

THE CANADIAN FAMILY PHYSICIAN
SHORTAGE: WHO IS AFFECTED AND HOW?

by

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CERTIFICATE OF APPROVAL


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ABSTRACT

The shortage of family physicians in Canada is reaching the level of crisis. It is now the rule, not the exception, to live in a community that does not have sufficient family physicians to care for all of its citizens, particularly in Northern and more remote regions. Existing stopgaps provide certain primary care services, but often in an expensive, inefficient, and non-continuous manner. In view of the 'gatekeeper' role of family physicians in the Canadian health care system, the potential implications of not having a family physician are vast, but unexamined. What truly are the implications of not having a family physician in the Canadian health care system? And who is affected? In order to answer these questions, data from the Statistics Canada Community Health Survey were accessed. This database is compiled by the federal government on a biyearly basis and documents the health status, demographics, and health care access characteristics of Canadians. This data provide the basis for examining the differences between those who have a family doctor and those who do not. Comparisons were made in four key areas: demographic, socioeconomic, health status, and preventive services. In general, it was found that people who do not have a regular doctor, when compared with those who do, are more likely to be single, male, non-elderly, non-white, and non-immigrant. They are also more likely to have a background of higher education, to be of lower income,

employed, and not own their own home. They are less likely than those with a doctor to have a chronic disease or a mental health problem, and are also less likely to have received medical screening tests or flu shots. These findings are upheld even when data are stratified by age category, chronic disease, and physician shortage level.

Chapter 1

INTRODUCTION

Canada's national health care system is generally considered to be one of the world's best, placing it in the top ten by most measures of quality. Established during the twentieth century, the Canadian health care system is a publicly financed, privately delivered model founded on the twin principles of universality and accessibility.¹ Its aim is to ensure that all Canadians have reasonable access to hospital, in-patient and outpatient physician services based on their medical need, not their ability to pay.¹ Canada's federal and provincial governments jointly share the financial and administrative responsibilities of this program.

History

The first organized health care system in Canada consisted of hospitals established by Catholic religious orders. These facilities were primarily aimed at providing health care for the poor. In contrast, wealthy citizens were cared for in their own homes by expensive personal physicians.

The early twentieth century saw the first widespread construction of government run hospitals, such as asylums for the mentally ill and sanitariums for those

suffering from tuberculosis. During the Great Depression calls for a public health system became widespread, and the idea of a national health insurance system grew in popularity, but governments had little money to enact the idea.

In 1946, Saskatchewan became the first Canadian province to introduce publicly-funded, universal hospital insurance. This province had long suffered a shortage of doctors and, as a result, had developed municipal doctor programs wherein physicians were subsidized to practice in designated towns. Groups of communities joined to open union hospitals under a similar model. In 1946, the Co-operative Commonwealth Federation government in Saskatchewan, under the leadership of Tommy Douglas, passed the Saskatchewan Hospitalization Act, guaranteeing free hospital care for much of the population. The ensuing two decades saw rapid growth of this movement across Canada, first in the provision of hospital care, and thereafter in the provision of outpatient care.

In 1962, Saskatchewan pioneered insurance coverage for outpatient physician services. The federal government enacted similar medical care legislation in 1968 under the “Medical Care Act” and, by 1972, all provincial and territorial health care plans had been extended to include outpatient doctors' services.

In 1979, a health services review reported that health care in Canada ranked among the best in the world, but warned that extra-billing by doctors and user

fees levied by hospitals were creating a two-tiered system, thereby threatening the universal accessibility of care for Canadians. In response to these concerns, Parliament passed the “Canada Health Act” in 1984 to discourage hospital user charges and extra-billing by physicians. The Canada Health Act replaced the two preceding acts, but retained the underlying principles of a national health insurance program.

Costs & Quality

Canada’s health care spending was \$130.3 billion in 2004, amounting to 9.5% of its GDP, or an average of \$1,886 (in US dollars) per person.^{2,3} By comparison, the United States government spent 13.6% of its annual GDP on health care in 2001, an average of \$2,548 per person.⁴

Canada’s comparatively lower cost for health care is commonly attributed to its decreased availability of expensive technological equipment such as MRI and CT scanners. The availability of technically advanced medical procedures is also identified as being more limited than in the United States. Indeed, the Canadian population has frequently expressed dismay about this issue, and there is no question that the relative shortage is real.^{5,6} The following brief table conveys the availability of such services in Canada and the United States.

Table 2.1 Availability of Selected Medical Technologies (per million population)^{7,6}

| | <u>Canada</u> | <u>United States</u> |
|----------------------------|---------------|----------------------|
| Open-Heart Surgery | 1.23 | 3.26 |
| Cardiac Catheterization | 1.50 | 5.06 |
| Organ Transplantation | 1.08 | 1.31 |
| Radiation Therapy | 0.54 | 3.97 |
| Lithotripsy | 0.16 | 0.94 |
| Magnetic Resonance Imaging | 0.46 | 3.69 |

Despite the above noted shortages and decreased availability, the overall performance of health care appears to be better in Canada than the US. According to the World Health Report 2000 (WHO) Canada ranked 7th in overall health attainment and 12th in overall system attainment, while the USA ranked 24th and 15th respectively. ^{8,9} Indeed, Canada's health system is cheaper, but it compares well on a statistical level with the American one. Life expectancy in 2005 was about two and a half years higher in Canada than in the United States, with Canadians living to an average of 80.1 years and Americans 77.7 (US Census Bureau). Canada currently ranks 8th among United Nations member countries with regards to life expectancy, while the United States ranks 29th.⁸ Infant and child mortality rates are also higher in the United States.⁹

Table 2.2 A Comparison of Canadian and U.S. Health Status Indicators^{7,9,10}

| | <u>Canada</u> | <u>United States</u> |
|---|---------------|----------------------|
| Infant Mortality Rate (per 1,000 live births, 2004) | 5 | 6 |
| Mat. Mortality Rate (per 100,000 live births, 2000) | 5 | 14 |
| Life Expectancy at Birth (years, men, 2004) | 78 | 75 |
| Life Expectancy at Birth (years, women, 2004) | 83 | 80 |

The Problem

In an effort to manage the high costs associated with medical care, and to ensure efficient and appropriate access to diagnostic and specialist services, Canada's health care system depends upon a sophisticated triage mechanism. At present, Canada's family physicians serve as the main entry point to the health care system. Patients cannot access specialists without a referral from a primary care provider. Nor can they access laboratory or imaging diagnostic services without a referral from a primary care provider. Family physicians, therefore, play a key role in managing access to Canada's health care system.

In general, this system of triage is successful. Canadians enjoy a standard of health that is among the best in the world, and a life expectancy that is one of the longest. The system's fundamental dependence on an ongoing relationship between a family physician and his or her patient lends itself to both financial and health benefits because it controls access to costly and limited health system resources and ensures a lifelong physician-patient relationship that fosters improved health education, disease prevention, and chronic disease management.

Various polls reveal that Canadians recognize and value this gatekeeper role. A recent Statistics Canada survey found that 80% of Canadians stated that they preferred to access care through their family physicians.¹¹ A public poll found that more than 66% of Canadians identify family physicians as the most

important caregivers for them and their families.¹² A College of Family Physicians of Canada commissioned poll reported that 88% of respondents agreed that having a family doctor allows them to feel more confident about their ability to access appropriate and timely care in the health system.¹³ In addition, Canadians who have a family doctor give the health system a much higher quality rating.^{14,15}

Unfortunately, patients are finding it increasingly difficult to find a family doctor. Canada is suffering a grave shortage of family physicians, a situation which is expected to worsen over the next decade.¹⁸ Reports show that millions of Canadians do not have, or have trouble finding, a doctor.^{16,18} Currently, more than 4 million Canadians do not have access to a family doctor and the situation is expected to worsen over the next decade.¹⁸ A 2004 public poll found that 5 million (16%) Canadians older than 18 years tried, but were unable to find a family doctor for themselves or their families.¹⁷ For 2003, Statistics Canada reported that 3.6 million Canadians (almost 14%) had no regular family physician, and almost 16% reported difficulty accessing routine or ongoing care.¹¹ In 2002, the College of Family Physicians of Canada estimated that Canada was short 3,000 family physicians and that this number would double by the end of the decade unless new recruitment and retention strategies were put in place.^{24,18}

Reasons for this shortage are multifaceted. They include decreased enrollment in family practice residency programs, emigration of physicians, increased retirement, decreased work hours, financial disincentives to becoming a family physician, and geographic disparities.

Decreased enrollment

During the past several years, the number of Canadian medical school graduates selecting family medicine as their first choice careers decreased from more than 40% in the early 1990s to 25% in 2003.¹⁹ Remuneration issues are among the strongest factors outside the medical school environment that students identify as affecting their career choices. On average, Canadian family doctors earn about one half of what a specialist earns. This issue has become particularly problematic in times of increasing student debt. Not surprisingly, many young graduates are dissuaded from choosing family practice as their specialty of choice for this reason.

To compound enrollment matters, medical school enrolment was reduced by 10% in the 1990's. This policy was created in 1991 in response to a perceived physician surplus during the 1980's. It aimed to limit the growth of physician supply, and thereby limit cost, and was implemented beginning in the fall of 1993. Much criticism and blame has been placed upon this policy, the full impact of which will continue to be felt over the next several years.

Emigration

The problem of decreased enrollment is complicated by the fact that higher salaries in the United States have long attracted the attention of Canadian doctors and nurses. Meanwhile, government attempts at limiting incomes, in order to control expenditures, have further alienated many physicians. As a result, there has been a net outflow of physicians each year since at least 1981.²⁰ The early 1990s even saw a number of graduating physicians move directly abroad without starting practice in Canada.²⁰

Retirement & Decreased Hours

To make matters worse, the number of physicians retiring in Canada almost tripled over the past twenty years.²⁰ The Ontario College of Physicians and Surgeons estimates that within the next decade or so, more than half of existing physicians will be over the age of 55, many presumably working reduced hours in semi-retirement. The 2004 National Physician Survey expects that 1400 family doctors will retire in the next 2 years.²⁰

In addition, responding to a longstanding history of heavy workloads and increasing “burn out”, many family physicians, particularly those who are female or elderly (over age 65), have chosen to reduce their workloads. In general, female physicians had a practice activity that was 21% lower than for men, as measured by health service billing, and elderly individuals exhibited a workload of

0.66 times the average.²⁰ Of note is that the proportion of women and elderly physicians has risen steadily over the past two years.

Moreover, the 2004 National Physician Survey (NPS) found that 60% of family physicians are either limiting the number of new patients they see or not taking new patients at all.²¹ In 2004, only 20% of family physician practices were fully open to new patients, down from 24% in 2001.²¹ As family physicians struggle with the challenge of work-life balance, the 2004 survey found that one quarter intended to reduce their regularly scheduled working hours within the next 2 years.²¹

Financial aspects

An Ontario Medical Association (OMA) study comparing billings to the provincial health plan found that, in 2000- 2001, a family physician's average gross billing was 61.8% of that of a specialist.²² After expenses, an average family physician earns 54.6% of that earned by a specialist. In terms of gross billings, the proportion had declined from 71.2% twenty years earlier.^{23,24} This issue has become particularly acute in times of increasing student debt since family practice, compared with other specialties, will have ongoing difficulties convincing students to make them first choice for their future careers.

Geography

Canada is the second largest country in the world (Russia is the largest) and hosts 33 million people. Approximately 80% of Canada's population live within an urban center. The other 20% are distributed across the remaining 95% of Canada's vast land.

Of particular concern to this study is that physicians are not evenly distributed throughout the country. Canada's physician shortage is affecting people in communities of all sizes, but some communities are affected more than others. The impact is particularly pronounced in rural and remote settings.^{25,26,27} In 1996, 22.2% of Canada's population lived in rural settings, while only 9.8% of Canadian physicians worked there.²⁵ It should also be noted that significant variations exist in rurality among the provinces and territories. For example, only 15.3% of the population lived in rural areas in British Columbia and Ontario in 2001.²⁶ In contrast, rural residents made up between 42% and 55% of the population in the Atlantic provinces. The most striking difference is with Nunavut, where 67.5% of the population lived in rural areas.

Questions

In light of the foregoing, it is now the rule, not the exception, to live in a community that does not have enough family physicians to care for all of its citizens, particularly in Northern and more remote regions.

Advocates argue that having a family physician improves health care system functioning by managing and triaging undifferentiated symptoms, matching patient needs to health care resources, and enhancing the system's ability to adapt to new circumstances.²⁸ By acting as an appropriate filter for high-technology care, family physicians help ensure its appropriate application.²⁸ Furthermore, because family physicians are the most financially and geographically accessible arm of the health care system, they are recognized to play a key role in reducing the socioeconomic and geographic disparities across the population.²⁸ These functions are arguably necessary for the efficient, equitable, and sustainable delivery of health care. They also facilitate the adaptability and resilience of the system as a whole.

Hailing these arguments, the College of Family Physicians of Canada recently released a position paper asserting that “every Canadian should have the opportunity to have a family physician of his or her own.”²⁴ They insisted that the lack of family physicians would pose distressing consequences for Canadians, yet failed to document or provide proof for what these negative consequences might be.^{Error! Bookmark not defined.} In fact, very little data exists on the health-related impact of having or lacking a family physician. Specifically, we do not know who is affected by the current physician shortage, nor how they are affected.

There is no question that Canadian family physicians play a critical role in both preventive and primary medical care services. As an integral part of their medical practices, family doctors regularly counsel patients on the prevention of injuries and illness, they assess the health status of their practice populations, and promote healthy living. It could be therefore be argued that individuals without a family doctor are less likely to engage in preventive screening tests and preventive services such as flu shots.

