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Examining the Gender, Ethnicity, and Age Dimensions of the Healthy Immigrant Effect: Implications for Health Care Policy

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Examining the Gender, Ethnicity, and Age Dimensions of the *Healthy Immigrant Effect*: Implications for Health Care Policy

Abstract
Using data from the 2005 Canadian Community Health Survey, the current study expands on previous research on the *healthy immigrant effect* (HIE) in adult populations by considering the effects of both immigrant and visible minority status on health for males and females in mid- (45-64) and later life (65+). The findings indicate that the HIE applies to recent immigrant men in midlife; that is, new male immigrants – those who immigrated less than 10 years ago – have better health compared to their Canadian-born counterparts, and that the effect is particularly strong for visible minorities. The picture is similar for older women who have recently immigrated, however this advantage largely disappears when a number of socio-demographic, socio-economic, and lifestyle factors are controlled. For older men and middle-aged women of color, however, the reality is strikingly different: both groups report health disadvantages compared to their Canadian-born counterparts, with both recent and longer-term midlife women having poorer health. Findings are discussed in terms of their implications for health care policy for immigrant adults.

Key Words: healthy immigrant effect, gender, ethnicity, mid-life, later life, health care policy

JEL: I18

Résumé
En se basant sur les données de l'Enquête sur la santé de 2005, la présente étude complète les recherches portant sur the *healthy immigrant effect* (HIE) auprès des populations adultes en examinant les effets du statut d'immigrant et de minorité visible sur la santé des hommes et des femmes d'âge moyen (45-64) et d'un âge plus avancé (65+). Les résultats indiquent que le HIE s'observe parmi les immigrants récents de sexe masculin dans la quarantaine, c'est-a dire, les nouveaux arrivants de sexe masculin (ceux qui ont immigré il y a moins de 10 ans) sont en meilleur état de santé que leurs homologues nés au Canada. Cet effet est particulièrement prononcé parmi les minorités visibles. La situation est similaire pour les femmes plus âgées qui ont immigré récemment, mais cet avantage disparaît en grande partie dès que l'on contrôle pour un certain nombre de facteurs socio-économiques, et du style de vie. Cependant, pour les hommes plus âgés et les femmes d'âge moyen de couleur, la réalité est très différente: les deux groupes rapportent un déficit de santé par rapport à leurs homologues nés au Canada, avec les femmes d'âge moyen arrivées récemment et à plus long terme ayant un moins bon état de santé. Les résultats sont discutés à la lumière de leurs implications pour les stratégies des politiques de soins de santé des immigrants d'âge adulte.

Introduction

Globerman (1998:31), in his study on the health care utilization patterns of immigrants, concludes that "age is the strongest single determinant of health problems" regardless of immigrant status; in fact, his research suggests that immigrants and the native-born utilize health care resources in similar ways at all stages of the life course including in old age. Indeed, according to Globerman, a *healthy immigrant effect* (HIE) does not exist with regard to the use of health care services even in later life.

In an attempt to interrogate this finding, Gee, Kobayashi and Prus (2004) use a population health perspective to examine the relationship between length of residence (time since immigration) and health status in mid- to later-life individuals. Such a perspective recognizes that the immigrant, socio-economic, and demographic (e.g., age, gender, ethnicity, language) characteristics of individuals, rather than "medical care inputs and health behaviours" (Dunn and Dyck, 2000:2) are the most salient predictors of health status over the life course. The findings from this study indicate that there are indeed differences between recent, longer-term and non-immigrants according to age on global measures of health status; specifically, there is evidence of a HIE for recent immigrants in midlife (45-64 years), but not for older adults (65+ years). Further support for the inclusion of age and other markers of inequality like gender and ethnicity as controls in studies on the HIE is found in Newbold's (2005) study of changing health risk among immigrants. Using longitudinal data from the National Population Health Survey (1994/5-2000/01), he finds that females and young adults (aged 20-34 years) have a lower risk of declining health status relative to males and other age groups, and that Blacks have an increased likelihood of moving from a healthy to unhealthy state than other racial groups. Such findings in the Canadian context, the country with the highest per capita net immigration rate in the world, behoove us to further explore the significance of these factors alone and in intersection in future

studies of immigrant health in other countries with rapidly growing visible minority foreign-born populations like the United States, the United Kingdom, and Australia, and to examine the policy implications of such research in the health care domain.

