The Thirtieth Report

Australia and New Zealand Dialysis and Transplant Registry

2007

Edited by

Stephen McDonald
Sean Chang
Leonie Excell

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ANZDATA Registry offers its most grateful appreciation to everyone who helped make this 30th 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] ..
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Australia and New Zealand Dialysis and Transplant Registry
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Editors: Stephen McDonald, Sean Chang and Leonie Excell

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 I (ON CD) (and website www.anzdata.org.au)

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

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

CONTENTS

The ANZDATA Registry is pleased to present its 2007 Annual Report. It is the 30th annual report and covers data collected until the end of the calendar year 2006. Once again there has been an ongoing commitment from Renal Units in Australia and New Zealand, which has provided us with a report which we are confident contains 100% of patients who have received dialysis and transplantation services in Australia and New Zealand in this time period. The staff of the Registry once again would like to thank the commitment of these Renal Units and the hard work of their staff in the timely and accurate provision of data.

Our data collection process has continued to evolve, with an increasing emphasis on "real-time" data collection, either by fax or web-based processes. This spreads the data entry burden throughout the year, and collects information about key events (new patients, transplants, graft failure and death). We have developed an interface to allow units to interrogate the database regarding these entries, allowing immediate access to "real-time" data.

In 2007, Lee Excell has continued in her role as Manager of the Registry and Co-editor of the report. Brian Livingston has continued to provide information technology expertise and data analysis and Carol Young and Christina Leitch have provided administrative support.

Dr Stephen McDonald has continued in his role as Executive Officer of the Registry. His scientific and epidemiological leadership has ensured that the output from the Registry has maintained its usual high standard and attracted recognition both nationally and internationally. Dr McDonald has been an invited speaker to present registry data at a number of International Nephrology conferences in 2007, continuing a process of increasing the profile of the Registry.

There have been some changes to the staffing of the Registry over the last year. Hannah Dent has filled the role of biostatistician part-time sharing this role with the University of Adelaide. Lis Steinmetz is having two years long service leave and his been replaced by Christina Leitch.

Dr Sean Chang was appointed as Fellow in Epidemiology at the beginning of 2006. This position is funded by AMGEN and continues a most productive association which has provided the Registry with an excellent resource which we hope will continue well into the future.

Dr Emmanuel Villar from France has spent the past twelve months as a visiting postdoctoral fellow. He has had a particular interest in dialysis rates and outcomes associated with diabetes.

One of the strengths of the Registry can be measured by the number of publications which have appeared in peer review journals based substantially on data from ANZDATA. These publications are listed on Page 19 of the report. A further measure of these is the citation of individual papers; by this measure there has been a steady improvement overall.

The major funding for the Registry continues to come from the Australian Commonwealth Department of Health and Ageing. Funds are also provided from Kidney Health Australia and the New Zealand Ministry of Health. Non-tied grants have been received from AMGEN Australia for the employment of the Fellow in Epidemiology. Novartis Pharmaceuticals Australia Pty Ltd, Janssen-Cilag Pty Ltd, Roche Products Pty Ltd, and Wyeth Australia Pty Ltd have also generously provided non-tied grants for the maintenance of the web-based data entry system.

This report is the product of the hard work of a number of individuals and committees. The ANZDATA Registry Executive and the ANZDATA Registry Steering Committee Membership are listed on Page 7. The Working Groups which deal with specialty areas have also continued to generate ideas for data collection and data analysis.

Most of all though, we are indebted for the time and effort put in by the contributing units and their staff have enabled the Registry to stay at the forefront of end stage renal failure registries on the world scene.

Graeme Russ

Chair ANZDATA Executive
December 2007

ANZDATA Registry Executive Committee

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

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Professor Graeme Russ
Dr Stephen McDonald
Mrs Leonie Excell
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Dr Ian Dittmer (New Zealand Representative)
Dr Scott Campbell (Project Manager—Transplantation)
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Dr Steven McTaggart (Project Manager—Paediatric Manager)
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Ms Denise Tomlinson (Nursing Representative)
Mr Damian Harding (Consumer Representative)

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Dr Stephen McDonald
Dr John Agar
Dr Kevan Polkinghorne

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

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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 6704. You may also write to us (ANZDATA Registry, C/- The Queen Elizabeth Hospital, 28 Woodville Road SA 5011) 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.

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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

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

2. Data collection

ANZDATA collects information from all renal units in Australia and New Zealand. 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. 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. An extensive cross-sectional survey is then performed twelve monthly (for data to 31st December).

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

3. Inclusion criteria

Included in the Registry are all patients 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 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 definition has changed for this report. We now use data from the Tissue Typing Laboratories, cross-checked with ANZDATA. Waiting list analyses are for patients' status at 31st December 2006.

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].

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

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 standard NH&MRC categories are used: 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 2006.

10.3 Population denominator

The population estimates used are the estimated resident populations (ERP) for the year 2006, 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.

