Asthma in Australia: findings from the 2004–05 National Health Survey

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Asthma in Australia: findings from the 2004–05 National Health Survey

Australian Centre for Asthma Monitoring
Woolcock Institute of Medical Research

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Abbreviations

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
ARIA	Accessibility/Remoteness Index of Australia
ASGC	Australian Standard Geographical Classification
BMI	body mass index
CI	confidence interval
CURF	confidentialised unit record file
DIMA	Department of Immigration and Multicultural Affairs
IRSD	Index of Relative Socio-Economic Disadvantage
NATSIHS	National Aboriginal and Torres Strait Islander Health Survey
NHS	National Health Survey
NSW	New South Wales
NT	Northern Territory
Qld	Queensland
RADL	Remote Access Data Library
SEIFA	Socio-Economic Indexes for Areas
SA	South Australia
Tas	Tasmania
Vic	Victoria
WA	Western Australia

Summary

This report presents results from the most recent National Health Survey conducted in 2004–05 by the Australian Bureau of Statistics. This survey provides Australia's only nation-wide source of individual experiences with asthma, including prevalence, management, quality of life and exposure to known risk factors. This report also compares findings from the current survey with those from the previous National Health Survey in 2001.

Good news

In 2004–05, the prevalence of asthma in Australia was estimated at 10.3% (or about 2,013,530 people), which was less than in 2001 when the prevalence was 11.6%. This decrease in prevalence was limited to children and adults aged less than 35 years.

Some of the troublesome impacts of asthma seem to have also reduced. Australians with current asthma rated their general health as better and reported less asthma-related days off work or study in 2004–05 than they did in 2001.

Things to work on

Prevalence remained higher among Indigenous Australians compared with other Australians and was also higher among people living in the most disadvantaged localities. Indeed, the gap in prevalence between the most advantaged and most disadvantaged localities widened between 2001 and 2004–05.

Less than one-quarter (23%) of people with asthma possessed a written asthma action plan in 2004–05. However, this was a substantial improvement on the rate of possession in 2001 (17%).

Only 14% of people with current asthma reported taking inhaled corticosteroids every day or night in the last 2 weeks, despite guidelines recommending that people with persistent asthma use this class of asthma medication twice daily.

One-quarter of adults with asthma were current smokers and 11% of children with asthma were exposed to passive smoke at home. These rates were no different from those observed for people without asthma, despite the known added health risks to people with asthma. Among women, there was also a relationship between the presence of asthma and obesity.

Compared with people without asthma, people with asthma had worse self-assessed health, higher levels of psychological distress, and more mental and behavioural problems. People aged under 35 years with asthma were twice as likely to have arthritis as those of the same age without asthma.

Conclusions

The results suggest that the burden of asthma in Australia has reduced and there have been some improvements in management between 2001 and 2004–05. However, socioeconomic disparities are widening and there are still a number of areas for improvement. Future health gains could be achieved through interventions that would improve appropriate use of

inhaled corticosteroids and written asthma action plans, reduce smoking, exposure to passive smoke and obesity among people with asthma.

1 Introduction

Asthma is a common chronic condition affecting people of all ages in Australia. Previous reports have established that it is widely distributed within the population and is associated with significant adverse effects on quality of life. Important changes in the prevalence of asthma have been noted over the past 20 to 30 years. During the 1980s and early 1990s there was a substantial increase in the prevalence of asthma, worldwide. In recent years this increasing trend appears to have plateaued (Asher et al. 2006; Eder et al. 2006). Effective management strategies are available to control the symptoms of asthma and prevent exacerbations but there is evidence that they are not universally adopted by those who stand to benefit. For these reasons, it is important to continue to monitor the prevalence of asthma, its distribution within the community and the uptake of effective disease management practices. Australia's National Health Survey (NHS) is an important source of information on all these aspects of asthma.

This report presents data about the prevalence of asthma in Australia, its management, its effect on quality of life and its related risk factors, using data from the NHS. The characteristics that differ among people with and without current asthma (distinguishing characteristics) are highlighted. The results presented here are from the most recent NHS conducted in 2004–05, and these are compared with the corresponding findings from the preceding NHS in 2001.

The NHS is a face-to-face interview survey conducted in a representative sample of households by the Australian Bureau of Statistics (ABS) about every 3 years. Information on health status, use of health services and facilities, and health and lifestyle characteristics is collected to provide a profile of health in the Australian population. In recent surveys, there has also been a particular focus on collecting information about the National Health Priority Area conditions, namely asthma, cancer, heart and circulatory conditions, diabetes, injuries, mental wellbeing and musculoskeletal conditions (including arthritis and osteoporosis).

An important strength of the NHS is that it is conducted in a nationally representative sample and has historically achieved a very high response rate. Of all the selected households (after sample loss), 92% fully responded in 2001 and 89% in 2004–05 (ABS 2006b). The 2004–05 NHS was conducted in conjunction with the National Aboriginal and Torres Strait Islander Health Survey (NATSIHS), which specifically collected information on the health status of Indigenous Australians. Information from this survey is also included where available.

In this first chapter, background information and the overview and objectives of this report are provided. Chapter 2 provides information on the prevalence of ever having asthma and the prevalence of current asthma; Chapter 3 investigates some aspects of asthma management and care, including possession of written asthma action plans and use of medication for asthma; Chapter 4 compares rates of smoking, and exposure to passive smoke, among people with and without asthma. Levels of exercise and obesity, both of which have been implicated as risk factors for asthma, are compared among people with and without the disease; Chapter 5 looks at how asthma affects quality of life; and Chapter 6 investigates the association between asthma and other long-term conditions.

Objectives of this report

- To describe recent time trends in asthma's impact, its management and its risk factors.
- To examine differences in asthma across age groups, between males and females, in states and territories, among socioeconomic groups and among urban, rural and remote populations.
- To provide specific findings about asthma for Aboriginal and Torres Strait Islander Australians and for people with a non-English-speaking background.
- To identify characteristics that distinguish people with and without current asthma.

2 Prevalence

Estimating the number of people in the community who have asthma is fundamental to evaluating the impact of asthma at a population level and is relevant to estimating resource needs and priorities. Examining differences among population subgroups in the prevalence of asthma provides insights into possible causative factors and also assists in targeting resources to areas of need. Examination of changes over time in the proportion of people who have asthma contributes to the evaluation of population-based efforts to prevent the disease and, if a rising trend is observed, may stimulate the search for environmental or lifestyle-related risk factors.

However, estimating the prevalence of asthma presents significant challenges as there is no universally applied and accepted definition for asthma. The prevalence of asthma has been estimated using a wide range of subjective, or self-reported, and objective measures, alone or in combination, in both clinical and population-based settings.

In this chapter, information on the prevalence of asthma in Australia is presented, as estimated from the NHS. The NHS estimates asthma prevalence using self-report by the survey respondents. It reports data on cumulative prevalence, that is, the prevalence of ever being diagnosed with asthma, and on period prevalence, that is, the prevalence of having current asthma.

2.1 Prevalence of ever having asthma

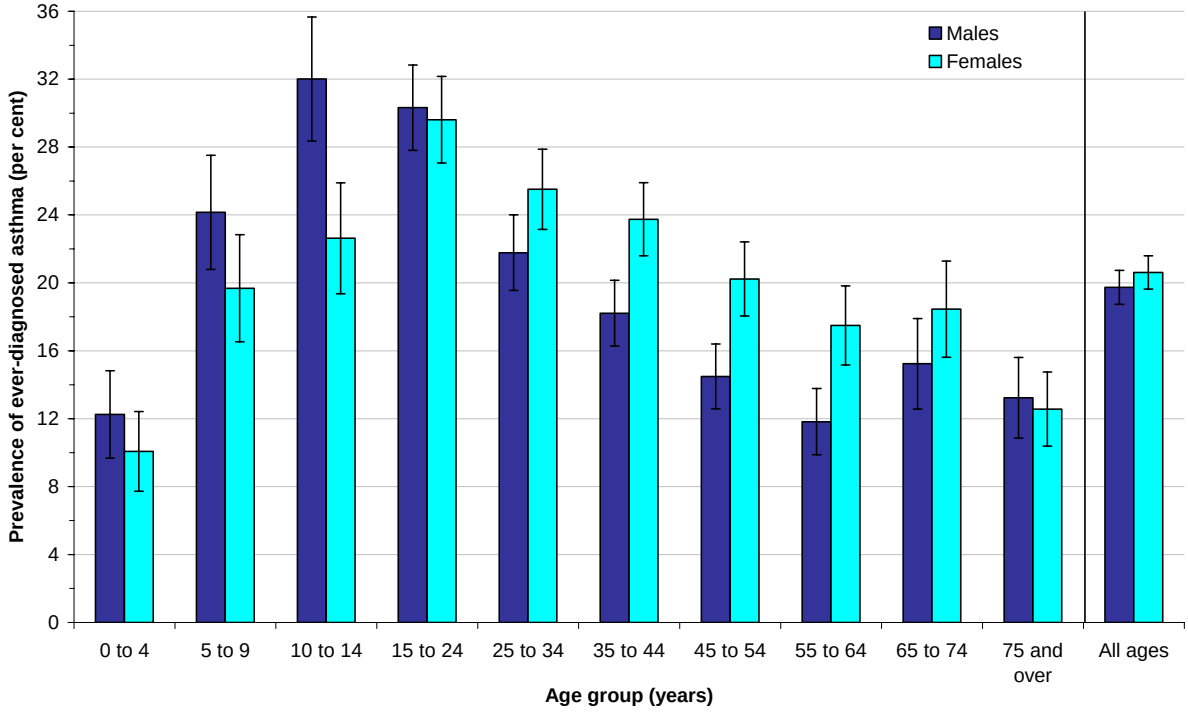
All participants in the NHS were asked the following question: 'Have you ever been told by a doctor or a nurse you have asthma?'. Those who answered 'yes' to this question were included as having ever had diagnosed asthma in the analyses presented in this section.

Based on data from the 2004–05 NHS, it is estimated that 3,979,476 Australians have been diagnosed with asthma by a doctor or nurse at some time in their lives. This equates to 20.3% (95% CI: 19.5%–21.0%) of Australians reporting ever having been diagnosed with asthma.

Comparison of results from the 2004–05 NHS with those reported in 2001 showed that, overall, the prevalence of ever being diagnosed with asthma in Australia remained relatively constant (20.4% in 2001 compared to 20.3% in 2004–05).

Age and sex

The overall prevalence of ever having been diagnosed with asthma was similar in females (20.6%) and males (19.7%). However, among children (aged less than 15 years) the prevalence was higher in males and among adults the prevalence was higher in females (Figure 2.1). This striking change in the relation of prevalence to sex after age 15 years is unchanged since 2001.



Note: Age-standardised to the Australian population as at June 2001.

Figure 2.1: Prevalence of ever having asthma diagnosed by a doctor or nurse, by age and sex, all ages, Australia, 2004–05

There was negligible change in prevalence observed between the two surveys among males (19.6% in 2001 compared with 19.7% in 2004–05) and females (21.2% in 2001 and 20.6% in 2004–05). However, there was a significant reduction in the prevalence of ever being diagnosed with asthma among children aged 0 to 14 years from 23.7% (95% CI: 22.3–25.1%) in 2001 to 20.4% (95% CI: 19.0–21.7%) in 2004–05 ($p < 0.0001$).

In contrast, the prevalence among young adults aged 15 to 34 years was virtually the same in 2001 and 2004–05 (26.6% compared with 26.7%, respectively).

2.2 Prevalence of current asthma

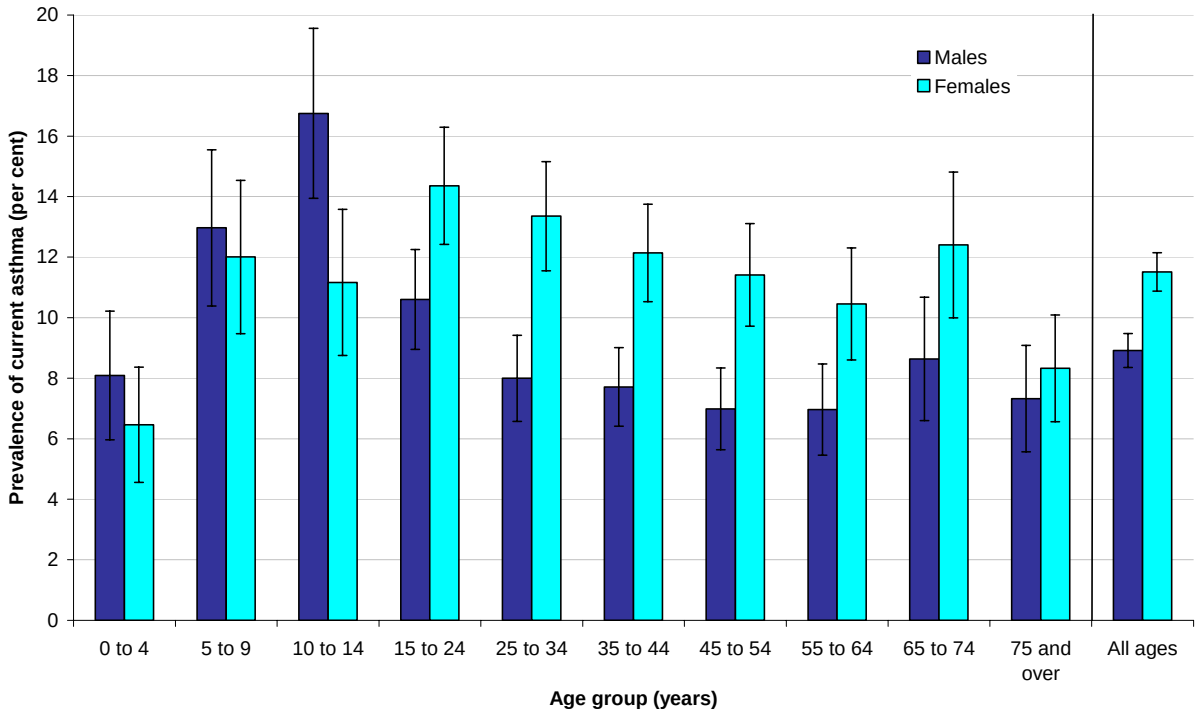
Subjects were classified as having current asthma if they reported ever being told they have asthma by a doctor or a nurse, and they also answered 'yes' to the question: 'do you still get asthma?'

The 2004–05 NHS estimated that 2,010,212 Australians had current asthma. This represents 10.3% of the Australian population, down from an estimated 11.6% in the 2001 NHS.

Age and sex

Overall, females had a significantly higher prevalence of current asthma than males (11.5% compared with 8.9%, $p < 0.0001$) and females comprised 57% of all people with the condition in 2004–05.

Among those aged 0 to 14 years, the prevalence was higher for males than females of the same age, but among those aged 15 years and over, current asthma was more prevalent in females than males. For males, the highest prevalence was among those aged 10 to 14 years (16.8%), while for females it was highest among those aged 15 to 24 years (14.4%) (Figure 2.2).

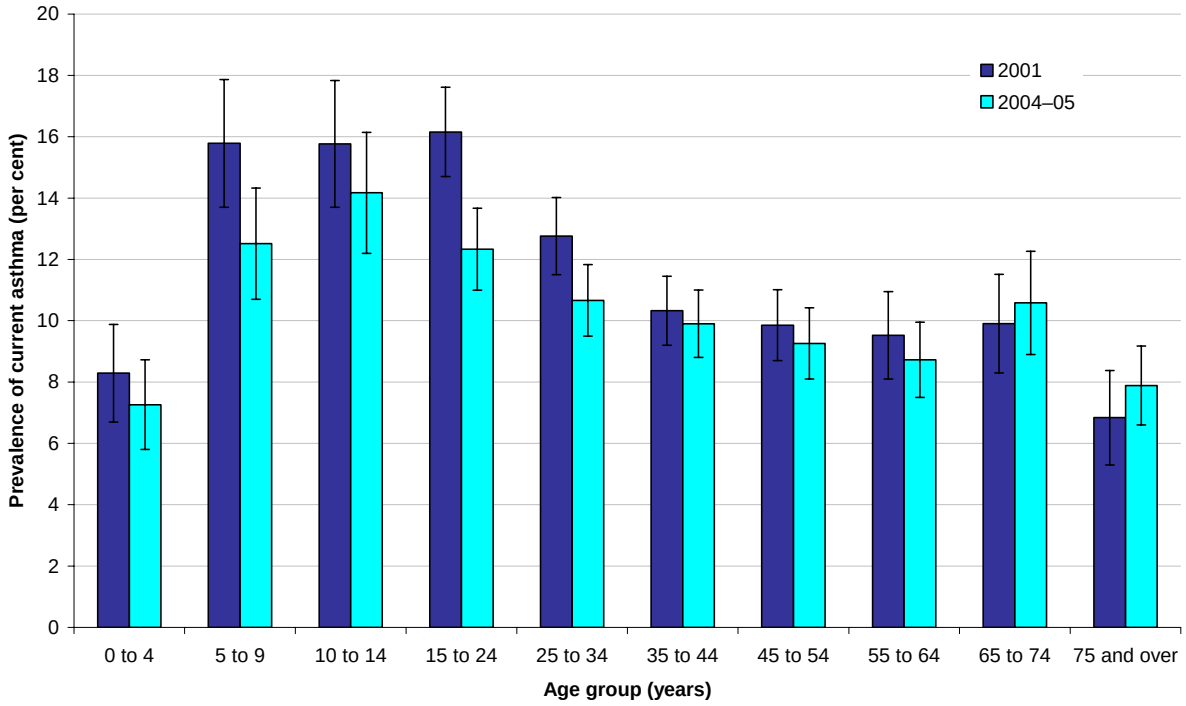


Note: Age-standardised to the Australian population as at June 2001.

Figure 2.2: Prevalence of current asthma, by age group and sex, all ages, Australia, 2004–05

The prevalence of current asthma among children and adults aged up to 34 years was significantly lower in 2004–05 (11.7%) compared with 2001 (14.0%) (Figure 2.3, $p < 0.0001$). However, there was no significant difference in the prevalence between the two survey years for people aged 35 years and older. Recent data from multi-country studies indicate that the prevalence of asthma in children has also fallen in other countries with a history of high prevalence rates (Asher et al. 2006).

Between 2001 and 2004–05, the prevalence of current asthma fell significantly among males, from 10.5% to 9.0% ($p < 0.0001$) and females, from 12.6% to 11.5% ($p = 0.0046$).



Note: Age-standardised to the Australian population as at June 2001.

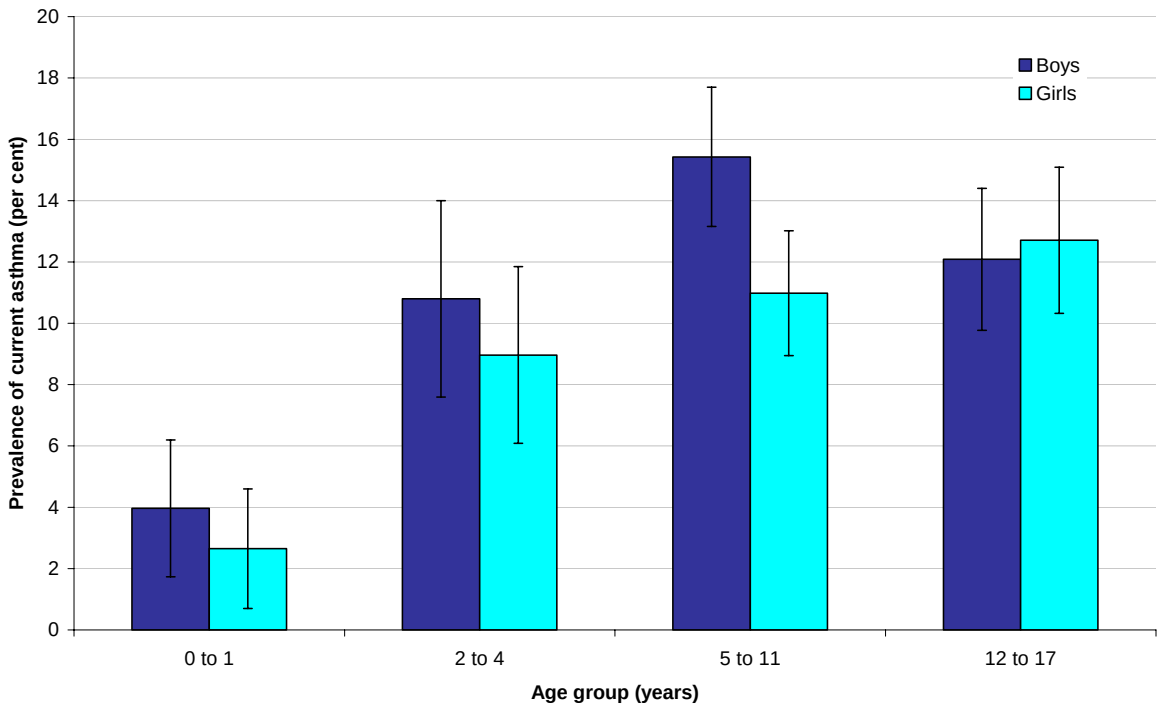
Figure 2.3: Prevalence of current asthma, by age group and survey year, Australia, 2001 and 2004–05

Prevalence of current asthma in children

Here we summarise data on the prevalence of current asthma among children aged up to 17 years. Among girls aged 0 to 17 years, the prevalence of current asthma in 2004–05 increased with age. The prevalence among boys was higher than girls up to age 11 years, with the highest being among boys of primary school age (5 to 11 years) (Figure 2.4). In this age group, the prevalence of current asthma was 15.1% in boys compared with 11.0% in girls.

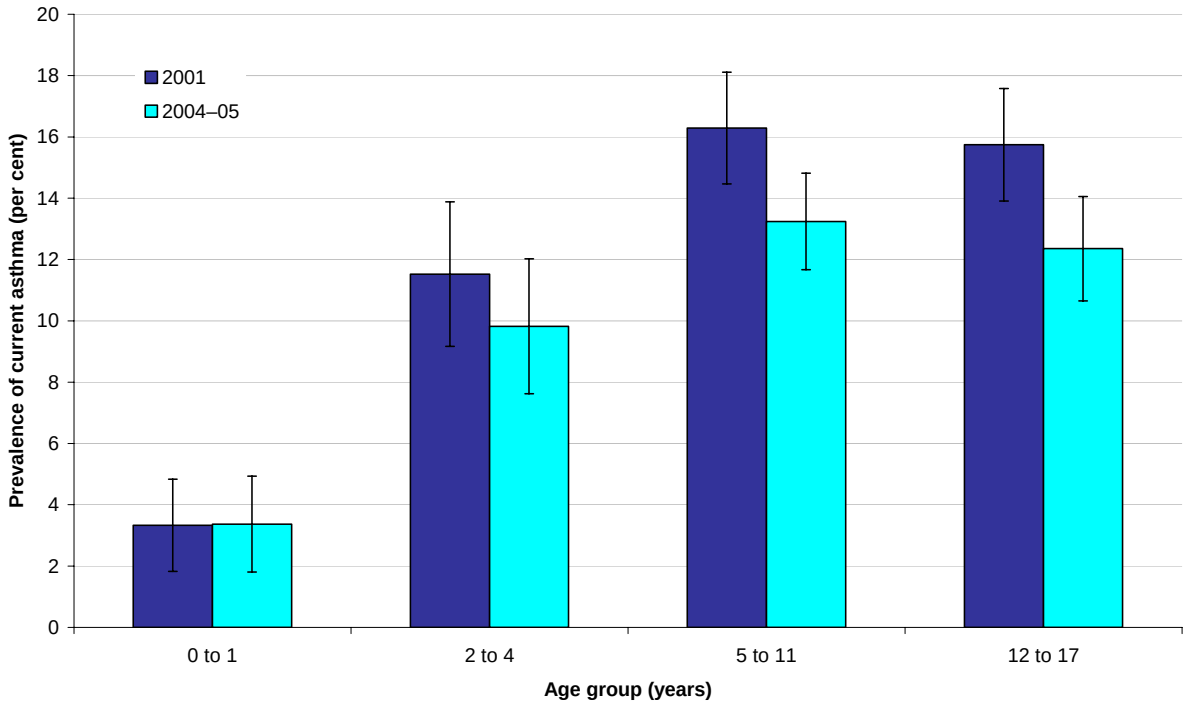
Between 2001 and 2004–05, the prevalence of current asthma among children aged 0 to 17 years fell significantly, from 15.5% to 12.2% ($p < 0.0001$), for boys and, to a lesser extent, from 12.2% to 10.3% ($p = 0.0122$) for girls.

While the prevalence of current asthma did not change for children aged 0 to 1 year between 2001 and 2004–05 (Figure 2.5), the prevalence rates among older children were lower in 2004–05, notably among those aged 5 to 17 years.



Note: Age-standardised to the Australian population as at June 2001.

