

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

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SUMMARY AND HIGHLIGHTS

Important things to note regarding people in Australia and New Zealand who required haemodialysis in 2023 are:

Compared to 2019, there was a greater relative increase in the number of people commencing haemodialysis in New Zealand than Australia (18% versus 4%), and in the total number of prevalent patients (22% versus 12%). [Table 4.1]

The proportion of prevalent patients aged 75 years or greater was much larger in Australia than New Zealand (27% versus 14%). [Table 4.2.1 and Figures 4.1- 4.2]

Overall survival from commencing haemodialysis has not changed over the last five years, being approximately 90% at 1 year and 50% at 5 years in both countries. However, survival is quite different for different age groups and co-morbidity states. To enable more accurate prognostication for clinicians, survival by age, diabetes status and cardiovascular disease status is presented. [Tables 4.4 & 4.5]

The proportion of people starting dialysis with established vascular access continued to decline in 2023, which should concern the renal community in both countries. Wide variation continues year by year, between individual caring hospitals, between Australian states and between Australia and New Zealand. In New Zealand in 2023, only 14% of people starting dialysis did so with established vascular access, compared to 22% in 2022, and compared to 38% in Australia in 2023 [Table 4.6]. A better understanding of this in ANZDATA would require an additional survey of the reason(s) why a catheter was required.

In terms of dialysis prescription, the proportion of people receiving >15 hours of haemodialysis each week is now 13.5% in New Zealand and 6.1% in Australia, having been almost 20% and above 10%, respectively in 2015 [Table 4.12 and Figure 4.24]. A much greater proportion of the people doing haemodialysis at home perform >15 hours per week [Figure 4.36], though the proportion of home haemodialysis patients is low at 15.8% in New Zealand and 8.3% in Australia.

The self-care variable was introduced to determine whether people were performing the haemodialysis procedure without assistance from a health professional or not (not self-care in their activities of daily living). Whilst a figure of 15% not doing “self-care” haemodialysis at home may reflect use of a program of visiting nurses, the proportion reported as doing self-care haemodialysis in satellite centres of 10% in Australia and 26% in New Zealand, seems implausible, and makes one wonder if the term is being incorrectly interpreted as to do with activities of daily living.

SUGGESTED CITATION

M Roberts, C Davies, E Au, S Bateman, J Chen, P Clayton, K Hurst, F Kholmurodova, D Lee, H McCarthy, S McDonald, W Mulley, B Solomon, T Sun, G Irish. 47th Report, Chapter 4: Haemodialysis. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2024. Available at: <http://www.anzdata.org.au>

INCIDENCE, CESSATION AND PREVALENCE

Table 4.1 presents the incidence, cessation and prevalence of haemodialysis patients in Australia and New Zealand over 2019-2023. Note that dialysis modality changes lasting less than 30 days are not included.

[^]Note that in this chapter hybrid dialysis (collected as a treatment modality from 2023) is included in the category of HD as opposed to the other chapters where it is generally categorised with PD.

[#]Note that in 2020 the ANZDATA registry began to record withdrawal from dialysis as a treatment decision in addition to documenting this as a cause of death. This change is reflected in fewer patients having death documented as cause of dialysis cessation in the table below. The great majority of people who withdraw from dialysis will die soon after this decision and therefore the total number of withdrawals and deaths is comparable to the number of deaths before 2020. Following withdrawal from dialysis in 2022, the median days to death was 5, and 90% of patients died within 18 days.

Table 4.1
Incidence, Cessation and Prevalence of Haemodialysis[^] Patients in Australia and New Zealand 2019-2023

Country	2019	2020	2021	2022	2023	
Australia	All patients who commenced HD					
	First dialysis treatment or returning after kidney recovery	2430	2353	2384	2534	2481
	Transfer from PD (no prior HD)	391	393	436	427	453
	Transfer from PD (prior HD)	150	183	172	151	159
	Failed Transplant (no prior HD)	50	42	50	48	50
	Failed Transplant (prior HD)	166	157	183	196	164
	Total	3187	3128	3225	3356	3307
	All patients who ceased HD					
	Received kidney transplant	632	541	545	593	678
	Transfer to PD	326	308	289	270	316
	Kidney recovery	79	89	86	91	99
	Withdrawal from dialysis [#]	-	578	743	781	742
	Deaths	1646	1159	1075	1335	1271
	Total	2683	2675	2738	3070	3106
	Total patients on HD at 31 December	11612	12045	12516	12799	12970
Patients on HD at home* at 31 December (% of all HD patients)	1072 (9.2%)	1131 (9.4%)	1132 (9.0%)	1125 (8.8%)	1072 (8.3%)	
New Zealand	All patients who commenced HD					
	First dialysis treatment or returning after kidney recovery	386	411	446	450	496
	Transfer from PD (no prior HD)	104	123	143	117	116
	Transfer from PD (prior HD)	71	57	68	56	47
	Failed Transplant (no prior HD)	8	5	10	7	7
	Failed Transplant (prior HD)	18	27	28	25	26
	Total	587	623	695	655	692
	All patients who ceased HD					
	Received kidney transplant	106	84	76	71	95
	Transfer to PD	112	127	113	110	89
	Kidney recovery	12	15	5	12	8
	Withdrawal from dialysis [#]	-	62	75	102	94
	Deaths	332	234	249	298	302
	Total	562	522	518	593	588
	Total patients on HD at 31 December	2019	2122	2298	2345	2457
Patients on HD at home* at 31 December (% of all HD patients)	407 (20.2%)	386 (18.2%)	394 (17.1%)	388 (16.5%)	389 (15.8%)	

[^]Includes Hybrid Dialysis [#]Includes Community House HD

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 2023

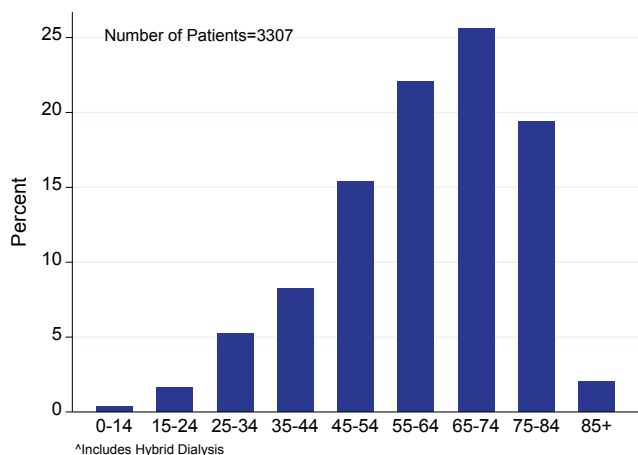


Figure 4.1.2
Age (%) of Incident Haemodialysis[^] Patients - New Zealand 2023

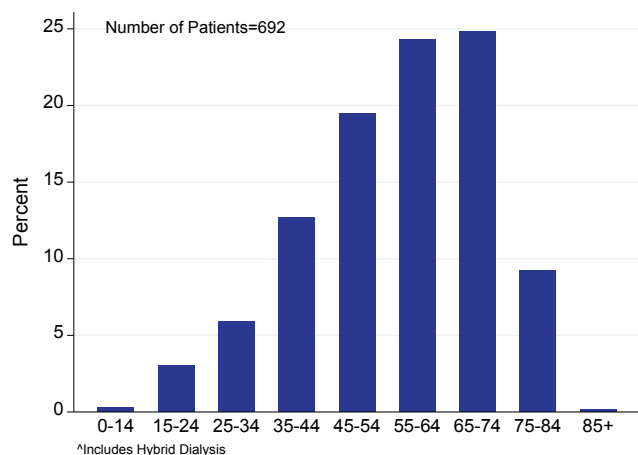


Figure 4.2.1
Age (%) of Prevalent Haemodialysis[^] Patients - Australia 31 Dec 2023

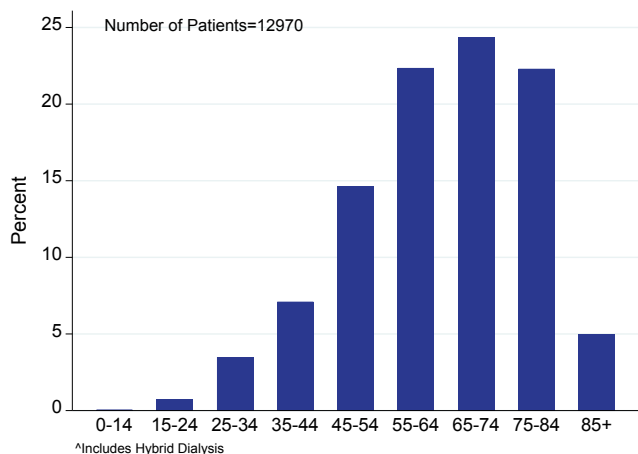


Figure 4.2.2
Age (%) of Prevalent Haemodialysis[^] Patients - New Zealand 31 Dec 2023

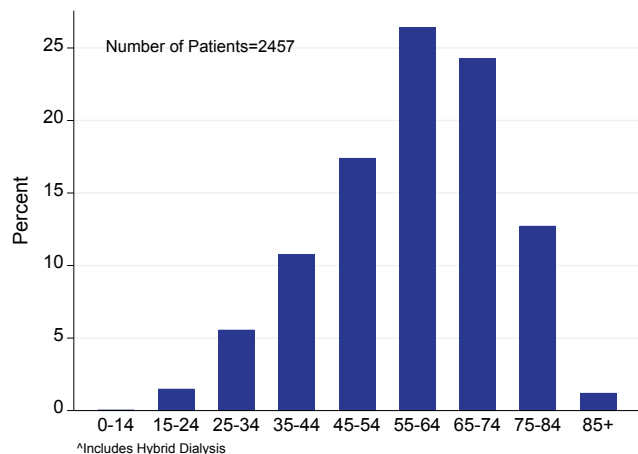


Table 4.2.1

Incident and Prevalent Haemodialysis^a Patients in Australia by Age Group 2019-2023

	Age group	2019	2020	2021	2022	2023
Incident Patients	0-14	10 (0%)	8 (0%)	14 (0%)	11 (0%)	13 (0%)
	15-24	65 (2%)	51 (2%)	67 (2%)	61 (2%)	54 (2%)
	25-34	153 (5%)	152 (5%)	163 (5%)	171 (5%)	173 (5%)
	35-44	232 (7%)	247 (8%)	277 (9%)	301 (9%)	272 (8%)
	45-54	573 (18%)	475 (15%)	491 (15%)	530 (16%)	510 (15%)
	55-64	680 (21%)	728 (23%)	710 (22%)	744 (22%)	730 (22%)
	65-74	858 (27%)	803 (26%)	857 (27%)	862 (26%)	846 (26%)
	75-84	543 (17%)	574 (18%)	578 (18%)	612 (18%)	642 (19%)
	85+	73 (2%)	90 (3%)	68 (2%)	64 (2%)	67 (2%)
	Total	3187	3128	3225	3356	3307
Prevalent Patients	0-14	6 (0%)	7 (0%)	7 (0%)	6 (0%)	6 (0%)
	15-24	111 (1%)	105 (1%)	112 (1%)	109 (1%)	95 (1%)
	25-34	400 (3%)	416 (3%)	405 (3%)	441 (3%)	453 (3%)
	35-44	759 (7%)	769 (6%)	876 (7%)	926 (7%)	922 (7%)
	45-54	1769 (15%)	1767 (15%)	1806 (14%)	1897 (15%)	1897 (15%)
	55-64	2517 (22%)	2677 (22%)	2738 (22%)	2809 (22%)	2900 (22%)
	65-74	2955 (25%)	3053 (25%)	3166 (25%)	3167 (25%)	3160 (24%)
	75-84	2532 (22%)	2654 (22%)	2773 (22%)	2798 (22%)	2893 (22%)
	85+	563 (5%)	597 (5%)	633 (5%)	646 (5%)	644 (5%)
	Total	11612	12045	12516	12799	12970

^aIncludes Hybrid Dialysis

Table 4.2.2

Incident and Prevalent Haemodialysis^a Patients in New Zealand by Age Group 2019-2023

	Age group	2019	2020	2021	2022	2023
Incident Patients	0-14	1 (0%)	3 (0%)	2 (0%)	1 (0%)	2 (0%)
	15-24	9 (2%)	22 (4%)	23 (3%)	14 (2%)	21 (3%)
	25-34	43 (7%)	32 (5%)	41 (6%)	62 (9%)	41 (6%)
	35-44	56 (10%)	54 (9%)	80 (12%)	60 (9%)	88 (13%)
	45-54	146 (25%)	129 (21%)	137 (20%)	106 (16%)	135 (20%)
	55-64	155 (26%)	180 (29%)	185 (27%)	179 (27%)	168 (24%)
	65-74	115 (20%)	136 (22%)	160 (23%)	169 (26%)	172 (25%)
	75-84	61 (10%)	62 (10%)	64 (9%)	61 (9%)	64 (9%)
	85+	1 (0%)	5 (1%)	3 (0%)	3 (0%)	1 (0%)
	Total	587	623	695	655	692
Prevalent Patients	0-14	1 (0%)	1 (0%)	2 (0%)	1 (0%)	1 (0%)
	15-24	22 (1%)	31 (1%)	32 (1%)	28 (1%)	37 (2%)
	25-34	113 (6%)	120 (6%)	127 (6%)	137 (6%)	137 (6%)
	35-44	217 (11%)	219 (10%)	251 (11%)	255 (11%)	265 (11%)
	45-54	376 (19%)	400 (19%)	416 (18%)	427 (18%)	428 (17%)
	55-64	545 (27%)	568 (27%)	611 (27%)	611 (26%)	649 (26%)
	65-74	524 (26%)	535 (25%)	587 (26%)	590 (25%)	597 (24%)
	75-84	206 (10%)	233 (11%)	257 (11%)	277 (12%)	313 (13%)
	85+	15 (1%)	15 (1%)	15 (1%)	19 (1%)	30 (1%)
	Total	2019	2122	2298	2345	2457

^aIncludes Hybrid Dialysis[BACK TO CONTENTS](#)

PATIENT SURVIVAL

Table 4.3 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. Censoring does not occur with transfer to hybrid dialysis. Survival for all incident kidney replacement therapy (KRT) patients who were treated with haemodialysis at commencement is reported.

Survival begins from the date of commencing KRT with haemodialysis.

Survival of people receiving dialysis differs substantially according to age, diabetes status and cardiovascular disease status (Tables 4.4 and 4.5) and data are presented this way to enable clinicians to estimate their patient’s survival based on where they fit in this table. Survival by individual components of this table is presented in the Figures 4.4-4.7.

