# Socio-economic status and the utilisation of physicians' services: results from the Canadian National Population Health Survey

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## Abstract

This paper assesses the extent to which Canada's universal health care system has eliminated socio-economic barriers in the use of physician services by examining the role of socio-economic status in the differential use of specific, publicly-insured, primary and specialist care services. Data from the 1994 National Population Health Survey, a nationally representative survey, were analysed using multiple logistic regression. In order to control for the association between primary and specialist utilisation, a two-staged least squares method was used for models explaining specialist utilisation. Health need, as measured by perceived health status and number of health problems, was found to be consistently associated with increased physician utilisation, for both primary and specialist visits. Whereas the likelihood of an individual making at least one visit to a primary care physician was found to be independent of income, those with lower incomes were more likely to be frequent users of primary care, that is, make at least six visits to a primary care physician. Even after adjusting for the greater utilisation of primary care services by those in lower socio-economic groups, and, therefore, their higher exposure to the risk of referral, the utilisation of specialist visits was greater for those in higher socio-economic groups. Canadians lacking a regular medical doctor were less likely to receive primary and specialist care, even after adjustments for socio-economic variables such as income and education. Although financial barriers may not directly impede access to health care services in Canada, differential use of physician services with respect to socio-economic status persists. After adjusting for differences in health need, Canadians with lower incomes and fewer years of schooling visit specialists at a lower rate than those with moderate or high incomes and higher levels of education attained despite the existence of universal health care. © 2000 Elsevier Science Ltd. All rights reserved.

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## Introduction

The implementation of a universal, publicly-funded medical insurance program in Canada was justified on the grounds that all citizens should have access to health-care services on the basis of need rather than ability to pay (Beck, 1973; Enterline et al., 1973; Manga et al., 1987). One of its primary goals was to provide all Canadian residents with necessary medical care on a prepaid basis, thereby reducing health inequalities and financial uncertainty. (Stewart, 1990). An important characteristic related to inequalities in health is socio-economic status (SES). The link between SES and health status has long been recognised, with lower income associated with poorer health status (Broyles et al., 1983; Manga et al., 1984; Mustard and Frohlich, 1995; Katz et al., 1996; McIsaac et al., 1997) Not only is this relationship positive, it also has no threshold; that is, the differentials do not merely affect the poor in relation to the wealthy but extend throughout all social classes (Pope, 1988).

Since the implementation of hospital insurance in 1958 and medical insurance in 1968, Canada's national health insurance system has done much to overcome the financial barriers to health service utilisation (Shah, 1994). One major study found that the implementation of universal health care resulted in a shift in the use of physician services from persons in higher income groups to persons in lower income groups (Enterline et al., 1973). Despite this shift in utilisation, barriers to the use of health care by the poor persist (Beck, 1973; Piperno and Di Orio, 1990; Haynes, 1991; McIsaac et al., 1997).

Most studies that considered a broad range of socio-demographic, economic and need characteristics, when examining the use of physician services, did not distinguish primary and specialist utilisation (Broyles et al., 1983; Manga et al., 1984). McIsaac et al. examined the utilisation of general practitioner (GP) and specialty services separately using the Ontario Health Survey (OHS) but there has been no nationally-representative study conducted that assessed these patterns for the 1990s. Moreover, McIsaac et al. did not control for the endogeneity of the use of GPs in accounting for specialist visits.

While insured residents may self-refer for primary care services, specialty and non-primary health services usually require referral from a GP (Kohn and White, 1976; Hulka and Wheat, 1985). Many of these services, including those provided by surgeons, allergists, rheumatologists, gynaecologists and psychiatrists, may be necessary to restore function or to enhance health status. Utilisation of referred services is comprised of two components. First, the patient initiates self-referral to a primary care provider and, second, referral to sub-sequent specialty care often depends on a visit to a primary care practitioner. By separating health utilisation into actions initiated by the patient and actions that require a general practitioner referral, greater understanding of the role of SES on health care utilisation may be gained.

The primary objective of this study is to explain, in a nationally representative sample, the role of SES in the differential use of publicly-insured, primary and specialty services in order to assess the extent to which socio-economic barriers in the use of physician services exist in Canada's universal health care system.

