



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

Summary and Highlights	3
Suggested Citation	3
Kidney Replacement Therapy in Aotearoa New Zealand	4
Incidence of Kidney Replacement Therapy (KRT)	4
Primary Cause of Kidney Disease.....	5
Children and Young Adults	5
Age.....	6
Prevalence of Kidney Replacement Therapy	6
Dialysis.....	7
Transplantation	9
Late Referral to Nephrology Services	9
Ethnicity and Kidney Replacement Therapy in Aotearoa New Zealand	9
New Patients.....	9
Primary Kidney Disease.....	12
Incidence Rates	12
Prevalent Patients	15
Diabetes.....	16
Incidence and Prevalence per Population.....	17
Transplantation	18
Transplant Survival	20
Dialysis.....	21
Timing of Dialysis Initiation.....	22
Vascular Access.....	23
Patient Flow	24
Late Referral to Nephrology Services	26
References	26

Summary and Highlights

This chapter presents information about the rates of people receiving kidney replacement therapy (KRT) for kidney failure in the form of dialysis or transplantation in Aotearoa New Zealand. Population statistics from estimates provided by Statistics New Zealand are used to calculate disease and treatment rates¹. 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.

Kidney Failure Incidence and Prevalence

There were 708 (137 per million population (pmp)) new patients who started KRT for kidney failure in 2021 in Aotearoa New Zealand. This rate has steadily risen from 2017, when there were 4693 (975 pmp) prevalent patients, to 5452 people (1054 pmp) in 2021. Diabetic kidney disease (44%) remains the number one cause of kidney failure, especially among Māori and Pasifika populations (table 9.4).

Treatment Modality

58% of kidney failure patients received dialysis, of which 62% occur at a facility (hospital and satellite dialysis unit). There has been a steady increase in the number and percentage of patients receiving facility-based dialysis (figure 9.7 and figure 9.10) since 2017. 187 patients (36 pmp) received a kidney transplant in 2021. This has been stable since 2017, bringing the total number of transplant patients in Aotearoa New Zealand, to 2297.

Ethnicity and Equity in Aotearoa New Zealand

There remain marked ethnic inequities amongst Māori and Pasifika kidney failure patients. Māori and Pasifika populations are more likely to develop kidney failure requiring kidney replacement therapy (figure 9.13) than non-Māori, non-Pacific populations. This disparity occurs as early as age 15-24, and the trend continues across all age groups. In addition, Māori and Pasifika kidney failure patients are less like to start treatment with a kidney transplant, with 0% of Pacific and 3% of Māori receiving pre-emptive kidney transplantation compared to 10% of non-Māori and non-Pacific in 2021. Overall, Māori and Pacific kidney failure patients received a kidney transplant 21-22% of the time compared to the Non-Māori, the non-Pasifika proportion of 59% (Table 9.5).

Suggested Citation

ANZDATA Registry. 45th Report, Chapter 9: Kidney Failure in Aotearoa New Zealand. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2022. Available at: <http://www.anzdata.org.au>

Kidney Replacement Therapy in Aotearoa New Zealand

Incidence of Kidney Replacement Therapy (KRT)

In 2021, 708 adults and children started kidney replacement therapy (KRT) in Aotearoa New Zealand, equivalent to 137 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 (137 versus 127 pmp in 2021).

Figure 9.1 - Incidence of Kidney Replacement Therapy - Aotearoa New Zealand 1992-2021

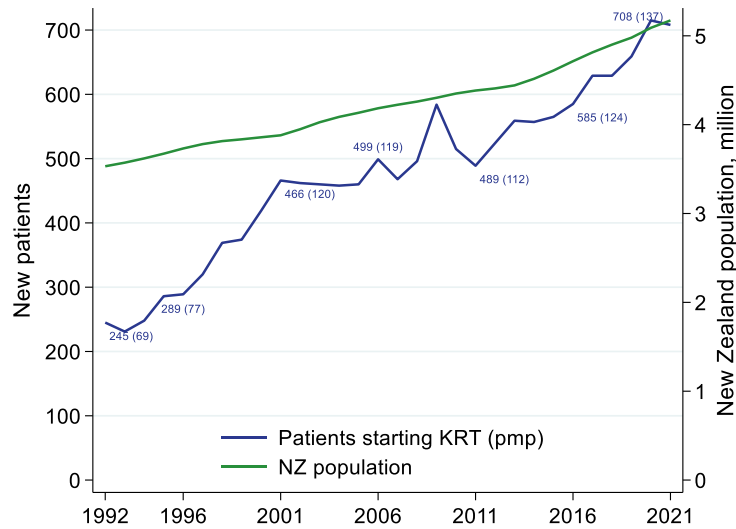
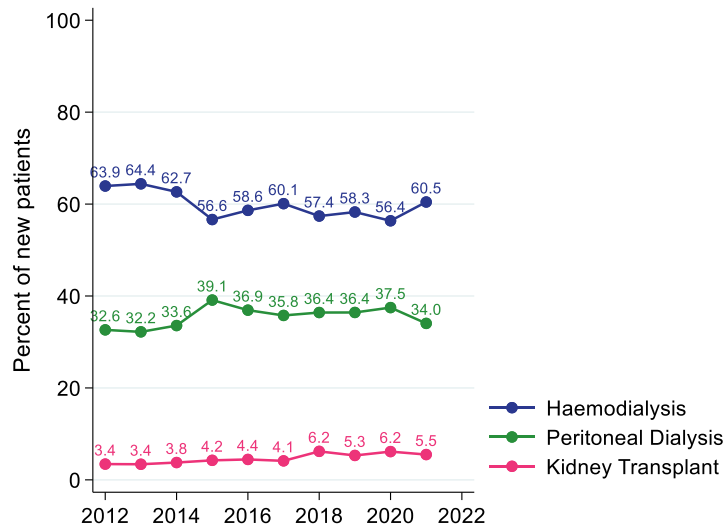


Table 9.1 Number (pmp) who Commenced Kidney Replacement Therapy in Aotearoa New Zealand, 2017-2021

	2017	2018	2019	2020	2021
Total	629 (131)	629 (128)	659 (132)	715 (140)	708 (137)
Pre-Emptive Transplant	26 (5)	39 (8)	35 (7)	44 (9)	39 (8)
Haemodialysis	378 (79)	361 (74)	384 (77)	403 (79)	428 (83)
Peritoneal Dialysis	225 (47)	229 (47)	240 (48)	268 (53)	241 (47)

Trends in the proportion of patients starting KRT by treatment modality are in figure 9.2.

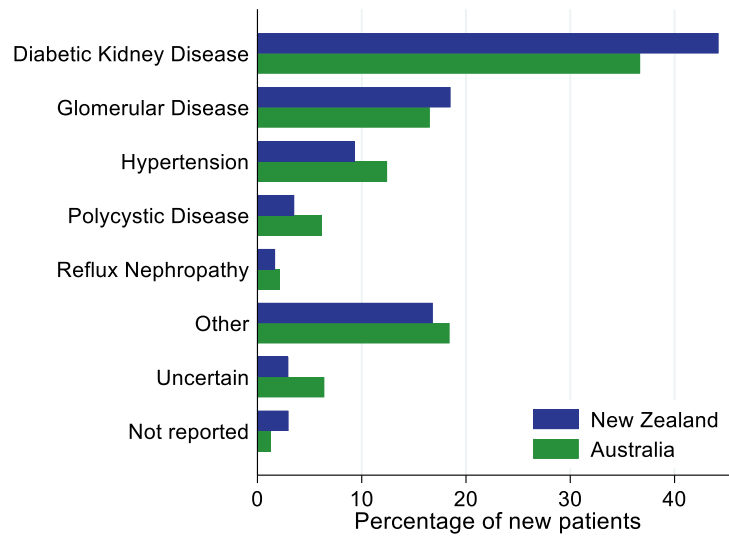
Figure 9.2 - Trends in Modality at Start of Kidney Replacement Therapy - Aotearoa New Zealand 2012-2021



Primary Cause of Kidney Disease

Figure 9.3 shows the primary cause of kidney failure for all patients commencing KRT in 2021.

Figure 9.3 - Primary Cause of Kidney Disease of New Patients Commencing Kidney Replacement Therapy, 2021

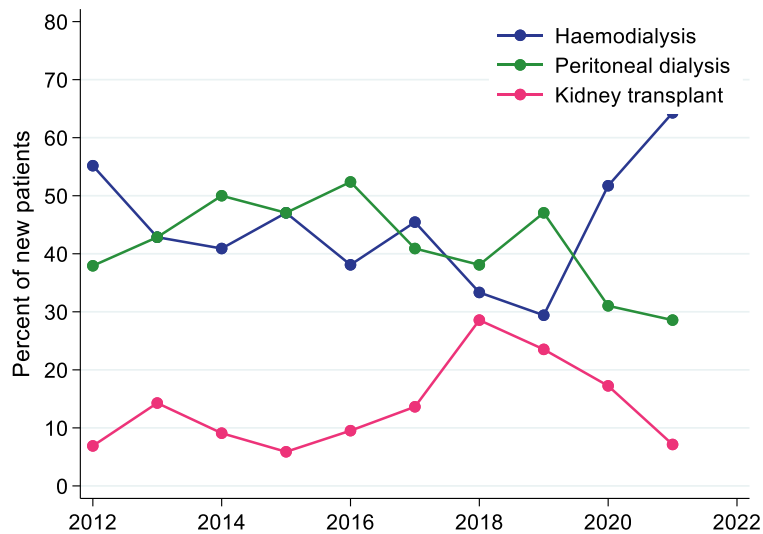


Children and Young Adults

In 2021, 28 patients in the 0-24 age group commenced kidney replacement therapy (17 pmp) in Aotearoa New Zealand. The incidence rate of KRT among young patients has ranged between 11 and 18 pmp from 2017-2021. The incidence rate of KRT is variable due to the low numbers of patients commencing KRT in this age group.

Of the 28 younger patients commencing KRT in Aotearoa New Zealand, in 2021, 2 (7%) patients received a pre-emptive transplant, 8 (29%) patients commenced with peritoneal dialysis, and 18 (64%) patients commenced with haemodialysis (figure 9.4).

