Occasional Paper

New Issue

Hospital Statistics

Aboriginal and Torres Strait Islander Australians

1997–98

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This Occasional Paper is intended to make the results of current research available to other interested parties. The aim is to encourage discussion and comment.

Views expressed in this paper are those of the authors and do not necessarily represent those of the Australian Bureau of Statistics. Where quoted or used, they should be attributed clearly to the authors.

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CONTENTS

LIST OF TABLES AND GRAPHS

SUMMARY

This publication presents information about the hospitalisation of people identified as Aboriginal and/or Torres Strait Islander in hospital records, as well as the procedures performed on them while in hospital. Data are from the financial year 1997–98 (the latest year for which data are currently available), from almost all public and private hospitals in Australia.

Data quality remains a critical issue in the assessment of Indigenous hospital separations and procedures. Although data from all States and Territories have been included in the analyses reported here, previous studies have shown that not all Indigenous patients are identified correctly in hospital records. As a result, the observed differences reported in this publication are under-estimates of the true differences between Indigenous males and females and their all-Australian counterparts. In addition to data quality concerns specific to the Indigenous population, there are other more general issues which may affect the quality of the data, such as the accuracy and consistency of coding of diagnoses and procedures.

Despite under-identification of Indigenous patients in hospital records, there were almost twice as many hospital separations among Indigenous people in 1997–98 as would have been expected if the Indigenous population had experienced the same hospital separation rates as the Australian population as a whole. The observed hospital separation rates were higher for the Indigenous population than for the total Australian population in every age group, with the smallest differences among people aged 5–14 years. The vast majority (about 98%) of hospital separations among people identified as Indigenous were recorded in public rather than private hospitals.

Dialysis (which is used to treat kidney failure) accounted for about 25% of all separations identified as Indigenous, and over 40% of all principal procedures performed on patients identified as Indigenous in 1997–98. There were nearly seven times as many separations for haemodialysis procedures among Indigenous males as expected based on all-Australian rates, and about 11 times as many as expected among Indigenous females.

Dialysis, pregnancy and childbirth, respiratory diseases and injury were together responsible for the majority of all hospital separations among people identified as Indigenous. There were more than the expected number of separations for these diseases and conditions as well as for mental disorders, (especially for alcohol and drug-related conditions), circulatory diseases, nervous system disorders, diseases of the skin and subcutaneous tissue, infectious and parasitic diseases, and endocrine, nutritional and metabolic disorders (especially diabetes and nutritional deficiencies).

There were also more than the expected number of several types of procedures among Indigenous males and females, such as operations on the cardiovascular system (primarily haemodialysis), obstetrical procedures, operations on the integumentary system (primarily operations on the skin), operations on the respiratory system, and some types of 'miscellaneous diagnostic and therapeutic procedures'.

Among those admitted to hospital, however, patients identified as Indigenous were less likely than other patients to have a principal procedure recorded. This was true for almost every type of principal diagnosis and in most jurisdictions and age groups. More work is needed to determine the reasons for this disparity.

Although the apparent rates of Indigenous hospital separations varied by State and Territory and by metropolitan, rural and remote area of residence, it is likely that at least some of this difference was due to differences in the quality of identification of Indigenous patients. The patterns with respect to main reasons for hospitalisation and main types of principal procedures among patients identified as Indigenous were generally similar across jurisdictions and areas of residence.

Limitations in the quality and availability of data compromise our ability to assess changes in Indigenous hospital use over time, both in absolute terms, and relative to the rest of the Australian population. There have been strong and sustained efforts in recent years by the Australian Bureau of Statistics and the Australian Institute of Health and Welfare in partnership with other organisations, such as State and Territory agencies, Indigenous organisations and individual hospitals, to improve the identification of Indigenous people in hospital records and other administrative collections, and recent progress has been encouraging. This work will help to increase the quality and availability of data in future years.

In the meantime, it is clear, despite the recognised deficiencies of the data, that Indigenous Australians are admitted to hospital at greater rates than the rest of the Australian population. This is not surprising, given the health disadvantages faced by the Indigenous population (see, for example, ABS & AIHW 1999), but admission to hospital is determined by a complex combination of factors in addition to the need for services, such as physical, economic and cultural access to services, the existence of alternative sources of care, and the referral patterns of primary health care providers. As a result, important areas of unmet need may co-exist with higher overall rates. More work is needed in this area, but improvements in the identification of Indigenous patients are required before this can be done with any degree of precision.

CHAPTER 1

INTRODUCTION

This publication presents information about the hospitalisation of people identified as Aboriginal and/or Torres Strait Islander in hospital records, as well as the procedures performed on them while in hospital. Data are from the financial year 1997–98 (the latest year for which data are currently available), from almost all public and private hospitals in Australia.

Analysis of hospital data is important because hospital services consume a large proportion of the health budget. Spending on acute care hospitals accounted for $14,448 million, or about 37% of all recurrent health services expenditure in Australia, in 1995–96 (AIHW 1998a). Analysis of hospital separations and procedures by age, sex, cause, and other characteristics can also provide a useful (albeit imperfect) indication of the patterns of ill health in a given population or sub-group.

With respect to the Indigenous population, the data are limited by the completeness with which Indigenous people are identified in hospital records. Although it is expected that the level of completeness of identification in hospital records varies from jurisdiction to jurisdiction (and, indeed, from hospital to hospital), the quality of data on Indigenous status in hospitals has not yet been assessed at a national level. Studies of a limited number of individual hospitals have suggested that the proportion of Indigenous people correctly identified in hospital records ranges from less than 50% to close to 100% (see, for example, ATSIHWIU 1999). National reporting on data quality in hospitals is expected in 2002, but in the meantime, there is no solid evidence on which to base decisions about including or excluding individual jurisdictions, with the exception of the Northern Territory, which has been shown to have high quality data (Condon et al. 1998). As a result, all jurisdictions have been included in the analyses reported in this publication. This means that data for the Indigenous population, which are based only on those people who were correctly identified as Indigenous in hospital records, are under-estimates of the true level of hospitalisation of Indigenous people. As a result, comparisons of the Indigenous population with other Australians will underestimate the true differences between the two populations.

In addition to the incomplete identification of Indigenous people in hospital records, there are also difficulties in estimating the size and composition of the Indigenous population (see, for example, ABS & AIHW 1999). This in turn results in a lack of comparable data over time, which makes it difficult to assess trends. As a result, no information on trends in hospital separations or procedures is reported in this publication.

Despite such difficulties, there is promise for future improvement. Work to improve data quality and availability is ongoing, and progress is being made in a number of areas (ABS & AIHW 1999). In the meantime, provided the figures are interpreted with care and an understanding of

INTRODUCTION *continued*   data limitations, the data can still be useful in describing the patterns of hospital use among Indigenous people and in revealing the types of diseases and conditions for which there are already greater than expected numbers of separations (and procedures) recorded among Indigenous people, despite the known under-identification of Indigenous people in hospital records.

CHAPTER 2

METHODS AND DATA QUALITY

HOSPITAL SEPARATIONS
DATA

Information on hospital separations and procedures was obtained from
the National Hospital Morbidity Database (NHMD), which is managed by
the Australian Institute of Health and Welfare (AIHW). The information in
the NHMD is provided to the AIHW by health authorities in each State
and Territory. The database includes information on the characteristics,
diagnoses and care of admitted patients in public and private hospitals
across Australia. Permission to access, analyse and publish the data was
sought and received from the relevant State and Territory authorities.

Data included in the NHMD are for admitted patients (i.e. excluding
outpatients) in almost all Australian hospitals, including public acute,
psychiatric and repatriation hospitals as well as private acute and
psychiatric hospitals and free-standing day hospital facilities. No data were
available from a few small public and private hospitals (for more details,
see AIHW 1999, pp. 2–3).

Data used in this publication relate to hospital separations which
occurred during the period 1 July 1997 to 30 June 1998. Records for
hospital boarders and unqualified neonates have been removed from the
dataset, with the exception of unqualified neonates in private hospitals in
the ACT, as these could not be identified (AIHW 1999). An unqualified
neonate (often referred to as a 'well baby') is a baby aged 9 days old or
less who: is a single live birth or the first live-born infant of a multiple
birth, and whose mother is currently an admitted patient; and is not
admitted to an intensive care facility in a hospital (AIHW 1999).

A hospital separation occurs when a patient is discharged, is transferred
to another facility or dies, or when the type of care changes (from acute
to rehabilitation, for example) (AIHW 1999). Hospital statistics are based
on separations rather than admissions because more information is
available at the end of a patient's stay in hospital than at the beginning,
such as information about diagnosis, length of stay, procedures
performed, etc. Data refer to separations (that is, episodes of care) rather
than to individual people. An individual may have been admitted to (and
separated from) hospital on more than one occasion during the year, and
each hospital separation would be counted in the figures presented here.
For example, some patients with kidney disease may have had three
recorded separations each week just for their routine dialysis treatment.

Coding of diagnoses and
procedures

The conditions diagnosed and the procedures undertaken during each
episode of care were coded according to the International Classification
of Diseases, 9th Revision (ICD-9-CM) (National Coding Centre 1996). This
publication presents data by principal diagnosis and principal procedure
only. The *National Health Data Dictionary* defines the principal
diagnosis as 'the diagnosis established after study to be chiefly
responsible for occasioning the patient's episode of care in hospital'; the
principal procedure is defined as 'the most significant procedure that was
performed for the treatment of the principal diagnosis' (National Health
Data Committee 1998, pp. 141 and 373). If no procedure was performed

| Coding of diagnoses and procedures *continued* | for treatment of the principal diagnosis, then coding should have been carried out according to the following hierarchy: 'procedure performed for treatment of additional diagnosis; diagnostic/exploratory procedure related to the principal diagnosis; or diagnostic/exploratory procedure related to the additional diagnoses for the episode of care' (National Health Data Committee 1998, p. 373). |

A procedure is defined as 'a clinical intervention that: is surgical in nature; and/or carries a procedural risk; and/or carries an anaesthetic risk; and/or requires special training; and/or requires special facilities or equipment only available in an acute care setting' (National Health Data Committee 1999, p. 318). For some episodes of hospital care, no procedures were recorded, while for other episodes of care, more than one procedure was recorded. Although information on additional diagnoses and procedures is available in the NHMD, variability in coding practices by hospital and/or jurisdiction (for example, in the number of additional diagnoses or procedures which can be recorded) mean that such data may not be sufficiently comparable to warrant analysis. More detailed information about data quality relating to the NHMD is available elsewhere (AIHW 1999).

Identifying Indigenous people in hospital records

Hospitals throughout Australia collect information on the Indigenous status of admitted patients, but the question used to determine the information differs from place to place (ABS & AIHW 1999). The method of determining the response also varies, from directly asking a question of all patients, to asking only some patients, to determining the answer based on the patient's appearance. With the increased use of computer-based records and paperless systems, a number of hospitals do not actually have a specified question, because they do not have a patient questionnaire. Rather, information is entered directly onto the computer. Instead of a specific question, a heading (such as 'Indigenous status') appears on the computer screen, followed by a series of options (such as 'Aboriginal', 'Torres Strait Islander', 'Both Aboriginal and Torres Strait Islander', 'Neither'). Although such a system has many potential benefits (such as reduced transcription errors and increased efficiency), it does make it difficult to determine the language and practice used to assess the Indigenous status of patients.

The collection approach recommended by the Australian Bureau of Statistics (ABS) to hospitals is to ask all patients for information on their Indigenous status, using the following standard question:

> *Are you of Aboriginal or Torres Strait Islander origin?*
> *(If of both Aboriginal and Torres Strait Islander origin, tick both 'yes' boxes.)*
>
> ☐ *No*
> ☐ *Yes, Aboriginal origin*
> ☐ *Yes, Torres Strait Islander origin*

This is the question used by the ABS in the five-yearly Census of Population and Housing, which provides the basis on which population estimates and projections are derived. These estimates and projections are in turn used in the denominator of rate and ratio statistics. The quality of the data is improved when the same question is used to ascertain the numerator (for example, the number of Indigenous hospital separations) and the denominator (for example, the number of people in the Indigenous population).

The variation in the methods used to ascertain whether or not patients are Indigenous is likely to manifest itself in the quality of the data. Although the quality of Indigenous identification in hospital records has not yet been formally assessed nationally, a few studies of individual hospitals have suggested that there is a wide range in the completeness of recording (table 2.1).

2.1   SELECTED STUDIES ASSESSING DATA QUALITY OF INDIGENOUS STATUS IN HOSPITAL RECORDS

Authors(b)	Year of study	Location and number of hospitals	Total number of patients interviewed	Number of patients who identified as Indigenous at interview	Proportion of Indigenous people(a) correctly identified in hospital records
			no.	no.	%
Shannon, Brough & Haswell-Elkins (1997)	1997	2 Brisbane hospitals	451	25	44% overall
Lynch & Lewis (1997)	1997	2 Queensland hospitals	1 836	76	66% and 70%
Condon et al. (1998)	1997	5 public hospitals in the Northern Territory	400	216	94% overall; range 92–100%
ATSIHWIU (1999)	1998	11 hospitals in 5 States and Territories	8 276	648	range 55–100%

(a) Based on identification at interview.

(b) See List of References for more details.

A study by the Aboriginal and Torres Strait Islander Health and Welfare Information Unit (ATSIHWIU 1999) is the largest one of its kind conducted to date. It was funded by the Australian Health Ministers' Advisory Council and was designed to develop and test a simple methodology that could be used by hospitals to assess the accuracy of the recording of Indigenous status in their own data collections. Following the success of this project, States and Territories have now committed to reporting on data quality in their hospital collections by the end of 2002.

The ATSIHWIU study was also intended to provide some indication of the quality of data in the pilot hospitals, although it was not designed to produce national or jurisdictional estimates. As indicated in table 2.1, the agreement between hospital records and personal interview of patients ranged from 55–100%. The level of agreement tended to be higher for hospitals outside capital cities and for those with a higher proportion of Indigenous people living in the hospital's catchment area. Other factors,

| Identifying Indigenous people in hospital records *continued* | such as the employment of Aboriginal Hospital Liaison Officers and the organisational culture and values of the hospital, also appeared to be important, although these are harder to measure (ATSIHWIU 1999).

With the exception of the Northern Territory study (Condon et al. 1998), no study to date has assessed the quality of Indigenous identification in hospital records for a whole jurisdiction. In addition, the other studies presented in table 2.1 showed considerable variability within jurisdictions. As a result, it is difficult to determine which jurisdictions (other than the Northern Territory) have data of adequate quality to allow for reporting.

The number of hospital separations and procedures depends on a combination of factors such as the need for services, the availability of and preference for alternative sources of care, referral practices of primary health care providers, and physical, economic and cultural access to care. As a result, it is not possible to determine, simply by looking at the numbers or rates, whether the quality of data is sufficient to allow reporting. Because it is not currently possible to include or exclude jurisdictions on the basis of data quality (with the exception of the Northern Territory, which would be included), all jurisdictions have been included in the analyses reported in this publication. |

| Missing data | Separations for which Indigenous status was not recorded have been classified as 'Other', and included along with those for whom Indigenous status was recorded as non-Indigenous. It should be noted that while there were 151,462 separations that were identified as Indigenous, there were a further 685,176 separations for which Indigenous status was not reported. Of these, only 8% were separations from public hospitals. No information about Indigenous status was available for private hospitals in Victoria, and these separations accounted for 71% of the separations for which Indigenous status was not recorded.

Separations for which age and/or sex was missing were excluded from analyses (such as age standardisation) which require this information. |

| POPULATION ESTIMATES | All Indigenous rates in this publication, with the exception of rates for metropolitan, rural and remote area of residence (see below), were calculated using the Australian Bureau of Statistics (ABS) low series experimental Indigenous population projections based on the 1996 Census (ABS 1998a). These projections began with the Indigenous estimated resident population as at 30 June 1996. The population was then grown forward, assuming a 1% annual decline in the fertility rate for Indigenous females; no change in the rate of births to Indigenous fathers and non-Indigenous mothers; no change in mortality rates; no change in net interstate migration; and nil overseas migration (ABS 1998a). The low series projections also assumed no change over time in the propensity of people to identify as Indigenous. That is, for the low series projections, the Indigenous population was assumed to grow only as a result of demographic factors, namely births, deaths and migration. |

POPULATION ESTIMATES
continued

Data for the total population were taken from published ABS estimates for 30 June 1997 (revised) and 30 June 1998 (provisional) (ABS 1998b). Non-Indigenous population estimates were calculated by subtracting the Indigenous population projections from the total population estimates.

Population estimates and projections by age, sex and State or Territory for 30 June 1997 and 30 June 1998 were averaged to provide an estimate as at 31 December 1997 (the mid-point of the 1997–98 financial year). The following age groups (in years) were used: less than 1, 1–4, 5–14, 15–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75 and over.

The ABS estimates and projections of the Indigenous population are referred to as 'experimental' because of the nature of the base population and deficiencies in the quality of data on births, deaths and migration. This means that standard estimation methods can not be used (ABS 1998c). More detailed information on the estimation and projection of the Indigenous population is presented elsewhere (ABS 1998a, 1998c; ABS & AIHW 1999; Cunningham & Paradies 2000).

In addition to data deficiencies due to the incomplete identification of Indigenous people in administrative data collections (such as births and deaths), there has been considerable volatility in the counts of Indigenous people from one census to the next. As a result, there have been large differences between what was projected for 1996 based on 1991 Census data, and what was subsequently estimated based on 1996 Census data (for more details, see ABS 1998a, 1998c; ABS & AIHW 1999; Ross 1999). This discrepancy in population figures is important in the analysis of health events because it affects the calculation of rate and ratio measures, including hospital separation and procedure rates (Cunningham 1998). Such rates typically include the number of events (such as separations) in the numerator and the relevant population estimate in the denominator. The use of 1996 Census-based estimates, which are higher than the 1991 Census-based projections for a given year (e.g. 1996), will result in lower apparent rates, all other things being equal, because the denominator is larger. The size of the difference between 1991 Census-based projections and 1996 Census-based estimates for 1996 (and for other years) varied from place to place, and the effect on rates will also vary. In addition, any changes over time in the completeness of identification of Indigenous people in hospital records may have taken place at different rates than changes in the identification of Indigenous people from one census to the next, which further complicates the interpretation of trend data.

ANALYSIS BY METROPOLITAN, RURAL AND REMOTE AREA OF RESIDENCE

Analysis by area of residence was performed using the Rural, Remote and Metropolitan Areas (RRMA) Classification (Department of Primary Industries and Energy & Department of Human Services and Health 1994). The RRMA classification uses information on population size and an index of remoteness (in non-metropolitan areas only) to assign each Statistical Local Area (SLA) to one of seven groups (two metropolitan, three rural and two remote). In this publication these groups have been further collapsed into three categories, the metropolitan, rural and

remote zones. The metropolitan zone consists of capital cities and other metropolitan centres (urban centre population greater than 100,000). The rural zone consists of small rural centres (urban centre population between 10,000 and 24,999), large rural centres (urban centre population between 25,000 and 99,000) and other rural centres (urban centre population less than 10,000), with each having an index of remoteness less than 10.5. The remote zone consists of remote centres (urban centre population greater than or equal to 5,000) and other remote areas (urban centre population less than 5,000), with each having an index of remoteness greater than 10.5. More information on the RRMA classification and its use in analysing health data is available elsewhere (Department of Primary Industries and Energy & Department of Human Services and Health 1994; AIHW 1998b).

Information on RRMA category is included in the NHMD for all hospital separations with adequate information on the patient's place of usual residence. Only separations identified as Indigenous were included in the analyses by area of residence reported in this publication. Some information about hospital separations and other health measures by area of residence for the Australian population as a whole has been published previously (AIHW 1998b).

