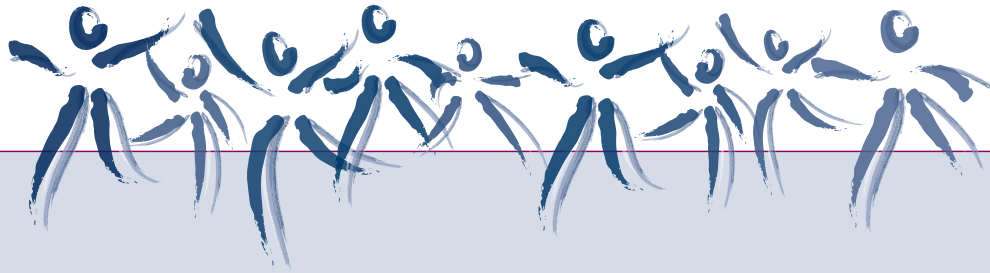
3. Prevalence



Key points

- Asthma remains a significant health problem in Australia, with prevalence rates that are high by international standards.
- In 2004–05, the prevalence of asthma in Australia was estimated at 10.2% (equivalent to 2,010,212 people).
- Compared with 2001, the prevalence of asthma decreased slightly in children and young adults but remained unchanged in older adults.
- Among those aged 0–14 years, the prevalence of asthma is higher among boys than girls, but among those aged 15 years and over, current asthma is more prevalent in females than males.
- The prevalence of asthma increases with increasing socioeconomic disadvantage. The gap in prevalence between the most advantaged and most disadvantaged localities increased between 2001 and 2004–05.
- The majority of children with asthma in Australia are classified as having infrequent episodic asthma while very few (less than 5%) have persistent asthma.
- Among adults, there was a decrease in the proportion classified as having severe asthma between 1999 and 2006, but the majority of adults with asthma have mild or very mild forms of the condition.
- Asthma commonly coexists with other chronic conditions. The presence of one or more comorbid conditions in people with current asthma is likely to compromise their quality of life.

Introduction

Estimating the number of people in the community who have asthma is fundamentally important in assessing the impact of asthma at a population level. Examining levels and trends in the prevalence of asthma allows planners to estimate resource needs and priorities both now and in the future. Differences among population subgroups in the prevalence of asthma provide insights into possible causal factors and also assist in targeting resources to areas of need. Finally, examination of changes over time in the number 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 an environmental or lifestyle-related cause for that rise.

In this chapter, we present data on the prevalence of asthma in Australia gathered from a wide range of sources. Data on time trends, differences among population groups, and international comparisons are reported.

In interpreting the information presented in this chapter, it is important to be aware of the difficulties in measuring asthma and reporting its prevalence. There is no universally applied definition of asthma. We report results from some international asthma studies involving Australia (Asher et al. 2006; Pearce et al. 2007) and from studies of local populations (Toelle et al. 2004; Valery et al. 2008; Wilson et al. 2006). 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.

Self-reported measures include doctor diagnosis of asthma, which may be self- or parent-reported (Adams et al. 2004b; Marks et al. 2007; Robertson et al. 1991; Wilson et al. 2006); symptoms, such as wheeze (Glasgow et al. 2001; ISAAC 1998; Pearce et al. 2007; Robertson et al. 1991), shortness of breath (particularly at night) (Burney et al. 1996; Woods et al. 2001; Zock et al. 2007), cough at night (Grant et al. 2000), wheezing with exercise (Grant et al. 2000; Jones 1994; Ponsonby et al. 1996) and taking treatment for asthma (Burney et al. 1996; Zock et al. 2007).

Objective measurements include: the twitchiness of the airways in response to inhaled stimuli (known as the bronchial provocation challenge test), the extent to which airway narrowing can be reversed by inhaled medication (known as the bronchodilator reversibility test) (Toelle et al. 2004); and day-to-day variability in airway narrowing (peak flow variability) (Parameswaran et al. 1999).

Over the last decade, the prevalence of asthma in Australia has been measured in a range of population health surveys, including the Australian Bureau of Statistics (ABS) National Health Survey and state and territory health surveillance programs. However, there are limited time series data available from these survey programs. Many surveys have been conducted only once or, where there are repeated measures, the definition used to identify people with asthma has changed, making it difficult to compare the prevalence.

The consistent use of standard asthma questions in population health surveys will improve our understanding about asthma, particularly as time series evolve and comparisons can be made across different surveys in Australia. The Australian Centre for Asthma Monitoring (ACAM) has endeavoured to address this issue and released a report in 2007 that recommended a module of survey questions relating to asthma for use in population surveys (ACAM 2007b). The report summarises the outcome of a series of projects that were undertaken to establish feasible, reliable and valid questions that should be used consistently in Australian health surveys to monitor national asthma indicators such as prevalence.

3.1 Ever diagnosed with asthma

The 2004–05 National Health Survey (NHS) provides the most recent nationwide data for the prevalence of asthma. Based on data from this survey, 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.

Data from recent health surveys show a range of estimates for the proportion of adults who report ever having been diagnosed with asthma (16–24%) (Table 3.1). There was a significant increase in the proportion of all adults ever being diagnosed with asthma in New South Wales from 16.6% (95% CI 16.1–17.2) in 1997 to 19.3% (95% CI 18.1–20.5) in 2006, with this increase being more significant for males than females (Centre for Epidemiology and Research 2007; Public Health Division 2001).

Table 3.1: Prevalence of asthma ever being diagnosed by a doctor, adults, most recent health survey results, 2002–2007

Location (source)	Year	No. in survey	Age range	Rate (%)	95% CI
Ever told by a doctor or nurse they have asthma					
Australia (1)	2004–05	20,400	16 years and over	20.2	19.5–20.8
Queensland (2)	2006	1,521	18 years and over	24.3	21.8–26.9
Ever told by a doctor or hospital they have asthma					
New South Wales (3)	2006	7,948	16 years and over	19.3	18.1–20.5
New South Wales (4)	2005	11,480	16 years and over	19.2	18.2–20.2
Ever told by a doctor they have asthma					
Victoria (5)	2006	approximately 7,500	18 years and over	21.2	19.8–22.6
	2005			21.1	19.7–22.5
	2004			20.2	19.0–21.4
	2003			20.4	19.2–21.6
	2002			21.9	20.5–23.3
Western Australia (6)	2006–07	5,932	16 years and over	17.4	15.8–19.0
	2005–06	5,998		16.7	15.4–18.0
	2004–05	5,010		17.3	15.8–18.9
	2003–04	5,169		17.6	15.9–19.6
	2002–03	4,732		16.3	15.1–17.5
South Australia (7)	2006–07	5,699	16 years and over	19.0	18.0–20.1

Note: CI = confidence interval.

Sources: (1) National Health Survey 2004–05 (confidentialised unit record files); (2) Epidemiology Services Unit, Queensland Health; (3) 2006 Report on Adult Health from the New South Wales Population Health Survey (Centre for Epidemiology and Research 2007); (4) 2005 Report on Adult Health from the New South Wales Population Health Survey (Centre for Epidemiology and Research 2006); (5) Victorian Department of Human Services 2007; (6) WA Health and Wellbeing Surveillance System, Epidemiology Branch, Department of Health, Government of Western Australia (data presented in financial years for WA); (7) South Australian Monitoring and Surveillance System (SAMSS), Department of Health, Government of South Australia.

Among children, recent health survey results indicate that the prevalence of ever being diagnosed with asthma ranges from 15.9% to 25.5% (Table 3.2).

Table 3.2: Prevalence of ever being diagnosed with asthma in children, most recent health survey results, 2002–2007

Location (source)	Year	Age range	No. in survey	Rate (%)	95% CI
Parent/guardian ever told by a doctor or nurse that their child has asthma					
Australia (1)	2004–05	0–15 years	5,506	20.8	19.4–22.1
Parent ever told by doctor that their child has asthma					
Victoria (2)	2006	1–12 years	4,602	20.8	19.5–22.2
Western Australia (3)	2006–07	Under 16 years	1,178	18.6	15.7–21.9
	2005–06		1,231	15.9	13.5–18.6
	2004–05		986	17.7	14.5–21.5
	2003–04		1,105	22.6	18.3–27.4
	2002–03		941	18.3	15.7–21.1
South Australia (4)	2006–07	2–15 years	1,276	22.1	19.9–24.5
Victoria (Barwon region) (5)	2005	6–7 years	2,208	24.4	22.8–26.0
Victoria (Melbourne) (6)	2002	6–7 years	2,968	25.5	23.7–27.4

Note: CI = confidence interval.

