The Relationship between Work Hours and Utilization of General Practitioners in Four Canadian Provinces

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Objective. To assess whether long work hours act as a barrier to accessing general practitioner (GP) services.

Data Sources. Secondary data from the 1996/1997 National Population Health Survey (NPHS) and administrative health services utilization data from four Canadian provinces.

Study Design. This study was cross-sectional, however, employment variables and GP utilization were reflective of the 12-month period preceding the NPHS interview date. Negative binomial regression was used to model the relationship between the number of GP visits in a 1-year period and employment-related variables while adjusting for other determinants of GP utilization including education, income, and health status.

Data Extraction Methods. NPHS and administrative data were linked to create an analysis file.

Principal Findings. Subjects with long, standard work hours (> 45 hours/week, with most hours during the day) had significantly lower GP utilization rates compared with full-time workers. White-collar workers with long work hours visited a GP significantly less often than white-collar workers with regular hours.

Conclusions. Long work hours may act as a nonfinancial barrier to accessing GP services independent of health status.

Key Words. Long work hours, access to care, general practitioner visits, occupation

In Canada's publicly funded health care system, policy is governed by the Canada Health Act whose primary objective is to "protect, promote, and restore the physical and mental well-being of residents of Canada and to facilitate reasonable access to health care services without financial or other barriers" (Canada Health Act 1984, c.6, s.3). "Reasonable access," while not explicitly defined by the Act, is generally assumed to have been achieved by

the removal of the direct cost of health care at the point of delivery (Birch and Abelson 1993; Birch, Eyles, and Newbold 1993; Newbold, Eyles, and Birch 1995).

A number of Canadian studies have examined access to general practitioner (GP) services in relation to income with conflicting results. While most conclude that there is no association between income and incidence of GP utilization when assessed over a 1-year period (Broyles et al. 1983; Birch, Eyles, and Newbold 1993; McIsaac, Goel, and Naylor 1997; Dunlop, Coyte, and McIsaac 2000; Finkelstein 2001), the association between income and volume of GP utilization is less clear. Several studies have reported an inverse association even after adjustment for need (Broyles et al. 1983; McIsaac, Goel, and Naylor 1997; Dunlop, Coyte, and McIsaac 2000), while others have reported no differential utilization by income level (Birch, Eyles, and Newbold 1993; Finkelstein 2001). In general, most studies that were unable to use direct measures to control for medical need found an expected inverse association between income and utilization of GP services (Roos and Mustard 1997; Kephart, Thomas, and MacLean 1998; Veugelers and Yip 2003); however, a recent study by Roos et al. (2004) observed lower than expected use of physician services among individuals from poorer neighborhoods.

While the literature examining equity of access to GP services in Canada contains many studies of the relationship between income and access to physician services, comparatively little attention has been given to other potential barriers to access (Birch and Abelson 1993; Birch, Eyles, and Newbold 1993). It has been suggested that opportunity costs associated with attending medical appointments may render some individuals less likely to access care than others (Broyles et al. 1983; Birch, Eyles, and Newbold 1993). There are reasons to believe that employment-related opportunity costs may influence an individual's ability to access GP services. Because the ability to attend

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ambulatory medical appointments is time dependent, “time crunch” imposed by work may operate as a barrier to utilization (Boaz and Muller 1989) in that it reduces opportunities to access medical appointments (Nishiyama and Johnson 1997). Lost wages for time off work may also deter some workers from accessing care (Broyles et al. 1983; Boaz and Muller 1989).

Studies of work hours and health have largely focused on the effect of long work hours on illness, injury, and health behavior (Caruso et al. 2004); however, the relationship between work hours and use of health care services has not been well studied. Only one qualitative study (Wellstood, Wilson, and Eyles 2006), and no quantitative studies were identified that have specifically assessed whether work hours act as a barrier to accessing GP services. The purpose of this study, therefore, was to examine the relationship between work hours and utilization of ambulatory GP services in order to assess the extent to which work hours may act as a barrier to access.