Estimates of the number of Indigenous people living in metropolitan, rural and remote areas were calculated separately for males and females using Australian Bureau of Statistics experimental Indigenous population estimates by SLA as at 30 June 1996 (ABS unpublished data). SLA-based experimental estimates of the Indigenous population have only been produced as at 30 June 1996, and it was not possible to derive a satisfactory estimate as at 31 December 1997. As a result, the rates of Indigenous separations and procedures by area of residence may have been over-estimated slightly due to an underestimation of the Indigenous population, the extent of which may have varied across areas. Any such over-estimation must be balanced against the under-estimation resulting from incomplete identification of Indigenous people in hospital records, which also may have varied by area of residence.

MEASURES OF MORBIDITY

A number of measures of morbidity are presented in this publication, including age-specific rates, directly age-standardised rates (ASR), and age-standardised morbidity ratios (SMR). These rates and ratios are used for separations and procedures, both overall and by cause of separation or type of procedure. It is important to note that hospital separations do not directly measure the prevalence of disease in a population, as not all people with a disease or condition are admitted to hospital, and some people have multiple admissions for the same problem.

Although the number of hospital separations (or procedures) occurring in a given time and place can provide useful information, it is generally more meaningful to think in terms of the number of separations in relation to the size of the population. Dividing the number of separations by the number of people in the population (total mid-year estimated resident population) gives us the crude separation rate, which is often

expressed as separations per 1,000 population. The age-specific separation rate is simply the separation rate for a particular age group, that is, the number of separations in a specific age group divided by the mid-year estimated population in the same age group.

The number of hospital separations (and procedures) in a population is influenced by the age structure of the population. In order to compare the experiences of two populations with different age structures, it is important to correct for the effect of age. This is especially relevant in comparisons of the Indigenous population with the non-Indigenous or total Australian population, as the Indigenous population has a considerably younger age structure than the non-Indigenous (and total Australian) population (ABS & AIHW 1999).

In this publication, correction for differences in age structure is performed using age standardisation. Standardisation can be performed using either the direct method or the indirect method. In direct standardisation, a standard population (such as the total Australian population) is chosen, and the age-specific rates for the groups of interest (e.g. Indigenous and other) are applied to the standard population. This results, for each group, in an age-standardised hospital separation (or procedure) rate, which is a theoretical estimate of what the rate would have been if age-specific hospital separation rates of the group of interest (e.g. Indigenous) had applied to the age structure of the standard population (e.g. all of Australia). ASRs are reported per 1,000 population. The ASRs for different groups can be compared, and a ratio of these rates can be calculated. In this publication, the standard population used is the total Australian population as at 30 June 1991, which is the current convention in Australia. It should be noted that the use of a different standard population would have resulted in different ASRs and rate ratios.

In indirect standardisation, a set of standard rates (rather than a standard population's age distribution) is used. The standard age-specific rates (e.g. all-Australian rates) are applied to the age structure of the group(s) of interest to calculate the 'expected' number of hospital separations (or procedures). This number indicates how many separations would be expected in the group of interest if it had experienced the standard rates (e.g. if the Indigenous population had experienced the all-Australian rates). The number of separations which were actually observed (in the case of the Indigenous population, those which occurred and *were recorded as Indigenous*) is then divided by the number expected, to produce the standardised morbidity ratio (SMR). An SMR greater than 1.0 indicates that more separations were observed than expected. An SMR less than 1.0 indicates that there were fewer than expected separations. In this publication, the standard rates used are those for 1997–98 for the total Australian population for the relevant sex for which the comparison is made. Although it is possible to calculate an SMR for the Indigenous and non-Indigenous populations using all-Australian rates in this way, only SMRs for the Indigenous population are presented in this publication.

MEASURES OF MORBIDITY
continued

All of the measures discussed in this section are affected by the incomplete identification of Indigenous people in hospital records. Because some proportion of separations and procedures for Indigenous people are not identified as Indigenous, the rates and ratios used in this publication may not adequately capture any differences between the Indigenous population and the total Australian population. It is important to keep this in mind when interpreting the results. In general terms, if the observed SMR (which is based only on those separations or procedures *identified* as Indigenous) is greater than 1.0, then the true SMR (which is based on complete identification of all Indigenous separations or procedures), is also greater than 1.0 (and larger than the observed SMR). If the observed SMR is around 1.0, then it is likely that the true SMR is greater than 1.0. If the observed SMR is less than 1.0, however, it is not possible to say with certainty what the true SMR would be. Depending on the level of under-identification (which is unknown) and the size of the observed SMR, the true SMR in such cases could be less than 1.0, close to 1.0, or greater than 1.0. This also applies to directly age-standardised rate ratios.

COMPARISON GROUP

The total Australian population is used as the comparison group in most of this publication. Although it may be theoretically preferable to use the non-Indigenous population as the comparison group (because the Indigenous population is included in the total population), there are practical difficulties in doing so. The incomplete identification of Indigenous people in hospital records means that a number of Indigenous separations are misclassified and included as non-Indigenous separations. In addition, the challenges of estimating the size and composition of the Indigenous population are carried through to the estimation of the non-Indigenous population. These difficulties can be avoided by using total Australian separations (and procedures) and the total Australian population, neither of which is affected by the imperfect recording of Indigenous status. Although the total population includes the Indigenous population, this does not present major difficulties in comparison because the Indigenous population is small relative to the total population.

In a few instances, in which direct standardisation is used (such as comparisons by State and Territory), the comparison group is 'Other', which consists of all separations not specifically identified as Indigenous. Although the separation and procedure rates in the total Australian population are not identical to those in the 'Other' group, they are very similar, and the choice of a comparison group makes little difference to the results in most cases.

COMPARISON WITH
FIGURES FROM OTHER
SOURCES

Comparison with figures from other sources and/or years should only be undertaken with extreme caution. Differences between the figures presented in this publication and figures presented elsewhere may be due to a variety of factors. These include changes over time in the quality of data, especially with respect to the recording of Indigenous status; differences in the population estimates used, both for the Indigenous population (due to the difference in the census year on

COMPARISON WITH
FIGURES FROM OTHER
SOURCES *continued*

which estimates are based) and for the total population (due to changes
between provisional and final estimates); the choice of the standard
population or standard rates used in age standardisation; and real
changes in the hospitalisation patterns of the Indigenous population over
time. Unfortunately it is not possible to quantify adequately the relative
contribution of each of these potential sources of difference.

Many of these factors also limit our ability to estimate trends over time.
This is why no data on trends are presented in this publication. In
addition to the strong possibility of changes in data quality over time, the
large increase in the number of people counted as Indigenous between
the 1991 Census and the 1996 Census makes it difficult to determine the
most appropriate estimates to use for intercensal years (see ABS & AIHW
1999 for more details).

STATISTICAL SIGNIFICANCE

Statistical significance is concerned with the type of error known as
sampling error. However, in the case of Indigenous hospital data,
non-sampling error (e.g. under-identification of Indigenous people in
hospital records) is of much greater concern. No measures of statistical
significance are used in this publication, as this could falsely suggest
greater precision than actually exists. All comparisons should be
interpreted with great caution, and readers should always bear in mind
the limitations of the data, such as those outlined above. The emphasis
should be on broad differences and similarities, and on patterns rather
than on detailed numerical figures.

CHAPTER 3   OVERVIEW OF HOSPITAL SEPARATIONS AND PROCEDURES

HOSPITAL SEPARATIONS

A total of 5.56 million hospital separations were recorded in Australia during the financial year 1997–98. Of these, 151,462 (2.7%) were identified as Indigenous. Separations identified as Indigenous accounted for 2.5% of all male separations and 2.9% of female separations (table 3.1). Indigenous people represented about 2.1% of Australia's population in 1996 (ABS 1998c).

Hospital sector

Most separations identified as Indigenous (98%) occurred in public hospitals (table 3.1). The low number of private hospital separations which were identified as Indigenous may be due at least in part to the possibility that a lower proportion of Indigenous patients are correctly identified in private hospitals. Indeed, some private hospitals did not provide information about the Indigenous status of any of their patients.

Although public hospitals also accounted for the majority of other separations, about one in three were recorded in private hospitals.

3.1   HOSPITAL SEPARATIONS, BY HOSPITAL SECTOR(a)

	Separations identified as Indigenous			Other separations(b)				Proportion of separations identified as Indigenous
	no.	%	rate(c)	no.	%	rate(c)	rate ratio(d)	%
MALES								
Public hospitals(e)	63 775	98.0	470	1 703 373	68.4	188	2.5	3.6
Private hospitals(f)(g)	1 306	2.0	18	788 651	31.6	86	0.2	0.2
Total	65 081	100.0	488	2 492 024	100.0	275	1.8	2.5
FEMALES								
Public hospitals(e)	84 107	97.4	568	1 918 799	65.7	201	2.8	4.2
Private hospitals(f)(g)	2 260	2.6	22	1 000 682	34.3	102	0.2	0.2
Total	86 367	100.0	589	2 919 481	100.0	303	1.9	2.9

(a) Data are for financial year 1997–98. Excludes separations for which age and/or sex was not stated.

(b) Includes separations identified as non-Indigenous and those for whom Indigenous status was recorded as unknown.

(c) Per 1,000 population. Directly age-standardised using the total Australian population as at 30 June 1991.

(d) Rate ratio is equal to rate of separations identified as Indigenous divided by the rate of other separations.

(e) Includes repatriation hospitals and public psychiatric hospitals.

(f) No data were available for the private hospital in the Northern Territory and a few other small private hospitals, and no information on Indigenous status of patients was available for private hospitals in Victoria.

(g) Includes private free-standing day hospitals.

Age-specific hospital separation rates

Hospital separation rates for males and females identified as Indigenous exceeded those for their all-Australian counterparts in every age group (table 3.2 and graph 3.3), with the smallest differences among children aged 5–14 years.

3.2 AGE-SPECIFIC HOSPITAL SEPARATION RATES INCLUDING DIALYSIS(a)

Age group (years)	*Males*			*Females*		
	Indigenous rate(a)(b)	*Australian rate(a)*	*Rate ratio(c)*	*Indigenous rate(a)(b)*	*Australian rate(a)*	*Rate ratio(c)*
Under 1	913	641	1.4	734	481	1.5
1–4	252	206	1.2	199	145	1.4
5–14	101	99	1.0	84	75	1.1
15–24	150	129	1.2	388	225	1.7
25–34	312	155	2.0	513	367	1.4
35–44	578	188	3.1	530	274	1.9
45–54	687	273	2.5	866	304	2.8
55–64	960	459	2.1	1 261	418	3.0
65–74	1 080	764	1.4	1 119	593	1.9
75 and over	1 179	1 041	1.1	1 149	777	1.5

(a) Per 1,000 population. Data are for the financial year 1997–98.

(b) Based on hospital separations identified as Indigenous.

(c) Indigenous rate divided by Australian rate.

3.3 HOSPITAL SEPARATIONS, ALL CAUSES(a)
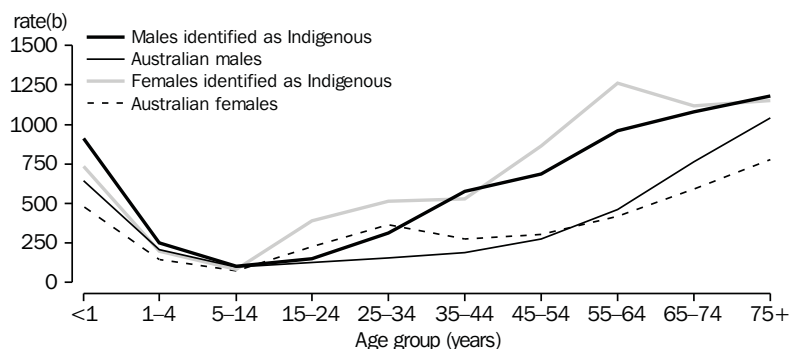
(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

Visits for dialysis accounted for a large proportion of separations among adults identified as Indigenous. Dialysis, which is used in the treatment of kidney failure, is generally performed on a same day basis, with multiple treatments per week. Age-specific hospital separation rates excluding dialysis are presented in table 3.4 and graph 3.5. More information about dialysis-related separations and procedures is presented in chapters 4 and 5.

3.4 AGE-SPECIFIC HOSPITAL SEPARATION RATES EXCLUDING DIALYSIS(a)

	Males			Females		
Age group (years)	Indigenous rate(a)(b)	Australian rate(a)	Rate ratio(c)	Indigenous rate(a)(b)	Australian rate(a)	Rate ratio(c)
Under 1	913	641	1.4	734	481	1.5
1–4	252	206	1.2	199	145	1.4
5–14	101	98	1.0	82	75	1.1
15–24	135	123	1.1	375	222	1.7
25–34	248	141	1.8	441	357	1.2
35–44	333	167	2.0	360	260	1.4
45–54	380	240	1.6	409	281	1.5
55–64	548	399	1.4	541	365	1.5
65–74	728	657	1.1	725	511	1.4
75 and over	930	967	1.0	889	747	1.2

(a) Per 1,000 population. Data are for the financial year 1997–98.

(b) Based on hospital separations identified as Indigenous.

(c) Indigenous rate divided by Australian rate.

3.5 HOSPITAL SEPARATIONS, ALL CAUSES EXCLUDING DIALYSIS(a)
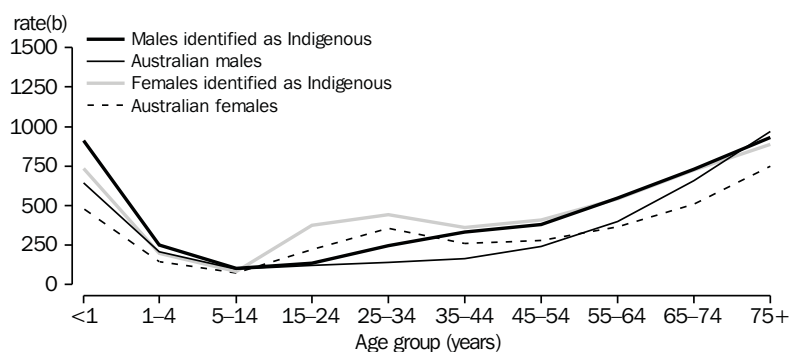
(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

Excess separations

After adjusting for age, there were nearly twice as many separations for males and females identified as Indigenous as would have been expected if the Indigenous population had experienced the same rates as the total Australian population (table 3.6). Because not all Indigenous separations were correctly identified as Indigenous in hospital records, this figure is an underestimate of the true excess.

3.6 STANDARDISED MORBIDITY RATIOS(a) FOR HOSPITAL SEPARATIONS

	Males	Females
Separations identified as Indigenous	65 081	86 367
Indigenous separations expected(b)	37 945	48 688
Apparent excess separations(c)	27 136	37 679
Standardised morbidity ratio(d)	1.7	1.8

(a) Data are for all causes combined including dialysis for the financial year 1997–98. Excludes separations for which age and/or sex was missing.

(b) Based on all-Australian rates.

(c) Apparent excess separations are equal to identified separations minus expected separations.

(d) Standardised morbidity ratio is equal to identified separations divided by expected separations.

Separations by State and Territory

After adjusting for age, Indigenous males and females were more likely to be hospitalised than other males and females in most States and Territories (table 3.7). The higher rate of hospitalisation for Indigenous people was most apparent in the Northern Territory, Western Australia and South Australia, where Indigenous people were between two and four times more likely to be hospitalised than other people in those jurisdictions. Although there may be differences across States and Territories in the true hospital separation rates for Indigenous people, it is likely that some of the apparent variation in Indigenous rates (and in the rate ratios) is explained by differences in the completeness with which Indigenous people are identified in hospital records. If the rates could be adjusted for under-identification of Indigenous people, the Indigenous rates (and therefore, the rate ratios) would increase. Such an adjustment is not yet possible, however, as the level of under-identification of Indigenous people in hospital records is not known for the majority of hospitals in Australia (see chapter 2).

3.7 HOSPITAL SEPARATIONS(a) IDENTIFIED AS INDIGENOUS BY STATE AND TERRITORY

State and Territory	Separations identified as Indigenous no.	rate(c)(d)	Other separations(b) no.	rate(c)(d)	rate ratio(e)	Proportion of separations identified as Indigenous %	Proportion of the population identified as Indigenous(f) %
			MALES				
New South Wales	13 392	375	833 222	267	1.4	1.6	1.8
Victoria(g)	2 447	288	634 850	277	1.0	0.4	0.5
Queensland(h)	17 135	473	476 652	291	1.6	3.5	3.1
South Australia	4 773	638	218 663	290	2.2	2.1	1.5
Western Australia	14 231	692	218 282	259	2.7	6.1	3.1
Tasmania	384	120	59 631	257	0.5	0.6	3.4
Northern Territory(i)	11 858	688	11 106	192	3.6	51.6	26.8
Australian Capital Territory	282	264	26 870	202	1.3	1.0	1.0
Australia(j)	**65 081**	**488**	**2 492 024**	**275**	**1.8**	**2.5**	**2.1**
			FEMALES				
New South Wales	17 941	419	980 097	296	1.4	1.8	1.8
Victoria(g)	3 296	345	762 069	308	1.1	0.4	0.5
Queensland(h)	22 132	554	538 806	316	1.8	3.9	3.2
South Australia	6 822	840	259 119	327	2.6	2.6	1.6
Western Australia	18 356	845	255 754	288	2.9	6.7	3.2
Tasmania	587	147	69 358	287	0.5	0.8	3.3
Northern Territory(i)	16 422	869	12 001	217	4.0	57.8	29.9
Australian Capital Territory	137	138	31 740	216	0.6	0.4	1.1
Australia(j)	**86 367**	**589**	**2 919 481**	**303**	**1.9**	**2.9**	**2.2**

(a) Based on place of usual residence. Excludes separations for which age and/or sex was not stated. Data are for financial year 1997–98 for public and private hospitals.

(b) Includes separations identified as non-Indigenous and those for whom Indigenous status was recorded as unknown.

(c) Per 1,000 population. Directly age-standardised using the total Australian population as at 30 June 1991.

(d) The true rate of hospitalisation of Indigenous people in States and Territories will be underestimated to the extent that Indigenous people are under-identified in the hospital records of those jurisdictions (refer Chapter 2, Methods and data quality).

(e) Rate ratio is equal to rate of separations identified as Indigenous divided by the rate of other separations.

(f) As estimated for 31 December 1997.

(g) No information on Indigenous status of patients was available for private hospitals in Victoria.

(h) Queensland Health has provided the following information: 'Based on an audit of reporting of Indigenous status, it is estimated that the total number of hospital separations for Indigenous males in Queensland is closer to 25,000 and for Indigenous females is closer to 33,000'.

(i) Public hospitals only.

(j) Includes those usually resident in other Australian territories or overseas, and those for whom place of usual residence was not stated.

Separations by metropolitan, rural and remote area of residence	Among those identified as Indigenous, hospital separation rates were highest for males and females living in remote areas and lowest for those living in metropolitan areas (table 3.8). Although some of this difference may be due to differences in the quality of identification of Indigenous patients, a trend in the same direction was observed among other separations.

3.8 HOSPITAL SEPARATIONS(a) IDENTIFIED AS INDIGENOUS BY AREA OF RESIDENCE(b)

	Separations identified as Indigenous		Other separations(c)			Proportion of separations identified as Indigenous	Proportion of the population identified as Indigenous
	no.	rate(d)	no.	rate(d)	rate ratio(e)	%	%
			MALES				
Metropolitan	16 415	424	1 718 997	276	1.5	0.9	1.1
Rural	19 727	445	674 959	284	1.6	2.8	2.8
Remote	27 801	641	65 771	308	2.1	29.7	19.2
			FEMALES				
Metropolitan	24 058	505	2 068 417	302	1.7	1.1	1.1
Rural	26 311	551	758 525	318	1.7	3.4	2.8
Remote	34 600	778	65 984	347	2.2	34.4	21.9

(a) Based on place of usual residence. Excludes separations for which age, sex and/or place of usual residence was not stated. Data are for financial year 1997–98.

