



CHAPTER 1

Incidence of Kidney Failure with Replacement Therapy

Summarising the number of incident patients with kidney failure with replacement therapy in Australia and New Zealand, the rate per million population and the demographic and clinical characteristics of incident patients

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Summary and Highlights

In Australia in 2021, there were 3281 new patients starting kidney replacement therapy (KRT), with an overall incidence rate of 127 per million population. In New Zealand the total new patients commencing KRT was 708, representing 137 per million population. In both countries, whilst stable for the past two years, this reflects an increase in incidence over time.

In Australia, the age group with the greatest number of incident patients continues to be those aged 75-84 years whereas in New Zealand the greatest number is in those aged 65-74 years. A greater proportion of men are commencing KRT in both countries (Australia: 57.0% 1192/2089, New Zealand: 65.8% 281/427)

Diabetes Mellitus continues to be the most common condition for new patients starting kidney replacement therapy, impacting 51% of Australians and 58% of New Zealanders. Diabetic Kidney Disease continued to be the most common cause of kidney failure representing 37% of incident patients in Australia and 44% in New Zealand.

Suggested Citation

ANZDATA Registry. 45th Report, Chapter 1: Incidence of Kidney Failure with Replacement Therapy. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2022. Available at: <http://www.anzdata.org.au>

Incident Patients

Tables 1.1 and 1.2 show the incidence of kidney failure with replacement therapy by modality, country and state as well as the incidence rates per million population (pmp).

Population estimates for Australia and New Zealand used throughout this chapter for the calculation of incidence per million population were sourced from the Australian Bureau of Statistics (2021)¹ and Stats NZ (2021)². State is based on the state of the treating hospital unless otherwise indicated.*

*NSW population estimates exclude residents of the NSW South Eastern region which includes the local government areas of Bega Valley, Eurobodalla, Goulburn Mulwaree, Hilltops, Queanbeyan-Palerang Regional, Snowy Monaro Regional, Upper Lachlan Shire and Yass Valley. ACT population includes residents of the NSW South Eastern region. The population base for the NSW South Eastern region is based on the estimated resident population by local government area from the Australian Bureau of Statistics (2022)³.

Table 1.1 Incidence of Kidney Failure with Replacement Therapy by Modality 2017-2021 (pmp)

Country	Event	2017	2018	2019	2020	2021
Australia	Total Incident KRT Patients	3121 (127)	3177 (127)	3265 (129)	3304 (129)	3281
	Pre-emptive Transplant	127 (5)	118 (5)	114 (4)	84 (3)	82 (3)
	Incident KRT Dialysis	2994 (122)	3059 (122)	3151 (124)	3220 (125)	3199
	Percentage PD	27%	26%	24%	28%	28%
	Percentage Home HD*	2%	2%	2%	2%	2%
	Percentage Facility HD	71%	72%	74%	70%	70%
New Zealand	Total Incident KRT Patients	629 (131)	629 (128)	659 (132)	715 (140)	708 (137)
	Pre-emptive Transplant	26 (5)	39 (8)	35 (7)	44 (9)	39 (8)
	Incident KRT Dialysis	603 (125)	590 (120)	624 (125)	671 (132)	669 (129)
	Percentage PD	37%	39%	38%	40%	36%
	Percentage Home HD*	1%	1%	2%	2%	2%
	Percentage Facility HD	62%	60%	59%	58%	62%

*Includes Community House HD

Table 1.2 Incidence of Kidney Failure with Replacement Therapy by Modality and Jurisdiction (pmp) 2021

State	Total Incident KRT Patients	Incident KRT Dialysis Patients	Pre-emptive Transplant Patients
QLD	706 (135)	691 (132)	15 (3)
NSW*	955 (120)	933 (117)	22 (3)
ACT*	71 (106)	71 (106)	0 (0)
VIC	769 (116)	743 (112)	26 (4)
TAS	58 (107)	58 (107)	0 (0)
SA	236 (133)	224 (126)	12 (7)
NT	118 (479)	118 (479)	0 (0)
WA	368 (137)	361 (135)	7 (3)
Australia	3281 (127)	3199 (124)	82 (3)
New Zealand	708 (137)	669 (129)	39 (8)

*ACT and NSW population estimates adjusted for SE NSW Region.

The total numbers of incident patients per year in Australia and New Zealand since the first local use of kidney replacement therapy are shown in figure 1.1.

Figure 1.1 - New Patients - Australia and New Zealand

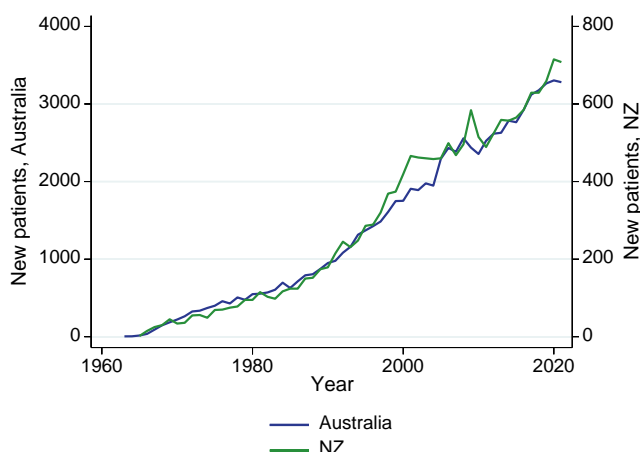


Figure 1.2 presents these data another way, showing the numbers of new patients per year and change in each country compared to the previous year over the last 30 years.

