Health Status of Older Immigrants to Canada*

K. Bruce Newbold and John K. Filice

RÉSUMÉ

En utilisant l'enquête 2000-2001 canadien de santé de la Communauté (CCHS), cet article examine l'état de santé (55+ âgé) de la population immigrée plus âgée relativement à celui des non-immigrés afin d'identifier des secteurs où leurs états de santé divergent. D'abord, nous comparons l'état de santé des immigrés plus âgés 55 âgés (nés à l'étranger) et de l'excédent au Canada au Canadiende de naissance en termes d'âge et genre, en utilisant des mesures multiples d'état de santé comprenant la santé auto-évaluée. En second lieu, nous identifions les facteurs liés à l'état de santé en utilisant les causes déterminantes du cadre de santé. Dans les deux cas, les questions principales sont si les différences dans l'état de santé existent, et si elles sont expliquées principalement par de facteurs socio-économique, socio-demographique styles de vie, qui peuvent être accordés à des problèmes à même le système canadien de santé. Les résultats indiquent qu'il y a une comparabilité relative dans l'état de santé des immigrés plus âgés, même après le contrôle pour l'âge.

ABSTRACT

Using the 2000/2001 Canadian Community Health Survey (CCHS), this paper examines the health status of the older (aged 55+) immigrant population relative to that of non-immigrants in order to identify areas where their health statuses diverge. First, we compare the health status of older immigrants (foreign-born) aged 55 and over in Canada to the Canadian-born in terms of age and gender using multiple measures of health status including self-assessed health. Second, we identify the factors associated with health status using the determinants of health framework. In both cases, the key questions are whether differences in health status exist and whether they are explained primarily by socio-economic, socio-demographic, or lifestyle factors that may point to problems with the Canadian health care system. Findings indicate that there is a relative comparability in the health status of older immigrants, even after controlling for age.

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Introduction

Representing more than 18.5 per cent of Canada's population in 2004 (Statistics Canada, 2004), the foreign-born are a rapidly growing segment of Canada's population. Recent literature has firmly established that the health and health-seeking behaviour of Canada's foreign-born, including refugees and immigrants, diverges from that of the native-born population (i.e., Ali, 2002; Chen, Wilkins, & Ng, 1996; Dunn & Dyck, 2000; Gee, Kobayashi, & Prus, 2004; McDonald & Kennedy, 2004). For example, the observed *healthy immigrant effect*, whereby the health status of immigrants at the time of arrival is high but subsequently declines and converges with the native-born population, is well documented (Globerman, 1998; Newbold & Danforth, 2003).

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Although the healthy immigrant effect may be more apparent than real with respect to self-assessed health (McDonald & Kennedy, 2004; Newbold, 2006, in press), recent immigrants rank their health higher than the Canadian-born and are less likely to report chronic conditions or disability. This is attributed to the fact that those in good health are more likely to immigrate to Canada and to the screening process at the time of entry that may disqualify those with serious medical conditions (Laroche, 2001).

While the health of immigrants is reasonably well documented in general, there is surprisingly little literature on the health status and need for care among the older immigrant population (Gee et al., 2004; Health Canada, 1999; Newbold, 2005, are three exceptions). As a result, for example, whether the healthy immigrant effect applies to this population is unknown. Similarly, do older immigrants share a health profile similar to older native-born Canadians, or is their health status poorer than the native-born average?

The lack of attention to the older immigrant population perhaps reflects the preference of Canada's immigration policy for younger, *economic* entrants and an apparent focus within the existing literature on the adjustment to Canadian society by the general immigrant population. Indeed, changing immigration policies that moved, in the 1980s and 1990s, from an emphasis on family reunification arrivals to one on economic immigrants meant an effective decrease in the proportion of elderly immigrants entering the country (Moore & Rosenberg, 1997), although immigrants who entered the country at a much earlier time are now old. Approximately 8.3 per cent of family reunification arrivals entering in 2001 were aged 65 or over (Citizenship and Immigration Canada, 2001). While the healthy immigrant effect may be less likely to characterize family reunification entrants, given their ability to draw upon immediate family for economic and social support, there is little in the literature to support this assumption. This reflects the inability to differentiate among immigrants based upon arrival type in most publicly available data files, such as the National Population Health Survey (NPHS) or the Canadian Community Health Survey (CCHS).

Some insights into the health of the older immigrant population can still be gleaned from the broader literature. In the United States, for example, the older foreign-born have better health than the U.S.-born old (Swallen, 1997), with lower rates of cancer, lung disease, and diabetes among immigrants. Likewise, LeClere, Jensen, and Biddlecom (1994) demonstrated that the native-born are more likely to have chronic conditions, be in fair or poor health, and have a disability. Conversely, Heron, Schoeni, and Morales (2002) reported that immigrants are more likely than the native-born to report fair or poor health, but are less likely to be obese or report an activity limitation.

From a Canadian perspective and based upon an analysis of the NPHS, Newbold and Danforth (2003) noted that older immigrants are less likely to rank their health as excellent, very good, or good relative to their younger counterparts. Based upon the longitudinal components (1994/1995–2000/2001) of the same survey, Newbold (2005, in press) concluded that older immigrants (over 65) are at greater risk of transitioning from a *healthy* to an *unhealthy* state relative to younger immigrants, while older immigrants (over 65) have a reduced risk of hospitalization relative to the native-born. In other words, older immigrants are more likely to experience declining health and are less likely to be hospitalized, suggesting unmet health needs.

Existing research also demonstrates that immigrants who have resided in Canada for a longer period of time do not necessarily share the health advantage of more recent arrivals (Pérez, 2002), potentially due to the deterioration of health over time as individuals age, the acquisition of unhealthy lifestyles (McDonald, 2005), their potentially differential use of health care facilities relative to the native-born, and social and/or cultural differences in how health is defined (e.g., Ali, 2002; Bentham, Hinton, Haynes, Lovett, & Bestwick, 1995; Dunn & Dyck, 2000; Elliott & Gillie, 1998; Prus & Lin, 2005; Raja-Jones, 1999). Knowledge of the older immigrant population's health may be important, given the increased prevalence of medical problems as individuals age, the corresponding increase in the need for health care, and the concomitant utilization of health care facilities and increased disability or prevalence of chronic conditions. Aging has clearly been associated with specific health outcomes, including increased risk of cardiovascular disease, mental health problems, arthritis, and diabetes (Belsky, 1999; Novak, 1997). Older immigrants may be faced with double or triple jeopardy, as their health status is potentially confounded by various factors, including cultural and language effects that further limit knowledge and access to health (i.e., Bentham et al., 1995; Deinard & Dunnigan, 1987). Moreover, some of these effects may be magnified by such issues as access to transportation, ease of personal mobility, familial roles, language, and other barriers to care.

In sum, significant variations in health status between Canada's native- and foreign-born populations may occur. At the same time, the existing literature offers

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conflicting results with respect to the health status of the older immigrant population, and/or has not adequately addressed the health status of the older immigrant population. The purpose of this paper is, therefore, twofold. First, it compares the health status of older immigrants (foreign-born) aged 55 and over to the Canadian-born in terms of age and gender. In particular, it focuses upon measures of health status including self-assessed health, the presence of chronic conditions, the Health Utilities Index (HUI3), and specific chronic conditions, including cancer and measures of heart disease and respiratory health. Second, it identifies the factors associated with health status using the determinants of health framework. In both cases, the key questions are whether differences in health status exist between immigrants and native-born and whether they are explained primarily by socio-economic, socio-demographic, or lifestyle factors.

