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Health-Care Utilization in Canada: 25 Years of Evidence

**Lori J. Curtis
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SEDAP Research Paper No. 190

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May 2007

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Health-Care Utilization in Canada: 25 Years of Evidence

Lori J. Curtis^a and William J. MacMinn^b

Abstract:

An abundance of literature links socio-economic status (SES) to health and health care in Canada and other countries. Recent anecdotal evidence indicates that Canadians believe their access to health care is diminishing over time. This study provides a brief description of utilization patterns in health-care services provided under public health insurance (physicians, specialists and hospitals) in Canada between 1978 and 2003. The relationships between SES and utilization, controlling for demographic characteristics are examined to investigate whether changes in the equity of utilization have occurred over time. Results indicate that SES inequities in utilization are apparent in publicly insured services; appearing to be more relevant in initial contact with the system rather than the number of visits. Specialist's services are particularly problematic and becoming more so over time.

Keywords: health-care utilization, socio-economic status, Canada

JEL Classification: I10, I11, I18

Résumé:

L'existence d'un lien entre le statut socio-économique (SES), la santé et le système de santé tant au Canada que dans d'autres pays est largement documenté dans la littérature. Une évidence anecdotique récente indique que les Canadiens sont convaincus que leur accès au soin de santé diminue avec le temps. Cette étude donne un bref aperçu des tendances relatives à l'utilisation des services de soin de santé fournis par le régime de santé publique (médecins, spécialistes et hôpitaux) au Canada entre 1978 et 2003. L'association entre SES et utilisation, tout en contrôlant pour les facteurs démographiques sont examinés pour déterminer si des changements dans le partage des ressources se sont effectivement produits à travers le temps. Les résultats suggèrent que des injustices basées sur le statut socio-économique dans l'utilisation de ressources sont évidentes dans les régimes d'assurance publique. Ces dernières apparaissent de manière plus évidente lors du contact initial avec le système plutôt qu'en termes du nombre de visites. L'accès aux services de spécialistes est particulièrement problématique et semble s'aggraver avec le temps.

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Acknowledgements:

The first author acknowledges Social Sciences and Humanities Research Funding via Canada Research Chairs (CRC) program and Social and Economic Dimensions of an Aging Population (SEDAP II). She also acknowledges the Canadian Institutes of Innovation and the Ontario Innovation Foundation for capital funding through the CRC program.

The authors would like to thank JoAnn Kingston-Riechers for insightful discussions, two anonymous referees and Catherine Deri for helpful comments, seminar participants in the Applied Research and Analysis Directorate of Health Canada and particularly Charles Mallory, Director of Health Supply and Demand Analysis, ARAD, Health Canada for assistance with data access. Financial support for the Canada Research Chair from Social Sciences and Humanities Research Council (SSHRC), Canada Foundation for Innovation (CFI) and Ontario Ministry of Research and Innovation are gratefully acknowledged. The analyses and conclusions expressed in this paper are those of the authors and should not be taken as reflecting an official position of Health Canada.

Notes on data sources:

The analyses were performed on Health Canada's DAIS|nesstar editions of anonymized microdata from the: 1978 Canadian Health Survey; 1985 General Social Survey (Health) Public Use File; 1991 General Social Survey (Health) Public Use File; 1994 National Population Health Survey, Health Share File; 1998 National Population Health Survey, Health Share File; Canadian Community Health Survey 2000-01 (Cycle 1.1) Annual Share File; Canadian Community Health Survey 2003 (Cycle 2.1), Annual Share File. All microdata sets were prepared by Health Statistics Division, Statistics Canada, with the exception of the 1985 and 1991 General Social Surveys, prepared by the General Social Survey Sub-Division, Statistics Canada. The analyses were carried out using STATA 8.2 SE, by the Health Supply and Demand Analysis Division, Applied Research and Analysis Directorate, Health Canada, and responsibility for the use and interpretation of these data is entirely that of the authors.

Health-Care Utilization in Canada: 25 Years of Evidence

1. Introduction

Access to health care is an important issue, particularly in countries with publicly-funded health care systems. Canadians have been covered for all medically necessary health care since 1972; the Canada Health Act (CHA) reinforced this right in 1984. However, public health insurance has not eliminated variation in health across socio-economic status (SES) in Canada or in other countries offering public health care systems. As a result, policy makers, and thus researchers, are questioning whether public health insurance is providing an equitable playing field – are those in need of care obtaining it irrespective of socio-economic or demographic characteristics?

This study provides a description of utilization patterns in health-care services (physician (MD) visits, specialist visits and hospitalizations) in Canada between 1978 and 2003. This 25 year period begins shortly after the realization of a public health insurance programme, covers the introduction of the Canada Health Act and expenditures in health care that increase substantially after the introduction of public health insurance, decrease with federal budget cuts in the mid-1990s and then rebound. The relationship between utilization and socio-economic and demographic characteristics are examined over this period. Previous studies have found that utilization of MD services tends to be relatively equitable, perhaps even ‘pro-poor’, but utilization of specialist visits is inequitable or ‘pro-rich’. In general, the poor exhibit higher utilization of hospital services; however, this is often cited as a function of higher rates of avoidable hospital admissions due to inequitable primary or preventive care rather than more equitable secondary care.

Results of this study indicate that inequities in health-care utilization are apparent and in some cases increasing over time. SES is positively related to the probability of any visits to a physician but inversely related to the number of visits, conditional on at least one visit. However, inequity in the probability of a specialist’s visits has been consistent over the study period; inequities in the number of visits are becoming more relevant as time passes. Hospital admissions and length of stay (LOS) seem to favour individuals from

lower SES groups; previous literature indicates this may indicate limitations in the primary care system.

2. Literature Review

The desire for equity was a main driver of the introduction of a public health insurance system in Canada. Public health insurance has been available to all Canadians since 1972 and offers the right to seek necessary health-care services without consideration of cost. However, this “zero price” at the point of utilization has not necessarily led to equal health in Canadian adults (Curtis and Phipps, 2004; Wagstaff and van Doorslaer, 2004; Curtis, 2001; Cairney and Arnold, 1998; Mustard and Frolich, 1995; Evans et al., 1994), or children (Curtis et al., 2004; Currie and Stabile, 2003; Case et al., 2002), or in other countries with public health care (van Doorslaer et al., 2004; Haynes, 1991). SES gradients in health status have led to a significant research literature on health care utilization, particularly regarding questions of equity in countries offering publicly provided health insurance or health care (Hurley and Grignon, 2006; Mangalore, 2006; Lasser et al., 2006; Atella et al. 2004). Inequality¹ or inequity in health-care utilization² is an important policy issue in countries, like Canada, where a fundamental principal of the health-care system is equitable access. However, recent study results frequently supported the “inverse care law” - those in most need of care get the least (Hart, 1971).

¹Inequity in utilization may develop as a result of under utilization by those with the lower levels of care or over utilization by those with higher levels or both. Although this is a very interesting question we do not attempt to answer it in this paper. We start with the more basic question of whether or not inequality in health care utilization exists after adjusting for ‘need’.

²Health researchers are careful to make the distinction between demand for health care, access to health care and health-care utilization. In general, we are unable to observe an individual’s demand for health care or whether or not they attempted to access the system. Typically, as is the case in these survey data, information is available only on the number of times the patient saw a medical practitioner (utilization) not how many times they wanted or attempted to access. In this study care is made to discuss utilization and not access.

Many Canadian studies of the relationship between health-care utilization and SES can be found in the health literature (e.g. Dunlop et al. 2000; Mustard et al., 1998; Roos and Mustard, 1997; Katz, 1996; Birch et al., 1993; Haynes, 1991)³. However these studies tend to examine a single period and/or ignore the unique distributional characteristics of utilization data⁴. This study adds to the current literature by examining the SES utilization correlation over 25 years (1978-2003), using a two-part model in an attempt to identify changes in the relationships which may have occurred as the Canadian health-care system evolved.

The seven cross-sections of data used in this study offer snapshot views of several distinct periods in the history of Canadian health care - post public health insurance. The study begins in 1978, soon after introduction of public health insurance, when health care expenditures were about 7% of GDP. In 1984, the Canada Health Act was introduced, re-confirming the equity goals of Canada's health-care system. Following the introduction of public health insurance, expenditures as a percentage Gross Domestic Product (GDP) rose fairly rapidly to a high of 10% of GDP in 1992. Tightening of federal and provincial health-care spending resulted in expenditures falling to 9% of GDP in 1997 and subsequent 're-investment' saw rebounding expenditures to new highs (over 10%) in 2005; expenditures/capita follow a similar pattern (see Appendix One – Figure 1).

³Many studies are found in the econometric literature examining the appropriate estimation of count data (see for example Sarma and Simpson, 2006; Winkelmann, 2003; Schellhorn, 2001; Hausman, et al., 1984;) or moral hazard (see for example Stabile, 2001; Schellhorn, 2001; Chiappori et al., 1998).

⁴This paper is intended to offer a description of utilization patterns and the relationships between health-care utilization and socio-economic status controlling for demographics and health status, over 25 years. The possibility of endogeneity of health status in the estimation equations is recognized as a hurdle in this literature and this paper. Instrumental variables analysis is typically utilized when endogenous regressors are present. However, it was impossible, as it often is, to identify instruments for health status in all of the surveys. Thus, the results are presented with this caveat. In a companion paper, Curtis (2006) uses measures of maternal and paternal health status, available in two surveys, as instruments and results are similar.