Figure 1.2.1 - New Patients and Change - Australia

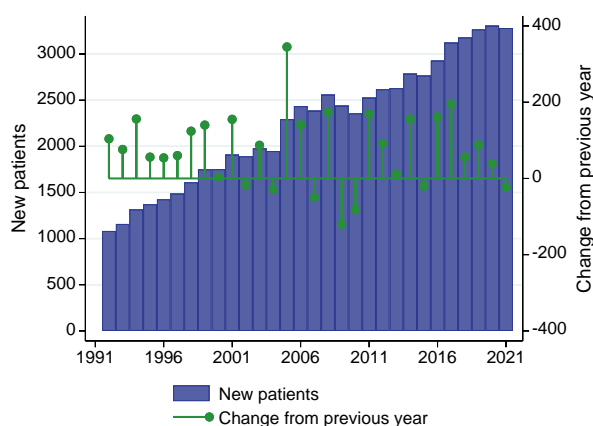


Figure 1.2.2 - New Patients and Change - New Zealand

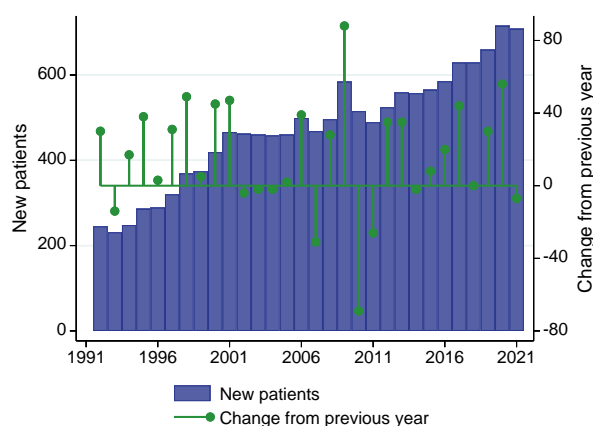


Table 1.3 shows the number of new patients (pmp) by state and country over 2017-2021.

Table 1.3 Kidney Failure with Replacement Therapy Incidence (pmp) 2017-2021

State	2017	2018	2019	2020	2021
QLD	629 (128)	675 (135)	676 (133)	676 (131)	706 (135)
NSW*	916 (120)	925 (119)	962 (122)	992 (125)	955 (120)
ACT*	53 (83)	53 (82)	80 (121)	58 (87)	71 (106)
VIC	778 (123)	806 (125)	754 (114)	818 (122)	769 (116)
TAS	56 (107)	46 (87)	66 (123)	42 (78)	58 (107)
SA	204 (118)	203 (117)	214 (122)	243 (137)	236 (133)
NT	121 (489)	131 (530)	133 (540)	102 (414)	118 (479)
WA	364 (141)	338 (130)	380 (145)	373 (140)	368 (137)
Australia	3121 (127)	3177 (127)	3265 (129)	3304 (129)	3281 (127)
New Zealand	629 (131)	629 (128)	659 (132)	715 (140)	708 (137)

*ACT and NSW population estimates adjusted for SE NSW Region.

Figure 1.3 shows incidence rates by age group, and figure 1.4 by age group and state; the bars represent 95% confidence intervals. Note the different y axes for each state.

