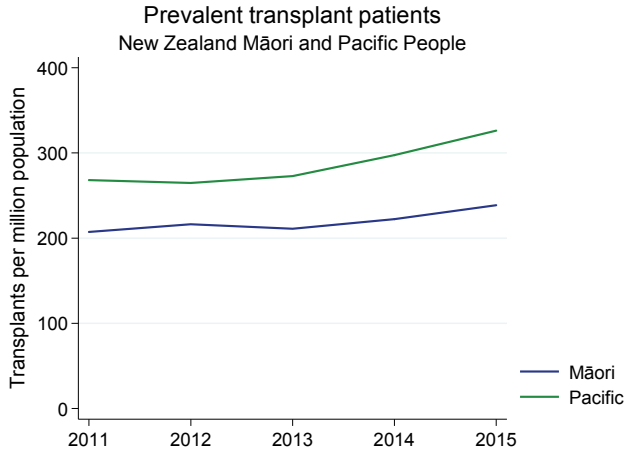
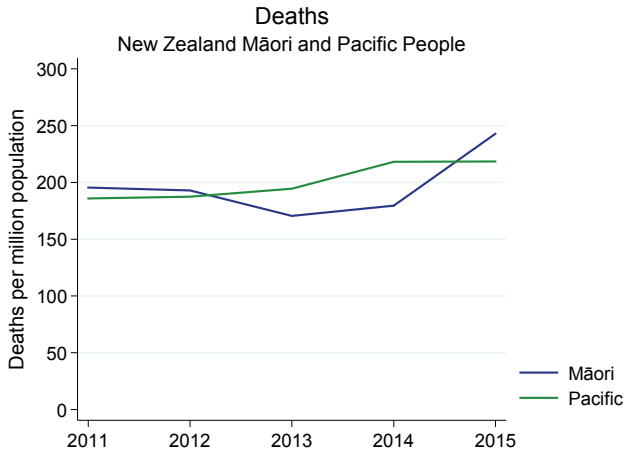


Figure 12.29



Geographical Distribution

Figure 12.26 shows the number of incident Aboriginal/TSI patients by postcode. The distribution of prevalent dialysis patients is summarised in figure 12.27 (by state) and 12.28 by statistical subdivision (SSD, obtained by mapping postcodes to SSD). Note that some postcodes are distributed over more than one SSD. Mapping data are courtesy of the Australian Bureau of Statistics.