Figure 2.4: Prevalence of current asthma in children aged 0 to 17 years, by age group and sex, Australia, 2004–05

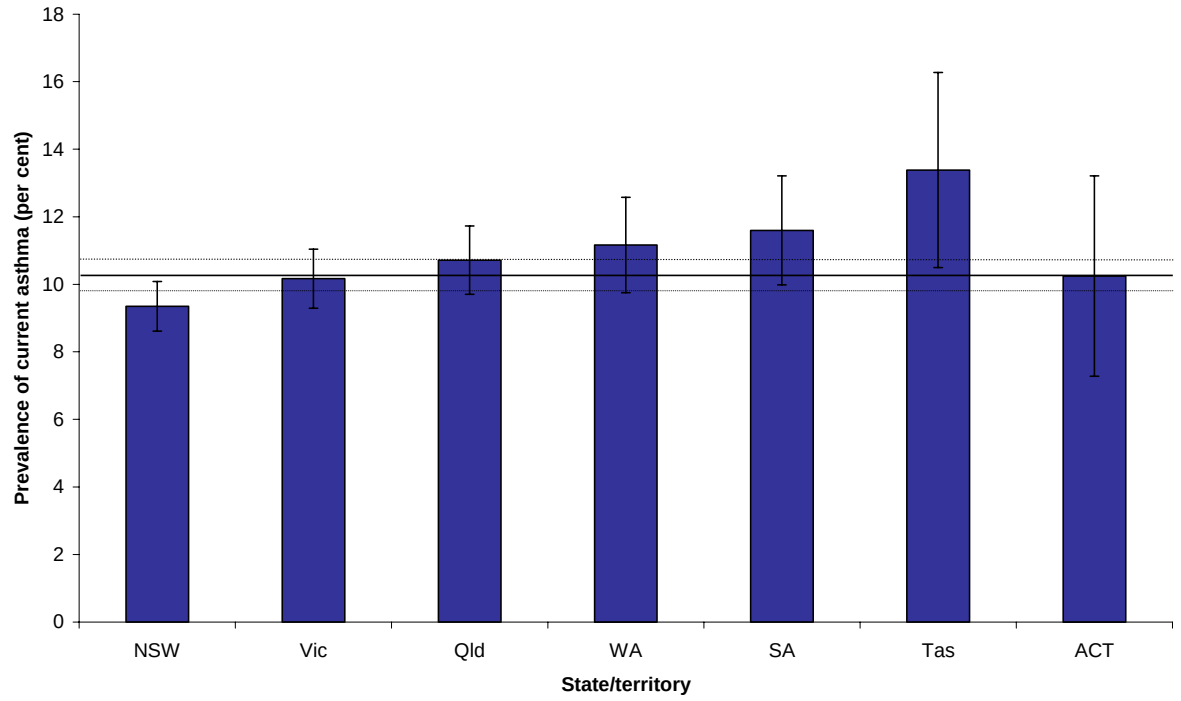


Note: Age-standardised to the Australian population as at June 2001.

Figure 2.5: Prevalence of current asthma in children aged 0 to 17 years, by age group, Australia, 2001 and 2004–05

States and territories

Estimates of the prevalence of current asthma in 2004–05 varied between 9.3% in New South Wales and 13.4% in Tasmania (Figure 2.6). While the prevalence of current asthma did not differ significantly from the national average in any of the states or the Australian Capital Territory, the rate in Tasmania was significantly higher than the rate in New South Wales.



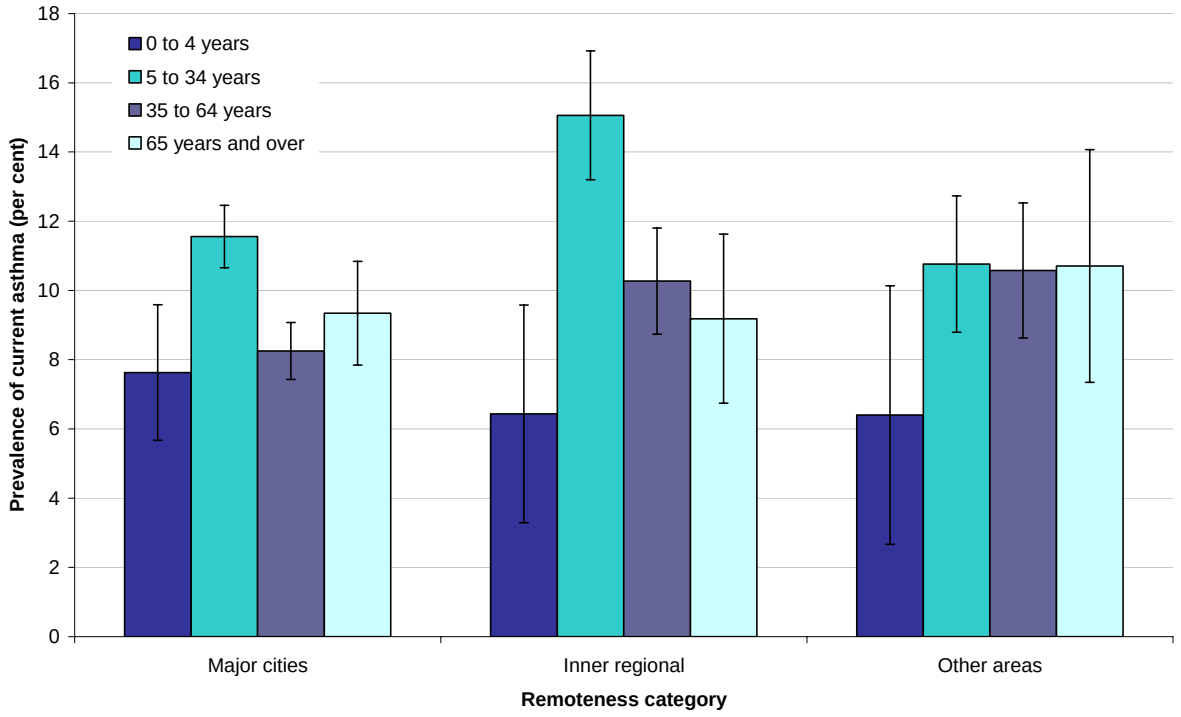
Notes

1. Bold horizontal line represents age-adjusted prevalence of current asthma in Australia (10.3%) and the dotted lines are the corresponding 95% confidence limits. The Northern Territory is excluded as the numbers are too small to produce reliable estimates, but it does contribute to the national estimates.
2. Age-standardised to the Australian population as at June 2001.

Figure 2.6: Prevalence of current asthma, by state and territory, all ages, Australia, 2004–05

Urban, rural and remote areas

In 2004–05, there were 13.2 million people living in *Major cities* of Australia, about 4 million people living in *Inner regional* Australia and the remaining 2.5 million people were residing in *Outer regional* Australia and other areas. With the exception of people aged 5 to 34 years, the prevalence of current asthma was similar across all these geographic areas in 2004–05 (Figure 2.7). However, among people aged 5 to 34 years, those living in *Inner regional* areas had a significantly higher prevalence of asthma (15.1%) than those living in *Major cities* (11.6%) or other areas (10.8%). Further, among people living in *Inner regional* areas and *Major cities*, the prevalence of asthma was significantly higher in people aged 5 to 34 years than in younger or older people.



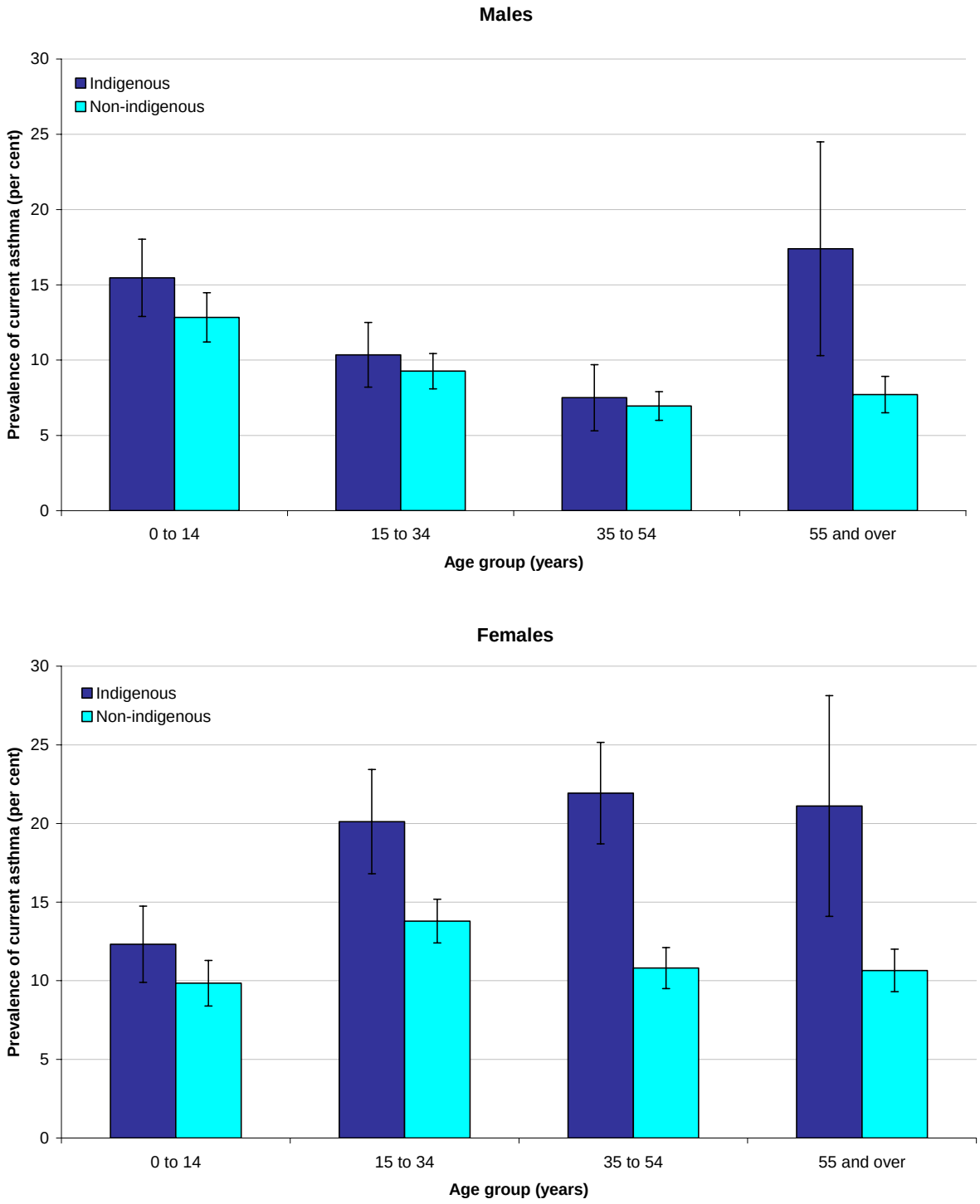
Note: Age-standardised to the Australian population as at June 2001. 'Other areas' includes *Outer regional*, *Remote* and *Very remote* categories of remoteness.

Figure 2.7: Prevalence of current asthma, by remoteness and age group, Australia, 2004–05

Aboriginal and Torres Strait Islander Australians

The crude prevalence of current asthma among Aboriginal and Torres Strait Islander Australians in the 2004–05 NATSIHS was 15.1%. Indigenous males had a significantly lower age-adjusted prevalence of current asthma (12.5%) than Indigenous females (19.9%) ($p < 0.0001$).

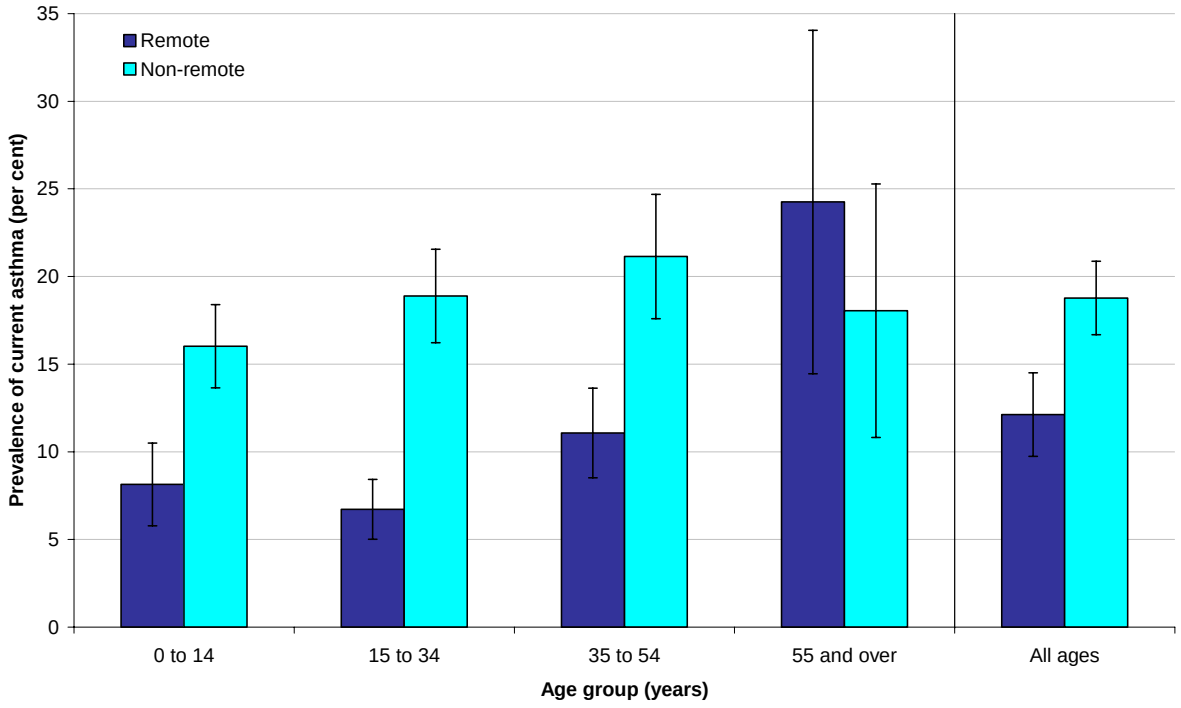
The age-adjusted prevalence of current asthma was higher among Indigenous Australians (16.5%) than other Australians (10.2%). Although this difference exists across all age groups, it is more prominent in older adults, especially females aged 35 years and over in whom the prevalence among Indigenous Australian females was double that observed for other Australian females in the same age group (22% versus 11%) (Figure 2.8). Among Aboriginal and Torres Strait Islander females, the prevalence was considerably higher in older adults than in children.



Note: Age-standardised to the Australian population as at June 2001.

Figure 2.8: Prevalence of current asthma, by age group, sex and Indigenous status, Australia, 2004–05

Among Aboriginal and Torres Strait Islander Australians aged less than 55 years, the prevalence of current asthma was significantly lower among those living in remote areas than among those living in non-remote areas (Figure 2.9). This regional difference was not evident among Aboriginal and Torres Strait Islander Australians aged 55 years and over. Overall, the prevalence of current asthma among Indigenous Australians was higher in those living in non-remote areas (18.8%) than in remote areas (12.1%) of Australia.



Note: Age-standardised to the Australian population as at June 2001.

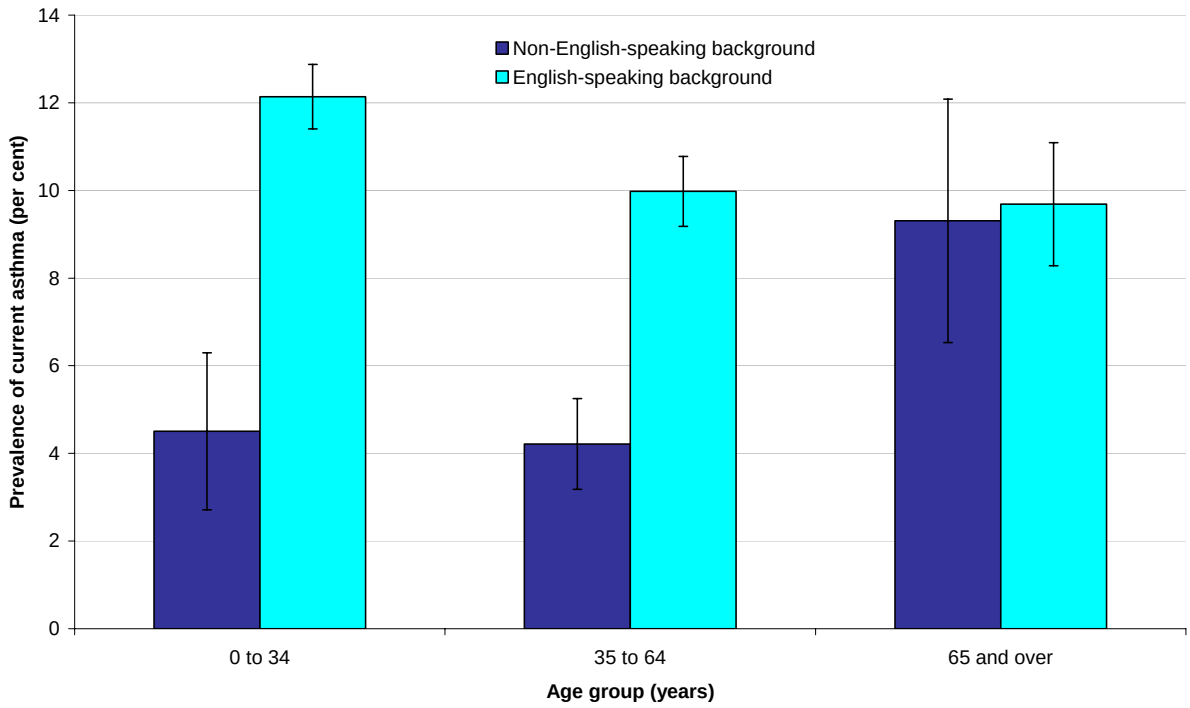
Figure 2.9: Prevalence of current asthma among Aboriginal and Torres Strait Islander Australians, by age group and remoteness, Australia, 2004–05

Among Aboriginal and Torres Strait Islander Australians the prevalence of current asthma was similar in 2004–05 compared with 2001 across all age groups. The overall prevalence of current asthma among Aboriginal and Torres Strait Islander Australians was 16.5% in 2004–05 compared with 17.7% in 2001 ($p = 0.4$).

Culturally and linguistically diverse background

In 2004–05, people from non-English-speaking backgrounds had a lower prevalence of current asthma than other Australians, especially among those aged 0 to 64 years (Figure 2.10). Compared with people from non-English-speaking backgrounds, the prevalence of current asthma among people from English-speaking backgrounds was 2.7 times as high in those aged less than 35 years, and 2.4 times as high in those aged 35 to 64 years. There was no difference in the prevalence of asthma by English-speaking background for people aged 65 years and over.

The prevalence of current asthma among people from non-English-speaking backgrounds did not differ between the sexes in 2004–05 (data not shown).



Note: Age-standardised to the Australian population as at June 2001.

Figure 2.10: Prevalence of current asthma, by broad age group and English-speaking versus non-English-speaking background, Australia, 2004–05

Overall, among people from non-English-speaking backgrounds, there were no significant changes in the prevalence of current asthma between 2001 and 2004–05 (data not shown).

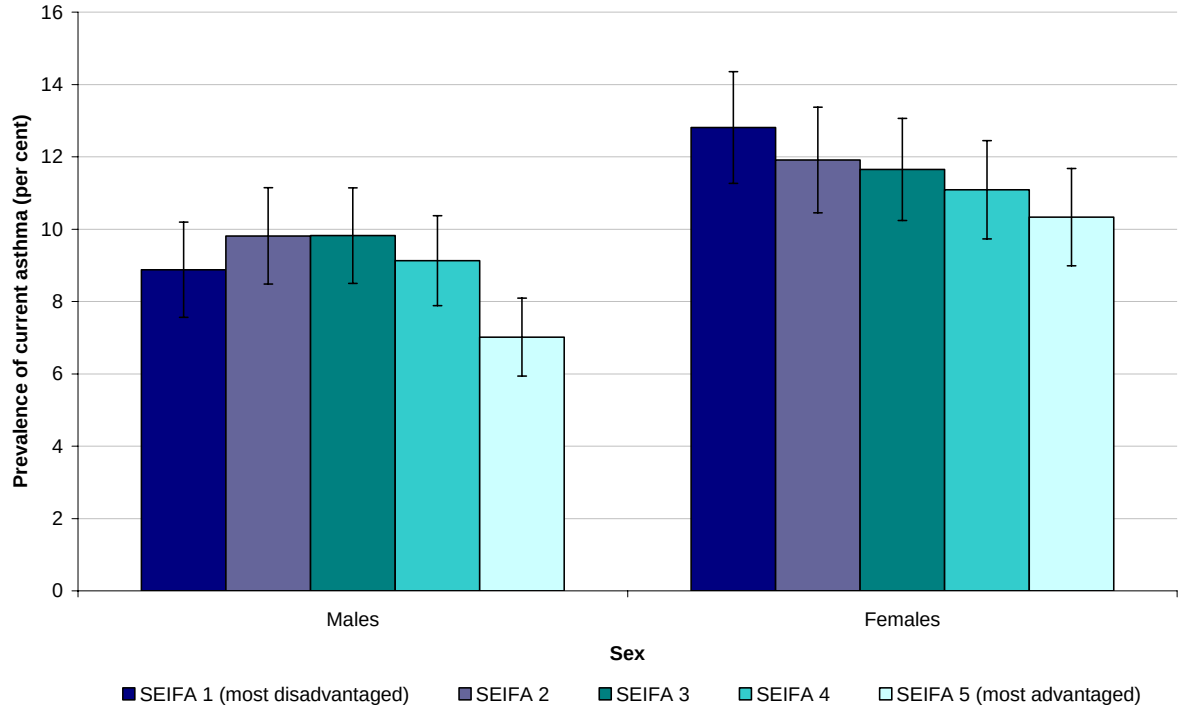
Socioeconomic disadvantage

In 2004–05, the prevalence of current asthma was significantly higher among people living in areas included in the three most socioeconomically disadvantaged quintiles of localities (10.8%) compared with those living in the most advantaged localities (8.6%). The difference in the prevalence of asthma between the lowest and highest socioeconomic quintile was 2.2 percentage points in 2004–05. This gap has widened since the 2001 survey, when the

difference in prevalence between the most disadvantaged and the most advantaged socioeconomic quintile was 0.9 percentage points.

Among females in 2004–05, the prevalence of asthma increased with increasing socioeconomic disadvantage (p trend = 0.003). For males, those living in the most advantaged localities had the lowest prevalence of current asthma but this was not significantly lower than the rates observed in the other quintiles of socioeconomic status (Figure 2.11). However, there was still a significant trend of increasing asthma prevalence with increasing socioeconomic disadvantage (p trend = 0.01).

There was no difference in the prevalence of current asthma among Aboriginal and Torres Strait Islander Australians according to the quintiles of socioeconomic status (data not shown).



Note: Age-standardised to the Australian population as at June 2001.

Figure 2.11: Prevalence of current asthma by sex and socioeconomic status, Australia, 2004–05

Government health card status

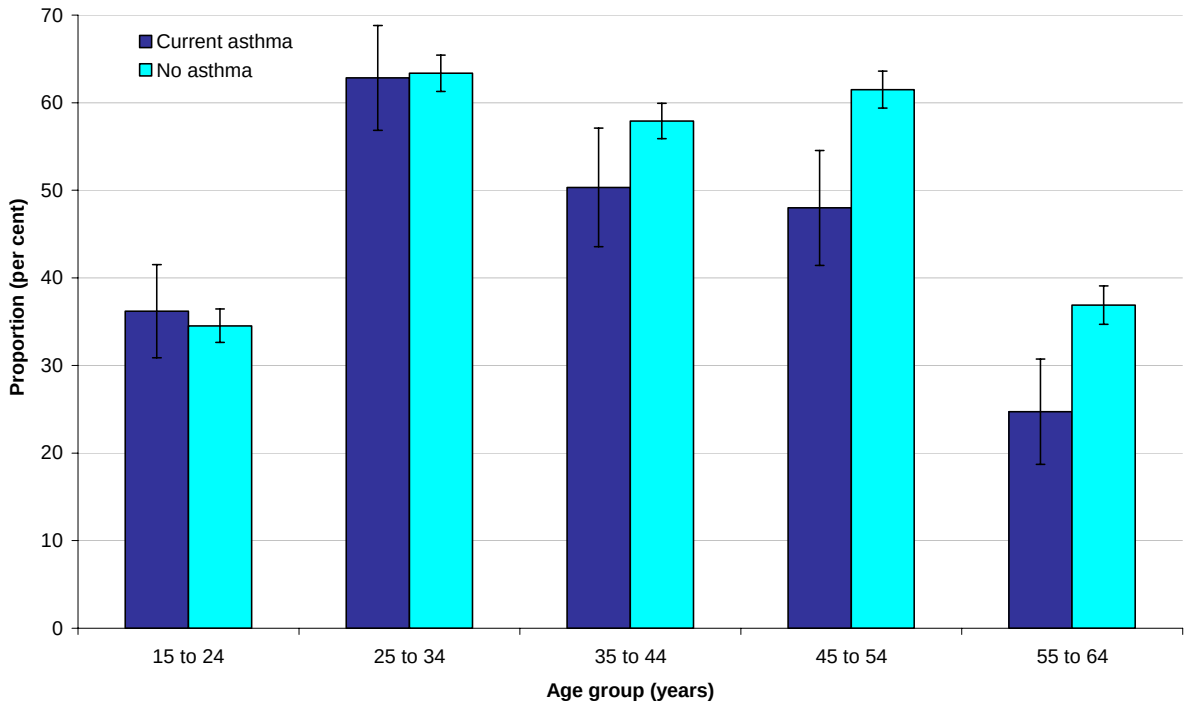
In 2004–05, the prevalence of current asthma among people with a government health concession card was 13.1% (Table 2.1). This was 1.5 times as high as the prevalence of current asthma in people without a Government health card (8.7%).

