1.09 End stage renal disease

The number of Aboriginal and Torres Strait Islander people with a principal diagnosis of end-stage renal disease as registered by the Australia and New Zealand Dialysis and Transplant Registry, expressed as a rate by age group, age-standardised rate and ratio

Data sources

Data for this indicator come from the Australia and New Zealand Dialysis and Transplant Registry, the AIHW National Hospital Morbidity Database and the AIHW National Mortality Database.

Australia and New Zealand Dialysis and Transplant Registry (ANZDATA)

The data reported here on Indigenous persons with end-stage renal disease (ESRD) have been supplied by ANZDATA. The interpretation and reporting of these data are the responsibility of the authors and in no way should be seen as an official policy or interpretation of the Registry.

In Australia, persons who develop ESRD and undertake dialysis or kidney transplantation are registered with ANZDATA. The Registry is the most comprehensive and reliable source of information on persons treated for ESRD. It compiles data on incidence and prevalence, renal complications, co-morbidities and patient deaths. The current Registry began in 1977 and is coordinated by the Queen Elizabeth Hospital in Adelaide. All relevant hospitals and related satellite units in Australia and New Zealand participate.

Indigenous identification in the Registry is based on self-identification in hospital records. However, because of the heightened awareness of the extent of renal disease in Indigenous Australians and the prolonged and repeated contact with renal units in hospitals, it is believed that Indigenous identification in the Registry is more complete than in general hospital data (Cass et al. 2001).

Registrations for which Indigenous status was not stated have been included under the 'other' category.

Hospitalisations

The National Hospital Morbidity Database is a compilation of episode-level records from admitted patient morbidity data collection systems in Australian hospitals in each state and territory. Information on the characteristics, diagnoses and care of admitted patients in public and private hospitals is provided annually to the AIHW by state and territory health departments.

Data are presented for the six jurisdictions which have been assessed by the AIHW as having adequate identification of Indigenous hospitalisations in 2004–05—New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory. These six jurisdictions represent approximately 96% of the Indigenous population of Australia. Data are presented by state/territory of usual residence of the patient.

Hospitalisations for which the Indigenous status of the patient was not reported have been included with hospitalisations data for non-Indigenous people under the 'other' category. This is to enable consistency across jurisdictions, as public hospitals in some states and

territories do not have a category for the reporting of 'not stated' or inadequately recorded/reported Indigenous status.

Hospitalisation data are presented for the 2-year period July 2004 to June 2006. An aggregate of 2 years of data has been used as the number of hospitalisations for some conditions is likely to be small for a single year.

The principal diagnosis is the diagnosis established to be the problem that was chiefly responsible for the patient's episode of care in hospital. The additional diagnosis is a condition or complaint either coexisting with the principal diagnosis or arising during the episode of care. The term 'hospitalisation' has been used to refer to a separation which is the episode of admitted patient care, which can be a total hospital stay (from admission to discharge, transfer or death) or a portion of a hospital stay beginning or ending a change in a type of care (for example, from acute to rehabilitation). 'Separation' also means the process by which an admitted patient completes an episode of care by being discharged, dying, transferring to another hospital or changing type of care.

Mortality

The National Mortality Database is a national collection of de-identified information for all deaths in Australia and is maintained by the AIHW. Information on the characteristics and causes of death of the deceased is provided by the Registrars of Births, Deaths and Marriages and coded nationally by the ABS. Information on the cause of death is supplied by the medical practitioner certifying the death, or by a coroner. The data are updated each calendar year.

Although the identification of Indigenous deaths is incomplete in all state and territory registration systems, four jurisdictions (Queensland, Western Australia, South Australia and the Northern Territory) have been assessed by the ABS and the AIHW as having adequate identification. These four jurisdictions represent approximately 60% of the Indigenous population of Australia. Data are presented by state/territory of usual residence rather than state/territory where death occurs.

Deaths for which the Indigenous status of the deceased was not reported have been excluded from the analysis.

Data have been combined for the 5-year period 2002–2006 because of the small number of deaths from some conditions each year. Data have been analysed using the year of registration of death for all years. Note that the 2006 edition of this report used year of occurrence of death for all years of analysis except for the latest year of available data for which year of registration of death was used. Data published in this report may therefore differ slightly from those published in the previous edition for comparable years of data.

Analyses

Age-standardised rates and ratios have been used as a measure of morbidity in the Indigenous population relative to other Australians. Ratios of this type illustrate differences between the rates of morbidity among Indigenous people and those of other Australians, taking into account differences in age distributions.

Registration data

Information is available on Indigenous persons with end-stage renal disease (ESRD) from the Australia and New Zealand Dialysis and Transplant Registry (ANZDATA).

ESRD is a complete or near-complete failure of the kidneys to excrete wastes, concentrate urine, and regulate electrolytes. ESRD occurs when the kidneys are no longer able to function at a level that is necessary for day-to-day life. It usually occurs as chronic renal failure worsens to the point where kidney function is less than 10% of normal.

