



Catalogue no. 82-003-XIE

Health Reports

Vol. 12 No. 3

How healthy are Canadians?

2001 Annual Report



Statistics
Canada

Statistique
Canada



Canada

How to obtain more information

Specific inquiries about this product and related statistics or services should be directed to: Health Statistics Division, Statistics Canada, Ottawa, Ontario, Canada, K1A 0T6 (telephone: (613) 951-1746).

For information on the wide range of data available from Statistics Canada, you can contact us by calling one of our toll-free numbers. You can also contact us by e-mail or by visiting our Web site.

National inquiries line	1 800 263-1136
National telecommunications device for the hearing impaired	1 800 363-7629
Depository Services Program inquiries	1 800 700-1033
Fax line for Depository Services Program	1 800 889-9734
E-mail inquiries	infostats@statcan.ca
Web site	www.statcan.ca

Ordering and subscription information

This product, Catalogue no. 82-003-XPE, is published quarterly as a standard printed publication at a price of CDN \$20.00 per issue and CDN \$58.00 for a one-year subscription. The following additional shipping charges apply for delivery outside Canada:

	Single issue	Annual subscription
United States	CDN \$ 6.00	CDN \$24.00
Other countries	CDN \$ 10.00	CDN \$40.00

This product is also available in electronic format on the Statistics Canada Internet site as Catalogue no. 82-003-XIE at a price of CDN \$15.00 per issue and CDN \$44.00 for a one-year subscription. To obtain single issues or to subscribe, visit our Web site at **www.statcan.ca**, and select Products and Services.

All prices exclude sales taxes.

The printed version of this publication can be ordered by

- Phone (Canada and United States) **1 800 267-6677**
- Fax (Canada and United States) **1 877 287-4369**
- E-mail **order@statcan.ca**
- Mail
Statistics Canada
Dissemination Division
Circulation Management
120 Parkdale Avenue
Ottawa, Ontario K1A 0T6
- And, in person at the Statistics Canada Reference Centre nearest you, or from authorized agents and bookstores.

When notifying us of a change in your address, please provide both old and new addresses.

Standards of service to the public

Statistics Canada is committed to serving its clients in a prompt, reliable and courteous manner and in the official language of their choice. To this end, the Agency has developed standards of service which its employees observe in serving its clients. To obtain a copy of these service standards, please contact Statistics Canada toll free at 1 800 263-1136.



Statistics Canada
Health Statistics Division

Health Reports

Volume 12, Number 3

Published by authority of the Minister responsible for Statistics Canada

© Minister of Industry, 2001

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without prior written permission from Licence Services, Marketing Division, Statistics Canada, Ottawa, Ontario, Canada K1A 0T6.

April 2001

Catalogue no. 82-003-XPE, Vol. 12, No. 3
ISSN 0840-6529

Catalogue no. 82-003-XIE, Vol. 12, No. 3
ISSN 1209-1367

Frequency: Quarterly

Ottawa

Note of Appreciation

Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued cooperation and goodwill.

SYMBOLS

The following standard symbols are used in Statistics Canada publications:

- .. figures not available
- ... figures not appropriate or not applicable
- nil or zero
- amount too small to be expressed
- P preliminary figures
- r revised figures
- x confidential to meet secrecy requirements of the Statistics Act

The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences - Permanence of Paper for Printed Library Materials, ANSI Z39.48 - 1984.



HEALTH REPORTS - SPECIAL ISSUE

Editor-in-Chief
Gary Catlin

Managing Editors
Larry Swain
Kathryn Wilkins

Contributors
Janet Che
Jiajian Chen
Doreen Duchesne
Larry Ellison
Laurie Gibbons
Heather Gilmour
Feng Hou
Francine Mayer
Claudio E. Pérez
Margot Shields
Kathryn Wilkins

Editors
Mary Sue Devereaux
Barbara Riggs
Kathryn Wilkins

Assistant Editor
Marc Saint-Laurent

Production Manager
Renée Bourbonnais

Production and Composition
Agnes Jones
Robert Pellarin
Micheline Pilon

Data Verification
Dan Lucas

Administration
Donna Eastman

Canadians are extremely interested in health: our own, the health of our family and friends, and the ability of the health care system to respond to our needs. Compared with most countries, Canadians have much about which they can feel proud. But we have by no means achieved all that is possible in health status or in the quality of health care.

Health encompasses many dimensions. It may be a capacity to function or an absence of disease. It may be a sense of well-being or the result of positive behaviours. Added to this is the growing recognition that the determinants of health—genetics, the physical environment, the socio-economic environment, early childhood experiences, and so on— influence overall population health status and, in some cases, the effectiveness of health care. The health status of a population changes slowly. Improvements in prevention, nutrition and physical activity may be reflected in the population's health only years later.

Health status is not evenly distributed. With each step up the socio-economic ladder, groups are less vulnerable to disease, disability and premature death. We have built an enviable health care system. Medical and technological advances are claiming small and large victories over disease every year. Yet, even in the face of these achievements, inequalities in health status persist.

Statistics Canada and the Canadian Institute for Health Information (CIHI) are reporting jointly on the health status of the Canadian population, the factors that determine or affect our health, and the performance of the health care system. These annual reports are intended to provide information and background so that Canadians, as well as decision-makers, can better judge the complex factors that contribute to improvements in health.

This report, the second in the annual series entitled “How healthy are Canadians?”, looks at differences in health between men and women. Its companion report, released by CIHI in May 2001, focuses on the health care system. Future reports will build on what we know today, endeavouring to fill gaps in our knowledge as a broader range of information becomes available.

Previous issues in the series

“How healthy are Canadians?”, *Health Reports*, Special Issue, Volume 11, Number 3, Statistics Canada catalogue number 82-003, March 31, 2000, and “How healthy are Canadians? A summary”, Internet publication, <http://www.statcan.ca>

Health Care in Canada – A First Annual Report, Canadian Institute for Health Information, April 26, 2000, full report and brochure, <http://www.cihi.ca>

About Health Reports

Health Reports is a peer-reviewed quarterly journal produced by the Health Statistics Division at Statistics Canada. It is designed for a broad audience that includes health professionals, researchers, policy makers, educators and students. Its mission is to provide high quality, relevant, and comprehensive information on the health status of the population and the health care system.

About Statistics Canada

Statistics Canada is authorized under the Statistics Act to collect, analyze and publish statistics relating to the social, economic and general activities and condition of Canadians. The Health Statistics Division’s primary objective is to provide statistical information and analyses about the health of the population, determinants of health, and the scope and utilization of Canada’s health care sector.

About the Canadian Institute for Health Information

Since 1994, the Canadian Institute for Health Information (CIHI) has been working to improve the health of Canadians and the health system by providing quality health information. CIHI is a national, not-for-profit organization with a mandate to coordinate the development and maintenance of an integrated approach to Canada’s health information. To this end, the Institute provides accurate and timely information that is needed to establish sound health policies, manage the Canadian health system effectively, and create public awareness of factors affecting good health.

The editors thank the members of the Expert Group for their expertise, time and input to this special issue of Health Reports. Please note that the views expressed in this report do not necessarily represent those of the individuals or their organizations.

ACKNOWLEDGEMENTS

Ross Baker
Department of Health Administration
University of Toronto

Charlyn Black
Manitoba Centre for Health Policy and Evaluation
and Canadian Institute for Health Information
and Canadian Institutes of Health Research

Carmen Connolly
Canadian Population Health Initiative
Canadian Institute for Health Information

Victor Dirnfeld
Past President
Canadian Medical Association

Clyde Hertzman
Department of Health and Epidemiology
University of British Columbia

Alejandro Jadad
University Health Network
University of Toronto

Steven Lewis
Access Consulting Ltd., Saskatoon *and*
University of Calgary

Jonathan Lomas
Canadian Health Services Research Foundation

Frank Markel
Joint Policy and Planning Committee

Richard Massé
Ministère de la santé et des services sociaux
Gouvernement du Québec

Robert McMurtry
Population and Public Health Branch
Health Canada

John Millar
Research and Population Health
Canadian Institute for Health Information

Cameron Mustard
Institute for Work & Health

Wendy Nicklin
Ottawa Hospital *and*
Canadian Nurses Association

Denis Roy
Régie régionale de la santé et des services sociaux
de Montréal-Centre

Judith Shamian
Health Policy and Communications Branch
Health Canada

Larry Swain
Health Statistics Division
Statistics Canada

Tom Ward
Nova Scotia Department of Health

Michael Wolfson
Analysis and Development
Statistics Canada

Robert Williams
Timmins and District Hospital

Jennifer Zelmer
Health Reports and Analysis
Canadian Institute for Health Information

The Health Divide—How the Sexes Differ

Introduction	9
Taking Risks/Taking Care	11
Stress and Well-being	21
Health Care/Self-Care	33
Death – Shifting Trends	41
Conclusion	47
Methods.....	49
How to Order	55
Health Statistics Division’s products and services, including prices and ordering information	

Requests to reprint

No part of this publication may be reproduced without prior written permission from Statistics Canada. To obtain this permission, an *Application for Copyright Authorization* must be submitted. This form is available from the Copyright Permission Officer, Marketing Division, Statistics Canada (fax: 613-951-1134).

Subscriptions

For information on subscribing, see *How to Order*. For other information, contact the Editors, **Health Reports**, Health Statistics Division, Statistics Canada, 18th Floor, R.H. Coats Building, Ottawa, Ontario, Canada, K1A 0T6. Telephone: (613) 951-7025. Fax: (613) 951-0792. E-mail: healthreports@statcan.ca

Electronic version

Health Reports is also published as an electronic product in PDF format. Single issues may be ordered using Visa or MasterCard from Statistics Canada's Internet site, downloaded onto your desktop and accessed with Adobe Acrobat Reader. To order a recent issue of *Health Reports*, visit our site at <http://www.statcan.ca>. Select "English" from the home page, then "Products and services" from the next page. Select "Downloadable publications (\$)" and then continue past the introductory page. You will find *Health Reports* (Catalogue 82-003-XIE) listed under "Publications for fee (\$)."

In Canada, as in other developed countries, health statistics have long shown that when men and women of the same age are compared, women have a higher prevalence of chronic disease and use more medical services, but men have higher mortality rates. This apparent paradox has been a major area of theory, investigation, and speculation for many years.

INTRODUCTION

Sex differences in health are affected by a variety of factors. They likely include male–female differences in biological susceptibility, exposure to various risks at different stages of the life course, and cultural influences. Socio-economic status is also important. Higher socio-economic status is associated with better health for both men and women. The generally lower socio-economic status of women may contribute to their higher rates of illness. Nonetheless, women’s life expectancy is longer than that of men.

Focusing on data from the National Population Health Survey (NPHS), vital statistics, the Canadian Cancer Registry, and the Census of Population, this special issue of *Health Reports* examines health differences between Canadian men and women. A wide array of indicators is presented. Some, such as death rates and life expectancy, have traditionally been used to describe health. Others are measures that have only recently become available on a population basis, such as the prevalence of stress and incidence of disease, disability and dependency. Lifestyle and health care practices, which may contribute to sex differences in health, are also examined.

The aim is to provide an accessible and comprehensive comparison of the health of men and women based on the most current data. The overall approach is descriptive, although some detailed analyses focus on specific topics of particular relevance to policy makers and health practitioners in their efforts to optimize the potential for good health among Canadians.

The report comprises four main sections. “Taking Risks/Taking Care” looks at sex differences in health behaviour, including nutrition, physical activity, body mass index, alcohol consumption and smoking. An analysis of people followed over time examines the relationship between specific risk factors and later diagnosis of chronic disease.

“Stress and Well-being” deals with emotional and physical health. Figures are presented on personal and work stress, depression, and the incidence and prevalence of major diseases. This section also contains information on injuries, chronic pain, activity limitations, and dependency. Data on social support show differences between men or women in their likelihood of having networks of family and friends that may buffer the impact of stress, depression and physical illness. Further analyses examine the association of stress with the later onset of specific diseases and the sex-specific odds of developing activity limitations or of dying associated with chronic conditions.

“Health Care/Self-Care” presents information on men’s and women’s use of mainstream health care—such as physicians and hospitals—and alternative health care. The ways in which each sex responds to minor illness are compared, and figures on medication use and home care are shown. Additional analysis focuses on factors related to women’s greater use of physicians and hospital services.

Finally, “Death—Shifting Trends” contains statistics on life expectancy and causes of death. Increases in life expectancy and the persistent gap

between the sexes during the 20th century are explored, along with the shifting positions of Canadian males and females in international rankings over the past 40 years. Trends since 1950 in male and female mortality attributable to major causes of death are shown. Recent data focus on the top ten causes of death for males and females and the causes that account for most mortality before age 75. Additional analyses compare the number of years males and females can expect to live free of activity limitations, and relative survival rates for common types of cancer.

Age, of course, is strongly associated with health, a reflection of accumulated risks and gradual decline in physiological resistance and resilience. As well, socio-economic status has repeatedly been shown to be related to health. Therefore, age and household income were examined and are noted in the text when a significant association emerged.

A “Methods” section at the end of the report describes the data sources, analytical techniques and limitations. Except for vital statistics, most analysis refers to the population in private households. Unless otherwise noted, residents of institutions are excluded.

In the mid-1970s, Canadian health policy experts produced a ground-breaking and internationally recognized document, the Lalonde Report, suggesting that factors other than the health care system were important contributors to health.¹ The term "lifestyle" began to be applied to habits and behaviours that affect health and that were considered to result from personal, deliberate, individual choices. These factors included exercise, smoking, nutrition, body weight, and alcohol use, among others. Epidemiological research quantifying the impacts of such "modifiable risk factors" on myriad disease outcomes quickly accumulated, and health promotion programs urged Canadians to reduce their fat intake, stop smoking, and start exercising.

TAKING RISKS/TAKING CARE

More recently, views on the factors influencing health have broadened. Lifestyle-related behaviours are now seen not only as individual choices, but also as behaviours that are influenced by the social, economic, cultural, and geographic context in which a person lives. Reflecting this thinking, public health initiatives designed to improve lifestyle are increasingly aimed at society at large. For example, smoking cessation strategies now encompass changes in legislation, tax deterrents and advertising bans.

While the effect of social, economic and cultural influences on lifestyle is considerable, another factor—gender—distinguishes health-related behaviour, even within the same milieu. Perhaps because of socialization, and perhaps because of biological differences, men and women have distinctly different lifestyles. The sexes differ not only in their propensity to adopt certain health-related habits, but also in their concerns about or attitudes toward health. Evidence of these differences has important implications for public health programs. Initiatives geared to reduce modifiable risks should consider male–female differences—levels of risk, perception and response.

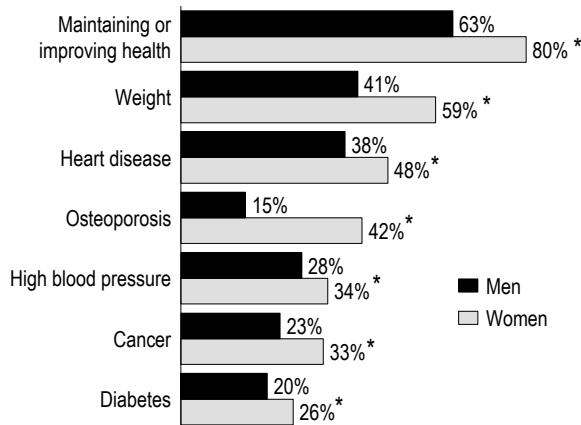
Nutrition

Today, a “poor diet” can mean eating too much of the “wrong” foods, as well as not enough of the “right” foods. Diets high in calories, fat, cholesterol, processed starches and sugars, and low in fruits and vegetables have been the subject of studies

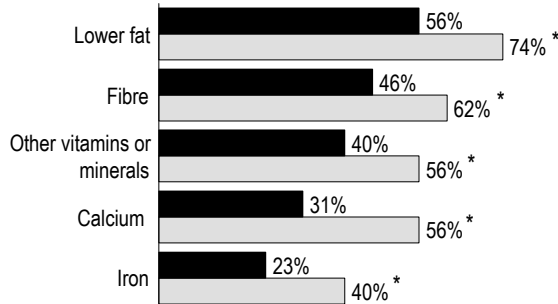
attempting to quantify their role in the development of disease.²⁻⁶ As well, research has addressed the alleged benefits of vitamins, calcium, fibre, antioxidants, and other nutrients in preventing or delaying disease.⁷⁻¹⁰

Food selection, population aged 15 or older, by reason for choosing or avoiding foods, 1998/99

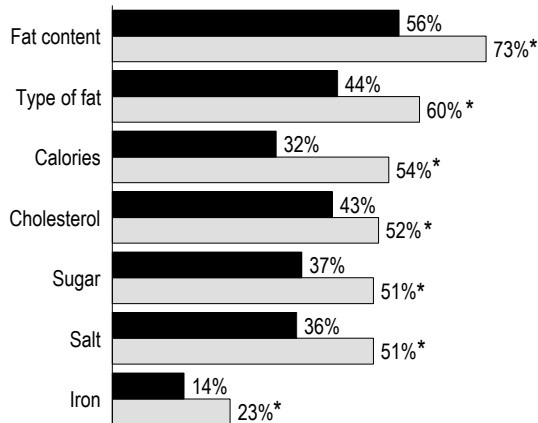
% who choose or avoid foods because of worry about:



% who choose foods because of:



% who avoid foods because of:



Data source: National Population Health Survey, household component
 * Difference between sexes is statistically significant ($p \leq 0.05$).

Perhaps because women usually take more responsibility than do men for family food shopping and meal preparation, nutritional concerns are often more important to women. According to the 1998/99 National Population Health Survey (NPHS), women are more likely than men to consider overall health, body weight, and specific diseases or conditions when making food choices.

Indeed, women were more concerned about maintaining or improving health through food choice than men: 80% versus 63%, respectively. Considerations of specific nutrient content reflect this difference between the sexes. For example, higher proportions of women reported that they looked at the fat, cholesterol and calorie content when choosing foods. Women were also more likely than men to consider fibre, calcium, iron, salt, sugar, or other vitamin/mineral content.

In today's society, the link between overconsumption of certain foods and excess body weight is common knowledge. Nonetheless, when body weight and food selection were examined, a notable difference between the sexes appeared. While 59% of women considered weight when selecting foods, just 41% of men did so. Further, men who actually were overweight (a body mass index of 25 or higher) were less likely than similarly overweight women to be concerned about food selection and its effects on weight. Considering that a greater percentage of men than women are, in fact, overweight (see "Body mass index"), these differences in food selection may arise less from actual risk than from a societal value that stigmatizes overweight women more than overweight men.

