

4. Body weight status



Alpine Ararat Ballarat Banyule Bass Coast Baw Baw Bayside Benalla Boroondara Brimbank Buloke Campaspe Cardinia Casey Central Goldfields Colac-Otway Corangamite Darebin East Gippsland Frankston Gannawarra Glen Eira Glenelg Golden Plains Greater Bendigo Greater Dandenong Greater Geelong Greater Shepparton Hepburn Hindmarsh Hobsons Bay Horsham Hume Indigo Kingston Knox Latrobe Loddon Macedon Ranges Manningham Mansfield Maribyrnong Maroondah Melbourne Melton Mildura Mitchell Moira Monash Moonee Valley Moorabool Moreland Mornington Peninsula Mount Alexander Moyne Murrindindi Nillumbik Northern Grampians Port Phillip Pyrenees Queenscliffe South Gippsland Southern Grampians Stonnington Strathbogie Surf Coast Swan Hill Towong Wangaratta Warrnambool Wellington West Wimmera Whitehorse Whittlesea Wodonga Wyndham Yarra Yarra Ranges Yarriambiack Alpine Ararat Ballarat Banyule Bass Coast Baw Baw Bayside Benalla Boroondara Brimbank Buloke Campaspe Cardinia Casey Central Goldfields Colac-Otway Corangamite Darebin East Gippsland Frankston Gannawarra Glen Eira Glenelg Golden Plains Greater Bendigo Greater Dandenong Greater Geelong Greater Shepparton Hepburn Hindmarsh Hobsons Bay Horsham Hume Indigo Kingston Knox Latrobe Loddon Macedon Ranges Manningham Mansfield Maribyrnong Maroondah Melbourne Melton Mildura Mitchell Moira Monash Moonee Valley Moorabool Moreland Mornington Peninsula Mount Alexander Moyne Murrindindi Nillumbik Northern Grampians Port Phillip Pyrenees Queenscliffe South Gippsland Southern Grampians Stonnington Strathbogie Surf Coast Swan Hill Towong Wangaratta Warrnambool Wellington West Wimmera Whitehorse Whittlesea Wodonga Wyndham Yarra Yarra Ranges Yarriambiack Alpine Ararat Ballarat Banyule Bass Coast Baw Baw Bayside Benalla Boroondara Brimbank Buloke Campaspe Cardinia Casey Central Goldfields Colac-Otway Corangamite Darebin East Gippsland Frankston Gannawarra Glen Eira Glenelg Golden Plains Greater Bendigo Greater Dandenong Greater Geelong Greater Shepparton Hepburn Hindmarsh Hobsons Bay Horsham Hume Indigo Kingston Knox Latrobe Loddon Macedon Ranges Manningham Mansfield Maribyrnong Maroondah Melbourne Melton Mildura Mitchell Moira Monash Moonee Valley Moorabool Moreland Mornington Peninsula Mount Alexander Moyne Murrindindi Nillumbik Northern Grampians Port Phillip Pyrenees Queenscliffe South Gippsland Southern Grampians Stonnington Strathbogie Surf Coast Swan Hill Towong Wangaratta Warrnambool Wellington West Wimmera Whitehorse Whittlesea Wodonga Wyndham Yarra Yarra Ranges Yarriambiack Alpine Ararat Ballarat Banyule Bass Coast Baw Baw Bayside Benalla Boroondara Brimbank Buloke Campaspe Cardinia Casey Central Goldfields Colac-Otway Corangamite Darebin East Gippsland Frankston Gannawarra Glen Eira Glenelg Golden Plains Greater Bendigo Greater Dandenong Greater Geelong Greater Shepparton Hepburn Hindmarsh Hobsons Bay Horsham Hume Indigo Kingston Knox Latrobe Loddon Macedon Ranges Manningham Mansfield Maribyrnong Maroondah Melbourne Melton Mildura Mitchell Moira

4. Body Weight Status

The body mass index (BMI) provides a measure of weight in relation to height and can be used to estimate levels of unhealthy weight in a population. It is calculated as weight in kilograms divided by height in metres squared:

$$\text{BMI} = \text{weight (kg)} / \text{height squared (m}_2\text{)}$$

The World Health Organisation classifies adult body weight status based on the following BMI scores:

BMI score	Weight category
<18.5	Underweight
18.5–24.9	Normal
25.0–29.9	Overweight
30.0–34.9	Obese class I
35.0–39.9	Obese class II
≥40.0	Obese class III

(WHO 2000)

Survey respondents were asked to report their height and weight and the formula described above was used to calculate their BMI.

It is important to note that studies comparing self-reported height and weight with actual physical measurement have shown that people tend to underestimate their weight and overestimate their height, resulting in an underestimation of their BMI. Therefore, estimates of the prevalence of overweight and obesity in a population that are based on self-reported data are likely to be an underestimate. A further cautionary note is that BMI cannot distinguish between body fat and muscle. Therefore, an individual who is very muscular with low body fat could have a high BMI estimate and be classified as being obese.

Self-reported data still have a place in health monitoring because such data are relatively inexpensive and easy to collect, and have been shown to be useful in monitoring trends over time.

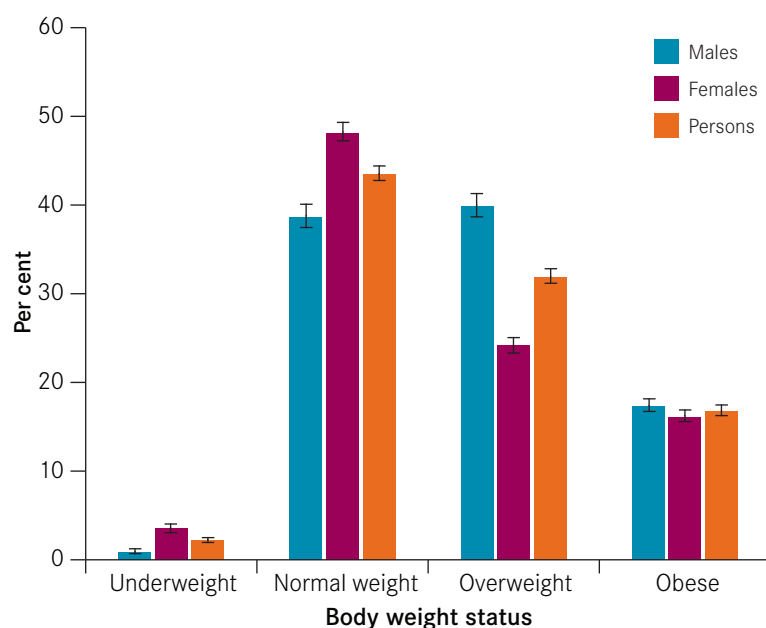
Survey results

- Almost half (48.6 per cent) of all persons aged 18 years and over were overweight or obese (31.9 per cent were overweight and 16.7 per cent were obese) in 2008.
- The proportion of persons who were underweight, or of normal weight, declined between 2002 and 2008, while the proportion of persons who were overweight or obese increased over this period.
- Between the sexes, the proportion of males (39.9 per cent) who were overweight was higher than the corresponding proportion of females (24.2 per cent), however, the proportion of females (3.6 per cent) who were underweight, was higher than the proportion of underweight males (0.9 per cent).
- Overweight and obesity were more prevalent among persons aged 45 years and over. Persons in the youngest age groups (18–24 years and 25–34 years) had the lowest rates of overweight and obesity, but had the highest rates of underweight body weight.
- More than one in ten (11.7 per cent) persons were classified as Class I obese (BMI 30–34.9), 3.4 per cent were classified as Class II obese (BMI 35–39.9) and 1.7 per cent were classified as Class III obese (BMI ≥40.0).
- A higher proportion of persons from rural areas were overweight (34.4 per cent) or obese (19.8 per cent), compared with persons from the metropolitan area (31.1 and 15.7 per cent, respectively).
- Among specific Department of Health regions, persons from the Hume (21.1 per cent), Loddon Mallee (21.0 per cent) and Grampians (20.3 per cent) regions had higher rates of obesity, compared with the rate for Victoria (16.7 per cent).
- There was a higher proportion of overweight males in the LGAs of Ararat, East Gippsland, Hobsons Bay, Moira, Murrindindi and Yarriambiack, compared with all Victorian males.
- There was a higher proportion of overweight females in the LGAs of Alpine, Baw Baw, Campaspe, Greater Geelong, Hindmarsh, Murrindindi and Strathbogie, compared with all Victorian females.
- There was a higher proportion of obesity for males in the LGAs of Buloke, Glenelg, Greater Shepparton, Hume, Mildura, Moorabool, Pyrenees, Towong, Wangaratta, Warrnambool and Wyndham, compared with all Victorian males.
- There was a higher proportion of obesity for females in the LGAs of Ararat, Cardinia, Casey, Corangamite, Frankston, Glenelg, Hindmarsh, Latrobe, Melton, Mitchell, Moira, Northern Grampians, Towong and Wodonga, compared with all Victorian females.