## Methods

### Data

Data from the National Population Health Survey (NPHS) was selected to model physician visits due to its nationally representative nature and its broad range of variables (Statistics Canada, 1994). With the exception of individuals residing on Canadian Forces Bases and Indian reservations and individuals in the Yukon, Northwest Territories and in some remote areas in Ontario and Quebec, the survey was designed to be representative of the entire population of Canada aged 12 and over. The excluded sub-populations are estimated to account for less than 3% of the total population (Statistics Canada, 1994). The NPHS is a multi-stage stratified sample of dwellings, comprised of two interview-administered components. The first component, the general component, collected limited information on all members of the household. The second component, the health component, was a more in-depth questionnaire, administered to one randomly selected member 12 years of age or older of each surveyed household. 20,725 households, resulting in a response rate of 88.7% completed the general component and 17,626 resulting in a conditional response rate of 96.1% completed the health component. Our study used data only from the health component of the NPHS as the relevant variables such as those pertaining to health status and health behaviour were included in this component.

The main dependent variables were number of GP and specialist visits based on the responses to the questions: "In the past 12 months, how many times have you seen or talked with (a) a general practitioner/family physician? (b) another medical doctor (such as a surgeon, allergist, gynaecologist, psychiatrist, etc.)?" Because these questions ask if the respondent has seen or talked to a health professional, some of the visits may have included telephone consultations.

The behavioural model of health service utilisation

(Andersen, 1995) provided a basis for selecting independent variables for modelling use by groups with different income and education levels. The model outlines the different factors that help to determine the health care that people receive and served as a guide in the selection of significant variables to include in a model of physician utilisation. Health status is controlled for by using perceived health relative to other persons of comparable age and the number of health problems. Self-perceived health status has been shown to be the most important determinant of both GP and referred services use (Fylkesnes, 1993). SES is measured by household income adjusted for differences in family size as it is likely to impact economic purchasing power and level of education. Education is a common measure of SES and hypothesised to protect against disease by influencing lifestyle behaviours, problem-solving abilities, and values (Wolinsky et al., 1983; Liberatos et al., 1988).

### Statistical methods and analysis

A two-staged model was used to examine the determinants of two dimensions of primary care and specialty use. The first stage assessed access to physician services; the characteristics of those individuals who saw a physician in a one-year period compared with those who did not. The second stage assessed frequency of physician service use; the characteristics of those individuals who saw a physician at least 6 times in a one year period. The decision to compare those having made 1–5 visits (non-frequent users) with those having made 6 or more visits (frequent users) was somewhat arbitrary. However, there has been no consensus on what constitutes frequent use of physician services in the literature. The decision to divide the number of visits between those who made 1–5 visits and those who made 6 or more visits allows comparison with earlier reports (Ministry of Health, 1992; McIsaac et al., 1997).

The sensitivity of the results was tested for different utilisation cut-points for the models explaining the occurrence of at least six physician visits. The analysis was re-run to model both the probability of making at least 5 visits and at least 7 visits to see if varying the selected cut-point affected the final conclusions of the study. Neither, the direction, the significance nor the magnitude of the resultant odds ratios were affected by the cut-point selected.

Due to the positive association between the probability of consulting a specialist and the probability of consulting a GP (McIsaac et al., 1997), a variable representing the predicted probability of persons making six or more visits to a GP was included in the models assessing specialist utilisation. This variable was derived by instrumental variable estimation and may be interpreted as capturing 'exposure' to specialist referral or as a 'risk factor' for referral (Kenkel, 1984). By including a variable representing a proxy for the propensity to be referred to a specialist due to 'persistence', the specialist equation postulates that specialist visits are influenced in part, by the intensity of GP utilisation.

Multivariate logistic modelling was employed for each of the four models; at least one GP visit, six or more GP visits, at least one specialist visit and six or more specialist visits. The models initially were fit using stepwise regression (SAS Institute, 1995) with a cut-off for inclusion of $p < 0.05$ using the Wald statistic (Hosmer and Lemeshow, 1989). The Wald statistic for each variable was examined and each estimated coefficient was compared with the coefficient from the univariate model containing only that variable. Coefficients were estimated using maximum likelihood estimation. Goodness-of-fit was measured by a generalised coefficient of determination (Cox and Snell, 1990).

### Results

Table 1 provides a brief description of the independent variables selected for the multi-variate model. There were 17,626 respondents over 12 years of age available for analysis (Table 2). Approximately 77 and 26% of the population had at least one self-reported visit to a GP and specialist, respectively, in the previous 12 months. Females were more likely than males to make at least one visit and to make frequent visits to both GPs and specialists.

