ASSESSING THE IMPACT OF MENTAL ILLNESS ON EMPLOYMENT, HOURS WORKED, AND EARNINGS IN CANADA

by

Ryan MacLeod

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Table of Contents

I Introduction

According to data from the National Comorbidity Study from the early 1990s, diagnosable psychiatric disorders affect about 30% of the non-institutionalized U.S. population in any given year and will affect almost 50% of that population over the span of their lifetime (Kessler, et al. 1994). Aside from the obvious suffering these individuals must endure, these statistics are concerning due to the considerable impact mental illness can have on labour market outcomes. Impaired concentration, reduced cognitive ability and absenteeism resulting from mental illness can reduce labour force participation, lead to involuntary unemployment, reduce an individual's ability to seek or maintain a job, and negatively impact on their productivity and subsequent wage offers (Ettner, Frank and Kessler 1997). Quantitative estimates of these impacts are necessary if we wish to have informed public policy to address these issues.

The goal of this paper is to do just that. More specifically, this paper seeks to estimate the impacts of mental illness on the probability of employment and on individual earnings and hours worked, conditional on being employed. This paper uses cross-sectional data from 2006/2007 from the National Public Health Survey (NPHS) and sample selection regression models to estimate this. The NPHS is a representative survey administered bi-annually by Statistics Canada, which collects information on health issues, including mental health issues, facing Canadians, as well as a large number of exogenous demographic variables which determine mental health and labour market outcomes (Statistics Canada 2010). The analysis in this paper will address two major concerns in estimating the impact mental illness has on labour market outcomes. It is first necessary to note that the impact mental health has on earnings and hours worked is likely composed of two distinct effects, both of which we are interested in estimating. First, mental health can make a person less likely to be employed and thus to make any earnings

or to work any hours at all. Second, for an individual that is employed despite their mental health, mental health can then impact on their wages, salary, or the number of hours they choose to work. This is known as a problem of selection bias. Respondents will self-select into or out of the sample (in this case, working individuals) and this selection process is itself impacted on by mental illness, creating bias in the estimated impact of mental illness on earnings or hours worked. To address this issue, this analysis makes use of sample selection models for estimating the impact of mental health on both income and hours worked. The second major concern, another source of bias in the estimates, is endogeneity bias. Endogeneity bias occurs when the dependent variable (in this case, a labour market outcome) and one of the regressors of interest (in this case mental illness) are thought to impact on each other, rather than one strictly impacting on the other without any feedback. It has been demonstrated in previous literature that mental illness has a negative effect on labour market outcomes. This is the effect we are interested in estimating. However, in addition to this, it is likely that labour market outcomes such as unemployment and financial stress can have an impact on mental health as well. In order to estimate the impact of mental illness on labour market outcomes, unbiased by the feedback labour market outcomes have on mental illness, this analysis will also make use of instrumental variable analysis. These two sources of bias are distinct and require both sample selection and instrumental variable estimation techniques to be properly controlled for.

Two different models are used to estimate the impact of mental illness on employment, income, and hours worked. The first is a standard Heckman model in which the employment equation serves as the selection equation and the results from that estimation are used to estimate the income and hours worked equations. The second model extends the Heckman framework to include instrumental variables, using an IV Probit model to estimate the employment equation

and using the results of that equation to estimate the income and hours worked equations by Two Stage Least Squares. These models will be discussed in further detail in Section IV.

Recent studies in the United States such as Ettner et. al. (1997) and Kessler et. al. (2008), among others, have estimated these relationships in an American context using the National Comorbidity Survey Replication. In both cases, mental illness has been found to have statistically and economically significant negative impacts on employment and earnings. However, there have been only limited attempts to estimate this relationship in a Canadian context. Stephens and Joubert (2001) use the 1996/1997 cross-sectional component of the NPHS to estimate the total societal cost of mental illness in Canada, including both direct costs, such as expenditures on medical consultations and treatment, and indirect costs, such as wages lost due to absenteeism in the work place. This analysis of lost wages, however, is based on the number of reported short-term sick days and long-term disability days and a battery of assumptions on the associated costs. While this analysis provides an estimate of the wages lost due to work hours lost, it does not estimate the total impact mental health can have on earnings and employment through channels such as reduced productivity, nor does it take potential endogeneity bias into account.

This paper will add to the literature in two meaningful ways. First, it will follow the regression analysis approach used in the American literature and apply it to Canadian data. This will allow for the first comprehensive estimates (to my knowledge) of the impact of mental illness on employment and earnings in Canada, while controlling for potential endogeneity bias. Second, it will take advantage of the newest available cycle of the NPHS, providing updated estimates of the labour market costs of mental illness.

The paper is structured as follows. Section II will provide a brief summary of how the literature on the subject has evolved to this point, while providing a more detailed summary of more recent works. Section III will discuss the data to be used, including the dependent, control and instrumental variables, and provide summary statistics. Section IV will detail the methodology to be used in estimating the relationship between mental illness and labour market outcomes and Section V will discuss the results of that estimation. Finally, Section VI will provide concluding remarks.

II Literature Review

The traditional approach followed in the literature investigating the impact of mental illness on labour market outcomes in the U.S. has been a human capital approach (Marcotte and Wilcox-Gok 2001). This approach is based on the idea that each individual worker has a stock of productive ability which is a function of various investments such as education, training and health. Illness, in this case mental illness, reduces a worker's productive ability, perhaps resulting in the worker being unable to work at all or just a reduction in the worker's productivity, which is reflected in earnings losses. Approaching the problem in this way has the advantage that the estimated impact on labour market outcomes is at once a measurement of both the loss of income to the individual worker and the lost productivity to society. However, there are chiefly two major problems to overcome in following this approach. The first is finding reliable data that is representative of the population at large. The second is figuring out how to appropriately control for exogenous factors which determine both mental health and labour market outcomes and to control for the potential that mental health and labour market outcomes

are determined simultaneously, leading to endogeneity bias in the estimates (Marcotte and Wilcox-Gok 2001).

Among the first studies to approach this problem are Bartel and Taubman (1979) and Benham and Benham (1981). Bartel and Taubman (1979) made use of data on white male veteran twins to assess the impact of various health issues on income. They found that mental illness was associated with around a 20% income penalty. Benham and Benham (1981) studied patients in a child guidance clinic in St. Louis, MO in the 1920s and compared them with some control subjects from the community. The result of their study was that mental illness was associated with roughly a 30% income penalty. While both of these studies were important in that they provided initial estimates of the labour market impacts of mental illness, they did not address either of the major problems discussed above. Neither samples are representative of the population at large and while the use of twins in Bartel and Taubman (1979) may address some endogeneity issues, Benham and Benham (1981) fails to address this problem.

The barrier to finding appropriate data sets was that objective information on mental health issues were only available through professional diagnoses, limiting the useful data to the sort of niche data sets used in early studies. To address this issue of collecting reliable, representative data on mental illness and its social effects, the U.S. National Institute of Mental Health (NIMH) began developing diagnostic interview surveys (DIS) which would allow trained interviewers to collect data in a community-based, representative sample at relatively low cost, which could be used to produce reliable diagnoses of mental illnesses in the studied population (Marcotte and Wilcox-Gok 2001). The first study to make use of the DIS was the epidemiological catchment area survey (ECA), which collected data on over 20,000 respondents in five geographic regions of the U.S. in the early 1980s.

Taking advantage of this new data set, Frank and Gertlet (1991) estimated the impact of mental illness on earnings to be a 21% reduction. Miller and Kelman (1992) considered a more detailed model, estimating the negative impact of schizophrenia on earnings to be between 10% and 35% and of anxiety and anti-social personality disorders to be between 3% and 10%. However, they found the impact of affective disorders such as depression and bi-polar disorder to be positive on earnings. This, as Marcotte and Wilcox-Gok (2001) point out, is likely due to the short-comings of the ECA. While the ECA was important as it provided a representative study and a fairly detailed analysis of the respondents' mental health, it did provided little information on exogenous control variables that determine mental health and labour market outcomes such as education and parent's mental health. As such, studies based on the ECA were able to address the first of the two major problems outlined earlier, but were not able to control for additional exogenous regressors that might be correlated with the variables of interest or endogeneity, likely leading to the unexpected results in Miller and Kelman (1992).

