Access to Primary and Preventive Care among Foreign-Born Adults in Canada and the United States

Lydie A. Lebrun and Lisa C. Dubay

Objective. To conduct cross-country comparisons and assess the effect of foreign birth on access to primary and preventive care in Canada and the United States.

Data Sources. Secondary data from the 2002 to 2003 Joint Canada–United States Survey of Health.

Study Design. Descriptive and comparative analyses were conducted, and logistic regression models were used to assess the effect of immigrant status and country of residence on access to care. Outcomes included measures of health care systems and processes, utilization, and patient perceptions.

Principal Findings. In adjusted analyses, immigrants in Canada fared worse than nonimmigrants regarding having timely Pap tests; in the United States, immigrants fared worse for having a regular doctor and an annual consultation with a health professional. Immigrants in Canada had better access to care than immigrants in the United States; most of these differences were explained by differences in socioeconomic status and insurance coverage across the two countries. However, U.S. immigrants were more likely to have timely Pap tests than Canadian immigrants, even after adjusting for potential confounders.

Conclusions. In both countries, foreign-born populations had worse access to care than their native-born counterparts for some indicators but not others. However, few differences in access to care were found when direct cross-country comparisons were made between immigrants in Canada versus the United States, after accounting for sociodemographic differences.

Key Words. Access to health care, primary care, immigrants, Canada, United States

Understanding the health care needs of immigrant populations is important because of their large and growing numbers. Migration patterns have a significant impact on the demographic composition of postindustrial countries, such as Canada and the United States. These countries display stagnant population growth due to lower fertility rates and higher life expectancy, and they

attract immigration from countries that are still maturing (LaVeist 2005). The proportion of foreign born in both countries has been growing steadily in the past few decades and, if current trends persist, is expected to surpass historical peaks. Currently, about 20 percent (6.2 million) of the Canadian population and 12 percent (34 million) of the American population is foreign born (Larsen 2004; Statistics Canada 2007). The United States currently gains about 1.2 million new immigrants each year, with top source countries including Mexico, Philippines, China, India, Vietnam, El Salvador, and South Korea (Passel and Suro 2005; Terrazas, Batalova, and Fan 2007). Canada receives about 220,000 new immigrants each year, a much smaller absolute number than the United States but twice the rate per capita; top source countries include China, India, Philippines, Pakistan, the United States, and South Korea (Citizenship and Immigration Canada 2007). As immigrant populations continue to grow, the health of this group will increasingly be reflected in the overall health status of Canada and the United States, making it ever more critical to monitor immigrant health and health care.

The "healthy immigrant effect" is well documented in the scientific literature (Frisbie, Cho, and Hummer 2001; Singh and Siahpush 2001; McDonald and Kennedy 2004; Newbold 2005; Cunningham, Ruben, and Narayan 2008), and it is a term used to describe the phenomenon whereby immigrants of all racial/ethnic groups are healthier upon arrival to their country of resettlement, compared with their native-born counterparts; however, this health advantage decreases over time (Stephen et al. 1994; Lara et al. 2005; Antecol and Bedard 2006). Various hypotheses have been proposed to explain this phenomenon, but one of particular relevance to this study is the notion that poor access to health care, especially primary and preventive care which can prevent or detect health problems early, contributes to immigrants' health deterioration (LeClerce, Jensen, and Biddlecom 1994; Shi et al. 2002; Newbold 2005; Starfield, Shi, and Macinko 2005). That is, although immigrants may be relatively healthy upon arrival, barriers to health care may lead to increased health risks over time. Thus, understanding the extent to which barriers to care exist has important implications for maintaining the health of individuals who migrate to these countries.

Address correspondence to Lydie A. Lebrun, M.P.H., Doctoral Candidate, Department of Health Policy and Management, Johns Hopkins University, Bloomberg School of Public Health, 624 North Broadway, Room 447, Baltimore, MD 21205; e-mail: llebrun@jhsph.edu. Lisa C. Dubay, Ph.D., Sc.M., Associate Professor, is with the Department of Health Policy and Management, Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD.

LITERATURE REVIEW

There is mixed evidence about immigrants' access to primary and preventive health care. Some studies have documented barriers to care among the foreign born, while others have found no significant difference in access between the foreign-born and their native-born counterparts. Within the literature showing limited use of the health care system by immigrants, there is also conflicting evidence regarding the reasons for this underutilization. On the one hand, immigrants are in better health upon arrival to their country of resettlement; on the other hand, barriers to care may discourage utilization.

In the United States, numerous studies have documented lower access to health care among immigrants. Compared with the native-born population, foreign-born individuals have been reported to be less likely to be insured, have a usual source of care, and receive timely cancer screenings; they also use fewer health care services (Vega et al. 1999; Goel et al. 2003; Lucas, Barr-Anderson, and Kington 2003; Dey and Lucas 2006; Goldman, Smith, and Sood 2006; Xu and Borders 2008; Derose et al. 2009). Among women, immigrants make less adequate use of prenatal care, as well as Pap smears and mammography screenings, compared with the native born (Carrasquillo and Pati 2004; Green et al. 2005; Fuentes-Afflick et al. 2006).

In Canada, there are also reports that immigrants have limited access to basic and preventive health services. For instance, compared with native-born Canadians, recent immigrants have less access to family doctors, consultations with any doctor, cancer screenings, and blood pressure tests. Over time, immigrants' use of these health care services converges to native-born levels (McDonald and Kennedy 2004; Woltman and Newbold 2007), but this increase may not be sufficient and indicates a possible unmet need for health care among immigrants (Newbold 2005). Immigrants also use mental health services less than nonimmigrants, and these differences cannot be attributed to lower rates of mental distress or use of alternative sources of care, but rather seem to reflect cultural and language barriers (Li and Browne 2000; Kirmayer et al. 2007). In addition, immigrants are more likely to visit dentists for treatment compared with native-born Canadians, who are more likely to visit dentists for preventive care (Newbold and Patel 2006).

On the other hand, several Canadian studies have indicated that foreign-born populations have equal or even better access to care compared with their native-born counterparts. Specifically, immigrants may be less likely to have unmet health care needs, and as likely or more likely to use general

medical services and dental services compared with nonimmigrants, even after adjusting for various sociodemographic characteristics (Wen, Goel, and Williams 1996; Wu, Penning, and Schimmele 2005; Newbold and Patel 2006).

While there has certainly been interest in examining immigrant health and health care in Canada as well as the United States, there have been very few comparative studies explicitly aiming to evaluate the effect of immigrant status on access to care simultaneously in these two countries. This research gap mostly results from a lack of appropriate cross-national data, but a unique dataset, the Joint Canada–United States Survey of Health (JCUSH), has recently provided new opportunities to examine health care services in these two countries and comparative studies are beginning to appear more frequently in the literature (Hurwitz and Chiang 2006; Kennedy and Morgan 2006a, 2006b; Mojtabai and Olsson 2006; Sanmartin et al. 2006; Vasiliadis et al. 2007; Zhang et al. 2008). A few previous studies have used the JCUSH to peripherally address the issue of immigrants' health care experiences; however, they have typically included foreign birth as a control variable in their analytical models, rather than as the main independent variable of interest, and have not made direct comparisons between immigrants living in Canada versus those living in the United States (Lasser, Himmelstein, and Woolhandler 2006; Blackwell, Martinez, and Gentleman 2008; Blackwell et al. 2009). One recently published study did use a cross-national comparative approach to directly compare immigrants and nonimmigrants in Canada and the United States, and examine the influence of health insurance on immigrants' access to care (Siddiqi, Zuberi, and Nguyen 2009). The findings indicated that health insurance is a key explanatory factor in health care disparities between the foreign born and the native born. However, the only outcomes examined were unmet medical needs and lack of a regular medical doctor. Further research is needed to determine whether the use of a broader set of indicators of access to care will lead to the same conclusions.