The results of the multivariate models are shown in Tables 3–6. Only those variables demonstrating a statistically significant association with physician visits in the univariate analysis were included. The variables most strongly associated with both visits to GPs and specialists were the number of health problems and perceived health status. Individuals reporting a greater number of health problems and poorer health status were more likely to report greater use of physician services.

With respect to SES, respondents in varying income groups displayed no difference in the probability of making at least one GP visit. There was no consistent relationship between income and having made six or more GP visits. When considering individuals making at least one specialist visit a clear gradient was found; individuals in higher income groups were more likely to see a specialist at least once compared individuals in lower income groups. Canadians with post-secondary education were more likely to make use of GP services than those without post-secondary education. There

Table 1
Description of independent variables

| Variable | Description |
|---|---|
| *Predisposing* | |
| Education | high school not completed, high school completed, some post-secondary, post-secondary completed |
| Immigration status | Canadian-born, an immigrant of 10 or more years and immigrant of less than 10 years |
| Marital status | married/common-law, single, widowed/divorced |
| Children | whether or not there are any children under the age of 12 in the household |
| *Enabling* | |
| Income adequacy | derived by the NPHS the variable income adequacy consists of five discrete categories based on household income and the size of the household |
| Employment status | currently working, not currently working and did not work in past year |
| Community | urban, rural |
| Region | Ontario, Quebec, Atlantic provinces, Prairie provinces and British Columbia |
| Regular medical doctor | based on the question: do you have a regular medical doctor? |
| *Need* | |
| Health status | perceived health relative to other persons of comparable age, excellent, very good, good, fair or poor |
| Number of health problems | respondents were asked about 20 different chronic health problems with the opportunity to volunteer other conditions not listed |
| *Health behaviour* | |
| Household smokers | respondents were asked if anyone smokes regularly inside the house |
| Alcohol consumption | the number of alcoholic drinks per week (0, 1–11, 12+) |
| Physical activity index | active, moderately active, inactive |

was no difference in the likelihood of making frequent use of GP services among different education levels. A gradient was evident among females making at least one visit to a specialist, with those attaining a higher level of education being more likely to make at least one visit to a specialist than with a lower level of education. Females with at least some post-secondary education were more likely to use specialist services on a frequent basis than those with a lower level of education.

Table 2
Visits to Canadian physicians in a 12-month period

|  | Males | Females | All |
|---|---|---|---|
| NPHS respondents | 8058 | 9568 | 17,626 |
| Canadian population | 11,780,331 | 12,168,265 | 23,948,596 |
| *General practitioners* | | | |
| Mean visits (median) | 4.94(1) | 7.10(2) | 6.11(2) |
| % No visits | 28.37 | 17.34 | 22.76 |
| % At least 1 visit | 71.63 | 82.66 | 77.24 |
| % 6 or more visits[a] | 17.94 | 26.74 | 22.73 |
| | | | |
| *Specialists* | | | |
| Mean visits (median) | 1.56(0) | 1.86(0) | 1.72 (0) |
| % No visits | 79.87 | 68.02 | 73.85 |
| % At least 1 visit | 20.13 | 31.98 | 26.15 |
| % 6 or more visits[a] | 13.06 | 16.81 | 15.39 |

[a] For those having made at least 1 visit.

Respondents reporting a regular medical doctor were more likely to use and make frequent use of GP and specialist services with the exception of females who were slightly less likely to make 6 or more specialist visits. Quebec residents had a lower likelihood of using GP services but were the most likely to make at least one specialist visit compared with those residing elsewhere in Canada. There was a tendency for residents of urban communities to make more visits to physicians than rural residents. However, the results for this variable differed for men and women when specialist use was assessed.

In most instances, negative health behaviour displayed a significant and positive association with the utilisation. Individuals reporting physical inactivity were significantly more likely to visit a specialist 6 or more times than those reporting physical activity. Non-smoking females were less likely to make 6 or more specialist visits than those females reporting daily smoking. Females and males consuming between 1 and 11 drinks per week were more likely to make use of specialist services compared to those consuming zero drinks per week.