Figure 9.4 - Children and Young Adults (0-24 years) Commencing KRT - Aotearoa New Zealand 2012-2021



Age

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

In 2021, the highest incidence of kidney replacement therapy in Aotearoa New Zealand, is among people in the 65-74 age group (356 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, 2012-2021

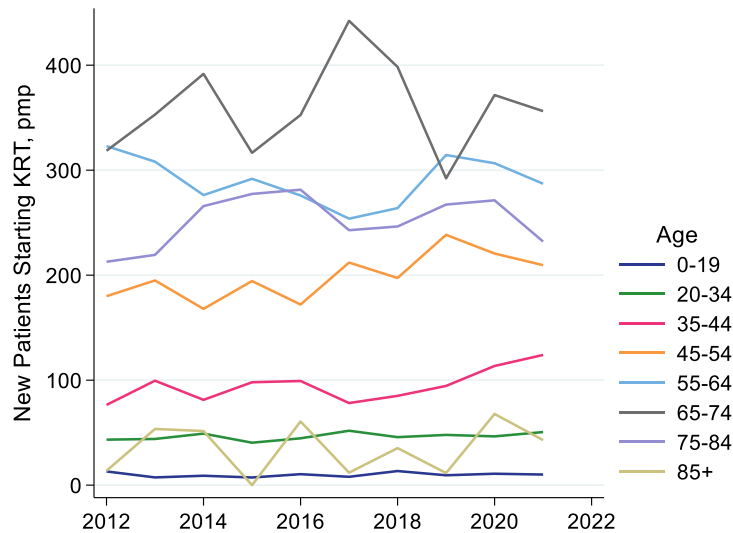
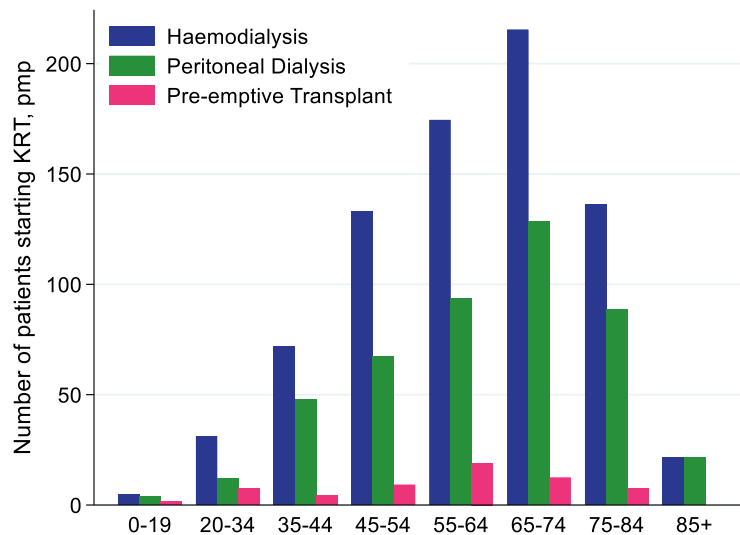


Figure 9.6 - Incidence of KRT by Age Group and Modality - Per Million Population, Aotearoa New Zealand 2021



Prevalence of Kidney Replacement Therapy

There were 5452 people (1054 pmp) receiving KRT in Aotearoa New Zealand, at the end of 2021 (figures 9.7-9.8 and table 9.2). Overall, Aotearoa New Zealand, has a higher prevalence (610 pmp) of patients on dialysis than patients with a kidney transplant (444 pmp).

Figure 9.7 - Prevalence of Dialysis and Transplantation - Aotearoa New Zealand 1992-2021

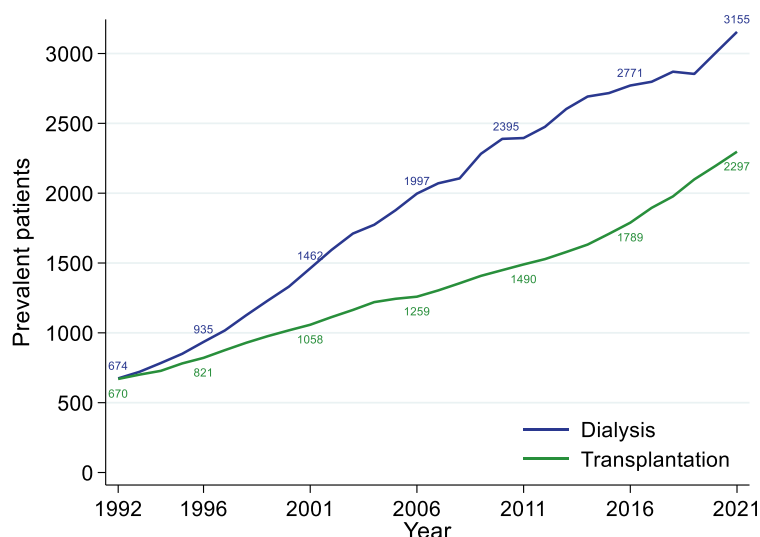
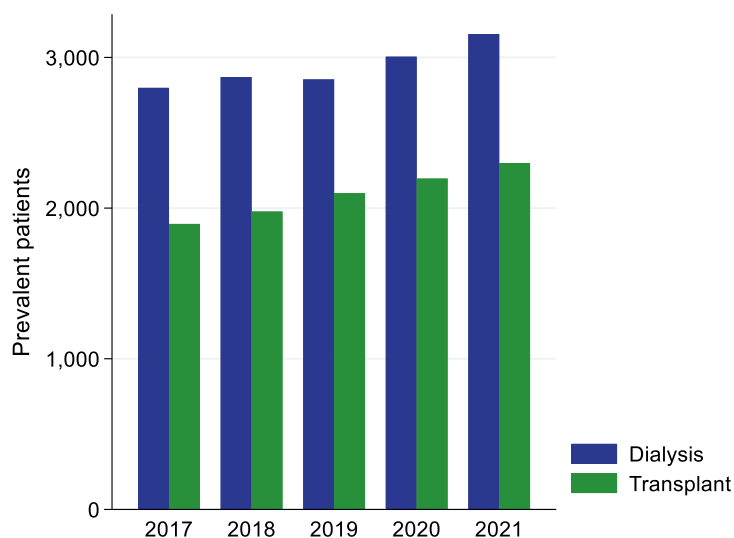


Table 9.2 Prevalence of Kidney Replacement Therapy (pmp) in Aotearoa New Zealand 2017-2021

	2017	2018	2019	2020	2021
Total	4693 (975)	4847 (989)	4953 (995)	5201 (1022)	5452 (1054)
Transplant	1895 (394)	1977 (403)	2099 (422)	2196 (431)	2297 (444)
Dialysis	2798 (581)	2870 (586)	2854 (573)	3005 (590)	3155 (610)

Figure 9.8 - Prevalence of Kidney Replacement Therapy - Aotearoa New Zealand 2017-2021



Dialysis

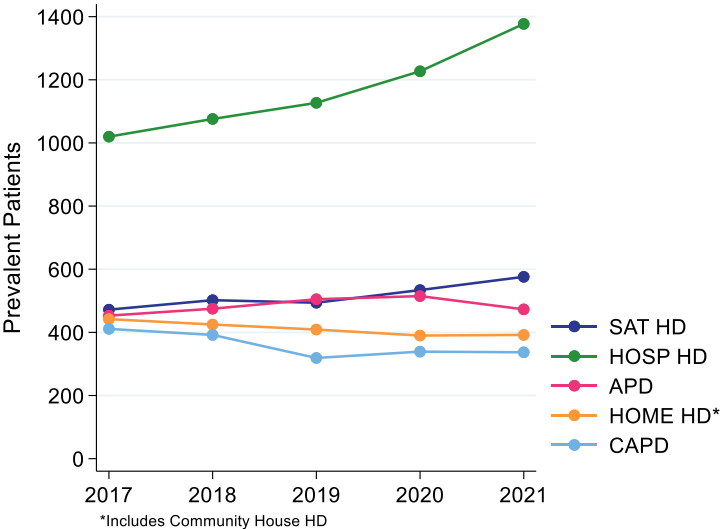
In 2021, 38% of the 3155 Aotearoa New Zealand dialysis patients had home-based dialysis (peritoneal dialysis, community house haemodialysis or home haemodialysis).

15% of the dialysis population had automated peritoneal dialysis (APD), 11% with continuous ambulatory peritoneal dialysis (CAPD), and 12% with home haemodialysis.

Figure 9.9 shows trends in the method and location of dialysis in Aotearoa New Zealand, over 2017-2021.

The Registry recognised that previous definitions for dialysis location did not accurately reflect the care delivery for all patients in Aotearoa New Zealand, and in 2020 introduced new data definitions to capture patients receiving community-based therapy. Due to the small number of Community House Dialysis patients reported to the Registry in 2021 (30 patients across New Zealand), this data has been combined with Home Haemodialysis numbers for reporting purposes in this report.

Figure 9.9 - Method and Location of Dialysis - Aotearoa New Zealand, 2017-2021

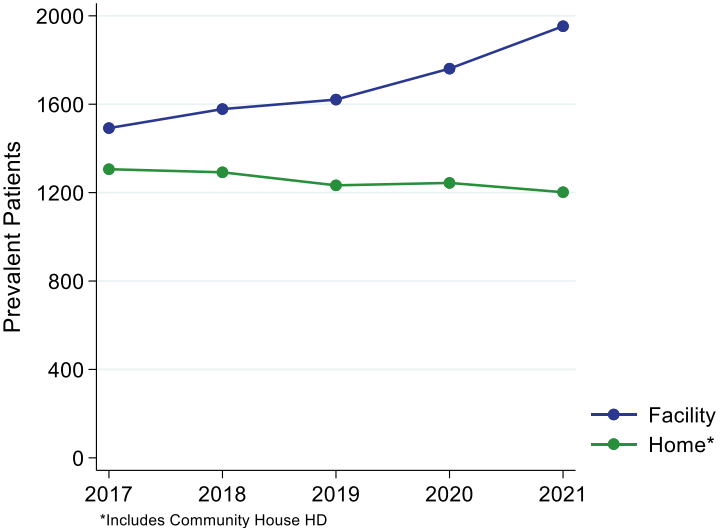


HD: Haemodialysis, SAT: Satellite, HOSP: Hospital, APD: Automated Peritoneal Dialysis, CAPD: Continuous Ambulatory Peritoneal Dialysis

62% of dialysis patients had haemodialysis in a satellite unit (18%) or a hospital unit (44%).