Figure 4.1 shows body weight status by sex in 2008, as determined by self-reported height and weight and subsequent calculation of corresponding body mass index (BMI).

Almost half (48.6 per cent) of all persons aged 18 years and over were overweight or obese (31.9 per cent were overweight and 16.7 per cent were obese). More than half (57.2 per cent) of all males in Victoria were overweight or obese, compared with 40.3 per cent of females.

Figure 4.1: Self-reported body weight status^(a), by sex, 2008



(a) Determined by calculation of body mass index (BMI).
Data are age standardised to the 2006 Victorian population.

Table 4.1 shows BMI status for the period 2002–2008. The proportion of persons who were underweight, or of normal weight, declined between 2002 and 2008, while the proportion of persons who were overweight or obese increased over this period.

Table 4.1: Body weight status^(a), 2002–2008

Body weight status	2002	2003	2004	2005	2006	2007	2008
	Per cent						
Underweight (<18.5)	3.4	3.4	3.4	2.6	1.9	2.0	2.2
Normal (18.5–24.9)	48.4	47.3	44.8	45.0	45.1	43.7	43.5
Overweight (25.0–29.9)	30.7	31.2	32.0	32.2	32.1	32.8	31.9
Obese (≥30.0)	14.4	14.0	14.4	15.6	15.3	15.4	16.7

(a) Determined by calculation of body mass index (BMI).

Note that figures may not add to 100 per cent due to a proportion of 'don't know' or 'refused' responses.

Data are age standardised to the 2006 Victorian population.

Ordinary least squares linear regression was used to test for trends over time.

Table 4.2 shows that a higher proportion of males were overweight (39.9 per cent), compared with females (24.2 per cent), while there was a similar proportion of obese males and females (17.3 per cent and 16.1 per cent, respectively).

Overweight and obesity were more prevalent for persons aged 45 years and over. Persons in the youngest age groups (18–24 years and 25–34 years) had the lowest rates of overweight and obesity, but had the highest rates of underweight body weight (figure 4.2 and figure 4.3).

Table 4.2: Body weight status^(a), by age group and sex, 2008

Age group (years)	Underweight (<18.5)			Normal (18.5–24.9)			Overweight (25.0–29.9)			Obese (≥30.0)		
	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI
Males												
18–24 years	2.4*	1.4	4.2	59.7	54.9	64.3	23.7	19.9	28.0	7.3	5.3	9.9
25–34 years	1.3*	0.7	2.5	46.7	42.7	50.7	37.0	33.3	40.9	11.6	9.5	14.2
35–44 years	0.2*	0.1	0.5	35.8	33.0	38.8	42.8	39.8	45.8	19.3	16.9	21.8
45–54 years	0.4*	0.2	1.0	27.5	25.1	30.1	44.4	41.6	47.2	25.0	22.6	27.6
55–64 years	0.6*	0.3	1.2	28.6	26.3	31.0	46.7	44.0	49.3	22.4	20.3	24.6
65+	0.9	0.6	1.4	35.7	33.5	37.9	42.8	40.6	45.1	17.5	15.9	19.4
Total	0.9	0.7	1.2	38.6	37.3	40.0	39.9	38.7	41.2	17.3	16.4	18.2
Females												
18–24 years	8.9	6.4	12.1	63.2	58.8	67.3	14.7	12.0	18.0	6.1	4.5	8.3
25–34 years	4.3	3.3	5.7	54.7	51.8	57.5	20.7	18.5	23.1	13.1	11.3	15.0
35–44 years	2.8	2.2	3.5	49.8	47.7	51.9	23.8	22.0	25.6	16.7	15.1	18.3
45–54 years	1.6	1.1	2.3	44.3	42.1	46.6	27.0	25.0	29.0	19.5	17.8	21.3
55–64 years	1.8	1.3	2.7	38.7	36.6	40.9	29.6	27.7	31.7	23.1	21.3	25.0
65+	2.5	2.0	3.2	38.6	36.7	40.4	29.7	28.0	31.5	18.7	17.2	20.3
Total	3.6	3.1	4.1	48.1	47.1	49.2	24.2	23.4	25.1	16.1	15.4	16.8
Persons												
18–24 years	5.6	4.2	7.4	61.4	58.2	64.5	19.3	16.9	22.0	6.7	5.4	8.4
25–34 years	2.8	2.2	3.6	50.7	48.2	53.1	28.9	26.7	31.2	12.4	10.9	13.9
35–44 years	1.5	1.2	1.9	42.9	41.1	44.7	33.2	31.4	34.9	17.9	16.5	19.4
45–54 years	1.0	0.8	1.4	36.0	34.3	37.8	35.6	33.9	37.3	22.2	20.7	23.8
55–64 years	1.2	0.9	1.7	33.7	32.1	35.3	38.0	36.4	39.7	22.7	21.4	24.2
65+	1.8	1.4	2.2	37.3	35.9	38.7	35.6	34.2	37.0	18.2	17.1	19.4
Total	2.2	2.0	2.5	43.5	42.6	44.3	31.9	31.1	32.7	16.7	16.1	17.3

(a) Determined by calculation of body mass index (BMI).

95% CI = 95 per cent confidence interval.

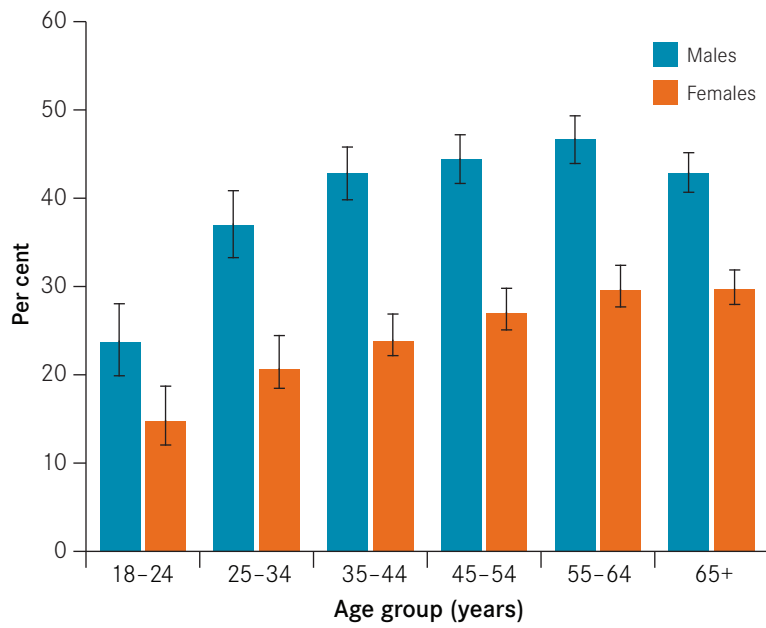
Note that figures may not add to 100 per cent due to a proportion of 'don't know' or 'refused' responses.

Data are crude estimates, except for the totals, which represent the estimates for Victoria and have been age standardised to the 2006 Victorian population.

