New Zealand

Dialysis Standards and Audit

Incorporating data from the
New Zealand Peritoneal Dialysis Registry

2006

Report for New Zealand Nephrology Services on behalf of the National Renal Advisory Board

Kelvin Lynn
Chair, Audit and Standards Subcommittee

January 2008

Establishment of a national quality assurance framework to improve the delivery of dialysis services to the New Zealand dialysis population.

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Acknowledgments

- **Associate Professor John Collins and the staff of the New Zealand Peritoneal Dialysis Registry**
- **Professor Graeme Russ, Dr Stephen McDonald of the Australian and New Zealand Dialysis Registry**
- **New Zealand Ministry of Health**
- **Clinical Directors, data collectors and staff of the Renal Units in New Zealand**
- **Peter Dini, Department of Nephrology, Christchurch Hospital**

Introduction

The National Renal Advisory (NRAB) presents its third annual audit report of the New Zealand dialysis care standards. As in the past, the 2006 report incorporates data from the New Zealand Peritoneal Dialysis (NZ PD) Registry established and maintained by Assoc Prof John Collins at Auckland Hospital.

The Standards and Audit Subcommittee of the NRAB has not made any substantial changes in the data being reported. The collection and collation of data for this report is critically dependent on the goodwill and hard work of renal units and the staff of the Australian and New Zealand Dialysis and Transplant (ANZDATA) and NZ PD Registries.

Despite the work done with the Service Specification Project Team for the DHB Funding and Performance Directorate of the Ministry of Health last year the goal of having the dialysis care standards appended to the Tier Two Renal Service Specifications in the Ministry of Health's National Service Framework library has not been achieved. Further discussions between the MOH and the NRAB continue. The standards are available for review by health professionals and the public on the New Zealand Kidney Foundation website http://www.nzkidneyfoundation.co.nz/.

The section of the report incorporating data provided directly from renal units to the Subcommittee is again incomplete but some units are making a concerted effort to address this issue.

The Department of Nephrology at Christchurch Hospital provides support for the production of this report and I am again indebted to the help of Peter Dini, Systems Manager.