METHODS

Design

This cross-sectional study used data from the 1996/1997 National Population Health Survey (NPHS) linked to provincial administrative data from four Canadian provinces—Nova Scotia, Manitoba, Saskatchewan, and British Columbia. Although the NPHS was cross-sectional, the labor force participation history reflected the 12-month period preceding the interview date. The measure of volume of GP services used was therefore also reflective of the year preceding the survey. To address confounding between work hours and GP utilization, the association was adjusted for other known determinants of health care use.

Study Population

Respondents to the 1996/1997 NPHS from the four study provinces who were between the ages of 25 and 59 and consented to “link and share” their survey information with administrative data for research purposes comprised the study population. Approximately 95 percent of respondents consented to data linkage and sharing. Respondents were excluded if they were unemployed for the duration of the study period, had an incomplete labor force history or had missing information for control variables (with the exception of income due to the large number of missing values). Women who were pregnant at the time of the survey were also excluded.

Data

The NPHS was designed to collect information on the health of Canadians every 2 years (Swain, Catlin, and Beaudet 1999). Using a two-stage, stratified sampling design, the NPHS collected limited demographic, socioeconomic, and health information from each member of the surveyed household as well as in-depth information pertaining to health status, health behaviors, labor force participation, and other topics from one randomly selected individual in each household (Tambay and Catlin 1995; Swain, Catlin, and Beaudet 1999). The overall response rate for the 1996/1997 NPHS cycle was 94.8 percent (Swain, Catlin, and Beaudet 1999). In addition, Manitoba sponsored a large, supplemental sample in 1996/1997 and achieved a 96.7 percent response rate (Statistics Canada 1997).

Provincial administrative databases were developed for physician billing and payment purposes following the introduction of universal health care in Canada (Williams and Young 1996). These databases are service based and contain patients' demographic information, diagnostic and treatment codes, and physician specialty codes for each visit (Muhajarine et al. 1997). Approximately 95 percent of physician services were captured by administrative databases (Williams and Young 1996) during the period of this study.

The overall linkage rate between NPHS and administrative data in this study was 96 percent. Ethics approval was received in all provinces in addition to privacy/confidentiality and/or ministerial review. Details regarding ethics and confidentiality can be found in another report (Kephart 2001).

Measures

The dependent variable in this study was the total number of GP visits accrued during the year preceding the survey, and was determined using administrative data. Provincial registration files provided information on out-of-province migration and death during the study year allowing for the calculation of follow-up time in person-days. NPHS data were used to construct all independent variables. The NPHS labor force history included start and stop dates, average number of weekly work hours, and shift information for up to three jobs. Using subjects' start and stop dates for each job, the total number of work hours, type of work shift, and number of jobs were first determined for each month and then summarized over the study period. The mean number of weekly work hours was calculated across all jobs. Part-time employment was defined as less than 35 hours/week, full time as

35–45 hours/week, and long hours as greater than 45 hours/week. Subjects who worked 50 percent or more of their work hours in a standard daytime shift were defined as having standard work hours. A subject was considered to have multiple jobs if they held two or more jobs concurrently for at least 3 consecutive months. Subjects who were employed during each of the 12 study months were classified as full-year workers. The NPHS coded occupation using the 1980 Standard Occupational Classification (SOC) based on subjects' reported "main job" (Shields 1999). Using this variable, broad occupational groupings were created for the purposes of analysis (Gaudette, Richardson, and Huang 1998).

