Health Status and Health Services Utilization of Canada's Immigrant and Non-Immigrant Populations

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Ce document compare l'état de santé des immigrants et leur utilisation des services de santé à ceux de la population d'origine canadienne à l'aide de données provenant de deux cycles (1985 et 1991) de l'Enquête sociale générale (ESG). Les résultats obtenus démontrent que l'état de santé des immigrants de même que leur utilisation des services de santé ne sont pas significativement différents de ceux de la population d'origine canadienne. Lorsque nous combinons les cycles de l'ESG, les résultats révèlent que l'état de santé et l'utilisation des services de santé par les immigrants n'ont pas changé dans le temps.

This paper compares the health status of immigrants and their utilization rates of health services to those of the Canadian-born population using data contained within two cycles (1985 and 1991) of the General Social Survey (GSS). Our main results show that neither the health status of immigrants nor their utilization rates of health services differ significantly from those of the Canadian-born population. When both data sets are pooled, the estimated results show that immigrants' health status and their use of health services have remained unchanged over time.

INTRODUCTION

Canada has historically relied on immigration to sustain its demographic and economic growth. Over the years, researchers from various fields have studied the economic status of immigrants and their impact on the Canadian economy. This paper extends the analysis of immigration in Canada to a virtually untouched area: health. More precisely, this paper compares analytically the health status of immigrants and their utilization of health services to those of the Canadian-born population, using data from two cycles (1985 and 1991) of the General Social Survey (GSS).[1]

Good health affects a person's ability to work and to realize fully his/her economic potential. In Canada, every immigrant applicant is subject, under the *Immigration Act*, to a mandatory medical examination. The object of this medical assessment is to determine whether immigrant applicants are likely to be a danger to public health or safety, and whether their admission might cause excessive demands on Canadian health or social services. While the immigration legislation ensures a satisfactory health condition for those entering the country, it cannot guarantee the maintenance of such a condition through time. The question then arises as to how the health of the immigrant population compares to

that of the Canadian-born population once the new-comers have been in the country for a number of years. One can push this issue further and ponder on possible differences in the utilization rates of health services by both populations. Answering these questions will help policymakers assess the impact of immigration on the health-care system and other publicly funded services, the accessibility of these services to newcomers to this country, the efficiency of the health-screening policy in place, as well as to evaluate the potential economic contributions of immigrants to the Canadian economy, since it is affected by their health status. By scrutinizing the health status and health services utilization of immigrants and non-immigrants at two different points in time and by using a number of alternative measures of health status and health services utilization (described below), the analysis presented in this study allows us to evaluate the assimilation effects and the possible convergence in time of the health status and health services utilization of immigrants and non-immigrants in Canada.

The second part of this paper outlines the evolution of Canadian immigration policy and the composition of Canada's immigrant population. Section three details the medical assessment by which immigrant applicants are evaluated. The fourth section summarizes the literature regarding relevant health and immigration issues. Section five presents the methodology and data used, and the next section presents and discusses the empirical results. Our main results show that neither the health status of immigrants nor their utilization rates of health services differ significantly from those of the Canadian-born population. When the data sets from the two GSS cycles are pooled, the estimated results show that immigrants' health status and health services utilization patterns have remained unchanged over time. The final section provides concluding remarks.

IMMIGRATION POLICY AND THE CHANGING COMPOSITION OF CANADA'S IMMIGRANT POPULATION

Over the years, the composition of Canada's immigrant population has changed drastically. In 1962, the federal government replaced its immigration policy based on national origin with a policy that selected immigrants according to a specific set of criteria. The establishment of this new non-discriminatory immigrant selection process was followed in 1967 by the introduction of the so-called Point System, which is still in place today. In Canada, immigrant candidates can enter the country as either non-refugee or refugee immigrants. Non-refugee applicants enter the country under three categories characterized by different entry requirements. First, independent and business immigrant candidates are allowed in the country based on their potential contribution to the economy, as evaluated by the Point System, and by their investment capacity, respectively. The Point System allows immigration authorities to select objectively immigrants according to the demand for various skills and occupations within the Canadian economy. Points are awarded based on a candidate's age, education, training, experience, personal suitability, occupational demand, arranged employment, and knowledge of official languages. Second, non-refugee applicants can enter the country under the family reunification classification. In this category, immigrant selection is solely based on kinship ties. Generally, these prospective immigrants are close relatives of those who have already successfully migrated to Canada, and they often do not enter the labour force. Finally, more distant relatives can enter the country under the assisted relative classification. These candidates are assessed through the Point System because they are likely to enter the labour force. However, the presence of relatives in Canada provides bonus points to these prospective immigrants. Finally, Canada also admits, without any economic assessment, convention refugees and individuals in refugee-like situations for humanitarian purposes.

Independent immigrants dominated the inflow of population to Canada until 1974, the year in which the federal government made it more difficult for independent applicants to immigrate. Their entry into Canada then became linked to having at least one point in the occupational demand category of the Point System (Green and Green 1995). The *Immigration Act* of 1978 reaffirmed the 1974 regulations that linked the entry of independent applicants to strict labour market requirements and facilitated the entry of a large number of refugees into the country. The various policy changes relative to the entry requirements of immigrants into the country have shifted Canada's immigration population inflow from its traditional sources of immigrants, in particular Great Britain and Eastern Europe, toward less-developed regions of the world, such as Asia and South/Central America. The proportion of incoming British immigrants to Canada has declined from 27 percent in the 1956-62 time period to 9 percent in the 1977-90 time period. Conversely, the proportion of incoming Asian immigrants has increased from 3 percent to 42 percent during the same periods. Moreover, the inflow of immigrants has changed over time with respect to the categories of immigrants entering the country. The changes in Canada's immigration policy since 1974 have lead to an increased emphasis on family reunification and humanitarian principles, thereby decreasing the proportion of economic immigrants entering the country. Appendix 1 illustrates recent Canadian immigration trends (1970 to 1993) by category of immigrants and by year of landing.

CANADA'S IMMIGRATION HEALTH POLICY

Under the *Immigration Act*, every immigrant applicant needs to undergo successfully a medical examination in order to immigrate to Canada. This medical assessment evaluates the admissibility of each applicant using five criteria: risk to public safety or public health, expected demand on health or social services, response to medical treatment, public health surveillance, and potential employability or productivity. More specifically, each applicant is assessed according to their medical history and to a mental as well as physical examination, which includes, among other things, a blood and urine analysis, as well as a chest x-ray.

According to section 19(1a) of the *Immigration Act*, applicants will be judged inadmissible to immigrate if they are likely to be a danger to public safety or health, or if their admission could generate excessive demands on health or social services.[2] For example, a person will be considered a danger to public health if he/she has active tuberculosis or an untreated or incompletely treated venereal disease. With respect to excessive demands on health or social services, medical officers typically assess the situation using a five- to ten-year window. As a rule, immigrant applicants will be made inadmissible under the excessive demands clause if their expected usage of health services exceeds that of the average Canadian (evaluated as $2,500/year); if their admission may displace a Canadian resident from obtaining services; or if the required services are not available and/or accessible. Examples of illnesses that may generate excessive demands on health and/or social services are infantile autism, most malignancies, any condition requiring long-term or permanent institutional care, any disease requiring dialysis or major organ transplant therapy, HIV infection, and severe neurological diseases, such as Alzheimer's and severe multiple sclerosis. Thus, prospective immigrants who have an illness (e.g., minor degree of arthritis, some cases of diabetes, and inactive tuberculosis) that is deemed not to constitute a danger to public health or safety and that will not generate excessive usage of health and social services will be admitted to Canada if they satisfy all other immigration requirements. Medical officers, however, may require that applicants be followed medically once in Canada.

The medical assessment of potential immigrants by no means completely screens out all candidates

with medical conditions. Rather, it filters out the severe cases that are likely to endanger the Canadian population and/or cause an excessive burden on the health-care system and on social services. In 1996, only 1.7 percent of all potential immigrants were judged inadmissible on the basis of the results of their medical examination, of which 86 percent could be considered for future admission.[3] It should thus be clear that the nature of the medical evaluation of prospective immigrants does not ensure, *a priori*, that incoming immigrants to Canada are in necessarily better health than is the average Canadian-born.

LITERATURE REVIEW

An important and often neglected issue in the empirical study of immigration is the health of immigrants. Trovato (1985) concludes that, overall, there is only a minimal disparity between the mortality rates of foreign-born and native-born Canadians, but that wider differences emerge when the two populations are broken down into more specific groupings. In a more recent study, Chen, Wilkins and Ng (1996) find that Canada's immigrants typically have more years free of disability and longer life expectancies than their non-immigrant counterparts. Furthermore, Chen, Ng and Wilkins (1996) conclude that immigrants are generally in better health than are non-immigrants.[4] Yet, immigrants who are women or who have declared either a low household income or unfinished secondary education are more likely, as is the Canadian-born population with the same characteristics, to suffer from long-term disabilities than is typical of men with a high household income or high educational attainment. House *et al.* (1990) obtain similar results when estimating the health status of non-institutionalized Americans 25 years of age or older.[5] These authors also find that the different measures of health status vary strikingly by socio-economic status, and that individuals in the low socio-economic strata are more likely to suffer from chronic illnesses and func-

tional limitations by middle-adulthood than is typical of individuals in higher economic strata.

