

Appendix 1: Indicators for arthritis and osteoporosis

A set of key indicators for osteoarthritis, rheumatoid arthritis and osteoporosis was developed by the National Centre and the NAMSCAG Data Working Group for national monitoring (AIHW 2006). The set consists of 16 indicators, covering risk factors, prevalence, quality of life, health service use and mortality (Table A1).

This appendix provides data for each indicator, by age group and sex, for the most recent year available.

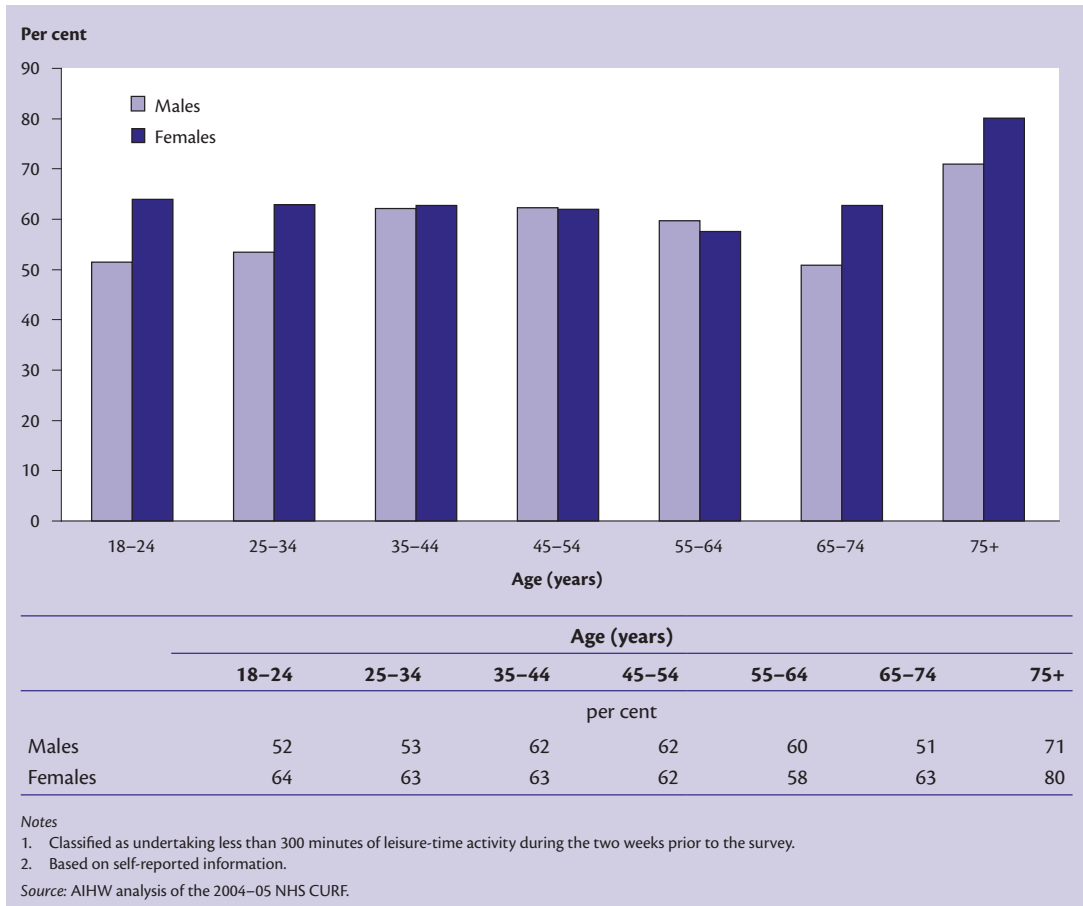
Table A1: National indicators for monitoring osteoarthritis, rheumatoid arthritis and osteoporosis

Category and number	Indicator
1 Risk factors	
1.1	Proportion of persons aged 18 years or over who are not engaged in sufficient physical activity to confer a health benefit ^(a) .
1.2	Proportion of persons aged 18 years or over who are overweight or obese ^(a) .
1.3	Proportion of persons aged 2–17 years who are overweight or obese.
2 Prevalence	
2.1	Prevalence of osteoarthritis among persons aged 25 years or over.
2.2	Prevalence of rheumatoid arthritis.
2.3	Prevalence of osteoporosis among persons aged 40 years or over.
2.4	Prevalence of arthritis among Aboriginal and Torres Strait Islander persons aged 25 years or over.
3 Quality of life	
3.1	Quality of life among persons aged 25 years or over with osteoarthritis.
3.2	Quality of life among persons with rheumatoid arthritis.
3.3	Quality of life among persons aged 40 years or over with osteoporosis.
4 Health service use	
4.1	Waiting time to see a rheumatologist for diagnosis of rheumatoid arthritis ^(b) .
4.2	Number of primary total hip replacements for arthritis.
4.3	Number of primary total knee replacements for arthritis.
4.4	Number of hospital separations for minimal trauma hip fractures among persons aged 40 years or over.
5 Mortality	
5.1	Death rates for rheumatoid arthritis as the underlying cause of death.
5.2	Death rates for rheumatoid arthritis as an associated cause of death.

(a) These indicators are also reported as part of the NHPA Risk Factors indicator set.

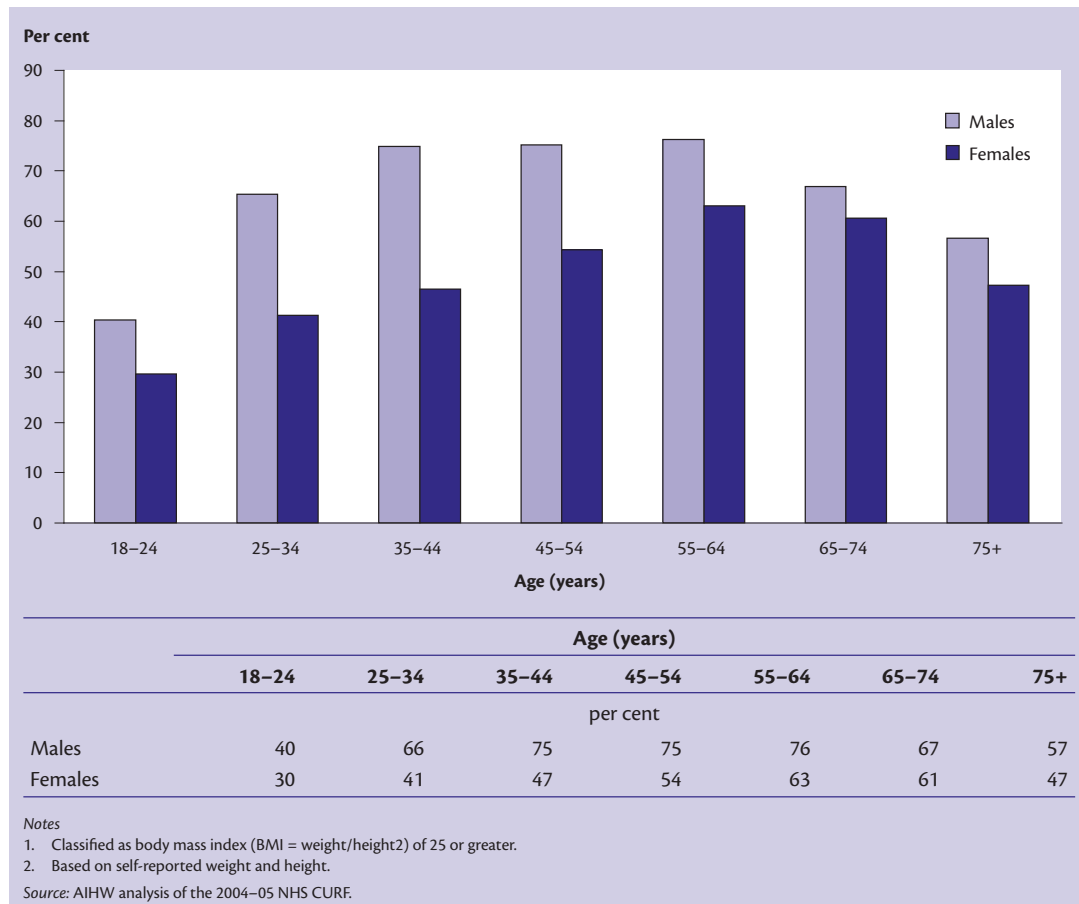
(b) No data for this indicator are currently available.

1.1 Proportion of persons aged 18 years or over who are not engaged in sufficient physical activity to confer a health benefit (2004–05)



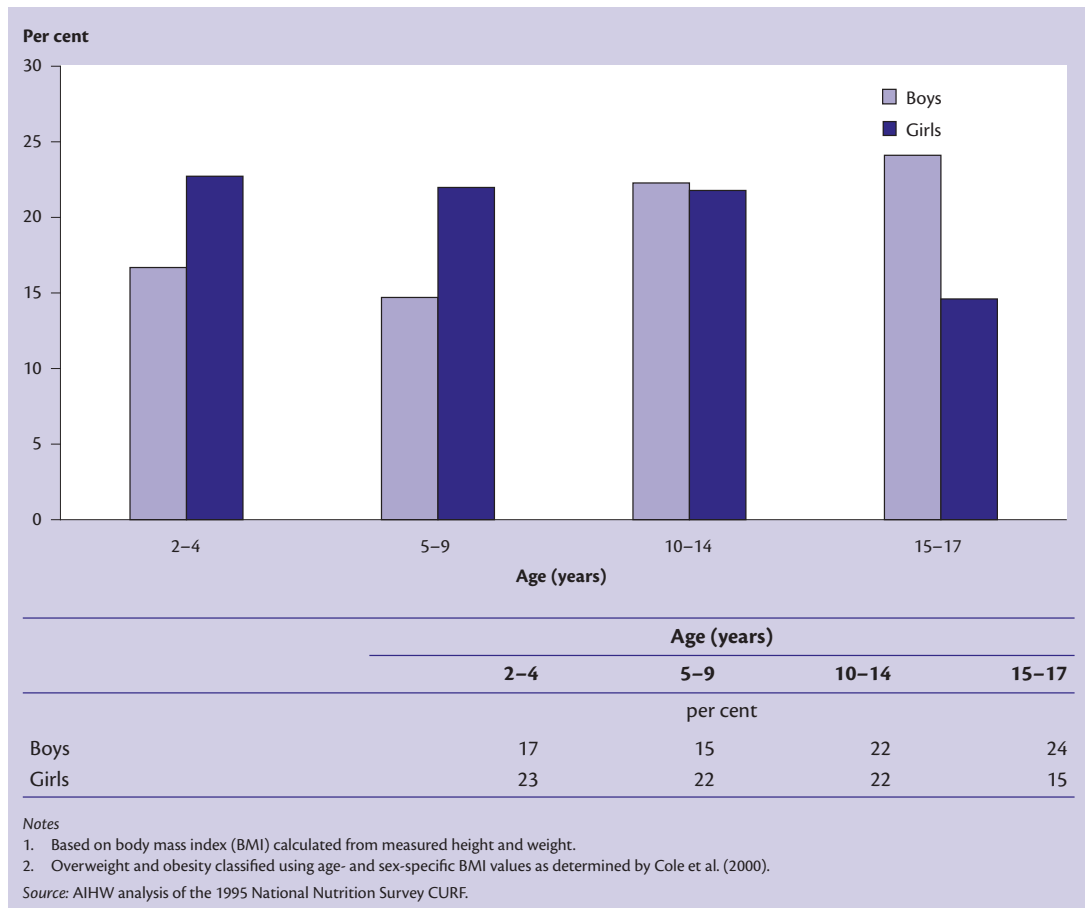
- Australian and international guidelines recommend undertaking 30 minutes of moderate intensity physical activity on at least 5 days of the week to obtain significant health benefits (DHAC 1999). Some common moderate intensity activities are brisk walking, swimming, social tennis, golf, table tennis and cricket.
- Including some vigorous activity each week provides extra health benefits. Football (all types), squash, jogging, basketball, cross-country hiking, martial arts and step aerobics are popular vigorous activities among Australians.
- Around 60% of Australian adults do not undertake sufficient physical activity for good health. At most ages, females are less likely than males to undertake sufficient activity.
- People aged 75 years or over are the most likely not to undertake sufficient activity, followed by those aged 35–54 years.
- Reduced functional capacity and the presence of multiple health conditions are likely to contribute to lower physical activity levels among older Australians.