In addition, a significant portion of everyday family practice involves the diagnosis and treatment of a diverse array of chronic diseases such as diabetes, hypertension, arthritis, stroke, heart disease and even mental health. Rural Canadian physicians even participate in the provision of many secondary and even tertiary services for patients in hospitals. Accordingly, it could be argued that Canadians lacking a regular physician are more likely suffer poor health.

These potential consequences are complicated by considerations of wealth and education. It is widely assumed that diminished primary care access disproportionately affects individuals of lower socioeconomic status (SES). This assertion is accepted with little contest in non-universal access arenas, but remains unexamined in countries where universal access exists. Specifically, it is well recognized that people of lower socioeconomic status are less likely to have primary care physicians in the United States, where access to primary care is often

a financial obstacle. It is unknown whether, and to what extent, socioeconomic status affects health care access in Canada.

Factors Complicating Existing Research

Family physician access, its demographic and socioeconomic corollaries, its relationship with health status, and its implications on preventive service acquisition are difficult factors to examine at any level. Importantly, these issues are exceedingly difficult to examine in the United States where access to primary care is primarily driven by financial considerations. Thus far, studies investigating the relationship between primary care physician access and health status are few in number, and results are mixed.^{28,29,30} Consider further the presumed negative effects of low SES which, in order to decipher the specific relationship between having a primary care physician and health status, necessitate controlling for factors such as insurance coverage, race/ethnicity, income, and education. Consequently, lacking direct information, investigators have had to employ proxies such as regional physician-population ratios in order to estimate the effect. However, it is clear that population ratios are an inadequate proxy for receipt of primary care in the United States. The presence of more primary care physicians per population does not ensure that more individuals in the population are exposed to primary care.

Advantage of Canadian Data

In Canada, providing statistics is a federal responsibility. Statistics Canada is the country's central statistical agency. It is legislated to serve this function for the whole of Canada and each of the provinces. Under the Statistics Act, Statistics Canada is required to "collect, compile, analyze, abstract and publish statistical information relating to the commercial, industrial, financial, social, economic and general activities and conditions of the people of Canada." In addition to conducting a Census every five years, there are about 350 active surveys on virtually all aspects of Canadian life. The Health Statistics Division's primary objective is to provide statistical information and analyses about the health of the population, determinants of health, and the scope and utilization of Canada's health care sector.

In 1991, Canada's National Task Force on Health Information cited a number of issues and problems with the health information system. Specifically, they noted that data was fragmented, incomplete, could not be easily shared, was not being analyzed to the fullest extent, and that the results of research were not consistently reaching Canadians. In response, the Canadian Institute for Health Information (CIHI) joined forces with Statistics Canada and Health Canada to create the Canadian Community Health Survey (CCHS). The objective of the Canadian Community Health Survey is to gather health-related data at the sub-

provincial levels of geography to provide timely, reliable, cross-sectional estimates of health determinants, health status and health system utilization across Canada.

Canadian data pose distinct advantages to examining the relationship between family physician access and health status. Specifically, Canadian demographic data allow us to more clearly identify and examine people who have a regular family physician. This eliminates the need to depend on indirect proxies such as regional physician-population ratios. Secondly, as noted previously, universal access to health care in Canada provides significant control over the confounding effects of financial barriers to health care access. Lastly, the current shortage of family physicians in an otherwise universal access model presents a particularly interesting situation for analysis. This unique combination of factors allows us to examine the implications of not having a family physician in an arena where financial obstacles to health care access are greatly diminished by universal health care policy, and residual socioeconomic confounders can be teased out using quality Canadian databases which include socioeconomic variables alongside health-related ones.

Potential Confounders

Further consideration must also be given to factors such as age, comorbid illness, and degree of community physician shortage, as potential confounding variables

in the outcome of any investigation on physician access and health service utilization.

With regards to age, for example, being elderly could present a greater likelihood of having a chronic illness and of acquiring a regular physician. If the elderly exhibited a preponderance among those who have a regular physician, their demographic, socioeconomic, and health status characteristics could confound findings and interpretations. Similarly, those with chronic diseases would have to be equally controlled for. Finally, the degree of physician shortage within a community could confound any investigation on physician access.

RESEARCH QUESTIONS & SPECIFIC AIMS

Research Questions

In summary, Canada boasts a universal health care system, but a physician shortage has left many Canadians without a family physician. The potential implications of not having a family physician remain vast, but unexamined. To begin to explore this important issue, data from a large scale population survey conducted in Canada in 2003 will be examined. In particular, the following questions are examined.

1. Are Canadians without a family physician more likely to be of a particular race, age group, or socioeconomic status?
2. Are Canadians without a physician more likely to suffer from chronic illnesses?
3. Are Canadians who do not have a regular physician less likely to receive preventive health services such as flu shots, appropriate cancer screening tests, and tobacco use assessments than those who do have a physician?

Hypotheses

1. Canadians without a family physician are more likely to be visible minorities, poor, unemployed, and single when compared with Canadians who have a family physician.
2. Canadians without a family physician are more likely to have a chronic illness than those who have a family physician.
3. Canadians without a family physician are less likely to receive preventive health services such as flu shots, or appropriate cancer screening tests than those who do not have a family physician.

Specific Aims

1. Examine the demographic characteristics of Canadians who have a family doctor (age, gender, race, language, marital status, immigrant status) and compare them with the demographics of Canadians who do not have a family doctor.
2. Examine the socioeconomic characteristics of Canadians who have a family doctor (income, home ownership, education, employment) and compare them with the socioeconomic characteristics of Canadians who do not have a family doctor.
3. Examine the health status of Canadians who have a family doctor (asthma, cancer, arthritis, heart disease, chronic obstructive pulmonary

disease, hypertension, diabetes, bowel disorder) and compare with the health status of Canadians who do not have a family doctor.

4. Examine the utilization of prevention services amongst Canadians who have a family doctor (flu shot, pap smear, mammogram, fecal occult blood test) and compare with those amongst Canadians who do not have a family doctor.
5. Examine the above associations after stratifying for age category, chronic illness and degree of community physician shortage, in view of the potentially confounding effects of these variables on the acquisition and utilization of family physician services.
6. Discern which of the above factors are the greatest predictors of having a family doctor, of having a chronic disease, and of having received preventive services.

Chapter 2

MATERIALS & METHODS

Data Source

The Canadian Community Health Survey began collection in September 2000 and has continued on a biyearly basis. It includes information on a wide range of topics, including alcohol consumption, chronic health conditions, fruit and vegetable consumption, general health, use of health services, height and weight, injuries, physical activity, restriction of activities and smoking. It also provides information on the socio-demographic characteristics, the income and the labor force characteristics of the population.

Data are collected from 134,072 individuals aged 12 or older, residing in households across all provinces and territories of Canada. Each individual is identified as belonging to one of 136 distinct health regions across Canada.³¹ The Ontario sample used for the current analysis consisted of 37 health regions and 42,000 respondents.

Responding to this survey is voluntary. It entails a 45 minute telephone interview of randomly selected participants. The CCHS questionnaire is administered by using a computer-assisted interviewing technique.

Data Quality

The Canadian Community Health Survey is a sample survey with a cross-sectional design. It targets individuals who are living in private dwellings in the ten provinces and the three territories of Canada. Persons living on Indian Reserves or Crown lands, residents of institutions, full-time members of the Canadian Armed Forces and residents of certain remote regions are excluded from this survey. The CCHS covers approximately 98% of the Canadian population aged 12 or older. To enhance response and diminish language barriers, surveys were even conducted in Chinese, Punjabi, Inuktitut, and Cree.

A total of 166,222 households were selected to participate. Of these, 134,072 individuals responded (80.7% personal level response rate). The 2003 survey had a targeted response rate of 80%. Upon completion of collection activities, the survey had achieved an overall response rate of 80.7%. Response rates ranged from a low of 71.6% in Ontario to a high of 88.3% in Newfoundland and Labrador.

Data Access

In Canada, the primary use of the data is for health surveillance. Public use data file copies are available from the Health Statistics Division of Statistics Canada. They are available free of charge to non-profit organizations in the health sector for research and non-commercial purposes. Entities with commercial interest pay a fee of around \$2,700 CAD for the public use files.

Choice of Specific Variables

The research question requires a comparison of individuals who have a family doctor with those who do not have a family doctor. Whether or not the respondent has a family doctor, therefore, formed the basis of all analysis. The following CCHS question was used for this: “Do you have a regular family doctor?”³² The responding options were “yes” or “no.”³² This variable (“FAMDOC”) was crosstabulated with demographic, socioeconomic, health status, and preventive service utilization variables to determine bivariate associations (chi square tests and odds ratios), and was used as the dependent variable in logistic regression analyses.

Demographic variables included age, sex, marital status, ethnic background (Immigrant, place of birth), skin color (white or visible minority), and primary language.

Socioeconomic factors included in this analysis included income, employment, and house ownership. The income variable was a dichotomous “low” or “high” designation as derived by the CCHS data. This derivation involved acquisition of income data which was then examined alongside the number of people in each household. Income was categorized as “low” if it was less than \$15,000 annually within a household composed of 1-2 people, less than \$20,000 annually within a household composed of 3-4 people, or less than \$30,000 within a household composed of 5 or more people.³³ Education was categorized as being either less than secondary, or greater than (or equal to) secondary.³³

The presence or absence of a chronic medical condition was established based on the question, “... I was interested in ‘long-term conditions’ that have lasted or expected to last 6 months or more and that have been diagnosed by a health professional. Do you have...?” The specific chronic conditions included for analysis were asthma, arthritis or rheumatism, high blood pressure, emphysema or chronic obstructive pulmonary disease (COPD), diabetes, heart disease, and cancer.³²

Preventive screening and immunization variables included mammogram, pap smear, fecal occult blood testing, and flu shots. Respondents were asked when they had last had these tests/immunizations done. This allowed examination of whether the screening tests had been undertaken in the recommended time frames. According to the Canadian Task Force on Preventive Health Care

Guidelines, screening mammography is recommended among women aged 50-69 every one to two years. Furthermore, annual pap smears are recommended for sexually active women from age 18-69. After two normal smears, screening may be reduced to every three years unless risk factors such as multiple sexual partners, smoking, or low SES exist. Lastly, colon cancer screening using Fecal Occult Blood Testing is recommended every one to two years on all asymptomatic individuals over 50 years of age. Yearly Prostate Cancer Screening using PSA test is not recommended, and was therefore excluded from this study. In accordance with the Canadian Task Force recommendations, the analysis of Mammograms was restricted to women aged 50-69 who had a mammogram in the past two years. The analysis of Pap Smears was restricted to women aged 20-69 (there were data on women aged below 20 years of age) who had a pap smear in the past year. The analysis of Fecal Occult Blood Testing was restricted to individuals aged 50 and above who had a FOBT within the past year.

One variable indicative of preventive intervention was also included: getting a flu shot. Canada's National Advisory Committee on Immunization recommends yearly influenza vaccine for all healthy children aged 6 months to 23 months, and all elderly individuals aged 65 and above. In addition, a yearly flu shot is recommended for all those at high risk for influenza related complications. For the purposes of our analysis, I restricted the study to individuals aged 65 and above (we have no data on children) who had a flu shot over the past year.

Two mental health variables were also included in the analysis. The first question asked, “We are interested in ‘long-term conditions’ which are expected to last or have already lasted 6 months or more and that have been diagnosed by a health professional. Do you have a mood disorder such as depression, bipolar disorder, mania or dysthymia?” The second question asked “Have you ever seriously considered committing suicide or taking your own life in the past 12 months?”

The following table (2.1) includes a complete list of the CCHS variables employed as dependent variables.

Table 2.1 Variables used for Analysis

Demographic

Sex
Age
Marital Status (MS)
Immigrant status (Immigrant)
Racial origin (White)

SocioEconomic Status

Income adequacy - 2 groups (Income)
Job status over past week (Employed)
Dwelling - owned by a member of household (Own)
Highest education level achieved in household (Education)

Preventive Services

Last time had flu shot (Flushot)
Last time mammogram was done (Mamm)
Last time had PAP smear test (Pap)
Last time had a fecal occult blood test (FOBT)

Health Status

Any chronic condition (ILL)
Asthma (Asthma)
Arthritis or rheumatism (OA)
High blood pressure (HTN)
Migraine headaches (HA)
Diabetes (DM)
Heart disease (CAD)
Cancer (Cancer)
Stomach or intestinal ulcers (PUD)
A bowel disorder / Crohn's Disease or colitis (IBD)
Emphysema or chronic obstructive pulmonary disease (COPD)

Mental Health Status

Diagnosed mood disorder (MOOD)
Seriously considered suicide past 12 months (Suicide)

Stratification:

Age category, chronic illness, and degree of community physician shortage will form the basis for stratified analyses. Age category is composed of 3 categories as follows: teen (age 12-19), adult (age 20-64), elderly (age 65 and above). Stratification for chronic illness will use the variable "chronic illness." Degree of community physician shortage involved the categorization of communities by the percent of people who had sought, but failed to obtain a regular physician due to lack of an available doctor in the area. Five categories were created: (<5% "less than 5% of respondents lacked a regular physician due to no doctor availability"), (5-9.9%) , (10-14.9%), (15-19.9%), (20+%).

Statistical Analysis:

Microsoft Excel 2000 was used for table and graph construction. SPSS 11.0 for Windows, graduate student edition, was used for statistical analysis. In the statistical analysis, variables were described with proportions. To test for differences between people who have a family and those who do not, I employed chi square tests of independence. The following steps were taken for analysis:

1. Patients were divided into two groups: those with and without a family physician.
2. These groups were compared with regards to various factors, including:
 - ◆ Demographics
 - ◆ Socioeconomic Status

- ◆ Preventive Services
 - ◆ Chronic Disease
 - ◆ Mental Health
3. Two-way tables were calculated (cross-tabulations).
 4. Elderly and Non-elderly patients were compared.
 5. Findings were stratified for illness and community shortage category.
 6. Chi-square and associated probability level were calculated for each variable.
 7. Odds ratios with 95% confidence intervals were calculated for each comparison. For multi-category variables, odds ratios are in reference to the first category response.
 8. Logistic regression was undertaken using “FAMDOC” as the dependent variable. Independent variables were chosen based on a selection of demographic, socioeconomic, health status, preventive screening, preventive/risk behavior categories. Additionally, regression was employed to discern the greatest predictors of preventive services.