Figure 1.3.1 - New Patients - Age Specific Rates - Australia

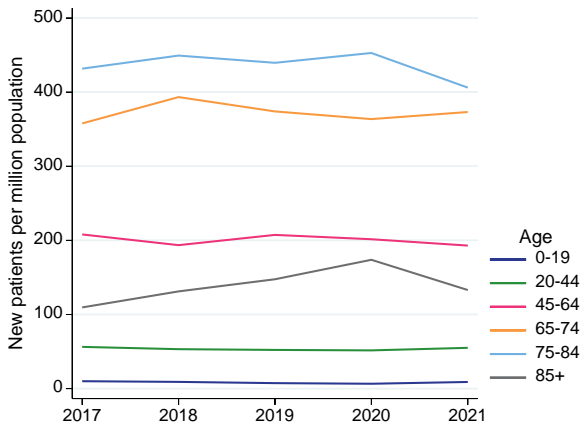


Figure 1.3.2 - New Patients - Age Specific Rates - New Zealand

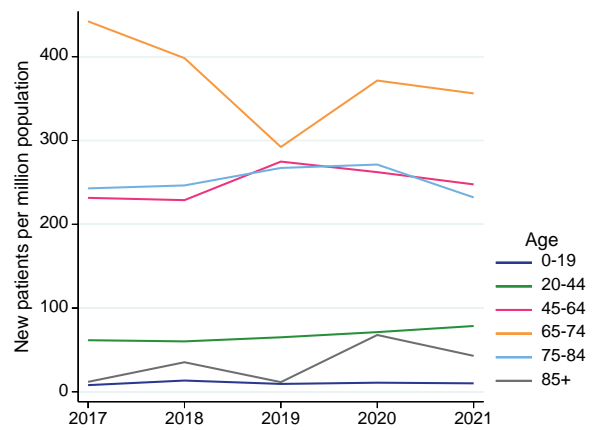


Figure 1.4.1 - New Patients by Age Group - NT

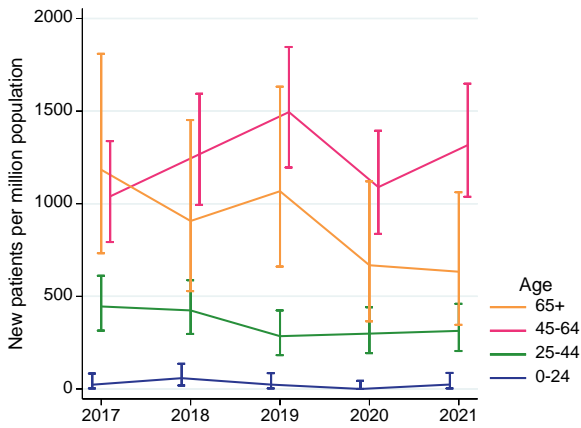


Figure 1.4.2 - New Patients by Age Group - NSW

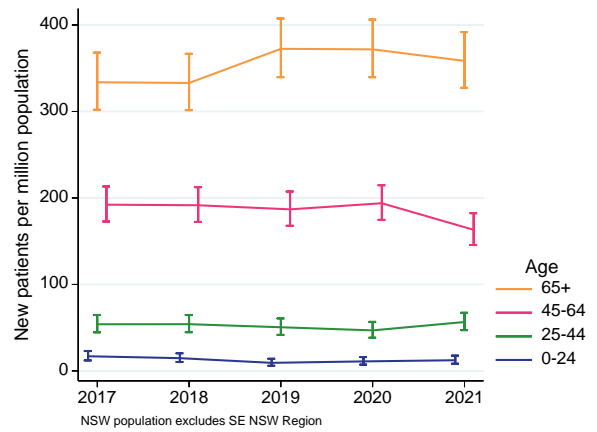


Figure 1.4.3 - New Patients by Age Group - VIC

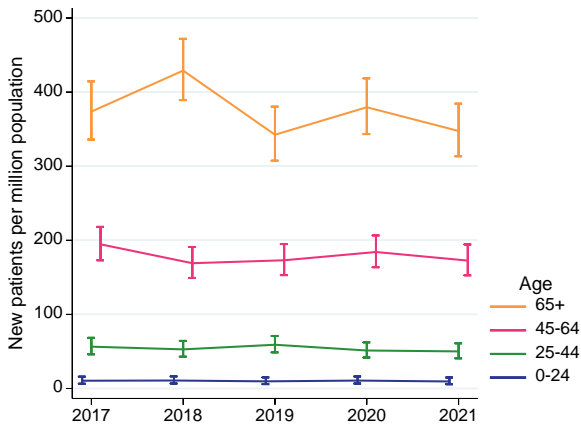


Figure 1.4.4 - New Patients by Age Group - QLD

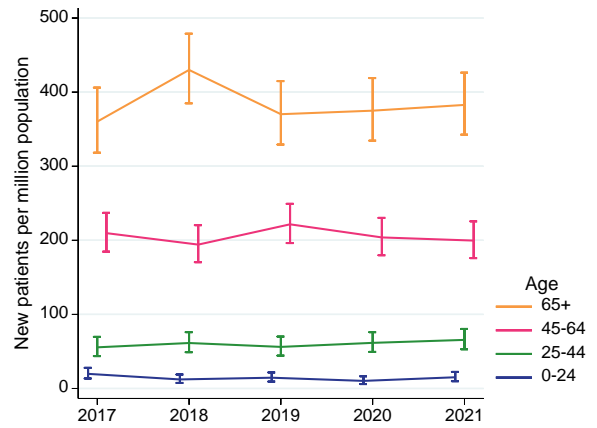


Figure 1.4.5 - New Patients by Age Group - SA

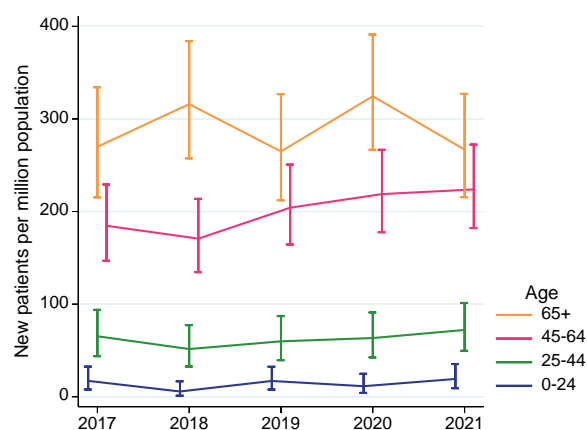


Figure 1.4.6 - New Patients by Age Group - WA

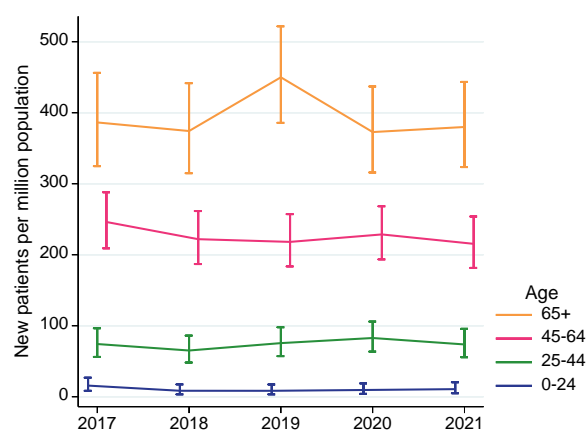


Figure 1.4.7 - New Patients by Age Group - TAS

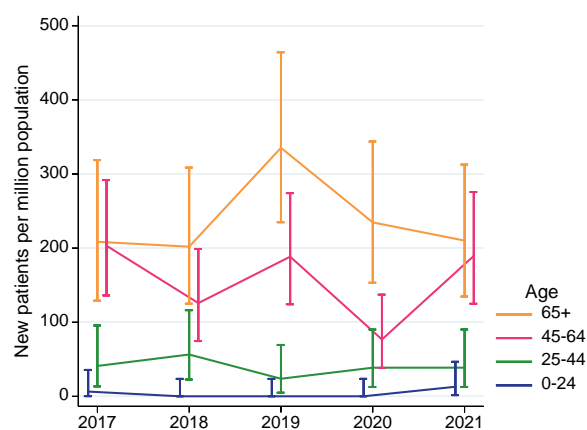
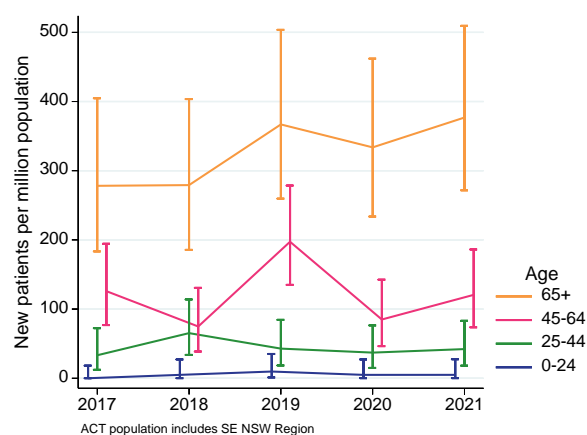


Figure 1.4.8 - New Patients by Age Group - ACT



The rates in older patients are shown in table 1.4. Table 1.5 further categorises the 2021 data by gender.

Table 1.4 Incidence (pmp) of Kidney Failure with Replacement Therapy in Older Patients 2017-2021

Country	Age	2017	2018	2019	2020	2021
Australia	60-64	379 (285)	379 (279)	397 (285)	411 (286)	377 (258)
	65-69	387 (324)	430 (356)	406 (331)	425 (337)	437 (342)
	70-74	383 (400)	445 (438)	449 (424)	435 (394)	465 (408)
	75-79	335 (495)	335 (479)	346 (471)	379 (490)	372 (457)
	80-84	160 (341)	198 (408)	199 (394)	211 (399)	182 (331)
