



CHAPTER 9

End Stage Kidney Disease 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.

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Executive Summary

This chapter presents information about the rates of end-stage kidney disease in Aotearoa New Zealand, including information stratified by age, gender and ethnicity. Clinical care patterns for treatment of end-stage kidney disease including dialysis and transplantation are described. Population statistics are drawn from estimates provided by Statistics New Zealand to calculate disease and treatment rates. Ethnicity population data are projections produced by Statistics New Zealand according to assumptions agreed to by the New Zealand Ministry of Health.

There are marked and persistent disparities in the incidence and prevalence of end-stage kidney disease and treatment practices in renal replacement therapy based on ethnicity in New Zealand, particularly for Maori and Pacific populations.

Suggested Citation

ANZDATA Registry. 42nd Report, Chapter 9: End Stage Kidney Disease in Aotearoa New Zealand. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2019. Available at: <http://www.anzdata.org.au>

Incidence of Renal Replacement Therapy (RRT)

In 2018, 619 adults and children started renal replacement therapy (RRT) in New Zealand, equivalent to 127 per million of population (pmp) (figure 9.1 and table 9.1). The proportion of the New Zealand population commencing RRT is similar to that of Australia (127 versus 124 pmp in 2018).

Figure 9.1 - Incidence of Renal Replacement Therapy - New Zealand 1989-2018

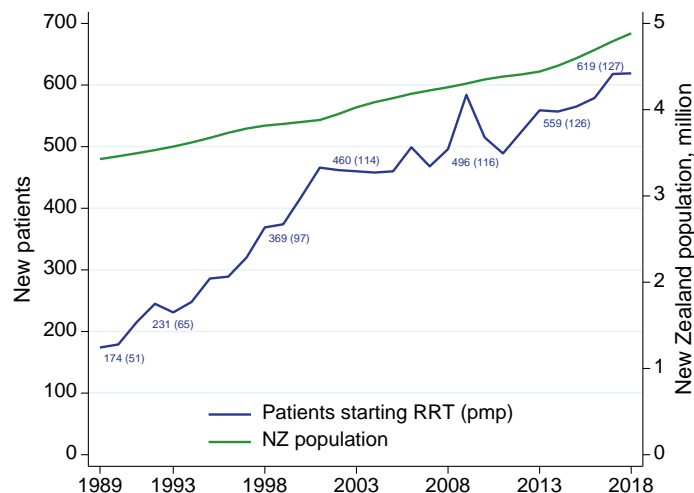
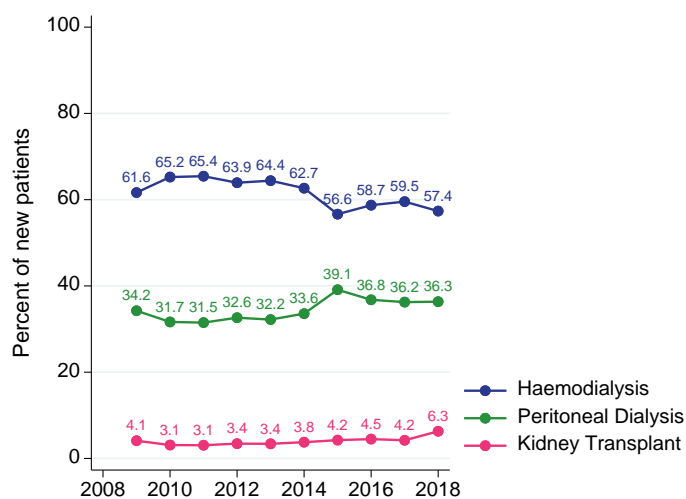


Table 9.1 Number (pmp) who Commenced Renal Replacement Therapy in New Zealand, 2014-2018

	2014	2015	2016	2017	2018
Total	557 (124)	565 (123)	579 (123)	618 (129)	619 (127)
Transplant	21 (5)	24 (5)	26 (6)	26 (5)	39 (8)
Haemodialysis	349 (77)	320 (70)	340 (72)	368 (77)	355 (73)
Peritoneal Dialysis	187 (41)	221 (48)	213 (45)	224 (47)	225 (46)

The proportion of patients who started RRT with a pre-emptive kidney transplant in New Zealand increased in 2018 to 6% of all incident patients (figure 9.2). The proportion of patients starting RRT with haemodialysis has been decreasing in recent years, whereas the proportion of patients starting RRT with peritoneal dialysis has been relatively stable.

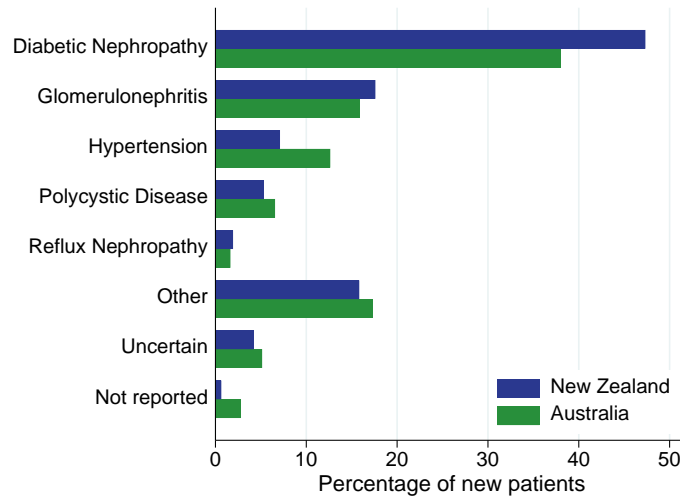
Figure 9.2 - Trends in Modality at Start of Renal Replacement Therapy - New Zealand 2009-2018



Primary Renal Disease

The leading cause of end-stage kidney disease in New Zealand in 2018 was diabetes (47%), followed by glomerulonephritis (18%) (figure 9.3). There is marked variation by ethnicity, with diabetic nephropathy the cause of ESKD in 2018 in 19%, 67%, 64% and 55% of European/Other, Māori, Pasifika and Asian New Zealanders respectively.

Figure 9.3 - Primary Renal Disease of New Patients Commencing Renal Replacement Therapy, 2018

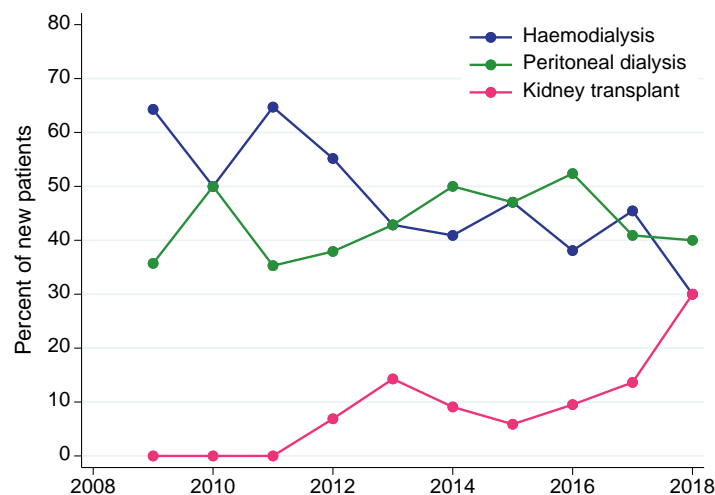


Children and Young Adults

In 2018, 20 patients in the 0-24 age group commenced renal replacement therapy (12 pmp) in New Zealand. The incidence rate of RRT among young patients has ranged between 11 and 14 pmp from 2014-2018. The incidence rate of RRT is variable due to the low numbers of patients commencing RRT in this age group.

Of the 20 younger New Zealand patients commencing RRT in 2018, 6 (30%) patients received a pre-emptive transplant, 8 (40%) patients commenced with peritoneal dialysis, and 6 (30%) patients commenced with haemodialysis (figure 9.4).