Canada's immigrant population has become a mosaic of cultures, rich in traditions and experiences. Many of these newcomers are unfamiliar with our type of health care and/or are unable to communicate effectively in either official languages, thereby making access to care more difficult. Moreover, cultural differences and various beliefs about health and medicine, along with the potential lack of knowledge or sensitivity by health-care providers, can raise cultural barriers that interfere with the delivery of adequate medical services.[6]

While the questions of tax payments and the consumption of public services by immigrants have been the focus of numerous studies,[7] there exist only two other Canadian studies addressing the impact of immigrants on the health-care sector. Chen, Ng and Wilkins (1996) find that, when adjusting for age, the hospitalization rates of non-European immigrants are significantly lower than are those of both European immigrants and of non-immigrants, and that immigrants and non-immigrants have a similar utilization rate of general practitioners' services. In a recent study conducted with data from the 1990 Ontario Health Survey (OHS), Wen, Goel and Williams (1996) find that immigrants and other ethnic/cultural groups are more likely to consult a general practitioner, but less likely to visit hospital emergency departments than are native-born Canadians. Native-born Canadians and immigrants tend to have similar visiting patterns with respect to specialists.[8] While these studies tend to suggest that immigrants and non-immigrants generally use medical services in a similar fashion, they, along with the present study, do not capture the difficulties encountered by immigrants in accessing them, nor the extent of their unmet needs.

More generally, Hung and Phu (1980) estimated the determinants of the utilization rate of medical services for the population of the province of

Quebec. Their results reveal that age and sex, followed by income, constitute the major determinants of the utilization rate of medical services. Recently, Hamilton, Hamilton and Grover (1994) updated a study published by Enterline *et al.* (1973) on the utilization rate of physician services in Montreal in 1971, by using the 1991 cycle of Statistics Canada's General Social Survey (GSS). The authors report considerable variations in the mean number of physician visits per person per year across provinces, ranging from 3.38 physician visits in Quebec to 4.84 physician visits in British Columbia.[9] Additionally, Hamilton, Hamilton and Grover's analysis confirms the negative relationship between income and the number of physician visits found in Enterline *et al.*'s 1973 study. This negative relationship between income and the number of consultations with a physician was also found in the United States (Hamilton, Hamilton and Grover 1994) and in Ireland (Nolan 1993).

DATA AND METHODOLOGY

Two data sets were used to evaluate the health status and utilization rates of health services by Canada's immigrant and non-immigrant populations. The 1985 and 1991 cycles of the GSS provide information on the respondents' health condition, on their usage of health services in the 12 months prior to the survey, as well as on socio-economic characteristics. The surveys include interviews with 11,200 and 11,924 non-institutionalized Canadians 15 years of age or older, respectively.[10] There are approximately 1,700 immigrants in each survey (Table 1). Residents of the Yukon and the Northwest Territories were excluded from both surveys. Since individuals included in both GSS cycles are not simple random samples of the target population, weights developed by Statistics Canada were used to adjust the quantitative estimates presented in this paper. We also generated robust estimators of variances to take into account the fact that the data are weighted and that the residuals might not be identically distributed (White 1980).

Health Status

The estimates of health status obtained in this analysis have been derived using three self-reported measures of health status: *Health*, *Dvhealth* and *Actlim*. Since self-reported health variables indicate perceived health rather than actual health, measurement errors may occur and represent a source of bias in the results (Butler *et al.* 1987; and Bound 1991). The first measure, labelled *Health*, is unquestionably the most subjective measure of health status used in this paper. This variable describes the health status of respondents by qualifying it in categories that range from "excellent" to "poor."[11] Smaller values of *Health* indicate good health, while poor health is described by larger values of this variable. The second measure, called *Dvhealth*, is a binary variable, taking the value of one if the respondent has at least one health problem, and taking the value of zero otherwise. An individual is said to have a health problem if he/she answered positively to at least one of a series of questions inquiring about the following chronic illnesses: heart trouble, diabetes, respiratory problems, and rheumatism/arthritis. Finally, the third measure of health status, *Actlim*, takes the value of one if the respondent suffers from any long-term activity limitations and of zero otherwise. All of these measures have been previously used in the literature as measures of health status (House *et al.* 1990; Nolan 1993; and Wen, Goel and Williams 1996).

All three measures of health status were regressed on a series of explanatory variables from each survey, as well as on a pooled data set from the two surveys, using a probit estimation method for the dependent variables *Dvhealth* and *Actlim*, and an ordered probit estimation method for the variable *Health*.[12] The (ordered) probit approach attempts to explain an observable discrete "event" (e.g., the presence of an illness, as opposed to the continuous number of days with this illness). These models are generally estimated using a maximum likelihood approach that maximizes the probability of replicating the discrete "events" observed in the

Sample Means by Selected Socio-Economic Characteristics, 1985 and 1991 GSS

	1985 GSS		1991 GSS	
Variables	Total Population	Immigrant Population	Total Population	Immigrant Population
Health Services				
Number of consultations				
– Physician	2.80	3.28	3.22	3.56
– Specialist	0.89	0.87	0.86	0.90
– Nurse	0.48	0.63	0.68	0.59
Time spent in the hospital	0.67	0.64	0.90	1.01
Health Status				
Health status	1.88	1.91	2.34	2.38
Derived health status	0.32	0.33	0.32	0.30
Activity limitation	0.12	0.13	0.11	0.09
Sex				
Female	0.51	0.50	0.51	0.48
Male	0.49	0.50	0.49	0.52
Ethnic Origin*				
French	0.28	0.04	0.31	0.04
British	0.44	0.28	0.42	0.23
Other	0.40	0.71	0.47	0.76
Mother Tongue				
English	0.58	0.37	0.56	0.31
French	0.26	0.05	0.26	0.03
Other	0.15	0.56	0.17	0.66
Education				
Some secondary or less	0.35	0.37	0.34	0.32
Secondary education	0.15	0.14	0.16	0.16
Some post-secondary	0.30	0.21	0.16	0.18
Post-secondary degree or diploma	0.20	0.25	0.31	0.33
Age	40.72	46.65	41.92	46.52
Household Income				
Less than 10,000	0.10	0.11	0.05	0.05
10,000 to 19,999	0.19	0.19	0.15	0.18
20,000 to 39,999	0.37	0.40	0.31	0.32
40,000 and over	0.33	0.31	0.49	0.45
Sample Size	11,200	1,772	11,924	1,740

Note: * Means do not sum to one since the respondent could report more than one ethnic origin.

sample. The ordered probit estimation method was preferred to Ordinary Least Squares (OLS) since, with the former approach, the categorical dependent variable can be evaluated on a non-linear scale, that is, the categories can be ranked into unequally spaced discrete intervals. An extensive number of explanatory variables, selected on the basis of previous findings, were used in the estimation of each regression. The selected explanatory variables were sex, cohort of arrival, country of origin, weight, type of smoker, province of residence, age, age-squared, marital status, number of children, expected household income, education, ethnicity, labour force status, occupation, and mother tongue.[13] Since causality between income and health flows in both directions, failing to account for this endogeneity will tend to overstate the impact of income on health status (Ettner 1996; Penrod 1997).[14] In order to account for this dual causality, we used expected household income in our health status estimations to eliminate the contemporaneous correlation between household income and the error term. To instrument household income, we first regressed it on a number of explanatory variables, such as sex, occupation, and marital status, and then used the results to generate expected values of household income.[15] The occupation variable was chosen to assess the impact of an individual's type of work on his/her health. Interaction dummy variables were created to allow the impact on health of having children and being single, divorced, married or widowed to vary between men and women. Moreover, as shown in Table 1, immigrants and non-immigrants tend to have, on average, different socio-economic characteristics. For example, immigrants tend to consult general practitioners more often and to perceive their health as being in worse condition than do their native counterparts. Furthermore, between about one-half to two-thirds of the immigrant population did not have English or French as their mother tongue, compared with approximately 15 percent for the total population. To account for these differences, we introduced a series of interaction variables between immigration status and expected household income, education, mother tongue, age, age-squared,

and ethnic origin. A descriptive list of all explanatory variables used can be found in Appendix 2.

Utilization of Health Services

Both cycles of the GSS provide information on the number of nights spent in a hospital as well as the number of visits by respondents to a general practitioner, a medical specialist or a nurse during the 12 months preceding the time of the interviews. The four dependent variables used in this study are the number of visits to general practitioners (*GP*), specialists (*Spec*) and nurses (*Nurse*), and time spent in the hospital (*Timehosp*).[16] The estimation of the number of consultations with three different health professionals characterized by different levels of accessibility will give us a broad picture of the use of health-care services by the Canadian population.[17] The average number of nights spent in a hospital by the Canadian population was approximately 0.7 in 1985 and 0.9 in 1991, while the average number of visits to a health-care professional (general practitioner, specialist, and nurse combined) was 4.2 in 1985 and 4.8 in 1991. While these numbers gave us, *a priori*, the impression that respondents spent, on average, more time in the hospital and consulted health professionals more frequently in 1991 than in 1985, this increase partly reflects the different levels of censoring for each dependent variable in each survey. In 1985, the maximum number of visits to each of the three types of health professional (general practitioner, specialist, and nurse) which survey respondents could report was 27. In 1991, respondents could report up to 52 visits to each health professional. For the length of stay in hospitals, the data were censored in 1985 at 15, but were not censored in 1991.[18]

Since many respondents reported having no contact with a health professional and/or spending any time in a hospital during the 12 months prior to the interview, a large number of observations are clustered at zero.[19] Consequently, OLS estimation method cannot be used in this analysis, as the resulting estimates could be subject to bias (Nolan 1993). Instead, in order to accommodate the data's

censored nature, a *two-limit tobit* estimation procedure was used to regress the length of stay in a hospital and the number of visits to general practitioners, specialists, and nurses on the explanatory variables. The explanatory variables for the utilization of health services regressions were sex, cohort of arrival, country of origin, province of residence, weight, type of smoker, age, age-squared, marital status, number of children, household income, education, ethnicity, labour force status, occupation, and mother tongue. Once again, interaction dummy variables were created between the variables female, marital status, and number of children, as well as between immigration status and household income, education, age, age-squared, mother tongue, and ethnic origin.

PRESENTATION AND DISCUSSION OF EMPIRICAL RESULTS

The results presented in this section allow us to compare the health status and utilization rates of health services of the immigrant and non-immigrant populations, as well as to verify the importance of age, education, and other key socio-economic characteristics in the determination of a person's health status and utilization rates of health services, regardless of his/her immigration status. Estimated results from the health-status equations are presented first, followed by the results obtained from the utilization of health services equations, and then by those of the pooled regression results.