Cross-national comparisons between Canada and the United States are relevant because of geographical, social, and cultural proximity between the two countries, and because both countries are composed of a large proportion of immigrants (Marchildon 2005). At the same time, there are significant health system differences between the two countries, most notably regarding health insurance coverage. Canadians have universal access to publicly funded health care services for medically necessary services, and they rely on private insurance and out-of-pocket payments for excluded services such as dental and vision care. On the other hand, most Americans possess private

insurance (e.g., employer-based coverage) to cover the cost of all health care. In general, public insurance for adults in the United States is provided only to the poor or to the disabled and those over 65 years, and almost 20 percent of the adult population remains uninsured (Cohen and Martinez 2007). Despite these differences, cross-country analyses provide an opportunity to examine the social contexts influencing access to health care, and a comprehensive picture of health care for the foreign born can inform policy makers in both countries about experiences that are relevant in their own national context. To the extent that one country performs better on a given measure, the other country may seek to better understand what factors might be contributing to its neighbor's success and what factors might be influencing its own shortfalls.

To build on the existing literature, data from the cross-national JCUSH dataset were used to conduct comparisons and assess the effect of foreign birth on access to primary and preventive care in Canada and the United States. The research questions of interest were as follows: (a) How do foreign-born adults' experiences with health care compare with those of native-born adults, in each country? and (b) Do foreign-born adults have better access to care in Canada or the United States? The purpose of the study was to test the hypothesis that foreign-born adults have worse access to care than their native-born counterparts in each country, reasoning that foreign-born individuals are likely to be disproportionately burdened with characteristics that pose barriers to care (e.g., low English proficiency, low socioeconomic status, discrimination) relative to native-born individuals. We also hypothesized that among foreign-born populations in each country, access would be better in Canada, where universal health coverage is provided, than the United States, where insurance coverage is fragmented and often excludes foreign-born populations.

Building on the recent work by Siddiqi and colleagues, the breadth of outcome measures was expanded to include additional indicators of access, utilization, and patient perceptions of care. In contrast to the analyses by Siddiqi and colleagues, which stratified immigrant and nonimmigrant groups by insurance coverage status, we chose to build incremental regression models using insurance status as a covariate (first excluding insurance then including it as a covariate), thus allowing us to quantify the effect of insurance coverage on access to care. The results of these analyses provide a nationally representative assessment of the effect of foreign birth on primary and preventive care experiences, measured through the use of various indicators, in two neighboring countries with significant immigrant populations.

METHODS

Data Source

Data came from the 2002 to 2003 JCUSH, a unique survey that represents the first—and thus far only—attempt to conduct multicountry comparisons, using a single questionnaire to collect health-related information and a standardized methodology across countries (Sanmartin et al. 2004). Thus, the dataset allows for direct comparisons between populations in Canada and the United States regarding access to health care services, a task that has not been possible previously. The complex design of the survey consisted of a stratified element sample with unequal probabilities of selection, in order to produce reliable nationally representative estimates.

Data were collected through a telephone survey. Interviews in Canada were conducted in English and in French; in the United States, they were conducted in English and Spanish. The target population included residents of Canada and the United States ages 18 years and older, living in private homes with a landline telephone. The response rates were 65.5 percent in Canada and 50.2 percent in the United States. The total JCUSH sample size was 8,688 individuals. For the current study, analyses were limited to nonelderly adults, ages 18–64 years, with available information regarding foreign birth status ($n = 6,620$).

Analytical Variables

All variables were self-reported. The main dependent variables of interest included various commonly used measures of access to primary and preventive health care, organized into broad categories (Kasper 1998; Shi and Singh 2008). Outcomes were selected because of their reasonable reliability and validity, their agreement with national health care recommendation guidelines, and/or their widespread availability in health-related datasets (Cleary and Jette 1984; Gordon, Hiatt, and Lampert 1993; Paskett et al. 1996; Roberts et al. 1996; U.S. Department of Health and Human Services 2000; Ritter et al. 2001; Gilbert, Rose, and Shelton 2002; McPhee et al. 2002; Raina et al. 2002; Agency for Healthcare Research and Quality 2005; Health Canada 2006).

Health care system structures or processes influence access; thus, having a regular medical doctor was selected as a representative indicator in this category because it is associated with patients' potential access to needed care. Next, health care utilization (or realized access) was measured by indicators for having any consultation with a health professional in the past 12 months, having a dentist visit in the past 12 months, having a Pap test screening in the

past 3 years (among women ages 18–64 years), and having a mammogram in the past 2 years (among women ages 50–64 years). These measures indicate entry into the health care system and access to appropriate preventive care and standard services, such as regular check-ups and screenings. Finally, patient perceptions were measured by reports of having unmet health care needs in the past 12 months, overall satisfaction with care, and perceived quality of care.

The main independent variables of interest were country of residence (United States versus Canada) and immigrant status. For each country, respondents were classified into two groups: foreign born (immigrant) and native born (nonimmigrant). The survey question, “In what country were you born?” was used to assign individuals to the appropriate group. So in Canada, all individuals reporting that they were born in a country other than Canada were considered immigrants; an equivalent classification method was used for the United States.

Other covariates were included in the analyses in order to account for the potential confounding effects of a variety of demographic and socioeconomic factors on access to health care. Demographic factors included categorical variables for age (18–29, 30–39, 40–49, 50–64 years), sex (male, female), and marital status (married/common-law/partnered, divorced/separated, widowed, and single, never married). Perceived need for care was measured by self-reported general health status.

Racial/ethnic origin was dichotomized into two categories: white versus non-white minority. While the U.S. portion of the dataset provided more specific racial/ethnic groupings according to federal guidelines (Office of Management and Budget 1997), the Canadian portion collapsed racial/ethnic background into this binary variable due to concerns about privacy and confidentiality. The dichotomous race/ethnicity variable was used for all analyses in order to obtain comparable results across the two countries.

Highest education attained was grouped into four categories: less than high school diploma, high school diploma or GED, trade school or community college, and some university or higher. Household income was grouped by income quintiles to allow for cross-country comparisons. Finally, insurance status variables were incorporated, including current health insurance coverage (for U.S. respondents) and dental insurance coverage (for respondents in both countries).

Because the household income quintile variable included 20.8 percent missing data, multiple imputation was used to fill in the missing values in a systematic manner, in order to preserve sample size in analyses. Other

covariates had sufficiently low rates of missingness (ranging from 0 to 3.3 percent), with cumulative missingness amounting to 4.22 percent; therefore, imputation was not performed for other variables.

Statistical Analysis

Cross-sectional descriptive and comparative analyses, as well as multivariable logistic regression models, were conducted. Survey weights were applied to obtain estimates that were representative of the target population, and the Taylor linearization method was used for variance estimation in order to account for complex sampling methods and weighting. The weight variables available in the dataset account for out-of-scope telephone numbers reached through random digit dialing, multiple telephone lines, household nonresponse, individual nonresponse, and poststratification. Two-tailed p -values $\leq .05$ were considered statistically significant. *Stata* software, version 10.0, was used for all analyses (StataCorp 2007).

