

C Characteristics of hospital users

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Abstract

Objectives

For people living in the community, this article explores selected health problems and personal characteristics that are associated with having been hospitalized.

Data source

The data, collected from a sample of people aged 15 and over living in 27,263 households in the 10 provinces, are from the household component of the 1994/95 National Population Health Survey.

Analytical techniques

Bivariate and multiple regression analyses were used to determine associations between hospitalization and chronic health problems, demographic characteristics, health-related behaviours, and socioeconomic status.

Main results

Having cancer or a long-term disability was strongly associated with hospitalization throughout adulthood. Among women under age 65, the odds of hospitalization were higher among those with inadequate income than among those with adequate income, even after controlling for differences in health status.

Key words

hospitalization, health services needs, chronic disease, socioeconomic status, health surveys

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In recent years, fiscal restraint at all levels of government, coupled with health reform measures, has changed the way health care is provided to the Canadian public. Tighter health care budgets have meant a steady decline in rates of hospitalization and shorter hospital stays.^{1,2} Nonetheless, the hospital sector continues to consume a considerable proportion of total health care expenditures. In 1993, an estimated \$26.1 billion was spent on hospital care. This represented 36% of the total direct costs of health care that year.³

According to the 1994/95 National Population Health Survey (NPHS), 2.2 million Canadians aged 15 and older (who do not reside in institutions) spent at least one night in a hospital, nursing home, or convalescent home during the 12-month period before the NPHS. (For ease of reference, hospitals, nursing homes, and convalescent homes are referred to collectively as "hospitals" in this article.) If the characteristics of people who are most at risk of being hospitalized are identified, programs that seek to reduce the demand for hospitalization can be rationally directed toward them. This article explores selected health problems and personal characteristics that are associated with hospitalization.

Methods

Data source

The data used in this article are from the household component of the 1994/95 National Population Health Survey (NPHS).⁴ The NPHS non-institutional sample comprised 27,263 households. Within each household, a knowledgeable person provided information regarding the health of each household member. In addition, a randomly selected household member provided in-depth information on their own health. (The individual providing the latter information may not have been the same person who provided the information about each household member.) The survey response rate (the proportion of selected households in which agreement to participate was obtained, including households later rejected for sampling reasons) was 88.7%. Among the randomly selected household members, the response rate was 96.1%.

NPHS data on hospitalization were 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.

Informed by the framework of Andersen and Newman, the variables selected in relation to hospitalization included indicators of illness such as self-perceived general health, chronic diseases, long-term disability, the occurrence of injury serious enough to limit regular activities, and body mass index. The selected variables considered to predispose people to hospitalization included age, sex and marital status. In addition, specific health-related behaviours, including smoking, alcohol use and recreational physical activity, were considered as predisposing factors. The selected enabling factors included educational attainment and household income adequacy (see *Definitions*).

According to Andersen and Newman, having a high income enables health services use. This view of income as an enabling factor is more appropriate in the context of the American health care system than it is for Canada. Nonetheless, income remains strongly and inversely linked to the health *status* of Canadians, and health care is a determinant of health status. Therefore, a key issue in this analysis is the relationship between income and hospitalization—an aspect of health care.

Information on hospitalization, chronic diseases, disability, living arrangements, educational attainment, and income was provided by one respondent on behalf of all household members. The more in-depth, health-related data pertaining to the occurrence of disabling

injury within the 12-month period before the survey—general health, recreational physical activity, height and weight, tobacco and alcohol use—were usually provided by non-proxy interview from a randomly selected household member only.

Analytical techniques

Logistic regression was used to determine the direction and strength of association between hospitalization during the previous 12 months and the selected variables. Preliminary investigations indicated that the variables associated with hospitalization differ between the sexes and at different ages. Therefore, separate analyses were performed for men and women and for the age groups 15 to 39, 40 to 64, and 65 and older. Each regression was weighted using survey weights rescaled to sum to the sample size.

