7. Asthma

7. Asthma

Introduction

Asthma is a common, chronic disorder affecting the airways of the lungs. Narrowing of these air passages (caused by the inflammation and swelling of the airway lining, and the overproduction of mucus) results in airway obstruction and difficulty with breathing, which may be reversed either spontaneously or with medical treatment. There is evidence that environmental and lifestyle factors (viral infections, exercise, exposure to irritants and air pollutants), as well as genetic factors such as an allergic tendency, increase the risk of developing asthma (Australian Centre for Asthma Monitoring (ACAM) 2011). The disease affects all age groups, but particularly young people, and ranges in severity from intermittent, mild symptoms to a severe, incapacitating and life-threatening disorder.

The Victorian Population Health Survey examined the prevalence of doctor-diagnosed self-reported asthma, both lifetime and current asthma. Respondents were asked whether they had ever been diagnosed with asthma by a doctor and those who responded 'yes' to this question were included in the estimate of the lifetime prevalence of asthma (sometimes referred to as 'asthma ever').

Respondents who indicated that they had been diagnosed with asthma were subsequently asked if they had experienced symptoms of asthma (wheezing, coughing, shortness of breath, chest tightness) in the previous 12 months. Those that indicated that they had were classified as having 'current' asthma. In addition, respondents who indicated that they were taking concurrent medication for the management of asthma but had not experienced symptoms in the previous 12 months were also included in the estimate of the prevalence of 'current' asthma. This aligns with the definitions recommended by ACAM for the purposes of estimating the prevalence of asthma (ACAM 2007).

Survey results

Lifetime prevalence of asthma

- Overall, 22.2 per cent of adults reported having ever been diagnosed with asthma by a doctor. The lifetime prevalence of asthma declined with age.
- Although there was no difference overall between the sexes, women aged 45 years or over had a higher lifetime prevalence of asthma compared with their male counterparts. The lifetime prevalence of asthma was similar between adults who lived in rural and metropolitan Victoria.
- The lifetime prevalence of asthma in Victorian adults did not change between 2003 and 2011–12.

Prevalence of current asthma

- Overall, 10.9 per cent of people had experienced symptoms of asthma or taken treatment for asthma in the 12 months preceding the survey. Overall, the prevalence of current asthma was significantly higher in women compared with men. The prevalence of current asthma in Victorian adults did not change between 2003 and 2011–12.
- There was no difference in the prevalence of current asthma between those who lived in rural compared with metropolitan Victoria. There were two LGAs in which a lower prevalence of current asthma was reported compared with all Victorian adults – Northern Grampians (S) and Whitehorse (C).

Lifetime prevalence of asthma

Table 7.1 and Figure 7.1 show the lifetime prevalence of asthma in Victoria, by age group and sex. Overall, 21.4 per cent of men, 22.8 per cent of women and 22.2 per cent of adults reported having ever been diagnosed by a doctor with asthma. While overall there was no difference between the sexes, women aged 45 years or over had a significantly higher lifetime prevalence of asthma compared with their male counterparts.

The lifetime prevalence of asthma declined with age. Adults and men aged 45 years or over and women aged 65 years or over had a significantly lower lifetime prevalence of asthma compared with all Victorian adults, men and women, respectively. By contrast men aged 18–34 years and women aged 25–34 years had a significantly higher lifetime prevalence of asthma compared with all men and women, respectively.

Table 7.1: Lifetime prevalence of asthma, by age group and sex, Victoria, 2011–12

Age group (years)	Males %	Males 95% CI LL	Males 95% CI UL	Females %	Females 95% CI LL	Females 95% CI UL	Persons %	Persons 95% CI LL	Persons 95% CI UL
18–24	33.2	28.0	38.9	27.2	22.8	32.1	30.3	26.8	34.1
25–34	27.8	23.5	32.5	29.5	26.2	33.0	28.6	25.9	31.5
35–44	21.6	19.1	24.3	20.2	18.4	22.2	20.9	19.4	22.6
45–54	15.6	13.7	17.7	21.3	19.6	23.2	18.5	17.2	19.9
55–64	16.1	14.2	18.2	21.6	19.9	23.5	18.9	17.7	20.3
65+	15.1	13.6	16.6	19.0	17.7	20.4	17.2	16.3	18.2
Total	21.4	20.0	22.7	22.8	21.8	23.9	22.2	21.3	23.1

Data are age-specific estimates, except for 'Total', which represent the estimates for Victoria and were age-standardised to the 2011 Victorian population.
LL/UL 95% CI = lower/upper limit of 95 per cent confidence interval.
Estimates that are (statistically) significantly different to the corresponding estimate for Victoria are identified by colour as follows: **above**/**below** Victoria..

Figure 7.1: Lifetime prevalence of asthma, by age group and sex, Victoria, 2011–12
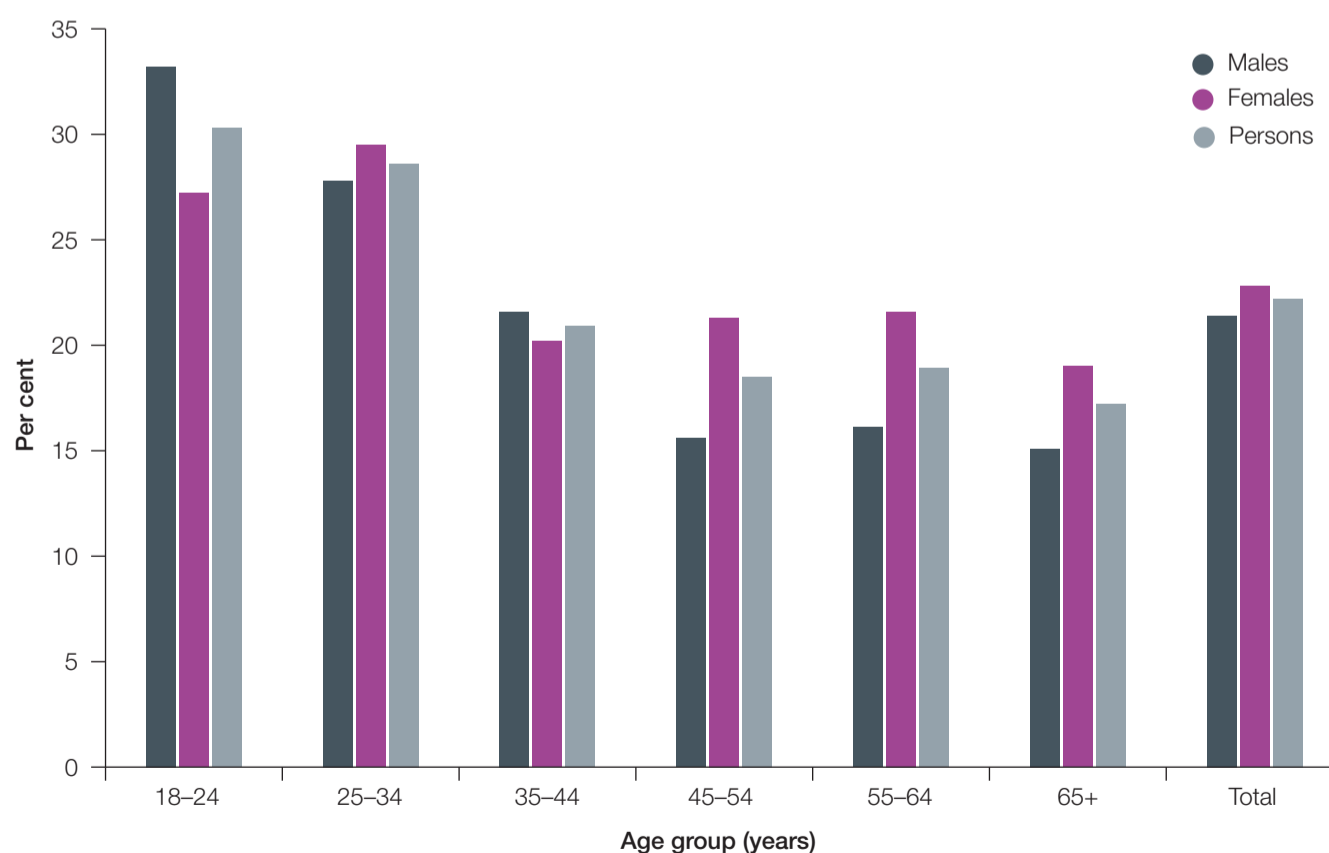
Data are age-specific estimates, except for 'Total', which represent the estimates for Victoria and were age-standardised to the 2011 Victorian population.

