© Health Research and Educational Trust
DOI: 10.1111/j.1475-6773.2012.01466.x
RESEARCH ARTICLE

Comparison of Health Care Utilization: United States versus Canada

Yuriy Pylypchuk and Eric M. Sarpong

Objective. To compare health care utilization between Canadian and U.S. residents.

Data Sources. Nationally representative 2007 surveys from the Medical Expenditure Panel Survey for the United States and the Canadian Community Health Survey for Canada.

Study Design. We use descriptive and multivariate methods to examine differences in health care utilization rates for visits to medical providers, nurses, chiropractors, specialists, dentists, and overnight hospital stays, usual source of care, Pap smear tests, and mammograms.

Principal Findings. The poor and less educated were more likely to utilize health care in Canada than in the United States. The differences were especially pronounced for having a usual source of care and for visits to providers, specialists, and dentists. Health care use for residents with high incomes and higher levels of education were not markedly different between the two countries and often higher for U.S. residents. Foreign-born residents were more likely to use health care in Canada than in the United States. The descriptive results were confirmed in multivariate regressions.

Conclusions. Given the magnitude of our results, the health insurance structure in Canada might have played an important role in improving access to care for subpopulations examined in this study.

Key Words. Health care services, universal coverage, Canada, United States

Differences in health care systems in the United States and Canada have garnered immense interest in recent years in view of rising health care expenditures and recent debates about approaches to health insurance coverage and access to health care. In Canada, health insurance covers expenses for physician and hospital services, with costs primarily financed by the federal, provincial, and territorial governments. In contrast, health coverage in the United States is provided through a mixture of public and private insurance, leaving a large percentage of the population underinsured and uninsured—with estimates showing 29 million underinsured adults in 2010 (Schoen et al. 2011) and 41.3 million uninsured in 2009 (Chu and Rhoades 2011). The different approaches to health care financing and coverage in Canada and the United

States present an opportunity to examine differences within and across sub-populations in the use of health care services.

The objective of our article is to examine differences in health care use between the two countries' total populations¹ and residents who are considered "vulnerable" regarding their access to and use of health care. Equitable utilization of health care can be assessed by comparing segments of the population who are likely to have barriers in accessing health care. To the extent that health coverage reduces the cost of health care services, health care may be more affordable for low-income groups living in countries with universal coverage. Immigrants or the foreign-born are another segment of the population often deemed "vulnerable." Conditional on income and educational attainment, immigrants may have language barriers, lack knowledge about the mechanisms of obtaining coverage, be employed in firms that do not offer coverage, and may be time constrained in accessing care. The presence of universal coverage may reduce some of these barriers for the foreign-born population. Finally, access to care among the less educated population can be quite challenging in countries without universal coverage, for reasons similar to those of immigrants and low-income populations. Comparing the three sub-populations across a wide spectrum of health care measures provides us with valuable information about the role of the health systems in reducing differences in health care access and use in the two countries.

Our study contributes to the previous literature on several fronts. First, we focus on a wide range of health services, many of which have not been compared between the two countries in the previous literature. In particular, we examine differences in having a usual source of care, visits to medical providers, nurses, chiropractors, dentists, and specialists, as well as overnight hospital stays, the use of Pap smear tests, and the use of mammograms. Second, our study uses much larger data sets than what were used in the previous literature, enabling us to improve the precision of estimates. Third, in addition to analyzing utilization behavior of the total population in the two countries, we focus on vulnerable subpopulations that were not comprehensively examined in a previous literature.

We use two nationally representative surveys—the Medical Expenditure Panel Survey (MEPS) for the United States and the Canadian Community

Author correspondence to Yuriy Pylypchuk, Ph.D., Social and Scientific Systems and Georgetown Public Policy Institute, 540 Gaither Road, Rockville, MD 20850; e-mail: yuriy.pylypch@ahrq.gov. Eric M. Sarpong, Ph.D., is with the Center for Financing, Access, and Cost Trends, Agency for Healthcare Research and Quality, Rockville, MD.

Health Survey (CCHS) for Canada to examine differences, overall and across subpopulations, in the use of health care. Because the two surveys are independent, the wording and the ordering of questions asked are not identical and may contribute to the differences in results. For key variables of interest, we compared estimates of utilization rates obtained from the MEPS and the CCHS with the Joint Canada/United States Survey of Health (JCUSH), which interviewed individuals consistently in the two countries. We find that for those variables that were available in the three surveys, the point estimates and the differences in utilization obtained from the MEPS and the CCHS were very similar to those from the JCUSH. We opted to use the MEPS and the CCHS over the JCUSH because the MEPS and the CCHS provide more information on health services use and have larger sample sizes than the JCUSH. Moreover, the JCUSH collects information using random telephone dialing, which implies that individuals without phone lines may not have been interviewed. Although the percentage of persons without telephones are relatively small (4.4 in the United States and 1.8 in Canada), persons without telephones are likely to be poor, less educated, and foreign-born—a key focus of our analysis.

PREVIOUS LITERATURE

There is a large body of literature that compares health outcomes and health services use among residents in the United States, Canada, and other developed countries. Access to health care and the use of health care tends to differ by characteristics such as socioeconomic status, nativity, and race-ethnicity. Blendon et al. (2002) found that Americans with below-average incomes were significantly more likely to report worse access to care than persons with below-average incomes in Canada. A study by Krajewski et al. (2009) suggested that access to emergency operative care is related to socioeconomic status in the United States, but not in Canada. Blackwell et al. (2009) used country-specific multivariate logistic regressions to predict the effects of individual characteristics on doctor visits and overnight hospitalizations. Relative to Canadian adults, there were significant differences in doctor contacts by income and health insurance among adults in the United States. Similarly, Lasser, Himmelstein, and Woolhandler (2006) examined differences in having a regular doctor, unmet health care needs, and forgoing needed medicines among low-income, foreign-born, and non-white populations. The authors found significant differences in each outcome for these subpopulations, and

the differences were larger for the United States than Canada. Using decomposition analysis, McGrail et al. (2009) found that health care system characteristics such as health insurance and lifestyle risk factors explained a larger share of the income-related health inequalities in the United States than in Canada.