People with current asthma were more likely to be government health concession cardholders (39.9%) than people without asthma (31.7%, $p < 0.0001$).

Labour force status

Among Australians of working age (15 to 64 years), the proportion who reported being employed full-time in 2004–05 was slightly lower among people with current asthma (46.1%) compared to people without asthma (52.1%). The proportion of people with current asthma among full-time employees was significantly lower for those aged 45 to 64 years, but among people aged less than 45 years, those with current asthma were just as likely to be working full-time as those without asthma (Figure 2.12).

The proportion of people who reported being unemployed but looking for work was similar whether they had current asthma (3.7%) or not (3.5%).

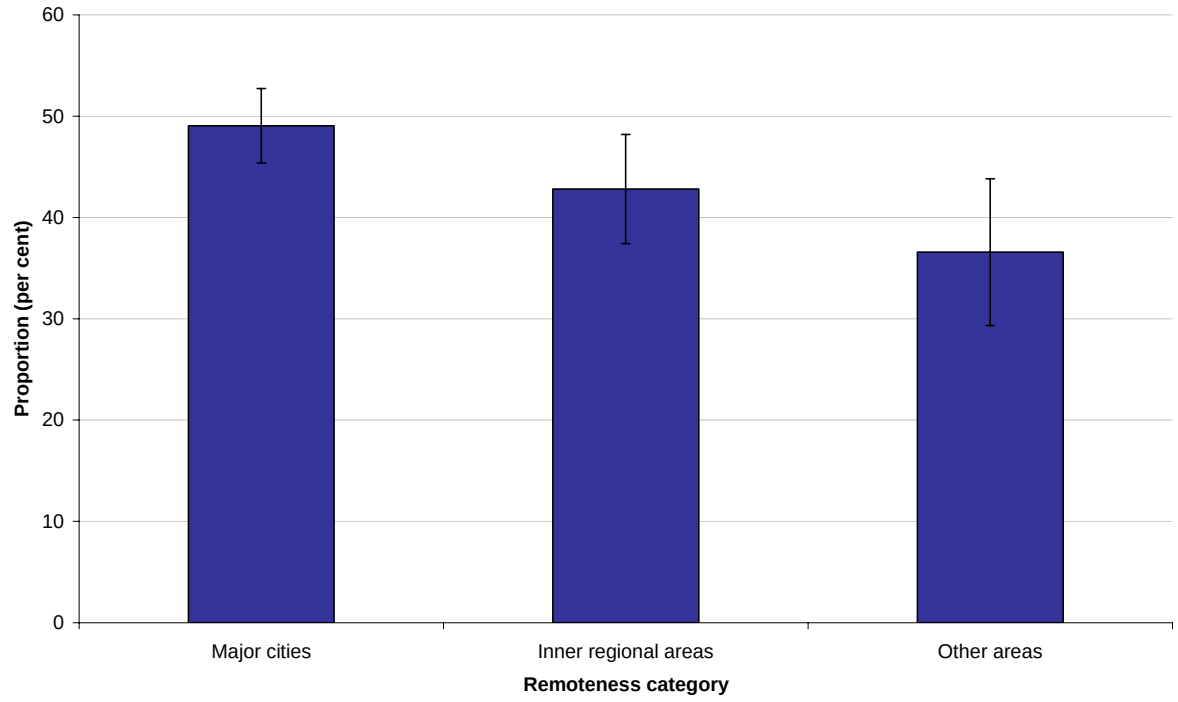


Note: Age-standardised to the Australian population as at June 2001.

Figure 2.12: Proportion of people aged 15 to 64 years who reported being employed full-time, by current asthma status and age, Australia, 2004–05

The prevalence of current asthma among people aged 15 to 64 years was significantly higher among those who were not in the labour force (12.0%) compared with those who were employed full-time (9.3%) (Table 2.1).

Almost 50% of people with current asthma who were living in major cities in 2004–05 were employed full-time. This proportion decreased with increasing levels of remoteness (Figure 2.13).



Note: Age-standardised to the Australian population as at June 2001.

Figure 2.13: Proportion of people aged 15 to 64 years with current asthma who reported working full-time, by remoteness category, Australia, 2004–05

Summary

Among children aged 0 to 14 years, asthma was more common in boys than girls but among adults asthma was more common among females than males. The highest reported prevalence was among 10 to 14 year-old boys. Indigenous Australians had a higher prevalence of asthma than other Australians and among women the difference increased with age. People from English-speaking backgrounds had a higher prevalence of asthma than those from a non-English-speaking background, particularly among those aged less than 65 years. In the older working population, people with asthma were less likely to be employed full time than people without asthma, but among those aged 15 to 44 years the proportion in full-time employment did not differ between those with and without asthma.

The prevalence of asthma in Australia fell between 2001 and 2004–05 in people aged less than 35 years but did not change among people aged 35 years and over. In the same period, socioeconomic disparities widened, as evidenced by the increase in the gap in asthma prevalence between the highest and lowest socioeconomic quintiles.

Table 2.1: Prevalence of current asthma in the Australian population, 2004–05

	Per cent	(95% CI)
Sex		
Males	9.0	(8.4–9.6)
Females	11.5	(10.812.2)
Age group		
0 to 4 years	7.3	(5.8–8.7)
5 to 14 years	13.3	(12.0–14.7)
15 to 34 years	11.5	(10.6–12.3)
35 to 64 years	9.0	(8.3–9.6)
65 years and over	9.3	(8.2–10.5)
All ages	*10.3*	*(9.8–10.7)*
Indigenous status		
Indigenous	16.5	(14.9–18.1)
Non-Indigenous	10.2	(9.7–10.7)
Culturally and linguistically diverse background		
Non-English-speaking background	5.0	(4.0–6.0)
English-speaking background	11.0	(10.5–11.5)
Employment status (15 to 64 years)		
Employed	9.3	(8.7–9.9)
Unemployed	10.1	(7.3–12.9)
Not in labour force	12.0	(10.7–13.3)
Remoteness category		
Major cities of Australia	9.8	(9.2–10.3)
Inner regional Australia	11.9	(10.9–13.0)
Other areas	10.4	(9.2–11.6)
Socioeconomic quintile		
SEIFA 1 (most disadvantaged)	10.8	(9.8–11.9)
SEIFA 2	10.9	(9.9–12.0)
SEIFA 3	10.8	(9.8–11.8)
SEIFA 4	10.2	(9.2–11.1)
SEIFA 5 (most advantaged)	8.6	(7.7–9.5)
Private health insurance		
Have private health insurance	9.5	(8.8–10.3)
Do not have private health insurance	10.4	(9.7–11.1)
Government health care card		
Have a government health care card	13.1	(11.9–14.2)
Do not have a government health care card	8.7	(8.0–9.3)
Do not know if have government health care card	6.8	(5.3–8.4)

Note: Age-standardised to the Australian population as at June 2001.

3 Management and care of asthma

Over the last 20 years a consensus has emerged, based on available evidence, that written asthma action plans and regular use of medications that control the disease and prevent exacerbations are key elements in the effective management of asthma. This chapter will review the data from the NHS relating to the use of these management strategies and health care utilisation for asthma in the Australian population.

3.1 Written asthma action plans

A written asthma action plan enables people with asthma to recognise deterioration in their condition promptly and respond appropriately, by integrating changes in symptoms and/or peak expiratory flow measurements with written instructions to adjust medication. The aim of an asthma action plan is to help the process of early intervention and to prevent or reduce the severity of acute asthma episodes. It has been found that use of a written asthma action plan reduces the need for extra medication, urgent visits to doctors, hospitalisations and deaths as well as improves lung function (Abramson et al. 2001; Gibson et al. 2003). Written asthma action plans have formed part of national guidelines for the management of asthma since 1989 (Woolcock et al. 1989) and have been promoted in public education campaigns by the National Asthma Council Australia (NAC 2006).

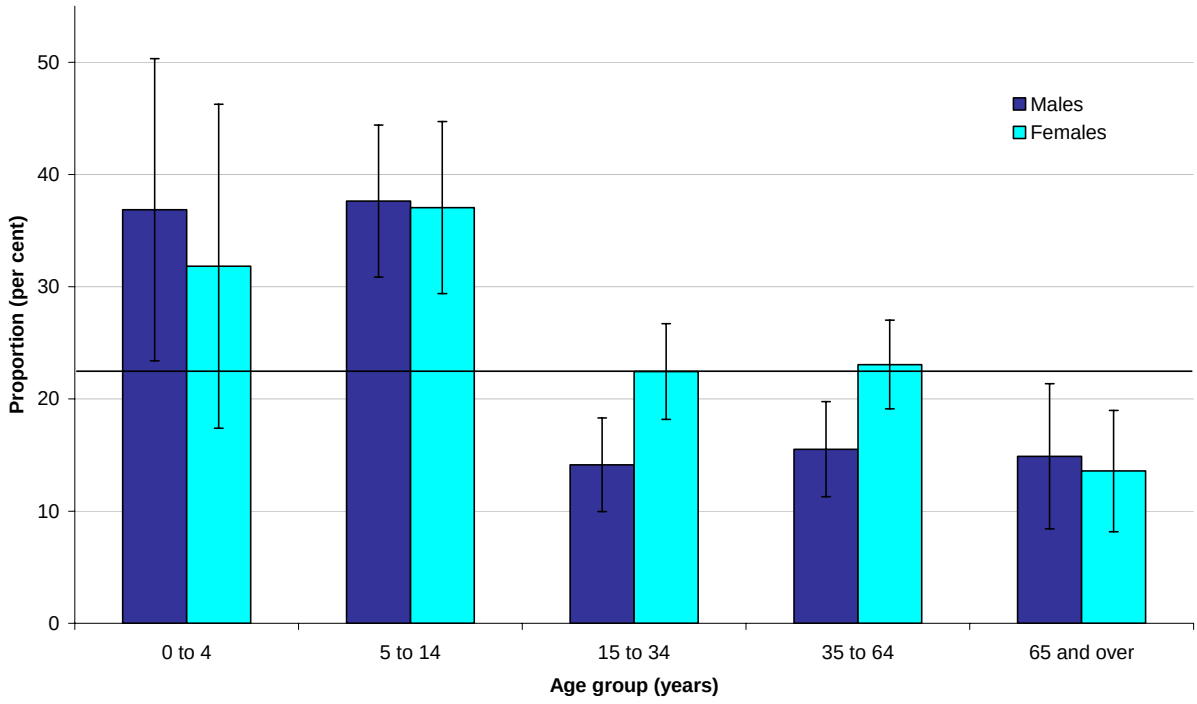
Asthma action plans may be provided in various formats. In the 2004–05 NHS, people who had indicated they had current asthma were asked: 'Do you have a written asthma action plan?' If the answer was 'yes', they were asked further questions about whether they got the asthma action plan from a doctor, a nurse or a chemist. Respondents were then shown a picture of a standard asthma action plan, as recommended by the National Asthma Council, and asked 'Is your action plan similar to this?'.

Less than one-quarter (23%) of all people with current asthma reported possessing a written asthma action plan in 2004–05. Approximately 5% of people with current asthma had never heard of an asthma action plan. Of those who did possess a written asthma action plan, 72% indicated that they possessed a standard plan.

The proportion of people with current asthma who had any type of written asthma action plan was significantly higher in the most recent survey compared with the 2001 survey, when only 17% had such a plan.

Age and sex

Children aged 5 to 14 years were significantly more likely to have a written asthma action plan than people aged 15 years and over (Figure 3.1). More females than males aged 15 to 64 years had a written asthma action plan but the differences were not statistically significant.



Notes: Age-standardised to the Australian population as at June 2001. The horizontal line represents the proportion of people of all ages with a written asthma action plan (22.5%).

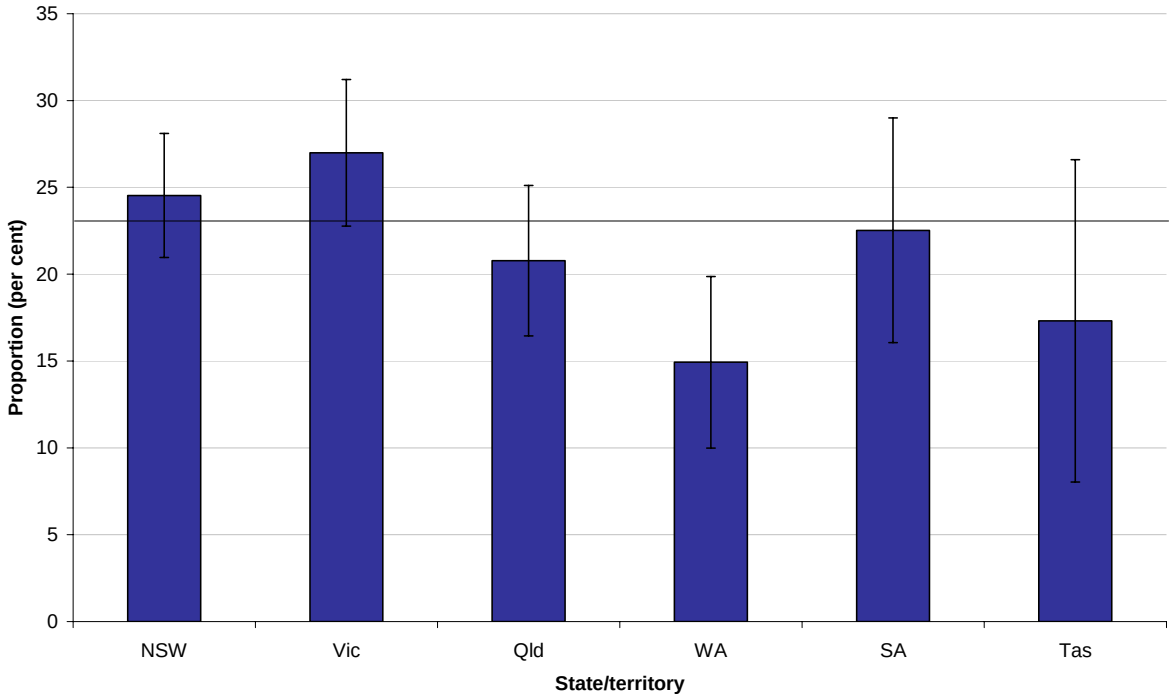
Figure 3.1: Possession of a written asthma action plan among people with current asthma, by age group and sex, Australia, 2004–05

Aboriginal and Torres Strait Islander Australians

In 2004–05, 24.6% of Aboriginal and Torres Strait Islander Australians with current asthma possessed an asthma action plan, which was similar to the corresponding proportion for non-Indigenous Australians (22.2%) ($p = 0.15$). Of those Aboriginal and Torres Strait Islander Australians who had a plan, 91.8% were obtained from a doctor and 78.4% were the standard type.

States and territories

Of the states and the Australian Capital Territory, Western Australia had the lowest proportion of people with a written asthma action plan in 2004–05 (15%). This proportion was significantly lower than the national average (Figure 3.2).



Notes: Age-standardised to the Australian population as at June 2001. The horizontal line represents the proportion of people of all ages with a written asthma action plan (22.5%). The Northern Territory and the Australian Capital Territory are excluded because numbers are too small to produce reliable estimates.

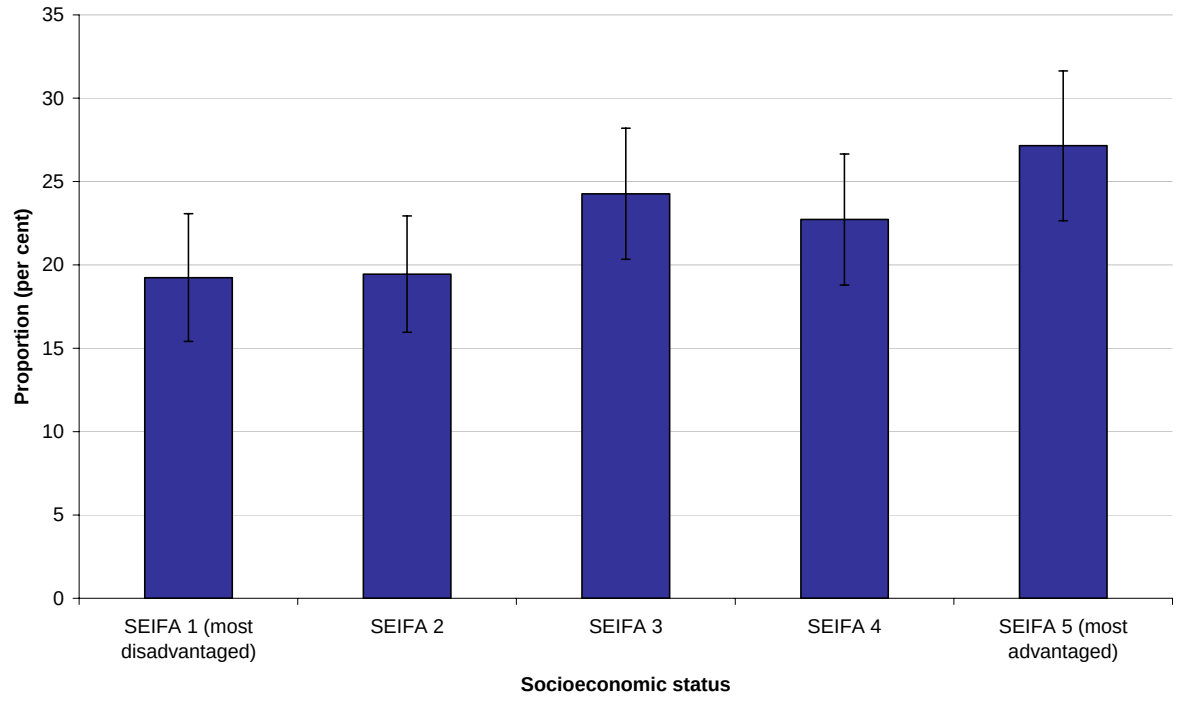
Figure 3.2: Possession of a written asthma action plan among people with current asthma, by state and territory, Australia, 2004–05

Urban, rural and remote areas

Overall, possession of a written asthma action plan did not differ significantly between those living in *Major cities*, *Inner regional* areas or other areas of Australia in 2004–05 (data not shown).

Socioeconomic disadvantage

In 2004–05, the proportion of people with current asthma who reported having a written asthma action plan was highest among those living in the most advantaged localities of Australia (27%) and lowest for those living in the most disadvantaged localities (19%) (Figure 3.3). There was a significant overall trend of increasing rates of possession of plans with higher levels of socioeconomic advantage (p trend = 0.002).



Note: Age-standardised to the Australian population as at June 2001.

Figure 3.3: Possession of a written asthma action plan among people with current asthma, by socioeconomic status, Australia, 2004–05

Source of written asthma action plan

Doctors were the most common source of written asthma action plans (94%) in 2004–05. Approximately 3% of people with current asthma who had a written asthma action plan got their plan from a nurse or a chemist, and the source was not specified for the remaining 3% of people.

3.2 Health-related actions taken for asthma

People with asthma take health-related actions for non-urgent reasons, such as routine review and prescription of usual asthma therapy, or for urgent management of disease exacerbations or 'attacks'. This section presents analyses of health-related actions taken for asthma in the 2 weeks before the interview. Respondents who had indicated they had current asthma were asked: 'Have you taken any of these actions for your asthma in the last 2 weeks?'.

The respondents were then shown a prompt card with various actions listed on it and asked: 'Which ones?'.

The health-related actions included on the prompt card were consultations with general practitioners and/or specialists; consultations with other health professionals; hospital admissions; visits to hospital emergency/casualty units and outpatient clinics; visits to day clinics; days away from work or study due to their asthma; other days of reduced activity

due to their asthma; and the use of pharmaceutical medications, natural/herbal medicines and vitamin or mineral supplements. It should be noted that respondents could choose more than one response.

In summary, 57% of people with current asthma reported undertaking one or more of the following actions *for their asthma* in the previous 2 weeks:

- 56% used pharmaceutical medications (see next section)
- 6.5% visited a doctor (that is, a general practitioner and/or specialist) and 1.3% consulted some other health professional
- 1% were admitted to hospital or visited hospital emergency departments or outpatients clinics
- 3% had days away from work or school, or other days of reduced activity.

The age groups most likely to have consulted a doctor were those aged 65 years and over (13.6%) and children aged 0 to 14 years (6.3%).

3.3 Use of asthma medications

Drug therapy is the mainstay of asthma management. Broadly speaking, there are three ways in which medications are used in the treatment of asthma:

1. to relieve symptoms when they occur
2. to control the disease and attempt to prevent symptoms and exacerbations
3. to treat exacerbations of the disease.

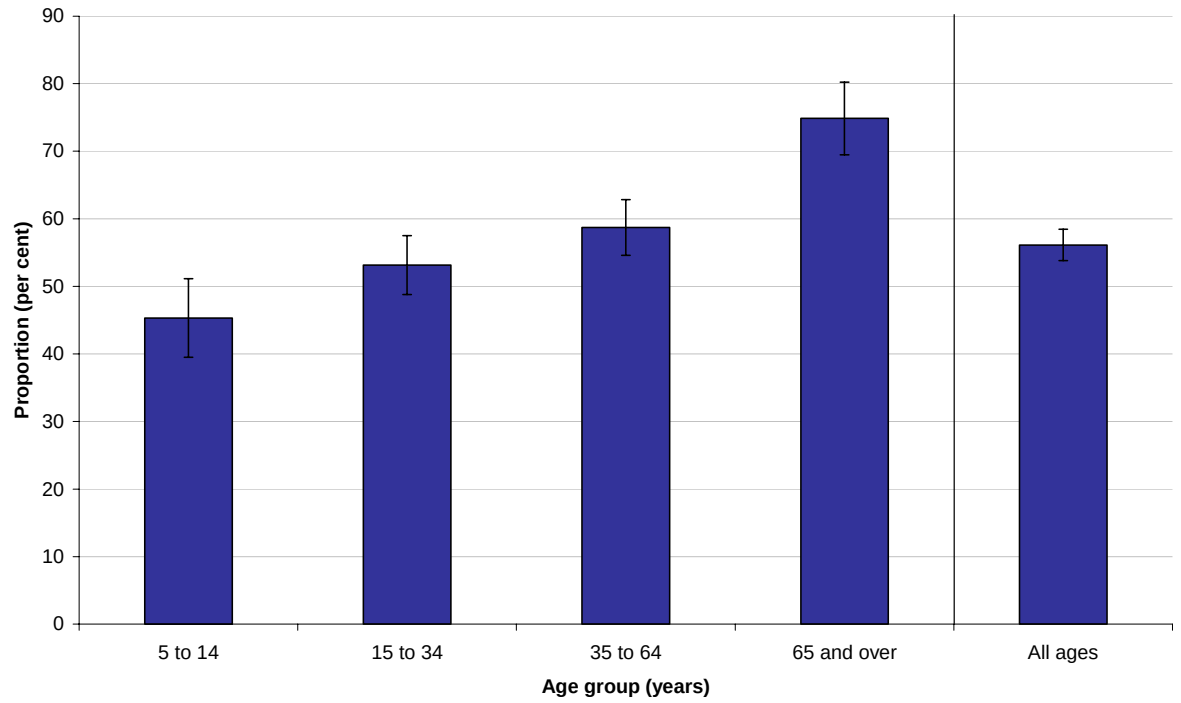
The most commonly used class of medications for rapid relief of symptoms are short-acting beta agonists, which are often referred to as 'relievers' or 'short-acting bronchodilators'. Inhaled corticosteroids, which are often referred to as 'preventers', are effective in controlling symptoms and preventing exacerbations in many people with asthma (Adams et al. 2003, 2004, 2005). Current international (GINA 2006) and Australian (NAC 2006) guidelines recommend that people with persistent asthma of all levels of severity use inhaled corticosteroids regularly. In people whose asthma symptoms are not sufficiently controlled with low or moderate doses of inhaled corticosteroids alone, the addition of long-acting beta agonists achieves improved control as effectively or more effectively than doubling the dose of inhaled corticosteroids (Greening et al. 1994). Oral corticosteroids have long been the mainstay of treatment for exacerbations of asthma.

In this section, the reported use of medications for the management of asthma is reviewed. In the 2004–05 NHS, respondents who indicated that they had current asthma were asked about use of medications for their asthma in the 2 weeks before the interview, not including vitamin and mineral supplements or natural or herbal medicines. The following questions were asked:

- Have you taken any medication for asthma in the last 2 weeks?
- What are the names or brands of all the asthma medications you have used in the last 2 weeks?