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

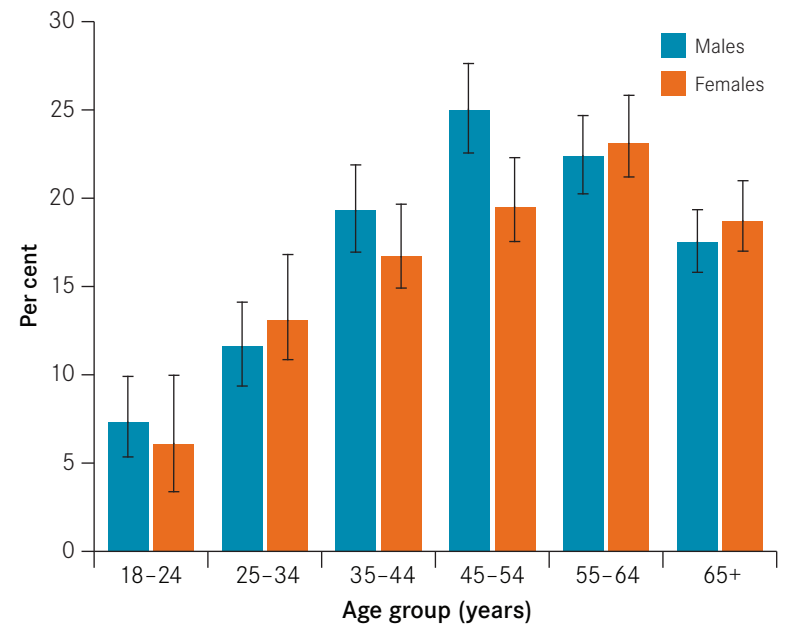
* Estimate has a relative standard error of between 25 and 50 per cent and should be interpreted with caution.

Figure 4.2: Proportion of males and females who were overweight (BMI 25.0–29.9), by age group, 2008



Data are crude estimates, they have not been age standardised.

Figure 4.3: Proportion of males and females who were obese (BMI ≥30.0), by age group, 2008



Data are crude estimates, they have not been age standardised.

The World Health Organisation has categorised obesity into three groups, ranging from moderate (Class I: BMI 30–34.9), to severe (Class II: BMI 35–39.9), through to very severe (Class III: BMI \geq 40.0). Table 4.3 shows the proportion of persons who were obese in 2008, by class of obesity, sex and age group.

Table 4.3: Prevalence of obesity, by obesity class, age group and sex, 2008

Age group (years)	Obese class I (30.0–34.9)			Obese class II (35.0–39.9)			Obese class III (\geq 40.0)		
	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI
Males									
18–24 years	4.6	3.1	6.8	2.2*	1.2	4.1	**	0.2	1.4
25–34 years	8.4	6.6	10.5	1.6*	0.9	2.6	1.7*	0.8	3.6
35–44 years	13.8	11.8	16.1	3.9	2.9	5.3	1.5*	0.9	2.7
45–54 years	18.3	16.1	20.6	3.7	2.8	4.8	3.0	2.1	4.4
55–64 years	16.0	14.2	18.0	4.4	3.4	5.6	2.0	1.4	2.9
65+	14.2	12.7	15.9	2.2	1.6	3.0	1.2	0.8	1.7
Total	12.6	11.8	13.5	2.9	2.6	3.4	1.7	1.4	2.1
Females									
18–24 years	5.0	3.5	7.1	0.9	0.4	1.8	**	0.1	0.7
25–34 years	8.6	7.2	10.3	3.0	2.2	4.1	1.4	0.9	2.2
35–44 years	9.6	8.5	10.8	5.0	4.1	6.0	2.1	1.5	2.9
45–54 years	13.1	11.7	14.7	4.0	3.2	5.0	2.4	1.8	3.1
55–64 years	15.4	13.9	17.0	5.7	4.7	6.8	2.0	1.5	2.7
65+	13.4	12.1	14.8	3.7	3.1	4.6	1.5	1.1	2.1
Total	10.8	10.2	11.4	3.7	3.4	4.1	1.6	1.4	1.9
Persons									
18–24 years	4.8	3.7	6.2	1.5*	0.9	2.5	0.4*	0.2	0.8
25–34 years	8.5	7.3	9.8	2.3	1.8	3.0	1.6	1.0	2.4
35–44 years	11.7	10.5	12.9	4.5	3.8	5.3	1.8	1.3	2.5
45–54 years	15.7	14.4	17.1	3.9	3.2	4.6	2.7	2.1	3.4
55–64 years	15.7	14.5	17.0	5.0	4.3	5.8	2.0	1.6	2.5
65+	13.8	12.8	14.8	3.0	2.6	3.6	1.4	1.1	1.7
Total	11.7	11.2	12.2	3.4	3.1	3.6	1.7	1.5	1.9

95% CI = 95 per cent confidence interval.

Data are crude estimates, except for the totals, which represent the estimates for Victoria and have been age standardised to the 2006 Victorian population.

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

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

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

The table shows that Class I obesity was the most common class of obesity, where 11.7 per cent of all persons surveyed had a BMI of 30.0–34.9. Only 3.4 per cent of persons were classified as being Class II obese (BMI of 35.0–39.9) and 1.7 per cent were classified as being Class III obese (BMI of \geq 40.0).

A higher proportion of males (12.6 per cent) were classified as Class I obese than females (10.8 per cent), while the proportion of females who were classified as Class II obese (3.7 per cent) was higher than the proportion of males (2.9 per cent). There was no difference in the proportion of males and females who were classified as Class III obese.

Persons aged 45 years and over had higher rates of Class I obesity, compared with all age groups. The pattern for Class II and Class III obesity by age group was less clear, however, persons aged 55–64 years (5.0 per cent) had higher rates of Class II obesity compared with all age groups (3.4 per cent) and persons aged 45–54 years (2.7 per cent) had higher rates of Class III obesity compared with all age groups (1.7 per cent).

Body mass index by region, rurality and LGA

Table 4.4 shows BMI status by sex, Department of Health region and rurality. The table shows that although there was no difference in the proportion of persons who were underweight in metropolitan and rural areas of the state, a higher proportion of persons from rural areas were overweight (34.4 per cent) or obese (19.8 per cent), compared with persons from the metropolitan area (31.1 and 15.7 per cent, respectively).

Between the sexes, a higher proportion of females from rural areas were overweight (27.5 per cent), compared with their metropolitan counterparts (23.2 per cent), while the rates for obesity among males (20.1 per cent) and females (19.5 per cent) from rural areas were higher than the rates for males (16.4 per cent) and females (15.1 per cent) from the metropolitan area.

Among specific Department of Health regions, persons from the Hume (21.1 per cent), Loddon Mallee (21.0 per cent) and Grampians (20.3 per cent) regions had higher rates of obesity, compared with the rate for Victoria (16.7 per cent). In contrast, persons from the Eastern Metropolitan region (14.1 per cent) had a lower rate of obese body weight compared with the rate for Victoria.

There was no difference in the proportion of males who were overweight between any of the Department of Health regions, but there was a higher proportion of overweight females in the Barwon–South Western (29.3 per cent), Gippsland (28.1 per cent) and Loddon Mallee (27.8 per cent) regions, compared with the rate for all Victorian females (24.2 per cent).

There was a higher proportion of males (21.6 per cent) in the Hume region who were obese, compared with all Victorian males (17.3 per cent). There was a higher proportion of obese females in the Loddon Mallee (21.0 per cent), Hume (20.7 per cent) and Grampians (19.9 per cent) regions, compared with all Victorian females (16.1 per cent).

