

Chapter 1

Incidence of End Stage Kidney Disease

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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. In Australia in 2014 there were 2,610 new RRT patients, with an overall incidence rate of 111 per million population (pmp). This rate has now been stable for several years. In New Zealand there were 547 new patients (122 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 2014 there were 22,234 (947 pmp) patients receiving RRT, and in New Zealand there were 4,306 (959 pmp).

Table 1.1. Stock and Flow 2010-2014

Country	Event	2010	2011	2012	2013	2014
AUSTRALIA	Total New Patients	2342 (106)	2516 (113)	2588 (114)	2573 (111)	2610 (111)
	Total Transplants	846 (38)	825 (37)	845 (37)	883 (38)	914 (39)
	Living Donor Transplants	296	255	238	253	267
	Subsequent Transplants	102	81	98	94	108
	Total Deaths	1599	1735	1663	1804	1745
	Dialysis Patients	1414	1509	1488	1567	1549
	Transplant Patients	185	226	175	237	196
	Total Prevalent	19232 (873)	19934 (892)	20769 (914)	21445 (927)	22234 (947)
	Dialysis Patients	10727 (487)	11071 (496)	11504 (506)	11777 (509)	12091 (515)
	Transplant Patients	8505 (386)	8863 (397)	9265 (408)	9668 (418)	10143 (432)
NEW ZEALAND	Total New Patients	515 (119)	487 (112)	519 (118)	554 (125)	547 (122)
	Total Transplants	110 (25)	118 (27)	108 (25)	116 (26)	138 (31)
	Living Donor Transplants	60	57	54	59	72
	Subsequent Transplants	6	8	9	5	12
	Total Deaths	354	413	393	379	409
	Dialysis Patients	319	369	361	347	365
	Transplant Patients	35	44	32	32	44
	Total Prevalent	3831 (884)	3876 (887)	3992 (909)	4163 (941)	4306 (959)
	Dialysis Patients	2388 (551)	2392 (548)	2467 (562)	2589 (585)	2678 (596)
	Transplant Patients	1443 (333)	1484 (340)	1525 (347)	1574 (356)	1628 (362)

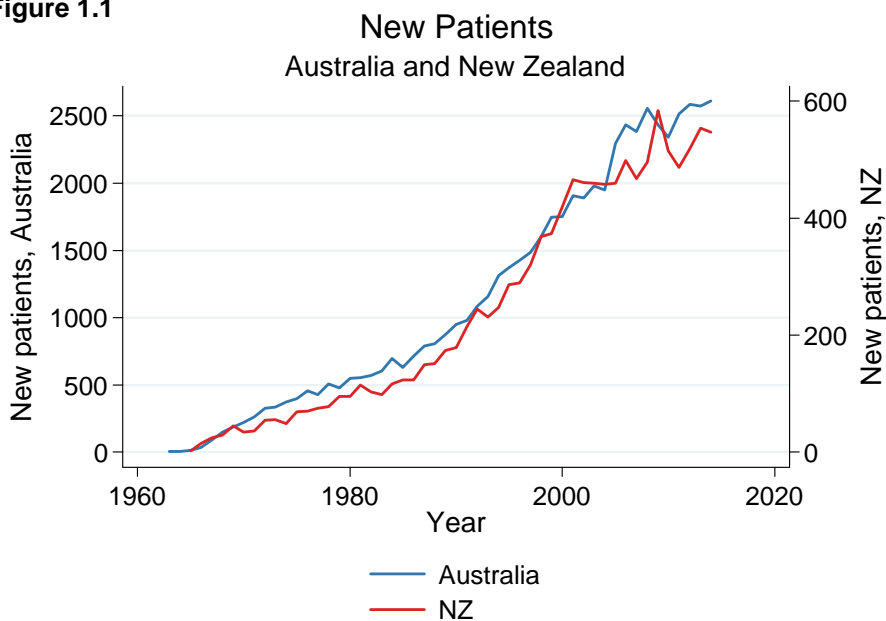
Table 1.2. Stock and Flow by State and Country 2014

State	New patients	Transplant operations	Deaths - dialysis	Deaths - transplant	Dialysis dependent	Functioning transplants	Total prevalent
QLD	447 (95)	145 (31)	281	36	2262 (479)	1931 (409)	4193 (888)
NSW	781 (104)	300 (40)	485	52	3825 (509)	2849 (379)	6674 (888)
ACT	69 (179)	0 (0)	53	6	281 (728)	241 (624)	522 (1352)
VIC	676 (116)	307 (53)	376	32	2978 (510)	2858 (489)	5836 (999)
TAS	45 (87)	0 (0)	29	5	227 (441)	222 (431)	449 (872)
SA	169 (100)	85 (50)	123	34	742 (440)	979 (581)	1721 (1021)
NT	113 (461)	0 (0)	65	6	557 (2273)	97 (396)	654 (2669)
WA	310 (120)	77 (30)	137	25	1219 (474)	966 (375)	2185 (849)
Aust	2610 (111)	914 (39)	1549	196	12091 (515)	10143 (432)	22234 (947)
NZ	547 (122)	138 (31)	365	44	2678 (596)	1628 (362)	4306 (959)

Incident Patients

Incident Rates

Figure 1.1



The total numbers of incident patients in Australia and New Zealand since the beginning of RRT are shown in figure 1.1. The flattening off of incidence in the last decade is apparent compared with the strong growth in the preceding decades.

Figure 1.2 presents 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 2010-2014. There is substantial variation in incidence rates between states, with the lowest rates in Tasmania (87 pmp in 2014) and the highest in the Northern Territory (461 pmp in 2014).