Other studies have produced mixed findings regarding utilization rates among specific subgroups in the United States and Canada. For instance, Siddiqi, Zuberi, and Nguyen (2009) compared health care access among insured and uninsured immigrants and natives within the United States and Canada using data from the JCUSH. The authors found that differences in unmet health care needs were similar between insured U.S. immigrants and Canadian immigrants. The authors also found that rates of reported unmet health care needs and absence of a regular doctor were much higher for uninsured U.S. immigrants compared to Canadian immigrants. A similar study by Lebrun and Dubay (2010) found that health services utilization rates within the United States and Canada were worse for immigrants compared to natives, but cross-country comparisons did not reveal any significant difference in utilization rates for the foreign-born population.

In addition to differences in access to and use of health care, several studies have found differences in reported health status by socioeconomic characteristics between residents of Canada and the United States. A study by Sanmartin et al. (2006) found that health status in the United States and Canada was similar, but more Americans in the poorest income quintile reported poor health status compared to their Canadian counterparts. Decker and Remler (2005) found that low-income residents in the United States were more likely to report poor health status than their Canadian counterparts. The differences in income gradient were reduced by half for individuals 65 and older, the age at which almost all U.S. citizens are eligible for health insurance through Medicare.

Although the rates of health care use for persons with low socioeconomic status, immigrants, and racial-ethnic minorities are often lower in the United States than in Canada, recent literature suggests that Canada and other developed countries lag behind the United States in preventive care services. Indeed, a study by O'Neill and O'Neill (2007) that used data from the CCHS, the MEPS, and the JCUSH found that screening rates for breast cancer, Pap smears, and prostate examinations were significantly higher in the United States than those in Canada.

Clearly, differences in characteristics tend to affect health care utilization in and across the two countries. The use of fairly recent data from the MEPS

and the CCHS would help shed light on differential use of health care and also the extent to which underserved individuals fare in the different health care systems.

DATA AND METHODS

Data

The data for the United States come from the 2007 MEPS, an ongoing overlapping panel survey administered by the Agency for Healthcare Research and Quality (AHRQ). The survey provides detailed and nationally representative information on health care utilization and expenditures, insurance coverage, sources of payment, health status, and demographic variables for the U.S. civilian, noninstitutionalized population. The data for Canada come from the 2007 CCHS, a nationally representative survey that uses a multistage, stratified cluster design to collect household information related to health status, health care utilization, and demographic characteristics for the Canadian population.

The two surveys collect rich information regarding the types of services individuals use during the year. We provide a summary of questions asked regarding the use of each health care service in the Appendix (available online) and outlined important details in this section. The two surveys asked respondents conceptually similar questions; however, the wordings of the questions are different for some variables. A key indicator of access to care is having a usual source of care. Both surveys asked respondents about having a usual source of care. The CCHS asks respondents whether they have a regular medical doctor. In contrast, the MEPS first asks respondents whether they have a usual source of care and subsequent questions asked respondents about the characteristics of the usual source of care. We view these responses as not directly comparable to the question asked in the CCHS because some individuals in the United States report a hospital, an emergency room, a nurse practitioner, a chiropractor, or some other non-physician provider as their usual source of care.

For this reason, we created two measures of having a usual source of care for the United States. The first measure is an indicator for whether a respondent reported having any usual source of care and the second measure indicates whether the respondent reported having a medical doctor. For Canada, we created an indicator for whether a respondent reported having a medical doctor. These measures provide important information regarding access

to care and the quality of access to care in the two countries. The remaining variables are binary indicators equal to one if the respondent visited or contacted a provider, a nurse, a specialist, or a dentist in the last 12 months. We also created measures indicating whether a person stayed in the hospital overnight, had a Pap smear in the last 12 months, or whether a respondent has ever had a mammogram.

To ascertain whether methodological differences in data collection between the two surveys may contribute to differences in our estimates, we resort to the JCUSH, which consistently and systematically interviewed respondents in the United States and Canada. In Table 1, we report the means and differences for selected measures that are available in all three surveys. The means for provider visits, dental visits, and mammograms are very similar between the JCUSH and the MEPS and between the JCUSH and the CCHS. There were slight differences in the point estimates for some of the selected measures between the JCUSH and the MEPS and between the JCUSH and the CCHS. In particular, the difference in having a usual source of care was significant when using MEPS-CCHS data, but it remained insignificant when JCUSH was used. However, we mitigated the impact of these differences by focusing much of the analysis on the difference-in-differences across subgroups in the United States and Canada.

