The Thirty Third Report

Australia and New Zealand Dialysis and Transplant Registry

2010

Edited by

Stephen McDonald
Leonie Excell
Brian Livingston

Funded by

Australian Organ and Tissue Authority
Kidney Health Australia
New Zealand Ministry of Health

Supported by

AMGEN Australia Pty Ltd
Genzyme Australia
Janssen-Cilag Pty Ltd
Novartis Pharmaceuticals Australia Pty Ltd
Roche Products Pty Ltd
Wyeth Australia Pty Ltd

Funding

ANZDATA Registry is funded by

Australian Organ and Tissue Authority
Kidney Health Australia
New Zealand Ministry of Health

Supported by unrestricted research Grants from

AMGEN Australia Pty Ltd
Genzyme Australia
Janssen-Cilag Pty Ltd
Novartis Pharmaceuticals Australia Pty Ltd
Roche Products Pty Ltd
Wyeth Australia Pty Ltd

Coordinating Centre

ANZDATA Registry
9th Floor - East Wing
Royal Adelaide Hospital
North Terrace,
Adelaide, South Australia, 5000

Phone (61-8) 8222.0949
Fax (61-8) 8222.0985 / 8222.0995
Email anzdata@anzdata.org.au
Web http://www.anzdata.org.au

Prof G Russ	Chair of ANZDATA Executive
A/Prof S McDonald	Executive Officer ANZDATA / Editor
Dr P Clayton	Amgen Fellow in Epidemiology
Mrs L Excell	Registry Manager / Editor (Retired Oct 2010)
Mr B Livingston	Information Manager
Mrs H Dent	Biostatistician
Dr N Briggs	Biostatistician
Dr B Grace	Research Fellow - ANZDATA Registry
Ms C Leitch	Administration
Ms K Textor	Administration

Printed in Adelaide, South Australia, 2011

ISSN 1329-2870

Acknowledgments

ANZDATA Registry offers its most grateful appreciation to everyone who helped make this 33rd Annual Report possible, especially the professionals and the staff of all the Renal Units and Tissue Typing Laboratories, upon whose reporting of data this enterprise ultimately depends.

Suggested Citation

An example of suggested citation for this report is as follows:

.. [Author's name] ..
Peritoneal Dialysis .. [page numbers] ..
ANZDATA Registry Report 2010
Australia and New Zealand Dialysis and Transplant Registry
Adelaide, South Australia.

Editors: Stephen McDonald, Leonie Excell, Brian Livingston

Publications based upon ANZDATA Registry information reported here or supplied upon request, must include the citation as noted above and the following notice:

The data reported here have been supplied by the Australia and New Zealand Dialysis and Transplant Registry. The interpretation and reporting of these data are the responsibility of the Editors and in no way should be seen as an official policy or interpretation of the Australia and New Zealand Dialysis and Transplant Registry.

APPENDIX II - AUSTRALIA **(Available on CD and from website www.anzdata.org.au)**

CONTENTS

APPENDIX III - NEW ZEALAND **(Available on CD and from website www.anzdata.org.au)**

CONTENTS

The Registry acknowledges that the report is a tribute to the commitment and involvement of renal units throughout Australia and New Zealand. This commitment results in an enormous amount of time and work from staff of these units. It has ensured 100% of units in Australia and New Zealand participate and we continue to be confident that all the patients who have received chronic dialysis and transplantation treatments in Australia and New Zealand in this time period are included.

Lee Excell continued in her role as manager of the Registry for the bulk of 2010. Her retirement in December brings to a close a career with the Registry which has extended for almost 34 years. The Registry wishes to acknowledge her enormous contribution to its success. She was present at the inception of the Registry and has fostered and nurtured its development as arguably the most successful Registry of its type in the world. We are pleased that she will provide further advice and consultancy in the future.

Brian Livingston continues as information manager and Christina Leitch has continued to provide administrative support. Bio-statistical expertise has been provided by Hannah Dent and Nancy Briggs.

Associate Professor Stephen McDonald continues in his role as Executive Officer of the Registry. His intellectual and academic leadership of the Registry has maximised the dissemination of the data and its analysis both nationally and internationally.

In 2010 Dr Philip Clayton was appointed Amgen Fellow in Epidemiology. We look forward to his involvement with the Registry and believe that this position is a major stimulus for the academic output of the Registry. We are greatly indebted to Amgen who continue to make a commitment to the funding of this position.

The ANZDATA Registry Steering Committee has once again been chaired by Professor Steven Chadban. We thank Steven for his inspired leadership and his ongoing interest in the Registry and its operations and output.

Major funding for the Registry has been provided from the Australian Commonwealth Department of Health and Ageing through the Australian Organ and Tissue Donation and Transplant Authority, Kidney Health Australia and the New Zealand Ministry of Health.

We are also grateful to industry for support. Non-tied grants have been received from Amgen for the employment of the Epidemiology Fellow which continued in 2010.

Once again involvement of many individuals who have been members of the ANZDATA Registry committees and working groups are greatly acknowledged. The members of these groups are listed on Page vii. .

2010 has proven to be a year of major change and upheaval for the Registry. After 33 years being housed at The Queen Elizabeth Hospital a move to the Royal Adelaide Hospital occurred in February 2010. We also gratefully thank the South Australian Department of Health for providing housing at the Royal Adelaide Hospital for the Registry. It would not be possible for the activities of the Registry to occur without this in-kind support.

Graeme Russ
Chair ANZDATA Executive
December 2010

ANZDATA REGISTRY EXECUTIVE COMMITTEE

Professor Graeme Russ—Chair
A/Professor Stephen McDonald—Executive Officer
Mrs Leonie Excell—Registry Manager
Mr Brian Livingston—Information Manager

ANZDATA REGISTRY STEERING COMMITTEE (2010 MEMBERS)

Professor Steven Chadban—Chair
Professor Graeme Russ
A/Professor Stephen McDonald
Mrs Leonie Excell
Dr Fiona Brown (Project Manager—Peritoneal Dialysis)
Dr Scott Campbell (Project Manager—Transplantation)
A/Professor Francesco Ierino
Dr Matthew Jose (Indigenous Interest Group)
Dr Vicki Levidiotis (Project Manager—Parental/Neonatal Outcomes Group)
Dr Wai Lim
Dr Maureen Lonergan
Dr Kelvin Lynn (New Zealand Representative)
Dr Timothy Mathew (Kidney Health Australia Representative)
Dr Steven McTaggart (Project Manager—Paediatric Group)
A/Professor Kevan Polkinghorne (Project Manager—Haemodialysis)
Dr Angela Webster (Project Manager—Cancer)
Dr Germaine Wong (Fellow in Cancer Epidemiology)
Ms Gillian Gorham (Nursing Representative)
Mr Damian Harding (Consumer Representative)

ANZDATA REGISTRY WORKING GROUPS (2009 MEMBERSHIP)

Transplant Working Group

Dr Scott Campbell (Project Manager)
A/Professor Stephen McDonald
Professor Graeme Russ
Professor Steven Chadban
Dr Wai Lim
Dr Shlomo Cohney

Cancer Working Group

Dr Angela Webster (Project Manager)
Dr Germaine Wong (Fellow in Cancer Epidemiology)
A/Professor Stephen McDonald
Professor Randall Faull
Professor Adrian Hibberd
Professor Jonathon Craig
Dr Rob Carroll

Peritoneal Dialysis Working Work

Dr Fiona Brown (Project Manager)
Professor David Johnson
A/Professor Stephen McDonald
A/Professor Kym Bannister
A/Professor Johan Rosman
Dr Kate Wiggins

Paediatric Working Group

Dr Steven McTaggart (Project Manager)
A/Professor Stephen McDonald
Dr Sean Kennedy

Haemodialysis Working Group

A/Professor Kevan Polkinghorne (Project Manager)
A/Professor Stephen McDonald
Professor Richard Allan
A/Prof Rowan Walker
Dr Mark Marshall,
Dr Vincent Lee

Parental/Neonatal Outcomes Group

Dr Vicki Levidiotis (Project Manager)
A/Professor Stephen McDonald
Dr Stephen Alexander
Ms Kathy Kable
Dr George Mangos
Dr Angela Makris

Indigenous Interest Group

Dr Matthew Jose (Project Manager)
Ms Gillian Gorham
Professor John Collins
Dr Mark Thomas
Dr Natasha Rogers
Dr Jacqueline Hughes
Lesley Salem

PRIVACY

In December 2001 changes to the Commonwealth Privacy Act were introduced which have led to changes to the collection of personal information. Essentially these extend to the private sector a number of changes based around 10 “National Privacy Principles” (NPP’s). A detailed exposition of these can be found at the Privacy Commissioner’s website (www.privacy.gov.au). Briefly, however, health information is treated as “sensitive” information, which must usually be collected and handled with consent of the person, unless certain conditions are met. Patients are entitled to view the information the Registry holds about them, and request alterations if the data is thought to be inaccurate.

Each Australian State has also enacted similar provisions which cover practice and patients in public hospitals.

ANZDATA does not release data identifiable by patient name. Results are published/released in tabular or graphic format only. Requests for data are met using deindentified data only. On occasion, when data identifying particular hospitals is involved, consent from the Director of the relevent renal unit is sought prior to the release of information.

COLLECTION OF DATA

ANZDATA spent some time during 2002 formulating an appropriate response to these issues including seeking advice from a variety of sources. The approach taken has been that of a “opt-out” consent, whereby patients are distributed information outlining the nature and purpose of the information collected, offered an opportunity to view that data and ask questions, and the opportunity to request withdrawal of part or all of their data. This approach is explicitly suggested for Registries by the Privacy Commissioner in his “Guidelines for the Health Sector”. To this end ANZDATA has circulated to all participating hospitals a patient information sheet (see opposite), for each hospital to use (or a locally modified version if appropriate) to inform patients.

At the time of data collection each unit is asked to certify that they have complied with measures under the relevant privacy measures.

Tissue Typing Data and Transplant Waiting List data are collected in each Tissue Typing Laboratory and entered into the National Organ Matching System database. These data are transmitted to ANZDATA for inclusion in the ANZDATA database and for this Report.

ANZDATA REGISTRY

AUSTRALIA AND NEW ZEALAND DIALYSIS AND TRANSPLANT REGISTRY

C/- Royal Adelaide Hospital
North Terrace,
Adelaide, 5000
South Australia

Phone: (08) 8222.0949
Fax: (08) 8222.0985
Email: anzdata@anzdata.org.au
Web:http://www.anzdata.org.au

Important Privacy Information

As part of routine medical care of people receiving treatment with dialysis or kidney transplantation, your kidney specialist collects certain information about the patients they treat. All kidney specialists throughout Australia and New Zealand report this information every twelve months to the Australia and New Zealand Dialysis and Transplant Registry (ANZDATA). ANZDATA collects the information for the purpose of monitoring treatments and performing analyses to improve quality of care for people with kidney failure.

1. What is ANZDATA ?
ANZDATA is an organization set up by Kidney Health Australia and the Australia and New Zealand Society of Nephrology to monitor dialysis and transplant treatments. ANZDATA is funded by the Australian and New Zealand Governments and Kidney Health Australia.

2. What information is collected about you ?
This information includes your name, age, gender, racial origin, hospital of treatment, some aspects of your medical condition (such as whether you have diabetes) and details about the type of kidney treatment you are receiving (dialysis or transplant).

We **DO NOT** collect details about your address, telephone number, medical insurance, or non-medical matters such as occupation, income, etc.

3. Is personal data ever released ?
The identity of people in the database **IS NOT released publicly nor in any reports**. Measures have been put into place to ensure the security of all collected information.

4. What is this information used for ?
The information is used primarily for quality assurance, investigating patterns of kidney disease, and planning appropriate health services. We release reports on a variety of topics, including an Annual Report examining the rates and treatment of kidney failure in Australia and New Zealand. We also have a major role in ensuring the quality of patient care by sending to each kidney unit each year a report outlining their activity. These reports also compare the outcome of the treatment they provide with that of other units throughout the two countries. Reports are also produced at a state and national level, and from time to time analyses are also produced for renal units, government health departments and industry concentrating on particular aspects of renal failure management eg peritoneal dialysis, transplantation, haemodialysis.

5. **Can you see what personal information ANZDATA collects and the reports that it produces ?**
Individuals are able to view their own information on request. You can request alterations if you believe it is inaccurate. You may also opt not to have your treatment included in this database, and you should let your kidney specialist know if this is the case. You can also choose not to have some information (eg racial origin) recorded. However, if your information is not included in the Registry, the ability to compare results in Australia and New Zealand or to analyse the results of different treatment methods and for different patient types (eg diabetics) will be compromised.

The national reports and much other material produced by ANZDATA are available free on the Internet at www.anzdata.org.au, or they can be sent to you on request to the address above. Your kidney specialist will also have copies of many of the reports.