Prior to the introduction of the CHA, Canadian utilization studies indicate that equity principals were intact. SES was either inversely related to utilization or an insignificant factor after controlling for 'need' (e.g., Manga et al., 1987; Broyles et al., 1983). Results post CHA or from regional studies are less consistent. Examining national trends using the 1985 General Social Survey (GSS), Birch, Eyles and Newbold (1993) found significant relationships between need and the probability and frequency of utilization but no relationship between income and utilization. However, disaggregation by need indicated that links were present between education and use particularly for those in the poorest health. In a similar study, the authors extracted information from the 1985 GSS on the two largest provinces and found a link between income and the probability of visiting a physician, after controlling for need, in Quebec but not in Ontario (Newbold, Birch and Eyles, 1994).

Katz et al. (1996) found an inverse relationship between income and health-care utilization using the 1990 Ontario Health Survey. The authors were unable to control for health status and surmised that higher utilization by individuals with lower SES was likely due to health status differences. Roos and Mustard (1997), used administrative data from Manitoba to demonstrate that individuals from lower-income neighbourhoods utilized more physician services than did higher-income groups but the differences were less than expected given probable health status differences. Specialist visits and surgical procedures did not vary across income groups even though individuals from lower-income neighbourhoods were expected to need substantially more services.

More recent research using the 1994 Canadian National Population Health Survey (NPHS) reveals differential utilization by SES after adjusting for 'need.' Although MD visits seem to be equitable, SES (in terms of education and/or income) is associated with specialists' visits; adults with lower levels of income and/or education are less likely to have a specialist's visit than those with higher levels (Dunlop et al, 2000). Data from the 1996 NPHS indicates that, after adjusting for need and insurance status, higher levels of income remain associated with a higher probability of any contact with MD (the magnitude is similar to that of insurance status) but fewer visits conditional on any

contact (Stabile, 2001). When examining network effects and utilization patterns of individuals whose mother tongue is neither English nor French using the 1994, 1996 and 1998 NPHS, Deri (2005) finds a significant relationship between income and the probability of any contacts with the system and the number of specialist's visits. In contrast, Sarma and Simpson (2006) find little relationship between health-care utilization and income using the 1998 NPHS.

Comparing Canada and the US using the 2002 Joint Canada US Survey of Health, Lasser et al. (2006) show that the richest Canadian (US) group is 1.7 (2.6) times more likely to have a regular physician and 1.5 (1.7) times more likely to have had a physician visit in the last year when compared to the lowest income group. The authors conclude that Canada is more equitable than the US but inequities are nevertheless apparent in Canada. van Doorslaer et al., (2006) examine equity in the utilization of physician services in 21 OECD countries; Canada fairs poorly. Although the likelihood of at least one visit to a MD is found to be equitable in most countries, Canada is one of three countries where the wealthy are more likely to visit a MD than individuals with lower incomes (a pro-rich bias). However a pro-poor bias is evident in Canada when examining the mean number of visits, given that at least one visit occurred. All countries show a pro-rich bias in the likelihood of utilizing any specialists' services and the number of specialist's visits given contact. Hurley and Grignon (2006) interpret the 'slightly pro-rich' bias in the likelihood of any visit to a MD in Canada offset by the 'slightly pro-poor' bias in number of visits as having little significance for health policy however they point out that the inequity in specialist's services is 'troubling'.

It has been suggested that this troubling inequity in physician's/specialist's visits may lead to further inequities in hospitalizations (Saxena et al. 2006). Studies examining the relationship between SES and hospitalizations typically find an inverse relationship between SES and hospitalizations; poorer individuals are more likely to be hospitalized and have longer lengths of stay (LOS) in Canada (Booth and Hux, 2003; Lin et al., 2002; Carriere et al., 2000; Billings et al., 1996, Manga et al., 1987) and internationally (Saxena et al., 2006; Pappas et al., 1997; Billings et al., 1996). The higher rates of hospitalization

are viewed not as a sign of equity but as a shortcoming of the primary care system given that many hospital stays are avoidable with timely, good quality primary care. Thus, hospital admissions for conditions that are potentially treatable in the primary care setting have become indicators of limited access to primary care (Blustein et al., 1998; Weissman et al., 1992).

In sum, studies using data collected following the budget cuts of the mid-1990s point out an association between health-care utilization and SES whereas earlier studies did not. Recent evidence indicates that adults in lower socio-economic circumstances tend to utilize fewer primary health-care and specialist's services and have more frequent hospitalizations and longer LOS after controlling for need. Inequities in physician visits tend to be driven mainly by differences in utilization of specialists, while inequities in hospitalizations are often found to be the result of inequitable treatment at the primary care level.

3. Theory and Estimation

Theory regarding health-care utilization has evolved over time. Early seminal studies modeled the demand for health care as any other good in order to estimate demand elasticities. For example, Manning et al. (1987) used experimental data, to estimate price and income elasticities for health care. More recently, the principal-agent framework has been the basis of models of health-care utilization. In these models, due to asymmetric information (i.e. the physician has more information about medical matters than the patient) the patient relies on the physician, their agent, to assist them in making optimal choices regarding health-care utilization. In a perfect principal-agent relationship, the physician offers exactly the amount of health care the patient would have chosen had the patient had full information. However, the relationship may not always be perfect due to physicians' economic, ethical and personal considerations (Evans, 1984).

Empirical work based on principal-agent models often assumes that the health-care utilization decision is a two step process. The use of a two part hurdle model enables exploration of utilization patterns across the two stages. First, differences in use/non-use

of health care are examined; typically, this stage is modeled as a decision of the individual. Second, the number of visits, conditional on at least one visit, is analyzed; this stage is usually modeled as the physician's decision (or a joint decision of physician and patient). A two-part hurdle model is utilized to overcome the unique distributional issues of utilization (count) data (Winkelmann, 2003; Chi, 1998; Mullahy, 1997; Pohlmeirer and Ulrich, 1995; Hausman et al., 1984). In the first step, the relationship between contact/no contact and individual/family characteristics is estimated using a logit regression. In the second step, the number of visits, conditional on at least one visit, is estimated utilizing a zero-truncated negative binomial regression⁵, an estimation procedure that is particularly suited to estimating distributions of strictly positive counts are possible (i.e., number of visits conditional on at least one) (Sarma and Simpson, 2006; Nguyen L et al., 2005; Lee et al., 2003; Winkelmann, 2003; Pohlmeirer and Ulrich, 1995)

The two step estimation process allows researchers to investigate whether inequities are occurring in the contact stage or the number of visits conditional on contact. Policy implications differ in the two situations. Policies addressing differences in seeking of care should focus on providing information, and incentives/disincentives, to those who should and should not be seeking care. Policies could include educating the public on proper use of medical services, transportation assistance for those in need, assistance with setting up appointments, time off work to visit the physician and/or more after-hours clinics.

⁵ Some researchers have suggested that the Sample Selection Model (SSM) (Heckman, 1980) should be used to estimate this type of process rather than the two-part model (2PM). Leung and Yu (1996) perform Monte Carlo analysis and find that the SSM is the best model when it is the correct model but if there are few exclusion restrictions, high proportion of censored observations and high levels of colinearity then the 2PM is the better performer. Winkelmann (2002) compares the two step model with six other models that are either nested or non-nested with one another. He finds that the two step model out performs all others. Pohlmeirer and Ulrich (1995) discuss the benefits of estimating the two-part hurdle model using the zero-truncated negative binomial model for only positive visits. As previously mentioned, the two-part model also lends itself nicely to policy interpretation.

Additional insurance coverage⁶ (e.g. for pharmaceuticals) may increase health-care utilization by those who cannot afford treatment, however, a debate exists over the existence of moral hazard in the demand for health care. Sarma and Simpson (2006) interpret a positive relationship between pharmaceutical insurance and general practitioner (gp) visits in Canada as moral hazard (often interpreted as a pejorative term). Recognizing that insurance status may be endogenous, Stabile (2001) use instrumental variables estimation and concludes that moral hazard is present in the demand for gp services in Canadian data. Chiappori et al. (1998) exploit a natural experiment and find no evidence of moral hazard in the demand for gp services in France. Williamson and Fast (1998) find that individuals with low income and no insurance do not seek necessary care because they cannot afford treatment, concluding that increased use of health care services in the presence of supplemental insurance may lead to higher levels of health.

Policies addressing differences in utilization conditional on accessing the system should focus on encouraging appropriate levels of care. For example, the physician needs to be adequately informed as to the patient's condition and the patient needs to be informed as to the necessity of treatments and their rights within the system; providing patient educators may help. Policies such as clinical guidelines which encourage horizontal equity may also be justified.

In the two step model it is assumed that the first step involves the decision of whether or not to contact a physician. This decision depends primarily on the individual; their perception of their health status and their ability to navigate the system. The second step, the decision regarding how many times the individual sees a practitioner given initial contact was made, is made primarily by the practitioner, based on their perception of the individual's health and incentive to treat the individual⁷(Chi, 1998). This model leads to

⁶ Insurance status is not available in many of the cross-sections of data utilized here. As a sensitivity analysis we included insurance status when possible and found, as others did, insurance variables were significantly positive but did not change other results substantially.

⁷It is against the Canada Health Act to charge a patient extra fees for services covered under public health insurance. However, physicians may offer preferential treatment, in the form of easier access or multiple referrals to some patients (Langley et al., 1992).

an estimation procedure that: 1) examines the likelihood of utilizing a physician's services; and 2) the number of visits, given that at least one visit has occurred.