Figure 1.2.1

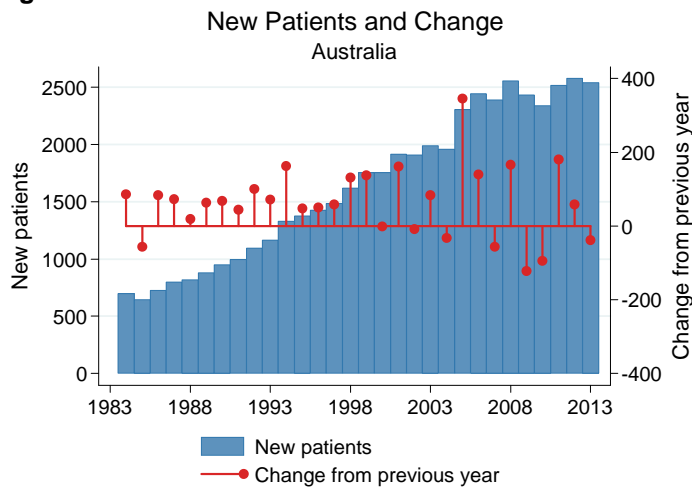


Figure 1.2.2

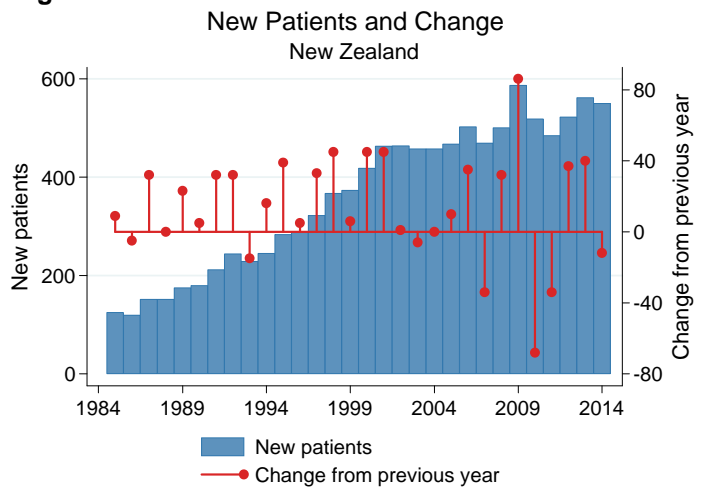


Table 1.3. RRT Incidence (pmp) 2010-2014

State	2010	2011	2012	2013	2014
QLD	452 (103)	456 (102)	474 (104)	507 (109)	447 (95)
NSW	731 (102)	790 (109)	816 (112)	789 (106)	781 (104)
ACT	53 (147)	53 (144)	63 (168)	53 (139)	69 (179)
Vic	575 (105)	604 (109)	643 (114)	659 (115)	676 (116)
Tas	47 (92)	53 (104)	49 (96)	45 (88)	45 (87)
SA	182 (112)	185 (113)	203 (123)	164 (98)	169 (100)
NT	65 (283)	83 (359)	98 (415)	86 (355)	113 (461)
WA	237 (103)	292 (124)	242 (99)	270 (107)	310 (120)
Aust	2342 (106)	2516 (113)	2588 (114)	2573 (111)	2610 (111)
NZ	515 (119)	487 (112)	519 (118)	554 (125)	547 (122)