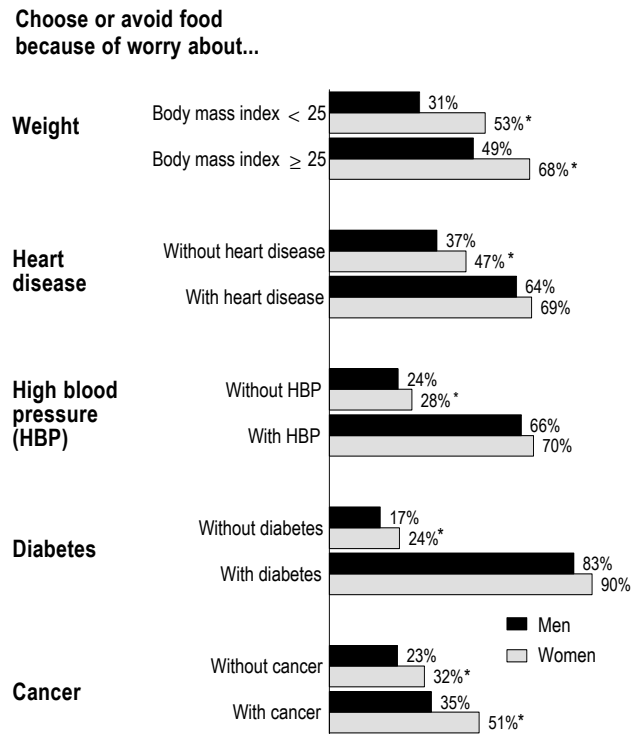
The NPHS also found that concern about specific chronic conditions influenced women's food choices more than men's. Heart disease was considered by 48% of women, compared with 38% of men. Similarly, women were more likely than men to think about osteoporosis, high blood pressure, cancer and diabetes when selecting food. The most marked difference was for osteoporosis, which is not surprising, given that women have a higher risk than men of developing this condition.

However, when nutritional concerns and food selection were further examined to compare men

and women who actually *had* been diagnosed with selected chronic conditions with those who had not, most of the significant differences between the sexes disappeared. This was the case for people with heart disease, high blood pressure and diabetes, although lack of statistical power may account for the disappearance of significant differences. To some extent, however, men may become as motivated as women to consider the implications of their food choices only after they have been diagnosed with a major health problem. Men with cancer provided a notable exception to this pattern: 35% of men with cancer considered their disease when they chose foods, significantly lower than the proportion of women with cancer (51%) who did so.

These findings indicate that women are generally more inclined to think of the health implications of their food choices. The degree to which dietary factors contribute to the risk of many diseases is not fully understood. For obesity, diabetes, and certain cancers such as colorectal and stomach,

Population aged 15 or older with and without specific chronic conditions, by reason for choosing or avoiding foods, 1998/99



Data source: National Population Health Survey, household component
 * Difference between sexes is statistically significant ($p \leq 0.05$).

however, the role of diet is well-established, and greater consideration of nutritional factors may partly account for the lower prevalence of these disorders among women.^{11,12}

Vitamins

People may take vitamins with the hope of preventing illness and disease or ensuring good health. The use of these supplements, in fact, is fairly common, particularly among women.

In 1998/99, about 4 out of 10 Canadians aged 15 or older reported that they had taken vitamins in the previous month: 47% of women and 34% of men. And while vitamin use among men varied little by age, it rose at older ages among women. By ages 45 to 64, more than half of women were vitamin-takers, compared with about one-third of men.

Given that vitamin supplements are usually an out-of-pocket expense, it is not surprising that use rose with household income. Nonetheless, at each income level, a significantly higher proportion of women than men said that they had recently taken vitamins.

Drinking

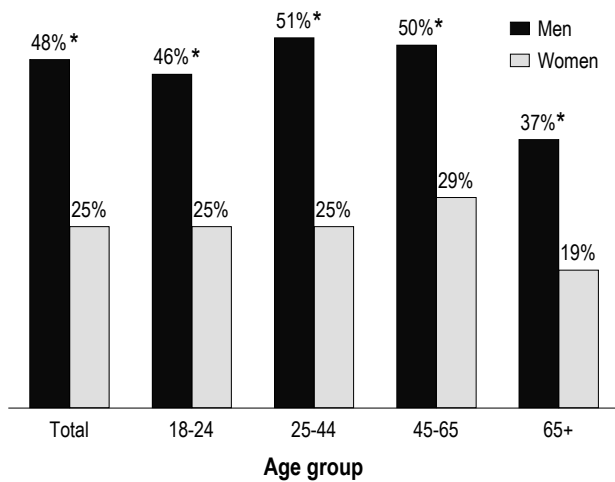
Research suggests that regular, moderate alcohol consumption may not be harmful for some individuals, and may even confer certain health benefits.¹³⁻¹⁵

About one-third of Canadians aged 18 or older consume alcohol at least once a week. The drinking patterns of men and women differ sharply, however. Men are almost twice as likely as women to consume alcohol on a weekly basis. In 1998/99, nearly half of men aged 18 or older, but only one-quarter of women, reported having had at least one drink per week. Weekly alcohol consumption was most common in the 25-to-64 age range and less so among seniors. However, in each age group, the proportion of men who reported consuming alcohol weekly significantly exceeded that for women.

The proportion of people consuming alcohol regularly rose with household income, perhaps reflecting differences in disposable income. People in the highest income group were more than twice

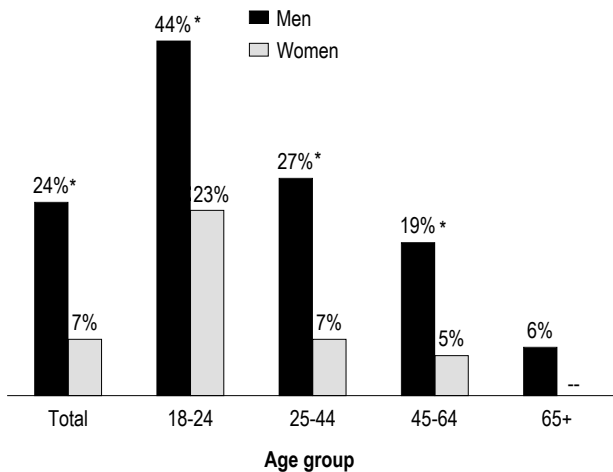
as likely to consume alcohol weekly as those at the lowest level: 44% compared with 21%, respectively. But, whether they belonged to the low, middle or high income group, men were significantly more likely than women to report weekly alcohol consumption.

Drink at least once a week, population aged 18 or older, by age group, 1998/99



Data source: National Population Health Survey, household component
 * Difference between sexes is statistically significant ($p \leq 0.05$).

Binge drink† at least once a month, population aged 18 or older, by age group, 1998/99



Data source: National Population Health Survey, household component
 † At least five drinks in one sitting.
 -- Coefficient of variation greater than 33.3%
 * Difference between sexes is statistically significant ($p \leq 0.05$).

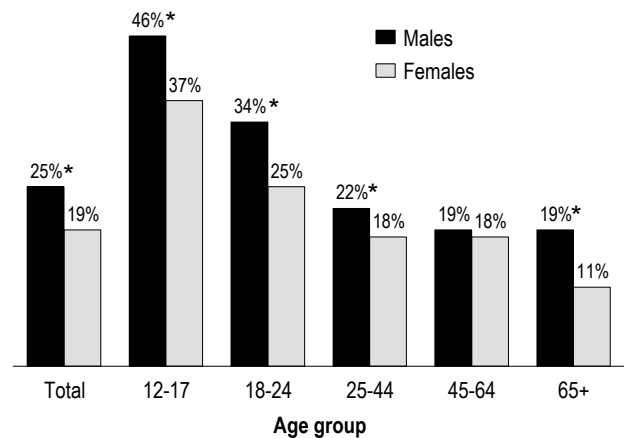
While moderate alcohol consumption is not considered a health risk, binge drinking is a different matter. Binge drinking—defined as consuming at least five alcoholic drinks at one sitting—was far more common among men than women. Nearly one in four men (24%) indulged in binge drinking at least once a month, compared with 7% of women. And 9% of men binged at least once a week, compared with 2% of women. Binge drinking was strongly related to age, particularly among men. At ages 18 to 24, fully 44% of men binged at least once a month, compared with 23% of women. At successively older ages, binge drinking was less frequent, but the sharp difference between men and women persisted.

Physical activity

Regular physical activity is beneficial to both physical and mental health.¹⁶⁻¹⁸ People who exercise are less susceptible to a number of chronic conditions and emotional problems.¹⁹

In 1998/99, 22% of Canadians in the household population aged 12 or older engaged in vigorous physical activity during their leisure time, based on energy expenditure and time spent in participation. To expend sufficient energy to be considered vigorously active, each day an individual would have

Population aged 12 or older who engage in vigorous leisure-time activity, by age group, 1998/99



Data source: National Population Health Survey, household component
 * Difference between sexes is statistically significant ($p \leq 0.05$).

Top five leisure-time physical activities, population aged 12 or older, 1998/99

Males		Females	
	Average sessions per month		Average sessions per month
Walking	8	Walking	11
Gardening/Yardwork	3	Home exercises	4
Home exercises	3	Gardening/Yardwork	3
Bicycling	2	Swimming	1
Weight training	2	Bicycling	1

Data source: National Population Health Survey, household component

to, for instance, walk for an hour, bicycle for 45 minutes, or jog for 20 minutes. Males were more likely than females to engage in vigorous activity, a pattern that held at all ages except 45 to 64.

Walking is by far the most popular leisure-time physical activity of Canadians. In 1998/99, people aged 12 or older reported taking walks an average of 10 times per month, with males averaging 8 sessions, and females, 11. (These figures reflect year-round averages; activities and frequencies may vary according to the season.) The frequency increased

with age, from 7 walks per month for 12- to 17-year-olds to 13 for seniors. In general, females reported taking walks more often than did males—seniors were the exception.

The second most common physical activity for females was home exercise. This includes workouts on stationary bikes, rowing machines or stair climbers, for example, and using televised or videotaped programs. Gardening/yardwork ranked third, followed by swimming, then bicycling. For males, gardening/yardwork placed second, and home exercises, third. Cycling ranked fourth before weight training, males' fifth most common physical activity.

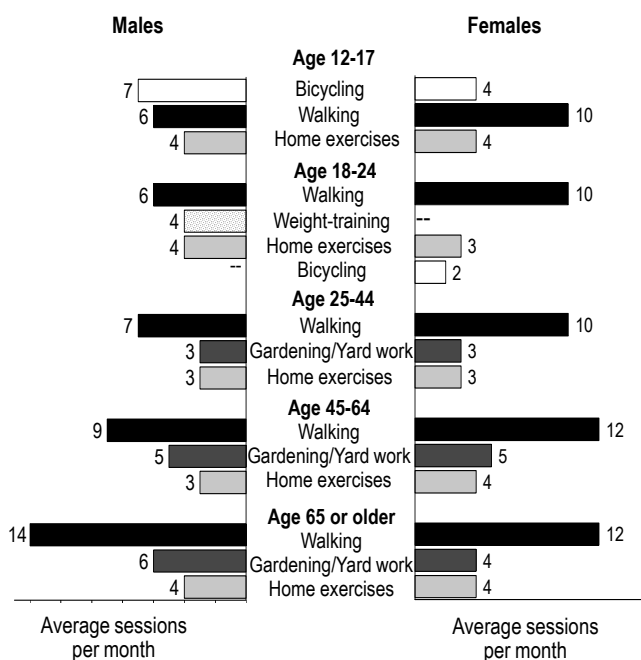
As expected, leisure-time physical activity varied with age. Bicycling ranked first for teenage boys and second for teenage girls. Among young adults (18 to 24), walking was the activity most often mentioned by both sexes, but weight training was second for men; home exercises, second for women. At older ages, walking was the number one physical activity for both men and women, with home exercises and gardening/yardwork ranking second or third.

Activity levels varied with income. People in the highest household income group were most likely to be vigorously active. Nonetheless, within each household income level, a significantly higher percentage of males than females were vigorously active during their leisure time.

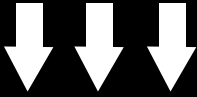
Leisure-time accounts for only part of an individual's total energy output. Paid work or household chores can also be physically demanding. However, almost a quarter of people aged 12 or older reported that "sitting" best described their usual daily non-leisure activity. Just under half of the population reported that their time was usually spent standing or walking, and 20% mentioned lifting and carrying light loads. A small minority—6%—reported that they typically did heavy labour. Not surprisingly, a significantly higher percentage of males than females (9% versus 2%) did heavy work.

Even among people whose usual daily routine involved mostly sitting, a higher percentage of males than females had vigorously active leisure time. This

Average sessions per month, most popular leisure-time physical activities, population aged 12 or older, 1998/99



Data source: National Population Health Survey, household component
 -- Not among top three leisure-time physical activities



Weight, exercise, smoking linked to disease

For both men and women, lifestyle factors—high BMI, physical inactivity and smoking, for example—have been linked to an increased incidence of many chronic conditions, and to earlier death.²⁰⁻²⁴ Similarly, analysis of National Population Health Survey (NPHS) data for people aged 18 or older who were followed over time indicate significant associations between specific lifestyle factors reported in 1994/95 and a subsequent diagnosis of certain chronic conditions. Associations with body weight, level of leisure-time physical activity and smoking persisted even when taking into account the effects of age and socio-economic status, factors associated with the onset of most chronic diseases.

Of course, the four years over which people were followed does not necessarily reflect the full period between the beginning of exposure to a risk factor and diagnosis of disease. In many cases, characteristics reported in 1994/95 had probably existed for some time.

Previous research indicates that excess weight is associated with life-threatening health problems such as heart disease, type II diabetes, certain forms of cancer, and stroke.²⁵ Relationships have also been found with chronic conditions such as high blood pressure and arthritis.

NPHS data support previous reports linking overweight/obesity with the onset of numerous diseases. Both sexes were affected. Even when age, education, household income, smoking, alcohol consumption, physical activity level and personal stress were taken into account, men classified as overweight/obese in 1994/95 had 1.6 times the odds of being diagnosed with arthritis sometime in the next four years, compared with men in the acceptable weight range. The odds that overweight/obese men would develop high blood pressure or heart disease in that period were 1.8 times the odds for men whose weight was acceptable. And compared with men of acceptable weight, the odds that overweight/obese men would be diagnosed with diabetes were 3.8 times as high.

In comparison with women of acceptable weight, those who were overweight/obese had

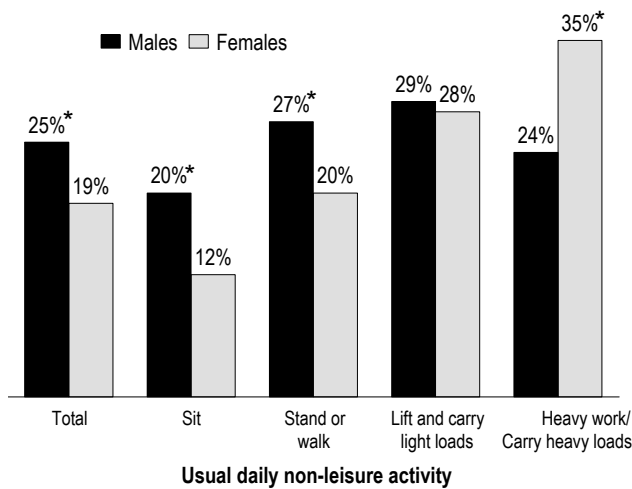
approximately one and a half times the odds of being diagnosed with arthritis, high blood pressure, migraine or asthma between 1994/95 and 1998/99, and 5.2 times the odds of being diagnosed with diabetes.

Notwithstanding the association of weight with subsequent disease, people who are overweight may be able to reduce their level of risk of some health consequences by being physically fit. Overweight/obese men who reported at least a moderate level of leisure-time physical activity in 1994/95 had significantly lower odds (0.5) of being diagnosed with heart disease over the next four years, compared with overweight/obese men with a low level of activity. Furthermore, a recent study in the United States reported that unfit men who were within the acceptable weight range had a higher risk of mortality than did overweight men (defined as BMI ≥ 27.8) who were fit.²⁶ However, this finding was not observed in the NPHS data (BMI ≥ 25.0).

Not surprisingly, smoking was associated with a subsequent diagnosis of respiratory and cardiovascular disease, as well as other chronic conditions. When the effects of age, education, household income, alcohol consumption, physical activity level, body mass index and personal stress were controlled, men who were daily smokers in 1994/95 had more than twice the odds of being diagnosed with bronchitis (2.4) or heart disease (2.2) by 1998/99, compared with men who had never smoked daily. And the odds that male daily smokers would report a new diagnosis of arthritis or back problems were one and a half times the odds for those who had never been daily smokers.

Compared with women who had never smoked daily, those who were daily smokers in 1994/95 had 1.8 times the odds of being diagnosed with asthma and 3.3 times the odds of being diagnosed with chronic bronchitis or emphysema by 1998/99. Furthermore, women who were heavy smokers (20 or more cigarettes per day) had increased odds of a new diagnosis of high blood pressure (1.5) or arthritis (1.8), compared with women who had never smoked daily.

Population aged 12 or older who engage in vigorous leisure-time activity, by usual daily non-leisure activity, 1998/99



Data source: National Population Health Survey, household component
 * Difference between sexes is statistically significant ($p \leq 0.05$).

was true for all age groups 25 or older. As well, among people with somewhat more strenuous daily activities (typically, standing or walking), a higher proportion of males than females had vigorously active leisure time. By contrast, the relatively few females who did heavy work were more likely than their male counterparts to engage in vigorous leisure-time pursuits (35% compared with 24%).

Body mass index

Body mass index, or BMI, is commonly used to determine if an individual is in a healthy weight range (see *Weight, exercise, smoking linked to disease*). It is calculated by dividing weight in kilograms by the square of height in metres. Values are sometimes not calculated for teenagers, whose weight may change substantially in adulthood, or seniors, whose loss of height may affect the validity of the measure. Nonetheless, in this report, as in many others, BMI is calculated for everyone aged 15 or older. Pregnant women are excluded.

In 1998/99, the average height of Canadian women was 1.62 metres (5 feet, 4 inches) and their average weight was 65.1 kilograms (144 pounds). The average man was 1.76 metres tall (5 feet, 9 inches) and weighed 80.4 kilograms (177 pounds). The average woman's BMI was 24.7, and the average man's, 25.8.

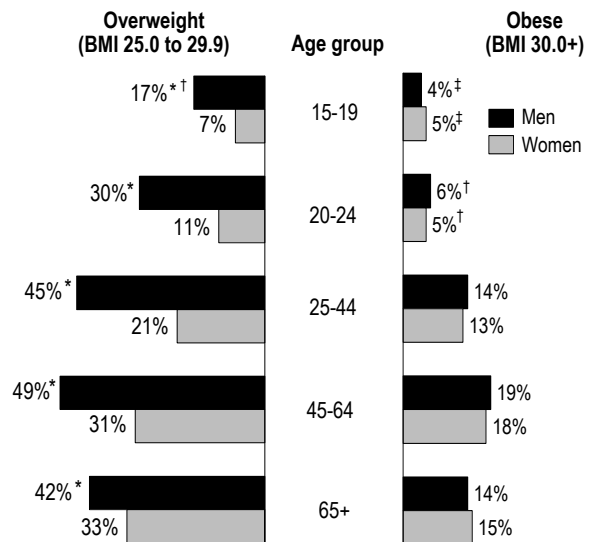
The BMI categories endorsed by the World Health Organization are: 18.5 or less (underweight), 18.6 to 24.9 (acceptable weight), 25.0 to 29.9 (overweight), and 30 or more (obese). According to this international standard, in 1998/99, about half of Canadians aged 15 or older were in the acceptable weight range, and only 3% were underweight. Close to one-third were overweight, and 14% were considered obese.