Almost 56% of people with current asthma had used medication for their asthma in the last 2 weeks (Figure 3.4). The proportion of persons with current asthma who used pharmaceutical medication increased with age (p trend < 0.0001). The lowest reported use

was among children aged 5 to 14 years (45%) and the highest was among those aged 65 years and over (75%).



Note: Age-standardised to the Australian population as at June 2001.

Figure 3.4: Use of asthma medication in the last 2 weeks among people with current asthma, by age group, Australia, 2004–05

Aboriginal and Torres Strait Islander Australians

Among Indigenous Australians aged 5 years and over with current asthma 59.2% (95% CI: 52.3–66.1%) reported using pharmaceutical medications for their condition in the last 2 weeks. This proportion was similar to the proportion of non-Indigenous Australians with asthma who reported using pharmaceutical medications (56.9%; 95% CI: 53.2–60.6%).

Among Aboriginal and Torres Strait Islander Australians, the proportion of people using pharmaceutical medications in the last 2 weeks for their asthma increased with age, from 38% among those aged 5 to 14 years to 79% among those aged 55 years and over.

Type of asthma medication

Of those people aged 5 years and over who had used asthma medications in the last 2 weeks, 84% had used short-acting beta agonists and 32% had used inhaled corticosteroids.

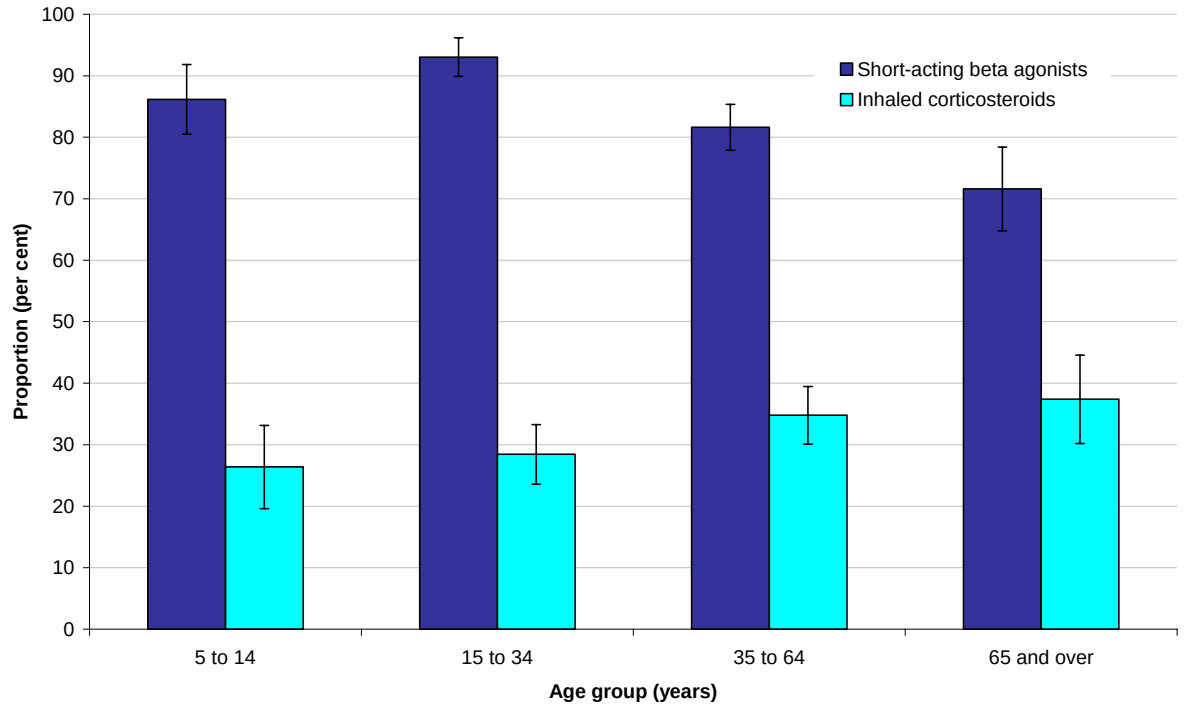
The prevalence of use of short-acting beta agonists was highest among young adults aged 15 to 34 years with current asthma, among whom 93.0% had used this medication class in the previous 2 weeks (Figure 3.5). Short-acting beta agonists were also commonly used among children and older adults. This is consistent with results from the 2001 survey

(ACAM 2005). Short-acting beta agonists are often used for relief of asthma symptoms and, since they do not require a prescription for purchase, are readily accessible.

Overall, 31.9% of people aged 5 years and over with current asthma reported using inhaled corticosteroids in the previous 2 weeks. Among those who used short-acting beta agonists in the previous 2 weeks in 2004–05, 27.7% had also used inhaled corticosteroids during this period. Regular use of inhaled corticosteroids is the recommended treatment in people with persistent asthma.

The use of inhaled corticosteroids and other asthma medications increased with age. This may reflect the changing nature of obstructive lung disease from childhood to older adult life. In 2004–05, the proportion of people with asthma using each class of asthma medication did not differ by remoteness category or socioeconomic status (data not shown).

Concession card holders receive a substantial subsidy for inhaled corticosteroids, which results in a six-fold reduction in the cost. Previous studies, using data from the Pharmaceutical Benefits Scheme, have shown that concession card holders are dispensed at least 2.5 times the amount of inhaled corticosteroids compared with those who do not hold a concession card (ACAM 2007). In the NHS, among people with current asthma aged 15 years and over, the rate of inhaled corticosteroid use in the previous 2 weeks was slightly higher in those with a government health care card (19.3%) compared with those without a government health care card (16.6%). This finding is consistent with, but much less marked than, the findings in the analysis of Pharmaceutical Benefits Scheme data.



Notes

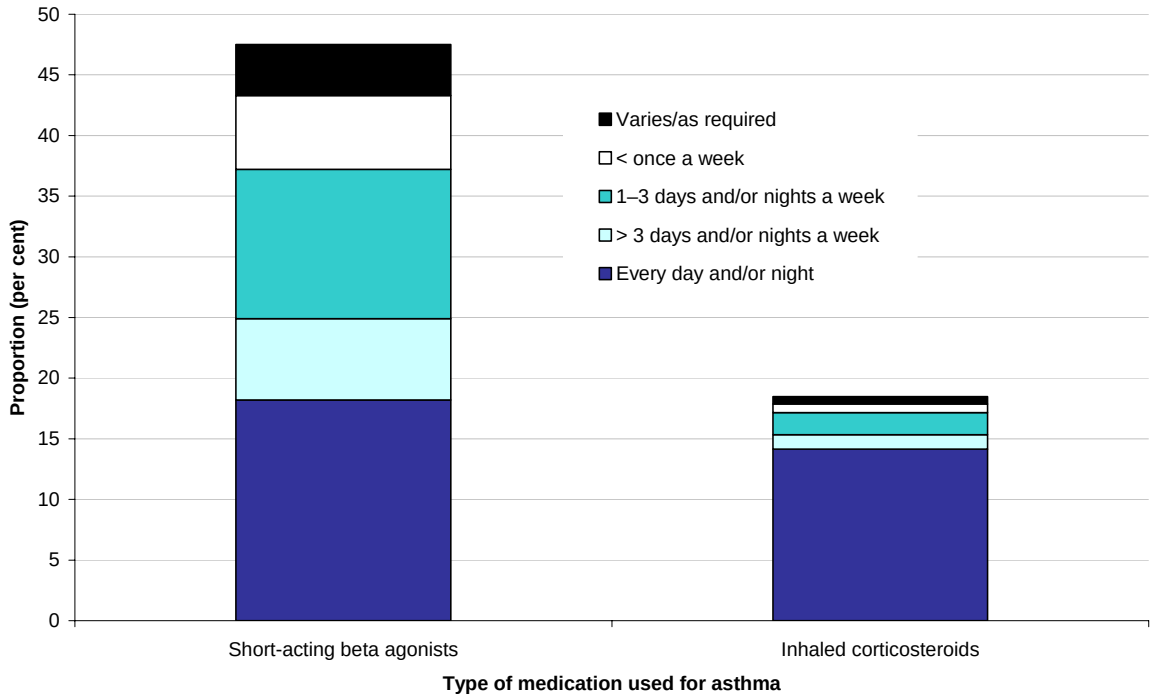
1. Age-standardised to the Australian population as at June 2001.
2. 'Short-acting beta agonists' includes medications containing salbutamol (e.g. Ventolin) and terbutaline (e.g. Bricanyl).
3. 'Inhaled corticosteroids' includes medications containing beclomethasone (e.g. Qvar), budesonide (e.g. Symbicort, Pulmicort) and fluticasone (e.g. Seretide, Flixotide, Flixonase). Although Flixonase is an inhaled nasal steroid, it could not be identified separately from the inhaled corticosteroids containing fluticasone and hence was included in our analyses.
4. The proportions in each age group do not add up to 100% because more than one type of asthma medication can be used.

Figure 3.5: Use of asthma medication in the last 2 weeks among people with current asthma, by age group and type of medication, people aged 5 years and over, Australia, 2004–05

Frequency of use of medications for asthma

Information on the frequency of use of various classes of medications for asthma is relevant to assessing disease control and the appropriateness of therapy. Respondents were asked 'How often did you use [name of medication] in the last 2 weeks?'.

Regular use of inhaled corticosteroids can control asthma symptoms (Adams et al. 2003, 2004, 2005), prevent hospital admissions (Rowe et al. 2000) and possibly reduce lung function decline (Dijkstra et al. 2006; Lange et al. 2006) among people with asthma. Guidelines recommend that people with persistent asthma use inhaled corticosteroids regularly (usually twice daily) and continuously. In 2004–05, 14.1% of people with current asthma reported taking inhaled corticosteroids every day or night in the last 2 weeks. A further 1.2% of people with current asthma had used them on more than 3 days or nights per week. Almost one-fifth (18.2%) of people with current asthma reported using short-acting beta agonists every day. Daily use of this class of medications implies that an individual has persistent asthma that is poorly controlled, which has been associated with poor outcomes (Anis et al. 2001; Suissa et al. 2002). It is likely that these individuals would benefit from the regular use of inhaled corticosteroids. Among those people with asthma who were using short-acting beta agonists every day, only 37% also used inhaled corticosteroids on 3 or more days per week and 60% did not use inhaled corticosteroids at all.



Notes

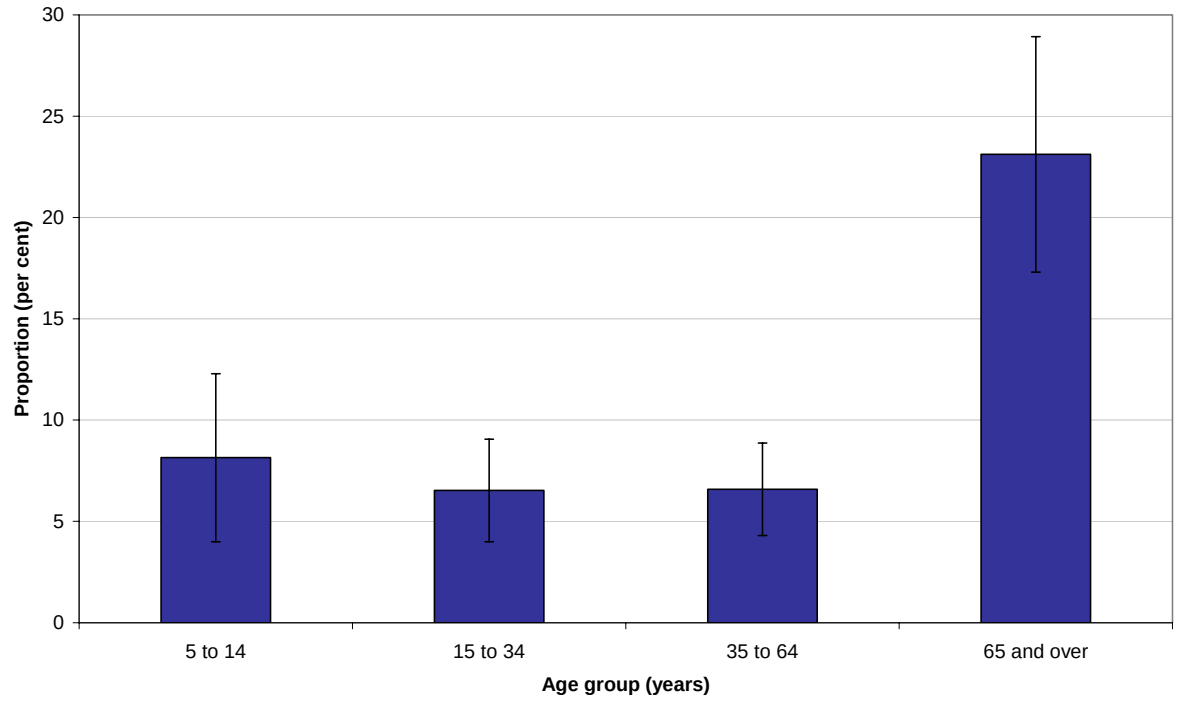
1. Age-standardised to the Australian population as at June 2001.
2. 'Short-acting beta agonists' includes medications containing salbutamol (e.g. Ventolin) and terbutaline (e.g. Bricanyl).
3. 'Inhaled corticosteroids' includes medications containing beclomethasone (e.g. Qvar), budesonide (e.g. Symbicort, Pulmicort) and fluticasone (e.g. Seretide, Flixotide, Flixonase). Although Flixonase is an inhaled nasal steroid, it could not be identified separately from the inhaled corticosteroids containing fluticasone and hence was included in our analyses.

Figure 3.6: Frequency of asthma medication use in the previous 2 weeks among people with current asthma, by type of medication, people aged 5 years and over, Australia, 2004–05

Use of nebulisers

All respondents who indicated that they had used asthma medication in the previous 2 weeks were asked whether they had used a nebuliser to administer the medication.

About 9% of people aged 5 years and over with current asthma had used a nebuliser to administer their asthma medication in the preceding 2 weeks (Figure 3.7). Older Australians had by far the highest rate of nebuliser use (23.1%) followed by children aged 5 to 14 years (8.1%). This method of delivery is generally not recommended since it delivers higher systemic doses without delivering higher doses to the airways.



Note: Age-standardised to the Australian population as at June 2001.

Figure 3.7: Use of nebulisers to administer asthma medication among people with current asthma aged 5 years and over, by age group, Australia, 2004–05

Summary

Although written asthma action plans have been recommended in national guidelines for the management of asthma for almost 20 years, the majority of people with asthma do not have one. Young adults, particularly men, those living in socioeconomically disadvantaged areas and those living in Western Australia were least likely to possess a written asthma action plan in 2004–05. More than 90% of written asthma action plans were obtained from doctors and approximately three-quarters were considered 'standard', that is, similar to that recommended by the National Asthma Council Australia.

Fifty-six per cent of people with asthma had used medication for their condition in the previous 2 weeks. The most commonly used class of asthma medication was short-acting beta agonists or 'reliever' medications. Eighteen per cent of people with current asthma used short-acting beta agonists every day, indicating poor control of asthma symptoms. Inhaled corticosteroids were used every day by 75% of respondents who were taking that class of medication. This is a pattern of use consistent with recommended guidelines. However, this was among only 14% of people with current asthma, and it is likely that many more would benefit from regular inhaled corticosteroid use. The use of a nebuliser to administer asthma medication is uncommon among young Australians but almost one-quarter of those aged 65 years and over reported doing so.

4 Lifestyle-related behaviours and asthma

In this chapter, data on lifestyle-related behaviours and their association with asthma are presented. Data on smoking status in adults and on passive smoke exposure in children are reported. Other lifestyle-related behaviours presented here include the association of overweight and obesity and exercise levels with current asthma.

4.1 People with asthma who smoke

The damaging effects of both active and passive smoking on one's wellbeing are well known, but people with asthma who smoke have further ill health. People with asthma who smoke tend to have more severe asthma (Siroux et al. 2000) and find their asthma more difficult to control. It has been shown that smoking impairs the effectiveness of inhaled corticosteroids in people with asthma (Chalmers et al. 2002), even at high doses (Pedersen et al. 1996). Smoking has also been reported as a risk factor for the development of asthma (Larsson L 1995; Plaschke et al. 2000) and asthma symptoms (Rasmussen et al. 2000; Strachan et al. 1996).

All NHS participants aged 18 years and over were asked 'Do you currently smoke?'. Those who answered 'yes' to this question are included as 'smokers' in the analyses in this section and this definition includes anyone who reported that they currently smoked daily or at least once a week.

Among adults aged 18 years and over, the prevalence of smoking was 24.5% (95%CI: 22.3–26.7%) among people with current asthma and 22.6% (95% CI: 21.9–23.4%) among people without current asthma. These findings suggest that the presence of asthma is often not sufficient to motivate people to quit smoking.

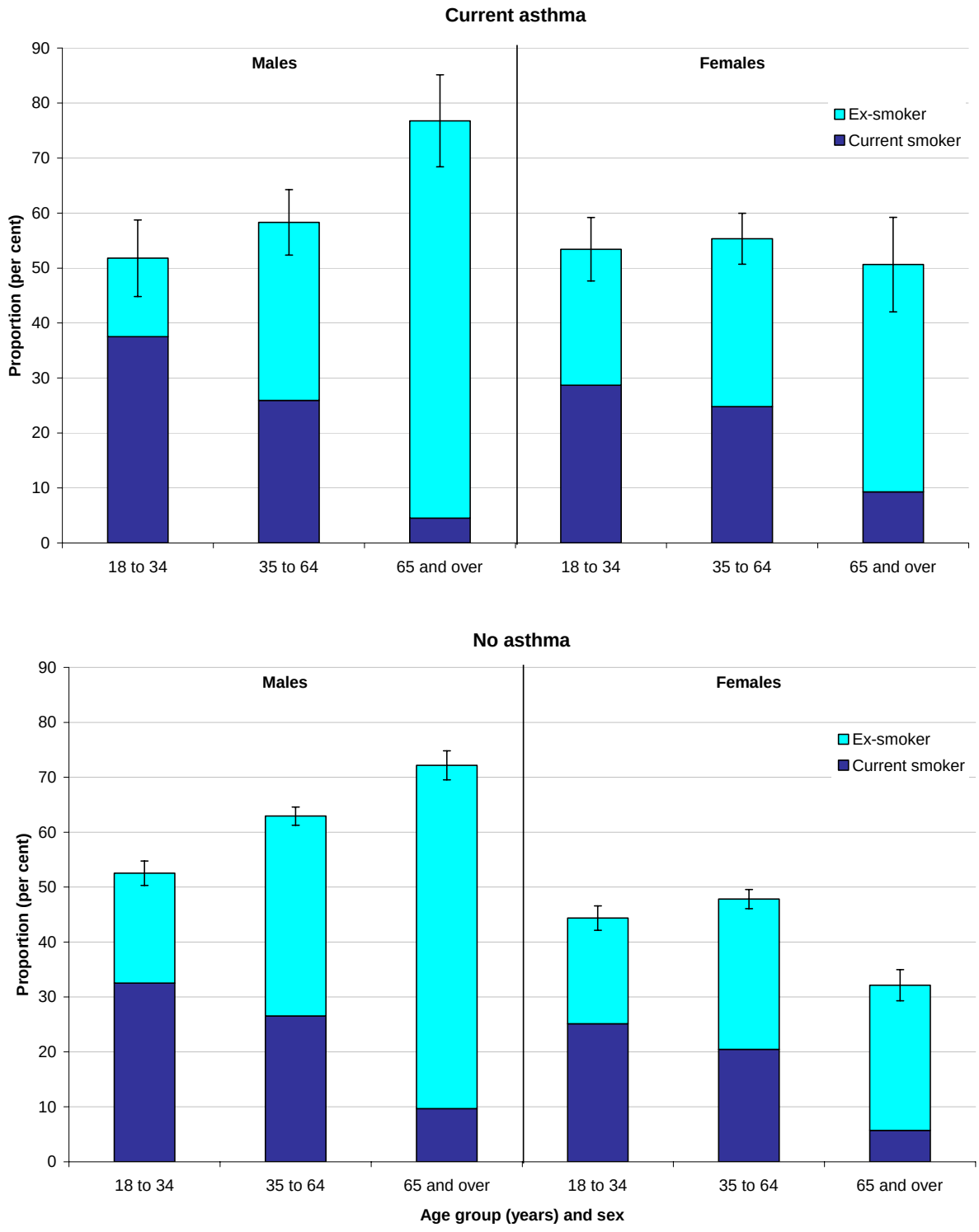
Age and sex

Nearly 40% of young men with asthma continue to smoke despite their illness (Figure 4.1). The proportion of adults with current asthma who were also smokers decreased markedly with increasing age, with both males and females aged 65 years and over being significantly less likely than their younger counterparts to be smokers. However, being an ex-smoker was far more common among older people who reported having current asthma and it is likely that some would be attributed to smoking-related respiratory disease, particularly chronic obstructive pulmonary disease, rather than asthma.

Smoking rates among males and females with asthma were the same as, if not higher than, smoking rates among those without the disease. This indicates that despite the known adverse effects, people with asthma continue to smoke. Therefore, future health gains could be achieved through targeting interventions that would reduce smoking in this group of Australians.

More females (45%) than males (40%) with current asthma reported never smoking (data not shown). This was most pronounced for people aged 65 years and over, for whom 49% of females had never smoked compared with 23% of males. Hence, asthma is less commonly

attributable to past or current smoking among females than males in this older age group. Among younger adults aged 18 to 34 years, the proportion of people with asthma who had ever smoked was similar in males and females but fewer males than females continued to smoke.



Note: Age-standardised to the Australian population as at June 2001.

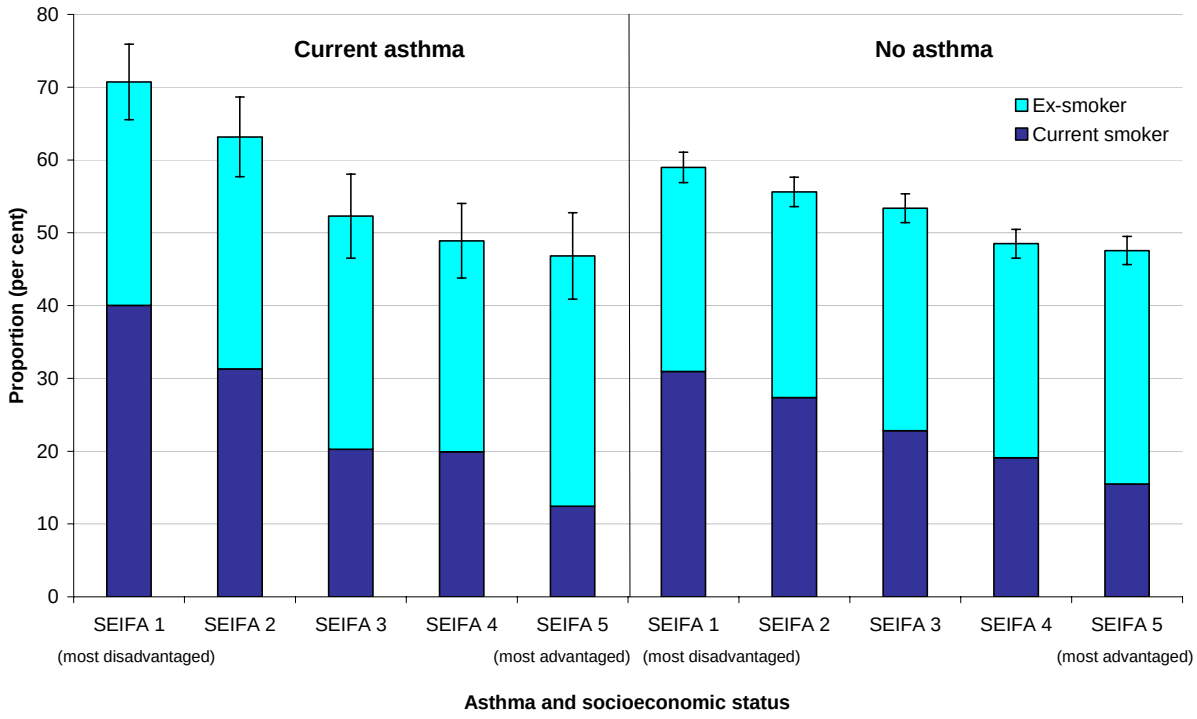
Figure 4.1: Smoking status among adults aged 18 years and over, by asthma status, age group and sex, Australia, 2004–05

Aboriginal and Torres Strait Islander Australians

Among Indigenous Australian adults aged 18 years and over, 48.2% (95% CI: 42.5–53.9%) of those with current asthma and 46.5% (95% CI: 43.6–49.4%) of those without asthma reported being smokers. These rates were twice as high as those reported for non-Indigenous Australians with (23.8% (95% CI: 21.2–26.4%)) and without (22.4% (95% CI: 21.5–23.2%)) current asthma.