Being married, divorced, widowed or living in a common-law situation all had the effect of increasing the likelihood of making at least one visit to a GP. Further, females with children under the age of 12 residing in the household were more likely to become frequent users of primary care and specialist services,

Table 3
Factors related to one or more visits to a GP for females and males[a]

| Variable | Females | | Males | |
|---|---|---|---|---|
| | adjusted OR | 95% CI | adjusted OR | 95% CI |
| *Education* | | | | |
| No high school | 1.00 | | 1.00 | |
| High school completed | 1.14 | (0.87, 1.50) | 0.96 | (0.87, 1.40) |
| Some post-secondary | 1.50 | (1.21, 1.86) | 1.07 | (1.01, 1.52) |
| Post-secondary completed | 1.45 | (1.12, 1.88) | 1.08 | (1.04, 1.64) |
| *Age* | | | | |
| 12–24 | 1.00 | | 1.00 | |
| 25–44 | 0.91 | (0.68, 1.22) | 1.14 | (0.75, 1.29) |
| 45–64 | 0.80 | (0.59, 1.09) | 1.42 | (0.65, 1.24) |
| 65–74 | 0.87 | (0.60, 1.26) | 3.76 | (1.07, 2.54) |
| 75 or older | 1.02 | (0.66, 1.57) | 4.83 | (1.11, 3.35) |
| *Health status* | | | | |
| Excellent | 1.00 | | 1.00 | |
| Very good | 1.18 | (0.99, 1.42) | 1.58 | (1.29, 1.80) |
| Good | 1.77 | (1.38, 2.28) | 2.07 | (1.54, 2.29) |
| Fair | 2.91 | (1.99, 4.24) | 3.02 | (1.33, 3.36) |
| Poor | 2.28 | (1.18, 4.40) | 11.56 | (2.67, 15.52) |
| *No. of reported health problems* | | | | |
| No problems | 1.00 | | 1.00 | |
| 1–3 | 1.06 | (0.80, 1.39) | 1.81 | (1.00, 1.67) |
| 4 or more | 1.95 | (1.35, 2.83) | 4.23 | (1.69, 3.56) |
| *Regular medical doctor* | | | | |
| No | 1.00 | | 1.00 | |
| Yes | 4.19 | (3.35, 5.23) | 3.98 | (2.74, 3.93) |
| *Community* | | | | |
| Rural | 1.00 | | 1.00 | |
| Urban | 1.22 | (1.00, 1.49) | 1.35 | (1.31, 1.89) |
| *Marital status* | | | | |
| Married/common-law | 1.00 | | 1.00 | |
| Single | 0.97 | (0.75, 1.25) | 0.62 | (0.60, 0.90) |
| Widowed/divorced | 1.21 | (0.97, 1.50) | 0.98 | (0.68, 1.09) |
| *Household member smokes* | | | | |
| Yes | 1.00 | | 1.00 | |
| No | 1.18 | (1.00, 1.40) | 1.55 | (1.26, 1.70) |
| *Province* | | | | |
| Ontario | 1.00 | | 1.00 | |
| Quebec | 0.78 | (0.57, 1.07) | 0.54 | (0.34, 0.64) |
| Maritime | 1.31 | (0.94, 1.81) | 0.75 | (0.41, 0.76) |
| Prairie | 1.08 | (0.78, 1.49) | 0.72 | (0.41, 0.76) |
| British Columbia | 0.90 | (0.76, 1.07) | 0.64 | (0.54, 0.75) |
| $R^2$ | | 0.12 | | 0.17 |

[a] Only statistically significant variables reported in tables.