Table 4.3
Unadjusted HD Patient Survival by Era 2012-2023; % [95% Confidence Interval]

Country	Era	Number of Patients	Survival			
			6 months	1 year	3 years	5 years
Australia	2012-2014	5576	94 [93, 94]	88 [87, 89]	69 [68, 71]	50 [48, 51]
	2015-2017	6085	94 [93, 95]	89 [89, 90]	70 [69, 72]	51 [50, 53]
	2018-2020	6997	95 [94, 95]	90 [89, 90]	69 [67, 70]	49 [47, 50]
	2021-2023	7311	94 [94, 95]	90 [89, 90]	-	-
New Zealand	2012-2014	1043	93 [91, 95]	89 [87, 91]	71 [67, 74]	51 [48, 55]
	2015-2017	1040	93 [91, 95]	88 [86, 90]	72 [68, 75]	52 [48, 55]
	2018-2020	1148	94 [92, 95]	89 [87, 91]	69 [66, 72]	44 [40, 49]
	2021-2023	1373	95 [94, 96]	91 [88, 92]	-	-

Haemodialysis at KRT Start
Censored for transplant and transfer to PD

Figure 4.3.1
Unadjusted HD Patient Survival by Era - Australia 2012-2023

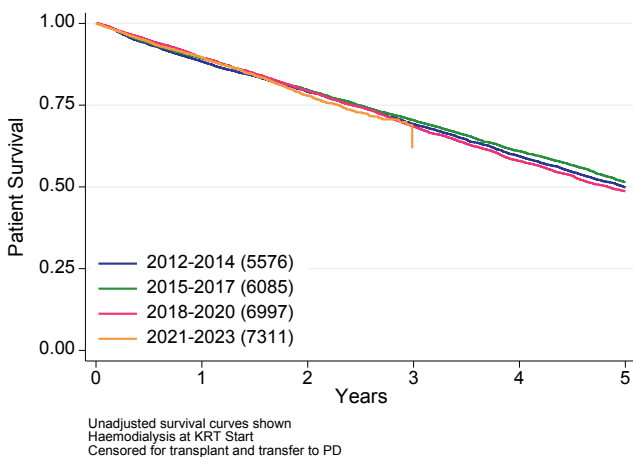
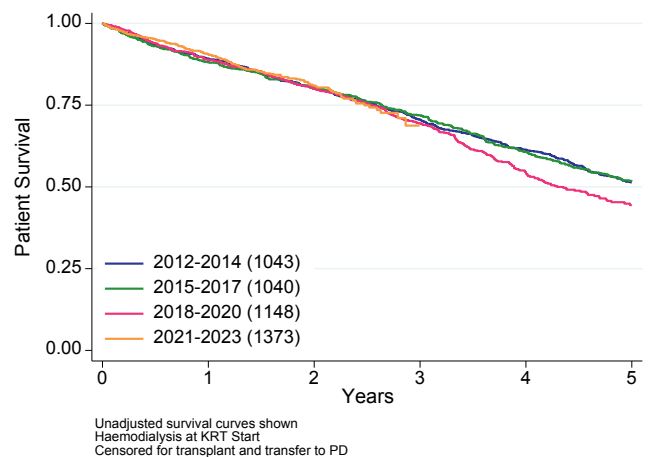


Figure 4.3.2
Unadjusted HD Patient Survival by Era - New Zealand 2012-2023



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Table 4.4
Unadjusted HD Patient Survival by Age Group, Diabetes Status and Cardiovascular Disease Status: Australia 2012-2023; % [95% Confidence Interval]

Age Group	Survival							
	DM-, CVD-		DM+, CVD-		DM-, CVD+		DM+, CVD+	
	1 year	5 years	1 year	5 years	1 year	5 years	1 year	5 years
<40 years	98 [96, 98]	90 [86, 92]	94 [92, 96]	70 [63, 75]	91 [83, 95]	67 [50, 79]	91 [87, 94]	56 [47, 65]
40-59 years	95 [94, 96]	74 [71, 77]	95 [94, 96]	68 [65, 70]	92 [89, 94]	60 [54, 65]	91 [90, 92]	54 [51, 56]
60-74 years	91 [89, 92]	57 [54, 60]	92 [90, 93]	56 [53, 59]	85 [83, 87]	45 [41, 49]	87 [86, 88]	41 [39, 43]
≥75 years	86 [84, 88]	37 [33, 40]	88 [86, 90]	37 [33, 41]	81 [79, 83]	33 [30, 36]	80 [78, 82]	25 [22, 27]

Haemodialysis at KRT Start

Censored for transplant and transfer to PD

DM-, CVD- : No diabetes and no cardiovascular disease

DM+, CVD- : Diabetes but no cardiovascular disease

DM-, CVD+ : Cardiovascular disease but no diabetes

DM+, CVD+ : Both cardiovascular disease and diabetes

Table 4.5
Unadjusted HD Patient Survival by Age Group, Diabetes Status and Cardiovascular Disease Status: New Zealand 2012-2023; % [95% Confidence Interval]

Age Group	Survival							
	DM-, CVD-		DM+, CVD-		DM-, CVD+		DM+, CVD+	
	1 year	5 years	1 year	5 years	1 year	5 years	1 year	5 years
<40 years	97 [93, 98]	86 [78, 91]	95 [89, 98]	66 [53, 76]	96 [75, 99]	91 [67, 98]	83 [68, 92]	42 [21, 61]
40-59 years	96 [93, 98]	69 [60, 77]	93 [90, 95]	61 [55, 66]	87 [78, 92]	57 [42, 70]	86 [83, 89]	45 [39, 50]
60-74 years	88 [82, 91]	49 [40, 58]	92 [89, 94]	50 [44, 57]	83 [77, 88]	37 [28, 45]	86 [83, 89]	37 [32, 42]
≥75 years	83 [71, 90]	13 [4, 28]	89 [80, 95]	41 [27, 56]	77 [67, 85]	31 [18, 45]	80 [72, 86]	14 [7, 24]

Haemodialysis at KRT Start

Censored for transplant and transfer to PD

DM-, CVD- : No diabetes and no cardiovascular disease

DM+, CVD- : Diabetes but no cardiovascular disease

DM-, CVD+ : Cardiovascular disease but no diabetes

DM+, CVD+ : Both cardiovascular disease and diabetes

Figure 4.4.1
Unadjusted HD Patient Survival by Age Group
- Australia 2012-2023

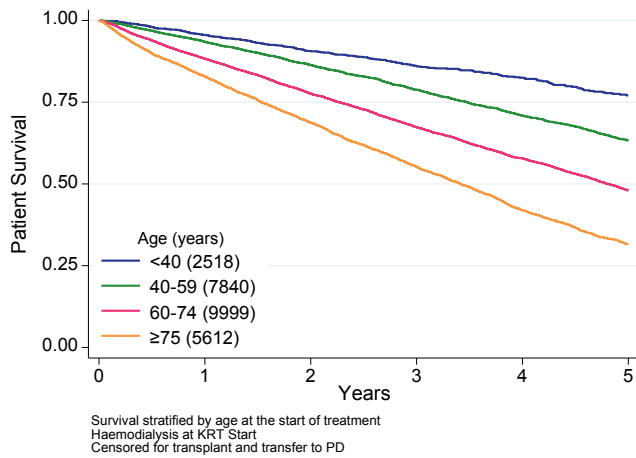


Figure 4.4.2
Unadjusted HD Patient Survival by Age Group
- New Zealand 2012-2023

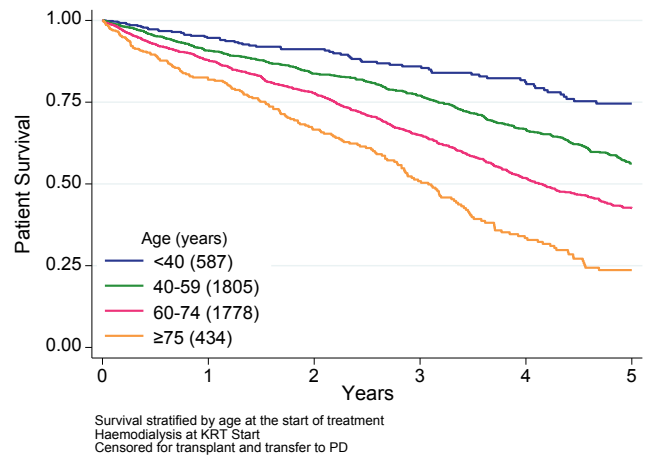


Figure 4.5.1
Unadjusted HD Patient Survival by Diabetes
- Australia 2012-2023

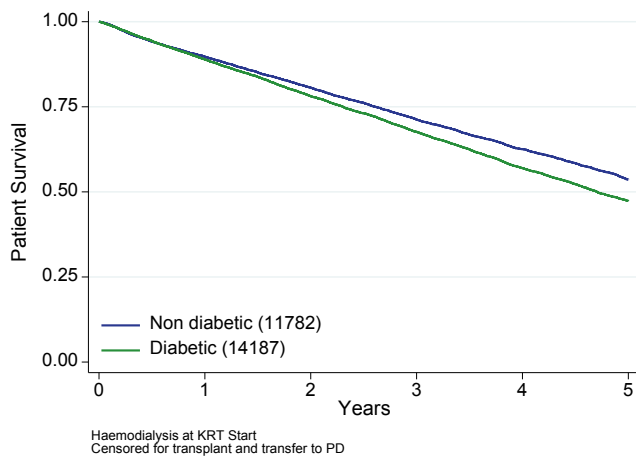


Figure 4.5.2
Unadjusted HD Patient Survival by Diabetes
- New Zealand 2012-2023

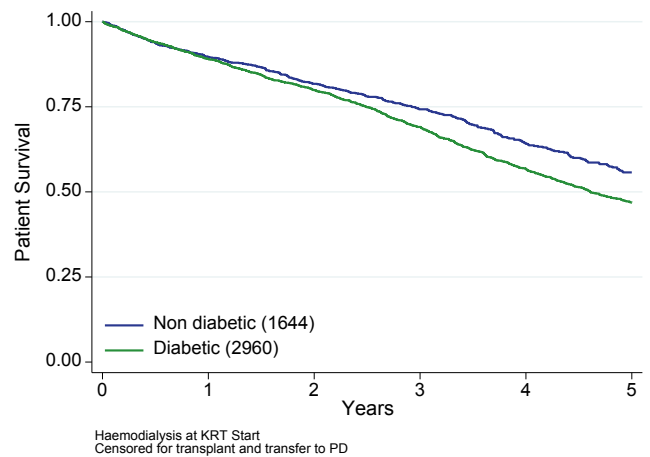


Figure 4.6.1
Unadjusted HD Patient Survival by Age Group
- Australia 2012-2023 No Diabetes and No Cardiovascular Disease

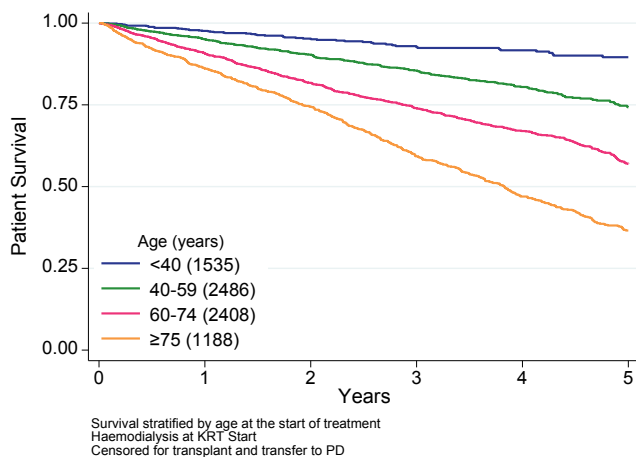


Figure 4.6.2
Unadjusted HD Patient Survival by Age Group
- Australia 2012-2023 Diabetes but No Cardiovascular Disease

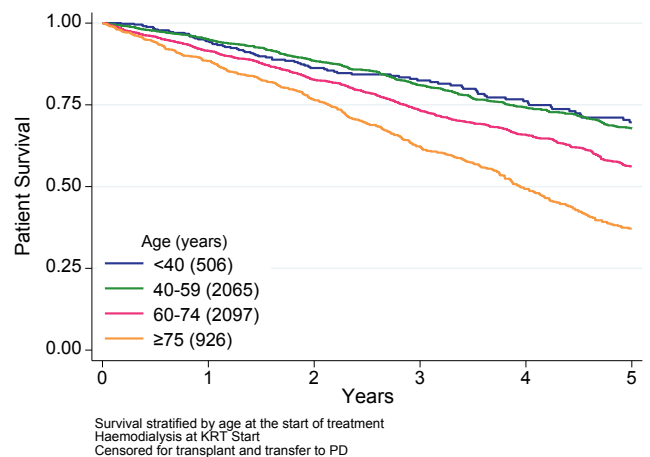


Figure 4.6.3
Unadjusted HD Patient Survival by Age Group - Australia 2012-2023 Cardiovascular Disease but No Diabetes

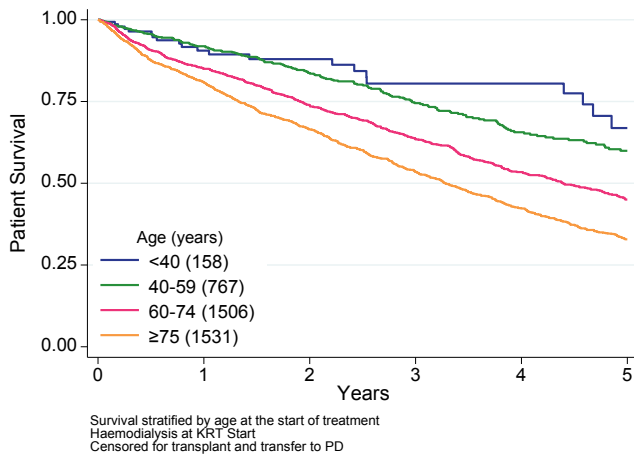


Figure 4.6.4
Unadjusted HD Patient Survival by Age Group - Australia 2012-2023 Both Diabetes and Cardiovascular Disease

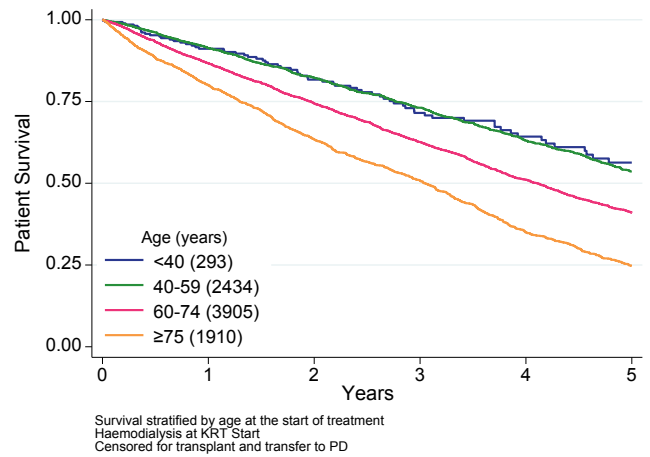


Figure 4.7.1
Unadjusted HD Patient Survival by Age Group - New Zealand 2012-2023 No Diabetes and No Cardiovascular Disease

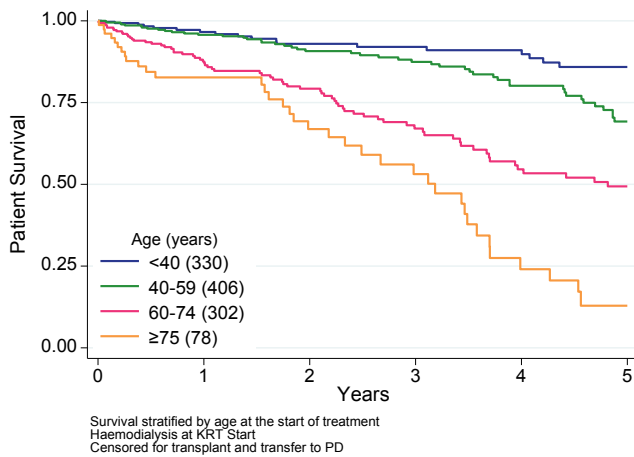


Figure 4.7.2
Unadjusted HD Patient Survival by Age Group - New Zealand 2012-2023 Diabetes but No Cardiovascular Disease

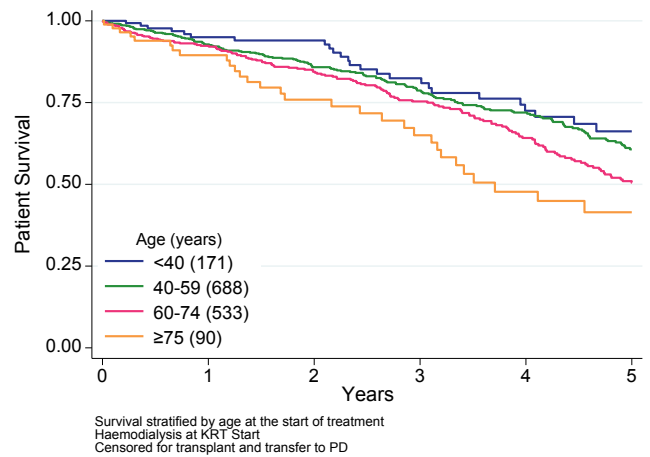


Figure 4.7.3
Unadjusted HD Patient Survival by Age Group - New Zealand 2012-2023 Cardiovascular Disease but No Diabetes