Data and Methods

Data were drawn from the 2000/2001 Canadian Community Health Survey (CCHS, Cycle 1.1), a representative national cross-sectional survey administered by Statistics Canada. The target population of the CCHS consisted of persons aged 12 and over resident in private dwellings in all provinces and territories, excepting those living on Aboriginal reserves, on Canadian Forces Bases, or in some remote places. Covering approximately 98 per cent of the population aged 12 and over, the CCHS included self-perceived health, chronic conditions, socio-demographic, and socio-economic information. In total, nearly 131,000 individuals (*immigrants/native-born*) were included in the sample, with the immigrant population representing approximately 17 per cent of the sample, of which 25 per cent were classified as visible minorities, the majority of all immigrants (93%) having been resident in the country for more than 10 years at the time of the survey.

Given that there is no clear or completely preferable definition of who is old, the sample was restricted to those aged 55 or older at the time of the survey, enabling a broader definition of the older population, consistent with that in other literature and including those transitioning into retirement ages (i.e., Litwack & Longino, 1987; Serow, 1992). The (unweighted) sample of 38,497 respondents (immigrants and native-born) was disaggregated by age (55–64, 65–74, and 75 plus), so that the health status of individual age groups could be evaluated. Overall, the native- and foreign-born shared similar age and gender profiles, with males representing 48.1 and 46.4 per cent of the immigrant and native-born samples, respectively, and near identical age profiles. For instance, 43.2 and 44.1 per cent of immigrants and native-born were aged 55–64, respectively. Similarly, 23.1 per cent of immigrants were aged 75 and over, nearly equivalent to the 22.7 per cent of the native-born population in the same age group. Within the immigrant sample, only 7 per cent were classified as *recent* immigrants, arriving in Canada within 10 years of the survey window, and just over 25 per cent of the foreign-born defined themselves as visible minorities (see Appendix).[1]

The current study used both subjective and objective measures of health status. First, health was subjectively measured by self-assessed health status, with individuals rating their health as *excellent*, *very good*, *good*, *fair*, or *poor* compared with that of their peers. Although this was not a direct measure of health status, numerous studies have demonstrated that self-assessed health is a good proxy for health status, including that of minority populations (Idler, Kasl, & Lemke, 1990; Kaplan & Comacho, 1993; Saravanabhavan & Marshall, 1994). Other research has revealed that global health status measures accurately reflect physical health problems, such as chronic and acute conditions, and may also be able to measure mental health, although to a lesser extent (Davies & Ware, 1981). Self-reported health is also highly correlated with mortality, morbidity, and health care utilization (Hoeymans, Feskens, Kromhout, & van den Bos, 1997; Miilunpalo, Vuori, Ola, Pasanen, & Urponen, 1997). For the purposes of this analysis, the proportion reporting excellent health and a dichotomous representation of health were utilized, with the latter distinguishing between those who ranked themselves as *healthy* (excellent, very good, or good self-assessed health) and those who ranked themselves as *unhealthy* (fair or poor self-assessed health).

Although self-assessed health is a good proxy for health status, respondents may have different response styles or reference points against which they judge their health, making it difficult to distinguish between differences in true health versus differences in reporting behaviour (Jürges, 2004). Therefore, objective measures of health were also included in this study. First, because of its unique properties and its ability to proxy health status (Furlong, Feeny, Torrance, & Barr, 2001), the Health Utilities Index (Mark 3) (HUI3) was used. Measuring health-related quality of life on a generic scale, it ranges from -0.36 to 1.0, with 1.0 representing perfect health, 0 representing death, and negative values representing health states considered *worse* than death. Eight core attributes (*vision*, *hearing*, *speech*, *emotion*, *ambulation*, *dexterity*, *cognition*, and *pain*

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and discomfort) provided information about the type and extent of disabilities. Utility scoring measures, based on predetermined ranking of health conditions, were then used to calculate individual health utility scores. Since each of the eight attributes contains five or six levels, HUI3 scores can represent 972,000 unique health states, clearly allowing for greater variation than self-reported health (Furlong et al., 2001). The effectiveness and reliability of HUI3 has been demonstrated in the context of stroke and arthritis (Grootendorst, Feeny, Torrance, & Barr, 2000), and in other health conditions (Boyle, Furlong, Feeny, Torrance, & Hatcher, 1995; Gemke & Bonsel, 1996). Second, the number and type of chronic conditions diagnosed by a health professional were also used as objective measures of health. Chronic conditions included heart disease, arthritis, asthma, stroke, diabetes, presence of cataracts, cancer, emphysema, and glaucoma.

The analysis followed two stages, with the first stage focusing upon a descriptive analysis of health status, cross-tabulated with immigrant status, age, and gender. The second stage utilized multivariate methods to evaluate the factors associated with health status, embedding the analysis within the broader determinants of health framework (Evans & Stoddart, 1990). Given the binomial nature of the derived self-assessed health variable (*healthy/unhealthy*) and the presence of chronic conditions (*yes/no*), potential correlates of these two measures of health status were evaluated using a binomial logistic model, defined as

$$P_i = 1/(1 + e^{\alpha+\beta X_i})$$

where X is a vector of explanatory variables and β is a vector of estimated parameters.

Second, ordinary least squares (OLS) regression was used to evaluate HUI3 as a dependent variable, with the model defined as

$$\text{HUI3} = X\beta + \mu$$

where X is a set of independent variables, β is a vector of estimated parameters, and μ is the error term.

Since the explanatory variables were either 0 or 1, the estimated coefficients could be interpreted as the change in the HUI3 score compared to the reference group as a result of having that particular attribute. In all three cases, equations were estimated for a *pooled* population, including both immigrants and non-immigrants alike. A dummy variable representing nativity status (*foreign-born/not*) revealed whether the two samples represented distinct populations, implying that differences in health status existed between the two. Equations were also estimated for the immigrant population only. Throughout the analysis, weights developed by Statistics Canada for non-response and sample selection were incorporated. Survivor bias may not, however, have been fully addressed by the sampling weights, because it could be argued that older individuals are, by their nature, intrinsically healthier by virtue of the fact that they have lived as long as they have.

The use of health care resources is not the only factor contributing to health status (Evans, 1994; Evans & Stoddart, 1990). The study, therefore, adopted a *determinants of health* perspective (see Appendix). Representing a synthesis of public health and social science literatures (Dunn & Dyck, 2000), issues such as lifestyle options, nutrition, housing, work, education, income, and mechanisms related to societal power, social identity, social status, and control over life circumstances were seen as influential in the distribution of health (Dunn, 1996; Evans, 1994). The determinants of health included within this analysis may be divided into five categories, including immigrant status, demographic, socio-economic, lifestyle, and health care use variables. Socio-economic variables included income adequacy (based upon *income* and *household size*) and education level (*high school graduate or less/greater than high school*). Demographic variables included age group (*55–64*, *65–74*, *over 75*), gender, marital status (*married/not married)*, and visible minority status, with members of visible minority groups potentially experiencing health differentially and facing differential barriers to good health owing to direct or indirect discrimination (i.e., Prus & Lin, 2005).