To address confounding, this study used a model developed by Andersen and Newman (1973) for a priori variable selection. The *predisposing* component of this model includes characteristics that render an individual more likely to use health care services, although they are not directly responsible for use. The predisposing variables included in this study were age, marital status, and education. *Enabling* factors provide a means of accessing health care at both the family and community levels. Household income, adjusted for household size, was used to control for family-level enabling factors. Several variables were used to adjust for enabling factors at the community level. The variable "health care unavailable" identified subjects who, at some time in the year preceding the survey, reported that they were unable to access a GP when required because the service was "not available in the area." This was derived from an NPHS question and was independent of the outcome variable, number of GP visits during the study year. Province of residence and a rural versus urban indicator were also included. Illness level or *need* represents the most direct cause of health service use (Joung, Van den Meer, and Mackenbach 1995). This study included several measures of need—self-reported health status, number of chronic conditions, activity restriction, and indicators for 11 self-reported chronic conditions. To control for chronic disease risk factors that could potentially influence utilization patterns, all models included adjustment for smoking, body mass index (BMI), physical activity, and drinking.

Analysis

All analyses were stratified by sex due to differences in health service utilization (Mustard et al. 1998; Bertakis et al. 2000) and employment factors (Wilkins and Beaudet 1998; Beaujot, Haddad, and McFarlane 2000). Unadjusted incidence rates of GP use (number of GP visits during the study year

per 1,000 person-days of observation) were calculated from administrative data. Negative binomial regression was then used to generate incidence rate ratios (IRRs) and 95 percent confidence intervals (95 percent CI), adjusted for the variables in the Andersen–Newman model. An IRR is a ratio of the incidence rate of GP use among subjects “exposed” to a particular characteristic, to the incidence rate among subjects not “exposed,” giving a comparative measure for the exposure. A CI that does not include the null value indicates a statistically significant difference between two incidence rates.

Negative binomial regression was used to model the relationship between work hours and GP utilization because the number of GP visits is a nonnegative count variable. It approximates Poisson regression, but is more appropriate when the independence assumption may be violated (Birch, Eyles, and Newbold 1993) and when the data are skewed (Katz, Hoffer, and Manning 1996). To account for unequal probabilities of selection, survey weights were used in all calculations. Corrected standard error estimates were generated using the bootstrap procedure with 500 weights per subject provided by Statistics Canada.

Data preparation and analyses were conducted using *SAS* Version 9.1 software (SAS Institute Inc. 2000).

RESULTS

There were 3,008 men and 2,609 women available for analysis after exclusions. Seventy-nine percent of men and 92 percent of women made at least one visit to a GP during the study year. Table 1 presents descriptive characteristics of the sample. Men were most likely to be employed in blue-collar professions (44 percent) and work full-time, standard hours (38 percent), whereas women were most likely to be employed in pink-collar (sales and service) professions (55 percent) and work part time (48 percent). Overall, 35 percent of men and 12 percent of women worked long hours. The lowest incidence rates of GP use in men and women were among those who worked long, standard hours (>45 hours/week on average, primarily in a standard daytime shift) (men: 8.47 per 1,000 person-days; women: 13.63 per 1,000 person-days).

Table 2 presents the adjusted IRRs for the relationship between work hours and GP utilization. Men and women who worked long, standard hours accessed a GP significantly less often relative to individuals who worked full time, standard hours (men: IRR 0.82, 95 percent CI 0.74–0.92; women: IRR

Table 1: Distribution of Selected Characteristics and Unadjusted Incidence Rates (IR) of GP Use^{*,†,‡}

