



# Renal Replacement Therapy in Infants

The Australian and New Zealand Experience

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# Renal Replacement Therapy

- ESRD in children
  - Growth
  - Nutrition
  - Development
    - Physical/ motor
    - Neurocognitive
    - Psychosocial
  - Family impact



- **Infants**
- 1-2 % of paediatric ESRF population
- 0.3/million population/year (UK)
- 6 new patients/million of same age (US)



# Infants and RRT

- Ethical concerns
- Co-morbidities
- Intention to treat
- Parental wishes and ability to undertake intensive level of care for infant incorporating dialysis, nutritional supplementation with NG /PEG feeding
- Developmental outcomes
- Use of resources



# Ethics and RRT in infants

- Multinational survey – Nth America, Europe/ UK, Japan
- 40% of paediatric nephrologists surveyed would provide RRT to infant less than 1 month of age
- 53% would offer RRT if 1-12 months in age
- Inter-country variation with respect to parental right to refuse treatment

» Geary, J Pediatr 1998



- 20 infants commenced chronic PD before 12 months of age
- 53% received antenatal diagnosis and all refused termination
- 11/20 renal dysplasia, 6/20 PUV
- 2 additional infants did not commence RRT
- 11/20 – transplanted, mean duration of PD 22 months (range 12 – 59 months)
- 4 converted to HD from PD
- 4 deceased (20%)
- 18 enteral feeding

