PHYSICIAN UTILIZATION IN QUÉBEC 1987 AND 1992-93; THE IMPACT OF REGIONALIZATION IN A COST-CONSTRAINED CLIMATE

By

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ABSTRACT

The objective of this thesis was to determine whether the development of a regionalized health care system in Québec has enabled this province to meet the health services needs of its citizens in the face of Federal cuts to health care. This was accomplished through the quantitative analysis of the relationship between the incidence of family physician use and self-assessed health status (a proxy for need for care) in Québec.

The data for this study came from the 1987 and 1992-93 Santé Québec which is a weighted random sample of the citizens living in Québec aged 15 years and over. Using Aday and Andersen's (1974) framework for the study of access to medical care, the relationship between physician utilization and need, predisposing and enabling characteristics of individuals were analyzed for both years of the survey. The results at the provincial level revealed that need was the most important determinant of use and further that those with higher levels of need had a greater probability of use. Yet, non-need variables were also important in determining use. Specifically, the importance of predisposing factors increased from 1987 to 1992-93. The data were also partitioned by need level and by health region (15 of the 18 health regions in Québec were included in the Santé Québec survey). These results showed that need level was important in influencing the associations between the enabling and predisposing variables and utilization. When the data were disaggregated to the regional level, a complex pattern of utilization behaviour appeared which was not apparent at the

provincial level.

The results of this analysis show that while regionalization has allowed the province of Québec to better identify the health care needs of Québec residents, variations in utilization still exist. It has also shown that while socio-economic barriers to use have diminished, the importance of socio-demographic characteristics have increased over time. There are three important conclusions which can be drawn from this analysis; 1) need is an important determinant of physician use, 2) temporal and spatial data analysis should be included in investigations of this type as they can reveal important variations which would otherwise be unnoticed, and 3) further research in this area should incorporate the use of both qualitative and quantitative analysis in order to better identify the individual processes involved in using physician services.

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CHAPTER ONE

Introduction

This thesis is located within the field of medical geography. This sub-discipline involves the application of geographic perspectives and methods to study health, disease, and health care (Johnston et al, 1994). There are two very broad streams within this discipline; the first concerns the spatial distribution of disease and how it relates to both the physical and social environment; and, the second stream relates to the geography of health and health care (Joseph and Phillips, 1984). One of the main objectives of this second stream is to "investigate how well the spatial variation in health care provision matches spatial differences in a population's need for services" (Johnston et al, 1994, p.242).

This thesis is concerned with this second stream of medical geography. Specifically, it examined the factors associated with the utilization of physician services in 15 of the 18 health regions in the province of Québec using quantitative analysis. Its main objective was to determine whether or not those in need of health care have access (use services) to physician care. The reason for using the terms 'use' and 'access' interchangeably was due to the fact that according to Joseph and Phillips, while accessibility and use are two very important geographic perspectives of health care provision they cannot be separated since use is a "manifestation of revealed accessibility" (Joseph and Phillips, 1984, p.9). In terms of measuring access to care, Donabedian (1972, p.111) argues that while "the proof of access

is use of services, not simply the presence of a facility. Access can, accordingly be measured by the level of use in relation to 'need'".

Health care resources are not equally available to all individuals. Joseph and Phillips contend that inequalities exist because the

> "[d]emand for public services emanates from individuals, who, in aggregate, are continuously (though unevenly) dispersed across space, while most public services are distributed from discrete facilities with fixed locations"
>
> (Joseph and Phillips, 1984, p.59).

Hence, knowing these inequalities exist means it is essential that health care delivery systems be organized in such a manner that enables individuals in need to make use of the services that do exist. In an ideal system, equity would exist in such a way that "provides equal resources for populations with equal needs (horizontal equity) but unequal resources for populations with unequal needs (vertical equity)" (Birch and Chambers, 1993, p.608). Using data from the 1987 and 1992-93 Santé Québec and employing Aday and Andersen's framework of access to health services, this thesis served to evaluate whether or not the organization of health care delivery in the province of Québec has enabled that province to meet the health care needs of its citizens. Specifically, it was the aim of this thesis to evaluate if the development of a regionalized health care system has allowed the province to continue to meet the health needs (using self-assessed health status as a proxy for need) of its citizens during a period of decreased federal funding to the nation's health care system.

In order to achieve this aim, it is first necessary to understand the character of health care in Québec. The following chapter provides a brief but relevant description of the nature of health care in Canada, including its financing and regulation. Chapter three discusses the development, financing and reform process of the health care system in Québec. In chapter four past studies of physician use in Canada are reviewed. Chapter five includes a discussion of the theory surrounding physician utilization and explores the frameworks which provide the foundation for this analysis. It also contains a description of the Santé Québec data set and a discussion of the sampling procedures used in the 1987 and 1992-93 surveys as well as a description of the statistical methods employed. In chapter six the results of the data analysis carried out at both aggregate and disaggregate levels for both surveys are presented. In particular, for both years of the survey a comparative analysis of the factors which influence physician use were examined at the individual level, across need levels (subgroups of the population reporting excellent, very good, good, fair and poor health) and within each of the health regions included in the survey. The final chapter provides the reader with a discussion of the results in terms of the evaluation of the Québec health care system and its ability to meet the needs of its citizens. Next, this chapter discusses the applications of this research's findings as they relate to theoretical and methodological issues.

CHAPTER TWO

The Canadian Health Care System

2.1 Nature of Health Care in Canada

The distribution of health care resources and the provision of services in Canada is a provincial responsibility. Partially funded by the federal government, the provinces are responsible for generating their own revenue for health care through either direct (income tax) or indirect (tobacco and alcohol) taxation (Rathwell, 1994, p.8). The methods and rates of taxation vary by province: in Alberta and British Columbia citizens pay annual premiums while in Ontario, Québec (with the highest at 3.75%) and Newfoundland payrolls are taxed (Rathwell, 1994, p.9). No matter what mode of revenue generation is used, no Canadian resident can be denied services for failure to pay premiums because payment is not a condition of coverage (Evans, 1992). It is the federal government (playing a somewhat secondary role with respect to funding) which ensures health care for all through its enforcement of the Canada Health Act (CHA) 1984.

The purpose of the CHA which was proclaimed law on April 17, 1987 was twofold; consolidation and ensuring accessibility. Prior to the CHA, hospital services were covered by the Hospital Insurance and Diagnostic Services Act (HIDS (1957)) and physician services were insured under the Medicare Act (1966). The CHA consolidated both these Acts and made amendments to the criteria (universality, comprehensiveness, portability, public

administration) the provinces were required to uphold in order to receive federal funds. In addition to requiring the coverage of all residents of Canada (as opposed to 95%) the condition of accessibility was introduced. Under this condition, the act prohibited the use of extra-billing and user fees declaring "that the primary objective of Canadian health policy is to protect, promote and restore the physical and mental well-being of residents of Canada and to facilitate reasonable access to health services without financial or other barriers" (Canada Health Act, 1984).

Any province which allowed the use of extra-billing or the charge of user fees would be deprived dollar for dollar of transfer payments. Although the notion of penalties is good in theory, penalties are only effective if they are enforced. The effectiveness of such penalties was witnessed recently in the province of British Columbia. On May 19, 1994, federal Health Minister Diane Marleau announced that she would withhold 1.7 million dollars from British Columbia as a result of the practice of extra-billing patients by 41 doctors in that province. These 41 doctors (who had opted out of the Medicare Services Plan) had collectively over billed their patients 1.7 million dollars. Some were charging $10-15 more than the standard fee for office visits and $25 more for surgery (Victoria Sun, June 25, 1994:A1). As a result of Marleau's financial penalty, on June 24, 1994, 27 of the 41 doctors agreed to no longer extra-bill their patients. According to British Columbia Health Minister, Paul Ramsay, the "remaining 14 doctors are not of great concern because they either work part time, are leaving the country or their services are not covered by the provincial plan" (Victoria Sun, June 25, 1994:A1). The Health Minister has also expressed a desire to take similar actions

in Ontario because the previous NDP government in Ontario had proposed slashing medicare payments for Canadians treated outside of the country from $400.00/day to $100.00/day (Calgary Herald, May 19, 1994:A2). Marleau stated that she would also withhold funding from Ontario as it is her "responsibility to ensure equitable access to all Canadians from coast to coast" (Toronto Star, August 29, 1995:A17). Ontario never implemented this policy since the NDP government was defeated by the Progressive Conservatives in the last provincial election. While the federal government has put in place specific penalties for provinces which breach the accessibility criterion, there appears to be nothing in place which would deter the provinces from breaching the other four (Rachlis and Kushner, 1994).

Despite this area of federal control, all the provinces have been given decision making power and are permitted to establish various health institutions and implement health policies as long as "they have fulfilled the stipulations of national legislation regarding the provision of health care" (Palley, 1987, p.614). This means that although the provinces may differ with respect to the insured services offered to their citizens, health care is "free at the point of delivery and is available to all citizens" irrespective of where they live (Rathwell, 1994, p.7).

2.2 The Financing of the Canadian Health Care System

The jurisdiction of the federal government over the provinces in matters of health care has been criticized by the provinces in recent years. The nature of the complaint stems from the fact that federal subsidies have decreased dramatically over time, leaving the provincial governments with a greater burden of financing. Despite this decrease, the federal

government still feels it has the right to enforce the legislation enshrined in the Canada Health Act. When established in 1957, the financing of HIDS was as follows:

> "it discriminated among the provinces according to provincial costs. The federal contribution to each province in respect of its shareable costs was (a) 25 percent of the average per capita cost in Canada as a whole, plus (b) 25 percent of the average per capita cost in the province itself, multiplied by the number of insured persons in the province" (Taylor, 1986, p.5).

This formula discriminated against the low income provinces by granting greater per capita stipends to the high income provinces. This resulted in disparities between the provinces with respect to the level of health care that could potentially be provided (Taylor, 1986).

The financing of the Medicare Act overcame some of the problems encountered with subsidizing HIDS. Under the Medicare Act, all provinces received one half of the national per capita cost multiplied by the number of insured persons. By ignoring the provincial per capita costs the government was able to increase the proportion of the costs paid in low income provinces and lower the proportion of the costs paid in high income provinces (Taylor, 1986).

The financing of the health and medical insurance programs was on a shared-cost basis up until 1977. Fifty-fifty shared cost financing was used because the federal government wished "to ensure that essential health services were available to all Canadians on a similar basis and to co-ordinate the development of insured health services" (Canada, 1981, p.39). However, in 1977 a change occurred to the financing of the health care system precipitated by both federal and provincial dissatisfaction with cost-sharing.

There were various reasons for federal and provincial discontentment. From a federal standpoint there were two problems with cost sharing. First, the federal government felt "it was no longer in control of its health budget since transfers under shared-cost arrangements were dependent upon provincial decisions" (Canada, 1981, p.67). The federal government was forced to give the provinces 50% of whatever they chose to spend on the approved services. This was problematic since the federal government had no way of knowing from year to year how large the bills would be. Second, the federal government felt that cost sharing was inequitable because the contributions per capita were different from province to province because the poorer provinces were unable to spend as much as the richer ones. Both Ontario and Québec were opposed to cost-sharing for various reasons. First, it encouraged the provinces to spend money on high-cost shareable services as opposed to low cost non-shareable services in order to receive federal contributions. For example, "too many elderly people were being kept in acute-care hospital beds because cost-sharing did not extend to nursing homes or home care" (Canada, 1991, pg. 12). Second, they felt that cost-sharing was too bureaucratic and time consuming because provinces had to wait for federal auditors to review and then approve provincial expenditures before they (provinces) could receive financing. Not all of the provinces were opposed to cost sharing. The Maritime provinces along with Saskatchewan disapproved of any movement away from cost-sharing. They felt that without cost-sharing the poorer provinces would face an unfair financial burden in trying to provide health care services. They argued that failure of the provinces to raise funds to provide services would lead to a deterioration in health care standards. Added to these

important issues was a growing concern regarding the conflict over federal/provincial jurisdictions. Both the provincial and federal governments were concerned with whether shared-cost financing constituted an "undesirable federal intrusion in areas of provincial jurisdiction" (Canada, 1981, p.67). That is, it was the federal government that decided which services would be entitled to reimbursement. As a result of these flaws, the financing of the Medicare program was brought together under the Federal-Provincial Fiscal Arrangements and Established Programs Financing Arrangement (EPF) effective April 1, 1977. Under this act, cost-sharing came to an end and was replaced by block funding which was comprised of two parts: financing in the form of a tax transfer and a cash payment.

Under the EPF arrangements, federal financing was now associated with increases in the population and the Gross National Product (GNP) as opposed to increases in health costs. That is, "[f]ederal contributions in a base year (1975-1976) are escalated by the rate of growth of the GNP" (Canada, 1981, p.68). The basic cash portion is calculated by "taking 50% of the federal contribution to health and medical insurance and post-secondary education in 1975-76 and increasing it by the rate of growth of the GNP" (Canada, 1981, p.68). Increases in the basic cash payment per capita from year to year are calculated using a three year moving average of the increases in the GNP. The cash payment was made up of two elements; a cash contribution and a transitional adjustment (equal to the difference between the basic cash contribution and the tax transfer).

Transfers are tax dollars which are taken from the wealthier provinces (Alberta, British Columbia and Ontario) and given to the seven poorer provinces (including Québec)

in order to pay for health care, social assistance and education. The tax transfer is made up of 13.5 personal and one corporate income tax points (Canada, 1981, p.68). The payments to the provinces were equalized to ensure that the total federal entitlement per capita was the same for the richest and the poorest province.

During the same time period, the federal government made a commitment to long term care. The federal government passed the Extended Health Care Act which covered the following services; nursing home intermediate care services, adult residential care, home care, converted mental hospitals and ambulatory care (Taylor, 1986, p.15). Payments for this program were equal to $20.00/capita in fiscal year 1977-78 and are increased from year to year using the three year moving average of the GNP (Canada, 1991, p.14).

The effect of the EPF arrangements was to ensure that the federal government had greater predictability and control over its expenditures and the provinces had greater flexibility (Taylor, 1986). A disadvantage of the EPF arrangements is that the provinces were and are still responsible for any increase in health care costs which exceed the growth rate of the GNP (Taylor, 1986). Hence, over time because of rapidly increasing costs, the provinces have had to be responsible for a greater proportion of health care funding. There were some other initial advantages associated with the EPF arrangements. The Parliamentary Task Force on Federal-Provincial Fiscal Arrangements points out that the EPF brought the provinces more money than cost-sharing would have. In fact, in fiscal years 1978-79 and 1979-80, the federal contributions increased at a greater rate than did provincial expenditures. In the first year, federal contributions increased by $1.218 million or 20% while provincial expenditures

only increased 6% (Canada, 1981, p.93). (However this is no longer the case as the cash portion provided by the federal government to the provinces has decreased over time).

The EPF formula for calculating the amount of the tax transfer and cash portion to be paid to each province did not remain untouched for very long. In 1986, nine years after its inception the federal conservative government altered the growth form for the EPF to an annual rate of increase of the GNP minus two percentage points over 1986-87 to 1990-91 (Canadian Medical Association, 1991, p.60A). In 1990, this same government passed Bill C-69 which stated that per capita EPF transfers would be frozen at the 1989-90 level for two years (Canadian Medical Association, 1991, p.60A). A final blow came in 1991 when Bill C-20 was introduced. This stated that the 1991 freeze would continue until 1994-95 (Canadian Medical Association, 1991, p.60A). These actions resulted in a major reduction to the level of federal funding the provinces received. For example, between fiscal years 1977-78 and 1978-79, the federal cash payments increased by 15.3% and the health tax transfer increased by 13.2% (Canada, 1994). However, between fiscal years 1986-87 and 1987-88 (the year of the first adjustment to the growth rate), the health tax transfer increased 12.3% while the cash payments increased by only 0.25% (Canada, 1994). Most recently, the level of funding between fiscal years 1993-94 and 1994-95 increased by only 4.1% for the health tax and decreased by 1% for the cash payments (Canada, 1994).

These two sections have illustrated some key concerns surrounding health care in Canada. While health care is administered by the provinces, it is strongly influenced by federal terms and conditions (Deber et al, 1991). This essentially means that citizens across

Canada are afforded universal accessibility to comprehensive, non-profit health care which is portable across the country. However, access does not ensure equity, i.e., "equal resources for populations with equal needs and unequal resources for populations with unequal needs" (Birch and Chambers, 1993, p.608). This means therefore that those with the greatest need may not be receiving or have access to the greatest amount of health care resources. While the provinces are 'free' to develop their own health care system it is difficult to properly meet the needs of populations without adequate federal and provincial funding. Nevertheless, it might be possible for provinces to design their health care systems in such a way that they are more responsive to changing needs and are therefore more likely to adequately identify and meet the health needs of their citizens despite decreased levels of federal funding. Québec has a very distinct health care system as its delivery of health care is much more regionalized than the systems found in other provinces.

In the next chapter, we will explore the nature of health care in Québec,. paying particular attention to its history, development and financing as well as its reform process to document its evolution into a more regionalized system.

CHAPTER THREE

The Québec Health Care System

3.1 History of Health Care in Québec

The province of Québec is unique with respect to its health care system. Prior to 1960, as a reflection of the importance of religion, the church was a dominant force in Québec society, particularly in the areas of education, health and welfare (Lee, 1979). Hospitals were owned and run by the church. However, due to the recommendations of the Commission of Inquiry on Health and Social Welfare (Castonguay-Nepveu 1966-1972), the structure of the delivery and organization of health care changed. The Commission, chaired by Claude Castonguay, published recommendations for change in the realm of health and social welfare. Their main thrust was for decentralization. They suggested that the province be divided into regions with each one headed by a Regional Health Office (RHO). The RHO was to be responsible for supervising the "planning and implementation of health care programs" and to "exercise direct budgetary supervision over all hospitals and health centres" (Lee, 1979, p.8). By directing supervisory power to the regional level, it was hoped that the distribution of funds and services would be directly associated with the needs of the population to be served.

Although the RHOs were to have many powers, they were directly accountable to the provincial government meaning that much of the power would remain centralized. The government of Québec "retained the perogative of decisions governing overall planning of the

health system and general control of public expenditures" (Lee, 1979, p.9). This is not necessarily a detriment as it is sometimes necessary for centralization to take place in order to decentralize (Perrow, 1977). That is, some central agency is needed to establish and ensure standards, norms and regulations for the regional level to function efficiently and equitably.

Regardless of this, Castonguay envisioned that the actual delivery if not the planning of health care would be regionalized. He proposed that in each region there would be a series of local health centres (delivering primary care), community health centres (hospitals) and university health centres (offering specialized services). This three tiered system would allow the free movement of patients between the centres. The Commission also believed that the creation of 'health teams' comprised of doctors, nurses and social workers working together in these centres would provide for more exhaustive services and collaborative efforts. The Commission was also concerned with rising health care costs and therefore proposed that physicians be salaried rather than paid according to fee-for-service measures.

3.1.1 Implementation of the Reforms

The Commission called for a major revamping of the existing system. How was it possible to implement such drastic changes to the health care system? In April 1970, Castonguay, who was a member of the Liberal Party, was elected to a provincial seat in the Québec National Assembly (Lee, 1979). The Liberal Party went on to form a majority government and Castonguay was appointed Minister of Health and Minister of Family and

Social Welfare. His new ministerial portfolios and legislative support provided him with the leverage needed to carry out the recommendations of his Commission.

1970 was a year of great transformation for health care in the province of Québec. In May, just one month after his election, Castonguay halted all new hospital construction in an effort to lessen financial costs. Ninety-eight proposed projects were discontinued which saved the province an estimated 400 million dollars (Lee, 1979). The money saved from these ventures was put toward the implementation and development of the Commission's proposed health centres. In November 1970, Bill 42 was passed which amalgamated the Ministry of Health and the Ministry of Family and Social Welfare into the Ministry of Health and Social Services. This Act acknowledged the fact that health is not just the mere absence of disease but that it hinges on a number of individual and societal factors. It was through this Ministry that Castonguay was able to undertake his major reforms.

On November 1, 1970, Bill 8, the Health Insurance Act was passed which established medical insurance for the provinces. This occurred just two years after the national health care program became effective (Medicare Act July 1, 1968) and two months before all of the provinces were fully participating. The Québec health insurance plan covered more than just the standard 'medically necessary' services performed in a doctor's office or hospital. The Québec plan also covered prescription drugs for those on social assistance or for those 65 years and older and dental services for children under ten years of age. They also covered prostheses, wheelchairs and other orthopaedic equipment (Québec, 1993a, p.9).

On December 24, 1971, Bill 65 was introduced which dealt specifically with

Castonguay's proposal for a decentralized mode for the delivery of health care in the province. Through its passage, the province was divided into twelve health regions each one headed by a regional council. Within each region two new building blocks emerged which absorbed the Public Health Units: departments of community health (DSCs) were established in 32 hospitals and, at the local level, local community service centres (CLSCs) were formed. The DSCs assumed the responsibilities of the previous public health units and municipal departments which included identifying health needs, and developing and evaluating programs. The CLSCs were responsible for providing health and social services to individuals living within their jurisdiction.

3.1.2 Québec Physicians

As mentioned previously, Castonguay hoped to reduce costs by altering the salaries of physicians. One way in which he aimed to reduce physician' salaries was through the passage of the health insurance plan (Bill 8). This bill was a major deterrent for physicians engaged in extra-billing. This bill divided physicians into three different groups;

> 1) Physicians who belonged to the plan and did not charge their patients more than the approved fees.
> 2) Physicians who opted out of the plan but did not charge their patients more than the approved fee schedule.
> 3) Physicians who opted out and charged their patients more than the approved fees
>
> (Lee, 1979).

Physicians falling into group one and the patients of doctors belonging to group two were reimbursed by the Québec Health Insurance Board (QHIB). On the other hand, the QHIB

would not reimburse doctors belonging to group three or their patients. Because this bill discriminated against doctors who chose to extra-bill, this discouraged patients from using doctors belonging to the third group.

Not all of the reforms envisioned by Castonguay ran as smoothly as was hoped. Specifically, many doctors feared the development of the CLSCs because they did not want their incomes to be salaried. Also, because the mandate of the CLSCs required that health care givers work as a team, "social workers, psychologists, nurses, physicians and others must operate together and share the power in decision making", physicians feared that they would lose their autonomy (DesMarchais, 1975, p.781). Because of this fear, the Federation des médecins omnipracticiens du Québec (FMOQ) encouraged those physicians "who refused to be integrated into the state-subsidized organization to develop their own private network of private clinics" (O'Neill, 1992, p.292). Four hundred of these polyclinics opened which attracted the experienced doctors (Renaud, 1987). As a result, when the development of the CLSCs was completed in 1989 only 160 (161 as of 1995) were opened rather than 210 as was originally planned (O'Neill, 1992). The development of the polyclinics served to make the system more complex since there were more paths of entry into the system, i.e., CLSCs, polyclinics and private practices. Since the CLSC was not the 'single gateway' into the system, coordination between health care centres was hindered (Renaud, 1987). Castonguay's hope to have doctors' incomes salaried has also not been realized. Presently, 90% of the doctors in Québec are paid on a fee-for-service basis and the remaining 10% are salaried.

3.2 A History of Cost Control in the Province of Québec

Despite differences in health care delivery throughout Canada, all provinces had at least one thing in common: rapidly increasing costs during the early 1970s. The province of Québec implemented both rigid and innovative cost control policies relative to the rest of Canada. Two of the biggest cost control policies were directed at Québec's largest expenditures; hospitals and physician incomes.

3.2.1 Hospital Control

In 1970, the province of Québec spent approximately 700 million dollars to finance hospitals (Canada, 1985). In order to reduce these costs, hospital financing expenditures were put on a global budget in 1973 which is still in place today. The Ministry of Health and Social Services provides each hospital with 26 instalments a year based on a predetermined budget (Palley, 1987). Hospital expenditures are tightly controlled by the provincial government with all hospitals being required to submit quarterly financial reports for provincial review. This enables the provincial government to supervise expenditures to ensure they are in line with budgets and to keep control of their associated costs.

3.2.2 Physician Control

Physician growth was greatest in the province of Québec relative to the rest of Canada during the 1970s (Contandriopoulos and Fournier, 1993). Physician costs in 1975 were 505 million dollars and accounted for 20% of the total medical costs (Canada, 1985). The policies

implemented by the Québec government to control the costs associated with doctors focused on two areas; a) controlling the number of physicians and b) controlling physician incomes.

3.2.2.1 Controlling the Number of Physicians

The policies introduced to limit physician growth were aimed at two areas; a) restricting the number of new doctors and b) reducing the number of specialists.

The first step the government took came in 1983 with reduced funding to medical schools (Contandriopoulos and Fournier, 1993). By limiting funding to medical schools this would decrease the number of people who could be admitted, thereby, preventing large increases in the number of new physicians setting up practice each year. Funding was allocated by the provincial government only for a specific number of students and if any school exceeded this quota they were penalized (reduced funding) (Contandriopoulos and Fournier, 1993). This restriction was successful and the number of medical school admissions decreased from 570 in 1983-84 to 481 in 1989-90. The admission figures for 1996-97 had further decreased to 406. (Québec, 1996b).

On average, specialists earn a higher income than general practitioners. Based on this, the Ministry felt their expenses could be decreased further by reducing the number of specialists compared to general practitioners in the province. In an attempt to achieve this goal, the number of residencies available to specialists was reduced from 337 in 1979 to 270 in 1983 (Contandriopoulos and Fournier, 1993). This measure was initially successful as the ratio of specialists to general practitioners changed from 55:45 in 1977 to 50:50 in 1990

(Contandriopoulos and Fournier, 1993). However, in 1994, the ratio was 60:40 suggesting that in the long run this policy has not been successful (Québec, 1996b).

3.2.2.2 Limiting Physician Incomes

In order to limit physician incomes, the province of Québec altered billing procedures and used income ceilings. First, in 1970 with the passage of Bill 8, extra-billing was banned (Barer et al, 1988). Second, in 1977 expenditures were reduced by altering which medical procedures could be billed (Barer et al, 1988). The number of billable procedures was reduced when 26 diagnostic and therapeutic procedures were incorporated into a single consultation fee (Barer et al, 1988). The Ministry then prohibited doctors from billing separately for minor surgery performed concurrently with major surgery. Finally, non-specialists who performed a specialist's procedure could not bill specialist rates. As a result, physician incomes were indirectly lowered due to the decrease in billings.

The provincial government also implemented direct controls to limit physician incomes. In November 1976, individual income ceilings were applied to general practitioners (Barer et al, 1988). If a GP exceeded the income ceiling in a particular year, he/she was only paid 25% of the fee for that service (Baret et al, 1988). Next, and directed at controlling the incomes of all physicians (not just general practitioners), changes were made to the level of fee increases per year: if the targeted incomes for a particular year were exceeded then the fee increases in the next year would be adjusted downwards.

The policies aimed at reducing costs can be regarded as effective. The rapid growth

of physician incomes was slowed substantially. Between 1976-1982 real fees decreased by 3.9% and in 1980 alone they decreased by 8% (Barer et al, 1988). Before these policies were introduced, Québec physicians were among those doctors with the highest salaries, however, by 1991 Québec doctors had the lowest physician incomes in Canada (Martin, 1992).

The province of Québec can be regarded as an innovator in the field of cost control as they have applied tougher controls than the other provinces for over a decade. Québec began its major cost reforms in the mid '70s while some of the other provinces failed to take major steps in reducing costs until the mid to late '80s (Evans et al, 1991). For example, the province of Québec banned extra-billing in 1970 whereas Alberta and Ontario permitted it until 1986. With respect to salaries, Québec has imposed the "highest limits of fee escalation" (Evans et al, 1991) while most provincial governments allowed physician fees and billings to increase (Barer et al, 1988). Nationally physician fees have increased 1-2%/year while in Québec there have been no fee increases (Barer et al, 1988). Hence, one can conclude Québec has not only succeeded in controlling costs but also in out-reforming the other provinces in the area of health care cost containment. Controlling both the number of physicians and physician incomes was extremely important because the money saved by rigid controls could be invested in other realms of health care.

3.3 Health Care Expenditures

Despite the aforementioned period of cost containment, health spending in Québec has continually increased. The province devotes a great deal of its financial resources to the

health care field. In fact, it consigns more of its Gross Domestic Product (GDP) to health care than do any of the other provinces. In 1989, Québec spent 9.1% of its GDP on health while Ontario spent 8.9% (Québec, 1993a, p.41). The proportion of total provincial government spending allocated to health increased from 26.4% in 1986-87 to 28.4% in 1992-93. Total health spending increased from $1,100.96 per capita (current dollars) in 1986-87 to $1,600.38 in 1992-93 (Québec, 1996a). This increase in health and social spending was at the expense of economic, educational and cultural spending which decreased over a ten year period (Québec, 1993b).

Health care puts an increasingly great demand on Québec's finances especially considering health and social spending have consistently been the largest government expenditures. With such great expenditures federal money is needed to support health care. However, as in the other provinces in Canada, the proportion of the share covered by federal transfers has been decreasing (see Figure A1 in Appendix A). For example, in 1986-87 Québec spent 7.8 billion dollars on health and social services and the federal government provided a further 3.5 billion dollars (Québec, 1993b), However, in 1992-93 Québec spent 17 billion dollars in this area while the federal government contributed 3.8 billion dollars.

As Table 3.1 illustrates, Québec received the second largest amount of money next to Ontario from the federal government during these years. With approximately 25% of the Canadian population, they received 23% of the total federal health cash transfers and 33% of the total federal health tax allotments (Canada, 1994). Yet, the actual cash transfers Québec has been receiving have decreased since 1992. As a result, the province of Québec devotes

more money to their health care program than the federal government. In 1990 federal transfers "accounted for less than 40% of the total budget earmarked for health and social services" (Québec, 1993b, p.41). How will Québec be able to fund the various health and social programs they wish to maintain while federal contributions are decreasing?

In 1991, the province of Québec published a document entitled *Equitable Funding Living Within Our Means* in an attempt to answer this question. This document aimed at "deciding what resources and funding framework would be most appropriate for maintaining a public system of health and social services in Québec" (Québec, 1991, p.1). In this document the government outlined the main threat to the maintenance of universal, free of charge access to health and social services, i.e., growing costs coupled with decreasing federal support. According to this policy, it is the Ministry's goal to;

> "• adapt the public expenditures process so that the rate at which costs increase does not exceed the growth of the collective wealth and takes into account citizens' ability to pay;
> • adapt services and reallocate resources according to the most urgent needs, and use them more effectively and efficiently in order to reduce pressure on costs from within the system;
> • diversify sources of funding, reduce the portion coming out of income tax and other general taxes and reestablish clear connections between expenditures and their funding, while ensuring that this diversification does not create any obstacles to the accessibility of services for the most disadvantaged;
> • reconcile increased expenses and their funding by revising the framework of current budget and financial management"
> (Québec, 1991 p.17).

Table 3.1: Total EPF Health Entitlements (Health Tax + Health Cash) From the Federal Government (in millions of dollars)

Province	1977-78	1982-83	1987-88	1992-93	1994-95
Alberta	385.8	817.2	1168.6	1384.0	1421.3
British Columbia	476.2	983.8	1437.6	1815.7	1916.2
Manitoba	206.9	364.6	530.3	585.2	591.8
New Brunswick	130.6	246.4	350.1	394.1	397.3
Newfoundland	106.8	200.4	279.2	305.3	304.9
Nova Scotia	163.9	300.2	431.5	483.7	490.5
Ontario	1679.1	3072.3	4553.6	5564.6	5715.9
P.E.I.	21.9	43.3	62.6	68.9	70.3
Québec	1306.2	2284.0	3240.1	3741.4	3810.2
Saskatchewan	182.0	345.1	499.2	527.8	531.9

(Canada, 1994)

In the document, the Ministry proposed ways of cutting costs while meeting these four goals. First, it was suggested that the incomes and fees of physicians and salaried workers be limited. Although the Ministry does not specify at which level incomes should be limited, it is unlikely that physicians will be willing to undergo further cuts to their salaries. It is also suggested that money could be saved by controlling the price of medications and "reviewing the range and basket of insured services" (Québec, 1991, p.20). Another suggested method of cost control would be to require institutions to make purchases jointly (especially for ultra specialized equipment). While this would decrease spending it could increase the waiting time for patients seeking treatment which in turn could negatively affect their health and well-being. It is also the intent of the Ministry to encourage the use of CLSCs and private offices by consumers for non-emergency services rather than the more expensive emergency centres located in hospitals.

With respect to the basic services now covered by provincial health insurance in Québec, the Ministry has suggested the adoption of two policies. The first calls for a revision to the current funding of the system through taxes. Three alternatives are suggested; employee tax, health income tax and reallocation of the Québec sales tax. For the employee tax, a percentage of a worker's salary above a certain limit and to a maximum would be devoted to health and social services. It is proposed that if this tax were to be implemented then the general income tax would decrease. The health income tax would involve allocating part of the income tax exclusively to health and social services. On the other hand, the Québec sales tax would be used in its entirety to the funding of health and social services. There are many advantages associated with these options: they do not violate the Canada Health Act, they increase awareness of users regarding the overall cost of the plan and consider the ability of the user to pay. The main disadvantage of these three options is that it increases the burden on taxpayers (Québec, 1991). In light of the recent recession, the slow recovery of the economy and the enormous provincial debt in Québec, can one justifiably demand more money from citizens?

The second policy would involve the introduction of user based fees for basic services. It is suggested that users should be required to pay a portion of nonmedical services (hospital meals and file management). While the Ministry acknowledges that this would be in violation of the Canada Health Act, it is stated that the most disadvantaged will be excluded from this fee. If the Ministry were able to implement this user fee what would stop them from expanding the services to which it could be applied? Many citizens who are not regarded as

being 'disadvantaged' by the Ministry but are not well off financially may not seek medical attention because of these user fees. If this were to happen this might affect the maintenance of good health. Another alternative suggested would be to charge citizens a deductible equal to $22/year and $5.00 per service used. Once again this proposal is contrary to the goal of accessibility under the CHA. However, the Ministry argues that they will give tax credits to those "economically disadvantaged citizens and those who require more frequent medical consultations" (Québec, 1991, p.21). Despite this, a tax credit is not useful to someone who cannot afford to pay the deductible and the user fees in the first place.

The problem of funding is a complex issue. This document shows how Québec is attempting to "find effective solutions to the problems of the cost and public funding of health and social services in Québec in a way consistent with the best interests of all Québecers" (Québec, 1991, p.II). The government has proposed many options in order to raise provincial money for health care. While most of these recommendations have not been implemented (and most likely will not be as long as the Canada Health Act is in place), if they were, they might be able to decrease costs via increased individual responsibility and awareness. By raising their own funds for health care and by de-insuring basic services (Québec health insurance no longer covers eye exams for persons aged 41-64 who are on social assistance nor dental exams for children) the province of Québec may be able to offset the decrease in federal funding. In doing so the province of Québec feels it would be;

> "reasonable to ask the federal government, to contribute to resolving the impasse in funding by not making its transfer payments dependent on standards that limit the province's

> free exercise of their responsibilities, in particular with respect to the basket of insured services and access to services"
> (Québec, 1991, p.24).

The province of Québec cannot justifiably expect the federal government not to regulate health care when they partially fund the system. If the federal government were to stop enforcing the Canada Health Act, there would be no guarantee that all citizens would be ensured equitable access to health care services. The Canada Health Act is the only means the federal government has of ensuring that the most disadvantaged members of society do not fall victim to inadequate health care as was the situation before the introduction of Medicare.

Sections 3.2 and 3.3 have highlighted an important aspect of the Québec health care system: with respect to financing, Québec has gone to great lengths (limiting physician incomes and restricting where practices can be set up) to reduce costs in certain areas of health care so that more money could be allocated to other health sectors. These series of cost cutting measures are important as they may have enabled the province to maintain their quality health care system despite the decrease in federal funding.

3.4 Recent Health Reforms in Québec

The direct funding of health care services is not the only area in which reform has taken and is taking place. Since 1985, Québec has been involved in producing a series of papers focusing on provincial health reforms. In 1985, as a result of rising health care costs a Commission of Inquiry chaired by Jean Rochon was set up to "evaluate the financing and

functioning of the system of health and social services" (Pineault, 1992, p.75). In its 1987 report the commission outlined the problems within the Québec health care system, offered solutions to these problems and made recommendations to ensure the maintenance and development of health care services.

According to the Commission, the health care system appeared to be confused. There was nothing in place to evaluate services and programs, some sectors (CLSCs and the DSCs) were unclear about their roles and in other areas there were overlapping functions. Rochon also found that the system appeared to be unreceptive to the changing needs of the population and that the Regional Councils had not allowed for full decentralization to take place.

Several recommendations were put forth in order to overcome these deficiencies. Rochon recommended that the regional councils be replaced by regional boards. The regional boards would be responsible for ensuring citizen participation, planning programs related to health and social problems and allocating budgets related to these programs. Each regional board was to consist of a board of directors made up of 15 elected members (some of whom had to be citizens). The regional board was to be responsible for submitting a health plan to the Ministry of Health and Social Services and the budget would be based on this plan. Because the Commission also found that health care in Québec lacked long-term health care and social priorities, it felt that by making regions submit plans they would be forced to think ahead and set long term goals. The Commission also clearly defined the roles of all the parties involved. Some of the responsibilities of the provincial government would be to oversee the regional budgets, planning and evaluating the system and to coordinate province

wide health programs (Québec, 1988). At the regional level, the boards were to ensure consumer participation, plan health programs and allocate the budgets (Québec, 1988).

The Commission also pointed out that since the Castonguay-Nepveu report, many changes had taken place in society (increased homelessness, sexually transmitted diseases, AIDS, environmental risks) and that polices should be adapted to meet these new needs. For example, the Rochon Commission stressed that social factors be taken into account when treating health problems. As a result, the Commission recommended that all health priorities be based on two categories of problems; health and social problems.

Although this is only a very brief summary of the Rochon report, its findings were quite exhaustive, covering a wide range of health and social issues. The Rochon Commission increased public awareness of the problems in the Québec health care system. As a result of this Commission and its recommendations, a series of policy documents were issued by the Ministry of Health and Social Services under the direction of its Minister Marc-Yvan Cote which led to the further reform of the system. The spirit of this new reform was borne out of the findings of the Commission and the Ministry's realization that the Québec health care system was facing many problems, the most pressing being; an aging population, homelessness, violence, funding issues and varying expectations of consumers. Generally, the Ministry felt that the bureaucratic rigidity and centralized nature of the system prevented it from adapting to changing needs, resources and communities (Québec, 1990). They felt that the system had to meet the following three challenges in order to improve;

"• ensuring development that corrects deficiencies in the services

> offered to the public and that will make it possible to meet future needs
> - ensuring a method of operation that makes the health and social services network more efficient in the use of resources and more effective in solving problems of health and well-being
> - ensuring financing that maintains the right balance between the network's expenditures and the community's ability to pay"
>
> (Québec, 1990 p.9).

The Ministry believed that in order to meet these challenges, it was necessary to establish a reform based on the viewpoint of Québec citizens (the citizens of Québec wanted a health care system which was characterized by more humane and personalized care and an equitable distribution of resources) as opposed to the viewpoint of the government and service providers. The goal of the reform was to make the citizen the focus of the health and social services network, hence the name *A Reform Centred on the Citizen* (1990). In an attempt to meet this goal the Ministry identified specific areas for reform centring around the three roles of citizens (consumer, decision-maker and payer). The document encompassed a broad spectrum for reform, ranging from establishing support for caregivers, to meeting the needs of those at risk (elderly, youth, disabled, cultural communities etc.), to increasing citizen participation and allocating resources according to the populations to be served.

In order to effectively and efficiently implement a reform of this size and scope, a new Act (Bill 120) was passed in August 1991. This piece of legislation formed the framework required to revamp the health care system. Bill 120, following the recommendations of the Rochon Commission, both outlined and reinforced the "rights of users and their participation

in decision making" (Québec 1992, p.3). This Act also "defined the roles and obligations of everyone involved in directing, organizing and delivering health and social services" (Québec 1992, p.3). One of the main thrusts of this act was to further regionalize the delivery of health care (Pineault, 1992). The province was further divided into 18 health regions (refer to Figure A2, Appendix A) and the regions were organized according to the recommendations made by the Commission. Each region was headed by a regional board which consisted of a Regional Assembly and a Board of Directors. The function of the Regional Assembly is to approve the annual reports of the regional boards and to elect the board of directors. Some of the functions of the Board of Directors are; to identify the health needs of citizens, encourage citizen participation, allocate budgets and to evaluate the effectiveness of services. Bill 120 ensured citizen participation. Seats on the Regional Assembly and Board of Directors were reserved for citizens. In the regional assemblies members are elected and membership varies from 60-150 people depending on the size of the region (Pineault, 1992). In each assembly 20% of the seats are reserved for citizens (Pineault, 1992).

The next step in the reform process came in 1992 when the Ministry of Health and Social Services on the recommendation of the Rochon Commission produced a document entitled *The Policy on Health and Well-Being*. Its purpose was to "explain the directions and means of action that Québec had chosen to improve the health and well-being of its citizens" (Québec, 1993a, p.10). The report outlined the intended focus and solutions to be taken with respect to specific problem areas in Québec society over the next ten years. This policy was founded on three beliefs: 1) there is a strong link between social factors (socio-economic

status, social support, physical environment etc.) and health and well-being. 2) there must be a sharing of responsibilities between individuals, families, communities, public authorities and society in order to maintain improved health and well-being 3) health and well-being is a necessary investment for society (Québec, 1993a).

On these three principles the Ministry identified 19 of the most prevalent health and social problems in Québec society and offered solutions to alleviate them by the year 2002 (Québec, 1993a). The problems identified can be divided into five groups; Social Adjustment, Physical Health, Public Health, Mental Health and Social Integration. It was within these five groups that the 19 objectives were defined. For example, under the category of Social Adjustment, the policy identified 6 objectives or problems. The first objective was to reduce the cases of abuse (sexual, violence, neglect) by the year 2002. The document then identified the reasons for the occurrence of abuse, its victims and ways to alleviate abuse. This same approach was applied to all of the 19 objectives. The document also included six different strategies for integrating all of the proposed solutions. This policy was a comprehensive and exhaustive approach for maintaining and improving health and well-being. The large scope of this policy enabled it to answer two questions "What societal choices offer the best opportunities for individuals, groups and society to maintain and improve their health and well-being?" and "How can the health and social services system best contribute to preventing and reducing problems and function effectively to promote health and well-being?" (Québec, 1992, p.10). The policy will require a vast sum of money (130 billion dollars) and massive public commitment for its success. This could be the reason why the Québec

government is allotting ten years for the full implementation of this project. Although it will be an expensive and lengthy process to achieve these goals it is necessary in order to "break the intergenerational cycle in which problems of health and social integration, which so often lead to poverty or result from it, are passed on from one generation to the next" (Québec, 1992, p.165).

As previously mentioned, the Rochon Commission recommended that the existing budgeting procedures be altered in order to incorporate a financing system that could enable regions to more accurately identify and better meet the health and social needs of Québec citizens. To date, the allocation of resources according to need has not been realized. In fact, 98% of all resources are still allocated according to the existing distribution of resources between regions. The remaining 2% of the resources are allocated based on a weighted per capita ratio (Pampalon, 1996). That is, a ratio is calculated based on the resources and the population in each region and then it is adjusted according to regional differences based on the cost of services and population needs.

3.5 Discussion of Implications for Research

As can be seen the province of Québec seems to be heading towards a health care system comprised of both social and health aspects as was envisioned by Castonguay. Although an important emphasis should be placed on the allocation of resources based on health and social needs this has not yet been implemented. However, by focusing on health promotion and disease prevention and by acknowledging that there are many contributors to

health status (individuals, family) the province of Québec may still be able to improve the health and well-being of its citizens. By continuing to focus on the importance of regionalization and by situating individuals at the center of its health care system, improved access to services may be the result.

