Repetitive strain injury

Michael Tjepkema

Abstract

Objectives

This article describes the characteristics of people who report a repetitive strain injury (RSI) and examines the association of an RSI with chronic pain and with psychological distress.

Data sources

The data are from Statistics Canada's 2000/01 Canadian Community Health Survey (CCHS) and the 1994/95 to 2000/01 National Population Health Survey (NPHS).

Analytical techniques

Cross-tabulations were used to estimate the prevalence of RSI and contact with health care professionals by selected characteristics. Multiple logistic regression models were used to determine if associations persisted after controlling for other factors, and to determine if RSIs were significantly associated with chronic pain and psychological distress.

Main results

In 2000/01, 10% of Canadians aged 20 or older reported having had an RSI serious enough to limit their usual activities at some point in the previous 12 months. Work-related activities were most often the cause, and injury to the upper body was more common than to the lower body. People with an RSI had more contacts with health care professionals and higher levels of chronic pain and psychological distress than did those without an RSI. Two years after an RSI was first reported, pain and distress levels remained high among men and had risen among women.

Key words

psychological distress, chronic pain, health care utilization, longitudinal studies

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Repetitive strain injury (RSI) is an umbrella term for a group of disorders usually caused by repetitive movements that affect the muscles, tendons and nerves[1] (see *Repetitive strain injury*). Unlike other injuries, which usually occur at a single point in time, RSIs develop over an extended period.[2] The origin and development of RSIs, however, are multifactorial and controversial.[3] Ergonomic stressors such as repetitive and forceful motions have been implicated, as have psychosocial factors.[2] Symptoms, usually pain, numbness and tingling, can last for months or years.[2] The impact of RSIs includes work disability, functional and activity limitations, and sleep disturbances.[4] More recently, RSIs have been linked with depression,[5] although whether depression follows or precedes an RSI has been debated.[6,7]

Many studies of RSI have been cross-sectional, directed at specific jobs, and have focused on either men or women. Relatively few have been longitudinal, conducted on a population basis or have analyzed the sexes separately.[8] Furthermore, much of the research has concentrated on the most severe cases of carpal tunnel syndrome.[9-16]

Data sources

The main part of this analysis is based on Statistics Canada's 2000/01 Canadian Community Health Survey (CCHS). The CCHS collects cross-sectional information about the health of Canadians every two years. Data collection for cycle 1.1 began in September 2000 and continued over 14 months. This analysis covers the household population aged 12 or older in all provinces and territories, except persons living on Indian reserves, on Canadian Forces bases, and in some remote areas.

The area frame designed for the Labour Force Survey is the primary sampling frame of the CCHS. A multistage stratified cluster design was used to sample dwellings within the area frame. A list of the dwellings was prepared, and a sample was selected from the list. The majority (83%) of the sampled households came from the area frame. Face-to-face interviews were held with respondents randomly selected from households in this frame. In some areas, a random digit dialling technique and/or a list frame of telephone numbers was used to conduct telephone interviews with the remaining 17% of the targeted sample.

In about 82% of the households selected from the area frame, one person was randomly selected; two people were randomly chosen in the remaining households. For households selected from the telephone frames, one person was randomly chosen. The response rate for the combined frame was 84.7%. A total of 6.3% of the interviews were obtained by proxy. More detailed descriptions of the CCHS design, sample and interview procedures can be found in a published report.[17]

The second part of the analysis is based on data from the National Population Health Survey (NPHS). The NPHS, which began in 1994/95, collects information about the health of Canadians every two years. It covers household and institutional residents in all provinces and territories, except persons living on Indian reserves, on Canadian Forces bases, and in some remote areas. The NPHS data in this article pertain to household residents in the 10 provinces.

The NPHS has both longitudinal and cross-sectional components. In 1994/95, data for household residents in the 10 provinces were collected using two questionnaires: General and Health. Socio-demographic and some basic health information was obtained for all members of sampled households from one knowledgeable household member by means of the General questionnaire. Additional, in-depth health information was collected for one randomly selected household member with the Health questionnaire. Because of the detailed nature of the Health questionnaire, proxy response was only accepted for special conditions (for example, the selected respondent was unable to provide his or her own information because of a health problem).

In 1994/95, 20,725 households participated in the NPHS, meaning that at least the General questionnaire was completed for the randomly selected respondent, representing a response rate of 88.7%. The response rate to the Health questionnaire (for the randomly selected respondents) was 96.1%. The randomly selected respondents from 1994/95—a total of 17,126—formed the basis for the longitudinal panel. In subsequent cycles, the response rates for the health component for the longitudinal panel were 93.6% (1996/97), 88.9% (1998/99) and 84.8% (2000/01). In the first three cycles, the NPHS had longitudinal and cross-sectional components, but starting in 2000/01 it became strictly longitudinal.

For the 1998/99 NPHS cross-sectional file used in this analysis, the overall response rate was 88.2% at the household level. The response rate for the randomly selected respondents in these households was 98.5%.

In 1994/95, the majority of interviews were conducted in person. In subsequent cycles, if respondents were willing and able, interviews were conducted by telephone. More detailed descriptions of the NPHS design, sample and interview procedures can be found in published reports.[18,19]

The CCHS sample used in this article is based on 113,796 respondents who were aged 20 or older in 2000/01 and indicated their repetitive strain injury (RSI) status. Of these respondents, 11,821 identified themselves as having an RSI.

The analysis that examines the immediate association of an RSI with chronic pain and psychological health is based on 13,739 NPHS respondents aged 20 or older in 1998/99. Of these respondents, 1,274 reported having had an RSI in the previous 12 months. The analysis of the two-year association of an RSI with chronic pain and psychological distress is based on 9,255 longitudinal respondents aged 20 or older in 1998/99, who were still residing in households in 2000/01 and had not reported an RSI in 1996/97. Of these, 737 identified themselves as having had an RSI in 1998/99.

With cross-sectional data from the 2000/01 Canadian Community Health Survey (CCHS), this article examines the prevalence of RSIs among Canadian men and women aged 20 or older, risk factors, and contacts with health care professionals. Cross-sectional and longitudinal data from the National Population Health Survey (NPHS) are analyzed to assess immediate and two-year associations of RSI with chronic pain and psychological distress (see *Data sources, Analytical techniques, Definitions* and *Limitations*).

Repetitive strain injury

Repetitive strain injury (RSI)—also known as cumulative trauma disorder, muscle tendon syndrome, overuse syndrome and repetitive motion injury—is a general term used to label injuries that often result from repetitive movements.[20] The exact pathophysiology is not well understood, but it is widely believed that repetitive activity damages tendons, affects circulation, and causes biomechanical stresses on the soft tissue by not allowing enough recovery time between movements.[21] Symptoms include pain, numbness and tingling in the affected body part.[2]

RSIs can be divided into two broad groups: tendon-related disorders and peripheral nerve entrapment disorders.[2] Tendon-related disorders involve inflammation of the tendon and sheath or injuries to them. Common disorders include tendinitis, tenosynovitis, epicondylitis (golfer's or tennis elbow) and rotator cuff tendinitis. Peripheral nerve entrapment disorders involve compression of a nerve. The most common is carpal tunnel syndrome, which is caused by compression to the median nerve. The second most common is cubital tunnel syndrome, caused by compression to the ulnar nerve in the cubital at the elbow.

Respondents to the National Population Health Survey (NPHS) and the Canadian Community Health Survey (CCHS) were told that *repetitive strain injuries* are caused by overuse or by repeating the same movement frequently and were given examples such as carpal tunnel syndrome, tennis elbow or tendinitis. They were asked, "In the past 12 months, did you have any injuries due to repetitive strain that were serious enough to limit your normal activities?" In the CCHS, if they answered "yes," they were asked to identify the body part most affected and the type of activity involved when the RSI occurred: sport or physical exercise; leisure or hobby; working at a job or business; household chores, other unpaid work or education; sleeping, eating or personal care; or any other activity. Multiple responses were permitted for the activity involved.

Repetitive strain injuries increasing

In 2000/01, one in ten Canadians aged 20 or older, or an estimated 2.3 million people, reported an RSI that was serious enough to limit their normal activities in the previous 12 months. This marked a steady rise since 1996/97 (Table 1), echoing other studies that showed increasing numbers of RSIs during the 1980s and early 1990s.[22-25] Men and women were equally likely to report an RSI, but the body parts affected and the activities in which the injuries originated differed between the sexes.

Table 1
Prevalence of repetitive strain injury, household population aged 20 or older, Canada excluding territories, 1996/97, 1998/99 and 2000/01

	Both sexes	Men	Women
	%	%	%
1996/97	8.0	8.2	7.9
1998/99	9.4*	9.6*	9.3*
2000/01	10.1*	9.9	10.3*

Data sources: *1996/97, 1998/99 National Population Health Survey, cross-sectional samples; 2000/01 Canadian Community Health Survey*
Note: *Comparison between 1996/97 and 1998/99 accounts for overlapping sample.*
** Significantly different from preceding period ($p < 0.05$)*

Half work-related

Most RSIs are caused by work-related activities. According to the CCHS, 55% of RSIs had occurred while working; the next most frequently cited activity was sports or physical exercise (20%) (Table 2). Although over half of all RSIs among both sexes were work-related, this was more common among men. Men were also more likely than women to mention sports or physical exercise. Women reported activities related to chores, unpaid work or education more often than did men.

Most RSIs affected the upper body. Specifically, 25% of people with an RSI cited the neck or shoulder; 23%, the wrist or hand; 19%, the upper or lower back; and 16%, the elbow or lower arm. The remaining 17% had an injury to the lower extremity or to an unspecified body part.

Arm, leg and back injuries affected men more often than women; women more often reported

Analytical techniques

Cross-tabulations based on data from the 2000/01 Canadian Community Health Survey (CCHS) were used to estimate the prevalence of repetitive strain injury (RSI) for men and women according to selected personal and work-related characteristics and lifestyle indicators (Appendix Table A). Multiple logistic regressions were used to model the association between these variables and reporting an RSI.

The 1998/99 National Population Health Survey (NPHS) cross-sectional sample (Appendix Table B) was used to examine the association of an RSI with chronic pain and psychological distress. The 2000/01 CCHS was used to examine the association of an RSI with the number of consultations with general practitioners, chiropractors and physiotherapists in the past year. Separate analyses were done for each sex using multiple linear regressions. The independent variables included in the models were: RSI, age, marital status, education, household income, work status, obesity, leisure-time physical activity, daily smoking, arthritis, diabetes and thyroid condition. For each model, age was a continuous variable, and records with missing values for the independent variables were dropped, except for household income and obesity, for which special categories were created to deal with missing values.