The current study takes up this challenge in seeking to answer the questions, "Does age, gender and ethnicity matter in assessing the health of immigrants? And, if so, in what ways?" By including age as a salient marker of inequality, the study: (1) adds to an HIE literature that has, to date, been largely focused on examinations of the influence(s) of the typical research triumvirate of "ethnicity-class-gender" on immigrant health; and (2), based on its findings, identifies and proposes a policy response(s) to health inequalities among immigrant populations that, despite differences in immigration and health care policies, can be translated cross-nationally to countries, i.e., the US, UK and Australia, where similar results for the HIE have been found (Kennedy, McDonald, and Biddle, 2006).

Methods

The results of this study are based on data from the public-use microdata file of the 2005 Canadian Community Health Survey (CCHS). The sample consists of 132,221 Canadians aged 12 or older living in private occupied dwellings, with an overall response rate of approximately 85 percent. Adjusted sample weights were used to account for unequal probabilities of selection and non-response in the multistage stratified cluster sampling design employed in the CCHS.

The independent variable, country of birth, is dichotomized as Canadian- and foreign-born. The foreign-born are further classified by length of time in Canada since initial immigration (0-9 years and 10+ years) and cultural/racial origin (non-White and White).

Three self-reported indicators of overall health are used as dependent variables. First, self-rated health (SRH), which provides a respondent's assessment of his/her overall health, is

dichotomized into: poor/fair vs. good/very good/excellent. Second, chronic condition (CC) indicates whether the respondent has one or more chronic health conditions which have lasted 6+ months and been diagnosed by a health professional: has at least one chronic condition vs. has no chronic condition. Third, activity restriction (AR) classifies respondents according to their need for help for health reasons with instrumental activities of daily living: needs help with at least one task vs. does not need help. Restriction of activities is often considered a broad measure of functional limitation and disability.

Other variables used in the analysis include: age in years (and age square); education (less than a high school diploma vs. high school diploma or higher), household income (before taxes); number of years smoked (for current daily smokers only; all others are coded as 0); and Body Mass Index (under- or overweight = BMI of <18.50 or >24.99, vs. other). Education and income have a large number of missing cases compared to the other variables. A linear regression substitution approach was used to handle missing income data. A regression was used to predict what a missing score "should be" on the basis of other variables in the dataset (i.e., age, sex, marital status, and labour force status). The missing income data were then replaced with these predicted scores. A dummy variable was constructed to indicate missing vs. non-missing education data. Table 1 provides information on all variables used in the study.

Logistic regression is used to model health outcomes for adults (45+ years) across immigrant/visible minority groups. Three models are progressively developed. Model 1 shows the main effects of immigrant status (new immigrant, long-term immigrant, and Canadian-born) on each health measure. Model 2 further distinguishes between visible minority statuses: white and non-white immigrants. The inclusion of this variable allows us to examine if any immigrant status disparities in health observed in Model 1 are due to visible minority status; that is, to

examine if a healthy immigrant effect actually reflects visible minority differences in health. Model 3 repeats the analysis in Model 2 with controls for age, age square, education, income, BMI, and years of smoking. Controlling for these factors allows us to see their impact on immigrant/visible minority differences in health. The Pearson chi-square goodness-of-fit test, χ^2, is used to assessment of the overall fit of the model.

The models are developed for each of the dependent variables. Table 2 looks at immigrant/visible minority differences in 'poor/fair" (condition of interest) vs. "good/very good/excellent" self-rated health. Table 3 examines "having a chronic condition" (condition of interest) vs. "not having a chronic condition," and Table 4 "needing help with at activities of daily living" (condition of interest) vs. "not needing help." With Canadian-born set as the reference category in the tables, an odds ratio less than one indicates that a group is less likely to report a health problem relative to Canadian born. An odds ratio greater than one indicates that a group is more likely to report a health problem compared to Canadian born. The analysis is done separately for males and females, as well as for ages 45-64 years and 65+. We stratify by age given that health and reasons for immigration to Canada differ by age.

Results

a. Midlife – 45-64 Years of Age

i. Males

There is evidence of a *healthy immigrant effect* among midlife males. Recent immigrants, those that have been in Canada for less than 10 years, in this age group are healthier than their Canadian-born counterparts. They are significantly less likely to report fair/poor health (O.R.=0.256, p<.01), a chronic condition (O.R.=0.398, p<.01), and a limitation of daily activities

compared to Canadian-born persons (O.R.=0.406, p<.01). See Model 1 in Tables 2-4 respectively.