3.5.1 Research Question and Hypotheses Tested

This chapter and the previous one have revealed some important issues with respect to the nature of health care in Canada and Québec. To re-iterate, all of the provinces in Canada are faced with decreased levels of federal funding which means they have been faced with a greater burden of financing over time. While the CHA ensures access, access does not necessarily translate into equity. This means that even though the provinces are upholding the virtues of universal, comprehensive, accessible, non-profit, portable health care, they may not be providing it on the basis of need. Is it possible that with the proper organization and delivery of health care, needs can be met? The policy directions Québec has undertaken set the grounding for this research. Based on the fact that Québec has taken steps to reduce physician costs in order to develop a more regionalized and responsive system of health care delivery, this thesis attempts to answer the following question; Has the development of a regionalized health care system enabled Québec to be successful in meeting the health services needs of Québec citizens in the face of Federal cuts to health care?

In order to assess this issue three hypotheses will be tested;

1) Use of family physician services within the past two weeks is independent

of individuals need and socio-demographic and economic characteristics in both 1987 and 1992-93.

2) Within groups of the population homogeneous in need, the association between the socio-demographic and economic variables and incidence of use is not significant in either 1987 or 1992-93.

3) For members of the population living within the same region, factors associated with the incidence of use are common in both 1987 and 1992-93.

The first hypothesis tests how important need is in determining utilization and how this importance has changed between the two time periods as regionalization has been consolidated. This will show whether those individuals with the greatest health needs are making use of health services. Rejection of this hypothesis would indicate that the use of family physician services is related to the need level of individuals. Rejection of the second hypothesis would demonstrate that the incidence of use given need could be confounded by socio-demographic and economic variables. It also examines change in the effects of these variables over time. The third hypothesis tests the factors associated with use in each of the 15 health regions included in the sample. This will reveal whether or not regional disparities exist and how successful Québec's decentralized model of health care is at meeting the needs of residents. Rejection of the third hypothesis would indicate that place of residence is an important determinant of use and indicate that regionalization has not yet equalized use given need.

CHAPTER FOUR

Literature Review

4.1 Canadian Context

From a policy perspective the rationale for carrying out this research has now been established but before proceeding with the analysis, it is now necessary to have some understanding of the nature of physician use (eg. factors which influence use, geographic variation). Within this chapter, several studies of physician utilization will be reviewed. The findings and problems which arise from past research will serve to illustrate the concerns surrounding the analysis of physician use as well as shape the direction of the present analysis. It is important to note that while many studies of physician utilization have been carried out, few have been done by geographers. As a result, much of the research lacks an examination of the importance of place (and time) in relation to utilization.

The structure and delivery of health care resources is distinct in every country. For example, in Canada health care services are free at the point of delivery, however, in the United States, it is necessary to purchase health insurance or pay for services before care is received. Income is such an important factor of utilization in the absence of comprehensive and universal health care that it can obscure the effects of other factors. Therefore, the remainder of this chapter will be devoted to the examination of studies of physician utilization

which pertain to the Canadian health care system.

Early studies (1970s and early 1980s) regarding the use of physician services focused mainly on the effects of Medicare on reducing financial barriers to health care (see McDonald et al (1973), Enterline et al (1973), Beck (1974), Beck and Horne (1980)). Most of these studies examined the relationships between use and income level in order to determine if utilization was still determined by ability to pay. The approach taken by recent studies (mid 1980s to present) is one which realizes the importance of examining need for care (as well as socio-economic characteristics) in explaining the variations in the use of physician services.

Tataryn et al (1995) examined the regional variation of ambulatory physician use in the province of Manitoba during the fiscal years of 1991-92. Their research showed regional differences in not only the level of supply of services but also for the rate of individual contact. For example, individuals in the region of Winnipeg made 72.5 more visits per 100 residents than did the other regions. However, Tataryn et al claim that the difference in contact rates is not a reflection of the supply patterns in the province of Manitoba. They state that even though Winnipeg had the largest supply of physicians and outside of Winnipeg, only the region of Westman had the services of at least some physicians in each of the speciality groups[1], "a very high proportion of Manitobans in every region were seen by a physician at least once over the course of a year, ranging from 77.7% in Thompson to 85.2% in Winnipeg" (Tataryn et al, 1995, DS91). Despite this, the region of Winnipeg seems to be at an advantage with respect to supply. For example, Winnipeg residents had greater access to specialists, making them three times as likely to be seen by a specialist for non consultative

care (reasons other than a second opinion). Also, general surgeons were the only specialty group found in five of the seven regions outside Winnipeg. Tataryn et al, contend that the difference in use between residents of Winnipeg and the other regions could be almost entirely explained by intensive users (individuals who made more than eight visits). Specifically, those 15 to 64 years of age had the "greatest impact on Winnipeg's higher use of physicians, accounting for 57% of the difference in the Winnipeg/non-Winnipeg usage patterns" (Tataryn et al, 1995, DS89). They also argued that Winnipeg's residents' higher rate of use was because of higher rates of visits to pediatricians, medical specialists and psychiatrists. Despite these suggested explanations, the fact that these groups have higher contact rates than their counterparts living elsewhere in the province indicates that barriers to access (longer waiting times, less specialized services) must exist in these other regions.

Nevertheless, Tataryn et al argued that the majority of residents of Manitoba have access to care (made at least one physician visit per year). However, defining access to care by the ability to make one visit is inaccurate for a number of reasons. First, this measure does not ensure that an individual has access for their second or third visits. It is possible that individuals living in communities with a minimal number of doctors may have to wait weeks for an appointment. Second, in those areas without specialists, where do individuals go to receive proper care? If an individual is required to travel a long distance can one really say they have access to care? Following the same line of reasoning, do those with the greatest need for care have the best access to care?

While no clear patter of use and need emerged from their research, their findings did

show that place of residence can dictate the type of care received and therefore utilization behaviour. For example, the two most northern regions, Thompson and Norman, had the greatest assessed need (scored highest on the socio-economic risk index and poorest on the premature mortality indicator) yet their physician utilization rates did not reflect their need level. Norman had relatively high rates of physician visits while Thompson residents had intermediate rates of physician visits. Central and Winnipeg had similar need. However, Central had the lowest physician contact rates in Manitoba and Winnipeg had the highest. The authors noted that many of the high-need northern communities are serviced by nursing stations. When visits to nurses are coupled with physician visits the region of Thompson did not appear to be underserved (Tataryn et al, 1995). Despite this finding, their research still showed that residents of northern communities do not have equal access to physicians with respect to their level of need. This points out the importance of allocating resources according to need level in order to provide adequate services and appropriate service providers to citizens.

Broyles et al (1983) used the Canada Health Survey (1978-79) in order to determine if the variations in physician utilization resulted from medical needs and socio-demographic variables as opposed to economic factors. With respect to incidence of use, they found that those with greater need (number of prescribed drugs, number of accidents, medical history, disability days, current medical conditions), females, married and separated, divorced or widowed individuals and white collar workers all had a greater likelihood of use than those with low need, males, single respondents and the unemployed. Relating to quantity of use,

those with greater medical needs and females used more services. On the other hand, individuals 65 years and older and the employed all used fewer services than their younger counterparts and the unemployed. While income was not statistically significant for incidence of use, Broyles et al found that the poor used services more than individuals earning a higher income. Their analysis illustrated the overwhelming importance of need and to a lesser extent the influence of some demographic factors in influencing physician use. However, it should be noted that their use of multiple regression for analyzing categorical data is not desirable (see Appendix C). Also, their choice of variables to measure need (disability days, number of prescribed drugs etc.) may not be independent of physician utilization which could have affected the outcome of their analysis (see Chapter 5, section 5.2).

Based on their findings, Broyles et al concluded that their results support the "contention that the utilization behaviour of individuals insured under the Medicare program is determined more by their medical needs than by their economic status" (Broyles et al, 1993, p.1052). Although Broyles et al did carry out an exhaustive study their level of analysis was restricted to the national level. This was restrictive since it is unrealistic to believe that the determinants of physician use are consistent across all provinces. Their study could have been strengthened had they performed analysis for each of the ten provinces or significant regions within the country.

Roos and Shapiro (1981) performed a study of health care utilization by the elderly in the province of Manitoba. The researchers carried out a survey of 4805 people (65 years and older) living in the metropolitan area of Winnipeg, Manitoba. The survey collected data

on social and demographic characteristics, a wide range of needs (psychological, physical (food and shelter), cultural and religious) and characteristics of physical and mental health. They found that while males made significantly less ambulatory visits, they were more likely to be hospitalized than females. This may be due to the fact that the women are using physician services for preventative care and as a result may not get "sick enough" to require the use of hospital services as often as men do. When examining health status, the researchers discovered that a decrease in self-rated health status was associated with a greater probability of making an ambulatory visit. In fact, they noted that as perceived health status goes from excellent to poor, the "mean number of ambulatory visits increased by three per year" (Roos and Shapiro, 1981, p.652). This illustrates the important role perceived health status has in determining utilization levels. The results failed to show "a significant relationship between use and income level for ambulatory visits" (Roos and Shapiro, 1981, p.654) but to further explicate their findings they re-estimated their analysis while holding health status constant. While their research showed that income was not a barrier to physician use, a low income level may dictate poor health status and therefore affect use of the system (Shapiro and Roos, 1981).

Shapiro and Roos (1985) also carried out an analysis of physician use in the city of Winnipeg, Manitoba to examine if and how the characteristics of elderly (65 years and older) non users (no physician visits in the past two years), low users (made 1-3 physician visits in the past two years) and frequent users (more than four visits) differed from each other. Shapiro and Roos found that individuals who were non-users, low users and frequent users

all had distinct characteristics. Specifically, they found that non users had a higher rate of mental impairment, were socially isolated and were more likely to be single than low users. The elderly who made four or more visits were more likely to be women, have more education and to report themselves in poorer health than non users and low users. On the other hand, the low users and non users were more likely than the frequent users to have some mental incapacity, to live in a remote or rural area, to be single, to have minimal schooling and were less likely to report two or more health problems. This study is important because it further supports the notion that universal health care has not been able to eliminate non-monetary barriers of utilization. It has important policy implications since it showed that provinces must do more than provide services which are free at the point of delivery.

Birch et al (1993b) examined factors affecting both the incidence and quantity of physician utilization, using data from the General Social Survey (1985). They found that respondents with higher levels of need (expressed as self-assessed health status) were associated with higher probabilities of visiting a physician in the past year as opposed to those individuals with low levels of need. They also found that females, older individuals and residents of Ontario and British Columbia all had higher probabilities of use than males, younger individuals and residents of Atlantic Canada. With respect to quantity of use, Birch et al observed that greater contact was significantly associated with greater need, females, increasing age, residents of Ontario and British Columbia and the sick unemployed. While income, education and marital status were not associated with utilization in these two stages of the analysis, education was significant when analysis was carried out for individuals

homogeneous in need. Their results showed that for those with excellent health, lower levels of education were associated with fewer physician contacts. Other findings were similar to those in the previous stages.

Newbold et al (1994) used the General Social Survey of 1985 to determine if variations in use could be explained by variations in supply-side characteristics. Factors affecting physician utilization were compared in the provinces of Ontario and Québec. While not many significant relationships were found, they did observe that greater levels of need (significant in both Ontario and Québec), older individuals (Québec) and females (Ontario and Québec) had an increased likelihood of use in both provinces. One interesting finding was that household income was both positively and significantly related to use at the individual level and for those with excellent and good health in the province of Québec. This analysis showed that the factors affecting use were statistically and significantly different in these two provinces. Furthermore, the differences remained even after the sample was partitioned into groups homogeneous in need. Newbold et al, contend that these differences were a result of supply-side factors. Rather than use an actual measure of supply (physician/population ratio), Newbold et al felt that each province would be a true reflection of its own supply levels. It is, however, questionable whether or not this analysis truly illustrated the effect of supply-side differences.

Eyles et al (1995) used the General Social Surveys of 1985 and 1991 to evaluate the relationship between use and need during a period of changing economic climate. They found that for both years, greater levels of need, women, older age groups and residents of Ontario

were all more likely to visit a physician than those with lower need levels, men, younger respondents and residents of Atlantic Canada. With respect to quantity of use, there was an interesting change in the effect of age. They found that in 1985 younger individuals had fewer visits while in 1991 they had more. Next they performed the same analysis for two groups of the population, individuals reporting excellent/very good/good health (the 'healthy' group) and fair/poor health (the 'sick' group). Among those in the 'healthy' group the findings were similar in both years, with the exception of age. They found that the two youngest age groups and those 65-74 years old used more services than those 75 and older. Among the 'sick', greater use was associated with younger individuals and non-divorced respondents.

Based on their findings, Eyles et al concluded there was little evidence to support the fact that the system was responding to the changing needs of the population. Women and older individuals used a proportionately greater volume of services even after controlling for need. While this could be due to their choice of measurement for need, Eyles et al (1995, p.330) suggested that "during periods of increasing attention to cost containment, these groups had been 'protected' in a relative sense from the burden of the changing fiscal climate and its consequences for health care". This suggests that universal health care alone is not sufficient to maintain equal access to care independent of the prevailing economic climate (Eyles et al, 1995). Their research is important because it highlights regional variations (residents of Ontario and British Columbia have a greater propensity to use services) in Canada showing that place does matter. Future research should explore why place is so important by answering the following types of questions; Do Ontarians and British

Columbians use more services because they have a greater level of supply, are they 'sicker' than residents living in the rest of Canada or do they just have better access to services? The inclusion of some measurement of supply might lend itself to a more exhaustive analysis and enable researchers to answer some of these questions.

4.2 Summary

Previous studies of physician utilization in Canada have incorporated several different methods and themes to evaluate factors affecting use. This review has highlighted a number of relationships which should be included in the present study and has also revealed deficiencies in past studies upon which this present analysis can improve. The bulk of the research has shown that in a health care system characterized by universal and comprehensive access to care, need level is a key determinant of utilization. Need was shown to both directly and indirectly (through its association with socio-demographic and economic variables) influence physician use (Birch et al (1993b), Eyles et al (1995), Newbold et al (1994)). We can see that when services are free at the point of delivery, economic factors have a minimal role in explaining use patterns. However, this research also reveals that although universal health care has appeared to remove financial barriers, there are non need factors which also influence the use of the health care system. These findings as seen in the studies carried out by Broyles et al (1983), Roos and Shapiro (1981), Shapiro and Roos (1985), Eyles et al (1995), Birch et al (1993b) and Newbold et al (1994) suggest that this present research should also include non need factors when examining utilization in relation to need.

There were some concerns which arose as a result of this review which will now be addressed. As previously stated, the measurement of access used by Tataryn et al (1995) may be problematic. For reasons already mentioned, access cannot be determined solely by whether or not one visits a physician. Instead access should be defined by including some sort of measure of need such as self-reported health status as is used in this analysis.

Broyles et al (1983) restricted their level of analysis to the aggregate level and as a result were not able to examine provincial differences in use across Canada. Past research (Birch et al (1993b), Eyles et al (1995), Newbold et al (1994) and Tataryn et al (1995)), has illustrated the importance of disaggregating data for purposes of analysis. By doing so these studies have shown that utilization and the factors which affect use are dependent on place and need level.

The research carried out by Tataryn et al (1995), Newbold et al (1994), and Eyles et al (1995) indicated the need for including a measure of supply when examining physician use. Tataryn et al observed regional differences for physician contact rates across regions in Winnipeg, however, they deny this is a reflection of supply. Eyles et al found that residents living in Ontario and British Columbia have higher probabilities of use than residents in the Atlantic provinces. However, they did not take this research one step further by determining if these differences were a manifestation of the supply level in each province. Newbold et al argued that the differences they observed in the factors affecting use in Ontario and Québec were a function of supply side differences. But, they also did not include some sort of measure of supply. These three studies illustrate a need to include variables which represent

place of residence and supply level. It is important to include these two variables since; a) the level of supply may directly affect use and/or b) place of residence can be a reflection of not only the level of supply but also the type of health care resources which exist in different areas. Further, the inclusion of a variable which represents place of residence may also be able to reflect the barriers of use which may be present in the various health regions of Québec. The inclusion of these variables can reveal where disparities exists (rural areas as opposed to urban settings) and also show if equal access to physicians with respect to need level exists in the province of Québec.

In summary, this review has pointed out a number of key issues which the present analysis had to take into consideration. In order to properly examine physician use in relation to need, this present study; 1) included a proper measure of access to care, 2) performed disaggregated data analysis for the 15 health regions included in the survey and for the five need levels, and 3) incorporated variables which measure supply and place of residence in the models.

CHAPTER FIVE

Method and Theory

5.1 Theory

5.1.1 Theoretical Frameworks of the Use of Physician Services

The literature suggests there are a number of frameworks which can be utilized in order to view health services utilization in relation to need. One of the earliest frameworks was developed by Andersen (1968). His framework devised a behavioural model of families' use of health services in which the determinants of use were divided into three categories; predisposing, enabling and need (Andersen, 1968). He argues that while need is the most important determinant of use, the importance of all factors in determining use will vary depending on the type of service used (physician, dentist, hospitals). Some of the existing frameworks used today (Andersen and Newman (1973), Aday and Andersen (1974)) are an extension of the framework proposed by Andersen. While they all emphasize the importance of societal and individual determinants of utilization (the predisposing, enabling and need components of use) their frameworks are broader than the original proposed by Andersen.

According to Andersen and Newman's (1973) model, the utilization of health services is a result of individual and societal determinants of health as well as the characteristics of the health care system. In this framework, utilization is directly affected by the individual

determinants of health. The societal determinants and the health services system indirectly affect use through their direct effect on the individual determinants of use. In this framework, the societal determinants of use can be divided into two categories; technology and norms. Technology can affect use in the following ways; 1) the introduction of antibiotics, immunization and sanitation all serve to improve the health of individuals which may in turn decrease utilization 2) advancements in surgery and the development of specialized equipment can both increase the use of health services. Norms refers to the way in which society can "induce or insure normal compliance on the part of members" (Andersen and Newman, 1973, p.100). Included in this component can be the way in which and where illnesses are treated.

The health care system can affect use both through its organization and its resources. The volume of resources is assumed to affect use in such a way that as the volume of resources per person increases the amount of medical care consumed will also increase. The geographic distribution of resources is also significant. The importance of the volume of supply may be diminished if health care resources are not equitably dispersed amongst the population. Access to services can range from whether or not medical insurance exists to the type of services covered under insurance and the waiting time for receiving treatment. Andersen and Newman state that accessibility should increase with the existence of health insurance, as waiting time decreases and as the type of conditions accepted for treatment increases (Andersen and Newman, 1973). The structure of the health care system refers to those characteristics which determine what happens to the patient after admission into the

system. Andersen and Newman argue that the medical practices of physicians, the disposition of staff and patients, and the care patients receive can all influence whether or not a patient will continue to seek care.

Similar to Andersen, in their model, the individual determinants of utilization are assigned to three categories; predisposing determinants, enabling determinants and illness level. Under the predisposing component it is argued that some individuals have a propensity to use services more than others because of characteristics which exist prior to the occurrence of illness . Factors included in this category are demographic characteristics (age, sex, marital status, past illness), social structure (education, race, occupation, family size) and beliefs (values concerning health and illness, knowledge of disease). The enabling component of the individual determinants of utilization are comprised of those variables which describe the "means" people have available to them in order to use services. This component consists of family characteristics (income, health insurance) and community characteristics (price of health services, place of residence, ratio of physicians to population). The third component of the individual determinants of utilization is illness level. Andersen and Newman argue that "illness level represents the most immediate cause of service use" (Andersen and Newman, 1973, p.109). Illness level can be that which is perceived by the individual through disability days, symptoms and self-assessed health status. Illness can also be evaluated through physical examinations. While this may not be feasible for research purposes, Andersen and Newman argue that it is possible for "the symptoms reported by individual to be weighed by a panel of physicians as to the probability of need for care for each symptom for each age group"

(Andersen and Newman, 1973, p.110).

The framework of health utilization behaviour proposed by Aday and Andersen (1974) is similar to the one developed by Andersen and Newman, i.e., based on access to medical services. While there are many factors which can affect access to care (income, insurance coverage, supply of physicians, geographic distribution), Aday and Andersen argue that "access may be even more appropriately considered in the context of whether those persons actually in need of medical care receive it" (Aday and Andersen, 1974, p.210). Need is measured by the same factors that Andersen and Newman used to measure illness level (perceived and evaluated health). Also built into this model are two new concepts; consumer satisfaction and health policy. Consumer satisfaction refers to those factors (convenience, courtesy, quality) which can indicate how pleased an individual is with the care they receive. That is, if an individual is not satisfied with the service provided they may be less likely to use it again. Health policy includes the mandates governing the financing, organization and manpower within the system. Aday and Andersen argue that if the objective of health policy is to improve access to care more people will gain entry into the system.

Their framework may be "conceptualized as proceeding from health policy objectives through the characteristics of the health care system and of the populations at risk to the outcomes" (utilization and consumer satisfaction) (Aday and Andersen, 1974, p.212). Aday and Andersen acknowledge the complex interrelations of these determinants of use as do Andersen and Newman. The complexity of this relationship indicates that it can be very difficult to isolate the most important determinant of use since the factors may be either

directly or indirectly related to each other. Despite this, Aday and Andersen argue that since this conceptual framework includes economic and organizational factors together it is beneficial for evaluating "the success of existing health policy or to predict the potential effectiveness of any proposed mechanisms for improving access to...the health delivery system" (Aday and Andersen, 1974, p.219).

5.1.2 Discussion

The frameworks developed by Andersen and Newman (1973) and Aday and Andersen (1974) have been incorporated into numerous health services utilization studies (see Arling (1985), Birch et al (1993b), Eyles et al (1995), Newbold et al (1994), Strain (1991), Wolinsky (1978)) and have been assessed on their ability to produce a reliable causal model of physician utilization. Based on their own evaluation, many researchers have criticized these conceptual frameworks. Wolinsky in his own study of utilization behaviour found that illness level and the predisposing and enabling characteristics were unrelated to health service utilization. He therefore concluded that the framework proposed by Andersen and Newman (1974) could not be supported by his research. Mechanic (1979) has also criticized these frameworks. Based on a review of utilization studies, Mechanic argued that mutivariate studies (with the exception of one) of physician utilization have only been able to demonstrate trivial psychosocial and organizational effects. Almost all of the variation explained in the models he evaluated resulted from perceived and evaluated need as opposed to the predisposing and enabling characteristics. Mechanic suggested that this could be due to incorrect

conceptualization in the frameworks. In essence, he argued that these models are insufficient for explaining utilization behaviour. He contended that constructs from illness-behaviour studies such as the "ways in which people perceived their bodies, make sense of their symptoms, and come to depend on the medical care system" should be incorporated into utilization models (Mechanic, 1979, p.394). Rundall (1981) in response to Mechanic argued that inadequate methodology as opposed to improper frameworks is the biggest contributor to low explanatory power. He believed that an inability to explain variation has more to do with the fact that most models estimated are additive (examine the independent effects) and/or they "assume linear relationships when constructing path models linking the three components to use" (Rundall, 1981, p.104). He claimed that it was the intent of Andersen and Newman (1973) to illustrate that the independent use of the predisposing, enabling and need factors is neither necessary nor sufficient for explaining physician utilization. He further argued that use will only occur "if one perceives oneself to be in need, and if one has the proper enabling characteristics, and if one is so predisposed" (Rundall, 1981, p.103). Following this, if one of these factors is missing then use cannot occur.

Similar to Mechanic's conviction, Strain (1991) also criticized these frameworks for their failure to adequately capture the process involved in using health services. Strain felt that while Andersen and Newman believed they had identified and defined the important determinants of health services utilization, they have omitted an extremely important component; the process surrounding use. She argued that the process surrounding use is never static and can vary depending on the reason for use (preventative as opposed to

curative), or for specific responses to symptoms. Despite its limitations ("consistently low explanatory power generally ranging from 4 to 30 percent of the explained variance") Strain believes the model can still provide insight (Strain, 1991, DS149).

Arling (1985) also assessed the usefulness of this framework in his analysis of physician visits by older people. Consistent with other studies, Arling found that need was the best predictor of use while the enabling and predisposing components explained a small fraction of the variance in physician visits. He also entered three sets of interactions into his model (medical conditions*impairment, medical conditions*economic deprivation, medical conditions*social support). His findings showed that the interaction terms did not explain a large proportion of additional variance in the model contrary to Rundall's (1981) argument. In spite of its weaknesses, Arling still contends that this model remains a useful heuristic.

It is important to note that while Andersen and Newman (1973) and Aday and Andersen (1974) have attempted to improve upon the original model suggested by Andersen, these more recent frameworks are still hindered by the same problems as the original model: an inability to operationalize certain personal characteristics. Specifically, Mechanic (1979) and Strain (1991) call for the development of a framework which takes into account social constructions of health and lay perceptions, however, it is hard if not impossible to find variables which can measure these attributes for a large-scale population study. Even though these other conceptual frameworks have tried to capture these different factors, they have not progressed much further than the original because certain individual characteristics are hard to operationalize. Despite this fact and the frameworks' limitations for causal analysis, the

model proposed by Aday and Andersen (1974) will be still be utilized in the present study. Aday and Andersen (1974) provide a useful framework because they not only introduce the concept of access to care in relation to need but also "involve a wider proposition: that national health policy should be taken into account when viewing the delivery of health care by a given system for a given population at risk" (Joseph and Phillips, 1984, p.114). It is possible to argue that the earlier chapters of the thesis dealt adequately with the context of health policy. Further, this research is neither concerned with finding the causal relationships underlying physician utilization nor is it an exhaustive evaluation of the factors which affect use. Rather, its main purpose is to explore the relationship between the individual determinants and actual use and to determine if health needs are being met. The framework not only provides an initial theory for grounding this research but also serves as a useful guideline for choosing variables. This research will serve to identify important individual factors in explaining utilization behaviour and build the foundation for further research.

5.2 Variables

This next section will discuss the variables used in the present analysis as well as the rationale for their use.

Predisposing

The predisposing factors included in this model are gender, age, marital status and occupation. Age and gender are included for a variety of reasons. During childbearing years (15-44) it is expected that women will seek care more often than men. Also, because medical

needs tend to increase as one grows older, it is expected that the probability of using services should increase with age. Marital status will serve as a proxy for social support. It is expected that divorced, separated and widowed individuals will have a greater likelihood of seeking care than married and single individuals. The occupational status of an individual can affect use in either two ways. The first argument states that those who are working are healthier than the unemployed and therefore have a lower probability of seeking care than the unemployed, i.e., 'the healthy worker effect'. The second line of reasoning views occupation as a surrogate for the opportunity costs of consuming health care (Broyles et al, 1983). Common to both arguments is the fact that the employed are expected to use less services than the unemployed.

Enabling

The enabling factors included in this model are income, education, supply and place of residence. While Andersen and Newman (1973) and Aday and Andersen (1974) argued that education is a predisposing factor, this author believes that it would be better served if it was incorporated as an enabling factor. First, it is generally accepted that as education level increases so does income level. As a result, education may be a proxy for income and therefore can be classified as an enabling variable. Secondly, the higher the level of education the more knowledge (possibly regarding health and prevention) that is acquired. Therefore higher levels of education may enable others to acquire more information on health behaviours. While it is not expected that household income will be positively associated with

use it will still be included. Broyles et al (1983, p.104) argued for its inclusion;

> "to the extent that the specific measures of health status fail to capture all dimensions of need, and to the extent that medical need is inversely associated with economic status, it is possible that persons in the low income groups will exhibit a greater propensity to seek care... than those in higher income categories".

The literature review has also revealed that place of residence and supply can influence use. That is, if one lives in an urban setting they may have greater access to care than individuals who live in rural areas. Also, it may be argued that higher levels of supply would translate into higher probabilities of use.

Need

Defining health needs is an area over which there is much debate. Some studies have measured need through the use of disability days, use of prescription drugs and previous illnesses (see Manga et al 1987, Broyles et al 1983). Criticism of these measures centres around the fact that they are not independent of utilization and therefore could "give rise to ambiguous interpretations of the estimated relationships" (Birch et al, 1993b, p.72). A plausible alternative to these measures is the use of self-assessed health status as a proxy for need (see Birch et al (1993b), Newbold et al, (1994), Eyles et al, (1995)). This measure is not without critics (see Collins and Klein, 1980). Yet, others have employed both the evaluated and perceived measures of need in utilization studies (see Strain (1991), Roos and Shapiro (1981), Wolinsky (1978)). Need for care is defined through self-assessed health

status in this analysis.

Utilization

In this study utilization is measured by incidence of physician use, i.e., the Santé Québec surveys asked respondents whether or not they had visited a general practitioner (just general practitioners, i.e., no specialists) within the last two weeks. There is some debate on the accuracy of self-reports which centers on the problems of an individual's ability to recall past behaviour for various time periods (see Cleary and Jette 1984). It should be noted that although "the problem of underreporting generally increases with length of recall period" (Andersen et al, p.19, 1979), Streiner and Norman (1989, p.41) point out that "people have difficulty remembering episodes of illness even over short periods of time". In this case, however, the author believes the chance of recall bias to be minimal since the period of recall was short and the respondents were only required to report incidence of use as opposed to estimating the number of visits they had made. Because the Santé Québec did not gather information on the number of times an individual visited a physician, analysis could not be carried out with respect to the volume of care consumed.

5.3 Data Set

The hypotheses were tested using data from Santé Québec, a weighted random sample of the province of Québec administered in 1987 and 1992-93. The targeted population for both surveys consisted of individuals (15 years and older) living in private households in 15

of the 18 health regions (see Figure A2 in Appendix A). Due to their geographical scattering and cultural specificity, the Cree and Inuit populations have been surveyed separately (see Daveluy et al., 1994 and Jetté et al., 1994). Also excluded were collective dwellings, hospitals and institutions. As a result of these exclusions the sampled population in 1987 and 1992-93 represented 98.5% and 97.5% of all private households in Québec respectively.

The Santé Québec surveys were designed to measure factors which determine health (lifestyle), health care utilization and individual health status. This survey collected data through the use of both private interviews and self-administered questionnaires. The private interview was a general survey on health which collected data regarding factors such as utilization and health problems. The self-administered questionnaire compiled information on lifestyle (alcohol and tobacco consumption, exercise) and health.

5.3.1 Sampling Procedure Used in 1987

The sampling procedure used in both surveys was divided into two stages and differed slightly between the two years. For the 1987 survey, the first stage involved selecting primary sampling units (PSUs: homogeneous areas from which households were selected) from the DSCs and in the second stage, private households were selected from each of the previously selected PSUs. PSUs were comprised of either census tracts (in non-metropolitan areas) or block-faces (in metropolitan areas). Of the PSUs made up of census tracts, 95% were single tracts while 5% were grouped census tracts. Census tracts were grouped in order to ensure that the requirement of a minimum of eighty households per PSU was met. This

would guarantee the sample was taken over a large enough area so that it was representative of the area and so that statistical analysis of the data could be carried out. Following this, if a census tract did not have a minimum of eighty households then it was combined with one or more census tracts until the requirement was met. In order to group census tracts together to form a PSU certain criteria had to be met. Each census tract had to; belong to the same DSC (this would reduce travel time); be connected by a road (to ease travel); and be as homogeneous as possible. In an attempt to achieve homogeneity, census tracts were matched on certain socio-economic and demographic characteristics (average income, education, unemployment, marital status) based on the 1981 census. By stratifying according to socio-economic and demographic factors, the survey ensured that the subjects selected were representative of the population in the areas in terms of those significant variables. This aided in increasing the external validity of the present study. The PSUs consisting of block-faces were composed of either a single block-face, groups of block faces, a single block or a group of blocks. Block-faces were grouped together in order to ensure that a minimum of forty households per PSU was achieved for the same reasons as noted above. Block-faces were grouped together based on the same criteria used for combining the census tracts. Once the PSUs were created, they "were systematically chosen using probabilities proportional to the number of households in the 1981 census, in order to make it more likely for the most densely populated PSUs to be chosen" (Québec, 1987a, p.17). In total 844 PSUs were chosen. Once they were selected the PSUs were then assigned to interviewers. The interviewers were required to enumerate each area to determine the number of private dwellings in each one as

defined by the Ministry of Health and Social Services.[2] The interviewers then submitted a list of all the private dwellings in each of their PSUs with the exception of seasonal dwellings, collective dwellings and institutions (Québec, 1987a, p.12). Once these lists were compiled, the second stage of the sampling plan was carried out, i.e., selection of the individual households. The dwellings were systematically chosen from those lists by means of a fractional interval. A random starting point was chosen and every n^{th} house was picked. This step was included to guarantee that a pure random sample was carried out. In 1987, a total of 13,700 households were selected.

5.3.2 Sampling Procedure Used in 1992-93

In the 1987 survey PSUs were created based on DSCs. However, for the 1992-93 survey because the DSCs were and are now defunct, the province was instead divided into strata (each one a combination of an administrative region (one of the health regions included in the survey) and a homogeneous region). It was from these strata that PSUs were created and sampled. The province of Québec was divided into four zones; Montreal metropolitan region (M), the regional capitals (C), the urban agglomerations (A) and the countryside (R). Each zone was then subdivided into three areas based on their socio-economic characteristics; poor, intermediate and rich. This was done using the 1986 census. This made a total of 12 homogeneous regions from which PSUs would be created. The PSUs were fashioned once again by combining census tracts or block-faces based on the criteria used for the 1987 survey. 1,139 PSUs were randomly sampled in proportion to the number of households in

each PSU according to the 1986 census. Once again, interviewers were required to enumerate the area and submit a list of all the private dwellings. From this, dwellings were chosen using a fractional interval. The 1992-93 survey had an additional requirement: a minimum of 800 households in each of the health regions and underprivileged areas had to be sampled. This was done to ensure analysis could be performed by region and for underprivileged groups which had been under represented in previous surveys.

The 1981 and 1986 census were used to group census tracts and block-faces and to select PSUs. It is possible that using the 1986 and the 1991 censuses would have provided more accurate population estimates as they would be closer in time to when the surveys were carried out. At the time the 1987 survey was conducted, the province was divided into 11 health regions and then further subdivided into 32 departments of community health (DSC). However, when the survey was administered in 1992-93, the number of health regions had increased to 18. This did not affect the analysis because the data provided for 1987 was adjusted so that it reflected the current configuration of the province (see Appendix B for discussion of reliability and validity).

5.4 Statistical Methods

The technical assessment of the data was based on the dichotomous nature of the dependent variable (0,1) which violates the assumptions of ordinary least squares (OLS) (see Aldrich and Nelson (1984) for discussion). Further, it was also shaped by the a priori assumption that incidence of use is non-linear (see Appendix C for further discussion). When

faced with a dichotomous dependent variable which is assumed to be non-linear in nature one can choose between various statistical models to use for statistical analysis: the most popular being the probit and logit models. Choosing between using a logit or a probit model is basically left to discretion and personal choice. This is due to the fact that "the cumulative normal and the logistic distributions are very close to each other except at the tails" (Maddala, 1992, p.328). Their only difference is the fact that "the probit model tends to approach the axis somewhat quicker than the logit model; however, the differences are relatively small" (Hanushek and Jackson, 1977, p.206). Their estimates are so close that is has been suggested that one could multiply the logit estimates by $\sqrt{3}/\pi$ to make them comparable to the probit estimates (Maddala, 1992). Thus is does not matter much which function is used except in cases where the data are heavily concentrated in the tails. It should be noted however, that the close similarity between the logit and probit models is confined to dichotomous dependent variables (Kmenta, 1986). Based on the above and the fact that past utilization research have utilized the probit model (Birch et al (1993b), Eyles et al (1995), Newbold et al (1994)), this present study also employed its use using a statistical program called Shazam to evaluate the factors which affect physician use.

The probit model is defined by $P_u = F(\alpha + \beta X_i)$, where P_u is the probability of the event occurring, $F(\cdot)$ is the cumulative probability function, X_i is the vector of independent variables, α is a constant and β is a vector of estimated coefficients (Kennedy, 1992) (refer to Appendix C for full description of the probit model). Coefficients are estimated using the maximum likelihood method (MLM) of estimation. The

> "conceptual difference between the OLS and the maximum likelihood method of estimation is that OLS is concerned with picking parameter estimates that yield the smallest sum of squared error in the fit between the model and the data, while MLM is concerned with picking parameter estimates that imply the highest probability or likelihood of having obtained the observed sample y"
>
> (Aldrich and Nelson, 1984, p.51).

The output provided by the probit model is somewhat similar to that found in OLS. As in OLS the t-test determines whether a particular parameter differs from zero (a value greater than 2 indicates a significant relationship). The goodness of fit of the model is measured using the likelihood ratio test (LR-test) which is similar to an F-test in OLS. The explanatory power of the model is measured using rho-squared. Rho-squared values range between 0 and 1. A rho-squared of about 0.2 is said to be a good fit (McFadden, 1974). Unlike the R-squared, the rho-squared is not a measure of the percentage of variation in the dependent variable explained by the model.

Following Aday and Andersen's model the need, enabling and predisposing components were forced into the equation based on a priori assumptions of their relationship with utilization. Since the independent variables are categorical, bivariate or multivariate representations were created. One value of each variable was chosen to be the reference variable and dummy variables were created. In each case the category chosen to be the reference variable was the one hypothesized to be most likely associated with visiting a physician. For example, the reference category for gender and age were females and those 75 years and older respectively (see Table D1a in Appendix D).

In addition to probit analysis, the frequency distribution of each variable was examined for both years of the survey. Further, cross-tabulations of specific combinations of variables were also carried out and analyzed. Both of these analyses were performed using SAS.

CHAPTER SIX

Statistical Analysis of the Factors Affecting Physician Utilization

6.1 Preliminary Data Analysis

6.1.1 Frequency Distributions

The first stage of the preliminary data analysis involved deriving frequency distributions for each variable. The purpose of this was to determine the distribution and/or characteristics of respondents in each year of the survey (refer to Tables D2a,b through D10a,b in Appendix D).

The results of the frequency distributions were as follows; the majority of the people surveyed rated their health as very good (40.5%) in 1987 and good (36.9%) in 1992-93. Gender and employment status were similar in both years, with females and the employed accounting for 51.5% and 55.2% of the respondents in 1987 and 51.0% and 53.8% in 1992-93 respectively. The majority of people surveyed stated they had high school education (41.7% (1987), 38.7% (1992-93)) and were married (64.9% (1987), 48.82% (1992-93)). Of the individuals surveyed in 1987, most (26.0%) were in the lowest income bracket, while in 1992-93 most (24.8%) of the people surveyed reported their income to be between $15,000-29,999. In 1987, the majority of respondents were between the ages of 25-44 (43.0%) while in 1992-93 most were between the ages of 45-54 (43.6%). As can be seen, the type of people

surveyed were almost similar between both years of the survey. Yet, the number of married people decreased from 1987 to 1992-93, while the number of single respondents increased from 13.0% to 15.5% and the number of divorced, separated and widowed respondents increased from 19.1% to 34.1%. Only 10.8% (1987) and 11.1% (1992-93) of the respondents reported visiting a family physician within the past two weeks.

The average person in both years of the survey would be a single, working female, between the ages of 45-54, earning between $30,000-39,999 with some post-secondary education and very good health status who has not visited her family physician in the past two weeks (see Table D1b in Appendix D).

6.1.2 Cross-Tabulations

The next stage of analysis involved constructing cross tabulations of; a) need and the dependent and independent variables, b) general practitioner use and the independent variables, and c) supply and use and need. The purpose of the cross tabulations was to discover any patterns in the data which might exist (refer to Tables D11a,b to Table D26a,b in Appendix D).

Among all income groups, the majority of individuals rated their health as either very good or good (Tables D11a and D11b). Generally, it was observed that as income level increased, the percentage of the respondents rating their health as poor decreased. Of those respondents with the greatest need (poor health status), 48.6% and 41.5% were in the lowest income groups in 1987 and 1992-93 respectively. This observation is similar to previous

research. Hay's (1988) study of the socio-economic status and health status of males using the 1978 Canada Health Survey, found a positive correlation between income and health. The National Population Health Survey (NPHS (1994)) results showed that those with higher income levels were more likely to rate their health as excellent or very good as compared to those with lower income.

The cross-tabulation of self-assessed health status and use revealed a very clear pattern (Tables D12a and D12b). As self-assessed health status improved (poor to excellent) the proportion of the population reporting use decreased. For example, in 1987, among those reporting their health as poor, 26% of the population reported visiting a family physician. While among those reporting their health as excellent, only 5.6% reported visiting their physician. This same pattern was observed in the 1992-93 survey. For those reporting their health as poor, 34.2% had visited a family physician, while only 7.8% of those with excellent health had visited a physician.

Another clear pattern emerged from the cross-tabulation of self-assessed health status and education (Tables D13a and D13b). Generally, the percentage of people rating their health as either fair or poor decreased as education level increased. Among all respondents reporting their health as either fair or poor, the majority of people had less than high school education. For example, in 1987, 52.6% of those with poor health and 42.4% of those with fair health had less than high school education. In 1992-93, these percentages decreased. That is, of those respondents with poor and fair health, 38.9% and 33.1% respectively, had less than high school education. This decrease may be explained by the fact that the

percentage of people with less than high school education reporting their health as good increased substantially from 34.1% in 1987 to 43.3% in 1992-93. It was also interesting to observe that in 1992-93, as education level increased, the percentage of the population rating their health as excellent increased. Although this same pattern was not observed for the 1987 survey, it has been observed in other research. The NPHS (1994) showed that 72% of those with a post secondary degree/diploma rated their health as excellent or very good while only 49% of those with less than secondary school education rated their health as excellent or very good.

In terms of self-assessed health status and age, this analysis revealed that for all ages in both surveys, the majority of people rated their health as either very good or good (Tables D14a and D14b). The results also showed that those between the ages of 25-44 made up the highest percentage of those rating their health as excellent (47.9% in both years) and those between the ages of 45-64 made up the greatest percentage of those rating their health as poor (44.3% (1987) and 37.6% (1992-93)). This cross-tabulation also showed that the two youngest age groups contributed the lowest percentage to those rating their health as poor in 1987 (2.32% (15-19), 2.42% (20-24)) and 1992-93 (0.94% (15-19), 3.03% (20-24)). Similarly, those in the two highest age groups made up the lowest percentage of those with excellent health, in 1987 (4.41% (65-74), 2.17% (75+)) and 1992-93 (4.67% (65-74), 2.14% (75+)). Most elderly individuals rated their health as good; 65-74 (37.1% (1987), 42.8% (1992-93)) and 75+ (34.7% (1987), 45.6% (1992-93)). This finding is comparable to previous work which has shown that the older a person is, the more likely they are to rate

their health as very good or good (see Linn and Linn (1980), Maddox and Douglas (1973) and Linn et al (1978)). Cockerham et al (1983) found that older persons are more likely than younger persons to rate their health positively. It has been suggested that the reasons for this could be that the elderly overestimate positive health status (see Maddox and Douglas (1973) and Linn et al (1978)) or that "the very old have survived longer because they were biologically elite and exempted from an aging population who died from major killer diseases" (Linn and Linn, 1980 p.311).

With respect to self-assessed health status and gender, for both years of the survey, males made up the highest percentage of the respondents rating their health as excellent, (55.4% (1987), 55.6% (1992-93)) (Tables D15a and D15b). Females on the other hand made up the greatest percentage of respondents rating their health as very good, good, fair and poor (both surveys). This finding is fairly consistent with past studies relating to gender differences and health perceptions (see Anson et al (1993)).

