



Nutrition: Findings from the Canadian Community Health Survey

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Measured Obesity

Adult obesity in Canada: Measured height and weight

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- In 2004, nearly one-quarter (23.1%) of adult Canadians, 5.5 million people aged 18 or older, were obese. An additional 36.1% (8.6 million) were overweight.
- The 2004 obesity figure was up substantially from 1978/79, when Canada's obesity rate had been 13.8%.
- As body mass index (BMI) increases, so does an individual's likelihood of reporting high blood pressure, diabetes and heart disease.
- Obese individuals tend to have sedentary leisure-time pursuits and to consume fruits and vegetables relatively infrequently.
- Canada's adult obesity rate is significantly lower than that in the United States: 23.1% compared with 29.7%.

The percentage of Canadians who are overweight or obese has risen dramatically in recent years, mirroring a worldwide phenomenon.¹⁻⁴ The health consequences of excess weight are well known. It is a risk factor for type 2 diabetes, cardiovascular disease, high blood pressure, osteoarthritis, some cancers and gallbladder disease.⁵⁻⁷ As well, psychosocial problems, functional limitations and disabilities are associated with excess weight.^{5,8}

For more than a decade, information about the weight of Canadians has been based on self-reports, that is, survey respondents reported their own height and weight rather than being measured and weighed. However, such data are known to underestimate the prevalence of overweight and obesity.⁹⁻¹² The 2004 Canadian Community Health Survey: Nutrition (CCHS), which directly measured respondents' height and weight, makes it possible to draw a more accurate picture (see *Appendix A: Data sources and analytical techniques*).

Majority overweight or obese

According to the 2004 CCHS, 23.1% of Canadians aged 18 or older, an estimated 5.5 million adults, had a body mass index (BMI) of 30 or more, indicating that they were obese (Table 1) (see *Appendix B: What is BMI?*). This is significantly higher than estimates derived from self-reported data collected in 2003, which yield an obesity rate of 15.2% (see *Appendix C: Methodology makes a difference*). Another 8.6 million, or 36.1%, were overweight.

Among people who are obese, BMIs vary greatly. As a result, obesity is divided into three categories, with successive values representing escalating health risks.^{3,5} People in Class I (BMI 30.0 to 34.9) have a high risk of developing health problems. For those in Class II (BMI 35.0 to 39.9), the risk is

very high, and in Class III (BMI 40 or more), extremely high. In 2004, 15.2% of Canadian adults had a BMI in Class I; 5.1% were in Class II, and 2.7%, in Class III (Table 1).

Sharp increase

In 1978/79, the Canada Health Survey collected measured height and weight data for a nationally representative sample of adults. That year, the age-adjusted obesity rate was 13.8%, far below the 2004 rate of 23.1% (Table 2). The increase was evident in each of the three obesity categories, especially Class II and Class III. The proportion of adults in Class II went from 2.3% to 5.1%; in Class III, from 0.9% to 2.7%

The obesity rate of every age group except 65 to 74 rose during this period (Chart 1). The most striking increases were among people younger than 35 and 75 or older. For instance, the percentage of 25- to 34-year-olds who were obese more than doubled, rising from 8.5% in 1978/79 to 20.5% in 2004. The extent of the increase among people aged 75 or older was about the same: from 10.6% to 23.6%.

The average BMI of adults rose from 25.1 in 1978/79 to 27.0 in 2004, and the BMI distribution of the adult population shifted toward the heavy end of the continuum (Chart 2).

Peaks in middle-age

In 2004, men and women were equally likely to be obese: 22.9% and 23.2%, respectively. However, when the three obesity categories are examined separately, a difference between the sexes emerges. A higher percentage of women than men were in Class III (Table 1, Chart 3).

For both sexes, obesity rates were lowest at ages 18 to 24 (10.7% of men and 12.1% of women), and peaked around 30% among 45- to 64-year-olds (Chart 4). The percentage of seniors who were obese was lower at about 25%.

Provincial differences

With a few notable exceptions, obesity rates did not vary greatly by province (Chart 5). In 2004, men's rate was significantly above the national level (22.9%) in Newfoundland and Labrador (33.3%) and Manitoba (30.4%). Women's rate surpassed the national figure (23.2%) in Newfoundland and Labrador (34.5%), Nova Scotia (30.3%) and Saskatchewan (32.9%).

Canada-United States

While Canada's obesity rates have, for the most part, been based on self-reported data, the United States has derived rates from actual measurements of height and weight since the early 1960s. With the directly

measured data from the 2004 CCHS, it is possible to compare the prevalence of obesity in the two countries.

Age-standardized results show that 29.7% of Americans aged 18 or older were obese in 1999-2002, significantly above the 2004 figure for Canada (23.1%). Most of this difference was attributable to the situation among women. Whereas 23.2% of Canadian women were obese, the figure for American women was 32.6%. As well, each obesity category (Class I, II and III) accounted for a higher percentage of American than Canadian women (Table 3). The difference in obesity rates between American and Canadian women prevailed in all age groups except 45 to 54 and 75 or older (Chart 6).

The obesity rate of Canadian men was 22.9%, significantly below the age-adjusted American rate of 26.7%. However, this was mainly a reflection of Class III obesity: American men were much more likely to have a BMI of 40 or more. The percentages of Canadian and American men whose BMI put them in Class I or II were statistically similar. American men aged 18 to 24, 35 to 44 and 65 to 74 were more likely than their Canadian counterparts to be obese (Chart 7).

The racial make-up of the two countries might explain some of the differences, as research has shown that obesity rates vary by ethnic origin.¹³ Nonetheless, when obesity rates of White Americans and Canadians are compared, White women in the United States were significantly more likely than those in Canada to be obese: 30.3% versus 24.8% (Table 3) (see *Appendix D: Definitions*). However, the percentages of White American and Canadian men who were obese did not differ.

In Canada, people of Aboriginal origin (off-reserve) had a significantly high obesity rate—37.6%—about 1.6 times higher than the national average (Tables A, B and C). These results are consistent with other research based on self-reported data.¹³

Related to lifestyle

As might be expected, the likelihood of being obese was related to diet and exercise. Men and women who ate fruit and vegetables less than three times a day were more likely to be obese than were those who consumed such foods five or more times a day (Chart 8). Although other factors may be driving this relationship, the association persisted when age and socio-economic status were taken into account. Another study has also shown obesity to be independently associated with infrequent consumption of fruit and vegetables.¹⁴ However, because the CCHS data are cross-sectional, the direction of this relationship cannot be determined (see *Appendix E: Limitations*).

Physical activity, too, was related to the prevalence of obesity. People whose leisure-time was sedentary were more likely than those who were physically active to be obese. For example, 27.0% of sedentary men were obese, compared with 19.6% of active men. Among women, obesity rates were high

not only for those who were sedentary, but also for those who were moderately active (Chart 9). These relationships remained statistically significant when adjustments were made to account for age and socio-economic status.

Socio-economic differences

Obesity rates varied by marital status for women, but not for men (Chart 10). About a quarter of married men and women aged 25 or older were obese. The rate was significantly higher among women who were widowed (30.0%). By contrast, the percentages of married, separated/divorced, widowed and never-married men who were obese were not significantly different.

The association between education and obesity was not straightforward. Men aged 25 to 64 with no more than secondary graduation had significantly high obesity rates, compared with men who were postsecondary graduates (Chart 11). Among women, those with less than secondary graduation were more likely than postsecondary graduates to be obese. As well, the obesity rate of women who had some, but had not completed, postsecondary education was high.

Men in lower-middle income households were less likely to be obese than were those in the highest income households. For women, those in middle and upper-middle income households had significantly elevated obesity rates, compared with women in the highest income households (Chart 12). When age was taken into account, the results for men persisted, but for women, only those in middle income households had a significantly high obesity rate.

Chronic conditions

Being overweight or obese is a risk factor for a number of chronic conditions. Analysis of CCHS data reveals associations between excess weight and high blood pressure, diabetes, and heart disease.

In 2004, fewer than 10% of men and women whose BMI was in the normal range reported having high blood pressure. The figure rose to just over 15% among those who were overweight, and to more than 20% among those who were obese (Chart 13, Table 4). Even when age, marital status, education, household income, smoking status and leisure-time physical activity were taken into account, excess weight was strongly associated with reporting high blood pressure (Table 5) (see *Appendix E: Limitations*).

A high BMI is a risk factor for type 2 diabetes.¹⁵ Just 2.1% of men whose BMI was in the normal range reported having diabetes; the figure was 3.7% among overweight men, and almost tripled (to at least 11%) among those who were obese (Chart 14). The pattern was similar for women. And even when

the effects of the other factors were taken into consideration, men and women who were obese had significantly high odds of reporting diabetes (Table 5).

The prevalence of heart disease increased with BMI among men. While 2.8% of men with a normal BMI reported having heart disease, the figure was 6.0% among men who were overweight and almost 8% among those who were obese (Chart 15). Even when age, marital status, education, household income, smoking, and leisure-time physical activity were taken into account, the association between BMI and heart disease among men remained (Table 5).

For women, the prevalence of heart disease did not differ significantly by BMI, except for those in obese Class I who were slightly more likely to have it than were women whose BMI was in the normal range. But when the other demographic, socio-economic and lifestyle factors were considered, this relationship disappeared.

Concluding remarks

Although it has generally been known that obesity rates have risen dramatically in Canada over the past quarter century, the extent of the increase was uncertain, because estimates relied on self-reported data. Results from the 2004 Canadian Community Health Survey: Nutrition (CCHS), based on directly measured height and weight, indicate that 23% of adults were obese. This was up from 14% in 1978/79, but still below the obesity rate in the United States (30%). However, in 2004, another 36% of Canadians were overweight. Consequently, a majority of Canadians—almost 60%—were in a weight range that increased their risk of developing health problems. In fact, according to results of the CCHS, as BMI increases, so does the likelihood of having high blood pressure, diabetes and heart disease. And for many people, further weight gain is probable. Longitudinal research has shown that those who are overweight are far more likely to continue to gain weight than to lose it.¹⁶

Acknowledgement

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Appendix A

Data sources and analytical techniques

Data from the 2004 Canadian Community Health Survey (CCHS): Nutrition were used to produce overweight and obesity prevalence rates for adults aged 18 or older by selected demographic, lifestyle and socio-economic factors (see <http://www.statcan.ca/english/concepts/hs/index.htm#content>). The 2004 CCHS was designed to gather information at the provincial level on the nutritional status of the Canadian population (see <http://www.statcan.ca/english/concepts/hs/index.htm#content>). It does not include residents of the three Territories, Indian reserves and some remote areas, and regular members of the Canadian Armed Forces. The response rate was 76.5%. The height and weight of 57.5% of adults (18 or older) who responded to the survey were directly measured (see *Appendix E: Limitations*).

Overweight and obesity rates for American adults were estimated from the 1999-2002 National Health and Nutrition Examination Survey (NHANES). The NHANES obtained measured height and weight data for 9,488 respondents aged 18 or older.

Historical estimates of Canadian obesity rates, based on directly measured height and weight, are from the 1978/79 Canada Health Survey and the Canadian Heart Health Surveys that took place in different provinces during the 1986 to 1992 period. Rates based on self-reported data are from the 1985 and 1990 Health Promotion Survey; the 1994/95, 1996/97 and 1998/99 National Population Health Survey (NPHS); and the 2000/01 and 2003 CCHS.

The American and Canadian historical estimates in this analysis are based on weighted data.

Descriptive statistics were used to estimate the proportion of adults who were obese in relation to selected characteristics (Tables A, B and C). Directly measured height and weight data were obtained for 12,428 CCHS respondents aged 18 or older. Because they represented just 57.5% of adults who responded to the 2004 CCHS, an adjustment was made to minimize non-response bias. A special sampling weight was created by redistributing the sampling weights of the non-respondents to the respondents using response propensity classes. Variables such as province, age, sex, household income, race, education, physical activity, fruit and vegetable consumption and chronic conditions were used to create the classes. The classes were created with the CHAID (Chi-Square Automatic Interaction Detector) algorithm available in Knowledge Seeker¹⁷ to identify the characteristics that best split the sample into groups that were dissimilar with respect to response/non-response. This adjusted weight was used to produce all estimates in this analysis. Standard errors and coefficients of variation were estimated using the bootstrap technique, which accounts for the survey design effects.¹⁸⁻²⁰

The body mass index (BMI) distribution (Chart 2) was smoothed by calculating three-point averages. For example, the percentage of the population with a BMI of 23 was calculated by summing

the percentage of people with a BMI of 22, the percentage with a BMI of 23 and the percentage with a BMI of 24, and then dividing the result by 3.