Figure 9.4 - Children and Young Adults (0-24 years) Commencing RRT - New Zealand 2009-2018



Age

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

The highest incidence of renal replacement therapy in New Zealand is among patients in the 65-74 age group (388 pmp). Children, young adults, and adults 85 years and older have the lowest rates of renal replacement therapy

Figure 9.5 - Incidence of Renal Replacement Therapy by Age Group - New Zealand, 2009-2018

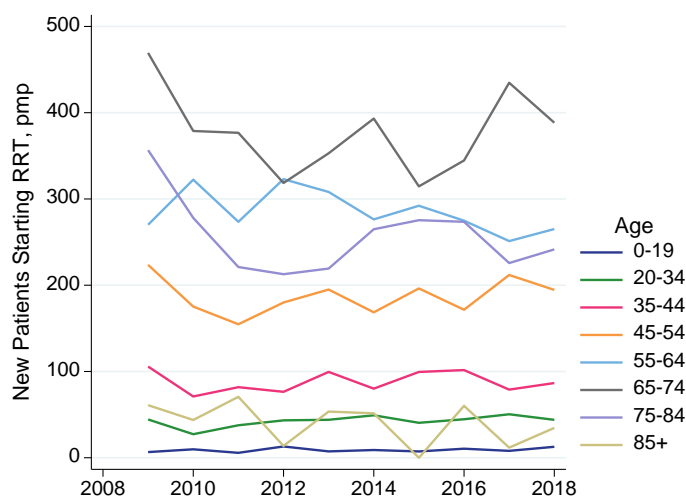
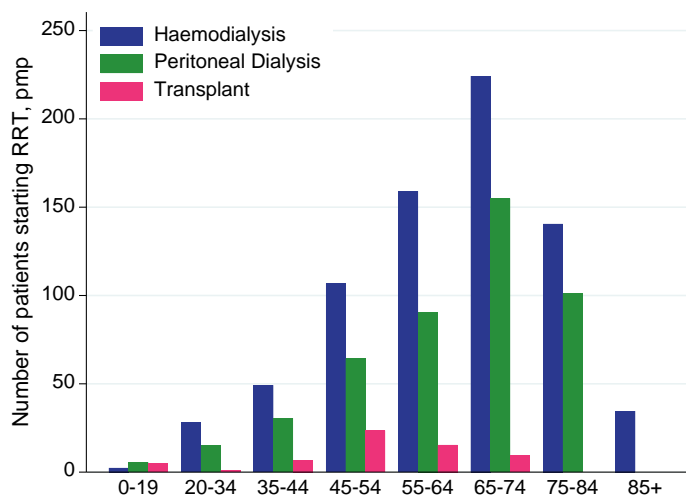


Figure 9.6 - Incidence of RRT by Age Group and Modality - Per Million Population, New Zealand 2018

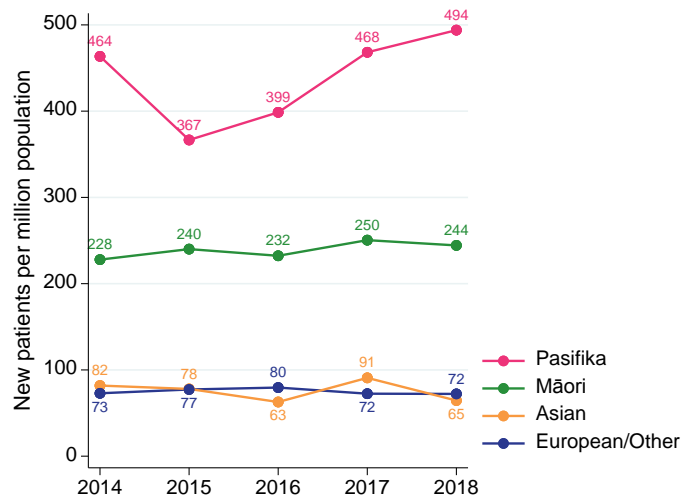


Ethnicity

There are marked and persistent disparities in the incidence and prevalence of end-stage kidney disease and treatment practices in renal replacement therapy based on ethnicity in New Zealand.

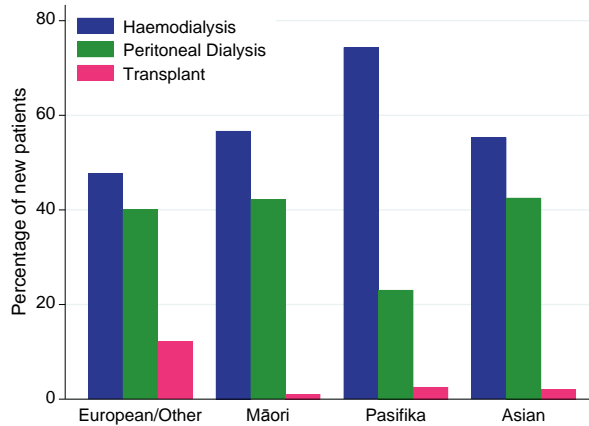
The incidence of renal replacement therapy is markedly higher among Pasifika (494 pmp) and Māori (244 pmp) patients, compared with Asian (65 pmp) and European/Other ethnicities (72 pmp) (figure 9.7).

Figure 9.7 - Incidence of RRT by Ethnicity in New Zealand 2014-2018



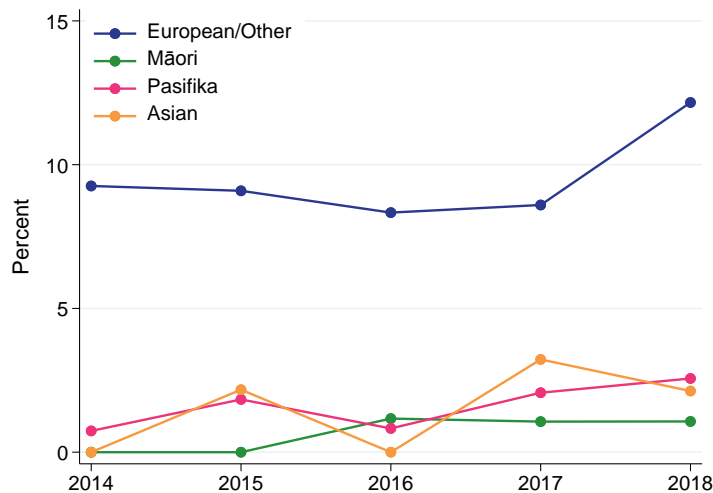
Māori, Pasifika and European/Other ethnicity patients had the highest proportion of patients starting dialysis with haemodialysis (57, 74 and 48 per 100 incident RRT patients), while among Asian patients, the highest proportion of patients started RRT on peritoneal dialysis (43 per 100 incident RRT patients) (figure 9.8). Overall, 12 European/Other ethnicity patients had a pre-emptive kidney transplant per 100 incident patients, while there was one pre-emptive kidney transplant per 100 incident patients among Māori patients, three among Pasifika patients, and two among Asian patients.

Figure 9.8 - Incidence of RRT by Ethnicity and Modality - New Zealand 2018



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 9.9).

Figure 9.9 - Percentage of Patients Starting RRT with Pre-emptive Kidney Transplant in New Zealand 2014-2018



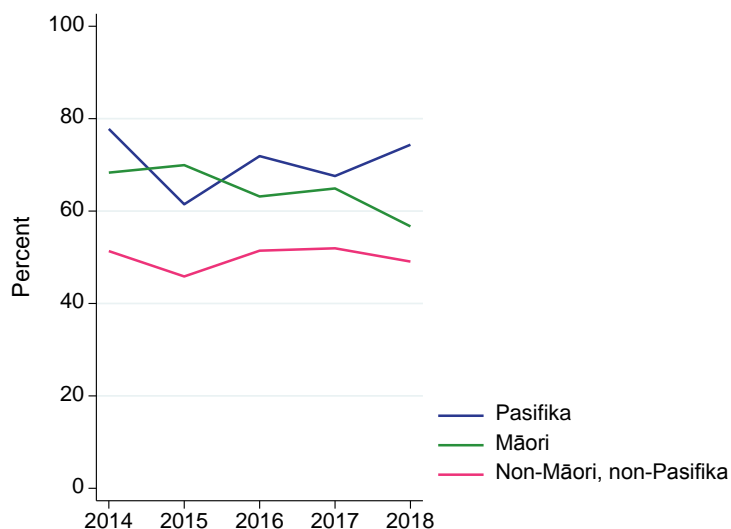
New Patients

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. This disparity in the incidence of end-stage kidney disease for Māori persists. The rate of haemodialysis commencement for 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 patients (figure 9.10). Only two Māori patients received a pre-emptive kidney transplant during 2018. In the last 5 years, six Māori patients have received a pre-emptive kidney transplant compared with 111 non-Māori, non-Pasifika patients (a 19-fold difference).

Table 9.2 New Patients (pmp) New Zealand 2014-2018

Year	Modality	Non-Māori, non-Pasifika	Māori	Pasifika	Total
2014	HD	134 (39)	110 (157)	105 (298)	349 (77)
2014	PD	107 (31)	51 (73)	29 (82)	187 (41)
2014	Graft	20 (6)	0 (0)	1 (3)	21 (5)
2015	HD	127 (36)	121 (170)	67 (185)	315 (69)
2015	PD	128 (36)	52 (73)	40 (111)	220 (48)
2015	Graft	22 (6)	0 (0)	2 (6)	24 (5)
2016	HD	144 (40)	108 (149)	87 (234)	339 (72)
2016	PD	116 (32)	61 (84)	33 (89)	210 (45)
2016	Graft	20 (6)	2 (3)	1 (3)	23 (5)
2017	HD	147 (40)	122 (166)	98 (258)	367 (77)
2017	PD	115 (31)	64 (87)	44 (116)	223 (47)
2017	Graft	21 (6)	2 (3)	3 (8)	26 (5)
2018	HD	132 (35)	106 (142)	116 (297)	354 (72)
2018	PD	109 (29)	79 (106)	36 (92)	224 (46)
2018	Graft	28 (7)	2 (3)	4 (10)	34 (7)

Figure 9.10 - 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 9.3. Māori and Pasifika peoples experience diabetes at a substantially higher rate than non-Māori, non-Pasifika patients.

