

Australian Government Australian Institute of Health and Welfare

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ARTHRITIS SERIES Number 17

# Population differences in health-care use for arthritis and osteoporosis in Australia

August 2011

Australian Institute of Health and Welfare Canberra Cat. no. PHE 147 The Australian Institute of Health and Welfare is a major national agency which provides reliable, regular and relevant information and statistics on Australia's health and welfare. The Institute's mission is authoritative information and statistics to promote better health and wellbeing.

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This publication is part of the Australian Institute of Health and Welfare's Arthritis series. A complete list of the Institute's publications is available from the Institute's website <www.aihw.gov.au>.

ISSN 1833-0991 ISBN 978-1-74249-191-2

#### Suggested citation

Australian Institute of Health and Welfare 2011. Population differences in health-care use for arthritis and osteoporosis in Australia. Arthritis series no. 17. Cat. no. PHE 147. Canberra: AIHW.

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Published by the Australian Institute of Health and Welfare

Please note that there is the potential for minor revisions of data in this report. Please check the online version at <www.aihw.gov.au> for any amendments.

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# Acknowledgments

The authors of this report were Alice Crisp, Tracy Dixon, Kuldeep Bhatia and Adrian Webster of the National Centre for Monitoring Arthritis and Musculoskeletal Conditions at the Australian Institute of Health and Welfare (AIHW). Lisa McGlynn, Teresa Dickinson, Lynelle Moon and Naila Rahman reviewed the report.

Preparation of the report was guided by the Steering Committee/Data Working Group of the National Centre for Monitoring Arthritis and Musculoskeletal Conditions. Members of the committee commented on drafts of the report and provided valuable input at all stages of its development.

This project was funded by the Australian Government Department of Health and Ageing.

# Abbreviations

ABS	Australian Bureau of Statistics
AIHW	Australian Institute of Health and Welfare
ARIA	Accessibility/Remoteness Index of Australia
ASGC	Australian Standard Geographical Classification
bDMARD	biological disease-modifying antirheumatic drug
BMI	body mass index
CD	Collection District
CURF	confidentialised unit record file
DMARD	disease-modifying antirheumatic drug
GP	general practitioner
IRSD	Index of Relative Socioeconomic Disadvantage
NATSIHS	National Aboriginal and Torres Strait Islander Health Survey
NHS	National Health Survey
SLA	Statistical Local Area
SES	socioeconomic status

# Summary

This report examines the differences in health-care use for doctor-diagnosed osteoarthritis, rheumatoid arthritis and osteoporosis between population groups. The report uses data from the 2004–05 National Health Survey, the 2004–05 National Aboriginal and Torres Strait Islander Health Survey and the AIHW National Hospital Morbidity Database. The focus is on health service use for those who report being diagnosed with the condition.

Several differences between population groups were noted in the use of primary health services and joint replacements for these conditions, particularly in relation to sex and socioeconomic status.

#### Sex

- Females were more likely to take actions to manage their osteoarthritis or osteoporosis in the 2 weeks before the 2004–05 National Health Survey than males. These actions included visiting a health professional, taking medication or making lifestyle changes. The level of inaction was 24% lower for females than males for osteoarthritis, and 29% lower for females than males for osteoporosis. No difference was noted for rheumatoid arthritis.
- Among those with osteoarthritis or osteoporosis, the rate of joint replacement surgery was lower for females than males. This contrasts with a tendency for females to have more severe disease.
- Among those with rheumatoid arthritis, females had a higher rate of joint replacement than males. This is consistent with a tendency toward more severe disease in females.

#### Socioeconomic status

- Complementary medicine use for osteoarthritis was 32% lower in the lowest socioeconomic group than in the highest socioeconomic group. Similar results were noted for rheumatoid arthritis and osteoporosis.
- The rate of partial knee replacement for osteoarthritis was 38% lower among the lowest socioeconomic group than among the highest socioeconomic group. The rate of total hip replacement was 18% lower in the lowest socioeconomic group. These results contrast with the higher prevalence of osteoarthritis in the lowest socioeconomic group.
- The rate of total hip replacement for osteoporosis was 45% lower for those in the lowest socioeconomic group than for those in the highest socioeconomic group. There was no correlation between socioeconomic status and osteoporosis prevalence.

# 1 Introduction

In Australia, differences in health outcomes have been observed for population groups such as Aboriginal and Torres Strait Islander people, those living in rural and remote areas, and people with lower socioeconomic status (SES) (AIHW 2010).

Differences in health outcomes can result from a variety of factors, including health-related behaviours, socioeconomic situations and environmental settings (AIHW 2010). Variations in access to and use of health services are also likely to contribute to these differing health outcomes.

This report explores differences or disparities in health-care use in Australia for the management of osteoarthritis, rheumatoid arthritis and osteoporosis in various population groups.

## What are health-care disparities?

Health-care disparities refer to differences in health and health care between population groups such as racial, ethnic, rural and remote, and SES groups (AHRQ 2003). Health-care disparities can be defined as 'population-specific differences in the presence of disease, health outcomes, or access to health care' (Health Policy Institute of Ohio 2004 p.3).

# How can disparities arise?

A variety of factors may give rise to disparities in health care, including:

- population attributes such as age and sex structure, genetic composition, health-related behaviours and disability levels
- variation in demand and unmet need, including disease prevalence and severity levels
- barriers to care, including service accessibility and cost
- overt or subtle discrimination
- cultural inhibitions and linguistic difficulties in seeking help
- poor understanding of the health system how it works and what services are available.

# Disparities in health-care use for arthritis and osteoporosis

Some groups in the Australian population experience disadvantage when it comes to health care and consequently health outcomes (AIHW 2010).

A need to address disparities in health-care access and outcomes in certain population groups has been recognised by the Australian Government through the Social Inclusion Agenda which includes strategies such as 'Closing the Gap' for Indigenous Australians.

Disparities in health-care use for musculoskeletal conditions are particularly important, as musculoskeletal conditions are the leading cause of long-term disability in Australia (AIHW 2008b).

Health services are of central importance in managing osteoarthritis, rheumatoid arthritis and osteoporosis. Early and effective treatment not only plays an important role in delaying disease onset but also reduces the severity of symptoms and the level of associated disability.

In common with most chronic conditions, the treatment and management of arthritis and osteoporosis occurs in a variety of settings including primary care, hospitals and allied health services.

General practitioners (GPs) may provide an initial diagnosis, relevant referrals, pharmaceutical prescriptions, and advice on self-management strategies and prevention of complications. Specialists prescribe more specialised drugs or other treatment, and deal with more complex issues; this is particularly the case for rheumatoid arthritis (AIHW 2008b).

Hospital services for these conditions provide surgical intervention or more specialised treatment. For osteoarthritis and rheumatoid arthritis, joint replacement surgery is used to improve functioning and reduce pain in the affected joint.

For osteoporosis, joint replacement surgery is used to repair the fractured joints that can stem from the condition.

Allied health-care professionals, such as physiotherapists and occupational therapists, help to manage pain and increase functioning (AIHW 2008b).

Complimentary medicines can play a role in reducing pain and inflammation, and slowing the progression of these conditions (Vitetta et al. 2008). Supplements such as glucosamine, fish oil containing omega-3 fatty acids, calcium and vitamin D have been found to be effective (Goldberg & Katz 2007).

For these reasons, information about access to and use of medical treatment for these conditions is highly relevant to health policy (Dieppe 2006).

# Natural history and management of arthritis and osteoporosis

#### Osteoarthritis

Osteoarthritis is a common chronic condition in which the cartilage in the moveable joints is damaged or worn away over time. It most often affects the spine, knees, hips and hands. Symptoms include pain, swelling, stiffness and restricted movement of the affected joints.

Osteoarthritis most commonly develops in people aged 45 years and over. The condition usually progresses slowly, with symptoms such as pain and functional impairment becoming more severe over time.

Risk factors for osteoarthritis include a high body mass index (BMI), physical inactivity, joint trauma and repetitive joint-loading tasks. More females than males are affected.

Treatment options for osteoarthritis include medications to reduce pain and inflammation, physiotherapy, occupational therapy, weight loss and exercise. Joint replacement surgery is used in severe cases to improve functioning and reduce pain in the affected joint.

#### **Rheumatoid arthritis**

Rheumatoid arthritis is a chronic inflammatory disease in which the immune system attacks and destroys the tissues of the body, particularly those lining the joints. Symptoms may include joint pain, swelling and stiffness, as well as fatigue, weakness, general malaise and fever. The joints are usually affected in a symmetrical fashion, with hands most often involved.

Rheumatoid arthritis is a multisystem disease, affecting a range of organs and tissues including the heart, lungs, nerves and eyes.

The onset of rheumatoid arthritis is most common between the ages of 30 and 55 years. The disease usually involves a rapid loss of functioning within the first 2 years after onset.

Smoking and a family history of the condition are risk factors for rheumatoid arthritis. More females than males are affected.

The use of disease-modifying antirheumatic drugs (DMARDs and bDMARDs) can slow the progression of rheumatoid arthritis. Other treatment options include medication to reduce pain and inflammation, physiotherapy, occupational therapy and exercise. Joint replacement surgery is used in severe cases.

#### Osteoporosis

Osteoporosis is a progressive disease in which bones lose density and structural quality. It is associated with an increased risk of fracture following minimal trauma – that is, trauma that would not break a healthy bone.

Osteoporotic fractures are most common at the hip, pelvis, wrist, shoulder, spine and ankle.

People are often unaware that they have osteoporosis because there are no symptoms until a fracture occurs.

Osteoporosis most commonly develops in ages 55 years and over. Major risk factors include a family history of the condition, a low BMI, low vitamin D levels, low calcium uptake, smoking, excess alcohol consumption, insufficient exercise, reduced oestrogen levels and long-term corticosteroid use. More females than males are affected.

Interventions to reduce the risk of fracture are important for people with osteoporosis. These include exercise, nutrition, reducing the risk of falls, and medications that reduce the absorption of minerals from the bones and promote bone strength. The treatment for fractures includes reconstructive surgery and rehabilitation activities such as physiotherapy and occupational therapy.

# Monitoring disparities in health-care use for arthritis and osteoporosis

This report investigates whether disparities exist in health-care use for arthritis and osteoporosis for different population groups in Australia. The following population groups are investigated:

- males and females
- people in urban, rural and remote areas
- populations of differing SES

- populations of differing country of birth
- Indigenous Australians and other Australians.

The analysis presented in this report is based on three different data sources:

- National Health Survey (NHS) 2004–05
- National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) 2004-05
- Australian Institute of Health and Welfare (AIHW) National Hospital Morbidity Database for 2004–05.

