Impact of health on the employment and earnings of young South Africans

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Abstract

This study measures the impact of depression and general/overall health on employment and earnings among individuals aged 15-39 years in South Africa. Though one of the richest countries in Africa, South Africa is plagued by substantial disease burden especially from tuberculosis, HIV/AIDS and injuries. Furthermore, 1 in 3 South Africans suffer from mental illness in their lifetime while 25% of workers suffer from depression. The country has very high unemployment rates, with the youth unemployment rate exceeding 50% in 2013. Data for the analysis come from the National Income Dynamics Study, a nationally representative panel survey of South African individuals and households. Using empirical models with sibling fixed effects, we find negative and statistically significant impact of poor health on employment but none for depression. General poor health and depression each has a negative impact on wages. While the general health-wage effect is more pronounced among those with little or no education as well as males, the wage effect of depression is not mediated by either education or gender.

1. INTRODUCTION

Poor health has been associated with poor economic outcomes in general and adverse labour market outcomes in particular while the converse obtains for good health. For instance, it has been noted that between 2000 and 2011 in low- and middle-income countries, mortality declines explained 11% of economic growth while about 24% of the growth in full income was accounted for by the value of additional life years (Jamison et al., 2013). There are various ways through which health can affect labour market outcomes. Firstly, better health is likely to result in increased productivity, thus increasing labour market earnings and the opportunity cost of non-participation in market activities (Cai & Kalb, 2006a). Moreover, by changing an individual's preferences between market and non-market time, ill health can affect the manner in which economic agents value time away from work thereby changing the relative utility between income and non-market time (Chirikos, 1993). For instance, poor health can result in the sick attaching more value to non-market time relative to the healthy (due to say, such time being invested in seeking health care). Additionally, poor health may indirectly affect labour market participation and earnings through reduced investment in human capital (e.g. through education) (Jack & Lewis, 2009). All these channels suggest a positive relationship between better health on the one hand, and labour market participation and earnings on the other. Conversely, low earnings due to poor health may induce an income effect, leading to a higher supply of labour/increased employment probability (this effect may be reinforced by the cost implications of ill health especially in the absence of universal health coverage); this latter effect may therefore suggest a negative relationship between better health and employment (Cai & Kalb, 2006a).

The foregoing has focused on a general relationship between health and labour market outcomes like labour supply and earnings. However, certain types of ill health have been identified in the recent past as especially important in determining key labour market outcomes. In this vein, the role of depression on employment and earnings has been increasingly noted by researchers (Ettner, Frank, & Kessler, 1997; Fletcher, 2013). As observed by Fletcher (2013), depression has recently been ranked among the most disabling illnesses in the world by the World Health Organization (WHO). Furthermore, the October 2012 WHO factsheet estimates that more than 350 million people suffer from depression globally. A number of channels have been hypothesized as mediating the relationship between psychiatric disorders in general and employment: affect factors like memory, mood or motivation; the unwillingness of employers to accommodate employees' illness; and employer taste-based discrimination (Chatterji, Alegria, & Takeuchi, 2008).

There are a number of reasons for studying the impact of health (and depression in particular) on employment and labour market earnings in South Africa. Though one of the richest countries in Africa and only one of few African countries categorized as an upper middle income country, South Africa is characterized by high disease burden. It has been described as suffering from a quadruple burden of disease due to mortality from communicable diseases, maternal and perinatal conditions and nutritional deficiencies; non-communicable diseases like diabetes and obesity; injuries; and HIV/AIDS[1] (Bradshaw et al., 2000). Moreover, the mental health disease burden in the country is also high. According to the South African Depression and Anxiety Group, the largest mental health support and advocacy group in South Africa, 1 in 3 South

[1] Though HIV/AIDS conventionally belongs to the communicable disease group, its unusually high prevalence in South Africa led to its separate classification.

Africans are affected by some form of mental illness; 1 in 4 people in the workplace have been diagnosed with depression; while 31.5% of teens have attempted suicide that required medical treatment.

Additionally, South Africa has very high (especially youth) unemployment rates. Banerjee et al. (2008) observed that though fairly low in the 1970s, the unemployment rate (by the International Labour Organization classification, ILO) just before the end of apartheid in 1994 was about 13%. This rose to about 15% and 26.7% in 1995 and 2005 respectively. Using the broad classification of unemployment, it rose from 28% in 1995 to 41% in 2005. Narrow and broad unemployment rates for prime-age adults were about 24% and 30% respectively in 2008 (Ranchhod, 2009), and have remained largely so in the current period. The apparent decline in the unemployment rate from the mid-2000s has been attributed to the rise in the number of discouraged job seekers. That said, youth unemployment rate (by the ILO classification) was 53.6% in 2013 (World Bank, 2015).

A general problem faced by studies examining the relationship between health and labour market outcomes is the difficulty in establishing causality. This is due to a number of factors which include the possibly contemporaneous relationship between health and either earnings or employment as well as the presence of unobserved heterogeneity, the latter due to factors like family background, neighbourhood effects, and co-occurring illnesses and behavior (Fletcher, 2013). For these reasons, studies that estimate correlations between health and employment/earnings are likely to uncover spurious relationships. In a bid to account for these potential sources of endogeneity, a number of studies have utilized instrumental variables (IV) models (Behrman & Rosenzweig, 2004; Ettner et al., 1997; Jäckle & Himmler, 2010). However, the difficulty in obtaining valid instruments puts into question the validity of such estimates.

This study mitigates the problems of contemporaneity and unobserved heterogeneity by exploiting the timing of health responses as well as sibling fixed effects. Using sibling fixed effects in particular in this sense enables us to control for genetic as well as family-related factors that may influence one's labour market outcomes upon entering the labour market. We show that while overall worse health outcomes have negative effect on employment probability, there is no statistically significant effect of depression on employment. We provide some suggestion as to why this may be true in South Africa. Also, the effect of adverse general health is more acute on the lowly educated relative to those with at least a high school education. The same is true for males relative to females. Furthermore, worse general health and depression each exerts negative impact on labour market earnings.

