

Health care services— recent trends

Highlights

- In 1998/99, Canadians with low incomes were more likely than those with higher incomes to be heavy users of physician services, to visit emergency departments, to be admitted to hospital, to take multiple medications, and to require home care services.
- Despite an increase in coverage in most provinces for prescription drug and dental insurance, significant differences in use of these services remain. Youth, older adults and Canadians with low incomes are less likely to have insurance coverage for dental care and prescription drugs.
- The percentage of Canadians who said they had health care needs that were not met increased from 4% in 1994/95 (1.1 million people) to 6% in 1998/99 (1.5 million people).
- The likelihood of going to hospital increases with age, having a lower income, having less than a secondary level of education, believing oneself to be in poor health, and being a smoker, physically inactive, and overweight.
- The risk of hospitalization is similar for both female smokers and male smokers. This represents an important change from past studies that showed smaller relative risks of hospitalization for female smokers than for male smokers.

Appropriate health care is not necessarily the principal determinant of the health of populations. While the availability of services or their lack may be decisive in individual cases, it cannot completely explain observed differences among the health of populations.¹ Genetic, social and environmental factors also play an important role in determining population health status. Nevertheless, once an individual becomes ill or injured, access to effective health care becomes paramount.

Under the provisions of the Canada Health Act of 1984, Canadians in each province are assured comprehensive and universal services administered by a public insurance plan. However, prescription medications outside of hospitals and most dental care are the responsibility of the individual.

During the past decade, all provinces and territories have made efforts to contain costs in treatment services and to increase the focus on community-based care. They have also moved toward a population health approach that places more emphasis on other determinants of health, such as social support, education, improved working conditions and personal health practices.

Methods

Data sources

This article is based on Statistics Canada's National Population Health Survey (NPHS)² (see *Annex*) and hospital discharge files for 1994/95 through 1997/98.

Person-Oriented Information (POI) morbidity data are from acute care, convalescent and chronic care hospitals. The data do not contain information on cases treated as outpatients or as patients in mental hospitals (patients treated in psychiatric units of general and allied special hospitals are included). Each record contains information abstracted from a patient's hospital chart and pertains to one continuous hospital stay.

Within the hospital records, diagnoses not related to diseases or injuries were excluded. This category included pregnancy-related diagnoses (ICD 630.0-678.9), congenital abnormalities (ICD 740.0-759.4), and non-disease-specific diagnoses (ICD V01.0-V82.9).

Analytical techniques

For the cross-sectional data on the use of health services, the population aged 12 or older is considered. The age groups 12 to 14, 15 to 24, 25 to 44, 45 to 64 and 65 or older constitute youth and young adults, the young working-age population, the older working-age population, and seniors. For trend analysis, the summary rates were age-adjusted to the estimated 1998 population (both sexes) using the direct standardization method. Bootstrap procedures were used to calculate the standard errors of estimates and the differences between prevalence rates in 1994/95 and 1998/99. The comparisons of rates between 1994/95 and 1998/99 are based on the unadjusted rates. At the time of writing, bootstrap procedures to compare adjusted rates at two time periods were not available. Where multiple means tests were employed, multiple comparisons were adjusted by the Exact Alpha/L method.

For the follow-up study, data were used from seven provinces in the share file of the 1994/95 National Population Health Survey: Prince Edward Island, Nova Scotia, New Brunswick, Ontario, Saskatchewan, Alberta and British Columbia. In this survey, 9,601 respondents aged 25 or older gave permission to link and share their information. These survey data were combined with hospital discharge data from the years 1994/95, 1995/96, 1996/97 and 1997/98, using the health insurance number. In all, 8.9 million records were reviewed. Of these, 2,673 hospital discharge records in the seven provinces were linked to survey respondents.

All analyses are based on weighted data. Prevalence estimates of risk factors and socioeconomic characteristics by sex and future hospital use were calculated. Because the population using hospitals has an older age distribution than the population not affected, weighted logistic regression was used to adjust for age, as well as other factors.

Because of the complex nature of the survey design, bootstrap procedures were employed to derive the variances of estimates for odds ratios and percentages and to compare differences between percentages (age was adjusted).³ The 0.05 level was used to denote statistical significance.

Limitations

Data from the NPHS are subject to the problems inherent in self-reported information. Specifically, there was no independent source to verify whether people who reported that they had been diagnosed with heart disease, diabetes, and high blood pressure actually did have those conditions.

The NPHS data used in this analysis were collected from people residing in households. Although the percentage of the population living in institutions is quite small, their characteristics may differ from those of household residents in ways that would affect the outcomes if the former were included in the analysis. And even for the household population, those who participated in the survey may have been healthier and more likely than non-respondents to engage in health-promoting behaviour.

Cholesterol and blood pressure levels were not measured, and height and weight were self-reported. However, NPHS body mass index (BMI) results are very close to actual measurements taken in the Canadian Heart Health Surveys (1986 to 1992), which found 57% of men and 39% of women to have BMIs over 27.0. Estimates of the prevalence of smoking in the Heart Health Surveys were also similar to NPHS results. On the other hand, high blood pressure prevalence estimates from the Heart Health Surveys exceed those derived from the NPHS, probably because they are based on actual blood pressure measurements rather than on self-reported values and treatment information. As well, the Heart Health Surveys estimated a slightly higher prevalence of diabetes (5%).

Linkage between the NPHS and hospital morbidity data was done separately for each province, but not across provinces. Visits occurring outside the patient's province of residence were not included.

The ability to link records between the NPHS and the hospital records depends on the accuracy of the health insurance numbers on both sets of data. Data from the NPHS for Québec, Manitoba and Newfoundland could not be linked to hospital data, as the identifiers on the hospital records were scrambled differently.

A limitation of this study was the lack of clinical severity indicators that could play a role in the patients' outcome. Ideally, one would control for severity, but such data were not available.

Information from the National Population Health Survey (NPHS) allows examination of some of the trends and recent changes that have occurred in the last decade (see *Methods*). Linking these data with hospital records enables us to better understand the key risk factors for hospitalization.

Contacts with a physician

In 1998/99, 81% of the population aged 12 or older contacted a medical doctor (includes general practitioners and specialists) on one or more occasions in the year before the survey (Table 1) (see *Health care use*). The contact rate increased with age, from 71% among youth aged 12 to 14 to 91% among persons in the 65-or-older age group. With the exception of the 12-to-14 age group, contact rates were higher among females than among males.

In general, contact with any medical doctor was more common in urban than rural areas. About 82% of urban residents had contacted a doctor, compared with 77% of rural residents. The disparity between rural and urban residents in contact rates was apparent in all three surveys.

The highest rates of contact with a family physician and/or specialist occurred in Prince Edward Island (86%) and Newfoundland (85%). In contrast, rates in Quebec (77%) and Alberta (79%) were among the lowest. Prince Edward Island and Newfoundland were the only provinces which had a significant increase in physician contact rates between 1994/95 and 1998/99.

There are also provincial differences in the proportion of the population that contacts doctors frequently. In Nova Scotia, 17% of the population had contacted a physician 10 or more times, compared with 8% in the province of Québec. In most provinces, the proportion of frequent users declined between 1994/95 and 1998/99. Exceptions to this pattern included Québec, Newfoundland and New Brunswick, where rates of frequent contact remained stable.

Contacts with dentists or orthodontists and dental health insurance

In 1998/99, 60% of the population aged 12 or older had contacted a dentist/orthodontist on one or

more occasions in the year preceding the survey (Table 2). The contact rate declined with age, from 84% among youth aged 12 to 14, to 40% among persons in the 65-or-older age group. With the exception of the 65-or-older group, contact rates were higher among females than among males.

About 61% of urban residents had contacted a dentist, compared with 54% of rural residents. The disparity between rural and urban residents in contact rates was apparent in all three cycles of the survey.

There was a wide range in provincial rates of dentist contact. Rates were above the national average (60%) in Ontario (66%) and British Columbia (63%). The province with the greatest increase in dental visits was Newfoundland, where rates increased from 36% in 1994/95 to 43% in 1998/99.

While contact with any medical doctor has remained relatively stable over time, the proportion of the population aged 15 or older that contacted a dentist increased slowly but steadily between 1978/79 (48%) and 1998/99 (61%) (data not shown).

According to the 1998/99 NPHS, 56% of the population aged 12 or older had some form of dental insurance (Table 3). Coverage tended to be highest among youth aged 12 to 14 (about 65%), then declined slightly in the 15-to-24 age group and rose to 63% for those aged 25 to 44. Only one-quarter of the 65-or-older age group (25%) was covered.

There were marked provincial differences in the proportion of the population with dental insurance. The lowest rates were in the province of Québec (41%), Prince Edward Island (43%) and Newfoundland (44%). The highest rates occurred in the provinces of Alberta (66%) and Ontario (64%). In Alberta, dental insurance rates increased from 57% in 1996/97 to 66% in 1998/99, a 9-percentage-point increase. Increases of 4 to 5 percentage points occurred in Newfoundland, Nova Scotia, and Ontario. Significant differences in dental insurance by socioeconomic status are discussed later, along with socioeconomic patterns for other kinds of health care use.

