Determinants of self-perceived health

Margot Shields and Shahin Shooshtari

Abstract

Objectives
This article examines determinants of self-perceived health. Factors associated with very good/excellent rather than good health are compared with those associated with fair/poor rather than good health.

Data source
The data are from the household cross-sectional and longitudinal components of the first three cycles (1994/95, 1996/97 and 1998/99) of Statistics Canada's National Population Health Survey (NPHS).

Analytical techniques
Cross-tabulations from the 1998/99 NPHS cross-sectional file were used to estimate the prevalence of very good/excellent and fair/poor health by sex and age group. Based on the longitudinal file, predictors of health perceptions in 1998/99 were studied in a multivariate model using generalized logistic regression.

Main results
While physical conditions were strongly related to health perceptions, some lifestyle, socio-economic and psycho-social factors were also statistically significant. Heavy smoking, irregular exercise and overweight were associated with fair/poor health ratings. Unhealthy changes in lifestyle were associated with fair/poor rather than good health. Distress, low self-esteem and low socio-economic status were negatively associated with very good/excellent health.

Key words
health status indicators, health behaviour, functional health, longitudinal studies, health surveys

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A crucial issue for population health surveys is identifying measures that are reliable, valid and straightforward to administer. Self-perceived health meets these criteria. Most surveys that assess health ask respondents for a global evaluation—usually a rating of their health along a four- or five-point scale from poor to excellent.

The reliability of such self-assessments has been found to be as good as or better than measures such as functional ability, chronic diseases and psychological well-being.[1] Relatively high four-week test/re-test reliability measures have been reported across various sub-populations.[1,2] Based on longer periods, self-reported health has been shown to be more stable than physicians' ratings.[3]

Self-perceived health is also strongly correlated with more extensive health scales, such as the Sickness Impact Profile,[4] the Perceived Well-Being Scale,[2] and various sub-scales of the Short Form 36 Health Survey Questionnaire,[5] which indicates a high degree of construct validity. Significant associations with physicians' ratings[3,6] further demonstrate the validity of self-perceived health.

Data source

Data source

This analysis is based on Statistics Canada's National Population Health Survey (NPHS). The NPHS, which began in 1994/95, collects information about the health of Canadians every two years. It covers household and institutional residents in all provinces and territories, except persons living on Indian reserves, on Canadian Forces bases, and in some remote areas. The NPHS has a longitudinal and a cross-sectional component.

Cross-sectional sample: The 1994/95 and 1996/97 (cycles 1 and 2) cross-sectional samples are made up of longitudinal respondents and other members of their households, as well as individuals who were selected as part of supplemental samples, or buy-ins, in some provinces. In 1994/95, the large majority of interviews were conducted in person. Most of the 1996/97 interviews were conducted by telephone, and additional respondents for the buy-ins were chosen using the random digit dialling technique. The 1998/99 (cycle 3) cross-sectional sample is made up mostly of longitudinal respondents and their cohabitants. Again, most of the interviews were conducted by telephone. Although no buy-ins were added to the cycle 3 sample, infants born in 1995 or later and immigrants who entered Canada after 1994 were randomly selected and added to keep the sample representative. To replace sample lost to attrition, individuals in dwellings that were part of the original sampling frame but whose household members did not respond in 1994/95 were asked to participate.

NPHS data are stored in two files. The General file contains socio-demographic and some health information obtained for each member of participating households. The Health file contains in-depth health information, which was collected for one randomly selected household member, as well as the information in the General file pertaining to that individual.

In 1994/95, in all selected households, one knowledgeable person provided the socio-demographic and health information about all household members for the General file. As well, one household member, not necessarily the same person, was randomly selected to provide in-depth health information about himself or herself for the Health file.

Among individuals in the longitudinal component in 1996/97 and 1998/99, the person providing in-depth health information about himself or herself for the Health file was the randomly selected person for the household in cycle 1 (1994/95), and was usually the person who provided information on all household members for the General file in cycles 2 and 3, if judged to be knowledgeable to do so. In households added to the 1996/97 cross-sectional sample (buy-ins), one knowledgeable household member—not necessarily the randomly selected respondent for the Health file—provided information for all household members for the General file. For the 1998/99 cross-sectional sample (longitudinal respondents and immigrants, infants, and individuals in households that did not participate in cycle 1), the randomly selected respondent was usually the person who provided information for the General file, again, if judged knowledgeable.

The 1994/95 provincial, non-institutional sample consisted of 27,263 households, of which 88.7% agreed to participate. After the application of a screening rule to maintain the representativeness of the sample, 20,725 households remained in scope. In 18,342 of these households, the selected person was aged 12 or older. Their response rate to the in-depth health questions was 96.1%, or 17,626 respondents.

In 1996/97, the overall response rate at the household level was 82.6%. The response rate for the randomly selected individuals aged 2 or older in these households was 95.6%. In 1998/99, the overall response rate was 88.2% at the household level. The response rate for the randomly selected respondents (aged 0 or older) in these households was 98.5%.

Longitudinal sample: Of the 17,626 randomly selected respondents in 1994/95, 14,786 were eligible members of the longitudinal panel, along with 468 persons for whom only general information was collected. An additional 2,022 of the 2,383 randomly selected respondents under age 12 were also eligible for the longitudinal panel. Thus, 17,276 respondents were eligible for re-interview in 1996/97, and 16,677 were still alive in 1998/99. A response rate of 93.6% was achieved for the longitudinal panel in 1996/97, and a response rate of 88.9%, based on the entire panel, was achieved in 1998/99. Of the 16,168 participants in 1996/97, full information (that is, general and in-depth health information for the first two survey cycles or an outcome of death or institutionalization) was available for 15,670. The corresponding number for 1998/99 was 14,619. More detailed descriptions of the NPHS design, sample, and interview procedures can be found in published reports.[7,8]

The longitudinal sample analyzed in this article consists of 9,371 respondents (3,991 men and 5,380 women) aged 25 or older in 1994/95 who were still residing in households in 1998/99. Every effort is made to collect the in-depth health information for the health component directly from the randomly selected individuals. However, in some cases, proxy responses were accepted. Because this article focuses on factors associated with self-perceived health and many of the variables included in the multivariate model were from multivariate sections of the health component that were skipped for proxy respondents, records for which a proxy response was accepted for this component were excluded. In total, 493 records (5%) were excluded because of a proxy response in one or more of the three NPHS cycles. Records for which proxy responses were accepted for the general component are included, since the information is more objective and can be accurately provided by a knowledgeable household member. The percentage of records included in the analyses for which proxy responses were accepted for the general component is 21% for 1994/95 data, 12% for 1996/97 data, and 9% for 1998/99 data.

When individuals rate their own health, they tap into information that has important prognostic power. Based on findings from longitudinal analyses, it can be concluded that self-perceived health is predictive of chronic disease incidence,[9-12] recovery from illness,[13] functional decline,[9,14-19] and the use of medical services,[20-23] even when more objective health measures are taken into account.

Self-perceived health has also been found to be predictive of mortality.[10,18,21,24-36] Again, the association persists even when measures such as clinical evaluation are considered. This is surprising, as the research was based on populations from different cultures and involved several age groups, and the question wording varied. The robustness of the concept, "self-perceived health," seems to override semantic and translation difficulties.[35]

The reliability, validity and predictive power of self-perceived health suggest that it is important to understand the factors that underlie it. Growing interest is focused on the meaning of self-perceived health; specifically, whether the positive end of the scale is a mirror-image of the negative end, or whether each represents different dimensions. In other words, what are the factors associated with someone evaluating their overall health as better or poorer than "good"?