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 1.3.1

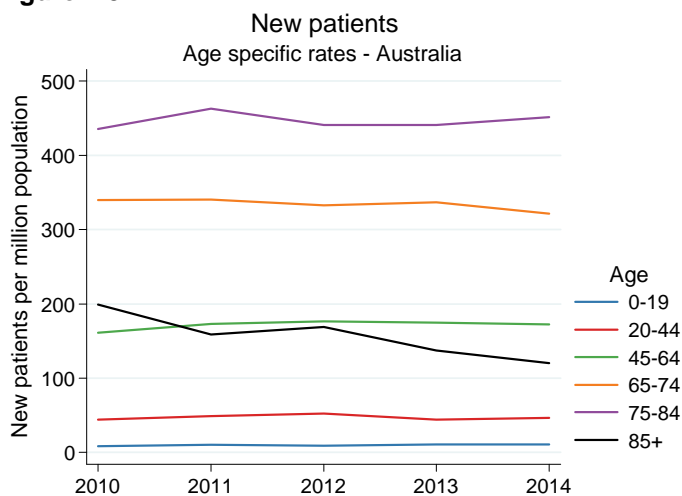


Figure 1.3.2

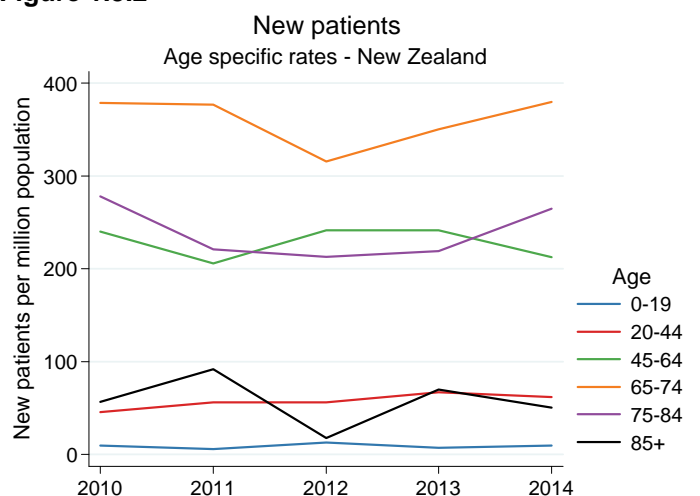


Figure 1.4.1

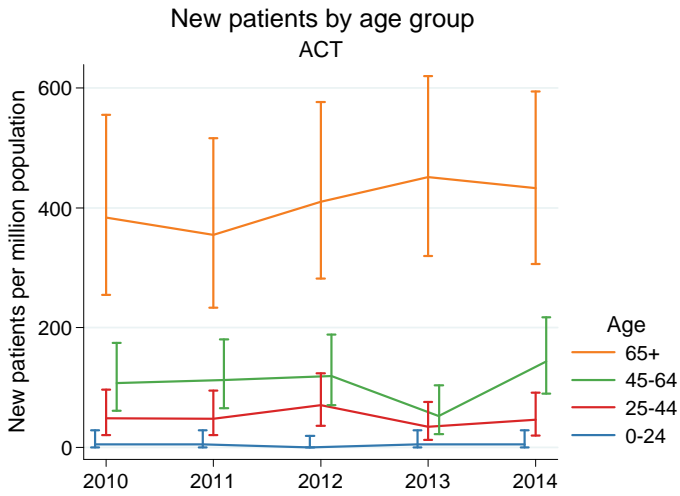


Figure 1.4.2

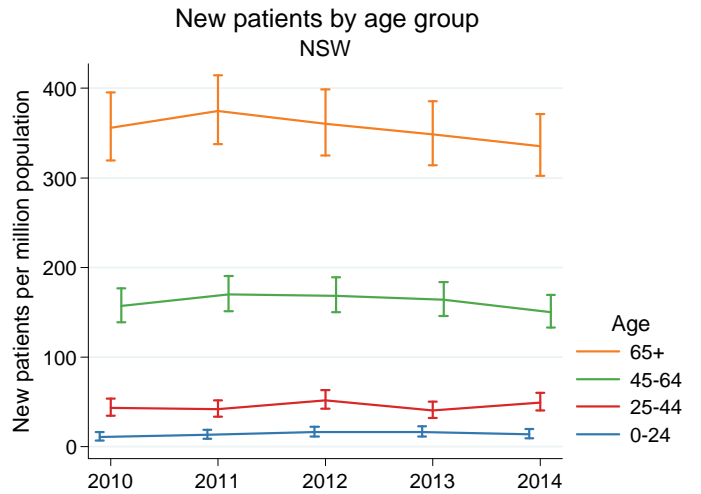


Figure 1.4.3

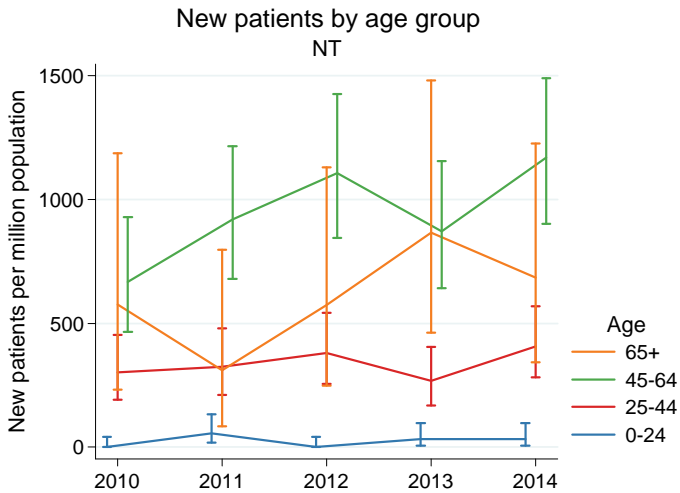


Figure 1.4.4

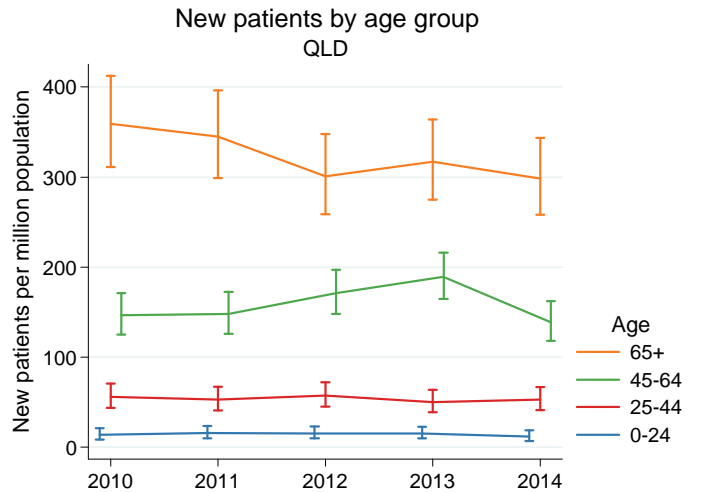


Figure 1.4.5

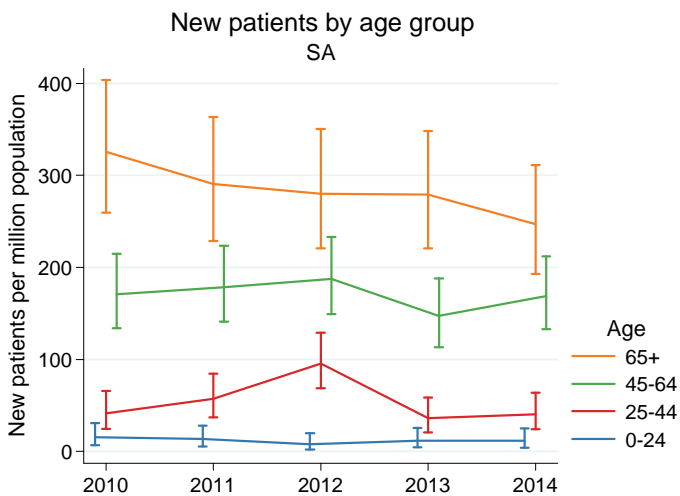


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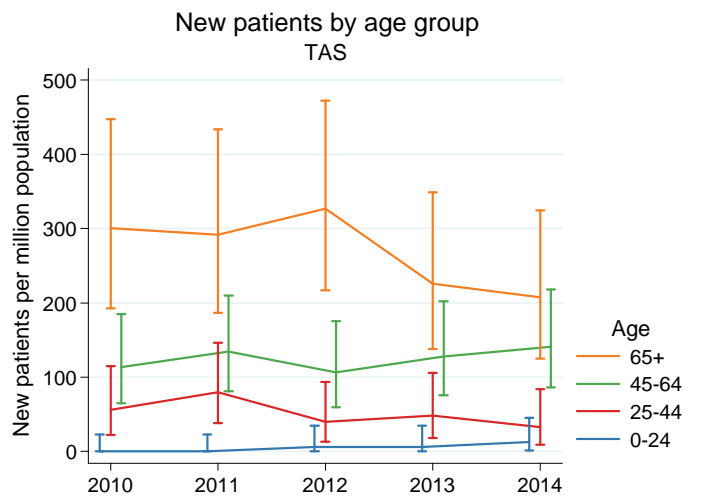