Patient survival for transplant recipients - rates for fixed periods are calculated according to the life-table method and 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 (ie 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 grafted during that period. Patients are followed up until they are either grafted (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.

10.7 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.

10.8 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.

11. Database

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

12. Statistics

Statistical analyses were performed using SPSS release version 15 and Stata version 10.

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 and have on-site nephrology presence).

In contrast, satellite units (see Page 17) provide haemodialysis treatments to selected patients, usually with lower staff ratios and no on-site nephrologist.

QUEENSLAND

Allamanda Private Hospital (Nephrocare)
Bundaberg Base Hospital
Cairns Base Hospital
Chermside Dialysis Unit (Nephrocare)
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 Unit (Gambro)
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

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
Macleay Dialysis Centre
Mater Misericordiae Hospital
Mayo Private Hospital - Taree
Port Macquarie Community Dialysis
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
  Westmead Hospital
    Orange Base Hospital
    Wentworth Dialysis Centre

AUSTRALIAN CAPITAL TERRITORY (ACT)

The Canberra Hospital

VICTORIA

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

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
Middlemore Hospital
Palmerston North Hospital
Taranaki Base Hospital
Waikato Hospital
Wellington Hospital
Whangarei Area Hospital

QUEENSLAND

Queensland Renal Transplantation Service
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Christchurch Hospital
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Wellington Hospital
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Queensland

Atherton Satellite - Cairns Base Hospital
Cairns Private Hospital 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
Logan Satellite - Princess Alexandra Hospital
Mt. Isa Satellite - Townsville Hospital
Noosa Satellite - Sunshine Coast Health District
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
Vincent Satellite - Townsville Hospital

New South Wales

Armidale Satellite -Tamworth Hospital
Ballina Satellite - Lismore Hospital
Bankstown Hospital - South West Sydney Renal Services
Bathurst Satellite Dialysis Centre - Orange Hospital
Blacktown Satellite - Westmead Hospital
Brewarrina Hospital
Broken Hill Hospital
Campbelltown Satellite - South West Sydney Renal Services
Cobar Hospital
Coffs Harbour Base Hospital
Coonamble Hospital
Dame Eadith Walker - Statewide Renal Services
Dubbo Base Hospital
Eora Satellite - Prince of Wales Hospital
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 (Gambro)
Liverpool Community Centre - South West Sydney Renal Services
Macleay Dialysis Centre - Kempsey
Maitland Hospital - Hunter New England Health
Moree Satellite - Tamworth Hospital
Moruya Satellite (Fresenius) - Statewide Renal Services
Muswellbrook - Hunter New England Health
Norfolk Island Hospital - Statewide Renal Services
Orange Base Hospital - Westmead Hospital
Shellharbour - Wollongong Hospital
Shoalhaven Satellite (Nowra) - Wollongong Hospital
Singleton Satellite - Hunter New England Health
Taree Community Dialysis - Hunter New England Health
Wagga Wagga Base Hospital
Wansey Satellite - Hunter New England Health
Wellington 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
Bacchus Marsh Hospital
Bairnsdale Hospital
Ballarat Health Services
Bendigo Hospital
Broadmeadows Satellite
Brunswick Satellite
Casey Satellite
Casterton Hospital
Caulfield General Medical Centre
Coburg Satellite
Cohuna Hospital
Colac Hospital
Corryong Satellite
Cranbourne Satellite
Dandenong Satellite
Daylesford Hospital
Donald Hospital
Echuca Hospital
Edenhope Hospital
Epping Dialysis Unit
Frankston Satellite
Gambro - Diamond Valley Community Hospital
Goulburn Valley Hospital
Hamilton Hospital
Hastings Hospital
Heidelberg - Austin Health

Victoria (Continued)

Horsham Satellite
Kyneton Hospital
La Trobe Regional Satellite
Lorne Hospital
Mansfield District Hospital
Maryborough District Health Service
Mildura Hospital
Moorabbin Satellite
Myrtleford Hospital
Newcomb Satellite
North East Kidney Service - Austin Health
Northern Hospital Satellite
Omeo District Hospital
Orbost Hospital
Peter James Centre
Portland District Health
Rosebud Hospital
Royal Park Home Dialysis Service—Royal Melbourne Hospital
Sale Hospital
Sandringham Satellite
Seymour Hospital
South Geelong Renal Unit - Geelong Hospital
St. George's Hospital
Sunshine Satellite
Swan Hill Hospital
Terang Satellite
Wangaratta Hospital
Warnnambool 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 Hospital
Ceduna Hospital
Clare Hospital
Hampstead Rehabilitation Satellite
Hartley Private Hospital (Nephrocare)
Lyell McEwin Satellite
Millicent Hospital
Modbury Private Dialysis Centre (Nephrocare)
Mount Gambier Satellite
Murray Bridge Hospital
Noarlunga Satellite
Payneham Private Dialysis Centre (Baxter)
Port Augusta Hospital
Port Lincoln Satellite Centre
Wayville Satellite Centre