Standard errors and coefficients of variation for estimates from the 1978/79 Canada Health Survey and the 1999-2002 National Health and Nutrition Examination Survey (NHANES) were estimated with SUDAAN, which uses a Taylor series linearization method to account for the complex survey sample design.

To compare obesity rates between surveys, the data were age-standardized to the 2004 CCHS using the direct method. The following six age groups were used:

Age group	Population (2004)	Proportion
Total	23,985,070	1.000
18 to 24	3,144,054	.1311
25 to 34	3,826,186	.1595
35 to 44	5,105,776	.2129
45 to 54	4,797,883	.2000
55 to 64	3,340,787	.1393
65 or older	3,770,384	.1572

Logistic regression models were used to determine if associations between obesity and fruit and vegetable consumption and leisure-time physical activity remained when age, marital status, education and household income were taken into account.

Separate logistic regressions for each sex were used to model having high blood pressure, diabetes, and heart disease in relation to BMI. The model included the following control variables: age, marital status, education, household income, smoking status and leisure-time physical activity. Respondents who were underweight or had missing information for education, smoking status and leisure-time physical activity were excluded from the models.

Appendix B

What is BMI?

Overweight and obesity are based on body mass index (BMI), which is a measure of an individual's weight in relation to his or her height. BMI is highly correlated with body fat and is widely used to indicate health risks.⁵ According to new Canadian guidelines, aligned with those of the World Health Organization, BMI is classified into six categories, each representing a different level of risk:

	BMI range	Risk of developing health problems
Underweight	<18.5	Increased
Normal weight	18.5 to 24.9	Least
Overweight	25.0 to 29.9	Increased
Obese Class I	30.0 to 34.9	High
Obese Class II	35.0 to 39.9	Very high
Obese Class III	≥ 40.0	Extremely high

BMI is calculated as follows:

Metric: $BMI = \text{weight(kg)} / \text{height (metres)}^2$

Non-metric: $BMI = \text{weight(pounds)} / \text{height (inches)}^2 \times 703$

For example, the weight cut points for a 5'10" (1.78m) person and a 5'4" (1.63 m) person would be:

	Height 70''/1.78m		Height 64''/1.63m	
	Weight	Weight	Weight	Weight
	(pounds)	(kg)	(pounds)	(kg)
Underweight	128 or less	58.4 or less	107 or less	49.0 or less
Normal weight	129 - 173	58.5 - 79.0	108 - 145	49.1 - 66.2
Overweight	174 - 208	79.1 - 94.8	146 - 174	66.3 - 79.5
Obese Class I	209 - 243	94.9 - 110.7	175 - 203	79.6 - 92.8
Obese Class II	244 - 278	110.8 - 126.5	204 - 232	92.9 - 106.1
Obese Class III	279+	126.6+	233+	106.2+

Appendix C

Methodology makes a difference

In the United States, data from the National Health and Nutritional Examination Survey (NHANES) show sharp rises in the obesity rate among adults between 1976-1980 and 1988-1994, and again, between 1988-1994 and 1999-2002.²¹

In Canada, it is difficult to pinpoint when obesity rates increased, because of variations in the methods used to collect information on height and weight. Comparable obesity rates²² for adults aged 18 or older, based on directly measured height and weight, can be calculated for 1978/79, the 1986-1992 period, and 2004 (Chart 16) (see *Appendix A: Data sources and analytical techniques*). These data reveal little change in the obesity rate between 1978/79 and 1986-1992, but a substantial increase by 2004.

This rise is paralleled in self-reported data, although the percentages are consistently lower (Chart 16). Obesity rates based on self-reported data show a substantial increase between 1985 and 1994/95. Rates stabilized from 1994/95 to 2003.

Between 2003 and 2004, when the collection method changed from self-reported to directly measured data, obesity rates rose sharply. This is not surprising, as self-reports yield lower rates of overweight and obesity.⁹⁻¹² Women are inclined to underestimate their weight, while men tend to overestimate their height. Moreover, underreporting of weight increases with higher levels of BMI.²³

Another problem with overweight/obesity rates based on self-reports is variation in the mode of collection. Self-reported data from face-to-face interviews result in higher obesity rates than do data collected from telephone interviews.²⁴ In 1985 and 1990, all interviews were conducted by telephone; in 1994/95, almost all interviews took place in person; in 1996/97 and 1998/99, most were by telephone; in 2000/01, it was approximately half and half; and in 2003, about one-quarter were in person.

Appendix D

Definitions

The *frequency of fruit and vegetable consumption* was assessed with questions from the Behavioural Risk Factor Surveillance System in the United States.²⁵ Respondents were asked:

- 1) “How often do you usually drink fruit juices such as orange, grapefruit or tomato? (for example, once a day, three times a week, twice a month)”
- 2) “Not counting juice, how often do you usually eat fruit?”
- 3) “How often do you (usually) eat green salad?”
- 4) “How often do you usually eat potatoes, not including French fries, fried potatoes, or potato chips?”
- 5) “How often do you (usually) eat carrots?”
- 6) “Not counting carrots, potatoes or salad, how many servings of other vegetables do you usually eat?”

Physical activity level was based on total energy expenditure (EE) during leisure time. EE was calculated from the reported frequency and duration of all of a respondent’s leisure-time physical activities in the three months before his or her 2004 CCHS interview and the metabolic energy demand (MET value) of each activity, which was independently established.²⁶

$EE = \sum (N_i * D_i * MET_i / 365 \text{ days})$, where

N_i = number of occasions of activity i in a year,

D_i = average duration in hours of activity i , and

MET_i = a constant value for metabolic energy cost of activity i .

An EE of 3 or more kilocalories per kilogram per day (KKD) was defined as *active*; 1.5 to 2.9 KKD, *moderately active*, and less than 1.5 KKD, *sedentary*.

Four categories were established for current *marital status*: married or living common-law; divorced or separated; widowed; and never married.

Household income was based on the number of people in the household and total household income from all sources in the 12 months before the interview.

Household income group	People in household	Total household Income
Lowest	1 to 4 5 or more	Less than \$10,000 Less than \$15,000
Lower-middle	1 or 2 3 or 4 5 or more	\$10,000 to \$14,999 \$10,000 to \$19,999 \$15,000 to \$29,999
Middle	1 or 2 3 or 4 5 or more	\$15,000 to \$29,999 \$20,000 to \$39,999 \$30,000 to \$59,999
Upper-middle	1 or 2 3 or 4 5 or more	\$30,000 to \$59,999 \$40,000 to \$79,999 \$60,000 to \$79,999
Highest	1 or 2 3 or more	\$60,000 or more \$80,000 or more

Respondents were grouped into four *education* categories based on the highest level attained: less than secondary graduation, secondary graduation, some postsecondary, and postsecondary graduation.

To measure chronic conditions, respondents were asked about long-term physical conditions that had lasted or were expected to last six months or longer and that had been diagnosed by a health professional. Three conditions were considered for this analysis: *high blood pressure, diabetes and heart disease*.

Ethnicity was based on the question: “People living in Canada come from many different cultural and racial backgrounds. Are you:

1. White?”
2. Chinese?”
3. South Asian (e.g., East Indian, Pakistani, Sri Lankan, etc.)?”
4. Black?”
5. Filipino?”
6. Latin American?”
7. Southeast Asian (e.g., Cambodian, Indonesian, Laotian, Vietnamese, etc.)?”
8. Arab?”
9. West Asian (e.g., Afghan, Iranian, etc.)?”
10. Japanese?”
11. Korean?”
12. Aboriginal Peoples of North America (North American Indian, Métis, Inuit/Eskimo)?”
13. Other – specify.

For the comparison with the White population in the United States, category 1 was selected. Multiple responses across the categories defined here were coded to “other.” To compare ethnic groups in Canada, the following categories were used: White (1); Black (4); Southeast/East Asian (2, 5, 7, 10, 11); off-reserve Aboriginal (12); and Other (3, 6, 8, 9, 13). Multiple responses across the categories defined here were coded to “Other.”

Appendix E

Limitations

For various reasons, 42.5% of respondents who participated in the 2004 CCHS did not have their weight and height directly measured. This level of non-response might bias estimates if these people differed systematically from those for whom measurements were obtained. A special technique was employed to reduce the possibility of such bias (see *Appendix A: Data sources and analytical techniques*).

Reasons for not measuring a respondent's height and weight were: refusal (13.6%); measuring equipment unavailable (9.0%); too tall for interviewer to measure (7.1%); interview conducted by telephone (4.5%); interview setting a problem (3.5%); respondent's physical condition (1.8%); and other (3.0%). Overall, men had a lower response rate than women: 54% versus 61%.

Percentage distribution of respondents, by provision of directly measured data and reason for non-response

	Total	Men	Women
	%	%	%
Total	100.0	100.0	100.0
Measured	57.5	54.4	60.6
Not measured	42.5	45.6	39.4
Refusal	13.6	13.0	14.2
Measuring equipment	9.0	8.6	9.3
Too tall for interviewer			
to measure	7.1	11.5	2.8
Telephone interview	4.5	4.5	4.4
Interview setting	3.5	4.2	2.8
Physical condition	1.8	1.4	2.1
Other	3.0	2.3	3.8

Men's response rates differed significantly by age, province, and household income; women's, by province, fruit and vegetable consumption, marital status, and household income.

Response rates to directly measured height and weight, by selected characteristics					
	Men	Women		Men	Women
	%	%		%	%
Total	54	61	Province		
			Newfoundland and Labrador	67 ↑	73 ↑
Age group			Prince Edward Island	59	72 ↑
18-24	57	64	Nova Scotia	65 ↑	69 ↑
25-34	52	61	New Brunswick	43 ↓	63
35-44	56	58	Quebec	62 ↑	67 ↑
45-54	49 ↓	61	Ontario	48 ↓	53 ↓
55-64	56	62	Manitoba	66 ↑	69 ↑
65-74	59	59	Saskatchewan	51	64
75+	57	60	Alberta	57	62
			British Columbia	53	64
Marital status (age 25+)					
Married	54	62 ↑	Fruit/Vegetable consumption		
Widowed	54	60	Less than 2 times a day	54	60
Separated/Divorced	55	57	2 to less than 5 times a day	54	59
Never married	53	56	5 or more times a day	56	63 ↑
Education (aged 25 to 64)			Leisure time		
Less than secondary graduation	53	57	Active	57	59
Secondary graduation	56	65	Moderately active	56	61
Some postsecondary	47	56	Sedentary	53	61
Postsecondary graduation	53	60	High blood pressure		
Household income			Yes	56	60
Lowest	47	70 ↑	No	54	61
Lower-middle	54	65	Diabetes		
Middle	60 ↑	63	Yes	50	63
Upper-middle	57	65 ↑	No	55	61
Highest	53	58	Heart disease		
Missing	41 ↓	43 ↓	Yes	53	58
			No	55	61

↑Significantly above overall rate

↓Significantly below overall rate

Although body mass index (BMI) classifications using data from the 1978/79 Canada Health Survey (CHS), the 1986 to 1992 Canadian Heart Health Surveys (CHHS), the 1999-2002 National Health and Nutrition Examination Survey (NHANES) and the 2004 Canadian Community Health Survey

(CCHS) were based on directly measured height and weight, the surveys did not have the same collection methods. For example, for the 2004 CCHS, field interviewers used portable electronic scales to weigh respondents in their homes; for the 1999-2002 NHANES, health professionals measured respondents in mobile laboratories.