Figure 12.30

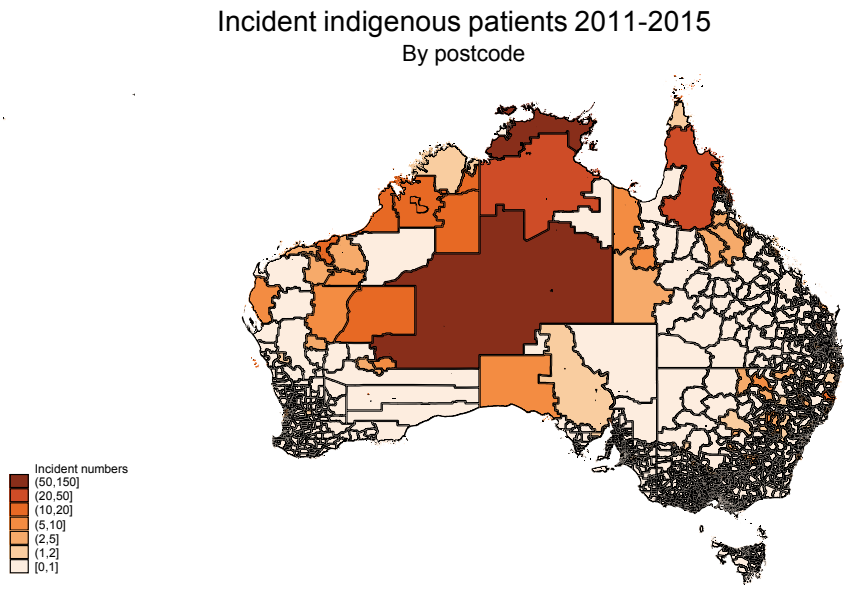


Figure 12.31

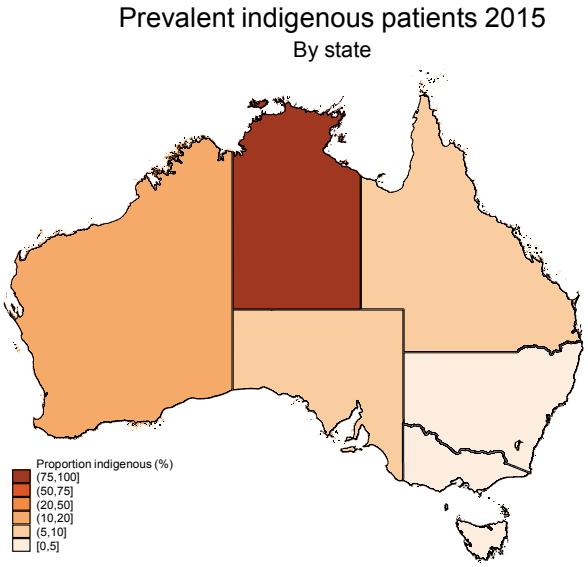
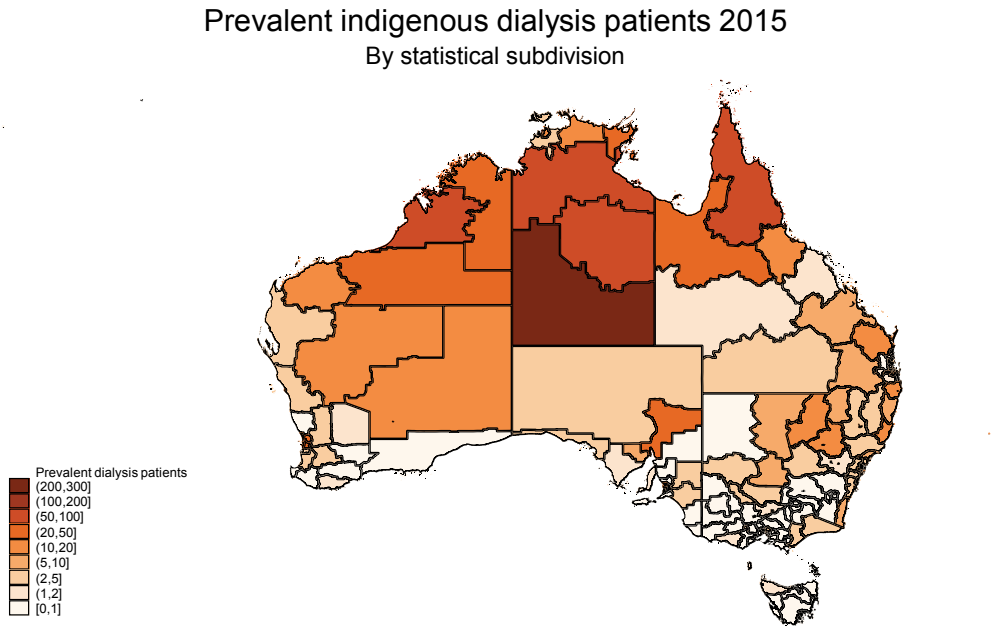


Figure 12.32



Late Referral

The percentage of Aboriginal and Torres Strait Islander Peoples referred late for treatment has been stable over 2013-2015 with the same rates and patterns as seen in the Non-Indigenous population (table 12.5). There appears to be a general trend of reducing late referral practices for both populations.

The proportion of patients who experience late referral to specialist nephrology services in Aotearoa/New Zealand appears to be decreasing over time, with a particularly notable decrease for Pacific patients.

Table 12.5 Percentage of Late Referral by Indigenous Status 2011-2015

	Australia		New Zealand		
Year	Non-indigenous	Aboriginal/TSI	Non-Māori, Non-Pacific	Māori	Pacific People
2011	22%	30%	22%	18%	26%
2012	22%	25%	15%	17%	17%
2013	19%	17%	11%	15%	22%
2014	18%	15%	14%	8%	20%
2015	18%	17%	13%	16%	11%

Vascular Access

Incident vascular access data are presented in table 12.6, and prevalent data in table 12.7.

For Australia, the proportion of Indigenous patients commencing dialysis with a catheter rather than permanent access was slightly higher than in non-indigenous patients in 2015 (table 12.6). In New Zealand rates of catheter use are similar between populations.