	85+	54 (110)	66 (131)	76 (148)	92 (174)	73 (133)
New Zealand	60-64	72 (273)	69 (255)	98 (350)	94 (323)	95 (309)
	65-69	110 (472)	88 (374)	69 (288)	100 (404)	94 (360)
	70-74	72 (403)	82 (428)	60 (298)	71 (334)	78 (351)
	75-79	46 (344)	42 (309)	49 (347)	50 (341)	40 (248)
	80-84	7 (83)	13 (149)	13 (143)	16 (165)	23 (209)
	85+	1 (12)	3 (35)	1 (12)	6 (68)	4 (43)

Table 1.5 Age and Gender of New Patients 2021

Country	Gender*	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total	Mean	Median
Australia	F	4	7	25	73	111	200	260	339	161	12	1192	58.7	62
	M	3	14	45	87	177	311	435	563	393	61	2089	61.2	64
New Zealand	F	1	1	12	21	41	58	72	57	16	2	281	53.6	56
	M	1	2	11	19	42	79	109	115	47	2	427	58.2	60

*No data on persons identifying as a gender other than male or female were reported to the registry

Late Referral

The following figures and tables examine late referral, defined as <3 months between initial review by a nephrologist and KRT start. Figure 1.5 shows the overall proportion of new patients referred late in Australia and New Zealand over the last 10 years. In 2021, among those with referral timing reported, 16% of Australian and 10% of New Zealand new patients were referred late. Figure 1.6 shows the variation in late referral rates across Australian states and figure 1.7 shows late referral rates by age for Australia and New Zealand.

Tables 1.6 shows late referral rates for new patients over 2017-2021 by primary kidney disease.