Sociodemographic characteristics of the foreign born and native born in both countries were examined, and comparisons of access to care based on immigrant status were also conducted, both within and across the two countries. Frequencies and prevalences were obtained for the outcomes of interest, and Pearson χ^2 -tests were performed to assess statistically significant differences in distributions across population groups.

Logistic regression modeling was also used to examine the association between the main independent variables of interest and dichotomous measures of access to care. Models were built in an incremental manner, with additional covariates being included in subsequent models (detailed results not shown). For each outcome measure, simple logistic regressions were first conducted to obtain the unadjusted associations for the total effect of the main independent variable on access to care. Then multivariable models were built to estimate adjusted associations, after accounting for other potential confounding variables, including demographic and need factors (i.e., age, sex, marital status, general health status), racial origin, socioeconomic factors (i.e., education, household income quintile), and insurance coverage (i.e., health insurance, dental insurance). Regression-adjusted probabilities were obtained, holding all covariates at the population average value.

Sensitivity analyses were used to assess the robustness of the study findings. Propensity score methods were used as an alternative approach to control for differences in covariate distributions between foreign-born and native-born groups. Observations with missing income quintile values were

imputed using various approaches, and models were also estimated by dropping from the analyses any observations with missing values. Results from the sensitivity analyses did not differ significantly from those presented here.

RESULTS

Sociodemographic Characteristics

The distribution of sociodemographic characteristics was generated for both foreign-born and native-born residents of Canada and the United States (Table 1). There were significant differences between the foreign born and the native born in Canada as well as the United States. The foreign born in Canada tended to be older, married, racial minorities, more educated, and lower income compared with their native-born counterparts. The foreign born in the United States tended to be younger, married, in poorer health, racial minorities, less educated, lower income, and lack health and dental insurance, compared with their native-born counterparts.

There were also significant differences across the foreign-born populations in both countries. Specifically, the foreign born in the United States were more often younger, in poorer health, racial minorities, less educated, lower income, and lack dental insurance, compared with the foreign born in Canada. Only three-quarters of immigrants in the United States had health insurance, compared with all immigrants in Canada who benefit from the universal health care system.

Effect of Foreign Birth on Access to Care in Canada

Table 2 shows unadjusted and regression-adjusted probabilities for various access to care indicators among foreign-born and native-born adults in Canada. In unadjusted analyses, a smaller proportion of foreign-born adults than native-born adults reported having a regular medical doctor (79.0 versus 83.5 percent, $p < .05$), a Pap test in the past 3 years (65.4 versus 80.4 percent, $p < .0001$), and excellent/good quality of care (78.8 versus 85.6 percent, $p < .01$).

Multiple logistic regression models were built to account for the various covariates. Regression-adjusted probabilities indicated that the association between immigrant status and access to care remained statistically significant for having a Pap test (69.6 percent foreign born versus 81.5 percent native born, $p < .05$) but became nonsignificant for having a regular medical doctor

Table 1: Distribution of Sociodemographic Characteristics by Country of Residence and Immigrant Status, Joint Canada–United States Survey of Health

	Canada (N = 2729)			United States (N = 3891)			Foreign Born, United States versus Canada
	Foreign Born n (%)	Native Born n (%)	Significance	Foreign Born n (%)	Native Born n (%)	Significance	
Number of respondents	473 (18.78)	2256 (81.22)		624 (17.27)	3267 (82.73)		
Age category							
18–29 years	85 (19.85)	506 (26.86)	***	136 (23.57)	609 (23.65)	***	***
30–39 years	144 (27.79)	538 (22.28)		193 (31.43)	765 (24.04)		
40–49 years	107 (22.41)	634 (26.39)		157 (23.41)	892 (25.50)		
50–64 years	137 (29.95)	578 (24.47)		138 (21.59)	1001 (26.81)		
Sex							
Female	260 (51.59)	1204 (49.40)	NS	316 (47.68)	1841 (51.78)	NS	NS
Male	213 (48.41)	1052 (50.60)		308 (52.32)	1426 (48.22)		
Marital status							
Single, never married	95 (19.02)	596 (25.45)		117 (17.38)	757 (23.19)		
Divorced/separated	52 (6.47)	297 (8.39)	**	88 (11.38)	550 (11.42)	*	NS
Widowed	12 (1.60)	51 (1.53)		16 (2.13)	92 (2.02)		
Married/common-law/partnered	314 (72.91)	1304 (64.63)		402 (69.11)	1854 (63.38)		
General health status							
Excellent	131 (27.86)	578 (26.66)	***	159 (25.56)	933 (28.99)	***	***
Very good	155 (32.26)	888 (39.82)		152 (23.23)	1185 (36.37)		
Good	148 (32.57)	559 (24.63)		190 (31.47)	815 (24.71)		
Fair	24 (4.12)	161 (6.43)		102 (16.76)	219 (6.82)		
Poor	15 (3.18)	65 (2.46)		20 (2.99)	112 (3.11)		
Race							
			***			***	***

Non-white minority	253 (54.67)	216 (10.63)	466 (78.42)	579 (22.35)	
White	216 (45.33)	2035 (89.37)	158 (21.58)	2655 (77.65)	
Educational attainment					
Some college/university or higher	201 (42.78)	645 (27.43)	203 (30.53)	1377 (40.43)	
Trade school, community college, or CEGEP	90 (18.90)	559 (23.89)	95 (15.96)	463 (13.74)	
High school or GED	131 (28.43)	668 (32.60)	197 (33.26)	1202 (38.08)	
Less than high school	47 (9.89)	374 (16.08)	124 (20.25)	211 (7.75)	
Household income quintile					
Highest quintile	68 (15.15)	409 (18.78)	77 (10.42)	673 (18.58)	
Upper-middle quintile	78 (15.87)	448 (20.5)	52 (7.81)	632 (19.01)	
Middle quintile	88 (19.18)	380 (16.64)	77 (12.88)	503 (16.40)	
Lower-middle quintile	86 (18.02)	370 (16.37)	108 (19.97)	486 (15.95)	
Lowest quintile	84 (15.27)	392 (14.79)	169 (26.47)	406 (12.19)	
Missing	69 (16.51)	257 (12.91)	141 (22.45)	567 (17.86)	
Insurance coverage					
Has health insurance [†]	—	—	465 (74.08)	2914 (89.32)	—
Has dental insurance	311 (68.42)	1480 (67.62)	338 (54.85)	2203 (69.29)	

* $p < .05$, ** $p < .01$, *** $p < .0001$, based on χ^2 -test for categorical variables.

[†]Canadian respondents were not asked about health insurance, but they were assumed to be 100% insured due to universal coverage in Canada.

Table 2: Estimates of Effect of Foreign Birth on Access to Care in Canada, Joint Canada–United States Survey of Health

	Unadjusted Probabilities (%)			Regression-Adjusted Probabilities (%) [†]			
	Foreign Born (n = 473)	Native Born (n = 2256)	Difference	Significance	Foreign Born	Native Born	Difference
Have a regular medical doctor	79.01	83.50	– 4.49	*	80.76	86.50	– 5.74
Consultation with health professional, past 12 months	93.30	94.73	– 1.43	NS	94.78	96.15	– 1.37
Dentist visit, past 12 months	64.57	65.89	– 1.32	NS	65.05	67.66	– 2.61
Pap test, past 3 years	65.43	80.38	– 14.95	***	69.61	81.50	– 11.89
Mammogram, past 2 years	76.96	75.18	1.78	NS	76.07	75.10	0.97
Any unmet health care needs, past 12 months	9.10	11.83	– 2.73	NS	7.77	10.7	– 2.93
Very/somewhat satisfied with care	86.64	86.23	0.41	NS	86.40	86.93	– 0.53
Excellent/good quality of care	78.79	85.55	– 6.76	**	81.36	86.39	– 5.03

* $p < .05$, ** $p < .01$, *** $p < .0001$.