Sources: (1) National Health Survey 2004–05 (confidentialised unit record files); (2) 2006 Victorian Child Health and Wellbeing Survey; (3) WA Health and Wellbeing Surveillance System, Epidemiology Branch, Department of Health, Government of Western Australia; (4) South Australian Monitoring and Surveillance System (SAMSS) Department of Health, Government of South Australia; (5) Vuillermin et al. 2007; (6) Robertson et al. 2004.

3.2 Current asthma

The 2004–05 NHS estimated that 2,010,212 Australians had current asthma. This represents 10.2% of the Australian population, down from an estimated 11.6% in 2001. Among adults, the prevalence of current asthma in recent years has ranged from 9.9% to 15.1% with most estimates around 11% (Table 3.3).

Table 3.3: Prevalence of current asthma in adults, most recent health survey results, 2002–2007

Location (source)	Year	Age range	No. in survey	Rate (%)	95% CI
Ever doctor-diagnosed asthma AND 'yes' to 'Do you still get asthma?'					
Australia (1)	2004–05	16 years and over	20,400	9.9	9.4–10.4
Ever doctor-diagnosed asthma AND 'yes' to 'Do you still have asthma?'					
South Australia (2)	2003	15 years and over	n.a.	12.2	n.a.
	2002		n.a.	13.4	n.a.
Ever doctor/hospital diagnosed asthma AND had symptoms of asthma or taken treatment for asthma in the last 12 months					
New South Wales (3)	2006	16 years and over	7,941	10.9	9.9–11.8
New South Wales (4)	2005	16 years and over	11,474	10.4	9.7–11.2
Queensland (5)	2006	18 years and over	1,521	13.7	11.9–15.9
	2004		2,231	15.1	13.5–16.8
Ever doctor-diagnosed asthma AND asthma symptoms (wheezing, coughing, shortness of breath, chest tightness) in the last 12 months					
Victoria (6)	2006	18 years and over	n.a.	10.5	9.5–11.5
	2005		n.a.	11.3	10.3–12.3
	2004		n.a.	10.5	9.5–11.5
	2003		n.a.	11.7	10.7–12.7
	2002		n.a.	12.6	11.6–13.6
Ever doctor-diagnosed asthma AND had symptoms of asthma or taken treatment for asthma in the last 12 months					
Western Australia (7)	2006–07	16 years and over	5,932	10.1	8.9–11.4
	2005–06		5,998	10.5	9.5–11.6
	2004–05		5,010	10.8	9.6–12.1
	2003–04		5,169	10.7	9.4–12.3
	2002–03		4,732	10.2	9.3–11.2
Ever doctor-diagnosed asthma AND 'took asthma medication that was prescribed or given to you by a doctor' or 'had whistling or wheezing in the chest at any time' in the past 12 months					
South Australia (8)	2006–07	16 years and over	5,699	13.4	12.5–14.3
	2005–06		5,727	13.9	13.0–14.8
	2004–05		5,791	14.1	13.2–15.0
Ever doctor-diagnosed asthma AND 'still have asthma' or 'had whistling or wheezing in the chest at any time in the past 12 months'					
Australia (9)	Dec 2003–Jan 2004	16 years and over	1,006	11.2	9.1–13.0

n.a. Not available

Sources: (1) National Health Survey 2004–05 (confidentialised unit record files); (2) Wilson et al. 2006; (3) 2006 Report on Adult Health from the New South Wales Population Health Survey (Centre for Epidemiology and Research 2007); (4) 2005 Report on Adult Health from the New South Wales Population Health Survey (Centre for Epidemiology and Research 2006); (5) Queensland Omnibus Survey, Epidemiology Services Unit, Queensland Health; (6) Victorian Department of Human Services 2007; (7) WA Health and Wellbeing Surveillance System, Epidemiology Branch, Department of Health, Government of Western Australia; (8) South Australian Monitoring and Surveillance System, Department of Health, Government of South Australia; (9) Australian Asthma Survey (Marks et al. 2007).

The most recent nationwide survey conducted in 2004–05 estimated that 11.3% of children aged 0–15 years in Australia had current asthma, defined as those who reported ever being diagnosed with asthma and responding 'yes' to 'Do you still get asthma?'. The prevalence of asthma has also been measured in a number of state, territory or local population-based surveys in Australia (Table 3.4).

The surveys have used different definitions to identify asthma and this is likely to influence the resulting prevalence estimates. Most state surveys defined current asthma as ever being diagnosed with asthma and also either having symptoms of asthma and/or taking treatment for asthma in the preceding year. Using this definition, the estimated prevalence of asthma in children in Western Australia (2006–07) and Victoria (2006) was 11.8% (aged 0–15 years) and 13.2% (1–12 years), respectively (Table 3.4). The differences in prevalence estimates are also likely to be influenced by the different age ranges of survey participants.

Table 3.4: Prevalence of current asthma in children, most recent health survey results, 2002–2007

Location (source)	Year	Age range	No. in survey	Rate (%)	95% CI
Ever doctor-diagnosed asthma and 'yes' to 'Do you still get asthma?'					
Australia (1)	2004–05	0–15 years	5,506	11.3	10.3–12.3
Australia (1)	2004–05	0–17 years	6,405	11.3	10.4–12.3
Ever doctor-diagnosed asthma AND had symptoms of asthma (coughing, wheezing, shortness of breath and chest tightness, when no cold or respiratory infection) or taken medication for asthma in last 12 months					
Victoria (2)	2006	1–12 years	4,602	13.2	12.0–14.4
Ever doctor-diagnosed asthma AND had symptoms of asthma or has taken treatment for asthma in the last 12 months					
Western Australia (3)	2006–07	Under 16 years	1,178	11.8	9.4–14.7
	2005–06		1,231	9.8	7.9–12.1
	2004–05		986	12.7	9.9–16.1
	2003–04		1,105	15.7	12.1–20.2
	2002–03		941	14.2	11.9–16.8
Australian Capital Territory (4)	2005	4–6 years	3,851	11.3	10.0–12.0
	2004		3,826	11.8	11.0–13.0
	2003		3,700	12.6	11.9–14.1
	2002		3,794	14.0	12.9–15.1
Ever doctor-diagnosed asthma AND 'took asthma medication that was prescribed or given to [child] by a doctor' or 'had whistling or wheezing in the chest at any time' in the past 12 months					
South Australia (5)	2006–07	2–15 years	1,276	14.8	13.0–16.9
	2005–06		1,339	16.6	14.7–18.7
	2004–05		1,345	17.7	15.8–19.9
Experienced wheeze or whistling in the chest in past 12 months					
Victoria (2)	2006	1–12 years	4,602	23.3	21.8–24.7
Victoria (Barwon region) (6)	2005	6–7 years	2,208	20.2	1.8–22.2
Victoria (Melbourne) (7)	2002	6–7 years	2,968	20.0	18.4–21.8
Had wheezing or whistling in chest at any time in the last 12 months					
South Australia (5)	2006–07	2–15 years	1,276	17.5	15.6–19.7

Note: CI = confidence interval.

Sources: (1) Australian Centre for Asthma Monitoring (ACAM) analysis of Australian Bureau of Statistics National Health Survey 2004–05 (confidentialised unit record files) (age standardised to the 2001 Australian population); (2) 2006 Victorian Child Health and Wellbeing Survey; (3) WA Health and Wellbeing Surveillance System, Epidemiology Branch, Department of Health, Government of Western Australia; (4) Phillips et al. 2007; (5) South Australian Monitoring and Surveillance System, Department of Health, Government of South Australia; (6) Vuillermin et al. 2007; (7) Robertson et al. 2004.

