

Chapter 1

Incidence of End Stage Kidney Disease



2016

ANZDATA Registry
39th Annual Report

Data to 31-Dec-2015

Stock and Flow

Tables 1.1 and 1.2 show the stock and flow of renal replacement therapy (RRT) patients by country and by state; the numbers in parentheses indicate the rates per million population (pmp). In Australia in 2015 there were 2,654 new RRT patients, with an overall incidence rate of 112 pmp. This rate has now been stable for several years. In New Zealand there were 527 new patients (115 pmp). The rate in New Zealand is subject to more annual variation due to lower numbers.

In contrast to incident patients, the number of prevalent patients in each country continues to climb; in Australia at the end of 2015 there were 23,012 (968 pmp) patients receiving RRT, and in New Zealand there were 4,368 (950 pmp).

Table 1.1 Stock and Flow 2011-2015

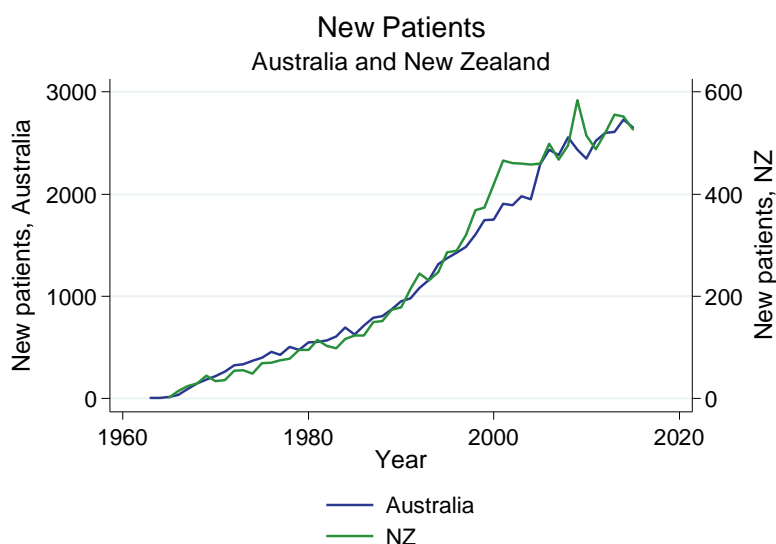
Country	Event	2011	2012	2013	2014	2015
Australia	Total New Patients	2520 (113)	2599 (114)	2610 (113)	2732 (116)	2654 (112)
	Total Transplants	825 (37)	845 (37)	883 (38)	913 (39)	949 (40)
	Living Donor Transplants	255	238	253	267	242
	Subsequent Transplants	81	98	94	108	107
	Total Deaths	1732	1663	1809	1838	1861
	Dialysis Patients	1507	1488	1570	1615	1639
	Transplant Patients	225	175	239	223	222
	Total Prevalent	19950 (893)	20792 (915)	21487 (929)	22285 (950)	23012 (968)
	Dialysis Patients	11085 (496)	11529 (507)	11831 (512)	12202 (520)	12461 (524)
	Transplant Patients	8865 (397)	9263 (408)	9656 (418)	10083 (430)	10551 (444)
New Zealand	Total New Patients	488 (111)	520 (118)	556 (125)	552 (122)	527 (115)
	Total Transplants	118 (27)	108 (25)	116 (26)	138 (31)	147 (32)
	Living Donor Transplants	57	54	59	72	74
	Subsequent Transplants	8	9	5	12	14
	Total Deaths	414	393	381	413	443
	Dialysis Patients	370	361	349	369	401
	Transplant Patients	44	32	32	44	42
	Total Prevalent	3877 (884)	3993 (906)	4166 (938)	4299 (953)	4368 (950)
	Dialysis Patients	2394 (546)	2471 (561)	2595 (584)	2680 (594)	2674 (582)
	Transplant Patients	1483 (338)	1522 (345)	1571 (354)	1619 (359)	1694 (369)

Table 1.2 Stock and Flow by State and Country 2015

Jurisdiction	New Patients	Transplant Operations	Deaths (Dialysis)	Deaths (Transplant)	Dialysis Dependent	Functioning Transplants	Total Prevalent
QLD	468 (98)	139 (29)	300	45	2369 (496)	1977 (414)	4346 (909)
NSW	811 (106)	331 (43)	540	55	3906 (513)	3004 (394)	6910 (907)
ACT	48 (123)	0 (0)	40	3	279 (714)	251 (642)	530 (1356)
VIC	657 (111)	303 (51)	384	61	3021 (509)	2976 (501)	5997 (1010)
TAS	55 (106)	0 (0)	29	2	241 (466)	236 (457)	477 (923)
SA	185 (109)	89 (52)	115	29	761 (448)	1007 (593)	1768 (1041)
NT	128 (523)	0 (0)	52	4	614 (2510)	102 (417)	716 (2927)
WA	302 (117)	87 (34)	179	23	1270 (490)	998 (385)	2268 (875)
Aust	2654 (112)	949 (40)	1639	222	12461 (524)	10551 (444)	23012 (968)
NZ	527 (115)	147 (32)	401	42	2674 (582)	1694 (369)	4368 (950)

Incident Patients

Figure 1.1



Incident Rates

The total numbers of incident patients in Australia and New Zealand since the beginning of RRT are shown in figure 1.1. Figures 1.2.1 and 1.2.2 present these data another way, showing the numbers of new patients and change in each country over the last 30 years .

Table 1.3 shows the number of new patients (pmp) by state and country over 2011-2015. There is substantial variation in incidence rates between states, with the lowest rates in Queensland (87 pmp in 2015) and the highest in the Northern Territory (523 pmp in 2015).