Health Status

Coefficient estimates and t-statistics for the three measures of health status, *Health*, *Dvhealth*, and *Actlim* are reported in Tables 2 and 3 for 1985 and 1991, respectively. The presence of an asterisk beside a reported t-statistic indicates that the variable is significant at the 95 percent confidence level.[20]

These results suggest that, overall, there are no significant differences between the health status of immigrants and non-immigrants, regardless of the survey year.[21] Furthermore, the inclusion in 1991 of six dummy variables indicating the respondents' place of birth shows that it does not generally have a significant impact on health status when *Health* and *Dvhealth* are used as dependent variables. When *Actlim* measures health status, the results suggest that individuals born in South/Central America, the Caribbean, Europe or Asia are less likely to suffer from long-term activity limitation than are native-born Canadians, a result similar to that of Chen, Wilkins and Ng (1996).

For both survey years, the estimated coefficients on the variable "age" are highly significant, indicating that health deteriorates as one gets older.[22] The impact of age on health status does not, however, generally differ between immigrants and non-immigrants. The only significant relationship was found in 1991, when health status was measured with the presence of at least one chronic disease (*Dvhealth*): as immigrants grow older, their probability of suffering from a chronic disease increases at a declining rate. Moreover, educational attainment and expected household income play an important role in the determination of one's health status.[23] Higher incomes and educational attainments are associated with better health, particularly in 1991. For the 1985 GSS, the estimated coefficients on education were jointly significant for the dependent variable *Health*. In 1991, the estimated coefficients on education are jointly significant in both the *Health* and *Dvhealth* equations. With respect to expected household income, for both surveys, individuals with high expected incomes were less likely to report suffering from long-term activity limitations than were those with low expected household incomes. In 1991, Canadians with high expected household incomes perceived themselves as being in better health than did those with low expected household incomes. For both survey years, and regardless of the health-status measure used, the impact of both educational attainment and expected household income on health status is not significantly different for immigrants and non-immigrants.

T<small>ABLE</small> 2

Estimated Coefficients for Health Status (t-ratios in parentheses) – 1985 GSS
Ordered Probit and Probit Regressions

Independent Variables	Dependent Variables			Independent Variables	Dependent Variables		
	Health	Dvhealth	Actlim		Health	Dvhealth	Actlim
intercept	-	-2.635	-2.284	educ3	-0.218	-0.135	-0.154
		(-6.012)*	(-4.191)*		(-2.887)*	(-1.507)	(-1.132)
female	-0.104	0.189	0.117	educ4	-0.317	-0.179	-0.014
	(-1.144)	(1.593)	(0.817)		(-3.761)*	(-1.764)	(-0.113)
coh0554	-0.521	-0.868	-0.131	educ2im	-0.057	-0.222	-0.071
	(-0.662)	(-0.835)	(-0.117)		(-0.309)	(-0.956)	(-0.250)
coh5569	-0.432	-1.040	-0.312	educ3im	0.078	0.027	-0.018
	(-0.552)	(-1.007)	(-0.273)		(0.419)	(0.122)	(-0.065)
coh7079	-0.332	-0.943	-0.076	educ4im	-0.093	-0.265	-0.001
	(-0.441)	(-0.961)	(-0.069)		(-0.525)	(-1.202)	(-0.002)
coh8085	-0.590	-1.051	-0.316	ethFrench	-0.174	0.033	-0.157
	(-0.747)	(-1.036)	(-0.289)		(-2.001)*	(0.308)	(-1.043)
mthFrench	0.174	-0.130	0.211	ethOther	-0.101	0.009	-0.028
	(1.531)	(-0.982)	(1.182)		(-1.725)	(0.127)	(-0.297)
mthOther	0.077	-0.121	0.070	ethFrench*im	-0.521	0.309	0.334
	(0.717)	(-0.962)	(0.448)		(-1.397)	(0.651)	(0.406)
mthFrench*im	0.716	0.936	0.163	ethOther*im	-0.210	-0.417	-0.427
	(1.951)	(2.123)*	(0.222)		(-1.094)	(-1.784)	(-1.169)
mthOther*im	0.309	0.645	0.198	wpred2	-0.157	0.007	-0.515
	(1.598)	(2.681)*	(0.535)		(-0.551)	(0.022)	(-1.385)
age	-0.010	0.054	0.054	wpred3	-0.185	0.104	-0.436
	(-0.866)	(3.493)*	(2.714)*		(-0.923)	(0.420)	(-1.509)
ageim	0.016	0.028	-0.025	wpred4	-0.162	-0.007	-0.751
	(0.363)	(0.704)	(-0.548)		(-0.665)	(-0.024)	(-2.171)*
agesq	0.0001	-0.0002	-0.0004	wpred2im	0.114	1.185	0.936
	(1.087)	(-1.031)	(-2.003)*		(0.160)	(1.512)	(1.150)
agesqim	-0.00007	-0.0002	0.0003	wpred3im	0.051	-0.010	0.410
	(-0.265)	(-0.633)	(0.765)		(0.153)	(-0.025)	(0.933)
educ2	-0.340	-0.148	-0.154	wpred4im	0.172	0.108	0.463
	(-4.218)*	(-1.412)	(-1.132)		(0.499)	(0.258)	(0.986)
Number of observations	4,170	4,137	4,173				
Log likelihood	NA	-2,181.11	-1,136.63				
Chi2(64)	NA	523.14	168.44				

Notes:

The presence of an asterisk beside a reported t-statistics indicates that the estimated coefficient is significant at the 95 percent confidence level.

The full set of regressors also includes: labour force status, marital status, number of children, marital status*female, children, children*female, province of residence, and occupation.

TABLE 3

Estimated Coefficients for Health Status (t-ratios in parentheses) – 1991 GSS
Ordered Probit and Probit Regressions

Independent Variables	Dependent Variables			Independent Variables	Dependent Variables		
	Health	Dvhealth	Actlim		Health	Dvhealth	Actlim
intercept	-	-1.313	-2.216	educ2im	-0.050	0.012	-0.008
		(-5.012)*	(-7.674)*		(-0.391)	(0.070)	(-0.041)
female	0.332	0.146	0.021	educ3im	0.032	0.108	-0.031
	(0.673)	(2.353)*	(0.286)		(0.259)	(0.604)	(-0.169)
coh0554	0.378	-0.906	-0.468	educ4im	0.031	0.212	-0.002
	(0.903)	(-1.336)	(-0.687)		(0.279)	(1.427)	(-0.014)
coh5569	0.161	-1.142	-0.520	ethFrench	0.106	0.074	0.156
	(0.384)	(-1.748)	(-0.765)		(2.083)*	(1.124)	(2.072)*
coh7079	0.061	-1.141	-0.367	ethOther	0.051	0.019	0.109
	(0.153)	(-1.776)	(-0.566)		(1.497)	(0.419)	(2.012)*
coh8085	0.178	-1.160	-0.697	ethFrench*im	0.058	0.064	0.196
	(0.442)	(-1.811)	(-1.066)		(0.224)	(0.238)	(0.569)
coh8691	0.312	-0.849	-0.217	ethOther*im	0.036	0.124	0.011
	(0.780)	(-1.302)	(-0.327)		(0.281)	(0.622)	(0.051)
mthFrench	0.040	-0.162	-0.210	wpred2	-0.374	-0.207	-0.083
	(0.589)	(-1.866)	(-2.215)*		(-3.402)*	(-1.313)	(-0.537)
mthOther	0.097	-0.043	-0.020	wpred3	-0.438	-0.100	-0.204
	(1.540)	(-0.556)	(-0.228)		(-3.621)*	(-0.558)	(-1.143)
mthFrench*im	-0.354	-0.067	-0.224	wpred4	-0.562	-0.172	-0.446
	(-1.323)	(-0.204)	(-0.602)		(-3.747)*	(-0.834)	(-1.972)*
mthOther*im	0.130	-0.073	-0.216	wpred2im	0.125	-0.186	-0.045
	(0.955)	(-0.342)	(-1.046)		(0.525)	(-0.542)	(-0.165)
age	0.003	0.015	0.035	wpred3im	0.054	-0.388	-0.061
	(0.549)	(2.117)*	(4.248)*		(0.237)	(-1.145)	(-0.229)
ageim	-0.005	0.051	0.025	wpred4im	0.148	-0.300	0.113
	(-0.399)	(2.761)*	(1.291)		(0.608)	(-0.849)	(0.382)
agesq	0.0004	0.0001	-0.0002	NorthAmerica	-0.298	-0.213	-0.405
	(0.703)	(1.458)	(-2.959)*		(-1.447)	(-0.653)	(-1.223)
agesqim	0.00002	-0.0005	-0.0002	SouthAmerica	-0.360	-0.404	-0.619
	(0.135)	(-2.645)*	(-0.836)		(-1.849)	(-1.231)	(-1.964)*
educ2	-0.212	-0.263	-0.190	Europe	-0.213	-0.128	-0.657
	(-4.551)*	(-4.211)*	(-2.397)*		(-1.213)	(-0.453)	(-2.597)*
educ3	-0.194	-0.129	0.010	Asia	-0.198	-0.488	-0.603
	(-3.948)*	(-2.003)*	(0.124)		(-1.107)	(-1.559)	(-2.199)*
educ4	-0.219	-0.233	0.022	Other	0.098	-0.053	-0.189
	(-4.984)*	(-4.113)*	(0.311)		(0.675)	(-0.213)	(-0.690)
Number of observations	10,011	9,819	10,011				
Log likelihood	NA	-5,153.12	-3029.803				
Chi2(72)	NA	1,448.86	642.960				

Notes:

The presence of an asterisk beside a reported t-statistics indicates that the estimated coefficient is significant at the 95 percent confidence level.

The full set of regressors also includes: labour force status, marital status, number of children, marital status*female, children, children*female, province of residence, and occupation.