Chapter 3

RESULTS

Baseline Results

There were 134,072 respondents to the survey. Baseline figures on their demographic background, socioeconomic status, chronic illness, and age-specific preventive service utilization can be seen in Table 3.1.

| | <u>N</u> | <u>Percent</u> |
|-----------------------------|----------|----------------|
| Has regular medical doctor? | | |
| Yes | 115,375 | 86.2 |
| No | 18,508 | 13.8 |
| Sex | | |
| Male | 61,464 | 45.8 |
| Female | 72,608 | 54.2 |
| Age Category | | |
| Teen | 18,524 | 13.8 |
| Adult | 86,982 | 64.9 |
| Elderly | 28,566 | 21.3 |
| Marital status | | |
| Married | 57,826 | 43.2 |
| Common Law | 9,896 | 7.4 |
| Widow/Separated/Divorced | 25,993 | 19.4 |
| Single/Never Married | 40,030 | 29.9 |

Table 3.1 (continued) Self-reported characteristics of 134,072 respondents to the Canadian Community Health Survey, 2003

| | <u>N</u> | <u>Percent</u> |
|---|----------|----------------|
| Immigrant status | | |
| Immigrant | 16,842 | 13.0 |
| Non Immigrant | 113,203 | 87.0 |
| Cultural/Racial origin | | |
| White | 117,410 | 90.2 |
| Visible Minority | 12,729 | 9.8 |
| Country of birth | | |
| Canada | 112,483 | 86.2 |
| Other | 18,007 | 13.8 |
| Language | | |
| Primarily English | 87,725 | 67.3 |
| Primarily French | 14,999 | 11.5 |
| English or French | 26,476 | 20.3 |
| Neither English nor French | 1,198 | 0.9 |
| Income | | |
| Low | 14,344 | 12.5 |
| Middle/High | 100,399 | 87.5 |
| Employment Status -- Last Week | | |
| At work | 65,101 | 58.8 |
| Absent | 5,343 | 4.8 |
| No job | 37,415 | 33.8 |
| Disabled | 2,844 | 2.6 |
| Home Ownership | | |
| Own | 99,485 | 74.4 |
| Do Not Own | 34,262 | 25.6 |
| Educational Level | | |
| Less than secondary | 42,775 | 32.5 |
| Secondary graduate | 22,646 | 17.2 |
| Other post-secondary | 9,044 | 6.9 |
| Post-secondary graduate | 57,201 | 43.4 |
| Has a chronic condition | | |
| Yes | 96,561 | 72.2 |
| No | 37,152 | 27.8 |
| Preventive Services | | |
| Pap Smear last year among women aged 20-69 | | 50.6 |
| Mammogram in past 2 years among women aged 50-69 | | 71.2 |
| Fecal Occult Blood Test past 2 years among individuals aged 50+ | | 4.4 |
| Flu Shot last year among individuals aged 65+ | | 62.8 |

Demography

Among respondents, 115,375 had a regular doctor, and 18,508 did not have one. As seen in Table 3.2, those who had a family doctor were more likely than those without a family doctor to be female, elderly, married, immigrant, white, not born in Canada, and English speaking. In contrast, people who did not have a family doctor were more likely to be male, teen or adult, single or common-law, non-immigrant, visible minority, born in Canada, and French speaker. All of these findings were statistically significant with p-values less than 0.001.

| | % Doctor | % No Doctor | p | Crude OR | 95% Confidence Interval |
|-------------------------------|---------------------|------------------------|----------|---------------------|--|
| Sex | | | | | |
| Male | 43.5 | 60.1 | <0.001 | 0.51 | (0.50, 0.53) |
| Female | 56.5 | 39.9 | | (ref) | |
| Age Category | | | | | |
| Teen | 13.5 | 15.3 | <0.001 | (ref) | |
| Adult | 63.1 | 76.3 | | 0.94 | (0.90, 0.98) |
| Elderly | 23.4 | 8.4 | | 3.17 | (2.97, 3.39) |
| Marital status | | | | | |
| Married | 45.5 | 29.4 | <0.001 | (ref) | |
| Common Law | 6.6 | 12.4 | | 0.35 | (0.33, 0.36) |
| Widow/Separated/Divorced | 20.4 | 13.7 | | 0.96 | (0.92, 1.01) |
| Single/Never Married | 27.5 | 44.6 | | 0.40 | (0.38, 0.41) |
| Immigrant status | | | | | |
| Immigrant | 13.3 | 10.8 | <0.001 | 1.27 | (1.21, 1.34) |
| Non Immigrant | 86.7 | 89.2 | | (ref) | |
| Cultural/Racial origin | | | | | |
| White | 91.0 | 85.2 | <0.001 | 1.77 | (1.69, 1.85) |
| Visible Minority | 9.0 | 14.8 | | (ref) | |
| Country of birth | | | | | |
| Canada | 85.9 | 88.2 | <0.001 | 0.82 | (0.78, 0.86) |
| Other | 14.1 | 11.8 | | (ref) | |
| Language | | | | | |
| Primarily English | 68.5 | 59.5 | <0.001 | (ref) | |
| Primarily French | 11.0 | 14.8 | | 0.64 | (0.61, 0.67) |
| English or French | 19.6 | 24.9 | | 0.68 | (0.66, 0.71) |
| Neither English nor French | 0.9 | 0.8 | | 0.96 | (0.81, 1.14) |

* OR = odds ratio comparing odds of having a family doctor among various demographic categories. Those categories without an OR were designated referent categories.

Socioeconomic Status

When compared to people who have a regular doctor, people who did not have a regular physician were more likely to have lower income, be employed fulltime, be less likely to own their own house, and to have a background of higher education and lower income (Table 3.3). Those who had a family doctor were more likely to be unemployed. Interestingly, they comparatively had higher income, were more likely to own their own house, and had lower education.

| | <u>% Doctor</u> | <u>% No Doctor</u> | <u>p</u> | <u>Crude OR</u> | <u>95% Confidence Interval</u> |
|------------------------------------|---------------------|------------------------|----------|---------------------|--|
| Income | | | | | |
| Low | 12.2 | 14.3 | <0.001 | 0.86 | (0.81, 0.91) |
| Middle/High | 87.8 | 85.7 | | (ref) | |
| Employment Status Last Week | | | | | |
| At work | 57.2 | 67.9 | <0.001 | (ref) | |
| Absent | 5.0 | 4.0 | | 1.48 | (1.36, 1.61) |
| No job | 35.0 | 26.9 | | 1.54 | (1.48, 1.60) |
| Disabled | 2.8 | 1.2 | | 2.67 | (2.67, 3.08) |
| Home Ownership | | | | | |
| Own | 76.5 | 61.1 | <0.001 | 2.07 | (2.00, 2.14) |
| Do Not Own | 23.5 | 38.9 | | (ref) | |
| Educational Level | | | | | |
| Less than secondary | 32.9 | 29.3 | <0.001 | (ref) | |
| Secondary graduate | 17.3 | 16.6 | | 0.95 | (0.90, 0.99) |
| Other post-secondary | 6.6 | 8.5 | | 0.70 | (0.66, 0.75) |
| Post-secondary graduate | 43.1 | 45.7 | | 0.86 | (0.83, 0.89) |

* OR = odds ratio comparing odds of having a family doctor among various socioeconomic categories. Those categories without an OR were designated referent categories.

Health Status

The health status of Canadians who do and do not have a family physician were compared, and results can be seen in Table 3.4. People who have a family doctor were consistently more likely to have a diverse array of diseases than people who do not have a family doctor. These include asthma, arthritis, hypertension, migraines, chronic obstructive pulmonary disease, diabetes, heart disease, cancer, or intestinal ulcers. People who had a family doctor were also more likely to have a mood disorder.

| <u>Chronic Disease</u> | <u>% Doctor</u> | <u>% No Doctor</u> | <u>p</u> | <u>Crude OR</u> | <u>95% Confidence Interval</u> |
|--------------------------------|-----------------|--------------------|----------|-----------------|--------------------------------|
| Has any chronic condition | 75.0 | 54.8 | <.001 | 2.48 | (2.40, 2.56) |
| asthma | 9.3 | 6.6 | <.001 | 1.45 | (1.36, 1.54) |
| arthritis or rheumatism | 23.9 | 9.4 | <.001 | 3.01 | (2.86, 3.17) |
| high blood pressure | 19.9 | 6.1 | <.001 | 3.86 | (3.60, 4.07) |
| migraine headaches | 10.7 | 7.9 | <.001 | 1.40 | (1.32, 1.48) |
| emphysema/COPD | 2.0 | 0.8 | <.001 | 2.53 | (2.05, 3.12) |
| diabetes | 6.4 | 1.7 | <.001 | 3.91 | (3.49, 4.38) |
| heart disease | 7.5 | 2.0 | <.001 | 4.06 | (3.65, 4.51) |
| cancer | 2.3 | 0.6 | <.001 | 3.67 | (3.06, 4.41) |
| stomach or intestinal ulcers | 3.3 | 2.1 | <.001 | 1.58 | (1.43, 1.76) |
| bowel disorder | 3.0 | 1.3 | <.001 | 2.37 | (2.08, 2.70) |
| <u>Mental Health</u> | | | | | |
| mood disorder | 6.2 | 3.5 | <.001 | 1.82 | (1.68, 1.97) |
| considered suicide past 12 mo. | 20.5 | 22.0 | 0.384 | 0.91 | (0.74, 1.12) |

* OR = odds ratio comparing odds of having family doctor among those with chronic condition versus those without chronic conditions.

Preventive Services

The preventive service utilization of Canadians who do and do not have a family physician is presented in Table 3.5. People who did not have a family doctor were significantly less likely to have undergone screening medical tests and procedures (pap, mammogram, fecal occult blood testing) than people who had a family doctor. They were also less likely to have had a flu shot.

| | <u>%</u> <u>Doctor</u> | <u>% No</u> <u>Doctor</u> | <u>p</u> | <u>Crude</u> <u>OR</u> | <u>Confidence</u> <u>Interval</u> |
|-------------------------|---------------------------|------------------------------|----------|---------------------------|--------------------------------------|
| Pap Smear | 0.53 | 0.35 | <0.001 | 2.07 | (1.95, 2.19) |
| Mammogram | 0.73 | 0.41 | <0.001 | 3.98 | (3.57, 4.45) |
| Fecal Occult Blood Test | 0.05 | 0.01 | <0.001 | 3.22 | (2.52, 4.11) |
| Flu Shot Last | 0.64 | 0.35 | <0.001 | 3.36 | (3.02, 3.74) |

* OR = odds ratio comparing odds of receiving preventive services among those with a family doctor versus those without a family doctor.

Comparison of Elderly and Non-Elderly Respondents

It was anticipated *a priori* that age could play a confounding role in the outcomes of this investigation. This anticipation fueled the specific aim to stratify for age category. Of particular concern was the greater likelihood of elderly individuals to have a regular physician, and the impact this might make on the interpretation demographic, socioeconomic, and health status outcomes. Table 3.6 outlines the discrepancies between elderly and non-elderly respondents. When compared with the non-elderly, elderly respondents exhibited a higher likelihood of having a

family doctor, of being female, married, immigrant, white, born in another country, unemployed, and of having a less than secondary education. They were also more likely to have a chronic condition and to have low income. This discrepancy fueled the impetus to stratify for age category.

| | ≥65 years old (%) n=28,558 | <65 years old (%) n=105,325 |
|-------------------------------|---|---|
| Has a regular medical doctor | 94.6 | 83.9 |
| Female | 60.1 | 52.5 |
| Married | 46.9 | 42.2 |
| Immigrant | 18.0 | 11.6 |
| White | 95.8 | 88.7 |
| Born in another country | 18.7 | 12.5 |
| Low income | 20.3 | 10.5 |
| No job last week | 83.9 | 25.9 |
| Own house | 75.2 | 74.1 |
| Less than secondary education | 50.2 | 27.7 |
| Has a chronic condition | 90.9 | 67.2 |

Stratification by age category

Stratification by age evidenced very little modification of demographic findings. Results are documented in Table 3.7. Demographically, people who have a family doctor still exhibited a greater likelihood of being female, married, white, and primarily English speakers. However, teens differed in their greater likelihood of having been born in Canada. People who do not have a family doctor remained more likely to be male, single, visible minorities, French speakers, and born in Canada.

