CHAPTER 9

Kidney Failure in Aotearoa New Zealand

ANZDATA gratefully acknowledges the patients and their whānau/families and the clinicians who provided data, and the contributions of the Aotearoa New Zealand Working Group and the National Renal Transplant Service.

Contents

Executive Summary

This chapter presents information about the rates of kidney failure in Aotearoa New Zealand, including information stratified by age and ethnicity. Clinical care patterns for treatment of kidney failure including dialysis and transplantation are described. Population statistics are drawn from estimates provided by Statistics New Zealand to calculate disease and treatment rates[1]. Ethnicity population data are projections produced by Statistics New Zealand according to assumptions agreed to by the New Zealand Ministry of Health; these include data from the 2018 census and incorporate additional information gained from the post-enumeration survey.

There are marked and persistent inequities in the incidence and prevalence of kidney failure and treatment practices in kidney replacement therapy based on ethnicity in Aotearoa New Zealand, particularly for Māori and Pasifika people.

Health services and health funders are required to fulfill Te Tiriti o Waitangi obligations to provide health and wellbeing to whānau Māori, including kidney health. This report includes monitoring of the current state of health provision to whānau Māori to monitor equity. These data are intended to inform quality improvement within health systems and by health providers.

Key findings of this report include:

- The rate of patients starting treatment for kidney failure in Aotearoa New Zealand is tracking slightly ahead of population growth: 123 per million population (pmp) in 2015, 131 pmp in 2019.
- The highest incidence of kidney replacement therapy is among patients aged 55-64 years, who have a slightly higher incidence than those aged 65-74 years.
- Māori (256 pmp) and Pasifika (486 pmp) patients have a 3-6-fold higher rate of starting kidney replacement therapy than European/Other (72 pmp) patients, and this difference is particularly marked in those aged <65 years.
- Diabetes is the cause of kidney failure in 67% of Māori and Pasifika patients starting kidney replacement therapy, compared to 27% of non-Māori and non-Pasifika patients, over the period 2015-2019.
- Transplant rates have grown steadily in the years 2015 to 2019, and Aotearoa New Zealand has now achieved a transplant rate (45 pmp) equivalent to the rate in Australia (44 pmp).
- There appear to be significant and persistent inequities by ethnicity in access to transplantation, with a smaller proportion of Māori and Pasifika patients having transplant as their treatment for kidney failure across all age groups, although all ethnicities have seen increases in transplant rates.
- A higher proportion of Aotearoa New Zealand dialysis patients (44%) are treated with home-based therapies (home haemodialysis or peritoneal dialysis) compared to Australian dialysis patients (25%). The majority of patients treated at home are on peritoneal dialysis (68%).
- Mortality rates for Māori and Pasifika patients on kidney replacement therapy are 3-5-fold higher than non-Māori and non-Pasifika patients, reflecting the high incidence of kidney failure and lower transplant rates in these populations.
- There is no evidence for any differences by ethnicity in the rates of late referral to specialist nephrology care.

Suggested Citation

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Kidney Replacement Therapy in Aotearoa New Zealand

Incidence of Kidney Replacement Therapy (KRT)

In 2019, 656 adults and children started kidney replacement therapy (KRT) in Aotearoa New Zealand, equivalent to 133 per million of population (pmp) (figure 9.1 and table 9.1). The proportion of the Aotearoa New Zealand population commencing KRT is similar to that of Australia (133 versus 127 pmp in 2019).

Figure 9.1 - Incidence of Kidney Replacement Therapy - Aotearoa New Zealand 1990-2019

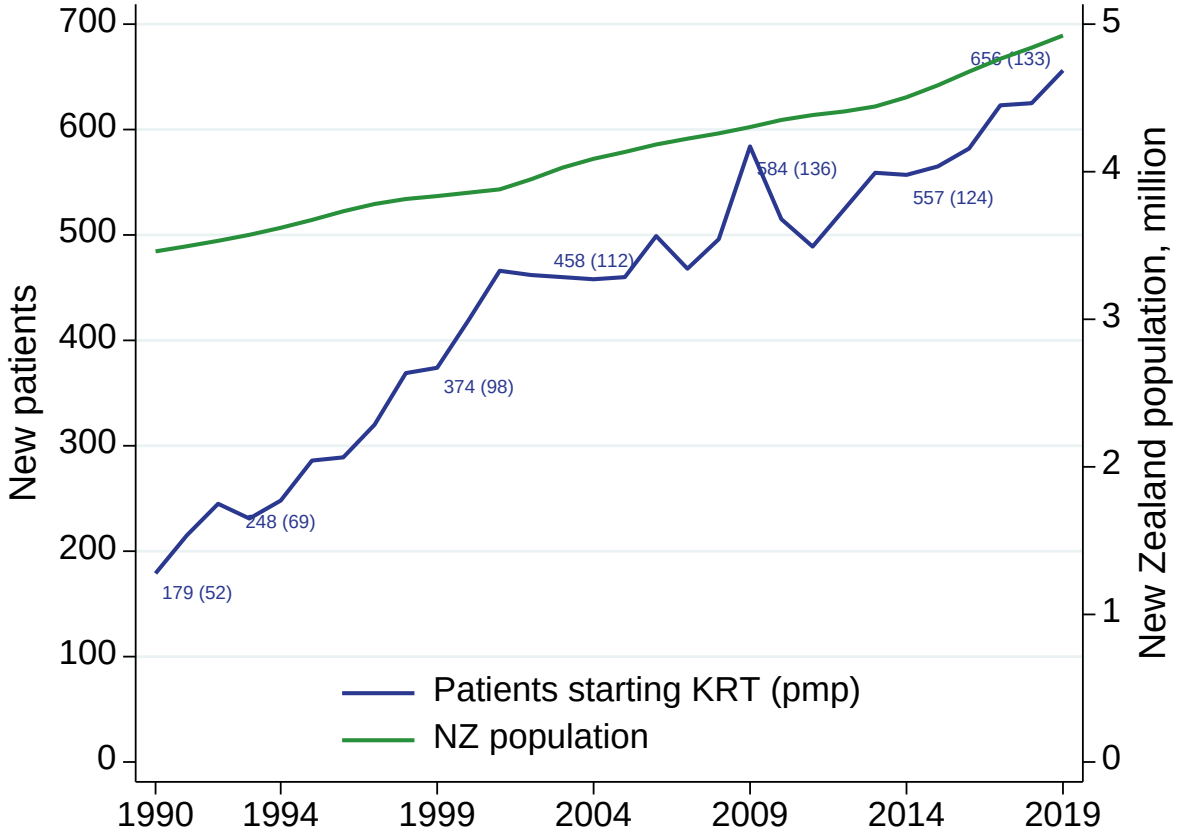
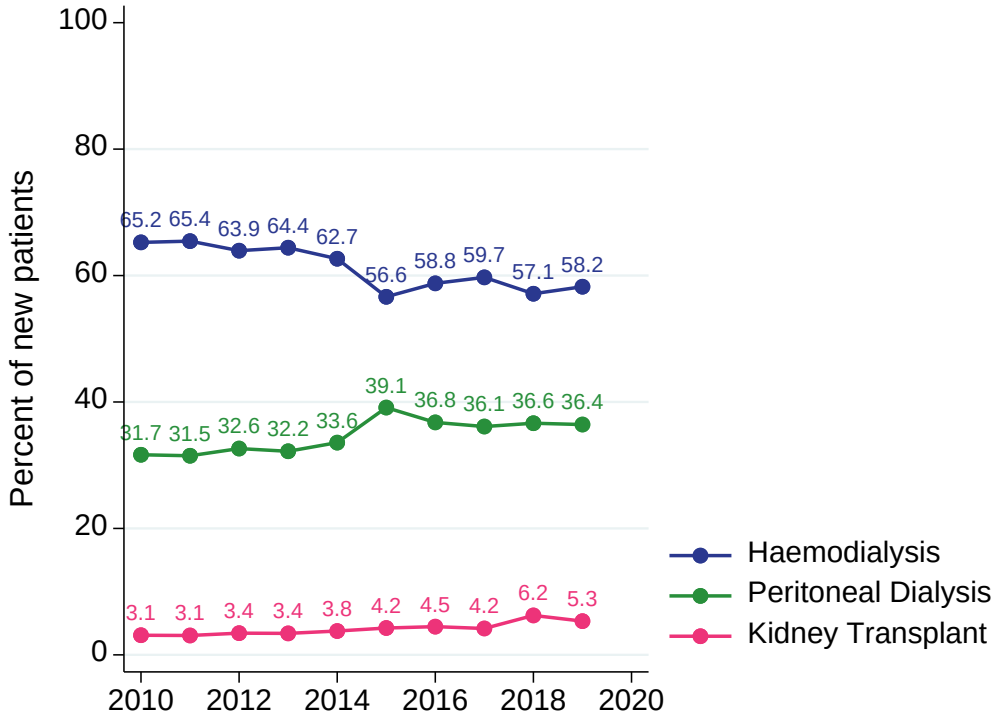


Table 9.1 Number (pmp) who Commenced Kidney Replacement Therapy in Aotearoa New Zealand, 2015-2019

	2015	2016	2017	2018	2019
Total	**565 (123)**	**582 (124)**	**623 (131)**	**625 (129)**	**656 (133)**
Pre-Emptive Transplant	24 (5)	26 (6)	26 (5)	39 (8)	35 (7)
Haemodialysis	320 (70)	342 (73)	372 (78)	357 (74)	382 (78)
Peritoneal Dialysis	221 (48)	214 (46)	225 (47)	229 (47)	239 (49)

The proportion of patients who started KRT with a pre-emptive kidney transplant in Aotearoa New Zealand increased in 2019 to 5% of all incident patients (figure 9.2). The proportion of patients starting KRT with haemodialysis has been decreasing in recent years, whereas the proportion of patients starting KRT with peritoneal dialysis has been relatively stable.

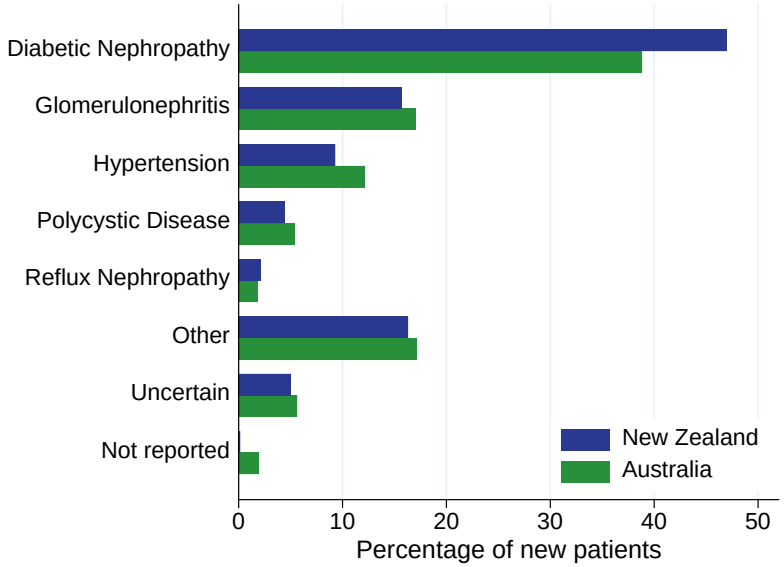
Figure 9.2 - Trends in Modality at Start of Kidney Replacement Therapy - Aotearoa New Zealand 2010-2019



Primary Cause of Kidney Disease

The leading cause of kidney failure in Aotearoa New Zealand in 2019 was diabetes (47%), followed by glomerulonephritis (16%) (figure 9.3). There is marked variation by ethnicity, with diabetic nephropathy the cause of kidney failure in 2019 in 18%, 62%, 65% and 52% of European/Other, Māori, Pasifika and Asian individuals respectively (further information of differences by patient ethnicity is provided in the next section).

Figure 9.3 - Primary Cause of Kidney Disease of New Patients Commencing Kidney Replacement Therapy, 2019

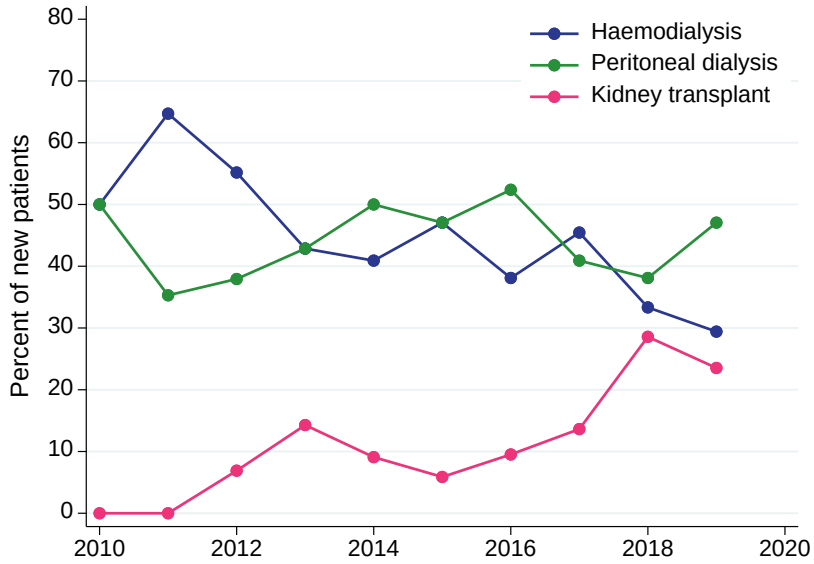


Children and Young Adults

In 2019, 17 patients in the 0-24 age group commenced renal replacement therapy (11 pmp) in Aotearoa New Zealand. The incidence rate of KRT among young patients has ranged between 11 and 14 pmp from 2015-2019. The incidence rate of KRT is variable due to the low numbers of patients commencing KRT in this age group.