A number of empirical studies exist on the relationship between health, employment and earnings; most suggest a positive relationship. These include randomized controlled trials (RCTs) where certain nutrients like iron and protein are randomized among a given population and the labour market effects measured subsequently (Behrman, 2009; Li et al., 1994; Thomas & Frankenberg, 2002). For instance in the study by Thomas and Frankenberg, iron deficiency was found to be negatively related to work capacity, endurance, energy efficiency and aerobic capacity. Iron supplementation for iron-deficient workers in Indonesia raised output by around 20% (Basta, Karyadi, & Scrimshaw, 1979) while a protein drink given to male children in their first three years of life increased their hourly wage rate by USD0.67 when they were aged 25-42 years (Behrman, 2009). Though well-conducted RCTs are a very reliable means of achieving identification, they are often very expensive; therefore the bulk of empirical research on the health-labour market relationship rely on observational data.

Studies that have examined the impact of self-assessed health (SAH) on employment/participation have generally found a positive effect. For instance, Stern (1989) instrumented a SAH index with relatively objective health measures and found that a one unit increase in the SAH index resulted in a 47% increase in labour market participation. Similarly, Cai and Kalb (2006b) found a 37% impact among 15-49 year-old women in Australia. Also, Jackle and Himmler (2010) found that self-reporting excellent health resulted in a 16 and 19 percentage point higher probability of labour market participation for men and women respectively relative to reporting poor health in Germany. However, caveats have been issued with regard to the use of objective health measures as SAH instruments (see e.g. Bound, 1991).

In a survey of the impact of various health indicators on wages in Latin America, Savedoff and Schultz (2000) found largely positive and statistically significant wage effects of health. The main identification strategy involved instrumenting health with community-level price proxies like access to potable water, distance to health facilities and the quality of household infrastructure. Studies in this regard include Murrugarra and Valdivia (1999) and Cortez (1999)- Peru (health indicator: number of days ill); Parker (1999)- Mexico (health indicators: disability, disabled days, self-reported relative health status and functional limitations); and Ribero and Nunez (2001)- Colombia (health indicators: disability and number of disabled days). Similar studies in Africa found positive impact of health (height) on labour market earnings (Schultz, 2002). However, the validity of these identification strategies is difficult to justify especially as decisions on residency are often endogenous. Using a panel framework with corrections for sample selection and endogeneity (SAH was instrumented for by number of doctor visits), Jackle and Himmler (2010) found that healthy males earned between 1.3-7.8% more than those in poor health in Germany.

A number of studies have examined the impact of depression on employment and earnings. For instance by instrumenting the presence of any psychiatric disorder with parental psychiatric disorder and own psychiatric disorder before the individual reached 18 years, Ettner et al. (1997) found that the presence of any psychiatric disorder significantly reduced both employment probability (14.2 and 12.6 percentage points for women and men respectively) and annual income ($5709 and $3168 for women and men respectively) in the US. Using religious beliefs and employment in social service jobs as instruments, Alexandre and French (2001) found that depression resulted in approximately 20% fall in employment probability and 8 weeks of work absenteeism per annum in the US. Furthermore, psychological conditions in childhood have been found to result in permanently low earnings of about USD4094 per year in the US (Smith & Smith, 2010). Using quantile regression, it was found that though the mean effects of mental health were not substantial, the effects were substantial at the lower end of the wage distribution in the US (Marcotte & Wilcox-Gok, 2003). Perhaps, this suggests that low earners (who are likely poorly educated) are more affected by mental health relative to high earners (who are more likely to be well educated). Using fixed effects and random effects IV models, it was found that lower psychological health resulted in lower wages for men while excellent SAH increased wages for women in Britain (Contoyannis & Rice, 2001). Exploring the relative strengths of physical and mental health on employment in the UK, Jones et al. (2006) found that disabled individuals with physical disability had a higher employment probability than those with mental disability. However, the study did not account for the potential endogeneity of health. Finally, in a study that controlled for both the contemporaneity of depression and employment/earnings as well as unobserved heterogeneity, Fletcher (2013) found that having depressive symptoms resulted in a 5% reduction in labour force attachment and 15% decline in earnings in the US. The

foregoing shows a generally negative effect of mental health/depression on employment/wages though identification remains controversial in many instances.

2. METHODS OF ANALYSIS

Model

In line with this study's goal of establishing causality by controlling for the contemporaneous relationship between health and the outcomes of interest as well as unobserved heterogeneity that may affect the health-labour market relationships, and following Fletcher (2013), the following models are specified for each labour market outcome:

$$employment_{i,t} = \alpha_0 + \alpha_1 health_{i,t-1} + X_{ei,t}\alpha_2 + \theta_s + u_{i,t} \quad [1]$$

$$\ln(earning)_{i,t} = \beta_0 + \beta_1 health_{t-1} + X_{wi,t}\beta_2 + \vartheta_s + v_{i,t} \quad [2]$$

where employment denotes whether or not the respondent is employed (i.e. engaged in a productive activity, often for money); earning denotes monthly labour market earnings; $health = \{SAH, Depression\}$; X_e and X_w are vectors of covariates relevant in the employment and earnings regressions respectively like education and gender; θ_s and ϑ_s are sibling fixed effects while u and v are idiosyncratic error terms; α and β are parameters. t denotes wave 3 (i.e. current period), while t-1 denotes wave 2.