Figure 9.10 shows the home (including community house) trends and facility-based dialysis in Aotearoa New Zealand, over 2017-2021.

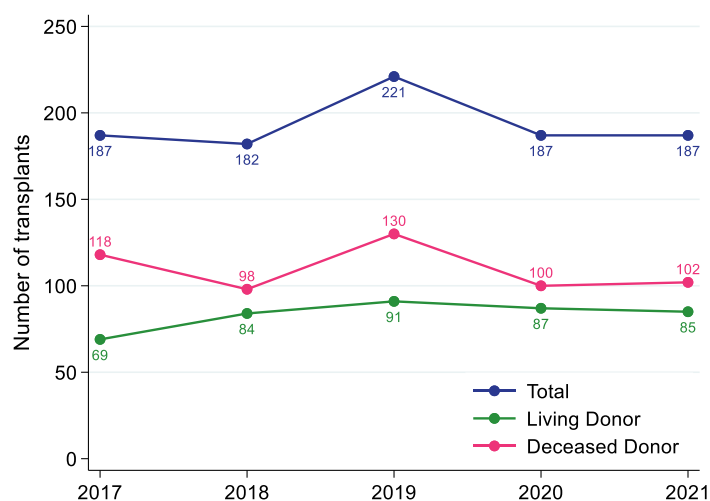
Figure 9.10 - Home and Facility-Based Dialysis - Aotearoa New Zealand, 2017-2021



Transplantation

In 2021, 187 patients (36 pmp) received a kidney transplant (figure 9.11).

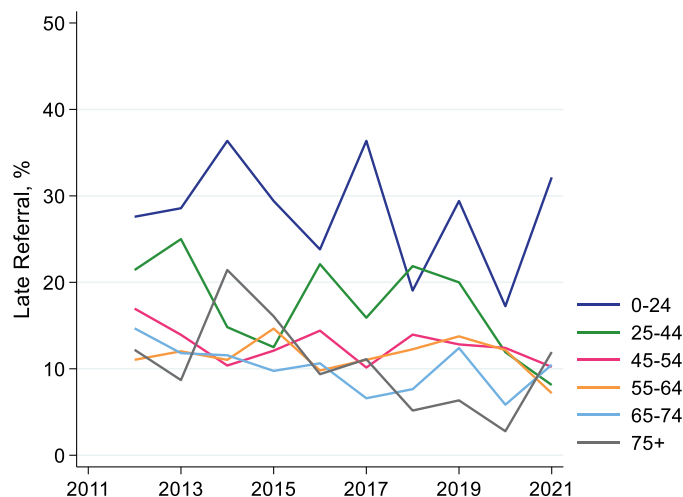
Figure 9.11 - New Kidney Transplants in Aotearoa New Zealand 2017-2021



Late Referral to Nephrology Services

Figure 9.12 shows the rate of late referrals (defined as the first assessment by a specialist nephrologist within 3 months of commencing dialysis) in Aotearoa New Zealand, over time by age group. Late referrals represented 10% of all patients who commenced kidney replacement therapy in 2021.

Figure 9.12 - Late Referral Rates by Age Group - Aotearoa New Zealand 2012 – 2021



Ethnicity and Kidney Replacement Therapy in Aotearoa New Zealand

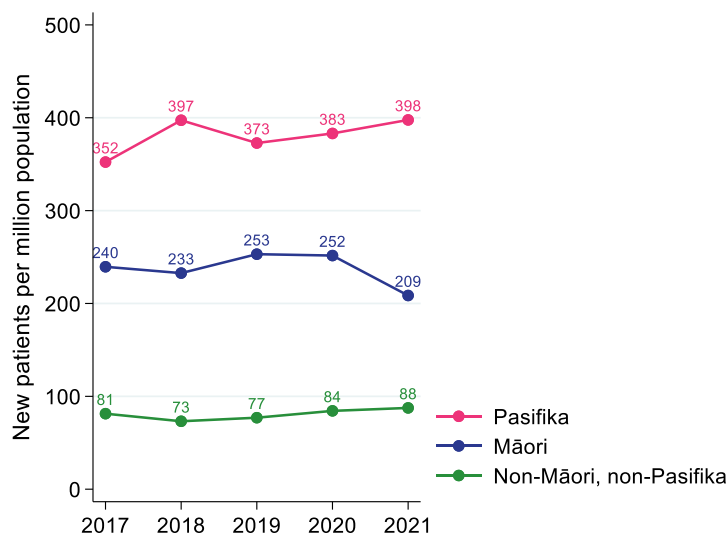
New Patients

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 (398 pmp) and Māori (209 pmp) patients, compared with Non-Māori, non-Pasifika patients (88 pmp) (figure 9.13).

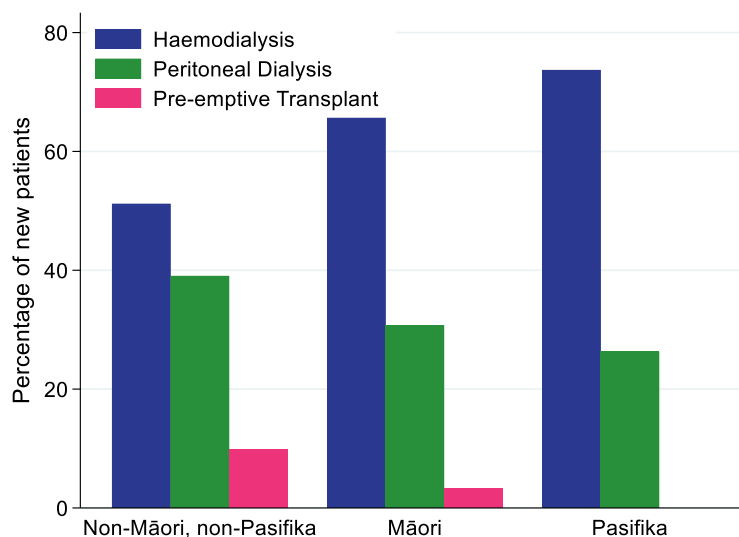
Please note that collection of ethnicity data in ANZDATA has evolved to align with the Australian Bureau of Statistics Australian Standard Classification of Cultural and Ethnic Groups² and data collection now allows a patient to nominate more than one ethnicity group. However, consultation regarding ethnicity data reporting is ongoing, and reporting guidelines are not finalised at publication. As a result, ethnicity data throughout this report includes only the first ethnicity category entered for each patient. Future reporting will aim to report more accurately on patients identifying as more than one ethnicity.

Figure 9.13 - Incidence of KRT by Ethnicity - Aotearoa New Zealand 2017-2021



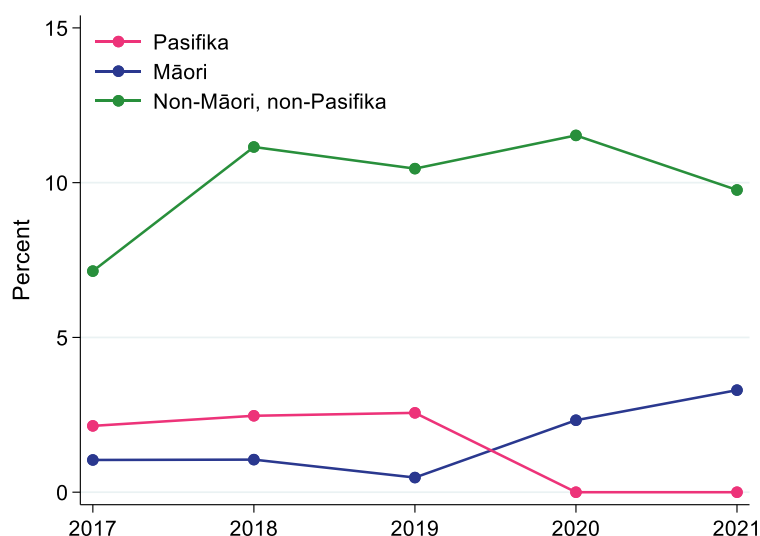
The initial therapy for patients starting KRT by ethnicity is in figure 9.14. Overall, 10% of Non-Māori, and non-Pasifika patients had a pre-emptive kidney transplant, while 3% of incident Māori patients received pre-emptive kidney transplants and 0% of Pasifika patients.

Figure 9.14 - Incidence of KRT by Ethnicity and Modality - Aotearoa New Zealand 2021



The rate of pre-emptive kidney transplants has continued to be markedly lower among Māori and Pasifika patients compared to Non-Māori and non-Pasifika patients. However, there has been an increase in pre-emptive renal transplantation amongst Maori patients since 2017 (figure 9.15).

Figure 9.15 - Percentage of Patients Starting KRT with Pre-emptive Kidney Transplant in Aotearoa New Zealand 2017-2021

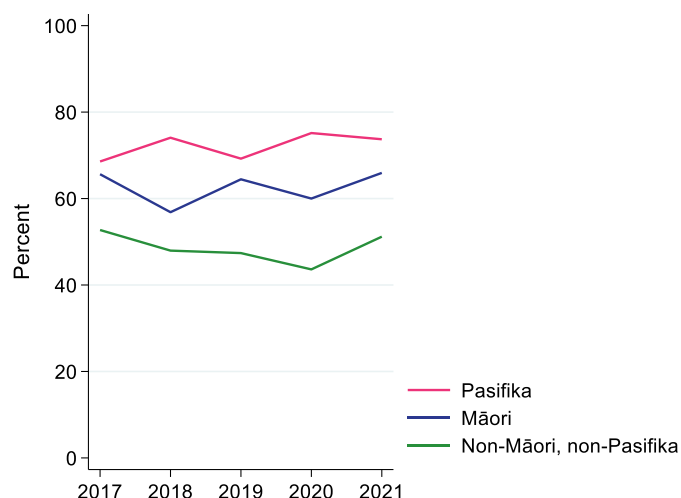


A total of 182 patients identifying as Māori, and 175 patients identifying as Pasifika, commenced treatment for kidney failure in 2021, representing 26% and 25%, respectively, of all patients starting kidney replacement therapy. This inequity in the incidence of kidney failure treated with kidney replacement therapy in Māori and Pasifika is persistent. The rate of haemodialysis commencement for non-Māori, and non-Pasifika patients was 3-fold lower than for Māori and 7-fold lower than for Pasifika. Māori and Pasifika were more likely to commence haemodialysis (HD) than peritoneal dialysis (PD) than non-Māori, non-Pasifika patients (figure 9.16). Only 6 Māori and no Pasifika patients had a pre-emptive kidney transplant in 2021. In the last 5 years, 16 Māori patients and 11 Pasifika have received a pre-emptive kidney transplant compared with 151 non-Māori, non-Pasifika patients (a 9-fold difference for Māori and 14-fold difference for Pasifika).