1.2 Proportion of persons aged 18 years or over who are overweight or obese (2004–05)



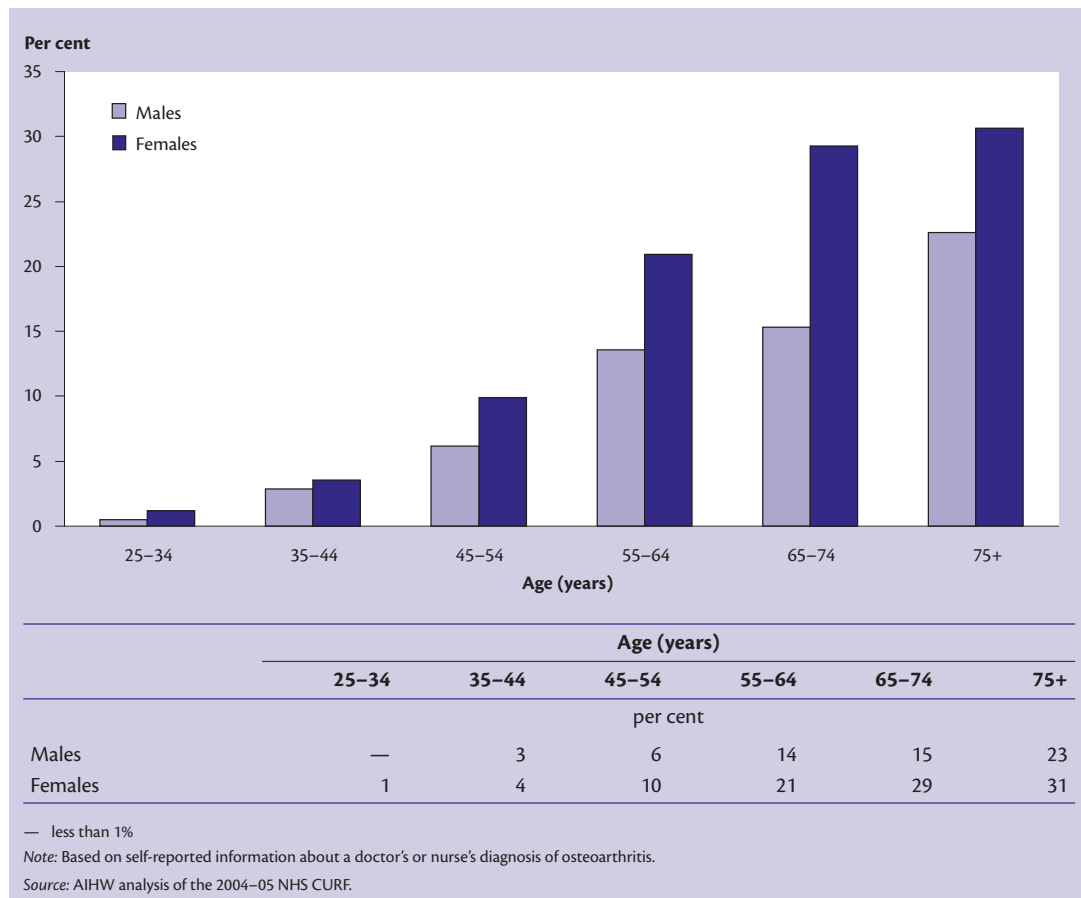
- Overweight and obesity are associated with a range of chronic health conditions, including Type 2 diabetes, coronary heart disease, stroke, osteoarthritis and some types of cancer.
- In 2004–05 it was estimated that two-thirds of Australian adult males and almost half of adult females were overweight or obese.
- Three-quarters of males aged 35–64 years were overweight or obese in 2004–05. Males in this age group were the least likely to undertake sufficient physical activity.
- Females aged 55–74 years were more likely than older or younger females to be overweight or obese, but were also more likely to undertake sufficient physical activity.
- Overweight and obesity rates in Australian adults increased significantly between 1989 and 2004–05. A similar trend was observed in many other countries, including England, Canada, New Zealand, the United States and Japan.

1.3 Proportion of persons aged 2–17 years who are overweight or obese



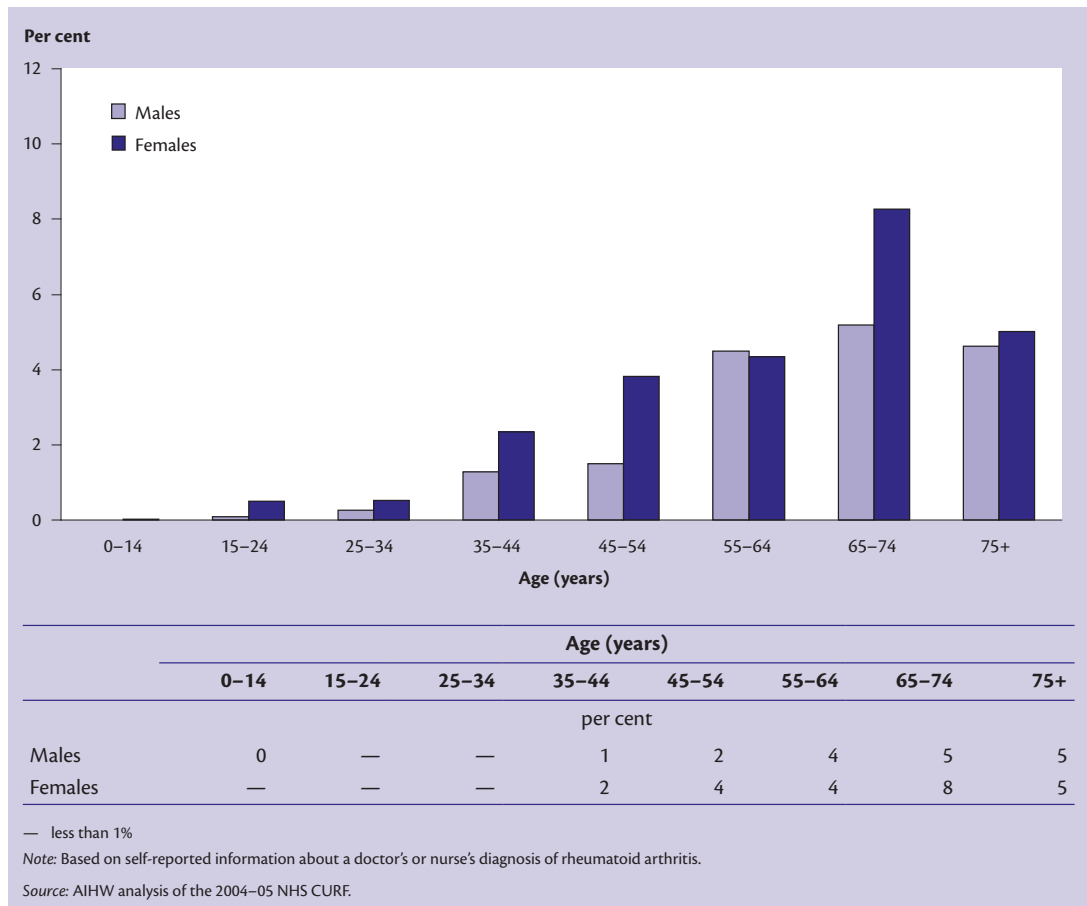
- In 1995, around 20% of Australians aged 2–17 years were overweight or obese for their age and sex.
- More recent data from state-based surveys suggests that this proportion may have risen to around 25% (Booth et al. 2006; Hands et al. 2004).
- At younger ages, girls are more likely than boys to be overweight or obese, whereas at older ages the reverse is true.
- Obesity in childhood is strongly predictive of obesity in adulthood (Magarey et al. 2003; Venn et al. 2007; Williams 2001).
- A high BMI at age 18 years is strongly associated with an increased risk of total hip replacement for osteoarthritis (Karlson et al. 2003).

2.1 Prevalence of osteoarthritis among persons aged 25 years or over (2004–05)



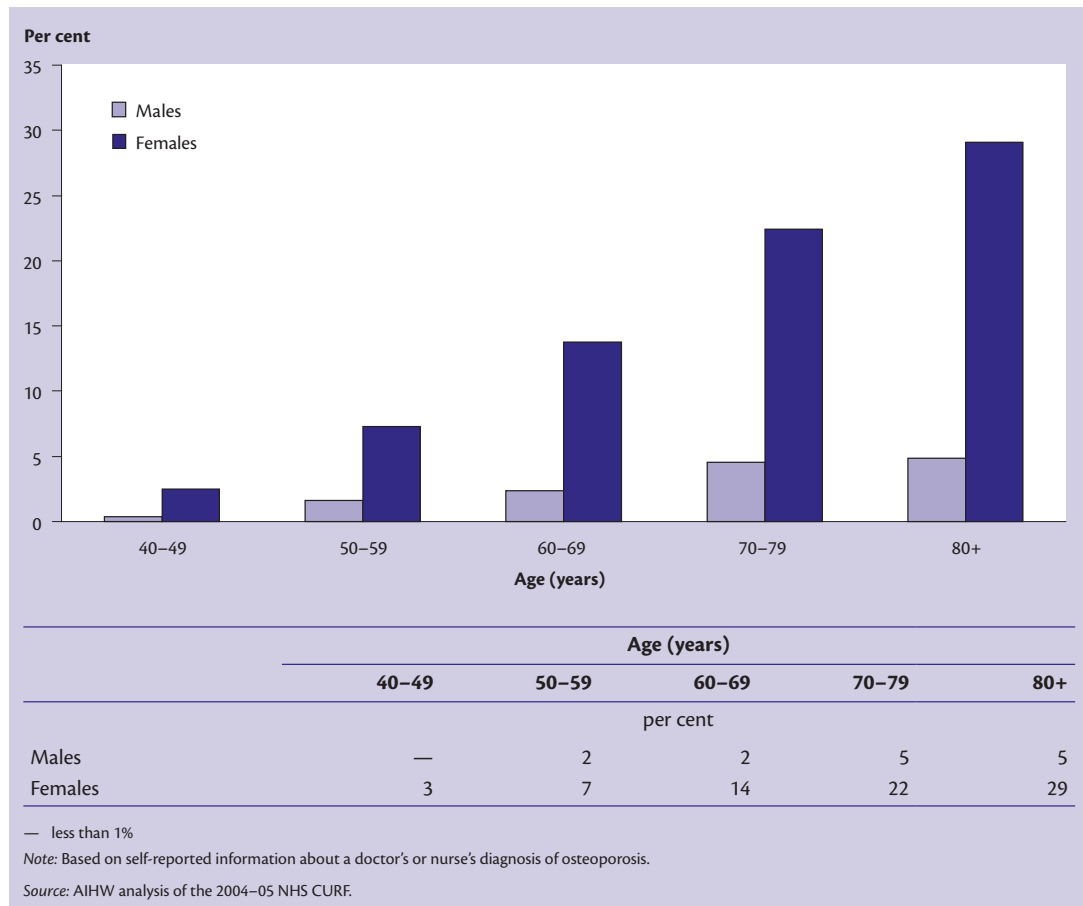
- Osteoarthritis is the most common form of arthritis, affecting over 1.5 million Australians.
- Females are more likely than males to report having been diagnosed with osteoarthritis.
- The prevalence increases rapidly with age, affecting 1% of Australians aged 25–34 years and rising to more than one-quarter of Australians aged 75 years or over.
- Modifiable risk factors for osteoarthritis include obesity, joint trauma or injury, repetitive joint-loading tasks, and joint misalignment.