Table 7.2 shows the age-adjusted lifetime prevalence of asthma for the period 2003 to 2011–12. The lifetime prevalence of asthma did not significantly change between 2003 and 2011–12 in men, women or all Victorian adults.

Table 7.2: Lifetime prevalence of asthma from 2003 to 2011–12, Victoria

| | Males | | | Females | | | Persons | | |
| | | 95% CI | | | 95% CI | | | 95% CI | |
Year	%	LL	UL	%	LL	UL	%	LL	UL
2003	18.3	16.5	20.3	22.0	20.5	23.7	20.2	19.0	21.5
2004	18.1	16.4	20.0	21.9	20.3	23.5	20.1	18.9	21.3
2005	19.7	17.8	21.8	22.3	20.7	24.1	21.1	19.8	22.4
2006	19.6	17.6	21.7	22.4	20.8	24.2	21.1	19.8	22.4
2007	18.5	16.5	20.6	22.7	21.0	24.5	20.7	19.4	22.1
2008	19.5	18.4	20.7	22.7	21.8	23.6	21.2	20.5	21.9
2009	19.4	17.6	21.4	21.5	20.0	23.2	20.5	19.3	21.7
2010	18.2	16.2	20.3	23.3	21.5	25.2	20.8	19.4	22.2
2011–12	**21.4**	**20.0**	**22.7**	**22.8**	**21.8**	**23.9**	**22.2**	**21.3**	**23.1**

Data were age-standardised to the 2011 Victorian population.
LL/UL 95% CI = lower/upper limit of 95% confidence interval.
Ordinary least squares linear regression was used to test for trends over time.

Table 7.3 shows the lifetime prevalence of asthma by Department of Health region and sex. There were no significant differences in the lifetime prevalence of asthma between those who lived in rural compared with metropolitan Victoria. Moreover, there were no significant regional differences among men, women or adults.

Table 7.3: Lifetime prevalence of asthma, by Department of Health region and sex, Victoria, 2011–12

| | Males | | | Females | | | Persons | | |
| | | 95% CI | | | 95% CI | | | 95% CI | |
Region	%	LL	UL	%	LL	UL	%	LL	UL
Eastern Metropolitan	22.5	19.3	25.9	24.0	20.9	27.4	23.1	20.9	25.5
North & West Metropolitan	21.7	19.6	24.1	20.9	19.2	22.7	21.3	19.9	22.8
Southern Metropolitan	19.4	16.8	22.2	22.8	20.5	25.3	21.2	19.4	23.0
Metropolitan	21.2	19.7	22.8	22.0	20.8	23.4	21.7	20.7	22.7
Barwon-South Western	19.4	14.1	26.0	22.1	18.5	26.2	21.7	17.9	26.2
Gippsland	19.9	16.3	24.0	24.7	21.3	28.5	22.4	19.8	25.2
Grampians	21.6	17.8	26.0	27.4	23.8	31.3	24.5	21.7	27.5
Hume	22.3	18.7	26.3	26.5	23.7	29.4	24.7	22.2	27.3
Loddon Mallee	22.6	18.8	26.9	26.9	22.7	31.5	25.3	22.0	29.0
Rural	21.8	19.2	24.7	25.3	23.5	27.2	23.8	22.1	25.6
Total	**21.4**	**20.0**	**22.7**	**22.8**	**21.8**	**23.9**	**22.2**	**21.3**	**23.1**

Data were age-standardised to the 2011 Victorian population.
Metropolitan and rural regions are identified by colour as follows: metropolitan/rural.
LL/UL 95% CI = lower/upper limit of 95% confidence interval.

Prevalence of current asthma

Table 7.4 and Figure 7.2 show the prevalence of current asthma, by age group and sex. Overall 10.9 per cent of people had experienced symptoms of asthma or taken treatment for asthma in the preceding 12 months. Overall, the prevalence of current asthma was significantly higher in women (12.3 per cent) compared with men (9.4 per cent). Specifically, the prevalence of current asthma was higher in women aged 25–34 and 45 years or over compared with men of the same age groups. The only age groups where there was no difference between the sexes were those aged 18–24 and 35–44 years.

Table 7.4: Prevalence of current asthma,[a] by age group and sex, Victoria, 2011–12

| Age group (years) | Males | | | Females | | | Persons | | |
| | | 95% CI | | | 95% CI | | | 95% CI | |
	%	LL	UL	%	LL	UL	%	LL	UL
18–24	12.7	9.1	17.5	12.9	9.9	16.6	12.8	10.3	15.8
25–34	9.6	7.3	12.5	15.5	13.0	18.3	12.5	10.7	14.5
35–44	10.1	8.3	12.2	11.0	9.6	12.6	10.6	9.4	11.8
45–54	7.8	6.4	9.4	11.8	10.4	13.3	9.8	8.8	10.9
55–64	8.3	6.9	9.9	12.8	11.5	14.3	10.6	9.6	11.7
65+	8.5	7.4	9.7	11.0	10.0	12.1	9.9	9.1	10.7
Total	9.4	8.5	10.3	12.3	11.5	13.2	10.9	10.3	11.5

a. Reported ever having been diagnosed with asthma by a doctor and have experienced symptoms (wheeze, coughing, shortness of breath or chest tightness) of asthma or taken treatment for asthma in the last 12 months.

Data are age-specific estimates, except for 'Totals', which represent the estimates for Victoria and were age-standardised to the 2011 Victorian population.

LL/UL 95% CI = lower/upper limit of 95% confidence interval.