The NPHS longitudinal file was used to measure two-year associations of an RSI with chronic pain and psychological distress (Appendix Table C). RSI status was determined from 1996/97 data (RSI questions were not asked in 1994/95). Respondents who did not report an RSI in 1996/97 were followed from 1998/99 to 2000/01. The 1998/99 independent variables were the same as those used in the cross-sectional analysis. To measure change, each 1998/99 outcome variable value (for example, psychological distress in 1998/99) was subtracted from the same 2000/01 outcome variable value (psychological distress in 2000/01) to determine if the value increased, decreased or was unchanged over the two years. The baseline (1998/99) score of the change variable was included in each model. The goal was to see if newly reported RSIs were associated with the change variable.

Cross-sectional data were weighted to represent the demographic makeup of the Canadian population in 1998/99 and 2000/01. Longitudinal estimates were weighted to represent the Canadian population in 1994/95. To compare trends in RSI prevalence between 1996/97 and 1998/99, a program that accounts for overlap in samples was used. To account for survey design effects, standard errors and coefficients of variation were estimated with the bootstrap technique.[26-28] The significance level was set at $p < 0.05$.

Table 2
Repetitive strain injury characteristics, by sex, household population aged 20 or older who reported RSI, Canada, 2000/01

	Both sexes		Men		Women	
	'000	%	'000	%	'000	%
Total	**2,283**	**100.0**	**1,098**	**100.0**	**1,185**	**100.0**
Body part†						
Neck/Shoulder	566	24.8	250	22.8*	316	26.7
Wrist/Hand	531	23.3	195	17.8*	335	28.3
Back	422	18.5	246	22.4*	176	14.9
Elbow/Lower arm	367	16.1	199	18.1*	167	14.1
Knee/Lower leg	199	8.7	108	9.9*	91	7.6
Ankle/Foot	115	5.0	57	5.2	58	4.9
Activity‡						
Working	1,233	54.6	620	57.1*	613	52.3
Sport/Physical exercise	446	19.7	275	25.3*	171	14.6
Chores/Unpaid work/ Education	317	14.0	94	8.7*	222	19.0
Leisure/Hobby	142	6.3	63	5.8	79	6.8

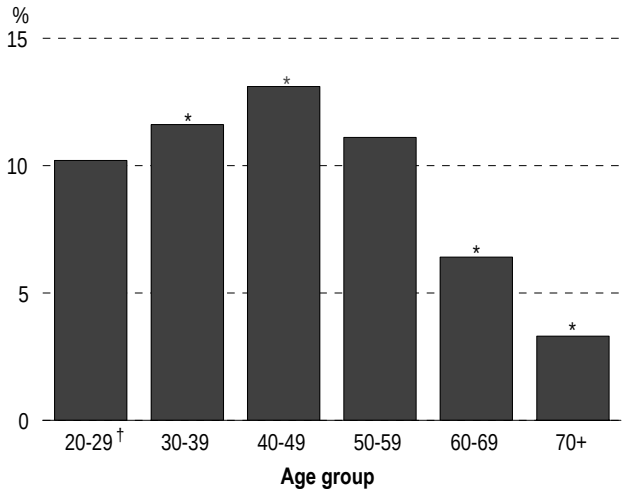
Data source: *2000/01 Canadian Community Health Survey*
Note: *5,237 men and 6,584 women reported RSI in 2000/01.*
† Because "other" category not shown, proportions may not total 100%.
‡ Multiple responses permitted
** Significantly different from women ($p < 0.05$)*

injuries to the neck or shoulder and wrist or hand. Research has consistently shown that women have a higher prevalence of carpal tunnel syndrome, whereas men have a higher prevalence of RSIs in the elbow.[4,29-32] These differences are likely attributable to the activities each sex undertakes. A study that controlled for job tasks found similar rates of carpal tunnel syndrome among both sexes, suggesting that the nature of the work performed and occupational exposure explain women's higher rates.[33]

Declines at older ages

Given that over half of RSIs were reported to have originated at work, it is hardly surprising that such injuries tend to affect people in the prime working years and decline at older ages (Chart 1). The pattern, however, differs between men and women (Table 3). When additional socio-demographic, work-related and lifestyle factors were taken into account, whether they were in their twenties, thirties or forties, men had about the same odds of reporting an RSI. By contrast, for women, the odds of having an RSI were significantly higher for those in their

Chart 1
Prevalence of repetitive strain injury, by age group, household population aged 20 or older, Canada, 2000/01



Data source: *2000/01 Canadian Community Health Survey*
† Reference category
** Significantly different from reference category (p < 0.05)*

thirties, forties or fifties, compared with those in their twenties. At older ages the odds were significantly lower for both sexes, perhaps because relatively few people are still in the workforce or doing strenuous chores at these ages.

Related to occupation

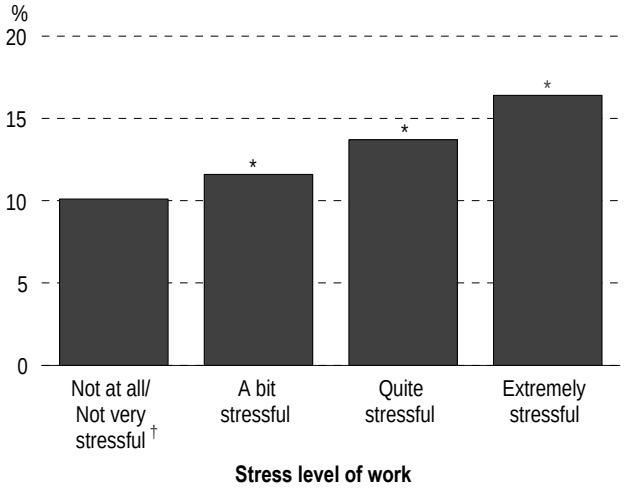
The large proportion of RSIs that were work-related may be attributable to the repetitive and forceful movements, heavy lifting and exposure to vibration that many jobs entail.[33-39] People who do not work have no exposure to workplace risk factors, so it is to be expected that in 2000/01, they were less likely than those who were working to report an RSI. Yet when the effects of other socio-demographic and lifestyle factors were taken into account, work status was not significantly associated with an RSI. Among the working population, however, occupation was.

Men who worked in sales or service; trades, transport or equipment operating; farming, forestry, fishing or mining; and processing, manufacturing or utilities had high odds of reporting an RSI, compared with those in management. Women in any occupation other than management had elevated odds of reporting an RSI. The odds were particularly high for women in traditionally male-dominated occupations: trades, transport or equipment operating; farming, forestry, fishing or mining; and processing, manufacturing or utilities.

Stress increases risk

Psychosocial factors—a fast work pace, role ambiguity, worry, monotonous tasks and stress—have been associated with RSIs.[8,11,23,38-44] People with at least some work stress had a relatively high prevalence of RSI in 2000/01 (Chart 2). This was especially true for those women who indicated that their work was "extremely" stressful—18% reported an RSI, compared with 10% who considered their work "not at all" or "not very" stressful. Even allowing for other factors, the odds of reporting an RSI were higher among women who found that most days at work were quite or extremely stressful, compared with women who found work either not very or not at all stressful. By contrast, for men, when the effects of other factors were taken into account, work stress was not significantly associated with RSIs.

Chart 2
Prevalence of repetitive strain injury, by stress level of work, household population aged 20 to 75 who worked in past 12 months, Canada, 2000/01



Data source: *2000/01 Canadian Community Health Survey*
† Reference category
** Significantly different from reference category (p < 0.05)*

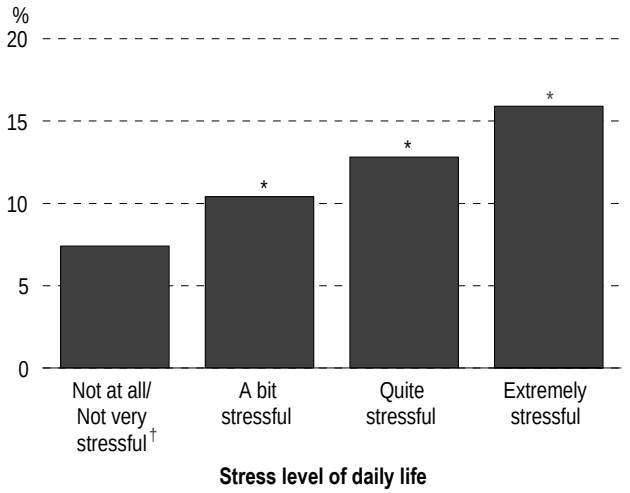
Table 3
Prevalence of and adjusted odds ratios for repetitive strain injury, by selected characteristics, household population aged 20 or older, Canada, 2000/01