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

Figure 1.2.1

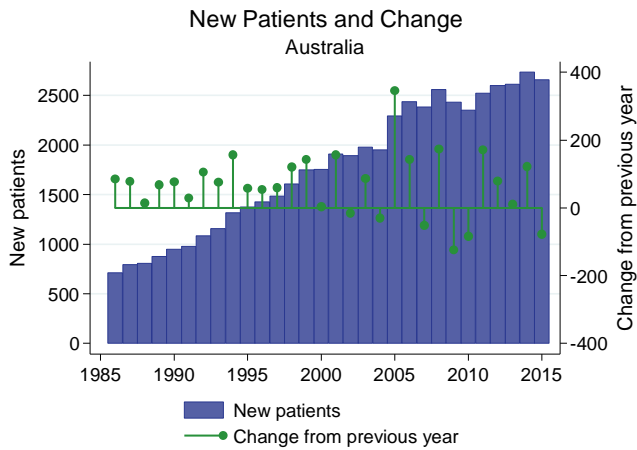


Figure 1.2.2

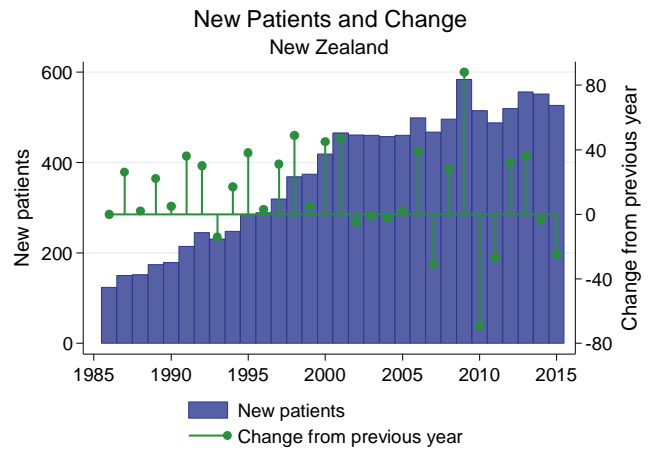


Table 1.3 RRT Incidence (pmp) 2011-2015

Jurisdiction	2011	2012	2013	2014	2015
QLD	456 (102)	476 (104)	516 (111)	515 (109)	468 (98)
NSW	794 (110)	821 (112)	809 (109)	816 (109)	811 (106)
ACT	53 (144)	63 (168)	53 (139)	71 (184)	48 (123)
Vic	604 (109)	644 (114)	658 (115)	684 (117)	657 (111)
Tas	53 (104)	50 (98)	46 (90)	45 (87)	55 (106)
SA	185 (113)	202 (122)	164 (98)	180 (107)	185 (109)
NT	82 (355)	99 (420)	87 (359)	114 (468)	128 (523)
WA	293 (125)	244 (100)	277 (110)	307 (120)	302 (117)
Aust	2520 (113)	2599 (114)	2610 (113)	2732 (116)	2654 (112)
NZ	488 (111)	520 (118)	556 (125)	552 (122)	527 (115)

