

Psychological health— depression

Highlights

- Depression is twice as prevalent in women as in men.
- Depression is much more common among younger women than older women.
- Depression is a chronic disease—one episode is highly predictive of future episodes.
- Social support may be a protective factor. Women who lacked emotional support had higher odds of a future depressive episode compared with women with emotional support.
- There is a strong association between smoking and depression, but the research evidence concerning the underlying reason is complex.

Depression causes substantial suffering and disruption in the lives of those affected and those around them. One study projects it to be the second leading cause of the overall burden of illness in 2020, following ischaemic heart disease.¹ Psychological distress and depression are associated with substantial use of hospitals and physician visits.²

The National Population Health Survey (NPHS) includes a set of questions designed to determine whether or not respondents have experienced symptoms of depression in the year prior to their interview. The responses are used to estimate the probability that respondents were clinically depressed (see *Methods* and *Appendix*). Using information from the first three cycles of the NPHS (1994/95, 1996/97 and 1998/99), this article reports on the prevalence and incidence of depression among Canadians aged 12 or older. It also identifies factors that are predictive of depression in 1996/97 or 1998/99. These factors are based on information provided in 1994/95 regarding personal characteristics, socioeconomic status, physical health, health behaviours, psychological well-being and social resources.

Methods

Data source

The prevalence estimates presented in this article are based on cross-sectional data from the household component of the first (1994/95), second (1996/97) and third (1998/99) cycles of the National Population Health Survey (NPHS) for the 10 provinces (see *Annex*). Data from the longitudinal component of the NPHS were used for the analysis of factors associated with a future episode of depression.

For 1994/95, the prevalence estimates are based on data from 7,451 men and 9,268 women aged 12 or older for whom information on depression is available from cycle 1. Estimates for 1996/97 are based on data from 32,706 men and 37,832 women; for 1998/99, from 6,720 men and 8,061 women.

The multivariate analysis of factors associated with a future episode of depression is based on 10,456 longitudinal respondents: 4,638 men and 5,818 women 12 or older. These respondents had not experienced a depressive episode in the 12 months prior to their baseline interview (cycle 1 in 1994/95) and had provided information on other cycle 1 variables used in the analysis. In addition, in order to be included, they must have answered cycle 2 and 3 questions that measure the probability of having experienced a depressive episode in the 12 months before the interview.

Analytical techniques

Two groups were formed: respondents who were "free" of depression at all three cycles, and respondents who were free of depression at baseline and who experienced a depressive episode in the 12 months prior to their cycle 2 or cycle 3 interview. Respondents are considered to have experienced a depressive episode if they obtained a score of 5 or more on the depression scale; this translates to a 0.90 probability of having experienced a depressive episode in the 12 months prior to the interview.

Results of the analysis of the factors associated with a future depressive episode are based on a generalized linear model with a repeated measures component. In order to identify factors that increase vulnerability to a future depressive episode, baseline characteristics of persons who had not experienced a depressive episode prior to their cycle 2 or cycle 3 interview are compared with the baseline characteristics of persons who did. Neither group had experienced a depressive episode in the 12 months prior to their cycle 1 interview. In addition to the selected cycle 1 indicators, two additional variables were entered in the model. The first one took into account the timing of the depressive episode; that is, whether it occurred before cycle 1 or cycle 2. The weighted percentage of respondents who experienced a depressive episode prior to their 1996/97 or 1998/99 interview were 2.4% and 2.6%, respectively. The second variable identified respondents who had experienced recurring depressive episodes; that is, at least one prior to their cycle 2 interview and one prior to their cycle 3 interview. Less than 1% (0.55%) of the respondents who had not experienced a

depressive episode prior to their cycle 1 interview experienced recurring depression. Separate regressions were done for men and women. Some variables were not included in the model for men because they created instability: recurring depression, occasional smoking and the third grouping of chronic conditions (heart, stroke, cancer and/or incontinence).

The cycle 1 dimensions included in the model were: personal characteristics, health behaviours, chronic conditions, and social and psychological resources (see *Appendix*). Personal characteristics include age, marital status, educational attainment, income, living arrangements and main activity. Health behaviours considered were smoking and drinking. Chronic conditions were measured by three indicators that include combinations of specific chronic conditions. Social resources included emotional support and social involvement; psychological resources was based on a score for self-esteem and mastery. The variables were chosen based on a literature review, face validity and availability in the NPHS. All variables were measured at baseline. The internal consistency of the scales measuring social and psychological resources was estimated by Cronbach's alpha and was calculated from the cross-sectional weighted 1994/95 sample for respondents 12 or older.

Sample data were weighted to represent the target population in 1994/95, the first cycle of NPHS data collection. To take into account design effects, the bootstrap technique was used to calculate the coefficients of variation for the estimates of rates and proportions. Standard errors used in the calculation of the confidence intervals were also estimated with this technique.³⁻⁵ Results at the $p \leq 0.05$ level were considered significant.

Limitations

The lifetime history of depression for NPHS respondents is unknown. Therefore, respondents classified as not having experienced a depressive episode could have suffered from depression prior to their 1994/95 interview. Moreover, because interviews for the NPHS are done every two years and respondents are only asked about depressive symptoms that occurred during the 12 months before the interview, respondents who had experienced a depressive episode in the year following their 1994/95 or their 1996/97 interviews (but not in the 12 months prior to the interview) are included among respondents who have not suffered from depression. The misclassification of these respondents would weaken the observed associations. The inability to detect an association between certain factors, such as marital status, and a future episode of depression may be, in part, due to the lack of information on the timing or duration of circumstances. For example, the NPHS does not provide information on the number of years a respondent has been widowed, divorced or separated. The finding of few statistically significant associations for men may be the result of a lack of statistical power. Finally, the NPHS data are based on self-report. Therefore, the extent to which the data are biased due to reporting error is unknown.