To address these short-comings of the ECA, the NIMH commissioned the National Comorbidity Study (NCS). The NCS was a survey of over 8,000 respondents designed to be representative of all citizens, aged 15-54, in 48 U.S. states (excluding Alaska and Hawaii), which used a modified DIS, similar to that used in the ECA (Marcotte and Wilcox-Gok 2001). The NCS included data on family history of mental illness and the respondent's social support structure, which Ettner, Frank and Kessler (1997) argues are suitable for use as instrumental variables to control for endogeneity bias of the estimated impact of mental illness on labour market outcomes. In this case, Ettner, Frank and Kessler estimated the impact of mental health on the probability of being employed, on the number of hours a person worked conditional on working one or more hours, and on personal income, conditional on having personal income

greater than zero. They found that the probability of a woman being employed fell by over 11% as a result of mental illness and that their conditional wages fell between 20 % and 50%. These effects were larger for men and men were also found to work fewer hours as a result of mental illness. Further, these estimates were larger in magnitude when instrumental variable analysis was used to control for endogeneity, suggesting that endogeneity bias was an issue and that this was the appropriate way to correct for it.

Marcotte, Wilcox-Gok, and Redmon (2000) also made use of the NCS data to estimate a more detailed model, estimating the impact of different types of mental illness and investigating whether the impact of an incident of mental illness decreases as time progresses. They found mental illness to have a large negative effect on employment and earnings but that the passing of time allowed an afflicted person to recoup some of those lost earnings.

In the early 2000s, the NIMH commissioned another round of the NCS, called the National Comorbidity Survey Replication (NCSR), which was representative of all citizens of 48 U.S. states, aged 15-64 (as opposed to 15-54 in the NCS), and which provided data on personal earnings specifically, rather than the broader category of personal income, which included non-wage income. Kessler et al. (2008) made use of this data set to update previous estimates of mental health's labour market impacts. Their findings were that mental illness lead to a significant decreased in average earnings of $22,545, decreasing from $38,851 to $16,306, with a societal loss of $193.2 billion. More specifically, they found mental illness lead to a decrease of $26,435 for men and $9,302 for women. Of this, roughly 75.4% was due to reduced earnings and 24.6% was due to reduced probability of having any earnings at all. It should be noted however that this study did not make any mention of controlling for potential endogeneity bias.

To my knowledge, there have only been two studies which sought to estimate the cost of mental illness in Canada. The first is Moore et al. (1997), a study of the economic impact of various illnesses, physical and mental, commissioned by Health Canada. The estimated reduction in productivity (what the authors refer to as the "indirect" cost) due to mental illness, which included the costs of short-term sick days ($866 million), long-term disability ($1,707 million) and premature death ($400 million) was approximately $3 billion. Stephens and Joubert (2001) noted, however, that the data used in this study only included medically treated and diagnosed mental disorders. As they point out, according to the 1996/1997 round of the National Public Health Survey (NPHS), only 21% and 29% of Canadian who in the previous year consulted psychologists and social workers, respectively, also consulted their family doctor or a psychiatrist, suggesting the numbers in the data used in Moore et al. (1997) significantly under counted the number of affected individuals. To correct for this, Stephens and Jourbert (2001) employ the 1996/1997 NPHS, which makes use of a diagnostic interview survey design to more accurately reflect the prevalence of mental illness in the Canadian population. The results of their study placed the value of reduced productivity due to mental illness in Canada closer to $6 billion in 1998 Canadian dollars. It should be noted, however, that neither of these studies make use of a regression analysis approach, as the American literature has, but rather simply estimate the cost of sick days, long-term disability, and lost income due to premature death by counting the occurrences of each and applying a battery of assumptions about the number of lost work hours and the average wages for each hour lost. However, absenteeism is only one channel through which mental illness can impact on an individual's earnings, and as such, these studies do not estimate the full impact. A regression analysis would be able to capture the effects of absenteeism as well as other effects such as reduced productivity on the job.

III Data

The data to be used in this study is a cross-section taken from Cycle 7 of the National Public Health Survey (NPHS), as administered by Statistics Canada.[1] The NPHS is a longitudinal study of 17,276 Canadians, living in one of the ten provinces, intended to collect data on the state of physical and mental public health in Canada and its socio-demographic determinants. Cycle 7, the latest available cycle, was conducted between May 2006 and April 2007 and had a response rate of 77.0% of the original sample. From this larger data set, a sample was taken of respondents, age 18-65, for which all required information was reported, producing a sample of 2,636 men and 2,781 women (Statistics Canada 2010).

The particular variables of interest taken from the survey were income, employment status, hours worked per week, and dummy variables indicating depression and mental distress. Figure 1 shows the estimated kernel density for the sample income distribution[2]. Unsurprisingly, the distribution is quite skewed to the right and as such, the natural logarithm of income will be used in all regression analysis, which appeared more normally distributed. Ideally, wage and/or salary earnings would be the preferred independent variable, however this was not asked in the survey. Total income may include some additional, irrelevant information but should function as an appropriate proxy for earnings. A dummy variable for employment was generated, equal to one if the respondent reported being currently employed. By this definition, the employment rate in the weighted survey is 81.51%. It is likely that mental illness can impact on employment in

[1] Ideally, an analysis of this subject would take advantage of the panel nature of the NPHS survey data. However, to my knowledge, the model used in this paper has not been extended to a panel context and so a simple cross-sectional analysis was employed instead.

[2] This and all other reported summary statistics in this section are calculated using survey weights provided in the data set to ensure the calculated statistics are representative of the Canadian population at large.

two ways: either by limiting a labour force participant's ability to receive or maintain a job or by making an individual less likely to decide to participate in the labour force in the first place. Hours worked are reported in the survey as the number of hours worked in a "usual" week, as estimated by the respondent.

The NPHS provides two appropriate measures of mental illness. The first is a derived variable based on a series of relevant questions which assigns a probability that a respondent would have been diagnosed with depression since the last cycle by an appropriate professional. Following Stephens and Joubert (2001) and the Statistics Canada definition, a probability of 90% or greater was taken to indicate depression in the respondent and a dummy variable was generated with this in mind. As noted by Stephens and Joubert (2001), there is no independently verified definition of "distress" as it is measured in the NPHS. Following their lead, a dummy variable was constructed indicating distress if the respondent answered the question of how often they felt the relevant distress since the last cycle with an answer of "A lot more often than usual" or "Somewhat more often than usual." By these definitions, the prevalence rate of depression and distress in the weighted sample was 4.53% and 7.73%, respectively.

Figures 2 and 3 show the estimated kernel densities of income for the depressed population and the distressed population, respectively. It can be readily seen that the estimated distribution of income among depressed respondents has a lot more weight toward the low end of the distribution and seems less dramatically skewed than the income distribution for the full sample. This indicates a noticeable negative relationship between depression and income, as expected. The estimated income distribution for distressed respondents appears to differ from the sample income distribution less significantly. It does appear, however, to have a lower modal value than that of the sample population. For depressed and distressed individuals, the weighted

employment rate is 69.50% and 76.90%, respectively, notably lower than the sample employment rate of 81.51%.

Among the control variables used in the income model are gender, age, marital status, education, race, the region in which the respondent was living, the number of alcoholic drinks the respondent reported consuming in an average week and whether or not the respondent lived in an urban or rural area. Additionally, in the employment model, the number of children under age 5 the respondent was responsible for and the reported combined income of all other household members are also controlled for. Gender is coded into a dummy variable called 'female', equal to one if the respondent was female. Age, ranging from 18 to 65, is coded simply as the reported age of the respondent, and a quadratic term is also included. Two dummy variables represent marital status: one called 'married', equal to one if the respondent is married or in a common-law relationship, and one called 'separated', equal to one if the respondent is divorced, separated or widowed. These are compared against the base case of respondents reported to be single. Education is coded into six dummy variables: 'high school', 'some post-secondary', 'trade', 'college/cegep', 'undergraduate' and 'higher university', each equal to one if that is the highest level of education the respondent reported completing. These are compared against the base case of respondents who have not reported having completed high school. Race is controlled for with a dummy variable called 'minority' indicating if the respondent is a visible minority and a similar dummy variable called 'urban' is equal to one if the respondent lived in an urban area. Dummies were generated indicating if the respondent lived in British Columbia, the Prairies, Quebec or the Atlantic provinces, which are compared to the base case of respondents living in Ontario. The average number of drinks per week is included following previous literature which suggests controlling for drug and/or alcohol dependency due to its correlation

with mental illness and income. While the survey does not provide a suitable variable for diagnosis of these illnesses, the number of alcoholic drinks the respondent reported drinking in an average week substitutes as a proxy for this. This is coded into a variable called ‘drinks per week’ which is equal to the reported average number of drinks the respondent had in a week. A quadratic term for number of drinks is also included. Finally, ‘outside income’ is constructed by subtracting the reported total income of the respondent from the respondent’s total household income. Any respondents which had not reported one of these relevant variables are excluded from the sample.

