CHAPTER 11

PAEDIATRIC REPORT

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This year, as well as providing a summary of current trends in the frequency and causes of ESKD, the paediatric report will focus on dialysis delivery and adequacy, technique survival and biochemical outcomes, as well as an overview of frequency, causes and treatment for children and adolescents with ESKD.

Incidence and Prevalence of ESKD in Children and Adolescents 1991 - 2010

General Overview

As shown in Figure 11.1, there is no clear long term trend in the incidence of children and adolescents developing ESKD and being treated with renal replacement therapy, although there are fluctuations from year to year. Prevalent numbers of treated ESKD have gradually increased across all age groups reflecting improved survival through increased duration of ESKD (Figure 11.2).

Figure 11.1

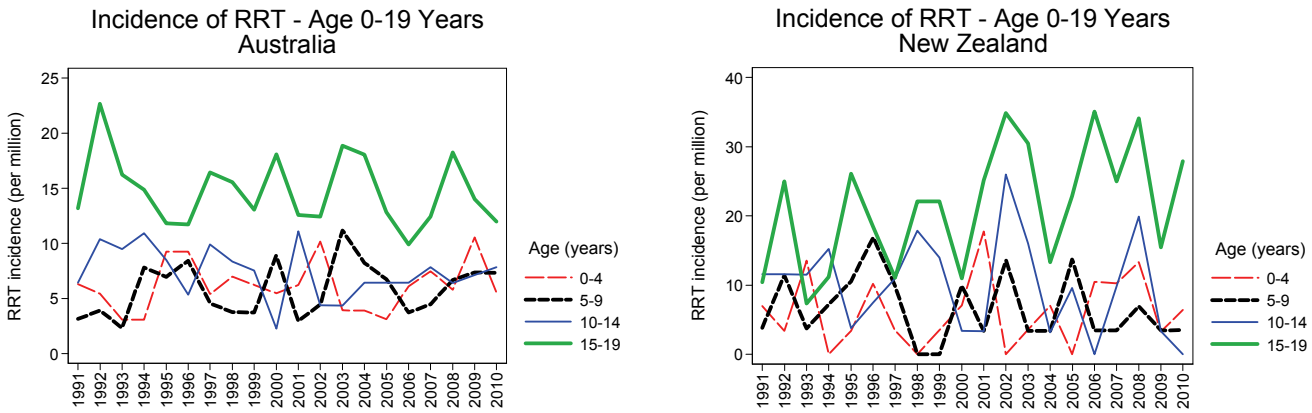
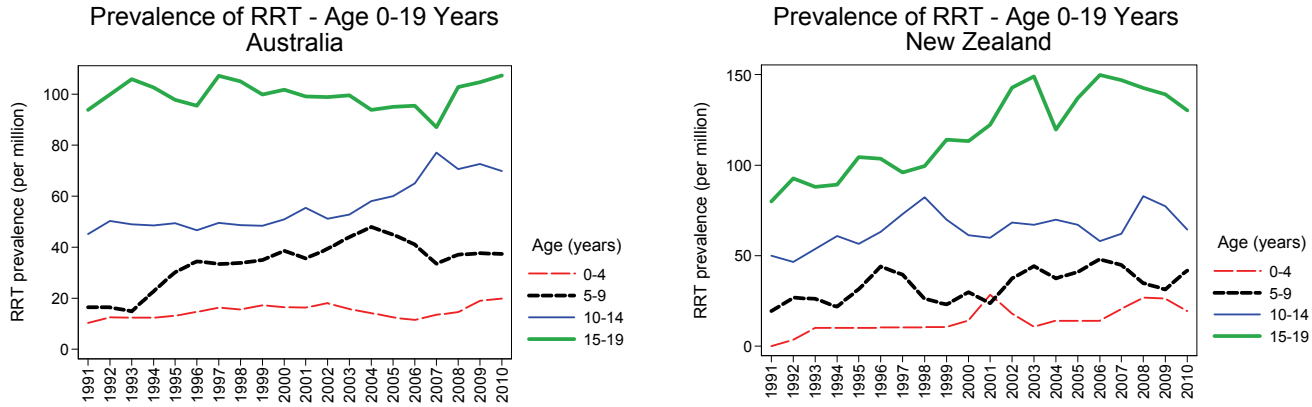