	Both sexes				Men				Women			
	Number	Prevalence	Adjusted odds ratio	95% confidence interval	Number	Prevalence	Adjusted odds ratio	95% confidence interval	Number	Prevalence	Adjusted odds ratio	95% confidence interval
	'000	%			'000	%			'000	%		
Total	**2,283**	**10.1**	…	…	**1,098**	**10.0**	…	…	**1,185**	**10.3**	…	…
Age group												
20-29†	422	10.2	1.0	…	225	10.8	1.0	…	197	9.6	1.0	…
30-39	551	11.6*	1.1*	1.0, 1.2	278	11.7	1.0	0.9, 1.2	273	11.5*	1.2*	1.1, 1.4
40-49	668	13.1*	1.2*	1.1, 1.3	320	12.6*	1.1	0.9, 1.2	348	13.6*	1.4*	1.2, 1.6
50-59	405	11.1	1.0	0.9, 1.1	176	9.6	0.8*	0.6, 0.9	229	12.6*	1.3*	1.1, 1.5
60-69	153	6.4*	0.6*	0.5, 0.7	67	5.8*	0.5*	0.4, 0.7	86	7.0*	0.8*	0.6, 0.9
70+	83	3.3*	0.4*	0.4, 0.6	32	3.0*	0.4*	0.3, 0.6	52	3.6*	0.5*	0.4, 0.7
Marital status												
Married/Common-law	1,520	10.2	1.0	0.9, 1.1	746	9.9	1.1	1.0, 1.2	774	10.5	0.9	0.8, 1.0
Previously married	287	9.2*	1.1	1.0, 1.2	93	9.7	1.1	1.0, 1.4	195	9.0*	1.0	0.9, 1.2
Never married†	474	10.5	1.0	…	258	10.2	1.0	…	216	11.0	1.0	…
Education												
Secondary graduation or less†	830	8.8	1.0	…	404	9.0	1.0	…	426	8.6	1.0	…
At least some postsecondary	1,432	11.1*	1.1*	1.1, 1.2	682	10.6*	1.1	1.0, 1.2	750	11.6*	1.2*	1.1, 1.3
Household income												
Lowest/Lower-middle	187	8.1*	0.8*	0.7, 0.9	72	8.2*	0.8*	0.6, 1.0	115	8.1*	0.8*	0.7, 0.9
Middle	392	8.8*	0.9*	0.8, 1.0	179	8.7*	0.9	0.8, 1.0	213	8.8*	0.8*	0.7, 1.0
Upper-middle	806	11.1	1.0	0.9, 1.1	391	10.7	1.0	0.9, 1.1	415	11.6	1.0	0.9, 1.1
Highest†	721	11.5	1.0	…	387	11.3	1.0	…	333	11.7	1.0	…
Work status (age 20-75)												
Currently employed†	1,731	11.8	1.0	…	905	11.3	1.0	…	826	12.4	1.0	…
Worked in past 12 months	158	11.6	1.0	0.9, 1.2	70	10.8	1.0	0.8, 1.2	88	12.4	1.1	0.9, 1.2
Did not work in past 12 months	345	6.9*	0.9	0.7, 1.3	104	5.9*	0.8	0.4, 1.3	241	7.4*	1.1	0.7, 1.7
Occupation (age 20-75)												
Management†	182	10.1	1.0	…	113	10.0	1.0	…	69	10.3	1.0	…
Professional	316	11.6*	1.2*	1.0, 1.3	134	10.8	1.1	1.0, 1.4	182	12.2*	1.2*	1.0, 1.5
Technologist/Technician/Technical	153	10.7	1.2*	1.0, 1.4	101	10.1	1.1	0.9, 1.3	52	12.2	1.3*	1.1, 1.7
Administrative/Financial/Clerical	226	11.3	1.2*	1.0, 1.4	37	10.8	1.2	0.9, 1.5	189	11.4	1.2*	1.0, 1.5
Sales/Service	391	12.1*	1.4*	1.2, 1.6	147	10.9	1.2*	1.0, 1.5	243	12.9*	1.6*	1.3, 1.9
Trades/Transport/Equipment operating	318	13.2*	1.6*	1.4, 1.8	275	12.9*	1.5*	1.3, 1.8	43	15.0*	1.8*	1.4, 2.4
Farming/Forestry/Fishing/Mining	67	12.3*	1.6*	1.4, 1.9	48	11.2	1.5*	1.2, 1.8	20	16.2*	2.1*	1.6, 2.9
Processing/Manufacturing/Utilities	110	13.3*	1.7*	1.4, 2.0	64	11.9	1.4*	1.1, 1.8	46	16.0*	2.2*	1.7, 2.9
Other	125	12.2*	1.5*	1.2, 1.7	57	11.9	1.4*	1.1, 1.8	69	12.5	1.5*	1.2, 1.9
Work stress (age 20-75)												
Not at all/Not very stressful†	400	10.1	1.0	…	210	9.8	1.0	…	191	10.4	1.0	…
A bit stressful	678	11.6*	1.1	1.0, 1.2	355	11.4*	1.1	0.9, 1.2	323	11.9*	1.1	1.0, 1.3
Quite stressful	548	13.7*	1.2*	1.1, 1.3	275	13.5*	1.2	1.0, 1.3	273	14.0*	1.2*	1.1, 1.4
Extremely stressful	172	16.4*	1.3*	1.1, 1.5	71	14.1*	1.1	0.9, 1.4	101	18.4*	1.4*	1.2, 1.7
Life stress												
Not at all/Not very stressful†	567	7.4	1.0	…	285	7.3	1.0	…	282	7.5	1.0	…
A bit stressful	922	10.4*	1.2*	1.1, 1.3	450	10.5*	1.3*	1.1, 1.4	472	10.2*	1.2*	1.1, 1.3
Quite stressful	619	12.8*	1.4*	1.3, 1.6	293	12.5*	1.5*	1.3, 1.7	326	13.0*	1.4*	1.3, 1.6
Extremely stressful	173	15.9*	1.8*	1.6, 2.1	69	14.0*	1.7*	1.4, 2.1	104	17.5*	1.9*	1.6, 2.3
Leisure time												
Active	554	13.3*	1.6*	1.5, 1.8	294	12.9*	1.7*	1.5, 1.9	260	13.7*	1.6*	1.4, 1.8
Moderately active	575	11.7*	1.4*	1.3, 1.5	279	11.9*	1.5*	1.3, 1.7	295	11.6*	1.3*	1.2, 1.4
Inactive†	1,047	8.9	1.0	…	452	8.6	1.0	…	596	9.2	1.0	…
Obese												
No†	1,851	9.9	1.0	…	906	9.8	1.0	…	946	10.1	1.0	…
Yes	379	11.5*	1.1*	1.0, 1.2	188	10.9*	1.1	1.0, 1.2	191	12.0*	1.2*	1.1, 1.3
Daily smoker												
No†	1,659	9.5	1.0	…	776	9.4	1.0	…	883	9.6	1.0	…
Yes	622	12.2*	1.2*	1.1, 1.3	321	11.5*	1.1*	1.0, 1.2	302	12.9*	1.3*	1.1, 1.4
Arthritis/Rheumatism												
No†	1,781	9.6	1.0	…	903	9.4	1.0	…	878	9.7	1.0	…
Yes	500	12.8*	2.0*	1.9, 2.1	193	13.5*	2.1*	1.9, 2.4	307	12.5*	1.9*	1.7, 2.0
Diabetes												
No†	2,191	10.2	1.0	…	1,056	10.1	1.0	…	1,135	10.3	1.0	…
Yes	91	8.6*	1.1	0.9, 1.2	41	7.5*	1.0	0.8, 1.2	49	9.9	1.2	1.0, 1.4
Thyroid condition												
No†	2,146	10.1	1.0	…	1,076	9.9	1.0	…	1,071	10.2	1.0	…
Yes	135	11.2	1.3*	1.1, 1.5	21	10.5	1.3	1.0, 1.7	114	11.3	1.2*	1.1, 1.4

Data source: *2000/01 Canadian Community Health Survey*
Notes: *The total model is based on 112,124 respondents. The male model is based on 51,080 respondents; the female model, 61,044respondents. "Unknown" categories for household income, obesity, physical activity and work stress were included in models to maximize sample size, but their odds ratios are not shown. "Not applicable" categories for work status, occupation and work stress were included in models, but their odds ratios are not shown. Because of missing values in other categories, 892 respondents were dropped from the male model, and 900 from the female model. Because of rounding, confidence interval with 1.0 as upper/lower limit may be significant.*
† Reference category
** Significantly different from reference category ($p < 0.05$)*
… Not applicable

Day-to-day life stress was also significantly associated with reporting an RSI (Chart 3). These differences persisted for both sexes when the other potentially confounding factors were considered. Compared with men and women who described their lives as not at all or not very stressful, those experiencing higher levels of stress had elevated odds of having an RSI.

Chart 3
Prevalence of repetitive strain injury, by stress level of daily life, household population aged 20 or older, Canada, 2000/01



Data source: *2000/01 Canadian Community Health Survey*
† Reference category
** Significantly different from reference category (p < 0.05)*

Other risk factors

Since sports activities and exercise accounted for about one in five RSIs, it is not surprising that both men and women with at least moderately active leisure time had significantly high odds of reporting an RSI. Also, among women, but not men, obesity was related to RSI . This may reflect carpal tunnel syndrome among women, as several studies have suggested that a higher body mass index (BMI) is related to the condition.[14,15,36,45,46] And for both sexes, the odds of having an RSI were significantly higher among daily smokers than among people who did not smoke daily.

Health care contacts and outcomes

To measure contact with health care professionals, Canadian Community Health Survey respondents were asked, "Not counting when you were an overnight patient, in the past 12 months how many times have you seen or talked on the telephone about your physical, emotional or mental health with a [list of health care professionals]?" Categories read to respondents included *family doctor or general practitioner, chiropractor,* and *physiotherapist*.

Chronic pain or discomfort was assessed by asking 1998/99 and 2000/01 National Population Health Survey (NPHS) respondents, "Are you usually free from pain or discomfort?" Those who answered "no" were asked to rank their usual pain intensity as mild, moderate or severe. Scores could range from 0 for no pain to 3 for severe pain.

Psychological distress was based on 1998/99 and 2000/01 NPHS respondents' answers to the following: During the past month, how often did you feel

...so sad that nothing could cheer you up?
...nervous?
...restless or fidgety?
...hopeless?
...worthless?
...that everything was an effort?

Each item was scored on a five-point scale: "all of the time" (score 4), "most of the time" (3), "some of the time" (2), "a little of the time" (1) or "none of the time" (0). Responses to all items were summed; the range of possible scores was 0 to 24, with higher values indicating more distress. The average score in 1998/99 was 2.9, with a standard deviation of 3.3. To deal with outlying values that skewed the distribution, scores more than two standard deviations above the mean were capped (scores greater than 10 were capped at 10). Values were capped for fewer than 6% of records in the cross-sectional 1998/99 NPHS. In the longitudinal file, about 4% of records were capped in 1998/99, and 3% in 2000/01. Cronbach's alpha for the psychological distress items was estimated at 0.794 in 1998/99.

Consistent with other research,[47] results of the analysis of 2000/01 CCHS data show that men and women with arthritis or rheumatism had significantly higher odds of reporting an RSI than did those without the condition. As well, the odds of having an RSI were high among women with a thyroid condition.

Contacts with health care professionals

In 2000/01, men and women who reported an RSI were more likely to have contacted general practitioners, chiropractors and physiotherapists in the past 12 months than were those without an RSI, and the difference was significant for almost every body part affected (Chart 4) (see *Health care contacts and outcomes*).

These associations persisted for both sexes when other factors were taken into account. Men who reported an RSI averaged about one more consultation with general practitioners in the

Definitions

Six *age groups* were used for the first part of this analysis: 20 to 29, 30 to 39, 40 to 49, 50 to 59, 60 to 69, and 70 or older. In the multiple linear regression models, age was a continuous variable.

A respondent's *marital status* was classified into three categories: married or in a common-law relationship, previously married (divorced, separated or widowed), and never married.

Education was based on the highest level attained; two groups were established: secondary graduation or less, and at least some postsecondary.

Household income groups were based on the number of people in the household and total household income from all sources in the 12 months before the interview:

Income group	Number of household members	Household income
Lowest/Lower-middle	1 to 4	Less than $20,000
	5 or more	Less than $30,000
Middle	1 or 2	$20,000 to $29,999
	3 or 4	$20,000 to $39,999
	5 or more	$30,000 to $59,999
Upper-middle	1 or 2	$30,000 to $59,999
	3 or 4	$40,000 to $79,999
	5 or more	$60,000 to $79,999
Highest	1 or 2	$60,000 and over
	3 or more	$80,000 and over

Work status for National Population Health Survey (NPHS) and Canadian Community Health Survey (CCHS) respondents aged 20 to 75 was classified into three categories: currently employed, worked in past 12 months, and did not work in past 12 months. CCHS respondents who were employed at the time of the interview or had worked in the previous 12 months were asked which of nine categories best described their occupation: 1) management; 2) professional (including accountants); 3) technologist, technician or technical; 4) administrative, financial or clerical; 5) sales or service; 6) trades, transport or equipment operating; 7) farming, forestry, fishing or mining; 8) processing, manufacturing or utilities; or 9) or any other occupation.