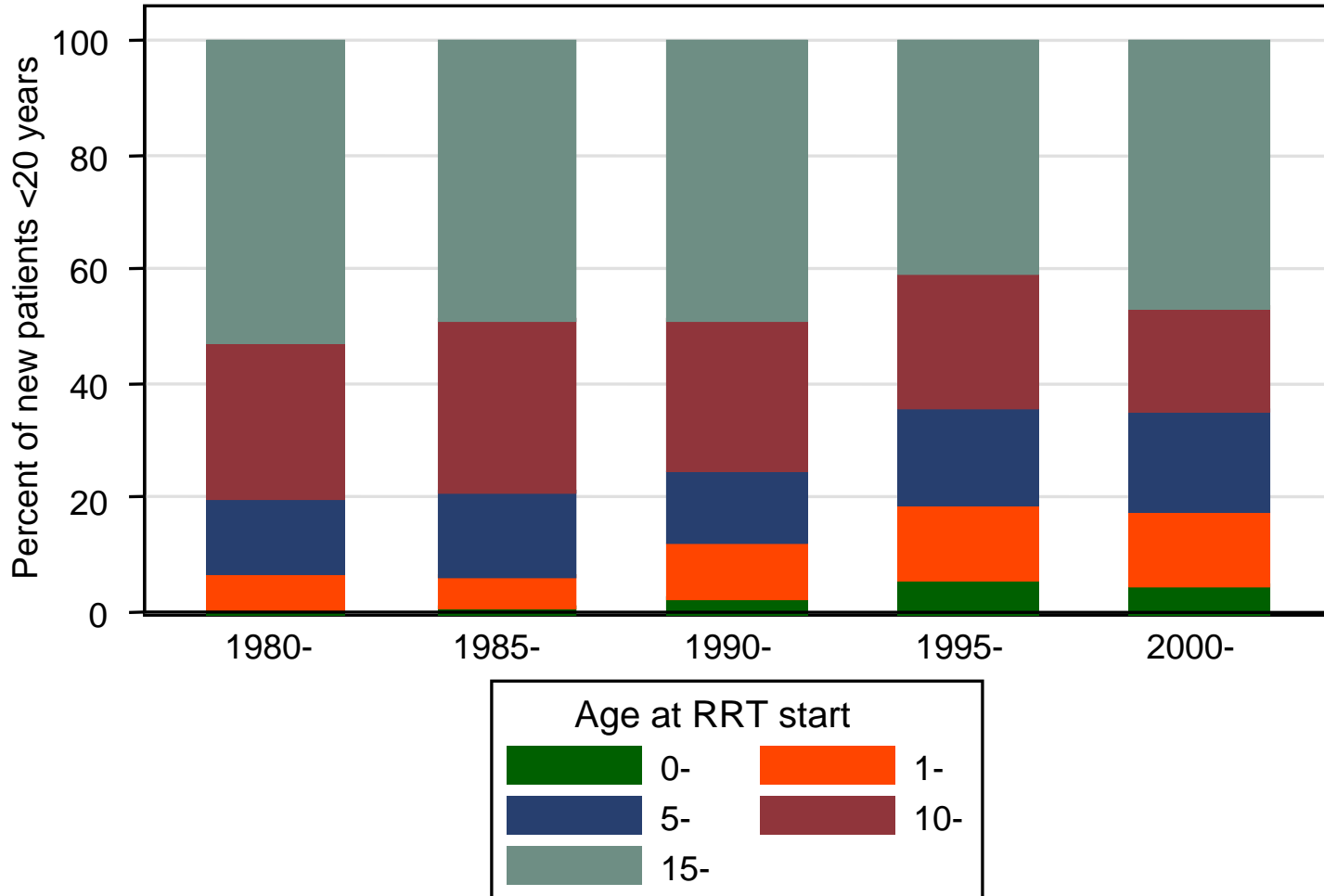
» Ledermann, J Pediatr 2000, 136



- ANZDATA Registry
  - Collects data 6 monthly from all Australian and New Zealand renal units
  - Based on ‘intention to treat’ with RRT, that is includes all patients in whom RRT was commenced in the belief that long term treatment will be required
  - Unable to determine those who commenced RRT with expectation of recovery