Figure 1.3.1

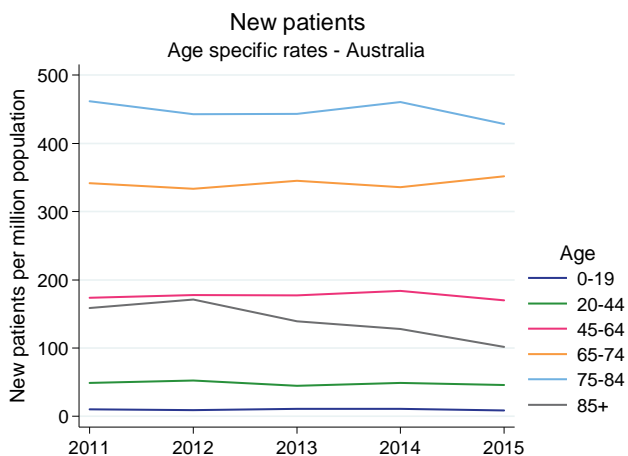


Figure 1.3.2

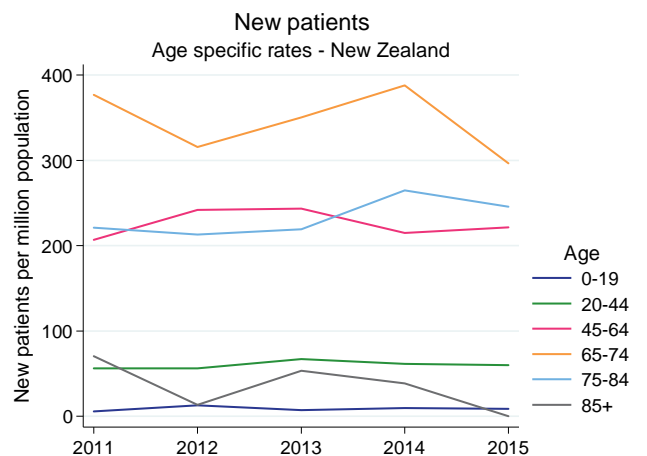


Figure 1.4.1

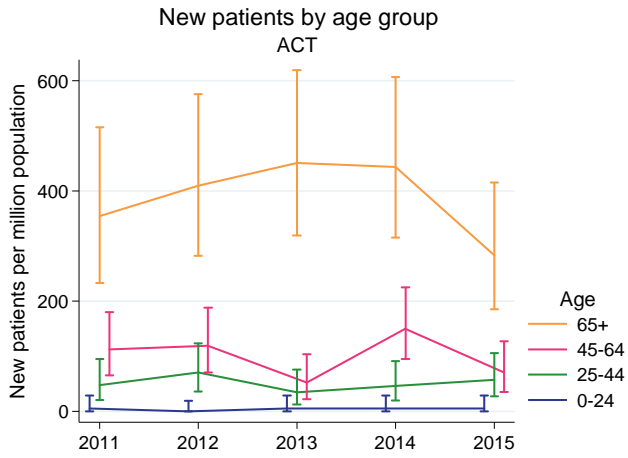


Figure 1.4.2

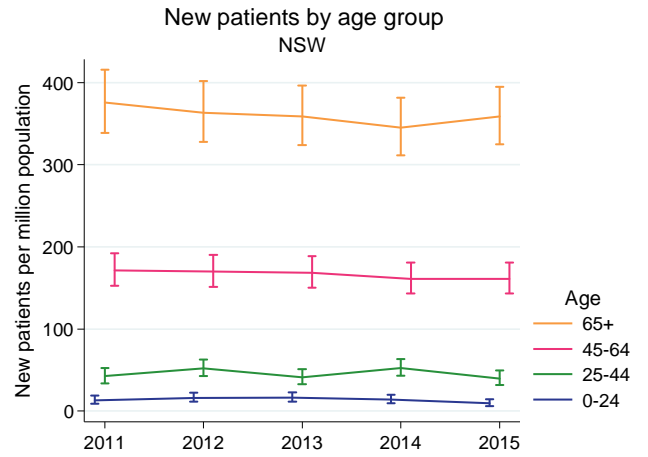


Figure 1.4.3

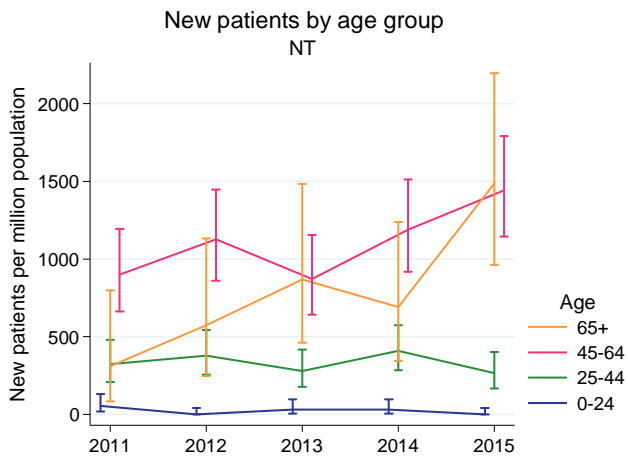


Figure 1.4.4

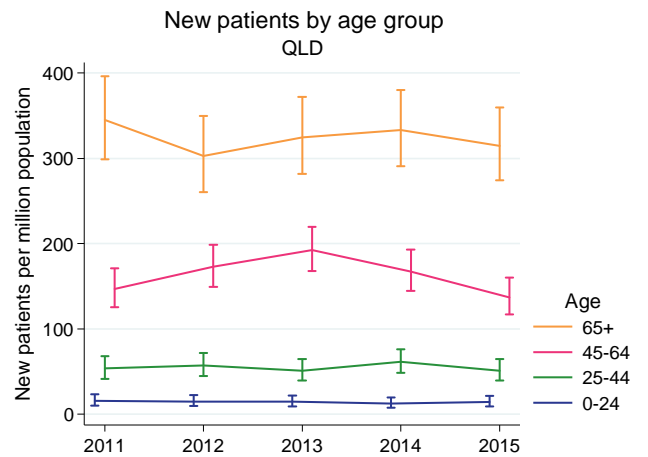


Figure 1.4.5

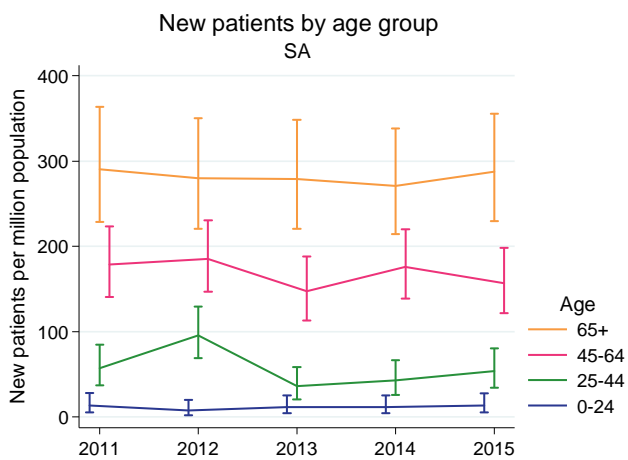


Figure 1.4.6

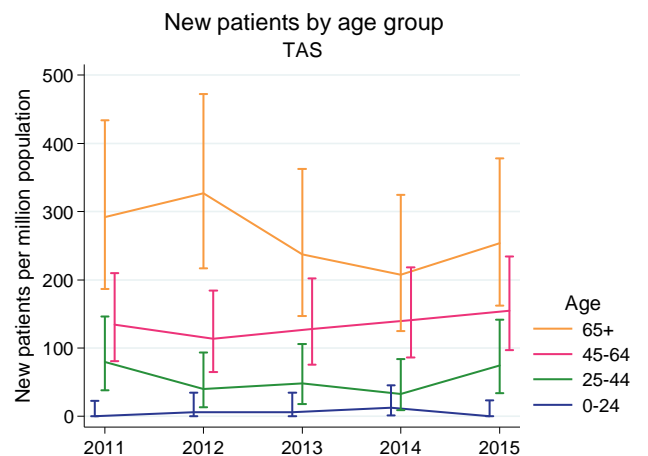


Figure 1.4.7

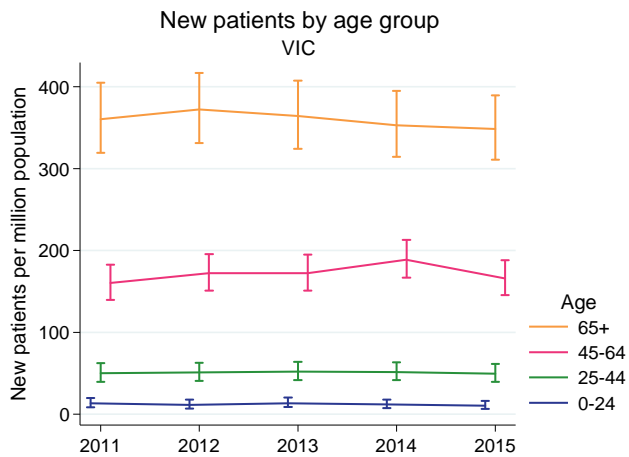
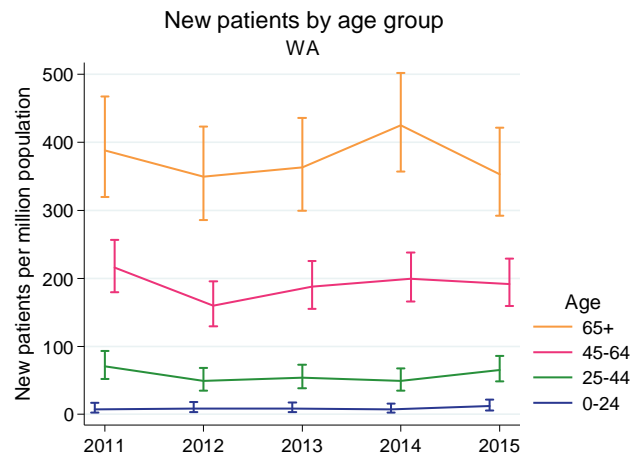


Figure 1.4.8



The rates in older patients are shown in table 1.4. Incidence rates for older patients tend to be lower in New Zealand than in Australia. Finally, table 1.5 further categorises the 2015 data by gender.

Table 1.4 Incidence (pmp) of ESKD in older patients 2011-2015

Country	Age	2011	2012	2013	2014	2015
Australia	60-64	295 (241)	321 (262)	325 (262)	327 (259)	307 (239)
	65-69	295 (309)	295 (288)	326 (302)	342 (306)	379 (329)
	70-74	280 (385)	298 (394)	317 (405)	308 (376)	328 (382)
	75-79	300 (537)	261 (456)	268 (454)	307 (502)	290 (457)
	80-84	163 (367)	190 (426)	192 (429)	182 (405)	175 (387)
	85+	64 (159)	72 (171)	61 (139)	58 (128)	48 (102)
New Zealand	60-64	62 (260)	83 (347)	79 (328)	77 (314)	78 (312)
	65-69	75 (416)	63 (330)	80 (389)	87 (402)	63 (279)
	70-74	47 (327)	45 (298)	46 (299)	59 (368)	53 (321)