Lifestyle variables included years of smoking, drinking status, social support, and physical activity. Smoking status was defined by the number of years of smoking and history of smoking, distinguishing between current smokers who had smoked for (a) more than 25 years and (b) less than 25 years and between current non-smokers who had (a) previously smoked and (b) never smoked. Recognizing the potential health benefits of moderate drinking and the concurrent negative effects of heavy drinking (Canadian Cardiovascular Society, 1998), *heavy drinkers* were defined as males who consumed more than 14 drinks per week or females who consumed more than nine drinks per week, while *moderate drinkers* included those consuming one or more drinks per week but fewer than the heavy-drinking threshold. Two other lifestyle variables included social support (represented by positive social interaction, measuring the degree of social interaction derived by Statistics Canada) and physical activity

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Table 1: Immigrant and native-born health status by gender, over 55 in 2000/2001

	SAH (Healthy) (%)	SAH (Excellent) (%)	Chronic Conditions (%)	Chronic Conditions (N)	HUI3 (% = 1.0)	HUI3 (Mean)	*n* (un-weighted)
Immigrants	73.4	14.8[a]	81.6	2.61	7.0	0.803	6,780
Male	74.8[a]	17.1[ab]	77.7[b]	2.40[b]	8.8[b]	0.825[b]	3,032
Female	72.0[a]	12.7[a]	85.3	2.79	5.3	0.782[a]	3,748
Native-Born	76.1	15.8	83.2	2.68	7.2	0.817	31,694
Male	75.6[b]	17.3[b]	79.5[b]	2.44[b]	8.9[b]	0.825[b]	13,523
Female	76.6	14.5	86.5	2.87	5.7	0.811	18,171

[a] Immigrants are statistically different ($p < 0.05$) from native-born.
[b] Males are statistically different ($p < 0.05$) from females by nativity.

(*physically active*, *moderate activity*, *inactive*). Immigrant status indicated whether or not an individual was an immigrant or native-born. Duration of residence, which was included in the immigrants-only model, captured those resident in Canada for 10 years or more versus recent arrivals. Finally, health care use was proxied by consultations (*yes*/*no*) with a general practitioner. This did not indicate the reason for consultation, but it is a widely used proxy of access to the health care system and therefore of health status (Birch, Eyles, & Newbold, 1993; Newbold, in press; Wilson, Jerrett, & Eyles, 2001).[2] Categorical representations of these explanatory variables were included within the models, based upon a priori expectations, with one value of each variable used as the reference category.

Results

Table 1 provides a summary of health status by gender and references self-assessed health, chronic conditions, and two interpretations of the Health Utilities Index (HIU3), including the mean HUI3 value and the proportion of respondents who scored 1.0 (*perfect* health on the HUI3 scale). In general, neither immigrants nor the native-born appeared to have a clear and consistent health advantage. For instance, the proportion of immigrants and native-born ranking themselves as healthy was not statistically different (73.4% and 76.1%, respectively), although a significantly smaller proportion of immigrants reported excellent general health (14.8%) than was observed within the older native-born population (15.8%). Although more than 80 per cent of both native- and foreign-born reported a chronic condition, there was no significant difference between the two groups. Insignificant differences were also noted with respect to the mean number of chronic conditions between immigrants and native-born. Although immigrants scored somewhat lower on the HUI3 scale (0.803) relative to the native-born (0.817), and a smaller proportion scored 1.0 (i.e., excellent health) on the scale (7.0 and 7.2% for immigrants and native-born, respectively), the difference was not statistically significant.

Differences were also noted by gender. Female immigrants were significantly less likely to rate their health as either healthy or excellent and scored a lower mean HUI3 value than their native-born counterparts. At the same time, there was no statistical difference in terms of the presence or number of chronic conditions between males and females. Among immigrants, females and males also differed, with female immigrants generally experiencing significantly poorer health than their male counterparts, whether measured by self-assessed health and presence and number of chronic conditions or by HUI3. In addition, males generally reported better health than their female counterparts, regardless of place of birth.

Despite a near identical age profile between the older immigrant and native-born samples, Table 2 controls for gender and age group (55–64, 65–74, and an open-ended age group, over 75) in order to evaluate potential differences in health by age group and changes in health over age. Echoing the results noted in Table 1, neither immigrants nor native-born had a clear health advantage when age was disaggregated, although increasing age was, not surprisingly, associated with declining health. Younger immigrants and native-born (aged 55–64) shared similar health profiles, with similar proportions rating their health as healthy, a result that was reinforced by similar average number of chronic conditions and HUI3 score, although the youngest immigrant group was also significantly less likely to report a chronic condition than the native-born (75.2 vs. 78.2%, respectively) and was less likely to report excellent

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Table 2: Immigrant and native-born health status (%) by age and gender, over 55 in 2000/2001

	Immigrants				Native-Born			
	All	Male	Female	*n*	All	Male	Female	*n*
SAH: Healthy (%)								
Aged 55–64	79.9	80.9a	78.9	1,981	82.0	81.6	82.3	10,004
Aged 65–74	73.6	73.9	73.3a	1,710	75.9	74.1	77.5	7,791
Over 75	60.8	62.6a	59.5	1,294	65.1	63.4	66.2	5,564
SAH: Excellent								
Aged 55–64	19.5[a]	22.1a[b]	16.8	513	20.1	21.6	18.7	2,224
Aged 65–74	13.2[a]	14.9a[b]	11.4	344	14.9	16.2	13.7	1,332
Over 75	8.5	9.9	7.7	189	8.7	8.6	8.8	707
Chronic Condition (%)								
Aged 55–64	75.2[a]	70.6[b]	79.9	1,887	78.3	74.6[b]	81.9	9,991
Aged 65–74	83.3	80.1[b]	86.4	1,974	85.0	81.8[b]	87.8	8,994
Over 75	91.3	89.4a[b]	92.7	1,822	90.2	87.4[b]	92.0	7,770
Number of Chronic Conditions (*N*)								
Aged 55–64	2.3	2.1	2.5	1,862	2.4	2.2[b]	2.7	9,878
Aged 65–74	2.7	2.5	2.8	1,948	2.7	2.5	2.9	8,887
Over 75	3.0	2.8	3.1	1,781	3.0	2.8	3.1	7,638
HUI3 (Average)								
Aged 55–64	0.850	0.860	0.840	2,430	0.853	0.859	0.848	12,422
Aged 65–74	0.816	0.839[b]	0.795	2,274	0.835	0.831	0.839	10,274
Over 75	0.691[a]	0.716[b]	0.673	1,932	0.722	0.729	0.717	8,326
HUI3 (% = 1)								
Aged 55–64	8.4	10.8a[b]	6.0[a]	197	8.1	10.0[b]	6.2	998
Aged 65–74	7.1	9.0a[b]	5.3[a]	155	7.1	8.5[b]	5.8	735
Over 75	4.2[a]	4.1[a]	4.3[a]	99	5.5	6.6[b]	4.7	435

n is based on unweighted sample size, males and females.
[a] Immigrants are statistically different ($p < 0.05$) from native-born.
[b] Males are statistically different ($p < 0.05$) from females by nativity.

health (19.5 vs. 20.1%) (these differences were relatively small). Clearly, declining health was associated with increased age, with greater divergences in health measures noted among the oldest immigrants (over 75). Often times, however, the differences among the old (over 75) were statistically insignificant, with the exception of the average HUI3 score and the proportion scoring a 1.0 on the HUI3 scale. In both cases, immigrants faired worse than the native-born population. Differences between immigrants and the native-born by gender were also noted (Table 2), although these largely echoed the findings noted earlier (i.e., no clear health advantage between immigrant and native-born males). However, males generally reported better health than their female counterparts. For example, males were more likely to rate their health as excellent, less likely to report a chronic condition, and more likely to score a higher HUI3.

