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## **MINIMUM WAGES AND ADOLESCENT ALCOHOL USE: EVIDENCE FROM A NATURAL EXPERIMENT**

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## Minimum Wages And Adolescent Alcohol Use: Evidence From A Natural Experiment

### Abstract

Renewed interest in the minimum wage has led many policy makers to consider it as a possible strategy to achieve poverty reduction. Literature on the social determinants of health has intimately linked health with income and so if such a policy reduced poverty it may lead to beneficial health outcomes. We consider the possibility of adverse health outcomes associated with minimum wage hikes. Using a sample of adolescents from Newfoundland and Labrador, we examine the impact of a two-tiered minimum wage law on their frequency of alcohol use and frequency of getting drunk over the period of 1998 to 2001. We exploit this two-tiered wage by using a differences-in-differences econometric approach where formally employed adolescents who would be eligible for the minimum wage are compared to informally employed and unemployed adolescents. As they age, the formally employed group was eligible for the higher minimum wage but the comparison groups were not. Our results demonstrate that being eligible for the minimum wage increased the frequency with which the formal group got drunk but did not increase their frequency of alcohol use as compared to the informal and unemployed groups.

Key words: alcohol; adolescents; minimum wage; difference-in-differences regression

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# 1 Introduction

Recent interest in the growth of income inequality has led to renewed advocacy for strategies to improve the incomes of the poorest members of society in Canada and the United States. Popular interest has focused on reducing income inequality and poverty via raising the minimum wage. This has led to political leaders in the United States and Canada to consider minimum wage hikes as viable policy to achieve these aims. There is a broad literature on both the positive and negative aspects of minimum wage hikes on income and employment. This paper deviates from this focus to instead address the unintended effects of minimum wage policy on health among adolescents.

Adolescence is a time when multiple major changes coincide, but two are especially relevant to this paper. First, it is the time when most people enter the workforce. Adolescents gain many skills from employment but their main goal is usually to gain a source of income from their job [12]. Given their other responsibilities with regard to education, extracurricular activities and social life, adolescents usually cannot devote as much time to work as adult workers. While their work provides them with income, this income is usually small. Estimates of the average annual income of a Canadian under the age of 20 in 2010 was \$8300 with a median income of \$6000 [4].

Second, adolescence is a time of experimentation where patterns of consumption can develop and become ingrained. Such patterns can have major detrimental effects on health. Safe-sex, drug abuse, and obesity in adulthood have significant correlations to corresponding health behaviours in adolescence. Similar correlations also apply to alcohol use among adolescents [11]. Heavy alcohol use in adolescence has been linked to alcohol addiction in adulthood [16]. Teenagers who use alcohol have poorer education outcomes and poorer job prospects [18, 19]. Alcohol not only has these long-term effects on health but more obvious short-term effects on adolescent health. Binge-drinking and regular alcohol use have been shown to have a negative physiological effect on brain functioning in imaging studies [17]. More obviously, alcohol use is implicated in the majority of adolescent traffic fatalities which is one of the leading causes of mortality in this age group [8]. These short-term and long-term detriments to health are major reasons for why alcohol is one of the major health policy issues for this demographic.

Evaluation of whether these two major aspects in adolescent life affect each other is important because it may suggest a policy pathway to changing alcohol use before it becomes a detriment to health. Since adolescent employees in Canada are most often paid minimum wage, they gain additional income every time a minimum wage hike occurs in a province [3]. Since most adolescent workers have such small incomes, providing them with more income may theoretically lead to additional consumption of alcohol. Evaluating the impact of minimum wage hikes on adolescent alcohol use is then important if policy makers care about adolescent alcohol use.

It must be emphasized that income has been intricately connected to health and well-being and we do not dispute the positive effects that increasing income can have on health. Early non-randomized research on this subject showed a consistent and strong positive link between income rises and health [7]. Recent research into quasi-randomized historical data on the Canadian guaranteed annual income project has demonstrated similar results [9]. It is important to emphasize that this research does not contradict these results. Rather it provides some evidence that income rises are not entirely benevolent and can lead to detrimental behaviour, especially among certain

groups.