All prevalence estimates are based on data that were weighted to the age- and sex-structure of the 1994/95 population.

Limitations

The data analyzed in this study are cross-sectional. Consequently, causality cannot be inferred from the relationships observed between variables.

The data that were collected by self- or proxy-report are subject to reporting error. In an effort to minimize this error in data related to chronic conditions, respondents were instructed to report only those conditions that were "diagnosed by a health professional."

The NPHS data used in this analysis were collected from people residing in the community. Although the percentage of the population living in institutions such as long-term care facilities is quite small (1% overall, and 5% of people aged 65 and older),⁵ the characteristics of the institutionalized population may differ from those of the community-dwelling population in ways that would affect the outcomes of the analysis if the former were included. Therefore, the findings are generalizable only to people living in the community.

The results reported in this article are somewhat limited by selection bias. For example, information about some hospital users was not collected because they live alone and were hospitalized at the time of the survey. Others had been in hospital during the previous 12 months but had since died. To the extent that the characteristics associated with hospitalization differ between the people who were surveyed and the entire population of hospital users, the results of the regression analyses are biased.

To identify these characteristics, some previous research has focused on the impact of specific health problems, such as headaches and musculoskeletal disorders.^{6,7} Other researchers studied the independent effects of age and illness severity on hospital admission.⁸

This article employs an approach to the determinants of hospitalization based on a framework specified by Andersen and Newman.⁹ Their framework is comprised of societal, systemic (in relation to the organization of health care), and individual dimensions. The individual dimension, the area of investigation in this article, is divided into three groups of determinants: illness, predisposing factors (e.g., age), and enabling factors (e.g., education).

Using data from the 1994/95 NPHS, this article examines the contribution of specific illness factors, including chronic diseases and other health problems, to hospitalization, as well as the extent to which selected predisposing and enabling factors, particularly socioeconomic status, are associated with hospitalization once differences in health status are taken into account (see *Methods*).

In addition to the NPHS, information on hospital utilization is available from other data bases developed and maintained by Statistics Canada (see *Administrative data*). Research based on these sources has previously been published in **Health Reports**. For example, administrative data were used to examine hospital separations attributed to specific diagnoses.¹⁰ Person-oriented data—sets of administrative records that are linked by patient—were used to investigate the number of people hospitalized by diagnosis.¹¹

One of the strengths of these administrative data bases is their completeness, but they provide little information about the personal attributes of patients. The NPHS, however, includes wide-ranging data on the characteristics of respondents, and thus, makes possible the research presented in this article.

Administrative data

Hospital separation statistics derived from Statistics Canada's Hospital Morbidity Data Base offer a different view of hospital utilization from the one presented in this article. For example, according to NPHS data, of selected self-reported chronic conditions, odds ratios for having been hospitalized were consistently high for people with cancer relative to those without. However, according to administrative data, of the leading diagnoses responsible for hospital stays, neoplasms (cancer) ranked fifth for men and for women (see table below). This difference is partly explained by the nature of administrative data, which include statistics on all conditions (acute as well as chronic) for which people are hospitalized.

Although the NPHS and the Hospital Morbidity Data Base both contain information on hospital utilization, there are several notable differences. For instance, each record in the administrative data base pertains to a hospital separation, but each record in the NPHS refers to an individual. Also, hospital separation records include the diagnosis responsible for the hospital stay, whereas this information was not collected by the NPHS. Information on the health of NPHS respondents, including the presence of selected chronic conditions and injuries, was collected, but it is unknown whether these conditions were directly associated with a reported hospital stay. The Hospital Morbidity Data Base is considered complete, whereas the NPHS collected data from randomly selected households. In addition, data from administrative records contain information about all people hospitalized regardless of their place of residence. Thus, the Hospital Morbidity Data Base covers people living in the community and in long-term care institutions. By contrast, the household component of the NPHS pertains exclusively to people living in households.