Earlier research indicates that individuals' ratings of their health are based on more than physical status. People without specific health problems do not automatically rate their health at the top of the scale; many describe it as "good," rather than "very good" or "excellent."[37] Some studies have suggested that poor ratings are primarily related to physical problems, while favourable ratings reflect an expanded view of health.[38-40] Qualitative research has revealed that health perceptions often include factors such as fitness and general well-being.[41-43]

Since it began in 1994/95, the biennial National Population Health Survey (NPHS) has asked respondents: "In general, would you say your health is excellent, very good, good, fair or poor?" With data from the first three NPHS cycles, this analysis examines the determinants of self-perceived health in 1998/99 and whether ratings at the positive and negative ends of the scale are associated with

different determinants. Individuals selecting the top two categories (very good/excellent) and those choosing the bottom two (fair/poor) are compared with people at the midpoint (good) (see *Data source* and *Analytical techniques*).

Analytical techniques

Cross-tabulations based on data from the 1998/99 cross-sectional Health file of the National Population Health Survey (NPHS) were used to estimate the prevalence rates of very good/excellent and fair/poor health.

Multiple logistic regression models, based on the longitudinal file, were used to explore the relationship between self-perceived health and various physical, socio-economic, lifestyle, and psycho-social factors. Self-perceived health in 1998/99 (Appendix Table A) was examined in conjunction with these factors at baseline in 1994/95 and with changes in these factors between 1994/95 and 1996/97. Two sets of regressions were fitted separately for men and women. In the first set, factors associated with reporting very good/excellent rather than good health in 1998/99 were examined. In the second set, factors associated with reporting fair/poor rather than good health were examined (based on respondents who reported good or fair or poor health in 1998/99). Sample sizes and distributions for the factors included in the regression models can be found in the Appendix (Tables B through E).

The outcome variables considered in the regression models were dichotomized (very good/excellent versus good health and fair/poor versus good health). All explanatory variables were also treated as dichotomous variables. Some consideration was given to treating the self-esteem and emotional distress scales as continuous variables. When the models were rerun in this way, the conclusions that could be drawn from these analyses were similar to those presented here (data not shown).

Cross-sectional data were weighted to represent the Canadian population in the 10 provinces in 1998/99. Longitudinal estimates were weighted to represent the Canadian population in the 10 provinces in 1994/95. To account for survey design effects, standard errors and coefficients of variation were estimated with the bootstrap technique.[44-46]

Based on the NPHS longitudinal file, for men, the correlation of the five-point self-perceived health scale across survey cycles was 0.55 between 1994/95 and 1996/97, 0.55 between 1996/97 and 1998/99, and 0.49 for the four years between 1994/95 and 1998/99. For women, the corresponding correlations were 0.59, 0.58 and 0.56.

Compared with men, women consider a broader set of factors when making general ratings of health.[47] Women are more likely to consider psychological factors and the presence of non-life-threatening illnesses. Because of the tendency for men and women to include different elements in their health assessments, the analyses in this article were conducted separately for each sex.

Most report very good or excellent health

In 1998/99, the majority of Canadians aged 25 or older—62%—reported very good or excellent health. Just 11% reported fair or poor health, and the remaining 27% described their health as good.

Not surprisingly, at older ages the prevalence of very good/excellent health declined, and the prevalence of fair/poor health rose (Chart 1). By age 65, individuals reporting very good/excellent health were in the minority (46% at ages 65 to 74; 37% at age 75 or older). Nonetheless, the percentage of seniors reporting very good/excellent health exceeded the percentage reporting fair/poor health.

Overall, men were more likely than women to describe their health as very good/excellent (63% versus 60%). However, the only age group at which the difference was significant was 45 to 54 (Chart 2). Conversely, a higher percentage of women than men described their health as fair/poor (12% and 10%). This reflected the situation at ages 25 to 34 and 35 to 44, when women were significantly more likely than men to report fair/poor health. At older ages, differences in the percentages of men and women describing their health as fair/poor were not significant.

Less positive perceptions of health are expected at older ages, given that physical problems tend to increase with age. To get a clearer picture of the determinants of self-perceived health, multivariate models that control for age were used. The models also included factors related to functional ability in everyday life.[48,49] Four major groups of variables were considered: physical, socio-economic, lifestyle, and psycho-social.

Chart 1
Prevalence of very good/excellent and fair/poor health, by age group, household population aged 25 or older, Canada excluding territories, 1998/99
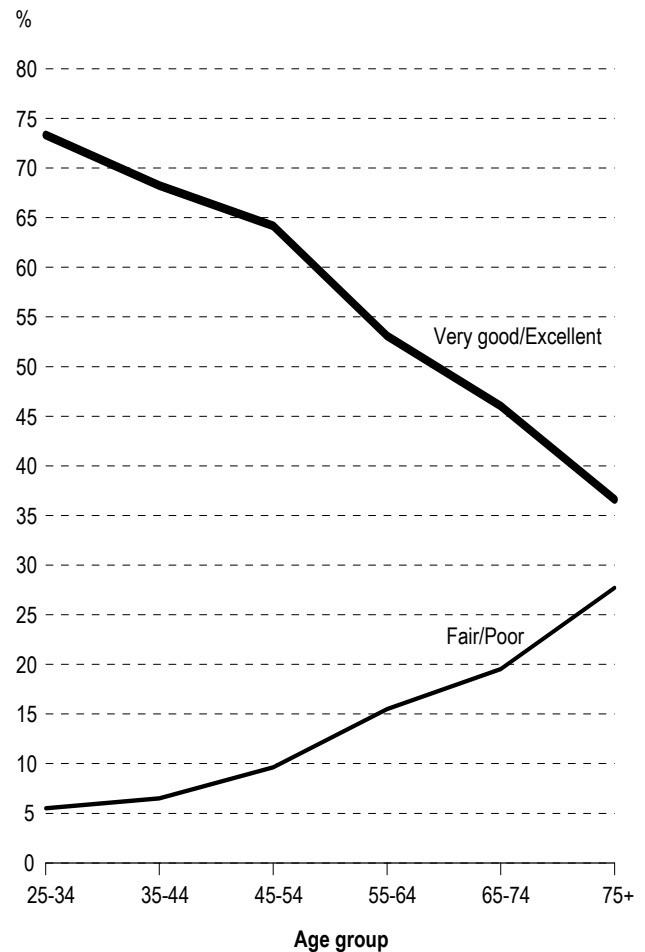
Data source: *1998/99 National Population Health Survey, cross-sectional sample, Health file*
Notes: *The prevalence of very good/excellent health decreases significantly as age increases (p ≤ 0.05 adjusted for multiple comparisons), with the following exception: no significant difference between age groups 35 to 44 and 45 to 54. The prevalence of fair/poor health increases significantly as age increases (p ≤ 0.05), with the following exceptions: no significant differences between age groups 25 to 34 and 35 to 44; 55 to 64 and 65 to 74.*

Key age groups

When physical status, socio-economic variables, health behaviours, and psycho-social characteristics in 1994/95 and 1996/97 were taken into consideration, the association between self-perceived health and age in 1998/99 largely disappeared (Tables 1 and 2). This suggests that the association between age and self-perceived health is often not actually attributable to age, but to these other factors.