This paper uses a natural experiment to determine how minimum wage hikes impact adolescent alcohol use. Using a two-tiered minimum wage in the province of Newfoundland and Labrador we show that adolescents who were eligible for the wage hike consumed more alcohol than those who were ineligible for the wage hike. Teenagers eligible for the minimum wage were much more likely to drink to get drunk at higher frequencies than those persons who were not eligible for the minimum wage.

We organize this paper in the following manner. Section II details the natural experiment that we exploit to demonstrate the effects of minimum wage hikes on adolescent alcohol use. Section III discusses our econometric methodology and sample selection. Section IV provides some basic summary statistics as well as results from our difference-in-differences regression. Section V discusses the limitations of this paper. Section VI provides some discussion on our results. Section VII provides several conclusions and a summary of this paper.

## 2 The two-tiered minimum wage in Newfoundland and Labrador

Prior to May 2002, there existed two minimum wages in the province of Newfoundland and Labrador. The Labour Standards Act, passed in 1992, set out a minimum wage for those above the age of 16 and at various points in time, this minimum wage ranged between \$5 per hour and \$5.75 per hour. This was in contrast to no legislated minimum wage for adolescent workers under the age of 16.

On May 1st, 2002, the legislature of Newfoundland and Labrador passed a regulation that amended the Labour Standards Act. This regulation raised the minimum wage to \$5.75 and eliminated some language that was present in the original act (and subsequent amendments) [14]. It specifically eliminated a clause applying the minimum wage to only those workers over the age of 16 and provided a new minimum wage that applied to all those workers formally employed in Newfoundland and Labrador [13].

The elimination of this two-tiered minimum wage overnight was notable in the public discourse only for its effect on the overall wage rate. Debates in the provincial legislature do not acknowledge the repeal of this age-specific minimum wage and focus instead on attempts to provide a working wage for minimum wage workers. This was especially pertinent at the time as the debates note that a significant number of Newfoundlanders earned the minimum wage and the majority of new jobs created during this period were in the service sector [15].

Popular press articles in the local newspaper are also scarce, however there were several that discussed the minimum wage hikes. A short November 2001 article in the St. John's Telegram noted that the minimum wage hike was introduced at the provincial government's annual party convention with a 25 cent increase due in May 2002 [1]. An equally brief article appeared in the Telegram on July 2001. That article noted that a group of students had been advocating for bringing the minimum wage in the province up to the level of other provinces in Atlantic Canada [2].

While the repeal of this law may not have made much impact in the public discourse, the fact that this two-tiered minimum wage existed provides us with a natural experiment. Prior to 2002, the adolescents who transitioned to the age of 16 were eligible for a pay rise overnight. They were entitled to a rise in the wage that they could earn if they had been earning less than the minimum wage. As a result, adolescents who were formally employed automatically increased their potential income.

This automatic increase in wage is useful because it is analogous to an increase in the minimum wage of adolescent workers who are formally employed. This increase in discretionary income had the potential to change consumption patterns including that of alcohol overnight. We use this natural experiment to evaluate the effect of raising the minimum wage on alcohol use among adolescents.

### 3 Data and Econometric Strategy

#### 3.1 Main Regressions

The data set that we employ to analyze this question is the National Longitudinal Survey of Children and Youth (NLSCY). The NLSCY is a survey conducted by Statistics Canada with the main goal of understanding social, economic, and demographic trends affecting youth and children in Canada. It is a longitudinal survey that was conducted over the years 1994 to 2009 in two-year waves. The NLSCY allows us to identify youths living and working in Newfoundland and Labrador in order to analyze the effect of their transition into eligibility for the minimum wage.

We particularly focus on the time period just prior to the repeal of this two-tiered minimum wage. Our sample consists of adolescents living in Newfoundland and Labrador during the period January 1998 to December 2001. We restrict those included in our sample to within 18 months above and below the age of 16. We also exclude those adolescents who have never consumed alcohol from our sample.

We separate the sample into three groups; first is a group of adolescents who are formally employed in the workforce. These persons would be eligible for a hike in their wage when reaching the age of 16 and can be considered the treatment group. The second group is comprised of adolescents who are informally employed. While this group has an income, these adolescents are ineligible for mandated wage hikes when transitioning to the age of 16. The final group includes adolescents who are not in the labour market. These youths are not eligible for any wage hike and do not have any wage income. This restricts our sample to approximately 150 total adolescents. P-values for select demographic variables for the formal vs. other sample can be examined in Table 1.