Hospital separations, by sex and responsible diagnosis, population aged 15 and older, Canada, 1994

Males – all diagnoses	1,242,404
Diseases of the circulatory system	259,805
Diseases of the digestive system	172,763
Injury and poisoning	126,633
Diseases of the respiratory system	109,326
Neoplasms	106,701
Mental disorders	78,222
All other diagnoses	388,954
Females – all diagnoses	1,855,969
Complications of pregnancy, childbirth, and the puerperium	500,074
Diseases of the circulatory system	205,324
Diseases of the digestive system	185,856
Diseases of the genitourinary system	138,088
Neoplasms	127,991
Injury and poisoning	114,385
All other diagnoses	584,251

Data source: Hospital Morbidity Data Base

Note: The diagnosis categories used correspond to ICD-9 chapters.

Strong links with cancer

Not surprisingly, being in fair or poor health (as reported to the NPHS by self-assessment) was significantly associated with hospitalization in all age groups and for both sexes. Not only does this result attest to the value of this single questionnaire item as an effective and efficient means of assessing health, it is also consistent with the findings of other studies that have shown self-rated health to be associated with various measures of health status.^{12,13}

Among the selected illness factors, the relationship between hospitalization and cancer was particularly strong. Nearly four out of every ten people who reported they had cancer had spent at least one night in the hospital during the 12 months before the NPHS (Table 1). For those with cancer relative to those without, the odds ratios for having been hospitalized (after the effects of other variables were controlled) were consistently elevated among all sex and age groups except young men (Table 2).

For men aged 15 to 39, the highest odds ratio was for those who reported having diabetes compared with those without. The odds of having been hospitalized for young men with diabetes were six times the odds for young men without this disorder, a finding that perhaps reflects the difficulty of controlling diabetes in this age group.

A relatively high percentage of people with heart disease were hospitalized: 24% for men and 33% for women aged 15 and older. While controlling for other factors, multivariate analysis revealed significantly high odds for hospitalization among men aged 40 to 64 with heart disease and for those with high blood pressure, compared with their counterparts without these diseases. High odds ratios for heart disease and for high blood pressure were also found among women aged 65 and older.

Allergies were significantly associated with hospitalization only among young adults (aged 15 to 39). Food allergies conferred odds of hospitalization that were about twice as high as among people in this age group without food allergies. Non-food allergies were statistically associated with hospitalization only in women.

For the effects of stroke and urinary incontinence, the proportions of affected people who were

hospitalized were high. Because of the small numbers of affected people still living in the community, reliable estimates of the proportions of people with these conditions who were hospitalized could only be calculated for women aged 15 and older. For urinary incontinence, the odds ratio was high among men aged 40 to 64. For effects of stroke, the odds ratio was significantly high among men 65 and older.

Small numbers also precluded the calculation of reliable estimates of the proportions of people with epilepsy who were hospitalized. Multivariate analysis, however, indicates that the odds of hospitalization were three times as high among women aged 15 to 39 and 40 to 64 who reported having epilepsy, compared with their counterparts without this condition.

The burden of arthritis/rheumatism, as a leading cause of disability, pain, activity restriction, dependency, diminished quality of life, and medical consultations is well documented.^{6,14,15} Despite its impact on other health care sectors, arthritis is usually not associated with admission to hospital. As expected, the proportions of people with arthritis/rheumatism who were hospitalized were lower than for many other chronic diseases. Multivariate analyses showed that arthritis/rheumatism was not significantly associated with hospitalization after controlling for the effects of other variables.

Among people aged 65 and over living in nursing homes and chronic care hospitals, arthritis/rheumatism is slightly *less* prevalent than it is among people the same age living in the community.⁵ It would appear that the health care needs of people with arthritis are being satisfied by informal and ambulatory care systems to the extent that they are largely able to continue living in the community and avoid hospitalization.