Table 12.6 Incident Vascular Access 2011-2015

		Australia		New Zealand		
Year	Vascular access	Non-indigenous	Aboriginal/TSI	Non-Māori, Non-Pacific	Māori	Pacific People
2011	AVF	641 (39%)	85 (38%)	41 (26%)	25 (28%)	10 (14%)
	AVG	28 (2%)	2 (1%)	1 (1%)	0 (0%)	1 (1%)
	CVC	830 (51%)	110 (49%)	104 (66%)	51 (57%)	49 (67%)
	Not reported	133 (8%)	29 (13%)	11 (7%)	13 (15%)	13 (18%)
2012	AVF	583 (36%)	69 (33%)	38 (28%)	30 (25%)	20 (26%)
	AVG	21 (1%)	3 (1%)	3 (2%)	0 (0%)	0 (0%)
	CVC	791 (49%)	108 (51%)	75 (56%)	68 (57%)	38 (49%)
	Not reported	216 (13%)	31 (15%)	18 (13%)	21 (18%)	19 (25%)
2013	AVF	495 (32%)	45 (19%)	37 (27%)	24 (19%)	19 (20%)
	AVG	23 (1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
	CVC	743 (48%)	112 (48%)	76 (56%)	62 (49%)	49 (52%)
	Not reported	302 (19%)	77 (33%)	23 (17%)	41 (32%)	26 (28%)
2014	AVF	544 (35%)	64 (26%)	30 (23%)	30 (28%)	16 (15%)
	AVG	22 (1%)	4 (2%)	1 (1%)	2 (2%)	1 (1%)
	CVC	687 (44%)	122 (49%)	76 (58%)	51 (47%)	54 (51%)
	Not reported	303 (19%)	57 (23%)	25 (19%)	25 (23%)	34 (32%)
2015	AVF	622 (42%)	90 (37%)	30 (25%)	31 (28%)	24 (39%)
	AVG	18 (1%)	3 (1%)	2 (2%)	3 (3%)	0 (0%)
	CVC	801 (54%)	145 (60%)	83 (70%)	76 (69%)	38 (61%)
	Not reported	36 (2%)	3 (1%)	4 (3%)	0 (0%)	0 (0%)

Prevalent Vascular Access 2011-2015

In contrast to incident vascular access, the rates of catheter use for prevalent dialysis patients in Australia are similar between non-Indigenous and Indigenous patients (table 12.7). Rates for New Zealand are also similar.

Tab 12.7 Prevalent Vasuclar Access 2011-2015

		Australia		New Zealand		
Year	Vascular access	Non-indigenous	Aboriginal/TSI	Non-Māori, Non-Pacific	Māori	Pacific People
2011	AVF	6081 (78%)	981 (83%)	457 (71%)	371 (74%)	341 (76%)
	AVG	660 (8%)	37 (3%)	38 (6%)	34 (7%)	8 (2%)
	CVC	1036 (13%)	152 (13%)	153 (24%)	95 (19%)	99 (22%)
	Not reported	37 (<1%)	6 (1%)	0 (0%)	2 (<1%)	0 (0%)
2012	AVF	6093 (76%)	1040 (81%)	467 (70%)	391 (73%)	373 (76%)
	AVG	622 (8%)	40 (3%)	33 (5%)	26 (5%)	9 (2%)
	CVC	1103 (14%)	165 (13%)	160 (24%)	113 (21%)	102 (21%)
	Not reported	162 (2%)	32 (3%)	5 (1%)	4 (1%)	7 (1%)
2013	AVF	6322 (77%)	1072 (81%)	460 (70%)	403 (71%)	403 (76%)
	AVG	589 (7%)	41 (3%)	39 (6%)	30 (5%)	18 (3%)
	CVC	1171 (14%)	202 (15%)	159 (24%)	129 (23%)	110 (21%)
	Not reported	78 (1%)	11 (1%)	2 (<1%)	2 (<1%)	2 (<1%)
2014	AVF	6256 (76%)	1142 (80%)	460 (68%)	455 (75%)	428 (75%)
	AVG	646 (8%)	45 (3%)	36 (5%)	29 (5%)	16 (3%)
	CVC	1103 (13%)	186 (13%)	169 (25%)	117 (19%)	122 (21%)
	Not reported	213 (3%)	51 (4%)	15 (2%)	5 (1%)	6 (1%)
2015	AVF	6211 (75%)	1158 (77%)	457 (67%)	426 (68%)	432 (76%)
	AVG	553 (7%)	45 (3%)	27 (4%)	35 (6%)	26 (5%)
	CVC	1081 (13%)	172 (11%)	184 (27%)	141 (23%)	105 (18%)
	Not reported	474 (6%)	138 (9%)	18 (3%)	21 (3%)	5 (1%)

Patient Flow

Table 12.8.1 shows the overall flow of Aboriginal and Torres Strait Islander patients in Australia, by state. The differences in death rates between states are likely to reflect a combination of the differences in ESKD prevalence, practice patterns and patient factors.

