



# CHAPTER 11

## End Stage Kidney Disease in Māori patients in Aotearoa/New Zealand

*Reporting the incidence, prevalence and survival in Māori patients of Aotearoa/New Zealand receiving renal replacement therapy.*

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## Executive Summary

In this chapter, the rates, practice patterns and outcomes of treatment for end-stage kidney disease for people identifying as Māori living in Aotearoa New Zealand are reported. Self-identified ethnicity is reported by renal units on behalf of patients.

Denominator population statistics are stratified by ethnicity. For example, the incidence of Renal Replacement Therapy (RRT) for Māori includes the national Māori population as the denominator. The denominator population is derived from the mid-year population (30 June) estimated each year by Statistics New Zealand from the Census (currently 2018). Denominator populations are not age-standardised in this report. Notably, Māori and non-Māori, non-Pasifika populations possess different age structures: Māori tend to be younger and demonstrate onset of long-term conditions at ages 10-20 years younger than non-Māori, non-Pasifika.

Overall, the disparity in the incidence rates of end-stage kidney disease for Māori patients are markedly and persistently higher than those for non-Māori, non-Pasifika patients. They experienced later referrals to specialist nephrology services and Māori patients had a higher use of facility dialysis as the principal modality of care, and lower use of each of the home-based modalities compared with non-Māori, non-Pasifika patients. Māori also continue to have significantly lower rates pre-emptive kidney transplantation.

## Suggested Citation

ANZDATA Registry. 42nd Report, Chapter 11: End Stage Kidney Disease in Māori patients in Aotearoa New Zealand. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2019. Available at: <http://www.anzdata.org.au>

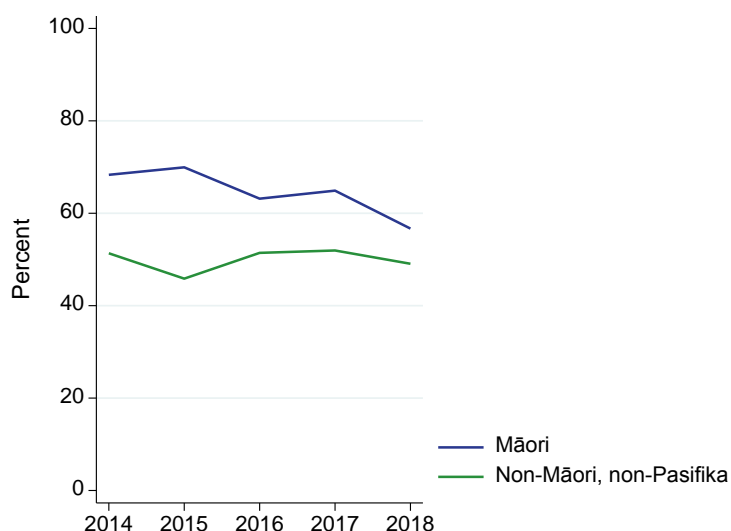
## New Patients

A total of 187 patients identifying as Māori commenced treatment for end-stage kidney disease in 2018, representing 31% of all patients starting renal replacement therapy. The rate of haemodialysis commencement in non-Māori, non-Pasifika patients was 4-fold lower than for Māori. Māori were more likely to commence dialysis with haemodialysis than peritoneal dialysis compared with non-Māori, non-Pasifika patients (figure 11.1). Two Māori patients received a pre-emptive kidney transplant during 2018. In the last 5 years, 6 Māori patients have received a pre-emptive kidney transplant compared with 111 non-Māori, non-Pasifika patients.

**Table 11.1 New Patients (pmp) New Zealand 2014-2018**

Year	Modality	Māori	Non-Māori, non-Pasifika
2014	HD	110 (157)	134 (39)
2014	PD	51 (73)	107 (31)
2014	Graft	0 (0)	20 (6)
2015	HD	121 (170)	127 (36)
2015	PD	52 (73)	128 (36)
2015	Graft	0 (0)	22 (6)
2016	HD	108 (149)	144 (40)
2016	PD	61 (84)	116 (32)
2016	Graft	2 (3)	20 (6)
2017	HD	122 (166)	147 (40)
2017	PD	64 (87)	115 (31)
2017	Graft	2 (3)	21 (6)
2018	HD	106 (142)	132 (35)
2018	PD	79 (106)	109 (29)
2018	Graft	2 (3)	28 (7)

**Figure 11.1 - Percentage of New Patients Commencing on Haemodialysis - New Zealand**



## Primary Renal Disease

The primary renal diseases of incident New Zealand patients over 2014-2018 are shown in table 11.2. Māori experience diabetic nephropathy at a substantially higher rate than non-Māori, non-Pasifika patients.

**Table 11.2 Primary Renal Disease of New Patients New Zealand 2014-2018**

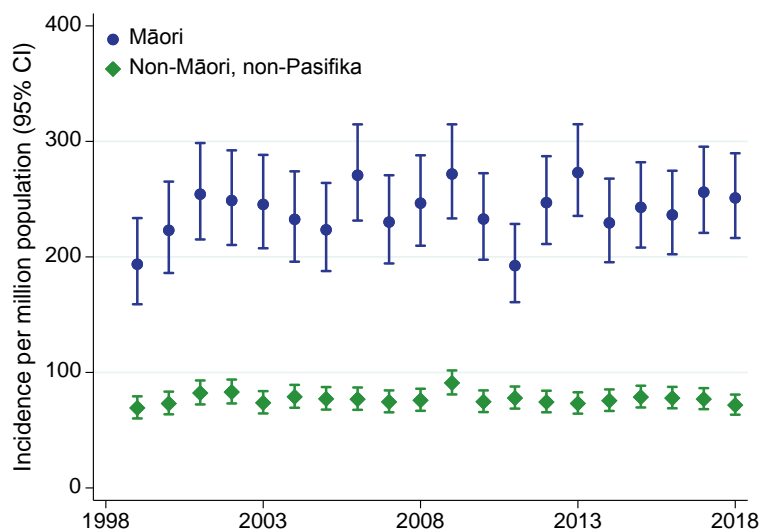
Primary Renal Disease	Māori	Non-Māori, non-Pasifika
Diabetic Nephropathy	616 (70%)	382 (28%)
Glomerulonephritis	123 (14%)	344 (25%)
Hypertension	40 (5%)	176 (13%)
Polycystic Disease	11 (1%)	111 (8%)
Reflux Nephropathy	8 (1%)	48 (4%)
Other	59 (7%)	241 (18%)
Uncertain	19 (2%)	61 (4%)
Not reported	4 (<1%)	7 (1%)
<b>Total</b>	<b>880</b>	<b>1370</b>