In this report, the NHS and the NATSIHS are used to estimate the prevalence of doctordiagnosed osteoarthritis, rheumatoid arthritis and osteoporosis in the different population groups. It is recognised that there are discrepancies in these estimates, relating to the identification of people with these conditions and the coverage of the Australian population in the NHS (Box 1.1). It is also recognised that access to services influences both the prevalence estimates as well as health service use. The ability of an individual to access a GP in a timely way, for example, can influence both the likelihood of being diagnosed with a condition as well the health service use of the individual. Because access to services affects both aspects, it potentially confounds the analysis of disparities in health service use.

For this reason, this report focuses on health service use for musculoskeletal conditions among people who have been diagnosed with the condition. The report shows how people engage with the health system once they have been diagnosed. This approach helps to limit the influence of access to services on the prevalence estimates.

An important implication of this method is that the findings of this report cannot be extrapolated beyond the group of diagnosed individuals captured in the survey data. Additionally, access to services is likely to affect the timing of diagnosis, which in turn can affect disease severity and therefore health service use. This factor should be kept in mind when interpreting these results.

#### Box 1.1: Estimating prevalence from the NHS and the NATSIHS

It is important to note that the NHS and the NATSIHS only collect information about musculoskeletal conditions that have been diagnosed by a doctor. Many people will have these conditions but will not have been diagnosed (NAMSCAG 2004). This is the case for osteoporosis, for example, as there are no outward symptoms of low bone density. Osteoporosis is often only diagnosed following a minimal trauma fracture. In some cases, the level of access to health services will affect diagnosis rates.

There are no data sources that monitor the prevalence of undiagnosed musculoskeletal conditions at the national level, broken down by population group.

In this report, the term 'prevalence' is used to mean the prevalence of a doctor-diagnosed condition unless otherwise specified.

The NHS does not collect information about people living in nursing homes or other institutions. Thus, the NHS results given here only apply to people who do not live in nursing homes or other institutions.

The three data sources are used to estimate the level of use of various health services across the different populations, in comparison with the prevalence.

The health services investigated in this report are outlined in Table 1.1.

		Type of data	
Data source	Measure	Service/action	Period
National Health Survey	Visits to clinicians	GPs/specialists	2 weeks before survey
2004–05	Use of medicines	Pharmaceuticals	2 weeks before survey
		Complementary medicines	2 weeks before survey
	No action taken	GPs/specialists, medicines, lifestyle changes	2 weeks before survey
National Aboriginal and Torres Strait Islander Health Survey 2004–05	Use of medicines	Pharmaceuticals	2 weeks before survey
AIHW National Hospital Morbidity Database	Procedures	Primary total knee and hip replacement	12-month timeframe (financial year)
2004–05		Partial knee and hip replacement	

The NHS and the NATSIHS provide information on actions taken to manage arthritis and osteoporosis, such as visits to GPs and specialists, and medication use, among members of the different population groups.

The NHS also provides information on the number of individuals who took no action for their condition, a measure covering health service use as well as personal lifestyle changes.

The AIHW National Hospital Morbidity Database provides information about the level of use of joint replacement surgery, a medical intervention necessary to manage severe disease, across the different population groups.

In a few cases, the numbers of surgeries in each population group were too small to allow for meaningful analysis. The number of joint replacement surgeries for musculoskeletal conditions among Indigenous Australians were not analysed due to small numbers (Box 1.2). Also, with the exception of the comparison between males and females, joint replacements for rheumatoid arthritis could not be compared between the various population groups.

# Box 1.2: Joint replacement rates among Indigenous Australians are not included in this report

It was not possible to publish the joint replacement rates for musculoskeletal conditions among Indigenous Australians due to the small numbers involved.

### Methods

Many of the rates presented in this report have been age standardised – a technique used to account for the effect of differences in age structure when comparing different population groups. Two different age standardisation procedures are used: direct age standardisation and indirect age standardisation. Detailed description of these two methods is given in Appendix 1.

## About this report

This report is organised into seven chapters including this introductory chapter.

Chapters 2–6 describe the prevalence and health service use for musculoskeletal conditions across the different sets of population groups under study here. Chapter 2 compares males and females, and Chapter 3 compares urban, rural and remote Australians. Chapter 4 looks at populations of differing SES. Chapter 5 looks at populations of differing country of birth, and Chapter 6 compares Indigenous Australians and other Australians.

The prevalence data in these chapters can be used as a broad indicator of the recognised health service needs in the population groups. However, they do not reflect unrecognised or undiagnosed need.

These chapters then provide information about the use of health services for these conditions in the different population groups. Two different types of data on health service use are presented. First, comparisons are made of the use of primary health services to manage these conditions. Second, comparisons are made of knee and hip replacements to manage severe disease. For osteoarthritis and osteoporosis, joint replacement surgery improves functioning and reduces pain in the affected joint. For osteoporosis, the surgery replaces the fractured joints that can stem from the condition.

Chapter 7 provides a discussion of the differences observed in health-care use, and highlights areas that potentially represent health-care disparities in the context of osteoarthritis, rheumatoid arthritis and osteoporosis.

Descriptions of the data sources and methods used in this report are outlined in Appendix 1. Detailed statistical tables are given in Appendix 2.

All statistical tests in this report are carried out at the 95% confidence level.

# 2 Sex

## Prevalence

An estimated 1.3 million Australians (9.8% of the population aged 25 years and over) had doctor-diagnosed osteoarthritis in 2004–05 (Table 2.1). The estimates were much smaller for rheumatoid arthritis (375,000, or 2.8%) and osteoporosis (578,500, or 4.2%).

All three conditions were more common in females than in males. After adjusting for age structure, females were 1.5 times as likely as males to have osteoarthritis or rheumatoid arthritis, and 5 times as likely to have osteoporosis.

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
Sex	Number ('000)	Per cent	Number ('000)	Per cent	Number ('000)	Per cent
Males	481.2	7.6	146.0	2.3	88.6	1.4
Females	822.2	11.9	229.5	3.4	489.9	7.0
People	1,303.4	9.8	375.4	2.8	578.5	4.2

Table 2.1: Prevalence of osteoarthritis, rheumatoid arthritis and osteoporosis, by sex, 2004-05

Notes

1. Ages 25 years and over.

2. Doctor-diagnosed cases only.

3. Rates have been directly age standardised to the Australian population as at 30 June 2001.

Source: AIHW analysis of the ABS 2004-05 NHS.

### Primary health service use

Females with rheumatoid arthritis visited GPs or specialists more commonly than males for the condition. Males with osteoporosis visited GPs and specialists more commonly than females for the condition. There was little difference between the two sexes in visits to GPs and specialists for osteoarthritis (Table 2.2; Table A2.7).

Table 2.2: Visits to GPs or specialists by people with osteoarthritis, rheumatoid arthritis and osteoporosis, by sex, 2004–05

Osteoarthritis		Rheumatoid arthritis		Osteoporosis		
Sex	Number ('000)	Per cent <sup>(a)</sup>	Number ('000)	Per cent <sup>(a)</sup>	Number ('000)	Per cent <sup>(a)</sup>
Males	58.2	12.1	16.8	11.5	10.9	*12.3
Females	101.1	12.3	35.8	15.6	43.0	8.8

\* Subject to a high standard error and should be used with caution (that is, relative standard error of 25–50%).

(a) Percentage of people with the musculoskeletal condition that visited the GP or specialist.

Notes

1. Ages 25 years and over.

2. Doctor-diagnosed cases only.

3. Visits to GPs or specialists in the 2 weeks before the survey.

Source: AIHW analysis of the ABS 2004-05 NHS.

No difference in pharmaceutical use was noted between males and females with arthritis or osteoporosis (Table A2.8).

Females with osteoarthritis or osteoporosis were more likely to use complementary medicines to manage their condition than males with these conditions. No sex difference was noted in the use of complementary medicines for managing rheumatoid arthritis (Table 2.3; Table A2.9).

Table 2.3: Use of complementary medicines	s by people with	osteoarthritis,	rheumatoid	arthritis and
osteoporosis, by sex, 2004–05				

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
Sex	Number ('000)	Per cent <sup>(a)</sup>	Number ('000)	Per cent <sup>(a)</sup>	Number ('000)	Per cent <sup>(a)</sup>
Males	183.3	38.1	55.7	38.2	21.3	24.1
Females	411.6	50.1	87.7	38.2	209.5	42.8

(a) Percentage of people with the musculoskeletal condition that used complementary medicines.

Notes

1. Ages 25 years and over.

2. Doctor-diagnosed cases only.

3. Use of complementary medicine in the 2 weeks before the survey.

Source: AIHW analysis of the ABS 2004-05 NHS.

Females were more likely to take actions to manage their osteoarthritis or osteoporosis than males. This measure covers actions such as medicine use, visits to a health professional, and lifestyle choices relating to diet and exercise. The level of inaction was 24% lower for females than males for osteoarthritis, and 29% lower for females than males for osteoporosis (Table 2.4; Table A2.10).

No difference was noted between males and females in relation to taking no action to manage their rheumatoid arthritis.

Table 2.4: No action taken for osteoart	thritis, rheumatoid	arthritis and osteo	porosis, by sex	, 2004-05
				,

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
Sex	Number ('000)	Per cent <sup>(a)</sup>	Number ('000)	Per cent <sup>(a)</sup>	Number ('000)	Per cent <sup>(a)</sup>
Males	133.0	27.6	33.1	22.7	31.7	35.8
Females	171.5	20.9	53.5	23.3	124.2	25.4

(a) Percentage of people with the musculoskeletal condition that took no management action.

Notes

1. Ages 25 years and over.

2. Doctor-diagnosed cases only.

3. Self-report of no action taken in the 2 weeks before the survey.

Source: AIHW analysis of the ABS 2004-05 NHS.

### Joint replacement surgery

#### Osteoarthritis

The number of joint replacements where the principal diagnosis was osteoarthritis is shown in Table 2.5. The three most common types of joint replacement for osteoarthritis are given.

Among people with doctor-diagnosed osteoarthritis, males had a higher surgery rate than females (Table 2.5; Table A2.24). For example, the rate of primary total hip replacement surgery among those with osteoarthritis was 34% higher for males than females.

	Primary total hip replacement		Partial knee replacement		Primary total knee replacement	
Sex	Number	Rate	Number	Rate	Number	Rate
Males	7,962	1,655	1,645	342	10,016	2,081
Females	9,330	1,135	1,589	193	14,054	1,709

Table 2.5: Joint replacement for osteoarthritis, by sex, 2004-05

Notes

1. Ages 25 years and over.

2. More than one joint replacement may have been performed in a single hospital separation. This analysis is based on the number of joint replacements performed.

 Rate per 100,000 population with doctor-diagnosed osteoarthritis from the NHS. The NHS prevalence estimate does not cover people living in nursing homes or other institutions.

Source: AIHW National Hospital Morbidity Database.