BMI has a number of limitations. It does not measure the distribution of body fat, which is important because excess fat in the abdominal areas is associated with increased health risks.⁵ BMI may misclassify young adults who have not reached full growth, people who are naturally very lean or very muscular, people who are very tall or very short, and certain ethnic or racial groups.¹³

BMI should not be calculated for pregnant women.⁵ However, pregnancy status was not asked in the 1978/79 CHS, the 1985 and 1990 Health Promotion Surveys, and the 1986 to 1992 Canada Heart Health Surveys.

In the 2004 CCHS, variables other than height and weight were self-reported. The degree to which these variables accurately reflect a person's health status/characteristics (fruit and vegetable consumption, presence of a chronic condition) is not known.

Respondents were asked about their leisure-time physical activities over the past three months. The results may have been affected by recall problems. Moreover, because physical activity at school and work were excluded, leisure time may not reflect overall physical activity.

The questions on fruit and vegetable consumption pertain to the number of times a day fruit and vegetables are consumed, not the amounts consumed. Because portion size is not specified, compliance with daily intake recommendations, such as the Canada Food Guide, cannot be assessed.

Rather than weight itself, factors associated with weight such as physical activity, body composition, visceral adiposity, physical fitness or dietary intake might be responsible for some or all of the associations of weight with high blood pressure, diabetes and heart disease.²⁷ As well, some diseases cause weight loss, while others are associated with weight gain. This analysis does not take into account recent weight gain/loss, which may be independently associated with poor health.

Type 1, type 2 and gestational diabetes cannot be differentiated in this analysis. Since the risk factors for the various forms of the disease are not the same, the strength of the relationship between BMI and the prevalence of "adult onset" diabetes (type 2) may have been diluted.

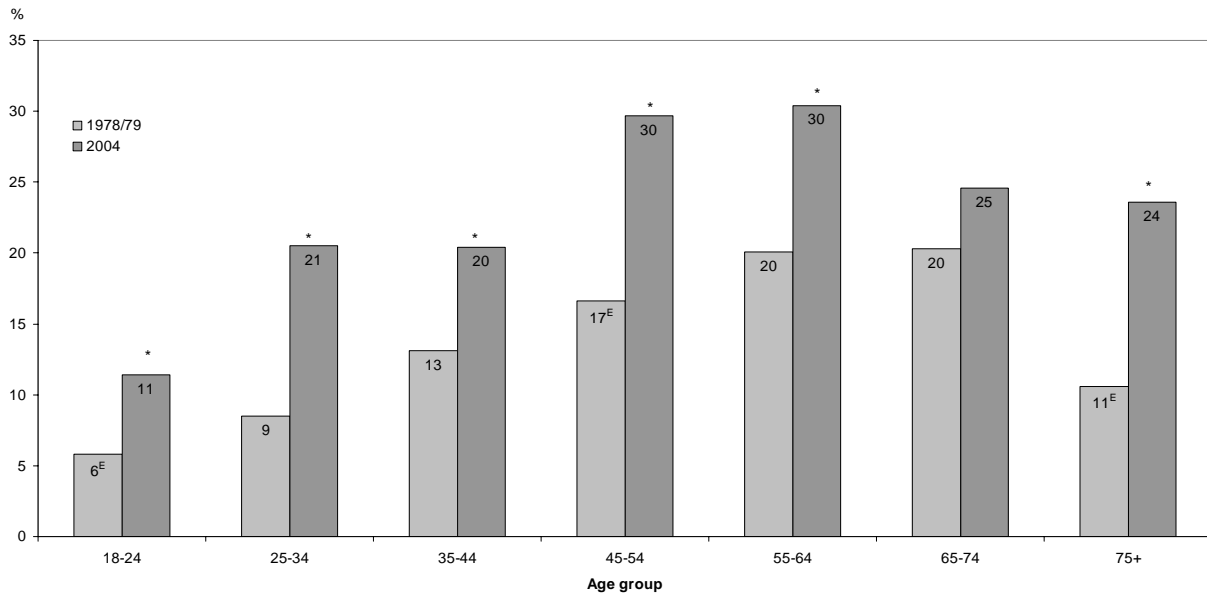
Because the CCHS is cross-sectional, no causality between obesity and a health behaviour or outcome can be inferred.

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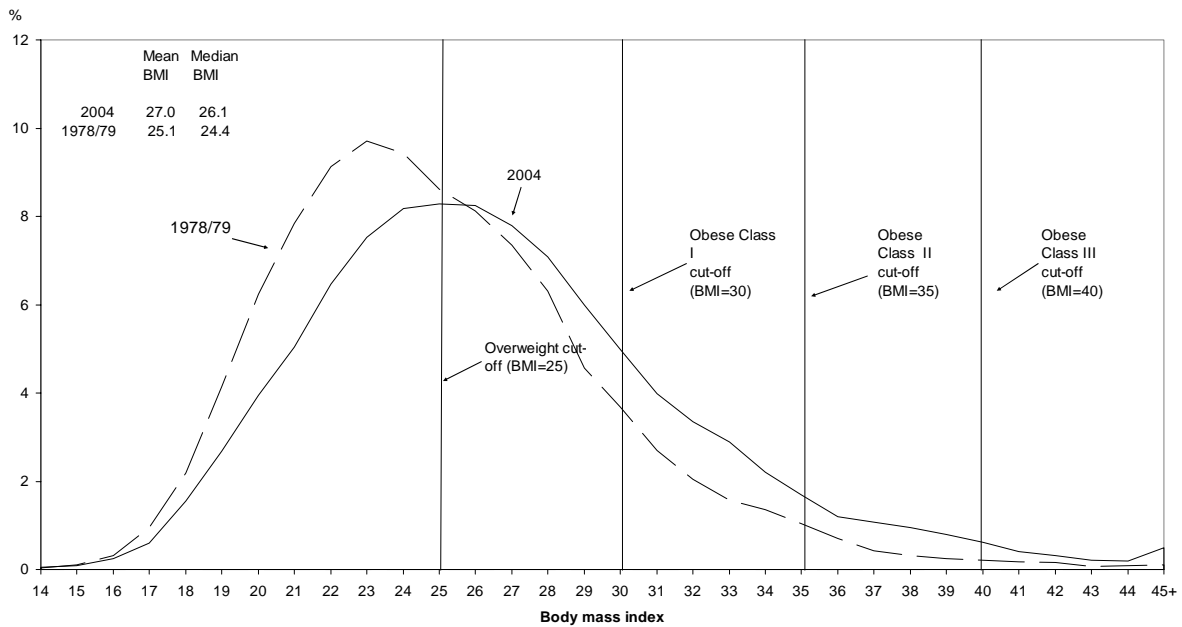
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Chart 1
Obesity rates, by age group, household population aged 18 or older, Canada excluding territories, 1978/79 and 2004



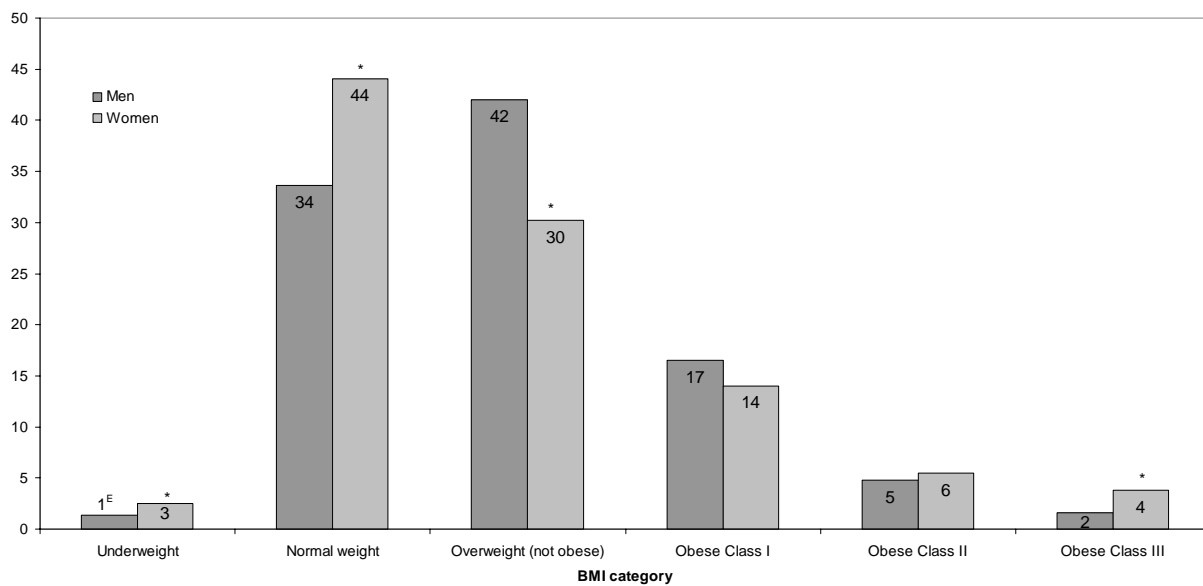
Data sources: 2004 Canadian Community Health Survey, Nutrition; 1978/79 Canada Health Survey
 * Significantly higher than estimate for 1978/79 (p < 0.05)
 E Coefficient of variation 16.6% to 33.3% (Interpret with caution)

Chart 2
Percentage distribution of body mass index (BMI), household population aged 18 or older, Canada excluding territories, 1978/79 and 2004



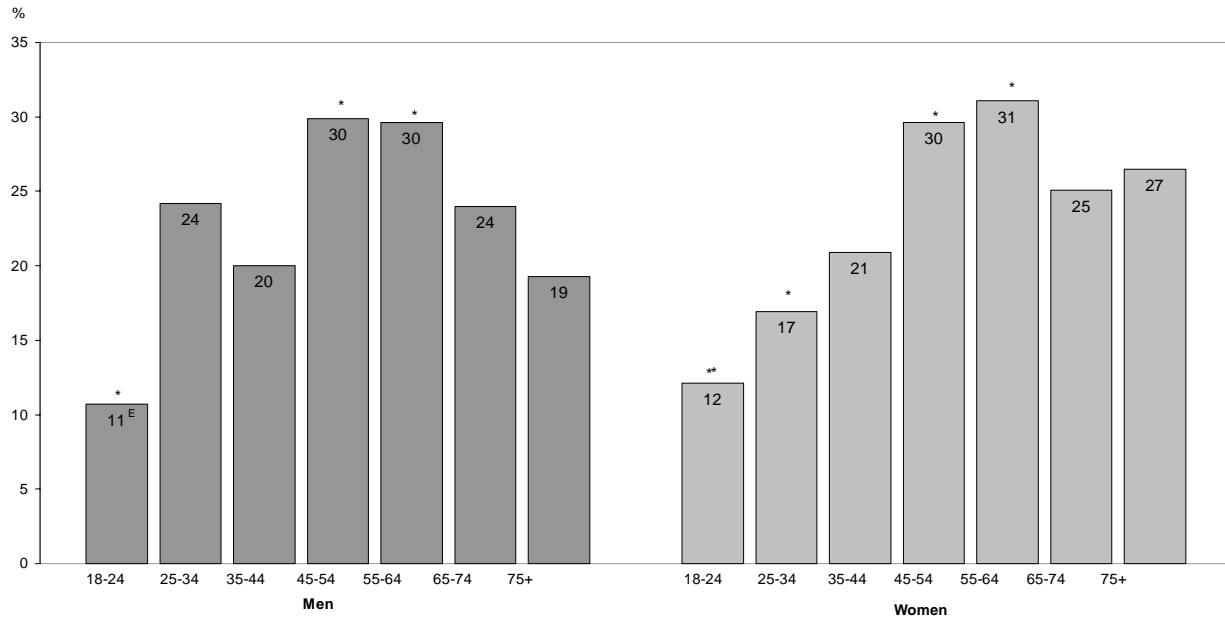
Data sources: 2004 Canadian Community Health Survey, Nutrition; 1978/79 Canada Health Survey

Chart 3
Percentage distribution of body mass index (BMI) categories, by sex, household population aged 18 or older, Canada excluding territories, 2004



