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Hubert Tote Alimezelli, Anne Leis, Chandima Karunanayake et Wilfrid Denis

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Résumé de l'article

La tendance actuelle montre que les institutions des services de santé et les gouvernements répondent de façon inadéquate aux besoins de plus en plus nombreux d'accès aux services de santé par les populations vieillissantes du Canada et d'autres pays développés. Après l'analyse de l'enquête post-censitaire 2006 de Statistiques Canada sur la Vitalité des Minorités de Langue Officielle, cette étude démontre qu'outre l'age, et en plus d'autres déterminants, les barrières linguistiques auxquelles font face les aînés de langue officielle en situation minoritaire affectent davantage l'autoévaluation de leur santé. Cette étude suggère quelques pistes de solution dont la compréhension des réalités contextuelles, l'amélioration de l'environnement linguistique et des services de santé dans la langue minoritaire.

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Determinants of self-rated health of Francophone seniors in a minority situation in Canada

Hubert Tote Alimezelli
Department of Community Health and Epidemiology
University of Saskatchewan

Anne Leis
Department of Community Health and Epidemiology
University of Saskatchewan

Chandima Karunanayake
Canadian Centre for Health and Safety in Agriculture
University of Saskatchewan

Wilfrid Denis
Department of Sociology, St. Thomas Moore College
University of Saskatchewan

Résumé

La tendance actuelle montre que les institutions des services de santé et les gouvernements répondent de façon inadéquate aux besoins de plus en plus nombreux d'accès aux services de santé par les populations vieillissantes du Canada et d'autres pays développés. Après l'analyse de l'enquête post-censitaire 2006 de Statistiques Canada sur la Vitalité des Minorités de Langue Officielle, cette étude démontre qu'outre l'age, et en plus d'autres déterminants, les barrières linguistiques auxquelles font face les aînés de langue officielle en situation minoritaire affectent davantage l'autoévaluation de leur santé. Cette étude suggère quelques pistes de solution dont la compréhension des réalités contextuelles, l'amélioration de l'environnement linguistique et des services de santé dans la langue minoritaire.

Abstract

Current trends show that governments and health institutions in Canada and other developed nations are responding inadequately to the growing need for health services of the increasingly aging population. The Analysis of Statistics Canada's 2006 post-census Survey on the Vitality of Official Language Minorities show that in addition to age and other socio-demographic determinants, linguistic barriers affect the self-rated health of seniors of official languages living in a minority situation. This study suggests among other things a greater understanding of Official language minorities' contextual realities, the improvement of both the linguistic environment and services in the minority language.

Introduction

Minority Francophone Seniors: A Vulnerable Population

Canada's population is aging rapidly as more and more people live longer than previous generations. Life expectancy in Canada increased from 60 years in 1922 to 74.9 years in 1979 to 80.4 years in 2005 (Statistics Canada, 2010; Human Resources and Skills Development Canada, 2010). It is anticipated that in 2026, one in five Canadians will be 65 years and over, compared to one in eight Canadians in 2001 (Government of Canada, 2010). This growing trend has significant ramifications regarding not only health care expectations and demands, but also the overall burden on the healthcare system. Seniors need more health services than the general population because of age-related health issues (Young et al., 2006; The Canadian Health Services Research Foundation, 2010; Suwal, 2007). For example, among those 65 and over, physical falls account for over 85% of injury hospitalization, which is significantly higher than in the general population (Public Health Agency of Canada, 2010).

Most Canadians assume that health care is equally accessible to everyone thanks to Canada's universal Medicare system. However, recent research in Canada and in Europe indicates that access to health care varies greatly depending on socioeconomic, geographic, and cultural factors (Plouffe, 2003; Franzini & Giannoni, 2010; Crawford et al., 2009). For example, among the general Canadian population, it has been shown that people in the lowest socioeconomic group are 5 times more likely to suffer from a chronic condition; this may be attributed to added stressful life conditions, geographic disparities, and systematic lack of investment in social capital (Frohlich, Ross, & Raymond, 2006).

In addition, compelling evidence demonstrates that language barriers have an adverse effect on access to health services (Gany & Ngo-Metzger, 2007; Shyve, 2007) and on quality care (Smedley, Stith, & Nelson, 2003). For example, a study on mortality trends in Canada from 1971 to 1996 showed that older, non-English speaking less educated women were less likely to use cervical cancer screening programs and therefore were at higher risk of morbidity and mortality (Wilkins, Berthelot, & Ng, 2002). In a qualitative study conducted in Ontario, minority Francophone women reported linguistic and cultural barriers while dealing with their breast cancer diagnostic and treatment (Austin, 2004). A low number of French-speaking health professionals and the difficulty of identifying them were also found to impede the availability of services in French and this situation was worse in rural settings due to healthcare workers' tendency to cluster in urban centres (Marmen & Delisle, 2003).

Scattered across Canada in a predominantly Anglophone environment, minority Francophone seniors face important challenges regarding access to and use of health services in their own language (Bouchard, Gilbert, Landry, & Deveau, 2006). Early evidence

from studies in the Canadian context suggests that French-speaking minorities may be in poorer health condition than the English-speaking majority population (Bouchard, Gaboury, Chomienne, Gilbert, & Dubois, 2009). According to Bowen (2004), minority linguistic groups such as Francophone seniors outside Quebec are at increased risk of ill-health due to their lower access to health services in their own language, diagnostic errors and poor patient-provider communication. When these language barriers are accompanied by challenges due to age, this may have an even greater impact on health. The research reported here is based on data collected by Statistics Canada in the 2006 post-census survey on the Vitality of Official Language Minorities (SVOLM) and is designed to explore factors associated with self-rated health in Francophone seniors.

Objectives

The objectives of the study were threefold: 1) to assess the determinants of self-rated health of minority Francophone seniors; 2) to compare them with those associated with self-rated health in minority Anglophone seniors in Quebec; and 3) to determine what significantly affects self-rated health among younger Francophone seniors compared to older seniors of the same language group.