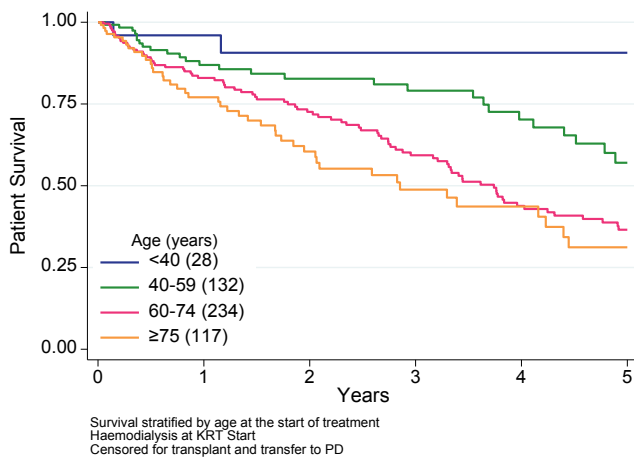
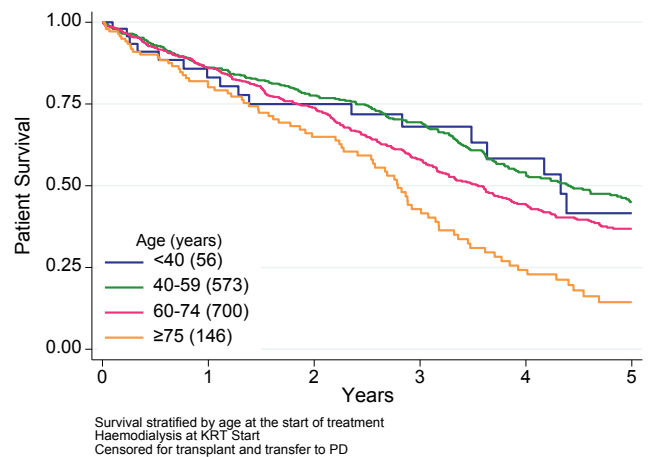


Figure 4.7.4
Unadjusted HD Patient Survival by Age Group - New Zealand 2012-2023 Both Diabetes and Cardiovascular Disease



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VASCULAR ACCESS

INCIDENT PATIENTS

Figures 4.8 to 4.11 and Table 4.6 show data related to vascular access for incident haemodialysis patients. This includes patients who start with a catheter and then transfer to planned peritoneal dialysis.

ANZDATA does not collect information about indication for haemodialysis catheter usage, hence the reasons why over half of patients commenced with a central venous catheter, including those referred sufficiently early (Figure 4.11), are not known.

Figure 4.8
Vascular Access - Initial KRT - Haemodialysis as Initial Modality

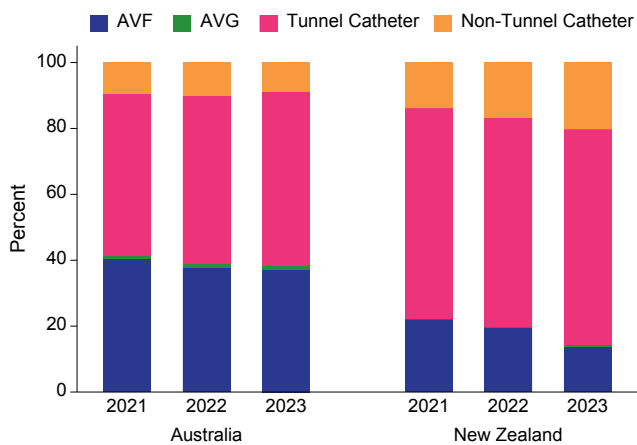


Figure 4.9
Vascular Access - Initial KRT - By Age Group 2023

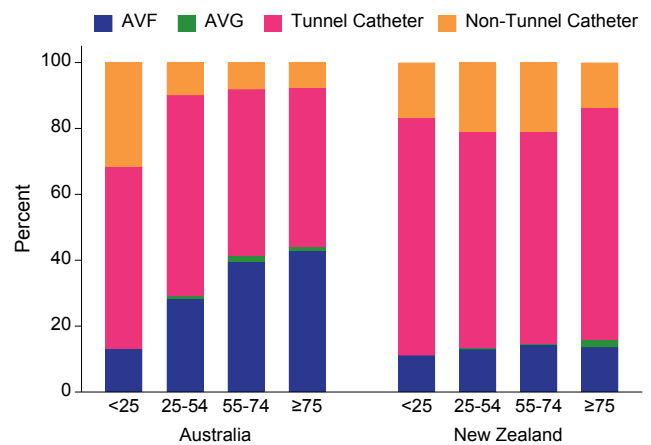


Figure 4.10.1
Vascular Access - Initial KRT - By Gender - Australia

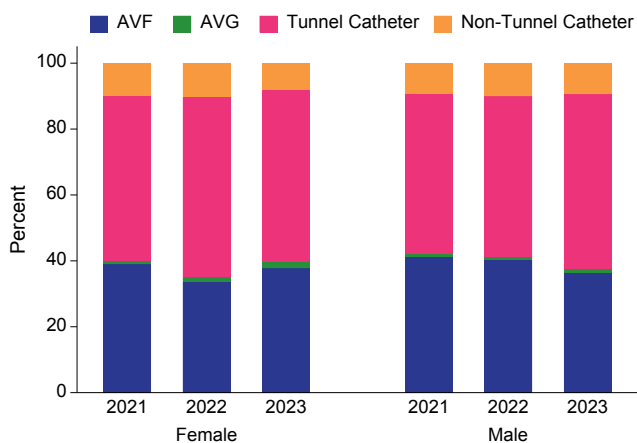


Figure 4.10.2
Vascular Access - Initial KRT - By Gender - New Zealand

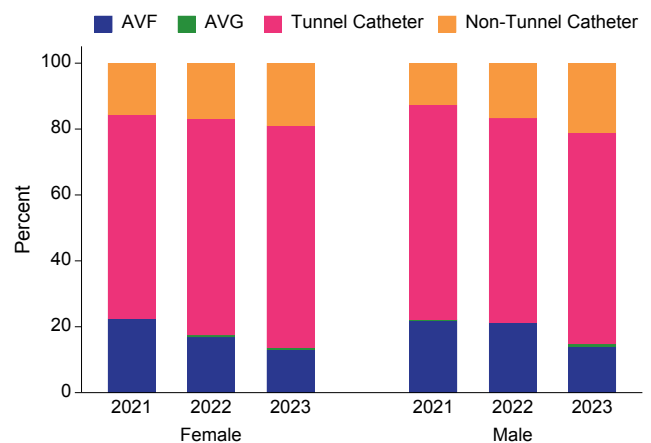


Figure 4.11.1
Vascular Access - Initial KRT - By Referral Time - Australia

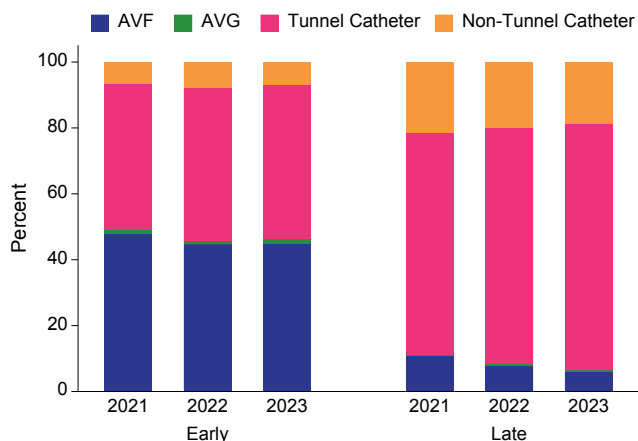


Figure 4.11.2
Vascular Access - Initial KRT - By Referral Time - New Zealand

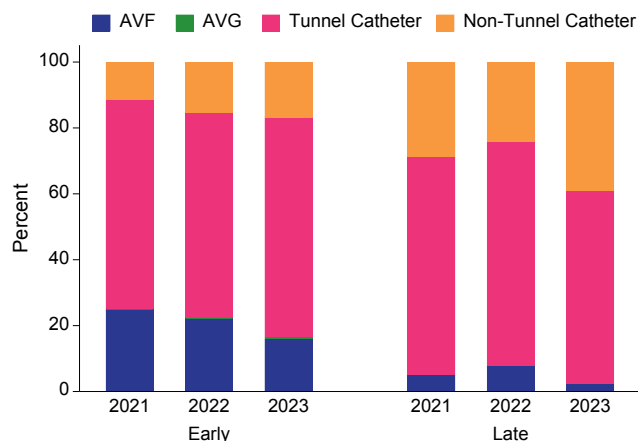


Figure 4.6
Incident Vascular Access by Australian State/Territory and Country 2021-2023

State/Country	2021		2022		2023	
	AVF/AVG	CVC	AVF/AVG	CVC	AVF/AVG	CVC
QLD	233 (45%)	287 (55%)	210 (40%)	311 (60%)	196 (36%)	356 (64%)
NSW/ACT	294 (42%)	405 (58%)	305 (40%)	460 (60%)	248 (36%)	432 (64%)
VIC	217 (39%)	333 (61%)	223 (40%)	335 (60%)	252 (41%)	364 (59%)
TAS	15 (33%)	30 (67%)	12 (26%)	34 (74%)	16 (52%)	15 (48%)
SA	77 (48%)	82 (52%)	82 (45%)	101 (55%)	80 (46%)	93 (54%)
NT	46 (43%)	62 (57%)	38 (29%)	93 (71%)	47 (40%)	70 (60%)
WA	90 (34%)	174 (66%)	101 (34%)	192 (66%)	99 (36%)	175 (64%)
Australia	972 (41%)	1373 (59%)	971 (39%)	1526 (61%)	938 (38%)	1505 (62%)
New Zealand	97 (22%)	337 (78%)	88 (20%)	355 (80%)	70 (14%)	419 (86%)

Figure 4.12.1
Percentage of all Patients who Commenced HD Starting with AVF/AVG - Australia 2023

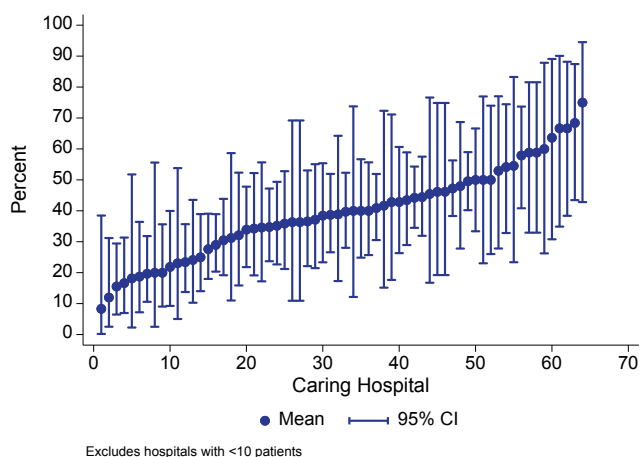
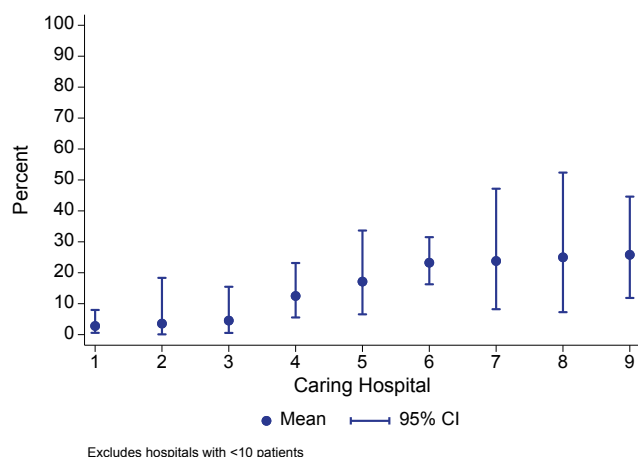


Figure 4.12.2
Percentage of all Patients who Commenced HD Starting with AVF/AVG - New Zealand 2023



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PREVALENT PATIENTS

Figures 4.13 to 4.16 and Table 4.7 show dialysis access among prevalent (rather than incident) patients (those receiving haemodialysis or hybrid dialysis at 31 December 2023).

Figure 4.13
Prevalent Haemodialysis[^] Access

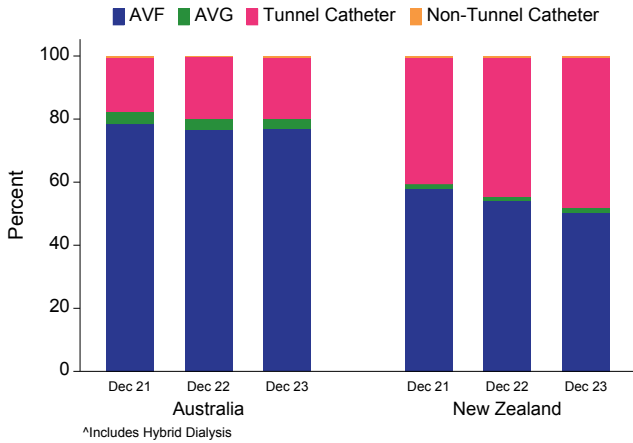


Figure 4.14
Prevalent Haemodialysis[^] Access - By Age Group 2023

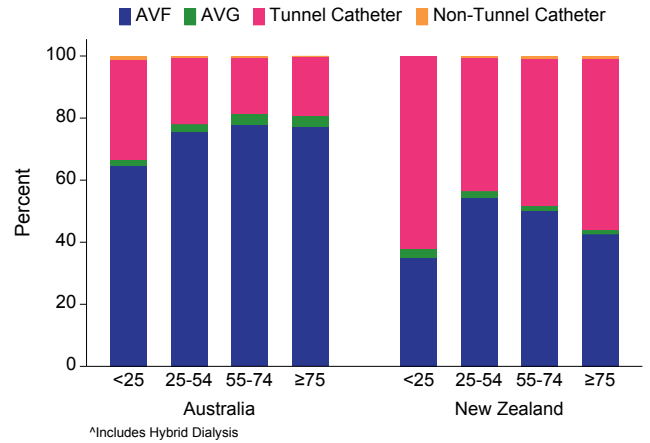


Figure 4.15.1
Prevalent Haemodialysis[^] Access - By Gender - Australia

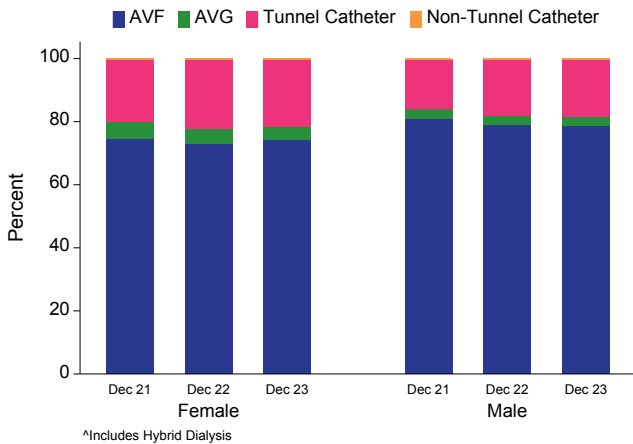


Figure 4.15.2
Prevalent Haemodialysis[^] Access - By Gender - New Zealand

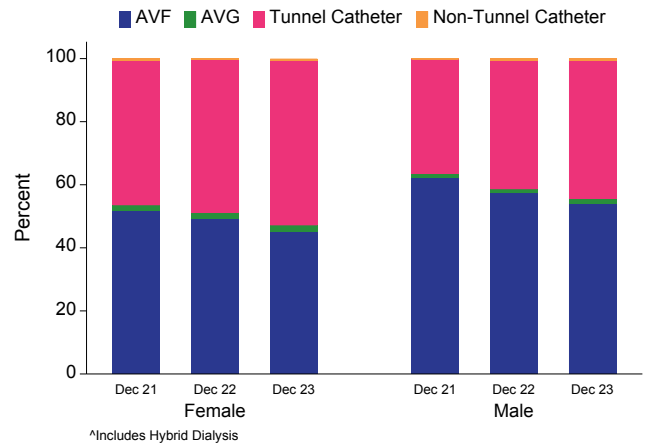


Figure 4.16
Prevalent Haemodialysis[^] Access - By Location 2023

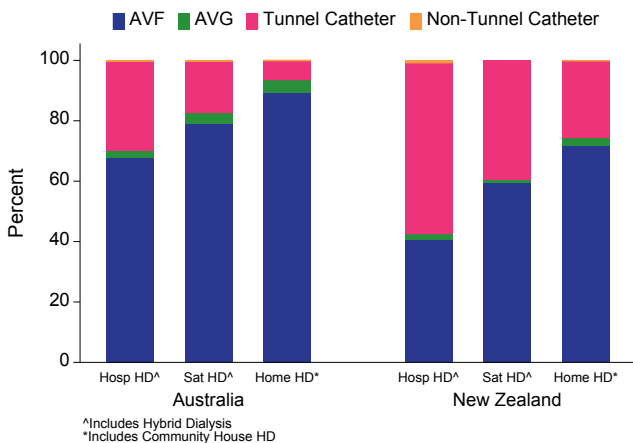


Table 4.7
Prevalent Haemodialysis[^] Vascular Access by Australian State/Territory and Country at 31 December 2023