#### **Rheumatoid arthritis**

Table 2.6 shows the two most common joint replacement procedures when the principal diagnosis was rheumatoid arthritis. Among those with doctor-diagnosed rheumatoid arthritis, females had a higher rate of joint replacement surgery than males (Table 2.6; Table A2.25).

Table 2.6: Joint replacement for rheumatoid arthritis, by sex, 2004-05

	Primary total replaceme	hip nt	Primary total knee replacement		
Sex	Number	Rate	Number	Rate	
Males	47	32	85	58	
Females	109	48	295	129	

Notes

1. Ages 25 years and over.

2. More than one joint replacement may have been performed in a single hospital separation. This analysis is based on the number of joint replacements performed.

3. Rate per 100,000 population with doctor-diagnosed rheumatoid arthritis from the NHS. The NHS prevalence estimate does not cover people living in nursing homes or other institutions.

Source: AIHW National Hospital Morbidity Database.

#### Osteoporosis

Table 2.7 shows the two most common joint replacement procedures when the principal diagnosis was osteoporosis. More females than males had these procedures. However, the prevalence of osteoporosis was much higher for females than males (Table 2.1). Thus, the rates of hip replacement among those with doctor-diagnosed osteoporosis were higher for males than females (Table 2.7; Table A2.26).

	Partial hip replacemer	) nt	Primary total hip replacement		
Sex	Number	Rate	Number	Rate	
Males	1,353	1,695	135	169	
Females	3,946	836	430	91	

Table 2.7: Joint replacement for osteoporosis, by sex, 2004-05

Notes

1. Ages 40 years and over.

2. More than one joint replacement may have been performed in a single hospital separation. This analysis is based on the number of joint replacements performed.

3. Rate per 100,000 population with doctor-diagnosed osteoporosis from the NHS. The NHS prevalence estimate does not cover people living in nursing homes or other institutions.

# 3 Remoteness of location

### Prevalence

#### Box 3.1: Classifying remoteness of location

This report uses the Australian Standard Geographical Classification (ASGC) Remoteness Areas classification to identify various regional areas (ABS 2008a). The classification allocates one of five remoteness categories to areas depending on their distance from major service centres. Areas are classified as *Major cities, Inner regional, Outer regional, Remote* and *Very remote*. In some cases the three most remote areas (*Outer regional, Remote* and *Very remote*) will be grouped together to form a category called *Other* areas.

The NHS does not gather data from *Very remote* areas. When NHS results are reported here, the *Other* areas group covers only *Outer regional* and *Remote* areas.

In 2004–05, two-thirds of Australians (66%) lived in *Major cities*, with a smaller proportion in *Inner regional* areas (21%) and *Other* areas (13%; including *Outer regional*, *Remote* and *Very remote* areas).

The remoteness categories for the NHS were based on the area of usual residence at the Collection District (CD) level. The remoteness categories for the AIHW National Hospital Morbidity Database were based on the area of usual residence at the Statistical Local Area (SLA) level. SLAs comprise one or more CDs. Thus, the remoteness categories for the NHS were calculated at a finer level than for the AIHW National Hospital Morbidity Database. This should be kept in mind when interpreting the joint replacement results that compare information from these two data sources. A full discussion of the differences is included in Appendix 1.

According to the NHS data, both osteoarthritis and rheumatoid arthritis were more prevalent among people living in *Inner regional* areas than among those living in *Major cities* (Figure 3.1; Table A2.2).

Osteoporosis was less common in Other areas than in Major cities.



## Primary health service use

The level of primary health service use among people with a doctor-diagnosed musculoskeletal condition did not differ by remoteness of location.

No significant differences were noted for visits to GPs and specialists (Table A2.11), pharmaceutical use (Table A2.12), complementary medicine use (Table A2.13) or lack of action to manage the condition (Table A2.14).

## Joint replacement surgery

#### Osteoarthritis

Figure 3.2 describes regional variation in joint replacements where the principal diagnosis was osteoarthritis (Figure 3.2; Table A2.27). The rates of primary total hip and knee replacement for osteoarthritis were significantly higher in the *Inner regional* areas than in *Major cities*. This accords with the higher prevalence of osteoarthritis in *Inner regional* areas than in *Major cities* (Figure 3.1).

In contrast, several of the results were not in line with the prevalence of the condition. The rates of primary total hip and knee replacement were significantly higher in *Other* areas than in *Major cities*, despite the similar prevalence of osteoarthritis between *Other* areas and *Major cities*.

The rates of partial knee replacement were lower outside the *Major cities*, despite the fact that osteoarthritis has a higher prevalence in *Inner regional* areas than *Major cities*, and a similar prevalence between *Other* areas and the *Major cities*.



#### Rheumatoid arthritis

Due to the small numbers involved, the joint replacement rate for rheumatoid arthritis could not be analysed.

#### Osteoporosis

The rate of partial hip replacement where the principal diagnosis was osteoporosis was 14% lower in *Inner regional* areas compared with *Major cities*, a statistically significant difference (Figure 3.3; Table A2.28). The prevalence of osteoporosis did not differ between these areas (Figure 3.1).

The rate of partial hip replacement for osteoporosis was also significantly lower in *Other* areas (10% lower), compared with *Major cities*. This result is in line with the lower prevalence of the condition in *Other* areas.

The rates of primary total hip replacement for osteoporosis were similar between *Inner regional* areas and *Major cities*, but significantly lower (25%) in *Other* areas compared to *Major cities* (Figure 3.3; Table A2.28) in line with disease prevalence (Figure 3.1).



# 4 Socioeconomic status

### Prevalence

#### Box 4.1: Classifying socioeconomic status (SES)

This report uses the Index of Relative Socioeconomic Disadvantage (IRSD) to measure SES. This index allows area of usual residence to be classified by the level of socioeconomic disadvantage in relation to other areas in Australia.

This index is based on several variables including income, education, unemployment, occupation, government housing, divorce or separation, access to a car, Indigenous status and fluency in English (ABS 2003).

In this report, the results are presented for five approximately equal-sized groups and numbered from 1 to 5. Group 1 (the lowest SES group) includes the most disadvantaged households, and group 5 (the highest SES group) includes the least disadvantaged households.

Based on the information available at the time of analysis, a different approach was used to divide the population into the five SES groups for the NHS and the AIHW National Hospital Morbidity Database (Appendix 1). For the NHS 2004–05 survey the geographical area used for the calculations was the CD. The data were divided using the area-based method, where an equal number of CDs were placed in each of the five groups.

For the AIHW National Hospital Morbidity Database the geographical area used in the database was the SLA. The data were divided using the population-based method. Data from the 2001 census relating to the number of people in each SLA were taken into account in order to place the divisions in such a way that, as far as possible, each of the five groups contained an equal number of people.

Both methods produced a set of five groups that contained about 20% of the Australian population, classified by IRSD. For the two data sources, the SES groups covered similar, but not identical, groups of people. This should be kept in mind when interpreting the joint replacement results that compare information from these two data sources.

Data from the 2004–05 NHS indicate that osteoarthritis and rheumatoid arthritis tend to be more prevalent with decreasing SES. The disease prevalence was significantly higher in the two groups with the lowest SES than the group with the highest SES (Figure 4.1; Table A2.3). There was no statistically significant difference for osteoporosis.



### Primary health service use

The level of primary health service use among people with doctor-diagnosed musculoskeletal conditions did not differ by SES, with the exception of the level of use of complementary medicines.

No significant differences were noted for visits to GPs and specialists (Table A2.15), pharmaceutical use (Table A2.16) or lack of action to manage the condition (Table A2.18) for all three conditions.

Among people with a doctor-diagnosed musculoskeletal condition, the use of complementary medicines was lower in the lower SES groups than in the highest SES groups (Figure 4.2).

The level of use of complementary medicines for osteoarthritis was 32% lower in the lowest SES group than in the highest SES group. Similarly, the level of use for rheumatoid arthritis was 45% lower in the lowest SES group.

The level of use for osteoporosis was lower in the first (lowest), third and fourth SES groups, compared with the highest SES group. There was no significant difference between the second lowest SES group and the highest SES group (Figure 4.2; Table A2.17).



## Joint replacement surgery

#### Osteoarthritis

Figure 4.3 shows the socioeconomic variation in joint replacement surgery where the principal diagnosis was osteoarthritis.

The rate of primary total knee replacement for osteoarthritis was greater in the lower SES groups than the highest SES group (Figure 4.3; Table A2.29). This result is in line with the higher prevalence of osteoarthritis in the lower SES groups (Figure 4.1).

In contrast, the rates of primary total hip replacement and partial knee replacement for osteoarthritis were lower in the lower SES groups, despite the greater prevalence of osteoarthritis in these groups.

For osteoarthritis the rate of primary total hip replacement was 18% lower in the lowest SES group than the highest SES group, and the rate of partial knee replacement was 38% lower in the lowest SES group than the highest SES group (Figure 4.3; Table A2.29).



#### Rheumatoid arthritis

Due to the small numbers involved, the joint replacement rate for rheumatoid arthritis could not be analysed.

#### Osteoporosis

The rate of primary total hip replacement where the principal diagnosis was osteoporosis was 45% lower in the lowest SES group than in the highest SES group (Table A2.30). This was a statistically significant difference. There was no correlation between SES and osteoporosis prevalence (Figure 4.1).

The rate of partial hip replacement for osteoporosis revealed no relationship with SES, with the exception of a small but statistically significant lower rate in the group with the second lowest SES (Table A2.30).

# 5 Country of birth

### Prevalence

#### Box 5.1: Country of birth categorisation

The countries of birth for current Australian citizens, for the purpose of this study, were grouped into three categories: 'Australia', 'Mainly English-speaking countries' (United Kingdom, Ireland, Canada, United States of America, South Africa, New Zealand), and 'Other countries' (covering all remaining countries). These three categories are used by the Australian Bureau of Statistics (ABS) (ABS 2010).

Although it would have been preferable to use a larger number of categories for country of birth in this report, this was not possible due to the small numbers involved.

The NHS suggests that the prevalence of osteoarthritis was similar among those born in Australia or in Mainly English-speaking countries (Figure 5.1; Table A2.4). The prevalence was much lower among those born in Other countries – a statistically significant difference.

The prevalence of rheumatoid arthritis was lower among Australians born overseas (whether born in Mainly English-speaking countries or otherwise) than among those born in Australia, but these differences were not statistically significant.

The prevalence of osteoporosis was similar across all groups.



# Primary health service use

The level of primary health service use among people with a doctor-diagnosed musculoskeletal condition did not differ by country of birth.

No significant differences were noted for visits to GPs and specialists (Table A2.19), pharmaceutical use (Table A2.20), complementary medicine use (Table A2.21) or lack of action to manage the condition (Table A2.22).

