CHAPTER 4

Haemodialysis

Reporting the incidence, prevalence and survival of haemodialysis patients in Australia and New Zealand; summarising dialysis prescriptions, laboratory results, dialysis adequacy, vascular access and rates of home haemodialysis treatment

Contents

Executive Summary

There were 11,544 people in Australia and 2,000 people in New Zealand receiving haemodialysis at the time of the 31 December 2019 survey. The total number of patients who commenced haemodialysis in 2019 was 3,138 in Australia and 549 in New Zealand. In both countries, approximately half of incident and prevalent patients were aged between 55-74 years.

Survival of incident haemodialysis patients in both countries remains stable in 2008-2019. The 1-year and 5-year survival of people aged 40 to 59 years was 93% and 66% respectively in Australia, and 93% and 62% respectively in New Zealand. The corresponding 1-year and 5-year survival for people who started haemodialysis at age ≥75 years was 81% and 33% respectively in Australia and 77% and 20% respectively in New Zealand.

The majority of patients have three sessions per week for 4-5 hours. In Australia, 4 hours is the most common prescription (41.7%) whereas in New Zealand 5 hours is the most common prescription (35.3%). The steep rise in the proportion of haemodialysis patients receiving haemodiafiltration stabilised in Australia (35.6%) and remains stable in New Zealand (20.5%). Within Australia this proportion ranges from 0% in Tasmania to 68.2% in Western Australia. We continue to try to characterise this practice with delivery mode and new to this report, substitution volume.

Vascular access practice remains challenging. Having an AVF or AVG for incident vascular access occurred in 41% of Australian patients and 22% of New Zealand patients. Although Australian state figures were not dissimilar, the proportion with AVF or AVG at first dialysis ranged from 20% to 72% in Australian treating hospitals and 5% to 60% in New Zealand treating hospitals. For prevalent patients, 83% of Australian patients and 67% of New Zealand patients utilised permanent vascular access.

The proportion of patients undertaking haemodialysis at home in 2019 was 20.4% in New Zealand and 9.3% in Australia. The majority are aged 45-64 years and median technique survival is 4 to 5 years.

Suggested Citation

ANZDATA Registry. 43rd Report, Chapter 4: Haemodialysis. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2020. Available at: http://www.anzdata.org.au

Incidence, Cessation and Prevalence

Table 4.1 presents the incidence, cessation and prevalence of haemodialysis in Australia and New Zealand over 2015-2019. Note that dialysis modality changes lasting less than 30 days are not included. The number of incident patients in Australia is growing steadily, whereas in New Zealand the number remains relatively constant. In Australia, the number of patients ceasing HD is lower than the number of incident patients, leading to strong growth in prevalent numbers. In New Zealand these numbers are similar, leading to a relatively stable number of prevalent patients.

Table 4.1 Incidence, Cessation and Prevalence of Haemodialysis in Australia and New Zealand 2015-2019

Country		2015	2016	2017	2018	2019
Australia	**All patients who commenced HD**					
	First dialysis treatment or returning after renal recovery	1911	2018	2201	2267	2392
	Transfer from PD (no prior HD)	362	410	407	392	385
	Transfer from PD (prior HD)	192	170	172	147	150
	Failed Transplant (no prior HD)	46	26	52	45	50
	Failed Transplant (prior HD)	153	158	158	194	161
	Total	**2664**	**2782**	**2990**	**3045**	**3138**
	All patients who ceased HD					
	Received kidney transplant	555	639	631	663	632
	Transfer to PD	323	309	313	289	324
	Renal recovery	57	70	78	84	74
	Deaths	1412	1515	1638	1586	1604
	Total	**2347**	**2533**	**2660**	**2622**	**2634**
	Total patients on HD at 31 December	**10116**	**10347**	**10662**	**11060**	**11544**
	Patients on HD at home at 31 December (% of all HD patients)	**1194 (11.8%)**	**1134 (11.0%)**	**1049 (9.8%)**	**1061 (9.6%)**	**1074 (9.3%)**
New Zealand	**All patients who commenced HD**					
	First dialysis treatment or returning after renal recovery	322	347	377	359	384
	Transfer from PD (no prior HD)	100	106	77	98	85
	Transfer from PD (prior HD)	77	60	44	66	56
	Failed Transplant (no prior HD)	7	9	8	10	7
	Failed Transplant (prior HD)	15	15	21	21	17
	Total	**521**	**537**	**527**	**554**	**549**
	All patients who ceased HD					
	Received kidney transplant	76	93	96	81	106
	Transfer to PD	111	131	122	126	105
	Renal recovery	9	7	15	14	12
	Deaths	278	288	300	275	309
	Total	**474**	**519**	**533**	**496**	**532**
	Total patients on HD at 31 December	**1919**	**1936**	**1923**	**1986**	**2000**
	Patients on HD at home at 31 December (% of all HD patients)	**484 (25.2%)**	**469 (24.2%)**	**441 (22.9%)**	**424 (21.3%)**	**408 (20.4%)**

Figures 4.1-4.2 and Table 4.2 present the age distribution of incident and prevalent haemodialysis patients in Australia and New Zealand.

Figure 4.1.1 - Age (%) of Incident Haemodialysis Patients - Australia 2019

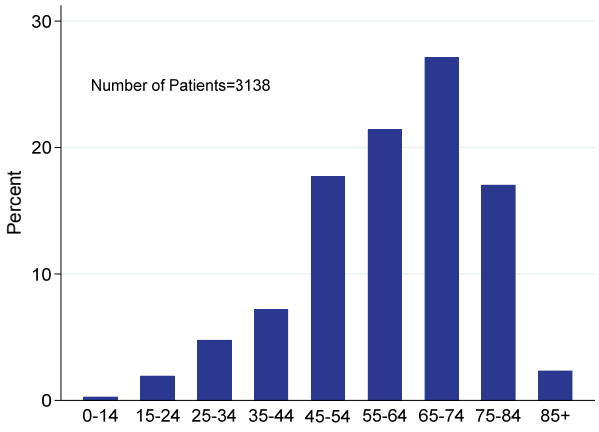


Figure 4.1.2 - Age (%) of Incident Haemodialysis Patients - New Zealand 2019

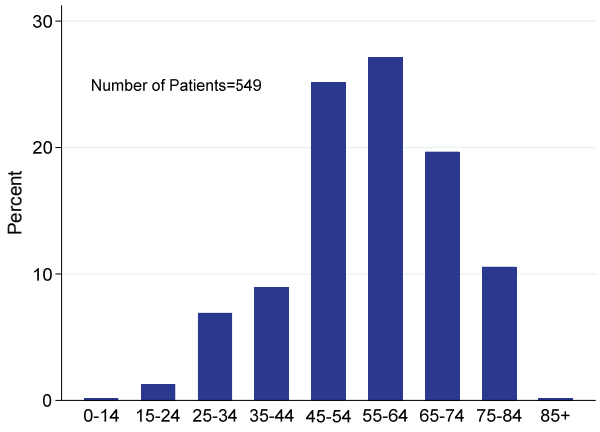


Figure 4.2.1 - Age (%) of Prevalent Haemodialysis Patients - Australia 31 Dec 2019

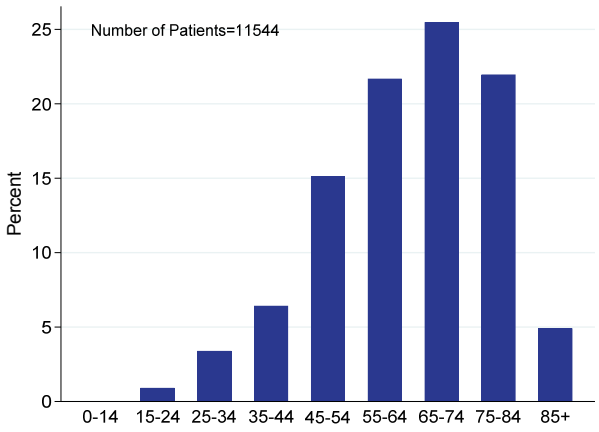


Figure 4.2.2 - Age (%) of Prevalent Haemodialysis Patients - New Zealand 31 Dec 2019

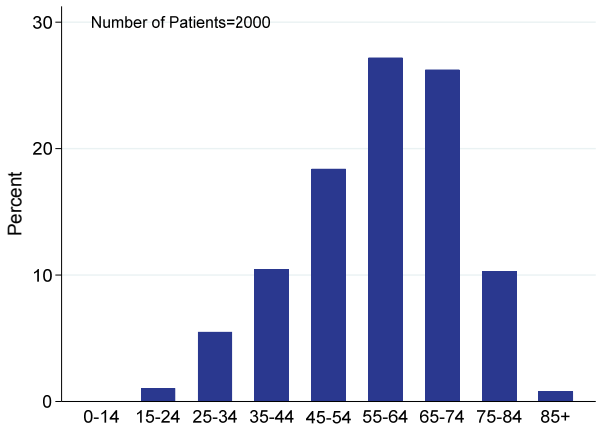


Table 4.2.1 Incident and Prevalent Haemodialysis Patients in Australia by Age Group 2015-2019

	Age group	2015	2016	2017	2018	2019
Incident Patients	**0-14**	12 (0%)	16 (1%)	17 (1%)	13 (0%)	9 (0%)
	15-24	48 (2%)	62 (2%)	70 (2%)	62 (2%)	61 (2%)
	25-34	128 (5%)	139 (5%)	146 (5%)	145 (5%)	150 (5%)
	35-44	239 (9%)	257 (9%)	247 (8%)	273 (9%)	227 (7%)
	45-54	437 (16%)	453 (16%)	500 (17%)	484 (16%)	557 (18%)
	55-64	574 (22%)	587 (21%)	691 (23%)	680 (22%)	673 (21%)
	65-74	705 (26%)	741 (27%)	761 (25%)	805 (26%)	852 (27%)
	75-84	469 (18%)	479 (17%)	504 (17%)	516 (17%)	535 (17%)
	85+	52 (2%)	48 (2%)	54 (2%)	67 (2%)	74 (2%)
	Total	**2664**	**2782**	**2990**	**3045**	**3138**
Prevalent Patients	**0-14**	7 (0%)	11 (0%)	10 (0%)	14 (0%)	6 (0%)
	15-24	108 (1%)	93 (1%)	108 (1%)	110 (1%)	106 (1%)
	25-34	333 (3%)	346 (3%)	352 (3%)	381 (3%)	392 (3%)
	35-44	767 (8%)	750 (7%)	759 (7%)	762 (7%)	743 (6%)
	45-54	1539 (15%)	1569 (15%)	1603 (15%)	1622 (15%)	1748 (15%)
	55-64	2124 (21%)	2176 (21%)	2282 (21%)	2394 (22%)	2504 (22%)
	65-74	2479 (25%)	2593 (25%)	2676 (25%)	2785 (25%)	2942 (25%)
	75-84	2238 (22%)	2289 (22%)	2329 (22%)	2437 (22%)	2536 (22%)
	85+	521 (5%)	520 (5%)	543 (5%)	555 (5%)	567 (5%)
	Total	**10116**	**10347**	**10662**	**11060**	**11544**

Table 4.2.2 Incident and Prevalent Haemodialysis Patients in New Zealand by Age Group 2015-2019

	Age group	2015	2016	2017	2018	2019
Incident Patients	0-14	3 (1%)	2 (0%)	3 (1%)	5 (1%)	1 (0%)
	15-24	15 (3%)	12 (2%)	13 (2%)	9 (2%)	7 (1%)
	25-34	22 (4%)	34 (6%)	41 (8%)	46 (8%)	38 (7%)
	35-44	52 (10%)	49 (9%)	39 (7%)	54 (10%)	49 (9%)
	45-54	113 (22%)	99 (18%)	118 (22%)	100 (18%)	138 (25%)
	55-64	150 (29%)	154 (29%)	134 (25%)	144 (26%)	149 (27%)
	65-74	117 (22%)	132 (25%)	138 (26%)	150 (27%)	108 (20%)
	75-84	48 (9%)	50 (9%)	40 (8%)	43 (8%)	58 (11%)
	85+	1 (0%)	5 (1%)	1 (0%)	3 (1%)	1 (0%)
	Total	**521**	**537**	**527**	**554**	**549**
Prevalent Patients	0-14	1 (0%)	1 (0%)	1 (0%)	3 (0%)	1 (0%)
	15-24	36 (2%)	32 (2%)	29 (2%)	33 (2%)	21 (1%)
	25-34	119 (6%)	116 (6%)	117 (6%)	121 (6%)	110 (6%)
	35-44	179 (9%)	203 (10%)	201 (10%)	205 (10%)	209 (10%)
	45-54	406 (21%)	368 (19%)	366 (19%)	362 (18%)	368 (18%)
	55-64	521 (27%)	537 (28%)	524 (27%)	534 (27%)	544 (27%)
	65-74	463 (24%)	493 (25%)	501 (26%)	525 (26%)	525 (26%)
	75-84	177 (9%)	171 (9%)	167 (9%)	189 (10%)	206 (10%)
	85+	17 (1%)	15 (1%)	17 (1%)	14 (1%)	16 (1%)
	Total	**1919**	**1936**	**1923**	**1986**	**2000**

Table 4.3 presents incident patients by primary renal disease. In both countries diabetic nephropathy is the leading cause of ESKD leading to haemodialysis.

Table 4.3.1 Incident Haemodialysis Patients in Australia by Primary Renal Disease 2015-2019

Primary Renal Disease	2015	2016	2017	2018	2019
Diabetic Nephropathy	1012 (38%)	1017 (37%)	1145 (38%)	1142 (38%)	1209 (39%)
Glomerulonephritis	533 (20%)	566 (20%)	565 (19%)	550 (18%)	588 (19%)
Hypertension	344 (13%)	378 (14%)	381 (13%)	365 (12%)	361 (12%)
Polycystic Disease	147 (6%)	157 (6%)	165 (6%)	186 (6%)	156 (5%)
Reflux Nephropathy	66 (2%)	67 (2%)	76 (3%)	67 (2%)	67 (2%)
Other	366 (14%)	414 (15%)	430 (14%)	504 (17%)	531 (17%)
Uncertain	122 (5%)	110 (4%)	166 (6%)	159 (5%)	181 (6%)
Not reported	74 (3%)	73 (3%)	62 (2%)	72 (2%)	45 (1%)
Total	**2664**	**2782**	**2990**	**3045**	**3138**

Table 4.3.2 Incident Haemodialysis Patients in New Zealand by Primary Renal Disease 2015-2019

Primary Renal Disease	2015	2016	2017	2018	2019
Diabetic Nephropathy	258 (50%)	264 (49%)	268 (51%)	265 (48%)	270 (49%)
Glomerulonephritis	106 (20%)	123 (23%)	124 (24%)	108 (19%)	87 (16%)
Hypertension	39 (7%)	38 (7%)	36 (7%)	27 (5%)	41 (7%)
Polycystic Disease	27 (5%)	23 (4%)	19 (4%)	19 (3%)	12 (2%)
Reflux Nephropathy	9 (2%)	8 (1%)	9 (2%)	11 (2%)	10 (2%)
Other	67 (13%)	64 (12%)	50 (9%)	94 (17%)	95 (17%)
Uncertain	15 (3%)	14 (3%)	17 (3%)	25 (5%)	33 (6%)
Not reported	0 (0%)	3 (1%)	4 (1%)	5 (1%)	1 (0%)
Total	**521**	**537**	**527**	**554**	**549**

Patient Survival

Table 4.4 and figure 4.3 present unadjusted haemodialysis patient survival by era and country. The outcome is patient death, censored at transplantation and transfer to peritoneal dialysis for ≥30 days. Survival for all incident renal replacement therapy (RRT) patients who were treated with haemodialysis at commencement is reported. Survival begins from the date of commencing renal replacement therapy with haemodialysis. Figure 4.4 presents survival curves by era, adjusted for a number of demographic and clinical characteristics.

