Socioeconomic status and inequalities relating to access to mental health professional services: Repeated cross-section data from the Canadian Community Health Survey

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1. Introduction

It is a well established result that an individual's socioeconomic status (SES), or economic and social position relative to others, as measured by income or education, is highly correlated with his or her health status. All other things being equal, a positive relationship between income and health status is demonstrated by many authors (Ettner, 1996; Frijters, Haisken-DeNew & Shields, 2005).[1] Similarly, Grossman (2000) provides theoretical evidence and Lleras-Muney (2005) provides empirical evidence that, all other things being equal, a positive relationship exists between education and health status.

One possible explanation for the SES-health gradient is that individuals with higher SES have greater access to health care services (Smith, 1999).[2] In an attempt to reduce SES inequalities regarding access to health care services in Canada, the federal government introduced a national health insurance system over 40 years ago (Stewart, 1990). Federal legislation, in the form of the *Canada Health Act*, was enacted to be the legal foundation of this national health insurance system. This system is comprised of provincial, publicly-funded medical insurance programs each having as a principal goal the granting of access to medically necessary health care services to all provincial residents based on need rather than ability to pay (Manga, Broyles & Angus, 1987).

Since the implementation of the national health insurance system in Canada, various authors (e.g., Haynes, 1991; McIsaac, Goel & Naylor, 1997) have demonstrated that the provision of universal coverage of health care (hereinafter referred to as "universal health

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[1] For a short review of the literature on the causal effect of income on health, see Frijters et al. (2005).

[2] Another possible explanation for the SES-health gradient is that individuals with higher SES are more efficient users of health care services and other health inputs.

coverage") does not completely eliminate SES barriers in the use of health care services.[3] In particular, using nationally-representative data, Dunlop, Coyte and McIsaac (2000) show that the probability of individuals with less education accessing the services of general practitioners (GPs) is lower than the probability of individuals with more education accessing these services. Dunlop et al. (2000) further demonstrate that the probability of individuals with less income or education accessing the services of specialists (e.g., dermatologists, gynaecologists, surgeons, etc.) is lower than the probability of individuals with more income or education, respectively, accessing the services of these health professionals. The positive associations between SES and access to physician services described by these authors can help explain the SES-health gradient, assuming that greater access to physician services yields better health outcomes.

There are, however, noticeable gaps in the existing literature concerning the relationship between SES and access to mental health services. Steele, Glazier and Lin (2006) remark that previous research has produced conflicting evidence about the relative probabilities that persons, differentiated in terms of SES, use the services provided by mental health professionals under universal health coverage in Canada.[4] In their study, the authors use outpatient billing claims (i.e., a type of administrative data) from 2000 to test whether, under universal health coverage,

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[3] The common method in these examinations involves verifying whether there are differences in the use of the services provided by physicians for persons in varying SES groups under universal health coverage. For a review of the studies applying this method to health in general in a Canadian context, see Dunlop, Coyte and McIsaac (2000).

[4] Steele et al. (2006) point out that the data from previous research is outdated (more than 15 years old at the time of the publication of their study in 2006), and that, beginning in the 1990s, significant efforts to erase the stigma of mental illness, primarily through public education campaigns, may have helped to change patterns of mental health professional service use in Canada. For a review of the previous research conducted in this field drawing on Canadian data, see Steele et al. (2006).

individuals from neighbourhoods in Toronto, Ontario, with high SES use the mental health services provided by GPs and psychiatrists more or less than individuals from neighbourhoods in this city with low SES. The authors find that females from the highest socioeconomic areas make use of more mental health services provided by GPs, compared to those from the lowest socioeconomic areas. In addition, the results show that, for both males and females, individuals from neighbourhoods with the highest SES make use of more mental health services provided by psychiatrists. Assuming that greater access to GP and psychiatrist services is related to better mental health outcomes, the findings of Steele et al. (2006) could help explain the SES-health gradient in the field of mental health.[5]

This paper is motivated by the observation that some analytical limitations exist in the studies performed to date concerning the relationship between SES and access to mental health services in Canada. Most notably, the paper by Steele et al. (2006) is limited in a couple of significant ways with respect to the applicability of its conclusions. First, given that the study area analysed by these authors consists only of one city (Toronto), the data set is not representative of the Canadian population. Next, because Steele et al. make use of outpatient billing claims in their analysis, they are not able to control for outpatient health status, an important determinant of health service utilisation. In contrast, Dunlop et al. (2000) analyse survey data, as opposed to administrative data, controlling for respondent health status. The data set employed by Dunlop et al. is representative of the Canadian population; however, these authors investigate the relationship between SES and access to health services provided by

[5] Lorant et al. (2003) indicate that low SES is generally associated with high psychiatric morbidity.

physicians in general. They do not look specifically at health service utilisation for mental health problems.[6]

In this paper, data from the Canadian Community Health Survey (CCHS) are analysed to investigate the relationship between SES and the use of mental health services in Canada. The CCHS is a cross-sectional survey, administered by Canada's national statistical agency, Statistics Canada, and has recently included precise questions explicitly asking Canadians whether they have accessed the services of a health professional for mental health reasons. Specifically, the CCHS examines whether residents of Alberta, New Brunswick and Ontario, during the years 2003, 2005 and 2007, have visited GPs, psychiatrists and psychologists once or more about their mental health.[7] Examining access to all three of these health professionals may be interesting as the services of psychologists, who are non-physician mental health professionals, are not incorporated into Canada's national health insurance system. The CCHS also contains information on whether individuals retain insurance covering prescription medications. In Canada, GPs and psychiatrists are legally authorised to issue prescriptions for medications, and there is evidence that such drugs are becoming more frequently employed in the treatment of

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[6] Lim et al. (2008) estimate that the economic burden of mental illness in Canada was $51 billion in 2003. The authors measure the cost of mental illness by means of the use of medical resources for mental health reasons, productivity losses due to long-term and short-term disability, and reductions in health-related quality of life.

[7] Under Canadian universal health coverage, a GP is a physician who can provide primary mental health services, while a psychiatrist is a physician who can provide speciality and non-primary mental health services, to insured residents. The services of a psychologist are not included in Canada's national health insurance system. A psychologist is a non-physician mental health professional who charges payments for his or her services either directly or indirectly through private health insurance plans of patients.

mental health issues (Romanow, 2002).[8] Stabile (2001) finds that insurance covering prescription medications, which is not a part of universal health coverage, leads to 'public moral hazard' – that is, the use of additional publicly-funded health care services as a result of private insurance. The impact (if any) of insurance covering prescription medications on the probability that individuals access mental health services is consequently investigated in this study. However, due to data constraints – namely that the necessary information is only available for the provinces of Alberta, New Brunswick and Ontario for the year 2003 – this portion of the study constitutes a preliminary analysis to inform future work.

Overall, this paper investigates how the probabilities of accessing the mental health services provided by GPs, psychiatrists and psychologists vary by level of education and income, after controlling for health status, under universal health coverage. It is found that higher levels of income do not affect access to the services of GPs and psychiatrists but do increase access to the services of psychologists in many cases. More importantly, it is found that, in comparison with individuals who have not completed high school, females who have completed a post-secondary education are 44, 66 and 80 percent more likely to access the services of GPs, psychiatrists and psychologists, respectively, in 2007; while males who have completed a post-secondary education are 122, 58 and 128 percent more likely to access the services of GPs, psychiatrists and psychologists, respectively, in 2007. These findings are important because they indicate that individuals with more education use or have access to more mental health services offered by GPs, psychiatrists and psychologists. If these services in fact aid in the maintenance and promotion of improved mental health, then the results regarding education help explain the

[8] To illustrate, Romanow reports a 115% increase in spending on psychoactive drugs in the Quebec drug insurance program between 1997 and 2000.

SES-health gradient in the field of mental health (as reported by authors such as Lorant et al., 2003).

2. Data

The source of data selected to model the utilisation of mental health services provided by GPs, psychiatrists and psychologists consists of public-use microdata files generated from the CCHS (Statistics Canada, 2005a, 2006a, 2009a). The CCHS is a nationally-representative cross-sectional questionnaire containing a wide range of variables that provide information related to health status, health care utilisation and health determinants for the Canadian population (Statistics Canada, 2005b, 2006b, 2009b).[9] Data are collected from persons 12 years of age and over living in private dwellings in the ten provinces and three territories. Excluded from sampling are individuals living on Indian Reserves and Crown Lands, institutional residents, full-time members of the Canadian Forces, and residents of certain remote regions. Subpopulations excluded from the CCHS are estimated to account for less than three percent of the total population of Canada.

Statistics Canada has typically operated the CCHS on a two-year collection cycle, the first year of the survey cycle (".1") being a general population questionnaire, and the second year of the survey cycle (".2") being a smaller questionnaire focusing on selected health topics and not including residents from all of the provinces or territories. In Cycle 1.2 of the CCHS, corresponding to the year 2002, mental health and well-being were chosen as the selected health topics to be examined. This cycle marked the beginning of the inclusion of specific questions in the CCHS directly asking Canadians whether they have accessed mental health professional

[9] Beginning in 2001, the CCHS replaced the cross-sectional component of the National Population Health Survey. Data from the 1994 National Population Health Survey are analysed by Dunlop et al. (2000).

services. Yet, Cycle 1.2 was not a general population questionnaire. For this reason, repeated cross-section data, consisting of variables taken from Cycle 2.1, Cycle 3.1 and Cycle 4.1 of the CCHS, are analysed in this study. These three cycles correspond to the years 2003, 2005 and 2007, respectively, and represent the three general population surveys, following the release of Cycle 1.2, for which public-use microdata files are presently available.

The three dependent variables to be examined pertain to one or more visits (i.e., access) to the mental health services offered by GPs, psychiatrists and psychologists. For the years 2003, 2005 and 2007, the CCHS asks respondents if they have accessed the services of each of these health professionals at least once in the past 12 months for mental health purposes (Statistics Canada, 2005b, 2006b & 2009b). The three questions of interest posed are represented as follows: "In the past 12 months, that is, from [date one year ago] to yesterday, have you seen or talked to [(1) a GP; (2) a psychiatrist; or (3) a psychologist] about your emotional or mental health?"

The samples in the analysis are restricted to residents (12 years of age and older) of Alberta, New Brunswick and Ontario, as residents of the remaining provinces and territories were not asked the questions of interest for each of the three years under consideration. Also, concerning income, education and insurance for prescription medications, a "no data" category is generated and retained in the analysis, for each of these three independent variables, for observations with no data.[10] Whenever these independent variables are being considered, the respective "no data" categories are included in the analysis (but these categories do not appear in

[10] In this study, observations with no data are defined as those for which a respondent provides an answer to a given question that falls into one of the following categories: "don't know"; "refusal"; or "not stated".

the results section of this paper). Observations with no data for any other variable are excluded from the analysis.

Table 1 presents descriptive statistics for the three dependent variables, for females and males residing in Alberta, New Brunswick or Ontario, for the years 2003, 2005 and 2007. Access rates for females are greater than access rates for males in all cases, and females access the mental health services of GPs at least twice as frequently as males in all three years. For both genders and for each type of mental health professional service, access rates appear to be relatively stable between 2003 and 2005, increasing noticeably in 2007. Lastly, for both genders and in all three years, the mental health services of GPs are accessed at a higher rate than the services of psychiatrists, while the services of psychiatrists are accessed at a higher rate than the services of psychologists.