Of the 17 younger patients commencing KRT in Aotearoa New Zealand in 2019, 4 (24%) patients received a pre-emptive transplant, 8 (47%) patients commenced with peritoneal dialysis, and 5 (29%) patients commenced with haemodialysis (figure 9.4).

Figure 9.4 - Children and Young Adults (0-24 years) Commencing KRT - Aotearoa New Zealand 2010-2019



Age

Kidney replacement therapy incidence rates vary widely by age group and modality (figures 9.5 and 9.6).

In 2019, the highest incidence of kidney replacement therapy in Aotearoa New Zealand is among people in the 55-64 age group (314 pmp). Children, young adults, and adults 85 years and older have the lowest rates of kidney replacement therapy

Figure 9.5 - Incidence of Kidney Replacement Therapy by Age Group - Aotearoa New Zealand, 2010-2019

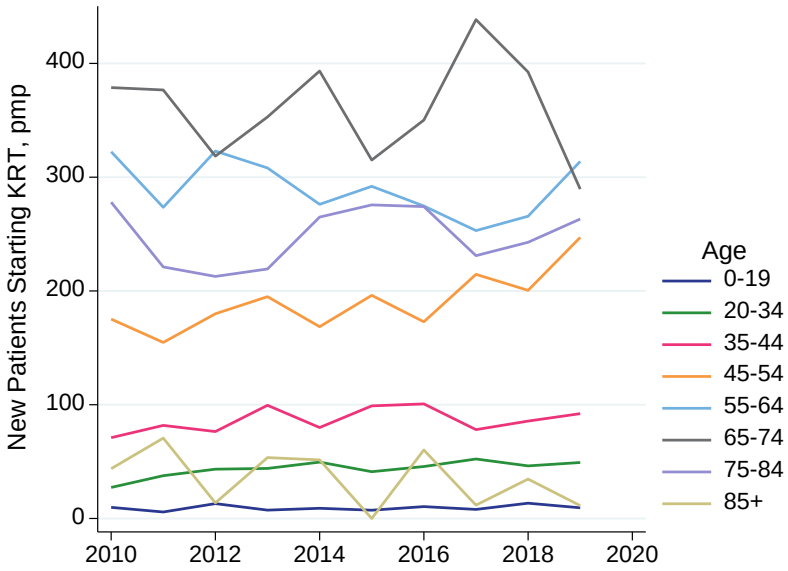
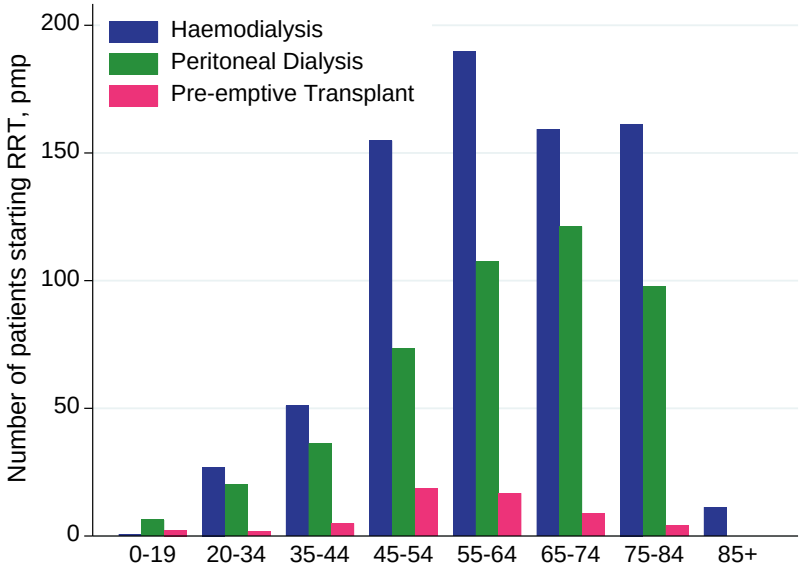


Figure 9.6 - Incidence of KRT by Age Group and Modality - Per Million Population, Aotearoa New Zealand 2019



Prevalence of Kidney Replacement Therapy

There were 4966 people (1009 pmp) receiving kidney replacement therapy in the form of dialysis or a kidney transplant in Aotearoa New Zealand at the end of 2019 (figures 9.7-9.8 and table 9.2). Overall Aotearoa New Zealand continues to have a higher prevalence (583 pmp) of dialysis patients as compared with Australia (549 pmp), and a lower prevalence of people treated with a kidney transplant (426 pmp versus 505 pmp), however the difference between these two treatment types has been reducing over the last five years.

Figure 9.7 - Prevalence of Dialysis and Transplantation - Aotearoa New Zealand 1990-2019

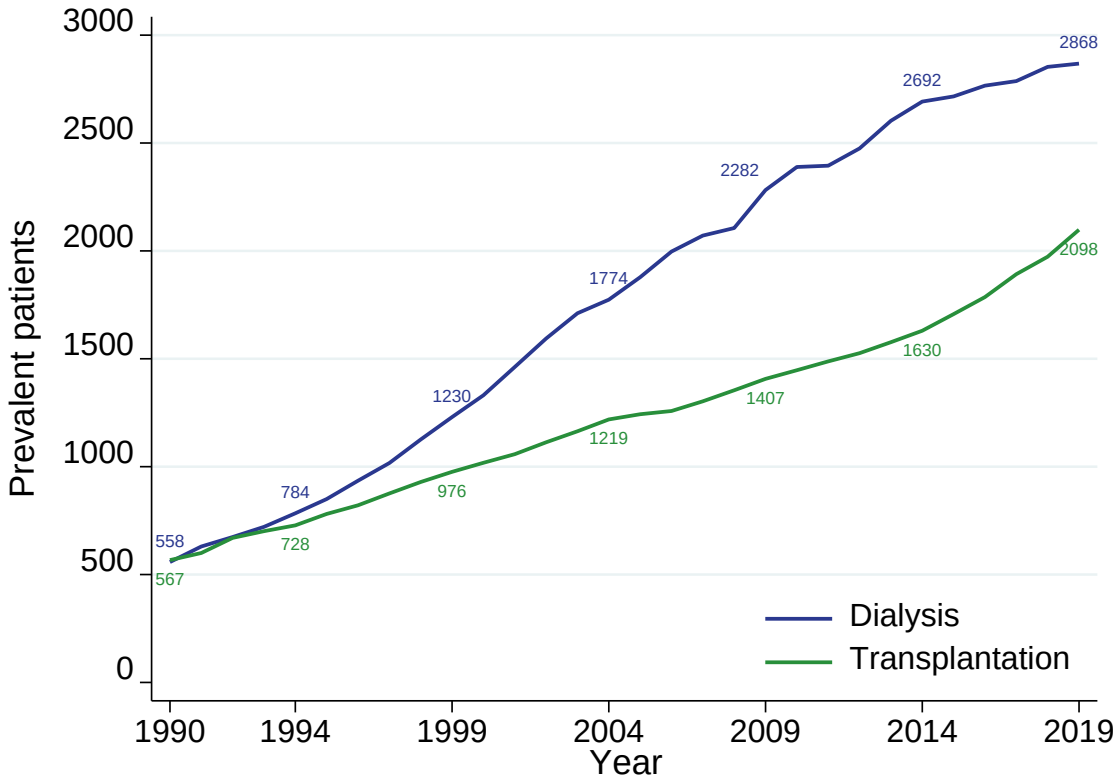
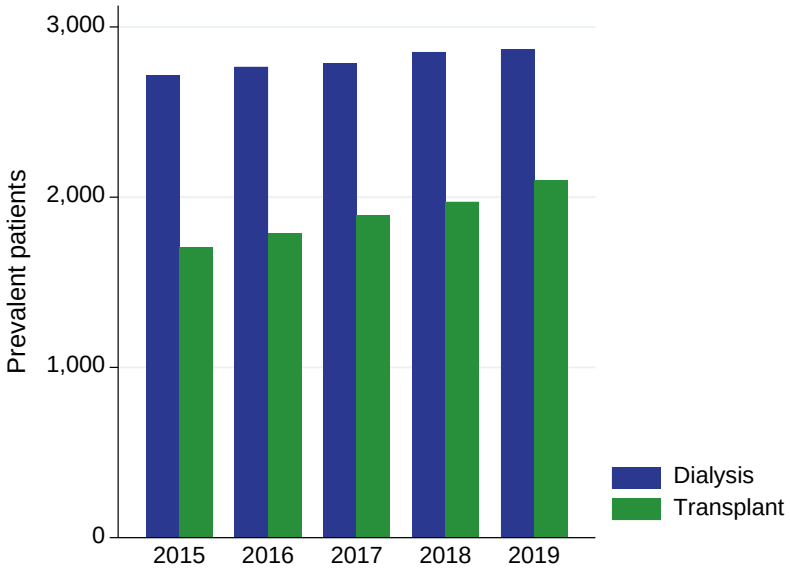


Table 9.2 Prevalence of Kidney Replacement Therapy (pmp) in Aotearoa New Zealand 2015-2019

	2015	2016	2017	2018	2019
Total	**4423 (965)**	**4552 (973)**	**4679 (982)**	**4826 (997)**	**4966 (1009)**
Transplant	1707 (372)	1786 (382)	1892 (397)	1973 (408)	2098 (426)
Dialysis	2716 (592)	2766 (591)	2787 (585)	2853 (589)	2868 (583)

Figure 9.8 - Prevalence of Kidney Replacement Therapy - Aotearoa New Zealand 2015-2019



Dialysis

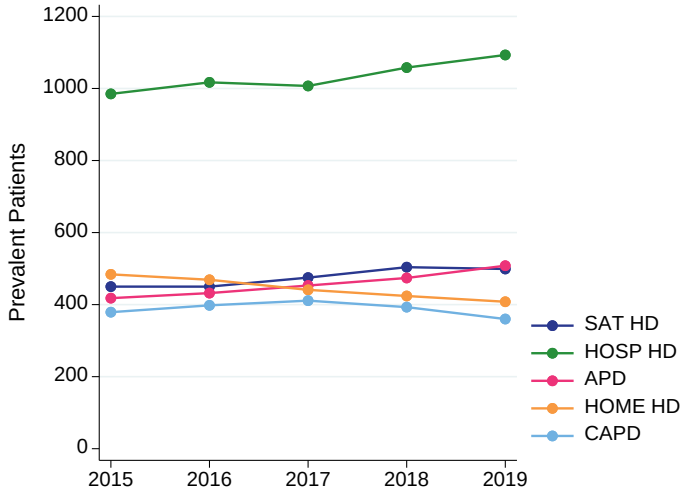
In 2019, 44% of the 2868 Aotearoa New Zealand dialysis patients were treated with home-based dialysis (peritoneal dialysis or home haemodialysis), as compared with 25% in Australia.

18% of the dialysis population were treated with automated peritoneal dialysis, 13% with continuous ambulatory peritoneal dialysis, and 14% with home haemodialysis.

Figure 9.9 shows trends in the method and location of dialysis in Aotearoa New Zealand over 2015-2019.

The Registry has recognized that current definitions for dialysis location do not accurately reflect the care delivery for all patients in Aotearoa New Zealand and has introduced new data definitions to capture patients receiving community-based therapy that will be included in future reports.

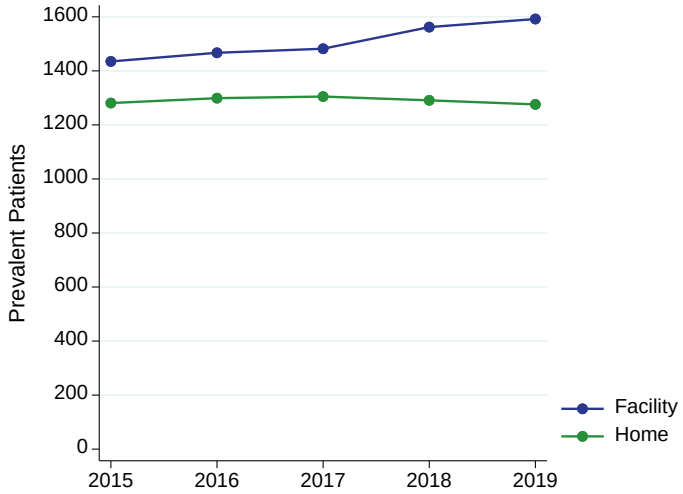
Figure 9.9 - Method and Location of Dialysis - Aotearoa New Zealand, 2015-2019



Overall, 56% of patients on dialysis were treated with haemodialysis in a satellite unit (17%) or in a hospital unit (38%).

Figure 9.10 shows trends in home and facility-based dialysis in Aotearoa New Zealand over 2015-2019.