We limited our analysis to the 25–64-year old population for each outcome, with the exception of measures for preventive care services. We also limited our sample to 40- to 64-year-old and 30- to 64-year-old women to examine the use of mammograms and Pap smear tests, respectively. We included those explanatory variables that were available in both surveys. The explanatory variables in the linear probability models include individuals' self-reported physical and mental health, selected chronic conditions² (arthritis, asthma, diabetes, and hypertension), age, gender, education, income, nativity, and marital status. We used standard categories of education, which are defined as individuals with less than a high school degree, high school degree or GED, some college, and bachelor's degree or higher. Information on nativity and length of stay in the United States was extracted from the National Health Interview Survey (NHIS) and linked to the MEPS. The CCHS collects nativity and length of stay information directly. The CCHS provides individual's annual income in Canadian dollars in intervals, whereas the MEPS provide individuals' annual income as a continuous variable in U.S. dollars. We used the purchasing power parity to convert Canadian dollars into U.S. dollars and then created income brackets for U.S. respondents

Table 1: Comparing Health Utilization Rates between the United States and Canada Using Three Surveys

Survey Name	JCUSH			MEPS US	CCHS Canada	Difference
	US	Canada	Difference			
Dental visit, past 12 months	0.67 (0.02)	0.67 (0.05)	0.00 (0.05)	0.67 (0.01)	0.66 (0.01)	-0.01 (0.01)
Have a usual source of care	0.81 (0.01)	0.86 (0.04)	0.05 (0.04)	0.77 (0.01)	0.85 (0.02)	0.08*** (0.02)
Mammogram, ever	0.85 (0.01)	0.72 (0.01)	-0.13*** (0.02)	0.90 (0.01)	0.72 (0.01)	-0.18*** (0.01)
Pap smear test, past 12 months	0.70 (0.02)	0.56 (0.02)	-0.14*** (0.02)	0.60 (0.01)	0.52 (0.01)	-0.08*** (0.01)
Provider visit, past 12 months	0.71 (0.01)	0.71 (0.03)	0.00 (0.03)	0.76 (0.01)	0.76 (0.01)	0.00 (0.01)

Note. Authors' calculations using the 2007 Medical Expenditure Panel Survey (MEPS) for the United States, the 2007 Canadian Community Health Survey (CCHS) for Canada, and 2002/2003 Joint Canada/United States Survey of Health (JCUSH). A positive difference in outcomes between Canada and the United States implies that utilization rate in Canada is higher than that in the United States for dental visit, provider visit, and having a usual source of care; the sample was limited to 25- to 64-year-old men and women. For mammogram and Pap smear test, the sample was limited to 30- to 64-year-old old women and 40- to 64-year-old old men, respectively.
Standard errors in parentheses.
*** $p < .01$.

Table 2: Distribution of Sociodemographic, Economic, and Health Characteristics: United States versus Canada (Proportions)

	<i>United States</i>	<i>Canada</i>
Educational attainment		
Less than high school	0.12 (0.01)	0.11 (0.01)
High school	0.31 (0.01)	0.16 (0.01)
Some college	0.15 (0.00)	0.07 (0.00)
College	0.41 (0.01)	0.64 (0.01)
Total personal annual income (in U.S. dollars)		
≤ \$0	0.06 (0.00)	0.04 (0.00)
>\$0 to <\$20,000	0.20 (0.01)	0.16 (0.01)
≥ \$20,000 to <\$39,000	0.25 (0.01)	0.24 (0.01)
≥ \$39,000 to <\$59,000	0.20 (0.00)	0.20 (0.00)
≥ \$59,000 to <\$80,000	0.12 (0.00)	0.12 (0.00)
≥ \$80,000	0.16 (0.01)	0.11 (0.01)
Foreign-born		
10 years or less	0.05 (0.00)	0.07 (0.01)
More than 10 years	0.13 (0.01)	0.16 (0.02)
<i>Health characteristics</i>		
Chronic conditions		
Arthritis	0.18 (0.01)	0.13 (0.01)
Asthma	0.09 (0.00)	0.08 (0.00)
Diabetes	0.07 (0.00)	0.05 (0.00)
High blood pressure	0.25 (0.01)	0.14 (0.00)
Health status		
Excellent overall health	0.26 (0.01)	0.23 (0.00)
Very good overall health	0.33 (0.01)	0.38 (0.01)
Good overall health	0.27 (0.01)	0.29 (0.01)
Fair overall health	0.10 (0.00)	0.07 (0.00)
Excellent mental health	0.40 (0.01)	0.39 (0.01)
Very good mental health	0.30 (0.01)	0.35 (0.01)
Good mental health	0.23 (0.01)	0.20 (0.00)
Fair mental health	0.06 (0.00)	0.04 (0.00)

Note. Authors' calculations using the 2007 Medical Expenditure Panel Survey for the United States and the 2007 Canadian Community Health Survey for Canada. Standard errors in parentheses.

that correspond to income brackets in the CCHS. Major explanatory variables used in our multivariate analyses are provided in Table 2.

Methods

For multivariate analyses, we estimated linear probability models to examine associations between several measures of health care use and an array of socio-demographic, economic, and health characteristics as follows:

$$y_i = \alpha_c \text{Canada}_i + b_1 D_i \times \text{Canada}_i + b_2 D_i + X_i' \Gamma + v_i \quad (1)$$

where y_i is a binary variable that equals one if individual i used a specific health service, *Canada* is a binary variable that equals one if respondent lives in Canada, D is a vector indicating subpopulations of interest, X is a vector of other observable characteristics (e.g., age, marital status, gender, education, income, and nativity),³ α_c , b_1 , b_2 , Γ are the corresponding coefficients, and v_i is an error term. The estimate α_c captures differences in utilization rates between Canada and the United States. Our estimate of interest is b_1 , which captures the relationship between health care use and demographic vector D for residents of Canada relative to residents of the United States. Because of a more generous health insurance structure in Canada, we hypothesize that the estimate b_1 will be positive, suggesting that subpopulations exhibit higher propensity to use health services in Canada than in the United States. We do not control for health insurance status of residents in the United States but rather consign differences in insurance regimes to the categorical variable Canada.

