

ACCESS TO HEALTH CARE SERVICES AND SELF-PERCEIVED
HEALTH OF CANADA'S OFFICIAL-LANGUAGE MINORITIES

ISABELLE GAGNON-ARPIN

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Epidemiology and community medicine
Faculty of medicine
University of Ottawa

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Abstract

Official-language minorities in Canada may face specific issues in accessing health care services that can lead to negative consequences on their health, utilization of health care services and satisfaction with the health care system. A secondary data analysis of the 2006 Survey on the Vitality of Official-Language Minorities revealed significant differences between the Anglophone minority (n=5,161) and the Francophone minority (n=12,029) with regards to general health, and access to and use of health care services. Important predictors of these outcomes included age, education level, household income, marital status and place of residence (urban/rural). Access to health care services in the minority language was associated with self-perceived health in the Anglophone minority only. Health policy recommendations elaborated in light of the findings include working on both the supply and the demand of health care services offered in the two official languages, while taking into consideration important contextual differences between regions.

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List of Abbreviations

CCHS	Canadian Community Health Survey
CHSSN	Community Health and Social Services Network
CI	Confidence interval
CLSC	<i>Centre Local de Santé Communautaire</i>
CNFS	<i>Consortium national de formation en santé</i>
CROP	<i>Centre de recherche sur l'opinion publique</i>
FCFA	<i>Fédération des communautés francophones et acadienne</i>
MAR	Missing at random
MCAR	Missing completely at random
MD	Medical doctor
MCMC	Monte Carlo Marcov Chain
NMAR	Not missing at random
NPHS	National Population Health Survey
OHS	Ontario Health Survey
OLCDB	Official Language Community Development Bureau
OR	Odds ratio
QCGN	Quebec Community Groups Network
SAS	Statistical Analysis Software
SE	Standard error
SES	Socio-economic status
SVOLM	Survey on the Vitality of Official-Language Minorities
WHO	World Health Organization

1.0 INTRODUCTION

The purpose of the present study was to carry out a secondary data analysis of the Survey on the Vitality of Official-Language Minorities (SVOLM). The survey was conducted by Statistics Canada in 2006 and collected information on official-language minority communities, which are defined as Francophones living in provinces and territories outside Quebec (the Francophone minority) and Anglophones living in Quebec (the Anglophone minority)¹. The aim of the survey was to achieve a greater understanding of the use of the minority language, namely French outside Quebec and English in Quebec, in a range of settings such as the private and public spheres, educational institutions, the media and various health care settings². In the present study, data from the “Health Module” of the SVOLM were mostly used to describe, compare and predict general health, access to and use of health care services by men and women of the two official-language minority groups in Canada.

This undertaking was of interest for several important reasons. First, the paucity of available information pertaining to the health status and utilization of health services by official-language minority communities has been widely denounced in past years. It was one of the largest national studies to investigate current access to and use of health care services in both the Francophone minority and the Anglophone minority. Furthermore, the pressing need for increased research on this understudied field coupled with the availability of Statistics Canada data on the subject matter are robust underlying factors of the importance of the present study. The SVOLM database remains highly under-analyzed, as highlighted in the 2007-2008 Annual Report of the Office of the Commissioner of Official Languages³. Still referring to the SVOLM, the Annual Report states that “Data from the survey will allow researchers the opportunity to develop new areas of study that will be useful not only for communities, but also for government interventions.”³ (p.82)

The study also served a scientific purpose as it was the first known to test the association between poor access to health care services in the minority language and poor self-perceived health in men and women of the two official-language minorities. Last but not least, the topic addressed is supported by strong political assizes, including the modified *Official Languages Act* of 1988⁴. In Section 41 of the Act, the Canadian Government

commits to “enhancing the vitality of the English and French linguistic communities in Canada and supporting and assisting their development” as well as “fostering the full recognition and use of both English and French in Canadian society”⁴. The topic addressed in the present study is therefore in line with information priorities identified in the field, the need to exploit the analytical potential of the SVOLM and the Government’s commitment to fostering the development of official-language minority communities as well as the use of both English and French in Canada.

2.0 REVIEW OF THE LITERATURE

The literature review performed for this thesis focused on two major themes, namely self-perceived health and health disparities as well as barriers in access to health care services. This was followed by an examination of specific predictors of general health, access to and use of health care services. The population targeted in the review was official-language minorities in Canada. Due to the paucity of relevant and available studies pertaining to this segment of the population, the scope of the review was widened to include research conducted in other countries and on the general Canadian population. The review served in defining some key terms and concepts, summarizing the historical context of advances in the field, presenting findings from pertinent studies and critically appraising their strengths and limitations.

General demographic information on official-language minorities in Canada as well as how they are defined is also presented. Restrictions regarding the types of publications included in the review were not applied. The literature review search was limited to studies conducted in French and English and published after 1975. The electronic databases MEDLINE, EMBASE and CINHALL were searched and reference lists of key studies were scanned to identify important publications which may have been overlooked. A gray literature search was performed in part by using Scopus, Web of Science and Google Scholar. A general search in Google helped identify key reports and other types of publications produced by governments and organizations.

2.1 Self-perceived health and health disparities

Self-perceived health is a validated indicator commonly used to measure health within a country or a group⁵⁻⁷. It is a subjective assessment of one's health status, which can include several dimensions of health such as physical, social and emotional. It is also known as self-rated health or subjective health. The widespread use of self-perceived health as a popular measure of health status in population-based research emerged with studies by Pfeiffer⁸, Singer *et al.*⁹ and LaRue *et al.*¹⁰ on the association between self-rated health and mortality. Mossey and Shapiro's 1982 secondary data analysis of the Manitoba Longitudinal Study revealed groundbreaking evidence that seven-year survival of elderly Canadians was better

predicted by self-ratings of health than by information from their medical records or self-reports of medical conditions ¹¹. Since then, many more studies on the association between self-perceived health and mortality followed. Idler and Beynamini ¹² reviewed 27 studies on the matter and revealed that in 23 of them, self-ratings of health predicted reliably survival in populations even after known health risk factors had been accounted for. The review concluded that “self-ratings represent a source of very valuable data on health status” (p.34).

The variable of self-perceived health has been introduced in validated instruments, such as the SF-36 health survey questionnaire, used to measure health status of populations. A study by Brazier *et al.* ⁷ tested the acceptability, validity and reliability of that instrument as a whole as well as of variables comprised in the questionnaire. The authors found that the internal consistency of self-perceived health was high, with a Cronbach’s α of 0.95 (with the recommended minimum being 0.85) and reliability coefficients of 0.80 (with the recommended minimum being 0.75). Furthermore, the study revealed excellent test-retest reliability (with a 2 week interval) of self-perceived health, with 96% of cases lying within the 95% confidence interval constructed for a normal distribution. The construct validity of self-perceived health was measured by investigating the distributions of scores by sex, age, social class, use of health services and suffering from a chronic disease. The distribution of scores was in line with what might be expected, which provided evidence of construct validity ⁷.

Self-perceived health can also be influenced by clinical factors such as symptoms of disease, morbidity, disability or by diagnosis made by health care professionals regarding a disease ¹³. The determinants of health, which include the social, economic and physical environment, laws and regulations, as well as individuals’ personal characteristics and behaviours, also have a combined effect on health and on people’s perception of their health ¹⁴⁻²¹. More specifically, the World Health Organization (WHO) highlights these main determinants of health: age, gender, income and social status, education, social support networks, genetics, the physical environment and health services ¹⁴.

Furthermore, the determinants of health are thought to be the most influential factors in producing health inequities between and within countries ²². Health inequities and health disparities/inequalities (often used interchangeably) have been the object of much debate, often regarding their definition and measurement, as well as the place they should occupy in

global health policy agendas. A 1992 paper by Whitehead²³, and following works by Braveman²⁴, served in clarifying these concepts, although many different definitions of health inequities and health disparities have been suggested. The definition retained for this thesis is the one elaborated by Braveman in the 2006 paper *Health Disparities and Health Equity: Concepts and Measurements*²⁴:

A health disparity/inequality is a particular type of difference in health or in the most important influences on health that could potentially be shaped by policies; it is a difference in which disadvantaged social groups (such as the poor, racial/ethnic minorities, women or other groups that have persistently experienced social disadvantage or discrimination) systematically experience worse health or greater health risks than more advantaged groups. (p.180)

The paper also clarifies that “pursuing health equity means pursuing the elimination of such health disparities/inequalities”²⁴ (p.180). It is important to clarify that since “equity” is the focus, differences in health are only considered health disparities if they are based on a social disadvantage (such as poverty, ethnicity, gender, location, etc.)^{25,26}. Therefore, these concepts are not merely of public or population health concern, but have strong social and human rights implications. Going back to Braveman’s definition, the latter has many strengths and a few weaknesses. The explicit mention of disparities in the determinants of health, and that differences in health are potentially modifiable through health policy, are strong points of the definition. However, its length and complexity make it less accessible than other definitions. Regardless, Braveman’s clear and thorough definition of health disparities is deemed to be the most complete in the available literature, and is thus retained for this thesis.

The concept of health equity was introduced in 1984 as part of the “Health for All” policy of the WHO²⁷. This initiative consisted in the formulation of 38 common top-priority health policy targets for the 32 member states of the World Health Organization European Region. Equity was a pivotal theme of many of the identified targets, including some at the very top of the priority list²⁷. Throughout the 1990s, the European Office of the World Health Organization (EURO) was an important proponent of health disparities as a field of research and as an integral part of health policy^{24,28-30}. In 1995, the WHO launched a key initiative called Equity in Health and Health Care, aimed at putting the issue of health equity

higher on the policy agendas of national governments and international agencies. Part of the initiative encouraged the monitoring of health inequalities within countries of all economic levels and between countries of different economic levels. Nonetheless, important international efforts were made to address the particular issue of health inequalities as observed in lower-income countries^{24,31-33}.

Historically, studies conducted in Europe and Latin America have generally focused on the differences in health between people of different positions in a socioeconomic hierarchy³⁴⁻³⁷. The emphasis is therefore on a group's health in relation to their level of education and income, employment status, occupation, etc. Such studies include, but are not limited to, several works by Kunst and coworkers on mortality by occupational class and socioeconomic inequalities^{29,38,39}, papers published by Gwatkin and coworkers on the burden of disease among the global poor^{40,41}, research by Strainstreet and coworkers on income inequality and mortality in England⁴², work by Bronfman and coworkers on social classes and infant mortality in Mexico^{37,43}, etc.

In more recent years, research on socioeconomic inequality has also been conducted extensively in North America. According to a United States' National Centre for Health Statistics 1998 report⁴⁴, socioeconomic status is linked to a wide range of health problems, including hypertension, cardiovascular disease, low birth weight, arthritis, diabetes and cancer. Studies have also found that having a lower socioeconomic status is associated with higher mortality^{45,46}. In Canada, Berthelot and Ross⁴⁷ found a relationship between socioeconomic position and various disease outcomes across places and through time, regardless of how social position is measured. A review of the literature performed by Lynch *et al.*⁴⁸ revealed contradicting findings, as it showed that income inequality and health have only been linked within the United States, Britain and Brazil. However, the paper's very brief methodology section raises questions regarding the approach taken for including studies in the review. The position of investigating health inequalities from the sole variable of income is also questionable.

According to a 2004 report produced by the Health Disparities Task Group of the Federal/Provincial/Territorial Advisory Committee on Population Health and Health Security⁴⁹, the most prominent factors associated with health disparities in Canada are socioeconomic status, Aboriginal identity, gender and geographic location. The report

highlights that people in the lowest quintile of income are more often and more severely sick or injured, resulting in a two-fold increase in their use of health care services compared to people in the highest quintile. In fact, approximately 20% of total health care spending may be attributable to income disparities, as calculated through an estimation of health care resources used by Canadian households⁴⁹. A key strength of the report is that it emerged from collaborative discussions between several experts in the field of health disparities. It contains input and contributions of specialists from various backgrounds and who hold different opinions and approaches to the study of health disparities. In addition, the report is able to quantify the approximate total health care spending attributable to income disparities.

In the United States, the majority of research conducted on health disparities has focused on identifying and measuring health or health care differences between racial and ethnic groups. Most of the studies on racial/ethnic disparities have compared the health status of African Americans, Latinos/Hispanics, Native Americans and Asians, to the health status of Caucasians, usually of European descent^{24,50-55}. A 1999 Commonwealth Fund report entitled *U.S. Minority Health: A Chartbook*⁵⁶ reviewed and compiled findings from several national data sources and Commonwealth Fund surveys regarding racial disparities. The report highlighted that Americans belonging to a visible minority have a lower life expectancy and an increased rate of disease. It also revealed that racial and ethnic disparities persist across age, sex and income categories. It stated that while lower socioeconomic status and less access to health care for minority Americans play a role in their poorer health status and higher mortality rates, these factors do not fully account for the observed racial and ethnic disparities in health outcomes⁵⁶. The investigation of racial and ethnic disparities while adjusting for socioeconomic status is an important strength of the study. Furthermore, the Commonwealth Fund is recognized for producing high-quality research, including surveys and various types of reports.

In Canada, many studies pertaining to racial or ethnic disparities have focused on the health of aboriginal peoples. For example, a study by Wilkins *et al.*⁵⁷ found that life expectancy at birth for on-reserve Aboriginal men is 67 years compared to 76 years for men of the general population of Canada. Also, 60.1% of off-reserve Aboriginal people reported suffering from a chronic or infectious disease versus 49.6% of the general population⁵⁷. The prevalence of diabetes for off-reserve Aboriginals is at least three times that of the general

Canadian population⁵⁸. Studies on the health of immigrants to Canada have mostly found that recent immigrants present a better health status than native-born Canadians⁵⁹⁻⁶². However, a study performed by Bergeron *et al.*⁶³, which entailed a secondary data analysis of the 2005 Canadian Community Health Survey (CCHS), revealed that the healthy immigrant effect is only present in certain subgroups of immigrants.

Studies have also exposed the occurrence of health disparities for which the underlying determinants are language and/or culture. These two factors are integral components of racial/ethnic disparities, but can also be studied outside that realm, such as in the context of official-language minorities⁶⁴. In Canada, three major reports of the health of French-speaking minorities have been produced for government officials and ministries : the Report of the Standing Committee on Official Languages⁶⁵, the Report of the Consultative committee for French-Speaking Communities⁶⁶ and the study by the *Fédération des communautés francophones et acadienne*⁶⁷. All three reports provide the unanimous conclusion that Francophones in minority situations have poorer health in general than their Anglophone counterparts.

However, the Report of the Standing Committee on Official Languages⁶⁵ warns: “It is extremely difficult at this time to know the exact state of health of members of official language minority communities” (p.49) and goes on to explain that findings on the health of Francophone minority communities are based on extremely fragmented data. As such, these claims justify the need for more research on the subject matter and call for the careful interpretation of findings from some of the studies presented below. Furthermore, the report highlights: “there are plenty of avenues of research, but there are obviously also significant gaps in our knowledge of the health status of members of official language minority communities” and “the reason for this gap is that administrative health data cannot be used to study official language minority communities because the language variable is not included in the health files managed by institutions, files that are used to compile provincial statistics” (p.49-50)⁶⁵. Systemic changes in the way data is gathered would therefore be an important step towards narrowing the identified knowledge gap. Still, some studies with varying validity have investigated the health status of Francophone and Anglophone minority communities.

In the paper entitled “*Health in Language Minority Situation*”, Bouchard *et al.*⁶⁴ found that the Francophone minority of Canada had a poorer self-perceived health compared to the Anglophone majority (17.6% vs. 13.2% identified their health as fair or poor). Although less striking, a similar discrepancy was observed between the Anglophone minority of Quebec and the Francophone majority of that province (14.1% vs. 12.4% identified their health as fair or poor)⁶⁴. Many factors, such as disadvantages in regard to certain social determinants of health, being in a minority situation per se, or poor access to health care services were potential explanations mentioned for the observed differential in self-perceived health. The study entailed a secondary data analysis of the 2001 and 2003 CCHS, from which data were merged in collaboration with the analysis and model-building team at Statistics Canada.

The sample used for the analyses was of 76,674 men (from which 3,450 were French-speaking) and 92,734 women (from which 4,729 were French-speaking). The biggest advantage of combining cycles of the CCHS is a much larger sample size for analysis, which increases the quality of the estimates produced. However, there are methodological issues associated with this procedure. For example, the level of representativeness of the estimates is questionable given the fact that they describe an “artificial” population, created by the post-hoc combination of different populations⁶⁸. The authors also used a unique algorithm to classify respondents of the CCHS in either the Francophone or Anglophone linguistic group. The use of this algorithm, which included the variables of mother tongue, preferred language of conversation, language in which the interview was conducted and preferred language of communication during the survey, is believed to have improved the classification of respondents into the correct linguistic group. However, the results of the study are less comparable to findings from previous studies, which usually use the variable of mother tongue to classify participants into Francophone or Anglophone groups.

The same study by Bouchard *et al.*⁶⁴ also tested the association between being in a minority situation and self-perceived health. When controlling for age, the Francophone minority was less likely to declare being in good, very good or excellent health compared to the Anglophone majority, both for men (odds ratio (OR) 0.66; 95% confidence interval (CI) 0.60, 0.73) and women (OR 0.83; 95% CI 0.75, 0.92). For women, this difference lessened

after adjusting for lifestyle variables (OR 0.88; 95% CI 0.79, 0.98) and was no longer significant after adjusting for income and education (OR 0.95; 95% CI 0.85; 1.07). After adjustment for all of the variables in the model (including morbidity and incapacity indicators), the difference remained significant for men (OR 0.83; 95% CI 0.72, 0.95). For the latter group, language in itself, or perhaps something related to one's language, explained part of the health disparities observed between Francophones and Anglophones. Bouchard *et al.*'s study⁶⁴ is the first found to have used advanced statistical methods to test the association between health and language in minority Francophones. As such, the results presented in their paper are not easily comparable to previous research. This observation is in accordance with the above statement regarding the lack of epidemiological research on the health of official-language minorities.

A few other descriptive studies have also focused on the health status of Francophone and Anglophone minority communities. In the paper entitled "*L'état de santé de la population francophone de l'Ontario*", Picard and Hébert⁶⁹ used data from the joint database of the 1996/1997 Ontario Health Survey (OHS) and of the 1996 Census. The authors found that compared to Anglophones of Ontario (67%), a smaller proportion of Francophones (62%) perceived their health as "very good" or "excellent". This difference also persisted across all age groups. There was an oversampling of Francophone participants in the OHS, which ensured a sufficient number of Francophones in the samples once stratified by various variables. Still, there were only 2,458 Francophones included in the sample, out of 36,892 participants. As such, more detailed analysis by sex, age or income levels could not be conducted.

A study by the *Institut national de santé publique*⁷⁰ in Quebec, which entailed a secondary data analysis of the 2007 CCHS, estimated the prevalence of fair or poor self-perceived health at 10.5% for Anglophones of the province. This prevalence is smaller than the one found by Bouchard *et al.*⁶⁴ and reported above. As mentioned, using mother tongue to classify respondents into linguistic groups, which was the case in the study by the *Institut national de santé publique*, yields more comparable results to national studies, but may increase misclassification bias. Analyses of various cycles of the CCHS and of the National Population Health Survey (NPHS) performed by Statistics Canada¹⁶ revealed that 11% of

men and 12% of women had fair or poor self-perceived health. Other studies also found a similar prevalence of the outcome amongst Canadian adults^{21,71}.

2.2 Barriers in access to health care services

Access is one of the most widely used, measured and discussed concept related to health care systems, and is deeply imbedded in health policy worldwide. Sometimes referred to as accessibility or availability of health care⁷², access has been studied for over sixty years and is the object of hundreds of publications⁷³. Access to health care received a surge of interest following the Declaration of Alma-Ata, which was adopted by member countries of the WHO at the International Conference on Primary Health Care in 1978⁷⁴. The primary health care approach presented at the conference advocates health as a human right, and identifies access as a necessary component to achieving the goal of “Health for All”^{68,73,75}. At the same event, the WHO put forth the following definition of accessibility to health:

Accessibility implies the continuing and organized supply of care that is geographically, financially, culturally, and functionally within easy reach of the whole community. The care has to be appropriate and adequate in content and in amount to satisfy the needs of people and it has to be provided by methods acceptable to them⁷⁵. (p. 58)

Among the plethora of definitions of access to health care published by various authors, the one elaborated by the WHO stands out as being clear and comprehensive. Regardless, the numerous definitions reveal the diversity of factors that influence access to health care, which revolve around the characteristics of health care systems, as well as those of individuals and groups. Factors related to health systems include, but are not limited to, health care cost, variety and quality of services, resources and availability of services. On the user-side, the health status and needs, attitudes, culture and values of individuals are examples of factors that have an influence on access⁷².

In 1981, Penchansky and Thomas published the article *The Concept of Access: Definition and Relationship to Consumer Satisfaction*⁷², in an effort to synthesize the multiple meanings and definitions assigned to access to health care. They defined access as “a concept representing the degree of ‘fit’ between the clients and the system” (p.128). The authors also elaborated on the five *As* of access to care: availability, accessibility, accommodation, affordability and acceptability. In summary, *availability* refers to the

adequacy between the supply and the demand (or need) of health care services. *Accessibility* is related to the geographic location of clients and health care providers, and includes transportation resources, travel time and distance. *Accommodation* encompasses factors related to how services are organized (i.e. hours of operation, telephone services, walk-in facilities) and how they are in accordance with clients' abilities and need. *Affordability* refers to the costs associated with care in relation to clients' income, health insurance, ability to pay, knowledge of prices, etc. Finally, *acceptability* includes the attitudes of both client and provider in regards to the other's personal characteristics or practices, such as age, sex, ethnicity, religion, type of health care facility or neighborhood ⁷².

A strength of Penchansky and Thomas' 1981 paper is that it describes a wide range of dimensions of access while putting them in relation to previous work published on health services utilization and patient satisfaction. It also tested the discriminant validity of each dimension by performing factor analyses, which were followed by regression analyses to test the construct validity of measures of the dimensions. Limitations of the paper include its inability to assess the interdependence between various dimensions of access and its shortfall in recommending robust measures of access. In fact, the different measures of access used between health surveys, and geographical regions, make it difficult to compare findings on access or even to paint a reliable picture of the situation within a specific area ⁷⁶.

The Merriam-Webster dictionary defines "barrier" as "something immaterial that impedes or separates: obstacle" ⁷⁷. In the context of health care, barriers in access can therefore be considered as factors that interfere with the relationship between the health system and individuals or groups. In Canada, the national health insurance program, often referred to as Medicare, has helped in the reduction of some financial barriers to health care. However, studies have shown that other affordability issues, such as low socioeconomic status or not having private complimentary health insurance, are associated with negative repercussions on access ^{78,79}.

Another type of barrier in access to health care which is of concern in Canada is related to the physical accessibility of services. This encompasses geographical issues such as travel time and distance to reach a point of access, the range and availability of services offered in rural and isolated communities, transportation resources, etc. ⁸⁰⁻⁸³ Furthermore, Canadian studies have shown that those living in rural areas typically face greater issues of

access to health care compared to those living in urban areas^{80,81,84,85}. The barriers associated with geography also affect the access to health care services for official-language minorities, especially Francophone communities outside Quebec, which are dispersed and often situated in rural areas⁶⁶.

In the paper *Access to Care: Remembering Old Lessons*, McLaughlin and Wyszewianski⁸⁶ suggest two measures of the goodness of fit between health care providers and clients, which reflect most of the dimensions of access to health care: having a regular medical doctor and having a regular site of care. The shortage of health care professionals in Canada, especially medical doctors and nurses, is an example of existing barriers which affect the availability of services⁸⁷. Although these shortages affect the Canadian population as a whole, the problem is especially prevalent in official-language minority communities, where the demand for linguistically-concordant services exceeds their supply⁶⁶. In 2007, the Report of the Standing Committee on Official Languages⁶⁵ highlights: “There is a significant shortage of trained health care workers in all parts of Canada, but the problem is much greater for minority communities, given their limited resources and the very few institutions that can offer training comparable to what is available to the majority. In some cases, the situation is truly critical.” (p. 88). The 2001 report to the Federal Minister of Health, produced by the Consultative Committee for French-Speaking Minority Communities⁶⁶, came to a similar conclusion for Francophones living outside of Quebec.

When investigating the access to a regular medical doctor for official-language minorities, Bouchard *et al.*^{88,89} revealed that 9.9% of Francophones living outside Quebec and 24.6% of Anglophones living in Quebec did not have a regular medical doctor. These proportions were similar to the ones found among the majority group of each region, with 10.4% of Anglophones living outside Quebec and 23.8% of Francophones living in Quebec without a regular medical doctor. The study entailed the combination and analysis of data from the 2001, 2003 and 2005 CCHS. As mentioned above, such combination of different cycles of CCHS is associated with limitations in the interpretation of results⁶⁸. A similar prevalence of not having a medical doctor has been found in other studies⁹⁰, and some highlight that compared to other provinces, Quebec has the greatest proportion of individuals without regular access to this type of essential service⁹¹.

The availability of health care services is ultimately linked to the use of these services by the population. Although the concepts of access to and use of services are quite intertwined, and the terms sometimes used interchangeably, there is a distinction made between the two in the present study as well as in most of the literature on the subject matter. The use refers to the actual utilization of a service by individuals, and is determined by a broad range of factors going beyond the availability or accessibility of a service. In the case of individuals who do not have a regular medical doctor, studies have shown that they are less likely to use medical services such as preventive, primary and specialist care ⁹²⁻⁹⁴.

In accordance with these findings, a 2007 study by the *Institut national de la statistique du Québec* ⁹⁵ which used data from various cycles of the CCHS revealed that respondents from Quebec had the lowest consultation rates of medical doctors compared to the other Canadian provinces. In addition to having an effect on frequency of use, not having a regular medical doctor is associated with the types of services that are used by Canadians. For example, the 2010 Statistics Canada *Health Fact Sheets* ⁹⁶ indicates that those without a regular medical doctor have higher-than-average use of services provided by community health centers, such as those offered at the *Centre Local de Santé Communautaire (CLSCs)* in Quebec.

Nonetheless, services provided by medical doctors remain the type of service most frequently used by Canadians and members of both official-language minorities alike ^{95,97}. Apart from the regular medical doctor, studies found that Anglophones living in Quebec mostly seek health care services offered by hospitals, health clinics and CLSCs ^{95,97}. Services provided by Info-Santé, the provincial telephone health line service in Quebec, were least frequently used by Anglophones of the province compared to five other types of health care services ⁹⁷. Similar information regarding different types of health services used by Francophones living outside Quebec was not found.

In addition to financial, geographic and availability issues, official-language minorities may face a specific barrier in access to health care services associated with language, which is an integral component of communication. In fact, communication is considered as one of the most influential factors of safety in health care ⁹⁸. Language barriers to health care, whether perceived or actual, refer to barriers in the communication between client and provider caused by the lack of a shared language between the parties

involved⁹⁹. Studies conducted in Canada and elsewhere have clearly demonstrated that linguistic barriers in health care settings can have detrimental effects on patient satisfaction, accessibility and quality of care as well as health outcomes^{67,99-104}. Language barriers may reduce the access to health care services¹⁰⁵⁻¹⁰⁷, including preventive services^{103,104}. They may also be an obstacle in the appropriate follow-up of patients, especially in regards to services based strongly on communication such as mental health services, rehabilitation, pre- and post-natal care, physiotherapy and social services⁹⁹. Language barriers to health care may also contribute to an increase in the use of emergency services, longer visit time per clinic on average, additional tests and less follow-up visits¹⁰⁸.

Language has also been shown to have a substantial influence on the quality of the patient-doctor relationship¹⁰⁹⁻¹¹³. In the paper *Culture, language and the patient-doctor relationship*, Ferguson *et al.*¹¹⁴ report that “minority patients, especially those not proficient in English, are less likely to engender empathic response from physicians, establish rapport with physicians, receive sufficient information, and be encouraged to participate in medical decision making” (p.359). According to a US Joint Commission study¹¹⁵, communication problems, including language and cultural differences, are among the most frequent root causes of medical errors. The same study also found that patients with limited English proficiency experience adverse outcomes from medical errors more severely than English-speaking patients. There are numerous negative effects of linguistic barriers to health care, which are extremely relevant in the context of Canada’s two official languages and multiculturalism approach.

More specifically, the 2001 report *Language Barriers in Access to Health Care* prepared by Bowen⁹⁹ for Health Canada identified four populations at risk of facing language barriers when accessing health care services: official-language minorities, Aboriginal peoples, deaf people and immigrants. The same report also highlighted that the access to health care services for these groups are negatively affected by language barriers⁹⁹. The Report to the Federal Minister of Health: Consultative Committee for French-Speaking Minority Communities⁶⁶, which gathered and assessed evidence from various studies, came to similar conclusions. It states that language barriers to care may lead to a reduction in the use of preventive services, jeopardize the quality of care and compliance of patients, increase consultation time and the number of diagnostic tests ordered⁶⁶.

A few other studies have investigated language barriers faced by Francophone minority communities in Canada. In a paper entitled “*Is language a barrier to the use of preventive services?*”, Woloshin *et al.*¹⁰⁴ found that Francophone women living in Ontario, Canada, were significantly less likely than Anglophone women to receive preventive services such as breast exams and mammography. The study included 22,448 women who had completed the 1990 OHS. The fact that the survey dated back two decades is in question concerning the present relevance of the findings, whereas the large sample size used for analyses is a strength of the study.

Still in Ontario, Bourbonnais *et al.*¹¹⁶ analyzed data from the 2003 CCHS and compared Anglophone and Francophone seniors (aged 65 and over) of the province in regards to various indicators of health, language and access to health care services. The study found that 27.8% of Francophones spoke French with the medical doctor whereas 90.5% of Anglophones spoke English with the medical doctor. Furthermore, Francophone respondents were less satisfied with the accessibility and quality of both provincial and community-based health care services compared to their Anglophone counterparts¹¹⁶. Although these findings are quite interesting, they were the result of descriptive analyses only and were therefore not the object of statistical models. As such, an important limitation of the study is that variables pertaining to respondents’ satisfaction with the accessibility and quality of health care services were not adjusted for socioeconomic characteristics or other potential confounders.

A 2001 study by the *Fédération des Communautés Francophones et Acadiennes du Canada* (FCFA)⁶⁷ revealed a poor availability and accessibility of health care services in French for minority Francophones. The study surveyed 71 communities across the country and found that the accessibility to health care services in English was 3 to 7 times higher than the accessibility of services in French. In Ontario specifically, 50 to 55% of respondents from the Francophone minority said they had no, or very little access to health care services in French in their province⁶⁷. A strength of the study is that it was the first national attempt at drawing a picture of the situation of access to health care services for Francophone minorities in Canada.

The data of the FCFA study were collected through a questionnaire that was answered by “over 300 people” who work in the health sector, including health services

managers, health care professionals and Francophones involved in the development of health services offered in French in their region. This was followed by some individual and group meetings, although the details of those encounters were not made explicitly. The final report does not provide a clear and thorough methods section and the exact number of participants included in the study was not specified. This raises interrogations regarding the way the data were collected and the subsequent scientific validity of the results.

Studies have also identified gaps in the access to health care services for the Anglophone minority of Quebec. According to the province's Community Health and Social Services Network (CHSSN) 2008-2013 Action Plan ¹¹⁷, Anglophones scored lower than Francophones on the following key health accessibility indicators: having a regular doctor, being satisfied with the quality of care, using hospital services, and having access to health information, testing services and medical specialists. In 2005, the CHSSN in collaboration with the *Centre de recherche sur l'opinion publique (CROP)* polling firm conducted the Survey on Anglophone Community Vitality, which surveyed Anglophones in Quebec. The findings, which were presented in Pocock's *Baseline Data Report 2005-2006* ⁹⁷, showed that 45.9% of Anglophones living in Quebec were dissatisfied with the access to health and social services in English in their region.

The study also found significant differences in the access to different types of health care services provided in English. It revealed that 86% of Anglophones were served in English by medical doctors. The proportions then dropped to 74% for services in hospitals involving an overnight stay, 70% for hospital emergency rooms, 67% for CLSCs and 63% for Info-Santé ⁹⁷. The survey also captured important differences in the levels of satisfaction within regions, with the accessibility to services in English being the poorest in the Abitibi-Témiscamingue and Nord-du-Québec regions. Anglophones of Montreal (West) were the most satisfied with their access to health care services in English. A strong point of the study is that it is one of the most elaborated accounts of the situation of access to health care services offered in English in Quebec. Furthermore, the sample of 3,129 Anglophone respondents to the survey was representative of the English-speaking population of Quebec. With this relatively small sample size, it is however surprising that there was sufficient power to compare respondents of the 17 administrative regions of Quebec on some indicators.