Figures 4, 5, and 6 show the estimated kernel densities for age for the sample population, depressed respondents and distressed respondents. As can be seen, the age distribution for depressed and distressed individuals has more weight below the age of 40 than that of the full sample, suggesting depression and distress was more prevalent among younger age groups than older. Table 1 shows mean values of the various control variables for the sample population and depressed and distressed respondents. Notably, depressed and distressed respondents were considerably more likely to be female and much more likely to belong to a visible minority group than the average respondent. Depressed respondents were more likely to be from the Prairies or Ontario and less likely to be from British Columbia or Quebec than the average respondent while distressed individuals were more likely to be from British Columbia and less likely to be from Quebec. As expected, the mean number of alcoholic drinks respondents consumed in an average week was higher for depressed and distressed respondents than for the sample population in general. In addition to appearing in Table 1, highest educational attainment is also shown in Figures 7, 8, and 9 for the sample population, depressed respondents and distressed respondents. Perhaps unexpectedly, depressed and distressed respondents were more

likely to have completed high school. Depressed respondents were more likely to have attained a postgraduate or professional degree and less likely to have done a college or CEGEP program. Distressed respondents were less likely to have attained an undergraduate degree but somewhat more likely to have completed a college or CEGEP program or to have partially completed some post-secondary education.

As expected, outside income appears to be negatively correlated with the probability of employment. The mean of total income from all other household members for employed respondents was calculated to be $38,449.31, compared to $39,399.27 for unemployed respondents. The number of dependent children under age 5 is found to be positively correlated with the probability of employment, with employed and unemployed respondents having 0.17 and 0.08 children under 5 on average, respectively.

As mentioned earlier, previous literature on the impact of mental illness on labour market outcomes has expressed concern over the likely endogeneity of mental illness in determining those outcomes. To control for this issue, it is necessary to make use of instrumental variable analysis. Ideal instruments will satisfy two criteria. First, it is necessary that the chosen instruments be significantly correlated with the endogenous regressors. Second, the instruments must not be correlated with the dependent variable except to the extent that it is correlated with the endogenous regressors. Ettner, Frank and Kessler (1997) argue for the validity of, and make use of, two instruments, one of which was a dummy variable indicating a family history of mental illness. Cycle 6 of the NPHS provides four similar variables, each indicating whether the respondent's mother, father, brother or sister have ever been diagnosed with depression. These four dummy variables should be correlated with a respondent's likelihood of experiencing mental illness and the impact of family history of mental illness on the respondent's labour

market outcomes is assumed to be negligible. A fifth instrument is a dummy variable indicating whether there has been a severe illness in the respondent's family since the previous cycle. Azoulay et al. (2005) shows a positive relationship between severe family illness and mental illness, suggesting this variable should have the desired correlation. Further, it seems reasonable to assume independence of the respondent's labour market outcomes and the incidence of severe illness in the respondent's family.

Empirical evidence shows that these instruments are appropriate. A Sargan test is conducted on the over-identifying restrictions provided by the proposed instruments. Under the null hypothesis of the test, the proposed instruments are not statistically significantly correlated with the dependent variable (Sargan 1958). Running the Sargan test on the proposed instruments in the income model yielded a test statistic of Chi2(1) = 0.570 with a corresponding p-value of 0.9033 for men and Chi2(1) = 0.280 with a corresponding p-value of 0.9637 for women, clearly failing to reject the null hypothesis of exogeneity of the instruments. First-stage regressions on the endogenous regressors, depressed and distressed, yielded F-statistics greater than 10 in both cases, suggesting that the instruments are satisfactorily correlated with the endogenous regressors.

IV Methodology

Two models are estimated in this paper, both with the following form:

$$\text{employed}_i = \beta_{1,0} + \beta_{1,1}\text{depressed}_i + \beta_{1,2}\text{distressed}_i + \mathbf{X}_{\text{emp},\,i}\boldsymbol{\beta}_{\text{Xemp},\,i} + u_i$$

$$\ln(\text{income})_i = \beta_{2,0} + \beta_{2,1}\text{depressed}_i + \beta_{2,2}\text{distressed}_i + \mathbf{X}_{\text{inc},\,i}\boldsymbol{\beta}_{\text{Xinc},\,i} + \beta_{2,\lambda}\lambda_i + v_i$$

$$hours_i = \beta_{3,0} + \beta_{3,1} depressed_i + \beta_{3,2} distressed_i + \mathbf{X}_{hours,\,i}\boldsymbol{\beta}_{Xhours,\,i} + \beta_{3,\lambda}\lambda_i + v_i$$

Where $\mathbf{X}_{emp,\,i}$ is a vector of the various control variables in the employment equation, $\mathbf{X}_{inc,\,i}$ and $\mathbf{X}_{hours,\,i}$ are equivalent vectors of the controls in the income and hours worked equations (both are a subset of $\mathbf{X}_{emp,\,i}$, where $\mathbf{X}_{emp,\,i}$ contains the additional regressors: ln(outside income) and the number of dependent children under age 5), $\boldsymbol{\beta}_{Xemp,\,i}$, $\boldsymbol{\beta}_{Xinc,\,i}$, and $\boldsymbol{\beta}_{Xhours,\,i}$ are the respective vectors of coefficients and λ_i is a proxy for the estimated probability of being employed. λ_i is defined by

$$\lambda_i = \phi\left(\mathbf{X}_{emp}\boldsymbol{\beta}_{Xemp}\right) / \Phi\left(\mathbf{X}_{emp}\boldsymbol{\beta}_{Xemp}\right)$$

where $\mathbf{X}_{emp}\boldsymbol{\beta}_{Xemp}$ are vectors of all explanatory variables and their coefficients in the employment equation, $\phi(.)$ is the standard normal pdf and $\Phi(.)$ is the standard normal cdf. Note that this calculation rests on the assumption that u_i is distributed standard normal. This model is to be estimated separately for men and for women, to allow for the impact of mental health on labour market outcomes to differ across genders.

In the income and hours worked equations, the control variables included are: age and its square, dummies indicating the region in which the respondent lives, dummies indicating if the respondent is married or separated as opposed to single, dummies indicating the respondent's highest reported educational attainment, and the number of alcoholic drinks the respondent reportedly consumed in an average week, as well as its square. The square of this final term is included in keeping with the findings of literature on the subject of alcohol's impact on income. Typically, moderate amounts of alcohol consumption are found to yield income premiums while heavy alcohol consumption is thought (though not always found) to yield an income penalty

(Hamilton and Hamilton 1997). The quadratic functional form chosen here allows for this relationship to be captured in the estimates. As previously mentioned, the employment equation includes all of the above listed controls as well as the above stated additional controls.

The first model is estimated by the Heckman two-step procedure. The first step involves estimating the employment equation by Probit estimation and using the predicted probabilities of employment from this regression to calculate the λ_i's. The second step then involves estimating the income and hours worked equations by ordinary least squares (OLS), using the calculated λ_i's as additional regressors which proxy for the probability of being employed. While this first model does not control for the likely existence of endogeneity bias, it is a useful exercise to compare the results of this model with the results of the IV analysis.

The second model is estimated using a procedure analogous to the Heckman two-step procedure, with the inclusion of instrumental variable analysis. The selection equation, namely the employment equation, is estimated by IV Probit estimation using the two-step Newey minimum chi-squared estimator (Newey 1987) and the λ_i's are then calculated in the same way as above. The income and hours worked equations are then estimated by two-stage least squares (2SLS), once again using the calculated λ_i's to control for the estimated probability of employment.