State/Country	2020		2021		2022	
	AVF/AVG	CVC	AVF/AVG	CVC	AVF/AVG	CVC
QLD	2072 (84%)	402 (16%)	2145 (82%)	481 (18%)	2129 (81%)	496 (19%)
NSW/ACT	2946 (81%)	708 (19%)	2995 (79%)	817 (21%)	2993 (79%)	774 (21%)
VIC	2354 (83%)	490 (17%)	2310 (81%)	533 (19%)	2358 (79%)	610 (21%)
TAS	127 (70%)	54 (30%)	121 (64%)	67 (36%)	116 (67%)	58 (33%)
SA	751 (88%)	104 (12%)	739 (84%)	142 (16%)	760 (84%)	142 (16%)
NT	651 (92%)	59 (8%)	663 (89%)	85 (11%)	651 (88%)	85 (12%)
WA	967 (77%)	297 (23%)	1034 (76%)	333 (24%)	1080 (77%)	315 (23%)
Australia	9868 (82%)	2114 (18%)	10007 (80%)	2458 (20%)	10087 (80%)	2480 (20%)
New Zealand	1316 (59%)	901 (41%)	1250 (56%)	1000 (44%)	1243 (52%)	1143 (48%)

[^]Includes Hybrid Dialysis

Figure 4.17 shows the proportion of haemodialysis patients at each hospital dialysing with an AVF/AVG on 31st December 2023, arranged from lowest to highest. In Australia, these proportions varied widely from 62-100%. The corresponding range in New Zealand was 36-74%.

Figure 4.17.1
% Prevalent HD[^] Patients Dialysing with AVF/AVG - Australia 31 December 2023

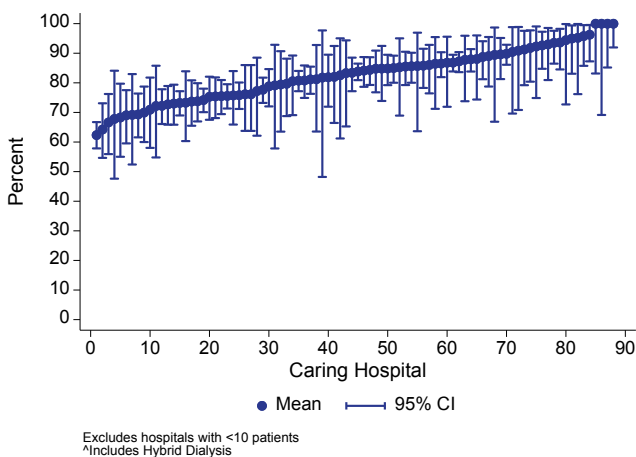
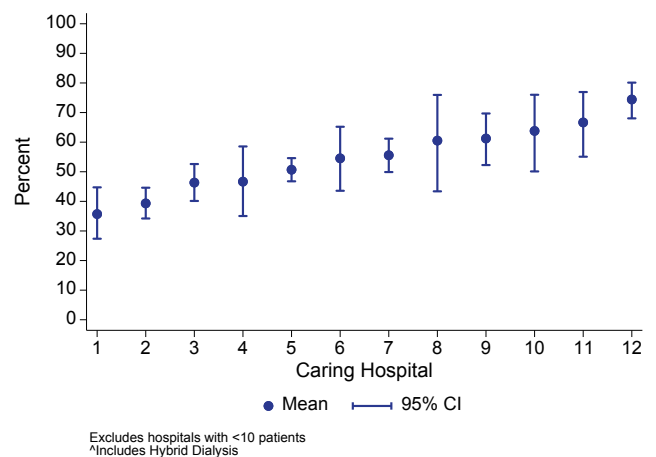


Figure 4.17.2
% Prevalent HD[^] Patients Dialysing with AVF/AVG - New Zealand 31 December 2023



DIALYSIS PRESCRIPTION

HOURS, SESSIONS AND BLOOD FLOW

Table 4.8
Blood Flow Rate by Type of Access at the session closest to 31 December 2023

Blood Flow Rate	Australia				New Zealand			
	AVF	AVG	CVC	Total	AVF	AVG	CVC	Total
<200	15 (0.2%)	0 (0.0%)	24 (1.0%)	39 (0.3%)	1 (0.1%)	0 (0.0%)	3 (0.3%)	4 (0.2%)
200-249	107 (1.1%)	5 (1.2%)	78 (3.1%)	190 (1.5%)	22 (1.8%)	3 (7.1%)	15 (1.3%)	40 (1.6%)
250-299	1319 (13.6%)	68 (16.7%)	856 (34.5%)	2252 (17.4%)	173 (14.4%)	6 (14.3%)	319 (27.9%)	498 (20.3%)
300-349	6649 (68.7%)	287 (70.5%)	1414 (57.0%)	8380 (64.6%)	745 (62.0%)	30 (71.4%)	747 (65.4%)	1523 (62.0%)
350-399	1322 (13.7%)	46 (11.3%)	100 (4.0%)	1468 (11.3%)	241 (20.1%)	3 (7.1%)	58 (5.1%)	302 (12.3%)
400+	258 (2.7%)	1 (0.2%)	3 (0.1%)	263 (2.0%)	19 (1.6%)	0 (0.0%)	1 (0.1%)	20 (0.8%)
Total	9680	407	2480	12970	1201	42	1143	2457

CVV-HD Patients excluded from Total.

Includes Hybrid Dialysis Patients.

Blood Flow Rate or Type of Access Not Reported for 418 Australian and 71 New Zealand patients.

Figure 4.18.1
Distribution of Blood Flow Rates - Prevalent Haemodialysis[^] - Australia

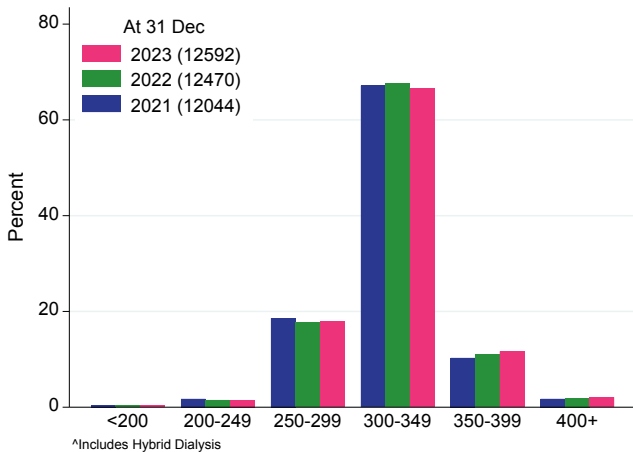


Figure 4.18.2
Distribution of Blood Flow Rates - Prevalent Haemodialysis[^] - New Zealand

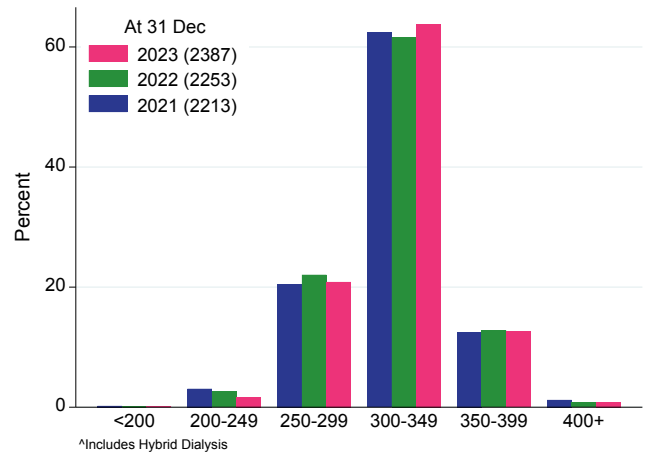


Table 4.9 shows the number of weekly sessions, and hours per session, at 31 December 2023. Figures 4.19 and 4.20 show HD frequency and session length respectively over 2021-2023. Figure 4.21 combines sessions and session length to show the total number of weekly hours of HD over 2021-2023.

Table 4.9
Duration and Number of Sessions per Week - December 2023

Country	Sessions per week	Hours of Each Treatment					Total
		<4	4	4.5	5	>5	
Australia	<3	123 (15.3%)	461 (57.4%)	125 (15.6%)	88 (11.0%)	6 (0.7%)	803
	3	500 (4.4%)	5136 (45.5%)	2605 (23.1%)	2727 (24.1%)	329 (2.9%)	11297
	3.1-4.9	31 (7.0%)	124 (27.9%)	46 (10.4%)	109 (24.5%)	134 (30.2%)	444
	5+	21 (35.6%)	6 (10.2%)	3 (5.1%)	5 (8.5%)	24 (40.7%)	59
	Total	675 (5.4%)	5727 (45.4%)	2779 (22.1%)	2929 (23.2%)	493 (3.9%)	12603
New Zealand	<3	4 (7.7%)	22 (42.3%)	5 (9.6%)	21 (40.4%)	0 (0.0%)	52
	3	36 (1.7%)	827 (38.9%)	514 (24.2%)	618 (29.1%)	131 (6.2%)	2126
	3.1-4.9	6 (3.0%)	53 (26.8%)	37 (18.7%)	54 (27.3%)	48 (24.2%)	198
	5+	2 (16.7%)	4 (33.3%)	0 (0.0%)	4 (33.3%)	2 (16.7%)	12
	Total	48 (2.0%)	906 (37.9%)	556 (23.3%)	697 (29.2%)	181 (7.6%)	2388

Intermediate durations are rounded up, e.g. 4.25 is included in 4.5.
Includes Hybrid Dialysis patients.
Hours or number of sessions were not reported for 367 Australian and 69 New Zealand patients.

Figure 4.19.1
Haemodialysis Frequency Per Week - Prevalent Haemodialysis[^] - Australia

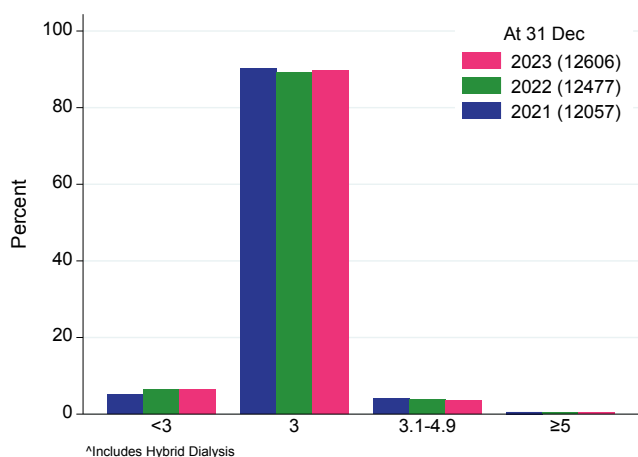


Figure 4.19.2
Haemodialysis Frequency Per Week - Prevalent Haemodialysis[^] - New Zealand

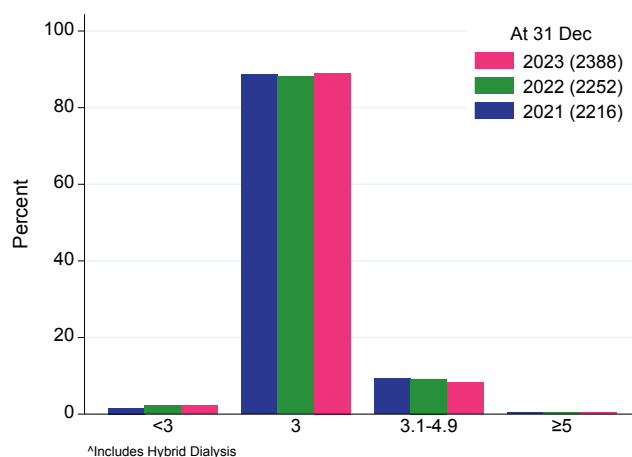


Figure 4.20.1
Haemodialysis Session Length (Hours) - Prevalent Haemodialysis[^] - Australia

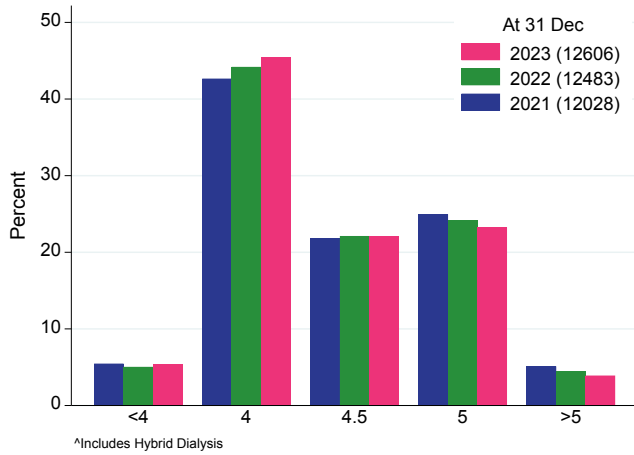


Figure 4.20.2
Haemodialysis Session Length (Hours) - Prevalent Haemodialysis[^] - New Zealand

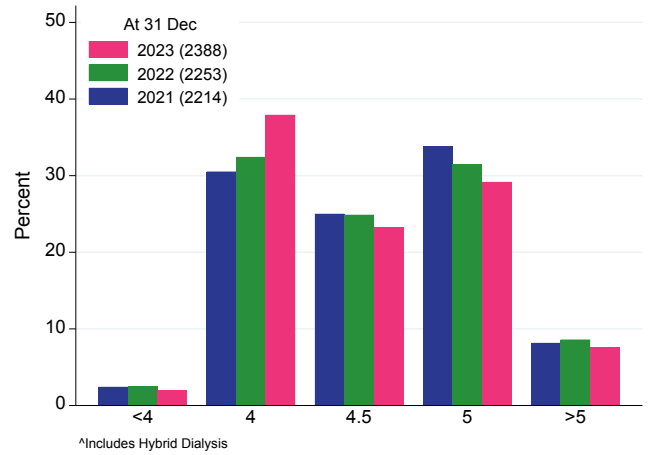


Figure 4.21.1
Haemodialysis Duration (Hours Per Week) - Prevalent Haemodialysis[^] - Australia