In 2000, the Missisquoi Institute also commissioned the CROP to conduct a survey amongst Anglophones of the province. The survey yielded similar results as the CHSSN-CROP study in regards to differences in access to services in English between regions ¹¹⁸. It also revealed similar variations in the access to different types of health care services provided in English. The best access was found for services provided by physicians, private nursing agencies and community-based resources, compared to services offered by public institutions such as the CLSCs, long-term care facilities and Info-Santé ¹¹⁸. At the time, the survey used to uncover these findings was the largest ever conducted of Quebec's Anglophone minority, with 3,126 Anglophones and 1,312 Francophones included in the final samples. The low response rates of 53.4% and 54.6% respectively put the study at risk of voluntary response bias.

After assessing studies on the subject, it can be concluded that both Francophone and Anglophone minority communities are at risk of facing barriers in access to health care services, especially in regards to the availability of linguistically concordant services. One could however argue the relative importance of this finding, given the high rate of bilingualism among official-language minority members, especially on the Francophone side ¹¹⁹. In fact, the CHSSN-CROP survey conducted in Quebec showed that bilingual Anglophones found it less important to get health care services in the minority language compared to those who were not bilingual ⁹⁷. Still, the same study also found that over 80% of Anglophones in Quebec reported that it was very important for them to receive health care services in English ⁹⁷.

On the Francophone minority side, a study by Bouchard *et al.* ¹²⁰, which entailed face to face interviews with elderly Francophones in Ontario, revealed interesting findings in regards to the role of language in health care settings. First, the study showed that the large majority of participants had French as their preferred language of communication. However, some of them were more comfortable communicating in English with health care professionals. The reasons explored for this discrepancy are quite complex, but stem from having experienced systematically poor access to health care services in French throughout their lives. As such, these Francophones had learned medical terms in English only and had been socialized to function as best they could in an Anglo-dominant society. Participants to the study were however vocal in detailing the negative consequences of not speaking French

with the health care professional. These included communication problems with the health care professionals as well as difficulty in expressing their emotions and pain. This was accompanied by insecurities regarding their linguistic competencies as well as repercussions on the patient-doctor relationship¹²⁰. The qualitative approach of the study allowed for an in depth investigation of the issues surrounding language in health care settings and revealed new and explanatory findings. However, the results are not necessarily representative of the Francophone population of Ontario, but rather an account of the personal opinions and experiences of participants to the study. Still, the authors managed to draw some general conclusions from the most recurrent observations.

Based on the demonstrated harmful consequences of language barriers to health care^{67,99-104}, including the ones presented in this review, the Canadian studies and reports found on the subject matter stress the importance of offering health care services in the minority language for official-language minorities^{66,101,104,121,122}. An example of this standpoint is found in the Report to the Federal Minister of Health: Consultative Committee for French-Speaking Minority Communities⁶⁶, which states the following:

“The service user's access to health services in his or her own language means far more than simply respect for that person's culture: it is, at times, indispensable for improving health and for people's taking ownership of their own health. A number of studies have confirmed that language is a key factor in the effectiveness of certain forms of care.”
(p.12)

It is in the scope of such statements that the association between the vulnerability to poor access to health care services in the minority language and poor self-perceived health was investigated for both official-language minorities in the present study.

An important limitation of governmental reports and some studies presented in this review pertains to the very nature of the subject addressed, which is highly politicized. Although the conclusions are drawn from evidence and scientific findings, they are often anchored in a social perspective that favors the development and vitality of Francophone and Anglophone minority communities. This comes as no surprise since it is also the position adopted by the Canadian Government, which has imbedded the issue in legal and operational obligations such as the *Official Languages Act* of 1988 and the Action Plan for Official Languages. Therefore, studies may be biased towards the underlying cause, which is

to enhance the capacity of Francophone and Anglophone minority communities to live in the official-language of their choice. Improved access to health care services in both official languages is in line with this position.

2.3 Predictors of general health and access to health care services

In 2005, the WHO established the Commission on Social Determinants of Health with the aim of gathering advice on how to reduce inequities in health ¹²³. At the launch of the Commission's final report in 2008, Director-General Dr Margaret Chan pronounced the following statement: "This ends the debate decisively. Health care is an important determinant of health. Lifestyles are important determinants of health. But... it is factors in the social environment that determine access to health services and influence lifestyle choices in the first place." The final report contains three overarching recommendations to reducing inequities in health: 1) improving daily living conditions; 2) tackling the inequitable distribution of power, money, and resources; 3) measuring and understanding the problem and assess the impact of action ¹²³. In regards to the third recommendation, the WHO advocates the importance for different sectors to work in collaboration, including governments, global institutions and agencies, civil society, the private sector, research and academic communities. Moreover, the role of research is clearly defined as "generating and disseminating evidence on the social determinants of health" ¹²⁴.

It is in this optic that the following six determinants of health are included in the present study and in the review of the literature: age, education level, household income, marital status, place of residence (urban or rural) and immigration. In the present study, these determinants are investigated as potential predictors of five specific outcomes in men and women of the two official-language minority groups in Canada. The outcomes are poor self-perceived health, finding it important to get health care services in the minority language, not having a regular medical doctor, having used the services of a regular medical doctor in the past 12 months and not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health. Unfortunately, a review of the available literature revealed very few studies which have investigated the predictors of these outcomes in official-language minorities. For this reason, findings from research conducted

among the general Canadian population, or in other countries, are almost exclusively presented in this section.

In the first instance, studies have clearly shown that increased age is associated with poor self-perceived health^{15,16,18,19,21,125}. A Statistics Canada study which entailed a secondary data analysis of the 2009 CCHS found that the proportion of respondents who perceived their health as very good or excellent decreased with every age group over 19 years of age⁹⁶. A large body of Canadian and international literature has also established the link between poor self-perceived health and socioeconomic status, including education^{15,125-127} and income^{18,20,21,127-129}. For example, a study by Shields and Shoostary²¹, which used data from various cycles of the NPHS, revealed that the risk of fair or poor health increased for Canadian adults who had not completed high school, compared to those with a higher level of education.

Marital status has not typically been linked to poor self-perceived health, especially when other factors such as age, sex, income and ethnicity are taken into consideration^{18,21}. Studies which have investigated the health of Canadians living in rural areas have revealed poorer health status and worse health indicators compared to urban dwellers^{17,130-134}. Some recent immigrants to Canada may benefit from a “healthy immigrant effect” and present better self-perceived health than Canadian-born or less recent immigrants to the country⁵⁹⁻⁶³.

A review of the available literature found very little studies pertaining to official-language minorities’ perception of the importance to get health care services in the minority language. As mentioned earlier in the review, the CHSSN-CROP survey conducted amongst Anglophones in Quebec found that bilingualism, as opposed to speaking English only, was associated with a lower reported importance to get health care services in the minority language. The same study also demonstrated that respondents aged 45 to 64 found it the most important for services to be offered in English in Quebec compared to other age groups⁹⁷. As reported above, a study by Bouchard *et al.*¹²⁰ revealed that elderly Francophones living in Ontario were more comfortable communicating in English with health care professionals. A possible reason for this is observation is that the scarcity of health care services in French means that they have learned health-related terminology in English only. Previous studies investigating the association of education, income, marital status, place of

residence or immigration, with the importance for official-language minorities to get health care services in the minority language were not found.

There are several reports on the predictors of not having a regular medical doctor in Canada^{16,90,91}. A Statistics Canada study which entailed a secondary analysis of the 2009 CCHS found that the odds of not having a regular medical doctor were lower for older age⁹⁰. The 2001 paper by Talbot *et al.*⁹¹ entitled “*Canadians without regular medical doctors. Who are they?*” came to a similar conclusion. The study which used data from the 1994-1995 NPHS also found that respondents who were in lower income categories, single or recent immigrants to Canada were more likely not to have a regular doctor⁹¹. The large sample size of 15,700 respondents used for the analysis is a strength of the study, whereas a limitation is related to the fact that the NPHS was conducted more than fifteen years ago. Various studies have also exposed that Canadians living in rural areas generally have less access to health care services compared to those living in urban areas^{80,81,84,85}.

Some studies have also investigated predictors of having used the services of a regular medical doctor in the past 12 months^{135,136}, although none address the issue among official-language minorities. The 2007 Canadian publication “*Going to the doctor*” by Nabalamba and Millar¹³⁶ of Statistics Canada examined adults’ patterns of consultation with general practitioners. The study, which used data from the 2005 CCHS, found that older Canadians were more likely than younger ones to have consulted a family physician or medical doctor in the year prior to the survey. Respondents in the lowest household income category were less likely to have used such services compared to those in the highest household income category¹³⁶.

Similar results in regards to age and household income were presented in Carrière’s paper entitled *Consultations with doctors and nurses*¹³⁵, which analyzed data from the 2003 CCHS. The association between marital status and use of health care services is unclear, as a review of the literature revealed scarce and contradictory findings on the subject matter¹³⁷⁻¹⁴⁰. Although living in a rural area has been associated with lower use of health care services¹⁴¹ as well as poorer access to services compared to living in an urban area^{136,137,141,142}, the 2005 study by Nabalamba¹³⁶ did not find significant differences in consultation rates with general practitioners. Studies have also found that immigrants and Canadian-born people have similar rates of utilization of services^{61,143,144}.

Not having a regular place to go when sick or needing advice on health has been associated with problems in accessing preventive, specialist and other types of health care services^{32,93,107,145-149}. However, not all studies found on the subject matter investigated having a regular medical doctor and having a regular place of care (besides the regular medical doctor) separately. Furthermore, these studies have mostly been conducted in the United States, where the focus is largely on the effects of insurance coverage, as well as differences between visible minorities, on access to a regular source of care. Still, studies have shown that younger age, education and especially income are associated with not having a regular source of care¹⁵⁰.

2.4 Overview of official-language minorities in Canada

Defining Francophone and Anglophone official-language minorities in Canada is an ongoing challenge faced by researchers who undertake studies on these populations. However, there is a standardized starting point in addressing the question at the national level, which is that as per Heritage Canada, “official-language minority communities” include Canadian English-speaking communities in Quebec, and Canadian French-speaking communities in provinces and territories other than Quebec¹⁵¹. It is important to specify that although a few regions within some provinces (namely Ontario and New-Brunswick) have a large proportion of French speakers, it is the smaller overall proportion of Francophones compared to Anglophones at the provincial level which makes English the “majority language” of a province. The same concept is applied for Quebec, where even if Montreal has a large proportion of English speakers, French remains the majority language of the province. Since the present study investigated official-language minorities at the national level, the Heritage Canada definition of official-language minorities was retained.

As mentioned above, this is however just a starting point because there is much debate over how to classify individuals into linguistic groups. In the article *Defining Francophones in Minority Situations: An Analysis of Various Statistical Definitions and their Implications*, Forgues and Landry¹⁵² identified four variables related to language most often used to define French speakers outside Quebec. These included mother tongue, knowledge of official languages, language spoken at home and first official language spoken. The authors exposed important discrepancies in the number of persons defined as

“Francophones” when using the different definitions. Jedwab¹⁵³ found similar differences in population size when choosing one linguistic variable over another to identify Anglophones living in Quebec.

Historically, mother tongue is the variable that has been most widely used to identify Canadians as either French or English speakers. An advantage of using the variable of mother tongue in studies is that the results are comparable to statistics dating back more than half a century. However, the growing diversity of the population in recent years due to an increase in immigration has led to a shift in the way people are classified into linguistic groups. More precisely, the variable of first official language spoken (English or French) is being used increasingly in surveys, studies and reports pertaining to official-language minorities¹⁵⁴. One advantage of this new method is that it is broader and more inclusive of Canadians with neither French nor English as their mother tongue. For example, a person may have Creole as their mother tongue, but use French as their main language of communication.

In December 1991, the concept of first official language spoken was introduced by the Canadian government in the *Communications with and Services to the Public* section of the Official Languages Regulations¹⁵⁵. The method used to identify people as having either French or English as their first official language spoken is described in Section 2 of the Regulation. It is important to specify that the variable of first official language spoken is not a census question, but is actually derived from questions on mother tongue, knowledge of official languages and language spoken most often at home¹⁵⁴.

On April 20, 2009, the variable of first official language spoken became a Statistics Canada “departmental standard”, meaning that it was approved by the Policy Committee and that the application of this measure is now compulsory in Federal initiatives¹⁵⁶. Furthermore, the variable of first official language spoken is specified within the *Official Languages Act* framework and is the unit of analysis used in most social statistics programs. A limitation of the use of first official language spoken is that although it is an approved standard in Canada, it is not comparable to internationally recognized standards. This is the case because it is a variable which measures a specific concept that is defined in the *Official Languages Act*, part of the Canadian legislation¹⁵⁶. Since studies pertaining to official-

language minorities in Canada do not typically involve direct comparisons with linguistic minorities that are found elsewhere, the impact of this limitation is therefore minimal.

According to the 2006 Census, there are 1,053,810 persons with French as their first official language living in the nine provinces and three territories outside Quebec ¹⁵⁷. This represents 14% of the total number of people with French as their first official language spoken in Canada, or 3.4% of the total Canadian population. There are Francophones living in every province and territory, making this official-language minority highly dispersed and scattered throughout the country. Furthermore, Francophones live in very different settings, ranging from relatively homogeneous communities (that have a large proportion of Francophones) to cities and villages with very few French speakers.

Naturally, the number and range of Francophone institutions as well as the degree to which French is integrated in daily life varies immensely in accordance with the proportion of Francophones living in a province, territory or region. The largest concentrations of Francophones living outside Quebec are found in Ontario, New-Brunswick and Southwestern Nova-Scotia. Communities with a large proportion of Francophones are often rural, although some cities such as Ottawa and Saint-Boniface are key historic and geographic centers of the Francophone minority of Canada. There is also a large influx of Francophone immigrants to cities such as Toronto and Edmonton ¹⁵⁷.

In Quebec, there are 994,723 persons with English as their first official language, which represents 13.4% of the total population of the province ¹⁵⁴. Unlike the Francophone minority which is dispersed through a large geographic area, 92% of Anglophones living in Quebec are concentrated in three regions of the province: Montreal, Outaouais and the Estrie/South of Quebec region. More precisely, 80.5% of Quebec's Anglophone minority lives in the Montréal Census Metropolitan Area, which represents 22% of the population of that region. This highly disproportionate distribution of Anglophones across the province has important implications with regards to services offered in English in different parts of Quebec ¹⁵⁴.

2.5 Health policy for official-language minorities

Demographic and other factors have a significant influence on provincial legislations and policies that regulate the offer of services in the minority language. Since health is largely a provincial matter, linguistic regulations introduced by provinces are the most prominent factors, policy-wise, which determine access to services in the minority language. Every province and territory except British Columbia and Newfoundland and Labrador has introduced some type of measure to recognize Francophones' rights or to guide the offer of French-language services. However, the weight and scope of these measures vary greatly. For example, Manitoba and Saskatchewan boast policy measures, whereas New Brunswick, Ontario, Nova Scotia and Prince Edward Island have implemented legislative measures for the provision of services to the Francophone communities¹⁵⁸.

New-Brunswick clearly stands out as it is the only officially bilingual province of the country, with its recognition of Anglophones and Francophones as having equal rights and status embedded in the *Canadian Charter of Rights and Freedoms*. New-Brunswick became officially bilingual in 1969, and in 2002, the province adopted the *Official Languages Act*, which requires public services to be offered in both English and French¹⁵⁹. Although Ontario is not officially bilingual, the *French Language Services Act* of 1986 guarantees the right to French-language services offered by provincial ministries and agencies in 25 designated areas. To date, a total of 215 agencies in Ontario have been designated as bilingual, a large proportion of which are institutions or community centers which offer health care services to individuals of the province¹⁶⁰.

In Quebec, Anglophones have linguistic rights which are guaranteed by Section 133 of the *Constitution Act, 1867*. The Anglophone minority is entitled to English-language services in the areas of health, justice and education. Nonetheless, the implementation of the *Charter of the French language* in 1977 (also known as Bill 101) did make French the only official language of the province¹⁵⁸. A list and content summary of the legislations pertaining to official languages in the ten Canadian provinces and three territories is presented at Appendix 1.

At the national level, the Official Language Community Development Bureau (OLCDB) within Health Canada has the mandate to coordinate the implementation of Section 41 of the *Official Languages Act* (Part VII)⁴, while respecting the jurisdiction of the

provinces and territories. Section 41 of the Act relates to the enhancement of the vitality of official-language minority communities and the promotion of the use of both English and French in the Canadian society⁴. The OLCDB oversees two main advisory committees, namely the Consultative Committee for French-Speaking Minority Communities and the Consultative Committee for English-Speaking Minority Communities, which produce and commission reports to guide health policy for official-language minority communities^{161,161}.

Key points which have been addressed in these reports include the importance of differential strategies tailored to the specific needs and demographic characteristics of the different communities, the necessity to act both on the supply and the demand of services and of concerted effort between political authorities, institutions and communities⁶⁶.

Another substantive contribution of the OLCDB was the creation of the Health Canada Action Plan 2006/07-2007/08-2008-09 in support of Part VII of the *Official Languages Act*. The Plan's objectives were to gain a better understanding of the situation and needs of official-language minority communities, integrate these needs into the strategic plans of the branches and regions and increase the control of both Francophone and Anglophone minority communities over programs, projects and services funded by Health Canada¹⁶².

There are also two main non-governmental organizations which represent Francophone minority communities and Anglophone minority communities respectively: the *Fédération des communautés francophones et acadienne* (FCFA) and the Quebec Community Groups Network (QCGN). The two organizations oversee associations and groups that represent official-language minorities in Canada and ensure their political representation at every level of government. In Quebec, the Community Health and Social Services Network (CHSSN) is the main driver in health policy change amongst the provincial government. On the Francophone minority side, there are no provincial or territorial organizations comparable to the CHSSN, in terms of the resourcefulness and impact of that group in defending official-language minorities' rights to health care.

2.6 Conclusions

A review of the available literature revealed various factors associated with health disparities, including socioeconomic factors, racial/ethnic differences, place of residence and aboriginal identity. In Canada, some official-language minorities may face a specific

disadvantage in health related to language, and to some extent culture, compared to the general population. There is a need for further investigations to assess if the Francophone minority presents a differential health status than the Anglophone minority.

Individuals and populations face different barriers in access to health care services, which can arise from affordability, physical accessibility, availability, or other types of issues. As a central component of communication, language has been identified as another source of barrier in access to health care. Official-language minority communities in Canada are at risk of language barriers to health care in addition to other access issues faced by the general population. There is however a gap in the knowledge concerning potential differences between the Francophone minority and the Anglophone minority with regards to some indicators of access to and use of health care services. There is also a lack of detailed descriptive information regarding the access to linguistically-concordant services offered by various types of health care professionals. It is not known if the vulnerability to poor access to health care services in the minority language is related to poor self-perceived health.

Finally, demographic and socioeconomic predictors of some indicators of general health and access to health care services include age, education, income, marital status, place of residence (urban or rural) and immigrant status. The available literature does hold a few contradictory findings in regards to the association between these factors and the outcomes of interest included in the review. However, the biggest gap identified lies in the near total absence of studies investigating predictors of general health and access to health care services among official-language minorities in Canada, and these predictors have important public health implications. A better understanding of demographic and socioeconomic predictors of general health and access to health care services, which is a focus of the present study, is important for the development of appropriate health policy for official-language minorities.

3.0 OBJECTIVES OF THE STUDY

The objectives of the present study were developed based on information needs identified in the literature review and through discussion with actors in the field. They were also influenced by the potential of the Survey on the Vitality of Official-Language Minorities (SVOLM) as well as the available techniques for analyzing data from the SVOLM's complex survey design. The three main objectives of the study are the following:

- 1) Provide a descriptive overview and compare the situation of men and women of the two official-language minority groups in regards to:
 - a. Self-perceived health;
 - b. Access to health care services in the minority language; and
 - c. General access to and use of health care services.

- 2) Identify the determinants of self-perceived health and access to health care services for men and women of the two official-language minorities.

- 3) Examine the association between the vulnerability to poor access to health care services in the minority language and poor self-perceived health.

4.0 METHODS

4.1 Study design

Overview of the Survey on the Vitality of Official-Language Minorities

The study was based on data from the Survey on the Vitality of Official-Language Minorities (SVOLM), conducted by Statistics Canada in 2006. The SVOLM is a post-censal survey, meaning that the respondents were chosen from the pool of individuals who had completed the long questionnaire in the 2006 Census (with the exception of Newfoundland and Labrador and Prince Edward Island where the short form questionnaire was used). The SVOLM emerged within a defined political context, which was the Canadian government's Action Plan for Official Languages, unveiled in the spring of 2003. The objectives for this five-year Action Plan were to enhance the vitality of the English and French linguistic minority communities, as well as to support and assist their development.

Funding to implement the SVOLM was made possible through a partnership between a number of federal departments and agencies whose activities were targeted by the Action Plan. The aim of the survey was to achieve a better understanding of the current situation of official-language minorities in regards to their use of both official languages in the public and private spheres. It focused on French-speakers outside Quebec and English-speakers in Quebec and gathered information on topics such as education, economic activity, linguistic trajectory from childhood to adulthood and access to health care services. The pivotal notion behind the survey is the concept of vitality, which in itself is not easily defined despite its common use in the political, academic and community spheres¹⁶³.

The debates surrounding the definition of vitality bring upon challenges in regards to its measurement. Nonetheless, the SVOLM succeeded in measuring some of the major dimensions of vitality within the context of Canada's official-language minority communities. Another layer of complexity which was captured in part by the SVOLM is the bi-dimensional nature of vitality, with one component being objective and the other subjective. More specifically, the objective component draws from facts and behaviours, whereas the subjective aspect is comprised of perceptions and representations¹⁶⁴. With the presence of different types of questions included in the survey, it is possible to link information on the perceptions held by official-language minority members to that of more

objective notions related to their behaviours. The juxtaposing of objective and subjective components of vitality not only enables interesting comparisons between findings from the two dimensions, but also generates important questions and areas of study to be further developed.

As previously mentioned, the SVOLM is a post-censal survey that focuses on the use of the two official languages by Anglophone and Francophone minority communities. Despite the fact that the Census contained a number of questions related to language, very few allowed for an in depth exploration of the use of language in various facets of life outside the home, such as in health-care or educational settings. Moreover, the Census did not capture information relevant to specific questions of interest for official-language minorities. The SVOLM was therefore conducted with the intention of filling some of the gaps in information, and to stimulate the production of useful statistics for developing programs and policies regarding official-language minorities¹⁶⁴.

The SVOLM questionnaire reflects the specific information needs of various federal partners. A number of qualitative tests as well as a pilot survey were conducted to determine the final content of the survey. The pilot survey served in evaluating the format of the questionnaire, the consistency between the questions and how they were formulated, as well as details surrounding the use of the computer-assisted telephone interview. As will be explained in greater detail below, the survey was directed at two samples: an adult sample and a child sample. The survey also contained a series of modules pertaining to various themes that were either common to both samples, or exclusive to one of them.

The common part of the questionnaire collected demographic, linguistic and cultural information about the respondent, as well as the child and/or other members of the household, where applicable. More specifically, the modules common to both samples focused on the respondent's language proficiency, economic activity and income, education, linguistic trajectory from childhood to adulthood and sense of belonging, and perceived subjective vitality. Only one module concerning school attendance was exclusive to the child sample. On the other hand, modules pertaining to the sense of belonging and subjective vitality, language practices and behaviours in the public sphere, as well as access to health care services were exclusive to the adult sample.

Target Population

The survey targeted Francophones living outside Quebec and Anglophones living in Quebec, as identified by answers to questions on mother tongue, knowledge of official languages and language spoken most often at home. The following criteria were used in order to capture people considered to belong to official-language minorities ¹⁶⁴.

1- French speakers outside Quebec are those:

- a) who have French as their mother tongue, alone or with another language;
- b) whose mother tongue is a non-official language (referred to in this report as allophones) and who, of the two official languages, know only French; or
- c) whose mother tongue is a non-official language, who know both French and English, and who speak either a non-official language or French, alone or with another language, most often at home.

2- English speakers in Quebec are those:

- a) who have English as their mother tongue, alone or with another language;
- b) whose mother tongue is a non-official language and who, of the two official languages, know only English; or
- c) whose mother tongue is a non-official language, who know both English and French, and who speak either a non-official language or English, alone or with another language, most often at home.

Another target population was identified in the Montreal census metropolitan area, where the competition between English and French brings a rather unique setting for the study of foreign-born official-language minority members. For this reason, and given the large number of allophones (defined as people who have neither French or English as their mother tongue) in Montreal, a sample of allophones with French as their first official language spoken was added to the sample of allophones with English as their first official language spoken. It is therefore possible to examine the linguistic orientation and trajectory of allophones living in the Montreal area. However, this sub-sample was not included in the present study.

Selection of Participants

The SVOLM used a two-phase stratified design, with the first phase consisting of the systematic distribution of the 2006 Census long form questionnaire (2B) to about every fifth household across Canada. The 2006 Census short form questionnaire (2A) was used in Newfoundland and Labrador and Prince Edward Island given the small number of official-language minorities in these two provinces. The second phase entailed the classification of official language minority respondents from the first phase into their appropriate strata. Apart from being classified in an official-language minority group, respondents to the survey were stratified in either the child or the adult sample, as well as by geographic region.

The child sample consisted of persons under age 18 living in households where at least one parent belongs to the official language minority, whereas the adult sample included persons 18 years and older who belong to the official language minority of their respective province or territory of residence. The strata were generally defined by the cross-classification of the provinces and the age as defined by the Census. Sub-provincial regions in Ontario, Quebec and New Brunswick were also used to create strata. The three territories were regrouped as one, but still divided by age strata (0-17 years and 18 years and over). A systematic sample of individuals was chosen from each stratum, and the concentration of official-language minorities in each region was included in the stratification in order to optimize the allocation of the sample. A coefficient of variation and a targeted minimum proportion were fixed to determine the sample size in each stratum.

Approximately 22,000 potential respondents were selected for the child sample and 30,000 for the adult sample, for a total of 52,000 potential respondents. The response rate to the survey was 76.1% for the child sample and 70.5% for the adult sample, yielding a total of 15,550 children and 20,067 adults in the final databases. As previously mentioned, the samples take into account important contextual elements such as the varying concentration of official-language minority members in different geographic areas, which has been shown to have an impact on the situations facing them. The samples also reflect the fact that official-language minority communities differ from one province to another, as well as between regions of the same province.

As mentioned above, questions included in the Health Module of the SVOLM were only asked to respondents in the adult sample. Since no health-related information was gathered for children, the child sample is not relevant in the scope of this thesis and was not retained for analysis. There was a total of 63 respondents (0.3%) surveyed from the three Canadian territories pooled together. Given this very small number, they were excluded from the analysis. The 2,491 respondents (1.2%) of the sub-sample of Allophones living in Montreal were also excluded from the analysis. Following the treatment of missing data for the outcome and predictor variables (which will be explained in detail below), the final sample used for analysis contained 17,190 respondents.

Data collection and access to the database

Response to the SVOLM was voluntary and data was collected nearly 6 months after the 2006 Census, from October 2006 to January 2007. Initially, participants were sent an introductory letter to their home address. This was followed by a telephone call to collect the data, with regional office interviewers conducting interviews that lasted approximately 40 minutes. The data were collected using computer-assisted telephone interviewing (CATI) techniques, in either English or French depending on the respondents' preference.

The SVOLM adult database, which is the property of Statistics Canada, was accessed through a contract signed with The Carleton, Ottawa, Outaouais local Research Data Centre (COOL RDC). Data analysis was conducted entirely on site at the COOL RDC, which is located on the 3rd floor of the University of Ottawa's Morisset Library. Data susceptible of revealing the identity of respondents were not used, as per the *Statistics Act* and other Statistics Canada regulations.

4.2 Variable selection and development

Descriptive variables

A total of 24 variables were retained from the Health Module of the SVOLM to provide descriptive information on the general health as well as the access to and use of health care services by official-language minorities. The 24 descriptive variables were classified into five groups: general health and access to health care services in the minority language (5), health care services provided by a regular medical door (5), health care services provided by

a nurse (4), health care services provided by a professional from a telephone health line or telehealth service (4), health care services provided by other health care professionals (6). All of the variables were either dichotomous or categorical and some response categories were collapsed for theoretical or technical reasons, such as to allow for the minimum cell-count of 10 observations to be met (as per Statistics Canada regulation ¹⁶⁵). Details regarding categorization of the outcome and predictor variables and of the exclusions performed are presented below, as well as summarized at Appendix 2.

Outcome variables

Self-perceived health

All adult respondents were asked the question “In general, would you say your health is:”, which was followed by a choice of five answers: excellent, very good, good, fair, or poor. Self-perceived health is considered a reliable and valid measure of health within a country ⁵⁻⁷ and is frequently used in large surveys such as the CCHS and the NPHS. For the purpose of the thesis, self-perceived health was dichotomized into “good” (which includes excellent, very good and good categories), and “poor” (which includes poor and fair categories). The main reason for dichotomizing self-perceived health was to facilitate comparison with results of previous Canadian studies. In fact, many studies dichotomize self-perceived health in this way, and it is often the categorization used in Statistics Canada publications ^{166,167}.

We excluded 56 participants (0.32%) with missing information on self-perceived health (answers coded as “Unknown”, “Refusal” or “Don’t know”). Of them, 16 (29%) were from the Anglophone minority and 40 (71%) were from the Francophone minority, which is very similar to the distribution of respondents belonging to the two official-language minority groups in the total sample. Three (5%) were 18-34 years of age, 33 (59%) were 35-64 and 20 (36%) were 65 years and older. Eighteen (32%) had university studies, 7 (13%) had a college education, 13 (23%) had a high school diploma only, 16 (29%) had not completed high school and 2 (7%) had missing observation on education level. Eleven (20%) of the deleted cases had a household income of less than \$30,000, 17 (30%) had a household income of \$30,000-\$59,000 and 26 (46%) had a household income of \$60,000 or more. Apart from the deleted cases being older, their demographic characteristics were similar to those of the final sample included in the analysis and presented at Appendix 3.

Finding it important to get health care services in the minority language

Adult respondents that know both English and French were asked the question “How important is it to you to get health care services in [minority language]? Is it...”, with 6 answer choices: very important, important, somewhat important, not very important, not important, or no opinion. This outcome variable was transformed into a dichotomous one, namely if a participant found it important to get health care services in minority language (yes or no). The dichotomization was undertaken in order to analyze, present and interpret the results of the various outcome variables in a consistent and straightforward manner. Most of the variables included in the descriptive analyses were also dichotomized accordingly. Conceptually, the dichotomization is believed to be appropriate way to investigate the importance of getting health care services in the minority language.

The “yes” group included respondents who answered “very important”, “important” or “somewhat important” to the original survey question. The “no” group included those who answered “not very important”, “not important” or “no opinion”. Respondents who know only English or French were not asked the question and were therefore coded as “Not asked” in the survey database, but were included in the “yes” category of the transformed variable. Since they do not know the majority language, it is assumed that they find it important to get health care services in the minority language. Respondents coded as “don’t know” in the original survey dataset were also included in the “no” category.

There were 24 respondents (0.14%) for whom information on how important it is for them to get health care services in the minority language was coded as “Unknown”, and were therefore excluded from the analysis. Of them, 4 (17%) were from the Anglophone minority and 20 (83%) were from the Francophone minority. The latter was over-represented in the missing cases compared to respondents of the final sample. Three (13%) of the missing cases were 18-34 years old and 21 (87%) were 35 to 64 years old. Ten (42%) had university studies, 5 (21%) had a college education, 7 (29%) had a high school diploma only and 2 (8%) had not completed high school. Two (8%) of the missing cases had a household income of less than \$30,000, 6 (25%) had a household income of \$30,000-\$59,000, 14 (58%) had a household income of \$60,000 or more and 2 (2%) had missing

income. Their demographic characteristics differed slightly from those of the study population included in the analysis with regards to age, education and income distribution.

Having a regular medical doctor

All adult respondents were asked “Do you have a regular medical doctor?”, which was a yes or no question. The few respondents who were coded as “Refusal” or “Don’t” were re-coded in the “no” category, since it is more probable that those who refused or did not know how to answer that question did not have a regular medical doctor.

There were 25 respondents (0.14%) coded as “Unknown”. Of them, 4 (16%) were from the Anglophone minority and 21 (84%) were from the Francophone minority. The missing is over-represented for the Francophone minority in comparison to the study population included in the analysis. Three (12%) were 18-34 years old and 22 (88%) were 35-64 years old. Ten (40%) had university studies, 5 (20%) had college education, 7 (28%) had a high school education and 3 (12%) had not finished high school. Three (12%) had a household income of \$30,000, 6 (24%) had a household income of \$30,000-\$59,000, 13 (52%) had a household income of \$60,000 or more and 3 (21%) had missing income. Missing cases differed from the sample of respondents included in the present study with regards to the distribution of age, income and education to some extent.