If you wish to discuss any of the issues raised here, please let your doctor know or telephone the ANZDATA Registry direct on [08] 8222 0949. You may also write to us (ANZDATA Registry, C/- Royal Adelaide Hospital, DX800, Mail Point 117, North Terrace, Adelaide, SA. 5000) or send us an e-mail (anzdata@anzdata.org.au).

GUIDELINES FOR DATA RELEASE

The policy for release of data to investigators, renal units and others was revised during 2002 and is summarised on the Website. ANZDATA encourages the analysis, use and citation of its data, and receives many data requests annually which vary in size and complexity. At times these overwhelm the limited resources within the Registry, and must be prioritised. Generally, formal requests for data are preceded by a period of consultation with a member of the Registry staff. Requests are welcome from Renal Physicians, other staff members of Renal Units, Charitable Bodies, Academic Institutions, Government Departments and Industry. Requests dealing with identifiable Hospital data (ie data which identifies outcomes of an individual hospital) will only be fulfilled with the explicit consent of the Heads of the relevant Hospital Units. Individual patient identified data (names) is not released.

ATTRIBUTION OF PUBLICATIONS

The policy on attribution of publications which incorporate ANZDATA sourced data was revised during 2002, following a period of consultation with participating physicians.

Where a member of a participating unit has analysed data provided by ANZDATA and subsequently prepared a manuscript, then “ANZDATA Registry” should be acknowledged as a secondary institution in addition to the author’s Hospital or University. This applies whether the primary data analysis is performed by the author or by ANZDATA staff. Where the author is an ANZDATA office holder or staff member then the primary attribution should be “ANZDATA Registry”.

Where ANZDATA data is only a minor portion of the work, then it may be more appropriate to acknowledge the source explicitly in the “Acknowledgements” section.

In both cases the disclaimer on page ii of this report should be included.

In all cases the source and treatment of the data should be made clear in the “Methods” section. Preferably the abstract (and keywords if applicable) should also include “ANZDATA” which would allow for searching Registry publications.

Dr Nancy Briggs
Biostatistician
ANZDATA Registry
Royal Adelaide Hospital, North Terrace,
Adelaide, South Australia, 5000

Dr Fiona Brown
Nephrologist
Department of Nephrology
Monash Medical Centre
Clayton Road, Clayton, Victoria, 3168

Dr Scott Campbell
Nephrologist and Transplant Physician,
Princess Alexandra Hospital, Ipswich Road,
Woolloongabba, Queensland, 4102

Dr Philip Clayton
Epidemiologist, ANZDATA Registry
Royal Adelaide Hospital, North Terrace,
Adelaide, South Australia, 5000

Professor Steven Chadban
Chair - ANZDATA Registry
Nephrologist and Transplant Physician,
Royal Prince Alfred Hospital, Missenden Road,
Camperdown. New South Wales, 2000

Mrs Hannah Dent
Biostatistician
ANZDATA Registry
Royal Adelaide Hospital, North Terrace,
Adelaide, South Australia, 5000

Mrs Leonie Excell
ANZDATA Registry Manager
Royal Adelaide Hospital, North Terrace,
Adelaide, South Australia, 5000

Dr Blair Grace
ANZDATA Registry - Research Fellow
Royal Adelaide Hospital, North Terrace
Adelaide, South Australia, 5000

Ms Kathy Hee
Manager
Donate Life
165 Grenfell Street
Adelaide, South Australia, 5000

Dr Lilian Johnstone
Paediatric Nephrologist
Department of Paediatric Nephrology
Monash Children's at Clayton, Southern Health
Clayton, Victoria, 3168

Dr Matthew Jose
Nephrologist
Department of Nephrology
Royal Hobart Hospital
Hobart, Tasmania, 7000

Dr Sean Kennedy
Paediatric Nephrologist
Nephrology Department
Sydney Children's Hospital
Randwick, NSW, 2031

Mr Brian Livingston
ANZDATA Registry, Information Manager
Royal Adelaide Hospital, North Terrace,
Adelaide, South Australia, 5000

Associate Professor Stephen McDonald
Executive Officer, ANZDATA
Royal Adelaide Hospital, North Terrace,
Adelaide, South Australia, 5000

Dr Steven McTaggart
Paediatric Nephrologist
Renal Unit
Princess Alexandra Hospital, Ipswich Road,
Woolloongabba, Queensland, 4102

Associate Professor Kevan Polkinghorne
Nephrologist
Department of Nephrology
Monash Medical Centre
Clayton Road, Clayton, Victoria, 3168

Professor Graeme Russ
Chair ANZDATA Executive, Co-Director Renal Unit
Royal Adelaide Hospital, North Terrace,
Adelaide, South Australia, 5000

Dr Angela Webster
Senior Lecturer (Clinical Epidemiology) / Nephrologist
School of Public Health
Edward Ford Building A27
University of Sydney, NSW, 2006

Dr Germaine Wong
Fellow in Cancer Epidemiology
ANZDATA Registry
Royal Adelaide Hospital, North Terrace,
Adelaide, South Australia, 5000

A number of definitions given below are used throughout this report unless otherwise stated.

1. Wording

Throughout this report 'treatment' refers to renal replacement therapy, including haemodialysis, peritoneal dialysis and transplantation. In places the word "graft" (or "allograft") is used for kidney transplant.

HD = haemodialysis CAPD = continuous ambulatory peritoneal dialysis APD = automated peritoneal dialysis
ESKD = end stage kidney disease

2. Data collection

ANZDATA collects information from all renal units in Australia and New Zealand. Data collection occurs at two time points. Key events (new patients, deaths, transplants) are notified as they occur, with units requested to send this at least monthly. This can occur either via a web-based interface or paper submission. An extensive cross-sectional survey is then performed twelve monthly (for data to 31st December). Currently this is by a paper-based system, with manual completion of the form and manual data entry. No formal audit mechanism is in place at this stage.

For kidney transplants, HLA matching and panel reactive antibodies are obtained direct from the Tissue Typing laboratories in each State.

Monthly summaries are distributed to the contributing units. Results contained in this (and other reports) are based on a final database locked and prepared after the end of year survey returns are received.

3. Inclusion criteria

Included in the Registry are all patients resident in Australia or New Zealand receiving renal replacement therapy where the intention to treat is long-term, ie medical opinion is that renal function will not recover. Cases of acute renal failure are excluded. People who move overseas permanently are censored at date of last treatment (or departure in the case of transplant recipients).

4. Modality attribution

The initial mode of dialysis is determined at 90 days after first treatment, to allow for early changes and maturation of access. Other transfers (between modalities, or from satellite to hospital haemodialysis etc.) are not analysed if less than 30 days, except for transfers between dialysis centres to which a 60 day rule is applied to allow for holiday movements.

5. Underlying renal disease

This is recorded by the treating hospital according to a modified EDTA coding system (details on back of survey form).

6. Deaths

Death rate is predominantly reported as number of patients died/total number of years of treatment of all patients treated at any time during the year. It is expressed as deaths per 100 patient years (pt yrs) at risk.

7. Comorbid conditions

These are recorded by the treating hospital. No formal definitions are supplied; the treating clinician is asked to record whether the patient has coronary artery disease, chronic lung disease, cerebrovascular disease, peripheral vascular disease or diabetes according to their clinical opinion on a yes / suspected / no basis.

8. Transplant Waiting List

The active transplant waiting list is based on data from the ARCBS Tissue Typing Laboratories, cross-checked with ANZDATA. Waiting list analyses are for patients' status at 31st December 2009.

9. Derived measures

9.1 Haemoglobin

Haemoglobin is recorded as the last available measurement before the end of the survey period.

9.2 Erythropoietic agents

Erythropoietin agent use is recorded as "yes" if these agents were used at any time during the survey period.

9.3 Iron studies

Iron studies are requested within the last three months of the survey period.

9.4 Estimated creatinine clearance

Where creatinine clearance is estimated from serum creatinine at entry or post transplantation, the Cockroft-Gault equation is used [1].

$Cl_{Cr}=(140\text{-age})*\text{weight} / (814*Cr_{serum})$[*0.85 if female]

The weight term used for this is lean body mass, calculated using the equation LBW=(0.9*[height-152])+(50 if male, 45.5 if female) [2].

9.5 Urea reduction ratio / Kt/V

Results are requested in one of these formats, using the stop flow method on a mid-week dialysis. Single pool Kt/V is collected, along with the method used. For conversion of URR to Kt/V urea the formula used [3] is

Kt/V = 0.023*PRU - 0.284 (note that PRU = percent reduction in urea and not URR).

9.6 Body mass index

Body mass index (BMI) is calculated as $\frac{\text{weight (kg)}}{(\text{height (m)})^2}$

The categories used are : underweight <20 kg/m^2 , normal 20-24.9 kg/m^2, overweight 25-29.9 kg/m^2, obese>=30 kg/m^2

9.7 Peritoneal dialysis measures

These are the standard measures, often calculated by computerised patient management programs.

9.7.1 Residual renal function

The measure used is the arithmetic mean of urea and creatinine clearance from a 24-hour urine collection and serum creatinine and urea.

9.7.2 Peritoneal equilibration test

The ratio of dialysate to plasma glucose is used, following a 4 hour dwell of a 2 litre 2.5% bag of dialysate, performed within 6 months after initiation of peritoneal dialysis.

10. Rates and Measures

10.1 Incidence rates

Except where otherwise stated, quoted incidence rates are per calendar year, and are expressed per million population.

10.2 Prevalence rates

Except where otherwise specified, prevalence rates are point prevalence rates at 31st December 2009.

10.3 Population denominator

The population estimates used are the estimated resident populations (ERP) for the year 2009, released by the Australian Bureau of Statistics and Statistics New Zealand. Figures used are those for the June quarter.

For both countries, the statistics bureaux record indigenous status on a self-identification basis For Australia, there has been considerable change in the propensity to self-identify as indigenous, such that a number of `estimates are released by the ABS [4]. For this report, the low range projections have been used.

10.4 Survival rates

For transplant recipients, survival rates exclude those who were transplanted overseas or were recipients of multiple organ grafts.

Graft survival (unless otherwise qualified) includes both cessation of graft function (ie return to dialysis) and patient death.

Rates for patient survival for fixed periods for transplantation are calculated according to the life-table method and thus include an adjustment to the risk-set of ½ of those censored without failure over the interval to create an “average” risk set.

10.5 Graft survival

For outcomes of kidney transplants, graft failure includes both loss of graft function (ie return to dialysis) and death of patients (with graft function). Calculations of patient survival for transplant recipients includes all subsequent modalities (i.e. deaths after graft failure are included). Patients transplanted overseas are excluded from calculations.

10.6 Dialysis Survival

Patient and technique survivals for haemodialysis and peritoneal dialysis are based on the dialysis modality at 90 days after first treatment for patients not transplanted during that period. Patients are followed up until they are either transplanted (at which point they are censored) or until they have a 'permanent' change of dialysis modality or until death or most recent follow up date. A 'permanent' change of dialysis is defined as any change in excess of 30 days.

Peritonitis survivals are calculated from first peritoneal dialysis (ignoring all earlier treatments) to date of first peritonitis episode. If there were no episodes of peritonitis then calculation is censored at change of treatment from peritoneal dialysis to haemodialysis or transplantation. Peritoneal dialysis includes automated peritoneal and continous ambulatory peritoneal dialysis. Excluded are patients who had peritonitis before commencing peritoneal dialysis.

10.8 Death and other event rates

Rates are expressed per 100 person years at risk (unless otherwise stated). Some analyses include survival of all patients, others exclude the first 90 days of followup. This is stated in the individual analyses.

10.9 Age standardisation

All rates are crude, not age-standardised. The age distribution of the populations for Australia and New Zealand are given in Appendix I.

10.9 Peritonitis rates

Peritonitis rates are present using episodes of peritonitis reported during periods of peritoneal dialysis - episodes reported prior to commencement of peritoneal dialysis (for example between Tenckhoff catheter insertion and commencement of peritoneal dialysis) are not included in these calculations.

11. Database

Data is stored on a relational database using ORACLE version 9I.

12. Statistics

Statistical analyses were performed using STATA version 11.

13. References

1. Cockcroft DW, Gault MH: Prediction of creatinine clearance from serum creatinine. Nephron 1976: 16;31-41.
2. Zasadny KR, Wahl RL: Standardized uptake values of normal tissues at PET with 2-[fluorine-18]-fluoro-2-deoxy-D-glucose: variation with body weight and method for correction. Radiology 1993: 189;847-850.
3. Basile C, Casino F, Lopez T: Percent reduction in blood urea concentration during dialysis estimates Kt/V in a simple and accurate way. Am J Kidney Dis 1990: 15;40-45.
4. Australian Bureau of Statistics: Experimental Projections of the Aboriginal and Torres Strait Islander Population. Canberra, ABS Cat. No. 3101.0, 2002.