Table 4
Factors related to six or more visits to a GP for females and males

| Variable | Females | | Males | |
|---|---|---|---|---|
| | adjusted OR | 95% CI | adjusted OR | 95% CI |
| *Education* | | | | |
| No high school | 1.00 | | | |
| High school completed | 1.20 | (0.95, 1.52) | not significant | not significant |
| Some post-secondary | 1.21 | (0.99, 1.47) | not significant | not significant |
| Post-secondary completed | 1.12 | (0.88, 1.43) | not significant | not significant |
| *Age* | | | | |
| 12–24 | 1.00 | | 1.00 | |
| 25–44 | 1.16 | (0.91, 1.48) | 1.69 | (1.14, 2.48) |
| 45–64 | 0.95 | (0.73, 1.24) | 1.42 | (0.96, 2.10) |
| 65–74 | 1.16 | (0.87, 1.54) | 1.72 | (1.11, 2.64) |
| 75 or older | 1.19 | (0.89, 1.59) | 2.33 | (1.42, 3.82) |
| *Income adequacy*[a] | | | | |
| 1st quintile | 1.00 | | 1.00 | |
| 2nd quintile | 1.14 | (0.85, 1.54) | 1.05 | (0.68, 1.64) |
| 3rd quintile | 0.82 | (0.63, 1.08) | 0.72 | (0.48, 1.08) |
| 4th quintile | 0.79 | (0.59, 1.05) | 0.63 | (0.43, 0.94) |
| 5th quintile | 0.70 | (0.49, 0.99) | 0.72 | (0.44, 1.18) |
| *Health status* | | | | |
| Excellent | 1.00 | | 1.00 | |
| Very good | 1.48 | (1.18, 1.85) | 1.82 | (1.30, 2.55) |
| Good | 2.63 | (2.10, 3.29) | 2.87 | (2.07, 3.97) |
| Fair | 5.58 | (4.20, 7.39) | 5.00 | (3.46, 7.23) |
| Poor | 11.89 | (7.54, 18.74) | 12.40 | (7.25, 21.22) |
| *No. of reported health problems* | | | | |
| No problems | 1.00 | | 1.00 | |
| 1–3 | 0.80 | (0.61, 1.04) | 1.85 | (1.18, 2.89) |
| 4 or more | 1.65 | (1.23, 2.80) | 4.25 | (2.62, 6.91) |
| *Regular medical doctor* | | | | |
| No | 1.00 | | 1.00 | |
| Yes | 1.62 | (1.10, 2.39) | 2.16 | (1.47, 3.16) |
| *Community* | | | | |
| Rural | 1.00 | | 1.00 | |
| Urban | 0.91 | (0.75, 1.10) | 1.37 | (1.02, 1.83) |
| *Children under age 12* | | | | |
| No | 1.00 | | 1.00 | |
| Yes | 1.26 | (1.04, 1.52) | 0.76 | (0.55, 1.03) |
| *Number of alcoholic drinks* | | | | |
| 0 | 1.00 | | 1.00 | |
| 1–11 | 0.84 | (0.71, 0.98) | 0.79 | (0.64, 0.98) |
| 12+ | 1.30 | (0.90, 1.86) | 0.77 | (0.54, 1.11) |
| Not stated | 0.29 | (0.05, 1.91) | 0.26 | (0.04, 1.66) |
| *Province* | | | | |
| Ontario | 1.00 | | 1.00 | |
| Quebec | 0.56 | (0.36, 0.87) | 0.59 | (0.35, 0.96) |
| Maritime | 1.21 | (0.78, 1.85) | 1.05 | (0.70, 1.58) |
| Prairie | 1.16 | (0.76, 1.77) | 1.01 | (0.67, 1.52) |
| British Columbia | 1.45 | (1.02, 2.07) | 1.14 | (0.86, 1.49) |
| $R^2$ | | 0.19 | | 0.20 |

[a] Derived by dividing household income into 5 levels adjusting for the number of household members.

Table 5
Factors related to one or more visits to a specialist, comparing users with non-users by females and males