We use two questions on adolescent alcohol use that the NLSCY asked of its respondents. The first question, on frequency of alcohol use, asked “how frequently have you consumed alcohol over the last 12 months?” The responses to this question allow us to determine whether the minimum wage rise influenced frequency of alcohol consumption. The second question asked “how frequently have you got drunk over the last 12 months?” This second variable of interest gives us some idea of intensity of alcohol use. Both questions classified responses into levels. These responses range from no use of alcohol to getting drunk “6-7 times per week”. The response to these survey questions

gives us the dependent variable in our regression.

Our econometric specification exploits the groups that we set up in the sample selection process. Thus we are interested in two independent variables and the interaction between these two variables. We are interested in the age of the youth in question and we are interested in the labour market status of that youth. Our regression is a difference-in-differences specification that exploits the age of eligibility for the minimum wage as the discontinuity point for the three groups that we compare against each other.

Why should this regression strategy demonstrate whether the minimum wage affects adolescent alcohol use? Our treatment group includes those adolescents who are formally employed. If there is any effect of this minimum wage hike on alcohol use, we should see it because formally employed adolescents are suddenly eligible for this rise in income. We can compare this result to those adolescents who are ineligible for this wage hike because they work informally or are unemployed. This comparison allows us to control for any inherent differences due to age and time related variables. Using a pre-post differences in these three groups and using the informally employed and unemployed as controls should give us some confidence in any effects we may find.

As this regression exploits a natural experiment and uses pseudo-control and treatment groups, we only control for one other confounder which is the age in months of the adolescent. Our regression is then an ordered logit model with frequency of alcohol use and frequency of getting drunk as the outcome variable. Our labour market groups are interacted with a dummy variable denoting whether the adolescent is over the age of 16. The specification of the regression is

$$C_i = A16_i\beta_1 + F_i\beta_2 + I_i\beta_3 + (A16_i \cdot F_i)\beta_4 + (A16_i \cdot I_i)\beta_5 + A_i\beta_6 + \epsilon_i \quad (1)$$

where  $C_i$  is defined as individual  $i$ 's adolescent alcohol use.  $A16_i$  is a binary that denotes whether an adolescent is above the age of 16.  $F_i$  is equal to one if the adolescent is employed in the formal labor market and  $I_i$  is equal to one if the adolescent is employed in the informal labor market. If these variables are both equal to zero, the adolescent is not employed. These two labour market variables are interacted with the binary age variable. Finally we add a variable  $A_i$  that is the age of the adolescent in months and  $\epsilon_i$  is an error term that is assumed to be independently and identically distributed. Our estimated effect of the minimum wage on frequency of alcohol use and getting drunk is then the coefficient on the interaction between formal labor market status and age dummy,  $\beta_4$ . Our regressions are re-weighted based upon sampling frequency weights provided by Statistics Canada.

## 3.2 Secondary Regressions

To demonstrate additional external validity of this natural experiment we also exploit the repeal of the law itself in May 2002. In order to do so we examine those persons in the formal labor market just prior and just after the repeal of the two-tiered minimum wage and compare the differences in this group to differences in the informal labor market group and the unemployed group. We restrict the sample of adolescents included to those under the age of 16 and to those respondents to the NLSCY who completed a survey in 2001 or 2002. We further exclude non-drinking adolescents

from this sample. This restriction allows us to compare a group of 14 and 15 year old persons who would not be eligible for the minimum wage *before* May 2002 to a very similar group of 14 and 15 year old adolescents eligible for the minimum wage just after May 2002. To do this we create a post-May 2002 dummy variable ( $Post2002$ ) equal to one if the interview was conducted after May 2002. We interact this with our labor market groups.