Figure 1.4.7

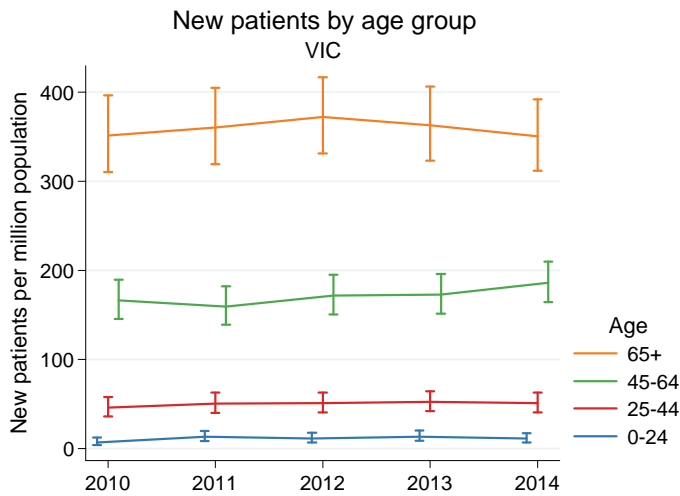
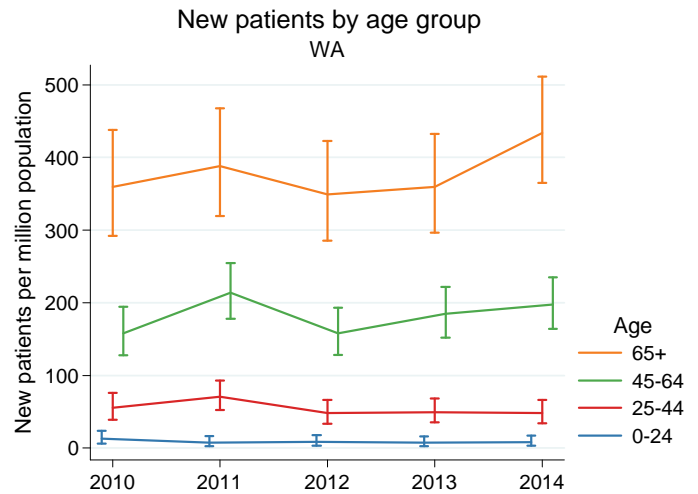


Figure 1.4.8



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 2014 data by sex.

Table 1.4. Incidence (pmp) of ESKD in older patients 2010-2014

Country	Age	2009	2010	2011	2012	2013
Australia	60-64	271 (234)	280 (234)	294 (240)	317 (259)	320 (258)
	65-69	288 (333)	255 (281)	293 (307)	294 (287)	316 (292)
	70-74	302 (444)	291 (413)	278 (382)	294 (389)	304 (389)
	75-79	297 (542)	271 (493)	301 (539)	259 (452)	262 (444)
	80-84	169 (394)	156 (357)	163 (367)	189 (424)	190 (425)
	85+	66 (179)	77 (199)	63 (156)	69 (164)	59 (135)
New Zealand	60-64	72 (325)	93 (402)	62 (260)	84 (351)	77 (319)
	65-69	75 (438)	70 (398)	75 (416)	62 (324)	78 (379)
	70-74	66 (511)	48 (354)	47 (327)	45 (298)	45 (292)
	75-79	49 (472)	33 (317)	22 (211)	27 (254)	34 (311)
	80-84	16 (204)	18 (227)	19 (234)	13 (159)	8 (97)
	85+	4 (61)	3 (44)	5 (71)	1 (14)	4 (54)

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	7	12	21	54	106	159	217	202	150	16	944	57.7	60
	M	8	9	35	65	136	262	362	421	329	39	1666	60.9	64
New Zealand	F	1	2	6	15	21	48	54	47	23	1	218	55.8	57.5
	M	2	3	9	18	27	56	87	96	29	2	329	57.8	61

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 2014 17% of Australian and 14% 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 2010-2014 by race and primary renal disease. Rates are similar amongst racial groups but vary substantially between primary renal disease categories; for example in Australia 9% of patients with polycystic kidney disease were referred late, compared with 32% of patients with “other” diseases.