Table 1

Contact with medical doctor in previous 12 months, household population aged 12 or older, by selected characteristics, Canada excluding territories, 1994/95, 1996/97 and 1998/99

| | Total population | | | Unadjusted percentage who contacted medical doctor | | | Age-adjusted percentage who contacted medical doctor | | |
|-------------------------|------------------|---------|---------|--|---------|---------|--|---------|---------|
| | 1994/95 | 1996/97 | 1998/99 | 1994/95 | 1996/97 | 1998/99 | 1994/95 | 1996/97 | 1998/99 |
| | '000 | | | % | | | % | | |
| Both sexes | | | | | | | | | |
| Total | 23,950 | 24,590 | 24,920 | 80 | 80 | 81 | 80 | 80 | 81 |
| 12-14 | 1,330 | 1,150 | 1,130 | 75 | 75 | 71* | ... | ... | ... |
| 15-24 | 3,790 | 3,980 | 4,070 | 77 | 76 | 77 | ... | ... | ... |
| 25-44 | 9,620 | 9,710 | 9,550 | 79 | 77 | 79 | ... | ... | ... |
| 45-64 | 5,970 | 6,340 | 6,680 | 80 | 82 | 83* | ... | ... | ... |
| 65+ | 3,250 | 3,420 | 3,490 | 90 | 90 | 91 | ... | ... | ... |
| Males | | | | | | | | | |
| Total | 11,780 | 12,100 | 12,260 | 74 | 73 | 74 | 74 | 73 | 74 |
| 12-14 | 710 | 580 | 600 | 68 | 70 | 73 | ... | ... | ... |
| 15-24 | 1,890 | 2,030 | 2,060 | 69 | 68 | 68 | ... | ... | ... |
| 25-44 | 4,810 | 4,850 | 4,780 | 71 | 68 | 70 | ... | ... | ... |
| 45-64 | 2,970 | 3,150 | 3,310 | 75 | 77 | 77 | ... | ... | ... |
| 65+ | 1,400 | 1,480 | 1,520 | 90 | 89 | 89 | ... | ... | ... |
| Females | | | | | | | | | |
| Total | 12,140 | 12,500 | 12,660 | 86 | 87 | 87 | 86 | 87 | 87 |
| 12-14 | 620 | 570 | 540 | 84 | 79 | 68* | ... | ... | ... |
| 15-24 | 1,890 | 1,950 | 2,010 | 85 | 85 | 87 | ... | ... | ... |
| 25-44 | 4,810 | 4,860 | 4,770 | 86 | 87 | 88 | ... | ... | ... |
| 45-64 | 2,970 | 3,180 | 3,370 | 85 | 87 | 88* | ... | ... | ... |
| 65+ | 1,850 | 1,940 | 1,970 | 89 | 90 | 91* | ... | ... | ... |
| Residence | | | | | | | | | |
| Rural | 4,020 | 4,310 | 4,620 | 75 | 77 | 77 | 75 | 77 | 77 |
| Urban† | 19,820 | 20,270 | 20,290 | 81 | 81 | 82 | 81 | 81 | 82 |
| Missing | 100 | 10 | 10 | 75 | -- | -- | -- | -- | ... |
| Household income | | | | | | | | | |
| Lowest | 4,100 | 3,230 | 3,160 | 79 | 81 | 82 | 79 | 81 | 81 |
| Lower-middle | 6,860 | 6,190 | 6,120 | 80 | 79 | 80 | 80 | 78 | 79 |
| Upper-middle | 8,170 | 7,960 | 8,530 | 80 | 80 | 81 | 81 | 81 | 82 |
| Highest | 3,670 | 3,110 | 5,240 | 81 | 80 | 82 | 82 | 81 | 82 |
| Missing | 1,140 | 4,100 | 1,860 | 80 | 80 | 79 | 79 | 80 | 79 |
| Province | | | | | | | | | |
| Newfoundland | 480 | 480 | 460 | 77 | 79 | 85* | 77 | 80 | 85 |
| Prince Edward Island | 110 | 110 | 110 | 83 | 80 | 87* | 83 | 80 | 86 |
| Nova Scotia | 760 | 770 | 770 | 83 | 82 | 82 | 83 | 82 | 82 |
| New Brunswick | 630 | 630 | 630 | 79 | 80 | 80 | 79 | 80 | 80 |
| Québec | 6,030 | 6,130 | 6,100 | 76 | 76 | 77 | 76 | 76 | 77 |
| Ontario | 9,050 | 9,320 | 9,460 | 83 | 82 | 83 | 83 | 82 | 83 |
| Manitoba | 890 | 900 | 890 | 81 | 80 | 83 | 81 | 81 | 83 |
| Saskatchewan | 790 | 800 | 810 | 80 | 80 | 83 | 80 | 79 | 83 |
| Alberta | 2,170 | 2,240 | 2,360 | 79 | 79 | 79 | 79 | 79 | 79 |
| British Columbia | 3,040 | 3,200 | 3,320 | 81 | 82 | 80 | 81 | 82 | 80 |

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

Notes: At the time of the analysis, bootstrap programs were not available for comparisons of age-adjusted rates over time. Consequently, comparisons between 1994/95 and 1998/99 were based on unadjusted rates. Because there was very little difference between the unadjusted and adjusted rates, reliance on the comparison of unadjusted rates is unlikely to have led to incorrect inferences. Because of rounding, detail may not add to totals.

† Continuously built-up areas with population of 1,000 or more and population density of 400 or more per square kilometre, based on previous census

... Not applicable

-- High sampling variability

* Significantly different from 1994/95

Table 2
Contact with dentist/orthodontist in previous 12 months, household population aged 12 or older, by selected characteristics, Canada excluding territories, 1994/95, 1996/97 and 1998/99

| | Total population | | | Unadjusted percentage who contacted dentist/orthodontist | | | Age-adjusted percentage who contacted dentist/orthodontist | | |
|-------------------------|------------------|---------|---------|--|---------|---------|--|---------|---------|
| | 1994/95 | 1996/97 | 1998/99 | 1994/95 | 1996/97 | 1998/99 | 1994/95 | 1996/97 | 1998/99 |
| | '000 | | | % | | | % | | |
| Both sexes | | | | | | | | | |
| Total | 23,950 | 24,590 | 24,920 | 56 | 58 | 60* | 56 | 58 | 60 |
| 12-14 | 1,330 | 1,150 | 1,130 | 78 | 81 | 84 | ... | ... | ... |
| 15-24 | 3,790 | 3,980 | 4,070 | 62 | 64 | 65 | ... | ... | ... |
| 25-44 | 9,620 | 9,710 | 9,550 | 59 | 62 | 62* | ... | ... | ... |
| 45-64 | 5,970 | 6,340 | 6,680 | 52 | 56 | 59* | ... | ... | ... |
| 65+ | 3,250 | 3,420 | 3,490 | 38 | 38 | 40 | ... | ... | ... |
| Males | | | | | | | | | |
| Total | 11,780 | 12,100 | 12,260 | 55 | 56 | 57 | 55 | 56 | 57 |
| 12-14 | 710 | 580 | 600 | 79 | 81 | 83 | ... | ... | ... |
| 15-24 | 1,890 | 2,030 | 2,060 | 61 | 60 | 63 | ... | ... | ... |
| 25-44 | 4,812 | 4,854 | 4,775 | 56 | 58 | 57 | ... | ... | ... |
| 45-64 | 2,970 | 3,150 | 3,310 | 52 | 55 | 56* | ... | ... | ... |
| 65+ | 1,400 | 1,480 | 1,520 | 41 | 36 | 42 | ... | ... | ... |
| Females | | | | | | | | | |
| Total | 12,140 | 12,500 | 12,660 | 57 | 61 | 62* | 57 | 61 | 62 |
| 12-14 | 620 | 570 | 540 | 77 | 80 | 85 | ... | ... | ... |
| 15-24 | 1,890 | 1,950 | 2,010 | 62 | 67 | 67 | ... | ... | ... |
| 25-44 | 4,810 | 4,860 | 4,770 | 63 | 66 | 67* | ... | ... | ... |
| 45-64 | 2,970 | 3,180 | 3,370 | 52 | 58 | 62* | ... | ... | ... |
| 65+ | 1,850 | 1,940 | 1,970 | 36 | 40 | 38 | ... | ... | ... |
| Residence | | | | | | | | | |
| Rural | 4,020 | 4,310 | 4,620 | 48 | 52 | 54* | 48 | 52 | 54 |
| Urban† | 19,820 | 20,270 | 20,290 | 58 | 60 | 61* | 57 | 59 | 61 |
| Missing | 100 | 10 | 10 | -- | -- | -- | -- | -- | -- |
| Household income | | | | | | | | | |
| Lowest | 4,100 | 3,230 | 3,160 | 39 | 40 | 39 | 39 | 40 | 39 |
| Lower-middle | 6,860 | 6,190 | 6,120 | 48 | 50 | 47 | 48 | 51 | 48 |
| Upper-middle | 8,170 | 7,960 | 8,530 | 63 | 65 | 65 | 62 | 64 | 64 |
| Highest | 3,670 | 3,110 | 5,240 | 75 | 78 | 79* | 76 | 78 | 79 |
| Missing | 1,140 | 4,100 | 1,860 | 59 | 58 | 57 | 59 | 59 | 56 |
| Province | | | | | | | | | |
| Newfoundland | 480 | 480 | 460 | 38 | 40 | 44* | 36 | 39 | 43 |
| Prince Edward Island | 110 | 110 | 110 | 55 | 57 | 57 | 54 | 57 | 56 |
| Nova Scotia | 760 | 770 | 770 | 53 | 53 | 55 | 53 | 53 | 55 |
| New Brunswick | 630 | 630 | 630 | 49 | 49 | 51 | 49 | 49 | 52 |
| Québec | 6,030 | 6,130 | 6,100 | 49 | 51 | 53* | 49 | 51 | 53 |
| Ontario | 9,050 | 9,320 | 9,460 | 63 | 66 | 66* | 63 | 66 | 66 |
| Manitoba | 890 | 900 | 890 | 53 | 56 | 58 | 53 | 57 | 59 |
| Saskatchewan | 790 | 800 | 810 | 43 | 45 | 49 | 43 | 46 | 49 |
| Alberta | 2,170 | 2,240 | 2,360 | 55 | 54 | 57 | 54 | 53 | 56 |
| British Columbia | 3,040 | 3,200 | 3,320 | 59 | 62 | 63 | 59 | 62 | 63 |