Chart 2
Prevalence of very good/excellent and fair/poor health, by sex and age group, household population aged 25 or older, Canada excluding territories, 1998/99
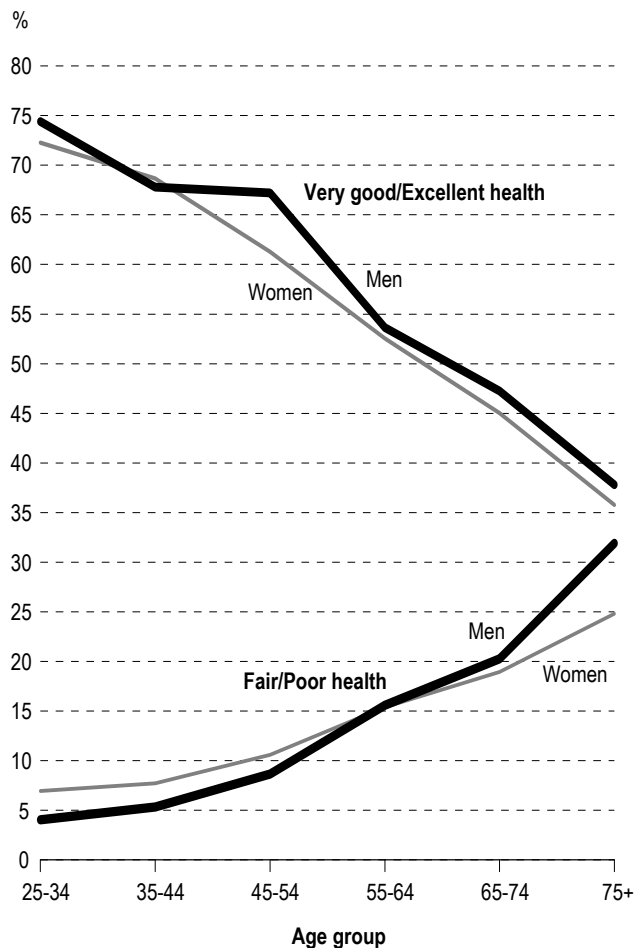

Data source: *1998/99 National Population Health Survey, cross-sectional sample, Health file*
Notes: *For age group 45 to 54, the prevalence rate of very good/excellent health is significantly higher (p ≤ 0.05 adjusted for multiple comparisons) for men. For age groups 25 to 34 and 35 to 44, the prevalence rate of fair/poor health is significantly higher (p ≤ 0.05 adjusted for multiple comparisons) for women.*

There were, however, exceptions. Men aged 65 to 74 had high odds of reporting fair/poor health, compared with men aged 35 to 44. Women aged 45 to 54 or 65 to 74 had low odds of reporting very good/excellent health, compared with women aged 35 to 44.

The findings for these age groups may partly result from individuals assessing their health in relation to social roles.[50,51] If people feel they are not fulfilling these roles, their health perceptions may be more negative. Changes that occur between ages 65 and 74, such as leaving the labour force, may create more pessimistic perceptions of health. To some degree, the diminished health perceptions of women aged 45 to 54 may be attributable to menopause.

The self-perceived health of people aged 75 or older did not differ significantly from that of 35- to 44-year-olds. Several studies have found that the older elderly often have more favourable health perceptions than do those aged 65 to 74.[52-55] It may be that health expectations are diminished in the later years, and simply surviving to such an age is evidence of at least good, if not very good, health.[56] Another possible explanation is a "healthy survivor" effect. By the time individuals reach their seventies, many of the sick have died or have been institutionalized, and the surviving cohort is more robust and healthy.[57]

Physical status crucial

The ability to carry out daily activities without limitation or dependence on others has been found to be a powerful determinant of self-perceived health.[55,58] This analysis of NPHS data also shows a strong association between functional status and health perceptions (see *Physical health*). Men and women with functional restrictions in 1994/95 had higher odds of reporting fair/poor health in 1998/99, and lower odds of reporting very good/excellent health, compared with people without restrictions (Tables 1 and 2).

Changes in functional status between 1994/95 and 1996/97 were also significant predictors of health perceptions in 1998/99. For both sexes, if functional status declined, the odds of reporting poor/fair health were high, and for men, the odds of reporting very/good excellent health were low. Conversely, if functional status improved, the odds of reporting poor/fair health were low for both sexes, and for the men, the odds of reporting very good/excellent health were high.

Chronic conditions were important influences on health perceptions at the positive end of the scale. Men and women with two or more chronic conditions in 1994/95 had lower odds of reporting very good/excellent health in 1998/99 than did those who did not have chronic conditions. By

Table 1

Adjusted odds ratios relating selected characteristics to very good/excellent and fair/poor versus good health in 1998/99, male household population aged 25 or older in 1994/95, Canada excluding territories

	Very good/ Excellent versus good health		Fair/Poor versus good health			Very good/ Excellent versus good health		Fair/Poor versus good health	
	Odds ratio	95% confidence interval	Odds ratio	95% confidence interval		Odds ratio	95% confidence interval	Odds ratio	95% confidence interval
Age 1994/95					**Health behaviours**				
25-34	1.2	0.9, 1.6	0.7	0.3, 1.6	**Smoking 1994/95**				
35-44†	1.0	…	1.0	…	Heavy smoker	0.5**	0.4, 0.7	0.7	0.3, 1.3
45-54	1.1	0.8, 1.6	1.9	0.9, 3.7	Light smoker	0.9	0.6, 1.3	0.5	0.2, 1.3
55-64	0.7	0.5, 1.0	1.3	0.7, 2.7	Former daily smoker	0.9	0.7, 1.2	0.7	0.4, 1.1
65-74	1.0	0.6, 1.6	2.5*	1.2, 5.1	Never smoked daily†	1.0	…	1.0	…
75+	0.6	0.3, 1.2	1.4	0.6, 3.5	**Change in smoking**				
Physical health					Decrease	0.8	0.5, 1.2	0.8	0.4, 1.6
Functional status 1994/95					Increase	0.8	0.5, 1.2	2.9*	1.2, 6.7
Restricted	0.3**	0.2, 0.5	4.6**	2.6, 8.2	No change†	1.0	…	1.0	…
No restrictions†	1.0	…	1.0	…	**Type of drinker 1994/95**				
Change in functional status					Weekly	1.1	0.9, 1.5	0.5*	0.3, 0.9
Decline	0.5**	0.3, 0.8	2.9**	1.6, 5.0	Former	1.3	0.9, 1.9	1.0	0.5, 1.8
Improvement	1.8*	1.1, 3.0	0.3**	0.2, 0.6	Less than weekly/Abstainer†	1.0	…	1.0	…
No change†	1.0	…	1.0	…	**New weekly drinker‡**	1.0	0.7, 1.5	0.5	0.2, 1.4
Chronic conditions 1994/95					**Physical activity 1994/95**				
None†	1.0	…	1.0	…	Regular†	1.0	…	1.0	…
One	0.8	0.6, 1.0	1.2	0.7, 1.9	Occasional/Infrequent	0.7*	0.6, 0.9	1.3	0.8, 2.2
Two+	0.6**	0.4, 0.8	1.3	0.7, 2.2	**Change in physical activity**				
New chronic condition(s)‡	0.7*	0.6, 1.0	1.6*	1.0, 2.5	Increase	1.2	0.9, 1.7	0.6	0.3, 1.0
Pain 1994/95					Decrease	1.0	0.8, 1.3	0.9	0.5, 1.4
Moderate/Severe	0.8	0.5, 1.3	1.4	0.8, 2.6	No change†	1.0	…	1.0	…
Mild or no pain†	1.0	…	1.0	…	**Weight 1994/95**				
Change in pain level					Underweight	0.5	0.2, 1.1	1.0	0.3, 3.3
Increase	0.5**	0.4, 0.8	1.1	0.6, 1.9	Acceptable†	1.0	…	1.0	…
Decrease	1.1	0.7, 1.8	1.1	0.6, 2.1	Some excess	1.0	0.8, 1.4	0.6	0.3, 1.2
No change†	1.0	…	1.0	…	Overweight	0.7*	0.6, 1.0	1.1	0.6, 1.9
Premature death of parent‡	0.9	0.7, 1.2	1.1	0.7, 1.9	**Unhealthy weight gain‡**	0.9	0.6, 1.2	0.9	0.4, 2.1
Socio-economic factors					**Psycho-social factors**				
Education 1994/95					**Low emotional support**				
Less than secondary graduation	0.8	0.6, 1.1	1.6*	1.0, 2.5	**1994/95‡**	0.8	0.5, 1.2	1.0	0.4, 2.1
Secondary graduation or more†	1.0	…	1.0	…	**Change in emotional support**				
Household income 1994/95					Increase	1.2	0.7, 1.9	1.3	0.5, 3.2
Lowest/Lower-middle/Middle	0.9	0.7, 1.1	1.5	1.0, 2.4	Decrease	0.8	0.6, 1.1	0.5*	0.3, 1.0
Upper-middle/Highest†	1.0	…	1.0	…	No change†	1.0	…	1.0	…
Marital status 1994/95					**Distress 1994/95**				
Married†	1.0	…	1.0	…	High	1.1	0.7, 1.7	1.7	0.8, 3.9
Never married	1.1	0.8, 1.5	0.6	0.3, 1.2	Low/Moderate†	1.0	…	1.0	…
Previously married	0.9	0.7, 1.2	1.0	0.6, 1.7	**Change in distress**				
					Increase	1.0	0.6, 1.5	2.1*	1.0, 4.2
					Decrease	0.9	0.6, 1.3	0.6	0.2, 1.3
					No change†	1.0	…	1.0	…
					Low self-esteem 1994/95‡	0.6*	0.4, 1.0	1.4	0.8, 2.5