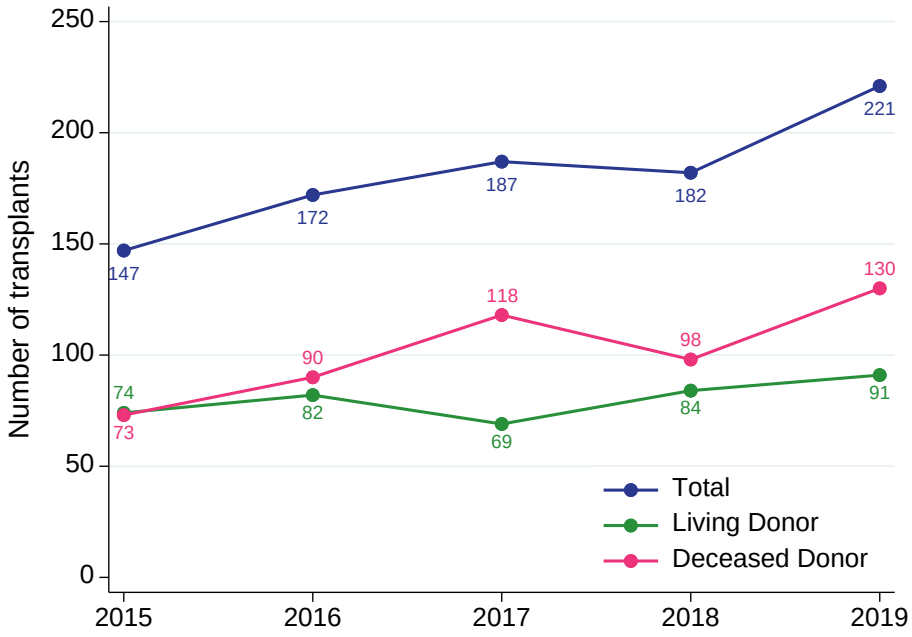
Figure 9.10 - Home and Facility Based Dialysis - Aotearoa New Zealand, 2015-2019



Transplantation

There has been a steady increase in the numbers of kidney transplants in Aotearoa New Zealand over the last five years. In 2019, 221 patients (45 pmp) were treated with a kidney transplant (figure 9.11)), the highest number ever performed. The increase in transplantation is due to strong growth in deceased donor kidney transplants, as well as a lesser increase in living donor transplants. The New Zealand transplant rate (45 pmp) in 2019 is now equivalent to the rate in Australia (44 pmp).

Figure 9.11 - New Kidney Transplants in Aotearoa New Zealand 2015-2019

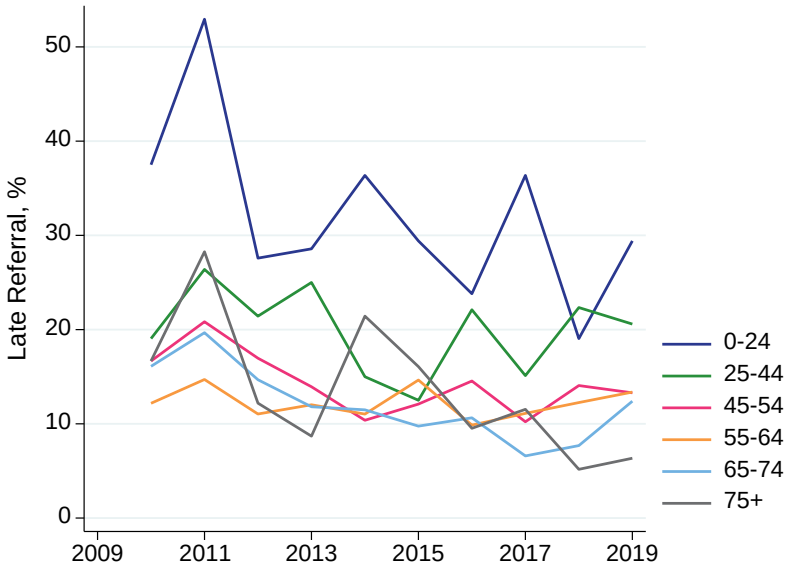


Late Referral to Nephrology Services

The rate of late referrals (defined as the first assessment by a specialist nephrologist within 3 months of commencing dialysis) has decreased in Aotearoa New Zealand over time. Late referrals represented 14% of all patients who commenced kidney replacement therapy in 2019. Late referrals reduce opportunities for patients to prepare for their preferred modality of dialysis or to have pre-emptive transplantation.

Younger Aotearoa New Zealand patients experience the highest rate of late referral. The highest rate of late referral has occurred among the 0-24 age group in the last decade (figure 9.12).

Figure 9.12 - Late Referral Rates by Age Group - Aotearoa New Zealand 2010 – 2019



Ethnicity and Kidney Replacement Therapy in Aotearoa New Zealand

The collection of ethnicity data in ANZDATA has evolved to align with Australian Bureau of Statistics Australian Standard Classification of Cultural and Ethnic Groups[2] and data collection now enables for a patient to have up to two ethnicities recorded. Consultation regarding collection and reporting of ethnicity data is ongoing and reporting guidelines have not been finalised at the time of publication. Ethnicity data throughout this report includes only the first ethnicity category entered for each patient.

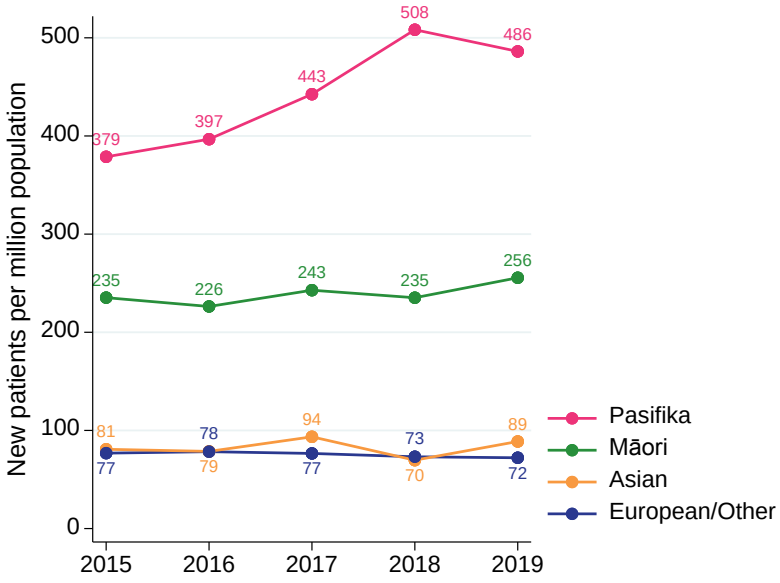
Future reporting will report more accurately on patients identifying as more than one ethnicity, following reporting best practice for residents of each country. Protocols for ensuring ethnicity is self-identified are not yet established. ANZDATA recognises that this approach does not yet align with the Ethnicity Data Protocols for the Health and Disability Sector[3] issued by the New Zealand Ministry of Health.

New Patients

There are marked and persistent inequities in the incidence and prevalence of kidney failure and the kidney replacement therapies provided based on ethnicity in Aotearoa New Zealand.

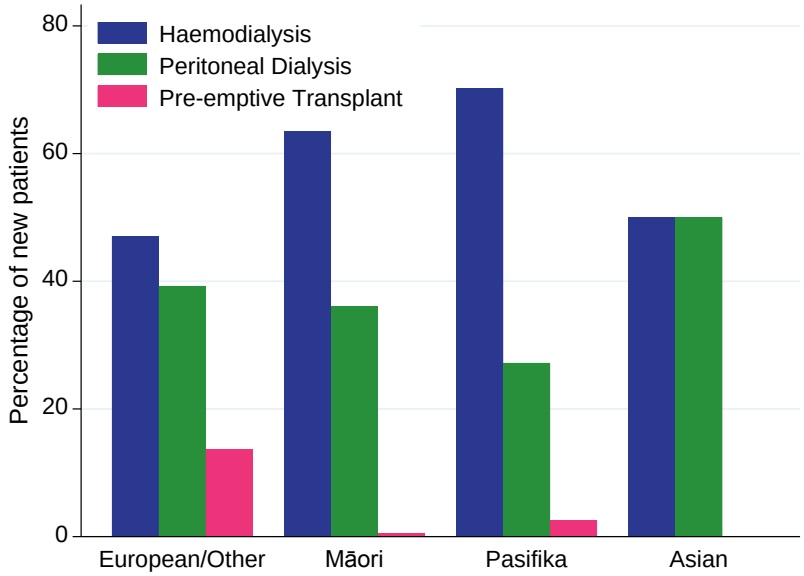
The incidence of kidney replacement therapy is markedly higher among Pasifika (486 pmp) and Māori (256 pmp) patients, compared with Asian (89 pmp) and European and other ethnicities (72 pmp) (figure 9.13).

Figure 9.13 - Incidence of KRT by Ethnicity - Aotearoa New Zealand 2015-2019



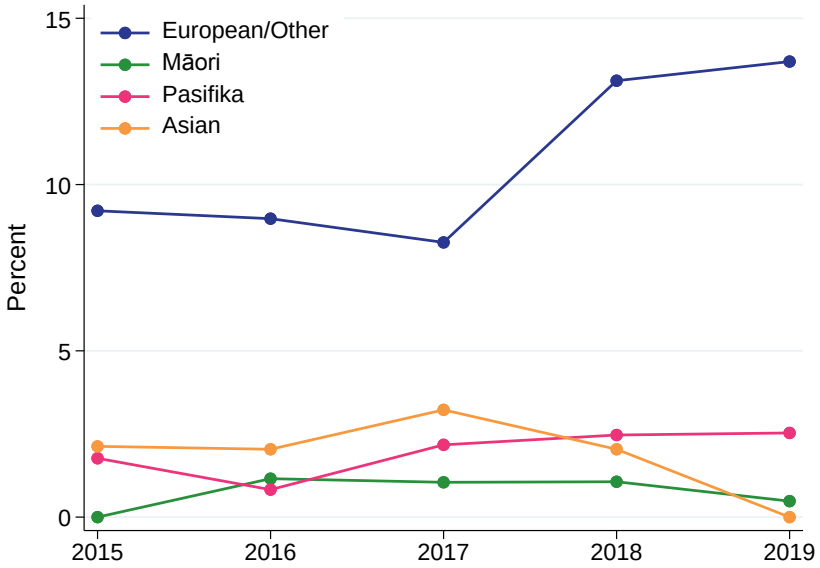
Among Māori, Pasifika and European/Other ethnicity patients commencing kidney replacement therapy in 2019, the highest proportion of patients started with haemodialysis as their initial therapy (63, 70 and 47 per 100 incident KRT patients, respectively), while among Asian patients, an equal proportion of patients started KRT on haemodialysis and peritoneal dialysis (50 per 100 incident KRT patients each) (figure 9.14). Overall, 14% of European/Other ethnicity patients had a pre-emptive kidney transplant, while <1% of incident Māori patients received pre-emptive kidney transplants, 3% of Pasifika patients, and there were no pre-emptive transplants among Asian patients.

Figure 9.14 - Incidence of KRT by Ethnicity and Modality - Aotearoa New Zealand 2019



The rate of pre-emptive kidney transplants has continued to be markedly lower among Māori, Pasifika, and Asian patients, compared to European/Other ethnicities (figure 9.15).

Figure 9.15 - Percentage of Patients Starting KRT with Pre-emptive Kidney Transplant in Aotearoa New Zealand 2015-2019

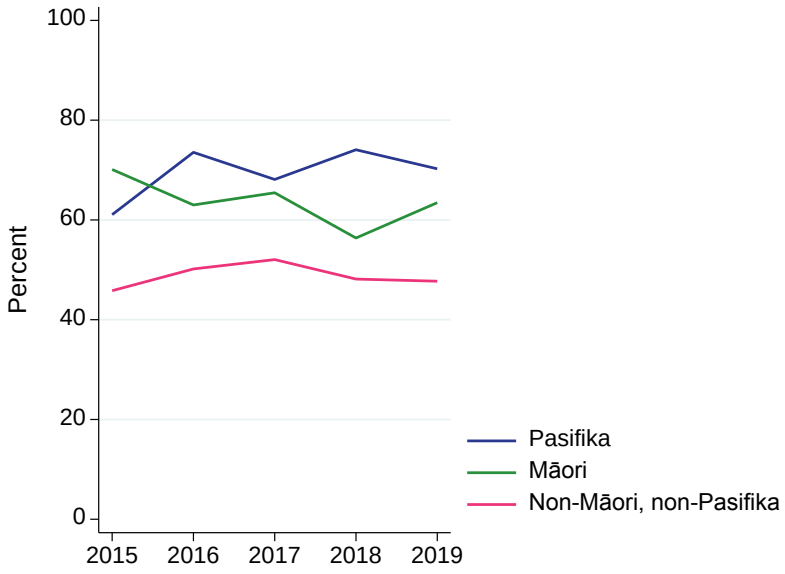


A total of 208 patients identifying as Māori commenced treatment for kidney failure in 2019, representing 32% of all patients starting kidney replacement therapy. This inequity in the incidence of kidney failure treated with kidney replacement therapy in Māori is persistent. The rate of haemodialysis commencement for non-Māori, non-Pasifika patients was 5-fold lower than for Māori. Māori were more likely to commence dialysis with haemodialysis than peritoneal dialysis compared with non-Māori patients (figure 9.16). Only one Māori patient was provided with a pre-emptive kidney transplant during 2019. In the last 5 years, 7 Māori patients have been provided with a pre-emptive kidney transplant compared with 125 non-Māori, non-Pasifika patients (an 18-fold difference).