Since the MEPS and the CCHS use complex sampling methods, our estimates and standard errors account for the stratification, clustering, and weights to ensure that results are nationally representative of the respective populations covered by the two surveys. All the statistical analyses were conducted using Stata 11 (StataCorp 2009). We present and discuss the descriptive results for the United States and Canada samples (Table 2) and then present and interpret the unadjusted and adjusted results from the linear probability models.

RESULTS

Differences in Sociodemographic, Economic, and Health Characteristics between Canada and the United States

Table 2 presents information on the distribution of sociodemographic, economic, and health characteristics for the United States and Canada. The results indicate that residents of both countries were very similar on many sociodemographic characteristics. Residents in the United States were more likely to fall into either the lowest or highest income categories, were less likely to have a college degree, and were less likely to be foreign-born compared with residents in Canada. For most health measures, Canadian

residents appear to be slightly healthier than U.S. residents. For example, Canadians were more likely to report being in very good or good overall and mental health compared with U.S. residents, although U.S. residents were more likely to report being in excellent, fair, or poor overall and mental health. The percentage of individuals with diabetes and asthma was slightly higher in the United States than that in Canada (about 2 and 1 percentage points, respectively). The percentage of individuals with high blood pressure and arthritis was 11 and 5 percentage points higher, respectively, in the United States than that in Canada.

Unadjusted and Adjusted Differences in Health Care Use between Aggregate Populations of the United States and Canada

Table 3 presents information on adjusted and unadjusted differences in health care services use for aggregate populations of the United States and Canada. For most measures, the unadjusted rates of health care services use were significantly higher in Canada than in the United States. The differences between

Table 3: Adjusted and Unadjusted Differences in Health Care Use between Canada and the United States

	<i>Unadjusted</i>	<i>Adjusted</i>
Chiropractor visit, past 12 months	0.10*** (0.01)	0.10*** (0.01)
Dentist visit, past 12 months	−0.01 (0.01)	−0.01** (0.00)
Have a medical doctor	0.20*** (0.02)	0.18*** (0.01)
Have a usual source of care	0.08*** (0.02)	0.11*** (0.01)
Hospital stay, overnight	0.01 (0.01)	0.04*** (0.01)
Mammogram, ever	−0.18*** (0.01)	−0.17*** (0.01)
Nurse visit, past 12 months	−0.01 (0.01)	0.01*** (0.00)
Pap smear test, past 12 months	−0.08*** (0.01)	−0.12*** (0.01)
Provider visit, past 12 months	0.00 (0.01)	0.02** (0.01)
Specialist visit, past 12 months	0.20*** (0.01)	0.20*** (0.01)

Note. Authors' calculations using the 2007 Medical Expenditure Panel Survey for the United States and the 2007 Canadian Community Health Survey for Canada. A positive difference in outcomes between Canada and the United States indicates that utilization rate in Canada is higher than that in the United States. The adjusted differences are coefficient estimates obtained from linear probability models that control for income, education, nativity status, health, age, gender, marital status, and employment. For chiropractor, dental, nurse, provider, and specialist visits, hospital stays, having a medical doctor, and a usual source of care, the sample was limited to 25- to 64-year-old old men and women. For mammogram and Pap smear test, the sample was limited to 30- to 64-year-old old women and 40- to 64-year-old old men, respectively.

Standard errors in parentheses.

** $p < .05$; *** $p < .01$.

the two countries were especially pronounced for the use of expensive health care services such as visit to specialists (20 percentage points, $p < .01$), visit to chiropractors (10 percentage points, $p < .01$), and having a medical doctor (20 percentage points, $p < .01$). The differences in health care services use between the two countries become insignificant and diminish in magnitude for health services such as nurse visits, dental visits, and provider visits (about 1 percentage points). The results also showed that utilization rates for mammograms (18 percentage points, $p < .01$) and Pap smear test (8 percentage points, $p < .01$) were higher in the United States than Canada. Furthermore, the adjusted differences from linear probability models mostly mirror the unadjusted results, suggesting that sociodemographic characteristics may not be important contributors to differences in health care use between the two countries. In fact, for several health care measures (e.g., provider visits, nurse visits, and hospital stays) the differences between the two countries were significant in the adjusted models.

Unadjusted Differences in Health Services Use between Canada and the United States by Education, Income, and Nativity

Table 4 presents information on unadjusted differences in health care use by income, education, and nativity status. For many measures of health care use, the results consistently demonstrate that the distributions of health care utilization rates across education groups are more unequal in the United States than those in Canada. For instance, individuals with less than a high school degree in the United States were significantly less likely to visit a dentist, a nurse, and a provider by 5, 3, and 9 percentage points, respectively. Individuals with less than a high school degree in the United States were also significantly less likely to have a regular medical doctor and usual source of care by 33 and 19 percentage points, respectively. However, the differences in these utilization rates diminished and often reversed for individuals with higher levels of education. In particular, individuals with college degrees were more likely to visit a dentist, a nurse, or a medical provider by 10, 3, and 5 percentage points, respectively, in the United States than corresponding counterparts in Canada. The differences in specialist visits and chiropractor visits remained relatively constant across education categories; however, these differences were still significantly higher for residents in Canada than in the United States. The results also indicate that rates of hospital stays were not significantly different between the two countries.