Further examination of these results suggests that there is a gradient of deterioration in health with time since immigration (i.e., a convergence in health differences between immigrants and Canadian-born persons). There is no significant difference between longer-term immigrant males, those that have been in Canada for 10 or more years, and Canadian-born males in self-rated health or restriction of activity (Model 1 in Tables 2-4).

Turning our attention to Model 2 in Tables 2-4 we see that immigrant status differences in health do reflect visible minority status. The health advantage of recent immigrants is particularly strong for non-Whites. For example, the odds of reporting poor/fair health for recent non-White immigrants are 85.5 percent lower relative to Canadian born persons (O.R.=0.145, p<.01), while the odds for recent White immigrants are just 35.3 percent lower compared with Canadian born persons (O.R.=0.647, p<.10). Hence, the results indicate that the HIE observed in Model 1 can be attributed, in part, to the exceptionally good health of recent non-White immigrants.

Interestingly, the inclusion of socio-demographic and behavioral controls (Model 3 in Tables 2-4) also has very limited impact on health differences between immigrant/visible minority status groups. The health advantage of new immigrant men aged 45-64 is not accounted for by differences in age, socio-economic status, or health behaviors between the immigrant/visible minority status groups. These findings seem to contradict the argument that a healthier immigrant population stems from advantages in socio-demographic, SES, and lifestyle factors, at least for males.

ii. Females

The findings for females ages 45-64 are less consistent with a HIE. Looking first at foreign-born females who have been in Canada for less than 10 years, we see that they are significantly less likely to have a chronic condition compared to their Canadian-born counterparts; however, they are just as likely to experience an activity restriction and more likely to report fair/poor health (see Model 1, Tables 2-4).

These disparities are largely affected by visible minority status. Model 2 (Tables 2-4) shows that it is only non-White recent immigrants who are less likely to have a chronic condition compared to Canadian-born (O.R.=0.477, $p<.01$). And while this group is moderately (36 percent) more likely to report poor/fair health compared to Canadian-born (O.R.=1.361, $p<.05$), their White counterparts exhibit a much higher level of poor/fair health (O.R.=1.758, $p<.01$).

Turning now to foreign-born females who have been in Canada for 10 years or more, the findings show that, unlike their male counterparts, they exhibit a disadvantage in health in comparison to the Canadian-born; that is, they are 1.4 and 1.2 times more likely to report poor/fair health and a chronic condition respectively (Model 1, Tables 2 and 4). Further, these disparities are similar for Whites and non-Whites (Model 2) and not affected after controlling for socio-demographic, SES, and lifestyle factors (Model 3).

b. Later Life – 65+ Years of Age

i. Males

The last three columns of Tables 2-4 show the relationship between immigrant/visible minority status and health for persons 65 years of age and older. Among foreign-born males who have been in Canada for 10 years or more, the results do not differ from those reported for ages 45-64;

that is, they are significantly less likely to have a chronic condition in comparison to the Canadian-born (O.R.= 0.836, p<.05) (Model 1 for age 65+ in Table 3).

The results across ages 45-64 to 65+, however, do differ in a few important ways. Recent male immigrants age 65+ years, namely non-Whites, are significantly more likely to report poor/fair health compared to the Canadian-born (O.R.=2.369, p<.01) (Model 2, Table 1); this is in opposition to the findings reported for their younger (age 45-64) counterparts. On the other hand, recent male immigrants age 65+, again namely non-Whites, are significantly less likely to have a chronic condition compared to the Canadian-born (O.R.=0.322, p<.01). These results are relatively unaffected by controls for socio-demographic, SES, and lifestyle factors (Model 3).

ii. Females

Non-White older female immigrants who have been in Canada for less than 10 years fare better than their male counterparts. Specifically, they are less likely to rate their health in a negative manner (O.R.=0.475, p<.05) (Model 2, Table 2) or to have a chronic condition relative to older Canadian-born females (O.R.=0.234, p<.01) (Model 2, Table 3).

When the data are adjusted for socio-demographic, SES, and lifestyle differences, however, their health becomes more comparable to that of older Canadian-born females. In particular, the odds of reporting poor/fair health for older foreign-born, non-White females who have been in Canada for less than 10 years become statistically insignificantly (O.R.=0.572, p>.10) and their risk of activity restriction becomes significantly higher relative to the Canadian born (O.R.=2.231, p<.01). Foreign-born, non-White females who have been in Canada for 10+ years are similarly disadvantaged after controlling for these factors (see Model 3 in Tables 2 and 4 respectively).