[†]Regression models adjusted for age, sex, marital status, health status, racial background, education, income quintile (and dental insurance for dentist visits).

and excellent/good quality of care. No differences were found for the remaining access measures.

Effect of Foreign Birth on Access to Care in the United States

Table 3 shows unadjusted and regression-adjusted probabilities for foreign-born and native-born adults in the United States. In unadjusted analyses, foreign-born adults fared worse than native-born adults on all measures of access, except for Pap tests and mammograms, where there were no statistically significant differences between the two groups. Specifically, fewer foreign-born adults than native-born adults reported having a regular medical doctor (63.2 versus 79.9 percent, $p < .0001$), a consultation with a health professional in the past 12 months (85.7 versus 94.1 percent, $p < .001$), a dentist visit in the past 12 months (51.7 versus 67.2 percent, $p < .0001$); and more foreign-born adults than native-born adults reported any unmet health care needs in the past 12 months (17.9 versus 13.9 percent, $p < .05$). There were also differences in both satisfaction with care and perceived quality of care depending on immigrant status. For satisfaction with care, foreign-born adults reported being very/somewhat satisfied slightly less often than native-born adults (86.8 versus 90.1 percent, $p < .05$). Similarly, for perceived quality of care, foreign-born adults reported excellent/good quality less often than native-born adults (82.1 versus 89.1 percent, $p < .0001$).

Multiple logistic regression models were then used to account for the various covariates, except health insurance. Regression-adjusted probabilities indicated that the association between immigrant status and access to care remained statistically significant for having a regular medical doctor and a consultation with a health professional, but they became nonsignificant for all other indicators. After adjusting for all covariates, including health insurance, the associations remained significant for having a regular medical doctor (74.2 percent foreign born versus 83.5 percent native born, $p < .01$) and having a consultation with a health professional (93.5 percent foreign born versus 96.2 percent native born, $p < .05$).

Effect of Country of Residence on Access to Care among Foreign-Born Adults

Table 4 presents comparisons made between foreign-born adults in Canada and foreign-born adults in the United States. In unadjusted analyses, a greater proportion of foreign-born adults in Canada reported having a regular medical doctor (79.0 percent), a health consultation in the past year (93.3 percent), and a dentist visit in the past year (64.6 percent), compared with foreign-born

Table 3: Estimates of Effect of Foreign Birth on Access to Care in the United States, Joint Canada–United States Survey of Health

	Unadjusted Probabilities (%)				Regression-Adjusted Probabilities (%) (Excluding Insurance) [†]				Regression-Adjusted Probabilities (%) (Including Insurance) [‡]			
	Foreign Born (n = 624)		Native Born (n = 3267)		Foreign Born		Native Born		Foreign Born		Native Born	
				Difference	Significance							Significance
Have a regular medical doctor	63.21	79.94	79.94	−16.73	****	71.05	83.12	83.12	74.20	83.46	83.46	***
Consultation with health	85.67	94.11	94.11	−8.44	***	91.63	95.73	95.73	93.47	96.18	96.18	*
professional, past 12 months												
Dentist visit, past 12 months	51.65	67.21	67.21	−15.56	****	66.58	68.61	68.61	66.92	68.58	68.58	NS
Pap test, past 3 years	85.37	88.96	88.96	−3.59	NS	85.40	90.11	90.11	86.62	90.18	90.18	NS
Mammogram, past 2 years	81.70	81.20	81.20	0.50	NS	84.54	84.85	84.85	85.29	84.82	84.82	NS
Any unmet health care needs,	17.90	13.86	13.86	4.04	*	11.76	12.46	12.46	9.90	12.24	12.24	NS
past 12 months												
Satisfaction with care—very/	86.81	90.09	90.09	−3.28	*	91.70	91.27	91.27	92.49	91.18	91.18	NS
somewhat satisfied												
Perceived Quality of care—	82.10	89.05	89.05	−6.95	****	88.12	90.36	90.36	88.87	90.26	90.26	NS
excellent/good												

* $p < .05$, ** $p < .01$, *** $p < .001$, **** $p < .0001$.

[†]Regression models adjusted for age, sex, marital status, health status, racial background, education, income quintile (and dental insurance for dentist visits).

[‡]Regression models additionally adjusted for health insurance.

Table 4: Estimates of Effect of Country of Residence on Access to Care among Foreign-Born Adults, Joint Canada–United States Survey of Health

	Unadjusted Probabilities (%)				Regression-Adjusted Probabilities (%) (Excluding Insurance from Models) [†]				Regression-Adjusted Probabilities (%) (Including Insurance in Models) [‡]			
	United States (n = 624)		Difference	Significance	United States		Difference	Significance	United States		Difference	Significance
	Canada (n = 473)				Canada				Canada			
Have a regular medical doctor	79.01	63.21	15.80	***	80.15	71.46	8.69	NS	75.8	75.69	0.11	NS
Consultation with health professional, past 12 months	93.30	85.67	7.63	**	96.86	94.37	2.49	NS	96.36	95.15	1.21	NS
Dentist visit, past 12 months	64.57	51.65	12.92	***	62.76	57.83	4.93	NS	63.69	57.34	6.35	NS
Pap test, past 3 years	65.43	85.37	−19.94	***	70.42	87.99	−17.57	*	67.67	89.69	−22.02	**
Mammogram, past 2 years	76.96	81.70	−4.74	NS	81.28	86.46	−5.18	NS	85.40	88.87	−3.47	NS
Any unmet health care needs, past 12 months	9.10	17.90	−8.80	***	8.99	15.20	−6.21	NS	10.35	12.45	−2.1	NS
Satisfaction with care—very/somewhat satisfied	86.64	86.81	−0.17	NS	86.78	90.11	−3.33	NS	86.38	90.29	−3.91	NS
Perceived quality of care—excellent/good	78.79	82.10	−3.31	NS	81.73	87.22	−5.49	NS	81.53	87.25	−5.72	NS

* $p < .01$, ** $p < .001$, *** $p < .0001$.

[†]Regression models adjusted for age, sex, marital status, health status, racial background, education, income quintile (and dental insurance for dentist visits).

[‡]Regression models additionally adjusted for health insurance in the United States.

adults in the United States (63.2, 85.7, and 51.7 percent, respectively; $p < .001$). Conversely, fewer immigrants in Canada reported unmet needs in the past year compared with immigrants in the United States (9.1 versus 17.9 percent, $p < .0001$). However, a smaller proportion of foreign-born women in Canada reported having a Pap test in the past 3 years, compared with foreign-born women in the United States (65.4 versus 85.4 percent, $p < .0001$). There were no differences based on country of residence for immigrants' receipt of mammograms, satisfaction with care, and quality of care.

The penultimate regression models adjusted for all covariates, except health insurance. Regression-adjusted probabilities indicated that the association between country of residence and access to care remained statistically significant for Pap tests among foreign-born women (70.4 percent Canada versus 88.0 percent United States, $p < .01$), but it became nonsignificant for all other indicators. After adjusting for all covariates, including health insurance, the association for having a Pap test remained significant (67.7 percent Canada versus 89.7 percent United States, $p < .001$).

DISCUSSION

In both countries, immigrants had worse access to care than nonimmigrants for some indicators but not others, providing some evidence in favor of the hypothesis that foreign birth is a risk factor for poor access to primary and preventive care. However, few differences in access to care were found when direct cross-country comparisons were made between immigrants in Canada versus the United States, after accounting for sociodemographic differences.