Table 9.3 New Patients (pmp) Aotearoa New Zealand 2017-2021

Year	Modality	Non-Māori, non-Pasifika	Māori	Pasifika	Total
2017	HD	155 (43)	126 (157)	96 (242)	377 (78)
	PD	118 (33)	64 (80)	41 (103)	223 (46)
	Pre-emptive Transplant	21 (6)	2 (2)	3 (8)	26 (5)
2018	HD	129 (35)	108 (132)	120 (294)	357 (73)
	PD	110 (30)	80 (98)	38 (93)	228 (47)
	Pre-emptive Transplant	30 (8)	2 (2)	4 (10)	36 (7)
2019	HD	136 (36)	136 (163)	108 (258)	380 (76)
	PD	121 (32)	74 (89)	44 (105)	239 (48)
	Pre-emptive Transplant	30 (8)	1 (1)	4 (10)	35 (7)
2020	HD	140 (37)	129 (151)	124 (288)	393 (77)
	PD	144 (38)	81 (95)	41 (95)	266 (52)
	Pre-emptive Transplant	37 (10)	5 (6)	0 (0)	42 (8)
2021	HD	173 (45)	120 (138)	129 (293)	422 (82)
	PD	132 (34)	56 (64)	46 (105)	234 (45)
	Pre-emptive Transplant	33 (9)	6 (7)	0 (0)	39 (8)

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 2017-2021 are in table 9.4. Māori and Pasifika peoples have a substantially higher rate of diabetic kidney disease than non-Māori, non-Pasifika patients.

Table 9.4 Primary Kidney Disease of New Patients in Aotearoa New Zealand 2017-2021

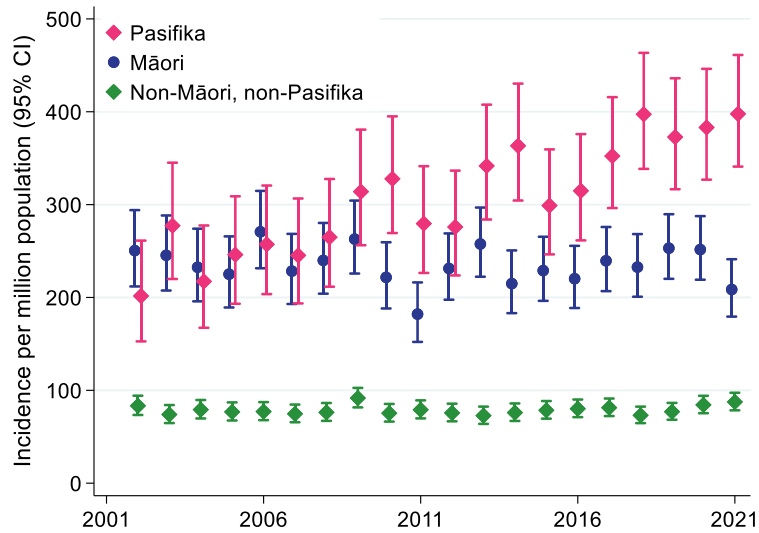
Primary Kidney Disease	Non-Māori, non-Pasifika	Māori	Pasifika
Diabetic Kidney Disease	423 (28%)	653 (66%)	501 (63%)
Glomerular Disease	377 (25%)	132 (13%)	99 (12%)
Hypertension	199 (13%)	49 (5%)	34 (4%)
Polycystic Disease	124 (8%)	13 (1%)	8 (1%)
Reflux Nephropathy	41 (3%)	14 (1%)	6 (1%)
Other	276 (18%)	96 (10%)	110 (14%)
Uncertain	61 (4%)	29 (3%)	28 (4%)
Not reported	8 (1%)	4 (<1%)	12 (2%)
Total	1509	990	798

Incidence Rates

Overall, the incidence rates 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.

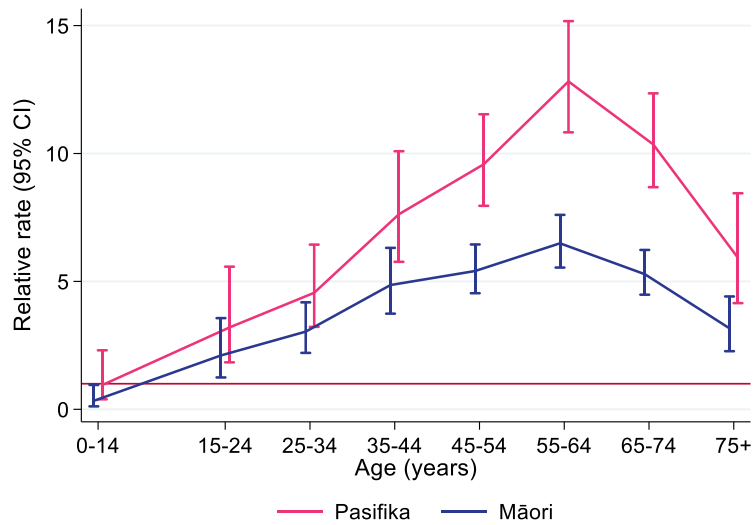
The incidence rates for KRT by ethnicity are in figure 9.17. The relative rate differs with age, see figure 9.18

Figure 9.17 - Unadjusted Incident KRT Rate - Aotearoa New Zealand



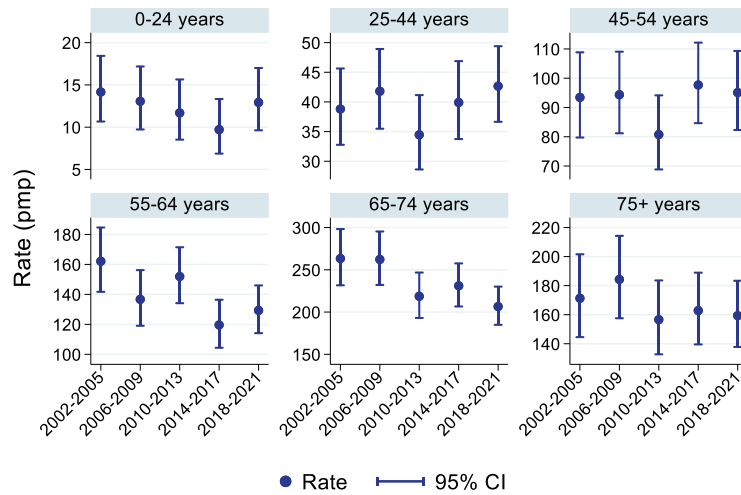
Among Māori and Pasifika peoples, inequities in the incidence of kidney failure occur as early as ages 15 to 24 years and are evident across all age groups (figure 9.18).

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 2017-2021



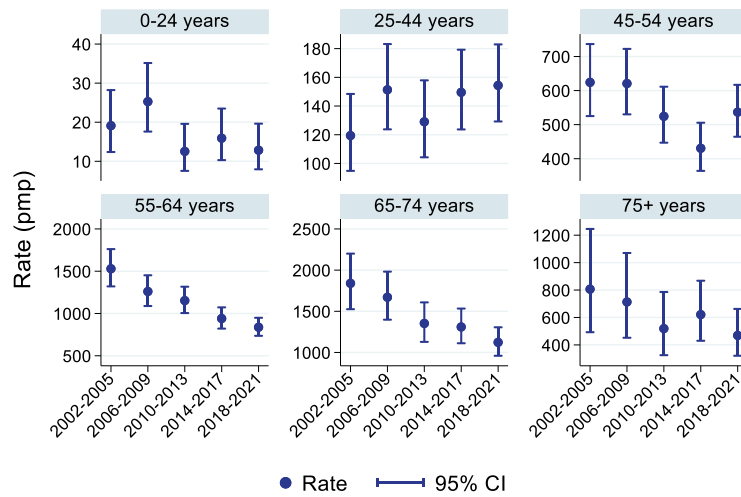
Age-specific trends in kidney replacement therapy are in figures 9.19.1-9.19.3 by patient ethnicity; note that the Y-axis scales vary.

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



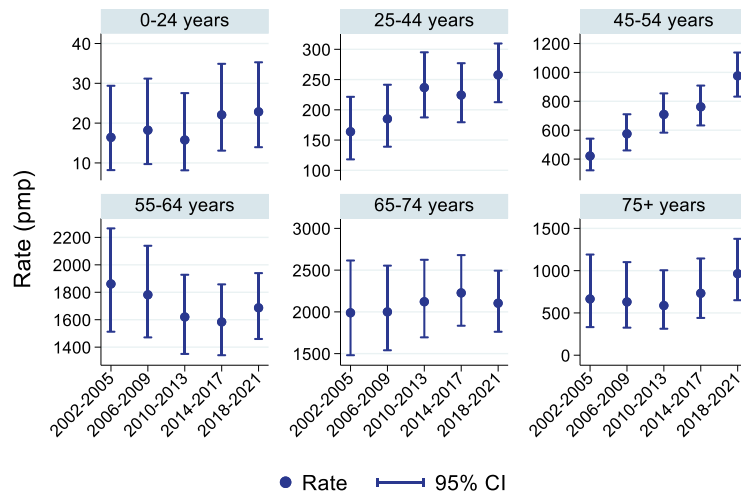
Note the Y axis scales vary between panels

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 patients with treated kidney failure by treatment modality and ethnicity is in table 9.5 and figure 9.20. The proportion of patients undergoing haemodialysis at home in each ethnic group is in figure 9.21.

