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## Keskusteluaiheita – Discussion papers

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### **ALCOHOL CONSUMPTION AND SICKNESS ABSENCE: EVIDENCE FROM PANEL DATA**

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**ABSTRACT:**

*Objective:* This paper examines the relationship between alcohol consumption and sickness absence.

*Methods:* We use regional panel data from Finland over the period 1993-2005. The data on individuals' health that we are using originates from Health Behaviour and Health among the Finnish Population conducted by the National Public Health Institute. To control for the effect of economic conditions on the prevalence of sickness absence, we aggregate Health Behaviour and Health among the Finnish Population to the regional level. Then we link the data, using information on individuals' residence, to the regional statistics produced by Statistics Finland. Panel data allows us to control for unobserved determinants of lifestyle behaviours associated with the region and survey year.

*Results:* The results show that alcohol consumption is associated with sickness absence, and particularly so for men. Therefore, the earlier aggregate time-series evidence from Sweden is largely confirmed in a regional panel data setting.

*Conclusion:* It is important to take into account the effects of alcohol consumption on sickness absence when considering the appropriate level of taxation of wines and spirits in Nordic countries.

**JEL: I10**

**Keywords:** Alcohol consumption; sickness absence

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**TIIVISTELMÄ:** Tutkimuksessa tarkastellaan alkoholin kulutuksen ja sairauspoissaolotodennäköisyyden välistä yhteyttä Suomen maakunnissa vuosina 1993-2005. Käyttämämme data on Kansanterveyslaitoksen Suomalaisen aikuisväestön terveystietojen -aineisto, josta muodostetaan alueellinen paneeliaineisto. Tulokset osoittavat, että alkoholin kulutus korreloi positiivisesti sairauspoissaolotodennäköisyyden kanssa, ja erityisesti miesten osalta.

**JEL: I10**

**Asiasanat:** Alkoholinkulutus; sairauspoissaolo

## 1. Introduction

Sickness absence constitutes a substantial loss of actual working time. Therefore, it is not surprising that there are a growing number of studies that have analysed the factors that have an influence on the prevalence of sickness absences (e.g. [1]). Health behaviour has a bearing on sickness absence, based on the evidence. In particular, there is a strand of literature that has put forward an argument according to which heavy drinkers have substantially higher rates of sickness absence (e.g. [2-3]). It has been an open question whether the relationship between alcohol consumption and sickness absence prevails at more moderate levels of alcohol use. In an important recent contribution, Norström [4] argues by using aggregate time-series evidence from Sweden over the period 1935-2002 that overall per capita alcohol consumption is strongly associated with sickness absence. Alcohol consumption turns out to be an essential determinant of sickness absence in Sweden even when taking into account the effects of unemployment and real wages. This is a rather provocative claim.

Norström [4] admits that the time-series evidence is rarely conclusive, because it is possible that there is some third factor (shifts in preferences over time, among others) that has an influence on both per capita alcohol consumption and sickness absence. For this reason, the time-series association between the variables of interest can be spurious. However, the issue can be tackled by using regional panel data, where both time-series and cross-sectional variation is present. In this paper, we estimate fixed-effects models that exploit within-region changes in alcohol consumption. In particular, the use of regional panel data allows us to control for unobserved determinants of lifestyle behaviours associated with the region and survey year. Our approach is similar to the one adopted by Ruhm [5] to examine the effect of overall economic conditions on health and health behaviour.

This paper uses regional panel data from Finland over the period 1993-2005. The Finnish case is interesting, because there have been an increase in the number of sickness absence since the end of the great depression of the early 1990s. At the same time, there has been an increase in alcohol consumption. It is interesting to see whether these two are connected. Furthermore, the issue is highly policy-relevant, because taxation has a lot of influence on the overall price level of wines and spirits in all Nordic countries and real prices have substantial influence on the consumption of alcohol beverages (e.g. [6]).

## **2. Materials and methods**

### *2.1. Data*

The data on individuals' health that we are using originates from Health Behaviour and Health among the Finnish Population conducted by the National Public Health Institute. This repeated cross-sectional data resembles data from the surveys done for the US Behavioral Risk Factor Surveillance System. The Finnish surveys on health and health behaviour started in 1978. They have been repeated annually, using samples of 5 000 randomly selected 15-64-year-old permanently resident citizens. Hence, the survey constitutes a representative sample of Finns. The sample frame excludes non-citizens, about 4% of the population. The survey was carried out as a postal questionnaire. On average, 73% of those targeted responded. The core questions have remained the same over the years. The survey contains detailed self-reported information on health and health behaviour. The aggregation of the survey to the regional level is arguably able to diminish the amount of idiosyncratic measurement error in self-reported measures of drinking.