It was hypothesized that immigrants' access to care would be better if they lived in Canada, where universal health coverage is provided, versus the United States, where insurance coverage is fragmented and often excludes foreign-born populations. Indeed, in unadjusted analyses, immigrants living in Canada had better access to care compared with immigrants living in the United States. On the other hand, immigrants who realized access to care in both countries reported similar rates of satisfaction with care and perceived quality of care. These findings suggest that although there are disparities in access to care across countries, once immigrants in each country achieve access they are equally content with their overall health care experiences. One explanation for this is that immigrants who have access to care may be endowed with more enabling resources than those without access, and those same resources may also help them obtain higher quality care.

Most of the differences in access were explained by differences across the two countries in socioeconomic status (i.e., education, income quintile, racial origin) and insurance coverage among immigrants. Adjusting for demographic and socioeconomic covariates effectively served to eliminate the effect of country of residence on access to care for all measures except Pap tests, and partly explained immigrants' barriers to primary and preventive care. Additionally adjusting for insurance status differences within the United States further attenuated the disparities across countries for having a regular medical doctor, having a health professional consultation, mammograms, and having any unmet health care needs.

A counterintuitive finding, however, was that immigrants in Canada were less likely to have a timely Pap test than immigrants in the United States, indicating that barriers to care remain for Canadian immigrants despite the country's universal health coverage. One potential explanation for this result may be that the United States has targeted efforts at increasing cancer screening among minority and low-income populations, and thus has successfully reached immigrants who tend to fit these sociodemographic profiles (Smedley, Stith, and Nelson 2003; National Center for Chronic Disease Prevention and Health Promotion 2009a, 2009b). Cervical cancer screening in Canada, on the other hand, has largely been "ad hoc" or opportunistic rather than through an organized screening program, and although certain provinces have implemented their own population-based screening programs these do not seem to specifically target underserved populations (Public Health Agency of Canada, Health Canada 2002). In addition, the U.S. Department of Health and Human Services introduced the National Standards on Culturally and Linguistically Appropriate Services in 2001, representing one federal attempt at promoting access to health care among diverse populations (Office of Minority Health 2007). In Canada, however, language barriers in access to care have been recognized, and regional or provincial service provision models have been developed, but no national standards of practice have been established to date (Bowen 2001; Pottie 2007; Goggins 2008).

Alternatively, it may be that the composition of immigrant populations are different in each country, and that there are unique cultural or behavioral barriers to Pap tests among immigrants to Canada, which have not been sufficiently addressed through the provision of universal health care. Although data limitations in the JCUSH prevented us from comparing immigrant composition across countries, Census data show that the United States receives more Hispanic immigrants than Canada, which receives a greater proportion of Asian immigrants (Passel and Suro 2005; Citizenship and Immigration

Canada 2007; Terrazas et al. 2007). Previous research has found that among immigrants to the United States, Latinas have a greater likelihood of receiving cervical cancer screenings than whites or Asians (De Alba et al. 2005); Pap test rates may be higher in the United States because of higher fertility rates among Latina immigrants, which brings them into contact with the health care system (Gonzales 2008). In Canada, Asian immigrants have significantly lower rates than Canadian-born women and other immigrant groups, even after many years of residence (McDonald and Kennedy 2007). These demographic differences may be associated with more barriers among Asian immigrants to Canada due to lack of knowledge of health-related issues and the health care system, cultural attitudes and beliefs, gender roles, or lack of culturally appropriate services (Lai and Chau 2007; Maticka-Tyndale, Shirpak, and Chinichian 2007; Wang 2007; Brotto et al. 2008; Roth and Kobayashi 2008; Wang, Rosenberg, and Lo 2008). Given that the survey was not conducted in Asian languages, immigrants from Asian countries (especially newer immigrants with limited English proficiency) may have been underrepresented in the JCUSH data; thus, the low Pap test rates in Canada may in fact overestimate the true rates, which may be even lower.

There were several limitations with this study. First, due to the lack of availability in the JCUSH dataset, some important determinants were not included in the analyses, including citizenship, length of stay, language proficiency, country/region of origin, and health beliefs. We expect that their inclusion would have highlighted barriers to care among noncitizen immigrants in the United States; differences in access to care between immigrants in Canada and the United States would have been accentuated because health insurance coverage in the former country is universal and not dependent on citizenship status. Length of stay would also likely be identified as a barrier to care in both countries, with more recent immigrants having worse access than more established immigrants. Information on language proficiency would probably have revealed worse access to care among Spanish-speaking immigrants in the United States, and even worse access among immigrants who spoke another language besides English or Spanish. Although Canada is officially a bilingual country committed to the provision of services in English and French, immigrants who are not fluent in either of these languages would also be expected to have worse access to care. Finally, there are differences between immigrants to Canada and those to the United States, besides the obvious difference in insurance coverage, which heighten the disparities in access across countries. Specifically, Canadian immigrants typically have higher education levels and higher incomes compared with U.S. immigrants.

We controlled for these differences in the multiple regression analyses, which accounted for many of the disparities, but such socioeconomic factors may be associated with other resources that enable access to care, including health beliefs, knowledge about the health care system, English proficiency, and so on. Inclusion of these types of variables might also help explain some of the disparities.

As well, the random digit dialing procedure excluded households without landline telephones, leading to potential biases. The percentage of households with no telephone is quite small, 1.8 percent in Canada and 4.4 percent in the United States (Sanmartin et al. 2004). In addition, poststratification techniques allowed for inferences to be made for the entire population, whether or not the households have telephone service. However, it is possible that immigrants were underrepresented in the sample. If this is the case, the disparities in access to care between the foreign-born and the native-born documented in this study were likely underestimated.

Similarly, surveys were only conducted in English and French (in Canada) and English and Spanish (in the United States), excluding households who only spoke other languages. Consequently, linguistically isolated households, especially newer immigrants, were more likely to be underrepresented in the survey. According to census data, about 10 percent of immigrants in both countries live in such households (Statistics Canada 2001a, 2001b, 2001c; Shin and Bruno 2003; Larsen 2004), and they are more likely to experience barriers to care than native-born individuals. Therefore, due to the language requirements for participation in the survey, the barriers in access to care for immigrants were likely conservatively estimated.

Another limitation is that JCUSH survey response rates were relatively low compared with other national health surveys. The rates were 65.5 percent in Canada and 50.2 percent in the United States, compared with 80.7 percent in the Canadian Community Health Survey and 74.2 percent in the U.S. National Health Interview Survey from the same year (National Center for Health Statistics 2004; Statistics Canada 2005). However, these latter surveys included in-person interviews, which tend to have higher response rates than telephone surveys. In addition, telephone survey response rates generally have been declining over the past few decades so this issue is not limited to the JCUSH. Furthermore, recent research has demonstrated that nonresponse often produces no or minimal bias, and that biases may be addressed through adjustments in survey weights, as was done in the JCUSH (Singer 2006; Kempf and Remington 2007).

Despite these limitations, this study contributes to the existing literature by examining the relationship between immigrant status and primary and preventive care, using a broad spectrum of indicators measuring access, utilization, and patient perceptions, in two primary migrant destinations. It uses the JCUSH dataset, which is the first multicountry survey using a single questionnaire and a standardized methodology, thus allowing for nationally representative, direct comparisons between Canada and the United States. Many previous studies have considered access to care in either Canada or the United States, but few have simultaneously compared results from the two countries. This study builds on previous analyses by including a wide array of outcome measures, and providing a comprehensive report of immigrants' health care experiences in North America.