Table 3 references specific diagnosed conditions by age and gender. Recalling that there was no difference between immigrants and the native-born in terms of the proportion reporting a chronic condition and the mean number of chronic conditions, was there similarity with respect to specific diagnosed conditions? Considering first overall (age-aggregated) differences between the foreign- and native-born in

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Table 3: Diagnosed chronic conditions (%): Immigrants and native-born by age and gender, 2000/2001

Chronic Condition	Immigrants			Native-Born		
	All	Males	Females	All	Males	Females
Arthritis						
Aged 55–64	26.0[a]	18.4[a]	33.9	30.9	24.4[b]	37.4
Aged 65–74	40.3[a]	28.5[a]	51.8	39.9	31.4[b]	47.2
Aged over 75	48.9[a]	39.7[b]	55.5	46.6	36.2[b]	53.4
Total	36.2	26.1[ab]	45.4[a]	37.5	29.0[b]	44.8
n	2,710	881	1,829	12,829	4,320	8,509
Asthma						
Aged 55–64	4.8[a]	3.4[c]	6.2[c]	7.6	5.5	9.7
Aged 65–74	5.7[a]	5.0[c]	6.4[c]	7.6	6.9	8.3
Aged over 75	7.4	8.5	6.6[c]	7.3	7.8	7.0
Total	5.7[a]	4.9[ab]	6.4[a]	7.5	6.4[b]	8.5
n	423	159	264	2,368	849	1,519
Cancer						
Aged 55–64	3.3	—	—	3.6	3.2[b]	4.1
Aged 65–74	4.8	5.9[c]	3.6[c]	5.6	6.4	4.8
Aged over 75	7.1	8.2[c]	6.3[c]	6.8	10.0	4.6
Total	4.7	5.3[b]	4.0	5.0	5.6[b]	4.5
n	330	174	156	1,611	789	822
Cataracts						
Aged 55–64	3.2	—	4.1[c]	4.4	3.7[b]	5.1
Aged 65–74	16.0	11.2	20.6	15.2	12.3	17.7
Aged over 75	26.4	23.5	28.5[a]	31.4	26.7[b]	32.8
Total	12.8[a]	9.6[b]	15.8	13.9	15.8[b]	16.4
n	966	315	651	4,830	1,521	3,309
Diabetes						
Aged 55–64	8.0	8.9	8.7[c]	8.7	10.6[b]	6.8
Aged 65–74	13.0	14.7	11.4	12.9	14.8	11.3
Aged over 75	13.8[a]	14.7[b]	13.2	12.0	15.1[b]	10.0
Total	11.4	12.1[b]	10.8	10.9	12.8[b]	9.1
n	769	378	391	3,591	1,796	1,795
Emphysema						
Aged 55–64	—	—	—	2.1	2.1[b]	2.1
Aged 65–74	—	—	—	3.7	5.2[b]	2.4
Aged over 75	3.1	—	—	4.2	6.0	3.0
Total	1.7[a]	—	—	3.1	3.9[b]	2.4
n	136	—	—	989	535	454

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Table 3: Continued

Chronic Condition	Immigrants			Native-Born		
	All	Males	Females	All	Males	Females
Heart Disease						
Aged 55–64	7.5[a]	8.5[b]	6.4[c]	9.2	11.6[b]	6.8
Aged 65–74	15.6	19.4[a]	11.9	18.5	22.4[b]	15.2
Aged over 75	24.1	24.6[b]	23.7	26.4	29.9[b]	24.1
Total	14.0[a]	15.5[ab]	12.7[a]	16.2	18.7[b]	14.0
n	998	480	518	5,343	2,559	2,784
High Blood Pressure						
Aged 55–64	24.1[a]	22.4[ab]	25.9	26.6	24.9[b]	28.3
Aged 65–74	37.2[a]	33.9[b]	40.3	62.8	34.0[b]	39.9
Aged over 75	44.3[a]	38.4[ab]	48.6	39.8	32.4[b]	44.6
Total	33.2	29.6[b]	36.5	33.1	29.3[b]	36.4
n	2,332	918	1,414	10,945	4,022	6,923
Glaucoma						
Aged 55–64	—	—	—	2.1	1.8[b]	2.4
Aged 65–74	3.6	—	4.2[c]	4.6	4.4[b]	4.8
Aged over 75	7.7	5.5[c]	9.3	8.4	6.6[b]	9.6
Total	3.7	2.7[b]	4.6	4.4	3.6[b]	5.0
n	295	111	184	1,480	482	998
Stroke						
Aged 55–64	—	—	—	1.5	1.5	1.4
Aged 65–74	3.0	—	—	3.6	4.2	3.0
Aged over 75	8.1	9.5[c]	7.0[c]	6.8	8.3	5.8
Total	3.4	3.7	3.2	3.4	3.7	3.1
n	239	111	128	1,085	518	567

n is based on unweighted sample size, males and females.
[a] Immigrants are statistically different ($p < 0.05$) from native-born.
[b] Males are statistically different ($p < 0.05$) from females by nativity.
[c] Estimate is subject to high sampling variability: $16.6 < CV < 33.3$.

the reporting of chronic conditions, immigrants were significantly less likely to report asthma than the native-born (5.7 vs. 7.5%, respectively), cataracts (12.8 vs. 13.9%), emphysema (1.7 vs. 3.1%), and heart disease (14.0 vs. 16.2%). There was no difference with respect to other specific diagnosed conditions. Differences between immigrants and the native-born were also apparent when the sample was disaggregated by age. Younger immigrants (aged 55–64) were less likely to report arthritis than their native-born counterparts (26.0 vs. 30.9%), but older immigrants (over 65) were more likely to. Thus, although there was no overall difference in the proportion of the older population (over 55) reporting arthritis, significant age effects were noted. Similarly, the two younger immigrant groups reported lower rates of high blood pressure, but a significantly higher percentage (44.3%) of old immigrants (over 75) reported high blood pressure than was observed in the native-born population (39.8%). Other age effects were also noted, including significantly lower rates of asthma among immigrants aged 55–64 and 65–74, greater prevalence of diabetes among immigrants aged over 75, and lower heart disease rates among immigrants aged 55–64 (relative to the native-born in all cases). Once again, differences by gender between

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the immigrant and native-born populations occurred, although these tended to reinforce differences observed within the two groups.