Table 9.3 Primary Renal Disease of New Patients New Zealand 2014-2018

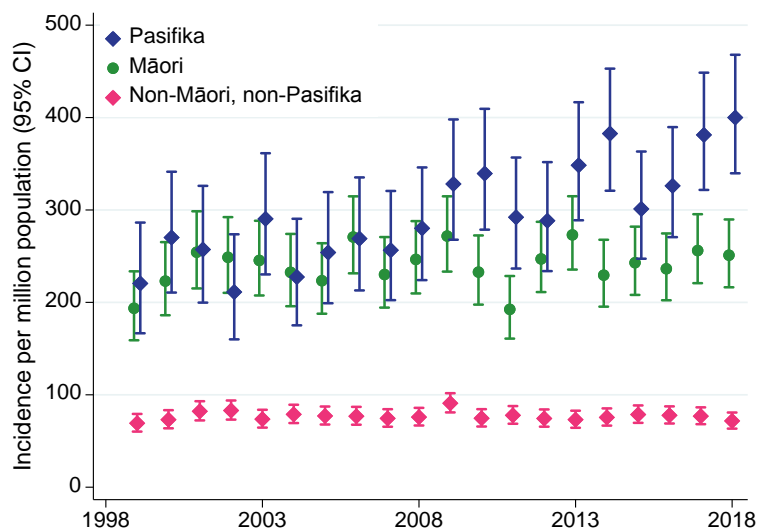
Primary Renal Disease	Non-Māori, non-Pasifika	Māori	Pasifika
Diabetic Nephropathy	382 (28%)	616 (70%)	463 (70%)
Glomerulonephritis	344 (25%)	123 (14%)	89 (13%)
Hypertension	176 (13%)	40 (5%)	34 (5%)
Polycystic Disease	111 (8%)	11 (1%)	9 (1%)
Reflux Nephropathy	48 (4%)	8 (1%)	6 (1%)
Other	241 (18%)	59 (7%)	50 (8%)
Uncertain	61 (4%)	19 (2%)	14 (2%)
Not reported	7 (1%)	4 (<1%)	1 (<1%)
Total	1370	880	666

Incidence Rates

Overall, the incidence rates (per million of population) of end-stage kidney disease for Māori and Pasifika 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 and Pasifika populations are considerably younger.

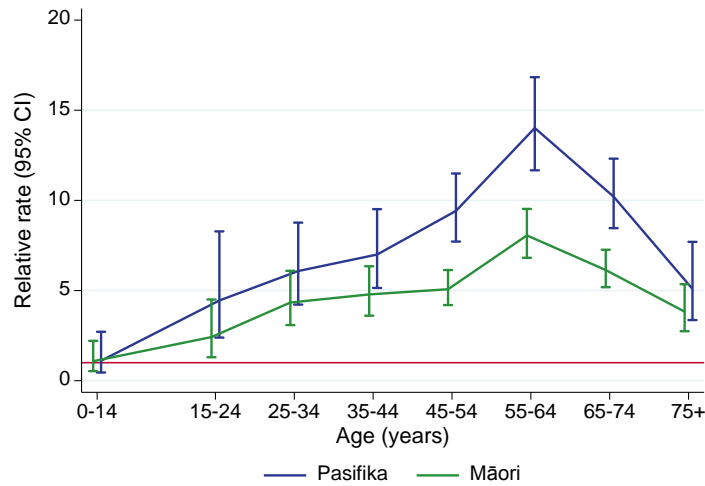
Although rates fluctuate from year to year, the incidence rates for Pasifika people have been increasing in recent years (figure 9.11). The relative rate differs with age - this is illustrated in figure 9.12.

Figure 9.11 - Unadjusted Incident RRT Rate - New Zealand



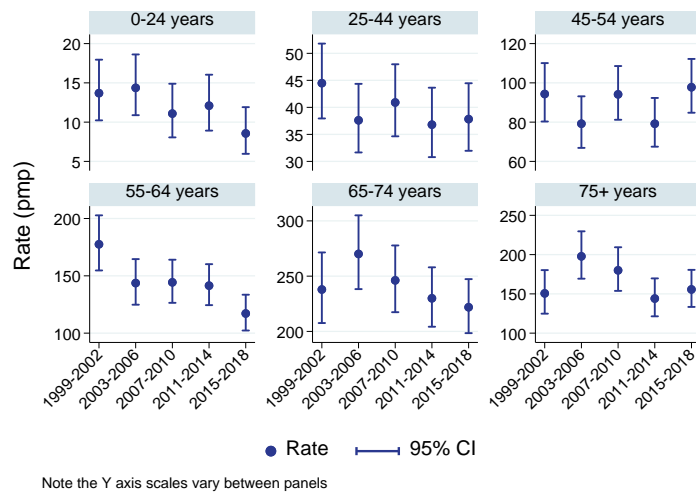
Among Māori and Pasifika peoples, disparities in the incidence of end-stage kidney disease occur as early as ages 15 to 24 years and are evident across all age groups (figure 9.12).

Figure 9.12 - Relative Incidence Rate of Treated ESKD for Māori and Pasifika Patients, compared with non-Māori, non-Pasifika patients - New Zealand 2014-2018



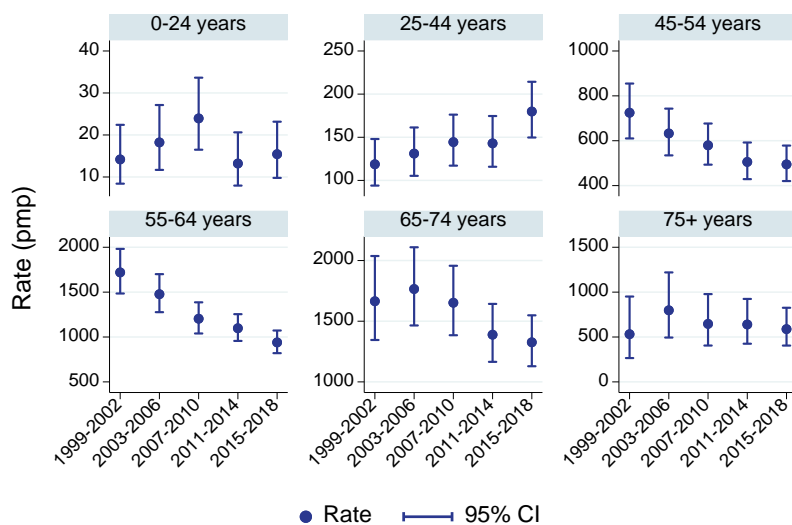
Age specific trends in renal replacement therapy practices for Māori and Pasifika people are shown in figure 9.13; note that the Y axis scales vary.

Figure 9.13.1 - Age-specific Incidence Rates of Treated ESKD - Non-Māori, non-Pasifika, New Zealand



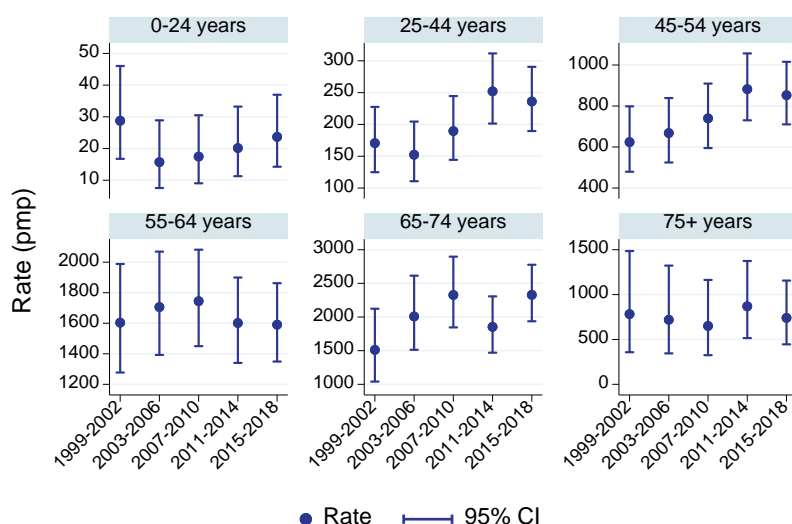
Note the Y axis scales vary between panels

Figure 9.13.2 - Age-specific Incidence Rates of Treated ESKD - Māori, New Zealand



Note the Y axis scales vary between panels

Figure 9.13.3 - Age-specific Incidence Rates of Treated ESKD - Pasifika, New Zealand



Note the Y axis scales vary between panels

Prevalent Patients

The number of prevalent Māori and Pasifika patients with treated end-stage kidney disease continues to rise year-on-year (table 9.4 and figure 9.14). From 2016 to 2018, there were notable increases in the numbers of Māori and Pasifika people receiving peritoneal dialysis or with a kidney transplant. The proportion of patients undergoing haemodialysis at home has been falling in each ethnic group (figure 9.15).