Table 4.4 Patient Survival by Era - Haemodialysis at RRT Start - Censored for Transplant and Transfer to PD: 2008-2019; % [95% Confidence Interval]

Country	Era	Number of Patients	Survival			
			6 months	1 year	3 years	5 years
Australia	2008-2010	5281	93 [92, 93]	87 [86, 88]	68 [66, 69]	51 [50, 53]
	2011-2013	5551	93 [92, 94]	88 [87, 89]	69 [67, 70]	50 [49, 52]
	2014-2016	5780	94 [93, 94]	89 [88, 90]	70 [69, 72]	53 [51, 55]
	2017-2019	6786	95 [94, 96]	90 [89, 91]	-	-
New Zealand	2008-2010	1015	94 [92, 95]	90 [88, 92]	71 [68, 74]	54 [50, 57]
	2011-2013	1014	93 [91, 95]	90 [88, 92]	72 [68, 75]	53 [49, 57]
	2014-2016	1011	94 [92, 95]	88 [85, 90]	69 [65, 72]	48 [43, 52]
	2017-2019	1110	93 [92, 95]	89 [87, 91]	-	-

Figure 4.3.1 - Patient Survival by Era - Haemodialysis at RRT Start - Australia 2008-2019, Censored for Transplant and Transfer to PD

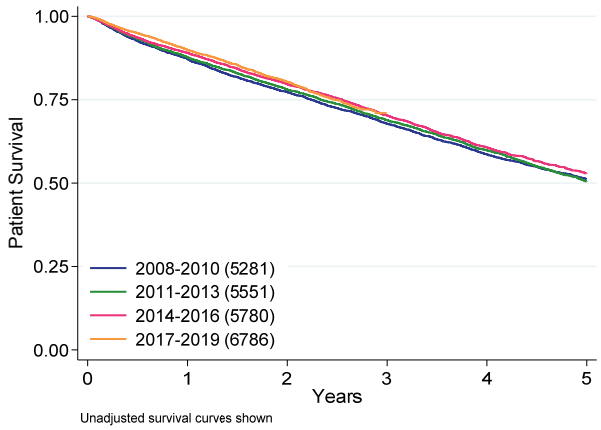


Figure 4.3.2 - Patient Survival by Era - Haemodialysis at RRT Start - New Zealand 2008-2019, Censored for Transplant and Transfer to PD

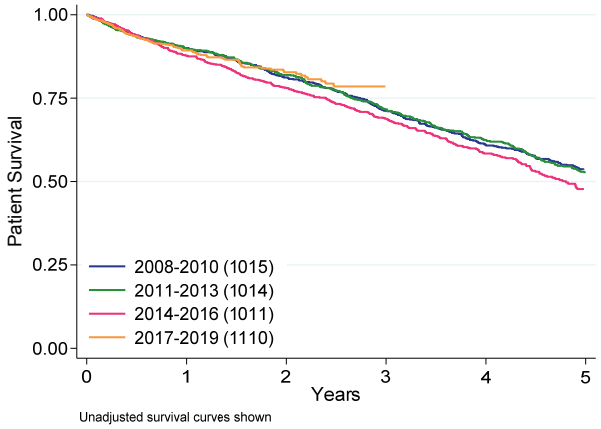


Figure 4.4.1 - Patient Survival by Era - Haemodialysis at RRT Start - Australia 2008-2019, Censored for Transplant and Transfer to PD, Adjusted for Age, Ethnicity, Diabetic Nephropathy, Comorbidity and Gender

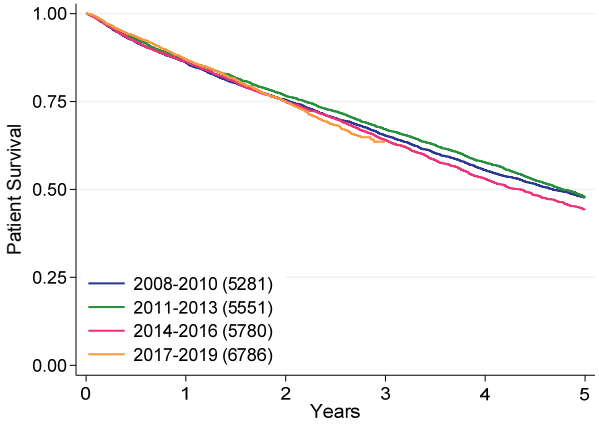


Figure 4.4.2 - Patient Survival by Era - Haemodialysis at RRT Start - New Zealand 2008-2019, Censored for Transplant and Transfer to PD, Adjusted for Age, Ethnicity, Diabetic Nephropathy, Comorbidity and Gender

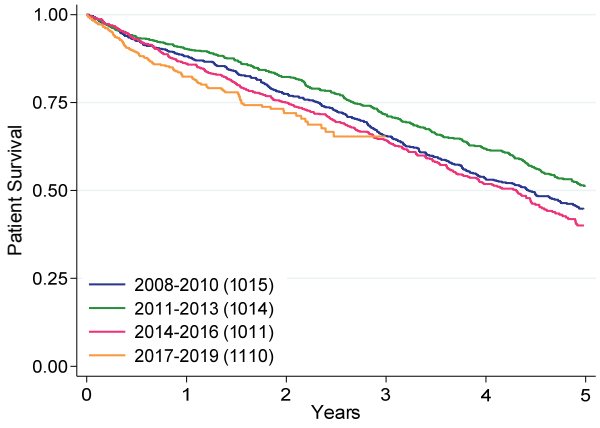


Table 4.5 and figure 4.5 present unadjusted patient survival stratified by age, and table 4.6 and figure 4.6 present the same data by diabetic status.

Table 4.5 Patient Survival by Age Group - Haemodialysis at RRT Start - Censored for Transplant and Transfer to PD: 2008-2019; % [95% Confidence Interval]

Country	Age Group	Number of Patients	Survival			
			6 months	1 year	3 years	5 years
Australia	**<40 years**	2273	98 [97, 99]	95 [94, 96]	86 [84, 88]	78 [74, 80]
	40-59 years	7233	97 [96, 97]	93 [93, 94]	80 [79, 81]	66 [64, 68]
	60-74 years	8791	93 [92, 93]	88 [87, 88]	68 [67, 69]	50 [49, 52]
	≥75 years	5101	89 [88, 90]	81 [80, 82]	55 [53, 56]	33 [31, 35]
New Zealand	**<40 years**	491	98 [96, 99]	95 [92, 97]	88 [83, 92]	79 [72, 84]
	40-59 years	1706	95 [94, 96]	93 [91, 94]	80 [78, 82]	62 [58, 65]
	60-74 years	1552	92 [90, 93]	87 [85, 89]	64 [60, 67]	44 [41, 48]
	≥75 years	401	86 [82, 89]	77 [72, 82]	45 [38, 51]	20 [15, 25]

Figure 4.5.1 - Patient Survival by Age Group Haemodialysis at RRT Start - Australia 2008-2019, Censored for Transplant and Transfer to PD

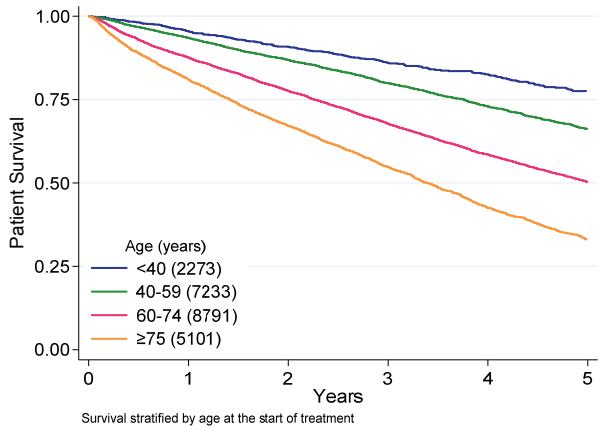


Figure 4.5.2 - Patient Survival by Age Group Haemodialysis at RRT Start - New Zealand 2008-2019, Censored for Transplant and Transfer to PD

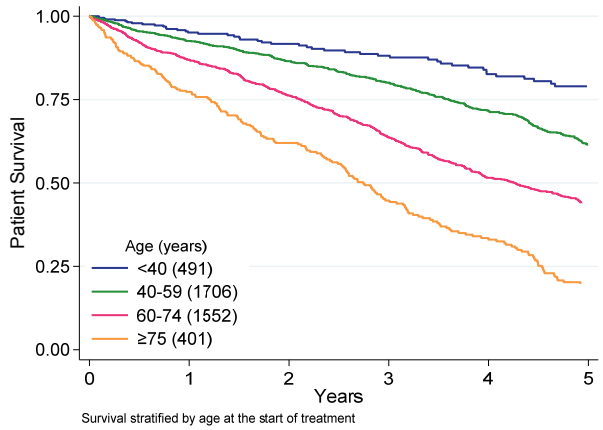


Table 4.6 Patient Survival by Diabetes - Haemodialysis at RRT Start - Censored for Transplant and Transfer to PD: 2008-2019; % [95% Confidence Interval]

Country	Diabetes	Number of Patients	Survival			
			6 months	1 year	3 years	5 years
Australia	**Non diabetic**	11212	93 [93, 94]	89 [88, 89]	71 [70, 72]	55 [54, 56]
	Diabetic	12186	94 [93, 94]	89 [88, 89]	68 [67, 69]	49 [48, 50]
New Zealand	**Non diabetic**	1616	93 [91, 94]	89 [87, 91]	74 [71, 77]	57 [53, 60]
	Diabetic	2534	94 [93, 95]	89 [88, 91]	69 [67, 71]	50 [47, 52]

Figure 4.6.1 - Patient Survival by Diabetes Haemodialysis at RRT Start - Australia 2008-2019, Censored for Transplant and Transfer to PD

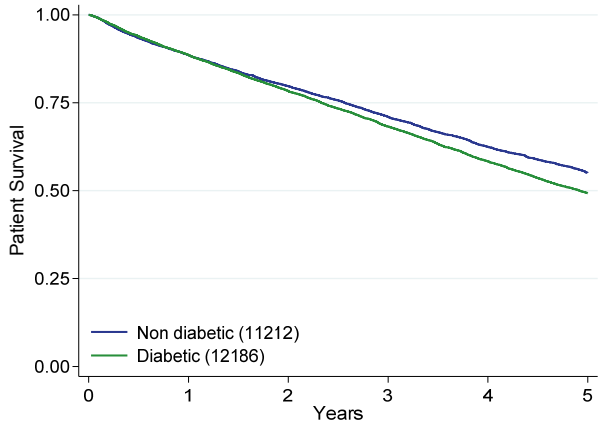


Figure 4.6.2 - Patient Survival by Diabetes Haemodialysis at RRT Start - New Zealand 2008-2019, Censored for Transplant and Transfer to PD

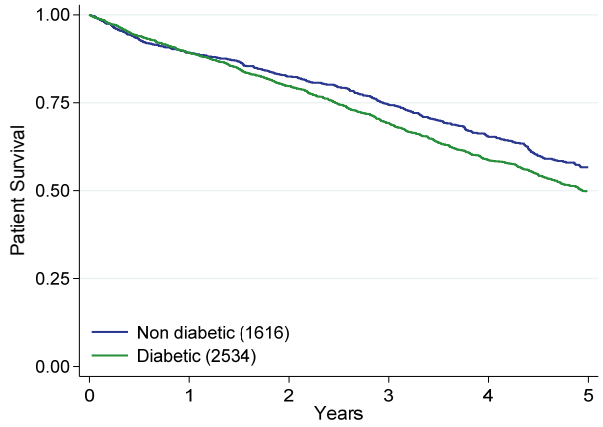


Figure 4.7 presents patient survival data for Australian haemodialysis patients by age, and by the presence of diabetes and/or cardiovascular disease. Figure 4.8 presents the same data for New Zealand.

Figure 4.7.1 - Patient Survival by Age Group Haemodialysis at RRT Start - Australia 2008-2019, Censored for Transplant and Transfer to PD. No Diabetes and No Cardiovascular Disease

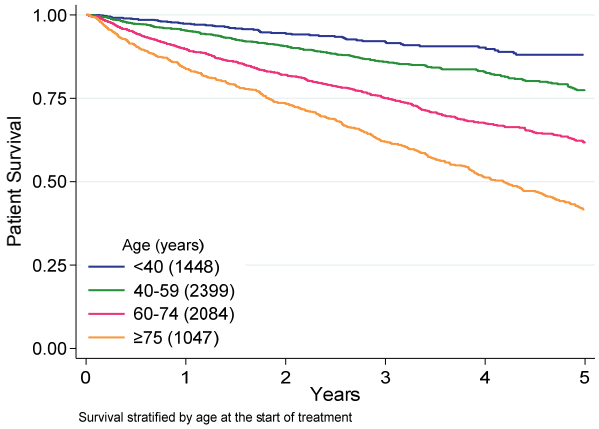


Figure 4.7.2 - Patient Survival by Age Group Haemodialysis at RRT Start - Australia 2008-2019, Censored for Transplant and Transfer to PD. Diabetes but No Cardiovascular Disease

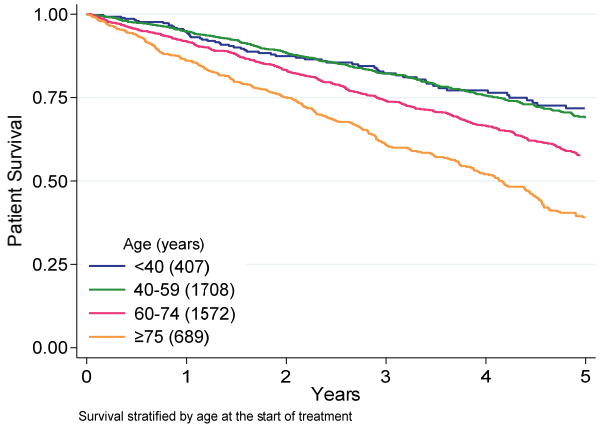


Figure 4.7.3 - Patient Survival by Age Group Haemodialysis at RRT Start - Australia 2008-2019, Censored for Transplant and Transfer to PD. Cardiovascular Disease but No Diabetes

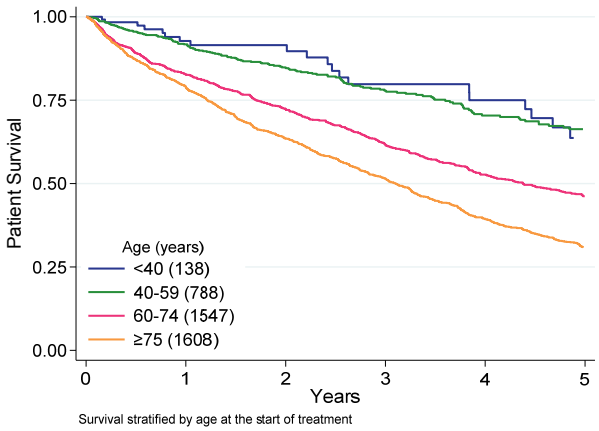


Figure 4.7.4 - Patient Survival by Age Group Haemodialysis at RRT Start - Australia 2008-2019, Censored for Transplant and Transfer to PD. Both Diabetes and Cardiovascular Disease