3. Statistical Methods

The three dependent variables are binary indicators. For each of these variables, the indicator equals "1" if the individual consulted the type of mental health professional being considered at least once in the past 12 months (and "0" if not). Given the qualitative nature of the dependent variables, logistic regression techniques are applied (separately to female and male respondents, for the years 2003, 2005 and 2007).[11] The main specification in this analysis is the

[11] The foundation of logistic regression analysis is the cumulative logistic distribution function which, for estimation purposes, can be transformed and linearized, as demonstrated by Gujarati (2003, pp. 596-597). In the present context, the cumulative logistic distribution function is given by the following equation:

$probability_{it} = P_{it} = (1 + \exp[-(\beta_0 + \sum_j \beta_{1j} X_{itj} + \sum_k \beta_{2k} Income_{itk} + \sum_l \beta_{3l} Education_{itl} + \omega_{it})])^{-1}$. For more information on logistic regression analysis, see Cramer (1991) or Gujarati (2003, sections 15.5-15.8 & 15.10).

estimation of the transformed and linearized logistic distribution function; it is represented as follows:

$$ln\,(\text{odds ratio}) = ln\,(P_{it} / [1 - P_{it}]) = L_{it} = \beta_0 + \sum_j \beta_{1j} X_{itj} + \sum_k \beta_{2k} Income_{itk} + \sum_l \beta_{3l} Education_{itl} + \varepsilon_{it}.$$

Here, P_{it} represents the estimated conditional probability that individual i accesses the services of the type of mental health professional in question in year t, given his or her income and education, as well as given other important personal characteristics of the individual that could have effects on this probability (described by X_{it}).[12]

In the main specification, X_{it} is composed of sets of binary variables controlling for personal characteristics of individual i in year t. An important component of X_{it} that needs to be controlled for is the general health status (or the self-perceived general health) of respondents. In terms of medical professional service use in general, Fylkesnes (1993) shows that self-perceived general health is the principal determinant of visits to a GP as well as to a specialist. Therefore, both self-perceived general health *and* self-perceived mental health are included as independent variables.[13] The key explanatory variables of interest are represented as $Income_{it}$ and $Education_{it}$,

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[12] The expression $P_{it} / (1 - P_{it})$ in the main specification, the *odds ratio*, is the ratio of the probability that individual i accesses the mental health services provided by a GP, psychiatrist or psychologist in year t to the probability that he or she does not access these services. The natural logarithm of the odds ratio, L_{it}, is called the *logit*; it is linear in the coefficients and changes with the odds ratio in the following manner: "[T]he logit becomes negative and increasingly large in magnitude as the odds ratio decreases from 1 to 0 and becomes increasingly large and positive as the odds ratio increases from 1 to infinity" (Gujarati, p. 596-597).

[13] Crossley and Kennedy (2002) conclude that self-assessed health may be considered a reliable measure of health when data are being considered that have been collected through the application of a common methodology (such as the computer-assisted personal and telephone interviewing employed for collection of CCHS data).

which are sets of indicators for income and education, respectively, for individual i in year t. The elements of the sets of binary independent variables used in this study are defined in Table 2.[14]

Two supplementary points about the composition of X_{it} require mention. The first point concerns the derivation of the community indicators listed in Table 2.[15] Instead of creating a dichotomous variable for each of the health regions defined in the CCHS for the provinces of Alberta, New Brunswick and Ontario, a set of four community indicators (metropolis, urban, rural/urban, rural) is constructed based on these regions. Appendix A details the division of the CCHS health regions into the four community variables.

The second point about the composition of X_{it} relates to the fact that, in the principal analysis, X_{it} excludes data on insurance for the non-prepaid services of psychologists as well as data on insurance for prescription medications. It would be ideal to include data on insurance for the services of psychologists in X_{it}, since an individual's utilisation of these services is expected to positively depend on whether he or she retains this type of insurance; nevertheless, this specific type of data is not available in the CCHS. It would also be ideal to include data on insurance for prescription medications in X_{it}, since an individual's utilisation of the mental health services of GPs and psychiatrists (i.e., health professionals legally authorised to issue prescriptions for medications) is expected to positively depend on whether he or she retains this type of insurance. Unfortunately, information on insurance for prescription medications is sparse in the CCHS, available for all three provinces in question only for the year 2003. Table 3

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[14] The behavioural model of health care utilisation conceived by Andersen (1995) and the previously-mentioned work of Dunlop et al. (2000) have guided the selection of independent variables in this research.

[15] Community indicators are included in X_{it} in an effort to control for the well-established finding that an inverse relationship exists between an individual's utilisation of mental health services and the distance he or she must travel to receive these services (see Holley, 1998, for a review of the literature concerning geography and mental health).

provides the results of a preliminary analysis with and without an indicator for the presence of full or partial insurance for drugs, for the year 2003, demonstrating that the odds ratios for education and income are extremely similar in both cases. Also, the findings in Table 3 show that, for the year 2003, the insurance variable does not have a significant effect on the probability of females or males employing the mental health services of GPs, psychiatrists or psychologists. These preliminary results provide the rationale for excluding insurance covering prescription medications from the principal analysis and for not focusing solely on the year 2003.

Finally, in order for the estimates produced from the data to be representative of the covered populations and not just the samples themselves, the analysis in this paper relies on CCHS sampling weights. Within each of the three cycles of the CCHS being considered, adjusted sampling weights are generated by summing the unadjusted (master) weights together and then dividing each of these unadjusted weights by the relevant within-cycle sum.

4. Results[16]

Tables 4 to 6 provide the odds ratios for factors related to one or more visits (i.e., access) to a GP, psychiatrist and psychologist, respectively, for mental health. The results are summarized in two subsections below. Subsection 4.1 expands in detail on the relationships between the proxies for SES and access to mental health services, while subsection 4.2 briefly reviews some notable results involving some of the control variables in the analysis.

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[16] In order to simplify the interpretation of the results, the odds ratios and *z* scores are provided from the logistic regressions performed. Nevertheless, for any given regressor, the logit (slope) coefficient can easily be obtained by taking the natural logarithm of the odds ratio, and the standard error of this coefficient can be calculated by dividing the logit coefficient by its corresponding *z* score. However, since the odds ratios and *z* scores are both rounded to two decimal places, the values of the logit coefficients and standard errors derived in this fashion will be approximate in nature.

4.1 Main results: Socioeconomic status (SES) and inequalities relating to access to a general practitioner (GP), psychiatrist or psychologist for mental health[17]

4.1.1 Education

Table 4 (p. 32) presents the odds ratios associating education and access to a GP. Compared to respondents who have not completed high school (the reference category), it becomes increasingly more probable, from 2003 to 2007, for female and male respondents who have completed a post-secondary education to access the services of a GP for mental health. The odds ratios for both females and males with a post-secondary education are not shown to be different from one in 2003, while they are shown to be statistically greater than one in 2007: It is 44% ($p \leq 0.001$) and 122% ($p \leq 0.001$) more probable, respectively, that females and males in 2007 with a post-secondary education access GP services in comparison with individuals in the reference category. Further, in 2007, the odds ratios are all significantly greater than unity, and they indicate that it is at least 33% ($p \leq 0.05$) and 68% ($p \leq 0.01$) more likely, respectively, for females and males who, as a minimum, have completed high school to access GP services.

Next, the odds ratios linking education and access to a psychiatrist are presented in Table 5 (p. 37). In comparison with respondents who have not completed high school, it becomes increasingly less probable, from 2003 to 2007, for female and male respondents who have completed a post-secondary education to access the services of a psychiatrist for mental health. The odds ratios for both females and males with a post-secondary education are greater than one in 2003, while they become less statistically significant in 2007: In 2003, it is 173% ($p \leq 0.001$)

[17] In the interpretation of the odds ratios in this subsection, the following rule of thumb is employed: If 1 is subtracted from the odds ratio of the jth regressor, and this value is multiplied by 100, then what is left is the "*percent change in the odds for a unit increase* [– from 0 to 1 in the present context –] *in the jth regressor*" (Gujarati, 2003, p. 602).

and 109% ($p \leq 0.01$) more probable, respectively, that females and males with a post-secondary education access psychiatrist services in comparison with individuals in the reference category; these probabilities decrease in 2007 to 66% ($p \leq 0.05$) and 58% (not significant), respectively.[18]

Lastly, the odds ratios in Table 6 (p. 42) relate education and access to a psychologist. From 2003 to 2007, there are differing outcomes for female and male respondents: For females, compared to those who have not completed high school, it becomes increasingly less probable over time for those who have completed a post-secondary education to access the services of a psychologist for mental health, with the greater probability of accessing these services decreasing from 177% ($p \leq 0.001$) in 2003 to 80% ($p \leq 0.05$) in 2007; whereas, for males, compared to those who have not completed high school, it becomes increasingly more probable over time for those who have completed a post-secondary education to access the services of a psychologist for mental health, with the greater probability of accessing these services increasing from 67% (not significant) in 2003 to 128% ($p \leq 0.01$) in 2007.[19]

4.1.2 Total annual household income (controlling for household size)

Table 4 (p. 32) presents the odds ratios associating total household income and access to a GP. All of the odds ratios for both females and males are shown to be statistically indifferent

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[18] In 2005, the odds ratios are all significantly greater than one, and they indicate that it is at least 94% ($p \leq 0.01$) and 114% ($p \leq 0.01$) more likely, respectively, for females and males who, as a minimum, have completed high school to access psychiatrist services.

[19] For females who have completed only some post-secondary education, the odds ratios are all significantly greater than one and are relatively stable, with the greater probability of accessing psychologist services ranging from 131% ($p \leq 0.01$) in 2003 to 114% ($p \leq 0.01$) in 2007. For males in the same education category, it is only more probable in 2007 that they access the services of a psychologist for mental health, with the greater probability of accessing these services being 151% ($p \leq 0.01$) in 2007, as opposed to 1% (not significant) in 2003 and 7% (not significant) in 2005.

from unity, except in one case.[20] These results indicate that, with the exception of the one case (males in 2007 in the upper middle income quintile), there is no difference in access to the mental health services of GPs for the three years in question amongst respondents with respect to income.

Next, the odds ratios linking total household income and access to a psychiatrist are shown in Table 5 (p. 37). Here, there are four odds ratios shown to be statistically less than one.[21] Indeed, all of the odds ratios are below unity in magnitude, with the exception of the ratio for females in 2005 in the upper middle income quintile. Overall, these results demonstrate that, in certain circumstances, it might be less probable for a respondent to access the mental health services of a psychiatrist when his or her total annual household income exceeds that income earned by a representative individual in the lowest income quintile.

The last set of odds ratios, relating total household income and access to psychologist services, is given in Table 6 (p. 42), where the reference category is once again made up of respondents in the lowest income quintile. For females, it becomes increasingly less likely over time that those in the middle and upper middle income quintiles access the services of a psychologist for mental health, with the greater probability of accessing these services decreasing from 135% ($p \leq 0.05$) in 2003 to 29% (not significant) in 2007, for those in the

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[20] This odds ratio is for males in 2007 in the upper middle income quintile: In this case, compared to the reference category (which is composed of individuals in the lowest income quintile), it is 66% ($p \leq 0.05$) more probable that males in this income quintile access GP services for mental health.