Socioeconomic disadvantage

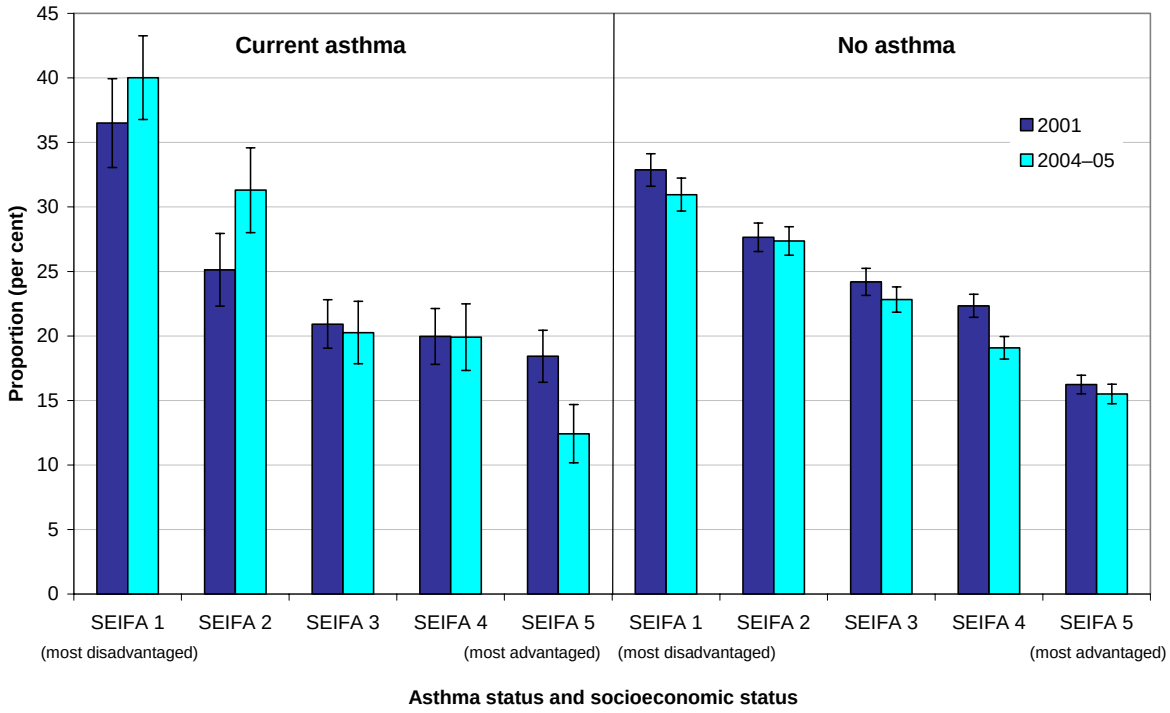
Among people with current asthma, the prevalence of smoking was over three times as high (40.0%) among those living in the most socioeconomically disadvantaged localities than among those living in more advantaged localities (12.4%) (rate ratio 3.2; 95% CI: 2.4–4.2) (Figure 4.2). Among people without asthma, those living in socioeconomically disadvantaged areas were twice as likely to be smokers than those living in more advantaged localities (rate ratio 2.0; 95% CI: 1.8–2.2). Furthermore, among those living in the most disadvantaged localities, the prevalence of smoking among people with current asthma (40.0%) was also higher than that observed among people without current asthma (31.0%). However, there were no differences in the prevalence of smoking among people with and without current asthma living in the most advantaged areas.



Note: Age-standardised to the Australian population as at June 2001.

Figure 4.2: Prevalence of current smoking and ex-smoking in adults aged 18 years and over, by asthma status and socioeconomic status, Australia, 2004–05

Between 2001 and 2004–05, the prevalence of smoking decreased significantly among people with current asthma residing in the most advantaged localities (Figure 4.3). In contrast, in the same period the proportion of people who reported being smokers increased among those with current asthma living in the two most disadvantaged socioeconomic quintiles. Among those without asthma, the prevalence of smoking decreased slightly across all socioeconomic quintiles between 2001 and 2004–05.



Notes:
1. For this comparison with the 2001 NHS results, the 'smokers' from 2001 also includes people who smoked less than weekly.
2. Age-standardised to the Australian population as at June 2001.

Figure 4.3: Proportion of smokers among adults aged 18 years and over, by asthma and socioeconomic status and survey year, Australia, 2001 and 2004–05

4.2 Passive smoke exposure in children with asthma

Exposure to environmental tobacco smoke, commonly referred to as 'passive smoke', in childhood is a recognised risk factor for the development of asthma symptoms and also for the worsening of pre-existing asthma. It has been shown that exposure to environmental tobacco smoke increases the risk of onset of wheezing illness in young children (Martinez et al. 1992) and that the association between exposure and childhood wheezing illness is most consistent at high levels of environmental tobacco smoke exposure (NHMRC 1997). These findings are supported by evidence from international studies which conclude that parental smoking is associated with more severe asthma in children (Pattenden et al. 2006; Strachan & Cook 1998), and that exposure to environmental tobacco smoke after birth is a likely cause

of wheezing or other acute respiratory illness in young children (Strachan & Cook 1997). Cohort studies have shown that children with pre-existing asthma who are exposed to environmental tobacco smoke have increased morbidity and asthma symptoms (Murray & Morrison 1989), more frequent exacerbations (Chilmonczyk et al. 1993), more severe asthma symptoms (Murray & Morrison 1993; Strachan & Cook 1998), impaired lung function (Chilmonczyk et al. 1993; Murray & Morrison 1989), and increased airway reactivity (Murray & Morrison 1989; Oddoze et al. 1999) or peak flow variability (Fielder et al. 1999; Frischer et al. 1993). There is also evidence that children exposed to environmental tobacco smoke are more likely to attend emergency departments with asthma (Evans et al. 1987). It has been shown that prevention of indoor smoking leads to a reduction in hospital admissions in children with asthma (Gurkan et al. 2000). Recovery after hospitalisation, measured by use of reliever medication and number of symptomatic days, is also impaired in children exposed to passive smoke (Abulhosn et al. 1997).

A recent study has reported that as much as 17% of adult-onset asthma is attributable to maternal smoking in childhood (Skorge et al. 2005). Other studies have reported that subjects who were exposed to passive smoke during their childhood are more likely to take up smoking themselves (Cook & Strachan 1999; Larsson et al. 2001) and this may increase their risk of developing asthma.

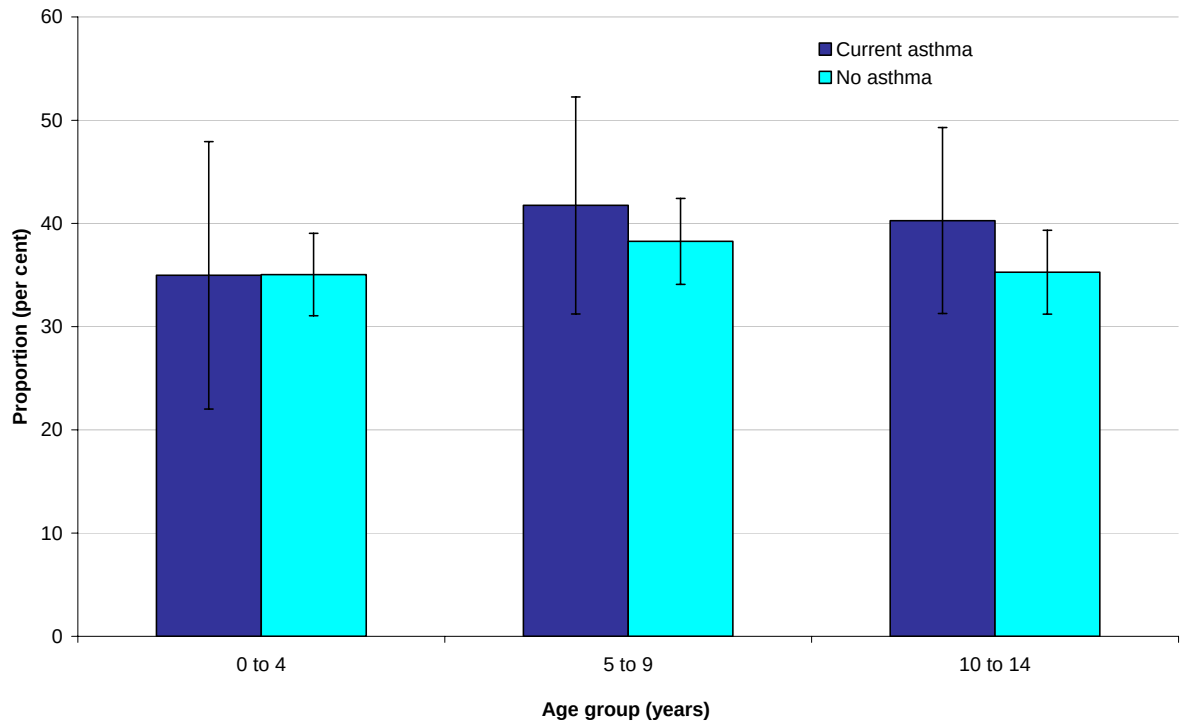
The large body of evidence regarding the harmful consequences of passive smoke exposure has resulted in the introduction of smoking bans in many public areas. Recent legislative changes in Australia prohibit smoking in places such as bars, cafes and restaurants, shopping centres, entertainment venues and the workplace. Unfortunately, young children, who are most vulnerable to the effects of passive smoke exposure, are most likely to be exposed to passive smoke in their home, where smoking bans do not apply.

This section provides data on the proportion of children living with one or more cigarette smokers (referred to here as 'potential exposure to passive smoke') and also the proportion of children who live in homes where smoking occurs inside the home (referred to as 'exposure to passive smoke in the home'). Respondents in households other than single person households were asked whether anyone else in the household smoked regularly and, if so, the number of people who did so. They were also questioned about whether they or anyone else usually smokes inside the house.

Potential exposure to passive smoke

Children living with regular smokers are potentially exposed to environmental tobacco smoke, or 'passive' smoke. In 2004–05, 39.1% of children aged 0 to 14 years with current asthma lived with one or more cigarette smokers. This proportion was marginally higher than that observed among children without current asthma (36.2%).

There was no significant difference in the rate of potential passive smoke exposure among children with or without current asthma by age (Figure 4.4) or sex (data not shown).



Note: Age standardised to the 2001 Australian population.

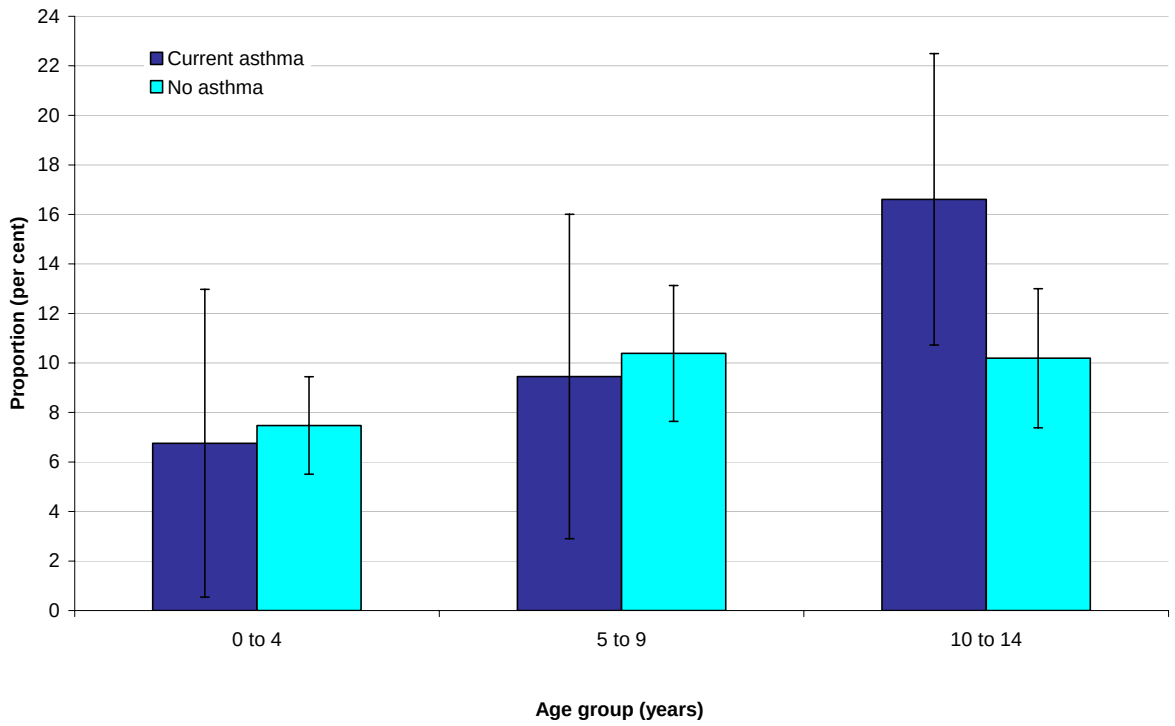
Figure 4.4: Proportion of children aged 0 to 14 years with one or more cigarette smokers in the household and potentially exposed to environmental tobacco smoke, by age group and current asthma status, Australia, 2004–05

Between 2001 and 2004–05, there was no significant change in the overall proportion of children aged 0 to 14 years living with one or more cigarette smokers (and, therefore, potentially exposed to environmental tobacco smoke) among those with and those without asthma (data not shown). There was also no change in the proportion of children who were living with one or more cigarette smokers in any specific age group.

There were as many children with current asthma living with one or more smokers and potentially exposed to passive smoke as children without asthma. Perhaps more importantly, it is necessary to ascertain whether or not the children were exposed to passive smoke in enclosed spaces, such as inside the home. The next section investigates this further.

Exposure to passive smoke inside the home

Eleven per cent of children with current asthma were residing in homes where smoking occurred inside the home. This rate was no different from that observed for children without asthma (9.4%). Children with current asthma continue to be exposed to environmental tobacco smoke in the home despite the known adverse effects. Young children and older children with asthma were exposed as much as their counterparts without asthma (Figure 4.5). These results suggest a need for health promotion in this area.

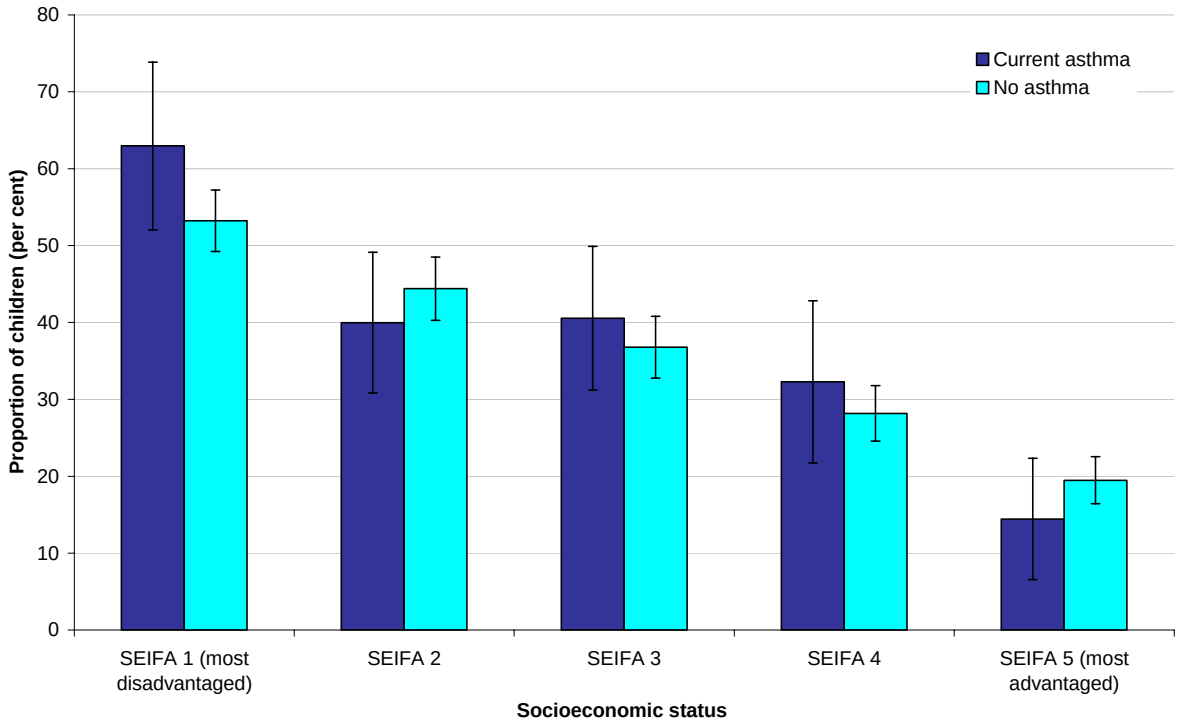


Note: Age-standardised to the 2001 Australian population.

Figure 4.5: Proportion of children aged 0 to 14 years residing with one or more cigarette smokers who usually smoke inside the house, by age group and current asthma status, Australia, 2004–05

Socioeconomic status

Children with current asthma were less likely to reside with a smoker in socioeconomically advantaged localities and more likely to reside with a smoker in socioeconomically disadvantaged localities when compared with children without current asthma (Figure 4.6). While these differences were not significant, it is apparent that a socioeconomic gradient exists and that disadvantaged localities may benefit from a targeted approach to health promotion aimed at reducing exposure to passive smoke in children with asthma.



Note: Age-standardised to the 2001 Australian population.

Figure 4.6: Proportion of children aged 0 to 14 years with one or more cigarette smokers in the household, by socioeconomic status and current asthma status, Australia, 2004–05

4.3 Overweight and obesity

Among many western cultures, obesity and asthma are becoming increasingly prevalent. People who are obese are two to three times more likely to report symptoms of asthma than people in the normal weight range (Nystrom Kronander et al. 2004). An association between obesity and some features of asthma, especially asthma symptoms and/or diagnosis, exists in both children and adults (Camargo et al. 1999; Lewis & Britton 2000; Shaheen et al. 1999; von Mutius et al. 2001). Among young adults the airways become narrower as body mass index (BMI: see Box 1) increases (King et al. 2005). The mechanisms of this airway narrowing are not known, but they could be due to functional or structural changes of the airways that occur with increasing BMI.

Box 1: Body mass index

Body mass index (BMI) is the most common method of expressing the degree of obesity and overweight. BMI is calculated as:

$$BMI = \frac{Weight\ (kg)}{Height\ (m)^2}$$

The normal weight range includes BMIs between 18.5 and 25. A BMI of 30 or more indicates obesity.

It is still not clear whether the onset of asthma precedes obesity or vice versa. A recent study conducted in the United States suggested that asthma may develop at some point en route to chronic obesity or that asthma and obesity develop concurrently (Stanley et al. 2005). Another study reported that boys with high BMIs were at increased risk of developing asthma (Mannino et al. 2006).

In the NHS, persons aged 15 years and over were asked to self-report their height and weight, enabling the self-reported BMI to be calculated. People with a self-reported BMI of less than 18.5 were categorised as being underweight, while those with a BMI of 25 to 30 were categorised as being overweight and those with BMI greater than 30 were classified as being obese. Overall, 15.7% of Australians aged 15 years and over were obese, 31.4% were overweight, 41.4% were in the normal weight range and 3.0% were underweight. The BMI of the remaining 8.5% of was not known.

In 2004–05, 29% of people with asthma were overweight and a further 21% were obese (Table 2). The prevalence of obesity was higher among people with current asthma than among people without asthma (15.1%) ($p < 0.0001$). However, the prevalence of overweight alone did not differ between people with (29.4%) and without (31.6%) asthma.

Table 4.1 : Distribution of body mass index in people with and without current asthma

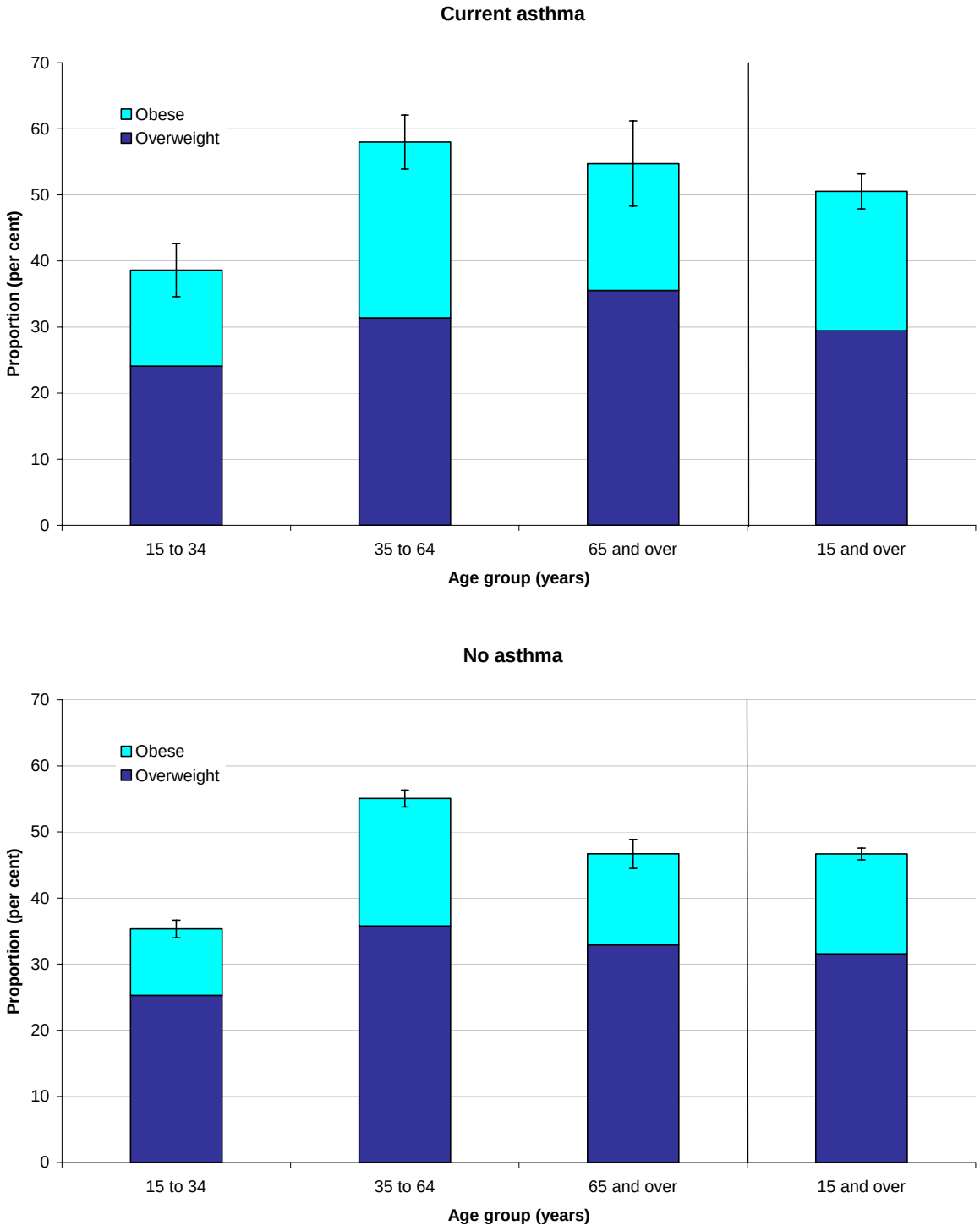
Body mass index	Current asthma (%)	95% CI	No asthma (%)	95% CI
Underweight (< 18.5)	3.1	(2.3–3.9)	3.0	(2.7–3.3)
Normal range				
18.5 to < 20.0	5.5	(4.4–6.6)	5.3	(4.9–5.7)
20.0 to < 25.0*	31.2	(28.8–33.6)	36.6	(35.8–37.5)
Overweight (25.0 to < 30.0)	29.4	(27.1–31.8)	31.6	(30.8–32.4)
Obese (30.0 and over)*	21.1	(19–23.2)	15.1	(14.5–15.7)
Not known	9.7	(8.2–11.2)	8.4	(7.9–8.9)

* Denotes statistically significant difference between people with and without asthma ($p < 0.001$).

Note: Age-standardised to the 2001 Australian population.

Age and sex

Among people with current asthma, the prevalence of overweight increased with age, ranging from 24% for 15 to 34 year olds to 35% for those aged 65 years and over, while the prevalence of obesity was highest for 35 to 64 year olds (26.6%) (Figure 4.7). Among those without current asthma, people aged 35 to 64 years had the highest proportion of overweight (35.8%) and obesity (19.3%).