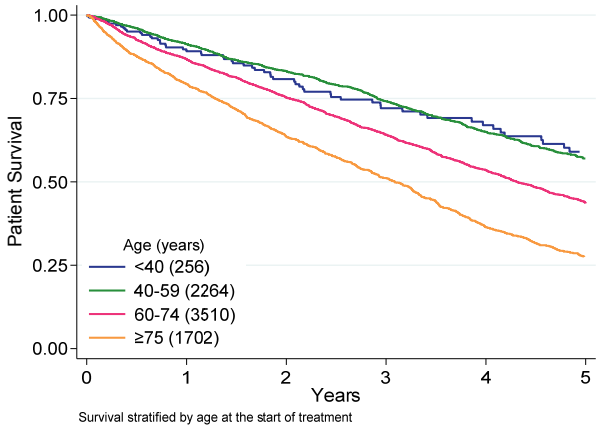


Figure 4.8.1 - Patient Survival by Age Group Haemodialysis at RRT Start - New Zealand 2008-2019, Censored for Transplant and Transfer to PD. No Diabetes and No Cardiovascular Disease

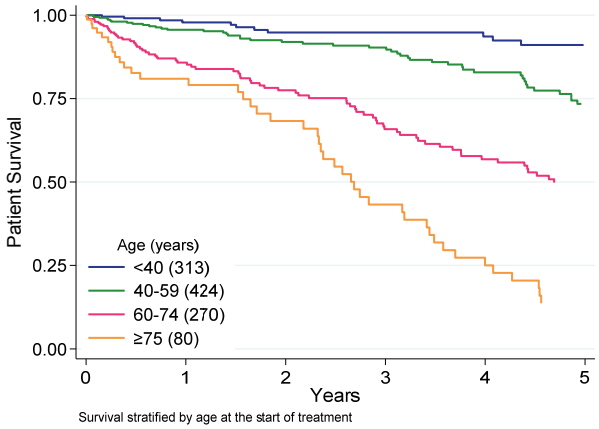


Figure 4.8.2 - Patient Survival by Age Group Haemodialysis at RRT Start - New Zealand 2008-2019, Censored for Transplant and Transfer to PD. Diabetes but No Cardiovascular Disease

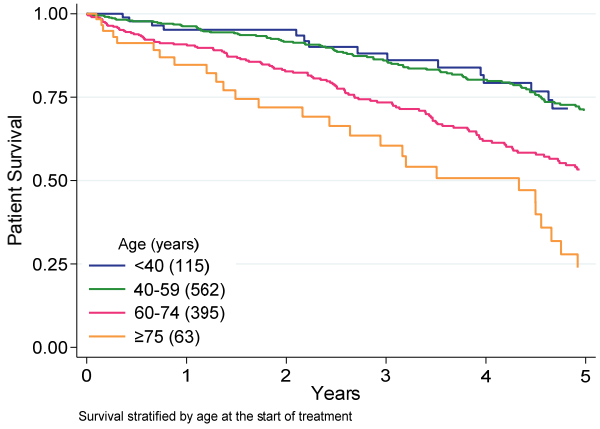


Figure 4.8.3 - Patient Survival by Age Group Haemodialysis at RRT Start - New Zealand 2008-2019, Censored for Transplant and Transfer to PD. Cardiovascular Disease but No Diabetes

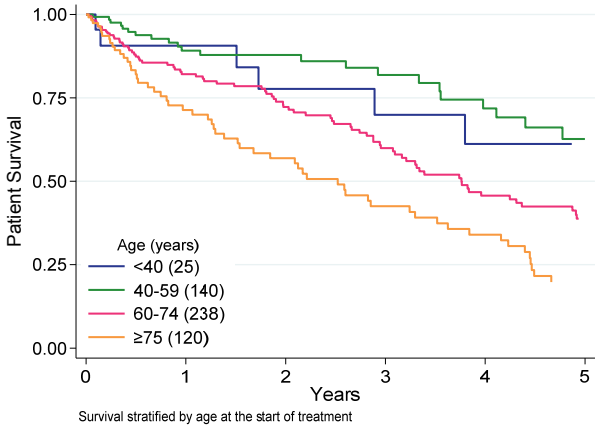
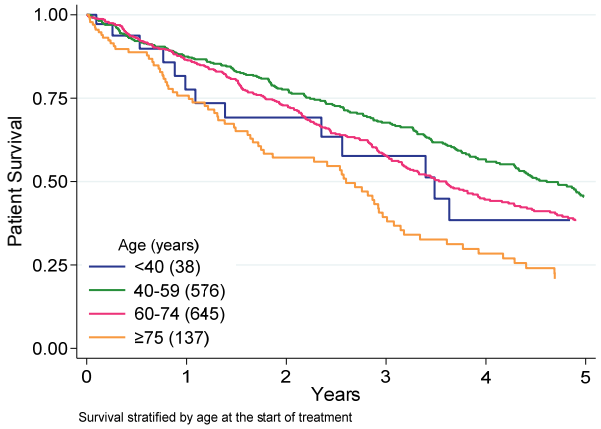


Figure 4.8.4 - Patient Survival by Age Group Haemodialysis at RRT Start - New Zealand 2008-2019, Censored for Transplant and Transfer to PD. Both Diabetes and Cardiovascular Disease



Dialysis Prescription

Table 4.7 shows the blood flow rates for all haemodialysis patients by year and country. Flows of 300-349mL/min was the most common in each country. Table 4.8 presents the same data by vascular access type for 2019; the distribution of blood flow rates was similar within each type of access, although slightly lower rates were seen in patients dialysing with a central venous catheter (CVC). The overall distribution of blood flow rates over 2017-2019 is shown in figure 4.9.

Table 4.7 Blood Flow Rates (mL/minute) 2015-2019

Country	Year	Total Patients*	Not Reported	<200	200-249	250-299	300-349	350-399	400+
Australia	2015	10112	569 (5.6%)	32 (0.3%)	214 (2.1%)	1438 (14.2%)	6000 (59.3%)	1664 (16.5%)	195 (1.9%)
	2016	10347	775 (7.5%)	28 (0.3%)	172 (1.7%)	1480 (14.3%)	6225 (60.2%)	1526 (14.7%)	141 (1.4%)
	2017	10662	417 (3.9%)	30 (0.3%)	190 (1.8%)	1547 (14.5%)	6892 (64.6%)	1459 (13.7%)	127 (1.2%)
	2018	11060	320 (2.9%)	41 (0.4%)	213 (1.9%)	1649 (14.9%)	7420 (67.1%)	1303 (11.8%)	114 (1.0%)
	2019	11544	470 (4.1%)	60 (0.5%)	192 (1.7%)	1816 (15.7%)	7593 (65.8%)	1271 (11.0%)	142 (1.2%)
New Zealand	2015	1919	77 (4.0%)	1 (0.1%)	107 (5.6%)	410 (21.4%)	1067 (55.6%)	230 (12.0%)	27 (1.4%)
	2016	1936	53 (2.7%)	7 (0.4%)	118 (6.1%)	469 (24.2%)	976 (50.4%)	274 (14.2%)	39 (2.0%)
	2017	1923	39 (2.0%)	6 (0.3%)	118 (6.1%)	430 (22.4%)	1024 (53.3%)	259 (13.5%)	47 (2.4%)
	2018	1985	39 (2.0%)	6 (0.3%)	93 (4.7%)	420 (21.2%)	1085 (54.7%)	277 (14.0%)	65 (3.3%)
	2019	2000	95 (4.8%)	4 (0.2%)	75 (3.8%)	400 (20.0%)	1151 (57.5%)	243 (12.1%)	32 (1.6%)

* CVV-HD Patients excluded from Total.

Table 4.8 Blood Flow Rate by Type of Access - December 2019

Blood Flow Rate	Australia			New Zealand		
	AVF	AVG	CVC	AVF	AVG	CVC
<200	40 (0.5%)	0 (0.0%)	19 (1.0%)	2 (0.2%)	0 (0.0%)	2 (0.3%)
200-249	113 (1.3%)	9 (1.9%)	70 (3.7%)	38 (3.1%)	1 (2.6%)	36 (5.7%)
250-299	1102 (12.9%)	78 (16.6%)	620 (32.5%)	201 (16.3%)	11 (28.2%)	187 (29.5%)
300-349	5995 (70.0%)	324 (68.8%)	1126 (59.1%)	743 (60.4%)	26 (66.7%)	380 (60.0%)
350-399	1155 (13.5%)	57 (12.1%)	56 (2.9%)	216 (17.5%)	1 (2.6%)	25 (3.9%)
400+	140 (1.6%)	1 (0.2%)	1 (0.1%)	30 (2.4%)	0 (0.0%)	2 (0.3%)
Total	**8567**	**471**	**1905**	**1231**	**39**	**633**

* CVV-HD Patients excluded from Total.
** Blood Flow Rate or Type of Access Not Reported for 638 Australian and 99 New Zealand patients.

Figure 4.9.1 - Distribution of Blood Flow Rates - Prevalent Haemodialysis – Australia

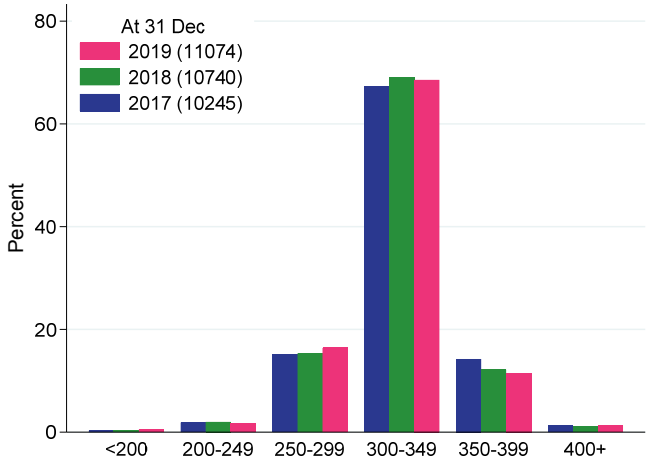


Figure 4.9.2 - Distribution of Blood Flow Rates - Prevalent Haemodialysis - New Zealand

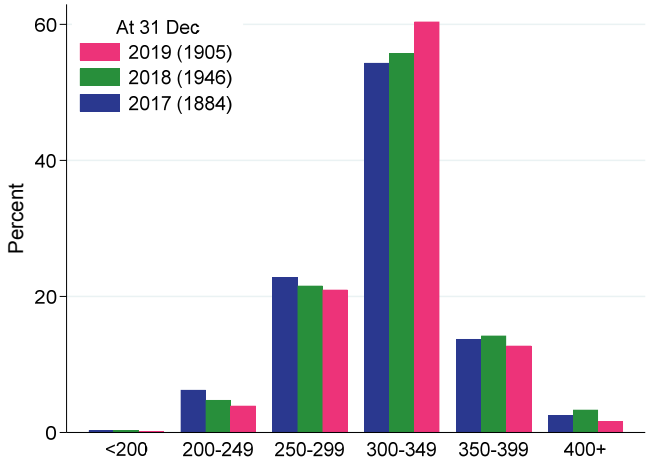


Table 4.9 shows the number of weekly sessions, and hours per session, at 31 December 2019. In each country the large majority were dialysing for 3 sessions per week, and for between 4-5 hours per session. Figure 4.10 shows the percentage of patients undertaking quotidian dialysis (defined here as >3 sessions per week OR >5 hours per session). Figures 4.11 and 4.12 show HD frequency and session length respectively over 2017-2019. Figure 4.13 combines sessions and session length to show the total number of weekly hours of HD over 2017-2019. New Zealand patients receive slightly more total hours of weekly HD compared with Australian patients.

Table 4.9 Duration and Number of Sessions per Week - December 2019

Country	Sessions per week	Hours of Each Treatment						
		<4	4	4.5	5	5.5	>5.5	Total
Australia	<3	71 (16.0%)	220 (49.7%)	77 (17.4%)	73 (16.5%)	0 (0.0%)	2 (0.5%)	**443**
	3	444 (4.4%)	4178 (41.7%)	2274 (22.7%)	2744 (27.4%)	155 (1.5%)	230 (2.3%)	**10025**
	3.1-4.9	34 (6.4%)	119 (22.3%)	50 (9.4%)	121 (22.7%)	25 (4.7%)	184 (34.5%)	**533**
	5+	30 (39.0%)	12 (15.6%)	1 (1.3%)	9 (11.7%)	1 (1.3%)	24 (31.2%)	**77**
	Total	**579 (5.2)**	**4529 (40.9)**	**2402 (21.7)**	**2947 (26.6)**	**181 (1.6)**	**440 (4.0)**	**11078**
New Zealand	<3	6 (12.5%)	25 (52.1%)	3 (6.3%)	12 (25.0%)	0 (0.0%)	2 (4.2%)	**48**
	3	22 (1.3%)	420 (25.5%)	484 (29.4%)	581 (35.3%)	58 (3.5%)	79 (4.8%)	**1644**
	3.1-4.9	4 (2.0%)	49 (24.4%)	36 (17.9%)	66 (32.8%)	3 (1.5%)	43 (21.4%)	**201**
	5+	4 (30.8%)	2 (15.4%)	0 (0.0%)	6 (46.2%)	0 (0.0%)	1 (7.7%)	**13**
	Total	**36 (1.9)**	**496 (26.0)**	**523 (27.4)**	**665 (34.9)**	**61 (3.2)**	**125 (6.6)**	**1906**

* Intermediate durations are rounded up, e.g. 4.25 is included in 4.5.
** Hours or number of sessions were not reported for 466 Australian and 94 New Zealand patients.