Having used the services of a regular medical doctor in the past 12 months

Adults who have a regular medical doctor were asked “In the last 12 months, have you used, either for yourself or to help another person, the services of your regular medical doctor?”, with the following 4 answer choices: yes (for myself), yes (for another person), yes (for myself and another person), or no. The variable was transformed in a yes or no dichotomous outcome. Respondents who answered “yes (for myself)” or “yes (for myself and another person)” to the original survey question were categorized as “yes” in the transformed variable and those who answered “yes (for another person)” or “no” were categorized as “no”. The respondents that were not asked the question because they do not have a regular medical doctor were also classified in the “no” category.

There were 42 respondents (0.24%) who were coded as “Unknown”, “Refusal” or “Don’t know”. Of the missing cases, 9 (21%) were from the Anglophone minority and 33

(79%) were from the Francophone minority. Ten (24%) were 18-34 years old, 26 (62%) were 35-64 years old and 6 (14%) were 65 and over. In regards to education level, 14 (33%) had university studies, 7 (17%) had a college education, 12 (29%) had a high school diploma, 8 (19%) had not completed high school and 1 (2%) had missing education. Four (10%) had a household income of \$30,000, 12 (29%) had a household income of \$30,000-\$59,000, 22 (52%) had a household income of \$60,000 or more and 4 (10%) had missing income. The demographic characteristics of the missing cases differed slightly from those of the study population included in the analysis with regards to the distribution of age and education.

Having a regular place to go (besides the regular medical doctor) when sick or needing advice on health

All adult respondents were asked the question “[Besides your regular medical doctor's office, is / Is] there a place that you usually go to when you are sick or need advice about your health?”, which the choice to answer yes or no. The few observations that were coded as “Don’t know” were regrouped with the “no” category, since it was assumed that someone with a regular medical doctor would be aware of it.

There were 35 respondents (0.20%) for whom information on if they have a regular place to go when sick (besides the regular medical doctor) was coded as “Refusal” or “Unknown”. From the missing cases, 8 (24%) were from the Anglophone minority and 26 (76%) were from the Francophone minority. Four (12%) were 18-34 years old, 26 (76%) were 35-64 and 4 (12%) were 65 and over. Eleven (32%) had university studies, 6 (18%) had college education, 11 (32%) had a high school education, 5 (15%) had not finished high school and 1 (3%) had missing education. In regards to the distribution of income, 7 (21%) had a household income of \$30,000, 6 (18%) had a household income of \$30,000-\$59,000, 18 (53%) had a household income of \$60,000 or more and 3 (9%) had missing income. The distribution of age and income was different between the missing cases and the sample of respondents included in the analysis.

Vulnerability to poor access to health care services in the minority language

The variable of the vulnerability to poor access to health care services in the minority language was created for the purpose of the thesis, and was derived from two variables of

the SVOLM: the importance of getting health care services in the minority language and the difficulty of getting those services in the minority language. Bilingual respondents for whom it was important to get health care services in the minority language (as well as respondents who spoke the minority language only) and who said it was difficult, very difficult or impossible for them to get health care services in the minority language were classified as being vulnerable to poor access to health care services in the minority language. In other words, these respondents would like to receive their health care services in the minority language, but are finding it difficult to do so.

Socioeconomic and demographic predictors

Six socioeconomic and demographic variables were identified in a review of the literature and were available in the dataset to be examined as potentially important risk factors for the five outcomes described above. The six socioeconomic predictors are age, education, household income, marital status, place of residence (urban or rural) and immigrant status.

Age

The adult survey was designed to include participants 18 years and older. Respondents were categorized in three age groups: 18-34 years old, 35 to 64 years old and 65 and over. There was no missing data for age.

Education

Adult respondents were asked “What is the highest level of education that you have attained?”, and were given 9 answer choices: university studies with degree, university studies with certificate or diploma, university studies without degree, certificate or diploma, non-university studies with certificate or diploma, non-university studies with certificate or diploma, secondary studies with high school diploma or high school equivalency certificate, partial high school, elementary school and no schooling. These options were then categorized in 4 education levels: university, college, high-school completed and high-school not completed.

Participants who reported having university studies with degree, university studies with certificate or diploma or university studies without degree, certificate or diploma were

coded as “University”. Participants who reported having non-university studies with certificate or diploma, as well as non-university studies with certificate or diploma were coded as “College”. Participants were coded as “High-school completed” if they had reported having secondary studies with high school diploma or high school equivalency certificate. Lastly participants were coded as “High school not completed” if they had reported partial high school, elementary school or no schooling.

A total of 29 respondents (0.17%) were originally coded as “Refusal” or “Don’t know” and were excluded from the main analyses. From those missing cases 17 (59%) were from the Anglophone minority and 12 (41%) were from the Francophone minority.

Income

A variable on respondent’s total household income was included in the original database of the survey. This variable was derived from 5 variables pertaining to respondent’s estimated total personal income, number of people living in the household, estimated total income of people living in the household, income category of people living in the household and total household income as reported on the Census (May 16, 2006). The derived variable of total household income ranged from less than \$10,000 to \$100,000 or more, and was categorized in 9 groups of \$10,000 (or more for the last group). For the purpose of the thesis household income was categorized into three groups: less than \$30,000, \$30,000-59,999\$ and \$60,000 or more.

There were 118 participants (0.68%) who were originally coded as “Unknown”, “Refusal” or “Don’t know” and which were excluded from the main analyses. All of the missing cases were from the Francophone minority.

Marital status

Respondent’s marital status was categorized in three groups: married/living common-law, widowed/separated/divorced and single. There were no missing observations for this variable.

Place of residence

Respondents were asked the question “Do you now live in a rural or urban area?”, with the options being rural or urban. There were 442 respondents (2.6%) who were coded as

“Unknown”, “Refusal” or “Don’t know” in the original dataset. These missing cases were pooled into a separate category which was named “Unknown”.

Immigrant

The question “Were you born in Canada?” was asked to all adult respondents, with the option to answer yes or no. Naturally, respondents who answered “yes” were categorized as being born in Canada, and those who answered “no” were categorized as being immigrants to Canada. One (0.01%) respondent was originally coded as “Don’t know”, and was subsequently excluded from the main analyses

4.3 Treatment of missing data

The problem of missing data in secondary analyses of existing survey data has been recognized and debated in the statistical literature ¹⁶⁸. In cross-sectional surveys such as the SVOLM, both unit nonresponse and item nonresponse are of concern and have the potential of introducing bias in the study. Unit nonresponse refers to subjects who refused to participate entirely to a survey, whereas item nonresponse pertains to missing answers to questions in the survey questionnaire. The latter type of nonresponse is the one discussed below ¹⁶⁹. Missing data from unit nonresponse are classified into three types: missing completely at random (MCAR), missing at random (MAR) and not missing at random (NMAR).

Data are MCAR when the probability of missing data on a variable is unrelated to the value of all other variables including the variable itself. MAR implies that the probability of missing data on a variable can depend on other variables but not on the value of the variable itself. Missing data is NMAR (or non-ignorable) when its value depends on the value of the variable itself. Dealing with non-ignorable missing data requires special modeling methods ¹⁷⁰. The variables retained for analysis in this study had very few missing data.

Listwise deletion

Listwise deletion, also called complete case analysis (drop technique), is the standard approach of dealing with missing data. This technique restricts the analysis to subjects with

no missing values for the variables of interest¹⁶⁹. The advantages of listwise deletion are that it can be used for any type of statistical analysis and that it does not require special computational methods or software. However, listwise deletion can introduce bias in the results if systematic differences exist between the complete and incomplete cases, thus affecting the validity of drawing conclusions for the larger population of interest. On the other hand if data are missing completely at random (MCAR), parameter estimates will be unbiased as the deleted cases will be a random sample of the original study population¹⁷⁰. Another disadvantage of using complete case analysis is that it reduces sample size, which can potentially affect the statistical power of the analysis^{168,171}.

A total of 222 respondents, or 1.3% of the sample population, were deleted from the dataset due to missing data on one or more of the five outcomes, and/or on one or more of the three predictor variables with missing observations (education, household income and immigrant status), which were all categorical variables. Listwise deletion was not used with the predictor variable of place of residence (living in an urban or rural area), which had 442 missing observations (2.6%). A separate “Unknown” category was created for this variable. Chen and Astebro¹⁷² compared six missing data techniques for categorical data. They found that for categorical data falling under the MAR or MCAR assumption, listwise deletion was a better technique of treating missing data. However, this method would be problematic if a lot of variables had more than 10-20% of missing data. Similarly, Langkamp *et al.*¹⁶⁸ compared five techniques for handling missing data and found that with 10% of missing data or less, listwise deletion gave similar results as the other approaches. Therefore, it is believed that the very small proportion (1.3%) of deleted cases due to missing data would not substantially impact the validity of the parameter estimates nor lead to a loss of statistical power in the present study.

Weighting

In addition to using the listwise deletion technique to deal with the small number of missing data, weights were attached to each subject included in the analysis in order to represent subjects who were excluded. A review conducted by Hold and Elliot¹⁷³ exposed that this approach is often used to compensate for nonresponse in surveys. This technique is an extension of the idea of using weights to account for multistage sampling methods, where

individuals in the population have unequal probabilities of being selected as participants to a survey. Data analysis of those complex surveys use sampling weights to take into account the probability of selecting a given person ^{168,169,174}. For results to be generalizable to the larger target population, missing data techniques applied to datasets which emerged from multistage sampling schemes must also take into account the issue of complex survey design. Raghunathan ¹⁶⁹ argues that attaching weights to subjects included in the analysis restores the representation of the original sample, which becomes distorted in the process of excluding subjects because of missing values.

Multiple imputation

Multiple imputation is another approach to dealing with missing data. One way to use the method is to impute a missing value by a value predicted by a regression model that uses all other observed variables in the dataset, including the outcomes ^{171,175-180}. To account for the uncertainty of which value to impute, multiple imputation works by creating multiple datasets that each contain a different imputed value representing a random sample of the missing values. Each multiply imputed datasets are analyzed separately, followed by a combination of the results to provide overall estimates and standard errors ^{177,181}. Multiple imputation has been shown to produce statistically valid inferences if missing values are MCAR or MAR ^{175,177,178,179}. Another advantage of this technique is that it allows for complete-data analysis without reduction of the sample size ^{170,177}.

On the other hand, listwise deletion has been shown to be more robust than multiple imputation when the MAR assumption is violated ¹⁷⁰. Since it is not possible to know whether missing data are MCAR, MAR or NMAR, multiple imputation was also performed in the present study and the results of the logistic regression were compared to those obtained through weighted complete case analysis. The MI procedure in SAS version 9.2 provides different methods for imputing missing values such as the regression method, the propensity score method or the Monte Carlo Markov Chain (MCMC). The choice of which method to use depends on the type of missing data pattern observed in the dataset, which can be either monotone or arbitrary. A monotone missing data pattern is present when missing data arises at the end of the data record with no gaps between full and missing data. An

arbitrary missing data pattern is observed when missing data is interspersed among full data values¹⁸².

The type of the variable to be imputed also needs to be taken into consideration when choosing the appropriate MI procedure. The present study used categorical variables, which require a monotone missing data pattern in order to be used in the PROC MI step. However, the examination of the missing data pattern revealed that the categorical variables had an arbitrary missing data pattern. A sophisticated two step approach was therefore undertaken to apply multiple imputation to the data. In the first instance (Step 1a), PROC MI was used to impute 5 datasets with enough data values to produce a monotone missing pattern (mcmc impute=monotone). It is important to note that in order for imputed values to match the format of observed values and existing ranges, imputed values were rounded and bounded during imputation. Step 1b entailed running another imputation in order to complete the full imputation (as Step 1a only produced 5 imputations that created monotone missing data). This allowed for the multiple imputation of data for the 5 outcomes variables as well as 3 predictors (education, income and marital status).

Step 2 used PROC REG to predict every outcome with the 6 potential categorical predictors (age, education, household income, marital status, place of residence and immigration). Step 3 was applied for every outcome and entailed the use of PROC MIANALYSE to combine results from the five imputed datasets. This procedure accounts for imputation variability and synthesizes the results from Step 1 and 2. Multiple imputation using Steps 1-3 were performed separately for the 4 sub-groups included in the study: Anglophone men, Francophone men, Anglophone women and Francophone women. The output for every outcome in each sub-population contains regression coefficients, standard errors, 95% confidence intervals and results of the test of significance. Parameter estimates from the logistic regression analysis of the imputed data were similar to results from the logistic regression analysis using the weighted complete case analysis.

As will be discussed below, bootstrap weights must be applied at all times when calculating the variance of any estimate produced with data from the SVOLM. Since BOOTVAR (the program that runs the bootstrap weights in SAS) does not support PROC MIANALYSE, this method cannot be used to treat missing data. The simpler procedures explained above (listwise deletion and weighting) were therefore used in this study.

4.4 Statistical analysis

SAS version 9.2 for Windows software was used to organize and manage data, to perform missing data procedures, to calculate descriptive and comparative statistics and to perform multivariable logistic regression analysis. Before elaborating on the statistical analyses performed, advanced techniques used for producing valid estimates and performing variance calculations with complex sample data are first explained.

Dealing with the complex survey design of the SVOLM

Producing valid estimates

Traditional statistical analyses performed in SAS assume that the data being analyzed constitute a simple random sample, in which everyone in the population of interest has exactly the same probability of being chosen during sample selection. However, many surveys such as the SVOLM are based on a complex sampling design, which results in sampling probabilities and non-response rates that vary considerably from one stratum to the other, as well as non-response rates that vary according to demographic characteristics¹⁶⁵. In order for point estimates to be representative of the target population, the statistical analysis performed must be weighted to the population.

Statistics Canada calculates the population weight assigned to each respondent and includes it as a variable called WEIGHT in the SVOLM analytical file. Creating the weights is a six-step process that includes calculation of the initial weight, adjustment to eliminate overlap, a first adjustment for out of scopes, adjustment for non-response, a second adjustment for out of scopes and post-stratification. Therefore, the final weight attached to each respondent undergoes numerous adjustments in order for the respondents to better represent the target population. Thus, weighting of the data ensures that the SVOLM sample is representative of the target population.

In many methods of analysis such as the calculation of proportions using SAS, the results can be made more meaningful by standardizing the weights attached to each respondent so that the average weight is equal to one. This standardization involves dividing each weight by the overall average weight of the final sample of respondents before

proceeding to the analysis. In more detail, the following steps as shown in the SVOLM User Guide ¹⁶⁵ were undertaken to standardize the weights and proceed to some of the analyses:

1. All respondents from the final sample ($n=17,190$) are selected;
2. The average value of WEIGHT for all these records is calculated. In other words, the sum of WEIGHT values is calculated for these n records and divided by the number of records (n);

$$\text{average mean: mean_wgt} = \frac{\sum_{i=1}^n \text{WEIGHT}_i}{n}$$

3. A new weight called sampleweight is calculated for each of these respondents:
sampleweight=WEIGHT/mean_wgt;
4. The new weight for each case = sampleweight;
5. Analyses are performed using the new weight, sampleweight.

Variance calculation

The variance (or its square root, the standard error) of every estimate calculated from the SVOLM is also subject to the complex sampling design and unequal selection probabilities of the survey. Therefore, while using weights usually yields accurate estimates, their associated variances are often erroneous and practically meaningless ¹⁶⁵. For this reason, applying traditional statistical tests to data from the SVOLM would produce inaccurate results. In order to bypass this issue, the bootstrap method described below was used to approximate the variance of the estimates.

Firstly, estimates obtained by using data from the SVOLM are based on a known sample of individuals and not on a complete census. This sample has a certain variability which represents the sampling error. The sampling error is often quantified by the sampling variance, which is based on the differences in all the possible samples taken from the target population. Even if this is true in theory, in practice it is impossible to calculate the variance of an estimate by using all possible samples. Since the SVOLM has a probabilistic sampling method, it is however possible to approximate the variance of an estimate based on a single sample. The bootstrap method, which uses a resampling technique, is an efficient and

validated way of obtaining such an approximation ¹⁶⁵. It is also the method recommended when dealing with Statistics Canada surveys such as the SVOLM.

The bootstrap method works by taking a certain number of independent subsamples from the sample data set, with replacement, and producing estimates for each of the subsamples. The latter are all the same size n as the initial dataset, but since every subsample is created by using units that are randomly selected with replacement, some of the original values will be selected more than once while others will be left out. The number of subsamples drawn (also called replicates) varies from one survey to the other, and consists of 1,000 subsamples in the case of the SVOLM. Each subsample has an adjusted weight specific to it, which is assigned to each unit belonging to the bootstrap subsample. This adjusted weight is referred to as the bootstrap weight. To estimate the variance for a point estimate taken from the SVOLM, the point estimate is calculated 1,000 times using the 1,000 bootstrap weights. The variability among the 1,000 estimates provides the variance estimate ¹⁶⁵.

In the present study, estimations of the variance were calculated with the SAS version of BOOTVAR by using the bootstrap weights that were produced and provided by Statistics Canada. The BOOTVAR program is a set of macros, where each macro estimates variances for a particular statistic. Variance estimation is a two step process that involves the use of three SAS programs. The first step entails the creation of a SAS data file containing the variables required for the analysis (first program). This file is created from the survey file and is read using a file layout provided with the data. The variables retained for analysis are then created, along with dummy variables for those that are categorical. For some analysis such as estimating totals, ratios and running regression models, variables must be dichotomized, using 1 for the records that have the characteristic and 0 otherwise. When needed, breakdown variables are included in the data file in order to identify the groups for which a separate analysis is desired. In the case of the present study, the breakdown variables of sex (men/women) and official-language minority group (Francophone/Anglophone) were created. It is also important to retain the WEIGHT variable in the SAS data file, as it is used to calculate point estimates with BOOTVAR.

The second step of variance calculation consists of running the BOOTVAR.SAS program (second program). This program calls another program named MACRO.SAS (third

program), which contains the program code of various macros. Standard use of this program does not usually necessitate modifications to be made to the MACRO.SAS by the user. However, before running the BOOTVAR.SAS program, the desired parameters and analyses must be specified. In the first instance, the program is modified to include a number of details related to the required parameters, such as the name of the directory where the analysis file is located, the name of the data file, the name of the directory and file containing the bootstrap weights, the name(s) of breakdown variable(s) when needed, the survey-specific parameters (i.e.: the name(s) of the unique identification variable(s) of the respondents, the name of the survey weight variable, etc.) and the name of the directory where the program MACRO.SAS is located. In the second instance, the BOOTVAR.SAS program is modified to specify the desired analysis. It is possible to obtain variance estimates for totals, ratios (including proportions and means), differences between ratios, percentiles, regression models (linear or logistic) and chi-square tests of independence¹⁸³. The specific tests used in BOOTVAR for the present study are detailed below. The program's default significance level for confidence intervals of 5% ($\alpha=0.05$) was retained for the analyses.

Descriptive analysis

Descriptive statistics were calculated using the FREQ Procedure in SAS. In order to be representative of the target population, all of the frequency distributions and percentages were weighted. The standardized sample weight was used to produce valid and representative point estimates. In a first instance, weighted frequency distributions and proportions provided information on the socioeconomic and demographic characteristics of the four sub-groups included in the study: Anglophone men, Francophone men, Anglophone women and Francophone women. Descriptive statistics were also obtained for self-perceived health and for variables pertaining to access to health care services in the minority language, as well as general access to and use of health care services, by men and women of the two official-language minority groups. In accordance with Statistics Canada guidelines regarding dissemination of data from the SVOLM, proportions were rounded to zero decimals¹⁶⁵.

Comparative analysis

For each of the descriptive statistics, chi-square tests were used to compare weighted proportions between the Anglophone minority and the Francophone minority for men and women. More specifically, the Rao-Scott second order adjusted chi-square test of independence was used in BOOTVAR to test for differences between proportions. The method which was first proposed by Rao and Scott¹⁸⁴ entails the calculation of Pearson's chi-square statistic, as well two chi-square statistics (denoted by RS2 and RS3) that have been modified to reflect the complex sample design of the survey. This method is valid in the case of the SVOLM while the multinomial assumptions used with the traditional Pearson criterion function are often inappropriate when using complex survey data¹⁸⁴.

The RS2 modified chi-square statistic is first calculated by dividing the Pearson chi-square statistic by the estimated design effect (\bar{b}_{RS2}). The RS2 statistic is assumed to have a chi-square distribution with $(r-1)(c-1)$ degrees of freedom, under the hypothesis of independence between variables A and B . The adjusted chi-squares statistic, RS3, is based upon Satterthwaite's approximation and is considerably more complex to calculate. In the present study, these calculations are performed by the BOOTVAR program. Applications of these methods are elaborated by Flyer, Morganstein, and Rust¹⁸⁵.

Logistic regression analysis

The BOOTVAR program was used to run univariate logistic regression models comparing the Francophone minority to the Anglophone minority (reference group), in men and women, for the five outcome variables of the study: poor self-perceived health, finding it important to get health care services in the minority language, not having a regular medical doctor, having used the services of a regular medical doctor in the past 12 months, and not having a regular place to go when sick or needing advice on health.

Subsequently, univariate logistic regression models were fit between each covariate (age, education, household income, place of residence and immigrant status) and the outcome variables in the four sub-groups of the study separately: Anglophone men, Francophone men, Anglophone women, Francophone women. Weighted odds ratios and 95% confidence intervals were obtained for every univariate logistic regression model.

The BOOTVAR program was also used to run multivariable logistic regression models. In the first instance, multivariable logistic regression analyses comparing the Francophone minority to the Anglophone minority (reference group), in men and women, were performed for every outcome variable of the study while adjusting for the six socioeconomic covariates. The weighted adjusted odds ratios and 95% confidence intervals were compared to the weighted crude odds ratios from the univariate logistic regression analyses.

Multivariable logistic regression analyses were then performed to determine important predictors of every outcome in the four sub-groups of the study separately. For comparative purposes between sub-groups and also between different outcomes, every model was adjusted for the same six socioeconomic covariates. Those that were significant at the 0.05 level of significance were identified as predictors of the outcome. A number of potential interactions between covariates were tested based on their theoretical plausibility. However, none were found to be of statistical significance and interaction terms were not included in the models. BOOTVAR provided weighted parameter estimates, standard errors, odds ratios, 95% confidence intervals, the Wald chi-square and significance of every variable included in the multivariable models.

Multivariable logistic regression analyses were also performed to test the association between the vulnerability to poor access to health care services in the minority language and poor self-perceived health while taking into consideration the six socioeconomic covariates. Separate models were created for the four sub-groups of the study. Potential interactions between covariates were tested, but none were found to be statistically significant. Odds ratios and 95% confidence intervals were obtained for each variable included in the models.

5.0 RESULTS

5.1 Characteristics of the study population

There were 17,190 participants included in the study, from which 8,023 (47%) were men and 9,167 (53%) were women (see Appendix 3 for the unweighted characteristics of the total study population). Table 1 presents the demographic and socioeconomic characteristics of the men included in the study, from which 2,503 (31%) were part of the Anglophone minority and 5,520 (69%) were part of the Francophone minority. The weighted proportion of men in the different age groups was significantly different between the Anglophone minority and the Francophone minority ($p=0.010$). Significantly more Francophone men had not completed high school, whereas a greater proportion of Anglophone men had university studies as their highest level of education ($p=0.001$).

The proportion of men in different household income categories was similar between the two official-language minority groups, with 54% of Anglophone men and 56% of Francophone men earning \$60,000 or more ($p=0.452$). A significantly greater proportion of Francophone men (68%) were married compared to Anglophone men (59%) ($p<0.001$). More Francophone men lived in a rural area than Anglophone men ($p<0.001$) did. A significantly greater proportion of Anglophone men (20%) were immigrants to Canada compared to Francophone men (13%) ($p<0.001$).

Table 1: Distribution of demographic and socioeconomic characteristics of men by official-language minority

Characteristics	Anglophone minority*		Francophone minority*		χ^2 p-value
	n	%	n	%	
Age (years)					
18-34	845	29	1241	25	0.010
35-64	1545	54	2866	57	
65 +	488	17	945	19	
Education					
University	933	32	1374	27	0.001
College	665	23	1094	22	
High school completed	649	23	1106	22	
High school not completed	630	22	1479	29	

Continues

Table 1 continued

Household income					
<\$30,000	486	17	765	15	0.452
\$30,000-\$59,999	833	29	1439	28	
\$60,000 or more	1559	54	2849	56	
Marital status					
Married/Common-law	1707	59	3451	68	<0.001
Widowed/Separated/Divorced	298	11	483	10	
Single	873	30	1119	22	
Place of residence					
Urban	1946	68	3020	60	<0.001
Rural	827	29	1901	38	
Unknown	106	3	131	2	
Immigrant					
No	2292	80	4393	87	<0.001
Yes	586	20	659	13	

*The numbers and proportions were rescaled according to the sampling weights.

Table 2 presents the demographic and socioeconomic characteristics of the 9,167 women included in the study, from which 2,658 (29%) were from the Anglophone minority and 6,509 (71%) were from the Francophone minority. The weighted proportion of women in the different age groups was not significantly different between the Anglophone minority and the Francophone minority ($p=0.107$). A greater proportion of Anglophone women (34%) had university studies compared to Francophone women (31%) ($p=0.014$). The proportion of women in different household income categories was similar between the two official-language minority groups ($p=0.465$). A greater proportion of Francophone women were married compared to Anglophone women ($p<0.001$). Women from the Francophone minority (35%) were higher in proportion to live in a rural area than women from the Anglophone minority (28%) ($p=0.012$). There were also proportionately more Anglophone women (19%) who were immigrants to Canada compared to Francophone women (13%) ($p=0.004$).

Table 2: Distribution of demographic and socioeconomic characteristics of women by official-language minority

Characteristics	Anglophone minority*		Francophone minority*		χ^2 p-value
	n	%	n	%	
Age (years)					
18-34	802	26	1462	24	0.107
35-64	1639	54	3559	57	
65+	604	20	1193	19	
Education					
University	1049	34	1899	31	0.014
College	734	24	1348	22	
High school completed	707	23	1536	25	
High school not completed	555	18	1431	23	
Household income					
<\$30,000	614	20	1187	19	0.465
\$30,000-\$59,999	896	29	1735	28	
\$60,000 or more	1535	50	3291	53	
Marital status					
Married/Common-law	1624	53	3998	64	<0.001
Widowed/Separated/Divorced	614	20	1201	19	
Single	807	27	1046	17	
Place of residence					
Urban	2046	67	3822	62	0.012
Rural	852	28	2195	35	
Unknown	147	5	197	3	
Immigrant					
No	2456	81	5398	87	0.004
Yes	589	19	816	13	

*The numbers and proportions were rescaled according to the sampling weights

5.2 Descriptive and comparative statistics

5.2.1 Self-perceived health and access to health care services in the minority language

Table 3 presents a summary of comparisons between the two official-language minorities with regards to self-perceived health and their general access to health care services in the minority language. Detailed descriptive and comparative statistics are presented at Appendix

4, Table 3.1-3.2. In both men and women, a higher proportion of Francophones had poor self-perceived health compared to Anglophones. Finding it important to get health care services in the minority language was more common amongst Anglophone men and women than their Francophone counterparts. Respondents of both official-language minorities reported the scarcity of professionals that speak the minority language as the principal reason for not being served in the minority language. However, a greater proportion of Anglophones than Francophones identified a communication problem or the behaviour of the respondent/of the professional or staff as the main reason for not being served in the minority language.

Table 3: Summary of self-perceived health and general access to health care services in the minority language by official-language minority in men and women

	Anglophone minority (%)*	Francophone minority (%)*	χ^2 p-value
Fair/poor self-perceived health			
Men	9	13	<0.001
Women	11	14	0.004
Finds it important to get health care services in the minority language			
Men	91	73	<0.001
Women	93	76	<0.001
Reason for not being served in the minority language: Scarcity of professionals that speak the minority language			
Men	71	88	<0.001
Women	77	88	<0.001

*The proportions were rescaled according to the sampling weights

5.2.2 Health care services provided by a regular medical doctor

Table 4 presents a summary of comparisons between the two official-language minorities with regards to their access to and use of health care services provided by a regular medical doctor (MD) in the past 12 months in men and women. Detailed descriptive and comparative statistics are presented at Appendix 4, Table 4.1-4.2. A significantly greater proportion of men and women of the Francophone minority had a regular MD, and had used the services of a regular MD in the past 12 months, compared to their Anglophone counterparts. The

minority language was used more often with the regular MD by Anglophones than Francophones of both sexes. A greater proportion of Francophone than Anglophone men and women identified the fact that the MD did not know the minority language as the principal reason for not being served in their language.

Table 4: Summary of the access to and use of health care services provided by a regular medical doctor (MD) by official-language minority in men and women

	Anglophone minority (%)*	Francophone minority (%)*	χ^2 p-value
Has a regular MD			
Men	64	85	<0.001
Women	82	91	<0.001
Used the services of an MD in the past 12 months			
Men	52	66	<0.001
Women	67	80	<0.001
Used the minority language with the MD			
Men	81	37	<0.001
Women	82	36	<0.001
Principal reason for not being served in the minority language: MD didn't know the language			
Men	36	72	0.007
Women	44	75	0.001

*The proportions were rescaled according to the sampling weights

5.2.3 Health care services provided by a nurse

A summary of the comparisons between the two official-language minorities with regards to the use of health care services provided by a nurse in the past 12 months in men and women is presented at Table 5. For detailed descriptive and comparative statistics, see Appendix 4, Table 5.1-5.2. A statistically similar proportion of Anglophones and Francophones from both sexes used the services of a nurse in the 12 months prior to the survey. For those that did use such services, a greater proportion of men and women of the Anglophone minority spoke the minority language with the nurse compared to the Francophone minority. A greater proportion of Francophone men and women reported that the nurse did not know the

language as the principle reason for not being served in the minority language than their Anglophone counterparts.

Table 5: Summary of the use of health care services provided by a nurse by official-language minority in men and women

	Anglophone minority (%)*	Francophone minority (%)*	χ^2 p-value
Used the services of an nurse in the past 12 months			
Men	23	20	0.170
Women	23	26	0.160
Used the minority language with the nurse			
Men	63	37	<0.001
Women	62	39	<0.001
Principal reason for not being served in the minority language: nurse didn't know the language			
Men	43	53	<0.001
Women	43	62	<0.001

*The proportions were rescaled according to the sampling weights

5.2.4 Health care services provided by a professional from a telephone health line or telehealth service

Table 6 presents a summary of comparisons between the two official-language minorities with regards to their use of health care services provided by a professional from a telephone health line/telehealth service in the past 12 months in men and women. Detailed descriptive and comparative statistics are presented at Appendix 4, Table 6.1-6.2. In both men and women, a significantly greater proportion of Francophones were aware of the existence of a telephone health line or telehealth service in their province compared to Anglophones. A greater proportion of Francophone women also used such services in the 12 months prior to the survey compared to Anglophone women. The principal reason identified for not being served in the minority language differed between women of the two linguistic groups.

Table 6: Summary of the use of health care services provided by a professional from a telephone health line or telehealth service by official-language minority in men and women

	Anglophone minority (%)*	Francophone minority** (%)*	χ^2 p-value
Is aware of the existence of a telephone health line or telehealth service in their province			
Men	41	61	<0.001
Women	58	75	<0.001
Used the services of a professional from a telephone health line/telehealth in the past 12 month			
Men	9	10	0.448
Women	14	17	0.029
Principal reason for not being served in the minority language: professional didn't know the language			
Men	27	27	0.964
Women	31	16	<0.001

*The proportions were rescaled according to the sampling weights

** Excludes respondents of the province of Prince Edward Island

5.2.5 Services provided by other health care professionals

A summary of the comparisons between the two official-language minorities with regards to their access to and use of other types of health care services in the past 12 months in men and women is presented at Table 7. For detailed descriptive and comparative statistics, see Appendix 4, Table 7.1-7.2. A greater proportion of Francophone men and women reported not having a regular place to go (besides their regular medical doctor) when sick or needing advice on their health compared to Anglophone men and women. For both sexes, the place identified to get such health care services also differed between the two official-language minorities. Significantly more Anglophone men and women reported that they spoke the minority language with the health care professional compared to their Francophone counterparts. A greater proportion of Francophone men and women identified that the health care professional did not speak the minority language as the principle reason for not being served in that language.