## Incidence Rates

Overall, the incidence rates (per million of population) of end-stage kidney disease for Māori patients are markedly and persistently higher than those for non-Māori, non-Pasifika patients. The disparity is confounded and underestimated by the age distributions of each population - Māori populations are considerably younger.

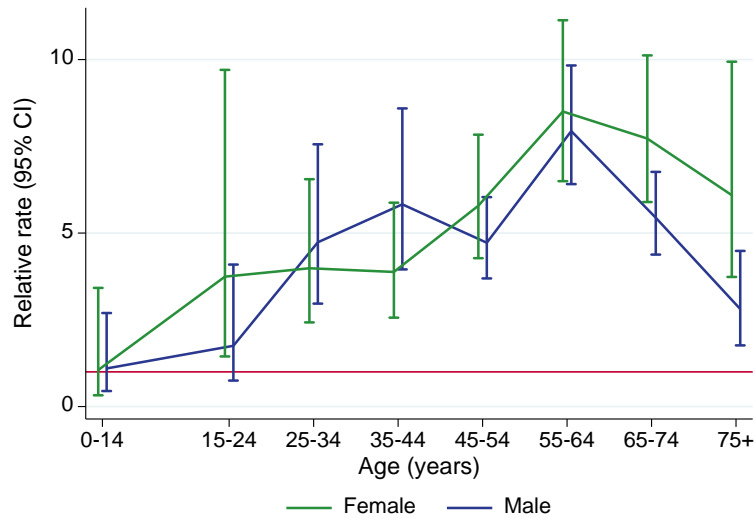
Although rates fluctuate from year to year, the incidence rates have been stable in recent years (figure 11.2). The relative rate differs with age - this is illustrated in figure 11.3.

**Figure 11.2 - Unadjusted Incident RRT Rate - New Zealand**



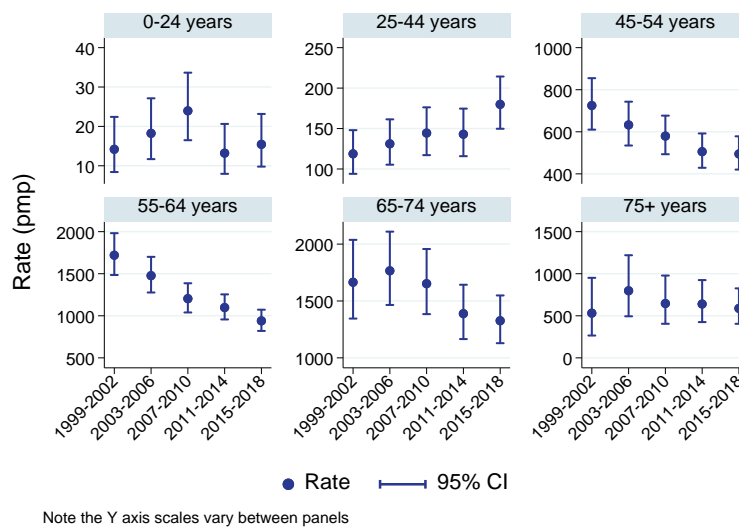
Among Māori, disparities in the incidence of end-stage kidney disease from non-Māori, non-Pasifika persons occur as early as ages 15 to 24 years and are evident across all age groups (figure 11.3). There is no indication of gender differences in incidence rates for Māori.

**Figure 11.3 - Relative Incidence Rate of Treated ESKD for Māori Patients compared with non-Māori, non-Pasifika Patients by Gender - New Zealand 2014-2018**



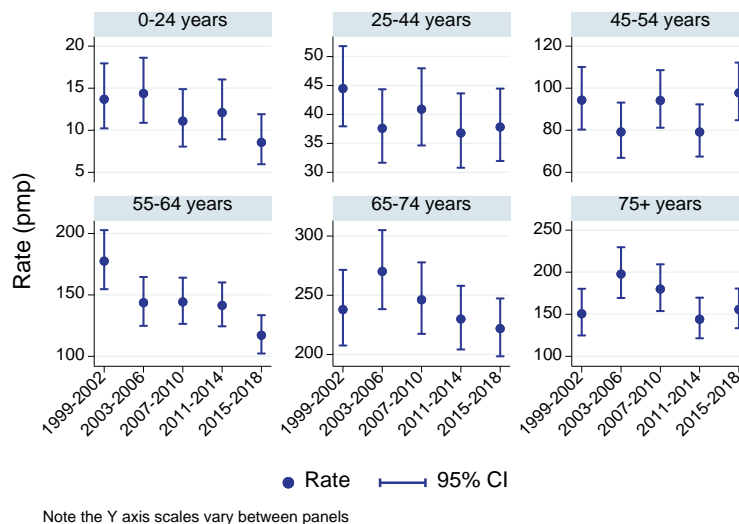
Age specific trends in renal replacement therapy practices for Māori are shown in figure 11.4; note that the Y axis scales vary.