	75-79	22 (211)	27 (254)	34 (311)	39 (343)	39 (325)
	80-84	19 (234)	13 (159)	8 (97)	13 (157)	11 (132)
	85+	5 (71)	1 (14)	4 (54)	3 (39)	0 (0)

Table 1.5 Age and sex new patients 2014

Country	Sex	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	Total	Mean	Median
Australia	F	2	8	21	65	92	181	204	242	143	10	968	58.2	60
	M	9	13	31	66	130	241	371	465	322	38	1686	61.2	64
New Zealand	F	3	2	4	14	30	44	53	52	24	0	226	55.5	58
	M	0	2	8	13	26	70	92	64	26	0	301	56.9	59

Late Referral

The following figures and tables examine late referral, defined as <3 months between referral and RRT start. Figure 1.5 shows the overall proportion of new patients referred late in Australia and New Zealand over the last 10 years. There has been a steady decline in both countries. In 2015 17% of Australian and 13% of New Zealand new patients were referred late. Rates have fallen in each Australian state (figure 1.6) and in all age groups (figure 1.7), although the New Zealand data are subject to more variation due to low numbers.

Tables 1.6 and 1.7 show late referral rates for new patients over 2011-2015 by ethnicity and primary renal disease. Rates are similar amongst ethnic groups but vary substantially between primary renal disease categories; for example in Australia 8% of patients with polycystic kidney disease were referred late, compared with 31% of patients with "other" diseases.