Our secondary regression is then much the same as our main regression. The interaction is between the labor market groups and whether the adolescent is in the pre-2002 group or post-2002 group. The regression is specified as

$$C_i = Post2002_i\alpha_1 + F_i\alpha_2 + I_i\alpha_3 + (Post2002_i \cdot F_i)\alpha_4 + (Post2002_i \cdot I_i)\alpha_5 + A_i\alpha_6 + \mu_i \quad (2)$$

where variables are specified as in the main regressions. We are interested in the coefficient on the interaction between the formal labour market group and the post-2002 dummy variable,  $\alpha_4$ .

## 4 Results

### 4.1 Primary Results

Table 1 demonstrates t-statistics on several descriptive variables for differences in means. From the descriptive statistics there are no statistical differences between the formally employed group and the group of adolescents in our sample who are not formally employed except on one variable - location of residence. This provides some justification that our labor market groups are not significantly different from each other on key variables.

Results from our regressions on frequency of alcohol use are presented in Table 2. As can be seen, the coefficient on our formal labor market interaction variable is not statistically significant. In fact other than the coefficients on the age dummy and the monthly age variable, nothing is significant in the marginal effects of the logit regression. As expected, as the age of an adolescent increases the probability that they will drink with increased frequency increases. In contrast though being over the age of 16 reduces the frequency of alcohol use and makes one much more likely to consume alcohol only a couple times a year or not at all. Being over the age of 16 increases the probability of these responses by 16.8% and 16.5% respectively. The only exception to these non-results is the the informal labor market interaction. Becoming 16 in the informal labor group is associated with a 6.6% increase in the chance that an adolescent will drink alcohol on a monthly basis significant at the 5% level. The marginal effects at other levels of alcohol use are insignificant otherwise.

Table 3 demonstrates our results on frequency of getting drunk among adolescents. Our results show that the interaction of age and the formal labor market significantly increases the probability of getting drunk on a regular basis relative to the unemployed sample and informally employed sample. The results are concentrated in a change from adolescents who do not get drunk on a regular basis to adolescents who get drunk once a month. At the margin our results show that being eligible for the minimum wage makes an adolescent 15.2% more likely to get drunk on a

monthly basis relative to the unemployed and informally employed. There is also a 20.5% decrease in the probability that a formally employed adolescent does not regularly get drunk relative to the unemployed and informally employed groups. As with frequency of alcohol use, as an adolescent ages it increases the probability that they will get drunk frequently and reduces the chance that they do not get drunk at all.

## 4.2 Secondary Results

Our secondary regression results exploiting the repeal of the two-tiered minimum wage law in Newfoundland and Labrador support our main results, although they are less significant. This may be due in part to reduced sample size. Nevertheless our regression show no effect of the minimum wage on formal labor market participant frequency of alcohol use. Similar to our primary regression results, the informal labour market group increases their frequency of alcohol use in response to the minimum wage and become 12.5% more likely to drink alcohol on a monthly basis. This result coincides with decreases in the probability of drinking alcohol with no frequency by 8.5% although this result is only significant at the 10% level.

Our results from regressions on frequency of getting drunk show that the formally employed group is significantly less likely to *not* drink to get drunk as a result of being eligible for the minimum wage. This is significant at the 1% level and suggests that the minimum wage was associated with a 48.6% reduction in the probability of being in this group relative to the informal group and unemployed group. We cannot say with any statistical certainty into which higher levels of drinking the minimum wage hike shifts adolescents from being non-drunks. All of the signs on the formal interaction group have positive coefficients which weakly support our primary results that the minimum wage hike was associated with a shift of adolescents from non-drunks to adolescents who became drunk with increased frequency.

In addition to these results, secondary regression on adolescent frequency of getting drunk demonstrates that the informally employed are much more likely to not get drunk at all. They are also less likely to drink relative to the rest of the sample from our differences in differences coefficient. The informally employed sample after the repeal of the law is associated with a 63.4% increase in probability that they do not get drunk.

## 5 Limitations and Robustness Checks

### 5.1 Causation

The first issue that we address is causation. While the exploitation of this particular policy change is not a randomized control trial, we will argue that our methodology is at least analogous to an RCT. We isolate the effect of an increase in wage by comparing those who are formally employed and over the age of sixteen to those who are formally employed and under the age of sixteen. This isolation ensures that we isolate the effect of the wage rise in this group, as we are comparing persons in the formal labor market against other persons in the formal labor market. This attempts to circumvent the issue of self-selection into the formal labor market that is inherent in many cohort



studies. We then compare the differences in this group to the differences in an unemployed group and an informally employed group to detrend the effects of confounding variables that relate to age.