4. Data Sources

Data⁸ used for this analysis are from the 1978 Canada Health Survey (CHS), the 1985 and 1991 General Social Surveys (GSS), the 1994 and 1998 National Population Health Surveys (NPHS), and the 2000-2001 (Cycle 1.1) and 2003 (Cycle 2.1) of the Canadian Community Health Survey (CCHS). All data were extracted from the share use health files except for the General Social Surveys in 1985 and 1991, as only public use health files were available for GSS data. All the surveys are population based and include non-institutionalized individuals living in Canada, excluding those from Indian Reserves, Canadian Forces Bases and some remote areas. Except for CCHS, the Territories are not sampled; hence, observations from the Territories were dropped to match the other surveys. Complex sampling methodologies were utilized in the surveys and the appropriate survey weights are utilized in all analysis.

The surveys are designed to collect information on the health of the Canadian population and related socio-economic and demographic information. The surveys include information on health status (self-reported general and disease-based), use of health-care services, health behaviours, economic characteristics, and demographics. The sample was restricted to individuals 20 years of age and older as this age group is likely to be making their own decisions concerning health care. Observations with non-responses to any of the questions used to derive variables in the analysis are excluded.

The use of health-care services is obtained via self report of visits to health-care providers and over-night stays in hospitals or nursing homes in the 12 months prior to the survey. Three measures of health care utilization are investigated. In each case the contacts are

⁸ All data were collected by Statistics Canada – see www.statscan.ca

recorded for the 12 months prior to the survey. The three measures are: i) physician visits, ii) specialist visits⁹, and iii) overnight hospital stays.

The estimation procedure corrects for left-hand truncation of the data. However, right-hand truncation may also be an issue for some of the data. Specifically, the public use files (GSS 1985 and 1991) are truncated to suppress observations with very high utilization. In the GSS 1985, physician, and specialist visits are capped at 27 and overnight hospital stays at 15; a small proportion of physician, and specialist visits are at the cap (1.0%, and 1.3%, respectively). Hospitals are more severely truncated; 16.7% of the reported stays are at the cap of 15. In the GSS 1991 caps were 52 contacts for physicians, and specialists (0.24%, and 0.33%, respectively, were at the cap). Capping the data at the 1985 GSS caps would increase comparability across time but it also complicates estimation and discards a great deal of information. Hence, the analyses are carried out on the available data, disregarding the caps. Some caution should be utilized when comparing hospital visits in 1985 to the other years.

Health status is proxied by fair/poor health status. A five-category (excellent, very good, good, fair, poor) self-rated health variable is available in the GSS 1991 and onward. The 1985 GSS contains a four-category health status variable (excellent, good, fair, poor). For all years other than 1978, poor health status is equal to one for those who reported to be in poor or fair health. Self-reported health status was not available in the 1978 survey however, there is information on whether or not an individual reported health problems or limitations in daily activities and/or work that were used to proxy of fair/poor health status¹⁰.

⁹Data on specialists' visits is not available for 1978; analysis is carried out for the period 1985 to 2003. Specialists are medical doctors, such as surgeon, allergist, gynecologists, psychiatrist, etc.

¹⁰Derivation of the poor health status variable in 1978 CHS is based on the presence of activity limitations, whether or not "ill health affected the amount of work you do?", and whether or not "you feel healthy enough to carry out the things you would like to do?" Poor health status is derived if the respondent reported: a major activity limitation or they cannot do a major activity, or; sometimes or never feeling healthy enough to carry out normal activities, or; ill health often affects the amount of work done.

A main focus of this study is the relationship between socio-economic status (SES) and health care utilization. Household income, education¹¹, labour force participation and immigrant status are included as SES variables. Indicators for low- and high-income persons (*poor* and *rich*) are derived by adjusting the best estimate of total household income from all sources by the square root of household size¹². Low-income status (*poor*) is equal to one for those individuals with adjusted household income less than half the median adjusted household income. Higher-income status (*rich*) is equal to one if individuals have adjusted incomes in the upper 90th percentile. Those who report their main activity as looking for work or not working due to a labour dispute are recorded as unemployed. Those who report not working and main activities such as caring for family, or retired are included in the 'not in the labour force' category.

Immigrants tend to be, on average, in better health upon their arrival to Canada; over time, their average health approaches that of the general population – often referred to as assimilation or the health immigrant effect- thus utilization patterns may differ in a similar way (McDonald and Kennedy, 2005; Deri, 2005). Immigrant families may face barriers to utilizing the system (e.g. prejudices within the system, language or cultural issues). Deri (2005) points out that there are strong network effects in health-care utilization patterns, particularly in the probability of any contact. The number of physicians speaking the immigrant's language is also positively related to both the probability of any use and the number of visits given use. Thus, immigrant status (equal to one if born outside Canada, zero otherwise) is also included. Immigrant status is interacted with years since immigration to Canada (current year/age minus year of /age at

¹¹University includes college diplomas.

¹²Household income is grouped in both the 1991 GSS and 1994 NPHS; an income variable was derived by assigning the midpoint of the income group for observations (e.g. \$10,000 to \$15,000 group had \$12,500). Individuals were assigned the value of the cap for the highest income groups (e.g. income > \$80,000 was assigned a value of \$80,000). Following adjustment by household size, *rich* and *poor* indicators were derived. Trend analysis indicated the results were reasonable. Sensitivity analyses, completed using other definitions of income, resulted in similar findings.

immigration) as a simple dichotomous immigrant status variable may not capture the dynamics of recent immigrant effects (the comparator becomes a native-born individual).

Other controls are based on the health and health care utilization literature (Sarma and Simpson, 2006; Mangalore, 2006; Schellhorn, 2001; Curtis, 2001; Birch et al., 1993). Age, sex, marital status and health behaviours are included. Age is controlled with dummy variables representing 5 year age intervals from 20 to 75 and a dummy for those over the age of 75 (40-45 years of age is the comparator). Dummy variables are also added to control for marital status (never married (*never married*) (and previously married (*previous married*) (currently married including common-law is the comparator) and sex (*male* (female is the comparator)). Health behaviours or lifestyle variables (i.e. smoking, activity levels, heavy drinking etc.) are hypothesized to have an important impact on health and health care utilization patterns. Individuals who participate in negative health behaviours may have different attitudes towards health care than those who have similar health status but who live healthier lifestyles. Following other literature (Sarma and Simpson, 2006; Mangalore, 2006; Schellhorn, 2001; Birch et al., 1993) we control for these factors. A derived dummy variable, negative health behaviours (*neg health behav*), equal to one if the individual smokes, has a sedentary life style, or consumes more than 2 drinks per day, is computed¹³ (the reference group is an individual who does not partake in these activities). Canada has a national health insurance scheme however covered services may vary as each province determines what is medically necessary thus, regional dummies are included as controls (Ontario is comparator).

5. Results

5.1 Descriptive Statistics

¹³ Exploratory analysis, excluding the variables and including different combinations of the variables, was performed due to the possibility of endogeneity of health behaviours and the problem of non-response to some of the health behaviour questions. The main results hold throughout. Creating a single negative health behaviours variable based on the three health behaviours typical used in the stated literature avoids a substantial loss of observations due mainly to missing information on activity levels with little impact on the overall results.

Health Care Utilization:

Table 1 (first 8 rows) presents the means for health-care utilization. Between 1978 and 2003, 79.5% to 84.6% of the population accessed medical doctors (MD) (general practitioners/family doctors and/or specialists). More Canadians (by 2.1% percentage points) had contact with a MD in 2003 compared to 1978. The highest proportion of contacts was in 1991 when 84.6% of Canadians contacted a MD, a 5.1 percentage point increase from 1978. The frequency of visits to physicians, conditional on at least one visit, increased from 1978 to 1994 (caps were present at 27 in 1985 and 52 if 1991), and then decreased throughout the remainder of the period. The average number of visits, for those who had visits, was 4.8 in 1978 and 5.2 visits in 2003. Visits decreased, on average, by about one-half a visit between 1994 and 1998 and by about a one-third of a visit between 2000 and 2003.

Data on specialists' services are unavailable before 1985; since then, the percentage of the population contacting specialists decreased by 1.7 percentage points from 30.7% in 1985 to 29.0% in 2003. There was an increase in the number of visits, conditional on at least one visit, from 3.1 in 1985 to a peak of 3.8 visits in 1994. By 2003, the average number of visits, conditional on one visit, settled back to around 3.2 visits, not significantly different than 1985.

Fewer Canadians (non-institutionalized) experienced hospital (nursing home/convalescent) admissions over the study period; a decrease of nearly 3 percentage points took place between 1978 (11.1%) and 2003 (8.3%). The hospitalization rate remained relatively constant until 1994, when it fell by 1.2 percentage points. There was a significant drop of 2 percentage points between 1994 and 1998, and period-to-period changes were small in magnitude thereafter. The number of nights spent in hospital (or LOS) also decreased significantly over time. In 2003, patients stayed, on average, 2.9 fewer nights than in 1978 (note the 1985 data were capped at 15 nights).

Population Characteristics:

The remainder of Table 1 presents the unconditional means for individual characteristics across the years. Trends indicate that individuals in the population are reporting themselves to be, on average, more healthy across time with just over 1/4 of the population reporting fair/poor health in 1978, falling to less than 1/5 in 1985, continuing to decline through 1998 when approximately 1/10th of the population reported fair/poor health, the proportion then increases slightly through the end of the period to just over 11%.