Incidence of end stage renal disease

- Between 2004 and 2006, there were 6,616 new patients registered with ANZDATA, of which 615 (10%) identified as Aboriginal or Torres Strait Islander. This is higher than the proportion of Indigenous people in the total population (2.4%).
- Indigenous people starting ESRD treatment were substantially younger than non-Indigenous Australians starting ESRD treatment. Over half (60%) of new Indigenous patients registered with ANZDATA were aged less than 55 years, whereas less than a third (30%) of non-Indigenous Australians registered were below that age (Table 1.09.1).
- Incidence rates of treated ESRD for Indigenous Australians were higher than for non-Indigenous Australians across all age groups. The difference was marked at ages 45–54 years and 55–64 years where incidence rates for Indigenous Australians were between 14 and 16 times those for non-Indigenous Australians.
- After adjusting for differences in age structure, the incidence rate of treated ESRD for Indigenous Australians was more than eight times the incidence rate of non-Indigenous Australians.
- Between 2004 and 2006, Indigenous males and females were 6 and 12 times as likely to register for treatment of ESRD as non-Indigenous males and females (Table 1.09.2).
- Incidence rates of treated ESRD for Indigenous Australians were higher than for non-Indigenous Australians in all states and territories. Rate ratios ranged from 3 in New South Wales and Victoria to 28 in the Northern Territory (Table 1.09.3).
- Incidence rates for ESRD among Indigenous Australians were higher in remote areas of Australia than in Major Cities. Indigenous Australians were 18 and 20 times as likely to register for treatment of ESRD as non-Indigenous Australians in Remote and Very Remote areas respectively, and 14 times as likely to register for treatment of ESRD in outer regional areas. In Major Cities and Inner Regional areas, incidence rates for Indigenous Australians were 4 to 6 times those for non-Indigenous Australians living in these areas (Table 1.09.4).

The reasons for the high incidence of treated ESRD among Indigenous Australians are probably related to the high proportion of the Indigenous population with factors which contribute to the increased risk of kidney impairment and lack of access to services for detection and treatment of chronic kidney disease (AIHW 2005a).

Table 1.09.1: Incidence of end-stage renal disease, by Indigenous status and age group, 2004–2006[(a)]

	Number		Per cent[(b)]		Indigenous	Non-Indigenous	
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous	No. per 1,000)[(c)]	No. per 1,000[(c)]	Rate ratio[(d)]
0–24	15	197	2.4	3.3	0.0	0.0	1.8*
25–44	161	822	26.2	13.7	0.4	0.0	8.4*
45–54	194	821	31.5	13.7	1.6	0.1	15.8*
55–64	169	1220	27.5	20.3	2.6	0.2	13.8*
65+	76	2941	12.4	49.0	1.8	0.4	4.9*
Total[(e)]	**615**	**6001**	**100.0**	**100.0**	**0.8**	**0.1**	**8.4***

* Represents results with statistically significant differences in the Indigenous/other comparisons.

(a) Calendar year reporting. Data are presented in 3-year groupings because of small numbers each year.
(b) Proportion of Indigenous and other patients in each age group.
(c) Age-specific rates per 1,000 population.
(d) Rate ratio Indigenous: non-Indigenous.
(e) Total rates are directly age-standardised using the Australian 2001 standard population.

Source: AIHW analysis of ANZDATA data.

Table 1.09.2: Incidence of end-stage renal disease for Indigenous Australians, by age group and sex, 2004–2006[(a)]

Age group	Male						Female						Total					
	No.	%[(b)]	No. per 1,000[(c)]	LCL 95%[(d)]	UCL 95%[(e)]	Rate ratio[(f)]	No.	%[(b)]	No. per 1,000[(c)]	LCL 95%[(d)]	UCL 95%[(e)]	Rate ratio[(f)]	No.	%[(b)]	No. per 1,000[(c)]	LCL 95%[(d)]	UCL 95%[(e)]	Rate ratio[(f)]
0–14 years	n.p.	n.p.	n.p.	n.p.	n.p.	2.6	0	0.0	0.0	0.0	0.0	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	1.3
15–24 years	n.p.	n.p.	n.p.	n.p.	n.p.	1.4	7	2.1	0.0	0.0	0.1	3.8*	11	1.8	0.0	0.0	0.1	2.3*
25–34 years	22	8.0	0.2	0.1	0.3	5.2*	20	5.9	0.2	0.1	0.3	6.1*	42	6.8	0.2	0.1	0.2	5.5*
35–44 years	60	21.7	0.7	0.5	0.9	9.2*	59	17.4	0.6	0.4	0.8	13.6*	119	19.3	0.6	0.5	0.8	10.8*
45–54 years	97	35.1	1.6	1.3	2.0	12.8*	97	28.6	1.5	1.2	1.8	21.3*	194	31.5	1.6	1.3	1.8	15.8*
55–64 years	61	22.1	2.0	1.5	2.4	8.5*	108	31.9	3.2	2.6	3.8	21.9*	169	27.5	2.6	2.2	3.0	13.8*
65 +years	28	10.1	1.6	1.0	2.1	3.1*	48	14.2	2.1	1.5	2.7	7.9*	76	12.4	1.8	1.4	2.3	4.9*
Total[(g)]	**276**	**100.0**	**0.7**	**0.6**	**0.8**	**5.9***	**339**	**100.0**	**0.9**	**0.8**	**1.0**	**12.1***	**615**	**100.0**	**0.8**	**0.7**	**0.9**	**8.4***

* Represents results with statistically significant differences in the Indigenous/non-Indigenous comparisons.