It should be noted that the structure of the NPHS imposes several important limitations on the analyses of prevalence, incidence and predictive factors. Because the NPHS asks about depressive symptoms during the year prior to the interview and the interviews for the NPHS are done every two years, respondents who experienced depressive symptoms 13 months or more before their interview would be classified as not having experienced a major depressive episode. In addition, the NPHS data are based on self-report (see *Methods*). Therefore, the extent to which they are biased because of reporting error is unknown. Finally, the finding of few statistically significant associations for men may be the result of a lack of statistical power.

Higher prevalence among youth and women

According to the NPHS, 4.3% of Canadians aged 12 or older reported symptoms strongly suggesting that they had experienced at least one major depressive episode (see *Definitions* and *Appendix*) in

Definitions

A major depressive episode is characterized by a depressed mood and/or lack of interest in most things, along with other symptoms, all lasting at least two weeks. These symptoms include appetite or sleep disturbance, decreased energy, difficulty concentrating, feelings of worthlessness and/or suicidal thoughts (see *Appendix* for more definitions of variables).

Prevalence of depression is the percentage of the population that is estimated to have experienced a major depressive episode at some time in the year before the 1994/95, 1996/97 or 1998/99 NPHS interview.

Two-year incidence of depression is the percentage of respondents who did not experience a major depressive episode in the year prior to their 1994/95 interview, but who did experience one in the year before their 1996/97 interview. Four-year incidence is based on the percentage of respondents who did not experience a depressive episode in the year prior to either their 1994/95 or 1996/97 interview but who did experience one in the year before their 1998/99 interview. Because information on lifetime history of depression is unknown, as well as information on symptoms experienced 13 to 24 months prior to the 1996/97 and 1998/99 interviews, it is not possible to have a "true" measure of incidence.

the year before their 1998/99 NPHS interview. The percentage was 5.2% in 1994/95 and 4.1% in 1996/97. These prevalence estimates are lower than those reported for the United States. According to the National Comorbidity Survey conducted in the United States between 1990 and 1992, where the same instrument was used, the 12-month prevalence of depression was 10% (around 13% for women and 8% for men).⁶

The prevalence of depression is not uniform across age groups. In all three cycles of the NPHS, it peaked among those aged 15 to 24, declined in mid-life, and was lowest among those aged 65 or older (Appendix Table A).

Depression is more prevalent among women than men. Approximately twice as many women reported symptoms that indicate a high probability of a major depressive episode in the first three cycles of the NPHS: around 7.1% of women compared with 3.3% of men in 1994/95; 5.4% of women compared with 2.7% of men in 1996/97; and 5.7% of women compared with 2.9% of men in 1998/99. This male-female pattern holds true, roughly, for all age groups between 12 and 64 (Charts 1 and 2 and Appendix Table A).

Highest incidence among young women

The incidence of depression was higher among women between the ages of 12 to 24, compared with women aged 25 or older (Appendix Table B). And compared with women, the incidence of depression in men was substantially lower (Appendix Table C). It ranged from 2.2% to 2.9% among men aged 12 to 44, and then dropped to below 2% among men aged 45 or older.

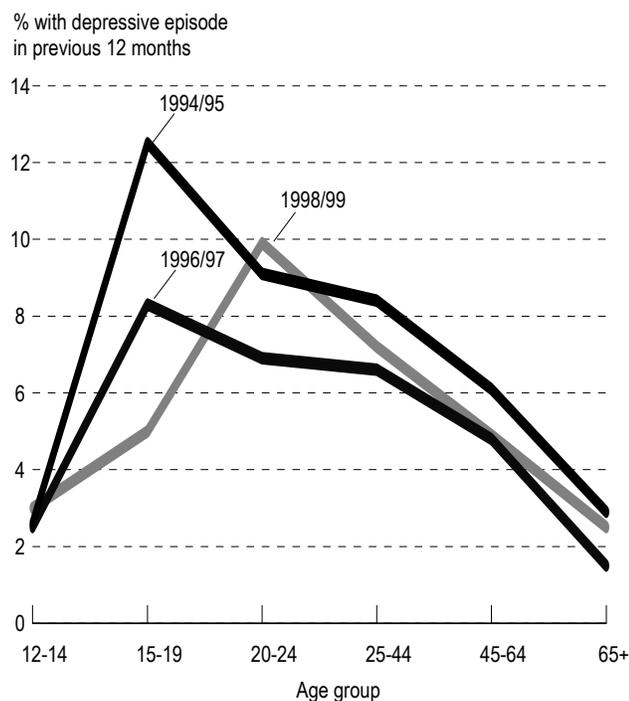
Predictive factors

Depression is the result of a complex set of influences.⁷ These influences include risk and vulnerability factors and provoking agents. Emotional reactivity, a risk factor, is thought to be inherited. Vulnerability increases following exposure to childhood trauma, and childhood trauma seems to be a stronger predisposing factor for women than men.⁸ Provoking agents include negative life events or chronic stress. Studies also indicate that social

support acts protectively.⁷ Depression has been conceptualized by some as an adaptive response that inhibits a response to a situation that may result in danger or loss.⁹

Based on their availability in the NPHS, various factors that measure environmental influences were selected and their association with the incidence of depression is presented. These factors include personal characteristics, socioeconomic status, health behaviours, chronic conditions, psychological well-being and social resources. With multivariate regression analysis, it is possible to determine the relative contribution of each factor to the odds of experiencing a major depressive episode. Results presented below are based on information provided in the 1994/95 NPHS by individuals who had not experienced a depressive episode prior to their interview and who had responded to the questions on depression in their 1996/97 and 1998/99 interviews.