Table 7: Summary of the access to and use of health care services provided by other health care professional by official-language minority in men and women

	Anglophone minority (%)*	Francophone minority (%)*	χ^2 p-value
Has a regular place to go when sick or needing advice on their health			
Men	60	52	0.001
Women	63	57	0.002
Where do they go: health clinic			
Men	34	48	<0.001
Women	47	49	<0.001
Used the minority language with the health care professional			
Men	62	43	<0.001
Women	60	33	<0.001
Principal reason for not being served in the minority language: professional didn't know the language			
Men	36	58	<0.001
Women	28	62	0.020

*The proportions were rescaled according to the sampling weights

5.3 General health and access to health care services

Table 8 shows crude and adjusted odds ratios (ORs) and their 95% confidence intervals (95% CIs) for five outcomes in men of the Francophone minority versus those of the Anglophone minority: poor self-perceived health, finding it important to get health care services in the minority language, not having a regular medical doctor, having used the services of a regular medical doctor in the past 12 months, and not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health. No interaction terms were found to be significant and included in the models. Odds ratios were adjusted for the six socioeconomic covariates, which were age, education, income, marital status, place of residence (urban or rural) and immigrant status.

The odds ratios adjusted for the six covariates did not differ greatly from the crude odds ratios (Table 8). Francophone men were significantly more likely to have poor self-perceived health ($OR_{adj}=1.39$, 95%CI=1.08, 1.79), to have used the services of a regular

medical doctor in the past 12 months ($OR_{adj}=1.69$, 95%CI=1.41, 2.02) and not to have a regular place to go (besides the regular medical doctor) when sick or needing advice on health ($OR_{adj}=1.44$, 95%CI=1.21, 1.72). Francophone men were however significantly less likely to find it important to get health care services in the minority language ($OR_{adj}=0.23$, 95%CI=0.18, 0.30) and not to have a regular medical doctor ($OR_{adj}=0.34$, 95%CI=0.28, 0.43).

Table 8: Crude odds ratios (OR_{crude}), adjusted odds ratios (OR_{adj}) and 95% confidence intervals (95%CI) for general health and access to health care services in Francophone men compared to Anglophone men

	OR_{crude} (95%CI)	OR_{adj} (95%CI)*
Poor self-perceived health	1.52 (1.18, 1.95)	1.39 (1.08, 1.79)
Finding it important to get health care services in the minority language	0.25 (0.20, 0.32)	0.23 (0.18, 0.30)
Not having have a regular medical doctor	0.32 (0.26, 0.40)	0.34 (0.28, 0.43)
Having used the services of a regular medical doctor in the past 12 months	1.75 (1.49, 2.06)	1.69 (1.41, 2.02)
Not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health	1.39 (1.16, 1.65)	1.44 (1.21, 1.72)

*Adjusted for all covariates: age, education, household income, marital status, place of residence, immigrant status

Table 9 shows crude and adjusted odds ratios and their 95% confidence intervals for general health and access to health care services in women of Francophone minority versus those of Anglophone minority. After adjustment for age, education, household income, marital status, place of residence (urban or rural) and immigrant status, Francophone women were significantly more likely to have poor self-perceived health ($OR_{adj}=1.29$, 95%CI=1.01, 1.65), to have used the services of a regular medical doctor in the past 12 months ($OR_{adj}=1.93$, 95%CI=1.61, 2.31) and not to have a regular place to go (besides the regular medical doctor) when sick or needing advice on health ($OR_{adj}=1.36$, 95%CI=1.15, 1.62). Francophone women were also significantly less likely to find it important to get health care services in the minority language ($OR_{adj}=0.22$, 95%CI=0.17, 0.29) and not to have a regular medical doctor ($OR_{adj}=0.40$, 95%CI=0.32, 0.51).

Table 9: Crude odds ratios (OR_{crude}), adjusted odds ratios (OR_{adj}) and 95% confidence intervals (95%CI) for general health and access to health care services in Francophone women compared to Anglophone women

	OR _{crude} (95%CI)	OR _{adj} (95%CI)*
Poor self-perceived health	1.38 (1.10, 1.73)	1.29 (1.01, 1.65)
Finding it important to get health care services in the minority language	0.24 (0.18, 0.31)	0.22 (0.17, 0.29)
Not having have a regular medical doctor	0.38 (0.30, 0.48)	0.40 (0.32, 0.51)
Having used the services of a regular medical doctor in the past 12 months	1.97 (1.63, 2.37)	1.93 (1.61, 2.31)
Not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health	1.30 (1.10, 1.55)	1.36 (1.15, 1.62)

*Adjusted for all covariates: age, education, household income, marital status, place of residence, immigrant status

5.3.1 Poor self-perceived health

The univariate analyses revealed the crude odds ratios and 95% confidence intervals for poor self-perceived health associated with various predictors in men and women of the two official-language minority groups. The results of these analyses are presented at Appendix 5, Table 9.1-9.2. As expected, younger adults in general had better health than older adults. Respondents who had not completed high school were significantly more likely to have poor self-perceived health compared to those with university studies. The crude odds of having poor self-perceived health were higher with increasing income for men of both official-language minority groups. Those with a household income of less than \$30,000 were significantly more likely to have poor self-perceived health compared to those with a household income of \$60,000 or more, in Anglophone men (OR=4.61, 95%CI= 2.69, 7.92), Francophone men (OR=3.84, 95%CI= 2.83, 5.40), Anglophone women (OR=5.45, 95%CI=3.20, 9.28) and Francophone women (OR=4.64, 95%CI=3.37, 6.38).

The crude odds of having poor self-perceived health were also higher for men and women of both official-language minority groups with a household income of \$30,000-\$59,999 compared to those with a household income of \$60,000 or more. In the four groups under study, those who were widowed, separated or divorced were significantly

more likely to report poor self-perceived health compared to those that were married or living in common law. In Francophone women only, respondents who were immigrants to Canada significantly less likely to have poor self-perceived health compared to Canadian-born women (OR=0.50, 95%CI=0.33, 0.76).

Results of the multivariable logistic regression to examine important predictors of poor self-perceived health in men of the two official-language minorities are presented in Table 10. Anglophone and Francophone men aged 65 years and over were significantly more likely to have poor self-perceived health than those between the ages of 35 to 64 years. In Francophone men only, those between the ages of 18 to 34 years were significantly less likely to have poor self-perceived health compared with those aged 35 to 64 years. The risk of poor self-perceived health was higher for Francophone men with lower education levels, as well as for Anglophones without a high school diploma, compared to those with university studies. In men of both official-language minorities, having a household income of less than \$30,000 was associated with higher odds of poor self-perceived health than having a household income of \$60,000 or more. In Francophone men only, those with a household income of \$30,000-\$59,999 were also more likely to have poor self-perceived health compared to wealthier individuals. The risk of poor self-perceived health was higher for Anglophone men who were widowed, separated or divorced compared to those who were married or living in common-law. The detailed results of the two multivariable logistic regression analyses are presented at Appendix 6, Table 10.1 and 10.2.

Table 10: Summary of multivariable logistic regression analysis for variables predicting poor self-perceived health in Anglophone and Francophone men

Predictors	Anglophone men		Francophone men	
	OR	95%CI*	OR	95%CI*
Age (years)				
18-34	0.91	(0.46, 1.83)	0.30	(0.19, 0.48)
35-64	1.00		1.00	
65+	2.05	(1.19, 3.54)	1.37	(1.01, 1.85)
Education				
University	1.00		1.00	
College	0.66	(0.27, 1.61)	1.85	(1.10, 3.13)
High school completed	0.81	(0.41, 1.60)	2.50	(1.60, 3.89)

Continues

Table 10 continued

High school not completed	2.74	(1.46, 5.13)	4.46	(2.90, 6.87)
Household income				
<\$30,000	2.96	(1.53, 5.72)	2.32	(1.60, 3.37)
\$30,000-\$59,999	1.27	(0.68, 2.37)	1.58	(1.15, 2.16)
\$60,000 or more	1.00		1.00	
Marital status				
Married/Common-law	1.00		1.00	
Widowed/Separated/Divorced	2.47	(1.22, 5.02)	0.98	(0.67, 1.42)
Single	1.15	(0.56, 2.34)	1.04	(0.68, 1.60)
Place of residence				
Urban	1.00		1.00	
Rural	0.92	(0.56, 1.49)	0.75	(0.57, 0.99)
Unknown	1.53	(0.99, 2.37)	1.22	(0.86, 1.74)
Immigrant				
No	1.00		1.00	
Yes	1.22	(0.65, 2.28)	1.06	(0.64, 1.77)

OR=odds ratio; 95%CI=95% confidence intervals

*Adjusted for all covariates: age, education, household income, marital status, place of residence, immigrant status

Table 11 shows the results of the multivariable logistic regression analysis to examine important predictors of poor self-perceived health in women of the Anglophone minority and Francophone minority. The odds of poor self-perceived health were higher with increasing age for Francophone women only. Women of both linguistic groups with less than a high school diploma, as well as Francophone women with a high school diploma only, were significantly more likely to have poor self-perceived health than those with university studies. Anglophone and Francophone women with a household income of less than \$30,000 were also significantly more likely to have poor self-perceived health compared with those whose household income was of \$60,000 or more. In Francophone women only, the risk of poor self-perceived health was also higher for respondents with a household income of \$30,000-\$59,999, compared to \$60,000 or more. The detailed results of the two multivariable logistic regression analyses are presented at Appendix 6, Table 11.1-11.2.

Table 11: Summary of multivariable logistic regression analysis for variables predicting poor self-perceived health in Anglophone and Francophone women

Predictors	Anglophone women		Francophone women	
	OR	95%CI*	OR	95%CI*
Age (years)				
18-34	0.45	(0.19, 1.06)	0.38	(0.24, 0.62)
35-64	1.00		1.00	
65+	1.51	(0.89, 2.57)	1.73	(1.31, 2.29)
Education				
University	1.00		1.00	
College	2.20	(0.98, 4.94)	1.01	(0.65, 1.58)
High school completed	1.35	(0.62, 2.96)	1.75	(1.11, 2.75)
High school not completed	6.49	(2.95, 14.28)	3.29	(2.15, 5.03)
Household income				
<\$30,000	3.16	(1.63, 6.11)	2.10	(1.43, 3.09)
\$30,000-\$59,999	1.37	(0.77, 2.46)	1.46	(1.03, 2.06)
\$60,000 or more	1.00		1.00	
Marital status				
Married/Common-law	1.00		1.00	
Widowed/Separated/Divorced	1.20	(0.71, 2.01)	1.45	(1.09, 1.94)
Single	1.07	(0.48, 2.37)	1.15	(0.72, 1.81)
Place of residence				
Urban	1.00		1.00	
Rural	1.03	(0.64, 1.66)	0.91	(0.70, 1.19)
Unknown	0.87	(0.53, 1.44)	0.96	(0.72, 1.27)
Immigrant				
No	1.00		1.00	
Yes	1.34	(0.77, 2.36)	0.82	(0.53, 1.29)

OR=odds ratio; 95%CI=95% confidence intervals

*Adjusted for all covariates: age, education, household income, marital status, place of residence, immigrant status

5.3.2 Finding it important to get health care services in the minority language

The univariate analyses showed the crude odds ratios and 95% confidence intervals for finding it important to get health care services in the minority language associated with various predictors in men and women of the two official-language minority groups. They are presented at Appendix 5, Tables 9.3-9.4. For Anglophone men, Francophone men and

Francophone women, the odds of finding it important to get health care services in the minority language were lower for respondents who were 65 and over compared with those who were between the ages of 35 and 64 years old. Francophone men and women who had not completed high school were significantly more likely to find it important to get health care services in the minority language compared to those who had university studies.

Francophone women with a household income of less than \$30,000 had higher odds of finding it important to get health care services in the minority language compared to women with a household income of \$60,000 or more (OR=1.33, 95%CI=1.05, 1.69). Men who were single were significantly more likely to find it important to get health care services in the minority language compared to men who were married or living in common-law. Francophone men and women who lived in a rural area were significantly more likely to find it important to get health care services in the minority language compared to those living in an urban setting. The odds of finding it important to get health care services in the minority language were lower for Francophone women born outside Canada compared to those born in Canada (OR=0.59, 95%CI=0.42, 0.81).

Results of the multivariable logistic regression to examine important predictors of finding it important to get health care services in the minority language for men of the two official-language minorities are presented in Table 12. Men aged 65 years and over were significantly less likely to find it important to get health care services in the minority language compared to men between the ages of 35 and 64. In Francophone men only, being 18 to 34 years old was associated with higher odds of finding it important to get health care services in the minority language compared to the same reference group. The odds of finding it important to get health care services in the minority language was higher for Anglophone and Francophone men who did not have a high school diploma compared with those who had university studies. Being single, as opposed to married or living in common-law, elevated the odds of finding it important to get health care services in the minority language. Francophone men living in a rural area were also significantly more likely to find it important to get health care services in the minority language than urban dwellers. The detailed results of the two multivariable logistic regression analyses are presented at Appendix 6, Table 12.1-12.2.

Table 12: Summary of multivariable logistic regression analysis for variables predicting finding it important to get health care services in the minority language in Anglophone and Francophone men

Predictors	Anglophone men		Francophone men	
	OR	95%CI*	OR	95%CI*
Age (years)				
18-34	0.92	(0.56, 1.50)	1.62	(1.21, 2.17)
35-64	1.00		1.00	
65+	0.59	(0.35, 0.99)	0.51	(0.39, 0.66)
Education				
University	1.00		1.00	
College	1.01	(0.56, 1.84)	0.81	(0.59, 1.11)
High school completed	1.31	(0.72, 2.40)	1.02	(0.77, 1.36)
High school not completed	2.51	(1.35, 4.67)	1.46	(1.06, 2.01)
Household income				
<\$30,000	0.78	(0.45, 1.34)	1.14	(0.81, 1.61)
\$30,000-\$59,999	1.34	(0.80, 2.24)	1.19	(0.92, 1.53)
\$60,000 or more	1.00		1.00	
Marital status				
Married/Common-law	1.00		1.00	
Widowed/Separated/Divorced	0.57	(0.29, 1.10)	0.95	(0.66, 1.36)
Single	2.03	(1.24, 3.33)	1.04	(0.78, 1.39)
Place of residence				
Urban	1.00		1.00	
Rural	1.03	(0.63, 1.67)	1.72	(1.39, 2.12)
Unknown	0.65	(0.37, 1.17)	1.01	(0.73, 1.39)
Immigrant				
No	1.00		1.00	
Yes	1.19	(0.73, 1.95)	0.88	(0.61, 1.25)

OR=odds ratio; 95%CI=95% confidence intervals

*Adjusted for all covariates: age, education, household income, marital status, place of residence, immigrant status

Table 13 presents the results of the multivariable logistic regression analysis to examine predictors of finding it important to get health care services in the minority language in Anglophone and Francophone women. Women with a household income of less than \$30,000 were significantly less likely to find it important to get health care services in the minority language compared to those with a household income of \$60,000 or more. The

odds of finding it important to get health care services in the minority language were higher for Francophone women who did not have a high school diploma compared with those with university studies. The odds were also higher for Anglophone women who were single as opposed to being married or living in common-law. In Francophone women only, living in a rural area was associated with higher odds of finding it important to get health care services in the minority language, compared to living in an urban area. Francophone women who were immigrants to Canada were significantly less likely to find it important to get health care services in the minority language than those born in Canada. The detailed results of the two multivariable logistic regression analyses are presented at Appendix 6, Table 13.1-13.2.

Table 13: Summary of multivariable logistic regression analysis for variables predicting finding it important to get health care services in the minority language in Anglophone and Francophone women

Predictors	Anglophone women		Francophone women	
	OR	95%CI*	OR	95%CI*
Age (years)				
18-34	0.64	(0.35, 1.16)	1.20	(0.84, 1.70)
35-64	1.00		1.00	
65+	1.32	(0.70, 2.50)	0.51	(0.40, 0.66)
Education				
University	1.00		1.00	
College	0.84	(0.40, 1.76)	0.84	(0.63, 1.12)
High school completed	0.99	(0.47, 2.09)	0.87	(0.65, 1.15)
High school not completed	1.30	(0.59, 2.87)	1.74	(1.29, 2.34)
Household income				
<\$30,000	0.51	(0.27, 0.96)	1.25	(0.95, 1.64)
\$30,000-\$59,999	1.18	(0.64, 2.20)	1.09	(0.84, 1.40)
\$60,000 or more	1.00		1.00	
Marital status				
Married/Common-law	1.00		1.00	
Widowed/Separated/Divorced	1.60	(0.63, 4.03)	1.11	(0.86, 1.42)
Single	2.25	(1.21, 4.19)	1.15	(0.83, 1.60)
Place of residence				
Urban	1.00		1.00	
Rural	0.89	(0.53, 1.50)	1.32	(1.06, 1.65)

Continues

Table 13 continued

Unknown	1.45	(0.61, 3.45)	0.92	(0.62, 1.42)
Immigrant				
No	1.00		1.00	
Yes	1.01	(0.47, 2.13)	0.62	(0.45, 0.86)

OR=odds ratio; 95%CI=95% confidence intervals

*Adjusted for all covariates: age, education, household income, marital status, place of residence, immigrant status

5.3.3 Not having a regular medical doctor

The crude odds ratios and 95% confidence intervals of the association between various predictors and not having a regular medical doctor (Appendix 5, Tables 9.5-9.6) revealed that the risk of not having a regular medical doctor was lower for older individuals compared with younger ones. Anglophone women with college studies were significantly more likely not to have a regular medical doctor compared to Anglophone women with university studies (OR=1.74, 95%CI=1.11, 2.71). Anglophone men with a household income of less than \$30,000 also had higher odds of not having a regular medical doctor than Anglophone men with a household income of \$60,000 or more.

Compared with being married or living in common-law, being single was associated with higher odds of not having a regular medical doctor in men and women of the two official-language minority groups. The risk of not having a regular medical doctor was lower for men living in a rural area compared to those living in an urban area for the Anglophone minority (OR=0.70, 95%CI=0.51, 0.98) and the Francophone minority (OR=0.63, 95%CI=0.49, 0.82). Francophone men who were immigrants to Canada were significantly more likely not to have a regular medical doctor compared to Canadian-born Francophone men.

Table 14 shows a summary of the multivariable logistic regression analysis to examine important predictors of not having a regular medical doctor in men of the two official-language minorities. The risk of not having a regular medical doctor was lower with increasing age for Anglophone and Francophone men. Compared to having a household income of \$60,000 or more, having a household income of less than \$30,000 was associated with higher odds of not having a regular medical doctor in men of both linguistic groups. Single men were also significantly more likely not to have a regular medical doctor than

those who were married or living in common-law. Francophone men who lived in a rural area were significantly less likely not to have a regular medical doctor than Francophone urban dwellers. The detailed results of the two multivariable logistic regression analyses are presented at Appendix 6, Table 14.1-14.2.

Table 14: Summary of multivariable logistic regression analysis for variables predicting not having a regular medical doctor in Anglophone and Francophone men

Predictors	Anglophone men		Francophone men	
	OR	95%CI*	OR	95%CI*
Age (years)				
18-34	1.97	(1.27, 3.05)	1.82	(1.36, 2.44)
35-64	1.00		1.00	
65+	0.24	(0.13, 0.43)	0.32	(0.21, 0.51)
Education				
University	1.00		1.00	
College	1.09	(0.68, 1.74)	1.02	(0.71, 1.47)
High school completed	0.84	(0.53, 1.33)	0.80	(0.54, 1.20)
High school not completed	1.09	(0.67, 1.77)	1.33	(0.81, 2.19)
Household income				
<\$30,000	1.66	(1.07, 2.56)	1.71	(1.01, 2.88)
\$30,000-\$59,999	1.41	(0.94, 2.12)	1.26	(0.93, 1.72)
\$60,000 or more	1.00		1.00	
Marital status				
Married/Common-law	1.00		1.00	
Widowed/Separated/Divorced	0.97	(0.49, 1.94)	1.40	(0.88, 2.24)
Single	2.12	(1.36, 3.29)	1.81	(1.29, 2.55)
Place of residence				
Urban	1.00		1.00	
Rural	0.71	(0.50, 1.01)	0.67	(0.50, 0.89)
Unknown	1.49	(0.94, 2.35)	0.76	(0.52, 1.11)
Immigrant				
No	1.00		1.00	
Yes	1.31	(0.86, 2.00)	1.37	(0.84, 2.24)

OR=odds ratio; 95%CI=95% confidence intervals

*Adjusted for all covariates: age, education, household income, marital status, place of residence, immigrant status

Table 15 presents the results of the multivariable logistic regression analysis to examine important predictors of not having a regular medical doctor in women of the Anglophone and Francophone minority. Women between the ages of 18 and 34 were significantly more likely not to have a regular medical doctor than those aged 35 to 64 years old. In Anglophone women only, respondents aged 65 or over were significantly less likely not to have a regular medical doctor than those between the ages of 35 to 64 years. The risk of not having a regular medical doctor was higher for Francophone women who were single compared to those who were married or living in common-law. The detailed results of the two multivariable logistic regression analyses are presented at Appendix 6, Table 15.1-15.2.

Table 15: Summary of multivariable logistic regression analysis for variables predicting not having a regular medical doctor in Anglophone and Francophone women

Predictors	Anglophone women		Francophone women	
	OR	95%CI*	OR	95%CI*
Age (years)				
18-34	2.01	(1.26, 3.20)	1.85	(1.17, 2.92)
35-64	1.00		1.00	
65+	0.45	(0.24, 0.84)	0.85	(0.50, 1.47)
Education				
University	1.00		1.00	
College	1.70	(1.08, 2.69)	0.87	(0.55, 1.37)
High school completed	1.56	(0.88, 2.76)	0.83	(0.50, 1.38)
High school not completed	1.63	(0.91, 2.90)	0.91	(0.54, 1.52)
Household income				
<\$30,000	1.22	(0.72, 2.04)	1.41	(0.91, 2.19)
\$30,000-\$59,999	0.97	(0.60, 1.55)	1.38	(0.97, 1.98)
\$60,000 or more	1.00		1.00	
Marital status				
Married/Common-law	1.00		1.00	
Widowed/Separated/Divorced	0.81	(0.47, 1.41)	1.11	(0.70, 1.78)
Single	1.25	(0.79, 1.99)	1.58	(1.01, 2.47)
Place of residence				
Urban	1.00		1.00	
Rural	0.76	(0.53, 1.11)	1.16	(0.81, 1.64)
Unknown	1.07	(0.64, 1.79)	0.66	(0.39, 1.13)

Continues

Table 15 continued

Immigrant				
No	1.00		1.00	
Yes	1.19	(0.71, 1.97)	0.98	(0.65, 1.49)

OR=odds ratio; 95%CI=95% confidence intervals

*Adjusted for all covariates: age, education, household income, marital status, place of residence, immigrant status

5.3.4 Having used the services of a regular medical doctor in the past 12 months

The univariate analyses revealed the crude odds ratios and 95% confidence intervals for having used the services of a regular medical doctor in the past 12 months associated with various predictors in men and women of the two official-language minority groups. As a reminder, only those who had answered in the affirmative to having a regular medical doctor were included in the analyses, for which the results are presented at Appendix 5, Tables 9.7-9.8. For men and women of both official-language minority groups, the odds of having used the services of a regular medical doctor in the past 12 months were higher for older respondents compared to younger ones. Respondents who were single also had lower odds of having used the services of a regular medical doctor in the past 12 months compared to those who were married or living in common-law, in Anglophone men (OR=0.26, 95%CI=0.19, 0.36), Francophone men (OR=0.45, 95%CI=0.36, 0.57), Anglophone women (OR=0.51, 95 %CI=0.35, 0.76) and Francophone women (0.58, 95%CI=0.45, 0.74). In Anglophone women only, being widowed, separated or divorced was associated with higher odds of having used the services of a regular medical doctor in the past 12 months compared to being married or living in common-law.

Results of the multivariable logistic regression to examine important predictors of having used the services of a regular medical doctor in the past 12 months in men of the Anglophone and Francophone minority are presented in Table 16. The odds of having used this type of service were higher with increased age in men of both official-language minorities. Being single, as opposed to married or living in common-law, lowered the odds of having used the services of a regular medical doctor in the past 12 months. The detailed results of the two multivariable logistic regression analyses are presented at Appendix 6, Table 16.1-16.2.

Table 16: Summary of multivariable logistic regression analysis for variables predicting having used the services of a regular medical doctor in the past 12 months in Anglophone and Francophone men

Predictors	Anglophone men		Francophone men	
	OR	95%CI*	OR	95%CI*
Age (years)				
18-34	0.36	(0.23, 0.55)	0.44	(0.34, 0.57)
35-64	1.00		1.00	
65+	4.44	(2.80, 7.07)	2.39	(1.80, 3.19)
Education				
University	1.00		1.00	
College	0.96	(0.61, 1.50)	0.91	(0.69, 1.21)
High school completed	0.93	(0.60, 1.44)	0.96	(0.73, 1.27)
High school not completed	0.74	(0.47, 1.16)	0.78	(0.56, 1.08)
Household income				
<\$30,000	0.68	(0.45, 1.04)	0.96	(0.64, 1.43)
\$30,000-\$59,999	0.74	(0.51, 1.09)	0.93	(0.74, 1.16)
\$60,000 or more	1.00		1.00	
Marital status				
Married/Common-law	1.00		1.00	
Widowed/Separated/Divorced	1.25	(0.69, 2.26)	0.90	(0.62, 1.32)
Single	0.60	(0.39, 0.92)	0.73	(0.56, 0.95)
Place of residence				
Urban	1.00		1.00	
Rural	1.22	(0.88, 1.69)	1.12	(0.92, 1.36)
Unknown	0.71	(0.45, 1.11)	1.42	(1.04, 1.95)
Immigrant				
No	1.00		1.00	
Yes	0.79	(0.53, 1.19)	1.00	(0.66, 1.50)

OR=odds ratio; 95%CI=95% confidence intervals

*Adjusted for all covariates: age, education, household income, marital status, place of residence, immigrant status

Results of the multivariable logistic regression to examine important predictors of having used the services of a regular medical doctor in the past 12 months in women of the two official-language minorities are presented in Table 17. Compared with women between the ages of 35 and 64, those aged 18 to 34 were significantly less likely to have used the services of a regular medical doctor in the past 12 months. In Anglophone women only,

those aged 65 and over were significantly more likely to have used such services. Having a household income of \$30,000-\$59,999, as opposed to \$60,000 or more, lowered the odds of having used the services of a regular medical doctor in the past 12 months for Anglophone women. Anglophone women living in a rural area were significantly more likely to have used the services of a regular medical doctor in the past 12 months than those living in an urban area. The detailed results of the two multivariable logistic regression analyses are presented at Appendix 6, Table 17.1-17.2.

Table 17: Summary of multivariable logistic regression analysis for variables predicting having used the services of a regular medical doctor in the past 12 months in Anglophone and Francophone women

Predictors	Anglophone women		Francophone women	
	OR	95%CI*	OR	95%CI*
Age (years)				
18-34	0.52	(0.34, 0.79)	0.60	(0.44, 0.82)
35-64	1.00		1.00	
65+	2.16	(1.36, 3.44)	1.28	(0.94, 1.75)
Education				
University	1.00		1.00	
College	0.73	(0.46, 1.17)	1.04	(0.76, 1.42)
High school completed	0.65	(0.40, 1.04)	1.03	(0.75, 1.40)
High school not completed	0.64	(0.38, 1.07)	0.84	(0.60, 1.19)
Household income				
<\$30,000	0.86	(0.53, 1.38)	0.85	(0.65, 1.12)
\$30,000-\$59,999	0.62	(0.41, 0.92)	0.88	(0.69, 1.11)
\$60,000 or more	1.00		1.00	
Marital status				
Married/Common-law	1.00		1.00	
Widowed/Separated/Divorced	1.59	(0.97, 2.60)	0.98	(0.74, 1.32)
Single	0.77	(0.49, 1.19)	0.75	(0.55, 1.02)
Place of residence				
Urban	1.00		1.00	
Rural	1.46	(1.05, 2.03)	0.87	(0.71, 1.08)
Unknown	0.69	(0.41, 1.17)	1.60	(1.11, 2.30)

Continues

Table 17 continued

Immigrant				
No	1.00		1.00	
Yes	0.95	(0.62, 1.46)	1.14	(0.83, 1.57)

OR=odds ratio; 95%CI=95% confidence intervals

*Adjusted for all covariates: age, education, household income, marital status, place of residence, immigrant status

5.3.5 Not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health

The univariate analyses revealed the crude odds ratios and 95% confidence intervals for not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health associated with various predictors in men and women of the two official-language minority groups. These results are presented at Appendix 5, Tables 9.9-9.10.

Francophone women who had not completed high school were significantly less likely not have a regular place to go (besides the regular medical doctor) when sick or needing advice on health compared to Francophone women with university studies (OR=0.77, 95%CI=0.62, 0.95). The risk of not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health was also lower for Francophone women living in a rural area compared to those living in an urban area (OR=0.68, 95%CI=0.57, 0.81).

Table 18 presents the results of the multivariable logistic regression analysis to examine predictors of not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health for Anglophone and Francophone men. Francophone men for whom information on whether they lived in an urban or rural area was not collected were significantly more likely not to have a regular place to go (besides the regular medical doctor) when sick or needing advice on health. The detailed results of the two multivariable logistic regression analyses are presented at Appendix 6, Table 18.1-18.2.

Table 18: Summary of multivariable logistic regression analysis for variables predicting not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health in Anglophone and Francophone men

Predictors	Anglophone men		Francophone men	
	OR	95%CI*	OR	95%CI*
Age (years)				
18-34	1.13	(0.75, 1.73)	1.03	(0.81, 1.32)
35-64	1.00		1.00	
65+	0.89	(0.62, 1.27)	1.24	(0.97, 1.59)
Education				
University	1.00		1.00	
College	0.69	(0.44, 1.06)	1.13	(0.87, 1.48)
High school completed	0.80	(0.53, 1.21)	1.02	(0.79, 1.30)
High school not completed	0.87	(0.58, 1.31)	0.97	(0.74, 1.27)
Household income				
<\$30,000	1.02	(0.68, 1.53)	0.86	(0.63, 1.16)
\$30,000-\$59,999	0.77	(0.55, 1.10)	0.89	(0.72, 1.10)
\$60,000 or more	1.00		1.00	
Marital status				
Married/Common-law	1.00		1.00	
Widowed/Separated/Divorced	1.13	(0.69, 1.83)	1.32	(0.97, 1.78)
Single	0.94	(0.61, 1.43)	1.05	(0.81, 1.37)
Place of residence				
Urban	1.00		1.00	
Rural	0.80	(0.59, 1.10)	0.89	(0.74, 1.06)
Unknown	1.12	(0.75, 1.66)	1.42	(1.09, 1.85)
Immigrant				
No	1.00		1.00	
Yes	1.00	(0.70, 1.43)	1.31	(0.92, 1.86)

OR=odds ratio; 95%CI=95% confidence intervals

*Adjusted for all covariates: age, education, household income, marital status, place of residence, immigrant status

Results of the multivariable logistic regression to examine predictors of not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health for women of the two official-language minorities are presented at Table 19.

Francophone women who lived in a rural area were significantly less likely not to have a

regular place to go (besides the regular medical doctor) when sick or needing advice on health compared to those who lived in an urban area. The detailed results of the two multivariable logistic regression analyses are presented at Appendix 6, Table 19.1-19.2.