Parent hospitals are listed below. In some cases, these have combined as part of a regional network and this is also indicated. The definition of a 'parent hospital' is a pragmatic one, and refers to units which offer a full range of dialysis services (i.e. can commence patients on dialysis, have on-site nephrologist presence and can deal wtith patients of all degrees of complexity).

In contrast, satellite units (see Page xvii) provide haemodialysis treatments to selected patients, usually with lower staff ratios and no on-site nephrologist.

QUEENSLAND

Allamanda Private Hospital (Fresenius)
Bundaberg Base Hospital
Cairns Base Hospital
Chermside Dialysis Unit (Fresenius)
Child and Adolescent Renal Service
Goldcoast Hospital
Henry Dalziel Dialysis Centre (Greenslopes) (Baxter)
Hervey Bay Hospital
John Flynn Hospital
Mackay Base Hospital
Princess Alexandra Hospital
  Queensland Renal Transplant Service
Rockhampton Base Hospital
Royal Brisbane Hospital
St Andrew's Dialysis Clinic (Diaverum)
Sunshine Coast Health District
  Caloundra Private Hospital
  Nambour General Hospital
  Nambour Selangor Private Hospital
The Townsville Hospital
Toowoomba Hospital
Wesley Private Hospital

NEW SOUTH WALES

Coffs Harbour Hospital
Dubbo Base Hospital
East Coast Renal Service
  Prince of Wales Hospital
  St. George Hospital
  St. Vincent's Hospital
  Sydney Children's Hospital
  Wollongong Hospital
Gosford Hospital
John Hunter Hospital
Lismore Hospital
Lismore Private Dialysis Clinic
Macleay Dialysis Centre - Kempsey
Manning Rural Referral Hospital
Mater Misericordiae Hospital
Mayo Private - Taree
Port Macquarie Base Hospital
Port Macquarie Private Hospital
Royal North Shore Hospital
South West Sydney Renal Services
  Liverpool Hospital
Statewide Renal Services
  Concord Hospital
  Royal Prince Alfred Hospital
Sydney Adventist Hospital
Tamworth Hospital
The Children's Hospital at Westmead
The Tweed Hospital
Western Renal Network
  Nepean Hospital
  Orange Hospital
  Westmead Hospital

AUSTRALIAN CAPITAL TERRITORY (ACT)

The Canberra Hospital

VICTORIA

Alfred Hospital
Austin Health
Eastern Health Integrated Renal Services
Epworth Hospital
Forest Hill Dialysis Centre (Fresenius)
Geelong Hospital
Kew Private Dialysis Centre
Malvern Dialysis Centre (Fresenius)
Monash Medical Centre – Adult
Monash Medical Centre – Paediatric
North West Dialysis Service
Royal Melbourne Hospital
Royal Children's Hospital
St. Vincent's Hospital
Western Health

TASMANIA

Launceston General Hospital
Royal Hobart Hospital

SOUTH AUSTRALIA

Flinders Medical Centre
The Queen Elizabeth Hospital
Royal Adelaide Hospital
Women's and Children's Hospital

NORTHERN TERRITORY

Alice Springs Hospital
Royal Darwin Hospital

WESTERN AUSTRALIA

Fremantle Hospital
Hollywood Private Hospital
Princess Margaret Hospital for Children
Royal Perth Hospital
Sir Charles Gairdner Hospital
St. John of God Private Hospital

NEW ZEALAND

Auckland City Hospital
Starship Children's Hospital
Christchurch Hospital
Dunedin Hospital
Hawkes Bay Hospital
Middlemore Hospital
Palmerston North Hospital
Taranaki Base Hospital
Waikato Hospital
Wellington Hospital
Whangarei Area Hospital

QUEENSLAND

Queensland Renal Transplantation Service
Princess Alexandra Hospital (Adult and Paediatric)
Director of Transplantation - Dr Tony Griffin
Ipswich Road
Woolloongabba 4102

NEW SOUTH WALES

John Hunter Hospital
Director of Transplantation - Professor Adrian Hibberd
Lookout Road
New Lambton Heights
Newcastle 2304

Prince of Wales Hospital
Director - Professor Bruce Pussell
Barker Street
Randwick 2031

Royal North Shore Hospital
Director - Dr Bruce Cooper
Pacific Highway
St Leonards 2065

Statewide Renal Services (Royal Prince Alfred Hospital)
Director of Transplantation - Professor Steven Chadban
Missenden Road
Camperdown 2050

Sydney Children's Hospital
Director - Dr Andrew Rosenberg
C/- Department of Nephrology
Prince of Wales Hospital
Barker Street
Randwick 2031

The Children's Hospital at Westmead
Director - Dr Stephen Alexander
Cnr Hawkesbury and Hainsworth Street
Westmead 2145

Westmead Hospital
Director - Professor Jeremy Chapman
Cnr Hawkesbury and Darcy Road
Westmead 2145

VICTORIA

Alfred Hospital
Director - Professor Napier Thomson
Commercial Road
Prahran 3181

Austin Health
Director - Dr David Power
Burgundy Road
Heidelberg 3084

Monash Medical Centre (Paediatric)
Director - Dr Amanda Walker
246 Clayton Road
Clayton 3165

Monash Medical Centre (Adult)
Director - Professor Peter Kerr
246 Clayton Road
Clayton 3165

Royal Children's Hospital
Director - Dr Colin Jones
Flemington Road
Parkville 3052

VICTORIA (CONTINUED)

Royal Melbourne Hospital
Director - Professor Gavin Becker
Parkville 3052

St. Vincent's Hospital
Director - Professor Robyn Langham
41 Victoria Parade
Fitzroy 3065

SOUTH AUSTRALIA

Central Northern Adelaide Transplant Service (from Jan 1, 2010)
Royal Adelaide Hospital
Director - Professor Graeme Russ
North Terrace
Adelaide 5000

(formerly) - The Queen Elizabeth Hospital
Woodville, South Australia 5011

Women's and Children's Hospital
Director - Dr Paul Henning
72 King William Road
North Adelaide 5006

WESTERN AUSTRALIA

Princess Margaret Hospital for Children
Director - Dr Ian Hewitt
Roberts Road
Subiaco 6008

Royal Perth Hospital
Director - Dr Kevin Warr
Wellington Street
Perth 6001

Sir Charles Gairdner Hospital
Director - Dr Harry Moody
Verdun Street
Nedlands 6009

NEW ZEALAND

Auckland City Hospital
Director - Dr Ian Dittmer
Park Road
Grafton, Auckland

Christchurch Hospital
Director - Dr David McGregor
Riccarton Avenue
Christchurch

Starship Children's Hospital
Director - Dr William Wong
Park Road
Grafton, Auckland

Wellington Hospital
Director - Dr Grant Pidgeon
Riddiford Street
Newtown, Wellington South

QUEENSLAND

Atherton Private Hospital - Cairns Base Hospital
Cairns Home Training Unit - Cairns Base Hospital
Cairns Private Hospital Satellite - Cairns Base Hospital
Cooktown Satellite - Cairns Base Hospital
East Street Self Care Dialysis Unit - Rockhampton Hospital
Gympie Satellite - Sunshine Coast Health District
Home Hill Satellite - Townsville Hospital
Innisfail Hospital - Cairns Base Hospital
Ipswich Satellite - Princess Alexandra Hospital
Kingaroy Satellite - Toowoomba Hospital
Logan Satellite - Princess Alexandra Hospital
Mossman Satellite - Cairns Base Hospital
Mt. Isa Satellite - Townsville Hospital
Noosa Satellite - Sunshine Coast Health District
North Lakes Dialysis Unit - Royal Brisbane Hospital
North Ward Satellite - Townsville Hospital
Palm Island Satellite - Townsville Hospital
Redcliffe Satellite - Royal Brisbane Hospital
Redlands Satellite - Princess Alexandra Hospital
St Vincent's Robina Satellite - Goldcoast Hospital

NEW SOUTH WALES

Armidale Hospital -Tamworth Hospital
Auburn Satellite - Westmead Hospital
Ballina Hospital - Lismore Hospital
Bankstown Hospital - South West Sydney Renal Services
Bathurst Satellite Dialysis Centre - Orange Hospital
Bega Satellite - Statewide Renal Services
Blacktown Regional Dialysis - Westmead Hospital
Bondi Dialysis Unit (Diaverum)
Brewarrina Hospital
Broken Hill Hospital
Campbelltown Satellite - South West Sydney Renal Services
Coonamble Hospital
Dame Eadith Walker - Statewide Renal Services
Eora Satellite - Prince of Wales Hospital
Fairfield Satellite - South West Sydney Renal Services
Forbes Hospital - New South Wales
Gosford Satellite - Gosford Hospital
Goulburn Satellite (Fresenius) - Statewide Renal Services
Grafton Hospital - Lismore Hospital
Griffith Base Hospital - Statewide Renal Services
Invarell Satellite - Tamworth Hospital
Lakehaven Satellite - Gosford Hospital
Lanceley Cottage - Royal North Shore Hospital
Lindfield Dialysis Unit (Diaverum)
Liverpool Community Centre - South West Sydney Renal Services
Maitland Hospital - Hunter New England Health
Mona Vale Satellite - Royal North Shore Hospital
Moree Satellite - Tamworth Hospital
Moruya Satellite (Fresenius) - Statewide Renal Services
Muswellbrook - Hunter New England Health
Norfolk Island Hospital - Statewide Renal Services
Penrith Community Dialysis Centre - Nepean Hospital
Shellharbour - Wollongong Hospital
Shoalhaven Satellite (Nowra) - Wollongong Hospital
Singleton Satellite - Hunter New England Health
Sutherland Hospital - St George Hospital
Sydney Dialysis Centre - New South Wales
Taree Community Dialysis - Hunter New England Health
Wagga Wagga Base Hospital
Wansey Satellite - Hunter New England Health
Wellington Hospital - New South Wales
Wollongong Satellite - Wollongong Hospital - New South Wales

AUSTRALIAN CAPITAL TERRITORY (ACT)

Canberra Community Satellite
Northside Dialysis Clinic (Fresenius)

VICTORIA

Angliss Hospital
Ararat Hospital
Austin Training Satellite - Austin Health
Bairnsdale Regional Health
Ballarat Health Service
Bendigo Hospital
Box Hill Satellite - Eastern Health Integrated Renal Services
Broadmeadows Satellite
Brunswick Satellite
Casey Hospital - Berwick
Casterton Hospital
Caulfield General Medical Centre
Coburg Satellite
Cohuna Hospital
Colac Hospital
Craigieburn Satellite
Cranbourne Satellite
Dandenong Satellite
Daylesford Hospital
Diamond Valley Dialysis Clinic (Diaverum)
Donald Hospital
Echuca Hospital
Edenhope Hospital
Epping Dialysis Unit
Frankston Satellite
Goulburn Valley Hospital
Hamilton Hospital
Hastings Hospital
Heidelberg Hospital - Austin Health

VICTORIA (CONTINUED)

Horsham Satellite
Kyneton Hospital
Latrobe Regional Satellite
Mansfield District Hospital
Maroondah Satellite
Maryborough Hospital
Melton Hospital
Mildura Hospital
Moorabbin Satellite
Myrtleford Hospital
Newcomb Satellite
Nhill Hospital Satellite
Northern Hospital Satellite - Royal Melbourne
North East Kidney Service - Austin Health
North Melbourne Dialysis Clinic (Diaverum)
Orbost Hospital
Peter James Centre
Portland District Health
Robinvale Hospital
Rosebud Hospital
Sale Hospital
Sandringham Satellite
Seymour Hospital
South Geelong Satellite - Geelong Hospital
St. George's Hospital
Sunshine Satellite Centre - Western Health
Swan Hill Hospital
Wangaratta Hospital
Warrnambool Hospital
Werribee Mercy Hospital
Western Gippsland Hospital
Williamstown Satellite
Wodonga Regional Health Service
Wonthaggi Hospital
Yarawonga District Hospital
Yarram Hospital

TASMANIA

North West Renal Unit, Burnie - Launceston Hospital

SOUTH AUSTRALIA

Berri Satellite
Ceduna Hospital
Clare Satellite
Hampstead Rehabilitation Satellite
Hartley Private Hospital (Fresenius)
Lyell McEwin Satellite
Millicent Hospital
Modbury Satellite (Fresenius)
Mount Gambier Satellite
Murray Bridge Hospital
Noarlunga Satellite
Payneham Satellite (Baxter)
Port Augusta Hospital
Port Lincoln Satellite Centre
Wayville Satellite Centre
Whyalla Satellite Centre

NORTHERN TERRITORY

Flynn Drive Satellite - Alice Springs Hospital
Katherine Dialysis Unit - Royal Darwin Hospital
Nightcliff Community Centre - Royal Darwin Hospital
Palmerston Satellite - Royal Darwin Hospital
Tennant Creek Hospital - Alice Springs Hospital
Tiwi Dialysis Centre - Royal Darwin Hospital

WESTERN AUSTRALIA

Albany - John Hortin Dialysis Unit
Armadale Satellite
Bunbury Satellite
Busselton Satellite
Cannington Dialysis Clinic (Diaverum)
Derby Satellite
Geraldton Hospital
Joondalup Satellite
Kalgoorlie Dialysis Unit
Kimberley Dialysis Centre - Royal Perth Hospital
Melville Satellite
Midland Private Dialysis Centre (Baxter)
Peel Health Campus - Mandurah
Port Hedland Dialysis Unit (Pilbara)- Royal Perth Hospital
Rockingham Satellite
Spearwood Satellite
Stirling Dialysis Clinic (Diaverum)

NEW ZEALAND

Auckland Home Training Unit
Bay of Islands Hospital - Whangarei Hospital
Carrington Satellite - Auckland City Hospital
Grafton Training Unit - Auckland City Hospital
Greenlane Hospital - Auckland City Hospital
Manukau Satellite - Middlemore Hospital
Middlemore Satellite - Middlemore Hospital
Nephrocare - Auckland
Nelson Hospital
Porirua Community Dialysis - Wellington Hospital
Rotarua Hospital - Waikato Hospital
Tauranga Hospital - Waikato Hospital
Waitakere Satellite - Auckland City Hospital

Publications in peer-reviewed journals based substantially on data from ANZDATA and released during the period of data covered by this report (2009) and during 2010 are listed below.