Determinants of Health: Multivariate Analysis

While easy to interpret, the results presented so far provide only a partial picture, with the extent and significance of the differences between immigrant and non-immigrant groups difficult to untangle, given the host of potential confounders. Tables 4 and 5 report the results of the pooled (native-born/immigrant) and immigrant-only logistic regression analyses for self-assessed health (healthy/unhealthy), the presence of chronic conditions (yes/no), along with multiple regression results for HUI3. For the self-assessed and the chronic condition models, the coefficients can be interpreted as the change in the likelihood of a health outcome. For the HUI3 model, the coefficients reflect the change in the HUI3 score, compared to the reference group, as a result of having that particular attribute. In general, the models provided ρ^2 or R^2 values consistent with what has been observed in the literature elsewhere and what have been deemed to be representative of a good fit (Wrigley, 1985). The results also implied that the immigrant-only models fit the data somewhat better than the pooled models in all but the self-assessed health case.

Turning first to the pooled results (Table 4), most of the observed relationships were consistent with the determinants of health literature. Of particular interest was nativity status. In the self-assessed health model, the results suggested that there was no difference in how immigrants and native-born ranked their health or in the likelihood of reporting a chronic condition. However, with respect to HUI3, the foreign-born had a significantly lower HUI3 score than the native-born ($0.626 - 0.019 = 0.607$), in broad support of the descriptive results noted earlier. Additionally, there was no difference in self-assessed health status and HUI3 between visible minorities and non-visible minorities. This may have represented the relative ''whiteness'' of the sample, given that a large proportion of immigrants had been in the country for some time and had immigrated from Europe, unlike more recent arrivals who tended to be younger and predominantly from non-European origins. However, visible minorities were significantly less likely to report a chronic condition than others.

Other co-variates showed a general consistency across the three pooled models. For instance, with respect to socio-demographic effects, respondents aged 55–64 and 65–74 years were more likely to rate their health highly and to have a higher HUI3 score and were less likely to report a chronic condition than their older (over 75) counterparts. Serving as a proxy for social interaction, marital status had a somewhat surprising effect, with marriage resulting in a lower HUI3 score relative to non-married individuals. Married respondents were also less likely to rank their health highly and more likely to report a chronic condition.

Gender differences were also observed, with males and females rating their health differently (Anderson, Blue, Holbrook, & Ng, 1993), with females more likely to rank their health highly, although they were more likely to have a chronic condition than males. While initially counter-intuitive, Lindeboom and van Doorslaer (2004) reported that female and older respondents appeared to be milder in their self-assessments than their male and younger counterparts. Jürges (2004) found that ''using self-assessed health as a proxy for true health can give rise to misleading inferences about social inequalities in health'' (p. 10). While HUI3 may have provided the most reliable insight into health status, it generally replicated the findings of self-assessed health, although there was no significant difference with respect to gender. This suggests that there may have been a different constitution of unmeasured factors interacting with gender, which may potentially have included the modification of perceived or real health status due to family and/or cultural expectations (Dyck, 1995; MacKinnon & Howard, 2000; Weerasinghe, Mitchell, Hamilton, & Ragheb, 2000) or due to differential behavioural and lifestyle effects (McDonald, 2005; Prus & Lin, 2005).

Turning to socio-economic effects, greater income adequacy was associated with a greater likelihood of being healthy and having a higher HUI3 score and a lesser likelihood of reporting a chronic condition. In the case of income adequacy, the findings may have represented the structure of this variable, which accounted for income and household size, as well as more substantive explanations related to potential underutilization of health services by the immigrant population (Epp, 1986; Newbold, in press). Despite Canada's health care system's being based upon universal first-dollar coverage for all medically necessary physician and hospital services, changes to the health care system in the 1990s made an increasing proportion of care non-insured. In an era of cost containment, the impact within the Canadian health system has not been equal across the population, with low-income groups and the poorly educated less able to deal with system restructuring, even within the publicly financed system (Birch & Gafni, 1999; Birch et al., 2003). By extension, the immigrant population may be at a particular disadvantage that is reflected in health differences

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Table 4: Logistic analysis of health status, pooled model, immigrants and native-born, over 55 in 2000/2001

	Self-rated		Chronic Conditions		HUI3	
	B	*t*	*B*	*t*	*B*	*t*
Intercept	0.539*	5.05	1.110*	9.22	0.626*	64.71
Immigrant Status: Immigrant	0.022	0.40	0.806	1.27	−0.019*	−3.73
Socio-demographic						
Female	0.326*	8.23	0.466*	10.47	0.003	0.86
Visible minority	−0.178	−1.87	−0.262*	−2.40	0.001	0.13
Aged 55–64	0.311*	6.49	−0.657*	−10.72	0.073*	16.04
Aged 65–74	0.239*	5.21	−0.299*	−4.76	0.077*	17.30
Married	−0.238*	−5.46	0.109*	2.18	−0.019*	−4.69
Socio-economic						
Less than or high school	−0.271*	−6.73	−0.114*	−2.52	−0.003	−0.96
Low-Middle Income	0.399*	8.53	−0.122	−1.94	0.035*	7.43
Upper-Middle Income	0.830*	15.12	−0.232*	−3.47	0.053*	10.08
Upper Income	1.327*	16.51	−0.394*	−4.93	0.075*	11.47
Lifestyle						
Smoked > 25 years	−0.396*	−7.43	0.003	0.05	−0.034*	−6.66
Smoked < 25 years	−0.315*	−2.55	0.243	1.69	−0.037*	−3.25
Former smoker	−0.300*	−7.11	0.321*	6.58	−0.027*	−7.01
Heavy Drinker	−0.185*	−4.40	0.045	0.85	−0.024*	−6.03
Moderate drinker	0.395*	8.09	−0.152*	−2.90	0.017*	4.07
Physically active	0.818*	14.12	−0.215*	−3.94	0.071*	15.41
Moderately active	0.582*	12.15	−0.102*	−1.96	0.064*	15.38
Positive social interaction	0.069*	14.36	−0.031*	−4.83	0.013*	26.37
Health care use: Consulted GP	−1.124*	−16.77	1.508*	31.21	−0.073*	−14.90
Likelihood ratio/F statistic	2,425.76		1,564.01		157.83	
ρ^2/R^2	0.112		0.092		0.138	
% concordant	72.6		70.2			
n (unweighted)	18,893		18,893		18,613	

* significant at $p < 0.05$.

by income. Other socio-economic co-variates demonstrated mixed effects across the three models. For instance, lower education was associated with a lower probability of high self-rated health but also a lower probability of reporting a chronic condition, while lower education was not associated with HUI3.