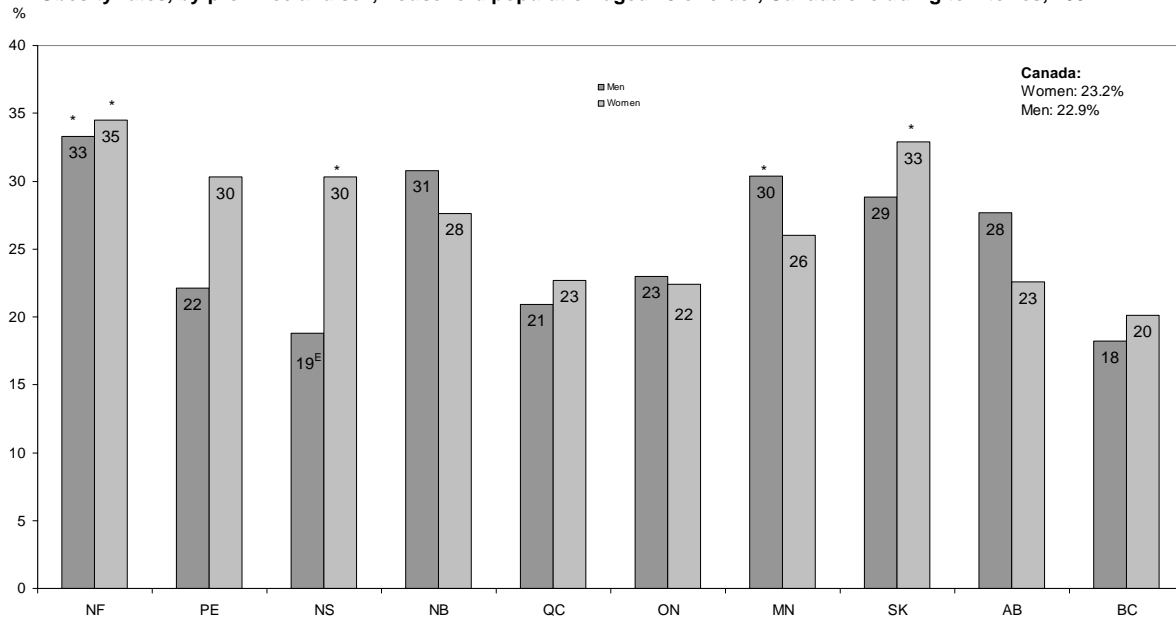
Data source: 2004 Canadian Community Health Survey: Nutrition
 * Significantly different than estimate for men ($p < 0.05$)
 E Coefficient of variation 16.6% to 33.3% (interpret with caution)

Chart 4
Obesity rates, by age group and sex, household population aged 18 or older, Canada excluding territories, 2004



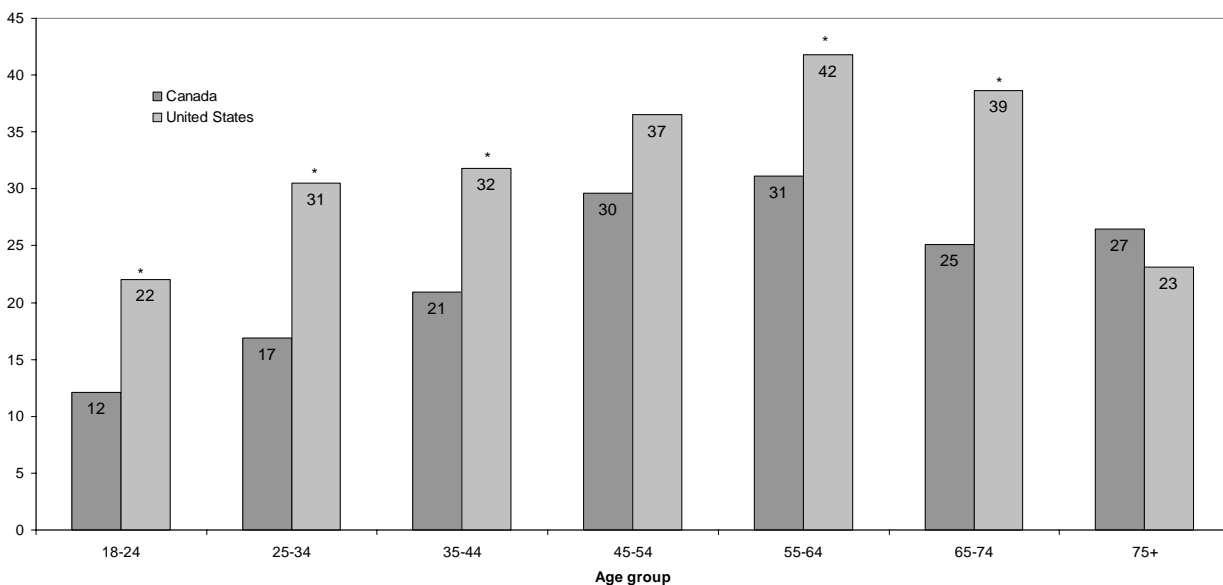
Data source: 2004 Canadian Community Health Survey: Nutrition
 * Significantly different from overall rate for same sex ($p < 0.05$)
 E Coefficient of variation 16.6% to 33.3% (interpret with caution)

Chart 5
Obesity rates, by province and sex, household population aged 18 or older, Canada excluding territories, 2004



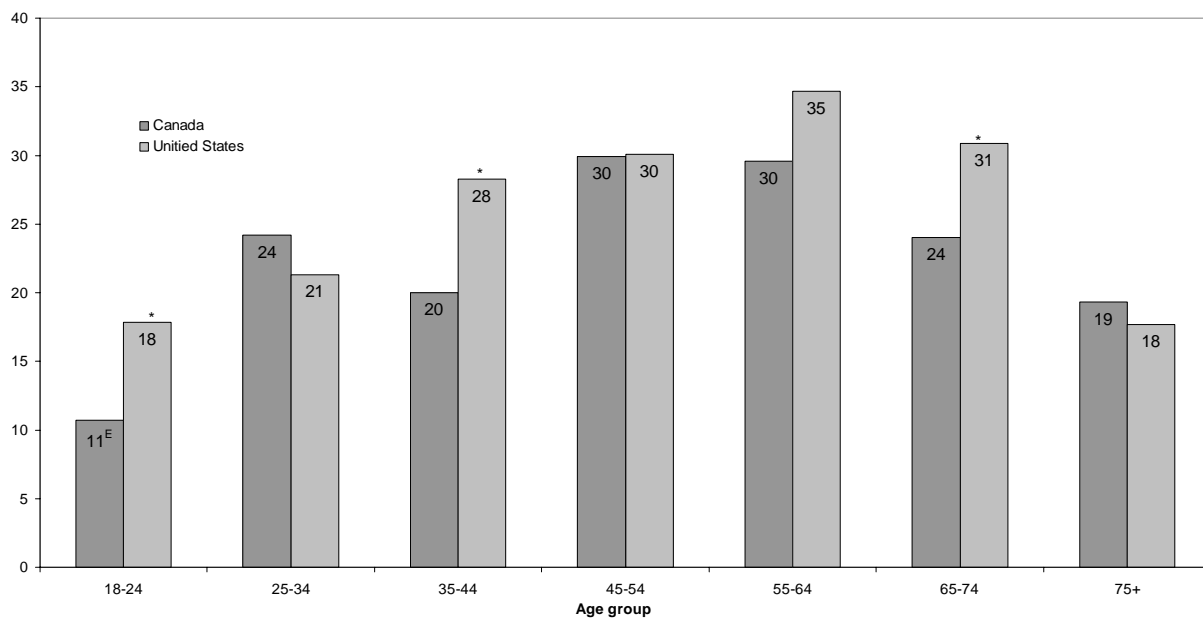
Data source: 2004 Canadian Community Health Survey: Nutrition
 * Significantly different from estimate for Canada ($p < 0.05$)
 E Coefficient of variation 16.6% to 33.3% (interpret with caution)

Chart 6
Obesity rates, by age group, female household population aged 18 or older, Canada excluding territories (2004) and United States (1999-2002)



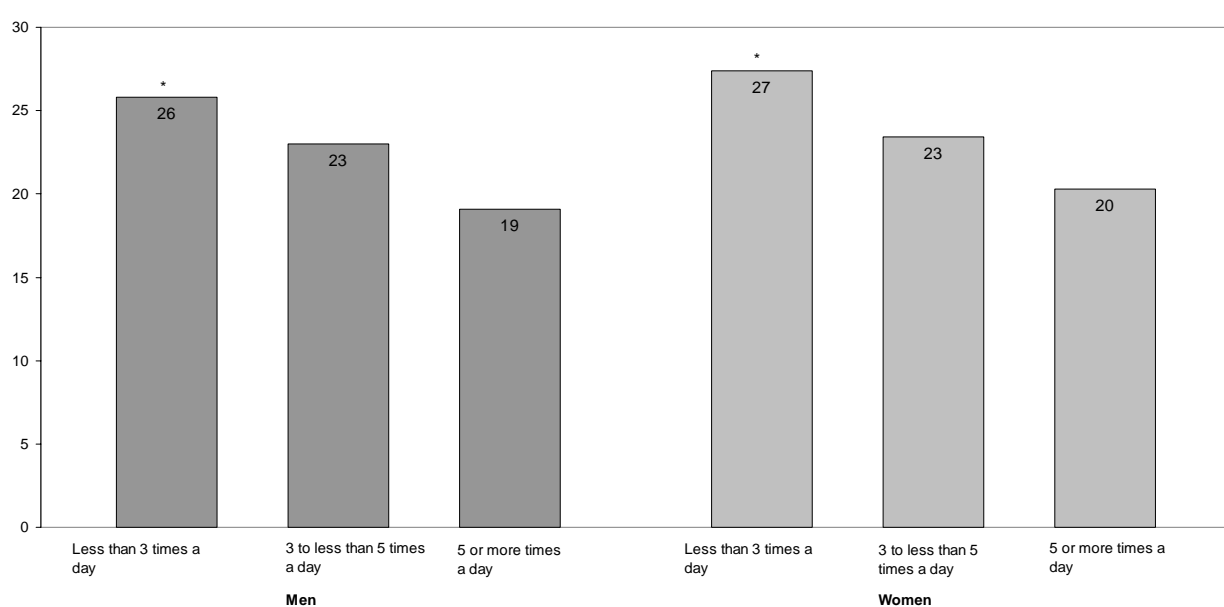
Data sources: 2004 Canadian Community Health Survey: Nutrition; 1999-2002 National Health and Nutrition Examination Survey
 * Significantly different from estimate for Canada ($p < 0.05$)
 E Coefficient of variation 16.6% to 33.3% (interpret with caution)

Chart 7
Obesity rates, by age group, male household population aged 18 or older, Canada excluding territories (2004) and United States (1999-2002)



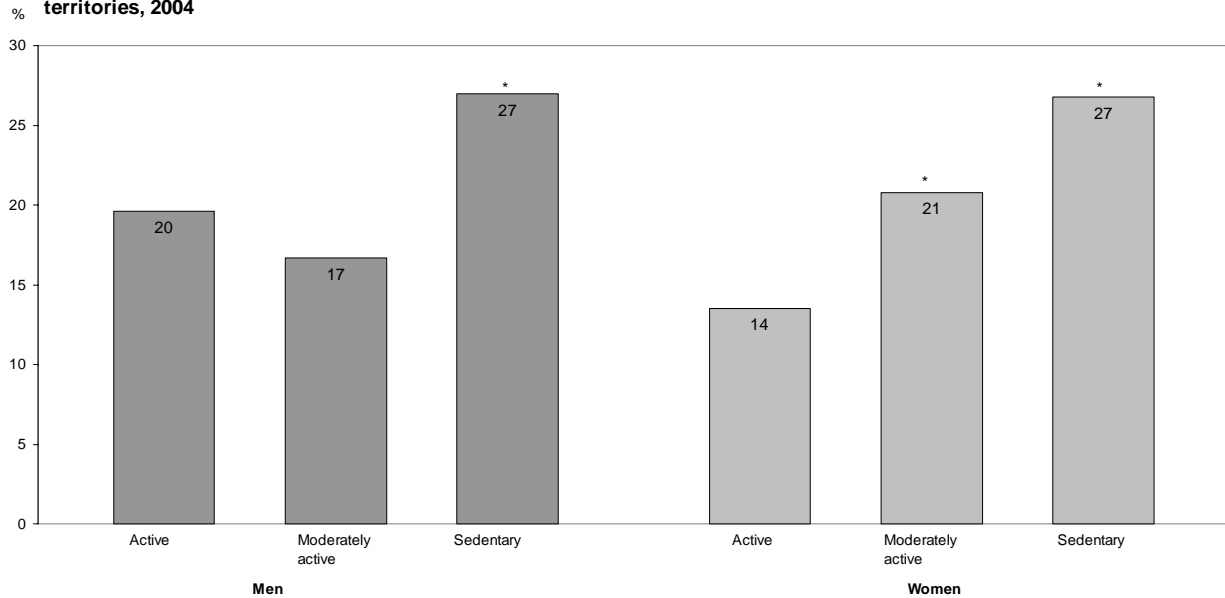
Data sources: 2004 Canadian Community Health Survey: Nutrition; 1999-2002 National Health and Nutrition Examination Survey
 * Significantly different from estimate for Canada (p < 0.05)
 E Coefficient of variation 16.6% to 33.3% (interpret with caution)