Chart 1
Prevalence of depression, by age group, female household population aged 12 or older, Canada excluding territories, 1994/95, 1996/97 and 1998/99



Data source: 1994/95, 1996/97 and 1998/99 National Population Health Survey, cross-sectional sample, Health file
Note: See Appendix Table A for confidence intervals.

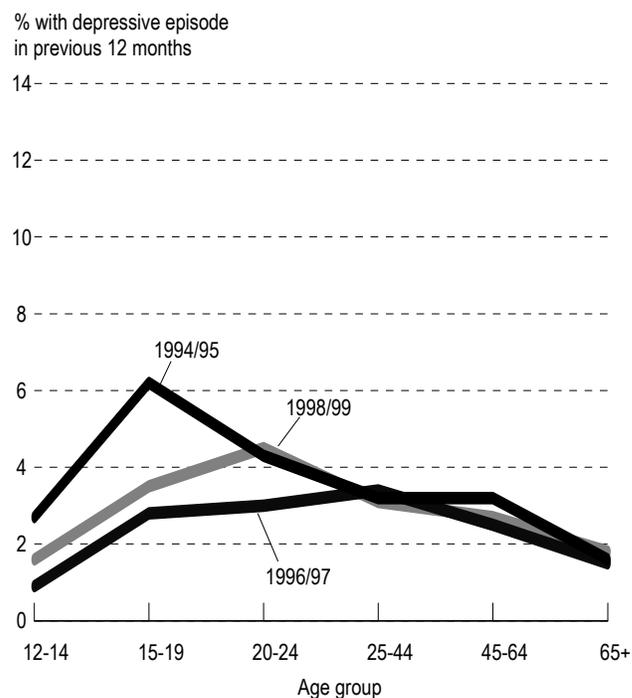
Younger age for women

As might be expected from the incidence rates for depression, the odds of having a major depressive episode were lower for women aged 65 or older, compared with any of the younger age groups considered (Table 1). Among men, age was not a significant predictor of a future depressive episode.

Smoking

Nicotine is thought to have antidepressant effects.¹⁰ Studies indicate that smokers who have a history of depression have more difficulty quitting smoking, have more severe withdrawal symptoms and are more susceptible to depression after they stop smoking than smokers who are not prone to depression.¹¹ Adolescents who were free of depressive symptoms at baseline and who were “established smokers,” that is, they had smoked at least 100 cigarettes in their lifetime and had smoked

Chart 2
Prevalence of depression, by age group, male household population aged 12 or older, Canada excluding territories, 1994/95, 1996/97 and 1998/99



Data source: 1994/95, 1996/97 and 1998/99 National Population Health Survey, cross-sectional sample, Health file
Note: See Appendix Table A for confidence intervals.

Table 1

Adjusted odds ratios of a depressive episode in 1996/97 and/or 1998/99, by selected characteristics in 1994/95, household population aged 12 or older, Canada excluding territories

	Women		Men	
	Odds ratio	95% confidence interval	Odds ratio	95% confidence interval
Personal characteristics				
Age				
12-14	5.24*	1.96, 14.02
15-19	6.11*	2.59, 14.42	3.71	0.93, 14.73
20-24	4.61*	2.06, 10.34	3.62	0.99, 13.12
25-44	3.30*	1.75, 6.23	2.35	0.76, 7.26
45-64	2.14*	1.18, 3.88	1.41	0.52, 3.87
65+†	1.00	...	1.00	...
Marital status				
Married†‡	1.00	...	1.00	...
Never married	1.06	0.68, 1.64	0.56	0.31, 1.01
Previously married	1.19	0.80, 1.75	1.24	0.39, 3.96
Educational attainment				
Less than secondary	0.84	0.57, 1.24	1.19	0.68, 2.08
Secondary graduation	0.85	0.59, 1.24	1.20	0.58, 2.49
Some postsecondary	0.76	0.56, 1.04	1.30	0.85, 2.00
Postsecondary graduation†	1.00	...	1.00	...
Inadequate income§				
	1.26	0.93, 1.73	1.19	0.64, 2.22
Lives alone§				
	0.81	0.50, 1.30	0.98	0.38, 2.54
Main activity				
Working†	1.00	...	1.00	...
In school	0.81	0.46, 1.43	2.14*	1.04, 4.39
Retired	0.78	0.47, 1.30	1.10	0.42, 2.92
Ill, disabled or caring for someone	0.86	0.61, 1.22	1.08	0.36, 3.25
Not working	0.75	0.35, 1.62	1.61	0.76, 3.42
Health behaviours				
Smoking				
Daily smoker	1.46*	1.08, 1.98	1.90*	1.25, 2.89
Occasional smoker	0.92	0.47, 1.81	1.00 ^a	...
Non-smoker†	1.00	...	1.00	...
Drinking				
Binge drinking ^{§††}	1.19	0.62, 2.28	1.90	0.84, 4.29
Chronic conditions				
Back problem, high blood pressure, migraine and/or ulcer ^{‡‡}	1.77*	1.34, 2.34	1.42	0.86, 2.35
Arthritis, emphysema, diabetes and/or glaucoma ^{‡‡}	1.28	0.89, 1.84	1.81	0.99, 3.31
Heart, stroke, cancer and/or incontinence ^{‡‡}	1.09	0.68, 1.74	^a	^a
Social resources				
Low emotional support	1.47*	1.06, 2.04	1.12	0.71, 1.78
Low social involvement	1.18	0.93, 1.51	0.89	0.60, 1.33
Psychological resources				
Low self-esteem [§]	1.09	0.87, 1.38	1.17	0.83, 1.64
Low mastery [§]	1.80*	1.38, 2.33	1.21	0.81, 1.81
Timing of depressive episode ^{§§}	0.96	0.73, 1.27	1.06	0.75, 1.51
Recurring depressive episode ^{†††}	2.97*	1.03, 8.55	^a	^a