Hospitalization was positively and significantly related to activity-limiting injury and long-term disability for men and women in most age groups. However, despite some collinearity between the dichotomous variables (long-term disability and arthritis/rheumatism), exclusion of long-term disability from the regression analysis resulted in only

a slight increase in the odds ratio for arthritis/rheumatism, and not to the level of significance.

The association of body mass index (BMI) with hospitalization varied by sex and age group (see *Definitions*). In men aged 40 to 64 and women aged 65 and older, low BMI was positively related to overnight stay in hospital. This association may reflect the effects of illness or poor nutritional status in lowering body weight. As well, in older women, the odds of being hospitalized might be higher among those who are underweight because of a greater risk of bone fracture due to osteoporosis.¹⁶

An examination of the association between hospitalization and some predisposing factors, including sex, living arrangements and smoking,

Definitions

Body mass index: body weight (in kilograms) divided by the square of body height (in metres)

Appropriate: 20 to 27

Underweight: < 20

Overweight: > 27

Leisure physical activity level: energy expenditure (in kilocalories) divided by body weight (in kilograms) per day

Active: > 2.9

Moderate: 1.5 to 2.9

Inactive: < 1.5

Income adequacy: measure is based on income and household size (Tables 1 and 2)

Household size	Income adequacy	
	Inadequate	Adequate
1 or 2 people	< \$15,000	≥ \$15,000
3 or 4 people	< \$20,000	≥ \$20,000
5 or more people	< \$30,000	≥ \$30,000

Income groups used in univariate analysis (Chart 2 only)

Household size	Income adequacy group				
	Lowest	Lower-middle	Middle	Upper-middle	Highest
1 or 2 people	< \$10,000	\$10,000- \$14,999	\$15,000- \$29,999	\$30,000- \$59,999	> \$60,000
3 or 4 people	< \$10,000	\$10,000- \$19,999	\$20,000- \$39,999	\$40,000- \$79,999	> \$80,000
5 or more people	< \$15,000	\$15,000- \$29,999	\$30,000- \$59,999	\$60,000- \$79,999	> \$80,000

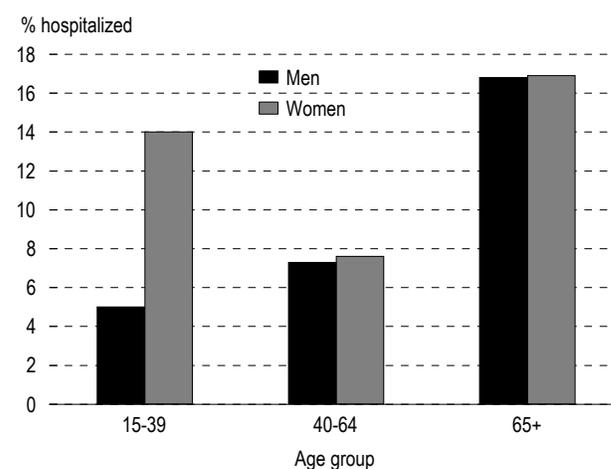
revealed surprisingly few patterns. Except in the childbearing age group (15 to 39), the percentages of women and men hospitalized were the same (Chart 1).^a Because the prevalence of many chronic diseases is higher in women than in men, this finding was unexpected.^{12,15}

Large differences in hospitalization rates were generally not observed by living arrangements (that is, living with or without a partner). The exception was women aged 15 to 39: of those who were living with a partner, 18% were hospitalized, compared with 10% of those living without a partner. The odds ratio for hospitalization among women living without a partner was also significantly low, presumably due to the greater frequency of hospital stays related to childbearing among women living with a spouse or partner.

No consistent association emerged in relation to smoking except in older adolescents and young adults. In the age group 15 to 39, higher proportions of current regular smokers were hospitalized than non-smokers or former and occasional smokers.