Despite the higher likelihood that men would be physically active, a higher percentage of men (42%) than women (24%) were overweight. Further, while the prevalence of overweight tended to increase with age for both sexes, the proportion of men who were overweight exceeded that for women in each age group.

Regardless of age, women were more likely than men to be in an acceptable weight range. And, from ages 15 to 44, a higher percentage of women than men were underweight.

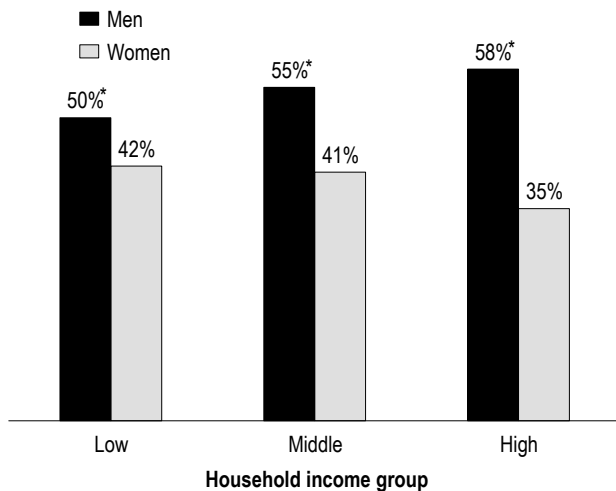
For obesity, there was no difference between the sexes: 14% of both men and women. The likelihood of obesity did vary with age, from less

Percentage of population aged 15 or older who were overweight or obese, by age group, 1998/99



Data source: National Population Health Survey, household component
 † Coefficient of variation between 16.6% and 25.0%
 ‡ Coefficient of variation between 25.1% and 33.3%
 * Difference between sexes is statistically significant ($p \leq 0.05$).

Percentage of population aged 15 or older who were overweight/obese, by household income group, 1998/99



Data source: National Population Health Survey, household component
* Difference between sexes is statistically significant ($p \leq 0.05$).

than 5% at ages 15 to 19, peaking at over 18% at ages 45 to 64, and falling to around 15% among seniors.

Analysis of BMI in relation to household income revealed that a significantly higher proportion of men than women were overweight/obese at all income levels. In addition, while the proportion of women who were overweight fell as household income level increased, the opposite was true for men. Consequently, the male–female gap in the percentage overweight was greatest in the highest income group.

Smoking

Smoking is widely recognized as the major cause of preventable death and illness. It is the leading cause of lung cancer and a risk factor for other cancers, as well as cardiovascular and respiratory diseases. Nonetheless, in 1998/99, 23% of Canadians aged 12 or older—an estimated 5.7 million people—smoked cigarettes daily. The proportion of males (24%) was higher than that of females (21%). However, among teens and young adults (ages 12 to 17 and 18 to 24), females were as likely as males to be smokers.

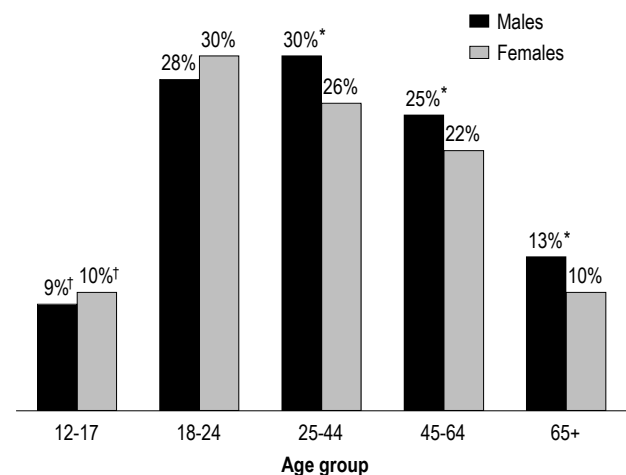
Despite widespread knowledge of tobacco's harmful effects, 6% of non-smokers aged 12 or older started smoking sometime between 1994/95 and 1998/99. A slightly but significantly higher proportion of males (7%) than females (5%) started smoking during this period.

Teenagers were the age group most likely to have begun smoking: one-fifth (21%) of teens aged 12 to 17 who had been non-smokers in 1994/95 were smokers by 1998/99. The difference in the proportions of boys and girls these ages who started smoking was not statistically significant. Furthermore, 72% of 12- to 17-year-olds who had been smokers in 1994/95 were still smoking by 1998/99. This compares with 66% among young adult smokers aged 18 to 24.

For smokers of all ages, the percentage who quit between 1994/95 and 1998/99 did not differ significantly between males (24%) and females (27%).

Smoking prevalence varied sharply by income. People in the lowest income households were nearly twice as likely to be current smokers (30%) as were those in the highest (16%). In contrast, the likelihood of smoking initiation or quitting did not vary by income.

Percentage of population aged 12 or older who were daily smokers, by age group, 1998/99



Data source: National Population Health Survey, household component
* Difference between sexes is statistically significant ($p \leq 0.05$).
† Coefficient of variation between 16.6% and 25.0%

Concluding remarks

Data from the National Population Health Survey (NPHS) indicate that men and women differ in a number of health-related behaviours. Women are more likely than men to select food with health concerns in mind, to use vitamins regularly, and to be an appropriate weight for their height. Women are also less likely to be smokers or binge drinkers. However, except for those involved in heavy labour on the job, women are less likely than men to pursue vigorous physical activity in their leisure time.

Lifestyle practices vary by income, with a generally greater likelihood of healthful behaviour among people of higher means. (An important exception was the pattern of overweight for men, which was more prevalent at successively higher income levels.) However, for most factors, significant differences emerged between men and women even within the same income category. This suggests that there are influences on health-related behaviour beyond socio-economic status that affect the sexes differently. Men and women are likely responding differently to similar influences within the same social context. For example, the importance of body weight is probably greater for women, while participating in physical activity and regular consumption of alcohol are more typical for men.

References

- 1 National Health and Welfare. *A New Perspective on the Health of Canadians* (Lalonde Report). Ottawa: Department of National Health and Welfare, 1974.
- 2 LaRosa JH, Becker DM, Fitzgerald S. Elevated blood cholesterol—a risk factor for coronary heart disease. *AAOHN Journal* 1990; 38(5): 211-5.
- 3 Stampfer MJ, Hu FB, Manson JE, et al. Primary prevention of coronary heart disease in women through diet and lifestyle. *The New England Journal of Medicine* 2000; 343(1): 16-22.
- 4 Morris KL, Zemel MB. Glycemic index, cardiovascular disease, and obesity. *Nutrition Reviews* 1999; 57(9): 273-6.
- 5 Cox BD, Whichelow MJ, Prevost AT. Seasonal consumption of salad vegetables and fresh fruit in relation to the development of cardiovascular disease and cancer. *Public Health Nutrition* 2000; 3(1): 19-29.
- 6 van't Veer P, Jansen MC, Klerk M, et al. Fruits and vegetables in the prevention of cancer and cardiovascular disease. *Public Health Nutrition* 2000 3(1): 103-7.
- 7 Jorde R, Bonna KH. Calcium from dairy products, vitamin D intake, and blood pressure: the Tromsø Study. *American Journal of Clinical Nutrition* 2000; 71(6): 1530-5.
- 8 Carr AC, Frei B. Toward a new recommended dietary allowance for vitamin C based on antioxidant and health effects in humans. *American Journal of Clinical Nutrition* 1999; 69(6): 1086-107.
- 9 Lee IM. Antioxidant vitamins in the prevention of cancer. *Proceedings of the Association of American Physicians* 1999; 111(1): 10-5.
- 10 Jacobs DR, Marquart L, Slavin J, et al. Whole-grain intake and cancer: an expanded review and meta-analysis. *Nutrition and Cancer* 1998; 30(2):85-96.
- 11 Gibbons L, Waters C, Ellison L, et al. Trends in colorectal cancer incidence and mortality. *Health Reports* (Statistics Canada, Catalogue 82-003) 2001; 12(2): 41-55.
- 12 National Cancer Institute of Canada. *Canadian Cancer Statistics 2000*. Toronto: National Cancer Institute of Canada, 2000.
- 13 Feskanich D, Korrnick SA, Greenspan SL, et al. Moderate alcohol consumption and bone density among postmenopausal women. *Journal of Women's Health* 1999; 8(1): 65-73.
- 14 Gaziano JM, Gaziano TA, Glynn RJ, et al. Light-to-moderate alcohol consumption and mortality in the Physicians' Health Study enrollment cohort. *Journal of the American College of Cardiology* 2000; 35(1): 96-105.
- 15 Hart RG, Pearce LA, McBride R, et al. Factors associated with ischemic stroke during aspirin therapy in atrial fibrillation: analysis of 2012 participants in the SPAF I-III clinical trials. The Stroke Prevention in Atrial Fibrillation (SPAF) Investigators. *Stroke* 1999; 30(6): 1223-9.
- 16 Drygas W, Kostka T, Jagier A, et al. Long-term effects of different physical activity levels on coronary heart disease risk factors in middle-aged men. *International Journal of Sports Medicine* 2000; 21(4): 235-41.
- 17 Fox KR. The influence of physical activity on mental well-being. *Public Health Nutrition* 1999; 2(3A): 411-8.
- 18 Sesso HD, Paffenbarger RS, Lee IM. Physical activity and coronary heart disease in men: The Harvard Alumni Health Study. *Circulation* 2000; 102(9): 975-80.
- 19 Chen J, Millar WJ. Health effects of physical activity. *Health Reports* (Statistics Canada, Catalogue 82-003) 1999; 11(1): 21-30.
- 20 Calle EE, Thun MJ, Petrelli JM, et al. Body-mass index and mortality in a prospective cohort of US adults. *The New England Journal of Medicine* 1999; 341(15): 1097-105.
- 21 Meng L, Maskarinec G, Lee J, et al. Lifestyle factors and chronic diseases: Application of a composite risk index. *Preventive Medicine* 1999; 29(4): 296-304.
- 22 Luoto R, Prättälä R, Uutela A, et al. Impact of unhealthy behaviors on cardiovascular mortality in Finland, 1978-1993. *Preventive Medicine* 1998; 27(1): 93-100.
- 23 Davis MA, Neuhaus JM, Moritz DJ, et al. Health behaviors and survival among middle-aged and older men and women in the NHANES I Epidemiologic Follow-up Study. *Preventive Medicine* 1994; 23(3): 369-76.

- 24 Uhlig T, Hagen KB, Kvien TK. Current tobacco smoking, formal education, and the risk of rheumatoid arthritis. *The Journal of Rheumatology* 1999; 26(1): 47-54.
- 25 Gilmore J. Body mass index and health. *Health Reports* (Statistics Canada, Catalogue 82-003) 1999; 11(1): 31-43.
- 26 Lee CD, Jackson AS, Blair SN. US weight guidelines: Is it also important to consider cardiorespiratory fitness? *International Journal of Obesity* 1998; 22 (suppl. 2): S2-S7.

Good health entails physical function, as well as the ability to carry out activities and roles as a member of society. But it also includes mental and emotional well-being. Moreover, these domains of health overlap. Sickness and injury can bring about emotional difficulties such as depression,^{1,2} while stress and anxiety may manifest themselves in physical illness.^{3,4}

Data about the prevalence of stress, emotional problems and chronic conditions provide some indication of the people who are vulnerable and in need of support. Thus, the information is important not only in terms of disease prevalence and mortality, but also from a public health perspective.

STRESS AND WELL-BEING

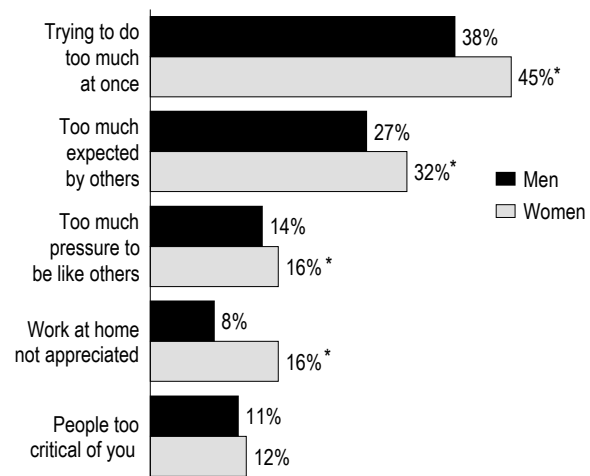
Although women generally live longer than men, throughout their lives women are more subject to a wide range of chronic conditions.⁵ The consequences of these conditions are often associated with activity limitations and poor health. However, the impact of those problems and responses to them differ for males and females.

Personal stress

Work, family and social commitments often contribute to a sense of time pressure, feeling that one has not met others' expectations, and feeling unappreciated. The resulting stress can influence the onset and progression of physical illness (see *Stress and disease*).

In the National Population Health Survey (NPHS), personal stress was defined as: trying to take on too much at once; feeling pressure to be like other people; feeling that others expect too much; feeling that your work around the home is not appreciated; and feeling that others are too critical of you. In 1994/95 (the most recent data available), 45% of women aged 18 or older reported that they were trying to do too much at once; 38% of men felt this way. Similarly, a third of women,

Percentage of population aged 18 or older experiencing personal stress, by type of stress, 1994/95



Data source: National Population Health Survey, household component
* Difference between sexes is statistically significant ($p \leq 0.05$).

Stress and disease

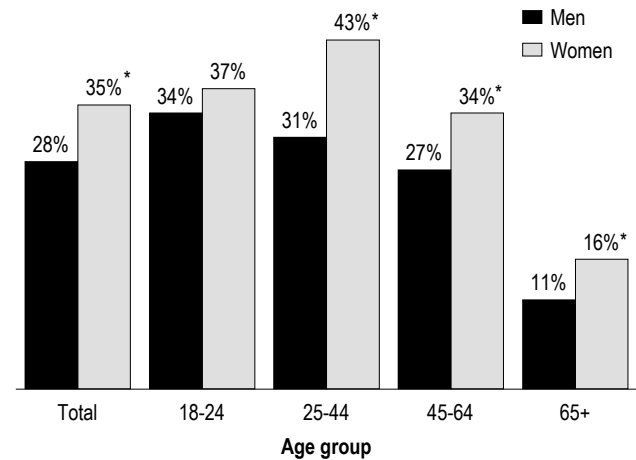
Although the exact mechanisms are not fully understood, the negative emotional and cognitive effects of stress may alter the immune response and increase susceptibility to disease.^{6,7} Stress can also play a role in the onset and course of autoimmune diseases such as rheumatoid arthritis.^{6,8} In addition, stress may prompt changes in health behaviour as individuals try to cope.^{7,9} For example, someone under pressure may take up smoking or begin to smoke more. Excessive eating, an unhealthy weight gain, and increased alcohol consumption are other potential responses.

Longitudinal data from the National Population Health Survey (NPHS) show that feeling personal stress in 1994/95 was predictive of developing chronic conditions over the next four years, even when age, socio-economic status and several health-related behaviours (smoking, drinking, body mass index, leisure-time physical activity) were taken into account. Men who had experienced high personal stress in 1994/95 had about twice the odds of having been diagnosed with migraine, ulcers or arthritis by 1998/99, compared with those who had not reported high personal stress. For women, high personal stress in 1994/95 was associated with significantly high odds of a new diagnosis of chronic bronchitis/emphysema (2.0), ulcers (1.6), asthma (1.6), back problems (1.5), or arthritis (1.3) by 1998/99.

More generally, men and women who experienced high personal stress had significantly low odds of having "continuing good health." To be in this healthy state, individuals had to rate their health as very good or excellent in each of the three NPHS cycles: 1994/95, 1996/97 and 1998/99. Compared with people who had not reported high personal stress in 1994/95, the odds of continuing good health were low among men (0.7) and women (0.5) who had experienced that level of stress.

As well, women who were under high personal stress in 1994/95, but had not experienced a major depressive episode in the preceding year, had high odds of reporting such an episode in 1996/97 (2.6) and in 1998/99 (1.8), compared with women who had not been under high stress. For men, however, high personal stress in 1994/95 was not significantly related to subsequent depressive symptoms.

Population aged 18 or older experiencing high[†] personal stress, by age group, 1994/95



Data source: National Population Health Survey, household component
[†] Replied "yes" to two or more personal stress items.

* Difference between sexes is statistically significant ($p \leq 0.05$).

but just over a quarter of men, said that others expected too much of them. Women were also more likely than men to feel pressure to be like others, or that their work around the home was not appreciated.

Not surprisingly, then, high personal stress—defined as experiencing at least two of these forms of stress—was more common in women than men. And though personal stress tended to decline at older ages, in each age group, a larger proportion of women than men were affected.

Work stress

Employment can have a positive effect on health as a result of steady or increased income, access to job-related benefits such as paid sick leave or drug and dental insurance plans, and a sense of self-esteem.

But having a job can also mean exposure to work stress, which can affect physical and emotional well-being^{5,9-11} (see *Stress at work*). Work stress stems from a number of sources: physically demanding labour, low support from co-workers and supervisors, job strain, and job insecurity.

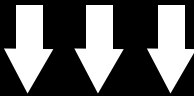
In 1994/95, about 4 in 10 Canadian workers aged 15 to 64 reported that their jobs were physically

demanding. As might be anticipated, this was more common among men than women. The proportions of workers in such jobs declined with age, and the difference between men and women disappeared from age 45 on.

Close to 3 in 10 workers reported low support from their co-workers. Among workers aged 45 or older, there was no difference between men and women, but from ages 15 to 44, women were more

likely than men to feel they had low co-worker support.

Around 2 in 10 workers experienced job strain. That is, they were in hectic jobs, subject to conflicting demands, and had little freedom in controlling the pace of their work or in deciding how to carry out their duties. Job strain tended to decrease with age, but at all ages, women were more likely than men to report it.



Stress at work

Work stress is linked to a variety of health problems, although the effects sometimes vary by sex.^{9,12,13} According to the 1994/95 National Population Health Survey (NPHS), several types of work stress were independently associated with various health problems.¹⁴ Work stress variables examined in relation to health problems included physical demands of the job, work strain, low co-worker support, low supervisor support, and job insecurity. The analysis controlled for occupation, full- or part-time employment, personal characteristics, health behaviours, and psychological variables. The personal characteristics were age, marital status, education, household income, and presence of children younger than 12 in the household. The health behaviours comprised smoking status and level of leisure-time physical activity. The psychological variables were recent negative life events, chronic strain, lack of closeness, and sense of mastery.

Not surprisingly, the odds of having suffered a work injury in the past 12 months were significantly high for men (3.3) and women (1.9) who had physically demanding jobs, compared with male and female workers whose jobs did not involve strenuous exertion.