Data source: National Population Health Survey, Longitudinal file, 1994/95 to 1998/99

Notes: The results are based on 4,638 men and 5,818 women. Of this group, 4.5% (n=210) men and 8.8% (n=510) women experienced a depressive episode before their 1996/97 or 1998/99 interview. In the regression model for men, the age groups 12 to 14 and 15 to 19 were combined into one group, 12 to 19.

† Reference category for which odds ratio is always 1.00

‡ Includes common-law and living with partner.

§ Reference category is absence of the characteristic.

†† Binge drinking was defined as every other week, on average, for women and weekly, on average, for men.

‡‡ One or more of the four chronic conditions versus none

§§ This dichotomous variable measures the elapsed time between baseline and a depressive episode. Respondents coded as "yes" had a depressive episode in the 12 months before their 1998/99 interview.

††† This dichotomous variable measures recurring depressive episodes. Respondents coded as "yes" had a depressive episode in the 12 months before their 1996/97 and 1998/99 interviews.

^a Occasional smoker, the third grouping of chronic conditions, and recurring depression were omitted from the regression model for men because sample counts were too low and they were creating instability in the model. With regard to smoking, never and occasional smokers is the reference category for men.

* $p \leq 0.05$

in the past 30 days, had increased odds of having developed depressive symptoms at follow-up.¹² Adolescents with depressive symptoms were also more likely than other adolescents to start smoking.¹³ While this may indicate that depression-prone smokers use tobacco to self-medicate,¹⁴ evidence from another study has shown that, at least in women, smoking and depression are the result of a familial predisposition, possibly gene-related.¹⁵

Evidence that smoking is related to depression can also be documented from the NPHS. People who smoked daily had increased odds of having a major depressive episode compared with non-smokers. The odds were almost double for men who smoked daily, and were one-and-a-half times higher for women who smoked daily (Table 1).

Chronic conditions

Research in a community sample has shown that the 12-month prevalence of depression is positively associated with the number of chronic conditions present.¹⁶ A recent extensive review of the literature concluded that depression is more common among patients with chronic pain, and that individuals with a history of depression may be at an increased risk of depression following the onset of chronic pain (the scar hypothesis).¹⁷ It is suspected that depression and chronic pain share a common biologic pathway, as both can be relieved by selective serotonin reuptake inhibitors or other antidepressants.¹⁸ Research also suggests that interpersonal stress experienced by patients with rheumatoid arthritis or osteoarthritis who are depressed increases disease flare-ups.¹⁹ Depression has also been implicated in the development of heart disease. Depressed patients are more likely to die following a heart attack than non-depressed patients.²⁰ Increased platelet function observed in depressed patients is the suspected mechanism, as it would promote plaque formation and contribute to coronary occlusion and coronary heart disease.²¹

According to the NPHS data, the diagnosis of a chronic health problem is predictive of depression for women only. Among women, the odds of experiencing a major depressive episode were almost double for those who reported a diagnosis of a back

problem, high blood pressure, migraine and/or an ulcer in 1994/95. No significant association was found between a future episode of depression and a prior diagnosis of arthritis, emphysema, diabetes and/or glaucoma or a diagnosis of heart disease, stroke, cancer and/or incontinence for women or men in 1994/95.

Social resources and psychological well-being

Results from the NPHS indicate that among women, three measures of psychological well-being and social support were significantly associated with having a major depressive episode.

A previous major depressive episode was predictive of future depression. Women who had experienced a major depressive episode in the year before their 1996/97 NPHS interview had three times the odds of having a subsequent major depressive episode in the year before their 1998/99 interview.

Depression is often accompanied by feelings of being overwhelmed and out of control. Women who scored below the median on the scale for sense of mastery in their 1994/95 NPHS interview had almost twice the odds of having a major depressive episode in the year before their 1996/97 or 1998/99 interviews as women who scored above the median (see *Appendix*).

The buffering hypothesis suggests that social support protects individuals from the negative effects of stress.²² Women who lacked emotional support in 1994/95 had higher odds of a future depressive episode than women who had adequate social support.

Marital status and living circumstances

Marital status and living circumstances were not associated with increased odds of having a major depressive episode for men or women. Likewise, educational attainment, inadequate income and main activity were not predictive of a depressive episode, with one exception. Men who were in school had twice the odds of a future depressive episode than men who were working. As stated previously, the inability to detect associations that are statistically

significant for men may be the result of a lack of statistical power.

Concluding remarks

Previous studies based on the first cycle of the NPHS reported that depression is most prevalent among youth and young adults and least prevalent among older adults.²³⁻²⁵ This analysis extends this finding, as it indicates that, relative to older adults, those in the youngest age groups have much higher odds of having a future depressive episode. This is the reverse of patterns identified in the past, when depression was more prevalent among older adults than younger adults. It has been suggested that this reversal may have occurred after the late 1970s, when socioeconomic conditions improved for older Canadians and worsened for youth and young adults.²⁵

The prevalence of depression among women is double that among men. This is consistent with previous studies,^{26, 27} and tends to pertain to all age groups up to 65. The higher prevalence of depression among women underscores the importance of prevention and health promotion efforts that address the mental health needs of women. The analysis of predictive factors among women suggests that such efforts are particularly needed among women with a history of depression, who suffer from a chronic illness, who lack social support, and who have little sense of control in their lives.