Table 3.7 Self-reported demographic characteristics of Canadian Community Health Survey respondents who do and do not have a regular doctor, stratified by age category*

| | <u>% Doctor</u> | <u>% No Doctor</u> | <u>p</u> | <u>OR</u> | <u>95% Confidence Interval</u> |
|--------------------------|---------------------|------------------------|----------|-----------|--|
| Sex | | | | | |
| Teen | | | | | |
| Male | 50.7 | 53.4 | 0.007 | 0.89 | (0.83, 0.97) |
| Female | 49.3 | 46.6 | | (ref) | |
| Adult | | | | | |
| Male | 43.5 | 62.9 | <0.001 | 0.46 | (0.44, 0.47) |
| Female | 56.5 | 37.1 | | (ref) | |
| Elderly | | | | | |
| Male | 39.4 | 47.6 | <0.001 | 0.72 | (0.65, 0.79) |
| Female | 60.6 | 52.4 | | (ref) | |
| Marital status | | | | | |
| Teen | | | | | |
| Married | 0.3 | 0.5 | <0.001 | (ref) | |
| Common Law | 0.8 | 1.8 | | 0.74 | (0.38, 1.46) |
| Widow/Separated/Divorced | 0.0 | 0.1 | | 0.46 | (0.11, 1.85) |
| Single/Never Married | 98.8 | 97.5 | | 1.62 | (0.89, 2.94) |
| Adult | | | | | |
| Married | 54.5 | 34.4 | <0.001 | (ref) | |
| Common Law | 9.9 | 15.7 | | 0.40 | (0.38, 0.42) |
| Widow/Separated/Divorced | 15.2 | 12.6 | | 0.76 | (0.72, 0.80) |
| Single/Never Married | 20.5 | 37.4 | | 0.35 | (0.33, 0.36) |
| Elderly | | | | | |
| Married | 47.5 | 37.2 | <0.001 | (ref) | |
| Common Law | 1.2 | 1.8 | | 0.53 | (0.36, 0.78) |
| Widow/Separated/Divorced | 46.2 | 48.4 | | 0.75 | (0.67, 0.84) |
| Single/Never Married | 5.2 | 12.6 | | 0.32 | (0.27, 0.38) |
| Immigrant status | | | | | |
| Teen | | | | | |
| Immigrant | 5.4 | 6.2 | 0.081 | 0.86 | (0.72, 1.02) |
| Non Immigrant | 94.6 | 93.8 | | (ref) | |
| Adult | | | | | |
| Immigrant | 13.2 | 11.2 | <0.001 | 1.21 | (1.15, 1.28) |
| Non Immigrant | 86.8 | 88.8 | | (ref) | |
| Elderly | | | | | |
| Immigrant | 18.2 | 15.5 | 0.010 | 1.21 | (1.05, 1.40) |
| Non Immigrant | 81.8 | 84.5 | | (ref) | |

* OR = odds ratio comparing odds of having family doctor among various demographic categories. Those categories without an OR were designated referent categories. Teen = 12-19, Adult = 20-64, Elderly 65+.

Table 3.7 (continued) Self-reported demographic characteristics of Canadian Community Health Survey respondents who do and do not have a regular doctor, stratified by age category*

| | <u>% Doctor</u> | <u>% No Doctor</u> | <u>p</u> | <u>OR</u> | <u>95% Confidence Interval</u> |
|-------------------------------|---------------------|------------------------|----------|-----------|--|
| Cultural/Racial origin | | | | | |
| Teen | | | | | |
| White | 87.0 | 78.2 | <0.001 | 1.86 | (1.68, 2.07) |
| Visible Minority | 13.0 | 21.8 | | (ref) | |
| Adult | | | | | |
| White | 90.1 | 85.8 | <0.001 | 1.51 | (1.43, 1.59) |
| Visible Minority | 9.9 | 14.2 | | (ref) | |
| Elderly | | | | | |
| White | 96.0 | 92.6 | <0.001 | 1.89 | (1.54, 2.32) |
| Visible Minority | 4.0 | 7.4 | | (ref) | |
| Country of birth | | | | | |
| Teen | | | | | |
| Canada | 93.7 | 92.9 | 0.139 | 1.13 | (0.96, 1.32) |
| Other | 6.3 | 7.1 | | (ref) | |
| Adult | | | | | |
| Canada | 85.9 | 87.7 | <0.001 | 0.86 | (0.81, 0.91) |
| Other | 14.1 | 12.3 | | (ref) | |
| Elderly | | | | | |
| Canada | 81.1 | 83.8 | 0.010 | 0.83 | (0.72, 0.96) |
| Other | 18.9 | 16.2 | | (ref) | |
| Language | | | | | |
| Teen | | | | | |
| Primarily English | 59.3 | 52.6 | <0.001 | (ref) | |
| Primarily French | 8.2 | 16.8 | | 0.43 | (0.38, 0.48) |
| English or French | 32.2 | 29.5 | | 0.96 | (0.88, 1.05) |
| Neither English nor French | 0.4 | 1.1 | | 0.30 | (0.19, 0.47) |
| Adult | | | | | |
| Primarily English | 69.3 | 59.8 | <0.001 | (ref) | |
| Primarily French | 11.0 | 14.7 | | 0.65 | (0.61, 0.68) |
| English or French | 19.0 | 24.8 | | 0.66 | (0.63, 0.69) |
| Neither English nor French | 0.8 | 0.7 | | 0.96 | (0.78, 1.19) |
| Elderly | | | | | |
| Primarily English | 72.0 | 69.0 | 0.005 | (ref) | |
| Primarily French | 12.5 | 12.3 | | 0.97 | (0.83, 1.15) |
| English or French | 13.8 | 17.1 | | 0.78 | (0.67, 0.89) |
| Neither English nor French | 1.6 | 1.6 | | 1.01 | (0.66, 1.54) |

* OR = odds ratio comparing odds of having family doctor among various demographic categories. Those categories without an OR were designated referent categories. Teen = 12-19, Adult = 20-64, Elderly 65+.

Socioeconomic variables were also stratified by age category. Results are listed in Table 3.8. The only modification seen was with teens: those with a doctor were more likely to be employed, as opposed to adults and elderly.

Table 3.8 Self-reported socioeconomic characteristics of Canadian Community Health Survey respondents who do and do not have a regular doctor, stratified by age category*

| | <u>% Doctor</u> | <u>% No Doctor</u> | <u>p</u> | <u>OR</u> | <u>95% Confidence Interval</u> |
|---------------------------------------|-----------------|--------------------|----------|-----------|--------------------------------|
| Income | | | | | |
| Teen | | | | | |
| Low | 10.8 | 18.3 | <0.001 | 0.54 | (0.47, 0.61) |
| Middle/High | 89.2 | 81.7 | | (ref) | |
| Adult | | | | | |
| Low | 9.9 | 12.1 | <0.001 | 0.80 | (0.75, 0.85) |
| Middle/High | 90.1 | 87.9 | | (ref) | |
| Elderly | | | | | |
| Low | 19.7 | 29.8 | <0.001 | 0.58 | (0.51, 0.66) |
| Middle/High | 80.3 | 70.2 | | (ref) | |
| Employment Status -- Last Week | | | | | |
| Teen | | | | | |
| At work | 51.6 | 50.1 | 0.078 | (ref) | |
| Absent | 2.4 | 1.6 | | 1.43 | (0.97, 2.11) |
| No job | 45.7 | 47.9 | | 0.92 | (0.83, 1.02) |
| Disabled | 0.3 | 0.4 | | 0.77 | (0.34, 1.78) |
| Adult | | | | | |
| At work | 67.2 | 73.6 | <0.001 | (ref) | |
| Absent | 6.1 | 4.5 | | 1.49 | (1.37, 1.63) |
| No job | 23.8 | 20.7 | | 1.26 | (1.20, 1.32) |
| Disabled | 2.8 | 1.1 | | 2.73 | (2.32, 3.22) |
| Elderly | | | | | |
| At work | 10.5 | 15.8 | <0.001 | (ref) | |
| Absent | 0.8 | 1.2 | | 1.00 | (0.53, 1.90) |
| No job | 84.3 | 78.1 | | 1.62 | (1.34, 1.95) |
| Disabled | 4.4 | 4.9 | | 1.34 | (0.94, 1.91) |

* OR = odds ratio comparing odds of having family doctor among various socioeconomic categories. Those categories without an OR were designated referent categories. Teen = 12-19, Adult = 20-64, Elderly 65+.

Table 3.8 (continued) Self-reported socioeconomic characteristics of Canadian Community Health Survey respondents who do and do not have a regular doctor, stratified by age category*

| | <u>% Doctor</u> | <u>% No Doctor</u> | <u>p</u> | <u>OR</u> | <u>95% Confidence Interval</u> |
|--------------------------|---------------------|------------------------|----------|-----------|--|
| Home Ownership | | | | | |
| Teen | | | | | |
| Own | 81.2 | 69.1 | <0.001 | 1.94 | (1.77, 2.12) |
| Do Not Own | 18.8 | 30.9 | | (ref) | |
| Adult | | | | | |
| Own | 75.9 | 58.4 | <0.001 | 2.24 | (2.16, 2.33) |
| Do Not Own | 24.1 | 41.6 | | (ref) | |
| Elderly | | | | | |
| Own | 75.5 | 71.6 | 0.001 | 1.22 | (1.09, 1.37) |
| Do Not Own | 24.5 | 28.4 | | (ref) | |
| Home Ownership | | | | | |
| Teen | | | | | |
| Own | 81.2 | 69.1 | <0.001 | 1.94 | (1.77, 2.12) |
| Do Not Own | 18.8 | 30.9 | | (ref) | |
| Adult | | | | | |
| Own | 75.9 | 58.4 | <0.001 | 2.24 | (2.16, 2.33) |
| Do Not Own | 24.1 | 41.6 | | (ref) | |
| Elderly | | | | | |
| Own | 75.5 | 71.6 | 0.001 | 1.22 | (1.09, 1.37) |
| Do Not Own | 24.5 | 28.4 | | (ref) | |
| Educational Level | | | | | |
| Teen | | | | | |
| Less than secondary | 80.2 | 72.8 | <0.001 | (ref) | |
| Secondary graduate | 10.7 | 13.5 | | 0.76 | (0.67, 0.85) |
| Other post-secondary | 7.1 | 10.6 | | 0.63 | (0.55, 0.72) |
| Post-secondary graduate | 2.1 | 3.2 | | 0.62 | (0.49, 0.79) |
| Adult | | | | | |
| Less than secondary | 16.5 | 17.6 | <0.001 | (ref) | |
| Secondary graduate | 19.8 | 17.7 | | 1.19 | (1.12, 1.27) |
| Other post-secondary | 7.3 | 8.5 | | 0.91 | (0.84, 0.98) |
| Post-secondary graduate | 56.4 | 56.2 | | 1.07 | (1.02, 1.13) |
| Elderly | | | | | |
| Less than secondary | 49.9 | 55.9 | <0.001 | (ref) | |
| Secondary graduate | 14.4 | 12.0 | | 1.35 | (1.15, 1.59) |
| Other post-secondary | 4.5 | 4.2 | | 1.20 | (0.92, 1.56) |
| Post-secondary graduate | 31.2 | 28.0 | | 1.25 | (1.11, 1.41) |

* OR = odds ratio comparing odds of having family doctor among various socioeconomic categories. Those categories without an OR were designated referent categories. Teen = 12-19, Adult = 20-64, Elderly 65+.

Stratifying for age category did not modify the finding that chronic diseases remained more prevalent across all age categories for people who have a family doctor. Results for this stratification are seen in Table 3.9.

| Age Category | % Doctor | % No Doctor | p | OR | 95% Confidence Interval |
|---------------------|---------------------|------------------------|----------|-----------|--|
| Teen | 55.3 | 46.5 | <0.001 | 1.42 | (1.31, 1.54) |
| Adult | 73.0 | 54.4 | <0.001 | 2.27 | (2.19, 2.35) |
| Elderly | 91.9 | 74.1 | <0.001 | 3.93 | (3.48, 4.44) |

* OR = odds ratio comparing odds of having a chronic condition among those with a family doctor versus those without a family doctor. Teen = 12-19, Adult = 20-64, Elderly 65+.

Stratification by chronic disease

As indicated in the specific aims, chronic disease status was identified as a potential confounder in the acquisition of a regular physician. Therefore, stratification by chronic disease status was employed to discern such an effect. Findings are documented in table 3.10. Stratification by chronic disease did not modify baseline demographic discrepancies between people who do and do not have a regular family doctor, but did reveal further insight into existing findings. For example, males were only half as likely as females to have a doctor, regardless of whether they are well, or ill. Similarly, French-speaking Canadians were less likely than English-speaking Canadians to have a doctor, whether ill or well.

Meanwhile, the elderly were slightly more likely than teens to have a doctor if they were well, but over 3 times as likely to have a doctor if they were ill. This was similar, though less pronounced, in the case of immigrants. Those born in Canada remained less likely than those born outside of Canada to have a doctor if they were well, but unexpectedly, they were even less likely to have a physician if they were ill.

Table 3.10 Self-reported demographic characteristics of Canadian Community Health Survey respondents who do and do not have a regular doctor, stratified by chronic illness*

| | | <u>%</u> <u>Doctor</u> | <u>% No</u> <u>Doctor</u> | <u>p</u> | <u>OR</u> | <u>95%</u> <u>Confidence</u> <u>Interval</u> |
|-----------------------|----------------------|---------------------------|------------------------------|----------|-----------|--|
| Sex | | | | | | |
| Ill | Male | 41.0 | 55.0 | <0.001 | 0.57 | (0.55, 0.59) |
| | Female | 59.0 | 45.0 | | (ref) | |
| Well | Male | 51.0 | 66.3 | <0.001 | 0.53 | (0.50, 0.56) |
| | Female | 49.0 | 33.7 | | (ref) | |
| Age Category | | | | | | |
| Ill | Teen | 9.9 | 13.0 | <0.001 | (ref) | |
| | Adult | 61.4 | 75.7 | | 1.10 | (1.04, 1.17) |
| | Elderly | 28.7 | 11.3 | | 3.44 | (3.17, 3.74) |
| Well | Teen | 24.1 | 18.1 | <0.001 | (ref) | |
| | Adult | 68.3 | 77.1 | | 0.70 | (0.65, 0.74) |
| | Elderly | 7.6 | 4.8 | | 1.25 | (1.11, 1.40) |
| Marital status | | | | | | |
| Ill | Married | 46.8 | 30.6 | <0.001 | (ref) | |
| | Common Law | 6.2 | 12.1 | | 0.33 | (0.31, 0.36) |
| | Widow/Sep/Div | 23.6 | 16.3 | | 0.95 | (0.89, 1.01) |
| | Single/Never Married | 23.3 | 41.0 | | 0.37 | (0.35, 0.39) |
| Well | Married | 41.6 | 27.9 | <0.001 | (ref) | |
| | Common Law | 7.9 | 12.8 | | 0.42 | (0.38, 0.45) |
| | Widow/Sep/Div | 10.7 | 10.5 | | 0.68 | (0.62, 0.74) |
| | Single/Never Married | 39.9 | 48.8 | | 0.54 | (0.51, 0.57) |

* OR = odds ratio comparing odds of having family doctor among various demographic categories. Those categories without an OR were designated referent categories. Teen = 12-19, Adult = 20-64, Elderly 65+.