Equations [1] and [2] suggest that an ordinary least squares (OLS) model suffers from omitted variable bias given that unobserved family-level determinants of either labour market outcome (e.g. ability) would be unaccounted for. Also, it is possible that apart from variations in health

determining changes in employment and earnings, changes in either labour market outcome might indeed induce changes in the health measure of interest. For instance, it is not implausible that being unemployed may predispose one to depression. Similarly, lower earnings may also result in depression given that such an individual's opportunity set becomes limited. These possibilities therefore suggest the likelihood of reverse causality in the health-labour market relationship. The need to at least mitigate this possibility necessitates the exploitation of the timing differences in the health and labour market responses afforded us by the panel nature of the dataset. In this case, previous health responses are used to predict current employment probability and labour market earnings.

It may be suggested that the use of health instruments would address both concerns raised above. However, it is a known fact that obtaining convincing instruments is very difficult. For instance, the validity of parental psychological health as an instrument for own psychological health a la Ettner et al. (1997) is questionable. One reason is that adverse parental psychological health may be induced by the child's non-employment or low earnings. In this case, it becomes difficult to argue that parental psychological health is exogenous to own labour market outcomes.

Furthermore, the use of dynamic panel data methods to account for endogeneity (e.g. the Arellano-Bond estimators) is not feasible as our dataset only has three waves while the Arellano-Bond method requires at least four waves of data in order to test the crucial no serial correlation assumption (Finkel, 2008).

Data

Data is sourced from the National Income Dynamics Study (NIDS) dataset. NIDS is the first nationally representative panel dataset of South African individuals and households and a rich

source of health and socio-economic data. Wave 1 was conducted in 2008 and each of the following waves was collected two years apart (i.e. 2010 and 2012). A detailed description of the dataset is available at www.nids.uct.ac.za. Our sample is restricted to the relatively young sub-sample of the data (i.e. respondents aged 15-39 years in wave 3). All analyses here were restricted to wave 3 except for wave 2 (i.e. lagged) health measures.

The outcomes of interest are employment (a dummy variable which equals one if the respondent was engaged in any productive activity usually for financial reward in the past four weeks, and zero otherwise) and the log of monthly earnings from labour market activities.

As earlier indicated, the health indicators are SAH – an indicator of overall health status- and depression. Though some authors express scepticism on the validity of SAH responses (Kreider, 1999), such responses have been found to reflect the rational thought processes of respondents, even capturing bodily sensations that are difficult to be picked up by clinical tests (Jylhä, 2009). Little wonder that SAH has a high predictive effect on subsequent mortality (Ardington & Gasealahwe, 2014; Wong, Wong, & Caplan, 2007). SAH is a five-level variable comprising excellent, very good, good, fair and poor health categories. The ten-question Center for Epidemiological Studies Depression scale (CES-D10) was used as the measure of depression. The CES-D10 index (which ranges from 0-30, where higher values denote more adverse psychological health) has been shown to be informative of one's psychological state, while having a CES-D10 value of 10 or more is associated with depressive symptoms (Andresen, Malmgren, Carter, & Patrick, 1994; Zhang et al., 2012).

3. RESULTS

This section depicts the descriptive statistics as well as the regression results for both employment and earnings. Table 1 is the descriptive statistics of the data for respondents aged 15-39 years.

Table 1: Descriptive statistics

Variable	Sample size	Mean	Std.Dev.
employment dummy	5324	0.594	0.5
monthly earning	3002	3249	3916.0
lagged health			
excellent sah	7864	0.493	0.5
very good sah	7864	0.31	0.5
good sah	7864	0.158	0.4
fair sah	7864	0.029	0.2
poor sah	7864	0.01	0.1
cesd	7536	6.624	4.0
matric†	11017	0.304	0.5
male	10029	0.472	0.5
age	12084	25.09	7.0
weekly hours	2613	40.84	16.7
union	2999	0.17	0.4
occupation			
managerial/professional	2104	0.175	0.4
semi-skilled	2104	0.488	0.5
elementary	2104	0.337	0.5
married/cohabiting	8426	0.161	0.4
smoking dummy	8419	0.158	0.4
drink (dummy=1 if s/he drinks ≥ 5 days/week)	8419	0.00796	0.1
household grant receipt dummy	10110	0.639	0.5
race			
african	12084	0.8092	0.4
coloured	12084	0.143	0.4
asian	12084	0.0144	0.1
white	12084	0.0338	0.2
provincial unemployment rate	11779	25.22	3.8
location			
rural formal	11227	0.0962	0.3
traditional authority	11227	0.398	0.5
urban formal	11227	0.426	0.5
urban informal	11227	0.0802	0.3
num.children††	12084	1.765	1.8
household size	10029	5.681	3.5
parentdth5‡	7646	0.063	0.2
parent grade‡‡	9132	0.776	0.4

Source: NIDS wave 2 and wave 3; author's calculations. Samples restricted to 15-39-year-old respondents in wave 3. Samples were corrected for survey design, national representativeness and non-random attrition; †dummy variable (=1 if respondent has at least 12 years of schooling; 0 otherwise); ††number of under-17 children in the household; ‡ dummy variable (=1 if parent died before respondent reached five years; 0 otherwise); ‡‡ dummy variable (=1 if any of respondent's parents had some education; 0 otherwise)

From Table 1, about 59% of the economically active sub-sample were engaged in some form of productive activity. Average monthly earnings was R3249 (i.e. $380)[2] with a high standard deviation typical of a highly unequal country like South Africa. Moreover, the relatively low monthly wage and high standard deviation are partly due to the fact that the sample includes very young workers. Most of the sample identified with better self-reported overall health outcomes. The average value of the lagged depression index was 6.6 while it was internally consistent (with a Cronbach alpha value of 0.77). Also, only approximately a third of the sample have at least twelve years of schooling (i.e. matric).

Table 2 provides descriptive evidence of the possible directions of the relationship between the health measures and employment probability and wages.