The results of the cross-tabulations of self-assessed health status and marital status showed that among those reporting their health as poor, those who were divorced, separated or widowed made up the lowest percentage (9.0% (1987), (20% (1992-93)) (the large increase in numbers was most likely a result of the increase in the number of divorced, separated or widowed individuals included in the 1992-93 survey) (Tables D16a and D16b). They also revealed an imbalance in the distribution, i.e., single respondents represented 12% and 15% of the 1987 and 1992-93 samples respectively but accounted for 26% and 34% of the population reporting their health as poor. This is not consistent with previous research.

Coombs (1991) reviewed over 130 studies on marital status and personal well-being and he found that generally, those who are married are the healthiest. The widowed and those who have never married rank next in health status while those who are divorced or separated have the highest rates of acute and chronic conditions.

In terms of self-assessed health status and employment, in 1987, those respondents who were employed accounted for 60.8% and 61.6% of those rating their health as excellent and very good, while those who were unemployed accounted for 67.4% and 83.6% of those reporting their health as fair and poor (Tables D17a and D17b). In 1992-93, the same relationship between health and employment was found. The employed accounted for 61% and 61.4% of those rating their health as excellent and very good and the unemployed accounted for 69.3% and 83.7% of those rating their health as fair or poor.

With respect to use and household income, in 1987, there was a general decrease in the proportion of the population in each income bracket reporting use (Tables D18a and D18b). The proportion reporting use decreased from 33.4% for the lowest income bracket, to only 10.7% in the second highest income level ($40,000-49,999), but then increased in the highest income level ($50,000+) to 13.8%. There was no clear pattern of decreasing use with increasing income in the 1992-93 survey. In this year, the second lowest income level ($15,000-29,999) accounted for the highest proportion of users, while the middle income group ($30,000-39,999) accounted for the lowest proportion (11.4%) of the population who visited a general practitioner.

In terms of utilization and education (Tables D19a and D19b) there was no clear

pattern of increasing or decreasing use with education level. However, in 1987, among those with less than high school education, 84.1% reported no use while 15.8% reported use while among those with post-secondary education, 91.7% reported no use while only 8.2% reported use. This same pattern of decreasing use with higher education level was observed in 1992-93. Among those with less than high school education, 85.5% reported no use and 14.5% reported use while for those with post-secondary education, 90.3% reported no use while only 9.7% reported use.

For the cross-tabulation of utilization and age, the proportion of the population in each age group reporting utilization increased with age (Tables D20a and D20b). That is, in 1987, for those aged 15-19, only 6.8% reported using a physician whereas for those respondents aged 75+, 20.6% reported visiting their family doctor. In 1992-93, for those aged 15-19, only 8.1% reported using a physician while for those aged 75+, 22.9% reported visiting a family physician.

The cross-tabulations of utilization and gender revealed an interesting relationship (Tables D21a and D21b). The distribution of those stating no use was fairly even for men and women in both years, (50.3% (women, 1987) and 49.5% (women, 1992-93)). However, gender differences existed for those visiting a physician. In both 1987 and 1992-93, women made up the highest percentage of those reporting utilization (61.6% (1987) and 63% (1992-93). This shows that gender differences with respect to utilization exist, i.e., women appear to be more likely to use services than men.

There were some interesting observations with respect to the distribution of users and

marital status (Tables D22a and D22b). For example, as mentioned previously, single respondents accounted for 12% and 15% of the population in 1987 and 1992-93 respectively, yet, they accounted for 17% and 22.4% of the users in these years. Divorced, separated and widowed respondents accounted for 18% and 33% of the population and represented 13% and 28% of the users in 1987 and 1992-93 respectively. Married respondents accounted for 67% and 50% of those surveyed and accounted for 67% and 48% of the users in 1987 and 1992-93 respectively.

With respect to utilization and employment, in 1987 and 1992-93, the employed accounted for 56.7% and 55.1% respectively of those reporting no use (Tables D23a and D23b). On the other hand, the unemployed accounted for 56.4% and 56.6% of those reporting use in 1987 and 1992-93. This shows a definitive trend between utilization and employment status.

No clear pattern could be seen for both the cross-tabulations of supply (as measured by the population/physician ratio) and need (Tables D24a and D24b) and supply and utilization (Tables D25a and D25b) in either years of the survey.

The chi-squared values for all of the cross-tabulations were significant at $p<0.0001$. This means that the null hypothesis which states the observed patterns occurred by chance alone can be rejected.

6.1.3 Simple Probit Analysis

In order to test a priori assumptions of the direction of the relationships between use

and each of the independent variables, simple probit models were constructed (refer to Tables E1 through E8 in Appendix E). Overall, most of the relationships found were as expected for both years of the survey. It was observed that as general health status increased, the probability of utilization decreased compared to those rating their health as poor. All age levels had a lower probability of use than the reference category. Furthermore, as age increased so did the probability of utilization. Those working had a lower probability of use than did the unemployed and as income increased, the probability of use decreased as compared to the lowest income level. Males had a lower probability of use than females and as education level increased, the likelihood of use decreased relative to those with less than high school education. With respect to marital status, the results showed that those who were single had a lower probability of use (1987 and 1992-93) than those who were divorced/separated/widowed. It was interesting to find that while marital status was negative in 1987, it was positive in 1992-93 meaning that married individuals had a higher probability of use than their divorced/separated/widowed counterparts. All models were significant with the exception of gender (1987), employment (1987 and 1992-93) and supply (1987 and 1992-93).

Neither smoking status nor drinking status were significant in 1987 or 1992-93 and they were therefore not included in remaining analyses in this study.

6.2 Secondary Data Analysis

Table 6.1 records the probability of use and need by household income for 1987 and

1992-93. In 1987, the probability of use decreased with income level, however, this same pattern was not observed in 1992-93. In 1992-93 the second lowest income group had the highest probability of visiting a general practitioner. Even more interesting is the fact that the probability of use increased by approximately 90% for those in the second highest income group. In 1987 and 1992-93 the probability of rating one's health as fair or poor was highest in the two lowest income groups. The probabilities increased once again for those in the second lowest and second highest income groups in 1992-93. Regardless of these increases, those in the lowest income group were more than four times likely to rate their health as fair or poor relative to those in the highest income group. This finding demonstrated the importance of income in determining health status. This is of great concern, considering that the goal of Québec's policy on Health and Well-Being was to reduce disparities "between social groups, not simply in regard to access to services but in regard to health and social well-being as well" (Québec, 1993b, p.10). The fact that those with the least amount of money have the poorest health shows that so far the policies implemented have not been successful in diminishing disparities.

TABLE 6.1: Relative Probability[1] of Family Physician Use and Need for Health Care in the Last Two Weeks, by Household Income, 1987-1992-93

		Income Quintile[2]				
		I	II	III	IV	V
Visited Family Physician	1987	2.413	1.186	1.190	0.770	1.0
Self-Report Health Fair/Poor	1987	4.615	1.919	1.203	0.818	1.0
Visited Family Physician	1992-93	1.818	2.150	0.907	1.592	1.0
Self-Report Health Fair/Poor	1992-93	4.279	3.452	1.064	2.123	1.0

[1] Probabilities expressed in relation to highest income quintile
[2] Roughly equal income quintiles with I being the lowest and V the highest

6.2.1 Multiple Probit Analysis

The next stage of the analysis involved the exploration of three models; 1) use and the need, socio-demographic and economic variables, 2) model one with the introduction of a supply variable, and, 3) model one with the addition of a dummy variable for region. In the third stage, the data were partitioned by need level and by place of residence.

The results of model one are found in Table 6.2 which records the estimated coefficients of the explanatory variables for incidence of use in both 1987 and 1992-93. The analysis revealed two (common) statistically significant patterns for the two years. Specifically, higher levels of self-assessed health status were significantly associated with lower probabilities of visiting a family physician as compared to those reporting their health as poor. These coefficients were significant for those with excellent, very good and good health (both samples) and fair health (1992-93 only). Males were seen to have a lower likelihood of use than females in both samples.

In terms of the other coefficients, although they were not significant their signs were consistent in both samples (with the exception of education). Marital status was shown to be associated with use. Single individuals (1987 and 1992-93) and married persons (1992-93 only) were significantly less likely to have visited a physician within the past two weeks as compared to those persons who were divorced, separated or widowed. Use was seen to be independent of age in 1987, however, in 1992-93 the likelihood of use was positively associated with age. In terms of employment, the sign of the coefficient in 1987 was consistent with the healthy worker effect, i.e., those who are working are less likely to visit

Table 6.2: Comparative Analysis of Physician Use in Québec for 1987 and 1992-93

Explanatory Variables			1987 Coeff	-CI	+CI.	1992-93 Coeff.	-CI	+CI
General Health	Excellent		-0.860***	-1.029	-0.691	-0.882***	-1.032	-0.731
	Very Good		-0.600***	-0.757	-0.442	-0.880***	-1.025	-0.735
	Good		-0.453***	-0.610	-0.297	-0.742***	-0.884	-0.599
	Fair		-0.116	-0.280	0.048	-0.356**	-0.506	-0.205
Need Partial Rho-Squared			*0.028*			*0.029*		
Sex	Male		-0.195***	-0.250	-0.141	-0.248***	-0.294	-0.201
Age	15-19		-0.138	-0.325	0.049	-0.395***	-0.541	-0.249
	20-24		-0.080	-0.252	0.092	-0.332***	-0.473	-0.192
	25-44		-0.071	-0.221	0.080	-0.387***	-0.499	-0.274
	45-64		-0.106	-0.252	0.040	-0.364***	-0.473	-0.256
	65-74		-0.055	-0.212	0.102	-0.257***	-0.376	-0.139
Marital Status	Married		-0.014	-0.092	0.064	-0.095**	-0.161	-0.030
	Single		-0.170**	-0.282	-0.059	-0.147**	-0.226	-0.068
Employment	Working		-0.118**	-0.181	-0.055	-0.028	-0.085	0.029
Predisposing Partial Rho-Squared			*0.009*			*0.014*		
Household Income	20,000-29,999	15,000-29,999	-0.072	-0.150	0.005	-0.038	-0.107	0.030
	30,000-39,999	30,000-39,999	0.000	-0.080	0.082	-0.026	-0.113	0.061
	40,000-49,999	40,000-59,999	-0.046	-0.136	0.045	-0.127**	-0.205	-0.050
	50,000+	60,000+	-0.031	-0.118	0.055	-0.150**	-0.238	-0.061
Education	High School		-0.029	-0.107	0.048	0.044	-0.030	0.118
	Some Post-Secondary		-0.074	-0.174	0.026	0.129**	0.041	0.218
	Post-Secondary		-0.110*	-0.202	-0.019	0.089*	0.005	0.172
Enabling Partial Rho-Squared			*0.007*			*0.001*		
Constant			-0.380**	-0.579	-0.180	0.089	-0.078	0.255
N			17141			21739		
Likelihood Ratio test			524.439 ***			677.649***		
Adjusted Rho-Squared			0.044			0.044		
Percentage Right Predictions			89.31			89.02		
Sensitivity (%)			0			0.67		
Specificity (%)			100			99.92		

* p<0.05, ** p<0.01, *** p<0.001

a physician than those who are unemployed. Use was independent of income in 1987 but related to it in 1992-93. But because the coefficients revealed that those in the lowest income level had the highest probability of use, it indicates that, at this level, disparities with respect to income level do not appear to exist. As noted above, there was a sign change for education level between the two samples. For 1987, the probability of use decreased as education level increased (post-secondary significant) while in 1992-93, higher levels of education were associated with greater probabilities of use (post-secondary and some post-secondary significant). This significant change over time may imply that for some reason those with higher levels of education have greater probability of using general practitioner services. Knowledge therefore seems relevant in explaining patterns of utilization. It may be that visits to physicians are for preventative services as well as curative ones among the more highly educated. On the other hand, education could be serving as a proxy for income. This might imply that those with greater levels of education have a higher probability of use because they are using services which are not covered under the health care system. It should be noted that this relationship was not produced in the cross-tabulations nor in the simple probit analysis for 1992-93. It is possible therefore that the relationship between use and education found at this stage may be a result of the interaction between education and the rest of the independent variables. In any event, these findings demonstrate the relevance of comparative analysis as the results from 1987 differ from the findings of 1992-93.

The LR-tests were significant for both samples which allowed for the rejection of the null hypothesis that need and the socio-demographic and economic variables were not related

to physician use. Although the rho-squared values appear to be quite low, 0.044, in both years this is quite common for cross-sectional studies of this type. Analyses based on large sample sizes tend to deflate the upper bound of the rho-squared by an unknown amount (McFadden, 1974). Moreover, it is possible that the low rho-squared values could be due to the fact that only slightly more than ten percent of the sample actually reported visiting a physician in the past two weeks. It is probable that this unevenness in the sample could have affected the ability of the model to predict use/non-use. Both models had good specificity (percentage of nonusers who were predicted as nonusers), 100% (1987) and 99.92% (1992-93) but very low sensitivity (percentage of users who were predicted as users), 0% (1987) and 0.67% (1992-93). Overall, the models correctly predicted 89.31% (1987) and 89.02% (1992-93) of respondents. These results show that the goodness of fit of these models was very poor, i.e., model was unable to predict who would visit a physician based on the variables entered into the model. The partial rho-squared values for the need block (0.028 in 1987 and 0.029 in 1992-93) demonstrated that need explained most of the variation in the dependent variable. Also, the partial rho-squared value for the predisposing blocks (i.e., sex, age, martial status, employment) increased substantially from 0.009 (1987) to 0.014 (1992-93). This may indicate that even after controlling for need the socio-demographic characteristics of individuals are becoming more important in explaining physician use. The fact that the partial rho-squared value for the enabling block decreased from 0.007 (16%) in 1987 to 0.001 (2%) in 1992-93, suggests that socio-economic characteristics are becoming less influential in determining use.

6.2.1.1 Interaction Terms

The importance of including interaction terms in analysis has been debated in past research. Previous studies (see Puffer (1987)) which included interaction terms "have found that specific interactions between need and socioeconomic status were significant in explaining observed variations in use and improved the overall performance of the model" (Birch et al, 1993b, p.89-90). On the other hand, Arling found that the inclusion of interaction terms "did not explain a great deal of additional variance, although they did reveal effects that were of theoretical importance" (Arling, 1985, p.369). While many might agree that statistical interactions can result in improved predictive accuracy and "improved understanding of the causes of physician utilization, there are disadvantages associated with their use" (Ronis and Harrison, 1988, p.368). In particular, an increase in the number of interaction terms included in a model will increase the number of significance tests performed which in turn will increase the probability that one or more of the statistically significant effects has occurred by chance. Also, a large number of interaction terms leads to a decrease in the degrees of freedom which "reduces the sensitivity of the significance tests and the precision of the estimates" (Ronis and Harrison, 1988, p.368). It is also possible that the interaction terms might be highly correlated which could also reduce the precision of the parameter estimates. Ronis and Harrison argue that the inclusion of interaction terms will not lead to large increases in predictive power (possibly only 5%). Furthermore, they stress that only a "small number of theoretically important interactions" should be included in one's analysis (Ronis and Harrison, 1988, p.371).

In order to test the importance of interactions, two different sets of interaction terms were successfully entered into the model.

6.2.1.1.1 Age-Sex Interactions

As previously stated, women are expected to use services more than men during childbearing years (15-44). In fact, "women in the reproductive age group use physician services at almost one and one-half times the rate of men in this age group, exclusive of utilization associated with pregnancy" (Hibbard and Pope, 1983, p.129). As a result, analysis was performed to examine the interaction between age and sex in order to determine if the higher probability of use for females in Québec was limited to women in the reproductive age group. The result as can be seen in Table 6.3 showed that there were no significant interactions between age and sex for the 1987 survey. For the 1992-93 survey, all of the age-sex interactions were negative and significant, suggesting that women at all ages (not just in their reproductive years) have a higher probability of use. One reason for this could be that "women have a greater interest and concern with health and that this factor is important to both the perception of symptoms and utilization rates for females" (Hibbard and Pope, 1983, p.137). Hibbard and Pope further suggested that women's greater interest in and concern with health may be a result of female socialization which not only places the experience of symptoms into a health context but also makes women responsible for not only their own health but the health of their family.

The rho-squared value did not increase in the 1987 model but increased in 1992-93

Table 6.3: Original Model with the Inclusion of Interaction Terms for Age and Sex

Explanatory Variables			1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
Need	Excellent		-0.866***	(-1.035,-0.697)	-0.880***	(-1.031,-0.729)
	Very Good		-0.606***	(-0.764,-0.449)	-0.880***	(-1.025,-0.735)
	Good		-0.459***	(-0.615,-0.302)	-0.743***	(-0.885,-0.600)
	Fair		-0.119	(-0.283,0.045)	-0.356***	(-0.506,-0.206)
Sex	Male		0.010	(-0.257.0.277)	0.077	(-0.114,0.268)
Age	15-19		-0.011	(-0.248,0.225)	-0.186*	(-0.368,-0.005)
	20-24		-0.082	(-0.306,0.142)	-0.198*	(-0.375,-0.022)
	25-44		0.033	(-0.163,0.228)	-0.216**	(-0.358,-0.074)
	45-64		-0.004	(-0.198,0.189)	-0.268**	(-0.409,-0.128)
	65-74		0.022	(-0.188,0.232)	-0.132	(-0.286,0.021)
Interactions	Male*15-19		-0.270	(-0.602,0.063)	-0.510***	(-0.769,-0.251)
	Male*20-24		-0.001	(-0.320,0.317)	-0.321**	(-0.572,-0.070)
	Male*25-44		-0.245	(-0.524,0.034)	-0.403***	(-0.607,-0.199)
	Male*45-64		-0.238	(-0.524,0.047)	-0.232*	(-0.442,-0.022)
	Male*65-74		-0.172	(-0.488,0.144)	-0.300*	(-0.541,-0.059)
Marital Status	Married		-0.018**	(-0.097,0.061)	-0.112**	(-0.178,-0.047)
	Single		-0.185**	(-0.297,-0.073)	-0.154***	(-0.233,-0.075)
Employment	Working		-0.110	(-0.174,-0.046)	-0.028	(-0.085,0.029)
Household Income	20,000-29,999	15,000-29,999	-0.072	(-0.150,0.006)	-0.039	(-0.108,0.030)
	30,000-39,999	30,000-39,999	0.0007	(-0.080,0.082)	-0.027	(-0.114,0.060)
	40,000-49,999	40,000-59,999	-0.047	(-0.138,0.043)	-0.128**	(-0.206,-0.050)
	50,000 +	60,000 +	-0.034	(-0.121,0.052)	-0.151**	(-0.240,-0.062)
Education	High School		-0.027	(-0.105,0.050)	0.041	(-0.033,0.115)
	Some Post-Secondary		-0.071	(-0.171,0.029)	0.125**	(0.036,0.213)
	Post-Secondary		-0.107*	(-0.199,-0.016)	0.080	(-0.003,0.164)
Constant			-0.462**	(-0.691,-0.234)	-0.032	(-0.212,0.148)
N			17141		21739	
Likelihood Ratio test			534.017***		702.032***	
Adjusted Rho-squared			0.044		0.045	
Percentage of Right Predictions			89.31		89.06	
Sensitivity (%)			0		0.5	
Specificity (%)			100		99.99	

* p<0.05, ** p<0.01, *** p<0.001

by approximately 2.5% (0.045). For the 1992-93 sample, the model had lower (0.5%) sensitivity compared to the original model and remained at 0% in 1987. The specificity of these models remained the same in 1987 and was relatively higher in 1992-93 (99.99%). These models correctly classified 89.31% (1987) and 89.06% (1992-93) of respondents. While conceptually these interaction terms are beneficial, from a statistical perspective it may not be that useful. The age-sex interaction terms were only significant in the 1992-93 and their addition to the models did not improve the models' ability to predict users. Furthermore the increase in the rho-squared value in 1992-93 was very small suggesting that this set of interaction terms was not statistically important in influencing use.

6.2.1.1.2 Need and Education/Need and Income

Following Puffer, need and education and need and income interactions were also included. These interactions were included to determine; a) whether or not educational level coupled with health status influences utilization, and, b) if utilization varies depending on income level combined with health status.

Although not significant in 1992-93, the need-education interactions in 1987 were all positive and some were significant as seen in Table 6.4. Those with excellent health and high school education (0.553 at $p<0.05$), very good health and high school education (0.572 at $p<0.01$), very good health and post-secondary education (0.534 at $p<0.05$) and good health and high school education (0.387 at $p<0.05$) all had a higher probability of use than those with poor health and less than high school education. This is an interesting finding since in

Table 6.4: Original Model with the Inclusion of Interaction Terms for Need and Education

Explanatory Variables			1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
Need	Excellent		-1.119***	(-1.405,-0.834)	-0.818***	(-1.040,-0.531)
	Very Good		-0.888***	(-1.119,-0.658)	-0.866***	(-1.125,-0.608)
	Good		-0.565***	(-0.778,-0.351)	-0.772***	(-1.007,-0.536)
	Fair		-0.266*	(-0.485,-0.047)	-0.299*	(-0.543,-0.056)
Sex	Male		-0.195***	(-0.249,-0.141)	-0.247***	(-0.294,-0.200)
Age	15-19		-0.148	(-0.336,0.040)	-0.387***	(-0.534,-0.241)
	20-24		-0.085	(-0.257,0.088)	-0.327***	(-0.468,-0.186)
	25-44		-0.077	(-0.228,0.074)	-0.385***	(-0.498,-0.272)
	45-64		-0.109	(-0.256,0.038)	-0.363***	(-0.472,-0.255)
	65-74		-0.059	(-0.217,0.099)	-0.255***	(-0.373,-0.136)
Marital Status	Married		-0.011**	(-0.089,0.068)	-0.095**	(-0.160,-0.030)
	Single		-0.170**	(-0.282,-0.059)	-0.148***	(-0.227,-0.069)
Employment	Working		-0.118**	(-0.181,-0.054)	-0.028	(-0.085,0.029)
Household Income	20,000-29,999	15,000-29,999	-0.071	(-0.149,0.007)	-0.039	(-0.108,0.029)
	30,000-39,999	30,000-39,999	0.0003	(-0.081,0.081)	-0.027	(-0.114,0.060)
	40,000-49,999	40,000-59,999	-0.049	(-0.140,0.042)	-0.127**	(-0.205,-0.050)
	50,000 +	60,000 +	-0.034	(-0.121,0.053)	-0.150**	(-0.238,-0.061)
Education	High School		-0.454*	(-0.816,-0.093)	0.087	(-0.226,0.400)
	Some Post-Secondary		-0.273	(-0.958,0.412)	0.177	(-0.363,0.717)
	Post-Secondary		-0.479	(-0.961,0.002)	0.035	(-0.367,0.437)
Interactions	Excellent*High School		0.553*	(0.122,0.984)	-0.123	(-0.500,0.254)
	Excellent*Some Post-Secondary		0.374	(-0.367,1.115)	-0.115	(-0.701,0.470)
	Excellent*Post-Secondary		0.441	(-0.103,0.984)	0.016	(-0.435,0.468)
	VeryGood*High School		0.572**	(0.186,0.958)	-0.059	(-0.408,0.290)
	VeryGood*Some Post-Secondary		0.321	(-0.381,1.024)	-0.035	(-0.599,0.529)
	VeryGood*Post-Secondary		0.534*	(0.030,1.037)	0.049	(-0.380,0.478)
	Good*High School		0.387*	(0.009,0.765)	-0.0003	(-0.331,0.330)
	Good*Some Post-Secondary		0.269	(-0.232,0.771)	0.031	(-0.524,0.585)
	Good*Post-Secondary		0.337	(-0.058,0.732)	0.092	(-0.325,0.508)
	Fair*High School		0.202	(0.337,1.671)	-0.055	(-0.402,0.291)
	Fair*Some Post-Secondary		0.372	(0.293,0.786)	-0.339	(-0.927,0.248)
	Fair*Post-Secondary		0.272	(0.465,1.712)	-0.016	(-0.459,0.427)
Constant			0.119	(-0.218,-1.831)	0.076	(-0.162,0.314)
N			17141		21739	
Likelihood Ratio test			544.119***		687.360***	
Adjusted Rho-squared			0.045		0.044	
Percentage of Right Predictions			89.31		89.03	
Sensitivity (%)			0		0.75	
Specificity (%)			100		99.92	

* p<0.05, ** p<0.01, *** p<0.001

model two both the direct effect of education and need on use was negative. This finding suggests that education level and self-assessed health status interact together to influence utilization in a very different way than they would if considered on their own.

The likelihood ratio tests were significant for both models meaning the null hypothesis could be rejected. The rho-squared value increased slightly by approximately 2.5% in 1987 (0.045) and remained the same in 1992-93 (0.044) which means the inclusion of need-education interaction terms added little to the explanatory power of the model. While the goodness of fit did not improve for the 1987 model it did improve for the 1992-93 model. Specifically, specificity remained the same while sensitivity increased from 0.67% (original) to 0.75%. Overall, 89.31% of respondents in 1987 and 89.03% of respondents in 1992-93 were correctly classified. The fact that the rho-squared value increased in 1987 and sensitivity improved in 1992-93 suggests that need-education interaction terms may be important in influencing use.

The degree of correlation between need level and income was too high and therefore statistical analyses of these interactions could not be performed. This suggests that health status may dictate income, i.e., being in poor health may mean being too sick to work and therefore having low household income. Alternatively, income may determine health status. That is, higher income levels may increase the probability of obtaining items which are conducive to good health, (food (vitamins, fruit and vegetables etc.), clothing and shelter). This finding is consistent with the result of past research examining the determinants of health (Black (1980), NPHS (1994), Ontario (1991), Hay (1988)).

6.2.2 Original Model with the Introduction of Supply

It is reasonable to assume that an individual can only use health care services if they are available and accessible. Although the CHA may ensure accessibility, this is not sufficient enough to guarantee use, especially if certain health care resources are minimal (or do not exist) or are unequally distributed throughout the country and in each province. The province of Québec has implemented a series of policies aimed at reducing the disparities of physician distribution across the province. The first step in the process was the passage of Bill 27 in 1984 (Contandriopoulos and Fournier, 1993). This Bill attempted to alter the distribution of physicians in order to reduce geographic disparities. Under this Bill, all new physicians who located in remote regions of Québec received 115-120% of the base rate for a service during the first three years of their practice. On the other hand, those physicians who chose to locate in areas with medical schools only received 70% of the basic rate for a service. In the second step of this process, residency positions were reserved for those physicians who chose to work in remote regions (50/320 in 1986 and 70/325 in 1990). Third, in 1987 Bill 75 was passed which limited where specialists could set up their practice. Each region was given a quota of physicians in each speciality per establishment (hospital, medical centre) and if a region reached its quota, a physician would not be allowed to practise in that region (Contandriopoulos and Fournier, 1993).

Exactly how effective have these policies been at diverting physicians away from urban centres such as Montréal? According to the literature, regional disparities of physician distribution still persist despite the policies that have been implemented. First, of the

residencies reserved in remote regions, fewer than 25 positions are filled per year (Contandriopoulos and Fournier, 1993). Second, specialists "still tend to be concentrated mainly in the major urban centres, resulting in shortages of primary specialties not only in remote regions but even in areas less than 50km from Montréal" (Contandriopoulos and Fournier, 1993, p.4).

Pampalon (1991) studied health discrepancies in rural areas in Québec. His results showed that health and professional consultation decreased as one moves toward the hinterland areas. A plausible reason for this could be due to fewer medical professionals and services in these areas. Based on this, Pampalon (1991) argued that the policies used to increase medical practice in outlying regions have not increased services in the remote hinterland areas. However, according to statistics published by the Collège des médecins du Québec the population physician ratios have generally decreased (as of 1992) in all of the health regions to the point that Côte-Nord, one of the most northern regions, has one of the lowest population physician ratios (883). Nevertheless, the ratios have remained relatively high in regions not located in urban centres (Abitibi-Témiscamingue (1088), Saguenay-Lac-Saint-Jean (1106), Mauricie-Bois-Francs (1159)) and are relatively low in the regions of Québec (716) and Montréal-Centre (817), suggesting that while disparities are diminishing they still exist. Consequently, because the province of Québec is concerned with regionalization and its ability to bring the delivery of care in line with individual needs, it is important to determine whether or not these disparities with respect to physician supply may influence use. That is, do individuals who live in regions with relatively high supply have a

greater probability of use?

Past research focusing on physician use in Canada suggests that supply may be an important determinant of physician utilization. As noted previously, Newbold et al (1994, p.325) have proposed that the statistically significant differences in utilization that they observed in the provinces of Ontario and Québec were a "function of supply-side differences". Broyles et al (1983) showed that volume of physician services used by individuals in the Canada Health Survey was partially determined by the availability of care (measured by physician/population ratio and community size).

In this next stage of analysis, the provincial level models, including the interaction models, were re-estimated with the introduction of supply to determine whether or not it played a pivotal role in determining and explaining variations in physician utilization. Table 6.5 records the outcome of the analysis for the introduction of supply into the original model. Supply was positive but only significant in 1987 and the size of the coefficient was small. This was interesting since one would expect the relationship to be the opposite of what was found: the higher the population/physician ratio the higher the use. That is, one may argue that when there are more doctors, individuals will have greater access to services and therefore utilization rates will be higher. This finding seems counter-intuitive but there may be effects not noticeable in the type of aggregate analysis being undertaken.

The LR-tests were significant, however, the rho-squared values seemed low, 0.045 in 1987 and 0.044 in 1992-93, which means that the addition of supply into the models contributed little to the explanatory power of these models. The sensitivity of the models

Table 6.5: Original Model with the Addition of Supply

Explanatory Variables			1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
General Health	Excellent		-0.862***	(-1.031,-0.693)	-0.883***	(-1.033,-0.732)
	Very Good		-0.604***	(-0.762,-0.447)	-0.882***	(-1.027,-0.737)
	Good		-0.455***	(-0.612,-0.298)	-0.743***	(-0.885,-0.601)
	Fair		-0.122	(-0.286,0.042)	-0.357***	(-0.508,-0.207)
Sex	Male		-0.197***	(-0.251,-0.143)	-0.248***	(-0.295,-0.201)
Age	15-19		-0.147	(-0.334,0.040)	-0.404***	(-0.551,-0.258)
	20-24		-0.086	(-0.258,0.086)	-0.340***	(-0.481,-0.199)
	25-44		-0.075	(-0.226,0.075)	-0.393***	(-0.506,-0.280)
	45-64		-0.105	(-0.251,0.041)	-0.368***	(-0.476,-0.259)
	65-74		-0.058	(-0.216,0.099)	-0.259***	(-0.377,-0.140)
Marital Status	Married		-0.024	(-0.102,0.055)	-0.097**	(-0.162,-0.032)
	Single		-0.167*	(-0.279,-0.056)	-0.144**	(-0.223,-0.065)
Employment	Working		-0.115*	(-0.178,-0.051)	-0.028	(-0.085,0.029)
Household Income	20,000-29,999	15,000-29,999	-0.074	(-0.151,0.004)	-0.040	(-0.109,0.029)
	30,000-39,999	30,000-39,999	-0.005	(-0.086,0.076)	-0.028	(-0.115,0.059)
	40,000-49,999	40,000-59,999	-0.051	(-0.142,0.040)	-0.130**	(-0.207,-0.052)
	50,000 +	60,000 +	-0.035	(-0.122,0.052)	-0.153**	(-0.241,-0.064)
Education	High School		-0.027	(-0.104,0.051)	0.046	(-0.028,0.120)
	Some Post-Secondary		-0.065	(-0.165,0.035)	0.133**	(0.044,0.221)
	Post-Secondary		-0.102*	(-0.194,-0.011)	0.093*	(0.010,0.177)
Supply			0.0002**	(0.00008,0.0003)	0.00001	(-0.00003, 0.0002)
Constant			-0.591**	(-0.831,-0.351)	-0.003	
N			17141		21739	
Likelihood Ratio test			534.062***		679.767***	
Adjusted Rho-squared			0.045		0.044	
Percentage of Right Predictions			89.31		89.04	
Sensitivity (%)			0		0.75	
Specificity (%)			100		99.32	

* p<0.05, ** p<0.01, ***p<0.001

remained at 0% (1987) and increased from 0.67% (original model) to 0.75% in 1992-93. Specificity was once again 100% in 1987 and decreased in 1992-93 (99.32%). The percentage of respondents correctly predicted was 89.31% in 1987 and 89.04% in 1992-93.

With respect to the age-sex interactions with the addition of supply, supply was once again only significant in 1987 and the age-sex interactions were only significant in 1992-93 (refer to Table E9 in Appendix E). The likelihood ratio tests were significant and the rho-squared values were relatively higher compared to the age-sex models without supply (0.045 in 1987 and 0.046 in 1992-93) but once again the increases were only approximately 2.5%. The small increase in the rho-squared values means that the addition of supply to these models contributed minimally to the explanatory power. The specificity and sensitivity were similar to the fit of the age-sex interactions models without supply.

Table E10 (Appendix E) shows that the inclusion of supply to the need-education interaction models yielded results which were similar to those in the model without supply, i.e., the need-education interactions were only significant in 1987 and followed the same pattern as before, with all interactions having a higher probability of use than those individuals with poor health and less than high school education. This model had both higher sensitivity (0.88%) than the model which did not include supply (1992-93 only). Overall, 89.31% (1987) and 89.04% (1992-93) of respondents were classified correctly.

The interaction between supply and need level was also examined to see if it influenced utilization (refer to Table E11 in Appendix E). The results showed that these interactions were all negative for both years of the survey. The interactions were significant

for excellent health status and supply (1987 and 1992-93), very good health and supply (1987 only) and good health and supply (1987 only). Because the signs of the coefficients were all negative this would indicate that these need and supply interactions predict a lower probability of use than those individuals with poor health status and their corresponding supply level. This would imply that individuals with the greatest need for health care will make use of it irrespective of supply in their area.

The LR-tests proved to be significant and the rho-squared value were relatively higher (0.045 in both 1987 and 1992-93) than the rho-squared values found in Table 6.2. However, these increases were so small (approximately 2.5%) that it indicates that this set of interactions also failed to increase the explanatory power of the model. The inclusion of these interactions did not improve the predictive power of the 1987 model. However, for the 1992-93 sample, the specificity increased slightly (99.94%) and the sensitivity of the model increased to 0.75%. The percentage of right predictions generated from these models was 89.31% (1987) and 89.05% (1992-93).

The fact that the relationship between supply and utilization was positive when it was significant suggests one of two things; 1) in some regions the system is very efficient or 2) in some regions the system is overburdened. In order to test these two possibilities, dummy variables for supply were created and two different sets of analyses were carried out. First, Québec city (the region with the lowest population/physician ratio in both years) was chosen as the reference region. The results showed no significant differences in the probability of visiting a physician between regions in 1987 (see Table E12 in Appendix E). In 1992-93 a

different picture emerged: the regions of Bas- Saint-Laurent, Saguenay-Lac-Saint-Jean and Montréal-Centre all had significantly lower probabilities of use than residents of Québec, suggesting that the higher levels of physician supply in Québec provides its residents with greater access compared with these two rural and one inner city region. This implies that equal access to care does not exist across the province. In order to understand the full impact of supply on use, in the second step, the region with the lowest supply of physicians (highest population/physician ratio) in 1987 (Lanaudière) and 1992-93 (Laurentides) was set as the reference region and the model was re-estimated (refer to Table E13 in Appendix E). Significant relationships which were only found in 1987 showed that Estrie, Abitibi-Témiscamingue and Chaudière-Appalaches had significantly lower probabilities of use than residents of Lanaudière. This finding shows that among these four rural regions, the region with the lowest supply (Lanaudière) has the highest probability of use.

Because of these differing results it is hard to say whether or not the health care system is efficient or over burdened. It is possible that the system is efficient in some areas and overburdened in others. The very different relationships between supply level and the probability of use across regions observed in this set of analyses is important. It indicates that accessibility to physician services may have worsened from 1987 to 1992-93 for those groups of the population living in regions with relatively low levels of supply. Although regionalization may have enabled the health care system to better identify the needs (as seen in the second stage of analysis) of the Québec population, this analysis of supply indicates that use in relation to need will still only occur if there is sufficient supply. It is possible therefore,

that access to the health care system in Québec is partly supply driven as opposed to demand driven.

The literature suggests that access to health care is important in determining variations of health care utilization. Following this, supply was introduced into the provincial level models for 1987 and 1992-93 in order to evaluate how much if any of the variation in utilization behaviour could be accounted for by supply. The results have shown that supply was only significant in 1987 and even then, the size of the coefficient was very small. The introduction of the supply variable did not result in substantial increases in the rho-squared values for any of the models. This suggests one of three possibilities; a) this aggregate level of analysis failed to show relationships which might be apparent at disaggregate levels, or, b) there are other factors which influence utilization that have not been included in this model, or, c) a two week recall period is too short, which therefore results in few respondents reporting utilization which leads to low rho-squared values. While there are alternative ways of entering supply into the models, this direct approach seemed the best and most feasible.[3]

To further test the effects of place, in model three, a dummy variable was introduced for the regions. Côte-Nord which is one of the most northern regions was chosen as the reference region. The likelihood ratio tests were significant in both models but the results of the t-tests illustrated that place of residence was neither significant in 1987 nor 1992-93 (see Table E14 in Appendix E). The effects of the other coefficients were similar to those found in the full model without region. There was a minimal increase in the rho-squared values (0.046 (1987) and 0.046 (1992-93)) which appears to show that place of residence is not

important in explaining variations of use. The sensitivity of the model remained the same in 1987 (0%) and improved slightly in 1992-93 (0.84%). The same trend was observed for specificity in 1987 (100%) and 1992-93 (99.94%). Overall, the models correctly predicted 89.31% (1987) and 89.05% (1992-93) of respondents.

6.3 Provincial data disaggregated by need level

Some studies of physician utilization suggest that limiting research to aggregated data analysis can result in misleading findings. Collins and Klein (1980) argue that the inferences of researchers drawn from results taken from the analysis of heterogeneous populations are susceptible to ecological fallacies. In their own research of access to primary care in Britain, Collins and Klein disaggregated their sample into different need levels ('not sick', 'acutely sick', 'chronic sick without restrictions', 'chronic sick with restrictions") examining general practitioner use among six socio-economic groups and found that "different health groups have different patterns of seeking health care" (Collins and Klein, 1980, p.1115).[4] For example, in the' not sick' group there was a class bias with professional males having higher access rates than the entire male population. On the other hand, for those 'chronically sick with restrictions', professional men had the lowest rate of access while semi-skilled workers had the highest rate of access. Building upon this, others (see Birch et al (1993b), Eyles et al (1995), Newbold et al (1994)) have also shown that the factors affecting physician use vary depending on need level. In further support of this technique, Mechanic (1979, p.392) points out that "using aggregated population indices for large areas is unlikely to capture the natural

opportunities and constraints for small subgroups of the population".

Tables 6.6 records the results of the estimations performed separately on the subgroups with excellent, very good, good, fair and poor health. Overall, the relationships which were observed for the provincial level of analysis were also observed by need level. In particular, gender was once again associated with use. Males were significantly associated with lower probabilities of visiting a physician for those in very good, good and fair health need levels (1987 and 1992-93) and excellent (1992-93 only) need level. Age was significantly associated with use for excellent, very good, fair and poor health (1992-93 only) and good health (1987 and 1992-93). In all cases the signs were consistent, i.e., increased likelihood of use as age increased. The healthy worker effect was seen once again for the 1987 sample and was significant for those in very good and excellent health. This relationship, was not observed at the provincial level in 1992-93 except for those reporting their health as fair. Use was independent of income among those reporting their health as excellent and very good for both samples. Where income was significant it was seen that generally as income level increased the probability of use decreased. This held true except for those with poor health status. For those reporting their health as poor, it was seen that those in the second lowest income level ($20,000-$29,999) had the lowest probability of visiting a physician, suggesting cumulative disadvantage for certain social groups in Québec. Education was only significant in two of the need levels, good and poor (1992-93 and 1987 respectively). For those with good health, those with some post-secondary education had the highest probability of visiting a physician compared with those with less than high school

Table 6.6: Comparison of the Use of Physician Services by Need Level

			EXCELLENT		VERY GOOD		GOOD		FAIR		POOR	
			1987	1992-93	1987	1992-93	1987	1992-93	1987	1992-93	1987	1992-93
Explanatory Variables			Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
Sex	Male		-0.136	-0.374***	-0.232***	-0.308***	-0.217***	-0.215***	-0.241**	-0.154*	0.247	0.006
Age	15-19		0.442	-0.626**	-0.230	-0.517**	-0.369*	-0.233	-0.453	-0.592*	0.443	-0.667
	20-24		0.373	-0.481*	-0.066	-0.575**	-0.337*	-0.144	-0.155	-0.598*	-0.545	-0.552
	25-44		0.438	-0.651**	-0.221	-0.571***	-0.141	-0.341**	-0.183	-0.151	0.043	-0.449
	45-64		0.160	-0.558**	-0.295	-0.623***	-0.126	-0.285**	-0.045	-0.181	-0.035	-0.590*
	65-74		-0.253	-0.401	-0.101	-0.396**	-0.114	-0.213*	0.057	-0.094	-0.220	-0.468*
Marital Status	Married		-0.120	-0.017	0.010	-0.154*	0.065	-0.139*	-0.117	0.024	-0.190	0.044
	Single		-0.287	-0.073	-0.171	-0.263**	-0.145	-0.203**	-0.169	0.075	-0.140	0.116
Employment	Working		-0.293**	-0.069	-0.142*	-0.002	-0.058	0.060	0.036	-0.301**	0.496	0.051
Household Income	20,000-29,999	15,000-29,999	0.067	-0.057	-0.022	0.019	-0.120	-0.020	-0.040	-0.209*	-0.841**	0.308
	30,000-39,999	30,000-39,999	0.024	0.055	0.040	0.112	-0.085	-0.120	0.182	-0.185	-0.054	0.385
	40,000-49,999	40,000-59,999	0.066	-0.092	0.096	-0.114	-0.233*	-0.125	-0.129	-0.111	-0.588	-0.078
	50,000 +	60,000 +	0.216	-0.051	0.042	-0.099	-0.141	-0.186*	-0.287*	-0.413*	0.116	0.305
Education	High School		-0.114	0.004	0.102	0.049	-0.015	0.057	-0.050	0.070	-0.582*	0.039
	Some Post-Secondary		-0.122	0.099	0.014	0.176	-0.089	0.163*	0.087	-0.070	-0.201	0.094
	Post-Secondary		-0.247	0.078	0.035	0.116	-0.147	0.084	0.050	0.114	-0.686*	-0.197
Constant			-1.526**	-0.572**	-1.011***	-0.592***	-0.772***	-0.741***	-0.490**	-0.411**	-0.255	-0.120
N			3044	3725	7101	7279	5031	8227	1642	2111	323	397
Likelihood Ratio test			32.636***	69.111***	72.592***	127.629***	89.674***	91.787***	40.043***	73.980***	35.432***	17.258***
Adjusted Rho-squared			0.021	0.029	0.015	0.028	0.021	0.014	0.014	0.026	0.048	0.007
Percentage of Right Predictions			94.79	91.88	91.08	91.60	87.77	88.76	78.17	78.63	72.70	65.89
Sensitivity (%)			0	0	0	0	0	0	0	0	0.024	10.71
Specificity (%)			100	100	100	100	100	99.92	100	99.92	100	99.92

* p<0.05, ** p<0.01, *** P<0.001

education. Among those with poor health, those with high school or post-secondary school had a significantly lower probability of visiting a physician within the past two weeks as opposed to those with less than high school education.

The LR-tests were significant for all of the models in both samples which means that non-need variables are important in explaining variations of use within groups of the population similar in need. Overall, the rho-squared values appeared to be low. The specificity of the models improved to 100% for the excellent and very good subgroups in 1992-93. The sensitivity improved slightly in 1987 (0.024%) and was much higher in 1992-93 (10.71%) for the subgroup of the population with poor health.