Figure 7.2: Prevalence of current asthma,[a] by age group and sex, Victoria, 2011–12
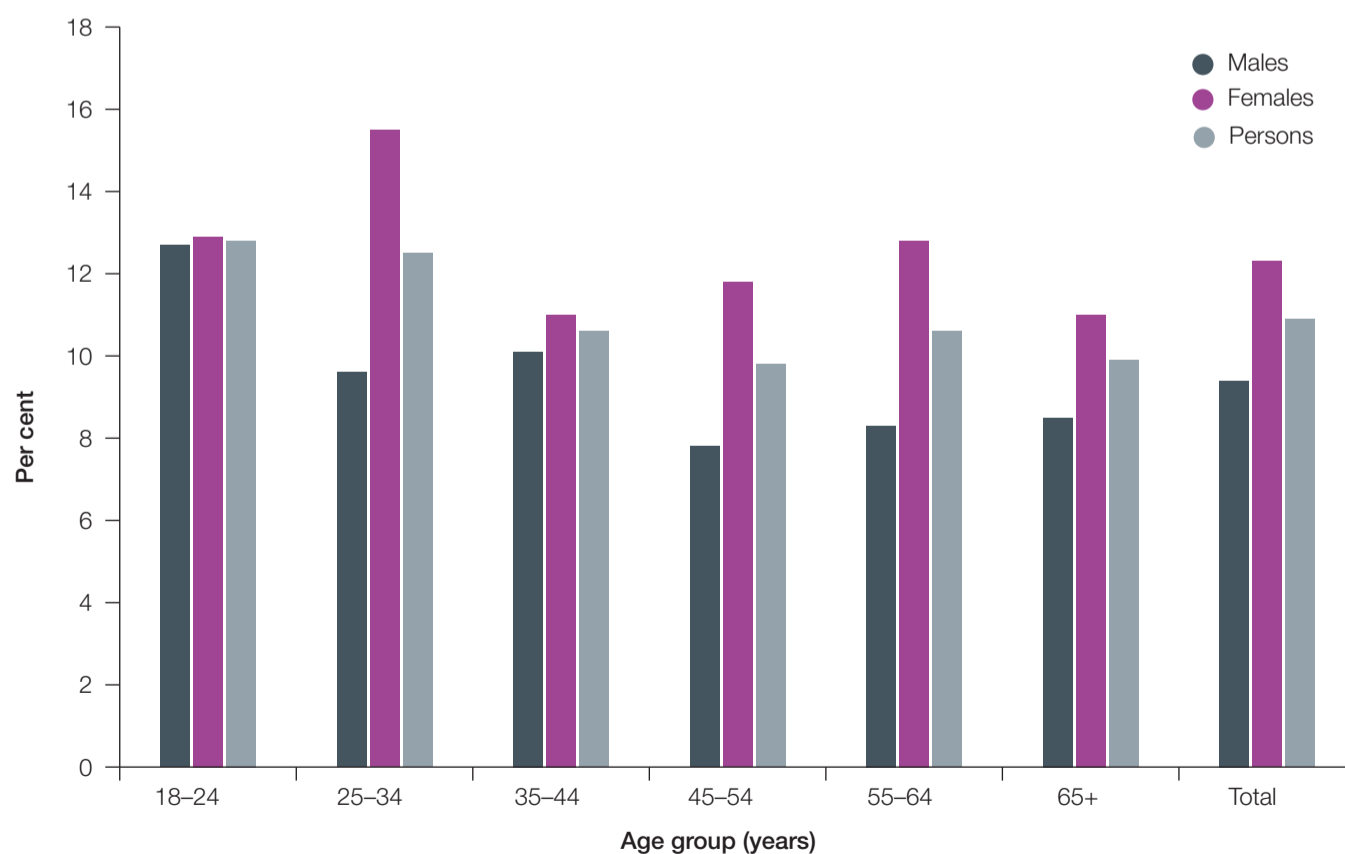
a. Reported ever having been diagnosed with asthma by a doctor and have experienced symptoms (wheeze, coughing, shortness of breath or chest tightness) of asthma or taken treatment for asthma in the preceding 12 months.

Data are age-specific estimates, except for 'Totals', which represent the estimates for Victoria and were age-standardised to the 2011 Victorian population.

Table 7.5 shows the prevalence of current asthma for the period 2003 to 2011–12. The prevalence of current asthma did not significantly change between 2003 and 2011–12 in men, women or all Victorian adults.

Table 7.5: Prevalence of current asthma,[a] from 2003 to 2011–12, Victoria

Year	Males %	95% CI LL	95% CI UL	Females %	95% CI LL	95% CI UL	Persons %	95% CI LL	95% CI UL
2003	9.4	8.2	10.9	13.7	12.4	15.1	11.6	10.7	12.6
2004	8.6	7.4	10.0	12.1	10.9	13.4	10.4	9.5	11.3
2005	9.5	8.1	11.2	13.1	11.8	14.6	11.3	10.3	12.4
2006	9.2	7.7	10.9	11.9	10.6	13.3	10.6	9.6	11.7
2007	8.7	7.3	10.2	12.1	10.8	13.6	10.4	9.4	11.5
2008	8.9	8.1	9.7	12.3	11.6	13.1	10.7	10.1	11.2
2009	8.7	7.4	10.1	10.7	9.6	11.9	9.8	8.9	10.7
2010	7.2	6.0	8.5	11.1	9.8	12.5	9.2	8.3	10.1
2011–12	**9.4**	**8.5**	**10.3**	**12.3**	**11.5**	**13.2**	**10.9**	**10.3**	**11.5**

a. Reported ever having been diagnosed with asthma by a doctor and have experienced symptoms (wheeze, coughing, shortness of breath or chest tightness) of asthma or taken treatment for asthma in the last 12 months.

Data were age-standardised to the 2011 Victorian population.
LL/UL 95% CI = lower/upper limit of 95% confidence interval.
Ordinary least squares linear regression was used to test for trends over time.

Table 7.6 shows the prevalence of current asthma, by Department of Health region and sex. There were no significant differences in the prevalence of current asthma between those who lived in rural compared with metropolitan Victoria. Moreover there were no significant regional differences among men, women or adults.

Table 7.6: Prevalence of current asthma,[a] by Department of Health region and sex, Victoria, 2011–12

Region	Males %	95% CI LL	95% CI UL	Females %	95% CI LL	95% CI UL	Persons %	95% CI LL	95% CI UL
Eastern Metropolitan	11.1	8.9	13.9	11.9	9.9	14.2	11.5	10.0	13.3
North & West Metropolitan	9.1	7.7	10.8	11.2	9.9	12.6	10.2	9.2	11.2
Southern Metropolitan	8.2	6.6	10.1	12.6	10.9	14.6	10.5	9.3	11.9
Metropolitan	**9.3**	**8.3**	**10.5**	**11.8**	**10.9**	**12.8**	**10.6**	**9.9**	**11.4**
Barwon-South Western	9.5	6.7	13.3	14.4	11.3	18.3	12.4	9.9	15.4
Gippsland	9.4	6.8	12.8	13.0	10.2	16.3	11.3	9.2	13.7
Grampians	8.2	6.4	10.4	14.6	12.2	17.4	11.4	9.8	13.2
Hume	11.0	8.0	15.0	13.3	11.4	15.5	12.2	10.3	14.4
Loddon Mallee	8.7	6.6	11.2	12.8	10.6	15.4	10.6	9.0	12.4
Rural	**9.3**	**7.9**	**10.9**	**13.8**	**12.4**	**15.2**	**11.6**	**10.6**	**12.7**
Total	**9.4**	**8.5**	**10.3**	**12.3**	**11.5**	**13.2**	**10.9**	**10.3**	**11.5**

a. Reported ever having been diagnosed with asthma by a doctor and have experienced symptoms (wheeze, coughing, shortness of breath or chest tightness) of asthma or taken treatment for asthma in the last 12 months.

Data were age-standardised to the 2011 Victorian population.
Metropolitan and rural regions are identified by colour as follows: metropolitan/rural.
LL/UL 95% CI = lower/upper limit of 95% confidence interval.

Asthma

Table 7.7 and Figure 7.3 show the prevalence of current asthma, by LGA. There was a lower prevalence of current asthma in adults who lived in the LGAs of Northern Grampians (S) and Whitehorse (C) compared with all Victorians.