Table 2: Proportional/mean differences in wages and employment across health categories

Employment			**Wages**		
Sick (N=146)	Healthy(N=3964)	Diff	Sick (N=64)	Healthy(N=2233)	Diff
0.47	0.59	-0.12***	2152	3137	-984**
(0.04)	(0.01)	(0.04)	(229)	(76)	(449)
Non-depressed (N=3113)	Depressed (N=828)	Diff	Non-depressed (N=1709)	Depressed (N=479)	Diff
0.58	0.62	-0.04**	3167	2791	376**
(0.01)	(0.02)	(0.02)	(87)	(144)	(181)

Robust standard errors in parentheses; † Sick (respondent self-reported fair or poor health), healthy (respondent self-reported excellent, very good or good health)

The relationships in Table 2 largely conformed to a priori expectations, as poor health conditions were generally associated with worse labour market outcomes. The only exception was the relationship between depression and employment, as having depressive symptoms was

[2] $1=R8.55 in 2012 (see http://www.irs.gov/Individuals/International-Taxpayers/Yearly-Average-Currency-Exchange-Rates)

associated with higher employment probabilities. Though one may not read much meaning into this as these are unconditional correlations which do not necessarily imply causality, a possible explanation is that the depressed view employment as a means of managing their depression and therefore exert more job seeking effort relative to the non-depressed. Moreover, the difference in magnitude was not substantial: only a four percentage point difference. However, among those who secured employment, the depressed were likely to be less productive, hence their lower average earnings.

Results for employment

Table A1 in the appendix reports (naïve) OLS results for the relationship between lagged SAH and employment. There was no statistically significant difference in the employment probabilities of respondents in the excellent health category and those in the very good and good categories across all specifications. However, those in fair and poor health had significantly lower employment probabilities. These results (and those of the controls) were generally robust to the inclusion of household-level variables (column 2), community-level variables (column 3), possibly co-occurring behaviors (drinking and smoking; column 4) and early childhood and parental characteristics (columns 5 and 6).

With regard to depression however, there was generally no statistically significant association while the controls were similar to what obtained in Table A1 (see Table A2 in the Appendix). This conforms to an earlier assertion in the literature that individual health indicators are less likely to be significant in a labour supply equation than composite measures (Currie & Madrian, 1999).

Table 3 depicts results controlling for both reverse causality and unobserved heterogeneity.

Table 3: Effect of SAH on employment

VARIABLES	(1) FE1	(2) FE2	(3) FE3	(4) FE4
v.good health	-0.06	-0.15**	-0.15**	-0.16***
	(0.05)	(0.06)	(0.06)	(0.06)
good health	-0.09	-0.17**	-0.18**	-0.21***
	(0.07)	(0.07)	(0.08)	(0.08)
fair health	-0.25***	-0.24**	-0.20**	-0.21**
	(0.09)	(0.10)	(0.09)	(0.09)
poor health	-0.42**	-0.49**	-0.49**	-0.60***
	(0.17)	(0.20)	(0.20)	(0.21)
matric	0.14***	0.13***	0.13***	0.12***
	(0.04)	(0.05)	(0.05)	(0.05)
male	0.07**	0.06	0.06	0.07
	(0.03)	(0.04)	(0.04)	(0.04)
age	0.03***	0.03***	0.03***	0.03***
	(0.00)	(0.00)	(0.00)	(0.00)
smoke		0.04	0.03	0.03
		(0.06)	(0.06)	(0.06)
drink		0.16	0.18	0.17
		(0.19)	(0.19)	(0.19)
parentdth5†			-0.20**	-0.22**
			(0.09)	(0.09)
parent grade††				-0.07
				(0.17)
Constant	-0.39***	-0.30**	-0.28**	-0.21
	(0.11)	(0.13)	(0.13)	(0.18)
Observations	1,070	755	738	715
R-squared	0.12	0.13	0.14	0.14
number of mothers	463	334	330	320
R^2 adjusted	0.115	0.124	0.125	0.130
within R^2	0.121	0.135	0.137	0.143
F	13.61	8.532	7.424	7.324

Robust Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; † dummy variable (=1 if parent died before respondent reached five years; 0 otherwise); †† dummy variable (=1 if any of respondent's parents had some education; 0 otherwise)

It can be seen from Table 3 that being in worse SAH relative to excellent health had a negative impact on employment irrespective of specification. Similarly, the control variables generally conformed to a priori expectations and were stable across specifications.

Table 4 depicts the impact of depression on employment.

Table 4: Impact of depression on employment

VARIABLES	(1) FE1	(2) FE2	(3) FE3	(4) FE4
lncesd	0.03	0.02	0.02	0.02
	(0.04)	(0.04)	(0.04)	(0.04)
matric	0.15***	0.14***	0.14***	0.13***
	(0.04)	(0.05)	(0.05)	(0.05)
male	0.08**	0.07	0.07	0.08*
	(0.04)	(0.05)	(0.05)	(0.05)
age	0.03***	0.03***	0.03***	0.03***
	(0.00)	(0.00)	(0.00)	(0.00)
smoke		0.04	0.03	0.04
		(0.06)	(0.06)	(0.06)
drink		0.17	0.19	0.19
		(0.20)	(0.20)	(0.20)
parentdth5†			-0.19*	-0.20*
			(0.10)	(0.11)
parent grade††				-0.05
				(0.16)
Constant	-0.44***	-0.36**	-0.33**	-0.28
	(0.13)	(0.15)	(0.15)	(0.19)
Observations	1,049	736	720	698
R-squared	0.11	0.11	0.11	0.11
number of mothers	454	326	322	312
R^2 adjusted	0.102	0.101	0.102	0.0994
within R^2	0.106	0.108	0.111	0.110
F	19.29	8.681	7.564	6.329

Robust Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; † dummy variable (=1 if parent died before respondent reached five years; 0 otherwise); †† dummy variable (=1 if any of respondent's parents had some education; 0 otherwise)

As Table 4 indicates, there was no statistically significant impact of depression on employment. These results are consistent with the OLS results shown earlier.