2.2 Prevalence of rheumatoid arthritis (2004–05)



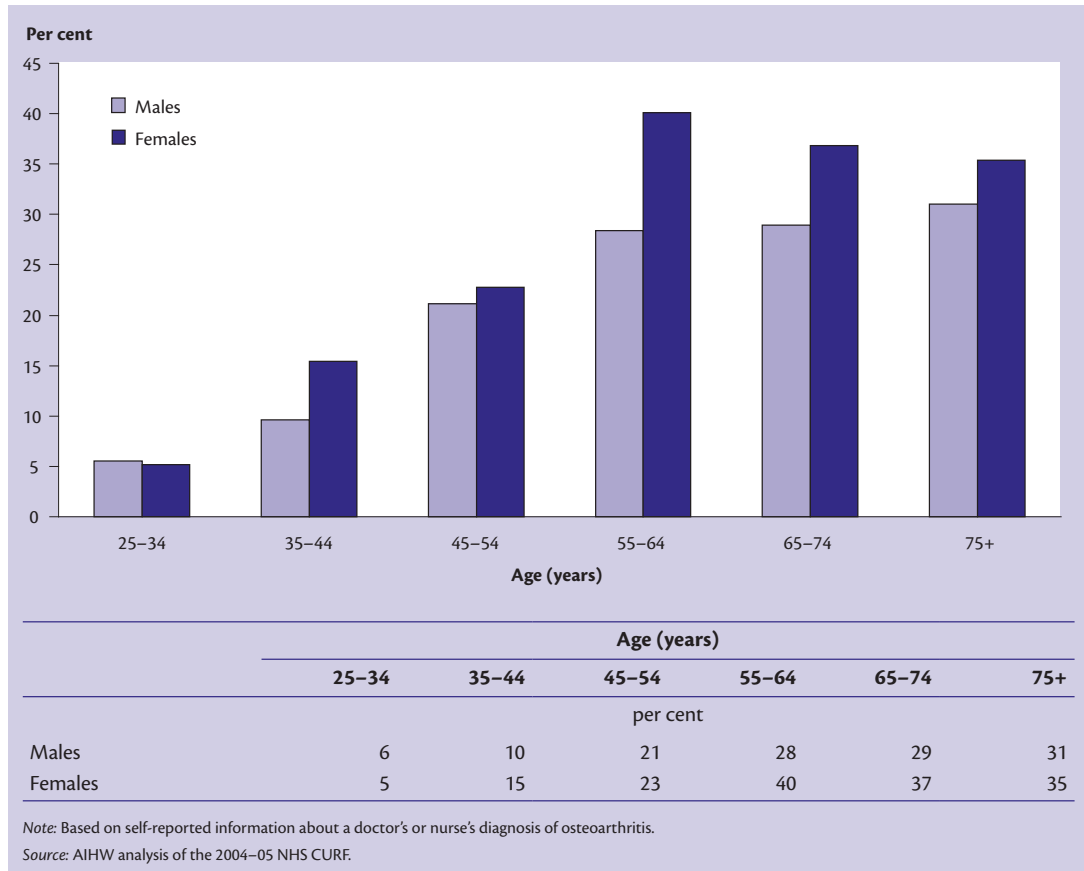
- Rheumatoid arthritis is an autoimmune disease causing inflammation of the synovial joints.
- Almost 384,000 Australians (2% of the population) self-report that they have been diagnosed with rheumatoid arthritis.
- Females are more likely than males to self-report rheumatoid arthritis.
- Prevalence increases with age up to 65–74 years, declining thereafter.
- Self-reported data are believed to significantly overestimate rheumatoid arthritis prevalence. Overseas studies report very high false positive rates in self-reports of rheumatoid arthritis (Bellamy et al. 1992; Kvien et al. 1996; Picavet & Hazes 2003; Star et al. 1996).
- In other developed countries, the prevalence of rheumatoid arthritis ranges from 0.3% to 1% (WHO Scientific Group 2003).

2.3 Prevalence of osteoporosis among persons aged 40 years or over (2004–05)



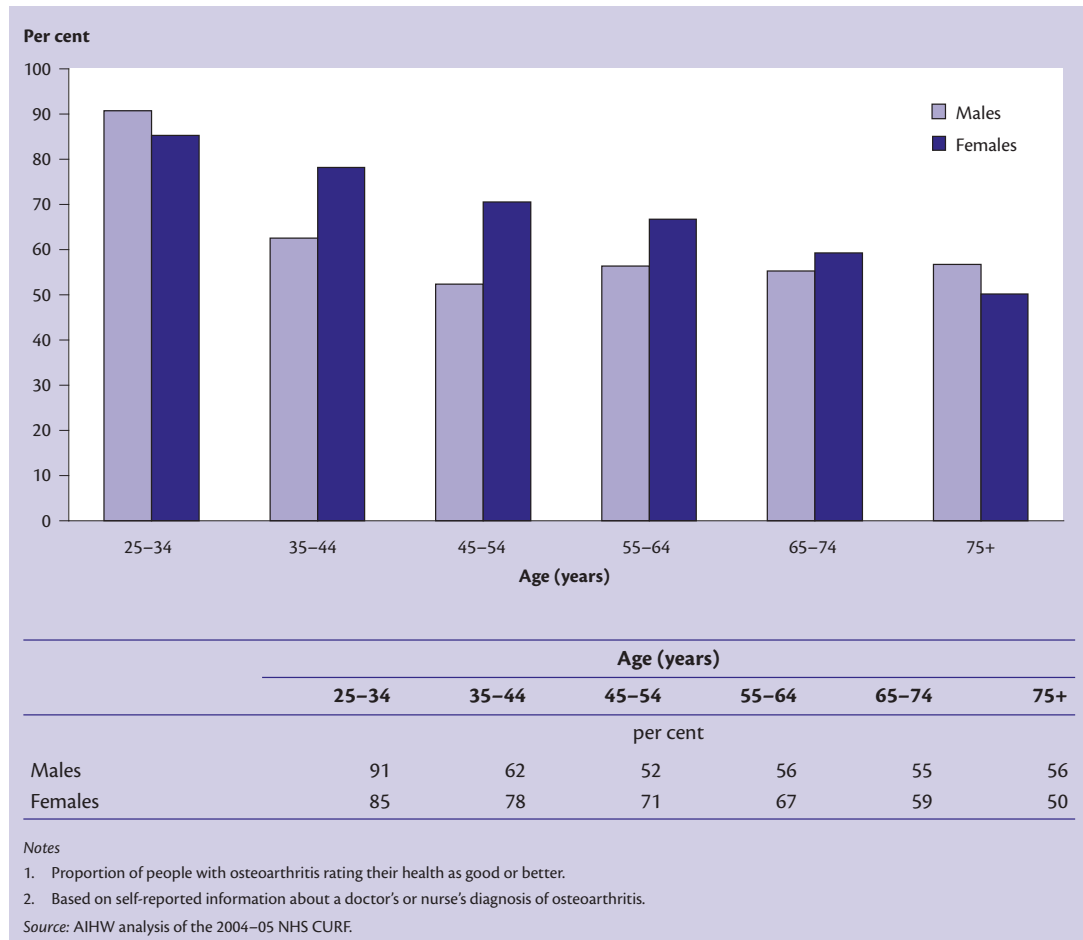
- Self-reported data suggest that almost 558,000 Australians aged 40 years or over (2% of males and 10% of females) have been diagnosed with osteoporosis.
- Prevalence increases rapidly with age; almost 1 in 3 females aged 80 years or over has osteoporosis compared with 1 in 33 females aged 40–49 years.
- Osteoporosis occurs without symptoms, so self-reported data are likely to considerably underestimate its prevalence.
- Around 4% of males and 20% of females aged 60 years or over self-report having been diagnosed with osteoporosis. Studies involving measurement of bone mineral density indicate that the prevalence of osteoporosis is 11% among males and 27% among females of this age (Nguyen et al. 2004).