Men experiencing high job strain in 1994/95 had high odds of suffering migraine (1.6) that year, compared with men who did not experience high job strain. As well, increasing levels of job strain among men were associated with increasing psychological distress, that is, feelings of sadness, nervousness, and that everything was an effort.

The odds of migraine were significantly high (1.5) among men with low co-worker support, compared with men receiving more support from their colleagues.

Among women, the odds of having had a work injury in the past year were significantly elevated for those who reported high job strain (1.2) or low co-worker support (1.8), compared with women who did not report these forms of work stress. In addition, at successively lower levels of co-worker support, women's psychological distress increased. And compared with women who did not perceive their job to be insecure, those who did had high odds of reporting migraine (1.4) in 1994/95.

Data for people followed over time showed that job strain was associated with subsequent depression. This association takes into account the effects of several potentially confounding variables: age, education, household income, smoking, alcohol consumption, leisure-time physical activity, body mass index, and personal stress. Controlling for these variables, the odds were high that men and women who experienced job strain in 1994/95 would, in 1996/97, report symptoms of having had a major depressive episode (2.7 and 1.8, respectively), compared with men and women who did not have job strain.

As well, the odds of having continuing good health (very good or excellent self-rated health in each of the three NPHS cycles) were significantly low for men (0.7) and women (0.8) who experienced job strain in 1994/95, compared with male and female workers who did not experience job strain.

Percentage of workers aged 15 or older reporting work stress or job dissatisfaction, by age group, 1994/95

Type of work stress/Job dissatisfaction	Age group			
	Total workers	15-24	25-44	45+
		%		
High physical demands				
Men	44*	56*	45*	38
Women	37	44	37	35
Low co-worker support				
Men	27	26	29	22
Women	31*	32*	34*	25
High job strain				
Men	17	25	18	11
Women	28*	37*	29*	20*
High job insecurity				
Men	18	17	19	15
Women	19	20	20	16
Low supervisor support				
Men	16	14	16	15
Women	15	18	14	13
Job dissatisfaction				
Men	8	10	8	8*
Women	9	12	10*	4

Data source: National Population Health Survey, household component
 * Differences between sexes is statistically significant ($p \leq 0.05$).

Substantial proportions of workers felt that their jobs were insecure (18%) or that they received little support from their supervisors (15%). The likelihood of being in either situation was about the same for men and women.

Overall, just 1 in 10 workers expressed job dissatisfaction. At ages 25 to 44, such sentiments were more common among women than among men. But at older ages, a larger percentage of men than women said they were dissatisfied with their job.

High physical demands, job strain, job dissatisfaction and job insecurity tended to be most common among people in low-income households, where equally large percentages of men and women were affected. At higher income levels, the various types of work stress were reported less frequently, but differences emerged between the sexes. In middle- and high-income households, men were more likely than women to report high physical demands, whereas women were more likely than

men to report job strain. As well, women in high-income households were more likely than their male counterparts to report high job insecurity and low co-worker support.

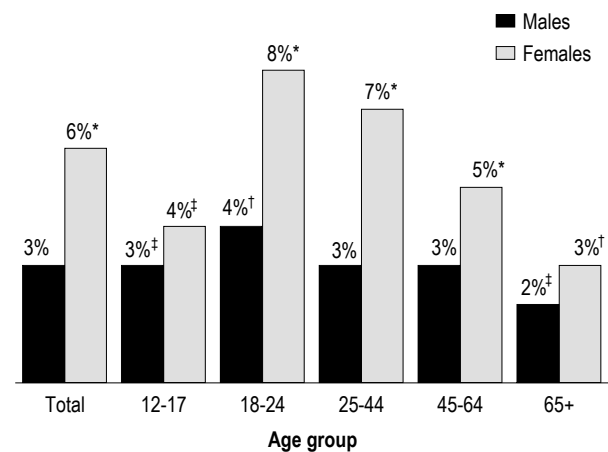
Depression

A major depressive episode is characterized by a depressed mood and/or lack of interest in most activities, accompanied by symptoms such as appetite or sleep disturbance, decreased energy, difficulty concentrating, and feelings of worthlessness and/or suicidal thoughts—all lasting at least two weeks.¹⁵ Understandably, such symptoms disrupt not only the lives of the people affected, but of those around them.

In 1998/99, an estimated 4% of Canadians aged 12 or older reported symptoms strongly suggesting that they had suffered at least one episode of depression during the previous year. The prevalence of depression among females was twice that among males: 6% versus 3%.

For both sexes, the prevalence of depression peaked at ages 18 to 24, and dropped at successively older ages. However, from ages 18 to 64, the prevalence was much higher among women than men. There was no gender gap among teenagers (12 to 17) and seniors.

Prevalence of depression in past year, population aged 12 or older, by age group, 1998/99



Data source: National Population Health Survey, household component
 † Coefficient of variation between 16.6% and 25.0%
 ‡ Coefficient of variation between 25.1% and 33.3%
 * Difference between sexes is statistically significant ($p \leq 0.05$).

Chronic conditions

Although the prevalence of most chronic conditions and diseases increases with age, the health consequences of specific conditions vary. Some, such as heart disease and cancer, can be fatal. Others, such as Alzheimer's disease and urinary incontinence, contribute to serious physical limitations and dependency and may eventually lead to institutionalization. By contrast, arthritis and back problems rarely result in death or institutionalization, although they can bring considerable pain and severely compromise quality of life (see *Impact of chronic conditions*).

Generally, non-fatal conditions tend to be more common among females. For instance, in 1998/99, larger percentages of females than males aged 12 or older reported having arthritis, non-arthritic back problems, migraine, and urinary incontinence. These are conditions that entail a substantial burden of illness, as they involve distressing symptoms, disability and considerable medical care. Diabetes, however, was more common among males than

females, perhaps a reflection of the higher prevalence of overweight/obesity among men.

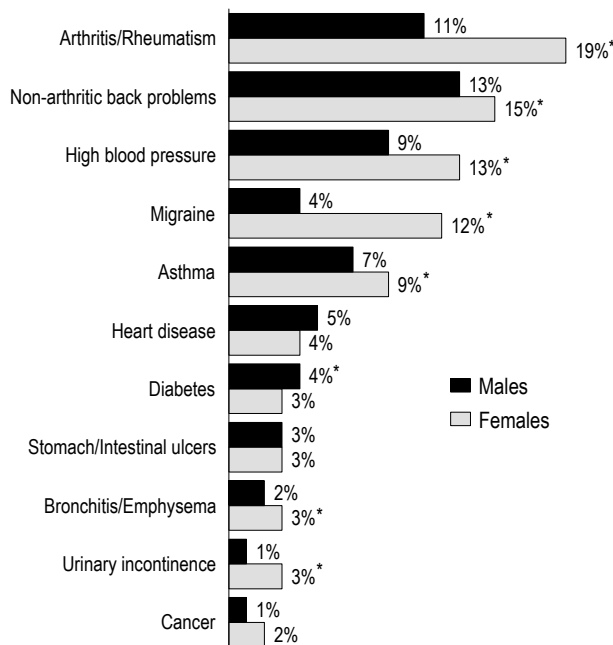
The two leading causes of death—heart disease and cancer—were reported much less frequently than other chronic conditions, and overall differences between the sexes were not significant.

Even among 12- to 24-year-olds, a male/female disparity in the prevalence of chronic conditions was evident. At these ages, females were more likely than males to suffer from migraine and back problems.

Chronic conditions were more prevalent at ages 25 to 44 than among younger people, and sex differences were notable. Higher percentages of women than men had migraine and arthritis, while diabetes affected a higher percentage of men.

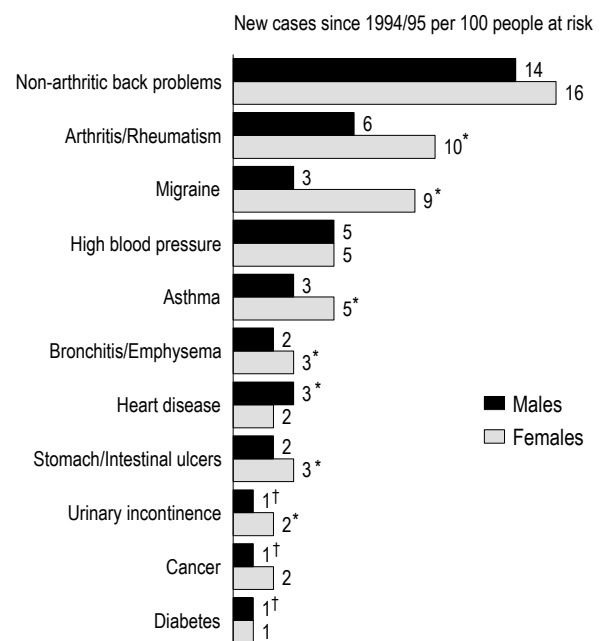
At ages 45 to 64, disparities between the sexes were pronounced. Women in this age range were more likely than their male contemporaries to report arthritis, migraine, asthma and bronchitis/emphysema. Cancer, too, was more prevalent among women, which may be partially attributable to breast cancer. By contrast, men were more likely

Prevalence of chronic conditions, population aged 12 or older, 1998/99



Data sources: 1998/99 National Population Health Survey, household component
 * Difference between sexes is statistically significant ($p \leq 0.05$).

Four-year cumulative incidence of chronic conditions, population aged 12 to 64, 1998/99



Data source: National Population Health Survey, household component
 † Coefficient of variation between 16.6% and 25.0%
 * Difference between sexes is statistically significant ($p \leq 0.05$).

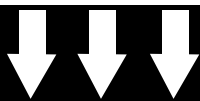
than women to have been diagnosed with heart disease.

Among seniors, some of the sex differences that existed at younger ages disappeared. For example, the prevalence of asthma, bronchitis/emphysema, heart disease and cancer was the same for elderly men and women. However, a higher percentage of women than men aged 65 or older had arthritis, high blood pressure, and migraine. Senior men were more likely than senior women to have diabetes.

The prevalence of most of these chronic conditions was higher among people in low-income

households than among those in more affluent households. The exceptions were migraine, which was more common at higher income levels, and cancer, which did not vary by income. However, many male–female differences in prevalence persisted regardless of income.

For instance, at all income levels, females were more likely than males to have arthritis, urinary incontinence and migraine, and in lower- and middle-income households, high blood pressure. Conversely, asthma was more common among females than males only in the highest income group.



Impact of chronic conditions

The presence of a chronic condition affects not only how well a person feels, but also the ability to carry out normal activities and to live independently. According to the National Population Health Survey (NPHS), in 1994/95, the odds were high that people aged 45 or older who had various chronic conditions would have an activity limitation, compared with people of the same age who did not have those specific conditions. The odds of reporting an activity limitation that year were particularly high for people with heart disease (4.6), chronic bronchitis/emphysema (3.4), arthritis (3.2) or back problems (2.8). The odds of activity limitation were also significantly high for those with cancer or asthma (both 2.1), migraine (1.7), or ulcers (1.5).

Longitudinal NPHS data show that the longer-term impact of these chronic conditions can be daunting. People who had not been limited in 1994/95 had significantly high odds of developing an activity limitation by 1998/99 if, in 1994/95, they had had heart disease (2.9), diabetes (2.3), migraine (2.0), or arthritis or back problems (both 1.5), compared with people who did not have these conditions. As well, the odds of describing one's health as at least good in 1994/95, but poor or fair in 1998/99, were high among people with heart disease or diabetes (both 2.1), arthritis or bronchitis/emphysema (both 1.7) or high blood pressure (1.6).

As might be expected, some conditions were more predictive of death than others. Compared with people who were not afflicted in 1994/95, the odds of having died by 1998/99 were high for those who had cancer (3.3), bronchitis/emphysema (2.1), heart disease (1.9), or diabetes (1.7).

Much of the sex difference in health status, therefore, appears to stem from the higher overall prevalence of many chronic conditions in women than in men, rather than from any difference in how the sexes respond to or tolerate such conditions. In fact, in 1994/95, men and women who had the same disease had equal odds of having an activity limitation or reporting poor or fair health.

In the long run, however, women seem to be more resilient. When men and women of the same age and with the same conditions in 1994/95 were compared, the odds that men would report their health as poor or fair in 1998/99 were 1.3 times the odds for women, and their odds of having died by that date were 1.4 times as great. Even including the population in health institutions, and accounting for other medical, psychosocial, behavioural, social and demographic factors, the odds of having died between 1994/95 and 1998/99 remained higher for men.

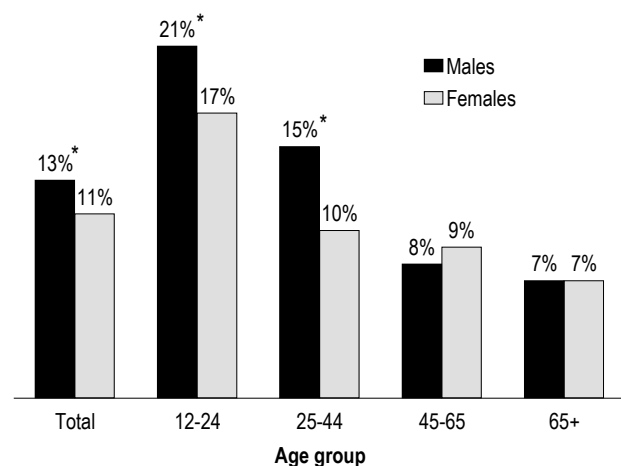
Heart disease was a special case. In lower-income households, women were more likely than men to be afflicted; in higher-income households, a larger percentage of men than women reported heart disease.

Females aged 12 to 64 were more likely than males to report a new diagnosis of arthritis, migraine, asthma, bronchitis/emphysema, ulcers, or urinary incontinence between 1994/95 and 1998/99. On the other hand, although substantial numbers of people developed back problems and high blood pressure, the gap between the sexes was not significant. (To avoid bias arising from differences in the attrition of senior men and women due to mortality and institutionalization, new cases were examined only for people aged 12 to 64 who were living in households in 1994/95.)

Injury

Injuries are a major cause of activity limitation and often require medical care and a period of recovery. This can impose heavy burdens (physical, emotional and financial) on the individuals who are injured and on the people who care for them. In 1998/99, 12% of Canadians aged 12 or older reported that in the previous year they had had at least one injury serious enough to limit their normal activities. Males were more likely than females to have been injured.

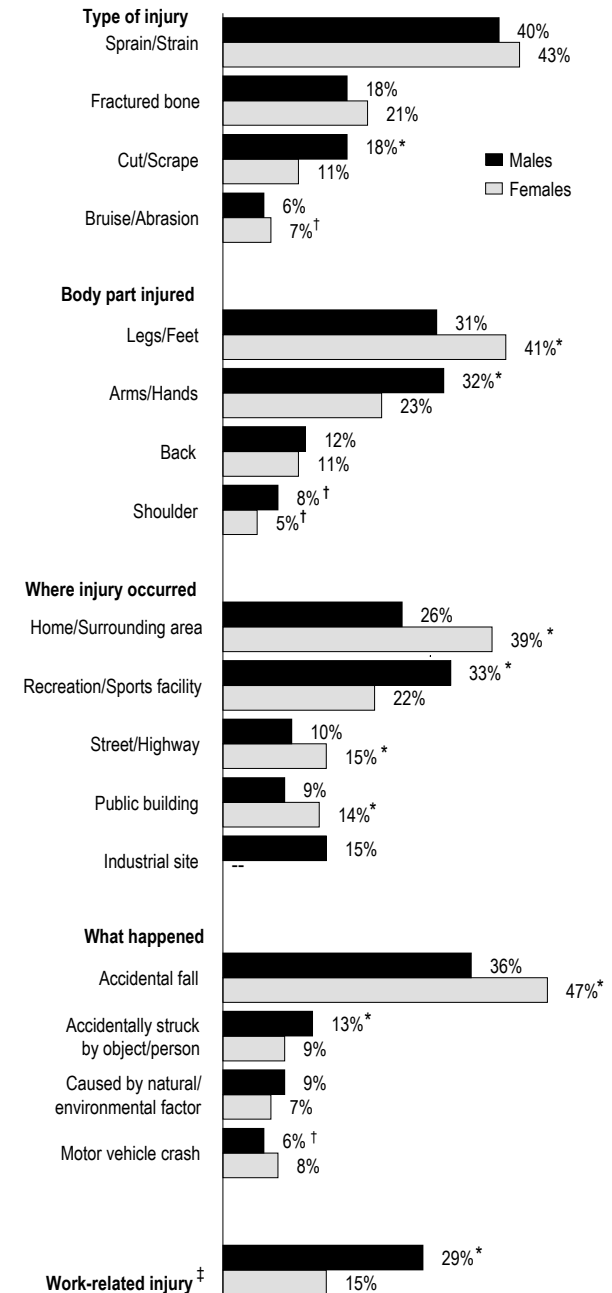
Percentage of population aged 12 or older injured† in past year, by age group, 1998/99



Data source: National Population Health Survey, household component
 † Excluding repetitive strain injuries
 * Difference between sexes is statistically significant ($p \leq 0.05$).

Injuries were particularly common among younger people (12 to 24). Up to age 44, higher proportions of males than females reported having been injured. With increasing age, however, injury

Characteristics of most serious injury, population aged 12 or older injured in past year, 1998/99



Data source: National Population Health Survey, household component
Note: Because "other" category is not shown, detail may not add to 100%.
 † Coefficient of variation between 16.6% and 25.0%
 ‡ Population aged 15 or older
 * Difference between sexes is statistically significant ($p \leq 0.05$).
 -- Coefficient of variation greater than 33.3%

rates declined, especially among men, so that from 45 on, differences between the sexes were not significant.

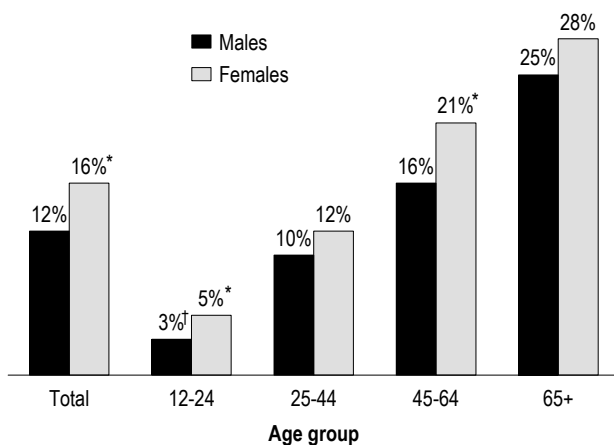
About four in ten injuries to females happened at home. One out of three injuries to males occurred in recreational or sports settings, a reflection of their greater participation in vigorous leisure-time activities. Males were also more likely than females to sustain injuries at work, which is not surprising, given that a higher percentage of men than women had a physically demanding job.

Falling was the most frequent cause of injury for both males and females in all age groups, and it accounted for a significantly larger proportion of injuries to females than males at age 25 or older. Being accidentally struck by an object or person was more common among males than females. There were no sex differences in the proportions of injuries caused by natural and environmental factors or by motor vehicle crashes.