Table 7.7: Prevalence of current asthma,[a] by LGA and sex, Victoria, 2011–12

LGA	Males %	95% CI LL	95% CI UL	Females %	95% CI LL	95% CI UL	Persons %	95% CI LL	95% CI UL
Alpine (S)	7.1*	3.1	15.4	6.6	4.2	10.3	7.2*	4.3	11.7
Ararat (RC)	**19.0***	10.9	30.8	**9.2**	6.4	13.2	15.3	9.8	22.9
Ballarat (C)	4.4*	2.1	9.2	16.3	11.6	22.6	10.7	7.7	14.5
Banyule (C)	6.6*	3.3	12.5	15.7	10.5	22.8	11.1	7.9	15.4
Bass Coast (S)	13.1*	5.2	29.2	15.8	9.9	24.3	14.3	8.8	22.4
Baw Baw (S)	6.5*	3.4	12.0	8.4*	4.9	14.1	8.0	5.2	12.2
Bayside (C)	8.8*	4.0	18.1	10.6*	5.6	19.3	9.4	5.8	14.8
Benalla (RC)	11.2*	4.8	23.9	9.9	7.1	13.6	11.6	7.0	18.6
Boroondara (C)	12.9*	7.0	22.5	8.5	5.5	12.9	10.8	7.0	16.2
Brimbank (C)	7.3*	4.1	12.8	10.9	7.2	16.2	9.3	6.5	13.0
Buloke (S)	17.8*	9.8	30.0	9.9	6.8	14.2	13.6	8.9	20.0
Campaspe (S)	7.3*	3.2	16.0	15.1*	7.7	27.7	10.4*	6.2	16.8
Cardinia (S)	11.1	6.8	17.8	11.0	6.8	17.3	11.3	8.0	15.7
Casey (C)	8.0	5.1	12.5	14.1	9.7	20.1	10.9	8.1	14.5
Central Goldfields (S)	17.1*	9.4	29.1	8.3*	4.3	15.3	13.0*	7.1	22.8
Colac-Otway (S)	4.1*	1.9	8.9	14.5	9.2	22.3	9.3	6.2	13.7
Corangamite (S)	8.2*	3.9	16.3	11.7	8.3	16.3	10.1	7.0	14.3
Darebin (C)	10.5*	6.2	17.1	11.0	7.3	16.3	10.9	7.9	14.8
East Gippsland (S)	8.7*	3.8	18.9	17.6	10.6	27.7	13.0	8.4	19.7
Frankston (C)	11.9*	6.4	21.2	16.8	11.5	23.9	14.6	10.3	20.4
Gannawarra (S)	7.8*	4.4	13.5	13.9*	8.0	23.1	10.6	6.9	15.9
Glen Eira (C)	7.0*	3.5	13.4	12.9*	7.1	22.2	9.8	6.4	14.9
Glenelg (S)	13.0*	6.3	24.7	10.0	7.0	14.1	12.1	7.7	18.5
Golden Plains (S)	16.5*	8.6	29.3	13.8	9.2	20.4	15.3	10.3	22.1
Greater Bendigo (C)	9.2*	3.9	20.2	10.7	7.6	14.8	9.5	6.8	13.2
Greater Dandenong (C)	10.1*	5.9	16.5	14.0	9.8	19.6	12.1	8.9	16.2
Greater Geelong (C)	11.8*	5.9	21.9	15.2	10.3	21.9	14.1	9.6	20.1
Greater Shepparton (C)	13.0*	5.8	26.7	14.2*	8.4	22.9	13.7*	8.2	22.1
Hepburn (S)	9.0	5.5	14.4	17.1	11.0	25.8	13.1	9.3	18.1
Hindmarsh (S)	12.6*	5.1	27.8	13.4	8.7	20.0	13.2	8.0	21.1
Hobsons Bay (C)	10.4*	4.9	20.9	12.7	7.8	19.9	11.6	7.6	17.3
Horsham (RC)	9.6*	5.2	17.2	15.2	10.1	22.1	12.5	8.9	17.3
Hume (C)	7.4*	4.1	13.1	12.5	8.8	17.5	9.7	7.0	13.2
Indigo (S)	10.4*	4.7	21.4	17.6	11.5	26.0	14.0	9.4	20.2
Kingston (C)	5.9*	2.5	13.2	8.4	5.2	13.4	7.2	4.6	11.0
Knox (C)	10.8*	6.1	18.5	18.8	13.2	26.0	14.5	10.6	19.4
Latrobe (C)	7.5*	4.1	13.5	12.0	7.7	18.1	9.8	6.9	13.9
Loddon (S)	7.6*	4.5	12.7	17.0	10.6	26.1	12.4	7.9	18.8
Macedon Ranges (S)	5.6*	2.4	12.6	18.1	11.3	27.7	11.2	7.2	16.9
Manningham (C)	11.7*	6.8	19.5	15.9*	8.8	27.1	13.2	8.8	19.2
Mansfield (S)	11.8*	6.0	21.9	12.3	8.0	18.4	12.4	8.2	18.2
Maribyrnong (C)	13.6*	6.3	27.0	11.0	6.8	17.3	12.4*	7.3	20.2

Table 7.7: Prevalence of current asthma,[a] by LGA and sex, Victoria, 2011–12 (continued)

LGA	Males %	95% CI LL	95% CI UL	Females %	95% CI LL	95% CI UL	Persons %	95% CI LL	95% CI UL
Maroondah (C)	15.1	9.3	23.5	12.7	8.1	19.3	13.4	9.6	18.3
Melbourne (C)	8.0*	4.1	14.8	11.9	7.6	18.1	9.6	6.6	13.8
Melton (S)	7.9*	4.8	12.9	8.8	6.0	12.7	8.4	6.1	11.4
Mildura (RC)	7.6*	4.5	12.6	12.6	8.3	18.7	10.1	7.3	14.0
Mitchell (S)	10.1*	5.6	17.4	14.2	10.5	19.0	12.5	9.0	17.0
Moira (S)	8.8*	4.1	18.1	9.2	5.9	13.9	8.9	5.8	13.5
Monash (C)	11.1*	5.9	20.0	7.9	4.9	12.6	9.8	6.3	15.0
Moonee Valley (C)	10.3*	5.0	19.9	8.1	5.2	12.5	9.8	6.2	15.2
Moorabool (S)	5.6*	3.3	9.5	14.9	9.5	22.5	10.1	7.1	14.2
Moreland (C)	9.3*	5.1	16.5	11.9	7.8	17.7	10.5	7.4	14.7
Mornington Peninsula (S)	4.5*	1.8	11.0	14.9*	8.4	25.0	10.0*	5.9	16.4
Mount Alexander (S)	17.2*	8.9	30.7	14.4*	8.6	23.1	16.3	10.3	24.8
Moyne (S)	7.3*	3.6	14.2	12.8*	7.5	20.9	10.1	6.5	15.4
Murrindindi (S)	15.4*	7.0	30.6	18.6	11.3	29.0	16.8	10.6	25.6
Nillumbik (S)	11.9*	6.2	21.4	17.0	10.4	26.6	14.1	9.5	20.6
Northern Grampians (S)	6.0*	3.2	10.8	8.2	5.4	12.3	7.1	5.0	10.0
Port Phillip (C)	9.3*	4.2	19.7	10.9	7.1	16.4	10.3	6.5	15.8
Pyrenees (S)	20.3*	9.7	37.9	12.7*	7.3	21.1	16.1*	8.2	29.3
Queenscliffe (B)	**	**	**	8.6*	5.0	14.4	9.1*	5.0	16.0
South Gippsland (S)	8.2*	4.5	14.6	9.2	6.5	12.9	8.7	6.2	12.0
Southern Grampians (S)	5.2*	2.2	11.8	16.9*	9.3	28.5	10.8*	6.0	18.8
Stonnington (C)	11.0*	6.3	18.3	13.5	8.1	21.5	11.8	8.1	16.9
Strathbogie (S)	5.3*	2.8	9.6	9.4	6.1	14.2	7.4	5.1	10.6
Surf Coast (S)	8.3*	3.3	19.5	16.1	9.7	25.5	12.6	7.7	20.0
Swan Hill (RC)	8.2*	3.9	16.8	12.2	7.3	19.5	10.3	6.7	15.4
Towong (S)	8.5*	3.4	19.7	16.0	10.9	23.0	12.7	8.4	18.9
Wangaratta (RC)	15.8*	9.0	26.1	15.8	10.8	22.6	15.7	11.2	21.6
Warrnambool (C)	12.6	7.8	19.8	15.8	9.6	24.9	14.4	9.9	20.4
Wellington (S)	9.4*	4.5	18.7	15.3*	7.4	29.2	13.0*	7.0	23.0
West Wimmera (S)	6.6*	2.8	14.7	13.1	8.1	20.6	9.8	6.4	14.8
Whitehorse (C)	4.4*	2.5	7.7	6.1	4.1	9.2	5.4	3.9	7.5
Whittlesea (C)	8.8*	5.1	14.9	11.6	7.3	18.0	10.2	7.1	14.4
Wodonga (RC)	5.5*	2.5	11.8	12.8	9.5	16.9	9.2	6.7	12.6
Wyndham (C)	9.7*	5.8	15.8	10.2	6.7	15.3	9.9	7.1	13.6
Yarra (C)	11.7*	4.9	25.4	10.5	6.9	15.6	11.1	6.9	17.4
Yarra Ranges (S)	15.2	9.2	24.0	15.0	10.2	21.5	15.5	11.3	20.8
Yarriambiack (S)	13.9	8.5	21.8	9.5	6.5	13.7	11.9	8.5	16.6
Victoria	**9.4**	**8.5**	**10.4**	**12.4**	**11.6**	**13.2**	**10.9**	**10.3**	**11.6**