Figure 4.10 - Haemodialysis Conventional/Quotidian - 2017-2019

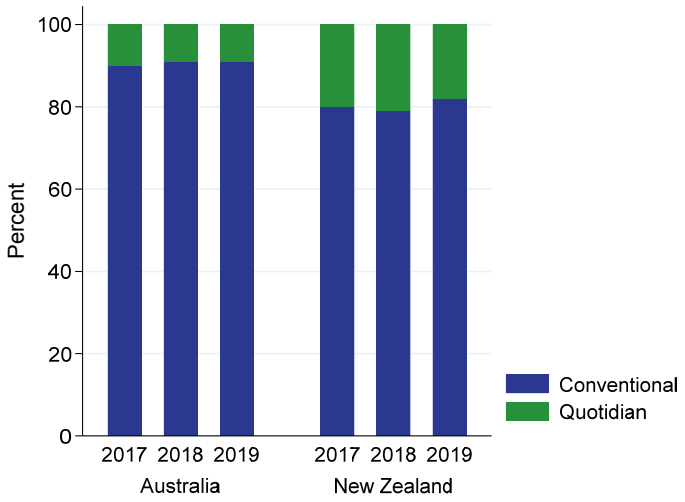


Figure 4.11 - Haemodialysis Frequency Per Week - 2017-2019

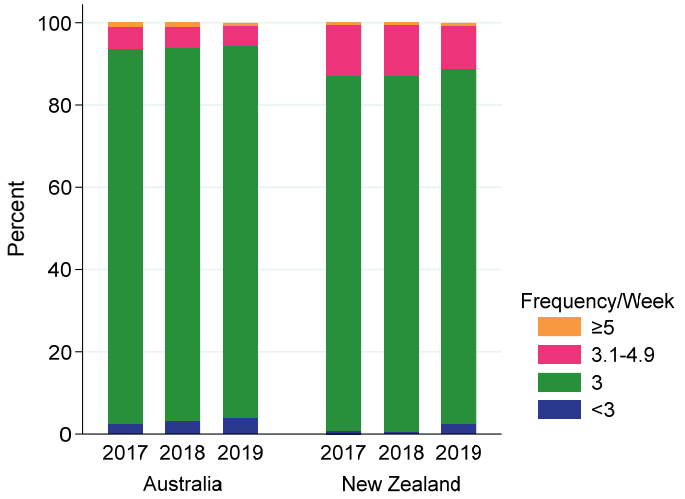


Figure 4.12 - Haemodialysis Session Length (Hours) - December 2017-2019

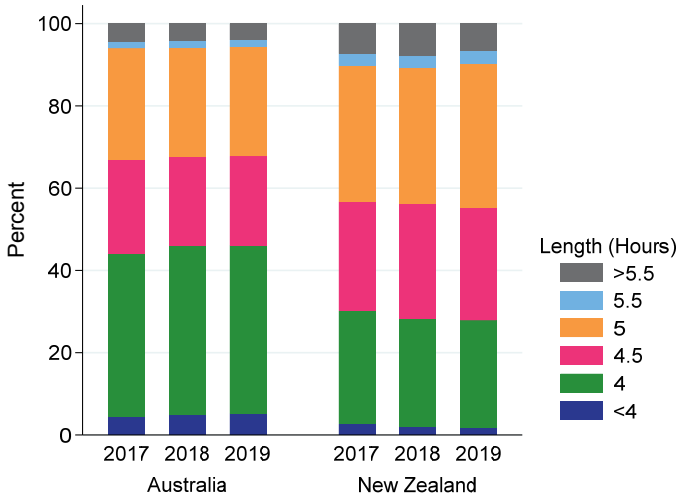
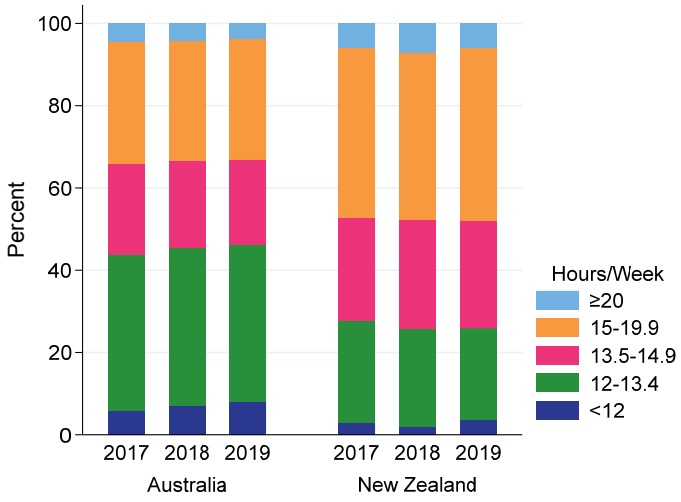


Figure 4.13 - Haemodialysis Duration (Hours Per Week) - December 2017-2019



Figures 4.14-4.16 show trends in dialysis prescription. The proportion of patients dialysing five days or more per week continues to fall in Australia but has increased for the last 2 years in New Zealand. Amongst the patients dialysing three times per week, the previously increasing proportion dialysing 4.5 hours or longer has fallen off in Australia but continues to rise in New Zealand. Similar trends are seen in the proportion dialysing >12 hours per week. Tables 4.10-4.12 present these same data for 2016-2019 by state/territory and country.

Figure 4.14 - Percentage of HD Patients Dialysing Five or More Days Per Week

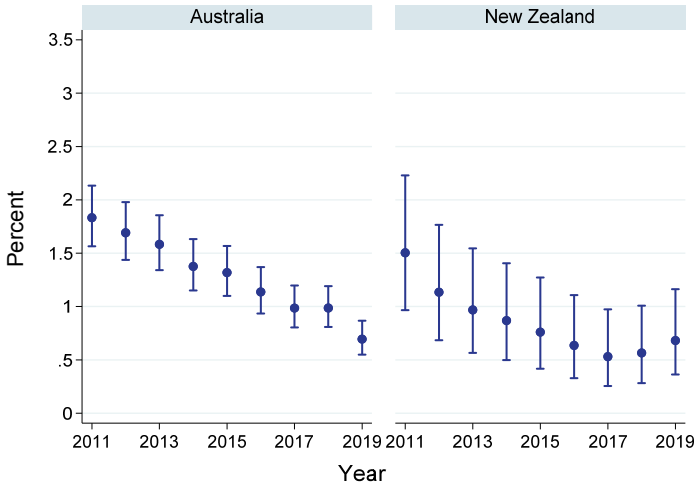


Figure 4.15 - Percentage of HD Patients Dialysing 3 Days Per Week Dialysing 4.5 Hours or Longer Per Session

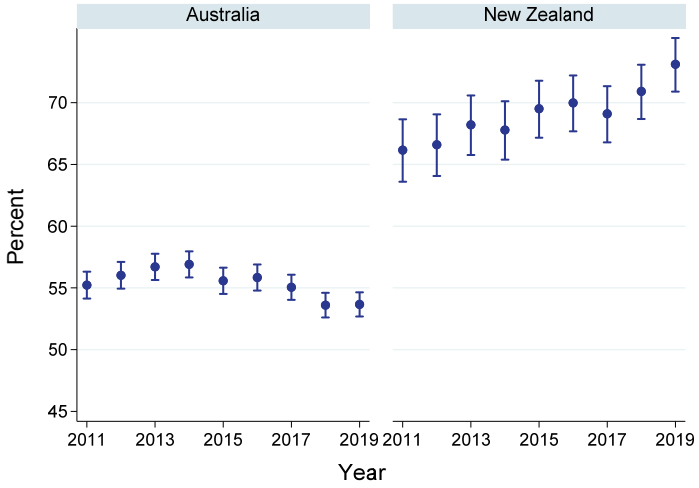


Figure 4.16 - Percentage of HD Patients Dialysing >12 Hours Per Week

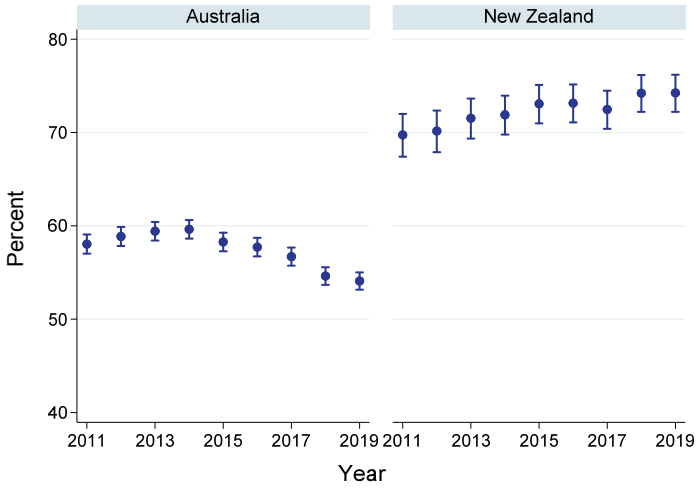


Table 4.10 Haemodialysis ≥5 Sessions per Week by Australian State/Territory and Country 2016-2019

State	2016	2017	2018	2019
QLD	38 (2.1%)	33 (1.7%)	34 (1.6%)	14 (0.6%)
NSW/ACT	12 (0.4%)	15 (0.5%)	18 (0.6%)	18 (0.5%)
VIC	43 (1.9%)	37 (1.5%)	34 (1.3%)	26 (1.0%)
TAS	3 (1.7%)	2 (1.1%)	2 (1.1%)	2 (1.0%)
SA	6 (0.9%)	4 (0.5%)	5 (0.6%)	5 (0.6%)
NT	1 (0.2%)	1 (0.2%)	1 (0.1%)	3 (0.4%)
WA	6 (0.7%)	9 (0.8%)	12 (1.1%)	9 (0.8%)
Australia	**109 (1.1%)**	**101 (1.0%)**	**106 (1.0%)**	**77 (0.7%)**
New Zealand	**12 (0.6%)**	**10 (0.5%)**	**11 (0.6%)**	**13 (0.7%)**

Table 4.11 Haemodialysis ≥4.5 Hours per Session - Three Sessions per Week by Australian State/Territory and Country 2016-2019

State	2016	2017	2018	2019
QLD	917 (56.8%)	984 (55.4%)	946 (50.6%)	996 (50.7%)
NSW/ACT	1921 (68.9%)	2027 (70.5%)	2089 (71.0%)	2105 (69.3%)
VIC	1040 (50.8%)	1127 (50.7%)	1180 (50.4%)	1199 (51.2%)
TAS	101 (62.7%)	105 (66.0%)	109 (66.5%)	118 (65.6%)
SA	200 (31.7%)	215 (30.4%)	225 (30.4%)	224 (30.1%)
NT	421 (73.7%)	447 (71.2%)	438 (65.9%)	481 (68.5%)
WA	203 (25.9%)	237 (24.4%)	240 (23.4%)	257 (24.4%)
Australia	**4803 (55.8%)**	**5142 (55.1%)**	**5227 (53.6%)**	**5380 (53.7%)**
New Zealand	**1131 (70.0%)**	**1125 (69.1%)**	**1195 (70.9%)**	**1202 (73.1%)**

Table 4.12 Haemodialysis >12 Hours per Week by Australian State and Country 2016-2019

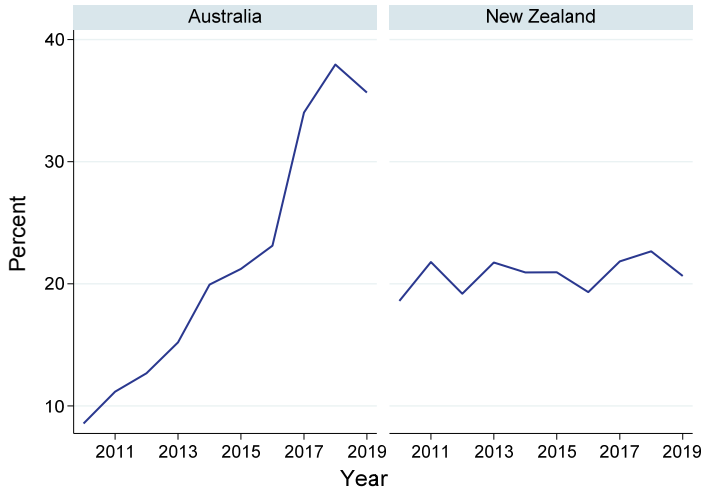
State	2016	2017	2018	2019
QLD	1091 (59.2%)	1126 (56.5%)	1104 (51.5%)	1133 (50.2%)
NSW/ACT	2132 (68.0%)	2223 (69.8%)	2268 (69.4%)	2291 (67.5%)
VIC	1259 (54.6%)	1323 (54.1%)	1360 (52.9%)	1357 (53.0%)
TAS	119 (66.5%)	119 (67.6%)	125 (67.9%)	131 (67.2%)
SA	235 (35.0%)	243 (32.9%)	252 (32.6%)	250 (31.6%)
NT	428 (73.8%)	456 (71.6%)	444 (65.7%)	488 (68.7%)
WA	262 (30.4%)	319 (29.7%)	316 (28.0%)	342 (29.1%)
Australia	**5526 (57.7%)**	**5809 (56.7%)**	**5869 (54.6%)**	**5992 (54.1%)**
New Zealand	**1378 (73.1%)**	**1366 (72.5%)**	**1445 (74.2%)**	**1415 (74.2%)**

Table 4.13 shows the use of high-flux dialysis and haemodiafiltration (HDF) by state/territory and country in 2019. There are substantial differences in the use of HDF across states/territories and countries. Figure 4.17 shows the rapid growth in the use of HDF in Australia, in contrast to New Zealand where its use has been steady since 2010.

Table 4.13 Number of Patients Receiving Standard Haemodialysis (and Membrane Type), Haemofiltration and Haemodiafiltration - December 2019

HD Modality	QLD	NSW/ACT	VIC	TAS	SA	NT	WA	Australia	New Zealand
Haemodialysis	1204	2370	2079	195	466	484	376	**7174**	**1515**
High Flux	1182	2299	1936	169	462	484	263	**6795**	**1282**
Non-High Flux	20	25	117	26	2	0	108	**298**	**226**
Unreported	2	46	26	0	2	0	5	**81**	**7**
Haemofiltration	2	6	3	0	0	0	0	**11**	**2**
Haemodiafiltration	1050	1047	507	0	329	226	806	**3965**	**392**
Percent HDF of Total	46.5%	30.6%	19.6%	0%	41.4%	31.8%	68.2%	**35.6%**	**20.5%**
Total	**2256**	**3423**	**2589**	**195**	**795**	**710**	**1182**	**11150**	**1909**

Figure 4.17 - Use of Haemodiafiltration - Prevalent Haemodialysis Patients 2010-2019



In the 2017 survey, the mode of delivery of substitution fluid for haemodiafiltration was recorded for the first time (table 4.14). In Australia and New Zealand, the predominant mode of delivery of substitution fluid for HDF was post-dilution. Pre-dilution was more common in New Zealand than in Australia.

Table 4.14 Mode of delivery of substitution fluid in patients using haemodiafiltration - December 2019

Country	HDF Type	2017	2018	2019
Australia	**Predilution**	198 (6%)	231 (6%)	314 (8%)
	Mixed Dilution	62 (2%)	156 (4%)	68 (2%)
	Postdilution	3178 (92%)	3675 (90%)	3583 (90%)
	Not Reported	24 (1%)	0 (0%)	0 (0%)
	Total	**3462**	**4062**	**3965**
New Zealand	**Predilution**	147 (36%)	166 (38%)	86 (22%)
	Mixed Dilution	2 (0%)	0 (0%)	0 (0%)
	Postdilution	264 (64%)	275 (62%)	306 (78%)
	Not Reported	1 (0%)	0 (0%)	0 (0%)
	Total	**414**	**441**	**392**

Of the 4,357 patients reported to be on HDF at the end of 2019, 3,832 reported an HDF substitution volume with a median volume of 24L. This is the first survey in which this variable has been collected.

Anaemia

Figure 4.18 shows the variation in Hb between treating hospitals; median Hb ranged from 105.5 to 120g/L in Australia and 99 to 117g/L in New Zealand.