**Figure 11.4.1 - Age-specific Incidence Rates of Treated ESKD - Māori, New Zealand**



Note the Y axis scales vary between panels

**Figure 11.4.2 - Age-specific Incidence Rates of Treated ESKD - Non-Māori, non-Pasifika, New Zealand**



Note the Y axis scales vary between panels

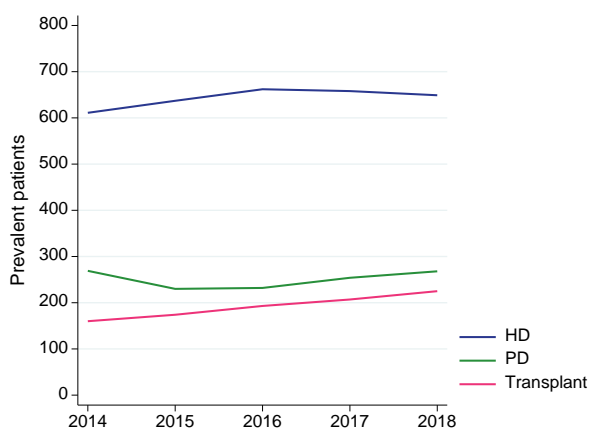
## Prevalent Patients

The number of prevalent Māori patients with treated end-stage kidney disease continues to rise year-on-year (table 11.3 and figures 11.5 and 11.6). From 2016 to 2018, there were notable increases in the numbers of Māori people receiving peritoneal dialysis and with a kidney transplant.

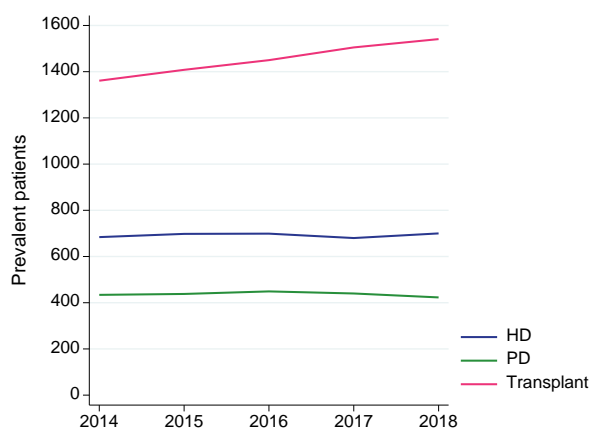
**Table 11.3 Prevalent Patients by Ethnicity and Treatment Modality New Zealand 2014-2018**

Year	Modality	Māori	Non-Māori, non-Pasifika
2014	HD	611 (59%)	684 (28%)
	% HD at home	23%	33%
	PD	269 (26%)	434 (18%)
	Tx	160 (15%)	1361 (55%)
2015	HD	637 (61%)	698 (27%)
	% HD at home	22%	31%
	PD	230 (22%)	438 (17%)
	Tx	174 (17%)	1408 (55%)
2016	HD	662 (61%)	699 (27%)
	% HD at home	21%	29%
	PD	232 (21%)	449 (17%)
	Tx	193 (18%)	1450 (56%)
2017	HD	658 (59%)	680 (26%)
	% HD at home	21%	28%
	PD	254 (23%)	440 (17%)
	Tx	207 (18%)	1505 (57%)
2018	HD	649 (57%)	700 (26%)
	% HD at home	20%	27%
	PD	268 (23%)	423 (16%)
	Tx	225 (20%)	1541 (58%)

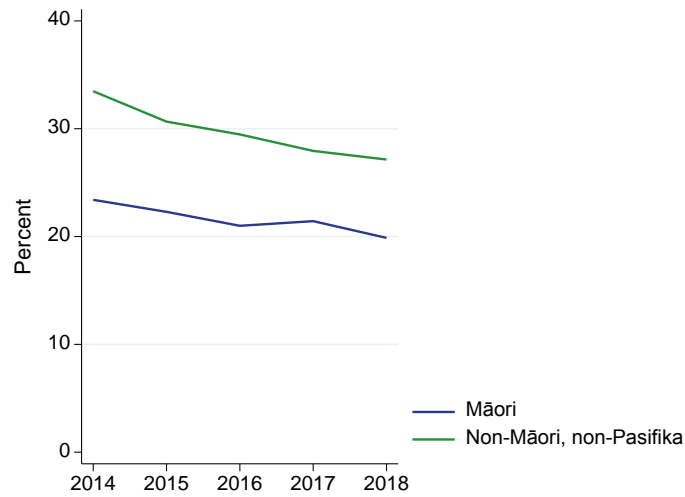
**Figure 11.5.1 - Prevalent Patients by Modality - New Zealand – Māori**