Data Source and Methods

The Survey on the Vitality of Official-Language Minorities (SVOLM)

The study used data from the Survey on the Vitality of Official-Language Minorities which was carried out by Statistics Canada following the May 2006 census and covered the 10 Canadian provinces and three territories. The adult portion of the survey targeted persons aged 18 years and over who belonged to official-language minorities. Every fifth respondent household on the list of members of official language minorities received a letter of introduction about the survey inviting them to respond to a telephone interview of approximately 40 minutes. A computer assisted direct entry method by interviewers as the interview unfolded over the telephone ensured more data accuracy and minimized reporting errors and biases. It yielded a response rate of 63% for 19,345 adults who completed the questionnaire. Of this sample, 12,376 were Francophone respondents in all Canadian provinces and territories except Quebec while 6,969 were Anglophone respondents in Quebec. Among the 36 modules of the survey questionnaire the health module consisted of questions on self-rated health, importance of being served in one's own language, access to and utilization of health services in the minority language such as physicians, nurses, telephone health lines, and hospital/clinics/health centres.

Guiding framework and selection of variables

The Behavioural Model of Health Services Use, which was adapted for this study as seen in Figure 1 below, was initially developed by Andersen to better circumscribe factors that might impact perceived and objective health status as well as consumer satisfaction. Such factors were grouped into three categories: the external environment, the population characteristics and health behaviours including personal health practices and use of health services (Andersen & Newman, 1973).

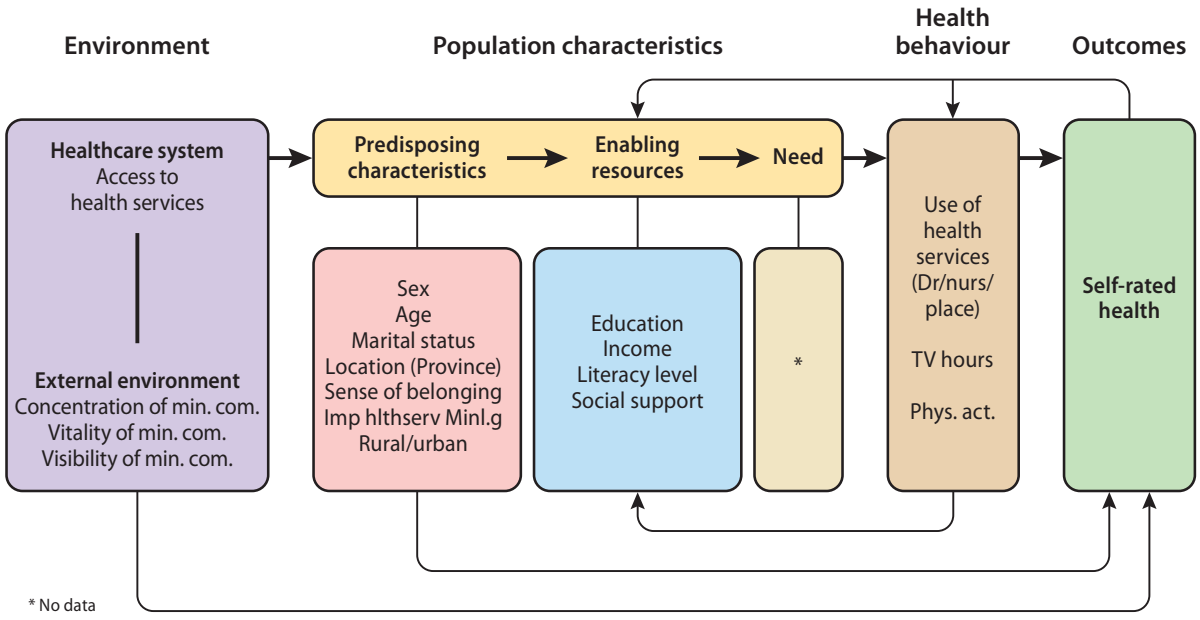
Within the health module of the SVOLM, the question: "In general would you say your health is: excellent, very good, good, fair, poor?", otherwise called "self-rated health", was answered by all respondents. According to the literature, this single question has been shown to be a valid and robust measure of subjective health (Lekander, Elofsson, Neve, Hansson, & Undén, 2004; Mavaddat et al., 2010). Therefore self-rated health was chosen as the primary outcome variable.

The selection of explanatory or independent variables was guided by the Andersen model, the literature on self-rated health, the researchers' knowledge of Francophone seniors living in a minority context and the available information within the SVOLM modules. Variables pertaining to the external environment included the following: *concentration of minority language community*, *vitality of minority language community*, and *visibility of minority language community*. The variable *concentration of minority language community* referred to the proportion of members of the minority language within their municipality of residence, *vitality of minority language community* referred to people's appraisal of the vitality of their minority language community. The variable *visibility of minority language community* was derived from four questions: the presence of the minority language community in businesses, in the media, in services provided by the federal government and in services provided by the provincial government. The categories for this new variable were: *weak visibility, intermediate visibility* and *strong visibility,* with *weak visibility* as the reference category. Visibility referred to the perception of the minority language in the media, community, and within government institutions.

For the population characteristics, the predisposing variables included the following information: *sex, age, marital status, residence (rural or urban), regions (location), sense of belonging to minority language community*, *importance attached to health services in the minority language*. The enabling resources variables are *education, income, literacy level, and social support*. The *social support* variable referred to likely people or services besides spouse to turn to in case of illness. The initial income variable was re-coded into a new variable called *Low Income Cut-off* (*LICO*) with categories of below and above $25,000. *LICO* is a poverty threshold developed by Statistics Canada with the established cut-off point at $23,300. In this study it was rounded to $25,000 because of the SVOLM income variable

pre-set categories (Citizenship and Immigration Canada, 2010; Statistics Canada, 2010). The Need component which often refers to particular health issues did not yield sufficient, relevant information from the survey due to missing cases or data. The Health Behaviour component of the model included the following variables: use of *doctor's services (less than three times, regularly, often)*, *use of nurse services (yes/no)*, *hours spent watching TV as an indicator of sedentary behaviour (with 14 hours per week as cut-off point)*, *physical activity* (defined as practising sports sometimes, regularly, or often), and a combined variable called *use of health services (Place)* including hospital, clinic, telephone health line, defined as place of health services use other than the regular physician's office. The cut-off point of 14 hours of TV per week is a threshold based on an average of two hours of TV watching daily, which research has consistently shown to have a negative impact on health (Katzmarzyk & Lee; 2012).

Figure 1
Variables Fitted in the Andersen Model



Sample description

Out of 19,345 adults respondents, 60% were 50 and over with 4,888 Francophone seniors and 3,161 Anglophone seniors in Quebec. According to Statistics Canada criteria, a "Francophone" outside Quebec was defined as an adult whose mother tongue was French, or who spoke French at home, or who knew French as his/her first official language spoken, or was interviewed in French, and an "Anglophone" in Quebec was similarly defined (Corbeil, Grenier, & Lafrenière, 2006). As shown in Table 1, the Territories had to be excluded from the analysis because the sample size was too small. Data was collected in each province but for analysis purposes, it was grouped into broader regions except for Ontario (See Table 2).