Lifestyle effects were also largely consistent with the literature. For instance, heavy drinking was associated with lower self-assessed health and a lower HUI3 score, while moderate drinking appeared to have a protective effect, increasing the likelihood of being healthy, decreasing the likelihood of reporting a chronic condition, and increasing the HUI3 score (Canadian Cardiovascular Society, 1998). Regular smokers who had smoked for 25 years or more were less likely to rate their health highly and more likely to score lower on the HUI3 scale than were those who had never smoked, although there were no significant differences with respect to chronic conditions. Former smokers (current non-smokers) observed similarly poor health outcomes, being less likely to rate their health highly, scoring lower on the HUI3 scale, and being more likely to report a chronic condition than

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Table 5: Logistic analysis of health status, immigrants, over 55 in 2000/2001

	Self-rated		Chronic Conditions		HUI3	
	B	*t*	*B*	*t*	*B*	*t*
Intercept	0.716*	2.45	0.985*	3.03	0.612*	23.76
Immigrant Status: Resident 0–9 years	0.290	1.15	−0.386	−1.51	0.037	1.58
Socio-demographic						
Female	0.118	1.08	0.626*	5.00	−0.013	−1.36
Visible minority	−0.167	−1.15	−0.166	−0.99	0.014	1.01
Aged 55–64	0.460*	3.44	−0.975*	−5.51	0.091*	7.32
Aged 65–74	0.162	1.36	−0.061	−0.34	0.074*	6.17
Married	−0.270*	−2.30	0.038	0.27	−0.023*	−2.15
Socio-economic						
High school	−0.250*	−2.40	−0.125	−1.01	−0.025*	−2.54
Low-middle income	0.302*	2.30	−0.041	−0.22	0.035*	2.58
Upper middle income	0.754*	5.02	−0.384	−1.99	0.063*	4.68
Upper income	1.211*	6.08	−0.314	−1.46	0.079*	4.70
Lifestyle						
Smoked > 25 years	−0.144	−0.85	0.266	1.38	−0.003	−0.20
Smoked < 25 years	−0.007	−0.02	0.375	0.88	−0.048	−1.46
Former smoker	−0.077	−0.67	0.473*	3.49	−0.030*	−2.86
Heavy drinker	−0.249*	−2.09	0.101	0.69	−0.004	−0.32
Moderate drinker	0.188	1.41	0.340*	2.31	0.018	1.50
Physically active	0.685*	5.06	−0.245	−1.73	0.090*	7.84
Moderately active	0.619*	4.76	−0.081	−0.55	0.082*	7.17
Positive social interaction	0.062*	5.10	−0.029	−1.75	0.012*	10.21
Health care use: Consulted GP	−1.05*	−5.22	1.702*	12.17	−0.087*	−6.08
Likelihood ratio/F statistic	300.43		280.16		28.99	
ρ^2/R^2	0.104		0.123		0.172	
% concordant	72.1		73.3			
n (unweighted)	2,614		2,614		2,566	

* significant at $p < 0.05$.

never-smokers. The poor health of former smokers may have reflected cessation of smoking among older individuals due to poor health and perhaps at the request of their physician. Smoking effects were not as strong for those current smokers who had smoked for less than 25 years, although they were still less likely to rank their health highly and experienced a reduced HUI3 score. Respondents with greater positive social interaction also had better health and a lower likelihood of chronic conditions, while physical activity was associated with better health and a lower likelihood of chronic conditions. Finally, individuals who reported consulting a GP in the past year were less likely to rate their health highly and more likely to report a chronic condition and to score lower on the HUI3 scale, with consultation most likely related to increased awareness of health.

The preceding regressions only identified a significant difference in how immigrants ranked their health relative to the native-born with respect to HUI3.

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Separate immigrants-only regressions were performed for each outcome (Table 5). In these sparser models, with fewer significant terms, most of the variables included retained signs consistent with those observed in the pooled models. In fact, only a handful of variables were significant predictors of chronic conditions among the foreign-born population. Specifically, former smokers, females, and individuals who consulted a GP were more likely to report a chronic condition, while individuals who were aged 55–64 were less likely to report a chronic condition than were those aged over 65.

Comparing results across all three immigrant-only models, individuals aged 55–64 were consistently more likely to rank their health highly or be healthier as measured by HUI3 and were less likely to have a chronic condition than older respondents. Former smokers were more likely to report a chronic condition and to score a lower HUI3 score, while drinking status had limited but consistent effects, with heavy drinkers less likely to rate their health highly. Consultation with a GP was also associated with decreased health status (measured by both self-assessed and HUI3) and an increased likelihood of reporting a chronic condition, although this was likely associated with increased awareness of (poor) health, and/or an increased sensitivity to existing (past) illnesses (Wilson et al., 2001). Finally, contrary to the healthy immigrant effect, duration of residence in Canada did not have a significant effect on any of the three measured health outcomes, although this finding may have reflected the relatively small proportion of immigrants that were classified as recent, having arrived in the 10 years preceding the survey. Visible minority status was also statistically insignificant across all three measures.

Other co-variates were significant in individual models. For instance, greater income adequacy was associated with better self-assessed health as well as higher HUI3 scores than for those with lower income adequacy, although it did not have an effect on chronic conditions. For instance, immigrants with *upper* income adequacy could expect to see their HUI3 scores increase by 0.079, compared to smaller increases for those with *upper-middle* or *lower-middle* income adequacy (0.035 and 0.063, respectively). Physical activity and positive social interaction were also associated with better health as measured by both self-assessed health and HUI3 but not with the presence of chronic conditions.

Finally, an interesting question is whether or not the variables affecting health were consistent between the immigrant and native-born samples, partially enabling answers to what are the particular determinants of health within the immigrant population. Since nativity status was a significant predictor of health in the pooled HUI3 model only, equivalent models were estimated for the native-born and immigrant populations (results not shown). Based upon *t* tests evaluating whether or not the estimated coefficients were statistically different, the results suggested that most often the magnitude of the variable changed, such that particular variables were more or less important among immigrants in defining their health relative to that of the native-born. For instance, although native-born females were more likely than males to rank their health high, gender had a statistically insignificant effect among foreign-born females. Similarly, education had a much stronger effect in securing high HUI3 scores among immigrants relative to the native-born. In the same way, while native-born former smokers reported lower self-assessed health, former smoking was insignificant among immigrants.

Conclusions

The increasing role of immigration within Canada has prompted greater discussion on a number of topics, including the health of immigrants. This paper has examined the health status of older immigrants, over 55, relative to native-born Canadians. Clearly, the immigrant population is a heterogeneous one, differing in terms of language abilities, resources, period and age of arrival, mortality rates, human capital, and other effects that affect both health status and the use of the health care system. At the same time, a picture of the health of older immigrants begins to emerge. In contrast with findings elsewhere (i.e., Newbold & Danforth, 2003), older native- and foreign-born people within Canada appear to rank their health similarly, with near-equality within the overall (over 55) population, as well as by age group. This lack of difference is generally reinforced when more objective measures of health, including the presence of chronic conditions and of specific diagnosed conditions, including those more commonly found within the older population, are examined or the HUI3 index is applied. That is, despite some variations between the two groups, the foreign-born do not systematically report *worse/better* health than the native-born.