The results relating to the impact of mother tongue and ethnic origin vary across years and with the measure of health status used as dependent variable. When health status is measured by the variable *Health*, the estimated coefficients relating to ethnicity are jointly statistically significant in both 1985 and 1991, thereby suggesting that individuals' ethnic origin influence the perception of their health status. However, the impact of ethnicity on health status is not significantly different for immigrants and non-immigrants. When *Dvhealth* and *Actlim* are used as dependent variables, ethnicity loses all explanatory power.[24] With respect to mother tongue, the results indicate that, in general, health status does not vary significantly across mother tongue, regardless of an individual's immigration status. When *Dvhealth* measures health status in 1985, however, immigrants whose mother tongue is not English are more likely to suffer from a chronic illness than are non-immigrants and immigrants whose mother tongue is English.

The impact of province of residence, marital status, number of children, occupation, sex, and labour force status varies across years and with the dependent variable used. Women's health status does not tend to be significantly different from that of men.[25] Smoking and weight problems have a negative impact on an individual's health, regardless of the survey year and of the dependent variable used. The estimated coefficients on the variable "not in labour force" generally indicate a negative relationship between health and being out of the labour force. Finally, occupation and province of residence do not have, in general, a significant impact on one's health status.

In summary, the results relating to the health-status equations indicate that the health status of immigrants and non-immigrants is not significantly different. Moreover, the majority of the estimated coefficients on the interaction variables between socio-economic characteristics — such as age, mother tongue, and education — and immigration status are not significantly different from zero. The

impact of education and expected household income varies considerably across health measures. Highly educated individuals tend to perceive themselves as being in better health than do less-educated individuals. Moreover, we found some evidence in 1991 that highly educated individuals were less likely to suffer from a chronic illness. With respect to expected household income, individuals with high expected income were less likely to report suffering from long-term activity limitations in both surveys. In 1991, Canadians with high expected household incomes perceived themselves as being in better health than did those with relatively low expected household incomes. Finally, while we found evidence that variables, such as age, weight, and type of smoking had a significant impact on health status, we found little evidence that mother tongue and ethnic origin play an important role in determining health status.[26]

Utilization of Health Services
As previously mentioned, utilization of health services is measured by the length of stay in a hospital (*Timehosp*) and by the number of consultations with a general practitioner (*GP*), a specialist (*Spec*), or a nurse (*Nurse*) the respondents have had during the 12 months preceding the time of the interview. All regressions were estimated using a two-limit tobit estimation procedure. Estimated coefficients and t-statistics can be found in Tables 4 and 5, for 1985 and 1991, respectively.

Results for both surveys indicate that, overall, immigrants and non-immigrants use health services in a similar manner. The estimated coefficients on the dummy variables related to the cohort of arrival variables and interaction variables between immigration status and various socio-economic characteristics are generally not, when tested jointly, significantly different from zero, indicating that immigrants' and non-immigrants' use of health services is not significantly different.[27]

Moreover, while place of birth does not have a significant impact on the length of stay in a hospital

TABLE 4

Estimated Coefficients for Health Services Utilization (t-ratios in parentheses) – 1985 GSS
Tobit Regressions

Independent Variables	Dependent Variables				Independent Variables	Dependent Variables			
	GP	Spec	Nurse	Timehosp		GP	Spec	Nurse	Timehosp
intercept	4.788	-2.544	-2.797	2.643	educ3	-0.519	0.003	2.071	-0.850
	(3.452)*	(-1.031)	(-0.592)	(0.534)		(-1.737)	(0.005)	(1.716)	(-0.674)
female	1.735	2.019	0.442	7.385	educ4	-0.647	-0.422	2.880	-0.341
	(4.351)*	(2.777)*	(0.259)	(4.392)*		(-1.845)	(-0.707)	(2.265)*	(-0.231)
coh0554	-6.867	-4.319	-20.579	-16.820	educ2im	-0.040	0.551	-8.096	-0.883
	(-1.942)	(-0.859)	(-1.405)	(-1.341)		(-0.046)	(0.368)	(-2.403)*	(-0.236)
coh5569	-5.507	-5.464	-21.591	-7.586	educ3im	0.662	-0.586	-6.713	-3.756
	(-1.564)	(-1.080)	(-1.446)	(-0.621)		(0.845)	(-0.447)	(-2.183)*	(-1.117)
coh7079	-4.834	-2.782	-18.073	-4.702	educ4im	0.619	-0.297	-2.667	-2.742
	(-1.391)	(-0.573)	(-1.385)	(-0.415)		(0.732)	(-0.257)	(-1.046)	(-0.808)
coh8085	-6.942	-8.511	-24.162	-12.917	ethFrench	-0.667	0.174	-3.108	-0.068
	(-1.925)	(-1.569)	(-1.592)	(-1.019)		(-1.953)	(0.320)	(-2.241)*	(-0.052)
mthFrench	0.441	-1.160	1.306	-0.141	ethOther	-0.279	0.033	-0.841	-0.651
	(0.969)	(-1.441)	(0.792)	(-0.075)		(-1.132)	(0.075)	(-0.880)	(-0.627)
mthOther	1.087	-0.034	3.516	-0.017	ethFrench*im	5.161	-3.866	0.859	6.671
	(1.493)	(-0.038)	(1.981)*	(-0.010)		(1.344)	(-1.159)	(0.173)	(1.000)
mthFrench*im	-3.402	-4.802	1.493	-60.664	ethOther*im	0.405	-0.323	-8.808	-5.699
	(-1.362)	(-1.533)	(0.366)	(-5.804)*		(0.517)	(-0.243)	(-2.205)*	(-1.417)
mthOther*im	-0.503	-0.500	0.970	-2.951	hldinc2	-0.007	0.074	-1.190	3.284
	(-0.540)	(-0.351)	(0.368)	(-0.875)		(-0.011)	(0.080)	(-0.571)	(1.712)
age	-0.126	-0.169	-0.507	-1.080	hldinc3	-0.635	0.584	-0.495	2.620
	(-2.182)*	(-1.565)	(-2.560)*	(-5.601)*		(-1.051)	(0.606)	(-0.237)	(1.350)
ageim	0.074	0.263	1.174	0.1413	hldinc4	-0.443	1.220	-0.679	4.320
	(0.509)	(1.299)	(1.703)	(0.270)		(0.737)	(1.280)	(-0.326)	(2.203)*
agesq	0.001	0.002	0.005	0.011	hld2im	2.079	0.621	-2.003	9.466
	(2.251)*	(1.948)	(2.348)*	(4.783)*		(1.592)	(0.275)	(-0.369)	(1.231)
agesqim	-0.00004	-0.003	-0.012	0.0016	hld3im	2.732	-1.233	0.139	-0.847
	(-0.029)	(-1.246)	(-1.713)	(0.306)		(2.380)*	(-0.655)	(0.026)	(-0.110)
educ2	-0.736	-0.660	2.278	-1.912	hld4im	2.359	-1.892	-1.090	5.802
	(-2.147)*	(-1.003)	(1.731)	(-1.270)		(2.190)*	(-1.052)	(-0.215)	(0.766)
Number of observations	2,953	2,957	2,952	2,946					
Log likelihood	-7952.197	-4112.810	-1,719.42	-1,991.12					
Chi2(68)	275.44	257.01	183.29	305.66					

Notes:

The presence of an asterisk beside a reported t-statistics indicates that the estimated coefficient is significant at the 95 percent confidence level.

The full set of regressors also includes: labour force status, marital status, number of children, province of residence, marital status*female, children*female, and occupation.

Table 5

Estimated Coefficients for Health Services Utilization (t-ratios in parentheses) – 1991 GSS
Tobit Regressions