Comparisons within and across countries indicate that health insurance coverage plays an important role in ensuring immigrants' access to care. To the extent that the health of these nations is increasingly being reflected by the health of a growing population of immigrants, policy makers interested in promoting their country's health and productivity, and reducing health care disparities, may want to consider expanding insurance coverage options for the foreign born. This is especially true in the United States, where undocumented immigrants receive no benefits or protection, and even documented immigrants are explicitly excluded from eligibility for federally funded health insurance for the first 5 years after arrival (Derose, Escarce, and Lurie 2007). The majority of the U.S. population receives insurance coverage through employers, but many immigrants work in low-paying jobs that do not offer affordable employer-sponsored insurance and thus they remain uninsured (Capps et al. 2002; Derose et al. 2007). While much of the policy debate surrounding health care coverage for immigrants in the United States has focused on unauthorized immigrants, 70 percent of the foreign-born population (28.0 million) in fact resides in the country legally (Passel and Cohn 2009). Two-thirds of immigrants are working, and while the foreign born make up 12 percent of the total population, they make up over 16 percent of the labor force (Larsen 2004; Passel and Cohn 2009). Thus, a large proportion of the foreign-born population merits consideration in policy efforts to improve access to care.

At the same time, health insurance should not be viewed as a panacea for assuring access to care for immigrants and other vulnerable populations. Indeed, disparities in access based on immigrant status persist in Canada, indicating that other barriers to care exist and have not yet been adequately addressed. In addition, stark socioeconomic differences exist across foreign-

born populations in each country, with a greater proportion of immigrants in the United States being racial/ethnic minorities and having lower education and income levels, compared with immigrants in Canada. Accounting for these differences reduces or eliminates access disparities across countries, suggesting that immigrants' access to care in the United States may also be improved by broader policy interventions aimed at improving access more generally among racial/ethnic minorities and populations with lower socioeconomic status.

ACKNOWLEDGMENTS

Joint Acknowledgment/Disclosure Statement: This work was supported in part by a Doctoral Research Award from the Canadian Institutes of Health Research and a National Research Service Award training grant from the U.S. Agency for Healthcare Research and Quality. This analysis is based on Joint Canada/United States Survey of Health public use microdata file, sponsored by Statistics Canada and the National Center for Health Statistics, which contains anonymized data. All computations on these microdata were prepared by the first author, and the responsibility for the use and interpretation of these data is entirely that of the authors.

Disclosure: None.

Disclaimer: None.

REFERENCES

- Agency for Healthcare Research and Quality. 2005. *The Guide to Clinical Preventive Services 2005: Recommendations of the U.S. Preventive Services Task Force*. Rockville, MD: Department of Health and Human Services.
- Antecol, H., and K. Bedard. 2006. "Unhealthy Assimilation: Why Do Immigrants Converge to American Health Status Levels?" *Demography* 43 (2): 337–60.
- Blackwell, D., M. Martinez, and J. Gentleman. 2008. "Women's Compliance with Public Health Guidelines for Mammograms and Pap Tests in Canada and the United States." *Women's Health Issues* 18: 85–99.
- Blackwell, D., M. Martinez, J. Gentleman, C. Sanmartin, and J.-M. Berthelot. 2009. "Socioeconomic Status and Utilization of Health Care Services in Canada and the United States: Findings from a Binational Health Survey." *Medical Care* 47: 1136–46.
- Bowen, S. 2001. *Language Barriers in Access to Health Care*. Ottawa, ON: Health Canada.

- Brotto, L., A. Chou, T. Singh, and J. Woo. 2008. "Reproductive Health Practices among Indian, Indo-Canadian, Canadian East Asian, and Euro-Canadian Women: The Role of Acculturation." *Journal of Obstetrics and Gynaecology Canada* 30: 229–38.
- Capps, R., L. Ku, M. Fix, C. Furguele, J. Passel, R. Ramchand, S. McNiven, D. Perez-Lopez, E. Fielder, M. Greenwell, and T. Hays. 2002. *How Are Immigrants Faring after Welfare Reform? Preliminary Evidence from Los Angeles and New York City*. Washington, DC: The Urban Institute.
- Carrasquillo, O., and S. Pati. 2004. "The Role of Health Insurance on Pap Smear and Mammography Utilization by Immigrants Living in the United States." *Preventive Medicine* 39: 943–50.
- Citizenship and Immigration Canada. 2007. "Facts and Figures 2006: Immigration Overview—Permanent and Temporary Residents. Canada—Permanent Residents by Top Source Countries" [accessed on April 13, 2008]. Available at <http://www.cic.gc.ca/english/resources/statistics/facts2006/permanent/12.asp>
- Cleary, P., and A. Jette. 1984. "The Validity of Self-Reported Physician Utilization Measures." *Medical Care* 22 (9): 796–803.
- Cohen, R., and M. Martinez. 2007. *Health Insurance Coverage: Early Release of Estimates from the National Health Interview Survey, 2006*. Hyattsville, MD: National Center for Health Statistics: Centers for Disease Control and Prevention.
- Cunningham, S., J. Ruben, and K. Narayan. 2008. "Health of Foreign-Born People in the United States: A Review." *Health and Place* 14: 623–35.
- De Alba, I., F. Hubbell, J. McMullin, J. Sweningson, and R. Saitz. 2005. "Impact of U.S. Citizenship Status on Cancer Screening among Immigrant Women." *Journal of General Internal Medicine* 20: 290–96.
- Derosé, K., B. Bahney, N. Lurie, and J. Escarce. 2009. "Immigrants and Health Care Access, Quality, and Cost." *Medical Care Research and Review* 66 (4): 355–408.
- Derosé, K., J. Escarce, and N. Lurie. 2007. "Immigrants and Health Care: Sources of Vulnerability." *Health Affairs* 26: 1258–68.
- Dey, A., and J. Lucas. 2006. *Physical and Mental Health Characteristics of U.S. and Foreign-Born Adults: United States, 1998–2003*. Advance Data from Vital and Health Statistics, No. 369. Washington, D.C.: National Center for Health Statistics.
- Frisbie, W., Y. Cho, and R. Hummer. 2001. "Immigration and the Health of Asian and Pacific Islander Adults in the United States." *American Journal of Epidemiology* 153 (4): 372–80.
- Fuentes-Afflick, E., N. Hessol, T. Bauer, M. O'Sullivan, V. Gomez-Lobo, S. Holman, T. Wilson, and H. Minkoff. 2006. "Use of Prenatal Care by Hispanic Women after Welfare Reform." *Obstetrics and Gynecology* 107 (1): 151–60.
- Gilbert, G., J. Rose, and B. Shelton. 2002. "A Prospective Study of the Validity of Data on Self-Reported Dental Visits." *Community Dentistry and Oral Epidemiology* 30 (5): 352–62.
- Goel, M., C. Wee, E. McCarthy, R. Davis, Q. Ngo-Metzger, and R. Phillips. 2003. "Racial and Ethnic Disparities in Cancer Screening: The Importance of Foreign Birth as a Barrier to Care." *Journal of General Internal Medicine* 18: 1028–35.