Chart 8
Obesity rates, by fruit and vegetable consumption and sex, household population aged 18 or older, Canada excluding territories, 2004



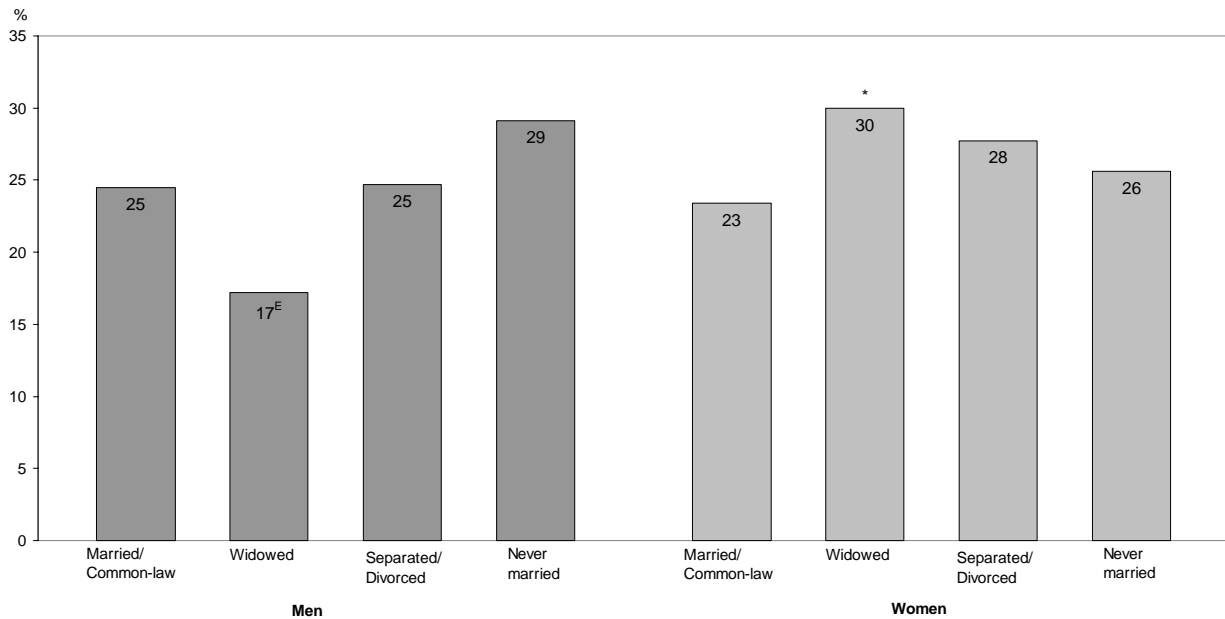
Data source: 2004 Canadian Community Health Survey: Nutrition
 * Significantly different from estimate for 5 or more times (p < 0.05)

Chart 9
Obesity rates, by leisure-time physical activity level and sex, household population aged 18 or older, Canada excluding territories, 2004



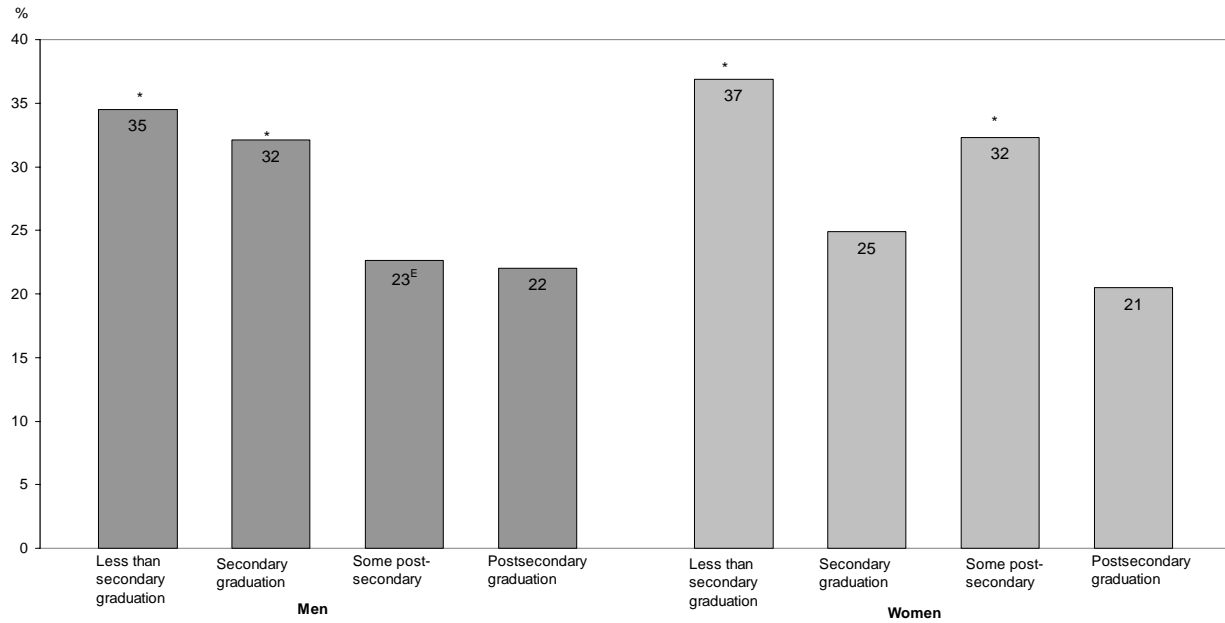
Data source: 2004 Canadian Community Health Survey: Nutrition
 * Significantly different from estimate for active (p < 0.05)

Chart 10
Obesity rates, by marital status and sex, household population aged 25 or older, Canada excluding territories, 2004



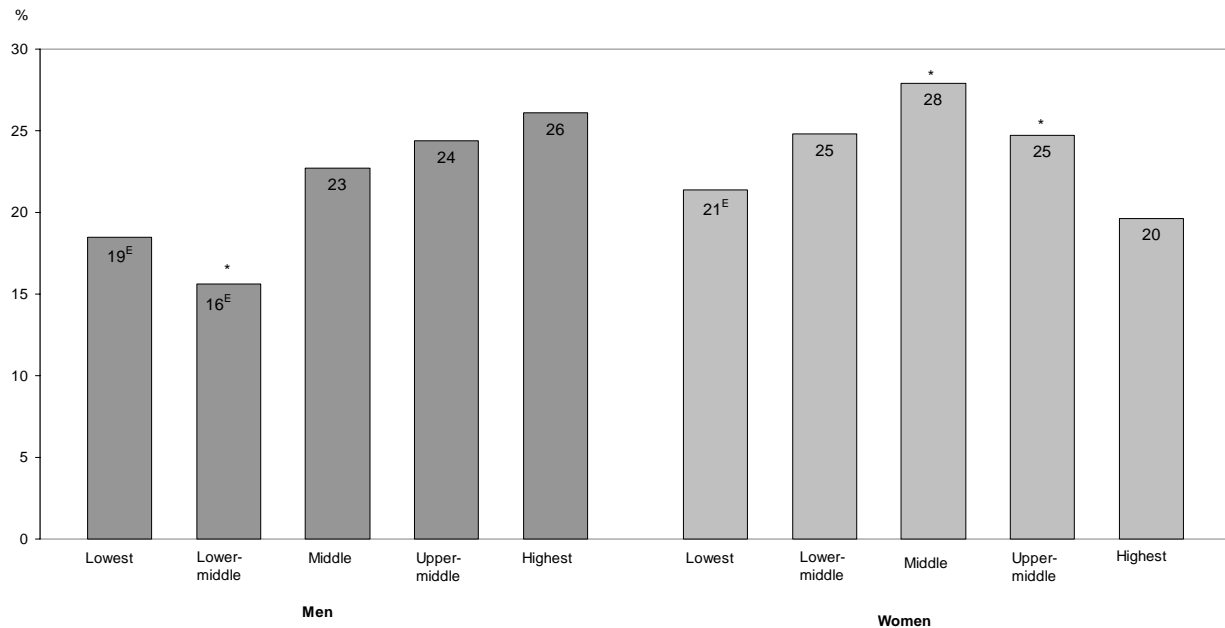
Data source: 2004 Canadian Community Health Survey: Nutrition
 * Significantly different from estimate for married/common-law (p < 0.05)
 E Coefficient of variation 16.6% to 33.3% (interpret with caution)

Chart 11
Obesity rates, by educational attainment and sex, household population aged 25 to 64, Canada excluding territories, 2004



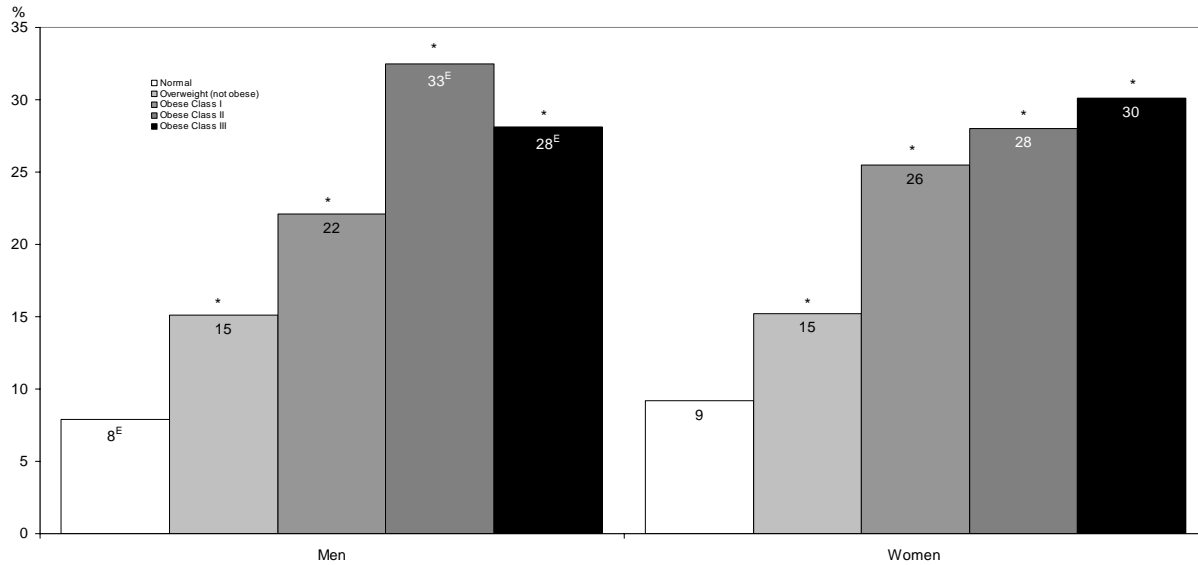
Data source: 2004 Canadian Community Health Survey: Nutrition
 * Significantly different from estimate for postsecondary graduation ($p < 0.05$)
 E Coefficient of variation 16.6% to 33.3% (interpret with caution)

Chart 12
Obesity rates, by household income and sex, household population aged 18 or older, Canada excluding territories, 2004