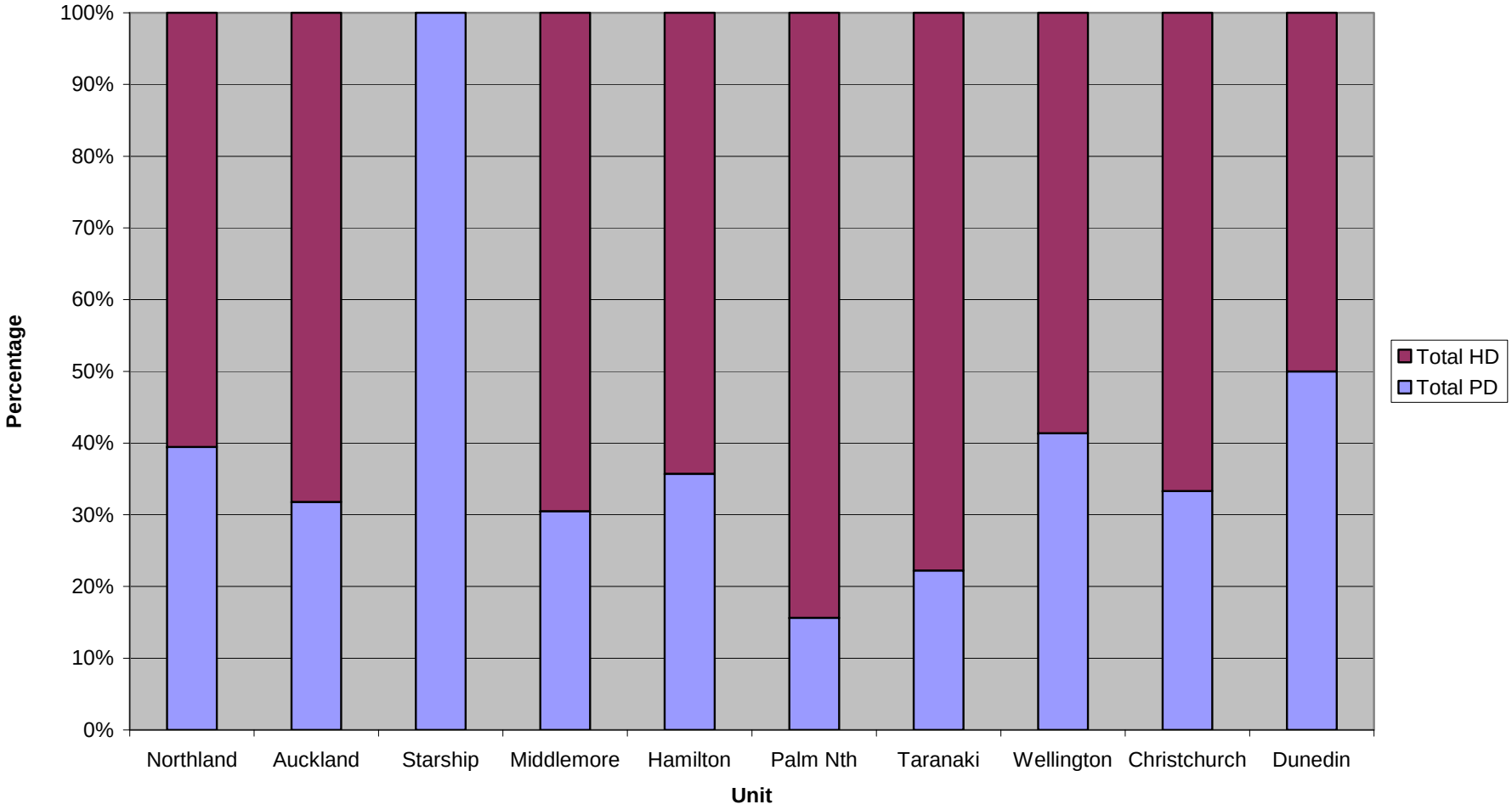
The process of data collection

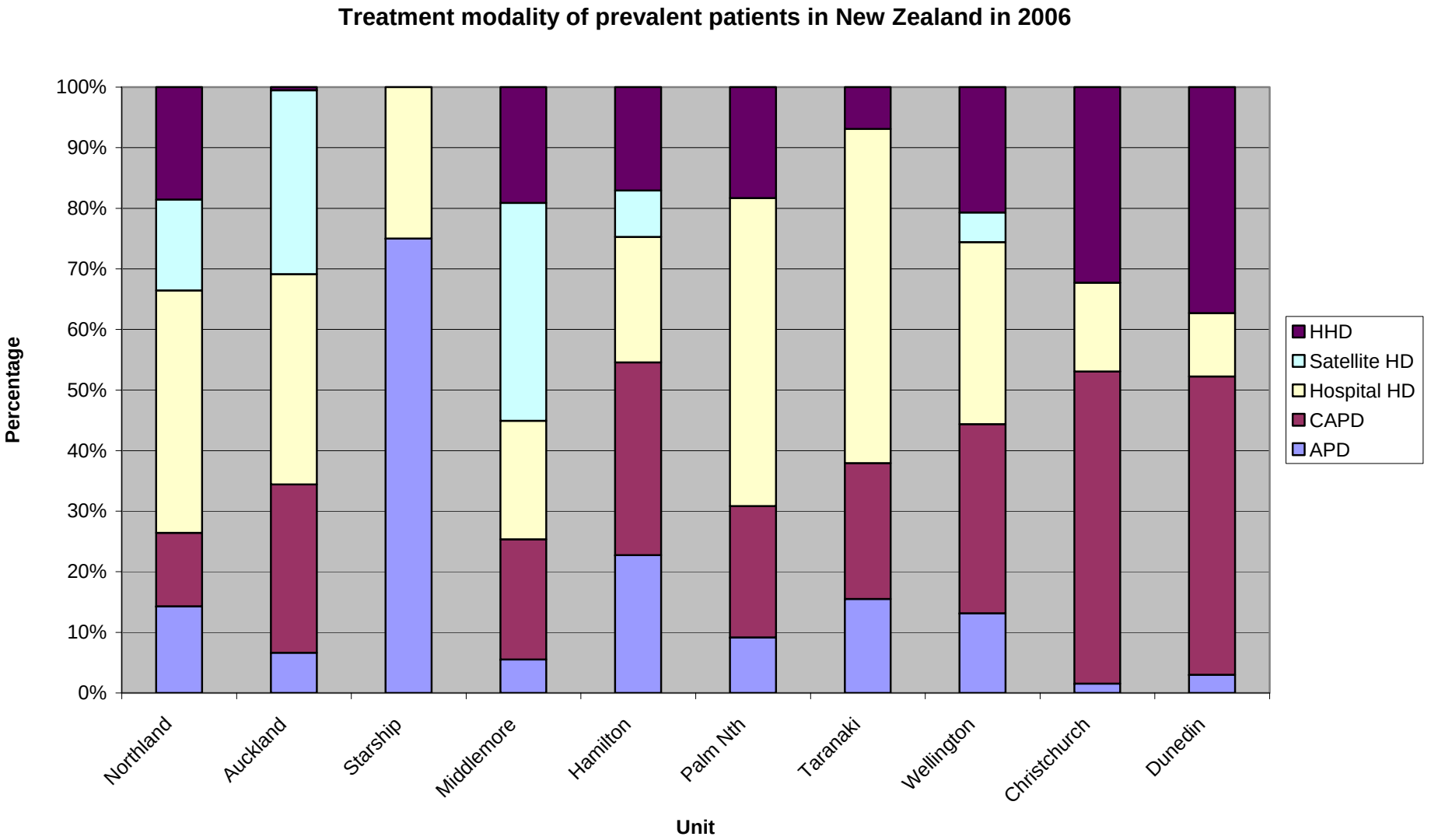
The 2006 Report includes data from the 2006 ANZDATA and NZ PD Registry Reports and from some renal units' audit programmes. The timing of data collection and reporting for these two Registries means that the New Zealand Audit Report cannot be distributed until their work is completed in the second half of the year following original data collection. Once both Registries have complete unit data the reports of enquiries related to the New Zealand audit programme can be produced quickly.

The National Renal Advisory Board would appreciate feedback on this report. Comments can be sent to Johan Rosman, Chair of NRAB, JRosman@middlemore.co.nz or Kelvin Lynn, kelvin.lynn@cdhb.govt.nz

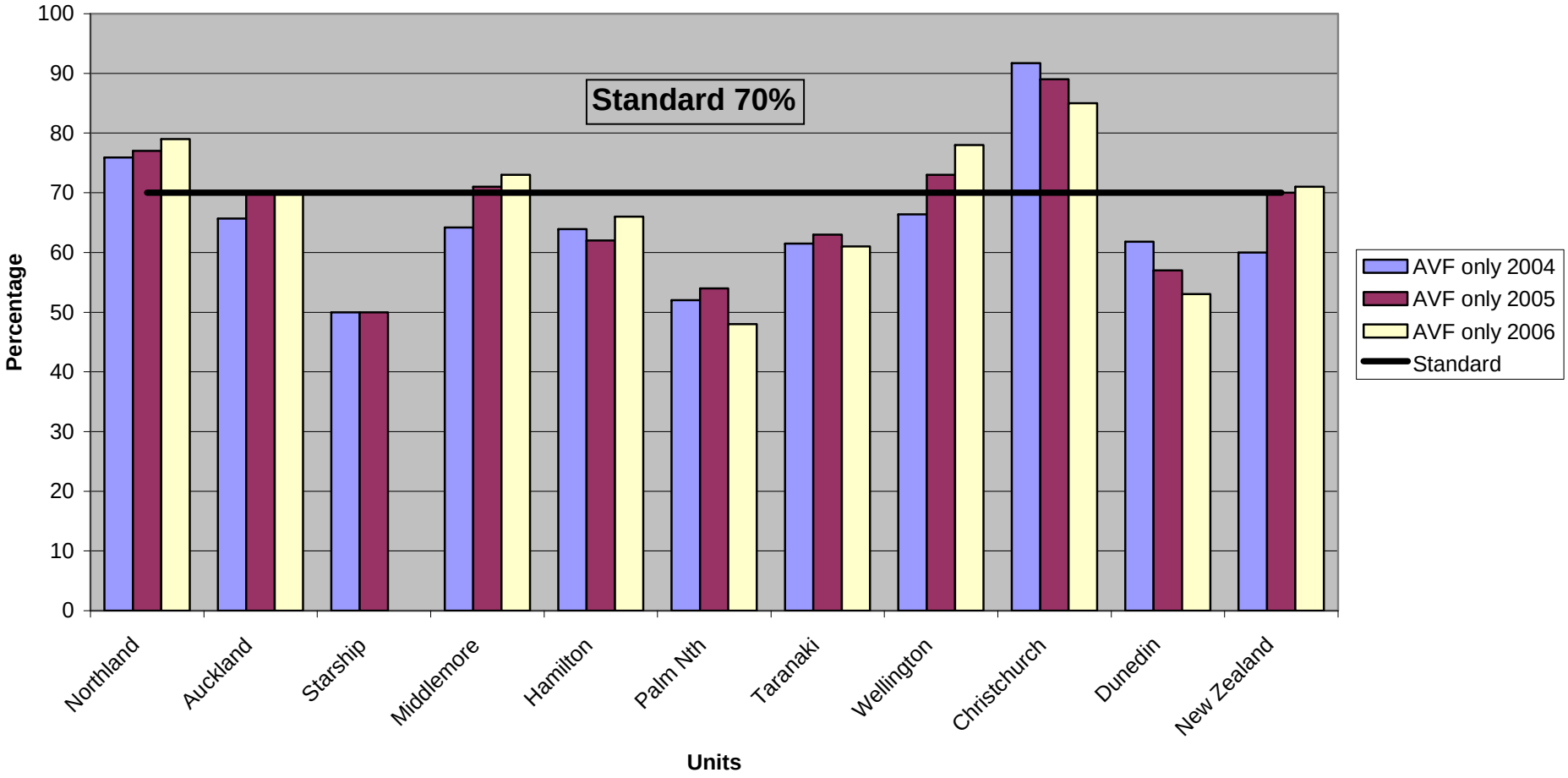
The audit data is shown in tabular and graphic form in the following pages. You may note minor changes in the data for 2004 and 2005 which result from corrections and updates to the ANZDATA and NZ PD databases.