V Results

The results from the Heckman model without instrumental variables are shown for men and women in Tables 2 and 3, respectively. The first column in each table gives the coefficients

and corresponding absolute z-statistics for the estimated coefficients from the income equation. Of the mental illness related regressors, only depression is found to have a statistically significant impact on income for men, with an estimated coefficient of -0.251, corresponding to a roughly 22.20% decrease in income, which is consistent with previous literature on the subject. For women, however, neither of the mental illness related regressors are found to have a statistically significant impact on income, though depression is predicted to lead to a roughly 12.7% decrease in income; half that of the effect in men, which is roughly consistent with the literature. Distress is estimated to have a positive but not statistically or economically significant impact on income for both genders. This is contrary to expectations given the results in previous literature. Estimated coefficients on the control variables generally behave as expected. Age is found to have a positive impact and peaks at around 44 years of age for both genders. The number of alcoholic drinks a respondent reported drinking in an average week is found to have a positive impact on income. Men living in the Atlantic provinces and Quebec are found to earn roughly 18% and 9.6% less than respondents living in Ontario, respectively, while men in the Prairies and British Columbia are found to earn 1.6% and 10.9% more, though only the Atlantic provinces difference was statistically significant. Women were predicted to earn significantly less in three of the four included regions when compared to those living in Ontario, earning 24.4% less in the Atlantic provinces, 10.6% less in the Prairies and 18.5% less in British Columbia. Married men are found to earn roughly 30% more than single men and married women 11.9% more than single women, while separated respondents are not found to earn significantly more or less than single respondents. Belonging to a visible minority group and living in an urban setting are not found to have any significant impact on income for either gender. Finally, all educational attainment dummies are found to have statistically significant

impacts on income relative to people with less than high school, increasing with each further level of education, as expected.

The second column of Tables 2 and 3 show the estimated coefficients and the absolute values of the corresponding z-scores in the hours worked equation for men and women, respectively. Neither depression nor distress are found to have a statistically significant impact on hours worked for men or women, suggesting that in the Canadian context, mental health does not significantly impact on the number of hours an individual will choose to work, conditional on their employment.

For both men and women, almost none of the included regressors are found to have statistically significant impacts on the number of hours worked in a week. Urban males were found to work a statistically significant 4.4 hours less than their rural counterparts while separated females were found to work a statistically significant 5.5 hours more than their single counterparts. On average, male respondents were found to work roughly 61 hours per week, roughly double the average female number of hours worked of 30.

The third column of Tables 2 and 3 show the estimated coefficients in the employment probit model for men and women, respectively, while Table 4 shows the calculated marginal effects for both cases. Marginal effects are calculated at the mean values of continuous regressors and calculated for a change from a value of zero to one for dummy variables. Depressed men are predicted to be 13.6% less likely to be employed while depressed women are predicted to be 20.3% less likely to be employed. However, this effect is only statistically significant for women. Distress is not found to have any statistically or economically significant

impact on the probability of employment for men, though it is economically significant for women, predicting a 10% decrease in the probability of employment.

Age is again found to have a positive impact on employment, peaking around age 44 for men and 36 for women. The number of drinks consumed per week is not found to have a statistically significant impact in either gender, though it is found to yield an income premium up to a peak at around 10 drinks per week. Men living in the Atlantic provinces are estimated to be 7.6% less likely to be employed, while men of the Prairies are estimated to be 9.3% more likely to be employed than men living in Ontario. Men living in Quebec and British Columbia are not found to be any more or less likely than their Ontario counter-parts to be employed. For women, region of residence has little impact on the probability of being employed. Women living in urban areas are found to be 6.7% more likely to be employed than women living in rural areas, while men's employment probability is not significantly affected by whether they living in an urban or rural area. Marital status is not found to have any significant impact on employment probability for men or women. Increasing levels of educational attainment are generally found to have statistically significant, positive and increasing impacts on employment probability. Finally, at the mean, additional dependent children under the age of five are found to decrease women's probability of employment by 12.4%, while not significantly impacting on a man's probability of employment, and a 1% increase in outside income was found to decrease a women's probability of employment by 4.8%, while similarly having no significant impact on men.

Tables 4 and 5 show the results for the estimated IV sample selection model for men and women, respectively, and Table 6 shows the estimated marginal impacts on employment for both genders. In the IV context, neither of the mental illness related regressors are found to have a statistically significant impact on income or hours worked for either gender, but the estimates are

very large in magnitude. However, depression is found to have a statistically significant, negative impact on employment probability for women, decreasing the employment probability by 36.2%. While it is consistent with previous literature that the addition of instrumental variable analysis appears to have increased the estimated impact of mental illness on labour market outcomes, the addition of instruments appears to have increased the standard errors by enough to remove the statistical significance of depression's impact on income. This may suggest that the addition of instruments has unintentionally clouded the analysis. The estimated coefficients on the control variables remain generally unchanged and so will not be discussed, for brevity's sake.

VI Conclusions

The stated intention of this paper is to estimate the impact of mental illness on labour market outcomes in Canada. Using data from the 2006/2007 cycle of the National Public Health Survey two sample selection models were estimated. The results of a simple Heckman model provided some evidence of a negative impact of mental illness on income in men and, to a lesser extent, in women. Depressed male respondents were found to earn roughly 25% less than their mentally healthy counterparts. This effect was found to be roughly half as large in magnitude for women, however, the impact was not significant for women. This negative impact of depression on income is consistent with estimates from the previous American literature on the subject. Depression was found to significantly decrease the employment probability for women by roughly 20%, and decrease the employment probability for men by roughly 13.6%, though this effect was not significant. However, distress was not found to have a significant impact on income or employment probabilities of respondents. This is contrary to expectations, as the

distress variable is meant to capture symptoms of general mental illness in respondents and so would be expected to have a negative impact on labour market outcomes. It seems possible, however, that the general nature of the distress variable is the cause of its apparent insignificance. Since distress does not correspond to any specific mental illness but rather acts as a catch-all for general symptoms of mental illness, it is possible this variable is not measuring debilitating mental illnesses, as was hoped. There is no significant evidence based on the simple Heckman models that mental illness has any impact on the number of hours a respondent chooses to work, suggesting that once a person is employed, mental illness does not affect their hours worked.

Results of the instrumental variable analysis down play the significance of mental illness in determining income. While the estimated impacts of mental illness on income are larger as a result of instrumenting, as is the case in previous literature, they are also insignificant in this context and in some cases, have taken unrealistically large values. This suggests that the chosen instruments, despite passing statistical tests of their validity, are still problematic in some way. Estimated impacts of mental illness on employment are similar in the instrumental context to how they appear in the non-instrumental context. Women are still predicted to be less likely to be employed as a result of depression, whether that be voluntary or involuntary. Men are not found to be statistically significantly less likely to be employed and distress is similarly not found to have a significant impact on the employment probabilities of either gender. In the instrumental variable analysis, hours worked are once again found to be insignificantly affected by mental health.

Ultimately, the results of this research imply that in a Canadian context, there is evidence to suggest that mental illness impacts on the labour market outcomes of men and women in

different ways. Depressed men appear no less likely to be employed than mentally healthy men, however there is some evidence to suggest their income is negatively impacted. Conversely, evidence suggests depressed women are less likely to be employed than mentally healthy women, though it is not clear whether this is due to them being less likely to seek work in the first place or them being less able to obtain or hold a job. However, mental illness does not appear to impact significantly on the income of women, conditional on their employment. Further, mental illness does not appear to impact significantly on the hours of work supplied by men or women, conditional on their employment.

Following the completion of this research, I see two obstacles to be overcome in order to better understand the impact of mental illness on labour market outcomes in Canada. First, it appears that the distress variables measured in the NPHS is insufficient as an indicator of non-depression, debilitating mental illness. If we wish to study the impacts of other mental illness on labour market outcomes in Canada, it would be necessary for future surveys to provide a more detailed assessment of mental health. Second, it appears as though the available instrumental variables from the NPHS may have had some problems relating to the increasing of variance in the estimates. Future analysis would benefit from the inclusion of information which would make for more suitable instruments, such as providing a more detailed family and personal history of mental illness, as well as a large sample size to obtain more precise estimates.