(a) Calender year reporting. Data are presented in 3-year groupings because of small numbers each year.
(b) Proportion of male, female and total registration rates for Indigenous persons in the period 2004–2006.
(c) Age-specific rates per 1,000 population.
(d) LCL = lower confidence limit.
(e) UCL = upper confidence limit.
(f) Rate ratio Indigenous: non-Indigenous.
(g) Total rates are directly age-standardised using the Australian 2001 standard population.

Source: AIHW analysis of ANZDATA data.

Table 1.09.3: Incidence of end-stage renal disease, by Indigenous status, sex and state/territory, 2004–2006[(a)]

	Males			Females			Persons		
	No.	No. per 1,000[(b)]	Ratio[(c)]	No.	No. per 1,000[(b)]	Ratio[(c)]	No.	No. per 1,000[(b)]	Ratio[(c)]
NSW									
Indigenous	30	0.3	2.2*	25	0.3	3.4*	55	0.3	2.7*
Non-Indigenous	1,187	0.1	. .	808	0.1	. .	1,995	0.1	. .
Vic									
Indigenous	12	0.4	3.5*	13	0.7	9.4*	25	0.6	5.9*
Non-Indigenous	950	0.1	. .	572	0.1	. .	1,522	0.1	. .
Qld									
Indigenous	68	0.8	6.1*	92	0.9	12.0*	160	0.9	8.5*
Non-Indigenous	724	0.1	. .	463	0.1	. .	1,187	0.1	. .
WA									
Indigenous	53	0.9	7.2*	66	1.1	16.9*	119	1.0	10.8*
Non-Indigenous	348	0.1	. .	200	0.1	. .	548	0.1	. .
SA									
Indigenous	18	0.9	7.3*	23	0.8	12.5*	41	0.9	9.2*
Non-Indigenous	304	0.1	. .	169	0.1	. .	473	0.1	. .
Tas									
Indigenous	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.
Non-Indigenous	65	0.1	. .	46	0.1	. .	111	0.1	. .
ACT									
Indigenous	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.	n.p.
Non-Indigenous	97	0.2	. .	45	0.1	. .	142	0.2	. .
NT									
Indigenous	93	2.0	17.0*	118	2.3	57.3*	211	2.2	27.6*
Non-Indigenous	17	0.1	. .	6	0.0	. .	23	0.1	. .
Australia									
Indigenous	**276**	**0.7**	**5.9***	**339**	**0.9**	**12.1***	**615**	**0.8**	**8.4***
Non-Indigenous	**3,692**	**0.1**	**. .**	**2,309**	**0.1**	**. .**	**6,001**	**0.1**	**. .**

* Represents results with statistically significant differences in the Indigenous/other Australian comparisons.

(a) Calendar year reporting. Data are presented in 3-year groupings because of small numbers each year.

(b) Directly age-standardised using the Australian 2001 standard population.

(c) Rate ratio Indigenous: non-Indigenous.

Source: AIHW analysis of ANZDATA data.

Table 1.09.4: Incidence of end-stage renal disease, by Indigenous status and remoteness, 2004–2006(a)

	Number		Per cent(b)		Indigenous	Non-Indigenous	
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous	No. per 1,000(c)	No. per 1,000(c)	Rate ratio(d)
Major Cities	71	4,229	11.8	70.6	0.4	0.1	3.5*
Inner Regional	62	1,219	10.3	20.4	0.5	0.1	5.5*
Outer Regional	169	465	28.1	7.8	1.1	0.1	14.4*
Remote	116	56	19.3	0.9	1.6	0.1	19.7*
Very Remote	184	19	30.6	0.3	1.4	0.1	18.3*
Australia(f)	**615**	**6,001**	**100.0**	**100.0**	**0.8**	**0.1**	**8.4***

* Represents results with statistically significant differences in the Indigenous/other comparisons.
(a) Calendar year reporting. Data are presented in 3-year groupings because of small numbers each year.
(b) Proportion of Indigenous and other patients in each age group.
(c) Directly age-standardised using the Australian 2001 standard population.
(d) Rate ratio Indigenous: non-Indigenous.
(e) Australia total includes cases where remoteness category was not known.

Source: AIHW analysis of ANZDATA data.

Time series analysis

Data on the incidence of ESRD among Indigenous and non-Indigenous Australians for the period 1991–2006 are presented below.