For this paper, the most important fact is that the survey contains information about sickness absence. This information is available over the period 1993-2005. Sickness absences are self-reported, but there is no particular reason to believe that employees would give systematically biased answers to this particular question, because their identity is not revealed to their employers. The most important advantage of information recorded in the survey is that it also contains information on short sickness absences that are not recorded by the Social Insurance Institution (KELA), which pays out sickness benefits to the affected employees. The reason for this is that short sickness absences do not entitle employees to payment of sickness benefits, but they obtain normal pay from the employers. This is essential, because most of the sickness absences are presumably short. Furthermore, relevant socioeconomic background variables such as gender and education, important for sickness absence, are reported in the survey.

To control for the effect of economic conditions on the prevalence of sickness absence, we aggregate Health Behaviour and Health among the Finnish Population to the regional level. Then we link the data, using information on individuals' residence, to the regional statistics produced by Statistics Finland. Individuals' residence is aggregated to eighteen provinces that correspond to the so-called NUTS3 regions stipulated by the European Union. In this paper, economic conditions are measured by the regional unemployment rate. We include the gender-specific regional unemployment rates among the explanatory variables to all models, because the earlier evidence from Nordic countries shows that unemployment is an important determinant of sickness absences (e.g. [1, 7]).

The variables that we are using are described in Table 1. Descriptive statistics show that Finnish women are more likely to report a positive number of sickness absences. (Tables 2-3). Holmlund [1] notes that it has become a stylised fact of the literature that women

have higher sickness absence rates. There has also been a slight upward trend in sickness absence, both for men and women (Table 2). Furthermore, sickness absences are more common in the province of Uusimaa that constitutes the region around the Helsinki metropolitan area (Table 3), where unemployment is lower compared to Eastern and Northern Finland. Arguably, the regional variation is useful when identifying the effect of alcohol consumption on sickness absence.

## 2.2. Methods

The models that we estimate have the following general structure:

$$Y_{jt} = \alpha_j + \beta X_{jt} + D_{jt} + \lambda_t + \varepsilon_{jt}$$

where  $Y$  is the outcome (the share of individuals that have reported at least one sickness absence day) for those living in province  $j$  in year  $t$ .  $X$  is a vector of aggregated individual-level characteristics for provinces,  $D$  represents the variable of interest, which is the average number of alcohol units consumed per week per person (1 unit = 4 cl of alcohol) in the province,  $\alpha$  and  $\lambda$  represent unobserved determinants of lifestyle behaviours associated with the region and survey year, and  $\varepsilon$  is an error term. Furthermore, in addition to the variables shown above, the gender-specific regional unemployment rate is included to all models, as noted earlier. In these fixed-effects model, the effect of alcohol consumption on sickness absences is identified by intra-region variations, relative to the corresponding changes in other regions. This helps us to avoid identifying spurious relations. In additional specifications, we also include individual-level controls (the years of education, age, age squared and marital status) that have been aggregated to the regional level.

We report all estimation results separately for men and women, because of biological, social norm and occupational structure differences between men and women. If we would pool observations both for men and for women in the estimation of the models, we would impose the restriction that the determination process of sickness absences is exactly the same between men and women. Consequently, by estimating the models separately for men and women, we allow that the same independent variables have different coefficients for men and women.

#### **4. Results**

We discover evidence according to which sickness absences are less common in the regions of higher unemployment, which is in line with the observations from other Nordic countries (e.g. [1, 7]). The most interesting finding that stems from the estimations is that sickness absence is positively related to alcohol consumption for both men (Table 4) and women (Table 5) in a panel data setting. However, it is important to note that we do not find statistically significant positive effect when we include regional dummies, but not year dummies to the models. Having said that we prefer the results obtained from the models in which we have taken the existence of time trends into account, because there have been overall fluctuations in sickness absence over the period 1993-2005, as shown earlier in Table 2. Moreover, the estimation results are statistically weaker when we include both regional and year dummies to the models (Tables 4-5). Standard errors for the estimates increase, but the point estimate for alcohol consumption remains reasonably similar especially for men. In this respect, it is important to keep in mind that all models include the gender-specific regional unemployment rates among the explanatory variables. Therefore,



including both regional and year dummies along with the gender-specific regional unemployment rates to the models arguably leaves too little variation in the data in order to identify the relationship that would be statistically significant. To examine robustness of our baseline findings, we have estimated the models by including individual-level characteristics to the models (Tables 6-7). All in all, the conclusions remain the same. The main difference to the earlier models is that when we include individual-level control variables to the models, we obtain somewhat stronger evidence for the relationship between alcohol consumption and sickness absences for men in the model in which we include both regional and year dummies. The opposite prevails for women, however.