To control for any differences related to age, we compare the differences in this treatment group to the differences in an unemployed group. This allows us to scrub out the effects of aging on alcohol consumption. Further, we attempt to exclude major effects of age by restricting the sample to those adolescents to adolescents relatively close to the age of 16.

Finally, to control for the interaction of age and income we also compare our treatment group to a group of adolescents who are employed but who are not in the formal labour market. We were particularly concerned that as adolescents transitioned to the age of sixteen there would be “birthday” effects and heavier drinking simply due to celebration of a milestone. This behaviour would be easier for employed adolescents as they have access to an income and so have the means to purchase alcohol. Thus we use a group of adolescents who are informally employed to control for this interaction effect. This provides an additional robustness check against selection problems in the formal labor treatment group, as one could argue that those adolescents in the formal labor group would be similar (or at least more similar) to the informally employed than those in the unemployed group.

Despite these controls, we cannot exclude the possibility that persons who are in the formal labor market and who are over the age of 16 have different characteristics than those under the age of 16. It may be that other omitted variables are driving those persons under the age of 16 into the formal labor market when compared to those over the age of 16. Indeed, adolescents may be entering the formal labor market *because* of the minimum wage and so have higher reservation wages. We present some statistics below on effect size that attempt to exclude this as a possibility. We further demonstrate that on most key variables (Table 1) there are not significant differences between the formally employed and other groups of adolescents except that the formally employed are more likely to live in urban centres. Controlling for this variable in our regressions does not change our results. Ultimately we cannot fully exclude an omitted variable as a possibility.

## 5.2 Effect Size

One of the major limitations with our analysis is that we cannot quantify the effect of the minimum wage hike on alcohol use. We do not have the actual wage that the adolescents are paid in either the formal or informal labor markets. Thus we do not know how much of a wage rise we are measuring when formally employed adolescents become eligible for the minimum wage. We assume that those adolescents employed in the formal labor market are getting a wage rise. It may be that this wage rise is large, or it may be small, but we cannot make a concrete statement that an increase in the wage of adolescents by a certain amount will lead to a precise estimate of increased probability of drinking. We can only say that adolescents in our sample who likely get higher wages used it to get drunk more often.

The size of this effect depends on how close the market clearing wage is to the minimum wage. If the market clearing wage is close to the minimum wage, then on average what we are estimating is a very small change in the effective wage translating into significant increases in the amount that an adolescent consumes alcohol. If this market clearing wage is actually much lower than the minimum

wage then what we are estimating is how much a large increase in the wage rate for adolescents translates into higher alcohol consumption. We are unable to find any relevant literature estimating actual market clearing wages for adolescents and so are unable to make any judgements on how theoretically large this rise could be in reality. Knowing this value would also be relevant to the previous limitation of causation as if the market clearing wage is close to the minimum wage, the chance that adolescents are entering the labor market because of the minimum wage is much lower.

To attempt to address this pitfall in our analysis we have examined public use data from the Labour Force Survey conducted by Statistics Canada. From this data we can glean the average wages paid to an age group in a province during a certain year, as well as the lowest wages paid out in the sample. This data will at least give us a clue of how different those who earn the market wage are from those who earn the minimum wage, even if it does not necessarily show the wages of our NLSCY sample. We examine the average, median, and lowest wage of those in the sample of Newfoundland and Labrador workers in the 15 to 16 age group over 1998 to 2001 (Figure 1). Over the four years examined, the average wage of this age group is in fact *above* the minimum wage and the lowest wage paid out to a worker is never less than 50 cents per hour below minimum wage. We leave it to the reader to decide whether this is a large or small difference between market-clearing wage and minimum wage.

### 5.3 Sample Size

The final criticism of our study that we address is sample size. As presented in our regressions, the sample that we examine is relatively small and never greater than 150 adolescents. We attempt to get around the possibility that these effects are not externally valid by using sampling weights provided by Statistics Canada based upon census sampling values of Newfoundland and Labrador. Nevertheless, given the small numbers in this study in both the formally employed and informally employed group of adolescents, results should be treated with caution.