- The number of Indigenous patients starting ESRD treatment has more than tripled over the last decade (from 54 in 1991 to 207 in 2004).
- Over the period 1991–2006, there were significant increases in the incidence rate of ESRD among Indigenous Australians. The fitted trend implies an average yearly increase in the rate of around 0.03 per 1,000 (or 3 per 100,000) which is equivalent to a 185% increase in the rate over the period. The fitted trend showed significant increases in the incidence of ESRD for both Indigenous males and females.
- Over the same period, there were also significant increases in the incidence rates of ESRD among non-Indigenous males and females, but these increases were not as rapid as in the Indigenous population (increase of 87% for males and 48% for females).
- There were significant increases in both the incidence rate ratios and rate differences between Indigenous and non-Indigenous Australians for ESRD over the period 1991–2004 (60% in the rate ratio and 215% in the rate difference for persons), reflecting both a relative and absolute increase in the gap between incidence rates for Indigenous and other Australians for ESRD over the period.

The rapid increase in the incidence of ESRD in the Indigenous population may reflect both real growth and the increasing availability and acceptability of kidney replacement therapy to Indigenous communities in recent years.

Fluctuations in the incidence rates of ESRD for Indigenous Australians over time may also reflect changing levels of identification of Indigenous registrations in the ANZDATA Registry and Indigenous population estimates. Caution should be exercised in assessing

trends in Indigenous ESRD rates over time and comparisons with the non-Indigenous population.

Table 1.09.5: Age-standardised incidence rates, rate ratios and rate differences for end-stage renal disease, 1991–2006

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Annual change[a]	% change over period[b]
	Indigenous rate (no. per 1,000)[c]																	
Males	0.2	0.2	0.4	0.5	0.6	0.4	0.5	0.7	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.03*	206.6
Females	0.3	0.4	0.4	0.6	0.6	0.5	0.8	0.6	0.9	0.7	0.9	0.8	0.7	0.8	1.0	0.8	0.03*	169.3
Persons	0.3	0.3	0.4	0.5	0.6	0.5	0.7	0.6	0.7	0.7	0.8	0.7	0.7	0.7	0.8	0.8	0.03*	184.5
	Non-Indigenous[c] rate (no. per 1,000)																	
Males	0.07	0.07	0.08	0.09	0.09	0.09	0.09	0.10	0.11	0.10	0.12	0.11	0.12	0.11	0.13	0.13	0.004*	86.5
Females	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.06	0.07	0.06	0.07	0.08	0.001*	47.6
Persons	0.06	0.06	0.06	0.07	0.07	0.08	0.07	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.10	0.003*	68.7
	Rate ratio[d]																	
Males	3.6	3.4	5.3	5.3	6.2	4.4	5.0	6.4	4.9	6.1	5.1	6.3	6.5	6.2	5.5	6.0	0.14*	57.4
Females	5.2	6.3	6.7	8.7	8.8	6.8	11.1	8.0	10.1	7.9	10.3	8.7	7.8	9.2	9.7	8.1	0.17*	49.3
Persons	4.8	5.2	6.4	7.6	8.2	6.1	8.8	8.0	8.2	7.7	8.5	8.5	8.0	8.7	8.5	8.0	0.19*	60.3
	Rate difference[e]																	
Males	0.2	0.2	0.3	0.4	0.5	0.3	0.4	0.5	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.03*	253.5
Females	0.2	0.3	0.4	0.5	0.6	0.4	0.8	0.6	0.8	0.6	0.8	0.7	0.6	0.7	0.9	0.7	0.03*	193.4
Persons	0.2	0.3	0.3	0.5	0.5	0.4	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.7	0.7	0.7	0.03*	215.2

* Represents results with statistically significant increases or declines at the $p < 0.05$ level over the period 1991–2006.

(a) Average annual change in rates, rate ratios and rate differences determined using linear regression analysis.

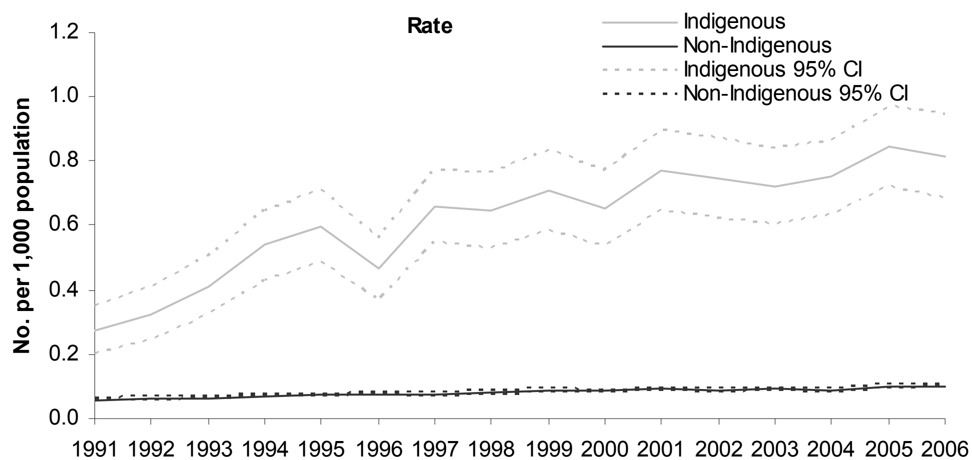
(b) Per cent change between 1991 and 2006 based on the average annual change over the period.