Northern Territory

Bathurst Island Hospital - Royal Darwin Hospital
Community Health Centre - 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

Western Australia

Armadale SatelliteBunbury Satellite
Geraldton Hospital
John Hortin Dialysis Unit - Albany
Joondalup Satellite Unit
Kalgoorlie Dialysis Unit
Kimberley Dialysis Centre - Royal Perth Hospital
Melville Satellite
Midland Private Dialysis Centre (Baxter)
Peel Health Campus - Mandurah
Pilbara Dialysis Unit [Port Hedland] - Royal Perth Hospital
Royal Perth Rehabilitation Hospital - Royal Perth Hospital

New Zealand

Bay of Islands Hospital - Whangarei Hospital
Carrington Satellite - Auckland City Hospital
Greenlane Hospital - Auckland City Hospital
Manukau Satellite - Middlemore Hospital
Middlemore Satellite - Middlemore Hospital
Porirui Satellite - 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 (2006) and during 2007 are listed below.

2006

1. Badve SV, Hawley CM, McDonald SP, Mudge DW, Rosman JB, Brown FG, Johnson DW, for The ANZDATA Registry P. D. Working Committee. Effect of previously failed kidney transplantation on peritoneal dialysis outcomes in the Australian and New Zealand patient populations. Nephrol Dial Transplant 21(3):776-83, 2006
2. Marshall MR, Byrne BG, Kerr PG, McDonald SP. Associations of hemodialysis dose and session length with mortality risk in Australian and New Zealand patients. Kidney Int 69(7):1229–36, 2006
3. McDonald SP, Russ GR. Recurrence of IgA Nephropathy Among Renal Allograft Recipients From Living Donors is Greater Among Those With Zero HLA Mismatches. Transplantation 82(6):759-62, 2006
4. Stewart JH, McCredie MR, Williams SM, Fenton SS, Trpeski L, McDonald SP, Jager KJ, van Dijk PC, Finne P, Schon S, Leivestad T, Lokkegaard H, Billiouw JM, Kramar R, Magaz A, Vela E, Garcia-Blasco MJ, Ioannidis GA, Lim YN. The enigma of hypertensive ESRD: observations on incidence and trends in 18 European, Canadian, and Asian-Pacific populations, 1998 to 2002. Am J Kidney Dis 48(2): 183-91, 2006
5. Irving M, Craig JC, Roger S, McDonald SP, Gallagher MP, Polkinghorne K, Mathew T, Walker R. Implementation of clinical practice guidelines: variability in implementation of iron management guidelines in chronic kidney disease patients on dialysis. Med J Aust 185(6):310-6, 2006
6. Kennedy SE, Mackie FE, Rosenberg AR, McDonald SP. Waiting Time and Outcome of Kidney Transplantation in Adolescents. Transplantation 82:1046-50, 2006
7. The ESRD Incidence Study Group. Geographic, ethnic, age-related and temporal variation in the incidence of end-stage renal disease in Europe, Canada and the Asia-Pacific region, 1998-2002. Nephrol Dial Transplant 21(8):2178-83, 2006
8. Rumpsfeld M, McDonald SP, Johnson DW. Higher Peritoneal Transport Status Is Associated with Higher Mortality and Technique Failure in the Australian and New Zealand Peritoneal Dialysis Patient Populations. J Am Soc Nephrol 17(1):271-8, 2006
9. Lim WH, McDonald SP, Russ GR. Effect on graft and patient survival between shipped and locally transplanted well-matched cadaveric renal allografts in Australia over a 10-year period. Nephrology (Carlton) 11(1):73-7, 2006
10. Vajdic CM, McDonald SP, McCredie MRE, van Leeuwen MT, Stewart JH, Law M, Chapman JR, Webster AC, Kaldor JM, Grulich AE. Cancer Incidence Before and After Kidney Transplantation. JAMA 296(23):2823-31, 2006