[21] These four odds ratios are for females in 2003 in the lower middle and highest income quintiles, as well as for males in 2003 and 2007 in the lower middle income quintile: For instance, for females in 2003, it is 47% ($p \leq 0.05$) less probable that those in the highest income quintile access psychiatrist services for mental health in comparison with those in the reference category.

middle income quintile, and from 112% ($p \leq 0.05$) in 2003 to 68% (not significant) in 2007, for those in the upper middle income quintile. Conversely, for females in the highest income quintile, it becomes increasingly more probable over time that individuals in this income quintile access psychologist services, with the greater probability increasing from 121% ($p \leq 0.05$) in 2003 to 137% ($p \leq 0.001$) in 2007. The results obtained for males in 2005 are similar to those for females in 2003. Specifically, in 2005, it is 108% ($p \leq 0.05$), 163% ($p \leq 0.01$) and 160% ($p \leq 0.05$) more probable that males in the middle, upper middle and highest income quintile, respectively, access psychologist services.[22,23]

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[22] The odds ratios for males in 2003 and 2007 are not statistically different from unity, apart from the one ratio for those in 2007 in the lower middle income quintile: In this case, it is actually 49% ($p \leq 0.05$) less probable that males in this income quintile access psychologist services relative to those in the reference category.

[23] Appendix B presents results from a pooled regression analysis, which includes robustness tests involving the two proxies for SES. These robustness tests consisted of: (1) pooling the data from 2003, 2005 and 2007 together; (2) running the regressions in the preceding analysis with this pooled data (controlling for the year from which each observation originates); and (3) running the regressions with these pooled data two more times, one time controlling for education but not for income, and another time controlling for income but not for education. Appendix B shows that, when income (education) is excluded from the regressions, the new odds ratios for education (income) are close, in terms of magnitude and level of significance, to the corresponding ratios from the regressions controlling for both education and income. The results from these robustness checks are an empirical justification for the inclusion of both education and income as proxies for SES. Theoretically, in contrast to income, education is considered to be a unique measure of SES as it influences lifestyle behaviours, problem-solving abilities and values, and thus helps to improve the self-management of health problems in general (Liberatos, Fink & Kelsey, 1988; Goldman & Smith, 2002).

4.2 Some notable results involving control variables related to access to a GP, psychiatrist or psychologist for mental health[24]

An important control variable is whether or not a respondent has a regular family doctor. A family doctor is also known as a GP. Thus, it intuitively makes sense that, for each case in Table 4 (p. 32), if respondents do not have a regular family doctor (i.e., do not have a regular GP), then they are less likely to access the mental health services of a GP. Table 5 (p. 37) shows that, although the values of the odds ratios are all below unity, not having a regular family doctor only negatively affects access to psychiatrist services statistically for males in 2003 and 2005. In Table 6 (p. 42), the values of the odds ratios are all below unity with respect to psychologist services; however, not having a regular family doctor does not negatively affect access to these services statistically for females in 2003 and 2007.

The most significant control variable in Tables 4 to 6 is the set of indicators representing self-perceived mental health. In comparison with respondents classifying their mental health as excellent, individuals rating their mental health as very good, good, fair, or poor are always more likely to access GP and psychiatrist services (Tables 4 & 5, pp. 32 & 37). This comparison is true as well for psychologist services, except for males in 2005 and 2007 who classify their mental health as very good (Table 6, p. 42). It is interesting to note that, in all three years, for females and males, and for each of the three dependent variables, the magnitudes of the odds ratios increase monotonically from excellent to poor, with the ratios reaching very high magnitudes for respondents with poor self-perceived mental health.

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[24] These results are not an exhaustive list of the notable outcomes pertaining to the control variables. For example, the odds ratios associated with respondents who have immigrated to Canada, in comparison with respondents born in Canada, are always below unity and often statistically significant (Tables 4-6, pp. 35, 40 & 45).

In terms of age, females and males 65 years of age and older are less likely to access the mental health services of GPs, psychiatrists and psychologists in all three years, compared to adult respondents between the ages of 35 and 44 (Tables 4-6, pp. 33, 38 & 43). In addition, the values of the odds ratios are all below unity for persons in the 55-to-64 age bracket, but these values are not always statistically significant.

Regarding province of residence, compared to female residents of Ontario, females residing in Alberta in 2007 are less likely to access psychiatrist services, while females residing in New Brunswick in all three years are less likely to access these services (Table 5, p. 38). Concerning access to psychologist services, females and males residing in Alberta in all three years are more likely to access these services in comparison with residents of Ontario, while only females residing in New Brunswick are more likely to access these services in comparison with female residents of Ontario (Table 6, p. 43).

With respect to the total usual hours worked per week by respondents, weighed against persons who are typically not working, females and males are less likely to access psychiatrist services if they usually work 36 to 44 hours per week; this result does not hold for the mental health services offered by GPs and psychologists (Tables 4-6, pp. 34, 39 & 44).

As a final point, concerning the type of community in which respondents live, compared to females residing in the city of Toronto, females residing outside of this metropolis in 2005 and 2007 are more likely to access the mental health services provided by GPs (Table 4, p. 36) and less likely to access such services provided by psychiatrists (Table 5, p. 41).

5. Discussion

This study investigates the associations between two proxies for SES (income and education) and access to the mental health services offered by GPs, psychiatrists and

psychologists under universal health coverage in three Canadian provinces (Alberta, New Brunswick and Ontario) during three years (2003, 2005 and 2007) for which recently-released CCHS microdata are available. The discussion of the results that follows emphasizes some key similarities and differences with previous research.

Similar to the findings of Dunlop et al. (2000), increased educational attainment is found to be associated with increased access to the mental health services provided by GPs, psychiatrists and psychologists. An analysis of the estimated results across the three years of data available suggests that, for the period 2003 to 2007, compared to persons without a high school diploma, it becomes more probable for persons who have completed a post-secondary education to access the mental health services of a GP, but less probable for these persons to access the services of a psychiatrist. These outcomes may reflect an underlying change in the way mental health issues are treated. For instance, assuming that there are more prescription medications available to physicians to treat mental health problems, it might be the case that GPs are now more able to treat persons with such problems, or more willing to do so given the shortage of psychiatrists in Canada which is reportedly worsening (Arehart-Treichel, 2008). Future research could examine whether GPs are indeed treating mental health more often across time with prescription drugs and, if so, whether this practice is effective.

For all three years considered, the probability that individuals access the services of GPs or psychiatrists for mental health does not depend on income (in most specifications). These findings regarding income and access to mental health services are relevant because they diverge from those obtained by Dunlop et al. (2000) in an important way. The present findings do not offer any grounds to conclude that a systematic difference exists based on income in Canada's national health insurance system with respect to access to psychiatrists. Dunlop et al. find that

income and access to physician specialist services are positively linked under universal health coverage in Canada.[25] Their findings include the services of psychiatrists since these professionals are physicians who specialize in mental health from a medical perspective.

It is also estimated in this study that insurance covering prescription medications does not significantly increase the probability of individuals employing mental health professional services. This finding is not in line with previous research. In particular, Stabile (2001) finds that individuals with insurance covering prescription medications are more likely to access publicly-funded health care services provided by physicians. Since GPs and psychiatrists are physicians and thus legally authorised to issue prescriptions for drugs, it is expected that the use of GP and psychiatrist services for mental health reasons would be related to an individual's insurance status. The disparity between the results obtained in this paper and the research of Stabile may very well be due, however, to the broad nature of the CCHS insurance variable used in this analysis. This variable measures in a simple dichotomous fashion whether respondents retain insurance which fully or partially pays for their prescription medications, making no indication of the amount or level of insurance held by respondents; hence, it is difficult to estimate the true effect of insurance for drugs on access to mental health professional services with the existing CCHS data.

The main limitation of this study surrounds the degree to which the results can be generalized. The analysis is limited to the populations of Alberta, New Brunswick and Ontario for the three years under consideration. Since Canadians from the remaining provinces and

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[25] As their measure of income, Dunlop et al. use "income adequacy", a variable derived by Statistics Canada, and based on total annual household income and household size. Income adequacy has been excluded from CCHS public-use microdata files since 2005 (Cycle 3.1). In this analysis, income is measured by total annual household income, controlling separately for household size.

territories were not asked the questions of interest concerning the dependent variables, the applicability of the findings to the Canadian population in its entirety is a possible subject for future exploration, if the appropriate data are made available. Further, the CCHS focuses on household dwellings and leaves out subpopulations including, but not limited to, the homeless, and individuals residing in institutions such as residences for seniors, nursing homes, psychiatric institutions, prisons and hospitals (Statistics Canada, 2005b, 2006b, 2009b). Although the subpopulations excluded from the CCHS are estimated to account for less than three percent of the total Canadian population, their patterns of access to primary (GP) and specialist (psychiatrist and psychologist) mental health services still remain unknown. Nonetheless, the omission of certain subpopulations is not considered to be detrimental to the analysis, given that the findings are not meant to reflect actual rates of access to mental health services, rather they are meant to identify general patterns of access to these services.

Another limitation of this study is that the time period being considered only spans from 2003 to 2007. In the stipulation of the results, various inferences are made about how the dependent variables are potentially changing across time based on education or income. Such inferences of potential gradient evolutions are made with caution. Consequently, the findings are viewed as preliminary and exploratory. Future research making use of subsequent CCHS general population questionnaires could substantiate or refute the proposed increases and decreases in SES gradients described herein.

6. Conclusion

The analysis presented in this paper provides notable findings relating to SES and inequalities in access to mental health professional services under universal health coverage in Canada, for the provinces of Alberta, New Brunswick and Ontario, during the years 2003, 2005

and 2007. As previously stated, one of the main goals of universal health coverage is to grant all Canadian residents access to medically necessary health care services based on need, or health status, rather than ability to pay. There is little evidence in this analysis that income is an important determinant of access to the medical services of GPs and psychiatrists. Educational attainment, on the other hand, is found to be a central SES source of inequalities concerning access to the services offered by GPs, psychiatrists and psychologists. It is estimated that, in comparison with individuals who have not completed high school, females who have completed a post-secondary education are 44, 66 and 80 percent more likely to access the services of GPs, psychiatrists and psychologists, respectively, in 2007; while males who have completed a post-secondary education are 122, 58 and 128 percent more likely to access the services of GPs, psychiatrists and psychologists, respectively, in 2007. Moreover, for the period 2003 to 2007, compared to persons without a high school diploma, it becomes more probable for females and males who have completed a post-secondary education to access the mental health services of GPs, but less probable for these individuals to access the services of psychiatrists. This result could possibly be a preliminary indication that GPs are now more able to treat persons with mental health problems or more willing to do so because of an escalating shortage of psychiatrists in Canada (Arehart-Treichel, 2008). Altogether, the numerous positive relationships found in this study between education and access to mental health professional services help explain the SES-health gradient in the domain of mental health documented by authors such as Lorant et al. (2003).