Figure 1.5

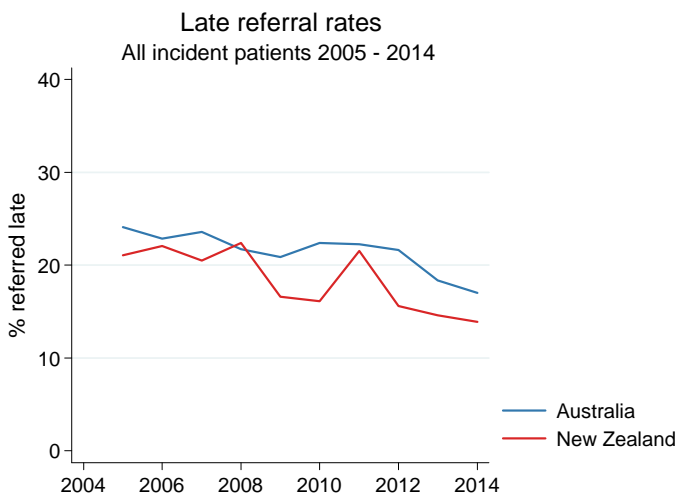


Figure 1.6

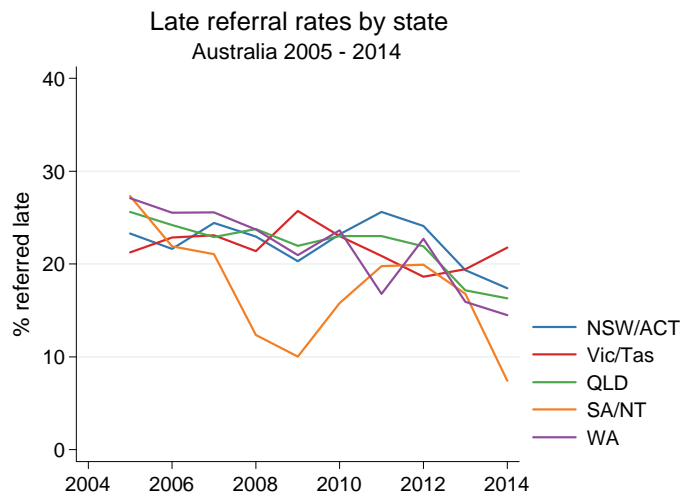


Figure 1.7.1

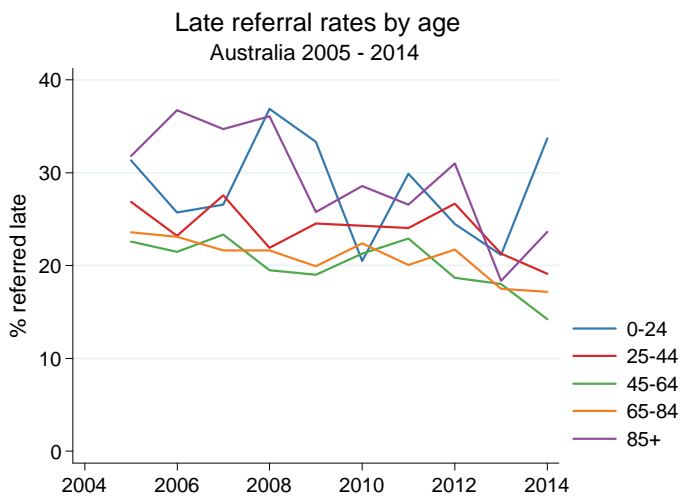


Figure 1.7.2

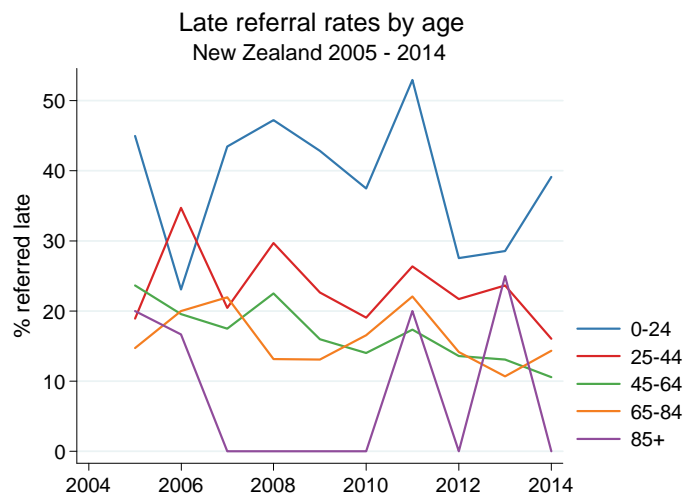


Table 1.6. Late referral by country and race 2010-2014

Country	Race	Late	Not late	Not reported	Total
Australia	Caucasian	1810 (20%)	7239 (79%)	82 (1%)	9131
	Aboriginal/TSI	272 (22%)	941 (76%)	30 (2%)	1243
	Asian	240 (21%)	914 (78%)	12 (1%)	1166
	Māori	35 (26%)	99 (73%)	2 (1%)	136
	Pacific	71 (25%)	206 (74%)	2 (1%)	279
	Other	114 (22%)	405 (77%)	6 (1%)	525
	Not reported	18 (12%)	90 (60%)	41 (28%)	149
	Total	2560 (20%)	9894 (78%)	175 (1%)	12629
New Zealand	Caucasian	160 (16%)	854 (84%)	4 (0%)	1018
	Asian	28 (13%)	179 (86%)	1 (0%)	208
	Māori	120 (15%)	668 (83%)	13 (2%)	801
	Pacific	110 (20%)	430 (79%)	3 (1%)	543
	Other	8 (18%)	36 (82%)	0 (0%)	44
	Not reported	0 (0%)	6 (75%)	2 (25%)	8
	Total	426 (16%)	2173 (83%)	23 (1%)	2622

Table 1.7. Late referral by country and primary renal disease 2010-2014

Country	Primary Renal Disease	Late	Not late	Not reported	Total
Australia	GN	551 (21%)	2043 (78%)	27 (1%)	2621
	Analgesic	28 (19%)	121 (80%)	2 (1%)	151
	Polycystic	74 (9%)	697 (89%)	10 (1%)	781
	Reflux	34 (12%)	253 (87%)	3 (1%)	290
	Hypertension	335 (19%)	1382 (80%)	17 (1%)	1734
	Diabetes	782 (17%)	3752 (82%)	34 (1%)	4568
	Other	540 (32%)	1117 (67%)	19 (1%)	1676
	Uncertain	183 (29%)	442 (70%)	6 (1%)	631
	Not reported	33 (19%)	87 (49%)	57 (32%)	177
	Total	2560 (20%)	9894 (78%)	175 (1%)	12629
New Zealand	GN	103 (19%)	429 (80%)	4 (1%)	536
	Analgesic	5 (36%)	9 (64%)	0 (0%)	14
	Polycystic	6 (5%)	116 (93%)	3 (2%)	125
	Reflux	8 (14%)	48 (86%)	0 (0%)	56
	Hypertension	37 (14%)	222 (85%)	2 (1%)	261
	Diabetes	156 (12%)	1084 (87%)	10 (1%)	1250
	Other	74 (30%)	171 (70%)	1 (0%)	246
	Uncertain	21 (26%)	59 (74%)	0 (0%)	80
	Not reported	16 (30%)	35 (65%)	3 (6%)	54
Total	426 (16%)	2173 (83%)	23 (1%)	2622	