Figure 4.18.1 - Haemoglobin in Haemodialysis Patients - Australia 31 December 2019

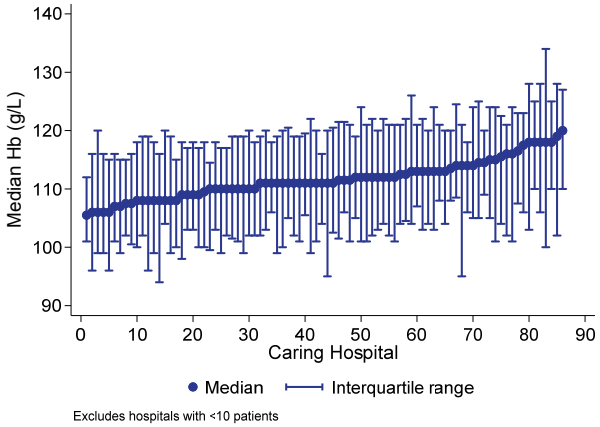


Figure 4.18.2 - Haemoglobin in Haemodialysis Patients - New Zealand 31 December 2019

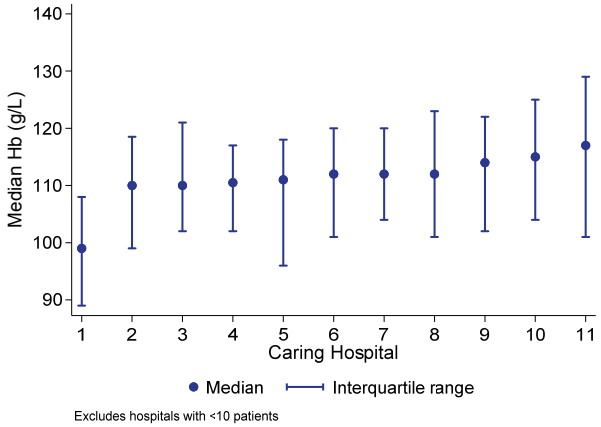


Figure 4.19 shows the proportion of patients with Hb between 110-129g/L; the proportion ranged from 24-69% in Australia and 15-51% in New Zealand.

Figure 4.19.1 - % Haemodialysis Patients with Hb 110-129 g/L - Australia 31 December 2019

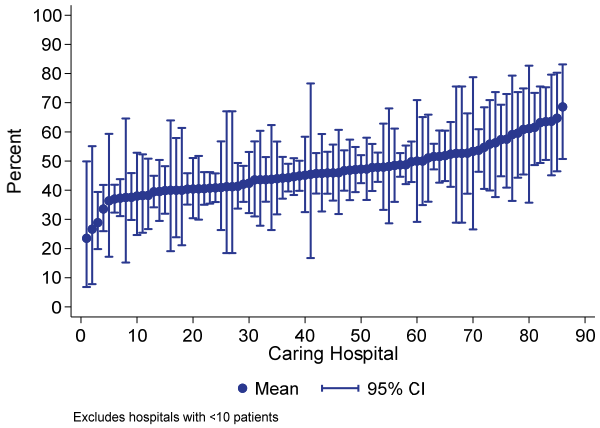
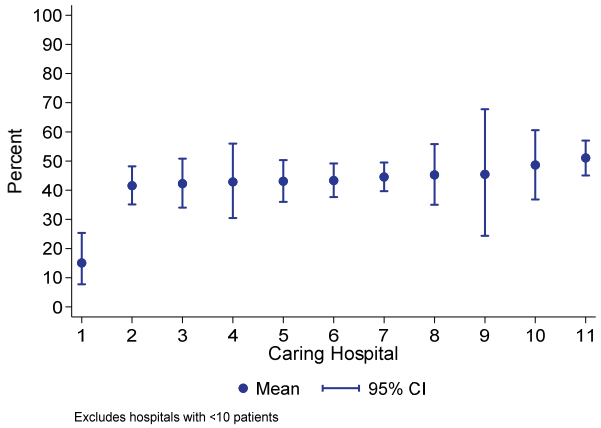


Figure 4.19.2 - % Haemodialysis Patients with Hb 110-129 g/L - New Zealand 31 December 2019



The proportion of patients with ferritin between 200-500µg/L ranged from 6-74% in Australia and 24-55% in New Zealand (figure 4.20). Figure 4.21 presents equivalent data for transferrin saturation.

Figure 4.20.1 - % Haemodialysis Patients with Ferritin 200-500 µg/L - Australia 31 December 2019

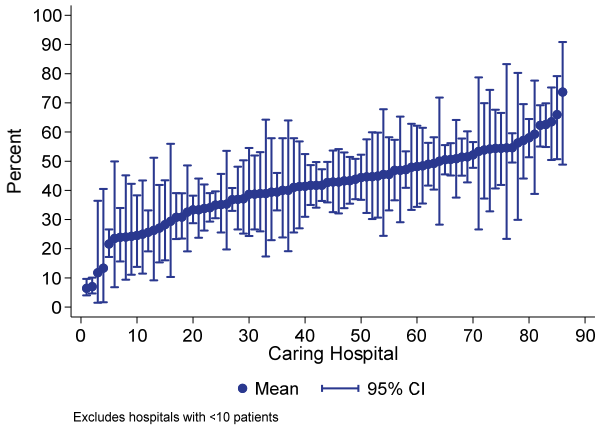


Figure 4.20.2 - % Haemodialysis Patients with Ferritin 200-500 µg/L - New Zealand 31 December 2019

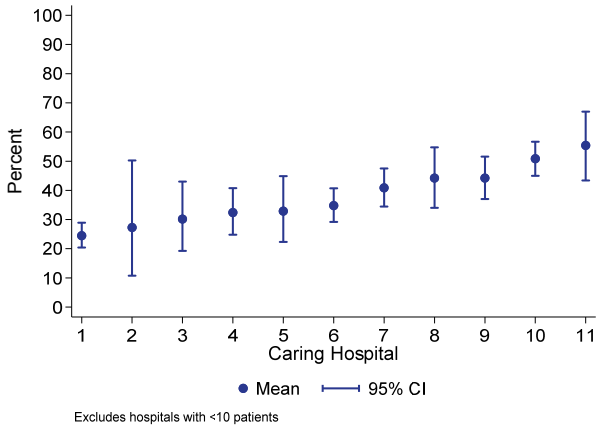


Figure 4.21.1 - % Haemodialysis Patients with TSat>20% - Australia 31 December 2019

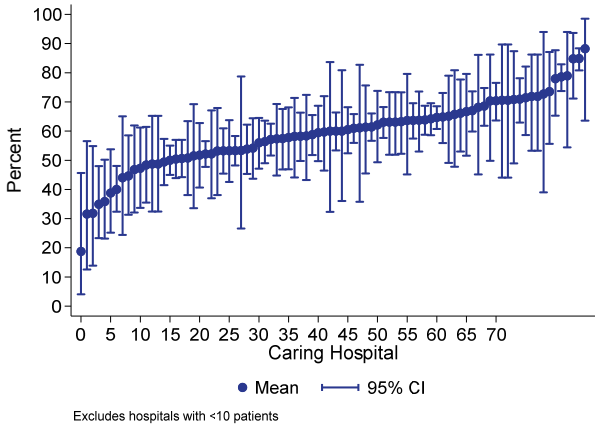
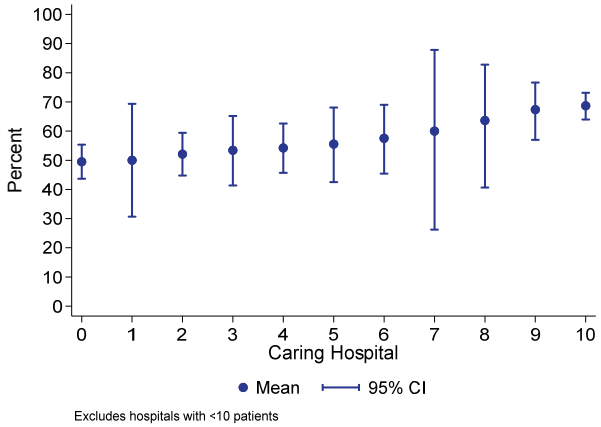


Figure 4.21.2 - % Haemodialysis Patients with TSat>20% - New Zealand 31 December 2019



Biochemistry

Figures 4.22 and 4.23 show the proportions of patients with calcium between 2.1-2.4mmol/L and phosphate between 0.8-1.6mmol/L respectively.

Figure 4.22.1 - % Haemodialysis Patients with Calcium 2.1-2.4 mmol/L - Australia 31 December 2019

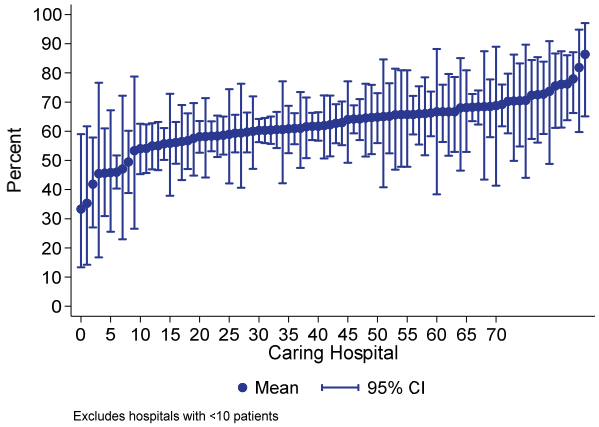


Figure 4.22.2 - % Haemodialysis Patients with Calcium 2.1-2.4 mmol/L - New Zealand 31 December 2019

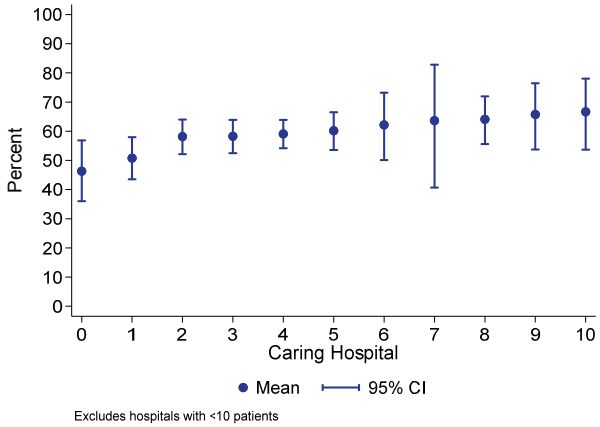


Figure 4.23.1 - % Haemodialysis Patients with Phosphate 0.8-1.6 mmol/L - Australia 31 December 2019

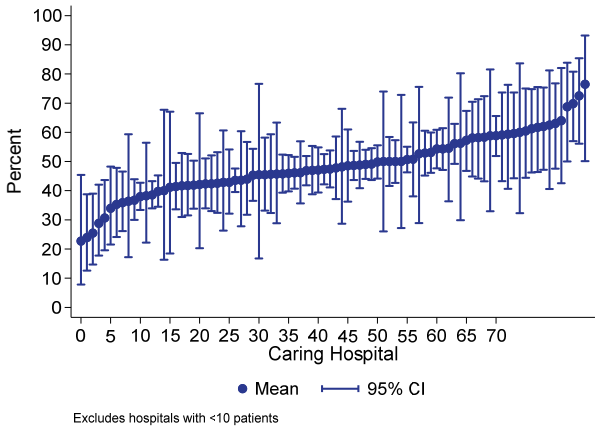
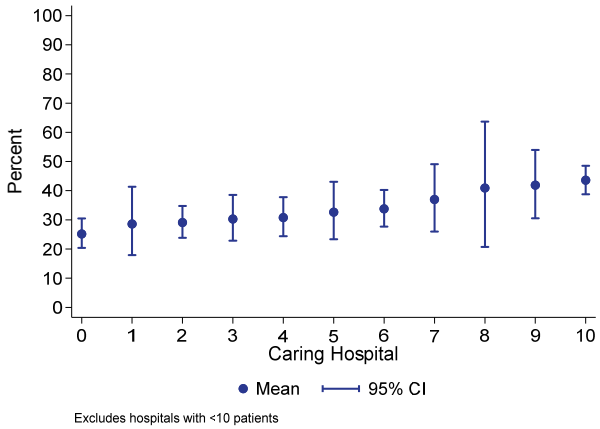


Figure 4.23.2 - % Haemodialysis Patients with Phosphate 0.8-1.6 mmol/L - New Zealand 31 December 2019



Dialysis Adequacy

Figure 4.24 shows the distribution of urea reduction ratio (URR) by country over 2017-2019; there is little change from year to year, and clearances are lower in New Zealand than in Australia. Figure 4.25 presents the 2019 data stratified by vascular access type.

Figure 4.24 - Urea Reduction Ratio - HD Three Sessions Per Week

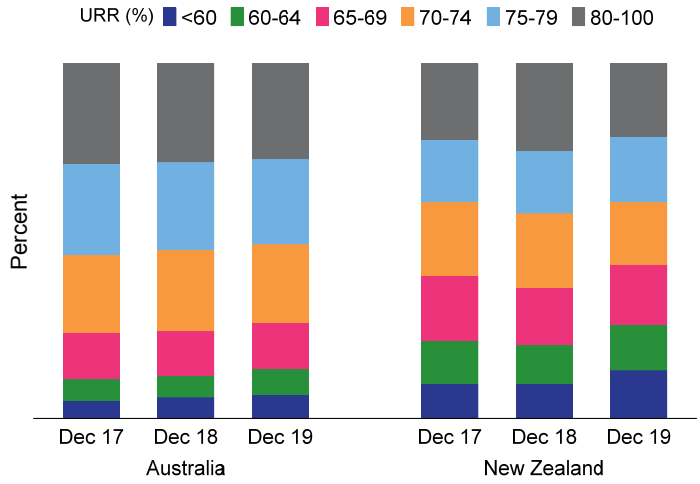


Figure 4.25 - Urea Reduction Ratio - By Type of Access, 2019 HD Three Sessions Per Week

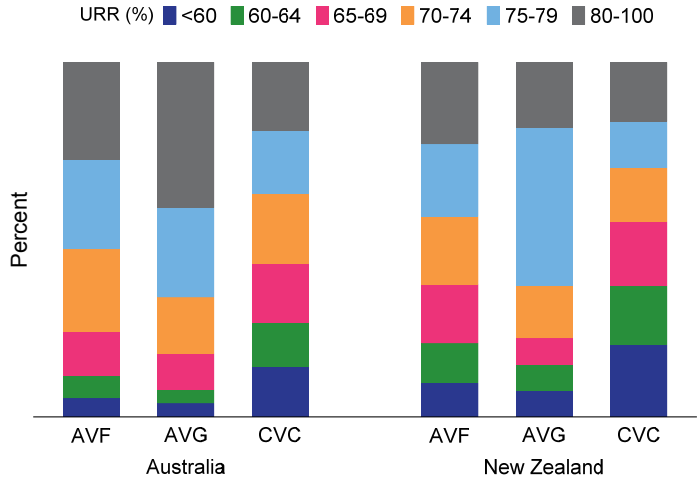


Table 4.15 presents URR by dialysis session duration. In general, as expected, the proportion of patients with a URR >70% typically increases with longer session duration.