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Table 1:
Descriptive statistics for the dependent variables

	Number of observations[a,b]	One or more visits to a general practitioner for mental health (%)	One or more visits to a psychiatrist for mental health (%)	One or more visits to a psychologist for mental health (%)
Females	95 242	6.95	2.21	1.73
2003	32 133	5.79	1.94	1.52
2005	30 818	5.95	2.01	1.54
2007	32 291	9.06	2.66	2.11
Males	79 184	2.88	1.46	1.09
2003	26 843	2.39	1.20	0.85
2005	25 745	2.28	1.39	1.01
2007	26 596	3.94	1.78	1.42

[a] The number of observations represents the number of CCHS respondents (12 years of age or older) residing in Alberta, New Brunswick or Ontario, including those observations with no data for income, education or insurance for prescription medications, but excluding those observations with no data for any other variable. For the purpose of this study, observations with no data are defined as those for which a respondent provides an answer to a given question that falls into one of the following categories: "don't know"; "refusal"; or "not stated".

[b] In the analysis regarding one or more visits to a psychologist for the year 2003, the number of males is restricted to 26 407. The dependent variable does not vary, in this case, across the 436 male respondents with no data for education; as a result, these observations are dropped.

Table 2:
Description of the independent variables

Variable (Indicator set)[a]	Description (Elements of indicator set)
Predisposing	
Education	high school not completed, high school completed, some post-secondary, post-secondary completed
Age	12–14, 15–19, 20–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75 or older
Immigration status	not applicable (born in Canada), 0–9 years since immigration, 10 or more years since immigration
Marital status	married or common-law, widowed or separated or divorced, single and never married
Living arrangement: Children	public-use master file data are divided into the following six categories to control for whether or not there are any children in the household: individual living without children [i.e., living alone, or only with spouse, partner or other individual(s)], parent living with spouse or partner and at least one child, single parent living with at least one child, child living with single parent, child living with two parents, other
Enabling	
Total annual household income	public-use master file data are divided into income quintiles, categorized for this study as follows: lowest, lower middle, middle, upper middle, highest
Household size	1, 2, 3, 4, 5 or more
Community	Appendix A details the division of the CCHS health regions into the following four community indicators for the provinces of Alberta, Ontario and New Brunswick: metropolis (city of Toronto), urban, rural/urban, rural
Province of residence	Alberta, New Brunswick, Ontario
Total usual hours worked per week	0 (not working), 1–8, 9–17, 18–26, 27–35, 36–44, 45–53, 54–62, 63 or more
Currently attending a school, college or university	no, yes (part-time), yes (full-time)
Regular family doctor (general practitioner)	respondents are asked if they have a regular family doctor: yes, no
Need	
Self-perceived mental health	respondents are asked to classify their mental health in general: excellent, very good, good, fair, poor
Self-perceived general health	respondents are asked to classify their overall health in general: excellent, very good, good, fair, poor
Health behaviour	
Type of smoker	never smoked, former smoker, occasional smoker, daily smoker
Typical monthly alcohol consumption	no drinks, monthly or less, weekly to biweekly, more than weekly
Physical activity index	active, moderately active, inactive

[a] The classification of the indicator sets into categories (predisposing, enabling, need, health behaviour) is attributed to Andersen (1995) and Dunlop et al. (2000).

Table 3:
Odds ratios for factors related to one or more visits for mental health (reference categories shaded; *z* scores in parentheses)

General practitioner services (2003)	Females		Males	
Variable	**Insurance for prescription medications variable**		**Insurance for prescription medications variable**	
	Excluded from analysis	*Included in analysis*	*Excluded from analysis*	*Included in analysis*
Education				
High school not completed	1.00	1.00	1.00	1.00
High school completed	0.96	0.96	1.10	1.10
	(-0.29)	(-0.32)	(0.44)	(0.45)
Some post-secondary	1.69***	1.68***	1.60*	1.58*
	(3.25)	(3.21)	(2.01)	(1.97)
Post-secondary completed	1.15	1.15	1.43	1.42
	(1.14)	(1.14)	(1.91)	(1.87)
Total annual household income				
Lowest income quintile	1.00	1.00	1.00	1.00
Lower middle income quintile	1.02	1.03	0.74	0.75
	(0.12)	(0.17)	(-1.13)	(-1.11)
Middle income quintile	1.46	1.47	0.70	0.70
	(1.92)	(1.91)	(-1.36)	(-1.36)
Upper middle income quintile	1.11	1.11	0.73	0.71
	(0.51)	(0.48)	(-1.14)	(-1.25)
Highest income quintile	1.36	1.35	0.97	0.92
	(1.39)	(1.33)	(-0.12)	(-0.28)
Partial or full insurance for prescription medications				
Yes	–	1.00	–	1.00
No	–	0.94	–	0.79
		(-0.55)		(-1.65)
Province of residence				
Ontario	1.00	1.00	1.00	1.00
Alberta	1.13	1.14	0.96	0.96
	(1.40)	(1.44)	(-0.24)	(-0.24)
New Brunswick	0.91	0.92	0.89	0.91
	(-0.69)	(-0.66)	(-0.43)	(-0.38)
N	32 133		26 843	

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 3 (continued):
Odds ratios for factors related to one or more visits for mental health (reference categories shaded; *z* scores in parentheses)

Psychiatrist services (2003)	Females		Males	
Variable	**Insurance for prescription medications variable**		**Insurance for prescription medications variable**	
	Excluded from analysis	*Included in analysis*	*Excluded from analysis*	*Included in analysis*
Education				
High school not completed	1.00	1.00	1.00	1.00
High school completed	1.85**	1.84**	1.20	1.19
	(2.85)	(2.82)	(0.54)	(0.53)
Some post-secondary	2.13**	2.11**	2.00	2.01
	(2.81)	(2.81)	(1.90)	(1.92)
Post-secondary completed	2.73***	2.73***	2.09**	2.09**
	(5.37)	(5.36)	(2.58)	(2.58)
Total annual household income				
Lowest income quintile	1.00	1.00	1.00	1.00
Lower middle income quintile	0.60*	0.61*	0.54*	0.53*
	(-2.02)	(-2.00)	(-1.95)	(-1.99)
Middle income quintile	0.66	0.66	0.64	0.64
	(-1.45)	(-1.47)	(-1.39)	(-1.42)
Upper middle income quintile	0.62	0.60	0.51	0.51
	(-1.69)	(-1.75)	(-1.79)	(-1.78)
Highest income quintile	0.53*	0.51*	0.85	0.87
	(-1.97)	(-2.04)	(-0.41)	(-0.37)
Partial or full insurance for prescription medications				
Yes	–	1.00	–	1.00
No	–	0.82	–	1.13
		(-1.01)		(0.60)
Province of residence				
Ontario	1.00	1.00	1.00	1.00
Alberta	1.29	1.29	0.72	0.73
	(1.52)	(1.53)	(-1.41)	(-1.41)
New Brunswick	0.60*	0.61*	0.71	0.70
	(-2.14)	(-2.08)	(-1.25)	(-1.29)
N	32 133		26 843	

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 3 (continued):
Odds ratios for factors related to one or more visits for mental health (reference categories shaded; *z* scores in parentheses)

Psychologist services (2003)	Females		Males	
Variable	**Insurance for prescription medications variable**		**Insurance for prescription medications variable**	
	Excluded from analysis	*Included in analysis*	*Excluded from analysis*	*Included in analysis*
Education				
High school not completed	1.00	1.00	1.00	1.00
High school completed	1.52	1.50	1.19	1.20
	(1.38)	(1.33)	(0.42)	(0.43)
Some post-secondary	2.31**	2.26**	1.01	1.00
	(2.66)	(2.61)	(0.01)	(0.00)
Post-secondary completed	2.77***	2.76***	1.67	1.67
	(3.54)	(3.53)	(1.27)	(1.26)
Total annual household income				
Lowest income quintile	1.00	1.00	1.00	1.00
Lower middle income quintile	1.52	1.55	1.42	1.48
	(1.23)	(1.30)	(0.54)	(0.61)
Middle income quintile	2.35*	2.29*	0.83	0.84
	(2.38)	(2.32)	(-0.28)	(-0.26)
Upper middle income quintile	2.12*	2.04*	1.07	1.03
	(2.10)	(1.95)	(0.10)	(0.04)
Highest income quintile	2.21*	2.08	1.27	1.20
	(2.05)	(1.85)	(0.33)	(0.25)
Partial or full insurance for prescription medications				
Yes	–	1.00	–	1.00
No	–	0.75	–	0.62
		(-1.44)		(-1.84)
Province of residence				
Ontario	1.00	1.00	1.00	1.00
Alberta	1.61**	1.62**	2.16***	2.15***
	(3.07)	(3.12)	(3.31)	(3.28)
New Brunswick	2.31***	2.33***	0.81	0.84
	(3.65)	(3.68)	(-0.54)	(-0.46)
N	32 133		26 407	

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 4:

Odds ratios for factors related to one or more visits to a general practitioner (GP) for mental health (reference categories shaded; *z* scores in parentheses)

Variable	Females			Males		
	2003	2005	2007	2003	2005	2007
Education						
High school not completed	1.00	1.00	1.00	1.00	1.00	1.00
High school completed	0.96	1.06	1.33*	1.10	0.86	1.68**
	(-0.29)	(0.40)	(2.39)	(0.44)	(-0.61)	(2.52)
Some post-secondary	1.69***	1.33	1.35*	1.60*	1.61	2.25***
	(3.25)	(1.70)	(1.96)	(2.01)	(1.92)	(3.55)
Post-secondary completed	1.15	1.46**	1.44***	1.43	1.97***	2.22***
	(1.14)	(2.74)	(3.43)	(1.91)	(3.67)	(4.75)
Total annual household income						
Lowest income quintile	1.00	1.00	1.00	1.00	1.00	1.00
Lower middle income quintile	1.02	1.06	1.00	0.74	0.88	1.27
	(0.12)	(0.38)	(0.00)	(-1.13)	(-0.44)	(1.00)
Middle income quintile	1.46	1.08	1.22	0.70	1.12	1.30
	(1.92)	(0.45)	(1.45)	(-1.36)	(0.41)	(1.16)
Upper middle income quintile	1.11	1.36	1.25	0.73	1.30	1.66*
	(0.51)	(1.73)	(1.57)	(-1.14)	(0.92)	(1.99)
Highest income quintile	1.36	1.38	1.17	0.97	1.64	1.35
	(1.39)	(1.78)	(1.14)	(-0.12)	(1.66)	(1.21)
Regular family doctor						
Yes	1.00	1.00	1.00	1.00	1.00	1.00
No	0.42***	0.25***	0.40***	0.36***	0.19***	0.25***
	(-3.77)	(-7.67)	(-4.52)	(-3.96)	(-6.38)	(-5.56)
Self-perceived mental health						
Excellent	1.00	1.00	1.00	1.00	1.00	1.00
Very good	2.21***	2.49***	2.00***	2.20***	2.61***	2.12***
	(6.08)	(7.21)	(6.54)	(3.59)	(4.24)	(4.04)
Good	5.44***	5.77***	4.57***	5.28***	8.17***	4.07***
	(12.66)	(12.98)	(13.98)	(7.83)	(9.36)	(7.35)
Fair	14.09***	16.00***	11.89***	19.38***	20.16***	10.64***
	(16.65)	(16.21)	(16.63)	(12.41)	(11.33)	(10.55)
Poor	25.32***	24.44***	13.07***	34.69***	56.72***	13.46***
	(14.49)	(13.70)	(13.06)	(10.47)	(10.11)	(7.55)