| Variable | Females | | Males | |
|---|---|---|---|---|
| | adjusted OR | 95% CI | adjusted OR | 95% CI |
| *Education* | | | | |
| No high school | 1.00 | | 1.00 | |
| High school completed | 1.19 | (1.16, 1.23) | 1.57 | (1.50, 1.64) |
| Some post-secondary | 1.72 | (1.69, 1.76) | 1.45 | (1.41, 1.49) |
| Post-secondary completed | 1.86 | (1.81, 1.90) | 1.39 | (1.34, 1.45) |
| *Age* | | | | |
| 12–24 | 1.00 | | 1.00 | |
| 25–44 | 1.16 | (1.13, 1.20) | 1.07 | (1.01, 1.14) |
| 45–64 | 1.19 | (1.15, 1.23) | 1.25 | (1.18, 1.33) |
| 65–74 | 0.89 | (0.86, 0.93) | 1.75 | (1.62, 1.89) |
| 75 or older | 0.72 | (0.68, 0.76) | 1.60 | (1.39, 1.85) |
| *Income adequacy*[a] | | | | |
| 1st quintile | 1.00 | | 1.00 | |
| 2nd quintile | 1.06 | (1.01, 1.11) | 0.76 | (0.68, 0.85) |
| 3rd quintile | 1.11 | (1.07, 1.16) | 1.01 | (0.93, 1.11) |
| 4th quintile | 1.23 | (1.18, 1.29) | 1.11 | (1.02, 1.22) |
| 5th quintile | 1.89 | (1.77, 2.03) | 1.31 | (1.19, 1.36) |
| *Health status* | | | | |
| Excellent | 1.00 | | 1.00 | |
| Very good | 1.29 | (1.26, 1.33) | 1.10 | (1.06, 1.14) |
| Good | 1.57 | (1.41, 1.74) | 1.54 | (1.44, 1.66) |
| Fair | 1.46 | (0.98, 2.18) | 1.97 | (1.62, 2.39) |
| Poor | 1.59 | (0.65, 3.87) | 2.50 | (1.41, 4.45) |
| *No. of reported health problems* | | | | |
| No problems | 1.00 | | 1.00 | |
| 1–3 | 1.46 | (1.41, 1.51) | 1.75 | (1.63, 1.87) |
| 4 or more | 1.86 | (1.72, 2.02) | 2.83 | (2.46, 3.26) |
| *Predicted probability of 6 or more GP visits* | | | | |
| 1–5 | 1.00 | | 1.00 | |
| 6 or more | 8.39 | (0.29, 240.04) | 2.56 | (0.33, 19.95) |
| *Regular medical doctor* | | | | |
| No | 1.00 | | 1.00 | |
| Yes | 0.71 | (0.66, 0.78) | 1.63 | (1.54, 1.73) |
| *Community* | | | | |
| Rural | 1.00 | | | |
| Urban | 1.54 | (1.51, 1.56) | not significant | not significant |
| *Physical activity* | | | | |
| Active | | | 1.00 | |
| Moderate | not significant | not significant | 0.94 | (0.91, 0.98) |
| Inactive | not significant | not significant | 0.80 | (0.78, 0.82) |
| *Number of alcoholic drinks* | | | | |
| 0 | 1.00 | | 1.00 | |
| 1–11 | 1.16 | (1.15, 1.18) | 1.18 | (1.16, 1.21) |
| 12+ | 0.99 | (0.91, 1.07) | 1.28 | (1.23, 1.33) |
| Not stated | 0.72 | (0.27, 1.95) | 0.92 | (0.44, 1.92) |

Table 5 (*continued*)

| Variable | Females | | Males | |
|---|---|---|---|---|
| | adjusted OR | 95% CI | adjusted OR | 95% CI |
| *Province* | | | | |
| Ontario | 1.00 | | 1.00 | |
| Quebec | 2.23 | (2.00, 2.47) | 1.08 | (1.03, 1.12) |
| Maritime | 0.87 | (0.80, 0.95) | 0.84 | (0.82, 0.86) |
| Prairie | 0.75 | (0.69, 0.81) | 0.70 | (0.68, 0.72) |
| British Columbia | 0.70 | (0.65, 0.75) | 0.68 | (0.66, 0.71) |
| $R^2$ | | 0.12 | | 0.11 |

[a] Derived by dividing household income into 5 levels adjusting for the number of household members.

whereas males living with young children were less likely to be frequent users of physician services.

## Discussion

Our study found physician utilisation to be consistently related to indicators of health need as measured by the number of health problems and perceived health status. However, men and women attaining a higher level of education were more likely to access GP services during a one-year period. Higher income and education levels were associated with being more likely to make at least one visit to a specialist during a one-year period. As most visits to specialists, in Canada, are the result of a referral by a GP the data suggests that higher income and education are likely associated with referrals to specialists as well.

The suggestion that SES was an important factor in receiving a referral to a specialist has implications regarding access to specialist care, cost and the appropriateness of the referral decision. In Canada, before a patient sees a specialist, a referral from a primary care physician is required. On grounds of equity, an 'ideal' health care system is one where health status is the main determinant of referral. However, studies have shown that patient preferences or expectations play an important role in accounting for the variation in the use of specialist services between those of high and low SES (Langley et al., 1992). The less educated or poor may be less able to express their need for care (Stewart, 1990). Furthermore, those of higher SES may have different attitudes about the benefits that can be realised by accessing specialist care and may in turn be more motivated to seek opportunities by requesting specific physician visits. It is possible, then, that those with higher levels of education and higher income can access and thereby benefit from the health care system more effectively than those of low SES, even when the system employs universal coverage. If specialised services are essential to maintaining and enhancing the stock of health, then it follows that socio-economic advantage enables an increased capacity to produce and sustain positive health. The role of primary care physicians as gatekeepers to ensure appropriate use of specialist care is necessary. Specialist care should be organised to serve those with the greatest health needs.