Across the SES variables, the percentage of those with adjusted household incomes less than half the median varies from a high of 18.4% in 2000 to a low of 13.3 % in 1991; 17.3% of the families in the study are poor in 2003. The percentage with incomes in the 90th percentile varies slightly (the percentiles are calculated before any observations are dropped). Over time, education levels have been rising, with substantially fewer people with less than high school diplomas (48.2% in 1978, 17.3% in 2003) or high school diplomas (from a high of 22.1% in 1978 to a low of 15.2% in 1998 and then increased again to 18.6% by the end of the period). There was a substantial increase of 34 percentage points in those holding university degrees from 10% in 1978 to 44.4% in 2003. Coinciding with the recession of the early 1990s, the employment rate dropped substantially in 1994 and the proportion of those not in the labour force also increased.

Several demographic trends are also apparent. The proportion of non-native born Canadians fell from 20.8% in 1978 to 17.6% in 1991 and then rebounded to 21.3 in 2003. There are fewer married, more single (never married), and more previously married individuals. The population is ageing; there are fewer persons below 35 years of age and substantially more in the 35 to 54 age groups in more recent years. The Canadian population is also more concentrated in Ontario and BC, while a significantly smaller percentage of population lives in Atlantic Canada and Quebec.

To summarize, the population is reporting itself as more healthy than in the past, it is also more educated, older, with fewer married individuals. Poverty levels have fluctuated but are on the increase in the 2000s. Although there have been statistically significant

changes in the percentage of Canadians making at least one contact with a medical doctor (family doctor/general practitioner or specialist), the changes have not been substantial in magnitude (about 2.1 percentage points) but neither have they declined. Amongst those making at least one contact, there are more visits, on average, between patients and gps; visits with specialists have not changed significantly over time. Fewer Canadians are spending nights in hospital; when they do, they are staying for shorter periods of time, roughly a half-week less.

As noted previously, utilization is not a measure of access. Moreover, access is very difficult to determine. However, there are questions regarding an individual's inability to obtain needed care in several of the surveys and although they are not identical¹⁴ they offer some information regarding individuals' perceptions of difficulties in obtaining care. In 1978, approximately 6.8% of respondents reported not receiving needed care, that decreased to 4.4% in 1994, increased again to 6.7% in 1998 and then almost double to 13% in 2000, decreasing slightly to 11.7% in 2003. For those in poor health status, assumed to be higher users of the health-care system, the percentages are approximately double. In each year, the percentage of poor (rich) individuals reporting problems accessing care is about 1.5 (0.75) times higher than (as high as) the overall average.

5.2 Socio-economic Status and Health Care Utilization

Tables 2 through 9 present the regression analyses. The even numbered tables examine contact/no contact while the odd numbered tables examine the number of visits, given at least one visit. Each table provides the change in probability associated with a change in the characteristic in question (holding all else constant). The odd numbered tables present the changes in number of visits from the mean number of visits. To bring perspective to the reported changes in probabilities or number of visits, the discussion of results will

¹⁴1978 question concerned - Reason for not seeing a health professional during the last 12 month; 1994 - Health Care needed/not received past year; 1998 - Health Care needed but not received? (Y/N); 2000 - During the past 12 months, was there ever a time when you felt that you needed health care but didn't receive it?; 2003 -During the past 12 months, was there ever a time when you felt that you needed health care but you didn't receive it?

include percentage changes in probabilities and mean visits. The results are reported for the years 1978 (except for specialists), 1985, 1991, 1994, 1998, 2000 and 2003. The significance of results refers to the associations between utilization and the given characteristic, controlling for all else, in the yearly results; trends in the estimated associations are also examined across time.

Table 2 presents the results for use/non-use of services provided by medical doctors (MD). First note that in all years, the probability that an individual in fair/poor health status visits a doctor is between 0.33 (98%) and 0.61 points (316%) higher than for those who are in better health. The probability difference grows over time, peaking in 1998 but remains substantial (those in poor health are about twice as likely to see a doctor as someone in good health) in the 2000s. The only other characteristics that compare in magnitude are being 75 years of age or older (compared to being 40 to 45 years old) and being male (compared to female). The difference in probabilities for the genders is much more stable across time at around 0.40 (a male is about 60% less likely to see a physician than a female).

Poverty is significantly associated with MD contacts in all years except 1998. In 1978 and 1991 poorer individuals have utilization probabilities that are 0.07 and 0.12 points higher than those of richer individuals. From 1994 to 2003, living in poverty is associated with lower probabilities of utilization, (0.06 points or 13% less likely in 1994 to 0.12 or 21% as likely in 2003). Living at the upper end of the income distribution results in the reverse situation. In 1985, 1994, 2000 and 2003 higher income individuals are significantly more likely (32%, 29%, 10% and 8%, respectively) to contact a physician than those from middle-income households.

Education offers a similar picture. Those with lower levels of education are about 10% less likely to contact a physician in 2000 and 2003, compared to high school graduates, but the two educational groups are not significantly different in the other years. University graduates are 10 to 30% more likely to make contact than high school graduates in the later years of the study and not significantly different prior to that. Those

who are unemployed were not significantly different from those who are employed when it comes to contacting a physician except for 2003 when they are 13% more likely to have at least one visit. However, those who are not in the labour force are significantly less likely to contact a MD in the early years of the study and more likely than employed persons in 1994, 2000, and 2003 (24%, 12% and 8%, respectively). New immigrants (in Canada up to 5 years) have a significantly higher probability (0.42 or 40%) of seeing a physician than native born individuals in 1991 but significantly lower probabilities in later years ((-0.16 or 27%, -0.23 or 37%, -0.11 or 20% and -0.19 or 32% in 1994, 1998, 2000 and 2003 respectively). Immigrants residing in Canada for longer periods of time do not differ systematically from native-born Canadians when it comes to probability of seeing a MD

Individuals who were never married are significantly less likely to contact a MD than married persons in all years and previously married in the later years of the study (10% and 7% fewer in 2000 and 2003). Individuals who have negative health behaviours are significantly less likely to contact a MD compared to those who do not in 1978, 1985, 2000 and 2003. As already stated, across the period, males are about one-half as likely to contact a physician as females and older individuals are more likely to contact a physician than middle-aged individuals. In general, individuals from provinces other than Ontario are less likely to contact a physician than those from Ontario.

Table 3 indicates the change in the population mean number of visits, conditional on at least one visit, for a change in the given characteristic (holding all else constant). Those in poor health have 6 and 11 more visits, on average, than the population mean and more than double the mean visits of a person in better health in 1978; triple them in 1991; and by 2003 a person in poor health has 2.7 times more visits with a physician than a than those in better health (odds ratios not reported). From 1991 onward, poorer individuals have more visits (~10%) than middle-income individuals or about one-half a visit more than the average person. Individuals from wealthier households are not significantly different from those from middle-income households except in 1994 when they have 13% more visits and in 2000 when they have 5% fewer.

Individuals with lower levels of education have about 25% more visits than high school graduates in the last few years of the study and those with university education have substantially more visits in 1985 and 1991 but similar numbers of visits in later years. In the early and late periods of the study, the unemployed had significantly more visits than the comparator, 3.4 more visits in 1978, 1.1 more in 1985, 1.15 more in 2000 and about 1/3 of a visit more in 2003. Individuals who were out of the labour force have significantly more visits than employed individuals throughout the study period (~30% in most years except 1978 and 1994 when they have ~50% more visits). Newer immigrants (less than 10 years in Canada) have consistently fewer visits in all but the earliest years of the study.

The results for demographic characteristics are mixed. Males have fewer visits, on average, than females by about 30% throughout the period. Never married individuals have similar numbers of visits as married individuals at the beginning of the study but towards the end have about 7% fewer visits and previously married individuals have about 10% more visits in 1978 and from 1998 onwards; differences are insignificant in other years. Surprisingly, younger individuals have more visits than those aged 40 to 45 years while older individuals have, on average, more visits in the beginning of the study period but the same or fewer visits than a middle-aged person by the end of the study period.

To summarize, those with poorer health are much more likely to contact a MD and have more visits, on average, than healthier individuals. Poorer and less educated persons are less likely to contact a physician but have more visits once contact is made. Wealthier and more educated individuals are more likely to have an initial visit than their counterparts but differences are insignificant across number of visits, conditional on a visit. The results are mixed for employment status; the unemployed have about as many contacts as an employed person. Those who are not in the labour force had fewer contacts at the beginning of the study but had similar or slightly higher likelihoods of making contact by the end of the study. However, both of groups have substantially more visits,

on average, than an employed person by the end of the study period. Newer immigrants are less likely to have any utilization and have fewer mean visits than native-born individuals and this is particularly true in the later years of the study.

Tables 4 and 5 describe the patterns for contact and visits with specialists from 1985. Table 4 indicates that the probability of contacting a specialist is significantly lower for lower SES groups and that the differences are quite stable over time. The less healthy are substantially more likely to have any contact with a specialist (the probability is about 0.45 points higher across the time frame or 175% higher than a person in good health). Individuals from poorer households are about 18% less likely to contact a specialist throughout the period than those from middle-income households; the wealthier over 25% more likely. The less educated are about 20% less likely and the better educated are about 15% to 30% more likely than someone with a high school education to have contact with a specialist. The unemployed contact specialists with somewhat higher likelihood compared to the employed but those who are not in the labour force do so significantly more often, about 30% more. Immigrants, no matter how long in Canada, are never more likely than native-born Canadians to contact a specialist.