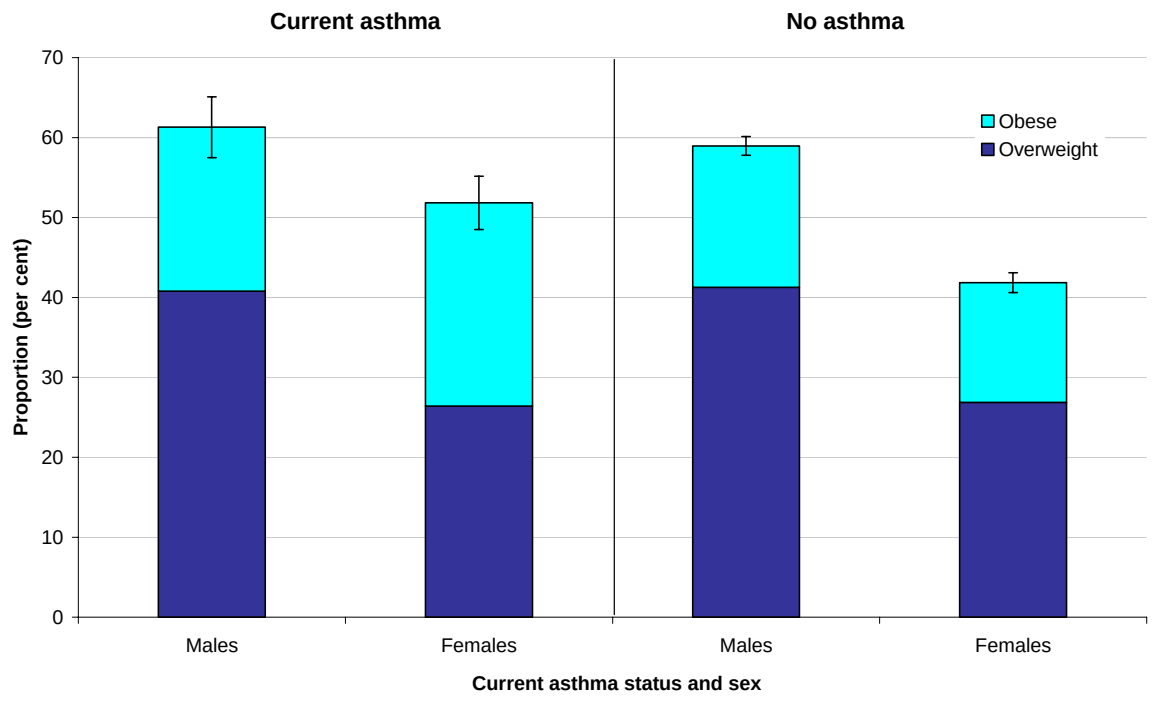


Note: Age-standardised to the Australian population as at June 2001.

Figure 4.7: Prevalence of overweight and obesity, by current asthma status and age group, people aged 15 years and over, Australia, 2004–05

Obesity was more common in females with current asthma (25.4%) than in females without current asthma (15.0%) ($p < 0.0001$) (Figure 4.8). This difference was not evident among males.

Other studies have also shown that the association between obesity and asthma was most evident in women. One study reported that 28% of new cases of asthma in females aged 9 to 26 years could be attributed to increased BMI before the age of 26 years (Hancox et al. 2005). Among males, however, there was little evidence of an association. In another study, women with a BMI of 30 or greater were 3.5 times (95% CI: 1.64 to 7.32) more likely to have recent asthma than women with a BMI less than 25 (Chen et al. 2005). The same risks were not observed in men.



Note: Age-standardised to the Australian population as at June 2001.

Figure 4.8: Prevalence of overweight and obesity, by current asthma status and sex, people aged 15 years and over, Australia, 2004–05

Aboriginal and Torres Strait Islander Australians

In 2004–05, proportionately more Aboriginal and Torres Strait Islander Australians with current asthma were classified as obese (32%) and less were classified as overweight (18%), than non-Indigenous Australians with current asthma (21% obese and 30% overweight). Hence, the total proportion classified as obese or overweight was similar in both groups.

The prevalence of obesity in Aboriginal and Torres Strait Islander Australians with current asthma (32%) was higher than the prevalence of obesity in Aboriginal and Torres Strait Islander Australians without asthma (25%).

It should be noted, however, that around twice as many Indigenous Australians as non-Indigenous Australians did not know their height and/or weight and so their BMI could not be calculated.

4.4 Exercise level

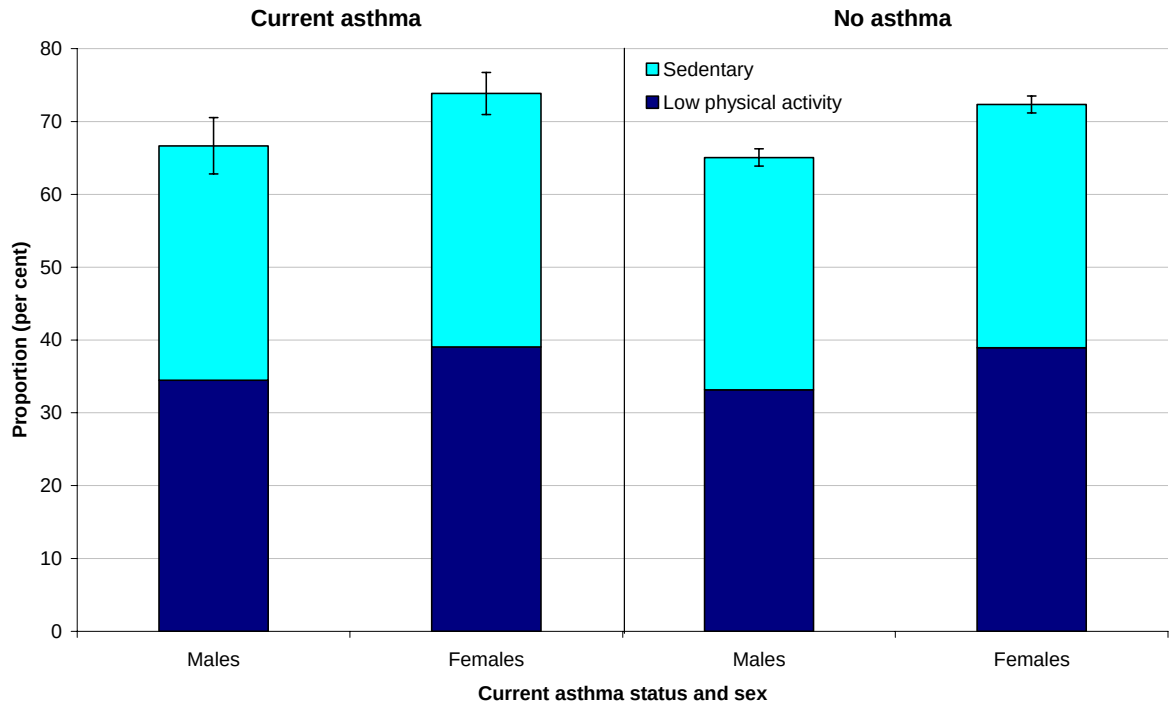
This section investigates differences in the level of exercise undertaken by people with and without asthma. The investigation focused on the proportion of people with and without asthma who are sedentary or have a low level of exercise, since these would be most likely to be associated with poor health outcomes. A description of the exercise levels and how they are calculated is provided in the Appendix (see Section A1.5).

These data exclude physical activity taken for reasons such as working around the house or in the course of paid work. These findings, therefore, should not be interpreted as an overall measure of physical activity. Furthermore, the limitations of self-reported data should be noted. The data presented here concern the 2-week period before the interview, which may or may not be representative of the whole calendar year. In particular, there could be substantial seasonal variation that would reflect the time of year in which data were collected.

Overall, 33.6% of Australians reported being sedentary, 36.0% reported low levels of exercise, 23.5% reported moderate levels of exercise and 6.8% reported high levels of exercise.

Age and sex

Among both males and females, the prevalence of low physical activity or being sedentary was similar for those with and without asthma (Figure 4.9). Irrespective of asthma status, females were more likely than males to be sedentary or undertaking a low level of exercise.

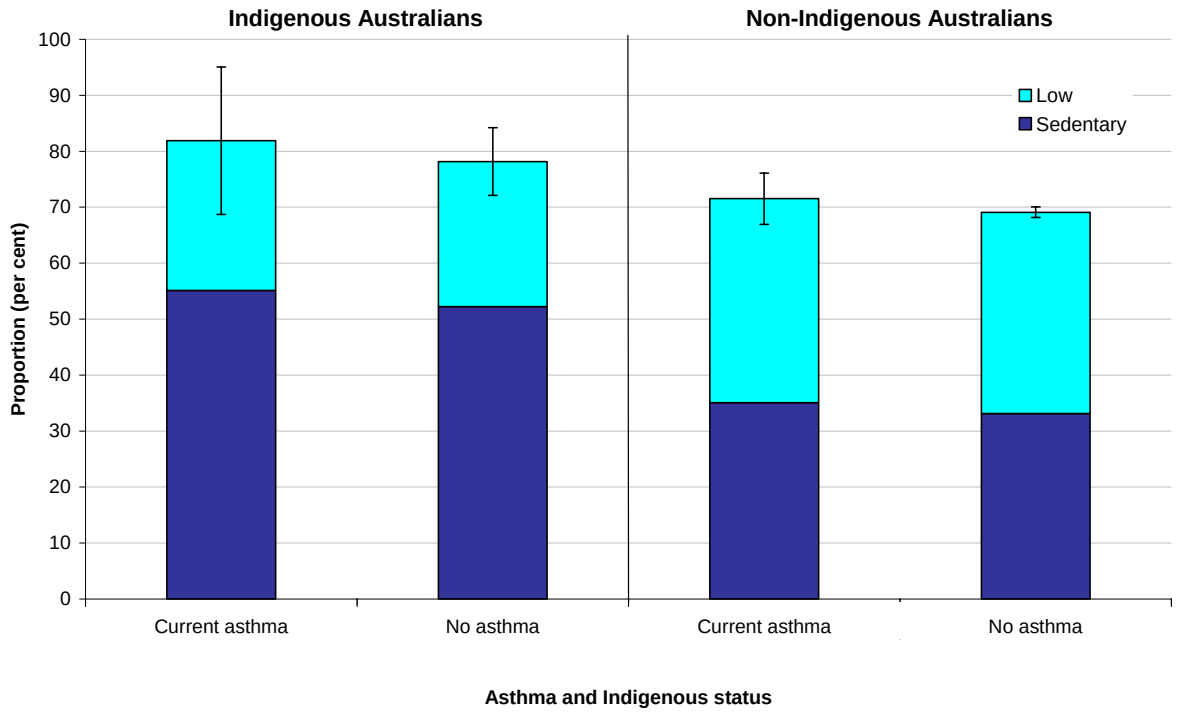


Note: Age-standardised to the Australian population as at June 2001.

Figure 4.9: Prevalence of low physical activity or being sedentary, by current asthma status and sex, people aged 15 years and over, Australia, 2004–05

Aboriginal and Torres Strait Islander Australians

Aboriginal and Torres Strait Islander Australians reported undertaking lower levels of physical activity than non-Indigenous Australians and significantly more Indigenous Australians were sedentary (Figure 4.10). This was true of Indigenous Australians both with and without current asthma.



Note: Age-standardised to the Australian population as at June 2001. Questions on exercise level were only collected from people residing in non-remote areas.

Figure 4.10: Prevalence of low physical activity or being sedentary, by Indigenous status and current asthma status, people aged 15 years and over, Australia, 2004–05

Summary

Despite the well-known damaging effects of smoking, there was a higher proportion of smokers among people with current asthma than among people without current asthma in 2004–05. Current smoking is more common among younger people with current asthma than older people with asthma. There was a marked socioeconomic gradient in smoking prevalence and the excess prevalence of smoking among people with asthma was mainly seen among people living in disadvantaged areas.

These results imply that developing asthma does not immediately encourage people to quit smoking, which probably reflects the highly addictive qualities of nicotine products. It is also plausible that some of the observed association between smoking and self-reported current asthma is attributable to the association with smoking-related respiratory disease, including chronic obstructive pulmonary disease.

Almost 40% of children with current asthma lived with smokers and were, therefore, potentially exposed to cigarette smoke in their homes. An estimated 11% of children with current asthma were living in homes where smoking occurred inside the home. There was a substantial socioeconomic gradient in exposure to environmental tobacco smoke. Children living in more disadvantaged localities were more likely to be exposed to environmental tobacco smoke, and this association was strongest among children who had current asthma.

Obesity was more common among women with current asthma than among women without asthma. The reason for the observed association between obesity and asthma in females remains unknown. This association was not observed among males. Overall, exercise levels were not related to the presence of asthma. Since there is evidence that obesity is associated with adverse outcomes in people with asthma, this area would serve to gain from health promotion.

Surprisingly, most lifestyle-related behaviours included in this chapter did not comprise distinguishing characteristics of current asthma. In particular, smoking rates were similar among people with and without asthma, although children with asthma from more socio-economically disadvantaged localities were more likely to be exposed to passive smoke than those without asthma.

5 Quality of life

Traditional measures of disease impact, such as prevalence and mortality rates, are important but are of limited use in understanding the extent of the effect a disease has on an individual. 'Health-related quality of life' is a term often used to describe an individual's perception of how a disease or condition affects their physical, psychological (emotional) and social wellbeing. This can be used to measure the impact of asthma on a person's health and everyday functioning.

Generic measures of quality of life are frequently used in health surveys such as the NHS to evaluate the overall impact of a person's health status on their health and everyday functioning. This chapter reports on the effect of asthma on several measures that are relevant to health-related quality of life including self-assessed health status, days of reduced activity, days off work or study, and psychological distress.

5.1 Self-assessed health status

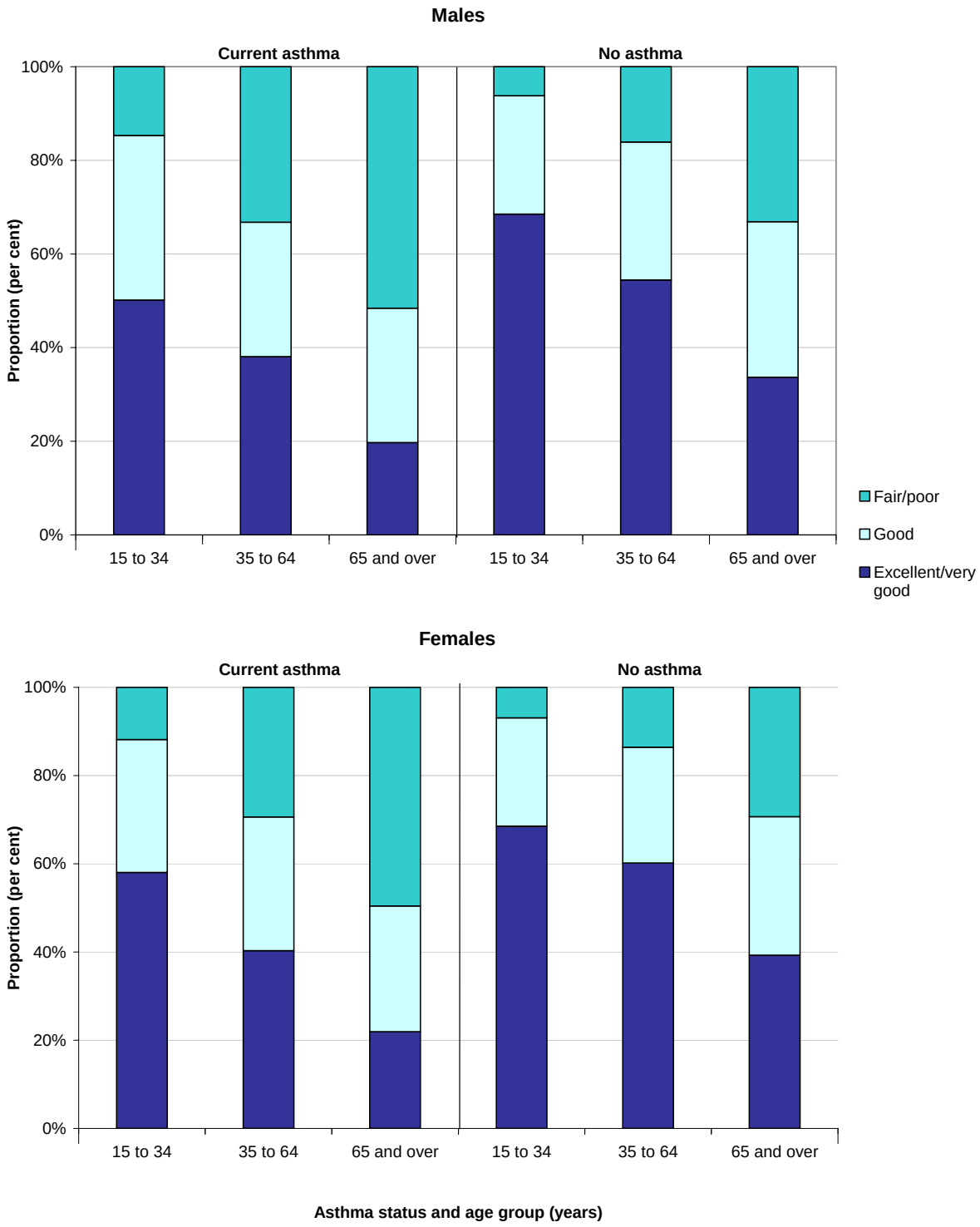
The overall health status of Australians aged 15 years and over was assessed using the following question: 'In general would you say that your health is excellent, very good, good, fair or poor?'.

The presence of asthma was associated with a worse self-assessed health status. Among people with current asthma, 42% rated their health as 'excellent' or 'very good', compared with 58% of people without current asthma. At the other end of the scale, 28% of people with current asthma rated their health as 'poor' compared with only 14% of people without current asthma.

Age and sex

In all age groups and for both sexes, people with current asthma rated their health worse than people without current asthma (Figure 5.1). The proportion of people with 'fair' or 'poor' self-reported health increased with increasing age, and the proportion of people with 'excellent' or 'very good' health decreased with increasing age. This was true for males and females with and without current asthma.

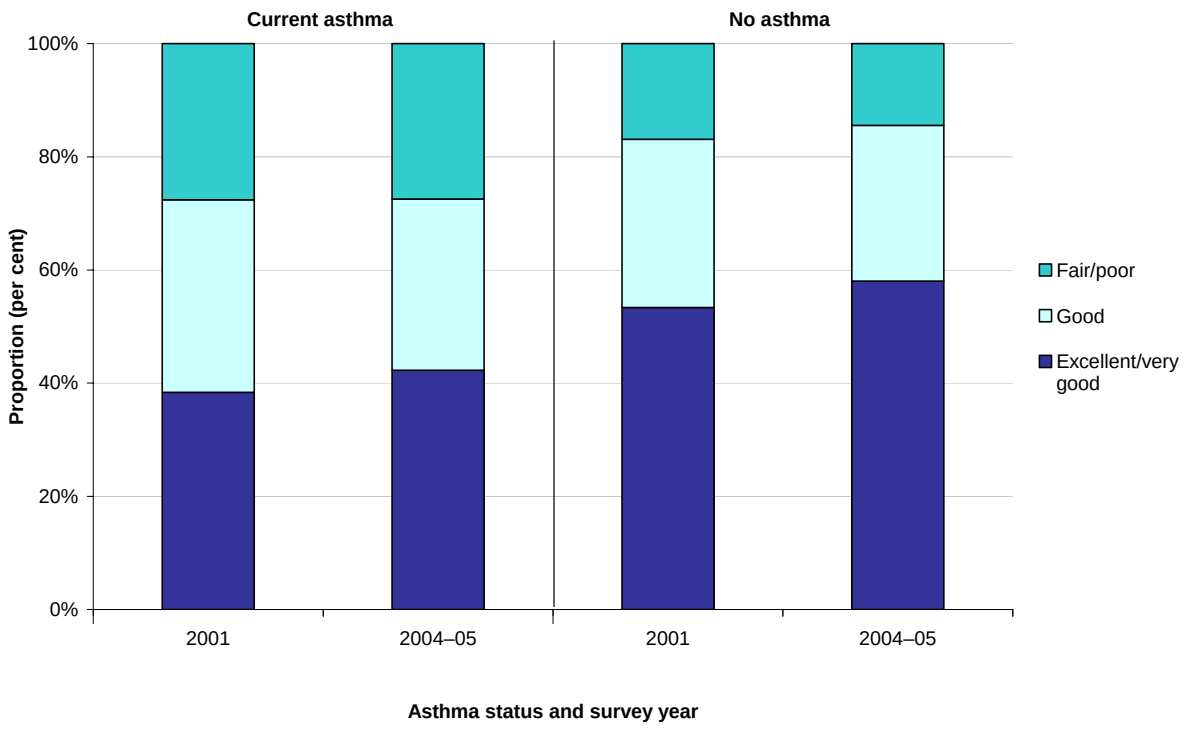
Females with current asthma rated their health marginally better than males with current asthma, particularly among those aged 15 to 34 years.



Note: Age-standardised to the Australian population as at June 2001.

Figure 5.1: Self-assessed health status, by sex, current asthma status and age group, people aged 15 years and over, Australia, 2004–05

In general, Australians with and without asthma rated their health better in 2004–05 than in 2001 (Figure 5.2).



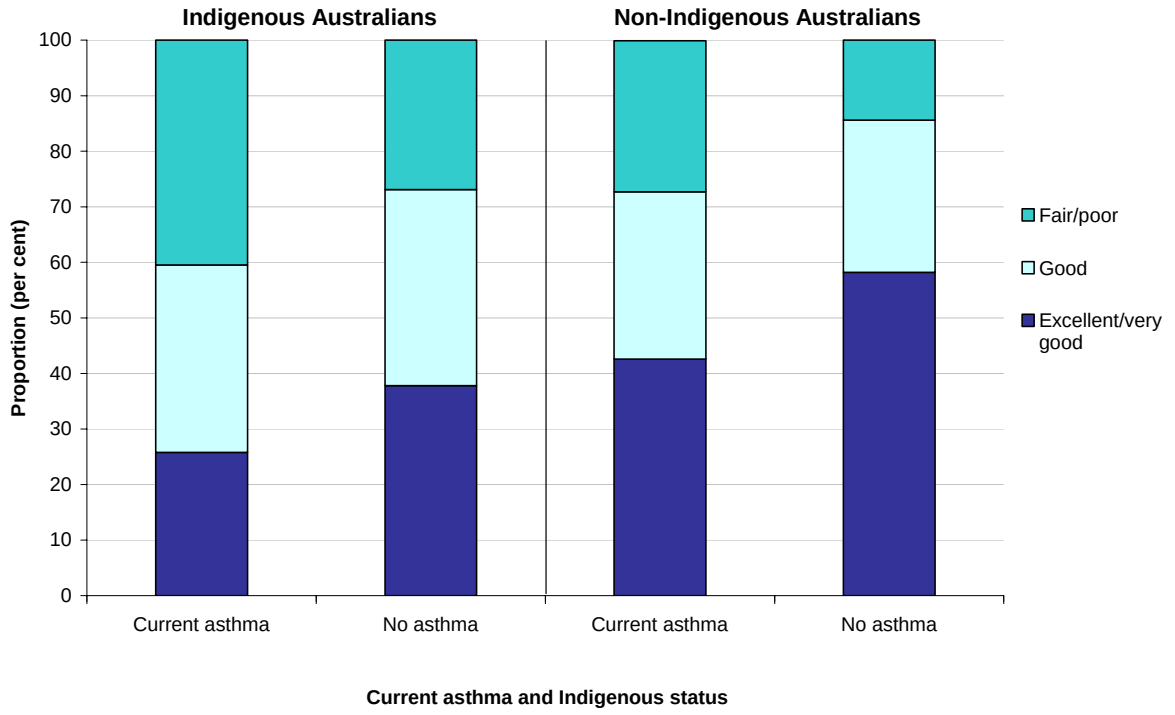
Note: Age-standardised to the Australian population as at June 2001.

Figure 5.2: Self-assessed health status, by survey year and current asthma status, people aged 15 years and over, Australia, 2001 and 2004–05

Aboriginal and Torres Strait Islander Australians

Among Aboriginal and Torres Strait Islander Australians with current asthma, about 26% rated their health as excellent/very good, 34% rated it as good and about 41% rated their health as fair/poor (Figure 5.3). In contrast, more Indigenous Australians without asthma rated their health as excellent/very good (38%) and fewer rated their health as fair/poor (27%).

In general, Indigenous Australians rated their health worse than non-Indigenous Australians. In fact, Indigenous Australians *without* asthma rated their health slightly worse than non-Indigenous Australians *with* the condition.



Note: Age-standardised to the Australian population as at June 2001.