Table 12.8.1 Patient Flow (pmp) Australia 2011-2015

Year	Event	QLD	NSW/ACT	VIC/TAS	SA	NT	WA	Australia
2011	New patients	65 (344)	36 (168)	12 (169)	17 (454)	66 (959)	62 (702)	258 (385)
	New Tx	4 (21)	4 (19)	2 (28)	9 (241)	0 (0)	9 (102)	28 (42)
	Pre-emptive Tx	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Prevalent dialysis	325 (1720)	165 (769)	52 (731)	79 (2112)	414 (6013)	276 (3127)	1311 (1957)
	Prevalent Tx	32 (169)	30 (140)	13 (183)	35 (936)	32 (465)	49 (555)	191 (285)
	Total prevalence	357 (1889)	195 (909)	65 (913)	114 (3047)	446 (6478)	325 (3682)	1502 (2242)
	Deaths	39 (206)	20 (93)	5 (70)	5 (134)	48 (697)	33 (374)	150 (224)
2012	New patients	52 (269)	48 (219)	14 (191)	13 (340)	85 (1215)	43 (477)	255 (373)
	New Tx	5 (26)	2 (9)	2 (27)	6 (157)	0 (0)	5 (56)	20 (29)
	Pre-emptive Tx	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Prevalent dialysis	342 (1767)	198 (905)	57 (779)	85 (2226)	453 (6473)	291 (3231)	1426 (2085)
	Prevalent Tx	37 (191)	29 (133)	14 (191)	30 (786)	34 (486)	48 (533)	192 (281)
	Total prevalence	379 (1958)	227 (1037)	71 (970)	115 (3011)	487 (6959)	339 (3764)	1618 (2365)
	Deaths	32 (165)	13 (59)	9 (123)	12 (314)	47 (672)	27 (300)	140 (205)
2013	New patients	69 (348)	39 (175)	11 (147)	14 (359)	78 (1097)	65 (707)	276 (395)
	New Tx	7 (35)	7 (31)	5 (67)	8 (205)	0 (0)	4 (44)	31 (44)
	Pre-emptive Tx	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Prevalent dialysis	364 (1836)	207 (927)	53 (707)	83 (2128)	475 (6678)	300 (3263)	1482 (2121)
	Prevalent Tx	43 (217)	31 (139)	16 (213)	30 (769)	36 (506)	49 (533)	205 (293)
	Total prevalence	407 (2053)	238 (1066)	69 (920)	113 (2898)	511 (7184)	349 (3796)	1687 (2414)
	Deaths	42 (212)	24 (108)	12 (160)	18 (462)	48 (675)	56 (609)	200 (286)
2014	New patients	54 (266)	36 (158)	13 (169)	16 (402)	101 (1397)	67 (714)	287 (402)
	New Tx	7 (34)	9 (40)	3 (39)	16 (402)	0 (0)	6 (64)	41 (57)
	Pre-emptive Tx	1 (5)	3 (13)	0 (0)	0 (0)	0 (0)	0 (0)	4 (6)
	Prevalent dialysis	374 (1840)	211 (926)	59 (767)	83 (2084)	510 (7054)	338 (3601)	1575 (2205)
	Prevalent Tx	45 (221)	41 (180)	16 (208)	30 (753)	43 (595)	45 (479)	220 (308)
	Total prevalence	419 (2062)	252 (1106)	75 (975)	113 (2837)	553 (7649)	383 (4081)	1795 (2513)
	Deaths	41 (202)	24 (105)	6 (78)	13 (326)	66 (913)	29 (309)	179 (251)
2015	New patients	53 (254)	33 (142)	5 (63)	10 (246)	103 (1402)	74 (772)	278 (381)
	New Tx	5 (24)	13 (56)	6 (76)	10 (246)	0 (0)	2 (21)	36 (49)
	Pre-emptive Tx	0 (0)	1 (4)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)
	Prevalent dialysis	376 (1804)	209 (898)	48 (609)	80 (1965)	558 (7594)	376 (3923)	1647 (2256)
	Prevalent Tx	50 (240)	49 (211)	21 (266)	34 (835)	42 (572)	45 (469)	241 (330)
	Total prevalence	426 (2044)	258 (1109)	69 (875)	114 (2801)	600 (8166)	421 (4392)	1888 (2586)
	Deaths	47 (226)	26 (112)	10 (127)	13 (319)	48 (653)	36 (376)	180 (247)

Table 12.8.2 shows the overall patient flow in New Zealand by ethnicity.