Treatment modality of incident patients in New Zealand in 2006



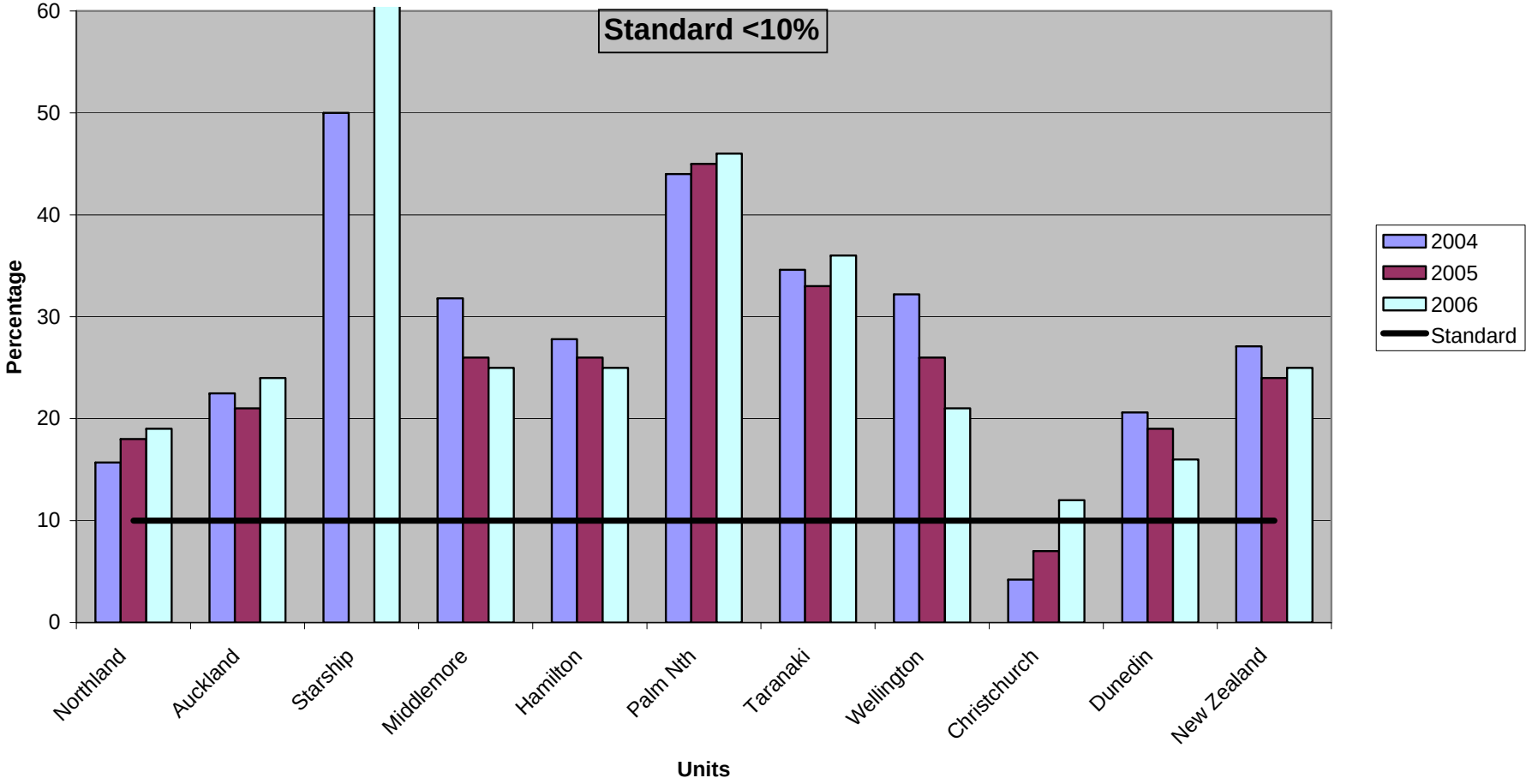

Treatment modality of prevalent patients in New Zealand in 2006
Percentage
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Northland
Auckland
Starship
Middlemore
Hamilton
Palm Nth
Taranaki
Wellington
Christchurch
Dunedin
Unit
HHD
Satellite HD
Hospital HD
CAPD
APD

Vascular access of prevalent HD patients in New Zealand at the end of 2004, 2005 & 2006 - percentage of AV fistulae



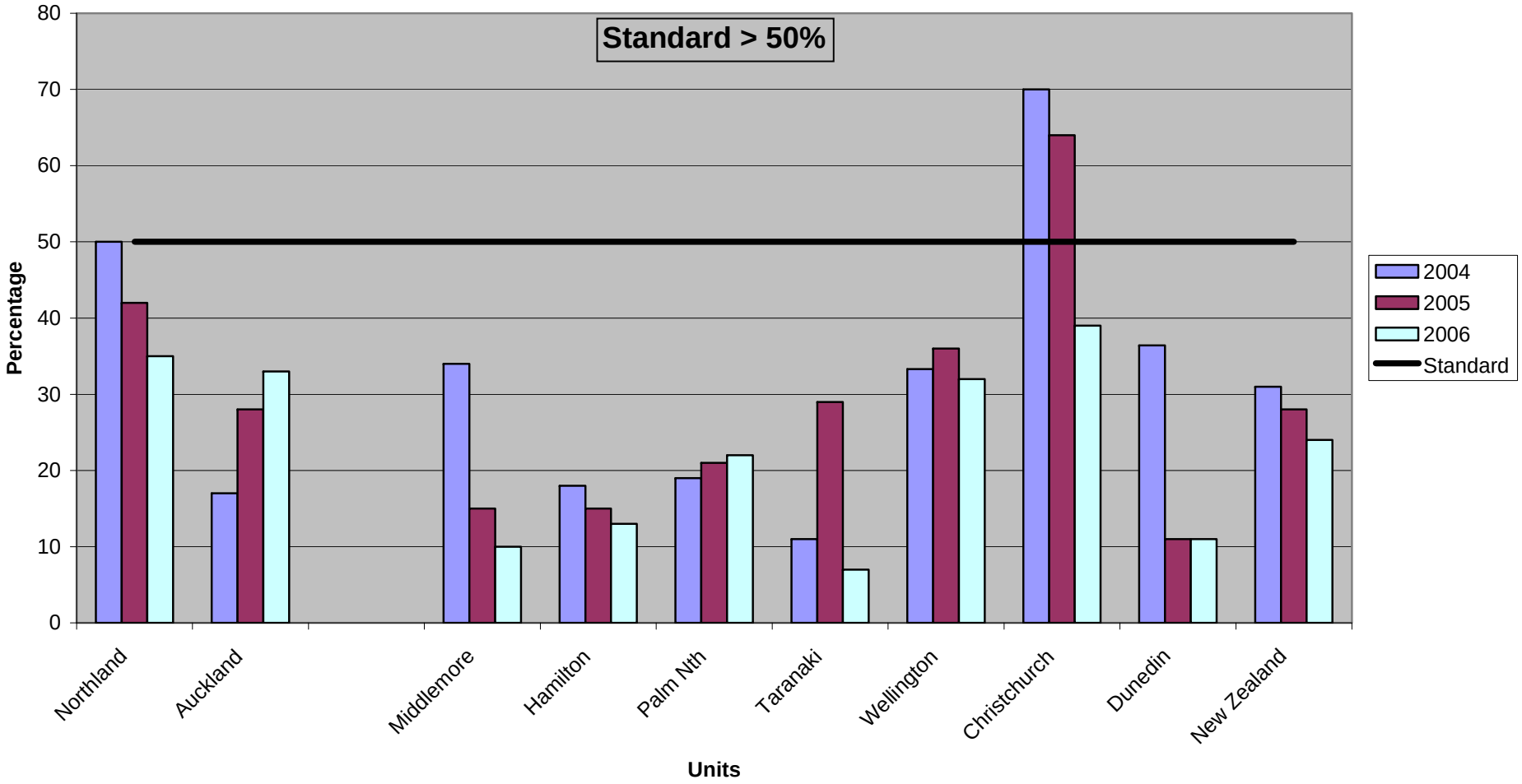
Total HD	Northland	Auckland	Starship	Middlemore	Hamilton	Palm Nth	Taranaki	Wellington	Christchurch	Dunedin	New Zealand
2004	83	213	2	296	133	50	26	143	48	34	1028
2005	100	224	2	312	152	65	30	150	61	37	1133
2006	103	257	3	324	160	83	36	148	61	32	1207

Vascular access in prevalent New Zealand HD patients at the end of 2004, 2005 & 2006 - use of catheters (Includes tunnelled and non-tunnelled catheters)