Table 1
Study Sample with Geographic Breakdowns

Location	Provincial and/or sub-provincial samples			Total sample size
Maritimes	Newfoundland & Labrador		189	1,845
	Prince Edward Island		256	
	Nova Scotia		298	
	New Brunswick (1,102)	North	394	
		South East	387	
		Rest	321	
Ontario	North East		386	1,754
	South East		411	
	Ottawa		385	
	Toronto		253	
	Rest		319	
Western provinces	Manitoba		378	1,289
	Saskatchewan		302	
	Alberta		334	
	British Columbia		275	
Total	**All provinces/regions except Quebec**			**4,888**
Quebec	All of Quebec			3,161
Territories	Yukon, Nunavut and the Northwest Territories			Excluded

Statistical analyses

- Descriptive analysis

Descriptive analyses including frequencies, cross tabulations, and bivariate linear regression analyses were carried out using SPSS 19. The outcome variable of self-rated health had five categories coded as follows: 1-Excellent, 2-Very Good, 3-Good, 4-Fair, 5-Poor. All potential variables to be considered for the model building phase of the multiple linear regression were coded appropriately either as binary variables with categories 0 and 1 or as a dummy variable for variables with more than two categories. The reference category coded as 0 was generally applied to categories with the highest number of cases.

A frequency analysis of all variables of interest led to the exclusion of variables with a high percentage of missing cases i.e. 10% and over. Some of them were nevertheless included in cross tabulation analyses to provide some context but could not be considered during the model building phase. Cross-tabulations were generated between some key independent variables and the outcome variable *self-rated health* which for this part of the analysis was combined as follows: (1) *poor and fair*, and (2) *good, very good, and excellent* (Table 2)

for better interpretation of results. The outcome variable *self-rated health* was assumed to be continuous. Consequently, a bivariate linear regression analysis was carried out in order to examine the association between each potential independent variable with the outcome variable *self-rated health*. Some variables were excluded from further consideration when no statistically significant association with self-rated health was found.

- Multiple linear regression

Multiple linear regression was used for this study because of its robustness in the multivariable analysis design, but also because unlike all other procedures that were examined, its key assumptions of linearity, independence of errors, equality of variances (homoscedasticity) and normality were all verified (Duke University, 2010; Pires & Rodrigues, 2007). The normal P-P plot of regression standardized residual showed that expected and observed values yielded excellent linearity. The Durban-Watson test statistic was used to evaluate the independence of errors; it yielded a value of 1.925 (~2) very close to 2 which showed that there was no serial correlation of errors (Duke University, 2010; Hor & Majithia, 2005). As for homoscedasticity, the plot of standardized residuals (ZRESID) with standardized predicted values (ZRESID) showed constant variance of the errors. Finally, a histogram of the standardized residuals with a bell curve confirmed that the assumption of normality was met.

A manual backward selection approach done through SPSS 19 was used since all potential explanatory variables were included in the model initially. Variables were eliminated on the basis of secondary importance as found in the literature and of non-significance ($P > 0.05$). However, some key variables such as age, sex, urban/rural, income and education were kept in the model because they are shown in the literature to be influential and might also be confounding factors.

The standard errors and confidence intervals yielded by SPSS were not accounted for due to the complex survey design methodology. In order to have correct standard errors and confidence intervals bootstrapping was done through SUDAAN (Phillips, 2004).

Results

The descriptive output showed that within the sample of 4,888 Francophone seniors, females represented 55.7% of the sample and people aged 50 to 64 years accounted for over 59% of the sample. In addition, over two thirds of the seniors had a partner (69.9%).

Cross-tabulations (See Table 2) showed that for the variable *importance of health services in the minority language*, those who felt that it was important to receive health services in French (minority language) rated their health significantly less favourably than those who

Table 2
Cross-tabulations of Self-rated Health and Selected Variables for Francophone Seniors (Values in %)

Independent variables of interest		Self-rated health		P-value
		Poor to fair	Good to excellent	
Importance of health services in minority language	Important	24.2	75.8	0.000
	Not important	20.8	79.2	
Rural/urban	Urban	22.8	77.2	0.000
	Rural	22.3	77.7	
Visibility of minority language community	Strong	22.7	77.3	0.000
	Weak	22.6	77.4	
Age	50-64 yrs	17.4	82.6	0.000
	65+ years	30.2	69.8	
Sex	Female	22.7	77.3	0.000
	Male	22.5	77.5	
Location	Maritimes	26.7	73.3	0.000
	Ontario	21.6	78.4	
	West	20.1	79.9	

thought it was not important. Those living in urban areas rated their health slightly less favourably than their rural counterparts. This difference was statistically significant. In addition, minority Francophones between 50 and 64 years rated their health significantly higher than those 65 years and over. Finally, seniors who stated that their community had a *strong Francophone visibility* rated their health slightly less favourably than those living in communities with *weak visibility*. Finally, Francophones in the West tended to rate their health better than those in Ontario and significantly better than those in the Maritimes.

Factors Affecting Self-rated Health Appraisal Among Francophone Seniors in Minority Situation

The results presented below (See Table 3) follow the Andersen model's categories, as described in the methods section. Since the outcome variable *self-rated health* was coded (1-Excellent, 2-Very Good, 3-Good, 4-Fair, 5-Poor.), the signs of beta coefficients in the multiple linear regression output should be interpreted accordingly with the minus (-) sign indicating better self-rated health and the plus (+) sign indicating poorer self-rated health.