6.4 Regional Level Analysis

6.4.1 Multiple Probit Analysis at the Regional Level

Both the analysis which included a dummy variable for region and the supply level appears to show that where an individual lives is not very important in determining use, given need and socio-demographic and economic characteristics. Rather who you are (as measured by socio-demographic and economic characteristics) and what you need seem to be the factors which determine the probability of use. Thus the policy of regionalization seems successful in the sense that differences in utilization are based on need and socio-demographic characteristics irrespective of region. But to explore this further, the sample was partitioned by place of residence (health region) and the original model was re-examined (refer to Tables F1 through F15 in Appendix F). There were some common associations which were

consistent across regions for both years of the survey. In particular, general health status was significant in nine of the fifteen regions for both years of the survey (for the other six, health status was either significant in 1987 or 1992-93 or not at all). The signs for need were generally congruent with the findings at the provincial level of analysis with the exception of three regions in 1992-93. In the regions of Outaouais (Beta -0.827 (very good), -0.753 (good) at $p<0.05$) and Estrie (-1.424 (very good), -1.286 (good) at $p<0.001$), those who rated their health as very good and good and in Mauricie-Bois-Francs (-1.067 (good) at $p<0.001$) those who rated their health as very good had the lowest probability of visiting a physician: a complex pattern suggesting that different types of analysis are required to discover what is happening in particular regions (see Section 6.4.2).

Gender once again proved to be an important factor in influencing use. In twelve of the fifteen regions, males were significantly associated with a lower probability of using a physician. Use was most frequently related to age in the 1992-93 sample. When significant all age levels had a lower probability of use than those 75 years and older and the probability of use tended to decrease as age increased. The region of Chaudière-Appalaches was an exception, with those between the ages of 65-74 (-0.666, $p<0.05$, 1987) having the significantly lowest probability of visiting a doctor. In the regions of Estrie (-0.663 at $p<0.05$, 1992-93) and Montérégie (-0.531 at $p<0.05$, 1992-93), those between the ages of 45-64 had the lowest probability of utilization.

Marital status was significantly associated with use in four regions. In Chaudière-Appalaches (-0.421 at $p<0.05$, 1992-93), Québec (-0.309 at $p<0.05$, 1992-93) and Mauricie-

Bois-Francs (-0.481 at $p<0.05$, 1987) single respondents had a lower likelihood of visiting a doctor. These associations were consistent with those observed in the other stages of analysis. In the region of Montérégie (0.581, $p<0.01$, 1987 only) those who were married had a higher probability of visiting a doctor than those who were divorced, separated or widowed. This clearly illustrates that marital status as a proxy for social support is variably related to use.

Employment was only significant in two regions (Montréal-Centre (-0.198 at $p<0.05$, 1987) and Estrie (-0.320 at $p<0.05$, 1992-93)) and once again the healthy worker effect was observed. Education was statistically significant in five regions (Abitibi-Témiscamingue, Estrie, Gaspésie-Les-Îles-de-la-Madeleine, Laurentides and Montréal-Centre) and the associations found varied little from the previous stages of analysis with two exceptions. In Montréal-Centre, those with some post-secondary education had the lowest probability of use (-0.358, $p<0.05$, 1987) while in Gaspésie-Les-Îles-de-la-Madeleine (0.363, $p<0.05$) those with high school education had the highest likelihood of visiting a general practitioner (1992-93 only).

There were other interesting findings. For example, use was seen to be dependent on income in eight regions. In three of those regions (Saguenay-Lac-Saint-Jean (1992-93), Laurentides (1992-93) and Québec (1987)) greater probability of use was generally associated with lower levels of income. However, in Gaspésie-Les-Îles-de-la-Madeleine (1992-93) the results showed that although all income levels had a lower likelihood of use than the reference level, those earning between $15,000-$29,999 had the lowest probability of use (-0.315 at

$p<0.05$). In a similar finding, those earning between $20,000-29,999 living in the region of Outaouais had the lowest probability of use (-0.376 at $p<0.05$, 1987). The most striking finding was in Abitibi-Témiscamingue (0.388 ($40,000-$49,999), at $p<0.05$, 1987) where not only did all income levels had a higher probability of visiting a physician than the reference category but the likelihood of use increased with income level (in 1992-93 the signs of the coefficients were once again negative). It is possible that the visits could have been for treatments not covered under the provincial insurance plan and were therefore only affordable to those with high income levels. This mixed pattern does however point to some relationship between place of residence and income that affects the desired policy relationship between use and need.

6.4.2 Regional level analysis disaggregated by need level

Since the regional level analysis revealed a complex pattern between use and need level, further analysis was required. Each region was partitioned by need level and the models were re-estimated (refer to Tables G1 through G15 in Appendix G). Because of the low numbers of individuals rating their health as either fair or poor, the sample was partitioned into two need levels; excellent/very good/good ('healthy' group) and fair/poor ('sick' group). Still, in some regions (Bas St. Laurent, Laurentides and Laval (1987 only)), the number of individuals falling into the fair/poor category were too low to generate output.

The results of this analysis were quite similar to those found in the previous stages. Specifically, gender was consistently negative and significant across need levels for both years

of the survey. In terms of age, among those in the 'healthy' group, use was dependent on age in ten regions. It was interesting to find that generally the probability of use decreased as age increased in three regions: Chaudière-Appalaches (-1.248 (65-74) at $p<0.01$, 1987), Estrie (-0.551 (45-64) at $p<0.05$, 1992-93) and Montérégie (-0.507 (45-64) at $p<0.05$, 1992-93). In the remaining regions the relationship between use and age varied. Specifically, in Lanaudière (1992-93, all significant) and Mauricie-Bois-Francs (-0.743 (25-44), -0.580 (45-64) and -0.511 (65-74) at $p<0.05$, 1987) it was observed that as age increased generally the probability of use increased. In Laurentides (-0.854 at $p<0.05$) and Saguenay-Lac-Saint-Jean (-0.616 at $p<0.05$) those between the ages of 25 and 44 had the lowest significant probability of use. In Montréal-Centre, the youngest (-0.589 (15-19) at $p<0.05$) had the lowest probability of use. In the region of Québec (-1.012 at $p<0.05$, 1992-93), those individuals between the ages of 20 and 24 had a significantly lower probability of use than those 75 years and older. For the 'sick' group the relationship between use and age also varied by year and region. In the region of Québec (-2.496 (20-24) at $p<0.05$, -1.575 (25-44) at $p<0.01$, -0.940 (45-64) at $p<0.05$), all in 1992-93) the probability of use increased with age. In Estrie (1992-93) those between the ages of 25-44 (-1.063 at $p<0.05$) and 45-64 (-0.810 at $p<0.05$) had a lower probability of use than respondents older than 75 years. In 1987 in Mauricie-Bois-Francs those between the ages of 25 and 44 (-1.321 at $p<0.05$) had the significantly lowest probability of use and in Côte-Nord (-2.054 at $p<0.05$, 1987) individuals in between the ages of 45-64 also had the lowest probability of use. However, in 1992-93 the relationship between use and age reversed in Mauricie-Bois-Francs. Specifically, those between the ages

of 15-19 (1.504 at $p<0.05$) and 25-44 (1.251 at $p<0.05$) all had higher probabilities of use than those 75 years and older.

Employment was significant in four regions: Montréal-Centre, Laval, Gaspésie-Les-Îles-de-la-Madeleine and Estrie. The results showed that the employed had a lower probability of use across need levels for both years with two exceptions. In Gaspésie-Les-Îles-de-la-Madeleine for those in the 'healthy' group, the employed had a significantly lower probability of use in 1987 (-0.356 at $p<0.05$). However, in 1992-93 (0.330 at $p<0.05$) the employed had a significantly higher probability of use than the unemployed. In Estrie (1987) for those in the 'sick' group it was observed that those individuals who work had a higher probability of use than those who were not working (this finding was not observed in any of the previous levels of analysis) while in 1992-93 for those in the 'healthy' group' employment was negatively related to use.

In terms of the other variables, it was once again observed that marital status was variably related to use by place of residence, across need levels and over time. In three of the regions where marital status was significant, the results were opposite to what was expected. In Chaudière-Appalaches (1987) for those in the 'sick' group, single individuals (1.234 at $p<0.05$) had a higher probability of use than divorced/separated/widowed respondents. For the same group, married (0.940 at $p<0.05$) and single (1.254 at $p<0.05$) respondents living in the region of Québec (1987) also had a higher probability of use than their divorced/separated/widowed counterparts. For those in the 'healthy' group, married respondents had a greater probability of use than the reference category in the region of

Montérégie (0.719 at $p<0.01$, 1987). It is interesting that married and single respondents only had significantly greater probability of use than those divorced/separated/widowed in the 1987 survey.

In terms of income, the analysis revealed findings which were not consistent with the health policy mandates in Québec. Specifically, in Estrie (1992-93) for those in the 'sick group' it was seen that the probability of use generally increased with income, with those earning between $15,000-29,999 (-0.969 at $p<0.01$) having the lowest probability of use. Furthermore, in 1987 among those in the 'healthy' group living in the regions of Abitibi-Témiscamingue (0.432 ($40,000-49,999) and 0.491 ($50,000+) both at $p<0.05$) and Laval (1.165 ($40,000-49,999) at $p<0.05$), not only did the probability of use generally increase with income level but all of the coefficients were positive. These findings illustrate a complex picture of utilization, need and income level. It appears that in some regions higher income levels allow individuals to visit the doctor (possibly for preventative care) and benefit by having good health. The fact that the results found in Abitibi-Témiscamingue and Laval were not reproduced in 1992-93 may mean that the policy reforms are beginning to meet their intended goal of reducing disparities among different social groups.

Some of the results for education painted a different picture from what was observed at the provincial and regional levels of analyses. Education was only significant in 1987 for those in the 'healthy' group. Here the analysis revealed that in the region of Québec (0.399 (high school) at $p<0.05$) all education levels had a higher probability of use than those with less than high school education. This is not consistent with the 1987 findings at the provincial

level which showed that education and use were negatively related. There were also variations between the provincial level of analysis in 1992-93 and this present level of analysis. In 1992-93 at the provincial level, it was seen that not only were the coefficients for education positive but as education level increased so did the probability of use. However, in the region of Lanaudière ('sick' group) it was observed that although all of the coefficients were positive, those with high school education (0.998 at $p<0.05$) had the highest probability of visiting a physician. Similar to the provincial model, in Abitibi-Témiscamingue (0.628 at $p<0.05$) and Estrie (0.465 at $p<0.05$) (both in the 'healthy' group) and Gaspésie-Les-Îles-de-la-Madeleine (1.430 at $p<0.01$, 'sick' group) it was observed that those with some post-secondary education had the highest probability of use.

This disaggregated level of analysis revealed a complicated picture of need, place of residence and utilization. This point is clearly illustrated by examining the factors which affect use in two regions (refer to Table 6.7). In Abitibi-Témiscamingue, use was statistically related to need, gender, income and education. More specifically, those reporting their health as very good (1992-93) and males (1987 and 1992-93) had a statistically significant lower probability of use than those individuals reporting their health as poor and women. Respondents earning between $40,000-49,999 (1987), those with some post-secondary education (1992-93) and those with post-secondary education (1992-93) had a statistically significant higher probability of use than those individuals earning less than $20,000 and those with less than high school education. In Montréal-Centre, use was statistically associated with need, gender, age, employment and education. As health status increased, the

probability of use decreased compared to those reporting their health as poor (all significant except fair health (1992-93)). Males (1992-93), the employed (1987) and those with some post-secondary education (1987) had statistically significant lower probabilities of use than females, the unemployed and those with less than high school education. Also, as age increased the probability of use generally decreased with, those between the ages of 15-19, 25-44 and 45-64 all having statistically significant lower probabilities of use than those respondents 75 years and older. Montréal-Centre had more statistically significant relationships between the individual determinants of use and utilization than did the region of Abitibi-Témiscamingue. One reason for this could be due to the increased sample size for the region of Montréal-Centre. It is also likely that because Montréal-Centre is an urban area with a larger population than Abitibi-Témiscamingue, the statistically significant relationships observed in Montréal-Centre are a reflection of population variability. Because population composition can influence the results, it would be interesting to set the Santé Québec data sets against census data to determine the extent to which variations in use are a function of the population composition in each health region.

These specific examples as well as the previous sections pertaining to the regional analyses of the data illustrate the complex relationship which exists between the factors associated with utilization and place of residence. The fact that both the factors which affect utilization and the way in which these factors affect utilization varied between need levels highlights the important role health status has in determining use. This illustrates the importance of not only considering health status when creating policies but also for

Table 6.7: Comparison of the Factors Associated With Utilization in Abitibi-Témiscamingue and Montréal-Centre

			Abitibi-Témiscamingue		Montréal-Centre	
			1987	1992-93	1987	1992-93
Explanatory Variables			Coeff.	Coeff.	Coeff.	Coeff.
General Health	Excellent		4.918	-0.596	-0.347	-0.778**
	Very Good		5.130	-0.774*	-0.114	-0.830**
	Good		5.255	-0.590	0.088	-0.609**
	Fair		5.804	-0.002	0.245	-0.262
Sex	Male		-0.353**	-0.251*	-0.159	-0.166*
Age	15-19		-0.928	-0.179	0.446	-0.553*
	20-24		-0.245	0.325	0.332	-0.271
	25-44		-0.655	0.261	0.331	-0.410*
	45-64		-0.414	0.116	0.311	-0.420**
	65-74		-0.162	0.073	-0.016	-0.325
Marital Status	Married		0.026	-0.057	-0.163	-0.199
	Single		-0.087	-0.127	-0.211	-0.105
Employment	Working		0.035	0.0001	-0.198*	0.003
Household Income	20,000-29,999	15,000-29,999	0.145	-0.220	-0.022	-0.061
	30,000-39,999	30,000-39,999	0.102	-0.387	-0.096	0.158
	40,000-49,999	40,000-59,999	0.388*	-0.165	-0.092	-0.227
	50,000 +	60,000 +	0.372	-0.039	-0.144	-0.288
Education	High School		0.331	0.294	-0.092	0.112
	Some Post-Secondary		0.466	0.534*	-0.358*	0.095
	Post-Secondary		0.218	0.545**	-0.222	-0.042
Constant			-6.361	-0.888*	-1.033**	-0.010
N			1076	1181	1964	2251
Likelihood Ratio test			51.798**	49.715**	60.386**	94.455**
Adjusted Rho-squared			0.064	0.047	0.039	0.056
Percentage of Right Predictions			91.28	89.58	90.48	89.77

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

disaggregating data for purposes of analysis.

6.5 Summary

Due to the nature of the rho-squared measure and its sensitivity to sample size, it was impossible to rely solely on it in order to assess the goodness of fit for each of the models in this study. As a result, it was necessary to examine the significance and direction of the coefficients as well as evaluate the sensitivity and specificity of each model. Generally, the models had high specificity but were unable to predict users correctly (low sensitivity), i.e., the overall goodness of fit of the models was very poor.

This thesis only examined the associations between the individual determinants of use and utilization. It is possible that a study which incorporates all of the determinants in Aday and Andersen's framework (health policy, characteristics of the health delivery system, characteristics of the population at risk and consumer satisfaction) might result in higher explanatory power.

One might also argue that by allowing insignificant variables to remain in the models this could create 'noise' which could in turn interfere with the models' ability to predict users correctly. Following this reasoning, parsimonious models were re-estimated at the provincial level for both the 1987 and 1992-93 samples. The results showed no increase for any of the measures of goodness of fit in 1987. In terms of the 1992-93 sample, the sensitivity of the model remained the same (0.67%) while the specificity of the model increased minimally from 99.92% (original) to 99.96% (parsimonious). These findings indicate that the inability of

these models to predict physician use was not a result of the inclusion of non-significant variables. This means that the exclusion of other factors which may be associated with use might explain the low predictive power of the models.

Multi-collinearity could be another possible reason for the low explanatory power of the models. The results of auxilliary regressions which were derived showed very high rho-squared values for certain variables (education (0.306 (1987), 0.317 (1992-93) and employment (0.293 (1987), 0.310 (1992-93)). These relatively higher rho-squared values indicate there might be some degree of correlation between the dependent variables. These possible associations between the dependent variables may have affected the outcome of this analysis by preventing the models from achieving high explanatory power.

It was interesting to find that overall sensitivity was higher in the 1992-93 sample. This may imply that sample size is a determinant of a model's ability to accurately predict use. As the sample size increases the chances of correctly predicting responses may also increase. It is possible therefore that the improvements in explanatory power seen in the 1992-93 sample are only an artifact of its increased sample size.

When need education interaction terms were included this also increased the sensitivity of the models (1992-93 only). The age-sex interaction terms also increased the rho-squared values in both 1987 and 1992-93. However, the increases in explanatory power were usually 2.5%, less than the five percent estimated by Ronis and Harrison. Therefore, one can conclude that although these interactions may be theoretically important (as they improve one's understanding of factors which affect use) they are not statistically important

in influencing utilization.

CHAPTER SEVEN

Conclusions

7.1 Summary of Research Findings

The aim of this thesis was to examine whether or not the Québec health care system had continued to meet the health needs of Québec citizens during a time of financial constraint by comparing utilization in relation to need and other factors using data from the 1987 and 1992-93 Santé Québec surveys. The comparison of the factors which influenced the use of family physician services in these two years in the province of Québec as well as the results shown in other studies of physician use indicate that need level is an important determinant of use. At the provincial level of analysis the partial rho-squared values for the need block (0.028 in 1987 and 0.029 in 1992-93) demonstrates that need explained most of the variation in the dependent variable (Table 3). The proportion of the rho-squared value contributed by the need block increased slightly from approximately 64% in 1987 to 66% in 1992-93 which may suggest that the Québec health care system is becoming better able to identify the need of its users. More importantly the partial rho-squared value for the predisposing blocks (i.e., sex, age, martial status, employment) increased substantially from 0.009 (1987) to 0.014 (1993-93). That is, the predisposing component accounted for only 20% of the rho-squared value in 1987 but in 1992-93 it accounted for 32% of the variation. This may indicate that

even after controlling for need the socio-demographic characteristics of individuals are becoming more important in explaining physician use. Even more interesting was the fact that the partial rho-squared value for the enabling block decreased from 0.007 (16%) in 1987 to 0.001 (2%) in 1992-93, suggesting that financial and other barriers to use are diminishing. At this level, the findings also showed that although there were non-need variables (marital status, income, education) which were significantly associated with use, gender was the only one which was consistently related to incidence of use in both years. Also, the rejection of the likelihood ratio tests demonstrates that utilization is related to need and the socio-demographic and economic variables in both years of the survey.

In the stage of analysis when probit analysis was carried out for individuals homogeneous in need the results illustrated that non-need variables were significantly associated with utilization in different ways across need levels which is consistent with other studies (Collins and Klein (1980), Birch et al (1993b), Eyles et al (1995), Newbold et al (1994)). This also implies that need level is important as it influences the associations between the predisposing and enabling variables and utilization. Further, the rejection of the null hypotheses showed that the relationship between the socio-economic and demographic variables and utilization varied not only by need level but also by year. The analysis at the regional level also showed that need level and gender were important determinants of use regardless of place of residence. However, there were other variables whose associations with utilization varied between regions indicating that barriers to use vary by place of residence. This suggests that geography as represented by place does matter, especially with

respect to the barriers which may prevent or inhibit the use of physician services.

The findings of this thesis, while illustrating the importance of need, also showed the importance of temporal and spatial data analyses. The regional level of analysis revealed a complex pattern of utilization behaviour which was neither apparent at the provincial level nor at the need levels. This demonstrates the relevance of analyses of sub-samples as the disaggregate picture is different from that of the aggregate.

Comparative analysis between these two years allowed for the evaluation of the Québec health care system during a period of regionalization as well as of cost containment by the federal government. The timing of the second sample (1992-93) was beneficial since it occurred during the beginning of the most recent reform process. This enabled the author to demonstrate how effective the reforms have been, initially, in identifying and meeting the needs of Québec citizens. The results indicated that inequalities in family physician utilization have not remained the same between 1987 and 1992-93. Specifically, socio-demographic variables are becoming increasingly more important in explaining utilization while the importance of socio-economic variables is decreasing. The fact that age became significant in 1992-93 suggests that the health care system may need to be flexible in order to effectively respond to changes which occur over time such as the increasing importance of predisposing factors.

Since need as defined by self-assessed health status has been shown to be an important determinant of use over time and across space, it indicates that the health care system in Québec appears to have been successful in meeting the health needs of Québec citizens.

However, the complex regional picture observed might demonstrate that Québec is not meeting the needs of its citizens in the same way in every region. This conclusion has some policy implications. Historically, the provision of health care has not always been consistent with the degree of need for health care. In fact "the design of policies has paid little, if any attention to the distribution of needs for health care within populations" (Birch et al, 1993a. p.88). Based on these findings two suggestions can be made regarding the allocation of health care resources.

The first concerns the allocation of resources and their relation to need. The idea of population needs based planning as suggested by the Rochon Commission and others (see Eyles and Birch (1993), Eyles et al (1991), Birch et al (1993a)) may be the most feasible and best way of incorporating need for care into the allocation of health care resources. This may insure that individual health and social needs are more effectively met. The second suggestion concerns the nature of health care in localities. Since the allocation of health care resources is "based largely on past patterns of service provision and utilization" any inequalities of the past will be present in the future (Birch et al, 1993a, p.69). One way of overcoming these persistent disparities might be to design a regionalized health care system such as that found in Québec. Québec seems to have made important strides in this manner, although the variable picture in the disaggregate analysis suggest that inequalities remain. However, one cannot speculate what would have occurred if all of the recommendations of Rochon had been implemented. These variations showed that the relationship between need, socio-demographic variables and place of residence continue to impact on physician utilization. To

explicate these relations further requires analyses with more disaggregated data sets and the delivery of services may require more localized fine-tuning than the present regionalization provides.

7.2 Significance of this Study and its Implications for Future Research

This research was not only important for evaluating the health care system in Québec but it also was significant in that it revealed the importance of a geography of health and health care. Pyle (1979) has stated that

> "so long as there are geographic variations in space and time, whether related to naturally occurring or artificial environments there is a definite need for geographic applications and communication of research findings"
> (Pyle, 1979, p.3).

Pyle raises an important issue: if medical geographic research can establish that place and time are of significance in terms of health care use then geography is important in this area of study. This present study showed that geographic methods (as manifested in both spatial and temporal comparisons) were essential for exploring utilization behaviours. In particular, it was observed that use and the factors associated with use varied both spatially and over time. By showing that barriers to use varied across health regions and by need level as well as between surveys, this research supports the contention that "inequalities can be evidenced at different spatial scales of analysis" (Jones and Moon, 1987, p.233). This study is thus important as it situates utilization in the context of spatial and temporal comparisons.

While adding to the existing literature of medical geography, it should be noted that this present study is limited to describing the factors which are associated with use across different levels of the population in Québec. This is a useful starting point: this type of analysis has neither fully identified all of the factors which are associated with use, nor can this method ever explain why these factors are of importance. A review of the literature reveals that this holds true for most of the studies which have analyzed physician use in Canada. Broyles et al (1983) were able to explain approximately 21% of the variation in the volume of physician care consumed. It is possible that they were able to predict more variation than the present research because of their inclusion of numerous variables to measure both need and supply. Also, Broyles et al (1983, p.1044) were forced to use discriminant analysis and multiple regression techniques in their examination of categorical data because "at the time the research was conducted, the software required to examine the statistical significance of coefficients estimated by the probit model was not available". It is plausible that the use of these methods could overstate the effects of the independent variables on use. The series of investigations of physician use carried out by Birch et al (1993b), Eyles et al (1995) and Newbold et al (1994) (using probit analysis) have resulted in what appear to be fairly low rho-squared values. At the provincial and national levels, the rho-squared values for the models of physician incidence are comparable to those found in the present analysis (0.04). However, when estimating quantity of physician use using two-stage estimation, Birch, Eyles and Newbold achieved rho-squared values which were much closer to 0.2. This suggests that while not useful for predicting incidence of use, the predisposing, enabling and

need characteristics of individuals may be more important for predicting the volume of care consumed by individuals. In support of this, Donabedian reminds us that;

> " one must distinguish two components in use of service: 'initiation' and 'continuation'. This is because different factors influence each, though any one factor may influence both"
> (Donabedian, 1972, p.111).

This research was not able to explore the validity of this notion since the Santé Québec surveys did not gather data on the volume of care consumed by individuals.

Much of the research on health care utilization (including the present study) pays special attention to the various socio-demographic and economic characteristics of individuals in explaining use patterns. The aforementioned inability of these studies to adequately identify the factors which predict physician use suggests that the individual determinants of use are not the only factors which determine use. Perhaps then future research should take this into consideration. Sayer (1992) cites there are two possible approaches one can undertake in explaining social phenomena; extensive and intensive. This present study was extensive, exploring a few properties of a large number of individuals, and hence was hindered by its inability to explore a vast array of human characteristics which could affect use. Future research in this area adopting a more intensive approach which would explore a large number of properties of a few individuals might be better able to determine the factors which are associated with use. For example, Litva (1992) in her study of lay perceptions of health and health care in small town Ontario found that choosing to visit a doctor is not an immediate response to illness (need). In fact, her informants stated that they would seek medical care

only after they had tried to deal with the problem (symptoms) themselves. Litva found that people 'deal' with their illness by first drawing upon past illness experiences and by consulting with others to "determine what they (others) think about their symptoms" (Litva, 1992, p.56). It is only at the point where the individual no longer trusts their ability to evaluate and treat their illness that he or she seek medical care.

Strain (1991) also examined the factors associated with physician visits for the elderly (65 years and older) living in the Winnipeg, Manitoba. Even though her study was extensive, she was able to provide one of the more enriched studies of physician utilization as compared to those carried out by previous researchers in this area. She has taken her research to a different level than the other researchers by including the effect of lay perceptions (individual health beliefs and values) on use. Strain measured values regarding health and illness and attitudes towards health services by asking respondents to "indicate how important they believed a host of health behaviours were to their overall health, irrespective of whether they engaged in the particular behaviour" (Strain, 1991, p.S146). Respondents were also required to indicate their agreement with a series of 22 statements through the use of a three point scale designed to measure the degree of medical scepticism and their belief in internal or external control. Contrary to previous research, Strain's research failed to show a significant relationship between the enabling (household income, adequacy of income) and the predisposing components (age, gender, marital status) of use and actual utilization with the exception of occupation. Those individuals who were employed in a professional or managerial occupation reported making more visits had a greater probability of making more

physician visits in one year (1985). Consistent with other studies, need was the most important determinant of use. Those with greater need (poorer perceived health, greater number of chronic conditions, individuals requiring assistance in daily living, have activity limiting problems and problems which cause pain or worry) were all more likely to report more physician visits. More importantly, Strain also found that health beliefs accounted for three percent of the variation in physician use. She discovered that the more scepticism a person had regarding the medical system, the fewer visits they were likely to make. Also, the more an individual believed that events were directly determined by their own inaction/action as opposed to fate or luck, the more likely they were to seek advice.

These two studies are of great importance especially considering that few studies take into account lay perceptions in explaining variations in physician use. This body of research illustrates the importance of lay perceptions in influencing behaviour because even if an individual has the means, propensity and need for care, they may not seek it if they.do not have confidence in the health care system.

To borrow from Strain, it appears that this present study has been unable to 'tap the process' that is involved in deciding whether or not to visit a physician and therefore the predictive power of the models remained low. Strain's study showed that overall, the predisposing, enabling and need variables accounted for only 21% of the variance and health beliefs and attitudes contributed an additional 3%. This illustrates that including measures of health beliefs and attitudes could increase predictive power. Litva's research is significant as it revealed there is an underlying process an individual goes through when deciding whether

or not to seek medical care: evaluation of symptoms, comparison with past illness, consultation with others. Qualitative methods which utilize intensive interviews may be more well suited for not only identifying which factors are important in influencing use but also why they are of such importance.

The results of previous utilization studies as well as the present study indicates that future research in this area of interest should focus on two priorities: 1) building upon the descriptive patterns of use and attempting to explain **why** people visit the doctor, and, de-emphasizing the importance of socio-economic and demographic variables since they do not appear to explain a great deal of the variation in utilization behaviour, and 2) considering the influence of other factors such as health beliefs and attitudes and lay perceptions of health and health care.

The use of other frameworks may be helpful in considering the second priority. Specifically, the Health Belief Model (Becker, 1974) which has been used primarily for explaining preventative health behaviours may be useful for non-preventative health behaviour as well. The focus of the model is the value an individual places on a goal and the perceptions of the probability of achieving that goal through a specific action. Becker argued that action (decision to visit a doctor) is partly dependent on an individual's concern about health matters and their willingness to seek and accept medical attention. Models and frameworks of utilization behaviour should also take into account gender differences with respect to health and health behaviours. In this analysis, the cross-tabulations of utilization and gender and self-assessed health status and gender illustrated that women use physician services more than

men and that women are less likely to rate their health as excellent as compared to men. Past research has observed similar findings. In particular, Anson et al (1993, p.422) in their analysis of gender differences in health perceptions among hypertensive patients, found that "twice as many women as men evaluated their health as 'poor', and on average reported 2.6 more symptoms than men". They also found that the level of distress, happiness, a sense of coherence, education, paid work and satisfaction with family functioning reduced gender differences in health perceptions. This suggests that men and women differ in the way that they define their own health, i.e., for women health is more than just physical and emotional well-being. Anson et al argued that the social construction of gender creates gender role and trait related risks which can increase morbidity through undesirable health perceptions. This indicates that any framework developed should be able to draw distinctions between the factors which influence use for men and for women.

Birch et al (1993a, p.73) have stated that "the utilization of health services is the outcome of a complex interaction of several factors, each of which may differ among populations". This raises an important point: if the factors which affect use are complex then the models and methods used to determine these factors should also be complex. That is, through the combination of various frameworks (Aday and Andersen (1974) and Becker (1974)), research methods (quantitative and qualitative) and different scales of analysis (spatial and temporal comparisons) future studies may be better suited for adequately identifying and explaining the importance of factors which determine the use of physician services.

NOTES

1. The speciality groups of physicians in Manitoba were classified into seven groups; General ractitioners, Pediatricians, Obstetrics and gynecology, Medical specialists (internists, nuerologists), Psychiatrists, General surgeons and Surgical specialists.

2. A private household is "a person or group of persons (other than foreign residents) who occupy a private dwelling and do not have a usual place of residence elsewhere in Canada" (Québec, 1987).

   A private dwelling is "a structurally separate set of living quarters with a private entrance from outside or from a common hall, lobby, vestibule or stairway inside the building. The entrance to the dwelling must be one that can be used without passing through the living quarters of someone else" (Québec, 1987).

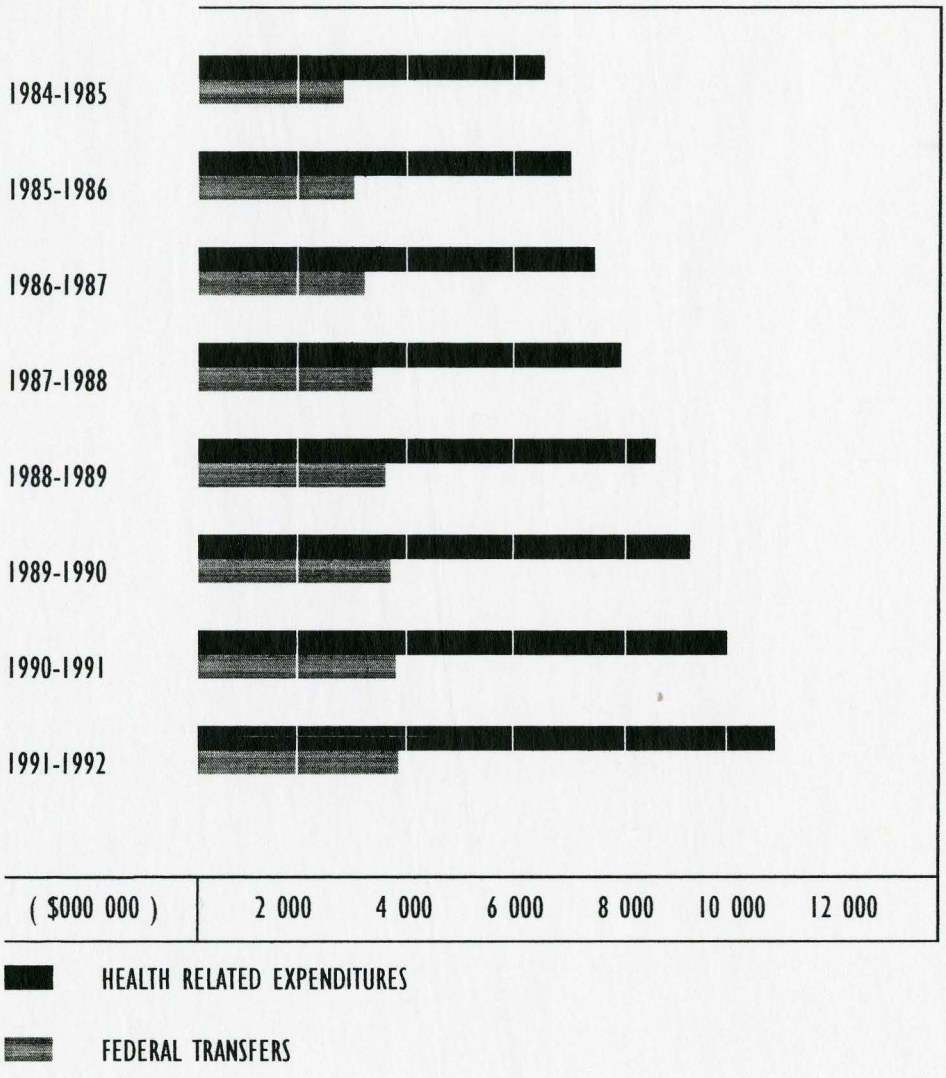
3. Others (see Carr-Hill et al (1994), Cromwell and Mitchell (1983), Long et al (1986)) have suggested that supply cannot be directly entered into the equation because of its relationship with utilization. Since the allocation of health care services is "based largely on past patterns of service provision and utilization" there is a very good chance that supply and use may be correlated. As a result, the output generated could be biased. One way of overcoming this would be to use a two-stage model which would first regress supply on a set of variables and then use the predicted values of supply as explanatory variables in place of their actual values in the regression of utilization on the independent variables (Carr-Hill et al, 1994). However, in this analysis, utilization is an individual level variable while supply is a regional level variable. It is highly unlikely that one person's use/non-use of health care services would affect the regional level allocation of supply. As a result, two stage estimation procedures were not used and supply was entered directly into the models.

4. The 'not sick' need level is defined as those individuals who did not fall into the other three groups reporting various kinds of morbidity. The 'acutely sick' groups are those who reported having to cut down on any of the activities they usually do every day (at work/ school), around the house and during free time because of illness or injury. The 'chronic sick without restrictions' need group are those individuals who have a long-standing illness or disability that does not limit their activities in any way. The 'chronic sick with restrictions' need group included those individuals whose long-standing illness or disability limit their activities (see Collins and Klein, 1980, p.1112).

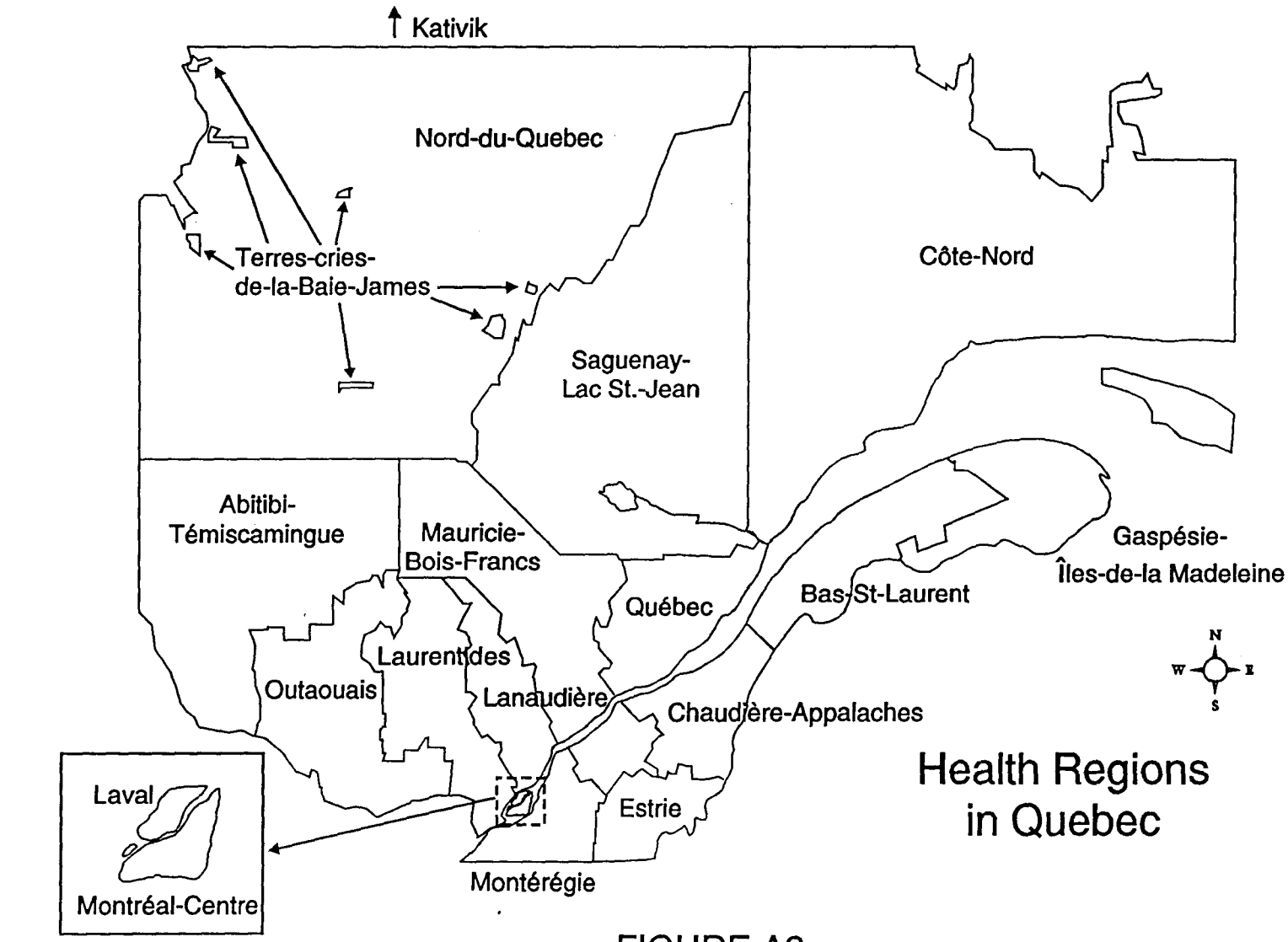
APPENDIX A

FIGURES

Figure A1 Quebec Health Expenditures and Federal Transfers, 1984-1985 to 1991-1992



(Quebec 1993b)



SOURCE: Ministry of Health and Social Services, Quebec

FIGURE A2

(map not to scale)

APPENDIX B

DISCUSSION OF DATA SET

ISSUES OF RELIABILITY AND VALIDITY

The Santé Québec is both a reliable and valid data source. Before the 1987 survey was carried out, a pilot study was conducted in 1983 in the DSCs of Verdun and Rimouski (Pampalon, 1991). This pretest tested the content and wording of the questionnaires and evaluated the usefulness of the design of the study. The findings of the pretest were positive which increased the overall reliability of both the 1987 and 1992-93 surveys.

Another advantage of the Santé Québec is that random sampling was used to select both the primary sampling units and the private dwellings. Random sampling is beneficial because it ensures that each subject has an equal chance of being chosen for the analysis. By minimizing selection bias, external validity is also increased. The response rate for the 1987 and 1992-93 surveys was 87% and 87.2% for the interviews and 81% and 85% for the self-administered questionnaires respectively. Such high response rates results increased generalizability of the findings to the rest of the province of Québec.

As previously mentioned, data were collected through interviews and self-administered questionnaires. There are drawbacks associated with each of these methods. When using interviews there is an increased likelihood of social desirability and interviewer distortion occurring which can reduce the reliability of the results (Woodward and Chambers, p.11, 1993). However, the interviewers employed to administer the Santé Québec were trained. The possibility that interviewer distortion or random error will occur decreases when interviewers are instructed on how to deliver questions properly, to remain neutral to the respondents' replies and to record answers correctly (Woodward et al, p.7, 1991). While

questionnaires are beneficial because they can minimize social desirability bias, one of their main disadvantages is that respondents may fail to answer some questions. While many argue that missing observations should be replaced by the average response for that question, in this analysis when respondents did not answer the questions those observations were skipped.

APPENDIX C

DISCUSSION OF THE PROBIT MODEL

Violation of the assumptions of ordinary least squares

The only restriction placed on the independent variables in an OLS equation ($Y_i = \alpha + bx_i + e_i$) is that they not be exact linear combinations of each other. Since the x_i's, b_i's and the e_i's are free to take on any values, then Y_i should be free to range from $-\infty$ to ∞. However, as previously stated, the dependent variable in this analysis is dichotomous (i.e., visited physician in the past two weeks, did not visit family physician in the past two weeks). If Y_i can only take on two values (0,1) then E_i can only take on two values for any given value of x_i.

For example, given $Y_i = \sum b_k X_{ik} + E_i$;

if $Y_i = 0$ $0 = \sum b_k X_{ik} + E_i$ then $E_i = -\sum b_k X_{ik}$ and
if $Y_i = 1$ $1 = \sum b_k X_{ik} + E$ then $E_i = 1 - \sum b_k X_{ik}$.

Since the assumptions of OLS are violated its use to estimate the model is not desirable. There are other models which can be employed in order to deal with the dichotomous nature of the dependent variable; the linear probability model (LPM), the probit model and the logit model, to name a few. A LPM is used when one assumes that the relationship between the expected value of Y and X is linear. There is, however, little support to expect that the relationship between the incidence of physician utilization in the past two weeks and the exogenous variables is linear. In fact,

> "[a] priori there is every reason to suspect that the expectation of a qualitative variable as a function of X must be nonlinear in X. Since that expectation must fall between 0 and 1, it makes little sense to choose a functional form which satisfies this constrain only by the imposition of artificial constraints on the range of values the

regression coefficients may assume"

(Aldrich and Nelson, 1984, p.26).

The purpose of this research is to estimate a probability model that relates the probability of visiting a family physician in the past two weeks to a range of exogenous variables. That is, $P_i = \text{Prob}(Y_i = 1) = F(X_i)$. According to Hanushek and Jackson (1977), there are three reasons why one should expect the cumulative density function ($F(X_i)$) to be nonlinear. First, $F(X_i)$ must fall between 0 and 1 which implies that the relationship is nonlinear at the boundaries. Second, nonlinear functions of an S-shape are more realistic. Third, a linear model is additive which is not applicable in this case. That is, "one would expect some interaction among the variables such that the marginal change in probability associated with a given variable almost surely depends upon values of the other exogenous factors" (Hanushek and Jackson, 1977, p.183). Using a LPM model when the relationship is nonlinear will result in least squares estimates which;

> "(1) have no known distributional properties, (2) are sensitive to the range of the data, (3) may grossly understate the magnitude of the true effects, (4) systematically yield probability predictions outside the range of 0 to 1, and (5) get worse as standard statistical practices for improving the estimates are employed"
>
> (Aldrich and Nelson, 1984, p.30).