Work stress was determined by asking CCHS respondents aged 20 to 75 who were working or who had worked at a job or business during the previous year about their main job: "Would you say that most days at work were: not at all stressful, not very stressful, a bit stressful, quite stressful, extremely stressful?" For this analysis, "not at all stressful" and "not very stressful" were combined.

Life stress was determined by asking CCHS respondents: "Thinking about the amount of stress in your life, would you say most days are: not at all stressful, not very stressful, a bit stressful, quite stressful, extremely stressful?" For this analysis, "not at all stressful" and "not very stressful" were combined.

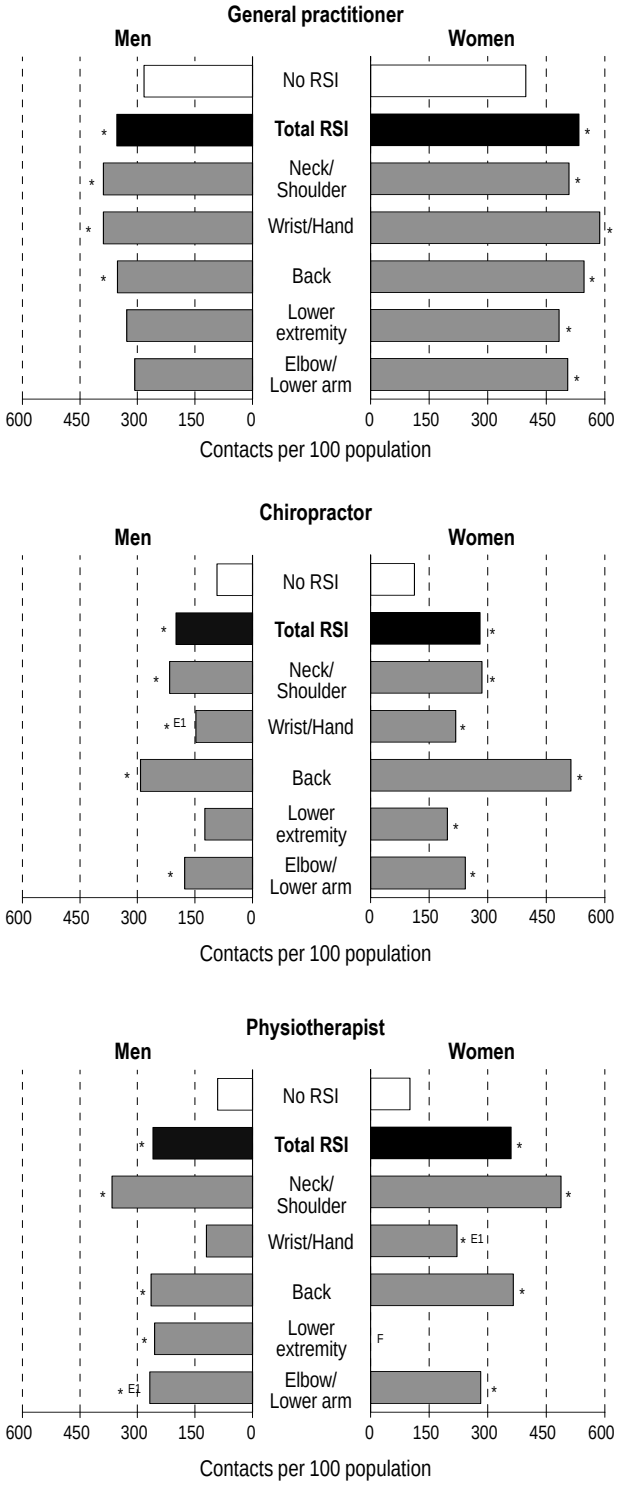
To derive *leisure-time physical activity level,* respondents' energy expenditure (EE) was estimated for each activity they engaged in during their leisure time. This was calculated by multiplying the number of times a respondent engaged in an activity over a 12-month period by the average duration in hours and by the energy cost of the activity (kilocalories expended per kilogram of body weight per hour of activity). To calculate an average daily EE for the activity, the estimate was divided by 365. This calculation was repeated for all leisure-time activities reported, and the resulting estimates were summed to provide an aggregate average daily EE. Respondents whose leisure-time EE was below 1.5 kcal/kg/day were considered physically inactive. A value between 1.5 and 2.9 kcal/kg/day indicated moderate activity. Respondents with an EE of 3.0 or more kcal/kg/day were considered active.

Obesity was defined as a body mass index of 30.0 or more, which was calculated by dividing weight in kilograms by height in metres squared. Pregnant women were excluded from this calculation.

Respondents were classified into two groups based on their smoking habits: *daily smokers* and *non-daily smokers*.

To measure the prevalence of specific chronic conditions, respondents were asked if they had any long-term conditions that had lasted or were expected to last 6 months or more and that had been diagnosed by a health care professional. A checklist of conditions was read to the respondents. Conditions considered in this analysis were *arthritis or rheumatism, diabetes* and a *thyroid condition*.

Chart 4
Contacts with health care professionals in past 12 months per 100 population aged 20 or older, by sex and body part affected by repetitive strain injury, Canada, 2000/01



Data source: *2000/01 Canadian Community Health Survey*
E1 Coefficient of variation between 16.6% and 25.0%
F Coefficient of variation greater than 33.3%
** Significantly greater than no RSI ($p < 0.05$)*

previous year than did men without an RSI (Appendix Table D). Women with an RSI had an average of 1.37 more such contacts than did women without RSIs. The pattern was the same for contacts with chiropractors and physiotherapists (Appendix Tables E and F).

Chronic pain and distress

The consequences of RSIs can be both physical and psychological. Analyses of data from the 1998/99 NPHS indicate that 23% of men with an RSI reported chronic pain or discomfort, compared with 13% of men who did not report an RSI (data not shown). The corresponding figures for women were 31% and 16%. And even when other factors, including age and arthritis (a painful condition), were taken into account, reporting an RSI was positively associated with chronic pain for both sexes (Appendix Table G). As well, men and women with an RSI reported significantly higher levels of psychological distress than did those without an RSI. However, it is not known if the pain and psychological distress preceded or followed the RSI, or if they resulted from the RSI or from other conditions and circumstances.

RSIs can be long-lasting.[4,5,10,29,48,49] In 2000/01, the elevated levels of chronic pain and distress reported by those who had an RSI had not declined among men. And for women, reporting an RSI in 1998/99 was associated with an increase in pain and distress by 2000/01 (Appendix Table H).

Concluding remarks

Repetitive strain injuries are affecting an increasing number of Canadians. In 2000/01, about 10% of people aged 20 or older reported having had an RSI in the previous year, up from 8% in 1996/97. Although this upturn may, indeed, be due to more injuries, it could also reflect heightened awareness of RSIs.[3,20,22,30,50] Nonetheless, what makes these empirical findings important is the sheer number of people reporting such injuries—an estimated 2.3 million in 2000/01.

Over half of the RSIs resulted from work-related activities, and injuries to the upper body were more common than to the lower body. RSIs tended to

Limitations

A repetitive strain injury (RSI) identified in the National Population Health Survey (NPHS) or the Canadian Community Health Survey (CCHS) is based on self-reported information. It is not known if the RSI had actually been diagnosed by a health care professional. Some research has suggested that when people become more aware of RSIs, they are more likely to report them.[22,30,50] Therefore, the NPHS and the CCHS may overestimate the prevalence of RSIs, compared with studies that use more stringent definitions.

The severity of the RSI was not measured. Some over- or underestimation of the association between RSI and the selected variables may result from this lack of information.

The body part reported to be most affected may not be the origin of the pain. This can occur in cases of referred pain from nerve entrapments, particularly if respondents have not consulted a health care professional. Moreover, the specific type of RSI (for example, carpal tunnel syndrome, tennis elbow) is not known, although different types and whether they are site-specific or non-specific with objective or subjective symptoms can have different risk factors and outcomes.[29,48,51] Grouping all RSIs may mask such differences and fail to detect significant associations.

It is not possible to ascertain if respondents who had contacted a general practitioner, chiropractor or physiotherapist in the previous year had done so because of their RSI.

A respondent's occupation at the time of the interview may differ from the occupation that contributed to the RSI. As well, information was not collected on job tasks that involve repetition and/or forceful movements. Associations between RSIs and selected characteristics may be affected by the absence of these variables.

The measure of respondents' energy expenditure likely underestimated total physical activity because it did not account for activity at work or while doing household chores.

affect people in their thirties and forties, underlining the seriousness of these injuries during the prime working years.

RSIs take a toll not only on physical health but also on mental health. Chronic pain and psychological distress were high among people with RSIs and did not diminish over a two-year period. In addition, RSIs involve greater costs to the health care system. People who reported an RSI had significantly more contacts with general practitioners, chiropractors and physiotherapists than did those without an RSI. ●

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References

1 Guidotti TL. Occupational repetitive strain injury. *American Family Physician* 1992; 45(2): 585-92.

2 Yassi A. Repetitive strain injuries. *Lancet* 1997; 349(9056): 943-7.

3 Melhorn JM. Cumulative trauma disorders and repetitive strain injuries. The future. *Clinical Orthopaedics and Related Research* 1998; 351: 107-26.

4 Rossignol M, Stock S, Patry L, et al. Carpal tunnel syndrome: what is attributable to work? The Montreal study. *Occupational and Environmental Medicine* 1997; 54: 519-23.

5 Keogh JP, Nuwayhid I, Gordon JL, et al. The impact of occupational injury on injured worker and family: outcomes of upper extremity cumulative trauma disorders in Maryland workers. *American Journal of Industrial Medicine* 2000; 38(5): 498-506.

6 O'Neil BB, Forsythe ME, Stanish WD. Chronic occupational repetitive strain injury. *Canadian Family Physician* 2001; 47: 311-6.

7 Magni G, Moreschi C, Rigatti-Luchini S, et al. Prospective study on the relationship between depressive symptoms and chronic musculoskeletal pain. *Pain* 1994; 56(3): 289-97.

8 Barnekow-Bergkvist M, Hedberg GE, Janlert U, et al. Determinants of self-reported neck-shoulder and low back symptoms in a general population. *Spine* 1998; 23(2): 235-43.

9 Rege AJ, Sher JL. Can the outcome of carpal tunnel release be predicted? *Journal of Hand Surgery [Br]* 2001; 26(2): 148-50.

10 DeStefano F, Nordstrom DL, Vierkant RA. Long-term symptom outcomes of carpal tunnel syndrome and its treatment. *Journal of Hand Surgery [Am]* 1997; 22(2): 200-10.

11 Nordstrom DL, Vierkant RA, DeStefano F, et al. Risk factors for carpal tunnel syndrome in a general population. *Occupational and Environmental Medicine* 1997; 54: 734-40.