**Figure 11.5.2 - Prevalent Patients by Modality - New Zealand - Non-Māori, non-Pasifika**

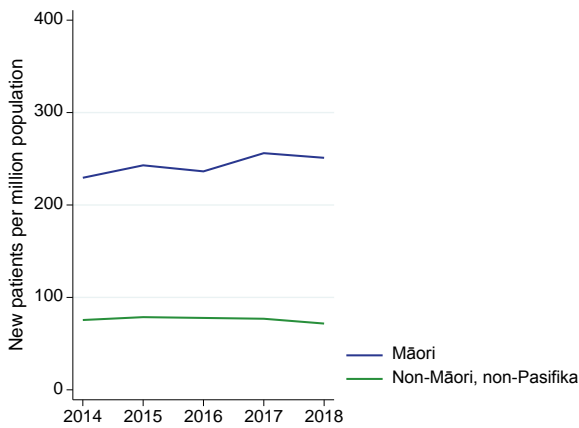


**Figure 11.6 - Prevalent Haemodialysis at Home by Ethnicity - New Zealand**

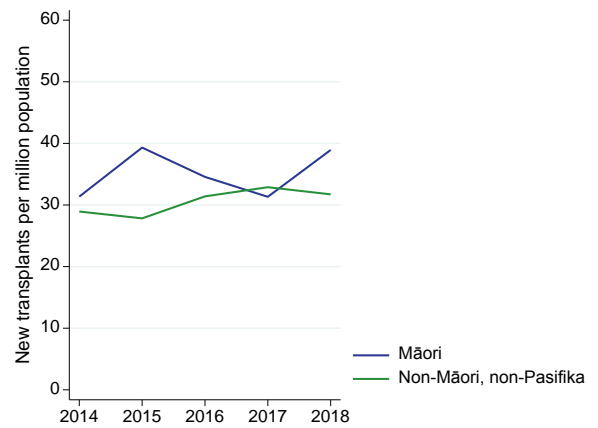


## Incidence and Prevalence per Population

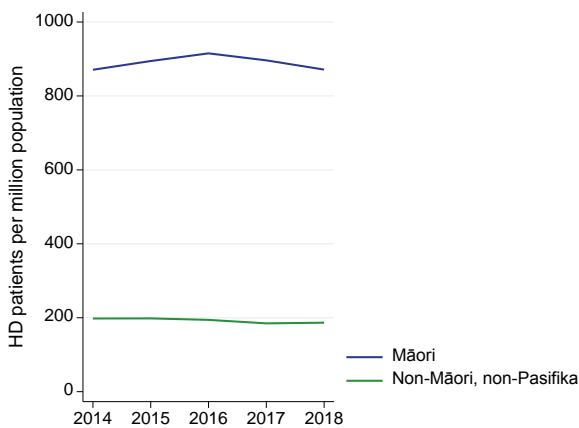
**Figure 11.7 - Incidence of New Patients - New Zealand**



**Figure 11.8 - Incidence of New Transplants - New Zealand**



**Figure 11.9 - Prevalent Haemodialysis Patients - New Zealand**



**Figure 11.10 - Prevalent Peritoneal Dialysis Patients - New Zealand**

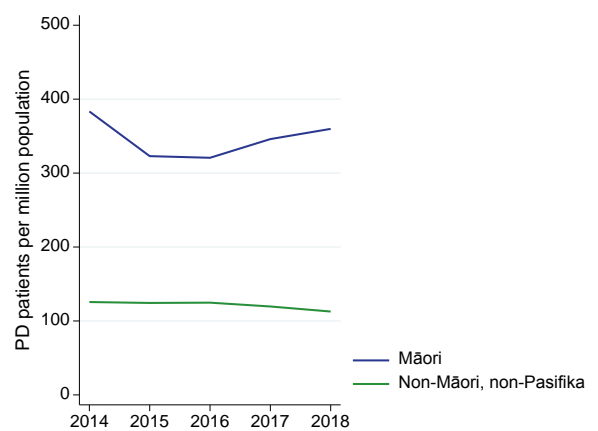


Figure 11.11 - Prevalent Transplant Patients - New Zealand

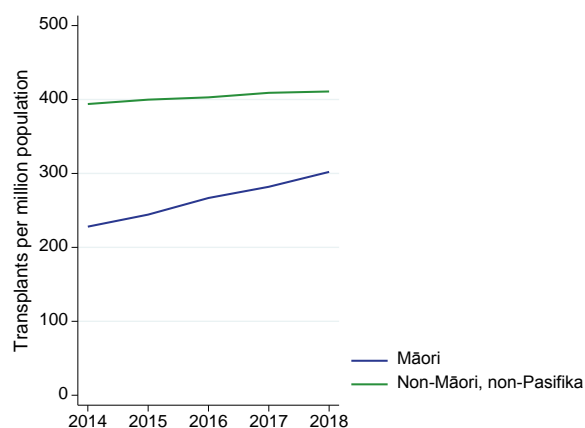
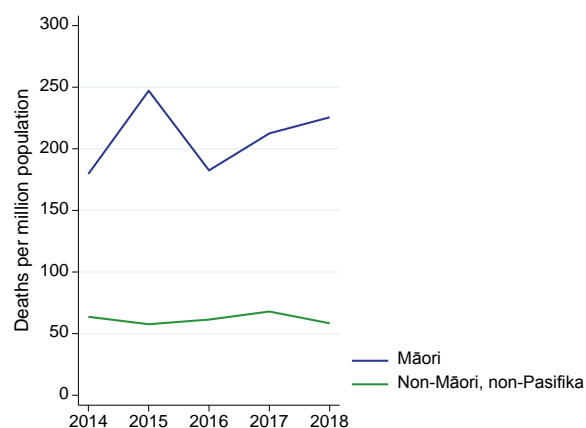


Figure 11.12 - Deaths of RRT Patients - New Zealand



## Transplantation

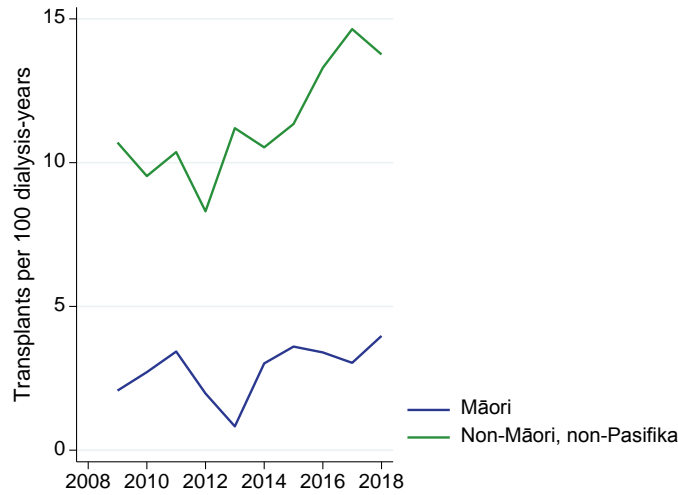
The numbers of transplant recipients over the last 10 years are shown in table 11.4 by ethnicity and donor type. Figure 11.13 shows the transplant rate of dialysed patients aged 15-64, using dialysis time as the denominator, which illustrates that Māori patients receive a kidney transplant at a much lower rate than Non-Māori, non-Pasifika patients. Information on donor source is shown in figure 11.14 and trends are shown in figure 11.15. Living donor rates have increased for Māori patients since 2013, with increases in living unrelated donors.