Table 4.4: Body weight status^(a), by rurality and Department of Health region, 2008

Region	Underweight (<18.5)			Normal (18.5–24.9)			Overweight (25.0–29.9)			Obese (≥30.0)		
	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI
Males												
Barwon-South Western	**			34.7	29.2	40.8	41.3	35.2	47.7	19.2	15.8	23.2
Eastern Metropolitan	1.6*	0.8	2.9	42.0	38.6	45.3	40.0	36.8	43.4	14.2	12.1	16.6
Gippsland	**			35.3	31.2	39.7	42.2	37.9	46.6	18.5	15.6	21.8
Grampians	1.3*	0.5	3.0	36.4	32.6	40.4	38.4	34.4	42.5	20.8	17.6	24.4
Hume	0.7*	0.3	1.5	33.6	30.3	37.1	42.4	39.1	45.8	21.6	18.6	24.8
Loddon Mallee	0.6*	0.3	1.1	33.2	29.2	37.4	42.7	38.7	46.8	21.0	17.9	24.6
North and West Metropolitan	0.7*	0.4	1.3	38.4	36.1	40.7	38.9	36.7	41.2	18.9	17.1	20.7
Southern Metropolitan	0.8*	0.5	1.5	40.3	37.5	43.2	39.5	36.7	42.4	15.1	13.1	17.2
Metropolitan	1.0	0.7	1.3	40.0	38.4	41.6	39.4	37.9	41.0	16.4	15.2	17.5
Rural	0.8	0.5	1.1	34.5	32.3	36.6	41.6	39.4	43.9	20.1	18.5	21.8
Total	0.9	0.7	1.2	38.6	37.3	40.0	39.9	38.7	41.2	17.3	16.4	18.2
Females												
Barwon-South Western	3.0*	1.4	6.7	43.4	38.7	48.3	29.3	25.3	33.8	17.8	15.0	20.9
Eastern Metropolitan	4.3	3.1	5.9	52.5	49.8	55.3	22.5	20.4	24.8	14.0	12.4	15.8
Gippsland	2.4	1.6	3.5	42.6	39.3	46.0	28.1	25.3	31.0	18.3	15.8	21.0
Grampians	1.9	1.2	3.0	44.0	40.2	47.9	25.2	21.9	28.7	19.9	17.5	22.6
Hume	3.0	2.1	4.1	42.2	39.5	45.0	26.6	24.3	29.0	20.7	18.7	22.8
Loddon Mallee	2.3	1.6	3.1	39.4	36.3	42.6	27.8	25.4	30.4	21.0	18.4	23.7
North and West Metropolitan	3.6	2.9	4.6	46.8	45.0	48.6	24.8	23.3	26.3	16.2	14.9	17.5
Southern Metropolitan	3.8	2.9	4.9	51.3	48.9	53.6	22.0	20.2	23.9	14.9	13.4	16.6
Metropolitan	3.8	3.3	4.5	49.9	48.7	51.2	23.2	22.2	24.3	15.1	14.3	16.0
Rural	2.6	1.9	3.5	42.2	40.5	44.0	27.5	25.9	29.1	19.5	18.3	20.8
Total	3.6	3.1	4.1	48.1	47.1	49.2	24.2	23.4	25.1	16.1	15.4	16.8
Persons												
Barwon-South Western	1.8*	0.8	3.7	39.2	35.4	43.1	35.2	31.4	39.1	18.4	16.1	21.1
Eastern Metropolitan	2.9	2.2	3.9	47.5	45.3	49.6	31.0	29.0	33.0	14.1	12.8	15.6
Gippsland	1.8	1.2	2.7	39.1	36.5	41.9	35.0	32.4	37.7	18.2	16.3	20.3
Grampians	1.6	1.0	2.5	40.2	37.4	43.1	31.8	29.1	34.6	20.3	18.2	22.5
Hume	1.8	1.3	2.5	38.1	35.9	40.3	34.3	32.2	36.4	21.1	19.3	23.1
Loddon Mallee	1.5	1.1	1.9	36.4	33.8	39.0	35.0	32.6	37.5	21.0	18.9	23.3
North and West Metropolitan	2.2	1.8	2.7	42.6	41.1	44.0	31.7	30.4	33.1	17.5	16.4	18.6
Southern Metropolitan	2.3	1.8	2.9	45.9	44.0	47.7	30.5	28.8	32.3	15.0	13.8	16.4
Metropolitan	2.4	2.1	2.8	45.0	44.0	46.1	31.1	30.2	32.1	15.7	15.0	16.5
Rural	1.7	1.3	2.2	38.5	37.1	39.9	34.4	33.0	35.7	19.8	18.8	20.8
Total	2.2	2.0	2.5	43.5	42.6	44.3	31.9	31.1	32.7	16.7	16.1	17.3

(a) Determined by calculation of body mass index (BMI).

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

95% CI = 95 per cent confidence interval.

Note that figures may not add to 100 per cent due to a proportion of 'don't know' or 'refused' responses.

Estimates have been age standardised to the 2006 Victorian population.

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

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

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

Body weight status

Table 4.5: Body weight status^(a), by sex and LGA, 2008

LGA	Males						Females					
	Overweight (25.0–29.9)			Obese (≥30.0)			Overweight (25.0–29.9)			Obese (≥30.0)		
	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI
Alpine (S)	46.3	36.4	56.5	15.8	10.2	23.8	36.6	30.5	43.1	15.4	11.5	20.3
Ararat (RC)	54.3	46.5	61.9	14.7	9.6	21.7	24.5	19.3	30.6	25.7	19.0	33.8
Ballarat (C)	36.8	29.1	45.2	19.0	13.3	26.6	22.9	17.8	29.1	20.2	15.5	25.9
Banyule (C)	41.3	33.3	49.7	17.8	12.3	24.9	26.1	21.1	31.7	16.2	11.7	21.9
Bass Coast (S)	31.6	24.9	39.3	22.9	15.6	32.4	26.8	20.6	34.1	13.9	10.0	18.8
Baw Baw (S)	38.4	29.6	48.0	18.1	12.3	25.9	31.7	25.8	38.3	16.3	11.9	22.1
Bayside (C)	45.1	36.5	54.0	12.1	7.5	19.1	17.3	12.6	23.2	10.0	6.7	14.6
Benalla (RC)	46.5	36.7	56.5	17.3	11.6	25.0	25.2	19.6	31.7	21.3	15.8	28.0
Boroondara (C)	31.1	24.4	38.7	9.5*	5.0	17.3	19.1	14.6	24.6	6.0	3.7	9.7
Brimbank (C)	40.0	33.3	47.1	23.3	17.1	30.9	22.9	18.1	28.4	18.4	14.3	23.2
Buloke (S)	36.9	31.3	42.9	39.9	33.5	46.6	30.5	22.8	39.5	17.4	12.7	23.3
Campaspe (S)	40.0	31.1	49.7	21.5	14.9	30.0	37.9	31.2	45.1	16.7	13.0	21.1
Cardinia (S)	42.5	34.3	51.2	18.8	13.4	25.7	25.8	20.3	32.3	23.3	18.1	29.6
Casey (C)	47.6	39.7	55.6	17.9	12.8	24.5	19.0	15.0	23.8	22.8	17.9	28.5
Central Goldfields (S)	32.0	24.5	40.6	21.7	14.4	31.5	24.5	19.0	31.0	20.7	16.0	26.2
Colac-Otway (S)	38.5	30.0	47.6	19.0	13.3	26.5	29.5	23.9	35.9	16.6	12.2	22.2
Corangamite (S)	42.3	33.2	52.0	19.4	13.2	27.6	22.9	17.8	29.0	23.9	18.4	30.3
Darebin (C)	39.3	31.8	47.2	17.4	12.3	24.0	20.1	15.8	25.2	16.2	12.3	21.0
East Gippsland (S)	57.9	48.1	67.2	13.5	9.0	19.9	28.4	22.3	35.5	17.9	11.2	27.5
Frankston (C)	37.7	29.9	46.2	18.0	12.4	25.5	22.8	18.1	28.3	21.6	17.0	26.9
Gannawarra (S)	46.6	36.9	56.6	13.3	8.9	19.5	20.0	15.4	25.7	21.4	16.8	26.8
Glen Eira (C)	38.4	30.5	46.9	16.3	11.0	23.5	24.3	18.5	31.2	9.1	6.2	13.1
Glenelg (S)	45.6	35.5	56.1	25.4	18.5	33.8	26.0	20.9	31.8	22.9	17.4	29.6
Golden Plains (S)	35.9	28.6	43.9	18.0	12.4	25.2	26.4	21.0	32.6	17.2	13.2	22.1
Greater Bendigo (C)	46.6	37.7	55.6	19.6	13.6	27.4	27.1	22.3	32.6	21.8	16.5	28.1
Greater Dandenong (C)	31.7	25.1	39.1	17.1	12.0	23.8	23.1	17.7	29.5	17.4	12.9	23.0
Greater Geelong (C)	42.2	32.6	52.4	17.9	12.8	24.4	31.4	25.3	38.3	16.7	12.6	21.7
Greater Shepparton (C)	38.6	30.4	47.4	24.6	18.4	32.1	20.1	15.8	25.1	22.3	16.8	29.0
Hepburn (S)	32.9	26.0	40.7	21.5	13.9	31.7	26.5	20.6	33.4	13.7	10.2	18.2
Hindmarsh (S)	41.8	33.5	50.5	22.1	15.7	30.2	32.3	27.2	37.9	22.6	17.7	28.2
Hobsons Bay (C)	52.5	44.0	60.8	18.0	12.8	24.6	28.2	22.8	34.2	13.7	10.0	18.3
Horsham (RC)	46.2	38.1	54.6	20.6	14.6	28.1	26.2	21.2	31.8	17.2	13.0	22.5
Hume (C)	31.5	24.9	39.0	26.8	20.9	33.7	28.6	23.6	34.1	20.1	15.4	25.8
Indigo (S)	36.9	29.9	44.5	16.2	10.9	23.4	26.2	19.9	33.7	21.6	16.0	28.6
Kingston (C)	39.7	31.2	48.8	12.5	8.2	18.5	24.6	19.2	31.0	13.6	9.6	18.8
Knox (C)	40.9	32.7	49.5	19.1	13.6	26.3	23.6	18.1	30.0	15.4	11.6	20.2
Latrobe (C)	42.8	34.2	51.9	17.5	12.0	24.9	25.8	20.4	32.0	21.9	16.9	27.9
Loddon (S)	47.4	37.7	57.3	15.6	11.1	21.4	24.4	17.9	32.3	21.6	15.3	29.6
Macedon Ranges (S)	40.3	32.0	49.2	20.3	13.7	29.0	31.6	23.6	40.8	18.6	13.5	25.1
Manningham (C)	40.5	32.5	49.1	12.9	8.7	18.8	22.3	17.2	28.3	15.2	11.0	20.6