Conclusions

One of the key findings from the current study is that the *healthy immigrant effect* applies to midlife males. Specifically, recent – those who immigrated less than 10 years ago – immigrant men between the ages of 45 and 64 years have better functional and self-rated health compared to the Canadian-born. And, upon further examination, the results suggest that there is a convergence in health differences between foreign- and Canadian-born men in midlife. Interestingly, the health advantage of recent immigrants is especially strong for visible minorities, suggesting that the observed HIE for middle-aged men is due, in part, to the exceptionally good health of recent visible minority immigrants. Finally, it should be noted that this advantage is not accounted for by differences in age, socio-economic status (SES), or health behaviors between the immigrant/visible minority groups, contradicting the argument that a healthier immigrant population can be attributed to advantages arising from such factors.

For midlife women, the findings are less consistent with a HIE, and the disparities are significantly influenced by visible minority status. Further, the study finds that unlike midlife men, longer term immigrant women in midlife are actually disadvantaged in health (on both self-reported measures) compared to the Canadian-born, and that these differences are similar for visible and non-visible minorities even after controlling for socio-demographic, SES, and lifestyle factors.

A different picture emerges in later life for men, particularly for visible minority men, as recent immigrants 65 years of age and older are more likely to be disadvantaged vis-à-vis self-reported health even after controlling for key factors. On the other hand, recent visible minority immigrant women in the latter stages of the life course fare much better on self-reported health measures. This advantage, however, disappears when the data are adjusted for other differences.

The same holds true for longer term visible minority immigrant women who are similarly disadvantaged when socio-demographic, SES and lifestyle factors are held constant.

Based on these findings, a key implication for health care policy and program planning for immigrant men and women in mid- to late adulthood, individuals that make up over one-half of the foreign-born adult population in Canada and increasingly larger proportions of the populations in the US, UK and Australia, is noteworthy here. In particular, the findings underscore the necessity for policymakers in these countries to address the differential health care needs of immigrant adults by gender and age group. Recent immigrant visible minority men in midlife and, to a lesser extent, their later life female counterparts may have fewer needs for services and programs in the early years of their residency, while certain new immigrant sub-groups, namely older men and midlife women of color may actually have increased needs for services due to poor health status. This increased need is likely to continue for these women as they age. In response to this reality, it is important that policies and programs be developed at both the national and province/state levels, particularly in geographic areas (i.e., built around urban centers) in which the majority of immigrants choose to reside, that: (a) target midlife immigrant and certain sub-groups of older immigrant women as they age over time; and (b) respond to the needs of an older immigrant male population from the outset.

Indeed, despite differences in demographic composition and policy frameworks in the immigration and health care domains, the fact that "evidence of strong positive selection effects for immigrants from all regions of origin in terms of education" (Kennedy. McDonald and Biddle, 2006) was found across all four of these countries in a study seeking to explain the HIE, provides some evidence to support the cross-national application of these findings and their policy implications.

a. Limitations of the Study

Although the Canadian Community Health Survey (CCHS) provides information on the health status and health care needs of adult Canadians, there are a number of limitations in using data from the CCHS for this study. First, despite the fact that its data allows for an examination of health status and health care utilization among immigrants, the survey does not collect information on immigrant status nor on the reasons for immigrants' entry into Canada. Hence, a more detailed analysis of immigrant men and women's health is not possible; that is, important variations in health status among naturalized citizens, landed immigrants, refugees, and non-permanent men and women cannot be examined in this study.

Second, it is important to note that while CCHS respondents who could not understand English or French were interviewed in their own language, linguistic (as well as cultural) barriers faced by new immigrants may prevent them from consulting health-care professionals, resulting in an under-diagnosis of health problems (Laroche, 2000). Relatedly, cultural factors like adherence to traditional values and beliefs may influence an individual's willingness to report health problems (Ali 2002; Kopec, Williams, To, and Austin, 2001) as there may be differences in their fundamental conceptualizations of health and illness (Saldov, 1991). Overall, the extent to which cultural and language differences in the Canadian population influence the interpretation and reporting of health problems is not well known. However, the magnitude of the differences in men's and women's health status between immigrant and Canadian-born populations reported here make it unlikely that cultural factors exclusively may explain these results.