Table 11.4 Number of Transplant Recipients (pmp) by Ethnicity New Zealand 2009-2018

Year	Donor Type	Māori	Non-Māori, non-Pasifika
2009	DD	10 (15)	39 (12)
	LD	8 (12)	58 (17)
	<b>Total</b>	<b>18 (27)</b>	<b>97 (29)</b>
2010	DD	13 (20)	32 (10)
	LD	7 (11)	49 (15)
	<b>Total</b>	<b>20 (30)</b>	<b>81 (24)</b>
2011	DD	15 (22)	39 (12)
	LD	6 (9)	49 (14)
	<b>Total</b>	<b>21 (31)</b>	<b>88 (26)</b>
2012	DD	11 (16)	37 (11)
	LD	4 (6)	49 (14)
	<b>Total</b>	<b>15 (22)</b>	<b>86 (25)</b>
2013	DD	5 (7)	45 (13)
	LD	4 (6)	53 (16)
	<b>Total</b>	<b>9 (13)</b>	<b>98 (29)</b>
2014	DD	13 (19)	44 (13)
	LD	9 (13)	56 (16)
	<b>Total</b>	<b>22 (31)</b>	<b>100 (29)</b>
2015	DD	13 (18)	44 (12)
	LD	15 (21)	54 (15)
	<b>Total</b>	<b>28 (39)</b>	<b>98 (28)</b>
2016	DD	12 (17)	57 (16)
	LD	13 (18)	56 (16)
	<b>Total</b>	<b>25 (35)</b>	<b>113 (31)</b>
2017	DD	17 (23)	70 (19)
	LD	6 (8)	51 (14)
	<b>Total</b>	<b>23 (31)</b>	<b>121 (33)</b>
2018	DD	15 (20)	65 (17)
	LD	14 (19)	54 (14)
	<b>Total</b>	<b>29 (39)</b>	<b>119 (32)</b>



Figure 11.13 - Transplant Rate of Dialysed Patients by Ethnicity 2009-2018 - New Zealand, Patients Aged 15-64



The number of transplants to Māori recipients increased since 2013, through a higher proportion of transplants from living donors, however, there are ongoing disparities in the rate of transplants between Māori and the non-Māori non-Pasifika population.

Figure 11.14 - Donor Type by Ethnicity - New Zealand 2009-2018

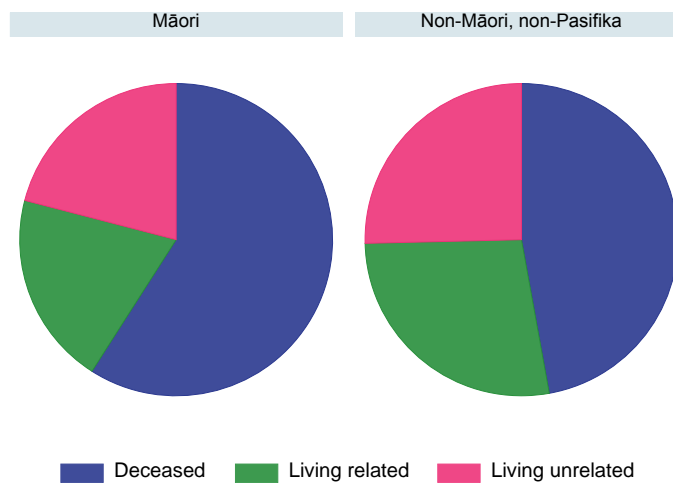


Figure 11.15 - Donor Type by Ethnicity and Year - New Zealand

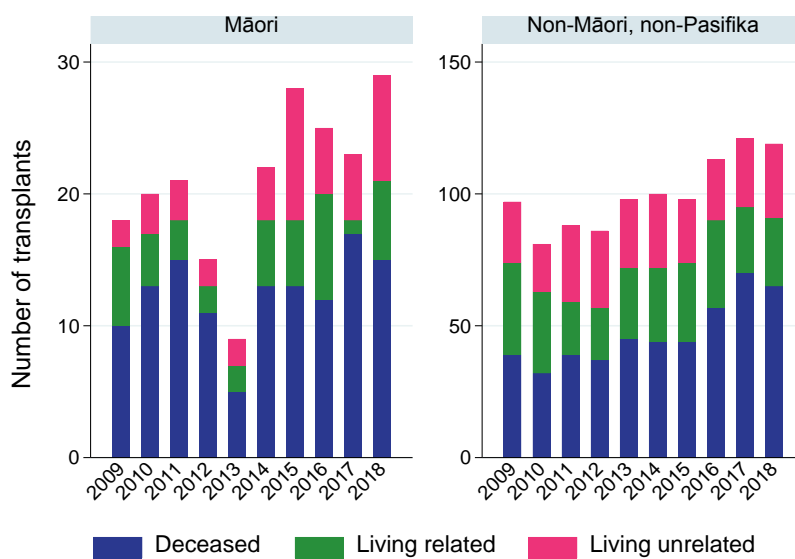
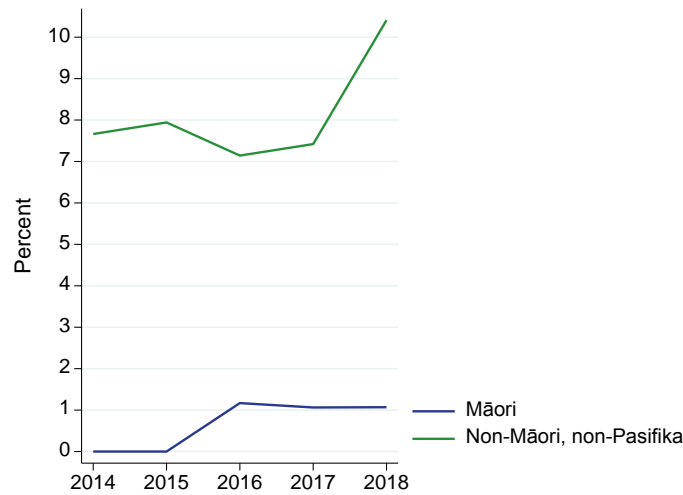