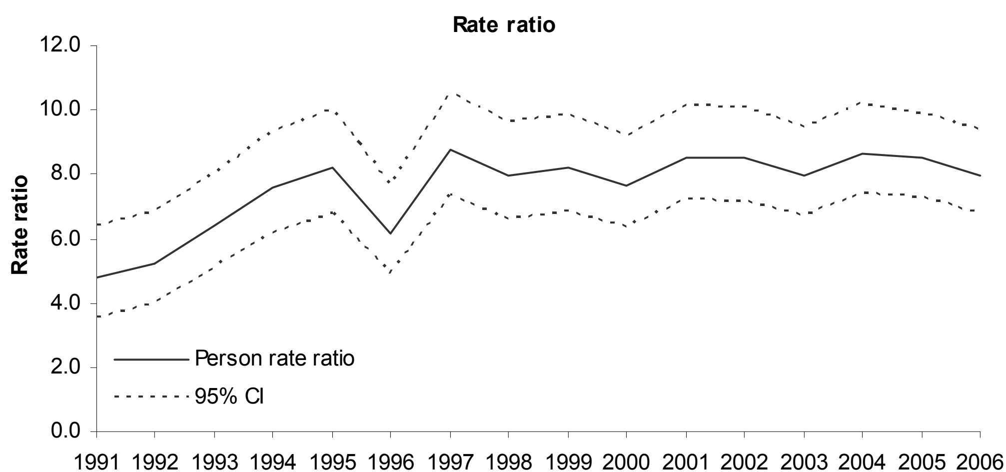
(c) Rates have been directly age-standardised using the 2001 Australian standard population.

(d) Incidence rate for non-Indigenous people divided by the rate for non-Indigenous Australians.

(e) Incidence rate for non-Indigenous people minus the rate for non-Indigenous Australians.

Source: AIHW analysis of ANZDATA data





Source: AIHW analysis of ANZDATA data.

Figure 1.09.1: Age-standardised registration rates, rate ratios and differences for end-stage renal disease, by Indigenous status, 1991–2006

Management of end-stage renal disease

ESRD patients require either a kidney transplant or dialysis to maintain the functions normally performed by the kidneys. Patterns of treatment for ESRD differ between Indigenous and non-Indigenous patients.

- As at 31 December 2006, of all Indigenous ESRD patients registered, 87% relied on dialysis and only 13% had received a kidney transplant. In contrast, 55% of non-Indigenous Australians living with ESRD relied on dialysis and 45% had received a kidney transplant (Table 1.09.6).
- Indigenous Australians were 10 times as likely as non-Indigenous Australians to have ESRD and rely on dialysis.

Once dialysis treatment has started, Indigenous people are less likely than other Australians to be placed on the active transplant waiting list and less likely to move from the waiting list to transplantation (McDonald & Russ 2003; Cass et al. 2003). Factors which may contribute to these disparities include miscommunication between Indigenous patients and health professionals, lack of understanding from Indigenous patients of their illness and its treatments, and lower rates of well-matched kidney donors for Indigenous patients than for other patients (Cass et al. 2003; McDonald & Russ 2003).

Table 1.09.6: Total patients with end-stage renal disease, by Indigenous status and treatment, as at 31 December 2006[(a)]

	Number		Per cent[(b)]		No. per 1,000[(c)]		
Treatment	**Indigenous**	**Non-Indigenous**	**Indigenous**	**Non-Indigenous**[)]	**Indigenous**	**Non-Indigenous**	**Ratio[(d)]**
Dialysis	971	8,211	86.9	54.7	3.9	0.4	10.1*
Transplant	147	6,806	13.1	45.3	0.5	0.3	1.4*
Total	**1,118**	**15,017**	**100.0**	**100.0**	**4.4**	**0.7**	**5.7***

* Represents results with statistically significant differences in the Indigenous/other comparisons.

(a) Calendar year reporting.

(b) Proportion of Indigenous and other patients receiving dialysis and transplants.

(c) Directly age-standardised using the Australian 2001 standard population.

(d) Rate ratio Indigenous:other.

Source: AIHW analysis of ANZDATA data.

Hospitalisations

- Over the period June 2004 to July 2006, there were 1,699,005 hospitalisations for chronic kidney disease and its sequelae in New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory combined, of which 193,806 (11.4%) were of Indigenous Australians.
- Approximately 41% of total hospitalisations of Indigenous Australians were for chronic kidney disease.

Hospitalisations for chronic kidney disease

Chronic kidney disease includes diabetic nephropathy, hypertensive renal disease, glomerular disease, chronic renal failure and end-stage renal disease (ESRD).

Hospitalisations of Indigenous Australians for chronic kidney disease and its sequelae in New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory combined over the period June 2004 to July 2006 are presented in Tables 1.09.7 and 1.09.8.