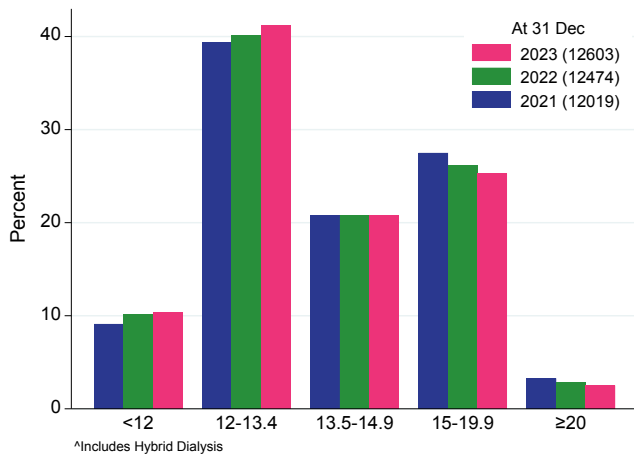
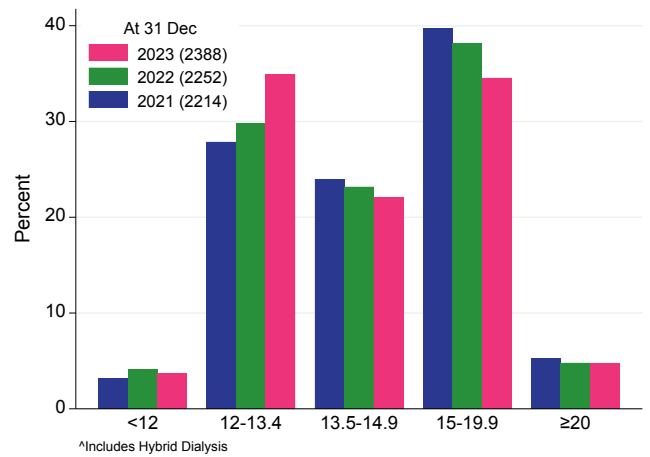
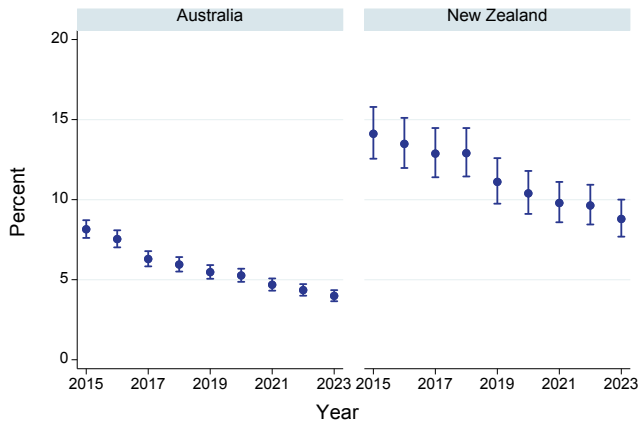


Figure 4.21.2
Haemodialysis Duration (Hours Per Week) - Prevalent Haemodialysis[^] - New Zealand



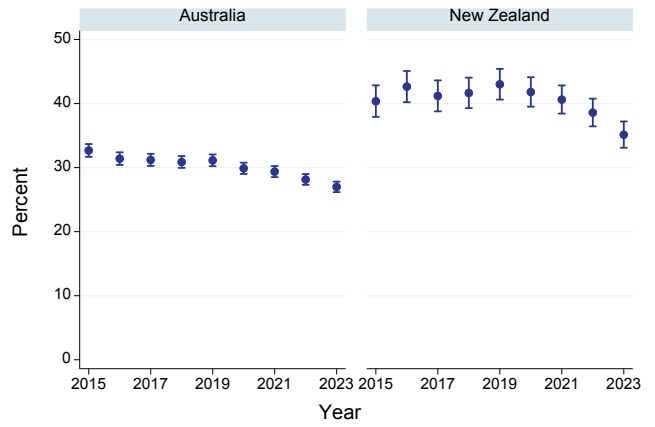
Figures 4.22-4.24 show trends in dialysis prescription. Tables 4.10-4.12 present these same data for 2020-2023 by state and country.

Figure 4.22
Percentage of HD[^] Patients Dialysing More than 3 Days Per Week



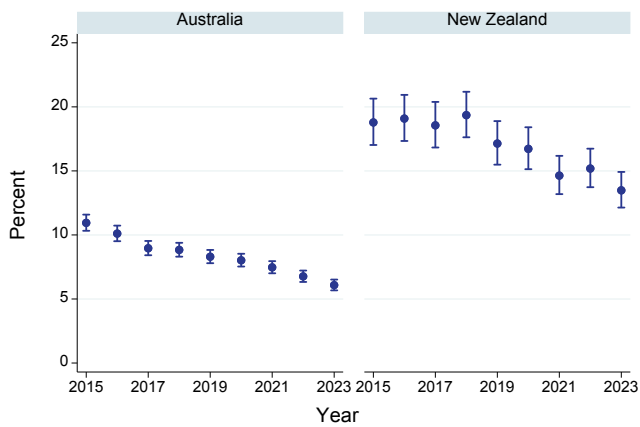
[^]Includes Hybrid Dialysis

Figure 4.23
Percentage of HD[^] Patients Dialysing 3 Days Per Week Dialysing 5 Hours or Longer Per Session



[^]Includes Hybrid Dialysis

Figure 4.24
Percentage of HD[^] Patients Dialysing >15 Hours Per Week



[^]Includes Hybrid Dialysis

Table 4.10

Haemodialysis[^] >3 Sessions per Week by Australian State/Territory and Country 2020-2023

State	2020	2021	2022	2023
QLD	113 (4.8%)	111 (4.5%)	116 (4.4%)	112 (4.3%)
NSW/ACT	179 (5.0%)	164 (4.4%)	164 (4.3%)	108 (2.9%)
VIC	190 (6.8%)	172 (6.0%)	153 (5.4%)	159 (5.3%)
TAS	16 (9.2%)	12 (6.6%)	7 (3.7%)	8 (4.3%)
SA	24 (2.9%)	25 (2.9%)	28 (3.2%)	31 (3.4%)
NT	5 (0.7%)	5 (0.7%)	8 (1.1%)	10 (1.3%)
WA	87 (6.9%)	76 (6.0%)	67 (4.9%)	75 (5.4%)
Australia	614 (5.3%)	565 (4.7%)	543 (4.4%)	503 (4.0%)
New Zealand	214 (10.4%)	217 (9.8%)	217 (9.6%)	210 (8.8%)

[^]Includes Hybrid Dialysis

Table 4.11

Haemodialysis[^] >5 Hours per Session - Three Sessions per Week by Australian State/Territory and Country 2020-2023

State	2020	2021	2022	2023
QLD	569 (27.7%)	508 (23.7%)	500 (22.3%)	476 (21.4%)
NSW/ACT	1495 (46.6%)	1519 (46.0%)	1478 (43.8%)	1377 (41.1%)
VIC	709 (28.1%)	761 (29.3%)	747 (28.6%)	765 (28.1%)
TAS	22 (14.2%)	20 (12.0%)	26 (14.8%)	30 (17.1%)
SA	70 (8.8%)	77 (9.5%)	85 (10.1%)	75 (8.9%)
NT	212 (31.1%)	226 (32.0%)	215 (29.2%)	233 (31.7%)
WA	74 (6.5%)	74 (6.6%)	82 (7.1%)	93 (7.4%)
Australia	3151 (29.9%)	3185 (29.4%)	3133 (28.1%)	3049 (27.0%)
New Zealand	755 (41.8%)	797 (40.6%)	766 (38.6%)	747 (35.1%)

[^]Includes Hybrid Dialysis

Table 4.12

Haemodialysis[^] >15 Hours per Week by Australian State/Territory and Country 2020-2023

State	2020	2021	2022	2023
QLD	156 (6.6%)	148 (6.0%)	139 (5.3%)	131 (5.0%)
NSW/ACT	412 (11.5%)	391 (10.6%)	371 (9.7%)	294 (7.8%)
VIC	230 (8.3%)	234 (8.2%)	206 (7.2%)	206 (6.9%)
TAS	18 (10.3%)	13 (7.2%)	11 (5.9%)	12 (6.4%)
SA	33 (4.0%)	31 (3.6%)	34 (3.9%)	35 (3.9%)
NT	15 (2.2%)	13 (1.8%)	18 (2.4%)	16 (2.1%)
WA	71 (5.6%)	68 (5.4%)	65 (4.8%)	73 (5.2%)
Australia	935 (8.0%)	898 (7.5%)	844 (6.8%)	767 (6.1%)
New Zealand	344 (16.7%)	324 (14.6%)	342 (15.2%)	322 (13.5%)

[^]Includes Hybrid Dialysis

HAEMODIALYSIS AND HAEMODIALFILTRATION

Figure 4.25 shows the change in percentage of haemodialysis patients treated with haemodiafiltration over time for Australia and New Zealand. Hybrid Dialysis patients are excluded as this information is not collected. Table 4.13 shows the use of high-flux dialysis and haemodiafiltration by state/territory and country in 2023.

Figure 4.25
Use of Haemodiafiltration - Prevalent Haemodialysis[^] Patients 2014-2023

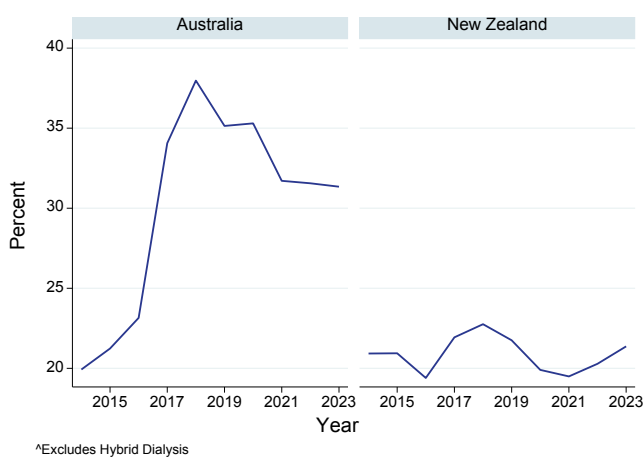


Table 4.13
Number of Patients Receiving Standard Haemodialysis (and Membrane Type), Haemofiltration and Haemodiafiltration - December 2023

HD Modality	QLD	NSW/ ACT	VIC	TAS	SA	NT	WA	Australia	New Zealand
Haemodialysis	1505 (57.2%)	2588 (68.6%)	2526 (84.9%)	187 (99.5%)	663 (73.7%)	705 (93.4%)	493 (35.1%)	8667 (68.7%)	1880 (78.6%)
High Flux	1250	2125	2245	152	657	323	345	7097	1512
Non-High Flux*	245	457	269	33	3	381	146	1534	363
Unreported	10	6	12	2	3	1	2	36	5
Haemofiltration	2 (0.1%)	10 (0.3%)	1 (0.0%)	0 (0.0%)	1 (0.1%)	1 (0.1%)	1 (0.1%)	16 (0.1%)	2 (0.1%)
Haemodiafiltration	1122 (42.7%)	1175 (31.1%)	447 (15.0%)	1 (0.5%)	235 (26.1%)	49 (6.5%)	912 (64.9%)	3941 (31.2%)	509 (21.3%)
Total	2629	3773	2974	188	899	755	1406	12624	2391

*Non-High Flux includes low flux and mid-cut-off or other membranes.
Excludes Hybrid Dialysis.

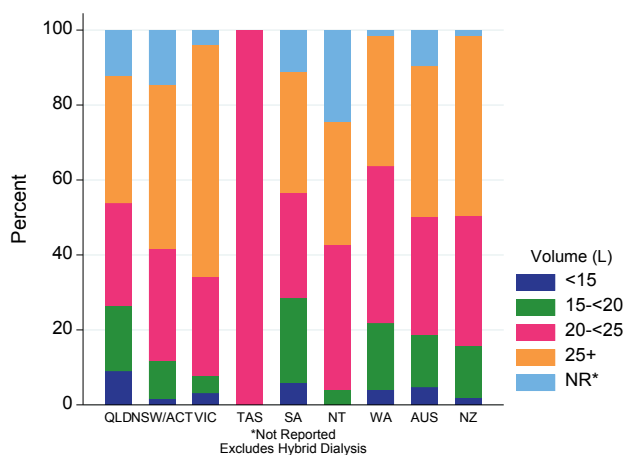
The mode of delivery of substitution fluid for haemodiafiltration is shown in Table 4.14. In Australia and New Zealand, the predominant mode of delivery of substitution fluid for haemodiafiltration was post-dilution.

Table 4.14
Mode of delivery of substitution fluid in patients using haemodiafiltration - December 2023

Country	Haemodiafiltration Type	2019	2020	2021	2022	2023
Australia	Predilution	265 (7%)	298 (7%)	306 (8%)	311 (8%)	346 (9%)
	Mixed Dilution	67 (2%)	60 (1%)	49 (1%)	35 (1%)	29 (1%)
	Postdilution	3585 (92%)	3745 (91%)	3463 (91%)	3586 (91%)	3566 (90%)
	Total	3917	4103	3818	3932	3941
New Zealand	Predilution	89 (21%)	98 (24%)	92 (21%)	125 (27%)	89 (17%)
	Mixed Dilution	0 (0%)	0 (0%)	2 (0%)	0 (0%)	6 (1%)
	Postdilution	336 (79%)	311 (76%)	334 (78%)	330 (73%)	414 (81%)
	Total	425	409	428	455	509

Excludes Hybrid Dialysis

Figure 4.26
HDF Substitution Volume by State/Territory and Country - at 31 Dec 2023



PLACE OF DIALYSIS AND SELF-CARE

Community house haemodialysis has been collected as a 'sub-modality' of haemodialysis since 2020. Community house haemodialysis enables patients/carers to undertake haemodialysis, independent of nursing or medical supervision, in a shared house or community facility. Hybrid dialysis has been collected as a modality of dialysis since 2023. Hybrid dialysis is defined as combined concurrent peritoneal dialysis and haemodialysis therapy. As this is a newly collected variable, there may have been under-reporting in the number of hybrid therapy patients.

Table 4.15
Prevalent Haemodialysis Patients by Location 2019-2023

Country	Modality	2019	2020	2021	2022	2023
Australia	Hospital	2987 (26%)	2992 (25%)	3161 (25%)	3341 (26%)	3389 (26%)
	Hospital Hybrid	-	-	-	-	5 (<1%)
	Satellite	7553 (65%)	7922 (66%)	8223 (66%)	8333 (65%)	8488 (65%)
	Satellite Hybrid	-	-	-	-	16 (<1%)
	Home	1072 (9%)	1106 (9%)	1112 (9%)	1115 (9%)	1065 (8%)
	Community House	-	25 (<1%)	20 (<1%)	10 (<1%)	7 (<1%)
	Total		11612	12045	12516	12799
New Zealand	Hospital	1120 (55%)	1212 (57%)	1330 (58%)	1380 (59%)	1424 (58%)
	Hospital Hybrid	-	-	-	-	5 (<1%)
	Satellite	492 (24%)	524 (25%)	574 (25%)	577 (25%)	639 (26%)
	Satellite Hybrid	-	-	-	-	0 (0%)
	Home	407 (20%)	354 (17%)	366 (16%)	356 (15%)	350 (14%)
	Community House	-	32 (2%)	28 (1%)	32 (1%)	39 (2%)
Total		2019	2122	2298	2345	2457

Community House was only collected from 2020 onwards as a modality of treatment.

Hybrid Dialysis was only collected from 2023 onwards as a modality of treatment.

Self-care is defined as dialysis performed by the patient with minimal assistance from a health care professional. Self-care enables patients to perform dialysis procedures independent of nursing or medical assistance in any type of facility or community setting. It does not refer to Activities of Daily Living.