Co-morbidities

Tables 1.8-1.10 show the co-morbidities at RRT entry of new patients in 2014. Notably, patients who have never smoked are in the minority in both countries, and non-diabetics are in the minority in New Zealand. 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. The last three years have seen a substantial fall in the number of patients reported as having coronary artery disease in both countries, and in Australia, peripheral vascular disease.

Table 1.8. Co-morbidities of new patients 2014

Country	Status at RRT entry	Coronary artery disease	Peripheral vascular disease	Cerebrovascular disease	Chronic lung disease
Australia	No	1728 (66%)	2092 (80%)	2265 (87%)	2214 (85%)
	Suspected	109 (4%)	115 (4%)	47 (2%)	82 (3%)
	Yes	737 (28%)	367 (14%)	260 (10%)	278 (11%)
	Not reported	36 (1%)	36 (1%)	38 (1%)	36 (1%)
New Zealand	No	370 (68%)	442 (81%)	459 (84%)	437 (80%)
	Suspected	40 (7%)	36 (7%)	19 (3%)	24 (4%)
	Yes	124 (23%)	56 (10%)	56 (10%)	73 (13%)
	Not reported	13 (2%)	13 (2%)	13 (2%)	13 (2%)

Table 1.9. Smoking status of new patients 2014

Country	Status at RRT entry	N (%)
Australia	Current	294 (11%)
	Former	974 (37%)
	Never	1214 (47%)
	Unknown	128 (5%)
New Zealand	Current	68 (12%)
	Former	214 (39%)
	Never	254 (46%)
	Unknown	11 (2%)

Table 1.10. Diabetic status of new patients 2014

Country	Diabetes at RRT entry	N (%)
Australia	No	1306 (50%)
	Not reported	41 (2%)
	Type 1	152 (6%)
	Type 2	1111 (43%)
New Zealand	No	216 (39%)
	Not reported	16 (3%)
	Type 1	24 (4%)
	Type 2	291 (53%)

Figure 1.8.1

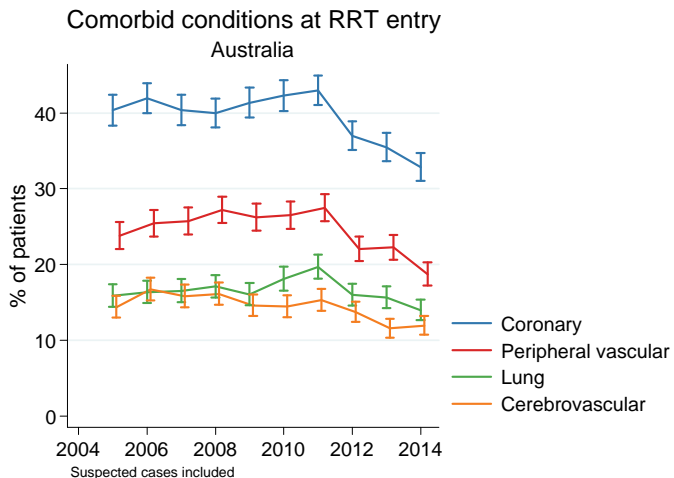


Figure 1.8.2

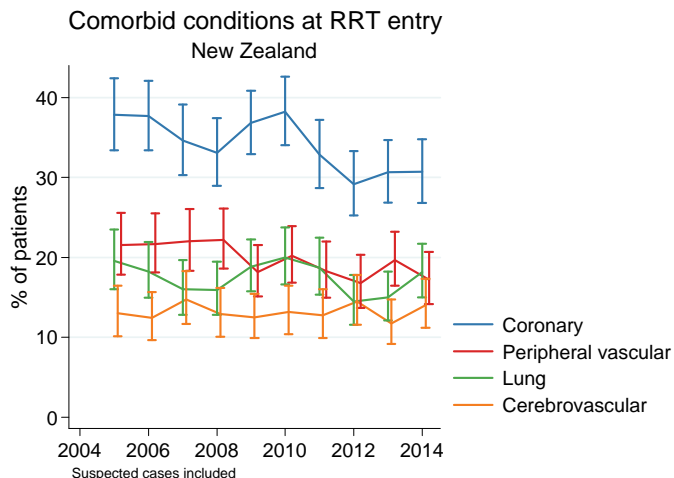
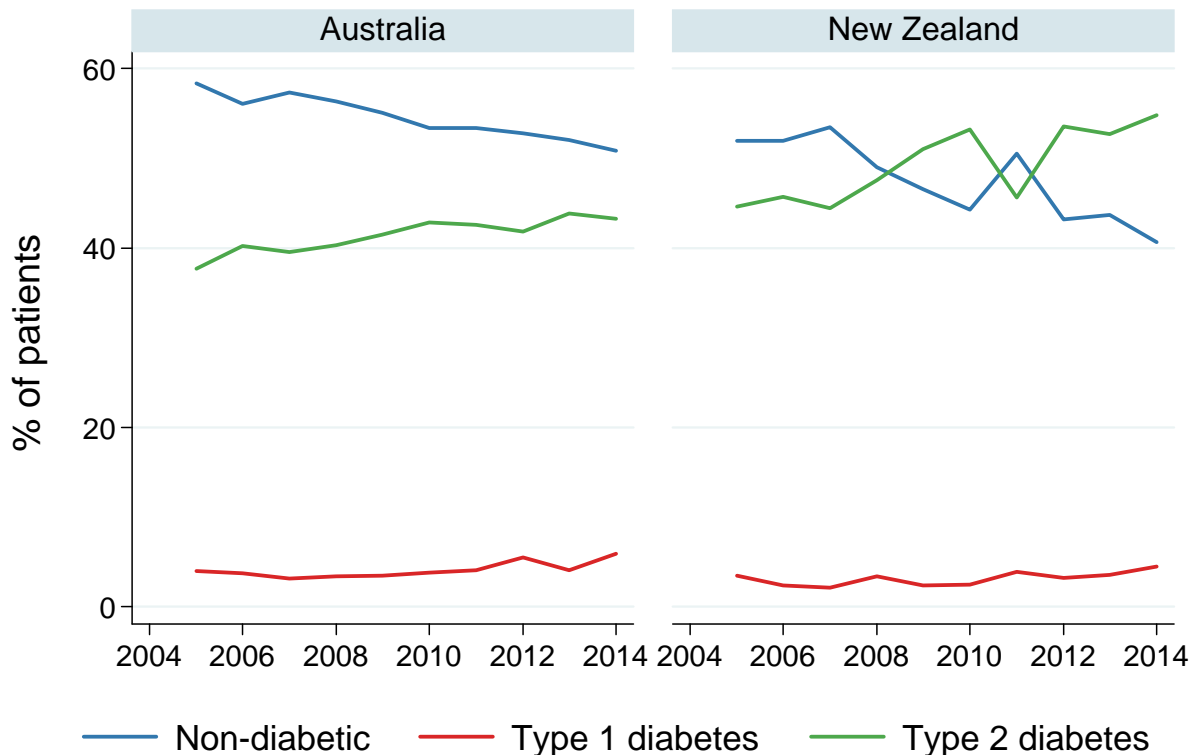