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

Notes: At the time of the analysis, bootstrap programs were not available for comparisons of age-adjusted rates over time. Consequently, comparisons between 1994/95 and 1998/99 were based on unadjusted rates. Because there was very little difference between the unadjusted and adjusted rates, reliance on the comparison of unadjusted rates is unlikely to have led to incorrect inferences. Because of rounding, detail may not add to totals.

† Continuously built-up areas with population of 1,000 or more and population density of 400 or more per square kilometre, based on previous census

... Not applicable

-- High sampling variability

* Significantly different from 1994/95

Table 3

Dental insurance, household population aged 12 or older, by selected characteristics, Canada excluding territories, 1996/97 and 1998/99

| | Total population | | Unadjusted percentage with dental insurance | | Age-adjusted percentage with dental insurance | |
|-------------------------|------------------|---------|---|---------|---|---------|
| | 1996/97 | 1998/99 | 1996/97 | 1998/99 | 1996/97 | 1998/99 |
| | '000 | | % | | % | |
| Both sexes | | | | | | |
| Total | 24,590 | 24,920 | 53 | 56* | 52 | 56 |
| 12-14 | 1,150 | 1,130 | 52 | 65* | ... | ... |
| 15-24 | 3,980 | 4,070 | 54 | 58* | ... | ... |
| 25-44 | 9,710 | 9,550 | 62 | 63 | ... | ... |
| 45-64 | 6,340 | 6,680 | 55 | 59* | ... | ... |
| 65+ | 3,420 | 3,490 | 21 | 25* | ... | ... |
| Males | | | | | | |
| Total | 12,100 | 12,260 | 53 | 56* | 52 | 56 |
| 12-14 | 580 | 600 | 51 | 67* | ... | ... |
| 15-24 | 2,030 | 2,060 | 52 | 57* | ... | ... |
| 25-44 | 4,850 | 4,780 | 61 | 61 | ... | ... |
| 45-64 | 3,150 | 3,310 | 55 | 60* | ... | ... |
| 65+ | 1,480 | 1,520 | 24 | 29* | ... | ... |
| Females | | | | | | |
| Total | 12,500 | 12,660 | 52 | 56* | 53 | 56 |
| 12-14 | 570 | 540 | 53 | 64* | ... | ... |
| 15-24 | 1,950 | 2,010 | 56 | 58 | ... | ... |
| 25-44 | 4,860 | 4,770 | 62 | 66* | ... | ... |
| 45-64 | 3,180 | 3,370 | 54 | 58* | ... | ... |
| 65+ | 1,940 | 1,970 | 20 | 23* | ... | ... |
| Residence | | | | | | |
| Rural | 4,310 | 4,620 | 46 | 50* | 46 | 49 |
| Urban† | 20,270 | 20,290 | 54 | 58* | 54 | 58 |
| Missing | 10 | 10 | -- | -- | -- | -- |
| Household income | | | | | | |
| Lowest | 3,230 | 3,160 | 23 | 30* | 24 | 31 |
| Lower-middle | 6,190 | 6,120 | 41 | 41 | 42 | 42 |
| Upper-middle | 7,960 | 8,530 | 66 | 65 | 64 | 63 |
| Highest | 3,110 | 5,240 | 75 | 78* | 70 | 75 |
| Missing | 4,100 | 1,860 | 50 | 49 | 51 | 48 |
| Province | | | | | | |
| Newfoundland | 480 | 460 | 41 | 45* | 40 | 44 |
| Prince Edward Island | 110 | 110 | 47 | 43 | 47 | 43 |
| Nova Scotia | 770 | 770 | 48 | 53* | 49 | 54 |
| New Brunswick | 630 | 630 | 52 | 55 | 52 | 55 |
| Québec | 6,130 | 6,100 | 39 | 41 | 39 | 41 |
| Ontario | 9,320 | 9,460 | 60 | 64* | 60 | 64 |
| Manitoba | 900 | 890 | 55 | 55 | 56 | 56 |
| Saskatchewan | 800 | 810 | 48 | 53 | 50 | 55 |
| Alberta | 2,240 | 2,360 | 57 | 67* | 57 | 66 |
| British Columbia | 3,200 | 3,320 | 58 | 59 | 58 | 59 |

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

Notes: At the time of the analysis, bootstrap programs were not available for comparisons of age-adjusted rates over time. Consequently, comparisons between 1996/97 and 1998/99 were based on unadjusted rates. Because there was very little difference between the unadjusted and adjusted rates, reliance on the comparison of unadjusted rates is unlikely to have led to incorrect inferences. Because of rounding, detail may not add to totals.

† Continuously built-up areas with population of 1,000 or more and population density of 400 or more per square kilometre, based on previous census

... Not applicable

-- High sampling variability

* Significantly different from 1996/97

Contacts with chiropractors and alternative health care providers

In 1998/99, 11% of the population aged 12 or older had contacted a chiropractor during the previous year. In the total population (both sexes), the utilization rates increased from 5% among youth aged 12 to 14 to 13% in the 45-to-64 age group.

Utilization rates were about the same for males and females. Urban residents were less likely to use chiropractic services than rural residents. This may reflect differences in provincial coverage for such services.

In 1998/99, about 8% of Canadians aged 12 or older (1.9 million people) visited an alternative

Health care use

To determine *contacts with health care professionals*, National Population Health Survey (NPHS) 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 with the following: family doctor or general practitioner, eye specialist, other medical doctor, dentist or orthodontist, chiropractor?" A derived variable was constructed to measure the number of visits with any medical doctor.

Heavy or frequent users of doctor services had contacted a doctor 10 or more times during the last 12 months.

Dental health insurance was determined with the question, "Do you have insurance that covers all or part of your dental expenses?" The question relating to prescription drug and dental insurance coverage was not asked on the 1994/95 NPHS. In an effort to be as inclusive as possible, the NPHS referred to "insurance" rather than "dental plan coverage." The NPHS data do not indicate the scope or type of coverage for dental services. There is no information about the proportion of the cost that individuals would be expected to pay, although such an expense could influence their use of dental services.

Respondents were asked, "In the past 12 months, have/has ... seen or talked to an alternative health care provider such as an acupuncturist, naturopath, homeopath or massage therapist about your/his/her physical, emotional or mental health?" Responses to this question were used to determine the proportion of the population that had used an *alternative health care provider*. If the respondent answered "yes," the next question was: "Who did ... see or talk to?" Response options were: massage therapist, acupuncturist, homeopath or naturopath, Feldenkrais or Alexander teacher, relaxation therapist, biofeedback teacher, rolfar, herbalist, reflexologist, spiritual healer, religious leader, self-help group (such as AA, cancer therapy, etc.), other. There are no data relating to the path by which people sought alternative health care, nor is there information about the frequency or cost of alternative health care practitioners. Absence of contact does not necessarily mean that the individual did not use alternative remedies.

NPHS respondents were asked about their use of specific *medications* in the month before the survey. Those who reported

having taken any medication in the past month were asked to report the number of medications they took in the previous two days. Having taken three or more different medications in those two days is considered multiple medication use.

Prescription medication insurance coverage was determined with the question, "Do you have insurance that covers all or part of the cost of your prescription medications?" Respondents were asked to include any private, government or employer-paid plans.

The use of *home care services* was determined by the question, "Have you received any home care services in the past 12 months?" Home care services were defined as health care or homemaker services received at home, with the cost being entirely or partially covered by the government. Examples of the services included: nursing care, help with bathing or housework, respite care and meal delivery. Formal home care constitutes only a part of all care rendered to people in their home. Although those who receive home nursing services probably have greater physical needs, or at least need more specialized care than can be provided by household members, it is reasonable to expect that in many respects, formal home care recipients do not differ much from people who receive informal care. However, since data on informal care were not available, respondents receiving informal care only were included with those not receiving formal home care.

The 1996/97 survey asked respondents, "Did you use any emergency services in the past 12 months?" The question was not asked in the 1994/95 and 1998/99 surveys. *Emergency services* were defined as medical services for serious health problems that require immediate care.