One alternative to the LPM is the probit model. The probit model assumes that the probability function is normal (that is, a normal random variable has a mean of zero and variance of one (refers to the distribution of the errors)) (Maddala, 1992, p.328). In using the probit (or logit) model one must assume there is an unobservable (latent) variable Y^*. In the case of this research, Y^* would be defined as the propensity of visiting a family physician

within the past two weeks. What we actually observe is a dummy variable given as

$$Y_i = 1 \text{ if } Y^* > 0,$$
$$\text{and } Y_i = 0 \text{ otherwise.}$$

Individual I has two choices; 1) visit a family physician and 2) do not visit a family physician. Aldrich and Nelson explain the theory underlying the choice of one alternative over the other as follows; Individual I will choose alternative one, if their preference for that alternative (W_{i1}) is greater than their preference for alternative two (W_{i2}). According to Aldrich and Nelson, preference is a linear function of the independent variables, i.e,

$$W_{i1} = \sum a_{k1}X_{ik} + e_{i1} \quad \text{and}$$
$$W_{i2} = \sum a_{k2}X_{ik} + e_{i2}$$

If Y_i^* is the difference between W_{i1} and W_{i2} then we can state that,

$Y_i^* = W_{i1} - W_{i2} = \sum(a_{k1} - a_{k2})X_{ik} + (e_{i1} - e_{i2})$. If we now let $b_k = (a_{k1} - a_{k2})$ and $u_i = e_{i1} - e_{i2}$, then $Y_i^* = \sum a_k X_{ik} - u_i$. Now, we can say that individual I will choose alternative one over two if $Y_i^* > 0$ or conversely if $\sum b_k X_{ik} - u_i > 0$. The probability that individual I will visit the doctor can be denoted by the following; $P(Y_i = 1) = P(Y_i^* > 0) = P(u_i < \sum b_k X_{ik})$. In order to estimate the probability that $Y_i = 1$, we need to know the total probability that $u_i < \sum b_k X_{ik}$. This is determined by the probability distribution ;

$$P(u_i < \sum b_k X_{ik}) = F(\sum b_k X_{ik}) = \int_{-\infty}^{\sum b_k X_{ik}} f(u)du$$

where f(u) is the probability density function of u_i. For this analysis we are assuming that u_i follows the normal distribution (probit) and therefore:

$$P(u_i<\sum b_k X_{ik}) = F(\sum b_k X_{ik}) = \int_{-\infty}^{\sum b_k X_{ik}} 1/\sqrt{2\pi}\ (\exp(-u^2/2))\ du.$$

Estimation of the Parameters

The parameters of the probit model are estimated by the maximum likelihood method (MLM). This procedure "derives an expression for the likelihood of observing the pattern of success, $Y_i = 1$, and nonsuccess, $Y_i = 0$, in a given data set" (Hanushek and Jackson, 1977,p.201). The likelihood of obtaining the given sample is determined by taking the product of the individual observations having the observed outcomes $Y_i = 1$ and $Y_i = 0$, that is, $P_i^{Yi}(1 - P_i)^{Yi}$. The value of the likelihood function given by,

$$L(Y|X,b) = \prod_{I=1}^{N} P_i^{Yi}(1 - P_i)^{Yi}$$

is dependent upon the unknown parameters of the probability distribution (Hanushek and Jackson, 1977). That is, the maximum likelihood estimation procedure "is concerned with picking parameter estimates that imply the highest probability or likelihood of having obtained the observed sample Y" (Aldrich and Nelson, 1984, p.51). The maximum likelihood finds b so as to maximize the probit likelihood,

$$L(Y|X,b) = \prod_{I=1}^{N} \left[\int_{-\infty}^{\sum b_k X_{ik}} 1/\sqrt{2\pi}\ (\exp(-u^2/2))\ du\ (\sum b_k X_{ik})\right]^{Y_i} \left[1 - \left[\int_{\sum b_k X_{ik}}^{\infty} 1/\sqrt{2\pi}\ (\exp(-u^2/2))\ du\ (\sum b_k X_{ik})\right]\right]^{1-Y_i}.$$

In order to maximize the probit likelihood, first we take the natural log of the function. Then the partial derivatives of the likelihood with respect to each of the estimated parameters are

taken and set equal to zero (Hamilton, 1992). The resultant equations are nonlinear and cannot be solved directly. As a result, an iterative procedure is used by which the computer finds successively better approximations for B_k In the first iteration, no parameters have been estimated with the exception of the intercept. With each successive iteration, the "parameter estimates improve, causing the log likelihood to increase. The process stops when the relative change in each coefficient drops below 0.001" (Hamilton, 1992, p.224).

APPENDIX D

TABLES OF PRELIMINARY DATA ANALYSIS

TABLE D1a: Bivariate and Multivariate Representation for Each Variable

VARIABLE	REFERENCE	CODE
Use		
Visited Physician in Past Two Weeks	Yes	1
	No	0
Need		
General Health Status	Excellent	1
	Very Good	2
	Good	3
	Fair	4
	Poor	5
Predisposing		
Sex	Male	1
	Female	0
Age	15-19	1
	20-24	2
	25-44	3
	45-64	4
	65-74	5
	75 years and older	6
Marital Status	Married	1
	Single	2
	Divorced/Separated/Widowed	3
Employment	Working	1
	Unemployed	0
Enabling		
Education	**Less than high school**	1
	High School	2
	Some Post-Secondary	3
	Post-Secondary	4
Income	1987 1992-93	
	$1-19,999 **$1-14,999** (1992-93)	1
	$20,000-29,999 $15,000-29,999	2
	$30,000-39,999 $30,000-39,999	3
	$40,000-49,999 $40,000-59,999	5
	$50,000+ $60,000+	5

Table D1b: Number of Observations and Mean Value for Each Variable

Variable	1987		1992-93	
	N	Mean	N	Mean
Utilization	19724	0.12	23564	0.11
General Health Status	19724	2.42	23564	2.51
Sex	19724	0.47	23564	0.48
Age	19724	3.22	23564	3.29
Marital Status	19724	1.73	23564	1.95
Employment	19724	0.53	23564	0.51
Household Income	19724	3.22	23564	3.17
Education	19724	2.50	23564	2.56
Supply	19724	1039.94	23564	999.81

Table D2a: Frequency Distribution for Physician Utilization (1987)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	4543874.2	89.1	4543874.2	89.1
Yes	548179.4	10.8	5092053.6	99.9
No Response	6615.5	0.1	5098699.2	100.0

Table D2b: Frequency Distribution for Physician Utilization (1992-93)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	5047118.2	89.0	5047118.2	89.0
Yes	622160.1	11.0	5669278.3	100.0
No Response	1795.3	0.0	5671073.5	100.0

Table D3a: Frequency Distribution for General Health Status (1987)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Excellent	947287.3	18.6	947287.3	18.6
Very Good	2066605.3	40.5	3013892.6	59.1
Good	1472239.0	28.9	4486131.6	88.0
Fair	4758871.0	9.3	4962018.6	97.3
Poor	100096.9	2.0	5062115.5	99.3
No Response	36553.7	0.7	5098669.2	100.0

Table D3b: Frequency Distribution for General Health Status (1992-93)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Excellent	1000926.1	17.6	1000926.1	17.6
Very Good	1935788.5	34.1	2936714.6	51.8
Good	2095133.1	36.9	5031847.7	88.7
Fair	511328.0	9.0	5543175.7	97.7
Poor	489144.2	1.6	5632319.9	99.3
No Response	38753.6	0.7	5671073.5	100.0

Table D4a: Frequency Distribution for Sex (1987)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Female	2623780.78	51.5	2623780.8	51.5
Male	2474888.4	48.5	5098669.2	100.0

Table D4b: Frequency Distribution for Sex (1992-93)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Female	2890186.8	51.0	2890186.8	51.0
Male	2780886.7	49.0	5671073.5	100.0

Table D5a: Frequency Distribution for Age (1987)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
15-19	484248.6	9.5	484248.6	9.5
20-24	528092.9	10.4	1012341.6	19.9
25-44	2190984.6	43.0	3203326.2	62.8
45-64	1293989.5	25.4	4497315.7	88.2
65-74	415571.6	8.2	4912887.3	96.4
75 +	185781.9	3.6	5098669.2	100.0

Table D5b: Frequency Distribution for Age (1992-93)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
15-19	472064.6	8.3	472064.6	8.3
20-24	469347.6	8.3	941412.2	16.6
25-44	2470708.1	43.6	3412120.3	60.2
45-64	1532383.1	27.0	4944503.3	87.2
65-74	485467.7	8.6	5429971.0	95.7
75+	241101.5	4.3	5671073.5	100.0

Table D6a: Frequency Distribution for Marital Status (1987)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Married	3308164.8	64.9	3308164.8	64.9
Single	661443.5	13.0	3969608.3	77.9
D/W/W	976000.2	19.1	4545608.6	97.0
No Response	153060.6	3.0	5098669.2	100.0

Table D6b: Frequency Distribution for Marital Status (1992-93)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Married	2767255.6	48.8	2767255.6	48.8
Single	880259.8	15.5	3647515.4	64.3
D/S/W	1934621.3	34.1	5582136.7	98.4
No Response	88936.8	1.6	5671073.5	100.0

Table D7a: Frequency Distribution for Employment (1987)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Unemployed	2274493.3	44.6	2274493.3	44.6
Working	2814598.8	55.2	5089092.1	99.8
No Response	9577.1	0.2	5098669.2	100.0

Table D7b: Frequency Distribution for Employment (1992-93)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Unemployed	2618286.1	46.2	2618286.1	46.2
Working	3052787.4	53.8	5671073.5	100.0

Table D8a: Frequency Distribution for Household Income (1987)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
$1-19,999	1325852.0	26.0	1325852.0	26.0
$20,000-29,999	908809.4	17.8	2234661.5	43.8
$30,000-39,999	864446.7	17.0	3099108.2	60.8
$40,000-49,999	643488.1	12.6	3742596.2	73.4
$50,000+	877460.9	17.2	4620057.2	90.6
No Response	478611.9	9.4	5098669.2	100.0

Table D8b: Frequency Distribution for Household Income (1992-93)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
$1-49,999	942699.3	16.6	942699.3	16.6
$15,000-29,999	1405868.11	24.8	2348567.4	41.4
$30,000-39,999	636372.5	11.2	2984939.9	52.6
$40,000-59,999	1373652.8	24.2	4358592.8	76.9
$60,000+	944900.6	16.7	63.3493.4	93.5
No Response	367580.2	6.5	5671073.5	100.0

Table D9a: Frequency Distribution for Education (1987)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
< High School	930931.9	18.3	930931.9	18.3
High School	2124004.5	41.7	3054936.4	59.9
Some Post-Secondary	732122.0	14.4	3787058.4	74.3
Post-Secondary	1208374.9	23.7	4995433.3	98.0
No Response	103235.9	2.0	5098669.2	100.0

Table D9b: Frequency Distribution for Education (1992-93)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
< High School	816449.0	14.4	816449.0	14.4
High School	2192705.4	38.7	3009154.4	53.1
Some Post-Secondary	964422.2	17.0	3973576.6	70.1
Post-Secondary	1632230.1	28.8	5605806.7	98.8
No Response	65266.8	1.2	5671073.5	100.0

Table D10a: Frequency Distribution for Region (1987)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Québec	454777.2	8.9	454777.2	8.9
Montréal-Centre	1461976.1	28.7	1916753.2	37.6
Gaspesie-Îles-de-la-Madeleine	87282.2	1.7	2004035.4	39.3
Estrie	204952.1	4.0	2208987.5	43.3
Bas St. Laurent	164418.0	3.2	2373405.5	46.5
Côte-Nord	74662.1	1.5	2448027.6	48.0
Abitibi-Témiscamingue	106518.2	5.1	2554545.8	53.1
Chaudière-Appalache	261980.0	3.6	2816525.8	56.7
Montérégie	821981.3	2.2	3638507.1	58.9
Saguenay	225111.0	4.4	3863618.1	63.3
Outaouais	182658.1	16.1	4046276.2	79.4
Laval	232022.0	4.5	4278298.2	83.9
Mauricie-Bois-Francs	356236.0	7.0	4634534.2	90.9
Lanaudière	97616.0	5.2	4832150.2	96.1
Laurentides	66519.0	3.9	5098669.2	100.0

Table D10b: Frequency Distribution for Region (1992-93)

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Québec	511683.1	9.0	511683.1	9.0
Montréal-Centre	1509672.8	26.6	2021355.9	35.6
Gaspesie-Îles-de-la-Madeleine	86166.2	1.5	2107522.1	37.2
Estrie	215330.5	3.8	2322852.6	41.0
Côte-Nord	81905.7	1.4	2404758.3	42.4
Bas St. Laurent	163464.2	2.9	2568222.4	45.3
Chaudière-Appalache	293168.3	5.2	2861390.8	50.5
Outaouais	236193.1	4.2	3097583.9	54.6
Abitibi-Témiscamingue	19780.1	2.1	3217363.9	56.7
Saguenay	225949.1	4.0	3443313.07	60.7
Montérégie	89903.2	17.5	4433216.3	78.2
Laval	264265.3	4.7	4697481.6	82.8
Mauricie-Bois-Francs	376754.5	6.6	5074236.1	89.5
Laurentides	317061.9	5.6	5391298.1	95.1
Lanaudière	279775.5	4.9	5671073.5	100.0

Table D11a: Need By Household Income (1987)

Frequency Percent Row Pct Col Pct	HOUSEHOLD INCOME						
	$1- 19,999	20,000- 29,999	30,000- 39,999	40,000- 49,999	50,000+	No Response	Total
HEALTH STATUS							
Excellent	201724 3.96 21.29 15.21	152265 2.99 16.07 16.75	177865 3.49 18.78 20.58	116993 2.29 12.35 18.18	192926 3.78 20.37 21.99	105515 2.07 11.14 22.05	947287 18.58
Very Good	437346 8.58 21.16 32.99	380793 7.47 18.43 41.90	367664 7.21 17.79 42.53	296057 5.81 14.33 46.01	422654 8.29 20.45 48.17	162091 3.18 7.84 33.87	2066605 40.53
Good	429935 8.43 29.20 32.43	269866 5.29 18.33 29.69	250309 4.91 17.00 28.96	184155 3.61 12.51 28.62	204450 4.01 13.89 23.30	133524 2.62 9.07 27.90	1472239 28.87
Fair	194728 3.82 40.92 14.69	83818 1.64 17.61 9.22	52599 1.03 11.05 6.08	38707 0.76 8.13 6.02	46766 0.92 9.83 5.33	59268 1.16 12.45 12.38	475887 9.33
Poor	48655 0.95 48.61 3.67	17381 0.34 17.36 1.91	10834 0.21 10.82 1.25	4435 0.09 4.43 0.69	5968.8 0.12 5.96 0.68	12823 0.25 12.81 2.68	100097 1.96 .
No Response	13464 0.26 36.83 1.02	4686 0.09 12.82 0.52	5175.9 0.10 14.16 0.60	3140.7 0.06 8.59 0.49	4696 0.09 12.85 0.54	5391 0.11 14.75 1.13	36554 0.72
Total	1325852 26.00	908809 17.82	864447 16.95	643488 12.62	877461 17.21	478612 9.39	5098669 100.00

STATISTICS FOR TABLE OF GENHLH BY HINC

Statistic	DF	Value	Prob
Chi-Square	25	196429.10	0.000

Sample Size = 5098669.1759

Table D11b: Need By Household Income (1992-93)

Frequency Percent Row Pct Col Pct	HOUSE INCOME						
	$1- 14,999	15,000- 29,999	30,000- 39,999	40,000- 59,999	60,000+	No Response	Total
HEALTH STATUS							
Excellent	130661 2.30 13.05 13.86	222247 3.92 22.20 15.81	119612 2.11 11.95 18.80	253299 4.47 25.31 18.44	205483 3.62 20.53 21.75	69624 1.23 6.96 18.94	1000926 17.65
Very Good	231243 4.08 11.95 24.53	430267 7.59 22.23 30.61	231710 4.09 11.97 36.41	521984 9.20 26.96 38.00	412722 7.28 21.32 43.68	107863 1.90 5.57 29.34	1935788 34.13
Good	374238 6.60 17.86 39.70	579357 10.22 27.65 41.21	231352 4.08 11.04 36.35	490789 8.65 23.43 35.73	276576 4.88 13.20 29.27	142821 2.52 6.82 38.85	2095133 36.94
Fair	163505 2.87 31.78 17.24	136867 2.41 26.77 9.74	42889 0.76 8.39 6.74	87180 1.54 17.05 6.35	41661 0.73 8.15 4.41	40226 0.71 7.87 10.94	511328 9.02
Poor	36960 0.65 41.46 3.92	24052 0.42 26.98 1.71	6709.2 0.12 7.53 1.05	11779 0.21 13.21 0.86	4954.3 0.09 5.56 0.52	4690.4 0.08 5.26 1.28	89144 1.57 .
No Response	7092.8 0.13 18.30 0.75	13078 0.23 33.75 0.93	4100.1 0.07 10.58 0.64	8622.2 0.15 22.25 0.63	3504.4 0.06 9.04 0.37	2355.6 0.04 6.08 0.64	38754 0.68
Total	942699 16.62	1405868 24.79	636373 11.22	1373653 24.22	944901 16.66	367580 6.48	5671074 100.00

STATISTICS FOR TABLE OF GENHLH BY HINC

Statistic	DF	Value	Prob
Chi-Square	25	268950.76	0.000

Sample Size = 5671073.5316

Table D12a: Need By Pysician Use (1987)

Frequency Percent Row Pct Col Pct	USE			
	No	Yes	No Response	Total
HEALTH STATUS				
Excellent	893246 17.52 94.30 19.66	52799 1.04 5.57 9.63	1242.2 0.02 0.13 18.78	947287 18.58
Very Good	1888487 37.04 91.38 41.56	174867 3.43 8.46 31.90	3251.3 0.06 0.16 49.15	2066605 40.53
Good	1291966 25.34 87.76 28.43	178151 3.49 12.10 32.50	2122.1 0.04 0.14 32.08	1472239 28.87
Fair	367534 7.21 77.23 8.09	108353 2.13 22.77 19.77	0 0.00 0.00 0.00	475887 9.33
Poor	74059 1.45 73.99 1.63	26038 0.51 26.01 4.75	0 0.00 0.00 0.00	100097 1.96
No Response	28582 0.56 78.19 0.63	7971.5 0.16 21.81 1.45	0 0.00 0.00 0.00	36554 0.72
Total	4543874 89.12	548179 10.75	6615.55 0.13	5098669 100.00

STATISTICS FOR TABLE OF GENHLTH BY GP

Statistic	DF	Value	Prob
Chi-Square	10	141833.44	0.000

Sample Size = 5098669.1759

Table D12b: Need By Physician Use (1992-93)

Frequency Percent Row Pct Col Pct	USE			
	No	Yes	No Response	Total
HEALTH STATUS				
Excellent	922466 16.27 92.16 18.28	78437 1.38 7.84 12.61	22.512 0.00 0.00 1.25	1000926 17.65
Very Good	1772556 31.26 91.57 35.12	162375 2.86 8.39 26.10	857.1 0.02 0.04 47.74	1935788 34.13
Good	1860841 32.81 88.82 36.87	234292 4.13 11.18 37.66	0 0.00 0.00 0.00	2095133 36.94
Fair	399801 7.05 78.19 7.92	110612 1.95 21.63 17.78	915.65 0.02 0.18 51.00	511328 9.02
Poor	58692 1.03 65.84 1.16	30452 0.54 34.16 4.89	0 0.00 0.00 0.00	89144 1.57
No Response	32762 0.58 34.54 0.65	5991.4 0.11 15.46 0.96	0 0.00 0.00 0.00	38754 0.68
Total	5047118 89.00	622160 10.97	1795.27 0.03	5671074 100.00

STATISTICS FOR TABLE OF GENHLTH BY GP

Statistic	DF	Value	Prob
Chi-Square	10	137532.59	0.000

Sample Size = 5671073.5316

Table D13a: Need By Education (1987)

Frequency Percent Row Pct Col Pct	EDUCATION					
	Less than High School	High School	Some Post-Secondary	Post-Secondary	No Response	Total
HEALTH STATUS						
Excellent	117742 2.31 12.43 12.65	404183 7.93 42.67 19.03	127052 2.49 13.41 17.35	281229 5.52 29.69 23.27	17080 0.33 1.80 16.54	947287 18.58
Very Good	231060 4.53 11.18 24.82	894270 17.54 43.27 42.10	359338 7.05 17.39 49.08	553559 10.86 26.79 45.81	28377 0.56 1.37 27.49	2066605 40.53
Good	317675 6.23 21.58 34.12	629581 12.24 42.76 29.64	195120 3.83 13.25 26.75	300244 5.89 20.39 24.85	29619 0.58 2.01 28.69	1472239 28.87
Fair	201674 3.96 42.38 21.66	160282 3.14 33.68 7.55	39104 0.77 8.22 5.34	56693 1.11 11.91 4.69	18133 0.36 3.81 17.57	475887 9.33
Poor	52645 1.03 52.59 5.66	24133 0.47 24.11 1.14	8984 0.18 8.98 1.23	11274 0.22 11.26 0.93	3061 0.06 3.06 2.97	100097 .1.96
No Response	10135 0.20 27.73 1.09	11555 0.23 31.61 0.54	2523.2 0.05 6.90 0.34	5375.6 0.11 14.71 0.44	6964.7 0.14 19.05 6.75	36554 0.72
Total	930932 18.26	2124004 41.66	732122 14.36	1208375 23.70	103236 2.02	5098669 100.00

STATISTICS FOR TABLE OF GENHLTH BY EDUC

Statistic	DF	Value	Prob
Chi-Square	10	479812.52	0.000

Sample Size = 5098669.1759

Table D13b: Need By Education (1992-93)

Frequency Percent Row Pct Col Pct	EDUCATION					
	Less than High School	High School	Some Post-Secondary	Post-Secondary	No Response	Total
HEALTH STATUS						
Excellent	86282	368263	185482	347689	13210	1000926
	1.52	6.49	3.27	6.13	0.23	17.65
	8.62	36.79	18.53	34.74	1.32	
	10.57	16.79	19.23	21.30	20.24	
Very Good	160865	710890	395378	653016	15641	1935788
	2.84	12.54	6.97	11.51	0.28	34.13
	8.31	36.72	20.42	33.73	0.81	
	19.70	32.42	41.00	40.01	23.96	
Good	353847	879106	316957	521533	23689	2095133
	6.24	15.50	5.59	9.20	0.42	36.94
	16.89	41.96	15.13	24.89	1.13	
	43.34	40.09	32.86	31.95	36.30	
Fair	169432	188327	56120	87855	9594	511328
	2.99	3.32	0.99	1.55	0.17	9.02
	33.14	36.83	10.98	17.18	1.88	
	20.75	8.59	5.82	5.38	14.70	
Poor	34692	32140	7021.2	14531	760.18	89144
	0.61	0.57	0.12	0.26	0.01	1.57
	38.92	36.05	7.88	16.30	0.85	
	4.25	1.47	0.73	0.89	1.16	
No Response	11331	13979	3464.4	7606.1	2372.5	38754
	0.20	0.25	0.06	0.13	0.04	0.68
	29.24	36.07	8.94	19.63	6.12	
	1.39	0.64	0.36	0.47	3.64	
Total	816449	2192705	964422	1632230	65266.8	5671074
	14.40	38.66	17.01	28.78	1.15	100.00

STATISTICS FOR TABLE OF GENHLTH BY EDUC

Statistic	DF	Value	Prob
Chi-Square	20	377733.92	0.000

Sample Size = 5671073.5316

Table D14a: Need By Age (1987)

Frequency Percent Row Pct Col Pct	AGE						
	15-19	20-24	25-44	46-64	65-74	75+	Total
HEALTH STATUS							
Excellent	131069	113159	453338	187421	41777	20523	947287
	2.57	2.22	8.89	3.68	0.82	0.40	18.58
	13.84	11.95	47.86	19.79	4.41	2.17	
	27.07	21.43	20.69	14.48	10.05	11.05	
Very Good	227356	239177	1009049	442665	106903	41455	2066605
	4.46	4.69	19.79	8.68	2.10	0.81	40.53
	11.00	11.57	48.83	21.42	5.17	2.01	
	46.95	45.29	46.05	34.21	25.72	22.31	
Good	103308	150083	574896	425273	154224	64455	1472239
	2.03	2.94	11.28	8.34	3.02	1.26	28.87
	7.02	10.19	39.05	28.89	10.48	4.38	
	21.33	28.42	26.24	32.87	37.11	34.69	
Fair	17845	21485	120789	183873	89283	42512	475887
	0.35	0.42	2.37	3.61	1.75	0.83	9.33
	3.75	4.54	25.38	38.64	18.76	8.93	
	3.69	4.09	5.51	14.21	21.48	22.88	
Poor	2323.8	2418.6	21478	44307	17730	11840	100097
	0.05	0.05	0.42	0.87	0.35	0.23	1.96
	2.32	2.42	21.46	44.26	17.71	11.83	
	0.48	0.46	0.98	3.42	4.27	6.37	
No Response	2346.7	1669.8	11435	10450	5655.2	4996.8	36554
	0.05	0.03	0.22	0.20	0.11	0.10	0.72
	6.42	4.57	31.28	28.59	15.47	13.67	
	0.48	0.32	0.52	0.81	1.36	2.69	
Total	484249	528093	2190985	1293990	415572	185782	5098669
	9.50	10.36	42.97	25.38	8.15	3.64	100.00

STATISTICS FOR TABLE OF GENHLTH BY AGE

Statistic	DF	Value	Prob
Chi-Square	25	451673.81	0.000

Sample Size = 5098669.1759

Table D14b: Need By Age (1992-93)

Frequency Percent Row Pct Col Pct	AGE						
	15-19	20-24	25-44	46-64	65-74	75+	Total
HEALTH STATUS							
Excellent	110143	104419	479122	239088	46716	21439	1000926
	1.94	1.84	8.45	4.22	0.82	0.38	17.65
	11.00	10.43	47.87	23.89	4.67	2.14	
	23.33	22.25	19.39	15.60	9.62	8.89	
Very Good	179867	178591	928432	482997	117464	48437	1935788
	3.17	3.15	16.37	8.52	2.07	0.85	34.13
	9.29	9.23	47.96	24.95	6.07	2.50	
	38.10	38.05	37.58	31.52	24.20	20.09	
Good	151145	157601	882595	586154	207689	109951	2095133
	2.67	2.78	15.56	10.34	3.66	1.94	36.94
	7.21	7.52	42.13	27.98	9.91	5.25	
	32.02	33.58	35.72	38.25	42.78	45.60	
Fair	26551	24461	148660	179605	88393	43658	511328
	0.47	0.43	2.62	3.17	1.56	0.77	9.02
	5.19	4.78	29.07	35.13	17.29	8.54	
	5.62	5.21	6.02	11.72	18.21	18.11	
Poor	836.78	2699	19037	33539	19190	13841	89144
	0.01	0.05	0.34	0.59	0.34	0.24	1.57
	0.94	3.03	21.36	37.62	21.53	15.53	
	0.18	0.58	0.77	2.19	3.95	5.74	
No Response	3522.2	1576.5	12862	11000	6016.5	3776.2	38754
	0.06	0.03	0.23	0.19	0.11	0.07	0.68
	9.09	4.07	33.19	28.38	15.53	9.74	
	0.75	0.34	0.52	0.72	1.24	1.57	
Total	472065	469348	2470708	1532383	485468	241103	5671074
	8.32	8.28	43.57	27.02	8.56	4.25	100.00

STATISTICS FOR TABLE OF GENHLTH BY AGE

Statistic	DF	Value	Prob
Chi-Square	25	301678.96	0.000

Sample Size = 5671073.5316

Table D15a: Need By Gender (1987)

Frequency Percent Row Pct Col Pct	AGE		
	Female	Male	Total
HEALTH STATUS			
Execellent	422313 8.28 44.58 16.10	525974 10.30 55.42 21.21	947287 18.58
Very Good	1060870 20.81 51.33 40.43	1005735 19.73 48.67 40.64	2066605 40.53
Good	802404 15.74 54.50 30.58	669835 13.14 45.50 27.07	1472239 28.87
Fair	267341 5.24 56.18 10.19	208546 4.09 43.82 8.43	475887 9.33
Poor	52580 1.03 52.53 2.00	47517 0.93 47.47 1.92	100097 1.96
No Response	18272 0.36 49.99 0.70	18281 0.36 50.01 0.74	36554 0.72
Total	2623781 51.46	2474888 48.54	5098669 100.00

STATISTICS FOR TABLE OF GENHLTH BY SEX

Statistic	DF	Value	Prob
Chi-Square	5	27729.957	0.000

Sample Size = 5098669.1759

Table D15b: Need By Gender (1992-93)

Frequency Percent Row Pct Col Pct	GENDER		
	Female	Male	Total
HEALTH STATUS			
Excellent	444130 7.83 44.37 15.37	556796 9.82 55.63 20.02	1000926 17.65
Very Good	986738 17.40 50.97 34.14	949051 16.73 49.03 34.13	1935788 34.13
Good	1107621 19.53 52.87 38.32	987512 17.41 47.13 35.51	2095133 36.94
Fair	278866 4.92 54.54 9.65	232462 4.10 45.46 8.36	511328 9.02
Poor	50229 0.89 56.35 1.74	38915 0.69 43.65 1.40	89144 1.57
No Response	22603 0.40 58.32 0.78	16151 0.28 41.68 0.58	38754 0.68
Total	2890187 50.96	2780887 49.04	5671074 100.00

STATISTICS FOR TABLE OF GENHLTH BY SEX

Statistic	DF	Value	Prob
Chi-Square	5	24924.838	0.000

Sample Size = 5671073.5316

Table D16a: Need By Marital Status (1987)

Frequency Percent Row Pct Col Pct	MARITAL STATUS				
	Married	Single	D/S/W	No Response	Total
Excellent	570655	109485	237335	29813	947287
	11.19	2.15	4.65	0.58	18.58
	60.24	11.56	25.05	3.15	
	17.25	16.55	24.32	19.48	
Very Good	13737892	214930	424578	53308	2066605
	6.94	4.22	8.33	1.05	40.53
	66.48	10.40	20.54	2.58	
	41.53	32.49	43.50	34.83	
Good	978636	211648	240160	41795	1472239
	19.19	4.15	4.71	0.82	28.87
	66.47	14.38	16.31	2.84	
	29.58	32.00	24.61	27.31	
Fair	305425	91993	58864	19605	475887
	5.99	1.80	1.15	0.38	9.33
	64.18	19.33	12.37	4.12	
	9.23	13.91	6.03	12.81	
Poor	61811	26134	8998.5	3153.7	100097
	1.21	0.51	0.18	0.06	1.96
	61.75	26.11	8.99	3.15	
	1.87	3.95	0.92	2.06	
No Respone	17849	7253.1	6064.5	5386.9	36554
	0.35	0.14	0.12	0.11	0.72
	48.83	19.84	16.59	14.74	
	0.54	1.10	0.62	3.52	
Total	3308165	661444	976000	153061	5098669
	64.88	12.97	19.14	3.00	100.00

STATISTICS FOR TABLE OF GENHLTH BY MS

Statistic	DF	Value	Prob
Chi-Square	15	112556.99	0.000

Sample Size = 5098669.1759

Table D16b: Need By Marital Status (1992-93)

Frequency Percent Row Pct Col Pct	MARITAL STATUS				
	Married	Single	D/S/W	No Response	Total
HEALTH STATUS					
Excellent	440344 7.76 43.99 15.91	147482 2.60 14.74 16.77	397979 7.02 39.76 20.57	15022 0.26 1.50 16.89	1000926 17.65
Very Good	957739 16.89 49.48 34.61	268071 4.73 13.85 30.45	685438 12.09 35.41 34.43	24540 0.43 1.27 27.59	1935788 34.13
Good	1063750 18.76 50.77 38.44	317435 5.60 15.15 36.06	679918 11.99 32.45 35.14	34030 0.60 1.62 38.26	2095133 36.94
Fair	245969 4.34 48.10 8.89	111736 1.97 21.85 12.69	143149 2.52 28.00 7.40	10474 0.18 2.05 11.78	511328 9.02
Poor	40140 0.71 45.03 1.45	30364 0.54 34.06 3.45	17462 0.31 19.59 0.90	1178.7 0.02 1.32 1.33	89144 1.57
No Response	19313 0.34 49.84 0.70	5072.6 0.09 13.09 0.58	10675 0.19 27.55 0.55	3692.8 0.07 9.53 4.15	38754 0.68
Total	2767256 48.80	880260 15.52	1934621 34.11	88936.8 1.57	5671074 100.00

STATISTICS FOR TABLE OF GENHLTH BY MS

Statistic	DF	Value	Prob
Chi-Square	15	85315.905	0.000

Sample Size = 5671073.5316

Table D17a: Need By Employment (1987)

Frequency Percent Row Pct Col Pct	EMPLOYMENT			
	Unemployed	Working	No Response	Total
HEALTH STATUS				
Excellent	367253 7.20 38.77 16.15	576330 11.30 60.84 20.48	3704.3 0.07 0.39 38.68	947287 18.58
Very Good	790047 15.50 38.23 34.74	1272251 24.95 61.56 45.20	4306.8 0.08 0.21 44.97	2066605 40.53
Good	68838 13.50 46.76 30.27	783104 15.36 53.19 27.82	750.75 0.01 0.05 7.84	1472239 28.87
Fair	320540 6.29 67.36 14.09	154532 3.03 32.47 5.49	815.23 0.02 0.17 8.51	475887 9.33
Poor	83708 1.64 83.63 3.68	16389 0.32 16.37 0.58	0 0.00 0.00 0.00	100097 1.96
No Respose	24561 0.48 67.19 1.08	11993 0.24 32.81 0.43	0 0.00 0.00 0.00	36554 0.72
Total	2274493 44.61	2814599 55.20	9577.08 0.19	5098669 100.00

STATISTICS FOR TABLE OF GENHLTH BY EMP

Statistic	DF	Value	Prob
Chi-Square	10	221895.57	0.000

Sample Size = 5098669.1759

Table D17b: Need By Employment (1992-93)

Frequency Percent Row Pct Col Pct	EMPLOYMENT		
	Unemployed	Working	Total
HEALTH STATUS			
Excellent	390295 6.88 38.99 14.91	610631 10.77 61.01 20.00	1000926 17.65
Very Good	746956 13.17 38.59 28.53	1188833 20.96 61.41 38.94	1935788 34.13
Good	1028691 18.14 49.10 39.29	1066442 18.80 50.90 34.93	2095133 36.94
Fair	354308 6.25 69.29 13.53	157020 2.77 30.71 5.14	511328 9.02
Poor	74621 1.32 83.71 2.85	14523 0.26 16.29 0.48	89144 1.57
No Response	23415 0.41 60.42 0.89	15338 0.27 39.58 0.50	38754 0.68
Total	2618286 46.17	3052787 53.83	5671074 100.00

STATISTICS FOR TABLE OF GENHLTH BY EMP

Statistic	DF	Value	Prob
Chi-Square	5	236468.54	0.000

Sample Size = 5671073.5316

Table D18a: Physician Use By Household Income (1987)

Frequency Percent Row Pct Col Pct	HOUSEHOLD INCOME						
	$1- 19,999	20,200- 29,999	30,000- 39,999	40,000- 49,999	50,000+	No Response	Total
USE							
No	1142193 22.40 25.14 86.15	818689 16.06 18.02 90.08	773310 15.17 17.02 89.46	585073 11.48 12.88 90.92	796999 15.63 17.54 90.83	427611 8.39 9.41 89.34	4543874 89.12
Yes	183101 3.59 33.40 13.81	90004 1.77 16.42 9.90	90279 1.77 16.47 10.44	58415 1.15 10.66 9.08	75869 1.49 13.84 8.65	50510 0.99 9.21 10.55	548179 10.75
No Response	558.14 0.01 8.44 0.04	116.27 0.00 1.76 0.01	857.48 0.02 12.96 0.10	0 0.00 0.00 0.00	4592.9 0.09 69.43 0.52	490.74 0.01 7.42	6615.6 0.13
Total	1325852 26.00	908809 17.82	864447 16.95	643488 12.62	877461 17.21	478612 9.39	5098669 100.00

STATISTICS FOR TABLE OF GP BY HINC

Statistic	DF	Value	Prob
Chi-Square	10	32624.631	0.000

Sample Size = 5098669.1759

Table D18b: Physician Use By Household Income (1992-93)

Frequency Percent Row Pct Col Pct	HOUSEHOLD INCOME						
	$1- 14,999	15,000- 29,999	30,000- 39,999	40,000- 59,999	60,000+	No Response	Total
USE							
No	800939 14.12 15.87 84.96	1237954 21.83 24.53 88.06	565692 9.98 11.21 88.89	1249596 22.03 24.76 90.97	866681 15.28 17.17 91.92	326255 5.75 6.46 88.76	5047118 89.00
Yes	141620 2.50 22.76 15.02	167459 2.95 26.92 11.91	70680 1.25 11.36 11.11	124034 2.19 19.94 9.03	77898 1.37 12.52 8.24	40468 0.71 6.50 11.01	622160 10.97
No Response	140.04 0.00 7.80 0.01	454.25 0.01 25.30 0.03	0 0.00 0.00 0.00	22.512 0.00 1.25 0.00	321.36 0.01 17.90 0.03	857.1 0.02 47.74 0.23	1795.3 0.03
Total	942699 16.62	1405868 24.79	636373 11.22	1373653 24.22	944901 16.66	367580 6.48	5671074 100.00

STATISTICS FOR TABLE OF GP BY HINC

Statistic	DF	Value	Prob
Chi-Square	10	35025.135	0.000

Sample Size = 5671073.5316

Table D19a: Physician Use By Education (1987)

Frequency Percent Row Pct Col Pct	EDUCATION					
	Less than High School	High School	Some Post-Secondary	Post-Secondary	No Response	Total
USE						
No	782651	1896453	667623	1107727	89419	4543874
	15.35	37.20	13.09	21.73	1.75	89.12
	17.22	41.74	14.69	24.38	1.97	
	84.07	89.29	91.19	91.67	86.62	
Yes	147505	225227	62972	98659	13816	548179
	2.89	4.42	1.24	1.93	0.27	10.75
	26.91	41.09	11.49	18.99	2.52	
	15.84	10.60	8.60	8.16	13.38	
No Response	775.82	2323.7	1527.4	1988.6	0	6615.6
	0.02	0.05	0.03	0.04	0.00	0.13
	11.73	35.13	23.09	30.06	0.00	
	0.08	0.11	0.21	0.16	0.00	
Total	930932	2124004	732122	1208375	103236	5098669
	18.26	41.66	14.26	23.70	2.02	100.00

STATISTICS FOR TABLE OF GP BY EDUC

Statistic	DF	Value	Prob
Chi-Square	8	38636.773	0.000

Sample Size = 5098669.1759

Table D19b: Physician Use By Education (1992-93)

Frequency Percent Row Pct Col Pct	EDUCATION					
	Less than High School	High School	Some Post-Secondary	Post-Secondary	No Response	Total
USE						
No	697936 12.31 13.83 85.48	1957352 34.51 38.78 89.27	860252 15.17 17.04 89.20	1473838 25.99 29.20 90.30	57740 1.02 1.14 88.47	5047118 89.00
Yes	118491 2.09 19.05 14.51	234759 4.14 37.73 10.71	102992 1.82 16.55 10.68	158392 2.79 25.46 9.70	7526.8 0.13 1.21 11.53	622160 10.97
No Response	22.512 0.00 1.25 0.00	594.29 0.01 33.10 0.03	1178.5 0.02 65.64 0.12	0 0.00 0.00 0.00	0 0.00 0.00 0.00	1795.3 0.03
Total	816449 14.40	2192705 38.66	964422 17.01	1632230 28.78	65266.8 1.15	5671074 100.00

STATISTICS FOR TABLE OF GP BY EDUC

Statistic	DF	Value	Prob
Chi-Square	8	16688.352	0.000

Sample Size = 5617073.5316

Table D20a: Physician Use By Age (1987)

Frequency Percent Row Pct Col Pct	AGE						
	15-19	20-24	25-44	45-64	65-74	75+	Total
USE							
No	451243	484334	1980646	1133293	347256	147101	4543874
	8.85	9.50	38.8	22.23	6.81	2.89	89.12
	9.93	10.66	43.59	24.94	7.64	3.24	
	93.18	91.71	90.40	87.58	83.56	79.18	
Yes	32728	43207	208440	157182	68316	38307	548179
	0.64	0.85	4.09	3.08	1.34	0.75	10.75
	5.97	7.88	38.02	28.67	12.46	6.99	
	6.76	8.18	9.51	12.15	16.44	20.62	
No Response	277.41	551.57	1898	3514.4	0	374.19	6615.6
	0.01	0.01	0.04	0.07	0.00	0.01	0.13
	4.19	8.34	28.69	53.12	0.00	5.66	
	0.06	0.10	0.09	0.27	0.00	0.20	
Total	484249	528093	2190985	1293990	415572	185782	5098669
	9.50	10.36	42.97	25.38	8.15	3.64	100.00

STATISTICS FOR TABLE OF GENHLTH BY EDUC

Statistic	DF	Value	Prob
Chi-Square	10	53919.135	0.000

Sample Size = 5098669.1759

Table D20b: Physician Use By Age (1992-93)

Frequency Percent Row Pct Col Pct	AGE						
	15-19	20-24	25-44	45-64	65-74	75+	Total
USE							
No	433739 7.65 8.59 91.88	423273 7.46 8.39 90.18	2237363 39.45 44.33 90.56	1360961 24.00 26.97 88.81	405817 7.16 8.04 83.59	185965 3.28 3.68 77.13	5047118 89.00
Yes	38326 0.68 6.16 8.12	45768 0.81 7.36 9.75	232348 4.10 37.35 9.40	170930 3.01 27.47 11.15	79650 1.40 12.80 16.41	55138 0.97 8.86 22.87	622160 10.97
No Response	0 0.00 0.00 0.00	305.75 0.01 17.03 0.07	997.14 0.02 55.54 0.04	492.37 0.01 27.43 0.03	0 0.00 0.00 0.00	0 0.00 0.00 0.00	1795.3 0.03
Total	472065 8.32	469348 8.28	2470708 43.57	1532383 27.02	485468 8.56	241103 4.25	5671074 100.00

STATISTICS FOR TABLE OF GP BY AGE

Statistic	DF	Value	Prob
Chi-Square	10	61107.504	0.000

Sample Size = 5671073.5316

Table D21a: Physiican Use By Gender (1987)

Frequency Percent Row Pct Col Pct	GENDER		
	Female	Male	Total
USE			
No	2283322 44.78 50.25 87.02	2260552 44.34 49.75 91.34	4543874 89.12
Yes	337900 6.63 61.64 12.88	210279 4.12 38.36 8.50	548179 10.75
No Response	2558.9 0.05 38.68 0.10	4056.7 0.08 61.32 0.16	6615.6 0.13
Total	2623781 51.46	2474888 48.54	5098669 100.00

STATISTICS FOR TABLE OF GP BY GENDER

Statistic	DF	Value	Prob
Chi-Square	2	25838.465	0.000

Sample Size = 5098669.1759

Table D21b: Physician Use By Gender (1992-93)

Frequency Percent Row Pct Col Pct	GENDER		
	Female	Male	Total
USE			
No	2496978 44.03 49.47 86.40	2550140 44.97 50.53 91.70	5047118 89.00
Yes	391860 6.91 62.98 13.56	230300 4.06 37.02 8.28	622160 10.97
No Response	1349.5 0.02 75.17 0.05	445.79 0.01 24.83 0.02	1795.3 0.03
Total	2890187 50.96	2780887 49.04	5671074 100.00