Data source: *1994/95, 1996/97 and 1998/99 National Population Health Survey, longitudinal sample, Health file*
Notes: *The model for fair/poor health is based on 1,460 male respondents (413 reported fair/poor health; 1,047 reported good health). The model for very good/ excellent health is based on 3,412 male respondents (2,365 reported very good/excellent health; 1,047 reported good health). Because of missing values, 92 respondents were dropped from the fair/poor model (40 reported fair/poor health; 52 reported good health) and 126 from the very good/excellent model (74 reported excellent/very good health; 52 reported good health). "Missing" categories for the household income and weight variables were included in the models to maximize sample sizes; however, their odds ratios are not shown. Because of rounding, some confidence intervals with 1.0 as the upper/lower limit were significant. Variables relating to change (for example, physical activity, chronic conditions) refer to changes between 1994/95 and 1996/97.*
† Reference category, for which odds ratio is always 1.0
‡ Reference category is absence of characteristic.
* p < 0.05
** p < 0.01
… Not applicable

Table 2

Adjusted odds ratios relating selected characteristics to very good/excellent and fair/poor versus good health in 1998/99, female household population aged 25 or older in 1994/95, Canada excluding territories

	Very good/ Excellent versus good health		Fair/Poor versus good health	
	Odds ratio	95% confidence interval	Odds ratio	95% confidence interval
Age 1994/95				
25-34	1.3	1.0, 1.7	1.0	0.6, 1.7
35-44†	1.0	…	1.0	…
45-54	0.7*	0.6, 1.0	1.4	0.8, 2.4
55-64	0.9	0.7, 1.2	1.2	0.7, 1.8
65-74	0.6**	0.4, 0.8	1.1	0.6, 1.9
75+	0.8	0.5, 1.3	1.1	0.6, 2.0
Physical health				
Functional status 1994/95				
Restricted	0.5**	0.4, 0.8	2.3**	1.5, 3.3
No restrictions†	1.0	…	1.0	…
Change in functional status				
Decline	0.7	0.5, 1.0	1.7*	1.1, 2.4
Improvement	1.1	0.7, 1.8	0.4**	0.3, 0.7
No change†	1.0	…	1.0	…
Chronic conditions 1994/95				
None†	1.0	…	1.0	…
One	0.7**	0.6, 0.9	1.0	0.7, 1.6
Two+	0.5**	0.4, 0.6	1.5	1.0, 2.4
New chronic condition(s)‡	0.7**	0.6, 0.9	1.7**	1.2, 2.2
Pain 1994/95				
Moderate/Severe	0.5**	0.4, 0.8	1.7*	1.1, 2.7
Mild or no pain†	1.0	…	1.0	…
Change in pain level				
Increase	0.6*	0.4, 0.9	1.3	0.8, 2.0
Decrease	1.1	0.8, 1.6	0.9	0.5, 1.4
No change†	1.0	…	1.0	…
Premature death of parent‡	1.1	0.9, 1.4	1.4*	1.0, 2.0
Socio-economic factors				
Education 1994/95				
Less than secondary graduation	0.8*	0.6, 1.0	1.3	1.0, 1.9
Secondary graduation or more†	1.0	…	1.0	…
Household income 1994/95				
Lowest/Lower-middle/Middle	0.7**	0.6, 0.8	1.4*	1.0, 2.1
Upper-middle/Highest†	1.0	…	1.0	…
Marital status 1994/95				
Married†	1.0	…	1.0	…
Never married	0.9	0.7, 1.2	1.8	0.9, 3.7
Previously married	1.2	0.9, 1.6	1.3	0.9, 1.8

	Very good/ Excellent versus good health		Fair/Poor versus good health	
	Odds ratio	95% confidence interval	Odds ratio	95% confidence interval
Health behaviours				
Smoking 1994/95				
Heavy smoker	0.6*	0.5, 0.9	1.2	0.7, 1.9
Light smoker	0.9	0.6, 1.3	0.8	0.5, 1.4
Former daily smoker	1.0	0.8, 1.2	0.8	0.6, 1.2
Never smoked daily†	1.0	…	1.0	…
Change in smoking				
Decrease	1.0	0.6, 1.5	1.2	0.7, 2.0
Increase	1.2	0.8, 1.9	1.6	0.8, 3.2
No change†	1.0	…	1.0	…
Type of drinker 1994/95				
Weekly	1.3*	1.0, 1.6	0.6*	0.4, 1.0
Former	1.1	0.8, 1.4	1.1	0.8, 1.6
Less than weekly/Abstainer†	1.0	…	1.0	…
New weekly drinker‡	1.3	0.9, 1.9	1.1	0.6, 2.1
Physical activity 1994/95				
Regular†	1.0	…	1.0	…
Occasional/Infrequent	0.7**	0.5, 0.9	1.2	0.8, 1.7
Change in physical activity				
Increase	1.1	0.9, 1.5	0.9	0.5, 1.4
Decrease	1.0	0.8, 1.3	1.5*	1.0, 2.3
No change†	1.0	…	1.0	…
Weight 1994/95				
Underweight	0.8	0.6, 1.2	1.2	0.7, 2.0
Acceptable weight†	1.0	…	1.0	…
Some excess weight	0.8	0.6, 1.1	1.2	0.8, 2.0
Overweight	0.6**	0.5, 0.7	1.2	0.8, 1.8
Unhealthy weight gain‡	0.8	0.6, 1.2	1.6*	1.0, 2.6
Psycho-social factors				
Low emotional support 1994/95‡	1.2	0.7, 2.1	1.6	1.0, 2.7
Change in emotional support				
Increase	1.0	0.6, 1.8	0.6	0.3, 1.2
Decrease	0.8	0.6, 1.2	0.8	0.5, 1.3
No change†	1.0	…	1.0	…
Distress 1994/95				
High	0.7*	0.5, 1.0	1.7*	1.1, 2.6
Low/Moderate†	1.0	…	1.0	…
Change in distress				
Increase	0.6*	0.4, 0.9	1.3	0.8, 2.1
Decrease	1.0	0.7, 1.4	1.0	0.6, 1.5
No change†	1.0	…	1.0	…
Low self-esteem 1994/95‡	0.6**	0.5, 0.9	1.5*	1.1, 2.2