(b) Classifications are based on the Rural, Remote and Metropolitan Areas Classification (Department of Primary Industries and Energy & Department of Human Services and Health 1994).

(c) Includes separations identified as non-Indigenous and those for whom Indigenous status was recorded as unknown.

(d) Per 1,000 population. Directly age-standardised using the total Australian population as at 30 June 1991.

(e) Rate ratio is equal to rate of separations identified as Indigenous divided by the rate of other separations.

Apparent hospital separation rates for Indigenous males and females from remote areas exceeded those for their Indigenous counterparts from metropolitan and rural areas in most ages groups (graphs 3.9 and 3.10). Age-specific rates for hospital separations excluding dialysis are presented in graphs 3.10 and 3.11.

3.9 HOSPITAL SEPARATIONS, ALL CAUSES BY USUAL RESIDENCE, MALES IDENTIFIED AS INDIGENOUS(a)

(a) Data are for the financial year 1997–98. Excludes people for whom age, sex and/or usual residence was not stated.
(b) Per 1,000 population.

3.10 HOSPITAL SEPARATIONS, ALL CAUSES BY USUAL RESIDENCE, FEMALES IDENTIFIED AS INDIGENOUS(a)
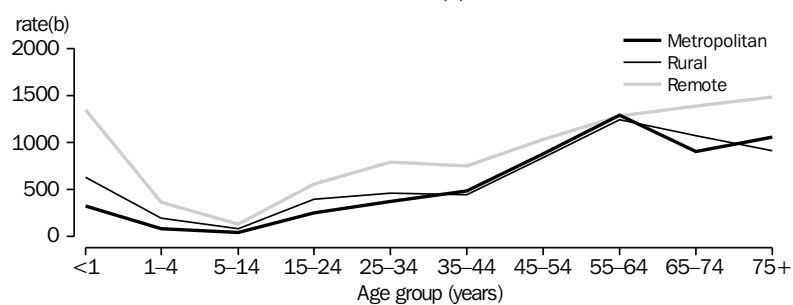
rate(b)

Metropolitan
Rural
Remote

(a) Data are for the financial year 1997-98. Exlcudes data for those for whom age, sex and/or usual residence was not stated.
(b) Per 1,000 population.

3.11 HOSPITAL SEPARATIONS, ALL CAUSES EXCLUDING DIALYSIS, BY USUAL RESIDENCE, MALES IDENTIFIED AS INDIGENOUS(a)

rate(b)

Metropolitan
Rural
Remote
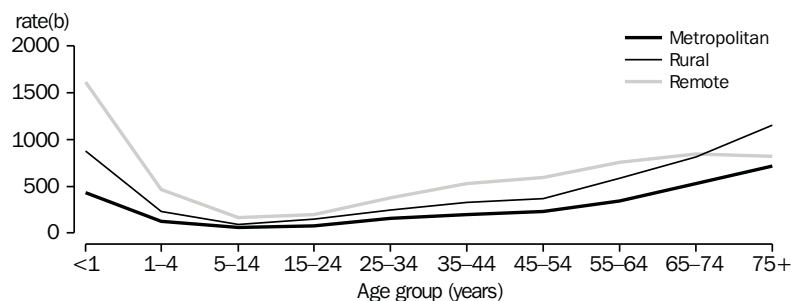
(a) Data are for the financial year 1997–98. Excludes data for those for whom age, sex and/or usual residence was not stated.
(b) Per 1,000 population.

3.12 HOSPITAL SEPARATIONS, ALL CAUSES EXCLUDING DIALYSIS, BY USUAL RESIDENCE, FEMALES IDENTIFIED AS INDIGENOUS(a)

rate(b)

Metropolitan
Rural
Remote
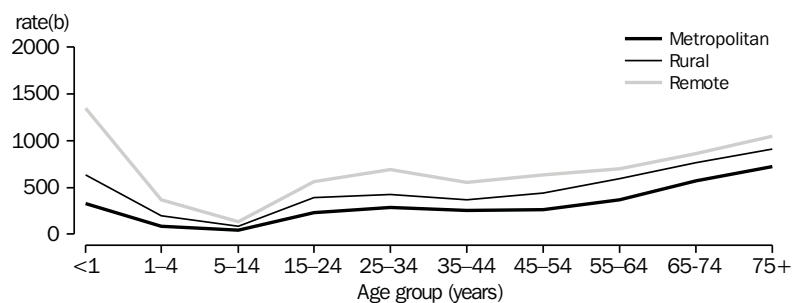
(a) Data are for the financial year 1997–98. Excludes data for those for whom age, sex and/or usual residence was not stated.
(b) Per 1,000 population.

Same day separations   About 41% of separations for males and females identified as Indigenous were classified as same day separations, compared with 48% for other males and 45% for other females (table 3.13). Hospital separations for dialysis, which is performed almost exclusively on a same day basis, accounted for a much larger proportion of same day separations among admitted patients identified as Indigenous (60%) than among other admitted patients (15%). After excluding separations for dialysis, about 21% of separations for Indigenous males and 22% of separations for Indigenous females were on a same day basis, compared with 43% of separations for other males and 42% of separations for other females.

3.13   SAME DAY SEPARATIONS(a)

	Separations identified as Indigenous			Other separations(b)		
	no.	% of same day separations	% of all separations	no.	% of same day separations	% of all separations
	MALES					
Same day separations for dialysis	16 219	61	25	225 507	19	9
Same day separations for other reasons	10 420	39	16	975 051	81	39
Total same day separations	26 639	100	41	1 200 558	100	48
	FEMALES					
Same day separations for dialysis	21 186	60	25	158 931	12	5
Same day separations for other reasons	14 401	40	17	1 155 855	88	40
Total same day separations	35 587	100	42	1 314 786	100	45

(a) Data are for financial year 1997–98.

(b) Includes separations identified as non-Indigenous and those for whom Indigenous status was recorded as unknown.

Average length of stay   The average length of stay for all separations (including same day separations) was around 3 to 4 days. After excluding same day separations, the average was around 6 days, and generally increased with age after infancy (table 3.14).

3.14   AVERAGE LENGTH OF STAY(a)

	Males		Females	
	Identified as Indigenous	Other(b)	Identified as Indigenous	Other(b)
Age groups (years)	no. of days	no. of days	no. of days	no. of days
Less than 1	6.1	6.2	6.8	6.6
1–4	3.9	2.4	4.2	2.4
5–14	3.6	3.2	3.8	2.9
15–24	5.4	5.8	3.9	3.8
25–34	5.6	6.4	4.3	4.5
35–44	6.7	5.8	5.4	5.1
45–54	7.6	6.0	5.6	5.8
55–64	7.9	6.6	8.3	6.7
65–74	12.8	6.6	10.9	8.4
75 and over	11.9	7.7	15.5	11.4
Average all age groups	**6.3**	**6.8**	**5.5**	**6.6**

(a) Excludes same-day admissions. Data are for the financial year 1997–98.

(b) Includes separations identified as non-Indigenous and those for whom Indigenous status was recorded as unknown.

Average length of stay
continued

Average length of stay varied by area of residence for separations identified as Indigenous as well as for other separations (table 3.15).

3.15 AVERAGE LENGTH OF STAY(a) BY AREA OF RESIDENCE(b)

	Males		Females	
	Identified as Indigenous	*Other(c)*	*Identified as Indigenous*	*Other(c)*
	no. of days	*no. of days*	*no. of days*	*no. of days*
Metropolitan	8.1	6.8	5.6	6.7
Rural	5.2	6.8	5.3	6.6
Remote	6.1	6.0	5.4	5.9
Australia	**6.2**	**6.8**	**5.4**	**6.6**

(a) Data are for the financial year 1997–98. Excludes same-day separations. Excludes separations for which usual residence, age and/or sex was missing.

(b) Classifications are based on the Rural, Remote and Metropolitan Areas Classification (Department of Primary Industries and Energy & Department of Human Services and Health 1994).
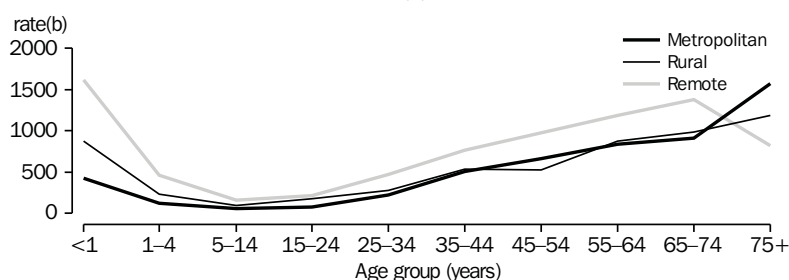
(c) Includes separations identified as non-Indigenous and those for whom Indigenous status was recorded as unknown.

Mode of separation

A separation occurs when a patient is discharged and goes home, is transferred to another facility, dies, leaves against medical advice, or for other or unspecified reasons. Separations identified as Indigenous were more likely than other separations to be recorded as 'left against medical advice' or transferred to another facility and less likely to be recorded as discharged home or died (table 3.16).

3.16 HOSPITAL SEPARATIONS BY MODE OF SEPARATION(a)

	Identified as Indigenous			Other		
	Males	*Females*	*Total*	*Males*	*Females*	*Total*
	%	*%*	*%*	*%*	*%*	*%*
Went home	87.5	89.3	88.5	92.5	93.2	92.8
Transferred to another facility	6.1	5.7	5.9	4.7	4.6	4.6
Left against medical advice	4.1	3.0	3.4	0.5	0.3	0.4
Died	0.8	0.5	0.6	1.4	1.1	1.2
Other(b)	1.6	1.6	1.6	0.9	0.9	0.9
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

(a) Data are for the financial year 1997–98. Excludes separations for which age and/or sex was missing.

(b) Includes statistical discharge, unknown or not supplied.

Indigenous group

Of all hospital separations identified as Indigenous in 1997–98, about 4.7% were identified as Torres Strait Islander (90% of which were hospitalised in Queensland). A further 68.5% were identified as Aboriginal and 1.4% were identified as both Aboriginal and Torres Strait Islander (table 3.17). A large proportion (25.4%) of separations identified as Indigenous did not specify the Indigenous group to which the patient belonged.

3.17 HOSPITAL SEPARATIONS BY INDIGENOUS GROUP(a)

					Identified as Indigenous	
	Males		*Females*		*Total*	
	no.	%	no.	%	no.	%
Aboriginal	44 995	69.1	58 796	68.1	103 791	68.5
Torres Strait Islander	2 577	4.0	4 608	5.3	7 185	4.7
Both Aboriginal & Torres Strait Islander origin	910	1.4	1 164	1.3	2 074	1.4
Indigenous not further specified	16 601	25.5	21 802	25.2	38 403	25.4
Total	**65 083**	**100.0**	**86 370**	**100.0**	**151 453**	**100.0**

(a) Data are for the financial year 1997–98. Excludes separations for which sex was missing.

PROCEDURES

A total of 4.2 million principal procedures were recorded in 1997–98, of which 2.1% were among patients identified as Indigenous. Regardless of whether they were identified as Indigenous, females were more likely than males to have a principal procedure recorded. Some of this difference is explained by procedures related to childbirth (see chapter 5).

Hospital sector

As with hospital separations, the vast majority (97%) of principal procedures recorded for patients identified as Indigenous were performed in public hospitals (table 3.18). By contrast, public hospitals accounted for about 62% of principal procedures recorded for other patients.

3.18 PRINCIPAL PROCEDURES BY HOSPITAL SECTOR(a)

	Public hospitals(b)		*Private hospitals(c)(d)*		*Total*	
	no.	%	no.	%	no.	%
PROCEDURES FOR SEPARATIONS IDENTIFIED AS INDIGENOUS						
Males	36 514	97.0	1 146	3.0	37 660	100.0
Females	49 880	96.2	1 976	3.8	51 856	100.0
Total	*86 394*	*96.5*	*3 122*	*3.5*	*89 516*	*100.0*
PROCEDURES FOR OTHER SEPARATIONS(e)						
Males	1 221 102	63.6	699 329	36.4	1 920 431	100.0
Females	1 365 633	61.2	865 838	38.8	2 231 471	100.0
Total	*2 586 735*	*62.3*	*1 565 167*	*37.7*	*4 151 902*	*100.0*

(a) Data are for financial year 1997–98. Excludes separations for which age and/or sex was not stated.

(b) Includes repatriation and public psychiatric hospitals.

(c) Includes private free-standing day clinics.

(d) No data were available for the private hospital in the Northern Territory and a few other small private hospitals, and no information on Indigenous status of patients was available for private hospitals in Victoria.

(e) Includes separations identified as non-Indigenous and those for whom Indigenous status was recorded as unknown.

Separations with a principal
procedure recorded

Among those admitted to hospital, patients identified as Indigenous were less likely than other patients to have a principal procedure recorded. About 59% of all hospital separations identified as Indigenous had a principal procedure recorded, compared with 77% of other hospital separations. The difference was apparent in every age group and for both males and females. After excluding haemodialysis procedures (the type of dialysis most commonly performed in hospitals), the differences were even greater, with 45% of separations identified as Indigenous having a principal procedure recorded, compared with 75% for other separations.

The pattern differed for public and private hospitals, however (graphs 3.19 and 3.20). Not only were private hospital separations more likely overall than public hospital separations to have a principal procedure recorded, but the proportion of private hospital separations with a principal procedure recorded was generally similar regardless of whether the patient was identified as Indigenous.

3.19 PUBLIC HOSPITAL SEPARATIONS WITH A PRINCIPAL PROCEDURE(a)
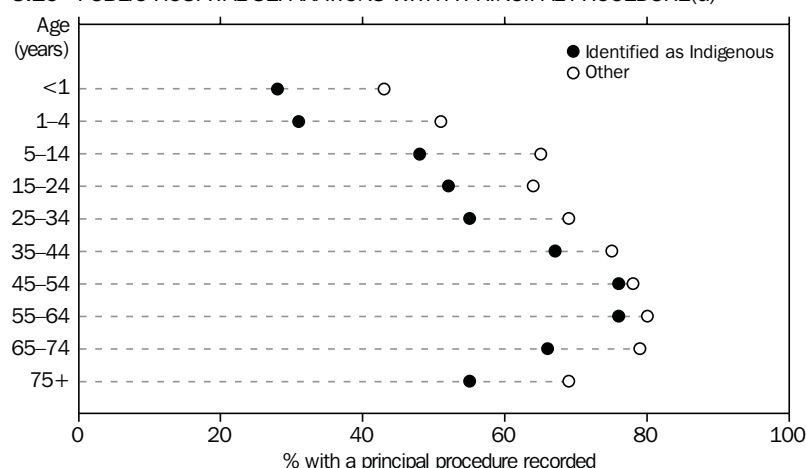
(a) Data are for the financial year 1997–98. Excludes separations for which age and/or sex was not stated.

3.20 PRIVATE HOSPITAL SEPARATIONS WITH A PRINCIPAL PROCEDURE(a)(b)
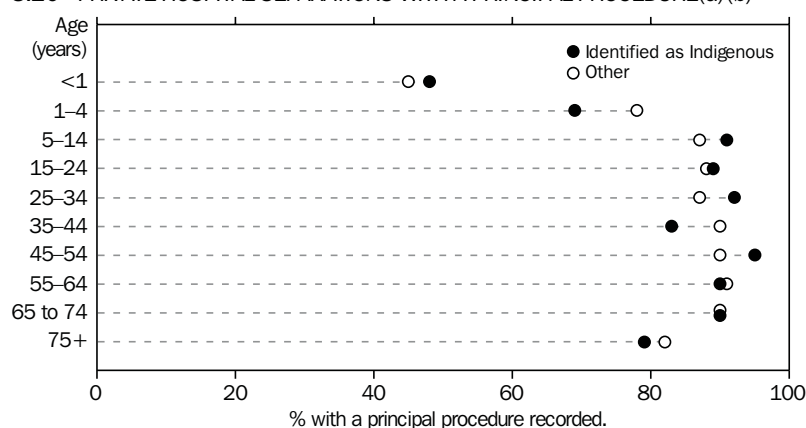
(a) Data are for the financial year 1997–98. Excludes separations for which age and/or sex was not stated.
(b) No data were available for some private hospitals, and no information on Indigenous status was available for private hospitals in Victoria.

Patients identified as Indigenous were less likely than other patients to
have a principal procedure recorded, regardless of their principal
diagnosis (graph 3.21), with the exception of 'other reasons for contact'
(for which the majority of visits were for dialysis and therefore included
a procedure).

3.21 HOSPITAL SEPARATIONS WITH A PRINCIPAL PROCEDURE RECORDED,
      BY PRINCIPAL DIAGNOSIS(a)
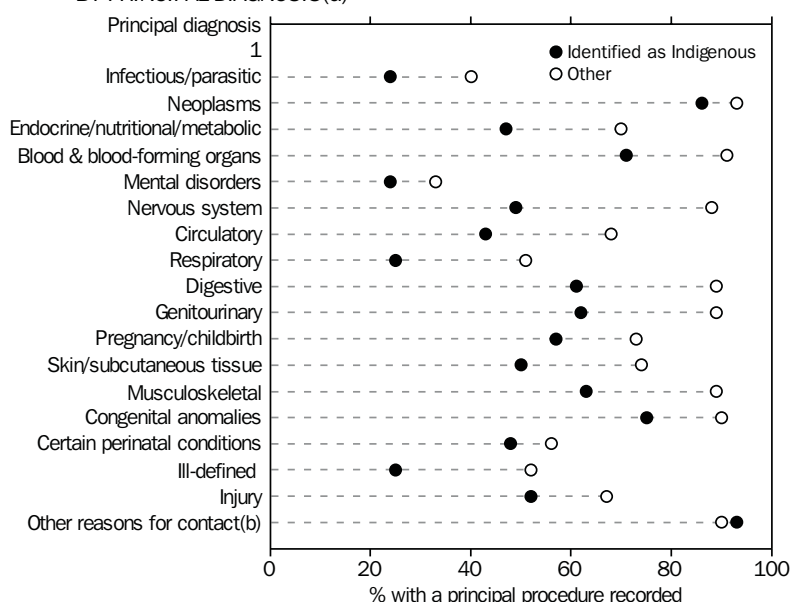
(a) Data are for the financial year 1997–98.
(b) Includes haemodialysis. 'Other reasons for contact' includes all ICD-9 V-codes, a supplementary
classification used to indicate a variety of circumstances which influence health status or bring
people into contact with the health care system but which do not fit into the main disease and
injury coding system (National Coding Centre 1996).

In most States and Territories, patients identified as Indigenous were less
likely than other patients to have a principal procedure recorded
(graph 3.22).

3.22 SEPARATIONS WITH A PRINCIPAL PROCEDURE RECORDED, BY STATE
      AND TERRITORY(a)(b)
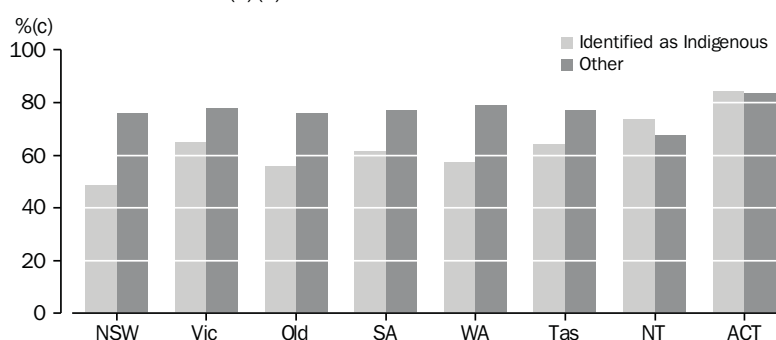
(a) Based on state of hospitalisation.
(b) Data are for the financial year 1997–98.
(c) With a principal procedure recorded.