The results are mixed for those with negative health behaviours but males have significantly fewer contacts (just over half as likely as females). Compared to married individuals, those who were never married have significantly fewer contacts by the end of the study period and older individuals are more likely to contact a specialist than middle-aged persons. Compared to Ontario, the probability of visiting a specialist is higher for Quebec residents, and lower in the Prairies and BC, and similar in the Atlantic.

The positive association with SES persists for the number of visits to a specialist, conditional on at least one visit although the relationship seems strongest in the later years of the study (Table 5). Health is once again, the most strongly associated characteristic with less healthy individuals having, on average, about 4 to 5 additional visits per year (2.5 times as many visits as a healthier individual). Poverty status does not matter except in 2003 when the poor have about 20% more visits (~half a visit) with a

specialist than someone from a middle-income household. The less educated have almost 20% fewer visits (~ half a visit) in the last two surveys which is an improvement from the 40% fewer visits (~ 1 visit) in 1978. Those who were not in the labour force had substantially higher visits from 1991 onward by about 0.4 visits and newer immigrants had about half as many visits as native born Canadians. Although the gap narrowed with years in Canada, immigrants with over 20 years tenure still had significantly fewer visits in the later years of the study.

Surprisingly, older (younger) individuals had substantially fewer (more) visits when compared to middle-aged individuals. Males had similar numbers of visits to females in the early periods of the study but fewer by the end. Non-married individuals had similar visits (except near the end of the study period when they had about 10% more) and those with negative health behaviours had higher visits (~ one-half to three-quarters more) than average in the latest periods. Individuals from most regions had fewer visits, on average, with a specialist when compared to those from Ontario.

The results for hospitals are presented in tables 6 and 7. Hospital admissions are most highly associated with health status; those in poor health are 2 to 3 times more likely to be hospitalized than someone in better health. The poor are more likely, in later periods of the study, to be hospitalized than those from middle-income households, the wealthy are about as likely. Those who are not in the labour force are more likely to be hospitalized than employed individuals and unemployed are never less likely to be hospitalized than employed individuals. Immigrants are less likely than non-immigrants in the later years of the study but significance is weak throughout. Never married individuals are about half as likely as married to be admitted to the hospital and previously married are less likely in 1985, 1998 and 2000. Those with negative health behaviours are approximately 20% more likely than those without to be hospitalized in the last half of the study period. Younger and older individuals are more likely to be hospitalized than middle-aged people (counter to popular belief, the likelihood is higher for younger individuals than older). In the final years of the study individuals from the

Atlantic and Prairie regions are more likely to be hospitalized than Canadians from Ontario.

Table 7 indicates that health status is primarily associated with the number of nights spent in hospital. In the final years of the study, those living in poorer and wealthier households have about 25% more and 20% fewer nights (~0.8 nights), respectively, in hospital than those from middle income households. Individuals who are not in the labour force have substantially more nights in hospital than their counter parts. Immigrants have significantly fewer nights than non-immigrants in later years of data. Those who are not married have more nights, on average, than do married individuals, but significance varies across the study. Males and those with negative health behaviours have more nights, on average, than the comparators. In general, the older have more nights and the younger fewer than the middle aged.

To summarize, for all health-care services, health status is most strongly associated with the probability of any contacts and the number of visits conditional on at least one contact. The magnitude of the relationship between health status and health-care utilization is stable or growing through time. Those with lower levels of SES (lower income, education, employment) have, on average, less likelihood of contacting a physician and those with higher levels of SES, a higher likelihood when compared to individuals living in middle-income households. This tendency seems to be growing over the period of the study. However those with lower SES have, on average, higher numbers of physician visits conditional on at least one visit. Thus, there appears to be some ‘adjustment’ once a person with lower SES is seen by a physician. The patterns are somewhat different for immigrants depending on time spent in Canada. Those with long tenure in Canada have probabilities similar to native-born Canadians but newer arrivals have much lower probabilities of seeing a physician. Conditional on at least one contact, all groups of immigrants have fewer visits, on average, than do non-immigrants particularly true in the later years of the study.

A persistent pattern of inequity is apparent when examining specialist's visits over time. Individuals with higher levels of SES are more likely to have contact with a specialist and if they have at least one visit, they have, in general, more visits than those in mid-SES circumstances. Moreover, individuals from lower SES households are less likely to have any visits with a specialist and, on average, have fewer visits if they do. Thus, after controlling for health status, wealthier, better educated, native-born individuals are receiving significantly different outpatient medical care (after controlling for health status) than those who are poorer, less educated or immigrants.

Patterns are also significantly different across SES for inpatient care after controlling for health status. As with other types of care, health status exhibits the strongest (in magnitude and significance) and most consistent relationship with admissions to hospital and number of nights spent once admitted (LOS). Those who report themselves as being in fair or poor health are about half a percentage point more likely to have an admission and stay, on average, 9 to 15 nights more than a healthier person. Poorer individuals are slightly more likely than those from middle-income households to be hospitalized and spend more nights when they are (~2 nights more). Wealthier persons are about as likely as their middle-income counterparts to be hospitalized but have shorter LOS by the end of the study (~ 2 nights less). Those who are not employed (particularly those who are not in the labour force) are also more likely to be hospitalized than those who are and individuals who report themselves not in the labour force have stays that are about 5 nights longer in 2003. Non-native born Canadians have about the same likelihood of hospitalization but, in the later period of the study, stay for substantially shorter periods when hospitalized.

6. Discussion and Conclusions

Substantial changes have taken place in our health-care system over the past quarter century. There also seems to be significant growth in anecdotal evidence and media coverage of the difficulty in obtaining health-care services in recent years. This study set out to present evidence on utilization patterns in Canada over 25 years, 1978 to 2003, in

order to examine if indeed some groups (particularly those in different SES groups) were experiencing different levels of care in a system designed to offer equitable care based on need rather than ability to pay.

The results demonstrate that although health status seems to be most strongly associated with utilization of publicly insured health-care services (those in poorer health experience more care), there is a strong indication that there is a bias towards providing care to higher SES groups; this is particularly evident in physician and specialists contacts. Conditional on at least one visit with a medical doctor, those living in lower SES circumstances (poor, less educated and non-working) have more visits, on average, than do higher SES individuals; there seems to be an adjustment towards more care for the poor once they access the system. However, this is not true for non-native born Canadians. It is also not true for specialist's services. There is a strong 'pro-rich', 'pro-educated', 'anti-poor' and 'anti-non-educated' bias in the probability of receiving any care from a specialist. As well, there is a strong 'anti-non-educated' bias in the number of visits to a specialist given at least one visit has occurred in later periods of the study. Thus, individuals from lower-income households seem to be treated as well as those from middle-income households (and maybe even better in 2003) once they are in the system but those with lower levels of education are still experiencing less care than those with higher educations. As was eluded to in the literature review, those with lower levels of SES have higher hospitalizations and longer lengths of stay, but this may be due to lower the levels of primary care they experience (unfortunately, there is no measure of avoidable hospitalization in this study). Equity seems to be more of an issue in the initial contact stage than in the amount of care received once in the system and seems to be more acute for specialists' services rather than other services.

Education is becoming a strong indicator of whether or not one receives any care and how much care they receive. Two explanations may be relevant here: 1) the educated individual may have more information on what is available (the latest technology etc.) and their rights within the health-care system and thus, may demand more care and be more persistent with their demands; 2) more educated individuals may know more people

within the health-care system (through social activities or living in the same neighbourhoods as physicians) and thus have better chances of obtaining services.

Overall, a decrease in the proportion of the population accessing physicians or specialists has not been seen; hospital admissions and length of stays have dropped over time (probably attributable to a substantial increase in out-patient services). Although a higher proportion of individuals complain about unmet needs (from approximately 7% in 1978 to 12% in 2003), the increase seems small relative to the anecdotal evidence and media attention to the increasing difficulty in attempts to obtain care. The evidence does indicate that there is a growing gap between the amount of care received by the rich and poor, higher and lower educated, and native and non-native born Canadians. While the probability of contacting a specialist has been consistently pro-rich, pro-educated over most of the period, the probability of contacting a medical doctor has grown more inequitable over time. Once having made contact, the number of visits with a MD) is equitable for most of the 25 years of the study; however, the number of visits to specialists is biased towards the pro-educated by the end of the period.

If Canadians wish to support the intent of the Canada Health Act and offer health care that is not related to ability to pay or any other individual characteristic¹⁵, policies should work to ensure that contacts with the system are more equitable. Issues leading to inequitable utilization of the health-care system may include: insurance (as individuals may not see a physician if they believe they cannot afford treatments and/or pharmaceuticals); language and cultural issues (particularly for immigrants and First Nations peoples); availability of physicians in poorer and more rural areas; and knowledge of when care is needed.

15 The health insurance plans of the provinces and territories must provide: reasonable access to insured health care services on uniform terms and conditions, unprecluded, unimpeded, either directly or indirectly, by charges (user charges or extra-billing) or other means (age, health status or financial circumstances) (http://www.hc-sc.gc.ca/ahc-asc/media/nr-cp/2002/2002_care-soinsbk4_e.html- accessed Dec. 5, 2006);

Specific public policy initiatives could include more clinics in under-serviced areas, supplemental insurance for the poor (noting previous discussion on moral hazard), increased cultural training for physicians and training more physicians from minority groups. Educational initiatives could also be offered to all Canadians on the appropriate use of the health-care system. Information intended for immigrant communities should be language specific (Deri, 2005). Given that specialists' services are strongly biased towards the wealthy and better educated and, in most cases, take a referral from a general practitioner, clinical guidelines for such referrals may be in order. Clinical guidelines for treatment by specialists may also be helpful in ensuring an equitable number of visits conditional on at least one visit taking place.