Independent Variables	Dependent Variables				Independent Variables	Dependent Variables			
	GP	Spec	Nurse	Timehosp		GP	Spec	Nurse	Timehosp
intercept	3.192	-6.132	-14.154	-6.536	educ2im	-0.001	-0.980	0.710	-9.015
	(4.901)*	(-4.528)*	(-3.816)*	(-1.447)		(-0.001)	(-0.979)	(0.222)	(-1.856)
female	1.743	1.051	0.559	-0.624	educ3im	-0.791	-0.882	-1.992	-6.005
	(5.839)*	(2.669)*	(0.476)	(-0.404)		(-0.882)	(-0.940)	(-0.652)	(-1.366)
coh0554	1.463	0.300	5.646	-8.271	educ4im	-1.021	-1.295	-2.071	-3.574
	(0.598)	(0.087)	(0.516)	(-0.514)		(-1.302)	(-1.442)	(-0.763)	(0.862)
coh5569	1.500	0.473	9.301	-7.896	ethFrench	0.486	0.945	2.753	1.105
	(0.628)	(0.137)	(0.861)	(-0.533)		(1.498)	(2.117)*	(1.788)	(0.716)
coh7079	0.964	-0.652	5.240	-10.914	ethOther	0.154	0.345	2.209	0.568
	(0.397)	(-0.196)	(0.494)	(-0.714)		(0.808)	(1.062)	(2.374)*	(0.535)
coh8085	0.205	-1.098	10.373	-15.874	ethFrench*im	-0.759	-1.314	-9.019	-0.571
	(0.091)	(-0.344)	(1.016)	(-1.060)		(-0.574)	(-0.984)	(-2.159)*	(-0.079)
coh8691	1.563	-1.547	9.782	-8.129	ethOther*im	0.844	-0.964	-0.504	-4.921
	(0.693)	(-0.490)	(0.974)	(-0.563)		(0.999)	(-0.947)	(-0.159)	(-0.995)
mthFrench	-0.240	-1.072	0.615	-2.467	hldinc2	-0.513	-0.133	-0.017	2.406
	(-0.601)	(-1.866)	(0.354)	(-1.200)		(1.537)	(-0.352)	(-0.016)	(1.766)
mthOther	-0.174	-0.827	-1.411	2.880	hldinc3	0.090	-0.113	-0.409	1.212
	(-0.520)	(-1.638)	(-0.810)	(1.564)		(0.369)	(-0.332)	(-0.412)	(0.866)
mthFrench*im	0.531	1.269	1.134	2.209	hldinc4	-0.348	-0.240	0.538	-1.251
	(0.407)	(0.731)	(0.246)	(0.267)		(-1.733)	(-0.668)	(0.536)	(-0.988)
mthOther*im	0.566	1.511	-2.194	2.039	hld2im	-0.644	0.043	-7.230	-5.914
	(0.638)	(0.173)	(-0.662)	(0.428)		(-0.739)	(0.049)	(-2.667)*	(-1.749)
age	-0.126	-0.014	-0.485	-0.892	hld3im	-0.601	1.328	0.022	5.455
	(3.717)*	(-0.303)	(-3.602)*	(-5.276)*		(-0.748)	(1.540)	(0.007)	(0.930)
ageim	0.047	-0.033	-0.212	0.588	hld4im	0.924	0.976	-2.534	1.858
	(0.523)	(-0.295)	(-0.636)	(1.119)		(1.338)	(1.124)	(-0.961)	(0.546)
agesq	0.002	0.0004	0.005	0.008	NorthAmerica	-1.520	2.723	-2.540	0.216
	(3.903)*	(0.774)	(3.483)*	(4.785)*		(-1.496)	(1.568)	(-0.450)	(0.025)
agesqim	-0.001	0.0003	0.002	-0.005	SouthAmerica	-2.723	2.672	-2.732	-8.534
	(-0.840)	(0.321)	(0.725)	(-1.067)		(-2.962)*	(1.557)	(-0.483)	(-1.022)
educ2	-0.647	-0.007	-0.509	-3.174	Europe	-1.605	2.127	0.647	-1.179
	(-2.661)*	(-0.016)	(-0.457)	(-2.104)*		(-2.195)*	(1.438)	(0.131)	(-0.153)
educ3	-0.009	0.804	0.363	-3.110	Asia	-1.271	1.541	-1.303	-0.959
	(-0.032)	(2.021)*	(-0.337)	(-2.130)*		(-1.436)	(0.984)	(-0.238)	(-0.126)
educ4	-0.213	0.968	0.769	-1.746	Other	-0.455	0.643	-1.011	8.256
	(-0.963)	(2.702)*	(0.818)	(-1.338)		(-0.653)	(0.606)	(-0.250)	(1.738)
Number of observations	8,029	8,035	8,032	8,026					
Log likelihood	-21,312.82	-9,878.16	-5,368.18	-5,363.93					
Chi2(74)	637.33	359.48	241.85	375.22					

Notes:

The presence of an asterisk beside a reported t-statistics indicates that the estimated coefficient is significant at the 95 percent confidence level.

The full set of regressors also includes: labour force status, marital status, province of residence, number of children, marital status*female, children*female, and occupation.

nor on the number of visits to either a nurse or a specialist, it has a significant impact on the number of consultations an individual has with a general practitioner. In 1991, individuals born outside Canada were less likely to consult a general practitioner than were native-born Canadians. This result, along with the previous results, could be an indicator that some immigrants, particularly those born in Europe or South/Central America might have certain difficulties or reticence in consulting health professionals. Our results, however, tend to indicate that, overall, immigrants and non-immigrants tend to access the various health services similarly.

For both survey years, the net impact of age, that is, the offsetting impact of age-squared on age, indicates that as individuals grow older, they tend to spend more time hospitalized and to consult health professionals more often, regardless of immigration status. Age does not seem to influence significantly the number of consultations an individual is going to have with a specialist.

The impact of educational attainment on health services utilization does not tend, overall, to differ between immigrants and non-immigrants.[28] Both surveys reveal that individuals with at least secondary education tend to consult general practitioners less often than do less-educated Canadians. In 1991, higher educated Canadians were less likely to be hospitalized than were less-educated Canadians, while the opposite relationship was found in 1991 when *Spec* was used as a dependent variable.

With respect to the relationship between household income and medical consultations, we were not able to reject the null hypothesis that the estimated coefficients on household income variables were not jointly significantly different from zero. This result holds for both survey years and regardless of the health professional consulted. Thus, our results do not corroborate the proposition that individuals with a low household income consult general practitioners, specialists, and nurses more frequently than individuals with a higher household income, a result

obtained by Hamilton, Hamilton and Grover (1994) and Hung and Phu (1980). When the variable *GP* measures health-services utilization in 1985, we find that immigrants with high household incomes were more likely to consult a general practitioner than were non-immigrants. With respect to time spent hospitalized, in 1985, individuals with a high household income were more likely to be hospitalized than were those with a low household income.

The impact of marital status, ethnic origin, mother tongue, sex, occupation, and labour force status varies across years and with the dependent variable used. Overall, our coefficient estimates suggest that mother tongue, ethnic origin, and occupation do not appear to have a significant impact on the utilization of health services in Canada.[29] Men and women tend to use health-care services differently. In general, women tend to consult health professionals and to be hospitalized more frequently than do men. This result can certainly be attributed, at least in part, to the fact that women bear children. Individuals who smoke, particularly former smokers, and/or have a weight problem are more likely to consult a health professional and to be hospitalized longer than are those who never smoked or reported a normal weight. Lastly, individuals who reported not being in the labour force were significantly more likely to consult a health professional and to be hospitalized than those who reported being employed.

In summary, the results suggest that, in general, there is no significant difference in the utilization rates of health services by immigrants and non-immigrants. However, place of birth tends to play a determinant role in the number of consultations individuals will have with a general practitioner. This evidence could potentially reflect reticence or difficulties encountered by immigrants when accessing certain health-care services. Overall, household income and educational attainment do not have a significant impact on medical consultations and, in most cases, this holds regardless of immigration status. The absence of a significant relationship

between income and medical consultations contrasts the findings of previous studies.

Pooled Regression Results

The pooled estimation results for health status and for the utilization rates of health services can be found in Tables 6 and 7, respectively. Pooling both surveys allows us to look for and examine any immigrant assimilation effects. Indeed, the estimated results allow us to assess whether the impact of the various socio-economic variables on the dependent variables has changed over time for any given immigrant arrival cohort. [30] In order to estimate these assimilation effects, a number of new dummy variables were added to the list of explanatory variables. A dummy variable labelled "Yr91," taking a value of one for observations emanating from the 1991 GSS and a value of zero otherwise was inserted into the regressions. New variables were also created from the interaction of "Yr91" with the variables relating to the time of arrival in Canada, age, and age-squared.

The estimation results confirm that the utilization rates of health services[31] by immigrants and non-immigrants are not significantly different, when either time spent hospitalized or the number of consultations with a general practitioner, a specialist, or a nurse measures health services utilization.[32] Moreover, there are no significant differences between the health status of immigrants and non-immigrants, regardless of the health-status measure used.[33] An individual's place of birth has a significant impact on his or her number of consultations with a general practitioner and on their health status when defined by *Actlim* and *Health*. Individuals born in Europe or Asia tend to have fewer long-term activity limitations, while those born in North America (excluding Canada) and Europe perceived themselves as being in worse health than do native-born Canadians. Furthermore, individuals born outside Canada are less likely to consult a general practitioner than are native-born Canadians. Overall, the results suggest that immigrants do not seem to constitute a special strain on the health-care sys-

tem as their health and usage of health services are not, in general, significantly different from their non-immigrant counterparts. In fact, in some instances, immigrants were found to be in better health and to use health services less often than did native-born Canadians.

The assimilation effect was assessed by testing jointly if the estimated coefficients on the interaction variables defined by cohort of arrival and survey year (Yr91) are jointly significantly different from zero. The estimated coefficient on the interaction variable between the survey year and the cohort of arrival 1986-91 was omitted from the estimation procedure, since those who immigrated between 1986 and 1991 are necessarily only present in the 1991 GSS. Our results show that for the utilization of health services, the null hypothesis cannot be rejected, indicating that immigrants' use of health services has not changed over time.[34] Put differently, health services utilization rates for a given immigrant cohort have not changed significantly relative to the comparison base of non-immigrants. The results with respect to health status do not reject the null hypothesis that the health status of immigrants has not changed over time.[35] Thus, the results tend to suggest that, overall, there has not been any deterioration in immigrants' health status over time, nor have immigrants changed their consumption behaviour with respect to health-care services.

The estimated coefficients on "Yr91" indicate that the health status reported in the 1985 and 1991 surveys are significantly different for all three measures of health status. While Canadians, irrespective of immigration status, indicated being in worse health in 1991 than in 1985 when *Dvhealth* and *Actlim* measure health status, the estimated coefficient on "Yr91" obtained when *Health1* measures health status indicates that Canadians perceived themselves as being in better health in 1991 than in 1985. With respect to health services, the estimated coefficient on "Yr91" indicates that there have been significant changes in the usage of health services

Tₐᵦₗₑ 6

Estimated Coefficients for Health Status (t-ratios in parentheses) – Pooled Sample
Ordered Probit and Probit Regressions