Data source: 1994/95, 1996/97 and 1998/99 National Population Health Survey, longitudinal sample, Health file
Notes: The model for fair/poor health is based on 2,118 female respondents (655 reported fair/poor health; 1,463 reported good health). The model for very good/ excellent health is based on 4,541 female respondents (3,078 reported very good/excellent health; 1,463 reported good health). Because of missing values, 118 respondents were dropped from the fair/poor model (50 reported fair/poor health; 68 reported good health) and 134 from the very good/excellent model (66 reported very good/excellent health; 68 reported good health). "Missing" categories for the household income and weight variables were included in the models to maximize sample sizes; however, their odds ratios are not shown. Because of rounding, some confidence intervals with 1.0 as the upper/lower limit were significant. Variables relating to change (for example, physical activity, chronic conditions) refer to changes between 1994/95 and 1996/97.
† Reference category, for which odds ratio is always 1.0
‡ Reference category is absence of characteristic.
* p < 0.05
** p < 0.01
… Not applicable

Physical health

Questions on activity limitation and activity dependency were used to define *functional status*. If respondents indicated that, because of a long-term physical or mental condition or health problem (one that had lasted or was expected to last six months or more), they were limited in the kind or amount of activity they could do at home, at school, at work or in other venues, they were considered to have an activity limitation. If respondents indicated that, because of health reasons, they required help preparing meals, shopping for groceries or other necessities, doing everyday housework, moving about inside the house, or in personal care such as washing, dressing or eating, they were classified as being activity dependent. Respondents were categorized as being functionally restricted in 1994/95 if they reported an activity limitation and/or activity dependency.

To assess change in functional status, respondents were assigned to one of the following three categories in 1994/95 and 1996/97: activity dependent, activity limited but not dependent, or free of activity limitation and dependency. Respondents were assessed as having an improvement if they moved up a value in this three-point scale by 1996/97, and as having a decline if they moved down.

To determine the presence of *chronic conditions*, respondents were asked if they had "any long-term health conditions that have lasted or are expected to last six months or more that have been diagnosed by a health professional." A checklist of conditions was read to them. Conditions considered in this analysis were: asthma, arthritis or rheumatism, back problems (excluding arthritis), high blood pressure, migraine, chronic bronchitis or emphysema, diabetes, epilepsy, heart disease, cancer, stomach or intestinal ulcers, the effects of stroke, urinary incontinence, Alzheimer's disease, cataracts, and glaucoma. Respondents were classified as having none, one, or two or more of these conditions in 1994/95. Respondents were classified as having a new chronic condition if they reported at least one condition from the checklist in 1996/97 that they had not reported in 1994/95.

Pain was assessed by asking, "Are you usually free from pain or discomfort?" Those who answered "no" were asked to rank their usual pain intensity as mild, moderate or severe. Pain level in 1994/95 was classified as "mild or no pain" versus "moderate or severe pain." A change in pain level between 1994/95 and 1996/97 was defined as an increase or decrease.

Premature death of parent was assessed by asking respondents if their biological parents were still alive. If either parent was no longer living, the age at death was asked. If either parent had died before age 65, the respondent was classified as having had a parent die prematurely. These questions on family history were asked in 1998/99.

contrast, the odds that men and women with chronic conditions in 1994/95 would report fair/poor health in 1998/99 were not significantly different from the odds for people who did not have chronic conditions. However, a newly diagnosed chronic condition was associated with high odds of fair/poor perceptions of health and low odds of very good/excellent perceptions.

Pain was linked to self-perceived health independent of functional status and chronic conditions, although the association was present more consistently for women. Moderate or severe pain in 1994/95 increased the odds that women would report fair/poor health and decreased the odds that they would report very good/excellent health in 1998/99, compared with women who were free of pain or had only mild pain. For men, pain in 1994/95 was a not a significant predictor of perceived health in 1998/99. But for both sexes, increased pain between 1994/95 and 1996/97 was associated with lower odds of reporting very good/excellent health in 1998/99. By contrast, a decrease in pain was not associated with health perceptions.

Parents' longevity

The link between self-perceived health and mortality may derive not only from one's own health, but also from the knowledge of familial risk factors.[27,35] According to the NPHS, this was the case for women. Those who had a biological parent die before age 65 had high odds of reporting fair/poor health, compared with women whose parents were still living or who had been at least 65 when they died. For men, there was no association between health perceptions and parents' longevity.

Socio-economic status

Abundant evidence shows that people with higher socio-economic status report better health than do those at lower levels. Similarly, in this analysis, even

when other factors were taken into account, the relationship between socio-economic status and health perceptions persisted (see *Socio-economic factors*). Men who had not completed secondary school had high odds of reporting fair/poor health, compared with those who had more education. Women who had not completed secondary school had low odds of reporting very good/excellent health. As well, women in lower-income households had high odds of reporting fair/poor health and low odds of reporting very good/excellent health, compared with those in more affluent households. Marital status was not significantly associated with health perceptions for either sex.

Tied to lifestyle

Exercise, maintaining a healthy weight, and refraining from smoking have been shown to positively affect health perceptions.[38,39,42,51,54,59-64] Studies have also suggested that such factors are more likely to be associated with the upper than the lower end of the self-perceived health scale.[38,39,42] It may be that a view of health encompassing lifestyle is possible only in the absence of poor physical health.[39] NPHS results support the notion that health behaviours are important in perceptions at the positive end of the scale. But health behaviours, particularly changes in them, are also linked to negative health perceptions (see *Health behaviours*).

Men and women who were heavy cigarette smokers in 1994/95 had reduced odds of reporting very good/excellent health in 1998/99, compared with those who had never smoked daily. Similarly, people who were overweight in 1994/95 had reduced odds of reporting very good/excellent health, compared with those whose weight was in the acceptable range. The same was true for people who engaged in physical activity occasionally or infrequently, compared with those who did so regularly. These relationships did not prevail at the fair/poor end of the self-perceived health scale.

Some unhealthy lifestyle changes were related to perceptions of fair/poor health. Men who reported increased cigarette consumption had close to three times the odds of reporting fair/poor health in 1998/99, compared with men whose consumption did not change. For women, both an unhealthy weight gain and a reduction in physical activity increased the odds of reporting fair/poor health. However, neither men's nor women's health perceptions were affected by improved health behaviour, specifically, decreased cigarette consumption or increased physical activity.

While heavy drinking is known to adversely affect health, moderate alcohol consumption may have some beneficial effects.[65-67] A study based on data

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Socio-economic factors

Respondents were grouped into two *education* categories based on the highest level attained as of 1994/95: less than secondary graduation or secondary graduation or more.

Household income was defined based on the number of people in the household and total household income from all sources in the 12 months before the 1994/95 interview.

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

In 1994/95, respondents were asked their *marital status*. Those who indicated "now married," "common-law" or "living with a partner" were grouped as "married." Individuals who answered "single" were classified as "never married." "Widowed," "separated" and "divorced" were combined into "previously married."