Table 9.3 New Patients (pmp) Aotearoa New Zealand 2015-2019

Year	Modality	Non-Māori, non-Pasifika	Māori	Pasifika	Total
2015	HD	126 (36)	122 (171)	69 (191)	**317 (69)**
	PD	127 (36)	52 (73)	42 (116)	**221 (48)**
	Pre-emptive Transplant	22 (6)	0 (0)	2 (6)	**24 (5)**
2016	HD	142 (40)	109 (151)	89 (240)	**340 (73)**
	PD	119 (33)	62 (86)	31 (84)	**212 (45)**
	Pre-emptive Transplant	22 (6)	2 (3)	1 (3)	**25 (5)**
2017	HD	152 (42)	125 (170)	94 (247)	**371 (78)**
	PD	119 (33)	64 (87)	41 (108)	**224 (47)**
	Pre-emptive Transplant	21 (6)	2 (3)	3 (8)	**26 (5)**
2018	HD	130 (35)	106 (142)	120 (308)	**356 (74)**
	PD	110 (30)	80 (107)	38 (97)	**228 (47)**
	Pre-emptive Transplant	30 (8)	2 (3)	4 (10)	**36 (7)**
2019	HD	136 (36)	132 (169)	111 (278)	**379 (77)**
	PD	119 (32)	75 (96)	43 (108)	**237 (48)**
	Pre-emptive Transplant	30 (8)	1 (1)	4 (10)	**35 (7)**

Figure 9.16 - Percentage of New Patients Commencing on Haemodialysis - Aotearoa New Zealand



Primary Kidney Disease

The primary kidney diseases of incident patients in Aotearoa New Zealand during 2015-2019 are shown in table 9.4. Māori and Pasifika peoples have a substantially higher rate of diabetic nephropathy than non-Māori, non-Pasifika patients.

Table 9.4 Primary Kidney Disease of New Patients in Aotearoa New Zealand 2015-2019

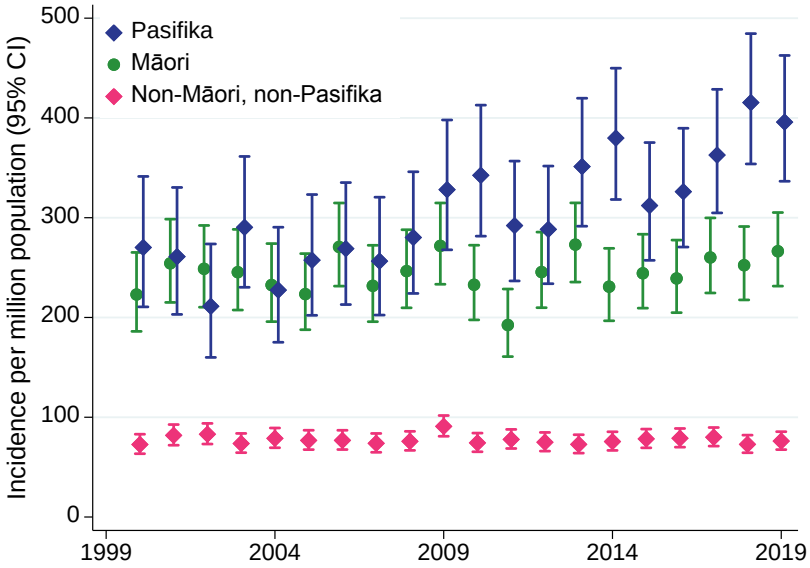
Primary Renal Disease	Non-Māori, non-Pasifika	Māori	Pasifika
Diabetic Nephropathy	386 (27%)	626 (67%)	466 (67%)
Glomerulonephritis	358 (25%)	133 (14%)	79 (11%)
Hypertension	174 (12%)	50 (5%)	36 (5%)
Polycystic Disease	124 (9%)	10 (1%)	10 (1%)
Reflux Nephropathy	41 (3%)	9 (1%)	7 (1%)
Other	254 (18%)	82 (9%)	65 (9%)
Uncertain	61 (4%)	22 (2%)	28 (4%)
Not reported	7 (<1%)	2 (<1%)	1 (<1%)
Total	**1405**	**934**	**692**

Incidence Rates

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

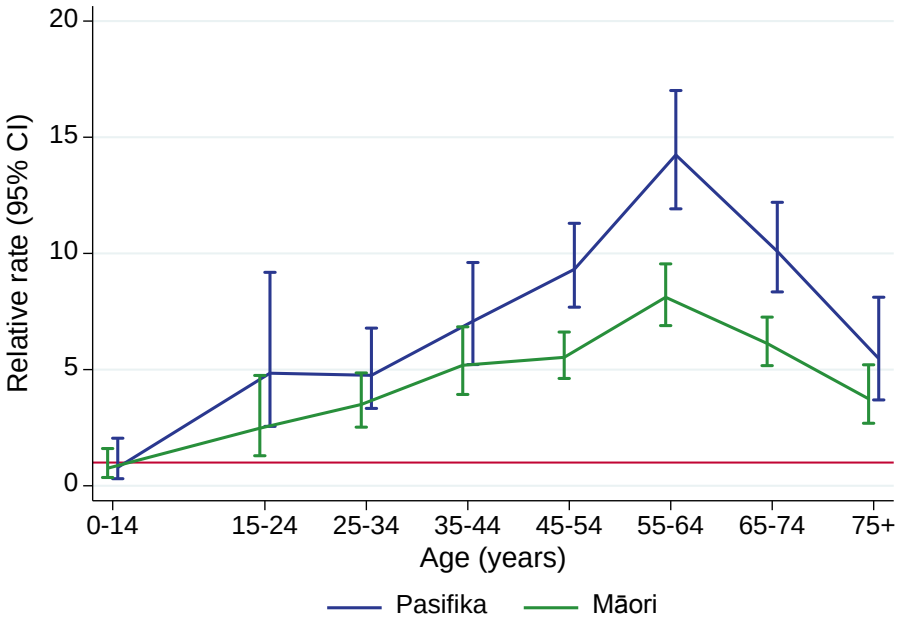
Although rates fluctuate from year to year, the incidence rates for Pasifika people have been increasing in recent years (figure 9.17). The relative rate differs with age - this is illustrated in figure 9.18.

Figure 9.17 - Unadjusted Incident KRT Rate - Aotearoa New Zealand



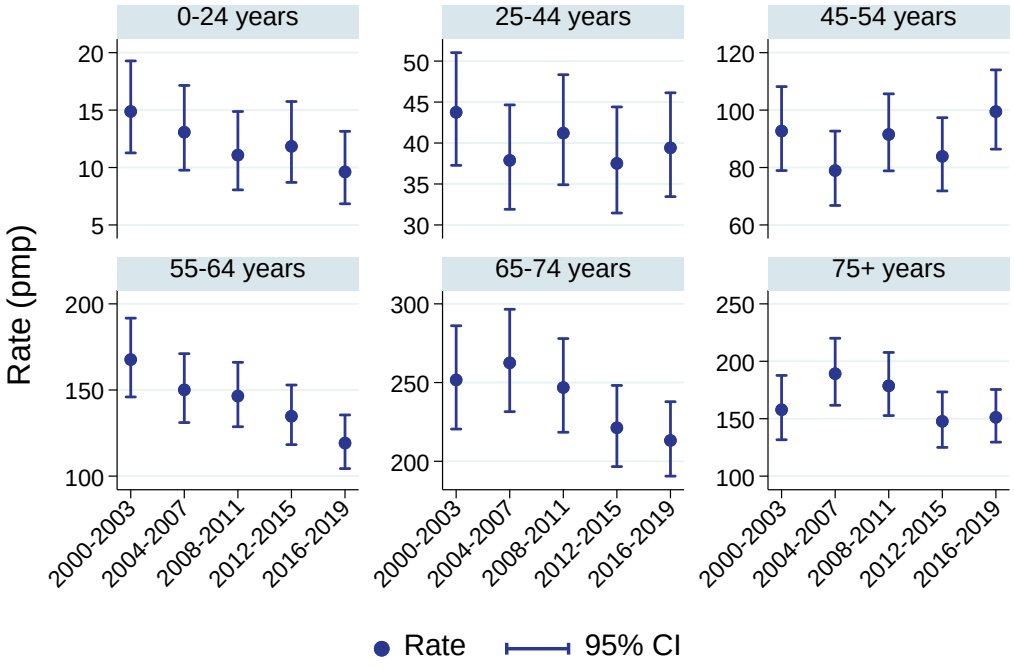
Among Māori and Pasifika peoples, inequities in the incidence of kidney failure occur as early as ages 15 to 24 years and are evident across all age groups (figure 9.18).

Figure 9.18 - Relative Incidence Rate of Treated Kidney Failure for Māori and Pasifika Patients, compared with non-Māori, non-Pasifika patients - Aotearoa New Zealand 2015-2019



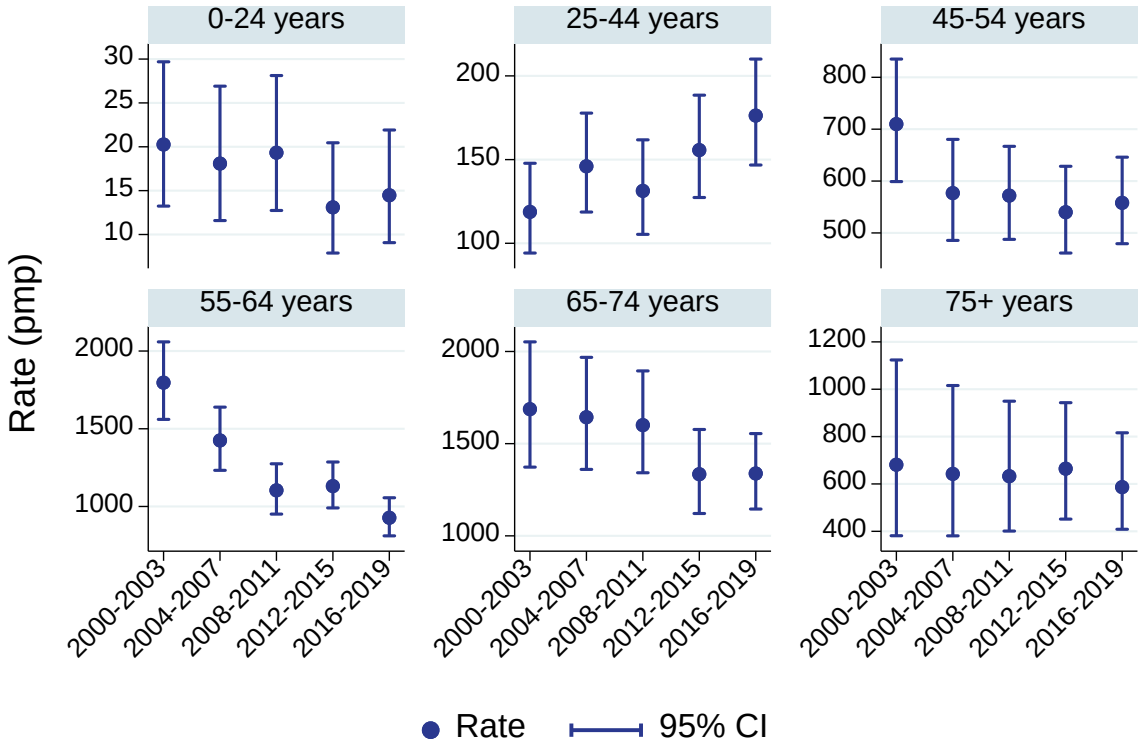
Age specific trends in kidney replacement therapy are shown in figures 9.19.1-9.19.3, by patient ethnicity; note that the Y axis scales vary.

Figure 9.19.1 - Age-specific Incidence Rates of Treated Kidney Failure - Non-Māori, non-Pasifika, Aotearoa New Zealand



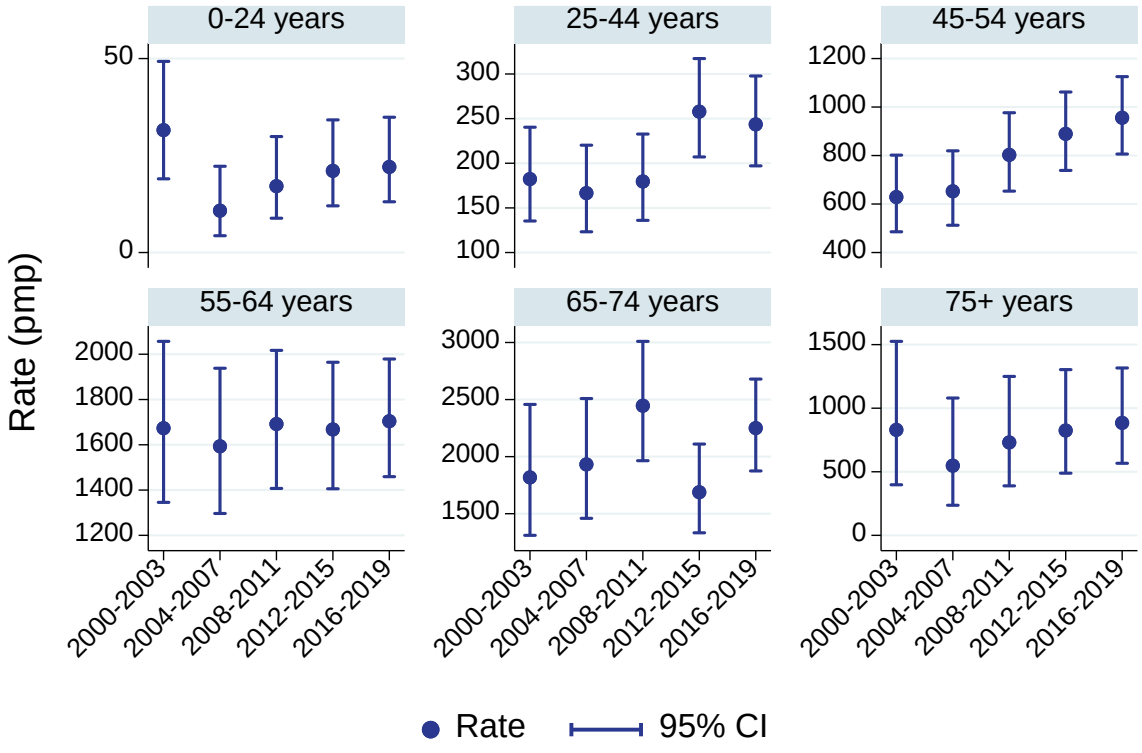
Note the Y axis scales vary between panels

Figure 9.19.2 - Age-specific Incidence Rates of Treated Kidney Failure - Māori, Aotearoa New Zealand



Note the Y axis scales vary between panels

Figure 9.19.3 - Age-specific Incidence Rates of Treated Kidney Failure - Pasifika, Aotearoa New Zealand



Note the Y axis scales vary between panels

Prevalent Patients

The number of prevalent Māori and Pasifika patients with treated kidney failure continues to rise year-on-year (table 9.5 and figure 9.20). From 2016 to 2018, there were notable increases in the numbers of Māori and Pasifika people treated with peritoneal dialysis or with a kidney transplant. The proportion of patients undergoing haemodialysis at home has been falling in each ethnic group (figure 9.21).