^a Of women aged 15 to 39, 7% had given birth within the year before the survey, an event for which the vast majority were hospitalized.

Chart 1
Percentage of people hospitalized in previous 12 months, by age group and sex, population aged 15 and older, all provinces, 1994/95



Data source: 1994/95 National Population Health Survey, household component (randomly selected respondents)

Note: All patients who stayed overnight in a hospital, nursing home or convalescent home are considered to have been hospitalized.

Table 1
 Percentage of people hospitalized in previous 12 months, by age group, sex and selected characteristics, all provinces, 1994/95

	Age group							
	Total 15+		15-39		40-64		65+	
	Men	Women	Men	Women	Men	Women	Men	Women
	%							
Total	7.4	12.1	5.0	14.0	7.3	7.6	16.8	16.9
Illness factors								
General health								
Excellent, very good, or good	5.9	10.3	4.6	13.1	5.7	5.4	13.0	12.5
Fair, poor	21.7	25.8	16.2	27.7	19.4	21.8	28.0	28.8
Chronic disease								
Alzheimer disease, other dementia	--	--	--	--	--	--	--	--
Arthritis/rheumatism	13.9	16.5	--	20.3	11.3	11.0	19.6	21.0
Asthma	11.2	17.5	--	18.6	--	13.5	--	--
Back problems excluding arthritis	12.3	17.5	11.0	20.1	11.6	12.1	18.0	23.5
Cancer	39.4	37.0	--	--	--	--	--	38.4
Cataracts	--	25.4	--	--	--	--	--	27.4
Chronic bronchitis, emphysema	16.4	22.3	--	24.1	--	--	--	29.6
Diabetes	20.8	21.0	--	--	--	--	24.5	24.6
Effects of stroke	--	35.0	--	--	--	--	--	--
Epilepsy	--	--	--	--	--	--	--	--
Food allergies	10.7	17.9	--	21.1	--	12.7	--	--
Glaucoma	--	--	--	--	--	--	--	--
Heart disease	24.0	32.6	--	--	25.8	29.6	22.1	35.3
High blood pressure	15.8	18.3	--	--	16.4	11.2	16.9	23.3
Migraine headaches	8.9	16.2	--	19.2	--	11.6	--	--
Non-food allergies	8.0	15.2	6.4	17.7	8.8	9.1	--	21.2
Stomach, intestinal ulcers	19.9	23.6	--	--	--	20.3	--	28.3
Urinary incontinence	--	25.2	--	--	--	--	--	--
Other health problems								
Activity-limiting injury	11.8	14.3	10.1	13.1	13.7	10.9	--	30.5
Long-term disability	18.8	23.8	14.1	24.8	18.9	19.3	24.6	28.9
Body mass index								
Appropriate	6.8	11.7	4.8	14.3	6.5	7.1	17.0	14.0
Underweight	8.4	11.7	--	10.5	--	--	--	26.8
Overweight	8.3	13.6	5.8	17.3	8.0	8.5	17.0	18.7
Unknown	--	--	--	--	--	--	--	--
Predisposing factors								
Living arrangements								
With partner	7.8	12.5	4.8	17.7	7.2	6.8	17.3	14.9
Not with partner	6.5	11.6	5.3	9.7	7.7	9.9	15.2	18.6
Physical activity								
Active	7.1	9.1	7.2	11.3	6.6	5.2	8.0	9.7
Moderate	8.5	10.3	6.4	11.6	9.5	7.2	14.8	14.1
Inactive	7.3	13.3	3.8	15.4	7.3	8.1	20.7	18.3
Unknown	--	--	--	--	--	--	--	--
Alcohol consumption								
≥ 1 drink/week	6.4	9.2	4.5	10.4	6.6	6.3	14.9	15.0
Some, but < 1 drink/week	6.8	12.0	4.5	14.6	6.9	6.2	17.6	15.7
None	11.2	15.3	8.1	16.2	10.5	11.6	18.5	18.5
Smoking								
Never	5.7	10.3	4.3	11.5	4.8	6.7	21.0	14.3
Former/occasional	8.7	13.2	4.5	14.7	8.6	7.9	16.1	20.8
Current regular	7.5	14.1	6.5	16.7	7.6	8.9	14.4	17.9
Enabling factors								
Household income								
Adequate	6.8	10.6	4.6	12.8	6.7	6.0	16.7	15.0
Inadequate	10.9	17.7	7.6	18.0	13.0	14.9	18.0	20.2
Unknown	--	--	--	--	--	--	--	--
Education								
Completed secondary school	6.3	11.7	5.0	14.1	6.4	7.0	14.8	16.3
Did not complete secondary school	9.8	13.2	5.1	13.4	9.8	9.2	18.7	17.4