The association between daily smoking and increased risk of depression among men and women is consistent with other studies.⁶⁻¹¹ Depression-prone individuals may use tobacco to self-medicate, or depression and smoking may share a common genetic basis. ●

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Appendix

Table A

Prevalence of depression, by age group and sex, household population aged 12 or older, Canada excluding territories, 1994/95, 1996/97 and 1998/99

	Cycle 1, 1994/95		Cycle 2, 1996/97		Cycle 3, 1998/99		Significant comparisons*		
	%	95% confidence interval	%	95% confidence interval	%	95% confidence interval	Cycle 1/Cycle 2	Cycle 2/Cycle 3	Cycle 1/Cycle 3
Total									
12-14	2.7 [‡]	1.1, 4.2	1.7 [†]	1.1, 2.3	2.3 [§]	0.8, 3.8			
15-19	9.2	7.1, 11.3	5.5	4.1, 6.8	4.2 [†]	2.7, 5.8	1 > 2		1 > 3
20-24	6.8	5.0, 8.6	4.9	3.9, 5.9	7.2	5.2, 9.2		3 > 2	
25-44	5.8	5.1, 6.6	5	4.5, 5.6	5.2	4.5, 5.8			
45-64	4.7	3.9, 5.4	3.7	3.2, 4.2	3.8	3.1, 4.5	1 > 2		
65+	2.3	1.7, 2.9	1.5	1.1, 1.9	2.2	1.5, 2.9			
Women									
12-14	2.6 [§]	0.7, 4.5	2.5 [†]	1.4, 3.6	3 [§]	0.0, 5.9			
15-19	12.5	9.1, 15.8	8.3	5.9, 10.7	5 [†]	2.7, 7.3	1 > 2		1 > 3
20-24	9.1	6.0, 12.1	6.9	5.2, 8.6	9.9	6.7, 13.1		3 > 2	
25-44	8.4	7.2, 9.6	6.6	5.8, 7.5	7.2	6.0, 8.4	1 > 2		
45-64	6.1	4.9, 7.4	4.8	4.0, 5.6	4.9	3.8, 6.0	1 > 2		
65+	2.9	2.0, 3.8	1.5 [†]	1.0, 2.0	2.5 [†]	1.5, 3.5	1 > 2		
Men									
12-14	2.7 [§]	0.2, 5.2	0.9 [§]	0.2, 1.5	1.6 [§]	0.0, 3.2			
15-19	6.2 [†]	3.5, 8.8	2.8 [†]	1.8, 3.8	3.5 [†]	1.3, 5.6	1 > 2		
20-24	4.3 [†]	2.5, 6.2	3 [†]	1.8, 4.2	4.5 [†]	2.1, 6.9			
25-44	3.2	2.5, 4.0	3.4	2.7, 4.1	3.1	2.4, 3.9			
45-64	3.2	2.1, 4.2	2.5	1.9, 3.1	2.7	1.9, 3.5			
65+	1.6 [†]	0.8, 2.3	1.5 [†]	0.8, 2.2	1.8 [†]	0.1, 2.7			

Data source: 1994/95, 1996/97 and 1998/99 National Population Health Survey, cross-sectional sample, Health file

[†] Coefficient of variation between 16.6% and 25.0%

[‡] Coefficient of variation between 25.1% and 33.3%

[§] Coefficient of variation greater than 33.3%

* $p \leq 0.05$; critical value adjusted for multiple comparisons

Table B
Two- and four-year incidence of a depressive episode, by selected characteristics in 1994/95, female household population aged 12 or older, Canada excluding territories