STATISTICS FOR TABLE OF GP BY GENDER

Statistic	DF	Value	Prob
Chi-Square	2	40876.291	0.000

Sample Size = 5671073.5316

Table D22a: Physician Use By Marital Status (1987)

Frequency Percent Row Pct Col Pct	MARITAL STATUS				
	Married	Single	D/S/W	No Response	Total
USE					
No	2936214 57.59 64.62 88.76	565908 11.10 12.45 85.56	904746 17.74 19.91 92.70	137006 2.69 3.02 89.51	4543874 89.12
Yes	366780 7.19 66.91 11.09	94967 1.86 17.32 14.36	70786 1.39 12.91 7.25	15646 0.31 2.85 10.22	548179 10.75
No Response	5171.2 0.10 78.17 0.16	568.91 0.01 8.60 0.09	467.67 0.01 7.07 0.05	407.74 0.01 6.16 0.27	6615.6 0.13
Total	3308165 64.88	661444 12.97	976000 19.14	153061 3.00	5098669 100.00

STATISTICS FOR TABLE OF GP BY MS

Statistic	DF	Value	Prob
Chi-Square	6	22898.012	0.000

Sample Size = 5098669.1759

Table D22b: Physician Use By Marital Status (1992-3)

Frequency Percent Row Pct Col Pct	MARITAL STATUS				
	Married	Single	D/S/W	No Response	Total
USE					
No	2468212 43.52 48.90 89.19	741001 13.07 14.68 84.18	1756131 30.97 34.79 90.77	81774 1.44 1.62 91.95	5047118 89.00
Yes	298551 5.26 47.99 10.79	139259 2.46 22.38 15.82	177188 3.12 28.48 9.16	7162.9 0.13 1.15 8.05	622160 10.97
No Response	492.37 0.01 27.43 0.02	0 0.00 0.00 0.00	1302.9 0.02 72.57 0.07	0 0.00 0.00 0.00	1795.3 0.03
Total	2767256 48.80	880260 15.52	1934621 34.11	88936.8 1.57	5671074 100.00

STATISTICS FOR TABLE OF GP BY MS

Statistic	DF	Value	Prob
Chi-Square	6	29766.100	0.000

Sample Size = 5671073.5316

Table D23a: Physician Use By Employment (1987)

Frequency Percent Row Pct Col Pct	EMPLOYMENT			
	Unemployed	Working	No Response	Total
USE				
No	1961795 38.48 43.17 86.25	2573894 50.48 56.65 91.45	8184.7 0.16 0.18 85.46	4543874 89.12
Yes	309072 6.06 56.38 13.59	237715 4.66 43.36 8.45	1392.3 0.03 0.25 14.54	548179 10.75
No Response	3626 0.07 54.81 0.16	2989.5 0.06 45.19 0.11	0 0.00 0.00 0.00	6615.6 0.13
Total	2274493 44.61	2814599 55.20	9577.08 0.19	5098669 100.00

STATISTICS FOR TABLE OF GP BY EMPLOYMENT

Statistic	DF	Value	Prob
Chi-Square	4	35185.913	0.000

Sample Size = 5098669.1759

Table D23b: Physician Use By Employment (1992-93)

Frequency Percent Row Pct Col Pct	EMPLOYMENT		
	Unemployed	Working	Total
USE			
No	2265639 39.95 44.89 86.53	2781479 49.05 55.11 91.11	5046118 89.00
Yes	352037 6.21 56.58 13.45	270123 4.76 43.42 8.85	622160 10.97
No Response	609 0.01 33.97 0.02	1185.4 0.02 66.03 0.04	1795.3 0.03
Total	2618286 46.17	3052787 53.83	5671074 100.00

STATISTICS FOR TABLE OF GP BY EMPLOYMENT

Statistic	DF	Value	Prob
Chi-Square	2	30580.094	0.000

Sample Size = 5671073.5316

Table D24a: Supply By Need (1987)

Frequency Percent Row Pct Col Pct	SUPPLY (Population/Physician Ratio)								
	752	812	879	897	1027	1030	1056	1059	Total
HEALTH STATUS									
Excellent	99055	273991	15327	32232	28017	14775	17736	41740	947287
	1.94	5.37	0.30	0.63	0.55	0.29	0.35	0.82	18.58
	10.46	28.92	1.62	3.40	2.96	1.56	1.87	4.41	
	21.78	18.74	17.56	15.73	17.04	19.80	16.65	15.93	
Very Good	186994	572631	34544	80577	63155	31909	40128	107814	2066605
	3.67	11.23	0.68	1.58	1.24	0.63	0.79	2.11	40.53
	9.05	27.71	1.67	3.90	3.06	1.54	1.94	5.22	
	41.12	39.17	39.58	39.31	38.41	42.76	37.67	41.15	
Good	125072	445901	24629	62671	49105	19954	34403	79119	1472239
	2.45	8.75	0.48	1.23	0.96	0.39	0.67	1.55	28.87
	8.50	30.29	1.67	4.26	3.34	1.36	2.34	5.37	
	27.50	30.50	28.22	30.58	29.87	26.74	32.30	30.20	
Fair	33110	124099	9547.1	23918	19568	6521.7	11833	26317	475887
	0.65	2.43	0.19	0.47	0.38	0.13	0.23	0.52	9.33
	6.96	26.08	2.01	5.03	4.11	1.37	2.49	5.53	
	7.28	8.49	10.94	11.67	11.90	8.74	11.11	10.05	
Poor	8538	34508	2528.8	3826.3	3090.8	778.33	1884.3	4403.2	100097
	0.17	0.68	0.05	0.08	0.06	0.02	0.04	0.09	1.96
	8.53	34.47	2.53	3.82	3.09	0.78	1.88	4.40	
	1.88	2.36	2.90	1.87	1.88	1.04	1.77	1.68	
No Response	2007	10846	706.39	1717.5	1484.1	684.15	532.84	2587.3	36554
	0.04	0.21	0.91	0.93	0.03	0.01	0.01	0.05	0.72
	5.49	29.67	1.93	4.70	4.06	1.87	1.46	7.08	
	0.44	0.74	0.81	0.84	0.90	0.92	0.50	0.99	
Total	454777	1461976	87282.2	204952	164418	74622.7	106518	261980	5098669
	8.92	28.67	1.71	4.02	3.22	1.46	2.09	5.14	100.00

Table D24a: Supply By Need *continued* (1987)

Frequency Percent Row Pct Col Pct	SUPPLY (Population/Physician Ratio)							
	1158	1166	1181	1223	1247	1269	1275	Total
HEALTH STATUS								
Excellent	150719 2.96 15.91 18.34	41496 0.81 4.38 18.43	31090 0.61 3.28 17.02	47406 0.93 5.00 20.43	66494 1.30 7.02 18.67	39332 0.77 4.15 19.90	47867 0.94 5.05 17.96	947287 18.58
Very Good	350176 6.87 16.94 42.60	91803 1.80 4.44 40.78	67232 1.32 3.25 36.81	111842 2.19 5.41 48.20	134700 2.64 6.52 37.81	81600 1.60 3.95 41.29	111499 2.19 5.40 41.84	2066605 40.53
Good	225268 4.42 15.30 27.41	62282 1.22 4.23 27.67	58166 1.14 3.95 31.84	49162 0.96 3.34 21.19	110535 2.17 7.51 31.03	51504 1.01 3.50 26.06	74469 1.46 5.06 27.94	1472239 28.87
Fair	76683 1.50 16.11 9.33	22827 0.45 4.80 10.14	20490 0.40 4.31 11.22	19632 0.39 4.13 8.46	35113 0.69 7.38 9.86	19599 0.38 4.12 9.92	26630 0.52 5.60 9.99	475887 9.33
Poor	12789 0.25 12.68 1.56	5056.1 0.10 5.05 2.25	4061.3 0.08 4.06 2.22	3044.4 0.06 3.04 1.31	7122.3 0.14 7.12 2.00	4766.7 0.09 4.76 2.41	3701.2 0.07 3.70 1.39	100097 1.96
No Response	6347.4 0.12 17.36 0.77	1646.4 0.03 4.50 0.73	1618.9 0.03 4.43 0.89	935.78 0.02 2.56 0.40	2271.7 0.04 6.21 0.64	815.41 0.02 2.23 0.41	2352.9 0.05 6.44 0.88	36554 0.72
Total	821981 16.12	225111 4.42	182658 3.58	232022 4.55	356236 6.99	197616 3.88	266519 5.23	5098669 100.00

STATISTICS FOR TABLE OF GP BY SUP

Statistic	DF	Value	Prob
Chi-Square	70	36214.001	0.000

Sample Size = 5098669.1759

Table D24b: Supply By Need (1992-93)

Frequency Percent Row Pct Col Pct	SUPPLY (Population/Physician Ratio)								
	716	817	822	849	883	941	990	1057	Total
HEALTH STATUS									
Excellent	89120	271340	12943	37935	14467	30560	43546	38895	1000926
	1.57	4.78	0.23	0.67	0.26	0.54	0.77	0.69	17.65
	17.42	17.97	15.02	17.62	17.66	18.70	14.85	16.47	
	8.90	27.11	1.29	3.79	1.45	3.05	4.35	3.89	
Very Good	189556	503803	23155	73876	25469	52156	96613	80353	1935788
	3.34	8.88	0.41	1.30	0.45	0.92	1.70	1.42	34.13
	37.05	33.73	26.87	34.31	31.10	31.91	32.95	34.02	
	9.79	26.03	1.20	3.82	1.32	2.69	4.99	4.15	
Good	186520	560728	35323	78108	31095	60369	115915	90439	2095133
	3.29	9.89	0.62	1.38	0.55	1.06	2.04	1.59	36.94
	36.45	37.14	40.99	36.27	37.96	36.93	39.54	38.29	
	8.90	26.76	1.69	3.73	1.48	2.88	5.53	4.32	
Fair	35852	135920	11876	20439	7878.2	15917	30521	20605	511328
	0.63	2.40	0.21	0.36	0.14	0.28	0.54	0.36	9.02
	7.01	9.00	13.78	9.49	9.62	9.74	10.41	8.72	
	7.01	26.58	2.32	4.00	1.54	3.11	5.97	4.03	
Poor	8490.5	27939	1919.7	3576	2202.5	2853	3337.3	4385.7	89144.2
	0.15	0.49	0.03	0.06	0.04	0.05	0.06	0.08	1.57
	1.66	1.85	2.23	1.66	2.69	1.75	1.14	1.86	
	9.52	31.34	2.15	4.01	2.47	3.20	3.74	4.92	
No Response	2145.4	9942.2	950.16	1396.9	793.87	1609.1	3235.8	1515.2	38753.6
	0.04	0.18	0.02	0.02	0.01	0.03	0.06	0.03	0.68
	0.42	0.66	1.10	0.65	0.97	0.98	1.10	0.64	
	5.54	25.65	2.45	3.60	2.05	4.15	8.35	3.91	
Total	511683	1509673	86166	215330	81906	163464	293168	236193	5671074
	9.02	26.62	1.52	3.80	1.44	2.88	5.17	4.16	100.00

Table D24b: Supply By Need *continued* (1992-93)

Frequency Percent Row Pct Col Pct	SUPPLY (Population/Physician Ratio)							
	1088	1106	1150	1154	1159	1183	1263	Total
HEALTH STATUS								
Excellent	19010 0.34 15.87 1.90	44971 0.79 19.90 4.49	165554 2.92 16.72 16.54	47995 0.85 18.16 4.80	78094 1.38 20.73 7.80	53586 0.94 16.90 5.35	52911 0.93 18.91 5.29	1000926 17.65
Very Good	35986 0.63 30.04 1.86	80464 1.42 35.61 4.16	349770 6.17 35.33 18.07	88784 1.57 33.60 4.59	119507 2.11 31.72 6.17	116666 2.06 36.80 6.03	99632 1.76 35.61 5.15	1935788 34.13
Good	48545 0.86 40.53 2.32	73662 1.30 32.60 3.52	370161 6.53 37.39 17.67	96687 1.70 36.59 4.61	135985 2.40 36.09 6.49	113010 1.99 35.64 5.39	98586 1.74 35.24 4.71	2095133 36.94
Fair	13046 0.23 10.89 2.55	21964 0.39 9.72 4.30	90264 1.59 9.12 17.65	23214 0.41 8.78 4.54	33481 0.59 8.89 6.55	26867 0.47 8.47 5.25	23484 0.41 8.39 4.59	511328 9.02
Poor	2592.3 0.05 2.16 2.91	2580.2 0.05 1.14 2.89	9150.6 0.16 0.92 10.26	5317.2 0.09 2.01 5.96	6337.9 0.11 1.68 7.11	5305.5 0.09 1.67 5.95	3156.4 0.06 1.13 3.54	89144.2 1.57
No Response	601.45 0.01 0.50 1.55	2308.7 0.04 1.02 5.96	5003 0.09 0.51 12.91	2269 0.04 0.86 5.85	3349.4 0.06 0.89 8.64	1627.9 0.03 0.51 4.20	2005.6 0.04 0.72 5.18	38753.6 0.68
Total	119780 2.11	225949 3.98	989903 17.46	264265 4.66	376754 6.64	317062 5.59	279775 4.93	5671074 100.00

STATISTICS FOR TABLE OF GP BY SUP

Statistic	DF	Value	Prob
Chi-Square	70	30533.256	0.000

Sample Size = 5671073.531

Table D25a: Supply By Physician Use (1987)

Frequency Percent Row Pct Col Pct	SUPPLY (Population/Physician Ratio)								
	752	812	879	897	1027	1030	1056	1059	Total
USE									
No	404011	1318482	76694	184463	146192	68039	97273	327147	4543874
	7.92	25.86	1.50	3.62	2.87	1.33	1.91	4.65	89.12
	8.89	29.92	1.69	4.06	3.22	1.50	2.14	5.22	
	88.84	90.18	87.87	90.00	88.91	91.18	91.32	90.52	
Yes	49853	139824	10589	19655	18226	6584.2	9127.9	24833	548179
	0.98	2.74	0.21	0.39	0.36	0.13	0.18	0.49	10.75
	9.09	25.51	1.93	3.59	3.32	1.20	1.67	4.53	
	10.96	9.56	12.13	9.59	11.09	8.82	8.57	9.48	
No Response	911.64	3658.8	0	834.1	0	0	116.27	0	6615.6
	0.02	0.07	0.00	0.02	0.00	0.00	0.00	0.00	0.13
	13.78	55.31	0.00	12.61	0.00	0.00	1.76	0.00	
	0.20	0.25	0.00	0.41	0.00	0.00	0.11	0.00	
Total	454777	1461976	87282.2	204952	164418	74622.7	106518	261980	5098669
	8.92	28.67	1.71	4.02	3.22	1.46	2.09	5.14	100.00

continued

Table D25a: Supply By Physician Use *continued* (1987)

Frequency Percent Row Pct Col Pct	SUPPLY (Population/Physician Ratio)							
	1158	1166	1181	1223	1247	1269	1275	Total
USE								
No	719002	202362	157799	206500	318192	176888	230832	4543874
	14.10	3.97	3.09	4.05	6.24	3.47	4.53	89.12
	15.82	4.45	3.47	4.54	7.00	3.89	5.08	
	87.47	89.89	86.39	89.00	89.32	89.51	86.61	
Yes	102651	22749	24276	25523	37860	20729	35687	548179
	2.01	0.45	0.48	0.50	0.74	0.41	0.70	10.75
	18.73	4.15	4.43	4.66	6.91	3.78	6.51	
	12.49	10.11	13.29	11.00	10.63	10.49	13.39	
No Response	328.03	0	582.79	0	183.95	0	0	6615.6
	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.13
	4.96	0.00	8.81	0.00	2.78	0.00	0.00	
	0.04	0.00	0.32	0.00	0.05	0.00	0.00	
Total	821981	225111	182658	232022	356236	197616	266519	5098669
	16.12	4.42	3.58	4.55	6.99	3.88	5.23	100.00

STATISTICS FOR TABLE OF GP BY SUP

Statistic	DF	Value	Prob
Chi-Square	28	15891.507	0.000

Sample Size = 5098669.1759

Table D25b: Supply By Physician Use (1992-93)

Frequency Percent Row Pct Col Pct	SUPPLY (Population/Physician Ratio)								
	716	817	822	849	883	941	990	1057	Total
USE									
No	450792	1350504	75739	190015	73476	149031	260130	206887	5047118
	7.95	23.81	1.34	3.35	1.30	2.63	4.59	3.65	89.00
	88.10	89.56	87.90	88.24	89.71	91.17	88.73	87.59	
	8.93	26.76	1.50	3.76	1.46	2.95	5.15	4.10	
Yes	60422	158312	10427	25315	8407.4	14433	33038	29307	622160
	1.07	2.79	0.18	0.45	0.15	0.25	0.58	0.52	10.97
	11.81	10.49	12.10	11.76	10.26	8.83	11.27	12.41	
	9.71	25.45	1.68	4.07	1.35	2.32	5.31	4.71	
No Response	469.86	857.1	0	0	22.512	0	0	0	1795.27
	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.03
	0.09	0.06	0.00	0.00	0.03	0.00	0.00	0.00	
	26.17	47.74	0.00	0.00	1.25	0.00	0.00	0.00	
Total	511683	1509673	86166	215330	81906	163464	293168	236193	5671074
	9.02	26.62	1.52	3.80	1.44	2.88	5.17	4.16	100.00

continued

Table D25b: Supply By Physician Use *continued* (1992-93)

Frequency Percent Row Pct Col Pct	SUPPLY (Population/Physician Ratio)							
	1088	1106	1150	1154	1159	1183	1263	Total
USE								
No	107604	205066	873557	233161	336710	281694	252752	5047118
	1.90	3.62	15.40	4.11	5.94	4.97	4.46	89.00
	89.83	90.76	88.25	88.23	89.37	88.85	90.34	
	2.13	4.06	17.31	4.62	6.67	5.58	5.01	
Yes	12176	20883	116346	31104	39904	35062	27024	622160
	0.21	0.37	2.05	0.55	0.70	0.62	0.48	10.97
	10.17	9.24	11.75	11.77	10.59	11.06	9.66	
	1.96	3.36	18.70	5.00	6.41	5.64	4.34	
No Response	0	0	0	0	140.04	305.75	0	1795.27
	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.03
	0.00	0.00	0.00	0.00	0.04	0.10	0.00	
	0.00	0.00	0.00	0.00	7.80	17.03	0.00	
Total	119780	225949	989903	264265	376754	317062	279775	5671074
	2.11	3.98	17.46	4.66	6.64	5.59	4.93	100.00

STATISTICS FOR TABLE OF GP BY SUP

Statistic	DF	Value	Prob
Chi-Square	28	6648.854	0.000

Sample Size = 5671073.5316

APPENDIX E

TABLES FOR SIMPLE AND MULTIPLE PROBIT ANALYSIS

Table E1: Physician Use and Need

Model		1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
General Health	Excellent	-0.948**	(-1.098,-0.798)	-1.008**	(-1.151,-0.865)
	Very Good	-0.731**	(-0.871,-0.591)	-0.971**	(-1.109,-0.834)
	Good	-0.526**	(-0.667,-0.385)	-0.809**	(-0.945,-0.673)
	Fair	-0.104	(-0.252,0.045)	-0.375**	(-0.520,-0.231)
	Constant	-0.643**	(-0.778,-0.508)	-0.408***	(-0.540,-0.276)
	N	19556		23373	
	Likelihood Ratio Test	466.383***		445.504***	
	Adjusted Rho-Squared	0.035		0.027	
	Percentage of Right Predictions	89.31		89.06	

Table E2: Physician Use and Gender

Model		1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
Gender	Male	-0.240	(-0.287,-0.193)	-0.286*	(-0.330,-0.243)
	Constant	-1.132**	(-1.163,-1.101)	-1.100	(-1.128,-1.072)
	N	19704		23558	
	Likelihood Ratio Test	99.283		170.058*	
	Adjusted Rho-Squared	0.007		0.010	
	Percentage of Right Predictions	89.24		89.03	

Table E3: Physician Use and Age

Model		1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
Age	15-19	-0.675***	(-0.811,-0.540)	-0.654***	(-0.772,-0.536)
	20-24	-0.574***	(-0.704,-0.444)	-0.552***	(-0.667,-0.437)
	25-44	-0.491***	(-0.601,-0.381)	-0.573***	(-0.665,-0.481)
	45-64	-0.348***	(-0.461,-0.235)	-0.475***	(-0.570,-0.380)
	65-74	-0.158*	(-0.285,-0.031)	-0.235*	(-0.343,-0.127)
	Constant	-0.818***	(-0.922,-0.714)	-0.743***	(-0.829,-0.657)
	N	19704		23558	
	Likelihood Ratio Test	181.575***		216.657***	
	Adjusted Rho-Squared	0.013		0.013	
	Percentage of Right Predictions	89.24		89.03	

Table E4: Physician Use and Marital Status

Model		1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
Marital Status	Married	-0.157*	(-0.224,-0.091)	0.235*	(0.178,0.294)
	Single	-0.393*	(-0.478,-0.308)	-0.565**	(-0.674,-0.455)
	Constant	-1.064**	(-1.124,-1.004)	-1.474	(-1.552,-1.395)
	N	19091		23149	
	Likelihood Ratio Test	87.057*		107.101**	
	Adjusted Rho-Squared	0.007		0.006	
	Percentage of Right Predictions	89.22		88.98	

Table E5: Physician Use and Employment

Model		1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
Employment	Working	-0.277*	(-0.324,-0.230)	-0.245*	(-0.287,-0.202)
	Constant	-1.098	(-1.131,-1.065)	-1.105**	(-1.135,-1.076)
	N	19676		23558	
	Likelihood Ratio Test	133.774		126.260	
	Adjusted Rho-Squared	0.010		0.008	
	Percentage of Right Predictions	89.24		89.03	

Table E6: Physician Use and Household Income

Model			1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
Household Income	20,000-29,999	15,000-29,999	-0.198**	(-0.269,-0.127)	-0.144**	(-0.207,-0.081)
	30,000-39,999	30,000-39,999	-0.167**	(-0.239,-0.096)	-0.186**	(-0.264,-0.107)
	40,000-49,999	40,000-59,999	-0.247**	(-0.329,-0.166)	-0.304**	(-0.369,-0.238)
	50,000+	60,000+	-0.271**	(-0.345,-0.198)	-0.353**	(-0.427,-0.280)
	Constant		-1.089***	(-1.131,-1.046)	-1.035***	(-1.083,-0.988)
	N		17879		22322	
	Likelihood Ratio Test		73.086***		122.302***	
	Adjusted Rho-Squared		0.006		0.008	
	Percentage of Right Predictions		89.21		89.03	

Table E7: Physician Use and Education

Model		1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
Education	High School	-0.247**	(-0.308,-0.186)	-0.185*	(-0.247,-0.122)
	Some Post-Secondary	-0.364**	(-0.446,-0.282)	-0.186*	(-0.259,-0.112)
	Post-SecondarY	-0.393**	(-0.465,-0.321)	-0.241**	(-0.307,-0.175)
	Constant	-1.000***	(-1.050,-0.951)	-1.058***	(-1.110,-1.006)
	N	19313		23314	
	Likelihood Ratio Test	136.021**		52.612**	
	Adjusted Rho-Squared	0.010		0.003	
	Percentage of Right Predictions	89.29		89.03	

Table E8: Physician Use and Supply

Model		1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
Supply		0.0002	(0.00009,0.0003)	0.00002	(-0.0001, 0.0001
	Constant	-1.460*	(-1.588,-1.331)	-1.249	(-1.377,-1.122)
	N	19704		21739	
	Likelihood Ratio Test	11.825		0.119	
	Adjusted Rho-Squared	0.0008		0.00004	
	Percentage of Right Predictions	89.24		89.02	

NOTE: for all models, * $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table E9: Model of Supply with the Inclusion of Interaction Terms for Age and Sex

Explanatory Variables			1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
Need	Excellent		-0.868***	(-1.037,-0.699)	-0.811***	(-1.031,-0.730)
	Very Good		-0.611***	(-0.769,0.453)	-0.882***	(-1.027,-0.737)
	Good		-0.460***	(-0.617,-0.303)	-0.744***	(-0.886,-0.602)
	Fair		-0.125	(-0.289,0.040)	-0.358**	(-0.508,-0.208)
Sex	Male		0.008	(-0.259,0.275)	0.078	(-0.113,0.269)
Age	15-19		-0.019	(-0.256,0.217)	-0.196*	(-0.377,-0.014)
	20-24		-0.088	(-0.313,0.136)	-0.206*	(-0.838,-0.289)
	25-44		0.028	(-0.167,0.224)	-0.222**	(-0.364,-0.080)
	45-64		-0.004	(-0.197,0.190)	-0.271**	(-0.412,-0.131)
	65-74		0.017	(-0.193,0.226)	-0.133	(-0.287,0.020)
Interactions	Male*15-19		-0.273	(-0.605,0.060)	-0.510**	(-0.769,-0.251)
	Male*20-24		-0.0005	(-0.319,0.318)	-0.322**	(-0.573,-0.071)
	Male*25-44		-0.245	(-0.524,0.034)	-0.404**	(-0.608,-0.200)
	Male*45-64		-0.239	(-0.525,0.047)	-0.233*	(-0.443,-0.023)
	Male*65-74		-0.167	(-0.484,0.149)	-0.302*	(-0.543,-0.061)
Marital Status	Married		-0.028	(-0.107,0.051)	-0.114**	(-0.180,-0.048)
	Single		-0.182**	(-0.295,-0.070)	-0.151**	(-0.230,-0.072)
Employment	Working		-0.107**	(-0.171,-0.043)	-0.027	(-0.085,0.030)
Household Income	20,000-29,999	15,000-29,999	-0.073	(-0.151,0.005)	-0.041	(-0.110,0.028)
	30,000-39,999	30,000-39,999	-0.005	(-0.086,0.076)	-0.028	(-0.115,0.059)
	40,000-49,999	40,000-59,999	-0.053	(-0.144,0.038)	-0.131**	(-0.208,-0.053)
	50,000 +	60,000 +	-0.038	(-0.125,0.049)	-0.153**	(-0.242,-0.065)
Education	High School		-0.025	(-0.103,0.053)	0.043	(-0.031,0.117)
	Some Post-Secondary		-0.062	(-0.162,0.038)	0.128**	(0.039,0.217)
	Post-Secondary		-0.100*	(-0.191,-0.008)	0.085*	(0.001,0.168)
Supply			0.0002**	(0.00008, 0.0004)	0.0001	(-0.00003, 0.0002)
Constant			-0.675**	(-0.941,-0.410)	-0.124	(-0.342,0.095)
N			17141		21739	
Likelihood Ratio test			543.770***		704.142***	
Adjusted Rho-squared			0.045		0.046	
Percentage of Right Predictions			89.31		89.03	
Sensitivity (%)			0		0.17	
Specificity (%)			100		99.95	

* p<0.05, ** p<0.01, *** p<0.001

Table E10: Model of Supply with the Inclusion of Interaction Terms for Need and Education

Explanatory Variables			1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
Need	Excellent		-1.129***	(-1.415,-0.843)	-0.819***	(-1.105,-0.532)
	Very Good		-0.897***	(-1.128,-0.666)	-0.865***	(-1.124,-0.607)
	Good		-0.576***	(-0.790,-0.361)	-0.770***	(-1.006,-0.535)
	Fair		-0.282**	(-0.502,-0.062)	-0.298**	(-0.542,-0.054)
Sex	Male		-0.197***	(-0.251,-0.143)	-0.247***	(-0.294,-0.200)
Age	15-19		-0.156	(-0.344,0.032)	-0.396***	(-0.543,-0.249)
	20-24		-0.090	(-0.263,0.082)	-0.334***	(-0.476,-0.193)
	25-44		-0.081	(-0.232,0.070)	-0.390***	(-0.504,-0.277)
	45-64		-0.108	(-0.255,0.039)	-0.367***	(-0.475,-0.258)
	65-74		-0.062	(-0.221,0.096)	-0.256***	(-0.375,-0.138)
Marital Status	Married		-0.020	(-0.099,0.059)	-0.097**	(-0.162,-0.032)
	Single		-0.167**	(-0.279,-0.056)	-0.145**	(-0.224,-0.066)
Employment	Working		-0.115**	(-0.178,-0.051)	-0.027	(-0.084,0.030)
Household Income	20,000-29,999	15,000-29,999	-0.072	(-0.150,0.006)	-0.041	(-0.110,0.028)
	30,000-39,999	30,000-39,999	0.005	(-0.087,0.076)	-0.028	(-0.115,0.059)
	40,000-49,999	40,000-59,999	-0.054	(-0.145,0.037)	-0.130**	(-0.208,-0.052)
	50,000 +	60,000 +	-0.038	(-0.125,0.049)	-0.152**	(-0.241,-0.064)
Education	High School		-0.464**	(-0.825,-0.101)	0.096	(-0.217,0.409)
	Some Post-Secondary		-0.298	(-0.986,0.390)	0.179	(-0.361,0.719)
	Post-Secondary		-0.493*	(-0.976,-0.010)	0.038	(-0.365,0.441)
Interactions	Excellent*High School		0.567**	(0.135,0.998)	-0.128	(-0.505,0.249)
	Excellent*Some Post-Secondary		0.402	(-0.342,1.146)	-0.112	(-0.697,0.473)
	Excellent*Post-Secondary		0.462	(-0.083,1.006)	0.021	(-0.430,0.473)
	VeryGood*High School		0.579**	(0.192,0.965)	-0.066	(-0.416,0.283)
	VeryGood*Some Post-Secondary		0.351	(-0.354,1.057)	-0.034	(-0.598,0.529)
	VeryGood*Post-Secondary		0.553*	(0.048,1.057)	0.050	(-0.379,0.479)
	Good*High School		0.400*	(0.022,0.778)	-0.008	(-0.338,0.323)
	Good*Some Post-Secondary		0.146	(-0.559,0.794)	0.032	(-0.522,0.586)
	Good*Post-Secondary		0.292	(0.221,0.851)	0.093	(-0.323,0.509)
	Fair*High School		0.353	(-0.042,0.749)	-0.063	(-0.410,0.283)
	Fair*Some Post-Secondary		0.333	(-0.400,1.066)	-0.339	(-0.926,0.249)
	Fair*Post-Secondary		0.485	(-0.049,1.018)	-0.017	(-0.460,0.426)
Supply			0.0002**	(0.00008, 0.0004)	0.001	(-0.00003, 0.0002)
Constant			0.119**	(-0.218,-1.831)	-0.018	(-0.162,0.314)
N			17141		21739	
Likelihood Ratio test			553.658**		689.513**	
Adjusted Rho-squared			0.046		0.044	
Percentage of Right Predictions			89.31		89.04	
Sensitivity (%)			0		0.75	
Specificity (%)			100		99.92	

* p<0.05, ** p<0.01, *** p<0.001

Table E11: Original Model with the Inclusion of Interaction Terms for Need and Supply

Explanatory Variables		1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
General Health	Excellent	0.177	(-0.720,1.175)	0.046	(-0.800,0.892)
	Very Good	0.273	(-0.564,1.111)	-0.613	(-1.428,0.201)
	Good	0.576	(-0.266,1.418)	-0.449	(-1.258,0.360)
	Fair	0.380	(-0.520,1.281)	-0.119	(-0.985,0.748)
Sex	Male	-0.197***	(-0.252,-0.143)	-0.247***	(-0.294,-0.200)
Age	15-19	-0.150	(-0.338,0.037)	-0.404***	(-0.551,-0.258)
	20-24	-0.090	(-0.262,0.082)	-0.338***	(-0.479,-0.197)
	25-44	-0.078	(-0.229,0.072)	-0.394***	(-0.507,-0.281)
	45-64	-0.107	(-0.254,0.039)	-0.369***	(-0.478,-0.261)
	65-74	-0.064	(-0.222,0.093)	-0.259***	(-0.378,-0.140)
Marital Status	Married	-0.023	(-0.101,0.056)	-0.099**	(-0.164,-0.034)
	Single	-0.169**	(-0.280,-0.057)	-0.146**	(-0.225,-0.067)
Employment	Working	-0.115**	(-0.178,-0.051)	-0.027	(-0.084,0.030)
Household Income	20,000-29,999 15,000-29,999	-0.074	(-0.152,0.004)	-0.041	(-0.109,0.028)
	30,000-39,999 30,000-39,999	-0.007	(-0.088,0.074)	-0.027	(-0.114,0.060)
	40,000-49,999 40,000-59,999	-0.051	(-0.142,0.040)	-0.132**	(-0.209,-0.054)
	50,000 + 60,000 +	-0.038	(-0.124,0.049)	-0.154**	(-0.243,-0.066)
Education	High School	-0.028	(-0.105,0.050)	0.047	(-0.028,0.121)
	Some Post-Secondary	-0.067	(-0.168,0.033)	0.132**	(0.043,0.221)
	Post-Secondary	-0.105*	(-0.197,-0.013)	0.091*	(0.007,0.174)
Supply		0.001**	(0.0003,0.002)	0.0005	(-0.0003,0.001)
Interactions	Excellent*Supply	-0.001*	(-0.002,-0.0002)	-0.001*	(-0.002, -0.00009)
	VeryGood*Supply	-0.0009*	(-0.002, -0.00006)	-0.0.003	(-0.001,0.0005)
	Good*Supply	-0.001*	(-0.002,-0.0002)	-0.0003	(-0.001,0.0005)
	Fair*Supply	-0.0005	(-0.001,0.0004)	-0.0002	(-0.001,0.0006)
Constant		-1.460**	(-2.271,-0.649)	-0.372	(-1.155,0.412)
N		17141		21739	
Likelihood Ratio test		544.521**		693.921**	
Adjusted Rho-squared		0.045		0.045	
Percentage of Right Predictions		89.31		89.05	
Sensitivity (%)		0		0.75	
Specificity (%)		100		99.94	

* p<0.05, ** p<0.01, *** p<0.001

Table E12: Original model with the Inclusion of a Dummy Variable[1] for Supply

Explanatory Variables		1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
General Health	Excellent	-0.859***	(-1.028,-0.690)	-0.882***	(-1.033,-0.731)
	Very Good	-0.602***	(-0.760,-0.444)	-0.884***	(-1.030,-0.739)
	Good	-0.448***	(-0.605,-0.292)	-0.746***	(-0.888,-0.603)
	Fair	-0.116	(-0.280,0.048)	-0.359***	(-0.509,-0.208)
Sex	Male	-0.196***	(-0.250,-0.142)	-0.247***	(-0.509,-0.208)
Age	15-19	-0.142	(-0.330,0.046)	-0.413***	(-0.294,-0.200)
	20-24	-0.083	(-0.255,0.090)	-0.347***	(-0.560,-0.266)
	25-44	-0.069	(-0.220,0.081)	-0.399***	(-0.489,-0.206)
	45-64	-0.103	(-0.250,0.043)	-0.373***	(-0.512,-0.285)
	65-74	-0.062	(-0.220,0.095)	-0.265***	(-0.482,-0.264)
Marital Status	Married	-0.019	(-0.098,0.059)	-0.100**	(-0.384,-0.147)
	Single	-0.161**	(-0.273,-0.050)	-0.144**	(-0.165,-0.034)
Employment	Working	-0.116**	(-0.180,-0.053)	-0.029	(-0.086,0.028)
Region	Bas St. Laurent	-0.060	(-0.227,0108)	-0.227**	(-0.387-,0.065)
	Saguenay-Lac St. Jean	-0.059	(-0.207,0.090)	-0.152*	(-0.291,-0.013)
	Mauricie-Bois Francs	-0.039	(-0.168,0.090)	0.091	(-0.205,0.023)
	Estrie	-0.152	(-0.311,0.006)	-0.033	(-0.168,0.101)
	Montréal-Centre	-0.082	(-0.181,0.018)	-0.108*	(-0.194,-0.022)
	Outaouais	0.111	(-0.042,0.264)	0.054	(-0.075,0.184)
	Abitibi-Témiscamingue	-0.155	(-0.368,0.058)	-0.086	(-0.261,0.088)
	Côte-Nord	-0.145	(-0.383,0.094)	-0.073	(-0.277,0.132)
	Gaspésie-Îles-de-la-Madeleine	0.027	(-0.181,0.235)	-0.071	(-0.267,0.124)
	Chaudières-Appalaches	-0.129	(-0.277,0.020)	-0.034	(-0.158,0.089)
	Laval	0.096	(-0.052,0.243)	0.019	(-0.107,0.144)
	Lanaudière	-0.043	(-0.200,0.115)	-0.079	(-0.208,0.049)
	Laurentides	0.095	(-0.040,0.230)	-0.068	(-0.189,0.052)
	Montérégie	0.058	(-0.048,0.164)	0.032	(-0.059,0.122)
Household Income	20,000-29,999 15,000-29,999	-0.077	(-0.156,0.0007)	-0.050	(-0.119,0.019)
	30,000-39,999 30,000-39,999	-0.017	(-0.099,0.064)	-0.036	(-0.123,0.051)
	40,000-49,999 40,000-59,999	-0.063	(-0.155,0.028)	-0.143**	(-0.221,-0.065)
	50,000 + 60,000 +	-0.055	(-0.142,0.033)	-0.171**	(-0.261,-0.082)
Education	High School	-0.030	(-0.108,0.048)	0.050	(-0.025,0.124)
	Some Post-Secondary	-0.070	(-0.171,0.030)	0.133**	(0.044,0.222)
	Post-Secondary	-0.104*	(-0.196,-0.012)	0.095*	(0.011,0.179)
Constant		-0.346**	(-0.561,-0.130)	0.162	(-0.019,0.344)
N		17141		21739	
Likelihood Ratio test		559.478**		710.361**	
Adjusted Rho-squared		0.046		0.046	
Percentage of Right Predictions		89.31		89.05	
Sensitivity (%)		0		0.84	
Specificity (%)		100		99.94	

* p<0.05, ** p<0.01, *** p<0.001

[1] The Quebec health region (lowest population/physician ratio) was chosen to be the reference category.