(a) Determined by calculation of body mass index (BMI).

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

95% CI = 95 per cent confidence interval.

LGA = local government area.

Estimates have been age standardised to the 2006 Victorian population.

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

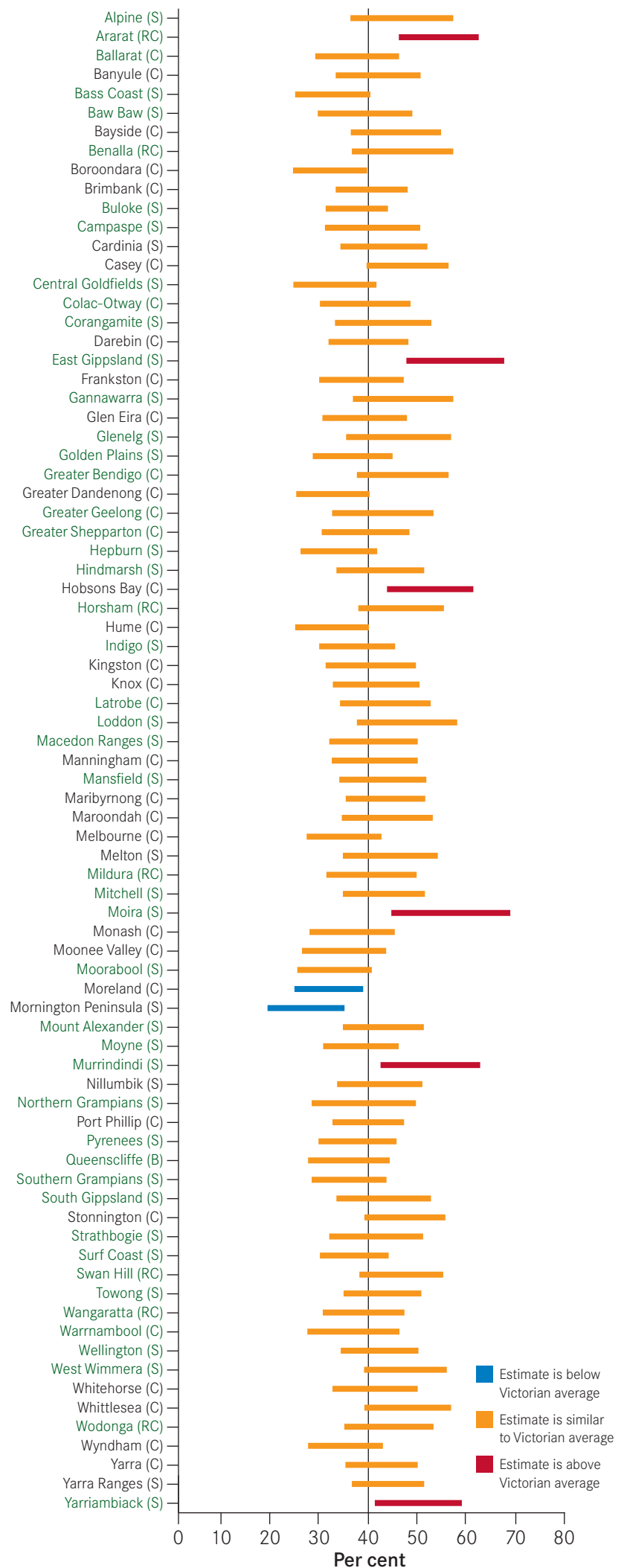
* Estimate has a relative standard error of between 25 and 50 per cent and should be interpreted with caution.

Table 4.5: Body weight status^(a), by sex and LGA, 2008 (continued)