- Of all hospitalisations for chronic kidney disease among Aboriginal and Torres Strait Islander peoples, the large majority (98%) were for care involving dialysis.
- Overall, Indigenous Australians were hospitalised for chronic kidney disease with dialysis at 11 times the rate of other Australians (Table 1.09.7).
- Indigenous Australians were hospitalised for care involving dialysis at 11 times the rate of other Australians, diabetic nephropathy at 11 times the rate of other Australians and chronic renal failure at 7 times the rate of other Australians.
- Approximately 44% of Indigenous Australians hospitalised for chronic kidney disease and its sequelae were males (85,842) and 56% were females (107,964).
- Indigenous males were hospitalised for chronic kidney disease with dialysis at 8 times the rate of other males, and Indigenous females were hospitalised for chronic kidney disease at 15 times the rate of other females (Table 1.09.8).
- Over the period June 2004 to July 2006, there were 207,528 bed-days additional with Indigenous chronic kidney disease hospitalisations in New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory combined, at an average of 1.1 days per separation. Excluding same-day separations for dialysis (189,949 hospitalisations), the average length of stay in hospital for Indigenous people with chronic kidney disease was 4.6 days compared with 4.9 days for other Australians.

Table 1.09.7: Hospitalisations for chronic kidney disease and its sequelae, by Indigenous status and type of kidney disease, NSW, Vic, Qld, WA, SA and NT, July 2004 to June 2006(a)(b)(c)(d)

	Number		Per cent(e)		Indigenous			Other(f)			
	Indigenous	Other(f)	Indigenous	Other(f)	No. per 1,000(g)	95% LCL(h)	95% UCL(i)	No. per 1000(g)	95% LCL(h)	95% UCL(i)	Rate Ratio(j)
Care involving dialysis (ESRD)	190,489	1,461,917	98.3	97.1	402.0	399.9	404.0	36.5	36.4	36.5	11.0*
Diabetic nephropathy	1,112	8,847	0.6	0.6	2.5	2.3	2.7	0.2	0.2	0.2	11.4*
Renal-tubulo interstitial diseases	873	12,266	0.5	0.8	1.1	1.1	1.2	0.3	0.3	0.3	3.6*
Chronic renal failure	636	9,160	0.3	0.6	1.6	1.5	1.7	0.2	0.2	0.2	7.0*
Glomerular diseases	417	4,634	0.2	0.3	0.3	0.3	0.3	0.1	0.1	0.1	2.5*
Hypertensive renal disease	54	1,263	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	3.2*
Other chronic diseases	225	7,112	0.1	0.5	0.3	0.3	0.4	0.2	0.2	0.2	1.7*
Total	**193,806**	**1,505,199**	**100.0**	**100.0**	**407.9**	**405.9**	**410.0**	**37.6**	**37.5**	**37.6**	**10.9***

* Represents results with statistically significant differences in the Indigenous/non-Indigenous comparisons.

(a) Data are from public and most private hospitals. Data exclude private hospitals in the Northern Territory.

(b) Categories are based on the ANZDATA for this measure. Other coding categories are based on the ICD-10-AM fifth edition (National Centre for Classification of Health 2006); ICD-10-AM codes Z49; E102, E112, E132 and E142; N11–N12 and N14–N16; N18–N19; N00–N08; I12–I13, I150 and I151; N25–N28, N391, N392, Q60–Q63, T824, T861, and Z940.

(c) Financial year reporting.

(d) Data are reported by state/territory of usual residence of the patient hospitalised and are for New South Wales, Victoria, Western Australia, South Australia, the Northern Territory and Queensland only. These six jurisdictions are considered to have adequate levels of Indigenous identification, although the level of accuracy varies by jurisdiction and hospital. Data for these six jurisdictions over-represent Indigenous populations in less urbanised and more remote locations. Hospitalisation data for these six jurisdictions should not be assumed to represent the hospitalisation experience in the other jurisdictions.

(e) Proportion of hospitalisations of Indigenous and non-Indigenous people in the period 2004–05 to 2005–06.

(f) 'Other' includes hospitalisations of non-Indigenous people and those for whom Indigenous status was not stated.

(g) Directly age-standardised using the Australian 2001 standard population.

(h) LCL = lower confidence limit.

(i) UCL = upper confidence limit.

(j) Rate ratio Indigenous:other.

Source: AIHW analysis of National Hospital Morbidity Database.

Table 1.09.8: Hospitalisations of Indigenous Australians for chronic kidney disease and its sequelae, by sex and type of kidney disease, NSW, Vic, Qld, WA, SA and NT, July 2004 to June 2006(a)(b)(c)(d)