Results for earnings

Table A3 and Table A4 in the Appendix depict OLS results of the association between SAH and depression respectively and wages. Both health variables were generally not statistically significant; however, the results were generally robust to the inclusion of household-level variables (column 2), the community-level variable (column 3), possibly co-occurring behaviors (drinking and smoking; column 4) and early childhood and parental characteristics (columns 5 and 6).

Table 5 presents results for the impact of overall health (SAH) on monthly earnings. It should be noted that the benchmark category for SAH in sibling FE wage regressions is fair health as there was no respondent in the sibling FE sample with a poor health response. Also, all wage regressions in this study are conditional on employment given the infeasibility of estimating a first stage probit FE regression necessary for estimating a selection model.

Table 5: Impact of SAH on earnings

VARIABLES	(1) FE1	(2) FE2	(3) FE3	(4) FE4
v.good health	0.00	0.01	-0.03	-0.02
	(0.15)	(0.14)	(0.15)	(0.15)
good health	-0.26	-0.16	-0.19	-0.16
	(0.24)	(0.29)	(0.28)	(0.27)
fair health	-0.81**	-0.79**	-0.86**	-0.87**
	(0.39)	(0.38)	(0.38)	(0.39)
matric3	0.31**	0.24*	0.25*	0.29**
	(0.13)	(0.13)	(0.13)	(0.13)
male3	-0.02	-0.07	-0.06	-0.00
	(0.14)	(0.13)	(0.14)	(0.15)
weekly hours	0.02***	0.02***	0.02***	0.02***
	(0.01)	(0.01)	(0.01)	(0.01)
union		0.61***	0.59***	0.57***
		(0.16)	(0.16)	(0.15)
age			0.01	0.01
			(0.01)	(0.01)
drink				0.67*
				(0.40)
smoke				-0.14
				(0.17)
Constant	6.70***	6.57***	6.31***	6.25***
	(0.33)	(0.29)	(0.53)	(0.53)
Observations	232	232	232	232
R-squared	0.13	0.21	0.21	0.23
number of mothers	107	107	107	107
R^2 adjusted	0.103	0.186	0.186	0.192
within R^2	0.126	0.211	0.214	0.227
F	2.804	5.134	4.572	4.101

Robust Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 5 indicates that being in fair health resulted in significantly lower earnings, while the coefficients on the controls largely conformed to a priori expectations and remained generally robust to different specifications. However, self-reporting very good or good health status did not result in any significantly lower earnings compared to being in excellent health.

The impact of depression on earnings is shown in Table 6. As expected, depression resulted in lower earnings.

Table 6: Impact of depression on earnings

VARIABLES	(1) FE1	(2) FE2	(3) FE3	(4) FE4
lagged lncesd	-0.35*	-0.33*	-0.34*	-0.34*
	(0.19)	(0.19)	(0.19)	(0.20)
matric3	0.30**	0.22*	0.22*	0.26**
	(0.14)	(0.13)	(0.13)	(0.13)
male3	-0.06	-0.13	-0.11	-0.09
	(0.16)	(0.15)	(0.15)	(0.17)
weekly hours	0.02***	0.02***	0.02***	0.02***
	(0.01)	(0.01)	(0.01)	(0.01)
union		0.63***	0.61***	0.59***
		(0.16)	(0.16)	(0.15)
age			0.01	0.01
			(0.01)	(0.01)
drink				0.69*
				(0.38)
smoke				-0.07
				(0.17)
Constant	7.33***	7.19***	6.97***	6.91***
	(0.42)	(0.38)	(0.52)	(0.52)
Observations	230	230	230	230
R-squared	0.15	0.24	0.24	0.25
number of mothers	106	106	106	106
R^2 adjusted	0.134	0.221	0.220	0.224
within R^2	0.149	0.238	0.240	0.251
F	3.457	6.941	6.267	5.184

Robust Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

4. DISCUSSION

Considering the effect of health on employment when controlling for only human capital characteristics like education and age (where age may be loosely viewed as a proxy for

experience/networks), being in fair and poor health resulted in 25% and 42% lower employment probability respectively relative to being in excellent health. When smoking and drinking were included, the effect of health ranged from 15-49%, with worse health outcomes having more negative impact on employment probability. This trend is generally repeated across the other specifications. The smaller sample due to the inclusion of parental characteristics makes us to mainly concentrate on the first two specifications. In comparison, these coefficients are bigger than Jackle and Himmler's (2010) fixed effects two-stage least squares estimates, where a ten-category health satisfaction variable was coalesced into four categories. Jackle and Himmler uncovered a 16 (19) percentage point higher probability of participation for being in excellent self-reported health relative to being in poor health among men (women). But our coefficients for poor health are similar to Stern's (1989) estimate of a 47% effect in the US, while Cai and Kalb (2006b) found a 37% effect of health on participation among women in Australia aged 15-49 years. However, our estimates might not be directly comparable to Stern's and Cai and Kalb's estimates as they used a SAH index (i.e. SAH was used as a five-value variable and not as separate dummies as in this study). However, when we used a health index as in their studies, we only found a 7-9% effect. The latter is however similar to Gomez and Nicolas' (2006) estimate of a 5% effect of adverse health shocks on employment in Spain[3].

As a side note, Table 5 depicts a positive relationship between smoking and employment. This may be an affordability issue where the employed/wage earners are more likely to afford drinking regularly. Fletcher (2013) also found a positive coefficient on drinking in the US.

[3] An individual was deemed to experience an adverse health shock if they reported a health deterioration in the second and third years of a three-year cycle while remaining employed in the first and second years.