In the external environment component, *concentration* and *vitality of minority language community* were both significantly associated with self-rated health ($p < 0.05$). More specifically, minority Francophone seniors living in *high concentration areas* compared

Table 3
Factors Associated with Minority Francophones' Self-rated Health

Factors		Beta	SE	CI	Wald F	P-value
Intercept		3.01	0.11	(2.81; 3.22)	820.89	0.0000
Importance of health services in minority language [no/yes (ref)]		-0.07	0.05	(-0.17; 0.03)	1.86	0.1731
Doctor services	Saw doctor less than three times	-0.43	0.05	(-0.53; -0.33)	73.15	0.0000
	Saw doctor often	0.45	0.07	(0.31; 0.59)	40.81	0.0000
	Saw doctor regularly (ref)					
Use of nurse services [yes/no (ref)]		0.17	0.05	(0.07; 0.28)	10.29	0.0014
Location	Western provinces	-0.13	0.06	(-0.25; -0.01)	4.24	0.0397
	Maritime provinces	0.05	0.05	(-0.05; 0.16)	1.06	0.3025
	Ontario (ref)					
Sex [male/female (ref)]		0.05	0.05	(-0.04; 0.15)	1.33	0.2486
Age [65+ years/50-64 years (ref)]		-0.04	0.07	(-0.18; 0.09)	0.38	0.5379
Marital status [no partner/partner (ref)]		0.12	0.05	(0.02; 0.23)	5.14	0.0236
Education	High school education	-0.34	0.07	(-0.48; -0.2)	21.83	0.0000
	Post-secondary education	-0.22	0.09	(-0.41; -0.04)	5.95	0.0149
	Less than high school (ref)					
Sense of belonging	Belonging to Francophone group	-0.18	0.08	(-0.34; -0.02)	5.02	0.0252
	Belonging to both Anglophone & Francophone groups	-0.09	0.07	(-0.23; 0.05)	1.67	0.1969
	Belonging to Anglophone group (ref)					
Vitality of minority language community [strong/weak (ref)]		-0.16	0.05	(-0.25; -0.06)	9.72	0.0019
Social support	Support from community	0.15	0.05	(0.05; 0.26)	8.43	0.0038
	Support from nobody	0.32	0.12	(0.09; 0.55)	7.46	0.0064
	Support from family & friends (ref)					
Literacy Level (reading) [poor/good (ref)]		0.27	0.06	(0.15; 0.39)	19.98	0.0000
Hours spent watching TV [>14 hrs/<14 hrs (ref)]		0.15	0.05	(0.05; 0.24)	9.74	0.0019
Practice of sports	Practice sports sometimes	-0.15	0.06	(-0.26; -0.04)	6.7	0.0098
	Practice sports often	-0.28	0.07	(-0.42; -0.14)	15.24	0.0001
	Practice sports regularly (ref)					
Community visibility (visibility of language)	Strong visibility	-0.11	0.06	(-0.23; 0.01)	3.25	0.0717
	Medium visibility	-0.09	0.06	(-0.2; 0.02)	2.63	0.1055
	Weak visibility (ref)					
Low income cut-off [below/above (ref)]		0.13	0.06	(0.02; 0.25)	5.07	0.0245
Rural/urban residence [rural/urban (ref)]		-0.07	0.05	(-0.16; 0.03)	1.88	0.171
Concentration of minority group [high/weak to medium (ref)]		0.17	0.06	(0.06; 0.28)	8.87	0.003
Interaction between sex and education level	Age*post-secondary education	-0.28	0.12	(-0.52; -0.04)	5.07	0.0246
	Age*high school education	0.04	0.1	(-0.16; 0.24)	0.16	0.6849

to those living in *weak to medium concentration areas* were more likely to report a poorer self-rated health. However, *strong vitality of minority language community* as opposed to *weak vitality* was associated with better self-rated health.

In the predisposing characteristics component of the Andersen model, the following variables, *marital status, location,* and *sense of belonging,* were found to be significantly associated with self-rated health ($p < 0.05$). With regard to *marital status*, the fact of *having a partner* compared to *having no partner* was associated with a better self-rated health. Also, living in *western provinces* compared to *Ontario* was associated with a better self-rated health. The dummy variable *living in the Maritimes* was not significant. In addition, Francophone seniors who felt they *belonged to the Francophone community* were more likely to rate their health higher than those who felt they *belonged to the Anglophone community*. However, belonging to both groups was not found to be statistically significant. In addition no significant differences were found between men and women and age groups.

In the enabling resources component of the Andersen model, *education, income, literacy level* and *social support* were all found to be statistically significantly associated with self-rated health. In terms of *literacy level*, having *poor reading skills* compared to having *good reading skills* was significantly associated with poorer self-rated health ($p < 0.0000$). Similarly, having an *income below the Low Income Cut-off (LICO)* was found to be associated with poorer self-rated health. *Having no social support* compared to *having support from family and friends* was also associated with poorer self-rated health. However, seniors who received *support from community resources and public institutions* tended to rate their health more poorly compared to those who received *support from family and friends*.

In the health behaviour component of the model, *watching TV for more than 14 hours a week, and physical activity,* were all statistically significantly associated with self-rated health. In fact, *watching TV more than 14 hours a week* compared to *less than 14 hours a week* was associated with poorer self-rated health. Conversely, *practising sports often* compared to *practising sports regularly* was associated with better self-rated health. Similarly, *practising sports sometimes* was also associated with better self-rated health. With regard to the use of health services, both of the following variables, *use of doctor services* and *use of nurse services,* were significantly associated with self-rated health. Unfortunately, *language of service* preference could not be assessed due to a high number of missing cases. As seen in Table 3 below, *seeing the doctor less than three times in a year*, as opposed to *regularly* was associated with better self-rated health. However, *seeing the doctor often* (more than six times a year) compared to *seeing the doctor regularly* (four to six times a year) was associated with a poorer self-rated health. Similarly, *use of nurse services* compared to *no nurse service use at all* was associated with a poorer self-rated health. One would expect then that use of doctor and nurse services is related to greater need and poorer health.

With regard to the interaction between age and education level, a graph of predicted probabilities (See Figure 1 in the Appendix) showed that in general, Francophone seniors aged 65 years and over had a higher probability of poorer self-rated health than those aged 50-64 years regardless of education levels.

Health Services Use by Francophone Seniors as a Determinant of their Self-rated Health

Using a multiple linear regression, a sub-analysis was conducted with a subsample of respondents who had accessed, at least once in the past twelve months, a doctor, a nurse, or any other place of health services. The resulting model (see Table 4) showed that *using hospital services* and *using clinic services* compared to *using no service at all* were each associated with poorer self-rated health. However, *the importance of receiving health services in the minority language* was not significantly associated with self-rated health among minority Francophone seniors who had accessed at least one health service.

Self-rated Health in Francophone Seniors Aged 50-64 Compared to those Aged 65+

As seen in Table 4, the variable *importance of health service in minority language* was not associated with self-rated health for Francophone seniors regardless of age groups. However, use of health services variables such as use of *doctor services* and *use of nurse services* were significantly associated with self-rated health for both age groups. The strength of the association for *doctor services* was similar across age groups but for *use of nurse services* the older age group showed a stronger association with self-rated health. With regard to the *concentration of minority language community*, seniors 65 years and over who lived in *areas of high concentration* as opposed to *weak to medium concentration areas* tended to rate their health more poorly than the younger age group living in the same areas.