Figure 11.2



CAUSES OF ESKD IN CHILDREN AND ADOLESCENTS 2005 - 2010

Overall, glomerulonephritis remains the most common cause of ESKD in children and adolescents (32%) but causes vary significantly with age. In young children renal hypoplasia/dysplasia is the most common cause while reflux nephropathy is a common cause of ESKD in adolescents.

Figure 11.3

Causes of End Stage Kidney Disease
In Children and Adolescents 2005 - 2010
Australia and New Zealand

Primary Renal Disease	Age Groups (Years)				Total
	0-4	5-9	10-14	15-19	
Glomerulonephritis	12 (18%)	14 (24%)	24 (33%)	68 (41%)	118 (32%)
Familial Glomerulonephritis			1 (1%)	7 (4%)	8 (2%)
Reflux Nephropathy	3 (5%)	3 (5%)	5 (7%)	31 (19%)	42 (12%)
Polycystic Kidney Disease	6 (9%)	3 (5%)	1 (1%)		10 (3%)
Medullary Cystic Disease		1 (2%)	2 (3%)	5 (3%)	8 (2%)
Posterior Urethral Valve	8 (12%)	6 (10%)	7 (10%)	5 (3%)	26 (7%)
Haemolytic Uraemic Syndrome	8 (12%)	1 (2%)	3 (4%)	3 (2%)	15 (4%)
Hypoplasia / Dysplasia	18 (27%)	12 (20%)	13 (18%)	16 (10%)	59 (16%)
Cortical Necrosis	1 (2%)	3 (5%)	2 (3%)	4 (2%)	10 (3%)
Interstitial Nephritis			1 (1%)	1 (1%)	2 (1%)
Cystinosis		2 (3%)			2 (1%)
Uncertain	1 (2%)	1 (2%)		9 (5%)	11 (3%)
Miscellaneous / Other	9 (14%)	13 (22%)	13 (18%)	18 (11%)	53 (15%)
Total	**66**	**59**	**72**	**167**	**364**

MODALITY OF TREATMENT 2005 - 2010

The modality of the first renal replacement treatment is shown in Figure 11.4. Although numbers are small and therefore fluctuate from year to year, around 18% of children and adolescents receive pre-emptive kidney transplants. Of the remainder, 42% commence renal replacement therapy with haemodialysis compared with 40% starting with peritoneal dialysis.

Figure 11.4

Modality of Initial Renal Replacement Therapy
By Year of First Treatment - Australia and New Zealand

Current Treatment	Year						
	2005	2006	2007	2008	2009	2010	Total
Haemodialysis	23 (43%)	23 (45%)	25 (42%)	35 (46%)	24 (38%)	23 (39%)	153 (42%)
Peritoneal Dialysis	18 (33%)	18 (35%)	26 (43%)	29 (38%)	30 (47%)	25 (42%)	146 (40%)
Transplant	13 (24%)	10 (20%)	9 (15%)	12 (16%)	10 (16%)	11 (19%)	65 (18%)
Total	**54**	**51**	**60**	**76**	**64**	**59**	**364**

For prevalent patients (Figure 11.5), a very different pattern is seen, with the great majority of children and adolescents with a functioning transplant. This reflects the relatively high rate of transplantation among children.