<i>Characteristic</i>	<i>Men (n = 3,008)</i>		<i>Women (n = 2,609)</i>	
	<i>%</i>	<i>IR</i>	<i>%</i>	<i>IR</i>
Work hours				
Part time	15.9	19.33	47.8	19.09
Full time, standard	37.6	12.72	32.7	16.57
Full time, nonstandard	11.6	13.29	7.2	15.86
Long, standard	25.5	8.47	9.1	13.63
Long, nonstandard	9.5	13.18	3.2	16.06
Occupation				
White collar	33.1	10.95	38.1	16.68
Pink collar	23.0	12.38	55.1	18.04
Blue collar	43.9	14.39	6.8	16.97
Multiple jobs				
Yes	7.6	12.38	8.6	18.53
No	92.4	12.83	91.4	17.35
Worked full year				
Yes	86.8	11.91	80.5	16.67
No	13.3	18.67	19.5	20.67
Age				
< 30	12.2	14.47	12.2	19.16
30–39	34.6	11.64	37.4	18.88
40–49	32.9	13.05	31.4	14.92
≥ 50	20.3	13.35	19.0	17.71
Education				
Less than high school	14.7	14.57	11.9	14.40
High school	16.3	13.13	14.9	19.79
Other postsecondary	28.9	12.87	27.1	17.53
College/university degree	40.0	11.94	46.2	17.43
Income adequacy				
Low or low-middle	6.1	15.06	9.9	21.77
Middle	22.4	11.55	25.3	16.84
Upper-middle or highest	68.0	12.98	60.1	17.54
No response	3.6	13.15	4.8	10.53
Marital status				
Married/common law	74.8	12.04	73.3	17.40
Other	25.2	15.04	26.7	17.57
Province				
British Columbia	59.3	15.04	59.4	18.78
Saskatchewan	13.2	12.26	13.6	16.60
Manitoba	15.2	7.95	14.4	14.67
Nova Scotia	12.3	8.53	12.7	15.27
Rural/urban indicator				
Rural	17.5	13.16	16.7	19.01
Urban	82.5	12.71	83.9	17.15

Continued

Table 1. *Continued*

<i>Characteristic</i>	<i>Men (n = 3,008)</i>		<i>Women (n = 2,609)</i>	
	<i>%</i>	<i>IR</i>	<i>%</i>	<i>IR</i>
Health care unavailable				
Yes	0.2	18.07	0.5	16.89
No	99.8	12.78	99.5	17.45
Self-reported health status				
Fair/poor	4.7	19.43	6.2	25.52
Good	27.8	16.11	24.8	19.31
Very good	44.4	11.46	45.4	17.56
Excellent	23.2	10.02	23.7	13.17
Number of chronic conditions				
None	46.4	9.20	39.2	14.55
One	34.3	14.52	27.9	16.23
Two or more	19.3	18.34	32.9	21.94
Restricted activity				
Yes	12.7	15.04	17.4	23.58
No	87.3	12.46	82.6	16.15
Smoking status				
Daily or occasional	31.7	14.35	26.9	18.63
Former or never	68.3	12.07	73.1	17.01
BMI				
<25	35.1	11.79	61.0	17.49
25–29.9	51.0	13.31	26.2	17.41
≥ 30	13.9	13.42	12.8	17.33
Alcohol use				
Regular drinker	75.0	12.24	56.1	15.63
Other	25.0	14.45	43.9	19.76
Physical activity				
Inactive	57.3	12.56	57.2	18.40
Active and moderate	42.7	13.10	42.8	16.18

*Results weighted to reflect unequal probabilities of selection.

†Cell percentages may not add up to 100% due to rounding.

‡Rate of GP use per 1,000 person-days.

0.77, 95 percent CI 0.68–0.88). Men with long, nonstandard work hours also had a lower rate of GP use; however, this was not statistically significant.

Among the nonoccupational variables, the rate of GP use was significantly lower for all age groups ≥ 30 years in women and in the 30–39 years age group in men compared to subjects <30 years. Education was not significantly associated with adjusted GP utilization in men or women. Men in the lowest level of income adequacy had a 20 percent higher rate of utilization relative to men in the highest level. Both men and women living in British Columbia and Saskatchewan had significantly higher rates of GP use com-

Table 2: Adjusted Incidence Rate Ratio (IRR) and 95% Confidence Interval (95% CI) for Work Hours and Utilization of GP Services^{*,†,‡}