2.4 Prevalence of arthritis among Aboriginal and Torres Strait Islander persons aged 25 years or over (2004–05)



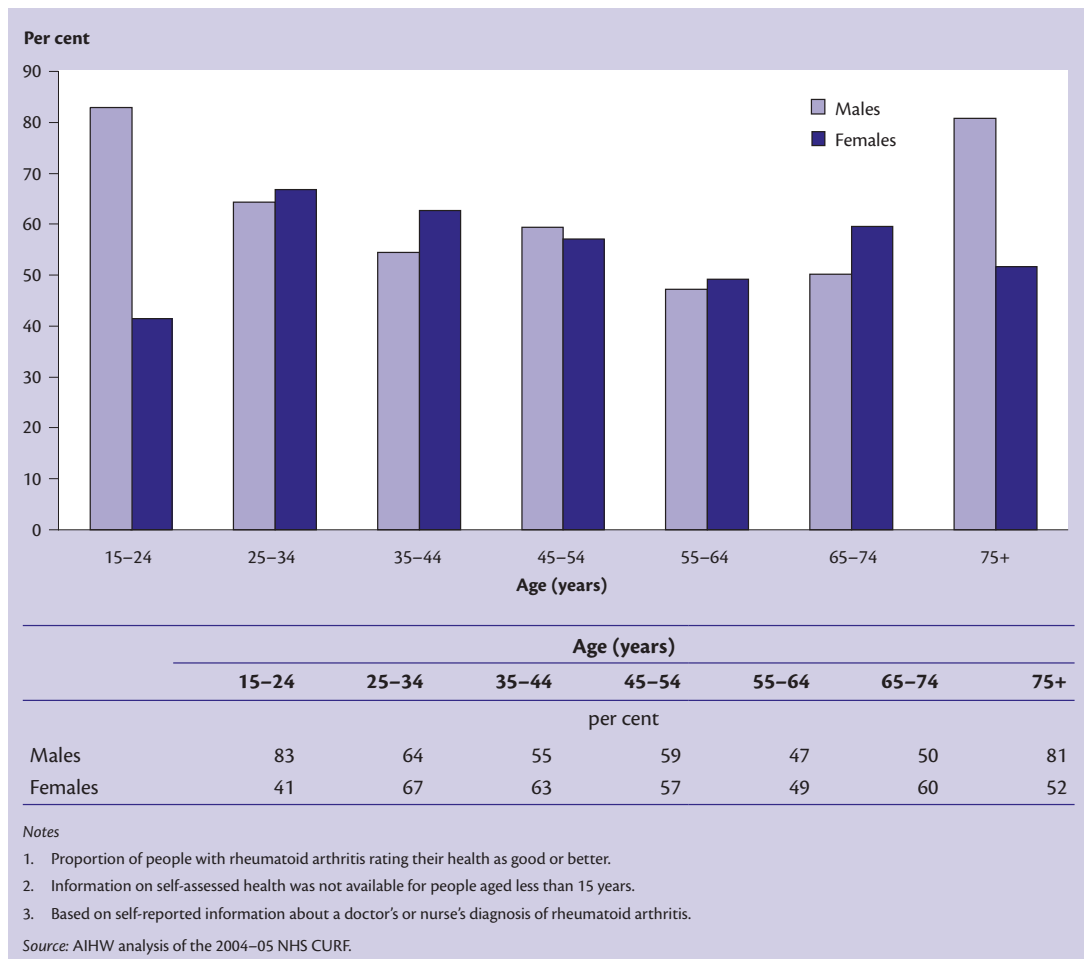
- Self-reported data indicate that more than 31,000 Aboriginal and Torres Strait Islander people aged 25 years or over have been diagnosed with arthritis.
- Indigenous females are more likely to report arthritis than Indigenous males.
- For both sexes, prevalence increases with age until 55 years, then is relatively stable.
- Indigenous Australians are more likely than non-Indigenous Australians to report having been diagnosed with arthritis (20% compared with 17%).
- Among people aged less than 65 years, arthritis is more common among Indigenous people, but for people aged 65 years or over it is more common among non-Indigenous people.
- The majority of arthritis cases in Indigenous Australians are likely to be cases of osteoarthritis (Minaur et al. 2004; Roberts-Thomson & Roberts-Thomson 1999).

3.1 Quality of life among persons aged 25 years or over with osteoarthritis (2004–05)



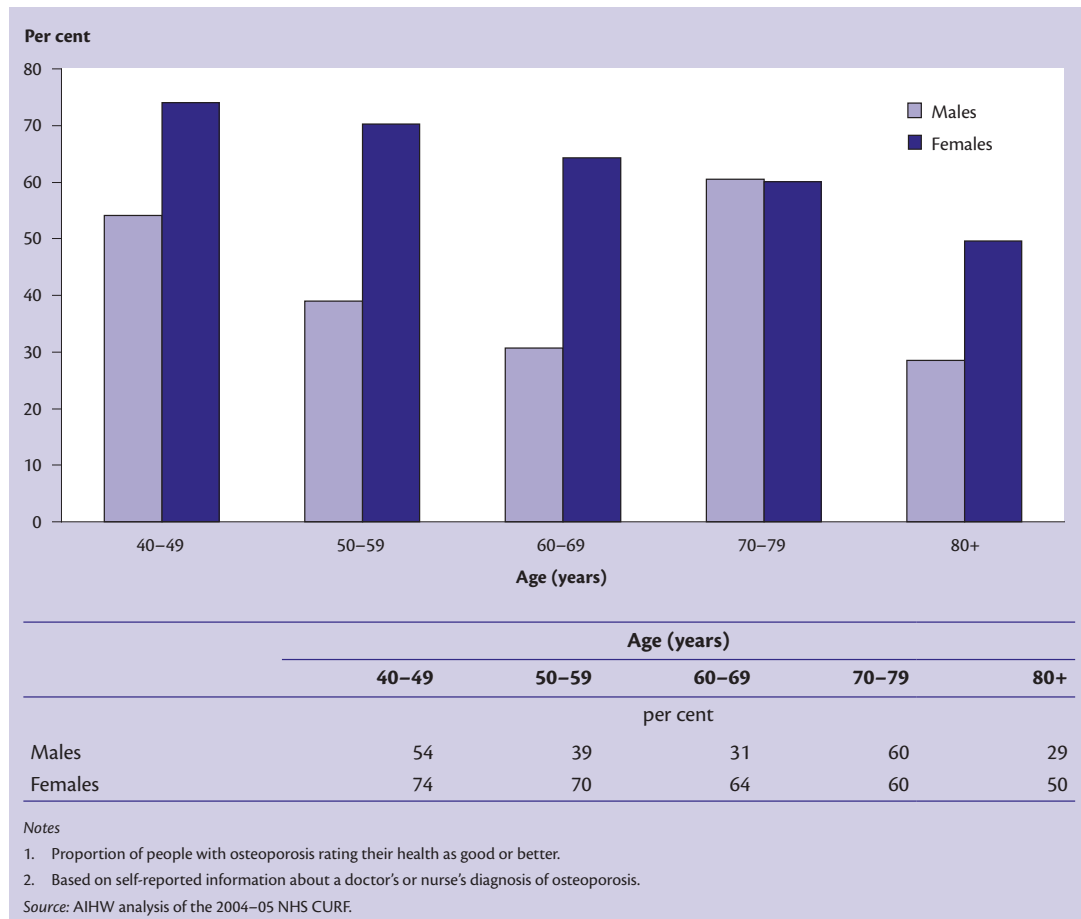
- Around two-thirds of people with self-reported doctor-diagnosed osteoarthritis in 2004–05 rated their general health as good, very good or excellent.
- The proportion rating their health as good or better generally decreased with age, and was higher among females than males in most age groups.

3.2 Quality of life among persons with rheumatoid arthritis (2004–05)



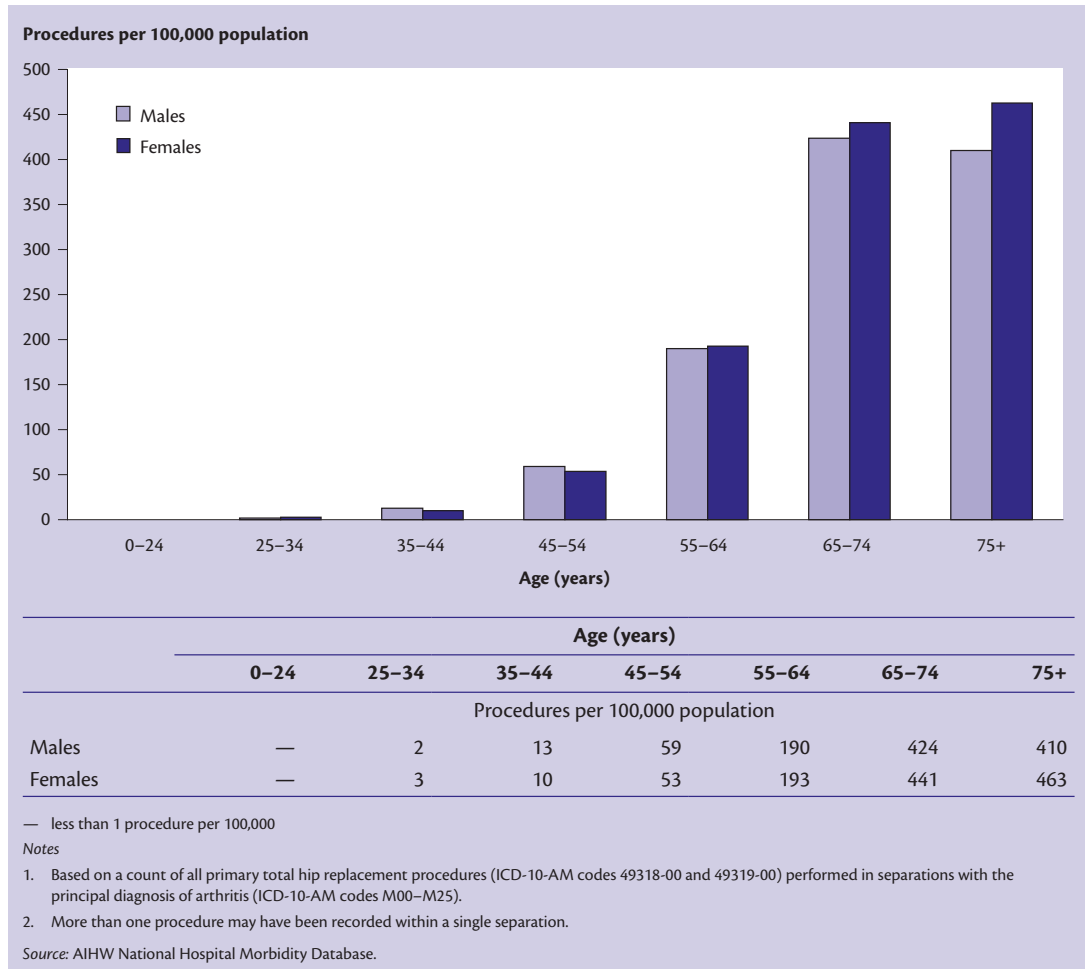
- Around 60% of people with rheumatoid arthritis aged 15 years or over in 2004–05 rated their general health as good, very good or excellent.
- Young women were the least likely to rate their health as good or better.
- Among females, the proportion rating their health as good or better decreased as time since diagnosis increased; for males the reverse was true.

3.3 Quality of life among persons aged 40 years or over with osteoporosis (2004–05)



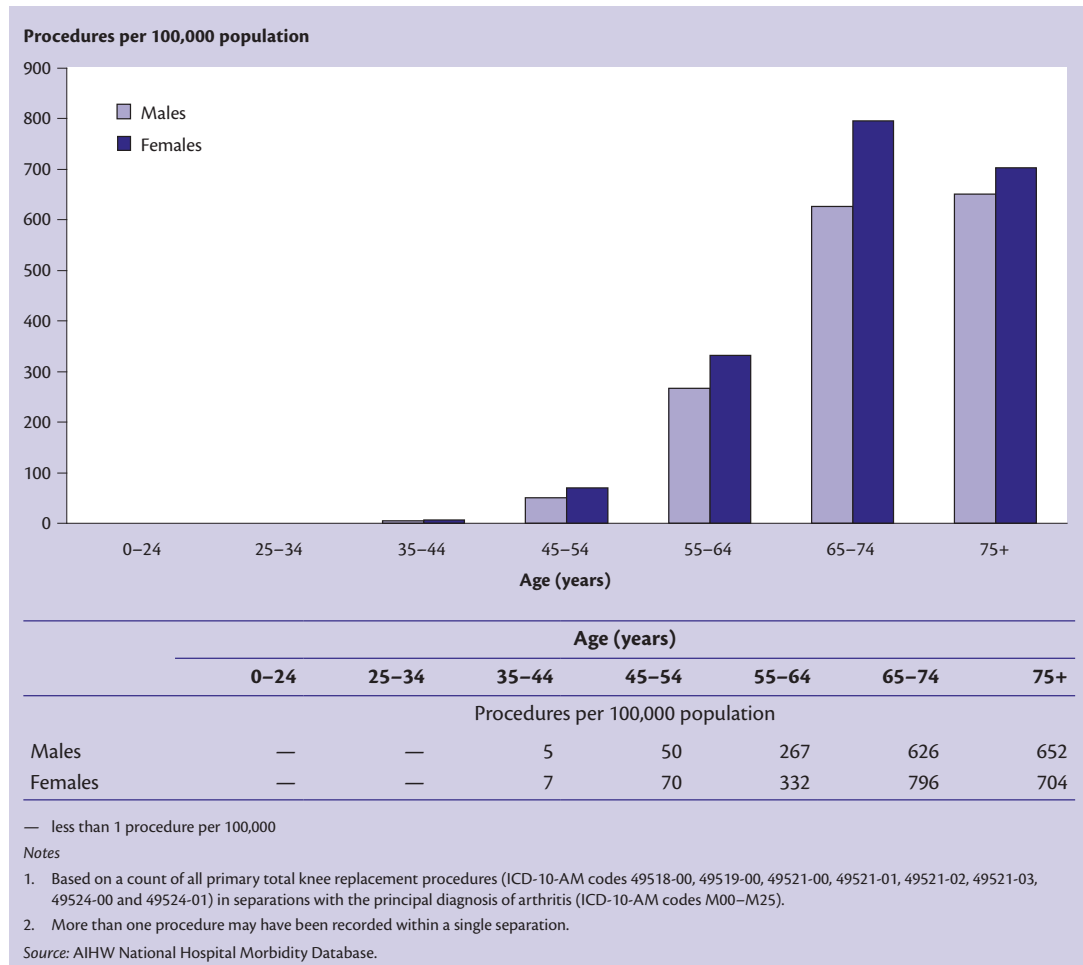
- Approximately half of males and two-thirds of females aged 40 years or over with osteoporosis rated their general health as good, very good or excellent.
- For both sexes, the proportion rating their health as good or better generally decreased with age.