2009

1. Yeates, KE, Cass, A, Sequist, TD, McDonald, SP, Jardine, MJ, Trpeski, L & Ayanian, JZ: Indigenous people in Australia, Canada, New Zealand and the United States are less likely to receive renal transplantation. *Kidney Int*, 2009.

2. Villar, E, Polkinghorne, K, Chang, S, Chadban, S & McDonald, S: Effect of type 2 diabetes on mortality risk associated with end-stage kidney disease. *Diabetologia*, In Press**:** 10.1007/s00125-009-1525-2, 2009.

3. Stewart, JH, Vajdic, CM, van Leeuwen, MT, Amin, J, Webster, AC, Chapman, JR, McDonald, SP, Grulich, AE & McCredie, MRE: The pattern of excess cancer in dialysis and transplantation. *Nephrol. Dial. Transplant.***:** gfp331, 2009.

4. Siva, B, Hawley, CM, McDonald, SP, Brown, FG, Rosman, JB, Wiggins, KJ, Bannister, KM & Johnson, DW: Pseudomonas Peritonitis in Australia: Predictors, Treatment, and Outcomes in 191 Cases. *Clin J Am Soc Nephrol*, 4**:** 957-964, 2009.

5. O'Shea, S, Hawley, C, McDonald, S, Brown, F, Rosman, J, Wiggins, K, Bannister, K & Johnson, D: Streptococcal peritonitis in Australian peritoneal dialysis patients: predictors, treatment and outcomes in 287 cases. *BMC Nephrology*, 10**:** 19, 2009.

6. McDonald, SP, Marshall, MR, Johnson, DW & Polkinghorne, KR: Relationship between Dialysis Modality and Mortality. *J Am Soc Nephrol*, 20**:** 155-163, 2009.

7. Macdonald, JA, McDonald, SP, Hawley, CM, Rosman, J, Brown, F, Wiggins, KJ, Bannister, K & Johnson, DW: Recovery of renal function in end-stage renal failure--comparison between peritoneal dialysis and haemodialysis. *Nephrol Dial Transplant.***:** Advance Access published on May 14, 2009, DOI 10.1093/ndt/gfp216, 2009.

8. Levidiotis, V, Chang, S & McDonald, S: Pregnancy and Maternal Outcomes Among Kidney Transplant Recipients. *J Am Soc Nephrol***:** ASN.2008121241, 2009.

9. Karamadoukis, L, Ansell, D, Foley, RN, McDonald, SP, Tomson, CRV, Trpeski, L & Caskey, FJ: Towards case-mix-adjusted international renal registry comparisons: how can we improve data collection practice? *Nephrol. Dial. Transplant.*,24**:** 2306-2311, 2009.

10. Johnson, DW, Dent, H, Hawley, CM, McDonald, SP, Rosman, JB, Brown, FG, Bannister, KM & Wiggins, KJ: Associations of dialysis modality and infectious mortality in incident dialysis patients in Australia and New Zealand. *Am J Kidney Dis*, 53**:** 290-7, 2009.

11. Irving, MJ, Johnson, DW, McDonald, S, Walker, RG, Frommer, MS & Craig, JC: Opinions on the Content and Effects of Clinical Practice Guidelines for CKD: A Survey of Nephrologists in Australia and New Zealand. *Am J Kidney Dis*, 53**:** 1082-90, 2009.

12. Howard, K, White, S, Salkeld, G, McDonald, S, Craig, J, Chadban, S & Cass, A: Cost-effectiveness of screening and optimal management for diabetes, hypertension and chronic kidney disease to prevent end-stage kidney disease: a modelled analysis. *Value in Health* In Press, 2009.

13. Howard, K, Salkeld, G, White, S, McDonald, S, Chadban, S, Craig, JC & Cass, A: The cost-effectiveness of increasing kidney transplantation and home-based dialysis. *Nephrology*, 14**:** 123-132, 2009.

14. Gallagher, M, Jardine, M, Perkovic, V, Cass, A, McDonald, S, Petrie, J & Eris, J: Cyclosporine withdrawal improves long-term graft survival in renal transplantation. *Transplantation*, 87**:** 1877-83, 2009.

15. Collins, MG, Chang, SH, Russ, GR & McDonald, SP: Outcomes of transplantation using kidneys from donors meeting expanded criteria in Australia and New Zealand, 1991 to 2005. *Transplantation*, 87**:** 1201-9, 2009.

16. Barraclough, K, Hawley, CM, McDonald, SP, Brown, FG, Rosman, JB, Wiggins, KJ, Bannister, KM & Johnson, DW: Corynebacterium peritonitis in Australian peritoneal dialysis patients: predictors, treatment and outcomes in 82 cases. *Nephrol. Dial. Transplant.***:** gfp322, 2009.

17. Orr, NI, McDonald, SP, McTaggart, S, Henning, P & Craig, JC: Frequency, etiology and treatment of childhood end-stage kidney disease in Australia and New Zealand. *Pediatr Nephrol*, 24**:** 1719-26, 2009.

18. Johnson DW, Dent H, Yao Q, Tranaeus A, Huang CC, Han DS et al.
Frequencies of hepatitis B and C infections among haemodialysis and peritoneal dialysis patients in Asia-Pacific countries: analysis of registry data.
Nephrol Dial Transplant. 2009 May; 24(5): 1598-603. (Epub 2008 Dec 18 doi:10.1093/ndt/gfn684)

19. Johnson DW, Dent H, Hawley CM, McDonald SP, Rosman JB, Brown FG et al.
Associations of Dialysis Modality and Cardiovascular Mortality in Incident Dialysis Patients.
Clin J Am Soc Nephrol (Epub 2009 Sep 3 doi: 10.2215/CJN.01750309)

(2009 Publications continued next page)

2009 **(Continued)**

20. Webster AC, Supramaniam R, Connell DL, Chapman JR, Craig JC. Validity of registry data: agreement between cancer records in an end stage kidney disease registry (voluntary reporting) and a cancer register (statutory reporting). Nephrology 2009 *(in press).*

21. van Leeuwen MT, Webster AC, McCredie MRE, Stewart JH, McDonald SP, Amin J, Kaldor JM, Chapman JR, Vadjic CM, Grulich AE. Reduction of immunosuppression after kidney transplant failure is associated with decreased risk of some cancer types. *BMJ 2009 (in press).*

22. Vajdic CM, van Leeuwen MT, Webster AC, McCredie MRE, Stewart JH, Chapman JR, Amin J, McDonald SP, Grulich AE. Cutaneous Melanoma is Related to Immune Suppression in Kidney Transplant Recipients. *Cancer Epidemiology, Biomarkers and Prevention 2009;* 18:2297-2303.

23. van Leewen MT, Grulich AE, Webster AC, McCredie MRE, Stewart JH, McDonald SP, Amin J, Kaldor JM, Chapman JR, Vadjic CM. Immunosuppression and other risk factors for early and late non-Hodgkin lymphoma after kidney Transplantation. *Blood* 2009; 114(3):630-7.

24. van Leewen MT, Grulich AE, McDonald SP, McCredie MRE, Amin J, Stewart JH, Webster AC, Chapman JR, Vajdic CM. Immunosuppression and other risk factors for lip cancer after kidney transplantation. *Cancer Epidemiology, Biomarkers and Prevention* 2009 18(2):561-569.

25. Wong G, Howard K, Webster AC, Chapman JR, Craig JC. The health and economic impact of cervical cancer screening and HPV vaccination in kidney transplant recipients. *Transplantation* 2009:87(7):1078-91.

26. Polkinghorne KR. Vascular access practice in haemodialysis: instrumental in determining patient mortality. Am J Kidney Dis. 2009 Mar;53(3):359-62.

27. Nesrallah GE, Suri RS, Moist LM, Cuerden M, Groeneweg KE, Hakim R, Ofsthun NJ, McDonald SP, Hawley C, Caskey FJ, Couchoud C, Awaraji C, Lindsay RM. International Quotidian Registry: annual report 2009. Hemodial Int. 2009 Jul: 13(3): 240-9.

28. Lim WH, Chang S, Chadban S, Campbell S, Dent H, Russ GR, McDonald SP. Interleukin-2 Receptor Antibody Reduces Rejection Rates and Graft Loss in Live Donor Kidney Transplant Recipients. Transplantation 2009 - in press.

29. Lim, WH, Russ GR, McDonald SP. Comparable transplant outcomes between local and shipped deceased donor kidneys in Australia: analysis of ANZDATA Registry 1992-2007. Nephrology 2009 - in press.

30. Miles R, Hawley CM, McDonald SP, Brown FG, Rosman JB, Wiggins KJ, Bannister KM, Johnson DW. Predictors and Outcomes of fungal peritonitis in peritoneal dialysis patients. Kidney International 2009 Sep: 76 (6): 622-8. E Pub 2009 Jun 10.

31. Macdonald JA, McDonald SP, Hawley CM, Rosman JB, Brown FG, Wiggins KJ, Bannister KM, Johnson DW. Recovery of renal function in end-stage renal failure - comparison between peritoneal dialysis and haemodialysis. Nephrol Dial Transplant 2009 Sept: 24(9): 2825-31. Epub 2009 May 14.

32. Johnson DW, Dent H, Hawley CM, McDonald SP, Rosman JB, Brown FG, Bannister KM, Wiggins KJ. Associations of dialysis modality and infectious mortality in incident dialysis patients in Australia and New Zealand. Am J Kid Disease 2009 Feb: 53(2): 290-7. Epub 2008 Sept 21

Publications in peer-reviewed journals based substantially on data from ANZDATA and released during 2010 are listed below.

2010

1 Barraclough K, Hawley CM, McDonald SP, Brown FG, Rosman JB, Wiggins KJ, *et al.* Polymicrobial peritonitis in peritoneal dialysis patients in Australia: predictors, treatment, and outcomes. *Am J Kidney Dis*. 2010; **55**: 121-31.

2 Bordador E, Johnson D, Henning P, Kennedy S, McDonald S, Burke J, *et al.* Epidemiology and outcomes of peritonitis in children on peritoneal dialysis in Australasia. *Pediatric Nephrology*. 2010; **25**: 1739-45.

3 Fahim M, Hawley CM, McDonald SP, Brown FG, Rosman JB, Wiggins KJ, *et al.* Culture-Negative Peritonitis in Peritoneal Dialysis Patients in Australia: Predictors, Treatment, and Outcomes in 435 Cases. *Am J Kidney Dis*. 2010; **55**: 690-7.

4 Jarvis EM, Hawley CM, McDonald SP, Brown FG, Rosman JB, Wiggins KJ, *et al.* Predictors, treatment, and outcomes of non-Pseudomonas Gram-negative peritonitis. *Kidney Int*. 2010; **78**: 408-14.

5 Lim WH, Russ GR, McDonald SP. Comparable transplant outcomes between local and shipped deceased-donor kidneys in Australia: analysis of Australia and New Zealand Dialysis and Transplant Registry 1992-2007. *Nephrology (Carlton)*. 2010; **15**: 124-32.

6 McDonald S. Incidence and treatment of ESRD among indigenous peoples of Australasia. *Clin Nephrol*. 2010; **74** Suppl 1: S28-31.

7 Webster AC, Supramaniam R, O'Connell DL, Chapman JR, Craig JC. Validity of registry data: agreement between cancer records in an end-stage kidney disease registry (voluntary reporting) and a cancer register (statutory reporting). *Nephrology (Carlton)*. 2010; **15**: 491-501.