Figure 1.5

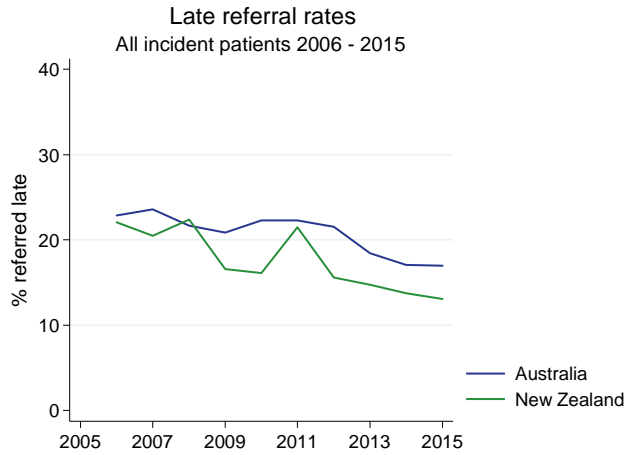


Figure 1.6

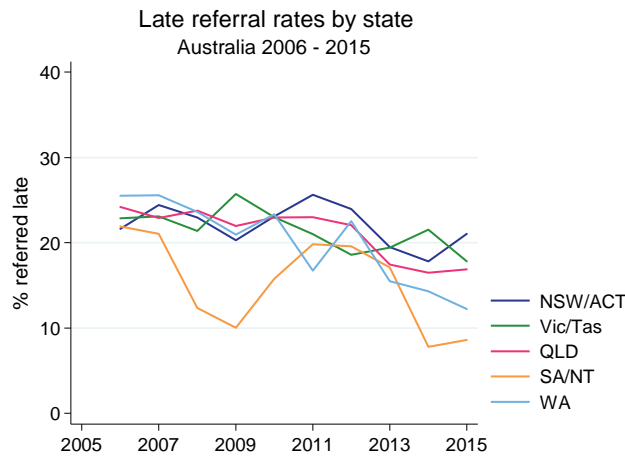


Figure 1.7.1

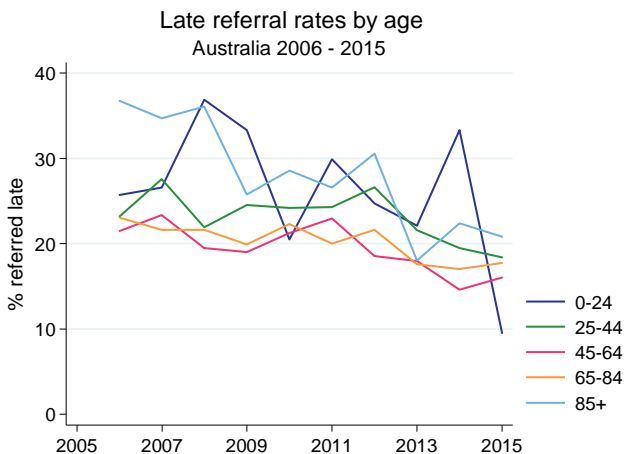


Figure 1.7.2

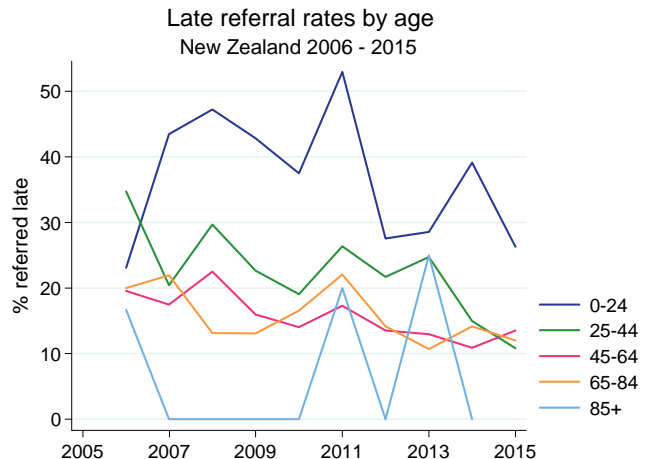


Table 1.6 Late referral by country and race 2011-2015

Country	Ethnicity	Late	Not late	Not reported	Total
Australia	Caucasian	1723 (19%)	7356 (80%)	137 (1%)	9216
	Aboriginal/TSI	272 (20%)	1037 (77%)	45 (3%)	1354
	Asian	246 (19%)	1008 (79%)	18 (1%)	1272
	Māori	34 (24%)	103 (73%)	5 (4%)	142
	Pacific	82 (26%)	235 (73%)	4 (1%)	321
	Other	120 (21%)	424 (76%)	17 (3%)	561
	Not reported	44 (18%)	126 (51%)	79 (32%)	249
	Total	2521 (19%)	10289 (78%)	305 (2%)	13115
New Zealand	Caucasian	158 (16%)	853 (84%)	3 (0%)	1014
	Aboriginal/TSI	0 (0%)	1 (100%)	0 (0%)	1
	Asian	25 (12%)	192 (88%)	0 (0%)	217
	Maori	116 (14%)	673 (84%)	13 (2%)	802
	Pacific	105 (19%)	442 (80%)	3 (1%)	550
	Other	9 (18%)	42 (82%)	0 (0%)	51
	Not reported	0 (0%)	6 (75%)	2 (25%)	8
	Total	413 (16%)	2209 (84%)	21 (1%)	2643

Table 1.7 Late referral by country and primary renal disease 2011-2015

Country	Primary Renal Disease	Late	Not late	Not reported	Total
Australia	GN	508 (19%)	2095 (79%)	46 (2%)	2649
	Analgesic	21 (15%)	113 (82%)	3 (2%)	137
	Polycystic	67 (8%)	702 (88%)	28 (4%)	797
	Reflux	29 (10%)	249 (89%)	2 (1%)	280
	Hypertension	333 (19%)	1440 (80%)	24 (1%)	1797
	Diabetes	791 (16%)	3960 (82%)	58 (1%)	4809
	Other	534 (31%)	1189 (68%)	27 (2%)	1750
	Uncertain	182 (29%)	439 (69%)	13 (2%)	634
	Not reported	56 (21%)	102 (39%)	104 (40%)	262
	Total	2521 (19%)	10289 (78%)	305 (2%)	13115
New Zealand	GN	105 (19%)	432 (80%)	4 (1%)	541
	Analgesic	6 (40%)	9 (60%)	0 (0%)	15
	Polycystic	4 (3%)	123 (95%)	3 (2%)	130
	Reflux	7 (11%)	59 (89%)	0 (0%)	66
	Hypertension	37 (15%)	211 (84%)	3 (1%)	251
	Diabetes	150 (12%)	1115 (88%)	9 (1%)	1274
	Other	80 (30%)	189 (70%)	0 (0%)	269
	Uncertain	17 (22%)	61 (77%)	1 (1%)	79
	Not reported	7 (39%)	10 (56%)	1 (6%)	18
	Total	413 (16%)	2209 (84%)	21 (1%)	2643

Co-morbidities

Tables 1.8-1.10 show the co-morbidities at RRT entry of new patients in 2015. Notably, patients who have never smoked are in the minority in both countries, and non-diabetics now also in the minority in both countries. Trends in the prevalence of these co-morbidities at RRT entry are shown in figures 1.7-1.8, with the bars representing 95% confidence intervals.