Figure 1.9

Diabetes status at RRT entry



Primary Renal Disease

The primary renal diseases of new patients over 2011-14 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 2014

Country	Primary Renal Disease	2011	2012	2013	2014
Australia	GN	571 (23%)	533 (21%)	502 (20%)	514 (20%)
	Analgesic	33 (1%)	41 (2%)	28 (1%)	12 (<1%)
	Polycystic	144 (6%)	139 (5%)	164 (6%)	168 (6%)
	Reflux	56 (2%)	66 (3%)	50 (2%)	58 (2%)
	Hypertension	364 (14%)	332 (13%)	372 (14%)	343 (13%)
	Diabetes	896 (36%)	962 (37%)	924 (36%)	954 (37%)
	Other	316 (13%)	377 (15%)	373 (14%)	320 (12%)
	Uncertain	131 (5%)	119 (5%)	126 (5%)	124 (5%)
	Not reported	5 (<1%)	19 (1%)	34 (1%)	117 (4%)
	Total		2516	2588	2573
New Zealand	GN	115 (24%)	105 (20%)	120 (22%)	85 (16%)
	Analgesic	5 (1%)	5 (1%)	1 (<1%)	1 (<1%)
	Polycystic	29 (6%)	28 (5%)	30 (5%)	20 (4%)
	Reflux	9 (2%)	8 (2%)	14 (3%)	17 (3%)
	Hypertension	51 (10%)	48 (9%)	54 (10%)	50 (9%)
	Diabetes	205 (42%)	256 (49%)	269 (49%)	260 (48%)
	Other	52 (11%)	48 (9%)	51 (9%)	54 (10%)
	Uncertain	21 (4%)	15 (3%)	14 (3%)	13 (2%)
	Not reported	0 (0%)	6 (1%)	1 (<1%)	47 (9%)
	Total		487	519	554

Table 1.12. Glomerulonephritis as primary renal disease 2014

Primary renal disease	Australia	New Zealand
Advanced GN (unclassified=end stage)	12	2
Extra and intra capillary GN (rapidly progressive)	7	1
Familial GN (including Alports)	7	0
Focal and segmental proliferative GN	19	4
Focal sclerosing GN (including hyalinosis)	31	6
GN other (specify)	24	0
GN with systemic disease (specify)	3	2
Goodpastures with linear IgG and lung haemorrhage	9	0
Membranous GN	25	4
Mesangial proliferative (IgA+)	135	13
Mesangial proliferative (IgA-)	6	1
Mesangial proliferative (no if studies)	5	1
Mesangiocapillary GN (dense deposit disease)	3	0
Mesangiocapillary GN (double contour)	9	4
Microscopic polyarteritis	13	3
Presumed GN (no biopsy)	115	23
Primary focal sclerosing GN/focal glomerular sclerosis	47	10
Proliferative GN with linear IgG and no lung haemorrhage	2	0
S.L.E.	15	3
Scleroderma	7	0
Secondary focal sclerosing GN	7	4
Wegeners granulomatosis	13	4
Total	514	85

Table 1.13. Miscellaneous primary renal diseases 2014

Primary renal disease	Australia	New Zealand
Balkan Nephropathy	1	0
Cadmium Toxicity	1	0
Calcineurin Inhibitor Toxicity	8	2
Cystinosis	0	1
Gout	1	1
Interstitial Nephritis	15	2
Lead Nephropathy	1	0
Lithium Toxicity	13	7
Loss of Single Kidney (Trauma-Surgery)	8	1
Oxalosis	6	0
Pyelonephritis	3	0
Renal Tuberculosis	2	0
Sarcoidosis	1	1
Bladder Neck Obstruction (Incl. Prostatomegaly)	4	1
Congenital Renal Hypoplasia And Dysplasia	16	3
Megaureter	1	0
Neuropathic Bladder	1	1
Obstructed Megaureter	0	1
Obstructive Nephropathy	25	2
Other Lower Urinary Tract Abnormalities (With 2Nd.Reflux)	2	1
Pelvi-Ureteric Junction Obstruction	2	1
Posterior Urethral Valves	3	0
Spina Bifida Or Myelomeningocele	1	0
Ureteric Obstructive Nephropathy	8	1
Calculi	7	1
Medullary Cystic Disease	6	0
Cortical Necrosis	1	1
Haemolytic Uraemic Syndrome	7	0
Amyloid Disease	15	3
Light Chain Nephropathy (Not Malignant)	3	2
Paraproteinaemia (Including Multiple Myeloma)	37	4
Renal Cell Carcinoma (Grawitz)	23	5
Transitional Cell Carcinoma Urinary Tract	4	0
Other	94	12