Table 9.5 Prevalent Patients by Ethnicity and Treatment Modality Aotearoa New Zealand 2017-2021

Year	Modality	Non-Māori, non-Pasifika	Māori	Pasifika
2017	HD	679 (26%)	668 (59%)	579 (64%)
	% HD at home*	28%	21%	18%
	PD	441 (17%)	254 (22%)	164 (18%)
	Transplant	1508 (57%)	213 (19%)	166 (18%)
2018	HD	695 (26%)	660 (57%)	635 (64%)
	% HD at home*	27%	20%	16%
	PD	424 (16%)	266 (23%)	172 (17%)
	Transplant	1550 (58%)	231 (20%)	185 (19%)
2019	HD	688 (25%)	677 (58%)	655 (63%)
	% HD at home*	26%	20%	15%
	PD	399 (15%)	246 (21%)	174 (17%)
	Transplant	1629 (60%)	251 (21%)	208 (20%)
2020	HD	696 (25%)	716 (58%)	721 (66%)
	% HD at home*	24%	17%	14%
	PD	426 (15%)	254 (21%)	163 (15%)
	Transplant	1700 (60%)	267 (22%)	216 (20%)
2021	HD	790 (27%)	760 (60%)	773 (66%)
	% HD at home*	21%	15%	13%
	PD	414 (14%)	225 (18%)	156 (13%)
	Transplant	1759 (59%)	283 (22%)	240 (21%)

*Includes Community House HD

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

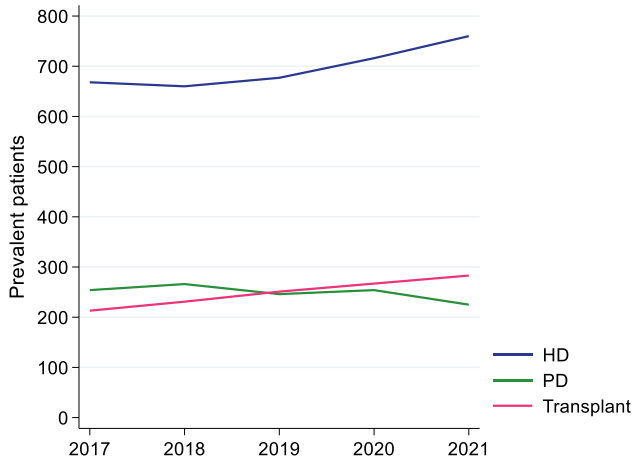


Figure 9.20.2 - Prevalent Patients by Modality - Aotearoa New Zealand - Pasifika

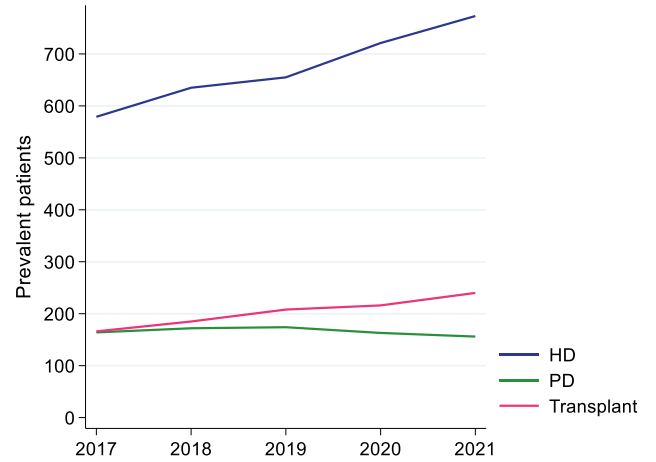


Figure 9.20.3 - Prevalent Patients by Modality - Aotearoa New Zealand - Non-Māori, non-Pasifika

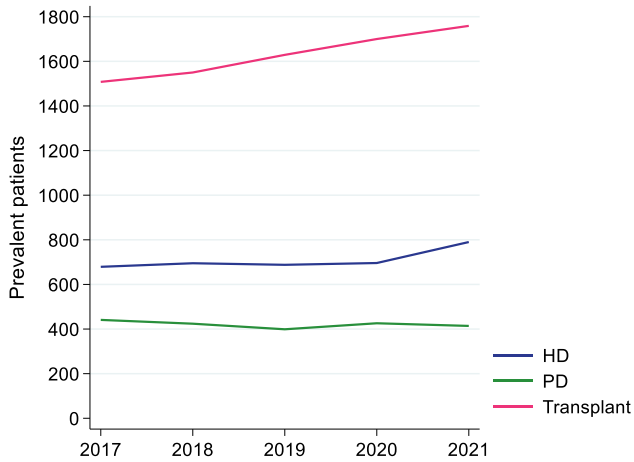
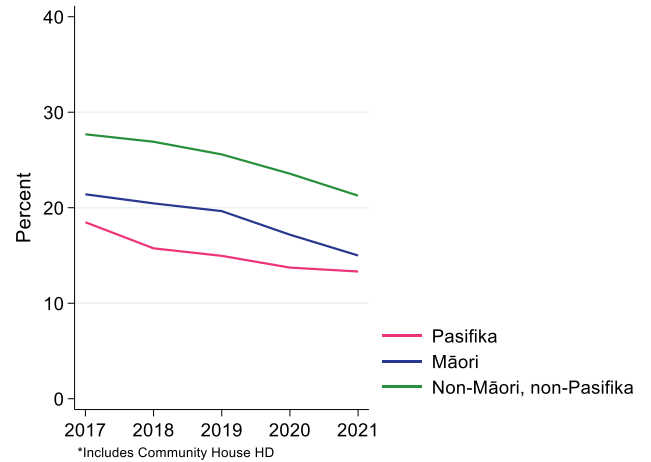


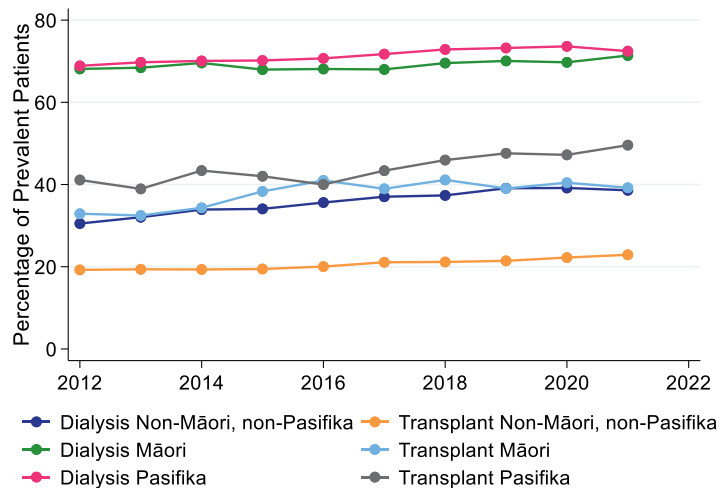
Figure 9.21 - Prevalent Haemodialysis at Home* (% of all HD) by Ethnicity - Aotearoa New Zealand



Diabetes

The percentage of prevalent KRT patients with diabetes as a comorbidity is shown in figure 9.22 by ethnicity and treatment modality.

Figure 9.22 - Diabetes as a Comorbidity in Prevalent Patients - Aotearoa New Zealand, 2012-2021



Incidence and Prevalence per Population

Figures 9.23 to 9.27 show trends in the incidence and prevalence of kidney failure treatment overall and by modality. Of note is the increasing prevalence of transplantation amongst Māori and Pasifika patients (figure 9.27). Figure 9.28 shows mortality by ethnicity.