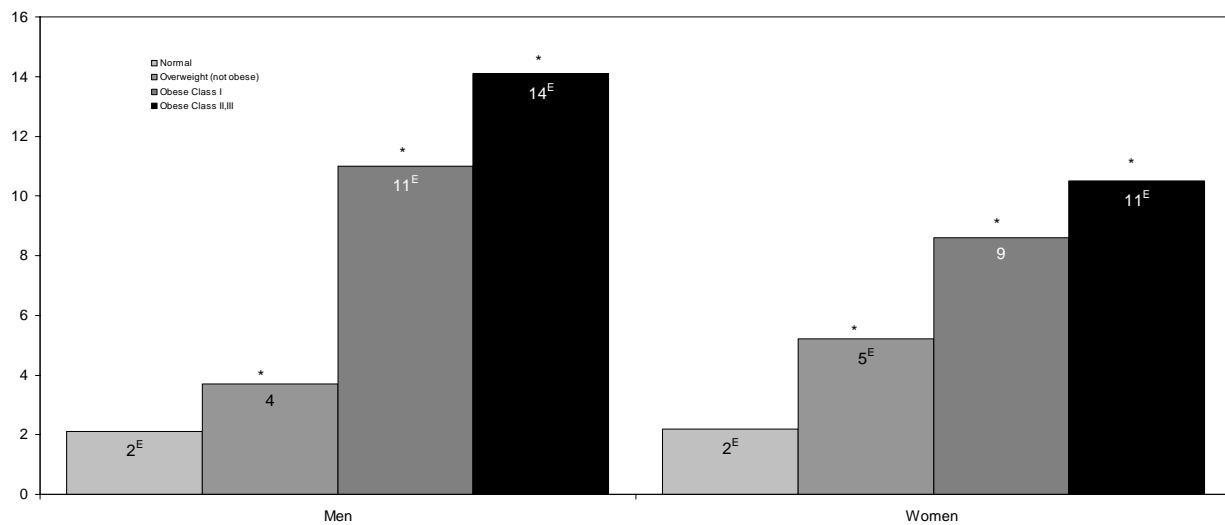
Data source: 2004 Canadian Community Health Survey: Nutrition
 * Significantly different from estimate for highest income group ($p < 0.05$)
 E Coefficient of variation 16.6% to 33.3% (interpret with caution)

Chart 13
Prevalence of high blood pressure, by BMI category and sex, household population aged 18 or older, Canada excluding territories, 2004



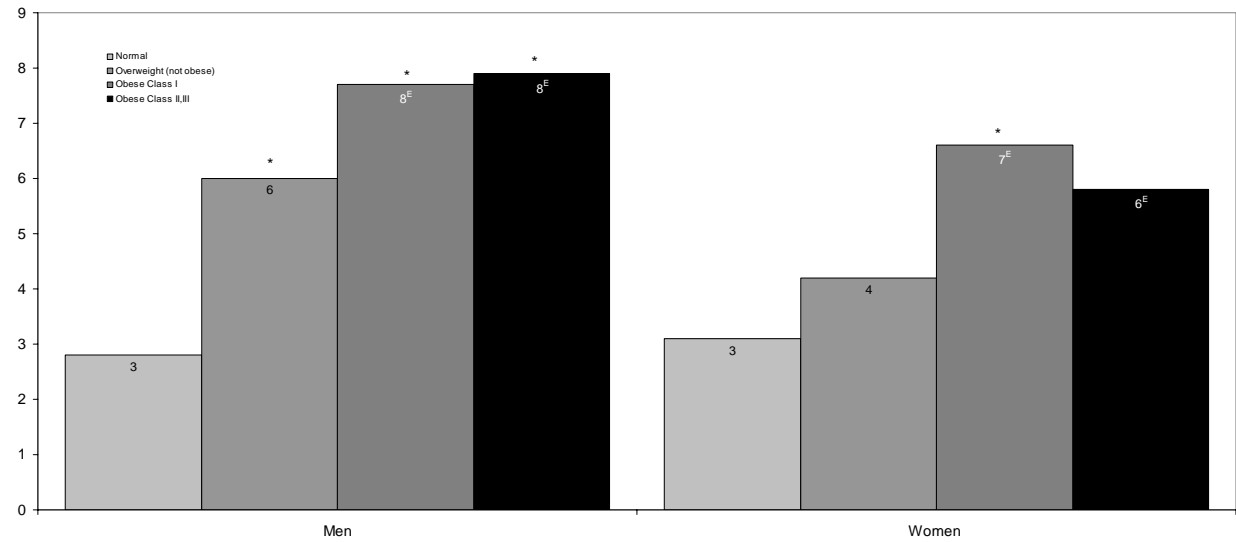
Data source: 2004 Canadian Community Health Survey: Nutrition
 * Significantly higher than estimate for normal ($p < 0.05$)
 E Coefficient of variation 16.6% to 33.3% (interpret with caution)

Chart 14
Prevalence of diabetes, by BMI category and sex, household population aged 18 or older, Canada excluding territories, 2004



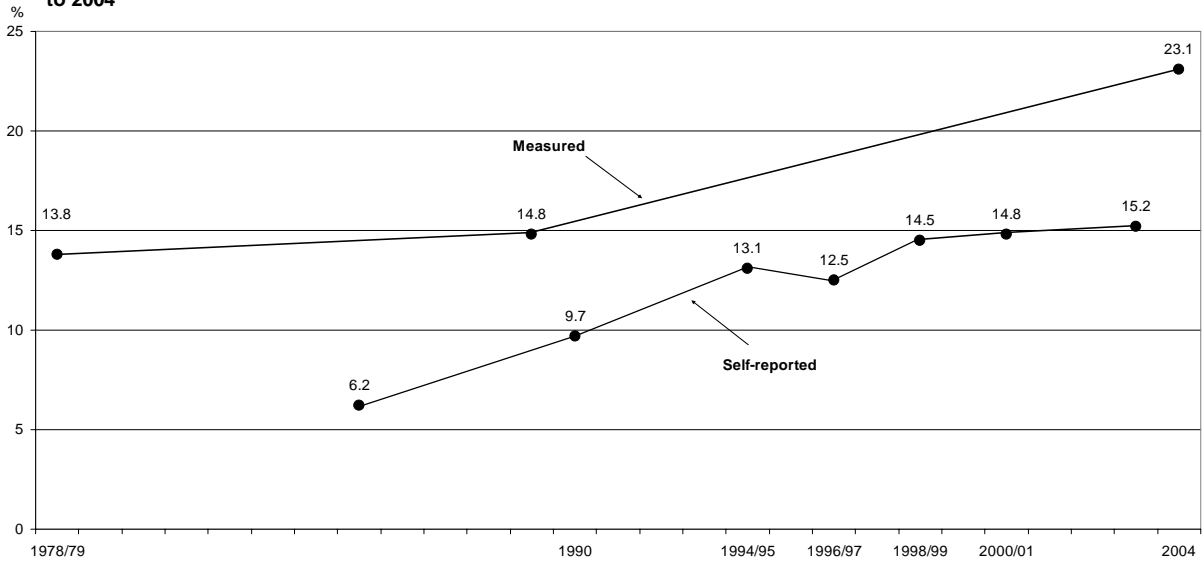
Data source: 2004 Canadian Community Health Survey: Nutrition
 * Significantly higher than estimate for normal ($p < 0.05$)
 E Coefficient of variation 16.6% to 33.3% (interpret with caution)

Chart 15
Prevalence of heart disease, by BMI category and sex, household population aged 18 or older, Canada excluding territories, 2004



Data source: 2004 Canadian Community Health Survey: Nutrition
 * Significantly higher than estimate for normal ($p < 0.05$)
 E Coefficient of variation 16.6% to 33.3% (interpret with caution)

Chart 16
Trends in obesity rates, household population aged 18 or older, Canada excluding territories, selected years, 1978/79 to 2004



Data sources: Measured: 1978/79 Canada Health Survey; 1986-1992 Canadian Heart Health Surveys (ages 18-74); 2004 Canadian Community Health Survey: Nutrition. Self-reported: 1985 and 1990 Health Promotion Survey; 1994/95, 1996/97 and 1998/99 National Population Health Survey; 2000/01 and 2003 Canadian Community Health Survey.
Notes: All survey data have been age-standardized to the 2004 CCHS. Age-adjusted obesity rates based on measured height and weight for population aged 18 to 74 are as follows: 13.7% (1978/79), 14.6% (1986-1992) and 23.1% (2004).

Table 1
Percentage distribution of body mass index (BMI), by sex, household population aged 18 or older, Canada excluding territories, 2004

	Both sexes		Men		Women	
	'000	%	'000	%	'000	%
Underweight	471	2.0	170 ^E	1.4 ^{*E}	302	2.5
Normal weight	9,328	38.9	3,986	33.6 [*]	5,343	44.1
Overweight (not obese)	8,647	36.1	4,984	42.0 [*]	3,663	30.2
Obese Class I	3,656	15.2	1,959	16.5	1,697	14.0
Obese Class II	1,231	5.1	568	4.8	663	5.5
Obese Class III	651	2.7	194	1.6 [*]	457	3.8
Overweight and obese (BMI ≥ 25)	14,185	59.1	7,706	65.0 [*]	6,480	53.4
Obese (BMI ≥ 30)	5,539	23.1	2,722	22.9	2,817	23.2

Data source: 2004 Canadian Community Health Survey: Nutrition

^{*} Significantly different from estimate for women ($p < 0.05$)

^E Coefficient of variation between 16.6% and 33.3% (interpret with caution)

Table 2
Percentage distribution of body mass index (BMI), by sex, household population aged 18 or older, Canada excluding territories, 1978/79 and 2004

	Both sexes		Men		Women	
	1978/79	2004	1978/79	2004	1978/79	2004
	%	%	%	%	%	%
Underweight	2.4	2.0	1.4 ^E	1.4 ^E	3.5	2.5
Normal weight	48.4	38.9 [*]	44.3	33.6 [*]	52.5	44.1 [*]
Overweight (not obese)	35.4	36.1	42.8	42.0	28.4	30.2
Obese Class I	10.5	15.2 [*]	9.5	16.5 [*]	11.3	14.0 [*]
Obese Class II	2.3 ^E	5.1 [*]	F	4.8 [*]	2.9	5.5 [*]
Obese Class III	0.9 ^E	2.7 [*]	F	1.6 [*]	1.5 ^E	3.8 [*]
Overweight and obese (BMI ≥ 25)	49.2	59.1 [*]	54.4	65.0 [*]	44.0	53.4 [*]
Obese (BMI ≥ 30)	13.8	23.1 [*]	11.5	22.9 [*]	15.7	23.2 [*]
Average BMI	25.4	27.0 [*]	25.7	27.2 [*]	25.2	26.7 [*]

Data sources: 2004 Canadian Community Health Survey: Nutrition; 1978/79 Canada Health Survey

Note: The 1978/79 Canada Health Survey estimates were age-standardized to the 2004 CCHS population.