Table 1.8 Co-morbidities of new patients 2015					
Country	Status at RRT entry	Coronary artery disease	Peripheral vascular disease	Cerebrovascular disease	Chronic lung disease
Australia	No	1669 (63%)	2078 (78%)	2261 (85%)	2213 (83%)
	Suspected	114 (4%)	128 (5%)	48 (2%)	65 (2%)
	Yes	788 (30%)	365 (14%)	257 (10%)	294 (11%)
	Not reported	83 (3%)	83 (3%)	88 (3%)	82 (3%)
New Zealand	No	345 (65%)	423 (80%)	447 (85%)	401 (76%)
	Suspected	52 (10%)	42 (8%)	22 (4%)	43 (8%)
	Yes	124 (24%)	56 (11%)	52 (10%)	77 (15%)
	Not reported	6 (1%)	6 (1%)	6 (1%)	6 (1%)

Table 1.9 Smoking status of new patients 2015		
Country	Status at RRT entry	N (%)
Australia	Current	292 (11%)
	Former	982 (37%)
	Never	1185 (45%)
	Unknown	195 (7%)
New Zealand	Current	79 (15%)
	Former	214 (41%)
	Never	230 (44%)
	Unknown	4 (1%)

Table 1.10 Diabetic status of new patients 2015		
Country	Diabetes at RRT entry	N (%)
Australia	No	1244 (47%)
	Not reported	65 (2%)
	Type 1	147 (6%)
	Type 2	1198 (45%)
New Zealand	No	231 (44%)
	Not reported	6 (1%)
	Type 1	23 (4%)
	Type 2	267 (51%)

Figure 1.8.1

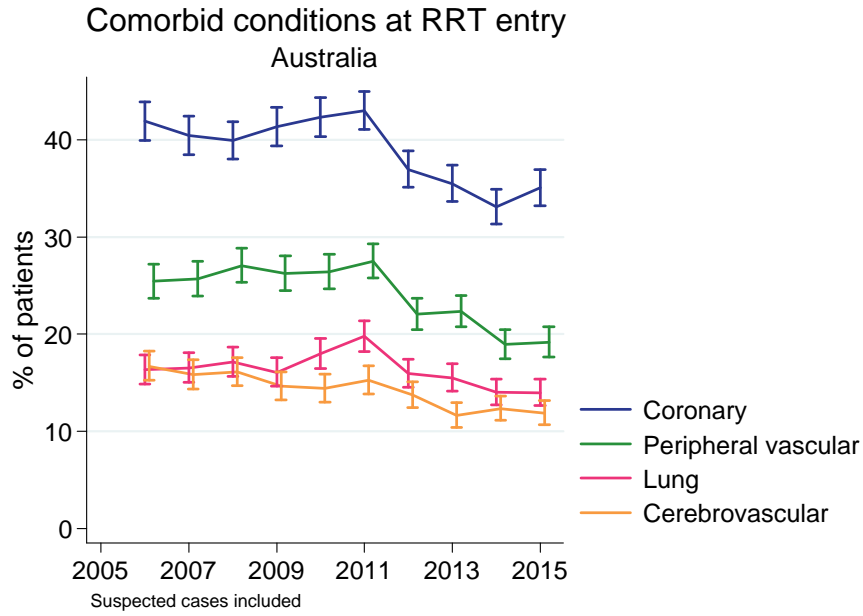


Figure 1.8.2

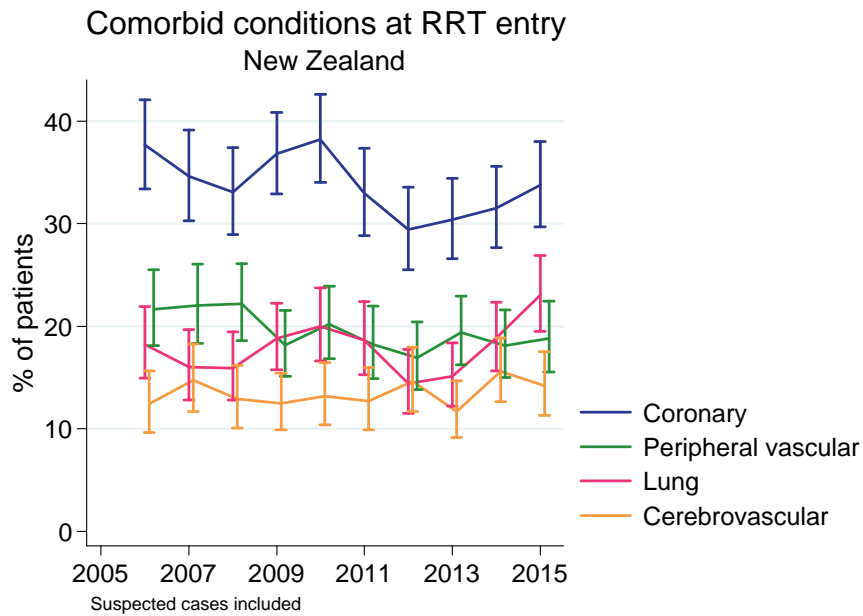
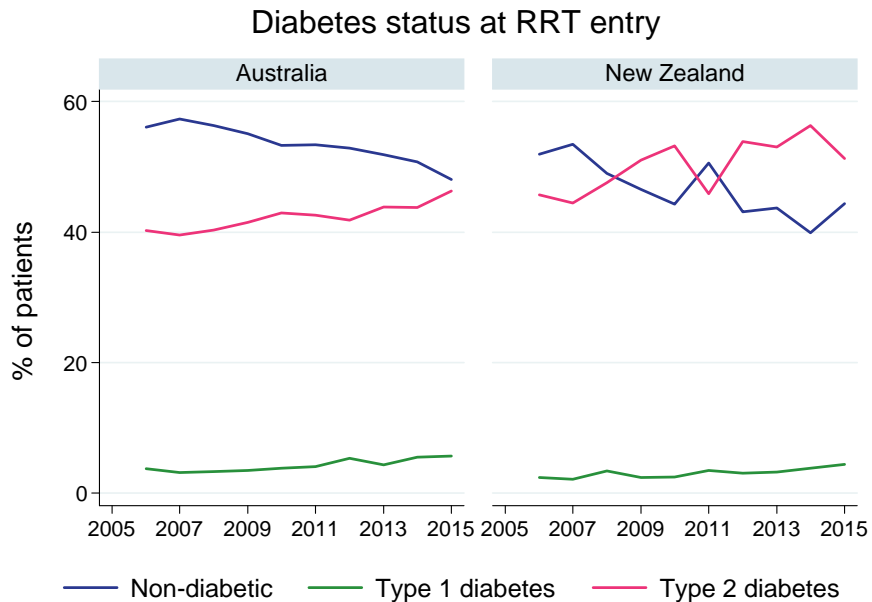