## 6 Discussion

Our research demonstrates the link between labour market policy and health among adolescents. We show that between the period of 1998 and 2001 adolescents in Newfoundland and Labrador who became eligible for the minimum wage consumed alcohol to get drunk more often than those adolescents who were informally employed or unemployed. We also demonstrate that even though this was the case, adolescents in the formal labour market did not have increased probability of drinking alcohol more frequently.

How do we reconcile these two results? It seems as though the increase in the wage of those adolescents in the formal labor market did not increase the frequency of alcohol consumption but did increase their intensity of alcohol consumption. The treatment group drank as frequently but got drunk more often as compared to the informally employed and unemployed. We speculate that this is likely a function of the way that adolescents consume alcohol. A body of previous literature shows that much of alcohol use in this age group is driven by peer effects [5, 6, 10]. If adolescents require social interaction to augment alcohol use and not everyone in their peer network is eligible

for wage rises, then those adolescents who get the wage hike do not drink more frequently. Instead, they may intensify consumption of alcohol when their friends can drink as well. This results in higher frequencies of getting drunk without any statistical effect on frequency of alcohol consumption.

This possibility is interesting because it provides some indication that there are externalities among adolescent drinkers. Reducing the incomes of some of an adolescents social group may lead to knock-on effects and reduce other adolescents consumption of alcohol as well. If your friends cannot drink, you are consequently less likely to drink, or so the logic goes. More research on this point is crucial, as examination of the networking effects of alcohol use in adolescents could lead to economic anti-drinking strategies that are much more effective and efficient.

Moving on to policy considerations, the broader point that we would like to make is that raising the minimum wage seems to have negative inadvertent effects on the health of adolescents. Given the current interest in raising the minimum wage, it is important to stress that few labour market policies as blunt as the minimum wage are completely benign even if they are well-intentioned. Minimum wage hikes may be beneficial and can be beneficial to the overall health of populations, but caution should be exercised when considering them. Our result is suggestive that more targeted approaches need to be considered if we are to use a labor policy like the minimum wage for health improvement.

We argue that careful consideration of labor policy with regard to health is important for policy makers to fully understand. However, the reverse side of this argument is that labour market policy can be an effective, if non-traditional, avenue for health change. There has been a deep and far-reaching literature on the social determinants of health and poverty reduction certainly counts itself as an effective health improvement strategy. Our results demonstrate that increasing the wage of adolescents can affect their health and health practices in negative ways.

Tying these two ideas together, though, yields a negative overall outlook for the minimum wage as a health improvement policy, especially in light of discussion surrounding alternative means of providing assistance to people with low incomes. Other more directed anti-poverty strategies may be better for targeting income support to poor families while avoiding the unintended side effects like those discussed in this paper. These may be more fruitful and efficient health improvement strategies than increasing the minimum wage.

## 7 Conclusion

We have shown in this paper that minimum wage increases can lead to adverse health practices among adolescents. Using a difference in differences regression, we exploited a two-tiered minimum wage in the province of Newfoundland and Labrador to demonstrate this result. Using formally employed adolescents as a treatment group, we compared the change in alcohol consumption and heavy alcohol consumption in this group to control groups of unemployed and informally employed adolescents. These two groups would not have been eligible for a mandated wage increase but would be similar in many of their other aspects and in their ages.

Our results show that increasing the wage of adolescents in Newfoundland and Labrador led to increased levels of using alcohol heavily or getting drunk. Our results also show no evidence that this increase led to increased frequency of alcohol use. We speculated that this result is due to the social nature of alcohol use among this age group. Adolescents do not drink more frequently as a result of this increase in income, but when they do consume alcohol they drink more than they would have without their wage increase.

Finally, our results have some implication for health policy. On one hand, our results show the potent ability of labor market policy to affect health practices. Policy makers can change health for better or worse through labour market variables. On the other hand, our results also show that well-intentioned policies can have adverse affects. Attempts to reduce poverty or inequality through the minimum wage may have unintended consequences that should be taken into account during the process of policy making.