Table 4.15 Urea Reduction Ratio - Prevalent Patients Three Sessions per Week - December 2019

Country	Hours per Session	Urea Reduction Ratio %		
		≤70	>70	Total
Australia	**<4 hours**	169 (39.9%)	255 (60.1%)	**424**
	4 hours	1276 (32.6%)	2644 (67.4%)	**3920**
	>4-5 hours	1301 (28.0%)	3352 (72.0%)	**4653**
	>5 hours	85 (26.6%)	235 (73.4%)	**320**
	Total	**2831 (30.4%)**	**6486 (69.6%)**	**9317**
New Zealand	**<4 hours**	9 (75.0%)	3 (25.0%)	**12**
	4 hours	130 (50.8%)	126 (49.2%)	**256**
	>4-5 hours	322 (44.2%)	406 (55.8%)	**728**
	>5 hours	31 (35.6%)	56 (64.4%)	**87**
	Total	**492 (45.4%)**	**591 (54.6%)**	**1083**

Figure 4.26 shows the distribution of median URR by treating hospital for patients dialysing three times per week. In Australia the median ranged from 67-87%, and in New Zealand it ranged from 65-85%.

Figure 4.26.1 - Median URR in Haemodialysis Patients - Three Sessions Per Week Australia 31 December 2019

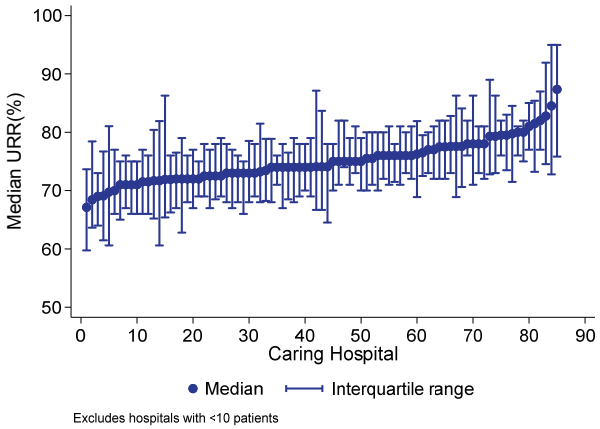


Figure 4.26.2 - Median URR in Haemodialysis Patients - Three Sessions Per Week New Zealand 31 December 2019

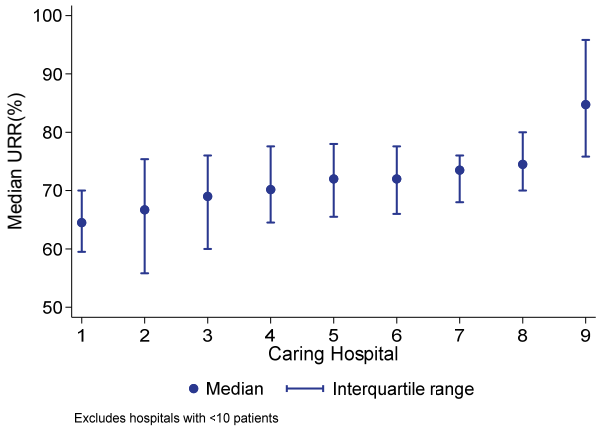


Figure 4.27 shows the proportion of patients with a URR >70%. In Australia this proportion ranged from 36-98%, and in New Zealand from 25-88%.

Figure 4.27.1 - % Haemodialysis Patients with URR>70% - Three Sessions Per Week Australia 31 December 2019

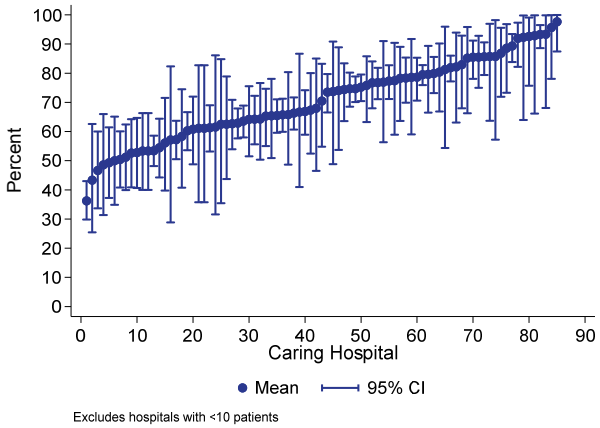
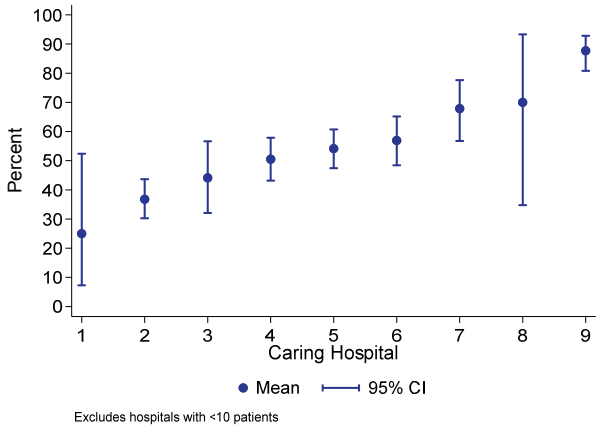


Figure 4.27.2 - % Haemodialysis Patients with URR>70% - Three Sessions Per Week New Zealand 31 December 2019



Vascular Access

Incident Patients

As shown in figures 4.28 to 4.31 and table 4.16, the majority of patients commenced haemodialysis as their first RRT with a catheter; tunnelled catheters were more common than non-tunnelled. Young (age <25 years) patients and those patients who were first seen by nephrologists <3 months before starting haemodialysis ("late referrals") were less likely to start with an AVF or AVG. Of the patients who were not late referrals, around half in Australia, and over two thirds in New Zealand, commenced with a catheter. ANZDATA does not collect information about the indication of HD catheter usage.

Figure 4.28 - Vascular Access - Initial RRT - Haemodialysis as Initial Modality

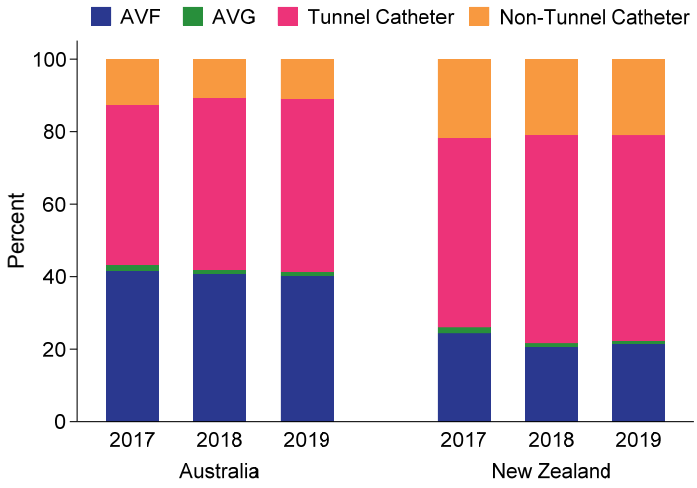


Figure 4.29 - Vascular Access - Initial RRT - By Age Group 2019

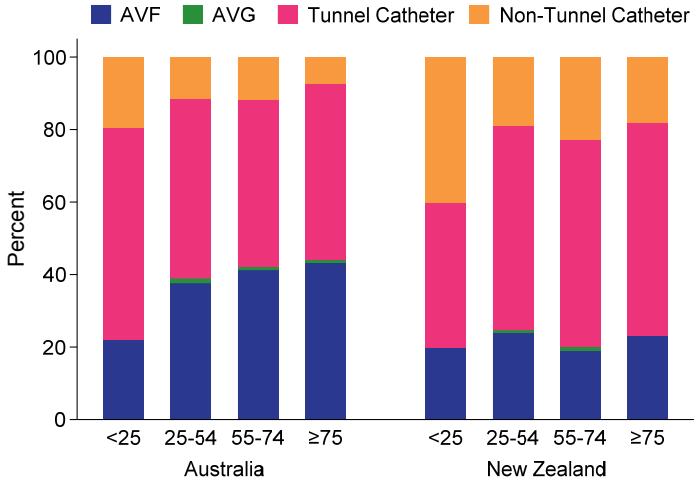


Figure 4.30.1 - Vascular Access - Initial RRT - By Gender – Australia

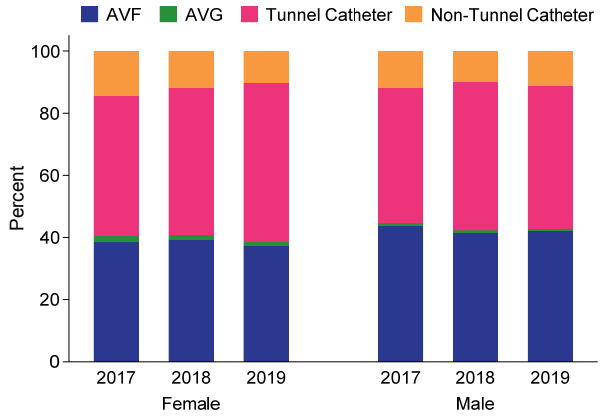


Figure 4.30.2 - Vascular Access - Initial RRT - By Gender - New Zealand

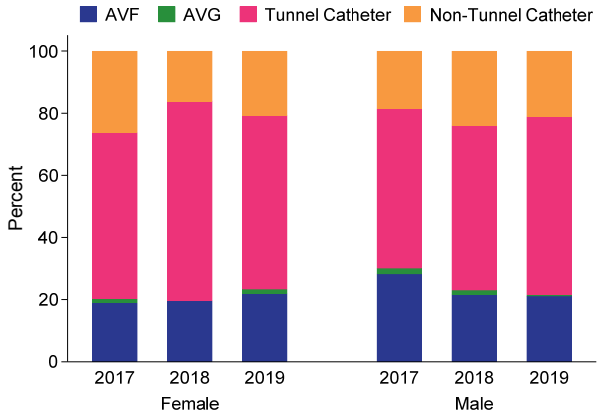


Figure 4.31.1 - Vascular Access - Initial RRT - By Referral Time – Australia

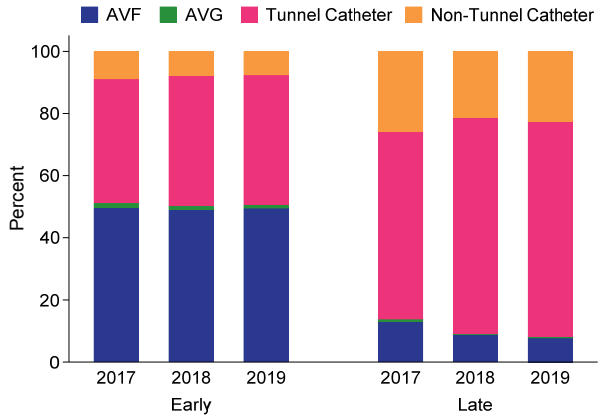


Figure 4.31.2 - Vascular Access - Initial RRT - By Referral Time - New Zealand

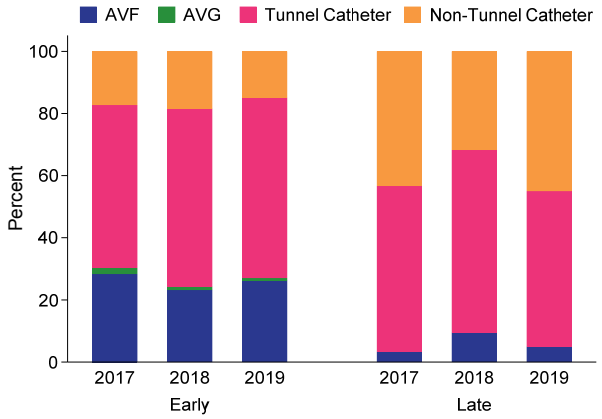


Table 4.16 Incident Vascular Access by Australian State/Territory and Country 2017-2019

State/Country	2017		2018		2019	
	AVF/AVG	CVC	AVF/AVG	CVC	AVF/AVG	CVC
QLD	203 (44%)	255 (56%)	208 (43%)	271 (57%)	212 (42%)	292 (58%)
NSW/ACT	272 (44%)	348 (56%)	258 (42%)	360 (58%)	297 (42%)	415 (58%)
VIC	229 (45%)	283 (55%)	234 (42%)	319 (58%)	204 (38%)	327 (62%)
TAS	13 (33%)	27 (68%)	11 (29%)	27 (71%)	24 (44%)	30 (56%)
SA	79 (54%)	68 (46%)	73 (47%)	81 (53%)	79 (47%)	88 (53%)
NT	48 (42%)	66 (58%)	42 (34%)	81 (66%)	48 (42%)	65 (58%)
WA	84 (33%)	173 (67%)	100 (40%)	149 (60%)	113 (40%)	169 (60%)
Australia	**928 (43%)**	**1220 (57%)**	**926 (42%)**	**1288 (58%)**	**977 (41%)**	**1386 (59%)**
New Zealand	**96 (26%)**	**273 (74%)**	**77 (22%)**	**279 (78%)**	**85 (22%)**	**297 (78%)**

Figure 4.32 shows the proportion of patients in each hospital starting haemodialysis as their first RRT with an AVF/AVG, arranged from the lowest to the highest. In Australia, this ranged widely from 20-72%. The corresponding range in New Zealand was 5-60%. This wide variation reflects differences in practices, protocols, resources and patient case-mix among centres.

Figure 4.32.1 - % Initial RRT HD Patients Starting with AVF/AVG - Australia 2019

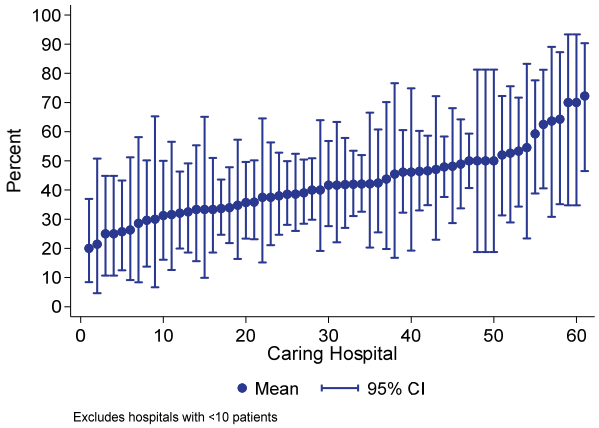
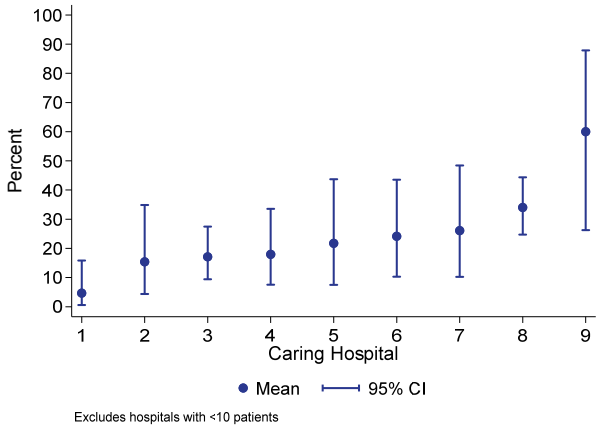


Figure 4.32.2 - % Initial RRT HD Patients Starting with AVF/AVG - New Zealand 2019



Prevalent Patients

Figures 4.33 to 4.36 and table 4.17 show dialysis access among all prevalent patients receiving haemodialysis at 31 December 2019. In Australia, the proportions of patients dialysing with AV grafts and fistulae at 31 December were stable, whereas in New Zealand there is a slight downward trend. Female patients in both countries, young (age <25 years) in Australia and old (age ≥75 years) patients in New Zealand were less likely to be dialysing with an AVF or AVG. Patients on home haemodialysis had the highest rate of AVF use in both Australia and New Zealand.