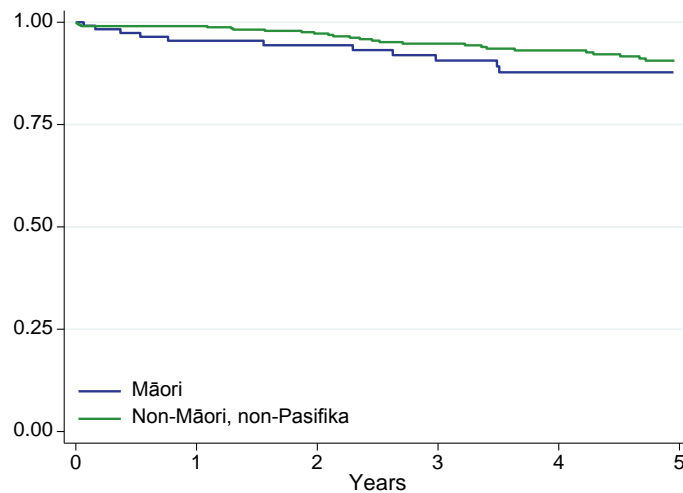
Figure 11.16 - Percentage of Patients Starting RRT with Pre-emptive Kidney Transplant - New Zealand



## Transplant Survival

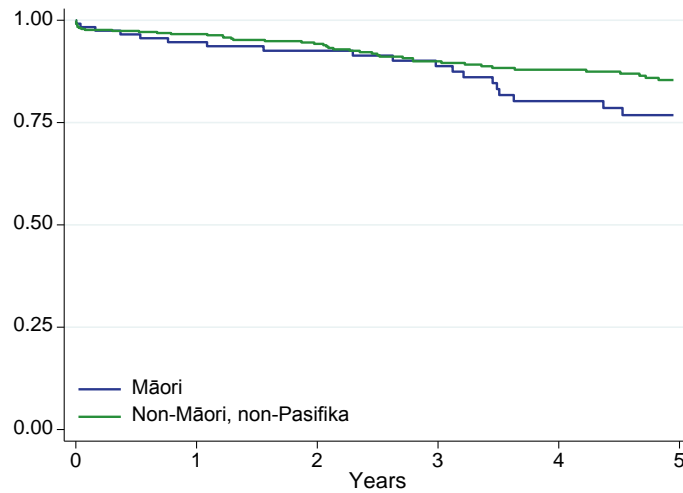
There is a small difference in survival after kidney transplantation from a deceased donor between Māori and non-Māori, non-Pasifika recipients, which is apparent from 6 months after transplantation. At 5 years after kidney transplantation from a deceased donor, 88% of Māori recipients and 91% of non-Māori, non-Pasifika recipients were alive (figure 11.17).

Figure 11.17 - Primary DD Graft Patient Survival 2009-2018 - New Zealand



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. Over the first three years, there was no difference in the proportions of Māori and non-Māori, non-Pasifika recipients who experienced graft loss. Transplant kidney function at 5 years post-transplant was recorded in 77% of Māori recipients compared with 85% of non-Māori, non-Pasifika persons (figure 11.18).

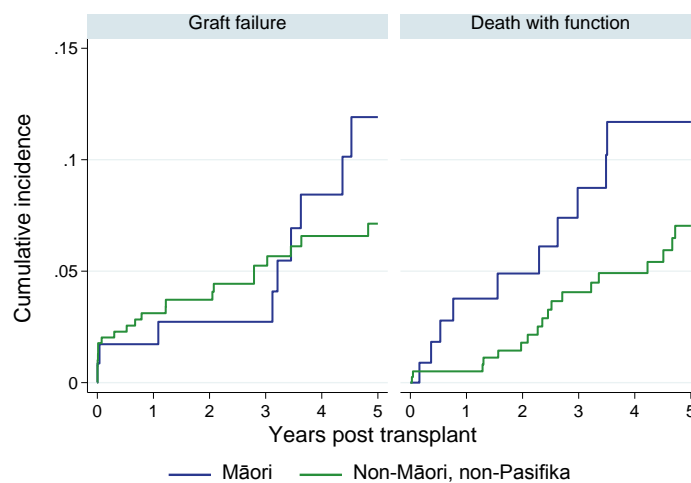
**Figure 11.18 - Primary DD Overall Graft Survival 2009-2018 - New Zealand**



Cumulative incidence curves (utilising competing risk techniques to account for the effects of both components of graft loss, ie graft failure and death with a functioning graft) are shown for Māori transplant outcomes in figure 11.19.

For Māori patients, mortality is increased immediately after transplantation, while rates of graft failure, at least in the first 3 years, appears to be comparable with non-Māori, non-Pasifika patients.