Independent Variables	Dependent Variables			Independent Variables	Dependent Variables		
	Health	Dvhealth	Actlim		Health	Dvhealth	Actlim
intercept	-	-2.470	-3.700	yr91	-0.824	1.086	1.195
		(-6.734)*	(-7.251)*		(-3.284)*	(2.950)*	(2.429)*
female	0.006	0.132	0.016	educ2	-0.281	-0.233	-0.221
	(0.122)	(2.483)*	(0.252)		(-6.316)*	(-4.291)*	(-3.187)*
coh0554	-0.494	-0.789	-0.041	educ3	-0.234	-0.125	-0.060
	(-0.744)	(-0.736)	(-0.036)		(-5.572)*	(-2.414)*	(-0.954)
coh5569	-0.424	-0.958	-0.206	educ4	-0.277	-0.218	-0.059
	(-0.649)	(-0.897)	(-0.179)		(-6.418)*	(-4.232)*	(-0.982)
coh7079	-0.331	-0.872	0.077	educ2im	-0.021	-0.032	-0.066
	(-0.532)	(-0.865)	(0.071)		(-0.194)	(-0.232)	(-0.407)
coh8085	-0.651	-0.973	-0.051	educ3im	0.085	0.094	-0.023
	(-1.014)	(-0.927)	(-0.048)		(0.813)	(0.691)	(-0.154)
coh8691	-0.397	-0.934	-0.286	educ4im	0.039	0.104	-0.030
	(0.870)	(-1.502)	(-0.460)		(0.401)	(0.850)	(-0.211)
coh0554*91	1.030	-0.194	-0.423	ethFrench	0.063	0.068	0.076
	(1.326)	(-0.160)	(-0.329)		(1.319)	(1.208)	(1.142)
coh5569*91	0.690	-0.261	-0.353	ethOther	0.033	0.023	0.081
	(0.911)	(-0.219)	(-0.275)		(1.020)	(0.596)	(1.709)
coh7079*91	0.508	-0.380	-0.500	ethFrench*im	0.032	0.067	0.230
	(0.708)	(-0.337)	(-0.410)		(0.130)	(0.287)	(0.702)
coh8086*91	0.900	-0.290	-0.688	ethOther*im	-0.020	-0.101	-0.161
	(1.219)	(-0.250)	(-0.569)		(-0.172)	(-0.669)	(-0.881)
mthFrench	0.074	-0.155	-0.080	wpred2	-0.094	0.018	-0.025
	(1.219)	(-2.122)*	(-0.931)		(-1.013)	(0.157)	(-0.200)
mthOther	0.083	-0.072	0.019	wpred3	-0.157	-0.001	0.089
	(1.449)	(-1.090)	(0.246)		(-1.550)	(-0.008)	(0.620)
mthFrench*im	0.021	0.399	-0.118	wpred4	-0.202	-0.085	0.042
	(0.092)	(1.467)	(-0.325)		(-1.590)	(-0.550)	(0.234)
mthOther*im	0.156	0.211	-0.059	wpred2im	0.192	-0.096	0.175
	(1.287)	(1.337)	(-0.327)		(0.825)	(-0.336)	(0.676)
age	0.002	0.055	0.084	wpred3im	-0.013	-0.179	0.062
	(0.155)	(3.609)*	(4.014)*		(-0.062)	(-0.706)	(0.290)
ageim	0.010	0.030	-0.021	wpred4im	0.026	-0.225	0.227
	(0.387)	(0.713)	(-0.455)		(0.120)	(-0.833)	(0.943)
agesq	0.00001	-0.0002	-0.001	NorthAmerica	-0.594	-0.115	-0.372
	(0.138)	(-1.185)	(-3.420)*		(-2.405)*	(-0.353)	(-1.167)
agesqim	-0.0001	-0.0003	0.0003	SouthAmerica	-0.585	-0.303	-0.574
	(-0.280)	(-0.667)	(0.758)		(-2.473)*	(-0.927)	(-1.807)
age91	0.009	-0.042	-0.052	Europe	-0.369	-0.134	-0.697
	(0.809)	(-2.534)*	(-2.359)*		(-1.808)	(-0.465)	(-2.756)*
agesq91	-0.00003	0.0003	0.001	Asia	-0.308	-0.506	-0.596
	(-0.235)	(1.955)	(2.345)*		(-1.447)	(-1.599)	(-2.164)*
age91im	-0.007	0.022	0.047	Other	-0.047	-0.030	-0.124
	(-0.235)	(0.494)	(0.934)		(-0.262)	(-0.118)	(-0.453)
agesq91im	0.00001	-0.0002	-0.001				
	(0.029)	(-0.474)	(-1.043)				
Number of observations	14,181	13,956	14,184				
Log likelihood	NA	-7394.414	-4205.397				
Chi2(77)	NA	1870.240	731.960				

Notes:
The presence of an asterisk beside a reported t-statistics indicates that the estimated coefficient is significant at the 95 percent confidence level.

The full set of regressors also includes: labour force status, marital status, number of children, marital status*female, children, children*female, province of residence, and occupation.

TABLE 7

Estimated Coefficients for Health Services Utilization (t-ratios in parentheses) – Pooled Sample
Censored Regressions

Independent Variables	Dependent Variables			
	GP	Spec	Nurse	Timehosp
intercept	4.578	-2.822	-3.891	14.675
	(3.313)*	(-1.198)	(-0.640)	(2.003)*
female	1.782	1.317	0.226	2.628
	(7.432)*	(3.886)*	(0.231)	(2.216)*
coh0554	-6.866	-4.785	-30.344	-26.107
	(-1.785)	(-0.933)	(-1.501)	(-1.215)
coh5569	-5.479	-5.956	-32.775	-14.231
	(-1.453)	(-1.171)	(-1.599)	(-0.672)
coh7079	-4.671	-3.541	-29.694	-11.926
	(-1.252)	(-0.718)	(-1.673)	(-0.630)
coh8085	-6.429	-9.514	-37.305	-23.030
	(-1.638)	(-0.223)	(-1.792)	(-1.064)
coh8691	0.0005	-0.698	10.910	-7.281
	(0.000)	(-0.223)	(1.170)	(-0.595)
coh0554*91	6.689	5.906	37.146	20.281
	(1.507)	(0.984)	(1.639)	(0.779)
coh5569*91	5.328	7.223	42.944	8.196
	(1.235)	(1.215)	(1.872)	(0.325)
coh7079*91	4.117	3.722	36.435	2.763
	(0.950)	(0.644)	(1.793)	(0.117)
coh8086*91	5.035	9.119	47.560	8.781
	(1.146)	(1.486)	(2.087)*	(0.343)
mthFrench	-0.665	-1.062	0.720	-1.784
	(-0.572)	(-2.232)*	(0.545)	(-1.081)
mthOther	0.360	-0.631	0.215	2.172
	(0.568)	(-1.408)	(0.158)	(1.459)
mthFrench*im	-0.665	-0.453	0.924	-4.678
	(-0.572)	(-0.295)	(0.266)	(-0.699)
mthOther*im	0.360	0.702	-1.093	-1.088
	(0.568)	(0.799)	(-0.448)	(-0.327)
age	-0.108	-0.136	-0.648	-1.706
	(-1.812)	(-1.283)	(-2.352)*	(-4.916)*
ageim	0.125	0.233	1.546	0.354
	(0.781)	(-1.112)	(1.815)	(0.391)
agesq	0.001	0.002	0.006	0.016
	(1.872)	(1.782)	(1.970)*	(4.401)*
agesqim	-0.0005	-0.002	-0.149	0.002
	(-0.294)	(-1.034)	(-1.787)	(0.169)
age91	-0.019	0.113	0.206	0.907
	(-0.296)	(1.015)	(0.707)	(2.478)*
agesq91	0.0003	-0.002	-0.001	-0.008
	(0.475)	(-1.311)	(-0.339)	(-2.199)*
age91im	-0.071	-0.259	-1.696	0.226
	(-0.396)	(-1.103)	(-1.884)	(0.220)
agesq91im	-0.0003	0.002	0.017	-0.007
	(-0.145)	(1.038)	(1.882)	(-0.683)

Independent Variables	Dependent Variables			
	GP	Spec	Nurse	Timehosp
yr91	0.875	-2.728	-4.712	-22.486
	(0.617)	(-1.110)	(-0.741)	(-2.891)*
educ2	-0.649	-0.186	0.392	-2.720
	(-3.207)*	(-0.538)	(0.428)	(-2.243)*
educ3	-0.250	0.497	-0.487	-1.843
	(-1.236)	(1.571)	(-0.568)	(-1.675)
educ4	-0.347	0.556	1.498	-1.479
	(-1.849)	(1.811)	(1.828)	(-1.372)
educ2im	0.022	-0.601	-2.161	-6.543
	(0.031)	(-0.721)	(-0.885)	(-1.775)
educ3im	-0.178	-0.960	-4.208	-6.909
	(-0.275)	(-1.251)	(-1.794)	(-2.003)*
educ4im	-0.527	-1.182	-2.966	-4.454
	(-0.849)	(-1.653)	(-1.422)	(-1.322)
ethFrench	0.196	0.725	1.229	0.836
	(0.761)	(2.026)*	(1.051)	(0.694)
ethOther	0.088	0.305	1.625	0.012
	(0.554)	(1.139)	(2.129)*	(0.014)
ethFrench*im	0.494	-1.277	-6.950	0.436
	(0.369)	(-1.023)	(-2.012)*	(0.076)
ethOther*im	0.577	-0.730	-4.633	-5.602
	(0.975)	(-0.892)	(-1.739)	(-1.561)
hldinc2	-0.699	-0.540	-2.859	0.858
	(-1.609)	(-1.070)	(-2.077)*	(0.496)
hldinc3	-1.238	-0.452	-3.085	-0.419
	(-2.897)*	(-0.869)	(-2.125)*	(-0.232)
hldinc4	-1.437	-0.197	-2.916	-0.823
	(-3.375)*	(-0.382)	(-2.028)*	(0.478)
hld2im	0.690	0.157	-4.650	-0.695
	(0.733)	(0.124)	(-1.444)	(-0.177)
hld3im	1.022	0.616	1.045	4.453
	(1.161)	(0.496)	(0.315)	(0.766)
hld4im	1.552	-0.203	0.304	3.470
	(1.861)	(-0.169)	(0.097)	(0.940)
NorthAmerica	-1.747	2.324	-3.455	-0.739
	(-1.781)	(1.385)	(-0.654)	(0.091)
SouthAmerica	-2.685	2.203	-2.816	-7.144
	(-3.106)*	(1.301)	(-0.547)	(-0.918)
Europe	-1.670	1.823	-1.422	-0.778
	(-2.351)*	(1.271)	(-0.310)	(-0.108)
Asia	-1.322	1.418	-2.152	0.137
	(-1.535)	(0.930)	(-0.427)	(0.019)
Other	-0.466	0.434	0.268	6.545
	(-0.669)	(0.440)	(0.070)	(1.541)

	GP	Spec	Nurse	Timehosp
Number of observations	10,982	10,992	10,984	10,972
Log likelihood	-29,407.49	-14,052.21	-7,204.30	-7,487.38
Chi2(83)	905.30	521.79	264.03	518.92

Notes:

The presence of an asterisk beside a reported t-statistics indicates that the estimated coefficient is significant at the 95 percent confidence level.