12 Stallings SP, Kasdan ML, Soergel TM, et al. A case-control study of obesity as a risk factor for carpal tunnel syndrome in a population of 600 patients presenting for independent medical examination. *Journal of Hand Surgery [Am]* 1997; 22A: 211-5.

13 Katz JN, Fossel KK, Simmons BP, et al. Symptoms, functional status, and neuromuscular impairment following carpal tunnel release. *Journal of Hand Surgery [Am]* 1995; 20(4): 549-55.

14 Higgs PE, Edwards D, Martin DS, et al. Carpal tunnel surgery outcomes in workers: effect of workers' compensation status. *Journal of Hand Surgery [Am]* 1995; 20(3): 354-60.

15 Adams ML, Franklin GM, Barnhart S. Outcome of carpal tunnel surgery in Washington State workers' compensation. *American Journal of Industrial Medicine* 1994; 25: 527-36.

16 Katz JN, Keller RB, Fossel AH, et al. Predictors of return to work following carpal tunnel release. *American Journal of Industrial Medicine* 1997; 31: 85-91.

17 Béland Y. Canadian Community Health Survey—Methodological overview. *Health Reports* (Statistics Canada, Catalogue 82-003) 2002; 13(3): 9-14.

18 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.

19 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.

20 Frederick LJ. Cumulative trauma disorders: an overview. *American Association of Occupational Health Nurses* 1992; 40(3): 113-6.

21 Crumpton-Young LL, Killough MK, Parker PL, et al. Quantitative analysis of cumulative trauma risk factors and risk factor interactions. *Journal of Occupational Environmental Medicine* 2000; 42(10): 1013-20.

22 Ashbury FD. Occupational repetitive strain injuries and gender in Ontario, 1986 to 1991. *Journal of Occupational and Environmental Medicine* 1995; 37(4): 479-85.

23 Hess D. Employee perceived stress: relationship to the development of repetitive strain injury symptoms. *American Association of Occupational Health Nurses* 1997; 45(3): 115-23.

24 Silversides A. Confusion surrounding repetitive strain injury highlighted at conference. *Canadian Medical Association Journal* 1997; 156(10): 1459-60.

25 Bureau of Labor Statistics. Disorders associated with repeated trauma; rate and number of cases by industry for 1997. Released 1999. Available at http://stats.bls.gov/iif/oshwc/osh/os/ostb0653.txt. Accessed March 10, 2003.

26 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 Conference.* Baltimore, Maryland, August 1999.

27 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.

28 Rust K, Rao JNK. Variance estimation for complex surveys using replication techniques. *Statistical Methods in Medical Research* 1996; 5: 281-310.

29 Feuerstein M, Miller VL, Burrell LM, et al. Occupational upper extremity disorders in the federal workforce. Prevalence, health care expenditures, and patterns of work disability. *Journal of Occupational Environmental Medicine* 1998; 40(6): 546-55.

30 Tanaka S, Wild DK, Seligman PJ, et al. The US prevalence of self-reported carpal tunnel syndrome: 1988 National Health Interview Survey data. *American Journal of Public Health* 1994; 84(11): 1846-8.

31 Silverstein B, Welp E, Nelson N, et al. Claims incidence of work-related disorders of the upper extremities: Washington State, 1987 through 1995. *American Journal of Public Health* 1998; 88: 1827-33.

32 Franklin GM, Haug J, Heyer N, et al. Occupational carpal tunnel syndrome in Washington State 1984-1988. *American Journal of Public Health* 1991; 81(6): 741-6.

33 McDiarmid M, Oliver M, Ruser J, et al. Male and female rate differences in carpal tunnel syndrome injuries: personal attributes or job tasks? *Environmental Research* 2000; 83(1): 23-32.

34 Hagberg M, Morgenstern H, Kelsh M. Impact of occupations and job tasks on the prevalence of carpal tunnel syndrome. *Scandinavian Journal of Work, Environment and Health* 1992; 18(6): 337-45.

35 Stenlund B, Goldie I, Hagberg M, et al. Shoulder tendinitis and its relation to heavy manual work and exposure to vibration. *Scandinavian Journal of Work, Environment and Health* 1993; 19(1): 43-9.

36 Wieslander G, Norback D, Gothe CJ, et al. Carpal tunnel syndrome (CTS) and exposure to vibration, repetitive wrist movement, and heavy manual work: a case-referent study. *British Journal of Industrial Medicine* 1989; 46: 43-7.

37 English CJ, Maclaren WM, Court-Brown C, et al. Relations between upper limb soft tissue disorders and repetitive movements at work. *American Journal of Industrial Medicine* 1995; 27(1): 75-90.

38 Ekberg K, Bjorkqvist B, Malm P, et al. Case-control study of risk factors for disease in the neck and shoulder area. *Occupational and Environmental Medicine* 1994; 51(4): 262-6.

39 Ekberg K, Karlsson M, Axelson O, et al. Cross-sectional study of risk factors for symptoms in the neck and shoulder area. *Ergonomics* 1995; 38(5): 971-80.

40 Fredriksson K, Alfredsson L, Thorbjornsson CB, et al. Risk factors for neck and shoulder disorders: a nested case-control study covering a 24-year period. *American Journal of Industrial Medicine* 2000; 38(5): 516-8.

41 Haufler AJ, Feuerstein M, Huang GD. Job stress, upper extremity pain and functional limitations in symptomatic computer users. *American Journal of Industrial Medicine* 2000; 38(5): 507-15.

42 Westgaard RH, Jensen C, Hansen K. Individual and work-related risk factors associated with symptoms of musculoskeletal complaints. *International Archives of Occupational and Environmental Health* 1993; 64(6): 405-13.

43 Ohlsson K, Attewell RG, Palsson B, et al. Repetitive industrial work and neck and upper limb disorders in females. *American Journal of Industrial Medicine* 1995; 27(5): 731-47.

44 Pope DP, Croft PR, Pritchard CM, et al. Occupational factors related to shoulder pain and disability. *Occupational and Environmental Medicine* 1997; 54: 316-21.

45 Tanaka S, Wild DK, Cameron LL, et al. Association of occupational and non-occupational risk factors with the prevalence of self-reported carpal tunnel syndrome in a national survey of the working population. *American Journal of Industrial Medicine* 1997; 32: 550-6.

46 de Krom MC, Kester ADM, Knipschild PG, et al. Risk factors for carpal tunnel syndrome *American Journal of Epidemiology* 1990; 132(6): 1102-10.

47 Solomon DH, Katz JN, Bohn R, et al. Nonoccupational risk factors for carpal tunnel syndrome. *Journal of General Internal Medicine* 1999; 14(5): 310-4.

48 Crossman MW, Gilbert CA, Travlos A, et al. Nonneurologic hand pain versus carpal tunnel syndrome: do psychological measures differentiate? *American Journal of Physical Medicine and Rehabilitation* 2001; 80(2): 100-7.

49 Bekkelund SI, Pierre-Jerome C, Torbergsen T, et al. Impact of occupational variables in carpal tunnel syndrome. *Acta Neurologica Scandinavica* 2001; 103: 193-7.

50 Yassi A, Sprout J, Tate R. Upper limb repetitive strain injuries in Manitoba. *American Journal of Industrial Medicine* 1996; 30(4): 461-72.

51 Tanaka S, Petersen M, Cameron L. Prevalence and risk factors of tendinitis and related disorders of the distal upper extremity among U.S. workers: comparison to carpal tunnel syndrome. *American Journal of Industrial Medicine* 2001; 39: 328-35.

Appendix

Table A

Distribution of selected characteristics, by sex, household population aged 20 or older, Canada, 2000/01