Other notable findings include the association between the *vitality of the minority community* and self-rated health. In fact, seniors aged 50-64 who felt that the vitality of their minority community was strong tended to rate their health better than those who felt their community had weak vitality. This association was not significant for the older age group. Also, *receiving social support from community resources and public institutions* and *receiving no support at all* (as opposed to *receiving support from family and friends*) were each significantly associated with poorer self-rated health for the younger age group while not showing any association at all for the older age group. Similarly, *literacy level* and *hours spent watching TV* were all significantly associated to self-rated health for the 50-64 age group while there was no significance at all for the older age group. Conversely, *medium* and *strong visibility of minority language community* as opposed to *weak visibility* were each significantly

Table 4
Explanatory Factors of Self-rated Health of Francophones (by health services and age)

Factors		Francophone seniors outside of Quebec							
		Francophone seniors main		Health services		50-64 age-group		65+ age-group	
		Beta	P-value	Beta	P-value	Beta	P-value	Beta	P-value
Importance of health services [no/yes (ref)]		-0.07	0.1731	-0.04	0.4614	-0.09	0.1682	-0.05	0.4939
Doctor services	Saw doctor less than 3 times	-0.43	0.0000	-0.41	0.0000	-0.43	0.0000	-0.42	0.0000
	Saw doctor often	0.45	0.0000	0.47	0.0000	0.49	0.0000	0.4	0.0000
	Saw doctor regularly (ref)								
Use of nurse services [no/yes (ref)]		0.17	0.0014			0.14	0.0431	0.26	0.0006
Location (rest of Canada)	Western provinces	-0.13	0.0397	-0.11	0.0903	-0.15	0.0783	-0.08	0.3614
	Maritime provinces	0.05	0.3025	0.01	0.7985	0.04	0.5996	0.08	0.2877
	Ontario (ref)								
Location (in Quebec)	Montreal								
	Outside of Montreal (ref)								
Sex [male/female (ref)]		0.05	0.2486	0.04	0.376	0.11	0.093	-0.04	0.5989
Age [65+years/50-64 years (ref)]		-0.04	0.5379	-0.05	0.5015				
Marital status [no partner/partner (ref)		0.12	0.0236	0.13	0.0195	0.14	0.0835	0.07	0.3332
Education	High school education	-0.34	0.0000	-0.31	0.0001	-0.28	0.0003	-0.38	0.0000
	Post-secondary education	-0.22	0.0149	-0.20	0.0226	-0.47	0.0000	-0.27	0.0036
	Less than high school (ref)								
Sense of belonging	Belonging to Francophone group	-0.18	0.0252	-0.22	0.007	-0.21	0.0581	-0.13	0.248
	Belonging to both Francophone & Anglophone groups	-0.09	0.1969	-0.12	0.1036	-0.12	0.222	-0.04	0.6788
	Belonging to Anglophone group (ref)								
Vitality of minority language community [strong/weak (ref)]		-0.16	0.0019	-0.16	0.0018	-0.18	0.0101	-0.13	0.0566

Table 4 (cont'd)

Factors		Francophone seniors outside of Quebec							
		Francophone seniors main		Health services		50-64 age-group		65+ age-group	
		Beta	P-value	Beta	P-value	Beta	P-value	Beta	P-value
Social support	Support from community resources & public institutions	0.15	0.0038	0.20	0.0006	0.17	0.0234	0.13	0.0789
	Support from nobody	0.32	0.0064	0.30	0.0271	0.36	0.0264	0.24	0.1123
	Support from family & friends (ref)								
Literacy level (reading) [poor/good (ref)]		0.27	0.0000	0.29	0.0000	0.38	0000	0.13	0.126
Hours spent watching TV [>14 hrs/<14 hrs (ref)]		0.15	0019	0.13	0.0095	0.2	0.0026	0.06	0.3448
Practice of sports	Practice sports sometimes	-0.15	0.0098	-0.16	0.007	-0.15	0.0282	-0.16	0.0943
	Practice sports often	-0.28	0.0001	-0.28	0.0001	-0.29	0.0009	-0.26	0.0152
	Practice sports regularly (ref)								
Community visibility (visibility of language)	Strong visibility	-0.11	0.0717	-0.11	0.1083	-0.03	0.7155	-0.24	0.0069
	Medium visibility	-0.09	0.1055	-0.10	0.093	-0.04	0.6452	-0.19	0.0162
	Weak visibility (ref)								
Low income cut-off [below/above (ref)]		0.13	0.0245	0.12	0.0561	0.06	0.536	0.21	0.0052
Rural/urban residence [rural/urban (ref)]		-0.07	0.171	-0.06	0.2391	-0.05	0.4086	-0.09	0.1861
Concentration of minority group [high/weak-med (ref)]		0.17	0.003	0.20	0.0006	0.15	0.0406	0.19	0.0251
Interaction between sex and education level	Age*post-secondary education	-0.28	0.0246	0.27	0.0386				
	Age*high school education	0.04	0.6849	0.16	0.9596				
Use of health services (place)	Hospital services			0.27	0.0000				
	Clinic services			0.16	0.0069				
	Other services			0.23	0.0768				
	Used no services (ref)								
		R^2: 0.250		R^2: 0.259		R^2: 0.258		R^2: 0.203	

associated with better self-rated health for the 65+ age group, but no significance was noted for the younger age group. Another important finding was that income was significantly associated with self-rated health for the older age group but not for the younger age group. In fact, being *below the LICO* for Francophone seniors aged 65+ as opposed to being *above the LICO* was associated with poorer self-rated health. Income levels as measured by being either above or below LICO did not affect the 50-64 age group.

Factors Affecting Self-rated Health Appraisal Among Francophone Seniors in Minority Situation Compared to Anglophone Minority Seniors in Quebec

The study also compared the results with Anglophone seniors living in Quebec, the other official language minority group. Table 5 below shows the beta coefficient and the p-values from the multiple linear regression output for Anglophone seniors living in Quebec side by side with that of Francophone seniors. As seen with the Francophone sample, Anglophone seniors living in Quebec were more likely to report poorer self-rated health if they used health services or used them more frequently.

For Anglophone seniors living in Quebec, the *importance of receiving health services in the minority language* was significantly associated with self-rated health. This was not the case for Francophone seniors outside of Quebec. Among Anglophone seniors in Quebec, those who reported that it was *not important to access health services in the minority language* were more likely to report a poorer self-rated health than those who thought it was important to do so.