The results of this study are consistent with the literature in that individuals having a regular medical doctor have greater access to primary care than those without a regular doctor (Hayward et al., 1990; Patrick and Bergnen, 1990; Newacheck et al., 1996). After controlling for demographic variables, socio-economic variables and variables indicating need, having a regular doctor was not only positively associated with access to primary care services but also to specialist care services. Although the primary objective of this study did not encompass the issue of whether having a regular medical doctor promoted better quality of care, we did find that, after controlling for health status and other variables in the model, reports of an absence of a regular medical doctor was associated with a lower likelihood of both GP and specialist visits. If one is interested in who is at risk for not obtaining needed care, the reason for lacking a regular medical doctor should be evaluated further. Regardless of the reason for the absence of a regular medical doctor, our study demonstrates that the establishment of a regular source of care might be effective in improving more accessible health care services.

When modelling the utilisation of specialist services, it was expected that the predicted probability of persons making six or more GP visits would be an important factor in determining use. The lack of significance of the predicted probability on specialist utilisation is difficult to interpret. One would expect that since a referral to a specialist usually occurs through a GP, that frequent GP visits would be a 'risk factor' for seeing a specialist. A possible explanation may lie in the fact that for most people, the probability of a large number of GP visits is small, less than 25%.

Using logistic regression to model frequent GP utilisation will result in a low predicted probability that people make at least 6 visits to a GP in one year. Inserting this predicted probability into the model explaining specialist utilisation may reduce the ability to detect any correlation between a high number of visits and the probability of seeing a specialist.

Smoking, alcohol and lack of physical activity are well-known risk factors for many diseases as well as for pain in general. However, the results from this study suggest that the relationship between these factors and health is not as straightforward as it seems.

With respect to the association between income and physician utilisation, the results confirm the findings of an earlier Canadian study (McIsaac et al., 1997). That is, there was no difference by household income for in-

Table 6
Factors related to six or more visits to a specialist for females and males[a]

| Variable | Females | | Males | |
|---|---|---|---|---|
| | adjusted OR | 95% CI | adjusted OR | 95% CI |
| *Education* | | | | |
| No high school | 1.00 | | | |
| High school completed | 1.11 | (0.89, 1.40) | not significant | not significant |
| Some post-secondary | 1.51 | (1.37, 1.67) | not significant | not significant |
| Post-secondary completed | 1.26 | (1.11, 1.43) | not significant | not significant |
| *Age* | | | | |
| 12–24 | 1.00 | | 1.00 | |
| 25–44 | 1.32 | (1.21, 1.56) | 0.75 | (0.60, 0.94) |
| 45–64 | 0.73 | (0.60, 0.89) | 0.63 | (0.48, 0.82) |
| 65–74 | 0.77 | (0.63, 0.95) | 0.28 | (0.20, 0.40) |
| 75 or older | 0.77 | (0.58, 1.01) | 0.21 | (0.11, 0.41) |
| *Health status* | | | | |
| Excellent | 1.00 | | 1.00 | |
| Very good | 1.48 | (1.29, 1.69) | 1.81 | (1.26, 2.58) |
| Good | 1.29 | (1.10, 1.50) | 2.29 | (1.46, 3.59) |
| Fair | 1.80 | (1.25, 2.61) | 3.13 | (1.64, 5.97) |
| Poor | 3.54 | (1.77, 7.10) | 3.11 | (0.94, 10.24) |
| *Predicted probability of 6 or more GP visits* | | | | |
| 1–5 visits | 1.00 | | 1.00 | |
| 6 or more visits | 2.20 | (0.78, 6.17) | 3.32 | (0.30, 37.29) |
| *Regular medical doctor* | | | | |
| No | 1.00 | | 1.00 | |
| Yes | 2.12 | (1.43, 3.16) | 3.75 | (2.24, 6.30) |
| *Community* | | | | |
| Rural | 1.00 | | | |
| Urban | 1.19 | (1.09, 1.29) | not significant | not significant |
| *Children under age 12* | | | | |
| No | 1.00 | | 1.00 | |
| Yes | 1.49 | (1.36, 1.64) | 0.42 | (0.33, 0.53) |
| *Physical activity* | | | | |
| Active | 1.00 | | | |
| Moderate | 0.87 | (0.79, 0.97) | not significant | not significant |
| Inactive | 1.32 | (1.21, 1.44) | not significant | not significant |
| *Smoking frequency* | | | | |
| Daily | 1.00 | | | |
| Occasionally | 1.73 | (1.36, 2.19) | not significant | not significant |
| Not at all | 0.83 | (0.78, 0.89) | not significant | not significant |
| $R^2$ | | 0.10 | | 0.09 |