Variable	Adjusted IRR (95% CI)	
	Men (n = 3,008)	Women (n = 2,609)
Work hours		
Part time	1.15 (0.98–1.34)	1.00 (0.92–1.09)
Full time, standard	1.00	1.00
Full time, nonstandard	1.03 (0.90–1.19)	0.99 (0.86–1.14)
Long, standard	0.82 (0.74–0.92)	0.77 (0.68–0.88)
Long, nonstandard	0.87 (0.75–1.00)	1.00 (0.82–1.21)
Occupation		
White collar	1.00	1.00
Pink collar	1.01 (0.89–1.15)	0.96 (0.89–1.04)
Blue collar	1.09 (0.98–1.21)	0.93 (0.82–1.07)
Age		
< 30	1.00	1.00
30–39	0.79 (0.69–0.90)	0.82 (0.74–0.91)
40–49	0.88 (0.76–1.01)	0.69 (0.62–0.77)
≥ 50	0.95 (0.81–1.11)	0.75 (0.66–0.86)
Education		
Less than high school	1.09 (0.95–1.25)	0.91 (0.80–1.03)
High school	1.00	1.00
Other postsecondary	0.92 (0.81–1.05)	0.97 (0.87–1.08)
College/university degree	0.96 (0.85–1.09)	0.91 (0.83–1.01)
Income adequacy		
Low or low-middle	1.20 (1.01–1.42)	1.01 (0.92–1.18)
Middle	0.96 (0.86–1.06)	1.00 (0.92–1.09)
Upper-middle or highest	1.00	1.00
No response	1.01 (0.85–1.20)	0.82 (0.71–0.94)
Province		
British Columbia	1.82 (1.64–2.02)	1.27 (1.16–1.38)
Saskatchewan	1.54 (1.36–1.75)	1.13 (1.01–1.25)
Manitoba	1.00	1.00
Nova Scotia	0.98 (0.84–1.15)	0.94 (0.83–1.05)
Self-reported health status		
Fair/poor	1.46 (1.19–1.79)	1.60 (1.36–1.88)
Good	1.28 (1.13–1.45)	1.24 (1.11–1.38)
Very good	1.09 (0.97–1.22)	1.18 (1.07–1.29)
Excellent	1.00	1.00
Number of chronic conditions		
None	1.00	1.00
One	1.34 (1.17–1.54)	1.07 (0.96–1.19)
Two or more	1.51 (1.17–1.95)	1.34 (1.14–1.58)

^{*}Models adjusted for all variables listed in the table as well as for multiple jobs, working full year, marital status, rural/urban indicator, health care unavailable, 11 chronic conditions, restricted activity, smoking, BMI, alcohol use, and physical activity.

[†]Results weighted to reflect unequal probabilities of selection.

[‡]Weighted confidence intervals have been bootstrapped to account for the complex sample design.

pared to residents of Manitoba. There was an inverse relationship between the rate of GP use and health status in men and women, which demonstrated a dose-response gradient. Men and women who reported “fair” or “poor” health status had rates that were 46 and 60 percent higher, respectively, than subjects reporting “excellent” health. Men and women reporting two or more chronic conditions also had significantly higher rates compared to subjects with no chronic conditions.

Independently, occupation was not a significant predictor of GP utilization; however, when the joint effect of work hours and occupation was further explored using an interaction term, male and female white-collar workers with long work hours had significantly lower rates of GP use compared to white-collar workers with full-time work hours (men: IRR 0.80, 95 percent CI 0.68–0.95; women: IRR 0.81, 95 percent CI 0.70–0.95, Tables 3 and 4). In contrast, rates of GP use in subjects with pink- and blue-collar occupations and long work hours did not vary significantly from those of white-collar workers with full-time work hours.

To assess whether workers with long hours accessed GP services commensurate with their level of need, we repeated our analyses stratified by health status (“fair,” “poor,” and “good” self-reported health indicated high need, and “very good” and “excellent” self-reported health indicated low need) and observed no differences between the strata-specific rates (data not shown).