Table 9.4 Prevalent Patients by Ethnicity and Treatment Modality New Zealand 2014-2018

Year	Modality	Non-Māori, non-Pasifika	Māori	Pasifika
2014	HD	684 (28%)	611 (59%)	573 (72%)
	% HD at home	33%	23%	20%
	PD	434 (18%)	269 (26%)	117 (15%)
	Tx	1361 (55%)	160 (15%)	105 (13%)
2015	HD	698 (27%)	637 (61%)	576 (70%)
	% HD at home	31%	22%	22%
	PD	438 (17%)	230 (22%)	127 (15%)
	Tx	1408 (55%)	174 (17%)	118 (14%)
2016	HD	699 (27%)	662 (61%)	567 (68%)
	% HD at home	29%	21%	22%
	PD	449 (17%)	232 (21%)	144 (17%)
	Tx	1450 (56%)	193 (18%)	128 (15%)
2017	HD	680 (26%)	658 (59%)	575 (64%)
	% HD at home	28%	21%	19%
	PD	440 (17%)	254 (23%)	164 (18%)
	Tx	1505 (57%)	207 (18%)	163 (18%)
2018	HD	700 (26%)	649 (57%)	623 (64%)
	% HD at home	27%	20%	16%
	PD	423 (16%)	268 (23%)	173 (18%)
	Tx	1541 (58%)	225 (20%)	182 (19%)

Figure 9.14.1 - Prevalent Patients by Modality - New Zealand – Māori

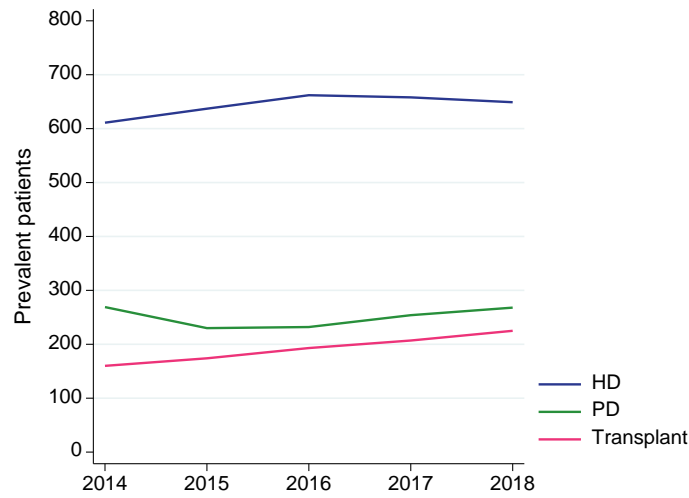


Figure 9.14.2 - Prevalent Patients by Modality - New Zealand - Pasifika

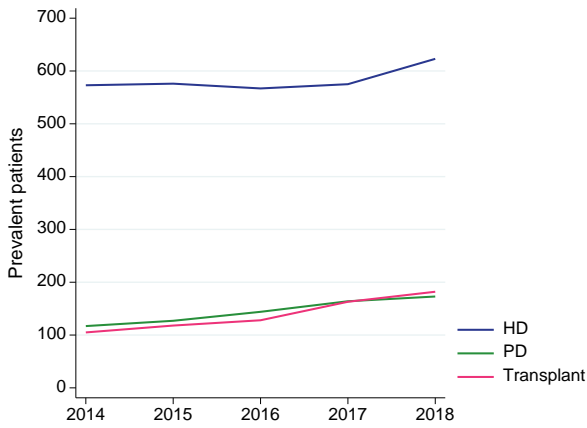


Figure 9.14.3 - Prevalent Patients by Modality - New Zealand - Non-Māori, non-Pasifika

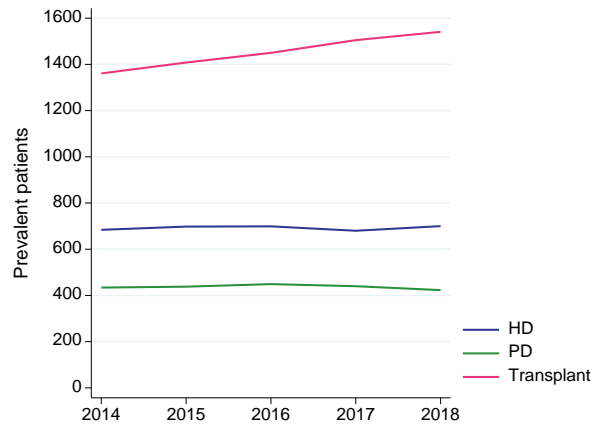
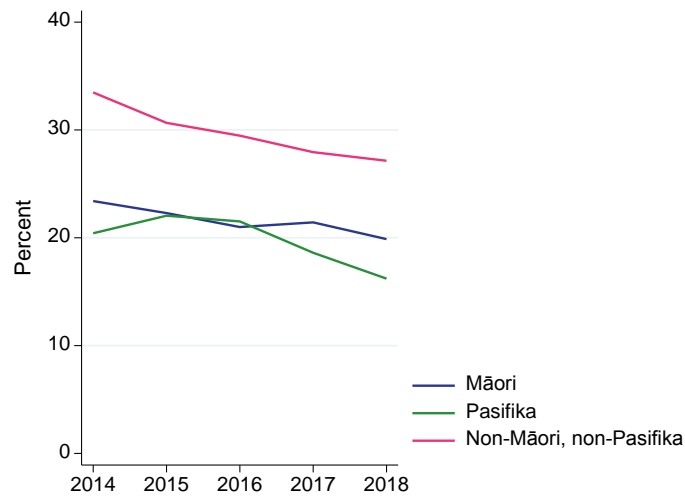


Figure 9.15 - Prevalent Haemodialysis at Home (% of all HD) by Ethnicity - New Zealand



Incidence and Prevalence per Population

Figures 9.16 to 9.21 show trends in the incidence and prevalence of ESKD 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 9.20).

