Reduced affordability of cigarettes and socio-economic inequalities in smoking continuation in Stakhanov, Ukraine, 2009

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The recent tobacco excise tax increase and economic crisis reduced cigarette affordability in Ukraine dramatically. Using survey data from Stakhanov (n = 1691), eastern Ukraine, we employed logistic regression analysis to examine whether socio-economic status was associated with the continuation of smoking in this environment in 2009. Low education (in women) and ownership of household assets (in men) were negatively associated with smoking continuation, whereas a positive association was found for personal monthly income. Our findings suggest that in a low-income setting where efficient cessation services are absent, reduced cigarette affordability may have only a limited effect in cutting down smoking.

Introduction

Reducing cigarette affordability has been regarded as the most efficient means of cutting tobacco consumption in high-income countries.¹ In Ukraine, as part of comprehensive tobacco control measures, the minimum tobacco excise tax increased by 5.6 times from September 2008 to May 2009.² Cigarette affordability was further reduced by the global economic crisis that hit the Ukrainian economy particularly hard, with GDP per capita dropping by ~35%, i.e. to 2545 US$ in 2009.³ Evidence from econometric studies from high-income countries suggests that increasing tax is more effective in reducing smoking in lower income groups.⁴ In lower income countries such as Ukraine, low socio-economic status is more likely to be linked to absolute poverty. Poverty has been shown to have an independent association with both higher smoking prevalence and lower quit ratios.⁵ Given this, it is possible that in Ukraine, smokers from lower socio-economic groups might be less sensitive to changes in cigarette prices and be more likely to continue smoking. We examine whether in conditions of severely reduced affordability of cigarettes, the propensity to continue smoking differs by socio-economic status by using survey data from Stakhanov, a small city in eastern Ukraine located near the Russian border.

Methods

The Stakhanov Health Interview Survey 2009 involved 3000 face-to-face interviews with individuals aged ≥18 years, randomly selected from a household-based sampling frame. The response rate of the primary sample was 88.8% (n = 2664) and the survey details are published elsewhere.⁶ We intended to primarily study the working-age population and thus restricted our analysis to the 20–64 years age group. After excluding cases with missing data (n = 154) our final sample included 546 men and 1145 women.

‘Smoking continuation’ refers to the proportion of current smokers among ever smokers, which includes both daily and occasional smokers (<3% of current smokers). For ‘educational level’ the respondents were classified into high (covering university level education), mid (combining general secondary and secondary professional ‘tehnikum’ education) and low educational groups (corresponding to less than general secondary or elementary vocational education). By ‘economic activity’ respondents were categorized as employed, unemployed or non-active. For ‘personal income’ respondents were asked to state their average personal monthly income from all sources (e.g. salary, pension, allowances, scholarships and alimony). This variable was divided into quintiles. A ‘household assets’ variable measured accumulated wealth over a longer period and was based on questions asking about the ownership of six items: a ‘dacha’ (countryside house), hot water in the house/flat, central heating, a modern washing machine, internet access and a car. These assets were summed for each respondent who were then divided into four groups: those having five to six assets, those having three to four, those having two and those having none or only one of these assets.

All prevalence figures were age-standardized by using the direct method with the total population of the Stakhanov administrative area in five-year age groups (as of 1 January 2009) as the standard. The associations with socio-economic variables were assessed using multiple logistic regression analysis. The SPSS 20 statistical software package was used for all calculations.

Results

Overall, 74% of all men and 28% of all women in the 20–64 years age group in Stakhanov had ever initiated smoking and 62% of men and 23% of women were current smokers (data not shown), which yields a continuation ratio of 84% for men and 78% for women (table 1). A strong negative educational gradient was found for smoking continuation among women, but not in men. The ownership of household assets was strongly and inversely associated with smoking continuation among men. The poorest
men had four times higher odds to continue smoking compared with the wealthiest. Among women, the association was not statistically significant. In contrast to the household wealth measure, men and women with the highest personal income had the highest odds to continue smoking. No statistically significant association with smoking continuation was found for economic activity, though unemployed women had an elevated risk for continuation.

Discussion

This study found a particularly strong association between household wealth and smoking continuation among men. In studies from high-income countries using multiple indicators, the measure of accumulated wealth, but not household income, also had a strong inverse association with smoking prevalence indicating that long-term poverty and not merely current purchasing power may predict smoking. There are several ways in which poverty may impact on smoking. Research in other contexts has shown, for example, that smoking may be used as a means for dealing with stress among poor individuals. Financial stress has been linked to lower rates of quitting and a higher relapse rate among ex-smokers. In addition, poverty has been associated with the use of higher nicotine content cigarettes and a higher smoke intake possibly increasing poor individuals’ nicotine dependence.

In contrast to household wealth, personal monthly income was positively associated with smoking continuation in Stakhanov. High personal income was predictive of smoking continuation among both men and women. Compared with household assets, monthly income may be more sensitive to sudden economic changes (e.g. job loss). Personal monthly income is more likely to reflect individually available resources to buy cigarettes and may therefore be more directly linked to the affordability of cigarettes. Our finding thus supports the view that price increases may have a higher impact on low-income earners in terms of smoking cessation. A recent study indicating increasing smoking prevalence among high-income earners in Ukraine is in line with our findings. However, the contrasting results also highlight the fact that different measures of material wealth may carry different meanings which have to be considered when assessing the effect of tax increases on smoking in different socio-economic groups.

Despite recently implemented tobacco control policies, some evidence suggests that the enforcement of tobacco control legislation has remained weak in Ukraine possibly due to the high social tolerance of smoking and broad acceptance of illegal activities. The cross-border smuggling of cigarettes from neighbouring Russia as a result of price differences between cheap cigarette brands in the two countries after the 2008 tax increase in Ukraine may also explain the generally very high continuation rates in Stakhanov. Moreover, the success of tobacco policies also depends on the availability of cessation services. The use of professional smoking cessation services has been extremely low among former smokers in Ukraine partly because cessation services are almost absent. This may be important for understanding our results, as the less advantaged, who have a higher degree of dependence, may have more difficulty in quitting by themselves, as possibly witnessed by the association we observed between lower female education and smoking continuation in this setting.

Some limitations of this study must be considered. First, our measure of smoking continuation reflects quitting over the entire life course, and we may have missed recent trends in smoking cessation rates, which may have been different from the long-term trends. Further research focusing on more recent trends in smoking cessation in Ukraine is thus required. Second, our smoking measure was based on self-reports that may result in an underestimation of cessation rates in Stakhanov. Moreover, the success of tobacco policies also depends on the availability of cessation services. The use of professional smoking cessation services has been extremely low among former smokers in Ukraine partly because cessation services are almost absent. This may be important for understanding our results, as the less advantaged, who have a higher degree of dependence, may have more difficulty in quitting by themselves, as possibly witnessed by the association we observed between lower female education and smoking continuation in this setting.

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Conclusion

The positive association between personal monthly income and smoking continuation suggests that reduced cigarette affordability may have had some effect in reducing smoking among low-income earners. However, the inverse association of household wealth...
(among men) and educational level (among women) with smoking continuation indicates that this effect is limited, possibly because of poverty and because efficient cessation services are absent.

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**Conflicts of interest**: None declared.

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**Key points**

- Recently, the cigarette affordability was severely reduced in Ukraine.
- Low education (among women) and low household wealth (among men) predicted higher odds of smoking continuation in Stakhanov, Ukraine.
- Low personal monthly income predicted lower odds of smoking continuation independent of other socioeconomic measures.
- In conditions where overall living standards are low and smoking cessation services are absent, tobacco control legislation may have a limited effect in reducing smoking.

**References**