[a] Only statistically significant variables reported in tables.

dividuals in the probability of making at least one visit to a GP but that individuals in higher income households were less likely to make 6 or more visits to a GP compared to those in low income households. However, the finding that the effect of education on physician utilisation was positive was somewhat different from the result of McIsaac et al. who found that the effect of education was negative for frequent primary health care utilisation but positive for specialist health care utilisation. This may be due to the fact that this study includes a variable indicating the extent to which one identifies with a regular medical doctor.

One of the most striking findings of this study concerns the patterns of utilisation with respect to province of residence. After adjusting for other variables, Quebec residents were consistently less likely to visit a GP at least once and at least six times than Canadians living in other jurisdictions. However, once specialist services were examined this trend was reversed. Quebec residents were found to be the most likely to make use of specialist services. Although it is beyond the scope of this study and thereby warrants a separate study, one explanation for this result may rest on the uneven geographical distribution of and, hence, access to, primary care and specialist physicians.

As expected, the results suggest that rural residents have less accessible health care (Broyles et al., 1983). In most instances, rural respondents were more likely to have access barriers to obtaining primary and specialist care than their urban counterparts. Individuals who lived in urban areas were more likely to seek health care and utilise more physician services than their rural counterparts, perhaps due to less travel time, greater ability to reach services and a greater physician/patient ratio (Fylkesnes, 1993).

There are some interesting questions beyond the scope of this study that might be addressed in future research. To the extent that physician utilisation depends on both supply and demand-side factors, it is important to include a variable representing patient demand. It seems reasonable to assume that individuals will have different demands for health care for a given level of need. It therefore follows that unequal utilisation may not be entirely inequitable. For example, demand for physician care may vary because some individuals prefer to take the risks associated with not seeking care. It may, therefore, be necessary to identify other variables that are aiding, or suppressing the relationship between SES and physician utilisation such as health beliefs, attitudes or preoccupation with health.

This study contributes to the research on the utilisation of physician services and access by incorporating a two-staged least squares method to explain specialist utilisation and by using an improved set of explanatory variables, namely, the inclusion of a variable indi-cating the extent to which one identifies with a regular medical doctor and the predicted probability of persons making six or more visits to a general practitioner.

There are some important limitations of this study. First, in a cross-sectional household survey, such as the NPHS, relationships between variables can be made with a calculable level of confidence but inferences as to causation should be made with caution. Second, in testing a large database such as the NPHS, multiple-hypothesis testing can result in spurious findings and incorrect conclusions. This study attempted to minimise this problem by choosing variables for analyses based on our review of the literature and on the behavioural model of health care utilisation. Third, the sampling strategy used in the study focused on household dwellings and excluded specific populations, such as the homeless, native people living on reservations and those in institutions. Although these excluded populations represent a small proportion of the total population of Canada, it is these populations that are more likely to be poor and have difficulty accessing primary and specialist services. For instance the institutionalised population of the country, is a group that includes seniors' residences, nursing homes, psychiatric institutions, prisons, hostels and hospitals. These represent groups with significantly high risk and lower socio-economic status. Taking these omissions into account, the actual rate of physician use may be higher; however, the purpose of the analysis was to identify factors related to use rather than the absolute rates. Finally, while only a small proportion of variance in physician visits was explained ($R^2$ ranged from 0.09–0.20), the purpose of this analysis was to explain differences in physician utilisation by different socio-economic groups. Therefore, the low levels of explanatory power identified in this study are consistent with those reported in the literature (Arling, 1985; Birch et al., 1993).

## Conclusion

Our study has demonstrated a positive relationship among health need and the use of primary care services under a universal publicly funded health care system. Health needs, defined by number of health problems and self-perceived health status, were the most important determinant of GP and specialist use. However, even after adjusting for factors representing need there remained some significant differences in the utilisation of physician services between socio-economic groups.

Despite universal health care, Canadians with lower incomes and education are less likely to visit specialists

than those with moderate or high incomes and a higher education, even after adjustments for need by including variables representing perceived health status and number of health problems.

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