Figure 9.16 - Incidence of New Patients - New Zealand

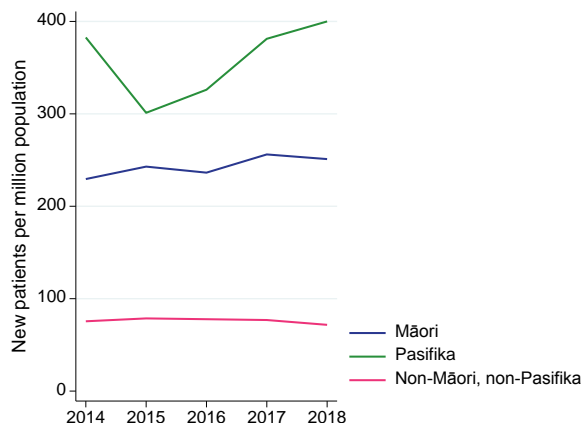


Figure 9.17 - Incidence of New Transplants - New Zealand

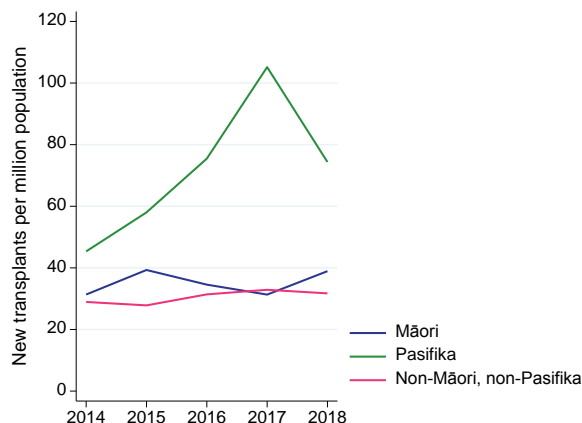


Figure 9.18 - Prevalent Haemodialysis Patients - New Zealand

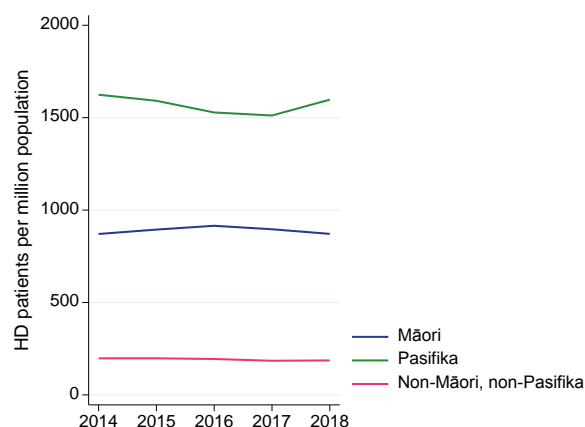


Figure 9.19 - Prevalent Peritoneal Dialysis Patients - New Zealand

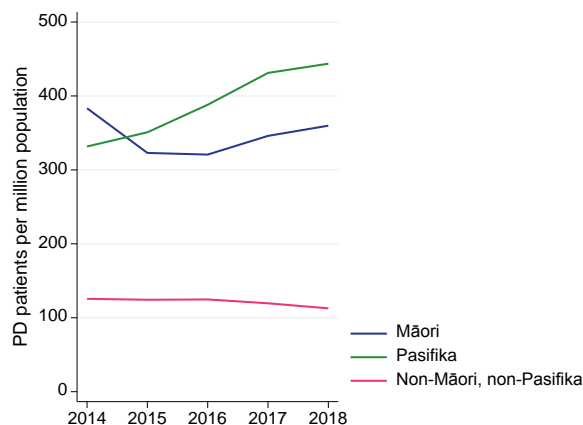


Figure 9.20 - Prevalent Transplant Patients - New Zealand

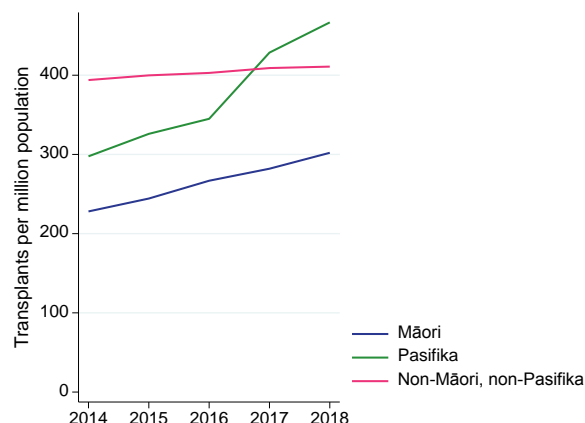
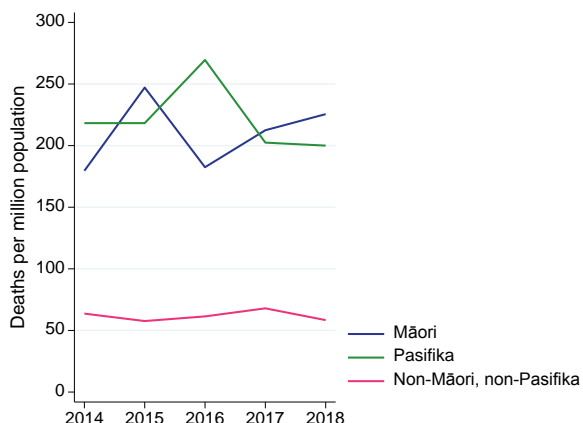


Figure 9.21 - Deaths of RRT Patients - New Zealand



Transplantation

In 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 ESKD in these populations (table 9.5). Information on donor source is shown in figure 9.22 and trends are shown in figure 9.23. Living donor rates have increased for Māori patients since 2013, with increases in living unrelated donors.

Table 9.5 Number of Transplant Recipients (pmp) by Ethnicity New Zealand 2009-2018

Year	Donor Type	Non-Māori, non-Pasifika	Māori	Pasifika
2009	DD	39 (12)	10 (15)	5 (16)
	LD	58 (17)	8 (12)	1 (3)
	Total	97 (29)	18 (27)	6 (19)
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	45 (13)	5 (7)	6 (17)
	LD	53 (16)	4 (6)	2 (6)
	Total	98 (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 (12)	13 (18)	16 (44)
	LD	54 (15)	15 (21)	5 (14)
	Total	98 (28)	28 (39)	21 (58)
2016	DD	57 (16)	12 (17)	18 (49)
	LD	56 (16)	13 (18)	10 (27)
	Total	113 (31)	25 (35)	28 (75)
2017	DD	70 (19)	17 (23)	29 (76)
	LD	51 (14)	6 (8)	11 (29)
	Total	121 (33)	23 (31)	40 (105)
2018	DD	65 (17)	15 (20)	18 (46)
	LD	54 (14)	14 (19)	11 (28)
	Total	119 (32)	29 (39)	29 (74)

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

Figure 9.22 - Donor Type by Ethnicity - New Zealand 2009-2018

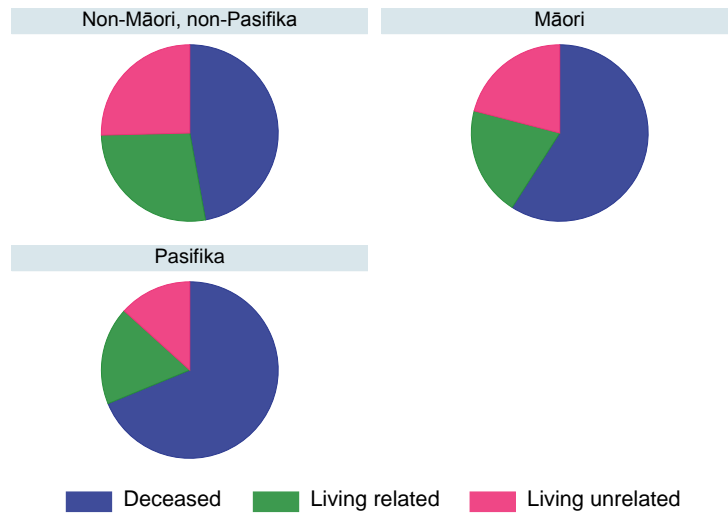


Figure 9.23 - Donor Type by Ethnicity and Year - New Zealand

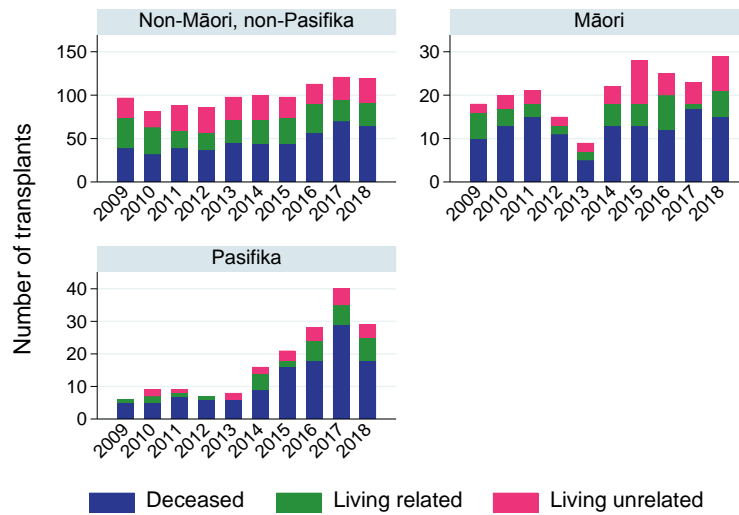
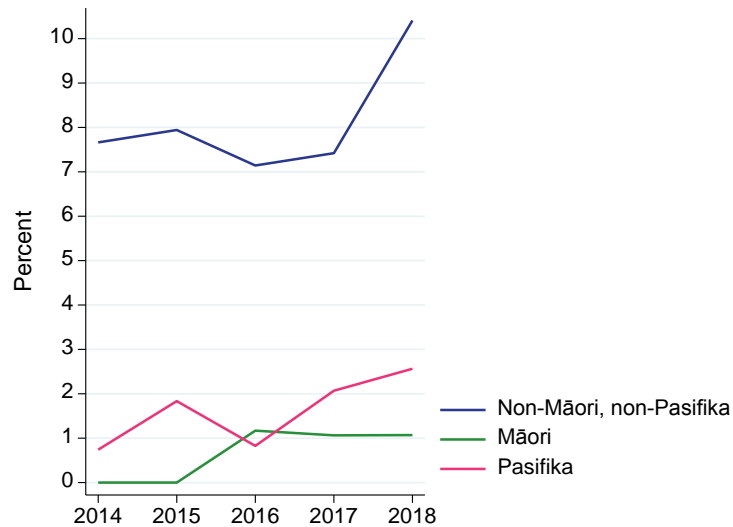


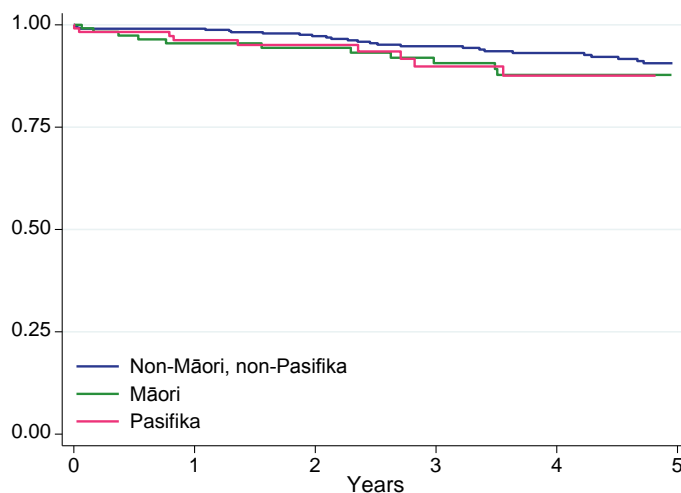
Figure 9.24 - Percentage of Patients Starting RRT with Pre-emptive Kidney Transplant - New Zealand



Transplant Survival

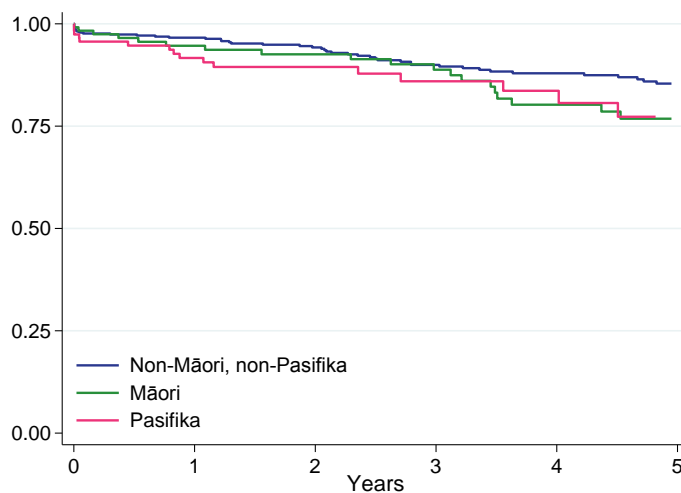
There is a small difference in survival after kidney transplantation from a deceased donor between Māori and non-Māori, non-Pasifika recipients, which is apparent from 6 months after transplantation. At 5 years post-transplant, 88% of Māori recipients and 91% of non-Māori, non-Pasifika recipients were alive 5 years after kidney transplantation from a deceased donation (figure 9.25).