Figure 9.23 - Incidence of New Patients - Aotearoa New Zealand

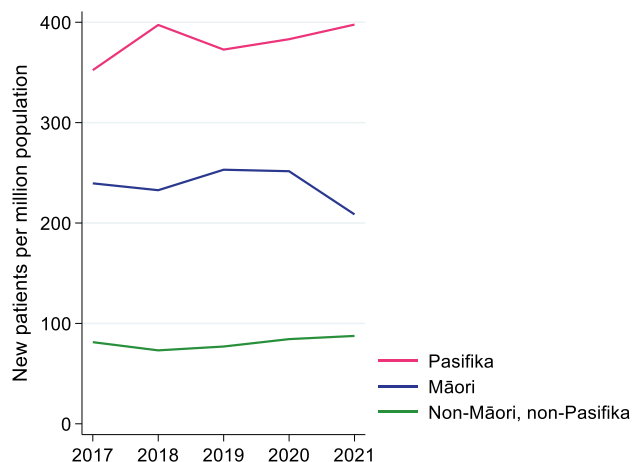


Figure 9.24 - Incidence of New Transplants - Aotearoa New Zealand

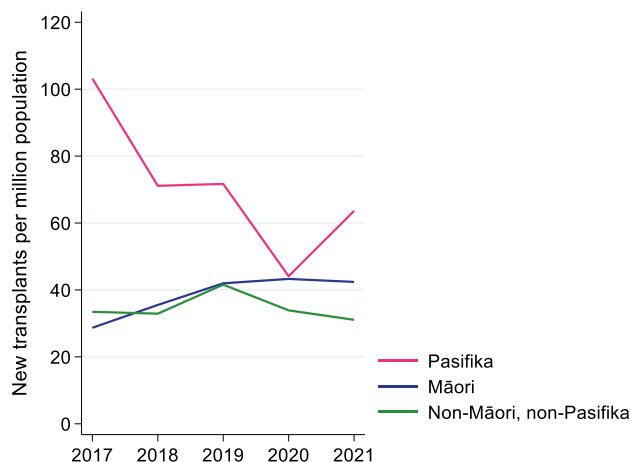


Figure 9.25 - Prevalent Haemodialysis Patients - Aotearoa New Zealand

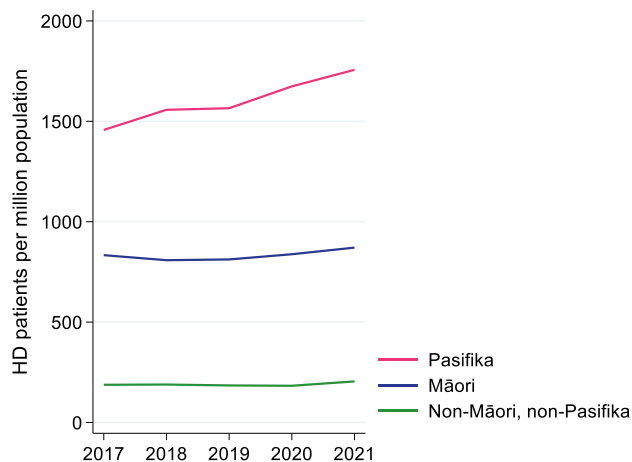


Figure 9.26 - Prevalent Peritoneal Dialysis Patients - Aotearoa New Zealand

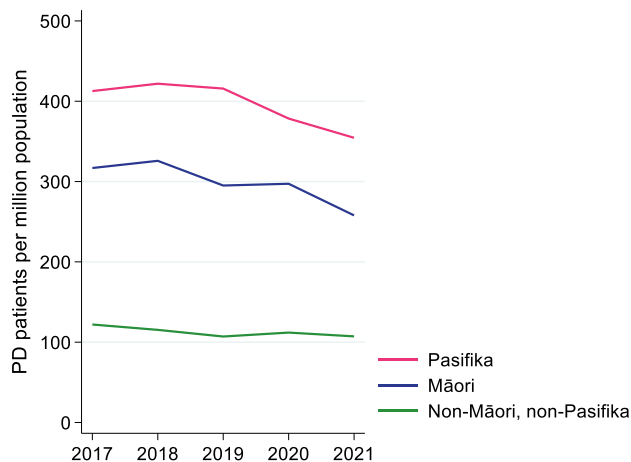


Figure 9.27 - Prevalent Transplant Patients - Aotearoa New Zealand

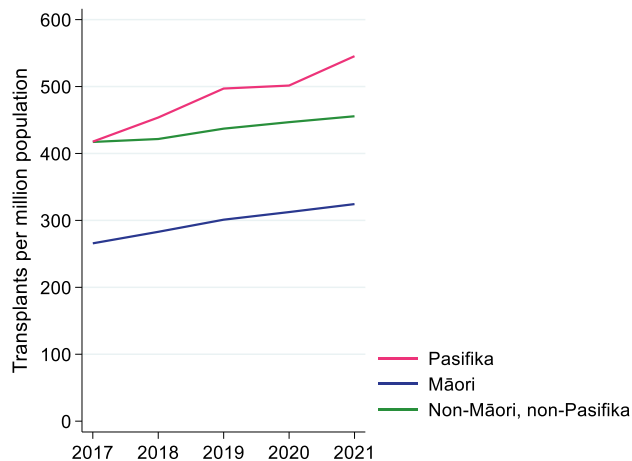
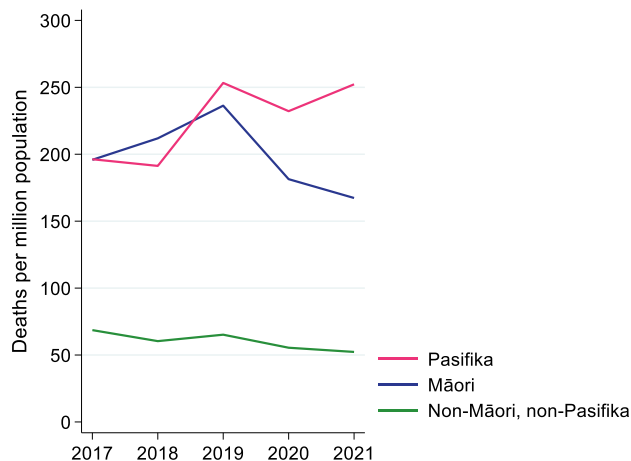


Figure 9.28 - Deaths of KRT Patients - Aotearoa New Zealand



Transplantation

In Aotearoa New Zealand, the proportion of Māori and Pasifika patients who receive a kidney transplant is very low. However, the transplant rate per million population is high due to the prevalence of kidney failure in these populations (table 9.6). Information on the donor source are in figure 9.29, and trends are in figure 9.30.

Table 9.6 Number of Transplant Recipients (pmp) by Donor Type and Ethnicity Aotearoa New Zealand 2012-2021

Year	Donor Type	Non-Māori, non-Pasifika	Māori	Pasifika
2012	DD	37 (11)	11 (15)	6 (17)
	LD	48 (14)	4 (6)	1 (3)
	Total	85 (26)	15 (21)	7 (20)
2013	DD	46 (14)	5 (7)	6 (17)
	LD	52 (16)	5 (7)	2 (6)
	Total	98 (29)	10 (13)	8 (22)
2014	DD	43 (13)	13 (17)	9 (24)
	LD	54 (16)	10 (13)	7 (19)
	Total	97 (29)	23 (31)	16 (43)
2015	DD	44 (13)	13 (17)	16 (42)
	LD	54 (16)	15 (20)	5 (13)
	Total	98 (28)	28 (36)	21 (56)
2016	DD	58 (16)	13 (17)	19 (49)
	LD	56 (16)	13 (17)	11 (28)
	Total	114 (32)	26 (33)	30 (77)
2017	DD	70 (19)	17 (21)	30 (75)
	LD	51 (14)	6 (7)	11 (28)
	Total	121 (33)	23 (29)	41 (103)
2018	DD	65 (18)	15 (18)	18 (44)
	LD	56 (15)	14 (17)	11 (27)
	Total	121 (33)	29 (36)	29 (71)
2019	DD	82 (22)	24 (29)	23 (55)
	LD	73 (20)	11 (13)	7 (17)
	Total	155 (42)	35 (42)	30 (72)
2020	DD	60 (16)	23 (27)	17 (39)
	LD	69 (18)	14 (16)	2 (5)
	Total	129 (34)	37 (43)	19 (44)
2021	DD	57 (15)	23 (26)	21 (48)
	LD	63 (16)	14 (16)	7 (16)
	Total	120 (31)	37 (42)	28 (64)

DD: Deceased Donor, LD: Living Donor

Figure 9.29 - Donor Type by Ethnicity - Aotearoa New Zealand 2012-2021

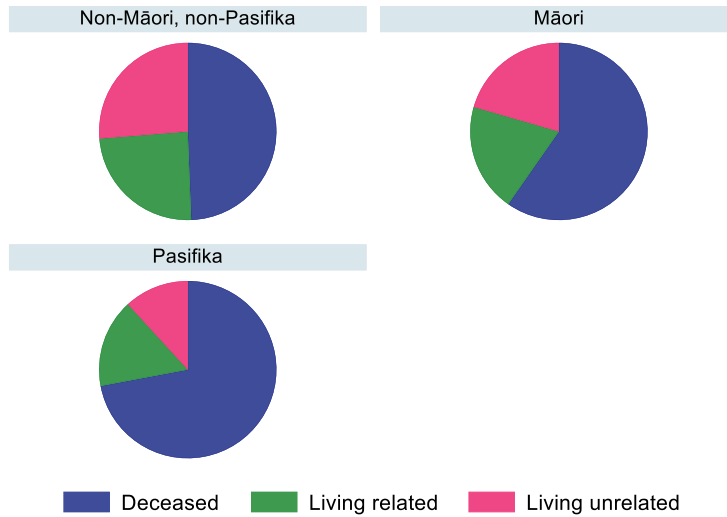


Figure 9.30 - Donor Type by Ethnicity and Year - Aotearoa New Zealand

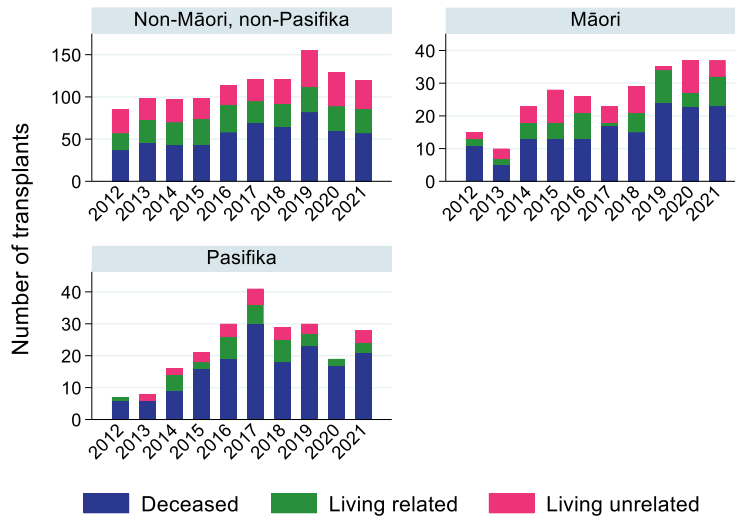
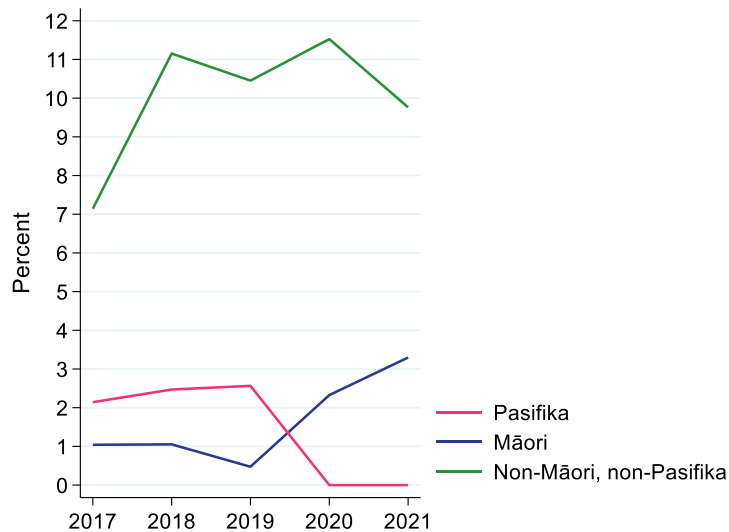


Figure 9.31 - Percentage of Patients Starting KRT with Pre-emptive Kidney Transplant - Aotearoa New Zealand

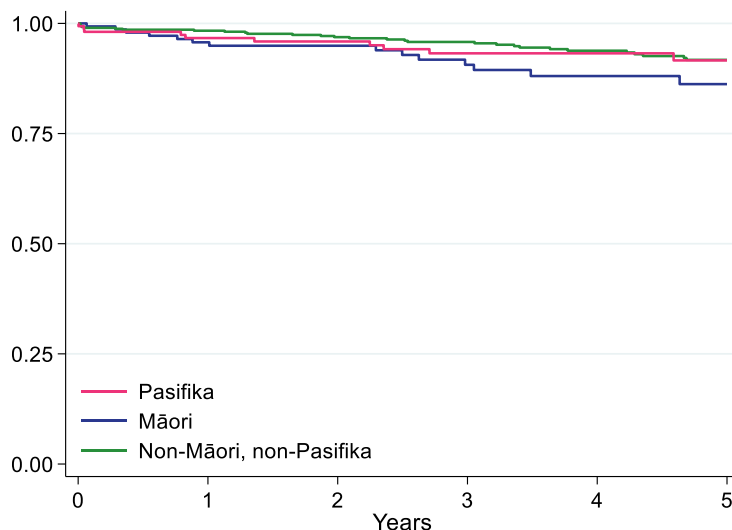


Transplant Survival

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.