Figure 11.5

Modality of Treatment for all Patients in Australia and New Zealand < 20 Years of Age at 31st December

Current Treatment	Year						
	2005	2006	2007	2008	2009	2010	Total
Haemodialysis	46 (12%)	43 (11%)	44 (12%)	49 (12%)	52 (12%)	56 (13%)	290 (12%)
Peritoneal Dialysis	44 (12%)	45 (12%)	61 (16%)	69 (17%)	72 (17%)	62 (15%)	353 (15%)
Transplant	282 (76%)	291 (77%)	277 (73%)	292 (71%)	298 (71%)	300 (72%)	1740 (73%)
Total	**372**	**379**	**382**	**410**	**422**	**418**	**2383**

DIALYSIS DELIVERY AND ADEQUACY

Figure 11.6 and 11.7 summarize the recent trends in HD practice among Paediatric patients.

Figure 11.6

Mean Sessions per Week Among Haemodialysis Patients
By Survey Period (95% CI)

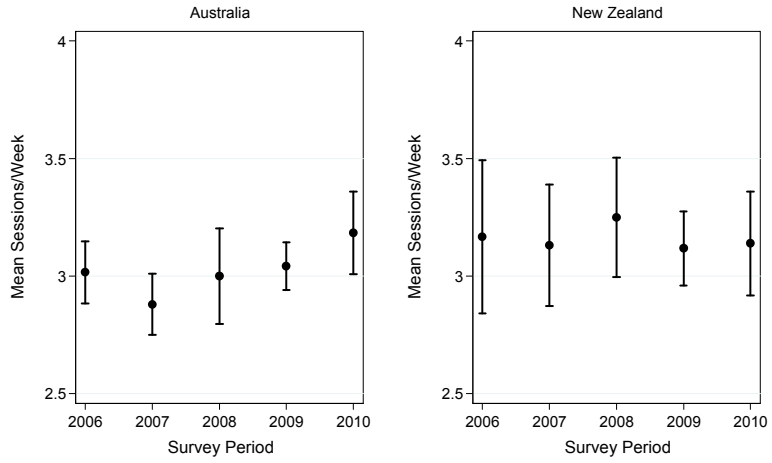
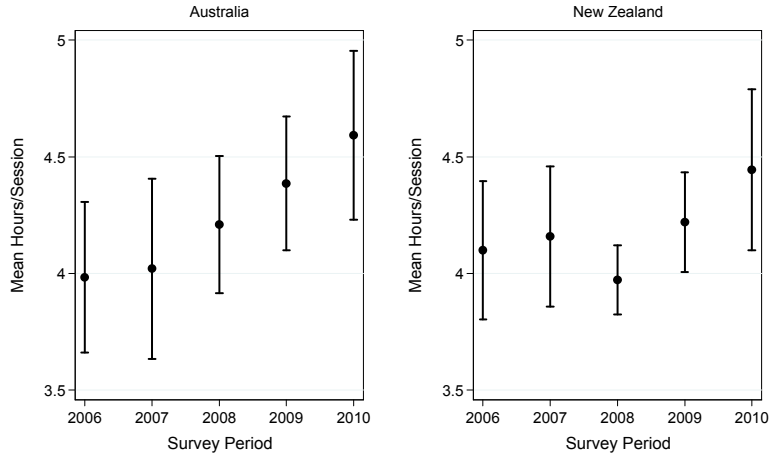


Figure 11.7

Mean Hours per Session Among Haemodialysis Patients
By Survey Period (95% CI)



DIALYSIS DELIVERY AND ADEQUACY

HAEMOGLOBIN

Various dialysis process indicators are summarized in Figures 11.8 - 11.15. For all of these graphs, the box indicates the 25th, 50th, and 75th centiles. The “Whiskers” indicate the 95th centiles for each category.