Figure 9.25 - 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 9.26).

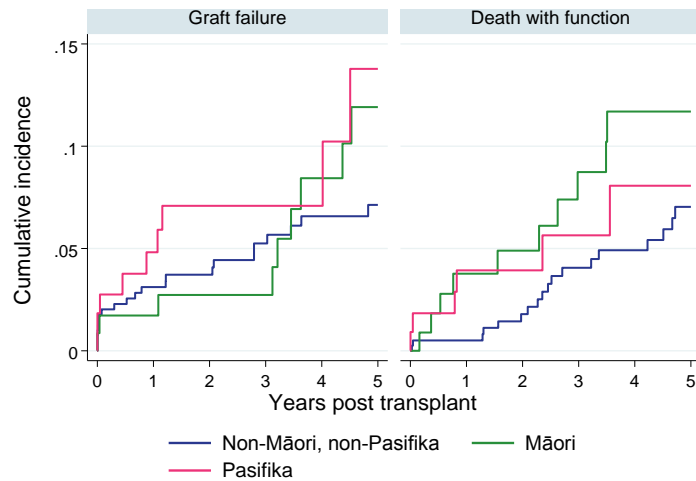
Figure 9.26 - Primary DD Overall Graft Survival 2009-2018 - New Zealand



Cumulative incidence curves (utilising competing risk techniques to account for the effects of both components of graft failure) are shown for transplant outcomes by ethnicity in figure 9.27.

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

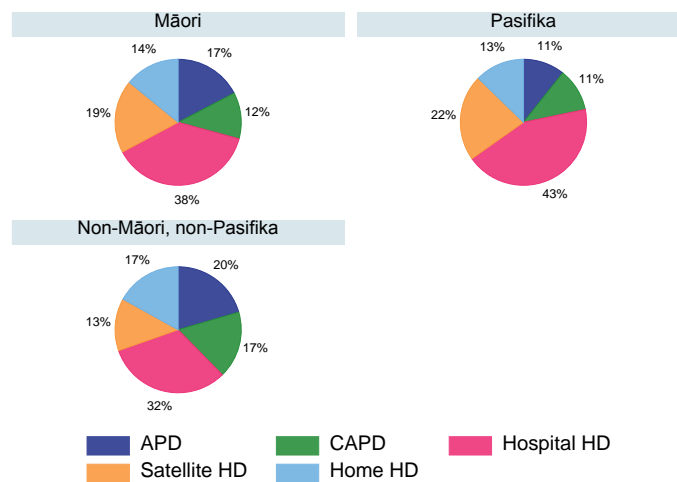
Figure 9.27 - Transplant Outcomes, New Zealand - Primary Deceased Donor Kidney-only Transplants 2009-2018



Dialysis

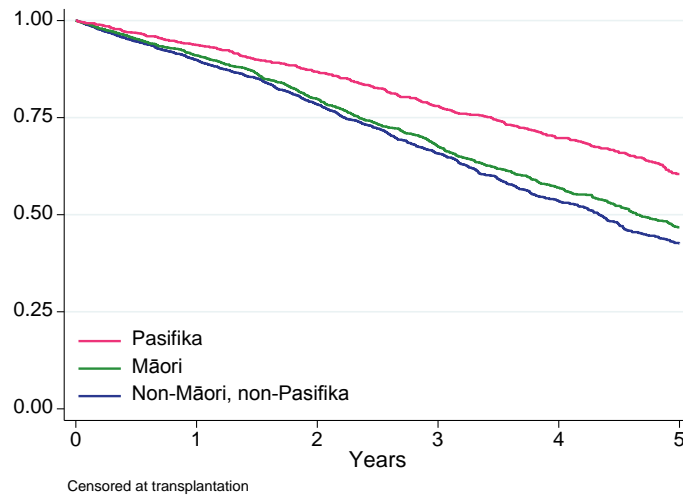
The distribution of dialysis modality is shown graphically in figure 9.28. Māori and Pasifika patients have a higher use of facility dialysis as the principal modality of care, and lower use of each of the home-based modalities. For non-Māori, non-Pasifika patients, over half have home-based care. The proportion of Māori and Pasifika patients receiving home-based dialysis is approximately 10-20% lower.

Figure 9.28 - Dialysis Modality End 2018 - New Zealand, by Ethnicity



Half of the people who started dialysis over 2009-2018 were alive 5 years later (figure 9.29). Non-Māori, non-Pasifika and Māori patients 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.

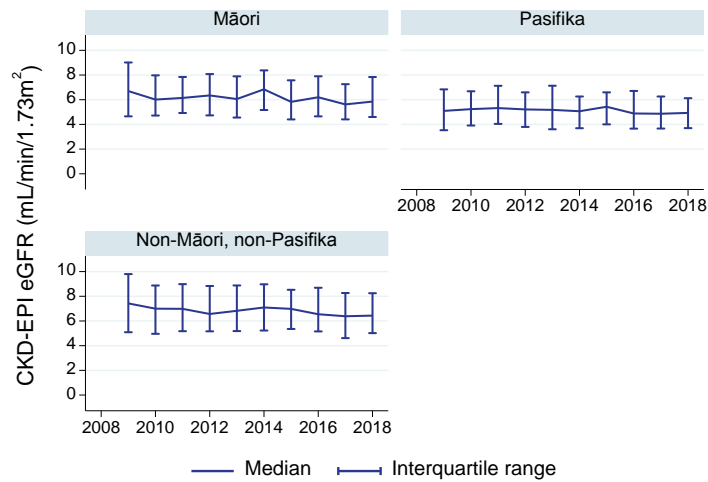
Figure 9.29 - Incident Dialysis Patient Survival 2009-2018 - New Zealand



Timing of Renal Replacement Therapy Initiation

In Aotearoa/New Zealand, the level of kidney function at which dialysis is commenced ranges between eGFR 4-5 mL/min/1.73m² for Pacific patients, 5-7 mL/min/1.73m² for Māori patients and 6-8 mL/min/1.73m² for non-Māori, non-Pasifika patients.

Figure 9.30 - eGFR at RRT start - New Zealand



Vascular Access

Incident Vascular Access

Incident vascular access data are presented in table 9.6, and prevalent data in table 9.7.

The proportion of Māori and Pasifika patients commencing RRT with haemodialysis with a central venous catheter rather than permanent access were slightly higher than in non-Māori, non-Pasifika patients in 2018, unlike in previous years (table 9.6).

Table 9.6 Incident Vascular Access New Zealand 2014-2018

Year	Vascular access	Non-Māori, non-Pasifika	Māori	Pasifika
2014	AVF	38 (28%)	41 (37%)	25 (24%)
	AVG	2 (1%)	2 (2%)	2 (2%)
	CVC	94 (70%)	65 (59%)	78 (74%)
	Not reported	0 (0%)	2 (2%)	0 (0%)
2015	AVF	34 (27%)	34 (28%)	25 (37%)
	AVG	2 (2%)	3 (2%)	0 (0%)
	CVC	88 (69%)	81 (67%)	42 (63%)
	Not reported	3 (2%)	3 (2%)	0 (0%)
2016	AVF	34 (24%)	31 (29%)	23 (26%)
	AVG	1 (1%)	0 (0%)	1 (1%)
	CVC	106 (74%)	75 (69%)	62 (71%)
	Not reported	3 (2%)	2 (2%)	1 (1%)
2017	AVF	32 (22%)	30 (25%)	26 (27%)
	AVG	2 (1%)	3 (2%)	1 (1%)
	CVC	113 (77%)	88 (72%)	71 (72%)
	Not reported	0 (0%)	1 (1%)	0 (0%)
2018	AVF	30 (23%)	22 (21%)	22 (19%)
	AVG	2 (2%)	0 (0%)	1 (1%)
	CVC	100 (76%)	84 (79%)	93 (80%)
	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 2018 than non-Māori, non-Pasifika patients (table 9.7).