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 4 (continued):
Odds ratios for factors related to one or more visits to a GP for mental health (reference categories shaded; *z* scores in parentheses)

Variable	Females			Males		
	2003	2005	2007	2003	2005	2007
Self-perceived general health						
Excellent	1.00	1.00	1.00	1.00	1.00	1.00
Very good	1.08	1.34*	1.14	0.97	1.40	1.41
	(0.57)	(2.26)	(1.13)	(-0.14)	(1.41)	(1.70)
Good	1.23	1.22	1.27*	0.97	1.17	1.39
	(1.53)	(1.36)	(2.04)	(-0.13)	(0.62)	(1.50)
Fair	1.23	1.05	1.71***	1.39	1.21	1.55
	(1.26)	(0.28)	(3.52)	(1.21)	(0.61)	(1.86)
Poor	1.36	1.64*	1.72**	2.14**	2.66**	2.01*
	(1.43)	(2.06)	(2.60)	(2.46)	(2.84)	(2.26)
Age						
12–14	0.28**	0.29***	0.53	0.32*	0.59	0.52
	(-2.63)	(-3.31)	(-1.77)	(-2.03)	(-0.99)	(-1.33)
15–19	0.72	0.84	0.71	0.31**	0.77	0.76
	(-1.19)	(-0.69)	(-1.48)	(-3.07)	(-0.58)	(-0.66)
20–24	0.81	1.37	1.43*	0.65	0.51	0.88
	(-1.12)	(1.86)	(2.26)	(-1.46)	(-1.76)	(-0.37)
25–34	1.19	1.26*	0.97	1.02	0.86	1.17
	(1.58)	(2.13)	(-0.34)	(0.11)	(-0.79)	(0.95)
35–44	1.00	1.00	1.00	1.00	1.00	1.00
45–54	0.84	1.03	0.74**	0.89	0.63**	0.89
	(-1.38)	(0.23)	(-2.50)	(-0.66)	(-2.60)	(-0.69)
55–64	0.51***	0.83	0.66**	0.84	0.48**	0.82
	(-4.67)	(-1.11)	(-3.10)	(-0.53)	(-2.81)	(-0.84)
65–74	0.29***	0.34***	0.34***	0.43*	0.22***	0.43***
	(-6.31)	(-4.64)	(-7.08)	(-2.20)	(-4.33)	(-3.18)
75 or older	0.22***	0.22***	0.29***	0.37**	0.19***	0.28***
	(-6.50)	(-6.77)	(-6.21)	(-2.50)	(-4.50)	(-4.71)
Province of residence						
Ontario	1.00	1.00	1.00	1.00	1.00	1.00
Alberta	1.13	1.10	0.98	0.96	1.05	0.86
	(1.40)	(1.02)	(-0.22)	(-0.24)	(0.30)	(-1.11)
New Brunswick	0.91	0.82	0.66***	0.89	1.35	0.76
	(-0.69)	(-1.56)	(-3.93)	(-0.43)	(1.37)	(-1.67)

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 4 (continued):
Odds ratios for factors related to one or more visits to a GP for mental health (reference categories shaded; *z* scores in parentheses)

Variable	Females			Males		
	2003	2005	2007	2003	2005	2007
Total usual hours worked per week						
0 (not working)	1.00	1.00	1.00	1.00	1.00	1.00
1–8	1.46	0.56*	0.88	1.87	1.14	0.99
	(1.84)	(-2.03)	(-0.55)	(1.48)	(0.28)	(-0.02)
9–17	1.08	0.60*	1.07	1.16	0.76	0.82
	(0.31)	(-2.27)	(0.35)	(0.30)	(-0.52)	(-0.33)
18–26	1.18	1.24	0.91	1.76	0.73	1.04
	(1.01)	(1.39)	(-0.63)	(1.41)	(-0.67)	(0.14)
27–35	1.19	0.82	1.21	1.31	1.63	0.58*
	(1.25)	(-1.41)	(1.52)	(0.87)	(1.53)	(-2.08)
36–44	0.89	0.83	0.96	1.18	0.75	0.46***
	(-0.97)	(-1.60)	(-0.36)	(0.76)	(-1.32)	(-3.76)
45–53	0.87	1.19	1.07	0.96	0.91	0.56**
	(-0.85)	(1.09)	(0.43)	(-0.18)	(-0.38)	(-2.80)
54–62	0.99	0.63*	0.78	1.20	0.43**	0.48**
	(-0.05)	(-2.20)	(-1.31)	(0.69)	(-2.62)	(-2.84)
63 or more	0.68	0.87	1.11	0.67	0.79	0.57*
	(-1.34)	(-0.42)	(0.42)	(-1.26)	(-0.78)	(-2.13)
Currently attending a school, college or university						
No	1.00	1.00	1.00	1.00	1.00	1.00
Yes, part-time	1.36	1.03	1.02	0.87	1.11	1.29
	(1.61)	(0.18)	(0.09)	(-0.39)	(0.35)	(0.87)
Yes, full-time	1.40	0.77	0.90	1.35	0.65	0.62
	(1.39)	(-1.29)	(-0.57)	(1.12)	(-1.09)	(-1.26)
Marital status						
Married or common-law	1.00	1.00	1.00	1.00	1.00	1.00
Widowed or separated or divorced	1.08	1.07	1.37*	1.81*	1.34	1.67*
	(0.40)	(0.42)	(2.14)	(2.26)	(1.20)	(2.34)
Single and never married	0.98	0.74	1.11	1.07	1.05	1.82**
	(-0.11)	(-1.77)	(0.73)	(0.24)	(0.21)	(2.72)

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 4 (continued):
Odds ratios for factors related to one or more visits to a GP for mental health (reference categories shaded; *z* scores in parentheses)

Variable	Females			Males		
	2003	2005	2007	2003	2005	2007
Immigration status						
Not applicable (born in Canada)	1.00	1.00	1.00	1.00	1.00	1.00
0–9 years since immigration	0.44*	0.31***	0.44***	0.24**	0.35*	0.29***
	(-2.42)	(-3.81)	(-3.37)	(-2.86)	(-2.48)	(-3.38)
10 or more years since immigration	0.72**	0.74*	0.60***	0.59*	0.56**	0.86
	(-2.67)	(-2.36)	(-4.44)	(-2.44)	(-2.96)	(-0.77)
Physical activity index						
Inactive	1.00	1.00	1.00	1.00	1.00	1.00
Moderately active	0.94	0.96	1.14	1.27	0.99	0.96
	(-0.65)	(-0.44)	(1.63)	(1.40)	(-0.04)	(-0.28)
Active	0.94	0.91	1.10	1.58***	1.02	0.92
	(-0.61)	(-1.00)	(1.07)	(3.19)	(0.12)	(-0.56)
Typical monthly alcohol consumption						
No drinks	1.00	1.00	1.00	1.00	1.00	1.00
Monthly or less	1.30*	1.13	0.86	0.90	0.81	0.97
	(2.15)	(1.13)	(-1.52)	(-0.51)	(-1.12)	(-0.19)
Weekly to biweekly	1.29*	1.18	0.83	1.16	0.74	0.98
	(1.95)	(1.39)	(-1.63)	(0.79)	(-1.62)	(-0.09)
More than weekly	1.45**	1.19	0.89	1.03	0.61**	0.83
	(2.50)	(1.31)	(-0.99)	(0.17)	(-2.63)	(-1.22)
Type of smoker						
Never smoked	1.00	1.00	1.00	1.00	1.00	1.00
Former smoker	1.22*	1.18	1.61***	0.93	1.26	0.98
	(1.99)	(1.65)	(5.54)	(-0.36)	(1.38)	(-0.15)
Occasional smoker	1.03	1.38*	1.63**	1.23	1.18	1.01
	(0.16)	(1.95)	(3.09)	(0.76)	(0.65)	(0.05)
Daily smoker	1.32*	1.46***	1.62***	1.48*	1.45*	1.28
	(2.43)	(3.34)	(4.82)	(2.06)	(1.93)	(1.49)

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 4 (continued):
Odds ratios for factors related to one or more visits to a GP for mental health (reference categories shaded; *z* scores in parentheses)

Variable	Females			Males		
	2003	2005	2007	2003	2005	2007
Household size						
1	1.00	1.00	1.00	1.00	1.00	1.00
2	0.84	0.70*	0.86	1.09	1.02	1.33
	(-1.01)	(-2.31)	(-1.08)	(0.36)	(0.07)	(1.32)
3	0.92	0.87	0.71	1.14	0.81	0.79
	(-0.37)	(-0.58)	(-1.73)	(0.39)	(-0.50)	(-0.67)
4	0.81	0.75	0.78	1.19	0.67	0.78
	(-0.88)	(-1.08)	(-1.18)	(0.46)	(-0.94)	(-0.65)
5 or more	0.82	0.83	0.64	1.08	0.49	0.51
	(-0.82)	(-0.66)	(-1.89)	(0.18)	(-1.55)	(-1.47)
Living arrangement: Children						
Individual living without children	1.00	1.00	1.00	1.00	1.00	1.00
Parent living with spouse or partner and at least one child	1.15	0.86	1.47*	1.13	0.99	1.54
	(0.72)	(-0.68)	(2.10)	(0.34)	(-0.04)	(1.19)
Single parent living with at least one child	1.00	1.84**	1.52**	0.71	1.22	0.63
	(-0.01)	(2.91)	(2.55)	(-0.76)	(0.46)	(-1.21)
Child living with single parent	0.73	0.66	0.98	0.89	0.74	0.45**
	(-1.22)	(-1.55)	(-0.07)	(-0.34)	(-0.81)	(-2.68)
Child living with two parents	0.48**	0.68	0.82	0.54	0.70	0.87
	(-2.78)	(-1.39)	(-0.83)	(-1.76)	(-0.83)	(-0.33)
Other	0.83	0.75	1.30	1.14	1.20	0.85
	(-0.75)	(-1.08)	(1.20)	(0.36)	(0.42)	(-0.37)
Community						
Metropolis (city of Toronto)	1.00	1.00	1.00	1.00	1.00	1.00
Urban	1.50*	1.52*	1.52**	0.99	0.98	0.99
	(2.28)	(2.22)	(2.98)	(-0.02)	(-0.08)	(-0.04)
Rural / Urban	1.31	1.56*	1.65***	1.01	0.89	1.15
	(1.49)	(2.29)	(3.51)	(0.04)	(-0.49)	(0.65)
Rural	1.36	1.50*	1.44**	0.89	0.76	0.95
	(1.64)	(2.05)	(2.47)	(-0.34)	(-1.06)	(-0.22)
N	32 133	30 818	32 291	26 843	25 745	26 596

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 5:

Odds ratios for factors related to one or more visits to a psychiatrist for mental health (reference categories shaded; *z* scores in parentheses)