2007

1. Chang SH, Russ GR, Chadban SJ, Campbell SB, McDonald. SP: Trends in Kidney Transplantation in Australia and New Zealand, 1993-2004.Transplantation 84:611-618, 2007
2. Chang SH, Coates, PTH, McDonald, SP: Effects of Body Mass Index (BMI) at Transplant on Outcomes of Kidney Transplantation. Transplantation 84: 981-987, 2007
3. Moist LM, Chang, SH, Polkinghorne, KR, McDonald SP: Trends in Hemodialysis Vascular Access from the Australia and New Zealand Dialysis and Transplant Registry (ANZDATA) 2000- 2005. Am J Kidney Dis 50: 612-621, 2007
4. Villar E, Chang SH, McDonald SP: Incidences, treatments, outcomes, and gender effect on survival in end-stage renal disease patients by diabetic status in Australia and New Zealand (1991-2005). Diabetes Care 30: 3070-3076, 2007
5. Lim WH, Chang SH, Coates PTH, McDonald SP: Parental Donors in Live-Donor Kidney Transplantation Affects Acute Rejection Rates and Glomerular Filtration Rates at 1 and 5 Years. Transplantation 84: 972-980, 2007
6. Badve SV, Hawley CM, McDonald, SP, Mudge DW, Rosman JB, Brown FG and Johnson, DW: Automated and continuous ambulatory peritoneal dialysis have similar outcomes. Kidney Int. 2007
7. McDonald SP, Russ GR, Campbell SB and Chadban SJ: Kidney Transplant Rejection in Australia and New Zealand: Relationships between rejection and graft outcome. Am J Trans, 7:1201-6, 2007
8. Craven A.-M.S, Hawley C.M, McDonald SP, Rosman JB, Brown FG, and Johnson DW: Predictors of renal recovery in Australian and New Zealand end-stage renal failure patients treated with peritoneal dialysis. Perit Dial Int. 2007.27(2):p. 184-191.9
9. Wiggins KJ, McDonald SP, Brown FG, Rosman JB and Johnson DW: High membrane transport status on peritoneal dialysis is not associated with reduced survival following transfer to haemodialysis. Nephrol Dial Transplant, 22:3005-12, 2007
10. Chang SH, Russ GR, Chadban SJ, Campbell SB, McDonald SP: Trends in adult post-kidney transplant immunosuppressive use in Australia, 1991-2005.Nephrology (In Press)

2005 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 | Hospital Unit No | Physician (Optional)

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

5 RACIAL ORIGIN (Record from list) | OTHER | **6** PRIMARY RENAL DISEASE (Record from list) | OTHER | **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 HEPATITIS C ANTIBODY

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

14 COURSE OF TREATMENT - COMPLETE ACCORDING TO CODE

A Hospital/Outpatient APD / IPD
C Satellite APD / IPD
E Home APD / IPD

L Hospital/Outpatient CAPD
M Home CAPD

B Hospital HD
D Satellite HD
F Home HD

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

	CODE	DAY	MTH	YR		CODE	DAY	MTH	YR		CODE	DAY	MTH	YR
1st					16th					31st				
2nd					17th					32nd				
3rd					18th					33rd				
4th					19th					34th				
5th					20th					35th				
6th					21st					36th				
7th					22nd					37th				
8th					23rd					38th				
9th					24th									
10th					25th									
11th					26th									
12th					27th									
13th					28th									
14th					29th									
15th					30th									

15 CANCER EVER? Y/N — If Yes, enter separate 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 the Pregnancy Outcome sheet — DATE OF LAST OUTCOME

THIS SECTION FOR ALL PATIENTS DIALYSED AT ANY TIME DURING THIS 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 | AT LAST HD | DECLOTTED during Survey Y=Yes N=No D=Declotted and revised | REVISED during Survey N=No S=Surgical A=Angioplasty B=Both

1=Native 2=Synthetic 3=Tunnel CV Catheter 4=Non Tunnel CV Catheter

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 EXCHANGES (Litres/week)

38 DIALYSATE **ONLY** (Creatinine Clearance) Adjusted for Body Surface Area (Litres/week/1.73 m²) | Range 10-200 Litres/week | **39** DIALYSATE **ONLY** WEEKLY Kt/V (Range 0.1 - 5.0) | **40** RESIDUAL RENAL FUNCTION (Creatinine Clearance) Adjusted for Body Surface Area (Litres/week/1.73 m²) | **41** REASON FOR TRANSFER DURING SURVEY (Record from list) From CAPD to APD From APD to CAPD From any PD to HD | 1st | 2nd | 3rd | 4th

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 CMV EBV AT GRAFT 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 (See list) | AGE | SEX | **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									

61 PRA AND CROSSMATCH

MAXIMUM	CURRENT

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]**
900 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'd
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

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	
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 DIALYSATE ONLY (Creatinine Clearance)
Range 10 - 200 litres/week
Litres /week / 1.73m² Body Surface Area

39 DIALYSATE ONLY WEEKLY Kt/V - **Range** 0.1 — 5.0

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

41 – REASON FOR TRANSFER
*** From CAPD to APD**
*** From APD to CAPD**
*** From any form of PD to HD**

10 Recurrent / persistent peritonitis
11 Acute peritonitis
15 Tunnel / exit site infection
16 Diverticulitis
20 Inadequate solute clearance
21 Inadequate fluid ultrafiltration
27 Abdominal abscess
30 Dialysate leak
31 Catheter block
32 Haemoperitoneum
35 Hernia
36 Abdominal pain
40 Abdominal surgery
41 Sclerosing peritonitis
45 Haematuria
46 Pleural effusion
50 Patient preference
51 Unable to manage self-care
60 Recovery of renal function
70 Transplantation
80 Death
81 Transfer outside Australia
82 Other surgery
83 Hydrothorax
99 Other (specify)