Table 4: Unadjusted Differences in Health Care Use by Education, Income, and Nativity Status between Canada and the United States

	Chiropractor Visit	Dentist Visit	Have Medical Doctor	Have Usual Source of Care	Hospital Stay	Mammogram	Nurse Visit	Pap Smear	Provider Visit	Specialist Visit
Educational attainment										
Less than high school	0.08*** (0.02)	0.05*** (0.02)	0.33*** (0.08)	0.19*** (0.02)	-0.01 (0.01)	-0.10*** (0.04)	0.03*** (0.01)	-0.07*** (0.03)	0.09*** (0.02)	0.20*** (0.01)
High school	0.09*** (0.02)	0.03* (0.01)	0.21*** (0.01)	0.10*** (0.01)	0.00 (0.01)	-0.17*** (0.02)	-0.02** (0.01)	-0.06** (0.03)	0.02* (0.01)	0.17*** (0.01)
Some college	0.12*** (0.02)	-0.05*** (0.02)	0.14*** (0.02)	0.04* (0.02)	0.00 (0.01)	-0.18*** (0.04)	0.00 (0.01)	-0.06* (0.04)	-0.04* (0.02)	0.21** (0.01)
College	0.09*** (0.01)	-0.10*** (0.01)	0.14*** (0.02)	0.04* (0.02)	0.01* (0.00)	-0.21*** (0.02)	-0.03*** (0.01)	-0.13*** (0.02)	-0.05*** (0.01)	0.21*** (0.01)
Total personal annual income										
≤\$0	0.10*** (0.02)	0.08*** (0.03)	0.31*** (0.03)	0.19*** (0.03)	0.00 (0.01)	-0.09*** (0.03)	0.01 (0.01)	0.02 (0.04)	0.08*** (0.02)	0.23*** (0.02)
>\$0 to <\$20,000	0.08*** (0.01)	0.01 (0.02)	0.24*** (0.02)	0.12*** (0.02)	0.01 (0.01)	-0.16*** (0.02)	0.01 (0.01)	-0.03 (0.02)	0.04** (0.02)	0.25*** (0.01)
≥\$20,000 to <\$39,000	0.07*** (0.02)	0.00 (0.01)	0.24*** (0.02)	0.10*** (0.02)	0.01* (0.00)	-0.17*** (0.02)	0.01 (0.01)	-0.09*** (0.02)	0.04*** (0.01)	0.21*** (0.01)
≥\$39,000 to <\$59,000	0.13*** (0.02)	-0.01 (0.01)	0.16*** (0.02)	0.05** (0.02)	-0.01 (0.01)	-0.24*** (0.02)	-0.02* (0.01)	-0.09*** (0.02)	-0.02 (0.02)	0.19*** (0.01)
≥\$59,000 to <\$80,000	0.11*** (0.02)	-0.04*** (0.02)	0.12** (0.02)	0.02 (0.02)	0.01 (0.01)	-0.21*** (0.03)	-0.03** (0.01)	-0.06** (0.03)	-0.06*** (0.01)	0.18*** (0.01)

continued

Table 4. Continued

	Chiropractor Visit	Dentist Visit	Have Medical Doctor	Have Usual Source of Care	Hospital Stay	Mammogram	Nurse Visit	Pap Smear	Provider Visit	Specialist Visit
≥ \$80,000	0.16*** (0.02)	−0.03*** (0.02)	0.12*** (0.02)	0.04* (0.02)	0.01** (0.00)	−0.21*** (0.03)	−0.02** (0.01)	−0.13*** (0.03)	−0.06 (0.02)	0.18*** (0.01)
Foreign-born										
10 years or less	0.10*** (0.03)	0.02 (0.03)	0.31*** (0.06)	0.21*** (0.06)	0.01 (0.01)	−0.31*** (0.01)	0.01 (0.01)	−0.09** (0.04)	0.11** (0.04)	0.21*** (0.02)
More than 10 years	0.12*** (0.03)	0.05** (0.02)	0.32*** (0.02)	0.21*** (0.02)	0.01 (0.01)	−0.11*** (0.03)	0.00 (0.01)	−0.03 (0.03)	0.10*** (0.02)	0.23*** (0.01)
N	94,808	94,944	84,364	84,364	94,948	18,878	94,808	23,067	94,462	94,543

Note. Authors' calculations using the 2007 Medical Expenditure Panel Survey for the United States and the 2007 Canadian Community Health Survey for Canada. A positive difference in outcomes between Canada and the United States indicates that utilization rate in Canada is higher than that in the United States. For chiropractor, dental, nurse, provider, and specialist visits, hospital stays, having a medical doctor, and a usual source of care, the sample was limited to 25- to 64-year-old old men and women. For mammogram and Pap smear test, the sample was limited to 30- to 64-year-old old women and 40- to 64-year-old old men, respectively.

Standard errors in parentheses.

** $p < .10$; *** $p < .05$; **** $p < .01$.

The unadjusted differences in utilization rates indicate that immigrants in Canada were significantly more likely to use health care services than immigrants in the United States, the exception being utilization rates for hospital stays, nurse visits, and dental visits for those with residency of 10 years or less. Overall, the differences in utilization rates for the foreign-born in both countries were similar to those for low-income and less-educated subgroups; a finding that underscores the need for further multivariate analysis to identify more precisely differences across our subpopulations of interest.

Adjusted Differences in Utilization Rates between Canada and the United States by Education, Income, and Nativity

Table 5 presents results from multivariate regression models specified in equation (1). The focus of our attention is the interaction effects of characteristics (i.e., income, education, and nativity) and Canada, the binary variable that captures Canadian residency. After controlling for health and other important characteristics, we found that the overall results were quantitatively smaller in magnitude but were qualitatively similar to the unadjusted differences presented in Table 4. One of the key measures of access to care is having a medical doctor. Our adjusted results indicate that relative to persons with college degrees, those with less than high school degrees and those with high school degrees were less likely to have a medical doctor by 14 and 5 percentage points, respectively. However, for Canadians, these differences shrunk by 9 and 5 percentage points, respectively; suggesting that only Canadians without high school degrees were less likely to have a medical doctor compared with college-educated Canadians. We found similar differences for visits to dentists, nurses, providers, and also for having a usual source of care. The differences in having a usual source of care between persons with college degrees and persons without college degrees was significantly smaller for residents in Canada than those for residents in the United States.