Table 3.10 (continued) Self-reported demographic characteristics of Canadian Community Health Survey respondents who do and do not have a regular doctor, stratified by chronic illness*

| | | <u>%</u> <u>Doctor</u> | <u>% No</u> <u>Doctor</u> | <u>p</u> | <u>OR</u> | <u>95%</u> <u>Confidence</u> <u>Interval</u> |
|-------------------------------|------------------------|---------------------------|------------------------------|----------|-----------|--|
| Immigrant status | | | | | | |
| Ill | Immigrant | 12.9 | 9.1 | <0.001 | 1.48 | (1.38, 1.59) |
| | Non Immigrant | 87.1 | 90.9 | | (ref) | |
| Well | Immigrant | 14.5 | 12.7 | <0.001 | 1.16 | (1.08, 1.25) |
| | Non Immigrant | 85.5 | 87.3 | | (ref) | |
| Cultural/Racial origin | | | | | | |
| Ill | White | 92.4 | 87.3 | <0.001 | 1.76 | (1.65, 1.87) |
| | Visible Minority | 7.6 | 12.7 | | (ref) | |
| Well | White | 87.1 | 82.6 | <0.001 | 1.42 | (1.33, 1.52) |
| | Visible Minority | 12.9 | 17.4 | | (ref) | |
| Country of birth | | | | | | |
| Ill | Canada | 86.3 | 89.9 | <0.001 | 0.71 | (0.66, 0.76) |
| | Other | 13.7 | 10.1 | | (ref) | |
| Well | Canada | 84.6 | 86.2 | <0.001 | 0.88 | (0.82, 0.94) |
| | Other | 15.4 | 13.8 | | (ref) | |
| Language | | | | | | |
| Ill | Primarily English | 69.1 | 59.7 | <0.001 | (ref) | |
| | Primarily French | 11.1 | 14.1 | | 0.68 | (0.64, 0.72) |
| | English or French | 18.9 | 25.7 | | 0.63 | (0.60, 0.67) |
| | Neither English/French | 0.9 | 0.6 | | 1.38 | (1.05, 1.81) |
| Well | Primarily English | 67.0 | 59.2 | <0.001 | (ref) | |
| | Primarily French | 10.6 | 15.7 | | 0.59 | (0.55, 0.64) |
| | English or French | 21.4 | 23.9 | | 0.79 | (0.75, 0.84) |
| | Neither English/French | 1.0 | 1.2 | | 0.77 | (0.61, 0.97) |

* OR = odds ratio comparing odds of having family doctor among various demographic categories. Those categories without an OR were designated referent categories. Teen = 12-19, Adult = 20-64, Elderly 65+.

With regards to socioeconomic variables, stratification by chronic disease did not modify initial findings. Table 3.11 documents these results. Persons of low income were consistently less likely to have a regular physician, whether they were ill or well. Individuals without a regular doctor were still found to exhibit an

increased likelihood of being employed, less likelihood of home ownership, and higher educational achievement. Those who were unemployed or disabled were about as likely as those employed to have a doctor when they were well, but 1.7 and 2.4 times as likely to have a doctor, respectively, if they were ill. Surprisingly, those who owned their own home were more likely than those who did not own their own home to have a doctor when they were well, as compared to when they were ill.

Table 3.11 Self-reported socioeconomic characteristics of Canadian Community Health Survey respondents who do and do not have a regular doctor, stratified by chronic illness*

| | | <u>%</u> | <u>% No</u> | <u>p</u> | <u>OR</u> | <u>95%</u> <u>Confidence</u> <u>Interval</u> | |
|---------------------------------------|-------------|----------|-------------|----------|-----------|--|--------------|
| Income | | | | | | | |
| Ill | Low | 13.5 | 15.3 | <0.001 | 0.87 | (0.82, 0.92) | |
| | Middle/High | 86.5 | 84.7 | | (ref) | | |
| Well | Low | 8.2 | 12.9 | <0.001 | 0.60 | (0.55, 0.65) | |
| | Middle/High | 91.8 | 87.1 | | (ref) | | |
| Home Ownership | | | | | | | |
| Ill | Own | 75.7 | 61.4 | <0.001 | 1.96 | (1.88, 2.04) | |
| | Do Not Own | 24.3 | 38.6 | | (ref) | | |
| Well | Own | 79.0 | 60.9 | <0.001 | 2.41 | (2.29, 2.54) | |
| | Do Not Own | 21.0 | 39.1 | | (ref) | | |
| Employment Status -- Last Week | | | | | | | |
| Ill | At work | 53.1 | 65.4 | <0.001 | (ref) | | |
| | Absent | 5.0 | 4.3 | | 1.43 | | (1.29, 1.60) |
| | No job | 38.2 | 28.2 | | 1.67 | | (1.59, 1.75) |
| | Disabled | 3.7 | 2.1 | | 2.16 | | (1.86, 2.50) |
| Well | At work | 69.1 | 71.0 | <0.001 | (ref) | | |
| | Absent | 5.0 | 3.7 | | 1.39 | | (1.22, 1.59) |
| | No job | 25.7 | 25.2 | | 1.04 | | (0.98, 1.11) |
| | Disabled | 0.2 | 0.2 | | 1.01 | | (0.57, 1.81) |

* OR = odds ratio comparing odds of having family doctor among various socioeconomic categories. Those categories without an OR were designated referent categories.

Table 3.11 (continued) Self-reported socioeconomic characteristics of Canadian Community Health Survey respondents who do and do not have a regular doctor, stratified by chronic illness*

| | | <u>%</u> | <u>% No</u> | <u>p</u> | <u>OR</u> | <u>95%</u> <u>Confidence</u> <u>Interval</u> |
|--------------------------|-------------------------|---------------|---------------|----------|-----------|--|
| Educational Level | | Doctor | Doctor | | | |
| Ill | Less than secondary | 33.4 | 29.0 | <0.001 | (ref) | |
| | Secondary graduate | 17.1 | 16.4 | | 0.92 | (0.86, 0.98) |
| | Other post-secondary | 6.5 | 8.7 | | 0.66 | (0.61, 0.71) |
| | Post-secondary graduate | 43.1 | 46.0 | | 0.83 | (0.79, 0.87) |
| Well | Less than secondary | 31.4 | 29.4 | <0.001 | (ref) | |
| | Secondary graduate | 18.1 | 16.9 | | 1.03 | (0.96, 1.11) |
| | Other post-secondary | 7.0 | 8.3 | | 0.80 | (0.73, 0.89) |
| | Post-secondary graduate | 43.5 | 45.4 | | 0.92 | (0.87, 0.98) |

* OR = odds ratio comparing odds of having family doctor among various socioeconomic categories. Those categories without an OR were designated referent categories.

Table 3.12 documents age- and time-specific preventive services stratified by chronic disease status. Adjusting for chronic disease status found that the discrepancy between those with and without a doctor persisted despite stratification: those without a regular doctor were consistently less likely to have undergone screening services than those who have a regular doctor, whether they were well or ill. However, the greatest discrepancies were seen among the well people. Among ill people, preventive services were two to three times more likely for those who have a regular doctor than those who do not. In contrast, among well people, preventive services were as high as six times more likely for those who have a regular doctor than those who do not. In fact, well people who have a doctor were consistently more likely to receive preventive services than ill people who lacked a doctor.

Table 3.12 Age- and time-specific preventive services among Canadian Community Health Survey respondents who do and do not have a family doctor, stratified by chronic illness

| | <u>%</u> <u>Doctor</u> | <u>% No</u> <u>Doctor</u> | <u>p</u> | <u>OR</u> | <u>95%</u> <u>Confidence</u> <u>Interval</u> |
|--------------------------------|---------------------------|------------------------------|----------|-----------|--|
| Pap Smear | | | | | |
| Ill | 0.514 | 0.358 | <0.001 | 1.90 | (1.77, 2.04) |
| Well | 0.563 | 0.333 | <0.001 | 2.58 | (2.33, 2.85) |
| Mammogram | | | | | |
| Ill | 0.738 | 0.465 | <0.001 | 3.24 | (2.85, 3.69) |
| Well | 0.711 | 0.287 | <0.001 | 6.10 | (4.86, 7.66) |
| Fecal Occult Blood Test | | | | | |
| Ill | 0.048 | 0.020 | <0.001 | 2.54 | (1.95, 3.32) |
| Well | 0.035 | 0.007 | <0.001 | 5.45 | (2.89, 10.29) |
| Flu Shot | | | | | |
| Ill | 0.657 | 0.391 | <0.001 | 2.99 | (2.65, 3.37) |
| Well | 0.496 | 0.239 | <0.001 | 3.14 | (2.45, 4.01) |

* OR = odds ratio comparing odds of receiving preventive services among those with a family doctor versus those without a family doctor.

Stratification by degree of community physician shortage

The final basis for stratification was degree of community physician shortage. As indicated in the specific aims, the degree of physician shortage was identified *a priori* as a potential confounder of physician acquisition and service utilization. Sociodemographic tables are not shown here, due to excessive length, and because this stratification did not modify initial findings. In some instances, differences became more pronounced, while in others they became less so. For example, the increased likelihood of females having physicians persisted equally across all shortage levels. However, a trend was evident when examining single

status: the greater the community shortage, the greater the proportion of single individuals without doctors.

When examining chronic disease under this stratification (see Table 3.13), people who have a family doctor were consistently found to be more likely than those without a family doctor to have a chronic illness, irrespective of the degree of community shortage. Odds ratios did not reveal a trend in keeping with degree of community shortage.

Table 3.13 Self-reported chronic disease among Canadian Community Health Survey respondents who do and do not have a regular doctor, stratified by community physician shortage category

| Community Shortage Category | % Doctor | % No Doctor | p | OR | 95% Confidence Interval |
|------------------------------------|-----------------|--------------------|----------|-----------|--------------------------------|
| <5% | 74.9 | 54.1 | <0.001 | 2.53 | (2.41, 2.65) |
| 5-9.9% | 75.5 | 56.2 | <0.001 | 2.41 | (2.28, 2.53) |
| 10-14.9% | 75.0 | 55.8 | <0.001 | 2.37 | (2.08, 2.69) |
| 15-19.9% | 74.5 | 51.8 | <0.001 | 2.72 | (2.27, 3.26) |
| 20+% | 69.5 | 51.7 | <0.001 | 2.13 | (1.81, 2.51) |

* OR = odds ratio comparing odds of having a chronic condition among those with a family doctor versus those without a family doctor.

An examination of preventive services while stratifying for community physician shortage was also undertaken, with results are listed in tables 3.14 and 3.15. Flu shots exhibited a clear trend with regards to shortage category: the greater the shortage, the lower the proportion of people who received the service. A similar trend was seen for Pap smears, but only in the first four shortage categories. The

greatest shortage category for Pap smears actually exhibited the highest rate of this service. Neither mammograms nor fecal occult blood tests revealed a clear pattern.

| | Community Shortage Category | % of Respondents who Received Service |
|--------------------------------|------------------------------------|--|
| Pap Smear | <5% | 51.6 |
| | 5-9.9% | 49.5 |
| | 10-14.9% | 46.9 |
| | 15-19.9% | 43.6 |
| | 20+% | 55.8 |
| Mammogram | <5% | 71.1 |
| | 5-9.9% | 72.0 |
| | 10-14.9% | 68.3 |
| | 15-19.9% | 77.8 |
| | 20+% | 57.7 |
| Fecal Occult Blood Test | <5% | 6.1 |
| | 5-9.9% | 1.8 |
| | 10-14.9% | 7.7 |
| | 15-19.9% | 0.0 |
| | 20+% | 0.0 |
| Flu Shot | <5% | 65.0 |
| | 5-9.9% | 60.1 |
| | 10-14.9% | 58.5 |
| | 15-19.9% | 55.7 |
| | 20+% | 54.6 |

Respondents were then divided into those who do and do not have a regular physician. Again, those with a regular physician were consistently more likely than those without a physician to have had preventive services. Interestingly, the highest rates of Pap smears, fecal occult blood tests, and flu shots for people without a physician were generally seen in communities with the greatest degree

of physician shortage. The greatest discrepancies in preventive service acquisition between those with and without a regular doctor, as evidenced by the highest odds ratios, as high as five times the likelihood for mammograms, and nearly as high for flu shots, were generally seen among communities with the least physician shortage.