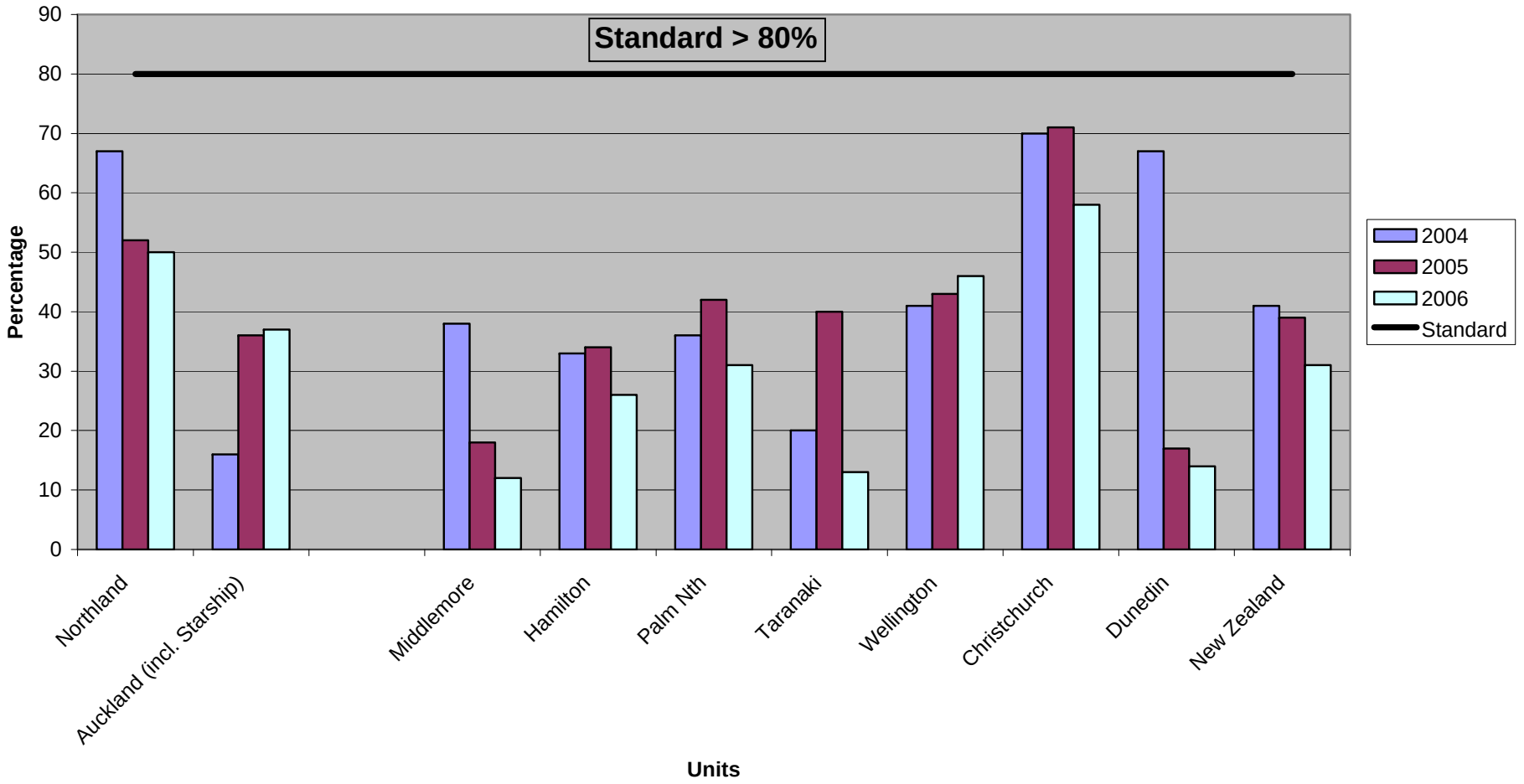
Total Catheters	Northland	Auckland	Starship	Middlemore	Hamilton	Palm Nth	Taranaki	Wellington	Christchurch	Dunedin	New Zealand
2004	13	48	1	94	37	22	9	46	2	7	279
2005	18	46	0	82	40	29	10	39	4	7	275
2006	19	62	3	81	41	38	13	31	7	5	300

Percentage of incident New Zealand HD patients starting HD with permanent vascular access in 2004, 2005 & 2006 - AV fistula or AV graft



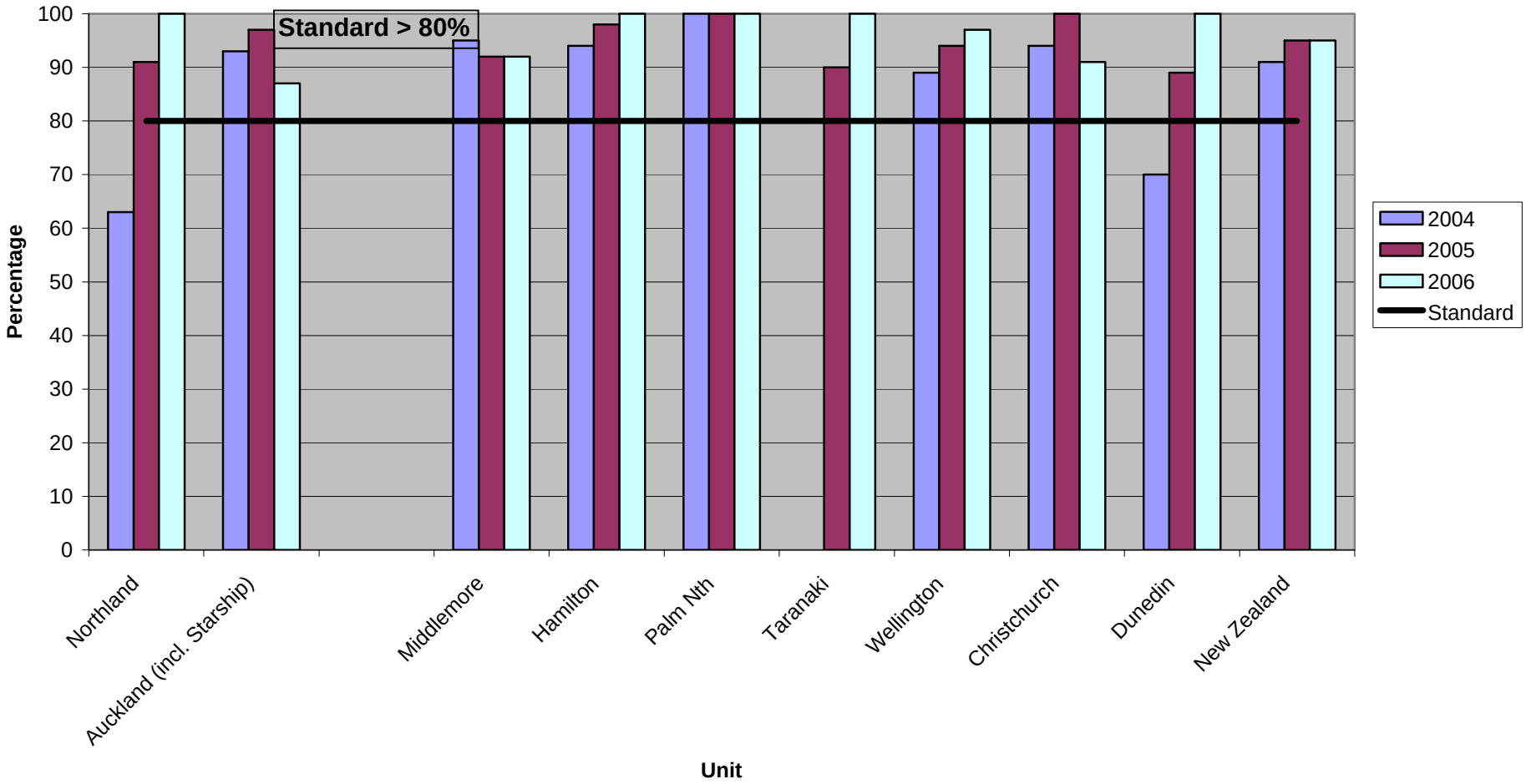
Total HD	Northland	Auckland	Starship	Middlemore	Hamilton	Palm Nth	Taranaki	Wellington	Christchurch	Dunedin	New Zealand
2004	20	47	0	56	40	21	9	43	26	11	273
2005	26	50	1	48	45	24	7	44	25	9	279
2006	23	75	0	57	54	27	14	34	18	9	311