Pain

Chronic pain can affect not only physical health, but also emotional well-being. It can invade all aspects of an individual's life—at home and at work; in personal and business relationships. In addition, chronic pain has implications for health care use, since people afflicted spend more time in hospital

Prevalence of chronic pain, population aged 12 or older, by age group, 1998/99



Data source: National Population Health Survey, household component

† Coefficient of variation between 16.6% and 25.0%

* Difference between sexes is statistically significant ($p \leq 0.05$).

and see physicians more often than those who are not afflicted.¹⁶

Many of the conditions that are more prevalent among females—migraine and arthritis, for instance—can be painful. Therefore, it is not surprising that in 1998/99, 16% of females aged 12 or older reported that they usually suffer from pain. The corresponding figure for males was 12%.

Chronic pain was most common among seniors, but the difference between men and women in this age range was not statistically significant: 25% and 28%, respectively. The age ranges in which females were more likely than males to experience chronic pain were 12 to 24 and 45 to 64.

Activity limitation and dependency

In 1998/99, 14% of the household population aged 12 or older had a long-term activity limitation; that is, a physical or mental condition that had lasted or was expected to last at least six months and that limited them at home, at school, at work, or in other settings (see *Impact of chronic conditions*). As expected, the likelihood of having an activity limitation rose with age, from 6% of 12- to 24-year-olds to 30% of seniors. Overall, the percentage of females (15%) with a limitation significantly exceeded the percentage of males (13%). However, 12- to 24-year-olds were the only age group in which the proportion of females with a limitation was significantly higher than the proportion of males.

Just 2% of the household population aged 12 or older were so limited that they depended on others to carry out activities of daily living, including washing or dressing themselves, eating, or moving about in their home. Overall, a slightly but significantly higher percentage of females relied on others for such help (2.4% versus 1.8% of males). Dependency was most common at age 65 or older (7%), but there was no difference between the percentages of senior men and women who lived in households and who were dependent.

For every 100 people who had not been limited in 1994/95, 9 had a limitation by 1998/99. And of every 100 people who had been independent in 1994/95, 2 had become dependent by 1998/99. Not surprisingly, new cases of activity limitation or

dependency were most likely at older ages. Overall, females were more likely than males to have developed an activity limitation, but there was no difference between the sexes in the percentages who had become dependent.

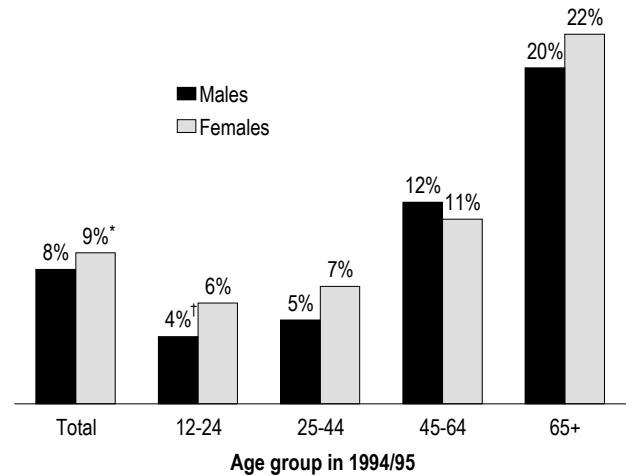
Activity limitations and dependency are not necessarily long-lasting. In fact, nearly half of people who reported a limitation in 1994/95, and 60% who had been dependent, reported that they were no longer in those situations by 1998/99. This may reflect the natural resolution of some conditions (back problems, for example) and effective treatment of others (such as arthritis), resulting in improvements in functional ability.

The likelihood that a limitation or dependency would disappear did not differ between the sexes. However, people in low-income households were least likely to report the disappearance of an activity limitation.

While the disappearance of activity limitation and dependency was most typical at younger ages, over one-third of seniors who had been limited or dependent in 1994/95 were free of those problems by 1998/99.

Both the incidence and disappearance of activity limitation include people who had been institutionalized by 1998/99. The incidence and

Population aged 12 or older who developed long-term activity limitation between 1994/95 and 1998/99, by age group



Data source: National Population Health Survey

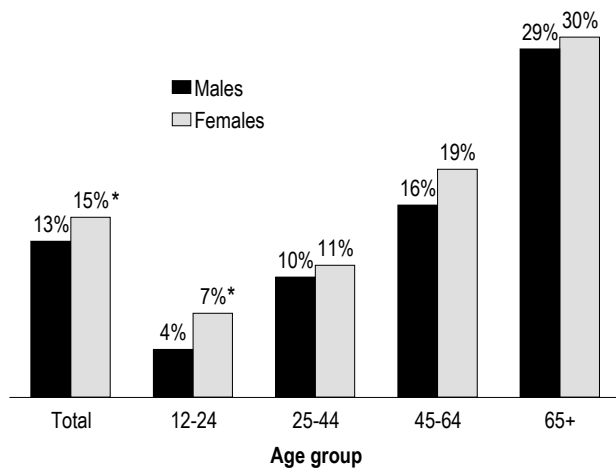
Note: Percentage of people with limitation by 1998/99 among those free of limitation in 1994/95. Includes people who had entered a long-term health care institution by 1998/99.

† Coefficient of variation between 16.6% and 25.0%

* Difference between sexes is statistically significant ($p \leq 0.05$).

disappearance of dependency, however, pertain only to people who remained in private households; those who had been institutionalized by 1998/99 were excluded from the analysis.

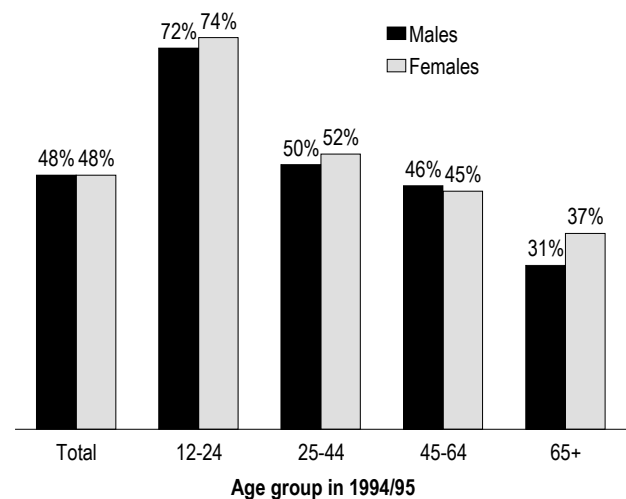
Population aged 12 or older with long-term activity limitation, by age group, 1998/99



Data source: National Population Health Survey, household component

* Difference between sexes is statistically significant ($p \leq 0.05$).

Population aged 12 or older who became free of long-term activity limitation between 1994/95 and 1998/99, by age group



Data source: National Population Health Survey

Note: Percentage of people free of limitation by 1998/99 among those with limitation in 1994/95. Includes people who had entered a long-term health care institution by 1998/99.

Social support

Social support often helps people cope with stress and illness, and it sometimes influences physical health.^{17,18} There are several types of social support, including affection, social interaction, emotional or informational support, and tangible support.

Affection is having someone who shows you love, who hugs you, and who makes you feel wanted. Social interaction means that you can have a good time, do something enjoyable, get your mind off things, or simply relax with family or friends. Emotional or informational support comes from people who understand you and your problems, whose advice you really want, and with whom you can share worries and fears. Tangible social support is more concrete—having someone to do specific tasks in a time of need: to help if you are confined

Population aged 12 or older with social support most or all of the time, by type of support, 1998/99

Type of social support	Males	Females
	%	
Tangible		
Having someone:		
To help if you were confined to bed	78*	75
To take you to the doctor if necessary	85	87
To prepare your meals if you could not	83*	78
To help with daily chores if you were sick	80*	77
Affection		
Having someone:		
To show you love and affection	85	89*
To hug you	76	81*
To love you and make you feel wanted	82	85*
Social interaction		
Having someone:		
To have a good time with	83	84
To get together with for relaxation	79	81
To help get your mind off things	78	78
To do something enjoyable with	83	83
Emotional/Informational		
Having someone:		
To listen when you need to talk	83	86*
To give you advice in a crisis	78	82*
To give you information to help you understand a situation	79	83*
To confide in or talk to about yourself or your problems	80	85*
Whose advice you really want	74	79*
To share your most private worries and fears	75	81*
To suggest how to handle a personal problem	78	82*
Who understands your problems	78	82*

Data source: National Population Health Survey, household component
* Difference between sexes is statistically significant ($p \leq 0.05$).

to bed; to take you to the doctor; and to prepare meals and do chores if you are unable to do so. In 1998/99, most Canadians aged 12 or older had access to each of these forms of social support.

However, the likelihood of having the various kinds of support differed by sex. Higher percentages of females than males had someone to show them love and affection, to hug them, and to make them feel wanted. As well, females were more likely to have people who would do such things as listen when they needed to talk, give advice in a crisis, and understand their problems. To some degree, the relatively high prevalence of personal and job stress, depression, and painful chronic conditions among women may be buffered by greater social support.

On the other hand, males were more likely than females to have someone to help them if they were confined to bed and to prepare meals and help with chores if they could not—in other words, tangible social support.

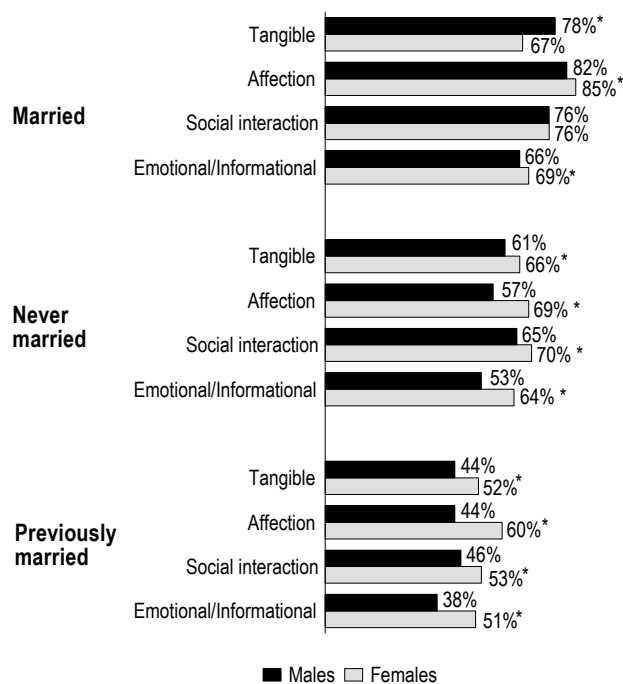
Up to age 45, females were more likely than males to have sources of affection and of emotional and informational support. From age 25 on, men were

Population aged 12 or older with social support most or all of the time, by type of support and age group, 1998/99

Type of support	Age group					
	Total	12-17	18-24	25-44	45-64	65+
	%					
Tangible						
Males	70*	69	69	71*	73*	65*
Females	65	75	72	65	63	57
Affection						
Males	72	71	69	75	75	63
Females	77*	79*	80*	82*	75	65
Social interaction						
Males	70	67	77	72	72	58
Females	71	76*	78	74	70	59
Emotional/Informational						
Males	59	55	61	62	60	53
Females	65*	71*	72*	67*	63	55

Data source: National Population Health Survey, household component
* Difference between sexes is statistically significant ($p \leq 0.05$).

Percentage of population aged 18 or older with social support most or all of the time, by marital status and type of support, 1998/99



Data source: National Population Health Survey, household component

Note: Refers to those who had support most or all of the time on each component of specific type of support.

* Difference between sexes is statistically significant ($p < 0.05$).

more likely than women to have tangible support. Among seniors, levels of support were relatively low, and except for tangible support, did not differ by sex.

The availability of social support is strongly related to marital status. Married men and women were most likely to have each of the four types of support; previously married people (divorced/separated/widowed), least likely. But in each marital status category, the percentage of females with support was the same or higher than the percentage of males. The exception was tangible support among married people: 78% of married men had such support, compared with 67% of married women. Moreover, the higher percentage of married men than married women with tangible support prevailed in all age groups older than 25.

Concluding remarks

For both sexes, personal and work stress are predictive of mental and physical health problems. Women, however, are much more likely than men to experience stress. This may reflect social expectations and the division of labour in the workplace and at home. The fact that women are more likely than men to experience stress may account for their higher prevalence and incidence of health problems.

But while women are more likely than men to suffer an array of debilitating and painful chronic conditions that are highly associated with activity limitation, the longer-term impact of these conditions is not the same for each sex. Once afflicted, women seem to be more resilient.

At most ages, notably the senior years, women were no more likely than men to have activity limitations or to be dependent. And given the same specific condition and the same age, men are more likely to report ill health and more likely to die than their female counterparts. In some measure, this may have to do with women's greater tendency to build support networks, perhaps to cope with stress and to deal with the effects of painful chronic diseases.

References

- 1 Fishbain DA, Cutler R, Rosomoff HL, et al. Chronic pain-associated depression: Antecedent or consequence of chronic pain? A review. *The Clinical Journal of Pain* 1997; 13(2): 116-37.
- 2 Ruoff GE. Depression in the patient with chronic pain. *The Journal of Family Practice* 1996; 43(6): S25-34.
- 3 Goldberg L, Comstock CW. Life events and subsequent illness. *American Journal of Epidemiology* 1976; 104: 146-58.
- 4 Lerner DJ, Levine S, Malspeis S, et al. Job strain and health-related quality of life in a national sample. *American Journal of Public Health* 1994; 84(10): 1580-5.
- 5 Verbrugge LM. The twain meet: Empirical explanations of sex differences in health and mortality. *Journal of Health and Social Behaviour* 1989; 30: 282-304.
- 6 Cohen S, Herbert TB. Health psychology: Psychological factors and physical disease from the perspective of human psychoneuroimmunology. *Annual Review of Psychology* 1996; 47: 113-42.

- 7 Cohen S, Tyrell DA, Smith AP. Psychological stress and susceptibility to the common cold. *The New England Journal of Medicine* 1991; 325(9): 606-12.
- 8 Koehler T. Stress and rheumatoid arthritis: A survey of empirical evidence in human and animal studies. *The Journal of Psychosomatic Research* 1985; 29(6): 655-63.
- 9 Hellerstedt WL, Jeffery RW. The association between job strain and health behaviours in men and women. *International Journal of Epidemiology* 1997; 26(3): 575-83.
- 10 Karasek RA, Theorell T. *Healthy Work: Stress, Productivity and the Reconstruction of Working Life*. New York: Basic Books, 1990.
- 11 Stansfeld SA, Fuhrer R, Head J, et al. Work and psychiatric disorder in the Whitehall II study. *Journal of Psychosomatic Research* 1997; 43(1): 73-81.
- 12 Roxburgh S. Gender differences in work and well-being: Effects of exposure and vulnerability. *Journal of Health and Social Behaviour* 1996; 37: 265-77.
- 13 Hall EM. Gender, work control and stress: A theoretical discussion and an empirical test. *International Journal of Health Services* 1989; 19(4): 725-45.
- 14 Wilkins K, Beaudet MP. Work stress and health. *Health Reports* (Statistics Canada, Catalogue 82-003) 1998; 10(3): 47-62.
- 15 Kessler RC, McGonagle KA, Zhao S, et al. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: Results from the National Comorbidity Survey. *Archives of General Psychiatry* 1994; 51(1): 8-19.
- 16 Millar WJ. Chronic pain. *Health Reports* (Statistics Canada, Catalogue 82-003) 1997; 7(4): 47-53.
- 17 Berkman L, Syme SL. Social networks, host resistance and mortality: A nine-year study of Alameda County residents. *American Journal of Epidemiology* 1979; 109: 186-204.
- 18 Munroe SM, Bromet EJ, Connell MM, et al. Social support, life events, and depressive symptoms: A 1-year prospective study. *Journal of Consulting and Clinical Psychology* 1986; 54(4): 424-31.

Women use health care services more frequently than men do. Several possible explanations for this difference have been offered. It may be that women actually have more need of health care, given their higher prevalence and incidence of many chronic conditions. As well, pregnancy and childbirth, along with female-specific diagnostic and preventive needs, may require regular contact with health care providers. Also, socialization and gender roles may encourage women to be more responsive to illness and to be more active in seeking medical care.^{1,2}

HEALTH CARE/SELF-CARE

Researchers have stressed the need to further investigate the pattern of gender difference in health care utilization,^{1,4} in order to understand the reasons that underlie women's higher use of various types of health care. If women's greater use of services reflects greater health needs, then such understanding may shed light on the male–female biological differences in health.

Physician visits

Females are more likely than males to contact physicians. Among people aged 12 or older in 1998/99, 85% of females, compared with 72% of males, reported that they had consulted a general practitioner in the previous year. The corresponding proportions reporting consultation with a specialist were 31% and 19%. Contact increased with age, but rates were generally higher among females.

Not only was the likelihood of any physician contact greater for females than males, but a higher percentage of females had frequent physician contact. Overall, 14% of females, compared with 8% of males, reported at least 10 doctor visits in the previous year.

Physician consultations in past year, population aged 12 or older, by age group, 1998/99

	At least one consultation with:					
	General practitioner		Specialist		10 or more consultations	
	Males	Females	Males	Females	Males	Females
	%%	%				
Total	72	85*	19	31*	8	14*
12-24	67	80*	10	25*	3†	12*
25-44	68	84*	17	32*	6	14*
45-64	75	86*	24	35*	11	13
65+	88	90	32	29	22	20

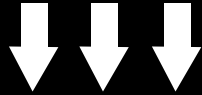
Data source: National Population Health Survey, household component

† Coefficient of variation between 16.6% and 25.0%

* Difference between sexes is statistically significant ($p \leq 0.05$).

Although higher rates of doctor contact among females are in line with their greater prevalence and incidence of chronic conditions, much of the difference reflected high rates among younger

women. At these ages, reproductive events and diagnostic and preventive health care largely account for the female excess in doctor contact (see *Women's health care needs*).



Women's health care needs

Data from the 1998/99 National Population Health Survey (NPHS) echo the results of previous studies, which have shown that pregnancy, childbirth, and uniquely female diseases and preventive and diagnostic needs are major factors behind women's greater use of mainstream health services.^{1,3,4}

In 1998/99, women aged 20 to 49 (the childbearing years) were more likely than men in the same age range to have consulted a general practitioner at least once in the past year (84% versus 66%). Women of these ages also reported about double the rate of consultations with specialists (32% versus 17%), compared with their male contemporaries. As well, the hospitalization rate of women in this age range (9%) surpassed the rate for men (3%).

Women's poorer health status has been commonly perceived as a major contributor to their greater use of health care services. Yet when controlling for health status (chronic conditions, general health, pain and distress), the odds that women would have consulted a general practitioner or a specialist in the previous year, or would have been hospitalized, were still more than double the odds for men. However, when female-specific needs (pregnancy/childbirth, mammograms, Pap smear tests and the use of birth control pills) were also taken into account, the odds that women aged 20 to 49 would consult a physician or be hospitalized were no greater than the odds for men in this age range.