Table 3.15 Age- and time-specific preventive services among Canadian Community Health Survey respondents who do and do not have a family doctor, stratified by community physician shortage category*

| Community Shortage Category | % Doctor | % No Doctor | p | OR | 95% Confidence Interval |
|------------------------------------|-----------------|--------------------|----------|-----------|--------------------------------|
| Pap Smear | | | | | |
| <5% | 53.2 | 32.0 | <0.001 | 2.41 | (2.20, 2.65) |
| 5-9.9% | 51.7 | 34.1 | <0.001 | 2.07 | (1.89, 2.28) |
| 10-14.9% | 48.5 | 39.7 | 0.002 | 1.43 | (1.15, 1.78) |
| 15-19.9% | 47.4 | 32.1 | <0.001 | 1.91 | (1.40, 2.59) |
| 20+% | 59.6 | 50.5 | 0.004 | 1.45 | (1.13, 1.86) |
| Mammogram | | | | | |
| <5% | 72.8 | 35.2 | <0.001 | 4.92 | (4.12, 5.88) |
| 5-9.9% | 74.8 | 40.9 | <0.001 | 4.28 | (3.60, 5.07) |
| 10-14.9% | 71.0 | 48.2 | <0.001 | 2.64 | (1.77, 3.93) |
| 15-19.9% | 79.9 | 66.7 | 0.023 | 1.99 | (1.12, 3.53) |
| 20+% | 62.1 | 48.9 | 0.039 | 1.71 | (1.03, 2.84) |
| Fecal Occult Blood Test | | | | | |
| <5% | 6.280 | 2.168 | <0.001 | 3.02 | (2.19, 4.17) |
| 5-9.9% | 1.907 | 0.584 | <0.001 | 3.31 | (1.82, 6.05) |
| 10-14.9% | 8.207 | 4.595 | <0.001 | 1.86 | (1.11, 3.09) |
| 15-19.9% | | | | | |
| 20+% | | | | | |
| Flu Shot | | | | | |
| <5% | 66.4 | 30.3 | <0.001 | 4.55 | (3.83, 5.40) |
| 5-9.9% | 61.8 | 36.1 | <0.001 | 2.86 | (2.43, 3.37) |
| 10-14.9% | 59.9 | 47.3 | 0.008 | 1.67 | (1.16, 2.41) |
| 15-19.9% | 59.6 | 29.2 | <0.001 | 3.57 | (2.02, 6.28) |
| 20+% | 55.0 | 53.8 | 1.000 | 1.05 | (0.54, 2.05) |

* OR = odds ratio comparing odds of receiving preventive services among those with a family doctor versus those without a family doctor.

Multiple Logistic Regression

Multiple logistic regression was employed to discern the predictors of having a regular doctor, of age- and time-appropriate preventive services, and also of chronic disease status. Results can be seen in tables 3.16-21. The strongest predictors of having a regular doctor included being female, married, disabled, and having a chronic condition. The odds of having a regular physician steadily declined with increasing physician shortage within a community. In fact, respondents were only 0.17 times as likely to have a regular physician in communities with the greatest physician shortage when compared to communities with the least shortage.

The strongest predictor of having any of the four age- and time-appropriate preventive services was having a regular doctor, with a consistently odds ratio of about 3 for each service. Being unemployed and having a chronic condition were also strong predictors of having undergone these services. Higher education level was a predictor of having a Pap smear and flu shot. Community physician shortage category did not reveal any clear trends in predicting preventive service.

The strongest predictors of chronic disease status included being disabled, elderly, and having a regular doctor.

Table 3.16 Multiple Logistic Regression results with regular doctor as dependent variable and demographic and patient health characteristics as predictors. (n= 81,894)

| Variable | B | Std. Error | Wald | df | Sig. | OR | 95% Confidence Interval for OR |
|-------------------------------|----------|-------------------|-------------|-----------|-------------|-----------|---------------------------------------|
| Female | 0.66 | 0.02 | 1264.04 | 1 | 0.000 | 1.94 | 1.87, 2.02 |
| Age Category | | | | | | | |
| Teen (referent) | | | 357.27 | 2 | 0.000 | | |
| Adult | -0.45 | 0.04 | 162.31 | 1 | 0.000 | 0.64 | 0.60, 0.69 |
| Elderly | 0.18 | 0.05 | 12.27 | 1 | 0.000 | 1.19 | 1.08, 1.32 |
| Marital status | | | | | | | |
| Married (referent) | | | 1117.49 | 3 | 0.000 | | |
| Common Law | -0.64 | 0.03 | 426.77 | 1 | 0.000 | 0.53 | 0.49, 0.56 |
| Widow/Separated | -0.23 | 0.03 | 59.14 | 1 | 0.000 | 0.79 | 0.75, 0.84 |
| Single/Never Married | -0.77 | 0.02 | 988.55 | 1 | 0.000 | 0.47 | 0.44, 0.49 |
| Immigrant status | | | | | | | |
| White | 0.21 | 0.09 | 5.97 | 1 | 0.015 | 1.24 | 1.04, 1.47 |
| Born in Canada | 0.27 | 0.03 | 72.70 | 1 | 0.000 | 1.30 | 1.23, 1.39 |
| Language | | | | | | | |
| English (referent) | | | 174.49 | 3 | 0.000 | | |
| French | -0.32 | 0.03 | 130.64 | 1 | 0.000 | 0.72 | 0.68, 0.76 |
| English/French | -0.21 | 0.02 | 87.45 | 1 | 0.000 | 0.81 | 0.77, 0.85 |
| Neither | -0.21 | 0.10 | 4.16 | 1 | 0.041 | 0.81 | 0.66, 0.99 |
| Low Income | -0.09 | 0.03 | 8.03 | 1 | 0.005 | 0.92 | 0.86, 0.97 |
| Employment Status (last week) | | | | | | | |
| At work (referent) | | | 153.81 | 3 | 0.000 | | |
| Absent | 0.28 | 0.05 | 37.48 | 1 | 0.000 | 1.32 | 1.21, 1.45 |
| No job | 0.14 | 0.02 | 34.88 | 1 | 0.000 | 1.15 | 1.10, 1.20 |
| Disabled | 0.81 | 0.08 | 105.61 | 1 | 0.000 | 2.25 | 1.93, 2.63 |
| Own Home | 0.56 | 0.02 | 736.99 | 1 | 0.000 | 1.75 | 1.68, 1.82 |
| Educational Level | | | | | | | |
| < Secondary (referent) | | | 18.62 | 3 | 0.000 | | |
| Secondary | 0.00 | 0.03 | 0.00 | 1 | 0.974 | 1.00 | 0.94, 1.06 |
| Some post-secondary | -0.14 | 0.04 | 15.58 | 1 | 0.000 | 0.87 | 0.81, 0.93 |
| Post-secondary graduate | -0.04 | 0.03 | 2.16 | 1 | 0.142 | 0.96 | 0.92, 1.01 |
| Has a chronic condition | 0.68 | 0.02 | 1307.47 | 1 | 0.000 | 1.98 | 1.91, 2.05 |
| Shortage Category | | | | | | | |
| <5% | | | 2069.19 | 4 | 0.000 | | |
| 5-9.9% | -0.46 | 0.02 | 501.52 | 1 | 0.000 | 0.63 | 0.61, 0.66 |
| 10-14.9% | -0.87 | 0.04 | 501.81 | 1 | 0.000 | 0.42 | 0.39, 0.45 |
| 15-19.9% | -1.12 | 0.05 | 437.60 | 1 | 0.000 | 0.33 | 0.29, 0.36 |
| 20+% | -1.78 | 0.05 | 1344.25 | 1 | 0.000 | 0.17 | 0.15, 0.19 |
| Constant | 1.33 | 0.10 | 192.59 | 1 | 0.000 | 3.77 | |

Table 3.17 Multiple Logistic Regression results with Pap Smear status (receipt of pap smear within past year) as dependent variable and demographic and patient health characteristics as predictors. (n= 24,734 females aged 20-69)

| Variable | B | Std. Error | Wald | df | Sig. | OR | 95% Confidence Interval for OR |
|-------------------------------|----------|-------------------|-------------|-----------|-------------|-----------|---------------------------------------|
| Has regular medical doctor | 1.06 | 0.03 | 1506.36 | 1 | 0.000 | 2.90 | 2.75, 3.06 |
| Marital status | | | 123.37 | 3 | 0.000 | | |
| Married (referent) | | | | | | | |
| Common Law | 0.23 | 0.03 | 72.32 | 1 | 0.000 | 1.25 | 1.19, 1.32 |
| Widow/Separated | 0.05 | 0.02 | 5.80 | 1 | 0.016 | 1.06 | 1.01, 1.10 |
| Single/Never Married | -0.09 | 0.02 | 17.80 | 1 | 0.000 | 0.91 | 0.88, 0.95 |
| Immigrant status | -0.13 | 0.08 | 2.79 | 1 | 0.095 | 0.88 | 0.75, 1.02 |
| White | -0.04 | 0.03 | 2.40 | 1 | 0.121 | 0.96 | 0.90, 1.01 |
| Born in Canada | 0.14 | 0.08 | 3.17 | 1 | 0.075 | 1.15 | 0.99, 1.33 |
| Language | | | 7.78 | 3 | 0.051 | | |
| English (referent) | | | | | | | |
| French | 0.05 | 0.03 | 4.45 | 1 | 0.035 | 1.06 | 1.00, 1.11 |
| English/French | 0.05 | 0.02 | 5.04 | 1 | 0.025 | 1.05 | 1.01, 1.09 |
| Neither | -0.02 | 0.09 | 0.04 | 1 | 0.832 | 0.98 | 0.82, 1.17 |
| Low Income | 0.08 | 0.03 | 7.73 | 1 | 0.005 | 1.08 | 1.02, 1.14 |
| Employment Status (last week) | | | 387.04 | 3 | 0.000 | | |
| At work (referent) | | | | | | | |
| Absent | 0.46 | 0.03 | 209.41 | 1 | 0.000 | 1.58 | 1.48, 1.68 |
| No job | 0.16 | 0.02 | 77.23 | 1 | 0.000 | 1.17 | 1.13, 1.21 |
| Disabled | -0.56 | 0.06 | 96.29 | 1 | 0.000 | 0.57 | 0.51, 0.64 |
| Own Home | -0.13 | 0.02 | 44.75 | 1 | 0.000 | 0.88 | 0.85, 0.91 |
| Educational Level | | | 635.41 | 3 | 0.000 | | |
| < Secondary (referent) | | | | | | | |
| Secondary | 0.46 | 0.03 | 297.15 | 1 | 0.000 | 1.58 | 1.50, 1.67 |
| Some post-secondary | 0.51 | 0.03 | 220.32 | 1 | 0.000 | 1.67 | 1.56, 1.79 |
| Post-secondary graduate | 0.58 | 0.02 | 631.84 | 1 | 0.000 | 1.78 | 1.70, 1.86 |
| Has a chronic condition | 0.17 | 0.02 | 97.52 | 1 | 0.000 | 1.19 | 1.15, 1.23 |
| Shortage Category | | | 75.71 | 4 | 0.000 | | |
| <5% | | | | | | | |
| 5-9.9% | -0.04 | 0.02 | 5.89 | 1 | 0.015 | 0.96 | 0.93, 0.99 |
| 10-14.9% | -0.11 | 0.04 | 7.55 | 1 | 0.006 | 0.90 | 0.83, 0.97 |
| 15-19.9% | -0.11 | 0.06 | 3.27 | 1 | 0.070 | 0.90 | 0.80, 1.01 |
| 20+% | 0.40 | 0.05 | 55.60 | 1 | 0.000 | 1.50 | 1.35, 1.67 |
| Constant | -2.54 | 0.09 | 850.28 | 1 | 0.000 | 0.08 | |

Table 3.18 Multiple Logistic Regression results with Mammogram status (receipt of mammogram within past 2 years) as dependent variable and demographic and patient health characteristics as predictors. (n= 14,268 females aged 50-69)

| Variable | B | Std. Error | Wald | df | Sig. | OR | 95% Confidence Interval for OR |
|-------------------------------|----------|-------------------|-------------|-----------|-------------|-----------|---------------------------------------|
| Has regular medical doctor | 1.12 | 0.05 | 511.67 | 1 | 0.000 | 3.06 | 2.78, 3.37 |
| Marital status | | | | | | | |
| Married (referent) | | | 378.57 | 3 | 0.000 | | |
| Common Law | -0.20 | 0.06 | 12.09 | 1 | 0.001 | 0.82 | 0.74, 0.92 |
| Widow/Separated | 0.45 | 0.03 | 261.86 | 1 | 0.000 | 1.57 | 1.49, 1.66 |
| Single/Never Married | -0.23 | 0.05 | 24.91 | 1 | 0.000 | 0.80 | 0.73, 0.87 |
| Immigrant status | -0.21 | 0.13 | 2.85 | 1 | 0.091 | 0.81 | 0.63, 1.04 |
| White | 0.18 | 0.05 | 13.56 | 1 | 0.000 | 1.20 | 1.09, 1.32 |
| Born in Canada | -0.16 | 0.12 | 1.63 | 1 | 0.202 | 0.85 | 0.67, 1.09 |
| Language | | | | | | | |
| English (referent) | | | 96.41 | 3 | 0.000 | | |
| French | 0.31 | 0.03 | 82.80 | 1 | 0.000 | 1.36 | 1.28, 1.46 |
| English/French | -0.05 | 0.03 | 2.16 | 1 | 0.142 | 0.96 | 0.90, 1.02 |
| Neither | -0.03 | 0.12 | 0.06 | 1 | 0.811 | 0.97 | 0.77, 1.23 |
| Low Income | -0.12 | 0.04 | 9.85 | 1 | 0.002 | 0.88 | 0.82, 0.95 |
| Employment Status (last week) | | | | | | | |
| At work (referent) | | | 435.58 | 3 | 0.000 | | |
| Absent | 0.14 | 0.06 | 6.15 | 1 | 0.013 | 1.15 | 1.03, 1.28 |
| No job | 0.47 | 0.02 | 373.52 | 1 | 0.000 | 1.59 | 1.52, 1.67 |
| Disabled | -0.15 | 0.06 | 6.68 | 1 | 0.010 | 0.86 | 0.77, 0.96 |
| Own Home | 0.15 | 0.03 | 23.13 | 1 | 0.000 | 1.16 | 1.09, 1.24 |
| Educational Level | | | | | | | |
| < Secondary (referent) | | | 158.51 | 3 | 0.000 | | |
| Secondary | 0.41 | 0.03 | 144.84 | 1 | 0.000 | 1.51 | 1.41, 1.61 |
| Some post-secondary | 0.26 | 0.05 | 24.81 | 1 | 0.000 | 1.29 | 1.17, 1.43 |
| Post-secondary graduate | 0.26 | 0.03 | 89.16 | 1 | 0.000 | 1.30 | 1.23, 1.37 |
| Has a chronic condition | 0.46 | 0.03 | 220.36 | 1 | 0.000 | 1.59 | 1.49, 1.69 |
| Shortage Category | | | | | | | |
| <5% (referent) | | | 15.74 | 4 | 0.003 | | |
| 5-9.9% | -0.02 | 0.02 | 0.72 | 1 | 0.395 | 0.98 | 0.93, 1.03 |
| 10-14.9% | -0.10 | 0.06 | 3.44 | 1 | 0.064 | 0.90 | 0.81, 1.01 |
| 15-19.9% | 0.26 | 0.08 | 10.58 | 1 | 0.001 | 1.30 | 1.11, 1.52 |
| 20+% | -0.02 | 0.10 | 0.02 | 1 | 0.882 | 0.98 | 0.80, 1.21 |
| Constant | -2.52 | 0.14 | 303.24 | 1 | 0.000 | 0.08 | |