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

(2005)

SUMMARY

KEY SUMMARY POINTS

AUSTRALIA

- There were 16,027 people (778 per million) receiving renal replacement therapy (RRT) at 31st December 2006. Of these, 6,845 (332 per million) had a functioning kidney transplant and 9,182 (446 per million) received dialysis treatment.
- 2,378 people commenced RRT in Australia in 2006 (115 per million). The incident rate varied from 339 per million population in the Northern Territory to 92 per million in Tasmania.
- The mean age at commencement was 60.7 years, the median 63.2 years and the age range 0.4 - 93.1 years.
- 32% of new patients had diabetic nephropathy attributed as their cause of end stage renal failure, 23% had glomerulonephritis and 15% hypertension.
- Of patients < 65 years of age and receiving dialysis treatment, 25% were on the active kidney transplantation waiting list. This proportion varied between 2% in the Northern Territory and 39% in the Australian Capital Territory. Only 4% of Aboriginal/Torres Strait Islander patients < 65 years were on the transplant waiting list.
- The death rate per 100 patient years was 14.8 for dialysis dependent patients (haemodialysis 14.8, peritoneal dialysis 14.9) and 2.0 for those with a functioning kidney transplant (deceased donor 2.5, live donor 1.1).
- Of the 1,322 deaths among dialysis dependent patients in 2006, 35% were due to cardiovascular causes, 33% to withdrawal from treatment, 10% to infection and 7% from malignancy.
- Of the 137 deaths among patients with kidney transplants, 32% were due to malignancy, 30% to cardiovascular causes and 15% to infection.
- There has been a 7% increase in the total number of prevalent dialysis patients from 8,620 in December 2005 to 9,182 in December 2006.
- There were 641 kidney transplant operations performed in 2006, a transplant rate of 31 per million population.
- Of these, 43% (274 grafts) were from live donors compared to 39% (246 grafts) in 2005.
  27% of primary live donor operations were performed without the recipient receiving prior dialysis therapy.
- For primary deceased donor grafts performed in 2005-2006, the 12 month patient and graft survival rates were 95% and 90% respectively.
- The five year primary deceased donor recipient and graft survival for operations performed in 2001-2002 were 90% and 82% respectively.
- There were 6,845 functioning kidney transplants in Australia at 31st December 2006, a prevalence of 332 patients per million represents a 5% increase over 2005.

KEY SUMMARY POINTS

NEW ZEALAND

- There were 3,224 people (779 per million) receiving renal replacement therapy (RRT) at 31st December 2006. Of these, 1,253 (303 per million) had a functioning kidney transplant, and 1,971 (476 per million) received dialysis treatment.
- 484 people (117 per million) commenced RRT in 2006.
- The mean age at commencement was 57.0 years, the median age 58.8 years and the age range 0.4 - 89.7 years.
- Diabetic nephropathy accounted for 42% of new patients, glomerulonephritis 21% and hypertension 12%.
- Of patients < 65 years of age, 22% were on the active kidney transplantation waiting list. 22% of Maoris and 14% of Pacific People < 65 years of age were on the transplant waiting list.
- The death rate per 100 patient years was 17.2 for dialysis dependent patients (haemodialysis 15.0, peritoneal dialysis 20.8) and 2.5 for those with a functioning kidney transplant (deceased donor 3.3, live donor 0.9).
- Of the 330 deaths among dialysis dependent patients in 2006, 39% were due to cardiovascular causes, 27% to withdrawal from treatment, 15% to infection and 6% from malignancy.
- Of the 31 deaths among patients with a kidney transplant, 48% were due to malignancy, 32% to cardiovascular causes and 13% due to infection.
- The number of patients who were dialysis dependent at 31st December 2006 (1,971) was an increase of 5% over the previous year. 54% of all dialysis dependent patients were receiving home dialysis. 70% of these were on peritoneal dialysis.
- The reported haemoglobin and use of erythropoietic agents has reached a plateau after increasing over recent surveys.
- There were 90 kidney transplant operations performed in 2006, a rate of 22 per million population.
- The percentage of live donors in 2006 was 54% (49 grafts), compared to 49% (46 grafts) in 2005.
- For primary deceased donor grafts performed in 2005-2006, the 12 month patient and graft survival rates were 96% and 90% respectively.
- The five year primary deceased donor recipient and graft survival for operations performed in 2001-2002 were 84% and 77% respectively.
- The 1,253 functioning kidney transplants at 31st December 2006, a prevalence of 303 per million represents a 1% increase from 2005.