Table 9.7 Prevalent Vascular Access New Zealand 2014-2018

Year	Vascular access	Non-Māori, non-Pasifika	Māori	Pasifika
2014	AVF	459 (67%)	457 (75%)	428 (75%)
	AVG	36 (5%)	29 (5%)	16 (3%)
	CVC	169 (25%)	117 (19%)	122 (21%)
	Not reported	20 (3%)	8 (1%)	7 (1%)
2015	AVF	453 (65%)	428 (67%)	431 (75%)
	AVG	27 (4%)	35 (5%)	26 (5%)
	CVC	183 (26%)	140 (22%)	108 (19%)
	Not reported	35 (5%)	34 (5%)	11 (2%)
2016	AVF	446 (64%)	452 (68%)	409 (72%)
	AVG	27 (4%)	27 (4%)	25 (4%)
	CVC	204 (29%)	167 (25%)	125 (22%)
	Not reported	22 (3%)	16 (2%)	8 (1%)
2017	AVF	423 (62%)	448 (68%)	411 (71%)
	AVG	20 (3%)	26 (4%)	14 (2%)
	CVC	222 (33%)	175 (27%)	142 (25%)
	Not reported	15 (2%)	9 (1%)	8 (1%)
2018	AVF	419 (60%)	438 (67%)	420 (67%)
	AVG	17 (2%)	21 (3%)	11 (2%)
	CVC	248 (35%)	176 (27%)	186 (30%)
	Not reported	16 (2%)	14 (2%)	6 (1%)

Patient Flow

Table 9.8 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 population than that of non-Māori, non-Pasifika patients, reflecting the much higher incidence and prevalence of ESKD in these populations.

Table 9.8 Patient Flow (pmp) New Zealand 2014-2018

Year	Event	Non-Māori, non-Pasifika	Māori	Pasifika
2014	New patients	261 (76)	161 (229)	135 (383)
	New transplants	100 (29)	22 (31)	16 (45)
	Pre-emptive transplants	20 (6)	0 (0)	1 (3)
	Prevalent dialysis	1118 (324)	880 (1254)	690 (1956)
	Prevalent transplants	1361 (394)	160 (228)	105 (298)
	Total prevalence	2479 (717)	1040 (1482)	795 (2253)
	Deaths	220 (64)	126 (180)	77 (218)
2015	New patients	277 (79)	173 (243)	109 (301)
	New transplants	99 (28)	28 (39)	21 (58)
	Pre-emptive transplants	22 (6)	0 (0)	2 (6)
	Prevalent dialysis	1136 (323)	867 (1217)	703 (1942)
	Prevalent transplants	1408 (400)	174 (244)	118 (326)
	Total prevalence	2544 (722)	1041 (1462)	821 (2268)
	Deaths	203 (58)	176 (247)	79 (218)
2016	New patients	280 (78)	171 (236)	121 (326)
	New transplants	113 (31)	25 (35)	28 (75)
	Pre-emptive transplants	20 (6)	2 (3)	1 (3)
	Prevalent dialysis	1148 (319)	894 (1236)	711 (1916)
	Prevalent transplants	1450 (403)	193 (267)	128 (345)
	Total prevalence	2598 (722)	1087 (1503)	839 (2261)
	Deaths	221 (61)	132 (182)	100 (270)
2017	New patients	283 (77)	188 (256)	145 (381)
	New transplants	121 (33)	23 (31)	40 (105)
	Pre-emptive transplants	21 (6)	2 (3)	3 (8)
	Prevalent dialysis	1120 (304)	912 (1242)	739 (1943)
	Prevalent transplants	1505 (409)	207 (282)	163 (429)
	Total prevalence	2625 (713)	1119 (1524)	902 (2371)
	Deaths	250 (68)	156 (212)	77 (202)
2018	New patients	269 (72)	187 (251)	156 (400)
	New transplants	119 (32)	29 (39)	29 (74)
	Pre-emptive transplants	28 (7)	2 (3)	4 (10)
	Prevalent dialysis	1123 (299)	917 (1231)	796 (2041)
	Prevalent transplants	1541 (411)	225 (302)	182 (467)
	Total prevalence	2664 (710)	1142 (1533)	978 (2508)
	Deaths	219 (58)	168 (226)	78 (200)

Cause of Death

The causes of death in 2018 are shown in figure 9.31 and table 9.9, categorised by ethnicity and modality at time of death.

For New Zealand Māori and Pasifika patients, 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. 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 9.31 - Cause of Death by Modality and Ethnicity, New Zealand - Deaths Occurring During 2018

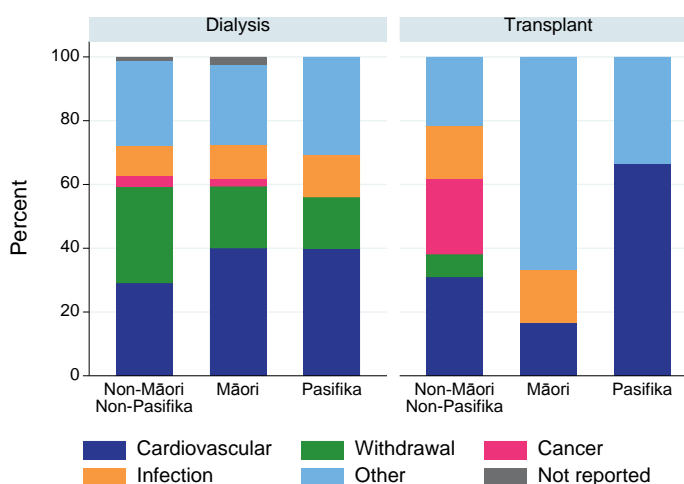


Table 9.9 Cause of Death by Modality and Ethnicity, New Zealand 2018

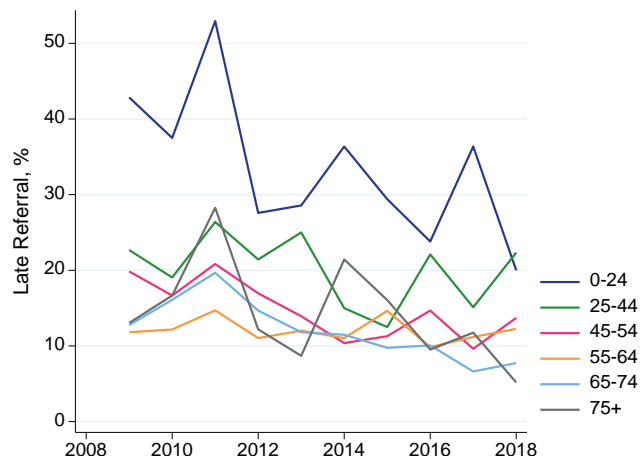
Modality	Cause of death	Non-Māori, non-Pasifika	Māori	Pasifika
Dialysis	Cardiovascular	50 (29%)	64 (40%)	30 (40%)
	Withdrawal	52 (30%)	31 (19%)	12 (16%)
	Cancer	6 (3%)	4 (3%)	0 (0%)
	Infection	16 (9%)	17 (11%)	10 (13%)
	Other	46 (27%)	40 (25%)	23 (31%)
	Not reported	2 (1%)	4 (3%)	0 (0%)
	Total		172	160
Transplant	Cardiovascular	13 (31%)	1 (17%)	2 (67%)
	Withdrawal	3 (7%)	0 (0%)	0 (0%)
	Cancer	10 (24%)	0 (0%)	0 (0%)
	Infection	7 (17%)	1 (17%)	0 (0%)
	Other	9 (21%)	4 (67%)	1 (33%)
	Not reported	0 (0%)	0 (0%)	0 (0%)
	Total		42	6

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 New Zealand over time. Late referrals represented 13% of all patients who commenced renal replacement therapy in 2018. Late referrals reduce opportunities for patients to prepare for their preferred modality of dialysis or to have pre-emptive transplantation.

Younger 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 9.32).

Figure 9.32 - Late Referral Rates by Age Group - New Zealand 2009 – 2018



There is no evidence of different late referral rates by ethnicity in New Zealand (figure 9.33 and table 9.10).

Figure 9.33 - Late Referral Rates by Ethnicity - New Zealand 2014 – 2018

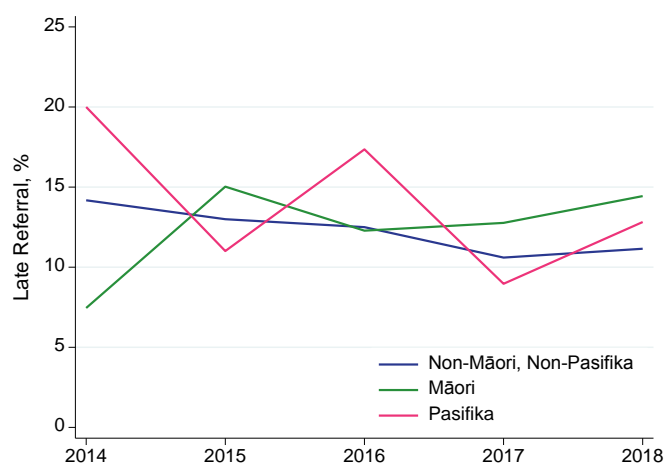


Table 9.10 Percentage of Late Referral by Ethnicity New Zealand 2014-2018

Year	Non-Māori, non-Pasifika	Māori	Pasifika
2014	14%	8%	20%
2015	13%	16%	11%
2016	13%	13%	18%
2017	11%	13%	9%
2018	11%	15%	13%

Prevalence of Renal Replacement Therapy

There were 4812 people (985 pmp) receiving renal replacement therapy in the form of dialysis or a kidney transplant in New Zealand at the end of 2018 (figures 9.34-9.35 and table 9.11). Overall New Zealand continues to have a higher prevalence (583 pmp) of dialysis patients as compared with Australia (536 pmp), and a lower prevalence of people treated with a kidney transplant (402 pmp versus 490 pmp).