Table 3.19 Multiple Logistic Regression results with Fecal Occult Blood Test status (receipt of FOBT within past 2 years) as dependent variable and demographic and patient health characteristics as predictors. (n= 1,933 respondents aged 50+)

| Variable | B | Std. Error | Wald | df | Sig. | OR | 95% Confidence Interval for OR |
|-------------------------------|----------|-------------------|-------------|-----------|-------------|-----------|---------------------------------------|
| Has regular medical doctor | 1.03 | 0.15 | 48.93 | 1 | 0.000 | 2.79 | 2.10, 3.73 |
| Female | -0.25 | 0.05 | 26.03 | 1 | 0.000 | 0.78 | 0.71, 0.86 |
| Marital status | | | 10.61 | 3 | 0.014 | | |
| Married (referent) | | | | | | | |
| Common Law | -0.33 | 0.16 | 4.25 | 1 | 0.039 | 0.72 | 0.53, 0.98 |
| Widow/Separated | 0.04 | 0.06 | 0.41 | 1 | 0.522 | 1.04 | 0.93, 1.16 |
| Single/Never Married | -0.24 | 0.11 | 5.13 | 1 | 0.023 | 0.78 | 0.64, 0.97 |
| Immigrant status | 0.50 | 0.31 | 2.59 | 1 | 0.108 | 1.66 | 0.90, 3.06 |
| White | 0.28 | 0.11 | 6.88 | 1 | 0.009 | 1.32 | 1.07, 1.62 |
| Born in Canada | 0.40 | 0.31 | 1.68 | 1 | 0.194 | 1.50 | 0.81, 2.75 |
| Language | | | 137.98 | 3 | 0.000 | | |
| English (referent) | | | | | | | |
| French | -3.68 | 0.38 | 94.10 | 1 | 0.000 | 0.03 | 0.01, 0.05 |
| English/French | -0.52 | 0.08 | 46.87 | 1 | 0.000 | 0.60 | 0.52, 0.69 |
| Neither | -0.26 | 0.23 | 1.21 | 1 | 0.271 | 0.77 | 0.49, 1.22 |
| Low Income | -0.03 | 0.09 | 0.10 | 1 | 0.757 | 0.97 | 0.82, 1.15 |
| Employment Status (last week) | | | 75.34 | 3 | 0.000 | | |
| At work (referent) | | | | | | | |
| Absent | 0.34 | 0.12 | 7.45 | 1 | 0.006 | 1.41 | 1.10, 1.79 |
| No job | 0.46 | 0.05 | 74.35 | 1 | 0.000 | 1.59 | 1.43, 1.76 |
| Disabled | 0.42 | 0.11 | 14.06 | 1 | 0.000 | 1.53 | 1.22, 1.90 |
| Own Home | 0.11 | 0.07 | 2.47 | 1 | 0.116 | 1.12 | 0.97, 1.28 |
| Educational Level | | | 5.54 | 3 | 0.136 | | |
| < Secondary (referent) | | | | | | | |
| Secondary | 0.08 | 0.07 | 1.28 | 1 | 0.259 | 1.08 | 0.94, 1.25 |
| Some post-secondary | 0.22 | 0.10 | 4.36 | 1 | 0.037 | 1.24 | 1.01, 1.52 |
| Post-secondary graduate | 0.10 | 0.06 | 3.09 | 1 | 0.079 | 1.11 | 0.99, 1.24 |
| Has a chronic condition | 0.27 | 0.07 | 13.32 | 1 | 0.000 | 1.31 | 1.13, 1.52 |
| Shortage Category | | | 278.65 | 4 | 0.000 | | |
| <5% (referent) | | | | | | | |
| 5-9.9% | -0.96 | 0.07 | 209.66 | 1 | 0.000 | 0.38 | 0.34, 0.44 |
| 10-14.9% | 0.54 | 0.09 | 35.88 | 1 | 0.000 | 1.72 | 1.44, 2.05 |
| 15-19.9% | -17.91 | 1286.12 | 0.00 | 1 | 0.989 | 0.00 | 0.00 |
| 20+% | -18.10 | 1654.50 | 0.00 | 1 | 0.991 | 0.00 | 0.00 |
| Constant | -4.80 | 0.36 | 174.07 | 1 | 0.000 | 0.01 | |

Table 3.20 Multiple Logistic Regression results with Flu Shot status (receipt of flu shot within past year) as dependent variable and demographic and patient health characteristics as predictors. (n= 8,837 respondents aged 65 and above)

| Variable | B | Std. Error | Wald | df | Sig. | OR | 95% Confidence Interval for OR |
|-------------------------------|----------|-------------------|-------------|-----------|-------------|-----------|---------------------------------------|
| Has regular medical doctor | 1.03 | 0.08 | 178.48 | 1 | 0.000 | 2.80 | 2.40, 3.25 |
| Female | 0.20 | 0.04 | 28.10 | 1 | 0.000 | 1.22 | 1.13, 1.31 |
| Marital status | | | | | | | |
| Married (referent) | | | 8.80 | 3 | 0.032 | | |
| Common Law | -0.07 | 0.13 | 0.24 | 1 | 0.623 | 0.94 | 0.72, 1.22 |
| Widow/Separated | -0.05 | 0.04 | 1.52 | 1 | 0.218 | 0.95 | 0.88, 1.03 |
| Single/Never Married | -0.22 | 0.08 | 8.47 | 1 | 0.004 | 0.80 | 0.69, 0.93 |
| Immigrant status | -0.21 | 0.22 | 0.89 | 1 | 0.346 | 0.81 | 0.53, 1.25 |
| White | -0.04 | 0.08 | 0.19 | 1 | 0.662 | 0.96 | 0.82, 1.14 |
| Born in Canada | -0.08 | 0.22 | 0.15 | 1 | 0.698 | 0.92 | 0.60, 1.41 |
| Language | | | | | | | |
| English (referent) | | | 27.05 | 3 | 0.000 | | |
| French | -0.27 | 0.05 | 24.95 | 1 | 0.000 | 0.76 | 0.69, 0.85 |
| English/French | -0.08 | 0.05 | 2.50 | 1 | 0.114 | 0.92 | 0.84, 1.02 |
| Neither | -0.22 | 0.14 | 2.36 | 1 | 0.124 | 0.80 | 0.61, 1.06 |
| Low Income | -0.27 | 0.05 | 25.24 | 1 | 0.000 | 0.76 | 0.69, 0.85 |
| Employment Status (last week) | | | | | | | |
| At work (referent) | | | 92.48 | 3 | 0.000 | | |
| Absent | 0.12 | 0.19 | 0.41 | 1 | 0.520 | 1.13 | 0.78, 1.65 |
| No job | 0.53 | 0.06 | 88.60 | 1 | 0.000 | 1.70 | 1.52, 1.90 |
| Disabled | 0.39 | 0.10 | 16.04 | 1 | 0.000 | 1.48 | 1.22, 1.79 |
| Own Home | -0.04 | 0.05 | 0.57 | 1 | 0.450 | 0.97 | 0.88, 1.06 |
| Educational Level | | | | | | | |
| < Secondary (referent) | | | 13.80 | 3 | 0.003 | | |
| Secondary | 0.06 | 0.05 | 1.47 | 1 | 0.225 | 1.07 | 0.96, 1.18 |
| Some post-secondary | 0.09 | 0.09 | 1.19 | 1 | 0.275 | 1.10 | 0.93, 1.30 |
| Post-secondary graduate | 0.15 | 0.04 | 13.69 | 1 | 0.000 | 1.16 | 1.07, 1.26 |
| Has a chronic condition | 0.66 | 0.06 | 137.90 | 1 | 0.000 | 1.93 | 1.73, 2.15 |
| Shortage Category | | | | | | | |
| <5% (referent) | | | 20.76 | 4 | 0.000 | | |
| 5-9.9% | -0.17 | 0.04 | 18.80 | 1 | 0.000 | 0.85 | 0.78, 0.91 |
| 10-14.9% | -0.15 | 0.09 | 2.89 | 1 | 0.089 | 0.86 | 0.73, 1.02 |
| 15-19.9% | -0.22 | 0.13 | 3.07 | 1 | 0.080 | 0.80 | 0.62, 1.03 |
| 20+% | -0.10 | 0.22 | 0.21 | 1 | 0.650 | 0.91 | 0.59, 1.39 |
| Constant | -1.41 | 0.25 | 30.94 | 1 | 0.000 | 0.25 | |

Table 3.21 Multiple Logistic Regression results with Chronic Disease status as dependent variable and demographic and patient health characteristics as predictors. (n= 69,007 respondents aged 65 and above)

| Variable | B | Std. Error | Wald | df | Sig. | OR | 95% Confidence Interval for OR |
|----------------------------------|----------|-------------------|-------------|-----------|-------------|-----------|---------------------------------------|
| Has regular medical doctor | 0.68 | 0.02 | 1171.63 | 1 | 0.000 | 1.98 | 1.91, 2.06 |
| Female | 0.37 | 0.02 | 591.11 | 1 | 0.000 | 1.45 | 1.40, 1.49 |
| Age Category | | | 1172.20 | 2 | 0.000 | | |
| Teen (referent) | | | | | | | |
| Adult | 0.60 | 0.03 | 368.31 | 1 | 0.000 | 1.82 | 1.71, 1.93 |
| Elderly | 1.46 | 0.04 | 1161.17 | 1 | 0.000 | 4.31 | 3.97, 4.69 |
| Marital status | | | 230.55 | 3 | 0.000 | | |
| Married (referent) | | | | | | | |
| Common Law | -0.16 | 0.03 | 36.29 | 1 | 0.000 | 0.85 | 0.81, 0.90 |
| Widow/Separated | 0.19 | 0.02 | 61.59 | 1 | 0.000 | 1.21 | 1.16, 1.27 |
| Single/Never Married | -0.19 | 0.02 | 83.75 | 1 | 0.000 | 0.83 | 0.79, 0.86 |
| Immigrant status | 0.34 | 0.10 | 10.55 | 1 | 0.001 | 1.40 | 1.14, 1.71 |
| White | -0.30 | 0.03 | 123.03 | 1 | 0.000 | 0.74 | 0.70, 0.78 |
| Born in Canada | 0.08 | 0.10 | 0.59 | 1 | 0.441 | 1.08 | 0.89, 1.32 |
| Language | | | 76.28 | 3 | 0.000 | | |
| English (referent) | | | | | | | |
| French | -0.16 | 0.02 | 42.74 | 1 | 0.000 | 0.85 | 0.81, 0.89 |
| English/French | 0.05 | 0.02 | 5.50 | 1 | 0.019 | 1.05 | 1.01, 1.09 |
| Neither | -0.35 | 0.08 | 17.45 | 1 | 0.000 | 0.70 | 0.59, 0.83 |
| Low Income | -0.13 | 0.03 | 21.48 | 1 | 0.000 | 0.88 | 0.83, 0.93 |
| Employment Status (last week) | | | 688.66 | 3 | 0.000 | | |
| At work (referent) | | | | | | | |
| Absent | 0.17 | 0.03 | 25.85 | 1 | 0.000 | 1.19 | 1.11, 1.27 |
| No job | 0.34 | 0.02 | 319.72 | 1 | 0.000 | 1.41 | 1.36, 1.46 |
| Disabled | 2.71 | 0.14 | 400.39 | 1 | 0.000 | 14.96 | 11.48, 19.50 |
| Own Home | 0.08 | 0.02 | 18.43 | 1 | 0.000 | 1.08 | 1.04, 1.12 |
| Educational Level | | | 69.23 | 3 | 0.000 | | |
| < Secondary (referent) | | | | | | | |
| Secondary | -0.19 | 0.02 | 60.77 | 1 | 0.000 | 0.82 | 0.79, 0.87 |
| Some post-secondary | -0.09 | 0.03 | 7.80 | 1 | 0.005 | 0.92 | 0.86, 0.97 |
| Post-secondary graduate | -0.15 | 0.02 | 48.86 | 1 | 0.000 | 0.86 | 0.82, 0.90 |
| Shortage Category | | | 8.39 | 4 | 0.078 | | |
| <5% | | | | | | | |
| 5-9.9% | -0.03 | 0.02 | 2.45 | 1 | 0.118 | 0.97 | 0.94, 1.01 |
| 10-14.9% | -0.06 | 0.04 | 2.77 | 1 | 0.096 | 0.94 | 0.87, 1.01 |
| 15-19.9% | -0.10 | 0.05 | 3.38 | 1 | 0.066 | 0.91 | 0.81, 1.01 |
| 20+% | -0.08 | 0.05 | 2.31 | 1 | 0.128 | 0.93 | 0.84, 1.02 |
| Constant | -1.01 | 0.32 | 10.15 | 1 | 0.001 | 0.36 | |

Chapter 4

DISCUSSION

Demographics and Gender

In some regards, demographic findings were as expected. For instance, it was not surprising to find that people who have a family doctor are more likely to be being female, married, and elderly when compared to those who do not have a regular family doctor. As noted earlier, similar patterns have been found in numerous previous studies, particularly with regards to gender. Indeed, being a young, single male in Canada poses a low demographic likelihood of having a family doctor.