Hospitalization in the NPHS refers to data collected by the following yes/no question, "In the past 12 months, has . . . been a patient overnight in a hospital, nursing home or convalescent home?" The reason for hospitalization was not asked. Heavy users of hospital services had spent more than three days in hospital.

To determine *access to health services/unmet needs*, respondents in the 1996/97 and 1998/99 surveys were asked about delays in receiving health care in the 12 months prior to the survey. The specific question asked: "During the past 12 months, was there ever a time when you needed health care but didn't receive it?"

practitioner in the year preceding the survey. The three leading alternative services were massage therapy (4%), homeopathy (2%) and acupuncture (2%). Women aged 12 or older (10%) were twice as likely as men (about 5%) to use some form of alternative health care.

There are wide provincial differences in the proportion of residents visiting chiropractors and alternative health care providers. This is probably attributable to differences in the types of services covered by provincial health care plans.

Medication use and prescription drug insurance

The use of multiple medications has implications for the possibility of adverse drug reactions through medication misuse.⁴ The measure also gives some insight into the importance of drugs in the medical management of chronic illness. In 1998/99, about 11% of the population aged 12 or older reported using three or more prescription drugs in the previous two days. Multiple drug use was higher among women (14%) than men (9%). The use of multiple medications tended to be higher in Nova Scotia (15%) and Prince Edward Island and New Brunswick (13%).

The population covered by drug insurance benefits has been growing.⁵ Among the lower income groups, the increase in coverage may be partly attributable to provincial health care plans. Among the upper income groups, the growth is likely attributable to the purchase of private insurance or the provision of insured benefits through employment. According to the 1998/99 NPHS, about 74% of the population aged 12 or older reported that they had insurance coverage for prescription medications. Drug insurance coverage tends to be relatively lower among younger or older Canadians (Table 4).

The percentage of individuals reporting coverage for prescription drugs varied by province as well, from just over half (55%) in Saskatchewan to 82% in Québec.

The 55% in Saskatchewan seems low, as the province has a prescription drug plan. However, an individual's perception of drug coverage may be

influenced by the presence of annual deductibles and co-payments. In Saskatchewan, most residents pay an \$850 deductible per person or family semi-annually along with a 35% co-payment, and therefore, some individuals may not regard themselves as having prescription drug insurance.

The dramatic increase in prescription drug insurance in Québec is probably attributable to the introduction of legislation to ensure that all provincial residents are covered by a prescription drug plan.⁶ The rise in prescription drug insurance may also represent an increase in awareness of the benefits that are currently available through a variety of provincial health programs. Decreases in the unemployment rate during the period may also be a factor, as access to prescription medication coverage is influenced by employment status.

Home care services

In 1998/99, an estimated 613,000 Canadian adults, or 3% of people aged 18 or older, reported receiving formal home care in the 12 months before the survey. About one-third of them were younger than 65—a clear indication that home care is not limited to geriatric services. However, the younger age group comprises a much smaller share of home care users. Only 1% of the household population under age 65 received home care, compared with 8% of 65- to-79-year-olds and 28% of those aged 80 or older.

There was little difference in the use of home care services by rural/urban residence. Similarly, there were only small provincial differences. Usage ranged from 1% in Prince Edward Island to 3% in Nova Scotia, Ontario, Manitoba, Saskatchewan and British Columbia.

Hospital emergency departments

In 1996/97, 21% of the population aged 12 or older used a hospital emergency department. Usage rates tended to be higher among females (24%) than among males (19%). The age pattern of emergency department use departs from the normal pattern of increasing rates by age. The highest usage rates tended to occur in the 15-to-24 and 25-to-44 age groups among both males and females. This may

Table 4
Prescription drug insurance, household population aged 12 or older, by selected characteristics, Canada excluding territories, 1996/97 and 1998/99

| | Total population | | Unadjusted percentage with prescription drug insurance | | Age-adjusted percentage with prescription drug insurance | |
|-------------------------|------------------|---------|--|---------|--|---------|
| | 1996/97 | 1998/99 | 1996/97 | 1998/99 | 1996/97 | 1998/99 |
| | '000 | | % | | % | |
| Both sexes | | | | | | |
| Total | 24,590 | 24,920 | 61 | 74* | 61 | 74 |
| 12-14 | 1,150 | 1,130 | 56 | 71* | ... | ... |
| 15-24 | 3,980 | 4,070 | 53 | 68* | ... | ... |
| 25-44 | 9,710 | 9,550 | 65 | 75* | ... | ... |
| 45-64 | 6,340 | 6,680 | 65 | 77* | ... | ... |
| 65+ | 3,420 | 3,490 | 51 | 72* | ... | ... |
| Males | | | | | | |
| Total | 12,100 | 12,260 | 61 | 73* | 61 | 73 |
| 12-14 | 580 | 600 | 56 | 72* | ... | ... |
| 15-24 | 2,030 | 2,060 | 50 | 66* | ... | ... |
| 25-44 | 4,850 | 4,780 | 65 | 74* | ... | ... |
| 45-64 | 3,150 | 3,310 | 65 | 77* | ... | ... |
| 65+ | 1,480 | 1,520 | 55 | 72* | ... | ... |
| Females | | | | | | |
| Total | 12,500 | 12,660 | 61 | 74* | 61 | 74 |
| 12-14 | 570 | 540 | 56 | 70* | ... | ... |
| 15-24 | 1,950 | 2,010 | 57 | 70* | ... | ... |
| 25-44 | 4,860 | 4,770 | 65 | 76* | ... | ... |
| 45-64 | 3,180 | 3,370 | 65 | 76* | ... | ... |
| 65+ | 1,940 | 1,970 | 48 | 72* | ... | ... |
| Residence | | | | | | |
| Rural | 4,310 | 4,620 | 56 | 68* | 56 | 68 |
| Urban† | 20,270 | 20,290 | 62 | 75* | 62 | 75 |
| Missing | 10 | 10 | -- | -- | -- | -- |
| Household income | | | | | | |
| Lowest | 3,230 | 3,160 | 38 | 58* | 38 | 56 |
| Lower-middle | 6,190 | 6,120 | 53 | 65* | 53 | 64 |
| Upper-middle | 7,960 | 8,530 | 73 | 79* | 72 | 79 |
| Highest | 3,110 | 5,240 | 76 | 86* | 74 | 85 |
| Missing | 4,100 | 1,860 | 55 | 70* | 56 | 70 |
| Province | | | | | | |
| Newfoundland | 480 | 460 | 57 | 62* | 56 | 62 |
| Prince Edward Island | 110 | 110 | 58 | 57 | 58 | 57 |
| Nova Scotia | 770 | 770 | 67 | 75* | 67 | 75 |
| New Brunswick | 630 | 630 | 63 | 67 | 63 | 67 |
| Québec | 6,130 | 6,100 | 55 | 82* | 54 | 82 |
| Ontario | 9,320 | 9,460 | 66 | 74* | 66 | 74 |
| Manitoba | 900 | 890 | 47 | 64* | 48 | 65 |
| Saskatchewan | 800 | 810 | 40 | 55* | 40 | 55 |
| Alberta | 2,240 | 2,360 | 67 | 76* | 67 | 76 |
| British Columbia | 3,200 | 3,320 | 62 | 67* | 62 | 67 |

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

Notes: At the time of the analysis, bootstrap programs were not available for comparisons of age-adjusted rates over time. Consequently, comparisons between 1996/97 and 1998/99 were based on unadjusted rates. Because there was very little difference between the unadjusted and adjusted rates, reliance on the comparison of unadjusted rates is unlikely to have led to incorrect inferences. Because of rounding, detail may not add to totals.

† Continuously built-up areas with population of 1,000 or more and population density of 400 or more per square kilometre, based on previous census

... Not applicable

-- High sampling variability

* Significantly different from 1996/97

Table 5
Hospitalization in previous 12 months, household population aged 12 or older, by selected characteristics, Canada excluding territories, 1994/95, 1996/97 and 1998/99