Health behaviours

Respondents were classified into four groups based on their *smoking* status in 1994/95. Those who usually smoked 20 or more cigarettes a day were defined as heavy smokers. Daily smokers who smoked less than 20 cigarettes a day were classified as light smokers. Former daily smokers were those who had smoked daily at some point in the past, but not at the time of their interview. The last group comprised those who never smoked daily.

Respondents were classified as having a change in smoking status if they increased or reduced consumption. An increase means they smoked cigarettes daily in 1996/97 but not in 1994/95, or they were daily smokers in both surveys and the number of cigarettes smoked per day increased by three or more (a pack a week). Respondents were classified as having a decrease if they were daily smokers in 1994/95 but no longer smoked daily in 1996/97, or if the number of cigarettes smoked per day decreased by three or more. Non-smokers in 1994/95 and 1996/97 were included in the no-change group.

To establish *type of drinker* in 1994/95, respondents were asked, "During the past 12 months, how often did you drink alcoholic beverages?" Individuals were categorized as being weekly drinkers, former drinkers (those who did not drink in the past 12 months, but did drink at some point in the past) or occasional drinkers/abstainers (less than once a week or never drank). A new weekly drinker was someone who drank on a weekly basis in 1996/97, but had not done so in 1994/95.

Physical activity in 1994/95 was based on the number of times in the previous three months that respondents had participated in leisure-time physical activity lasting more than 15 minutes. Monthly frequency was derived as the number of times in the past three months divided by 3. Respondents were classified as regular if the number of times per month was 12 or more; occasional if the number was 4 to 11, and infrequent if the number was 3 or less. Respondents were classified as having a change in physical activity between 1994/95 and 1996/97 if they moved up or down between these three levels.

The *Canadian Guidelines for Healthy Weights* use body mass index (BMI) to determine an acceptable range of *weights* and to identify excess weight and underweight.[70] BMI is calculated by dividing weight in kilograms by the square of height in metres. Four weight categories were identified in 1994/95: underweight (BMI less than 20); acceptable weight (20 to less than 25); some excess weight (25 to 27); and overweight (greater than 27). Respondents were classified as having an unhealthy weight gain between 1994/95 and 1996/97 if they moved from underweight or acceptable weight to some excess weight or overweight, or if they moved from some excess weight to overweight. Respondents who were pregnant were excluded from BMI measures.

from Finland[68] found that sub-optimal health ratings were most likely among heavy drinkers and abstainers and least likely among moderate drinkers. (In this analysis of NPHS data, small sample sizes prohibited considering heavy drinkers as a separate group.) According to the NPHS, men and women who were weekly drinkers in 1994/95 had lower odds of reporting fair/poor health in 1998/99, compared with those who were lifetime abstainers or who drank, but less than once a week. As well, women who were weekly drinkers in 1994/95 had high odds of reporting very good/excellent health in 1998/99.

Psychological well-being plays a role

Consistent with other research,[12,15,26,51,61,69] NPHS findings indicate that psychological factors play a role in health perceptions (see *Psycho-social factors*).

Men and women categorized as having low self-esteem in 1994/95 had low odds of reporting very good/excellent health in 1998/99, compared with people whose self-esteem was not low. For women, self-esteem was also significant at the negative end of the scale—those with low self-esteem in 1994/95 had increased odds of reporting fair/poor health four years later.

Among women, feelings of distress in 1994/95 were associated with high odds of fair/poor health and low odds of very good/excellent health in 1998/99. For men, distress in 1994/95 was not significantly related to health perceptions in 1998/99. However, men who experienced an increase in distress had high odds of reporting fair/poor health in 1998/99. And for women, an increase in distress reduced the odds of reporting very good/excellent health. On the other hand, a decrease in

Psycho-social factors

Four "yes/no" questions were used to measure *emotional support* in 1994/95:

- Do you have someone you can talk to about your private feelings or concerns?
- Do you have someone you can really count on in a crisis situation?
- Do you have someone you can really count on to give you advice when you are making important personal decisions?
- Do you have someone who makes you feel loved and cared for?

If the answer to any of these questions was "no" in 1994/95, the respondent was classified as having low emotional support. Respondents were classified as having a change in emotional support between 1994/95 and 1996/97 if the number of "no" responses increased or decreased.

Distress in 1994/95 was based on responses to the following questions:

- During the past month, about how often did you feel so sad that nothing could cheer you up?
- During the past month, how often did you feel
  ... nervous?
  ... restless or fidgety?
  ... hopeless?
  ... worthless?
- During the past month how often did you feel that everything was an effort?

Each question was answered on a five-point scale: "all of the time" (score 4), "most of the time" (3), "some of the time" (2), "a little of the time" (1) or "none of the time" (0). Responses to all items were scored and summed; the possible range of scores was 0 to 24, with a higher score indicating more distress. Respondents scoring 7 or more in 1994/95 (an average score of more than 1 per item) were categorized as a having high distress. The average score was 3.5, with a standard deviation of 3.4. Based on the 1994/95 cross-sectional file, high distress scores made up 16% of the weighted distribution. Respondents were classified as having a change in distress if their overall score went up or down by 4 or more points between 1994/95 and 1996/97 (an increase or decrease of more than one standard deviation).

Self-esteem in 1994/95 was defined using six items. Respondents answered the following questions on a five-point scale: "strongly disagree" (score 0), "disagree" (1), "neither agree nor disagree" (2), "agree" (3) or "strongly agree" (4).

- You feel that you have a number of good qualities.
- You feel that you're a person worth at least equal to others.
- You are able to do things at least as well as most other people.
- You take a positive attitude towards yourself.
- On the whole, you are satisfied with yourself.
- All in all, you're inclined to feel you're a failure (reverse scale on this item.)

Respondents scoring 17 or less were considered to have low self-esteem (an average score per item of less than 3). Low self-esteem scores made up 13% of the weighted distribution based on the 1994/95 cross-sectional file.

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distress had no significant association with self-perceived health for either sex.

Although some research has found a link between emotional support and health,[71-73] in this analysis, low emotional support in 1994/95 was not significantly linked to health perceptions in 1998/99. This may, in part, result from the limited scope of the NPHS questions (see *Limitations*). A rather unexpected finding was that men who experienced a decrease in emotional support between 1994/95 and 1996/97 actually had lower odds of reporting fair/poor health in 1998/99, compared with men who did not experience such a decrease. A possible explanation may lie in the relationship with marital status. The loss of a spouse through divorce,

separation or death was related to a decrease in emotional support (data not shown). If the decline in emotional support was associated with such a loss, self-perceived health may have improved because the stressful period surrounding the marital break-up or death was over. Sample sizes, however, were not large enough to consider loss of spouse as factor in the multivariate analysis.

Concluding remarks

Findings from the National Population Health Survey indicate that although physical factors were significantly related to self-perceived health, so were health behaviours, psycho-social characteristics and socio-economic status. Some variables affected

perceptions at only one end of the self-perceived health scale, while others were "double-risk" factors, in that they were significantly associated with both positive and negative perceptions (Table 3). Moreover, what was significant for one sex was not necessarily significant for the other.

Not surprisingly, several aspects of physical health were important double-risk factors. For both sexes, restricted functional status at baseline was associated with low odds of reporting very good/excellent health and high odds of reporting fair/poor health. Diagnosis of a new chronic condition between 1994/95 and 1996/97 had the same effect on health perceptions.

Two other physical health variables were double-risk factors only for men. A decline in functional status lowered men's odds of reporting very good/excellent health and raised the odds of reporting fair/poor health; an improvement in functional status had the opposite effect. For women, but not men, moderate or severe pain was a double-risk factor.