Notably, mortality for Māori and Pacific patients is 5-fold higher per million of population.

Table 12.8.2 Patient Flow (pmp) New Zealand 2011-2015

Year	Event	Non-Māori, Non-Pacific	Māori	Pacific
2011	New patients	263 (78)	130 (192)	95 (289)
	New Tx	89 (26)	20 (30)	9 (27)
	Pre-emptive Tx	15 (4)	0 (0)	0 (0)
	Prevalent dialysis	1077 (319)	749 (1109)	567 (1727)
	Prevalent Tx	1254 (371)	140 (207)	88 (268)
	Total prevalence	2331 (690)	889 (1316)	655 (1995)
	Deaths	223 (66)	132 (195)	61 (186)
2012	New patients	250 (74)	168 (246)	97 (289)
	New Tx	86 (25)	15 (22)	7 (21)
	Pre-emptive Tx	16 (5)	1 (1)	1 (3)
	Prevalent dialysis	1090 (322)	774 (1131)	602 (1791)
	Prevalent Tx	1284 (379)	148 (216)	89 (265)
	Total prevalence	2374 (701)	922 (1348)	691 (2055)
	Deaths	202 (60)	132 (193)	63 (187)
2013	New patients	247 (73)	189 (273)	119 (345)
	New Tx	98 (29)	9 (13)	8 (23)
	Pre-emptive Tx	16 (5)	2 (3)	1 (3)
	Prevalent dialysis	1096 (322)	850 (1228)	644 (1870)
	Prevalent Tx	1329 (390)	146 (211)	94 (273)
	Total prevalence	2425 (712)	996 (1439)	738 (2143)
	Deaths	202 (59)	118 (170)	67 (195)
2014	New patients	258 (75)	159 (227)	135 (382)
	New Tx	100 (29)	22 (31)	16 (45)
	Pre-emptive Tx	20 (6)	0 (0)	1 (3)
	Prevalent dialysis	1111 (322)	876 (1249)	688 (1949)
	Prevalent Tx	1356 (392)	156 (222)	105 (297)
	Total prevalence	2467 (714)	1032 (1471)	793 (2247)
	Deaths	220 (64)	126 (180)	77 (218)
2015	New patients	265 (75)	156 (219)	104 (288)
	New Tx	98 (28)	28 (39)	21 (58)
	Pre-emptive Tx	22 (6)	0 (0)	2 (6)
	Prevalent dialysis	1123 (319)	849 (1192)	695 (1922)
	Prevalent Tx	1404 (399)	170 (239)	118 (326)
	Total prevalence	2527 (718)	1019 (1431)	813 (2248)
	Deaths	198 (56)	173 (243)	79 (218)

Cause of Death

The causes of death in 2015 are shown in table 12.9, categorised by country, ethnicity and modality at time of death. Cardiovascular disease was the leading cause of death amongst all ethnic groups on dialysis, apart from non-indigenous dialysis patients in whom withdrawal was the most common cause of death.

Table 12.9 Cause of Death 2015

		Australia		New Zealand		
Modality	**Cause of death**	**Non-indigenous**	**Aboriginal/TSI**	**Non-Māori, Non-Pacific**	**Māori**	**Pacific People**
Dialysis	**Cardiovascular**	447 (31%)	51 (30%)	56 (34%)	69 (42%)	33 (45%)
	Withdrawal	505 (35%)	45 (26%)	53 (32%)	36 (22%)	7 (10%)
	Cancer	52 (4%)	6 (3%)	7 (4%)	7 (4%)	2 (3%)
	Infection	124 (9%)	27 (16%)	21 (13%)	21 (13%)	8 (11%)
	Other	319 (22%)	43 (25%)	30 (18%)	30 (18%)	23 (32%)
	Total	1447	172	167	163	73
Transplant	**Cardiovascular**	42 (19%)	1 (14%)	6 (21%)	3 (33%)	1 (25%)
	Withdrawal	21 (10%)	0 (0%)	1 (4%)	0 (0%)	0 (0%)
	Cancer	59 (27%)	3 (43%)	15 (54%)	1 (11%)	1 (25%)
	Infection	29 (13%)	1 (14%)	4 (14%)	2 (22%)	0 (0%)
	Other	65 (30%)	2 (29%)	2 (7%)	3 (33%)	2 (50%)
	Total	**216**	**7**	**28**	**9**	**4**

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