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## A Tables and Figures



Figure 1: Wage characteristics of 15 and 16 year old workers in Newfoundland and Labrador

Table 1: Table of Sample Characteristic P-Values

Characteristic	P-value of mean (Formal vs. Other)
Wave	0.3302
Gender	0.3834
Residence Area	0.0089
Age in Months	0.3170
Household Income*	0.9296
Single parent status*	0.9937
How many close friend drink alcohol?*	0.3312

\* Due to data availability these p-values are only for the sample in wave 4.

Table 2: Marginal effects on frequency of alcohol use

Variable	No regular alcohol use	A couple times a year	1-2 times per month	$\geq 1$ times per week
Age over 16	0.165**	0.168***	-0.185***	-0.261**
Formally employed	-0.00989	-0.0153	0.0119	0.0184
Informally employed	0.0218	0.0280	-0.0285	-0.0339
Formal · Age over 16	-0.0537	-0.108	0.0382	0.143
Informal · Age over 16	0.0898	0.0659**	-0.124	-0.100
Age in Months	-0.00946**	-0.0139**	0.0117**	0.0167***
N	149			
Model F-Stat	3.78			

\*\*\* - Significant at the 1% level \*\* - Significant at the 5% level \* - Significant at the 10% level

Note: Due to responses all adolescents above the level of “ $\geq 1$  times per month” are classified as “ $\geq 1$  times per week”



Table 3: Marginal effects on frequency of getting drunk

Variable	Does not get drunk	A couple times a year	1-2 times per month	1-2 times per week	3-5 times per week	6-7 times per week
Age over 16	0.168	0.0113	-0.100	-0.0673	-0.00332	-0.00827
Formally employed	0.170	-0.0341	-0.0807*	-0.0470	-0.00221	-0.00547
Informally employed	0.0733	-0.00580	-0.0396	-0.0239	-0.00114	-0.00282
Formal · Age over 16	-0.205***	-0.256	0.152**	0.247	0.0169	0.0447
Informal · Age over 16	0.233	-0.0787	-0.0944	-0.0517	-0.00239	-0.0059
Age in Months	-0.0146*	-0.00141	0.00909*	0.00593	0.000289	0.000718
N	139					
Model F-Stat	2.21					

\*\*\* - Significant at the 1% level \*\* - Significant at the 5% level \* - Significant at the 10% level

Table 4: Marginal effects on frequency of alcohol use - Post -2002

Variable	No Alcohol use	A couple times a year	1-2 times per month	Weekly or more often
Post-May 2002	0.0214	0.00548	-0.0406	-0.0193
Formally employed	-0.00123	-0.000562	0.00231	0.00120
Informally employed	-0.0331	-0.0263	0.0606	0.0383
Formal · Post-2002	0.0427	-0.00342	-0.0838	-0.0351
Informal · Post-2002	-0.0856*	-0.128	0.126**	0.160
Age in Months	-0.00860	-0.00383	0.0162	0.00835
N	74			
Model F-Stat	9.53			

\*\*\* - Significant at the 1% level \*\* - Significant at the 5% level \* - Significant at the 10% level

Note: Due to responses all adolescents above the level of “1-2 times per month” are classified as “Weekly or more often”

Table 5: Marginal effects on frequency of getting drunk- Post -2002

Variable	Does not get drunk	A couple times a year	1-2 times per month	1-2 times per week	$\geq$ 1-2 times per week
Post-May 2002	0.0888	-0.0729	-0.0113	-0.00306	-0.00157
Formally employed	0.189	-0.159	-.00215	-0.00578	-0.00296
Informally employed	0.634***	-0.516***	-0.0829*	-0.0233	-0.0121
Formal · Post-2002	-0.486***	0.160	0.199	0.0800	0.0473
Informal · Post-2002	0.328***	-0.285***	-0.0311*	-0.00819	-0.00416
Age in Months	-0.0276	0.0222	0.00381	0.00105	0.000539
N	68				
Model F-Stat	6.15				

\*\*\* - Significant at the 1% level \*\* - Significant at the 5% level \* - Significant at the 10% level

Note: Due to responses all adolescents above the level of “1-2 times per week” are classified as “ $\geq$  1-2 times per week”