Table 19: Summary of multivariable logistic regression analysis for variables predicting not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health in Anglophone and Francophone women

Predictors	Anglophone women		Francophone women	
	OR	95%CI*	OR	95%CI*
Age (years)				
18-34	1.11	(0.72, 1.72)	0.94	(0.73, 1.20)
35-64	1.00		1.00	
65+	1.30	(0.89, 1.90)	1.23	(0.99, 1.53)
Education				
University	1.00		1.00	
College	0.84	(0.55, 1.27)	1.00	(0.79, 1.26)
High school completed	1.22	(0.80, 1.86)	1.10	(0.87, 1.40)
High school not completed	0.69	(0.43, 1.11)	0.78	(0.60, 1.00)
Household income				
<\$30,000	1.03	(0.69, 1.55)	0.91	(0.72, 1.16)
\$30,000-\$59,999	1.01	(0.69, 1.48)	0.97	(0.79, 1.19)
\$60,000 or more	1.00		1.00	
Marital status				
Married/Common-law	1.00		1.00	
Widowed/Separated/Divorced	1.23	(0.80, 1.90)	0.95	(0.76, 1.20)
Single	0.89	(0.57, 1.39)	0.99	(0.77, 1.28)
Place of residence				
Urban	1.00		1.00	
Rural	0.94	(0.70, 1.26)	0.70	(0.59, 0.84)
Unknown	1.10	(0.63, 1.93)	1.46	(1.03, 2.06)
Immigrant				
No	1.00		1.00	
Yes	1.04	(0.69, 1.58)	1.16	(0.86, 1.56)

OR=odds ratio; 95%CI=95% confidence intervals

*Adjusted for all covariates: age, education, household income, marital status, place of residence, immigrant status

5.4 Access to health care services in the minority language related to health

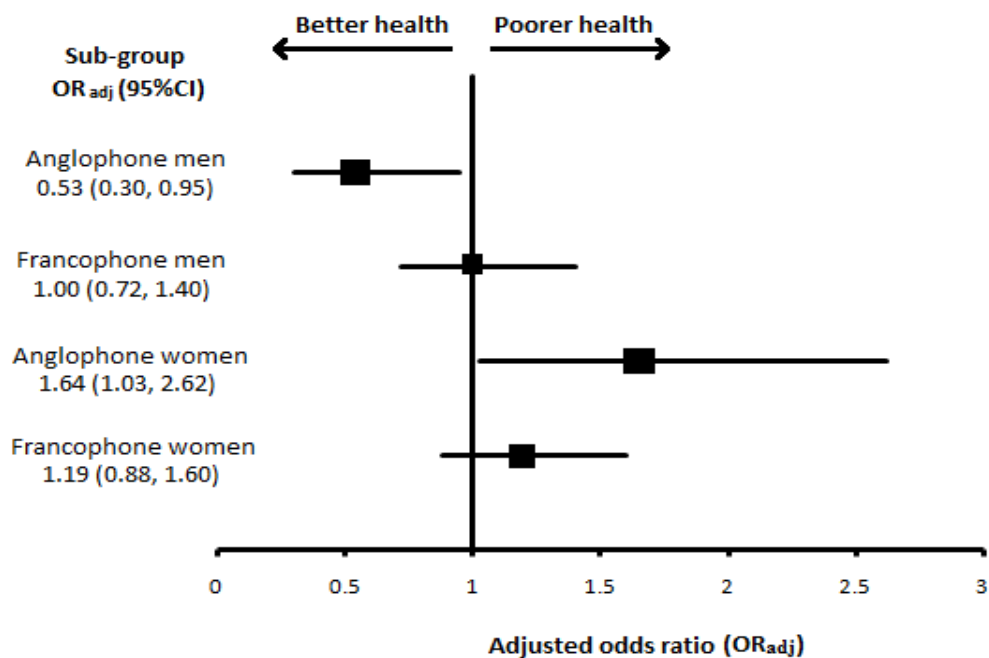
Table 20 shows crude and adjusted odds ratios and their 95% confidence intervals for the association between the vulnerability to poor access to health care services in the minority language and poor self-perceived health for men and women of the two official-language minorities. Figure 1 is a visual representation of the adjusted odds ratios and 95% confidence intervals of the association above in the four groups. After adjustment for age, education, household income, marital status, place of residence (urban or rural) and immigrant status, Anglophone men who were vulnerable to having poor access to health care services in the minority language were significantly less likely to have poor self-perceived health ($OR_{adj}=0.53$, 95%CI=0.30, 0.95). The association was not significant for Francophone men ($OR_{adj}=1.00$, 95%CI=0.72, 1.40). Anglophone women who were vulnerable to having poor access to health care services in the minority language were significantly more likely to have poor self-perceived health ($OR_{adj}=1.64$, 95%CI=1.03, 2.62). The association was not significant for Francophone women ($OR_{adj}=1.19$, 95%CI=0.88, 1.60).

Table 20: Crude odds ratios (OR_{crude}), adjusted odds ratios (OR_{adj}) and 95% confidence intervals (95%CI) for the association between the vulnerability to poor access to health care services in the minority language and poor self-perceived health in men and women of the two official-language minorities

	OR_{crude} (95%CI)	OR_{adj} (95%CI)*
Anglophone men	0.55 (0.32, 0.94)	0.53 (0.30, 0.95)
Francophone men	0.83 (0.61, 1.14)	1.00 (0.72, 1.40)
Anglophone women	1.40 (0.82, 2.14)	1.64 (1.03, 2.62)
Francophone women	0.88 (0.68, 1.15)	1.19 (0.88, 1.60)

*Adjusted for all covariates: age, education, household income, marital status, place of residence, immigrant status

Figure 1: Forest plot of the association between the vulnerability to poor access to health care services in the minority language and poor self-perceived health in men and women of the two official-language minorities



6.0 DISCUSSION

Findings pertaining to self-perceived health, access to health care services in the minority language, general access to (regardless of the language in which services were delivered) and use of health care services by official-language minorities are discussed below. This is followed by a discussion on the predictors of general health and access to health care services for the four groups included in the study. The SVOLM is a unique survey in the sense that it was one of the first national large-scale efforts to collect detailed information on the access to and use of health care services by the two official-language minority groups in Canada. In Quebec, the 2005 Survey on Anglophone Community Vitality, conducted by the CROP polling firm on behalf of the Community Health and Social Services Network (CHSSN), investigated some of the themes present in the SVOLM. On the Francophone side however, comparable data had not been previously collected. Consequently, the available literature on most of the themes addressed in the present study is either scarce or inexistent at times. To compensate for this limit, broader comparisons with statistics pertaining to the general Canadian population have been undertaken.

6.1 Overview of general health and health care utilization

Self-perceived health

After adjustment for the six covariates, men and women from the Francophone minority were significantly more likely to have fair or poor self-perceived health than their counterparts from the Anglophone minority. The few studies that have looked at the health of these two groups have mostly focused on comparing the health status of official-language minorities to the health status of the general population, or of the majority group^{64,121,186-188}. The prevalence of fair or poor self-perceived health was of 9% for Anglophone men, 13% for Francophone men, 11% for Anglophone women and 14% for Francophone women. A recent study by Bouchard *et al.*⁶⁴ that used data from the 2001 and 2003 CCHS reported the prevalence of fair or poor self-perceived health to be of 14% for Anglophones in Quebec and 18% for Francophones outside Quebec. In the study, both official-language minority groups had a significantly greater prevalence of poor self-perceived health than their respective majority group counterparts.

A study by Quebec's *Institut national de santé publique* that analyzed data from the 2007 CCHS found that 10.5% of Anglophones in Quebec had fair or poor self-perceived health⁷⁰. In 2006, Statistics Canada conducted an analysis of self-rated health status of the general Canadian population based on data from various cycles of the CCHS and of the NPHS. The prevalence of fair or poor self-perceived health was found to be of 11% for men and 12% for women¹⁶. This prevalence is similar to the one found in the present study as well as reported in previous studies^{21,71}.

However, the difference in self-perceived health between the Francophone and the Anglophone minority is difficult to explain given the fact that the SVOLM survey did not measure other health indicators, nor capture information regarding biological or behavioral determinants of health. For example, information regarding important factors that influence health, such as having a chronic disease or respondents' lifestyle (including eating and exercise habits, smoking and other risk factors) were not collected by the SVOLM. What the analyses suggest is that the measured socioeconomic and demographic determinants of health included in the models do not explain all the observed discrepancy in general health observed between the Francophone and the Anglophone minority.

When investigating the findings in the context of the two minority groups' access to health care services, it is interesting to note that although minority Anglophones have poorer access to regular medical doctors than minority Francophones, the former still report better general health than the latter. However, the analyses showed that minority Anglophones were more likely than minority Francophones to report having a regular place to go (besides the regular medical doctor) when sick or needing advice on health, which might compensate for their poorer access to regular medical doctors.

Access to health care services in the minority language

Men and women from the Anglophone minority were significantly more likely to find it important to get health care services in the minority language compared to men and women from the Francophone minority. Still, the majority of respondents, 91% of Anglophone men, 73% of Francophone men, 93% of Anglophone women and 76% of Francophone men, found it important to get health care services in the minority language. The comparison of the two official-language minorities' perceived importance to get health care services in the

minority language had not been undertaken in previous studies. A potential explanation for the discrepancy observed may be related to the varying level of bilingualism between members of the two official-language minority groups. It has been found that being bilingual lessens one's perceived importance to get health care services in the minority language⁹⁷. Given the higher rate of bilingualism amongst members of the Francophone minority compared to members of the Anglophone minority¹¹⁹, this could explain some of the difference in perceived importance to get health care services in the minority language.

When looking at provincial linguistic regulations dealing with the offer of services in the minority language, we can see that the rights of Anglophones in Quebec have always been protected by strong legislations (imbedded in Section 133 of the *Constitution Act, 1867*)¹⁵⁸. As such, the Anglophone minority of Quebec benefits from anchored institutional structures which focus on the provision of English-language services. In contrast, the linguistic rights acquired by some Francophone communities at the provincial level are relatively recent, with the Nova Scotia *French-language Services Act* being implemented in 2004 only, for example. In Newfoundland and Labrador as well as British Columbia, there are no legislations in place regarding services provided in French.

By implementing laws and policies on the offer of linguistically-concordant services, provinces and municipalities set the tone for the demand of these services and even for the population's perceived importance of having access to them. Inevitably, differences in linguistic legislations protecting Anglophone minority communities compared to Francophone ones led to the latter group being much more bilingual than the former. In most parts of Canada, Francophones still have to learn English and "submit" in some ways to the Anglophone majority, in order to survive. Although they represent a small proportion of Anglophones living in Quebec, those who are outside the region of Montreal also face greater language issues than those living in that highly bilingual city.

Other psychosocial or even biological factors could also be reasons for the discrepancy observed, based on the fact that the Francophone minority suffers from a greater syndrome of "mionoritization" compared to the Anglophone minority. As mentioned above, Anglophones in Quebec are more established, recognized and organized as a group than Francophones living outside Quebec. The latter may be therefore more exposed to negative experiences and states such as social isolation, feelings of inferiority, poor self-esteem and

poor social support¹⁸⁹. This can in turn be linked to Marmot and Brunner's work on the effects of social context on biological pathways and health¹⁹⁰⁻¹⁹². In a similar vein, studies by Wilkinson *et al.*^{193,194} have found that shame is the principal vector of negative social experiences that leads to adverse health outcomes. Even though these hypotheses have not been formally investigated in the context of Canada's official-language minorities, they remain a potential explanation for the differences observed between minority Anglophones and Francophones in both self-perceived health, and the importance of getting health care services in the minority language.

Aside from the comparison between the two official-language minority groups, the findings of the present study suggest a high demand and need for services to be offered in the minority language for both Anglophone and Francophone minority groups. A similar observation was drawn from the 2005 Survey on Anglophone Community Vitality, conducted by the CROP polling firm on behalf of the CHSSN. The study found that over 80% of Anglophones in Quebec reported that it was very important for them to receive health care services in English⁹⁷. Apart from the SVOLM, there are no known national surveys that directly addressed that question to minority Francophones.

Additionally, many studies and reports stress the importance of offering health care services in the minority language for official-language minorities^{66,101,104,121,122}. In a 2001 report prepared by Bowen for Health Canada, four Canadian populations were identified as being at risk of facing language barriers when accessing health care services: official-language minorities, Aboriginal peoples, deaf people and immigrants⁹⁹. The same report also states: "There is compelling evidence that language barriers have an adverse effect on access to health services"⁹⁹. The 2001 Report to the Federal Minister of Health: Consultative Committee for French-Speaking Minority Communities⁶⁶ enumerates potential negative impacts of language barriers to care, such as a reduction of the use of preventive services, an increase in consultation time and on the number of diagnostic tests ordered, a decrease in quality of care and in compliance⁶⁶.

Numerous studies, mostly conducted in the United States or Canada, have also objectively measured the effects of language barriers in health care settings, which are often detrimental to access and use of health care services, quality of care and health^{67,99-104}. Other studies have shown that the importance of linguistic concordance in the delivery of

care increases for services based on interpersonal or psychosocial interactions, rather than those that are technical or biomedical in nature⁹⁹. Examples of services where language of communication is most important include psychotherapy, pre- and post-natal monitoring, physiotherapy and social services^{66,99}.

A new variable named the “vulnerability to poor access to health care services in the minority language” was generated for the present study. It regrouped indicators of the demand for and supply of services by identifying who, from the pool of respondents that found it important to get health care services in the minority language, also found it difficult to get those services. The reasoning behind the creation of this variable was based on the premise that inherently, poor access to health care services in the minority language is only a potentially negative situation for people who *want* to get those services in the minority language. For example, someone could have poor access to health care services in the minority language, but due to their strong linguistic competencies in the majority language, it would not negatively impact the delivery of care, treatment, or ultimately their health or satisfaction with the services.

It was found that the vulnerability to poor access to health care services in the minority language was not significantly different between the two official-language minorities. The prevalence was 22% for Anglophone men, 21% for Francophone men, 27% for Anglophone women and 26% for Francophone women. This variable was unique to the present study as it was derived from two variables of the SVOLM. As such, it is not comparable to findings reported in previous studies on the access to health care services for official-language minorities. This raises the issue of the validity of the derived variable, which has not been previously tested.

Also, since the variable is based on respondent’s perception of the importance to get health care services in the minority language, as well as their past experiences with accessing those services, it may be prone to some bias. For example, a healthy 25 year old Anglophone male with a basic knowledge of French might underestimate the importance of getting health care services in English, until he is faced with a health emergency in which he would prefer to communicate in that language with health care professionals. The opposite situation, where official-language minority members overestimate the importance of getting health care services in the minority language, may also occur.

Even if the results are not directly comparable to those obtained from the derived variable unique to the present study, the general access to health care services for official-language minorities has been investigated in a few Canadian studies. On the Francophone minority side, a study conducted by the FCFA ⁶⁷ in 2001 revealed that within 71 communities surveyed, the accessibility of health care services in English for the Anglophone majority was 3 to 7 times higher than the accessibility of services in French for the Francophone minority of the same region. Furthermore, 50 to 55% of minority Francophones surveyed had no, or very little, access to health care services in French in. This study also points out that the lack of health care services in French leads to important prejudice to the health of these minority communities. The reader should however be informed that the scientific validity of the study is questionable due to the way the data were collected. The results are presented, albeit with caution, because it is one of very few national studies to investigate access to health care services for Francophone minority communities.

A study conducted by Woloshin *et al.* ¹⁰⁴ found that even after adjustment for sociodemographic characteristics and contact with the health care system, Francophone women living in Ontario were significantly less likely than Anglophone women to receive two types of preventive services: breast exams and mammographies. A study by Bourbonnais *et al.* ¹¹⁶ that analyzed data from the 2003 CCHS revealed that compared to Anglophone respondents of Ontario aged 65 and over, Francophones of the same age-group were less satisfied with the accessibility and quality of both provincial and community-based health care services.

The access to health care services for the Anglophone minority has also been addressed in a few studies. Results from the CROP survey commissioned by the Missisquoi Institute in 2000 revealed dramatic differences in the reported levels of access to health care services in English between regions of the province ^{118,195}. The study found that the access to health care services in English was higher for services provided by physicians, private nursing agencies and community-based resources, compared to services offered by public institutions such as the CLSCs, long-term care facilities and telephones health lines such as Info-Santé ¹⁹⁵. The CHSSN-CROP survey mentioned above revealed that 45.9% of Quebec's English-speaking respondents were dissatisfied with their access to health and

social services in English in their region⁹⁷. This survey also found important regional differences in satisfaction with the access to these services in English, with Anglophones living in the Abitibi-Témiscamingue, Nord-du-Québec and Montreal (West) regions being most satisfied with their access^{97,195}.

After identifying the prevalence of individuals who are vulnerable to poor access to health care services in the minority language, the present study investigated the reason given by respondents for not being served in the minority language. It was found that the main reason differed in proportion between the two official-language minority groups in both men and women. Nonetheless, the vast majority of respondents identified the scarcity of professionals that speak the minority language as the principal reason for this situation. This issue is not unique to official-language minorities, as the shortage of various health care professionals such as medical doctors and nurses is also affecting the access to health care services for the general Canadian population. However, as illustrated in a 2007 Report of the Standing Committee on Official Languages⁶⁵, “There is a significant shortage of trained health care workers in all parts of Canada, but the problem is much greater for minority communities, given their limited resources and the very few institutions that can offer training comparable to what is available to the majority. In some cases, the situation is truly critical.” (p.88)

In its 2001 report to the Federal Minister of Health, the Consultative Committee for French-Speaking Minority Communities⁶⁶ also highlights: “In Canada there is currently a serious shortage of professionals who are able to serve the French-speaking minority communities in French. Moreover, the number of enrolments in health sector training programs is too low to meet these communities’ crying needs. Indeed, the enrolment numbers would have to triple, if not quadruple.” (p.26) Also, a significantly greater proportion of Anglophone men (22%) and women (16%) reported a communication problem or the behaviour of the respondent or of the professional as the main reason for not being served in the minority language compared to Francophone men (7%) and women (6%).

Access to health care services in the minority language was also examined in greater detail by investigating the language in which services were provided by specific health care professionals in the 12 months prior to the survey. It was found that the Anglophone minority spoke the minority language with regular medical doctors, nurses and health care

professionals (other services) in a greater proportion than did the Francophone minority. In the case of services provided by a regular medical doctor, 81% of Anglophone men, 82% of Anglophone women, 37% of Francophone men and 36% of Francophone women reported using the minority language with that health care professional. Previous studies had not compared the two official-language minority groups in regards to this issue.

A secondary data analysis of the 2003 CCHS conducted by Bourbonnais *et al.*¹¹⁶, which looked at the language spoken with the medical doctor for seniors (65 years and over) living in Ontario, found that 28% of Francophones spoke French with their medical doctors. On the Anglophone minority side, the 2006 CROP-CHSSN survey⁹⁷ revealed similar numbers as the present study, with 86% of Anglophones in Quebec reporting being served in English by a doctor at a private office or clinic. The same study also revealed important regional differences in the proportion of Anglophones that spoke English with their medical doctors, which was as low as 3% in the Mauricie region and as high as 98% in Montreal (West)⁹⁷.

The substantial influence of language on the patient-doctor relationship has been established in many studies¹⁰⁹⁻¹¹³. In a 2002 study, Ferguson *et al.*¹¹⁴ reported that “minority patients, especially those not proficient in English, are less likely to engender empathic response from physicians, establish rapport with physicians, receive sufficient information, and be encouraged to participate in medical decision making” (p.359). Language discordance between patients and their medical doctors has also been associated with poor comprehension and interactive communication, as well as patient dissatisfaction¹¹¹⁻¹¹³.

In regards to the language used by minority Anglophones when accessing different types of health care services, the present study found that access to care in English was the highest for services provided by a regular medical doctor, followed by those provided by a nurse, by a health care professional (other services) and finally by a professional from a telephone health line/telehealth service. The access to health care services in French for the Francophone minority ranges from 33% to 43% for services provided by the different health care professionals. This was the first study to compare the two official-language minorities in regards to the language used with various health care professionals. Previous studies, such as the one conducted by the FCFA⁶⁷ and the CHSSN-CROP in Quebec⁹⁷ investigated the

access to health care services in the minority language for services provided in different health care settings.

The 2001 FCFA study found that partial or full access to health care services in French for Francophones living outside Quebec as provided by medical clinics, community health centers, home services and hospitals ranged between 45% and 50%⁶⁷. The CHSSN-CROP study revealed that Anglophones living in Quebec were served in English the most by medical doctors (86%), followed by hospitals involving an overnight stay (74%), hospital emergency rooms (70%), CLSCs (67%) and Info-Santé (63%)⁹⁷. The findings of the present study related to this topic are therefore consistent with the literature, and provide an important insight as to which services are lacking the most in terms of the provision of linguistically-concordant care to official-language minorities.

The principal reason identified for not being served in the minority language was significantly different between the two official-language minority groups when it came to services provided by a regular medical doctor, a nurse and a health care professional (other services). A greater proportion of respondents from the Francophone minority identified that the professional did not know the language as the principal reason for not being served in the minority language. This reason was also often identified, although in a smaller proportion, by the Anglophone minority. Inversely, a greater proportion of minority Anglophones than Francophones identified that they were not served in the minority language because they were bilingual or because the discussion started in the majority language. These findings provide an insight as to potential strategies to increase the access to these specific types of health care services in the minority language, which will be discussed below.

General access to and use of health care services

Some findings of the present study pertain to the access to and use of health care services for official-language minorities, regardless of the language in which services were delivered. In the first instance, it was found that respondents from the Anglophone minority were significantly more likely not to have a regular medical doctor than those from the Francophone minority. The proportion of respondents who did not have a regular medical doctor was of 36% for men and 18% for women of the Anglophone minority, and 15% for

men and 8% for women of the francophone minority. A study by Bouchard *et al.*^{88,89} that combined data from the 2001, 2003 and 2005 CCHS found a similar discrepancy between the two official-language minority groups. It revealed that 9.9% of Francophones living outside Quebec and 24.6% of Anglophones living in Quebec did not have a regular medical doctor. The same study also found that 10.4% of Anglophones living outside Quebec and 23.8% of Francophones living in Quebec, which are the linguistic majority groups of each region, did not have a regular medical doctor. Therefore, the access to a medical doctor differed only between the two official-language minority groups, and not between the minority and the majority groups^{88,89}.

A study by Talbot *et al.*⁹¹ that analyzed data from the NPHS found that 14% of Canadian adults did not have a regular medical doctor. The same study also found that participants from Quebec were significantly less likely to have a regular medical doctor compared to those of other provinces. The proportion of Quebecers who did not have a regular medical doctor was 26%. A Statistics Canada publication that used data from the 2007 CCHS revealed that among Canadians aged 12 or older, 19% of males and 10% of females did not have a regular medical doctor⁹⁰. Therefore, these previous findings as well as the ones that emerged from the present study point to a real discrepancy with regards to the access to a regular medical doctor for individuals who speak the official minority language living in Quebec compared to the rest of the Canadian population. Furthermore, the shortage of medical doctors in Quebec seems to be affecting both English and French-speaking individuals of the province.

Having a regular medical doctor is associated with various positive outcomes, such as having better access to preventive and other care¹⁹⁶⁻²⁰⁰, improved compliance with medications²⁰¹⁻²⁰³, increased patient satisfaction²⁰⁴⁻²⁰⁶, less discomfort and dissatisfaction when having a chronic disease²⁰⁷, etc. As such, it is anticipated that greater access to a regular medical doctor (preferably one that can speak English) for the Anglophone minority of Quebec would be beneficial for that group.

After adjustment for the covariates, a greater proportion of respondents from the Francophone minority had used the services of a regular medical doctor in the 12 months prior to the survey compared to the Anglophone minority. The proportion of use was of 60% for Francophone men, 80% for Francophone women, 52% for Anglophone men and 67% for

Anglophone women. This observation is in accordance with the previous finding that the Anglophone minority was significantly less likely to have a regular medical doctor compared to the Francophone minority. It is therefore expected that the Anglophones would be less likely to have used services from the health care professional. Studies have also shown that not having a regular medical doctor is associated with a decreased use of medical services, including preventive, primary and specialist care⁹²⁻⁹⁴. Furthermore, those without a regular medical doctor often underestimate their need for medical services, which could increase their risk of not receiving appropriate and timely care^{93,197}.

A study by the *Institut national de la statistique du Québec*⁹⁵ that analyzed data from various cycles of the CCHS found slightly higher consultation rates than the present study, with 69% of participants from Quebec having used services from a medical doctor in the year prior to the survey. This was also the lowest consultation rate across Canada. The other Canadian provinces had consultation rates of 79% to 84%, with a national average of 78%⁹⁵. A study by Nabalamba and Millar¹³⁶ that analyzed data from the 2004 CCHS found similar results for the Canadian population, with 77% of adults aged 18 to 64 and 88% of seniors having used services of a general practitioner in the year prior to the survey. Comparing findings from the present study to what is found in the literature suggests that the Francophone minority uses services from medical doctors at about the same rate as the general Canadian population. A similar conclusion is drawn for Anglophones living in Quebec compared to the average consultation rate of that province.

A high proportion of respondents, especially from the Anglophone minority, were not aware of the existence of a telephone health line or telehealth service in their province. More specifically, 59% of Anglophone men, 42% of Anglophone women, 39% of Francophone men and 25% of Francophone women did not know about that service. The present study was unique in investigating this specific issue amongst official-language minority members. The use and development of new information and telecommunication technologies has been identified in governmental and other reports as important avenues for the delivery of health care services to official-language minorities across the country^{66,117,195}. These new technologies are especially promising for the Francophone minority, which is geographically dispersed throughout the country. Many Francophone minority

communities are established in rural or isolated areas, making the development, visibility and use of telephone health lines or telehealth services all the more crucial.

A greater proportion of Francophone women (17%) reported having used the services of a professional from a telephone health line/telehealth service in the past 12 months compared to Anglophone women (14%). The difference in proportion was not significant between Anglophone men (9%) and Francophone men (10%). The 2006 CHSSN-CROP survey conducted in Quebec revealed that compared to five other types of health care services, Info-Santé (the provincial telephone health line) was the service least frequently used by Anglophones of the province, with 19% of respondents having used this type of service in the previous 12 months. This was much lower than the 30% consultation rate amongst Francophones of Quebec⁹⁷. The proportion of Francophones outside Quebec that use services from a telephone health line or telehealth service has not been reported in previous studies. As mentioned above, this type of service is especially important and relevant to official-language minority communities, especially those located outside Quebec, which are often isolated geographically.

After adjustment for the six covariates, a significantly greater proportion of respondents from the Francophone minority (48% of men and 43% of women) did not have a place where they usually go (besides the regular medical doctor) when sick or needing advice on their health compared to the Anglophone minority (40% of men and 37% of women). This difference might be explained by the present study's finding that a greater proportion of respondents from the Francophone minority reported having a regular medical doctor, which might decrease their need to seek health care services elsewhere. These results also suggest that although a large proportion of official-language minorities use services from a regular medical doctor when sick or needing advice on their health, they often seek health care services elsewhere.

For respondents that did have a place where they went (besides the regular medical doctor) when they were sick or needed advice on their health, a greater proportion of respondents from the Francophone minority went to the hospital or the health clinic compared to the Anglophone minority. These were also the principal locations of choice for the Anglophone minority, although a greater proportion went to the community health centre compared to the Francophone minority. The latter observation was in accordance with 2008

CCHS results presented in Statistics Canada's *Health Fact Sheets*⁹⁶, which highlights that "Provinces and territories with below-average levels of having a doctor had higher-than-average use of community health centers by those without a regular doctor, for example the use of CLSCs in Quebec." Studies also found that besides the regular medical doctor, Anglophones in Quebec mostly use health care services provided by hospitals, health clinics and CLSCs^{95,97}. It is therefore important that linguistically concordant services for official-language minorities be offered in different health-care settings such as hospitals, clinics and community health centers.

6.2 Predictors of general health and access to health care services

The present study examined important socioeconomic and demographic predictors of five outcomes: poor self-perceived health, finding it important to get health care services in the minority language, not having a regular medical doctor, having used the services of a regular medical doctor in the past 12 months, not having a regular place to go when sick or needing advice on health. The predictors of each outcome were obtained for Anglophone men, Francophone men, Anglophone women and Francophone women separately, and are discussed below.

Age

In both the univariate and multivariable analyses, being 65 and over was found to increase the risk of poor self-perceived health in Anglophone men, Francophone men and Francophone women, compared to those between the ages of 35 and 64. Additionally, Francophone men and women aged 18 to 34 had decreased odds of having poor self-perceived health compared to those aged 35 to 64 years old. The difference in the risk of poor self-perceived health for Anglophone women of different age groups was significant in the univariate analysis only. Data from the 2009 CCHS published by Statistics Canada revealed that the proportion of adults reporting very good or excellent health decreased with age⁹⁶. Older age has also been linked with lower self-perceived health in a number of other studies^{15,16,18,19,21,125}.

The findings of the present study are therefore in accordance with the body of the literature on the subject matter. Potential explanations for the increase in poor self-perceived

health for older individuals include higher morbidity rates, heightened invalidity, a decrease in the quality of life and overall deteriorating health status associated with age. It is therefore important to recognize that older members of the two official-language minorities are in poorer health than younger individuals. They constitute a sub-group of the population that have greater health care needs and who are frequent users of the health care system. Health care services offered in the minority language and tailored to their needs, including services provided in long-term care facilities and retirement homes, should not be overlooked.

In the multivariable analysis, Anglophone men, Francophone men and Francophone women aged 65 and over had lower odds of finding it important to get health care services in the minority language. For Anglophones living in Quebec, the CHSSN-CROP study⁹⁷ had a similar observation. When compared with other age groups, a greater proportion of participants aged 45 to 64 years old felt that it was very important for health care services to be available in English in Quebec. Potential explanations for this finding were not explored by the authors. However, Anglophones who were bilingual were less likely to say that it would be very important to receive services in English in the future, compared to Anglophones who were not bilingual⁹⁷. Even if the bilingualism levels of respondents by age groups were not investigated, it is possible that older Anglophones in Quebec are in fact more bilingual, which in turn could lessen their perceived importance for services to be offered in English.

A study conducted by Bouchard *et al.*¹²⁰ on the access to health care services for Francophone seniors living in Ontario also came to interesting conclusions. The authors found that although participants' preferred language of communication was French, the situation was more complex when it came to receiving health care services. For various reasons such as a prolonged difficulty of getting health care services in their language, as well as the effects of assimilation on Francophones living outside Quebec, some of the participants highlighted the fact they had learned medical terms in English only, and were therefore more comfortable communicating in that language with health care professionals. Nonetheless, participants of the study were vocal about the consequences of receiving health care services in their second language. These concerns included a difficulty in expressing their emotions and pain and in communicating with the health care professional, insecurities

regarding their linguistic competencies, impediment in the relation of trust with the medical doctor, etc.¹²⁰.

Therefore, it is possible that the findings which showed that older age is associated with lower odds of finding it important to get health care services in the minority language could be explained by deep-rooted psycho-social and contextual factors that may have been affecting older official-language minority members for years. Young and middle-aged adults may also be more comfortable being vocal about their wants and needs, even more so with the promotion of linguistic rights being put at the forefront in recent years. Further investigation is however needed to gain a better understanding of the reasons behind the observations drawn from the present study. As such, the explanations presented here remain highly speculative and point towards future interesting areas of research.

In the four sub-groups of the study, those aged 18 to 34 had higher odds of not having a regular medical doctor compared to those between the ages of 35 to 64. For Anglophone men, Anglophone women and Francophone men, respondents aged 65 and over had lower odds of not having a regular medical doctor compared to the same reference group as above. A similar trend is observed in the general Canadian population^{16,90,91}. For example, a Statistics Canada study that used data from the 2009 CCHS revealed that the likelihood of not having a regular medical doctor decreases with age⁹⁰. The findings of the present study are therefore congruent with trends presented in the literature, and go in accordance with the previous observation that older individuals had higher odds of poor self-perceived health compared to middle-aged ones. Being in poorer health leads to a greater need to receive care and therefore secure a regular medical doctor. Nonetheless, having a regular doctor guarantees a favorable entry point into the health care system and is beneficial for official-language minorities of all ages.

The adjusted odds of having used the services of a regular medical doctor in the past 12 months were lower for respondents aged 18 to 34, compared to those between the ages of 35 to 64, for the four sub-groups of the study. Anglophone men, Francophone men and Anglophone women aged 65 and over had higher odds of having used the services of a regular medical doctor in the past 12 months. Older Francophone women had similar odds of having used the services of a regular medical doctor in the past 12 months than those of the middle age group. Studies looking at consultation rates of medical doctors also found

that compared to younger Canadians, older people were more likely to have seen or talked to a medical doctor in the past year ^{135,136}.

This suggests that official-language minorities of different age groups use services from medical doctors in similar proportions as their counterparts in the general population. It is also consistent with the findings that older individuals had poorer health and were less likely not to have a regular medical doctor. It is therefore expected that older official-language minorities have an increased use of services provided by a regular medical doctor compared to younger ones. Once again, this highlights the importance for services to be available and tailored to the needs of elderly Francophones and Anglophones living in a minority situation across the country.

Education

Results from univariate and multivariable analyses showed that in the four sub-groups included in the present study, those with high school not completed had higher odds of having poor self-perceived health compared to those with university studies. Francophone men and women with a high school diploma also had higher odds of poor self-perceived health. In Francophone men only, respondents with a college studies had higher odds of having poor self-perceived health than those with university studies. Education, amongst other socio-economic status (SES) indicators, has been extensively linked to poor self-perceived health ^{15,125-127}. The WHO also states that low education levels are linked with poor health ¹⁷. In Canada, a study by Shields and Shooshtari ²¹ that analyzed data from the first three cycles (1994/95, 1996/97 and 1998/99) of the NPHS found that respondents who had not completed high school had higher odds of reporting fair or poor health compared to those with a higher education level.