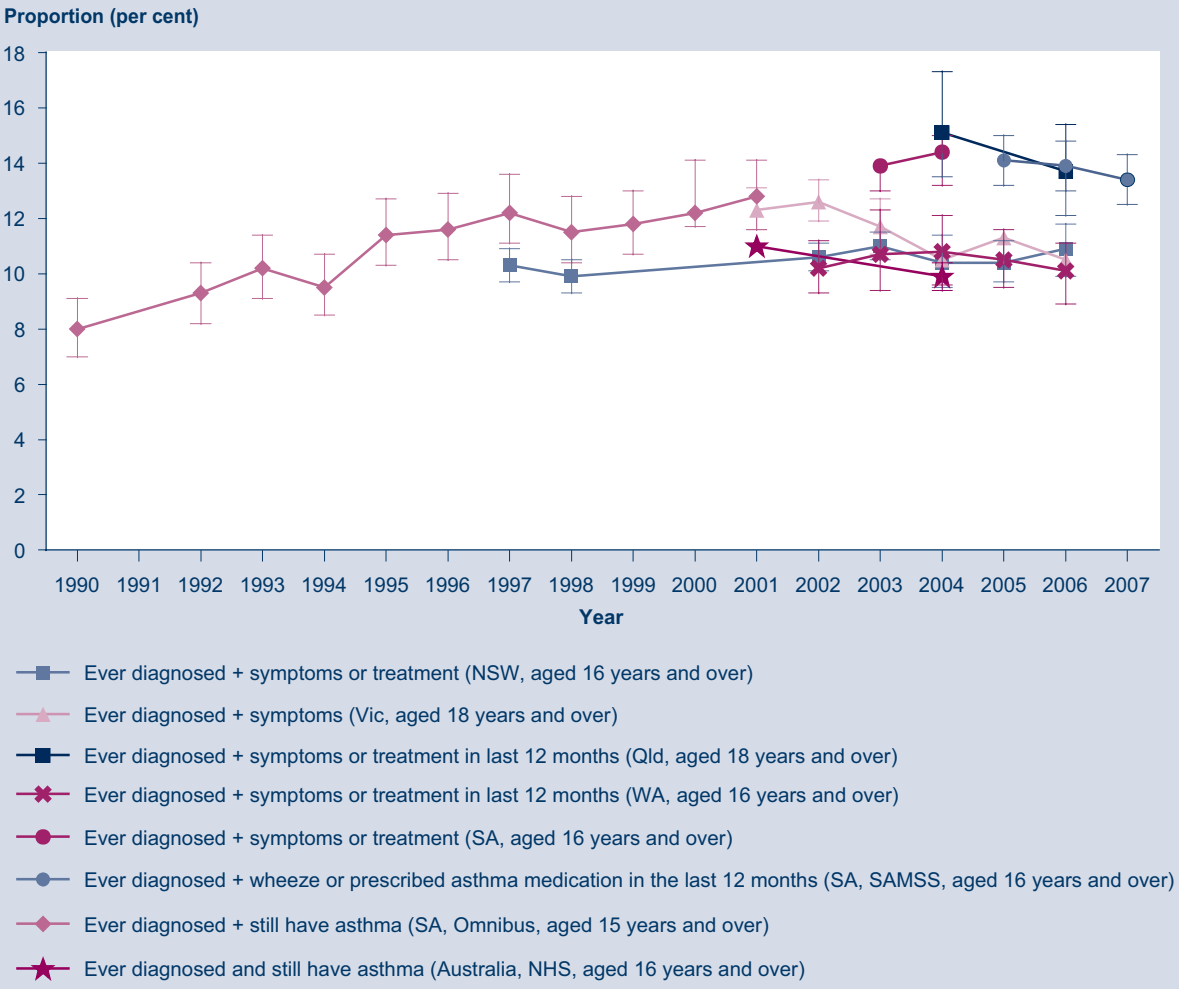
The prevalence of 'recent wheeze' was higher than the prevalence of asthma in children (Table 3.4). In Victoria in 2006, it was estimated that 23.3% of children aged 1–12 years had experienced wheeze or whistling in their chest in the past 12 months. An estimated 17.5% of children aged 2–15 years had experienced the same symptoms in South Australia in 2006–07. The extent to which this represents undiagnosed asthma, as opposed to non-asthma, viral-associated wheeze, cannot be ascertained from the available data.

3.3 Time trends in current asthma

Important changes in the prevalence of asthma have been noted over the past 20–30 years. During the 1980s and early 1990s, there was a substantial worldwide increase in the prevalence of asthma. In recent years, this increasing trend appears to have plateaued (Asher et al. 2006; Eder et al. 2006).

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

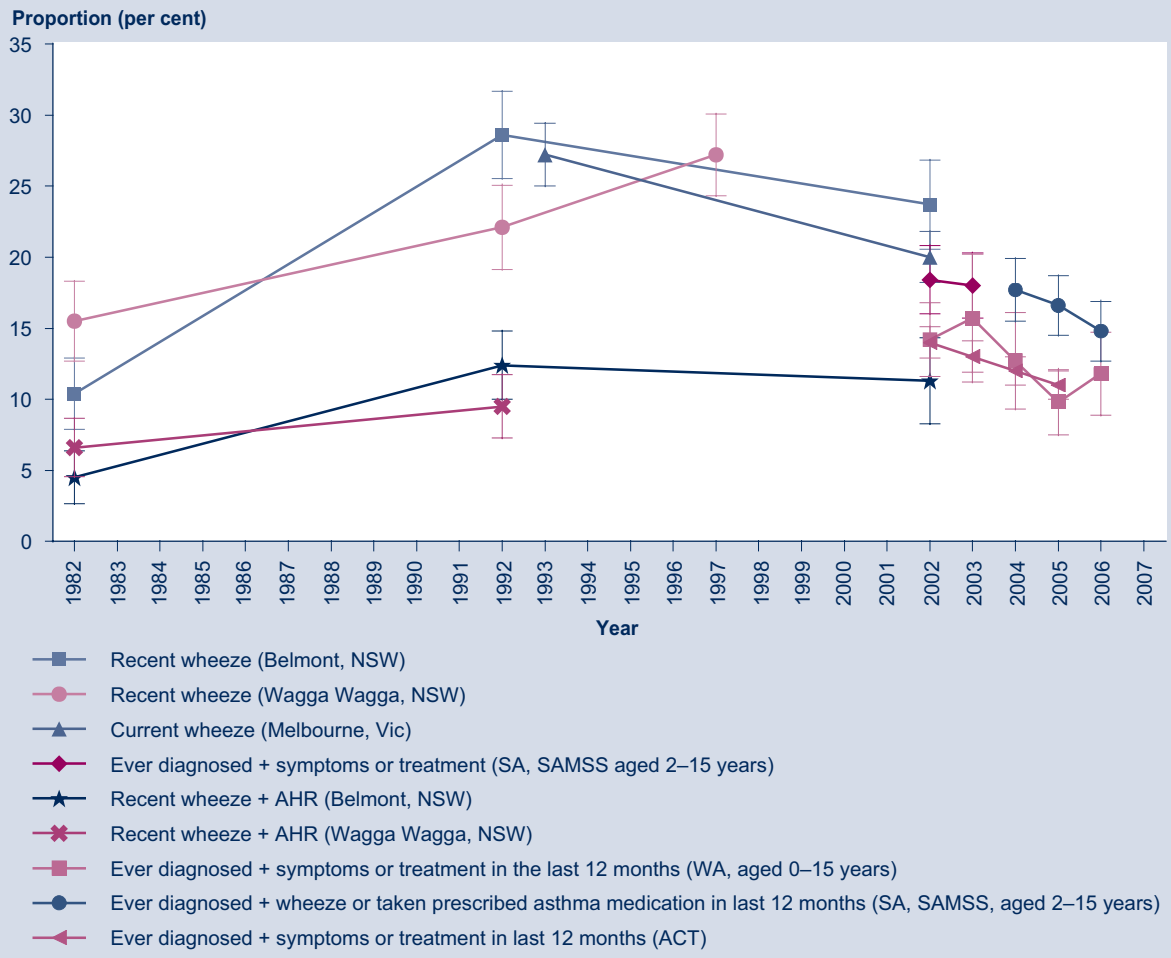
Among adults in South Australia, the prevalence of asthma diagnosed by a doctor increased in the early 1990s, especially among females and the elderly (Wilson et al. 2006). However, since 1997, the prevalence of current asthma among adults has been remarkably stable in a number of studies (Figure 3.1). In contrast, the prevalence of current asthma among children increased during the 1980s and early 1990s (Figure 3.2) but since then the trend has reversed. The nationwide prevalence of current asthma among people aged 5–34 years declined from 14.0% in 2001 to 11.7% in 2004–05 ($p < 0.0001$, ABS National Health Surveys). This downward trend is confirmed in several series of surveys conducted in children since the mid-1990s. International studies have also observed a decrease in the prevalence of asthma among children in countries with a history of high prevalence rates (Asher et al. 2006).



Note: SAMSS = South Australian Monitoring and Surveillance System.

Sources: State computer-assisted telephone interview (CATI) surveys; Australian Bureau of Statistics National Health Surveys (NHSs).

Figure 3.1: Prevalence of current asthma, adults, 1990–2007



Notes: SAMSS = South Australian Monitoring and Surveillance System, AHR = airway hyperresponsiveness.

Sources: Comino et al. 1996; Downs et al. 2001; Peat et al. 1994; Toelle et al. 2004; Population Research and Outcome Studies Unit, South Australian Department of Human Services; WA Health and Wellbeing Surveillance System, Epidemiology Branch, Department of Health, Government of Western Australia.