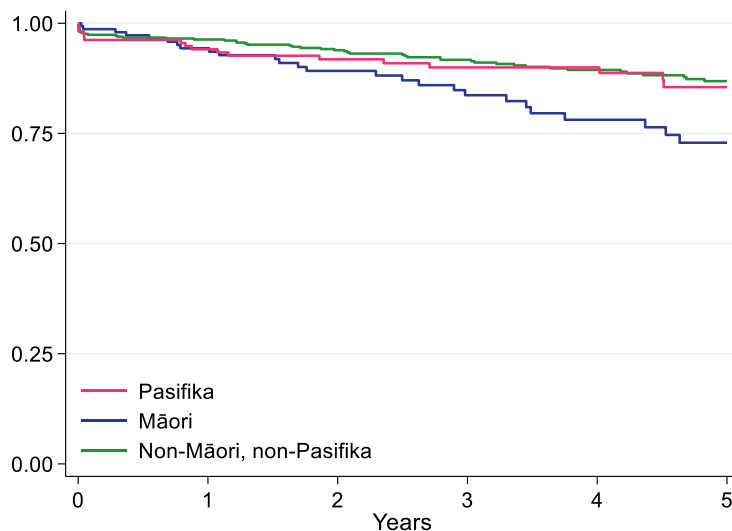
There is a small difference in patient survival after kidney transplantation from a deceased donor between Māori and non-Māori, non-Pasifika recipients, which is apparent from 6 months after transplantation. At 5 years post-transplant, 86% of Māori recipients, 92% of Pasifika recipients, and 92% of non-Māori, 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 2012-2021



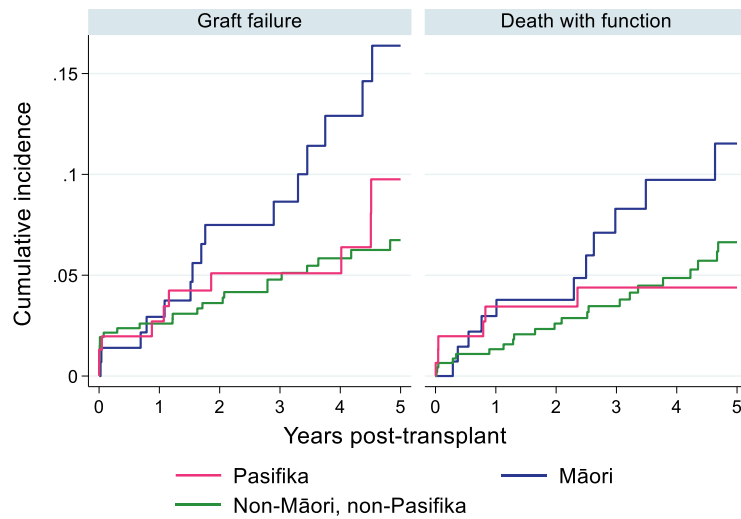
Over the first 5 years after a kidney transplant from a deceased donor, some kidney transplants are lost, either through the transplant failing or the patient dying with a functioning kidney. Over time, there are increasing proportions of Māori and Pasifika recipients who experienced graft loss compared with non-Māori, non-Pasifika persons. The proportion of functioning kidney transplants at 5 years post-transplant was 73% for Māori and 85% 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 2012-2021



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.

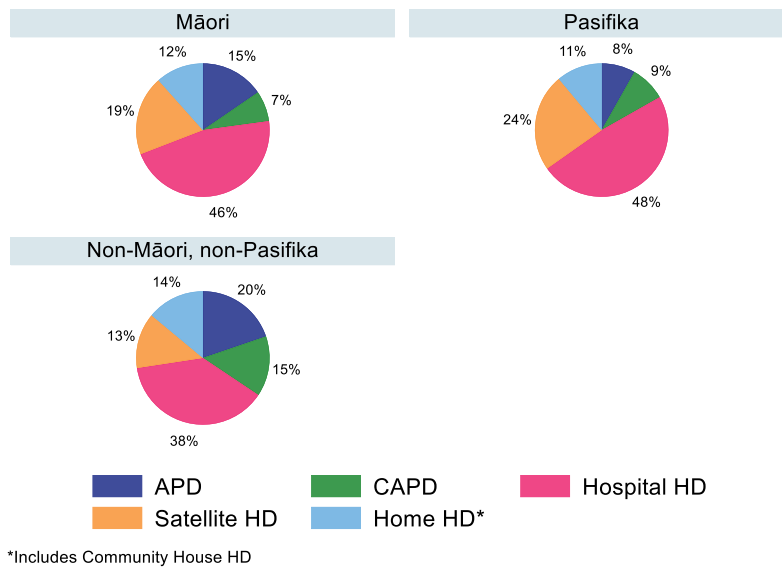
Figure 9.34 - Transplant Outcomes, Aotearoa New Zealand - Primary Deceased Donor Kidney-only Transplants 2012-2021



Dialysis

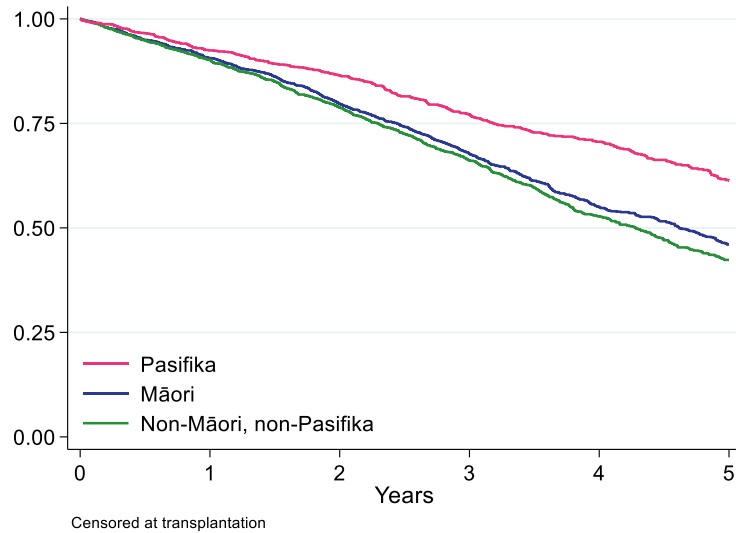
The distribution of dialysis modality is shown graphically in figure 9.35. Māori and Pasifika patients have higher use of facility dialysis as the principal modality of care and lower use of the home-based modalities.

Figure 9.35 - Dialysis Modality End 2021 - Aotearoa New Zealand, by Ethnicity



Half of the people who started dialysis in 2012-2021 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 better survival. Observed differences in survival between populations may reflect different age distributions and access to competing treatments (transplantation), which may have impacted mortality estimates.

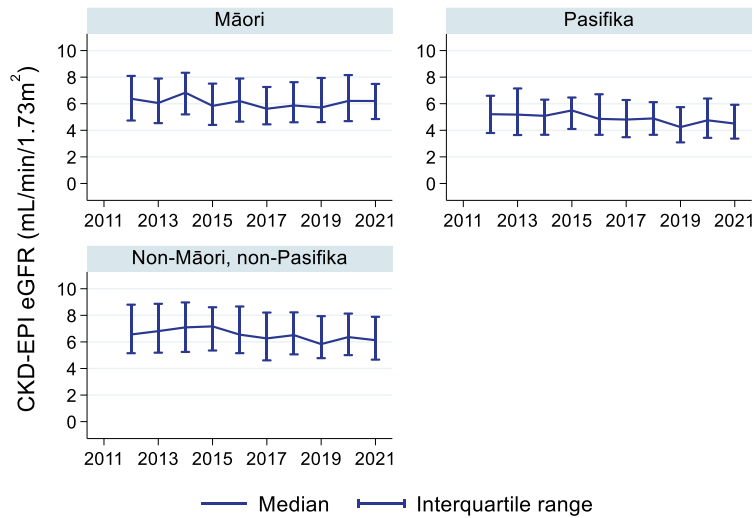
Figure 9.36 - Patient Survival, Incident Dialysis Patients - Aotearoa New Zealand 2012-2021



Timing of Dialysis Initiation

The level of kidney function at which dialysis is commenced (based on estimated Glomerular Filtration Rate (eGFR)) is shown in figure 9.37 by patient ethnicity.

Figure 9.37 - eGFR at Dialysis Initiation - Aotearoa New Zealand



Vascular Access

Incident Vascular Access

Incident vascular access data by patient ethnicity are documented in table 9.7, and prevalent data is in table 9.8.