| | Total population | | | Unadjusted percentage hospitalized | | | Age-adjusted percentage hospitalized | | |
|-------------------------|------------------|---------|---------|------------------------------------|---------|---------|--------------------------------------|---------|---------|
| | 1994/95 | 1996/97 | 1998/99 | 1994/95 | 1996/97 | 1998/99 | 1994/95 | 1996/97 | 1998/99 |
| | | '000 | | | % | | | % | |
| Both sexes | | | | | | | | | |
| Total | 23,950 | 24,590 | 24,920 | 9 | 8 | 7* | 9 | 8 | 7 |
| 12-14 | 1,330 | 1,150 | 1,130 | 2 | 3 | 3 | ... | ... | ... |
| 15-24 | 3,790 | 3,980 | 4,070 | 9 | 6 | 5* | ... | ... | ... |
| 25-44 | 9,620 | 9,710 | 9,550 | 9 | 8 | 6* | ... | ... | ... |
| 45-64 | 5,970 | 6,340 | 6,680 | 8 | 7 | 7* | ... | ... | ... |
| 65+ | 3,250 | 3,420 | 3,490 | 17 | 15 | 16* | ... | ... | ... |
| Males | | | | | | | | | |
| Total | 11,780 | 12,100 | 12,260 | 7 | 6 | 6* | 7 | 7 | 6 |
| 12-14 | 710 | 580 | 600 | 2 | 3 | 5 | ... | ... | ... |
| 15-24 | 1,890 | 2,030 | 2,060 | 6 | 4 | 3* | ... | ... | ... |
| 25-44 | 4,810 | 4,850 | 4,780 | 5 | 5 | 3* | ... | ... | ... |
| 45-64 | 2,970 | 3,150 | 3,310 | 8 | 7 | 7 | ... | ... | ... |
| 65+ | 1,400 | 1,480 | 1,520 | 17 | 16 | 17 | ... | ... | ... |
| Females | | | | | | | | | |
| Total | 12,140 | 12,500 | 12,660 | 12 | 10 | 9* | 12 | 10 | 9 |
| 12-14 | 620 | 570 | 540 | 2 | 2 | 2 | ... | ... | ... |
| 15-24 | 1,890 | 1,950 | 2,010 | 11 | 8 | 8* | ... | ... | ... |
| 25-44 | 4,810 | 4,860 | 4,770 | 13 | 11 | 9* | ... | ... | ... |
| 45-64 | 2,970 | 3,180 | 3,370 | 9 | 7 | 6* | ... | ... | ... |
| 65+ | 1,850 | 1,940 | 1,970 | 17 | 14 | 15 | ... | ... | ... |
| Residence | | | | | | | | | |
| Rural | 4,020 | 4,310 | 4,620 | 10 | 10 | 8* | 10 | 10 | 8 |
| Urban† | 19,820 | 20,270 | 20,290 | 9 | 8 | 7* | 9 | 8 | 7 |
| Missing | 100 | 10 | 10 | -- | -- | -- | -- | -- | -- |
| Household income | | | | | | | | | |
| Lowest | 4,100 | 3,230 | 3,160 | 14 | 11 | 12* | 14 | 11 | 12 |
| Lower-middle | 6,860 | 6,190 | 6,120 | 10 | 9 | 9 | 9 | 9 | 8 |
| Upper-middle | 8,170 | 7,960 | 8,530 | 7 | 7 | 7 | 7 | 8 | 7 |
| Highest | 3,670 | 3,110 | 5,240 | 8 | 6 | 5* | 9 | 7 | 5 |
| Missing | 1,140 | 4,100 | 1,860 | 10 | 7 | 6* | 10 | 7 | 6 |
| Province | | | | | | | | | |
| Newfoundland | 480 | 480 | 460 | 9 | 10 | 8 | 10 | 10 | 8 |
| Prince Edward Island | 110 | 110 | 110 | 11 | 11 | 9* | 11 | 11 | 9 |
| Nova Scotia | 760 | 770 | 770 | 10 | 9 | 9 | 10 | 9 | 9 |
| New Brunswick | 630 | 630 | 630 | 9 | 11 | 12 | 9 | 11 | 12 |
| Québec | 6,030 | 6,130 | 6,100 | 10 | 9 | 8* | 10 | 9 | 8 |
| Ontario | 9,050 | 9,320 | 9,460 | 9 | 7 | 7* | 9 | 7 | 7 |
| Manitoba | 890 | 900 | 890 | 10 | 9 | 8 | 10 | 9 | 8 |
| Saskatchewan | 790 | 800 | 810 | 10 | 8 | 8* | 9 | 8 | 8 |
| Alberta | 2,170 | 2,240 | 2,360 | 10 | 7 | 7* | 10 | 8 | 7 |
| British Columbia | 3,040 | 3,200 | 3,320 | 8 | 8 | 7* | 8 | 8 | 7 |

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

Notes: At the time of the analysis, bootstrap programs were not available for comparisons of age-adjusted rates over time. Consequently, comparisons between 1994/95 and 1998/99 were based on unadjusted rates. Because there was very little difference between the unadjusted and adjusted rates, reliance on the comparison of unadjusted rates is unlikely to have led to incorrect inferences. Because of rounding, detail may not add to totals.

† Continuously built-up areas with population of 1,000 or more and population density of 400 or more per square kilometre, based on previous census

... Not applicable

-- High sampling variability

* Significantly different from 1994/95

reflect the relatively high rates of injury and acute problems such as asthma attacks among young people.

Hospitalization

According to the 1998/99 NPHS, 7% of the household population had been hospitalized in the previous year (Table 5). In the total population (both sexes), utilization rates increased from 3% in the 12-to-14 age group to 16% in the 65-or-older age group. Although females were more likely to be hospitalized, the age pattern of use differed from that of males. Among males, usage rates were higher in the 12-to-14 age group than in the 15-to-24 and 25-to-44 age groups and then increased with age. Among females, hospitalization increased to age 25 to 44 (likely due to pregnancy), decreased in the 45-to-64 age group and then peaked in the 65-or-older age group.

New Brunswick had the highest hospitalization rate (12%); Ontario, Alberta and British Columbia, the lowest (7%). The trend in all provinces was down, except for New Brunswick where the rate increased from 9% to 12%.

In 1998/99, 5% of the population were in hospital for three or more days. As expected, the highest rates of use were concentrated in the older age groups where chronic diseases are more prevalent. Among individuals aged 65 or older, 13% were hospitalized for three or more days.

In New Brunswick, 8% of the population were hospitalized for three or more days, compared with 4% in Ontario, Alberta and British Columbia. In all provinces except New Brunswick, the proportion of the population that was institutionalized for three or more days declined between 1994/95 and 1998/99. In New Brunswick, the proportion remained stable. In 1994/95, the rate was 7%; in 1998/99, 8%.

Risk profile of hospital patients

Further analysis of hospitalization was based on an analysis of the 1994/95 NPHS share file linked with hospital morbidity data for the years 1994/95, 1995/96, 1996/97 and 1997/98 in seven provinces. Those who are most likely to be hospitalized are

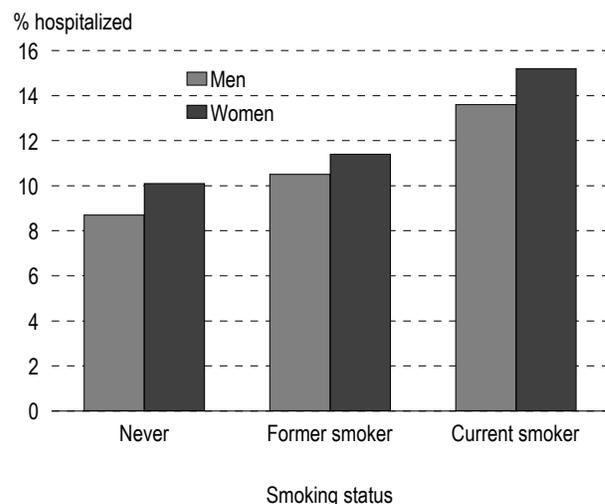
older people and the chronically ill. They are more likely to be men with confounding socioeconomic factors such as lower income and education levels and a higher prevalence of risk factors.

In addition to socioeconomic status (discussed later), factors that predict hospitalization included the following:

- **Smoking.** Age-adjusted percentages show that current smokers (14.7%, 95% confidence interval 13.0-16.3) were admitted to hospital more than those who never smoked (9.8%, 95% confidence interval 8.6-11.0) and more than former smokers (11.3%, 95% confidence interval 10.1-12.5) (Chart 1) (see *Health status and health behaviours*). This substantial effect of current smoking on the risk of hospitalization was similar for women and men (Table 6). This age- and sex-adjusted analysis also shows that former smokers had lower odds of hospitalization than current smokers, providing further evidence of the value of smoking cessation for improving subsequent health.

Some evidence suggests that statistical analyses may overestimate the impact of smoking by failing to control for competing risk factors.⁷ For example, some of the difference between smokers and non-

Chart 1
Age-adjusted percentage of household population aged 25 or older in 1994/95 who were hospitalized at least once in next 30 months, by smoking status and sex, seven provinces[†]



Data source: 1994/95 National Population Health Survey Share file linked with Hospital Morbidity files for 1994/95 to 1997/98

Note: Excludes pregnancy-related hospitalizations.

[†] Excludes Newfoundland, Québec and Manitoba.