Interestingly, findings from the present study suggest that for Francophone men and women, poorer self-perceived health is not only more prevalent for respondents with the lowest level of education, but also for those with a high school diploma, and in the case of Francophone men, those who had a college education, compared to respondents with university studies. This suggests a greater impact of education on the perceived health of minority Francophones compared to minority Anglophones. Some earlier studies of the Francophones from Ontario who participated in the 1996/97 NPHS also found a bigger

impact of some determinants on health of that linguistic minority compared to the Anglophone majority^{69,121,188}.

The way through which SES negatively impacts health has not been clearly demonstrated, although many biological, social, psychological and behavioural pathways have been explored^{190,207-212}. Behavioural factors which have been associated with lower SES include lower levels of physical activity²¹³⁻²¹⁷, heavier alcohol consumption and higher smoking rates^{215,216,218,219}. This is of great public health importance since it can lead to the development of health promotion initiatives that target individuals with lower SES. Findings from the present and other studies also confirm that official-language minorities with lower education levels are at risk of poorer health, which in turn supports the development of health promotion campaigns aimed at these groups.

Anglophone men, Francophone men and Francophone women with high school not completed had higher odds of finding it important to get health care services in the minority language compared to those with a university education. Previous studies investigating education as a predictor of this specific issue amongst official-language minorities were not found. However, finding it important to get health care services in English for Anglophones in Quebec has been previously linked to bilingualism⁹⁷, and bilingualism has been shown to be affected by education and income¹¹⁸. Therefore, it is not surprising that official-language minority members who are less educated, thus potentially less bilingual, also find it more important to get health care services in the minority language. In connection with the above findings regarding low SES and poorer health, access to linguistically concordant health promotion and disease prevention activities for official-language minorities is therefore relevant.

Household income

Univariate and multivariable analyses revealed that in men and women of both official-language minority groups, those with a household income of less than \$30,000 were at higher risk of poor self-perceived health than those with a household income of \$60,000 or more. For Francophone men and women only, having a household income of \$30,000-\$59,999 also increased the odds of poor self-perceived health compared to having a household income of \$60,000 or more. The latter finding suggests that compared to minority

Anglophones, income has a broader impact on the self-perceived health of minority Francophones, in the sense that those in the middle household income category also have poorer self-perceived health compared to those with the highest level of household income. Low income has been associated with poor health outcomes or poor self-perceived health in a number of previous studies^{18,20,21,127-129}. Both Health Canada and the WHO have identified income as an important determinant of health^{17,220}.

As mentioned above, these observations have considerable public health implications, since those with low SES can be identified as at risk of poor health. This can lead to the development of targeted initiatives aimed at improving the access to health care services or the health education of these groups for examples. Ultimately, up-stream efforts to elevate education and income levels in a population can also have positive repercussion on the health status of individuals. For example, having an acceptable household income can lead to parents' financial capacity to enroll their children in sports activities, potentially resulting in improved health of the children and the development of healthy life and exercise habits from an early age. The positive effects of being able to afford nutritious food or safe housing are other examples of how higher income can improve the health of the general population and of official-language minorities alike.

Results from univariate analyses showed that for Anglophone and Francophone men only, having a household income of less than \$30,000 increased the risk of not having a regular medical doctor compared to having a household income of \$60,000 or more. This is consistent with findings from a study conducted by Talbot *et al.*⁹¹, which was one of the first to investigate the characteristics of Canadians who do not have a regular medical doctor. The study entailed a secondary data analysis of the 1994-1995 NPHS and revealed that poorer respondents were more likely not to have a regular medical doctor than wealthier respondents⁹¹. Men were also more likely not to have a regular medical doctor, which might explain why varying levels of household income have an influence on that outcome for men and not women.

The mechanisms with which household income influences having a regular medical doctor are unclear. It could however be stipulated that individuals with a lower household income are more likely to be younger, single or have a lower education level, which are also factors that are associated with not having a regular medical doctor in the present study.

However, low household income remained a predictor of not having a regular medical doctor even after adjustment for these variables. Low income may also be linked to other factors such as having received a poorer health education than those with higher income. This can lead to particular attitudes about health and subsequent behaviours such as failing to adopt a preventive approach to health and disease, and thus not seeking a regular medical doctor. In a public health perspective, findings from the present study could suggest that men of the two official-language minorities are vulnerable of not receiving timely care that could be provided by a regular medical doctor.

Anglophone women with a household income of \$30,000-\$59,999 had lower odds of having used the services of a regular medical doctor in the past 12 months compared to those with a household income of \$60,000 or more. The international literature holds contradicting evidence regarding the potential association between income and use of health care services²²¹. Some Canadian studies have however found that individuals with low income are less likely than those with a higher income to have used services from a medical doctor in the previous year^{135,135,136}. In the present study, it is interesting to observe that Anglophone women were the only group of respondents for whom the use of services from a regular medical doctor in the past year was predicted by a category of household income.

There is not compelling evidence, from the present study nor the available literature, that Anglophone women in the middle-income category are in better health than those in the highest income category. As such, we are lead to investigate other potential explanations for their lower use of services from a regular medical doctor. For one, it is important to remember that the odds of not having a regular doctor were higher for the Anglophone minority compared to the Francophone minority. It is therefore possible that Anglophone women in Quebec who are in the middle-income category face a double disadvantage in terms of being able to use such services. However, this hypothesis would not explain why women with a household income of \$30,000 or less do not also have lower odds of not having used the services of a regular medical doctor in the past year. Further investigation is therefore needed to uncover more robust explanations of the above findings.

Marital status

The multivariable analyses revealed that Anglophone men and Francophone women who were widowed, separated or divorced had higher odds of poor self-perceived health compared to those that were married or living in common law. In studies that have investigated the determinants of self-perceived health, marital status in itself has not typically been found to be associated with poor self-perceived health after adjustment for other characteristics such as age, sex, income and ethnicity^{18,21}. Social support from a broader perspective, such as support provided by family, friends and community members is a determinant of health recognized by the WHO¹⁷. In the case of the present study, being part of a linguistic minority may affect how marital status is related to self-perceived health. For example, the potentially negative effects of a linguistically discordant interaction between a patient and a health care professional may be alleviated by the presence of a spouse, which can help in the communication process. Aside from how the mechanisms of this finding can be explained, a key aspect to retain is that Anglophone men and Francophone women living in minority settings and who are widowed, separated or divorced are vulnerable to poor self-perceived health.

Results from multivariable analyses revealed that men and women of the Anglophone minority who were single had higher odds of finding it important to get health care services in the minority language compared to those who were married or living in common-law. It is possible that not having the presence of a spouse for support or help, especially in regards to health issues or consultations with health care professionals, increases the perceived importance to have access to linguistically concordant health care services. Lower rates of bilingualism amongst Anglophones living in Quebec, compared to Francophones living outside Quebec¹¹⁹, might explain why being single is increasing the former group's perception of the importance to get health care services in the minority language and not the latter's. On a health policy and public health level, the above findings are important in the sense that linguistically concordant health services and health promotion initiatives should not only be geared towards children or families, but also reach single adults of the two official-language minorities.

Our data also demonstrated that being single increased the risk of not having a regular medical doctor compared to being married or living in common-law, for Anglophone

men, Francophone men and Francophone women. This observation is consistent with a previous Canadian study that found that being single increases the likelihood of not having a regular medical doctor⁹¹. Since being married or living in common-law is associated with having children and taking care of a family, interactions with the health care system become more systematic, and become a part of parents' responsibilities. As such, it is expected that individuals who are single, especially those in good health, are not in contact with the health care system as much and are therefore less likely to have a regular medical doctor.

In the present study, the odds of poor self-perceived health did not differ significantly between respondents who were single and those who were married or living in common law. This suggests that single respondents' lower risk of having a regular medical doctor is unlikely attributable to better health, but is more likely linked to personal characteristics, lifestyle or other factors external to health status. A potential public health implication of this observation is that single men of both official-language minorities as well as single Francophone women are at risk of delaying seeking care when faced with a health problem because they do not have a regular medical doctor to consult.

In Anglophone and Francophone men only, being single as opposed to being married or living in common-law lowered the odds of having used the services of a regular medical doctor in the past 12 months. A literature review on the subject revealed contradicting findings on the potential association between marital status and use of health care services¹³⁷⁻¹⁴⁰. Use of health care services may be linked to actual need or other factors. As mentioned above, the risk of poor self-perceived health did not differ significantly between men who were single and those who were married or living in common law. The hypothesis regarding the link between having children and increased contact with the health care system may also apply to the use of services provided by a regular medical doctor.

Place of residence (urban or rural)

Results of the multivariable analyses revealed that Francophone men who lived in a rural area had lower odds of poor self-perceived health than those living in an urban area. Although this was observed for only one of the four groups under study, it contradicts findings from previous Canadian studies that revealed that individuals living in rural areas report poorer health as well as worst health indicators compared to those living in an urban

area^{17,130-134}. A potential explanation of the observation of the present study is that Francophone men may not have the same personal risk factors that are prevalent in rural populations, such as higher rates of obesity and smoking¹³¹. This would however need further investigation. Another hypothesis is that since their work more often involves physically demanding labour, they may not have the same perception of health and disease as men living in urban areas. This seems like a more probable explanation for the difference in self-perceived health observed between urban and rural dwellers.

Men and women of the Francophone minority who lived in a rural area had higher odds of finding it important to get health care services in the minority language compared to those who lived in an urban area. Even if previous studies have not investigated this specific association, this observation may be linked to lower rates of bilingualism amongst Francophones living in rural areas compared to those in urban areas¹¹⁹. Still, it gives an important insight as to the necessity, as well as the challenges, of offering health care services in the minority language in urban but also in broad rural geographical regions.

Our analyses showed that Francophone men who lived in a rural area had lower odds of not having a regular medical doctor compared to those who lived in an urban area. This finding is not expected since Francophone men living in a rural area also had lower odds of poor self-perceived health than those living in an urban area. Also, a review of the literature revealed that Canadians living in rural areas typically face greater access issues to health care services compared to those living in urban areas^{80,81,84,85}. However, since access to specialist care is more limited in rural areas, it is possible that Francophone men compensate by having a regular medical doctor, which secures an entry point into the medical system. In a similar vein, a study by Nabalamba and Millar¹³⁶ of Statistics Canada did find that individuals living in rural areas had low odds of consulting a specialist, but high odds of four or more consultations with the medical doctor.

Immigrant status

Results from the multivariable analyses showed that being an immigrant to Canada was not a predictor of any of the outcomes under study. In terms of self-perceived health, the hypothesis of the “healthy immigrant effect” is therefore not relevant to official-language minorities in light of the present findings. However, our study did not differentiate between

recent immigrants and those who have been in Canada for a number of years. Making this distinction could have generated different results. Following observations made by Talbot *et al.*⁹¹, it was anticipated that immigrants to Canada might have shown higher odds of not having a regular medical doctor compared to Canadian-born respondents. Since a lot of people get assigned a regular medical doctor at a young age, or the fact that it can take months or years to secure one, were explanations behind the possibility that official-language minorities who were immigrants to Canada might have had less access to a regular medical doctor. However, this did not seem to be the case in the present study.

When it comes to the use of health care services, previous reports had found that immigrants and Canadian-born individuals have similar rates of utilization of services^{61,143,144}. This was also the case in the present study, where immigrants and those born in Canada did not have different odds of having used services from a regular medical doctor in the previous year. However, these findings should not deter recent interest in studying immigrants as a sub-group of official-language minorities who may face particular issues in regards to health or access to health care services.

6.3 Poor self-perceived health and the vulnerability to poor access to health care services in the minority language

Multivariable analyses revealed that Anglophone men who were vulnerable to having poor access to health care services in the minority language had lower odds of poor self-perceived health compared to those who were not vulnerable to having poor access to health care services in the minority language. This finding contradicts the available literature on the subject matter. Since it is unlikely that poor access is having a positive effect on Anglophone men's health, it is more probable that some other characteristics of these men, for which the statistical models did not account for, are contributing to their better health status. It is also possible that men in better health are less likely to seek care or be in contact in the health care system. In that case, poor access to health care services in the minority language may not affect their health as much as someone who needs frequent care.

Another potential explanation of the unexpected results may be related to the questionable validity of the variable of vulnerability to poor self-perceived health.

Because this variable was derived from the SVOLM and created for the purpose of this study, it has not been previously used or validated as part of other research projects. As such, interpretation of the results must be done with caution. Even more so because the opposite association was observed for Anglophone women, for whom being vulnerable to poor access to health care services in the minority language increased the risk of poor self-perceived health. This is consistent with the available literature, which stresses the importance of offering linguistically-concordant services to official-language minorities, and which highlights the many negative consequences of poor access to health care in one's preferred language.

The differences in the association between the vulnerability to poor access to health care services in the minority language and poor self-perceived health between men and women of the Anglophone minority would necessitate further investigation. A hypothesis for the observed difference between men and women in regards to the results may be that women generally use more health care services than men²²²⁻²²⁶. They also require more specialized services such as pre and post-natal care, preventive screenings and treatments for menopause. Therefore, being vulnerable to poor access to health care services in the minority language may have a greater impact on women's health than on men's.

Lastly, the association between the vulnerability to poor access to health care services in the minority language and poor self-perceived health was not significant for men or women of the Francophone minority. This could be related to the high rates of bilingualism amongst Francophones living outside Quebec¹¹⁹. Once again, the validity of the explanatory variable would also have to be investigated in future research.

6.4 Strengths, limitations and potential biases

An important strength of the study was that it was a large national study that investigated general health, access to and use of different health care services in both the Francophone minority and the Anglophone minority of Canada. It was the first study of its size to get information on, and to compare these two linguistic groups with regards to many of the indicators of interest. Therefore, it paints a broad descriptive and comparative picture of the situation. It also examined important socioeconomic and demographic predictors of general

health and access to health care services in men and women of the two official-language minority groups.

Selection bias is an important concern for the validity of a survey. Given the large sample size (especially when taking into consideration the relatively small number of the target population) and the relatively high response rate of 70.5%, it is not likely that selection bias would substantially affect the results of the study. Moreover, there was a very small percentage of missing data for each covariate and outcome, minimizing the introduction of bias caused by non-respondents. The use of sampling and bootstrap weights in the analysis, to account for the complex sampling design of the SVOLM, also corrected unequal selection probability in order to produce results that are representative of the target population.

The use of cross-sectional data poses a limitation in the sense that it cannot lead to conclusions regarding causation between variables. Another potential limitation lies in the way the data were collected, which was by telephone interview. St-Pierre and Beland²²⁷ found that compared to people interviewed in person, those interviewed by telephone tend to perceive themselves in better health than they really are. Additionally, self-perceived health was the only variable of the survey related to the health status of respondents. More in-depth information regarding chronic disease, disability or quality of life was not collected. The validity of the variable of self-perceived health may also differ between linguistic groups, and it is possible that its interpretation varies according to language and culture.

The totality of the data also relied on participants' self-report and was not compared to objective measures. The fact that data were not collected for members of the general population also limits the comparability and interpretation of the results. Additionally, the questions of the survey required participants to recall past situations regarding the access to and use of health care services provided in the previous year. This could lead to recall bias if participants did not remember past events accurately. It is however expected that this type of bias would be randomly distributed within the sample of respondents, and would not be a systematic occurring.

Another limitation of the study is related to the very theme of the SVOLM, which investigates the vitality of official-language minorities. Historically, language has been highly politicized in Canada and is an issue at the core of the country's existence and

functioning. Linguistic wars, battles and rights have shaped the Canadian population's demographics and society. Therefore, a survey created and used to investigate such politically-charged themes as access to services in the minority language is inevitably rooted in a social perspective that supports vitality and official-language minorities' rights. It is therefore crucial to recognize the context in which the survey was conducted and to interpret the results with scientific rigor.

Furthermore, the survey used the variables of mother tongue, first official language spoken and language most spoken at home in order to identify potential respondents that belong to an official-language minority in Canada. It is important to specify that individuals who indicated both French and English as their mother tongue or first official language spoken were identified as official-language minority members. It is anticipated that this inclusive approach could lessen the captured negative effects of poor access to health care services in the minority language on health, since those who are bilingual would not be as affected by this occurring.

The target population of the SVOLM also included those whose mother tongue is a non-official language, who know both French and English, and who speak either a non-official language or the minority language, alone or with another language, most often at home¹⁶⁴. The criteria used to identify official-language minorities have been the object of many debates and their methodological implications have been explored in a depth^{152-154,156}. As explained at p.22-24 above, mother tongue has generally been used by Statistics Canada to classify individuals as English or French speakers. Other linguistic criteria are also used, which are either more inclusive or more restrictive definitions of official-language minorities in Canada¹⁵⁴.

The Statistics Canada analytical paper *Portrait of Official Language Minorities in Canada - Anglophones in Quebec*¹⁵⁴ states that two main considerations should be taken into account when deciding which definition of official-language minorities to choose for estimating a language group:

On the one hand, if the objective is to enumerate the population considering all language groups on an equal basis—in other words, treating them symmetrically and creating mutually exclusive categories for estimating them (e.g., English, French, Other), then this implies an appropriate allocation of multiple responses... On the other hand, if the objective is to focus on a single language group (e.g., Anglophones), the criteria for

inclusion can be broadened without being concerned about the implicit overlaps between language groups. (p.7)

Since the purpose of the SVOLM was to investigate the situation of two independent language groups, Francophones living outside Quebec and Anglophones living in Quebec, rather than to compare linguistic groups within these two regions, a more inclusive definition of official-language minorities was favored by Statistics Canada. The criteria used by statistics Canada to identify respondents to the survey include mother tongue, first official language spoken and language most spoken at home. The above publication goes on to explain the rationale behind the use of first official language spoken as a criterion in Statistics Canada studies ¹⁵⁴:

The latter criterion [of first official language spoken] is now used increasingly as a criterion for defining language groups in studies on official-language minorities. The reason for this is that shifts over the years in the composition of the Canadian population tend to call for a redefinition or broadening of the concept of Anglophone group or community, since a significant number of persons whose mother tongue is neither English nor French nevertheless use English either predominantly or commonly in their daily lives. (p.7)

As such, in line with the objectives of the SVOLM and the choice to adhere to an inclusive definition of official-language minorities, the target population of the survey included those who have neither English nor French as their mother tongue (also called “allophones”), but who know both official languages. The inclusion of respondents who fall into this category was done in order to capture all potential individuals who might require being served in the minority language in the public and private spheres. Apart from services that may be available in their mother tongue, allophones who know both English and French will inevitably be using services offered in either, or both, official languages.

This inclusive definition has important limits, one of them being that it introduces uncertainty associated with pooling allophones who know both English and French with allophones who know the minority language only, and respondents who have the minority language as their mother tongue. As explained in the methods section, the SVOLM is a post-censal survey, meaning that the respondents were chosen from the pool of individuals who had completed the long questionnaire in the 2006 Census. It is therefore not possible to

identify from variables in the SVOLM dataset which respondents fall into the category of allophones who know both English and French, and who speak either a non-official language or the minority language, alone or with another language, most often at home.

However, the SVOLM dataset does contain the variable of mother tongue, which enabled us to identify the unweighted proportion of respondents who have neither English nor French as their mother tongue (ie. are allophones) in the final sample. The proportion of allophones is 4.2% in the Francophone minority and 7.9% in the Anglophone minority. Again, these include allophones who know the minority language only, as well as those who know both official languages. The uncertainty associated with including allophones who know both English and French, and who speak either the minority language or another language at home, is therefore assumed to be minimal due to their small proportion in the final sample.

In order to get an idea of that uncertainty, descriptive results were generated using a data set which excluded all allophones. These new results were then compared to the original results presented in the current study. As shown at Appendix 7, the proportions that emerged from the descriptive analysis using the data set without allophones differed very little from the proportions generated from the final data set of the current study. The few results that vary are usually in the order of 1%, which is due to rounding in most cases. Therefore, either including or excluding allophones seems to provide similar results.

Furthermore, one could argue that in the context of investigating the access to health care services in the minority language, the linguistic situation of an allophone who knows both English and French is not necessarily different than that of someone who has the minority language as their mother tongue but who is also perfectly bilingual. More specifically, both types of individuals may or may not benefit from receiving health care services in the minority language. In that case, some of the uncertainty in the study results is associated with the lack of information regarding the linguistic competencies of respondents to the SVOLM and of health care professionals delivering the services. Information related to linguistic complexities such as literacy levels or competency in the other official language was not captured by the SVOLM questionnaire, and is another limitation of the current study. Further studies are warranted to further explore this possibility.

The variable of “finding it important to get health care services in the minority language” was the sole indication of respondents’ desire, or perceived need, for services to be offered in the minority language. Additionally, the survey did not collect information on the linguistic abilities of health care professionals. For example, a nurse may be able to provide services in her second official language, but the quality and correctness of the language used can greatly influence the care provided. The present study is therefore limited by the data collected through the SVOLM and cannot assess or take into consideration important intricacies related to the linguistic competency of both clients and providers of health care services.

There is a limitation inherent to the use of the bootstrap method to calculate the variance of estimates obtained from the SVOLM. For example, the BOOTVAR macro in SAS does not support tests such as the likelihood ratio test, or the use of log-binomial regression models. This limited the statistical analyses that could be performed with the data.

The generalization of the findings to official-language minorities on a national scale is deemed appropriate. However, the results may not necessarily apply to minority groups at a specific provincial/territorial or regional level, given the varying contexts, needs and issues that affect different communities across Canada. On the Francophone minority side, data on respondents of New-Brunswick and Ontario have more weight on the final results since these two provinces are home to the majority of Francophones living outside Quebec. Ontario as well as New-Brunswick, being the only officially bilingual province, also have more developed legislation that guarantee the offer of French-language services. As such, the more advantageous situations of respondents from these two provinces may hide some of the more negative realities, in terms of access to linguistically concordant health services, faced by Francophones of the western provinces or of Newfoundland and Labrador for example. A similar limitation is exposed for the Anglophone minority, where the more advantageous situation of Anglophones living in Montreal with regards to access to English-language services may camouflage very poor access to these services in remote regions of Quebec. The possible heterogeneity within the minority language groups is therefore a limitation of the study.

Pooling of all minority Francophones into one group and minority Anglophones into another was done for comparison purposes and to obtain the appropriate statistical power to perform some of the statistical analyses. Stratification by sex allowed for an added level of precision. The SVOLM itself also could not cover all of the particularities of official-language minorities of each province and region. Furthermore, the survey did not collect any information on the “linguistic majority”, namely the Anglophone population of Canada and Francophones living in Quebec. This brought upon a limitation in terms of the analyses that could be performed, as well as the comparison and interpretation of the results. As a strategy to help minimize the impact of this important limitation, the results of the present study were compared (when possible) to findings from previous studies that had been conducted on the general population.

6.4 Health policy recommendations

The present study found a discrepancy between the high demand for health care services to be available in the minority language and the gap in the offer of linguistically-concordant services, especially for those provided in French to the Francophone minority. Actions should therefore be taken at various levels to improve the access to health care services in both official languages. This necessitates the involvement of three key stakeholders, namely governments, institutions and communities. It is recommended that governments and political bodies acknowledge the legitimacy of the need for health services to be available in both official languages and provide the appropriate financial, legal and strategic support to improve access.

It is also deemed favorable that institutions comply with linguistic regulations and policies, such as the *French Language Services Act* in Ontario, which ensures the delivery of provincial government services in French to Francophones living in the 25 designated areas across the province. Furthermore, it would be beneficial to encourage the proactive offer of services in the minority language by health services providers, ensure the visibility of such services and support community initiatives to improve access. Communities with a significant proportion of official-language minority members should encourage citizens to ask for services in their preferred language and express their needs clearly, as well as engage them in taking social responsibility of the issue. It is also recommended that communities

develop appropriate initiatives geared towards the specific health care needs of the population.

Findings of the present study point to some of the root-causes of poor access to health care services in the minority language, for which recommendations are elaborated. First, strategies to improve access should focus on the issue of the scarcity of health care professionals that speak the minority language, in both the Francophone and the Anglophone minority. Thus, increasing the pool of health care professionals who can deliver services in the minority language is crucial. On the minority Francophone side, it is recommended that continued funding be allocated to the *Consortium national de formation en santé* (CNFS), which coordinates the recruitment and training of health care professionals in French-language programs offered in eleven post-secondary universities and colleges across the country. The very mandate of the CNFS is to improve the delivery of health care services in French to Francophone communities outside Quebec. This is achieved through post-secondary training and research which focuses on the specific needs of communities. Strategies geared towards the retention of French-speaking health care professionals in Francophone communities are also important.

For the Anglophone minority, the promotion and awareness of the importance of the active offer of services in English by health care professionals with English as a second language is recommended to improve some of the access problems. Since a greater proportion of Quebecers with French as their first language is already bilingual compared to the Anglophone population outside Quebec (37% vs. 7%)¹¹⁹, improving the second-language skills of health care professionals working in Quebec, as well as their attitudes towards the minority population, is strongly suggested to improve the access to services in English.

The present study identified the sectors in which provision of services in the minority language were lacking the most. Caution should however be taken with the use of these findings since important differences exist between regions of the two official-language minority groups, which were not captured in the study. For the Francophone minority, access to health care services in French is poor for every type of service. Since members of that population mostly go to their regular medical doctor when sick or needing advice on health, improving the access to Francophone or bilingual medical doctors is favorable. In a

second instance, improving access to services in French provided by nurses, hospitals, clinics, community health centers and other types of services would be beneficial.

On the Anglophone minority side, it is crucial that the severe medical doctor shortage in Quebec be addressed seriously. Then, the most critical needs are to improve the access to services in English provided by CLSCs and Info-Santé services. In fact, the optimal utilization of telephone health line services to provide health care information and advice to members of both official-language minorities is a key recommendation. Improving provincial telephone health line and telehealth services offered in both official languages, as well as increasing their promotion and visibility could counteract some of the access barriers faced by rural and geographically dispersed communities, especially Francophone ones. In Quebec, the CHSSN have undertaken this task, and it is recommended that funding for this project be continued. For Francophones living outside Quebec, a suggestion would be for the creation of a national electronic and telehealth network which would provide French services to the more isolated Francophones communities. This network could follow the model of the Alberta First Nations Telehealth Program, which provides 21 First Nation Communities with telehealth programs that include videoconferencing.

In parallel to the suggestions presented above, it is imperative to work on improving the social determinants of health, especially the ones that are modifiable (even in the long term) and most related to health and access issues. More precisely, it is recommended that the focus be put on improving education and household income, for which some levels were associated with poor self-perceived health and less access to a regular medical doctor. Furthermore, socioeconomic inequalities seemed to have a greater effect on outcomes of the Francophone minority. Strategies to improve the situation of members of the two official-language minorities should therefore take the particular needs and priorities of each group into consideration.

Those between the ages of 18 to 34 as well as single people were also especially vulnerable to not having a medical doctor or not having used such services in the previous year. It is recommended that tailored assistance in securing a regular medical doctor be offered to these groups. Awareness of the importance for official-language minority members to ask for services in their preferred language should target everyone, with a

special focus on those aged 65 and over, those with university studies and those who live in urban areas.

6.6 Conclusions

This was one of the first known studies to investigate and compare the general health, access to and use of health care services by Canada's two official-language minorities. Men and women of the Francophone minority reported poorer self-perceived health than those of the Anglophone minority. The study indicates that there is a discrepancy between the high demand for services to be offered in the minority language and the offer of these services to both official-language minority groups, especially the Francophone minority. Improving the access to health care services in English offered by CLSCs and Info-Santé is most critical for the Anglophone minority in Quebec, whereas the access to services in French is lacking in every health care sector investigated outside Quebec. Compared to the situation of the Francophone minority living outside Quebec, the important medical doctor shortage in Quebec is affecting the Anglophone minority in a significant proportion and needs to be addressed. The vulnerability to poor access to health care services in the minority language seems to have a negative effect on Anglophone women's health only, although the validity of the explanatory variable is questionable.

The study also identified important predictors of general health and access to health care services by men and women of the two official-language minorities, which included age, education level, household income, marital status and place of residence. Low education and household income levels were identified as the most modifiable risk factors (in the long term) of poor self-perceived health and access to a regular medical doctor. The development and implementation of specific strategies to improve the socioeconomic situation of official-language minorities is therefore recommended. Initiatives geared at improving the access to a regular medical doctor should also target the younger population as well as those who are single.

On the demand side, being older, having university studies and living in an urban area were predictors of not finding it important to get health care services in the minority language. Awareness campaigns on the importance for official-language minorities to ask for services in their preferred language should target more towards these groups. By

working on the demand and the supply of health care services provided in English and French, Canada's official-language minorities may benefit from an increased access to services in their preferred language, which is a central component of their identity and vitality.

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APPENDICES

Appendix 1: Legislations dealing with official languages in the Canadian provinces and territories*

Province/ Territory	Law/Policy/ Constitutional Provision	Summary of Content
Newfoundland and Labrador	None	None
Prince Edward Island	<i>French Language Services Act (1999)</i>	<ul style="list-style-type: none"> • The Act specifies the extent of services to be provided in the two official languages. Government institutions have a duty to communicate with members of the public in the official language of their choice. • The development of the Acadian and Francophone community is encouraged. • The Act contains provisions to ensure that the two official languages are respected in the Legislative Assembly and before the courts; however, these provisions have not yet been proclaimed.
Nova Scotia	<i>French-language Services Act (2004)</i>	<ul style="list-style-type: none"> • French-language services are provided by certain designated government institutions. The provision of services is subject to regulations. • The development of the Acadian and Francophone community is encouraged. • The Act does not deal with the status of French in the courts.
New Brunswick	<p><i>Official Languages Act (1969, 2002)</i></p> <p>Commissioner of Official Languages for New Brunswick</p> <p><i>An Act Recognizing the Equality of the Two Official Linguistic Communities in</i></p>	<ul style="list-style-type: none"> • French and English are the official languages of the Legislative Assembly, legislation and the courts. • Members of the public have the right to communicate with and to receive services from provincial institutions in the official language of their choice. Services in the two official languages are provided in the following areas, subject to certain conditions: policing, health, and municipal services.

	<p><i>New Brunswick</i></p> <p>Sections 16 to 20 of the <i>Canadian Charter of Rights and Freedoms</i> (1982)</p>	<ul style="list-style-type: none"> • There is a Commissioner of Official Languages for New Brunswick. • The equal status, rights and privileges of the French and English linguistic communities are recognized. • The principles contained in the two above-mentioned Acts are guaranteed by or under the Constitution of Canada. • New Brunswick is the only officially bilingual province.
Quebec	<p><i>Charter of the French Language</i> (1977)</p> <p>Section 133 of the <i>Constitution Act, 1867</i> (1867)</p>	<ul style="list-style-type: none"> • French is the official language of Quebec. • The English-speaking community is entitled to services in English in the areas of justice, health and education. Services in English are offered in municipalities in which more than half of the residents have English as their mother tongue. • The use of French and English is permitted in legislative proceedings, before the courts, and for the printing and publication of Acts of the Legislature and records and journals of the Legislative Assembly.
Ontario	<p><i>French Language Services Act</i> (1986)</p> <p>French Language Services Commissioner</p> <p><i>Courts of Justice Act</i> (1990)</p>	<ul style="list-style-type: none"> • The use of French and English is permitted in the Legislative Assembly and for the printing and publication of Acts of the Legislature. • Services in French are provided in 25 designated areas where the concentration of Francophones is at least 10% or represents at least 5,000 people. The agencies required to provide services in French are designated by law. • There is a French Language Services Commissioner for Ontario. • English and French are the official languages of the courts of Ontario, and a party to a proceeding who speaks French has the right to require that it be conducted as a bilingual proceeding. • Special rules apply to written pleadings

		and to processes that are conducted as bilingual proceedings.
Manitoba	<p><i>French Language Services Policy</i> (1989, 1999)</p> <p>Section 23, <i>Manitoba Act</i> (1870)</p>	<ul style="list-style-type: none"> • Services in French are provided in a number of designated areas where the French-speaking population is concentrated. French-language services are actively offered by fully or partially bilingual service centres. • The use of French and English is permitted in parliamentary debates, before the courts, and for the printing and publication of Acts of the Legislature and records and journals of the Legislative Assembly.
Saskatchewan	<p><i>Language Act</i> (1988)</p> <p><i>Government of Saskatchewan French-Language Services Policy</i> (2003)</p>	<ul style="list-style-type: none"> • English is the official language of Saskatchewan. • The use of French is permitted in the Legislative Assembly and before certain courts. • All acts and regulations may be enacted in English only or in English and French. • Communication with the public and service delivery are provided in the two official languages where appropriate. • Provisions have been made for consultations with the Francophone community. • Policy guidelines exist to facilitate the implementation of the language policy by government departments and agencies.
Alberta	<p><i>Languages Act</i> (2000)</p>	<ul style="list-style-type: none"> • English is the official language of Alberta. • The use of French is permitted in legislative proceedings and before certain courts. • All acts and regulations are enacted, printed and published in English.
British Columbia	None	None
Yukon	<p><i>Languages Act</i> (1988)</p>	<ul style="list-style-type: none"> • The Act deals with the use of French, English and Aboriginal languages.