- Goggins, K. 2008. "More Than Words: Health Care Interpreters Play Key Role in Quality Care." *Cross Currents: The Journal of Addiction and Mental Health* 11 (3).
- Goldman, D., J. Smith, and N. Sood. 2006. "Immigrants and the Cost of Medical Care." *Health Affairs* 25 (6): 1700–11.
- Gonzales, F. 2008. *Hispanic Women in the United States, 2007*. Washington, DC: Pew Hispanic Center.
- Gordon, N., R. Hiatt, and D. Lampert. 1993. "Concordance of Self-Reported Data and Medical Record Audit for Six Cancer Screening Procedures." *Journal of the National Cancer Institute* 85 (7): 566–70.
- Green, E., K. Freund, M. Posner, and M. David. 2005. "Pap Smear Rates among Haitian Immigrant Women in Eastern Massachusetts." *Public Health Reports* 120: 133–39.
- Health Canada. 2006. "Screening for Cervical Cancer: It's Your Health" [accessed on July 15, 2008]. Available at <http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/diseases-maladies/cervical-uterus-eng.php>
- Hurwitz, E., and L. Chiang. 2006. "A Comparative Analysis of Chiropractic and General Practitioner Patients in North America: Findings from the Joint Canada/United States Survey of Health, 2002–03." *BMC Health Services Research* 6: 1–17.
- Kasper, J. 1998. "Part III: What Can We Realistically Expect from Surveys? Constraints of Data and Methods." *Health Services Research* 33 (3): 715–39.
- Kempf, A., and P. Remington. 2007. "New Challenges for Telephone Survey Research in the Twenty-First Century." *Annual Review of Public Health* 28: 113–26.
- Kennedy, J., and S. Morgan. 2006a. "A Cross-National Study of Prescription Nonadherence Due to Cost: Data From the Joint Canada–United States Survey of Health." *Clinical Therapeutics* 28 (8): 1217–24.
- . 2006b. "Health Care Access in Three Nations: Canada, Insured America, and Uninsured America." *International Journal of Health Services* 36 (4): 697–717.
- Kirmayer, L., M. Weinfeld, G. Burgos, G. Galbaud du Fort, J.-C. Lasry, and A. Young. 2007. "Use of Health Care Services for Psychological Distress by Immigrants in an Urban Multicultural Milieu." *Canadian Journal of Psychiatry* 52 (5): 295–304.
- Lai, D., and S. Chau. 2007. "Predictors of Health Service Barriers for Older Chinese Immigrants in Canada." *Health and Social Work* 32 (1): 57–65.
- Lara, M., C. Gamboa, M. Kahramanian, L. Morales, and D. Bautista. 2005. "Acculturation and Latino Health in the United States: A Review of the Literature and its Sociopolitical Context." *Annual Review of Public Health* 26: 367–97.
- Larsen, L. 2004. *The Foreign-Born Population in the United States: 2003. Current Population Reports, P20-551*. Washington, D.C.: U.S. Census Bureau.
- Lasser, K., D. Himmelstein, and S. Woolhandler. 2006. "Access to Care, Health Status, and Health Disparities in the United States and Canada: Results of a Cross-National Population-Based Survey." *American Journal of Public Health* 96: 1300–07.
- LaVeist, T. 2005. "The Demography of American Racial/Ethnic Minorities." In *Minority Populations and Health: An Introduction to Health Disparities in the United States*, edited by T. LaVeist, pp. 30–50. San Francisco: Jossey-Bass.

- LeClerce, F., L. Jensen, and A. Biddlecom. 1994. "Health Care Utilization, Family Context, and Adaptation among Immigrants to the United States." *Journal of Health and Social Behavior* 35: 370–84.
- Li, H., and A. Browne. 2000. "Defining Mental Illness and Accessing Mental Health Services: Perspectives of Asian Canadians." *Canadian Journal of Community Mental Health* 19 (1): 143–59.
- Lucas, J., D. Barr-Anderson, and R. Kington. 2003. "Health Status, Health Insurance, and Health Care Utilization Patterns of Immigrant Black Men." *American Journal of Public Health* 93: 1740–47.
- Marchildon, G. 2005. *Health Systems in Transition: Canada*. Copenhagen: WHO Regional Office for Europe on behalf of the European Observatory on Health Systems and Policies.
- Maticka-Tyndale, E., K. Shirpak, and M. Chinichian. 2007. "Providing for the Sexual Health Needs of Canadian Immigrants: The Experience of Immigrants from Iran." *Canadian Journal of Public Health* 98 (3): 183–86.
- McDonald, J., and S. Kennedy. 2004. "Insights into the 'Healthy Immigrant Effect': Health Status and Health Service Use of Immigrants to Canada." *Social Science and Medicine* 59: 1613–27.
- . 2007. "Cervical Cancer Screening by Immigrant and Minority Women in Canada." *Journal of Immigrant and Minority Health* 9: 323–34.
- McPhee, S., T. Nguyen, S. Shema, B. Nguyen, C. Somkin, P. Vo, and R. Pasick. 2002. "Validation of Recall of Breast and Cervical Cancer Screening by Women in an Ethnically Diverse Population." *Preventive Medicine* 35: 463–73.
- Mojtabai, R., and M. Olfson. 2006. "Treatment Seeking for Depression in Canada and the United States." *Psychiatric Services* 57 (5): 631–39.
- National Center for Chronic Disease Prevention and Health Promotion. 2009a. "Halting the Cancer Burden: At a Glance" [accessed on October 16, 2009]. Available at <http://www.cdc.gov/NCCDPHP/publications/AAG/dcpc.htm>
- National Center for Chronic Disease Prevention and Health Promotion. 2009b. *Racial and Ethnic Approaches to Community Health (REACH U.S.): Finding Solutions to Health Disparities*. Atlanta, GA: Centers for Disease Control and Prevention.
- National Center for Health Statistics. 2004. *2003 National Health Interview Survey (NHIS) Public Use Data Release: NHIS Survey Description*. Hyattsville, MD: National Center for Health Statistics.
- Newbold, B. 2005. "Health Status and Health Care of Immigrants in Canada: A Longitudinal Analysis." *Journal of Health Services Research and Policy* 10 (2): 77–83.
- Newbold, K., and A. Patel. 2006. "Use of Dental Services by Immigrant Canadians." *Journal of the Canadian Dental Association* 72 (2): 143a–f.
- Office of Management and Budget. 1997. *Federal Register Notice—Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity*. Washington, D.C.: Office of Management and Budget.
- Office of Minority Health. 2007. "National Standards on Culturally and Linguistically Appropriate Services (CLAS)" [accessed on March 20, 2009]. Available at <http://minorityhealth.hhs.gov/templates/browse.aspx?lvl=2&lvlID=15>