	Males						Females					
	No.	**%(e)**	**No. per 1,000(f)**	**95% LCL(g)**	**95% UCL(h)**	**Rate ratio(i)**	**No.**	**%(e)**	**No. per 1,000(f)**	**95% LCL(g)**	**95% UCL(h)**	**Rate ratio(i)**
Care involving dialysis (ESRD)	84,491	98.4	370.9	368.0	373.8	7.8*	105,998	98.2	429.7	426.9	432.6	15.9*
Diabetic nephropathy	470	0.5	2.2	1.9	2.4	8.1*	642	0.6	2.8	2.6	3.0	15.6*
Renal-tubulo interstitial diseases	97	0.1	0.3	0.2	0.3	2.3*	776	0.7	1.9	1.8	2.1	3.7*
Chronic renal failure	427	0.5	2.6	2.3	2.8	9.2*	209	0.2	0.8	0.7	0.9	4.3*
Glomerular diseases	223	0.3	0.3	0.3	0.4	2.1*	194	0.2	0.3	0.3	0.4	3.1*
Hypertensive renal disease	32	0.0	0.1	0.1	0.2	3.4*	22	0.0	0.1	0.0	0.1	3.0*
Other chronic diseases	102	0.1	0.3	0.2	0.3	1.2	123	0.1	0.4	0.3	0.4	2.2*
Total	**85,842**	**100.0**	**376.6**	**373.6**	**379.5**	**7.7***	**107,964**	**100.0**	**436.0**	**433.1**	**438.9**	**15.4***

* Represents results with statistically significant differences in the Indigenous/non-Indigenous comparisons.

(a) Data are from public and most private hospitals. Data exclude private hospitals in the Northern Territory.

(b) Categories are based on the ANZDATA for this measure. Other coding categories are based on the ICD-10-AM fifth edition (National Centre for Classification in Health 2006); ICD-10-AM codes Z49; E102, E112, E132 and E142; N11–N12 and N14–N16; N18–N19; N00–N08; I12–I13, I150 and I151; N25–N28, N391, N392, Q60–Q63, T824, T861, and Z940.

(c) Financial year reporting.

(d) Data are reported by state/territory of usual residence of the patient hospitalised and are for New South Wales, Victoria, Western Australia, South Australia, the Northern Territory and Queensland only. These six jurisdictions are considered to have adequate levels of Indigenous identification, although the level of accuracy varies by jurisdiction and hospital. Data for these six jurisdictions over-represent Indigenous populations in less urbanised and more remote locations. Hospitalisation data for these six jurisdictions should not be assumed to represent the hospitalisation experience in the other jurisdictions.

(e) Proportion of hospitalisations of Indigenous and non-Indigenous people in the period 2004–05 to 2005–06.

(f) Directly age-standardised using the Australian 2001 standard population.

(g) LCL = lower confidence limit.

(h) UCL = upper confidence limit.

(i) Rate ratio Indigenous:other.

Source: AIHW analysis of National Hospital Morbidity Database.

Mortality

- Over the period 2002–2006, in Queensland, Western Australia, South Australia and the Northern Territory, there were 4,493 deaths for which chronic kidney disease was recorded as the underlying cause of death, of which 298 deaths (7%) were of Indigenous Australians.
- Approximately 4% of all deaths of Indigenous Australians over this period were from chronic kidney disease.
- Approximately 40% of all Indigenous Australians who died from chronic kidney disease were males and 60% were females.
- After adjusting for differences in age structure, Indigenous Australians were 5.5 times as likely as non-Indigenous Australians to have died from chronic kidney disease between 2002 and 2006.
- Indigenous males died from chronic kidney disease at over four times the rate of non-Indigenous males, and Indigenous females died from chronic kidney disease at over six times the rate of non-Indigenous females.
- In the period 2002–2006, similar proportions of Indigenous and non-Indigenous deaths for which chronic kidney disease was recorded as the underlying cause of death were reported with circulatory disease as an additional cause of death (58% and 60%, respectively). Over the same period, 21% of Indigenous deaths for which chronic kidney disease was recorded as the underlying cause of death were reported with diabetes as an additional cause of death, compared with 8% of non-Indigenous deaths. Approximately 14% of Indigenous deaths and 9% of non-Indigenous deaths for which chronic kidney disease was recorded as the underlying cause of death were reported with digestive system diseases as an additional cause of death.

Data quality issues

ANZDATA

The data reported here on Indigenous persons with end-stage renal disease (ESRD) have been supplied by the Australia and New Zealand Dialysis and Transplant Registry (ANZDATA). The interpretation and reporting of these data are the responsibility of the authors and in no way should be seen as an official policy or interpretation of the Registry.

Indigenous status question

Patients in the Registry are identified according to 'racial origin'. Aboriginal people and Torres Strait Islanders are identified separately, but separate results are not always published for Torres Strait Islanders because of small numbers of patients.

Under-identification

The completeness of identification of Indigenous people in the registry is not known, but the nature of the illness means that treatment centres have prolonged contact with patients and, therefore, have a considerable opportunity to collect accurate information (Disney et al. 1997).

Indigenous identification is based on self-identification and discussion with the treating physician. There is often significant concern about the quality of Indigenous identification in morbidity, mortality and demographic data sets. However, racial identification in the ANZDATA Registry is reported to be good. A survey form is completed every 6 months for all patients on maintenance dialysis or with functioning renal transplants. In this survey, question 5 is about 'Racial origin' and includes a prompt regarding Indigenous status. ESRD patients have regular contact with renal services from the time of diagnosis, through intensive maintenance therapy until death. There is heightened awareness of renal disease in Indigenous Australians and multiple opportunities exist to reconfirm data accuracy (Cass et al. 2001).

Hospital separations data

Separations

The number and pattern of hospitalisations can be affected by differing admission practices among the jurisdictions and from year to year, and differing levels and patterns of service delivery.