Figure 3.2: Prevalence of current asthma, children aged 15 years and under, 1982–2007

3.4 International comparisons

The prevalence of asthma is relatively high in Australia by international standards. The reason for the high prevalence of asthma in Australia is not known. In phase III of the International Study of Asthma and Allergies in Childhood (ISAAC), the prevalence of wheeze in the last 12 months among those aged 6–7 years ranged from 2.4% to 37.6% and was highest among centres in New Zealand, the United Kingdom, Australia and Latin America (Pearce et al. 2007—supplementary web-tables). In Australia, the prevalence of recent wheeze had decreased by 0.8% per year between phase I (conducted in 1993) and phase III (2002).

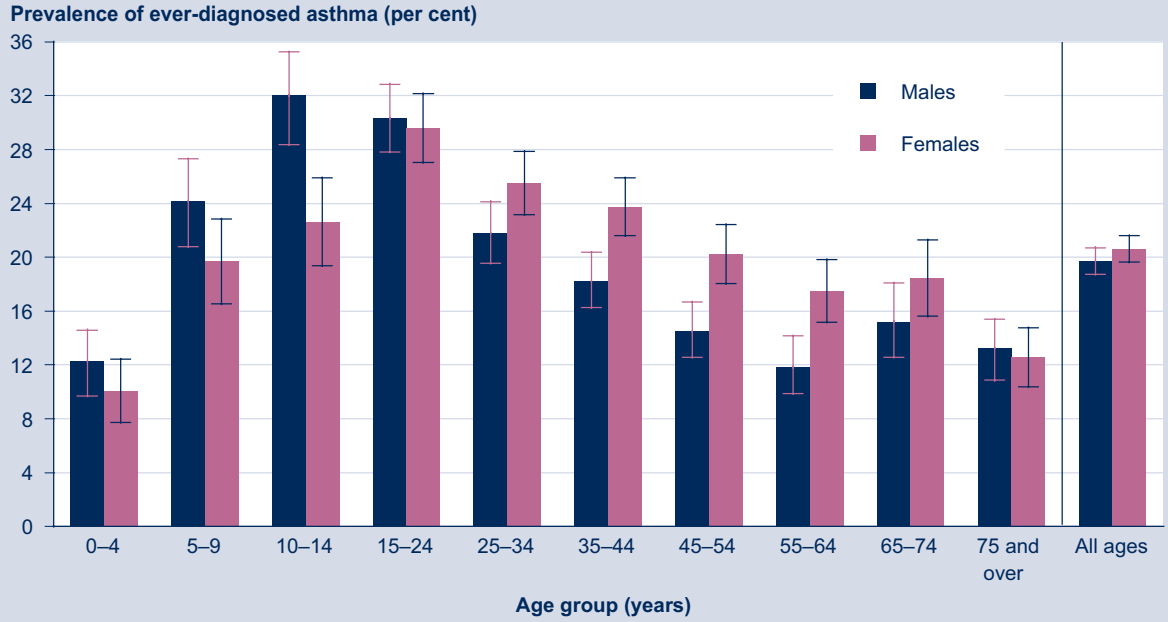
Singapore (–0.80% per year) and South Korea (–1.71% in Seoul) also reported decreases in the prevalence of recent wheeze between phase I and III, but increases were observed in the eastern Mediterranean region (0.79% per year), Spain, the United Kingdom (0.50%) and Canada (0.47%). Generally speaking, the ISAAC study has demonstrated a trend towards a decline in the prevalence of asthma symptoms in English-speaking countries.

3.5 Population subgroups

Age and sex

Ever having been diagnosed with asthma

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 3.3; see also Appendix 2, Table A2.5).



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

Source: Australian Centre for Asthma Monitoring (ACAM) analysis of Australian Bureau of Statistics (ABS) National Health Survey 2004–05 confidentialised unit record files.

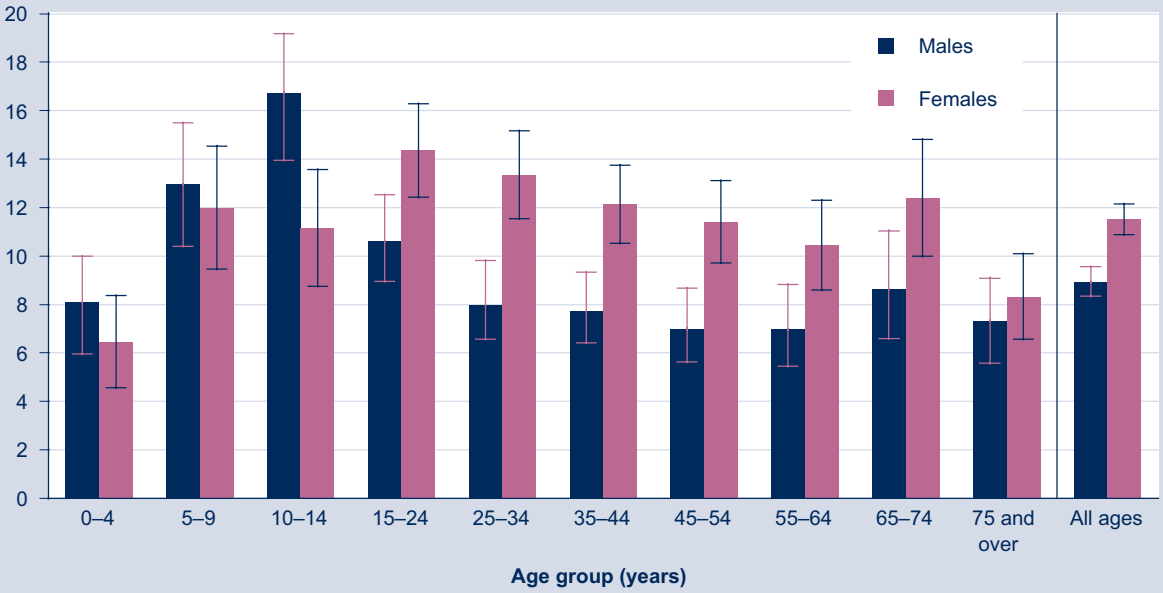
Figure 3.3: Prevalence of ever having been diagnosed with asthma, by age and sex, 2004–05

Current asthma

In 2004–05, the median age of people with asthma, excluding those aged less than 5 years, was 33 years.

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

Among those aged 0–14 years, the prevalence was higher for males than females, but among those aged 15 years and over, current asthma was more prevalent in females than males. Among males, the highest prevalence was in those aged 10–14 years (16.8%), while among females it was highest in those aged 15–24 years (14.4%) (Figure 3.4; see also Appendix 2, Table A2.6).



Note: Age-standardised to the Australian population as at June 2001. The overall prevalence of current asthma among females was significantly higher than among males ($p < 0.0001$).

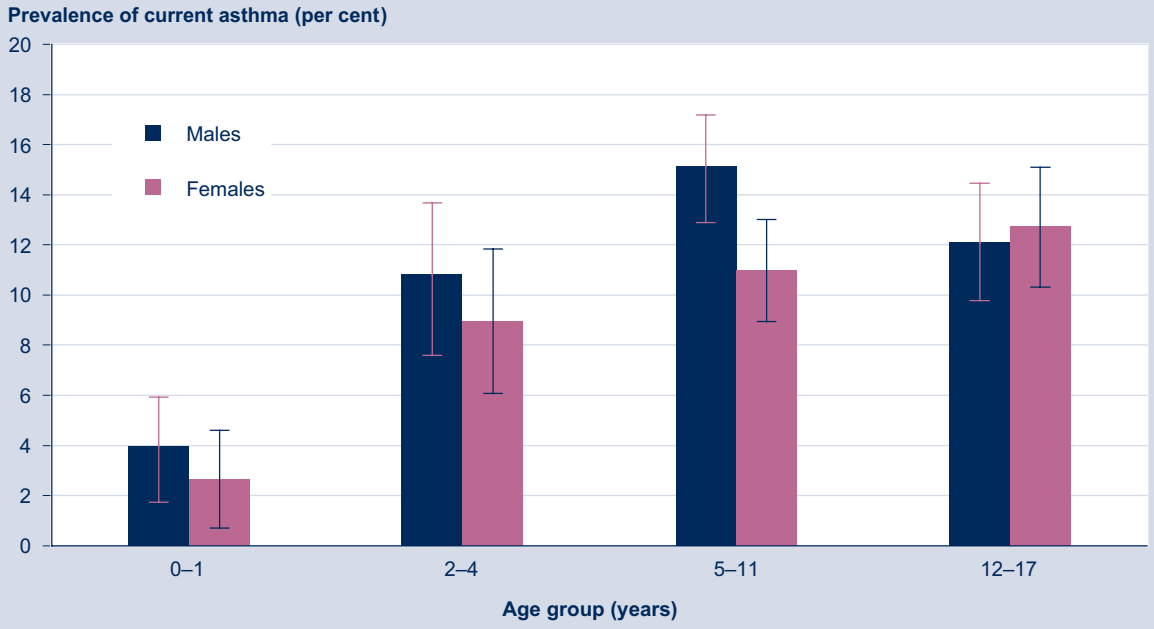
Source: Australian Centre for Asthma Monitoring (ACAM) analysis of Australian Bureau of Statistics (ABS) National Health Survey 2004–05 confidentialised unit record files.