Table 9.5 Prevalent Patients by Ethnicity and Treatment Modality Aotearoa New Zealand 2015-2019

Year	Modality	Non-Māori, non-Pasifika	Māori	Pasifika
2015	HD	694 (27%)	638 (61%)	581 (70%)
	% HD at home	31%	22%	22%
	PD	438 (17%)	229 (22%)	129 (16%)
	Tx	1408 (55%)	175 (17%)	119 (14%)
2016	HD	694 (27%)	663 (61%)	573 (68%)
	% HD at home	30%	21%	21%
	PD	450 (17%)	232 (21%)	145 (17%)
	Tx	1454 (56%)	195 (18%)	130 (15%)
2017	HD	680 (26%)	662 (59%)	576 (64%)
	% HD at home	28%	21%	18%
	PD	443 (17%)	254 (23%)	164 (18%)
	Tx	1510 (57%)	208 (19%)	166 (18%)
2018	HD	695 (26%)	653 (57%)	631 (64%)
	% HD at home	27%	20%	16%
	PD	426 (16%)	266 (23%)	172 (17%)
	Tx	1552 (58%)	226 (20%)	185 (19%)
2019	HD	682 (25%)	664 (57%)	649 (62%)
	% HD at home	26%	20%	15%
	PD	414 (15%)	259 (22%)	191 (18%)
	Tx	1631 (60%)	247 (21%)	209 (20%)

Figure 9.20.1 - Prevalent Patients by Modality - Aotearoa New Zealand – Māori

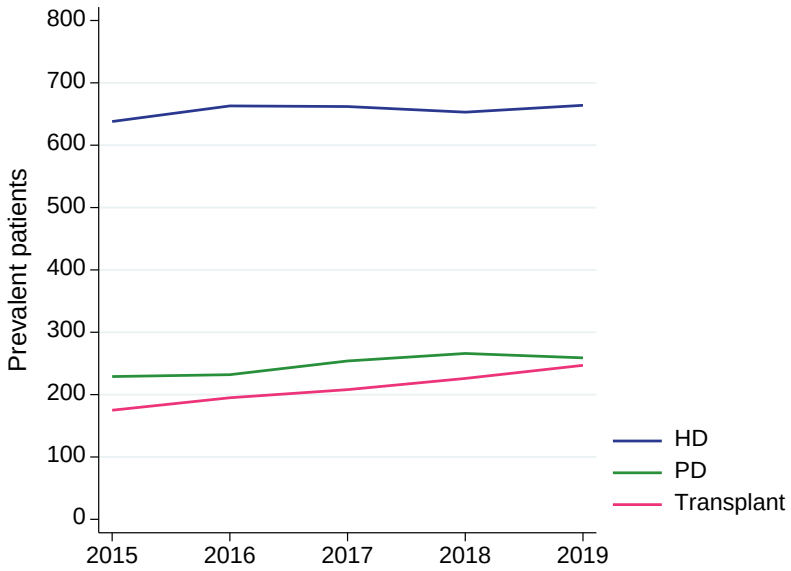


Figure 9.20.2 - Prevalent Patients by Modality - Aotearoa New Zealand – Pasifika

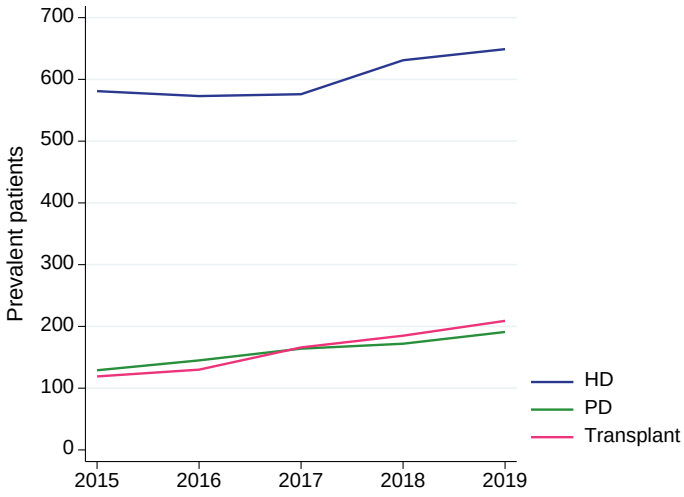


Figure 9.20.3 - Prevalent Patients by Modality - Aotearoa New Zealand - Non-Māori, non-Pasifika

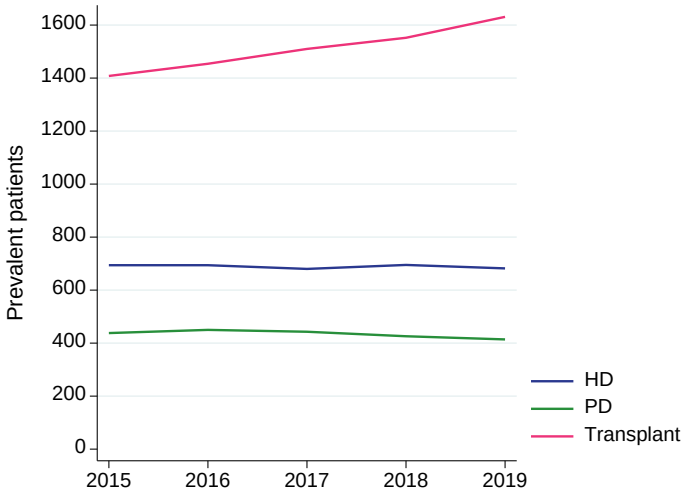
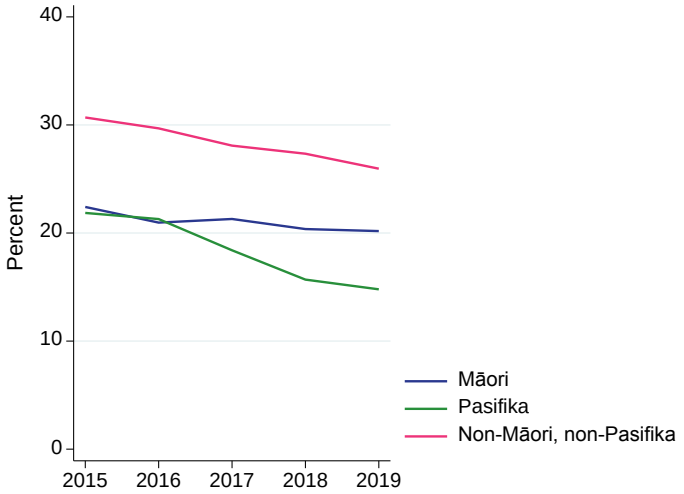


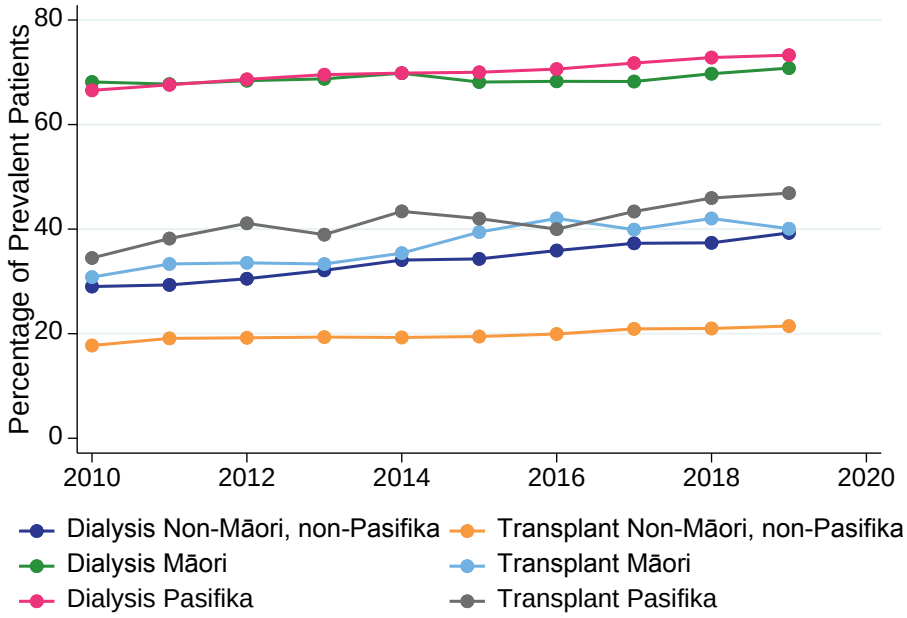
Figure 9.21 - Prevalent Haemodialysis at Home (% of all HD) by Ethnicity - Aotearoa New Zealand



Diabetes

The percentage of prevalent, Non-Māori, non-Pasifika dialysis patients with diabetes as a comorbidity has increased by 10 percentage points over the previous decade (figure 9.22).

Figure 9.22 - Diabetes as a Comorbidity in Prevalent Patients - Aotearoa New Zealand, 2010-2019



Incidence and Prevalence per Population

Figures 9.23 to 9.28 show trends in the incidence and prevalence of Kidney Failure treatment overall, haemodialysis, peritoneal dialysis and transplantation, and mortality by ethnicity. Of note is the increasing prevalence of transplantation amongst Māori and Pasifika patients (figure 9.27).