Figure 1.9



Primary Renal Disease

The primary renal diseases of new patients over 2012-15 are shown in table 1.11. Diabetes continues to be the leading cause of ESKD in both countries, followed by glomerulonephritis (table 1.12). Analgesic nephropathy is now a rare cause of ESKD. The “other” causes from table 1.11 are shown in detail in table 1.13. There has been a trend towards missing data for primary disease in Australia; the Registry is actively seeking to address this problem.

Table 1.11 Primary renal disease of new patients 2015

Country	Primary Renal Disease	2012	2013	2014	2015
Australia	GN	535 (21%)	513 (20%)	561 (21%)	467 (18%)
	Analgesic	41 (2%)	29 (1%)	14 (1%)	20 (1%)
	Polycystic	142 (5%)	166 (6%)	183 (7%)	161 (6%)
	Reflux	66 (3%)	50 (2%)	61 (2%)	47 (2%)
	Hypertension	335 (13%)	381 (15%)	372 (14%)	344 (13%)
	Diabetes	965 (37%)	941 (36%)	1018 (37%)	989 (37%)
	Other	376 (14%)	374 (14%)	338 (12%)	348 (13%)
	Uncertain	120 (5%)	129 (5%)	126 (5%)	128 (5%)
	Not reported	19 (1%)	27 (1%)	59 (2%)	150 (6%)
		Total	2599	2610	2732
New Zealand	GN	105 (20%)	120 (22%)	93 (17%)	107 (20%)
	Analgesic	5 (1%)	1 (<1%)	2 (<1%)	2 (<1%)
	Polycystic	28 (5%)	30 (5%)	20 (4%)	23 (4%)
	Reflux	8 (2%)	14 (3%)	19 (3%)	16 (3%)
	Hypertension	48 (9%)	53 (10%)	51 (9%)	48 (9%)
	Diabetes	257 (49%)	270 (49%)	292 (53%)	250 (47%)
	Other	48 (9%)	53 (10%)	55 (10%)	61 (12%)
	Uncertain	15 (3%)	14 (3%)	14 (3%)	15 (3%)
	Not reported	6 (1%)	1 (<1%)	6 (1%)	5 (1%)
		Total	520	556	552

Table 1.12 Glomerulonephritis as primary renal disease 2015

Primary renal disease	Australia	New Zealand
Advanced GN (unclassified=end stage)	5	6
Extra and intra capillary GN (rapidly progressive)	12	3
Familial GN (including Alports)	14	2
Focal and segmental proliferative GN	16	10
Focal sclerosing GN (including hyalinosis)	40	5
GN other (specify)	30	6
GN with systemic disease (specify)	4	0
Goodpastures with linear IgG and lung haemorrhage	11	0
Henoch-Schonlein purpura	2	2
Membranous GN	25	4
Mesangial proliferative (IgA+)	127	16
Mesangial proliferative (IgA-)	8	0
Mesangial proliferative (no if studies)	6	2
Mesangiocapillary GN (dense deposit disease)	2	1
Mesangiocapillary GN (double contour)	5	3
Microscopic polyarteritis	5	0
Presumed GN (no biopsy)	68	21
Primary focal sclerosing GN or focal glomerular sclerosis	42	11
Proliferative GN with linear IgG and no lung haemorrhage	1	2
S.L.E.	19	7
Scleroderma	4	1
Secondary focal sclerosing GN	12	1
Wegener's granulomatosis	9	4
Total	467	107