For most utilization measures (with the exception of hospital use and mammogram), the differences in health care use between the wealthiest (i.e., income greater or equal to \$80,000) and the poorest (i.e., income less than or equal to zero) was significantly reduced for residents living in Canada. The largest reduction was evident for having a doctor (25 percentage points), Pap smear test (23 percentage points), and for visiting a dentist (19 percentage points). For the highest income group, the differences in many outcomes diminish to zero, suggesting that the wealthiest residents in Canada and the United States exhibit similar propensity to use health care.

Table 5: Effects of Income, Education, and Nativity Status on Health Care Use: Canada versus the United States

	Chiropractor Visit	Dentist Visit	Have Medical Doctor	Have Usual Source of Care	Hospital Stay	Mammogram	Nurse Visit	Pap Smear	Provider Visit	Specialist Visit
Educational attainment										
College (Reference group)										
Less than high school	-0.04*** (0.01)	-0.24*** (0.01)	-0.14*** (0.01)	-0.12*** (0.01)	-0.02*** (0.00)	-0.11*** (0.02)	-0.06*** (0.01)	-0.08*** (0.02)	-0.14*** (0.00)	-0.04*** (0.01)
High school	-0.03*** (0.01)	-0.13*** (0.01)	-0.05*** (0.01)	-0.05*** (0.01)	-0.01** (0.01)	-0.05*** (0.01)	-0.04*** (0.01)	-0.07*** (0.02)	-0.08*** (0.00)	-0.01* (0.01)
Some college	-0.02*** (0.01)	-0.05*** (0.01)	-0.02 (0.02)	-0.02 (0.02)	0.00 (0.01)	-0.01 (0.01)	-0.03** (0.02)	-0.05*** (0.02)	-0.03*** (0.01)	0.00 (0.01)
Total personal annual income										
≥ \$80,000 (Reference group)										
≤ \$0	-0.04*** (0.01)	-0.29*** (0.02)	-0.27*** (0.02)	-0.21*** (0.02)	-0.02* (0.01)	-0.05* (0.03)	-0.06*** (0.01)	-0.24*** (0.03)	-0.19*** (0.02)	-0.08*** (0.01)
>\$0 to <\$20,000	-0.04*** (0.01)	-0.23*** (0.01)	-0.16*** (0.01)	-0.13*** (0.01)	0.00 (0.01)	-0.05*** (0.02)	-0.04*** (0.01)	-0.19*** (0.02)	-0.15*** (0.01)	-0.07*** (0.01)
≥\$20,000 to <\$39,000	-0.02** (0.01)	-0.17*** (0.01)	-0.11*** (0.01)	-0.08*** (0.01)	0.01 (0.01)	-0.03* (0.02)	-0.03*** (0.01)	-0.11*** (0.02)	-0.11*** (0.00)	-0.04*** (0.01)
≥ \$39,000 to <\$59,000	-0.01 (0.01)	-0.09*** (0.01)	-0.05*** (0.01)	-0.03** (0.01)	0.02** (0.01)	-0.01 (0.02)	-0.02* (0.01)	-0.07*** (0.02)	0.07*** (0.00)	-0.02** (0.01)
≥ \$59,000 to <\$80,000	-0.01 (0.01)	-0.03* (0.01)	-0.04** (0.02)	-0.01 (0.01)	0.01 (0.01)	0.00 (0.02)	-0.01 (0.01)	-0.07** (0.03)	0.03*** (0.01)	0.00 (0.01)
Foreign-born										
Native (Reference group)										
Stayed 10 years or less	-0.03*** (0.00)	-0.08*** (0.02)	-0.17*** (0.02)	-0.17*** (0.02)	-0.02 (0.01)	-0.01 (0.03)	-0.05*** (0.01)	-0.05* (0.03)	-0.09*** (0.01)	-0.01* (0.01)

continued

Table 5. Continued

	Chiropractor Visit	Dentist Visit	Have Medical Doctor	Have Usual Source of Care	Hospital Stay	Mammogram	Nurse Visit	Pap Smear	Provider Visit	Specialist Visit
Stayed more than 10 years	-0.03*** (0.01)	0.01 (0.01)	-0.09*** (0.01)	-0.08*** (0.01)	-0.03 (0.01)	0.03** (0.01)	-0.04*** (0.01)	0.04** (0.02)	-0.03*** (0.01)	-0.02*** (0.00)
Education and Canada interactions										
Less than high school × Canada	0.00 (0.01)	0.04*** (0.01)	0.09*** (0.01)	0.07*** (0.01)	0.02** (0.01)	0.07*** (0.02)	0.03*** (0.01)	0.00 (0.02)	0.06*** (0.02)	-0.06*** (0.01)
High school × Canada	-0.01* (0.00)	0.06*** (0.01)	0.05** (0.01)	0.04*** (0.01)	0.01 (0.01)	0.02 (0.01)	0.01 (0.01)	0.03 (0.02)	0.03*** (0.01)	-0.05*** (0.01)
Some College × Canada	0.01 (0.01)	0.00 (0.01)	-0.01 (0.01)	-0.01 (0.01)	0.00 (0.01)	-0.01 (0.02)	0.01 (0.01)	0.03 (0.03)	0.02* (0.01)	-0.02* (0.01)
Annual income and Canada interactions										
<\$0 × Canada	0.03** (0.01)	0.19*** (0.02)	0.25*** (0.02)	0.19*** (0.02)	0.02 (0.01)	0.04 (0.03)	0.05*** (0.01)	0.23*** (0.04)	0.12*** (0.02)	0.07*** (0.02)
≥ \$0 to <\$20,000 × Canada	0.07*** (0.01)	0.09 (0.01)	0.14*** (0.01)	0.10*** (0.01)	0.02*** (0.01)	0.04*** (0.02)	0.05*** (0.01)	0.14*** (0.03)	0.10*** (0.01)	0.08*** (0.01)
≥ \$20,000 to <\$39,000 × Canada	0.02*** (0.01)	0.09*** (0.01)	0.10*** (0.01)	0.07*** (0.01)	0.00 (0.01)	0.03* (0.02)	0.03*** (0.01)	0.09*** (0.03)	0.07*** (0.01)	0.05*** (0.01)
≥ \$39,000 to <\$59,000 × Canada	0.01 (0.01)	0.10*** (0.01)	0.05*** (0.01)	0.03*** (0.01)	-0.01 (0.01)	0.02 (0.02)	0.02*** (0.01)	0.08*** (0.03)	0.05*** (0.01)	0.04*** (0.01)
≥ \$59,000 to <\$79,999 × Canada	0.02* (0.01)	0.08*** (0.01)	0.05* (0.02)	0.02 (0.01)	0.00 (0.01)	0.03 (0.02)	0.02 (0.01)	0.09 (0.03)	0.02* (0.01)	0.02* (0.01)