Variable	Females			Males		
	2003	2005	2007	2003	2005	2007
Education						
High school not completed	1.00	1.00	1.00	1.00	1.00	1.00
High school completed	1.85**	1.94**	1.37	1.20	2.14**	1.00
	(2.85)	(2.71)	(1.32)	(0.54)	(2.62)	(-0.01)
Some post-secondary	2.13**	3.59***	1.30	2.00	4.91***	1.86*
	(2.81)	(4.96)	(1.03)	(1.90)	(5.29)	(1.94)
Post-secondary completed	2.73***	2.45***	1.66*	2.09**	3.10***	1.58
	(5.37)	(4.28)	(2.29)	(2.58)	(5.20)	(1.77)
Total annual household income						
Lowest income quintile	1.00	1.00	1.00	1.00	1.00	1.00
Lower middle income quintile	0.60*	0.75	0.83	0.54*	0.97	0.57*
	(-2.02)	(-1.08)	(-0.91)	(-1.95)	(-0.13)	(-2.09)
Middle income quintile	0.66	0.73	0.83	0.64	0.61	0.71
	(-1.45)	(-1.18)	(-0.86)	(-1.39)	(-1.68)	(-1.19)
Upper middle income quintile	0.62	1.04	0.91	0.51	0.76	0.88
	(-1.69)	(0.13)	(-0.36)	(-1.79)	(-0.91)	(-0.43)
Highest income quintile	0.53*	0.99	0.83	0.85	0.94	0.89
	(-1.97)	(-0.05)	(-0.76)	(-0.41)	(-0.17)	(-0.38)
Regular family doctor						
Yes	1.00	1.00	1.00	1.00	1.00	1.00
No	0.94	0.82	0.76	0.47*	0.49**	0.82
	(-0.19)	(-0.90)	(-1.37)	(-2.11)	(-2.78)	(-0.77)
Self-perceived mental health						
Excellent	1.00	1.00	1.00	1.00	1.00	1.00
Very good	2.30***	2.16**	1.94**	2.32**	2.28**	2.70***
	(3.43)	(2.68)	(2.82)	(2.55)	(2.65)	(3.35)
Good	8.57***	9.85***	5.61***	5.63***	7.49***	5.07***
	(9.54)	(7.88)	(7.60)	(5.24)	(6.37)	(5.77)
Fair	28.66***	24.28***	17.21***	20.64***	24.52***	17.28***
	(13.32)	(9.79)	(11.40)	(9.13)	(9.29)	(9.09)
Poor	71.12***	73.61***	59.06***	75.59***	94.47***	60.34***
	(14.63)	(10.92)	(13.98)	(10.70)	(11.12)	(10.61)

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 5 (continued):
Odds ratios for factors related to one or more visits to a psychiatrist for mental health (reference categories shaded; *z* scores in parentheses)

Variable	Females			Males		
	2003	2005	2007	2003	2005	2007
Self-perceived general health						
Excellent	1.00	1.00	1.00	1.00	1.00	1.00
Very good	1.61*	0.99	1.05	0.85	0.78	1.03
	(2.06)	(-0.04)	(0.20)	(-0.47)	(-0.88)	(0.09)
Good	1.63*	1.02	1.44	0.83	0.96	0.93
	(2.06)	(0.07)	(1.64)	(-0.52)	(-0.15)	(-0.23)
Fair	1.87*	1.62	1.31	1.89	1.48	1.25
	(2.39)	(1.65)	(1.04)	(1.62)	(1.21)	(0.65)
Poor	1.70	2.37*	1.12	1.01	1.27	1.03
	(1.71)	(2.37)	(0.32)	(0.02)	(0.57)	(0.06)
Age						
12–14	0.24**	0.55	0.34	1.08	0.25*	0.44
	(-2.63)	(-1.30)	(-1.85)	(0.12)	(-2.39)	(-1.45)
15–19	0.37*	0.70	0.93	0.45	1.18	0.42
	(-2.34)	(-0.80)	(-0.21)	(-1.36)	(0.29)	(-1.81)
20–24	0.44*	0.77	0.95	0.46	0.64	0.39*
	(-2.24)	(-0.83)	(-0.19)	(-1.50)	(-0.96)	(-2.40)
25–34	0.75	0.92	1.09	0.51*	1.22	0.75
	(-1.25)	(-0.43)	(0.38)	(-2.14)	(0.77)	(-0.98)
35–44	1.00	1.00	1.00	1.00	1.00	1.00
45–54	1.01	0.77	1.01	1.20	0.76	0.87
	(0.05)	(-1.28)	(0.05)	(0.81)	(-1.09)	(-0.59)
55–64	0.84	0.60*	0.66	0.50*	0.74	0.73
	(-0.77)	(-2.06)	(-1.88)	(-2.39)	(-1.09)	(-1.04)
65–74	0.30***	0.11***	0.37***	0.31**	0.35**	0.51
	(-3.98)	(-6.99)	(-3.52)	(-2.98)	(-2.52)	(-1.86)
75 or older	0.14***	0.12***	0.18***	0.02***	0.09***	0.08***
	(-4.79)	(-5.26)	(-4.86)	(-5.06)	(-3.99)	(-4.29)
Province of residence						
Ontario	1.00	1.00	1.00	1.00	1.00	1.00
Alberta	1.29	0.81	0.64**	0.72	0.81	1.01
	(1.52)	(-1.29)	(-2.70)	(-1.41)	(-0.91)	(0.03)
New Brunswick	0.60*	0.50**	0.57*	0.71	1.43	0.48**
	(-2.14)	(-2.63)	(-2.18)	(-1.25)	(1.17)	(-2.81)

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 5 (continued):
Odds ratios for factors related to one or more visits to a psychiatrist for mental health (reference categories shaded; *z* scores in parentheses)

Variable	Females			Males		
	2003	2005	2007	2003	2005	2007
Total usual hours worked per week						
0 (not working)	1.00	1.00	1.00	1.00	1.00	1.00
1–8	0.84	1.06	0.75	2.81*	0.81	0.38
	(-0.49)	(0.11)	(-0.69)	(2.03)	(-0.28)	(-1.41)
9–17	1.10	0.34**	1.00	1.65	1.19	0.38*
	(0.27)	(-2.64)	(0.00)	(1.31)	(0.40)	(-2.23)
18–26	1.27	0.72	0.82	0.20**	0.78	0.47
	(0.92)	(-1.12)	(-0.70)	(-2.93)	(-0.65)	(-1.56)
27–35	0.46**	0.64*	0.71	0.97	1.42	0.51*
	(-2.87)	(-2.04)	(-1.47)	(-0.07)	(1.00)	(-2.00)
36–44	0.48***	0.51***	0.39***	0.48*	0.56*	0.45**
	(-3.61)	(-3.66)	(-4.74)	(-2.29)	(-2.26)	(-2.97)
45–53	0.58	0.45**	0.39***	0.43*	0.52*	0.46**
	(-1.86)	(-3.00)	(-3.71)	(-2.49)	(-2.29)	(-2.83)
54–62	0.34*	0.44*	0.28**	0.46	0.14***	0.25***
	(-2.30)	(-2.09)	(-3.15)	(-1.62)	(-4.93)	(-4.26)
63 or more	1.14	0.49	0.39	0.59	0.57	0.38**
	(0.32)	(-1.62)	(-1.80)	(-1.27)	(-1.45)	(-2.53)
Currently attending a school, college or university						
No	1.00	1.00	1.00	1.00	1.00	1.00
Yes, part-time	1.07	1.19	1.40	1.15	0.81	2.18
	(0.19)	(0.51)	(0.76)	(0.24)	(-0.52)	(1.73)
Yes, full-time	1.54	0.80	0.85	0.52	0.31*	1.23
	(0.98)	(-0.67)	(-0.60)	(-1.46)	(-2.40)	(0.57)
Marital status						
Married or common-law	1.00	1.00	1.00	1.00	1.00	1.00
Widowed or separated or divorced	1.18	1.43	1.50	1.42	1.63	1.69
	(0.50)	(1.22)	(1.69)	(0.93)	(1.48)	(1.54)
Single and never married	1.50	1.25	1.74*	1.78	1.30	2.25*
	(1.22)	(0.84)	(2.23)	(1.52)	(0.84)	(2.08)

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 5 (continued):
Odds ratios for factors related to one or more visits to a psychiatrist for mental health (reference categories shaded; *z* scores in parentheses)

Variable	Females			Males		
	2003	2005	2007	2003	2005	2007
Immigration status						
Not applicable (born in Canada)	1.00	1.00	1.00	1.00	1.00	1.00
0–9 years since immigration	0.44	0.57	0.17***	0.34	0.11**	0.21**
	(-1.58)	(-1.71)	(-3.70)	(-1.48)	(-3.11)	(-2.93)
10 or more years since immigration	0.76	0.86	0.67*	0.78	0.45**	0.69
	(-1.55)	(-0.75)	(-2.07)	(-1.01)	(-3.07)	(-1.37)
Physical activity index						
Inactive	1.00	1.00	1.00	1.00	1.00	1.00
Moderately active	0.85	0.82	1.00	0.91	0.98	0.90
	(-1.01)	(-1.29)	(-0.03)	(-0.45)	(-0.08)	(-0.53)
Active	1.22	1.01	1.06	1.15	0.77	0.89
	(1.19)	(0.06)	(0.33)	(0.68)	(-1.32)	(-0.55)
Typical monthly alcohol consumption						
No drinks	1.00	1.00	1.00	1.00	1.00	1.00
Monthly or less	1.01	0.78	0.97	0.81	0.78	0.55*
	(0.07)	(-1.50)	(-0.20)	(-0.80)	(-1.10)	(-2.27)
Weekly to biweekly	0.77	0.85	0.81	0.85	0.83	0.52**
	(-1.35)	(-0.91)	(-1.05)	(-0.56)	(-0.84)	(-2.90)
More than weekly	0.95	0.77	0.72	0.58*	0.65*	0.70
	(-0.21)	(-1.14)	(-1.53)	(-1.94)	(-1.93)	(-1.73)
Type of smoker						
Never smoked	1.00	1.00	1.00	1.00	1.00	1.00
Former smoker	1.24	1.18	1.70***	1.96**	1.29	1.08
	(1.31)	(1.00)	(3.63)	(2.76)	(1.13)	(0.32)
Occasional smoker	1.97**	0.97	1.59	0.85	1.09	1.19
	(2.50)	(-0.08)	(1.38)	(-0.33)	(0.26)	(0.56)
Daily smoker	1.25	1.17	2.06***	2.12**	1.31	1.58*
	(1.22)	(0.86)	(3.81)	(2.67)	(1.09)	(1.95)

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 5 (continued):
Odds ratios for factors related to one or more visits to a psychiatrist for mental health (reference categories shaded; *z* scores in parentheses)

