FREE Policy Brief Series

Can Anti-Smoking Campaigns Increase Obesity? Evidence from Belarus

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May, 2013

In this brief, we discuss the possible effects of an anti-tobacco campaign on obesity levels in Belarus based on results of Amialchuk et al (2012). Both smoking and obesity are among the main health concerns in Belarus. Negative correlation between smoking and body weight is well documented, but can anti-tobacco campaign cause an increase in obesity rates? Results of studies from developed countries provide mixed evidence. In Amialchuk et al (2012), we use household survey data from Belarus to establish the link between smoking and body mass index (BMI). We use cigarette prices and regional smoking prevalence as instruments for smoking, and find a negative effect of smoking on BMI. Moreover, using the quantile regression approach, we find that smoking has different effects on body weight for different BMI quantiles, with the largest negative effect in the upper part of the conditional BMI distribution. These findings suggest that anti-tobacco campaigns may slightly increase obesity rates, and campaigns should therefore ideally also include measures to promote a healthy lifestyle. On the other hand, the potentially modest weight gain from an anti-tobacco campaign is likely to be more than offset by the general improvements in health.

Smoking and Obesity in Belarus

Smoking prevalence in Belarus, like in many other transitional countries, is quite high. According to the Belarusian Household Survey of Income and Expenditure from 2010, the smoking rate was 26%, with a much higher prevalence of among men (49.3%) compared to women (9.5%).[1]

Despite the troubling levels of smoking prevalence, little has been done to combat smoking in Belarus. While most of the post-Soviet economies liberalized the tobacco industry, it remains under government control in Belarus. The profits of the state-owned cigarette producers, along with tobacco taxes, constitute an important part of Belarusian budget revenues. This might explain why the Belarusian government has not engaged in anti-tobacco campaigns in the past. However, Belarus is currently implementing Anti-Tobacco Plan for 2011-2015 in cooperation with the World Health Organization.

The Anti-Tobacco Plan includes a variety of anti-tobacco actions and measures. In particular, the government has plans to gradually increase tobacco taxes, introduce smoking-free zones and restrict smoking in public places, along with a massive informational campaign about the dangers of

[1] The social norms explain difference in smoking rates of men and women. In younger population, however, gender differences in smoking rates are less pronounced.

smoking and ways to quit. These measures have the potential to lead to a significant decrease in smoking prevalence. However, an unintended consequence of these policies might be an increase in overweight and obesity rates.

In fact, obesity is another important health problem of Belarus. In 1996-2008, (the period of analysis in Amialchuk et al (2012)), the mean BMI among adults was 26, which suggests that an average Belarusian adult is just on the borderline between healthy weight and overweight. In particular, 34% of adults are overweight, while approximately 15% of adults are obese. Moreover, the distribution of weight status has undergone substantial changes over time: the percentage of individuals in the right tail of the BMI distribution has increased over time, with the percentage of obese increasing faster than the percentage of overweight individuals.

The Link between Smoking and Obesity

The negative relationship between smoking and body weight is well-documented in the medical literature. This inverse relationship is mostly attributed to how smoking affects body weight by boosting metabolism and suppressing appetite. However, causality is usually difficult to establish: for example, a smoking person may also be more likely to eat unhealthy foods and care less about their health in general. Nevertheless, most of the previous studies have found a significant negative effect of smoking on body weight.

Since in many developed countries, the decrease in smoking prevalence coincided in time with the surge in both overweight and obesity rates, the question arises whether anti-smoking campaigns are in part responsible for the increase in obesity rates. However, the evidence on the effects of anti-tobacco campaigns on overweight/obesity rates in developed countries is mixed. Some studies do not find any significant effect on obesity (Nonnemaker et al, 2009).

Evidence from Belarus

As mentioned above, smoking behavior and BMI may be jointly determined, and to deal with the challenge of establishing causality, we utilize the method of instrumental variables analysis. We employ two instrumental variables in our estimation: (i) the mean number of cigarettes smoked per day in the same year-region-gender- and education group as the respondent, and (ii) the average yearly price per pack of cigarettes in the region where the respondent lives. Gilmore et al. (2001) identify important demographic and socio-economic differences in smoking rates, which dictates our use of gender and education categories (below secondary, secondary, university degree) to construct groups of observations that will be followed over time. The use of region as a grouping variable allows us to capture the social norm associated with smoking at the regional level. We exclude the individual's own cigarette smoking when we create group-level means. Group-specific smoking prevalence is likely to be predictive of the individual's own smoking preferences, but is unlikely to have a direct effect on individual's weight status other than through the effect on individual's smoking. After accounting for the fixed differences in average smoking among regions, gender, and education groups within each year, the source of variation that is available to identify the effect of the instrument on individual's smoking is the differences in smoking prevalence among various interactions of year, region, gender and education categories.

We use lagged prices as instrument for current year cigarette consumption of the individuals in order to account for the addictive and inelastic nature of demand for smoking and the inability to quickly change smoking behavior after a price change. Furthermore, we use natural log of cigarette prices in order to account for the potentially non-linear effect on

the number of cigarettes smoked. Cigarette prices are likely to influence an individual's BMI only through its effect on smoking.

Other controls in our regressions include total personal income; household size; age; gender; single vs. married indicator; indicators of self-reported health status (good health, fair health, and poor health indicators); number of medical visits in the last 3 months; indicator for having been hospitalized in the last 12 months; indicator for whether health affects ability to work; sports practicing indicator; indicators for the educational attainment (university diploma, secondary education); and indicators for being currently employed, having ever worked, and being a student.

Our endogeneity-corrected estimates suggest that one additional cigarette per day would decrease BMI by roughly 0.23 units, and would reduce the probability of being overweight by approximately 2.5%. Furthermore, there is a small but significant effect on the likelihood of being obese: an additional cigarette smoked per day decreases the probability of being obese by 1.3%. Our results suggest an important implication that smoking is inversely related to body weight, and has some effect on obesity rates.

We also explore the difference in the effect of smoking on body weight across different quantiles of conditional BMI distribution. The largest effect is obtained for the 75th and 90th percentiles, and the smallest effects for the 10th and 25th percentiles. Smoking has a large effect on the body weight of individuals who are at the upper tail of the BMI distribution. These findings suggest that a reduction in smoking rate may lead to an increase in obesity rates by inducing weight gain among the population near the top end of the conditional BMI distribution.

While we found evidence of a possible increase in obesity rates resulting from the anti-tobacco campaign, it is important to remember that adverse health effects of smoking are numerous and the health benefits of smoking cessation are far in excess of the risk of weight gain. The current high prevalence of smoking and number of overweight individuals in Belarus constitute a major public health concern. Our results suggest that the prevalence of overweight and obesity might be exacerbated by the anti-tobacco campaign. From a policy perspective, an increase in obesity rates among the general population may be a reasonable concern for policy instruments targeted at reducing the overall smoking rates. It would therefore be wise to promote healthy eating habits and sports together with the anti-smoking campaign. However, the potentially modest weight gain from anti-tobacco campaign only is likely to be more than offset by the general health improvements associated with a decline in smoking rates.

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