With regard to the *concentration factor of the minority community*, and unlike the finding in the Francophone minority community, there was no significant association derived from the multiple linear regression model. Also surprisingly, *living in Montreal* as opposed to *living outside of Montreal* was not significantly associated with self-rated health.

Differences observed between the two populations with regard to other explanatory variables showed that *marital status*, *sense of belonging to the minority language community*, *social support* and *hours watching TV* were significantly associated with self-rated health among Francophone seniors outside of Quebec but not among Anglophone seniors in Quebec.

With regard to the interaction between age and education level, a graph of predicted probabilities (see Figure 2 in the Appendix) showed that generally, as was the case with Francophone seniors, Anglophone seniors aged 65 years and over had a higher probability of poorer self-rated health than those aged 50-64 years regardless of education levels.

Table 5
Comparing Factors Associated with Minority Francophone Seniors' Self-rated Health with that of Anglophone Seniors

Factors		Francophone seniors outside QC		Anglophone seniors in QC	
		Beta	P-value	Beta	P-value
Importance health services [no/yes (ref)]		-0.07	0.1731	0.25	0.0028
Doctor services	Saw doctor less than 3 times	-0.43	0.0000	-0.33	0.0000
	Saw doctor often	0.45	0.0000	0.46	0.0000
	Saw doctor regularly (ref)				
Use of nurse services [no/yes (ref)]		0.17	0.0014	0.16	0.0182
Location (rest of Canada)	Western provinces	-0.13	0.0397		
	Maritime provinces	0.05	0.3025		
	Ontario (ref)				
Location (in Quebec)	Montreal			-0.05	0.5006
	Outside of Montreal (ref)				
Sex [male/female (ref)]		0.05	0.2486	0.03	0.6375
Age [65+ years/50-64 years (ref)]		-0.04	0.5379	0.02	0.8175
Marital status [no partner/partner (ref)		0.12	0.0236	0.08	0.21
Education	High school education	-0.34	0.0000	-0.09	0.3015
	Post secondary education	-0.22	0.0149	-0.24	0.011
	Less than high school (ref)				
Sense of belonging	Belonging to Francophone group	-0.18	0.0252	0.16	0.1922
	Belonging to both Francophone & Anglophone groups	-0.09	0.1969	0.12	0.032
	Belonging to Anglophone group (ref)				
Vitality of minority language community [strong/weak (ref)]		-0.16	0.0019	-0.01	0.8914
Social support	Support from community resources & public institutions	0.15	0.0038	0.07	0.307
	Support from nobody	0.32	0.0064	0.23	0.0981
	Support from family & friends (ref)				
Literacy level (reading) [poor/good (ref)]		0.27	0.0000	0.26	0.0000
Hours spent watching TV [>14 hrs/<14 hrs (ref)]		0.15	0.0019	0.08	0.1319
Practice of sports	Practice sports sometimes	-0.15	0.0098	-0.13	0.0352
	Practice sports often	-0.28	0.0001	-0.27	0.0028
	Practice sports regularly (ref)				
Community visibility (visibility of language)	Strong visibility	-0.11	0.0717	-0.13	0.0863
	Medium visibility	-0.09	0.1055	-0.05	0.4906
	Weak visibility (ref)				
Low income cut-off [below/above (ref)]		0.13	0.0245	0.25	0.0002
Rural/urban residence [rural/urban (ref)]		-0.07	0.171	-0.07	0.3319
Concentration of minority group [high/weak to medium (ref)]		0.17	0.003	0.08	0.264
Interaction between sex and education level	Age* post-secondary education	-0.28	0.0246	-0.25	0.0639
	Age* high school education	0.04	0.6849	-0.28	0.024
		R^2: 0.250		**R^2: 0.180**	

Discussion

According to the findings above, linguistic minority status combined with other factors affect the self-rated health of minority Francophone seniors living in Canada. However, it is surprising that linguistic minority status is not independently associated with self-rated health. Our study also confirmed the association between use (or increased use) of health services and declining (self-rated) health. This association even remained within the age group models. Finally, this study demonstrated that seniors' experience from both official language minority groups is similar, but also presents a few significant differences between Anglophones in Quebec and Francophones outside of Quebec. No significant differences were found between male and female seniors.

For official language minority seniors living in Canada, this study confirmed the association between their self-rated health and variables commonly known to determine health such as income, education, and other socio-economic status variables (World Health Organization, 2010). For minority Francophone seniors, strong *vitality of minority language community*, *sense of belonging to the francophone community*, strong *visibility of minority community*, and high *literacy levels* were independently positively associated with self-rated health. Conversely, self-rated health was negatively associated with li*ving in high concentration minority community areas, finding it important to have health services in the minority language, receiving social support from community resources and public institutions, and using health services*.

Under normal circumstances, living in high concentration areas for minority community members should be the source of increased health benefits such as reduced mortality and better health due to better access to health services in general and hopefully in the minority language (Stafford, Becares, & Nazroo, 2009; Pickett & Wilkinson, 2008). However, in the case of seniors living in rural areas and facing declining independence and deteriorating health, a move to the city is often prompted by the desire to access specialized services more readily within reasonable driving distances (Garretson, Walline, Heisler, & Townsend, 2010; Casey, Call, & Klinger, 2001). This trend of seniors moving to cities as a result of their declining health may lead to the false impression that high concentration areas are a risk factor for poorer health (Davenport, Rathwell, & Rosenberg, 2009). In fact, Francophone seniors living in a minority situation with poorer health status seek services where they are available and often move in assisted living situations available in higher concentration areas. It has also been argued that lack of health services in rural and remote areas does not necessarily translate into poor health. In fact, community social support, close ties as well as a deep and shared understanding of community may play an important role in the overall sense of health and well-being (Skinner et al., 2008). A study looking at health status and racial minority concentration found that there was no association for ethnic groups

except for older whites aged 65-74 years (Mellor & Milyo, 2004). In the current study, the association between concentration of minority language community and self-rated health remained for both Francophone age groups 50-64 years and 65 years and over. However, with Anglophones in the Quebec sample, no association was found between concentration of minority community and self-rated health. This finding corroborates other studies that have identified no association between area density of ethnic minority groups and self-rated health (Karlsen, Nazroo, & Stephenson, 2002). It appears therefore that other factors play a more important role than the concentration factor itself – factors such as the characteristics of the minority community environment which may include the visibility of the minority community or the vitality of the minority community, and the availability and accessibility of health services in the minority language.