Figure 1.5 - Late Referral Rates - All Incident Patients 2012 – 2021

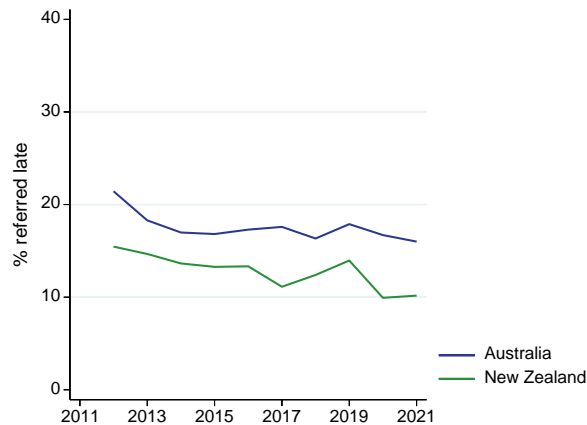


Figure 1.6 - Late Referral Rates by State/Territory - Australia 2012 – 2021

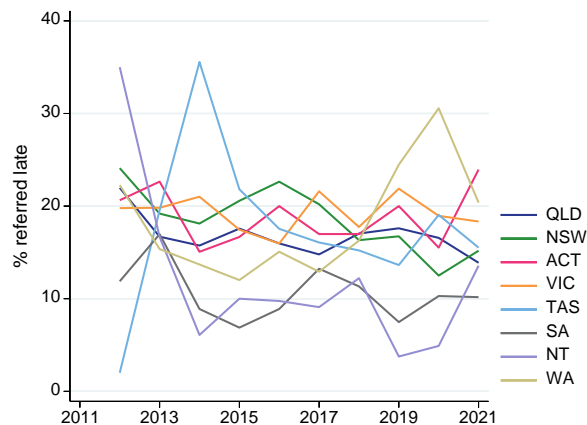


Figure 1.7.1 - Late Referral Rates by Age - Australia 2012 - 2021

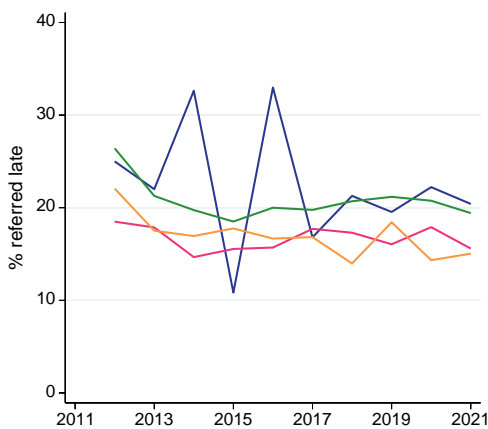


Figure 1.7.2 - Late Referral Rates by Age - New Zealand 2012 - 2021

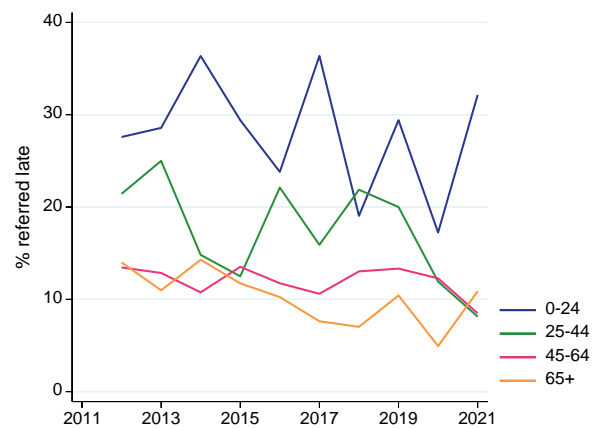


Table 1.6 Late Referral by Country and Primary Kidney Disease 2017-2021

Country	Primary kidney disease	Late	Not Late	Not Reported	Total
Australia	Diabetic Kidney Disease	865 (14%)	5247 (85%)	45 (1%)	6157
	Glomerular Disease	452 (16%)	2284 (83%)	27 (1%)	2763
	Hypertension	308 (15%)	1668 (84%)	18 (1%)	1994
	Polycystic Disease	64 (7%)	908 (93%)	8 (1%)	980
	Reflux Nephropathy	23 (7%)	286 (93%)	0 (0%)	309
	Other	714 (27%)	1926 (73%)	16 (1%)	2656
	Uncertain	264 (27%)	703 (72%)	5 (1%)	972
	Not reported	39 (12%)	167 (53%)	111 (35%)	317
	Total	2729 (17%)	13189 (82%)	230 (1%)	16148
New Zealand	Diabetic Kidney Disease	147 (9%)	1421 (90%)	16 (1%)	1584
	Glomerular Disease	91 (15%)	518 (84%)	6 (1%)	615
	Hypertension	30 (10%)	256 (89%)	2 (1%)	288
	Polycystic Disease	5 (3%)	140 (97%)	0 (0%)	145
	Reflux Nephropathy	5 (8%)	56 (92%)	0 (0%)	61
	Other	77 (16%)	411 (83%)	5 (1%)	493
	Uncertain	24 (20%)	95 (80%)	0 (0%)	119
	Not reported	4 (11%)	14 (40%)	17 (49%)	35
	Total	383 (11%)	2911 (87%)	46 (1%)	3340

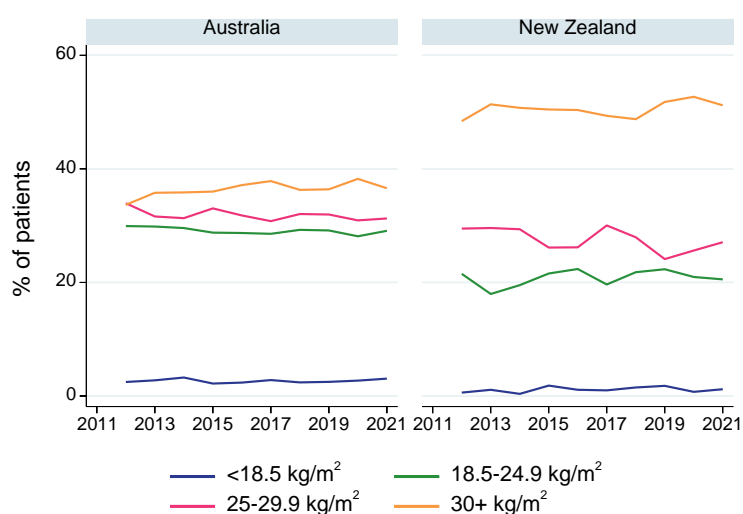
Body Mass Index

Table 1.7 shows the body mass index (BMI, in kg/m²) category at KRT entry of new adult patients in 2021. Trends in the prevalence of BMI at KRT entry are shown in figure 1.8.