Table 6
Age- and sex-adjusted odds ratios for hospitalization in next 30 months, household population aged 25 or older in 1994/95, by selected characteristics, seven provinces[†]

| | Both sexes (sex-age-adjusted) | | Men (age-adjusted) | | Women (age-adjusted) | |
|--|-------------------------------|-------------------------|--------------------|-------------------------|----------------------|-------------------------|
| | Odds ratio | 95% confidence interval | Odds ratio | 95% confidence interval | Odds ratio | 95% confidence interval |
| Household income | | | | | | |
| Lowest | 1.41* | 1.06, 1.87 | 1.33 | 0.85, 2.06 | 1.52 * | 1.03, 2.25 |
| Lower-middle | 1.31* | 1.03, 1.68 | 1.18 | 0.81, 1.72 | 1.41 | 0.99, 1.99 |
| Upper-middle | 1.36* | 1.07, 1.73 | 1.33 | 0.94, 1.89 | 1.38 | 0.96, 1.97 |
| Highest [‡] | 1.00 | ... | 1.00 | ... | 1.00 | ... |
| Educational attainment | | | | | | |
| Less than secondary | 1.57* | 1.26, 1.96 | 1.49 * | 1.08, 2.04 | 1.71 * | 1.27, 2.31 |
| Secondary school graduation | 1.34 | 0.99, 1.80 | 1.08 | 0.70, 1.67 | 1.61 * | 1.08, 2.38 |
| Some postsecondary | 1.23 | 0.98, 1.54 | 0.99 | 0.70, 1.41 | 1.50 * | 1.12, 2.00 |
| Postsecondary graduation [‡] | 1.00 | ... | 1.00 | ... | 1.00 | ... |
| Health status and health care use | | | | | | |
| One or more disability days [§] | 1.68* | 1.36, 2.06 | 1.64 * | 1.19, 2.26 | 1.65 * | 1.27, 2.16 |
| Pain and discomfort [§] | 1.44* | 1.12, 1.85 | 1.27 | 0.83, 1.96 | 1.49 * | 1.09, 2.04 |
| Overnight hospital stay [§] | 2.23* | 1.81, 2.76 | 3.95 * | 2.83, 5.50 | 2.06 * | 1.57, 2.70 |
| Weight | | | | | | |
| Insufficient | 1.02 | 0.74, 1.39 | 1.24 | 0.68, 2.24 | 1.01 | 0.69, 1.47 |
| Overweight | 1.29* | 1.08, 1.53 | 1.07 | 0.82, 1.41 | 1.55 * | 1.24, 1.94 |
| Acceptable [‡] | 1.00 | ... | 1.00 | ... | 1.00 | ... |
| Type of smoker | | | | | | |
| Current smoker | 1.73* | 1.41, 2.11 | 1.68 * | 1.18, 2.40 | 1.72 * | 1.32, 2.23 |
| Former smoker | 1.25* | 1.03, 1.52 | 1.28 | 0.93, 1.78 | 1.10 | 0.85, 1.43 |
| Non-smoker [‡] | 1.00 | ... | 1.00 | ... | 1.00 | ... |
| Daily cigarette consumption | | | | | | |
| 1-24 | 1.48* | 1.20, 1.82 | 1.42 | 0.98, 2.07 | 1.53 * | 1.18, 2.00 |
| 25+ | 2.10* | 1.61, 2.73 | 1.88 * | 1.29, 2.75 | 2.48 * | 1.68, 3.66 |
| None [‡] | 1.00 | ... | 1.00 | ... | 1.00 | ... |
| Type of drinker | | | | | | |
| Daily drinker | 0.86 | 0.65, 1.13 | 0.88 | 0.48, 1.62 | 0.85 | 0.61, 1.18 |
| Occasional drinker | 0.97 | 0.69, 1.35 | 1.08 | 0.52, 2.23 | 0.86 | 0.60, 1.24 |
| Former drinker | 1.14 | 0.85, 1.54 | 1.42 | 0.74, 2.70 | 0.97 | 0.69, 1.36 |
| Abstainer [‡] | 1.00 | ... | 1.00 | ... | 1.00 | ... |
| Alcohol consumption | | | | | | |
| Heavy | 0.26* | 0.12, 0.55 | 0.25 * | 0.11, 0.59 | 0.11 | 0.00, >99.00 |
| Light | 0.83 | 0.69, 1.00 | 0.74 | 0.54, 1.02 | 0.88 | 0.69, 1.12 |
| Non-drinker [‡] | 1.00 | ... | 1.00 | ... | 1.00 | ... |
| Physical activity | | | | | | |
| Active [§] | 0.77* | 0.64, 0.92 | 0.78 * | 0.62, 0.99 | 0.70 * | 0.56, 0.88 |
| Daily [§] | 0.88 | 0.74, 1.05 | 0.91 | 0.70, 1.21 | 0.82 | 0.65, 1.04 |
| Psychosocial status | | | | | | |
| Depression [§] | 1.74* | 1.23, 2.46 | 1.09 | 0.56, 2.11 | 1.99 * | 1.31, 3.05 |
| Work stress [§] | 1.00 | 1.00, 1.01 | 1.00 | 0.99, 1.00 | 1.01 | 1.00, 1.01 |
| No social support [§] | 1.14 | 0.90, 1.43 | 0.98 | 0.71, 1.34 | 1.31 | 0.94, 1.81 |
| No recent life events [§] | 0.75* | 0.62, 0.91 | 0.72 * | 0.54, 0.97 | 0.77 * | 0.61, 0.98 |
| Stress [§] | 1.40* | 1.12, 1.75 | 1.09 | 0.75, 1.59 | 1.59 * | 1.18, 2.15 |
| Chronic conditions | | | | | | |
| High blood pressure [§] | 1.38* | 1.14, 1.68 | 1.47 * | 1.08, 2.00 | 1.37 * | 1.08, 1.76 |
| Diabetes [§] | 1.40* | 1.01, 1.93 | 1.46 | 0.92, 2.31 | 1.31 | 0.80, 2.14 |
| Heart disease [§] | 1.81* | 1.45, 2.27 | 2.06 * | 1.45, 2.91 | 1.53 * | 1.12, 2.09 |
| Asthma [§] | 1.86* | 1.36, 2.56 | 1.18 | 0.66, 2.10 | 2.50 * | 1.72, 3.63 |
| Cancer [§] | 1.66* | 1.13, 2.44 | 1.76 | 0.91, 3.42 | 1.54 | 0.96, 2.48 |
| Effects of a stroke [§] | 2.14* | 1.28, 3.55 | 1.30 | 0.56, 3.02 | 3.36 * | 1.67, 6.77 |
| No long-term condition [§] | 0.57* | 0.46, 0.71 | 0.52 * | 0.38, 0.72 | 0.62 * | 0.47, 0.82 |

Data source: 1994/95 National Population Health Survey share file linked with Hospital Morbidity files for 1994/95 to 1997/98

Note: Excludes pregnancy-related hospitalizations.

† Excludes Newfoundland, Québec and Manitoba.

‡ Reference category for which odds ratio is always 1.00

§ Reference category is absence of characteristic or condition.

* $p \leq 0.05$

smokers may be attributable to their occupational and social groups, which tend to be correlated with smoking habits.⁷ However, even when other risk factors were added to the model, those smoking 25 or more cigarettes per day were found to have higher odds of hospitalization (odds of 2.0 for those smoking 25 or more cigarettes per day, 95% confidence interval 1.5-2.6) (Table 7). Also, the odds of hospitalization increased with the number of cigarettes smoked per day for both males and females.

• **Physical activity and weight.** When adjusted by age and sex, physically inactive women and men were more likely to be hospitalized than those who were active (12.3% versus 10.0%, $p < 0.01$). This relationship was more apparent for women who were overweight and less active (Table 6). When other risk factors were added to the model, the results for women remained statistically significant for those who were overweight (Table 7). For both sexes together, when other risk factors were added, exercise and being overweight were statistically significant.

Table 7

Adjusted odds ratios for hospitalization in next 30 months, household population aged 25 or older in 1994/95, by selected characteristics, seven provinces[†]

| | Both sexes (including all risk factors in model) | | Both sexes (excluding smoking and alcohol consumption from model) | | Both sexes (excluding alcohol consumption from model) | | Men (including all risk factors in model) | | Women (including all risk factors in model) | |
|---------------------------------------|---|-------------------------------|---|-------------------------------|--|-------------------------------|--|-------------------------------|--|-------------------------------|
| | Odds ratio | 95% confidence interval | Odds ratio | 95% confidence interval | Odds ratio | 95% confidence interval | Odds ratio | 95% confidence interval | Odds ratio | 95% confidence interval |
| Sex[‡] | 0.97 | 0.81, 1.16 | 0.97 | 0.82, 1.16 | 0.94 | 0.79, 1.12 | ... | ... | ... | ... |
| Age | 1.04* | 1.03, 1.05 | 1.04* | 1.03, 1.04 | 1.04* | 1.03, 1.05 | 1.05* | 1.04, 1.06 | 1.03* | 1.03, 1.04 |
| Household income | | | | | | | | | | |
| Lowest | 1.19 | 0.87, 1.63 | 1.32 | 0.96, 1.80 | 1.22 | 0.90, 1.66 | 1.16 | 0.74, 1.81 | 1.27 | 0.82, 1.98 |
| Middle | 1.20 | 0.95, 1.54 | 1.25 | 0.98, 1.59 | 1.21 | 0.95, 1.54 | 1.11 | 0.77, 1.59 | 1.28 | 0.88, 1.85 |
| High [§] | 1.00 | ... | 1.00 | ... | 1.00 | ... | 1.00 | ... | 1.00 | ... |
| Educational attainment | | | | | | | | | | |
| Less than secondary | 1.36* | 1.07, 1.74 | 1.47* | 1.16, 1.87 | 1.39* | 1.10, 1.77 | 1.41 | 1.00, 1.99 | 1.37 | 0.99, 1.90 |
| Secondary graduation | 1.26 | 0.92, 1.73 | 1.31 | 0.96, 1.80 | 1.27 | 0.93, 1.74 | 1.09 | 0.70, 1.70 | 1.39 | 0.91, 2.13 |
| Some postsecondary | 1.15 | 0.91, 1.47 | 1.20 | 0.94, 1.52 | 1.16 | 0.92, 1.47 | 0.95 | 0.67, 1.36 | 1.37* | 1.01, 1.86 |
| Postsecondary graduation [§] | 1.00 | ... | 1.00 | ... | 1.00 | ... | 1.00 | ... | 1.00 | ... |
| Body weight | | | | | | | | | | |
| Insufficient | 0.86 | 0.61, 1.22 | 0.91 | 0.65, 1.29 | 0.88 | 0.62, 1.25 | 0.83 | 0.41, 1.66 | 0.93 | 0.63, 1.39 |
| Overweight | 1.23* | 1.04, 1.47 | 1.24* | 1.04, 1.47 | 1.25* | 1.05, 1.49 | 1.03 | 0.78, 1.37 | 1.48* | 1.17, 1.86 |
| Acceptable [§] | 1.00 | ... | 1.00 | ... | 1.00 | ... | 1.00 | ... | 1.00 | ... |
| Physical activity | | | | | | | | | | |
| Active ^{††} | 0.81* | 0.69, 0.97 | 0.80* | 0.67, 0.95 | 0.81* | 0.68, 0.97 | 0.82 | 0.64, 1.05 | 0.81 | 0.63, 1.04 |
| Daily cigarette consumption | | | | | | | | | | |
| None [§] | 1.00 | ... | ... | ... | 1.00 | ... | 1.00 | ... | 1.00 | ... |
| 1-24 | 1.42* | 1.14, 1.77 | ... | ... | 1.41* | 1.13, 1.75 | 1.38 | 0.93, 2.04 | 1.45* | 1.08, 1.94 |
| 25+ | 1.99* | 1.51, 2.62 | ... | ... | 1.90* | 1.45, 2.49 | 1.86* | 1.25, 2.76 | 2.21* | 1.46, 3.33 |
| Alcohol consumption | | | | | | | | | | |
| Heavy | 0.22* | 0.10, 0.54 | ... | ... | ... | ... | 0.21* | 0.08, 0.55 | 0.11 | 0.00, >99.00 |
| Light | 0.84 | 0.69, 1.03 | ... | ... | ... | ... | 0.70* | 0.50, 0.98 | 0.94 | 0.73, 1.21 |
| Non-drinker [§] | 1.00 | ... | ... | ... | ... | ... | 1.00 | ... | 1.00 | ... |