Percentage of non-late referred (<3 months) New Zealand HD patients starting HD with permanent access in 2004, 2005 & 2006- AV fistula or AV graft



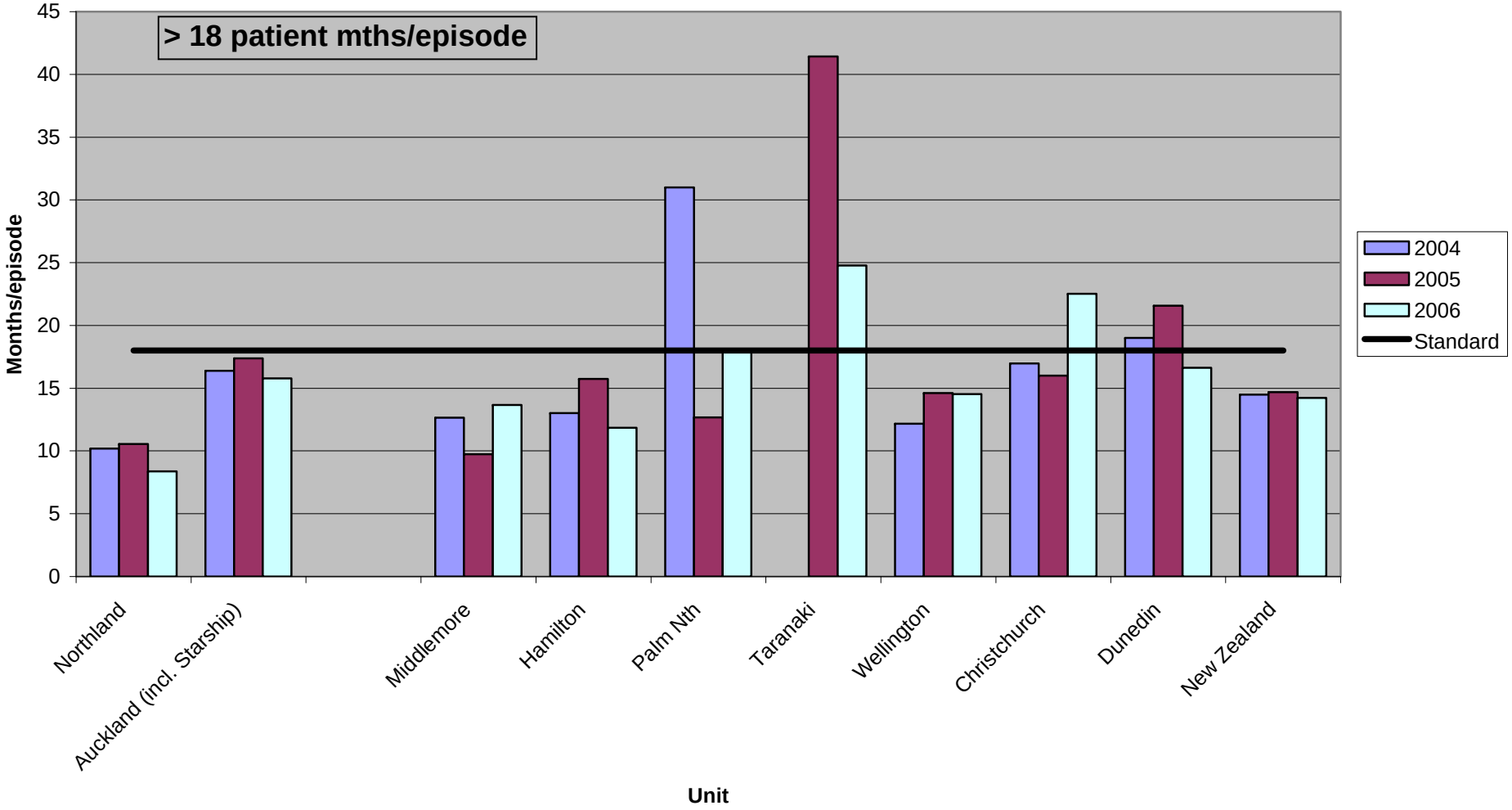
Total HD	Northland	Auckland	Starship	Middlemore	Hamilton	Palm Nth	Taranaki	Wellington	Christchurch	Dunedin	New Zealand
2004	15	32	0	47	21	11	5	34	23	6	194
2005	21	39	0	40	18	12	5	37	21	6	199
2006	14	60	0	49	27	16	8	24	12	7	217

Percentage of first PD catheters in New Zealand PD patients that are functioning at one year for 2004, 2005 & 2006



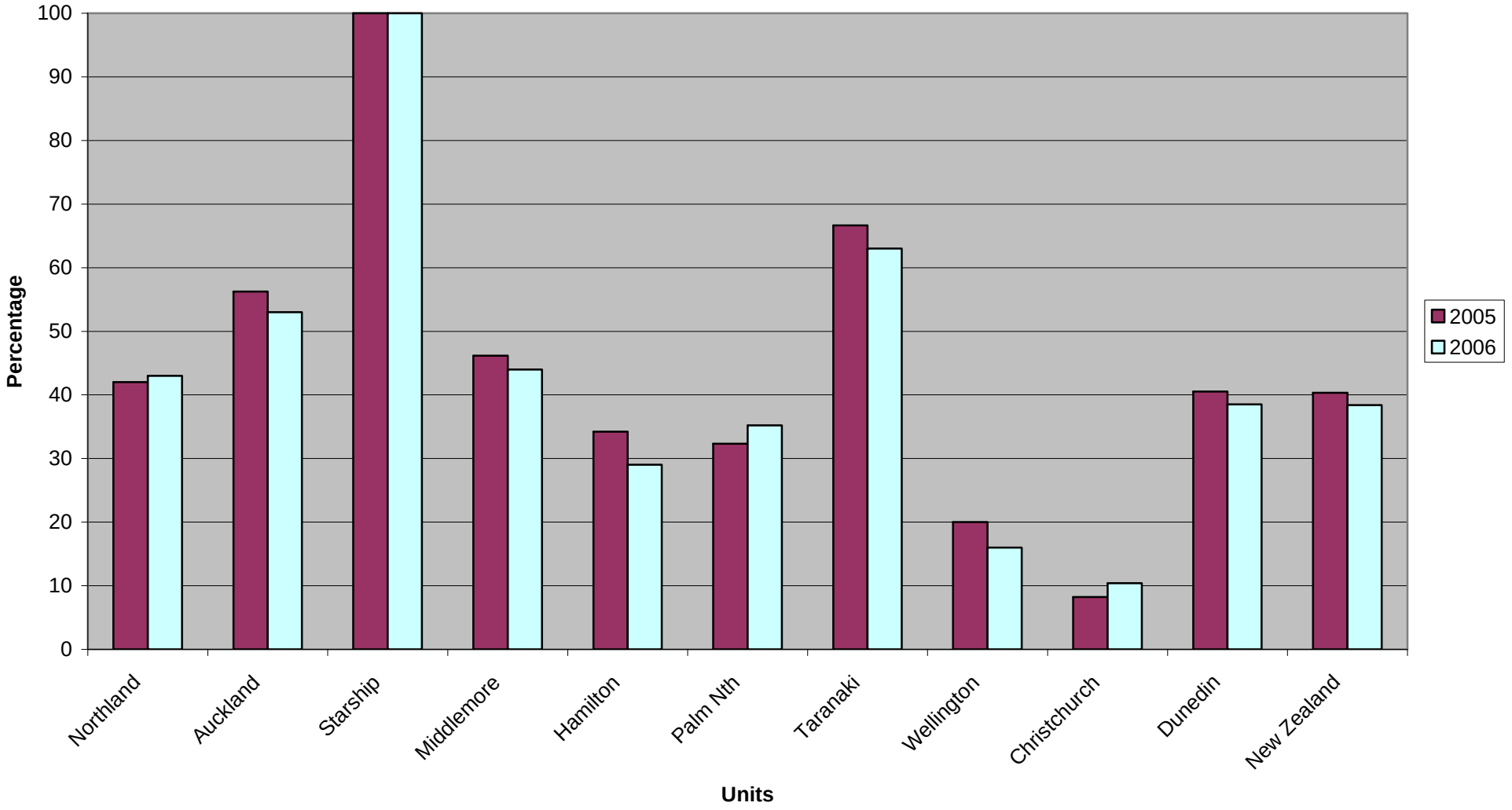
Total Catheters	Northland	Auckland	Starship	Middlemore	Hamilton	Palm Nth	Taranaki	Wellington	Christchurch	Dunedin	New Zealand
2004	10	48	0	41	53	20	NA	43	18	13	246
2005	12	48	0	44	54	11	10	39	27	11	256
2006	20	59	0	40	67	15	8	35	24	13	281