LGA	Males						Females					
	Overweight (25.0–29.9)			Obese (≥30.0)			Overweight (25.0–29.9)			Obese (≥30.0)		
	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI
Mansfield (S)	42.3	34.1	50.9	17.7	12.8	24.0	22.1	16.8	28.6	16.6	11.8	22.8
Maribyrnong (C)	42.9	35.4	50.7	13.0	8.9	18.4	22.1	17.4	27.6	10.2	7.1	14.5
Maroondah (C)	43.2	34.6	52.3	20.4	14.2	28.3	25.1	19.7	31.2	11.6	8.2	16.1
Melbourne (C)	34.1	27.3	41.6	10.0	6.5	15.0	14.2	9.2	21.2	11.1	7.3	16.6
Melton (S)	43.9	34.8	53.4	22.5	16.8	29.6	24.9	19.9	30.6	24.5	20.0	29.6
Mildura (RC)	39.8	31.4	48.9	29.1	21.5	38.0	26.2	20.9	32.2	20.8	16.0	26.6
Mitchell (S)	42.5	34.8	50.7	19.1	13.7	25.9	27.7	22.3	33.8	23.5	17.4	31.0
Moira (S)	57.1	44.9	68.4	13.3	9.1	19.0	26.4	20.8	32.9	22.3	17.2	28.4
Monash (C)	35.7	27.9	44.4	13.4	8.6	20.2	20.1	15.8	25.2	18.8	14.7	23.8
Moonee Valley (C)	34.0	26.3	42.6	23.2	16.8	31.1	23.6	18.7	29.4	12.3	9.1	16.2
Moorabool (S)	32.1	25.4	39.6	26.9	19.5	35.8	26.9	21.4	33.2	22.5	16.5	29.9
Moreland (C)	30.9	24.8	37.8	20.0	14.9	26.2	29.2	23.4	35.8	17.5	13.2	22.8
Mornington Peninsula (S)	25.8	19.1	33.9	20.2	13.6	29.1	28.0	22.0	34.9	16.7	12.0	22.8
Mount Alexander (S)	42.4	34.8	50.4	16.4	11.2	23.4	22.4	17.2	28.7	21.9	16.3	28.8
Moyne (S)	37.6	30.7	45.2	21.0	15.1	28.4	24.5	19.4	30.6	20.1	15.6	25.5
Murrindindi (S)	52.5	42.7	62.2	12.2	8.4	17.2	36.4	28.2	45.6	13.6	9.4	19.2
Nillumbik (S)	41.6	33.6	50.1	14.5	9.7	21.1	20.3	15.5	26.1	8.5	5.5	12.9
Northern Grampians (S)	38.0	28.3	48.8	22.1	15.2	31.0	23.8	18.3	30.3	23.8	18.4	30.2
Port Phillip (C)	39.3	32.7	46.3	10.2	6.9	15.0	18.3	14.0	23.4	8.7	5.8	12.9
Pyrenees (S)	36.9	29.7	44.8	32.5	23.7	42.7	28.5	22.7	35.1	17.5	13.2	22.7
Queenscliffe (B)	35.0	27.5	43.3	6.4*	3.3	11.9	19.2	14.3	25.2	7.5	4.8	11.3
Southern Grampians (S)	35.1	28.3	42.7	19.1	13.8	25.9	25.5	20.0	31.8	16.2	12.0	21.6
South Gippsland (S)	42.5	33.5	52.0	24.3	17.5	32.6	30.1	23.3	37.8	22.2	16.1	29.7
Stonnington (C)	47.0	39.3	54.9	7.0*	3.3	14.5	16.7	12.3	22.2	9.2	6.2	13.3
Strathbogie (S)	40.8	32.0	50.3	24.1	17.3	32.5	33.5	25.6	42.4	18.1	12.9	24.7
Surf Coast (S)	36.3	30.0	43.1	15.1*	8.6	25.0	20.4	15.5	26.4	12.9	9.0	18.1
Swan Hill (RC)	46.3	38.3	54.5	18.5	11.3	28.7	30.0	23.6	37.3	22.5	16.7	29.7
Towong (S)	42.2	35.0	49.9	25.8	20.6	31.8	24.7	19.5	30.8	25.6	20.0	32.1
Wangaratta (RC)	38.2	30.6	46.4	29.6	20.9	40.2	29.3	22.4	37.2	20.9	16.5	26.3
Warrnambool (C)	35.9	27.4	45.3	25.5	18.7	33.7	27.0	21.2	33.7	17.9	13.5	23.3
Wellington (S)	41.6	34.4	49.3	20.3	14.1	28.3	30.4	25.1	36.3	18.3	13.5	24.3
West Wimmera (S)	47.2	39.2	55.2	23.3	17.3	30.6	30.9	24.1	38.7	22.0	15.5	30.1
Whitehorse (C)	40.7	32.7	49.2	14.6	10.2	20.3	25.0	19.9	30.8	10.1	7.3	13.7
Whittlesea (C)	47.6	39.3	56.1	17.0	11.9	23.8	28.8	23.8	34.4	19.1	15.1	24.0
Wodonga (RC)	43.6	35.1	52.5	19.2	14.1	25.7	25.3	20.3	31.0	21.9	17.1	27.7
Wyndham (C)	34.4	27.6	41.9	23.9	18.3	30.7	28.9	24.2	34.2	18.9	15.1	23.4
Yarra (C)	42.1	35.3	49.1	9.7*	5.9	15.5	22.7	17.6	28.6	10.4	7.2	14.8
Yarra Ranges (S)	43.5	36.7	50.5	14.0	9.4	20.4	23.8	18.5	30.1	20.2	15.5	25.9
Yarriambiack (S)	49.9	41.5	58.4	18.5	12.9	25.7	28.0	22.0	34.9	21.3	15.6	28.4
Total	39.9	38.7	41.2	17.3	16.4	18.2	24.2	23.4	25.1	16.1	15.4	16.8

Table 4.5 and figure 4.4 show the proportion of overweight males by LGA. The highest proportion of overweight males was in East Gippsland (57.9 per cent) and the lowest in Mornington Peninsula (25.8 per cent). There was a higher proportion of overweight males in East Gippsland (57.9 per cent), Moira (57.1 per cent), Ararat (54.3 per cent), Hobsons Bay (52.5 per cent), Murrindindi (52.5 per cent) and Yarriambiack (49.9 per cent), compared with all Victorian males (39.9 per cent).

Figure 4.4: Proportion of males who were overweight (BMI 25.0–29.9), by LGA, 2008



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

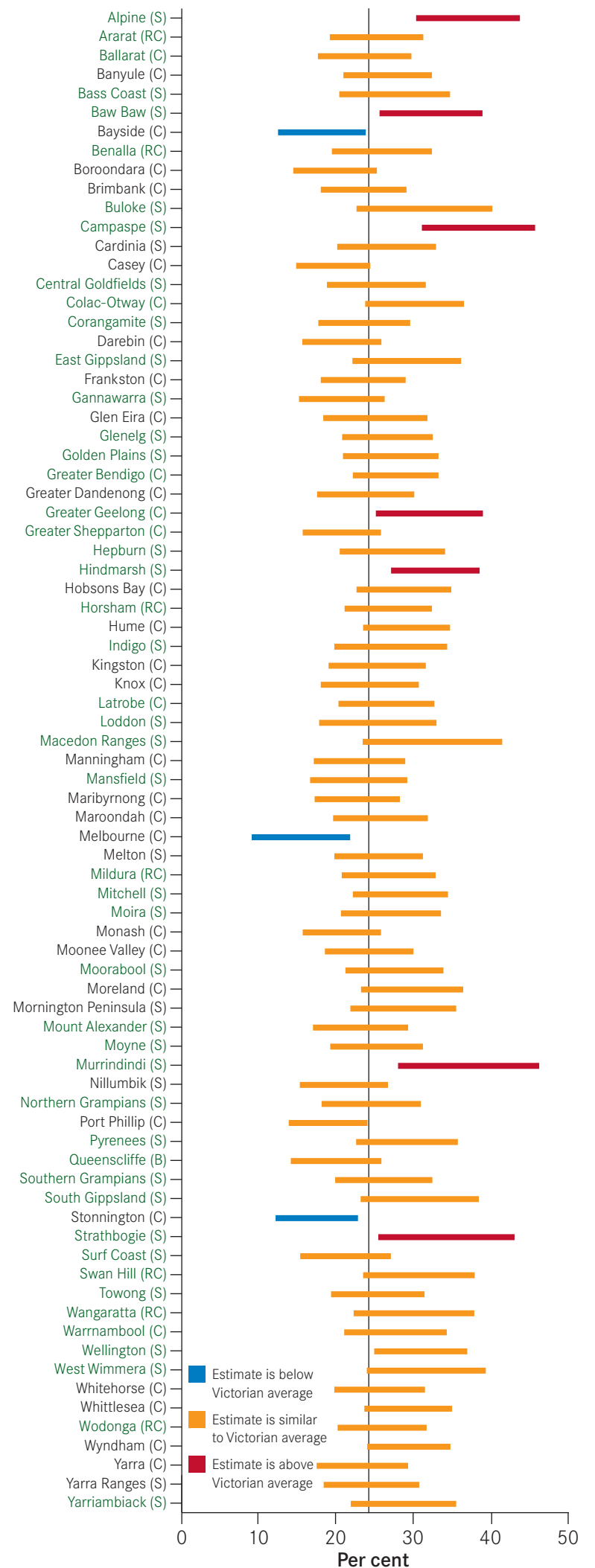
LGA = local government area.

Data are age standardised to the 2006 Victorian population.

The line on the graph is the Victorian estimate, it does not show the 95% CI. See the relevant table for the 95% CI for Victoria (Total).

Table 4.5 and figure 4.5 show the proportion of overweight females by LGA. The highest proportion of overweight females was in Campaspe (37.9 per cent) and the lowest in Melbourne (14.2 per cent). There was a higher prevalence of overweight females in Campaspe (37.9 per cent), Alpine (36.6 per cent), Murrindindi (36.4 per cent), Strathbogie (33.5 per cent), Hindmarsh (32.3 per cent), Baw Baw (31.7 per cent) and Greater Geelong (31.4 per cent), compared with all Victorian females (24.2 per cent).