## Joint replacement surgery

#### Osteoarthritis

Figure 5.2 shows the variation by country of birth for joint replacements where the principal diagnosis was osteoarthritis. Joint replacement rates for osteoarthritis were significantly lower among people born in Other countries than among those born in Australia (Figure 5.2; Table A2.31). For example, the primary total hip replacement rate was 46% lower among those born in Other countries than among those born in Australia. This is in accordance with the significantly lower prevalence of osteoarthritis among those born in Other countries (Figure 5.1).

Knee replacement rates for osteoarthritis were significantly lower among people born in Mainly English-speaking countries when compared to people born in Australia (34% lower for partial knee replacements and 24% lower for primary total knee replacements; Figure 5.2; Table A2.31), despite no significant difference in the prevalence of osteoarthritis (Figure 5.1).

Total hip replacement rates for osteoarthritis did not differ between people born in Mainly English-speaking countries and people born in Australia (Figure 5.2). The prevalence of osteoarthritis also did not differ between these groups.



#### **Rheumatoid arthritis**

Due to the small numbers involved, the joint replacement rate for rheumatoid arthritis could not be analysed.

#### Osteoporosis

Table A2.32 shows the rate of joint replacement where the principal diagnosis was osteoporosis, compared by country of birth. The rate of joint replacement for osteoporosis was similar for those born in Australia and in Mainly English-speaking countries, but significantly lower for people born in Other countries. The prevalence of osteoporosis did not differ significantly by country of birth (Figure 5.1).

# 6 Indigenous status

### Prevalence

#### Box 6.1: Indigenous identification

In this report, the population was grouped into two categories: 'Indigenous Australians' and 'Other Australians'. The 'Indigenous Australians' category covers people who identify as being of Australian Aboriginal and/or Torres Strait Islander origin. All other people are included in the 'Other Australians' category. The 'Other Australians' category includes people whose Indigenous status is unknown.

In the 2004–05 NATSIHS, a smaller list of questions was used in remote areas (a category covering *Remote* and *Very remote* areas) than was used in the NHS. This smaller list did not contain a specific question about the presence of osteoarthritis or rheumatoid arthritis. Therefore, the prevalence estimates for these two conditions among Indigenous Australians relate only to non-remote areas.

An estimated 26,000 Indigenous Australians had osteoarthritis, 12,200 had rheumatoid arthritis and 9,100 had osteoporosis in 2004–05 (NATSIHS).

Indigenous Australians were more likely than Other Australians to have osteoarthritis or rheumatoid arthritis. The prevalence of osteoporosis appeared to be similar between Indigenous and Other Australians (Figure 6.1; Table A2.5).



Indigenous Australians appear to develop osteoarthritis at younger ages than Other Australians. The prevalence of osteoarthritis was 2.2 times higher among Indigenous Australians than Other Australians in the 25–44 age group. This is a statistically significant difference (Figure 6.2; Table A2.6).



# Primary health service use

The 2004–05 NATSIHS was used to compare primary health service use between Indigenous Australians and Other Australians. Unfortunately, due to differences in survey design between the NHS and the NATSIHS, it was only possible to compare pharmaceutical use (see the NATSIHS section in Appendix 1 for a full explanation).

Among people with osteoarthritis, rheumatoid arthritis or osteoporosis, there was no significant difference in the percentage of people using pharmaceuticals between Indigenous Australians and Other Australians (Table A2.23). The results for osteoarthritis and rheumatoid arthritis only relate to non-remote areas.

## Joint replacement surgery

Due to the small numbers involved, the joint replacement rate for osteoarthritis, rheumatoid arthritis and osteoporosis among Indigenous Australians could not be analysed.

# 7 Discussion

The accessibility of health care for osteoarthritis, rheumatoid arthritis and osteoporosis is an important issue. Early and effective treatment can delay disease onset, and reduce the severity of symptoms and the level of associated disability.

This report investigated the level of use of primary health services and joint replacement surgery for arthritis or osteoporosis in different population groups in Australia. The prevalence of doctor-diagnosed arthritis or osteoporosis was used as a broad indicator of the recognised health service needs in the population groups.

The 2004–05 NHS provided the information about primary health service use and condition prevalence used in this report. This survey does not cover people in nursing homes or other institutions. The AIHW National Hospital Morbidity Database provided the information about joint replacement surgery used in this report.

In terms of seeking primary health services or taking action to deal with the problem, several differences were noted between various population groups, defined on the basis of sex, remoteness of location, SES, country of birth or Indigenous status. Significant differences were also found in the uptake of joint replacement surgery when compared along the same population lines.

### Use of primary health services

In a few cases, the reported use of primary health services differed significantly between the population groups.

Males were more likely than females to take no action to manage their osteoarthritis or osteoporosis in the 2 weeks before the 2004–05 NHS. This could be due to a pattern, identified in other studies, that suggests males are less likely to take appropriate and timely action to manage health problems that do not require immediate attention (Smith et al. 2006).

This pattern did not apply to rheumatoid arthritis, perhaps due to the fast onset and severe symptoms of this condition, which are more likely to necessitate prompt medical care.

No difference was noted in primary health service use for these conditions by remoteness of location or country of birth.

Primary health service use differed by SES, with a lower level of use of complementary medications in the groups with lower SES. Complementary medications for musculoskeletal conditions can play a role in early preventive interventions for these conditions. For example, calcium supplements, fish oil and glucosamine are all classed as complementary medications, and work to slow the progression of musculoskeletal conditions (Goldberg & Katz 2007).

Among people with a musculoskeletal condition, the percentage of people using pharmaceuticals for the condition did not differ between Indigenous Australians and Other Australians.

# Joint replacement surgery

Significant differences were noted for knee and hip replacement surgery between the population groups. The differences were not only noted in the uptake of knee and hip replacement surgery by remoteness of location, SES and country of birth but also between males and females.

In the case of osteoarthritis and rheumatoid arthritis, knee and hip replacement surgery is an elective procedure that is used at the advanced stages of the disease to improve functioning and reduce pain. A low rate of this surgery in a certain population group, among those with the condition, may indicate that the population group is underserviced for this important intervention. However, another explanation for a low surgery rate is that the population group has a lower proportion of the severe cases that require surgery.

For osteoporosis, knee and hip replacement surgery may be recommended to repair the minimal trauma fractures that stem from the condition. Due to the pain and functional limitations associated with a fractured knee or hip, the level of unmet need for surgery is expected to be negligible. Based on this assumption, a low rate may be attributed to a lower proportion of the severe cases that lead to fractures.

Joint replacement rates are not compared between Indigenous Australians and Other Australians in this report. The number of joint replacements among patients identifying as Indigenous was too low to allow meaningful analysis. A previous study obtained larger numbers by looking at all hospital procedures used to treat a musculoskeletal condition and found a 20% lower procedure rate among Indigenous Australians than among Other Australians (AIHW 2008a).

In this section, joint replacement data from the AIHW National Hospital Morbidity Database are compared with prevalence data from the NHS. It is important to note that there were small differences in the methods used to divide the population by remoteness and SES for these two data sources. The different methods are outlined in Appendix 1. The remoteness and SES groups in the two data sources cover similar, but not identical, groups of people.

#### Osteoarthritis

The rate of knee and hip replacement for osteoarthritis varied by sex, remoteness, SES and country of birth. Among those with osteoarthritis, males had a higher rate of knee and hip replacement than females. This difference is not consistent with the generally higher severity of knee osteoarthritis among women, and the equivalent severity of hip osteoarthritis between men and women (Srikanth et al. 2005).

Partial knee replacements for osteoarthritis were lower than expected (based on prevalence) outside the *Major cities*. Total knee and total hip replacements for osteoarthritis were higher than expected (based on prevalence) in the more remote areas (*Other* areas).

Population groups with lower SES had lower rates of total hip and partial knee replacement surgery for osteoarthritis than groups with higher SES. This result contrasts with the higher prevalence of osteoarthritis in the lower SES groups. This suggests that there may be some financial barriers for these types of surgery. The rate of primary knee replacement was higher in the lower SES groups, in line with the higher prevalence of osteoarthritis in the lower SES groups.

People born overseas received the expected level of surgery for osteoarthritis, with the exception that those born overseas in Mainly English-speaking countries received knee replacements at a lower rate than expected based on prevalence.

#### Rheumatoid arthritis

Among those with rheumatoid arthritis, the surgery rates were higher for females than males, potentially reflecting the generally higher severity of the condition among females (Sokka et al. 2009).

Due to the small numbers involved, it was not possible to analyse the joint replacement data for rheumatoid arthritis for the other population groups.

#### Osteoporosis

Hip replacement rates for osteoporosis differed between many of the population groups under study. Knee replacements were less common for this condition, and were not included in the analysis.

Among those with osteoporosis, males had a higher rate of hip replacement surgery, despite the generally higher severity of the condition among women (Seeman 2002).

Hip replacement rates for osteoporosis were generally in line with prevalence by remoteness. However, partial hip replacement rates were lower than expected, based on prevalence, in *Inner regional* areas.

Hip replacement rates for osteoporosis were lower than expected (based on prevalence) for people born overseas in non-English-speaking countries.

Partial hip replacement rates for osteoporosis were generally in line with prevalence for the different SES groups. Total hip replacement rates for osteoporosis were lower than expected (based on prevalence) for those with lower SES.

# **Appendix 1: Data sources and methods**

### Data sources

Three different data sets were used for the analysis presented in this report. These are the 2004–05 National Health Survey (NHS), the 2004–05 National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) and the AIHW National Hospital Morbidity Database.

#### **National Health Survey**

The NHS, conducted every 3 years by the ABS, is designed to collect national information about the health of Australians, their use of health services and facilities, and health-related aspects of their lifestyle (ABS 2006b). A community-based survey, the NHS does not collect information from people living in nursing homes or other institutions. The NHS data are based on self-reports. The survey does not gather data from *Very remote* areas.

In addition to sociodemographic information, health-related behaviours and risk factors, the NHS collects information on several doctor-diagnosed, long-term conditions that have lasted or are likely to last 6 months. Information about the use of health services is mostly based on actions taken to deal with the condition in question in the 2 weeks before the survey.

This report has used 2004–05 NHS CURF (confidentialised unit record file) data on three long-term conditions, namely osteoarthritis, rheumatoid arthritis and osteoporosis, to generate linked information about their prevalence, health service use and other health-related actions (to manage the condition). In particular, the following health actions were investigated: visits to GPs or specialists, use of pharmaceuticals or complementary medications, and whether no action was taken to manage the condition. The measure of 'no action' related to actions such as medicine use, visits to a health professional and lifestyle choices such as diet and exercise. This measure included cases where the respondent did not know if any action was taken.

Sociodemographic information was used to identify population groups for comparative analysis.

#### National Aboriginal and Torres Strait Islander Health Survey

The NATSIHS was conducted by the ABS in 2004–05, concurrently with the NHS. The NATSIHS is intended to be repeated at 6-yearly intervals. The 2004–05 survey included responses from 10,439 Indigenous Australians, and collected information from remote and non-remote areas (ABS 2006a). Data collected from Indigenous Australians in the NHS were pooled with the NATSIHS collection.