Figure 11.8

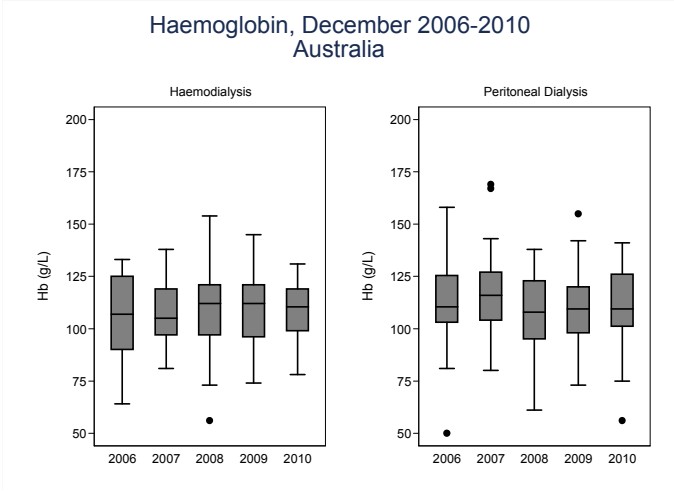
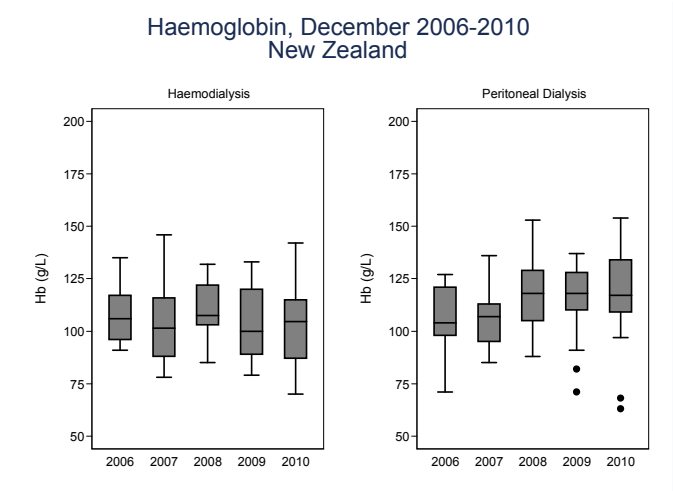


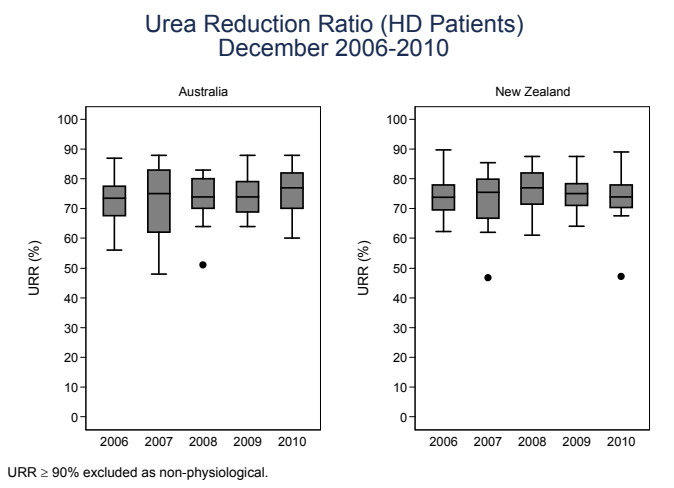
Figure 11.9



UREA REDUCTION RATIO (HD PATIENTS)

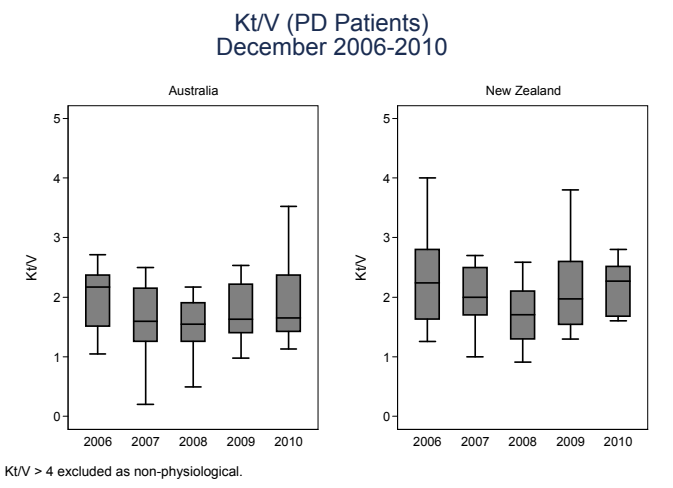
KT/V (PD PATIENTS)

Figure 11.10



URR ≥ 90% excluded as non-physiological.