4.2 Number of primary total hip replacements for arthritis (2006–07)



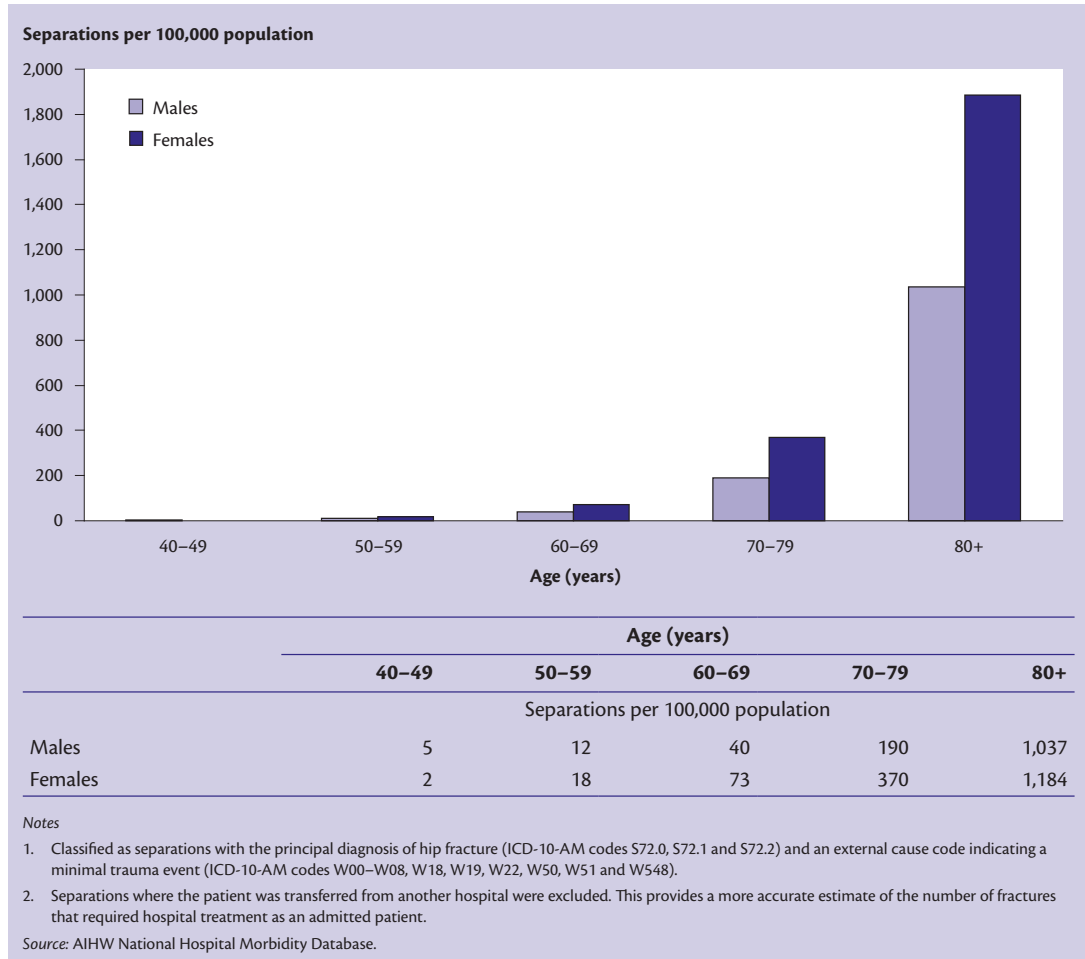
- Total hip replacements can effectively reduce pain and improve function in people with osteoarthritis of the hip.
- More than 18,300 primary total hip replacement procedures were performed in Australia in 2006–07.
- Females are slightly more likely than males to have a total hip replacement (84 compared with 81 procedures per 100,000 population in 2006–07).
- Total hip replacements are most common among people aged 65 years or over.

4.3 Number of primary total knee replacements for arthritis (2006–07)



- Total knee replacement is an effective treatment for osteoarthritis of the knee.
- Almost 27,900 primary total knee replacement operations were performed in Australia in 2006–07.
- At all ages, females are more likely to undergo total knee replacement than males.

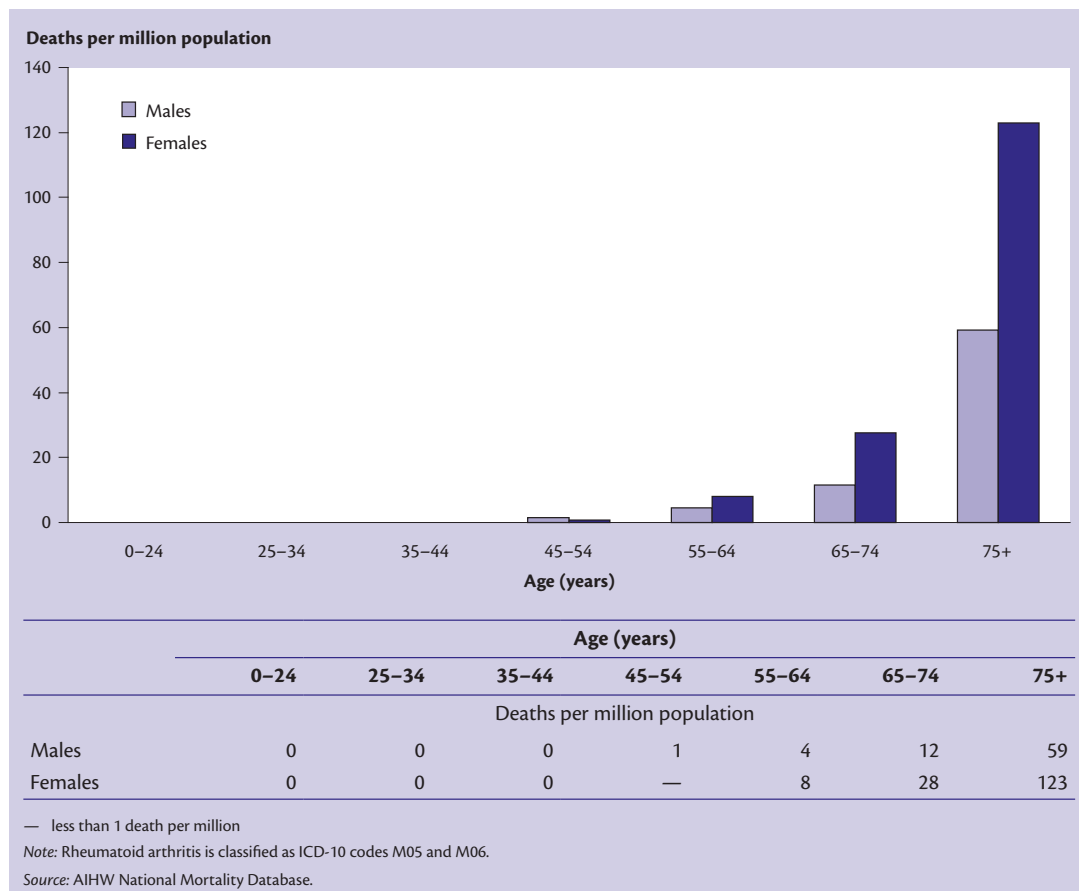
4.4 Number of hospital separations for minimal trauma hip fractures among persons aged 40 years or over (2006–07)



- Minimal trauma hip fracture is one of the most serious complications of osteoporosis.
- Half of all people suffering a hip fracture do not regain their pre-fracture mobility and independence (Johnell 1997).
- People who had a minimal trauma hip fracture 1 year previously are much more likely than others of the same age to have mobility problems, to be unable to walk independently and to need assistance with activities of daily living (Boonen et al. 2004).
- Mortality following minimal trauma hip fracture is increased, with a risk of death 2–3 times greater than normal in the first 12 months post-fracture (Center et al. 1999). This increased risk is seen at all ages and in both sexes.
- There were more than 16,600 minimal trauma hip fractures among people aged 40 years or over in 2006–07.

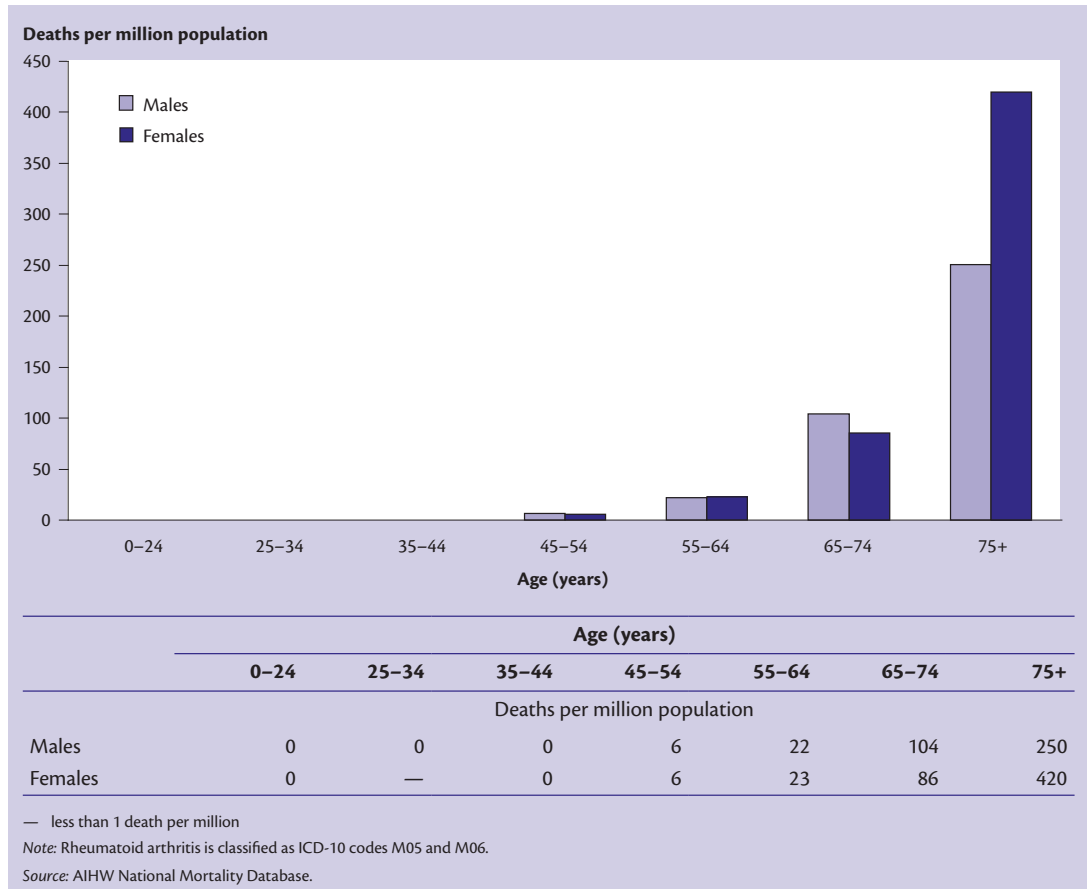
- In most age groups, minimal trauma hip fractures are almost twice as common among women compared with men.
- The minimal trauma hip fracture rate increases dramatically with age, with rates among people aged 80 years or over being around 100 times those among people aged 50–59 years and 5 times those among people aged 70–79 years.