Figure 3.4: Prevalence of current asthma, by age and sex, 2004–05

Current asthma in children

Among girls aged 0–17 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 (5–11 years) (Figure 3.5). 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 0–17 years fell significantly, from 14.0% to 11.3% ($p < 0.0003$).



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

Source: Australian Centre for Asthma Monitoring (ACAM) analysis of Australian Bureau of Statistics (ABS) National Health Survey 2004–05 confidentialised unit record files.

Figure 3.5: Prevalence of current asthma in children, by age and sex, 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 3.6). 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.

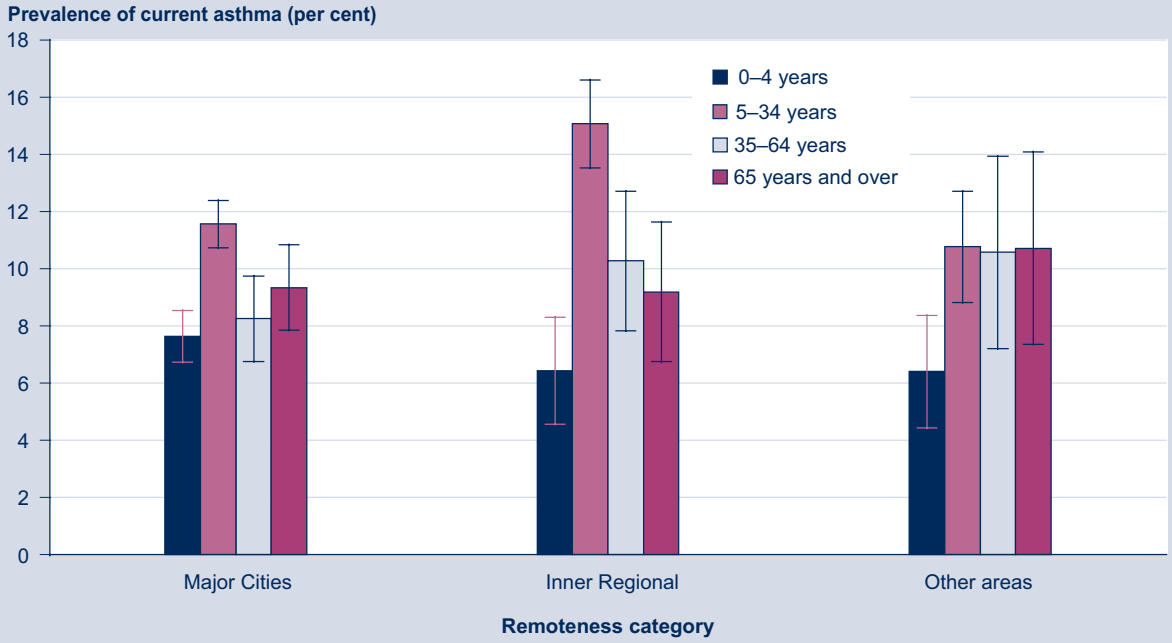
Note: Age-standardised to the Australian population as at June 2001. The Northern Territory is excluded as the numbers are too small to produce reliable estimates, but it does contribute to the national estimate.

Source: Australian Centre for Asthma Monitoring analysis of Australian Bureau of Statistics National Health Survey 2004–05 confidentialised unit record files.

Figure 3.6: Prevalence of current asthma, by state and territory, all ages, 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 living in inner regional Australia and the remaining 2.5 million in outer regional Australia and other areas. With the exception of people aged 5–34 years, the prevalence of current asthma was similar across all these geographical areas in 2004–05 (Figure 3.7). However, among people aged 5–34 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 5–34 years than in younger or older people.



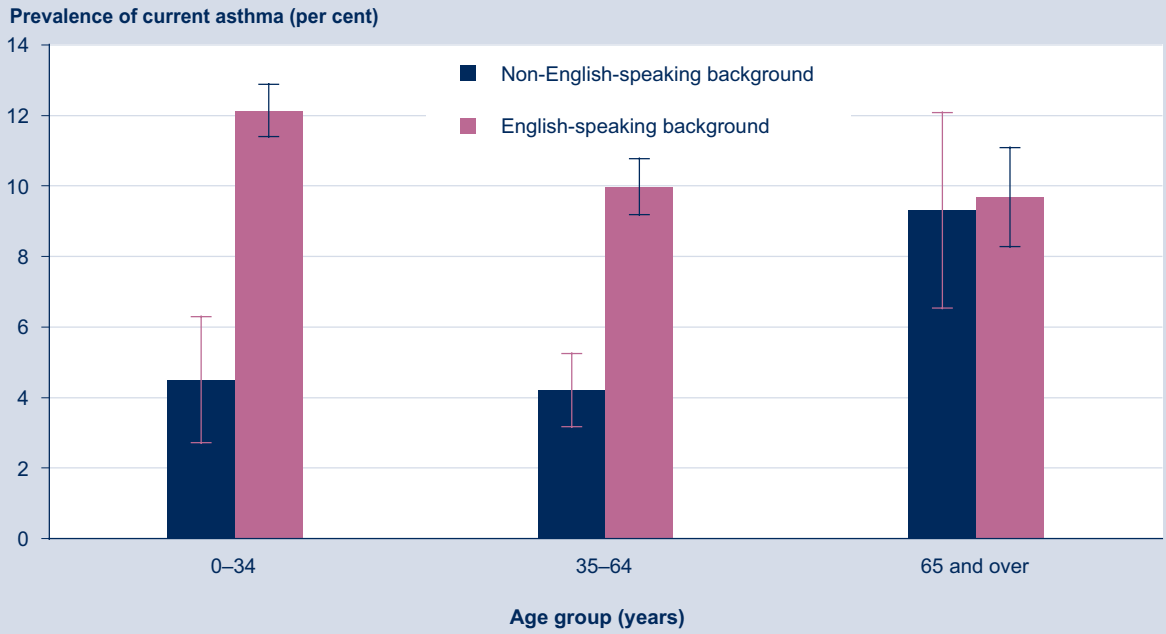
Note: Age-standardised to the Australian population as at June 2001. 'Other areas' includes Outer Regional, Remote and Very Remote categories of remoteness.
Source: Australian Centre for Asthma Monitoring (ACAM) analysis of Australian Bureau of Statistics (ABS) National Health Survey 2004–05 confidentialised unit record files.

Figure 3.7: Prevalence of current asthma, by age and remoteness, 2004–05

Country of birth

Data from the South Australian Omnibus survey aggregated from 1990 to 2003 show that the prevalence of asthma among people born in Australia was 1.39 times (95% CI 1.24–1.55) as high as the prevalence of asthma among those born overseas (Wilson et al. 2006). Data from the ABS 2004–05 NHS support this. In 2004–05, people from non-English-speaking backgrounds had a lower prevalence of current asthma than other Australians, especially among those aged 0–64 years (Figure 3.8). 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 35–64 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).