- Paskett, E., C. Tatum, D. Mack, H. Hoen, L. Case, and R. Velez. 1996. "Validation of Self-Reported Breast and Cervical Cancer Screening Tests among Low-Income Minority Women." *Cancer Epidemiology Biomarkers and Prevention* 5 (9): 721–26.
- Passel, J., and D. Cohn. 2009. *A Portrait of Unauthorized Immigrants in the United States*. Washington, DC: Pew Hispanic Center.
- Passel, J., and R. Suro. 2005. *Rise, Peak, and Decline: Trends in U.S. Immigration 1992–2004. Executive Summary*. Washington, D.C.: Pew Hispanic Center.
- Pottie, K. 2007. "Misinterpretation: Language Proficiency, Recent Immigrants, and Global Health Disparities." *Canadian Family Physician* 53: 1899–901.
- Public Health Agency of Canada, H. C. 2002. *Cervical Cancer Screening in Canada: 1998 Surveillance Report*. Ottawa, ON: Public Works and Government Services.
- Raina, P., V. Torrance-Rynard, M. Wong, and C. Woodward. 2002. "Agreement between Self-Reported and Routinely Collected Health-Care Utilization Data among Seniors." *Health Services Research* 37 (3): 751–74.
- Ritter, P., A. Stewart, H. Kaymaz, D. Sobel, D. Block, and K. Lorig. 2001. "Self-Reports of Health Care Utilization Compared to Provider Records." *Journal of Clinical Epidemiology* 54: 136–41.
- Roberts, R., E. Bergstrahl, L. Schmidt, and S. Jacobsen. 1996. "Comparison of Self-Reported and Medical Record Health Care Utilization Measures." *Journal of Clinical Epidemiology* 49 (9): 989–95.
- Roth, M., and K. Kobayashi. 2008. "The Use of Complementary and Alternative Medicine among Chinese Canadians: Results from a National Survey." *Journal of Immigrant and Minority Health* 10: 517–28.
- Sanmartin, C., J.-M. Berthelot, E. Ng, K. Murphy, D. Blackwell, J. Gentleman, M. Martinez, and C. Simile. 2006. "Comparing Health and Health Care Use in Canada and the United States." *Health Affairs* 25 (4): 1133–42.
- Sanmartin, C., E. Ng, D. Blackwell, J. Gentleman, M. Martine, and C. Simile. 2004. *Joint Canada/United States Survey of Health, 2002–03*. Statistics Canada, Health Analysis and Measurement Group and Centers for Disease Control and Prevention, National Center for Health Statistics.
- Shi, L., and D. Singh. 2008. *Delivering Health Care in America: A Systems Approach*. Boston: Jones and Bartlett.
- Shi, L., B. Starfield, R. Politzer, and J. Regan. 2002. "Primary Care, Self-Rated Health, and Reductions in Social Disparities in Health." *Health Services Research* 37 (3): 529–50.
- Shin, H., and R. Bruno. 2003. *Language Use and English-Speaking Ability: 2000. Census 2000 Brief*, pp. 1–11. Washington, D.C.: U.S. Census Bureau.
- Siddiqi, A., D. Zuberi, and Q. Nguyen. 2009. "The Role of Health Insurance in Explaining Immigrant Versus Non-Immigrant Disparities in Access to Health Care: Comparing the United States to Canada." *Social Science and Medicine* 69 (10): 1452–9.
- Singer, E. 2006. "Nonresponse Bias in Household Surveys." *Public Opinion Quarterly* 70 (5): 637–45.
- Singh, G., and M. Siahpush. 2001. "All-Cause and Cause-Specific Mortality of Immigrants and Native-Born in the United States." *American Journal of Public Health* 91: 392–99.

- Smedley, B., A. Stith, and A. Nelson. 2003. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Washington, DC: Institute of Medicine.
- Starfield, B., L. Shi, and J. Macinko. 2005. "Contribution of Primary Care to Health Systems and Health." *Milbank Quarterly* 83 (3): 457–502.
- StataCorp. 2007. *Stata Statistical Software: Release 10.0*. College Station, TX: StataCorp.
- Statistics Canada. 2001a. "Detailed Language Spoken at Home, Frequency of Language Spoken at Home and Sex for Population, for Canada, Provinces, Territories, Census Metropolitan Areas and Census Agglomerations, 2001 Census—20% Sample Data" [accessed on April 27, 2010]. Available at <http://www12.statcan.ca/english/census01/products/standard/themes/RetrieveProductTable.cfm?Temporal=2001&PID=55536&APATH=3&GID=431515&METH=1&PTYPE=55440&THEME=41&FOCUS=0&AID=0&PLACENAME=0&PROVINCE=0&SEARCH=0&GC=0&GK=0&VID=0&VNAMEF=&VNAMEF=&FL=0&RL=0&FREE=0>
- Statistics Canada. 2001b. "Immigrant Status by Period of Immigration, 2001 Counts, for Canada, Provinces and Territories—20% Sample Data" [accessed on April 27, 2010]. Available at <http://www12.statcan.ca/english/census01/products/highlight/Immigration/Page.cfm?Lang=E&Geo=PR&View=1&Table=1&StartRec=1&Sort=2&BI=Counts>
- Statistics Canada. 2001c. *Knowledge of Official Languages, 2001 Counts for Both Sexes, for Canada, Provinces and Territories—20% Sample Data*. Ottawa, ON: Statistics Canada.
- Statistics Canada. 2005. *Canadian Community Health Survey 2003: User Guide for the Public Use Microdata File*. (Catalogue no. 82M0013GPE). Ottawa, ON: Statistics Canada.
- Statistics Canada. 2007. "Population by Immigrant Status and Period of Immigration, 2006 Counts, for Canada, Provinces and Territories—20% Sample Data" [accessed on December 16, 2007]. Available at <http://www12.statcan.ca/english/census06/data/highlights/Immigration/Table403.cfm?Lang=E&T=403&GH=4&SC=1&S=99&O=A>
- Stephen, E., K. Foote, G. Hendershot, and C. Schoenborn. 1994. "Health of the Foreign-Born Population: United States, 1989–90." *Advance Data* 241: 1–12.
- Terrazas, A., J. Batalova, and V. Fan. 2007. "Frequently Requested Statistics on Immigrants in the United States" [accessed on October 1, 2008]. Available at <http://www.migrationinformation.org/USfocus/display.cfm?id=649>
- U.S. Department of Health and Human Services. 2000. *Healthy People 2010*. Washington, DC: U.S. Government Printing Office.
- Vasiliadis, H., A. Lesage, C. Adair, P. Wang, and R. Kessler. 2007. "Do Canada and the United States Differ in Prevalence of Depression and Utilization of Services?" *Psychiatric Services* 58 (1): 63–71.
- Vega, W., B. Kolody, S. Aguilar-Gaxiola, and R. Catalano. 1999. "Gaps in Service Utilization by Mexican Americans with Mental Health Problems." *American Journal of Psychiatry* 156: 928–34.
- Wang, L. 2007. "Immigration, Ethnicity, and Accessibility to Culturally Diverse Family Physicians." *Health and Place* 13: 656–71.

- Wang, L., M. Rosenberg, and L. Lo. 2008. "Ethnicity and Utilization of Family Physicians: A Case Study of Mainland Chinese Immigrants in Toronto, Canada." *Social Science and Medicine* 67 (9): 1410–22.
- Wen, S., V. Goel, and J. Williams. 1996. "Utilization of Health Care Services by Immigrants and Other Ethnic/Cultural Groups in Ontario." *Ethnicity and Health* 1 (1): 99–109.
- Woltman, K., and K. Newbold. 2007. "Immigrant Women and Cervical Cancer Screening Uptake." *Canadian Journal of Public Health* 98 (6): 470–75.
- Wu, Z., M. Penning, and C. Schimmele. 2005. "Immigrant Status and Unmet Health Care Needs." *Canadian Journal of Public Health* 96 (5): 369–73.
- Xu, K., and T. Borders. 2008. "Does Being an Immigrant Make a Difference in Seeking Physician Services?" *Journal of Health Care for the Poor and Underserved* 19: 380–90.
- Zhang, X., P. Lee, T. Thompson, S. Sharma, L. Barker, L. Geiss, G. Imperatore, E. Gregg, X. Zhang, and J. Saaddine. 2008. "Health Insurance Coverage and Use of Eye Care Services." *Archives of Ophthalmology* 126 (8): 1121–26.

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Appendix SA1: Author Matrix.

Please note: Wiley-Blackwell is not responsible for the content or functionality of any supporting materials supplied by the authors. Any queries (other than missing material) should be directed to the corresponding author for the article.