	Two-year incidence		Four-year incidence		Significant comparisons*	
	%	95% confidence interval	%	95% confidence interval	Two-year incidence	Four-year incidence
Personal characteristics						
Age						
12-14	§	§	§	§		
15-19	7.9†	4.8, 10.9	7.2†	3.8, 10.6	> 65+	> 65+
20-24	5.1†	2.9, 7.3	8.4‡	3.6, 13.3	> 65+	> 65+
25-44	4.7	3.6, 5.8	4.4	3.5, 5.4	> 65+	> 65+
45-64	3.7	2.6, 4.7	3.2†	2.0, 4.4	> 65+	> 65+
65+	1.3‡	0.6, 1.9	1.6‡	0.6, 2.6		
Marital status						
Married††	3.7	3.1, 4.3	3.8	2.9, 4.6		
Never married	6.3	4.4, 8.2	5†	3.2, 6.8	> married; previously married	
Previously married	3.4†	2.1, 4.6	4†	2.5, 5.6		
Educational attainment						
Less than secondary	5.0	3.7, 6.2	4.3	2.9, 5.7		
Secondary graduation	5.2	3.5, 6.9	2.6†	1.5, 3.7		
Some postsecondary	3.8	2.5, 5.1	4	2.8, 5.2		
Postsecondary graduation	3.5	2.4, 4.5	4.9	3.3, 6.4		
Inadequate income						
No	3.9	3.2, 4.7	3.6	2.8, 4.4		
Yes	5.3	3.9, 6.7	5.1‡	3.2, 7.1		
Lives alone						
No	4.6	3.8, 5.3	4.3	3.4, 5.1	> yes	
Yes	2.4†	1.5, 3.3	3.1†	1.9, 4.3		
Main activity						
Working	4.5	3.6, 5.5	4.8	3.6, 6.0	> retired	
In school	6.9‡	2.8, 11.0	4.6‡	1.6, 7.6		
Retired	1.8‡	0.8, 2.7	2.2‡	1.0, 3.3		
Ill or disabled	§	§	§	§		
Caring for someone	4.1†	2.7, 5.5	3.1†	1.9, 4.3		
Had a job in last 12 months	§	§	§	§		
Did not work in last 12 months	§	§	§	§		
Health behaviours						
Smoking						
Daily smoker	6.8	4.9, 8.6	5.8	4.3, 7.4	> not a smoker	> not a smoker
Occasional smoker	§	§	§	§		
Not a smoker	3.7	3.0, 4.3	3.6	2.8, 4.4		
Binge drinking‡‡						
No	4.3	3.6, 5.0	4	3.3, 4.7		
Yes	§	§	§	§		
Chronic conditions						
Back problem, high blood pressure, migraine and/or ulcer§§						
No	3.9	3.2, 4.6	3.7	2.8, 4.6	> no	> no
Yes	5.3	3.9, 6.8	5.2	3.9, 6.5		
Arthritis, emphysema, diabetes and/or glaucoma§§						
No	4.2	3.5, 4.9	4.2	3.3, 5.0		
Yes	4.7†	3.1, 6.2	3.9†	2.4, 5.4		
Heart, stroke, cancer and/or incontinence§§						
No	4.4	3.7, 5.1	4.2	3.4, 4.9		
Yes	3.4‡	1.6, 5.2	3.6‡	1.8, 5.4		
Social resources						
Low emotional support						
No	4.2	3.5, 4.9	3.8	3.0, 4.5		
Yes	5.1†	3.2, 7.0	6.4†	3.7, 9.1		
Low social involvement						
No	3.8	2.9, 4.6	3.1	2.2, 3.9		> no
Yes	4.9	3.9, 5.8	5.2	4.1, 6.4		
Psychological resources						
Low self-esteem						
No	3.5	2.8, 4.3	3.6	2.7, 4.5		
Yes	5.1	4.0, 6.1	4.6	3.4, 5.8	> no	
Low mastery						
No	2.6	1.8, 3.3	3.3	2.4, 4.2		
Yes	5.8	4.8, 6.9	4.7	3.7, 5.8	> no	> no

Data source: National Population Health Survey, Longitudinal file, 1994/95 to 1998/99

Notes: The results are based on 5,879 women, 8% (n = 468) of whom had experienced a depressive episode before their 1996/97 or 1998/99 interview. Two-year incidence is the percentage of respondents who did not experience depressive episode in the year before their 1994/95 interview, but did experience one in the year before their 1996/97 interview. Four-year incidence is the percentage of respondents who did not experience a major depressive episode in the year before their 1994/95 or 1996/97 interview, but who did experience one in the year before their 1998/99 interview.

† Coefficient of variation between 16.6% and 25.0%

‡ Coefficient of variation between 25.1% and 33.3%

§ Coefficient of variation greater than 33.3%

†† Includes common-law and living with partner

‡‡ Every other week, on average

§§ One or more of the chronic conditions

* p < 0.05; critical value adjusted for multiple comparisons

Table C
Two- and four-year incidence of a depressive episode, by selected characteristics in 1994/95, male household population aged 12 or older, Canada excluding territories

	Two-year incidence		Four-year incidence		Significant comparisons*	
	%	95% confidence interval	%	95% confidence interval	Two-year incidence	Four-year incidence
Personal characteristics						
Age						
12-14	§	§	§	§		
15-19	§	§	§	§		
20-24	§	§	§	§		
25-44	2.9†	1.7, 4.2	2.2†	1.5, 2.9		
45-64	1.8†	0.9, 2.6	1.8†	0.8, 2.8		
65+	1.8†	0.7, 2.8	§	§		
Marital status						
Married††	2.6†	1.7, 3.4	2	1.4, 2.6		
Never married	2.3†	1.2, 3.3	2.4†	1.4, 3.5		
Previously married	§	§	§	§		
Educational attainment						
Less than secondary	2.7‡	1.4, 4.1	2.3†	1.3, 3.3		
Secondary graduation	§	§	§	§		
Some postsecondary	2.8†	1.8, 3.8	2.5†	1.2, 3.8		
Postsecondary graduation	1.6†	0.8, 2.4	2†	1.2, 2.8		
Inadequate income						
No	2.2	1.5, 2.9	2.2	1.6, 2.7		
Yes	§	§	2.9†	1.4, 4.4		
Lives alone						
No	2.6	1.8, 3.3	2.1	1.6, 2.7		
Yes	2.1†	0.9, 3.2	2.4†	1.1, 3.8		
Main activity						
Working	2.3†	1.5, 3.2	1.7	1.2, 2.3		
In school	§	§	6.3‡	2.3, 10.2		
Retired	1.6†	0.6, 2.6	§	§		
Ill or disabled	§	§	§	§		
Caring for someone	§	§	§	§		
Had a job in last 12 months	§	§	§	§		
Did not work in last 12 months	§	§	§	§		
Health behaviours						
Smoking						
Daily smoker	4.1†	2.3, 6.0	3.2†	1.9, 4.5		
Occasional smoker	§	§	§	§		
Not a smoker	1.9†	1.2, 2.6	1.9	1.3, 2.5		
Binge drinking††						
No	2.3	1.7, 2.9	2.1	1.6, 2.6		
Yes	§	§	§	§		
Chronic conditions						
Back problem, high blood pressure, migraine and/or ulcer§						
No	2.1†	1.4, 2.8	2.1	1.5, 2.8		
Yes	3.9†	1.9, 5.9	2.2†	1.2, 3.2		
Arthritis, emphysema, diabetes and/or glaucoma§						
No	2.4	1.6, 3.2	2	1.5, 2.6		
Yes	3.2†	1.4, 5.0	3†	1.1, 5.0		
Heart, stroke, cancer and/or incontinence§						
No	2.5	1.8, 3.2	2.3	1.7, 2.8		
Yes	§	§	§	§		
Social resources						
Low emotional support						
No	2.1†	1.4, 2.8	2.4	1.8, 3.0		>yes
Yes	4.1†	2.0, 6.2	1.3†	0.5, 2.1		
Low social involvement						
No	2.0†	1.0, 2.9	2.6†	1.6, 3.6		
Yes	2.9†	1.9, 3.9	1.8	1.2, 2.4		
Psychological resources						
Low self-esteem						
No	2.2†	1.3, 3.1	1.9†	1.2, 2.6		
Yes	2.9†	1.9, 3.9	2.5	1.7, 3.2		
Low mastery						
No	1.8†	0.9, 2.7	2.3†	1.5, 3.1		
Yes	3.1†	2.0, 4.1	2.1	1.4, 2.7		