The full set of regressors also includes: labour force status, marital status, number of children, province of residence, marital status*female, children*female, and occupation.

from 1985 to 1991 when *Timehosp* is the dependent variable. Regardless of immigration status, Canadians tended to be hospitalized for shorter periods of time in 1991 than in 1985. When health services utilization is measured by the number of consultations with a health-care professional (either general practitioner, specialist, or nurse), the estimated coefficient on "Yr91" indicates that the Canadian population did not consult health-care professionals differently in 1991 than they did in 1985. The above results, however, could partly reflect differences in the specification of the various dependent variables in both surveys. In the case of chronic conditions and long-term activity limitations, the observed increased in prevalence could partly result from improved awareness and diagnosis of the various health problems.

As previously demonstrated by other researchers, the pooled regression results confirm the important role that age plays in determining health status and health services utilization. Individuals are more likely to report deteriorating health and use health services, as they grow older. This result holds, in most cases, regardless of immigration status. Moreover, the impact of age on health status (*Actlim* and *Dvhealth*) has changed over time. Irrespective of immigration status, Canadians tended to report being in better health in 1991 than in 1985. Thus, our results show some evidence that Canadians are staying healthy longer.

Individuals with low educational attainment are much more likely to have health problems than are those with higher educational attainment. Moreover, we found few significant relationships between health status, health services utilization and (expected) household income, a result in contrast to that of other studies. This lack of influence of expected household income on health status could partly be attributed to our instrumentation of household income. As noted earlier, to instrument household income, we first regressed household income on a number of explanatory variables such as sex, occupation, and marital status, and then used the

results to generate expected values of household income. The possible use of an alternative instrument might improve the fit of our regressions. Our lack of significant results could also be attributed to a possible downward bias resulting from the fact that an individual's economic experience over the long term, which is likely to exert an important influence on health status, is not taken into account in cross-sectional studies of health status (Penrod 1997).

The pooled regression results indicate that mother tongue and ethnic origin are not generally statistically significant in determining an individual's health status and health services utilization. Moreover, the impact of these characteristics does not vary with an individual's immigration status.[36] While uses of the health services by men and women are, once again, generally statistically different, they tend to have a similar health status.[37] Individuals who are not in the labour force, who smoke, or have weight problems are significantly more likely to be sick and to consult health professionals than are Canadians who are employed, are non-smokers, or of normal weight. The impact of occupation, number of children, and marital status on health status and the utilization of health services varies across specifications.[38]

CONCLUSIONS

This paper has analyzed whether the health status and the utilization rate of health services differ between Canada's immigrants and non-immigrants, using data contained in the 1985 and 1991 GSS cycles. The findings bring a new dimension to the debate regarding the impact of immigrants on the Canadian economy by providing empirical evidence on the health status of immigrants, as well as on their use of health services.

Three measures of health status (perception of health, chronic illness, and long-term activity limitation) were used in the analysis. In all three cases,

we found that the health status of immigrants and non-immigrants did not differ significantly. The impact of the other explanatory variables, however, differed somewhat across dependent variables. For example, individuals born either in Europe or Asia suffer less from long-term activity limitations than do native-born Canadians, a result that corroborates that of Chen, Wilkins and Ng (1996). On the other hand, individuals born in North America (excluding Canada) and Europe tend to perceive their health status differently than do the Canadian-born. Indeed, these individuals *perceived* their health as being worse than that of those born in Canada, but do not suffer more from either chronic diseases or long-term activity limitations than do their native-born counterparts. This result could reflect some differences in the perception of one's health status across cultures. While we found significant relationships between health status and variables such as labour force status, age, educational attainment, type of smoker, and presence of a weight problem, we found few, if any, significant relationships between health status and mother tongue, ethnic origin, and expected household income.

The pooling of both data sets allowed us to assess possible assimilation effects for immigrants. Our results indicate that the health status of immigrants has not changed over time. More generally, we found that, irrespective of immigration status, Canadians reported a health status in 1991 that was significantly different than that in 1985. When health status was measured in terms of chronic illnesses or long-term activity limitations, Canadians indicated being in worse health in 1991 than in 1985. However, as previously mentioned, these results could be partly attributable to variations in awareness and diagnosis, as well as differences across surveys. The results obtained when health status is measured by perceived health indicate that Canadians *perceived* themselves in better health in 1991 than in 1985.

Health services utilization was estimated using four different dependent variables: time spent hospitalized as well as the number of consultations an individual had with a general practitioner, a specialist, or a nurse over a 12-month period. While these services are all covered by public medical insurance, they represent various levels of care and the costs associated with these services differ markedly. This study has found that, in general, immigrants and non-immigrants tend to consult health-care providers in a similar fashion. These results are based on *actual* hospitalization and visits to health-care providers, and by no means control or capture immigrants' unmet needs in health-care services. When we examine the impact of place of birth on health services utilization, we find that individuals born outside Canada are significantly less likely to consult a general practitioner than are native-born Canadians. This result could reflect a certain degree of reticence or lack of knowledge faced by immigrants to Canada, due, for example, to cultural or ancestral beliefs.

The results pertaining to the assimilation effects indicate that immigrants' use of health-care services has not changed over time. While the Canadian population did not consult health-care professionals differently in 1991 than they did in 1985, they tended to be hospitalized for shorter periods of time in 1991 than in 1985. Age, sex, labour force status, type of smoker, and the presence of a weight problem have a significant impact on an individual's use of health-care services. Women tend to use health-care services more often than do men. This result can certainly be partly attributed to the fact that women bear children. As with the case of health status, we found few significant relationships between health services utilization and mother tongue, ethnic origin, and household income. Since this study only assesses health services utilization through *actual* hospitalization/consultations rather than desired or required medical attention, it fails to capture the unmet needs of individuals.

In short, the results presented in this paper show that immigrants' and non-immigrants' health status and use of health-care services are, overall, not significantly different. These findings reflect the fact

that the medical screening process that immigrant applicants must pass before immigrating to Canada filters out only those with severe medical cases and allows immigrants with medical conditions to enter the country. All and all, one can conclude that Canada's immigrant population is more or less as healthy as the average native-born Canadian and will use, on average, similar amounts of health-care services.

NOTES

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[1]This analysis is based on the Statistics Canada Microdata files on Health and Social Support — Cycles 1 and 6, which contain data collected in the 1985 and 1991 General Social Surveys. All computations on these microdata were prepared by the author and the responsibility for the use and interpretation of these data is entirely that of the author.

[2]Refugees are exempted from the "excessive demands on health or social services" clause.

[3]Canada. Citizenship and Immigration Canada (1997). Once successfully treated in their own country, these individuals can reapply to immigrate to Canada. For example, in the cases of immigrant applicants with a declared cancer, they can apply to immigrate to Canada if their cancer has been in remission for at least five years.

[4]Chen, Ng and Wilkins' (1996) results are based on a descriptive approach adjusted for age.

[5]House *et al.* (1990) use three different self-reported health indicators present in the Americans' Changing Lives (ACL) survey to estimate the health status of indi-

viduals in the sample. These indicators include the number of major chronic conditions experienced in the last year, an index of functional status and a variable reflecting the extent of health-related limitations of daily activities.

[6]See, for example, Canada. Health and Welfare Canada (1988); Vu (1996); and Hodes (1997). This study only focuses on traditional health services. As with non-immigrants, immigrants — particularly those originating from Asia — might make extensive use of non-traditional health care, such as herbal therapy, which may act as a substitute for traditional care and thus reduce their use of traditional health-care services.

[7]See, for example, Baker and Benjamin (1995*a, b*); Akbari (1989, 1991, 1995); Simon (1992); Jensen (1989); and Blau (1984).

[8]Wen, Goel and Williams' (1996) results are based on both descriptive and multi-variate logistic approaches. In the latter, they use health status as an explanatory variable in their health services utilization equations. In this case, health status may be considered an endogenous variable, which raises questions as to the validity of their results.

[9]By "physicians," the authors mean general practitioners and medical specialists.

[10]In both surveys, respondents under 65 were interviewed by phone, while respondents aged 65 or over were sampled from households that had rotated out of the Labour Force Survey (LFS) and were interviewed in person.

[11]For the 1991 GSS, the question used to define the dependent variable *Health* asked the respondent to compare their state of health to that of others, while for the 1985 GSS, respondents were asked to describe their own state of health. This variable categorizes the health status of respondents into four and five categories for the 1985 and 1991 GSS, respectively.

[12]All regressions presented in this paper were estimated using STATA.

[13]The variable "country of origin" was only available in the 1991 GSS.

[14]For a survey on the relationship between socio-economic characteristics and health, see Feinstein (1993).

[15] The use of expected household income may not

entirely eliminate the potential bias resulting from a reverse causal relationship. For example, poor health can have an impact on employability and thus lower expected household income. The variables used to estimate expected household income (e.g., occupation) may lead to a new bias since they are also subject to health-selection effects and may ultimately also be endogenous.

[16]Since the length of time covered by these questions is 12 months, there may be a *memory* bias in these variables as individuals may approximate the number of consultations and nights hospitalized they have had in the year. The available data do not allow the evaluation of the magnitude and direction of this bias.

[17]To consult a specialist, a patient typically requires a referral from a general practitioner.