Finally, higher rates of hospitalization for people from lower SES groups should not be viewed as an indication of equity. Although a measure of unavoidable hospitalizations was not available for this study, several recent studies have examined equity in hospital admissions and lengths of stay and have found that at least some of the advantages seen by individuals from lower SES households or neighbourhoods are a result of conditions that could have been successfully treated or controlled with the provision of adequate primary care. Thus, equitable primary care is not only a question of fairness but also an avenue to avoid the necessity of more expensive forms of treatment.

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Table 1 Variable Means	Sample Means						
	1978	1985	1991	1994	1998	2000	2003
MD contacts	79.53	77.76*	84.63*	80.93*	82.11*	82.37*	81.62*
MD visits	4.78~	4.63	4.88*	5.86*	5.34*	5.46*	5.17*
Spec Contacts		30.72	29.25*	27.12*	27.63*	30.10~	28.96*
Spec visits		3.05	3.13	3.84*	3.22~	3.40*	3.20
Admissions	11.14	11.02	11.26	9.97*	7.99*	8.65*	8.33*
Hospital Nights	11.15	6.21*	8.90*	11.37	8.91*	9.01*	8.29*
Poor Health	25.93	18.61*	12.99*	11.17*	10.12*	12.39*	11.20*
Poor	15.32	17.37*	13.30*	14.57^	16.94*	18.37*	17.34*
Rich	10.42	10.03	8.56*	7.58*	10.01~	9.81^	9.97~
Less than HS	48.23	36.66*	30.57*	26.03*	21.65*	21.23*	17.25*
High School	22.12	18.86*	16.27*	15.85*	15.21*	19.46*	18.64*
Post Secondary	19.62	16.20*	29.01*	24.93*	26.91*	19.66	19.76
University	10.03	28.27*	24.16*	33.19*	36.23*	39.65*	44.36*
Employed	58.40	64.80*	66.40*	56.77*	61.27*	62.04*	63.13*
Unemployed	5.83	3.59*	5.03*	4.32*	3.70*	3.93*	4.08*
Not in LF	35.86	31.65*	28.58*	38.90*	35.21~	34.08*	32.84*
Immigrant	21.80	17.75*	17.64*	19.85*	21.16~	21.73	21.32
YSI 0 to 5years	0.03	0.01*	0.02*	0.03*	0.02*	0.03*	0.02*
YSI 5 to 10	0.03	0.02*	0.02*	0.02*	0.03	0.03	0.03
YSI 10 to 15	0.03	0.03~	0.02*	0.02*	0.02*	0.03	0.03
YSI 15 to 20	0.02	0.02	0.02	0.02	0.02^	0.02*	0.02^
Neg Health Behav	66.21	57.68*	56.34*	72.02*	67.23^	66.05*	62.26*
Male	47.27	52.34*	50.24*	48.54*	49.51*	50.23*	51.22*
Married	73.89	72.91^	71.30*	68.61*	65.98*	67.75*	68.56*
Never Married	14.46	15.30^	16.23*	17.40*	18.39*	18.55*	18.56*
Previous Married	11.65	11.79	12.48*	14.00*	15.63*	13.68*	12.88*
20 to 24 years	14.32	14.05	12.76*	10.49*	8.69*	9.11*	9.25*
25 to 29 years	12.39	13.03^	13.79*	13.05^	11.28*	10.33*	9.83*
30 to 34 years	9.88	11.87*	12.37*	12.54*	13.63*	12.37*	11.87*
35 to 39 years	7.66	8.63*	11.39*	10.96*	12.44*	12.56*	12.89*
40 to 44 years	8.04	6.70*	8.90*	9.47*	9.82*	10.98*	10.83*
45 to 49 years	7.56	6.81*	6.95*	7.47	8.56*	9.27*	9.61*
50 to 54 years	7.14	6.18*	5.91*	6.22*	6.36*	6.95	7.98*
55 to 59 years	6.01	5.61^	5.48*	5.67^	5.80	5.29*	5.76
60 to 64 years	5.04	5.75*	5.01	5.27	4.97	4.79	4.55*
65 to 69 years	3.72	4.56*	3.54	4.65*	3.95	4.16^	3.86
70 to 75 years	2.22	3.21*	2.73*	3.11*	3.45*	3.01*	2.97*
Age >75 years	4.00	5.62*	4.59*	5.86*	6.37*	5.85*	5.66*
Atlantic	8.74	7.18*	9.34^	8.29^	7.87*	7.53*	7.09*
Quebec	28.72	29.08	28.67	24.84*	24.94*	25.62*	24.37*
Ontario	34.88	37.41*	30.86*	38.02*	37.31*	38.58*	39.77*
Prairies	15.98	16.87*	17.12*	16.25	16.06	15.57	15.69
BC	11.69	9.46*	14.01*	12.60*	13.82*	12.71*	13.07*
Sample Size	16,043	6,961	8,655	14,394	10,900	83,703	80,468

* significantly different from 1978 (1985 for specialist) at 1%; ^at 5%, ~ at 10%

Table 2 Change in Probability of a Medical Doctor's Visit

Md contact	1978	1985	1991	1994	1998	2000	2003
Poor Health	0.33*	0.35*	0.39*	0.56*	0.61*	0.53*	0.46*
Poor	0.07^	-0.11^	0.12^	-0.06~	-0.03	-0.06*	-0.12*
Rich	-0.05	0.14^	0.03	0.13*	0.03	0.05*	0.04^
Less than HS	-0.04	-0.03	-0.04	-0.06	0.03	-0.05*	-0.05*
Post Secondary	0.00	0.05	-0.03	0.12*	0.07	0.04*	0.08*
University	0.05	0.01	0.09~	0.12*	0.13*	0.05*	0.13*
Unemployed	-0.06	0.07	-0.10	-0.06	0.02	-0.02	0.06^
Not in LF	-0.05~	0.02	-0.12^	0.11*	0.04	0.06*	0.04*
Immigrant	0.01	0.10	0.00	0.02	0.08~	-0.04^	0.02
YSI 0_5	-0.10	0.00	0.42*	-0.16^	-0.23*	-0.11*	-0.19*
YSI 5_10	0.14^	-0.16	0.07	0.02	0.08	0.07^	-0.01
YSI 10_15	-0.06	0.05	-0.05	-0.02	0.48*	0.03	-0.01
YSI 15_20	-0.01	-0.04	0.10	0.16~	0.05	0.05	0.06
Neg Health Behav	-0.06*	-0.16*	-0.04	0.04~	-0.04	-0.07*	-0.06*
Male	-0.41*	-0.44*	-0.43*	-0.35*	-0.45*	-0.43*	-0.41*
Never Married	-0.23*	-0.09^	-0.17*	-0.20*	-0.16*	-0.09*	-0.15*
Previous Married	0.03	0.00	-0.02	-0.07~	-0.08~	-0.05*	-0.04^
20 to 24 years	0.23*	0.10	0.34*	0.13^	0.04	0.02	0.03
25 to 29 years	0.13*	0.07	0.17*	0.13*	-0.09~	0.04^	-0.03~
30 to 34 years	0.03	0.01	0.26*	0.06	-0.09~	0.02	-0.03~
35 to 39 years	-0.04	0.02	0.13^	0.12*	-0.04	0.02	-0.01
45 to 49 years	0.04	-0.02	0.26*	-0.05	-0.10~	0.05*	0.00
50 to 54 years	-0.01	0.15~	0.22*	0.19*	-0.03	0.17*	0.09*
55 to 59 years	0.00	0.18^	0.37*	0.11^	0.32*	0.22*	0.19*
60 to 64 years	-0.01	0.28*	0.30*	0.13^	0.17^	0.31*	0.30*
65 to 69 years	0.16*	0.18~	0.59*	0.33*	0.22*	0.29*	0.36*
70 to 75 years	0.14^	0.26^	0.54*	0.35*	0.41*	0.37*	0.41*
Age >75 years	0.31*	0.32*	0.68*	0.44*	0.37*	0.50*	0.46*
Atlantic	-1.18*	-0.13^	-0.07	-0.07~	0.01	0.03~	0.11*
Quebec	-0.28*	-0.08~	-0.22*	-0.16*	-0.20*	-0.17*	-0.16*
Prairies	-0.06~	0.00	-0.16*	-0.08^	-0.08^	-0.05*	0.00
BC	-0.08^	0.07	-0.06	-0.06~	-0.08~	-0.03^	0.07*
Sample Size	16,043	6,961	8,655	14,394	10,900	83,703	80,468

* significant at 99% level; ^ at 95% level, ~ at 90% level

Table 3 Change in Number of Visits to a Medical Doctor
(conditional on at least one visit)