Peritonitis rates in New Zealand PD patients (months/episode) for 2004, 2005 & 2006



Total Patients	Northland	Auckland	(inc Stars	Middlemore	Hamilton	Palm Nth	Taranaki	Wellington	Christchurch	Dunedin	New Zealand
2004	25	140		94	193	49	23	122	61	35	742
2005	24	137		98	182	40	22	124	64	30	721
2006	37	144		110	192	37	22	118	69	35	764

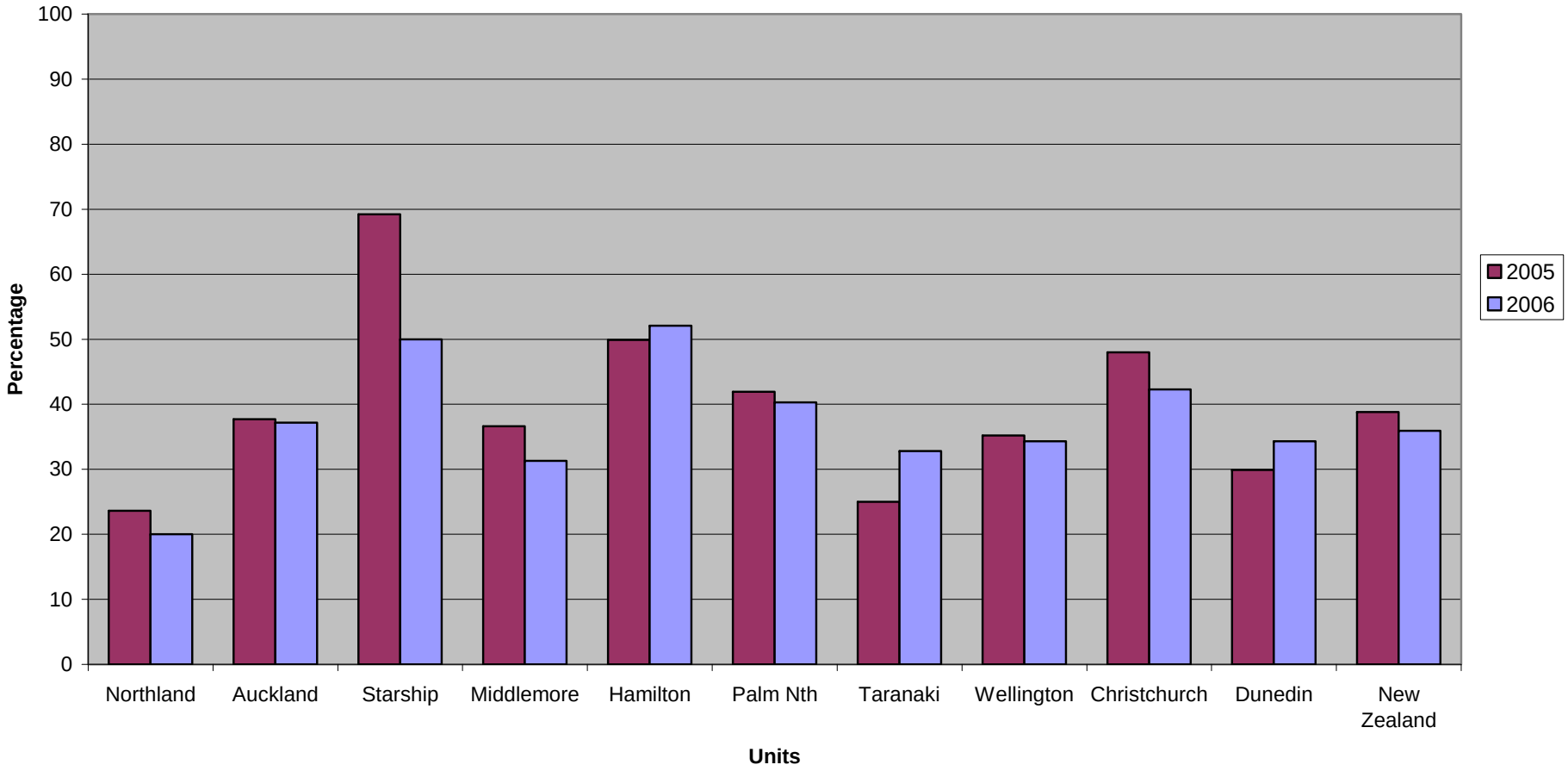
Percentage of HD patients - Session Length (< 4.5h/session) for 2005 & 2006



Total Patients	Northland	Auckland	Starship	Middlemore	Hamilton	Palm Nth	Taranaki	Wellington	Christchurch	Dunedin	New Zealand
2005	42	126	2	144	52	21	20	30	5	15	457
2006	36	100	1	117	36	19	15	18	5	10	357

Dialysis frequency and duration of session 2005 and 2006						
	Duration of dialysis treatment					
Dialysis frequency	**< 4 hours**		**> 4 hours**		**Total**	
	2005	**2006**	**2005**	**2006**	**2005**	**2006**
< 3/week	3	3	18	14	21	17
3 x weekly	32	27	1,010	1,080	1.042	1,107
> 3/week	16	18	54	65	70	83
Total	51	48	1,082	1,159	1,133	1,207

Percentage of dialysis patients with Hb Concentration (< 110g/l) at end of 2005 & 2006



Total Patients	Northland	Auckland	Starship	Middlemore	Hamilton	Palm Nth	Taranaki	Wellington	Christchurch	Dunedin	New Zealand
2005	29	132	9	150	166	44	13	96	60	20	719
2006	28	146	6	136	155	48	19	91	55	23	707

Extract from the 2006 New Zealand Peritoneal Dialysis Registry Report

Section 1. Peritoneal catheter survival

(Audit standard - >80% of first PD catheters functioning at 1 year.)

Peritoneal catheter insertions were not included in this analysis if the following occurred in the first year: the patient died with the catheter in situ, the patient recovered renal function and discontinued PD, the patient was transplanted or the patient was lost to follow up.