Table E13: Original Model with the Inclusion of a Dummy Variable[1] for Supply

Explanatory Variables		1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
General Health	Excellent	-0.859***	(-1.028,-0.690)	-0.882***	(-1.033,-0.731)
	Very Good	-0.602***	(-0.760,-0.444)	-0.884***	(-1.030,-0.739)
	Good	-0.448***	(-0.605,-0.292)	-0.746***	(-0.888,-0.603)
	Fair	-0.116	(-0.280,0.048)	-0.359***	(-0.509,-0.208)
Sex	Male	-0.196***	(-0.250,-0.142)	-0.247***	(-0.509,-0.208)
Age	15-19	-0.142	(-0.330,0.046)	-0.413***	(-0.294,-0.200)
	20-24	-0.083	(-0.255,0.090)	-0.347***	(-0.560,-0.266)
	25-44	-0.069	(-0.220,0.081)	-0.399***	(-0.489,-0.206)
	45-64	-0.103	(-0.250,0.043)	-0.373***	(-0.512,-0.285)
	65-74	-0.062	(-0.220,0.095)	-0.265***	(-0.482,-0.264)
Marital Status	Married	-0.019	(-0.098,0.059)	-0.100**	(-0.384,-0.147)
	Single	-0.161**	(-0.273,-0.050)	-0.144**	(-0.165,-0.034)
Employment	Working	-0.116**	(-0.180,-0.053)	-0.029	(-0.086,0.028)
Region	Bas St. Laurent	-0.154	(-0.332,0023)	-0.147	(-0.325,0.031)
	Saguenay-Lac St. Jean	-0.153	(-0.313,0.006)	-0.073	(-0.231,0.085)
	Québec	-0.095	(-0.230,0.040)	0.079	(-0.049,0.208)
	Mauricie-Bois Francs	-0.133	(-0.275,0.0080)	-0.116	(-0.148,0.125)
	Estrie	-0.247**	(-0.415,-0.078)	0.046	(-0.109,0.201)
	Montréal-Centre	-0.177**	(-0.293,-0.061)	-0.029	(-0.144,0.086)
	Outaouais	0.017	(-0.147,0.180)	0.134	(-0.016,0.283)
	Abitibi-Témiscamingue	-0.250*	(-0.470,-0.029)	-0.007	(-0.197,0.183)
	Côte-Nord	-0.239	(-0.485,0.007)	0.007	(-0.211,0.224)
	Gaspésie-Îles-de-la-Madeleine	0.068	(-0.284,0.149)	0.008	(-0.201,0.218)
	Chaudières-Appalaches	-0.224**	(-0.383,-0.064)	0.045	(-0.100,0.190)
	Laval	0.0008	(-0.158,0.160)	0.098	(-0.049,0.245)
	Lanaudière	-0.137	(-0.306,0.031)		
	Laurentides			0.011	(-0.131,0.153)
	Montérégie	0.037	(-0.158,0.085)	0.111	(-0.007,0.229)
Household Income	20,000-29,999 15,000-29,999	-0.077	(-0.156,0.0007)	-0.050	(-0.119,0.019)
	30,000-39,999 30,000-39,999	-0.017	(-0.099,0.064)	-0.036	(-0.123,0.051)
	40,000-49,999 40,000-59,999	-0.063	(-0.155,0.028)	-0.143**	(-0.221,-0.065)
	50,000 + 60,000 +	-0.055	(-0.142,0.033)	-0.171**	(-0.261,-0.082)
Education	High School	-0.030	(-0.108,0.048)	0.050	(-0.025,0.124)
	Some Post-Secondary	-0.070	(-0.171,0.030)	0.133**	(0.044,0.222)
	Post-Secondary	-0.104*	(-0.196,-0.012)	0.095*	(0.011,0.179)
Constant		-0.251*	(-0.476,-0.026)	0.083	(-0.114,0.281)
N		17141		21739	
Likelihood Ratio test		559.478***		710.361***	
Adjusted Rho-squared		0.046		0.047	
Percentage of Right Predictions		89.31		89.54	
Sensitivity (%)		0		0.84	
Specificity (%)		100		99.94	

* p<0.05, ** p<0.01, *** p<0.001

[1] Laurentides reference region in 1987 (highest population/physician ratio)
[2] Lanaudière reference region in 1992-93 (highest population/physician ratio)

Table E14: Original Model with the Inclusion of a Dummy Variable for Region

Explanatory Variables			1987 Coeff.	1987 (-CI,+CI)	1992-93 Coeff.	1992-93 (-CI,+CI)
General Health	Excellent		-0.859***	(-1.028,-0.690)	-0.882***	(-1.033,-0.731)
	Very Good		-0.602***	(-0.760,-0.444)	-0.884***	(-1.030,-0.739)
	Good		-0.448***	(-0.605,-0.292	-0.746***	(-0.888,-0.603)
	Fair		-0.116	(-0.280,0.048)	-0.359***	(-0.509,-0.208)
Sex	Male		-0.196***	(-0.250,-0.142)	-0.247***	(-0.294,-0.200)
Age	15-19		-0.142	(-0.330,0.046)	-0.413***	(-0.560,-0.266)
	20-24		-0.083	(-0.255,0.090)	-0.347***	(-0.489,-0.206)
	25-44		-0.069	(-0.220,0.081)	-0.399***	(-0.512,-0.285)
	45-64		-0.103	(-0.250,0.043)	-0.373***	(-0.482,-0.264)
	65-74		-0.062	(-0.220,0.095)	-0.265***	(-0.384,-0.147)
Marital Status	Married		-0.019	(-0.098,0.059)	-0.100**	(-0.165,-0.034)
	Single		-0.161**	(-0.273,-0.050)	-0.144**	(-0.223,-0.065)
Employment	Working		-0.116**	(-0.180,-0.053)	-0.029	(-0.086,0.028)
Region	Bas St. Laurent		0.085	(-0.180,0.350)	0.153	(-0.392,0.085)
	Saguenay-Lac St. Jean		0.086	(-0.168,0.340)	0.080	(-0.304,0.145)
	Québec		0.145	(-0.094,0.383)	0.073	(-0.132,0.277)
	Mauricie-Bois Francs		0.106	(-0.137,0.349)	0.018	(-0.228,0.191)
	Estrie		-0.008	(-0.267,0.252)	0.039	(-0.183,0.261)
	Montréal-Centre		0.063	(-0.166,0.292)	0.036	(-0.232,0.161)
	Outaouais		0.256	(-0.0005,0.512)	0.127	(-0.091,0.345)
	Abitibi-Témiscamingue		-0.010	(-0.306,0.285)	0.014	(-0.261,0.234)
	Gaspésie-Îles-de-la-Madeleine		0.172	(-0.121,0.464)	0.002	(-0.261,0.264)
	Chaudières-Appalaches		0.016	(-0.238,0.269)	0.038	(-0.177,0.253)
	Laval		0.240	(-0.013,0.493)	0.091	(-0.125,0.307)
	Lanaudière		0.102	(-0.157,0.361)	-0.007	(-0.224,0.211)
	Laurentides		0.239	(-0.007,0.485)	0.004	(-0.209,0.217)
	Montérégie		0.203	(-0.029,0.434)	0.104	(-0.094,0.302)
Household Income	20,000-29,999	15,000-29,999	-0.077	(-0.156,0.0007)	-0.050	(-0.119,0.019)
	30,000-39,999	30,000-39,999	-0.017	(-0.099,0.064)	-0.036	(-0.123,0.051)
	40,000-49,999	40,000-59,999	-0.063	(-0.155,0.028)	-0.143**	(-0.221,-0.065)
	50,000 +	60,000 +	-0.055	(-0.142,0.033)	-0.171**	(-0.261,-0.082)
Education	High School		-0.030	(-0.108,0.048)	0.050	(-0.025,0.124)
	Some Post-Secondary		-0.070	(-0.171,0.030)	0.133**	(0.044,0.222)
	Post-Secondary		-0.104*	(-0.196,-0.012)	0.095*	(0.011,0.179)
Constant			-0.490**	(-0.791,-0.190)	0.090	(-0.162,0.341)
N			17141		21739	
Likelihood Ratio test			559.478**		710.361***	
Adjusted Rho-squared			0.046		0.046	
Percentage of Right Predictions			89.31		89.54	
Sensitivity (%)			0		0.84	
Specificity (%)			100		99.94	

* p<0.05, ** p<0.01, *** p<0.001

APPENDIX F

TABLES OF REGIONAL LEVEL ANALYSIS

Table F1: Regional Comparison of the Incidence of Family Physician Utilization (Abitibi-Témiscamingue)

Explanatory Variables			1987 Coeff.	-CI	+CI	1992-93 Coeff.	-CI	+CI
General Health	Excellent		4.918	-6534.6	6544.4	-0.596	-1.280	0.089
	Very Good		5.130	-6534.4	6544.6	-0.774*	-1.437	-0.112
	Good		5.255	-6534.2	6544.8	-0.590	-1.234	0.053
	Fair		5.804	-6533.7	6545.3	-0.002	-0.664	0.659
Sex	Male		-0.353*	-0.594	-0.111	-0.251*	-0.460	-0.042
Age	15-19		-0.928	-1.870	0.014	-0.179	-1.008	0.650
	20-24		-0.245	-1.053	0.563	0.325	-0.452	1.101
	25-44		-0.655	-1.416	0.106	0.261	-0.431	0.952
	45-64		-0.414	-1.149	0.320	0.116	-0.561	0.793
	65-74		-0.162	-0.949	0.626	0.073	-0.651	0.796
Marital Status	Married		0.026	-0.354	0.407	-0.057	-0.355	0.240
	Single		-0.087	-0.657	0.484	-0.127	-0.482	0.229
Employment	Working		0.035	-0.245	0.316	0.0001	-0.253	0.253
Household Income	20,000-29,999	15,000-29,999	0.145	-0.180	0.469	-0.220	-0.508	0.068
	30,000-39,999	30,000-39,999	0.102	-0.283	0.487	-0.387	-0.806	0.032
	40,000-49,999	40,000-59,999	0.388*	0.021	0.755	-0.165	-0.494	0.164
	50,000 +	60,000 +	0.372	-0.066	0.810	-0.039	-0.446	0.368
Education	High School		0.331	-0.050	0.710	0.294	-0.070	0.657
	Some Post-Secondary		0.466	0.003	0.930	0.534*	0.090	0.979
	Post-Secondary		0.218	-0.245	0.681	0.545*	0.130	0.961
Constant			-6.361	-6545.9	6533.1	-0.888*	-1.757	-0.019
N			1076			1181		
Likelihood Ratio test			51.798***			49.715***		
Adjusted Rho-squared			0.064			0.047		
Percentage of Right Predictions			91.28			89.58		

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table F2: Regional Comparison of the Incidence of Family Physician Utilization (Bas-St-Laurent)

Explanatory Variables			1987 Coeff.	-CI	+CI	1992-93 Coeff.	-CI	+CI
General Health	Excellent		-1.139**	-1.850	-0.427	-1.515***	-2.211	-0.820
	Very Good		-0.692*	-1.329	-0.059	-1.177**	-1.818	-0.537
	Good		-0.622	-1.240	-0.004	-0.849*	-1.461	-0.236
	Fair		-0.390	-1.021	0.242	-0.688*	-1.332	-0.044
Sex	Male		-0.375**	-0.601	-0.149	-0.265*	-0.482	-0.047
Age	15-19		-1.864***	-2.734	-0.993	-0.019	-0.668	0.629
	20-24		-0.922*	-1.609	-0.235	0.006	-0.645	0.657
	25-44		-1.132**	-1.724	-0.539	-0.029	-0.539	0.481
	45-64		-0.868**	-1.437	-0.298	-0.127	-0.611	0.358
	65-74		-0.659*	-1.243	-0.074	-0.046	-0.559	0.468
Marital Status	Married		0.102	-0.259	0.463	0.031	-0.287	0.348
	Single		0.256	-0.238	0.750	0.012	-0.371	0.394
Employment	Working		0.003	-0.271	0.278	0.042	-0.227	0.312
Household Income	20,000-29,999	15,000-29,999	0.022	-0.285	0.329	-0.029	-0.308	0.250
	30,000-39,999	30,000-39,999	-0.047	-0.389	0.295	0.157	-0.229	0.544
	40,000-49,999	40,000-59,999	0.237	-0.168	0.641	-0.212	-0.599	0.175
	50,000 +	60,000 +	-0.344	-0.833	0.145	-0.167	-0.582	0.249
Education	High School		0.165	-0.136	0.467	0.107	-0.221	0.434
	Some Post-Secondary		-0.353	-0.911	0.205	0.162	-0.242	0.567
	Post-Secondary		0.262	-0.124	0.648	-0.081	-0.475	0.312
Constant			0.356	-0.452	1.164	-0.259	-0.969	0.452
N			1054			1243		
Likelihood Ratio test			74.761***			47.448***		
Adjusted Rho-squared			0.085			0.050		
Percentage of Right Predictions			85.30			91.46		

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table F3: Regional Comparison of the Incidence of Family Physician Utilization (Chaudière-Appalaches)

Explanatory Variables			1987 Coeff.	-CI	+CI	1992-93 Coeff.	-CI	+CI
General Health	Excellent		-1.381***	-2.051	-0.712	-1.345**	-2.066	-0.624
	Very Good		-1.393***	-2.033	-0.754	-1.325**	-2.014	-0.635
	Good		-1.204**	-1.836	-0.572	-1.136**	-1.811	-0.460
	Fair		-0.782*	-1.423	-0.142	-0.689	-1.384	0.007
Sex	Male		-0.212*	-0.415	-0.008	-0.256*	-0.449	-0.062
Age	15-19		-0.645	-1.315	0.024	-0.291	-0.909	0.327
	20-24		-0.528	-1.146	0.090	-0.358	-0.986	0.271
	25-44		-0.381	-0.869	0.107	-0.382	-0.865	0.101
	45-64		-0.380	-0.855	0.096	-0.284	-0.737	0.169
	65-74		-0.666*	-1.225	-0.105	-0.058	-0.552	0.436
Marital Status	Married		0.169	-0.200	0.538	-0.214	-0.501	0.072
	Single		0.060	-0.409	0.530	-0.421*	-0.795	-0.048
Employment	Working		-0.154	-0.396	0.087	0.150	-0.091	0.392
Household Income	20,000-29,999	15,000-29,999	-0.105	-0.387	0.177	0.198	-0.091	0.487
	30,000-39,999	30,000-39,999	-0.050	-0.361	0.262	0.106	-0.261	0.474
	40,000-49,999	40,000-59,999	-0.235	-0.577	0.107	0.010	-0.329	0.350
	50,000 +	60,000 +	0.178	-0.143	0.498	0.122	-0.272	0.516
Education	High School		0.064	-0.213	0.341	-0.056	-0.349	0.238
	Some Post-Secondary		0.055	-0.351	0.461	0.122	-0.232	0.477
	Post-Secondary		0.080	-0.251	0.412	0.038	-0.289	0.365
Constant			0.315	-0.468	1.098	0.402	-0.356	1.161
N			1430			1304		
Likelihood Ratio test			57.052***			62.706***		
Adjusted Rho-squared			0.052			0.054		
Percentage of Right Predictions			91.07			88.90		

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table F4: Regional Comparison of the Incidence of Family Physician Utilization (Côte-Nord)

Explanatory Variables			1987 Coeff.	-CI	+CI	1992-93 Coeff.	-CI	+CI
General Health	Excellent		-0.886	-1.788	0.015	-0.517	-1.032	-0.002
	Very Good		-0.845	-1.716	0.027	-0.546*	-1.039	-0.053
	Good		-0.583	-1.449	0.284	-0.455	-0.934	0.024
	Fair		-0.053	-0.936	0.831	-0.316	-0.828	0.195
Sex	Male		-0.561***	-0.806	-0.316	-0.405***	-0.591	-0.218
Age	15-19		-0.402	-1.320	0.517	0.329	-0.340	0.999
	20-24		-0.326	-1.171	0.519	-0.275	-0.992	0.442
	25-44		-0.688	-1.488	0.111	-0.049	-0.626	0.528
	45-64		-0.701	-1.494	0.091	0.116	-0.436	0.668
	65-74		-0.719	-1.678	0.239	0.120	-0.492	0.095
Marital Status	Married		-0.250	-0.610	0.111	-0.111	-0.389	0.167
	Single		-0.407	-0.900	0.087	-0.261	-0.617	0.095
Employment	Working		-0.059	-0.321	0.202	-0.043	-0.266	0.181
Household Income	20,000-29,999	15,000-29,999	-0.107	-0.476	0.263	0.202	-0.086	0.490
	30,000-39,999	30,000-39,999	0.167	-0.165	0.498	-0.159	-0.546	0.227
	40,000-49,999	40,000-59,999	0.226	-0.139	0.591	-0.031	-0.331	0.270
	50,000 +	60,000 +	-0.062	-0.494	0.370	-0.050	-0.376	0.277
Education	High School		0.071	-0.277	0.419	0.009	-0.292	0.310
	Some Post-Secondary		-0.201	-0.695	0.293	0.037	-0.323	0.396
	Post-Secondary		0.211	-0.195	0.616	0.011	-0.337	0.360
Constant			0.273	-0.851	1.396	-0.517	-0.951	0.431
N			91.50			89.72		
Likelihood Ratio test			65.311***			50.359***		
Adjusted Rho-squared			0.081			0.038		
Percentage of Right Predictions			91.50			89.72		

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table F5: Regional Comparison of the Incidence of Family Physician Utilization (Estrie)

Explanatory Variables			1987 Coeff.	-CI	+CI	1992-93 Coeff.	-CI	+CI
General Health	Excellent		-0.877*	-1.487	-0.267	-1.138***	-1.743	0.0532
	Very Good		-0.881**	-1.458	-0.304	-1.424***	-2.008	-0.839
	Good		-0.735*	-1.305	-0.165	-1.286***	-1.862	-0.710
	Fair		-0.371	-0.961	0.218	-1.106***	-1.729	-0.484
Sex	Male		-0.191	-0.392	0.009	-0.274**	-0.460	-0.088
Age	15-19		-0.073	-0.678	0.531	-0.511	-1.098	0.077
	20-24		-0.461	-1.051	0.128	-0.354	-0.931	0.223
	25-44		-0.243	-0.715	0.228	-0.602*	-1.078	-0.126
	45-64		-0.342	-0.793	0.110	-0.663*	-1.113	-0.212
	65-74		-0.285	-0.792	0.222	-0.286	-0.767	0.195
Marital Status	Married		-0.185	-0.476	0.105	0.014	-0.258	0.286
	Single		-0.062	-0.471	0.347	0.138	-0.200	0.476
Employment	Working		0.248	0.003	0.493	-0.320*	-0.536	-0.105
Household Income	20,000-29,999	15,000-29,999	0.075	-0.189	0.339	-0.230*	-0.493	0.033
	30,000-39,999	30,000-39,999	0.089	-0.223	0.401	-0.127	-0.473	0.219
	40,000-49,999	40,000-59,999	-0.334	-0.707	0.039	-0.020	-0.340	0.299
	50,000 +	60,000 +	0.009	-0.321	0.339	-0.097	-0.432	0.239
Education	High School		-0.188	-0.467	0.091	0.208	-0.102	0.517
	Some Post-Secondary		-0.104	-0.476	0.269	0.380*	0.006	0.754
	Post-Secondary		-0.262	-0.603	0.080	0.092	-0.259	0.443
Constant			-0.100	-0.778	0.579	0.711*	0.087	1.284
N			1433			1423		
Likelihood Ratio test			39.641***			90.421***		
Adjusted Rho-squared			0.033			0.078		
Percentage of Right Predictions			91.09			89.54		

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table F6: Regional Comparison of the Incidence of Family Physician Utilization (Gaspésie-Îles-De-La-Madeleine)

Explanatory Variables			1987 Coeff.	-CI	+CI	1992-93 Coeff.	-CI	+CI
General Health	Excellent		-1.609***	-2.259	-0.959	-0.931**	-1.532	-0.330
	Very Good		-1.198***	-1.782	-0.615	-0.929**	-1.509	-0.349
	Good		-1.388***	-1.973	-0.803	-0.763*	-1.319	-0.208
	Fair		-1.172**	-1.781	-0.562	-0.391	-0.961	0.180
Sex	Male		-0.315*	-0.566	-0.065	-0.336**	-0.535	-0.136
Age	15-19		-0.421	-1.170	0.328	-0.792*	-1.443	-0.140
	20-24		0.205	-0.442	0.852	-0.635	-1.293	0.023
	25-44		-0.064	-0.590	0.462	-0.519*	-1.021	-0.018
	45-64		-0.116	-0.626	0.394	-0.229	-0.675	0.216
	65-74		-0.320	-0.934	0.294	-0.550*	-1.062	-0.038
Marital Status	Married		-0.205	-0.557	0.147	-0.145	-0.438	0.147
	Single		-0.339	-0.849	0.172	-0.055	-0.418	0.308
Employment	Working		-0.309	-0.614	-0.003	0.181	-0.059	0.422
Household Income	20,000-29,999	15,000-29,999	-0.270	-0.607	0.067	-0.315*	-0.568	-0.061
	30,000-39,999	30,000-39,999	-0.193	-0.581	0.195	-0.145	-0.532	0.241
	40,000-49,999	40,000-59,999	0.108	-0.312	0.528	-0.190	-0.521	0.142
	50,000 +	60,000 +	0.134	-0.320	0.589	-0.180	-0.649	0.288
Education	High School		-0.000	-0.323	0.322	0.363*	0.075	0.652
	Some Post-Secondary		-0.266	-0.828	0.295	0.201	-0.219	0.621
	Post-Secondary		-0.208	-0.654	0.238	0.226	-0.139	0.592
Constant			0.747	-0.005	1.500	0.080	-0.567	0.726
N			779			1204		
Likelihood Ratio test			56.994***			62.975***		
Adjusted Rho-squared			0.071			0.057		
Percentage of Right Predictions			86.77			88.24		

* p<0.05, ** p<0.01, *** p<0.001

Table F7: Regional Comparison of the Incidence of Family Physician Utilization (Lanaudière)

Explanatory Variables			1987 Coeff.	-CI	+CI	1992-93 Coeff.	-CI	+CI
General Health	Excellent		-0.695	-1.581	0.192	-1.068*	-1.803	-0.333
	Very Good		-0.432	-1.230	0.366	-0.961*	-1.669	-0.253
	Good		-0.150	-0.947	0.646	-0.786*	-1.487	-0.086
	Fair		0.452	-0.385	1.289	-0.322	-1.059	0.415
Sex	Male		-0.655**	-0.985	-0.326	-0.424**	-0.643	-0.206
Age	15-19		5.690	-3202.3	3213.7	-0.881*	-1.617	-0.145
	20-24		5.652	-3202.3	3213.6	-0.743*	-1.444	-0.042
	25-44		5.678	-3202.3	3213.7	-1.032**	-1.613	-0.451
	45-64		5.669	-3202.3	3213.7	-0.803*	-1.361	-0.245
	65-74		6.044	-3201.9	3214.0	-0.467	-1.068	0.135
Marital Status	Married		0.239	-0.225	0.703	-0.106	-0.407	0.194
	Single		-0.023	-0.683	0.637	-0.212	-0.609	0.185
Employment	Working		-0.092	-0.440	0.256	-0.004	-0.264	0.256
Household Income	20,000-29,999	15,000-29,999	-0.047	-0.456	0.362	-0.091	-0.459	0.277
	30,000-39,999	30,000-39,999	-0.207	-0.708	0.295	0.117	-0.313	0.546
	40,000-49,999	40,000-59,999	-0.466	-1.002	0.070	0.110	-0.260	0.480
	50,000 +	60,000 +	-0.152	-0.686	0.381	0.108	-0.337	0.554
Education	High School		0.187	-0.256	0.631	-0.071	-0.402	0.260
	Some Post-Secondary		-0.172	-0.864	0.520	0.051	-0.339	0.441
	Post-Secondary		-0.067	-0.606	0.471	0.023	-0.349	0.395
Constant			-6.501	-3214.5	3201.5	0.654	-0.217	1.525
N			658			1188		
Likelihood Ratio test			67.710***			69.197***		
Adjusted o-squared			0.126			0.075		
Percentage of Right Predictions			89.04			89.98		

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table F8: Regional Comparison of the Incidence of Family Physician Utilization (Laurentides)

Explanatory Variables			1987 Coeff.	-CI	+CI	1992-93 Coeff.	-CI	+CI
General Health	Excellent		-1.168*	-2.228	-0.107	-1.142**	-1.824	-0.460
	Very Good		-0.592	-1.560	0.377	-0.836*	-1.470	-0.202
	Good		-0.528	-1.497	0.440	-0.524	-1.142	0.094
	Fair		-0.343	-1.350	0.663	-0.238	-0.884	0.407
Sex	Male		-0.253	-0.559	0.053	-0.200	-0.405	0.005
Age	15-19		-0.785	-2.126	0.555	-0.277	-0.917	0.364
	20-24		0.564	-0.452	1.581	-0.568	-1.203	0.068
	25-44		0.507	-0.337	1.351	-0.651*	-1.143	-0.159
	45-64		0.189	-0.620	0.998	-0.455	-0.923	0.013
	65-74		-0.064	-0.936	0.809	0.002	-0.503	0.507
Marital Status	Married		-0.173	-0.610	0.264	0.060	-0.211	0.332
	Single		-0.070	-0.789	0.650	-0.116	-0.473	0.242
Employment	Working		-0.201	-0.549	0.146	0.227	-0.025	0.479
Household Income	20,000-29,999	15,000-29,999	0.102	-0.336	0.540	-0.250	-0.551	0.051
	30,000-39,999	30,000-39,999	0.063	-0.388	0.513	-0.115	-0.496	0.266
	40,000-49,999	40,000-59,999	-0.258	-0.802	0.286	-0.493*	-0.846	-0.141
	50,000 +	60,000 +	0.134	-0.338	0.606	-0.455*	-0.835	-0.074
Education	High School		-0.338	-0.759	0.084	0.153	-0.159	0.466
	Some Post-Secondary		-0.420	-0.968	0.128	0.244	-0.146	0.634
	Post-Secondary		-0.585*	-1.102	-0.068	0.435**	0.079	0.791
Constant			-0.169	-1.408	1.070	-0.094	-0.769	0.580
N			552			1252		
Likelihood Ratio test			37.264***			73.983***		
Adjusted Rho-squared			0.051			0.073		
Percentage of Right Predictions			86.44			89.37		

* p<0.05, ** p<0.01, *** p<0.001

Table F9: Regional Comparison of the Incidence of Family Physician Utilization (Laval)

Explanatory Variables			1987 Coeff.	-CI	+CI	1992-93 Coeff.	-CI	+CI
General Health	Excellent		4.696	-5474	5485	-0.600	-1.221	0.021
	Very Good		5.498	-5474	5485	-0.297	-0.886	0.291
	Good		5.530	-5474	5485	-0.478	-1.064	0.107
	Fair		6.007	-5474	5486	0.094	-0.525	0.712
Sex	Male		-0.564*	-1.036	-0.093	-0.210*	-0.413	-0.008
Age	15-19		-1.150	-3.295	0.995	-0.278	-0.984	0.428
	20-24		-0.448	-2.273	1.376	-0.303	-1.008	0.401
	25-44		-0.271	-1.767	1.224	-0.456	-1.045	0.133
	45-64		0.223	-1.217	1.662	-0.379	-0.946	0.188
	65-74		0.408	-1.109	1.926	-0.145	-0.750	0.460
Marital Status	Married		0.012	-0.735	0.759	-0.166	-0.456	0.124
	Single		0.102	-1.219	1.424	-0.280	-0.660	0.099
Employment	Working		0.094	-0.418	0.607	-0.042	-0.287	0.203
Household Income	20,000-29,999	15,000-29,999	0.089	-0.896	1.074	-0.112	-0.441	0.218
	30,000-39,999	30,000-39,999	0.891	0.005	1.777	-0.284	-0.695	0.126
	40,000-49,999	40,000-59,999	0.876	-0.012	1.764	-0.341	-0.679	-0.002
	50,000 +	60,000 +	0.481	-0.448	1.410	-0.498*	-0.887	-0.108
Education	High School		0.117	-0.477	0.710	0.148	-0.175	0.471
	Some Post-Secondary		0.248	-0.550	1.046	-0.050	-0.437	0.338
	Post-Secondary		-0.253	-0.984	0.477	0.336	-0.017	0.689
Constant			-7.013	-5486.8	5472.8	-0.057	-0.829	0.715
N			313			1139		
Likelihood Ratio test			40.291***			57.450***		
Adjusted Rho-squared			0.117			0.053		
Percentage of Right Predictions			88.22			88.06		

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table F10: Regional Comparison of the Incidence of Family Physician Utilization (Mauricie-Bois-Francs)

Explanatory Variables			1987 Coeff.	-CI	+CI	1992-93 Coeff.	-CI	+CI
General Health	Excellent		-1.604***	-2.229	-0.979	-0.953**	-1.462	-0.444
	Very Good		-1.517***	-2.109	-0.925	-1.067***	-1.567	-0.565
	Good		-1.182**	-1.769	-0.596	-0.667*	-1.150	-0.183
	Fair		-0.694*	-1.303	-0.085	-0.314	-0.830	0.201
Sex	Male		0.046	-0.159	0.252	-0.117	-0.284	0.050
Age	15-19		-0.717*	-1.418	-0.016	-0.121	-0.653	0.412
	20-24		-1.030**	-1.700	-0.360	-0.032	-0.558	0.494
	25-44		-0.738*	-1.258	-0.218	0.121	-0.292	0.535
	45-64		-0.523*	-1.019	-0.026	-0.118	-0.516	0.279
	65-74		-0.411	-0.922	0.099	-0.019	-0.446	0.408
Marital Status	Married		-0.211	-0.503	-0.081	-0.037	-0.263	0.189
	Single		-0.481*	-0.940	-0.022	-0.089	-0.366	0.188
Employment	Working		-0.156	-0.403	-0.091	0.078	-0.125	0.280
Household Income	20,000-29,999	15,000-29,999	0.005	-0.282	0.292	-0.139	-0.371	0.093
	30,000-39,999	30,000-39,999	0.260	-0.019	0.540	-0.210	-0.505	0.085
	40,000-49,999	40,000-59,999	-0.085	-0.452	0.282	-0.155	-0.424	0.113
	50,000 +	60,000 +	-0.125	-0.518	0.268	-0.235	-0.570	0.099
Education	High School		0.091	-0.200	0.382	-0.204	-0.465	0.057
	Some Post-Secondary		0.344	-0.023	0.712	-0.318	-0.651	0.015
	Post-Secondary		0.194	-0.155	0.542	0.050	-0.244	0.344
Constant			0.757*	0.048	1.466	-0.189	-0.761	0.384
N			1288			1753		
Likelihood Ratio test			109.003***			66.476***		
Adjusted ho-squared			0.109			0.045		
Percentage of Right Predictions			89.01			89.48		

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table F11: Regional Comparison of the Incidence of Family Physician Utilization (Montérégie)

Explanatory Variables			1987 Coeff.	-CI	+CI	1992-93 Coeff.	-CI	+CI
General Health	Excellent		-1.151**	-1.745	-0.557	-1.440***	-2.118	-0.763
	Very Good		-0.965**	-1.522	-0.409	-1.330**	-1.989	-0.671
	Good		-0.974**	-1.534	-0.415	-1.290**	-1.943	-0.637
	Fair		-0.341	-0.921	0.239	-0.840*	-1.511	-0.170
Sex	Male		-0.108	-0.298	0.082	-0.338***	-0.502	-0.173
Age	15-19		-0.159	-0.836	0.518	-0.327	-0.897	0.242
	20-24		-0.196	-0.803	0.411	-0.278	-0.839	0.284
	25-44		-0.241	-0.785	0.302	-0.397	-0.858	0.064
	45-64		-0.453	-0.985	0.078	-0.531*	-0.978	-0.085
	65-74		-0.085	-0.635	0.465	-0.458	-0.940	0.025
Marital Status	Married		0.581**	0.226	0.937	-0.069	-0.305	0.167
	Single		0.074	-0.427	0.575	-0.273	-0.577	0.032
Employment	Working		-0.204	-0.432	0.024	-0.113	-0.312	0.086
Household Income	20,000-29,999	15,000-29,999	-0.008	-0.313	0.297	0.079	-0.192	0.350
	30,000-39,999	30,000-39,999	0.053	-0.243	0.348	-0.031	-0.377	0.316
	40,000-49,999	40,000-59,999	-0.108	-0.456	0.241	0.075	-0.222	0.371
	50,000 +	60,000 +	0.107	-0.204	0.418	0.012	-0.318	0.341
Education	High School		-0.152	-0.446	0.143	-0.074	-0.351	0.204
	Some Post-Secondary		0.074	-0.280	0.429	0.150	-0.161	0.460
	Post-Secondary		-0.126	-0.469	0.217	0.061	-0.240	0.362
Constant			-0.259	-0.982	0.465	0.758	-0.005	1.522
N			1390			1751		
Likelihood Ratio test			81.590***			70.304***		
Adjusted Rho-squared			0.0666			0.043		
Percentage of Right Predictions			87.80			87.93		

* p<0.05, ** p<0.01, *** p<0.001

Table F12: Regional Comparison of the Incidence of Family Physician Utilization (Montréal-Centre)

Explanatory Variables			1987 Coeff.	-CI	+CI	1992-93 Coeff.	-CI	+CI
General Health	Excellent		-0.347	-0.900	0.206	-0.778**	-1.220	-0.335
	Very Good		-0.114	-0.636	0.408	-0.830**	-1.252	-0.407
	Good		0.088	-0.428	0.604	-0.609**	-1.023	-0.196
	Fair		0.245	-0.297	0.787	-0.262	-0.704	0.181
Sex	Male		-0.159	-0.324	0.006	-0.166*	-0.317	-0.016
Age	15-19		0.446	-0.142	1.033	-0.553*	-1.008	-0.098
	20-24		0.332	-0.221	0.885	-0.271	-0.662	0.120
	25-44		0.331	-0.173	0.834	-0.410*	-0.725	-0.095
	45-64		0.311	-0.180	0.801	-0.420*	-0.726	-0.114
	65-74		-0.016	-0.564	0.533	-0.325	-0.658	0.008
Marital Status	Married		-0.163	-0.374	0.049	-0.199	-0.403	0.005
	Single		-0.211	-0.501	0.079	-0.105	-0.332	0.123
Employment	Working		-0.198*	-0.390	-0.006	0.003	-0.185	0.190
Household Income	20,000-29,999	15,000-29,999	-0.022	-0.251	0.206	-0.061	-0.274	0.153
	30,000-39,999	30,000-39,999	-0.096	-0.351	0.160	0.158	-0.106	0.421
	40,000-49,999	40,000-59,999	-0.092	-0.381	0.197	-0.227	-0.475	0.022
	50,000 +	60,000 +	-0.144	-0.398	0.110	-0.288	-0.580	0.004
Education	High School		-0.092	-0.334	0.151	0.112	-0.130	0.353
	Some Post-Secondary		-0.358*	-0.658	-0.058	0.095	-0.192	0.382
	Post-Secondary		-0.222	-0.494	0.051	-0.042	-0.316	0.233
Constant			-1.033**	-1.709	-0.438	-0.010	-0.493	0.473
N			1964			2251		
Likelihood Ratio test			60.386***			97.455***		
Adjusted Rho-squared			0.039			0.056		
Percentage of Right Predictions			90.48			89.77		

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table F13: Regional Comparison of the Incidence of Family Physician Utilization (Ououtais)

Explanatory Variables			1987 Coeff.	-CI	+CI	1992-93 Coeff.	-CI	+CI
General Health	Excellent		-0.956**	-1.598	-0.315	-0.724*	-1.308	-0.139
	Very Good		-0.827*	-1.432	-0.223	-0.827*	-1.384	-0.269
	Good		-0.663*	-1.263	-0.062	-0.753*	-1.302	-0.205
	Fair		-0.489	-1.123	0.146	-0.366	-0.952	0.220
Sex	Male		-0.197	-0.407	0.013	-0.168	-0.355	0.020
Age	15-19		0.134	-0.687	0.955	-0.416	-1.060	0.229
	20-24		-0.142	-0.924	0.641	-0.210	-0.812	0.392
	25-44		0.211	-0.483	0.905	-0.368	-0.888	0.151
	45-64		-0.272	-0.959	0.414	-0.152	-0.653	0.348
	65-74		0.362	-0.334	1.059	-0.005	-0.546	0.536
Marital Status	Married		-0.067	-0.357	0.224	0.158	-0.133	0.449
	Single		-0.235	-0.669	0.199	0.173	-0.174	0.521
Employment	Working		-0.062	-0.310	0.187	-0.157	-0.382	0.069
Household Income	20,000-29,999	15,000-29,999	-0.376*	-0.725	-0.027	0.058	-0.260	0.377
	30,000-39,999	30,000-39,999	-0.011	-0.311	0.288	0.002	-0.374	0.378
	40,000-49,999	40,000-59,999	-0.285	-0.663	0.094	-0.162	-0.514	0.190
	50,000 +	60,000 +	0.055	-0.261	0.370	-0.060	-0.410	0.290
Education	High School		-0.265	-0.584	0.053	0.005	-0.289	0.299
	Some Post-Secondary		0.217	-0.165	0.599	0.068	-0.301	0.437
	Post-Secondary		-0.124	-0.495	0.247	0.140	-0.189	0.468
Constant			-0.056	-0.930	0.818	-0.181	-0.882	0.520
N			1010			1256		
Likelihood Ratio test			65.889***			43.669***		
Adjusted Rho-squared			0.063			0.031		
Percentage of Right Predictions			86.40			87.29		

* p<0.05, ** p<0.01, *** p<0.001

Table F14: Regional Comparison of the Incidence of Family Physician Utilization (Québec)

Explanatory Variables			1987 Coeff.	-CI	+CI	1992-93 Coeff.	-CI	+CI
General Health	Excellent		-1.172***	-1.778	-0.565	-0.158	-0.746	0.429
	Very Good		-0.715*	-1.276	-0.154	-0.413	-0.988	0.161
	Good		-0.529	-1.090	0.031	-0.460	-1.027	0.107
	Fair		-0.146	-0.747	0.456	0.022	-0.582	0.626
Sex	Male		-0.360***	-0.568	-0.152	-0.436***	-0.614	-0.258
Age	15-19		-0.233	-0.933	0.468	-0.703*	-1.239	-0.168
	20-24		-0.571	-1.237	0.095	-1.419***	-2.061	-0.776
	25-44		-0.408	-0.973	0.158	-0.628**	-1.042	-0.214
	45-64		-0.432	-0.984	0.120	-0.416*	-0.810	-0.023
	65-74		-0.080	-0.674	0.514	-0.487*	-0.914	-0.061
Marital Status	Married		-0.080	-0.378	0.218	-0.227	-0.471	0.017
	Single		0.386	-0.797	0.025	-0.309*	-0.596	-0.022
Employment	Working		0.135	-0.110	0.380	-0.090	-0.305	0.126
Household Income	20,000-29,999	15,000-29,999	-0.331*	-0.624	-0.038	0.038	-0.221	0.298
	30,000-39,999	30,000-39,999	-0.439*	-0.759	-0.118	-0.143	-0.470	0.185
	40,000-49,999	40,000-59,999	-0.155	-0.470	0.161	-0.156	-0.449	0.137
	50,000 +	60,000 +	-0.549***	-0.900	-0.197	-0.080	-0.413	0.253
Education	High School		0.258	-0.060	0.574	0.044	-0.241	0.329
	Some Post-Secondary		0.051	-0.357	0.459	0.297	-0.032	0.626
	Post-Secondary		0.165	-0.199	0.529	0.152	-0.158	0.461
Constant			0.089	-0.638	0.815	0.087	-0.566	0.740
N			1283			1635		
Likelihood Ratio test			80.653***			112.376***		
Adjusted Rho-squared			0.078			0.084		
Percentage of Right Predictions			89.34			88.79		

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table F15: Regional Comparison of the Incidence of Family Physician Utilization (Saguenay-Lac-St-Jean)

Explanatory Variables		1987 Coeff.	-CI	+CI	1992-93 Coeff.	-CI	+CI
General Health	Excellent	-0.596*	-1.152	-0.040	-1.029**	-1.685	-0.372
	Very Good	-0.293	-0.805	0.219	-0.904*	-1.538	-0.269
	Good	0.025	-0.481	0.531	-0.771*	-1.399	-0.144
	Fair	0.070	-0.463	0.603	-0.362	-1.008	0.284
Sex	Male	-0.398***	-0.581	-0.215	-0.222*	-0.414	-0.030
Age	15-19	-0.317	-0.941	0.306	0.016	-0.595	0.627
	20-24	-0.000	-0.573	0.571	0.046	-0.540	0.633
	25-44	-0.213	-0.721	0.294	-0.253	-0.734	0.229
	45-64	-0.297	-0.792	0.198	-0.171	-0.634	0.293
	65-74	0.013	-0.520	0.546	-0.177	-0.693	0.338
Marital Status	Married	0.015	-0.266	0.296	-0.031	-0.318	0.256
	Single	-0.284	-0.677	0.108	-0.142	-0.496	0.212
Employment	Working	0.013	-0.194	0.220	0.089	-0.140	0.319
Household Income	20,000-29,999 15,000-29,999	-0.168	-0.413	0.078	-0.290*	-0.559	-0.021
	30,000-39,999 30,000-39,999	-0.327*	-0.585	-0.069	-0.406*	-0.740	-0.071
	40,000-49,999 40,000-59,999	-0.213	-0.483	0.057	-0.346*	-0.648	-0.044
	50,000 + 60,000 +	-0.270	-0.590	0.051	-0.473*	-0.869	-0.076
Education	High School	0.028	-0.213	0.269	0.012	-0.286	0.310
	Some Post-Secondary	-0.178	-0.536	0.179	0.110	-0.267	0.486
	Post-Secondary	-0.115	-0.425	0.196	0.019	-0.322	0.360
Constant		-0.498	-1.171	0.175	-0.015	-0.758	0.728
N		1721			1498		
Likelihood Ratio test		89.191***			54.114***		
Adjusted Rho-squared		0.067			0.046		
Percentage of Right Predictions		89.63			90.78		

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

APPENDIX G

TABLES OF REGIONAL ANALYSIS BY NEED LEVEL

Table G1: Regional Comparison of Utilization by Need Level (Abitibi-Témiscamingue)

			EXCELLENT/VERY GOOD/GOOD				FAIR/POOR			
Explanatory Variables			1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)	1987 Coeff.	(-CI,+CI)	1992-93 Coeff.	(-CI,+CI)
Sex	Male		-0.235	(-0.500,0.029)	-0.414**	(-0.650,-0.1778)	-1.033**	(-1.701,-0.366)	0.482	(-0.007,1.041)
Age	15-19		-0.759	(-1.859,0.342)	-0.515	(-1.466,0.436)	-6.871	(-2433,2419)	-4.777	(-11433,11423)
	20-24		-0.321	(-1.293,0.651)	-0.032	(-0.944,0.880)	-0.535	(-2.315,1.245)	1.104	(-0.775,2.984)
	25-44		-0.792	(-1.664,0.205)	-0.116	(-0.949,0.718)	-0.500	(-1.982,0.982)	1.110	(-0.220,2.439)
	45-64		-0.446	(-1.364,0.472)	-0.152	(-0.975,0.672)	-0.660	(-2.041,0.722)	0.230	(-1.032,1.493)
	65-74		-0.419	(-1.458,0.620)	-0.070	(-0.979,0.839)	-0.146	(-1.481,1.190)	0.252	(-1.024,1.528)
Marital Status	Married		-0.056	(-0.481,0.369)	-0.068	(-0.413,0.276)	0.229	(-0.762,1.220)	-0.048	(-0.691,0.596)
	Single		-0.388	(-1.045,0.269)	-0.015	(-0.416,0.385)	1.217	(-0.213,2.647)	-0.624	(-1.481,0.234)
Employment	Working		0.107	(-0.201,0.414)	0.054	(-0.224,0.331)	-0.615	(-1.521,0.291)	-0.009	(-0.699,0.682)
Household Income	20,000-29,999	15,000-29,999	0.253	(-0.113,0.620)	-0.158	(-0.494,0.178)	-0.304	(-1.171,0.563)	-0.325	(-0.963,0.312)
	30,000-39,999	30,000-39,999	0.134	(-0.296,0.564)	-0.425	(-0.901,0.051)	0.447	(-0.632,1.526)	0.275	(-0.783,1.334)
	40,000-49,999	40,000-59,999	0.432*	(0.023,0.841)	-0.102	(-0.467,0.263)	0.269	(-0.830,1.368)	-0.244	(-1.258,0.770)
	50,000 +	60,000 +	0.491*	(0.026,0.956)	-0.061	(-0.510,0.389)	-0.409	(-2663,2655)	0.048	(-1.311,1.408)
Education	High School		0.311	(-0.145,0.766)	0.349	(-0.105,0.803)	0.223	(-0.544,0.990)	0.078	(-0.629,0.784)
	Some Post-Secondary		0.432	(-0.093,0.957)	0.628*	(0.106,1.151)	0.103	(-1.273,1.478)	0.085	(-1.144,1.314)
	Post-Secondary		0.124	(-0.414,0.662)	0.571*	(0.075,1.067)	0.436	(-0.761,1.633)	0.284	(-0.715,1.283)
Constant			-1.179*	(-2.022,-0.336)	-1.284**	(-2.064,-0.504)	-0.232	(-1.402,0.938)	-1.458*	(-2.693,-0.223)
N			950		1025		126		156	
Likelihood Ratio test			24.386***		33.025***		27.938***		21.281***	
Adjusted Rho-squared			0.032		0.038		0.125		0.035	
Percentage Right Predictions			92.49		90.99		82.56		82.56	

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table G2: Regional Comparison of Utilization by Need Level (Bas-St-Laurent)

			EXCELLENT/VERY GOOD/GOOD				FAIR/POOR			
Explanatory Variables			1987 Coeff.		1992-93 Coeff.		1987 Coeff.		1992-93 Coeff.	
Sex	Male		-0.375**	(-0.626,-0.125)	-0.174	(-0.406,0.058)			-0.822*	(-1.417,-0.227)
Age	15-19		-1.896***	(-2.816,-0.976)	-0.008	(-0.728,0.712)			-0.699	(-2.497,1.100)
	20-24		-1.060*	(-1.802,-0.318)	0.071	(-0.631,0.773)			-5.879	(-2142,2130)
	25-44		-1.221***	(-1.879,-0.563)	-0.069	(-0.650,0.512)			-0.045	(-1.297,1.207)
	45-64		-0.915**	(-1.558,-0.271)	-0.090	(-0.652,0.473)			-0.256	(-1.303,0.791)
	65-74		-0.512	(-1.195,0.172)	-0.043	(-0.658,0.572)			0.020	(-0.991,1.032)
Marital Status	Married		0.191	(-0.229,0.612)	0.043	(-0.303,0.389)			0.105	(-0.673,0.882)
	Single		0.388	(-0.165,0.942)	0.023	(-0.392,0.439)			0.340	(-0.627,1.306)
Employment	Working		0.138	(-0.153,0.428)	0.058	(-0.221,0.337)			-0.771	(-1.956,0.413)
Household Income	20,000-29,999	15,000-29,999	-0.130	(-0.475,0.215)	0.080	(-0.227,0.386)			-0.703	(-1.547,0.140)
	30,000-39,999	30,000-39,999	-0.079	(-0.443,0.294)	0.274	(-0.147,0.695)			-0.785	(-2.047,0.476)
	40,000-49,999	40,000-59,999	0.167	(-0.242,0.575)	-0.068	(-0.474,0.339)			-0.488	(-1.846,0.869)
	50,000 +	60,000 +	-0.432	(-0.925,0.062)	-0.154	(-0.590,0.282)			0.018	(-1.894,1.929)
Education	High School		0.169	(-0.189,0.527)	-0.157	(-0.535,0.222)			0.636	(-0.042,1.314)
	Some Post-Secondary		-0.303	(-0.877,0.271)	-0.066	(-0.503,0.371)			0.858	(-0.480,2.197)
	Post-Secondary		0.238	(-0.185,0.660)	-0.318	(-0.738,0.101)			0.424	(-1.392,2.240)
Constant			-0.419	(-1.062,0.225)	-1.245***	(-1.768,-0.722)			-0.691	(-1.560,0.178)
N			918		1094				149	
Likelihood Ratio test			44.129***		10.833***				23.856***	
Adjusted Rho-squared			0.061		0.004				0.072	
Percentage Right Predictions			90.70		92.61				83.51	

* p<0.05, ** p<0.01, *** p<0.001

Table G3: Regional Comparison of Utilization by Need Level (Chaudière-Appalaches)