8 Edey M, Hawley CM, McDonald SP, Brown FG, Rosman JB, Wiggins KJ, *et al.* Enterococcal peritonitis in Australian peritoneal dialysis patients: predictors, treatment and outcomes in 116 cases. *Nephrol Dial Transplant*. 2010; **25**: 1272-8.

9 Fahim M, Hawley CM, McDonald SP, Brown FG, Rosman JB, Wiggins KJ, *et al.* Coagulase-negative staphylococcal peritonitis in Australian peritoneal dialysis patients: predictors, treatment and outcomes in 936 cases. *Nephrol Dial Transplant*. 2010; **25**: 3386-92.

10 Govindarajulu S, Hawley CM, McDonald SP, Brown F, Rosman J, Wiggins KJ, *et al.* Staphylococcus Aureus Peritonitis in Australian Peritoneal Dialysis Patients: Predictors, Treatment, and Outcomes in 503 Cases. *Perit Dial Int*. 2010; **30**: 311-9.

11 Johnson DW, Cho Y, Livingston BE, Hawley CM, McDonald SP, Brown FG, *et al.* Encapsulating peritoneal sclerosis: incidence, predictors, and outcomes. *Kidney Int*. 2010; **77**: 904-12.

12 Johnson DW, Hawley CM, McDonald SP, Brown FG, Rosman JB, Wiggins KJ, *et al.* Superior survival of high transporters treated with automated versus continuous ambulatory peritoneal dialysis. *Nephrol Dial Transplant*. 2010; **25**: 1973-9.

13 Lim WH, Chadban SJ, Campbell S, Dent H, Russ GR, McDonald SP. Interleukin-2 receptor antibody does not reduce rejection risk in low immunological risk or tacrolimus-treated intermediate immunological risk renal transplant recipients. *Nephrology (Carlton)*. 2010; **15**: 368-76.

14 Lim WH, Chang S, Chadban S, Campbell S, Dent H, Russ GR, *et al.* Donor-recipient age matching improves years of graft function in deceased-donor kidney transplantation. *Nephrol Dial Transplant*. 2010; **25**: 3082-9.

15 Marley JV, Dent HK, Wearne M, Fitzclarence C, Nelson C, Siu K, *et al.* Haemodialysis outcomes of Aboriginal and Torres Strait Islander patients of remote Kimberley region origin. *Med J Aust*. 2010; **193**: 516-20.

16 Brook NR, Gibbons N, Nicol DL, McDonald SP. Open and laparoscopic donor nephrectomy: activity and outcomes from all Australasian transplant centers. *Transplantation*. 2010; **89**: 1482-8.

17 Pilmore H, Dent H, Chang S, McDonald SP, Chadban SJ. Reduction in cardiovascular death after kidney transplantation. *Transplantation*. 2010; **89**: 851-7.

18 Scott DR, Wong JK, Spicer TS, Dent H, Mensah FK, McDonald S, *et al.* Adverse impact of hepatitis C virus infection on renal replacement therapy and renal transplant patients in Australia and New Zealand. *Transplantation*. 2010; **90**: 1165-71.

19 van Leeuwen MT, Webster AC, McCredie MRE, Stewart JH, McDonald SP, Amin J, *et al.* Effect of reduced immunosuppression after kidney transplant failure on risk of cancer: population based retrospective cohort study. *BMJ*. 2010; **340**: c570-.

2007

AUST. & N.Z. DIALYSIS AND TRANSPLANT SURVEY

THIS SECTION FOR ALL PATIENTS

REGISTRY NUMBER | 1 INITIAL HOSPITAL: Hospital/State, Hosp. Unit No. | CURRENT PARENT HOSPITAL: Hospital/State, Hosp. Unit No | Physician (Optional)

2 Surname, Given Names | 3 DATE OF BIRTH | 4 SEX

5 RACIAL ORIGIN (Record from list) | 6 PRIMARY RENAL DISEASE (Record from list) | 7 BIOPSY Y/N | 8 SE. CREATININE AT ENTRY

9 COUNTRY OF BIRTH (If Australia or NZ - Tick box): AUST | NZ | OTHER COUNTRY (Please specify)

10 POSTCODE At Entry | POSTCODE At End Survey

11 CO-MORBID CONDITIONS AT ENTRY

LATE REFERRAL (<3 MTHS BEFORE FIRST TREATMENT) (Y/N) | HEIGHT (cms) | WEIGHT (kg) | CIGARETTE SMOKING (N=Never F=Former C=Current) | Kidney Health Australia

DISEASE AT ENTRY AND DURING CURRENT SURVEY

Y=Yes N=No S=Suspected

	CHRONIC LUNG Y/S/N	CORONARY ARTERY Y/S/N	PERIPHERAL VASCULAR Y/S/N	CEREBRO VASCULAR Y/S/N	DIABETES N=No O=Type 1 Insulin dependent P=Type 2 Non Insulin requiring Q=Type 2 Insulin requiring
AT ENTRY					
LAST					
CURRENT					

OTHER CO-MORBID CONDITIONS (Write In)

AT ENTRY	
PREVIOUS ENTRIES	
CURRENT	

12 CENTRE OF TREATMENT

Enter geographical location at Death or End of Survey

	HOSPITAL / CENTRE NAME (Write In or Tick if same)	CENTRE CODE	DATE TRANSFER
CURRENT			
LAST			

13 COURSE OF TREATMENT

COMPLETE ACCORDING TO CODE

REASON FOR DIALYSIS MODALITY CHANGE from CAPD to APD / APD to CAPD / Any PD to HD / HD to any PD
Enter Reason for Change FROM Previous Modality TO Current Modality
Refer to codes on back of form

A APD / IPD Hospital
C APD / IPD Satellite
E APD / IPD Home
L CAPD Hosp/Outpatient
M CAPD Home
B HD Hospital
D HD Satellite
F HD Home
G Transplant in AUST/NZ
H Date of last post graft dialysis
X Transplant Overseas
I Graft function Temporary/Permanently ceased (Date return to dialysis)
J Own kidney function recovered. Dialysis ceased
K Date of last visit if lost to follow up
Z DATE OF DEATH

SEQ. No.	CODE	DAY	MTH	YR	REASON
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					

SEQ. No.	CODE	DAY	MTH	YR	REASON
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					

SEQ. No.	CODE	DAY	MTH	YR	REASON
35					
36					
37					
38					

14 HEPATITIS C ANTIBODY

1=Positive 2=Negative 3=Not done	CURRENT	LAST

15 CANCER EVER? Y/N — If Yes, please complete Cancer Form

16 CAUSE OF DEATH (Record from list) | OTHER

17 WAS GRAFT SUSTAINING LIFE? — Without dialysis at time of death Y=Yes N=No

18 PARENTHOOD

HAS THIS PATIENT BECOME PREGNANT OR FATHERED A CHILD DURING THIS SURVEY — Y=Yes N=No

If Yes, please complete a Parenthood Outcome form

DATE OF LAST OUTCOME

THIS SECTION FOR ALL PATIENTS DIALYSED AT ANY TIME DURING THE SURVEY PERIOD

19 TYPE OF DIALYSIS (See list) | 20 DRY WEIGHT AT LAST DIALYSIS kg (HD and PD Patients) | 21 UNCORRECTED CALCIUM mmol/l (See instructions on the back of the form) | 22 PHOSPHATE mmol/l | 23 HAEMOGLOBIN g/l Last Available | 24 EPO AGENT Y=Yes N=No | 25 FERRITIN ug/l Within last 3 mths of Survey or record not done | 26 % SATURATION IRON (Transferrin Saturation)

HAEMODIALYSIS

27 DIALYSER BRAND (Write In) CODE | BRAND NAME AND MODEL

28 BLOOD FLOW RATE Pump Speed (mls/min) | 29 SESSIONS PER WEEK | 30 HOURS PER SESSION | 31 UREA REDUCTION or Kt/V Method (See List) Value

32 ACCESS IN USE (Functioning only) Enter for ALL PATIENTS ON HAEMODIALYSIS AT ANY TIME DURING THIS SURVEY PERIOD

AT FIRST HD: 1=Native 2=Synthetic 3=Tunnel CV Catheter 4=Non Tunnel CV Catheter | AT LAST HD

FOR FISTULAS AND GRAFTS ONLY
DECLOTTED during Survey Y=Yes N=No D=Declotted and revised | REVISED during Survey N=No S=Surgical A=Angioplasty B=Both

IN THE EVENT OF THE PATIENT HAVING BOTH HD AND PD, AND A TRANSPLANT DURING THE SURVEY COMPLETE SECTIONS 19-41 INCLUSIVE

ALL PERITONEAL DIALYSIS

33 PET TEST (Once Only) Within first 6 mths (Dx / Plasma Creatinine at 4 hours) | 34 CONNECTION SYSTEM CODE (Write In) | 35 PERITONITIS DATE OF FIRST EPISODE | 36 NUMBER OF EPISODES OF PERITONITIS During this Survey | 37 TOTAL VOLUME OF WEEKLY CHANGES (Litres/week)

38 CREATININE CLEARANCE Dialysate ONLY — Adjusted for Body Surface Area (Litres/week/1.73 m²) Range 10-200 Litres/Week

39 WEEKLY Kt/V Dialysate ONLY (Range 0.1 - 5.0)

40 RESIDUAL RENAL FUNCTION (Creatinine Clearance) — Adjusted for Body Surface Area (Litres/week/1.73 m²)

41 PD SOLUTIONS - Y=Yes N=No (Please fill in all boxes): Glucose | Icodextrin | Low GDP Lactate | Low GDP Bicarbonate | OTHER

CURRENT GRAFT (IN THE EVENT OF BOTH GRAFT FAILURE AND RETRANSPLANT IN THIS SURVEY - USE A NEW FORM)

42 GRAFT NUMBER | 43 DATE OF THIS TRANSPLANT | 44 REFERRING HOSPITAL | 45 DONOR HOSPITAL | 46 TRANSPLANT HOSPITAL | 47 RECIPIENT ANTIBODY STATUS AT GRAFT CMV EBV 1=Positive 2=Negative 3=Not done | 48 NUMBER REJECTION EPISODES THIS SURVEY (Complete acute rejection form for each episode) (at any time)

49 DONOR DETAILS SOURCE AGE SEX (See list) | 50 TOTAL ISCHAEMIA (Hours) | 51 IMMEDIATE FUNCTION (See list) | 52 DISEASE IN GRAFT If Yes (See list) | 53 DATE FIRST PROVEN (eg. Graft biopsy) | 54 CAUSE OF GRAFT FAILURE OTHER (Record from list)

55 MONOCLONAL / POLYCLONAL THERAPY (Record from list)

COURSE	DATE	AGENT	OTHER	NUMBER OF DOSES GIVEN	REASON	OTHER
1st						
2nd						
3rd						

56 TOTAL DAILY DRUG DOSE (mg)

	TOTAL INITIAL ORAL DOSE	1 MTH	2 MTH	3 MTH	6 MTH	1 YR	2 YR	3 YR	5 YR	7 YR	10 YR	15 YR	20 YR	25 YR	30 YR	35 YR
CYA																
AZA																
PRED																
TACROL																
MMF																
SIROL																
OTHER																

57 CYA SPARING DRUG 0=NOT GIVEN 1=GIVEN (eg DILTIAZEM - KETOCONAZOLE - VERAPAMIL)

58 BODY WEIGHT (kg)

59 SERUM CREATININE µmol/L

FOR OFFICE USE ONLY

60 HLA TYPING

	BLOOD GROUP	A		B		DR		DQ	
RECIPIENT									
DONOR									

62 PRA AND CROSSMATCH

MAXIMUM	CURRENT

ANZDATA Registry 2010 Report

DATA COLLECTION FORM

INSTRUCTIONS FOR DIALYSIS AND TRANSPLANTATION SURVEY COMPILATION
PLEASE READ THE EXPLANATORY NOTES BEFORE COMMENCING TO FILL IN THE FORMS
Please complete the form using neat capitals

5 – RACIAL ORIGIN
1 Caucasoid
2 Australian Aborigine
3 Chinese
4 Maori
5 Arab
61 Cook Islander
63 Samoan
64 Tongan
65 Torres Strait Islander
69 Pacific People – other (**specify**)
7 Indian
8 Indonesian
9 Malay
10 Filipino
11 Vietnamese
20 Other (**specify**)
00 Patient objects to answering question

Mixed race coded by patient's assessment

6 - PRIMARY RENAL DISEASE
Results of ANCA (Anti Neutrophil Cytoplasmic Antibody) test in association with glomerulonephritis should be entered in box marked OTHER