Data source: 1994/95 National Population Health Survey, household component (randomly selected respondents)

-- Amount too small to be expressed.

Table 2
Odds ratios relating selected factors to hospitalization in previous 12 months, population aged 15 and older, by age group and sex, all provinces, 1994/95

	Age group					
	15-39		40-64		65+	
	Men	Women	Men	Women	Men	Women
Sample size	3,649	4,236	2,813	3,116	1,230	1,897
Illness factors						
General health						
<i>Excellent, very good, or good</i>	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Fair or poor	2.55**	1.73**	1.65*	2.23**	1.87**	1.50*
Chronic disease [†]						
Arthritis/ rheumatism	0.37	0.94	0.79	0.92	1.00	1.05
Asthma	1.74 *	0.96	0.46	1.12	1.02	0.68
Back problems excluding arthritis	1.57 *	1.25	1.15	1.03	0.98	1.06
Cancer	2.15	3.04**	4.80**	6.98**	4.54**	3.18**
Cataracts	--	--	0.04**	1.15	1.00	1.54*
Chronic bronchitis, emphysema	0.37	1.41	0.51	0.93	1.26	1.34
Diabetes	5.73**	1.23	0.96	1.13	1.22	1.06
Effects of stroke	2.01	0.56	0.97	1.26	1.96*	1.61
Epilepsy	2.56	2.93**	0.75	3.66*	..	0.77
Food allergies	2.22**	1.66**	0.91	1.07	0.50	0.92
Glaucoma	--	--	5.29**	0.55	1.00	0.95
Heart disease	3.18	1.11	2.20**	1.90*	1.13	2.41**
High blood pressure	0.92	1.61	2.39**	0.94	0.87	1.64**
Migraine headaches	0.95	1.05	0.44	1.25	1.48	0.64
Non-food allergies	1.06	1.29*	1.25	1.06	1.05	1.25
Stomach, intestinal ulcers	1.98	1.49	2.80**	2.35**	0.97	1.06
Urinary incontinence	--	--	5.41*	0.81	1.78	1.43
Other health problems [†]						
Activity-limiting injury	3.00**	0.87	2.26**	1.54*	1.71	2.03**
Long-term disability	2.45**	1.54**	2.99**	2.43**	1.26	1.75**
Body mass index						
<i>Appropriate</i>	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Underweight	0.99	0.74*	2.26*	0.97	0.80	1.95**
Overweight	1.33	1.03	0.87	0.87	0.93	1.28
Unknown	0.42	0.63	--	0.65	0.13	0.31
Predisposing factors						
Living arrangements						
<i>With partner</i>	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Not with partner	0.98	0.45**	0.84	0.96	0.82	1.03
Physical activity						
<i>Active</i>	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Moderate	0.98	0.89	1.53	1.34	2.13*	1.27
Inactive	0.49**	1.18	1.15	1.39	2.38**	1.20
Unknown	0.27**	1.73*	0.51	1.44	1.39	1.49
Alcohol consumption						
<i>≥1 drink/week</i>	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Some, but <1 drink/week	1.14	1.41**	0.86	0.86	1.02	0.98
None	2.15**	1.78**	1.46	1.36	0.90	1.02
Smoking						
<i>Never</i>	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Former/occasional	0.98	1.35**	1.70*	1.09	0.52**	1.61**
Current regular	1.46	1.46**	1.20	0.91	0.41**	1.41
Enabling factors						
Household income						
<i>Adequate</i>	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Inadequate	1.46	1.62**	1.57	1.92**	0.96	1.34
Unknown	1.25	1.49	0.49	1.67	0.99	1.50
Education						
<i>Completed secondary school</i>	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Did not complete secondary school	0.78	0.93	1.28	0.81	1.25	0.92