Table 1.7 BMI Category at KRT Entry for Adult Patients 2021

Country	Category	BMI at KRT Entry
Australia	<18.5	97 (3%)
	18.5-24.9	923 (29%)
	25-29.9	992 (31%)
	30+	1161 (36%)
	Not reported	65 (2%)
New Zealand	<18.5	8 (1%)
	18.5-24.9	138 (20%)
	25-29.9	182 (26%)
	30+	344 (49%)
	Not reported	26 (4%)

Figure 1.8 - BMI Category at KRT Entry for Adult Patients



Co-morbidities

Tables 1.8-1.10 show the co-morbidities at KRT entry of new patients in 2021. Trends in the prevalence of these co-morbidities at KRT entry are shown in figures 1.9-1.10, with the bars representing 95% confidence intervals.

Table 1.8 Co-morbidities of New Patients 2021

Country	Status at KRT Entry	Coronary Artery Disease	Peripheral Vascular Disease	Cerebrovascular Disease	Chronic Lung Disease
Australia	No	2158 (66%)	2635 (80%)	2913 (89%)	2818 (86%)
	Suspected	184 (6%)	198 (6%)	76 (2%)	116 (4%)
	Yes	934 (28%)	444 (14%)	286 (9%)	341 (10%)
	Not reported	5 (0%)	4 (0%)	6 (0%)	6 (0%)
New Zealand	No	536 (76%)	612 (86%)	654 (92%)	621 (88%)
	Suspected	40 (6%)	41 (6%)	16 (2%)	16 (2%)
	Yes	132 (19%)	55 (8%)	38 (5%)	71 (10%)
	Not reported	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Table 1.9 Smoking Status of New Patients 2021

Country	Status at KRT Entry	Smoking
Australia	Current	356 (11%)
	Former	1100 (34%)
	Never	1754 (53%)
	Not reported	71 (2%)
New Zealand	Current	92 (13%)
	Former	260 (37%)
	Never	334 (47%)
	Not reported	22 (3%)

Table 1.10 Diabetic Status of New Patients 2021

Country	Status at KRT Entry	Diabetes
Australia	No	1569 (48%)
	Type 1	188 (6%)
	Type 2	1481 (45%)
	Not reported	43 (1%)
New Zealand	No	281 (40%)
	Type 1	30 (4%)
	Type 2	382 (54%)
	Not reported	15 (2%)

Figure 1.9.1 - Comorbid Conditions at KRT Entry – Australia

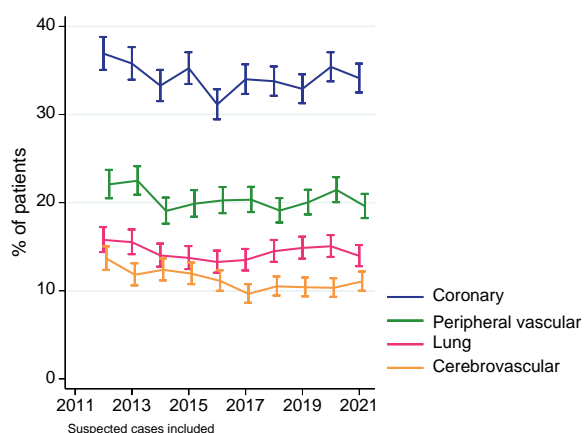


Figure 1.9.2 - Comorbid Conditions at KRT Entry - New Zealand

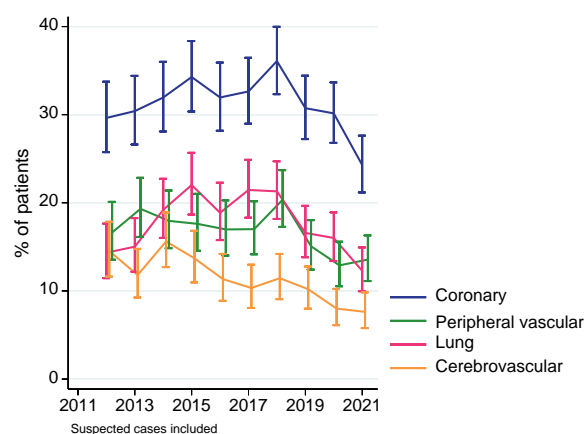
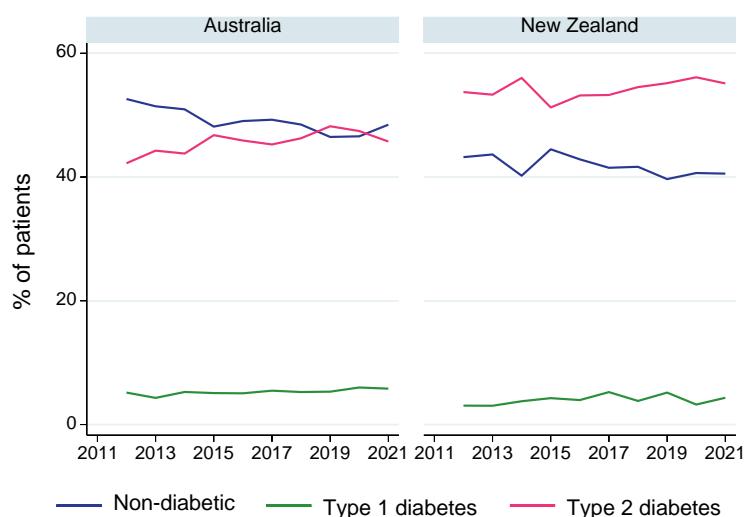