a. Reported ever having been diagnosed with asthma by a doctor and have experienced symptoms (wheeze, coughing, shortness of breath or chest tightness) of asthma or taken treatment for asthma in the last 12 months.

Data were age-standardised to the 2011 Victorian population, using 10-year age groups.
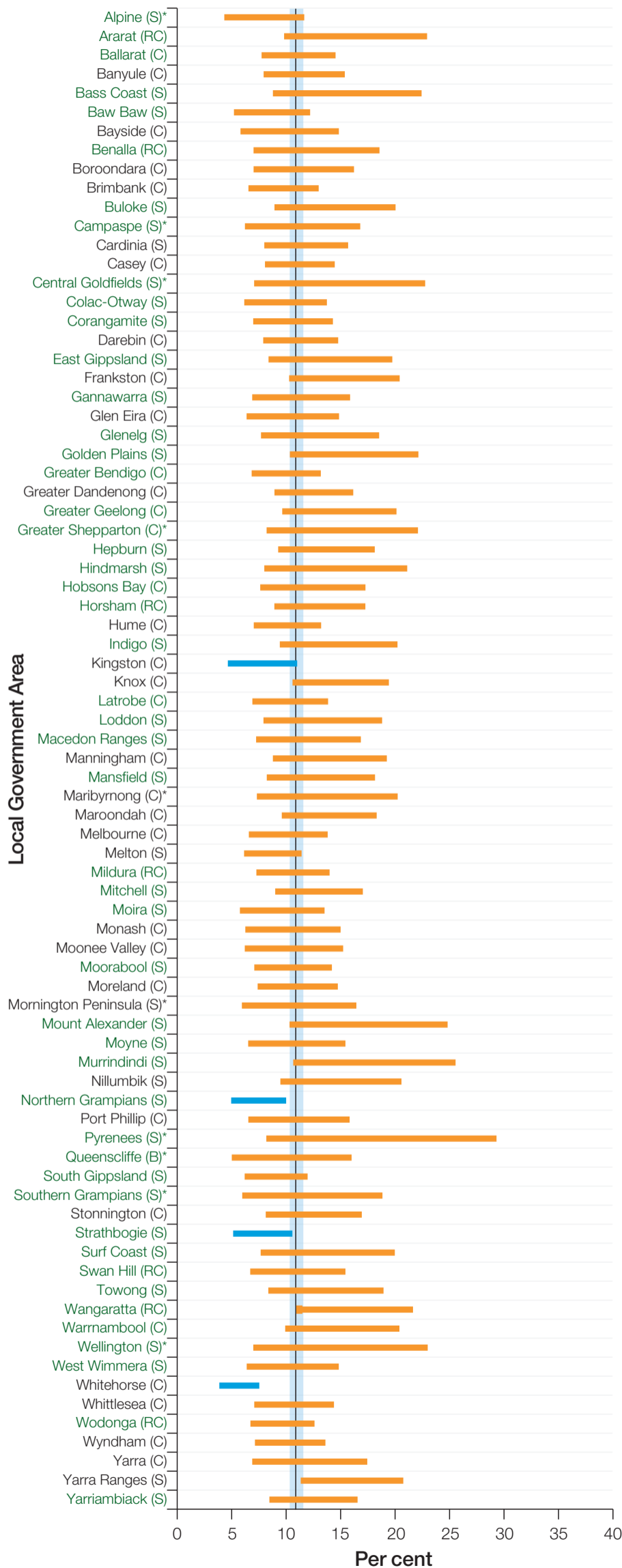
Metropolitan and rural LGAs are identified by colour as follows: metropolitan/rural.

LL/UL 95% CI = lower/upper limit of 95 per cent confidence interval.

LGA= Local government area; B = Borough; C = City; S = Shire; RC = Rural City.

Estimates that are (statistically) significantly different to the corresponding estimate for Victoria are identified by colour as follows: above/below Victoria.

* Estimate has a relative standard error (RSE) of between 25 and 50 per cent and should be interpreted with caution.

** Estimate has a RSE greater than 50 per cent and is not reported as it is unreliable for general use.

Figure 7.3: Prevalence of current asthma[a] in adults, by LGA, Victoria, 2011–12

a. Reported ever having been diagnosed with asthma by a doctor and have experienced symptoms (wheeze, coughing, shortness of breath or chest tightness) of asthma or taken treatment for asthma in the last 12 months.

Data were age-standardised to the 2011 Victorian population, using 10-year age groups.

The horizontal bars represent the 95% CI around the estimate for each LGA.

The vertical line on the graph is the Victorian estimate and the vertical column is the 95% CI around the estimate for Victoria.

Metropolitan and rural LGAs are identified by colour as follows: metropolitan/rural.

95% CI = 95 per cent confidence interval; LGA= local government area; B = Borough; C = City; S = Shire; RC = Rural City.

Estimates that are (statistically) significantly different to the corresponding estimate for Victoria are identified by colour as follows: above/below Victoria.

* Estimate has a relative standard error (RSE) of between 25 and 50 per cent and should be interpreted with caution.

Table 7.8 shows the prevalence of current asthma, by selected socioeconomic determinants, modifiable risk factors and health status.

When compared with all Victorian men, a significantly higher prevalence of current asthma was reported among men with the following characteristics:

- tertiary educated
- very high level of psychological distress
- fair or poor self-reported health status.