Variable	Females			Males		
	2003	2005	2007	2003	2005	2007
Household size						
1	1.00	1.00	1.00	1.00	1.00	1.00
2	0.99	0.97	1.15	0.92	1.00	1.08
	(-0.03)	(-0.12)	(0.59)	(-0.25)	(-0.01)	(0.22)
3	1.05	0.72	0.85	0.86	0.98	0.47
	(0.14)	(-0.88)	(-0.44)	(-0.31)	(-0.06)	(-1.77)
4	0.66	0.48	1.00	0.72	1.41	0.31**
	(-1.05)	(-1.90)	(-0.01)	(-0.64)	(0.73)	(-2.62)
5 or more	0.76	0.41*	0.34**	0.55	1.48	0.34*
	(-0.70)	(-2.07)	(-2.68)	(-1.15)	(0.76)	(-2.06)
Living arrangement: Children						
Individual living without children	1.00	1.00	1.00	1.00	1.00	1.00
Parent living with spouse or partner and at least one child	1.03	1.01	0.98	1.25	0.51	2.63*
	(0.09)	(0.04)	(-0.07)	(0.45)	(-1.46)	(2.20)
Single parent living with at least one child	0.76	0.83	0.47**	0.49	1.98	2.14
	(-0.79)	(-0.55)	(-2.54)	(-1.26)	(1.12)	(1.52)
Child living with single parent	0.82	0.98	0.84	1.25	1.20	1.12
	(-0.51)	(-0.05)	(-0.47)	(0.50)	(0.42)	(0.25)
Child living with two parents	1.34	1.52	0.98	1.05	0.50	1.67
	(0.71)	(1.11)	(-0.06)	(0.11)	(-1.38)	(1.10)
Other	0.89	1.16	0.79	2.17	0.36*	2.26
	(-0.25)	(0.38)	(-0.64)	(1.69)	(-1.95)	(1.64)
Community						
Metropolis (city of Toronto)	1.00	1.00	1.00	1.00	1.00	1.00
Urban	0.78	0.65*	0.68*	0.92	0.45**	1.35
	(-1.19)	(-2.17)	(-1.98)	(-0.27)	(-3.12)	(1.07)
Rural / Urban	0.87	0.55**	0.39***	1.10	0.31***	1.15
	(-0.61)	(-2.70)	(-4.43)	(0.29)	(-4.24)	(0.46)
Rural	0.68	0.42***	0.42***	0.74	0.32***	1.08
	(-1.51)	(-3.80)	(-3.91)	(-0.91)	(-3.90)	(0.26)
N	32 133	30 818	32 291	26 843	25 745	26 596

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 6:

Odds ratios for factors related to one or more visits to a psychologist for mental health (reference categories shaded; *z* scores in parentheses)

Variable	Females			Males		
	2003	2005	2007	2003	2005	2007
Education						
High school not completed	1.00	1.00	1.00	1.00	1.00	1.00
High school completed	1.52	1.22	1.03	1.19	0.91	1.64
	(1.38)	(0.74)	(0.10)	(0.42)	(-0.24)	(1.69)
Some post-secondary	2.31**	2.21**	2.14**	1.01	1.07	2.51**
	(2.66)	(2.79)	(2.55)	(0.01)	(0.17)	(3.07)
Post-secondary completed	2.77***	2.26***	1.80*	1.67	1.96*	2.28**
	(3.54)	(3.43)	(2.34)	(1.27)	(2.12)	(3.14)
Total annual household income						
Lowest income quintile	1.00	1.00	1.00	1.00	1.00	1.00
Lower middle income quintile	1.52	1.65	1.45	1.42	1.68	0.51*
	(1.23)	(1.48)	(1.59)	(0.54)	(1.39)	(-2.22)
Middle income quintile	2.35*	1.90	1.29	0.83	2.08*	0.73
	(2.38)	(1.77)	(1.08)	(-0.28)	(2.02)	(-1.01)
Upper middle income quintile	2.12*	2.33**	1.68	1.07	2.63**	0.55
	(2.10)	(2.50)	(1.82)	(0.10)	(2.57)	(-1.69)
Highest income quintile	2.21*	2.63**	2.37***	1.27	2.60*	0.65
	(2.05)	(2.77)	(3.56)	(0.33)	(2.29)	(-1.40)
Regular family doctor						
Yes	1.00	1.00	1.00	1.00	1.00	1.00
No	0.91	0.56*	0.76	0.52*	0.40***	0.57*
	(-0.30)	(-1.97)	(-1.00)	(-1.92)	(-3.34)	(-2.13)
Self-perceived mental health						
Excellent	1.00	1.00	1.00	1.00	1.00	1.00
Very good	2.41**	2.71***	3.02***	3.78***	1.45	1.45
	(2.77)	(4.46)	(4.93)	(3.90)	(1.25)	(1.43)
Good	3.86***	5.00***	6.37***	4.84***	2.62**	2.88***
	(3.98)	(6.09)	(8.02)	(4.70)	(3.13)	(4.14)
Fair	13.66***	13.45***	14.18***	28.17***	12.52***	8.82***
	(6.90)	(8.09)	(9.54)	(9.20)	(7.04)	(7.15)
Poor	26.75***	18.53***	33.93***	49.54***	19.67***	16.08***
	(6.39)	(6.05)	(10.85)	(6.37)	(5.54)	(6.65)

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 6 (continued):
Odds ratios for factors related to one or more visits to a psychologist for mental health (reference categories shaded; *z* scores in parentheses)

Variable	Females			Males		
	2003	2005	2007	2003	2005	2007
Self-perceived general health						
Excellent	1.00	1.00	1.00	1.00	1.00	1.00
Very good	0.93	1.28	0.79	0.91	0.78	0.93
	(-0.30)	(1.27)	(-1.19)	(-0.29)	(-0.80)	(-0.27)
Good	0.83	1.03	0.84	0.81	1.15	1.29
	(-0.64)	(0.11)	(-0.84)	(-0.62)	(0.45)	(0.91)
Fair	1.00	1.43	1.08	1.14	1.54	1.27
	(-0.01)	(1.24)	(0.32)	(0.31)	(1.13)	(0.70)
Poor	1.90	4.12***	1.21	1.12	1.78	1.45
	(1.75)	(3.70)	(0.59)	(0.17)	(1.25)	(0.84)
Age						
12–14	1.58	1.05	1.21	0.41	1.72	3.39*
	(0.75)	(0.10)	(0.37)	(-0.96)	(0.78)	(2.22)
15–19	1.29	1.03	0.88	0.36	1.32	1.21
	(0.52)	(0.06)	(-0.36)	(-1.25)	(0.42)	(0.39)
20–24	0.69	0.66	0.96	0.63	0.68	1.14
	(-1.05)	(-1.11)	(-0.13)	(-0.87)	(-0.58)	(0.34)
25–34	0.96	0.93	0.97	0.91	0.76	1.04
	(-0.18)	(-0.37)	(-0.18)	(-0.32)	(-0.95)	(0.18)
35–44	1.00	1.00	1.00	1.00	1.00	1.00
45–54	1.29	0.80	0.60*	0.94	0.79	0.99
	(1.05)	(-0.94)	(-2.40)	(-0.20)	(-0.73)	(-0.06)
55–64	0.63	0.72	0.39***	0.37**	0.54	0.51**
	(-1.56)	(-1.16)	(-3.96)	(-2.56)	(-1.74)	(-2.49)
65–74	0.17***	0.16***	0.20***	0.01***	0.09***	0.26***
	(-3.88)	(-4.55)	(-4.49)	(-5.74)	(-4.58)	(-3.28)
75 or older	0.08***	0.03***	0.07***	0.15**	0.06**	0.09***
	(-3.90)	(-6.05)	(-6.91)	(-2.57)	(-2.65)	(-4.09)
Province of residence						
Ontario	1.00	1.00	1.00	1.00	1.00	1.00
Alberta	1.61**	2.64***	1.91***	2.16***	1.70**	1.52*
	(3.07)	(6.05)	(4.43)	(3.31)	(2.61)	(2.38)
New Brunswick	2.31***	2.55***	1.58*	0.81	1.71	1.60
	(3.65)	(4.35)	(2.28)	(-0.54)	(1.49)	(1.67)

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 6 (continued):
Odds ratios for factors related to one or more visits to a psychologist for mental health (reference categories shaded; *z* scores in parentheses)

Variable	Females			Males		
	2003	2005	2007	2003	2005	2007
Total usual hours worked per week						
0 (not working)	1.00	1.00	1.00	1.00	1.00	1.00
1–8	1.80	0.44	0.68	0.73	1.07	1.39
	(1.55)	(-1.66)	(-0.85)	(-0.36)	(0.08)	(0.59)
9–17	0.75	2.21*	1.09	0.51	0.62	1.42
	(-0.79)	(2.38)	(0.26)	(-0.86)	(-0.96)	(0.73)
18–26	1.13	1.34	0.91	0.44	0.29*	0.81
	(0.39)	(0.99)	(-0.36)	(-1.28)	(-2.05)	(-0.52)
27–35	1.03	1.27	0.64	1.15	0.65	0.81
	(0.09)	(0.92)	(-1.68)	(0.27)	(-0.87)	(-0.50)
36–44	1.16	0.86	0.75	1.06	0.62	0.85
	(0.57)	(-0.69)	(-1.46)	(0.14)	(-1.47)	(-0.68)
45–53	0.88	0.78	1.17	1.05	0.61	0.51**
	(-0.26)	(-0.97)	(0.67)	(0.13)	(-1.31)	(-2.57)
54–62	0.66	0.82	0.51*	0.50	0.56	0.63
	(-1.10)	(-0.53)	(-2.08)	(-1.41)	(-1.42)	(-1.44)
63 or more	0.61	1.64	0.65	0.44	1.17	0.69
	(-0.80)	(1.30)	(-1.03)	(-1.39)	(0.30)	(-0.96)
Currently attending a school, college or university						
No	1.00	1.00	1.00	1.00	1.00	1.00
Yes, part-time	2.32**	1.54	0.91	1.40	2.40**	2.32**
	(2.56)	(1.46)	(-0.36)	(0.76)	(2.62)	(2.50)
Yes, full-time	2.24**	1.37	1.18	2.26	1.85	2.07*
	(2.46)	(0.94)	(0.64)	(1.21)	(1.39)	(2.24)
Marital status						
Married or common-law	1.00	1.00	1.00	1.00	1.00	1.00
Widowed or separated or divorced	1.27	1.36	1.23	0.72	2.60*	1.81
	(0.83)	(1.14)	(0.73)	(-0.92)	(2.41)	(1.45)
Single and never married	1.13	1.19	1.04	0.59	1.15	1.09
	(0.46)	(0.63)	(0.13)	(-1.49)	(0.30)	(0.20)

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 6 (continued):
Odds ratios for factors related to one or more visits to a psychologist for mental health (reference categories shaded; *z* scores in parentheses)