The lack of any effect of depression on employment is surprising given that depression is often associated with debilitating effects. However, it may not be unconnected with the fact that depression is a condition that is relatively easy to hide from prospective employers over the (often short) duration of the job hiring process. This is unlike many physical/physiological conditions like blindness and deafness which can be easily observed during the job hiring process. Critics may argue that the lack of any effect emanates from the very small variation in the depression index (i.e. a 1% change). To test this, we also used a dummy depression variable (which equals one for those with depressive symptoms, and zero otherwise). The results were similar to those reported here, indicating no significant effect. Similarly, a standard deviation change in the depression index did not have any significant effect on employment probability either. These results are available on request. Indeed, our results are not novel; employing a similar identification strategy as in this study, depression also did not exert any significant impact on employment in the US even at the 10% level of significance (Fletcher, 2013).

Adverse SAH had a negative impact on earnings. But before discussing these results, a caveat regarding the small sample size of the sibling fixed effects wage regressions is in order as the sample size was about 230 observations from approximately 107 mothers. Thus, the efficiency of these estimates may not be guaranteed.

Across all specifications, only being in fair health resulted in significantly lower earnings relative to being in excellent health. The effects were generally robust across the different specifications: 79-87%. Similarly, the coefficients of the controls generally conformed to a priori expectations and were robust across specifications. These coefficients are way larger than what obtained in Cai (2009), where being in very good/excellent health and good health respectively resulted in 20% and 17% higher hourly earnings in Australia relative to the benchmark category. Even a

conversion of the wage variable to hourly earnings (as used by Cai) only resulted in a slight decrease: 73-79% lower earnings relative to those in excellent health (results available on request).

On the impact of depression on monthly earnings, a 1% increase in the CES-D10 depression index resulted in 0.33-0.35% decline in earnings. These results are similar to findings in Levinson et al. (2010), where serious mental illness was associated with earnings reduction of 0.3% in low and middle-income countries (including some African countries). A dummy depression variable by Fletcher (2013) resulted in a 22-28% wage reduction in the US depending on the specification. Also as shown in the above review, depression resulted in a significant income decline in the US (Ettner et al., 1997). These studies thus not only validate our finding that depression is an important inhibitor of earnings, the finding of such significant effects in different contexts shows that the deleterious effects of depression on earnings is not limited to developed countries only. Though relatively more emphasis has been placed on the effects of physical ailments on labour market outcomes in developing countries perhaps due to their more obvious nature, it is imperative to accord mental health and depression in particular significant attention as a possible productivity inhibitor.

There are potentially different pathways through which health in general and depression in particular may affect employment and labour market earnings. For instance, depression may only have a direct effect on earnings, where the direct consequences of depression like lack of concentration on the job, taking more time to complete tasks as well as making more mistakes than usual (see e.g. SADAG, 2015) will likely result in reduced productivity and lower earnings. This direct effect (which may be seen as a reflection of the effect of the pure human capital characteristic of health on employment and wages) has been largely uncovered in the above

results. On the other hand, the effect of depression/poor health may be felt through/reinforced by its interaction with other characteristics of the individual such as human capital accumulation and hours of labour supplied. For instance, poor health may adversely affect earnings through lower investments in human capital acquisition. Also, it is possible that education imbues individuals with life skills which help them to mitigate the adverse earnings consequences of ill health. In this case, we will expect poor health to have a greater negative impact on earnings among those with low education (who are likely to be the low earners). This is similar to evidence in the US where many mental health conditions significantly affected earnings among low earners but had no effect among high earners (Marcotte & Wilcox-Gok, 2003). On the other hand, the sick may supply less work hours due to, say, a change in their time preferences as a result of illness (where they may value time spent seeking health care more than the healthy).

Table 7 tests the hypotheses that the impact of SAH on employment is mediated through education, gender and age. Column 1 tests the hypothesis that the relationship is mediated by educational attainment (rather than separate SAH dummies as used in the previous results, the five-category SAH index was used here given that the interaction of a non-dummy and a dummy is more intuitively appealing than interacting two dummy variables; this convention informs the form of the variables used in the other specifications too). Though the SAH-education interaction was not statistically significant, a Wald test of this interaction term and the main SAH coefficient was jointly significant at 1%. Therefore, it appears that the negative effect of adverse SAH on employment was more pronounced among the less educated. Using a similar argument, we conclude that the negative effect of adverse health on employment was more pronounced among males relative to females. On the other hand, both the direct effect of the lagged SAH dummy (SAH=1 if the respondent is in excellent, very good or health, and 0 otherwise) and its

interaction with age were insignificant, perhaps suggesting that age did not mediate the health-employment relationship.

Table 7: Factors mediating the impact of health on employment

VARIABLES	(1) FE1	(2) FE2	(3) FE3
lagged sah index	-0.08***	-0.06*	
	(0.03)	(0.03)	
matric	0.11	0.14***	0.14***
	(0.08)	(0.04)	(0.04)
male	0.07**	0.14*	0.07**
	(0.03)	(0.07)	(0.04)
age	0.03***	0.03***	0.03**
	(0.00)	(0.00)	(0.02)
lagged sah index*matric	0.02		
	(0.04)		
lagged sah index*male		-0.04	
		(0.04)	
lagged sah dummy			0.31
			(0.45)
lagged sah dummy*age			-0.00
			(0.02)
Constant	-0.29**	-0.33***	-0.73
	(0.12)	(0.12)	(0.45)
Observations	1,070	1,070	1,070
R-squared	0.12	0.12	0.12
number of mothers	463	463	463
R^2 adjusted	0.115	0.116	0.113
within R^2	0.119	0.120	0.117
F	18.23	18.38	18.01

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

However, an investigation of these potential interactions between ill health in general and depression in particular and human capital accumulation (proxied by education) and the supply of hours indicates that these pathways did not mediate the effect of poor health/depression on earnings in South Africa (see Table 8 below). Thus, the evidence suggests only a direct impact.