When compared with all Victorian women, a significantly higher prevalence of current asthma was reported among women with the following characteristics:

- moderate, high or very high levels of psychological distress
- fair or poor self-reported health status
- obesity.

When compared with all Victorian men, a significantly lower prevalence of current asthma was reported among men with the following characteristic:

- excellent or very good self-reported health status.

When compared with all Victorian women, a significantly lower prevalence of current asthma was reported among women with the following characteristics:

- low level of psychological distress
- excellent or very good self-reported health status
- normal body weight.

Table 7.8: Prevalence of current asthma,[a] by selected socioeconomic determinants, modifiable risk factors and health status, Victoria, 2011–12

| | Males | | | Females | | |
	%	95% CI LL	95% CI UL	%	95% CI LL	95% CI UL
Total	**9.4**	**8.5**	**10.3**	**12.3**	**11.5**	**13.2**
Area of Victoria						
Rural	9.3	7.9	10.9	13.8	12.4	15.2
Metropolitan	9.3	8.3	10.5	11.8	10.9	12.8
Education level						
Primary	10.3	8.6	12.2	14.9	12.8	17.3
Secondary	8.2	6.9	9.7	11.8	10.6	13.2
Tertiary	13.1	11.4	14.9	11.3	10.1	12.7
Total annual household income						
< $40,000	11.4	9.3	13.8	13.5	11.5	15.9
$40,000 to < $100,000	9.4	7.9	11.1	12.0	10.6	13.4
≥ $100,000	10.6	8.5	13.2	11.9	9.9	14.4
Psychological distress [b]						
Low (<16)	7.7	6.7	8.7	9.6	8.7	10.5
Moderate (16–21)	12.4	10.2	15.0	15.8	14.1	17.7
High (22–29)	13.0	10.0	16.8	16.9	14.4	19.7
Very high (≥ 30)	17.0	11.9	23.6	22.3	17.6	27.8
Physical activity [c, h]						
Sedentary	8.3	5.8	11.7	13.4	10.2	17.5
Insufficient time and sessions	9.5	7.7	11.6	11.8	10.3	13.4
Sufficient time and sessions	9.4	8.4	10.6	12.5	11.5	13.6
Met fruit / vegetable guidelines [d]						
Both guidelines	9.8*	5.3	17.3	13.7	10.4	17.8
Vegetable guidelines [e]	10.4	6.4	16.2	14.1	11.4	17.3
Fruit guidelines [e]	8.8	7.5	10.4	13.1	11.9	14.5
Neither	9.7	8.5	10.9	11.6	10.6	12.8

a. Reported ever having been diagnosed with asthma by a doctor and have experienced symptoms (wheeze, coughing, shortness of breath or chest tightness) of asthma or taken treatment for asthma in the last 12 months.

b. Based on the Kessler 10 scale for psychological distress.

c. Based on national guidelines (DoHA 1999).

d. Based on national guidelines (NHMRC 2003).

e. Includes those meeting both guidelines.

f. Long-term risk of alcohol-related harm refers to the increased risk of developing various cancers, cirrhosis of the liver, cognitive problems and dementia, and alcohol dependence.

g. Based on body mass index (BMI).

h. Data were age-standardised to the 2011 Victorian population using 10-year age groups (other variables were standardised using 5-year age groups).

Due to small numbers it was not possible to analyse data by employment status.

LL/UL 95% CI = lower/upper limit of 95 per cent confidence interval.

Estimates that are (statistically) significantly different to the corresponding estimate for Victoria are identified by colour as follows: **above**/**below** Victoria.

* Estimate has a relative standard error (RSE) of between 25 and 50 per cent and should be interpreted with caution.

Note that estimates may not add to 100 per cent due to a proportion of 'don't know' or 'refused to say' responses, not reported here.

Table 7.8: Prevalence of current asthma,[a] by selected socioeconomic determinants, modifiable risk factors and health status, Victoria, 2011–12 (continued)

	Males %	Males 95% CI LL	Males 95% CI UL	Females %	Females 95% CI LL	Females 95% CI UL
Long-term risk of alcohol-related harm [f]						
Abstainer	8.1	6.2	10.5	12.7	11.1	14.5
Low risk	9.7	8.7	10.8	12.2	11.3	13.2
Risky or high risk	7.4	4.9	11.0	16.8	11.8	23.4
Smoking status						
Current smoker	7.8	6.2	9.8	11.6	9.6	13.9
Ex-smoker	9.1	6.4	12.8	13.9	10.9	17.6
Non-smoker	9.7	8.6	11.1	12.1	11.2	13.2
Self-reported health						
Excellent / very good	7.1	6.0	8.4	9.3	8.3	10.5
Good	9.4	8.0	11.1	12.6	11.4	14.0
Fair / poor	14.9	12.2	18.1	20.7	18.1	23.6
Diabetes status (excluding gestational)						
No diabetes	9.2	8.3	10.2	12.2	11.4	13.0
Diabetes	13.3	8.3	20.6	16.3	10.9	23.8
Body weight status [g]						
Underweight	7.2*	2.8	17.3	8.2	5.7	11.7
Normal	8.8	7.5	10.3	9.9	8.9	11.1
Overweight	9.4	7.7	11.4	13.9	12.1	15.9
Obese	11.7	9.4	14.4	15.7	13.6	18.0

a. Reported ever having been diagnosed with asthma by a doctor and have experienced symptoms (wheeze, coughing, shortness of breath or chest tightness) of asthma or taken treatment for asthma in the last 12 months.

b. Based on the Kessler 10 scale for psychological distress.

c. Based on national guidelines (DoHA 1999).

d. Based on national guidelines (NHMRC 2003).

e. Includes those meeting both guidelines.

f. Long-term risk of alcohol-related harm refers to the increased risk of developing various cancers, cirrhosis of the liver, cognitive problems and dementia, and alcohol dependence.

g. Based on body mass index (BMI).

h. Data were age-standardised to the 2011 Victorian population using 10-year age groups (other variables were standardised using 5-year age groups).

Due to small numbers it was not possible to analyse data by employment status.

LL/UL 95% CI = lower/upper limit of 95 per cent confidence interval.

Estimates that are (statistically) significantly different to the corresponding estimate for Victoria are identified by colour as follows: **above**/**below** Victoria.

* Estimate has a relative standard error (RSE) of between 25 and 50 per cent and should be interpreted with caution.

Note that estimates may not add to 100 per cent due to a proportion of 'don't know' or 'refused to say' responses, not reported here.

The relationship, if any, was investigated between SES and the age-adjusted prevalence of current asthma in men and women, using total annual household income as a measure of SES (Figure 7.4). The prevalence of current asthma did not vary by total annual household income in men or women, indicating that there was no association between the prevalence of current asthma and SES.