Table 3: Adjusted Incidence Rate Ratio (IRR) and 95% Confidence Interval (95% CI) for the Joint Effect of Work Hours and Occupation in Men^{*,†,‡}

Work Hours	Occupation		
	White Collar	Pink Collar	Blue Collar
Full time	1.00	1.00 (0.84–1.19)	1.05 (0.91–1.21)
Part time	1.06 (0.82–1.38)	0.93 (0.66–1.30)	1.21 (0.91–1.62)
Long	0.80 (0.68–0.95)	1.10 (0.84–1.44)	1.03 (0.84–1.28)

*Models adjusted for type of work hours (standard versus nonstandard), multiple jobs, working full year, age, education, income adequacy, marital status, province, rural/urban indicator, health care unavailable, self-reported health status, 11 chronic conditions, number of chronic conditions, restricted activity, smoking, BMI, alcohol use, and physical activity.

†Results weighted to reflect unequal probabilities of selection.

‡Weighted confidence intervals have been bootstrapped to account for the complex sample design.

Table 4: Adjusted Incidence Rate Ratio (IRR) and 95% Confidence Interval (95% CI) for the Joint Effect of Work Hours and Occupation in Women^{*,†,‡}

Work Hours	Occupation		
	White Collar	Pink Collar	Blue Collar
Full time	1.00	0.97 (0.87–1.09)	0.86 (0.69–1.08)
Part time	1.03 (0.90–1.16)	0.96 (0.82–1.12)	1.07 (0.81–1.43)
Long	0.81 (0.70–0.95)	0.99 (0.78–1.25)	1.43 (0.94–2.18)

*Models adjusted for type of work hours (standard versus nonstandard), multiple jobs, working full year, age, education, income adequacy, marital status, province, rural/urban indicator, health care unavailable, self-reported health status, 11 chronic conditions, number of chronic conditions, restricted activity, smoking, BMI, alcohol use, and physical activity.

†Results weighted to reflect unequal probabilities of selection.

‡Weighted confidence intervals have been bootstrapped to account for the complex sample design.

DISCUSSION

The results of this study indicate that there is an inverse association between long work hours and utilization of GP services. We found that subjects with long work hours totaling more than 45 hours/week accrued during standard, daytime shifts had significantly lower rates of GP use relative to workers with 35–45 hours/week from standard, daytime shifts even after adjustment for need and other determinants of health care use. This association persists in the subgroup of workers with high need and reinforces the conclusion that factors other than need and income, such as time constraints imposed by work hours, also affect access to care.

In this study population of 3,008 men and 2,609 women, the impact of long, standard work hours on the actual volume of physician visits is impressive—227,539 more visits in men and 150,447 more visits in women would be expected if long work hours were eliminated. This would represent a relative increase in the total number of annual physician visits of 3.7 percent in men and 2.1 percent in women in the provinces included in this study. In a publicly funded health care system, reducing unnecessary use is a policy priority (Roos et al. 2004). Thus, lower rates of utilization among workers with long hours could be considered an effective cost containment measure, assuming that it does not result in under use of primary health care services relative to need, and does not adversely impact future health status via lower quality of care such as inadequate screening or delayed diagnosis. The effect of long work hours on quality of care and on other health outcomes should be a focus of future studies.

The literature specific to long work hours as a barrier to accessing health services is sparse. Nonetheless, the finding from a recent qualitative study that the most prevalent individual barrier to accessing primary care among men was work responsibility seems to support these results (Wellstood, Wilson, and Eyles 2006). Additionally, although Beaujot, Haddad, and MacFarlane (2000) did not specifically assess access to health care, they did find an inverse association between time spent doing domestic activities and time spent in paid work in both men and women. The potential barrier imposed by long work hours supports recommendations from a national commission on health care that primary care reform include flexible models of delivery to allow individuals with employment-related difficulty accessing GP services during standard office hours an opportunity to do so during alternate delivery hours (Romanow 2002).