Table 8: Factors mediating the impact of health on earnings

VARIABLES	(1) FE1	(2) FE2	(3) FE3	(4) FE4
lagged sah index	-0.15*			
	(0.09)			
matric	0.24	0.25*	-0.52	0.23*
	(0.28)	(0.13)	(0.52)	(0.13)
lagged sah index*matric	0.00			
	(0.16)			
lagged sah dummy		0.41		
		(0.40)		
lagged sah dummy*hours		0.01		
		(0.02)		
lagged lncesd			-0.61*	
			(0.35)	
lagged lncesd*matric			0.43	
			(0.30)	
lagged depression dummy				-0.02
				(0.79)
lagged depression dummy*hours				0.00
				(0.01)
male3	-0.06	-0.06	-0.10	-0.05
	(0.14)	(0.14)	(0.15)	(0.14)
weekly hours	0.02***	0.01	0.02***	0.02***
	(0.01)	(0.02)	(0.01)	(0.01)
union	0.58***	0.60***	0.60***	0.63***
	(0.16)	(0.16)	(0.15)	(0.17)
age	0.01	0.01	0.01	0.01
	(0.01)	(0.01)	(0.02)	(0.01)
Constant	6.51***	5.90***	7.42***	6.40***
	(0.51)	(0.70)	(0.67)	(0.50)
Observations	232	232	230	230
R-squared	0.20	0.21	0.27	0.19
number of mothers	107	107	106	106
R^2 adjusted	0.180	0.187	0.247	0.169
within R^2	0.205	0.211	0.270	0.195
F	6.031	5.286	6.025	5.019

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

5. CONCLUSION

To the extent that contemporaneity and unobserved heterogeneity are significant causes of endogeneity between employment/earnings on the one hand, and overall health status and depression on the other, this study has made important findings. Firstly, while better SAH has a positive effect on employment, there is no statistically significant employment effect of depression. The latter might be due to job seekers' ability to conceal depressive symptoms relative to more obvious components of general health status during the often short period of the hiring process. On the other hand, both health measures significantly affect wages. Exploring the possible pathways through which these effects come about, we found possible interactions between self-reported health and educational attainment as well as gender, where the negative effect of adverse SAH on employment appears to be more pronounced among the less educated and males. However, the effects of both overall health status and depression on earnings appear to be direct effects only (apparently capturing the pure human capital effect of health) with no significant interaction effects.

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APPENDIX

Table A1: SAH-employment relationship (OLS)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
very good health	-0.00	0.00	0.00	-0.00	0.00	0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
good health	-0.03	-0.02	-0.01	-0.02	-0.02	-0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
fair health	-0.12**	-0.10**	-0.11**	-0.11**	-0.10**	-0.10**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
poor health	-0.21**	-0.20**	-0.23***	-0.23***	-0.23**	-0.26***
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
matric	0.12***	0.10***	0.11***	0.11***	0.11***	0.10***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
male	0.16***	0.13***	0.13***	0.12***	0.11***	0.12***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
age	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
married/cohabit	0.04**	0.01	-0.00	-0.00	-0.01	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
household size		-0.01***	-0.01***	-0.01***	-0.01***	-0.01***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
coloured		0.16***	0.11***	0.09***	0.10***	0.10***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
asian		0.02	-0.08	-0.08	-0.09	-0.09
		(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
white		0.03	-0.02	-0.03	0.00	-0.01
		(0.07)	(0.06)	(0.06)	(0.06)	(0.06)
grant3		-0.08***	-0.07***	-0.08***	-0.08***	-0.10***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
number u-17 children in hh		-0.00	-0.00	-0.00	-0.00	0.00
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
provincial unemp rate			-0.01***	-0.01***	-0.01***	-0.01***
			(0.00)	(0.00)	(0.00)	(0.00)
traditional authority			-0.24***	-0.24***	-0.23***	-0.24***
			(0.03)	(0.03)	(0.03)	(0.03)
urban formal			-0.12***	-0.12***	-0.12***	-0.12***
			(0.02)	(0.02)	(0.03)	(0.03)
urban informal			-0.18***	-0.18***	-0.18***	-0.18***
			(0.03)	(0.03)	(0.04)	(0.04)
drink				0.01	0.02	0.04
				(0.07)	(0.08)	(0.08)
smoke				0.04**	0.04*	0.03
				(0.02)	(0.02)	(0.02)
parentdth5					0.02	0.02
					(0.03)	(0.03)
parent grade						0.00
						(0.02)
Constant	-0.10**	0.04	0.43***	0.44***	0.44***	0.47***
	(0.04)	(0.05)	(0.07)	(0.08)	(0.08)	(0.09)
Observations	3,478	3,478	3,478	3,471	3,105	2,792
R^2	0.11	0.14	0.16	0.17	0.17	0.17
F	64	41.33	47.68	43.36	38.20	35.02

Robust Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table A2: Depression-employment relationship (OLS)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
ln lagged cesd index	-0.01	0.01	0.00	0.00	-0.00	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
matric	0.12***	0.11***	0.11***	0.12***	0.12***	0.11***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
male	0.16***	0.13***	0.13***	0.12***	0.12***	0.13***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
age	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
married/cohabit	0.04**	0.01	-0.00	-0.00	-0.01	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
household size		-0.01***	-0.01***	-0.01***	-0.01***	-0.01***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
coloured		0.15***	0.10***	0.09***	0.10***	0.10***
		(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
asian		0.02	-0.08	-0.09	-0.10	-0.09
		(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
white		0.00	-0.04	-0.05	-0.02	-0.02
		(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
grant3		-0.08***	-0.07***	-0.08***	-0.08***	-0.10***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
number u-17 children in hh		-0.00	-0.00	-0.00	-0.00	0.00
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
provincial unemp rate			-0.01***	-0.01***	-0.01***	-0.01***
			(0.00)	(0.00)	(0.00)	(0.00)
traditional authority			-0.24***	-0.24***	-0.23***	-0.23***
			(0.03)	(0.03)	(0.03)	(0.03)
urban formal			-0.13***	-0.12***	-0.13***	-0.13***
			(0.02)	(0.02)	(0.03)	(0.03)
urban informal			-0.17***	-0.17***	-0.18***	-0.17***
			(0.03)	(0.03)	(0.04)	(0.04)
drink				0.01	0.02	0.04
				(0.07)	(0.08)	(0.08)
smoke				0.04**	0.04*	0.03
				(0.02)	(0.02)	(0.02)
parentdth5					0.01	0.02
					(0.03)	(0.03)
parent grade						0.00
						(0.02)
Constant	-0.10**	0.02	0.40***	0.41***	0.41***	0.42***
	(0.05)	(0.05)	(0.08)	(0.08)	(0.09)	(0.09)
Observations	3,329	3,329	3,329	3,323	2,978	2,685
R-squared	0.10	0.14	0.16	0.16	0.16	0.17
F	94.63	58.92	52.73	47.07	41.16	36.83