		<ul style="list-style-type: none"> • The use of French and English is permitted in legislative proceedings, before the courts, and for the printing and publication of Acts of the Legislature. • Services are provided in both official languages by government institutions if there is significant demand and depending on the nature of the office.
North West Territories	<p><i>Official Languages Act</i> (1988, 2003)</p> <p>Languages Commissioner of the Northwest Territories</p>	<ul style="list-style-type: none"> • English, French and nine Aboriginal languages are the official languages of the Northwest Territories. • The use of French and English is permitted in legislative proceedings, before the courts, and for the printing and publication of Acts of the Legislature. • Services are provided in both official languages by government institutions if there is significant demand and depending on the nature of the office. • There is a Languages Commissioner for the N.W.T.
Nunavut	<p><i>Official Languages Act</i> (1988, 2003, 2008)</p> <p>Office of the Languages Commissioner of Nunavut</p>	<ul style="list-style-type: none"> • English, French and Inuit (Inuktitut/Inuinnaqtun) are the official languages of Nunavut. • The use of official languages is permitted in legislative proceedings, before the courts, and for the printing and publication of legislation. • Services are provided to the public in the official languages by government institutions if there is significant demand and depending on the nature of the office. • There is a Languages Commissioner for Nunavut.

*Adapted from :

Hudon, M.E. Language Regimes in the Provinces and Territories. Legal and Legislative Affairs Division, Parliament of Canada. Revised March 12 2010. Publication No. 06-38-E. Available from: <http://www2.parl.gc.ca/content/lop/researchpublications/prb0638-e.pdf>

Appendix 2: Flowchart of variable categories and exclusions

Variables	Original variable categories from SVOLM questionnaire	Variable categories used in current study and exclusions
Self-perceived health	Excellent	Good
	Very good	
	Good	
	Fair	Poor
	Poor	Excluded n=56 participants (0.32%)
	Unknown	
	Refusal	
Don't know		
Finding it important to get health care services in the minority language	Very important	Yes
	Important	
	Somewhat important	
	Not asked (<i>knows the minority language only</i>)	
	Not very important	No
	Not important	
	No opinion	
Unknown	Excluded n=24 participants (0.14%)	
Having a regular medical doctor	Yes	Yes
	No	No
	Unknown	Excluded n=25 participants (0.14)
Having used the services of a regular medical doctor in the past 12 months	Yes, for myself	Yes
	Yes, for myself and another person	
	Yes, for another person	No
	No	
	Does not have a regular medical doctor	
	Unknown	Excluded n=42 participants (0.24%)
	Refusal	
Don't know		
Having a regular place to go (besides the regular medical doctor) when sick or needing advice on health	Yes	Yes
	No	No
	Don't know	Excluded n=35 participants (0.20%)
	Refusal	
	Unknown	
Age	18-25	18-34 years old
	25-34	
	35-44	
	45-54	35 to 64 years old

	55-64	
	65+	65+
Education	University studies with degree	University
	University studies with certificate or diploma	
	University studies without degree, certificate or diploma	
	Non-university studies with certificate or diploma	College
	Non-university studies with certificate or diploma	
	Secondary studies with high school diploma or high school equivalency certificate	High-school completed
	Partial high school	High-school not completed
	Elementary school	
	No schooling	
	Refusal	Excluded n=29 participants (0.17%)
Don't know		
Income	Less than \$10,000	Less than \$30,000
	\$10,000 to less than \$20,000	
	\$20,000 to less than \$30,000	
	\$30,000 to less than \$40,000	
	\$40,000 to less than \$50,000	\$30,000-59,999\$
	\$50,000 to less than \$60,000	
	\$60,000 to less than \$80,000	
	\$80,000 to less than \$100,000	
	\$100,000 or more	\$60,000 or more
	Unknown	
	Refusal	
	Don't know	
Marital status	Married	Married/living common-law
	Living common-law	
	Widowed	Widowed/separated/divorced
	Separated	
	Divorced	
	Single, never married	Single
Place of residence	Rural	Rural
	Urban	Urban
	Unknown	Unknown
	Refusal	
	Don't know	
Immigrant	Yes	Yes
	No	No
	Don't know	Excluded n=1 participant (0.01%)

Appendix 3: Unweighted characteristics of the final sample included in the study

Characteristics	Total sample (n=17 190)	
	n	%
Official-language minority		
Anglophone	5161	30
Francophone	12029	70
Sex		
Men	8023	47
Women	9167	53
Age (years)		
18-34	5481	32
35-64	7642	44
65 +	4067	24
Education		
University	4593	27
College	3737	22
High school completed	4293	25
High school not completed	4567	27
Household income		
<\$30,000	3268	19
\$30,000-\$59,999	5129	90
\$60,000 or more	8793	51
Marital status		
Married/Common-law	10271	60
Widowed/Separated/Divorced	2355	14
Single	4564	26
Place of residence		
Urban	8882	52
Rural	7866	45
Unknown	442	3
Immigrant		
No	15366	89
Yes	1824	11

Appendix 4: Descriptive and comparative statistics of general health, access to and use of health care services by official-language minority in men and women

Table 3.1: Men's self-perceived health and access to health care services in the minority language by official-language minority

	Anglophone minority*		Francophone minority*		χ^2 p-value
	n	%	n	%	
Self-perceived health					
Excellent/very good/good	2632	91	4412	87	<0.001
Fair/poor	267	9	682	13	
Finds it important to get health care services in the minority language					
No	250	9	1374	27	<0.001
Yes	2628	91	3679	73	
Is comfortable asking for health care services in the minority language?					
No	449	18	692	22	0.142
Yes	1999	82	2455	78	
Is vulnerable to poor access to health care services in the minority language					
No	2245	78	3978	79	0.689
Yes	633	22	1074	21	
Reason for not being served in the minority language					
Scarcity of professionals that speak the minority language	441	71	909	88	<0.001
Communication problem/ Behaviour of respondent or of professional and staff	138	22	77	7	
Service/Accessibility and environment	44	7	54	5	

*The numbers and proportions were rescaled according to the sampling weights

Table 3.2: Women's self-perceived health and access to health care services in the minority language by official-language minority

	Anglophone minority*		Francophone minority*		χ^2 p-value
	n	%	n	%	
Self-perceived health					
Excellent/very good/good	2695	89	5269	86	0.004
Fair/poor	318	11	858	14	

Finds it important for you to get health care services in the minority language					
No	210	7	1480	24	<0.001
Yes	2835	93	4734	76	
Is comfortable asking for health care services in the minority language					
No	609	23	920	23	0.916
Yes	2077	77	3090	77	
Is vulnerable to poor access to health care services in the minority language					
No	2230	73	4576	74	0.843
Yes	814	27	1639	26	
Reason for not being served in the minority language					
Scarcity of professionals that speak the minority language	615	77	1389	88	<0.001
Communication problem/ Behaviour of respondent or of professional and staff	130	16	97	6	
Service/Accessibility and environment	57	7	99	6	

*The numbers and proportions were rescaled according to the sampling weights

Table 4.1: Men's use of health care services provided by a regular medical door (MD) by official-language minority

	Anglophone minority*		Francophone minority*		χ^2 p-value
	n	%	n	%	
Has a regular MD					
No	1024	36	765	15	<0.001
Yes	1854	64	4288	85	
Used the services of an MD in the past 12 months					
No	1373	48	1732	34	<0.001
Yes	1505	52	3320	66	
Reason for using the services of an MD					
Routine or on-going care	984	67	1787	57	0.001
Minor health problem	267	18	623	20	
Major health problem	97	7	211	7	
An Emergency	23	2	71	2	
Getting prescriptions, information or advice/Other	89	6	454	14	
Used the minority language with the MD					
No	268	19	1959	63	<0.001

Yes	1173	81	1153	37	
Principal reason for not being served in the minority language					
MD didn't know the language	94	36	1191	72	0.007
Respondent or attendant feels more at ease in the majority language	38	15	235	14	
Respondent is bilingual/	93	35	139	8	
Discussion started in other language					
Respondent's behaviour/Availability/Quality of service/Other	38	15	85	5	

*The numbers and proportions were rescaled according to the sampling weights

Table 4.2: Women's use of health care services provided by a regular medical door (MD) by official-language minority

	Anglophone minority*		Francophone minority*		χ^2 p-value
	n	%	n	%	
Has a regular MD					
No	538	18	468	8	<0.001
Yes	2507	82	5746	92	
Used the services of an MD in the past 12 months					
No	1002	33	1222	20	<0.001
Yes	2043	67	4905	80	
Reason for using the services of an MD					
Routine or on-going care	1383	69	2866	59	0.014
Minor health problem	306	15	876	18	
Major health problem	95	5	277	6	
An Emergency	25	1	65	1	
Getting prescriptions, information or advice/Other	208	10	737	15	
Used the minority language with the MD					
No	352	18	3028	64	<0.001
Yes	1655	82	1735	36	
Principal reason for not being served in the minority language					
MD didn't know the language	153	44	1937	75	0.001
Respondent or attendant feels more at ease in the majority language	39	11	360	14	
Respondent is bilingual/	129	37	146	6	
Discussion started in other language					
Respondent's behaviour/Availability/Quality of service/Other	31	9	137	5	

*The numbers and proportions were rescaled according to the sampling weights

Table 5.1: Men's use of health care services provided by a nurse by official-language minority

	Anglophone minority*		Francophone minority*		χ^2 p-value
	n	%	n	%	
Used the services of an nurse in the past 12 months					
No	2220	77	4016	80	0.170
Yes	654	23	1030	20	
Reason for using the services of a nurse					
Routine or on-going care	268	38	404	37	0.923
Minor health problem	201	29	273	25	
Major health problem	66	9	153	14	
An Emergency	88	13	142	13	
Getting prescriptions, information or advice/Other	81	12	108	10	
Used the minority language with the nurse					
No	262	37	681	63	0.002
Yes	443	63	498	37	
Principal reason for not being served in the minority language					
Nurse didn't know the language	107	43	285	53	0.005
Respondent or attendant feels more at ease in the majority language	21	9	115	21	
Respondent is bilingual/	70	28	82	15	
Discussion started in other language					
Respondent's behaviour/ Availability/Quality of service/Other	48	20	59	11	

*The numbers and proportions were rescaled according to the sampling weights

Table 5.2: Women's use of health care services provided by a nurse by official-language minority

	Anglophone minority*		Francophone minority*		χ^2 p-value
	n	%	n	%	
Used the services of an nurse in the past 12 months					
No	2336	77	4613	74	0.160
Yes	706	23	1588	26	
Reason for using the services of a nurse					
Routine or on-going care	314	37	743	43	0.713
Minor health problem	213	25	373	21	

Major health problem	78	9	201	12	
An Emergency	99	12	196	11	
Getting prescriptions, information or advice/Other	156	18	223	13	
Used the minority language with the nurse					
No	324	38	1044	61	<0.001
Yes	536	62	668	39	
Principal reason for not being served in the minority language					
Nurse didn't know the language	132	43	504	62	<0.001
Respondent or attendant feels more at ease in the majority language	16	5	129	16	
Respondent is bilingual/	97	32	113	14	
Discussion started in other language					
Respondent's behaviour/	62	20	72	9	
Availability/Quality of service/Other					

*The numbers and proportions were rescaled according to the sampling weights

Table 6.1: Men's use of health care services provided by a professional from a telephone health line or telehealth service by official-language minority**

	Anglophone minority*		Francophone minority*		χ^2 p-value
	n	%	n	%	
Is aware of the existence of a telephone health line or telehealth service in their province					
No	1698	59	1983	39	<0.001
Yes	1180	41	3046	61	
Used the services of a professional from a telephone health line/telehealth in the past 12 month					
No	2627	91	4565	90	0.448
Yes	247	9	480	10	
Used the minority language with the professional from a telephone health line/telehealth					
No	127	52	270	57	0.852
Yes	119	48	205	43	
Principal reason for not being served in the minority language					
Professional didn't know the language	35	27	59	27	0.964
Respondent or attendant feels more at ease in the majority language	18	14	77	35	
Respondent is bilingual/	50	40	45	21	
Discussion started in other language					

Respondent's behaviour/Availability/Quality of service/Other	24	19	36	17
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*The numbers and proportions were rescaled according to the sampling weights

** Excludes respondents of the province of Prince Edward Island

Table 6.2: Women's use of health care services provided by a professional from a telephone health line or telehealth service by official-language minority**

	Anglophone minority*		Francophone minority*		χ^2 p-value
	n	%	n	%	
Is aware of the existence of a telephone health line or telehealth service in their province					
No	1280	42	1568	25	<0.001
Yes	1765	58	4613	75	
Used the services of a professional from a telephone health line/telehealth in the past 12 month					
No	2625	86	5148	83	0.029
Yes	420	14	1062	17	
Used the minority language with the professional from a telephone health line/telehealth					
No	219	52	622	60	0.608
Yes	200	48	422	40	
Principal reason for not being served in the minority language					
Professional didn't know the language	64	31	78	16	<0.001
Respondent or attendant feels more at ease in the majority language	30	15	188	39	
Respondent is bilingual/	91	44	104	22	
Discussion started in other language					
Respondent's behaviour/Availability/Quality of service/Other	20	10	109	23	

*The numbers and proportions were rescaled according to the sampling weights

** Excludes respondents of the province of Prince Edward Island

Table 7.1: Men's use of health care services provided by other health care professional by official-language minority

	Anglophone minority*		Francophone minority*		χ^2 p-value
	n	%	n	%	

Has a regular place to go when sick or needing advice on their health

No	1157	40	2437	48	0.001
Yes	1720	60	2615	52	
Where do they go					
Hospital	589	34	1250	48	<0.001
Health clinic	637	37	1130	43	
Community health centre	399	23	74	3	
Other doctor, nurse, specialist/pharmacy/other	95	6	154	6	
Used other types of health care services in the past 12 months					
No	1958	68	3633	72	0.052
Yes	918	32	1416	28	
Reason for using the services					
Routine or on-going care	215	23	345	24	0.820
Minor health problem	467	49	632	43	
Major health problem	48	5	105	7	
An Emergency	112	12	225	16	
Getting prescriptions, information or advice/Other	102	11	147	10	
Used the minority language with the health care professional					
No	355	38	917	63	<0.001
Yes	589	62	528	37	
Principal reason for not being served in the minority language					
Professional didn't know the language	125	36	445	58	<0.001
Respondent or attendant feels more at ease in the majority language	40	12	122	16	
Respondent is bilingual/	119	34	123	16	
Discussion started in other language					
Respondent's behaviour/	62	18	79	10	
Availability/Quality of service/Other					

*The numbers and proportions were rescaled according to the sampling weights

Table 7.2: Women's use of health care services provided by other health care professional by official-language minority

	Anglophone minority*		Francophone minority*		χ^2 p-value
	n	%	n	%	
Has a regular place to go when sick or needing advice on their health					
No	1124	37	2689	43	0.002
Yes	1921	63	3525	57	

Where do they go					
Hospital	494	26	1460	41	<0.001
Health clinic	892	47	1732	49	
Community health centre	419	22	103	3	
Other doctor, nurse, specialist/pharmacy/other	115	6	227	6	
Used other types of health care services in the past 12 months					
No	1856	61	4006	65	0.081
Yes	1187	39	2197	35	
Reason for using the services					
Routine or on-going care	263	21	458	20	0.391
Minor health problem	664	52	1016	44	
Major health problem	79	6	213	9	
An Emergency	135	11	331	14	
Getting prescriptions, information or advice/Other	135	11	298	13	
Used the minority language with the health care professional					
No	516	41	1544	67	<0.001
Yes	758	60	765	33	
Principal reason for not being served in the minority language					
Professional didn't know the language	134	28	782	62	0.020
Respondent or attendant feels more at ease in the majority language	37	8	162	13	
Respondent is bilingual/	203	42	191	15	
Discussion started in other language					
Respondent's behaviour/ Availability/Quality of service/Other	108	22	198	10	

*The numbers and proportions were rescaled according to the sampling weights

Appendix 5: Results of the univariate analyses of general health and access to health care services associated with the predictors in men and women of the two official-language minorities

Table 9.1: Crude odds ratios (ORs) and 95% confidence intervals (95% CI) for poor self-perceived health by socioeconomic factors in Anglophone and Francophone men

	Anglophone men OR (95% CI)	Francophone men OR (95% CI)
Age (years)		
18-34	0.82 (0.46, 1.46)	0.27 (0.18, 0.40)
35-64	1.00	1.00
65 +	3.54 (2.16, 5.79)	2.45 (1.87, 3.20)
Education		
University	1.00	1.00
College	0.63 (0.26, 1.49)	1.53 (0.90, 2.61)
High school completed	0.94 (0.48, 1.83)	2.40 (1.54, 3.76)
High school not completed	4.06 (2.30, 7.19)	6.55 (4.32, 9.92)
Household income		
<\$30,000	4.61 (2.69, 7.92)	3.84 (2.83, 5.40)
\$30,000-\$59,999	1.77 (1.05, 2.97)	2.33 (1.72, 3.16)
\$60,000 or more	1.00	1.00
Marital status		
Married/Common-law	1.00	1.00
Widowed/Separated/Divorced	3.91 (2.13, 7.19)	1.67 (1.15, 2.43)
Single	0.92 (0.53, 1.60)	0.66 (0.46, 0.933)
Place of residence		
Urban	1.00	1.00
Rural	1.04 (0.66, 1.63)	1.01 (0.79, 1.29)
Unknown	1.98 (1.22, 3.21)	1.61 (1.17, 2.23)
Immigrant		
No	1.00	1.00
Yes	1.11 (0.63, 1.96)	0.62 (0.37, 1.02)

Table 9.2: Crude odds ratios (ORs) and 95% confidence intervals (95% CI) for poor self-perceived health by socioeconomic factors in Anglophone and Francophone women

	Anglophone women OR (95% CI)	Francophone women OR (95% CI)
Age (years)		
18-34	0.43 (0.23, 0.81)	0.32 (0.21, 0.48)
35-64	1.00	1.00
65 +	3.04 (1.96, 4.72)	3.48 (2.72, 4.45)
Education		

University	1.00	1.00
College	2.31 (1.03, 5.16)	1.19 (0.77, 1.83)
High school completed	1.86 (0.86, 4.03)	2.24 (1.49, 3.39)
High school not completed	11.44 (5.67, 23.06)	7.26 (5.19, 10.14)
Household income		
<\$30,000	5.45 (3.20, 9.28)	4.64 (3.37, 6.38)
\$30,000-\$59,999	1.88 (1.09, 3.24)	2.27 (1.67, 3.09)
\$60,000 or more	1.00	1.00
Marital status		
Married/Common-law	1.00	1.00
Widowed/Separated/Divorced	2.37 (1.51, 3.72)	3.04 (2.34, 3.95)
Single	0.70 (0.38, 1.29)	0.72 (0.49, 1.03)
Place of residence		
Urban	1.00	1.00
Rural	1.60 (1.07, 2.39)	1.05 (0.84, 1.32)
Unknown	1.22 (0.72, 2.08)	1.14 (0.82, 1.57)
Immigrant		
No	1.00	1.00
Yes	1.30 (0.79, 2.15)	0.50 (0.33, 0.76)

Table 9.3: Crude odds ratios (ORs) and 95% confidence intervals (95% CI) for finding it important to get health care services in the minority language by socioeconomic factors in Anglophone and Francophone men

	Anglophone men OR (95% CI)	Francophone men OR (95% CI)
Age (years)		
18-34	1.43 (0.91, 2.24)	1.48 (1.16, 1.89)
35-64	1.00	1.00
65 +	0.60 (0.36, 1.02)	0.64 (0.51, 0.80)
Education		
University	1.00	1.00
College	1.17 (0.66, 2.09)	1.00 (0.74, 1.36)
High school completed	1.33 (0.75, 2.35)	1.23 (0.94, 1.63)
High school not completed	1.86 (0.99, 3.49)	1.33 (1.01, 1.75)
Household income		
<\$30,000	0.85 (0.48, 1.52)	1.06 (0.79, 1.43)
\$30,000-\$59,999	1.44 (0.88, 2.35)	1.17 (0.93, 1.47)
\$60,000 or more	1.00	1.00
Marital status		
Married/Common-law	1.00	1.00
Widowed/Separated/Divorced	0.54 (0.27, 1.05)	0.87 (0.62, 1.22)
Single	1.89 (1.23, 2.93)	1.36 (1.06, 1.75)

Place of residence		
Urban	1.00	1.00
Rural	1.12 (0.70, 1.77)	1.80 (1.47, 2.20)
Unknown	0.69 (0.39, 1.23)	0.95 (0.71, 1.28)
Immigrant		
No	1.00	1.00
Yes	1.01 (0.64, 1.61)	0.75 (0.53, 1.05)

Table 9.4: Crude odds ratios (ORs) and 95% confidence intervals (95% CI) for finding it important to get health care services in the minority language by socioeconomic factors in Anglophone and Francophone women

	Anglophone women OR (95% CI)	Francophone women OR (95% CI)
Age (years)		
18-34	0.83 (0.48, 1.44)	1.14 (0.85, 1.51)
35-64	1.00	1.00
65 +	1.37 (0.75, 2.49)	0.71 (0.57, 0.89)
Education		
University	1.00	1.00
College	0.85 (0.42, 1.71)	0.94 (0.70, 1.24)
High school completed	1.06 (0.53, 2.11)	0.95 (0.71, 1.27)
High school not completed	1.30 (0.65, 2.57)	1.55 (1.19, 2.00)
Household income		
<\$30,000	0.66 (0.37, 1.19)	1.33 (1.05, 1.69)
\$30,000-\$59,999	1.29 (0.71, 2.32)	1.11 (0.88, 1.41)
\$60,000 or more	1.00	1.00
Marital status		
Married/Common-law	1.00	1.00
Widowed/Separated/Divorced	1.53 (0.68, 3.44)	1.05 (0.83, 1.32)
Single	1.49 (0.87, 2.54)	1.26 (0.98, 1.62)
Place of residence		
Urban	1.00	1.00
Rural	0.83 (0.50, 1.37)	1.46 (1.18, 1.80)
Unknown	1.50 (0.64, 3.51)	0.90 (0.59, 1.38)
Immigrant		
No	1.00	1.00
Yes	1.01 (0.48, 2.11)	0.59 (0.42, 0.81)

Table 9.5: Crude odds ratios (ORs) and 95% confidence intervals (95% CI) for not having a regular medical doctor by socioeconomic factors in Anglophone and Francophone men

	Anglophone men OR (95% CI)	Francophone men OR (95% CI)
Age (years)		
18-34	3.17 (2.26, 4.43)	2.21 (1.66, 2.94)
35-64	1.00	1.00
65 +	0.27 (0.15, 0.51)	0.41 (0.28, 0.61)
Education		
University	1.00	1.00
College	1.44 (0.92, 2.25)	1.00 (0.70, 1.43)
High school completed	1.00 (0.66, 1.51)	0.79 (0.55, 1.14)
High school not completed	0.89 (0.57, 1.38)	0.79 (0.53, 1.18)
Household income		
<\$30,000	1.53 (1.02, 2.28)	1.49 (0.98, 2.26)
\$30,000-\$59,999	1.31 (0.89, 1.91)	1.08 (0.81, 1.43)
\$60,000 or more	1.00	1.00
Marital status		
Married/Common-law	1.00	1.00
Widowed/Separated/Divorced	0.85 (0.46, 1.60)	1.24 (0.82, 1.89)
Single	3.95 (2.83, 5.51)	2.80 (2.07, 3.79)
Place of residence		
Urban	1.00	1.00
Rural	0.70 (0.51, 0.98)	0.63 (0.49, 0.82)
Unknown	1.36 (0.90, 2.04)	0.72 (0.51, 1.02)
Immigrant		
No	1.00	1.00
Yes	1.03 (0.72, 1.48)	1.65 (1.04, 2.63)

Table 9.6: Crude odds ratios (ORs) and 95% confidence intervals (95% CI) for not having a regular medical doctor by socioeconomic factors in Anglophone and Francophone women

	Anglophone women OR (95% CI)	Francophone women OR (95% CI)
Age (years)		
18-34	2.33 (1.56, 3.47)	2.23 (1.60, 3.10)
35-64	1.00	1.00
65 +	0.47 (0.25, 0.86)	0.95 (0.59, 1.52)
Education		
University	1.00	1.00
College	1.74 (1.11, 2.71)	0.85 (0.56, 1.30)
High school completed	1.30 (0.79, 2.16)	0.82 (0.53, 1.27)
High school not completed	1.00 (0.60, 1.67)	0.77 (0.51, 1.16)
Household income		

<\$30,000	1.08 (0.69, 1.69)	1.36 (0.90, 2.07)
\$30,000-\$59,999	0.94 (0.62, 1.42)	1.34 (0.96, 1.87)
\$60,000 or more	1.00	1.00
Marital status		
Married/Common-law	1.00	1.00
Widowed/Separated/Divorced	0.71 (0.41, 1.21)	1.06 (0.68, 1.64)
Single	2.04 (1.39, 2.99)	2.27 (1.59, 3.24)
Place of residence		
Urban	1.00	1.00
Rural	0.77 (0.55, 1.08)	1.12 (0.81, 1.56)
Unknown	1.06 (0.66, 1.69)	0.62 (0.36, 1.06)
Immigrant		
No	1.00	1.00
Yes	1.08 (0.70, 1.67)	1.07 (0.72, 1.58)

Table 9.7: Crude odds ratios (ORs) and 95% confidence intervals (95% CI) for having used the services of a regular medical doctor in the past 12 months by socioeconomic factors in Anglophone and Francophone men

	Anglophone men OR (95% CI)	Francophone men OR (95% CI)
Age (years)		
18-34	0.25 (0.18, 0.36)	0.40 (0.32, 0.50)
35-64	1.00	1.00
65 +	3.85 (2.40, 6.15)	2.25 (1.74, 2.88)
Education		
University	1.00	1.00
College	0.69 (0.45, 1.06)	0.82 (0.63, 1.07)
High school completed	0.80 (0.54, 1.17)	0.92 (0.71, 1.19)
High school not completed	0.98 (0.66, 1.43)	1.22 (0.92, 1.61)
Household income		
<\$30,000	0.75 (0.51, 1.08)	1.14 (0.84, 1.55)
\$30,000-\$59,999	0.78 (0.56, 1.10)	1.07 (0.87, 1.31)
\$60,000 or more	1.00	1.00
Marital status		
Married/Common-law	1.00	1.00
Widowed/Separated/Divorced	1.50 (0.88, 2.56)	1.12 (0.79, 1.58)
Single	0.26 (0.19, 0.36)	0.45 (0.36, 0.57)
Place of residence		
Urban	1.00	1.00
Rural	1.19 (0.89, 1.60)	1.12 (0.94, 1.34)
Unknown	0.78 (0.52, 1.16)	1.53 (1.15, 2.04)

Immigrant		
No	1.00	1.00
Yes	1.05 (0.76, 1.47)	0.93 (0.65, 1.34)

Table 9.8: Crude odds ratios (ORs) and 95% confidence intervals (95% CI) for having used the services of a regular medical doctor in the past 12 months by socioeconomic factors in Anglophone and Francophone women

	Anglophone women OR (95% CI)	Francophone women OR (95% CI)
Age (years)		
18-34	0.45 (0.30, 0.66)	0.56 (0.44, 0.71)
35-64	1.00	1.00
65 +	2.12 (1.36, 3.30)	1.16 (0.88, 1.53)
Education		
University	1.00	1.00
College	0.71 (0.45, 1.12)	1.05 (0.78, 1.40)
High school completed	0.72 (0.44, 1.17)	1.06 (0.78, 1.42)
High school not completed	1.01 (0.63, 1.61)	1.03 (0.79, 1.36)
Household income		
<\$30,000	1.03 (0.68, 1.56)	0.86 (0.67, 1.11)
\$30,000-\$59,999	0.68 (0.45, 1.02)	0.87 (0.69, 1.11)
\$60,000 or more	1.00	1.00
Marital status		
Married/Common-law	1.00	1.00
Widowed/Separated/Divorced	1.81 (1.16, 2.82)	1.06 (0.80, 1.39)
Single	0.51 (0.35, 0.76)	0.58 (0.45, 0.74)
Place of residence		
Urban	1.00	1.00
Rural	1.39 (1.02, 1.89)	0.86 (0.70, 1.05)
Unknown	0.71 (0.42, 1.20)	1.67 (1.15, 2.44)
Immigrant		
No	1.00	1.00
Yes	0.97 (0.64, 1.47)	1.13 (0.84, 1.52)

Table 9.9: Crude odds ratios (ORs) and 95% confidence intervals (95% CI) for not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health by socioeconomic factors in Anglophone and Francophone men

	Anglophone men OR (95% CI)	Francophone men OR (95% CI)
Age (years)		
18-34	1.04 (0.73, 1.48)	1.08 (0.86, 1.34)
35-64	1.00	1.00
65 +	0.93 (0.66, 1.32)	1.21 (0.98, 1.50)

Education		
University	1.00	1.00
College	0.67 (0.44, 1.03)	1.05 (0.81, 1.36)
High school completed	0.77 (0.52, 1.13)	0.93 (0.73, 1.19)
High school not completed	0.79 (0.55, 1.16)	0.92 (0.73, 1.17)
Household income		
<\$30,000	1.00 (0.68, 1.47)	0.93 (0.70, 1.22)
\$30,000-\$59,999	0.75 (0.53, 1.05)	0.93 (0.76, 1.13)
\$60,000 or more	1.00	1.00
Marital status		
Married/Common-law	1.00	1.00
Widowed/Separated/Divorced	1.09 (0.68, 1.76)	1.33 (0.98, 1.80)
Single	1.01 (0.71, 1.42)	1.05 (0.83, 1.00)
Place of residence		
Urban	1.00	1.00
Rural	0.78 (0.58, 1.05)	0.84 (0.70, 1.00)
Unknown	1.13 (0.76, 1.68)	1.47 (1.13, 1.92)
Immigrant		
No	1.00	1.00
Yes	1.04 (0.74, 1.46)	1.37 (0.97, 1.95)

Table 9.10: Crude odds ratios (ORs) and 95% confidence intervals (95% CI) for not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health by socioeconomic factors in Anglophone and Francophone women

	Anglophone women OR (95% CI)	Francophone women OR (95% CI)
Age (years)		
18-34	1.01 (0.70, 1.46)	0.98 (0.79, 1.20)
35-64	1.00	1.00
65 +	1.31 (0.94, 1.84)	1.10 (0.91, 1.32)
Education		
University	1.00	1.00
College	0.85 (0.57, 1.28)	0.94 (0.75, 1.18)
High school completed	1.29 (0.84, 1.99)	1.03 (0.81, 1.31)
High school not completed	0.81 (0.53, 1.22)	0.77 (0.62, 0.95)
Household income		
<\$30,000	1.06 (0.74, 1.54)	0.86 (0.70, 1.06)
\$30,000-\$59,999	1.05 (0.73, 1.52)	0.93 (0.77, 1.13)
\$60,000 or more	1.00	1.00
Marital status		
Married/Common-law	1.00	1.00

Widowed/Separated/Divorced	1.27 (0.86, 1.86)	0.96 (0.79, 1.17)
Single	0.92 (0.64, 1.33)	0.97 (0.78, 1.19)
Place of residence		
Urban	1.00	1.00
Rural	0.90 (0.68, 1.21)	0.68 (0.57, 0.81)
Unknown	1.09 (0.62, 1.92)	1.46 (1.03, 2.08)
Immigrant		
No	1.00	1.00
Yes	1.07 (0.73, 1.58)	1.30 (0.97, 1.75)

Appendix 6: Results of the multivariable logistic regression analyses for variables predicting general health and access to health care services in men and women of the two official language minorities

Table 10.1: Summary of multivariable logistic regression analysis for variables predicting poor self-perceived health in Anglophone men

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	-3.263	0.292			124.76	<0.001
Age (years)						
18-34	-0.090	0.356	0.91	(0.46, 1.83)	0.06	0.800
35-64			1.00			
65 +	0.717	0.279	2.05	(1.19, 3.54)	6.61	0.010
Education						
University studies			1.00			
College studies	-0.417	0.455	0.66	(0.27, 1.61)	0.84	0.360
High school completed	-0.217	0.349	0.81	(0.41, 1.60)	0.39	0.535
High school not completed	1.007	0.321	2.74	(1.46, 5.13)	9.87	0.002
Household income						
<\$30,000	1.085	0.336	2.96	(1.53, 5.72)	10.41	0.001
\$30,000-\$59,999	0.236	0.321	1.27	(0.68, 2.37)	0.54	0.462
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	0.905	0.362	2.47	(1.22, 5.02)	6.25	0.0124
Single	0.138	0.363	1.15	(0.56, 2.34)	0.14	0.7044
Place of residence						
Urban			1.00			
Rural	-0.087	0.247	0.92	(0.56, 1.49)	0.12	0.7238
Unknown	0.428	0.221	1.53	(0.99, 2.37)	3.75	0.0528
Immigrant						
No			1.00			
Yes	0.199	0.318	1.22	(0.65, 2.28)	0.39	0.5303