This report used data from the 2004–05 NATSIHS CURF. The 2004–05 NATSIHS questionnaire was mostly similar to that used for the 2004–05 NHS. It was possible to extract information on condition prevalence and use of pharmaceuticals. However, due to differences in the questions, it was not possible to collect comparable information to the NHS on the following subjects: visits to the GP or specialist, complementary medicine use and actions taken for the musculoskeletal condition. Therefore, these results could not be directly compared between Indigenous Australians and Other Australians.

#### **AIHW National Hospital Morbidity Database**

Based on administrative records, 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 using standard data definitions. The database covers almost all hospitals in Australia including public, private, psychiatric and day hospital facilities.

'Separation' is the term for an episode of care for an admitted patient, which can be a total hospital stay (from admission to discharge, transfer or death), or a portion of a hospital stay beginning or ending in a change of type of care (for example, from acute to rehabilitation).

The database includes information on sex, age, Indigenous status, area of usual residence, diagnoses and procedures (AIHW 2006). Diagnosis codes are based on the 10th revision of the International Statistical Classification of Diseases and Related Health Problems, Australian Modification (ICD-10-AM) 4th Edition (NCCH 2004b). Procedure codes are based on the Australian Classification of Health Interventions 4th Edition (NCCH 2004a).

Information was extracted from the database relating to all joint replacements where the principal diagnosis was arthritis or osteoporosis, and the separation occurred within the 2004–05 financial year. More than one joint replacement may have been performed in a single hospital separation.

Separations were included if the care type was 'null'. Separations were not included if the care type was 'hospital boarder', 'posthumous organ donation' or 'newborn unqualified days'.

Certain joint replacement results were not published due to small numbers. When less than 40 procedures occurred in a population group, the results were not published.

# Demographic, statistical and epidemiological methods

#### Age standardisation

This technique is used to remove the effect of differences in age structure when comparing rates between different population groups. Two different age standardisation methods are used in this report: direct and indirect age standardisation. The direct method is used when the populations under study are large and the age-specific rates are reliable. The indirect method is used when the populations to be compared are small or where there is some uncertainty about the stability of age-specific rates.

#### Direct age standardisation

For direct age standardisation, the age distribution of a population is set equal to that of a reference population and the age-specific rates of the population in question are rescaled. The directly standardised rate can be compared with any other directly standardised rate that was calculated using the same reference population. In this report, the mid-year 2001 Australian population was used as the reference population (ABS 2008b).

#### Indirect age standardisation

For indirect age standardisation, one of the populations under study is chosen as the reference population. The number of cases observed in the population of interest is divided by the number that would be expected if this population had the same age-specific rates as the reference population. This produces a rate ratio. The rate ratio can be thought of as a summary measure of the difference in the rate between the population of interest and the reference population, once differences in age structure have been corrected for.

The rate ratio in the reference population is 1 by definition. In the population of interest, a rate ratio greater than 1 indicates that this population has a higher rate than the standard population. Conversely, a rate ratio less than 1 indicates that this population has a lower rate than the standard population.

The rate ratio can be expressed in the form of a percentage difference. For example, a rate ratio of 1.2 in the population of interest represents a 20% higher rate in this population than in the reference population.

#### Significance testing

Significance testing is a way of marking differences between various population groups. Saying that two values are 'significantly different' means that there is strong evidence of a real difference between the two values that is not by chance alone.

In this report 95% confidence intervals were used to test significance. The confidence intervals were calculated using the methods described below.

#### Confidence intervals for NHS and NATSIHS data

Confidence intervals for survey data were calculated using the method described in AIHW 2005, p. 304, based on the method given by Kendall and Stuart (1969).

#### Confidence intervals for hospital data

Although hospital data contain a complete count of events, significance testing was carried out because the number of joint replacement surgery events was small, and was thus expected to be influenced by random error. The hospital data in this report were compared between population groups using indirect standardisation. Confidence intervals for the indirectly standardised hospitalisation rates were calculated on the basis of the number of observed events using the square-root transform, as described by Breslow and Day (1987 p. 70–1).

This formula calculates the 95% confidence interval as:

Lower bound = 
$$RR \left( 1 - \frac{1.96}{2D^{1/2}} \right)^2$$

Upper bound =  $RR\left(\frac{D+1}{D}\right)\left(1 + \frac{1.96}{2(D+1)^{1/2}}\right)^2$ 

RR is the rate ratio and D is the observed number of events in the population of interest.

#### Estimation of disease prevalence

Prevalence refers to the number of people affected by a particular condition in the population at a given time. The term is often used interchangeably with prevalence rate, which technically is the number of affected individuals in the population divided by the resident population at the time of estimation.

This report was concerned with the prevalence of arthritis and osteoporosis in various population groups in Australia. The identification of individuals with these conditions in the 2004–05 NHS and the NATSIHS was based on self-reports of the presence of a doctor-diagnosed condition at the time of the survey. Estimation of disease in this way is called 'point prevalence'.

For osteoarthritis, the prevalence was compared between Indigenous Australians and Other Australians using age-specific rates (Figure 6.2). The prevalence rates for the three conditions for males and females were directly age standardised (Table 2.1). For all other comparisons between population groups, the prevalence rates were indirectly age standardised, due to the smaller numbers involved.

#### Health service use

A variety of measures can be used to study health service use, such as population health surveys, information given by service providers and administrative records. This report focuses on two of these sources, namely population health surveys and administrative records.

Primary health service use was investigated using the NHS and NATSIHS population surveys. Joint replacement surgery for arthritis and osteoporosis was investigated using the AIHW National Hospital Morbidity Database, an administrative data source. The health service use for each musculoskeletal condition was compared between the different population groups.

For males and females, the crude rates of health service use among those with the condition were used. These results were not age standardised because the large differences in age structure between males and females with these conditions meant that age standardisation gave unsatisfactory results.

The health service use results for the remaining population groups were indirectly age standardised, due to the small numbers involved. Two different approaches were used. For the primary health service use results gathered from the NHS and the NATSIHS, the level of service use among those with arthritis or osteoporosis in each population group was calculated. These results were then indirectly age standardised.

In contrast, the joint replacement rates were calculated by dividing the number of people receiving joint replacements by the full number of people in each population group. These rates were then indirectly age standardised. In order to take the condition prevalence into account, these joint replacement results were then compared with the prevalence results in Chapter 2. This approach was taken because, unlike primary health service use, joint replacement surgery is required only by those with severe arthritis or osteoporosis.

#### Coding of diagnoses and procedures

The International Statistical Classification of Diseases and Related Health Problems, 10th revision, Australian Modification (ICD-10-AM) 4th Edition (NCCH 2004b) was used for classifying diagnoses in the AIHW National Hospital Morbidity Database. Procedure codes were drawn from the Australian Classification of Health Interventions 4th Edition (NCCH 2004a).

Table A1.1: ICD-10-AM codes for a principal diagnosis of osteoarthritis, rheumatoid arthritis or osteoporosis

Disease or injury	ICD-10-AM codes	
Rheumatoid arthritis	M05, M06	
Osteoarthritis	M15–M19	
Osteoporosis	M80-M82	

Procedure	ICD-10-AM codes
Partial hip replacement	47522–00, 49315–00
Primary total hip replacement	49318–00, 49319–00
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

Table A1.2: ICD-10-AM codes for knee and hip replacement procedures

#### **Defining population groups**

Population health studies over the last several years have identified population groups in Australia that may have experienced health disparities. These groups were used in our analysis.

#### **Remoteness of location**

For this report, three major geographical regions were defined by remoteness of location, namely *Major cities, Inner regional* areas, and *Other* areas (including *Outer regional, Remote* and *Very remote* locations). Individual records were classified by the area of usual residence at the Statistical Local Area (SLA) or Collection District (CD) level. Each SLA or CD has a score on the Accessibility/Remoteness Index of Australia (ARIA) (DHAC & University of Adelaide 2001). 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.

The remoteness categories for the NHS were based on the area of usual residence at the CD level (ABS 2006b). The remoteness categories for the AIHW National Hospital Morbidity Database were based on the area of usual residence at the SLA level (AIHW 2006). SLAs comprise one or more CDs. Thus, the remoteness categories for the NHS were calculated at a finer level than for the AIHW National Hospital Morbidity Database. The consequence is that a small number of people may be covered in a certain remoteness category in one data source and a different (adjacent) category in the other data source. This will only affect individuals whose score is close to the cut-off point between regions. The effect on the results presented here is expected to be marginal.

Records that could not be mapped to one of the three regions were excluded from the geographical analyses in this report.

In the AIHW National Hospital Morbidity Database, although most separations included data on the state or territory of usual residence, not all states and territories were able to provide information on the area of usual residence in the form of an SLA code. New South Wales, Victoria, Western Australia, Tasmania, the Australian Capital Territory and the Northern Territory were able to provide SLA codes both for patients usually resident in the jurisdiction and for patients not usually resident in the jurisdiction. Queensland and South Australia provided SLA codes for patients usually resident in the jurisdiction and postcodes for patients not usually resident in the jurisdiction (AIHW 2006).

The AIHW mapped the supplied area of residence data for each separation to 2004 SLA codes and to Remoteness Area categories. This was undertaken on a probabilistic basis as necessary, using ABS concordance information describing the distribution of the population by postcode, Remoteness Areas and SLAs in 2004. The mapping process identified missing, invalid and superseded codes, but resulted in 99.5% of records being assigned 2004 SLA codes. The remainder of records had a usual residence of Overseas/Not elsewhere classified or Not reported, and were not used in the analysis by remoteness of location (AIHW 2006).

Due to the probabilistic nature of this mapping, the SLA and Remoteness Area data for individual separations may not be accurate; however, the overall distribution of separations by geographical areas is considered useful.

#### Socioeconomic status (SES)

In this report, the Index of Relative Socio-economic Disadvantage (IRSD) was used to determine SES. This index is one of several socioeconomic indexes derived by the ABS from information collected in the 2001 Census of Population and Housing. The IRSD is an areabased measure that represents the average level of socioeconomic disadvantage across a geographic area, such as the SLA or CD. It is derived from attributes such as income, educational attainment, unemployment, jobs in relatively unskilled occupations, Indigenous status, and divorce or separation (ABS 2003).

Individual records were classified by the IRSD value of the area (SLA or CD) of the person's usual residence. The records were then divided into five groups. Each group contains about 20% of the total Australian population. Group 1 (the lowest SES group) includes the most disadvantaged households and group 5 (the highest SES group) includes the least disadvantaged households. Records that could not be mapped to an IRSD value were excluded from the analysis by SES.