100 Presumed GN, type undefined histologically (no biopsy)
110 Focal sclerosing GN (including hyalinosis)
111 Primary focal sclerosing GN or focal glomerular sclerosis
112 Secondary focal sclerosing GN
121 Mesangiocapillary GN with subendothelial deposits (double contour)
122 Mesangiocapillary GN with intramembranous deposits (dense deposit disease)
130 Membranous GN
140 Extra and intra capillary GN (extensive crescents - clinically rapidly progressive)
151 Mesangial proliferative (IgA+ positive)
152 Mesangial proliferative (IgA- negative)
153 Mesangial proliferative (no I.F. studies)
160 Focal and segmental proliferative GN (including focal necrotising)
170 Advanced GN (unclassified = end stage)
180 GN with systemic disease (**specify**)
181 Goodpasture's syndrome with linear IgG and lung haemorrhage
182 Proliferative GN with linear IgG -no lung haemorrhage
183 SLE
184 Henoch-Schonlein purpura
185 Wegener's Granulomatosis
186 Microscopic Polyarteritis
187 Scleroderma
190 GN other (**specify**)
191 Familial GN (**specify Alport's - yes** or **no**)
200 Analgesic nephropathy
300 Renal vascular disease due to malignant hypertension (NO primary renal disease)
301 Renal vascular disease – type unspecified
302 Renal vascular disease – due to hypertension (nephrosclerosis) (NO primary renal disease)
303 Atheroembolic disease (cholesterol emboli)
304 Bilateral renal artery stenosis
400 Polycystic kidney disease
401 Medullary cystic disease
402 Infantile/juvenile polycystic kidney disease
500 Reflux nephropathy
600 Pyelonephritis
700 Calculi
701 Gout
801 Diabetes – Type 1 (insulin dependent) **[Juvenile onset]**
802 Diabetes – Type 2 (non-insulin requiring)
803 Diabetes – Type 2 (insulin requiring) **[Mature onset]**
000 Other (**specify**)
001 Uncertain diagnosis
002 Lead nephropathy
003 Cadmium toxicity
004 Renal tuberculosis
005 Amyloid disease
006 Haemolytic uraemic syndrome
007 Cortical necrosis
008 Interstitial nephritis
009 Congenital renal hypoplasia and dysplasia
010 Loss of single kidney (**specify - e.g. trauma, surgery**)
011 Megaureter
012 Oxalosis
013 Cystinosis
014 Balkan nephropathy
015 Renal cell carcinoma (GRAWITZ)
016 Transitional cell carcinoma of urinary tract
017 Paraproteinaemia (including multiple myeloma)

PRIMARY RENAL DISEASE cont.
018 Light chain nephropathy (benign)
019 Lithium toxicity
020 Post partum nephropathy
021 Sarcoidosis
031 Posterior urethral valves
032 Pelvi-ureteric junction obstruction
033 Obstructed megaureter
034 Neuropathic bladder
035 Non-obstructed dilated bladder and ureters (megacystitis – megaureter)
036 Spina bifida or myelomeningocoele
037 Bladder neck obstruction (incl. prostatomegaly)
039 Other lower urinary tract abnormalities (with secondary reflux) (**specify**)
040 Ureteric obstructive nephropathy
041 Obstructive nephropathy

13 – REASON FOR MODALITY CHANGE
From CAPD to APD
From APD to CAPD
From any form of PD to HD
From HD to any form of PD

10 Recurrent / persistent peritonitis
11 Acute peritonitis
15 Tunnel / exit site infection
16 Diverticulitis
20 Inadequate solute clearance
21 Inadequate fluid ultrafiltration
22 Excessive fluid ultrafiltration
27 Abdominal abscess
30 Dialysate leak
31 Catheter block
32 Haemoperitoneum
33 Catheter fell out
35 Hernia
36 Abdominal pain
40 Abdominal surgery
41 Sclerosing peritonitis
42 Peritoneal infection
43 Multiple adhesions
44 Pregnancy
45 Haematuria
46 Pleural effusion
47 Cardiovascular instability
48 Geography – poor access to dialysis services
49 Vascular access problems
50 Patient preference
51 Unable to manage self-care
60 Recovery of renal function
70 Transplantation
80 Death
81 Transfer outside Australia or New Zealand
82 Other surgery
83 Hydrothorax
85 Poor nutrition
86 Scrotal oedema
90 Planned transfer after acute PD start
91 Planned transfer after acute HD start
99 Other (**specify**)

16 - CAUSE OF DEATH
CARDIAC
10 Myocardial ischaemia (presumed)
11 Myocardial ischaemia and infarction
12 Pulmonary oedema
13 Hyperkalaemia
14 Haemorrhagic pericarditis
15 Hypertensive cardiac failure
16 Cardiac arrest – cause uncertain
17 Other causes of cardiac failure (**specify**)

VASCULAR
21 Pulmonary embolus
22 Cerebrovascular accident
23 Gastrointestinal haemorrhage
24 Haemorrhage from dialysis access site
25 Haemorrhage from transplant artery
26 Aortic aneurysm – rupture
27 Haemorrhage from elsewhere (**specify**)
28 Bowel infarction

INFECTION
Please enter code for nature of infective organism, after the code for site of infection Please **specify type of organism**
eg Staph, CMV, Candida, etc

eg 321 Lung infection – bacterial (staph)
322 Lung infection – viral (CMV)

31 CNS	1 Bacterial
32 Lung	2 Viral
33 Urinary tract	3 Fungal
34 Wound	4 Protozoa
35 Shunt	5 Other
36 Peritoneum	

CAUSE OF DEATH cont.
37 Septicaemia – site unknown (**specify organism**)
38 Liver (incl. viral hepatitis) (**specify** A, B, CMV, herpes, etc)
39 Other site (**specify**)

SOCIAL
40 Withdrawal for psycho-social reasons
41 Patient refused further treatment (**specify reason**)
42 Suicide
43 Therapy ceased for any other reason (**specify reason**)
44 Accidental death (**specify**)
45 Withdrawal for cardiovascular comorbid conditions
46 Withdrawal for cerebrovascular comorbid conditions
47 Withdrawal for peripheral vascular comorbid conditions
48 Withdrawal related to malignancy
49 Withdrawal related to dialysis access difficulties (AVF, Tenckhoff, etc)

MISCELLANEOUS
50 Hepatic failure (**specify**)
51 Uraemia caused by graft failure
52 Pancreatitis
53 Bone marrow depression
54 Cachexia
55 Unknown
56 Malignant disease
57 Perforation of abdominal viscus – peptic ulcer, diverticulum, appendix
58 Dialysis dementia (aluminium)
59 Other (**specify**)
60 Immunodeficiency due to viral infection (**specify organisms involved**)
61 Chronic respiratory failure
62 Sclerosing peritonitis

19 – TYPE OF DIALYSIS
11 Haemodialysis – plate dialysers
12 Haemodialysis – hollow fibre dialysers
15 Haemofiltration
16 Haemodiafiltration
19 C.V.V.HD (Intensive Care Unit)
20 Peritoneal – bags no cycler
21 Peritoneal – continuous ambulatory (CAPD)
22 Peritoneal – automated (APD)
23 Peritoneal – intermittent cycler (IPD)
25 Peritoneal – other (**specify**)

20 – DRY WEIGHT
At end of survey, transplantation or death.

21 – UNCORRECTED CALCIUM
Not corrected for albumin
Midweek, predialysis and closest to end of survey, transplantation or death.

22 – PHOSPHATE
Midweek, predialysis and closest to end of survey, transplantation or death.

23 – HAEMOGLOBIN
Midweek, predialysis and closest to end of survey, transplantation or death.

31 – URR or Kt/V **Please enter method used**
A Urea Reduction Ratio % (URR%)
B Kt/V (by BIOSTAT)
C Kt/V (by UKM)
D Kt/V (by DAUGIRDAS – single pool)
E Kt/V (other method – **specify**)

Kt/V (for HD patients) Range 0.5 – 2.2

UREA REDUCTION RATIO %
(Pre dialysis urea – post dialysis urea) x 100 **= URR%**
Pre dialysis urea

Pre dialysis urea:
Blood should be drawn from the 'arterial' needle immediately prior to dialysis, at a mid-week dialysis session

Post dialysis urea:
Blood is again drawn from the 'arterial' needle and this should occur **within 20 seconds** after cessation of the blood pump (alternatively the pump can be turned down to 50 ml/min) – this is to avoid problems with recirculation

32 – ACCESS IN USE
Type at First HD - leave blank if initial renal replacement treatment was not haemodialysis.

Type at Last HD - enter for all patients on haemodialysis at any time during the survey. Enter the procedure closest to the end of survey, change to PD, transplantation, or death.

33 – PET TEST (Required **Once Only** per patient)
Standard Peritoneal Dialysis Equilibration Test
performed 1-6 months after initiation of PD
(2.5% 2 litre exchanges)

Provide dialysis/plasma creatinine at 4 hours
Range 0.1 – 1.2

38 to 40 – PD CLEARANCE STUDIES
Generated from a 24 hour collection of PD effluent and urine

NOTE: Dialysate Creatinine Clearance and Kt/V both refer to dialysis clearances ONLY (NOT the total of dialysis and renal clearances).

38 **CREATININE CLEARANCE (Dialysate only)**
Range 10 - 200 litres/week
Litres/week/1.73m^2 Body Surface Area

39 **WEEKLY Kt/V (Dialysate only) - Range** 0.1 – 5.0

40 **RESIDUAL RENAL FUNCTION (Creatinine Clearance)**
Litres/week/1.73m^2 Body Surface Area

49 – SOURCE OF DONOR KIDNEY
1 Deceased Donor
2 Sister (if twin, record 6 or 7)
3 Brother (if twin, record 6 or 7)
4 Mother
5 Father
6 Monozygotic (identical) twin
7 Dizygotic (non-identical) twin
8 Other related living donor (**specify**)
9 Son
10 Daughter
11 Husband
12 Wife
13 Cousin
14 Unrelated living donor (**specify**)

50 – TOTAL ISCHAEMIA (HOURS)
From time of donor renal artery interruption or aortic clamp, until time of release of renal artery in the recipient (clamp off)

51 – IMMEDIATE FUNCTION
1 Spontaneous fall in se.creatinine by 10% within 24 hours
2 Spontaneous fall in se.creatinine by 10%, first recorded between 25-72 hours
3 Poor immediate function. No spontaneous fall in se.creatinine within 72 hours; but no dialysis needed
4 No immediate function. No spontaneous fall (> 10%) in se.creatinine; dialysis required within 72 hours

52 – DISEASE IN GRAFT **Histologically proven**
Complete this section for **FUNCTIONING or FAILED GRAFTS**

Please enter **Date first proven (e.g. Graft Biopsy)**

B = BK virus nephropathy in graft
Y = Disease recurrence
– primary renal disease and disease in graft the same
D = De novo glomerulonephritis
– primary renal disease known and not the same
G = Glomerulonephritis in graft
– primary renal disease unknown or not biopsied

In cases of glomerulonephritis, where histological confirmation of recurrence may be uncertain, enter as G

54 – CAUSE OF GRAFT FAILURE
REJECTION
10 Hyperacute rejection (within 48 hours of transplantation)
20 Acute rejection at anytime, causing graft failure
40 Chronic allograft nephropathy (slow progressive loss of renal function, not due to recurrent original disease or acute rejection)

VASCULAR
50 Renal artery stenosis
51 Renal artery thrombosis
52 Renal vein thrombosis
53 Renal vessel haemorrhage (primary)
54 Renal vessel haemorrhage (secondary)
55 Embolus – thrombo
56 Embolus – cholesterol
57 Haemolytic uraemic syndrome

TECHNICAL
60 Non-viable kidney (due to pre-transplant cortical necrosis)
61 Cortical necrosis post transplant (not due to rejection)
70 Ureteric and bladder problems

GLOMERULONEPHRITIS
82 Mesangiocapillary GN with subendothelial deposits
83 Mesangiocapillary GN with intramembranous deposits (dense deposit disease)
84 Focal sclerosing GN (including hyalinosis)
85 Membranous GN
86 Mesangial proliferative GN (IgA positive)
87 Goodpasture's syndrome
88 Intra and extra capillary GN with extensive crescents (clinically rapidly progressive)
89 Other (**specify**)

DRUG THERAPY
90 Complications of drug therapy requiring reduction or withdrawal of steroid and/or immunosuppressants
91 Non-compliance with therapy – causing graft failure
92 Rejection following I/S reduction due to malignancy
93 Rejection following I/S reduction due to infection

MISCELLANEOUS
00 Other (**specify**)
01 Donor malignancy
02 Malignancy invading graft
05 BK virus nephropathy

55 – MONOCLONAL / POLYCLONAL THERAPY
Record in order of administration, each separate course of such drugs; a second course of the same drug should be separately recorded
Complete the requested details regarding, date, identity of drug, number of doses given, and reason for administration, according to the following codes

TYPE OF AGENT	NUMBER OF DOSES
2 Daclizumab (Zenepax)	
4 OKT3	
5 Intravenous Immunoglobulin	Record actual
6 Basiliximab (Simulect)	number of doses given
7 Rituximab	
8 Polyclonal anti T cell	
9 Other monoclonal (**specify**)	