Age-specific rates for principal procedures

The age-specific rates for hospital separations with a principal procedure recorded were higher for Indigenous males and females than for their all-Australian counterparts throughout most of adult life (graph 3.23). After excluding haemodialysis procedures, the Indigenous and all-Australian rates were similar (graph 3.24). As with rates for all separations identified as Indigenous (table 3.2), however, the Indigenous rates for separations with a principal procedure recorded are under-estimated, although the extent is unknown.

3.23 PRINCIPAL PROCEDURES, ALL TYPES(a)
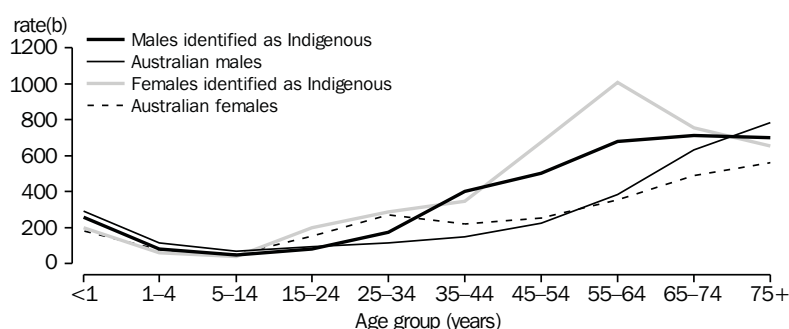
(a) Data are for the financial year 1997–98. Excludes procedures for which age and/or sex was missing.
(b) Per 1,000 population.

3.24 PRINCIPAL PROCEDURES, ALL TYPES EXCLUDING HAEMODIALYSIS(a)
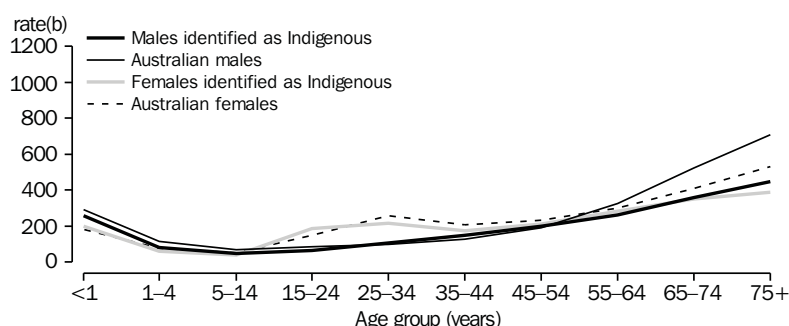
(a) Data are for the financial year 1997–98. Excludes procedures for which age and/or sex was missing.
(b) Per 1,000 population.

Excess procedures

After adjusting for age, there were about one and a half times as many principal procedures recorded as expected for Indigenous males and females, based on all-Australian rates (table 3.25). This figure includes haemodialysis procedures.

3.25 STANDARDISED MORBIDITY RATIOS(a) FOR PRINCIPAL PROCEDURES

	Males	Females
Procedures identified as Indigenous	37 660	51 856
Indigenous procedures expected(b)	26 759	34 953
Apparent excess procedures(c)	10 901	16 903
Standardised morbidity ratio(d)	1.4	1.5

(a) Data are for the financial year 1997–98 and are for recorded principal procedures. Excludes procedures for which age and/or sex was missing.

(b) Based on all-Australian rates.

(c) Apparent excess procedures are equal to identified procedures minus expected procedures.

(d) Standardised morbidity ratio is equal to identified procedures divided by expected procedures.

After adjusting for age, males and females identified as Indigenous in
South Australia, Western Australia and the Northern Territory were about
2–4 times more likely than other people in those jurisdictions to have a
hospital separation with a principal procedure recorded (table 3.26).

Although there may have been real differences across States and
Territories in the rates of procedures performed in hospital on
Indigenous people (as a result of differences in need, access and/or use
of services), it is likely that at least some of the variation is due to
differences in the completeness with which Indigenous people are
identified in hospital records. There may also be differences among the
States and Territories in the coding and recording of principal
procedures.

3.26 PRINCIPAL PROCEDURES FOR PATIENTS(a) IDENTIFIED AS INDIGENOUS, BY STATE AND TERRITORY

State and Territory	Procedures among patients identified as Indigenous		Procedures among other patients(b)		rate ratio(e)	Proportion of procedures among patients identified as Indigenous %	Proportion of the population identified as Indigenous(f) %
	no.	rate(c)(d)	no.	rate(c)(d)			
MALES							
New South Wales	6 154	204	630 748	201	1.0	1.0	1.8
Victoria(g)	1 563	197	504 316	219	0.9	0.3	0.5
Queensland	9 495	284	360 370	219	1.3	2.6	3.1
South Australia	2 837	429	167 593	221	1.9	1.7	1.5
Western Australia	8 165	428	171 791	203	2.1	4.5	3.1
Tasmania	229	57	47 516	204	0.3	0.5	3.4
Northern Territory(h)	8 587	546	7 818	139	3.9	52.3	26.8
Australian Capital Territory	215	202	21 968	165	1.2	1.0	1.0
Australia(i)	**37 660**	**310**	**1 958 091**	**211**	**1.5**	**1.9**	**2.1**
FEMALES							
New South Wales	9 315	231	747 524	224	1.0	1.2	1.8
Victoria(g)	2 148	233	581 112	234	1.0	0.4	0.5
Queensland	12 358	336	409 027	239	1.4	2.9	3.2
South Australia	4 289	590	198 628	251	2.4	2.1	1.6
Western Australia	10 733	523	201 604	226	2.3	5.1	3.2
Tasmania	394	100	52 397	214	0.5	0.7	3.3
Northern Territory(h)	11 987	697	8 519	158	4.4	58.5	29.9
Australian Capital Territory	84	109	25 505	173	0.6	0.3	1.1
Australia(i)	**51 856**	**383**	**2 283 327**	**231**	**1.7**	**2.3**	**2.2**

(a) Based on place of usual residence. Excludes patients for which age and/or sex was not stated. Data are for financial year 1997–98 for public and private hospitals.

(b) Includes patients identified as non-Indigenous and those for whom Indigenous status was recorded as unknown.

(c) Per 1,000 population. Directly age-standardised using the total Australian population as at 30 June 1991.

(d) The true rate of hospitalisation of Indigenous people in States and Territories will be underestimated to the extent that Indigenous people are under-identified in the hospital records of those jurisdictions (refer Chapter 2, Methods and data quality).

(e) Rate ratio is equal to rate of procedures among patients identified as Indigenous divided by the rate of procedures among other patients.

(f) As estimated for 31 December 1997.

(g) No information on Indigenous status of patients was available for private hospitals in Victoria.

(h) Public hospitals only.

(i) Includes those usually resident in other Australian territories or overseas, and those for whom place of usual residence was not stated.

Procedures by metropolitan, rural and remote area of residence

Males and females from remote areas who were identified as Indigenous were slightly more likely than their counterparts from metropolitan and rural areas to have a hospital separation with a principal procedure recorded (table 3.27).

3.27   PRINCIPAL PROCEDURES FOR PATIENTS(a) IDENTIFIED AS INDIGENOUS, BY AREA OF RESIDENCE(b)

	Separations identified as Indigenous		Other separations(c)			Proportion of separations identified as Indigenous	Proportion of the population identified as Indigenous
	no.	rate(d)	no.	rate(d)	rate ratio(e)	%	%
MALES							
Metropolitan	12 287	348	1 370 541	220	1.6	0.9	1.1
Rural	10 178	250	486 127	203	1.2	2.1	2.8
Remote	14 394	362	40 425	187	1.9	26.3	19.2
FEMALES							
Metropolitan	18 807	418	1 634 088	238	1.8	1.1	1.1
Rural	14 479	328	537 465	225	1.5	2.6	2.8
Remote	17 527	429	40 301	211	2.0	30.3	21.9

(a) Based on place of usual residence. Excludes separations for which age, sex and/or usual residence was not stated. Data are for financial year 1997–98.

(b) Classifications are based on the Rural, Remote and Metropolitan Areas Classification (Department of Primary Industries and Energy & Department of Human Services and Health 1994).

(c) Includes separations identified as non-Indigenous and those for whom Indigenous status was recorded as unknown.

(d) Per 1,000 population. Directly age-standardised using the total Australian population as at 30 June 1991.

(e) Rate ratio is equal to rate of separations identified as Indigenous divided by the rate of other separations.

Procedures performed on a same day basis

About 58% of all principal procedures recorded among patients identified as Indigenous and 53% of principal procedures among other patients were performed on a same day basis. About 73% of same day procedures among patients identified as Indigenous were for haemodialysis, which accounted for over 40% of all Indigenous procedures. Over 99.5% of haemodialysis procedures were performed on a same day basis, with the proportion similar for patients identified as Indigenous and other patients.

For most other types of principal procedures, the proportion performed on a same day basis was lower for patients identified as Indigenous than for other patients (graph 3.28).

3.28 PRINCIPAL PROCEDURES PERFORMED ON A SAME DAY BASIS, BY TYPE OF PROCEDURE(a)
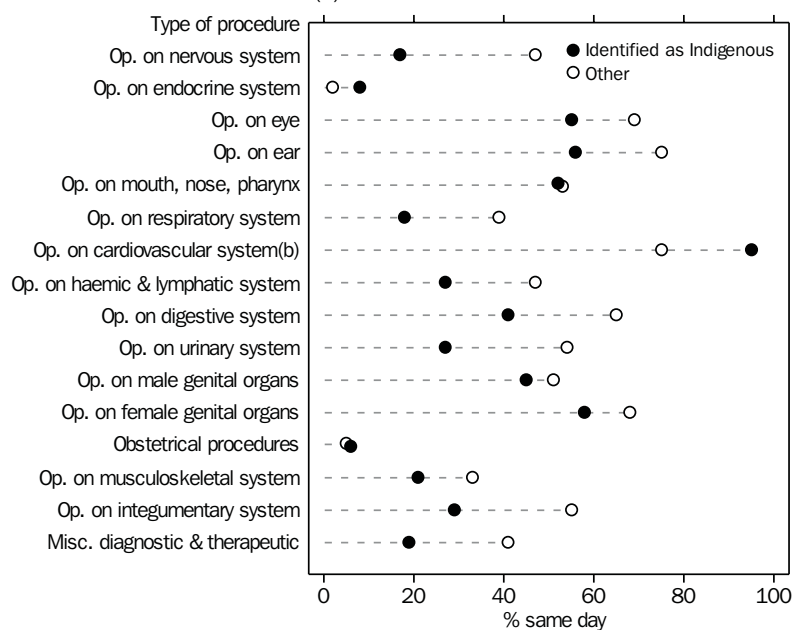
(a) Data are for the financial year 1997–98.
(b) Includes haemodialysis.

CHAPTER 4   MAIN REASON FOR HOSPITALISATION

PRINCIPAL DIAGNOSIS

The most common type of principal diagnosis recorded in 1997–98 for males and females identified as Indigenous was 'other reasons for contact', the majority of which were visits for dialysis (table 4.1). Other common types of principal diagnoses were related to pregnancy and childbirth, respiratory diseases and injury (table 4.1, graph 4.2). Together, these four categories accounted for 54% of separations among males identified as Indigenous and 62% of separations among females identified as Indigenous.

4.1   HOSPITAL SEPARATIONS IDENTIFIED AS INDIGENOUS, BY CAUSE(a)

	Separations identified as Indigenous		SMR(b)		Proportion of total separations	
	Males	Females	Males	Females	Males	Females
	no.	no.	ratio	ratio	%	%
Infectious/parasitic diseases	2 366	2 292	2.1	2.2	3.6	2.7
Neoplasms	891	1 519	0.6	0.7	1.4	1.8
Endocrine/nutritional/metabolic disorders	1 553	1 734	3.4	2.9	2.4	2.0
Diseases of blood and blood-forming organs	291	460	0.7	1.1	0.4	0.5
Mental disorders	3 854	3 224	2.0	1.5	5.9	3.7
Nervous system diseases	2 867	2 621	1.3	1.2	4.4	3.0
Circulatory diseases	3 166	2 901	1.7	2.0	4.9	3.4
Respiratory diseases	8 150	7 514	2.1	2.3	12.5	8.7
Digestive diseases	4 493	4 373	1.0	0.8	6.9	5.1
Genitourinary diseases	1 429	4 629	1.0	1.1	2.2	5.4
Complications of pregnancy and childbirth	0	14 527	0	1.4	0	16.8
Diseases of skin and subcutaneous tissue	2 604	2 283	2.9	3.1	4.0	2.6
Musculoskeletal diseases	1 642	1 433	0.7	0.8	2.5	1.7
Congenital anomalies	377	258	0.5	0.5	0.6	0.3
Certain perinatal conditions	1 026	883	0.8	0.9	1.6	1.0
Ill-defined conditions	3 336	3 919	1.4	1.4	5.1	4.5
Injury	8 282	6 725	1.7	2.3	12.7	7.8
Other reasons for contact(c)						
Dialysis	16 311	21 215	6.7	11.2	25.1	24.6
Other	2 393	3 830	0.7	0.9	3.7	4.4
Total	*18 704*	*25 045*	*3.1*	*4.2*	*28.7*	*29.0*
Not specified	50	27	3.6	3.1	0.1	0.0
All causes (excluding dialysis)	**48 770**	**65 152**	**1.4**	**1.4**	**74.9**	**75.4**
All causes (including dialysis)	**65 081**	**86 367**	**1.7**	**1.8**	**100.0**	**100.0**

(a)   Data are for financial year 1997–98 for public and private hospitals. No data were available for the private hospital in the Northern Territory and a few other small private hospitals, and no information on Indigenous status of patients was available for private hospitals in Victoria. Excludes separations for which age and/or sex was unknown. Causes are categorised according to the International Classification of Diseases, 9th Revision (ICD-9) (WHO 1977). See Appendix for categories.

(b)   Standardised morbidity ratio is equal to hospital separations identified as Indigenous divided by expected separations, based on all-Australian rates.

(c)   'Other reasons for contact' includes all ICD-9 V-codes, a supplementary classification used to indicate a variety of circumstances which influence health status or bring people into contact with the health care system but which do not fit into the main disease and injury coding system (National Coding Centre 1996).

4.2 MOST COMMON REASONS FOR HOSPITALISATION(a)
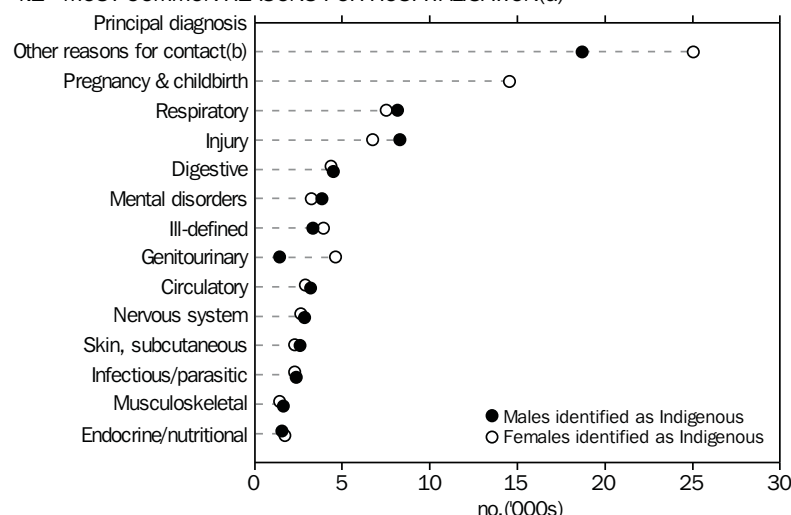
(a) Data are for the financial year 1997–98.
(b) Includes dialysis. 'Other reasons for contact' includes all ICD-9 V-codes and is a supplementary classification used to indicate a variety of circumstances which influence health status or bring people into contact with the health care system but which do not fit into the main disease and injury coding system (National Coding Centre 1996).

'Other reasons for contact'

The category 'other reasons for contact' includes all ICD-9 V-codes. The V-codes form a supplementary classification used to indicate a variety of circumstances which influence health status or bring people into contact with the health care system but which do not fit into the main disease and injury coding system (National Coding Centre 1996). Examples include presentation for treatment of a known condition (such as chemotherapy, dialysis, and infertility treatment), contact by people who are not ill but who have a specific reason for interacting with a health service (such as organ donation, cosmetic plastic surgery and fitting of a prosthetic device), and the presence of a personal or family history of various conditions (such as an allergy to medications or the presence of a transplanted organ). Uncomplicated live births would also be included in this category, but many of these separations have been excluded as 'unqualified neonates' (see chapter 2). As with other ICD-9 codes, V-codes may be recorded as the principal diagnosis or as an additional diagnosis, but only those recorded as the principal diagnosis are considered in this publication.

The category 'other reasons for contact' was the principal diagnosis recorded for about 29% of all separations identified as Indigenous (table 4.1). The majority of separations in this category (over 85% among people identified as Indigenous) had a principal diagnosis of 'contact for dialysis'. There were almost seven times as many separations for dialysis among males identified as Indigenous and 11 times as many among females identified as Indigenous as would be expected if Indigenous people had experienced the same rates as all Australians (table 4.3). More information about dialysis procedures is presented in chapter 5.

4.3 STANDARDISED MORBIDITY RATIOS(a) FOR 'OTHER REASONS FOR CONTACT WITH HEALTH SERVICES'(b)

	Indigenous males			Indigenous females		
	Observed separations			Observed separations		
			SMR(c)			SMR(c)
	no.	%	ratio	no.	%	ratio
Contact related to communicable disease risk or personal/family history	33	0.1	0.2	58	0.1	0.3
Contact related to reproduction and development, liveborn infants	279	0.4	0.6	1 528	1.8	1.4
Dialysis	16 311	25.1	6.7	21 215	24.6	11.2
Other contact related to procedures, aftercare, conditions	1 308	2.0	0.5	1 281	1.5	0.6
Contact for other reasons	773	1.2	1.5	963	1.1	1.7
All 'other reasons for contact'	**18 704**	**28.7**	**3.1**	**25 045**	**29.0**	**4.2**

(a) Based on all-Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98. 'Other reasons for contact' includes all ICD-9 V-codes, a supplementary classification used to indicate a variety of circumstances which influence health status or bring people into contact with the health care system but which do not fit into the main disease and injury coding system (National Coding Centre 1996).

(c) Standardised morbidity ratio (SMR) is equal to observed separations divided by expected separations.

Complications of pregnancy and childbirth

Diagnoses in the category 'complications of pregnancy and childbirth' (which includes normal delivery) accounted for about 17% of all separations among females identified as Indigenous (table 4.1). The rate of hospitalisation for pregnancy and childbirth was higher for Indigenous females than for all Australian females until about age 25 years (graph 4.4), which reflects the higher birth rates at younger ages among Indigenous women (Day et al. 1999).