Figure 9.23 - Incidence of New Patients - Aotearoa New Zealand

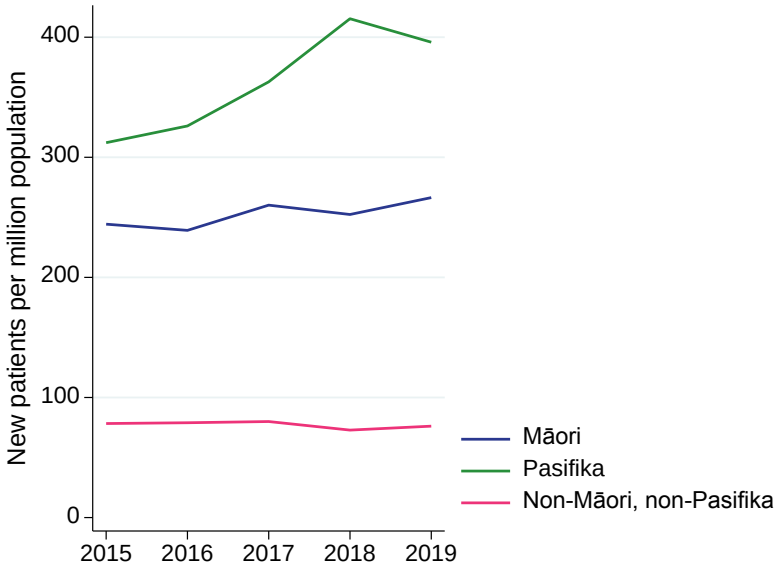


Figure 9.24 - Incidence of New Transplants - Aotearoa New Zealand

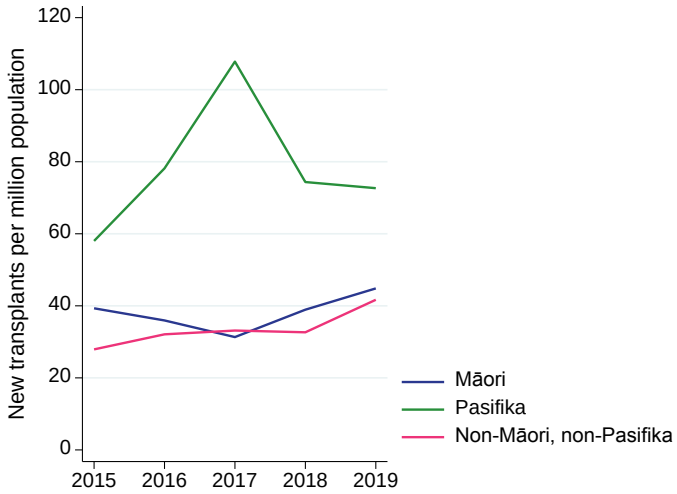


Figure 9.25 - Prevalent Haemodialysis Patients - Aotearoa New Zealand

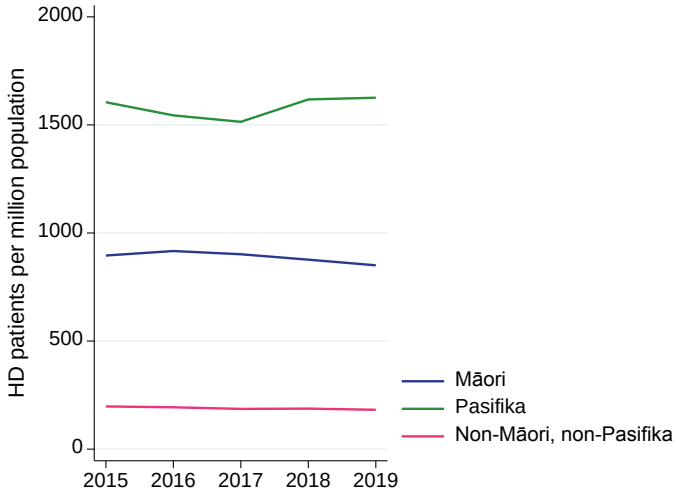


Figure 9.26 - Prevalent Peritoneal Dialysis Patients - Aotearoa New Zealand

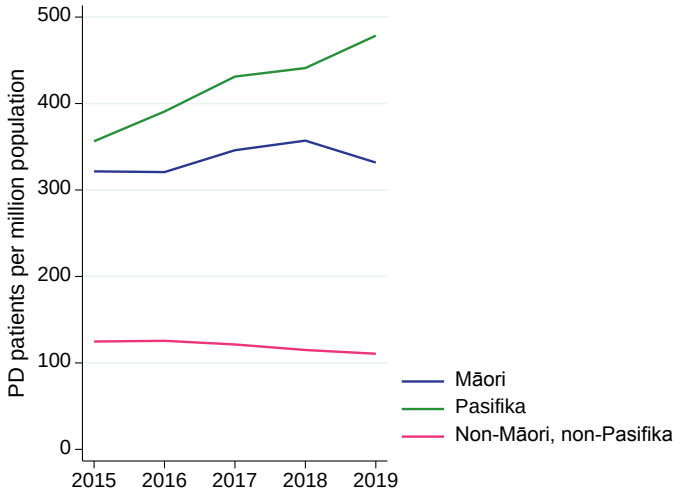


Figure 9.27 - Prevalent Transplant Patients - Aotearoa New Zealand

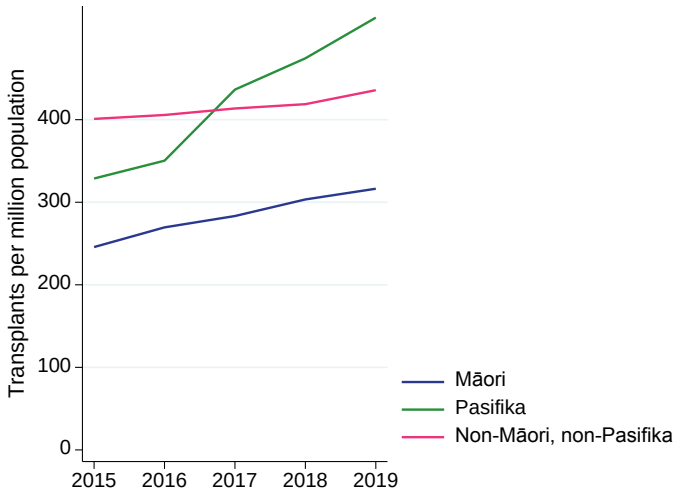
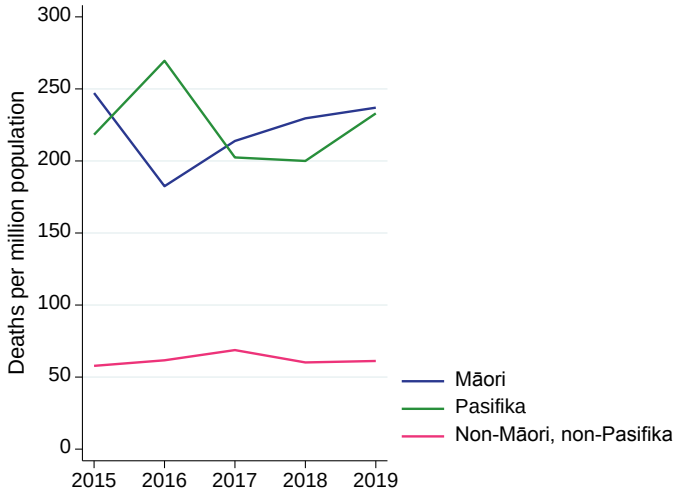


Figure 9.28 - Deaths of KRT Patients - Aotearoa New Zealand



Transplantation

In Aotearoa New Zealand, the proportion of Māori and Pasifika patients who receive a kidney transplant is very low, although the transplant rate per million population is high due to the prevalence of kidney failure in these populations (table 9.6). Information on donor source is shown in figure 9.29 and trends are shown in figure 9.30. Living donor kidney transplant rates have increased for Māori patients since 2013, with a general increase in live donors, both related and unrelated.

Table 9.6 Number of Transplant Recipients (pmp) by Ethnicity Aotearoa New Zealand 2010-2019

Year	Donor Type	Non-Māori, non-Pasifika	Māori	Pasifika
2010	DD	32 (10)	13 (20)	5 (16)
	LD	49 (15)	7 (11)	4 (12)
	Total	**81 (24)**	**20 (30)**	**9 (28)**
2011	DD	39 (12)	15 (22)	7 (21)
	LD	49 (14)	6 (9)	2 (6)
	Total	**88 (26)**	**21 (31)**	**9 (27)**
2012	DD	37 (11)	11 (16)	6 (18)
	LD	49 (14)	4 (6)	1 (3)
	Total	**86 (25)**	**15 (22)**	**7 (21)**
2013	DD	46 (14)	5 (7)	6 (17)
	LD	53 (16)	4 (6)	2 (6)
	Total	**99 (29)**	**9 (13)**	**8 (23)**
2014	DD	44 (13)	13 (19)	9 (26)
	LD	56 (16)	9 (13)	7 (20)
	Total	**100 (29)**	**22 (31)**	**16 (45)**
2015	DD	44 (13)	13 (18)	16 (44)
	LD	54 (15)	15 (21)	5 (14)
	Total	**98 (28)**	**28 (39)**	**21 (58)**
2016	DD	58 (16)	13 (18)	19 (51)
	LD	57 (16)	13 (18)	10 (27)
	Total	**115 (32)**	**26 (36)**	**29 (78)**
2017	DD	70 (19)	17 (23)	30 (79)
	LD	51 (14)	6 (8)	11 (29)
	Total	**121 (33)**	**23 (31)**	**41 (108)**
2018	DD	65 (18)	15 (20)	18 (46)
	LD	56 (15)	14 (19)	11 (28)
	Total	**121 (33)**	**29 (39)**	**29 (74)**
2019	DD	83 (22)	24 (31)	22 (55)
	LD	73 (20)	11 (14)	7 (18)
	Total	**156 (42)**	**35 (45)**	**29 (73)**

The number of transplants to Māori and Pasifika recipients has increased since 2013, through a higher proportion of transplants from live donors for Māori recipients and greater numbers of transplants from deceased donors for Pasifika recipients.

Figure 9.29 - Donor Type by Ethnicity - Aotearoa New Zealand 2010-2019

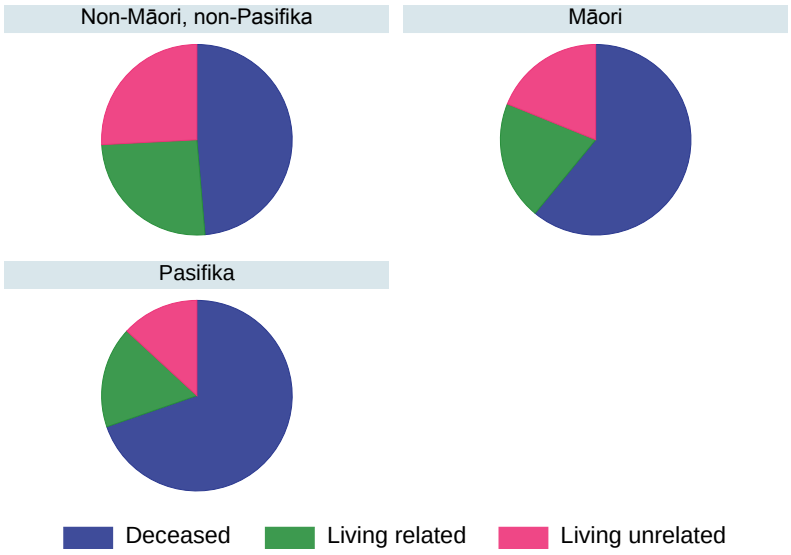


Figure 9.30 - Donor Type by Ethnicity and Year - Aotearoa New Zealand

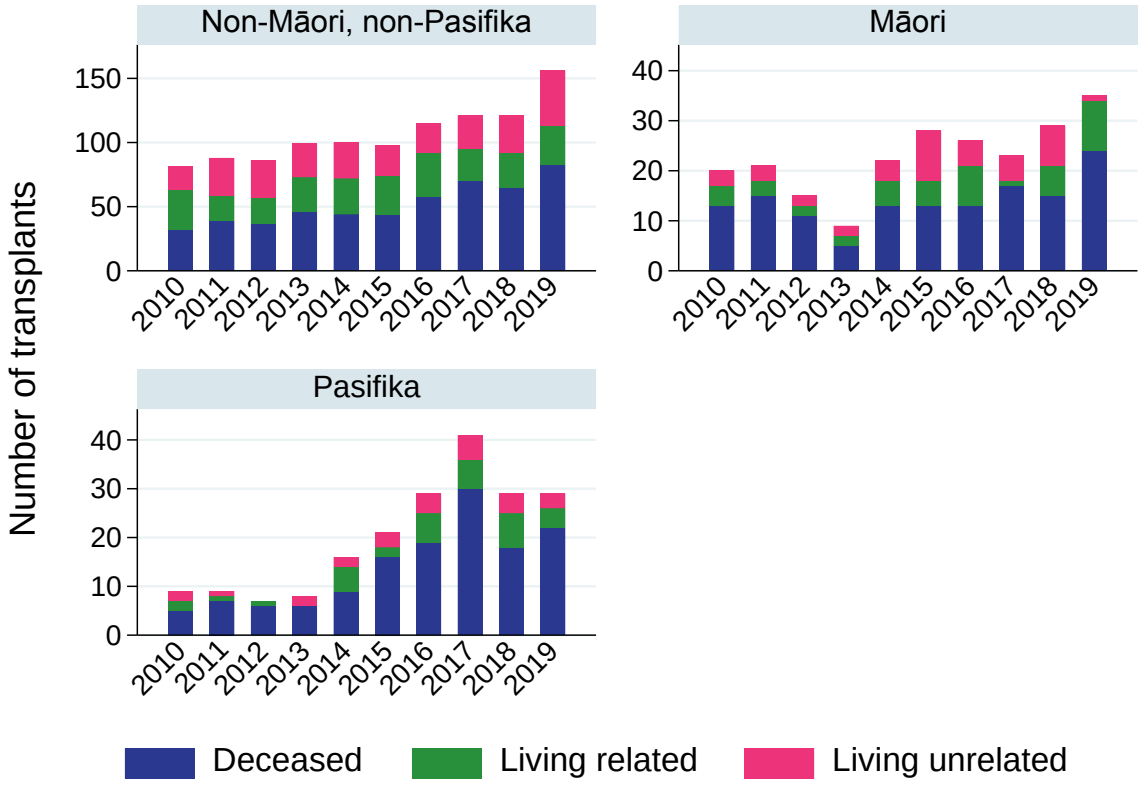
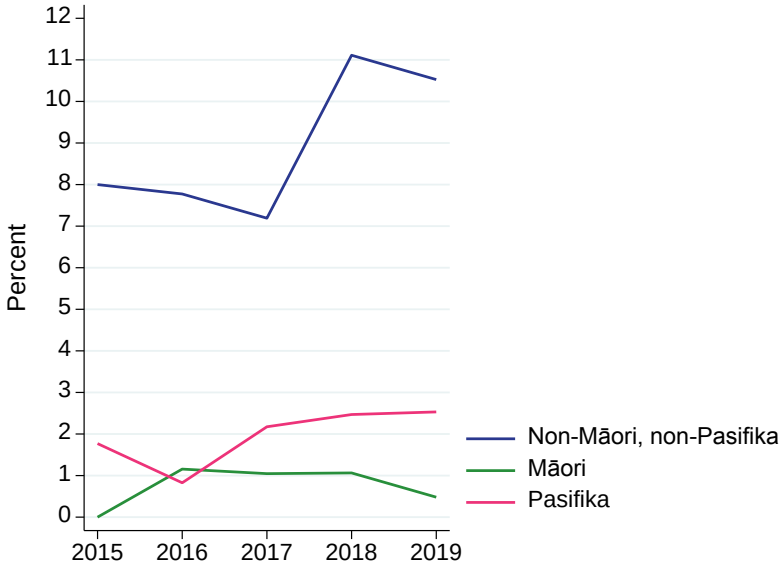


Figure 9.31 - Percentage of Patients Starting KRT with Pre-emptive Kidney Transplant - Aotearoa New Zealand

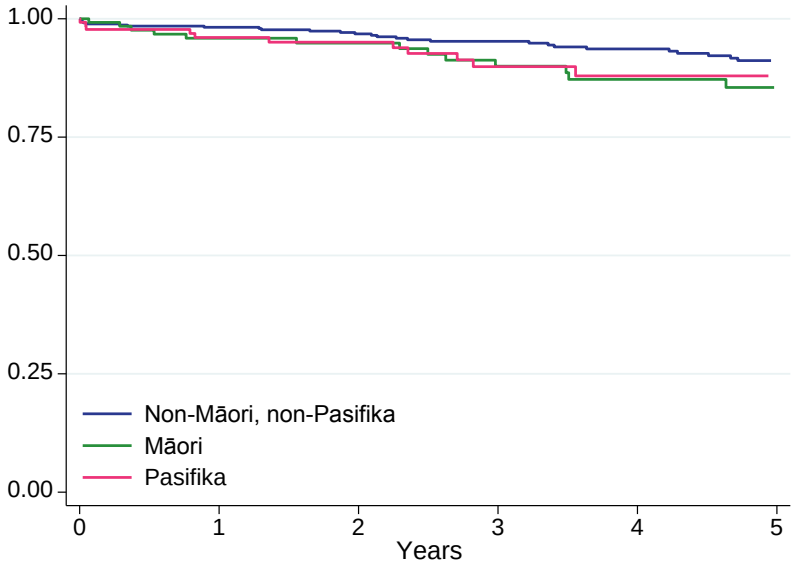


Transplant Survival

Graft and patient survival for kidney transplant recipients in Aotearoa New Zealand, calculated by the Kaplan-Meier method, are shown in figures 9.32-9.33.