	Both sexes			Men			Women		
	Sample size	Estimated population		Sample size	Estimated population		Sample size	Estimated population	
		'000	%		'000	%		'000	%
Total	**113,796**	**22,541**	**100.0**	**51,919**	**11,034**	**100.0**	**61,877**	**11,507**	**100.0**
Repetitive strain injury									
Yes	11,821	2,283	10.1	5,237	1,098	9.9	6,584	1,185	10.3
No	101,975	20,258	89.9	46,682	9,936	90.1	55,293	10,322	89.7
Age group									
20-29	16,428	4,139	18.4	7,522	2,094	19.0	8,906	2,045	17.8
30-39	22,860	4,756	21.1	10,697	2,375	21.5	12,163	2,381	20.7
40-49	24,393	5,106	22.7	11,841	2,538	23.0	12,552	2,567	22.3
50-59	18,708	3,650	16.2	8,969	1,829	16.6	9,739	1,822	15.8
60-69	14,030	2,397	10.6	6,367	1,154	10.5	7,663	1,243	10.8
70+	17,377	2,492	11.1	6,523	1,043	9.5	10,854	1,449	12.6
Marital status									
Married/Common-law	68,218	14,896	66.1	33,355	7,542	68.4	34,863	7,354	63.9
Previously married	24,439	3,122	13.8	7,242	955	8.7	17,197	2,167	18.8
Never married	20,985	4,501	20.0	11,268	2,529	22.9	9,717	1,972	17.1
Missing	154	22	0.1	54	7[E1]	0.1[E1]	100	14[E1]	0.1 [E1]
Education									
Secondary graduation or less	51,644	9,421	41.8	23,126	4,474	40.5	28,518	4,947	43.0
At least some postsecondary	60,923	12,910	57.3	28,170	6,447	58.4	32,753	6,463	56.2
Missing	1,229	211	0.9	623	113	1.0	606	98	0.8
Household income									
Lowest /Lower-middle	15,794	2,299	10.2	5,262	888	8.0	10,532	1,412	12.3
Middle	25,232	4,476	19.9	10,725	2,054	18.6	14,507	2,422	21.0
Upper-middle	35,817	7,262	32.2	17,526	3,672	33.3	18,291	3,590	31.2
Highest	25,260	6,265	27.8	13,678	3,420	31.0	11,582	2,845	24.7
Missing	11,693	2,238	9.9	4,728	1,000	9.1	6,965	1,238	10.8
Work status									
Currently employed	68,234	14,660	65.0	35,459	7,987	72.4	32,775	6,673	58.0
Worked in past 12 months	6,409	1,359	6.0	2,859	650	5.9	3,550	709	6.2
Did not work in past 12 months	28,388	5,013	22.2	9,752	1,781	16.1	18,636	3,233	28.1
Not applicable (age 75 or older)	9,875	1,324	5.9	3,398	523	4.7	6,477	801	7.0
Missing	890	185	0.8	451	93	0.8	439	92	0.8
Occupation									
Management	8,223	1,807	8.0	4,965	1,136	10.3	3,258	671	5.8
Professional	12,141	2,730	12.1	4,824	1,241	11.2	7,317	1,489	12.9
Technologist/Technician/Technical	5,755	1,432	6.4	3,844	1,001	9.1	1,911	430	3.7
Administrative/Financial/Clerical	9,030	2,009	8.9	1,246	343	3.1	7,784	1,666	14.5
Sales/Service	15,197	3,235	14.4	5,514	1,351	12.2	9,683	1,884	16.4
Trades/Transport/Equipment operating	11,632	2,414	10.7	10,146	2,128	19.3	1,486	286	2.5
Farming/Forestry/Fishing/Mining	4,526	546	2.4	3,549	424	3.8	977	122	1.1
Processing/Manufacturing/Utilities	3,464	829	3.7	2,287	540	4.9	1,177	289	2.5
Other	4,736	1,023	4.5	1,960	474	4.3	2,776	549	4.8
Not applicable	38,296	6,346	28.2	13,165	2,308	20.9	25,131	4,039	35.1
Missing	796	170	0.8	419	88	0.8	377	81	0.7
Work stress									
Not at all/Not very stressful	19,442	3,973	17.6	9,930	2,132	19.3	9,512	1,840	16.0
A bit stressful	28,057	5,829	25.9	14,259	3,108	28.2	13,798	2,721	23.6
Quite stressful	18,041	3,998	17.7	8,658	2,040	18.5	9,383	1,957	17.0
Extremely stressful	4,683	1,051	4.7	2,121	505	4.6	2,562	546	4.7
Not applicable	37,312	6,029	26.7	12,510	2,136	19.4	24,802	3,893	33.8
Missing	6,261	1,662	7.4	4,441	1,112	10.1	1,820	549	4.8
Life stress									
Not at all/Not very stressful	41,217	7,703	34.2	19,405	3,915	35.5	21,812	3,788	32.9
A bit stressful	44,182	8,877	39.4	19,904	4,269	38.7	24,278	4,608	40.0
Quite stressful	22,903	4,846	21.5	10,184	2,343	21.2	12,719	2,503	21.8
Extremely stressful	5,293	1,087	4.8	2,317	491	4.5	2,976	596	5.2
Missing	201	27	0.1	109	15	0.1	92	12	0.1
Leisure time									
Active	22,172	4,177	18.5	11,107	2,273	20.6	11,065	1,904	16.6
Moderately active	25,674	4,892	21.7	11,308	2,349	21.3	14,366	2,543	22.1
Inactive	59,631	11,758	52.2	24,904	5,259	47.7	34,727	6,499	56.5
Missing	6,319	1,713	7.6	4,600	1,153	10.4	1,719	560	4.9
Obese									
No	91,638	18,643	82.7	42,426	9,244	83.8	49,212	9,399	81.7
Yes	18,647	3,307	14.7	9,106	1,721	15.6	9,541	1,587	13.8
Missing	3,511	591	2.6	387	69	0.6	3,124	521	4.5
Daily smoker									
No	85,796	17,380	77.1	37,787	8,217	74.5	48,009	9,163	79.6
Yes	27,801	5,116	22.7	14,009	2,786	25.2	13,792	2,330	20.2
Missing	199	45	0.2	123	31	0.3	76	14[E1]	0.1 [E1]
Arthritis/Rheumatism									
No	89,341	18,627	82.6	43,439	9,586	86.9	45,902	9,041	78.6
Yes	24,348	3,896	17.3	8,427	1,438	13.0	15,921	2,458	21.4
Missing	107	18	0.1	53	9[E1]	0.1[E1]	54	9[E1]	0.1[E1]
Diabetes									
No	107,449	21,475	95.3	48,829	10,475	94.9	58,620	11,000	95.6
Yes	6,290	1,053	4.7	3,067	551	5.0	3,223	501	4.4
Missing	57	13[E1]	0.1[E1]	23	F	F	34	6[E2]	0.1[E2]
Thyroid condition									
No	106,592	21,316	94.6	50,807	10,826	98.1	55,785	10,490	91.2
Yes	7,113	1,210	5.4	1,082	201	1.8	6,031	1,010	8.8
Missing	91	15[E1]	0.1[E1]	30	8[E2]	0.1[E2]	61	7[E1]	0.1[E1]

Data source: *2000/01 Canadian Community Health Survey*
Note: *Excludes 120 respondents with unknown RSI status in 2000/01. Because of rounding, detail may not add to totals.*
E1 Coefficient of variation between 16.6% and 25.0%
E2 Coefficient of variation between 25.1% and 33.3%
F Coefficient of variation greater than 33.3%

Table B
Distribution of selected characteristics, by sex, household population aged 20 or older, Canada excluding territories, 1998/99

	Both sexes			Men			Women		
	Sample size	Estimated population		Sample size	Estimated population		Sample size	Estimated population	
		'000	%		'000	%		'000	%
Total	**13,739**	**21,621**	**100.0**	**6,242**	**10,562**	**100.0**	**7,497**	**11,059**	**100.0**
Repetitive strain injury									
Yes	1,274	2,038	9.4	586	1,013	9.6	688	1,025	9.3
No	12,465	19,583	90.6	5,656	9,550	90.4	6,809	10,034	90.7
Marital status									
Married/Common-law	8,188	14,103	65.2	4,038	7,231	68.5	4,150	6,873	62.1
Previously married	2,853	3,317	15.3	802	1,016	9.6	2,051	2,301	20.8
Never married	2,698	4,201	19.4	1,402	2,316	21.9	1,296	1,885	17.0
Education									
Secondary graduation or less	5,504	8,194	37.9	2,519	3,917	37.1	2,985	4,277	38.7
At least some postsecondary	8,223	13,401	62.0	3,715	6,629	62.8	4,508	6,772	61.2
Missing	12	F	F	8	F	F	4	F	F
Household income									
Lowest/Lower-middle	2,223	2,704	12.5	755	1,063	10.0	1,468	1,641	14.8
Middle	3,699	5,366	24.8	1,638	2,531	24.0	2,061	2,835	25.6
Upper-middle	4,599	7,562	35.0	2,258	3,843	36.4	2,341	3,719	33.6
Highest	2,406	4,586	21.2	1,238	2,472	23.4	1,168	2,115	19.1
Missing	812	1,403	6.5	353	654	6.2	459	749	6.8
Work status									
Currently employed	8,126	13,768	63.7	4,238	7,604	72.0	3,888	6,164	55.7
Worked in past 12 months	901	1,312	6.1	394	586	5.5	507	726	6.6
Did not work in past 12 months	3,547	5,261	24.3	1,203	1,849	17.5	2,344	3,412	30.9
Not applicable (age 75 or older)	1,163	1,269	5.9	407	524	5.0	756	744	6.7
Missing	2	F	F	0	0	0	2	F	F
Leisure time									
Active	2,615	4,175	19.3	1,342	2,279	21.6	1,273	1,895	17.1
Moderately active	3,247	5,230	24.2	1,485	2,634	24.9	1,762	2,595	23.5
Inactive	7,613	11,675	54.0	3,233	5,310	50.3	4,380	6,364	57.5
Missing	264	542	2.5	182	339	3.2	82	204	1.8
Obese									
No	11,323	18,079	83.6	5,227	8,921	84.5	6,096	9,158	82.8
Yes	2,152	3,144	14.5	982	1,586	15.0	1,170	1,558	14.1
Missing	264	399	1.8	33	56[E1]	0.5[E1]	231	343	3.1
Daily smoker									
No	10,269	16,382	75.8	4,499	7,775	73.6	5,770	8,606	77.8
Yes	3,446	5,191	24.0	1,729	2,759	26.1	1,717	2,432	22.0
Missing	24	49[E2]	0.2[E2]	14	F	F	10	F	F
Arthritis/Rheumatism									
No	10,890	17,827	82.5	5,300	9,185	87.0	5,590	8,643	78.2
Yes	2,842	3,778	17.5	939	1,372	13.0	1,903	2,406	21.8
Missing	7	F	F	3	F	F	4	F	F
Diabetes									
No	13,124	20,762	96.0	5,943	10,088	95.5	7,181	10,674	96.5
Yes	614	853	3.9	299	474	4.5	315	378	3.4
Missing	1	F	F	0	0	0	1	F	F
Thyroid condition									
No	12,979	20,584	95.2	6,115	10,375	98.2	6,864	10,209	92.3
Yes	758	1,035	4.8	127	188	1.8	631	847	7.7
Missing	2	F	F	0	0	0	2	F	F

Data source: *1998/99 National Population Health Survey, cross-sectional sample, Health file*
Note: *Excludes 17 respondents with unknown RSI status in 1998/99. Because of rounding, detail may not add to totals.*
E1 Coefficient of variation between 16.6% and 25.0%
E2 Coefficient of variation between 25.1% and 33.3%
F Coefficient of variation greater than 33.3%

Table C
Distribution of selected characteristics, by sex, household population aged 20 or older in 1998/99 who did not report RSI in 1996/97, Canada excluding territories

	Both sexes			Men			Women		
	Sample size	Estimated population		Sample size	Estimated population		Sample size	Estimated population	
		'000	%		'000	%		'000	%
Total	**9,255**	**18,416**	**100.0**	**4,048**	**8,959**	**100.0**	**5,207**	**9,456**	**100.0**
Repetitive strain injury									
Yes	737	1,512	8.2	332	741	8.3	405	771	8.2
No	8,512	16,896	91.8	3,712	8,212	91.7	4,800	8,684	91.8
Missing	6	F	F	4	F	F	2	F	F
Marital status									
Married/Common-law	5,664	12,107	65.7	2,719	6,245	69.7	2,945	5,861	62.0
Previously married	1,904	2,805	15.3	488	822	9.2	1,416	1,983	21.0
Never married	1,687	3,505	19.0	841	1,892	21.1	846	1,612	17.1
Education									
Secondary graduation or less	3,665	6,701	36.4	1,587	3,097	34.6	2,078	3,604	38.1
At least some postsecondary	5,589	11,713	63.6	2,460	5,860	65.4	3,129	5,853	61.9
Missing	1	F	F	1	F	F	0	0	0
Household income									
Lowest/Lower-middle	1,392	2,085	11.3	419	724	8.1	973	1,361	14.4
Middle	2,523	4,522	24.6	1,062	2,133	23.8	1,461	2,389	25.3
Upper-middle	3,205	6,599	35.8	1,517	3,333	37.2	1,688	3,266	34.5
Highest	1,675	4,177	22.7	858	2,295	25.6	817	1,882	19.9
Missing	460	1,033	5.6	192	474	5.3	268	558	5.9
Work status									
Currently employed	5,520	11,985	65.1	2,781	6,602	73.7	2,739	5,383	56.9
Worked in past 12 months	578	1,099	6.0	234	478	5.3	344	621	6.6
Did not work in past 12 months	2,402	4,350	23.6	788	1,528	17.1	1,614	2,822	29.8
Not applicable (age 75 or older)	755	982	5.3	245	352	3.9	510	630	6.7
Missing									
Leisure time									
Active	1,746	3,563	19.3	865	1,962	21.9	881	1,602	16.9
Moderately active	2,271	4,614	25.1	1,004	2,353	26.3	1,267	2,261	23.9
Inactive	5,127	9,970	54.1	2,102	4,480	50.0	3,025	5,490	58.1
Missing	111	268	1.5	77	165	1.8	34	104[E1]	1.1[E1]
Obese									
No	7,634	15,419	83.7	3,408	7,589	84.7	4,226	7,829	82.8
Yes	1,479	2,720	14.8	623	1,334	14.9	856	1,386	14.7
Missing	142	278	1.5	17	36[E2]	0.4[E2]	125	241	2.6
Daily smoker									
No	6,961	13,995	76.0	2,940	6,601	73.7	4,021	7,394	78.2
Yes	2,279	4,385	23.8	1,099	2,335	26.1	1,180	2,051	21.7
Missing	15	F	F	9	F	F	6	F	F
Arthritis/Rheumatism									
No	7,312	15,231	82.7	3,425	7,799	87.1	3,887	7,431	78.6
Yes	1,940	3,182	17.3	622	1,160	12.9	1,318	2,022	21.4
Missing	3	F	F	1	F	F	2	F	F
Diabetes									
No	8,869	17,718	96.2	3,865	8,582	95.8	5,004	9,135	96.6
Yes	385	692	3.8	183	377	4.2	202	315	3.3
Missing	1	F	F	0	0	0.0	1	F	F
Thyroid condition									
No	8,740	17,593	95.5	3,966	8,813	98.4	4,774	8,780	92.9
Yes	514	821	4.5	82	146	1.6	432	675	7.1
Missing	1	F	F	0	0	0.0	1	F	F