Figure 11.11



Kt/V > 4 excluded as non-physiological.

Biochemical Outcomes

Serum Calcium

Figure 11.12

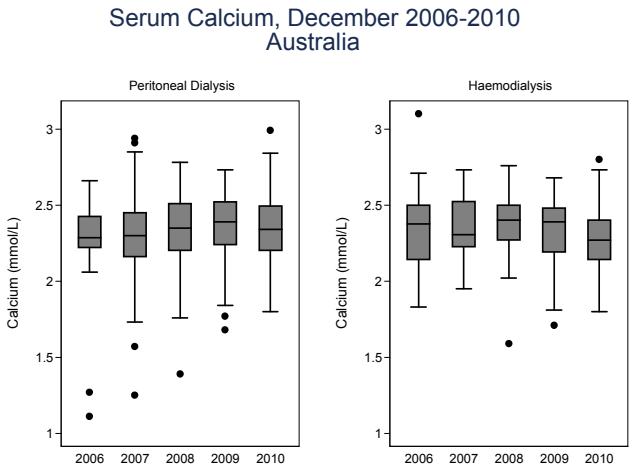
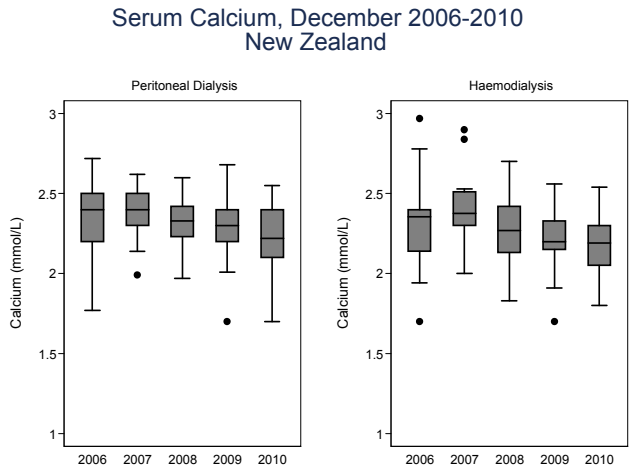


Figure 11.13



Serum Phosphate

For HD patients, Serum Phosphate is reported from a pre-dialysis specimen of a mid–week session.

Figure 11.14

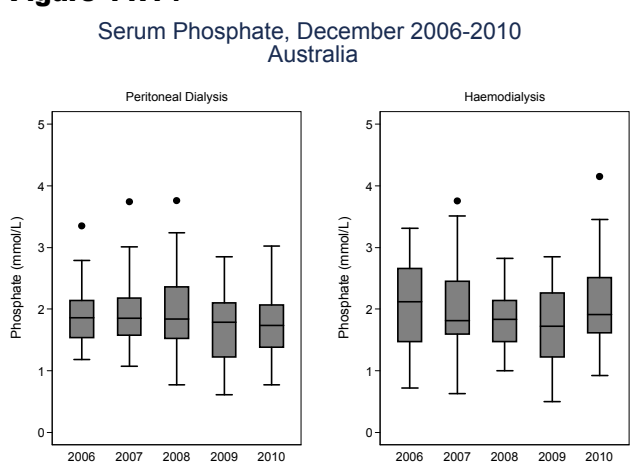
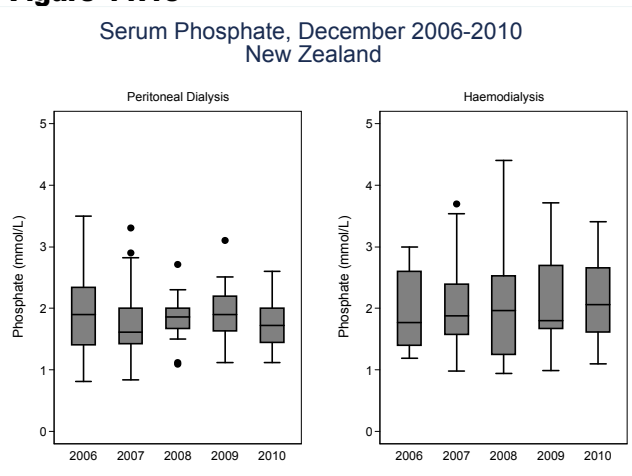