(shaded box = standard not achieved)

Northland

	2000	2001	2002	2003	2004	2005	2006
No. of 1st catheter insertion	14	12	27	12	10	12	20
Censored	1	3	6	2	2	1	0
Catheter failed within 1 year	3	5	6	3	3	1	0
Catheter function over 1 year	10	4	15	7	5	10	20
Percentage	77%	44%	71%	70%	63%	91%	100%
No. of subsequent catheter insertion	7	1	3	1	3	4	6
Censored	2	0	0	0	0	0	0
Catheter failed within 1 year	3	0	2	0	2	2	0
Catheter function over 1 year	2	1	1	1	1	2	6
Percentage	40%	100%	33%	100%	33%	50%	100%
Total insertions	21	13	30	13	13	16	26

Auckland

	2000	2001	2002	2003	2004	2005	2006
No. of 1st catheter insertion	66	59	60	39	48	48	59
Censored	8	9	9	8	6	9	6
Catheter failed within 1 year	10	9	6	5	3	1	7
Catheter function over 1 year	48	41	45	26	39	38	46
Percentage	83%	82%	88%	84%	93%	97%	87%
No. of subsequent catheter insertion	20	14	17	9	10	12	17
Censored	0	0	8	2	1	3	5
Catheter failed within 1 year	7	1	6	0	1	1	5
Catheter function over 1 year	13	13	3	7	8	8	7
Percentage	65%	93%	33%	100%	89%	89%	58%
Total insertions	86	73	77	48	58	60	76

Middlemore

	2000	2001	2002	2003	2004	2005	2006
No. of 1st catheter insertion	45	43	30	39	41	44	40
Censored	5	10	4	6	4	5	1
Catheter failed within 1 year	4	3	6	5	2	3	3
Catheter function over 1 year	36	30	20	28	35	36	36
Percentage	90%	91%	77%	85%	95%	92%	92%
No. of subsequent catheter insertion	13	5	2	7	4	7	2
Censored	1	0	0	1	1	1	0
Catheter failed within 1 year	3	2	2	2	1	2	1
Catheter function over 1 year	9	3	0	4	2	4	1
Percentage	75%	60%	0%	67%	67%	67%	50%
Total insertions	58	48	32	46	45	51	42

Hamilton

	2000	2001	2002	2003	2004	2005	2006
No. of 1st catheter insertion	58	70	65	40	53	54	67
Censored	12	6	6	3	1	5	3
Catheter failed within 1 year	4	5	4	0	3	1	0
Catheter function over 1 year	42	59	55	37	49	48	64
Percentage	91%	92%	93%	100%	94%	98%	100%
No. of subsequent catheter insertion	22	11	11	12	17	14	6
Censored	4	0	3	3	3	1	1
Catheter failed within 1 year	6	4	1	5	4	1	0
Catheter function over 1 year	12	7	7	4	10	12	5
Percentage	67%	64%	88%	44%	71%	92%	100%
Total insertions	80	81	76	52	70	68	73

Palmerston North

	2000	2001	2002	2003	2004	2005	2006
No. of 1st catheter insertion	15	9	12	14	20	11	15
Censored	2	1	0	1	5	0	1
Catheter failed within 1 year	0	0	2	0	0	0	0
Catheter function over 1 year	13	8	10	13	15	11	14
Percentage	100%	100%	83%	100%	100%	100%	100%
No. of subsequent catheter insertion	1	1	0	1	2	2	1
Censored	0	0	0	0	0	0	1
Catheter failed within 1 year	1	1	0	0	0	0	0
Catheter function over 1 year	0	0	0	1	2	2	0
Percentage	0%	0%	0%	100%	100%	100%	0%
Total insertions	16	10	12	15	22	13	16

Taranaki

	2000	2001	2002	2003	2004	2005	2006
No. of 1st catheter insertion	0	0	0	0	0	10	8
Censored	0	0	0	0	0	0	1
Catheter failed within 1 year	0	0	0	0	0	1	0
Catheter function over 1 year	0	0	0	0	0	9	7
Percentage	0%	0%	0%	0%	0%	90%	100%
No. of subsequent catheter insertion	0	0	0	0	0	2	3
Censored	0	0	0	0	0	0	0
Catheter failed within 1 year	0	0	0	0	0	1	0
Catheter function over 1 year	0	0	0	0	0	1	3
Percentage	0%	0%	0%	0%	0%	50%	100%
Total insertions	0	0	0	0	0	12	11

Wellington

	2000	2001	2002	2003	2004	2005	2006
No. of 1st catheter insertion	42	57	40	52	43	39	35
Censored	4	8	2	6	8	5	2
Catheter failed within 1 year	3	1	2	4	4	2	1
Catheter function over 1 year	35	48	36	42	31	32	32
Percentage	92%	98%	95%	91%	89%	94%	97%
No. of subsequent catheter insertion	7	3	0	2	6	9	6
Censored	1	1	0	0	0	0	0
Catheter failed within 1 year	1	0	0	0	0	1	2
Catheter function over 1 year	5	2	0	2	6	8	4
Percentage	83%	100%	0%	100%	100%	89%	67%
Total insertions	49	60	40	54	49	48	41

Christchurch

	2000	2001	2002	2003	2004	2005	2006
No. of 1st catheter insertion	21	19	28	28	18	27	24
Censored	6	7	4	3	2	3	1
Catheter failed within 1 year	1	1	1	2	1	0	2
Catheter function over 1 year	14	11	23	23	15	24	21
Percentage	93%	92%	96%	92%	94%	100%	91%
No. of subsequent catheter insertion	5	4	1	4	5	1	4
Censored	4	0	0	1	2	0	0
Catheter failed within 1 year	0	1	1	1	2	1	0
Catheter function over 1 year	1	3	0	2	1	0	4
Percentage	100%	75%	0%	67%	33%	0%	100%
Total insertions	26	23	29	32	23	28	28

Dunedin

	2000	2001	2002	2003	2004	2005	2006
No. of 1st catheter insertion	9	20	19	12	13	11	13
Censored	4	9	3	4	3	2	1
Catheter failed within 1 year	1	2	3	2	3	1	0
Catheter function over 1 year	4	9	13	6	7	8	12
Percentage	80%	82%	81%	75%	70%	89%	100%
No. of subsequent catheter insertion	4	6	1	3	5	12	8
Censored	0	0	0	1	0	4	1
Catheter failed within 1 year	1	0	0	0	1	3	2
Catheter function over 1 year	3	6	1	2	4	5	5
Percentage	75%	100%	100%	100%	80%	63%	71%
Total insertions	13	26	20	15	18	23	21

New Zealand

	2000	2001	2002	2003	2004	2005	2006
No. of 1st catheter insertion	270	289	281	236	246	256	281
Censored	42	53	34	33	31	28	16
Catheter failed within 1 year	26	26	30	21	19	11	13
Catheter function over 1 year	202	210	217	182	196	217	252
Percentage	75%	73%	77%	77%	91%	95%	95%
No. of subsequent catheter insertion	79	45	35	39	52	63	53
Censored	12	1	11	8	7	7	8
Catheter failed within 1 year	22	9	12	8	11	15	10
Catheter function over 1 year	45	35	12	23	34	41	35
Percentage	57%	78%	34%	59%	76%	73%	78%
Total insertions	349	334	316	275	298	319	334

Section 3.Peritonitis

Peritonitis Frequency Tables

(Audit standard > 18 patient months/episode)

(shaded box = standard not achieved)

Northland

	2000	2001	2002	2003	2004	2005	2006
Patients on PD as at year end	30	26	37	36	18	22	34
Months on PD	445.10	327.05	378.00	438.20	417.93	264.09	343.19
Peritonitis episodes	31	39	39	45	41	25	41
Patients with peritonitis	23	26	23	21	22	17	28
Months per episode	14.36	8.39	9.69	9.74	10.19	10.56	8.37

Auckland

	2000	2001	2002	2003	2004	2005	2006
Patients on PD as at year end	140	158	148	147	129	123	150
Months on PD	1539.48	1810.55	1860.55	1791.82	1818.03	1494.56	1719.7
Peritonitis episodes	93	112	99	87	111	86	109
Patients with peritonitis	61	78	76	61	72	61	82
Months per episode	16.55	16.17	18.79	20.60	16.38	17.38	15.78