Robust Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table A3: SAH-wage relationship (OLS)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
very good health	-0.00	0.01	0.01	0.01	0.00	-0.02
	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)
good health	0.01	0.02	0.02	0.02	0.05	0.02
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)
fair health	-0.28	-0.26	-0.25	-0.25	-0.31	-0.30
	(0.21)	(0.21)	(0.21)	(0.21)	(0.23)	(0.24)
poor health	0.16	0.16	0.18	0.20	0.24	0.31
	(0.21)	(0.19)	(0.19)	(0.20)	(0.24)	(0.24)
matric3	0.64***	0.59***	0.59***	0.57***	0.59***	0.56***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
male3	0.21***	0.18***	0.17***	0.21***	0.18***	0.19***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)
age	0.01***	0.01***	0.01***	0.01***	0.01***	0.01**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
married/cohabit	0.25***	0.18***	0.18***	0.17***	0.21***	0.20***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)	(0.07)
union	0.71***	0.71***	0.70***	0.70***	0.67***	0.68***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)
weekly hours	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
traditional authority		-0.16**	-0.15**	-0.16**	-0.17**	-0.16**
		(0.07)	(0.07)	(0.07)	(0.07)	(0.08)
urban formal		0.11**	0.10*	0.10*	0.07	0.06
		(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
urban informal		-0.03	-0.03	-0.03	-0.02	-0.04
		(0.09)	(0.09)	(0.09)	(0.10)	(0.10)
coloured		0.09*	0.08	0.13**	0.14**	0.16***
		(0.05)	(0.05)	(0.05)	(0.06)	(0.06)
asian		0.76***	0.78***	0.80***	0.80***	0.77***
		(0.21)	(0.22)	(0.22)	(0.21)	(0.21)
white		0.68**	0.69**	0.72**	0.70**	0.66*
		(0.33)	(0.33)	(0.33)	(0.33)	(0.34)
number u-17 children in hh		-0.05***	-0.05***	-0.05***	-0.05***	-0.05***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
provincial unem rate			0.01	0.01	0.01	0.01*
			(0.01)	(0.01)	(0.01)	(0.01)
drink				0.10	0.15	0.11
				(0.12)	(0.14)	(0.14)
smoke				-0.14**	-0.14**	-0.12*
				(0.06)	(0.06)	(0.07)
parentdth5					-0.09	-0.12
					(0.10)	(0.12)
parent grade						0.13*
						(0.07)
Constant	6.03***	6.04***	5.86***	5.86***	5.83***	5.73***
	(0.17)	(0.17)	(0.24)	(0.24)	(0.26)	(0.27)
Observations	1,927	1,927	1,927	1,923	1,703	1,530
R-squared	0.23	0.26	0.26	0.26	0.26	0.27
F	66.54	42.91	41.26	37.24	30.97	29.78

Robust Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table A4: Depression-wage relationship (OLS)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
ln lagged cesd index	-0.04	-0.00	0.00	0.00	0.02	0.01
	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)
matric	0.63***	0.59***	0.59***	0.57***	0.59***	0.56***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
male	0.21***	0.18***	0.18***	0.21***	0.18***	0.19***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)
age	0.01**	0.01***	0.01***	0.01***	0.01**	0.01**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
married/cohabit	0.25***	0.19***	0.19***	0.18***	0.22***	0.21***
	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)
union	0.72***	0.71***	0.71***	0.71***	0.68***	0.69***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)
weekly hours	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
traditional authority		-0.17**	-0.16**	-0.16**	-0.17**	-0.17**
		(0.07)	(0.08)	(0.08)	(0.08)	(0.08)
urban formal		0.12**	0.11*	0.10*	0.07	0.05
		(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
urban informal		-0.01	-0.01	0.00	-0.00	-0.01
		(0.09)	(0.09)	(0.09)	(0.10)	(0.10)
coloured		0.09*	0.09	0.13**	0.15**	0.17***
		(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
asian		0.76***	0.78***	0.80***	0.80***	0.77***
		(0.21)	(0.22)	(0.22)	(0.21)	(0.21)
white		0.61	0.62	0.65	0.64	0.62
		(0.41)	(0.41)	(0.41)	(0.41)	(0.41)
number u-17 children in hh		-0.04***	-0.04***	-0.04***	-0.05***	-0.05***
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
provincial unemp rate			0.01	0.01	0.01	0.01
			(0.01)	(0.01)	(0.01)	(0.01)
drink				0.11	0.16	0.13
				(0.12)	(0.14)	(0.14)
smoke				-0.14**	-0.14**	-0.13*
				(0.06)	(0.07)	(0.07)
parentdth5					-0.10	-0.13
					(0.10)	(0.12)
parent grade						0.13*
						(0.07)
Constant	6.15***	6.10***	5.93***	5.93***	5.88***	5.83***
	(0.18)	(0.20)	(0.28)	(0.28)	(0.30)	(0.32)
Observations	1,833	1,833	1,833	1,830	1,626	1,462
R-squared	0.22	0.25	0.25	0.25	0.25	0.25
F	86.57	47.25	44.55	39.44	31.72	30.39

Robust Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1