While men's double-risk factors had to do solely with physical health, this was not the case for women. Relatively low household income, low self-esteem and high distress were double-risk factors for women. As well, women who were weekly drinkers had high odds of reporting very good/excellent

Limitations

This analysis explores factors associated with opposite ends of the self-perceived health spectrum (very good/excellent and fair/poor) versus the mid-point (good). Further insights might have been gained by making more detailed comparisons across the five-point scale. For example, are the factors associated with fair versus good ratings the same as those associated with poor versus good ratings? Small sample sizes prohibited analysis at this level of detail.

Despite efforts to maximize response, some members selected for the longitudinal panel in 1994/95 did not respond in subsequent survey cycles (1996/97 and/or 1998/99), and were not included in this analysis. Adjustments to survey weights were applied to people who responded in all three cycles (continuers) to compensate for those who did not respond (dropouts).[8] Although this weight adjustment reduced the bias among continuers for many NPHS variables, it is possible that some bias may still exist.

National Population Health Survey data are self- or proxy-reported by a knowledgeable household member. Cases for which a proxy reporter provided the health component data were excluded from this analysis (see *Methods*). Exclusion of these cases may have weakened or distorted some associations. Individuals whose health component data were provided by proxy tended to be less healthy, since proxy responses for this component were only accepted if the selected respondent was unable to answer because of special circumstances such as a medical problem.

Cases where the responses to the general component component of the questionnaire were provided by a proxy reporter were included in this analysis, and the degree to which they are inaccurate because of reporting error is unknown. For example, the incidence of chronic conditions may be affected by the use of proxy responses.[74] At the same time, self-reported data may not be accurate, since the

responses were not verified by an independent source. For example, it is not possible to know if respondents who reported a diagnosed chronic condition had actually received a professional diagnosis.

Respondents may give socially desirable answers to questions on issues such as smoking, alcohol consumption and weight. For instance, in exploring the relationship between alcohol consumption and self-perceived health, it was not possible to consider heavy drinkers as a separate group because of small sample size. This may, in part, have resulted from some individuals underestimating their alcohol consumption. As well, self-reported height and weight (used to calculate body mass index) may underestimate the prevalence of overweight.[75,76] Inaccurate self-reporting of height is particularly common among the elderly, who frequently experience the loss of height that occurs with aging.[76] Such individuals often cite their height as measured in their younger years. As a result, BMI for the elderly may be more prone to underestimation.

It was not possible to consider changes in self-esteem between 1994/95 and 1996/97 in relation to self-perceived health, since self-esteem questions were not asked in 1996/97.

The data on emotional support were limited, because just four "yes/no" questions were asked. Consequently, the range of scores was restricted, and this may have affected the relationship between emotional support and self-reported health.

Finally, it is possible that factors related to self-reported health that were not included in this analysis may have confounded some of the associations that were found. For example, an individual with undiagnosed heart disease may not feel up to engaging in physical activity. In such a case, the relationship between self-reported health and exercise levels may have resulted from the confounding factor.

Table 3
Summary of significant odds ratios relating selected characteristics to very good/excellent and fair/poor versus good health in 1998/99, by sex, household population aged 25 or older in 1994/95, Canada excluding territories

	Men		Women	
	Very good/ Excellent health	Fair/ Poor health	Very good/ Excellent health	Fair/ Poor health
Age 1994/95				
45-54			−	
65-74		+	−	
Physical health				
Functional restriction 1994/95	[−	+]	[−	+]
Decline in functional status†	[−	+]		+
Improved functional status†	[+	−]		−
Chronic conditions				
One			−	
Two+	−		−	
New chronic conditions(s)†	[−	+]	[−	+]
Moderate/Severe pain 1994/95			[−	+]
Increased pain†	−		−	
Premature death of parent				+
Socio-economic factors				
Less than high school graduation 1994/95		+	−	
Low/Lower-middle/Middle household income 1994/95			−	+
Health behaviours				
Heavy smoker 1994/95	−		−	
Increased smoking†		+		
Weekly drinker	−		[+	−]
Occasional/Infrequent physical activity 1994/95	−		−	
Decreased physical activity†				+
Overweight 1994/95	−		−	
Unhealthy weight gain†				+
Psycho-social factors				
Decreased emotional support†		−		
High distress 1994/95			[−	+]
Increased distress†		+	−	
Low self-esteem 1994/95	−		[−	+]

Notes: *Summary of significant odds ratios presented in Tables 1 and 2;* **+** *indicates odds ratio significantly higher than 1, and* **−** *indicates odds ratio significantly lower than 1 (p < 0.05)*
† Between 1994/95 and 1996/97
☐ *Represents double-risk factor.*

health and low odds of reporting fair/poor health. This supports other research suggesting that women take account of a broader range of items than do men when they assess their health.[47]

Of course, this is not to say that socio-economic status, psycho-social characteristics and lifestyle were significant for only women's health perceptions. For instance, among men, having less than secondary school graduation, an increase in distress, and an increase in smoking were associated with high odds of reporting fair/poor health. And for both sexes, heavy smoking, physical inactivity and being overweight significantly reduced the odds of reporting very good/excellent health.

Notable among the factors related to self-perceived health were those that involved change. When people rate their health, they think not only of their current situation, but also of trajectories—declines and improvements.[35] This analysis indicates that change—in physical status, lifestyle, psycho-social factors, or even being in an age group associated with change—was important.

This analysis emphasizes the complexity of an individual's assessment of his or her health. The links between health perceptions and psychological factors suggest that such ratings encompass both the mind and the body. The links with lifestyle suggest that health perceptions have a normative component (an awareness of how one "should" behave to be "healthy"), particularly for women. And even when the effects of physical health, psycho-social characteristics and lifestyle were considered, the socio-economic gradient did not disappear.

Understanding the determinants of self-perceived health may reveal its predictive power and provide relevant information for health promotion practices. Self-perceived health may also be an underexploited source of information for clinicians. When individuals rate their health, they consider a wide spectrum of factors, some of which may not be easily detected by health care professionals. ●

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Appendix

Table A
Distribution of levels of self-perceived health in 1998/99, by sex, household population aged 25 or older in 1994/95, Canada excluding territories

	Men			Women		
	Sample size	Estimated population		Sample size	Estimated population	
		'000	%		'000	%
Total	**3,991**	**7,832**	**100.0**	**5,380**	**8,812**	**100.0**
Very good/Excellent	2,439	4,983	63.6	3,144	5,246	59.5
Good	1,099	2,065	26.4	1,531	2,552	29.0
Fair/Poor	453	785	10.0	705	1,013	11.5

Data source: 1994/95, 1996/97 and 1998/99 National Population Health Survey, longitudinal sample, Health file
Note: Because of rounding, detail may not add to totals.