Longitudinal analysis is needed because the lack of difference and the inability to see the healthy immigrant effect may reflect the relatively small proportion of recent arrivals (7.0%) in the sample. Data sources that place greater emphasis on the population of recent arrivals to Canada may find greater disparities with respect to gender, culture,

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and origin. One important exception from the multivariate results suggests that immigrants score a significantly lower HUI3 than their native-born counterparts, although the difference is still relatively small. Although self-assessed health is widely used in health research, reliability of the measure may be a concern, especially among older respondents (Jürges, 2004; Lindeboom & van Doorslaer, 2004). At the same time, HUI3 captures the full distribution of health, rather than the threshold between healthy and unhealthy. Therefore, given its more objective nature, the HUI3 may provide a more reliable insight into health status.

The data employed in this analysis can only provide limited detail with respect to duration of residence effects (*0–9/ over 10 years* in Canada) and no detail with respect to immigrant arrival class (i.e., *refugee*, *economic immigrant*, *family reunification entrant*), both of which may affect health status. Individuals arriving under family reunification policies, for example, are potentially able to draw upon family members for support and health care as required. Entrants under other classes, including refugees and economic immigrants, may not have the same level of social or familial support, potentially increasing the need for care as they age. Moreover, the sample would appear to have captured a group of immigrants that, on average, has a relatively long history of residency within Canada, increasing the likelihood that they can manoeuvre through Canada's health system and that they have acculturated to Canadian society, echoing findings by Marmot and Syme (1976).

Among more recent arrivals, achieving health may not be as equitable, particularly if social or cultural conventions determine health behaviours and the ability to interact within the larger community. Prus and Lin (2005) suggest that social-structural effects (i.e., socio-demographic, SES) are more important than behavioural/lifestyle effects for explaining differences in health. The implications are potentially significant, particularly if potential barriers to health care, including language and cultural issues, prevent immigrants from entering the health care system. Such an outcome is supported by findings that immigrants tend to utilize health services less frequently, receive poorer-quality health services than non-immigrants, and/or do not receive care in line with needs (Epp, 1986; Ontario Ministry of Health, 1993; Newbold, in press). Moreover, language, socio-economic status, cultural factors, and social network factors have been observed to create barriers to use (Bentham et al., 1995; Elliott & Gillie, 1998; Deinard & Dunnigan, 1991).

Notes

1 It is reasonable to assume that the majority of new arrivals entered under the family reunification class or as refugees, but it is not possible to speculate on the entry class of earlier arrivals.

2 The CCHS does not include information on the reason for GP consultation.

References

Ali, J. (2002). Mental health of Canada's immigrants. In Statistics Canada, *Supplement to health reports* (Catalogue 82-003-SIE) (pp.1–11). Ottawa: Statistics Canada.

Anderson, J., Blue, C., Holbrook, A., & Ng, M. (1993). On chronic illness: Immigrant women in Canada's work force—a feminist perspective. *Canadian Journal of Nursing Research, 25*(2), 7–22.

Belsky, J. (1999). *The Psychology of Aging*. Pacific Grove: Brooks/Cole.

Bentham, G., Hinton, J., Haynes, R., Lovett, A., & Bestwick, C. (1995). Factors affecting non-response to cervical cytology screening in Norfolk, England. *Social Science and Medicine*, *40*(1), 131–135.

Birch, S., Eyles, J., & Newbold, K.B. (1993). Equitable access to health care: Methodological extensions to the analysis of physician utilization in Canada. *Health Economics, 2,* 87–101.

Birch, S., & Gafni, A. (1999, August 8–11). *Achievements and challenges of Medicare in Canada: Are we there yet? Are we on course?* Paper presented at the First Australia and New Zealand Health Research Conference, Manly, NSW, Australia.

Birch, S., Jerrett, M., Law, M., Elliott, S., Eyles, J., & Wilson, K. (2003). Heterogeneities in the production of health: Smoking, health status, and place. In S. Birch, J.F.P. Bridges, & G.T. Papanikos (Eds.), *Issues of health economics and health management* (pp. 13–27). Athens, GA: Athens Institute for Education and Research.

Boyle, M.H., Furlong, W., Feeny, D.H., Torrance, G.W., & Hatcher, J. (1995). Reliability of the Health Utilities Index-Mark III used in the 1991 cycle-6 Canadian General Social Survey Health Questionnaire. *Quality of Life Research, 4,* 249–257.

Risk indicators worksheet R-1. (1998, November 13–14). Canadian Cardiovascular Society Consensus Conference, National Cardiovascular Disease Surveillance System, Montreal.

Chen, J., Wilkens, R., & Ng, E. (1996). Life expectancy of Canada's immigrants from 1986 to 1991. *Health Reports, 8*(3), 29–38.

Citizenship and Immigration Canada. (2001). *Facts and figures 2001*. Retrieved 12 December 2005 from http://www.cic.gc.ca/english/pub/facts2001/index.html#family.

https://doi.org/10.1353/cja.2007.0009 Published online by Cambridge University Press

Davies, A.R., & Ware, J. (1981). *Measuring health perceptions in the health insurance experiment*. Santa Monica, CA: Rand Corporation.

Deinard, A.S., & Dunnigan, T. (1987). Hmong health care: Reflections on a six-year experience. *International Migration Review, 21*(3), 857–865.

Dunn, J. (1996). Inequalities in health and the housing question. In G. Moon, M. Gould, & R. Watt (Eds.), *Proceedings of the 7th International Symposium in Medical Geography*. Portsmouth, UK: University of Portsmouth.

Dunn, J., & Dyck, I. (2000). Social determinants of health in Canada's immigrant population: Results from the National Population Health Survey. *Social Science and Medicine, 51,* 1573–1593.

Dyck, I. (1995). Putting chronic illness in ''place'': Women immigrants' accounts of their health care. *Geoforum, 26*(3), 247–260.

Elliott, S.J., & Gillie, J. (1998). Moving experiences: A qualitative analysis of health and migration. *Health and Place, 4*(4), 327–339.

Epp, J. (1986). *Achieving health for all: A framework for health promotion*. Ottawa: Health and Welfare Canada.

Evans, J. (1994). Introduction: Migration and Health. *International Migration Review, 21*(3), v–xiv.

Evans, R., & Stoddart, G. (1990). Producing health, consuming health care. *Social Science and Medicine, 31,* 1347–1363.

Furlong, W.J., Feeny, D.H., Torrance, G.W., & Barr, R.D. (2001). The Health Utilities Index (HUI) system for assessing health-related quality of life in clinical studies. *Annals of Medicine, 33,* 375–384.

Gee, E.M., Kobayashi, K.M., & Prus, S.G. (2004). Examining the ''healthy immigrant effect'' in later life: Findings from the Canadian Community Health Survey. *Canadian Journal on Aging, 23,* S55–S63.

Gemke, R.J., & Bonsel, G.J. (1996). Reliability and validity of a comprehensive health status measure in a heterogeneous population of children admitted to intensive care. *Journal of Clinical Epidemiology, 49,* 327–333.

Globerman, S. (1998). *Immigration and health care utilization patterns in Canada* (Research on Immigration in the Metropolis, WP #98–08).

Grootendorst, P., Feeny, D., & Torrance, G.W, Furlong, W. (2000). Health Utilities Index Mark 3: Evidence of construct validity for stroke and arthritis in a population health survey. *Medical Care, 38*(3), 290–299.

Health Canada. (1999). *Canadian research on immigration and health*. Ottawa: Author.