Table 4.16
Haemodialysis Patients by Self-care 2023

Country	Modality	Self Care	Not Self Care	Not Reported	Total
Australia	Hospital	255 (8%)	3003 (89%)	131 (4%)	3389
	Satellite	883 (10%)	7471 (88%)	134 (2%)	8488
	Home	834 (78%)	167 (16%)	64 (6%)	1065
	Community House	2 (29%)	5 (71%)	0 (0%)	7
	Hybrid	20 (95%)	1 (5%)	0 (0%)	21
	Total		1994 (15%)	10647 (82%)	329 (3%)
New Zealand	Hospital	67 (5%)	1341 (94%)	16 (1%)	1424
	Satellite	166 (26%)	440 (69%)	33 (5%)	639
	Home	288 (82%)	51 (15%)	11 (3%)	350
	Community House	36 (92%)	2 (5%)	1 (3%)	39
	Hybrid	5 (100%)	0 (0%)	0 (0%)	5
	Total		562 (23%)	1834 (75%)	61 (2%)

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HOME HAEMODIALYSIS

PREVALENCE

The distribution of prevalent home haemodialysis patients (including community house haemodialysis patients) by state is shown in Table 4.17. The 2023 data are further stratified by age in Figure 4.27.

Table 4.17
Number (%) of Prevalent Haemodialysis[^] Patients Treated with Home Haemodialysis* 2019 - 2023

State	2019	2020	2021	2022	2023
QLD	254 (10.9%)	239 (9.7%)	241 (9.3%)	242 (9.0%)	225 (8.3%)
NSW/ACT	448 (12.6%)	468 (12.8%)	468 (12.4%)	480 (12.4%)	442 (11.4%)
VIC	189 (6.9%)	227 (7.9%)	239 (8.1%)	230 (7.8%)	225 (7.4%)
TAS	11 (5.6%)	8 (4.5%)	9 (4.8%)	8 (4.3%)	6 (3.2%)
SA	37 (4.6%)	29 (3.5%)	32 (3.7%)	34 (3.8%)	33 (3.6%)
NT	38 (5.2%)	56 (7.7%)	41 (5.5%)	28 (3.7%)	37 (4.9%)
WA	95 (7.4%)	104 (7.9%)	102 (7.2%)	103 (7.2%)	104 (7.0%)
Australia	1072 (9.2%)	1131 (9.4%)	1132 (9.0%)	1125 (8.8%)	1072 (8.3%)
New Zealand	407 (20.2%)	386 (18.2%)	394 (17.1%)	388 (16.5%)	389 (15.8%)

[^]Includes Hybrid Dialysis

*Includes Community House HD

Figure 4.27
Age Distribution of Home HD* Patients by State/ Territory and Country - at 31 Dec 2023

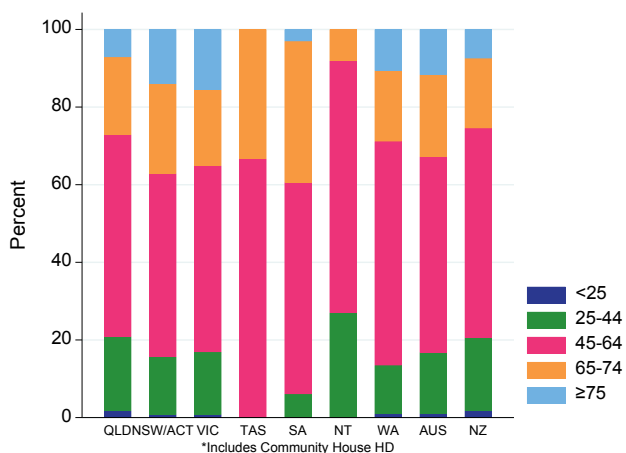


Figure 4.28.1
Home HD* Percent of all HD^ by Age at 31 Dec 2023 - Australia

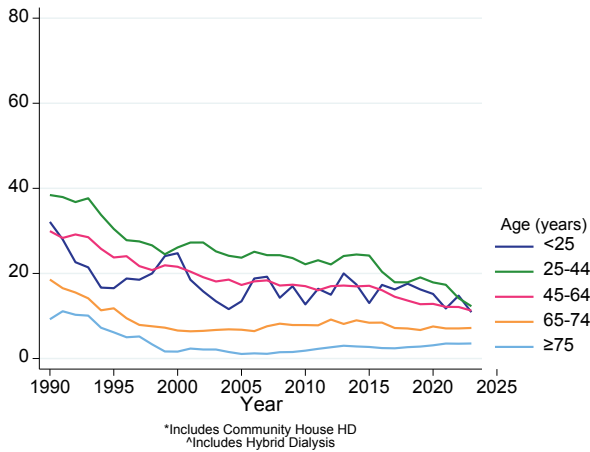
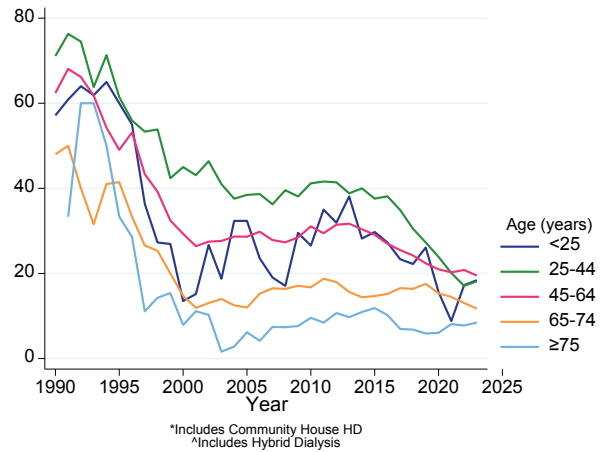


Figure 4.28.2
Home HD* Percent of all HD^ by Age at 31 Dec 2023 - New Zealand



There is substantial variation between hospitals, and between countries, in the proportion of haemodialysis patients who dialyse at home (Figure 4.29).

Figure 4.29.1
% Haemodialysis^ Patients on Home HD* - Australia 31 December 2023

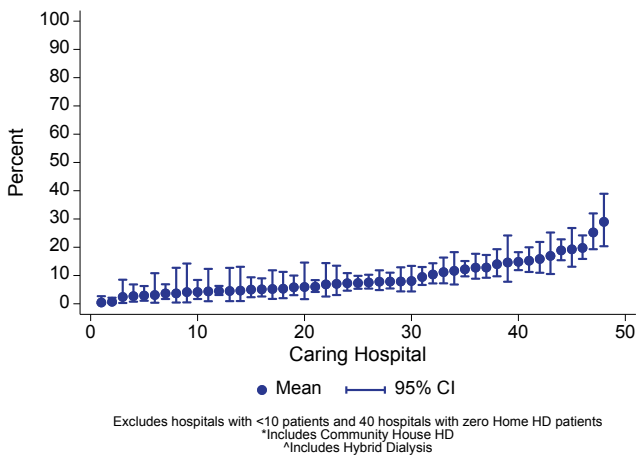
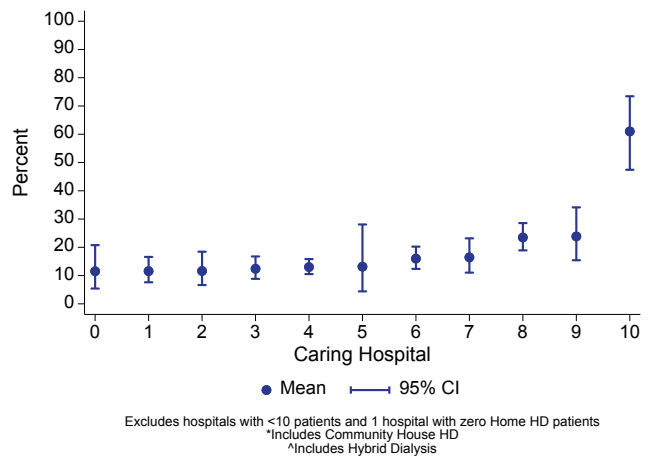


Figure 4.29.2
% Haemodialysis^ Patients on Home HD* - New Zealand 31 December 2023



HOME HAEMODIALYSIS SURVIVAL AND TREATMENT FAILURE

Home haemodialysis treatment failure refers to cessation of home haemodialysis (including community house haemodialysis) to have haemodialysis in satellite or hospital for more than 30 days, to do peritoneal dialysis for more than 30 days, or due to death of the patient. Receipt of a kidney transplant is not a 'treatment failure' and so follow-up is censored at transplantation, or 31 Dec 2023. Only patients initiating home haemodialysis within the first 365 days of KRT 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 4.32).

Figure 4.30
Treatment Failure - Home Haemodialysis* 2013 - 2023

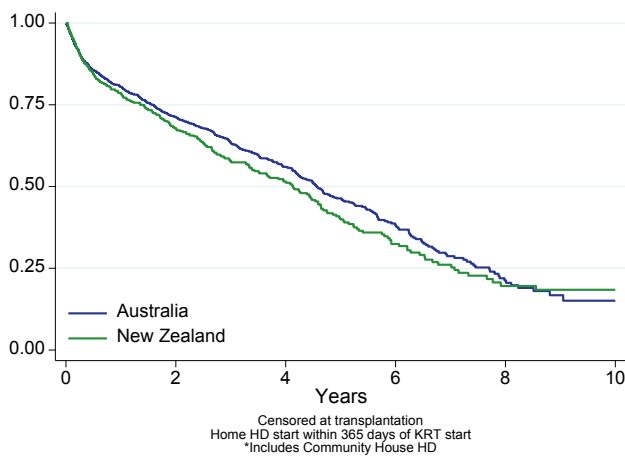


Figure 4.31
Treatment Failure by Age Group - Home Haemodialysis* 2013 - 2023

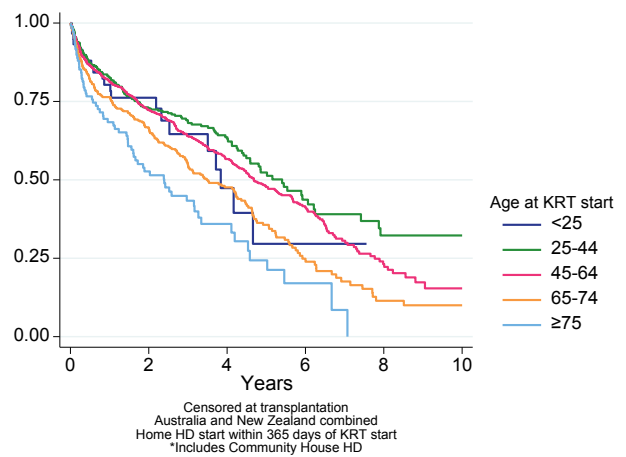
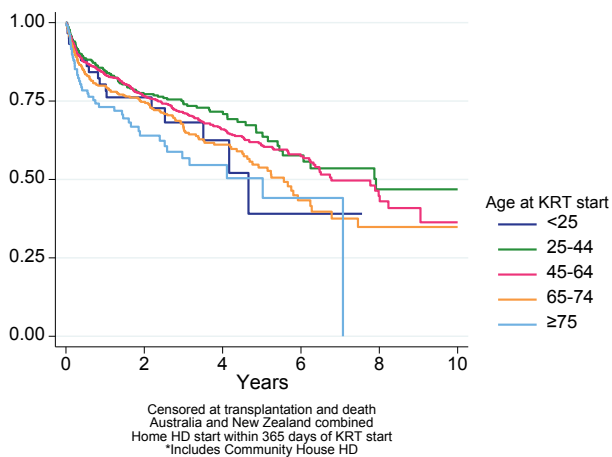


Figure 4.32
Death-Censored Treatment Failure by Age Group - Home Haemodialysis 2013 - 2023

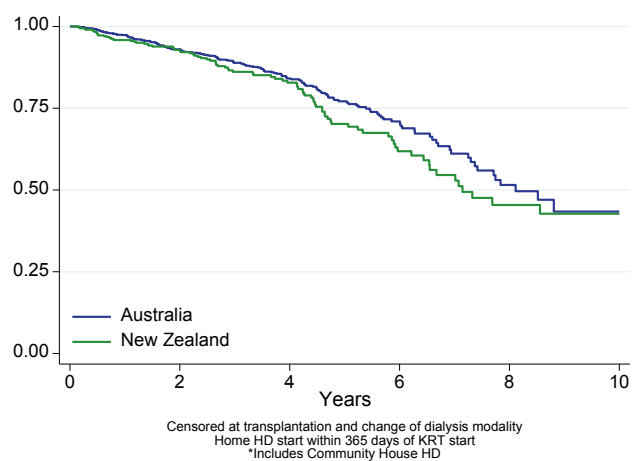


The modality or status following home haemodialysis treatment failure or censoring for 2013 - 2023 are shown in Table 4.18.

Table 4.18
Reason for Home Haemodialysis Treatment Failure 2013-2023

Modality or Status Following Treatment Failure	Australia	New Zealand
Other HD ≥ 30 days	461 (26%)	176 (31%)
PD ≥ 30 days	47 (3%)	9 (2%)
Transplant	545 (30%)	103 (18%)
Lost to Follow Up	2 (0%)	0 (0%)
Renal Recovery	14 (1%)	4 (1%)
End of follow-up	532 (30%)	186 (33%)
Death	158 (9%)	78 (14%)
Withdrawal from dialysis	33 (2%)	12 (2%)
Total	1792	568

Figure 4.33
Patient Survival - Home Haemodialysis* 2013 - 2023



HOME HAEMODIALYSIS PRESCRIPTION

The following figures explore trends in home haemodialysis prescriptions.

Figure 4.34.1
Home Haemodialysis* Frequency Per Week - Prevalent Home HD* - Australia

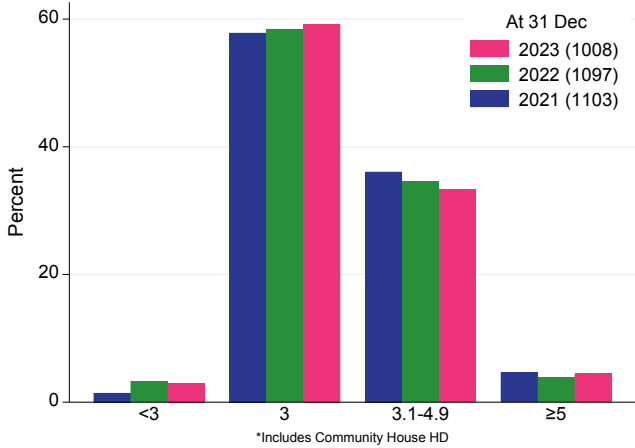


Figure 4.34.2
Home Haemodialysis* Frequency Per Week - Prevalent Home HD* - New Zealand

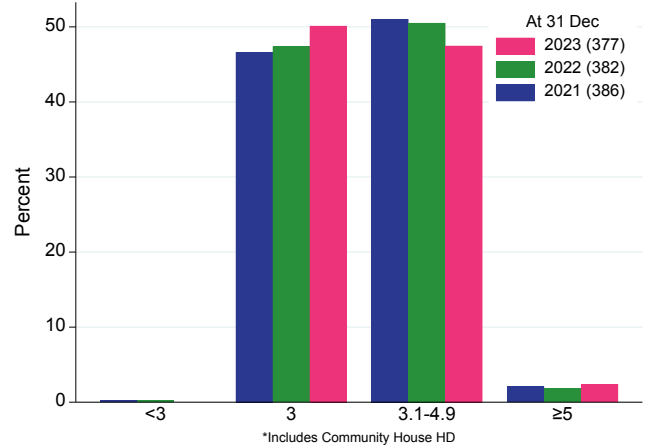


Figure 4.35.1
Home Haemodialysis* Session Length (Hours) - Prevalent Home HD* - Australia

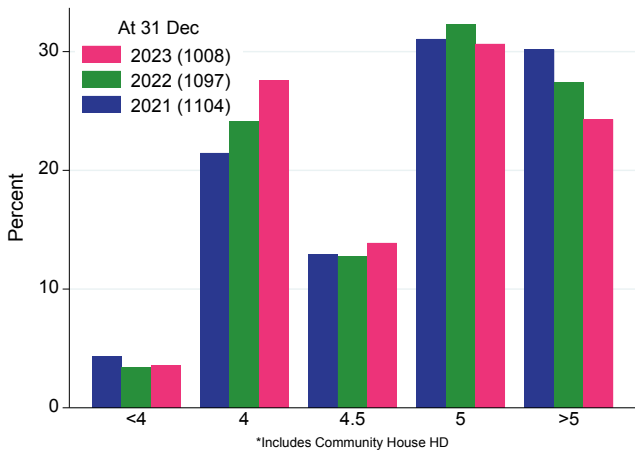


Figure 4.35.2
Home Haemodialysis* Session Length (Hours) - Prevalent Home HD* - New Zealand