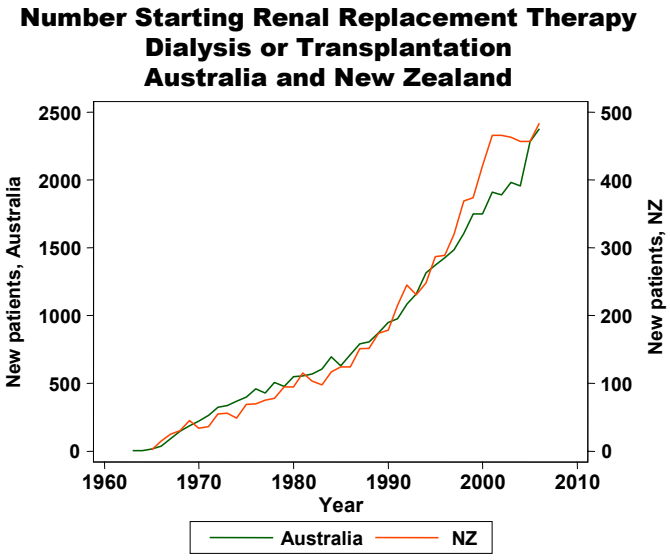
TRENDS IN KIDNEY DISEASE OVER TIME

This section is a new one, and represents a slight change in the format of the report, following comments from various sources. In particular, there appears a role for a brief, narrative-style summary of particular themes in relation to end-stage kidney disease in Australia and New Zealand that sits somewhere between the simple figures of the "summary points", and the exhaustive detail of the chapters and appendices. To this end, while some of the material section is unique, some is drawn from other areas of the report.

In this first "trends" section, we have chosen to highlight changes in rates of incidence (of renal replacement therapy) and how these people are treated.

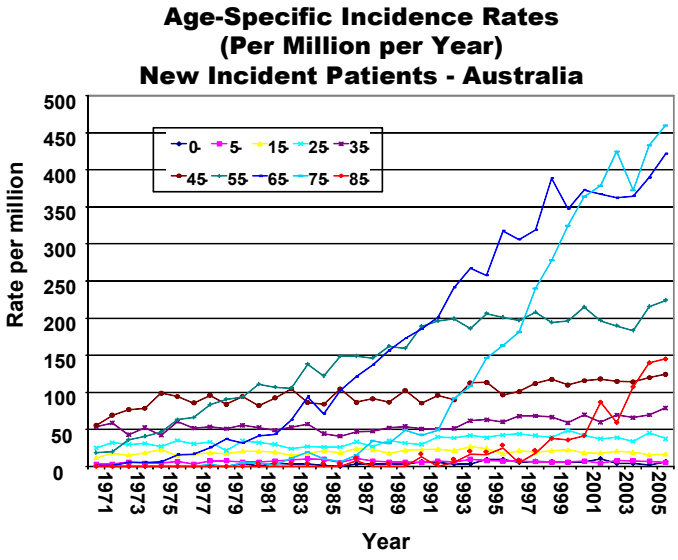
For both Australia and New Zealand, the incidence rates since the Registry commenced have increased steadily since commencement of renal replacement therapy (RRT=dialysis and transplantation). The number of new patients each year for both countries is illustrated in Figure 0.1.

Figure 0.1



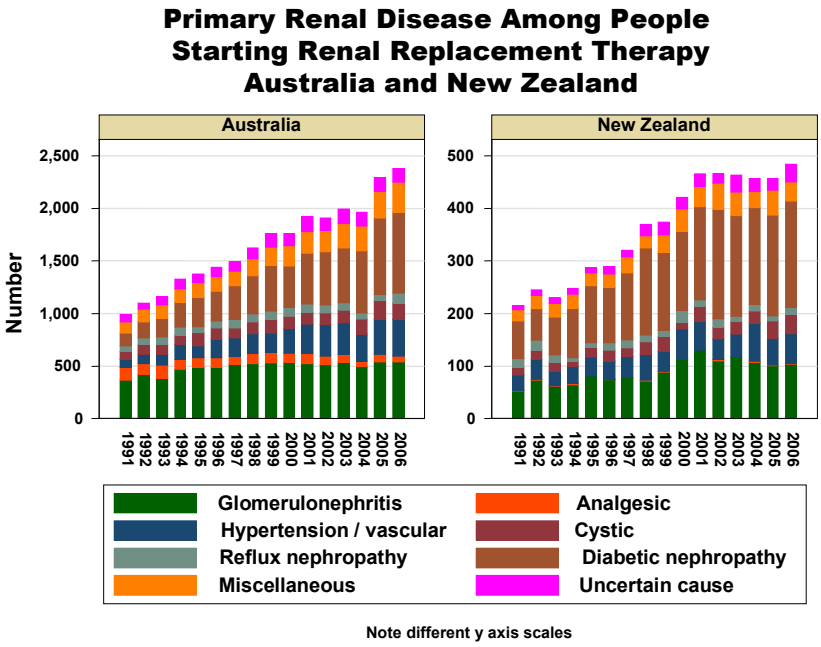
Clearly, these numbers reflect in part changes in the population but examination of age-specific rates shows dramatic changes. These changes have not been constant across all age groups. As illustrated in Figure 0.2 for Australia, the rates among the youngest age groups have been constant for many years, with increases in successively older age groups over time. Initially, the 55-64 year age group increased from the mid 1970's, then the 65-74 year age group in the late 1980's, and the 75-84 year old age group in the mid 1990's. There has also been an increase in the 85 and older age group, however the overall impact of this on the actual numbers of people requiring treatment is lesser, as the absolute rates are lower and the proportion of the population in this age group is substantially smaller than in younger age groups.