			EXCELLENT/VERY GOOD/GOOD			FAIR/POOR			
Explanatory Variables			1987 Coeff.		1992-93 Coeff.		1987 Coeff.		1992-93 Coeff.	
Sex	Male		-0.122	(-0.350,0.106)	-0.344**	(-0.560,-0.128)	-0.548*	(-1.009,-0.086)	-0.016	(-0.515,0.484)
Age	15-19		-0.332	(-1.135,0.490)	-0.413	(-1.159,0.333)	-1.631	(-3.372,0.110)	-0.129	(-1.563,1.306)
	20-24		-0.309	(-1.034,0.415)	-0.383	(-1.128,0.363)	-5.349	(-2937,2927)	-5.905	(-1902,1890)
	25-44		-0.296	(-0.904,0.313)	-0.475	(-1.104,0.153)	-0.762	(-1.714,0.190)	-0.566	(-1.557,0.426)
	45-64		-0.267	(-0.860,0.327)	-0.468	(-1.087,0.151)	-0.611	(-1.505,0.283)	0.185	(-0.528,0.897)
	65-74		-1.248*	(-0.219,-0.301)	0.055	(-0.598,0.708)	-0.210	(-1.124,0.704)	-0.311	(-1.113,0.491)
Marital Status	Married		0.105	(-0.298,0.507)	-0.067	(-0.403,0.268)	0.750	(-0.156,1.656)	-0.726*	(-1.356,-0.095)
	Single		-0.250	(-0.816,0.317)	-0.323	(-0.742,0.097)	1.234*	(-0.216,2.253)	-0.604	(-1.582,0.373)
Employment	Working		-0.206	(-0.468,0.056)	0.134	(-0.130,0.398)	-0.065	(-0.721,0.590)	0.607	(-0.125,1.340)
Household Income	20,000-29,999	15,000-29,999	-0.174	(-0.499,0.151)	0.116	(-0.226,0.458)	-0.102	(-0.690,0.487)	0.462	(-0.144,1.067)
	30,000-39,999	30,000-39,999	-0.143	(-0.487,0.200)	0.095	(-0.314,0.504)	0.147	(-0.689,0.984)	-0.536	(-1.634,0.562)
	40,000-49,999	40,000-59,999	-0.360	(-0.745,0.026)	-0.075	(-0.459,0.310)	0.012	(-0.804,0.828)	-0.100	(-1.004,0.804)
	50,000 +	60,000 +	0.125	(-0.221,0.472)	0.006	(-0.425,0.438)	-0.256	(-1.367,0.855)	0.258	(-0.923,1.439)
Education	High School		0.077	(-0.259,0.413)	0.101	(-0.250,0.452)	-0.047	(-0.608,0.514)	-0.229	(-0.856,0.398)
	Some Post-Secondary		0.062	(-0.400,0.525)	0.360	(-0.037,0.756)	-0.100	(-1.132,0.932)	-5.845	(-1753,1742)
	Post-Secondary		0.103	(-0.276,0.482)	0.189	(-0.183,0.561)	0.024	(-0.966,1.014)	-0.382	(-1.374,0.609)
Constant			-0.970**	(-1.575,-0.365)	-0.884*	(-1.508,-0.259)	-0.700	(-1.728,0.328)	-0.046	(-0.763,0.672)
N			1249		1148		181		156	
Likelihood Ratio Test			25.944***		26.781***		17.441***		32.551***	
Adjusted Rho-squared			0.027		0.024		0.004		0.087	
Percentage Right Predictions			92.52		90.55		78.04		75.89	

* p<0.05, ** p<0.01, *** p<0.001

Table G4: Regional Comparison of Utilization by Need Level (Côte-Nord)

			EXCELLENT/VERY GOOD/GOOD				FAIR/POOR			
Explanatory Variables			1987 Coeff.		1992-93 Coeff.		1987 Coeff.		1992-93 Coeff.	
Sex	Male		-0.550**	(-0.820,-0.280)	-0.424***	(-0.629,-0.220)	-0.727*	(-1.392,-0.063)	-0.439	(-0.937,0.060)
Age	15-19		-0.306	(-1.383,0.771)	0.209	(-0.613,1.031)	-5.999	(-101.52,89.52)	-0.092	(-1.588,1.404)
	20-24		-0.304	(-1.318,0.709)	-0.360	(-1.216,0.497)	-1.945	(-4.710,0.820)	-5.523	(-4090,4079)
	25-44		-0.709	(-1.694,0.276)	-0.224	(-0.962,0.514)	-1.491	(-3.420,0.437)	0.153	(-0.885,1.191)
	45-64		-0.603	(-1.579,0.373)	-0.091	(-0.806,0.624)	-2.054*	(-3.993,-0.116)	0.520	(-0.370,1.410)
	65-74		-0.797	(-2.055,0.460)	0.309	(-0.489,1.108)	-1.717	(-3.840,0.406)	-0.152	(-1.139,0.835)
Marital Status	Married		-0.199	(-0.621,0.222)	-0.150	(-0.464,0.163)	-0.551	(-1.319,0.216)	0.187	(-0.439,0.813)
	Single		-0.461	(-1.009,0.087)	-0.333	(-0.721,0.055)	-0.092	(-1.543,1.359)	0.368	(-0.599,1.335)
Employment	Working		-0.046	(-0.324,0.233)	0.002	(-0.238,0.243)	0.352	(-0.556,1.261)	-0.242	(-0.917,0.434)
Household Income	20,000-29,999	15,000-29,999	-0.087	(-0.513,0.339)	0.135	(-0.196,0.466)	-0.388	(-1.295,0.519)	0.446	(-0.182,1.074)
	30,000-39,999	30,000-39,999	0.274	(-0.099,0.647)	-0.201	(-0.641,0.240)	-0.526	(-1.464,0.412)	0.024	(-0.811,0.860)
	40,000-49,999	40,000-59,999	0.284	(-0.117,0.686)	-0.068	(-0.401,0.266)	0.035	(-1.375,1.446)	0.102	(-0.669,0.873)
	50,000 +	60,000 +	-0.040	(-0.513,0.432)	-0.085	(-0.439,0.269)	-0.935	(-2.436,0.566)	-0.041	(-1.121,1.039)
Education	High School		0.196	(-0.223,0.616)	0.131	(-0.227,0.488)	-0.452	(-1.298,0.394)	-0.315	(-0.981,0.352)
	Some Post-Secondary		-0.202	(-0.800,0.395)	0.124	(-0.294,0.543)	0.158	(-0.974,1.290)	-0.153	(-0.962,0.655)
	Post-Secondary		0.369	(-0.102,0.840)	0.124	(-0.280,0.528)	-0.853	(-2.182,0.477)	-0.391	(-1.236,0.454)
Constant			-0.714	(-1.615,0.187)	-0.896*	(-1.566,-0.226)	1.970	(-0.166,4.106)	-1.044*	(-1.965,-0.123)
N			1041		1299		112		192	
Likelihood Ratio test			43.220***		38.839***		19.721***		15.336***	
Adjusted Rho-squared			0.065		0.036		0.040		0.006	
Percentage Right Predictions			92.68		90.60		80.63		83.05	

* p<0.05, ** p<0.01, *** p<0.001

Table G5: Regional Comparison of Utilization by Need Level (Estrie)

			EXCELLENT/VERY GOOD/GOOD				FAIR/POOR			
Explanatory Variables			1987 Coeff.		1992-93 Coeff.		1987 Coeff.		1992-93 Coeff.	
Sex	Male		-0.215	(-0.437,0.006)	-0.186	(-0.371,-0.002)	-0.065	(-0.595,0.465)	-0.204	(-0.696,0.289)
Age	15-19		-0.300	(-0.997,0.397)	-0.365	(-0.970,0.241)	0.927	(-5193,5195)	-0.162	(-2.347,2.023)
	20-24		-0.556	(-1.239,0.127)	-0.267	(-0.864,0.331)	-5.243	(-2354,2344)	-0.379	(-2.159,1.401)
	25-44		-0.324	(-0.905,0.256)	-0.504	(-1.013,0.004)	-0.249	(-1.215,0.717)	-1.063*	(-2.002,-0.123)
	45-64		-0.399	(-0.969,0.170)	-0.551*	(-1.044,-0.058)	-0.066	(-0.900,0.768)	-0.810*	(-1.560,-0.061)
	65-74		-0.457	(-1.108,0.195)	-0.140	(-0.643,0.364)	0.259	(-0.697,1.214)	-0.427	(-1.255,0.400)
Marital Status	Married		-0.050	(-0.405,0.304)	0.062	(-0.212,0.336)	-0.684*	(-1.302,-0.066)	-0.391	(-1.045,0.262)
	Single		0.214	(-0.247,0.674)	0.058	(-0.284,0.400)	-6.308	(-1580,1567)	0.162	(-0.598,0.921)
Employment	Working		0.176	(-0.090,0.442)	-0.237*	(-0.453,-0.022)	0.823*	(0.100,1.546)	-0.493	(-1.232,0.246)
Household Income	20,000-29,999	15,000-29,999	0.101	(-0.194,0.395)	-0.147	(-0.400,0.107)	0.049	(-0.611,0.708)	-0.969*	(-1.726,-0.211)
	30,000-39,999	30,000-39,999	0.152	(-0.186,0.489)	-0.128	(-0.470,0.215)	-0.740	(-1.864,0.385)	-0.706	(-2.020,0.609)
	40,000-49,999	40,000-59,999	-0.312	(-0.726,0.102)	-0.153	(-0.464,0.157)	-0.632	(-1.705,0.440)	0.200	(-0.567,0.966)
	50,000 +	60,000 +	0.075	(-0.267,0.417)	-0.119	(-0.447,0.209)	-5.919	(-2452,2440)	-0.507	(-1.644,0.630)
Education	High School		-0.214	(-0.541,0.114)	0.269	(-0.064,0.602)	-0.110	(-0.693,0.472)	0.272	(-0.366,0.910)
	Some Post-Secondary		-0.166	(-0.572,0.240)	0.465*	(0.082,0.847)	0.265	(-1.259,1.790)	-0.331	(-1.276,0.614)
	Post-Secondary		-0.336	(-0.722,0.051)	0.165	(-0.204,0.533)	0.540	(-0.450,1.530)	-0.136	(-1.056,0.784)
Constant			-0.917**	(-1.453,-0.380)	-0.821**	(-1.286,-0.355)	-0.435	(-1.189,0.319)	0.395	(-0.403,1.193)
N			1253		1416		180		177	
Likelihood Ratio test			17.911***		37.117***		23.858***		37.278***	
Adjusted Rho-squared			0.014		0.029		0.060		0.124	
Percentage Right Predictions			92.33		89.69		81.23		80.27	

* p<0.05, ** p<0.01, *** p<0.001

Table G6: Regional Comparison of Utilization by Need Level (Gaspésie-Îles-De-La-Madeleine)

			EXCELLENT/VERY GOOD/GOOD				FAIR/POOR			
Explanatory Variables			1987 Coeff.		1992-93 Coeff.		1987 Coeff.		1992-93 Coeff.	
Sex	Male		-0.429**	(-0.709,-0.149)	-0.442**	(-0.669,-0.215)	0.154	(-0.475,0.782)	0.086	(-0.409,0.581)
Age	15-19		-0.549	(-1.390,0.293)	-0.484	(-1.257,0.288)	-0.383	(-2.327,1.562)	-7.104	(-2015,2001)
	20-24		0.019	(-0.688,0.726)	-0.499	(-1.288,0.290)	-4.952	(-9852,9842)	-1.373	(-2.992,0.247)
	25-44		-0.432	(-1.035,0.170)	-0.410	(-1.052,0.231)	0.596	(-0.665,1.858)	-1.083*	(-2.078,-0.088)
	45-64		-0.526	(-1.118,0.066)	-0.299	(-0.899,0.300)	1.009	(-0.116,2.134)	-0.101	(-0.815,0.613)
	65-74		-0.664	(-1.406,0.078)	-0.280	(-0.919,0.360)	0.748	(-0.509,2.005)	-1.420*	(-2.643,-0.196)
Marital Status	Married		-0.076	(-0.460,0.307)	-0.201	(-0.540,0.138)	-0.321	(-1.272,0.629)	-0.160	(-0.810,0.490)
	Single		-0.545	(-1.140,0.050)	-0.214	(-0.624,0.196)	0.553	(-0.646,1.752)	0.538	(-0.358,1.434)
Employment	Working		-0.356*	(-0.678,-0.033)	0.330*	(0.063,0.596)	0.544	(-0.658,1.745)	-0.656	(-1.444,0.133)
Household Income	20,000-29,999	15,000-29,999	-0.136	(-0.505,0.233)	-0.244	(-0.535,0.047)	-0.988*	(-1.916,-0.061)	-0.481	(-1.100,0.138)
	30,000-39,999	30,000-39,999	-0.079	(-0.500,-0.342)	-0.072	(-0.486,0.341)	-0.470	(-1.435,0.496)	-5.389	(-2011,2000)
	40,000-49,999	40,000-59,999	0.167	(-0.276,0.610)	-0.179	(-0.559,0.200)	0.081	(-1.849,2.011)	-0.085	(-0.878,0.708)
	50,000 +	60,000 +	0.299	(-0.175,0.772)	-0.106	(-0.592,0.380)	-6.148	(-9050,9038)	-5.114	(-3804,3794)
Education	High School		0.003	(-0.370,0.376)	0.246	(-0.098,0.589)	0.274	(-0.470,1.017)	0.738*	(0.131,1.346)
	Some Post-Secondary		-0.175	(-0.772,0.421)	-0.099	(-0.603,0.406)	-5.322	(-8457,8446)	1.430**	(0.485,2.375)
	Post-Secondary		-0.204	(-0.711,0.303)	0.039	(-0.383,0.460)	0.296	(-0.951,1.542)	0.560	(-0.369,1.489)
Constant			-0.352	(-0.952,0.248)	-0.701*	(-1.233,-0.169)	-1.238	(-2.601,0.124)	-0.494	(-1.190,0.203)
N			670		1024		109		180	
Likelihood Ratio test			35.914***		31.841***		17.481***		38.234***	
Adjusted Rho-squared			0.055		0.034		0.002		0.119	
Percent Right Predictions			88.98		90.34		77.80		75.73	

* p<0.05, ** p<0.01, *** p<0.001

Table G7: Regional Comparison of Utilization by Need Level (Lanaudière)

			EXCELLENT/VERY GOOD/GOOD				FAIR/POOR			
Explanatory Variables			1987 Coeff.		1992-93 Coeff.		1987 Coeff.		1992-93 Coeff.	
Sex	Male		-0.731**	(-1.106,-0.356)	-0.479**	(-0.722,-0.236)	-0.464	(-1.260,0.332)	-0.126	(-0.751,0.499)
Age	15-19		5.237	(-7101,7112)	-0.961*	(-1.726,-0.195)	4.838	(-8779,8789)	-5.639	(-3180,3169)
	20-24		5.244	(-7101,7112)	-0.943*	(-1.675,-0.211)	5.437	(-8779,8789)	0.398	(-2.539,3.336)
	25-44		5.237	(-7101,7112)	-1.264**	(-1.883,-0.645)	5.584	(-8778,8790)	-0.145	(-2.322,2.031)
	45-64		5.162	(-7101,7112)	-0.898**	(-1.492,-0.304)	6.041	(-8778,8790)	0.330	(-1.669,2.329)
	65-74		5.885	(-7101,7112)	-0.838*	(-1.504,-0.172)	5.469	(-8778,8789)	1.406	(-0.684,3.496)
Marital Status	Married		0.357	(-0.188,0.903)	-0.262	(-0.593,0.069)	0.170	(-0.932,1.273)	0.682	(-0.114,1.479)
	Single		0.028	(-0.805,0.861)	-0.269	(-0.695,0.158)	0.499	(-0.855,1.852)	0.168	(-1.126,1.462)
Employment	Working		-0.098	(-0.490,0.294)	0.036	(-0.247,0.320)	0.290	(-0.648,1.228)	-0.189	(-1.057,0.679)
Household Income	20,000-29,999	15,000-29,999	-0.064	(-0.527,0.399)	-0.098	(-0.523,0.328)	-0.270	(-1.189,0.648)	-0.514	(-1.400,0.373)
	30,000-39,999	30,000-39,999	-0.320	(-0.883,0.243)	0.161	(-0.324,0.646)	0.269	(-1.035,1.572)	-0.272	(-1.469,0.926)
	40,000-49,999	40,000-59,999	-0.526	(-1.133,0.081)	0.124	(-0.303,0.550)	-0.058	(-1.507,1.391)	-0.081	(-0.960,0.798)
	50,000 +	60,000 +	-0.113	(-0.694,0.469)	0.171	(-0.322,0.664)	-0.573	(-2.223,1.077)	-5.596	(-2586,2575)
Education	High School		0.148	(-0.362,0.659)	-0.248	(-0.617,0.122)	0.405	(-0.545,1.355)	0.998*	(0.017,1.978)
	Some Post-Secondary		-0.311	(-1.094,0.472)	-0.076	(-0.501,0.349)	0.100	(-1.543,1.743)	0.336	(-0.801,1.474)
	Post-Secondary		-0.031	(-0.640,-0.578)	-0.028	(-0.436,0.380)	-0.571	(-1.795,0.652)	0.119	(-0.853,1.091)
Constant			-6.468	(-7113,710)	0.113	(-0.494,0.719)	-6.325	(-8790,8778)	-1.428	(-3.338,0.482)
N			582		1071		76		117	
Likelihood Ratio test			40.001***		48.678***		10.449***		32.182***	
Adjusted Rho-squared			0.096		0.064		0.126		0.131	
Percentage Right Predictions			91.75		91.37		74.88		80.19	

* p<0.05, ** p<0.01, *** p<0.001

Table G8: Regional Comparison of Utilization by Need Level (Laurentides)

			EXCELLENT/VERY GOOD/GOOD				FAIR/POOR			
Explanatory Variables			1987 Coeff.		1992-93 Coeff.		1987 Coeff.		1992-93 Coeff.	
Sex	Male		-0.262	(-0.591,0.068)	-0.200	(-0.422,0.022)			-0.452	(-0.973,0.069)
Age	15-19		-1.269	(-2.760,0.222)	-0.462	(-1.195,0.271)			-0.565	(-2.552,1.421)
	20-24		0.146	(-1.084,1.375)	-0.607	(-1.336,0.122)			-0.735	(-2.325,0.855)
	25-44		0.087	(-1.006,1.180)	-0.854*	(-1.455,-0.254)			-0.085	(-0.933,0.764)
	45-64		-0.159	(-1.231,0.913)	-0.630*	(-1.211,-0.049)			-0.321	(-1.049,0.408)
	65-74		-0.367	(-1.543,0.810)	-0.092	(-0.714,0.531)			0.063	(-0.752,0.878)
Marital Status	Married		-0.002	(-0.521,0.518)	0.029	(-0.279,0.336)			0.242	(-0.326,0.810)
	Single		0.196	(-0.586,0.979)	-0.183	(-0.583,0.217)			0.075	(-0.721,0.872)
Employment	Working		-0.242	(-0.610,0.127)	0.233	(-0.037,0.503)			0.175	(-0.616,0.966)
Household Income	20,000-29,999	15,000-29,999	0.067	(-0.414,0.549)	-0.303	(-0.643,0.038)			-0.267	(-0.869,0.336)
	30,000-39,999	30,000-39,999	-0.006	(-0.488,0.477)	-0.169	(-0.587,0.250)			-0.306	(-1.344,0.733)
	40,000-49,999	40,000-59,999	-0.364	(-0.958,0.231)	-0.574*	(-0.963,-0.184)			-0.143	(-1.086,0.800)
	50,000 +	60,000 +	0.127	(-0.375,0.629)	-0.506*	(-0.912,-0.099)			-0.836	(-2.359,0.688)
Education	High School		-0.175	(-0.661,0.312)	0.195	(-0.180,0.570)			-0.059	(-0.619,0.502)
	Some Post-Secondary		-0.273	(-0.871,0.326)	0.149	(-0.293,0.591)			0.398	(-0.517,1.313)
	Post-Secondary		-0.373	(-0.939,0.194)	0.400	(-0.007,0.807)			0.754	(-0.114,1.621)
Constant			-0.670	(-1.746,0.406)	-0.571	(-1.176,0.034)			-0.438	(-1.104,0.228)
N			486		1100				152	
Likelihood Ratio test			19.349***		31.862***				11.937***	
Adjusted Rho-squared			0.023		0.034				0.041	
Percentage Right Predictions			88.21		91.01				75.48	

* p<0.05, ** p<0.01, *** p<0.001

Table G9: Regional Comparison of Utilization by Need Level (Laval)

			EXCELLENT/VERY GOOD/GOOD				FAIR/POOR			
Explanatory Variables			1987 Coeff.		1992-93 Coeff.		1987 Coeff.		1992-93 Coeff.	
Sex	Male		-0.406	(-0.897,0.086)	-0.280*	(-0.501,-0.058)			0.111	(-0.463,0.685)
Age	15-19		4.171	(-5327,5335)	-0.300	(-1.065,0.464)			0.239	(-1.778,2.256)
	20-24		4.950	(-5326,5336)	-0.328	(-1.085,0.428)			-5.114	(-4329,4319)
	25-44		4.976	(-5326,5336)	-0.599	(-1.243,0.045)			0.426	(-1.132,1.985)
	45-64		5.583	(-5325,5337)	-0.551	(-1.177,0.074)			0.501	(-0.931,1.933)
	65-74		6.009	(-5325,5337)	-0.324	(-1.009,0.361)			0.839	(-0.641,2.320)
Marital Status	Married		0.104	(-0.756,0.965)	-0.282	(-0.597,0.034)			0.393	(-0.403,1.189)
	Single		0.283	(-1.113,1.680)	-0.453*	(-0.864,-0.041)			0.599	(-0.524,1.722)
Employment	Working		0.040	(-0.507,0.587)	0.073	(-0.195,0.340)			-0.943*	(-1.765,-0.121)
Household Income	20,000-29,999	15,000-29,999	0.279	(-0.910,1.469)	-0.003	(-0.390,0.384)			-0.385	(-1.113,0.344)
	30,000-39,999	30,000-39,999	0.972	(-0.064,2.008)	-0.143	(-0.601,0.315)			-0.603	(-1.723,0.516)
	40,000-49,999	40,000-59,999	1.165*	(0.142,2.188)	-0.184	(-0.574,0.205)			-0.853*	(-1.661,-0.045)
	50,000 +	60,000 +	0.587	(-0.486,1.659)	-0.372	(-0.804,0.061)			-0.023	(-1.202,1.156)
Education	High School		0.280	(-0.353,0.913)	0.091	(-0.278,0.460)			0.378	(-0.384,1.139)
	Some Post-Secondary		0.163	(-0.684,1.010)	-0.147	(-0.585,0.291)			0.483	(-0.469,1.436)
	Post-Secondary		-0.241	(-1.041,0.558)	0.239	(-0.163,0.641)			0.659	(-0.146,1.464)
Constant			-7.284	(-5338,5324)	-0.328	(-0.963,0.307)			-1.300	(-2.846,0.247)
N			283		1012				127	
Likelihood Ratio test			32.001***		31.716***				23.713***	
AdjustedRho-squared			0.111		0.032				0.043	
Percentage Right Predictions			88.93		89.74				76.77	

* p<0.05, ** p<0.01, *** p<0.001

Table G10: Regional Comparison of Utilization by Need Level (Mauricie-Bois-Francs)

			EXCELLENT/VERY GOOD/GOOD				FAIR/POOR			
Explanatory Variables			1987 Coeff.		1992-93 Coeff.		1987 Coeff.	1992-93 Coeff.		
Sex	Male		0.079	(-0.152,0.310)	-0.067	(-0.248,0.114)	0.282	(-0.243,0.807)	-0.316	(-0.759,0.127)
Age	15-19		-0.783	(-1.624,0.058)	-0.534	(-1.121,0.053)	0.108	(-1.513,1.728)	1.504*	(0.093,2.916)
	20-24		-0.976	(-1.697,-0.255)	-0.224	(-0.782,0.335)	-5.905	(-1096,1084)	-4.843	(-4958,4948)
	25-44		-0.743*	(-1.321,-0.166)	-0.193	(-0.647,0.261)	-1.321*	(-2.538,-0.104)	1.251**	(0.276,2.227)
	45-64		-0.580*	(-1.146,-0.013)	-0.327	(-0.769,0.114)	-0.451	(-1.514,0.611)	0.404	(-0.472,1.280)
	65-74		-0.511*	(-1.091,0.068)	-0.126	(-0.602,0.350)	-0.446	(-1.594,0.703)	0.314	(-0.602,1.230)
Marital Status	Married		-0.225	(-0.554,0.104)	-0.041	(-0.294,0.212)	-0.281	(-0.928,0.366)	0.156	(-0.387,0.699)
	Single		-0.731*	(-1.324,-0.138)	-0.035	(-0.334,0.264)	0.522	(-0.366,1.409)	-0.357	(-1.183,0.469)
Employment	Working		-0.201	(-0.469,0.066)	0.048	(-0.168,0.265)	0.201	(-0.474,0.877)	-0.239	(-0.866,0.387)
Household Income	20,000-29,999	15,000-29,999	0.062	(-0.256,0.381)	-0.064	(-0.325,0.198)	-0.289	(-0.994,0.416)	-0.386	(-0.923,0.151)
	30,000-39,999	30,000-39,999	0.238	(-0.074,0.549)	-0.078	(-0.397,0.240)	0.642	(-0.074,1.358)	-1.460*	(-2.833,-0.088)
	40,000-49,999	40,000-59,999	-0.184	(-0.615,0.247)	-0.050	(-0.344,0.244)	0.490	(-0.436,1.416)	-0.740	(-1.508,0.029)
	50,000 +	60,000 +	-0.059	(-0.479,0.362)	-0.201	(-0.574,0.172)	-0.435	(-1.549,0.680)	-0.171	(-1.089,0.747)
Education	High School		0.062	(-0.276,0.400)	-0.136	(-0.437,0.166)	0.165	(-0.490,0.820)	-0.324	(-0.908,0.259)
	Some Post-Secondary		0.394	(-0.021,0.809)	-0.227	(-0.597,0.143)	-0.425	(-1.327,0.478)	-0.841	(-1.717,0.036)
	Post-Secondary		0.196	(-0.190,0.581)	0.057	(-0.271,0.386)	-0.520	(-1.615,0.575)	-0.097	(-0.912,0.718)
Constant			-0.561*	(-1.075,-0.047)	-0.929***	(-1.346,-0.512)	0.090	(-0.953,1.133)	-0.672	(-1.529,0.185)
N			1142		1564		146		189	
Likelihood Ratio test			38.88***		16.854***		29.963***		32.812***	
AdjustedRho-squared			0.046		0.008		0.062		0.083	
Percent Right Predictions			91.64		90.96		74.65		77.30	

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table G11: Regional Comparison of Utilization by Need Level (Montérégie)

			EXCELLENT/VERY GOOD/GOOD			FAIR/POOR			
Explanatory Variables			1987 Coeff.		1992-93 Coeff.		1987 Coeff.		1992-93 Coeff.	
Sex	Male		-0.121	(-0.330,0.089)	-0.355**	(-0.532,-0.179)	-0.077	(-0.563,0.409)	-0.158	(-0.636,0.320)
Age	15-19		-0.174	(-0.943,0.596)	-0.285	(-0.904,0.335)	-5.823	(-6243,6231)	-1.028	(-2.529,0.472)
	20-24		-0.218	(-0.931,0.495)	-0.233	(-0.839,0.373)	-0.694	(-2.258,0.870)	-5.748	(-1365,1353)
	25-44		-0.261	(-0.923,0.402)	-0.423	(-0.931,0.084)	-0.706	(-1.858,0.445)	-0.292	(-1.469,0.884)
	45-64		-0.560	(-1.226,0.106)	-0.507*	(-1.002,-0.013)	-0.270	(-1.179,0.639)	-0.886	(-1.985,0.214)
	65-74		-0.193	(-0.887,0.501)	-0.525	(-1.074,0.023)	0.071	(-0.863,1.004)	-0.555	(-1.665,0.555)
Marital Status	Married		0.719**	(0.266,1.172)	-0.063	(-0.323,0.197)	0.144	(-0.511,0.799)	-0.213	(-0.821,0.395)
	Single		0.225	(-0.351,0.801)	-0.254	(-0.591,0.083)	-5.725	(-4643,4632)	-0.267	(-0.991,0.457)
Employment	Working		-0.236	(-0.481,0.009)	-0.073	(-0.286,0.139)	0.195	(-0.484,0.874)	-0.605	(-1.252,0.041)
Household Income	20,000-29,999	15,000-29,999	-0.026	(-0.364,0.312)	0.091	(-0.223,0.405)	0.005	(-0.772,0.781)	0.005	(-0.561,0.572)
	30,000-39,999	30,000-39,999	0.011	(-0.343,0.321)	-0.084	(-0.473,0.305)	0.350	(-0.351,1.052)	0.298	(-0.596,1.193)
	40,000-49,999	40,000-59,999	-0.163	(-0.542,0.216)	0.030	(-0.310,0.370)	-0.109	(-1.147,0.929)	0.447	(-0.233,1.127)
	50,000 +	60,000 +	0.066	(-0.277,0.408)	-0.024	(-0.389,0.340)	0.126	(-0.697,0.950)	0.379	(-0.646,1.404)
Education	High School		-0.138	(-0.487,0.211)	-0.141	(-0.460,0.178)	0.067	(-0.551,0.684)	-0.016	(-0.595,0.562)
	Some Post-Secondary		0.100	(-0.299,0.498)	0.094	(-0.248,0.436)	0.694	(-0.560,1.947)	0.181	(-0.816,1.179)
	Post-Secondary		-0.080	(-0.469,0.309)	0.027	(-0.312,0.366)	-0.188	(-1.139,0.763)	-0.156	(-0.875,0.563)
Constant			-1.308**	(-2.011,-0.606)	-0.523*	(-1.001,-0.045)	-0.409	(-1.321,0.504)	0.238	(-0.928,1.404)
N			1245		1576		145		175	
Likelihood Ratio test			36.316***		33.556***		14.728***		17.314***	
AdjustedRho-squared			0.033		0.021		0.032		0.005	
Percent Right Predictions			90.03		89.32		69.82		73.94	

* p<0.05, ** p<0.01, *** p<0.001

Table G12: Regional Comparison of Utilization by Need Level (Montréal-Centre)

			EXCELLENT/VERY GOOD/GOOD				FAIR/POOR			
Explanatory Variables			1987 Coeff.		1992-93 Coeff.		1987 Coeff.		1992-93 Coeff.	
Sex	Male		-0.202*	(-0.378,-0.026)	-0.221*	(-0.386,-0.056)	-0.029	(-0.496,0.438)	0.037	(-0.347,0.420)
Age	15-19		0.346	(-0.301,0.992)	-0.589*	(-1.083,-0.095)	0.544	(-1.443,2.531)	-0.749	(-2.275,0.777)
	20-24		0.340	(-0.278,0.958)	-0.339	(-0.770,0.091)	-0.013	(-1.606,1.581)	-0.166	(-1.254,0.921)
	25-44		0.349	(-0.228,0.926)	-0.475	(-0.831,-0.119)	-0.222	(-1.211,0.768)	-0.507	(-1.201,0.186)
	45-64		0.316	(-0.257,0.889)	-0.522*	(-0.875,-0.170)	0.118	(-0.700,0.935)	-0.403	(-1.017,0.211)
	65-74		0.042	(-0.585,0.669)	-0.372**	(-0.758,0.013)	-0.332	(-1.329,0.665)	-0.315	(-0.993,0.364)
Marital Status	Married		-0.084	(-0.319,0.152)	-0.273*	(-0.498,-0.048)	-0.481	(-0.986,0.024)	0.158	(-0.338,0.654)
	Single		-0.137	(-0.447,0.172)	-0.197	(-0.449,0.055)	-0.469	(-1.282,0.343)	0.323	(-0.205,0.851)
Employment	Working		-0.258*	(-0.462,-0.053)	0.075	(-0.133,0.282)	0.223	(-0.327,0.773)	-0.437	(-0.938,0.063)
Household Income	20,000-29,999	15,000-29,999	0.042	(-0.207,0.291)	-0.020	(-0.266,0.225)	-0.240	(-0.803,0.323)	-0.300	(-0.767,0.166)
	30,000-39,999	30,000-39,999	-0.095	(-0.368,0.177)	0.184	(-0.108,0.477)	-0.138	(-0.905,0.629)	0.084	(-0.607,0.775)
	40,000-49,999	40,000-59,999	-0.079	(-0.388,0.230)	-0.209	(-0.491,0.071)	-0.173	(-1.141,0.796)	-0.347	(-0.929,0.235)
	50,000 +	60,000 +	-0.075	(-0.340,0.190)	-0.219	(-0.536,0.099)	-5.715	(-2505,2493)	-1.274*	(-2.454,-0.095)
Education	High School		-0.059	(-0.328,0.210)	0.149	(-0.142,0.441)	-0.173	(-0.730,0.383)	0.111	(-0.342,0.565)
	Some Post-Secondary		-0.432*	(-0.761,-0.102)	0.139	(-0.191,0.468)	0.414	(-0.415,1.243)	-0.240	(-0.942,0.461)
	Post-Secondary		-0.303	(-0.602,-0.004)	-0.063	(-0.380,0.254)	0.307	(-0.450,1.064)	0.313	(-0.332,0.958)
Constant			-1.133**	(-1.704,-0.562)	-0.661**	(-1.033,-0.289)	-0.578	(-1.368,0.213)	-0.308	(-0.951,0.334)
N			1790		1985		211		266	
Likelihood Ratio test			36.995***		51.243***		21.296***		24.157***	
AdjustedRho-squared			0.026		0.035		0.041		0.026	
Percent Right Predictions			91.32		91.06		83.81		77.63	

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table G13: Regional Comparison of Utilization by Need Level (Outaouais)

			EXCELLENT/VERY GOOD/GOOD				FAIR/POOR			
Explanatory Variables			1987 Coeff.		1992-93 Coeff.		1987 Coeff.		1992-93 Coeff.	
Sex	Male		-0.290*	(-0.521,-0.059)	-0.204	(-0.409,0.0003)	0.385	(-0.213,0.982)	0.183	(-0.326,0.691)
Age	15-19		0.342	(-0.660,1.343)	-0.522	(-1.262,0.218)	-5.622	(-7401,7390)	-0.701	(-2.416,1.015)
	20-24		0.151	(-0.819,1.120)	-0.337	(-1.044,0.371)	-6.115	(-4557,4544)	-0.237	(-1.656,1.183)
	25-44		0.354	(-0.547,1.255)	-0.538	(-1.168,0.091)	0.657	(-0.701,2.015)	-0.137	(-1.128,0.853)
	45-64		0.036	(-0.857,0.928)	-0.370	(-0.989,0.249)	-0.880	(-2.148,0.387)	0.220	(-0.630,1.071)
	65-74		0.674	(-0.246,1.594)	-0.244	(-0.924,0.437)	-0.123	(-1.353,1.108)	0.284	(-0.630,1.197)
Marital Status	Married		-0.090	(-0.424,0.243)	0.185	(-0.143,0.513)	-0.075	(-0.776,0.626)	0.105	(-0.583,0.793)
	Single		-0.239	(-0.717,0.239)	0.186	(-0.203,0.575)	-0.068	(-1.277,1.140)	0.116	(-0.698,0.930)
Employment	Working		-0.066	(-0.330,0.198)	-0.121	(-0.363,0.122)	-0.465	(-1.277,0.348)	-0.742	(-1.493,0.009)
Household Income	20,000-29,999	15,000-29,999	-0.351	(-0.739,0.037)	0.003	(-0.361,0.366)	-0.621	(-1.650,0.408)	-0.004	(-0.702,0.694)
	30,000-39,999	30,000-39,999	0.031	(-0.302,0.365)	-0.148	(-0.580,0.285)	-0.347	(-1.047,0.353)	0.621	(-0.165,1.406)
	40,000-49,999	40,000-59,999	-0.227	(-0.625,0.171)	-0.296	(-0.692,0.101)	-5.483	(-5873,5862)	0.723	(-0.206,1.653)
	50,000 +	60,000 +	0.065	(-0.281,0.411)	-0.176	(-0.568,0.216)	-0.331	(-1.293,0.632)	0.555	(-0.371,1.481)
Education	High School		-0.137	(-0.501,0.227)	0.034	(-0.315,0.383)	-0.690	(-1.473,0.093)	-0.006	(-0.610,0.599)
	Some Post-Secondary		0.312	(-0.107,0.731)	0.155	(-0.258,0.567)	0.060	(-1.213,1.334)	-0.505	(-1.664,0.654)
	Post-Secondary		-0.018	(-0.436,0.401)	0.224	(-0.150,0.599)	-0.304	(-1.280,0.671)	-0.056	(-0.886,0.773)
Constant			-1.104*	(-1.942,-0.266)	-0.765*	(-1.398,-0.132)	-0.115	(-1.339,1.108)	-0.869	(-1.745,0.007)
N			872		1109		138		147	
Likelihood Ratio test			35.729***		19.638***		35.184***		14.756***	
Adjusted Rho-squared			0.038		0.011		0.130		0.026	
Percent Right Predictions			87.86		89.06		76.31		73.22	

* p<0.05, ** p<0.01, *** p<0.001

Table G14: Regional Comparison of Utilization by Need Level (Québec)

			EXCELLENT/VERY GOOD/GOOD				FAIR/POOR			
Explanatory Variables			1987 Coeff.		1992-93 Coeff.		1987 Coeff.		1992-93 Coeff.	
Sex	Male		-0.352**	(-0.573,-0.130)	-0.381**	(-0.570,-0.192)	-0.630	(-1.329,0.068)	-0.931**	(-1.511,-0.351)
Age	15-19		-0.205	(-0.992,0.582)	-0.192	(-0.824,0.440)	-0.791	(-2.845,1.263)	-5.979	(-227,215)
	20-24		-0.584	(-1.353,0.185)	-1.012*	(-1.751,-0.272)	-1.079	(-2.772,0.614)	-2.496*	(-4.721,-0.271)
	25-44		-0.448	(-1.105,0.210)	-0.219	(-0.739,0.301)	-0.984	(-2.266,0.298)	-1.575*	(-2.736,-0.413)
	45-64		-0.443	(-1.096,0.210)	-0.055	(-0.561,0.450)	-0.777	(-1.891,0.336)	-0.940*	(-1.696,-0.183)
	65-74		-0.165	(-0.859,0.530)	-0.186	(-0.723,0.351)	0.138	(-1.208,1.483)	-0.849	(-1.723,0.025)
Marital Status	Married		-0.160	(-0.474,0.154)	-0.282*	(-0.550,-0.014)	0.940*	(0.014,1.866)	-0.231	(-0.864,0.402)
	Single		-0.633*	(-1.097,-0.168)	-0.447*	(-0.762,-0.132)	1.254*	(0.048,2.459)	0.181	(-0.702,1.064)
Employment	Working		0.063	(-0.191,0.317)	-0.136	(-0.360,0.088)	0.869	(-0.102,1.841)	0.324	(-0.540,1.188)
Household Income	20,000-29,999	15,000-29,999	-0.321	(-0.641,-0.0005)	0.004	(-0.287,0.294)	-0.301	(-1.187,0.584)	0.222	(-0.404,0.847)
	30,000-39,999	30,000-39,999	-0.408*	(-0.747,-0.068)	-0.229	(-0.587,0.128)	-0.866	(-2.051,0.318)	-0.205	(-1.370,0.960)
	40,000-49,999	40,000-59,999	-0.077	(-0.410,0.256)	-0.159	(-0.472,0.153)	-1.255*	(-2.274,-0.236)	-1.121	(-2.467,0.226)
	50,000 +	60,000 +	-0.496*	(-0.861,-0.130)	-0.104	(-0.454,0.247)	-1.173	(-0.235,0.188)	-0.171	(-1.623,1.284)
Education	High School		0.399*	(0.024,0.773)	0.050	(-0.284,0.384)	-0.769	(-1.553,0.015)	0.213	(-0.407,0.833)
	Some Post-Secondary		0.216	(-0.252,0.683)	0.328	(-0.038,0.694)	-0.810	(-1.905,0.285)	-0.099	(-1.277,1.079)
	Post-Secondary		0.219	(-0.198,0.636)	0.243	(-0.100,0.586)	0.203	(-0.994,1.400)	0.186	(-1.017,1.389)
Constant			-0.616	(-1.238,0.005)	-0.603*	(-1.133,-0.074)	-0.017	(-1.023,0.988)	0.588	(-0.184,1.361)
N			1174		1486		109		149	
Likelihood Ratio test			44.789***		65.370***		22.301***		42.510***	
Adjusted Rho-squared			0.049		0.055		0.038		0.162	
Percent Right Predictions			90.77		89.51		81.74		80.26	

* p<0.05, ** p<0.01, ***p<0.001

Table G15: Regional Comparison of Utilization by Need Level (Saguenay-Lac-St-Jean)

			EXCELLENT/VERY GOOD/GOOD				FAIR/POOR			
Explanatory Variables			1987 Coeff.		1992-93 Coeff.		1987 Coeff.		1992-93 Coeff.	
Sex	Male		-0.410***	(-0.607,-0.214)	-0.321**	(-0.532,-0.109)	-0.385	(-0.887,0.117)	0.127	(-0.356,0.610)
Age	15-19		-0.526	(-1.202,0.149)	-0.237	(-0.933,0.458)	-4.921	(-4763,4754)	0.297	(-1.281,1.874)
	20-24		-0.284	(-0.915,0.347)	-0.252	(-0.924,0.420)	1.204	(-0.374,2.782)	0.639	(-0.703,1.981)
	25-44		-0.427	(-0.999,0.144)	-0.616*	(-1.182,-0.050)	0.565	(-0.672,1.802)	0.593	(-0.378,1.564)
	45-64		-0.486	(-1.048,0.076)	-0.471	(-1.025,0.082)	0.540	(-0.615,1.696)	0.446	(-0.420,1.311)
	65-74		-0.058	(-0.664,0.549)	-0.365	(-0.974,0.244)	0.564	(-0.641,1.770)	0.086	(-0.895,1.068)
Marital Status	Married		-0.073	(-0.382,0.235)	0.019	(-0.306,0.343)	0.368	(-0.289,1.025)	-0.294	(-0.950,0.363)
	Single		-0.370	(-0.798,0.058)	-0.128	(-0.540,-0.285)	0.206	(-0.762,1.175)	-0.441	(-1.200,0.318)
Employment	Working		0.003	(-0.214,0.219)	0.066	(-0.180,0.313)	-0.319	(-0.991,0.353)	0.481	(-0.213,1.174)
Household Income	20,000-29,999	15,000-29,999	-0.222	(-0.491,0.046)	-0.224	(-0.536,0.088)	0.048	(-0.579,0.675)	-0.527	(-1.126,0.072)
	30,000-39,999	30,000-39,999	-0.368*	(-0.642,-0.095)	-0.247	(-0.614,0.120)	-0.265	(-1.000,0.470).	-1.496**	(-2.666,-0.325)
	40,000-49,999	40,000-59,999	-0.188	(-0.471,0.095)	-0.301	(-0.640,0.038)	-0.592	(-1.422,0.238)	-0.677	(-1.465,0.112)
	50,000 +	60,000 +	-0.328	(-0.666,0.010)	-0.483*	(-0.926,-0.040)	0.165	(-0.840,1.171)	-0.381	(-1.474,0.712)
Education	High School		0.044	(-0.232,0.320)	0.120	(-0.249,0.488)	0.074	(-0.461,0.609)	-0.125	(-0.677,0.427)
	Some Post-Secondary		-0.132	(-0.518,0.253)	0.225	(-0.210,0.659)	-0.666	(-1.884,0.552)	-0.114	(-1.288,1.061)
	Post-Secondary		-0.136	(-0.474,0.202)	0.158	(-0.251,0.567)	-0.036	(-1.028,0.956)	-0.349	(-1.136,0.439)
Constant			-0.418	(-0.973,0.138)	-0.720*	(-1.252,-0.188)	-1.451*	(-2.645,-0.257)	-0.584	(-1.395,0.226)
N			1521		1322		200		176	
Likelihood Ratio test			57.461***		25.489***		12.992***		17.201***	
Adjusted Rho-squared			0.050		0.024		0.010		0.003	
Percent Right Predictions			90.53		92.32		82.84		79.60	

* p<0.05, ** p<0.01, *** p<0.001

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