5.1 Death rates for rheumatoid arthritis as the underlying cause of death (2006)



- The underlying cause of death is defined as the disease, condition or injury initiating the sequence of events leading directly to death.
- Rheumatoid arthritis was the underlying cause of 169 deaths in Australia in 2006.
- Corresponding to the higher prevalence of the disease among females, the death rate for rheumatoid arthritis was higher among females than males (10 compared with 5 per million population).
- The majority of deaths from rheumatoid arthritis occurred in people aged 65 years or over.

5.2 Death rates for rheumatoid arthritis as an associated cause of death (2005)



- An associated cause of death is defined as any condition, disease or injury (other than the underlying cause) considered to contribute to death.
- Rheumatoid arthritis was listed as an associated cause of 652 deaths in Australia in 2006.
- The majority of deaths where rheumatoid arthritis was listed as an associated cause were among people aged 55 years or over.
- Rheumatoid arthritis is much more likely to be recorded as an associated cause of death than as the underlying cause.
- Common underlying causes of death in cases where rheumatoid arthritis is listed as an associated cause include cardiovascular diseases (45% of such deaths in 2006), cancers (19%) and respiratory diseases (11%).

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Appendix 2: Data sources, methods and classifications

DATA SOURCES

A variety of data sources were used in the production of this report. These are described briefly below.

Population surveys

Population surveys are designed to gather information about the characteristics and behaviours of the general population. To conduct a population survey, a random sample of the population is selected and asked to participate. ('Random' means that every person in the population has an equal chance of being selected.) If a reasonably large proportion of the people selected agree to participate, then the results of the survey can be generalised to the whole population. In this case, the sample is said to be 'representative' of the population.

National Health Survey

The National Health Survey (NHS), conducted every three years by the Australian Bureau of Statistics, is designed to obtain national information on the health status of Australians, their use of health services and facilities, and health-related aspects of their lifestyle (ABS 2006a). The most recent survey was conducted in 2004–05, with previous surveys being conducted in 2001, 1995, 1989–90, 1983 and 1977. The survey is community-based and does not include information from people living in nursing homes or those who are otherwise institutionalised.

Data available from the NHS include self-reports of long-term conditions, including various forms of arthritis, back pain, osteoporosis and other diseases of the musculoskeletal system and connective tissues. Some information on age at diagnosis, medications used and other actions taken for arthritis or osteoporosis is also available. The survey also collects information about health risk factors and behaviours, injuries and use of health services.

National Aboriginal and Torres Strait Islander Health Survey

The National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) was conducted by the Australian Bureau of Statistics in 2004–05, concurrently with the NHS. It is intended that the NATSIHS be repeated at 6-yearly intervals. The 2004–05 survey included responses from 10,439 Aboriginal and Torres Strait Islander people, and aimed to provide information about the health circumstances of Indigenous Australians from remote and non-remote areas (ABS 2006b). Questions were similar to those asked in the NHS. Data collected from Aboriginal and Torres Strait Islander respondents to the NHS also contribute to estimates for Indigenous Australians calculated from the NATSIHS.

Survey of Disability, Ageing and Carers

Conducted by the Australian Bureau of Statistics, the Survey of Disability, Ageing and Carers (SDAC) collects national information on people with disabilities, older people (aged 60 years or over) and their carers (ABS 2004a). The survey is conducted every 5 years (with surveys in 1988, 1993, 1998 and 2003), and covers people in private and non-private dwellings, including people in cared accommodation establishments, but excluding those in correctional institutions. The survey collects data on disability due to impairments, activity limitations and/or participation restrictions, and also collects information about the role of various diseases and health conditions as disabling conditions.

Other surveys

Instead of gathering information about the whole population, the surveys described below are designed to obtain information from or about a specific group of people, for example, information about people visiting doctors or specialists, or people with a certain health condition.

Bettering the Evaluation and Care of Health (BEACH) GP surveys

The BEACH Survey of General Practice is an ongoing survey looking at the clinical activities of general practitioners (GPs). The study is conducted by the Australian General Practice Statistics and Classification Centre (an AIHW collaborating unit) at the University of Sydney. BEACH began in April 1998 and involves an ever-changing random sample of approximately 1,000 GPs per year, collecting information on almost 100,000 GP–patient encounters (Britt et al. 2005). Data collected include reasons for encounter, problems managed, management techniques, and details of pharmacological and non-pharmacological treatments prescribed.

Voice of Arthritis Social Impact Study

The Voice of Arthritis Social Impact Study was conducted by Arthritis Australia to investigate the impact of arthritis on people with the condition, their families and carers. The survey was mailed out to 3,000 people with arthritis in March 2004, with 1,016 responding. About three quarters of respondents (76%) were 60 years of age or older and 61% were female. The majority of respondents had osteoarthritis (68%) or rheumatoid arthritis (28%). The study explored respondents' levels of satisfaction or dissatisfaction with medication, therapy, information available, physical health, economic issues, education, relationships, lifestyle and employment.

Administrative data collections

Administrative data are collected for reasons other than research; for example, to track expenditure or for auditing government programs. In many cases, however, administrative data can be very useful for research purposes.

AIHW Disease Expenditure Database

The Disease Expenditure Database contains information about the money spent by both governments and individuals to purchase or provide goods and services for particular diseases. The information is collected from a wide range of sources including the Australian Bureau of Statistics, Commonwealth,

state and territory health authorities, the Department of Veterans' Affairs, the Private Health Insurance Administration Council, Comcare, and the major workers' compensation and compulsory motor vehicle third-party insurers in each state and territory.

The first detailed Australian study of expenditure across disease and injury groups was published in 1998 and referred to the financial year 1993–94. The latest study refers to the financial year 2004–05. The information from the database is linked to other non-monetary data sources and analyses to provide information specific for diseases, injury groups, age and sex. The database does not include information on other costs incurred by patients (such as the cost of pain and suffering, travel costs, lost quality and quantity of life) or by their carers and families.

AIHW National Hospital Morbidity Database

The AIHW National Hospital Morbidity Database contains data on episodes of care for patients admitted to hospital in Australia. The data are supplied to the AIHW by state and territory health authorities and the Department of Veteran's Affairs using standard definitions contained in the National Health Data Dictionary. The database includes information on sex, age, Indigenous status, area of usual residence, diagnoses and procedures (AIHW 2006). Diagnoses and procedures are coded based on the International Statistical Classification of Diseases and Related Health Problems, Australian Modification (ICD-AM), 9th revision from 1993–94 to 1998–99 and 10th revision from 1998–99 onwards (both ICD-9-AM and ICD-10-AM codes were included on the database for 1998–99). Since 1996–97 the database includes data from almost all hospitals including public, private, psychiatric and day hospital facilities. It is not possible to count patients individually as the data are episode-based, and therefore estimates of disease incidence and prevalence cannot be obtained from this data source.

AIHW National Mortality Database

The AIHW National Mortality Database contains information pertaining to deaths registered in Australia. Deaths are registered by the State and Territory Registrars of Births, Deaths and Marriages. The information is provided to the Australian Bureau of Statistics for coding of the cause of death and compilation into aggregate statistics. Information available includes sex, age at death, date of death, area of usual residence, Indigenous status, country of birth and cause of death. The cause of death is certified by the medical practitioner or the coroner and coded using the International Classification of Diseases (ICD), the 9th revision from 1979 to 1996 and 10th revision from 1997. Multiple causes of death, including the underlying and all associated causes of death recorded on the death certificate, are available from 1997 onwards.

Pharmaceutical Benefits Scheme and Repatriation Pharmaceutical Benefits Scheme

The Pharmaceutical Benefits Scheme (PBS) and Repatriation Pharmaceutical Benefits Scheme (RPBS) are national government-funded schemes that subsidise the cost of a wide range of pharmaceutical medicines to help provide affordable access to medications for Australians. About 80% of all prescription medications available in Australian pharmacies are listed on the PBS or RPBS. This data source contains information about prescription medications dispensed by Australian pharmacies that were subsidised under either scheme. It includes details of medication type, date of prescription and supply, pharmacy post code, patient details (date of birth, sex, post code), prescribing doctor type (GP or specialist) and type of payment (that is, general, concession or safety net). Monthly data are available from 1992 onwards, however the data are more consistently reliable from 1996 onwards.

STATISTICAL METHODS

Incidence

Incidence refers to the number of new cases (of a disease, condition or event) occurring during a given period.

Prevalence

Prevalence refers to the number or proportion (of cases, instances, etc.) present in a population at a given time. It includes both new and existing cases.

Age-specific rates

Age-specific rates are calculated by dividing the number of events (such as deaths, disease cases or hospital separations) occurring in each specified age group by the estimated resident population for the corresponding age group. The rates are expressed as events per 100 (that is, a percentage or proportion), per 1,000, per 100,000 or per million population.

Age-standardised rates

Age standardisation is a method of removing the influence of age when comparing populations with different age structures. Age-standardised rates in this report generally use the direct age-standardisation method. The directly age-standardised rate is the weighted sum of age-specific (five-year age group) rates, where the weighting factor is the corresponding age-specific standard population. For this report, the Australian estimated residential population as at 30 June 2001 was used as the standard population. The same standard population was used for males and females to allow valid comparison of age-standardised rates both between the sexes and over time.

Direct age standardisation

Direct age standardisation is the most common method of age standardisation, and is used in this report for prevalence, incidence, hospitalisations and deaths data. This method is generally used when the population under study is large and the age-specific rates are reliable. The calculation of direct age-standardised rates comprises three steps:

- Step 1: Calculate the age-specific rate for each age group.
- Step 2: Calculate the expected number of cases in each age group by multiplying the age-specific rate by the corresponding standard population for each age group.
- Step 3: Sum the expected number of cases in each age group and divide this sum by the total of the standard population to give the age-standardised rate.