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Appendix I: Figures

Figure 1 – Sample kernel distribution for income

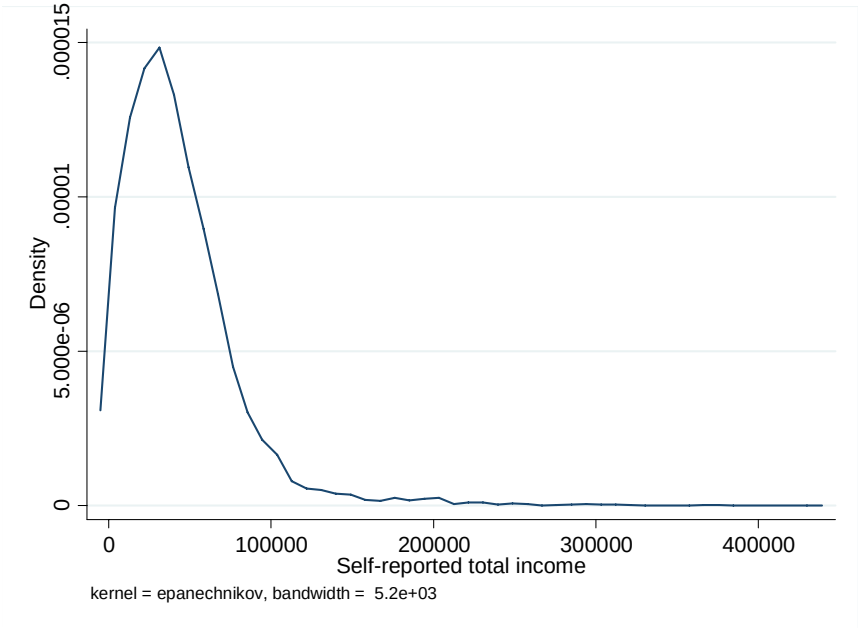


Figure 2 – Kernel distribution for income among depressed respondents

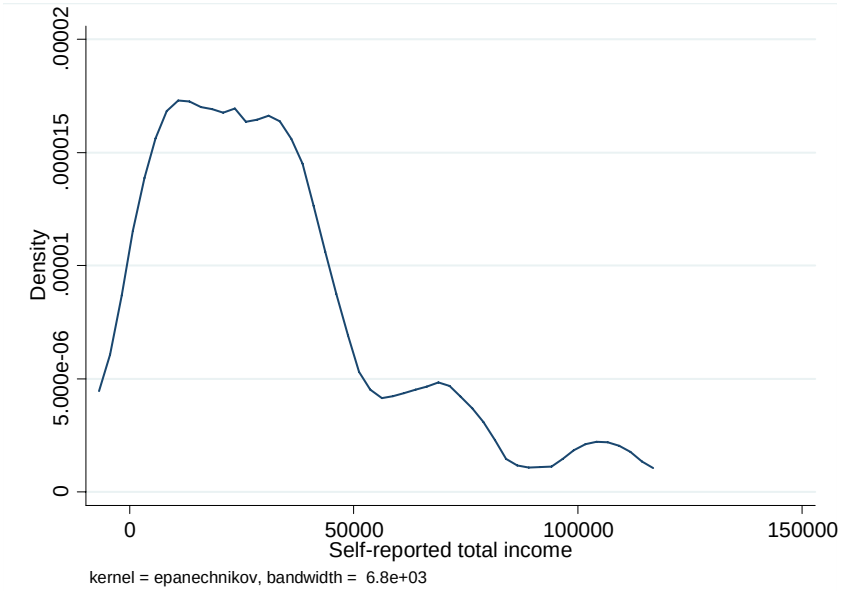


Figure 3 – Kernel distribution for income among distressed respondents

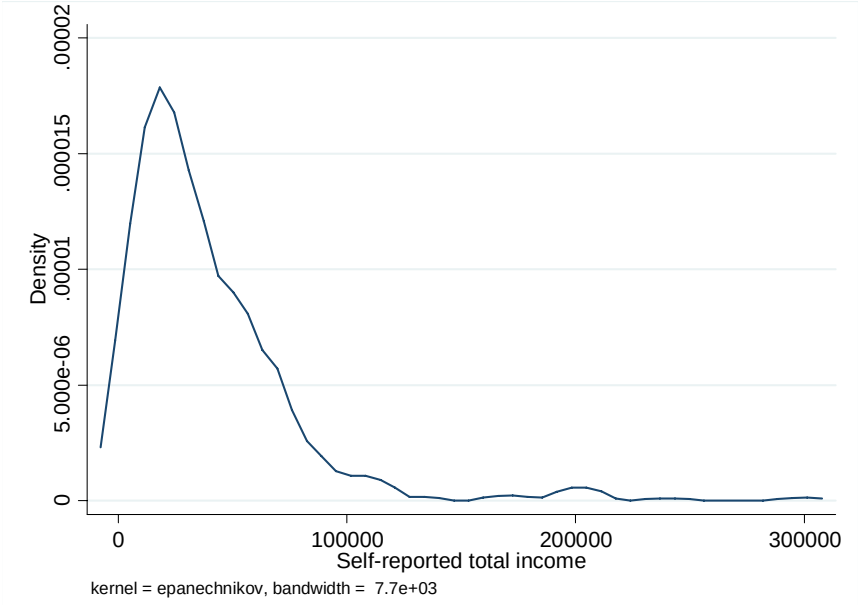


Figure 4 – Sample kernel distribution for age

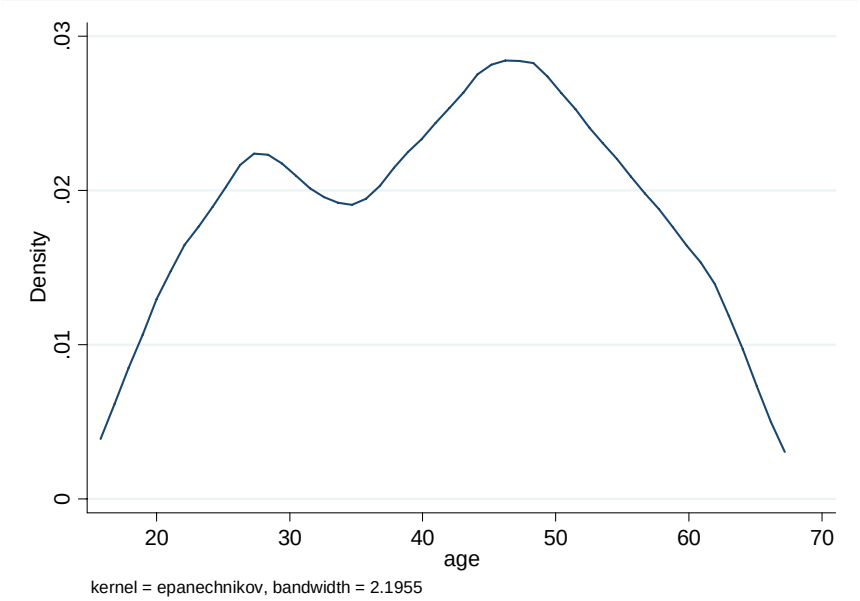


Figure 5 - Kernel distribution for age among depressed respondents

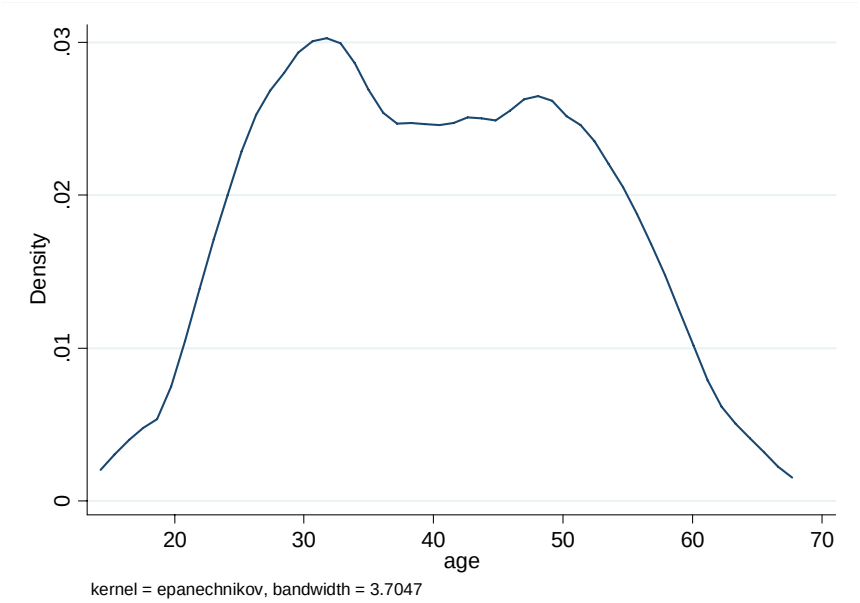


Figure 6 – Kernel distribution for age among distressed respondents

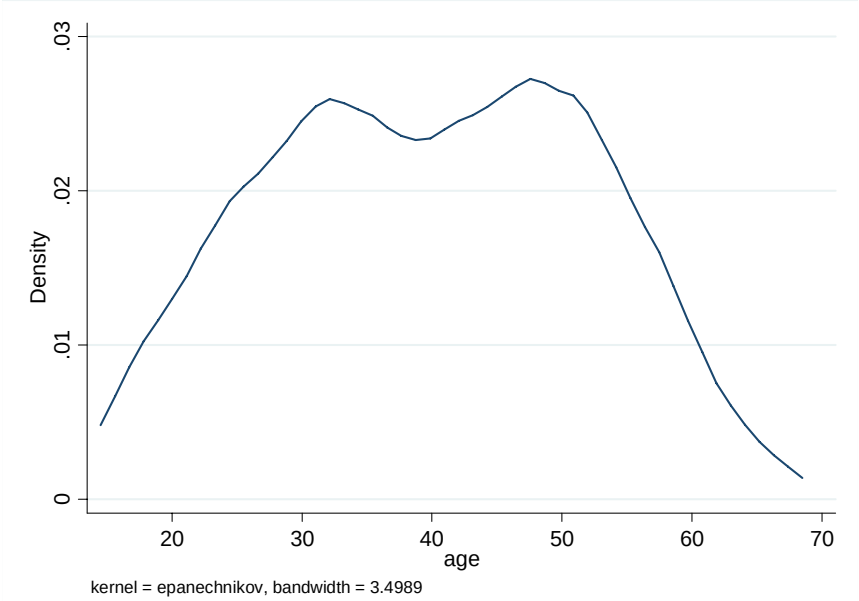


Figure 7 – Highest reported educational attainment by proportion

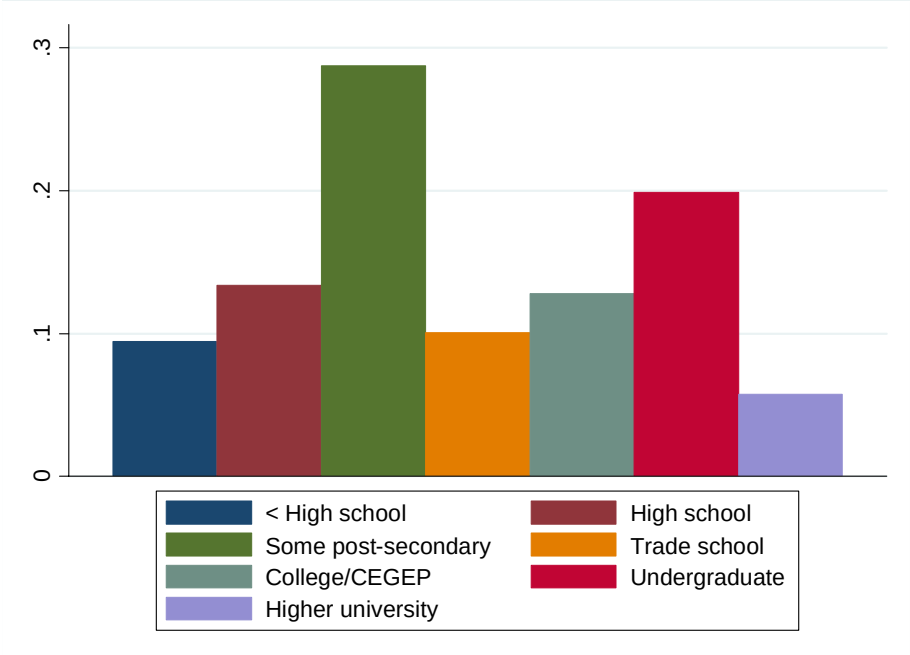


Figure 8 – Highest reported educational attainment by proportion for depressed respondents

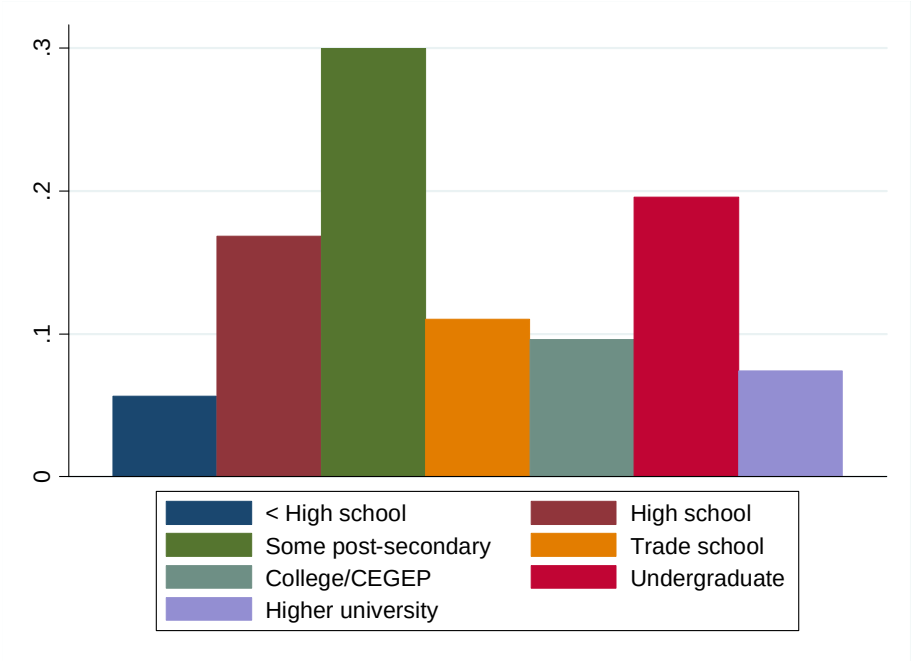
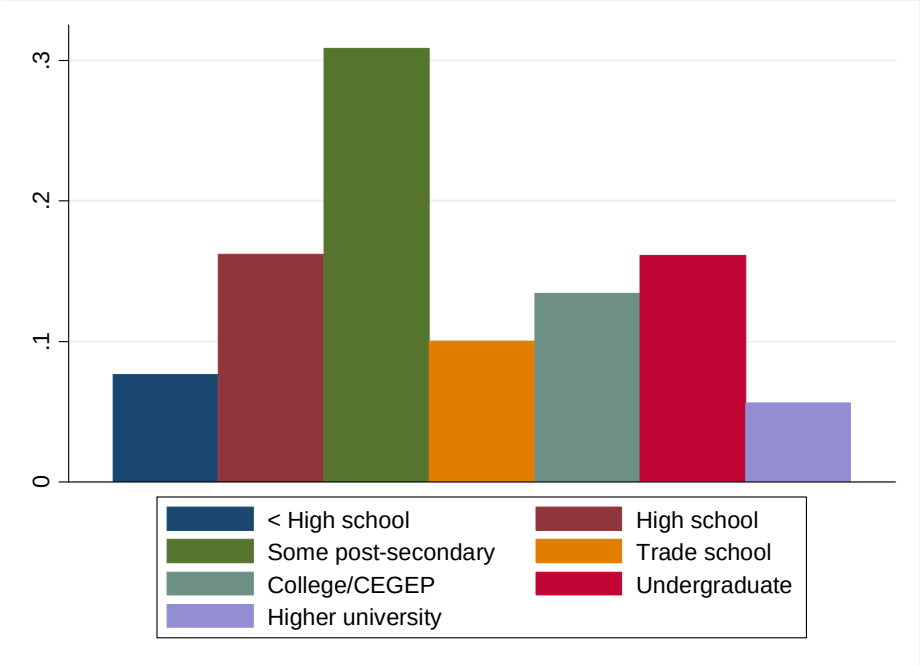


Figure 9 – Highest reported educational attainment by proportion for distressed respondents



Appendix II: Tables

Table 1 - Sample means for the full sample, depressed and distressed respondents

	Sample Population	Depressed Respondents	Distressed Respondents
Female	48.64%	63.83%	61.29%
Married	77.20%	69.86%	72.06%
Separated	4.48%	6.23%	4.57%
Less than high school	9.43%	5.64%	7.65%
High School	13.38%	16.83%	16.23%
Some Post-Secondary	28.72%	29.95%	30.87%
Trade	10.04%	11.03%	10.03%