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error, β =beta

Table 10.2: Summary of multivariable logistic regression analysis for variables predicting poor self-perceived health in Francophone men

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	-2.923	0.192			232.34	<0.001

Age (years)						
18-34	-1.212	0.241	0.30	(0.19, 0.48)	25.32	<0.001
35-64			1.00			
65 +	0.312	0.156	1.37	(1.01, 1.85)	4.01	0.045
Education						
University			1.00			
College	0.617	0.268	1.85	(1.10, 3.13)	5.32	0.021
High school completed	0.914	0.226	2.50	(1.60, 3.89)	16.36	0.001
High school not completed	1.495	0.220	4.46	(2.90, 6.87)	46.15	<0.001
Household income						
<\$30,000	0.841	0.191	2.32	(1.60, 3.37)	19.42	<0.001
\$30,000-\$59,999	0.456	0.161	1.58	(1.15, 2.16)	7.98	0.005
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	-0.022	0.190	0.98	(0.67, 1.42)	0.01	0.910
Single	0.040	0.221	1.04	(0.68, 1.60)	0.03	0.857
Place of residence						
Urban			1.00			
Rural	-0.286	0.140	0.75	(0.57, 0.99)	4.18	0.041
Unknown	0.201	0.180	1.22	(0.86, 1.74)	1.24	0.265
Immigrant						
No			1.00			
Yes	0.063	0.260	1.06	(0.64, 1.77)	0.06	0.810

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error, β =beta

Table 11.1: Summary of multivariable logistic regression analysis for variables predicting poor self-perceived health in Anglophone women

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	-3.500	0.353			98.09	<0.001
Age (years)						
18-34	-0.804	0.438	0.45	(0.19, 1.06)	3.37	0.066
35-64			1.00			
65 +	0.411	0.272	1.51	(0.89, 2.57)	2.29	0.130
Education						
University			1.00			
College	0.788	0.413	2.20	(0.98, 4.94)	3.65	0.056
High school completed	0.303	0.399	1.35	(0.62, 2.96)	0.57	0.448
High school not completed	1.870	0.402	6.49	(2.95, 14.28)	21.61	<0.001

Household income						
<\$30,000	1.150	0.337	3.16	(1.63, 6.11)	11.67	0.006
\$30,000-\$59,999	0.316	0.298	1.37	(0.77, 2.46)	1.12	0.289
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	0.179	0.264	1.20	(0.71, 2.01)	0.46	0.497
Single	0.065	0.407	1.07	(0.48, 2.37)	0.03	0.874
Place of residence						
Urban			1.00			
Rural	0.027	0.243	1.03	(0.64, 1.66)	0.01	0.911
Unknown	-0.137	0.257	0.87	(0.53, 1.44)	0.29	0.593
Immigrant						
No			1.00			
Yes	0.296	0.287	1.34	(0.77, 2.36)	1.06	0.303

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 11.2: Summary of multivariable logistic regression analysis for variables predicting poor self-perceived health in Francophone women

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	-2.739	0.172			253.26	<0.001
Age (years)						
18-34	-0.957	0.241	0.38	(0.24, 0.62)	15.77	<0.001
35-64			1.00			
65 +	0.549	0.143	1.73	(1.31, 2.29)	14.68	<0.001
Education						
University			1.00			
College	0.015	0.226	1.01	(0.65, 1.58)	0.00	0.948
High school completed	0.559	0.230	1.75	(1.11, 2.75)	5.90	0.015
High school not completed	1.190	0.218	3.29	(2.15, 5.03)	29.94	<0.001
Household income						
<\$30,000	0.742	0.197	2.10	(1.43, 3.09)	14.16	0.002
\$30,000-\$59,999	0.377	0.176	1.46	(1.03, 2.06)	4.61	0.032
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	0.373	0.147	1.45	(1.09, 1.94)	6.49	0.011
Single	0.136	0.234	1.15	(0.72, 1.81)	0.34	0.561

Place of residence						
Urban			1.00			
Rural	-0.094	0.136	0.91	(0.70, 1.19)	0.48	0.489
Unknown	-0.044	0.145	0.96	(0.72, 1.27)	0.09	0.760
Immigrant						
No			1.00			
Yes	-0.193	0.230	0.82	(0.53, 1.29)	0.70	0.402

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 12.1: Summary of multivariable logistic regression analysis for variables predicting finding it important to get health care services in the minority language in Anglophone men

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	2.129	0.257			68.54	<0.001
Age (years)						
18-34	-0.086	0.252	0.92	(0.56, 1.50)	0.12	0.732
35-64			1.00			
65 +	-0.523	0.266	0.59	(0.35, 0.99)	3.87	0.049
Education						
University			1.00			
College	0.012	0.304	1.01	(0.56, 1.84)	0.00	0.969
High school completed	0.271	0.308	1.31	(0.72, 2.40)	0.78	0.378
High school not completed	0.921	0.316	2.51	(1.35, 4.67)	8.52	0.004
Household income						
<\$30,000	-0.248	0.277	0.78	(0.45, 1.34)	0.80	0.371
\$30,000-\$59,999	0.294	0.261	1.34	(0.80, 2.24)	1.27	0.261
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	-0.567	0.339	0.57	(0.29, 1.10)	2.80	0.094
Single	0.710	0.252	2.03	(1.24, 3.33)	7.97	0.005
Place of residence						
Urban			1.00			
Rural	0.028	0.249	1.03	(0.63, 1.67)	0.01	0.912
Unknown	-0.424	0.294	0.65	(0.37, 1.17)	2.07	0.150
Immigrant						
No			1.00			
Yes	0.175	0.252	1.19	(0.73, 1.95)	0.48	0.488

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 12.2: Summary of multivariable logistic regression analysis for variables predicting finding it important to get health care services in the minority language in Francophone men

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	0.713	0.121			35.06	<0.001
Age (years)						
18-34	0.483	0.150	1.62	(1.21, 2.17)	10.37	0.001
35-64			1.00			
65 +	-0.675	0.134	0.51	(0.39, 0.66)	25.30	<0.001
Education						
University			1.00			
College	-0.209	0.162	0.81	(0.59, 1.11)	1.67	0.197
High school completed	0.022	0.416	1.02	(0.77, 1.36)	0.02	0.881
High school not completed	0.377	0.163	1.46	(1.06, 2.01)	5.33	0.021
Household income						
<\$30,000	0.133	0.176	1.14	(0.81, 1.61)	0.58	0.448
\$30,000-\$59,999	0.171	0.128	1.19	(0.92, 1.53)	1.77	0.183
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	-0.056	0.185	0.95	(0.66, 1.36)	0.09	0.761
Single	0.041	0.149	1.04	0.78, 1.39)	0.07	0.786
Place of residence						
Urban			1.00			
Rural	0.540	0.109	1.72	(1.39, 2.12)	25.54	<0.001
Unknown	0.009	0.162	1.01	(0.73, 1.39)	0.00	0.957
Immigrant						
No			1.00			
Yes	-0.133	0.184	0.88	(0.61, 1.25)	0.53	0.468

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 13.1: Summary of multivariable logistic regression analysis for variables predicting finding it important to get health care services in the minority language in Anglophone women

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	2.528	0.287			77.87	<0.001
Age (years)						
18-34	-0.452	0.307	0.64	(0.35, 1.16)	2.17	0.141
35-64			1.00			
65 +	0.278	0.325	1.32	(0.70, 2.50)	0.73	0.394
Education						

University			1.00			
College	-0.172	0.375	0.84	(0.40, 1.76)	0.21	0.648
High school completed	-0.011	0.382	0.99	(0.47, 2.09)	0.00	0.977
High school not completed	0.263	0.404	1.30	(0.59, 2.87)	0.42	0.516
Household income						
<\$30,000	-0.673	0.322	0.51	(0.27, 0.96)	4.37	0.037
\$30,000-\$59,999	0.168	0.316	1.18	(0.64, 2.20)	0.28	0.595
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	0.467	0.473	1.60	(0.63, 4.03)	0.97	0.324
Single	0.810	0.317	2.25	(1.21, 4.19)	6.53	0.011
Place of residence						
Urban			1.00			
Rural	-0.112	0.263	0.89	(0.53, 1.50)	0.18	0.671
Unknown	0.374	0.442	1.45	(0.61, 3.45)	0.72	0.397
Immigrant						
No			1.00			
Yes	0.006	0.383	1.01	(0.47, 2.13)	0.00	0.989

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 13.2: Summary of multivariable logistic regression analysis for variables predicting finding it important to get health care services in the minority language in Francophone women

Predictor	<i>B</i>	SE	OR	95%CI	Wald χ^2	p-value
Intercept	1.098	0.115			91.06	<0.001
Age (years)						
18-34	0.181	0.179	1.20	(0.84, 1.70)	1.02	0.312
35-64			1.00			
65 +	-0.673	0.130	0.51	(0.40, 0.66)	26.69	<0.001
Education						
University			1.00			
College	-0.172	0.145	0.84	(0.63, 1.12)	1.41	0.234
High school completed	-0.143	0.144	0.87	(0.65, 1.15)	0.98	0.321
High school not completed	0.553	0.151	1.74	(1.29, 2.34)	13.39	0.003
Household income						
<\$30,000	0.221	0.139	1.25	(0.95, 1.64)	2.55	0.110
\$30,000-\$59,999	0.082	0.130	1.09	(0.84, 1.40)	0.39	0.531
\$60,000 or more			1.00			
Marital status						

Married/Common-law			1.00			
Widowed/Separated/ Divorced	0.100	0.127	1.11	(0.86, 1.42)	0.62	0.430
Single	0.138	0.168	1.15	(0.83, 1.60)	0.67	0.414
Place of residence						
Urban			1.00			
Rural	0.280	0.113	1.32	(1.06, 1.65)	6.18	0.013
Unknown	-0.061	0.210	0.92	(0.62, 1.42)	0.08	0.773
Immigrant						
No			1.00			
Yes	-0.470	0.164	0.62	(0.45, 0.86)	8.22	0.004

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 14.1: Summary of multivariable logistic regression analysis for variables predicting not having a regular medical doctor in Anglophone men

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	-1.064	0.200			28.20	<0.001
Age (years)						
18-34	0.677	0.223	1.97	(1.27, 3.05)	9.21	0.002
35-64		0.305	1.00			
65 +	-1.433		0.24	(0.13, 0.43)	22.09	<0.001
Education						
University			1.00			
College	0.088	0.239	1.09	(0.68, 1.74)	0.13	0.714
High school completed	-0.174	0.235	0.84	(0.53, 1.33)	0.55	0.459
High school not completed	0.085	0.249	1.09	(0.67, 1.77)	0.12	0.732
Household income						
<\$30,000	0.505	0.222	1.66	(1.07, 2.56)	5.15	0.023
\$30,000-\$59,999	0.343	0.208	1.41	(0.94, 2.12)	2.71	0.010
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	-0.029	0.354	0.97	(0.49, 1.94)	0.01	0.936
Single	0.749	0.226	2.12	(1.36, 3.29)	10.99	0.001
Place of residence						
Urban			1.00			
Rural	-0.347	0.182	0.71	(0.50, 1.01)	3.63	0.057
Unknown	0.397	0.232	1.49	(0.94, 2.35)	2.92	0.087
Immigrant						

No			1.00			
Yes	0.268	0.217	1.31	(0.86, 2.00)	1.53	0.216

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 14.2: Summary of multivariable logistic regression analysis for variables predicting not having a regular medical doctor in Francophone men

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	-2.052	0.171			143.64	<0.001
Age (years)						
18-34	0.600	0.149	1.82	(1.36, 2.44)	16.18	<0.001
35-64			1.00			
65 +	-1.131	0.232	0.32	(0.21, 0.51)	23.84	<0.001
Education						
University			1.00			
College	0.020	0.185	1.02	(0.71, 1.47)	0.01	0.913
High school completed	-0.220	0.203	0.80	(0.54, 1.20)	1.17	0.279
High school not completed	0.284	0.255	1.33	(0.81, 2.19)	1.24	0.265
Household income						
<\$30,000	0.535	0.268	1.71	(1.01, 2.88)	3.99	0.046
\$30,000-\$59,999	0.233	0.157	1.26	(0.93, 1.72)	2.20	0.138
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	0.339	0.239	1.40	(0.88, 2.24)	2.01	0.157
Single	0.594	0.174	1.81	(1.29, 2.55)	11.61	0.001
Place of residence						
Urban			1.00			
Rural	-0.405	0.146	0.67	(0.50, 0.89)	7.75	0.005
Unknown	-0.271	0.191	0.76	(0.52, 1.11)	2.02	0.156
Immigrant						
No			1.00			
Yes	0.318	0.250	1.37	(0.84, 2.24)	1.62	0.203

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 15.1: Summary of multivariable logistic regression analysis for variables predicting not having a regular medical doctor in Anglophone women

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	-2.016	0.245			67.53	<0.001

Age (years)							
18-34	0.696	0.239	2.01	(1.26, 3.20)	8.51	0.004	
35-64			1.00				
65 +	-0.801	0.320	0.45	(0.24, 0.84)	6.25	0.012	
Education							
University			1.00				
College	0.532	0.233	1.70	(1.08, 2.69)	5.21	0.023	
High school completed	0.444	0.291	1.56	(0.88, 2.76)	2.33	0.127	
High school not completed	0.487	0.295	1.63	(0.91, 2.90)	2.73	0.099	
Household income							
<\$30,000	0.195	0.264	1.22	(0.72, 2.04)	0.54	0.461	
\$30,000-\$59,999	-0.033	0.240	0.97	(0.60, 1.55)	0.02	0.892	
\$60,000 or more			1.00				
Marital status							
Married/Common-law			1.00				
Widowed/Separated/ Divorced	-0.207	0.281	0.81	(0.47, 1.41)	0.54	0.462	
Single	0.225	0.237	1.25	(0.79, 1.99)	0.90	0.342	
Place of residence							
Urban			1.00				
Rural	-0.269	0.190	0.76	(0.53, 1.11)	1.99	0.159	
Unknown	0.067	0.262	1.07	(0.64, 1.79)	0.07	0.797	
Immigrant							
No			1.00				
Yes	0.171	0.259	1.19	(0.71, 1.97)	0.44	0.509	

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 15.2: Summary of multivariable logistic regression analysis for variables predicting not having a regular medical doctor in Francophone women

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	-2.889	0.177			265.32	<0.001
Age (years)						
18-34	0.614	0.233	1.85	(1.17, 2.92)	6.95	0.008
35-64			1.00			
65 +	-0.157	0.277	0.85	(0.50, 1.47)	0.32	0.572
Education						
University			1.00			
College	-0.144	0.232	0.87	(0.55, 1.37)	0.38	0.537
High school completed	-0.184	0.260	0.83	(0.50, 1.38)	0.50	0.478
High school not completed	-0.099	0.263	0.91	(0.54, 1.52)	0.14	0.708

Household income						
<\$30,000	0.345	0.224	1.41	(0.91, 2.19)	2.37	0.1234
\$30,000-\$59,999	0.323	0.182	1.38	(0.97, 1.98)	3.15	0.076
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	0.108	0.239	1.11	(0.70, 1.78)	0.21	0.651
Single	0.458	0.227	1.58	(1.01, 2.47)	4.05	0.044
Place of residence						
Urban			1.00			
Rural	0.145	0.179	1.16	(0.81, 1.64)	0.65	0.419
Unknown	-0.413	0.271	0.66	(0.39, 1.13)	2.31	0.128
Immigrant						
No			1.00			
Yes	-0.018	0.213	0.98	(0.65, 1.49)	0.01	0.934

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 16.1: Summary of multivariable logistic regression analysis for variables predicting having used the services of a regular medical doctor in the past 12 months in Anglophone men

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	0.558	0.189			8.75	0.003
Age (years)						
18-34	-1.027	0.222	0.36	(0.23, 0.55)	21.47	<0.001
35-64			1.00			
65 +	1.492	0.237	4.44	(2.80, 7.07)	39.75	<0.001
Education						
University			1.00			
College	-0.045	0.229	0.96	(0.61, 1.50)	0.04	0.846
High school completed	-0.071	0.223	0.93	(0.60, 1.44)	0.10	0.749
High school not completed	-0.299	0.229	0.74	(0.47, 1.16)	1.70	0.192
Household income						
<\$30,000	-0.384	0.215	0.68	(0.45, 1.04)	3.18	0.075
\$30,000-\$59,999	-0.299	0.195	0.74	(0.51, 1.09)	2.34	0.126
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	0.225	0.301	1.25	(0.69, 2.26)	0.56	0.454
Single	-0.518	0.221	0.60	(0.39, 0.92)	5.48	0.019

Place of residence						
Urban			1.00			
Rural	0.195	0.167	1.22	(0.88, 1.69)	1.36	0.243
Unknown	-0.347	0.232	0.71	(0.45, 1.11)	2.24	0.135
Immigrant						
No			1.00			
Yes	-0.230	0.205	0.79	(0.53, 1.19)	1.26	0.262

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 16.2: Summary of multivariable logistic regression analysis for variables predicting having used the services of a regular medical doctor in the past 12 months in Francophone men

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	0.889	0.113			61.63	<0.001
Age (years)						
18-34	-0.817	0.128	0.44	(0.34, 0.57)	40.88	<0.001
35-64			1.00			
65 +	0.873	0.146	2.39	(1.80, 3.19)	35.54	<0.001
Education						
University			1.00			
College	-0.091	0.142	0.91	(0.69, 1.21)	0.41	0.523
High school completed	-0.037	0.139	0.96	(0.73, 1.27)	0.07	0.792
High school not completed	-0.249	0.166	0.78	(0.56, 1.08)	2.26	0.133
Household income						
<\$30,000	-0.043	0.206	0.96	(0.64, 1.43)	0.04	0.833
\$30,000-\$59,999	-0.074	0.113	0.93	(0.74, 1.16)	0.43	0.512
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	-0.100	0.193	0.90	(0.62, 1.32)	0.27	0.603
Single	-0.322	0.136	0.73	(0.56, 0.95)	5.60	0.018
Place of residence						
Urban			1.00			
Rural	0.114	0.100	1.12	(0.92, 1.36)	1.29	0.255
Unknown	0.351	0.161	1.42	(1.04, 1.95)	4.79	0.029
Immigrant						
No			1.00			
Yes	-0.002	0.209	1.00	(0.66, 1.50)	0.00	0.991

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 17.1: Summary of multivariable logistic regression analysis for variables predicting having used the services of a regular medical doctor in the past 12 months in Anglophone women

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	1.157	0.199			33.97	<0.001
Age (years)						
18-34	-0.655	0.213	0.52	(0.34, 0.79)	9.47	0.002
35-64			1.00			
65 +	0.771	0.237	2.16	(1.36, 3.44)	10.56	0.001
Education						
University			1.00			
College	-0.315	0.241	0.73	(0.46, 1.17)	1.71	0.192
High school completed	-0.436	0.240	0.65	(0.40, 1.04)	3.29	0.070
High school not completed	-0.446	0.260	0.64	(0.38, 1.07)	2.95	0.086
Household income						
<\$30,000	-0.154	0.242	0.86	(0.53, 1.38)	0.40	0.525
\$30,000-\$59,999	-0.482	0.203	0.62	(0.41, 0.92)	5.63	0.018
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	0.462	0.252	1.59	(0.97, 2.60)	3.36	0.067
Single	-0.265	0.224	0.77	(0.49, 1.19)	1.40	0.237
Place of residence						
Urban			1.00			
Rural	0.376	0.168	1.46	(1.05, 2.03)	4.97	0.026
Unknown	-0.368	0.266	0.69	(0.41, 1.17)	1.92	0.166
Immigrant						
No			1.00			
Yes	-0.053	0.220	0.95	(0.62, 1.46)	0.06	0.808

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 17.2: Summary of multivariable logistic regression analysis for variables predicting having used the services of a regular medical doctor in the past 12 months in Francophone women

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	1.643	0.1396			138.48	<0.001
Age (years)						
18-34	-0.507	0.160	0.60	(0.44, 0.82)	10.00	0.002
35-64			1.00			
65 +	0.249	0.158	1.28	(0.94, 1.75)	2.48	0.115
Education						

University			1.00			
College	0.038	0.161	1.04	(0.76, 1.42)	0.06	0.814
High school completed	0.026	0.159	1.03	(0.75, 1.40)	0.03	0.568
High school not completed	-0.172	0.173	0.84	(0.60, 1.19)	0.97	0.325
Household income						
<\$30,000	-0.158	0.137	0.85	(0.65, 1.12)	1.31	0.252
\$30,000-\$59,999	-0.133	0.121	0.88	(0.69, 1.11)	1.20	0.274
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	-0.016	0.149	0.98	(0.74, 1.32)	0.01	0.915
Single	-0.287	0.155	0.75	(0.55, 1.02)	3.43	0.064
Place of residence						
Urban			1.00			
Rural	-0.135	0.109	0.87	(0.71, 1.08)	1.55	0.214
Unknown	0.467	0.187	1.60	(1.11, 2.30)	6.23	0.013
Immigrant						
No			1.00			
Yes	0.132	0.163	1.14	(0.83, 1.57)	0.66	0.415

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 18.1: Summary of multivariable logistic regression analysis for variables predicting not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health in Anglophone men

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	-0.117	0.176			0.44	0.507
Age (years)						
18-34	0.126	0.214	1.13	(0.75, 1.73)	0.35	0.555
35-64			1.00			
65 +	-0.120	0.185	0.89	(0.62, 1.27)	0.42	0.517
Education						
University			1.00			
College	-0.378	0.223	0.69	(0.44, 1.06)	2.86	0.091
High school completed	-0.222	0.212	0.80	(0.53, 1.21)	1.10	0.294
High school not completed	-0.136	0.207	0.87	(0.58, 1.31)	0.43	0.511
Household income						
<\$30,000	0.020	0.208	1.02	(0.68, 1.53)	0.01	0.923
\$30,000-\$59,999	-0.256	0.179	0.77	(0.55, 1.10)	2.05	0.152
\$60,000 or more			1.00			

Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	0.118	0.248	1.13	(0.69, 1.83)	0.23	0.634
Single	-0.066	0.216	0.94	(0.61, 1.43)	0.09	0.758
Place of residence						
Urban			1.00			
Rural	-0.223	0.158	0.80	(0.59, 1.10)	1.98	0.159
Unknown	0.111	0.202	1.12	(0.75, 1.66)	0.30	0.584
Immigrant						
No			1.00			
Yes	-0.004	0.183	1.00	(0.70, 1.43)	0.00	0.983

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 18.2: Summary of multivariable logistic regression analysis for variables predicting not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health in Francophone men

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	-0.129	0.111			1.35	0.246
Age (years)						
18-34	0.032	0.126	1.03	(0.81, 1.32)	0.06	0.802
35-64			1.00			
65 +	0.217	0.126	1.24	(0.97, 1.59)	2.99	0.084
Education						
University			1.00			
College	0.125	0.137	1.13	(0.87, 1.48)	0.83	0.362
High school completed	0.016	0.126	1.02	(0.79, 1.30)	0.02	0.898
High school not completed	-0.030	0.137	0.97	(0.74, 1.27)	0.05	0.828
Household income						
<\$30,000	-0.157	0.157	0.86	(0.63, 1.16)	0.99	0.320
\$30,000-\$59,999	-0.114	0.108	0.89	(0.72, 1.10)	1.13	0.288
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	0.275	0.155	1.32	(0.97, 1.78)	3.14	0.076
Single	0.053	0.132	1.05	(0.81, 1.37)	0.16	0.688
Place of residence						
Urban			1.00			
Rural	-0.121	0.093	0.89	(0.74, 1.06)	1.71	0.192
Unknown	0.348	0.135	1.42	(1.09, 1.85)	6.63	0.010

Immigrant						
No			1.00			
Yes	0.270	0.180	1.31	(0.92, 1.86)	2.25	0.133

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 19.1: Summary of multivariable logistic regression analysis for variables predicting not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health in Anglophone women

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	-0.579	0.172			11.36	0.008
Age (years)						
18-34	0.109	0.222	1.11	(0.72, 1.72)	0.24	0.625
35-64			1.00			
65 +	0.262	0.195	1.30	(0.89, 1.90)	1.81	0.179
Education						
University			1.00			
College	-0.179	0.215	0.84	(0.55, 1.27)	0.69	0.405
High school completed	0.199	0.216	1.22	(0.80, 1.86)	0.85	0.357
High school not completed	-0.372	0.242	0.69	(0.43, 1.11)	2.37	0.123
Household income						
<\$30,000	0.032	0.206	1.03	(0.69, 1.55)	0.02	0.876
\$30,000-\$59,999	0.012	0.192	1.01	(0.69, 1.48)	0.00	0.950
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/ Divorced	0.208	0.223	1.23	(0.80, 1.90)	0.87	0.351
Single	-0.119	0.229	0.89	(0.57, 1.39)	0.27	0.604
Place of residence						
Urban			1.00			
Rural	-0.067	0.151	0.94	(0.70, 1.26)	0.19	0.6593
Unknown	0.099	0.286	1.10	(0.63, 1.93)	0.12	0.7305
Immigrant						
No			1.00			
Yes	0.042	0.213	1.04	(0.69, 1.58)	0.04	0.8439

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Table 19.2 Summary of multivariable logistic regression analysis for variables predicting not having a regular place to go (besides the regular medical doctor) when sick or needing advice on health in Francophone women

Predictor	β	SE	OR	95%CI	Wald χ^2	p-value
Intercept	-0.147	0.102			2.08	0.150
Age (years)						
18-34	-0.065	0.127	0.94	(0.73, 1.20)	0.26	0.610
35-64			1.00			
65 +	0.236	0.111	1.23	(0.99, 1.53)	3.43	0.064
Education						
University			1.00			
College	-0.002	0.119	1.00	(0.79, 1.26)	0.00	0.990
High school diploma	0.096	0.122	1.10	(0.87, 1.40)	0.62	0.430
High school not completed	-0.252	0.130	0.78	(0.60, 1.00)	3.75	0.053
Household income						
<\$30,000	-0.090	0.122	0.91	(0.72, 1.16)	0.54	0.462
\$30,000-\$59,999	-0.032	0.105	0.97	(0.79, 1.19)	0.09	0.760
\$60,000 or more			1.00			
Marital status						
Married/Common-law			1.00			
Widowed/Separated/Divorced	-0.047	0.115	0.95	(0.76, 1.20)	0.17	0.682
Single	-0.009	0.130	0.99	(0.77, 1.28)	0.00	0.945
Place of residence						
Urban			1.00			
Rural	-0.351	0.091	0.70	(0.59, 0.84)	15.01	0.001
Unknown	0.378	0.177	1.46	(1.03, 2.06)	4.56	0.033
Immigrant						
No			1.00			
Yes	0.147	0.150	1.16	(0.86, 1.56)	0.96	0.327

OR=odds ratio; 95%CI=95% confidence intervals; SE=standard error; β =beta

Appendix 7: Comparison of descriptive results from current study with results obtained from analysis of data set which excluded allophones

Table 21a: Distribution of demographic and socioeconomic characteristics of men by official-language minority (comparing results in current study to results when allophones are excluded from the analysis)

Characteristics	Anglophone minority*		Francophone minority*	
	%	% (without allophones)	%	% (without allophones)
Age (years)				
18-34	29	29	25	24
35-64	54	54	57	57
65 +	17	17	19	19
Education				
University	32	32	27	24
College	23	23	22	22
High school completed	23	23	22	23
High school not completed	22	22	29	31
Household income				
<\$30,000	17	17	15	15
\$30,000-\$59,999	29	29	28	28
\$60,000 or more	54	54	56	56
Marital status				
Married/Common-law	59	59	68	69
Widowed/Separated/Divorced	11	11	10	10
Single	30	30	22	21
Place of residence				
Urban	68	68	60	57
Rural	29	29	38	41
Unknown	3	3	2	2
Immigrant				
No	80	83	87	95
Yes	20	17	13	5

*The numbers and proportions were rescaled according to the sampling weights.

Table 22a: Distribution of demographic and socioeconomic characteristics of women by official-language minority (comparing results in thesis to results when allophones are excluded from the analysis)

Characteristics	Anglophone minority*		Francophone minority*	
	%	% (without allophones)	%	% (without allophones)
Age (years)				
18-34	26	26	24	22
35-64	54	54	57	58
65 +	20	20	19	20
Education				
University	34	34	31	28
College	24	24	22	22
High school completed	23	23	25	26
High school not completed	18	18	23	24
Household income				
<\$30,000	20	20	19	19
\$30,000-\$59,999	29	29	28	28
\$60,000 or more	50	51	53	53
Marital status				
Married/Common-law	53	53	64	64
Widowed/Separated/Divorced	20	20	19	20
Single	27	27	17	16
Place of residence				
Urban	67	67	62	60
Rural	28	28	35	37
Unknown	5	5	3	3
Immigrant				
No	81	83	87	94
Yes	19	17	13	6

*The numbers and proportions were rescaled according to the sampling weights.

Table 23a: Summary of self-perceived health and general access to health care services in the minority language by official-language minority in men and women (comparing results in thesis to results when allophones are excluded from the analysis)

	Anglophone minority*		Francophone minority*	
	%	% (without allophones)	%	% (without allophones)
Fair/poor self-perceived health				
Men	9	9	13	13
Women	11	11	14	15
Finds it important to get health care services in the minority language				
Men	91	92	73	73
Women	93	93	76	77
Reason for not being served in the minority language: Scarcity of professionals that speak the minority language				
Men	71	70	88	88
Women	77	77	88	88

*The proportions were rescaled according to the sampling weights

Table 24a: Summary of the access to and use of health care services provided by a regular medical doctor (MD) by official-language minority in men and women (comparing results in thesis to results when allophones are excluded from the analysis)

	Anglophone minority*		Francophone minority*	
	%	% (without allophones)	%	% (without allophones)
Has a regular MD				
Men	64	64	85	86
Women	82	83	91	92
Used the services of an MD in the past 12 months				
Men	52	53	66	66
Women	67	67	80	80
Used the minority language with the MD				
Men	81	82	37	39
Women	82	83	36	38

Principal reason for not being served in the minority language: MD didn't know the language

Men	36	37	72	74
Women	44	44	75	75

*The proportions were rescaled according to the sampling weights

Table 25a: Summary of the use of health care services provided by a nurse by official-language minority in men and women (comparing results in thesis to results when allophones are excluded from the analysis)

	Anglophone minority*		Francophone minority*	
	%	% (without allophones)	%	% (without allophones)
Used the services of an nurse in the past 12 months				
Men	23	23	20	21
Women	23	23	26	26
Used the minority language with the nurse				
Men	63	63	37	39
Women	62	63	39	40
Principal reason for not being served in the minority language: nurse didn't know the language				
Men	43	44	53	52
Women	43	43	62	61

*The proportions were rescaled according to the sampling weights

Table 26a: Summary of the use of health care services provided by a professional from a telephone health line or telehealth service by official-language minority in men and women (comparing results in thesis to results when allophones are excluded from the analysis)

	Anglophone minority*		Francophone minority*	
	%	% (without allophones)	%	% (without allophones)
Is aware of the existence of a telephone health line or telehealth service in their province				
Men	41	41	61	61
Women	58	58	75	76

Used the services of a professional from a telephone health line/telehealth in the past 12 month				
Men	9	8	10	10
Women	14	14	17	17
Principal reason for not being served in the minority language: professional didn't know the language				
Men	27	28	27	28
Women	31	32	16	17

*The proportions were rescaled according to the sampling weights

** Excludes respondents of the province of Prince Edward Island

Table 27a: Summary of the access to and use of health care services provided by other health care professional by official-language minority in men and women (comparing results in thesis to results when allophones are excluded from the analysis)

	Anglophone minority*		Francophone minority*	
	%	% (without allophones)	%	% (without allophones)
Has a regular place to go when sick or needing advice on their health				
Men	60	60	52	52
Women	63	63	57	58
Where do they go: health clinic				
Men	34	36	48	47
Women	47	47	49	49
Used the minority language with the health care professional				
Men	62	62	43	41
Women	60	60	33	34
Principal reason for not being served in the minority language: professional didn't know the language				
Men	36	37	58	58
Women	28	27	62	60

*The proportions were rescaled according to the sampling weights