Table B
Distribution of age and physical health factors, by sex, household population aged 25 or older in 1994/95, Canada excluding territories

	Men			Women		
	Sample size	Estimated population		Sample size	Estimated population	
		'000	%		'000	%
Total	**3,991**	**7,832**	**100.0**	**5,380**	**8,812**	**100.0**
Age 1994/95						
25-34	995	2,068	26.4	1,317	2,247	25.5
35-44	1,027	2,279	29.1	1,230	2,377	27.0
45-54	799	1,580	20.2	896	1,549	17.6
55-64	536	976	12.5	790	1,240	14.1
65-75	459	675	8.6	717	974	11.1
75+	175	254	3.2	430	426	4.8
Functional status 1994/95						
Restricted	685	1,165	14.9	1,149	1,666	18.9
No restrictions	3,305	6,664	85.1	4,231	7,146	81.1
Missing	1	--	--	0	--	--
Change in functional status						
Decline	326	630	8.0	539	798	9.1
Improvement	330	561	7.2	517	775	8.8
No change	3,322	6,617	84.5	4,305	7,219	81.9
Missing	13	--	--	19	20†	0.2†
Chronic conditions 1994/95						
None	2,221	4,610	58.9	2,620	4,640	52.7
One	1,080	2,085	26.6	1,417	2,300	26.1
Two+	683	1,124	14.3	1,339	1,868	21.2
Missing	7	--	--	4	--	--
New chronic condition(s)						
None	2,959	5,841	74.6	3,773	6,260	71.0
One+	1,015	1,954	25.0	1,587	2,528	28.7
Missing	17	37†	0.5†	20	25†	0.3†
Pain 1994/95						
Moderate/Severe	428	807	10.3	805	1,332	15.1
Mild or no pain	3,545	6,989	89.2	4,559	7,440	84.4
Missing	18	37†	0.5†	16	40†	0.5†
Change in pain level						
Increase	292	557	7.1	462	691	7.8
Decrease	387	722	9.2	667	1,151	13.1
No change	3,292	6,504	83.0	4,234	6,928	78.6
Missing	20	49†	0.6†	17	42†	0.5†
Premature death of parent						
Yes	990	1,940	24.8	1,512	2,449	27.8
No	2,994	5,868	74.9	3,861	6,345	72.0
Missing	7	--	--	7	--	--

Data source: 1994/95, 1996/97 and 1998/99 National Population Health Survey, longitudinal sample, Health file
Notes: Because of rounding, detail may not add to totals. Variables relating to change refer to changes between 1994/95 and 1996/97.
† Coefficient of variation between 25.1% and 33.3%
-- Sample too small to provide reliable estimate

Table C
Distribution of socio-economic factors, by sex, household population aged 25 or older in 1994/95, Canada excluding territories

	Men		Women	
	Sample size	Estimated population	Sample size	Estimated population
		'000 %		'000 %
Total	**3,991**	**7,832 100.0**	**5,380**	**8,812 100.0**
Education 1994/95				
Less than secondary graduation	1,121	1,810 23.1	1,514	2,158 24.5
Secondary graduation or more	2,862	6,004 76.7	3,859	6,640 75.4
Missing	8	-- --	7	-- --
Household income 1994/95				
Lowest/Lower-middle/Middle	1,734	3,011 38.4	2,822	4,068 46.2
Upper-middle/Highest	2,092	4,450 56.8	2,354	4,366 49.6
Missing	165	371 4.7	204	377 4.3
Marital status 1994/95				
Married	2,756	5,980 76.3	3,201	6,146 69.7
Never married	689	1,177 15.0	624	872 9.9
Previously married	546	676 8.6	1,555	1,794 20.4

Data source: 1994/95, 1996/97 and 1998/99 National Population Health Survey, longitudinal sample, Health file
Note: Because of rounding, detail may not add to totals.
-- Sample too small to provide reliable estimate

Table D
Distribution of health behaviours, by sex, household population aged 25 or older in 1994/95, Canada excluding territories

	Men		Women	
	Sample size	Estimated population	Sample size	Estimated population
		'000 %		'000 %
Total	**3,991**	**7,832 100.0**	**5,380**	**8,812 100.0**
Smoking 1994/95				
Heavy smoker	752	1,372 17.5	629	1,001 11.4
Light smoker	411	794 10.1	684	1,060 12.0
Former daily smoker	1,390	2,601 33.2	1,368	2,144 24.3
Never smoked daily	1,434	3,052 39.0	2,693	4,594 52.1
Missing	4	-- --	6	-- --
Change in smoking				
Decrease	439	789 10.1	515	801 9.1
Increase	331	654 8.4	367	592 6.7
No change	3,212	6,366 81.3	4,485	7,396 83.9
Missing	9	-- --	13	-- --
Type of drinker 1994/95				
Weekly	2,003	4,055 51.8	1,341	2,347 26.6
Former	494	789 10.1	847	1,288 14.6
Less than weekly/ Abstainer	1,485	2,968 37.9	3,189	5,169 58.7
Missing	9	-- --	3	-- --
New weekly drinker				
Yes	324	672 8.6	314	580 6.6
No	3,646	7,109 90.8	5,047	8,190 92.9
Missing	21	51‡ 0.6‡	19	43‡ 0.5‡
Physical activity 1994/95				
Regular	2,114	4,148 53.0	2,838	4,498 51.0
Occasional or infrequent	1,860	3,652 46.6	2,528	4,293 48.7
Missing	17	32‡ 0.4‡	14	20‡ 0.2‡
Change in physical activity				
Increase	896	1,878 24.0	1,259	2,165 24.6
Decrease	801	1,534 19.6	1,028	1,661 18.8
No change	2,271	4,375 55.9	3,072	4,951 56.2
Missing	23	45‡ 0.6‡	21	35‡ 0.4‡
Weight 1994/95 †				
Underweight	97	209 2.7	509	923 10.7
Acceptable	1,369	2,846 36.3	2,320	3,842 44.5
Some excess	1,014	1,926 24.6	799	1,287 14.9
Overweight	1,489	2,795 35.7	1,568	2,424 28.1
Missing	22	56‡ 0.7‡	88	164 1.9
Unhealthy weight gain †				
Yes	484	949 12.1	493	805 9.5
No	3,448	6,761 86.3	4,537	7,382 86.9
Missing	59	122§ 1.6§	178	310 3.6

Data source: 1994/95, 1996/97 and 1998/99 National Population Health Survey, longitudinal sample, Health file
Notes: Because of rounding, detail may not add to totals. Variables relating to change refer to changes between 1994/95 and 1996/97.
† Excluding pregnant women.
‡ Coefficient of variation between 25.1% and 33.3%
§Coefficient of variation between 16.6% and 25%
-- Sample too small to provide reliable estimate

Table E

Distribution of psycho-social factors by sex, household population aged 25 or older in 1994/95, Canada excluding territories

	Men			Women		
	Sample size	**Estimated population**		**Sample size**	**Estimated population**	
		'000	%		'000	%
Total	**3,991**	**7,832**	**100.0**	**5,380**	**8,812**	**100.0**
Low emotional support 1994/95						
Yes	814	1,587	20.3	781	1,326	15.1
No	3,128	6,152	78.5	4,557	7,415	84.2
Missing	49	93†	1.2†	42	70 †	0.8†
Change in emotional support						
Increase	541	1,069	13.6	562	991	11.3
Decrease	462	884	11.3	426	736	8.4
No change	2,910	5,720	73.0	4,319	6,961	79.0
Missing	78	160	2.0	73	124	1.4
Distress 1994/95						
High	402	780	10.0	838	1,420	16.1
Low/Moderate	3,546	6,959	88.9	4,498	7,301	82.9
Missing	43	93†	1.2†	44	91 †	1.0†
Change in distress						
Increase	258	552	7.0	426	699	7.9
Decrease	506	973	12.4	759	1,295	14.7
No change	3,157	6,145	78.5	4,116	6,676	75.8
Missing	70	162	2.1	79	142	1.6
Low self-esteem 1994/95						
Yes	405	740	9.4	722	1,115	12.7
No	3,551	7,020	89.6	4,618	7,609	86.3
Missing	35	72†	0.9†	40	88 †	1.0†

Data source: *1994/95, 1996/97 and 1998/99 National Population Health Survey, longitudinal sample, Health file*
Notes: *Because of rounding, detail may not add to totals. Variables relating to change refer to changes between 1994/95 and 1996/97.*
† Coefficient of variation between 16.6% and 25%