Figure 0.2



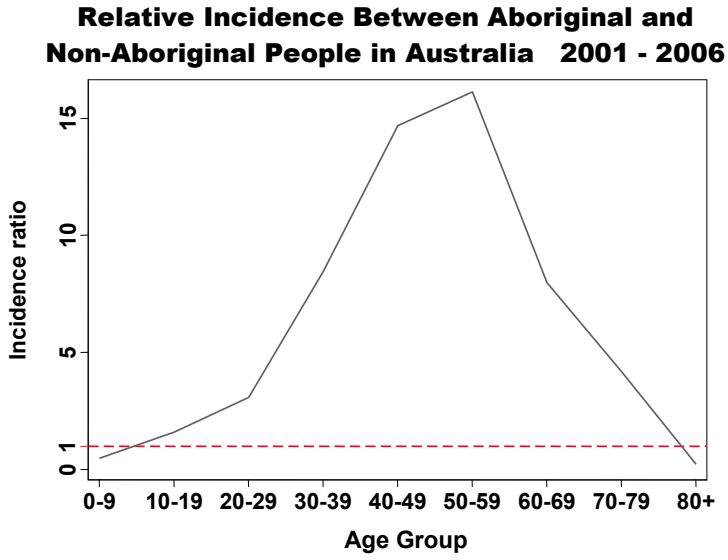
Associated closely with this change in rates has been a change in the types of kidney disease to which the end-stage kidney failure is attributed. In particular, the bulk of the increase has occurred in people with diabetic nephropathy and kidney disease related to hypertension and renovascular disease (Figure 0.3).

Figure 0.3



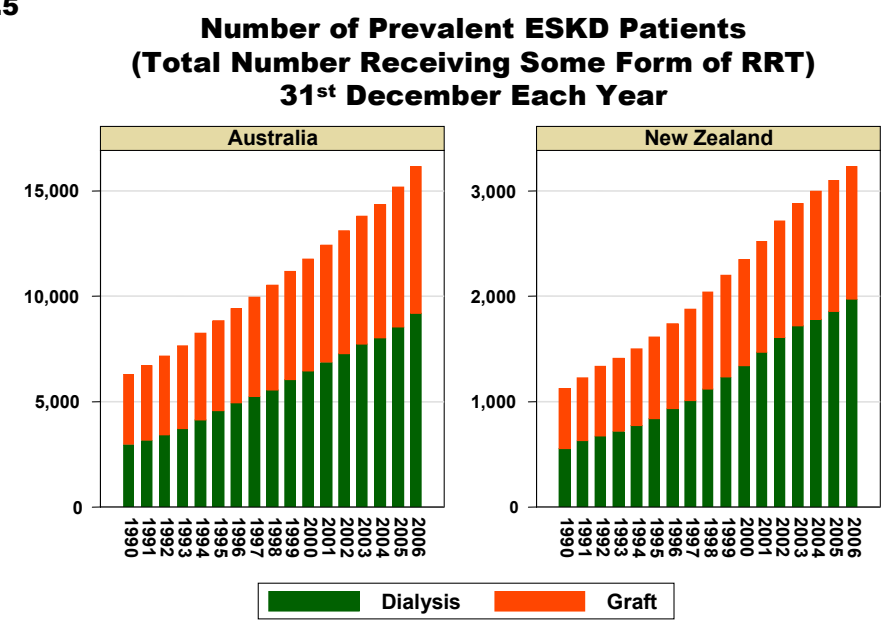
Another major trend over the previous 20 years has been the rapid rise in the rates of kidney disease among indigenous people in both Australia and in New Zealand. There are a number of publications based on ANZDATA material which have already been released and which describe the patterns and trends (1-5); there is also a very substantial body of work about the likely reasons underlying the very high rates of earlier stages of kidney disease among Aboriginal Australians in particular. The differential rates between Aboriginal and non-Aboriginal people in Australia varies with age, and is illustrated in Figure 0.4.