[18]While the maximum number of nights spent in a hospital, which a respondent could report in 1991 was 365, the maximum reported was 125. All in all, less than 1 percent of individuals reported having 27 and 52 consultations with a general practitioner, specialist or nurse in 1985 and 1991, respectively. With respect to time spent hospitalized, approximately 3 percent of individuals reported being hospitalized 15 days in 1985.

[19]For both surveys, approximately 70 percent of respondents did not consult a specialist, while about 89 percent of them reported having no consultations with a nurse. In 1985, 20 percent of respondents reported having no consultations with a general practitioner. This proportion fell to 16 percent in 1991. Finally, in both survey years, approximately 87 percent of the respondents did not stay overnight in a hospital.

[20]Two-tailed tests have been performed in all cases. The tables found in this study only present a subset of the results. The full set of results is available from the author upon request.

[21]The null hypothesis stipulates that the coefficients on the variables "cohort of arrival" and the interaction variables between immigration status and various socio-economic characteristics are not jointly significantly different from zero. The chi-square values are 12.52 and 23.79 in 1985 for *Actlim* and *Dvhealth*, respectively (16 degrees of freedom), and 18.14 and 23.98, respectively, in 1991 (17 degrees of freedom). When the dependent variable is *Health*, the F-test value is 0.58 in 1985 and 1.17 in 1991.

[22]An exception arises when health status is measured by the dependent variable *Health*.

[23]To test whether expected household income and education are collinear, we examined the sample correlation between education and expected household income variables. The sample correlation indicated that there is no multicollinearity between education and expected household income in all three samples used (Fomby, Hill and Johnson 1980).

[24]With the exception of *Actlim*, 1991 GSS.

[25]One exception arises in 1985, when *Dvhealth* is the dependent variable.

[26]Note, however, that some exceptions do arise.

[27]Two exceptions do arise, however, when *Timehosp* is used as dependent variable in 1985 and when the number of consultations with a general practitioner (*GP*) is used as dependent variable in 1991. When the number of consultations with a general practitioner (*GP*), specialist (*Spec*), and nurse (*Nurse*) was used as the dependent variable, the chi-square values are 22.77, 21.70, and 20.28, respectively for 1985, and 27.82, 16.50, and 20.94 respectively for 1991. When *Timehosp* was used as the dependent variable, the chi-square values are 147.32 for 1985 and 13.44 for 1991 (16 degrees of freedom in 1985 and 17 degrees of freedom in 1991).

[28]One exception arises in 1985: immigrants with at least secondary education were less likely to consult a nurse than were non-immigrants with similar characteristics.

[29]Based on individual tests; some exceptions do arise, see results reported in Tables 4 and 5.

[30]Since the dependent variable *Health* did not have the same number of categories in the two samples, a new dependent variable was created *Health1*. This new variable categorizes health status in four categories, ranging from "excellent" to "poor," by combining the categories excellent and very good in the 1991 GSS.

[31]The two-limit estimation method was replaced by the censored-normal regression estimation method to accommodate the different censoring values of the dependent variables.

[32]The null hypothesis stipulates that the coefficients on the variables "cohort of arrival" and the interaction

variables between immigration status and various socio-economic characteristics are not jointly significantly different from zero. The chi-square values are 20.13, 18.44, and 20.96 for *GP*, *Spec*, and *Nurse*, respectively (17 degrees of freedom). The chi-square value is 20.28 for *Timehosp*.

[33]The chi-square values are 16.17 and 19.73 for *Actlim* and *Dvhealth*, respectively (17 degrees of freedom). For the dependent variable *Health*, the F-test value is 0.68 (17 degrees of freedom).

[34]The chi-square values are 5.97, 8.52, and 6.39 for the dependent variables *GP*, *Spec*, and *Nurse*, respectively (4 degrees of freedom). When the dependent variable is defined as *Timehosp*, the chi-square value is 5.84 (4 degrees of freedom).

[35]The chi-square values are 1.04 and 0.64 for *Actlim* and *Dvhealth*, respectively (4 degrees of freedom). For the dependent variable *Health1*, the F-test value is 1.73 (4 degrees of freedom).

[36]Two exceptions arise. Immigrants with an ethnic origin other than British or French are less likely to consult a nurse than are immigrants of other ethnic origins and non-immigrants.

[37]Exceptions arise when either *Nurse* or *Dvhealth* is used as dependent variable.
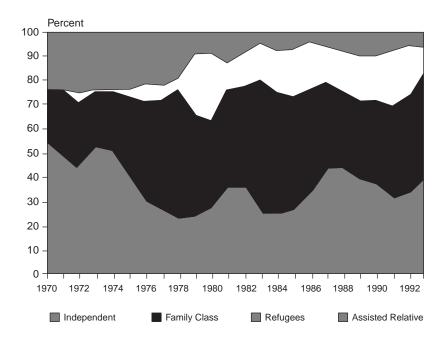
[38]Based on individual tests.

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APPENDIX 1
CATEGORY OF IMMIGRANTS BY YEAR OF LANDING, **1970-1993**

Percent

Independent   Family Class   Refugees   Assisted Relative

Sources: Citizenship and Immigration Canada (1994); Employment and Immigration Canada (1984, 1985, 1990, 1991); Employment and Immigration Canada (1981).

APPENDIX 2
DESCRIPTION OF VARIABLES

Dependent Variables

Timehosp	Time spent in hospital
Health	Health Status
Cons	Number of consultations with nurse, doctor or specialist
Dvhealth	1 if health problem: 0 otherwise
Dvactlim	1 if limited activities; 0 otherwise
Health1	Health Status - Pooled Regressions

Occupation

Occ1	Managerial, Administrative and Related Occupations
Occ2	Occupations in Natural Sciences, Engineering and Math
Occ3	Social Science, Religion and Teaching
Occ4	Occupations in Health and Medicine
Occ5	Recreational, Artistic, and Related Occupations
Occ6	Clerical and Related Occupations
Occ7	Sales and Services
Occ8	Farms Occupation
Occ9	Primary Occupations
Occ10	Processing Occupations
Occ11	Machining and Related Occupations
Occ12	Product Fabricating, Assembling and Repairing Occup.
Occ13	Construction Trades Occupations
Occ14	Transport Equipment Operating Occupations
Occ15	Material Handling and Related Occupations
Occ16	Other Crafts and Equipment Operating Occ. & n.e.c Occ.

Age

Age	Age
Ageim	Age*Immigration Status
Agesq	Age squared
Agesqim	Agesq* Immigration Status
Age91	Age*yr91
Agesq91	Agesq*yr91
Age91i	Age91*Immigration Status
Agesq91i	Agesq91*Immigration Status

Sex

Female	Female
Male	Male

Immigrants - Cohort of Arrival

Coh0554	1905-1954
Coh5569	1955-1969
Coh7079	1970-1979
Coh8085	1980-1985
Coh8691^	1986-1991
Coh0554*91	1905-1954*yr91
Coh5569*91	1955-1969*yr91
Coh7079*91	1970-1979*yr91
Coh8085*91	1980-1986*yr91
Coh8691*91	1986-1991*yr91

Ethnicity

EthFrench	French
EthEnglish	English
EthOther	Other
EthnFrench*im	French * Immigration Status
*EthnEnglish*im*	British* Immigration Status
EthnOther*im	Other* Immigration Status

Education

Educ1	Some secondary or less
Educ2	Secondary graduation
Educ3	Some post-secondary
Educ4	Post-secondary degree or diploma
Educ1im	Some secondary or less* Immigration Status
Educ2im	Secondary graduation*Immigration Status
Educ3im	Some post-secondary* Immigration Status
Educ4im	Post-secondary* Immigration Status

Expected Household Income

Wpred1	Less than 10,000
Wpred2	10,000 to 19,999
Wpred3	20,000 to 39,999
Wpred4	40,000 and over
Wpred1im	Less than 10,000* Immigration Status
Wpred2im	10,000 to 19,999* Immigration Status
Wpred3im	20,000 to 39,999* Immigration Status
Wpred4im	40,000 and over* Immigration Status

Household Income

Hldinc1	Less than 10,000
Hldinc2	10,000 to 19,999
Hldinc3	20,000 to 39,999
Hldinc4	40,000 and over
Hld1im	Less than 10,000* Immigration Status
Hld2im	10,000 to 19,999* Immigration Status
Hld3im	20,000 to 39,999* Immigration Status
Hld4im	40,000 and over* Immigration Status

Country of Birth

*Canada^*	Born in Canada
NorthAmerica^	North America (except Canada)
SouthAmerica^	South/ Central America, Caribbean
Europe^	Europe
Asia^	Asia
Other^	Other

Province of Residence

NFLD	Newfoundland
NS	Nova Scotia
NB	New Brunswick
PEI	Prince Edward Island
QUE	Quebec
ONT	Ontario
MB	Manitoba
SK	Saskatchewan
AB	Alberta
BC	British Columbia

Marital Status

Ms1	Now married or common law
Ms2	Single never married
Ms3	Widow or widower
Ms4	Divorced or separated
Ms1fem	married *female
Ms2fem	single* female
Ms3fem	widow *female
Ms4fem	divorced* female

Weight

W1	Underweight
W2	Acceptable
W3	Overweight

Mother Tongue

MthEnglish	English
MthFrench	French
MthOther	Other
*MthEnglish*im*	English* Immigration Status
MthFrench*im	French* Immigration Status
MthOther*im	Other* Immigration Status

Labour Force Status

LF1	Employed
LF2	Unemployed
LF3	Not in labour force

Children

Childfem	children*female
Children	Number of children

Type of Smoker

Tysmok1	Regular & pipe & cigar smoker
Tysmok2	Occasional smoker
Tysmok3	Non-smoker - never smoke
Tysmok4	Non-smoker - former smoker

Survey Year

Yr91	1 if survey if GSS91: 0 otherwise

Notes: Children variables for GSS91: Number of respondent's single children <25 years of age.
^ indicates variables only available in the 1991 GSS.
italic indicates reference categories.