It is important to note that the IRSD relates to the average disadvantage of all people living in the SLA or CD. It will therefore tend to understate the true level of socioeconomic disadvantage at an individual level.

For the NHS data the ABS calculated the SES groups. For the 2004–05 survey the geographical area used in these calculations was the CD. The data were divided using the area-based method, where an equal number of CDs were placed in each of the five groups (ABS 2006c).

For the AIHW National Hospital Morbidity Database the geographical area used in the database was the SLA (AIHW 2006). The data were divided using the population-based method. Data from the 2001 Census relating to the number of people in each SLA were taken

into account in order to place the divisions in such a way that, as far as possible, each of the five groups contained an equal number of people.

Both methods produce a set of five groups that contain about 20% of the Australian population. For the two data sources the SES groups cover similar, but not identical, groups of people. A small number of people will be counted in one group in one data source and a different (adjacent) group in the other data source. In this report, the results relating to the five SES groups show trends across several SES groups, so the effect of the different division method is expected to be low.

In the AIHW National Hospital Morbidity Database, separations without an SLA code were mapped to an SLA code on a probabilistic basis, where possible (AIHW 2006). This process is explained further in the previous section 'Remoteness of location'. Records that could not be mapped to an SLA code were excluded from the analysis by SES.

#### **Country of birth**

The country of birth was recorded using the *Standard Australian Classification of Countries* (*SACC*), 1998 (ABS 1998). The country of birth for current Australian citizens was then grouped into three categories: 'Australia', 'Mainly English-speaking countries' (United Kingdom, Ireland, Canada, United States of America, South Africa, New Zealand), and 'Other countries' (ABS 2010). Although it would be preferable to use finer categories by country of birth, small numbers preclude this level of detail.

Records where the country of birth was unknown or not recorded were excluded from the country of birth analyses in this report.

#### **Indigenous Australians**

In this report, the population was grouped into two categories: 'Indigenous Australians' and 'Other Australians'. The 'Indigenous Australians' category covers people who identify as being of Australian Aboriginal and/or Torres Strait Islander origin. All other people are included in the 'Other Australians' category. The 'Other Australians' category includes people whose Indigenous status is unknown.

Information relating to Indigenous Australians was gathered from three different sources, namely the NHS, the NATSIHS and the AIHW National Hospital Morbidity Database. In the 2004–05 NATSIHS, a smaller list of questions was used in remote areas (a category covering *Remote* and *Very remote* areas). This smaller list did not contain a question about the presence of osteoarthritis and rheumatoid arthritis (ABS 2006c). Therefore, the prevalence estimates for these two conditions among Indigenous Australians only relate to non-remote areas. The Indigenous identifiers on the AIHW National Hospital Morbidity Database were considered usable only for hospital separations registered in certain jurisdictions. These jurisdictions were New South Wales, Victoria, Queensland, South Australia, Western Australia and public hospitals in the Northern Territory (AIHW 2006). The number of joint replacements for the three musculoskeletal conditions among Indigenous Australians was too small to allow for meaningful analysis, so these results were not published.

# **Appendix 2: Additional statistical tables**

The tables included in this appendix provide detailed statistical information about the prevalence and health service use results in this report.

The tables are presented in three sections:

- prevalence
- primary health service use
- joint replacement surgery.

The information is presented along two dimensions:

- sociodemographic factors (sex, remoteness of location, SES, country of birth, Indigenous status)
- medical condition (osteoarthritis, rheumatoid arthritis, osteoporosis).

The following notation is used:

- \* subject to a high relative standard error (25–50%) and should be used with caution
- \*\* subject to a very high relative standard error (50% or greater) and is therefore too unreliable for general use
- + statistically significant difference at the 95% confidence level.

### Prevalence

The tables in this section relate to the prevalence of doctor-diagnosed osteoarthritis, rheumatoid arthritis or osteoporosis. The information is based on self-reports from the 2004–05 NHS and the NATSIHS. All results relate to people aged 25 years or older.

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
Sex	Number ('000)	Per cent	Number ('000)	Per cent	Number ('000)	Per cent
Males	481.2	7.6	146.0	2.3	88.6	1.4
Females	822.2	11.9	229.5	3.4	489.9	7.0
People	1,303.4	9.8	375.4	2.8	578.5	4.2

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Notes

1. Rates have been directly age standardised to the Australian population as at 30 June 2001.

Source: AIHW analysis of the ABS 2004-05 NHS.

# Table A2.2: Prevalence of osteoarthritis, rheumatoid arthritis and osteoporosis, by remoteness,2004-05

	Osteoarthritis		oarthritis Rheumatoid arthritis		Osteoporosis	
Area of residence	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	Rate/RR
Major cities	832	<u>9,688</u>	224	<u>2,607</u>	407	<u>4,738</u>
Inner regional	320	+1.17	98	+1.34	120	0.91
Other <sup>(a)</sup>	150	0.92	54	1.22	52	+0.67

(a) Includes Outer regional and Remote areas, but excludes Very remote areas.

Notes

1. For Major cities, the rate is per 100,000 population.

2. For the other two areas of residence, the rate ratio (RR) measures the prevalence level in each group, in comparison with the level in *Major cities*. Differences in age structure between the different groups have been corrected for using indirect standardisation.

Source: AIHW analysis of the ABS 2004-05 NHS.

	Osteoarth	Osteoarthritis Rheumatoid arthritis		Rheumatoid arthritis		osis
SES	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	Rate/RR
1 Lowest	273	+1.27	83	+1.68	106	0.88
2	286	+1.23	84	+1.55	114	0.89
3	252	1.12	79	1.49	99	0.80
4	251	1.07	72	1.31	135	1.03
5 Highest	238	<u>8,406</u>	57	<u>2,004</u>	120	4,242

#### Table A2.3: Prevalence of osteoarthritis, rheumatoid arthritis and osteoporosis, by SES, 2004-05

Notes

1. For the highest SES group, the rate is per 100,000 population.

2. For the other four groups, the rate ratio (RR) measures the prevalence level in each group, in comparison with the level in the highest SES group. Differences in age structure between the different groups have been corrected for using indirect standardisation.

	Osteoarthritis		Rheumatoid	Rheumatoid arthritis		Osteoporosis	
Country of birth	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	Rate/RR	
Australia	938	<u>10,270</u>	268	<u>2,929</u>	398	<u>4,358</u>	
Mainly English- speaking countries	203	1.04	43	0.78	76	0.97	
Other countries	162	+0.60	65	0.84	104	0.94	

Table A2.4: Prevalence of osteoarthritis, rheumatoid arthritis and osteoporosis, by country of birth, 2004–05

Notes

1. For the Australian-born group, the rate is per 100,000 population.

2. For the other two groups, the rate ratio (RR) measures the prevalence level in each group, in comparison with the level in the

Australian-born group. Differences in age structure between the different groups have been corrected for using indirect standardisation.

Source: AIHW analysis of the ABS 2004-05 NHS.

# Table A2.5: Prevalence of osteoarthritis, rheumatoid arthritis and osteoporosis, by Indigenous status, 2004–05

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
Indigenous status	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	Rate/RR
Indigenous Australians	12.3	+1.46	3.6	+1.98	4.1	0.90
Other Australians	1,282.1	<u>10,064</u>	362.9	<u>2,849</u>	574.1	<u>4,452</u>

Notes

1. For Other Australians, the rate is per 100,000 population.

2. For Indigenous Australians, the rate ratio (RR) measures the prevalence level, in comparison with the level for Other Australians. Differences in age structure between the two groups have been corrected for using indirect standardisation.

Source: AIHW analysis of the ABS 2004-05 NATSIHS.

# Table A2.6: Age-specific prevalence of osteoarthritis, by Indigenous status, 2004–05 (per cent)

	Age group					
Indigenous status	25–44 years	45–64 years	65+ years			
Indigenous Australians	4.45	15.30	18.75			
Other Australians	+2.00	12.15	24.61			

Notes

1. The prevalence is expressed as the percentage of people with osteoarthritis in the population group.

### Primary health service use

The tables in this section relate to the use of primary health services among people with doctor-diagnosed osteoarthritis, rheumatoid arthritis or osteoporosis, as reported in the 2004–05 NHS. All results relate to people aged 25 years or older.

#### Sex

Table A2.7: Visits to GPs or specialists for osteoarthritis, rheumatoid arthritis and osteoporosis, by sex, 2004–05

	Osteoarthritis		eoarthritis Rheumatoid arthritis		Osteoporosis	
Sex	Number ('000)	Per cent <sup>(a)</sup>	Number ('000)	Per cent <sup>(a)</sup>	Number ('000)	Per cent <sup>(a)</sup>
Males	58.2	12.1	16.8	11.5	10.9	*12.3
Females	101.1	12.3	35.8	15.6	43.0	8.8
People	159.3	12.2	52.6	14.0	53.9	9.3

(a) Percentage of people with the musculoskeletal condition visiting the GP or specialist.

Note: Self-reported visits to a GP or specialist for the musculoskeletal condition in the 2 weeks before the survey.

Source: AIHW analysis of the ABS 2004-05 NHS.

# Table A2.8: Use of pharmaceuticals for osteoarthritis, rheumatoid arthritis and osteoporosis, by sex,2004-05

Osteoarthritis		Rheumatoid arthritis		Osteoporosis		
Sex	Number ('000)	Per cent <sup>(a)</sup>	Number ('000)	Per cent <sup>(a)</sup>	Number ('000)	Per cent <sup>(a)</sup>
Males	177.4	36.9	69.8	47.8	37.3	42.1
Females	345.6	42.0	119.1	51.9	212.6	43.4
People	523.0	40.1	188.9	50.3	249.9	43.2

(a) Percentage of people with the musculoskeletal condition using pharmaceuticals.

Note: Self-reported use of pharmaceuticals for the condition in the 2 weeks before the survey.

Source: AIHW analysis of the ABS 2004-05 NHS.

# Table A2.9: Use of complementary medicines for osteoarthritis, rheumatoid arthritis and osteoporosis, by sex, 2004–05

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
Sex	Number ('000)	Per cent <sup>(a)</sup>	Number ('000)	Per cent <sup>(a)</sup>	Number ('000)	Per cent <sup>(a)</sup>
Males	183.3	38.1	55.7	38.2	21.3	24.1
Females	411.6	50.1	87.7	38.2	209.5	42.8
People	594.9	45.6	143.4	38.2	230.8	39.9

(a) Percentage of people with the musculoskeletal condition using complementary medicines.

Note: Self-reported use of complementary medicines for the condition in the 2 weeks before the survey.

	Osteoart	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
Sex	Number ('000)	Per cent <sup>(a)</sup>	Number ('000)	Per cent <sup>(a)</sup>	Number ('000)	Per cent <sup>(a)</sup>	
Males	133.0	27.6	33.1	22.7	31.7	35.8	
Females	171.5	20.9	53.5	23.3	124.2	25.4	
People	304.5	23.4	86.6	23.1	155.9	26.9	

Table A2.10: No action taken for osteoarthritis, rheumatoid arthritis and osteoporosis, by sex, 2004–05

(a) Percentage of people with the musculoskeletal condition taking no management action.