Similar to other studies (D'Souza et al. 2004), we did not observe an independent relationship between occupation and GP utilization; however, we found that the relationship between long work hours and GP utilization varied by occupation. Both men and women from white-collar professions who worked long hours had significantly lower rates of GP use than full-time white-collar workers. Variation in ability to access health care by employment characteristics has been previously noted (Young 1999). Even in the absence of direct opportunity costs (such as lost wages) for taking time off to attend medical appointments, there may be other career opportunity costs, particularly in certain professions. Shields (1999) has suggested that professionals and managers often under-report their overtime. If this were the case, the magnitude of the observed association between long working hours and white-collar professions in this study would have been even larger. To the degree that higher-status professionals tend to have greater job control (D'Souza et al. 2004), possibly rendering them more able to access health care during work hours, it is important to acknowledge that this finding could also result from under-adjustment for need in that white-collar workers may be in better health (D'Souza et al. 2004).

Consistent with other studies, we found that GP utilization was significantly associated with the province of residence (Birch, Eyles, and Newbold 1993; Dunlop, Coyte, and McIsaac 2000) and measures capturing need for health care (Birch, Eyles, and Newbold 1993; Miilunpalo et al. 1997; Dunlop, Coyte, and McIsaac 2000; Finkelstein 2001; Al-Windi, Dag, and Kurt 2002). We did not find evidence of a relationship between income and GP utilization among women; however, men in the lowest category of income adequacy had a 20 percent higher rate of GP utilization relative to men in the highest income

level, even after controlling for other determinants of utilization. Other Canadian studies that have been able to include measures for need have similarly reported an inverse association between income and volume of GP utilization (Broyles et al. 1983; McIsaac, Goel, and Naylor 1997; Dunlop, Coyte, and McIsaac 2000).

There are several strengths of this study including the availability of objective health service utilization data, the ability to adjust for a broad range of need indicators, and the ability to take time sequencing into account by measuring GP utilization for the same time period as the labor force participation history, albeit to a limited extent. There are also several limitations of this study. These results can only be considered to reflect the four Canadian provinces included in this study and due to the cross-sectional nature of this analysis, causal relationships between variables cannot be inferred. All independent variables were obtained from survey data, which may be affected by recall bias. Although this study included several measures to adjust for need, they may not have been robust enough to fully capture the variation in GP use that is explained by need. If this were the case, however, the true impact of long hours on access to GP services would have been even greater. Finally, less healthy individuals may have selected to work shorter hours for medical reasons introducing selection bias. It is expected, however, that this would have had the effect of biasing the estimates toward the null value.

CONCLUSION

In conclusion, this study found that individuals with long work hours have significantly lower rates of GP use that cannot be explained by differences in need. This has important implications for health care policy and suggests the need to develop alternate models for primary care delivery, such as extended practice hours, to allow more equitable access for individuals with time constraints such as those imposed by employment.

ACKNOWLEDGMENTS

Data for this study were provided under the auspices of the Canadian Population Health Institute funded project entitled, "Socioeconomic Differences in the Use of Health Care: Why Are There Non-Financial Barriers to 'Medically Necessary' Services?" DF was supported by a Research Training Fellowship

from the National Health Research and Development Program, Health Canada during the conduct of this project. The authors are grateful to M. Strang, Saskatchewan Department of Health, for reviewing the manuscript and L. Lethbridge, Dalhousie University, for her invaluable assistance with bootstrapping.

Disclaimer: This study is based in part on nonidentifiable data provided by the Nova Scotia, Manitoba, Saskatchewan, and British Columbia Departments of Health. The interpretations and conclusions contained herein do not necessarily represent those of the Governments or Departments of Health of the involved provinces. The research and analysis are based on data produced by Statistics Canada and the opinions expressed do not represent the views of Statistics Canada.

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SUPPLEMENTARY MATERIAL

The following supplementary material for this article is available online:

Appendix A. Unadjusted gender-specific incidence rates (IR) of GP use for chronic conditions.

This material is available as part of the online article from:

<http://www.blackwell-synergy.com/doi/abs/10.1111/j.1475-6773.2006.00683.x> (this link will take you to the article abstract).

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