Figure 11.15



Vascular Access

At First Treatment

Vascular access for haemodialysis is summarized in Figures 11.16 -11.19.

Figure 11.16

Vascular Access at First Treatment
Australia

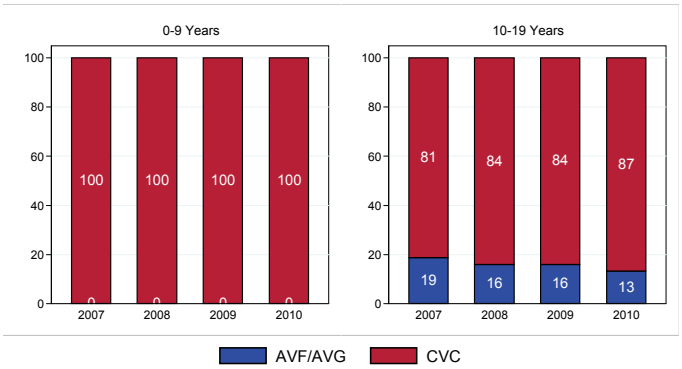
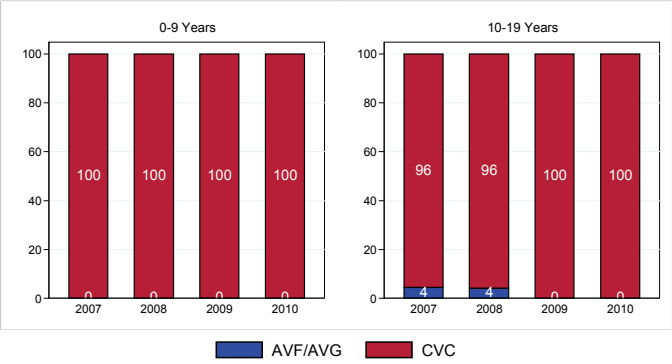


Figure 11.17

Vascular Access at First Treatment
New Zealand



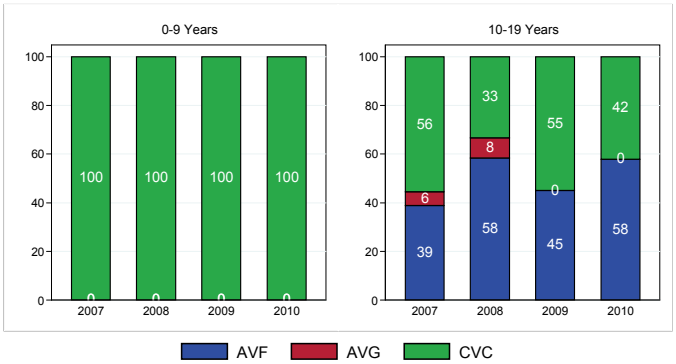
Prevalent Haemodialysis Access

Figure 11.18

Prevalent Haemodialysis Access
Australia

Figure 11.19

Prevalent Haemodialysis Access
New Zealand



PD Technique Survival by Age Category

PD technique survival, censored for transplantation, loss to follow-up and recovery of renal function is presented below. The numbers available for analysis after the first year drop significantly in each age group in both countries, due to transplantation. Of the 170 patients, 41 (24%) received a transplant within one year of commencement of RRT. By two years a total of 73 (43%) of patients had received transplants.