Heron, M.P., Schoeni, R.F., & Morales, L.S. (2002). *Health status of older immigrants in the United States* (RAND Working Paper Series 02-07, DRU-2862-NIA). Santa Monica, CA: RAND Corporation.

Hoeyymans, N., Feskens, E., Kromhout, D., & van den Bos, G. (1997). Aging and the relationship between functional status and self-rated health in elderly men. *Social Science and Medicine, 45*(10), 1527–1536.

Idler, E., Kasl, S., & Lemke, J. (1990). Self-evaluated health and mortality among the elderly in New Haven, Connecticut, Iowa, and Washington Counties, Iowa, 1982–1986. *American Journal of Epidemiology, 131,* 91–103.

Jürges, H. (2004). *Self-assessed health, reference levels and mortality* (Mannheim Research Institute for the Economics of Aging, Discussion Paper Series 57). Mannheim, Germany: University of Mannheim.

Kaplan, G., & Comacho, T. (1993). Self-evaluated health and mortality: A nine-year follow up of the human population laboratory component. *American Journal of Epidemiology, 117,* 292–305.

Laroche, M. (2001). Health status and health services utilization of Canada's immigrant and non-immigrant populations. *Canadian Public Policy, 26*(1), 51–73.

LeClere, F.B., Jensen, L., & Biddlecom, A.E. (1994). Health care utilization, family context, and adaptation among immigrants to the United States. *Journal of Health and Social Behavior, 35,* 370–384.

Lindeboom, M., & van Doorslaer, E. (2004). Cut-point shift and index shift in self-reported health. *Journal of Health Economics, 23,* 1083–1099.

Litwack, E., & Longino, C.F. (1987). Migration patterns among the elderly: A developmental perspective. *Gerontologist, 27,* 266–272.

MacKinnon, M., & Howard, L.L. (2000). *Affirming immigrant women's health: Building inclusive health policy.* Halifax, NS: Maritime Centre for Excellence in Women's Health, Dalhousie University.

Marmot, M.G., & Syme, S.L. (1976). Acculturation and coronary heart disease in Japanese-Americans. *American Journal of Epidemiology, 104*(3), 225–247.

McDonald, J.T. (2005). *The health behaviors of immigrants and native-born people in Canada* (SEDAP Research Paper No. 144, McMaster University). Hamilton, ON: SEDAP, McMaster University.

McDonald, J.T., & Kennedy, S. (2004). Insights into the ''healthy immigrant effect'': Health status and health service use of immigrants to Canada. *Social Science and Medicine, 59,* 1613–1627.

Miilunpalo, S., Vuori, I., Ola, P., Pasanen, M., & Urponen, H. (1997). Self-rated health status as a health measure: The predictive value of self-reported health status in the use of physician services and on mortality in the working age population. *Journal of Clinical Epidemiology, 50*(5), 517–528.

Moore, E.G., & Rosenberg, M.W. (1997). *Growing old in Canada*. Toronto: Statistics Canada/ITP Nelson.

https://doi.org/10.1353/cja.2007.0009 Published online by Cambridge University Press

Newbold, K.B. (2006, in press). Self-rated health within the Canadian immigrant population: Risk and the healthy immigrant effect. *Social Science and Medicine, 60,* 1359–1370.

Newbold, K.B. (In press). Health care use and the Canadian immigrant population. *International Journal of Health Services.*

Newbold, K.B., & Danforth, J. (2003). Health status and Canada's immigrant population. *Social Science and Medicine, 57,* 1981–1995.

Novak, M. (1997). *Aging and society: A Canadian perspective*. Toronto: International Thomson.

Ontario Ministry of Health. (1993). *Time for change: Immigrant, refugee and racial minority women and health care needs.* Toronto: Queen's Printer.

Pérez, C.E. (2002). Health status and health behavior among immigrants. In Statistics Canada, *Supplement to health reports* (Catalogue 82-003-SIE) (pp. 1–12). Ottawa: Statistics Canada.

Prus, S., & Lin, Z. (2005). Ethnicity and health: An analysis of physical health differences across twenty-one ethnocultural groups in Canada (SEDAP Research Paper No. 143, McMaster University). Hamilton, ON: SEDAP, McMaster University.

Raja-Jones, H. (1999). Breast screening and ethnic minority women: A literature review. *British Journal of Nursing, 8,* 1284–1288.

Saravanabhavan, R.C., & Marshall, C.A. (1994). The older Native American Indian with disabilities: Implications for providers of health care and human services. *Journal of Multicultural Counseling and Development, 22,* 182–194.

Serow, W.J. (1992). Unanswered questions and new directions in research on elderly migration: Economic and demographic perspectives. *Journal of Aging and Social Policy, 4*(3/4): 73–89.

Statistics Canada. (2002). *Canadian Community Health Survey, 2001*. Ottawa: Author.

Statistics Canada. (2004). *Proportion of foreign-born population, by census metropolitan area (1991 to 2001 Censuses)*. Retrieved 11 July 2006 from http://www40.statcan.ca/l01/cst01/demo47a.htm.

Swallen, K.C. (1997). Do health selection effects last? A comparison of morbidity rates for elderly adult immigrants and U.S.-born elderly persons. *Journal of Cross-Cultural Gerontology, 12,* 317–339.

Weerasinghe, S., Mitchell, T., Hamilton, L., & Ragheb, M. (2000). *Equitable access to healthcare, health promotion, and disease prevention for recent immigrant women living in Nova Scotia, Canada: Report on Phase 1.* Halifax, NS: Maritime Centre for Excellence in Women's Health, Dalhousie University.

Wilson, K., Jerrett, M., & Eyles, J. (2001). Testing relationships among determinants of health, health policy, and self-assessed health status in Quebec. *International Journal of Health Services, 31*(1), 67–89.

Wrigley, N. (1985). *Categorical data analysis*. London: Longman.

Appendix: Summary Characteristics (%) of the Immigrant and Native-Born Populations, 2000–2001

	Immigrants	Native-Born
Socio-Demographic		
Male	48.1	46.4
Visible minority	25.6	1.7
Aged 55–64	43.2	44.1
Aged 65–74	33.7	33.3
Over 75[a]	23.1	22.7
Married	71.6	66.7
Divorced/Separated/Widowed[a]	24.8	27.6
Single[a]	3.6	5.7
Socio-economic		
High school graduate or less	54.6	59.6
Lower income adequacy[a]	13.7	14.9
Low-middle income adequacy	29.1	30.1
Upper-middle income adequacy	32.9	34.6
Upper income adequacy	24.2	20.3
Lifestyle		
Smoked > 25 years	9.2	15.6
Smoked < 25 years	1.7	2.2
Former smoker (current non-smoker)	30.9	40.0
Non-smoker[a]	58.1	42.2
Heavy drinker	38.8	35.3
Moderate drinker	34.2	35.2
Non-drinker[a]	27.0	29.5
Physically active	19.5	17.8
Moderately active	22.4	22.6
Inactive[a]	58.2	59.6
Health Care Use		
Consulted GP	88.8	86.3
Overall	26.1	73.9
n (unweighted)	6,780	31,694

[a] Indicates variable used as reference category in logistic regressions.

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