Indigenous status question

Some jurisdictions have slightly different approaches to the collection and storage of the standard Indigenous status question and categories in their hospital collections. The 'not stated' category is missing from several collections. It is recommended that the standard wording and categories be used in all jurisdictions (AIHW 2005b).

Under-identification

The incompleteness of Indigenous identification means the number of hospital separations recorded as Indigenous is an underestimate of hospitalisations involving Aboriginal and Torres Strait Islander peoples. For several years, Queensland, South Australia, Western Australia and the Northern Territory reported that Indigenous status in their hospital separations data was of acceptable quality (AIHW 2007). The AIHW, however, has recently completed an assessment of the level of Indigenous under-identification in hospital data in all states and territories.

(continued)

Data quality issues (continued)

Results from this assessment indicate that New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory have adequate Indigenous identification (20% or less overall under-identification of Indigenous patients) in their hospital separations data (AIHW unpublished data). It has therefore been recommended that reporting of Indigenous hospital separations data be limited to aggregated information from New South Wales, Victoria, Queensland, Western Australia, South Australia and the Northern Territory. The proportion of the Indigenous population covered by these six jurisdictions is 96%. The following caveats have also been recommended for analysis of hospitalisation data from selected jurisdictions (ABS & AIHW 2005):

- *Interpretation of results should take into account the relative quality of the data from the jurisdictions included (currently a small degree of Indigenous under-identification in data from Western Australia and the Northern Territory and relatively marked Indigenous under-identification in data from South Australia and Victoria).*
- *Data for these six jurisdictions over-represent Indigenous populations in less urbanised and more remote locations.*
- *Hospitalisation data for these six jurisdictions are not necessarily representative of the jurisdictions not included.*

From the AIHW study it was possible to produce correction factors for the level of Indigenous under-identification in hospital data for each jurisdiction and at the national level.

Numerator and denominator

Rate and ratio calculations rely on good numerator and denominator data. The changes in the completeness of identification of Indigenous people in hospital records may take place at different rates from changes in the identification of Indigenous people in other administrative collections and population censuses. Denominators used here are sourced from Experimental estimates and projections: Aboriginal and Torres Strait Islander Australians 1991 to 2009 *(ABS 2004).*

Mortality data

Deaths

The mortality rate for Indigenous Australians can be influenced by identification of Indigenous deaths, late registration of deaths, and changes to death forms and/or processing systems. Because of the small size of the Indigenous population, these factors can significantly affect trends over time and between jurisdictions.

Indigenous status question

All jurisdictions comply with the standard wording for the Indigenous status question and categories for their death registration forms. However, New South Wales, Victoria, South Australia, the Northern Territory and the Australian Capital Territory all have wording that is slightly different from the national standard for the instruction regarding those with both Aboriginal and Torres Strait Islander origin (ABS & AIHW 2005). Although the wording is only slightly different, it would be ideal to have all jurisdictions asking the question in exactly the same way.

(continued)

Data quality issues (continued)

Under-identification

Almost all deaths in Australia are registered. However, the Indigenous status of the deceased is not always recorded/recorded correctly. The incompleteness of Indigenous identification means the number of deaths registered as Indigenous is an underestimate of deaths occurring in the Aboriginal and Torres Strait Islander population (ABS 1997). As a result, the observed differences between Indigenous and non-Indigenous mortality are under-estimates of the true differences.

Although the identification of Indigenous deaths is incomplete in all state and territory registration systems, four jurisdictions (Queensland, Western Australia, South Australia and the Northern Territory) have been assessed by the ABS and the AIHW as having adequate identification. Longer term mortality trend data are limited to three jurisdictions (Western Australia, South Australia and the Northern Territory) with 10 years of adequate identification of Indigenous deaths in their recording systems (ABS & AIHW 2005). The quality of the time series data is also influenced by the late inclusion of a 'not stated' category for Indigenous status in 1998. Before this time, the 'not stated' responses were probably included with the non-Indigenous.

The ABS calculated the implied coverage (identification) of Indigenous deaths for the period 2002–2006 using population estimates: New South Wales 45%, Victoria 32%, Queensland 51%, South Australia 62%, Western Australia 72%, Northern Territory 90%, Tasmania and the Australian Capital Territory were not calculated because of small numbers, Australia 55% (ABS 2007).

Note that different causes may have levels of under-identification that differ from the all-cause coverage estimates. Note also that the quality of the cause of death data depends on every step of the process of recording and registering deaths (including the documentation available at each step of the process) from certification to coding of cause of death.

There are also current concerns about data quality for causes of death, especially relating to external causes of death of all Australians (not just Indigenous) (ABS 2006).

Numerator and denominator

Rate and ratio calculations rely on good numerator and denominator data. The changes in the completeness of identification of Indigenous people in death records may take place at different rates from changes in the identification of Indigenous people in other administrative collections and population censuses. Denominators used here are sourced from Experimental estimates and projections: Aboriginal and Torres Strait Islander Australians 1991 to 2009 *(ABS 2004).*

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