4.4 HOSPITAL SEPARATIONS, PREGNANCY AND CHILDBIRTH(a)(b)
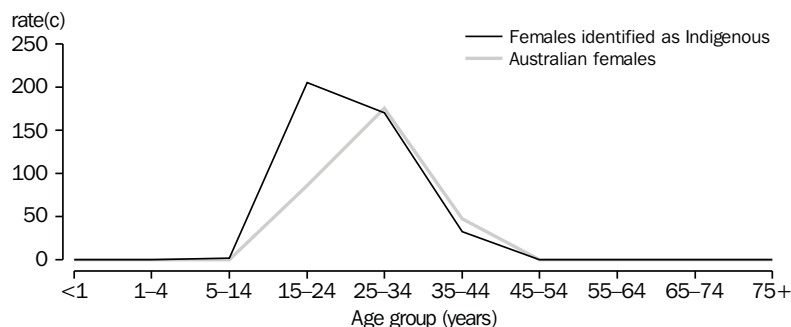
(a) Data are for the financial year 1997--98.
(b) Includes normal delivery.
(c) Per 1,000 population.

There were more separations among Indigenous females than expected, based on all Australian rates, for normal delivery as well as for a range of types of complications (table 4.5).

	Indigenous females		
	Observed separations		
			SMR(c)
	no.	%	ratio
Pregnancy with abortive outcome	1 911	2.2	1.0
Complications mainly related to pregnancy	5 889	6.8	1.8
Normal delivery	1 294	1.5	1.7
Other indications regarding pregnancy, labour, delivery	5 137	5.9	1.2
Complications of the puerperium	296	0.3	1.4
All complications of pregnancy and childbirth	**14 527**	**16.8**	**1.4**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed separations divided by expected separations.

Respiratory diseases

Diseases of the respiratory system accounted for almost 13% of separations among males identified as Indigenous and about 9% of separations among females identified as Indigenous (table 4.1). Despite under-identification of Indigenous patients, there were about twice as many separations among Indigenous males and females as would be expected based on all-Australian rates.

Hospital separation rates for respiratory diseases were considerably higher for Indigenous males and females than for their all-Australian counterparts in infancy and early childhood, as well as after age 25 years (graph 4.6). Among children identified as Indigenous, respiratory diseases accounted for over a third (35%) of separations among infants and about a third (32%) of separations among children aged 1–4 years.

4.6   HOSPITAL SEPARATIONS FOR RESPIRATORY DISEASES(a)

(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

Respiratory diseases
continued

There were more hospital separations than expected among Indigenous males and females for most types of respiratory disease (table 4.7). Pneumonia and influenza were important contributors to the higher rates of hospitalisation for respiratory diseases, with nearly five times as many separations as expected among Indigenous males and females.

4.7   STANDARDISED MORBIDITY RATIOS(a) FOR RESPIRATORY DISEASES(b)

	Indigenous males			*Indigenous females*		
	Observed separations		SMR(c)	*Observed separations*		SMR(c)
	no.	%	ratio	no.	%	ratio
Acute respiratory infection	2 260	3.5	2.1	1 869	2.2	2.5
Other diseases of upper respiratory tract	296	0.5	0.3	299	0.3	0.3
Pneumonia and influenza	2 691	4.1	4.8	2 190	2.5	4.5
Bronchitis and emphysema	343	0.5	5.7	318	0.4	6.1
Asthma	1 117	1.7	1.3	1 555	1.8	2.2
Other COPD and allied conditions	475	0.7	5.3	420	0.5	5.9
Other diseases of the respiratory system	968	1.5	3.8	863	1.0	4.2
All respiratory diseases	**8 150**	**12.5**	**2.1**	**7 514**	**8.7**	**2.3**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed separations divided by expected separations.

Injury

Injury accounted for almost 13% of separations among males identified as Indigenous and nearly 8% of separations among females identified as Indigenous. Overall there were about twice as many separations among Indigenous males and females as expected based on all-Australian rates (table 4.1).

Indigenous males and females were more likely than their all-Australian counterparts to be hospitalised for injury in every age group, with large differences throughout the adult years (graph 4.8). Although the rates were generally higher for males than for females, the rates for Indigenous females were higher than those for all-Australian males throughout the adult years.

4.8   HOSPITAL SEPARATIONS FOR INJURY(a)
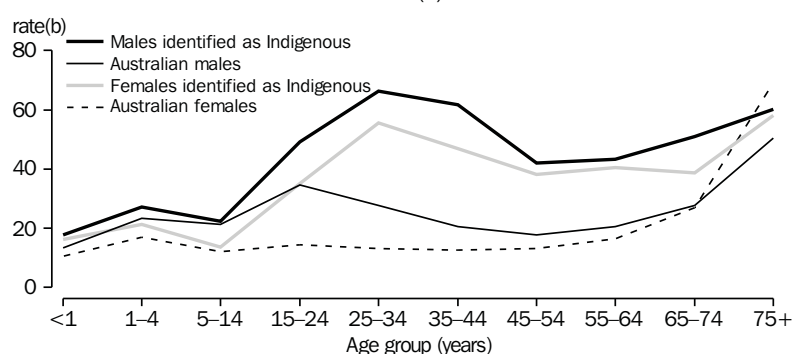
(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

Injury *continued*   The majority of hospital separations for injury were in the categories 'open wounds, intracranial, internal, or blood vessel injury' and 'fractures, dislocations, sprains and strains' (table 4.9). For every type of injury, there were more separations among Indigenous males and females than expected based on all-Australian rates.

4.9   STANDARDISED MORBIDITY RATIOS(a) FOR INJURY(b)

	Indigenous males			Indigenous females		
	Observed separations		SMR(c)	Observed separations		SMR(c)
	no.	%	ratio	no.	%	ratio
Fractures, dislocations, sprains, strains	2 541	3.9	1.3	1 572	1.8	1.6
Open wounds, intracranial, internal, blood vessel injury	3 266	5.0	2.4	2 300	2.7	4.1
Late effects, burns, superficial, other injuries	1 124	1.7	1.9	1 117	1.3	3.1
Poisoning, toxic effects	605	0.9	1.5	785	0.9	1.6
Other, unspecified effects of external causes	152	0.2	1.8	201	0.2	2.8
Complications of surgical, medical care (not elsewhere classified)	594	0.9	1.3	750	0.9	1.7
All injury	**8 282**	**12.7**	**1.7**	**6 725**	**7.8**	**2.3**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed separations divided by expected separations.

Every separation with a primary diagnosis of injury should be accompanied by a code for the external cause of the injury or poisoning. External causes are defined as 'the environmental event, circumstance or condition as the cause of injury, poisoning and other adverse effect' (National Health Data Committee, 1999, p.267).

There were more separations than expected among Indigenous males and females for nearly every type of external cause, but the most striking differences were for injuries purposely inflicted by others (table 4.10).

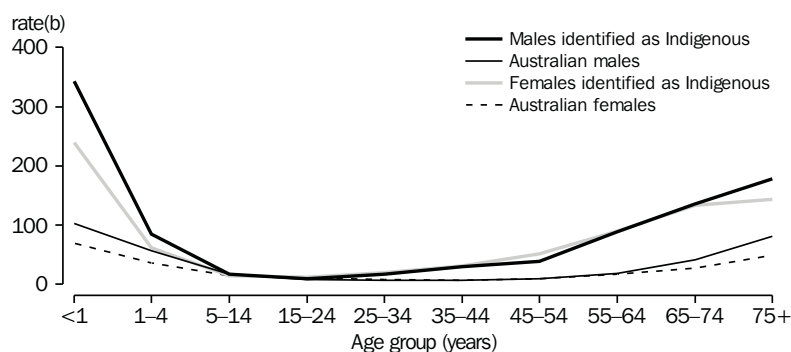| | Indigenous males | | | Indigenous females | | |
| | Observed separations | | | Observed separations | | |
| | | | SMR(c) | | | SMR(c) |
	no.	%	ratio	no.	%	ratio
Transport accidents	806	1.2	1.1	335	0.4	0.9
Accidental poisoning	278	0.4	1.4	328	0.4	1.7
Misadventure during or due to medical care	581	0.9	1.4	705	0.8	1.7
Accidental falls	1 413	2.2	1.3	951	1.1	1.2
Accidents caused by fire or flames	128	0.2	3.6	51	0.1	4.3
Other accidents, late effects	2 118	3.3	1.4	1 230	1.4	2.0
Adverse effects of therapeutic drugs, biologicals	60	0.1	2.4	64	0.1	2.1
Self-inflicted injury, suicide	367	0.6	2.2	431	0.5	1.7
Injury purposely inflicted by others, homicide	1 905	2.9	6.4	2 168	2.5	(d)20.1
Other external causes	69	0.1	7.0	46	0.1	6.6
All injury(e)	**8 282**	**12.7**	**1.7**	**6 725**	**7.8**	**2.3**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed separations divided by expected separations.

(d) This figure should be interpreted with caution, as injuries purposely inflicted by others may be seriously under-reported, especially among non-Indigenous women.

(e) Includes injuries with unspecified cause.

Digestive diseases

Diseases of the digestive system accounted for 7% of all hospital separations among males identified as Indigenous and 5% of hospital separations among females identified as Indigenous (table 4.1). There were broadly similar patterns across age for Indigenous males and females and their all-Australian counterparts (graph 4.11).

4.11 HOSPITAL SEPARATIONS FOR DIGESTIVE DISEASES(a)
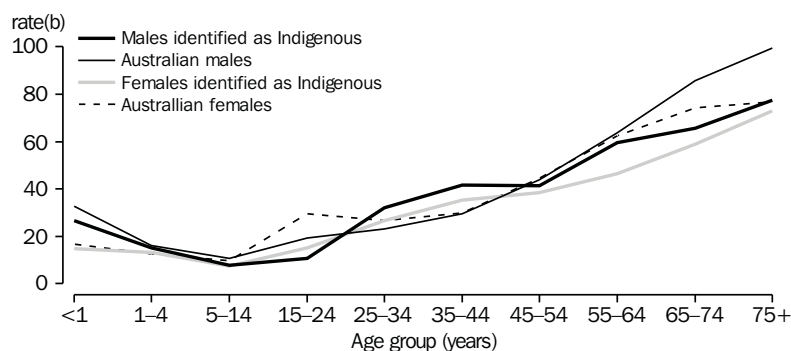
(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

Although there were generally fewer than expected hospital separations from various types of digestive diseases among Indigenous males and females (table 4.12), at least some of this difference can be explained by under-identification of Indigenous patients.

Digestive diseases *continued*   Despite such under-identification however, there were more separations than expected for males and females identified as Indigenous for diseases of the liver and for other digestive diseases.

4.12   STANDARDISED MORBIDITY RATIOS(a) FOR DIGESTIVE DISEASES(b)

	Indigenous males			Indigenous females		
	Observed separations			Observed separations		
			SMR(c)			SMR(c)
	no.	%	ratio	no.	%	ratio
Diseases of oral cavity, salivary glands, jaw	648	1.0	0.6	754	0.9	0.5
Diseases of oesophagus, stomach, duodenum	1 140	1.8	1.0	921	1.1	0.8
Appendicitis	241	0.4	0.7	244	0.3	0.9
Abdominal hernia	349	0.5	0.5	180	0.2	0.6
Non-infectious enteritis, colitis	207	0.3	0.9	318	0.4	1.0
Other diseases of intestines, peritoneum	488	0.7	0.7	615	0.7	0.7
Diseases of the liver	232	0.4	3.3	164	0.2	3.6
Other digestive diseases	1 188	1.8	2.9	1 177	1.4	1.4
All digestive diseases	**4 493**	**6.9**	**1.0**	**4 373**	**5.1**	**0.8**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed separations divided by expected separations.

Mental disorders   Mental disorders accounted for about 6% of separations among males identified as Indigenous and almost 4% among females identified as Indigenous (table 4.1). There were twice as many separations from mental disorders as expected among Indigenous males and 1.5 times as many as expected among Indigenous females. Indigenous males and females were more likely to be hospitalised for these conditions than their all-Australian counterparts in most age groups (graph 4.13).

4.13   HOSPITAL SEPARATIONS FOR MENTAL DISORDERS(a)

(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

There were more separations than expected among Indigenous people for various types of mental disorders, but the greatest differences in relative terms were for alcohol and drug-related psychosis, dependence and abuse (table 4.14).

4.14   STANDARDISED MORBIDITY RATIOS(a) FOR MENTAL DISORDERS(b)

	Indigenous males			*Indigenous females*		
	Observed separations			*Observed separations*		
			SMR(c)			SMR(c)
	no.	%	ratio	no.	%	ratio
Alcohol and drug-related psychosis, dependence, abuse	1 786	2.7	4.7	889	1.0	3.9
Other psychoses	1 155	1.8	1.4	1 224	1.4	1.3
Other mental disorders	913	1.4	1.3	1 111	1.3	1.2
All mental disorders	**3 854**	**5.9**	**2.0**	**3 224**	**3.7**	**1.5**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed separations divided by expected separations.

Genitourinary diseases

Diseases of the genitourinary system accounted for about 2% of separations among males identified as Indigenous and about 5% of separations among females identified as Indigenous (table 4.1). The rates of hospitalisation from genitourinary diseases were generally similar for Indigenous people and for all Australians, with the exception of older females (graph 4.15).

4.15   HOSPITAL SEPARATIONS FOR GENITOURINARY DISEASES(a)

(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

There were more separations than expected among Indigenous males and females for diseases of the urinary system (which includes kidney disease), but fewer than expected separations for other types of genitourinary diseases (table 4.16).

	Indigenous males			Indigenous females		
	Observed separations			Observed separations		
			SMR(c)			SMR(c)
	no.	%	ratio	no.	%	ratio
Diseases of the urinary system	972	1.5	1.4	1 986	2.3	2.6
Diseases of male genital organs	444	0.7	0.7	0	0.0	0.0
Diseases of the breast	13	0.0	0.4	214	0.2	0.9
Diseases of female genital organs	0	0.0	0.0	2 429	2.8	0.8
All genitourinary diseases	**1 429**	**2.2**	**1.0**	**4 629**	**5.4**	**1.1**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed separations divided by expected separations.

Circulatory diseases

Diseases of the circulatory system accounted for about 5% of separations among males identified as Indigenous and about 3% of separations among females identified as Indigenous (table 4.1). The rates of hospitalisation for circulatory diseases were markedly higher for Indigenous people than for all Australians from age 25 to 65 years among males and from age 25 to 75 years among females (graph 4.17).

4.17   HOSPITAL SEPARATIONS FOR CIRCULATORY DISEASES(a)
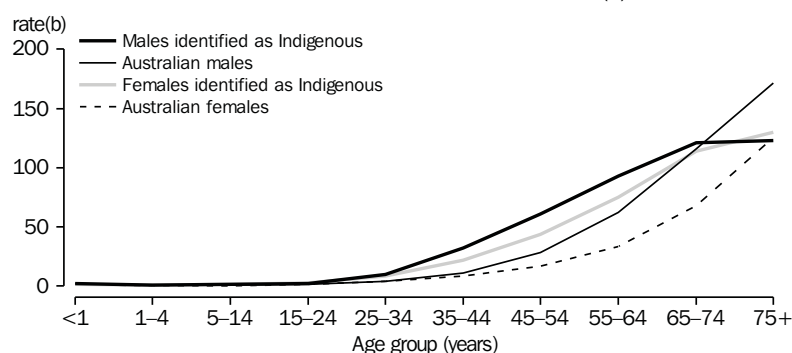
(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

There were more separations than expected among Indigenous males and females for almost every type of circulatory disease (table 4.18), but the largest differences in relative terms were for rheumatic heart disease and hypertensive disease.

	Indigenous males			Indigenous females		
	Observed separations			Observed separations		
			SMR(c)			SMR(c)
	no.	%	ratio	no.	%	ratio
Rheumatic heart disease	131	0.2	13.6	201	0.2	12.6
Hypertensive disease	158	0.2	5.5	254	0.3	6.4
Ischaemic heart disease	1 245	1.9	1.6	944	1.1	2.7
Other heart disease	960	1.5	2.3	884	1.0	2.6
Cerebrovascular disease	316	0.5	1.9	319	0.4	2.2
Other diseases of the circulatory system	356	0.5	0.7	299	0.3	0.5
All circulatory diseases	**3 166**	**4.9**	**1.7**	**2 901**	**3.4**	**2.0**

(a) Based on all Australian age-, sex-, and cause-specific rates.
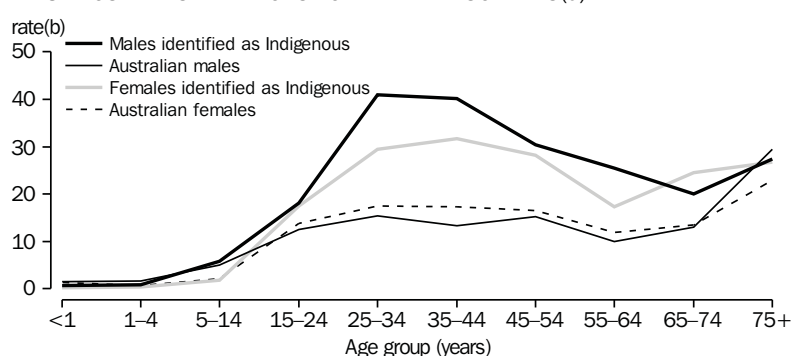
(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed separations divided by expected separations.

Nervous system diseases

Diseases of the nervous system accounted for about 4% of separations among males identified as Indigenous and about 3% of separations among females identified as Indigenous (table 4.1). Rates of hospitalisation from nervous system diseases were higher for Indigenous males and females than for all Australian males and females throughout most of adulthood (graph 4.19).

4.19 HOSPITAL SEPARATIONS FOR NERVOUS SYSTEM DISEASES(a)
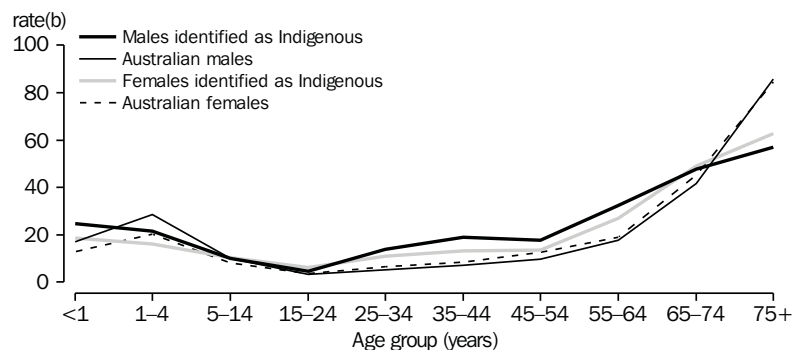
(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

There were more separations than expected for all types of nervous system diseases among Indigenous females and for some types among Indigenous males (table 4.20).

	Indigenous males			Indigenous females		
	Observed separations			Observed separations		
			SMR(c)			SMR(c)
	no.	%	ratio	no.	%	ratio
Central and peripheral nervous system disorders and diseases	1 381	2.1	2.3	939	1.1	1.3
Disorders of eye and adnexa	556	0.9	1.0	737	0.9	1.1
Diseases of ear and mastoid process	930	1.4	0.9	945	1.1	1.2
All nervous system diseases	**2 867**	**4.4**	**1.3**	**2 621**	**3.0**	**1.2**

(a) Based on all Australian age-, sex-, and cause-specific rates.
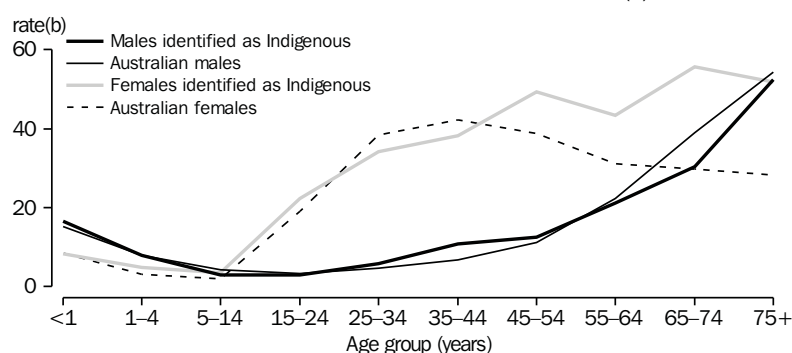
(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed separations divided by expected separations.