Note: Self-report of no action taken in the 2 weeks before the survey.

Source: AIHW analysis of the ABS 2004-05 NHS.

#### **Remoteness of location**

Table A2.11: Visits to GPs or specialists for osteoarthritis, rheumatoid arthritis and osteoporosis, by remoteness, 2004–05

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
Area of residence	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	<u>Rate</u> /RR
Major cities	105.5	<u>12.6</u>	33.0	<u>14.7</u>	33.0	<u>8.1</u>
Inner regional	36.6	0.89	*6.5	+0.46	*9.1	0.99
Other <sup>(a)</sup>	18.0	0.96	*13.1	1.71	*11.8	+2.75

(a) Includes Outer regional and Remote areas, but excludes Very remote areas.

Notes

1. Self-reported visits to a GP or specialist for the condition in the 2 weeks before the survey.

2. For *Major cities*, the rate is per 100 people with the musculoskeletal condition.

3. For the other two areas of residence, the rate ratio (RR) measures the level of visits to GPs or specialists in each group in comparison with the level in *Major cities*. Differences in age structure between the different groups have been corrected for using indirect standardisation.

Source: AIHW analysis of the ABS 2004-05 NHS.

# Table A2.12: Use of pharmaceuticals for osteoarthritis, rheumatoid arthritis and osteoporosis, by remoteness, 2004–05

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
Area of residence	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	<u>Rate</u> /RR
Major cities	338.3	<u>40.6</u>	106.9	<u>47.7</u>	184.9	<u>45.4</u>
Inner regional	123.6	0.99	48.9	1.00	42.6	0.83
Other <sup>(a)</sup>	61.1	1.02	33.1	1.27	22.4	1.04

(a) Includes Outer regional and Remote areas, but excludes Very remote areas.

Notes

1. Self-reported pharmaceutical use for the condition in the 2 weeks before the survey.

2. For Major cities, the rate is per 100 people with the musculoskeletal condition.

 For the other two areas of residence, the rate ratio (RR) measures the level of pharmaceutical medicine use in each group in comparison with the level in *Major cities*. Differences in age structure between the different groups have been corrected for using indirect standardisation.

4. No statistically significant differences were found when the rate ratios were compared between the three areas of residence.

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
Area of residence	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	Rate/RR
Major cities	385.6	46.2	88.4	<u>39.5</u>	168.3	<u>41.3</u>
Inner regional	144.8	0.99	35.8	0.92	44.2	0.94
Other <sup>(a)</sup>	64.4	0.95	19.3	0.96	18.4	0.87

# Table A2.13: Use of complementary medicines for osteoarthritis, rheumatoid arthritis and osteoporosis, by remoteness, 2004–05

(a) Includes Outer regional and Remote areas, but excludes Very remote areas.

Notes

1. Self-reported complementary medicine use for the condition in the 2 weeks before the survey.

2. For Major cities, the rate is per 100 people with the musculoskeletal condition.

 For the other two areas of residence, the rate ratio (RR) measures the level of complementary medicine use in each group in comparison with the level in *Major cities*. Differences in age structure between the different groups have been corrected for using indirect standardisation.

4. No statistically significant differences were found when the rate ratios were compared between the three areas of residence.

Source: AIHW analysis of the ABS 2004-05 NHS.

# Table A2.14: No action taken for osteoarthritis, rheumatoid arthritis and osteoporosis, by remoteness, 2004–05

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
Area of residence	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	Rate/RR
Major cities	183.3	<u>22.0</u>	54.7	<u>24.4</u>	111.3	<u>27.3</u>
Inner regional	76.0	1.05	20.3	0.90	33.4	0.95
Other <sup>(a)</sup>	45.2	1.35	*11.6	0.84	*11.2	0.77

(a) Includes Outer regional and Remote areas, but excludes Very remote areas.

Notes

1. Self-report of no action taken in the 2 weeks before the survey.

2. For Major cities, the rate is per 100 people with the musculoskeletal condition.

3. For the other two areas of residence, the rate ratio (RR) measures the level of no action taken in each group in comparison with the level in *Major cities*. Differences in age structure between the different groups have been corrected for using indirect standardisation.

4. No statistically significant differences were found when the rate ratios were compared between the three areas of residence.

#### Socioeconomic status (SES)

# Table A2.15: Visits to GPs or specialists for osteoarthritis, rheumatoid arthritis and osteoporosis, by SES, 2004–05

SES	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	Rate/RR
1 Lowest	34.2	1.00	*9.8	0.56	*11.8	0.99
2	35.2	1.13	*13.2	0.98	*14.6	3.22
3	32.7	1.08	*7.2	0.70	*10.9	1.26
4	30.6	1.05	*10.8	1.04	*11.1	1.46
5 Highest	26.2	<u>11.0</u>	*11.6	<u>20.4</u>	*5.5	<u>4.6</u>

Notes

1. Self-reported visits to a GP or specialist for the condition in the 2 weeks before the survey.

2. For the highest SES group, the rate is per 100 people with the musculoskeletal condition.

3. For the other four groups, the rate ratio (RR) measures the level of visits to GPs or specialists in each group in comparison with the level in the highest SES group. Differences in age structure between the different groups have been corrected for using indirect standardisation.

4. No statistically significant differences were found when the rate ratios were compared between the five SES levels.

Source: AIHW analysis of the ABS 2004-05 NHS.

# Table A2.16: Use of pharmaceuticals for osteoarthritis, rheumatoid arthritis and osteoporosis, by SES, 2004–05

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
SES	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	Rate/RR
1 Lowest	105.5	1.11	42.7	1.19	46.6	1.12
2	126.0	1.32	49.1	1.20	52.0	1.09
3	104.2	1.30	37.6	1.01	46.8	1.25
4	110.6	1.29	33.9	0.95	54.7	1.03
5 Highest	75.9	<u>31.9</u>	25.6	<u>45.0</u>	48.5	<u>40.3</u>

Notes

1. Self-reported pharmaceutical use for the condition in the 2 weeks before the survey.

2. For the highest SES group, the rate is per 100 people with the musculoskeletal condition.

3. For the other four groups, the rate ratio (RR) measures the level of pharmaceutical medicine use in each group in comparison with the level in the highest SES group. Differences in age structure between the different groups have been corrected for using indirect standardisation.

4. No statistically significant differences were found when the rate ratios were compared between the five SES levels.

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
SES	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	Rate/RR
1 Lowest	102.4	+0.68	21.8	+0.55	37.9	+0.64
2	120.3	+0.76	26.0	0.63	48.6	0.73
3	128.0	0.95	34.4	0.88	28.9	+0.51
4	115.4	0.84	32.1	0.91	48.5	+0.60
5 Highest	127.8	<u>53.6</u>	28.0	<u>49.3</u>	66.3	<u>55.2</u>

Table A2.17: Use of complementary medicines for osteoarthritis, rheumatoid arthritis and osteoporosis, by SES, 2004–05

Notes

1. Self-reported complementary medicine use for the condition in the 2 weeks before the survey.

2. For the highest SES group, the rate is per 100 people with the musculoskeletal condition.

3. For the other four groups, the rate ratio (RR) measures the level of complementary medicine use in each group in comparison with the level in the highest SES group. Differences in age structure between the different groups have been corrected for using indirect standardisation.

Source: AIHW analysis of the ABS 2004-05 NHS.

Table A2.18: No action taken for osteoarthritis, rheumatoid arthritis and osteoporosis, by S	SES,
2004–05	

	Osteoarthritis		Rheumatoid a	arthritis	Osteoporosis	
SES	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	Rate/RR
1 Lowest	70.2	1.23	20.4	0.93	28.1	1.25
2	73.3	1.23	20.2	1.08	27.4	1.34
3	52.0	0.88	18.5	1.07	32.2	1.76
4	56.3	1.06	*13.6	0.82	40.9	1.67
5 Highest	51.7	<u>21.7</u>	*14.0	<u>24.6</u>	25.1	<u>20.9</u>

Notes

1. Self-report of no action taken in the 2 weeks before the survey.

2. For the highest SES group, the rate is per 100 people with the musculoskeletal condition.

3. For the other four groups, the rate ratio (RR) measures the level of no action taken in each group, in comparison with the level in the highest SES group. Differences in age structure between the different groups have been corrected for using indirect standardisation.

4. No statistically significant differences were found when the rate ratios were compared between the five SES levels.

#### **Country of birth**

# Table A2.19: Visits to GPs or specialists for osteoarthritis, rheumatoid arthritis and osteoporosis, by country of birth, 2004–05

	Osteoarthritis		Rheumatoid a	Rheumatoid arthritis		Osteoporosis	
Country of birth	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	Rate/RR	
Australia	118.4	<u>12.6</u>	43.1	<u>16.1</u>	35.1	<u>8.8</u>	
Mainly English-speaking countries	25.2	1.00	*3.8	0.59	*13.8	1.85	
Other countries	*15.6	0.77	*5.6	0.62	*5.0	+0.53	

Notes

1. Self-reported visits to a GP or specialist for the condition in the 2 weeks before the survey.

2. For the Australian-born group, the rate is per 100 people with the musculoskeletal condition.

3. For the other two groups, the rate ratio (RR) measures the level of visits to GPs or specialists in each group, in comparison with the level in the Australian-born group. Differences in age structure between the different groups have been corrected for using indirect standardisation.

Source: AIHW analysis of the ABS 2004-05 NHS.

# Table A2.20: Use of pharmaceuticals for osteoarthritis, rheumatoid arthritis and osteoporosis, by country of birth, 2004–05

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
Country of birth	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	<u>Rate</u> /RR
Australia	386.7	<u>41.2</u>	142.4	<u>53.2</u>	165.4	<u>41.5</u>
Mainly English-speaking countries	74.0	0.91	17.7	0.78	37.3	1.08
Other countries	62.3	0.91	28.9	0.81	47.2	1.06

Notes

1. Self-reported pharmaceutical use for the condition in the 2 weeks before the survey.

2. For the Australian-born group, the rate is per 100 people with the musculoskeletal condition.

3. For the other two groups, the rate ratio (RR) measures the level of pharmaceutical medicine use in each group, in comparison with the level in the Australian-born group. Differences in age structure between the different groups have been corrected for using indirect standardisation.

4. No statistically significant differences were found when the rate ratios were compared between the three categories for country of birth.