Figure 7.4: Prevalence of current asthma, by total annual household income and sex, Victoria, 2011–12
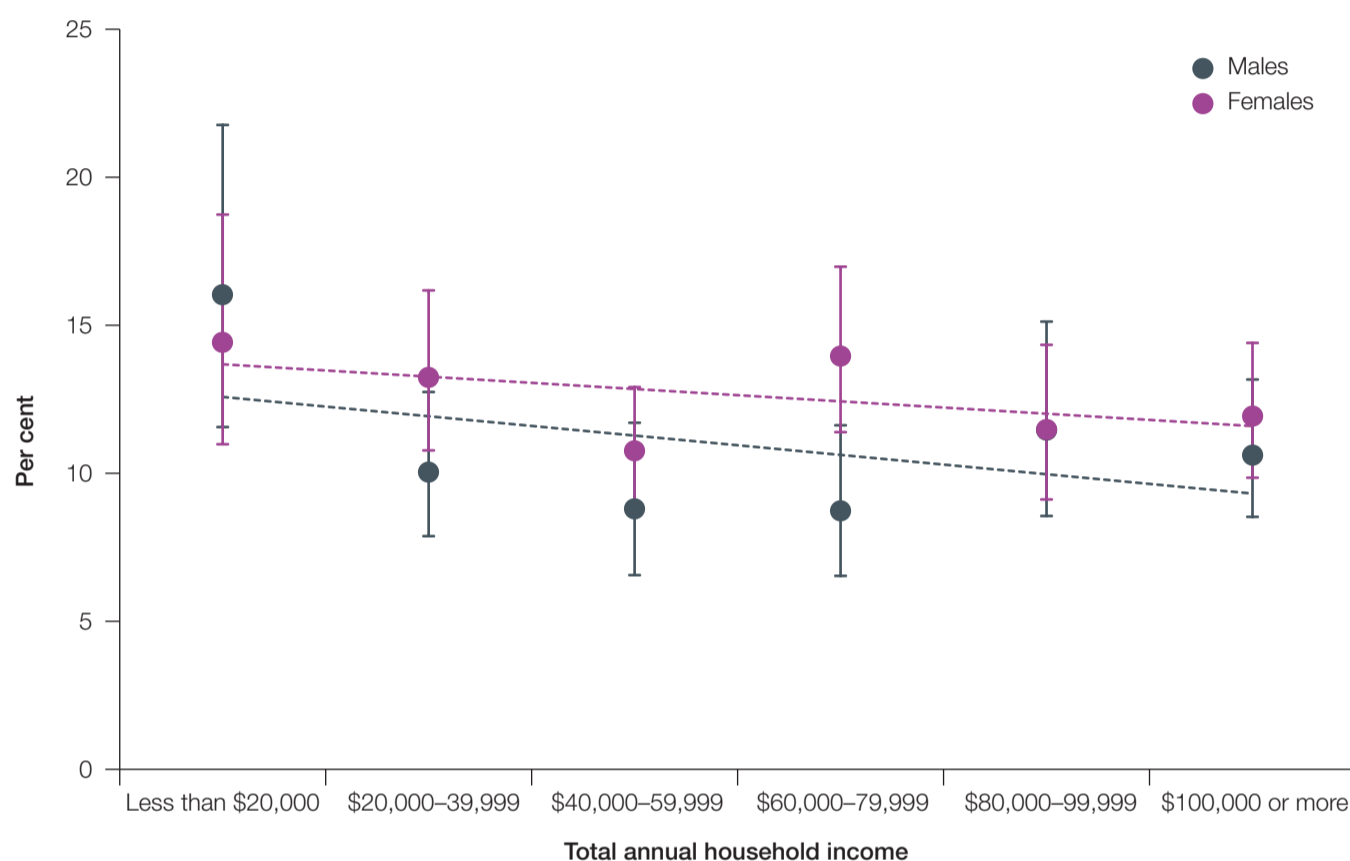
Data were age-standardised to the 2011 Victorian population.

95% CI = 95 per cent confidence interval.

Ordinary least squares linear regression was used to test for statistical significance.

Discussion

Interpretation of the findings

Asthma has been a National Health Priority Area since 1999, acknowledging the significant burden of illness and injury it has in the Australian community.

In 2011–12, 10.9 per cent of Victorians aged 18 years or over had experienced symptoms of asthma or had taken treatment for asthma in the preceding 12 months, with the prevalence of current asthma significantly higher in women (12.3 per cent) compared with men (9.4 per cent). The prevalence of 'current' asthma and asthma 'ever' are two different measures, with 'current' asthma measuring asthma experienced over the 12 months prior to the survey and asthma 'ever' measuring the cumulative lifetime experience of asthma. The prevalence of asthma 'ever' is always higher than that for current asthma because a substantial proportion of people who develop asthma in their childhood have complete resolution of their symptoms by the time they reach adulthood (Koh & Irving 2007). The Victorian Population Health Survey data found that 22.2 per cent of adults reported having ever been diagnosed with asthma by a doctor.

There were no differences in estimates of lifetime prevalence of asthma (or asthma ever) between men and women, and this may reflect that while childhood asthma is more common among boys (ABS 2012), the prevalence of current asthma is higher in women.

While the association between gender and asthma prevalence has been explored by a number of studies, no single explanation has been able to fully explain the specific mechanisms for the differences that exist (Kynyk, Mastronarde & McCallister 2011). Broadly, it is proposed that hormonal changes and genetic susceptibility both contribute to the change in prevalence that occurs about the time of puberty (Postma 2007), with sex hormones considered to have influences on immunity and lung cell function (Melgert et al. 2007).

Analysis of time trends showed no significant changes in the estimates of either lifetime prevalence of asthma or current asthma between 2003 and 2011–12. This is consistent with estimates reported by the ABS National Health Surveys in 2004–05, 2007–08 and 2011–12, which also describe lifetime prevalence of asthma and prevalence of current asthma

remaining constant over this period (ABS 2012; ACAM 2011). The Victorian Population Health Survey finding of a slight, although not significant, increase in the prevalence of current asthma in Victorian adults in 2011–12 may be accounted for by the expansion of the definition of current asthma now used in the Victorian Population Health Survey. In accordance with ACAM indicators (ACAM 2007), estimates now include people who have taken treatment to manage their asthma in the previous 12 months.

Although some studies have suggested that there are regional differences in the prevalence of current asthma throughout Australia (ACAM 2011), no significant differences were observed in the prevalence of asthma between the metropolitan and rural areas of Victoria. Moreover at the LGA level only two LGAs (Northern Grampians (S) and Whitehorse (C)), differed in the prevalence of current asthma from the overall state estimate.

For men and women, a higher prevalence of current asthma was observed in respondents reporting both very high levels of psychological distress and poor/fair self-reported health. In women, a more marked impact of current asthma was observed on levels of psychological distress, with a higher prevalence of current asthma observed in respondents also reporting moderate and high levels of psychological distress.

This may be reflective of the higher prevalence of current asthma among women compared with men. By contrast in both men and women, a lower prevalence of asthma was observed among those reporting excellent/good self-reported health. Consistent with other population health studies (Ampon et al. 2005; Oraka, King & Callahan 2010), these findings highlight the impact that a chronic illness such as asthma may have on mental health and wellbeing and how people assess their health status.

This finding is supported by research from 34 countries (including Australia), which also found that asthma and wheezing are strongly associated with depression and anxiety in adults (Wong et al. 2013). Further investigation of the relationship between asthma and depression (Table 7.9) showed that in 2011–12 the prevalence of current asthma was significantly higher among those who had ever been diagnosed with depression by a doctor compared with those who had not. While it is not possible to determine causality or its direction in a cross-sectional study design, these findings highlight the importance of addressing comorbidities in the management of chronic disease. The prevalence of doctor-diagnosed depression and/or anxiety, along with the use of mental health services, is explored further in chapter 9.