REASON FOR USE
1 Prophylaxis
7 Treatment for acute rejection
8 Other (**specify**)

56 – TOTAL DAILY DRUG DOSE
Enter the total daily dose for each drug where applicable; if an unlisted drug is used, enter the name in the space provided marked **OTHER**

Only those drugs taken at the listed intervals should be entered; where necessary provide the dose recorded on the closest day preceding the requested time interval

The initial drug dose (at zero months) is **the first oral maintenance dose**; do **NOT** enter the intravenous loading doses administered at or shortly after transplantation

(2007)

SUMMARY

KEY SUMMARY POINTS

AUSTRALIA

- There were 18,243 people (834 per million population) receiving renal replacement therapy (RRT) at 31st December 2009. Of these, 7,902 (361 per million) had a functioning kidney transplant and 10,341 (473 per million) were receiving dialysis treatment.
- 2,337 people commenced RRT in Australia in 2009 (107 per million per year). The incidence rate varied from 320 per million population per year in the Northern Territory to 72 per million per year in the Australian Capital Territory (ACT).
- The mean age at commencement was 60.7 years, the median 63.4 years and the age range 3.5 months - 95.1 years.
- 33% of new patients had diabetic nephropathy attributed as their cause of end stage renal failure, 24% had glomerulonephritis and 14% hypertension.
- Of patients < 65 years of age and receiving dialysis treatment, 18% were on the active kidney transplantation waiting list at 31st December 2009. This proportion varied between <1% in the Northern Territory and 30% in the Australian Capital Territory (ACT). Only 4% of Aboriginal/Torres Strait Islander patients < 65 years were on the transplant waiting list.
- The mortality rate per 100 patient years was 15.3 for dialysis dependent patients and 1.20 for those with a functioning kidney transplant.
- Of the 1,525 deaths among dialysis dependent patients in 2009, 37% were due to withdrawal from treatment, 34% were due to cardiovascular causes, 12% to infection and 5% from malignancy.
- Of the 141 deaths among patients with kidney transplants, 27% were due to malignancy, 23% to cardiovascular causes and 20% to infection.
- There has been a 2% increase in the total number of prevalent dialysis patients from 10,135 in December 2008 to 10,341 in December 2009.
- There were 772 kidney transplant operations performed in 2009, (a transplant rate of 35 per million population). This was the second highest number ever of transplants performed; the highest being in 2008.
- Of these, 42% (326 grafts; 184 related and 142 non related) were from living donors, compared to 44% (354 grafts; 177 related and 177 non related) in 2008. 37% of primary live donor operations were performed without the recipient receiving prior dialysis therapy ("pre-emptive" transplants).
- For primary deceased donor grafts performed in 2008-2009, the 12 month patient and graft survival rates were 97% and 93% respectively.
- The five year primary deceased donor recipient and graft survival for operations performed in 2004-2005 were 89% and 80% respectively.
- In 2009, 1174 patients (11%) of Aboriginal/TSI ethnicity were dialysis dependent, 160 patients (2%) had a functioning transplant and 24 patients (3%) had a new transplant. There were 189 patients (8%) that commenced renal replacement therapy.
- The proportion of haemodialysis patients with a haemoglobin value >120 g/l has fallen consistently over the past three years (presumably in response to evidence about the adverse effects of higher Hb targets in some groups).
- There has been a steady decline in the proportion of people with serum phosphate >1.8 mmol/L over the last few years, with one third of patients reported values above this target.
- Among people receiving haemodialysis as their initial treatment modality, and referred to a nephrologist more than three months prior to starting dialysis, only 54% of people had a usable permanent access (AV fistula or graft) at the time of initial haemodialysis.

KEY SUMMARY POINTS

NEW ZEALAND

- There were 3,663 people (849 per million) receiving renal replacement therapy (RRT) at 31st December 2009. Of these, 1,403 (325 per million) had a functioning kidney transplant, and 2,260 (524 per million) were receiving dialysis treatment.
- 567 people (131 per million per year) commenced RRT in New Zealand in 2009.
- The mean age at commencement was 57.6 years, the median age 59.2 years and the age range 3.5 - 88.0 years.
- Diabetic nephropathy accounted for 47% of new patients, glomerulonephritis 22% and hypertension 11%.
- Of the incident diabetic patients, 22% (126 patients) were Maori, 12% (70 patients) were Pacific People, 7% (40 patients) were Caucasoid and 6% (31 patients) were of other ethnicity.
- Of patients < 65 years of age, 20% were on the active kidney transplantation waiting list at 31st December 2009. 21% of Maoris, 16% of Pacific People and 13% of Asians < 65 years of age were on the transplant waiting list.
- The mortality rate per 100 patient years was 18.8 for dialysis dependent patients and 1.36 for those with a functioning kidney transplant.
- Of the 331 deaths among dialysis dependent patients in 2009, 45% were due to cardiovascular causes, 25% to withdrawal from treatment, 14% to infection and 4% from malignancy.
- Of the 34 deaths among patients with a kidney transplant, 50% were due to malignancy,26% to cardiovascular causes and 9% due to infection.
- The number of patients who were dialysis dependent at 31st December 2009 (2,260) was an increase of 8% (2,102 patients) the previous year. 51% of all dialysis dependent patients were receiving home dialysis, of whom 68% were having peritoneal dialysis.
- There were 121 kidney transplant operations performed in 2009, a rate of 28 per million population.
- The percentage of live donors in 2009 was 55% (67 grafts), similar to 2008, 57% (69 grafts).
- For primary deceased donor grafts performed in 2008-2009, the 12 month patient and graft survival rates were 99% and 97% respectively.
- The five year primary deceased donor recipient and graft survival for operations performed in 2004-2005 were 91% and 87% respectively.
- The 1,403 functioning kidney transplants at 31st December 2009, a prevalence of 325 per million represents a 4% increase from 2008.
- Among people receiving haemodialysis as their initial treatment modality, and referred to a nephrologist more than three months prior to starting dialysis, only 40% of people had a usable permanent access (AV fistula or graft) at the time of first treatment.

PROLOGUE

Stephen McDonald

PROLOGUE
2009 REPORT

Each year in the "prologue' we try to highlight issues of interest.
In this report, we illustrate two areas

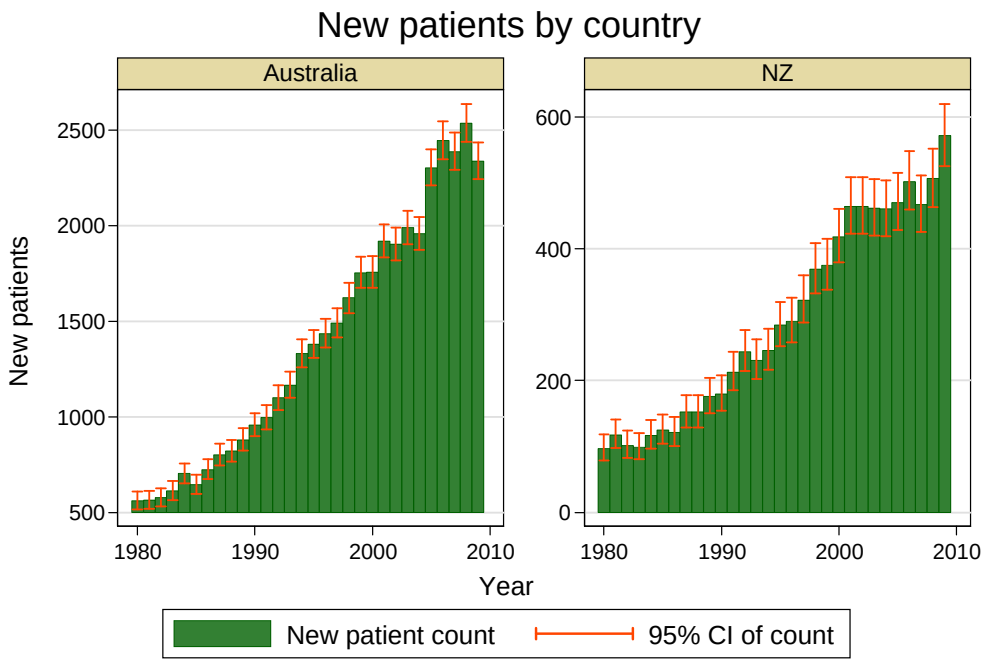
1) Recent trends in incidence rates
2) Variation in results between centres

INCIDENCE RATE TRENDS

There has been a progressive increase in incidence rates in both Australia and New Zealand. This has been primarily due to increases in rates among older people, in both Australia and New Zealand through to the mid 2000s. However, in the last few years there have been clear suggestions of a change in this trend, with apparent stabilisation of overall rates and the age-specific incidence rates in most groups. This is true for indigenous as well as non-indigenous people in both Australia and New Zealand. This stabilisation of incidence rates is similar to that observed some years ago in the USA, and has also been seen in the United Kingdom.

This is illustrated in Figure i for overall rates. However, overall interpretation of these trends is difficult - rates appeared to stabilise over the 1998-2000 period in Australia but then increased again, and the implications of the higher 2010 total in New Zealand are not yet clear.

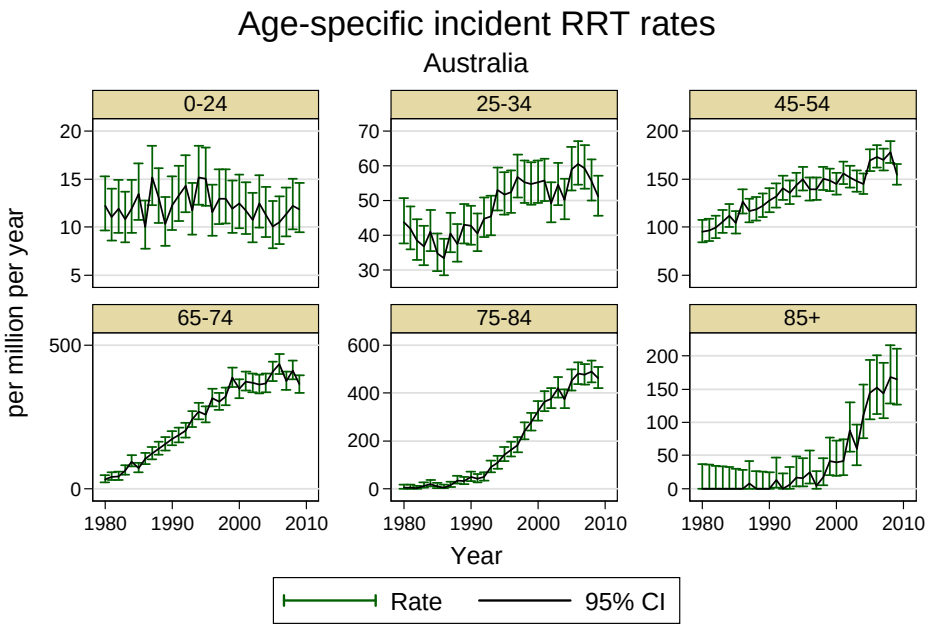
Figure i



ANZDATA Registry, incident RRT patients by country and year

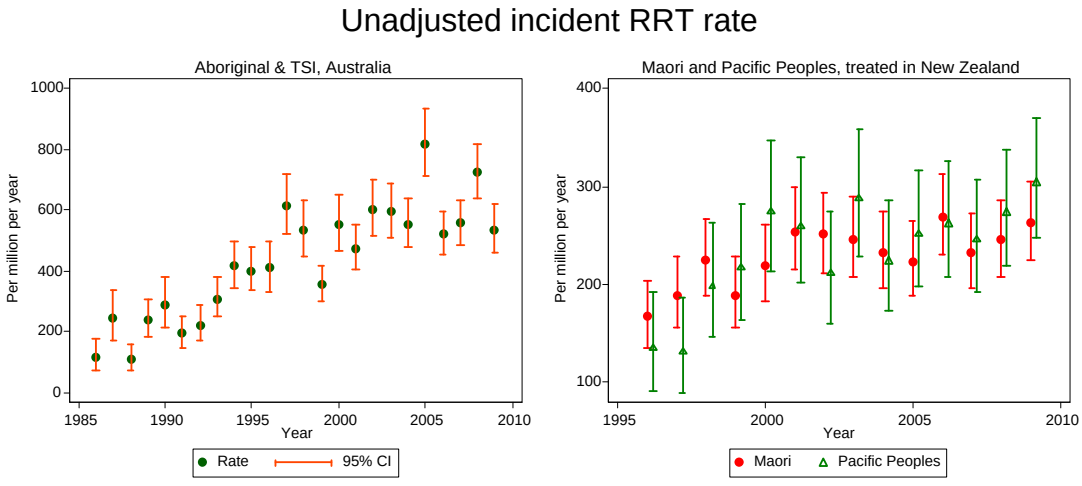
Figure ii illustrates age-specific Australian rates. Further information about the detailed incident numbers is available in the relevant chapters. Age specific rates for New Zealand are illustrated in Figure 2.3 in Chapter 2.