^{*} Significantly different from estimate for 1978/79 ($p < 0.05$)

^E Coefficient of variation between 16.6% and 33.3% (interpret with caution)

^F Coefficient of variation greater than 33.3% (suppressed because of extreme sampling variability)

Table 3
Percentage distribution of body mass index (BMI), by sex and race, household population aged 18 or older, Canada excluding territories (2004) and United States (1999-2002)

	Both sexes				Men				Women			
	All races		White		All races		White		All races		White	
	Canada	US	Canada	US	Canada	US	Canada	US	Canada	US	Canada	US
	%	%	%	%	%	%	%	%	%	%	%	%
Underweight	2.0	2.1	1.7	2.3	1.4 ^E	1.2 ^E	1.1 ^E	1.1 ^E	2.5	3.0	2.2	3.5 [*]
Normal weight	38.9	34.0 [*]	36.6	35.3	33.6	31.4	29.9	30.6	44.1	36.4 [*]	43.1	40.0
Overweight (not obese)	36.1	34.3	36.5	33.5 [*]	42.0	40.8	43.4	40.9	30.2	28.0	29.9	26.3 [*]
Obese Class I	15.2	17.4 [*]	16.5	17.2	16.5	17.6	18.3	18.5	14.0	17.2 [*]	14.7	15.8
Obese Class II	5.1	7.6 [*]	5.6	7.4 [*]	4.8	5.8	5.3	5.6	5.5	9.3 [*]	5.8	9.2 [*]
Obese Class III	2.7	4.7 [*]	3.1	4.3 [*]	1.6	3.2 [*]	1.9 ^E	3.3 [*]	3.8	6.1 [*]	4.2	5.2
Overweight and obese (BMI ≥ 25)	59.1	64.0 [*]	61.7	62.4	65.0	67.5	69.0	68.3	53.4	60.6 [*]	54.7	56.5
Obese (BMI ≥ 30)	23.1	29.7 [*]	25.2	28.9 [*]	22.9	26.7 [*]	25.5	27.4	23.2	32.6 [*]	24.8	30.3 [*]
Average BMI	27.0	27.9 [*]	27.3	27.7 [*]	27.2	27.7 [*]	27.6	27.9	26.7	28.1 [*]	27.1	27.6

Data sources: 2004 Canadian Community Health Survey: Nutrition; 1999-2002 National Health and Nutrition Examination Survey (NHANES)

Note: The 1999-2002 NHANES estimates were age-standardized to the 2004 CCHS population.

^{*} Significantly different from estimate for Canada (p < 0.05)

^E Coefficient of variation between 16.6% and 33.3% (interpret with caution)

Table 4
Prevalence of high blood pressure, diabetes and heart disease, by BMI category, household population aged 18 or older, Canada excluding territories, 2004

	Both sexes	Men	Women
	%	%	%
High blood pressure			
Normal weight	8.7	7.9 ^E	9.2
Overweight	15.1 [*]	15.1 [*]	15.2 [*]
Obese Class I	23.7 [*]	22.1 [*]	25.5 [*]
Obese Class II	30.1 [*]	32.5 ^{*E}	28.0 [*]
Obese Class III	29.5 [*]	28.1 ^{*E}	30.1 [*]
Diabetes			
Normal weight	2.2	2.1 ^E	2.2 ^E
Overweight	4.3 [*]	3.7 [*]	5.2 ^{*E}
Obese Class I	9.9 [*]	11.0 ^{*E}	8.6 [*]
Obese Class II, III	12.0 [*]	14.1 ^{*E}	10.5 ^{*E}
Heart Disease			
Normal weight	3.0	2.8	3.1
Overweight	5.2 [*]	6.0 [*]	4.2
Obese Class I	7.2 [*]	7.7 ^{*E}	6.6 ^{*E}
Obese Class II, III	6.7 ^{*E}	7.9 ^{*E}	5.8 ^E

Data source: 2004 Canadian Community Health Survey: Nutrition

^{*} Significantly different from normal weight (p < 0.05)

^E Coefficient of variation between 16.6% and 33.3% (interpret with caution)

Table 5
Odds ratios relating body mass index (BMI) to high blood pressure, diabetes and heart disease, by sex, household population aged 18 or older, Canada excluding territories, 2004

	High blood pressure		Diabetes		Heart disease	
	Adjusted odds ratio	95% confidence interval	Adjusted odds ratio	95% confidence interval	Adjusted odds ratio	95% confidence interval
Both sexes						
Normal weight ^a	1.0	...	1.0	...	1.0	...
Overweight	1.5 *	1.2, 2.0	1.6 *	1.1, 2.3	1.3	0.9, 1.9
Obese Class I	2.9 *	2.1, 3.8	3.8 *	2.5, 5.8	1.8 *	1.2, 2.9
Obese Class II, III	...	...	5.4 *	3.4, 8.4	2.1 *	1.3, 3.5
Obese Class II	4.7 *	3.0, 7.5	...	...	...	...
Obese Class III	5.4 *	3.3, 8.6	...	...	...	...
Men						
Normal weight ^a	1.0	...	1.0	...	1.0	...
Overweight	1.8 *	1.1, 2.9	1.5	0.9, 2.5	1.7 *	1.1, 2.7
Obese Class I	3.3 *	2.0, 5.5	5.1 *	2.6, 10.1	2.4 *	1.2, 4.5
Obese Class II, III	...	...	7.0 *	3.4, 14.4	2.7 *	1.2, 5.8
Obese Class II	6.6 *	3.0, 14.4	...	...	...	...
Obese Class III	4.9 *	1.9, 12.7	...	...	...	...
Women						
Normal weight ^a	1.0	...	1.0	...	1.0	...
Overweight	1.3	0.9, 1.7	1.8 *	1.0, 3.3	1.0	0.6, 1.6
Obese Class I	2.5 *	1.7, 3.7	2.9 *	1.7, 4.9	1.4	0.7, 2.7
Obese Class II, III	...	...	4.4 *	2.4, 8.1	1.6	0.8, 3.1
Obese Class II	3.5 *	1.9, 6.2	...	...	...	...
Obese Class III	5.5 *	2.8, 9.5	...	...	...	...

Data source: 2004 Canadian Community Health Survey: Nutrition

Note: Models control for age (continuous), marital status, education, household income, smoking, and leisure-time physical activity.

a Reference category

 * Significantly different from normal weight ($p < 0.05$)

... not applicable

Table A

Overweight and obesity rates, by selected characteristics, male household population aged 18 or older, Canada excluding territories, 2004

	Estimated population '000	Overweight		Obese		Overweight/Obese	
		%	95% confidence interval	%	95% confidence interval	%	95% confidence interval
Total	11,861	42.0	39.3, 44.8	22.9	20.7, 25.2	65.0	62.4, 67.5
Age group							
18-24	1,681	27.0 *	21.5, 32.4	10.7 ^{aE}	6.7, 14.8	37.7 *	31.8, 43.7
25-34	1,900	39.9	33.3, 46.6	24.2	18.0, 30.4	64.1	58.1, 70.1
35-44	2,577	44.5	37.3, 51.7	20.0	15.2, 24.7	64.5	57.5, 71.4
45-54	2,370	42.4	36.0, 48.8	29.9 *	24.6, 35.2	72.3 *	66.2, 78.3
55-64	1,623	45.9	40.0, 51.7	29.6 *	23.8, 35.4	75.5 *	69.4, 81.5
65-74	1,025	52.7 *	46.5, 58.8	24.0	19.4, 28.6	76.7 *	71.9, 81.5
75+	685	49.0 *	42.1, 55.8	19.3	13.5, 25.1	68.3	62.0, 74.6
Province							
Newfoundland and Labrador	200	47.6	39.3, 55.8	33.3 *	25.1, 41.5	80.9 *	75.2, 86.6
Prince Edward Island	50	49.8	42.1, 57.6	22.1	16.0, 28.2	71.9	64.1, 79.8
Nova Scotia	351	40.1	30.0, 50.2	18.8 ^E	11.9, 25.6	58.8	49.2, 68.5
New Brunswick	280	39.5	29.4, 49.6	30.8	22.4, 39.2	70.4	62.0, 78.7
Québec	2,868	41.2	35.0, 47.4	20.9	15.4, 26.3	62.0	56.4, 67.7
Ontario	4,595	40.9	36.4, 45.5	23.0	19.2, 26.7	63.9	59.1, 68.7
Manitoba	408	39.8	33.7, 46.0	30.4 *	24.9, 36.0	70.3	65.2, 75.3
Saskatchewan	347	44.5	35.3, 53.8	28.8	21.0, 36.6	73.3 *	65.5, 81.1
Alberta	1,182	41.1	33.2, 48.9	27.7	21.9, 33.6	68.8	61.9, 75.7
British Columbia	1,580	47.3	38.4, 56.2	18.2	12.7, 23.6	65.4	57.8, 73.1
Ethnic origin							
White	9,720	43.4	40.5, 46.3	25.5 *	23.0, 28.0	69.0 *	66.4, 71.5
Black	172	31.0 ^E	10.9, 51.1	^F	...	50.7 ^E	27.1, 74.3
Southeast/East Asian	811	35.4 ^E	22.1, 48.6	^F	...	39.1 ^{aE}	26.0, 52.3
Aboriginal (off-reserve)	86	31.8 ^E	16.5, 47.0	33.6 ^E	19.2, 48.0	65.3	50.7, 80.0
Other	1,027	38.6	27.4, 49.8	14.2 ^{aE}	7.0, 21.4	52.8 *	41.6, 64.0
Fruit and vegetable consumption							
Less than 3 times a day	4,124	37.4 *	33.3, 41.5	25.8 *	22.1, 29.5	63.2	58.9, 67.5
3 to less than 5 times a day	4,605	42.2	37.7, 46.6	23.0	19.4, 26.7	65.2	60.8, 69.7
5 + times a day ^a	3,100	47.8	42.7, 52.9	19.1	15.0, 23.2	66.9	62.2, 71.6
Leisure-time physical activity level							
High ^a	2,361	45.8	40.7, 50.8	19.6	15.3, 23.9	65.3	60.1, 70.6
Moderate	2,979	44.8	39.8, 49.8	16.7	13.5, 20.0	61.5	56.4, 66.6
Sedentary	6,520	39.4	35.4, 43.4	27.0 *	23.7, 30.3	66.4	62.9, 70.0
Marital status (aged 25+)							
Married/Common-law ^b	7,590	46.2	42.7, 49.8	24.5	21.6, 27.3	70.7	67.2, 74.2
Widowed	237	55.6	43.5, 67.7	17.2 ^E	9.7, 24.8	72.9	63.8, 81.9
Separated/Divorced	822	42.6	33.4, 51.9	24.7	17.6, 31.8	67.3	58.2, 76.5
Never Married	1,516	34.8 *	28.5, 41.0	29.1	22.0, 36.2	63.8 *	58.3, 69.4
Education (aged 25 to 64)							
Less than secondary graduation	1,149	39.6	31.7, 47.5	34.5 *	26.8, 42.3	74.1	66.7, 81.6
Secondary graduation	1,487	36.7	28.2, 45.1	32.1 *	23.6, 40.6	68.8	60.4, 77.1
Some postsecondary	550	44.6	31.5, 57.6	22.6 ^E	13.7, 31.5	67.2	55.5, 78.9
Postsecondary graduation ^a	5,197	45.4	41.0, 49.8	22.0	18.6, 25.3	67.4	63.1, 71.7
Household income							
Lowest	245	36.2 ^E	20.1, 52.2	18.5 ^E	7.6, 29.5	54.7 *	40.0, 69.5
Lower-middle	540	44.4	30.7, 58.1	15.6 ^{aE}	8.2, 23.0	60.0	45.2, 74.8
Middle	2,139	40.4	34.0, 46.8	22.7	16.9, 28.5	63.1 *	57.1, 69.1
Upper-middle	4,160	39.6 *	35.3, 43.8	24.4	20.7, 28.1	64.0 *	59.5, 68.5
Highest ^a	3,886	45.9	41.3, 50.5	26.1	22.3, 29.9	72.0	67.7, 76.3
Not stated	891	40.5	29.8, 51.2	8.6 ^{aE}	4.9, 12.3	49.1 *	38.2, 60.0

Data source: 2004 Canadian Community Health Survey: Nutrition

Notes: Age groups, provinces and ethnic origin are compared with rate for Canada. Respondents with missing information are: marital status (3), education (40), fruit and vegetable consumption (14).

a Reference category

 * Significantly different from reference category ($p < 0.05$)

E Coefficient of variation between 16.6% and 33.3% (interpret with caution)

F Coefficient of variation greater than 33.3% (suppressed because of extreme sampling variability)

Table B

Overweight and obesity rates, by sex and selected characteristics, female household population aged 18 or older, Canada excluding territories, 2004