Biopsy rates for primary renal disease are essentially stable in both countries (figure 1.9); the bars show 95% confidence intervals.

Figure 1.10.1

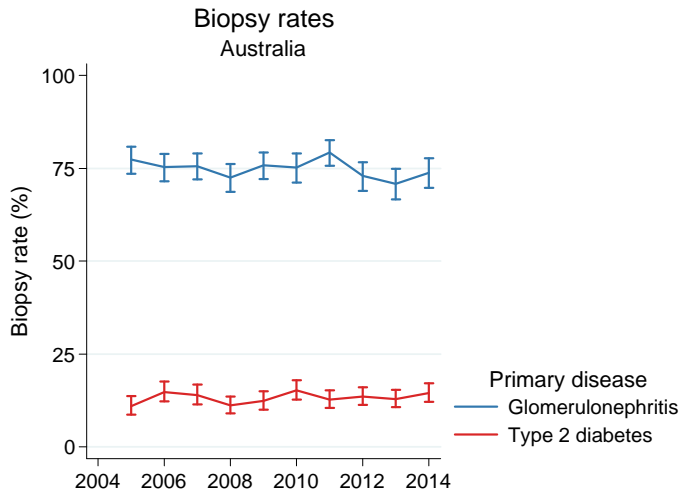
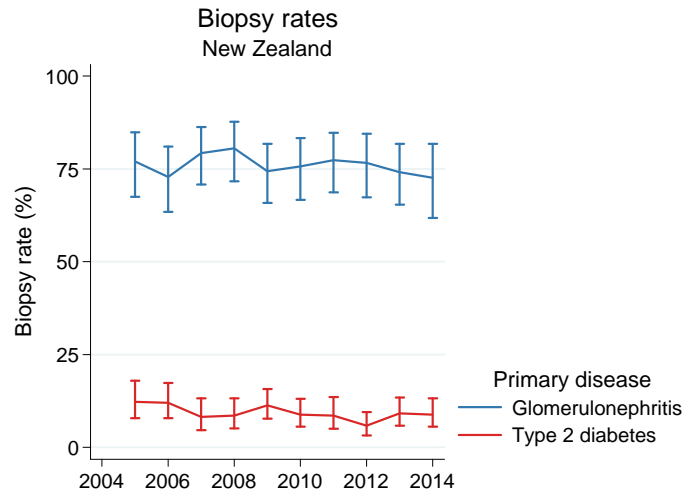


Figure 1.10.2



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 7.4mL/

min/1.73m² in 2014. In New Zealand timing of RRT hasn't changed in the last 10 years, with a median eGFR at RRT start of 6.6mL/min/1.73m² in 2014.

Figure 1.11.1

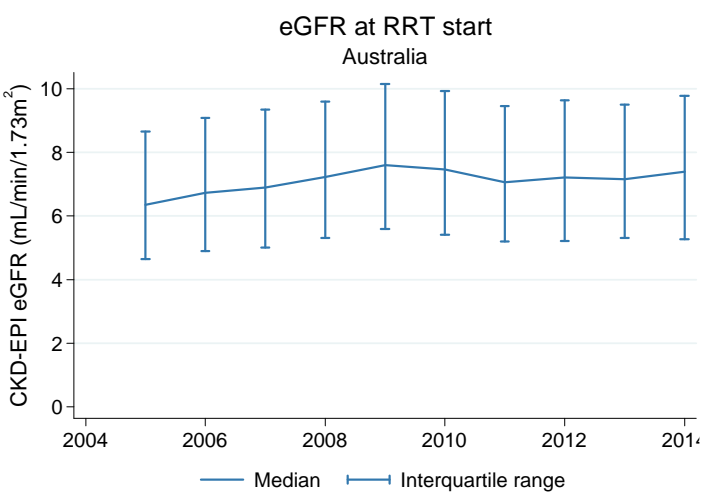
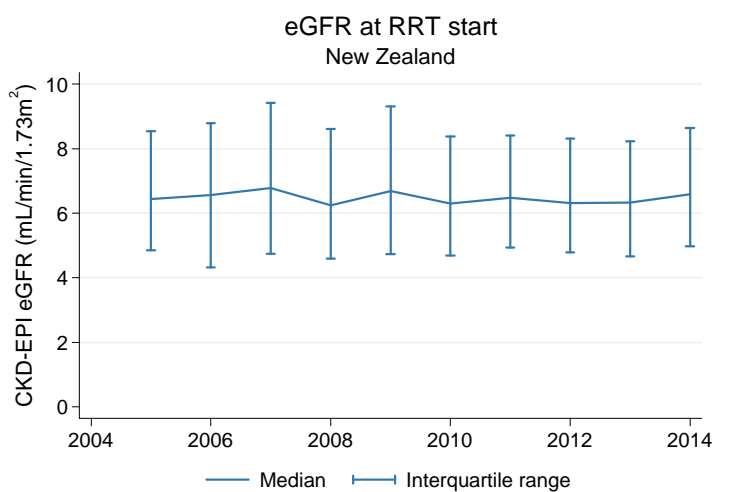


Figure 1.11.2



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