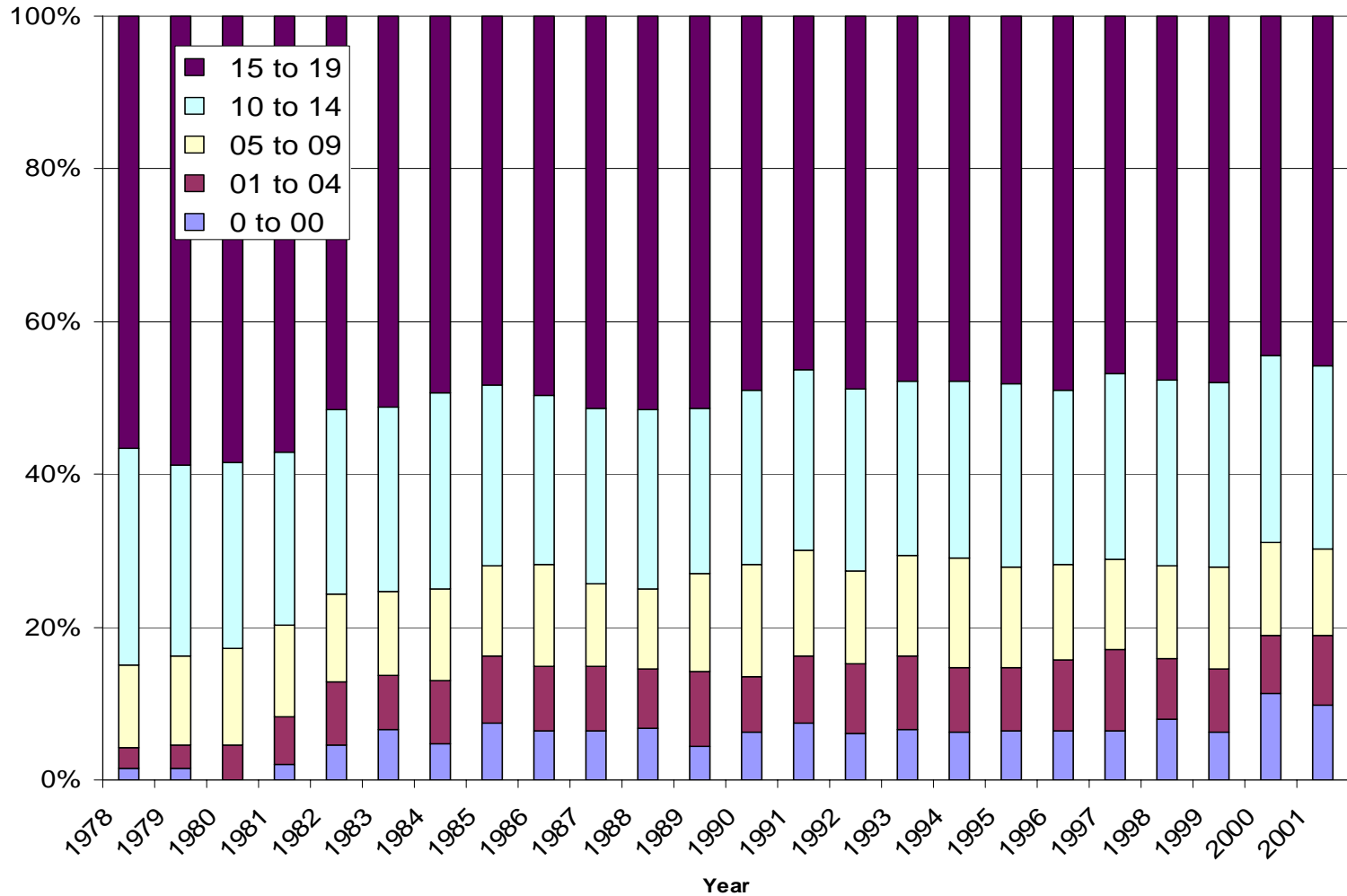


# Proportions of patients < 20 years at incident RRT



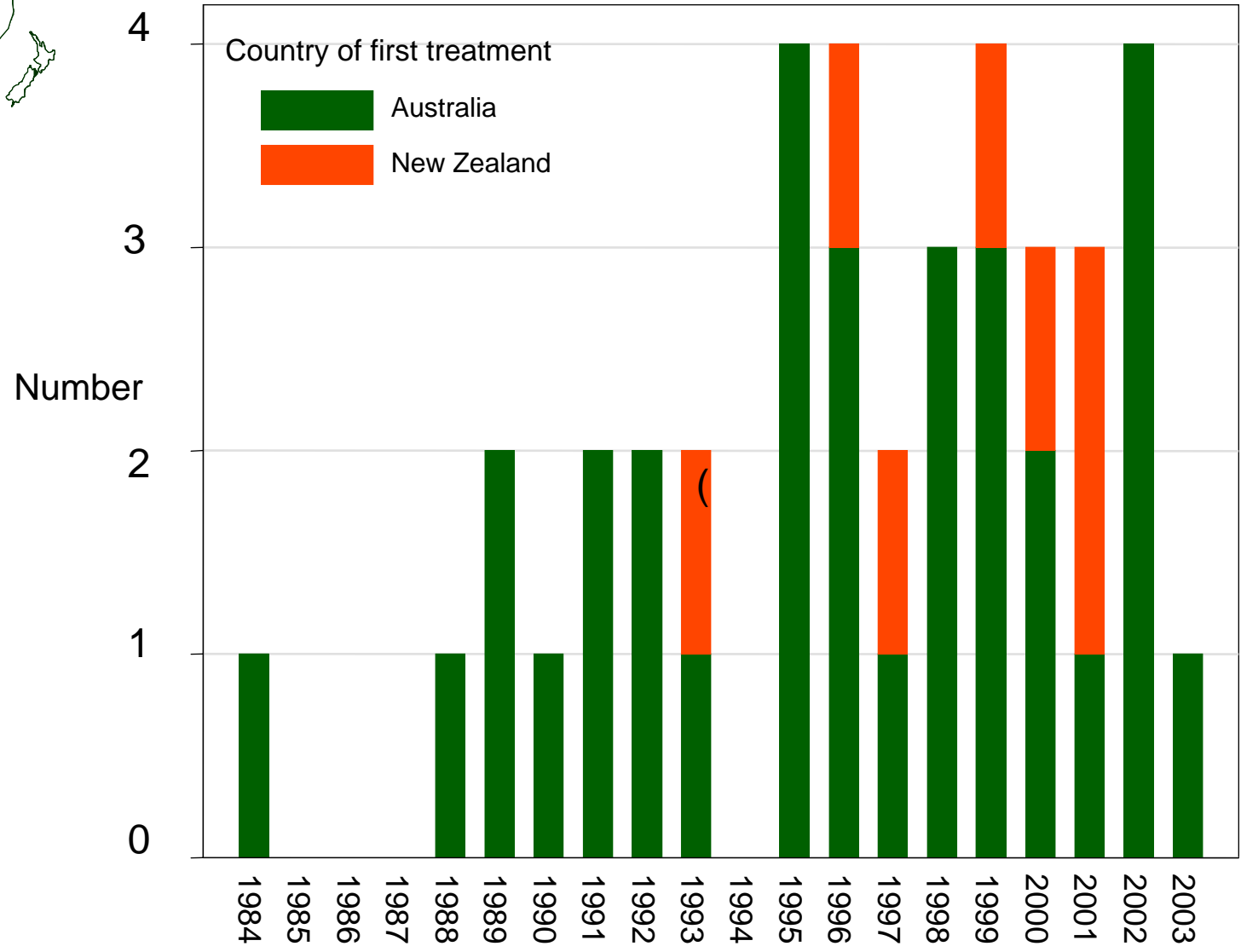


# USRDS comparisons





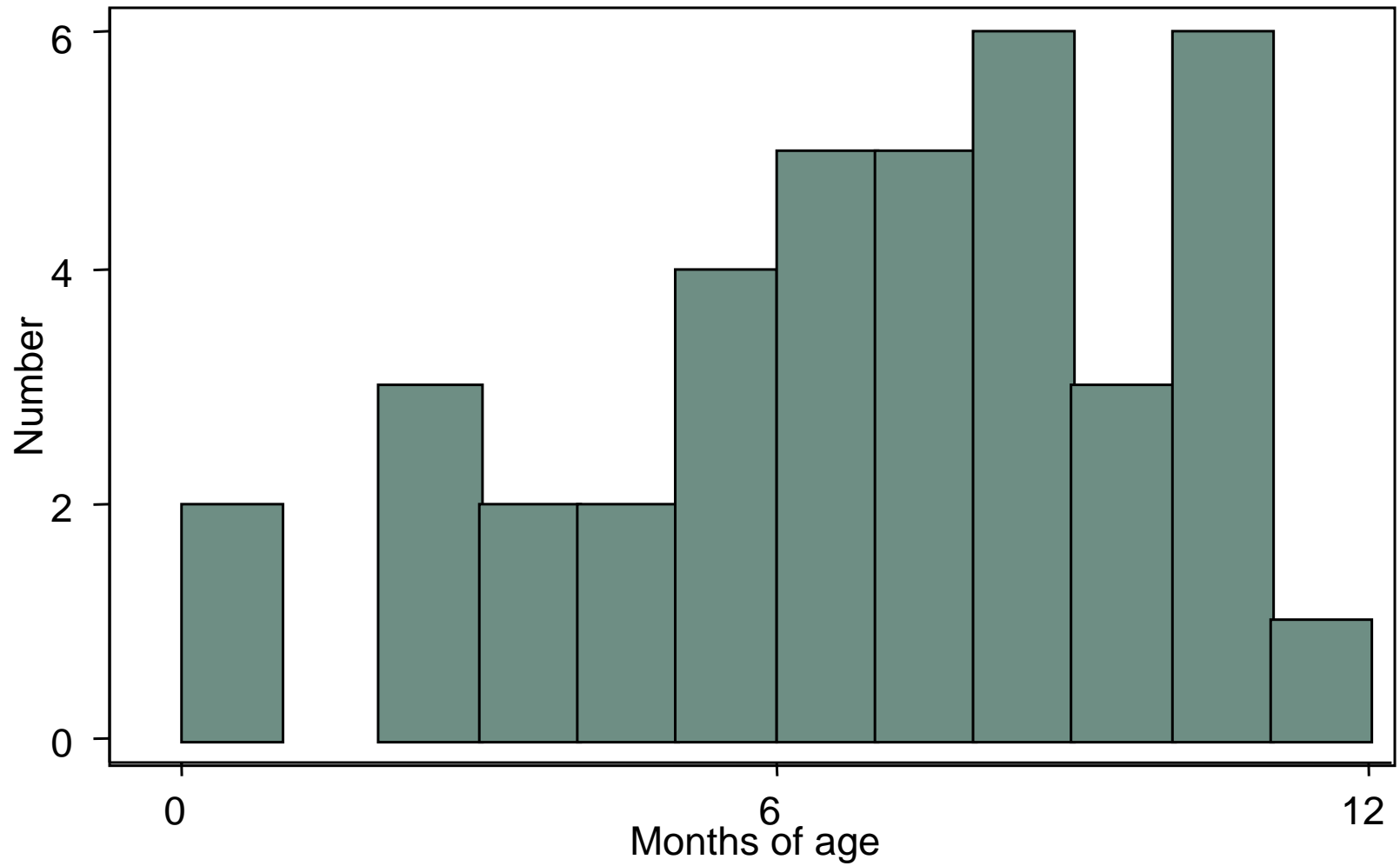
# Incident RRT < 12 months



39 infants reported to ANZDATA to 2003

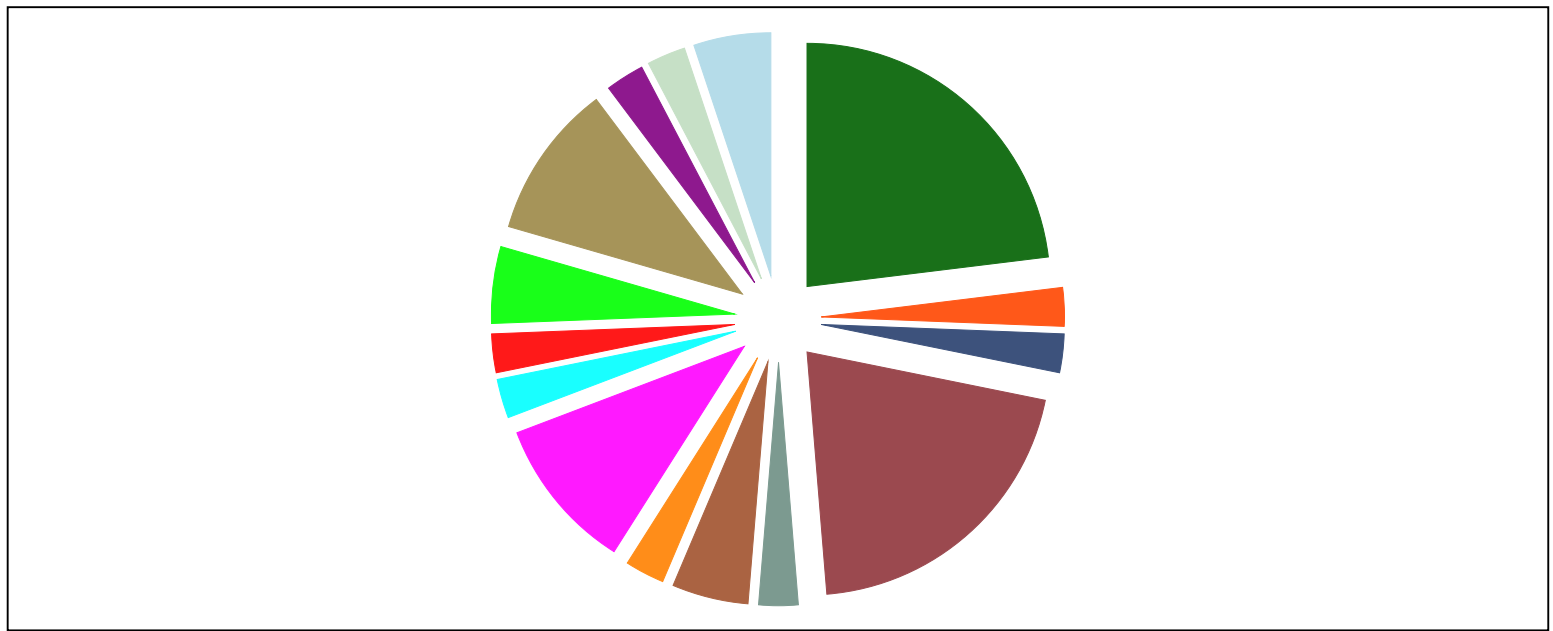

















# Infants - Age at commencement of RRT





# Causes of ESRD in infants < 12 months at start RRT



	Cong. renal dysplasia		Cong. tubulo interstitial nephritis
	Congenital finnish nephrosis		Congenital nephrotic syndrome
	Cortical necrosis		Denys-Drash syndrome
	Diffuse mesangiosclerosis		HUS
	Interstitial nephritis		Juvenile PCK
	Medullary cystic disease		Posterior urethral valves
	Prune belly syndrome		Reflux nephropathy
	Uncertain		



# Long term outcomes

- 35/39 initially treated with PD



# Long term outcomes

- 27 infants received a transplant
  - 8 DD, 19 LD (4 mother, 8 father)
  - Time to transplant:
    - median 18.4 [IQR 13.2-23.9] months
  - Age at transplant:
    - median 25.2 [IQR 20.6-33.0] months