continued

Table 5. Continued

	Chiropractor Visit	Dentist Visit	Have Medical Doctor	Have Usual Source of Care	Hospital Stay	Mammogram	Nurse Visit	Pap Smear	Provider Visit	Specialist Visit
Foreign-born and Canada interactions										
Stayed	-0.04*** (0.01)	0.00 (0.02)	0.09*** (0.02)	0.10*** (0.02)	0.01 (0.01)	-0.09* (0.05)	-0.01 (0.01)	-0.03 (0.03)	0.06*** (0.02)	0.00 (0.01)
10 years or less ×										
Canada										
Stayed	-0.02*** (0.01)	0.06*** (0.02)	0.12*** (0.01)	0.11*** (0.01)	0.01 (0.01)	-0.02 (0.02)	0.00 (0.01)	0.00 (0.02)	0.04*** (0.01)	0.03*** (0.01)
more than 10 years ×										
Canada										
Canada	0.05*** (0.01)	-0.13*** (0.01)	0.06*** (0.01)	0.05*** (0.01)	0.03** (0.01)	-0.20*** (0.01)	-0.02*** (0.01)	-0.21*** (0.02)	-0.06*** (0.01)	0.17*** (0.01)
N	94,808	94,944	84,364	84,364	94,948	18,878	94,808	23,067	94,462	94,543

Note. Authors' calculations using the 2007 Medical Expenditure Panel Survey for the United States and the 2007 Canadian Community Health Survey for Canada. The adjusted differences are coefficient estimates obtained from linear probability models that control for income, education, nativity status, health, age, gender, marital status, and employment. For chiropractor, dental, nurse, provider, and specialist visits, hospital stays, having a medical doctor, and a usual source of care, the sample was limited to 25- to 64-year-old old men and women. For mammogram and Pap smear test, the sample was limited to 30- to 64-year-old old women and 40- to 64-year-old old men, respectively.

Standard errors in parentheses.
* $p < .10$; ** $p < .05$; *** $p < .01$.

Finally, our specification enables us to compare differences in utilization behavior of foreign-born population between the two countries relative to that of native-born residents. We disaggregated the results for immigrants by length of stay in each country—those who lived in the country for 10 years or less (recent immigrants), and those who lived in the country for more than 10 years (assimilated immigrants). Recent and assimilated immigrants were less likely to have a doctor as a usual source of care by 17 and 9 percentage points than natives, respectively; however, for foreign-born residents of Canada, this effect was reduced by 9 and 12 percentage points, respectively. The result produces important implications. First, immigrants exhibit strong assimilation with respect to health care use, where, in the case of having a medical doctor, the differences between recent immigrants and natives and assimilated immigrants and natives were reduced by almost half (from 17 to 9 percentage points). Second, immigrants of Canada assimilate into the health care system more successfully than immigrants in the United States, which is evidenced by the fact that assimilated immigrants in Canada exhibited higher propensity to have a doctor than Canadian natives. A similar story holds for such measures as visiting a dentist, a specialist, and having a usual source of care. This may be due to the fact that immigrants can better exploit the benefits of the health insurance structure after assimilating in the foreign country.

Our results are different from the study by Lebrun and Dubay (2010) that found that immigrants' use of health care was not significantly different between the two countries. A possible reason for the differences in results may be that Lebrun and Dubay's study did not disaggregate immigrants by length of stay in the two countries. Another explanation could be due to the sample size of the foreign-born population—13,338 in our data versus 1,097 in Lebrun and Dubay's study.⁴

CONCLUSIONS

A number of studies have highlighted differences in health care utilization between the United States and Canada. To inform the debate on this issue, we used nationally representative data sets from the United States and Canada to examine differences in health care utilization for the total population and also for specific subpopulations in the two countries. Our findings indicate that for individuals with high income and higher education, utilization rates were similar between the two countries and, in some instances, higher in the United States than those in Canada. Our findings also indicated that low-income, less

educated, and foreign-born individuals were more likely to use health care services in Canada than in the United States. These differences were especially large among services that are likely to be expensive, such as visits to specialists, physicians, or having a medical doctor as a regular source of care. The use of preventive services, such as mammograms and Pap smear, was considerably higher in the United States than that in Canada.