College/CEGEP	12.81%	9.58%	13.46%
Undergraduate	19.87%	19.57%	16.12%
Higher University	5.75%	7.40%	5.64%
Urban	77.88%	78.56%	79.25%
Minority	10.04%	18.98%	9.95%
British Columbia	10.94%	8.72%	13.71%
Prairies	16.01%	19.87%	17.66%
Ontario	38.64%	45.14%	37.86%
Quebec	26.40%	18.68%	23.07%
Atlantic	8.01%	7.59%	7.70%
Drinks per week	2.79	3.16	3.02

Notes: Column 1 includes all adults age 18 to 65 in the NPHS 2006/2007. Column 2 includes all adults age 18 to 65 who were found in the survey to have a 90% probability or greater of being diagnosed with a depression disorder if they had consulted a medical professional. Column 3 includes all adults age 18 to 65 who answered the question of how often they felt relevant distress since the last cycle with an answer of "A lot more often than usual" or "Somewhat more often than usual." With the exception of "Drinks per week" all of the control variables are dummies indicating if the named condition applies to the respondent. Education dummies correspond to the highest level of education achieved by the respondent and region variables indicate the region in which the respondent lives. "Drinks per week" indicates the number of alcoholic drinks the respondent reported drinking in a "usual" week. For all control variables except "Drinks per week" the reported statistics are the proportion of the sample for which the control variable equals one. For "Drinks per week" the reported statistic is the sample mean.