# Long term outcomes

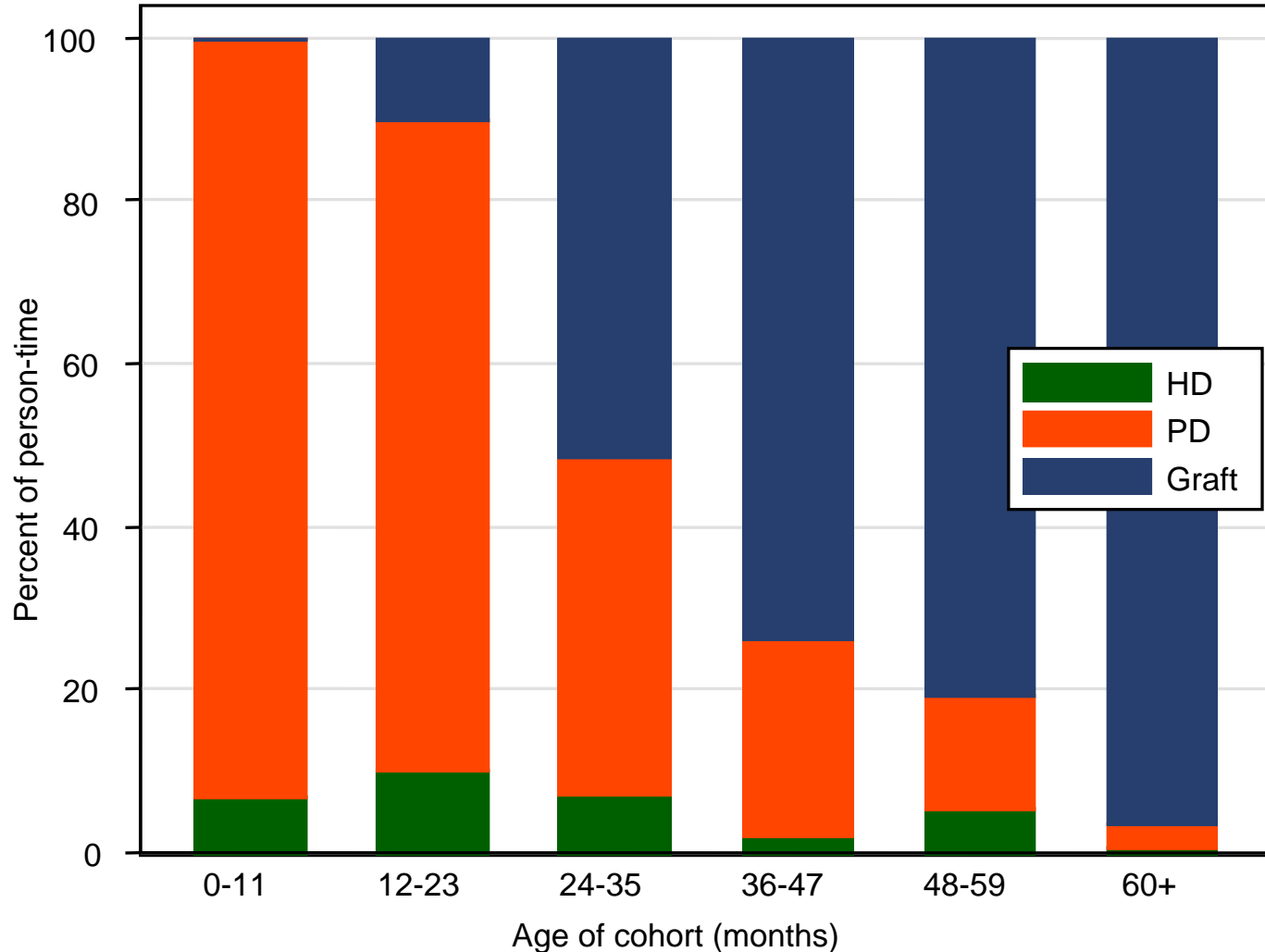
- 14 deaths (36%)

## Causes of death

- Infection – 6
  - Peritonitis 3
- Cardiac arrest - cause uncertain - 3
- Therapy ceased - 2
  - parental request
  - hypoxic brain damage
- Hyperkalaemia - 1
- Uraemia caused by graft failure - 1
- Acute demyelinating encephalopathy - 1



# RRT modalities



*Person-time by RRT modality, all ANZDATA <12 months at RRT start, as cohort ages. Data to 31 Sep 2003*