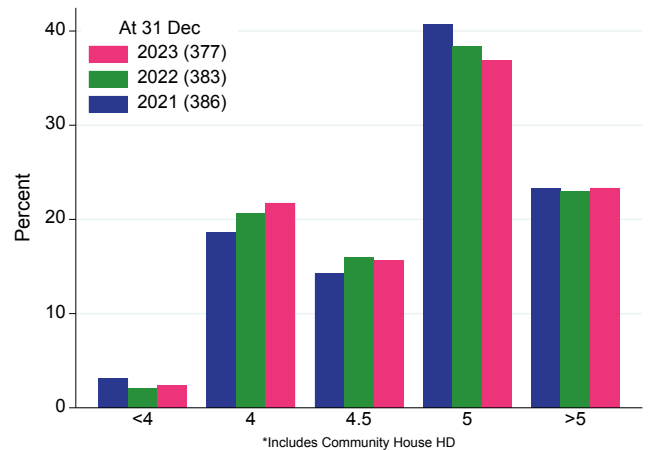


Figure 4.36.1
Home Haemodialysis* Duration (Hours Per Week) - Prevalent Home HD* - Australia

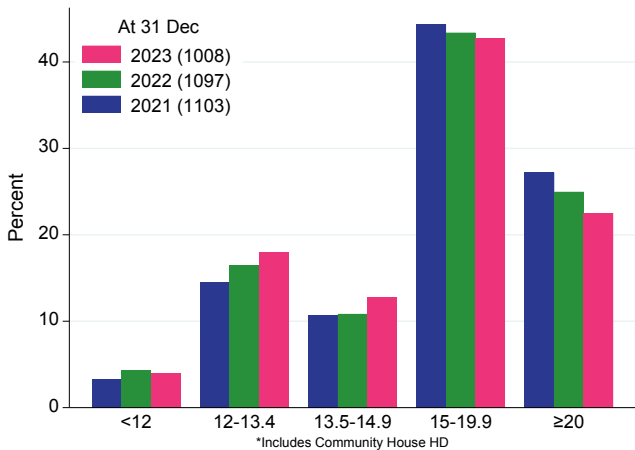
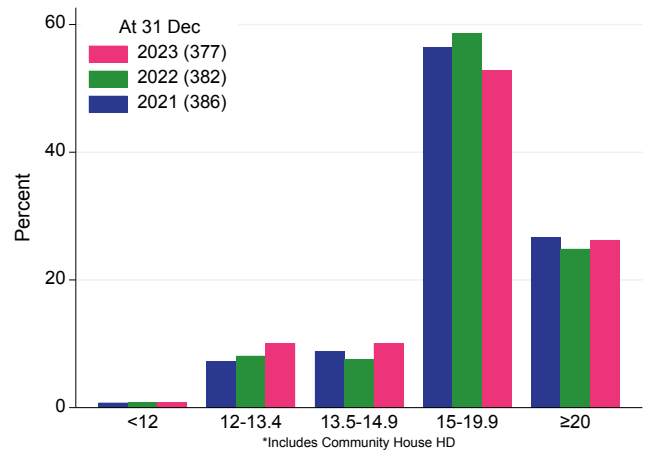


Figure 4.36.2
Home Haemodialysis* Duration (Hours Per Week) - Prevalent Home HD* - New Zealand



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Figure 4.37
Percentage of Home HD* Patients Dialysing More than 3 Days Per Week

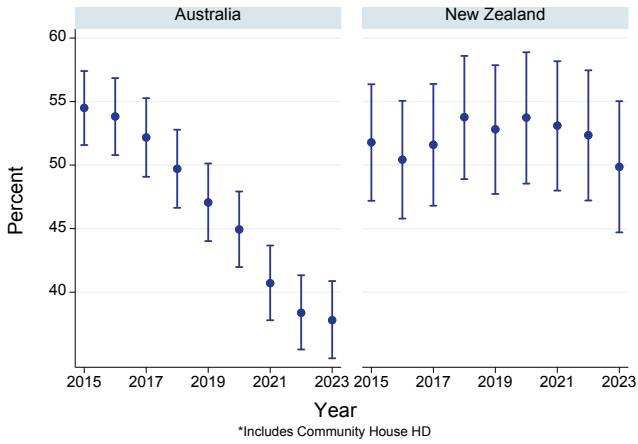


Figure 4.38
Percentage of Home HD* Patients Dialysing 3 Days Per Week Dialysing 5 Hours or Longer Per Session

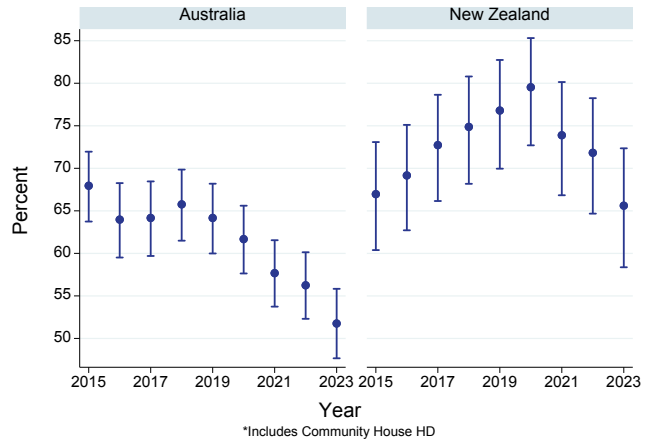
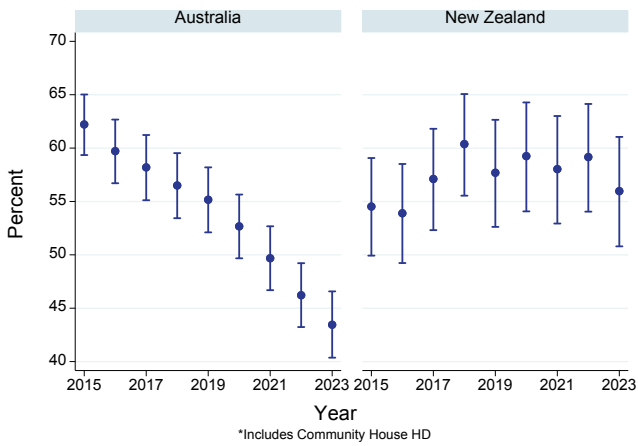


Figure 4.39
Percentage of Home HD* Patients Dialysing >15 Hours Per Week



LABORATORY BASED DATA AT THE TIME OF THE ANNUAL SURVEY

ANAEMIA MANAGEMENT

The median haemoglobin at 31 Dec 2023 of haemodialysis patients at each centre ranged from 103 to 124g/L in Australia and 102 to 116g/L in New Zealand (Figure 4.40). 81% of patients in Australia, and 82% in New Zealand were prescribed an erythropoiesis-stimulating agent (ESA) at the time of the annual survey.

Figure 4.40.1
Haemoglobin in Haemodialysis^a Patients - Australia 31 December 2023

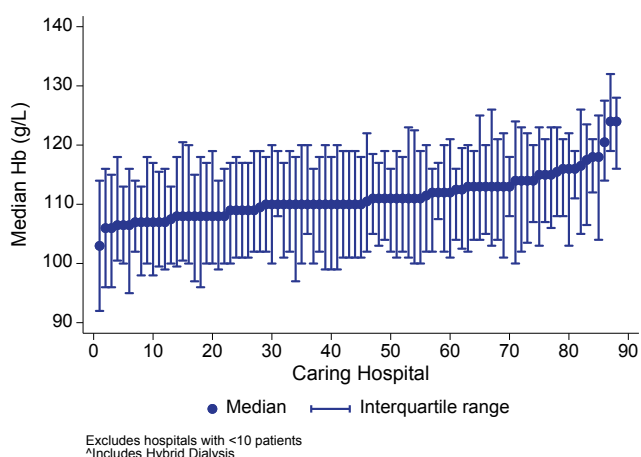
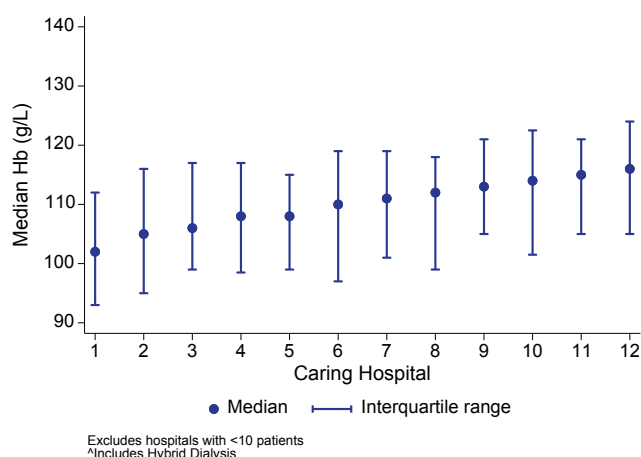


Figure 4.40.2
Haemoglobin in Haemodialysis^a Patients - New Zealand 31 December 2023



The proportion of patients on haemodialysis prescribed an ESA whose haemoglobin was between 100-115g/L ranged from 16-69% in Australia and 34-52% in New Zealand (Figure 4.41).

Figure 4.41.1
% Haemodialysis^a Patients receiving an ESA with Hb 100-115 g/L - Australia 31 December 2023

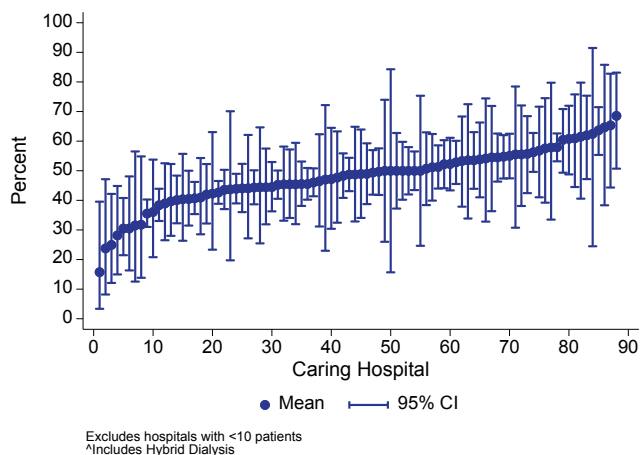
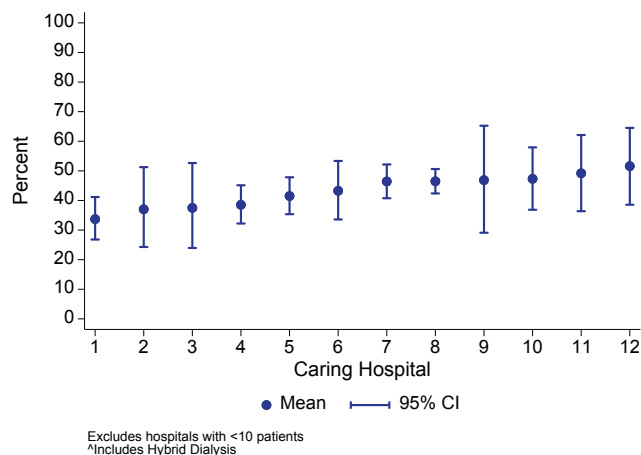


Figure 4.41.2
% Haemodialysis^a Patients receiving an ESA with Hb 100-115 g/L - New Zealand 31 December 2023



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The proportion of patients receiving an ESA considered iron replete (ferritin between 200-500µg/L) ranged from 15-73% in Australia and 22-50% in New Zealand (Figure 4.42). Figure 4.43 presents equivalent data for transferrin saturation.

Figure 4.42.1
% Haemodialysis^ Patients receiving an ESA with Ferritin 200-500 µg/L - Australia 31 December 2023

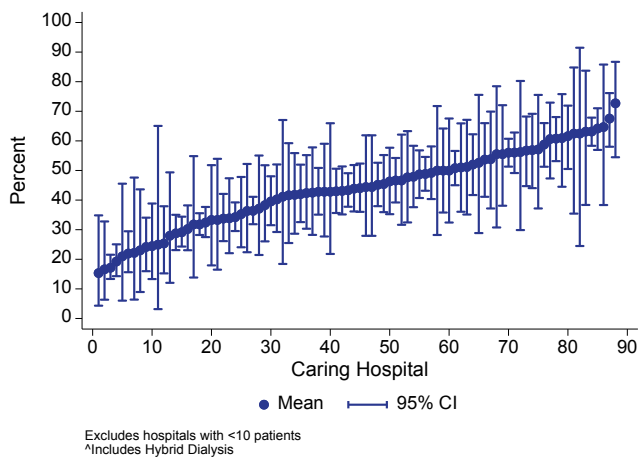


Figure 4.42.2
% Haemodialysis^ Patients receiving an ESA with Ferritin 200-500 µg/L - New Zealand 31 December 2023

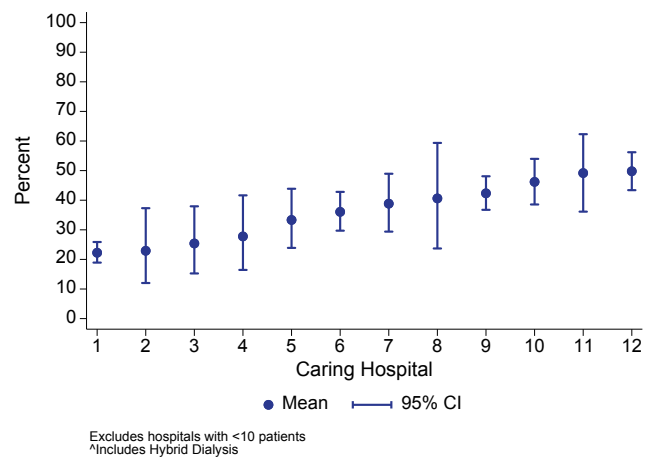


Figure 4.43.1
% Haemodialysis^ Patients receiving an ESA with TSat>20% - Australia 31 December 2023

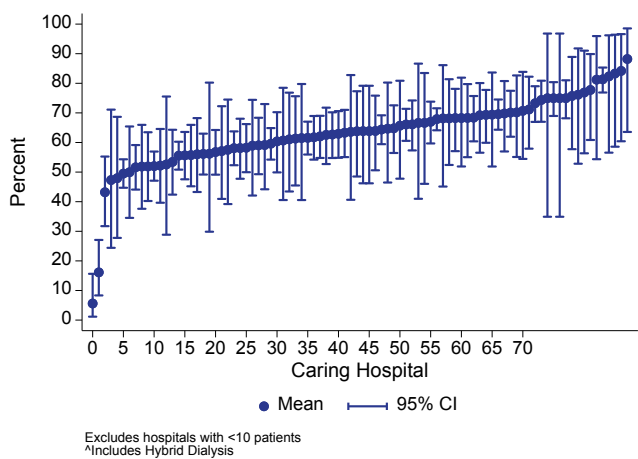
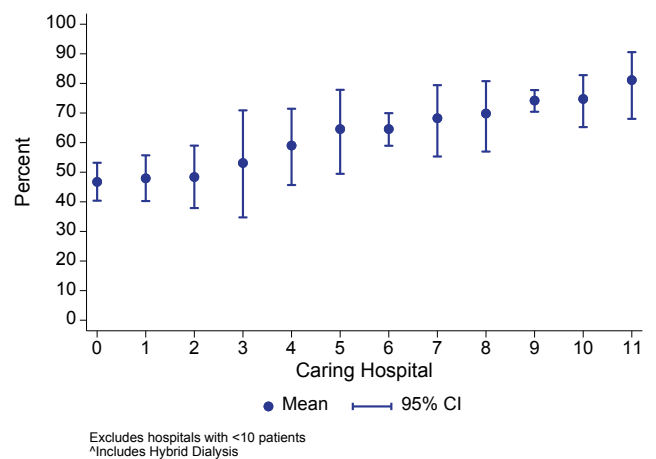


Figure 4.43.2
% Haemodialysis^ Patients receiving an ESA with TSat>20% - New Zealand 31 December 2023



CALCIUM AND PHOSPHATE

Figures 4.44 and 4.45 show the proportions of patients with serum calcium between 2.1-2.4mmol/L and phosphate between 0.8-1.6mmol/L respectively at the time of the annual survey. Note that the calcium is not corrected for albumin.