## **5. Conclusions**

This paper examines the relationship between alcohol consumption and sickness absence. We use regional panel data from Finland over the period 1993-2005. Panel data allows us to control for unobserved determinants of lifestyle behaviours associated with the region and survey year. The results show that alcohol consumption is associated with sickness absence, and particularly so for men. Therefore, aggregate time-series evidence from Sweden provided by Norström [4] is largely confirmed in a regional panel data setting. This observation carries a clear lesson that has been overlooked in recent policy discussions. Namely, it is important to take into account the effects of alcohol consumption on sickness absence when considering the appropriate level of taxation of wines and spirits in Nordic countries.

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Table 1. Definition of the variables.

Variable	Definition/explanation
Sickness absences	Share of individuals in a region with at least one sickness absence day in a year
Drinks	Number of alcohol units consumed per week (1 unit = 4 cl of alcohol)
Regional unemployment	Gender-specific regional unemployment rate
Age	Age in years
Age squared	Age in years squared
Education	The years of education

Table 2. Share of individuals with at least one sickness absence day by gender and year.

	Men	Women
1993	0.548	0.603
1994	0.563	0.652
1995	0.543	0.608
1996	0.599	0.640
1997	0.580	0.647
1998	0.591	0.630
1999	0.606	0.638
2000	0.590	0.644
2001	0.602	0.653
2002	0.607	0.637
2003	0.594	0.666
2004	0.598	0.641
2005	0.615	0.668

Source: Authors' calculations from Health Behaviour and Health among the Finnish Population.

Table 3. Share of individuals with at least one sickness absence day by gender and region.

	Men	Women
Uusimaa	0.64	0.72
Varsinais-Suomi	0.61	0.68
Satakunta	0.57	0.64
Häme	0.62	0.67
Pirkanmaa	0.61	0.65
Päijät-Häme	0.57	0.65
Kymenlaakso	0.59	0.62
South Karelia	0.60	0.65
Etelä-Savo	0.55	0.65
Pohjois-Savo	0.58	0.63
North Karelia	0.54	0.62
Central Finland	0.58	0.64
South Ostrobothnia	0.60	0.61
Ostrobothnia	0.59	0.62
Central Ostrobothnia	0.57	0.68
North Ostrobothnia	0.60	0.65
Kainuu	0.59	0.55
Lapland	0.54	0.61

Source: Authors' calculations from Health Behaviour and Health among the Finnish Population.

Table 4. Estimated effect of alcohol consumption on the share of individuals with at least one sickness absence day, men.

Variable	(1)	(2)	(3)	(4)
Drinks	0.006** (2.01)	0.003 (0.90)	0.006** (2.14)	0.004 (1.23)
Regional unemployment	-0.004** (-4.14)	-0.004*** (-4.73)	-0.004** (-2.53)	-0.009** (-2.01)
Regional dummies	No	Yes	No	Yes
Year dummies	No	No	Yes	Yes
N	234	234	234	234

Note: Robust t statistics in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Table 5. Estimated effect of alcohol consumption on the share of individuals with at least one sickness absence day, women.

Variable	(1)	(2)	(3)	(4)
Drinks	0.016** (2.31)	0.005 (0.85)	0.019** (2.27)	0.010* (1.53)
Regional unemployment	-0.005** (-3.58)	-0.003** (-2.54)	-0.006** (-2.42)	0.008* (1.59)
Regional dummies	No	Yes	No	Yes
Year dummies	No	No	Yes	Yes
N	234	234	234	234

Note: Robust t statistics in parentheses. \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

Table 6. Estimated effect of alcohol consumption on the share of individuals with at least one sickness absence day, men.

Variable	(1)	(2)	(3)	(4)
Drinks	0.007** (2.15)	0.004 (1.25)	0.008** (2.39)	0.006* (1.85)
Regional unemployment	-0.004** (-3.48)	-0.007** (-5.64)	-0.004** (-2.04)	-0.011** (-2.38)
Regional dummies	No	Yes	No	Yes
Year dummies	No	No	Yes	Yes
N	234	234	234	234

Note: Regressions include unreported controls for the years of education, age, age squared and a dummy indicating whether an individual is married or cohabiting.

Table 7. Estimated effect of alcohol consumption on the share of individuals with at least one sickness absence day, women.

Variable	(1)	(2)	(3)	(4)
Drinks	0.013** (2.41)	0.003 (0.53)	0.017** (2.16)	0.009 (1.14)
Regional unemployment	-0.004** (-2.90)	-0.001 (-0.89)	-0.005** (-2.51)	0.006 (-1.45)
Regional dummies	No	Yes	No	Yes
Year dummies	No	No	Yes	Yes
N	234	234	234	234

Note: Regressions include unreported controls for the years of education, age, age squared and a dummy indicating whether an individual is married or cohabiting.

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