The odds that women would have consulted a general practitioner in the past year were significantly high for those who had had a Pap smear (3.6) or a mammogram (2.8) in that period, or had taken birth control pills (2.2) in

the past month, compared with women who had not. By contrast, being pregnant or giving birth did not significantly raise the odds of having consulted a general practitioner.

Being pregnant or giving birth did, however, significantly raise the odds of having consulted a specialist. The odds that a woman aged 20 to 49 would have visited a specialist were 2.2 times the odds for women who had not been pregnant or given birth. The odds of a specialist visit were also high (2.2) for women who had had a Pap smear, compared with those who had not.

Of course, pregnancy and childbirth were strongly associated with hospitalization. Compared with other women aged 20 to 49, those who had been pregnant had 14.5 times the odds of having been hospitalized in the past year.

Administrative data from hospitals tell the same story. In 1996/97, there were 11,450 hospital admissions per 100,000 women aged 20 to 49. Fully half of these admissions were attributable to pregnancy and childbirth. The hospitalization rate for men in the same age group that year was 4,500 admissions per 100,000.

Percentage of women aged 20 to 49 in 1998/99 who reported that they:

	%
Had mammogram in past year	5
Were pregnant or gave birth in past two years	6
Took birth control pills in last month	9
Had Pap test in past year	29

Data source: National Population Health Survey, household component

Note: Information on male-specific health care is not available from the NPHS.

Consultations with physicians tend to rise with age among both sexes, particularly men. At 65 or older, almost the same percentages of men and women reported contact with general practitioners and specialists. And after age 45, there was no difference between the proportions of men and women reporting 10 or more contacts.

Hospital stays

In 1998/99, just 7% of the household population aged 12 or older reported that they had spent at least one night in hospital in the past year. Hospitalization was more common among females than males: 9% versus 6%. The higher overall rate for females was attributable to the youngest age groups (12 to 24 and 25 to 44), and is largely related to pregnancy and childbirth. From age 45 on, men and women had similar hospitalization rates.

Females (5%) were also significantly more likely than males (4%) to have spent three or more days in hospital. Once again, much of the difference reflects the situation at younger ages. However, for both sexes, the highest rates of prolonged hospitalization were at older ages, and differences between senior men and women were not significant.

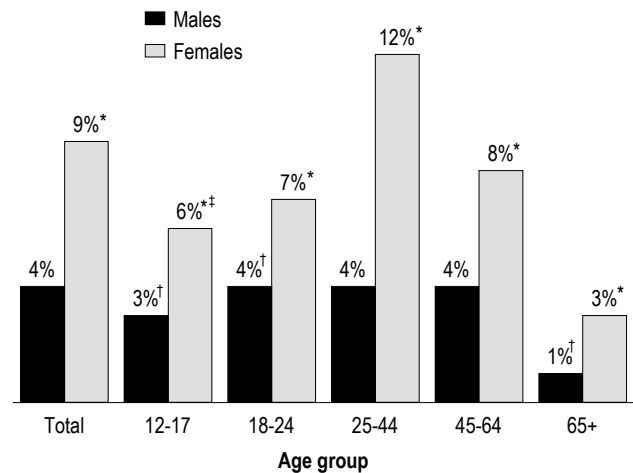
Consultations for emotional health

Canadians can seek help for mental or emotional problems from a number of health care professionals, including general practitioners, psychiatrists, psychologists, and social workers or counsellors. In 1998/99, 6% of the population aged 12 or older (about 1.5 million people) reported having contacted a health care professional about their mental or emotional health in the past year.

At every age, and at all household income levels, the proportion of females reporting a consultation for mental/emotional health exceeded that for males. While the overall male–female figures were 4% versus 9%, the most striking gap was among 25- to 44-year-olds: 4% versus 12%.

However, among people who had sought help for mental or emotional problems, there was no statistically significant overall difference by sex in

Population aged 12 or older reporting consultation for mental or emotional health in past year, by age group, 1998/99



Data source: National Population Health Survey, household component

† Coefficient of variation between 25.1% and 33.3%.

‡ Coefficient of variation between 16.6% and 25.0%.

* Difference between sexes is statistically significant ($p \leq 0.05$).

the average number of consultations: 10 visits for males and 9 for females.

Alternative care

Although Canadians continue to rely on mainstream health care, they also seek alternatives. In 1998/99, an estimated 16% of people aged 12 or older—around 4 million—reported that they had consulted an alternative health care provider in the previous year, compared with 14% in 1994/95. Overall, the proportion of females who sought alternative care in 1998/99 significantly surpassed that for males: 18% compared with 14%.

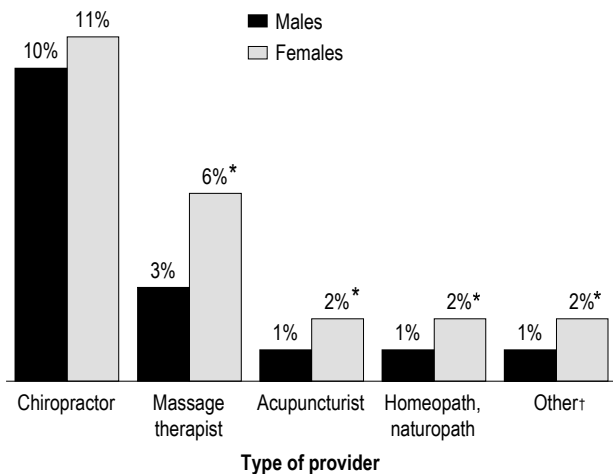
Chiropractors, massage therapists, homeopaths or naturopaths, and acupuncturists were the alternative health care providers most commonly consulted. Males and females were equally likely to have seen a chiropractor, but females were more likely to have sought treatment from each of the other types of practitioner.

Individuals with higher household incomes were significantly more likely than those at lower income levels to report using alternative health care, a finding consistent with previous studies.^{5,6} Further, at higher income levels, women were more likely than men to have consulted an alternative practitioner.

Use of alternative care was most common in young and middle adulthood. Nearly 20% of people aged 25 to 44 and 45 to 64 reported the use of alternative services, compared with about 10% of people aged 12 to 24 or 65 years or older.

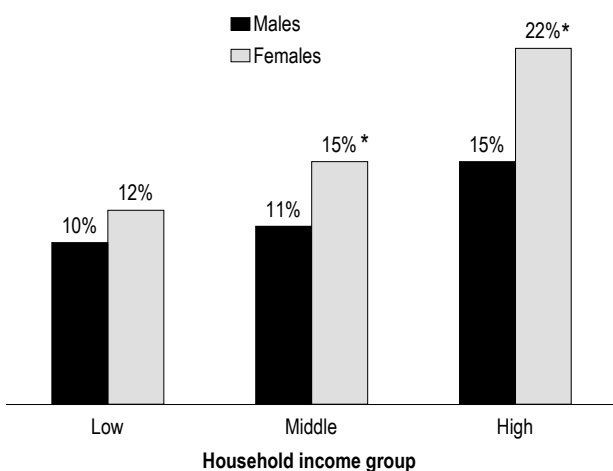
Most Canadians (96%) who reported seeking alternative forms of treatment in 1998/99 had also consulted mainstream health care professionals such

Population aged 12 or older consulting alternative health care provider in past year, by type of provider, 1998/99



Data source: National Population Health Survey, household component
 † Includes Feldenkrais, Alexander or biofeedback teacher, relaxation therapist, herbalist, reflexologist, spiritual or religious healer.
 * Difference between sexes is statistically significant ($p \leq 0.05$).

Population aged 12 or older consulting alternative health care provider in past year, by household income group, 1998/99



Data source: National Population Health Survey, household component
 * Difference between sexes is statistically significant ($p \leq 0.05$).

as nurses or general practitioners, social workers or psychologists, or physiotherapists. It is not known, however, whether the consultations were for the same health problem(s). Females were more likely than males to have consulted both alternative and mainstream health care providers.

Medication use

During the course of a month, a majority of Canadians take some type of over-the-counter and/or prescription medication. Most common, by far, are pain relievers. In 1998/99, close to two-thirds of people aged 12 or older (65%) reported that they had taken a pain reliever such as acetylsalicylic acid, acetaminophen, medicine for arthritis, or an anti-inflammatory. Cough/cold remedies ranked second (20%), followed by stomach remedies and blood pressure medications (about 10% each). Allergy medicine, penicillin or other antibiotics, and asthma medications were the next most commonly reported drugs. This ranking prevailed among both sexes, but for each medication, a higher percentage of females reported use.

The most pronounced difference was for pain relievers: 71% of females said they had used such medications in the previous month, compared with 58% of males. This may be partly related to females' higher prevalence of painful conditions such as arthritis and migraine. Cultural differences may also

Population aged 12 or older taking selected medications in past month, 1998/99

Type of medication	Both sexes	Males	Females
	%		
Pain†	65	58	71*
Cough/Cold	20	19	21*
Stomach	11	10	11*
Blood pressure	10	8	11*
Allergy	9	8	10*
Penicillin/Other antibiotics	8	7	10*
Asthma	6	5	7*
Heart	4	5*	4
Diabetes‡	3	3*	2

Data source: National Population Health Survey, household component
 † Includes acetaminophen, acetylsalicylic acid, arthritis medicine, anti-inflammatories.
 ‡ Includes insulin and pills to control diabetes.
 * Difference between sexes is statistically significant ($p \leq 0.05$).

play a role; for instance, males may be less likely to acknowledge pain.

Medications for heart disease and for diabetes were used less frequently: no more than 4% of the total population. Reflecting the higher prevalence of these conditions among males, they were more likely than females to report recent use of heart and diabetes medications.

Much medication use is age-related. The younger the person, the more likely the use of cough/cold remedies and allergy medicine. On the other hand, the use of medications for blood pressure, heart disease, diabetes and stomach ailments rises with age.

Treating sore throats, colds and flu

Some of Canadians' medication use is attributable to colds and flu. About a third of adults will have a sore throat, cold or flu in any given month. And, generally, such illnesses are more common among women.

In 1998/99, 34% of women aged 15 or older said that they had been sick with a sore throat, cold, or flu in the previous month. By comparison, about 27% of men reported the same ailments. This excess for women was apparent from ages 15 to 64, but disappeared by age 65.

Just 17% of seniors had had a sore throat, cold or flu in the past month. By contrast, 46% of 15- to 24-year-olds reported symptoms. This may reflect younger individuals' greater exposure to illness and their lower acquired immunity.

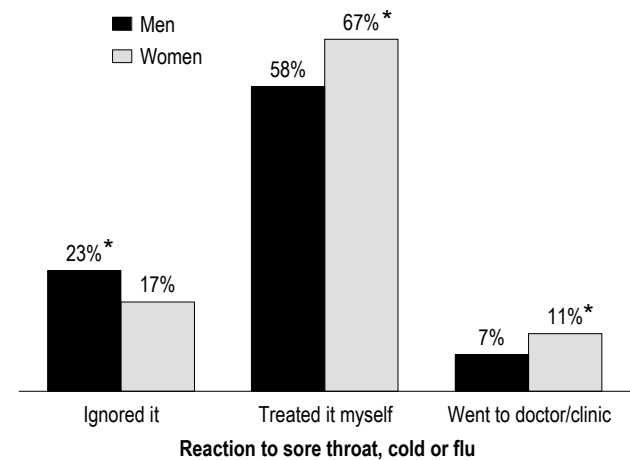
People who have colds or flu tend to take care of themselves rather than seek care elsewhere. Close to two-thirds (63%) of those who reported cold/flu

Population aged 15 or older who had sore throat, cold or flu in past month, by age group, 1998/99

	Both sexes	Men	Women
		%	
Total	30	27	34*
15-24	46	39	52*
25-44	35	31	38*
45-64	25	21	29*
65+	17	16	18

Data source: National Population Health Survey, household component
* Difference between sexes is statistically significant ($p \leq 0.05$).

Population aged 15 or older who had sore throat, cold or flu in past month, by initial reaction to problem, 1998/99

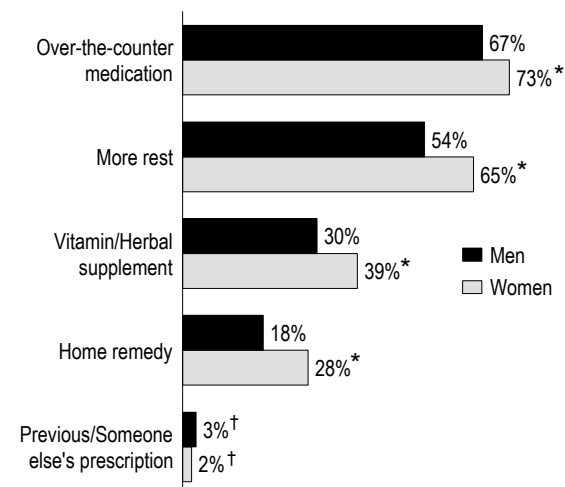


Data source: National Population Health Survey, household component
* Difference between sexes is statistically significant ($p \leq 0.05$).

symptoms initially reacted by using some type of self-treatment. Women were more likely than men to do so, but they were also more likely to consult a physician. Only about a fifth of people ignored symptoms altogether, though men had a greater tendency to do this than did women.

Individuals who treated themselves for cold/flu symptoms used a variety of strategies, including

Population aged 15 or older who had sore throat, cold or flu in past month and treated themselves, by type of self-treatment, 1998/99



Data source: National Population Health Survey, household component
† Coefficient of variation between 16.6% and 25.0%
* Difference between sexes is statistically significant ($p \leq 0.05$).

getting more rest and using home remedies, over-the-counter medications or vitamin/herbal supplements. Women were more likely than men to use each of these self-treatments. In addition, a small percentage of people reported using an “old” prescription medication, or one that had been prescribed for someone else.

Home care

In 1998/99, less than 3% of the household population aged 18 or older received formal, government-supported home care—nursing, assistance with bathing or housework, or meal delivery, for example. As expected, the likelihood of being a home care recipient was much greater for seniors than for individuals younger than 65. Among seniors, no gender gap was evident; that is, the proportions of men and women who were home care recipients did not differ significantly, at 10% and 13%, respectively.

The proportion of people receiving home care did vary noticeably, however, by household income. Just over 1% of those in the highest income category were home care recipients, compared with about 7% at the lowest level. The variations by income may reflect a greater need for care among members of lower income households, because they are generally not as healthy as more affluent individuals.

The association between low income and home care use may be somewhat related to age. However, previous research focusing on people aged 65 or older indicates that even when the effects of age are taken into account, low income is independently predictive of receiving home care.⁷

It may also be that people with higher incomes are more likely to secure private care, rather than government-supported services. To some extent, this could be because some provinces means-test the provision of these services, and consequently, residents of high-income households would not be eligible.

No difference between the sexes emerged at the opposite ends of the income range. In the middle-income category, though, women were more likely than men to receive home care.

Concluding remarks

According to data from the 1998/99 National Population Health Survey, females aged 12 or older tend to use health care services more than their male counterparts do.

For mainstream health care, such as consultations with general practitioners or specialists and hospital stays, females report higher overall rates of contact compared with males. But, when women’s reproductive role and female-specific health care needs during the childbearing years are taken into account, there is no significant difference in the amount of mainstream health care used by men and women in that age range. And after the reproductive years, use of such care differs little by sex.

However, females are also more likely than males to have had consultations about their emotional health, or with an alternative health care provider. In addition, they report greater use of medications, particularly pain relievers. This may be attributable to their greater likelihood of reporting certain painful chronic conditions, such as arthritis or migraine.

Even when they have relatively minor ailments, like colds or flu, women are more likely to take care of themselves than are men. Although relatively few people ignore symptoms altogether, this reaction is more common among men.

Women’s greater use of a variety of health care services may reflect a greater awareness and concern about health matters, as well as a more proactive and preventive approach to protecting their health.

References

- 1 Verbrugge LM. Gender and health: an update on hypotheses and evidence. *Journal of Health and Social Behavior* 1985; 26: 156-82.
- 2 Cleary PD, Mechanic D, Greenly JR. Sex differences in medical care utilization: An empirical investigation. *Journal of Health and Social Behavior* 1982; 23: 106-19.
- 3 Green CA, Pope CR. Gender, psychosocial factors and the use of medical services: a longitudinal analysis. *Social Science and Medicine* 1999; 48: 1363-72.

- 4 Mustard CA, Kaufert P, Kozyrskyj A, et al. Sex differences in the use of health care services. *The New England Journal of Medicine* 1998; 338: 1678-83.
- 5 Millar WJ. Use of alternative health care practitioners by Canadians. *Canadian Journal of Public Health* 1997; 88(3): 154-8.
- 6 Ramsay C, Walker M, Alexander J. Alternative medicine in Canada: use and public attitudes. *Public Policy Sources* 1999; 21, Fraser Institute.
- 7 Wilkins K, Beaudet MP. Changes in social support in relation to seniors' use of home care. *Health Reports* (Statistics Canada, Catalogue 82-003) 2000; 11(4): 39-47.

For centuries, information on deaths has been used to study the health status of populations. Statistics tabulated by cause of death, sex and age provide information that is useful in comparing the importance of fatal diseases between males and females, and the ages at which each sex is at highest risk of dying of particular diseases. Life expectancy, an indicator of population health that is based on the age at which people die, is another means of comparing the sexes, and of examining trends over time.

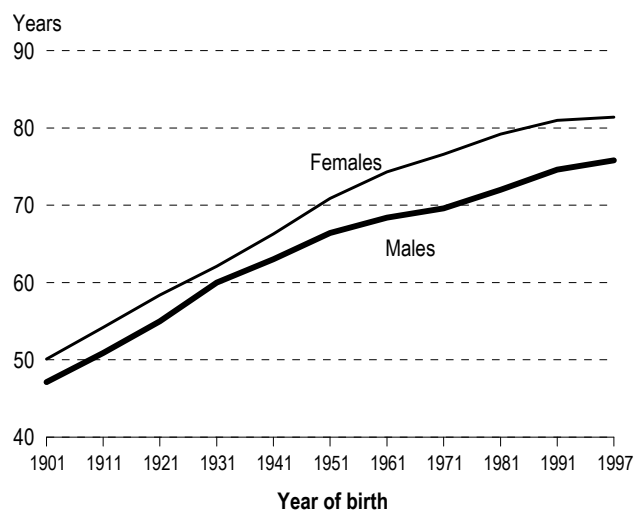
DEATH — SHIFTING TRENDS

Analysis of Canadian death statistics by sex reveals marked differences. Men die at earlier ages than women, on average, and causes of death differ to some extent, especially in youth and early adulthood. As well, more men than women die prematurely of avoidable causes.

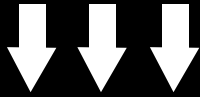
Women live longer

Since 1901, life expectancy in Canada has risen dramatically for both sexes, although females have consistently enjoyed an advantage over males.^{1,2} Females born at the beginning of the 20th century could expect their life to last 50.1 years, three years longer than males. By 1997, female life expectancy had risen to 81.4 years, compared with 75.8 for males—a gap of 5.6 years. The gap was widest in 1981, when life expectancy for females exceeded that for males by 7.1 years. During the 1990s, life expectancy gains for both sexes were smaller than they had been in previous decades, and less for females than for males. (See *Disability-free life expectancy*.)