Figure ii



A similar trend towards "levelling off" can be seen in recent years among incident rates for indigenous people, both in Australia and New Zealand. Overall indigenous rates for Australian Aboriginal and New Zealand Maori and Pacific Peoples are shown in Figure iii. It should be noted that there are a number of other influences on indigenous rates; in particular they are subject to changes in the propensity of people in the population to identify themselves as indigenous. (This has been examined in some depth in Australia by the Australian Bureau of Statistics). Further information on indigenous incidence is contained in Chapter 12.

Figure iii

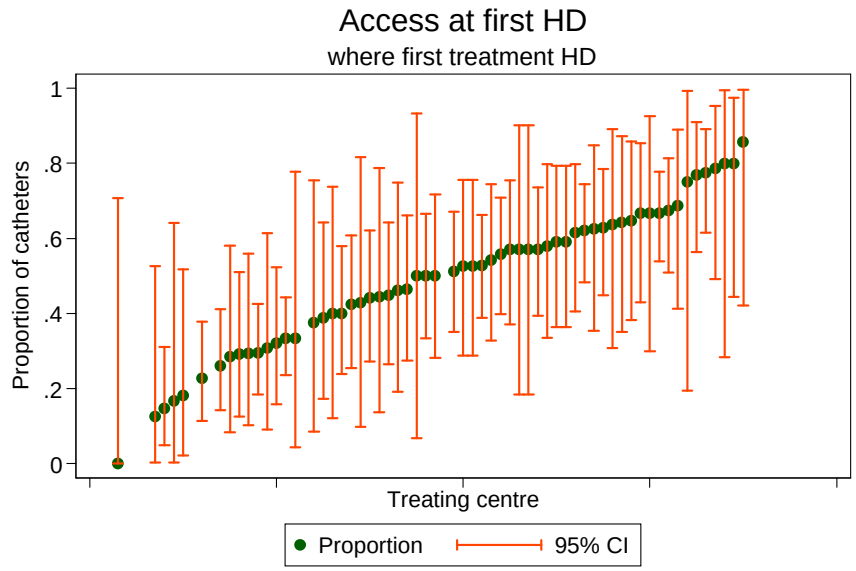


VARIATION IN RESULTS BETWEEN CENTRES

For some years, we have published graphs illustrating the variation in some parameters between units and between areas. Examples of this include peritonitis rate, phosphate level and (in the transplant arena) variation in waiting times for transplantation between States. Interest in this clinical variation is increasing, particularly from the quality assurance perspective. Over 2010-2011 ANZDATA, at the request of the Dialysis Nephrology and Transplantation Subcommittee of ANZSN and KHA, has developed enhanced reporting of Key Process Indicators for dialysis patients. This will be based around the "real-time" reporting system; beginning in 2011 contributing units will be provided (on a three monthly basis) with a report with dialysis KPI's. After considerable discussion, two KPI's will be reported initially - the number and rates of episodes of peritonitis among PD patients, and the rates of central venous catheter use at first haemodialysis (where this is the first renal replacement therapy).

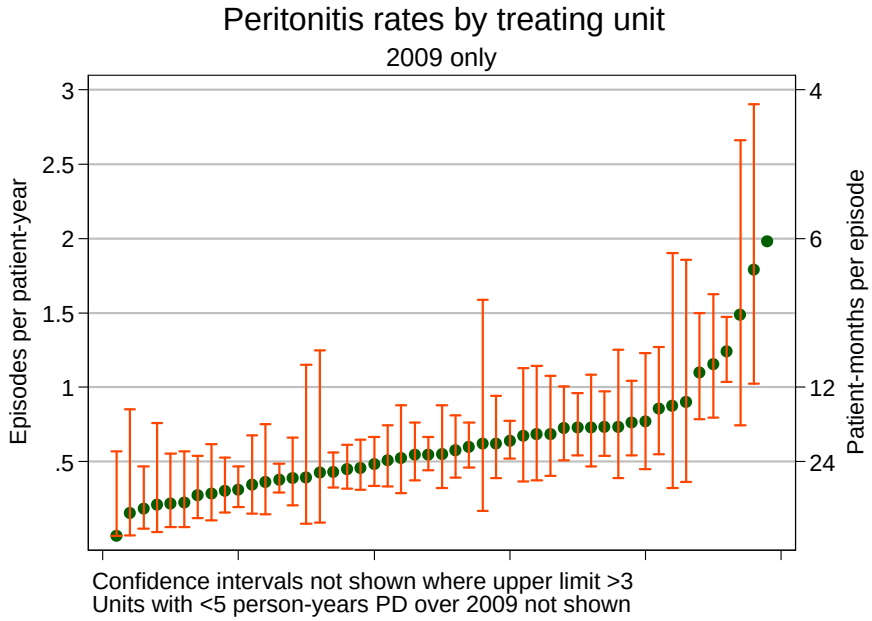
For both these parameters, there is considerable variation in rates between centres. For access at first haemodialysis, this might reflect variation in late referral. However, even after exclusion of these patients there is large variation in CVC use (Figure iv). Similar large variation is seen in peritonitis rate (Figure v).

Figure iv



ANZDATA, non-late referred new RRT 2009, HD at first treatment

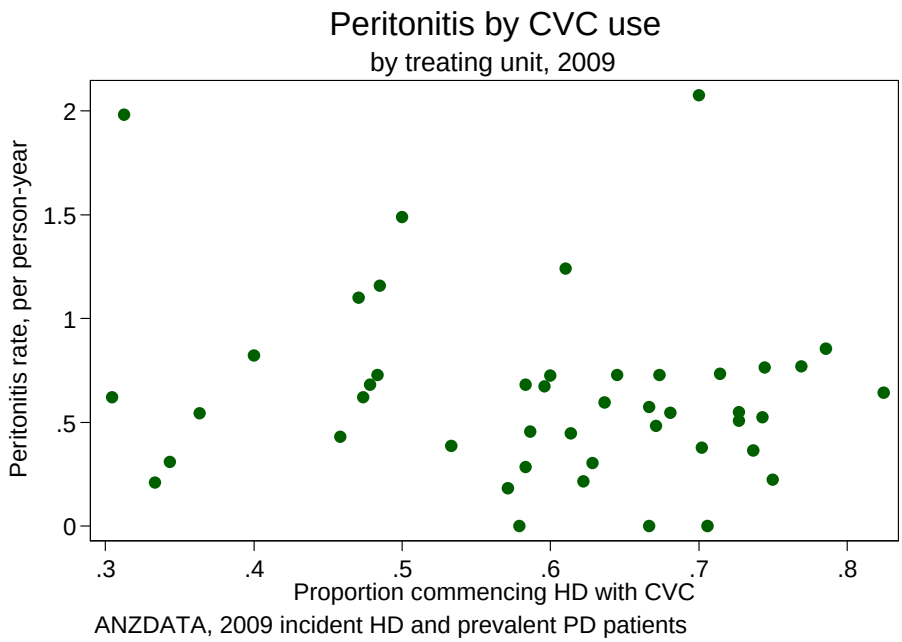
Figure v



Confidence intervals not shown where upper limit >3
Units with <5 person-years PD over 2009 not shown

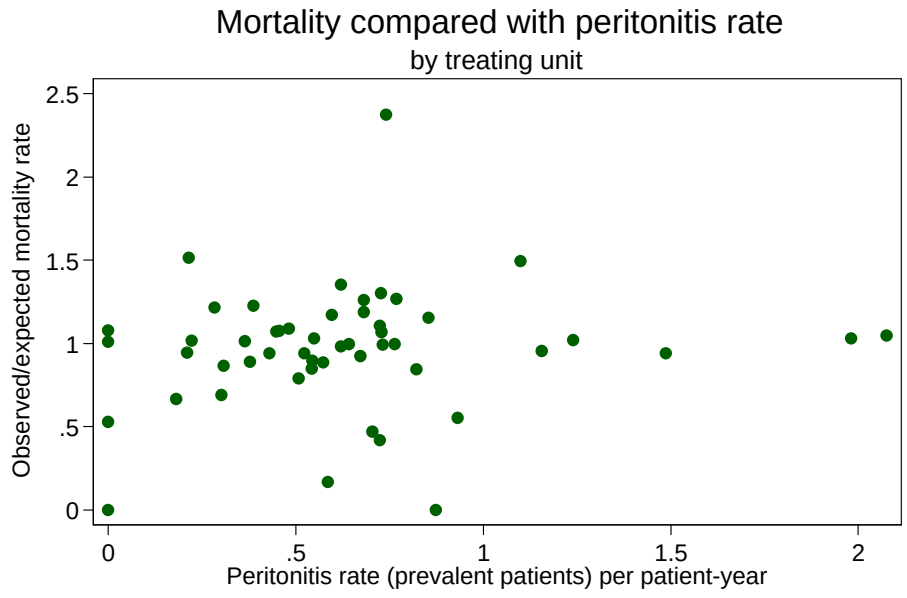
An obvious question which arises is how the various markers of "quality" relate to each other. In the case of use of central venous catheters and peritonitis rate (among transplant patients) there is little to suggest units that perform well on one marker also perform well on the other. This is illustrated in the scatter plot in Figure vi.

Figure vi



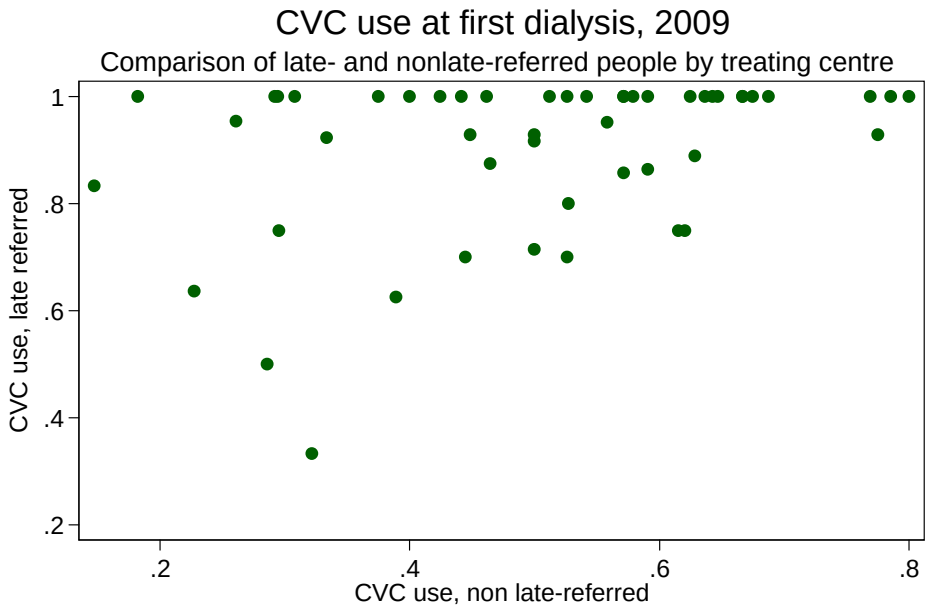
Similarly, there is no clear relationship between the observed peritonitis rates and the overall mortality for a given unit (across haemodialysis and peritoneal dialysis patients, adjusted for comorbidity). This is demonstrated in Figure vii, where the ratio of observed / expected mortality is compared with the observed peritonitis rates.

Figure vii



This lack of relationship extends to evaluation of different groups with the same marker. Although it is to be expected that overall rates of CVC use at the time of first dialysis will be much higher among patients referred late to nephrological care, it is reasonable to hypothesise that units which have low rates of CVC use among non-late referred patients might also have relatively lower rates among late-referred patients. This might reflect the underlying provision of access services etc. However, when the proportion of catheter use in each unit is compared between the two groups, it can be seen from Figure viii that there is only a modest relationship between these two measures.

Figure viii



ANZDATA, CVC use among incident HD patients where HD is the first RRT modality, >10 new patients in 2009

There are clearly a number of factors which will influence the relationships between various markers. Investigation into these will form a part of the ANZDATA Registry's work program over the coming year, to allow better interpretation of the published KPIs.

Of course, it is illogical to expect a single marker to be a good reflection of all aspects of care. There are a wide variety of possible markers which could be utilised in evaluation, particularly given the number of biochemical parameters which are influenced by dialysis treatments.

However, for many of these the relationship between the marker and mortality risk is not clear, or may be governed by factors beyond the control of the treating centre. For example, there is good epidemiological data linking phosphate concentrations among dialysis patients with mortality, but interventional data is lacking.

The markers chosen have been selected on the basis of clinical relevance and amenability to modification. For both peritonitis and access at first haemodialysis there is an immediate and direct mortality risk to patients, they are factors over which a renal unit (and associated services) have a substantial degree of influence, they are easily measured, accurately defined and are responsive over a short time frame to changes in protocols or procedures.