Table 9.7 Incident Vascular Access Aotearoa New Zealand 2017-2021

Year	Vascular access	Non-Māori, non-Pasifika	Māori	Pasifika
2017	AVF	35 (23%)	33 (26%)	25 (26%)
	AVG	2 (1%)	3 (2%)	1 (1%)
	CVC	116 (75%)	88 (70%)	70 (73%)
	Not reported	2 (1%)	2 (2%)	0 (0%)
2018	AVF	28 (22%)	22 (20%)	22 (18%)
	AVG	2 (2%)	0 (0%)	1 (1%)
	CVC	98 (76%)	86 (80%)	97 (81%)
	Not reported	1 (1%)	0 (0%)	0 (0%)
2019	AVF	33 (24%)	28 (21%)	20 (19%)
	AVG	2 (1%)	0 (0%)	1 (1%)
	CVC	101 (74%)	107 (79%)	87 (81%)
	Not reported	0 (0%)	1 (1%)	0 (0%)
2020	AVF	30 (21%)	22 (17%)	33 (27%)
	AVG	0 (0%)	0 (0%)	0 (0%)
	CVC	109 (78%)	107 (83%)	90 (73%)
	Not reported	1 (1%)	0 (0%)	1 (1%)
2021	AVF	42 (24%)	21 (18%)	29 (22%)
	AVG	1 (1%)	0 (0%)	0 (0%)
	CVC	129 (75%)	99 (83%)	100 (78%)
	Not reported	1 (1%)	0 (0%)	0 (0%)

AVF: Arteriovenous Fistula, AVF: Arteriovenous Graft, CVC: Central Venous Catheter

Prevalent Vascular Access

Vascular access for prevalent dialysis patients are in table 9.8 by patient ethnicity.

Table 9.8 Prevalent Vascular Access Aotearoa New Zealand 2017-2021

Year	Vascular access	Non-Māori, non-Pasifika	Māori	Pasifika
2017	AVF	416 (61%)	453 (68%)	412 (71%)
	AVG	19 (3%)	26 (4%)	15 (3%)
	CVC	222 (33%)	177 (26%)	140 (24%)
	Not reported	22 (3%)	12 (2%)	12 (2%)
2018	AVF	412 (59%)	444 (67%)	420 (66%)
	AVG	17 (2%)	21 (3%)	11 (2%)
	CVC	245 (35%)	180 (27%)	191 (30%)
	Not reported	21 (3%)	15 (2%)	13 (2%)
2019	AVF	394 (57%)	422 (62%)	431 (66%)
	AVG	15 (2%)	18 (3%)	5 (1%)
	CVC	250 (36%)	212 (31%)	190 (29%)
	Not reported	29 (4%)	25 (4%)	29 (4%)
2020	AVF	381 (55%)	411 (57%)	434 (60%)
	AVG	11 (2%)	17 (2%)	13 (2%)
	CVC	270 (39%)	251 (35%)	256 (36%)
	Not reported	34 (5%)	37 (5%)	18 (2%)
2021	AVF	397 (50%)	448 (59%)	432 (56%)
	AVG	11 (1%)	11 (1%)	10 (1%)
	CVC	327 (41%)	265 (35%)	296 (38%)
	Not reported	55 (7%)	36 (5%)	35 (5%)

Patient Flow

Table 9.9 shows the overall patient flow in New Zealand by ethnicity. Notably, mortality for Māori and Pasifika patients is 3 to 5-fold higher per million of the population than that of non-Māori, non-Pasifika patients.

Table 9.9 Patient Flow (pmp) Aotearoa New Zealand 2017-2021

Year	Event	Non-Māori, non-Pasifika	Māori	Pasifika
2017	New patients	294 (81)	192 (240)	140 (352)
	New transplants	121 (33)	23 (29)	41 (103)
	Pre-emptive transplants	21 (6)	2 (2)	3 (8)
	Prevalent dialysis	1120 (310)	922 (1150)	743 (1870)
	Prevalent transplants	1508 (417)	213 (266)	166 (418)
	Total prevalence	2628 (727)	1135 (1416)	909 (2287)
	Deaths	244 (68)	156 (195)	77 (194)
2018	New patients	269 (73)	190 (233)	162 (397)
	New transplants	121 (33)	29 (36)	29 (71)
	Pre-emptive transplants	30 (8)	2 (2)	4 (10)
	Prevalent dialysis	1119 (304)	926 (1134)	807 (1979)
	Prevalent transplants	1550 (422)	231 (283)	185 (454)
	Total prevalence	2669 (726)	1157 (1417)	992 (2433)
	Deaths	217 (59)	170 (208)	78 (191)
2019	New patients	287 (77)	211 (253)	156 (373)
	New transplants	155 (42)	35 (42)	30 (72)
	Pre-emptive transplants	30 (8)	1 (1)	4 (10)
	Prevalent dialysis	1087 (292)	923 (1107)	829 (1981)
	Prevalent transplants	1629 (437)	251 (301)	208 (497)
	Total prevalence	2716 (729)	1174 (1408)	1037 (2478)
	Deaths	239 (64)	194 (233)	106 (253)
2020	New patients	321 (84)	215 (252)	165 (383)
	New transplants	128 (34)	37 (43)	19 (44)
	Pre-emptive transplants	37 (10)	5 (6)	0 (0)
	Prevalent dialysis	1122 (295)	970 (1135)	884 (2052)
	Prevalent transplants	1700 (447)	267 (312)	216 (501)
	Total prevalence	2822 (742)	1237 (1448)	1100 (2554)
	Deaths	209 (55)	155 (181)	100 (232)
2021	New patients	338 (88)	182 (209)	175 (398)
	New transplants	120 (31)	37 (42)	28 (64)
	Pre-emptive transplants	33 (9)	6 (7)	0 (0)
	Prevalent dialysis	1204 (312)	985 (1129)	929 (2111)
	Prevalent transplants	1759 (456)	283 (324)	240 (545)
	Total prevalence	2963 (767)	1268 (1453)	1169 (2656)
	Deaths	201 (52)	146 (167)	111 (252)

Cause of Death

The causes of death in 2021 are in figure 9.38 and table 9.10, categorised by ethnicity and modality at the time of death.

Differences between ethnicities are likely to reflect, at least in part, the different age distributions of these populations.

Figure 9.38 - Cause of Death by Modality and Ethnicity - Deaths Occurring During 2021, Aotearoa New Zealand

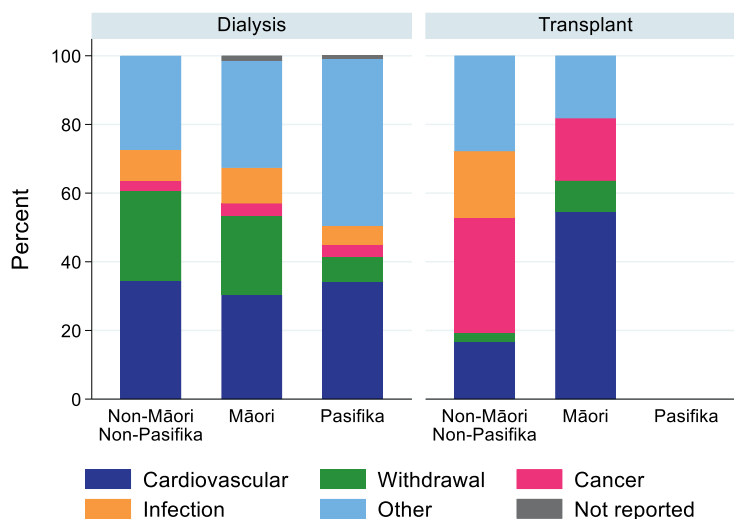


Table 9.10 Cause of Death by Modality and Ethnicity, Aotearoa New Zealand 2021

Modality	Cause of death	Non-Māori, non-Pasifika	Māori	Pasifika
Dialysis	Cardiovascular	57 (35%)	41 (30%)	38 (34%)
	Withdrawal	43 (26%)	31 (23%)	8 (7%)
	Cancer	5 (3%)	5 (4%)	4 (4%)
	Infection	15 (9%)	14 (10%)	6 (5%)
	Other	45 (27%)	42 (31%)	54 (49%)
	Not reported	0 (0%)	2 (1%)	1 (1%)
	Total		165	135
Transplant	Cardiovascular	6 (17%)	6 (55%)	0 (0%)
	Withdrawal	1 (3%)	1 (9%)	0 (0%)
	Cancer	12 (33%)	2 (18%)	0 (0%)
	Infection	7 (19%)	0 (0%)	0 (0%)
	Other	10 (28%)	2 (18%)	0 (0%)
	Not reported	0 (0%)	0 (0%)	0 (0%)
	Total		36	11

Late Referral to Nephrology Services

Late referral rates (defined as the first assessment by a specialist nephrologist within 3 months of commencing dialysis) by ethnicity in Aotearoa New Zealand, are in figure 9.39 and table 9.11.

Figure 9.39 - Late Referral Rates by Ethnicity - Aotearoa New Zealand 2017 – 2021

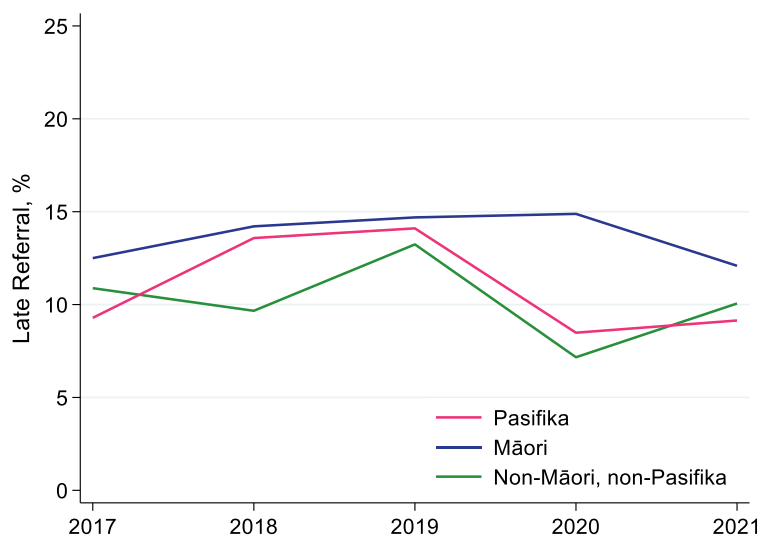


Table 9.11 Percentage of Late Referral by Ethnicity Aotearoa New Zealand 2017-2021

Year	Non-Māori, non-Pasifika	Māori	Pasifika
2017	11%	13%	9%
2018	10%	14%	14%
2019	13%	15%	14%
2020	7%	15%	8%
2021	10%	12%	9%

References

¹ This work is based on/includes Stats NZ's data, licensed by Stats NZ for re-use under the Creative Commons Attribution 4.0 International licence. Stats NZ, 2021, Estimated Resident Population by Age and Sex (1991+) (Annual-Jun), NZ Infoshare, viewed 5 Jan 2022, <http://infoshare.stats.govt.nz/>

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>