Md	1978	1985	1991	1994	1998	2000	2003
Poor Health	6.26*	7.32*	11.08*	11.25*	9.72*	9.88*	8.79*
Poor	0.14	0.09	0.59^	0.82*	0.43~	0.66*	0.47*
Rich	0.10	-0.05	-0.20	0.76^	0.11	-0.27*	0.00
Less than HS	-0.05	0.23	0.34	0.23	0.53~	0.16~	0.26^
Post Secondary	-0.76*	0.05	0.78*	0.76*	0.16	0.11	0.47*
University	-0.72*	0.88*	0.83*	0.12	0.27	0.00	0.05
Unemployed	3.39*	1.06~	0.49	0.70	-0.21	1.15*	0.36^
Not in LF	2.49*	1.20*	1.37*	2.81*	1.44*	1.97*	1.65*
Immigrant	-0.33	0.00	0.34	0.12	0.37	-0.22^	-0.36*
YSI 0_5	-0.57	1.25	-1.42^	-1.29*	-0.64	-1.97*	-0.93*
YSI 5_10	0.67	1.48~	-1.22~	3.46*	-1.82*	-0.33~	-0.31~
YSI 10_15	0.72	0.97	1.76^	0.18	-0.69	0.16	-0.88*
YSI 15_20	2.58*	1.71^	1.07	0.06	0.21	0.22	-0.16
Neg Health Behav	0.24	-0.05	-0.78*	0.29	0.16	0.66*	0.72*
Male	-1.24*	-1.25*	-1.46*	-1.52*	-1.28*	-1.47*	-1.40*
Never Married	-0.33	0.51~	-0.34	0.23	0.11	-0.27*	-0.36*
Previous Married	0.48~	0.19	0.29	0.18	0.64*	0.22^	0.57*
20 to 24 years	-0.33	-0.42	1.71*	-0.59	0.75~	0.05	0.05
25 to 29 years	0.53	0.28	1.95*	0.41	1.44*	0.98*	1.19*
30 to 34 years	-0.62^	-0.28	1.37*	0.00	1.17*	0.71*	1.09*
35 to 39 years	-1.20*	-0.88^	0.44	-0.41	1.07*	0.27^	0.31*
45 to 49 years	-0.19	0.60	-0.29	-0.59~	0.43	-0.11	-0.41*
50 to 54 years	-0.24	0.00	0.68	-0.41	0.85^	0.00	-0.16
55 to 59 years	-0.43	-0.28	0.59	-1.47*	1.34*	0.44*	0.00
60 to 64 years	0.76~	0.05	1.81*	-1.29*	-0.21	-0.05	-0.16
65 to 69 years	-0.43	0.93	1.71*	-0.70~	0.05	-0.33^	-0.36^
70 to 75 years	-0.33	1.30^	1.42^	-1.17*	1.17^	0.00	-0.52*
Age >75 years	0.57	2.22*	3.42*	-0.70~	0.96^	-0.22	-0.31^
Atlantic	-0.72*	-0.19	-0.49	-0.53~	0.05	-0.55*	0.05
Quebec	-1.24*	-1.34*	-1.76*	-2.17*	-1.50*	-1.53*	-1.60*
Prairies	-0.57*	0.32	-0.78*	-0.47^	-0.21	0.00	-0.10
BC	-0.10	0.23	0.49	0.29	0.80*	0.49*	0.31*
Sample Size	12,636	5,814	7,441	11,754	9,058	69,258	66,307

* significant at 99% level; ^ at 95% level, ~ at 90% level

Table 4 Change in the Probability of a Specialist's Visit

	1985	1991	1994	1998	2000	2003
Poor Health	0.44*	0.42*	0.44*	0.48*	0.47*	0.47*
Poor	-0.09^	0.02	-0.08^	-0.10*	-0.08*	-0.08*
Rich	0.23*	0.13*	0.18*	0.14*	0.07*	0.11*
Less than HS	-0.10^	-0.06	-0.11*	-0.06~	-0.09*	-0.12*
Post Secondary	0.10^	0.12*	0.13*	0.12*	0.05*	0.07*
University	0.12*	0.23*	0.13*	0.16*	0.10*	0.13*
Unemployed	0.12	0.10~	0.07	0.01	0.05*	0.04^
Not in LF	0.15*	0.13*	0.17*	0.13*	0.12*	0.14*
Immigrant	0.10^	0.14*	0.08*	-0.03	-0.03~	-0.04*
YSI 0_5	-0.50*	0.28*	-0.28*	-0.10	-0.12*	-0.09*
YSI 5_10	-0.14	-0.24^	0.04	-0.23*	-0.15*	-0.10*
YSI 10_15	-0.12	-0.14	-0.13	0.14	-0.05~	-0.08*
YSI 15_20	-0.28*	-0.21^	-0.09	-0.37*	-0.03	-0.08^
Neg Health Behav	-0.07^	-0.05^	0.04~	-0.03	-0.03*	0.02^
Male	-0.20*	-0.18*	-0.30*	-0.30*	-0.27*	-0.28*
Never Married	-0.02	0.00	-0.14*	-0.03	-0.05*	-0.05*
Previous Married	-0.07	-0.05	-0.04	0.02	-0.07*	-0.01
20 to 24 years	-0.23*	0.05	-0.05	-0.04	-0.03~	0.00
25 to 29 years	-0.06	0.03	-0.02	-0.03	-0.02	-0.03~
30 to 34 years	-0.02	0.00	-0.05	-0.07	0.02	0.05*
35 to 39 years	-0.09	0.08	0.04	0.10^	0.00	0.06*
45 to 49 years	0.13~	0.08	-0.05	0.08	0.02	0.02
50 to 54 years	-0.04	0.13^	0.02	0.13*	0.10*	0.07*
55 to 59 years	0.07	0.25*	0.03	0.17*	0.13*	0.10*
60 to 64 years	-0.02	0.14^	0.04	0.08	0.16*	0.17*
65 to 69 years	0.02	0.21*	0.07	0.07	0.12*	0.13*
70 to 75 years	0.20^	0.15~	-0.02	0.08	0.17*	0.12*
Age >75 years	0.08	0.29*	-0.04	-0.01	0.12*	0.09*
Atlantic	-0.06	0.00	-0.09^	-0.11^	-0.04*	-0.03
Quebec	0.06	0.08~	0.13*	0.16*	0.13*	0.12*
Prairies	-0.09^	-0.13*	-0.10*	-0.11*	-0.12*	-0.09*
BC	-0.04	-0.02	-0.13*	-0.16*	-0.12*	-0.06*
Sample Size	6,961	8,655	14,394	10,900	83,703	80,468

* significant at 99% level; ^ at 95% level, ~ at 90% level

Table 5

Change in Number of Specialists' Visits
(conditional on at least one visit)

	1985	1991	1994	1998	2000	2003
Poor Health	3.87*	5.70*	6.18*	4.60*	5.44*	4.70*
Poor	-0.21	0.69	0.42	0.10	-0.07	0.61*
Rich	0.37	-0.44	-0.04	1.13^	0.17	-0.19
Less than HS	-0.98*	-0.13	0.04	0.68	-0.58*	-0.58*
Post Secondary	-0.61	0.28	2.30*	0.32	-0.10	0.03
University	0.15	0.56	0.00	0.84~	0.20	0.32^
Unemployed	-0.64	-1.16^	0.23	-0.48	0.48~	-0.42~
Not in LF	0.43	-0.03	3.03*	0.97^	2.35*	0.99*
Immigrant	-0.61	-0.13	0.27	0.13	-0.61*	-0.32^
YSI 0_5	6.50~	-1.94*	0.04	-1.38~	-1.60*	-1.57*
YSI 5_10	1.28	-1.31	0.84	-2.13*	0.10	-0.77*
YSI 10_15	-0.95	0.03	-0.77	-1.45^	-1.16*	-0.67^
YSI 15_20	0.82	-0.19	-0.81	1.48	-0.78^	-0.99*
Neg Health Behav	0.24	-0.69*	0.58~	-0.35	0.51*	0.74*
Male	0.21	-0.47~	0.31	0.10	-0.51*	-0.70*
Never Married	-0.31	-0.59	1.08^	-0.35	0.48*	-0.26^
Previous Married	0.43	0.25	-0.77^	0.52	0.17	0.32^
20 to 24 years	0.24	0.59	-2.27*	-0.23	-0.24	-0.51*
25 to 29 years	2.53*	1.78^	0.88	0.61	2.04*	1.41*
30 to 34 years	1.74^	1.63^	0.27	0.71	0.58*	1.79*
35 to 39 years	0.98	-0.16	-1.50*	-0.61	0.31	1.02*
45 to 49 years	0.24	-1.28*	-1.54*	-0.93^	-0.10	-0.61*
50 to 54 years	-0.34	-0.72	-2.04*	-1.19*	-0.03	-0.16
55 to 59 years	0.55	-0.91~	-2.38*	-0.19	-0.20	-0.38^
60 to 64 years	-0.21	0.97	-2.30*	-1.67*	-1.02*	-0.26
65 to 69 years	0.98	-0.34	-2.11*	-1.80*	-0.92*	-0.64*
70 to 75 years	0.49	-1.16~	-2.73*	-2.16*	-1.05*	-1.15*
Age >75 years	0.76	-0.13	-2.27*	-1.77*	-1.60*	-1.50*
Atlantic	-0.79	-0.56	-1.11^	-0.74	-1.26*	-0.64*
Quebec	-0.76^	-1.00*	-1.27*	-1.51*	-1.29*	-1.18*
Prairies	0.15	0.47	-0.35	-0.52	-0.58*	-0.06
BC	0.34	0.44	0.12	-0.48	-0.65*	-0.22~
Sample Size	2,198	2,600	3,822	2,937	24,465	23,161