Data source: National Population Health Survey, Longitudinal file, 1994/95 to 1998/99

Notes: The results are based on 4,693 men, 4.2% (n = 199) of whom had experienced a depressive episode before their 1996/97 or 1998/99 interview. Two-year incidence is the percentage of respondents who did not experience a major depressive episode in the year before their 1994/95 interview, but did experience one in the year before their 1996/97 interview. Four-year incidence is the percentage of respondents who did not experience a major depressive episode in the year before their 1994/95 or 1996/97 interview, but who did experience one in the year before their 1998/99 interview.

† Coefficient of variation between 16.6% and 25.0%

‡ Coefficient of variation between 25.1% and 33.3%

§ Coefficient of variation greater than 33.3%

†† Includes common-law and living with partner

‡‡ Every other week, on average

§§ One or more of the chronic conditions

* p ≤ 0.05; critical value adjusted for multiple comparisons

Definition of variables

Using the methodology of Kessler et al,⁶ the National Population Health Survey measures a *major depressive episode (MDE)* with a subset of questions from the Composite International Diagnostic Interview. These questions cover a cluster of symptoms for a depressive disorder, which are listed in the *Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R)*.²⁸

The question numbers refer to those used in the mental health section of the NPHS questionnaire. There are three possible paths through these questions: “yes” to 2, then 3 to 13; “no” to 2, “yes” to 16, then 17 to 26; and “no” to 2 and “no” to 16.

- 2 “During the past 12 months, was there ever a time when you felt sad, blue, or depressed for two weeks or more in a row?” (Yes - go to 3; No - go to 16)
- 16 “During the past 12 months, was there ever a time lasting two weeks or more when you lost interest in most things like hobbies, work, or activities that usually give you pleasure?” (Yes - go to 17; No - end)
- 3/17 “For the next few questions, please think of the two-week period during the past 12 months when: 3. these feelings were worst.” 17. you had the most complete loss of interest in things.”
“During that time how long did these feelings usually last?” (All day long; Most of the day; About half of the day; Less than half the day)
- 4/18 “How often did you feel this way during those two weeks?” (Every day; Almost every day; Less often)
- 5 “During those two weeks did you lose interest in most things?” (Yes; No)
- 6/19 “Did you feel tired out or low on energy all of the time?” (Yes; No)
- 7/20 “Did you gain weight, lose weight, or stay about the same?” (Gained weight; Lost weight; Stayed about the same; Was on a diet)
- 8/21 “About how much did you gain/lose?”
- 9/22 “Did you have more trouble falling asleep than you usually do?” (Yes; No)
- 10/23 “How often did that happen?” (Every night; Nearly every night; Less often)
- 11/24 “Did you have a lot more trouble concentrating than usual?” (Yes; No)
- 12/25 “At these times, people sometimes feel down on themselves, no good, or worthless. Did you feel this way?” (Yes; No)
- 13/26 “Did you think a lot about death—either your own, someone else’s, or death in general?” (Yes; No)

A value of 1 was assigned to any “yes” answer to the “yes/no” questions. For questions 8 and 21, a score of 1 was assigned if the change in weight was at least 10 pounds (4.5 kilograms). For questions 10 and 23, a score of 1 was given to respondents who reported having trouble falling asleep every night or nearly every night. Those who replied “yes” to question 2, and whose symptoms lasted all day or most of the day, and had occurred every day or almost every day, had a maximum possible score of 8. For those who responded “yes” to

question 16, and whose symptoms lasted all day or most of the day, and had occurred every day or almost every day, the maximum possible was 7. Respondents who replied “no” to questions 2 and 16 scored 0.

Response scores were totalled, and the results were transformed into a probability estimate of a diagnosis of MDE. For this article, if the estimate was 0.9 or more, that is, 90% likelihood of a positive diagnosis of MDE, the respondent was considered to have experienced a depressive episode in the previous 12 months. To obtain a probability of 0.90, respondents had to score 5 or more. Respondents were classified as having experienced a new MDE if their scores indicated a depressive episode before their 1996/97 or 1998/99 interview, but not in the 12 months before their 1994/95 interview.

Personal characteristics included in the analysis were: age, marital status, educational attainment, income adequacy, living arrangements, and main activity.