Figure 9.34 - Prevalence of Dialysis and Transplantation - New Zealand 1989-2018

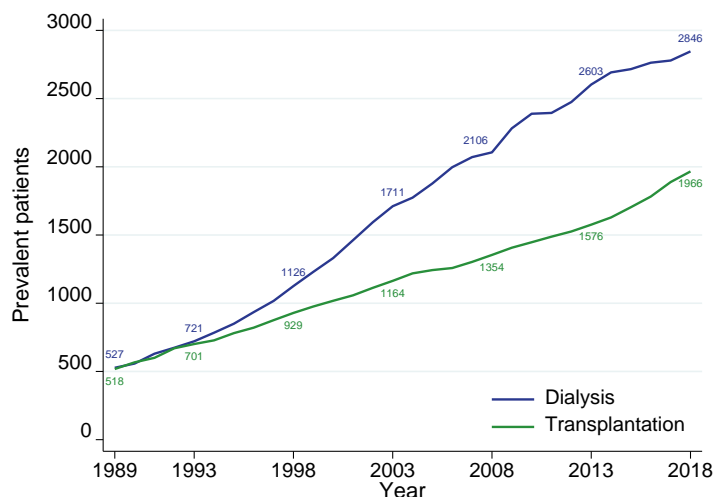
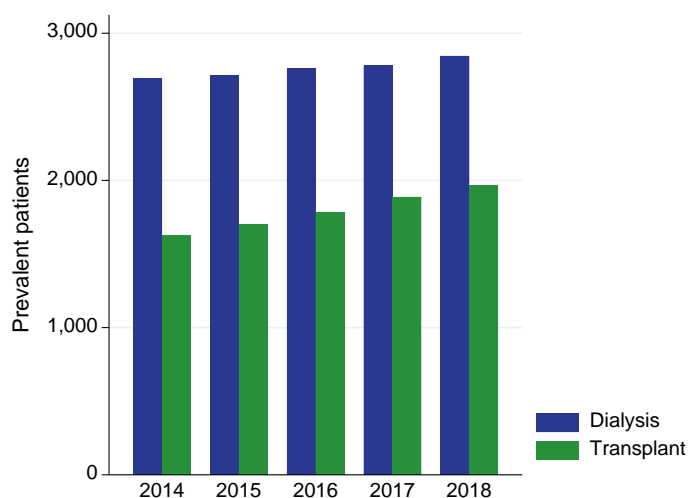


Table 9.11 Prevalence of Renal Replacement Therapy (pmp) in New Zealand 2014-2018

	2014	2015	2016	2017	2018
Total	4321 (958)	4420 (962)	4545 (968)	4667 (974)	4812 (985)
Transplant	1629 (361)	1704 (371)	1782 (380)	1888 (394)	1966 (402)
Dialysis	2692 (597)	2716 (591)	2763 (589)	2779 (580)	2846 (583)

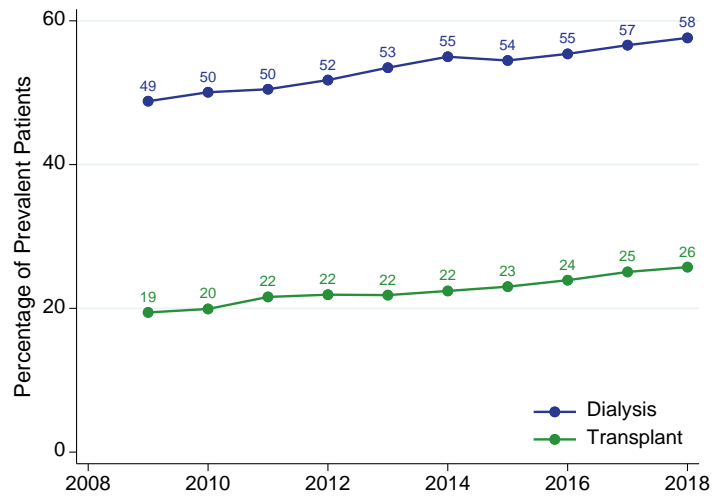
Figure 9.35 - Prevalence of Renal Replacement Therapy - New Zealand 2014-2018



Diabetes

The percentage of prevalent dialysis patients with diabetes as a comorbidity has increased by 9 percentage points over the previous decade (figure 9.36).

Figure 9.36 - Diabetes as a Comorbidity in Prevalent Patients - New Zealand, 2009-2018



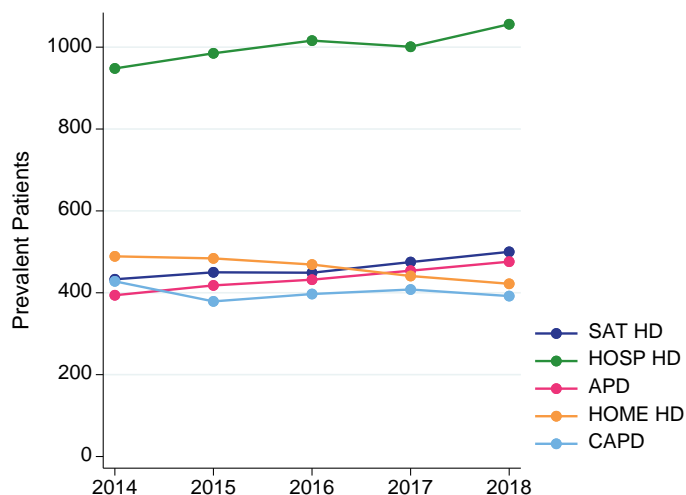
Dialysis

In 2018, 45% of the 2750 New Zealand dialysis patients were treated with home-based dialysis (peritoneal dialysis or home haemodialysis), as compared with 26% in Australia.

Home-based dialysis therapies consisted of 17% of patients treated with automated peritoneal dialysis, 14% treated with continuous ambulatory peritoneal dialysis, and 15% treated with home haemodialysis.

Figure 9.37 shows trends in the method and location of dialysis in New Zealand over 2014-2018.

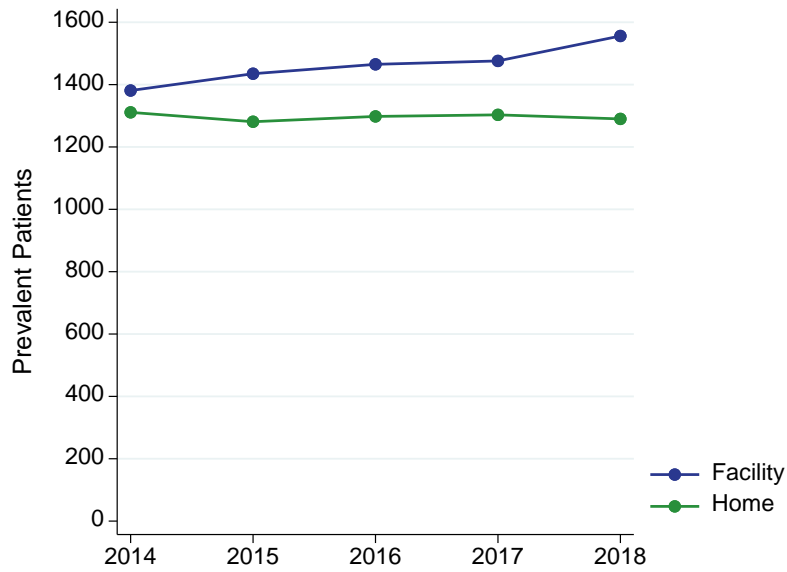
Figure 9.37 - Method and Location of Dialysis - New Zealand, 2014-2018



Overall, 55% of patients on dialysis were treated with haemodialysis in a satellite unit (18%) or in a hospital unit (37%).

Figure 9.38 shows trends in home and facility-based dialysis in New Zealand over 2014-2018.

Figure 9.38 - Home and Facility Based Dialysis - New Zealand, 2014-2018



Transplantation

The National Renal Transplant Service (NRTS) was established in New Zealand in early 2014 with funding from the New Zealand Government. The purpose of the NRTS is to increase kidney transplantation rates in New Zealand with an initial focus on living donor kidney transplantation.

In 2018, 182 patients (37 pmp) were treated with a kidney transplant (figure 9.39). The New Zealand transplant rate (37 pmp) remains lower than for Australia (46 pmp).

Figure 9.39 - New Kidney Transplants in New Zealand 2014-2018