Figure 1.10 - Diabetes Status at KRT Entry



Primary Kidney Disease

The primary kidney disease of new patients over 2018-2021 are shown in table 1.11. Details of the type of glomerular disease reported are shown in table 1.12. Rates of biopsy confirmation of glomerular disease, hypertension, type 2 diabetic kidney disease and uncertain kidney disease are shown in figure 1.11.

The “other” causes from table 1.11 are shown in detail in table 1.13.

Table 1.11 Primary Kidney Disease of New Patients 2018 - 2021

Country	Primary kidney disease	2018	2019	2020	2021
Australia	Diabetic Kidney Disease	1203 (38%)	1274 (39%)	1273 (39%)	1204 (37%)
	Glomerular Disease	529 (17%)	563 (17%)	587 (18%)	542 (17%)
	Hypertension	402 (13%)	402 (12%)	385 (12%)	408 (12%)
	Polycystic Disease	212 (7%)	179 (5%)	177 (5%)	202 (6%)
	Reflux Nephropathy	57 (2%)	59 (2%)	53 (2%)	70 (2%)
	Other	523 (16%)	553 (17%)	541 (16%)	604 (18%)
	Uncertain	161 (5%)	179 (5%)	234 (7%)	210 (6%)
	Not reported	90 (3%)	56 (2%)	54 (2%)	41 (1%)
	Total	3177	3265	3304	3281
New Zealand	Diabetic Kidney Disease	301 (48%)	312 (47%)	331 (46%)	313 (44%)
	Glomerular Disease	111 (18%)	108 (16%)	131 (18%)	131 (19%)
	Hypertension	45 (7%)	60 (9%)	65 (9%)	66 (9%)
	Polycystic Disease	34 (5%)	29 (4%)	28 (4%)	25 (4%)
	Reflux Nephropathy	12 (2%)	14 (2%)	17 (2%)	12 (2%)
	Other	96 (15%)	106 (16%)	112 (16%)	119 (17%)
	Uncertain	26 (4%)	29 (4%)	25 (3%)	21 (3%)
	Not reported	4 (1%)	1 (<1%)	6 (1%)	21 (3%)
	Total	629	659	715	708

Table 1.12 Glomerular Disease (GN) as Primary Kidney Disease 2021

Primary kidney disease	Australia	New Zealand
Advanced GN (unclassified=end stage)	3	1
Extra and intra capillary GN (rapidly progressive)	3	0
Familial GN (including Alports)	20	5
Focal and segmental proliferative GN	13	9
Focal sclerosing GN (including hyalinosis)	31	4
GN other (specify)	24	6
GN with systemic disease (specify)	14	0
Goodpastures with linear IgG and lung haemorrhage	17	1
Henoch-Schonlein purpura	2	0
Membranous GN	29	11
Mesangial proliferative (IgA+)	158	30
Mesangial proliferative (IgA-)	13	4
Mesangial proliferative (no if studies)	0	1
Mesangiocapillary GN (dense deposit disease)	3	1
Mesangiocapillary GN (double contour)	4	1
Microscopic polyarteritis	11	5
Presumed GN (no biopsy)	47	20
Primary focal sclerosing GN or focal glomerular sclerosis	102	23
Proliferative GN with linear IgG and no lung haemorrhage	2	2
Scleroderma	6	0
Secondary focal sclerosing GN	12	0
Systemic Lupus Erythematosus	18	6
Wegeners granulomatosis	10	1
Total	542	131

Table 1.13 Miscellaneous Primary Kidney Diseases 2021

Primary kidney disease	Australia	New Zealand
Analgesic Nephropathy	6	0
Balkan Nephropathy	1	0
Calcineurin Inhibitor Toxicity	11	0
Cystinosis	1	0
Gout	2	1
Interstitial Nephritis	46	6
Lead Nephropathy	2	0
Lithium Toxicity	20	2
Loss of Single Kidney (Trauma-Surgery)	4	1
Oxalosis	3	1
Pyelonephritis	5	0
Bladder Neck Obstruction (Incl. Prostatomegaly)	4	0
Congenital Renal Hypoplasia and Dysplasia	17	2
Neuropathic Bladder	7	0
Obstructive Nephropathy	24	7
Other Lower Urinary Tract Abnormalities (With Secondary Reflux)	3	1
Pelvi-Ureteric Junction Obstruction	2	0
Posterior Urethral Valves	4	1
Spina Bifida Or Myelomeningocele	2	2
Ureteric Obstructive Nephropathy	9	2
Calculi	7	1
Medullary Cystic Disease	7	0
Cortical Necrosis	5	1
Haemolytic Uraemic Syndrome	10	1
Amyloid Disease	28	3
Light Chain Nephropathy (Not Malignant)	7	0
Paraproteinaemia (Including Multiple Myeloma)	28	3
Renal Cell Carcinoma (Grawitz)	30	1
Transitional Cell Carcinoma Urinary Tract	3	1
Other (Specify)	306	82