Data source: 1994/95 National Population Health Survey share file linked with Hospital Morbidity files for 1994/95 to 1997/98

Note: Excludes pregnancy-related hospitalizations.

[†] Excludes Newfoundland, Québec and Manitoba.

[‡] Reference category is men.

[§] Reference category for which odd ratio is always 1.00

^{††} Reference category is absence of characteristic.

... Not applicable

* $p \leq 0.05$

• **Alcohol consumption.** In this study, age-adjusted percentages showed that non-drinkers (13.1%, 95% confidence interval 11.4-14.9) were hospitalized at almost double the rate of heavy drinkers (7.3%, 95% confidence interval 3.9-10.7). However, daily but not heavy drinkers also had higher levels of hospitalization. When age was taken into account, male heavy drinkers had significantly lower odds of being hospitalized than non-drinkers. The results remained statistically significant when adjusted for other risk factors (Table 7).

The much higher rate of hospitalization among non-drinkers when compared with occasional and heavy drinkers can possibly be explained by confounding risk factors. For example, individuals suffering from pre-existing chronic conditions or illnesses requiring prescription drug therapy may be

prohibited from consuming alcoholic beverages. Some studies have found that heavy drinkers are not necessarily more likely to use more health services in comparison with light drinkers. This may be because heavy drinkers often fail to seek care for their health problems.^{8,9}

• **Depression.** Women with depression were more likely to be hospitalized than were those without depression (age-adjusted 18.7% versus 11.5%, $p < 0.01$). This relationship was not found for men (see *Psychosocial characteristics*).

• **Chronic conditions.** As expected, those without any long term chronic conditions—including high blood pressure, diabetes, asthma and stroke—are less likely to go to the hospital (age- and sex-adjusted 8.1% versus 13.1%, $p < 0.01$). Women with depression, asthma, stroke or high

Health status and health behaviours

General health was assessed with the question, "In general, would you say your health is: excellent, very good, good, fair, poor?"

Chronic conditions: Respondents to the NPHS were asked whether they had "long-term conditions that have lasted or are expected to last six months or more and that have been diagnosed by a health professional." The interviewer read a list of conditions. Those included in this analysis are: high blood pressure, diabetes, asthma, arthritis or rheumatism, back problems, chronic bronchitis or emphysema, heart disease, cancer, effects of stroke, urinary incontinence, cataracts, glaucoma, migraine headaches, sinusitis, epilepsy, stomach and intestinal ulcers.

Type of smoker was defined as: current smoker—current daily or occasional smoker; former smoker—former daily smoker or former occasional smoker; and never smoker—never smoked.

Daily cigarette consumption was defined as: 1 to 24 cigarettes—current daily smoker and 1 to 24 cigarettes a day; 25 and more—current daily smoker at least 25 or more cigarettes each day; never or former smoker—current occasionally or never smoked.

Type of drinker was defined as: regular drinker—a drink at least once a month; occasional drinker—less than one drink a month; former drinker—did not have a drink in last 12 months; and abstainer (never drank). In the regression, regular or occasional drinkers were compared with non-drinkers and abstainers.

Alcohol consumption was defined as: heavy drinker—drink daily with three or more drinks a day; light drinker—drink daily but less than three drinks a day or occasional drinker; non drinker—did not have a drink during the past 12 months or never drank.

Physical activity was from the Physical Activity Index. It was categorized as:

Active: Those who averaged 1.5 or more kilocalories per day.

Inactive: Those with an energy expenditure below 1.5 kcal/kg/day.

Daily exercise was based on the monthly frequency of physical activities lasting more than 15 minutes.

Daily: 30 or more times per month.

Not daily: less than 30 times per month.

To measure the occurrence of *injuries*, respondents were asked: "In the past 12 months, did you have any injuries that were serious enough to limit your normal activities?"

Body weight was calculated for persons aged 15 to 49, excluding pregnant women, using the following formula: Body Mass Index (BMI) = weight (kg)/squared height (metres). The four body mass categories were defined as: insufficient weight, BMI less than 20; acceptable weight, BMI 20 to 24.9; some excess weight, BMI 25 to 27; overweight, BMI greater than 27. In the regression, acceptable weight was compared with some excess weight and overweight.

blood pressure were more likely to be hospitalized; men with heart disease and high blood pressure were more likely to be hospitalized (Table 6).

- Believing oneself to be in good health was associated with not going to hospital.

Dissatisfaction is increasing

The proportion of Canadians who said that they needed health care but did not receive it rose from 4% in 1994/95 to 6% in 1998/99. Although this incremental change appears small, from a public health perspective a small shift in prevalence over the entire population has a greater effect than a large change made on a small percentage of the population.¹⁰ It represents the difference between 1.1 million people in 1994/95 and 1.5 million in

1998/99. The perception of an unmet need was higher among females (7%) than males (5%).

An important question is whether the additional number of people with unmet needs represents a subset of the population who continually have unmet needs, or whether the composition of the population with unmet needs is changing over time.

By using the longitudinal NPHS file it is possible to examine the distribution of the population that reported they needed health care but did not receive it in 1994/95, 1996/97 and 1998/99. Among the subset of the total population (4%) that had unmet needs in 1994/95, about 7% had unmet needs in all three surveys, and 70% had unmet needs only in the first survey. The remainder (23%) reported unmet needs once or twice over the three survey periods. However, a limitation of this interpretation is that it is not possible to know whether the unmet needs change over time or whether the same need is being unmet. In addition, since the unmet needs are based on self-reports, it is not possible to judge the severity of the unmet need. Dissatisfaction may range from minimal to substantial.

In summary, in the total population, 79% do not report unmet needs over all three surveys. About 19% report an unmet need one time, and the remaining 2% report unmet needs at two or more survey points.

Psychosocial characteristics

No recent negative life events was measured in two categories by an adjusted recent life events index (0 versus 1-10). Recent negative life events include physical abuse, unwanted pregnancy, abortion or miscarriage, major financial difficulties, and serious problems at work or in school.

Social support was defined from a perceived social support index. It is composed of four items that reflect whether respondents feel that they have someone they can confide in, someone they can count on, someone who can give them advice and someone who makes them feel loved. A high score indicates greater perceived social support.

Stress was measured in two categories from the General Chronic Stress Index. This general stress index is composed of items that are relevant to all respondents. The stressors include activity overload, financial difficulties and problems with relationships. Scores of 4 to 11 were compared with scores of 0 to 3.