Table 1.13 Miscellaneous primary renal diseases 2015

Primary renal disease	Australia	New Zealand
Balkan Nephropathy	1	0
Calcineurin Inhibitor Toxicity	11	2
Cystinosis	1	0
Gout	2	0
Interstitial Nephritis	31	12
Lead Nephropathy	1	0
Lithium Toxicity	23	3
Loss of Single Kidney (Trauma-Surgery)	8	2
Oxalosis	2	0
Post Partum Nephropathy	2	0
Pyelonephritis	5	3
Renal Tuberculosis	2	1
Bladder Neck Obstruction (Incl. Prostatomegaly)	4	0
Congenital Renal Hypoplasia and Dysplasia	15	1
Megaureter	1	0
Neuropathic Bladder	3	0
Obstructed Megaureter	1	0
Obstructive Nephropathy	20	1
Other Lower Urinary Tract Abnormalities (With 2Nd.Reflux)	4	1
Pelvi-Ureteric Junction Obstruction	1	0
Posterior Urethral Valves	6	1
Spina Bifida or Myelomeningocele	1	0
Ureteric Obstructive Nephropathy	8	1
Calculi	10	3
Medullary Cystic Disease	9	0
Cortical Necrosis	4	0
Haemolytic Uraemic Syndrome	11	0
Amyloid Disease	20	2
Light Chain Nephropathy (Not Malignant)	2	0
Paraproteinaemia (Including Multiple Myeloma)	29	4
Renal Cell Carcinoma (Grawitz)	19	3
Transitional Cell Carcinoma Urinary Tract	3	0
Other	88	21

Biopsy rates for primary renal disease are essentially stable in both countries (figure 1.10); the bars show 95% confidence intervals.

Figure 1.10.1

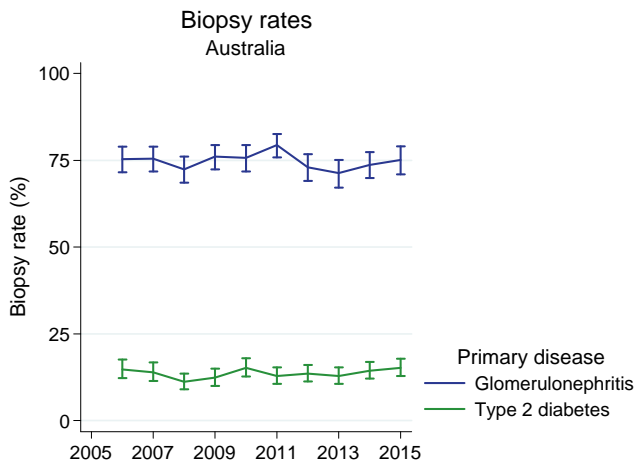
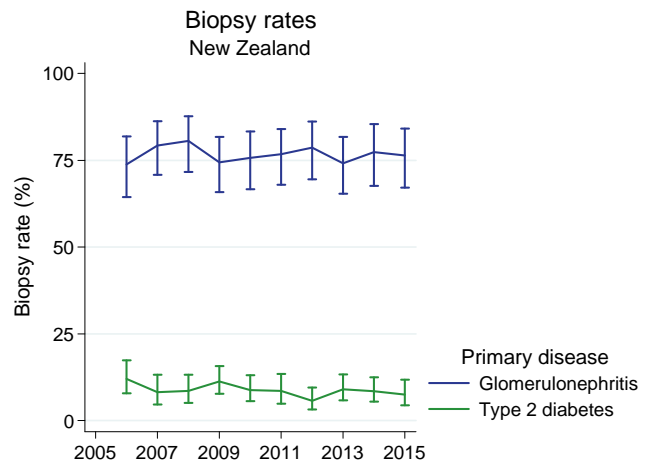


Figure 1.10.2



Timing of RRT Start

The median eGFR at RRT start over time is shown in figure 1.10. In Australia there was a slight trend towards earlier initiation of RRT until 2009; since then the median eGFR has stabilised, and was 7.3mL/min/1.73m² in 2015. In New Zealand timing of RRT hasn't changed in the last 10 years, with a median eGFR at RRT start of 6.4mL/min/1.73m² in 2015.

Figure 1.11.1

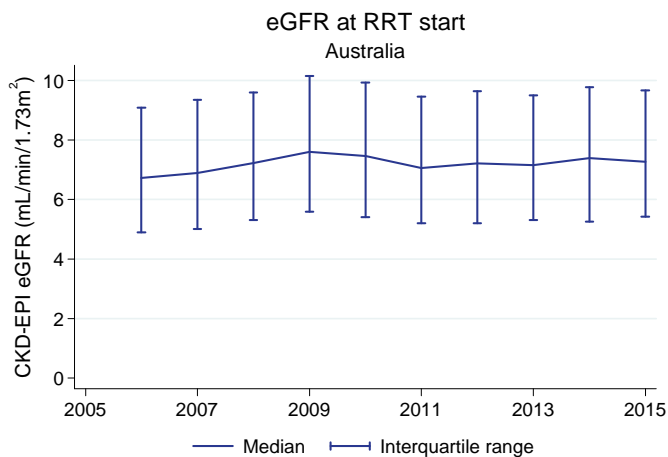
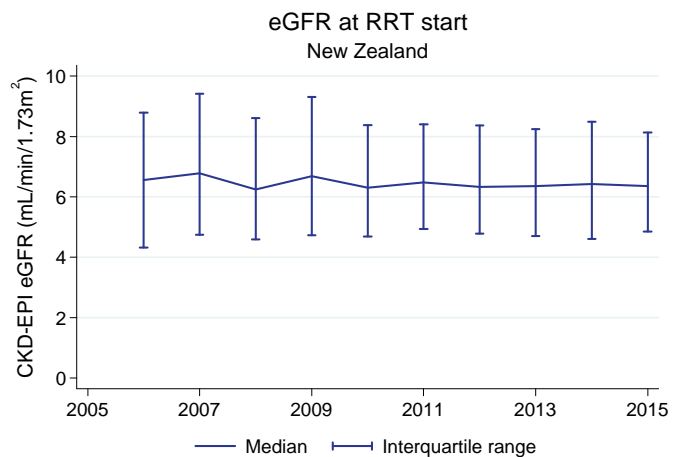


Figure 1.11.2



Suggested Citation:

ANZDATA Registry. 39th Report, Chapter 1: Incidence of End Stage Kidney Disease. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2017. Available at: <http://www.anzdata.org.au>

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