It is clearly established in the literature that social support contributes significantly to health status. However, the question about who provides social support seems critical. As the study results suggest, support from community resources and public institutions, for example, may not be adequate in many cases. Although community support is often valued, it may not live up to the perceived expectations of residents. Looking at the impact of community support on health, Skinner et al. (2008) concluded that there is a great deal of complexity and ambiguity with regard to the understanding of community and the support role the community may play in the lives of seniors.

Among the sub-group of respondents who used health services, doctor services and nurse services, each service utilization variable was significantly associated with poorer self-rated health. In the literature, both using health services and not having access to health services have been found to be associated with poorer self-rated health. The association between use of health services or higher frequency of use of health services and poorer self-rated health may be due to the fact that those using health services are already in poor health (Cicero et al., 2009; Katz et al., 1997). On the other hand, not using health services as a result of not having access to health services has also been found to be associated with poorer self-rated health (Hong et al., 2004). The issue may lie in determining when not using health services is due to barriers to access rather than not accessing health services due to good health. However, in the Canadian context where universal healthcare is supposed to ensure access to health services to all, we can reasonably understand why not using health services in this study was associated with better self-rated health. Studies such as that of Turner et al. found that there was an 87% increase in the odds of reporting poor self-rated health among people without private health coverage in the U.S. compared with those with such additional health coverage (Goins, Hays, Landerman, & Hobbs, 2001). The relationship between access to health services, language, or other determinants, and self-rated health may be bidirectional as some studies have suggested. Just as these determinants affect self-rated health, so does self-rated health have an impact on them in return. For example, in a

New Zealand study, Flett and colleagues looked at the predictors of health care utilization in the local ethnic community of Maori elders and found that self-rated health was a significant predictor of doctor visits (Flett, Hirini, Long, & Millar, 2004). Prospective studies rather than cross-sectional studies such as this one may be more adequate in determining the direction of the association between health services use and self-rated health.

Not much research has been published with regard to the importance of receiving health services in the minority language. However, it is known in general that good, effective or satisfactory clinician-patient communication with seniors is associated with better health outcomes (Bluestein & Rutledge, 2006; Bayliss, Ellis, & Steiner, 2007; Miura, Kariyasu, Yamasaki, & Sumi, 2004). In fact, language barriers can lead to disparities in the health of minority populations compared to the general population (Health Canada, 2007; Diel, Westwick, Badgett, Sugarek, & Todd, 1993; Fiscella, Franks, Doesher, & Saver, 2002; Gerrish, 2000; Donaldson, 1986). This may explain why descriptive and multivariable analyses showed that seniors who considered that it was important to receive health services in the minority language tended to have poorer self-rated health than those who did not think that it was important. Importance given to access to health services in the minority language may be more indicative of a felt need, a deep desire to be served in the language in which seniors are most comfortable, rather than simply an insignificant or an unimportant desire, that these respondents consider that receiving health services in their language is an integral part of their quality health care. If minority Francophone seniors who find it important to have health services in the minority language are expressing a felt need that is not being met or satisfied, this lack of provision may actually contribute to their poorer health status.

With regard to age groups, our research did not show a marked difference between those 50-64 years old and those 65 years and over, except for an increased strength of the association generally noticeable for the older age group. This suggests that as age increases, so does the use of health services due to poorer health. This finding corroborates the universally accepted fact that with age comes declining health status (Chen, Cohen, & Kasen, 2007; Martel & Belanger, 2000; Rice & Feldman, 1983; Wise, 1997).

A comparison with minority Anglophone seniors living in Quebec based on the multivariable analysis models showed that the two linguistic groups may have in common their minority status and face similar challenges such as language issues with regard to access to and use of health services. However, their contexts are very different. Contrary to minority Francophone seniors who are spread over a larger geographic area, minority Anglophone population groups in Quebec enjoy a closer proximity to one another The Francophone population outside of Quebec may also be more diverse than the Anglophone population in Quebec. It is also important to note that the Anglophone population clustered around

Montreal is unique and only in New Brunswick is there an equivalent and comparable Francophone concentration. The rest of the Francophone population is often made up of small pockets of Francophones whose number is negligible. These contextual realities, among others, impact on the provision of, access to, and use of health services as well as on the appraisal of one's health. This may be helpful in explaining some of the ambiguities in the findings.

This study presents several limitations. The cross-sectional design prevents us from knowing the direction of the association and whether or not the independent variables preceded the outcome variable. We also found that we could not use many of the variables deemed important for this study because of a high number of missing cases. Questions that could have been asked to all the survey respondents were asked only to a few, hence limiting the usefulness of the questions. With a low R-square value of 0.250 the multiple linear regression model was able to explain only 25% of the variation in the outcome variable *self-rated health*. As indicated above, this is probably due to the fact that data on some key variables in the "need" component of the Andersen model of health services use were not available. Ideally, a multiple linear regression model should include continuous variables and not categorical variables. Multinomial logistic regression was considered. However, the high number of cells with small frequencies excluded such a possibility. As a result, the use of multiple linear regression with solely categorical variables might have impacted on the magnitude of the linear correlation between variables and on the low R-squares observed. Breakdown points for categorical variables recoded as binary or dummy variables may not have been adequately chosen and this may lead to bias or outliers (Blankmeyer, 2006). In this study, breakdown points were chosen with circumspection and attention was paid to frequency distribution before transforming variables with more than two categories into binary variables. Moreover, the versatility and robustness of multiple linear regressions still yielded a solid and adequate statistical model that met all the key assumptions as noted above. A final limitation is the fact that this study does not allow for comparability with the majority population since the survey was only carried out within the official language minority populations and not among the general Canadian population.

Conclusion

Despite these limitations, this study which benefits from a strong sampling design, confirms some of the common variables associated with self-rated health in vulnerable populations. However, it fails to build a more robust explanatory model that would explain more than 25% of the variance. Factors such as the use of health services, the concentration of the minority community, and the importance of health services in French, all of which are relevant in the Canadian context, were found to uniquely impact the self-rated health of minority Francophone seniors. Our study highlights the importance of key aspects of

official language minorities such as the sense of belonging to the community, the vitality of the minority community, and the concentration of the minority community as factors that affect seniors' self-rated health as well as access to and use of health services. Policies facilitating greater connectedness among seniors of official language minority status, and increased institutionalization of services and activities would enhance the vitality and minority density and, by the same token, help improve their health status. It is hoped that further studies will be carried out to generate a more in-depth understanding of how concentration of minority community and importance of health services in the minority language affect the self-rated health of official language minorities in Canada.