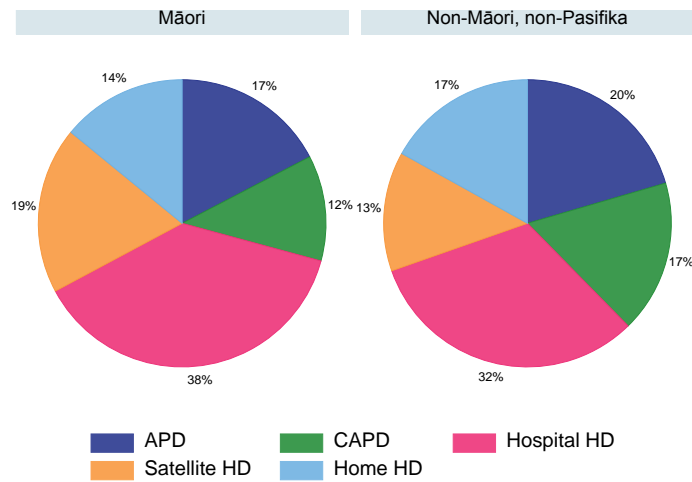
**Figure 11.19 - Transplant Outcomes, New Zealand - Primary Deceased Donor Kidney-only Transplants 2009-2018**



## Dialysis

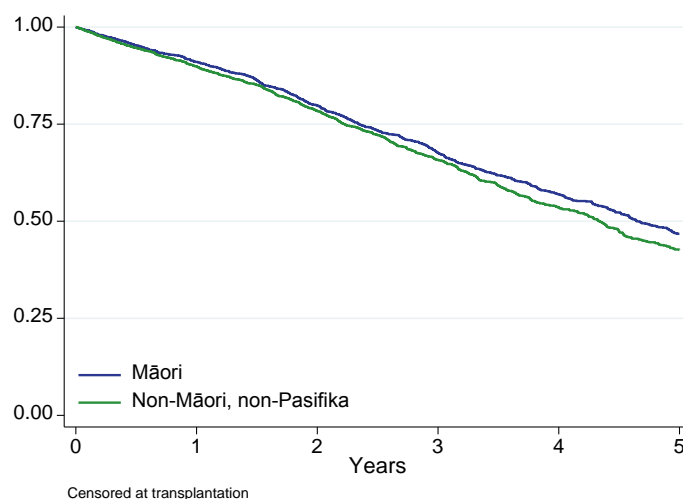
The distribution of dialysis modality is shown graphically in figure 11.20. Māori patients had a higher use of facility dialysis as the principal modality of care, and lower use of each of the home-based modalities. For non-Māori, non-Pasifika patients, over half underwent home-based care. The proportion of Māori patients receiving home-based dialysis was approximately 10% lower.

**Figure 11.20 - Dialysis Modality End 2018 - New Zealand, by Ethnicity**



Half of the people who started dialysis over 2009-2018 were alive 5 years later (figure 11.21). Non-Māori-non-Pasifika 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.

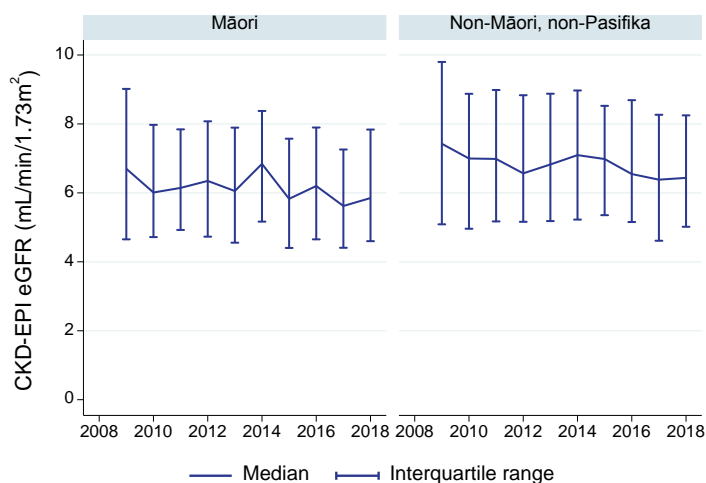
**Figure 11.21 - Incident Dialysis Patient Survival 2009-2018 - New Zealand**



## Timing of Renal Replacement Therapy Initiation

In Aotearoa New Zealand, the level of kidney function at which dialysis was commenced ranged between eGFR 5-7 mL/min/1.73m<sup>2</sup> for Māori patients and 6-8 mL/min/1.73m<sup>2</sup> for non-Māori, non-Pasifika patients.

Figure 11.22 - eGFR at RRT start - New Zealand



## Late Referral

The proportion of patients who experienced late referral to specialist nephrology services in Aotearoa/New Zealand over 2014-2018 is shown in table 11.5. Late referral is becoming more common in Māori and less common in non-Māori, non-Pasifika patients.

Table 11.5 Percentage of Late Referral by Ethnicity New Zealand 2014-2018

Year	Māori	Non-Māori, non-Pasifika
2014	8%	14%
2015	16%	13%
2016	13%	13%
2017	13%	11%
2018	15%	11%

## Vascular Access

### Incident Vascular Access

Incident vascular access data are presented in table 11.6, and prevalent data in table 11.7.

The proportion of Māori patients commencing RRT with haemodialysis using a catheter rather than permanent access was similar to that in non-Māori, non-Pasifika patients in 2018 (table 11.6).

**Table 11.6 Incident Vascular Access New Zealand 2014-2018**

Year	Vascular access	Māori	Non-Māori, non-Pasifika
2014	AVF	41 (37%)	38 (28%)
	AVG	2 (2%)	2 (1%)
	CVC	65 (59%)	94 (70%)
	Not reported	2 (2%)	0 (0%)
2015	AVF	34 (28%)	34 (27%)
	AVG	3 (2%)	2 (2%)
	CVC	81 (67%)	88 (69%)
	Not reported	3 (2%)	3 (2%)
2016	AVF	31 (29%)	34 (24%)
	AVG	0 (0%)	1 (1%)
	CVC	75 (69%)	106 (74%)
	Not reported	2 (2%)	3 (2%)
2017	AVF	30 (25%)	32 (22%)
	AVG	3 (2%)	2 (1%)
	CVC	88 (72%)	113 (77%)
	Not reported	1 (1%)	0 (0%)
2018	AVF	22 (21%)	30 (23%)
	AVG	0 (0%)	2 (2%)
	CVC	84 (79%)	100 (76%)
	Not reported	0 (0%)	0 (0%)

## Prevalent Vascular Access

In contrast to incident vascular access, the rate of catheter use for prevalent dialysis patients is lower for Māori patients in 2018 than non-Māori, non-Pasifika patients (table 11.7).