Table 2 – Heckman results for income, hours worked and employment of men

	ln(Income)	Hours Worked	Employed
Depressed	-0.251	-1.461	-0.374
	*(2.20)**	*(0.46)*	*(1.84)*
Distressed	0.018	2.552	-0.047
	(0.23)	*(1.17)*	*(0.31)*
Age	0.044	-0.509	0.262
	(1.82)	*(0.80)*	*(17.93)***
Age^2	-0.000	0.007	-0.003
	(1.09)	*(0.96)*	*(20.90)***
Drinks	0.019	-0.037	-0.009
	*(4.10)***	*(0.28)*	*(0.90)*
$Drinks^2$	-0.000	0.004	0.000
	*(2.71)***	*(1.19)*	*(0.45)*
Atlantic	-0.180	2.404	-0.220
	*(3.38)***	*(1.61)*	*(2.30)**
Quebec	-0.096	-0.772	-0.115
	(1.79)	*(0.51)*	*(1.15)*
Prairies	0.016	2.912	0.290
	(0.31)	*(1.93)*	*(2.77)***
British Columbia	0.109	-0.274	0.087
	(1.61)	*(0.14)*	*(0.66)*
Urban	0.009	-4.412	0.125
	(0.21)	*(3.77)***	*(1.67)*
Married	0.295	1.820	0.155
	*(4.60)***	*(1.00)*	*(1.11)*
Separated	0.225	5.277	0.009
	(1.93)	*(1.59)*	*(0.04)*
Minority	-0.032	-1.967	0.097
	(0.51)	*(1.11)*	*(0.76)*
High school	0.141	-2.795	0.553
	(1.77)	*(1.27)*	*(4.34)***
Some post-secondary	0.285	-0.934	0.331
	*(4.35)***	*(0.52)*	*(3.41)***
Trade school	0.337	-1.020	0.203
	*(4.62)***	*(0.50)*	*(1.66)*
College/CEGEP	0.315	-3.182	0.292
	*(4.03)***	*(1.47)*	*(2.06)**
Undergraduate	0.471	-2.798	0.352
	*(6.50)***	*(1.40)*	*(2.89)***

High university	0.814	-2.346	0.790
	*(8.00)***	*(0.83)*	*(4.14)***
Children			0.065
			(0.72)
ln(outside income)			-0.022
			(0.57)
Lambda	-0.593		
	*(3.27)***		
Constant	9.093	60.911	-3.827
	*(17.58)***	*(4.49)***	*(7.53)***
Observations		2636	

Notes: In all columns the sample includes adult males age 18 to 65. In column 1 the dependent variable is the natural logarithm of income. In column 2 the dependent variable is the number of hours the respondent reported working in a "usual" week. In column 3 the dependent variables is a dummy indicating if the respondent is employed. Depression is a dummy variable indicating all respondents who were found in the survey to have a 90% probability or greater of being diagnosed with a depression disorder if they had consulted a medical professional. Distress is a dummy variable indicating all respondents who answered the question of how often they felt relevant distress since the last cycle with an answer of "A lot more often than usual" or "Somewhat more often than usual." See text for definitions of all other control variables. Results in column 3 are for a Probit model estimating the probability of employment and results in columns 1 and 2 are produced by OLS taking the calculated inverse Mills ratio as an additional control variable. Absolute values of z statistics are shown in parentheses. * significant at 5%; ** significant at 1%.

Table 3 - Heckman results for income, hours worked and of women

	ln(Income)	Hours Worked	Employed
Depressed	-0.127	2.521	-0.518
	(1.33)	*(1.44)*	*(4.27)***
Distressed	0.037	-0.263	0.100
	(0.59)	*(0.22)*	*(0.97)*
Age	0.089	0.454	0.216
	*(3.66)***	*(1.02)*	*(15.27)***
Age^2	-0.001	-0.004	-0.003
	*(2.78)***	*(0.67)*	*(17.85)***
Drinks	0.011	-0.382	0.024
	(1.09)	*(1.94)*	*(1.32)*
$Drinks^2$	-0.000	0.023	-0.001
	(0.65)	*(2.16)**	*(1.11)*
Atlantic	-0.243	-0.200	-0.119
	*(4.53)***	*(0.20)*	*(1.41)*
Quebec	-0.099	-1.164	-0.020
	(1.78)	*(1.12)*	*(0.23)*
Prairies	-0.106	-1.518	0.112
	*(2.03)**	*(1.54)*	*(1.34)*
British Columbia	-0.185	-2.546	-0.059
	*(2.62)***	*(1.92)*	*(0.52)*
Urban	0.076	-1.089	0.173
	(1.71)	*(1.30)*	*(2.66)***
Married	0.119	1.921	-0.114
	(1.64)	*(1.40)*	*(0.96)*
Separated	0.043	5.508	0.081
	(0.44)	*(2.95)***	*(0.45)*
Minority	0.095	2.065	-0.163
	(1.34)	*(1.54)*	*(1.50)*
High school	0.187	-0.296	0.497
	(1.87)	*(0.16)*	*(4.45)***
Some post-secondary	0.429	-1.169	0.539
	*(4.61)***	*(0.69)*	*(5.84)***
Trade school	0.501	-0.688	0.573
	*(4.80)***	*(0.36)*	*(4.72)***
College/CEGEP	0.582	-2.019	0.784
	*(5.36)***	*(1.02)*	*(6.85)***
Undergraduate	0.883	0.895	0.688
	*(8.80)***	*(0.49)*	*(6.57)***

High university	1.080	-0.745	1.085
	*(7.89)***	*(0.29)*	*(5.87)***
Children			-0.337
			*(5.81)***
ln(outside income)			-0.133
			*(3.37)***
Lambda	0.090		
	*(3.66)***		
Constant	-0.002	29.890	-2.027
	*(2.78)***	*(2.97)***	*(4.20)***
Observations		2781	

Notes: In all columns the sample includes adult females age 18 to 65. In column 1 the dependent variable is the natural logarithm of income. In column 2 the dependent variable is the number of hours the respondent reported working in a "usual" week. In column 3 the dependent variables is a dummy indicating if the respondent is employed. Depression is a dummy variable indicating all respondents who were found in the survey to have a 90% probability or greater of being diagnosed with a depression disorder if they had consulted a medical professional. Distress is a dummy variable indicating all respondents who answered the question of how often they felt relevant distress since the last cycle with an answer of "A lot more often than usual" or "Somewhat more often than usual." See text for definitions of all other control variables. Results in column 3 are for a Probit model estimating the probability of employment and results in columns 1 and 2 are produced by OLS taking the calculated inverse Mills ratio as an additional control variable. Absolute values of z statistics are shown in parentheses. * significant at 5%; ** significant at 1%.

Table 4 – Estimated marginal effects on employment from the probit model for men and women

	Men	Women
Depressed	-0.136	-0.203
Distressed	-0.007	0.036
Age	0.089	0.080
Age^2	-0.001	-0.001
Drinks	-0.003	0.009
$Drinks^2$	0.000	0.000
Atlantic	-0.076	-0.039
Quebec	-0.040	-0.007
Prairies	0.093	0.044
British Columbia	0.027	-0.020
Urban	0.044	0.067
Married	0.054	-0.042
Separated	0.003	0.030
Minority	0.037	-0.064
High school	0.161	0.172
Some post-secondary	0.105	0.189
Trade school	0.065	0.189
College/CEGEP	0.090	0.250
Undergraduate	0.110	0.228
High university	0.206	0.296
Children	0.021	-0.124
ln(outside income)	-0.007	-0.048

Notes: In column 1 the sample is adult males age 18 to 65. In column 2 the sample is adult females are 18 to 65. See text for definitions of dependent variables. Reported statistics are marginal effects corresponding to the employment Probit model estimates shown in Tables 3 and 4.