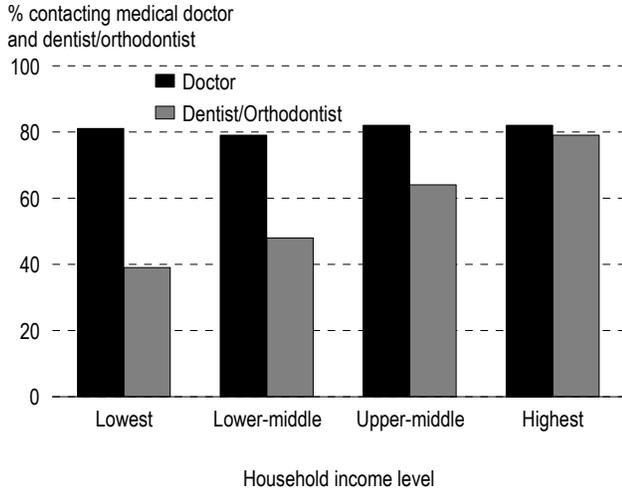
Using the methodology of Kessler et al.,¹¹ the NPHS identifies a major depressive episode (MDE) with a subset of questions from the Composite International Diagnostic Interview. These questions cover a cluster of symptoms for depressive disorder, which are listed in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM III-R).¹² Responses to these questions were scored on a scale and transformed into a probability estimate of a diagnosis of MDE. If this estimate was 0.9, that is, 90% certainty of a positive diagnosis, then the respondent was considered to have experienced depression in the previous 12 months.

Socioeconomic differences and disparities

Due to universal coverage for medically needed services, there was no substantive difference between household income groups in whether or not they had contacted any physician (Table 1). At the same time, individuals in lower income groups were much more likely to be heavy users of physician services. Among persons in the lowest income group, 17% contacted a physician 10 or more times, compared with 8% of the highest income group.

In contrast to physician contact, there was a large socioeconomic gradient in dental care use by household income level (see *Socioeconomic characteristics*). In the lowest income households, 39% of the population had contacted a dentist in the past year, compared with 79% of the highest income

Chart 2
Age-adjusted percentage of household population aged 12 or older who contacted medical doctor and dentist/orthodontist in past 12 months, by household income level, Canada excluding territories, 1998/99



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

level, a difference of 40 percentage points (Table 2). The association between income and contact with a dentist is much more pronounced than the association between income and contacts with a medical doctor (Chart 2). This difference reflects the fact that under the Canada Health Act physician services are viewed as medically necessary, while dental services are not.

Between 1994/95 and 1998/99, the proportion of the population who had contacted a dentist increased from 56% to 60%. The increase is apparent by sex, rural/urban residence, and province. However, contact rates within income groups remained relatively stable during the period. Increases in rates that did occur tended to occur in the upper household income groups, with the result that in 1998/99, the disparity between the lowest income group and the highest increased. In 1994/95, the difference in contact rates between the lowest household income group and the highest was 35 percentage points (39% compared with 76%), while in 1998/99, the difference reached 40 percentage points (39% compared with 79%).

Dental insurance coverage is also strongly associated with household income (Table 3). At the highest income level, the rate was over twice that for the lowest (78% compared with 30%).

Canadians in higher income levels are more likely to use chiropractors and alternative health practitioners than are people with lower income levels. Between 1994/95 and 1998/99, the prevalence rates for alternative practitioner use increased in all household income groups, with the result that the disparity in alternative practitioner use between the lowest and highest income group increased. In 1994/95, about 4% of the lowest household income group and 6% of the highest income group used an alternative practitioner. In 1998/99, the corresponding rates were 6% and 10%.

As household income rose, the proportion of the population that used multiple medications declined. In the lowest income group, 16% used multiple medications, compared with 10% of the highest income group.

Although there is no gradient in utilization by income levels, people in the lowest income level had higher odds of using government-funded home

Socioeconomic characteristics

Lives alone was defined as:

Lives alone (size of household = 1).

Not alone (size of household greater than 1).

Household income level was calculated by taking into account both household income and the number of people in the household.

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

care, compared with those in the highest income group.

The NPHS showed an inverse gradient in the use of hospital services by household income. In 1998/99, 12% of people in the lowest income group were hospitalized in the previous year, compared with 7% of the upper-middle income group and 5% of the highest income group. The disparity between the lowest and highest income groups increased from 1994/95 (5%) to 1998/99 (7%). People in lower income groups were also more likely to be hospitalized for three or more days—8% in the lowest income group and 3% in the highest income group.

The 1996/97 NPHS also showed an inverse association between emergency department use and household income level. Among people in the lowest income group, 24% had contacted a hospital

emergency department, compared with 19% in the highest income group.

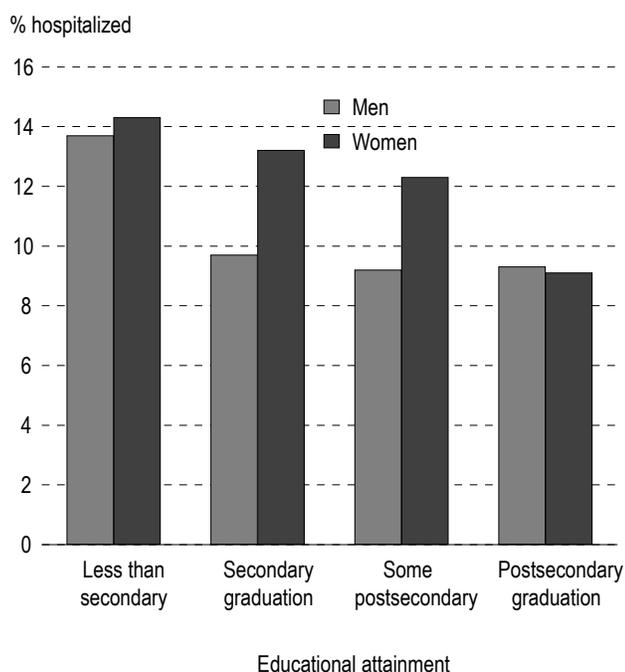
People in the lowest income levels were (10%) more likely to state they had not received care when they needed it.

After linking 1994/95 NPHS and hospital data, a clear relationship emerges between socioeconomic conditions (measured by income and education levels) and hospitalization.

Age-adjusted percentages show more men and women in the lowest income level (12.9%) were hospitalized, compared with the highest income group (8.5%, $p=0.03$). There was a definite relationship between income and hospital utilization. Those with lower incomes still had higher odds of going to the hospital than those with the highest incomes (Table 6). However, when risk factors were added to the model, the results for income were not statistically significant (Table 7). This is likely due to the correlation of risk factors with socioeconomic status.

Men and women with less than secondary education (13.8%, 95% confidence interval 12.0-15.6) were more likely to be hospitalized than were their counterparts with college or university education (9.3%, 95% confidence interval 9.7-10.7). There is a clear relationship between education level and hospital utilization, with persons with lower levels of education using more hospital services than those with high school education and above (Chart 3). When adjustments for age and sex were made, those with the lowest education still had higher odds of hospitalization (Table 6). If one adjusts for risk factors as well, education was still significant (Table 7). If smoking and alcohol consumption are removed from this model, the importance of education on future hospitalization increases. This is a reflection of the fact that the effect of education on hospitalization is moderated by the correlation between risk factors and socioeconomic status.

Chart 3
Age-adjusted percentage of household population aged 25 or older in 1994/95 who were hospitalized at least once in next 30 months, by educational attainment and sex, seven provinces†



Data source: 1994/95 National Population Health Survey Share file linked with Hospital Morbidity files for 1994/95 to 1997/98

Note: Excludes pregnancy-related hospitalizations.

† Excludes Newfoundland, Québec and Manitoba.

Concluding remarks

To a large extent, Canada's universal medical care system has ensured equitable access to medical and hospital services, but not necessarily to good health. Canadians living in low-income situations are more

likely than those with higher incomes to be heavy users of physician services and emergency department visits, to be admitted to hospital, to take multiple medications and to require home care services. People with less than secondary education (especially women) are almost twice as likely to be hospitalized. These are all indications of poorer health status among low-income Canadians.

Significant inequities exist in access to health services (dental care, for example) that are not covered by Canada's medical insurance plan. This is a reflection of the uneven distribution of insurance for these services among the population. For example, youth, older Canadians and low-income Canadians are less likely to have coverage for dental care and prescription drugs. The high coverage among the middle age groups may reflect benefits offered through employment. These inequities persist despite the increase in coverage in most provinces for prescription drug and dental insurance.

Increases in unfulfilled health care needs may reflect growing public dissatisfaction with longer waiting times for treatment.

The use of home care is likely under-reported due to a non-standard understanding of what home care is. Increases in home care use are likely related to the trend to shift care into the community and the aging of the population. At the same time, the majority of informal care is provided by family members, friends and neighbours.¹⁰ The aging of the population and corresponding increase in chronic illnesses that are best treated at home, and advances in drug and other therapies that have made it possible for people to leave hospital earlier, suggest that the need for effective home care services will increase in the next 20 years.

The likelihood of going to hospital increases with age, having a lower income, having less than a secondary education, believing oneself to be in poor health and being a smoker, physically inactive, overweight and a non-drinker. People with health problems including depression, high blood pressure, diabetes, heart disease, stroke and asthma are also more likely to be hospitalized.

Gender differences in hospitalization related to

smoking are worthy of further study. For example, some past studies have shown smaller relative risks of hospitalization for female smokers than male smokers.¹³ The smaller relative risks observed for female smokers were attributed to lower average exposure due to later age at smoking initiation and fewer packs smoked per day for females.¹⁴

This pattern may have held true in the past. However, differences between men's and women's smoking habits have diminished over time.¹⁴ Teenage girls now smoke more than teenage boys—a trend that is likely to have significant long-term effects on disease, hospitalization and life expectancy patterns among women in Canada. ●

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