The reasons underlying this gender discrepancy are not well understood. One reason might be that men are required to think about health issues less often than women, who routinely go for Pap tests or mammograms and are also more likely to accompany their children. As a result, women may develop a greater level of comfort, or even a habit, about going to their doctor. Another reason might be

psychological differences that exist between the sexes. For example, males might be less likely to pay attention to changes in their own bodies than women, and possibly more reluctant to come forward with concerns if they should exist.

Whatever the underlying reasons might be, the persistence of this finding is undeniable: men are consistently less likely than women to visit a doctor. When coupled with existing figures that males have a significantly higher all-cause and disease-specific mortality rate than females, a relevant suggestion arises: there is a link between mortality and having a family doctor. But the suggestion is far from conclusive. As the Canadian Community Health Survey continues to acquire data over the next two decades, it will be possible to examine time-series implications of family physician exposure and health outcome, and thereby better discern the relevant health implications of having or not having a family physician within the Canadian health care system.

Unexpected Sociodemographic Findings

This study found that those without a regular physician exhibited comparably lower income and less house ownership. This is not entirely unexpected, in view of previous findings that lower socioeconomic status is often associated with decreased physician access and lower health status. However, I was surprised to find that those who *have* a family doctor are more likely to have a background of

higher income, *lower* education, and an increased likelihood of being born outside of Canada.

The finding of lower education among those with a regular doctor is supported by related studies on general practitioner utilization. Specifically, a Slovenian study examined 2,160 adult patients to discern the predictors of frequent attendance in general practice and found that frequent attenders were more likely to have lower educational status.³⁴ Similarly, an Australian study examining predictors of general practitioner utilization among 897 people aged 70 years and older found that men who were older or who had lower occupational status used more medical services, as did women who had less education.³⁵

When coupled with the findings of country of birth, a possible explanation began to take shape: perhaps we are witnessing the result of elderly preponderance among those who have a regular family doctor. Specifically, being elderly corresponds with a greater likelihood of having a doctor (94.6%), of being female (60.1%), White (95.8%), married (46.9%), not born in Canada (18.7%), having a less than secondary education (50.2%), and being unemployed (83.9%). This is not entirely unexpected when considering that in Canada, a large proportion of the elderly are composed of first generation immigrant laborers from Europe who are currently retired. But this theory is not airtight: elderly Canadians also happen to be twice as likely to have low income than non-elderly Canadians. The

concomitance of lower education and higher income therefore cannot be solely explained by elderly predominance among those with a regular doctor.

Health Status

Canadians with a regular family doctor were consistency found to be more likely to suffer from a chronic disease when compared to Canadians who do not have a family doctor. The most striking differences in my study were seen with heart disease, diabetes, cancer, and hypertension. Odds ratios revealed that those with a regular doctor were about four times more likely to have heart disease, diabetes, and hypertension, and three and a half times more likely to have cancer. This finding persisted even when the analysis was adjusted for age category and degree of physician shortage within the community. In effect, whether people are young or old, and whether there is a shortage or abundance of physicians, people who have a regular doctor are far more likely to be ill than those who do not have a family doctor.

This finding is in keeping with previous investigations. The above-mentioned Slovenian study by Kersnik et al. (2001) also found that frequent attenders of general practitioners were more likely to have a chronic disease,

higher scores of anxiety and depression, and lower perceived quality of life. They were also less likely to try self-care and more likely to use health services.³⁴

This finding opposes my initial hypothesis that increased physician access would correlate with decreased morbidity, an idea derived from related studies on the impact of primary care access on morbidity and mortality. For example, Shi et. al (2001) employed 1990 US state level data and found a significant association between primary care physician supply and reduced all cause and cause specific mortality and increased life expectancy, even after controlling for income inequality and population sociodemographic characteristics.³⁰ They followed this study with a cross sectional, time series (eleven years of data 1985-95 from 50 US states) analysis of secondary data and found an increased supply of primary care practitioners was negatively associated with infant mortality and low birth weight, even after controlling for education, unemployment, racial/ethnic composition, income inequality, and urban/rural differences³⁰ My discrepant results may be due to the physician shortage itself.

It would appear that in response to Canada's current physician shortage, the population has reorganized itself in a manner that constitutes self triage, and family physician access is prioritized to the least healthy. Indeed, my study has found that those who do *not* have a family physician in this time of shortage appear to be those who have better health and greater education. In contrast, those who *do* have family physicians in this time of shortage are those who are ill

and elderly. Given the cross sectional nature of our data, it is difficult to discern the direction of these associations. In other words, it is not clear whether those with diseases are more likely to seek out and acquire a family physician, or whether having a family physician causes one to be “sick.” Indeed, there is little question that having a physician results in a greater likelihood of undergoing medical investigation. The result, of course, is the greater likelihood of being diagnosed with a disease and, hence, being identified as having a chronic illness.

Preventive Services

Counseling and screening for acute and chronic diseases are integral to the role of family doctors. Annual check-ups give the family doctor an opportunity to offer regular advice about disease prevention and healthy living. It is easily conceivable that Canadians who lack a family doctor would be less likely to receive preventive services such as cancer screening and flu shots. Conversely, those who do have a family doctor would be expected to exhibit greater utilization of preventive services. This study confirmed these suspicions. Preventive services were consistently less likely to have occurred amongst those without a family physician than amongst those with a family physician, even when stratifying for illness and degree of community physician shortage. Indeed, after adjusting for sociodemographic and chronic illness factors using multiple logistic regression, having a regular physician remained the strongest predictor of receiving

preventive services. If having a physician plays the dominant role in acquiring preventive services, then those least likely to have a regular physician will be expected to suffer the greatest impact of preventable diseases.

The clinical relevance is plain, and this finding may well represent the most important implication of family physician shortage and future health status in Canada. Preventive services are specifically constructed to diminish the impact of disease while enhancing the quality and quantity of life. Without them, it is expected that an individual will suffer preventable morbidity and, quite possibly, a shorter life expectancy. Strong studies in support of this assertion already exist, particularly with regards to breast cancer screening, cervical cancer screening, colon cancer screening, and flu shot administration for the young and elderly.

Therefore, according to this study, those at greatest risk for preventable diseases in the future are those who are male, adult, visible minorities, single, and do not suffer from a chronic disease. There is a socioeconomic characteristic as well: these individuals are more likely to be employed and have a background of lower income and of higher education. Related research reveals that the aforementioned gender discrepancy in physician access is also manifested in diminished preventive services.³⁶ The impact of decreased GP visits on Australian men has found that men are much less likely than women to engage in preventative health screens, such as checking for testicular cancer or requesting

cholesterol or blood pressure tests.³⁶ Men's diets were also found to be poorer than women's and they were less likely to use sunscreen or receive vaccines and flu shots.³⁶

An important consideration for the foregoing is the gradual shift that is currently taking place in Canada towards the utilization of nurse practitioners and nurses in preventive service delivery. It is felt that disease prevention, health education, health promotion, and many prevention services can be successfully implemented under the care of nurses and nurse practitioners who work in collaboration with primary care physicians. Indeed, such a change is likely going to be the key to maintaining, improving, and rendering more sustainable the existing health care system in Canada. Numerous diseases are amenable to preventive interventions including modification of life-style based risk factors such as avoidance of tobacco use and dietary and exercise modifications, as well as the application of evidence-based screening. "Primary Care Teams" consisting of family physicians, nurses, nurse practitioners, and dieticians will eventually form and work towards ensuring that those at risk of developing certain diseases or cancers are optimally identified, screened, and treated.

Thus far, such teams have been most aggressively implemented in rural and remote areas of Canada, where physician shortage is greatest. This might explain the remarkable findings that surfaced when preventive services were adjusted by

community physician shortage level. I found that while preventive services consistently decreased as physician shortage increased among those who have a regular doctor, preventive services in general *increased* as physician shortage increased for those who do not have a family doctor. As a result, the greatest discrepancy in preventive service acquisition was seen in communities with the least physician shortage. Communities with the greatest levels of shortage were able to provide higher levels of Pap smears, mammograms, and flu shots for those without a family physician, while still providing these services for those with a family physician. As time-series data becomes available, it will be possible to discern the prospective impact of such services and the relevance of family doctor involvement.

Multiple Logistic Regression

Multiple logistic regression reveals that there are demographic, socioeconomic, and health-related differences among people who do and do not have a regular doctor. After controlling for these differences, having a doctor was found to be strongly, and consistently predictive of receiving each and every preventive service. The greatest predictors of having a regular doctor, in turn, included being female, married, disabled, and having a chronic condition. Importantly the odds of having a regular physician steadily declined with increasing physician shortage within a community. In fact, respondents were only 0.17 times as likely to have a regular physician in communities with the greatest physician shortage

when compared to communities with the least shortage. Clearly, degree of physician shortage is related to the likelihood of having a regular doctor. Consequently, one would anticipate that communities with the greatest physician shortage would also exhibit the lowest rates of preventive service. This trend was easily evident with regards to flu shots, but not so clearly evident when examining the other preventive services. As previously noted, the active involvement of nurses in primary care and preventive service delivery for rural and remote areas might explain the increased rates of preventive service utilization in the greatest shortage communities. Further studies will be needed to discern whether this supposition is correct, and to elucidate the causes of this interesting but confusing finding.

Strengths & Limitations

This study poses several important strengths. Firstly, it initiates a systematic examination of the relevance and implications of Canada's physician shortage, a politically hot topic that has remained uninvestigated. Secondly, Canada's universal access strengthens this study by diminishing the socioeconomic obstacle to health care access, thereby rendering findings less encumbered by hard-to-control financial confounders. Thirdly, the Canadian Community Health Survey data specifically identifies people who do and do not have a regular physician, thereby eliminating the need for proxies such as physician population ratios. Fourthly, the broad range of socio-demographic, disease, and health service

utilization variables elicited by the survey allows for a more complete degree of analysis. Lastly, the survey achieved a very good overall response rate of 76.5% across the country, a rather remarkable achievement considering the 134,000 respondents involved.

The very large sample size of this study poses both a strength and a limitation. With this much power, it is possible to detect associations that may be statistically significant, but negligible from a clinical or population health perspective. Additional studies will be required not only to replicate these results but also to ascertain their relevance.

Another very relevant limitation is the cross sectional nature of the data. This type of data necessarily limits our assessments to simple associations. It would be inappropriate to draw any causal relationships. Nevertheless, we currently lack a better way to examine the gravity of the family physician crisis in Canada. Despite its limitations, this cross sectional study will establish the correlative groundwork for further future analysis as time-series data becomes available. As time series data becomes available from this survey, it will be possible to pursue higher quality prospective studies.

Furthermore, the survey data are based upon self-reported responses. Steps were taken to enhance validity, particularly as pertains to chronic disease status, by

specifically identifying 'long-term conditions' as those which “would have lasted or be expected to last 6 months or more and that have been diagnosed by a health professional.” Future studies might be able to link respondents with provincial billing data sources to discern the validity of chronic disease or preventive service responses.

Chapter 5

SUMMARY AND CONCLUSIONS

Is having a primary care physician associated with better health? The question of primary care access and its relevance to health status is arguably a very important one. It is a particularly pressing question in Canada where, despite a nationally-funded universal health care system, many Canadians lack family physician access due to a decade-long physician shortage. Remarkably, despite numerous public polls, countless newspaper articles, large government spending, and general public outrage and fear about the implications of not having a family physician, very little documentation exists as to whether people who lack a family doctor are actually worse off than those who have one. This question formed the basis for this thesis undertaking, wherein Canadians who have a family physician were compared with those who do not have one. Comparisons were made on 4 main fronts: demographic, socioeconomic, health status, and preventive services.

In general, it was found that people who do not have a regular doctor were more likely to be single, male, non-elderly, non-White, and non-immigrant when compared to those who have a regular doctor. They were also more likely to have a background of higher education, to be of lower income, employed, and not own their own home. With regards to health status, they were less likely than those with a doctor to have a chronic disease or a mental health problem. Importantly, they were less likely to have received medical screening tests or flu shots. These characteristics are upheld even when data were stratified by physician shortage level and chronic illness.

In contrast, those who have a family doctor were more likely to be female, elderly, married, immigrant, white, English-speaking, and born outside of Canada. They were more likely to have a background of lower education, to be of middle/high income, to own their own home, and to be jobless or disabled. Those who have a regular physician were also more likely to have a chronic disease and to have received age- and time-appropriate preventive services. Adjustment by community shortage level found no modification of these findings.

Logistic regression revealed that the greatest predictors of having a regular doctor included being female, married, disabled, and having a chronic condition. Moreover, the odds of having a regular physician steadily declined with increasing

physician shortage within a community. Importantly, having a regular physician was consistently the strongest predictor of having received any of the preventive services examined. Accordingly, the likelihood of having received a flu shot in the past year steadily declined with increasing community shortage. Nevertheless, some unexpected trends were noted when stratifying preventive service utilization by degree of community physician shortage: those with a regular physician remained far more likely than those without a regular physician to have received preventive services, but the greatest discrepancies between those with and without a doctor were consistently noted in communities with the least shortage of physicians. The reason for this is not understood, but might be attributable to increased primary care nursing services in rural and remote regions.

Although the cross sectional nature of this study necessarily limits our assessments to simple associations, we have nevertheless been able to establish the correlative groundwork for further future analysis. As time-series data become available, it will be possible to pursue prospective studies and better discern the implications of not having a regular physician in the Canadian health care system.

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