Life expectancy at birth, 1901 to 1997



Data sources: References 1 and 2



Disability-free life expectancy

Overall population health has traditionally been measured by indicators such as infant mortality and life expectancy. This has largely reflected the availability of detailed data from death certificates. However, as the importance of infectious diseases as major causes of death has declined over the past century, people now survive to older ages when susceptibility to chronic diseases is greater, and frailty and functional limitations are more common. As a result, conventional life expectancy and other mortality-based indicators are becoming less adequate as measures of health in the population.

Recently, a number of health expectancy measures have integrated some assessment of quality of health or morbidity. An obvious advantage of such indicators is that they are responsive both to changes in mortality rates and to changes in the quality of health.

One such measure is disability-free life expectancy (DFLE). This indicator combines information on mortality rates with data on the prevalence of activity limitation. DFLE estimates the number of years of life that can be expected to be free of activity limitation.

Estimates of DFLE for 1995-1997 indicate that women could expect to spend just over 12 years, or 15% of their lives, with a disability, compared with about 10 years (13%) for men. Clearly, women's longer total life expectancy does not mean that they have an equivalent advantage in disability-free years. Although women's total life expectancy exceeded that for men by 5.8 years, the gap in disability-free life expectancy was less—a little more than three years.

Life expectancy and disability-free life expectancy, 1995-1997

	Life expectancy	Disability-free life expectancy	Difference	
	Years	Years	Years	%
Both sexes	78.4	67.1	11.3	14
Male	75.4	65.5	9.9	13
Female	81.2	68.7	12.5	15

Data sources: Canadian Vital Statistics Database; 1996 Census of Population

International comparisons

Since 1961, Canada's life expectancy has consistently ranked among the top 10 of the 29 OECD (Organisation for Economic Co-operation and Development) countries.³ In 1961, 1971, 1981 and 1991, Canadian females' relative ranking was higher than their male counterparts'.

From 1995 to 1997, the pattern changed, with Canadian males ranking higher internationally than Canadian females. In 1997, for example, Canadian male life expectancy was fifth, behind Japan, Sweden, Iceland and Switzerland. Canadian female life

expectancy was eighth, behind Japan, Switzerland, France, Spain, Belgium, Sweden and Italy.

International ranking of life expectancy at birth for Canada, selected years, 1961 to 1997

	Males	Females
1961	8	7
1971	10	6
1981	9	6
1991	4	3
1995	4	5
1996	5	7
1997	5	8

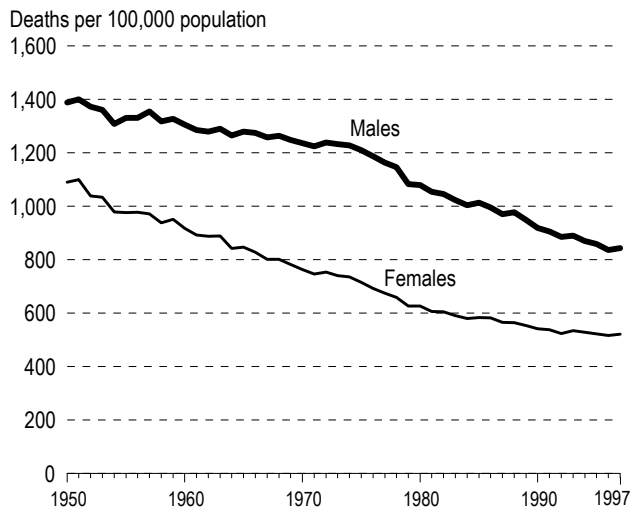
Data source: Reference 3

Notes: Rank = 1 for highest life expectancy among OECD countries

Trends in mortality rates

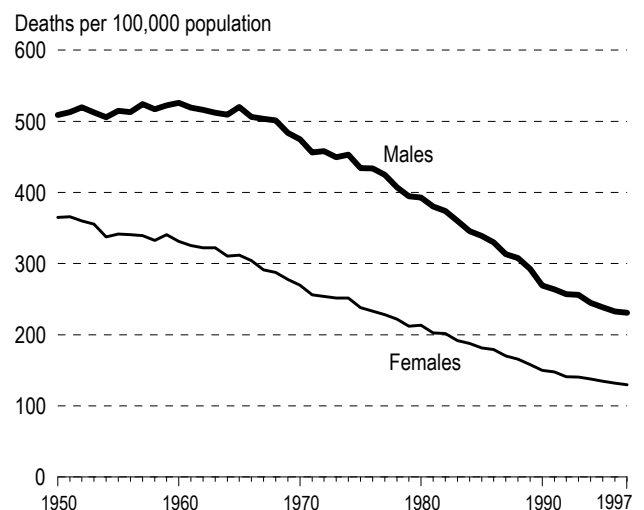
Over the latter half of the 20th century, age-standardized death rates, which remove the effects of changes in population age structure, fell markedly. During these years, the 52% reduction in the female mortality rate for all causes combined considerably exceeded the 39% decrease for males. From 1990 to 1997, however, the death rate declined by twice as much for males (8%) as it did for females (4%).

Age-standardized† mortality rates, all causes, 1950 to 1997



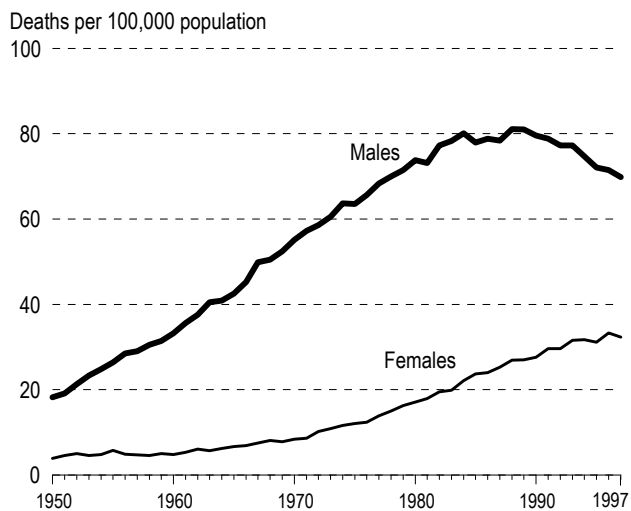
Data source: Canadian Vital Statistics Database
† Standardized to 1991 Canadian population

Age-standardized† mortality rates, heart diseases, 1950 to 1997



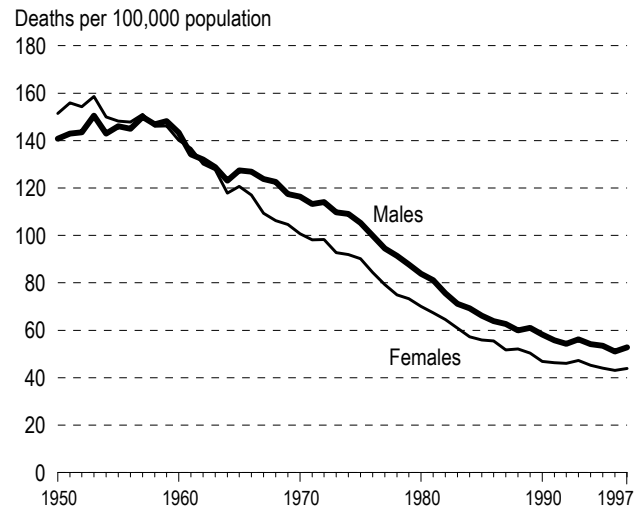
Data source: Canadian Vital Statistics Database
† Standardized to 1991 Canadian population

Age-standardized† mortality rates, cancer of trachea, bronchus and lung, 1950 to 1997

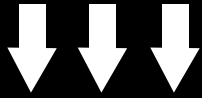


Data source: Canadian Vital Statistics Database
† Standardized to 1991 Canadian population

Age-standardized† mortality rates, cerebrovascular disease, 1950 to 1997



Data source: Canadian Vital Statistics Database
† Standardized to 1991 Canadian population



Cancer survival

Since the mid-1990s, the most common sites in which cancer cases are detected are sex-specific: the breast for women and the prostate for men. For each sex, lung cancer now ranks second in new cases diagnosed, and colorectal cancer, third.

Lung cancer, however, causes the largest number of cancer deaths regardless of sex, and colorectal cancer ranks third. The second-ranking causes of cancer deaths are breast cancer for women and prostate cancer for men.

Relative survival compares the survival rate of cancer patients with the overall survival rate of a population with the same distribution of age, sex, and province of residence. Among these four cancer sites, five-year relative survival is highest for breast and prostate cancer. Except for the very young and very old, women receiving a diagnosis of breast cancer in 1992 were 80% as likely to live another five years as women of the same age in the same province. The outlook was essentially the same for men diagnosed with prostate cancer.

The age-standardized five-year relative survival rate for colorectal cancer was

considerably lower: 56% for men and 58% for women.

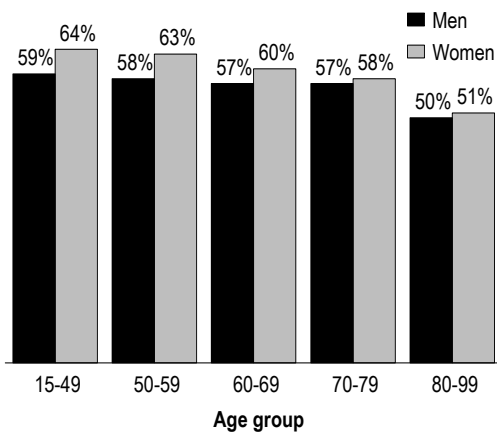
The prognosis for lung cancer was lower still. Age-standardized five-year relative survival rates were 15% for men and 18% for women.

Among people diagnosed with colorectal or lung cancer, the relative survival of women slightly exceeded the relative survival of men. The apparent advantage for women might be partly explained by their more frequent use of health care, leading to a better chance of earlier diagnosis and treatment.

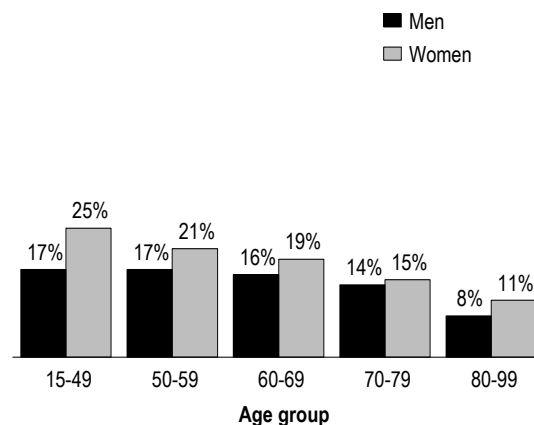
Survival from cancer is substantially influenced by stage at diagnosis.⁴⁻⁶ Patients diagnosed early tend to survive longer than those diagnosed when the cancer has spread beyond the original tumour site. Availability of and access to treatment also play a role in survival. But without data about stage at diagnosis or treatment, it is not possible to determine how differences in five-year survival rates might be affected by these factors.

See also *Health Indicators*, an electronic publication available free on the internet at <http://www.statcan.ca>

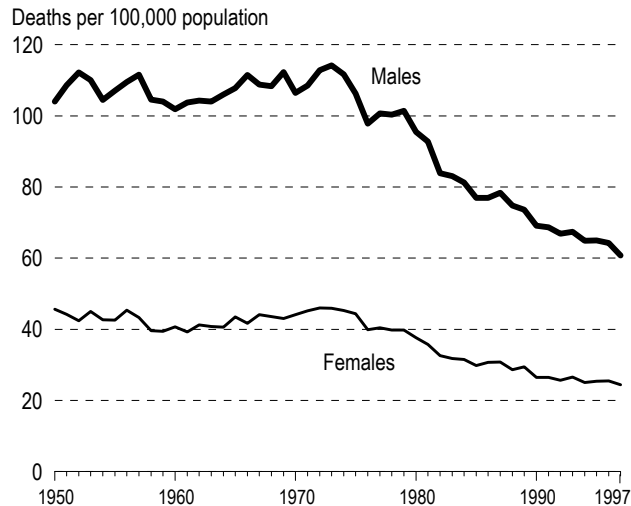
Five-year relative survival for colorectal cancer cases diagnosed in 1992, by age group



Five-year relative survival for lung cancer cases diagnosed in 1992, by age group



Age-standardized[†] mortality rates, external causes of injury and poisoning, 1950 to 1997



Data source: Canadian Vital Statistics Database
[†] Standardized to 1991 Canadian population

steadily since 1950, levelled off in the mid-1980s, then fell throughout the 1990s. For women, however, the rate began increasing only in the mid-1960s, but then in contrast to the rate for men, continued to rise in the 1990s. The dissimilarity between the sexes in the recent patterns in death rates reflects the earlier popularity of smoking in men than women, as well as earlier downturns in smoking prevalence in men (see *Cancer survival*).

During the 1990s, declines in the death rate for diseases of the heart were nearly equal for men and women. Likewise, for other major causes of death, such as cerebrovascular diseases (mainly stroke) and external causes of injury and poisoning (the major components of which are motor vehicle accidents and suicide), decreases in rates during the 1990s were nearly parallel between the sexes.

Top 10 causes

For both males and females, the top 10 causes of death accounted for about 83% of deaths in 1997. The top two causes were reversed: slightly more males died of cancer than of heart disease, while the opposite was true for females. Cerebrovascular diseases (primarily stroke) was the third leading cause for both males and females. The proportion of deaths attributed to cancer and heart diseases

Deaths due to top 10 causes, 1997

	Males	Females
Number of deaths		
Cancer	31,555	27,148
Heart diseases	30,149	27,268
Cerebrovascular disease	6,675	9,376
Pulmonary diseases	5,607	4,011
Unintentional injuries	5,305	3,321
Pneumonia/Influenza	3,749	4,283
Suicide	2,914	†
Diabetes	2,767	2,932
Diseases of arteries	2,505	2,262
Disease of central nervous system	2,104	2,945
Psychoses	‡	3,084

Data source: Canadian Vital Statistics Database

† Did not rank in top 10 causes for females.

‡ Did not rank in top 10 causes for males.

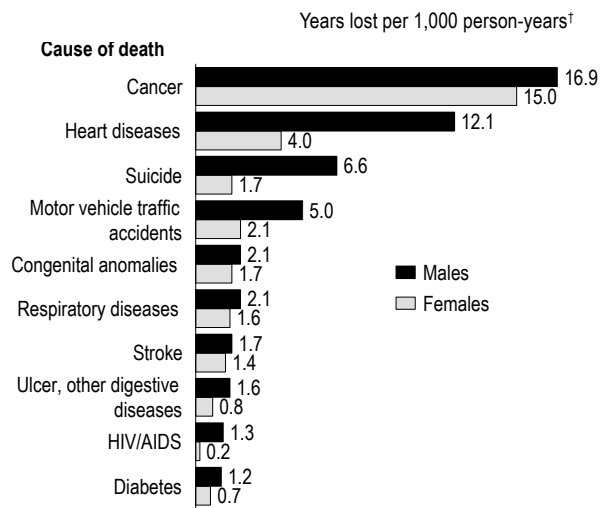
combined was marginally higher for males (55%) than females (52%). Females, however, were more likely to die from cerebrovascular diseases (9% versus 6%).

Six of the seven remaining causes were also the same for both sexes, but the ranking differed. For example, deaths due to pneumonia and influenza ranked fourth for females, but sixth for males. Mortality from hereditary and degenerative diseases of the central nervous system (such as Alzheimer's disease) was also more widespread among females, a reflection of their longer life expectancy. Suicide, the seventh leading cause of death for males, did not register among the top 10 for females. Conversely, deaths traced to psychoses were common enough among females to be included among the top 10.

Potential years of life lost

While mortality rates are useful in evaluating the relative impact of causes of death occurring at any age, potential years of life lost (PYLL) is an indicator of premature mortality. According to convention, PYLL was calculated by subtracting the age at which death actually occurred from age 75; for instance, death at age 3 would result in 72 years of potential life lost, and at age 69, 6 years. The calculation of PYLL thus gives more weight to deaths at younger than at older ages. The PYLL rate for suicide, for example, is high, reflecting the relative importance of this cause during the teenage years and young

Rate of potential years of life lost (PYLL) before age 75, selected causes of death, 1997



Data source: Canadian Vital Statistics Database
† Standardized to 1997 Canadian population

adulthood. By contrast, the age-standardized mortality rate for suicide, calculated without reference to age, ranks lower.

For most major causes of PYLL before age 75, the rate for males exceeds that for females, indicating a higher risk of earlier death. For example, the PYLL rate for heart diseases is three times as high for men as it is for women. And for two causes often involving violence—suicide and motor vehicle accidents—the PYLL rate for men exceeds that for women by factors of four and two, respectively. On the other hand, the male excess in PYLL rates for cancer, congenital anomalies, stroke and chronic obstructive lung disease is less pronounced.

Concluding remarks

Although for the past century women's life expectancy exceeded that of men, the gap began to narrow during the 1990s. This change stems largely

from an important shift in the pattern of mortality rates for smoking-related respiratory cancers. Although the death rate for these cancers in men still greatly surpasses that in women, the rate for men is falling, while that for women is still on the rise.

Recent changes in international rankings of Canadian life expectancy also reflect the changing pattern between the sexes. Life expectancy for both Canadian men and women has always been among the top 10 of the OECD countries, but in recent years, Canadian men's international rankings have improved, while Canadian women's have slipped.

Finally, premature mortality is greater for men for most causes of death. These include causes resulting from conditions such as heart disease, as well as causes due to external events such as motor vehicle crashes.

References

- 1 Bélanger A, Gilbert S. *Report on the Demographic Situation in Canada 1998-1999: Current Demographic Analysis* (Statistics Canada, Catalogue 91-209-XPE) Ottawa: Minister of Industry, 1999.
- 2 Statistics Canada. *The Daily*. Ottawa: Minister of Industry, May 13, 1999.
- 3 Organisation for Economic Co-operation and Development. *Health Data 2000 - Comparative Analysis of 29 Countries* (CD-ROM). Paris: Organisation for Economic Co-operation and Development, July 15, 2000.
- 4 Wingo PA, Gloecker Ries LA, Parker SL, et al. Long-term cancer patient survival in the United States. *Cancer Epidemiology, Biomarkers and Prevention* 1998; 7: 271-82.
- 5 Gatta G, Capocaccia R, Coleman MP, et al. Toward a comparison of survival in American and European cancer patients. *Cancer* 2000; 89: 893-900.
- 6 Welch HG, Schwartz LM, Woloshin S. Are increasing 5-year survival rates evidence of success against cancer? *Journal of the American Medical Association* 2000; 283: 2975-8.

This special report, based on vital statistics, census data, nationally representative findings from the National Population Health Survey (NPHS) and data from the cancer registries, compiles new evidence of the differences in health attitudes, behaviours, illness and mortality between Canadian males and females.