Diseases of skin and subcutaneous tissue

Diseases of the skin and subcutaneous tissue accounted for about 4% of separations among males identified as Indigenous and almost 3% of separations among females identified as Indigenous (table 4.1). There were about three times as many separations as expected for both Indigenous males and females, based on all-Australian rates. Rates of hospitalisation for diseases of skin and subcutaneous tissue were higher for Indigenous males and females than all Australian males and females in every age group (graph 4.21).

4.21   HOSPITAL SEPARATIONS, DISEASES OF SKIN & SUBCUTANEOUS
        TISSUE(a)
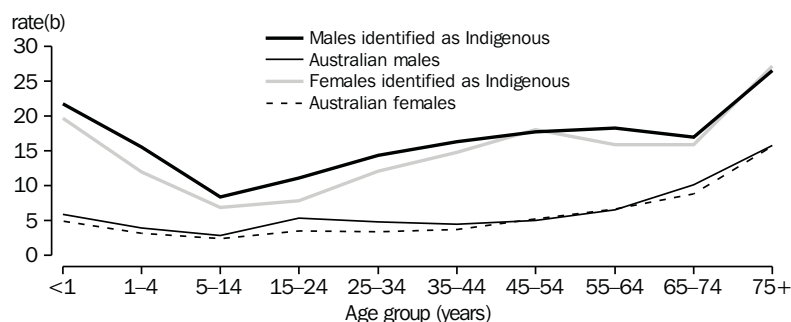
(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

Infections accounted for over 80% of separations for diseases of skin and subcutaneous tissue for males and females identified as Indigenous (table 4.22) and there were about five to six times more separations than expected for this type of condition, based on all-Australian rates.

4.22   STANDARDISED MORBIDITY RATIOS(a) FOR DISEASES OF SKIN AND SUBCUTANEOUS TISSUE(b)

	Indigenous males			Indigenous females		
	Observed separations		SMR(c)	Observed separations		SMR(c)
	no.	%	ratio	no.	%	ratio
Infections of skin and subcutaneous tissue	2 150	3.3	4.7	1 868	2.2	6.2
Other inflammatory conditions of skin and subcutaneous tissue	73	0.1	1.0	78	0.1	1.0
Other diseases of skin and subcutaneous tissue	381	0.6	1.0	337	0.4	1.0
All diseases of skin and subcutaneous tissue	**2 604**	**4.0**	**2.9**	**2 283**	**2.6**	**3.1**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed separations divided by expected separations.

Infectious and parasitic diseases

Infectious and parasitic diseases were responsible for almost 4% of separations among males identified as Indigenous and almost 3% of separations among females identified as Indigenous (table 4.1). There were twice as many separations for Indigenous people as expected, based on all-Australian rates. Rates of hospitalisation were higher for Indigenous males and females than for their all-Australian counterparts in almost every age group, but the largest differences were among infants and young children (graph 4.23). Infectious and parasitic diseases accounted for about 14% of separations among Indigenous infants and a similar proportion among Indigenous children aged 1–4 years.

4.23   HOSPITAL SEPARATIONS FOR INFECTIOUS & PARASITIC DISEASES(a)
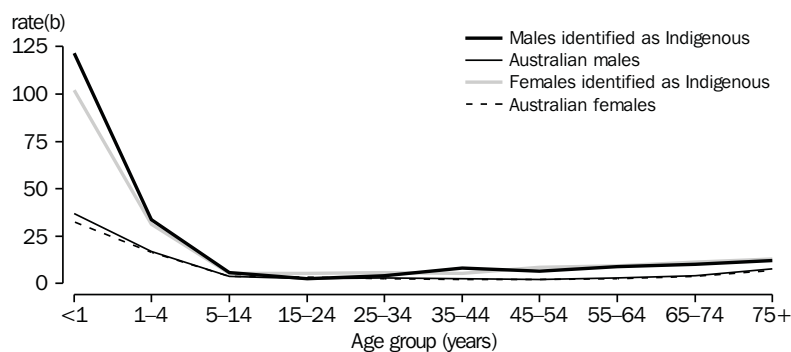
(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

There were more than the expected numbers of separations among Indigenous people for all types of infectious and parasitic diseases (table 4.24).

4.24 STANDARDISED MORBIDITY RATIOS(a) FOR INFECTIOUS AND PARASITIC DISEASES(b)

	Indigenous males			*Indigenous females*		
	Observed separations			*Observed separations*		
			SMR(c)			SMR(c)
	no.	%	ratio	no.	%	ratio
Intestinal infectious disease	1 177	1.8	2.3	1 034	1.2	2.1
Other bacterial disease	346	0.5	3.0	343	0.4	3.1
Viral and chlamydial diseases	449	0.7	1.1	466	0.5	1.2
Other infectious and parasitic diseases	394	0.6	6.2	449	0.5	8.3
All infectious and parasitic diseases	**2 366**	**3.6**	**2.1**	**2 292**	**2.7**	**2.2**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed separations divided by expected separations.

Musculoskeletal diseases

Diseases of the musculoskeletal system accounted for almost 3% of separations among males identified as Indigenous and almost 2% of separations among females identified as Indigenous (table 4.1). The rates of hospitalisation for musculoskeletal diseases were lower for Indigenous people than for all Australians in almost every age group (graph 4.25).

4.25 HOSPITAL SEPARATIONS, MUSCULOSKELETAL DISEASES(a)
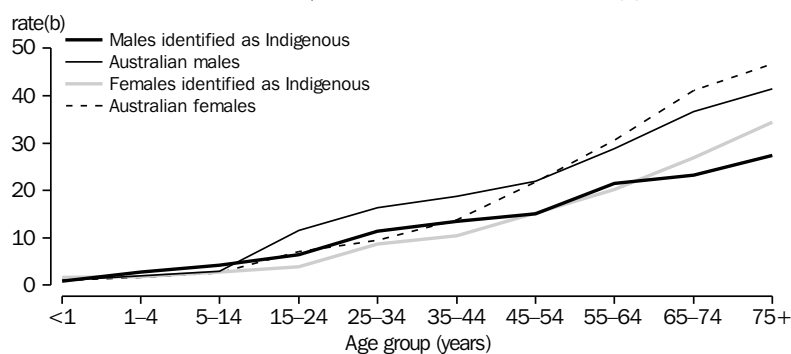
(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

There were fewer separations than expected for males and females identified as Indigenous for all types of diseases of the musculoskeletal system (table 4.26).

	Indigenous males			Indigenous females		
	Observed separations			Observed separations		
			SMR(c)			SMR(c)
	no.	%	ratio	no.	%	ratio
Joint diseases	745	1.1	0.7	588	0.7	0.7
Disorders of the back	270	0.4	0.6	342	0.4	0.8
Other musculoskeletal, connective tissue diseases	627	1.0	0.9	500	0.6	0.8
All musculoskeletal and connective tissue diseases	**1 642**	**2.5**	**0.7**	**1 433**	**1.7**	**0.8**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed separations divided by expected separations.

Endocrine, nutritional and metabolic disorders

About 2% of separations among males and females identified as Indigenous were for endocrine, nutritional and metabolic disorders (table 4.1). The rates of hospitalisation for these conditions were higher for Indigenous people than for all Australians in most age groups (graph 4.27).

4.27 HOSPITAL SEPARATIONS, ENDOCRINE, NUTRITIONAL, AND METABOLIC DISORDERS(a)
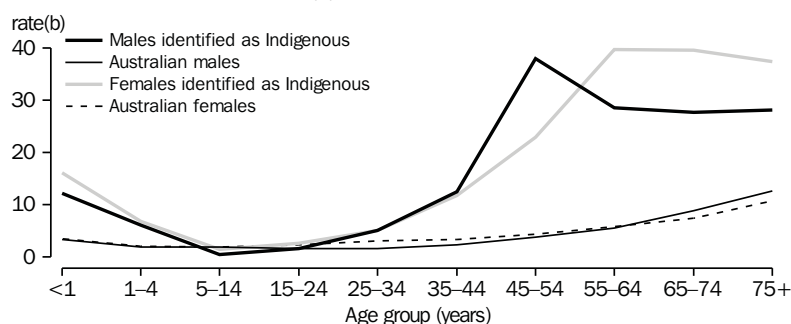
(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

There were more than the expected number of separations for most types of endocrine, nutritional and metabolic disorders for Indigenous males and females, but the largest differences in relative terms were for nutritional deficiencies and diabetes (table 4.28).

4.28 STANDARDISED MORBIDITY RATIOS(a) FOR ENDOCRINE, NUTRITIONAL AND METABOLIC DISORDERS(b)

	Indigenous males			*Indigenous females*		
	Observed separations			*Observed separations*		
			SMR(c)			SMR(c)
	no.	%	ratio	no.	%	ratio
Diabetes	927	1.4	6.0	962	1.1	6.2
Other endocrine gland and thyroid disorders	47	0.1	1.2	128	0.1	1.0
Nutritional deficiencies	145	0.2	14.4	175	0.2	14.3
Other metabolic and immunity disorders	434	0.7	1.7	469	0.5	1.6
All endocrine, nutritional and metabolic disorders	**1 553**	**2.4**	**3.4**	**1 734**	**2.0**	**2.9**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed separations divided by expected separations.

PRINCIPAL DIAGNOSIS BY STATE AND TERRITORY

As discussed in chapters 2 and 3, it is likely that the quality of identification of Indigenous hospital patients varies by State and Territory, although the level of under-identification is unknown for most hospitals. This makes it difficult to compare overall and cause-specific hospital separation rates by State and Territory. It is possible, however, to look at the principal diagnosis among those identified as Indigenous to determine whether the patterns are similar from place to place.

In almost every State and Territory, the most common reason for hospitalisation among males identified as Indigenous was 'other reasons for contact', a category which includes dialysis (table 4.29). For females identified as Indigenous, 'other reasons for contact' and conditions related to pregnancy and childbirth were the most commonly recorded principal diagnoses in most States and Territories (table 4.30).

4.29 MOST COMMON REASONS FOR HOSPITAL SEPARATIONS, BY STATE AND TERRITORY, MALES IDENTIFIED AS INDIGENOUS(a)(b)

	New South Wales	Victoria(c)	Queensland	South Australia	Western Australia	Northern Territory(d)	Australia(e)
	%	%	%	%	%	%	%
'Other reasons for contact'(f)	15	23	25	24	23	55	29
Injury	12	12	16	14	14	8	13
Respiratory	15	12	12	13	15	10	13
Digestive	10	10	7	8	6	3	7
Mental disorders	11	8	5	7	6	2	6
Circulatory	6	5	5	6	5	3	5
Other causes(g)	31	30	30	28	31	19	27
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**

(a) Data are for the financial year 1997–98, based on place of hospitalisation. Excludes separations for which age and/or sex was missing. Data for Tasmania and the Australian Capital Territory are not presented due to relatively small numbers. 'Most common reasons for hospitalisation' is based on ICD-9 chapters. See Appendix for a full listing.

(b) It is likely that the quality of identification of hospital patients varies by State and Territory, although the level of under-identification is unknown for most hospitals.

(c) No information on Indigenous status of patients was available for private hospitals in Victoria.

(d) Public hospitals only.

(e) Includes Tasmania and the Australian Capital Territory.

(f) Includes dialysis. 'Other reasons for contact' includes all ICD-9 V-codes, a supplementary classification used to indicate a variety of circumstances which influence health status or bring people into contact with the health care system but which do not fit into the main disease and injury coding system (National Coding Centre 1996).

(g) Includes all other ICD-9 chapters combined.

4.30 MOST COMMON REASONS FOR HOSPITAL SEPARATIONS, BY STATE AND TERRITORY, FEMALES IDENTIFIED AS INDIGENOUS(a)(b)

	New South Wales	Victoria(c)	Queensland	South Australia	Western Australia	Northern Territory(d)	Australia(e)
	%	%	%	%	%	%	%
'Other reasons for contact'(f)	16	28	24	31	26	52	29
Pregnancy and childbirth	20	20	18	13	17	13	17
Respiratory	10	7	9	8	11	6	9
Injury	7	7	9	8	10	6	8
Genitourinary	6	6	6	6	5	4	5
Digestive	7	6	6	4	5	2	5
Other causes(g)	34	26	28	29	26	17	27
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**

(a) Data are for the financial year 1997–98, based on place of hospitalisation. Excludes separations for which age and/or sex was missing. Data for Tasmania and the Australian Capital Territory are not presented due to relatively small numbers. 'Most common reasons for hospitalisation' is based on ICD-9 chapters. See Appendix for a full listing.

(b) It is likely that the quality of identification of hospital patients varies by State and Territory, although the level of under-identification is unknown for most hospitals.

(c) No information on Indigenous status of patients was available for private hospitals in Victoria.

(d) Public hospitals only.

(e) Includes Tasmania and the Australian Capital Territory.

(f) Includes dialysis. 'Other reasons for contact' includes all ICD-9 V-codes, a supplementary classification used to indicate a variety of circumstances which influence health status or bring people into contact with the health care system but which do not fit into the main disease and injury coding system (National Coding Centre 1996).

(g) Includes all other ICD-9 chapters combined.

PRINCIPAL DIAGNOSIS BY
METROPOLITAN, RURAL AND
REMOTE AREA OF
RESIDENCE

As with States and Territories, it is possible that the quality of identification of Indigenous people in hospital records varies based on whether they live in a metropolitan, rural or remote area. As discussed in chapter 2, the study by ATSIHWIU (1999) suggested that identification was generally better away from capital cities and in places with a relatively high concentration of Indigenous people. Although this makes it difficult to interpret the rates of hospitalisation by region, it is useful to look at the patterns of separations among patients identified as Indigenous.

In metropolitan, rural and remote areas alike, the most commonly reported principal diagnosis for males and females identified as Indigenous was 'other reasons for contact' (table 4.31). However, the proportion of separations for this group of causes varied considerably from 43–44% in metropolitan areas to 22–24% in rural and remote areas. This is probably due in part to the location of haemodialysis units, as this pattern was also evident for Australians overall.

4.31   MOST COMMON REASONS FOR HOSPITAL SEPARATIONS, BY AREA OF RESIDENCE(a)

	Metropolitan	Rural	Remote	Australia
	%	%	%	%
MALES IDENTIFIED AS INDIGENOUS				
'Other reasons for contact'(b)	44	22	24	29
Injury	9	13	15	13
Respiratory	7	14	15	13
Digestive	7	9	6	7
Mental disorders	8	7	4	6
Circulatory	4	5	5	5
Other causes(c)	25	35	36	27
Total	100	100	100	100
FEMALES IDENTIFIED AS INDIGENOUS				
'Other reasons for contact'(b)	43	24	23	29
Pregnancy and childbirth	16	18	16	17
Respiratory	5	9	11	9
Injury	5	7	10	8
Genitourinary	5	6	5	5
Digestive	5	6	5	5
Other causes(c)	21	30	30	27
Total	100	100	100	100

(a) Data are for the financial year 1997–98, based on place of usual residence. Excludes separations for which age, sex and/or place of usual residence was missing. Classifications are based on the Rural, Remote and Metropolitan Areas Classification (Department of Primary Industries and Energy & Department of Human Services and Health 1994). 'Most common reasons' is based on ICD–9 chapters. See Appendix for a full listing.

(b) Includes dialysis. 'Other reasons for contact' includes all ICD-9 V-codes, a supplementary classification used to indicate a variety of circumstances which influence health status or bring people into contact with the health care system but which do not fit into the main disease and injury coding system (National Coding Centre 1996).

(c) Includes all other ICD-9 chapters combined.

CHAPTER 5   TYPE OF PRINCIPAL PROCEDURE

TYPES OF PROCEDURES

The most common types of principal procedures recorded in 1997–98 for males identified as Indigenous were operations on the cardiovascular system (95% of which were haemodialysis procedures), 'miscellaneous diagnostic and therapeutic procedures', operations on the digestive system, operations on the musculoskeletal system, and operations on the integumentary system, which together accounted for about 89% of the total (table 5.1 and graph 5.2). For females identified as Indigenous, operations on the cardiovascular system (96% of which were haemodialysis procedures), 'miscellaneous diagnostic and therapeutic procedures', obstetrical procedures, operations on the female genital system and operations on the digestive system were the most common types of principal procedures recorded, accounting for 85% of the total. For Australian males and females overall, the most common types of principal procedures were miscellaneous diagnostic and therapeutic procedures (24%) and operations on the digestive system (18%).

5.1 PRINCIPAL PROCEDURES FOR PATIENTS IDENTIFIED AS INDIGENOUS(a)

	Procedures for patients identified as Indigenous		SMR(b)		Proportion of total procedures	
	Males	Females	Males	Females	Males	Females
	no.	no.	ratio	ratio	%	%
Operations on the nervous system	472	551	0.8	0.7	1.3	1.1
Operations on the endocrine system	20	57	0.7	0.6	0.1	0.1
Operations on the eye	560	686	0.9	1.0	1.5	1.3
Operations on the ear	589	561	0.6	0.8	1.6	1.1
Operations on the nose, mouth, pharynx	1 010	999	0.4	0.4	2.7	1.9
Operations on the respiratory system	384	226	1.3	1.1	1.0	0.4
Operations on the cardiovascular system						
Haemodialysis	16 417	21 414	6.7	11.4	43.6	41.3
Other	936	888	1.0	1.3	2.5	1.7
Total	*17 353*	*22 302*	*5.2*	*8.7*	*46.1*	*43.0*
Operations on the haemic and lymphatic system	87	119	0.6	0.8	0.2	0.2
Operations on the digestive system	2 990	3 402	0.7	0.7	7.9	6.6
Operations on the urinary system	525	508	0.7	1.0	1.4	1.0
Operations on the male genital organs	612	0	0.5	0	1.6	0
Operations on the female genital organs	0	4 249	0	0.8	0	8.2
Obstetrical procedures	0	5 817	0	1.1	0	11.2
Operations on the musculoskeletal system	2 831	1 711	0.8	0.8	7.5	3.3
Operations on the integumentary system	2 494	2 301	1.6	1.2	6.6	4.4
Miscellaneous diagnostic and therapeutic procedures	7 733	8 367	1.1	1.2	20.5	16.1
Total (excluding haemodialysis)	**21 243**	**30 442**	**0.9**	**0.9**	**56.4**	**58.7**
Total (including haemodialysis)	**37 660**	**51 856**	**1.4**	**1.5**	**100.0**	**100.0**

(a) Data are for financial year 1997–98 for public and private hospitals. No data were available for the private hospital in the Northern Territory and a few other small private hospitals, and no information on Indigenous status of patients was available for private hospitals in Victoria. Excludes procedures for which age and/or sex was unknown. Procedures are grouped according to the International Classification of Diseases, 9th Revision (ICD-9) (WHO 1977). See Appendix for categories.

(b) Standardised morbidity ratio is equal to procedures on patients identified as being Indigenous divided by expected procedures, based on all-Australian rates.