The health status of official language minority seniors throughout Canada might improve greatly by: improving the official language minority community linguistic environment, facilitating access to health services in the minority language, enhancing community vitality and community visibility, pooling minority language community resources together, and working towards an increased sense of belonging to the minority language community.

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Mots clés

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Contact

Hubert Tote Alimezelli
ali.tote@usask.ca

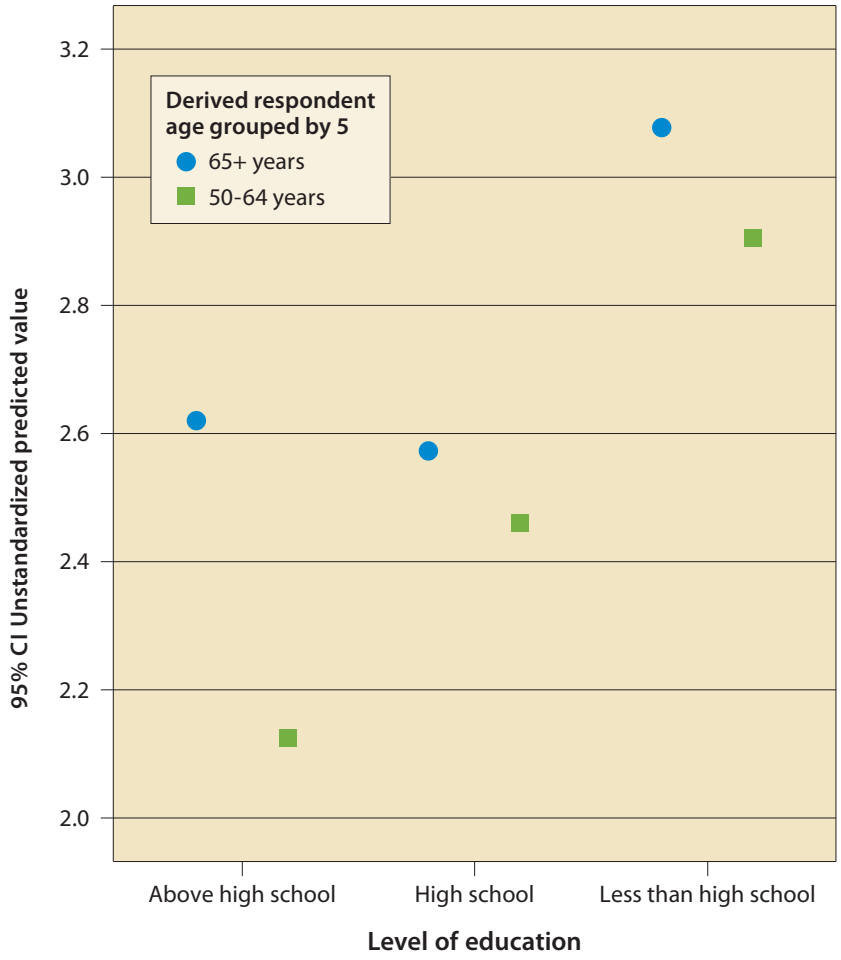
Anne Leis
anne.leis@usask.ca

Chandima Karunanayake
cpk646@mail.usask.ca

Wilfrid Denis
wdenis@stmcollege.ca

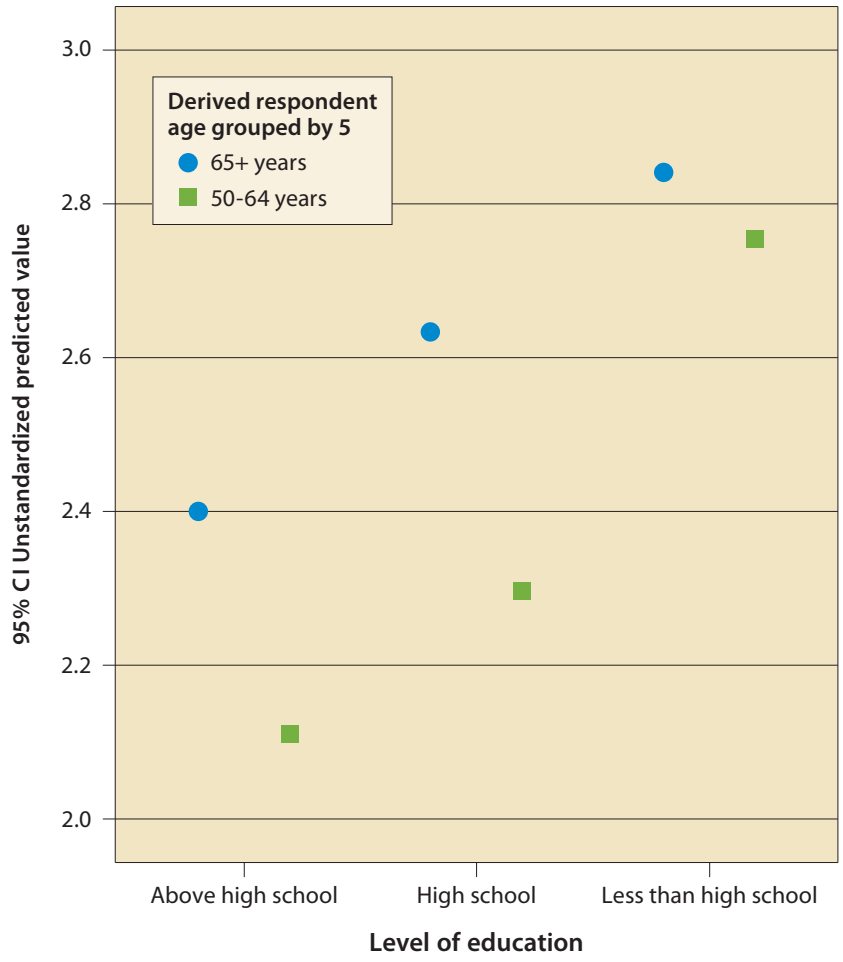
Appendix

Figure 1
Graph of Predicted Probabilities for Francophone Seniors Outside of Quebec



Cases weighted by Weight to apply to all SVOLM records

Figure 2
Graph of Predicted Probabilities for Anglophone Seniors in Quebec



Cases weighted by Weight to apply to all SVOLM records