Age was subdivided into 6 groups: 12 to 14, 15 to 19, 20 to 24, 25 to 44, 45 to 64, and 65 or older.

Respondents were asked for their current *marital status*. Those who indicated the “now married,” “common-law” or “living with a partner” options were grouped together as “married.” Individuals who answered “single” were classified as “never married,” and “widowed,” “separated” and “divorced” were categorized as “previously married.”

Educational attainment was grouped into four categories: less than secondary graduation, secondary graduation, some postsecondary, and postsecondary graduation.

Income adequacy is based on household income in relation to household size. Household income is classified as inadequate according to the following criteria:

Household income	Household size
Less than \$15,000	1 or 2 persons
Less than \$20,000	3 or 4 persons
Less than \$30,000	5 or more persons.

Lives alone was coded “yes” for all individuals who were not sharing a household with another person.

Respondents were categorized according to their main activity. Categories were mutually exclusive. These include currently working, in school, retired, ill or disabled, caring for someone, had a job in the last 12 months but not currently working, and did not work in the last 12 months. For the multivariate analysis, ill or disabled was combined with caring for someone, and the not working category included those who had a job in the last 12 months but were not currently working and did not work in the last 12 months.

Health behaviours include *smoking and drinking*. To assess smoking behaviour, respondents were asked: “At the present time do you smoke cigarettes daily, occasionally or not at all?”

To assess drinking behaviour, respondents were asked: “During the past 12 months, have you had a drink of beer, wine, liquor or any other alcoholic beverage?” Those who answered “yes” were asked: “How often in the past 12 months have you had 5 or more drinks on one occasion?” Men who reported that they had 52 or more occurrences of drinking 5 or more drinks in one occasion in the last

year were considered to be binge drinkers. For women the cut-off was 26 or more occurrences or every two weeks on average. Respondents who stated that they had not used alcohol in the past 12 months were coded "0" on the indicator measuring drinking behaviour.

Respondents were asked if they had "long-term conditions that have lasted or are expected to last six months or more and that have been diagnosed by a health care professional." Only a subset of *chronic conditions* was retained, and they were combined into three major groupings. The first group included back problems, high blood pressure, migraine, and ulcer. The second group was composed of arthritis, emphysema, diabetes, and glaucoma. The last group included heart disease, stroke, cancer and incontinence. In the 1994/95 interview, a list was read, and the interviewer marked all the conditions that applied. In 1996/97 and 1998/99, the respondent was asked to answer "yes" or "no" to each condition. Respondents were categorized as having none or one or more chronic conditions for each grouping.

Social resources include perceived emotional support and social involvement. Four "yes/no" questions measured emotional support. Those who answered "no" to one or more questions (16%) were classified as lacking social support.

1. Do you have someone you can confide in, or talk to about your private feelings or concerns?
2. Do you have someone you can really count on to help you out in a crisis situation?
3. Do you have someone you can really count on to give you advice when you are making important personal decisions?
4. Do you have someone who makes you feel loved and cared for?

The estimated internal consistency for this index is .64.

Social involvement measures frequency of participation in associations or voluntary organizations and frequency of attendance at religious services in the last year. Respondents were asked: "Are you a member of any voluntary organizations or associations such as school groups, church social groups, community centres, ethnic associations or social, civic or fraternal clubs? (Yes; No - go to 3). If "yes," respondents answered the following question on a five-point scale ("at least once a week," "at least once a month," "at least three or four times a year," "at least once a year," "not at all"): (Question 2) "How often did you participate in meetings or activities sponsored by these groups in the past 12 months?" and "If you belong to many, just think of the ones in which you are most active."

All respondents were also asked (Question 3): "Other than on special occasions (such as weddings, funerals or baptisms), how often did you attend religious services or religious meetings in the past 12 months?"

Questions 2 and 3 were scored from 0 ("not at all") to 4 ("at least once a week"). Respondents who answered "no" to question 1 were given a score of 0 on question 2. Answers were summed for a potential range of 0 to 8. The median value for the 1994/95 cross-sectional distribution was used to as the cut-off for low social involvement (a score below 3). Around 52% of the longitudinal respondents had low social involvement. The estimated internal consistency for this index is .45.

Psychological resources include self-esteem and mastery. Self-esteem measures the "positiveness" with which individuals regard themselves.²⁹ On a five-point scale from "strongly disagree" (score 0) to "strongly agree" (score 4), respondents to the NPHS replied to the following statements:

1. You feel that you have a number of good qualities.
2. You feel that you're a person of worth at least equal to others.
3. You are able to do things as well as most other people.
4. You take a positive attitude toward yourself.
5. On the whole, you are satisfied with yourself.
6. All in all, you're inclined to feel you're a failure (scoring reversed).

Respondents who scored below the median of the cross-sectional distribution (a score of 20) (54%) were considered to have low self-esteem. The internal consistency of the scale was estimated at 0.84.

Sense of mastery measures the extent to which people believe that their life chances are under their control.³⁰ On a five-point scale from "strongly agree" (score 0) to "strongly disagree" (score 4) respondents replied to the following statements:

1. You have little control over the things that happen to you.
2. There is really no way you can solve the problems you have.
3. There is little you can do to change many of the important things in your life.
4. You often feel helpless in dealing with the problems of life.
5. Sometimes you feel that you are being pushed around in life.
6. What happens to you in the future mostly depends on you (scoring reversed).
7. You can do just about anything you really set your mind to (scoring reversed).

Respondents who scored below the median of the 1994/95 cross-sectional distribution (a score of 20) were classified as having a low sense of mastery. The scale's internal consistency estimate is 0.75.