In interpreting age-standardised rates, some issues need to be taken into consideration:

- The age-standardised rate is for comparison purposes only. The magnitude of an age-standardised rate has no intrinsic value since it is only an index measure. Therefore an age-standardised rate is not a substitute for age-specific rates.
- An age-standardised rate is not only influenced by the frequency of the underlying diseases, but is also dependent on the differences between the age structure of the population of interest and the standard population selected. Therefore, the results of comparisons based on age-standardised rates may not only reflect the difference in the frequency of the diseases compared, but also will be partly dependent on the standard population used. However, since the standard population used in this report is the total Australian population in 2001, the age distribution closely reflects that of the current Australian population. The results of comparisons based on these age-standardised rates are valid.

Indirect age standardisation and rate ratios

In situations where populations are small or where there is some uncertainty about the stability of age-specific rates, indirect standardisation is used. This effectively removes the influence of different age structures, but does not provide a result in terms of a rate. Rather, the summary measure is a ratio (called a 'rate ratio') of the number of observed cases compared to the number that would be expected if the age-specific rates of the standard population applied in the population under study. Calculation of a rate ratio comprises the following steps:

- Step 1: Calculate the age-specific rates for each age group in the standard population.
- Step 2: Apply these age-specific rates to the number of people in each age group of the population under study, and sum these to derive the total expected number of cases in that population.
- Step 3: Sum the observed cases in the population under study and divide this number by the expected number derived in step 2. This is the rate ratio. Depending on the types of cases involved, the rate ratio may be called the standardised incidence ratio (SIR), standardised prevalence ratio (SPR), standardised mortality or morbidity ratio (SMR).

A rate ratio of 1 indicates the same number of observed cases as were expected, suggesting rates in the two populations are similar. A rate ratio greater than 1 indicates more cases observed than were expected, suggesting rates in the population under study are higher than in the standard population.

In this report, the indirect method is used in Chapter 7 when comparing the arthritis and osteoporosis indicators between different population groups.

Significance testing

Significance testing is a way of detecting differences between different population groups. Saying that two values are 'significantly different' means that we have strong evidence that there is a real difference between the two values that has not come about purely by chance. In this report significance tests for differences in rates between two population groups (as shown in Chapter 7) have been based on calculating 95% confidence intervals for the rate ratios. Confidence intervals were calculated using the two methods described below.

Confidence intervals for census-type data (e.g. mortality, hospital separations)

Confidence intervals for death and hospitalisation rates were calculated on the basis of the number of observed events using the square-root transform, as described by Breslow & Day (1987: 70–71).

This formula calculates the 100(1- α)% confidence interval as:

$$\text{Lower bound} = RR \left(1 - \frac{Z_{\alpha}}{2D^{1/2}} \right)^2$$

$$\text{Upper bound} = RR \left(\frac{D+1}{D} \right) \left(1 + \frac{Z_{\alpha}}{2(D+1)^{1/2}} \right)^2$$

Where RR is the rate ratio, Z_{α} is the 100(1- α) percentile of the unit normal distribution and D is the observed number of events in the population of interest.

Confidence intervals for survey data (e.g. NHS)

Confidence intervals for survey data were calculated using the method described in *Rural, regional and remote health—Indicators of health* (AIHW 2005: 304), after Kendall & Stuart (1969).

CLASSIFICATIONS

Aboriginal and Torres Strait Islander people

For the period 2000–2005, the Indigenous identifiers on the AIHW National Mortality Database and the AIHW National Hospital Morbidity Database were considered usable only for deaths or hospital separations registered in certain jurisdictions. (The states and territories included in analyses are noted in the relevant text, figure or table.) This makes it difficult to get accurate national estimates of Indigenous hospitalisation and mortality rates, make comparisons with the non-Indigenous population, and examine geographical variation. Trends in indicators for the Indigenous population need to be interpreted with caution as differences may reflect changes in data quality, coverage, or collection methods rather than real changes in Indigenous health. The reliability of Indigenous status as reported by another person (for example, when registering a death) is also unknown.

In this analysis, only persons specifically identified as being of Aboriginal and/or Torres Strait Islander origin were classified as Indigenous. All other persons were classified as non-Indigenous. The non-Indigenous group therefore includes data where the person's Indigenous status was unknown or not recorded.

Area of usual residence

In most Australian national data collections, area of usual residence is recorded at the Statistical Local Area (SLA) level. Since SLA boundaries may change from year to year, concordance files supplied by the ABS were used to map all data used in this analysis to the 2001 SLA boundaries. Geographical areas were therefore able to be defined consistently over time.

For this report, three major geographical regions were defined: major cities, inner regional Australia, and other areas (including outer regional, remote and very remote locations). SLAs can be classified into these three regions based on their score on the Accessibility/Remoteness Index of Australia (DoHA & University of Adelaide 1999). This index is calculated based on how distant a place is by road from urban centres of different sizes, and therefore provides a relative indication of how difficult it might be for residents to access certain services, such as health care and education. Records that could not be mapped to one of the three regions were excluded from the geographic analyses in this report.

Socioeconomic status

In this report, the Index of Disadvantage (IoD) was used to determine socioeconomic status (ABS 2004b). This index is one of several socioeconomic indexes derived by the Australian Bureau of Statistics from information collected in the Census of Population and Housing. The IoD is an area-based measure that represents the average level of disadvantage across a geographic area, in this case the SLA. It is derived from social and economic characteristics of the SLA such as low income, low educational attainment, high levels of public sector housing, high unemployment, and jobs in relatively less skilled occupations.

Individual records can be classified into quintiles of socioeconomic disadvantage based on the IoD value of the SLA of the person's usual residence. SLAs can then be grouped into quintiles so that each quintile contains approximately 20% of the total Australian population. Quintile 1 includes the most disadvantaged households and Quintile 5 the least disadvantaged households. Records that could not be mapped to an IoD value were excluded from the analyses of socioeconomic status presented in this report.

It is important to note that the IoD relates to the average disadvantage of all people living in the SLA. It will therefore tend to understate the true inequality in health at an individual level.

Classification of causes of death, diagnoses and procedures

The International Statistical Classification of Diseases and Related Health Problems (ICD) is used to classify diseases and other health problems (including symptoms and injuries) in clinical and administrative records. The use of a standard classification system enables the storage and retrieval of diagnostic information for clinical and epidemiological purposes that is comparable between different service providers, across countries and over time.

The latest version, ICD-10, was endorsed by the 43rd World Health Assembly in May 1990 and officially came into use in WHO member states from 1994. In Australia, ICD-10 has been used for classifying causes of death since 1999. The Australian modification of ICD-10, the ICD-10-AM, has been used for classifying diagnoses in hospital records since 1998–99.

The current version of the ICD does not incorporate a classification system for health interventions. Work on revising the International Classification of Procedures in Medicine (ICPM), first published in 1978, virtually ceased in 1989 due to the difficulty in keeping up with the rapid and extensive changes in the field. Several countries, including Australia, the UK and the USA, developed their own systems of classification for health interventions. The Australian Classification of Health Interventions (ACHI) (previously known as MBS-Extended) is used in conjunction with ICD-10-AM for classifying surgical procedures and other health interventions in Australian hospital records.

A renewed focus on developing an international classification system has seen work restarted in recent years, with field trials of the International Classification of Health Interventions (ICHI) undertaken by the Australian National Centre for Classification in Health (NCCH) in 2007.

Further information about the ICHI, ACHI and ICD-10-AM can be obtained from the NCCH web site at <www3.fhs.usyd.edu.au/ncchwww/site/index.htm>.

Table A2.1: ICD-10 and ICD-10-AM codes used in identifying arthritis and musculoskeletal diseases and injuries in hospital morbidity and mortality data

Disease or injury	ICD-10/ICD-10-AM codes
Diseases	
Rheumatoid arthritis	M05, M06
Osteoarthritis	M15–M19
Juvenile arthritis	M08, M09
Osteoporosis	M80–M82
Fractures	
Fracture of ankle	S82.5–S82.6, S82.8, S92.1
<i>Fracture of hip and pelvis</i>	
– Femoral neck fracture	S72.0
– Intertrochanteric fracture	S72.11
– Pelvic fracture	S32.3–S32.5, S32.81, S32.83, S32.89
– Other	S72.1–S72.2, S72.9
<i>Fracture of shoulder</i>	
– Fracture of clavicle	S42.0
– Fracture of neck of humerus	S42.2
– Other	S42.1, S42.7–S42.9
Fracture of spine	S12.0–S12.7, S12.9, S22.0–S22.1, S32.0–S32.2, S32.7, S32.82, T08
<i>Fracture of wrist or forearm</i>	
– Colles' fracture	S52.51
– Scaphoid fracture	S62.0
– Other	S52, S62.1
Fractures at other sites	S02, S12.8, S22.2–S22.9, S42.3–S42.4, S62.2–S62.8, S72.3–S72.8, S82.0–S82.4, S78.7, S82.9, S92, T02, T10, T12, T14.2
External cause of injury	
Minimal trauma falls	W00, W01, W03–W08, W18, W19
Other minimal trauma events	W22, W50, W51, W54.8

Table A2.2: ICD-10-AM codes used to identify clinical interventions for people with arthritis and musculoskeletal conditions

Intervention	ICD-10-AM codes
Partial hip replacement	47522-00, 49315-00
Primary total hip replacement	49318-00, 49319-00
Revision hip replacement	49346-00, 49324-00, 49327-00, 49330-00, 49333-00, 49339-00, 49342-00, 49345-00
Partial knee replacement	49517-00
Primary total knee replacement	49518-00, 49519-00, 49521-00, 49521-01, 49521-02, 49521-03, 49524-00, 49524-01, 49534-00
Revision knee replacement	49530-00, 49530-01, 49533-00, 49554-00, 49527-00
<i>Allied health interventions</i>	
– physiotherapy	95550-03
– occupational therapy	95550-02
– social work	95550-01
– dietetics	95550-00
– other	95550-04 through 95550-13

Classification of general practice encounters

The International Classification of Primary Care (ICPC) is used as a classification for primary care or general practice wherever applicable. Development of the ICPC was initiated in the early 1970s to overcome a number of problems faced in applying the ICD system in primary care settings (such as difficulty in classifying symptoms and undiagnosed disease).

The second edition of ICPC, known as ICPC-2, was published in 1998 by the World Organization of Family Doctors (WONCA). ICPC-2 classifies patient data and clinical activity in the domains of general/family practice and primary care, taking into account the frequency distribution of problems seen in these domains. It allows classification of the patient's reason for encounter, the problems/diagnoses managed, interventions, and the ordering of these data in an episode of care structure. In Australia, an extended terminology known as ICPC-2-PLUS is used to classify general practice encounter data in electronic health record systems, research projects and the BEACH GP survey program.

Further information about ICPC-2 and ICPC-2-PLUS can be obtained from the Family Medicine Research Centre website at <www.fmrc.org.au>.