5.2 MOST COMMON TYPES OF PROCEDURES(a)

Type of procedure

- Op. on cardiovascular system(b)
- Misc. diagnostic & therapeutic procs.
- Obstetrical procs.
- Op. on female genital organs
- Op. on digestive system
- Op. on musculoskeletal system
- Op. on integumentary system

● Males identified as Indigenous
○ Females identified as Indigenous

no.('000s)
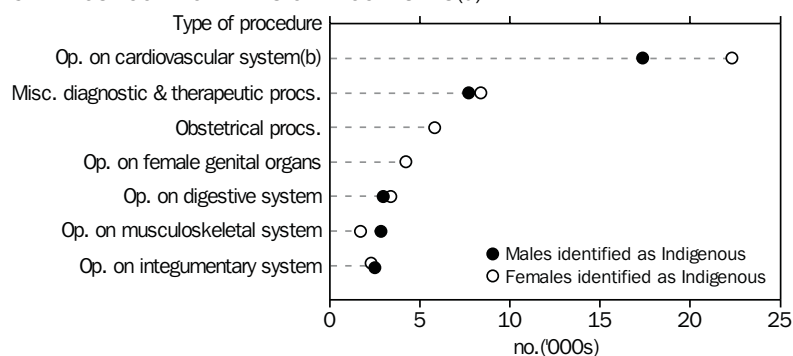
(a) Data are for the financial year 1997–98.
(b) Includes haemodialysis.

Operations on the cardiovascular system

There were nearly 40,000 separations among males and females identified as Indigenous for which the principal procedure recorded was an operation on the cardiovascular system. This category, which includes haemodialysis, accounted for 46% of all principal procedures among Indigenous males and 43% among Indigenous females (table 5.1). Indigenous males and females were much more likely to undergo these procedures than were their all-Australian counterparts throughout adult life. There were about five times as many operations on the cardiovascular system as expected (based on all-Australian rates) among Indigenous males and almost nine times as many as expected among Indigenous females.

Haemodialysis (the type of dialysis most commonly performed in hospitals) accounted for a large majority of operations on the cardiovascular system among patients identified as Indigenous (table 5.1), and the age-specific rates for haemodialysis procedures (graph 5.3) were almost identical to those for all operations on the cardiovascular system.

5.3 HAEMODIALYSIS PROCEDURES(a)
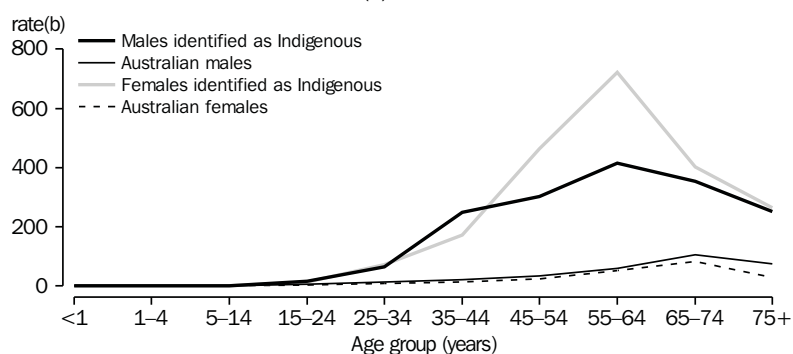
rate(b)

—— Males identified as Indigenous
—— Australian males
—— Females identified as Indigenous
- - - Australian females

Age group (years)

(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

Haemodialysis accounted for about 44% of all recorded principal procedures among males identified as Indigenous and 41% among females identified as Indigenous, compared with 12% among all Australian males and 8% among all Australian females. There were almost seven times more dialysis procedures recorded among Indigenous males and over 11 times more among Indigenous females than expected based on Australian rates (table 5.4).

5.4   STANDARDISED MORBIDITY RATIOS(a) FOR OPERATIONS ON THE CARDIOVASCULAR SYSTEM(b)

	Indigenous males			Indigenous females		
	Observed procedures			Observed procedures		
			SMR(c)			SMR(c)
	no.	%	ratio	no.	%	ratio
Haemodialysis	16 417	43.6	6.7	21 414	41.3	11.4
Other operations on the cardiovascular system	936	2.5	1.0	888	1.7	1.3
All operations on the cardiovascular system	**17 353**	**46.1**	**5.2**	**22 302**	**43.0**	**8.7**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed procedures divided by expected procedures.

Miscellaneous diagnostic and therapeutic procedures

About 20% of principal procedures recorded among males identified as Indigenous and 16% among females identified as Indigenous were coded in the category 'miscellaneous diagnostic and therapeutic procedures'. This category includes a wide variety of procedures, such as diagnostic radiology, nuclear medicine, physical therapy, rehabilitation, counselling, blood transfusions, injections, etc. The age-specific rates for this category of procedures for males and females identified as Indigenous were higher than those for their all-Australian counterparts in some age groups (graph 5.5).

5.5   MISCELLANEOUS DIAGNOSTIC & THERAPEUTIC PROCEDURES(a)
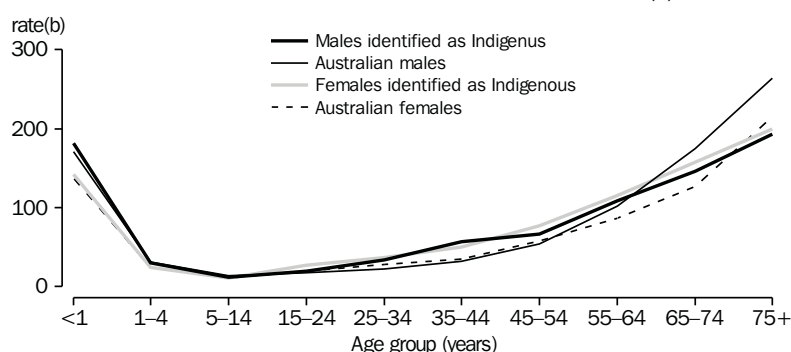
(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

For many types of procedures classified as miscellaneous diagnostic and therapeutic procedures, there were greater numbers recorded among Indigenous males and females than would be expected based on all-Australian rates (table 5.6).

5.6 STANDARDISED MORBIDITY RATIOS(a) FOR MISCELLANEOUS DIAGNOSTIC & THERAPEUTIC PROCEDURES(b)

	Indigenous males			Indigenous females		
	Observed procedures		SMR(c)	Observed procedures		SMR(c)
	no.	%	ratio	no.	%	ratio
Diagnostic radiology and related techniques	1 389	3.7	1.3	1 422	2.7	1.5
Interview, evaluation, consultation, other examination	241	0.6	0.9	205	0.4	1.1
Diagnostic and therapeutic intervention	450	1.2	1.3	631	1.2	1.5
Physical & respiratory therapy, rehabilitation and related	2 053	5.5	1.6	1 988	3.8	1.6
Procedures related to the psyche	1 022	2.7	1.9	1 211	2.3	1.6
Ophthalmologic and otologic diagnosis and treatment	27	0.1	0.9	22	0.0	0.9
Non-operative intubation and irrigation	635	1.7	1.5	467	0.9	1.2
Replacement and removal of therapeutic appliances	107	0.3	1.0	101	0.2	1.1
Non-operative removal of foreign body or calculus	67	0.2	0.7	74	0.1	1.2
Other non-operative procedures	1 742	4.6	0.7	2 246	4.3	0.8
All miscellaneous diagnostic and therapeutic procedures	**7 733**	**20.5**	**1.1**	**8 367**	**16.1**	**1.2**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed procedures divided by expected procedures.

Obstetrical procedures

There were nearly 6,000 obstetrical procedures for females identified as Indigenous, accounting for about 11% of all recorded principal procedures in this group of women (table 5.1). There were about 10% more obstetrical procedures recorded among Indigenous women than would be expected based on all-Australian rates (table 5.7). This is not surprising, given the higher fertility rates of Indigenous women (ABS 1999), but it is likely to be an under-estimate, due to the under-identification of Indigenous women in hospital records.

The overall population-based rates were higher for Indigenous females than for all-Australian females. However, among patients with a principal diagnosis relating to pregnancy and childbirth, those identified as Indigenous were less likely than all Australian women to have a principal procedure recorded (40% versus 51% respectively).

5.7 STANDARDISED MORBIDITY RATIOS(a) FOR OBSTETRICAL PROCEDURES(b)

	Indigenous females		
	Observed procedures		
			SMR(c)
	no.	%	ratio
Forceps, vacuum, breech delivery	354	0.7	0.6
Other procedures inducing or assisting delivery	1 967	3.8	1.1
Caesarian delivery	1 431	2.8	1.2
Other obstetrical operations	2 065	4.0	1.2
All obstetrical procedures	**5 817**	**11.2**	**1.1**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed procedures divided by expected procedures.

Operations on the female genital organs

Operations on the female genital organs accounted for about 8% of principal procedures recorded among females identified as Indigenous (table 5.1). Operations on the uterus and supporting structures accounted for almost half of the procedures in this category among Indigenous females (table 5.8). There were fewer than the expected number of operations on the female genital organs recorded among Indigenous females, but this is likely to be due at least in part to the under-identification of Indigenous females in hospital records.

5.8 STANDARDISED MORBIDITY RATIOS(a) FOR OPERATIONS ON THE FEMALE GENITAL ORGANS(b)

	Indigenous females		
	Observed procedures		
			SMR(c)
	no.	%	ratio
Operations on the ovaries and fallopian tubes	790	1.5	1.0
Operations on the cervix	674	1.3	1.0
Other incision, excision of the uterus	576	1.1	0.7
Other operations on the uterus and supporting structures	1 976	3.8	0.7
Operations on the vagina, vulva and perineum	233	0.4	0.7
All operations on the female genital organs	**4 249**	**8.2**	**0.8**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed procedures divided by expected procedures.

Operations on the digestive system

Operations on the digestive system accounted for 8% of principal procedures recorded among males identified as Indigenous and almost 7% among females identified as Indigenous (table 5.1). The rate of operations on the digestive system was lower for Indigenous males and females than for all Australian males and females in nearly every age group (graph 5.9).

5.9 OPERATIONS ON THE DIGESTIVE SYSTEM(a)
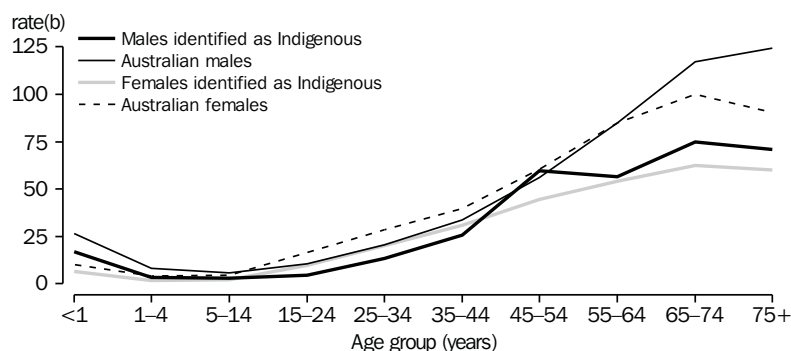
(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

There were fewer than expected numbers of procedures recorded among
Indigenous males and females for most types of operations on the
digestive system (table 5.10), but this is likely to be explained at least in
part by under-identification of Indigenous patients.

5.10 STANDARDISED MORBIDITY RATIOS(a) FOR OPERATIONS ON THE DIGESTIVE SYSTEM(b)

	Indigenous males			Indigenous females		
	Observed procedures			Observed procedures		
			SMR(c)			SMR(c)
	no.	%	ratio	no.	%	ratio
Operations on the oesophagus and stomach	207	0.5	0.9	159	0.3	0.7
Operations on the intestines	1 271	3.4	0.5	1 371	2.6	0.5
Operations on the appendix	205	0.5	0.6	211	0.4	0.7
Operations on the rectum and anus	215	0.6	0.7	123	0.2	0.5
Operations on the liver, gallbladder, biliary tract, pancreas	172	0.5	0.8	533	1.0	1.0
Repair of hernias	298	0.8	0.4	120	0.2	0.6
Other operations in the abdominal region	622	1.7	4.4	885	1.7	1.4
All operations on the digestive system	**2 990**	**7.9**	**0.7**	**3 402**	**6.6**	**0.7**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed procedures divided by expected procedures.

Operations on the
musculoskeletal system

Operations on the musculoskeletal system accounted for almost 8% of
principal procedures recorded among males identified as Indigenous and
about 3% of procedures among females identified as Indigenous
(table 5.1). The rates for procedures in this category were lower for
Indigenous males and females than all Australian males and females in
most age groups (graph 5.11).

5.11 OPERATIONS ON MUSCULOSKELETAL SYSTEM(a)

(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

There were fewer than the expected number of procedures recorded among Indigenous males and females for most types of operations on the musculoskeletal system (table 5.12), but this is likely to be explained at least in part by under-identification of Indigenous patients.

5.12 STANDARDISED MORBIDITY RATIOS(a) FOR OPERATIONS ON THE MUSCULOSKELETAL SYSTEM(b)

	Indigenous males			Indigenous females		
	Observed procedures		SMR(c)	Observed procedures		SMR(c)
	no.	%	ratio	no.	%	ratio
Operations on bones and on facial joints	667	1.8	1.0	331	0.6	0.8
Reduction of fractures and dislocations	981	2.6	0.9	651	1.3	1.2
Operations on other joint structures	669	1.8	0.5	401	0.8	0.4
Operations on muscle, tendon, fascia, bursa	374	1.0	0.8	256	0.5	0.8
Other procedures on the musculoskeletal system	140	0.4	2.3	72	0.1	3.3
All operations on the musculoskeletal system	**2 831**	**7.5**	**0.8**	**1 711**	**3.3**	**0.8**

(a) Based on all Australian age-, sex-, and cause-specific rates.

(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed procedures divided by expected procedures.

Operations on the integumentary system

Operations on the integumentary system accounted for almost 7% of principal procedures recorded among males identified as Indigenous and about 4% among females identified as Indigenous (table 5.1). About 43% of operations on the integumentary system among patients identified as Indigenous had a principal diagnosis of injury.

The rate of operations of this type were higher for Indigenous males and females than for their all-Australian counterparts throughout most of life (graph 5.13).

5.13 OPERATIONS ON INTEGUMENTARY SYSTEM(a)
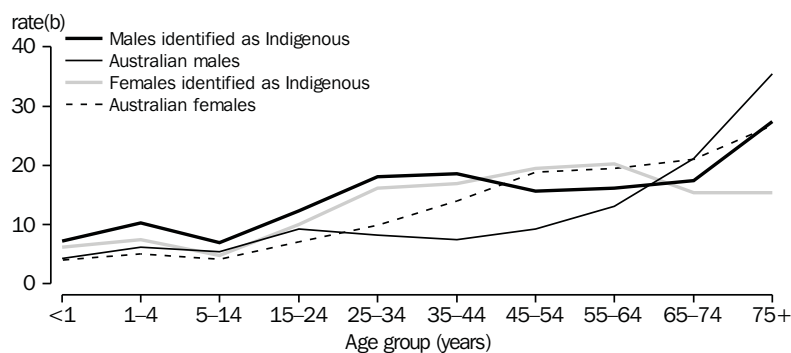
(a) Data are for the financial year 1997–98.
(b) Per 1,000 population.

Most operations on the integumentary system were operations on the skin and subcutaneous tissue. There were about 60% more operations on the skin and subcutaneous tissue among Indigenous males and females than expected based on all-Australian rates (table 5.14).

5.14 STANDARDISED MORBIDITY RATIOS(a) FOR OPERATIONS ON THE INTEGUMENTARY SYSTEM(b)

	Indigenous males			Indigenous females		
	Observed procedures			Observed procedures		
			SMR(c)			SMR(c)
	no.	%	ratio	no.	%	ratio
Operations on the breast	15	0.0	0.4	296	0.6	0.5
Operations on the skin and subcutaneous tissue	2 479	6.6	1.6	2 005	3.9	1.6
All operations on the integumentary system	**2 494**	**6.6**	**1.6**	**2 301**	**4.4**	**1.2**

(a) Based on all Australian age-, sex-, and cause-specific rates.
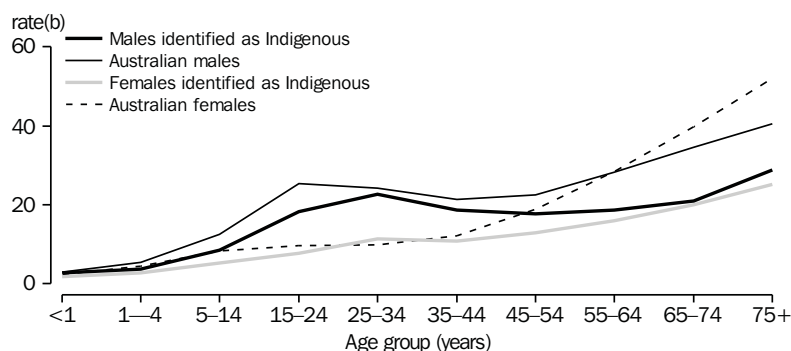
(b) Data are for the financial year 1997–98.

(c) Standardised morbidity ratio (SMR) is equal to observed procedures divided by expected procedures.

Operations on the ear
Although not one of the most common types of principal procedures recorded, operations on the ear are of particular interest given the higher rates of ear infection and subsequent hearing problems experienced by the Indigenous population (Couzos and Murray 1999). Operations on the ear were recorded as the principal procedure for 1,150 patients identified as Indigenous. About 90% of these operations could be classified as a reconstruction or other operation on the middle or inner ear. Over 80% (843) of middle and inner ear operations among Indigenous people were recorded among children aged 1–14 years. However, there were fewer middle and inner ear operations than expected (based on all-Australian rates) among Indigenous children aged 1–14 years.

TYPES OF PROCEDURES BY STATE AND TERRITORY

As discussed in chapters 2 and 3, it is likely that the quality of identification of Indigenous people in hospital records varies by State and Territory, although the level of under-identification is unknown for most hospitals. This makes it difficult to compare overall and cause-specific hospital procedure rates by State and Territory. It is possible, however, to look at the principal procedure recorded among patients identified as Indigenous to determine whether the patterns are similar from place to place.

In almost every State and Territory, the most commonly recorded types of principal procedures among males and females identified as Indigenous were operations on the cardiovascular system and 'miscellaneous diagnostic and therapeutic procedures' (tables 5.15 and 5.16). Although the proportions varied by State and Territory, these two categories accounted for a substantial proportion of all principal procedures recorded among Indigenous patients in every State and Territory.

5.15   MOST COMMON TYPES OF PRINCIPAL PROCEDURES, MALES IDENTIFIED AS INDIGENOUS(a)(b)

	New South Wales	Victoria(c)	Queensland	South Australia	Western Australia	Northern Territory(d)	Australia(e)
	%	%	%	%	%	%	%
Operations on the cardiovascular system(f)	24	30	44	41	37	72	46
Miscellaneous diagnostic & therapeutic procedures	27	29	21	23	26	10	21
Operations on the digestive system	15	11	7	6	11	2	8
Operations on the musculoskeletal system	11	10	8	9	8	4	8
Operations on the integumentary system	6	5	9	7	8	4	7
Other types of procedures(g)	17	15	11	14	10	8	10
Total	100	100	100	100	100	100	100

(a) Data are for the financial year 1997–98, based on place of hospitalisation. Excludes procedures for which age and/or sex was missing. Data for Tasmania and the Australian Capital Territory are not presented due to relatively small numbers. 'Most common types of procedures' is based on ICD-9 chapters. See Appendix for a full listing.

(b) It is likely that the quality of identification of hospital patients varies by State and Territory, although the level of under-identification is unknown for most hospitals.

(c) No information on Indigenous status of patients was available for private hospitals in Victoria.

(d) Public hospitals only.

(e) Includes Tasmania and the Australian Capital Territory.

(f) Includes haemodialysis.

(g) Includes all other ICD-9 procedure chapters combined.