Figure 4.44.1
% Haemodialysis^ Patients with Calcium 2.1-2.4 mmol/L - Australia 31 December 2023

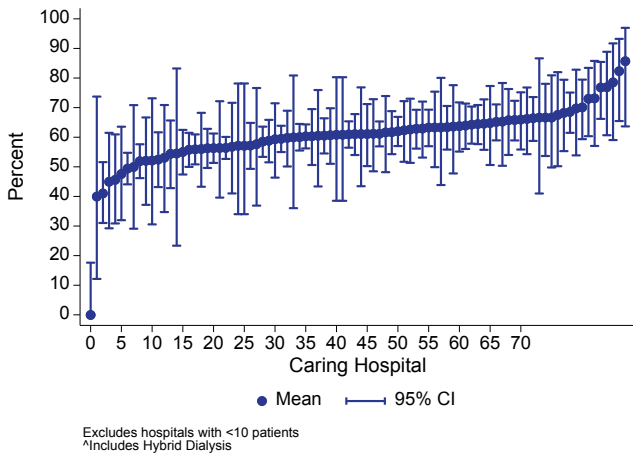


Figure 4.44.2
% Haemodialysis^ Patients with Calcium 2.1-2.4 mmol/L - New Zealand 31 December 2023

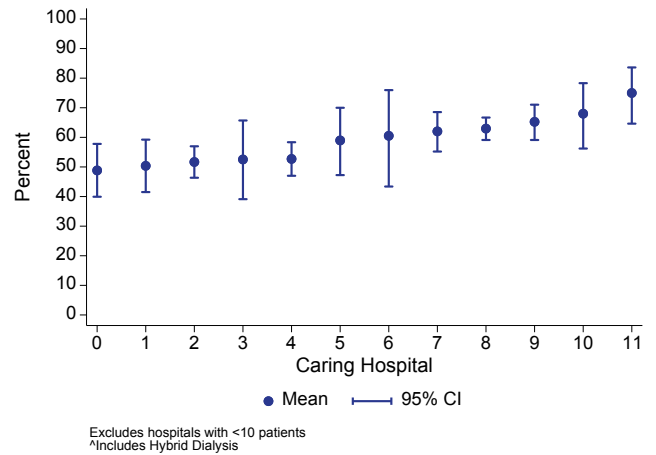


Figure 4.45.1
% Haemodialysis^ Patients with Phosphate 0.8-1.6 mmol/L - Australia 31 December 2023

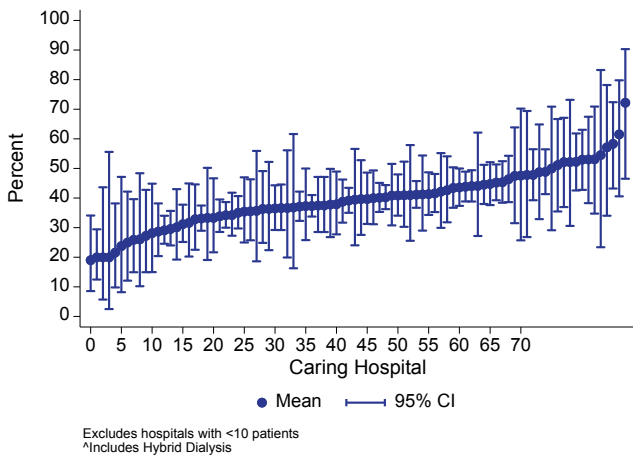
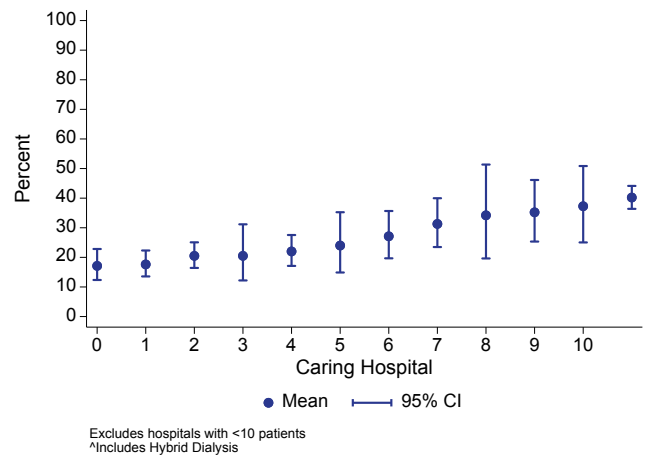


Figure 4.45.2
% Haemodialysis^ Patients with Phosphate 0.8-1.6 mmol/L - New Zealand 31 December 2023



UREA REDUCTION RATIO

Figure 4.46 shows the distribution of urea reduction ratio (URR) by country over 2021-2023. Figure 4.47 presents the 2023 data stratified by vascular access type.

Figure 4.46.1
Urea Reduction Ratio (%) - HD^ Three Sessions Per Week - Australia

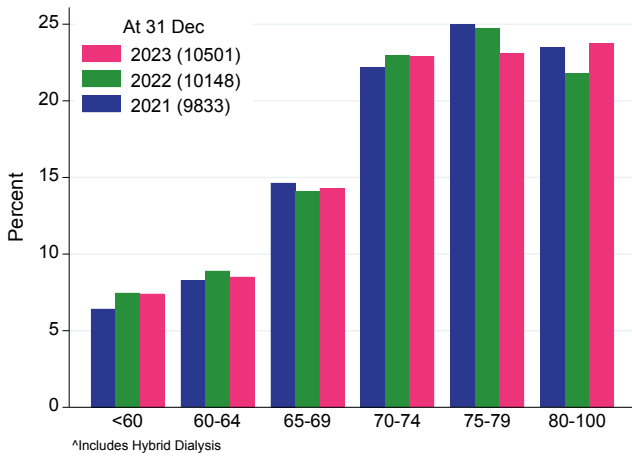


Figure 4.46.2
Urea Reduction Ratio (%) - HD^ Three Sessions Per Week - New Zealand

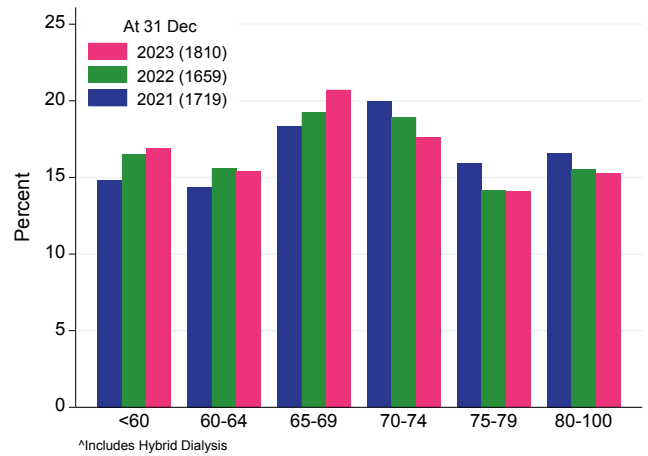


Figure 4.47.1
Urea Reduction Ratio (%) By Type of Access - HD^ Three Sessions Per Week - Australia 2023

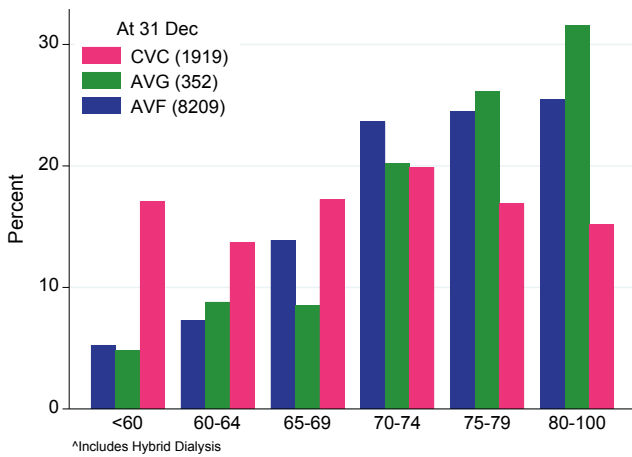


Figure 4.47.2
Urea Reduction Ratio (%) By Type of Access - HD^ Three Sessions Per Week - New Zealand 2023

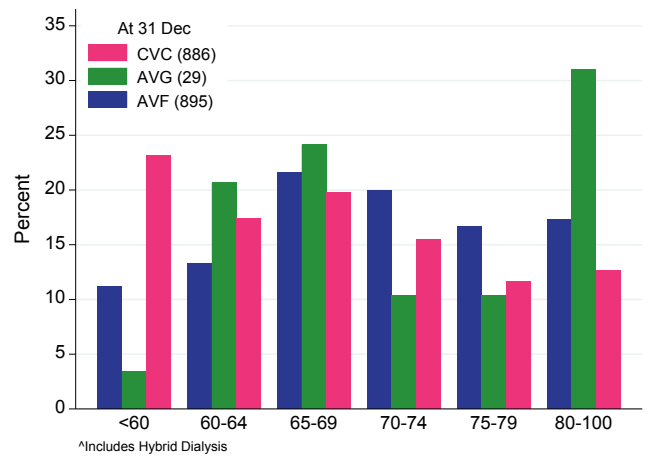


Table 4.19 presents URR by dialysis session duration. In general, as expected, the proportion of patients with a URR >70% typically increases with longer session duration.

Table 4.19
Urea Reduction Ratio - Prevalent Patients HD^ Three Sessions per Week - December 2023

Country	Hours per Session	Urea Reduction Ratio %		
		≤70	>70	Total
Australia	<4 hours	203 (43.8%)	260 (56.2%)	463
	4 hours	1599 (33.5%)	3169 (66.5%)	4768
	>4-5 hours	1601 (32.1%)	3383 (67.9%)	4984
	>5 hours	96 (33.6%)	190 (66.4%)	286
	Total	3499 (33.3%)	7002 (66.7%)	10501
New Zealand	<4 hours	19 (63.3%)	11 (36.7%)	30
	4 hours	423 (58.3%)	303 (41.7%)	726
	>4-5 hours	506 (53.5%)	439 (46.5%)	945
	>5 hours	51 (46.8%)	58 (53.2%)	109
	Total	999 (55.2%)	811 (44.8%)	1810

^Includes Hybrid Dialysis

Figure 4.48 shows the distribution of median URR by treating hospital for patients dialysing three times per week. In Australia the median ranged from 63-87%, and in New Zealand it ranged from 65-75%.

Figure 4.48.1
Median URR in Haemodialysis^ Patients - Three Sessions Per Week Australia 31 December 2023

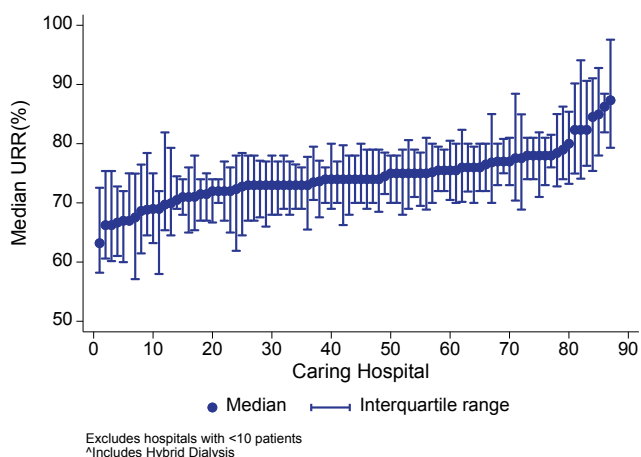
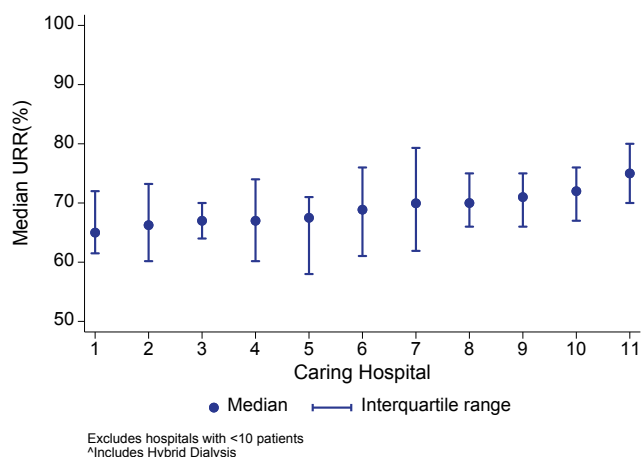


Figure 4.48.2
Median URR in Haemodialysis^ Patients - Three Sessions Per Week New Zealand 31 December 2023



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Figure 4.49 shows the proportion of patients with a URR >70%. In Australia this proportion ranged from 33-100%, and in New Zealand from 18-74%.

Figure 4.49.1
% Haemodialysis^ Patients with URR>70% - Three Sessions Per Week Australia 31 December 2023

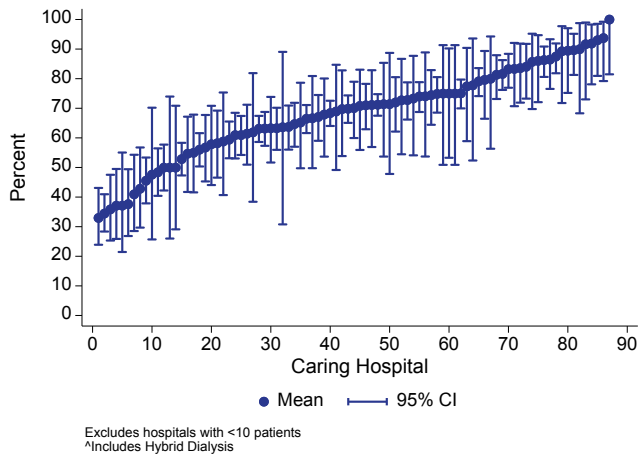
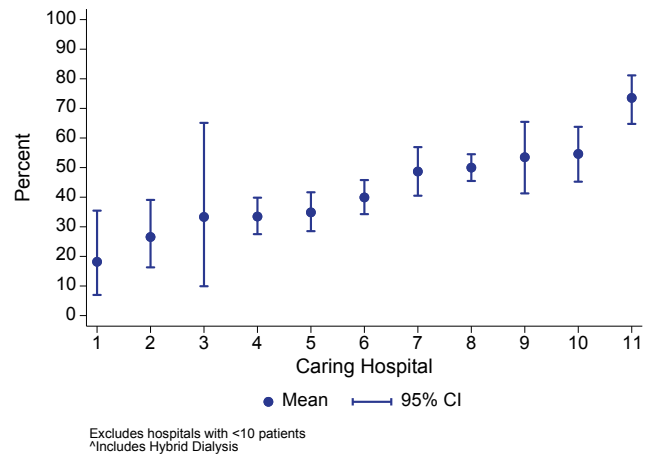
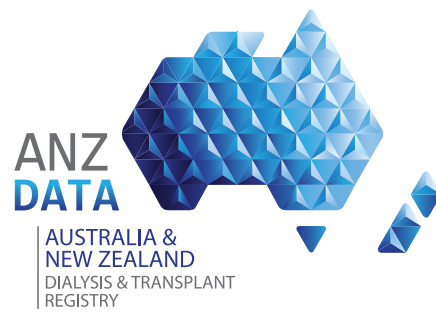


Figure 4.49.2
% Haemodialysis^ Patients with URR>70% - Three Sessions Per Week New Zealand 31 December 2023





CHAPTER 4

Haemodialysis