Variable	Females			Males		
	2003	2005	2007	2003	2005	2007
Immigration status						
Not applicable (born in Canada)	1.00	1.00	1.00	1.00	1.00	1.00
0–9 years since immigration	0.60	0.29*	0.51	0.42	0.56	0.42
	(-1.01)	(-2.41)	(-1.81)	(-1.25)	(-0.99)	(-1.58)
10 or more years since immigration	0.58*	0.67	0.55*	0.35**	0.25***	0.48**
	(-1.93)	(-1.65)	(-2.44)	(-2.79)	(-3.53)	(-2.52)
Physical activity index						
Inactive	1.00	1.00	1.00	1.00	1.00	1.00
Moderately active	0.67*	0.86	0.90	1.68	1.09	1.37
	(-2.08)	(-0.93)	(-0.66)	(1.92)	(0.40)	(1.54)
Active	1.02	0.87	1.17	1.32	1.27	1.17
	(0.11)	(-0.82)	(0.97)	(1.16)	(0.97)	(0.76)
Typical monthly alcohol consumption						
No drinks	1.00	1.00	1.00	1.00	1.00	1.00
Monthly or less	0.94	1.02	1.27	0.87	0.69	0.86
	(-0.33)	(0.08)	(1.28)	(-0.35)	(-1.45)	(-0.61)
Weekly to biweekly	0.86	1.35	1.59*	0.69	0.82	1.06
	(-0.71)	(1.39)	(2.14)	(-1.02)	(-0.73)	(0.23)
More than weekly	1.43	0.93	1.29	0.82	0.73	1.12
	(1.28)	(-0.29)	(1.14)	(-0.54)	(-1.23)	(0.45)
Type of smoker						
Never smoked	1.00	1.00	1.00	1.00	1.00	1.00
Former smoker	1.36	1.00	1.27	0.93	2.22**	1.17
	(1.86)	(0.00)	(1.53)	(-0.27)	(3.17)	(0.66)
Occasional smoker	1.02	1.64	1.40	0.81	1.23	1.79*
	(0.07)	(1.60)	(1.21)	(-0.35)	(0.42)	(2.02)
Daily smoker	1.14	0.72	1.30	0.83	1.82*	1.13
	(0.51)	(-1.43)	(1.32)	(-0.57)	(2.24)	(0.46)

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Table 6 (continued):
Odds ratios for factors related to one or more visits to a psychologist for mental health (reference categories shaded; *z* scores in parentheses)

Variable	Females			Males		
	2003	2005	2007	2003	2005	2007
Household size						
1	1.00	1.00	1.00	1.00	1.00	1.00
2	0.55*	0.48**	0.60	0.43*	0.93	0.73
	(-2.16)	(-2.87)	(-1.81)	(-2.44)	(-0.21)	(-0.84)
3	0.97	0.41*	0.59	0.55	0.86	0.43*
	(-0.07)	(-2.21)	(-1.75)	(-1.32)	(-0.27)	(-2.30)
4	0.62	0.34*	0.53	0.45	1.12	0.55
	(-1.04)	(-2.23)	(-1.73)	(-1.74)	(0.22)	(-1.47)
5 or more	0.60	0.17***	0.48	0.34	1.21	0.33*
	(-1.13)	(-3.62)	(-1.86)	(-1.90)	(0.33)	(-2.30)
Living arrangement: Children						
Individual living without children	1.00	1.00	1.00	1.00	1.00	1.00
Parent living with spouse or partner and at least one child	0.64	1.25	0.80	0.75	0.76	1.39
	(-1.17)	(0.54)	(-0.70)	(-0.66)	(-0.56)	(0.74)
Single parent living with at least one child	1.38	1.59	1.07	3.77*	0.85	1.43
	(0.90)	(1.42)	(0.19)	(2.06)	(-0.19)	(0.67)
Child living with single parent	0.45	1.05	1.57	2.92*	1.45	0.83
	(-1.77)	(0.13)	(1.07)	(2.34)	(0.79)	(-0.46)
Child living with two parents	0.49	1.12	0.67	0.63	0.50	0.74
	(-1.73)	(0.21)	(-1.29)	(-0.92)	(-1.31)	(-0.77)
Other	0.53	1.79	0.63	1.50	0.59	1.63
	(-1.50)	(1.26)	(-1.29)	(0.85)	(-0.94)	(0.99)
Community						
Metropolis (city of Toronto)	1.00	1.00	1.00	1.00	1.00	1.00
Urban	1.20	0.73	0.93	1.87	1.12	0.96
	(0.52)	(-1.15)	(-0.30)	(1.39)	(0.25)	(-0.11)
Rural / Urban	0.64	0.52*	0.68	1.25	0.83	0.97
	(-1.20)	(-2.24)	(-1.46)	(0.50)	(-0.38)	(-0.08)
Rural	0.79	0.66	0.53*	1.20	0.60	0.68
	(-0.61)	(-1.45)	(-2.35)	(0.39)	(-1.00)	(-0.97)
N	32 133	30 818	32 291	26 407	25 745	26 596

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Appendix A:

Division of the Canadian Community Health Survey (CCHS) health regions into the four community variables

Community variable (Indicator set)[a]	Province of residence	CCHS health regions separated by province of residence (Elements of indicator set)[b]
Metropolis	Ontario	City of Toronto Health Unit (HU)
Urban	Alberta	Calgary Health Region, Capital Health
	Ontario	Durham Regional HU, City of Hamilton HU, Middlesex-London HU, Niagara Regional Area HU, City of Ottawa HU, Peel Regional HU, Waterloo HU, Windsor-Essex County HU, York Regional HU
Rural / Urban	Alberta	Chinook Regional Health Authority, Palliser Health Region, David Thompson Regional Health Authority
	Ontario	Brant County HU, Halton Regional HU, Huron and Perth HUs, Chatham-Kent HU, Kingston-Frontenac-Lennox-Addington HU, Lambton HU, North Bay and Timiskaming HUs, Peterborough County-City HU, Simcoe Muskoka District HU, Sudbury and District HU, Thunder Bay District HU, Wellington-Dufferin-Guelph HU
	New Brunswick	Region 1, Region 2, Region 3
Rural	Alberta	East Central Health, Aspen Regional Health Authority, Peace Country and Northern Lights Health Region
	Ontario	Algoma District HU, Elgin-St. Thomas HU, Grey Bruce HU, Haldimand-Norfolk HU, Haliburton-Kawartha-Pine Ridge District HU, Hastings and Prince Edward Counties HU, Leeds-Grenville-Lanark District HU, Northwestern HU, Oxford County HU, Porcupine HU, Renfrew County and District HU, Eastern Ontario HU
	New Brunswick	Region 4 or 5, Region 6 or 7

[a] The CCHS health regions are divided into the four community variables based on the estimated population residing in each region (Statistics Canada, 2007). The City of Toronto HU is by far the most populous health region; thus, it alone is designated as a metropolis. Next, health regions with estimated populations of more than 300 000 persons are classified as urban communities; health regions with estimated populations between 75 000 and 300 000 persons are designated as rural/urban communities; and health regions with estimated populations of less than 75 000 persons are defined as rural communities.

[b] In order to define the community variables consistently across the years 2003, 2005 and 2007, the following groupings of CCHS health regions are required: (1) for 2003, the Muskoka-Parry Sound and Simcoe County District HUs (Ontario) are grouped together as the Simcoe Muskoka District HU; and (2) for 2007, Peace Country Health and the Northern Lights Health Region (Alberta) are grouped together as the Peace Country and Northern Lights Health Region.

Appendix B:

Odds ratios for factors related to one or more visits for mental health (reference categories shaded; *z* scores in parentheses)

General practitioner services (2003, 2005 & 2007)

Variable	Females		Males	
	Total annual household income variable		**Total annual household income variable**	
	Excluded from analysis	*Included in analysis*	*Excluded from analysis*	*Included in analysis*
Education				
High school not completed	1.00	1.00	1.00	1.00
High school completed	1.15	1.13	1.28	1.26
	(1.83)	(1.60)	(1.92)	(1.83)
Some post-secondary	1.47***	1.44***	1.88***	1.84***
	(4.18)	(3.93)	(4.39)	(4.27)
Post-secondary completed	1.41***	1.36***	1.92***	1.86***
	(4.92)	(4.38)	(6.23)	(5.87)

Variable	Females		Males	
	Education variable		**Education variable**	
	Excluded from analysis	*Included in analysis*	*Excluded from analysis*	*Included in analysis*
Total annual household income				
Lowest income quintile	1.00	1.00	1.00	1.00
Lower middle income quintile	1.04	1.02	1.07	1.04
	(0.46)	(0.20)	(0.44)	(0.22)
Middle income quintile	1.26**	1.22*	1.13	1.07
	(2.49)	(2.10)	(0.79)	(0.43)
Upper middle income quintile	1.24*	1.19	1.37	1.25
	(2.24)	(1.74)	(1.90)	(1.34)
Highest income quintile	1.32**	1.23*	1.48*	1.30
	(2.78)	(2.10)	(2.41)	(1.63)
N	95 242		79 184	

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Appendix B (continued):
Odds ratios for factors related to one or more visits for mental health (reference categories shaded; *z* scores in parentheses)

Psychiatrist services (2003, 2005 & 2007)

Variable	Females		Males	
	Total annual household income variable		**Total annual household income variable**	
	Excluded from analysis	*Included in analysis*	*Excluded from analysis*	*Included in analysis*
Education				
High school not completed	1.00	1.00	1.00	1.00
High school completed	1.65***	1.67***	1.34	1.35
	(3.57)	(3.65)	(1.62)	(1.65)
Some post-secondary	2.04***	2.06***	2.56***	2.59***
	(4.58)	(4.59)	(4.59)	(4.61)
Post-secondary completed	2.09***	2.15***	2.08***	2.08***
	(6.03)	(6.10)	(4.71)	(4.70)

Variable	Females		Males	
	Education variable		**Education variable**	
	Excluded from analysis	*Included in analysis*	*Excluded from analysis*	*Included in analysis*
Total annual household income				
Lowest income quintile	1.00	1.00	1.00	1.00
Lower middle income quintile	0.77	0.73*	0.70*	0.67*
	(-1.80)	(-2.18)	(-2.00)	(-2.29)
Middle income quintile	0.81	0.73*	0.67*	0.63**
	(-1.33)	(-1.96)	(-2.20)	(-2.61)
Upper middle income quintile	0.91	0.81	0.75	0.67*
	(-0.54)	(-1.24)	(-1.52)	(-2.05)
Highest income quintile	0.84	0.73	1.00	0.88
	(-0.94)	(-1.77)	(0.02)	(-0.61)
N	95 242		79 184	

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$

Appendix B (continued):

Odds ratios for factors related to one or more visits for mental health (reference categories shaded; *z* scores in parentheses)

Psychologist services (2003, 2005 & 2007)

Variable	Females		Males	
	Total annual household income variable		**Total annual household income variable**	
	Excluded from analysis	*Included in analysis*	*Excluded from analysis*	*Included in analysis*
Education				
High school not completed	1.00	1.00	1.00	1.00
High school completed	1.24 (1.33)	1.20 (1.13)	1.27 (1.16)	1.26 (1.12)
Some post-secondary	2.27*** (4.63)	2.20*** (4.44)	1.62* (2.19)	1.60* (2.11)
Post-secondary completed	2.40*** (5.73)	2.22*** (5.14)	1.98*** (3.64)	1.94*** (3.49)

Variable	Females		Males	
	Education variable		**Education variable**	
	Excluded from analysis	*Included in analysis*	*Excluded from analysis*	*Included in analysis*
Total annual household income				
Lowest income quintile	1.00	1.00	1.00	1.00
Lower middle income quintile	1.57** (2.65)	1.48* (2.29)	0.86 (-0.62)	0.83 (-0.75)
Middle income quintile	1.82*** (3.18)	1.67** (2.77)	0.94 (-0.25)	0.90 (-0.46)
Upper middle income quintile	2.08*** (3.99)	1.86*** (3.37)	1.02 (0.06)	0.93 (-0.27)
Highest income quintile	2.61*** (5.22)	2.25*** (4.44)	1.11 (0.41)	0.99 (-0.05)
N	95 242		79 184	

* $p \leq 0.05$ ** $p \leq 0.01$ *** $p \leq 0.001$