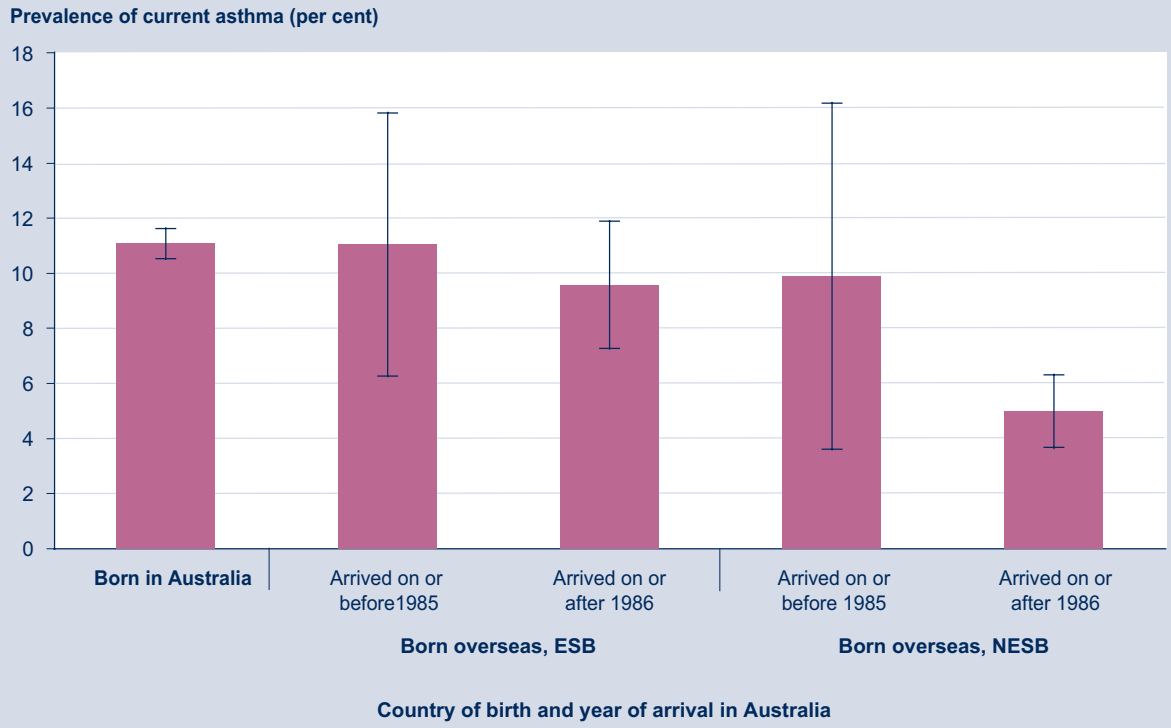
Notes: Age-standardised to the Australian population as at June 2001. English-speaking background includes anyone born in Australia, New Zealand, Canada, United Kingdom, Ireland, United States of America or South Africa. Non-English-speaking background includes all those born in other countries. See Appendix 1, Section A1.12.2 for further information on country of birth classifications.

Source: Australian Centre for Asthma Monitoring (ACAM) analysis of Australian Bureau of Statistics (ABS) National Health Survey 2004–05 confidentialised unit record files.

Figure 3.8: Prevalence of current asthma, by age and country of birth, 2004–05

The disparity in the prevalence of asthma between those born in English-speaking countries and those born in non-English-speaking countries diminished with age (Figure 3.8). A large study in the United Kingdom reported a lower incidence of new-onset asthma among those born outside the United Kingdom (odds ratio 0.75; 95% CI 0.67–0.83) (Gopalakrishnan et al. 2005). Surveys conducted in migrant populations have shown that the risk of developing asthma increases with duration of residence in Australia (Leung 1996; Leung et al. 1994).

There was no difference in the prevalence of asthma between those born in Australia and those born in other English-speaking nations who subsequently migrated to Australia, regardless of the duration of residence in Australia (Figure 3.9). In contrast, among those born overseas in non-English-speaking countries, the prevalence of asthma was higher if they had migrated to Australia before 1985 than if they arrived in 1986 or later (p = 0.012).



Note: English-speaking background (ESB) includes anyone born in Australia, New Zealand, Canada, United Kingdom, Ireland, United States of America or South Africa. Non-English-speaking background (NESB) includes all those born in other countries. See Appendix 1, Section A1.12.2 for further information on country of birth classifications.

Source: Australian Centre for Asthma Monitoring (ACAM) analysis of Australian Bureau of Statistics (ABS) National Health Survey 2004–05 confidentialised unit record files.

Figure 3.9: Prevalence of current asthma by country of birth and year of arrival in Australia, 2004–05

Socioeconomic disadvantage

In 2004–05, the prevalence of current asthma was significantly higher among people living in more socioeconomically disadvantaged localities compared with those in more advantaged localities (p trend < 0.0001, Figure 3.10). The trend did not differ between men and women (data not shown). This observation reinforces findings from a longer-term survey conducted in South Australia between 1990 and 2003, which found that the prevalence of asthma was significantly inversely associated with income (Wilson et al. 2006).

Notes: Age-standardised to the Australian population as at June 2001; SEIFA = Socio-economic Indexes for Areas.

Source: Australian Centre for Asthma Monitoring (ACAM) analysis of Australian Bureau of Statistics (ABS) National Health Survey 2004–05 confidentialised unit record files.

Figure 3.10: Prevalence of current asthma by socioeconomic status, 2004–05

The most recent Australian data show an increase in the disparity and a significant difference in asthma prevalence between those living in the most disadvantaged areas and those living in the least disadvantaged areas. 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 was 0.9 percentage points.

3.6 Patterns of asthma in adults

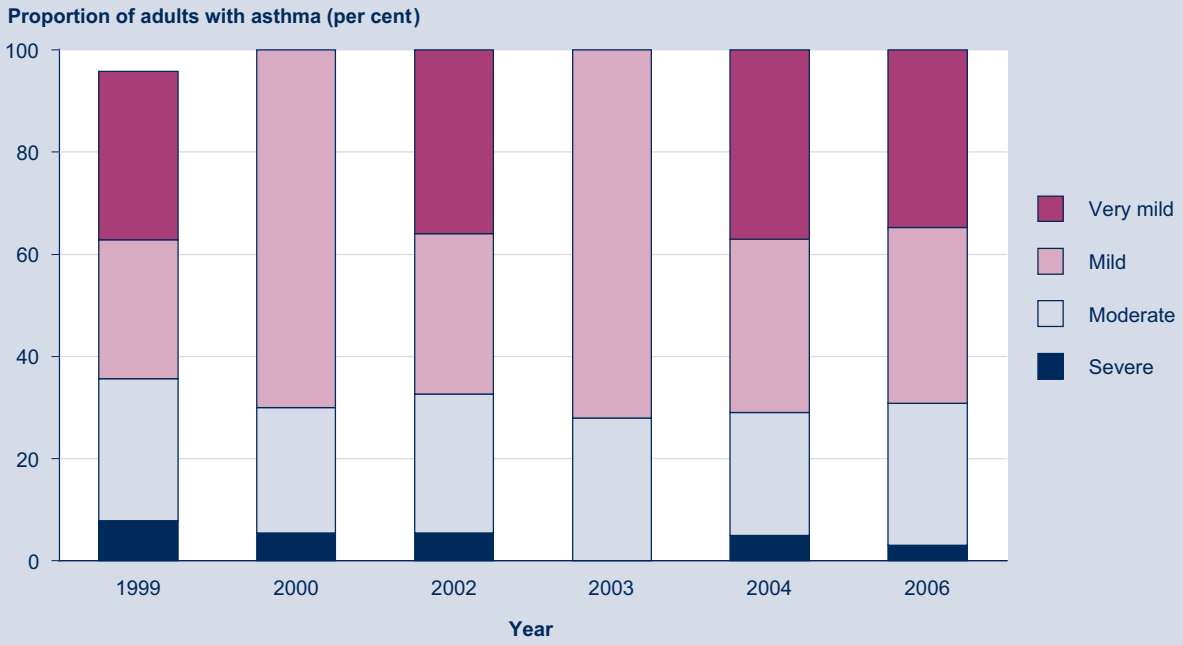
Among adults, asthma can be classified according to its pattern and severity as intermittent, mild persistent, moderate persistent or severe persistent, using the criteria listed in Table 3.5. The individual is assigned to the asthma pattern in which the most severe feature is present, even if no other features associated with that pattern are present.

Table 3.5: National Asthma Council Australia Asthma Management Handbook assessment of asthma severity in newly diagnosed adults

Feature	Intermittent	Mild persistent	Moderate persistent	Severe persistent
Daytime asthma symptoms	Less than weekly	More than weekly and less than daily	Daily	Daily—physical activity is restricted
Night-time asthma symptoms	Less than 2 per month	More than twice a month but not weekly	Weekly or more often	Frequent
Exacerbations	Infrequent	Occasional	Occasional	Frequent
	Brief	May affect activity or sleep	May affect activity or sleep	
Spirometry				
FEV_1	At least 80% predicted	At least 80% predicted	60–80% predicted	60% predicted or less
FEV_1 variability	Less than 20%	20–30%	More than 30%	More than 30%

Note: FEV_1 = forced expiratory volume in 1 second.
Source: NAC 2006.

Among 503 adults attending general practitioners (GPs) for the management of asthma in 2006, about one-third had 'very mild' (intermittent) asthma (34.8%) and 'mild' asthma (34.4%), while 27.8% had 'moderate' asthma and only 3.0% were classified as having 'severe' asthma (AIHW: Britt & Miller 2007, Supplementary Analysis of Nominated Data (SAND) abstract 96). From 1999 to 2006, the proportion of adults with asthma who were assessed by their GPs as having severe asthma decreased from 7.9% to 3.0%. The majority (70%) of adults with asthma were classified by their GPs as having mild or very mild asthma (Figure 3.11).