Figure 5.3: Self-assessed health status in people aged 15 years and over, by Indigenous and asthma status, Australia, 2004–05

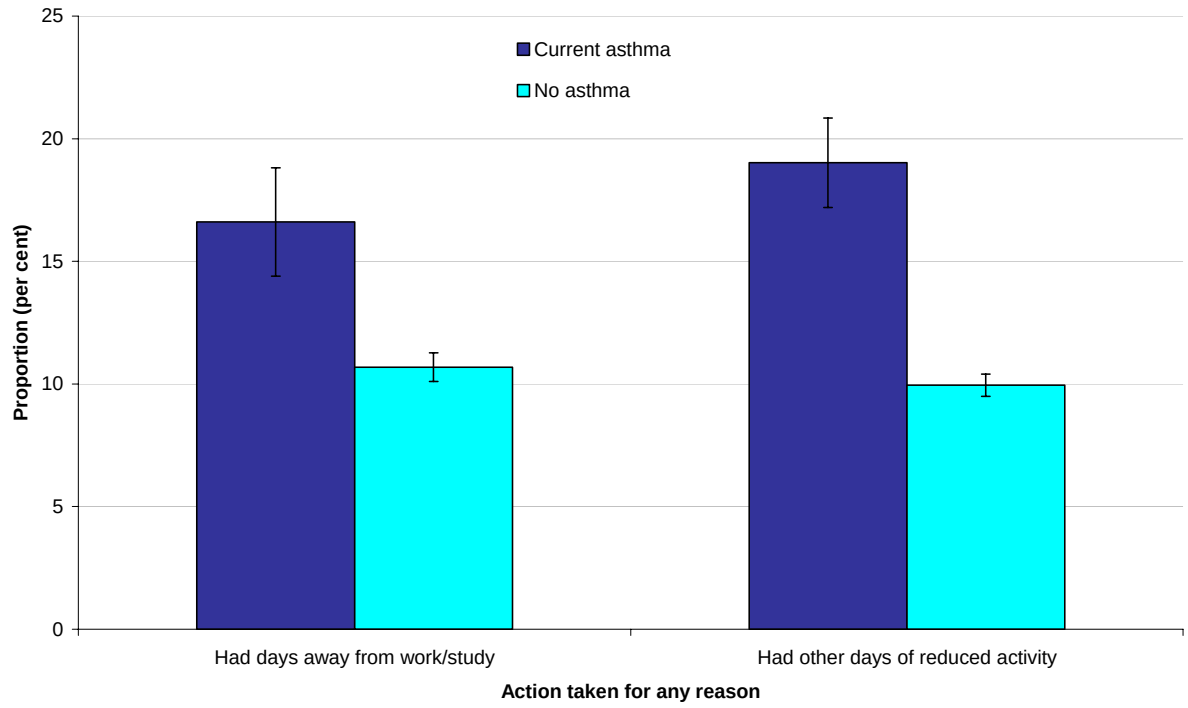
5.2 Days of reduced activity

This section reports on days of reduced activity in the previous 2 weeks in those aged 5 years and over. 'Days of reduced activity' comprises days away from work or study and other days of reduced activity, which are derived from the answers to the following questions:

- In the last 2 weeks have you stayed away from your work/school/place of study for more than half the day because of any illness or injury you had?
- Apart from when you were away from work/school/your place of study, on any [other] days in the last 2 weeks have you had to cut down on anything you usually do because of any illness or injuries?

In addition to these questions, respondents aged 5 years and over with current asthma were asked about days of reduced activity in the previous 2 weeks that occurred as a direct result of their asthma.

A significantly higher proportion of people with current asthma had days off work or school (16.6%) compared with people without current asthma (10.7%) ($p < 0.0001$) (Figure 5.4). Among people with current asthma, there was also a significantly higher percentage that had other days of reduced activity (19.0%) compared with those without current asthma (10.0%) ($p < 0.0001$).



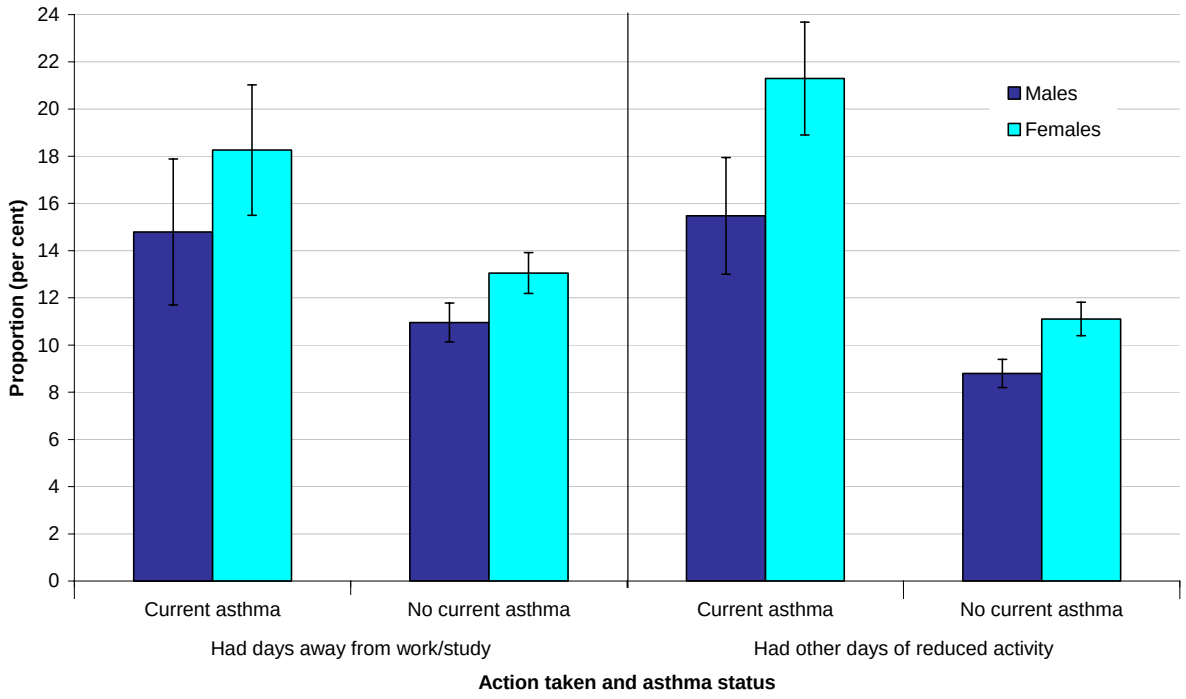
Note: Age-standardised to the Australian population as at June 2001.

Figure 5.4: Action taken in the last 2 weeks for any reason, by asthma status, people aged 5 years and over, Australia, 2004–05

Age and sex

Among people with current asthma aged 5 years and over, 1.3% of males and 1.5% of females had days away from work/study in the last 2 weeks because of their asthma. In addition, asthma had resulted in 2% of males and 2% of females with current asthma having other days of reduced activity.

A higher proportion of females reported other days of reduced activity compared with males (Figure 5.5), although the disparity was more prominent among people with current asthma (21.3% of females versus 15.5% of males) compared with people without current asthma (11.1% of females versus 8.9% of males). A similar pattern was observed for days away from work or study.

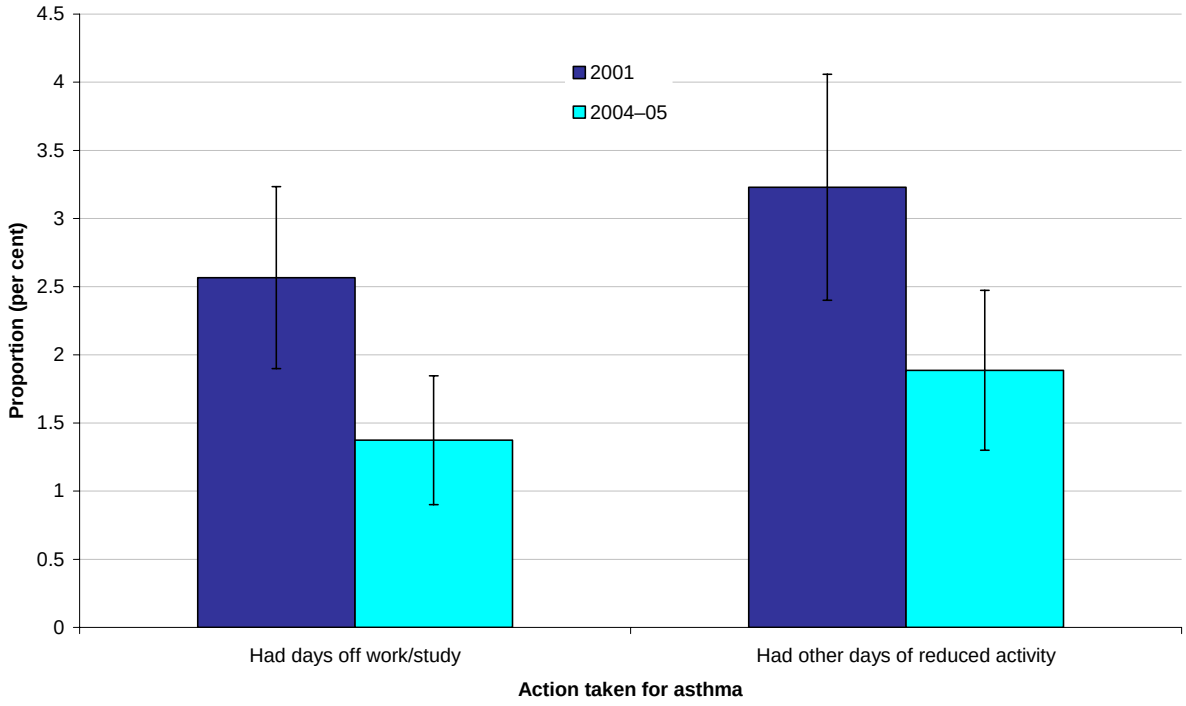


Note: Age-standardised to the Australian population as at June 2001.

Figure 5.5: Action taken in the last 2 weeks for any reason, by asthma status and sex, people aged 5 years and over, Australia, 2004–05

The proportion of people with current asthma who had days off work or study because of their asthma decreased from 2.6% in 2001 to 1.4% in 2004–05 (p = 0.005) (Figure 5.6). Much of this difference was attributed to a large decrease among males with asthma (3.3% in 2001 compared to 1.3% in 2004–05) (data not shown).

The proportion of people who had other days of reduced activity because of their asthma also decreased by a significant amount, from 3.2% in 2001 to 1.9% in 2004–05 (p = 0.002) (Figure 5.6).



Note: Age-standardised to the Australian population as at June 2001.

Figure 5.6: Action taken in last 2 weeks for asthma, by survey year, people aged 5 years and over with current asthma, Australia, 2001 and 2004–05

5.3 Psychological distress

The psychological component of quality of life encompasses thoughts, emotions and behaviours. People with good mental health are generally able to function well in relation to the handling of everyday activities and work through any obstacles they may encounter in day-to-day life while working towards the achievement of important goals.

A recent South Australian study reported a higher prevalence of depression among people with asthma compared with people without asthma (Goldney et al. 2003). Furthermore, this study found that people with more severe symptoms of asthma (shortness of breath, waking at night with asthma symptoms or morning symptoms) were more likely to suffer from major depression than those without severe symptoms.

General measures of the psychological component of quality of life are able to detect small differences in the psychological health of people with and without current asthma. These have identified that higher levels of anxiety and depression are distinguishing characteristics of people with current asthma (ACAM 2005).

In this section, results from the Kessler Psychological Distress Scale, which forms part of the NHS questions for those aged 15 years and over, are presented. This measure consists of 10 questions on aspects of psychological distress, such as feeling nervous, hopeless, restless or fidgety, depressed or worthless. Responses to questions about the level of anxiety and depressive symptoms in the last 4 weeks (ranging from 'none of the time' to 'all of the time')

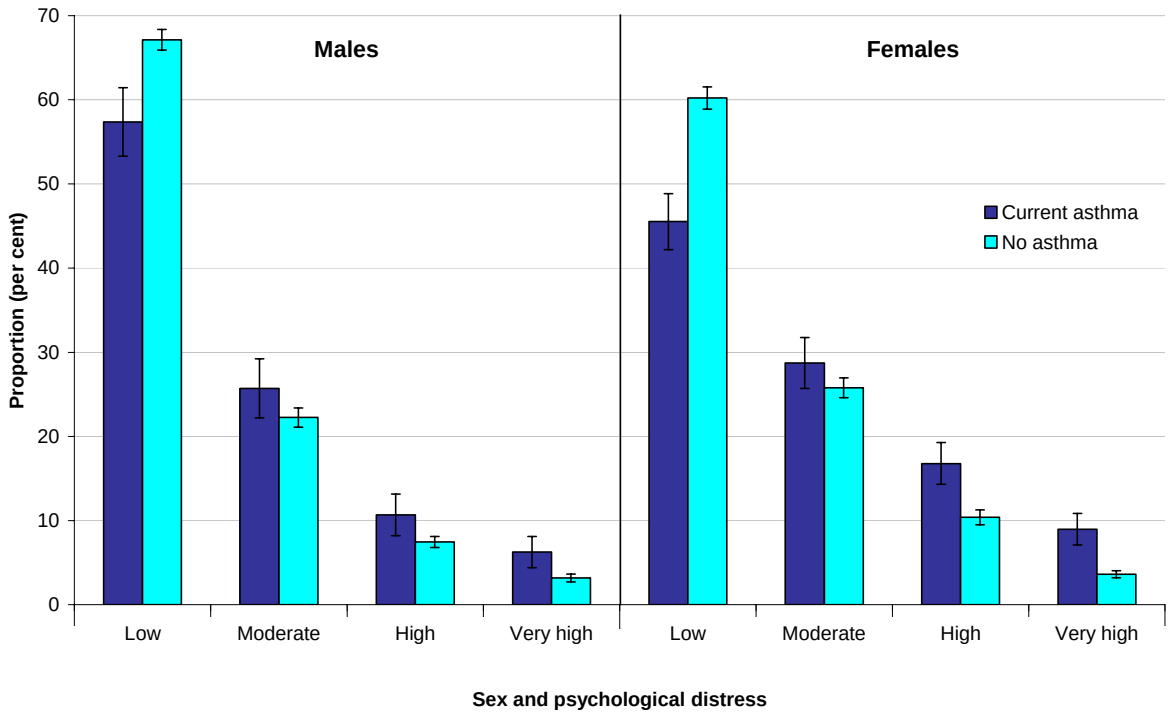
are scored and summed to give a final score with higher scores representing higher levels of anxiety or depression.

There was a higher level of psychological distress among people with current asthma compared with people without current asthma. The proportion of people categorised as having high or very high psychological distress was significantly greater among people with asthma (22.3%) compared with people without asthma (12.3%) ($p < 0.0001$). People with current asthma were 1.9 times (95% CI: 1.7–2.2) more likely to have high or very high psychological distress than people without current asthma.

Age and sex

In the general population, females were more likely than males to have high or very high psychological distress (odds ratio 1.4; 95% CI: 1.3–1.5). Among people with current asthma, the disparity in psychological distress between the sexes was even more pronounced. Females with current asthma were 1.8 times (95% CI: 1.4–2.3) more likely to have high or very high psychological distress than males with current asthma (Figure 5.7).

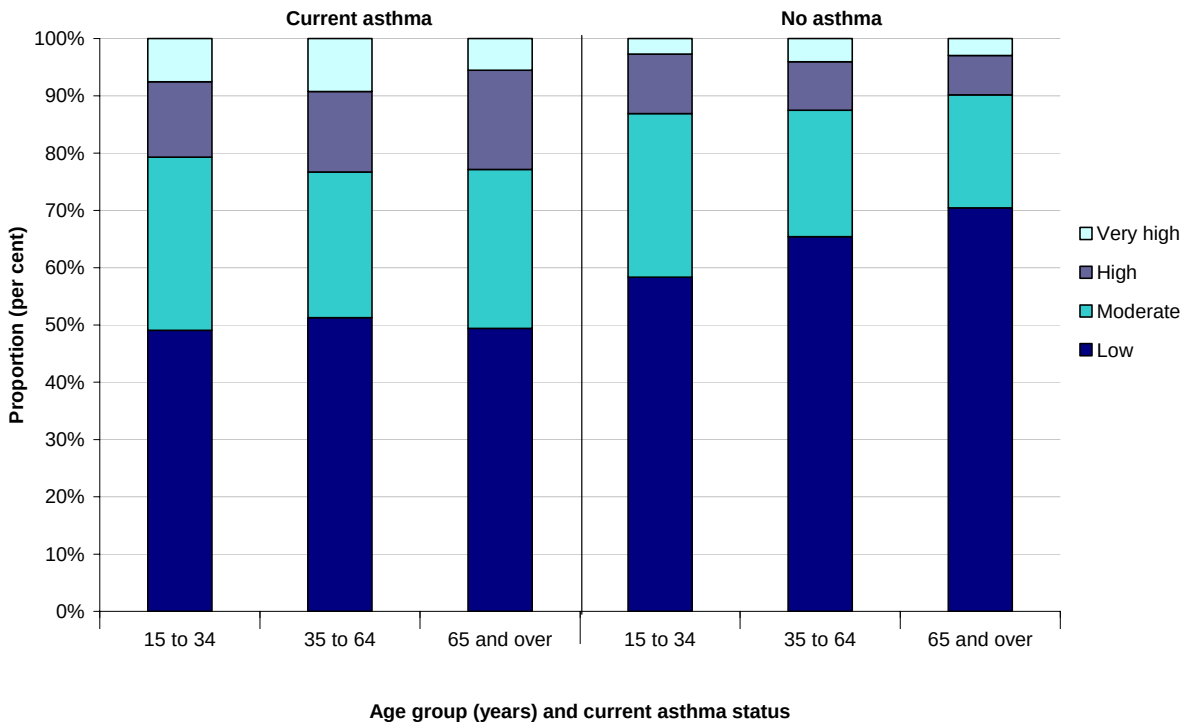
Furthermore, among females, those with current asthma were 2.2 times (95% CI: 1.9–2.5) more likely to have high or very high psychological distress than those without asthma.



Note: The Kessler-10 scores corresponding to the levels of psychological distress are: low—10 to 15; moderate—16 to 21; high—22 to 29; very high—30 to 50. Age-standardised to the Australian population as at June 2001.

Figure 5.7: Prevalence of low to very high psychological distress, by asthma status and sex, people aged 15 years and over, Australia, 2004–05

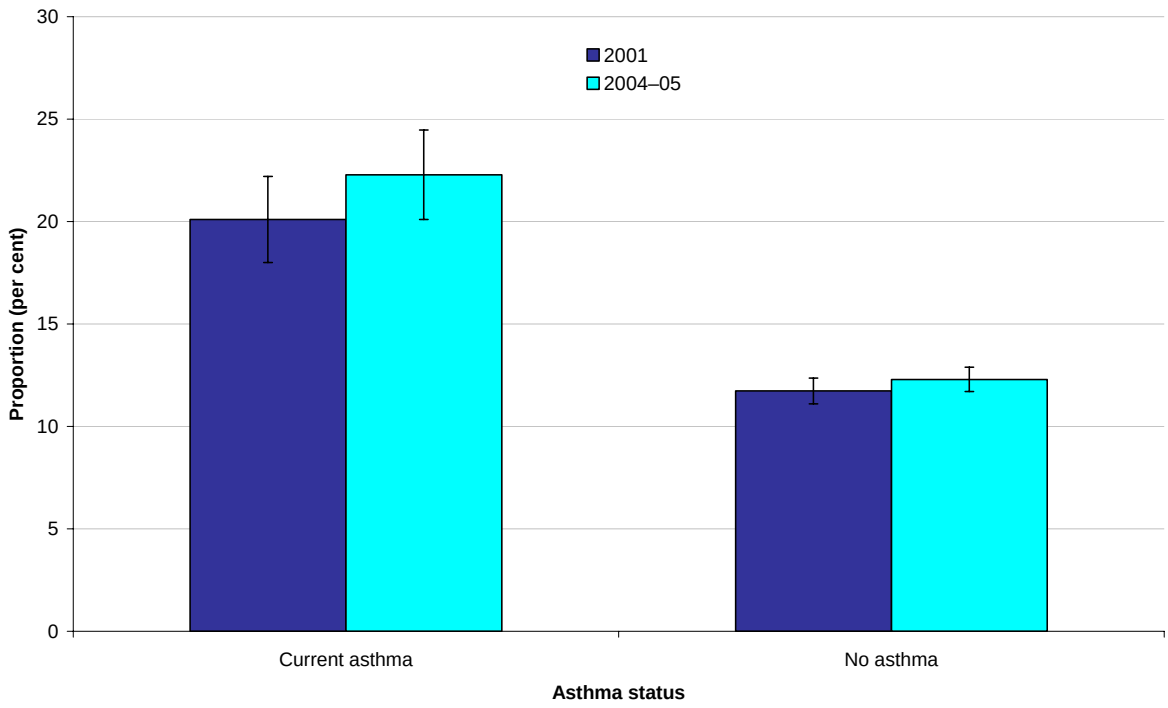
Among people with current asthma, about half reported a low level of psychological distress in all age groups but the proportion who reported having a high or very high level of psychological distress increased with age (Figure 5.8). In contrast, among people without current asthma, the proportion with high or very high psychological distress decreased and the proportion with low psychological distress increased with age.



Note: Age-standardised to the Australian population as at June 2001.

Figure 5.8: Prevalence of psychological distress, by asthma status and age group, people aged 15 years and over, Australia, 2004–05

The proportion of people with and without current asthma reporting high or very high psychological distress did not change significantly between 2001 and 2004–05 (Figure 5.9).



Note: Age-standardised to the Australian population as at June 2001.

Figure 5.9: Prevalence of high to very high psychological distress, by asthma status and survey year, people aged 15 years and over, Australia, 2001 and 2004–05

Summary

Poorer outcomes in a range of measures relevant to health-related quality of life were identified as distinguishing characteristics among people with current asthma in Australia.

Asthma was associated with poorer self-assessed health across all ages and for both sexes in 2004–05, although there has been some improvement since 2001. Asthma also resulted in a substantially higher proportion of days of reduced activity and days lost from work or study, for both males and females with current asthma. The self-reported burden of asthma, in terms of days taken off from work/study or other reduced activity days had reduced significantly since the 2001 NHS.

While it is well known that asthma has detrimental effects on physical functioning, it has recently come to light that asthma also affects psychological or 'mental' health (Goldney et al. 2003). Australians with current asthma reported worse psychological health than those without asthma, and the difference was more pronounced in females and in older persons.

6 Comorbidity with other long-term conditions

A recent Australian study showed that people with asthma were more likely to report diabetes, arthritis, heart disease, stroke, cancer and osteoporosis (Adams et al. 2006). This study also found that having both asthma and another chronic condition was associated with worse quality of life, especially among those aged 35 years and over.

This chapter will investigate the prevalence of other National Health Priority Area conditions in people with asthma and compare these with people without current asthma in 2004–05.

Among people of all ages with current asthma, 20% also had arthritis and 14% also had mental and behavioural disorders (Table 6.1). Overall, people with current asthma were 1.4 times more likely to have arthritis than people without current asthma. Arthritis was the most common comorbid condition among people with current asthma aged 35 years and over and the second most common in those aged less than 35 years. Among those aged 0 to 34 years, people with current asthma were twice as likely to have arthritis as those without current asthma and the rate ratio decreased as age increased. People who are hospitalised with asthma or die from asthma are more likely to have also had musculoskeletal problems reported (ACAM 2006). It was hypothesised that this may be related to steroid-induced osteoporosis associated with the use of inhaled corticosteroids to manage asthma.

In 2004–05, people with current asthma of all ages were 1.7 times more likely to have mental and behavioural problems than people without current asthma. The rate ratio was highest among those aged 0 to 34 years, where people with current asthma were 1.9 times more likely to have mental and behavioural disorders than people without current asthma. These findings are consistent with the results presented in Section 5.3 of this report, where people with current asthma were more likely to report high or very high psychological distress than people without current asthma.

Among those aged 35 to 64 years, 6.7% of people with current asthma and 4.0% of those without current asthma had diabetes. In this age group people with current asthma were 2.5 times more likely to have malignant neoplasm (cancer) than people without current asthma.

These findings are consistent with the South Australian findings (Adams et al. 2006) and also with national data on diseases associated with asthma in hospitalisations or deaths (ACAM 2006). People who died in Australia between 1997 and 2003 with asthma listed as one of multiple causes of death were 1.9 times (95% CI: 1.8–2.1) more likely to also have musculoskeletal disease, 1.6 times (95% CI: 1.3–1.9) more likely to also have depression or anxiety and 1.5 times (95% CI: 1.4–1.6) more likely to also have diabetes mellitus (ACAM 2006) than people who did not have asthma as a cause of death. Similar findings were reported for national hospital admissions data, where people who were hospitalised with asthma as one of multiple diagnoses in 2003–04 were 2.9 times (95% CI: 2.8–3.0) more likely to also have heart failure and 2.1 times (95% CI: 2.0–2.2) more likely to also have depression and anxiety than people who did not have an asthma diagnosis.