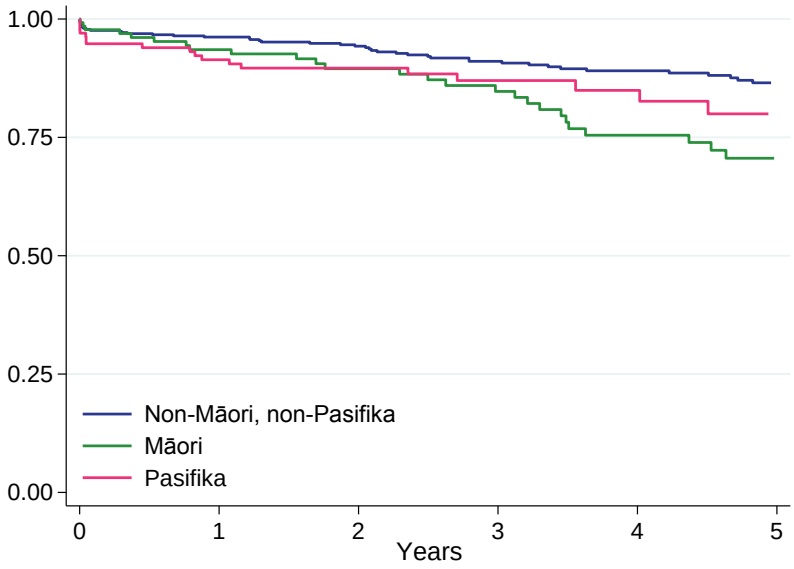
There is a small difference in patient survival after kidney transplantation from a deceased donor between Māori and non-Māori, non-Pasifika recipients, which is apparent from 6 months after transplantation. At 5 years post-transplant, 85% of Māori recipients, 88% of Pasifika recipients, and 91% of non-Māori, non-Pasifika recipients were alive 5 years after kidney transplantation from a deceased donor (figure 9.32).

Figure 9.32 - Patient Survival, Recipients of Primary Deceased Donor Grafts - Aotearoa New Zealand 2010-2019



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 time, there appears to be increasing proportions of Māori and Pasifika recipients who experienced graft loss compared with non-Māori, non-Pasifika persons. The proportion of functioning kidney transplants at 5 years post-transplant was 71% for Māori and 80% for Pasifika recipients, compared with 87% for non-Māori, non-Pasifika persons (figure 9.33).

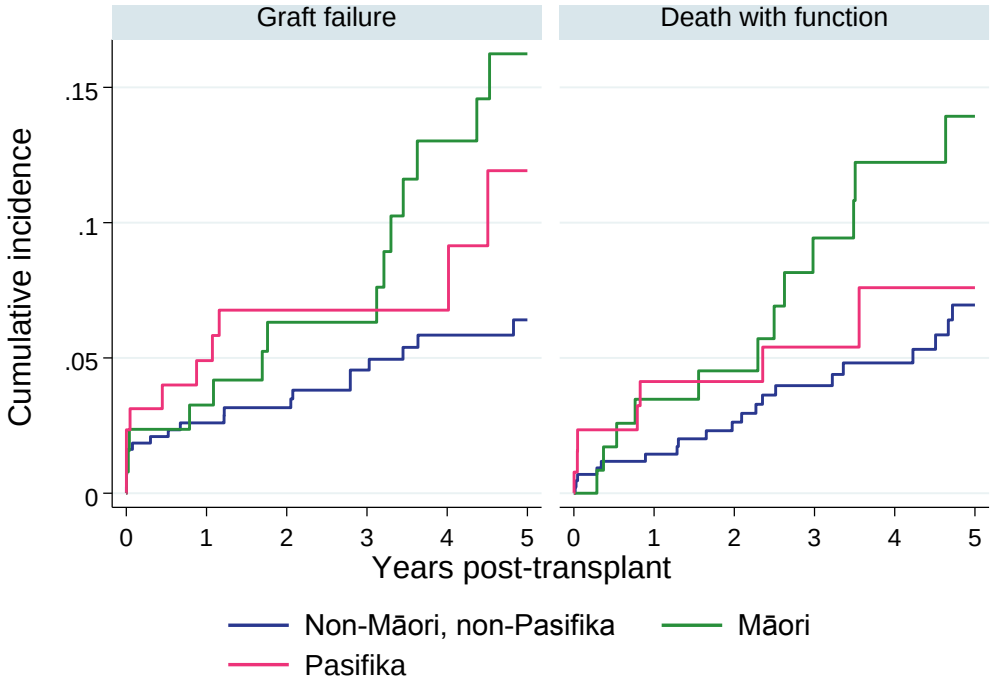
Figure 9.33 - Graft Survival, Recipients of Primary Deceased Donor Grafts - Aotearoa New Zealand 2010-2019



Cumulative incidence curves (utilising competing risk techniques to account for the effects of both components of graft failure) are shown for transplant outcomes by ethnicity in figure 9.34.

For Māori and Pasifika patients, both mortality and graft failure (not due to death) appear to be increased following transplantation compared with non-Māori non-Pasifika patients. The highest rates of both events are seen in Māori, patients.

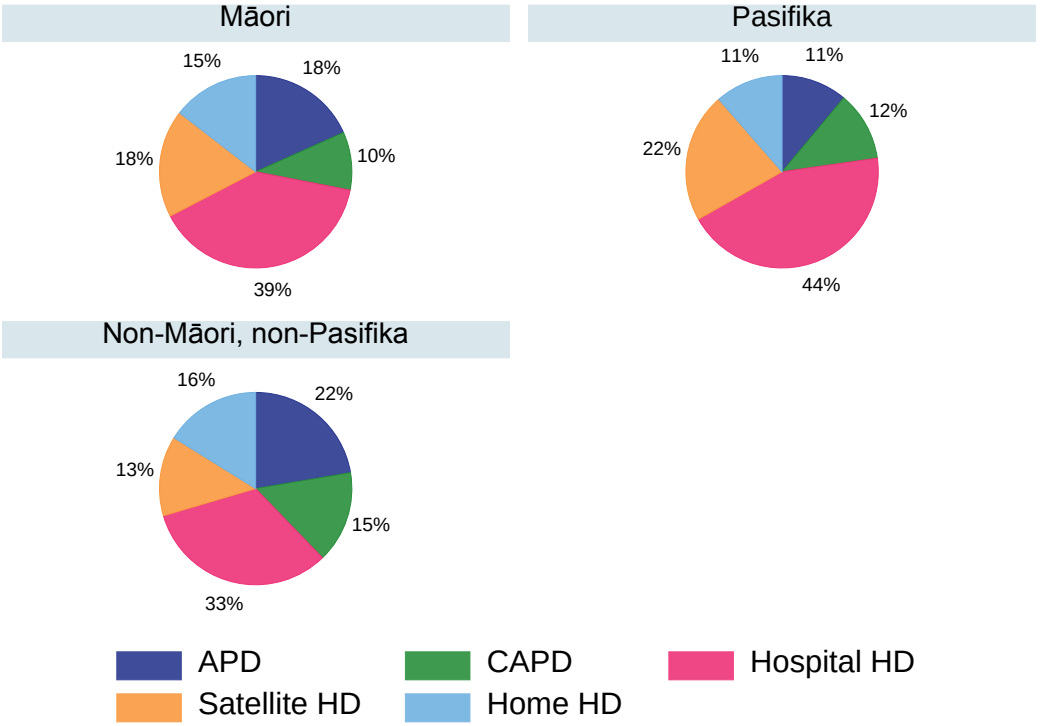
Figure 9.34 - Transplant Outcomes, Aotearoa New Zealand - Primary Deceased Donor Kidney-only Transplants 2010-2019



Dialysis

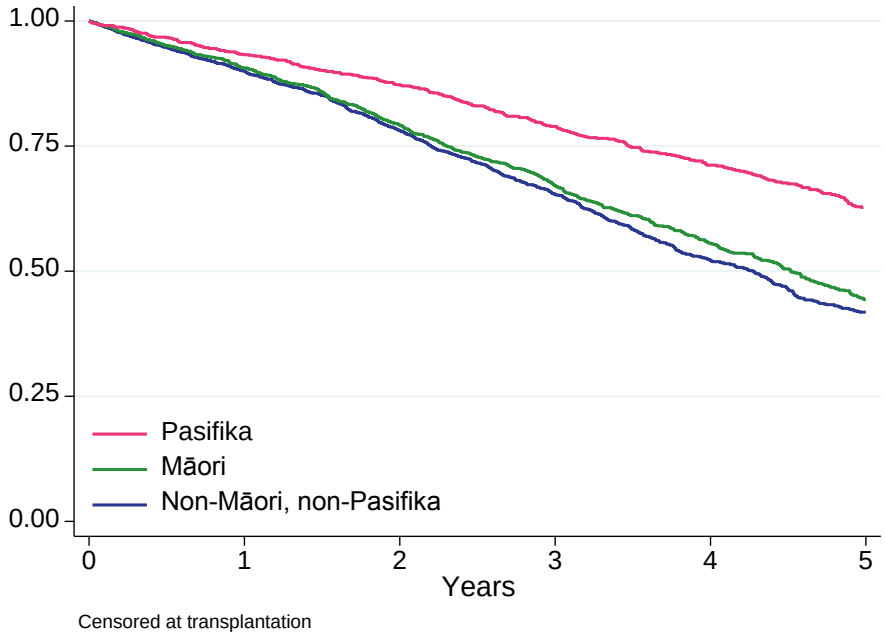
The distribution of dialysis modality is shown graphically in figure 9.35. Māori and Pasifika patients have a higher use of facility dialysis as the principal modality of care, and lower use of each of the home-based modalities. For non-Māori, non-Pasifika patients, over half have home-based care. The proportion of Māori and Pasifika patients receiving home-based dialysis is approximately 10-20% lower.

Figure 9.35 - Dialysis Modality End 2019 - Aotearoa New Zealand, by Ethnicity



Half of the people who started dialysis over 2010-2019 were alive 5 years later (figure 9.36). Non-Māori non-Pasifika and Māori patients experienced similar survival over 5 years after starting dialysis, with Pasifika patients having apparently better survival. It is possible that observed differences in survival between populations reflect different age distributions and access to competing treatments (transplantation), which may have impacted mortality estimates.

Figure 9.36 - Patient Survival, Incident Dialysis Patients - Aotearoa New Zealand 2010-2019

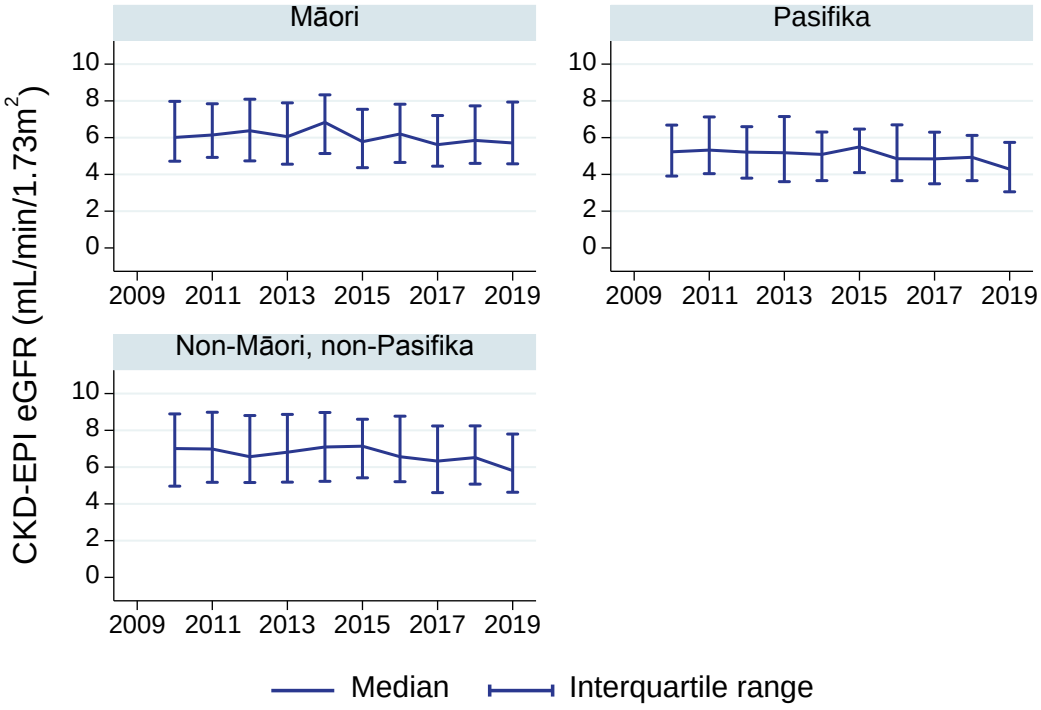


Censored at transplantation

Timing of Dialysis Initiation

In Aotearoa New Zealand, the level of kidney function at which dialysis is commenced ranges between estimated Glomerular Filtration Rate (eGFR) 4-5 mL/min/1.73m^2 for Pacific patients, 5-7 mL/min/1.73m^2 for Māori patients and 6-8 mL/min/1.73m^2 for non-Māori, non-Pasifika patients.