Figure 0.4



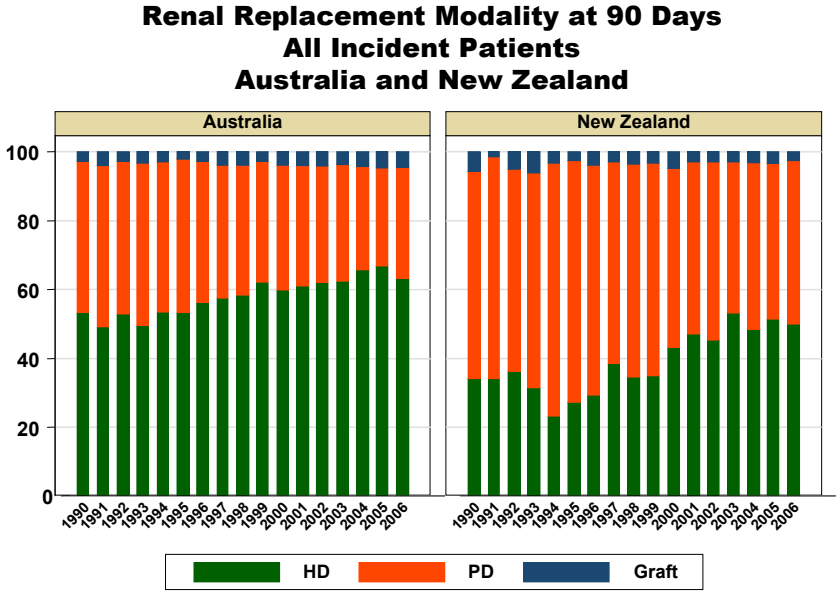
A predictable outcome of increasing rates of new patients starting RRT each year is an increase in the total number of patients receiving some form of RRT at any one time. The trends in this number are illustrated in Figure 0.5. It can be seen that there is a steady increase year on year, and that the greatest increase has been in patients receiving dialysis treatment rather than transplantation. Over the period since 1990, the number of people in Australia receiving RRT has increased by 5.9% per year, and in New Zealand by 6.9% per year. Over this time, the proportion of all people receiving RRT who had a functioning kidney transplant has steadily fallen in both countries. Provision and funding of appropriate RRT services for this growing group is clearly a major challenge for the health systems of both countries (6).

Figure 0.5



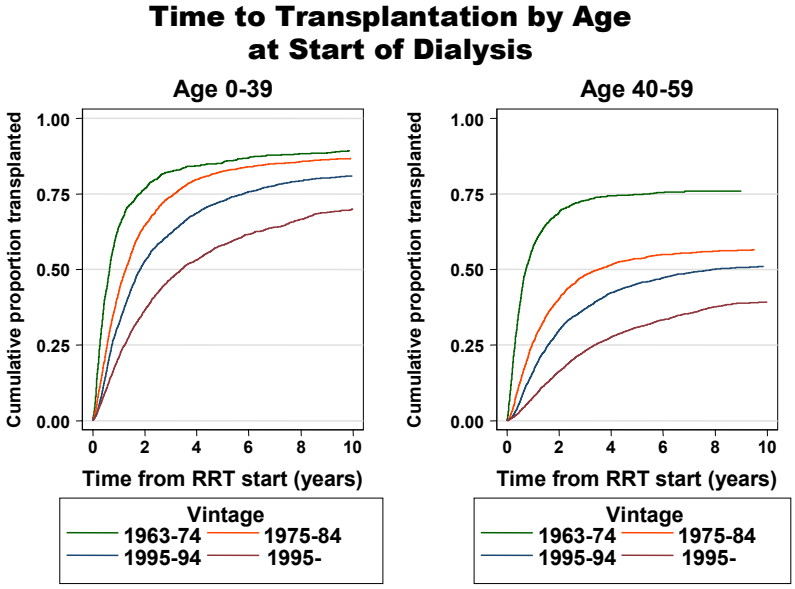
Patterns of treatment have also changed over time. The treatment modality in use at 90 days is a commonly accepted surrogate for the planned longer term method of dialysis, as it allows time for in the implementation of an appropriate long-term treatment strategy among people who present late with their kidney disease. As can be seen in Figure 0.6, there is a steady trend towards HD and away from PD over the past 15 years.

Figure 0.6



Although the success rates of kidney transplantation have been steadily improving over many years, the number of kidney transplants is a key limiting factor. The number of transplants performed from deceased kidney donors have been static for ten years; there has been an increasing number of kidneys from living donors, particularly living unrelated donors in very recent years. Nevertheless, it can be seen from Figure 0.7 that a lower proportion of people are actually reaching transplantation. This is not explained simply by the ageing of the patients entering renal replacement therapy – it is true even for the younger age groups in whom transplantation would be the usual option if available, such are the <40 year age group.

Figure 0.7



Note that in the Kaplan-Meier graphs in Figure 0.7 the denominator is the population at that point in time - for example at five years approximately 75% of people still receiving RRT (either dialysis or transplantation) have received a transplant. People who have died (either before or after transplantation) or who have reached the end of their follow up are removed from follow up at the time of death or loss to follow up.

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