Data sources: *1994/95 to 2000/01 National Population Health Survey, longitudinal sample, Health file*
Note: *Excludes 968 respondents who reported RSI in 1996/97 and 4 with unknown RSI status in 1996/97. Because of rounding, detail may not add to totals.*
E1 Coeffidient of variation between 16.6% and 25.0%
E2 Coefficient of variation between 25.1% and 33.3%
F Coefficient of variation greater than 33.3%

Table D
Regression coefficients relating number of general practitioner contacts in past 12 months to selected characteristics, by sex, household population aged 20 or older, Canada, 2000/01

	Number of general practitioner contacts in past 12 months					
	Men			Women		
	B	95% confidence interval	beta	B	95% confidence interval	beta
Reported RSI†	0.96*	0.73, 1.18	0.05*	1.37*	1.11, 1.63	0.06*
Age	0.00	-0.01, 0.01	0.00	-0.04*	-0.05, -0.04	-0.11*
Marital status						
Married/Common-law	0.21	-0.02, 0.44	0.02	0.26*	0.01, 0.52	0.02*
Previously married	0.45*	0.16, 0.74	0.02*	0.62*	0.30, 0.95	0.04*
Never married‡	…	…	…	…	…	…
At least some postsecondary education†	-0.16*	-0.31, -0.01	-0.01*	-0.25*	-0.43, -0.07	-0.02*
Household income						
Lowest/Lower-middle	0.76*	0.29, 1.24	0.03*	0.97*	0.62, 1.33	0.05*
Middle	0.21*	0.02, 0.40	0.01*	0.23	-0.01, 0.47	0.01
Upper-middle	0.05	-0.09, 0.20	0.00	0.06	-0.13, 0.24	0.00
Highest‡	…	…	…	…	…	…
Work status (age 20-75)						
Currently employed‡	…	…	…	…	…	…
Worked in past 12 months	0.64*	0.40, 0.89	0.03*	0.83*	0.49, 1.18	0.03*
Did not work in past 12 months	2.02*	1.60, 2.45	0.12*	1.07*	0.87, 1.27	0.07*
Leisure time						
Active	-0.44*	-0.63, -0.26	-0.03*	-0.55*	-0.74, -0.36	-0.03*
Moderately active	-0.24*	-0.40, -0.09	-0.02*	-0.39*	-0.55, -0.24	-0.02*
Inactive‡	…	…	…	…	…	…
Obese†	0.47*	0.29, 0.65	0.03*	0.90*	0.64, 1.16	0.05*
Daily smoker†	0.17	-0.03, 0.37	0.01	0.26*	0.03, 0.48	0.01*
Arthritis/Rheumatism†	1.90*	1.56, 2.23	0.11*	2.20*	1.94, 2.46	0.13*
Diabetes†	2.93*	2.24, 3.62	0.11*	2.08*	1.54, 2.62	0.06*
Thyroid condition†	1.58*	0.94, 2.22	0.04*	1.08*	0.79, 1.37	0.04*
Intercept	1.64			4.47		
Model information						
Sample size	51,125			60,985		
R^2	0.08			0.05		
Adjusted R^2	0.08			0.05		
Degrees of freedom	20			20		
	51,104			60,964		
Dropped because of missing values	794			892		

Data source: *2000/01 Canadian Community Health Survey*
Note: *"Unknown" categories for household income and obesity and "not applicable" category for work status were included in models to maximize sample size, but their B and beta coefficients are not shown.*
† Reference category is absence of characteristic.
‡ Reference category
** $p < 0.05$*
… Not applicable

Table E
Regression coefficients relating number of chiropractor contacts in past 12 months to selected characteristics, by sex, household population aged 20 or older, Canada, 2000/01

	Number of chiropractor contacts in past 12 months					
	Men			Women		
	B	95% confidence interval	beta	B	95% confidence interval	beta
Reported RSI†	0.94*	0.67, 1.21	0.05*	1.52*	1.16, 1.88	0.07*
Age	-0.01*	-0.01, 0.00	-0.02*	0.00	-0.01, 0.00	-0.01
Marital status						
Married/Common-law	0.37*	0.19, 0.55	0.03*	-0.11	-0.39, 0.16	-0.01
Previously married	0.43*	0.19, 0.67	0.02*	-0.07	-0.35, 0.22	0.00
Never married‡	…	…	…	…	…	…
At least some postsecondary education†	0.05	-0.09, 0.20	0.00	0.25*	0.09, 0.41	0.02*
Household income						
Lowest/Lower-middle	-0.34	-0.80, 0.11	-0.02	-0.49*	-0.76, -0.23	-0.03*
Middle	-0.34*	-0.53, -0.14	-0.02*	-0.21*	-0.41, -0.01	-0.01*
Upper-middle	-0.24*	-0.39, -0.09	-0.02*	0.04	-0.17, 0.25	0.00
Highest‡	…	…	…	…	…	…
Work status (age 20-75)						
Currently employed‡	…	…	…	…	…	…
Worked in past 12 months	-0.31*	-0.51, -0.10	-0.01*	-0.12	-0.53, 0.28	0.00
Did not work in past 12 months	-0.17	-0.49, 0.15	-0.01	-0.30*	-0.47, -0.13	-0.02*
Leisure time						
Active	0.13	-0.02, 0.27	0.01	0.32*	0.12, 0.53	0.02*
Moderately active	0.15	-0.02, 0.32	0.01	0.28*	0.11, 0.45	0.02*
Inactive‡	…	…	…	…	…	…
Obese†	0.08	-0.08, 0.24	0.01	0.20	-0.03, 0.43	0.01
Daily smoker†	-0.10	-0.29, 0.09	-0.01	-0.01	-0.21, 0.18	0.00
Arthritis/Rheumatism†	0.67*	0.39, 0.95	0.04*	0.69*	0.51, 0.88	0.05*
Diabetes†	-0.19	-0.42, 0.04	-0.01	-0.16	-0.41, 0.08	-0.01
Thyroid condition†	0.15	-0.32, 0.62	0.00	0.18	-0.03, 0.39	0.01
Intercept	1.06			1.20		
Model information						
Sample size	51,206			61,114		
R^2	0.01			0.01		
Adjusted R^2	0.01			0.01		
Degrees of freedom	20			20		
	51,185			61,093		
Dropped because of missing values	713			763		

Data source: *2000/01 Canadian Community Health Survey*
Notes: *"Unknown" categories for household income and obesity and "not applicable" category for work status were included in models to maximize sample size, but their B and beta coefficients are not shown. Because of rounding, confidence interval with 0 as upper limit may be significant.*
† Reference category is absence of characteristic.
‡ Reference category
** $p < 0.05$*
… Not applicable

Table F
Regression coefficients relating number of physiotherapist contacts in past 12 months to selected characteristics, by sex, household population aged 20 or older, Canada, 2000/01

	Number of physiotherapist contacts in past 12 months					
	Men			Women		
	B	95% confidence interval	beta	B	95% confidence interval	beta
Reported RSI†	1.60*	1.21, 1.99	0.06*	2.51*	1.89, 3.13	0.09*
Age	-0.01*	-0.02, 0.00	-0.03*	0.01	-0.01, 0.02	0.01
Marital status						
Married/Common-law	0.00	-0.32, 0.33	0.00	-0.16	-0.44, 0.13	-0.01
Previously married	0.18	-0.30, 0.66	0.01	-0.16	-0.59, 0.27	-0.01
Never married‡	…	…	…	…	…	…
At least some postsecondary education†	-0.05	-0.28, 0.18	0.00	0.31*	0.05, 0.57	0.02*
Household income						
Lowest/Lower-middle	-0.03	-0.59, 0.53	0.00	0.19	-0.39, 0.77	0.01
Middle	0.10	-0.22, 0.42	0.01	-0.03	-0.35, 0.30	0.00
Upper-middle	-0.01	-0.20, 0.18	0.00	0.14	-0.13, 0.41	0.01
Highest‡	…	…	…	…	…	…
Work status (age 20-75)						
Currently employed‡	…	…	…	…	…	…
Worked in past 12 months	0.43	-0.01, 0.87	0.01	0.14	-0.27, 0.56	0.00
Did not work in past 12 months	0.55*	0.10, 1.00	0.03*	-0.01	-0.25, 0.23	0.00
Leisure time						
Active	0.09	-0.16, 0.33	0.00	0.04	-0.23, 0.31	0.00
Moderately active	-0.11	-0.32, 0.10	-0.01	0.00	-0.26, 0.26	0.00
Inactive‡	…	…	…	…	…	…
Obese†	0.04	-0.17, 0.26	0.00	0.11	-0.15, 0.36	0.00
Daily smoker†	0.09	-0.18, 0.37	0.01	0.07	-0.16, 0.31	0.00
Arthritis/Rheumatism†	1.07*	0.71, 1.42	0.05*	0.95*	0.62, 1.27	0.05*
Diabetes†	0.11	-0.25, 0.48	0.00	0.21	-0.29, 0.70	0.01
Thyroid condition†	0.52	-0.38, 1.43	0.01	0.05	-0.22, 0.33	0.00
Intercept	1.28			0.43		
Model information						
Sample size	51,202			61,114		
R^2	0.01			0.01		
Adjusted R^2	0.01			0.01		
Degrees of freedom	20			20		
	51,181			61,093		
Dropped because of missing values	717			763		