Table 6.1: Comorbidities among people with and without asthma by age group, Australia, 2004–05

Age group	Comorbidity	Current asthma % (95% CI)	No asthma % (95% CI)	Rate ratio (95% CI)
0 to 34 years	Mental and behavioural disorders	12.4 (10.3, 14.5)	6.5 (6.0, 7.1)	1.90 (1.50–2.41)
	Arthritis	3.1 (2.0, 4.2)	1.4 (1.2, 1.7)	2.15 (1.29–3.59)
	Cancer	*0.3 (0.0, 0.7)	*0.2 (0.1, 0.3)	1.79 (0.48–6.65)
	Diabetes mellitus	*0.3 (0.0, 0.5)	0.4 (0.2, 0.5)	0.73 (0.27–1.99)
	Heart, stroke or vascular diseases	*0.2 (0.0, 0.5)	0.2 (0.1, 0.3)	0.96 (0.28–3.30)
	Osteoporosis	*0.1 (0.0, 0.3)	*0.2 (0.1, 0.3)	0.66 (0.17–2.52)
35 to 64 years	Arthritis	32.0 (28.4, 35.6)	20.2 (19.2, 21.2)	1.58 (1.38–1.82)
	Mental and behavioural disorders	17.3 (14.3, 20.3)	10.4 (9.7, 11.2)	1.66 (1.33–2.07)
	Diabetes mellitus	6.7 (4.8, 8.7)	4.0 (3.5, 4.5)	1.67 (1.18–2.37)
	Heart, stroke or vascular diseases	6.5 (4.6, 8.4)	3.4 (2.9, 3.8)	1.94 (1.32–2.83)
	Cancer	4.8 (3.2, 6.5)	1.9 (1.6, 2.2)	2.54 (1.55–4.16)
	Osteoporosis	3.6 (2.2, 5.0)	2.8 (2.4, 3.2)	1.28 (0.85–1.93)
65 years and over	Arthritis	63.7 (57.2, 70.3)	47.9 (45.8, 50.1)	1.33 (1.18–1.50)
	Osteoporosis	21.0 (15.5, 26.5)	13.4 (11.9, 14.9)	1.56 (1.13–2.17)
	Heart, stroke or vascular diseases	20.1 (14.7, 25.6)	18.2 (16.5, 19.9)	1.11 (0.83–1.48)
	Diabetes mellitus	16.0 (11.0, 20.9)	13.4 (11.9, 14.9)	1.19 (0.85–1.67)
	Mental and behavioural disorders	8.1 (4.5, 11.7)	7.1 (6.0, 8.3)	1.13 (0.74–1.74)
	Cancer	*5.7 (2.7, 8.8)	6.1 (5.1, 7.2)	0.93 (0.56–1.55)
All ages	Arthritis	20.0 (18.2, 21.9)	14.8 (14.3, 15.4)	1.35 (1.23–1.49)
	Mental and behavioural disorders	13.6 (12.0, 15.2)	8.2 (7.8, 8.6)	1.66 (1.43–1.94)
	Heart, stroke or vascular diseases	4.7 (3.7, 5.7)	3.7 (3.4, 4.0)	1.25 (0.98–1.59)
	Diabetes mellitus	4.3 (3.3, 5.3)	3.5 (3.2, 3.8)	1.24 (0.97–1.59)
	Osteoporosis	3.7 (2.8, 4.6)	2.9 (2.6, 3.2)	1.28 (0.99–1.66)
	Cancer	2.5 (1.8, 3.2)	1.6 (1.4, 1.8)	1.55 (1.08–2.21)

* Estimate has a relative standard error greater than 25% and should be interpreted with caution.

Notes

1. Crude rates shown.
2. Arthritis includes all types.
3. Cancer describes 'malignant neoplasm'. It should be noted that people in hospital are excluded from the sample.
4. Mental and behavioural disorders includes mood (affective) problems, anxiety-related problems, and behavioural and emotional problems with usual onset in childhood/adolescence.
5. Heart, stroke or vascular diseases includes ischaemic heart diseases, cerebrovascular diseases, oedema and heart failure, and diseases of the arteries, arterioles and capillaries.

Summary

Findings from the 2004–05 NHS indicated that there was a higher prevalence of arthritis, particularly among children and young adults, and of mental and behavioural disorders among people with current asthma. People aged 35 to 64 years with current asthma were 2.5 times more likely to have cancer than those without current asthma. The presence of one or more comorbid conditions in people with current asthma is likely to compromise their quality of life and may complicate the management of the disease.

Appendix 1: Methods, definitions and population groups

A1.1 Methods of the National Health Survey

The NHS, conducted by the ABS periodically since 1977, is designed to collect information on the health status, use of health services and facilities, and health and lifestyle characteristics of residents across Australia. It aims to get national information on a range of health issues, provide information on health indicators for National Health Priority Areas and for important population subgroups, and, where possible, enable trends to be monitored over time.

Households from all states and territories are sampled randomly using a stratified multi-stage area sample to ensure that all eligible members of the population within a given state and territory have an equal chance of selection. Residents from hospitals, nursing and convalescent homes, boarding schools, prisons, single quarters of military establishments and persons living in Australia but not usually considered part of the Australian population are excluded. Non-private dwellings such as hostels, boarding houses, hotels and motels are also excluded.

In 2004–05, the NHS sampled approximately 19,500 households from non-sparsely settled areas of all states and territories of Australia between August 2004 and July 2005 (ABS 2006b). One adult, aged 18 years or over and, where applicable, one child, were included from each selected dwelling, providing a total sample of approximately 25,900 respondents. Parents or guardians were interviewed on behalf of children or, where possible, children aged 15 to 17 years were interviewed in person, with parental consent. The average survey time was 40 minutes per household.

In this report, data from the 2004–05 and 2001 surveys are used. The estimate of the prevalence of current asthma is derived from two questions asked in the survey (see Table A1). The proportion of the sample who had 'current' asthma (that is, 'still get asthma') has been estimated. This subgroup of the population was asked additional questions from the asthma module of the survey, also described in Table A1. In order to make comparisons of various outcomes in people with and without asthma, the authors also analysed data from the NHSs that are designed for the general population (Table A2).

The 2004–05 and 2001 ABS NHS data presented in this report have been accessed through the ABS Remote Access Data Library (RADL). This facility is available to authorised users to access confidentialised unit record files (CURFs), which are de-identified record level data. Grouping variables are incorporated in these data (for example, region of birth, age group) to ensure that information from these records cannot be used to identify an individual.

The 2004–05 NHS CURF contains eight separate files: household, (all) persons in household, (selected) person, alcohol, conditions, medications, injury damage and body part injured. There are two formats of the NHS CURF data—the expanded and the basic. The expanded CURF contains some information that is more detailed than that available in the basic CURF.

The expanded CURF can only be accessed through the RADL, while the basic CURF can be accessed either through the RADL or via CD-ROM (ABS 2006c). For the purposes of this report, the expanded CURF was used, unless stated otherwise.

The National Aboriginal and Torres Strait Islander Health Survey

The NHS included questions about whether the respondent came from an Aboriginal or Torres Strait Islander background. This sample was included in the main analyses. In addition, the NHS has over-sampled in Indigenous Australian populations to enable more reliable estimates of health status in Indigenous Australians since 1995. This component of the NHS is referred to as the NATSIHS. A total sample of 10,439 Aboriginal and Torres Strait Islander Australians was included in the NATSIHS (ABS 2006d). This component of the survey carried out further sampling of 4,904 Aboriginal and Torres Strait Islander Australians in remote Indigenous communities. The response rates for the NATSIHS non-remote and remote samples were 83.4% and 85.5%, respectively. The majority of questions used were the same as those administered in the 2004–05 NHS. However, some asthma-specific questions were not included in the 2004–05 NATSIHS, namely those about respiratory symptoms, type of medication used, nebuliser use or actions taken for asthma (Table A3). Furthermore, information about asthma action plans was only collected in non-remote areas.

The 2004–05 and 2001 ABS NATSIHS data presented in this report have also been accessed through the ABS RADL, using the expanded CURF, which is the only format available for the NATSIHS.

Table A1: Asthma-specific questions from the ABS National Health Survey relevant to this report

Question(s)	Section of this report where data presented
Have you ever been told by a doctor or a nurse that you have asthma?	Section 2.1 (Prevalence of ever having asthma)
If yes, do you still get asthma?	Section 2.2 (Prevalence of current asthma)
Do you have a written asthma action plan?	Section 3.1 (Written asthma action plans)
Did you get the asthma action plan from a doctor?	
Did you get the asthma action plan from a nurse?	
Did you get the asthma action plan from a chemist?	
Is your action plan similar to this?	
Have you taken any medication for asthma in the last 2 weeks?	Section 3.3 (Use of asthma medications)
What are the names or brands of all the asthma medication you have used in the last 2 weeks?	
During the last 2 weeks have you used a nebuliser to administer this/any of these medication(s) for your asthma?	
Have you taken any of these actions for your asthma in the last 2 weeks?	Section 3.2 (Health-related actions taken for asthma)
Which ones?	Section 5.2 (Days of reduced activity)
10. Admitted to hospital as an inpatient	
11. Visited outpatient clinic	
12. Visited emergency/casualty	
13. Visited day clinic	
14. Consulted a doctor (GP or specialist)	
15. Consulted other health professional	
16. Had days away from study/work	
17. Had other days of reduced activities	
18. Taken vitamin or mineral supplements	
19. Used natural/herbal medicines	
Did you consult a general practitioner or a specialist?	

Table A2: General questions from the ABS National Health Survey relevant to this report

Question(s)	Section of this report where data presented
In general, would you say that your health is excellent, very good, good, fair or poor?	Section 5.1 (Self-assessed health status)
How much do you weigh? How tall are you without shoes?	Used to calculate BMI in Section 4.3 (Overweight and obesity)
In the last 2 weeks, have you walked for sports, recreation or fitness? How many times did you walk for sports, recreation or fitness in the last 2 weeks? What was the total amount of time you walked for sports, recreation or fitness in the last 2 weeks?	Used to calculate level of exercise in Section 4.4 (Exercise level)
In the last 2 weeks did you do any exercise which caused a moderate increase in your heart rate or breathing, that is, moderate exercise? How many times did you do any moderate exercise in the last 2 weeks? What was the total amount of time you spent doing moderate exercise in the last 2 weeks?	Used to calculate level of exercise in Section 4.4 (Exercise level)
In the last 2 weeks did you do any other exercise which caused a large increase in your heart rate or breathing, that is, vigorous exercise? How many times did you do any vigorous exercise in the last 2 weeks? What was the total amount of time you spent doing vigorous exercise in the last 2 weeks?	Used to calculate level of exercise in Section 4.4 (Exercise level)
Do you currently smoke? Do you smoke regularly, that is, at least once a day? Have you ever smoked regularly (that is at least once a day)?	Section 4.1 (People with asthma who smoke)
Does anyone (else) in this household smoke regularly that is at least once a day? How many (other) people in this household smoke regularly? Do you or does anyone else usually smoke inside the house?	Section 4.2 (Passive smoke exposure in children with asthma)
In the past 4 weeks: About how often did you feel tired out for no good reason? About how often did you feel nervous? About how often did you feel so nervous that nothing could calm you down? About how often did you feel without hope/hopeless? About how often did you feel restless or jumpy/fidgety? About how often did you feel so restless that you could not sit still? About how often did you depressed? About how often did you feel that everything was an effort? About how often did you feel so sad that nothing could cheer you up? About how often did you feel worthless? Responses: 1. All of the time / 2. Most of the time / 3. Some of the time / 4. A little of the time / 5. None of the time	Used to calculate Kessler 10 score in Section 5.3 (Psychological distress)
In the last 2 weeks have you stayed away from your work for more than half the day because of any illness or injury you had? On how many days in the last 2 weeks have you stayed away from your work?	Section 5.2 (Days of reduced activity) Used to calculate differences between people with and without current asthma

Table A3: Asthma-specific and other relevant questions included in the National Aboriginal and Torres Strait Islander Survey 2004–05

Data item	Non-remote	Remote
Ever diagnosed asthma	✓	✓
Current asthma	✓	✓
Whether has written asthma action plan	✓	×
Source of written asthma action plan	✓	×
Whether has standard asthma action plan	✓	×
Whether used pharmaceutical medications for asthma in the last 2 weeks	✓	✓
Type of medication used	×	×
Use of nebuliser	×	×
Action taken for asthma	×	×
Body mass index	✓	✓
Exercise level	✓	×

A1.2 Calculation of rates

Rates are used to describe the prevalence of a condition in a population or a population subgroup. Prevalence rates refer to the number of people with a specified condition within a population divided by the size of the population. For the purposes of this report, rates per 100 persons or percentage have been used.

Population-based rates

Crude rates

Crude rates have been calculated by dividing the number of people with a condition in a population or the number of events that occurred in a population in a year by the size of that population at the middle of that year. The mid-year population is an estimate of the average population during the whole year.

$$n/\text{population} \times 100$$

where n = number of persons with a condition or number of events, and population is the mid-year population for the relevant year.

Age- and sex-specific rates

Where needed, rates have been estimated separately for individual age groups and for males and females. In this case the relevant cases or events (for the numerator) are those within the specific age–sex group, and the relevant population (for the denominator) is the specified age–sex group within the whole population.

Age-standardised rates

Age-standardised rates are used in this report to adjust for differences in population age structures when comparing rates for different periods of time, geographic areas and/or population subgroups.

Age-standardised rates have been calculated using the following formula:

$SR = \sum(r_i P_i)/\sum P_i$

where

SR is the standardised rate for the population being studied

r_i is the sex- and age-group specific rate for sex and age group *i* in the population being studied

P_i is the population of sex and age group *i* in the standard population.

The Australian population as at 30 June 2001 was the standard population in all analyses.

For trend data that are presented in broad age groups (for example, 5–14 years, 15–34 years, 35–64 years, 65 years and over) the rates for these broad groups are age-standardised to adjust for variation in age structure within them.

Confidence intervals

The rates and proportions contained within this report represent estimates derived from the available enumerated sample or aggregated data. These estimates contain inherent uncertainty, which is larger where the size of the sample or population from which it was estimated is smaller. Confidence intervals are used to show the extent of this uncertainty (that is, the precision of the estimates). The 95% confidence interval (CI) is an estimate of the range of values within which the 'true' population value is expected to lie, with 95% certainty (see Figure A1.1). Very wide confidence intervals are often obtained when the sample size is small (resulting in high relative standard errors). In this case, the results should be interpreted with caution.

In the tables, 95% confidence intervals are presented as ranges of values (in the form, xx to yy). In the figures, 95% confidence intervals are depicted by vertical lines extending above and below each point or column.

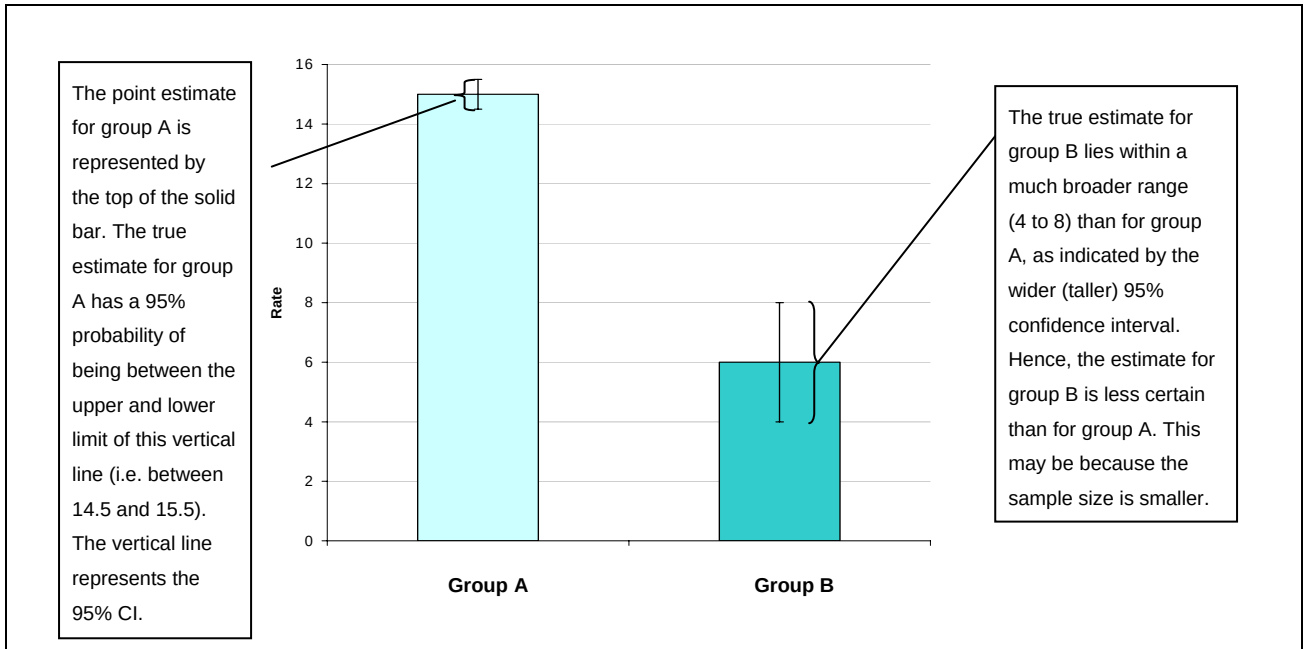


Figure A1.1: Point estimates and 95% confidence intervals

The formula for calculating the 95% confidence intervals was:

$$95\%\ \text{CI for point estimate} = \text{point estimate} \pm 1.96 \times \text{standard error}$$

The standard error was calculated using the relative standard errors of a proportion (ABS 2006a).

Tests of statistical significance

Differences in rates among groups have been tested by the chi square test using frequencies weighted to the sample population (Table A4) using the following formula to calculate the scaled weight:

$$\text{Scaled weight} = \text{Original weight} \times \frac{\text{Sample size}}{\text{Sum of weights}}$$

Linear trends in rates have been tested using the chi square test for trend.

Table A4: Sample size and sum of weights used, by age group and Indigenous status

	Sample size		Sum of weights	
Age (years)	**2004–05**	**2001**	**2004–05**	**2001**
0 to 15	5,506	8,109	4,165,755	4,232,442
0 to 17	6,405	8,944	4,718,446	4,730,919
0 to 14	5,126	7,687	3,920,591	3,946,749
0 to 34	11,589	14,051	9,427,204	9,319,165
15 and over	**20,780**	**19,175**	**15,760,948**	**14,968,893**
All ages	**25,906**	**26,862**	**19,681,539**	**18,915,642**
Indigenous Australians (all ages)	**35,950**	**30,060**	**19,766,697**	**18,987,956**

A1.3 Population data

This report uses population data sourced from the Australian Institute of Health and Welfare, which, in turn, are sourced from the ABS Demography section and are updated as revised or new estimates become available. All population estimates currently produced by the ABS are referred to as estimated resident populations.

Estimated resident populations are based on the 5-yearly Census of Population and Housing, to which three significant adjustments are made:

- All respondents in the census are placed in their state/territory, statistical local area, and postcode of usual residence. Overseas visitors counted in the census are *excluded*.
- An adjustment is made for persons missed in the census (approximately 2%).
- Australians temporarily overseas on census night (these are not counted in the census) are added to the usual residence census count adjusted for undercount.

Estimated resident populations are then updated each year from the census data using indicators of population change such as births, deaths and net migration. More information is available from <www.abs.gov.au>.

A1.4 Population groups

Aboriginal and Torres Strait Islander Australians

'Indigenous Australians' refers to people who identify themselves as being of Aboriginal or Torres Strait Islander origin. It is important to identify health disadvantages, with respect to asthma, among Aboriginal and Torres Strait Islander Australians. However, it is also important to ensure an acceptable level of reliability and validity of the data that are used for this purpose. This applies to assignation of Indigenous status as much as it does to all other aspects of the data.

The information about people living in remote regions and people who are socioeconomically disadvantaged is also applicable to a large number of Aboriginal and Torres Strait Islander Australians.

Non-English-speaking background

Elements associated with cultural background may have an impact on health status. People whose first language is not English have been identified as population groups that are likely to experience disadvantage when seeking access to health and related services (ABS 1999). As such, it is necessary to describe the health status of people from different backgrounds. The term 'non-English-speaking background' has been used throughout this publication to describe people who have re-settled in Australia but who come from countries where English is not the primary language spoken.

The former Department of Immigration and Multicultural Affairs (DIMA), now known as the Department of Immigration and Citizenship, developed a classification from 1996 census data, which placed every country into one of four groups based on the relative English proficiency of recent arrivals to Australia (DIMA 2001).

English-speaking background is defined as those people born in Australia, New Zealand, the United Kingdom, Ireland, the United States of America, Canada or South Africa, which corresponds to the DIMA English proficiency countries in group 1. These are the main countries from which Australia receives overseas settlers who are likely to speak English. Non-English-speaking background is defined as those people whose country of birth was somewhere other than one of these seven countries. This corresponds to the DIMA English proficiency countries in the remaining groups 2 to 4.

Data in this report for non-English-speaking background analyses was accessed from the NHS basic CURF because the country of birth was grouped into the categories corresponding to DIMA English proficiency countries (that is, Australia, main English speaking countries and others). The expanded CURF contained information on, for example, North America and South America grouped as a whole, which was not appropriate for our analyses since 'Americas' includes countries of English-speaking *and* non-English-speaking background.

Socioeconomic disadvantage

The Socio-Economic Index for Areas (SEIFA) Index of Relative Socio-Economic Disadvantage (IRSD) is one of four indexes developed by the ABS to measure socioeconomic characteristics associated with geographic locations (ABS 2003), based on information from the 2001 Australian census. Each index summarises information relating to a variety of social and economic characteristics associated with families and households, personal education qualifications and occupation.

This report uses the SEIFA 2001 index, which provides a summary score for a range of key socioeconomic variables that are related to health status, including household income and resources, education, occupation, fluency in English and Indigenous status. The index is constructed so that relatively advantaged areas have high index values (Table A5).

Table A5: SEIFA quintiles and their corresponding IRSD score

Quintile	IRSD score
Quintile 1 (most disadvantaged)	<950.53
Quintile 2	950.53–<977.56
Quintile 3	977.56–<1007.04
Quintile 4	1007.04–<1059.69
Quintile 5 (most advantaged)	≥1059.69

Individual records were classified into quintiles of socioeconomic disadvantage according to the SEIFA index value associated with the statistical local area of usual residence of the individual. Quintile 1 (SEIFA 1) includes the most disadvantaged households and quintile 5 (SEIFA 5) includes the most advantaged households.

It is important to note that the index reflects the relative disadvantage of all people living in an area, not an individual. Therefore, this measure probably underestimates the true inequality in health at the individual level.

Urban, rural and remote areas

Accessibility to health and education services plays an important role in the successful treatment and management of asthma. Urban, rural and remote areas have been identified in this report using the Australian Standard Geographical Classification (ASGC) of remoteness.

The ASGC is based on the Accessibility/Remoteness Index of Australia (ARIA), which measures remoteness solely on the basis of geographical accessibility, and excludes urban/rural, socioeconomic and population size factors. This index can be applied to any location in Australia. It is based on physical geography, whereby locations are classified on the basis of the proximity (that is, the distance people must travel on a road network) to the nearest of 545 service centres, which differ in size and, hence, in the availability of education and health services. The centres with small populations generally have a limited choice of general practitioners, specialists and hospital care.

Values of remoteness for populated localities are calculated by measuring the shortest road distance between a locality and the nearest of each of five different categories of service centres. Each of the populated localities across Australia has been assigned an ARIA index

score to assess their remoteness from goods, services and opportunities for social interaction. (For full methods, see ABS 2001).

Table A6: ABS classes of remoteness by ASGC and their definition

ASGC classification	ARIA index score	Definition
Major cities of Australia	0–0.2	Geographic distance imposes minimal restriction upon accessibility to the widest range of goods, services and opportunities for social interaction
Inner regional Australia	>0.2–2.4	Geographic distance imposes some restriction upon accessibility to the widest range of goods, services and opportunities for social interaction
Outer regional Australia	>2.4–5.92	Geographic distance imposes a moderate restriction upon accessibility to the widest range of goods, services and opportunities for social interaction
Remote Australia	>5.92–10.53	Geographic distance imposes a high restriction upon accessibility to the widest range of goods, services and opportunities for social interaction
Very remote Australia	>10.53–15	Locationally disadvantaged. Geographic distance imposes the highest restriction upon accessibility to the widest range of goods, services and opportunities for social interaction

For the purposes of this report, the three broader areas of *Major cities*, I*nner regional*, and 'other areas' have been used since cell sizes were too small for accurate estimation in our analyses. 'Other areas' comprises *Outer regional*, *Remote* and *Very remote* areas of Australia.

A1.5 Calculation of exercise level

Respondents to the NHS aged 15 years and over were asked whether they did any exercise such as walking, moderate exercise or vigorous exercise for sport, recreation or fitness, during the last 2 weeks. 'Vigorous' exercise was defined as exercise that caused a large increase in the respondent's heart rate or breathing and 'moderate' exercise was defined as exercise that induced a moderate increase in the heart rate or breathing.

Respondents were also asked about the number of times and the total amount of time they spent on each category of exercise in the previous 2 weeks. From this information, an exercise level was derived for each respondent in order to describe the relative overall exercise level in the preceding 2 weeks and to provide an indication of the quality of activities undertaken in terms of maintaining heart, lung and muscle fitness. The exercise level is based on a score calculated as:

$$\text{Exercise level score} = \text{Number of times activity undertaken} \times \text{Average time per session (minutes)} \times \text{Intensity}$$

An intensity value of 3.5 was given for walking, 5.0 for moderate exercise and 7.5 for vigorous exercise. An individual score was derived for walking, moderate and vigorous exercise and these scores were then summed to provide a total score for the respondent for the 2 weeks before the interview. Score ranges and their corresponding exercise level labels are provided in Table A7.

Table A7: Categories of exercise level in the 2 weeks preceding interview and corresponding scores used in the NHS

Exercise level	Criteria
Sedentary	Scores less than 100[(a)]
Low	Scores of 100 to less than 1600
Moderate	Scores of 1600 to 3200 or more than 3200 but less than 2 hours of vigorous exercise
High	Scores greater than 3200 and 2 hours or more of vigorous exercise

(a) Includes no exercise.

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