Figure 1.11.1 Biopsy Rates - Australia

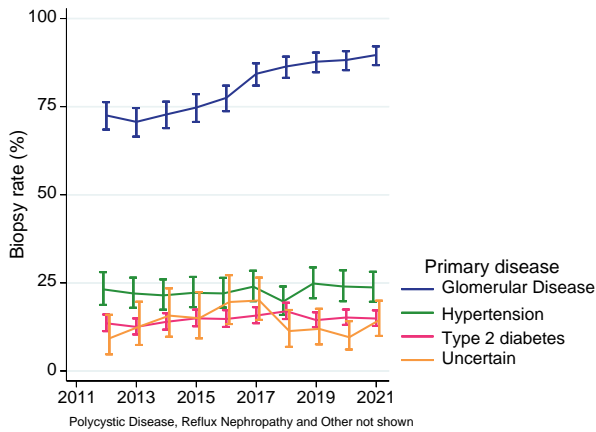
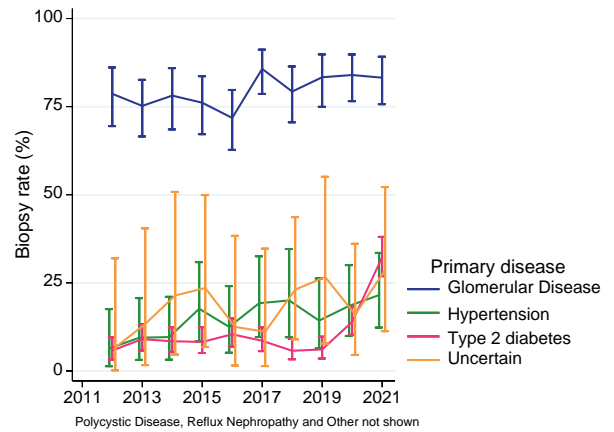


Figure 1.11.2 - Biopsy Rates - New Zealand



Timing of Kidney Replacement Therapy Start

The median eGFR for adult patients (calculated using the CKD-EPI formula) at KRT start over time is shown in figure 1.12. In 2021 this was 7.5mL/min/1.73m² in Australia and 5.9mL/min/1.73m² in New Zealand.

Figure 1.12.1 - eGFR at KRT Start - Australia

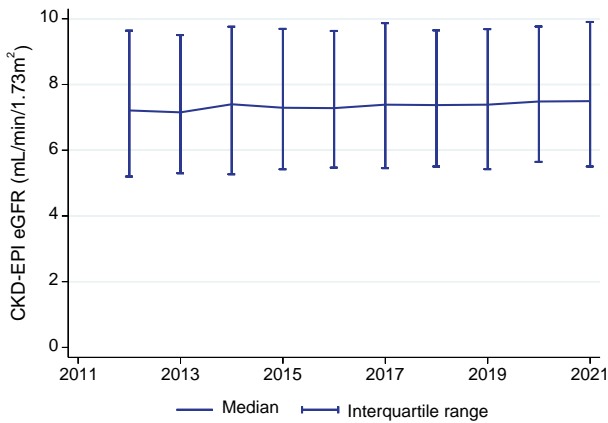
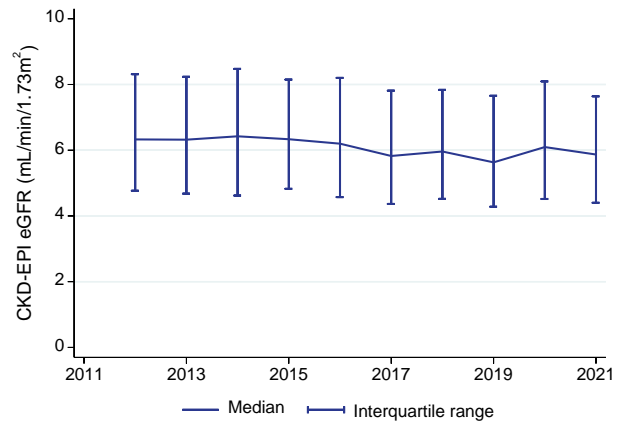


Figure 1.12.2 - eGFR at KRT Start - New Zealand



References

¹ Australian Bureau of Statistics, 2021, Quarterly Population Estimates (ERP), by State/Territory, Sex and Age, Jun 2021, viewed 22 Dec 2021, <https://www.abs.gov.au/statistics/people/population/national-state-and-territory-population/jun-2021>

² 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, 2021, Estimated Resident Population by Age and Sex (1991+) (Annual-Jun), NZ Infoshare, viewed 5 Jan 2022, <http://infoshare.stats.govt.nz/>

³ Australian Bureau of Statistics, 2022, Regional Population by Age and Sex, Australia, 2021, viewed 14 Sep 2022, <https://www.abs.gov.au/statistics/people/population/regional-population-age-and-sex/2021>