Data source: *2000/01 Canadian Community Health Survey*
Note: *"Unknown" categories for household income and obesity and "not applicable" category for work status were included in models to maximize sample size, but their B and beta coefficients are not shown. Because of rounding, confidence interval with 0 as upper limit may be significant.*
† Reference category is absence of characteristic.
‡ Reference category
** $p < 0.05$*
… Not applicable

Table G

Regression coefficients relating chronic pain or discomfort and psychological distress to selected characteristics, by sex, household population aged 20 or older, Canada excluding territories, 1998/99

	Chronic pain or discomfort							Psychological distress						
	Men				Women			Men				Women		
	B	95% confidence interval		beta	B	95% confidence interval		beta	B	95% confidence interval		beta	B	95% confidence interval		beta
Reported RSI†	0.19*	0.12,	0.26	0.09*	0.23*	0.14,	0.32	0.09*	0.84*	0.53,	1.15	0.09*	0.75*	0.46,	1.03	0.07*
Age	0.00	0.00,	0.00	-0.03	0.00	0.00,	0.00	-0.01	-0.04*	-0.04,	-0.03	-0.21*	-0.03*	-0.04,	-0.02	-0.16*
Marital status																
Married/Common-law	0.09*	0.04,	0.13	0.06*	0.00	-0.06,	0.05	0.00	-0.20	-0.43,	0.04	-0.03	-0.69*	-0.95,	-0.43	-0.11*
Previously married	0.12*	0.05,	0.19	0.06*	0.02	-0.06,	0.10	0.01	0.54*	0.14,	0.94	0.06*	-0.30	-0.67,	0.07	-0.04
Never married‡	…	…		…	…	…		…	…	…		…	…	…		…
At least some postsecondary education†	-0.02	-0.07,	0.02	-0.02	-0.06*	-0.11,	-0.01	-0.04*	0.07	-0.12,	0.25	0.01	-0.04	-0.24,	0.16	-0.01
Household income																
Lowest/Lower-middle	0.10*	0.01,	0.18	0.04*	0.07	-0.02,	0.16	0.03	0.54*	0.18,	0.91	0.06*	0.73*	0.35,	1.10	0.09*
Middle	0.03	-0.03,	0.09	0.02	-0.03	-0.09,	0.04	-0.01	0.25	-0.02,	0.51	0.04	0.29*	0.00,	0.58	0.04*
Upper-middle	-0.02	-0.07,	0.03	-0.02	-0.04	-0.10,	0.02	-0.02	-0.03	-0.26,	0.19	-0.01	0.09	-0.14,	0.32	0.01
Highest‡	…	…		…	…	…		…	…	…		…	…	…		…
Work status (age 20-75)																
Currently employed‡	…	…		…	…	…		…	…	…		…	…	…		…
Worked in past 12 months	0.00	-0.06,	0.07	0.00	0.02	-0.05,	0.08	0.01	0.48*	0.06,	0.91	0.04*	0.71*	0.36,	1.05	0.06*
Did not work in past 12 months	0.20*	0.12,	0.28	0.12*	0.12*	0.06,	0.18	0.07*	1.03*	0.72,	1.34	0.15*	0.58*	0.32,	0.84	0.09*
Leisure time																
Active	-0.05*	-0.10,	-0.01	-0.04*	-0.11*	-0.16,	-0.06	-0.05*	-0.21*	-0.39,	-0.02	-0.03*	-0.46*	-0.67,	-0.24	-0.06*
Moderately active	-0.07*	-0.12,	-0.03	-0.05*	-0.10*	-0.14,	-0.05	-0.05*	-0.37*	-0.58,	-0.16	-0.06*	-0.41*	-0.61,	-0.21	-0.06*
Inactive‡	…	…		…	…	…		…	…	…		…	…	…		…
Obese†	0.01	-0.04,	0.06	0.01	0.10*	0.03,	0.17	0.05*	0.03	-0.19,	0.25	0.00	0.09	-0.16,	0.33	0.01
Daily smoker†	0.05*	0.01,	0.10	0.04*	0.11*	0.05,	0.16	0.06*	0.37*	0.16,	0.58	0.06*	0.65*	0.43,	0.86	0.09*
Arthritis/Rheumatism†	0.57*	0.48,	0.66	0.30*	0.61*	0.53,	0.69	0.33*	0.45*	0.18,	0.71	0.06*	0.70*	0.46,	0.94	0.10*
Diabetes†	0.12	-0.02,	0.26	0.04	0.18*	0.04,	0.32	0.04*	0.18	-0.27,	0.63	0.01	0.70*	0.26,	1.14	0.04*
Thyroid condition†	0.06	-0.10,	0.22	0.01	0.06	-0.04,	0.16	0.02	0.02	-0.57,	0.61	0.00	0.32*	0.02,	0.63	0.03*
Intercept	0.09				0.19				3.59				4.13			
Model information																
Sample size	6,041				7,397				5,982				7,343			
R^2	0.16				0.17				0.08				0.08			
Adjusted R^2	0.16				0.17				0.07				0.08			
Degrees of freedom	20				20				20				20			
	6,020				7,376				5,961				7,322			
Dropped because of missing values	201				100				260				154			

Data source: *1998/99 National Population Health Survey, cross-sectional sample, Health file*

Note: *"Unknown" categories for household income and obesity and "not applicable" category for work status were included in models to maximize sample size, but their B and beta coefficients are not shown.*

† Reference category is absence of characteristic.

‡ Reference category

** $p < 0.05$*

… Not applicable

Table H
Regression coefficients relating change in chronic pain or discomfort and change in psychological distress between 1998/99 and 2000/01 to selected 1998/99 characteristics, by sex, household population aged 20 or older who did not report RSI in 1996/97, Canada excluding territories

	Chronic pain or discomfort						Psychological distress					
	Men			Women			Men			Women		
	B	95% confidence interval	beta	B	95% confidence interval	beta	B	95% confidence interval	beta	B	95% confidence interval	beta
Reported RSI†	0.03	-0.05, 0.11	0.01	0.13*	0.04, 0.23	0.05*	0.21	-0.21, 0.63	0.02	0.54*	0.14, 0.94	0.05*
Age	0.00	0.00, 0.00	-0.01	0.00	0.00, 0.00	0.01	-0.02*	-0.03, -0.01	-0.09*	-0.03*	-0.04, -0.02	-0.15*
Marital status												
Married/Common-law	0.02	-0.03, 0.07	0.01	0.02	-0.04, 0.07	0.01	-0.20	-0.51, 0.12	-0.04	-0.02	-0.32, 0.28	0.00
Previously married	0.07	-0.03, 0.16	0.03	0.05	-0.03, 0.13	0.03	-0.01	-0.44, 0.42	0.00	-0.12	-0.48, 0.23	-0.02
Never married‡	…	…	…	…	…	…	…	…	…	…	…	…
At least some postsecondary education†	0.00	-0.05, 0.06	0.00	-0.03	-0.08, 0.02	-0.02	0.00	-0.23, 0.23	0.00	-0.17	-0.38, 0.05	-0.03
Household income												
Lowest/Lower-middle	0.20*	0.09, 0.31	0.08*	0.05	-0.03, 0.14	0.02	0.58*	0.06, 1.10	0.06*	0.56*	0.20, 0.92	0.07*
Middle	0.09*	0.03, 0.14	0.06*	0.00	-0.08, 0.08	0.00	0.32	0.00, 0.64	0.05	0.25	-0.07, 0.57	0.04
Upper-middle	0.04	-0.01, 0.09	0.03	0.00	-0.05, 0.06	0.00	0.17	-0.08, 0.43	0.03	0.21	-0.06, 0.48	0.03
Highest‡	…	…	…	…	…	…	…	…	…	…	…	…
Work status (age 20-75)												
Currently employed‡	…	…	…	…	…	…	…	…	…	…	…	…
Worked in past 12 months	-0.05	-0.11, 0.01	-0.02	0.01	-0.07, 0.10	0.01	0.03	-0.47, 0.52	0.00	-0.22	-0.61, 0.17	-0.02
Did not work in past 12 months	0.11*	0.02, 0.21	0.06*	0.02	-0.04, 0.09	0.01	0.28	-0.09, 0.66	0.04	0.35*	0.09, 0.60	0.05*
Leisure time												
Active	-0.03	-0.09, 0.02	-0.02	-0.11*	-0.16, -0.06	-0.06*	-0.11	-0.39, 0.16	-0.02	-0.26*	-0.50, -0.01	-0.03*
Moderately active	-0.08*	-0.13, -0.03	-0.05*	-0.04	-0.10, 0.02	-0.02	-0.19	-0.44, 0.06	-0.03	-0.12	-0.34, 0.11	-0.02
Inactive‡	…	…	…	…	…	…	…	…	…	…	…	…
Obese†	-0.01	-0.07, 0.05	0.00	0.11*	0.03, 0.19	0.05*	-0.16	-0.43, 0.11	-0.02	0.10	-0.21, 0.42	0.01
Daily smoker†	0.08*	0.03, 0.14	0.06*	0.02	-0.03, 0.07	0.01	0.07	-0.18, 0.31	0.01	0.44*	0.20, 0.67	0.06*
Arthritis/Rheumatism†	0.18*	0.08, 0.29	0.09*	0.28*	0.18, 0.37	0.15*	0.31	-0.04, 0.67	0.04	0.50*	0.22, 0.77	0.07*
Diabetes†	0.17	-0.01, 0.34	0.05	0.08	-0.09, 0.24	0.02	-0.21	-0.73, 0.31	-0.01	0.11	-0.36, 0.58	0.01
Thyroid condition†	0.11	-0.10, 0.32	0.02	0.09	-0.01, 0.19	0.03	-0.08	-0.61, 0.45	0.00	0.22	-0.17, 0.62	0.02
Pain/Discomfort	-0.65*	-0.72, -0.59	-0.61*	-0.63*	-0.69, -0.58	-0.60*	-0.63*	-0.68, -0.58	-0.59*	-0.58*	-0.63, -0.54	-0.56*
Intercept	0.03			0.07			1.74			2.05		
Model information												
Sample size	3,956			5,152			3,733			5,008		
R^2	0.33			0.31			0.33			0.30		
Adjusted R^2	0.32			0.31			0.33			0.29		
Degrees of freedom	21			21			21			21		
	3,934			5,130			3,711			4,986		
Dropped because of missing values	92			55			315			199		

Data sources: *1994/95 to 2000/01 National Population Health Survey, longitudinal sample, Health file*
Notes: *"Unknown" categories for household income and obesity and "not applicable" category for work status were included in models to maximize sample size, but their B and beta coefficients are not shown. Respondents who reported RSI in 1996/97, or whose RSI status was unknown were excluded.*
† Reference category is absence of characteristic.
‡ Reference category
** $p < 0.05$*
… Not applicable