# Table A2.21: Use of complementary medicines for osteoarthritis, rheumatoid arthritis and osteoporosis, by country of birth, 2004–05

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
Country of birth	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	Rate/RR
Australia	418.8	<u>44.6</u>	109.1	<u>40.8</u>	155.9	<u>39.2</u>
Mainly English-speaking countries	99.1	1.09	*14.7	0.82	34.9	1.12
Other countries	76.9	1.04	19.6	0.71	40.1	0.96

Notes

1. Self-reported complementary medicine use for the condition in the 2 weeks before the survey.

2. For the Australian-born group, the rate is per 100 people with the musculoskeletal condition.

3. For the other two groups, the rate ratio (RR) measures the level of complementary medicine use in each group in comparison with the level in the Australian-born group. Differences in age structure between the different groups have been corrected for using indirect standardisation.

4. No statistically significant differences were found when the rate ratios were compared between the three categories for country of birth.

Source: AIHW analysis of the ABS 2004-05 NHS.

# Table A2.22: No action taken for osteoarthritis, rheumatoid arthritis and osteoporosis, by country of birth, 2004–05

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
Country of birth	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	Rate/RR
Australia	232.0	24.7	55.9	<u>20.9</u>	109.9	<u>27.6</u>
Mainly English-speaking countries	39.7	0.77	*11.9	1.38	*14.0	0.73
Other countries	32.7	0.83	18.7	1.55	32.0	1.19

Notes

1. Self-report of no action taken in the 2 weeks before the survey.

2. For the Australian-born group, the rate is per 100 people with the musculoskeletal condition.

3. For the other four groups, the rate ratio (RR) measures the level of no action taken in each group in comparison with the level in the

Australian-born group. Differences in age structure between the different groups have been corrected for using indirect standardisation.

#### **Indigenous status**

Table A2.23: Use of pharmaceuticals for osteoarthritis, rheumatoid arthritis and osteoporosis, by Indigenous status, 2004–05

	Osteoarthritis		Rheumatoid arthritis		Osteoporosis	
Indigenous status	Number ('000)	Rate/RR	Number ('000)	Rate/RR	Number ('000)	Rate/RR
Indigenous Australians	5.4	1.30	2.7	0.90	1.6	1.21
Other Australians	549.5	<u>42.9</u>	189.3	<u>52.2</u>	261.1	<u>45.5</u>

Notes

1. Self-reported pharmaceutical use for the condition in the 2 weeks before the survey.

2. For Indigenous Australians, the rate ratio (RR) measures the level of pharmaceutical medicine use in comparison with the level for Other Australians. Differences in age structure between the two groups have been corrected for using indirect standardisation.

3. For Other Australians, the rate is per 100 people with the musculoskeletal condition.

4. No statistically significant difference was found when the rate ratio for Indigenous Australians was compared with that of Other Australians.

<sup>4.</sup> No statistically significant differences were found when the rate ratios were compared between the three categories for country of birth. Source: AIHW analysis of the ABS 2004–05 NHS.

### Joint replacement surgery

The tables in this section relate to the use of joint replacement surgery for osteoarthritis, rheumatoid arthritis or osteoporosis. The data were derived from the AIHW National Hospital Morbidity Database for the year 2004–05. The tables on osteoarthritis and rheumatoid arthritis include people aged 25 years and older, and the tables on osteoporosis include people aged 40 years and older.

#### Sex

	Primary total hip replacement		Partial knee replacement		Primary total knee replacement	
Sex	Number	Rate <sup>(a)</sup>	Number	Rate <sup>(a)</sup>	Number	Rate <sup>(a)</sup>
Males	7,962	1,655	1,645	342	10,016	2,081
Females	9,330	1,135	1,589	193	14,054	1,709
People	17,292	1,327	3,234	248	24,070	1,847

 Table A2.24: Joint replacement for osteoarthritis, by sex, 2004–05

(a) Rate per 100,000 population with doctor-diagnosed osteoarthritis from the NHS.

Note: More than one joint replacement may have been performed in a single hospital separation. This analysis is based on the number of joint replacements performed.

Source: AIHW National Hospital Morbidity Database.

	Primary tot replacem	al hip ent	Primary tota replacem	II knee Ient	
Sex	Number	Rate <sup>(a)</sup>	Number	Rate <sup>(a)</sup>	
Males	47	32	85	58	
Females	109	109 48		129	
People	156	156 42		101	

#### Table A2.25: Joint replacement for rheumatoid arthritis, by sex, 2004-05

(a) Rate per 100,000 population with doctor-diagnosed rheumatoid arthritis from the NHS.

*Note:* More than one joint replacement may have been performed in a single hospital separation. This analysis is based on the number of joint replacements performed.

Source: AIHW National Hospital Morbidity Database.

oburce. All the National Hospital Morbidity Database.

#### Table A2.26: Joint replacement for osteoporosis, by sex, 2004-05

	Partial h replacem	ip ent	Primary total hip replacement		
Sex	Number	Number Rate <sup>(a)</sup>		Rate <sup>(a)</sup>	
Males	1,353	1,695	135	169	
Females	3,946	836	430	91	
People	5,299 916		565	98	

(a) Rate per 100,000 population with doctor-diagnosed osteoporosis from the NHS. *Notes* 

1. People aged 40 years and over.

 More than one joint replacement may have been performed in a single hospital separation. This analysis is based on the number of joint replacements performed.

#### **Remoteness of location**

	Primary total hip replacement		Partial knee replacement		Primary total knee replacement	
Area of residence	Number	Rate/RR	Number	Rate/RR	Number	Rate/RR
Major cities	10,495	<u>118.2</u>	2,165	<u>24.4</u>	14,414	<u>162.3</u>
Inner regional	4,560	+1.20	695	+0.88	6,201	+1.18
Other <sup>(a)</sup>	2,134	1.05	357	+0.83	3,327	+1.20

#### Table A2.27: Joint replacement for osteoarthritis, by remoteness, 2004-05

(a) Includes Outer regional, Remote and Very remote areas.

Notes

1. More than one joint replacement may have been performed in a single hospital separation. This analysis is based on the number of joint replacements performed.

2. For *Major cities*, the rate is per 100,000 population.

3. For the other two areas of residence, the rate ratio (RR) measures the level of joint replacement in each group in comparison with the level in *Major cities*. Differences in age structure between the different groups have been corrected for using indirect standardisation.

Source: AIHW National Hospital Morbidity Database.

# Table A2.28: Joint replacement for osteoporosis, by remoteness,2004-05

	Partial hip replacement		Primary to replacer	tal hip nent
Area of residence	Number <u>Rate</u> /RR		Number	Rate/RR
Major cities	3,632	<u>62.1</u>	386	<u>6.6</u>
Inner regional	1,074	+0.86	122	0.90
Other <sup>(a)</sup>	556	+0.90	51	+0.75

(a) Includes Outer regional, Remote, and Very remote areas.

Notes

- This analysis is based on the number of joint replacements performed.
- 3. For *Major cities*, the rate is per 100,000 population.

4. For the other two areas of residence, the rate ratio (RR) measures the level of joint replacement in each group in comparison with the level in *Major cities*. Differences in age structure between the different groups have been corrected for using indirect standardisation.

<sup>1.</sup> People aged 40 years and over.

<sup>2.</sup> More than one joint replacement may have been performed in a single hospital separation.

#### Socioeconomic status (SES)

	Primary to replacer	Primary total hip replacement		knee ment	Primary total knee replacement	
SES	Number	Rate/RR	Number	Rate/RR	Number	<u>Rate</u> /RR
1 Lowest	3,070	+0.82	544	+0.62	4,884	+1.06
2	3,792	0.99	642	+0.72	5,937	+1.26
3	3,430	1.01	583	+0.74	4,647	+1.12
4	3,003	0.97	548	+0.76	3,719	0.99
5 Highest	3,935	<u>131.9</u>	908	<u>30.4</u>	4,783	<u>160.4</u>

#### Table A2.29: Joint replacement for osteoarthritis, by SES, 2004-05

Notes

1. More than one joint replacement may have been performed in a single hospital separation. This analysis is based on the number of joint replacements performed.

2. For the highest SES group, the rate is per 100,000 population.

3. For the other four groups, the rate ratio (RR) measures the level of joint replacement in each group in comparison with the level in the highest SES group. Differences in age structure between the different groups have been corrected for using indirect standardisation.

Source: AIHW National Hospital Morbidity Database.

#### Table A2.30: Joint replacement for osteoporosis, by SES, 2004-05

	Partial replacer	Partial hip replacement Number <u>Rate</u> /RR		tal hip nent
SES	Number			Rate/RR
1 Lowest	1,030	0.98	91	+0.55
2	1,019	+0.92	95	+0.55
3	1,016	1.00	101	+0.65
4	933	1.03	86	+0.62
5 Highest	1,276	<u>63.5</u>	187	<u>9.3</u>

Notes

1. People aged 40 years and over.

3. For the highest SES group, the rate is per 100,000 population.

4. For the other four groups, the rate ratio (RR) measures the level of joint replacement in each group in comparison with the level in the highest SES group. Differences in age structure between the different groups have been corrected for using indirect standardisation.

More than one joint replacement may have been performed in a single hospital separation. This analysis is based on the number of joint replacements performed.

#### **Country of birth**

#### Table A2.31: Joint replacement for osteoarthritis, by country of birth, 2004-05

	Primary total hip Partial k replacement replacem		knee ement	Primary to replace	total knee cement	
Country of birth	Number	Rate/RR	Number	Rate/RR	Number	<u>Rate</u> /RR
Australia	12,140	<u>131.1</u>	2,428	<u>26.2</u>	17,728	<u>191.5</u>
Mainly English-speaking countries	2,572	1.02	339	+0.66	2,797	+0.76
Other countries	2,101	+0.54	383	+0.49	3,009	+0.51

Notes

1. More than one joint replacement may have been performed in a single hospital separation. This analysis is based on the number of joint replacements performed.

2. For the Australian-born group, the rate is per 100,000 population.

3. For the other two groups, the rate ratio (RR) measures the level of joint replacement in each group in comparison with the level in the Australian-born group. Differences in age structure between the different groups have been corrected for using indirect standardisation.

Source: AIHW National Hospital Morbidity Database.

#### Table A2.32: Joint replacement for osteoporosis, by country of birth, 2004-05

	Partial hip Primary total hi replacement replacement		total hip ement	
Country of birth	Number	Rate/RR	Number	<u>Rate</u> /RR
Australia	3,631	<u>60.5</u>	382	<u>6.4</u>
Mainly English-speaking countries	663	0.96	80	1.06
Other countries	758	+0.83	78	+0.72

Notes

2. More than one joint replacement may have been performed in a single hospital separation. This analysis is based on the number of joint replacements performed.

3. For the Australian-born group, the rate is per 100,000 population.

4. For the other two groups, the rate ratio (RR) measures the level of joint replacement in each group in comparison with the level in the Australian-born group. Differences in age structure between the different groups have been corrected for using indirect standardisation.

<sup>1.</sup> People aged 40 years and over.

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