Data source: 1994/95 National Population Health Survey, household component (randomly selected respondents)

Note: Odds ratios for the reference categories are shown in parentheses. Because calculations of the standard errors did not account for design effects, the odds ratios were considered significant only if their confidence intervals did not overlap the values 0.955 and 1.055, for odds ratios less than one and greater than one, respectively.

† The reference category is the absence of the condition.

* $0.01 \leq p < 0.05$

** $p < 0.01$

-- Not included in regression because of low prevalence.

Among people aged 40 and older, however, no regular association between hospitalization and smoking habits was observed. Multivariate analysis revealed similarly inconsistent associations by age and sex between hospitalization and smoking. In women aged 15 to 39, for example, both current tobacco use (smoking at least one cigarette every day) and former or occasional use, in comparison with not smoking, showed highly significant positive associations with hospitalization. However, in men aged 65 and older, current smoking and former or occasional smoking were both negatively associated with hospitalization. Because smoking is known to cause chronic respiratory problems, not to mention numerous cancers, its apparently “protective” relationship with hospitalization in older men is puzzling.

For some variables, the small number of people in some age and sex categories may partly explain these unexpected results. For example, the categories, “former or occasional smoking” and “current smoking,” were both negatively and positively associated with hospitalization (in different age and sex categories). However, regression analysis using all the data combined (that is, all ages for both sexes) yielded odds ratios of 1.24 and 1.19 (both significant at the level of $p < 0.05$) for former or occasional smoking and current smoking, respectively (data not shown).

For other predisposing factors, namely age, leisure physical activity level and alcohol use, distinct patterns emerged in relation to hospitalization. Understandably, hospitalization was most common among older people. One in six people aged 65 and older reported spending at least one night in hospital. This is nearly identical to the result derived from Statistics Canada’s 1991 General Social Survey.¹⁷

In general, people whose leisure physical activity was categorized as “active” were hospitalized less frequently than people who were less active. In men aged 15 to 39, however, the opposite pattern was observed; the percentage hospitalized was lowest among those classified as “inactive.” Even when all other variables were controlled, the odds ratio for this inactive group of men was 0.49 (Table 2). However, the high odds ratio for inactive men aged

65 and over suggests that the deleterious effects of inactivity may be delayed until later in life.

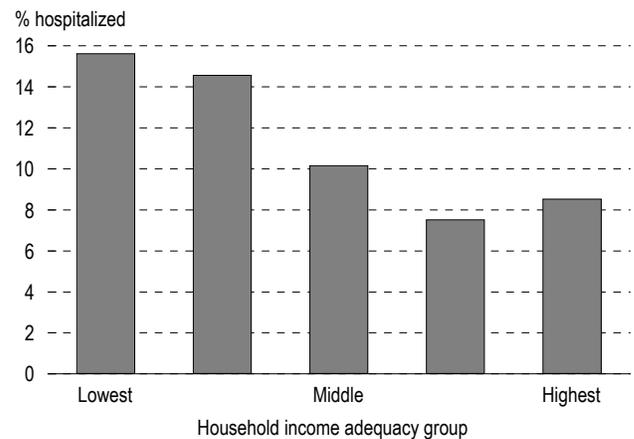
With regard to alcohol use, the proportion of people hospitalized was highest among those who reported that they never drink and lowest among those who reported consuming at least one drink per week. This pattern was quite consistent in both sexes and all age groups, and may reflect the greater likelihood of pre-existing health problems that were not included in this analysis among people who abstain from alcohol use.¹⁷ Multivariate analysis indicated that only in the age group 15 to 39 were the odds ratios for abstinence significantly elevated.