Figure 4.33 - Prevalent Haemodialysis Access

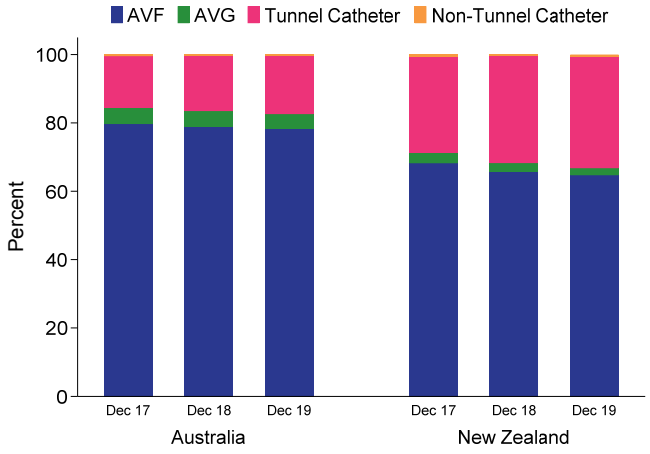


Figure 4.34 - Prevalent Haemodialysis Access - By Age Group 2019

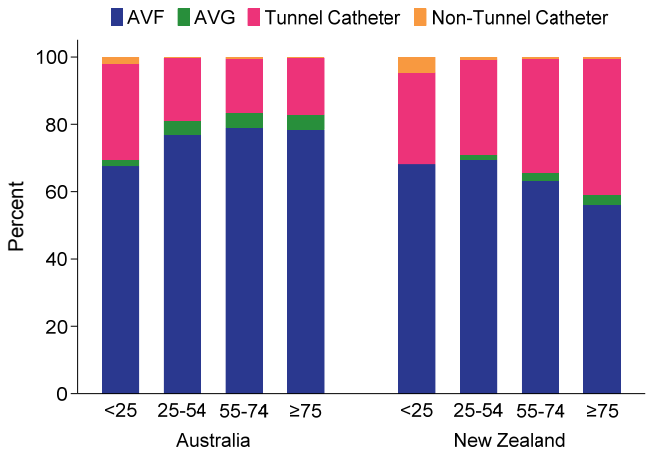


Figure 4.35.1 - Prevalent Haemodialysis Access - By Gender – Australia

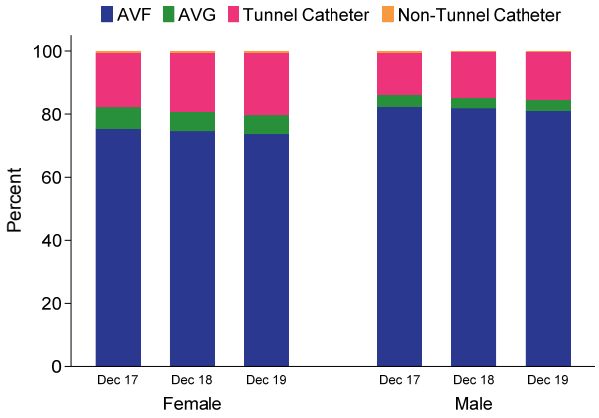


Figure 4.35.2 - Prevalent Haemodialysis Access - By Gender - New Zealand

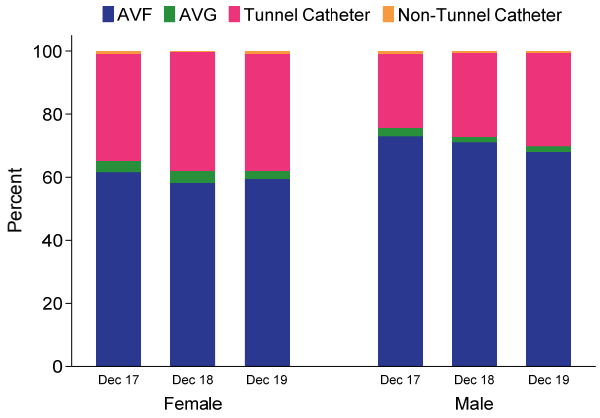


Figure 4.36 - Prevalent Haemodialysis Access - By Location 2019

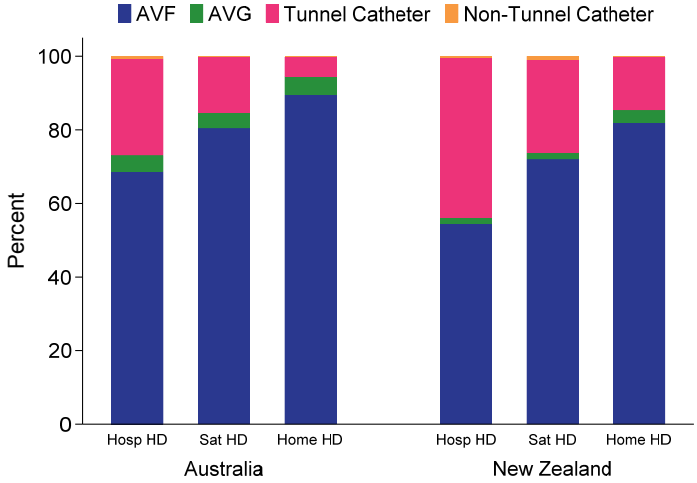


Table 4.17 Prevalent Vascular Access by Australian State/Territory and Country at 31 December 2019

State/Country	2017		2018		2019	
	AVF/AVG	CVC	AVF/AVG	CVC	AVF/AVG	CVC
QLD	1711 (86%)	279 (14%)	1789 (84%)	352 (16%)	1910 (85%)	344 (15%)
NSW/ACT	2666 (84%)	518 (16%)	2715 (83%)	551 (17%)	2603 (80%)	655 (20%)
VIC	2092 (86%)	352 (14%)	2157 (84%)	414 (16%)	2128 (83%)	438 (17%)
TAS	134 (76%)	42 (24%)	139 (76%)	45 (24%)	140 (72%)	55 (28%)
SA	667 (90%)	71 (10%)	688 (89%)	84 (11%)	696 (88%)	95 (12%)
NT	560 (88%)	73 (12%)	587 (88%)	81 (12%)	642 (91%)	66 (9%)
WA	821 (77%)	250 (23%)	884 (78%)	244 (22%)	919 (78%)	252 (22%)
Australia	**8651 (85%)**	**1585 (15%)**	**8959 (83%)**	**1771 (17%)**	**9038 (83%)**	**1905 (17%)**
New Zealand	**1344 (71%)**	**539 (29%)**	**1329 (68%)**	**618 (32%)**	**1270 (67%)**	**633 (33%)**

Figure 4.37 shows the proportion of haemodialysis patients at each hospital dialysing with an AVF/AVG on 31st December 2019, arranged from the lowest to the highest. In Australia, these proportions varied widely from 54-100%. The corresponding range in New Zealand was 36-83%.

Figure 4.37.1 - % Prevalent HD Patients Dialysing with AVF/AVG - Australia 31 December 2019

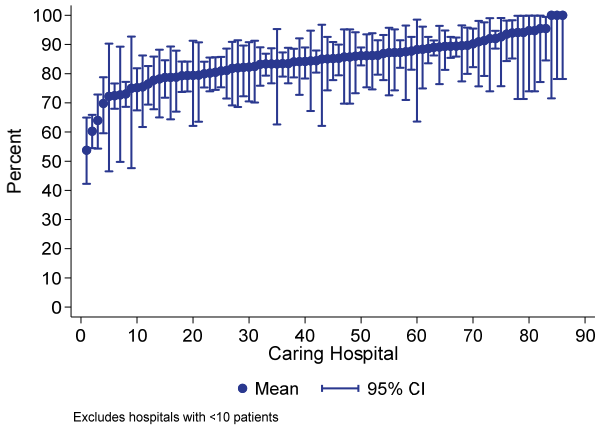
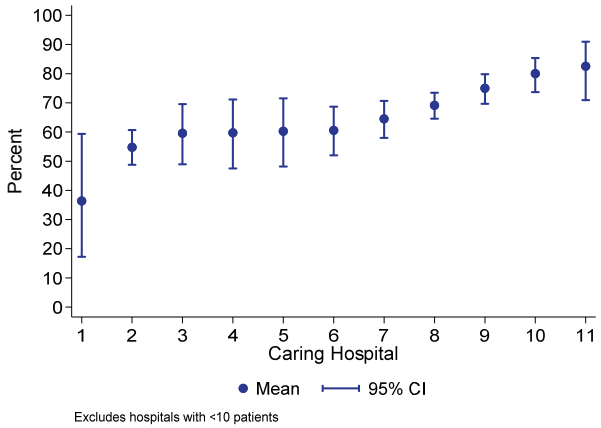


Figure 4.37.2 - % Prevalent HD Patients Dialysing with AVF/AVG - New Zealand 31 December 2019



Home Haemodialysis

The percentage of prevalent haemodialysis patients treated with home dialysis is shown in table 4.18 by state/territory and country. Table 4.19 shows these percentages for patients aged 65 years and older. The age distribution of prevalent home HD patients in 2019 by state/territory and country is shown in

Table 4.18 Number (%) of Prevalent Haemodialysis Patients Treated with Home Haemodialysis 2015 - 2019

State	2015	2016	2017	2018	2019
QLD	284 (14.6%)	266 (13.3%)	249 (11.9%)	263 (11.9%)	257 (11.1%)
NSW/ACT	504 (15.5%)	476 (14.5%)	434 (13.2%)	446 (13.3%)	449 (12.8%)
VIC	217 (8.9%)	204 (8.3%)	195 (7.7%)	179 (6.8%)	185 (6.8%)
TAS	25 (12.9%)	21 (11.7%)	11 (6.3%)	13 (7.1%)	12 (6.2%)
SA	34 (5.2%)	30 (4.4%)	28 (3.7%)	34 (4.4%)	36 (4.5%)
NT	41 (6.9%)	40 (6.5%)	39 (5.9%)	35 (5.0%)	39 (5.3%)
WA	89 (8.4%)	97 (8.6%)	93 (8.0%)	91 (7.6%)	96 (7.5%)
Australia	**1194 (11.8%)**	**1134 (11.0%)**	**1049 (9.8%)**	**1061 (9.6%)**	**1074 (9.3%)**
New Zealand	**484 (25.2%)**	**469 (24.2%)**	**441 (22.9%)**	**424 (21.3%)**	**408 (20.4%)**

Figure 4.38 – Age Distribution of Home HD Patients by State/Territory and Country - at 31 Dec 2019

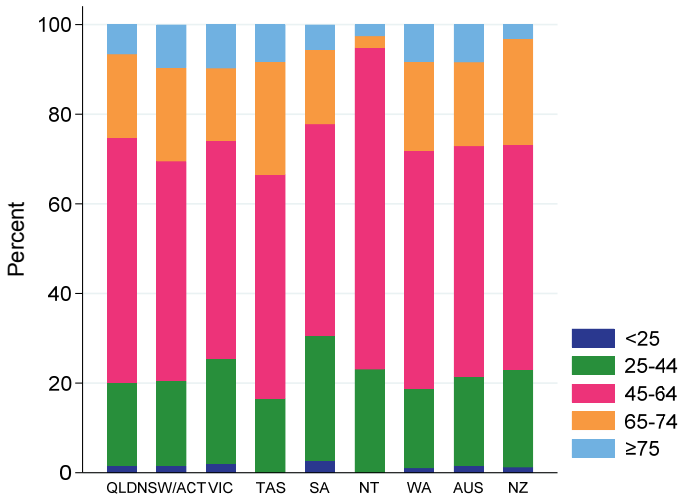


Table 4.19 Number (%) of Prevalent Haemodialysis Patients Aged >=65 Years Treated with Home Haemodialysis 2015 - 2019

State	2015	2016	2017	2018	2019
QLD	73 (7.6%)	60 (6.1%)	53 (5.1%)	67 (6.0%)	65 (5.5%)
NSW/ACT	124 (6.8%)	135 (7.3%)	123 (6.6%)	129 (6.9%)	137 (7.0%)
VIC	52 (3.6%)	51 (3.4%)	45 (3.0%)	39 (2.4%)	48 (2.9%)
TAS	6 (6.2%)	5 (5.2%)	4 (4.4%)	5 (4.8%)	4 (3.5%)
SA	8 (2.2%)	9 (2.5%)	6 (1.5%)	10 (2.4%)	8 (1.9%)
NT	6 (6.0%)	5 (5.0%)	6 (4.7%)	4 (3.2%)	2 (1.4%)
WA	16 (3.4%)	25 (4.9%)	27 (5.2%)	29 (5.4%)	27 (4.7%)
Australia	**285 (5.4%)**	**290 (5.4%)**	**264 (4.8%)**	**283 (4.9%)**	**291 (4.8%)**
New Zealand	**91 (13.9%)**	**94 (13.8%)**	**96 (14.0%)**	**100 (13.7%)**	**109 (14.6%)**

The trends in the proportion of haemodialysis patients treated with home HD in different age groups are illustrated in figure 4.39. In general home haemodialysis has become less common as a proportion of all haemodialysis patients, especially for younger patients.

Figure 4.39.1 - Home HD Percent of all HD by Age at 31 Dec 2019 - Australia

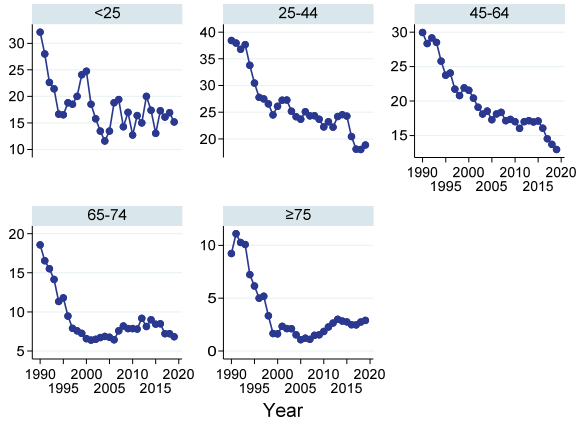
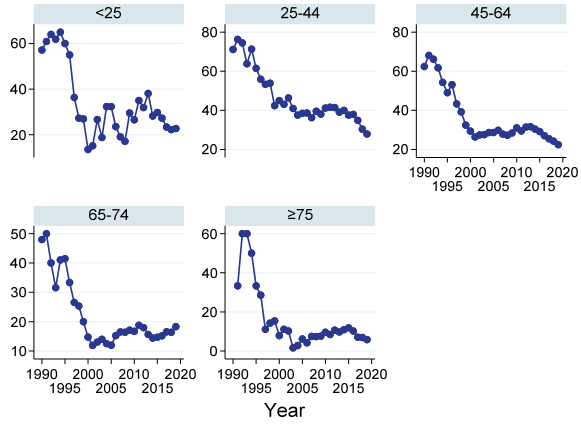


Figure 4.39.2 - Home HD Percent of all HD by Age at 31 Dec 2019 - New Zealand



There is substantial variation between hospitals, and between countries, in the proportion of haemodialysis patients who dialyse at home (figure 4.40).