CONCLUSION

Consistent with findings from other countries, the health and illness experiences of men and women are paradoxical. Women experience more illness, more years of disability and more stress than do men, but they also live longer. Even after diagnosis of fatal diseases, women appear to survive longer than men do.

A number of factors might explain these differences. Women's greater likelihood of being sick may be due to environmental influences, such as closer exposure to children, higher levels of stress at work and at home and generally lower socio-economic status.

In 1998/99, 15% of females aged 12 or older, compared with 10% of males, lived in low-income households. The gap was particularly pronounced among seniors: 26% of women versus 13% of men. Yet regardless of income level, most of the key male–female differences in health behaviour, chronic conditions, and health care use persisted.

The socialization of males and females may also account for some of the difference. Women seem to take more interest in measures to prevent illness and to promote health in general, and they may be more likely to acknowledge illness or pain. Women also make greater use of the health care system,

thereby creating more opportunities for diagnosis.

Genetic or physiological differences may partially account for women's greater longevity, meaning that women may be more physically resilient than men. However, the greater amount of social support that women receive may also contribute to the difference.

Cultural and societal influences on behaviour also affect health. For example, the narrowing of the male–female gap in life expectancy in recent years reflects tobacco use, a factor strongly based in the cultural context. Due to differences in the wartime experiences and advertising pressures experienced by men and women, women lagged behind men in taking up smoking, and never smoked to the same extent. However, among young Canadians today, there is no difference between male and female smoking rates, and sex differences in mortality due to smoking-related respiratory diseases seem to be narrowing.

The reasons behind the differences in health attitudes, health-related behaviours, health status and health care use between men and women are often a matter of speculation, and will no doubt be the focus of considerable future research. However, at issue for public health policy are the implications of the differences, as much as the root causes. Specific areas in which the health-related needs of men and women differ signal the potential for public health intervention. Men, for example, could benefit from measures to encourage more awareness of the links between diet and disease, and to discourage binge drinking and other potentially harmful practices that result in higher rates of injury. Increasing men's use of preventive health practices,

including the use of the health care system for screening and health promotion counselling, might also improve men's health status. Women need support to become more physically active and to lower their stress levels. They also require assistance in living with pain and disability.

This report documents sharp differences in the health of Canadian men and women. The mechanisms of the biological, social, cultural and socio-economic influences that give rise to the differences are not known. However, the findings emphasize the need for sex-specific public health programs that recognize the different trajectories to illness and disease for men and women.

METHODS

Data sources

Most of the analysis in this report is based on data from the household component of Statistics Canada's National Population Health Survey (NPHS). The NPHS, which began in 1994/95, collects information about the health of the Canadian population 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 both a longitudinal and a cross-sectional component (see *National Population Health Survey samples*). Respondents who are part of the longitudinal component will be followed for up to 20 years. More detailed descriptions of the NPHS design, sample, and interview procedures can be found in published reports.^{1,2}

Mortality data were obtained from the Canadian Vital Statistics Database, which compiles information provided by the vital statistics registrars in each province and territory, the Canadian Cancer Registry, and from the *Report on the Demographic Situation in Canada, 1998-1999*.³ Disability-free life expectancy is based on data from the 1996 Census of Population and mortality data for the years 1995 to 1997 from the Canadian Vital Statistics Database.

Analysis

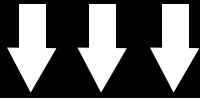
The selection of indicators for this report was guided by frameworks that have recently been developed by several organizations, including the National Consensus Conference on Population Health Indicators (Canadian Institute for Health

Information), the World Health Organisation, and the First Ministers' Accord.^{4,6} These documents offer a broad array of indicators pertaining to health status, non-medical determinants of health, health system performance, and community and health system characteristics. (Recent data on many of these indicators are available on the Statistics Canada website [<http://www.statcan.ca>] and the Canadian Institute for Health Information [CIHI] website [<http://www.cihi.ca>].)

Differences between men's and women's health status are measured with indicators traditionally used to describe health (for example, life expectancy and mortality rates), as well as with data that have only recently become available (such as incidence of disease, disability, dependency and disability-free life expectancy). Health status is also examined through prevalence data for chronic conditions, depression, injury and chronic pain.

Variables representing non-medical determinants of health include behaviours such as smoking initiation and cessation, alcohol use and physical activity. Other non-medical determinants include stress and social support. Socio-economic status, well known to be associated with health and illness, is represented by level of income and was considered in all analyses. Detailed information about lifestyle and health care practices, which may provide insight into the factors that contribute to differences in men's and women's health, is also examined.

The analysis has a broad scope and spans the health of men and women at one point in time as well as over time. The findings are based on



National Population Health Survey samples

Cross-sectional sample: The 1994/95 and 1996/97 (cycles 1 and 2) National Population Health Survey (NPHS) 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 the additional respondents 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 after 1994 and immigrants who entered Canada after that year were randomly selected and added to keep the sample representative. As well, to replace the sample that was lost to attrition, individuals in dwellings that were part of the original sampling frame, but whose members did not respond in 1994/95, were contacted and asked to participate.

NPHS data consisting of socio-demographic and some health information obtained for each member of participating households are found in the General file. 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, is found in the Health file.

In households belonging to the cross-sectional buy-in component, 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. In households that were added to the 1998/99 cross-sectional sample (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, if he or she was considered to be knowledgeable about other household members.

The 1994/95 provincial, non-institutional sample consisted of 27,263 households, of which 88.7% agreed to participate. After 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 cycles of the survey or an outcome of death or institutionalization) was available for 15,670. The corresponding number for 1998/99 was 14,619 respondents.

tabulations and complex multivariate analyses that account for the simultaneous contribution of numerous variables to the outcome of interest. Except for analysis based on vital statistics and from the cancer registries, the data refer to the population in private households. Residents of institutions are excluded, unless otherwise noted.

Most of the NPHS information is cross-sectional. However, longitudinal data are used to show the incidence of chronic diseases; movement in and out of activity limitation and dependency; smoking initiation and cessation; and associations between lifestyle and stress and chronic diseases, and between chronic conditions and health and death.

Cross-sectional NPHS data were weighted to represent the population at the date of each survey cycle. Longitudinal data were weighted to represent the population when the survey began (1994/95). To account for survey design effects, estimates of variance were generated using the bootstrap technique.⁷⁻⁹ Unless otherwise stated, all differences and odds ratios mentioned in the text are statistically significant ($p \leq 0.05$). On charts and tables, statistically significant differences are indicated with an asterisk.

Estimates of disability-free life expectancy are calculated according to the Sullivan method.¹⁰ This method is based on rates of disability in the population by sex and age group. Disability-free life expectancy represents the difference between life expectancy and life expectancy with disability. The standard error of the estimates of disability-free life expectancy and thus the upper and lower confidence intervals around the estimates are based on the method of Mathers.¹¹ This method takes into account natural fluctuations in rates of death, and sampling variability in rates of disability.

Using data on breast, prostate, lung and colorectal cancer cases diagnosed in 1992 from the Canadian Cancer Registry, five-year relative survival rates were calculated using the *strel*¹² module in STATA.¹³ Except for data from Quebec, the analysis excluded cases previously diagnosed with any invasive cancer. In Quebec, such cases could be identified and excluded only if their previous invasive tumour was diagnosed in 1992. Subjects diagnosed through autopsy or death certificate only were also excluded.

For the most part, relative survival rates were calculated using 1991 provincial life tables. Canadian life tables were used for Prince Edward Island, the Yukon, and the Northwest Territories. Relative survival rates for each cancer site were directly standardized to the age distribution of all patients who were diagnosed with that cancer and included in the analysis.

Limitations

National Population Health Survey data are self- or proxy-reported, and the degree to which they are inaccurate because of reporting error is unknown. For example, there was no independent source to verify whether people who reported that they had been diagnosed with a chronic condition actually did have that condition. As well, there may be some tendency for respondents to give socially desirable answers to questions on topics such as weight, alcohol consumption, and smoking.

It is possible that some differences in prevalence rates between males and females may be partially attributed to proxy responses. A recent study of proxy reporting in the NPHS found evidence of proxy effects; that is, accepting proxy responses may have resulted in underestimates of prevalence rates.¹⁴ Moreover, there were systematic differences in the data reported by men and women when they were reporting information for other household members.

As most NPHS information is cross-sectional, causality cannot be inferred. With longitudinal data, however, at least one criterion of causality—the temporal relationship between pre-existing conditions and the subsequent outcome—can be established.

Questions on disability in the Census of Population are generally used to capture the sample of the post-censal Health and Activity Limitations Survey. Because of the decision not to conduct this survey in 1996, data on disability from the Census of Population of 1996 were neither verified nor imputed. More precisely, no validation was undertaken to check the completeness or consistency of the data, and as a result, no corrections to the data were made.

References

- 1 Tambay J-L, Catlin G. Sample design of the National Population Health Survey. *Health Reports* (Statistics Canada, Catalogue 82-003) 1995; 7(1): 29-38.
- 2 Swain L, Catlin G, Beaudet MP. The National Population Health Survey—its longitudinal nature. *Health Reports* (Statistics Canada, Catalogue 82-003) 1999; 10(4): 69-82.
- 3 Bélanger A, Gilbert S. *Report on the Demographic Situation in Canada, 1998-1999: Current Demographic Analysis* (Statistics Canada, Catalogue 91-209-XPE) Ottawa: Minister of Industry, 1999.
- 4 Canadian Institute for Health Information. National Consensus Conference on Population Health Indicators—Final Report. Ottawa: CIHI, 1999.
- 5 World Health Organization. *Introduction to the WHO Common Framework on Measuring and Reporting on the Health of Populations*. UN-ECE and WHO Joint Meeting on Measuring Health Status. Ottawa: October 2000.
- 6 Canadian Intergovernmental Conference Secretariat. *First Ministers' Meeting Communiqué on Health*. Available at: http://www.scis.gc.ca/cinfo00/800038004_e.html. Accessed November 21, 2000.
- 7 Rao JNK, Wu CFJ, Yue K. Some recent work on resampling methods for complex surveys. *Survey Methodology* (Statistics Canada, Catalogue 12-001) 1992; 18(2): 209-17.
- 8 Rust KF, Rao JNK. Variance estimation for complex surveys using replication techniques. *Statistical Methods in Medical Research* 1996; 5: 281-310.
- 9 Yeo D, Mantel H, Liu TP. Bootstrap variance estimation for the National Population Health Survey. *American Statistical Association: Proceedings of the Survey Research Methods Section*. Baltimore: August 1999.
- 10 Sullivan DF. A single index of mortality and morbidity. *HSMHA Health Reports* 1971; 86(4): 347-54.
- 11 Mathers C. *Health Expectancies in Australia in 1981 and 1988*. Canberra: Australian Institute of Health, AGPS, 1991.
- 12 Slogget A, Hills M, deStavola B, et al. *Strel: Estimation of Relative Survival*. London: School of Hygiene and Tropical Medicine, 2000.
- 13 STATA Corporation. *Intercooled STATA for Windows*. College Station, Texas: STATA Corporation, 1999.
- 14 Shields M. Proxy reporting in the National Population Health Survey. *Health Reports* (Statistics Canada, Catalogue 82-003) 2000; 12(1): 21-39.

HOW TO ORDER

An inventory of Health Statistics
Division's information products and
services, including publications (print,
diskette, microfiche or Internet),
microdata files and special tabulations



To order the products listed below, contact:

Marketing Division, Sales and Service
 Statistics Canada
 Ottawa, Ontario
 K1A 0T6
 Telephone: (613) 951-7277
 1-800-267-6677, toll free in Canada
 Fax: (613) 951-1584,
 or visit our site on the Internet: www.statcan.ca

Title	Catalogue number	Format	Price (CAN\$)#	
Health Reports	· subscription · single issue	82-003-XPE	Paper	\$ 58
				\$ 20
	· subscription · single issue	82-003-XIE	Internet	\$ 44
				\$ 15
(This issue downloadable for free)				
Health Indicators, electronic publication	82-221-XIE	Internet	Free	
Health Statistics at a Glance	82F0075XCB	CD-ROM	\$100	
Health Regions 2000 – Boundaries, Geographic Information and Population Estimates	82F0082XCB	CD-ROM	\$ 60	
Guide to Health Statistics (This provides quick and easy access to health information on Statistics Canada's web site. It can only be used online in html format and cannot be downloaded.)	82-573-GIE	Internet	Free	
Statistical Report on the Health of Canadians	82-570-XIE	Internet	Free	
Report on Smoking Prevalence in Canada, 1985 to 1999	82F0077XIE	Internet	Free	
Health Care in Canada 2000 – A First Annual Report	82-222-XIE (and http://www.cihi.ca)	Internet	Free	
Health Statistics: Catalogue of Products and Services	82F0058XIE	Internet	Free	
Cancer				
Cancer Incidence in Canada, 1969-1993 (For 1994 to 1996, available as shelf table or custom tabulations through the Client Custom Services Unit - see page 55)	82-566-XPB	Paper	\$ 42	
Cancer Record, Newsletter for Cancer Registries in Canada	82F0081XIB	Internet	Free	
Heart Disease				
The Changing Face of Heart Disease and Stroke in Canada	82F0076XIE	Internet	Free	
Hospitalization				
Canadian Classification of Diagnostic, Therapeutic and Surgical Procedures and Treatments	82-562-XPB	Paper	\$ 40	
Life Expectancy				
Life Tables, Canada and Provinces, 1990-1992	84-537-XPB	Paper	\$ 40	
	84-537-XDB	Diskette	\$ 40	
National Population Health Survey				
National Population Health Survey Overview 1994-95	82-567-XPB	Paper	\$ 10	
	82-567-XIB	Internet	\$ 8	

† All prices exclude sales tax.

‡ See inside cover for shipping charges.

Title	Catalogue number	Format	Price (CAN\$)†‡
National Population Health Survey (cont'd)			
National Population Health Survey Overview 1996-97	82-567-XPB	Paper	\$35
	82-567-XIB	Internet	\$26
User's guide for the public use microdata file National Population Health Survey 1998-99 - Household component	82M0009GPE	Paper	\$50
User's guide for the public use microdata file National Population Health Survey 1996-97 - Household Component	82M0009GPE	Paper	\$50
User's guide for the public use microdata file National Population Health Survey 1996-97 - Health Care Institutions	82M0010GPE	Paper	\$50
Information about the National Population Health Survey (See also section on Microdata files)	82F0068XIE	Internet	Free
Nursing			
Registered Nurses Management Data 1998, Shelf Table (This shelf table can be ordered through the Client Custom Services Unit - see page 55)	83F0005XPB	Paper	\$25
Occupational Surveillance			
Occupational Surveillance in Canada: Cause-specific mortality among workers, 1965-1991	84-546-XCB	CD-ROM	\$500
Residential Care			
Residential Care Facilities, 1997-98 (These data are available as custom tabulations through the Client Custom Services Unit - see page 55)			
Vital Statistics			
Shelf tables			
Health Statistics Division produces shelf tables for the following, from 1996 and 1997 data year.			
General Summary of Vital Statistics	84F0001XPB	Paper	\$20
Causes of Death	84F0208XPB	Paper	\$20
Mortality - Summary List of Causes	84F0209XPB	Paper	\$20
Mortality - Summary List of Causes, 1997	84F0209XIB	Internet	Free
Births and Deaths	84F0210XPB	Paper	\$20
Marriages	84F0212XPB	Paper	\$20
Divorces, 1998	84F0213XPB	Paper	\$20
Leading Causes of Death	84F0503XPB	Paper	\$20
(These shelf tables can be ordered through the Client Custom Services Unit - see page 55)			
Other			
Validation study for a record linkage of births and deaths in Canada	84F0013XIE	Internet	Free
Historical Information			
Vital Statistics Compendium, 1996	84-214-XPE	Paper	\$45
	84-214-XIE	Internet	\$33
Reproductive Health: Pregnancies and Rates, Canada, 1974-1993	82-568-XPB	Paper	\$32
Selected Mortality Statistics, Canada, 1921-1990	82-548-XPB	Paper	\$40
The Decline of Marriage in Canada, 1981 to 1991	84-536XPB	Paper	\$36

† All prices exclude sales tax.

‡ See inside cover for shipping charges.



Health Statistics Division provides a custom tabulation service to meet special resource needs and supplement published data on a fee-for-service basis. Custom tables can be created using a variety of health and vital statistics data sources maintained by the Division.

To order custom tabulations, contact:

Client Custom Services Unit

Health Statistics Division

Statistics Canada

Ottawa, Ontario

K1A 0T6

Telephone: (613) 951-1746

Fax: (613) 951-0792

Email: HD-DS@statcan.ca



Microdata Files

To order the products listed below, contact:

Client Custom Services Unit

Health Statistics Division
 Statistics Canada
 Ottawa, Ontario
 K1A 0T6
 Telephone: (613) 951-1746
 Fax: (613) 951-0792
 Email: HD-DS@statcan.ca

National Population Health Survey public-use microdata files

		Product number	Format	Price (CAN\$) ^{†‡}
Cycle 3, 1998-99				
Household	Cross-sectional data in Flat ASCII files, User's Guide, data dictionary, indexes, layout, Beyond 20/20 Browser for the Health File	82M0009XCB	CD-ROM	\$2,000
Custom tables	Household Institutions	82C0013 82C0015	Price varies with information requirements Price varies with information requirements	
Cycle 2, 1996-97				
Household	Cross-sectional Flat ASCII Files, Beyond 20/20 Browser for the Health File	82M0009XCB	CD-ROM	\$500
Health care institutions	Cross-sectional Flat ASCII File	82M0010XCB	CD-ROM	\$250 Clients who purchase the 1996/97 Household file will receive the Institutions file free of charge
Custom tables	Household Institutions	82C0013 82C0015	Price varies with information requirements Price varies with information requirements	
Cycle 1, 1994-95				
Household	Data, Beyond 20/20 Browser Flat ASCII Files, User's Guide	82F0001XCB	CD-ROM	\$300
Health care institutions	Flat ASCII Files	82M0010XDB	Diskette	\$75
Custom tables	Household Institutions	82C0013 82C0015	Price varies with information requirements Price varies with information requirements	

[†] All prices exclude sales tax.

[‡] See inside cover for shipping charges.



Canadian Community Health Survey (CCHS)

A new survey, the Canadian Community Health Survey (CCHS), is being conducted by Statistics Canada to provide regular and timely cross-sectional estimates of health determinants, health status and health system utilization for 132 health regions across the country.

For more information about this survey, visit our web site at <http://www.statcan.ca>, under "Concepts, definitions and methods," followed by "Discussion papers or new surveys."

National Population Health Survey (NPHS) Questionnaires

- Household
- Institutions
- North

The NPHS questionnaires are downloadable from Statistic Canada's website at <http://www.statcan.ca>, under Concepts, definitions and methods, followed by Questionnaires and data dictionaries and National Population Health Survey.

Canadian Statistics

Obtain free tabular data on aspects of Canada's economy, land, people and government.

For more information, visit our web site at <http://www.statcan.ca>: under "Canadian Statistics," and then click on "Health."