Notes: In data point for 2003, moderate section also includes those whose asthma was classified as severe. In data point for 2000 the mild category also includes adults whose asthma was classified as being very mild. In data point for 1999, asthma severity classifications were not available for 4.2% of adults and, therefore, the column does not add up to 100%.

Source: AIHW: Britt & Miller 2007.

Figure 3.11: Distribution of severity of asthma among adults attending general practitioners, 1999 to 2006

People with troublesome asthma in adult life have often had symptoms of asthma in childhood. The Tasmanian Longitudinal Health Study (TAHS), which includes 8,583 subjects who have been followed since 1968, found that 91% of adults classified as having persistent asthma (asthma symptoms reported during at least three follow-up visits over a 37-year period) or frequent asthma (asthma symptoms during two follow-up visits) at age 44 years had developed their asthma as young children (Dharmage et al. 2008).

Several studies have now suggested that females are more likely to be classified as having severe asthma than males. A European study found 2.8 times more females in the severe asthma group than males (ENFUMOSA Study Group 2003).

3.7 Patterns of asthma in children

Among children, asthma is classified as infrequent intermittent, frequent intermittent, mild persistent, moderate persistent or severe persistent using the criteria listed in Table 3.6. As for adults, the child is assigned to the asthma pattern in which the most severe feature is present, even if no other features associated with that pattern are present. Before 2006, a three-level classification was used: persistent, frequent episodic and infrequent episodic (NAC 2002).

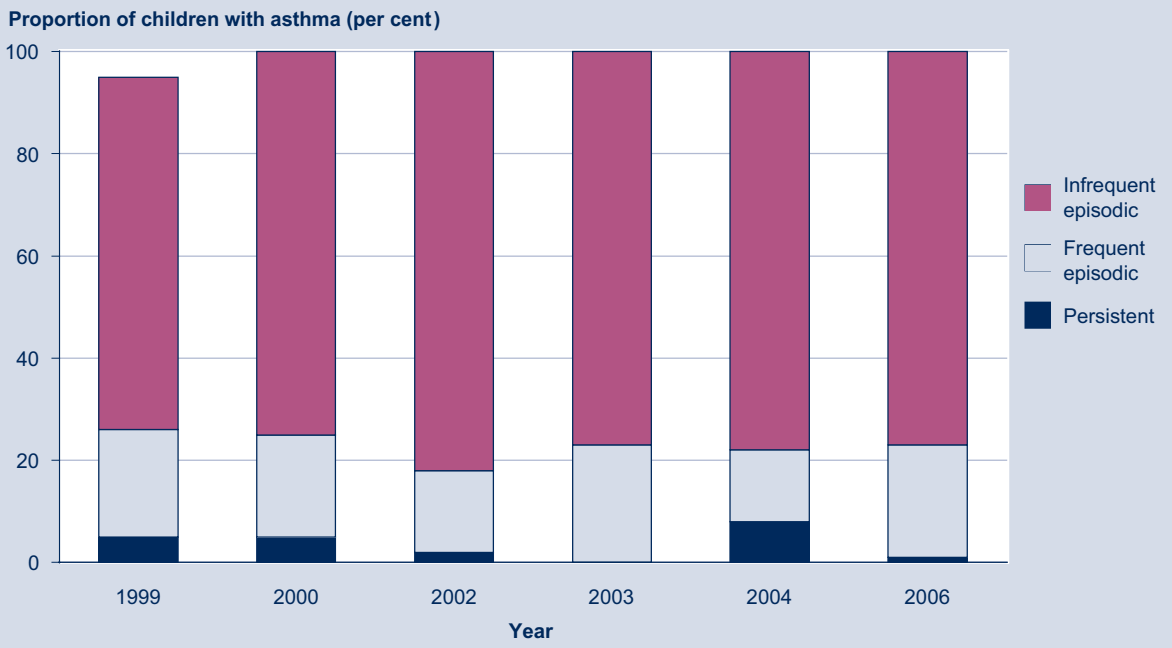
Table 3.6: National Asthma Council Australia Asthma Management Handbook assessment of asthma severity in newly diagnosed children aged over 5 years

Feature	Infrequent intermittent	Frequent intermittent	Mild persistent	Moderate persistent	Severe persistent
Daytime asthma symptoms between exacerbations	Nil	Nil	More than once a week but not every day	Daily	Continuous
Night-time asthma symptoms between exacerbations	Nil	Nil	More than twice a month but not every week	More than once a week	Frequent
Exacerbations	Brief Mild Occur less than every 4–6 weeks	More than twice a month	May affect activity and sleep	At least twice a week Restrict activity or affects sleep	Frequent Restrict activity
PEF or FEV_1	More than 80% predicted	At least 80% predicted	At least 80% predicted	60–80% predicted	60% predicted or less
PEF variability	Less than 20%	Less than 20%	20–30%	More than 30%	More than 30%

Note: PEF = peak expiratory flow; FEV_1 = forced expiratory volume in 1 second.
Source: NAC 2006.

More severe or poorly controlled asthma has important consequences for the child and the health-care system. Children with inadequately controlled or severe asthma are more likely to use emergency medical care or require hospital admission compared with those with mild-to-moderate forms of the condition.

Among children with asthma, the proportion classified as having 'persistent' asthma fluctuated around 4% (period average) between 1999 and 2006. There was a peak in the proportion of children with persistent asthma in 2004 (7.6%) and then a substantial drop to only 1.2% in 2006 (Figure 3.12). The majority of children with asthma (76%) had infrequent episodic asthma during the observed period, whilst 18.6% were classified by their GPs as having 'frequent episodic' asthma.



Note: Blue section of 2003 column represents the proportion of children classified as having 'persistent' or 'frequent episodic' asthma. In data point for 1999, asthma severity classifications were not available for 5.6% of children and, therefore, the column does not add up to 100%.

Source: Supplementary Analysis of Nominated Data (SAND) abstracts (AIHW: Britt & Miller 2007).

Figure 3.12: Distribution of severity of asthma among children attending general practitioners, 1999 to 2006

3.8 Sleep disturbance due to asthma

People with severe or poorly controlled asthma may be woken from sleep with asthma symptoms. Sleep disturbance due to asthma is an important adverse outcome of the illness and is regarded as a marker of disease control. Population surveys confirm that this is a common problem in both adults and children with asthma (Table 3.7). In Victoria in 2006, 17.2% of children aged 1–12 years had been woken by asthma or wheezing in the last 4 weeks (Victorian Child Health and Wellbeing Survey).

The Australian centre of the ISAAC study reported a slight reduction in the prevalence of symptoms of severe asthma among 6–7-year-old children between 1993 and 2002. Decreases in night cough (–0.43% per year) and a reduction in the proportion of children who reported more than four attacks of wheezing in the previous 12 months (–0.32%) were observed (Pearce et al. 2007—supplementary web-tables). We cannot determine whether this apparent reduction in symptoms of severe asthma between 1993 and 2002 can be attributed to better management of the condition (both at home and in the primary care setting) or a decrease in the prevalence of severe asthma during this time.

In Australia, an estimated 20.4% of children and 22.5% of adults had been woken due to their asthma during the past 4 weeks in the summer of 2003–04 (Marks et al. 2007). Overseas studies have demonstrated much higher rates of sleep disturbance, varying from 36–59% in North America, Europe and Asia (Rabe et al. 2004).

Table 3.7: Proportion of people with current asthma whose sleep was disturbed by asthma, 1996–2006

Population/study	Response	Rate (%)	95% CI
ADULTS			
Times woken up because of asthma in the past 4 weeks			
Australian Asthma Survey	Every night	3.2	2.1–4.3
December 2003 to January 2004	More than once per week	8.8	7.1–10.6
Age 16 years and over	Less than once per week	10.5	8.2–11.9
	Not at all	77.5	75.4–80.6
		(*n* = 1,006)	
Woken at night due to asthma			
SA Omnibus	Weekly or more often	2003 16.2	n.a.
Age 15 years and over		2002 17.6	n.a.
		2001 15.9	n.a.
		2000 11.8	n.a.
		1999 14.5	n.a.
		1998 13.3	n.a.
		1997 21.6	n.a.
		1996 15.4	n.a.
CHILDREN			
Been woken by asthma or wheezing in last 4 weeks			
Victorian Child Health and Wellbeing Survey (2006)	Yes	17.2	13.7–20.7
Age 1 to under 13 years	No	82.7	79.2–86.2
		(*n* = 652)	
Times woken up because of asthma in the past 4 weeks			
Australian Asthma Survey	Every night	0.9	0.0–2.2
December 2003 to January 2004	More than once per week	7.6	3.9–11.3
Age less than 16 years	Less than once per week	11.9	7.5–16.5
	Not at all	79.6	74.4–85.6
		(*n* = 199)	

n.a. Not available

Note: 95% confidence intervals (95% CIs) for results from the Australian Asthma Survey were estimated using the sample size and the proportions and the normal approximation.
Sources: Australian Asthma Survey—Marks et al. 2007; Victorian Child Health and Wellbeing Survey—unpublished data; SA Omnibus— Wilson et al. 2006.