Figure 4.40.1 - % Haemodialysis Patients on Home HD - Australia 31 December 2019

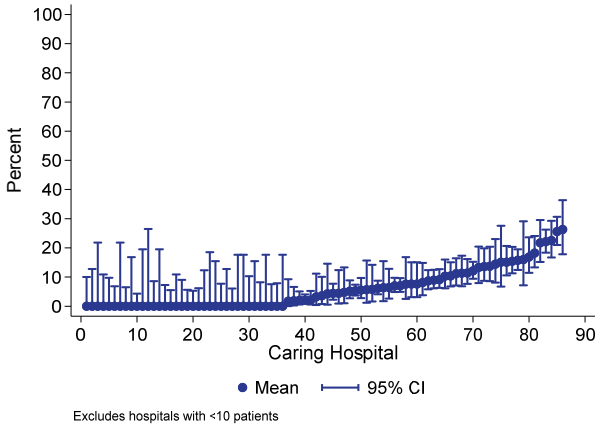
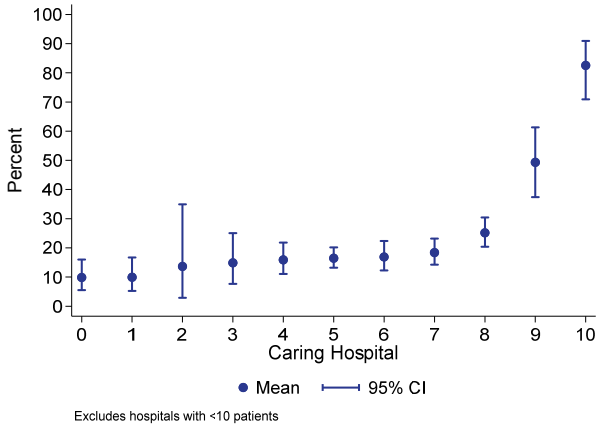


Figure 4.40.2 - % Haemodialysis Patients on Home HD - New Zealand 31 December 2019



The following figures explore the concept of technique failure as applied to home haemodialysis. Each treatment episode can end in a variety of ways. Changes to another dialysis modality (either institutional haemodialysis or peritoneal dialysis) for 30 or more days are considered a “failure”, as is death. Follow-up is censored at transplantation, or 31 Dec 2019. Only patients initiating home haemodialysis within the first 365 days of RRT commencement are included. When death of a patient is counted as a censoring event (rather than “failure”), the differences between the age groups become less apparent (figure 4.43).

Figure 4.41 - Technique Survival - Home Haemodialysis 2009 – 2019

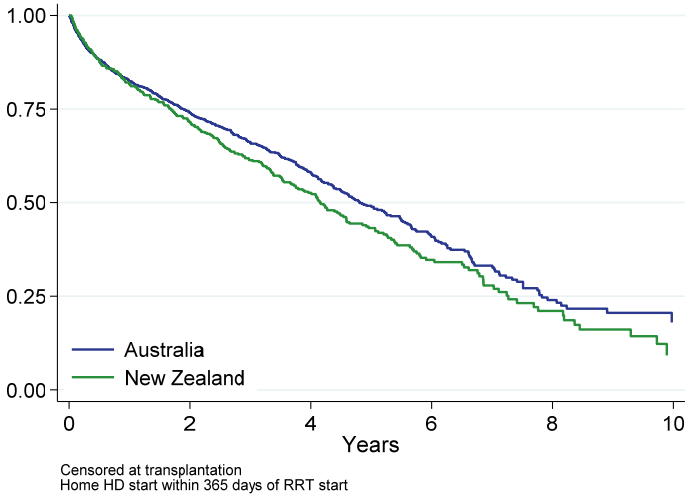


Figure 4.42 - Technique Survival by Age Group - Home Haemodialysis 2009 – 2019

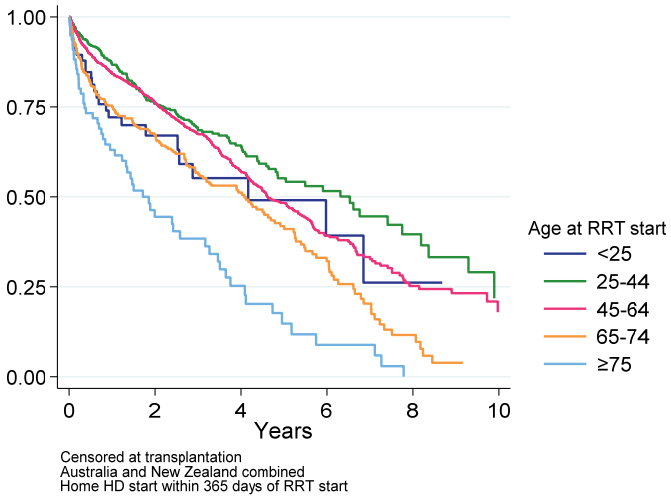


Figure 4.43.1 - Death-Censored Technique Survival by Age Group - Home Haemodialysis 2009 - 2019 Australia

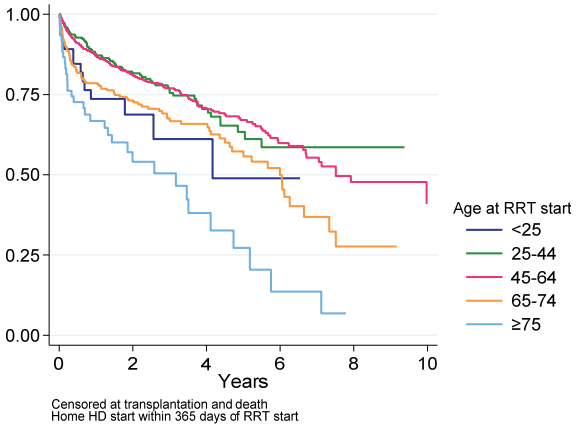


Figure 4.43.2 - Death-Censored Technique Survival by Age Group - Home Haemodialysis 2009 - 2019 New Zealand

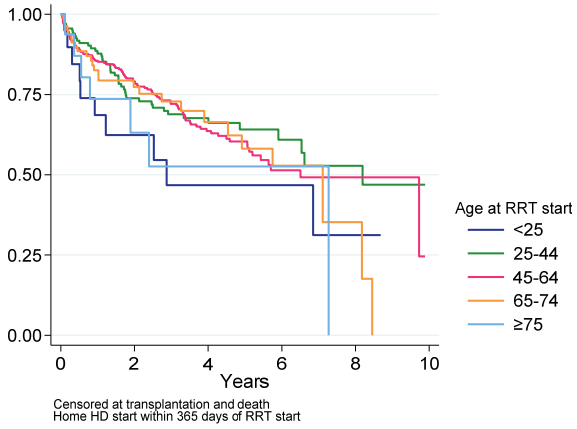
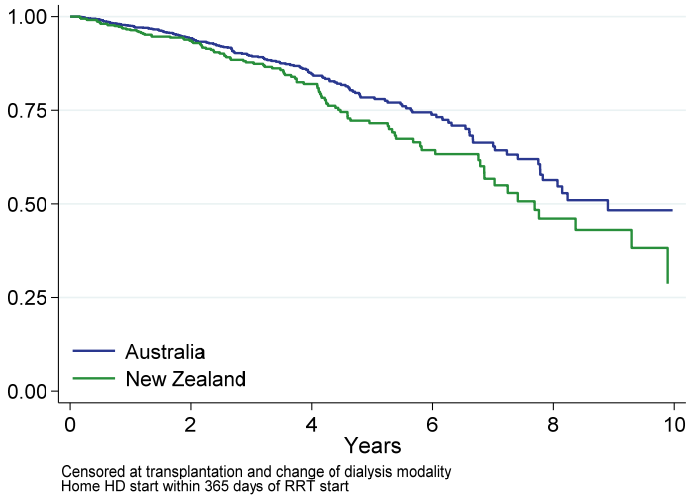


Figure 4.44 - Patient Survival - Home Haemodialysis 2009 – 2019



The following figures explore trends in home haemodialysis prescriptions. Quotidian dialysis is defined as >3 sessions per week OR >5 hours per session.

Figure 4.45 - Home Haemodialysis Conventional/Quotidian - 2017-2019

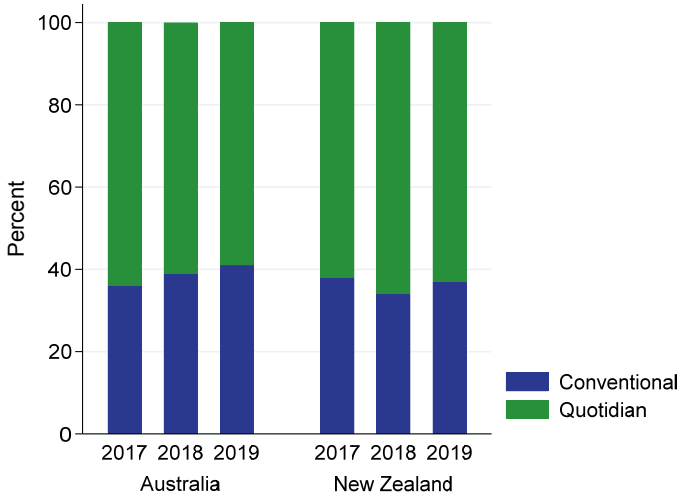


Figure 4.46 - Home Haemodialysis Frequency Per Week - 2017-2019

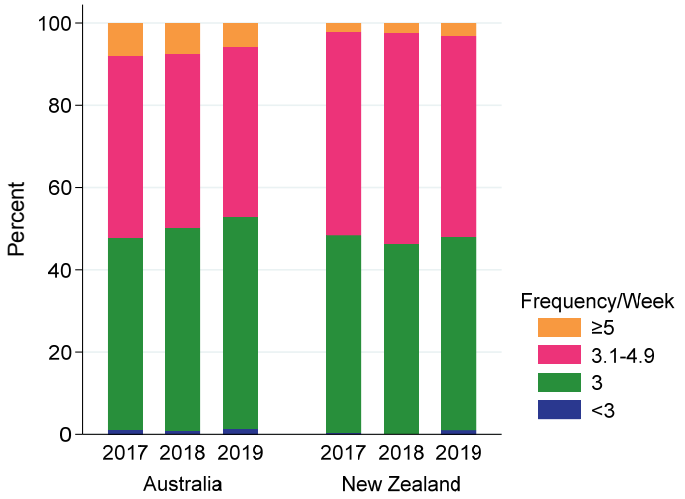


Figure 4.47 - Home Haemodialysis Session Length (Hours) - December 2017-2019

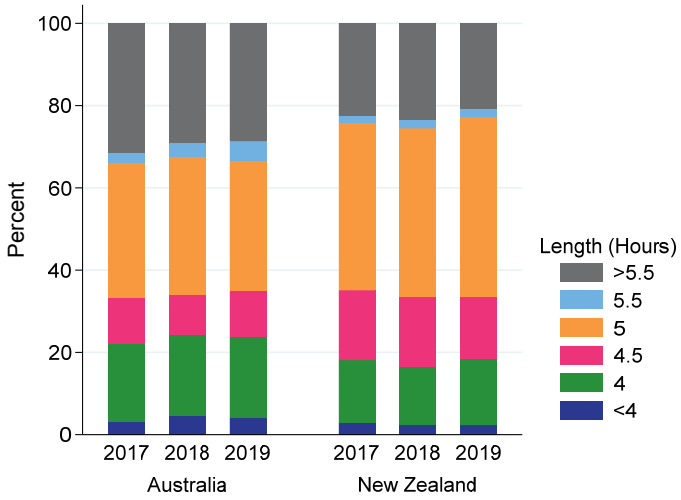


Figure 4.48 - Home Haemodialysis Duration (Hours Per Week) - December 2017-2019

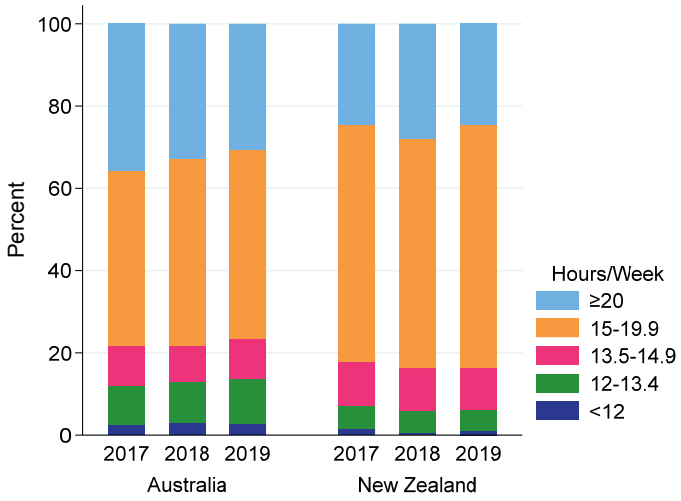


Figure 4.49 - Percentage of Home HD Patients Dialysing Five or More Days Per Week

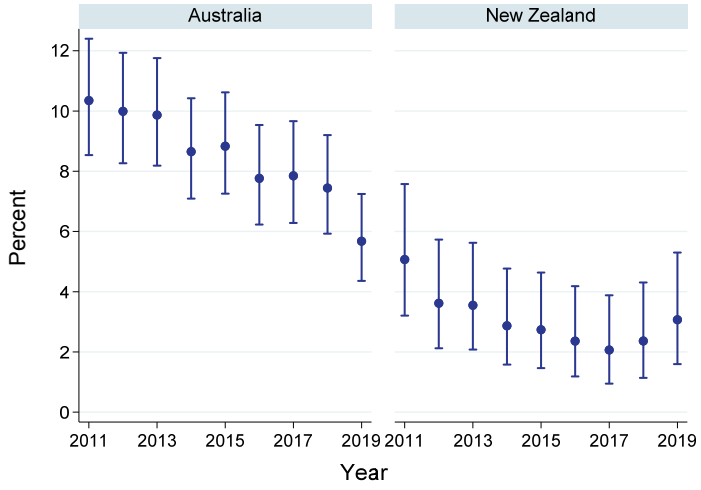


Figure 4.50 - Percentage of Home HD Patients Dialysing 3 Days Per Week Dialysing 4.5 Hours or Longer Per Session

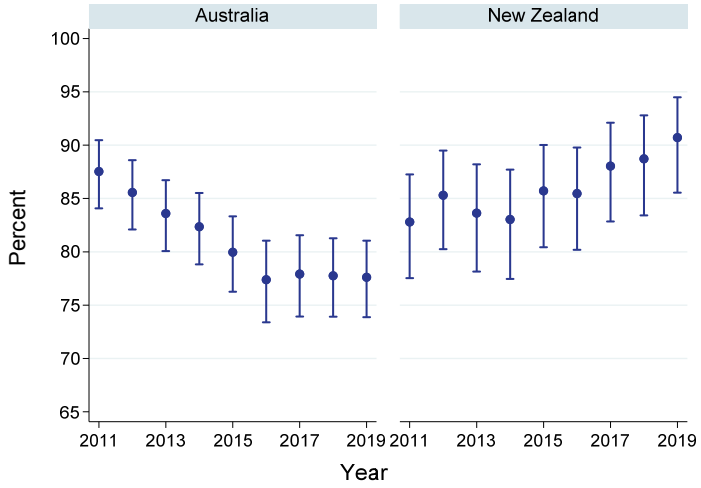


Figure 4.51 - Percentage of Home HD Patients Dialysing >12 Hours Per Week