Table 7.9: Prevalence of current asthma[a] by doctor-diagnosed depression,[b] Victoria, 2011–12

| Doctor diagnosed depression | Males | | | Females | | | Persons | | |
| | | 95% CI | | | 95% CI | | | 95% CI | |
	%	LL	UL	%	LL	UL	%	LL	UL
No	8.3	7.3	9.3	10.3	9.5	11.2	9.2	8.6	9.9
Yes	15.5	13.0	18.4	18.4	16.5	20.6	17.4	15.8	19.1
Total	9.4	8.5	10.3	12.3	11.5	13.2	10.9	10.3	11.5

a. Reported ever having been diagnosed with asthma by a doctor and have experienced symptoms (wheeze, coughing, shortness of breath or chest tightness) of asthma or taken treatment for asthma in the last 12 months.
b. Respondents were asked whether they had ever been diagnosed with depression and/or anxiety by a doctor.
Data were age-standardised to the 2011 Victorian population
LL/UL 95% CI = lower/upper limit of 95 per cent confidence interval.
Estimates that are (statistically) significantly different to the corresponding estimate for Victoria are identified by colour as follows: **above** /**below** Victoria.
Note that estimates may not add to 100 per cent due to a proportion of 'don't know' or 'refused' responses, not reported here.

Smoking is known to have a deleterious effect on infant, child and adult asthma, both directly and as environmental tobacco smoke (ACAM 2011). ACAM indicators also include the prevalence of smoking in people with asthma for the purpose of monitoring exposure to and impact of environmental and other risk factors for asthma, and to evaluate population health interventions to prevent the onset and exacerbation of asthma. Smoking cessation initiatives represent one of the key health promotion strategies for reducing the prevalence of asthma. Additional analyses (not shown) found that there were no significant differences in the prevalence of smoking among men or women irrespective of whether they did or did not have current or past asthma. Given that smoking is particularly inadvisable in people who suffer from asthma, this would suggest a subpopulation of focus for public health practitioners involved in smoking cessation policies and interventions.

A higher prevalence of current asthma was observed in Victorian women who were obese. The exact nature of the association between obesity and asthma is not completely understood. Research suggests that common predisposing factors (such as physical activity and diet) exist between asthma and obesity (Ali & Ulrik 2013). Alternatively it has been proposed that obese asthma patients represent a distinct clinical phenotype of asthma, resulting from biological mechanisms whereby obesity could cause or worsen asthma (such as breathing difficulties or gastroesophageal reflux disease) (Ali & Ulrik 2013; Gibeon et al. 2013) or via specific cellular pathways relating to inflammation or hormones associated with obesity (Gibeon et al. 2013; Lugogo, Kraft & Dixon 2010). This serves to further highlight the management issues associated with multiple comorbidities.

Other sources of data

Table 7.10 compares data from the 2011–12 Victorian Population Health Survey with estimates for the prevalence of asthma reported by the ABS for Australia and Victoria in the 2001, 2004–05 and 2007–08 National Health Survey and the 2011–12 Australian Health Survey. The estimates provided by all surveys are similar, although statistical comparisons cannot be made as the ABS does not publish 95 per cent confidence intervals.

Table 7.10: Comparison of selected data sources of prevalence estimates of asthma

Survey	Population (age in years)	Lifetime prevalence of asthma			Current asthma		
		Males	Females	Persons	Males	Females	Persons
VPHS 2011-12 [a]		21.4 (20.0–22.7)	22.8 (21.8–23.9)	22.2 (21.3–23.1)	9.4 (8.5–10.3)	12.3 (11.5–13.2)	10.9 (10.3–11.5)
AHS 2011–12	Australia (18+)	-	-	-	9.5	10.9	10.2
AHS 2011–12	Victoria (18+)	-	-	-	10.7	11.1	10.9
NHS 2007–08	Australia (16+)	-	-	19.2	-	-	9.8
NHS 2004–05	Australia (18+)	-	-	20.3	-	-	9.9 [b]
NHS 2001	Australia (18+)	-	-	20.4	-	-	11.0 [b]

a. VPHS estimates are presented with 95% confidence intervals
b. Determined from response to 'Do you still get asthma?'
AHS = Australian Health Survey; NHS = National Health Survey; – = not available.

Concluding remarks

The current focus for minimising the burden of asthma is directed at appropriate management of the disease. This includes maintaining regular contact with a doctor, developing a personalised asthma action plan, monitoring symptoms, taking medication appropriately, identifying and avoiding asthma triggers and being physically active. The proportion of people with current asthma who were given an asthma action plan by their doctor, how often the asthma action plan was used, and the usefulness of these plans for both managing an acute attack and in helping with day-to-day management will be included in the upcoming statewide Victorian Population Health Survey 2012 report.

Further information

The Asthma Foundation Victoria has a number of programs and resources in asthma support, monitoring, management and education. Visit online at <www.asthma.org.au>.

A Department of Health fact sheet on asthma is available at <health.vic.gov.au/edfactsheets/downloads/asthma.pdf>.

References

ABS (Australian Bureau of Statistics) 2012, *Australian health survey: first results, 2011–12*, cat. no. 4364.0.55.001, ABS, Canberra.

ABS (Australian Bureau of Statistics) 2013, *Australian Health Survey: First Results, 2011–12 - Victoria*, viewed 22 Jan 2013 <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4364.0.55.0012011-12?OpenDocument>

Ali Z, Ulrik CS 2013, 'Obesity and asthma: A coincidence or a causal relationship? A systematic review', *Respiratory Medicine*, 107(9):1287-300.

Ampon RD, Williamson M, Correll PK, Marks GB 2005, 'Impact of asthma on self-reported health status and quality of life: a population based study of Australians aged 18-64', *Thorax*, 60(9):735-9.

Australian Centre for Asthma Monitoring (ACAM) 2011, *Asthma in Australia 2011*, Australian Institute of Health and Welfare (AIHW), Canberra.

Australian Centre for Asthma Monitoring (ACAM) 2007, *Australian asthma indicators: Five year review of asthma monitoring in Australia*, AIHW, Canberra.

DoHA (Department of Health and Ageing) 1999, *National physical activity guidelines for adults*, DoHA, Canberra.

Gibeon D, Batuwita K, Osmond M, Heaney LG, Brightling CE, Niven R, et al. 2013, 'Obesity-associated severe asthma represents a distinct clinical phenotype: analysis of the British Thoracic Society Difficult Asthma Registry Patient cohort according to BMI', *Chest*, 143(2):406–14.

Koh MS, Irving LB 2007, 'The natural history of asthma from childhood to adulthood', *International Journal of Clinical Practice*, 61(8):1371-4.

Kynyk JA, Mastronarde JG, McCallister JW 2011, 'Asthma, the sex difference. Current opinion in pulmonary medicine', *Comparative Study Review*, 17(1):6–11.

Lugogo NL, Kraft M, Dixon AE 2010, 'Does obesity produce a distinct asthma phenotype? *Journal of Applied Physiology*, 108(3):729-34.

Melgert BN, Ray A, Hylkema MN, Timens W, Postma DS 2007, 'Are there reasons why adult asthma is more common in females? Current allergy and asthma reports'. *Comparative Study Review* 7(2):143-50.

NHMRC (National Health and Medical Research Council) 2003, *Dietary guidelines for Australian adults*, NHMRC, Canberra.

Oraka E, King ME, Callahan DB 2010, 'Asthma and serious psychological distress: prevalence and risk factors among US adults, 2001-2007.' *Chest* 137(3):609–16.

Postma DS 2007, 'Gender differences in asthma development and progression', *Gender Medicine*, 4 Suppl B:S133-46.

Wong KO, Hunter Rowe B, Douwes J, Senthilselvan A 2013, 'Asthma and wheezing are associated with depression and anxiety in adults: an analysis from 54 countries', *Pulmonary Medicine*, 929028.