3.9 Comorbid conditions among people with asthma

People with asthma are more likely to report diabetes, arthritis, heart disease, stroke, cancer and osteoporosis (Adams et al. 2006). Furthermore, having both asthma and another chronic condition is associated with worse quality of life, especially among those aged 35 years and over (Adams et al. 2006).

This section compares the prevalence of comorbidity with other long-term conditions among people with and without asthma using data from the ABS 2004–05 NHS.

The most common respiratory comorbid condition among people with asthma was sinusitis or rhinitis (40%). The prevalence of sinusitis or rhinitis among people without asthma was less than half this (19%) (Table 3.8). The association with asthma was strongest in those aged 0–34 years, where the prevalence of sinusitis or rhinitis was 2.5 times as high among those with asthma as those without asthma.

People with asthma were 4.5 times more likely to also report emphysema or chronic bronchitis (prevalence 10%) than people without asthma (prevalence 2.2%). Among those aged 35–64 years, the difference was even greater. In this age group, the prevalence of emphysema or chronic bronchitis was 5.4 times as high among those with asthma as those without asthma.

In terms of non-respiratory comorbidities, overall, the prevalence of mental and behavioural disorders was 1.7 times as high among people with asthma as those without asthma. The association was strongest in those aged 0–34 years, where the prevalence of mental and behavioural disorders among people with current asthma was 1.9 times as high as the prevalence among those without current asthma.

Table 3.8: The prevalence and rate ratios associated with selected long-term comorbidities among people with and without asthma by age group, 2004–05

Age group	Comorbidity	Current asthma % (95% CI)	No asthma % (95% CI)	Rate ratio (95%CI)
0–34 years	Sinusitis and rhinitis	39.6 (36.6–42.6)	15.5 (14.7–16.4)	2.5 (2.3–2.9)
	Emphysema and chronic bronchitis	4.3 (3.1–5.6)	1.2 (0.9–1.4)	3.7 (2.2–6.2)
	Diabetes mellitus	n.p.	0.4 (0.2–0.5)	n.p.
	Heart, stroke and vascular disease	n.p.	0.2 (0.1–0.3)	n.p.
	Arthritis and osteoporosis	3.3 (2.2–4.4)	1.6 (1.3–1.9)	2.1 (1.3–3.3)
	Mental and behavioural disorders	12.4 (10.3–14.4)	6.5 (6.0–7.1)	1.9 (1.5–2.4)
	Cancer	n.p.	*0.2 (0.1–0.3)	n.p.
35–64 years	Sinusitis and rhinitis	44.1 (40.0–48.1)	23.7 (22.6–24.7)	1.9 (1.6–2.1)
	Emphysema and chronic bronchitis	12.5 (10.0–15.0)	2.3 (1.9–2.7)	5.4 (3.6–8.3)
	Diabetes mellitus	6.5 (4.8–8.3)	3.9 (3.4–4.4)	1.7 (1.2–2.4)
	Heart, stroke and vascular disease	6.3 (4.6–8.1)	3.2 (2.8–3.7)	2.0 (1.3–2.9)
	Arthritis and osteoporosis	34.8 (31.3–38.3)	22.3 (21.3–23.2)	1.6 (1.4–1.8)
	Mental and behavioural disorders	17.3 (14.5–20.2)	10.5 (9.7–11.2)	1.7 (1.3–2.1)
	Cancer	4.7 (3.2–6.2)	1.8 (1.5–2.2)	2.6 (1.5–4.3)
65 years and over	Sinusitis and rhinitis	28.7 (22.6–34.7)	18.0 (16.3–19.7)	1.6 (1.2–2.1)
	Emphysema and chronic bronchitis	24.9 (19.1–30.7)	6.1 (5.0–7.2)	4.1 (2.6–6.4)
	Diabetes mellitus	16.3 (11.6–21.0)	13.4 (11.8–14.9)	1.2 (0.9–1.7)
	Heart, stroke and vascular disease	21.5 (16.2–26.9)	18.5 (16.8–20.3)	1.2 (0.9–1.5)
	Arthritis and osteoporosis	85.5 (81.1–89.9)	61.7 (59.5–63.8)	1.4 (1.3–1.5)
	Mental and behavioural disorders	7.5 (4.4–10.5)	7.0 (5.9–8.1)	1.1 (0.7–1.7)
	Cancer	*5.9 (3.0–8.7)	6.2 (5.1–7.2)	0.9 (0.6–1.6)
All ages	Sinusitis and rhinitis	40.0 (37.7–42.2)	19.0 (18.4–19.6)	2.1 (1.9–2.3)
	Emphysema and chronic bronchitis	10.0 (8.7–11.4)	2.2 (2.0–2.5)	4.5 (3.5–5.9)
	Diabetes mellitus	4.7 (3.8–5.6)	3.4 (3.1–3.6)	1.4 (1.1–1.8)
	Heart, stroke and vascular disease	5.3 (4.3–6.2)	3.7 (3.4–4.0)	1.4 (1.1–1.8)
	Arthritis and osteoporosis	25.7 (24.2–27.3)	17.1 (16.6–17.6)	1.5 (1.4–1.6)
	Mental and behavioural disorders	13.7 (12.1–15.2)	8.1 (7.7–8.5)	1.7 (1.5–2.0)
	Cancer	2.7 (2.0–3.4)	1.6 (1.4–1.8)	1.7 (1.2–2.4)

* Estimate has a relative standard error greater than 25% and should be interpreted with caution.
n.p. Not published (estimate has a relative standard error greater than 45% and is not statistically reliable).

Notes

1. Age-standardised rates shown. Age-standardised to the Australian population as at 30 June 2001.
2. Arthritis includes all types.
3. Cancer describes 'malignant neoplasm'. People in hospital are excluded from the sample.
4. Mental and behavioural disorders include mood (affective) problems, anxiety-related problems, and behavioural and emotional problems with usual onset in childhood or adolescence.
5. Heart, stroke or vascular disease includes ischaemic heart diseases, cerebrovascular diseases, oedema and heart failure, and diseases of the arteries, arterioles and capillaries.
6. CI = confidence interval.

Source: Australian Centre for Asthma Monitoring (ACAM) analysis of Australian Bureau of Statistics (ABS) National Health Survey 2004–05 confidentialised unit record files.

Among those aged 35–64 years, 6.5% of people with asthma and 3.9% of people without asthma had diabetes in 2004–05. In this age group, the prevalence of cancer (malignant neoplasm) among people with asthma was 2.6 times as high as the prevalence among people without asthma.

Among those aged 0–34 years, people with current asthma were twice as likely to have arthritis or osteoporosis as those without asthma. The strength of this association decreased with increasing age. This relationship has been observed in previous studies. It has been shown that 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 steroids to manage asthma.

Asthma commonly coexists with other chronic conditions. The presence of one or more comorbid conditions in people with current asthma is likely to compromise their quality of life. Furthermore, the presence of comorbid conditions may complicate the process of managing asthma.

Summary

Among children aged 0–14 years, asthma was more common in boys than girls, but among people aged 15 years and over, asthma was more common among females than males. The highest reported prevalence was among 10–14-year-old boys. 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. None of the states or territories had prevalence rates for asthma that differed from the national average.

In recent years, the prevalence of asthma in Australia has decreased in people aged less than 35 years but has remained unchanged among people aged 35 years and over. There is also evidence of an increase in the gap in asthma prevalence between the highest and lowest socioeconomic quintiles.

The majority of children with asthma in Australia are classified as having infrequent episodic asthma, while less than 5% of children have persistent asthma. Among adults, the proportion classified as having severe asthma decreased between 1999 and 2006, and the majority of adults with asthma have mild or very mild forms of the condition. Findings from the ABS 2004–05 NHS indicated that there was a higher prevalence of arthritis or osteoporosis, particularly among children and young adults, and of mental and behavioural disorders among people with current asthma compared with people without asthma. The proportion of people with emphysema or chronic bronchitis was also 4.5 times as high and the proportion of people with sinusitis or rhinitis was 2.1 times as high among people with asthma compared with people without 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.