* significant at 99% level; ^ at 95% level, ~ at 90% level

Table 6 Change in the Probability of Admission to a Hospital/Nursing Home

	1978	1985	1991	1994	1998	2000	2003
Poor Health	0.37*	0.46*	0.39*	0.48*	0.55*	0.51*	0.49*
Poor	0.03	-0.04	0.14*	0.17*	0.08	0.07*	0.08*
Rich	-0.08	0.19*	-0.04	-0.03	-0.15~	-0.05^	-0.04
Less than HS	0.04	0.05	0.10~	-0.02	0.06	0.02	0.02
Post Secondary	-0.09^	0.05	0.06	0.04	0.09	0.05^	-0.04^
University	-0.08	0.06	0.12^	-0.03	0.16*	0.00	-0.01
Unemployed	0.31*	0.13	-0.01	0.09	0.21^	0.10*	0.03
Not in LF	0.35*	0.28*	0.25*	0.24*	0.25*	0.20*	0.23*
Immigrant	-0.04	-0.04	0.05	0.06	-0.05	-0.10*	-0.07*
ysi 0_5	0.17^	-0.01	-0.19	-0.24*	0.13	-0.04	-0.14*
YSI 5_10	0.15~	-0.15	-0.34^	-0.02	-0.11	-0.06	0.00
YSI 10_15	-0.23^	-0.12	-0.46*	0.04	0.07	0.07	-0.11^
YSI 15_20	0.10	-0.20	-0.15	-0.23~	-0.13	-0.01	-0.03
Neg Health Behav	0.11*	0.02	-0.05	0.10*	0.11*	0.04*	0.06*
Male	-0.21*	-0.23*	-0.14*	-0.23*	-0.23*	-0.19*	-0.21*
Never Married	-0.31*	-0.35*	-0.32*	-0.28*	-0.30*	-0.20*	-0.30*
Previous Married	-0.01	-0.12^	-0.02	-0.06	-0.14*	-0.06*	0.00
20 to 24 years	0.11~	0.27*	0.44*	0.34*	0.42*	0.26*	0.45*
25 to 29 years	0.22*	0.16~	0.47*	0.45*	0.46*	0.36*	0.41*
30 to 34 year	-0.03	0.16~	0.37*	0.26*	0.29*	0.29*	0.45*
35 to 39 years	-0.18*	-0.19~	0.10	0.25*	0.20^	0.17*	0.26*
45 to 49 years	-0.14^	-0.03	-0.03	-0.06	0.12	-0.03	0.10*
50 to 54 years	-0.15^	0.07	0.08	0.09	0.02	0.02	0.10*
55 to 59 years	-0.10	-0.14	0.17~	0.06	0.39*	0.11*	0.17*
60 to 64 years	-0.13~	-0.12	-0.21~	0.31*	0.13	0.16*	0.22*
65 to 69 years	-0.14^	-0.19	0.07	0.29*	0.31*	0.18*	0.20*
70 to 75 years	-0.04	0.14	0.15	0.24*	0.39*	0.21*	0.26*
Age >75 years	-0.07	0.19~	0.29*	0.37*	0.49*	0.34*	0.33*
Atlantic	0.04	0.15~	-0.06	-0.04	0.14^	0.06^	0.08*
Quebec	-0.06~	-0.02	-0.10^	0.00	0.04	0.09*	0.04^
Prairies	0.15*	0.05	0.01	0.02	0.02	0.07*	0.08*
BC	0.04	0.11	-0.10~	-0.13*	0.01	0.01	0.01
Sample Size	16,043	6,961	8,655	14,394	10,900	83,703	80,468

* significant at 99% level; ^ at 95% level, ~ at 90% level

Table 7

Change in Mean Number of Nights in Hospital
(conditional on staying at least one night)

	1978	1985	1991	1994	1998	2000	2003
Poor Health	8.59*	1.37*	11.84*	11.71*	13.19*	12.88*	14.59*
Poor	-0.33	0.06	2.76^	-2.05	1.16	1.80*	1.99*
Rich	-3.01*	0.12	0.09	-3.18	2.94	-1.71^	-1.82*
Less than HS	0.11	-0.75	0.62	3.41~	3.21~	-1.17^	0.41
Post Secondary	-1.34	-0.56	-1.07	2.62	3.03	0.81	-0.17
University	-1.56	-0.56	0.27	0.57	3.47~	-0.54	1.33^
Unemployed	3.90*	0.81	2.58	-0.45	-4.46^	0.09	1.49
Not in LF	2.01*	1.24^	1.25	7.05*	3.92^	8.74*	4.81*
Immigrant	0.11	-0.25	4.54*	-1.59	0.80	-2.16*	-0.50
YSI 0_5	-0.45	1.61	0.18	3.98	-2.67	0.72	-5.31*
YSI 5_10	-2.12	-1.06	-3.47	-0.91	-1.51	-0.18	-2.65^
YSI 10_15	-0.22	3.73^	4.18	2.50	-6.06^	-3.33*	-2.57^
YSI 15_20	-4.79*	-1.18	-6.50*	-6.37^	-4.54	-2.70~	-2.24
Neg Health Behav	1.00~	-0.12	0.71	2.96^	-0.27	-0.36	-0.33
Male	-0.11	0.06	1.51~	1.25	4.10*	2.07*	1.16*
Never Married	5.46*	0.37	1.96	5.23^	7.04*	8.02*	0.33
Previous Married	2.34*	0.25	1.42	2.27	13.19*	3.87*	3.32*
20 to 24 years	-4.01*	-2.17*	-1.42	-8.53*	1.60	-1.71^	-4.56*
25 to 29 years	-2.90*	-2.24*	0.09	-8.07*	-2.05	-0.18	-3.73*
30 to 34 years	-3.12*	-1.30~	3.03	-7.62*	6.15~	-0.36	-3.56*
35 to 39 years	0.45	1.06	6.05*	-4.43^	2.58	2.16^	-2.74*
45 to 49 years	1.90	0.75	4.72~	-5.46^	4.10	0.72	-0.50
50 to 54 years	2.34	-0.68	3.20	0.11	1.16	6.67*	-1.24
55 to 59 years	2.12	1.49	9.26*	-6.59*	16.31*	6.76*	0.50
60 to 64 years	1.34	-0.87	8.81*	-7.96*	11.94*	4.05*	1.41
65 to 69 years	4.46*	1.12	7.30*	0.34	14.70*	9.37*	6.80*
70 to 75 years	5.13*	0.50	5.96^	4.89	18.53*	7.21*	1.66
Age >75 years	4.68*	0.62	9.97*	-0.34	17.29*	13.88*	6.71*
Atlantic	-0.56	1.06	0.09	-0.45	5.88*	0.90	0.58
Quebec	-1.23~	-2.36*	-1.25	0.00	3.65^	-1.44*	-0.25
Prairies	-0.56	0.00	0.27	-4.21*	1.34	-0.45	-0.75
BC	-1.23	-1.06~	-1.16	-2.05	-1.34	0.36	-1.58*
Sample Size	1,950	933	1,118	1,591	999	8,418	8,031

Appendix One

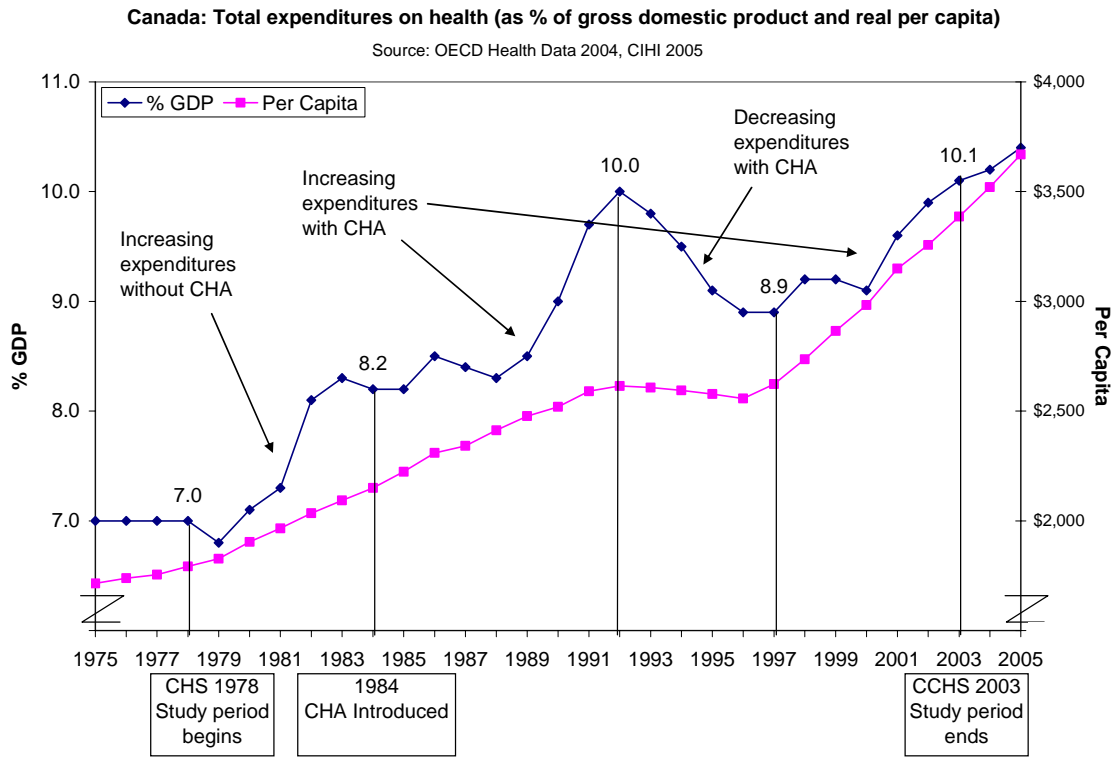


Figure 1 (source: authors constructed with data obtained from CIHI, 2004).

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