Middlemore

	2000	2001	2002	2003	2004	2005	2006
Patients on PD as at year end	106	106	93	84	88	98	111
Months on PD	1251.74	1278.01	1198.06	1037.35	1051	1169.07	1311
Peritonitis episodes	89	81	87	71	83	120	96
Patients with peritonitis	57	54	51	39	47	59	49
Months per episode	14.06	15.78	13.77	14.61	12.66	9.74	13.66

Hamilton

	2000	2001	2002	2003	2004	2005	2006
Patients on PD as at year end	169	183	202	214	193	200	193
Months on PD	2044.80	2046.45	2328.17	2467.91	2565.8	2313.42	2190.27
Peritonitis episodes	198	198	206	207	197	147	185
Patients with peritonitis	114	116	114	115	114	89	104
Months per episode	10.33	10.34	11.30	11.92	13.02	15.74	11.84

Palmerston North

	2000	2001	2002	2003	2004	2005	2006
Patients on PD as at year end	44	31	42	48	42	45	37
Months on PD	544.51	417.69	408.91	526.63	619.7	506.61	448.81
Peritonitis episodes	19	23	32	23	20	40	25
Patients with peritonitis	15	11	26	17	15	18	18
Months per episode	28.66	18.16	12.78	22.90	30.99	12.67	17.95

Taranaki

	2000	2001	2002	2003	2004	2005	2006
Patients on PD as at year end	0	0	0	0	0	23	24
Months on PD	0.00	0.00	0.00	0.00	0	248.55	272.59
Peritonitis episodes	0	0	0	0	0	6	11
Patients with peritonitis	0	0	0	0	0	6	10
Months per episode	0.00	0.00	0.00	0.00	0.00	41.43	24.78

Wellington

	2000	2001	2002	2003	2004	2005	2006
Patients on PD as at year end	94	110	0	122	109	120	113
Months on PD	1154.11	1262.95	0.00	1250.16	1496.43	1372.75	1380.7
Peritonitis episodes	53	50	0	59	123	94	95
Patients with peritonitis	44	37	0	43	72	61	62
Months per episode	21.78	25.26	0.00	21.19	12.17	14.60	14.53

Christchurch

	2000	2001	2002	2003	2004	2005	2006
Patients on PD as at year end	53	49	56	59	48	61	70
Months on PD	614.63	586.00	599.21	672.03	797.6	688.23	766.04
Peritonitis episodes	63	36	32	38	47	43	34
Patients with peritonitis	30	19	22	27	25	23	20
Months per episode	9.76	16.28	18.73	17.69	16.97	16.01	22.53

Dunedin

	2000	2001	2002	2003	2004	2005	2006
Patients on PD as at year end	28	34	32	31	30	28	38
Months on PD	254.34	334.58	355.95	427.35	399.13	388.35	349.31
Peritonitis episodes	15	16	19	16	21	18	21
Patients with peritonitis	13	12	15	11	12	14	16
Months per episode	16.96	20.91	18.73	26.71	19.01	21.58	16.63

New Zealand

	2000	2001	2002	2003	2004	2005	2006
Patients on PD as at year end	664	697	610	741	657	720	770
Months on PD	7848.71	8063.28	7128.85	8611.45	9312	8446	8781.57
Peritonitis episodes	571	560	518	546	643	575	617
Patients with peritonitis	357	353	327	334	379	348	389
Months per episode	13.75	14.40	13.76	15.77	14.48	14.69	14.23

Note: The 2002 result does not include Wellington

Commentary

Demography

- There continues to be a substantial variation between units in regard to initial and prevalent dialysis modality; particularly in the proportion of patients on centre dialysis.
- The number of incident patients continues to rise annually.
- The numbers of prevalent haemodialysis and peritoneal dialysis patients both increased in 2006.

Haemodialysis adequacy, frequency and duration of treatment

- There has been a fall in the number of haemodialysis patients receiving less than 4.5 hours dialysis per session from 457 (40%) to 357 (38%, when compared to 2005.
- Twenty-four patients on thrice weekly dialysis are receiving less than 4 hours dialysis for each treatment session: a substantial reduction in patient number compared to 2005.

Vascular access for haemodialysis

- **Eight of ten units** again achieved the standard for optimal vascular access (arteriovenous (AV) fistula + graft) for prevalent patients but **none** for incident patients or the more stringent standard for non-late presenting patients.
- There has been an increase in the number of prevalent haemodialysis patients using a central venous catheter (CVC) for dialysis and **no renal unit** has <10% of their patients using this form of vascular access. At 31 Dec 2006, 300 haemodialysis patients (25% of all New Zealand haemodialysis patients) were using a CVC for vascular access with the range being 12 to 46% of haemodialysis patients across units.
- A significant proportion of patients who received haemodialysis for up to 90 days before starting on peritoneal dialysis used a CVC. There is no way from the Registry data to

know whether there was an intention during the pre-dialysis phase of care that peritoneal dialysis would be the starting treatment modality. In 2006, there were 72 such patients who had up to 90 days haemodialysis before changing to peritoneal dialysis and **all but two** had a CVC as vascular access. Thirty-one of these patients (43%) were late presenters.

- The continuing high rates of CVC use in some units are of concern because of the evidence that patient survival is inferior with this form of access when compared with an AV fistula. Although the data are sparse, it appears that the rates of blood stream infections related to CVCs are well within the international recommendations.
- Disappointingly, the current audit results in regard to vascular access do not provide any reassurance that there have been substantial changes in the co-ordination of, and capacity to provide, timely vascular access. This indicates a problem with the predialysis co-ordination of vascular access services and requires a multidisciplinary approach to finding a solution. A recent analysis of haemodialysis vascular access from ANZDATA for 2000 to 2005 also notes a decline in the use of arteriovenous fistulae and an increase in CVC use for incident and prevalent patients[1].

Peritoneal dialysis

- The number of first peritoneal dialysis catheters functioning at year end continues to be excellent with all units achieving the standard.
- Peritonitis rates vary considerably. Four units either achieve or are very close to the standard of at least 18 patient months/episode of peritonitis. Units with a large proportion of Maori and Pacific patients have inferior results (see the 2005 report for more in depth analysis)

Anaemia management

- Dialysis patients with the anaemia of chronic renal failure and a haemoglobin concentration < 100g/L are entitled to receive subsidised epoietin. Many units have revised their treatment target to 100 – 120 g/L in the light of recent publications examining the risks of a higher treatment target, particularly in patients with cardiac disease[2,3] and on consideration of Clinical Practice Guidelines[4].
- The proportion of dialysis patients with a haemoglobin concentration < 110g/L in 2006 fell to 36% (707 patients). In the light of the alteration in treatment target it may be useful to report the number of patients with a haemoglobin concentration < 100g/L in the next report.

Data provided by renal units

- Waiting times for the provision of arteriovenous fistulae varies amongst the four units that provided data. This audit standard has been difficult to report on as the nature of referral to a vascular surgeon varies, the rate of progression of kidney disease may slow after referral and, in some cases, the patient has asked for a deferment of surgery.
- Four units provided data on dialysis catheter related blood stream infections and all had rates < 4/1000 catheter days.

References

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Appendix A: Circulation list

The National Renal Advisory Board

Standards and Audit Subcommittee

Heads of New Zealand Renal Units

Chief Executive Officers of DHBs with Renal Units

New Zealand Peritoneal Dialysis Registry

Australia and New Zealand Dialysis Registry

New Zealand Ministry of Health (Director General)

Australian and New Zealand Society of Nephrology

Renal Society of Australasia, New Zealand Branch

New Zealand Kidney Foundation

Board of Nephrology Practice New Zealand

Patient support groups/societies

Appendix B

Members of the Standards and Audit Working Party

Kelvin Lynn, Chair
Anne de Bres (resigned Nov 2003)
Adrian Buttimore
Brenda Clune (resigned Nov 2004)
Mark Marshall
Jenny Walker
Tafale Maddren