Figure 4.5: Proportion of females who were overweight (BMI 25.0–29.9), by LGA, 2008



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

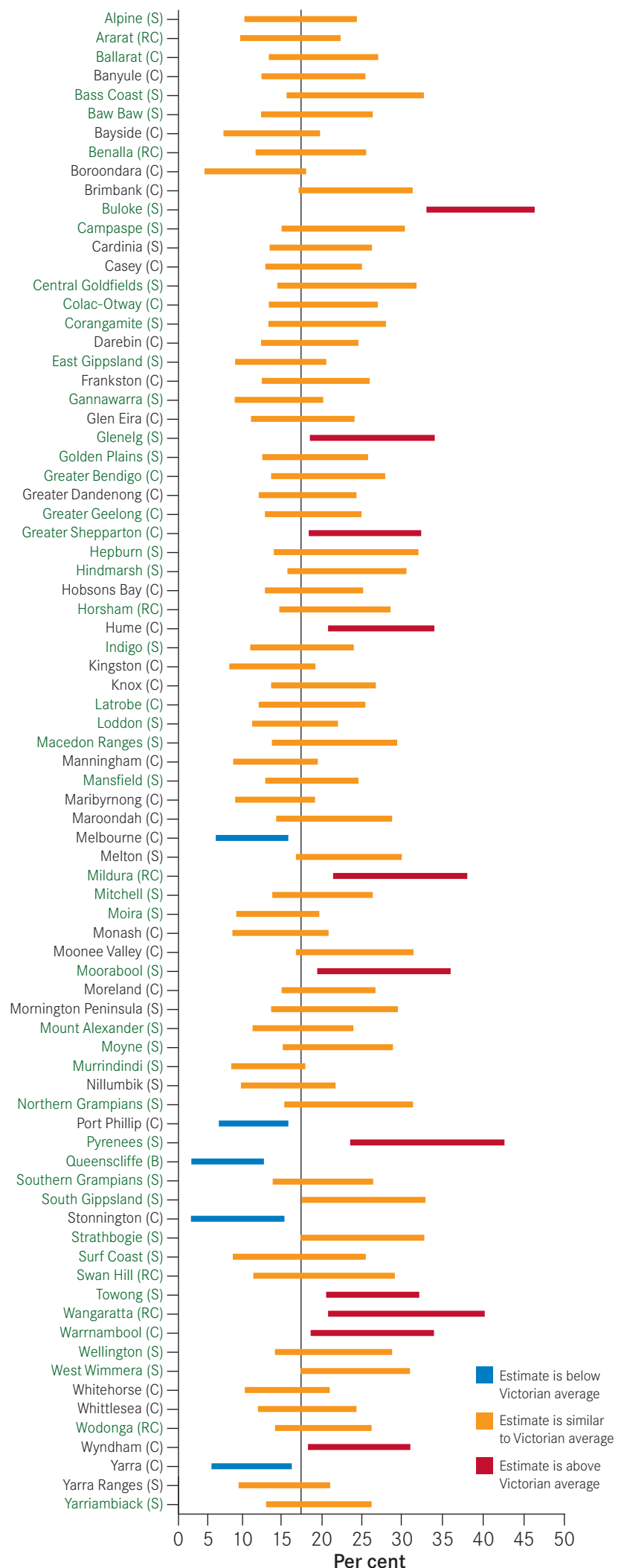
LGA = local government area.

Data are age standardised to the 2006 Victorian population.

The line on the graph is the Victorian estimate, it does not show the 95% CI. See the relevant table for the 95% CI for Victoria (Total).

Table 4.5 and figure 4.6 show the proportion of obese males by LGA. There was a higher proportion of obese males in Buloke (39.9 per cent), Pyrenees (32.5 per cent), Wangaratta (29.6 per cent), Mildura (29.1 per cent), Moorabool (26.9 per cent), Hume (26.8 per cent), Towong (25.8 per cent), Warrnambool (25.5 per cent), Glenelg (25.4 per cent), Greater Shepparton (24.6 per cent) and Wyndham (23.9 per cent), compared with all Victorian males (17.3 per cent).

Figure 4.6: Proportion of males who were obese (BMI ≥30.0), by LGA, 2008



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

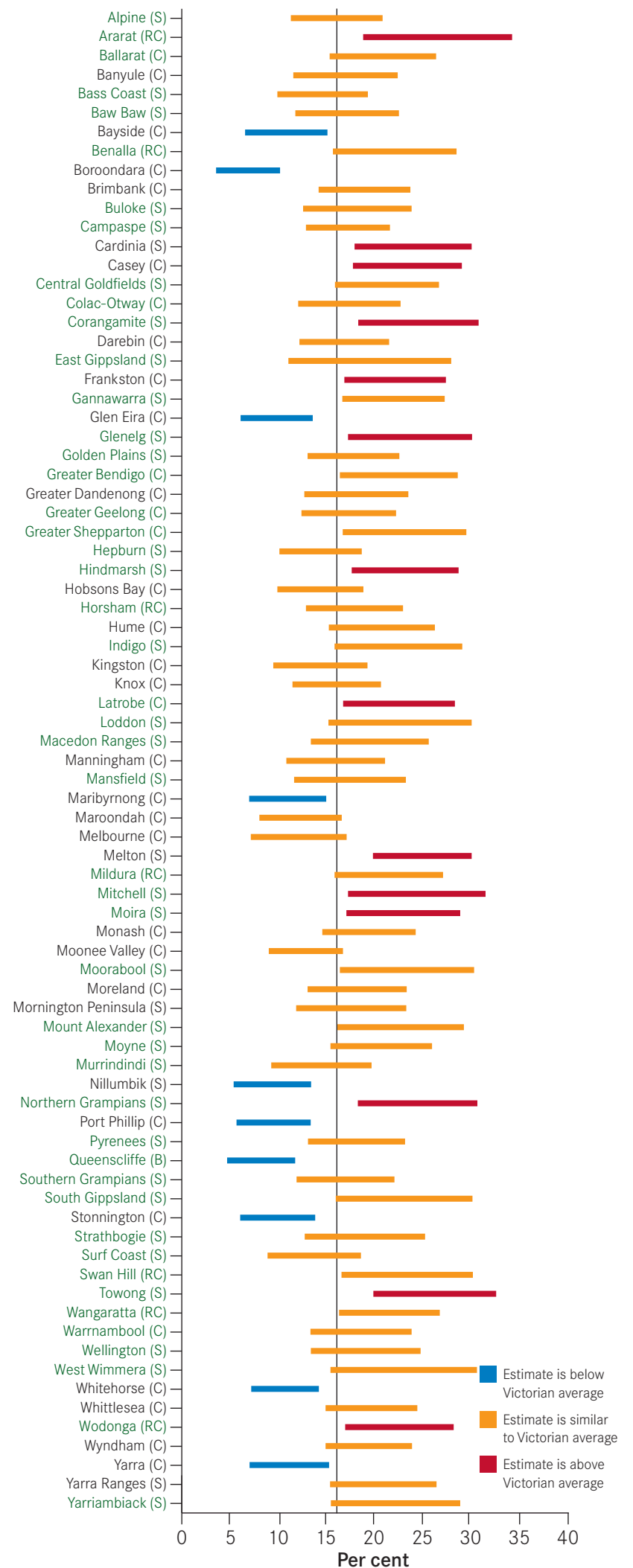
LGA = local government area.

Data are age standardised to the 2006 Victorian population.

The line on the graph is the Victorian estimate, it does not show the 95% CI. See the relevant table for the 95% CI for Victoria (Total).

Table 4.5 and figure 4.7 show the proportion of obese females by LGA. There was a higher proportion of obese females in Ararat (25.7 per cent), Towong (25.6 per cent), Melton (24.5 per cent), Corangamite (23.9 per cent), Northern Grampians (23.8 per cent), Mitchell (23.5 per cent), Cardinia (23.3 per cent), Glenelg (22.9 per cent), Casey (22.8 per cent), Hindmarsh (22.6 per cent), Moira (22.3 per cent), Latrobe (21.9 per cent), Wodonga (21.9 per cent) and Frankston (21.6 per cent), compared with all Victorian females (16.1 per cent).

Figure 4.7: Proportion of females who were obese (BMI ≥30.0), by LGA, 2008



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

LGA = local government area.

Data are age standardised to the 2006 Victorian population.

The line on the graph is the Victorian estimate, it does not show the 95% CI. See the relevant table for the 95% CI for Victoria (Total).

Body mass index by selected health indicators

Table 4.6 shows BMI status by selected health indicators for males. The table shows that males who were non-drinkers, current smokers, or had very high levels of psychological stress, had lower rates of overweight body weight, compared with all Victorian males. Males who had lower levels of self-reported health, and very high levels of psychological distress, had higher rates of obesity.