Table 5 - IV Selection model results for income, hours worked and employment for men

	ln(Income)	Hours Worked	Employed
Depressed	3.044	-49.147	12.919
	(1.14)	*(0.92)*	*(0.83)*
Distressed	-4.124	109.242	-14.080
	(0.86)	*(1.29)*	*(0.78)*
Age	0.148	1.371	0.246
	*(2.14)**	*(2.41)**	*(7.16)***
Age^2	-0.002	-0.015	-0.003
	(1.90)	*(2.11)**	*(9.93)***
Drinks	0.020	-0.198	0.018
	*(3.44)***	*(1.75)*	*(0.46)*
$Drinks^2$	0.000	0.007	-0.001
	*(2.40)***	*(2.33)**	*(0.60)*
Atlantic	-0.259	2.546	-0.208
	*(3.75)***	*(2.07)**	*(0.90)*
Quebec	-0.132	-0.473	-0.327
	*(2.12)**	*(0.37)*	*(0.88)*
Prairies	0.062	4.899	0.174
	(1.14)	*(4.21)***	*(0.65)*
British Columbia	0.061	0.843	0.169
	(0.78)	*(0.52)*	*(0.53)*
Urban	0.045	-4.041	0.125
	(1.05)	*(4.41)***	*(0.72)*
Married	0.467	1.826	0.361
	*(4.63)***	*(1.13)*	*(0.92)*
Separated	0.080	9.852	-0.515
	(0.19)	*(1.81)*	*(0.63)*
Minority	0.028	-0.775	0.308
	(0.40)	*(0.53)*	*(0.84)*
High school	0.503	-2.036	0.558
	*(3.64)***	*(0.7)*	*(1.91)*
Some post-secondary	0.634	-2.329	0.729
	*(3.87)***	*(0.73)*	*(1.34)*
Trade school	0.512	-0.205	0.226
	*(6.15)***	*(0.12)*	*(0.77)*
College/CEGEP	0.631	-4.015	0.922
	*(4.75)***	*(1.38)*	*(1.10)*
Undergraduate	0.728	-2.297	0.264
	*(10.44)***	*(1.36)*	*(0.89)*

High university	1.279	-2.436	1.070
	*(5.43)***	*(0.61)*	*(1.86)*
Children			0.116
			(0.60)
ln(outside income)			0.071
			(0.51)
Lambda	0.361	-8.992	
	(0.90)	*(1.26)*	
Constant	6.434	21.472	-4.160
	*(4.74)***	*(1.62)*	*(3.55)***
Observations		2641	

Notes: In all columns the sample includes adult males age 18 to 65. In column 1 the dependent variable is the natural logarithm of income. In column 2 the dependent variable is the number of hours the respondent reported working in a "usual" week. In column 3 the dependent variables is a dummy indicating if the respondent is employed. Depression is a dummy variable indicating all respondents who were found in the survey to have a 90% probability or greater of being diagnosed with a depression disorder if they had consulted a medical professional. Distress is a dummy variable indicating all respondents who answered the question of how often they felt relevant distress since the last cycle with an answer of "A lot more often than usual" or "Somewhat more often than usual." See text for definitions of all other control variables and for a list of instrumental variables used. Results in column 3 are for an IV Probit model estimating the probability of employment and results in columns 1 and 2 are produced by 2SLS taking the calculated inverse Mills ratio as an additional control variable. Absolute values of z statistics are shown in parentheses. * significant at 5%; ** significant at 1%.

Table 6 - IV Selection model results for income, hours worked and employment for women

	ln(Income)	Hours Worked	Employed
Depressed	-0.849	93.363	-3.197
	(0.13)	*(1.00)*	*(2.01)***
Distressed	0.793	-14.041	0.567
	(0.41)	*(0.78)*	*(0.44)*
Age	0.139	-3.098	0.222
	(0.31)	*(0.65)*	*(13.98)***
Age^2	-0.002	0.041	-0.003
	(0.27)	*(0.68)*	*(16.38)***
Drinks	0.019	-0.552	0.025
	(1.62)	*(2.39)**	*(1.29)*
$Drinks^2$	-0.001	0.033	-0.001
	(1.08)	*(2.33)**	*(1.23)*
Atlantic	-0.222	1.205	-0.135
	(1.39)	*(0.75)*	*(1.45)*
Quebec	-0.041	-1.983	-0.027
	(0.56)	*(1.66)*	*(0.28)*
Prairies	-0.001	-2.082	0.090
	(0.01)	*(1.16)*	*(0.97)*
British Columbia	-0.289	-1.937	-0.081
	*(2.78)***	*(1.22)*	*(0.66)*
Urban	0.135	-3.273	0.169
	(0.78)	*(1.16)*	*(2.35)**
Married	0.220	4.713	-0.127
	(0.32)	*(0.90)*	*(0.95)*
Separated	0.408	4.091	0.120
	(0.71)	*(2.12)**	*(0.62)*
Minority	0.135	4.857	-0.184
	(0.38)	*(1.3)*	*(1.56)*
High school	0.482	-11.487	0.542
	(0.62)	*(0.84)*	*(4.46)***
Some post-secondary	0.666	-12.013	0.601
	(0.78)	*(0.87)*	*(5.73)***
Trade school	0.753	-10.995	0.581
	(1.00)	*(0.84)*	*(4.41)***
College/CEGEP	0.919	-14.937	0.831
	(0.91)	*(0.89)*	*(6.63)***
Undergraduate	1.164	-10.326	0.685
	(1.43)	*(0.74)*	*(6.10)***

High university	1.559	-15.529	1.077
	(1.29)	*(0.08)*	*(5.48)***
Children			-0.361
			*(5.45)***
ln(outside income)			-0.161
			*(3.44)***
Lambda	0.306	-41.865	
	(0.12)	*(1.02)*	
Constant	5.889	114.193	-1.728
	(0.62)	*(1.03)*	*(3.12)***
Observations		2505	

Notes: In all columns the sample includes adult females age 18 to 65. In column 1 the dependent variable is the natural logarithm of income. In column 2 the dependent variable is the number of hours the respondent reported working in a "usual" week. In column 3 the dependent variables is a dummy indicating if the respondent is employed. Depression is a dummy variable indicating all respondents who were found in the survey to have a 90% probability or greater of being diagnosed with a depression disorder if they had consulted a medical professional. Distress is a dummy variable indicating all respondents who answered the question of how often they felt relevant distress since the last cycle with an answer of "A lot more often than usual" or "Somewhat more often than usual." See text for definitions of all other control variables and for a list of instrumental variables used. Results in column 3 are for an IV Probit model estimating the probability of employment and results in columns 1 and 2 are produced by 2SLS taking the calculated inverse Mills ratio as an additional control variable. Absolute values of z statistics are shown in parentheses. * significant at 5%; ** significant at 1%.

Table 7 - Estimated marginal effects on employment from the probit model for women

	Men	Women
Depressed	0.716	-0.362
Distressed	-0.284	0.223
Age	0.176	0.142
Age^2	-0.002	-0.002
Drinks	0.013	0.016
$Drinks^2$	-0.001	-0.001
Atlantic	-0.066	-0.049
Quebec	-0.099	-0.010
Prairies	0.062	0.034
British Columbia	0.060	-0.030
Urban	0.044	0.065
Married	0.133	-0.047
Separated	-0.145	0.046
Minority	0.112	-0.067
High school	0.211	0.213
Some post-secondary	0.279	0.236
Trade school	0.081	0.228
College/CEGEP	0.353	0.322
Undergraduate	0.095	0.268
High university	0.407	0.403
Children	0.083	-0.231
ln(outside income)	0.051	-0.102

Notes: In column 1 the sample is adult males age 18 to 65. In column 2 the sample is adult females are 18 to 65. See text for definitions of dependent variables. Reported statistics are marginal effects corresponding to the employment IV Probit model estimates shown in Tables 5 and 6.