	Estimated population '000	Overweight		Obese		Overweight/Obese	
		%	95% confidence interval	%	95% confidence interval	%	95% confidence interval
Total	12,124	30.2	28.1, 32.3	23.2	21.3, 25.1	53.4	51.2, 55.7
Age group							
18-24	1,463	22.3 *	17.6, 27.1	12.1 *	8.6, 15.6	34.4 *	29.2, 39.6
25-34	1,926	26.1	20.0, 32.2	16.9 *	12.9, 21.0	43.0 *	36.5, 49.5
35-44	2,529	27.6	22.3, 32.9	20.9	16.6, 25.2	48.5	42.5, 54.6
45-54	2,428	33.8	28.4, 39.2	29.6 *	24.4, 34.8	63.4 *	57.5, 69.3
55-64	1,718	32.1	27.5, 36.8	31.1 *	26.2, 36.1	63.3 *	58.0, 68.5
65-74	1,028	37.9 *	32.2, 43.6	25.1	20.4, 29.8	63.0 *	56.6, 69.4
75+	1,032	36.1 *	31.3, 40.9	26.5	21.8, 31.1	62.5 *	57.5, 67.6
Province							
Newfoundland and Labrador	205	26.8	19.9, 33.7	34.5 *	27.4, 41.7	61.4	52.7, 70.0
Prince Edward Island	53	31.0	24.8, 37.3	30.3	23.3, 37.4	61.4 *	54.7, 68.0
Nova Scotia	368	30.2	23.0, 37.3	30.3 *	23.6, 37.1	60.5	53.1, 67.8
New Brunswick	289	31.1	23.9, 38.3	27.6	19.8, 35.3	58.7	50.7, 66.8
Québec	2,952	28.0	23.3, 32.7	22.7	17.9, 27.5	50.7	45.2, 56.3
Ontario	4,708	31.0	27.4, 34.6	22.4	19.4, 25.4	53.4	49.4, 57.4
Manitoba	418	28.9	24.5, 33.4	26.0	21.6, 30.4	54.9	49.5, 60.3
Saskatchewan	356	30.2	23.0, 37.5	32.9 *	26.0, 39.8	63.1 *	55.8, 70.4
Alberta	1,164	30.3	24.2, 36.4	22.6	18.1, 27.2	52.9	46.6, 59.2
British Columbia	1,609	32.5	26.9, 38.2	20.1	15.9, 24.3	52.7	46.4, 58.9
Ethnic origin							
White	10,134	29.9	27.7, 32.1	24.8 *	22.7, 26.9	54.7	52.3, 57.1
Black	223	42.7 ^E	19.9, 65.5	F	...	65.8 ^E	41.5, 90.0
Southeast/East Asian	664	24.0 ^E	13.1, 34.9	F	...	31.4 ^{*E}	19.4, 43.5
Aboriginal (off-reserve)	174	29.3 ^E	19.3, 39.3	40.0 *	27.9, 52.0	69.3 *	56.9, 81.6
Other	930	35.3 ^E	23.1, 47.4	14.5 ^{*E}	7.9, 21.2	49.8	38.1, 61.5
Fruit and vegetable consumption							
Less than 3 times a day	2,919	29.1	25.1, 33.0	27.4 *	23.2, 31.6	56.5	52.1, 60.8
3 to less than 5 times a day	4,681	29.5	26.5, 32.6	23.4	20.5, 26.3	53.0	49.4, 56.6
5 + times a day ^a	4,474	31.8	27.9, 35.8	20.3	17.1, 23.4	52.1	48.0, 56.2
Leisure-time physical activity level							
High ^a	1,945	27.0	22.0, 31.9	13.5	10.5, 16.6	40.5	35.1, 46.0
Moderate	2,905	31.4	27.1, 35.7	20.8 *	17.5, 24.1	52.2 *	47.5, 56.9
Sedentary	7,273	30.6	27.8, 33.5	26.8 *	24.0, 29.5	57.4 *	54.2, 60.6
Marital status (aged 25+)							
Married/Common-law ^b	7,268	32.0	29.0, 34.9	23.4	20.8, 26.1	55.4	52.2, 58.6
Widowed	1,088	37.3	32.8, 41.8	30.0 *	25.2, 34.8	67.3 *	63.1, 71.5
Separated/Divorced	1,124	31.5	25.1, 37.9	27.7	21.7, 33.8	59.3	51.6, 67.0
Never Married	1,171	21.4 *	16.4, 26.5	25.6	19.2, 31.9	47.0 *	40.0, 54.1
Education (aged 25 to 64)							
Less than secondary graduation	1,168	36.5	27.9, 45.1	36.9 *	28.6, 45.2	73.4 *	66.9, 79.9
Secondary graduation	1,697	28.4	22.6, 34.3	24.9	19.0, 30.8	53.3	46.6, 60.0
Some postsecondary	586	31.3	22.7, 40.0	32.3 *	23.9, 40.8	63.7 *	54.0, 73.4
Postsecondary graduation ^a	5,027	29.0	25.6, 32.4	20.5	17.8, 23.2	49.5	45.7, 53.3
Household income							
Lowest	428	25.6	17.4, 33.9	21.4 ^E	12.9, 30.0	47.1	35.0, 59.2
Lower-middle	833	30.8	23.9, 37.6	24.8	18.5, 31.1	55.6	48.0, 63.1
Middle	2,500	31.0	26.5, 35.6	27.9 *	23.3, 32.5	58.9 *	54.1, 63.8
Upper-middle	3,854	28.4	24.7, 32.1	24.7 *	21.6, 27.9	53.1	49.2, 57.1
Highest ^a	3,412	31.2	26.5, 35.8	19.6	15.8, 23.5	50.8	46.0, 55.6
Missing	1,097	33.1	26.2, 39.9	18.1	13.1, 23.0	51.1	43.4, 58.9

Data source: 2004 Canadian Community Health Survey: Nutrition

Notes: Age groups, provinces and ethnic origin are compared with rate for Canada. Respondents with missing information are: marital status (5), education (45), fruit and vegetable consumption (30), physical activity level (2).

^a Reference category

* Significantly different from reference category (p < 0.05)

^E Coefficient of variation between 16.6% and 33.3% (interpret with caution)

^F Coefficient of variation greater than 33.3% (suppressed because of extreme sampling variability).

... Not applicable

Table C

Overweight and obesity rates, by selected characteristics, household population aged 18 or older, Canada excluding territories, 2004

	Estimated population '000	Overweight		Obese		Overweight/Obese	
		%	95% confidence interval	%	95% confidence interval	%	95% confidence interval
Total	23,985	36.1	34.3, 37.8	23.1	21.7, 24.5	59.1	57.4, 60.8
Age group							
18-24	3,144	24.8 *	21.0, 28.7	11.4 *	8.7, 14.1	36.2 *	32.0, 40.3
25-34	3,826	33.0	28.5, 37.4	20.5	16.9, 24.2	53.5 *	49.1, 57.9
35-44	5,106	36.2	31.9, 40.4	20.4 *	17.3, 23.5	56.6	52.1, 61.0
45-54	4,798	38.0	34.0, 42.1	29.7 *	26.2, 33.3	67.8 *	63.5, 72.1
55-64	3,341	38.8	35.2, 42.4	30.4 *	26.3, 34.5	69.2 *	65.0, 73.4
65-74	2,053	45.3 *	40.7, 49.8	24.6	21.2, 27.9	69.9 *	65.6, 74.1
75+	1,717	41.2 *	37.3, 45.2	23.6	19.9, 27.3	64.8 *	60.9, 68.8
Province							
Newfoundland and Labrador	405	37.1	31.7, 42.5	33.9 *	28.5, 39.3	71.0 *	65.9, 76.1
Prince Edward Island	104	40.2	35.4, 44.9	26.3	21.6, 31.1	66.5 *	61.4, 71.6
Nova Scotia	719	35.0	28.8, 41.2	24.7	20.2, 29.2	59.7	53.6, 65.8
New Brunswick	570	35.3	28.8, 41.7	29.2 *	24.0, 34.4	64.4	58.4, 70.5
Québec	5,820	34.5	30.5, 38.5	21.8	18.2, 25.4	56.3	52.5, 60.1
Ontario	9,304	35.9	33.1, 38.7	22.7	20.3, 25.1	58.6	55.5, 61.6
Manitoba	827	34.3	30.8, 37.8	28.2 *	24.7, 31.7	62.5	58.9, 66.1
Saskatchewan	703	37.3	31.1, 43.5	30.8 *	25.5, 36.2	68.1 *	63.0, 73.3
Alberta	2,346	35.7	30.7, 40.7	25.2	21.4, 29.0	60.9	55.9, 65.9
British Columbia	3,189	39.8	34.4, 45.3	19.2 *	15.8, 22.6	59.0	53.7, 64.3
Ethnic origin							
White	19,854	36.5	34.7, 38.3	25.2 *	23.5, 26.8	61.7 *	59.9, 63.4
Black	395	37.6 ^E	22.6, 52.6	21.6 ^E	10.1, 33.1	59.2	42.1, 76.2
Southeast/East Asian	1,475	30.2	21.5, 39.0	^F	...	35.7 *	26.8, 44.6
Aboriginal (off-reserve)	260	30.1	21.6, 38.6	37.8 *	28.2, 47.5	68.0	58.5, 77.4
Other	1,957	37.0	28.8, 45.3	14.4 ^{*E}	9.5, 19.2	51.4 *	43.6, 59.2
Fruit and vegetable consumption							
Less than 3 times a day	7,044	33.9 *	31.0, 36.9	26.5 *	23.8, 29.1	60.4	57.3, 63.5
3 to less than 5 times a day	9,287	35.8	33.1, 38.6	23.2	20.9, 25.6	59.0	56.2, 61.9
5 + times a day ^a	7,574	38.4	35.4, 41.4	19.8	17.3, 22.3	58.2	55.3, 61.1
Leisure-time physical activity level							
High ^a	4,306	37.3	33.6, 40.9	16.9	14.1, 19.6	54.1	50.1, 58.2
Moderate	5,885	38.2	35.0, 41.3	18.7	16.5, 21.0	56.9	53.7, 60.2
Sedentary	13,794	34.8	32.4, 37.1	26.9 *	24.7, 29.0	61.7 *	59.2, 64.1
Marital status (aged 25+)							
Married/Common-law ^b	14,858	39.3	37.0, 41.5	24.0	22.1, 25.8	63.2	60.9, 65.5
Widowed	1,325	40.6	36.1, 45.0	27.7	23.5, 31.9	68.3 *	64.6, 72.0
Separated/Divorced	1,946	36.2	31.0, 41.4	26.5	22.0, 30.9	62.7	57.0, 68.4
Never Married	2,688	29.0 *	24.7, 33.2	27.5	22.7, 32.4	56.5 *	51.8, 61.2
Education (aged 25 to 64)							
Less than secondary graduation	2,316	38.0	32.2, 43.9	35.7 *	29.9, 41.5	73.8 *	68.7, 78.8
Secondary graduation	3,184	32.3	27.8, 36.8	28.3 *	23.1, 33.4	60.5	55.6, 65.4
Some postsecondary	1,136	37.7	29.4, 46.1	27.6	21.2, 34.1	65.4	57.8, 73.0
Postsecondary graduation ^a	10,224	37.3	34.5, 40.1	21.2	19.0, 23.5	58.6	55.6, 61.5
Household income							
Lowest	674	29.5 *	21.6, 37.4	20.4 ^E	13.6, 27.2	49.9 *	40.3, 59.4
Lower-middle	1,373	36.1	29.6, 42.7	21.2	16.2, 26.1	57.3	50.2, 64.4
Middle	4,639	35.4	31.5, 39.2	25.5	21.9, 29.1	60.9	57.0, 64.7
Upper-middle	8,014	34.2 *	31.4, 37.0	24.6	22.0, 27.1	58.8	55.7, 61.9
Highest ^a	7,297	39.0	35.6, 42.4	23.1	20.3, 25.9	62.1	58.7, 65.5
Missing	1,988	36.4	30.3, 42.5	13.8 *	10.4, 17.3	50.2 *	43.8, 56.7

Data source: 2004 Canadian Community Health Survey: Nutrition

Notes: Age groups, provinces and ethnic origin are compared with rate for Canada. Respondents with missing information are: marital status (8), education (85), fruit and vegetable consumption (44), physical activity level (2).

^a Reference category

 * Significantly different from reference category ($p < 0.05$)

^E Coefficient of variation between 16.6% and 33.3% (interpret with caution)

^F Coefficient of variation greater than 33.3% (suppressed because of extreme sampling variability)

... Not applicable