	New South Wales	Victoria(c)	Queensland	South Australia	Western Australia	Northern Territory(d)	Australia(e)
	%	%	%	%	%	%	%
Operations on the cardiovascular system(f)	24	37	36	45	40	68	43
Miscellaneous diagnostic & therapeutic procedures	20	16	17	16	21	7	16
Obstetrical procedures	14	11	15	9	10	7	11
Operations on the female genital organs	14	12	7	10	7	5	8
Operations on the digestive system	11	8	7	5	6	3	7
Other types of procedures (g)	17	16	18	15	16	10	15
Total	100	100	100	100	100	100	100

(a) Data are for the financial year 1997–98, based on place of hospitalisation. Excludes procedures for which age and/or sex was missing. Data for Tasmania and the Australian Capital Territory are not presented due to relatively small numbers. 'Most common types of procedures' is based on ICD-9 chapters. See Appendix for a full listing.

(b) It is likely that the quality of identification of hospital patients varies by State and Territory, although the level of under-identification is unknown for most hospitals.

(c) No information on Indigenous status of patients was available for private hospitals in Victoria.

(d) Public hospitals only.

(e) Includes Tasmania and the Australian Capital Territory.

(f) Includes haemodialysis

(g) Includes all other ICD-9 procedure chapters combined.

TYPES OF PROCEDURES BY METROPOLITAN, RURAL AND REMOTE AREA OF RESIDENCE

As with States and Territories, it is likely that the quality of identification of Indigenous patients varies based on whether they live in a metropolitan, rural or remote area. For example, as discussed in chapter 2, the study by ATSIHWIU (1999) suggested that identification was generally better away from capital cities and in places with a relatively high concentration of Indigenous people. Although this makes it difficult to interpret the rates of hospital procedures by region, it is useful to look at the patterns among patients identified as Indigenous.

In metropolitan, rural and remote areas alike, the most commonly recorded principal procedure among males and females identified as Indigenous was operations on the cardiovascular system (table 5.17). However, the proportion of procedures accounted for by these types of operations varied considerably by area, from 39% (rural) to 57% (metropolitan) among males and 37% (rural) to 52% (metropolitan) among females. This is probably due in part to the location of haemodialysis units, as this pattern was also evident for Australians overall.

5.17   MOST COMMON TYPES OF PRINCIPAL PROCEDURES, BY AREA OF RESIDENCE(a)

	Metropolitan	Rural	Remote	Australia
	%	%	%	%
MALES IDENTIFIED AS INDIGENOUS				
Operations on the cardiovascular system(b)	57	39	42	46
Miscellaneous diagnostic and therapeutic procedures	17	23	21	20
Operations on the digestive system	7	9	8	8
Operations on the musculoskeletal system	6	9	8	8
Operations on the integumentary system	4	6	10	7
Other types of procedures(c)	9	14	11	9
Total	100	100	100	100
FEMALES IDENTIFIED AS INDIGENOUS				
Operations on the cardiovascular system(b)	52	37	38	43
Miscellaneous diagnostic and therapeutic procedures	14	16	18	16
Obstetrical procedures	10	13	11	11
Operations on the female genital organs	7	10	8	8
Operations on the digestive system	6	8	6	7
Other types of procedures(c)	11	16	19	15
Total	100	100	100	100

(a) Data are for the financial year 1997–98, based on place of place of usual residence. Excludes separations for which age, sex and/or place of usual residence was missing. Classifications are based on the Rural, Remote and Metropolitan Areas Classification (Department of Primary Industries and Energy & Department of Human Services and Health 1994). 'Most common types of procedures' is based on ICD-9 chapters. See Appendix for a full listing.

(b) Includes haemodialysis.

(c) Includes all other ICD-9 procedure chapters combined.

CHAPTER 6   **DISCUSSION**

Data quality remains a critical issue in the assessment of Indigenous hospital separations and procedures. Although data from all States and Territories have been included in the analyses reported here, it has been shown that not all Indigenous patients are identified correctly in hospital records (see chapter 2). As a result, the observed differences reported in this publication are under-estimates of the true differences between Indigenous males and females and their all-Australian counterparts. Unfortunately, the proportion of Indigenous patients who are identified correctly in hospital records is not currently known for most hospitals, and as a result it is not possible to adjust or correct the data. In addition, limitations in the quality and availability of data compromise our ability to assess changes in the patterns of hospital use by Indigenous people over time, both in absolute terms, and relative to the rest of the Australian population.

The results presented here for 1997–98 are similar to those reported previously for 1996–97 (ABS & AIHW 1999). In short, despite under-identification of Indigenous patients in hospital records, there were more hospital separations among Indigenous people than would be expected if the Indigenous population experienced the same hospital separation rates as the Australian population as a whole. The vast majority of hospital separations identified as Indigenous (and procedures performed on patients identified as Indigenous) were recorded in public rather than private hospitals. This is in sharp contrast to the pattern for other separations (about a third of which were in private hospitals), but it is consistent with the relative economic disadvantage of the Indigenous population and their lower levels of private health insurance cover (ABS & AIHW 1999). It must be noted, however, that separations from private hospitals were much more likely than those from public hospitals to be missing information about the Indigenous status of the patient.

The observed hospital separation rates were higher for the Indigenous population than for the total Australian population in every age group, with the smallest differences among people aged 5–14 years. Dialysis, pregnancy and childbirth, respiratory diseases and injury were responsible for the majority of hospital separations among Indigenous people. There were more than the expected number of separations for these diseases and conditions as well as for mental disorders (especially those related to alcohol and drug use), circulatory diseases, nervous system disorders, diseases of the skin and subcutaneous tissue, infectious and parasitic diseases, and endocrine, nutritional and metabolic disorders (especially diabetes and nutritional deficiencies).

The observed procedure rates were also higher for Indigenous people than for all Australians in most adult age groups. Although this difference largely disappeared after excluding haemodialysis, the procedure rates would almost certainly have been higher if all Indigenous patients had been correctly identified. Despite under-identification, there were more than the expected number of several types of procedures among

Indigenous males and females, such as operations on the cardiovascular system (primarily haemodialysis), obstetrical procedures, operations on the integumentary system, operations on the respiratory system, and some types of 'miscellaneous diagnostic and therapeutic procedures'.

It is important to note, however, that these procedure rates are based on the Indigenous population as a whole, rather than on those admitted to hospital (who are the only ones eligible to have a hospital procedure recorded in the National Hospital Morbidity Database (NHMD)). When analysis was limited to hospital in-patients, a somewhat different pattern emerged. Hospital patients identified as Indigenous were consistently less likely than other patients to have a principal procedure recorded, regardless of their principal diagnosis (with the exception of visits for dialysis). Some of this disparity may be related to differences in the recording (as opposed to the performance) of procedures across hospitals, and to the almost exclusive reliance by Indigenous patients on public hospitals (in which patients overall were less likely to have a principal procedure recorded), but it was not explained by age, nor jurisdiction. Further work is needed to explain these results.

Perhaps the most striking finding reported in this publication is the relatively high proportion of Indigenous separations and procedures accounted for by dialysis (which was almost exclusively haemodialysis for end-stage renal disease), as well as the large excess in dialysis rates compared with what would have been expected based on all-Australian rates. Dialysis accounted for about 25% of all separations identified as Indigenous, and over 40% of all procedures performed on patients identified as Indigenous in 1997–98. There were nearly seven times as many haemodialysis procedures among Indigenous males as expected based on all-Australian rates, and about 11 times as many among Indigenous females. Although the majority of dialysis-related hospital visits are for routine treatment, these visits represent considerable costs in terms of time, money and human resources. Centre-based haemodialysis treatment (such as that performed in a clinic or hospital) has been estimated to cost about $50,000 per year per patient (not including travel costs) (Catford et al. 1997). Based on the number of procedures recorded in the NHMD, this would suggest a cost in excess of $10 million per year on haemodialysis for Indigenous people alone, a figure which is likely to increase as new patients begin haemodialysis. Without a successful kidney transplant, people with end-stage renal disease must continue on some type of dialysis for the rest of their lives. Indigenous people with this disease are less likely than other Australian patients to have a functioning transplant (Disney et al. (eds) 1997), which may be due to such factors as greater likelihood of being ineligible for transplant due to poor health, difficulty in finding a suitable donor and/or poorer access to health services.

Apparent differences in the rates of Indigenous hospital separations according to jurisdiction, area of residence and sector (public/private) must be interpreted with caution because of the real possibility of significant differences in the quality of identification of Indigenous people

in hospital records by jurisdiction, area and/or sector. Despite differences in the observed rates by State and Territory and by metropolitan, rural and remote area of residence, there was a high degree of consistency in the patterns across jurisdictions and areas with respect to the most common diagnoses and procedures for people identified as Indigenous. The most notable exception was the Northern Territory, in which dialysis accounted for a much higher proportion of separations and procedures among those identified as Indigenous than was the case in other jurisdictions. According to data published elsewhere, the Northern Territory appears to have had a greater reliance than other States and Territories on centre-based haemodialysis (as opposed to home-based haemodialysis, peritoneal dialysis or transplant) in the treatment of end-stage renal disease in Indigenous people (Catford et al. 1997; Disney et al. (eds) 1997; ABS & AIHW 1999). In addition, a recent study (Cass et al. 1999) has suggested that the rates of end-stage renal disease may be higher among Indigenous people in the Northern Territory than those in other areas. The higher proportion of dialysis-related visits and procedures among people identified as Indigenous in metropolitan areas compared with those living in rural and remote areas may reflect the location of dialysis machines in metropolitan areas, combined with the need for dialysis patients to relocate to these areas for treatment.

As an indicator of the health status of a population, hospital use is limited. In addition to data quality issues relating to the Indigenous status of patients, there are other more general data quality issues which must be recognised, such as the accuracy of coding of diagnoses and procedures, and variations in coding practices by hospital, jurisdiction, etc. Hospital use is not a measure of the prevalence of disease, as not all cases of disease require admission to hospital and many patients (such as those on dialysis) have multiple episodes of care for the same problem. Although data on reasons for consultation with general medical practitioners are now becoming available from the BEACH study (see, for example, Britt et al. 1999), it is important to note that this study does not include other sources of primary health care, such as visits to Aboriginal Health Workers, nurses, and hospital outpatients and emergency departments, which may be more important for Indigenous people than for other Australians.

Admission to hospital is determined by a complex combination of factors such as need for services, physical, economic and cultural access to services, the existence of alternative sources of care, and the referral patterns of primary health care providers. For example, an increase in the number of hospital admissions (and separations) could indicate

worsening health in a population (and therefore greater need for services), or it could result from increased access to services or a change in referral practices (possibly indicating a reduction in the levels of previously unmet need). Clearly, the correct interpretation of the data in such a case would require information beyond just the numbers and rates of separations.

Despite such shortcomings, hospital use remains an important health indicator. Although it is generally one of the easiest health indicators to measure, there are obvious challenges with respect to monitoring the hospital use of the Indigenous population. These in turn result in uncertainty about the precise levels of Indigenous hospital use, the relative differentials between Indigenous and other Australians, changes in absolute and relative use over time, and the meaning of those changes. There have been strong and sustained efforts in recent years by the Australian Bureau of Statistics and the Australian Institute of Health and Welfare in partnership with other organisations, such as State and Territory agencies, Indigenous organisations and individual hospitals, to improve the identification of Indigenous people in administrative collections such as hospital records, and recent progress has been encouraging. This work will help to increase the quality and availability of data.

In the meantime, it is clear, despite the recognised deficiencies of the data, that Indigenous Australians continue to be admitted to hospital at greater rates than the rest of the Australian population. This is not surprising, given the health disadvantages faced by the Indigenous population (see, for example, ABS & AIHW 1999). However, it is not clear from the data presented here whether the higher rates of hospitalisation among Indigenous people are commensurate with the levels of illness, or whether there remain important areas of unmet need, due to such factors as financial, cultural, physical and other barriers. More work is needed in this area, but improvements in the identification of Indigenous patients are required before this can be done with any degree of precision.

APPENDIX   **ICD-9 CODES**

The ICD-9 codes (World Health Organisation 1977) used in this publication are listed below.

DIAGNOSIS CODES

CHAPTER	NAME USED IN THIS PUBLICATION	ICD-9 CODES
I	Infectious/parasitic diseases	001–139
II	Neoplasms	140–239
III	Endocrine/nutritional/metabolic disorders	240–279
IV	Diseases of blood and blood forming organs	280–289
V	Mental disorders	290–319
VI	Nervous system diseases	320–389
VII	Circulatory diseases	390–459
VIII	Respiratory diseases	460–519
IX	Digestive diseases	520–579
X	Genitourinary diseases	580–629
XI	Complications of pregnancy and childbirth	630–677
XII	Diseases of skin and subcutaneous tissue	680–709
XIII	Musculoskeletal diseases	710–739
XIV	Congenital anomalies	740–759
XV	Certain perinatal conditions	760–779
XVI	Ill-defined conditions	780–799
XVII	Injury	800–999 and E800–E999
XVIII	Other reasons for contact (V-codes)	V1–V82

The following sub-chapter groupings were used.

CHAPTER	SUB-CHAPTER	ICD-9 CODES
Infectious/parasitic		
	Intestinal infectious diseases	001–009
	Other bacterial disease	010–041
	Viral and chlamydial diseases	042–079
	Other infectious and parasitic diseases	080–139
Endocrine/nutritional/metabolic disorders		
	Diabetes	250
	Other endocrine gland and thyroid disorders	240–249 and 251–259
	Nuritional deficiencies	260–269
	Other metabolic and immunity disorders	270–279
Mental disorders		
	Alcohol and drug-related psychosis, dependence, abuse	291–292 and 303–305
	Other psychoses	290 and 293–299
	Other mental disorders	300–302 and 306–319
Nervous system diseases		
	Central and peripheral nervous system disorders and diseases	320–359
	Disorders of eye and adnexa	360–379
	Diseases of ear and mastoid process	380–389
Circulatory diseases		
	Rheumatic heart disease	390–398
	Hypertensive disease	401–405
	Ischaemic heart disease	410–414
	Other heart disease	415–429
	Cerebrovascular disease	430–438
	Other diseases of circulatory system	440–459
Respiratory diseases		
	Acute respiratory infection	460–466
	Other diseases of upper respiratory tract	470–478
	Pneumonia and influenza	480–487
	Bronchitis and emphysema	490–492
	Asthma	493
	Other COPD and allied conditions	494–496
	Other diseases of respiratory system	500–519
Digestive diseases		
	Diseases of oral cavity, salivary glands, jaws	520–529
	Diseases of oesophagus, stomach, duodenum	530–537
	Appendicitis	540–543
	Abdominal hernia	550–553
	Non-infectious enteritis, colitis	555–558
	Other diseases of intestines, peritoneum	560–569
	Diseases of the liver	570–573
	Other digestive diseases	574–579
Genitourinary diseases		
	Diseases of urinary system	580–599
	Diseases of male genital organs	600–608
	Disorders of the breast	610–611
	Diseases of female genital organs	614–629

CHAPTER	SUB-CHAPTER	ICD-9 CODES

Complications of pregnancy and childbirth

Pregnancy with abortive outcome	630–639
Complications mainly related to pregnancy	640–648
Normal delivery	650
Other indications re: pregnancy, labour, delivery	651–669
Complications of puerperium	670–677

Diseases of skin and subcutaneous tissue

Infections of skin and subcutaneous tissue	680–686
Other inflammatory conditions of skin and subcutaneous tissue	690–698
Other diseases of skin and subcutaneous tissue	700–709

Diseases of musculoskeletal system

Joint diseases	710–719
Disorders of the back	720–724
Other diseases of musculoskeletal system	726–739

Injury—type of injury

Fractures, dislocations, sprains and strains	800–848
Open wounds, intracranial, internal, blood vessel injury	850–904
Late effects, burns, superficial, other injuries	905–959
Poisoning, toxic effects	960–989
Other, unspecified effects of external causes	990–995
Complications of surgical, medical care (not elsewhere classified)	996–999

Injury—external cause

Transport accidents	E800–E849
Accidental poisoning	E850–E869
Misadventure during or due to medical care	E870–E879
Accidental falls	E880–E888
Accidents caused by fire or flames	E890–E899
Other accidents, late effects	E900–E929
Adverse effects of therapeutic drugs, biologicals	E930–E949
Self-inflicted injury, suicide	E950–E959
Injury purposely inflicted by others, homicide	E960–E969
Other external causes	E970–E999

Other reasons for contact

Contact related to communicable disease risk or personal/family history	V01–V19
Contact related to reproduction and development, liveborn infants	V20–V39
Dialysis	V56
Other contact related to procedures, aftercare, conditions	V40–V55 and V57–V59
Contact for other reasons	V60–V82

CHAPTER	NAME USED IN THIS PUBLICATION	ICD-9 CODES
I	Operations on the nervous system	010–059
II	Operations on the endocrine system	060–079
III	Operations on the eye	080–169
IV	Operations on the ear	180–209
V	Operations on the mouth, nose, pharynx	210–299
VI	Operations on the respiratory system	300–349
VII	Operations on the cardiovascular system	350–399
VIII	Operations on the haemic and lymphatic system	400–419
IX	Operations on the digestive system	420–549
X	Operations on the urinary system	550–599
XI	Operations on the male genital organs	600–649
XII	Operations on the female genital organs	650–719
XIII	Obstetrical procedures	720–759
XIV	Operations on the musculoskeletal system	760–849
XV	Operations on the integumentary system	850–869
XVI	Miscellaneous diagnostic and therapeutic procedures	870–999

The following sub-chapter groupings were used.

CHAPTER	SUB-CHAPTER	ICD-9 CODES
Operations on the ear		
	Operations on the external ear	180–189
	Reconstruction, other operation on middle, inner ear	190–209
Operations on the cardiovascular system		
	Haemodialysis	399.5
	Other operations on the cardiovascular system	350–399, excluding 399.5
Operations on the digestive system		
	Operations on the oesophagus and stomach	420–449
	Operations on the intestines	450–469
	Operations on the appendix	470–479
	Operations on the rectum and anus	480–499
	Operations on the liver, gallbladder, biliary tract, pancreas	500–529
	Repair of hernias	530–539
	Other operations in the abdominal area	540–549
Operations on the female genital organs		
	Operations on the ovaries and fallopian tubes	650–669
	Operations on the cervix, uterus and supporting structures	670–679
	Other incision, excision of the uterus	680–689
	Other operations on the uterus and supporting structures	690–699
	Operations on the vagina, vulva and perineum	700–719
Obstetrical procedures		
	Forceps, vacuum, breech delivery	720–729
	Other procedures inducing or assisting delivery	730–739
	Caesarian delivery	740–749
	Other obstetric operations	750–759
Operations on the musculoskeletal system		
	Operations on bones and on facial joints	760–789
	Reduction of fractures and dislocations	790–799
	Operations on other joint structures	800–819
	Operations on muscle, tendon, fascia, bursa	820–839
	Other procedures on the musculoskeletal system	840–849
Operations on the integumentary system		
	Operations on the breast	850–859
	Operations on the skin and subcutaneous tissue	860–869
Miscellaneous diagnostic and therapeutic procedures		
	Diagnostic radiology and related techniques	870–889
	Interview, evaluation, consultation, other examination	890–919
	Diagnostic and therapeutic intervention	920–929
	Physical & respiratory therapy, rehabilitation, and related	930–939
	Procedures related to the psyche	940–949
	Ophthalmologic and otologic diagnosis and treatment	950–954
	Non-operative intubation and irrigation	960–967
	Replacement and removal of therapeutic appliances	970–978
	Non-operative removal of foreign body or calculus	980–985
	Other non-operative procedures	990–999

LIST OF REFERENCES

ABS   Australian Bureau of Statistics

AIHW   Australian Institute of Health and Welfare

ATSIHWIU   Aboriginal and Torres Strait Islander Health and Welfare
                   Information Unit

WHO   World Health Organization

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