Use of PD solutions is shown in Figure 11.22.

Figure 11.20

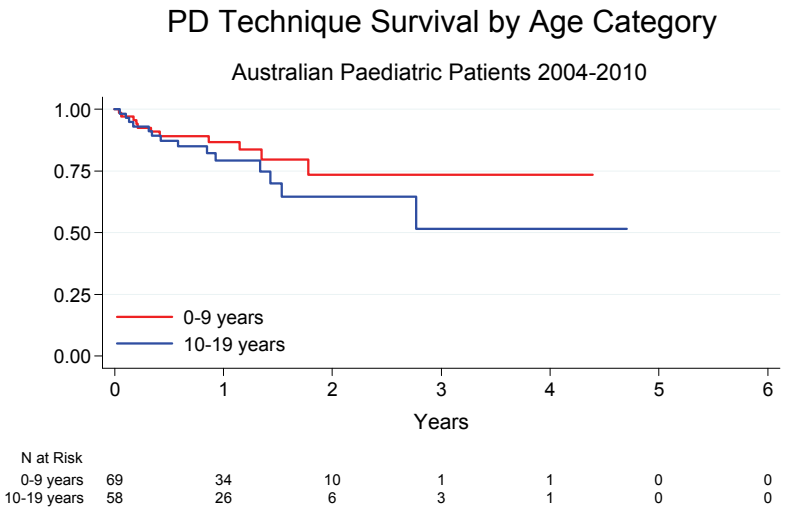


Figure 11.21

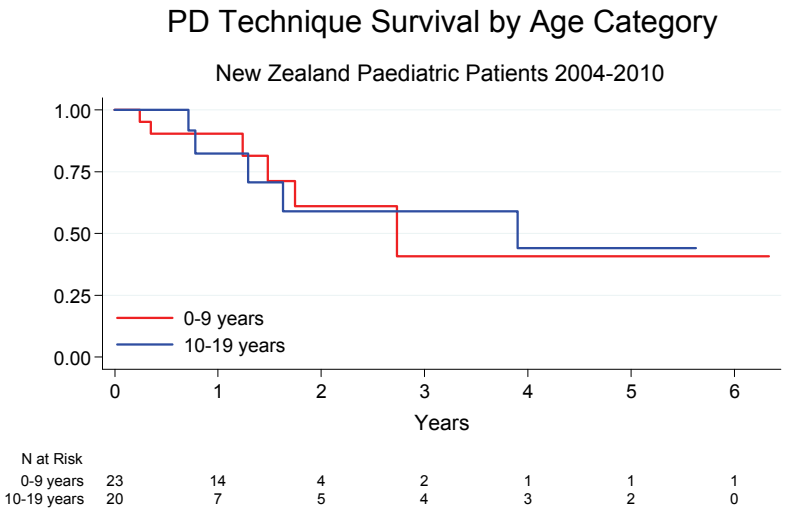


Figure 11.22

Use of PD Solutions 2007 - 2010

Solutions	Australia				New Zealand			
	2007	2008	2009	2010	2007	2008	2009	2010
	(n = 44)	(n = 50)	(n = 55)	(n = 48)	(n = 17)	(n = 19)	(n = 17)	(n = 14)
Glucose	43 (98%)	47 (94%)	54 (98%)	38 (79%)	16 (94%)	18 (95%)	16 (94%)	14 (100%)
Icodextrin	8 (18%)	6 (12%)	11 (20%)	4 (8%)	1 (6%)	3 (16%)	3 (18%)	1 (7%)
Low GDP Lactate	0 (0%)	2 (4%)	2 (4%)	10 (21%)	6 (35%)	2 (11%)	0 (0%)	0 (0%)
Low GDP Bicarbonate	4 (9%)	1 (2%)	11 (20%)	18 (38%)	5 (29%)	15 (79%)	12 (71%)	8 (57%)