Third, it is important to note that despite evidence of a HIE in mid-life, longitudinal data are needed to verify a true convergence in health status between immigrants and native-born

persons over time. It is not possible with the cross-sectional data used here to rule out a cohort effect, whereby differences in men's and women's health among immigrant groups are partly due to the country of birth of immigrants. For instance, longer-term immigrants are more likely to be from Europe and recent immigrants from non-European regions, and both regions vary in terms of general population health – today's immigrants may make-up a healthier cohort than cohorts who immigrated earlier – and in the type and quality of health care systems. Additionally, health requirements for entry into Canada (as well as the US, UK and Australia) have also changed, i.e., become more stringent, over time (Perez, 2002). It should also be noted that, as we are unable to acquire standardized health status and utilization data pre-immigration from all source countries, the validity of findings on the HIE may be called into question even if longitudinal data were collected post-immigration.

Finally, in using the CCHS Public Use Microdata File (PUMF) as the primary data source for this study, this examination is limited in two ways. First, age is defined in five-year groups (e.g., 45-49 years) as opposed to respondents' actual age. Subsequently, some of the key variations between immigrants and non-immigrants may be due to small differences in the average age of respondents within each of their age cohort groups. Second, the PUMF does not allow for the consideration of a key variable such as ethnicity (i.e., country of birth) as both a control and independent variable in the current analyses.

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Table 1 Sample Characteristics by Age and Gender

	45-64	65+
MALE		
Poor/Fair Health	13.4%	26.3%
Chronic Condition	72.7%	88.4%
Activity Restriction	10.0%	26.6%
Immigrant Status		
FB, <10 yrs	3.4%	1.0%
FB, 10+ yrs	20.4%	27.8%
CB	76.2%	71.2%
Visible Minority (Non-White)	13.6%	12.8%
Mean Age in years (SD)	53.6 (5.4)	73.2 (5.5)
Mean Age-square (SD)	2905 (596)	5392 (820)
Education		
<High School	15.7%	36.7
Missing	2.8%	5.3%
Mean Income in dollars (SD)	73,592 (36520)	44226 (27867)
Unacceptable weight	66.4%	60.5%
Years Smoke	6.9 (14.3)	5.0 (15.7)
n	**20,090**	**8,519**
FEMALE		
Poor/Fair Health	14.0%	26.4%
Chronic Condition	80.6%	92.9%
Activity Restriction	19.9%	44.3%
Immigrant Status		
FB, <10 yrs	3.1%	1.2%
FB, 10+ yrs	19.7%	23.9%
CB	77.2%	74.9%
Visible Minority (Non-White)	8.6%	9.0%
Mean Age in years (SD)	53.5 (5.4)	74.1 (5.8)
Mean Age-square (SD)	2892 (592)	5524 (858)
Education		
<High School	15.4%	43.2%
Missing	2.7%	4.9%
Mean Income in dollars (SD)	65586 (36549)	36003 (25645)
Unacceptable weight	52.5%	53.8%
Years Smoke	5.9 (13.2)	3.8 (13.5)
n	**20,550**	**10,627**

FB, <10 yrs: foreign-born, less than 10 years in Canada
FB, 10+ yrs: foreign-born, 10 or more years in Canada
CB: Canadian-born
Source: Canadian Community Health Survey (CCHS), 2005 (weighted data)

Table 2 Odds Ratios for Immigrant/Visible Minority Status Differences in Poor/Fair Self-Reported Health, by Age and Gender

	(1)	(2)	(3)	(1)	(2)	(3)
	45-64			**65+**		
MALE						
Immigrant/Visible Minority Status						
FB, <10 yrs	.256***			2.112***		
White		.647*	.739		1.006	1.312
Non-White		.145***	.153***		2.369***	3.033***
FB, 10+ yrs	1.040			.960		
White		1.112*	1.199***		.979	1.095
Non-White		.968	1.116		.930	1.172
CB		1.000	1.000		1.000	1.000
χ^2	71.0***	86.7***	1228.0***	9.8***	11.9**	485.4***
FEMALE						
Immigrant/Visible Minority Status						
FB, <10 yrs	1.463***			.706		
White		1.758***	2.289***		1.904*	2.221**
Non-White		1.361**	1.407**		.457**	.566
FB, 10+ yrs	1.372***			1.426***		
White		1.240***	1.346***		1.235***	1.276***
Non-White		1.589***	1.965***		2.052***	2.354***
CB		1.000	1.000		1.000	1.000
χ^2	48.9***	60.0***	1482.6 ***	51.0***	85.2***	564.0***