Low income linked to hospitalization

The proportion of people hospitalized was generally inversely related to income adequacy (Table 1 and Chart 2). After adjusting for differences in other health-related variables, the odds ratios for hospitalization among women aged 15 to 39 and 40 to 64 living in households with inadequate income were significantly elevated relative to those with adequate income.^b Several earlier studies of health

^b The odds ratios for inadequate income for men aged 15 to 39 and for women aged 65 and older, although elevated, were only of borderline significance, both with p values of 0.07, probably because of the small cell size.

Chart 2
Percentage of people hospitalized in previous 12 months, by household income adequacy group, population aged 15 and older, all provinces, 1994/95



Data source: 1994/95 National Population Health Survey, household component (randomly selected respondents)

Note: All patients who stayed overnight in a hospital, nursing home or convalescent home are considered to have been hospitalized.

services use in Canada have reported that low income is nearly as important a determinant as is illness.¹⁸⁻²⁰

The association between inadequate income and hospitalization also corroborates the results of a recent study that compared hospital use between residents of Ontario and the United States. This study showed that among people in ill health, admission rates in Ontario, but not in the U.S., are nearly twice as high among poor people as they are among non-poor people.²¹ The findings from the NPHS also complement the results of Statistics Canada's 1991 General Social Survey that showed a higher occurrence of hospitalization among people aged 65 and over with inadequate income than among those with adequate income.¹⁷

Analyses of survey data from 1978/79, however, indicate that although the volume of hospital use (measured in days of stay) was higher among people with low income than among those with high income, family income was not related to the frequency of hospitalization.²⁰ The absence of an association between income and hospitalization in the 1978/79 survey may have resulted from the use of family income rather than the more refined income adequacy measure that was used in the analyses of the later surveys. Alternatively, the contrasting results may reflect a change over time in the association of income with hospitalization.

Coping with hospital cuts

To curtail hospital services without compromising people's health will partially depend on progress in preventing or alleviating the severity of the particular conditions that are associated with hospitalization. Cancer was strongly linked with hospitalization, and some forms can be prevented. Lung cancer, which leads all others in causing death, is nearly entirely preventable, as are numerous other cancers caused by smoking.

For other diseases, for example, breast and prostate cancer and some kinds of heart disease, relatively little is known about prevention. Surgical intervention — inevitably requiring hospitalization — may offer the best hope. In these cases, it does not seem desirable to shift the burden of

postoperative or palliative care to out-patient or community care services without adequate formal supports in place.

For conditions such as injury, the potential for more immediate prevention, and thus reduction of the need for hospitalization may be greater. Motor vehicle-related injury prevention, for example, is an area of public health that has benefited from campaigns and legislation to discourage drinking and driving, as well as advances in automotive engineering and highway design. Fewer resources have been directed to other concerns, such as falls among elderly people, a frequent cause of serious injury and hospitalization.²²

Although universal access to medical care in Canada has removed the direct financial barriers to physicians' services and hospital care,^c differences persist in the availability of the social and instrumental circumstances that enhance health. Clearly, people with inadequate incomes have less access to the living conditions, preventive services, diet and other less tangible factors that contribute to good health. The findings of this study show that a larger proportion of people of inadequate means are indeed receiving hospital services; evidence perhaps of the success of universal access to illness care but also evidence of a continuing failure of an equitable distribution of wellness.²³⁻²⁹

^c Among people with inadequate income, access to health care services may still be hampered by lack of transportation, difficulty obtaining child care, etc.

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