We found that immigrants in Canada were more likely to use health services than their counterparts in the United States. The unadjusted differences were especially large for outcomes such as having a medical doctor (32 percentage points) and visits to specialists (23 percentage points). However, low-income, less educated, and foreign-born residents in the United States were more likely to use preventive care than corresponding subpopulations in Canada, indicating possible substitution away from expensive care among low-income, less educated, and foreign-born residents in the United States.

Our study used two nationally representative surveys—the MEPS for the United States and the CCHS for Canada—to examine differences in health care use among specific subpopulations. The joint use of these two independent surveys enabled us to compare utilization rates across a wide range of health services and to capture differences in health care use among relatively small subpopulations such as immigrants. We demonstrate that responses to questions that are conceptually similar between the two surveys (the MEPS and the CCHS) are also similar to those found in the JCUSH, which was administered in both countries at the same time.

A significant proportion of residents in the United States lack health insurance and most residents face higher cost of health care, whereas residents in Canada have universal health care coverage but face long waiting times for visits to medical providers and hospitals. Our results shed light on the debate about barriers to health care in both countries. The findings of our analysis demonstrate that Canadians are more likely to utilize health care services than residents in the United States. This is especially true for subpopulations with low incomes, less education, and the foreign-born. Given the magnitude of the differences in our findings and the fact that differences in health care use between the two countries have not changed much, after controlling for numerous health and demographic characteristics, universal coverage might have played an important role in improving access to care for the subpopulations examined in this study.

ACKNOWLEDGMENTS

Joint Acknowledgment/Disclosure Statement: The authors are grateful to Thomas Selden and Joel Cohen for their helpful comments and suggestions that improved this article. The authors also wish to acknowledge Statistics Canada in providing us with the Canadian Community Health Survey data.

Disclaimers: The views expressed in this article are those of the authors, and no official endorsement by the Agency for Healthcare Research and Quality, or the Department of Health and Human Services is intended or should be inferred.

Disclosures: None.

NOTES

1. Our primary focus is the 25- to 64-year-old old population; however, for preventive care services measures, the age of selected sample varies. See data section for details.
2. We also control for these selected chronic conditions because studies suggest that differential health care use is related to differences in health characteristics (i.e., chronic conditions and health status) between the two countries (Klarenbach and Jacobs 2003; Pozen and Cutler 2009).
3. See Table 2 for details on education, income, and health characteristics.
4. To further explore the issue of sample size, we duplicated the analysis in Lebrun and Dubay (2010) with our data by comparing (1) estimated results on the sample of immigrants equal to the number in Lebrun and Dubay (2010) study with (2) the estimated results on the full sample of immigrants in our data. We randomly drew immigrants from a uniform distribution, repeated the procedure 100 times, and averaged the estimates of interest. Differences in health services use, such as dentist, nurse, doctor visits, and Pap smear were insignificant ($p > .10$). The estimates for remaining outcomes were significant ($p < .05$), but they were about twice smaller in magnitude than the results obtained from a full sample of immigrants.

REFERENCES

- Blackwell, D. L., M. E. Martinez, J. F. 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.
- Blendon, R. J., C. Schoen, C. M. DesRoches, R. Osborn, K. L. Scoles, and K. Zapert. 2002. "Inequities in Health Care: A Five-Country Survey." *Health Affairs* 21: 182–91.

- Chu, M. C., and J. A. Rhoades. 2011. "The Uninsured in America, 1996–2010: Estimates for the U.S. Civilian Noninstitutionalized Population under Age 65." Statistical Brief #336. Rockville, MD: Agency for Healthcare Research and Quality.
- Decker, S. L., and D. Remler. 2005. "How Much Might Universal Health Insurance Reduce Socioeconomic Disparities in Health? A Comparison of the U.S. and Canada." *Applied Health Economics and Health Policy* 3: 205–16.
- Klarenbach, S., and W. P. Jacobs. 2003. "International Comparison of Health Resource Utilization in Subjects with Diabetes: An Analysis of Canadian and American National Health Surveys." *Diabetes Care* 26: 1116–22.
- Krajewski, S. A., S. M. Hameed, D. S. Smink, and S. O. Rogers. 2009. "Access to Emergency Operative Care: A Comparative Study between the Canadian and American Health Care Systems." *Surgery* 146: 300–7.
- Lasser, K. E., D. U. 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: 1300–7.
- Lebrun, L. A., and L. C. Dubay. 2010. "Access to Primary and Preventive Care among Foreign-Born Adults in Canada and the United States." *Health Services Research* 45: 1693–712.
- McGrail, K. M., E. van Doorslaer, N. A. Ross, and C. Sanmartin. 2009. "Income-related Health Inequalities in Canada and the United States: A Decomposition Analysis." *American Journal of Public Health* 99: 1856–63.
- O'Neill, J., and D. O'Neill. 2007. "Health Status, Health Care, and Inequality: Canada vs. United States." *Forum for Health Economics and Policy* 10: 1–43.
- Pozen, A., and D. Cutler. 2009. "Comparing Health of Individuals with Heart Disease in the United States and Canada." *Forum for Health Economics and Policy* 12(2), Article 7.
- Sanmartin, C., E. Ng, 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: 1133–42.
- Schoen, C., M. M. Doty, R. H. Robertson, and S. R. Collins. 2011. "Affordable Care Act Reforms Could Reduce the Number of Underinsured U.S. Adults by 70 Percent." *Health Affairs* 30: 1762–71.
- Siddiqi, A., D. Zuberi, and Q. C. 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: 1452–9.
- StataCorp. 2009. *Stata Statistical Software: Release 11*. College Station, TX: StataCorp LP.

SUPPORTING INFORMATION

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

Appendix SA1: Author Matrix.

Appendix SA2: Comparison of Questions Asked between Surveys.

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.