Figure 9.37 - eGFR at Dialysis Initiation - Aotearoa New Zealand



Incident Vascular Access

Incident vascular access data are presented in table 9.7, and prevalent data in table 9.8.

The proportions of Māori and Pasifika patients commencing KRT with haemodialysis with a central venous catheter (CVC) rather than permanent access (Arteriovenous Fistula (AVF) or Graft (AVG)) were slightly higher than in non-Māori, non-Pasifika patients in 2019, unlike in previous years (table 9.7).

Table 9.7 Incident Vascular Access Aotearoa New Zealand 2015-2019

Year	Vascular access	Non-Māori, non-Pasifika	Māori	Pasifika
2015	AVF	34 (27%)	34 (28%)	25 (36%)
	AVG	2 (2%)	3 (2%)	0 (0%)
	CVC	87 (69%)	82 (67%)	44 (64%)
	Not reported	3 (2%)	3 (2%)	0 (0%)
2016	AVF	33 (23%)	31 (28%)	24 (27%)
	AVG	1 (1%)	0 (0%)	1 (1%)
	CVC	104 (73%)	76 (70%)	63 (71%)
	Not reported	4 (3%)	2 (2%)	1 (1%)
2017	AVF	35 (23%)	32 (26%)	23 (24%)
	AVG	2 (1%)	3 (2%)	1 (1%)
	CVC	114 (75%)	88 (70%)	70 (74%)
	Not reported	1 (1%)	2 (2%)	0 (0%)
2018	AVF	29 (22%)	22 (21%)	23 (19%)
	AVG	2 (2%)	0 (0%)	1 (1%)
	CVC	98 (75%)	84 (79%)	96 (80%)
	Not reported	1 (1%)	0 (0%)	0 (0%)
2019	AVF	33 (24%)	27 (20%)	22 (20%)
	AVG	2 (1%)	0 (0%)	1 (1%)
	CVC	101 (74%)	105 (80%)	88 (79%)
	Not reported	0 (0%)	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 and Pasifika patients in 2019 than non-Māori, non-Pasifika patients (table 9.8).

Table 9.8 Prevalent Vascular Access Aotearoa New Zealand 2015-2019

Year	Vascular access	Non-Māori, non-Pasifika	Māori	Pasifika
2015	AVF	452 (65%)	428 (67%)	433 (75%)
	AVG	26 (4%)	35 (5%)	27 (5%)
	CVC	180 (26%)	141 (22%)	110 (19%)
	Not reported	36 (5%)	34 (5%)	11 (2%)
2016	AVF	444 (64%)	452 (68%)	411 (72%)
	AVG	26 (4%)	27 (4%)	26 (5%)
	CVC	202 (29%)	168 (25%)	126 (22%)
	Not reported	22 (3%)	16 (2%)	10 (2%)
2017	AVF	422 (62%)	449 (68%)	411 (71%)
	AVG	19 (3%)	26 (4%)	15 (3%)
	CVC	222 (33%)	176 (27%)	141 (24%)
	Not reported	17 (3%)	11 (2%)	9 (2%)
2018	AVF	418 (60%)	441 (68%)	419 (66%)
	AVG	17 (2%)	21 (3%)	11 (2%)
	CVC	245 (35%)	178 (27%)	191 (30%)
	Not reported	15 (2%)	13 (2%)	10 (2%)
2019	AVF	391 (57%)	415 (63%)	424 (65%)
	AVG	15 (2%)	18 (3%)	5 (1%)
	CVC	242 (35%)	202 (30%)	188 (29%)
	Not reported	34 (5%)	29 (4%)	32 (5%)

Patient Flow

Table 9.9 shows the overall patient flow in Aotearoa New Zealand by ethnicity. Notably, mortality for Māori and Pasifika patients is 3 to 5-fold higher per million of population than that of non-Māori, non-Pasifika patients, reflecting the much higher incidence and prevalence of kidney failure, and relatively lower prevalence of transplants in these populations.

Table 9.9 Patient Flow (pmp) Aotearoa New Zealand 2015-2019

Year	Event	Non-Māori, non-Pasifika	Māori	Pasifika
2015	New patients	275 (78)	174 (244)	113 (312)
	New transplants	99 (28)	28 (39)	21 (58)
	Pre-emptive transplants	22 (6)	0 (0)	2 (6)
	Prevalent dialysis	1132 (322)	867 (1217)	710 (1961)
	Prevalent transplants	1408 (401)	175 (246)	119 (329)
	Total prevalence	2540 (723)	1042 (1463)	829 (2290)
	Deaths	203 (58)	176 (247)	79 (218)
2016	New patients	283 (79)	173 (239)	121 (326)
	New transplants	115 (32)	26 (36)	29 (78)
	Pre-emptive transplants	22 (6)	2 (3)	1 (3)
	Prevalent dialysis	1144 (319)	895 (1237)	718 (1935)
	Prevalent transplants	1454 (406)	195 (270)	130 (350)
	Total prevalence	2598 (725)	1090 (1507)	848 (2285)
	Deaths	221 (62)	132 (182)	100 (270)
2017	New patients	292 (80)	191 (260)	138 (363)
	New transplants	121 (33)	23 (31)	41 (108)
	Pre-emptive transplants	21 (6)	2 (3)	3 (8)
	Prevalent dialysis	1123 (308)	916 (1248)	740 (1946)
	Prevalent transplants	1510 (414)	208 (283)	166 (436)
	Total prevalence	2633 (721)	1124 (1531)	906 (2382)
	Deaths	251 (69)	157 (214)	77 (202)
2018	New patients	270 (73)	188 (252)	162 (415)
	New transplants	121 (33)	29 (39)	29 (74)
	Pre-emptive transplants	30 (8)	2 (3)	4 (10)
	Prevalent dialysis	1121 (302)	919 (1234)	803 (2059)
	Prevalent transplants	1552 (419)	226 (303)	185 (474)
	Total prevalence	2673 (721)	1145 (1537)	988 (2533)
	Deaths	223 (60)	171 (230)	78 (200)
2019	New patients	285 (76)	208 (266)	158 (396)
	New transplants	156 (42)	35 (45)	29 (73)
	Pre-emptive transplants	30 (8)	1 (1)	4 (10)
	Prevalent dialysis	1096 (293)	923 (1182)	840 (2105)
	Prevalent transplants	1631 (436)	247 (316)	209 (524)
	Total prevalence	2727 (729)	1170 (1499)	1049 (2628)
	Deaths	229 (61)	185 (237)	93 (233)

Cause of Death

The causes of death in 2019 are shown in figure 9.38 and table 9.10, categorised by ethnicity and modality at time of death.

Differences between ethnicities are likely to reflect, at least in part, the different age distributions of these populations, and future Reports will explore these in more detail.

Figure 9.38 - Cause of Death by Modality and Ethnicity - Deaths Occurring During 2019, Aotearoa New Zealand

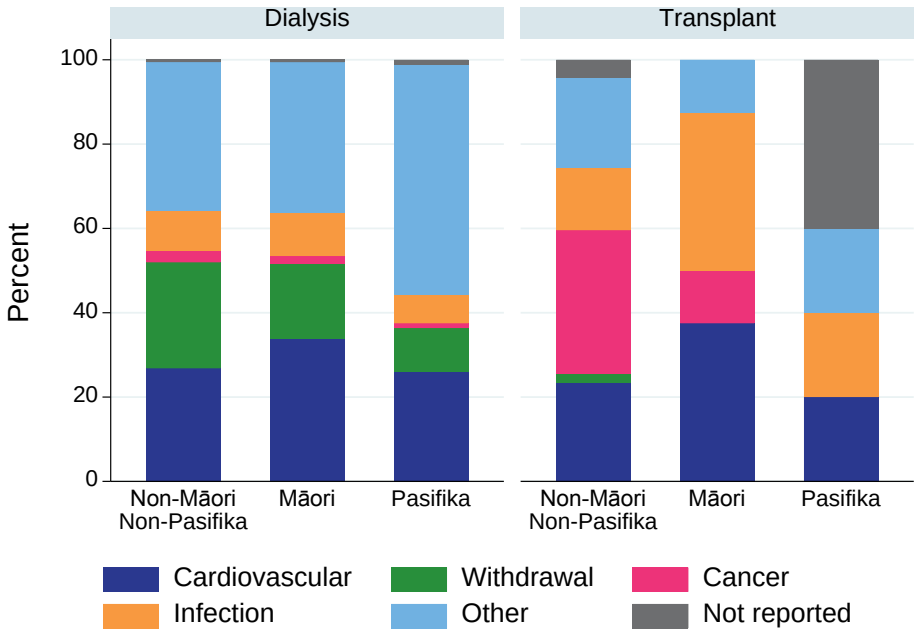


Table 9.10 Cause of Death by Modality and Ethnicity, Aotearoa New Zealand 2019

Modality	Cause of death	Non-Māori, non-Pasifika	Māori	Pasifika
Dialysis	**Cardiovascular**	48 (27%)	59 (34%)	23 (26%)
	Withdrawal	45 (25%)	31 (18%)	9 (10%)
	Cancer	5 (3%)	3 (2%)	1 (1%)
	Infection	17 (9%)	18 (10%)	6 (7%)
	Other	63 (35%)	62 (36%)	48 (55%)
	Not reported	1 (1%)	1 (1%)	1 (1%)
	Total	**179**	**174**	**88**
Transplant	**Cardiovascular**	11 (23%)	3 (38%)	1 (20%)
	Withdrawal	1 (2%)	0 (0%)	0 (0%)
	Cancer	16 (34%)	1 (13%)	0 (0%)
	Infection	7 (15%)	3 (38%)	1 (20%)
	Other	10 (21%)	1 (13%)	1 (20%)
	Not reported	2 (4%)	0 (0%)	2 (40%)
	Total	**47**	**8**	**5**

Late Referral to Nephrology Services

There is no evidence of different late referral rates by ethnicity in Aotearoa New Zealand (figure 9.39 and table 9.11).

Figure 9.39 - Late Referral Rates by Ethnicity - Aotearoa New Zealand 2015 – 2019

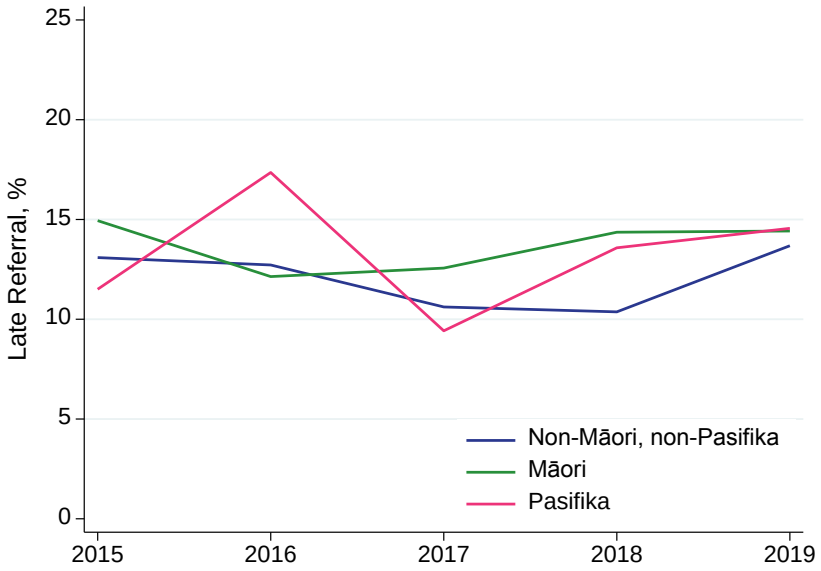


Table 9.11 Percentage of Late Referral by Ethnicity Aotearoa New Zealand 2015-2019

Year	Non-Māori, non-Pasifika	Māori	Pasifika
2015	13%	15%	12%
2016	13%	12%	17%
2017	11%	13%	9%
2018	10%	14%	14%
2019	14%	14%	15%

References

[1] This work is based on/includes Stats NZ's data which are licensed by Stats NZ for re-use under the Creative Commons Attribution 4.0 International licence. Stats NZ, 2019, Estimated Resident Population by Age and Sex (1991+) (Annual-Jun), NZ Infoshare, viewed 19 Dec 2019, http://archive.stats.govt.nz/infoshare/

[2] Australian Bureau of Statistics, 2019, Australian Standard Classification of Cultural and Ethnic Groups (ASCCEG), December 2019, viewed 23 Oct 2020, https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/1249.0Main+Features12019?OpenDocument

[3] Ministry of Health. 2017. HISO 10001:2017 Ethnicity Data Protocols. Wellington: Ministry of Health.