Table A2.3: ICPC-2-PLUS codes used in identifying arthritis and musculoskeletal conditions in general practice data

Condition	ICPC-2 and ICPC-2-PLUS codes
Diseases of the musculoskeletal system and connective tissue	L
Rheumatoid arthritis (includes juvenile arthritis)	L88
Osteoarthritis	L83011, L84004, L84009, L84010, L84011, L84012, L89001, L90001, L91001, L91003, L91008, L91015, L92007
Osteoporosis	L95

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Glossary

additional diagnosis	Conditions or complaints either co-existing with the principal diagnosis or arising during the episode of care. Additional diagnoses give information on factors that result in increased length of stay, more intensive treatment or the use of greater resources.
admitted patient	A patient who undergoes a hospital's formal admission process to receive treatment and/or care. This treatment and/or care is provided over a period of time and can occur in hospital and/or in the person's home.
age-specific rate	A rate for a specific age group. Both the numerator and denominator relate to the same age group.
age-standardisation	A method of removing the influence of age when comparing populations with different age structures. This procedure is required because the incidence and prevalence of many diseases varies strongly (usually increasing) with age. The age structures of different populations are converted to the same 'standard' structure, and the incidence/prevalence rates are calculated.
ankylosing spondylitis	An autoimmune disease that causes arthritis of the spine, resulting in pain, stiffness and loss of motion in the joints and ligaments.
arthritis	A group of disorders in which there is inflammation of the joints, which can become stiff, painful, swollen or deformed. The two main types of arthritis are osteoarthritis and rheumatoid arthritis .
associated cause(s) of death	Any condition(s), diseases and injuries—other than the underlying cause —contributing to death. See also cause of death .
autoimmune diseases	Diseases, such as rheumatoid arthritis and Type 1 diabetes in which the immune system reacts against its own body tissues.
body mass index (BMI)	A standardised measure of weight adjusted for person's height. BMI is calculated by dividing the person's weight (in kilograms) by their height (in metres) squared, that is, $\text{kg} \div \text{m}^2$. For adult men and women, underweight is a BMI below 18.5, acceptable weight is from 18.5 to less than 25, overweight is 25 and above (includes obese), and obese is 30 and over.
carer	Someone who looks after a relative or friend who has a disability , a chronic illness, or is a frail, aged person. Carers come from all walks of life, cultural backgrounds and age groups.

cause of death	From information reported on the medical certificate of cause of death, each death is classified by the underlying cause of death , according to rules and conventions of various editions of the International Classification of Diseases . The underlying cause is defined as the disease or condition that initiated the train of events leading directly to death. Deaths from injury or poisoning are classified according to the circumstances of the event that produced the fatal injury, called the external cause(s) of death, rather than to the nature of the injury.
chronic	Persistent and long-lasting.
chronic diseases	Term applied to a diverse group of diseases, such as heart disease, cancer and arthritis, that tend to be long lasting and persistent in their symptoms or development. Although these features also apply to some communicable diseases (infections), the term is usually confined to non-communicable diseases.
comorbidity	The occurrence of two or more health problems in a person at the same time.
conjunctivitis	Inflammation of the conjunctiva, the membrane that coats the eye and the inside of the eyelids.
Crohn's disease	An inflammatory disease of the gastrointestinal tract. Symptoms include recurrent abdominal pain, fever, nausea, vomiting, weight loss and diarrhoea.
dermatitis	Inflammation of the skin.
dermatomyositis	A disease of the connective tissue, characterised by swelling, dermatitis and inflammation of the muscle tissue.
direct costs	Financial costs to the Australian health system for providing prevention and treatment services, such as hospitals, aged care homes, primary care and specialist services, pharmaceuticals and other medications, allied health services, research, health administration and public health programs.
disability	A concept of several dimensions relating to an impairment in body structure or function, a limitation in activities (such as mobility and communication), a restriction in participation (involvement in life situations such as work, social interaction and education), and the affected person's physical and social environments.
disability-adjusted life year (DALY)	Years of healthy life lost through either premature death or through living with disability due to illness or injury.
early intervention	Timely identification and tailored advice and support for those identified with a condition. 'Early' does not necessarily mean early in life but rather early in the time course or progress of a condition; a nexus between prevention and treatment.

enthesitis	Inflammation at the place where the tendons or ligaments attach to the bones.
external cause	An environmental event, circumstance or condition as the cause of injury, poisoning or other adverse effect. The term is used in disease classification (for example, in describing causes of death).
health professional	A person who helps in identifying, preventing or treating illness or disability, such as a general practitioner, allied health professional or specialist.
health-related quality of life	A measure of the degree to which a person's satisfaction or happiness with various aspects of life (for example, physical functioning or social interaction) is affected by their health status.
hostel	An establishment for people who cannot live independently but who do not need nursing care in a hospital or nursing home . Hostels provide board, lodging or accommodation and cater mostly for the aged, distressed or those with a disability. Residents are generally responsible for their own provisions but may be given domestic assistance such as help with meals, laundry and personal care.
impairment	Any loss or abnormality of psychological, physiological or anatomical structure or function.
incidence	The number of new cases (of an illness or event) occurring during a given period. Compare with prevalence .
indicator	A key statistic chosen to describe (indicate) a situation concisely, help assess progress and performance, and act as a guide to decision making. It may have an indirect meaning as well as a direct one; for example, overall death rate is a direct measure of mortality but is often used as a major indicator of population health.
Indigenous person	A person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander and is accepted as such by the community with which he or she is associated.
indirect costs	The costs to the community due to a condition other than direct costs , such as the loss of earnings due to absenteeism and early retirement, the loss of potential tax revenue, and the value of volunteer carers.
inflammation	Response to injury or infection, marked by localised redness, heat, swelling and pain. Can also occur when there is no clear external cause and the body reacts against itself, as in autoimmune diseases .
International Classification of Diseases	The World Health Organization's internationally accepted classification of death and disease. The 10th revision (ICD-10) is currently in use.
intervention	In the context of health, refers to actions for the prevention, treatment or management of health problems, for example medicines, surgery, counselling or lifestyle advice.

juvenile arthritis	A term describing any form of inflammatory arthritis of unknown cause first occurring before the 16th birthday and lasting at least 6 weeks.
length of stay	Duration of hospital stay, calculated by subtracting the date the patient is admitted from the date of separation . All leave days, including the day the patient went on leave, are excluded. A same-day patient is allocated a length of stay of one day.
Lyme disease	A bacterial disease transmitted by ticks. Symptoms include a rash at the site of the tick bite, fever, headache, muscle aches and swollen lymph nodes. May cause arthritis and heart problems if untreated.
medicines	Agents used to treat disease or injury; includes both pharmaceuticals and non-pharmaceuticals. Can include items purchased from a pharmacy (prescribed or not prescribed), health food shop or supermarket, including vitamins and herbal products.
morbidity	Refers to ill health in an individual and to levels of ill health in a population or group.
mortality	Death.
multi-disciplinary care	A team approach to the provision of health care by all relevant health and non-health community-based, medical and allied health disciplines.
multiple sclerosis	An autoimmune disease that affects the central nervous system.
musculoskeletal	Relating to the muscles, joints and bones.
National Health Priority Areas (NHPAs)	A collaborative initiative of Commonwealth, State and Territory Governments that seeks to focus public attention and health policy on areas that contribute significantly to the burden of disease in Australia and for which there is potential for health gain.
non-admitted patient	A patient who receives care from a recognised non-admitted patient service or clinic of a hospital, including emergency departments and outpatient clinics.
nursing homes	Establishments which provide long-term care involving regular basic nursing care for people who are frail, disabled, convalescing or with a chronic illness, or for senile inpatients.
obesity	Marked degree of overweight, defined as body mass index of 30 or over.
optimal	Most desirable possibility under a restriction expressed or implied.
osteoarthritis	A chronic and common form of arthritis , affecting mostly the spine, hips, knees and hands. It first appears from the age of about 30 and is more common and severe with increasing age.
osteoporosis	Thinning and weakening of the bone substance, with a resulting risk of fracture.

overweight	Defined as a body mass index of 25 or over. See also obesity .
prescription drugs	Pharmaceutical drugs available only on the prescription of a registered medical practitioner and available only from pharmacies.
prevalence	The number of cases (of illness or events) present in a population at a given time. Compare with incidence .
prevention	Stopping an event or episode from occurring or progressing by performing or avoiding certain activities.
principal diagnosis	The diagnosis describing the problem that was chiefly responsible for the patient's episode of care in hospital.
principal procedure	The most significant procedure that was performed for treatment of the principal diagnosis .
psoriasis	A condition marked by red, scaly areas of skin, particularly on the knees, elbows and scalp but affecting any part of the body. It is thought to be due to increased activity of the immune system in the skin. In some cases the joints may also be involved, leading to arthritis, often in the knees, back or ankles.
reactive arthritis	A form of arthritis that develops after an infection, often marked by the combination of arthritis, conjunctivitis and urethritis. It occurs mainly in young men and in most cases resolves within 12 months. Sometimes called Reiter's syndrome.
rheumatic fever	A delayed complication of an untreated streptococcal infection, involving fever, inflammation of the joints and damage to the heart valves.
rheumatoid arthritis	A chronic autoimmune disease whose most prominent feature is joint inflammation, most often affecting the hand joints in symmetrical fashion. Other parts of the body, notably the eyes, heart and blood vessels, may also be affected. Can occur in all age groups but most commonly appears between ages 35 to 45.
rickets	A disease caused by vitamin D deficiency, which leads to softening and weakening of the bones.
risk factor	Any factor that presents a greater risk of a health disorder or other unwanted condition or event. Some risk factors are regarded as causes of disease, others are not necessarily so.
same-day patients	Hospital patients who are admitted and separated on the same day.
scleroderma	A chronic disease that causes thickening and tightening of the skin. The deeper tissues and internal organs may also be affected. Also called systemic sclerosis.

self-management	Involves (the individual with the condition) engaging in activities that protect and promote health; monitoring and managing of symptoms and signs of illness; managing the impacts of illness on functioning, emotions and interpersonal relationships; and adhering to treatment regimes.
separation	The formal process by which a hospital records the completion of treatment and/or care for an admitted patient .
special needs group/ at risk group	Refers to groups of people who have needs relating to their health that are not always considered initially, or who have particular requirements, or who may be disadvantaged. Examples include people living in rural and remote areas, Indigenous communities, socioeconomically or intellectually disadvantaged people, and people in custody.
statistical significance	An indication from a statistical test that an observed difference or association may be significant or 'real' because it is unlikely to be due alone to chance. A statistical result is usually said to be 'significant' if it would occur by chance less than once in 20 times.
symptom	Any indication of a disorder.
systemic lupus erythematosus (SLE)	A chronic autoimmune disease that affects the skin, joints and organs, commonly causing joint pain and arthritis.
Type 1 diabetes	A chronic autoimmune disease in which the body produces little or no insulin, and therefore cannot process glucose (a type of sugar) into energy. People with Type 1 diabetes need insulin replacement for survival. It occurs mostly among children and young adults, but can arise at any age.
Type 2 diabetes	The most common form of diabetes, occurring mostly in people aged 50 years or over, though becoming more common in younger people. People with Type 2 diabetes produce insulin, but may not produce enough or cannot use it effectively. It may be managed with changes to diet and exercise, oral glucose-lowering drugs, insulin injections, or a combination of these.
underlying cause of death	The condition, disease or injury initiating the sequence of events leading to death; that is, the primary, chief, main or principal cause. Compare with associated cause(s) of death .
underweight	Defined as a body mass index of less than 18.5.
urethritis	Inflammation of the urethra, the tube that passes urine from the bladder to the outside.
uveitis	Inflammation of the inner eye.

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