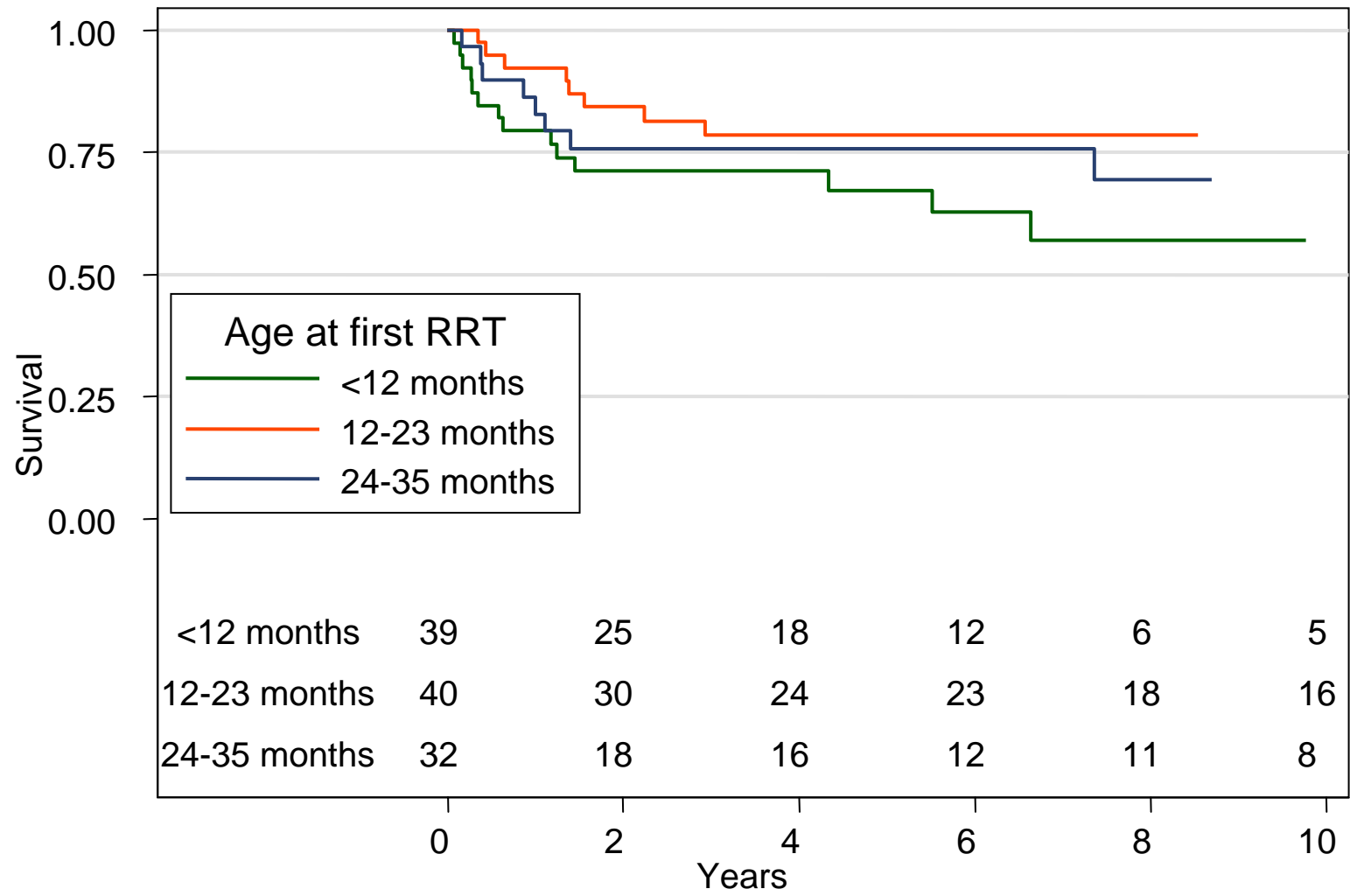


# Outcomes

- Survival [95% CI] of infants at...
  - 1 year            79 [95% CI 63-89]%        (n=29)
  - 2 year            71 [95% CI 54-83]%        (n=25)
  - 5 year            67 [95% CI 49-80]%        (n=15)
  - 10 year           57 [95% CI 37-73]%        (n=5)



# Long term survival of very young children - Age based comparisons





# Conclusions

- Experience of RRT in Australia and New Zealand is small, but increasing
- Peritoneal dialysis is usual dialysis modality
- Majority of infants are transplanted after a median of 18 months
- Mortality rate is high
- Outcome following transplantation does not appear as successful as older children



# Acknowledgement

- Dr Stephen McDonald, ANZDATA