Table 4.6: Body weight status^(a), by selected health indicators, males, 2008

	Underweight (<18.5)			Normal (18.5–24.9)			Overweight (25.0–29.9)			Obese (≥30.0)		
	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI
Physical activity^(b)												
Sedentary	**			35.8	30.0	41.9	38.6	32.6	45.1	18.2	14.9	22.1
Insufficient time and/or sessions	1.4*	0.8	2.4	35.4	32.8	38.1	40.5	38.0	43.1	18.7	16.8	20.8
Sufficient time and sessions	0.7	0.5	1.0	40.3	38.6	42.0	40.4	38.7	42.0	16.1	15.0	17.3
Alcohol consumption^(c)												
At risk or high risk of long-term harm	3.5*	1.7	7.1	31.5	26.1	37.5	41.2	35.7	47.0	21.6	17.3	26.7
At risk or high risk of short-term harm	0.9	0.6	1.3	35.8	34.0	37.5	42.0	40.3	43.8	18.1	16.8	19.6
Abstainer from alcohol	1.7*	0.9	3.2	41.9	38.1	45.8	33.6	30.0	37.4	17.7	15.2	20.6
Nutrition^(d)												
Met guidelines for fruit and vegetable consumption	**			44.1	36.6	52.0	41.1	34.0	48.7	10.7	7.6	14.7
Met guidelines for vegetable consumption	**			45.0	38.5	51.7	38.5	32.2	45.3	13.5	10.3	17.5
Met guidelines for fruit consumption	0.7*	0.4	1.2	39.4	37.4	41.5	41.6	39.6	43.7	15.6	14.3	17.0
Did not meet guidelines for either fruit or vegetables	1.1	0.8	1.5	37.8	36.1	39.6	39.5	37.8	41.2	18.3	17.0	19.6
Smoking status												
Non-smoker	0.6	0.4	0.9	41.0	39.2	42.8	39.6	37.9	41.4	16.0	14.8	17.4
Ex-smoker	1.5*	0.6	3.9	35.4	32.2	38.8	41.8	38.8	44.8	18.2	16.2	20.4
Current	1.8	1.2	2.7	41.6	38.6	44.6	35.3	32.6	38.2	17.0	14.8	19.4
Self-rated health												
Excellent or very good	0.6	0.4	0.9	46.7	44.7	48.8	40.5	38.5	42.5	9.5	8.5	10.7
Good	1.0	0.6	1.6	34.8	32.8	36.9	41.4	39.3	43.5	19.7	18.1	21.3
Fair or poor	1.5*	0.8	2.6	27.9	25.1	30.9	36.3	33.4	39.3	29.3	26.6	32.2
Level of psychological distress^(e)												
Low to moderate (< 22)	0.9	0.6	1.2	38.6	37.2	40.0	40.7	39.3	42.1	16.6	15.7	17.7
High (22–29)	**			39.1	34.7	43.7	36.3	32.1	40.7	20.5	17.2	24.2
Very high (30–50)	2.2*	0.9	5.4	39.2	32.9	45.9	30.7	24.0	38.2	24.8	19.5	31.0
Total	0.9	0.7	1.2	38.6	37.3	40.0	39.9	38.7	41.2	17.3	16.4	18.2

(a) Based on Body Mass Index (BMI) score.

(b) Based on national guidelines (DoHA 1999) and excludes adults aged less than 19 years.

(c) Based on national guidelines (NHMRC 2001).

(d) Based on national guidelines (NHMRC 2003).

(e) Based on Kessler 10 Psychological Distress Scale (K10).

95% CI = 95 per cent confidence interval.

Note that figures may not add to 100 per cent due to a proportion of 'don't know' or 'refused' responses.

Data are age standardised to the 2006 Victorian population.

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

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

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

Table 4.7 shows BMI status by selected health indicators for females. The table shows that females who were ex-smokers had higher rates of overweight body weight, compared with all Victorian females. Females who engaged in insufficient physical activity to meet the levels recommended in the national guidelines, were non-drinkers, those who rated their health status as fair, poor or good and those with high to very high levels of psychological distress, had higher rates of obese body weight compared with all Victorian females.

Table 4.7: Body weight status^(a), by selected health indicators, females, 2008

	Underweight (<18.5)			Normal (18.5–24.9)			Overweight (25.0–29.9)			Obese (≥30.0)		
	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI	%	Lower 95% CI	Upper 95% CI
Physical activity^(b)												
Sedentary	6.7*	3.4	12.7	43.1	37.5	48.9	20.6	17.1	24.6	19.8	16.8	23.2
Insufficient time and/or sessions	3.1	2.4	4.2	46.2	44.1	48.4	23.6	21.9	25.4	19.0	17.6	20.6
Sufficient time and sessions	4.0	3.3	4.8	49.8	48.4	51.2	25.3	24.2	26.5	14.3	13.4	15.2
Alcohol consumption^(c)												
At risk or high risk of long-term harm	2.9*	1.5	5.6	52.8	46.8	58.7	23.5	19.1	28.6	10.5	7.6	14.5
At risk or high risk of short-term harm	3.2	2.5	4.0	49.5	47.7	51.3	25.9	24.4	27.6	14.4	13.3	15.6
Abstainer from alcohol	3.8	2.8	5.2	45.2	42.8	47.7	22.0	20.1	23.9	19.5	17.9	21.1
Nutrition^(d)												
Met guidelines for fruit and vegetable consumption	2.8	1.9	4.3	49.8	45.5	54.2	26.9	23.2	31.0	14.3	12.1	16.9
Met guidelines for vegetable consumption	3.1	2.1	4.4	49.0	45.4	52.6	26.8	23.7	30.1	14.9	12.8	17.1
Met guidelines for fruit consumption	3.3	2.7	4.0	49.5	48.0	51.0	24.9	23.7	26.2	15.7	14.8	16.7
Did not meet guidelines for either fruit or vegetables	3.8	3.1	4.6	46.8	45.2	48.4	23.4	22.1	24.7	16.7	15.7	17.8
Smoking status												
Non-smoker	3.5	2.9	4.2	50.0	48.6	51.3	22.8	21.8	23.9	15.6	14.8	16.6
Ex-smoker	2.1	1.5	2.8	45.4	42.5	48.3	28.7	26.1	31.5	17.0	15.4	18.7
Current	5.6	4.2	7.4	46.1	43.5	48.8	23.9	21.9	26.0	16.0	14.4	17.8
Self-rated health												
Excellent or very good	3.9	3.2	4.7	58.3	56.8	59.9	23.2	22.0	24.4	9.4	8.7	10.3
Good	2.5	2.0	3.1	43.4	41.7	45.2	25.9	24.5	27.4	18.8	17.6	20.1
Fair or poor	5.3	3.9	7.2	29.8	27.4	32.4	24.3	22.2	26.6	29.0	26.8	31.3
Level of psychological distress^(e)												
Low to moderate (< 22)	3.2	2.7	3.8	49.8	48.6	51.0	24.4	23.5	25.4	15.1	14.4	15.9
High (22–29)	4.8	3.5	6.5	41.1	38.0	44.4	24.3	21.6	27.2	22.4	19.8	25.2
Very high (30–50)	6.6*	3.9	11.1	32.1	27.5	37.0	22.2	18.3	27.5	26.7	22.4	31.6
Total	3.6	3.1	4.1	48.1	47.1	49.2	24.2	23.4	25.1	16.1	15.4	16.8

(a) Based on Body Mass Index (BMI) score.

(b) Based on national guidelines (DoHA 1999) and excludes adults aged less than 19 years.

(c) Based on national guidelines (NHMRC 2001).

(d) Based on national guidelines (NHMRC 2003).

(e) Based on Kessler 10 Psychological Distress Scale (K10).

95% CI = 95 per cent confidence interval.

Note that figures may not add to 100 per cent due to a proportion of 'don't know' or 'refused' responses.

Data are age standardised to the 2006 Victorian population.

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

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

References

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

NHMRC (National Health and Medical Research Council) 2001, *Alcohol guidelines for Australian adults*, NHMRC, Canberra.

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

WHO (World Health Organisation) 2000, *Obesity: preventing and managing the global epidemic*, WHO technical report series 894, WHO, Geneva.