**Table 11.7 Prevalent Vascular Access New Zealand 2014-2018**

Year	Vascular access	Māori	Non-Māori, non-Pasifika
2014	AVF	457 (75%)	459 (67%)
	AVG	29 (5%)	36 (5%)
	CVC	117 (19%)	169 (25%)
	Not reported	8 (1%)	20 (3%)
2015	AVF	428 (67%)	453 (65%)
	AVG	35 (5%)	27 (4%)
	CVC	140 (22%)	183 (26%)
	Not reported	34 (5%)	35 (5%)
2016	AVF	452 (68%)	446 (64%)
	AVG	27 (4%)	27 (4%)
	CVC	167 (25%)	204 (29%)
	Not reported	16 (2%)	22 (3%)
2017	AVF	448 (68%)	423 (62%)
	AVG	26 (4%)	20 (3%)
	CVC	175 (27%)	222 (33%)
	Not reported	9 (1%)	15 (2%)
2018	AVF	438 (67%)	419 (60%)
	AVG	21 (3%)	17 (2%)
	CVC	176 (27%)	248 (35%)
	Not reported	14 (2%)	16 (2%)

## Patient Flow

Table 11.8 shows the overall patient flow in New Zealand by ethnicity. Notably, mortality for Māori patients is 3 to 4-fold higher per million of population.

**Table 11.8 Patient Flow (pmp) New Zealand 2014-2018**

Year	Event	Māori	Non-Māori, non-Pasifika
2014	New patients	161 (229)	261 (76)
	New transplants	22 (31)	100 (29)
	Pre-emptive transplants	0 (0)	20 (6)
	Prevalent dialysis	880 (1254)	1118 (324)
	Prevalent transplants	160 (228)	1361 (394)
	Total prevalence	1040 (1482)	2479 (717)
	Deaths	126 (180)	220 (64)
2015	New patients	173 (243)	277 (79)
	New transplants	28 (39)	99 (28)
	Pre-emptive transplants	0 (0)	22 (6)
	Prevalent dialysis	867 (1217)	1136 (323)
	Prevalent transplants	174 (244)	1408 (400)
	Total prevalence	1041 (1462)	2544 (722)
	Deaths	176 (247)	203 (58)
2016	New patients	171 (236)	280 (78)
	New transplants	25 (35)	113 (31)
	Pre-emptive transplants	2 (3)	20 (6)
	Prevalent dialysis	894 (1236)	1148 (319)
	Prevalent transplants	193 (267)	1450 (403)
	Total prevalence	1087 (1503)	2598 (722)
	Deaths	132 (182)	221 (61)
2017	New patients	188 (256)	283 (77)
	New transplants	23 (31)	121 (33)
	Pre-emptive transplants	2 (3)	21 (6)
	Prevalent dialysis	912 (1242)	1120 (304)
	Prevalent transplants	207 (282)	1505 (409)
	Total prevalence	1119 (1524)	2625 (713)
	Deaths	156 (212)	250 (68)
2018	New patients	187 (251)	269 (72)
	New transplants	29 (39)	119 (32)
	Pre-emptive transplants	2 (3)	28 (7)
	Prevalent dialysis	917 (1231)	1123 (299)
	Prevalent transplants	225 (302)	1541 (411)
	Total prevalence	1142 (1533)	2664 (710)
	Deaths	168 (226)	219 (58)

## Cause of Death

The causes of death in 2018 are shown in figure 11.23 and table 11.9, categorised by ethnicity and modality at time of death.

For Māori, the most common cause of death amongst those who died while receiving dialysis was cardiovascular disease.

Among non-Māori, non-Pasifika dialysis patients, withdrawal from dialysis was the most common cause of death.

Figure 11.23 - Cause of Death by Modality and Ethnicity, New Zealand - Deaths Occurring During 2018

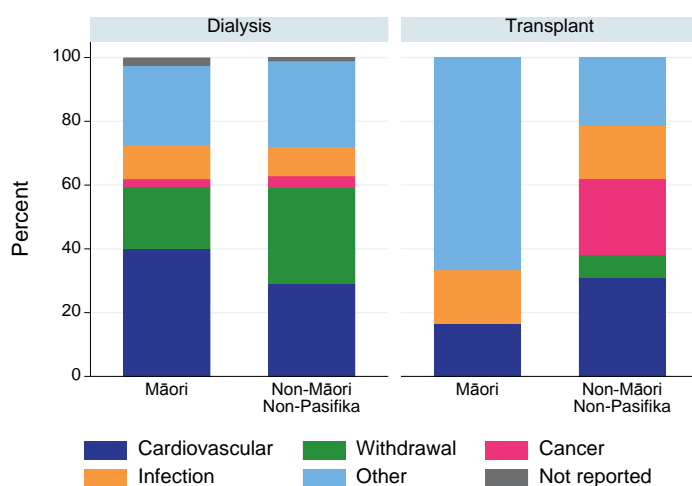


Table 11.9 Cause of Death by Modality and Ethnicity, New Zealand 2018

Modality	Cause of death	Māori	Non-Māori, non-Pasifika
Dialysis	Cardiovascular	64 (40%)	50 (29%)
	Withdrawal	31 (19%)	52 (30%)
	Cancer	4 (3%)	6 (3%)
	Infection	17 (11%)	16 (9%)
	Other	40 (25%)	46 (27%)
	Not reported	4 (3%)	2 (1%)
	<b>Total</b>		<b>160</b>
Transplant	Cardiovascular	1 (17%)	13 (31%)
	Withdrawal	0 (0%)	3 (7%)
	Cancer	0 (0%)	10 (24%)
	Infection	1 (17%)	7 (17%)
	Other	4 (67%)	9 (21%)
	Not reported	0 (0%)	0 (0%)
	<b>Total</b>		<b>6</b>