FB, <10 yrs: foreign-born, less than 10 years in Canada (white and non-white)
FB, 10+ yrs: foreign-born, 10 or more years in Canada (white and non-white)
CB: Canadian-born (reference category)

Model 1 (1) shows effect of immigrant status on health
Model 2 (2) shows effect of immigrant, visible minority status on health
Model 3 (3) repeats Model 2 controlling for age (and age square), education, income, BMI, and years of smoking.

*** = $p < 0.01$, ** = $p < 0.05$, *= $p < 0.10$.

Source: CCHS, 2005 (weighted data)

Table 3 Odds Ratios for Immigrant/Visible Minority Status Differences in Having a Chronic Condition, by Age and Gender

	(1)	(2)	(3)	(1)	(2)	(3)
	45-64			**65+**		
MALE						
Immigrant/Visible Minority Status						
FB, <10 yrs	.398***			.366***		
White		.480***	.534***		1.012	1.071
Non-White		.375***	.452***		.322***	.385***
FB, 10+ yrs	.882***			.836**		
White		.951	.874***		.822**	.799***
Non-White		.780***	.814***		.867	.966
CB		1.000	1.000		1.000	1.000
χ^2	130.9***	141.4***	517.4***	15.4***	17.4***	158.6***
FEMALE						
Immigrant/Visible Minority Status						
FB, <10 yrs	.613***			.273***		
White		1.259	1.363		.531	.531
Non-White		.477***	.616***		.234***	.489**
FB, 10+ yrs	.954			1.065		
White		1.116*	1.045		1.046	.998
Non-White		.776***	.855**		1.105	1.377*
CB		1.000	1.000		1.000	1.000
χ^2	26.1***	66.7***	549.9***	26.7***	28.7***	139.8***

FB, <10 yrs: foreign-born, less than 10 years in Canada (white and non-white)
FB, 10+ yrs: foreign-born, 10 or more years in Canada (white and non-white)
CB: Canadian-born (reference category)

Model 1 (1) shows effect of immigrant status on health
Model 2 (2) shows effect of immigrant, visible minority status on health
Model 3 (3) repeats Model 2 controlling for age (and age square), education, income, BMI, and years of smoking.

*** = $p < 0.01$, ** = $p < 0.05$, *= $p < 0.10$.

Source: CCHS, 2005 (weighted data)

Table 4 Odds Ratios for Immigrant/Visible Minority Status Differences in Needing Help with Daily Tasks, by Age and Gender

	(1)	(2)	(3)	(1)	(2)	(3)
	45-64			**65+**		
MALE						
Immigrant/Visible Minority Status						
FB, <10 yrs	.406***			.731		
White		.542*	.568*		.976	1.248
Non-White		.366***	.342***		.692	.796
FB, 10+ yrs	.946			.990		
White		1.128*	1.224***		.969	1.044
Non-White		.723***	.791**		1.004	1.428***
CB		1.000	1.000		1.000	1.000
χ^2	29.4***	45.9***	738.9***		1.2	1.6 808.7***
FEMALE						
Immigrant/Visible Minority Status						
FB, <10 yrs	.889			1.024		
White		.856	.983		1.083	.914
Non-White		.903	.921		1.007	2.232***
FB, 10+ yrs	1.229***			.991		
White		1.203***	1.192***		.947	.922
Non-White		1.269***	1.445***		1.126	1.410***
CB		1.000	1.000		1.000	1.000
χ^2	26.6***	25.2***	494.3***	0.1	3.6	1139.2***

FB, <10 yrs: foreign-born, less than 10 years in Canada (white and non-white)
FB, 10+ yrs: foreign-born, 10 or more years in Canada (white and non-white)
CB: Canadian-born (reference category)

Model 1 (1) shows effect of immigrant status on health
Model 2 (2) shows effect of immigrant, visible minority status on health
Model 3 (3) repeats Model 2 controlling for age (and age square), education, income, BMI, and years of smoking.

*** = $p < 0.01$, ** = $p < 0.05$, *= $p < 0.10$.

Source: CCHS, 2005 (weighted data)

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