

The Effects of Alcohol Price Increases on Mortality from External Causes in Russia

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Abstract:

Background: Several studies have documented significant contemporaneous effects of changes in vodka consumption per capita on mortality from external causes in Russia. Objectives: To assess the relationship between the price of vodka and violent mortality rates in Russia from 2010 to 2015. Methods: Trends in the real price of vodka and violent mortality rates between 2010 and 2015, were compared. Results: A Spearman's correlation analysis suggests a statistically significant inverse relationship between the real price of vodka and suicides, homicides, accidental drowning, mortality due to exposure to smoke, fire and flames and fatal falls. Conclusions: The results from this study suggest an inverse aggregate-level relationship between the price of vodka and violent mortality rates in Russia. These findings are in agreement with the arguments that increase in alcohol prices is the most consistent alcohol policy intervention.

Keywords: Alcohol; Price; Mortality from external causes; Russia; 2010-2015

Introduction

The high level of alcohol consumption, together with a pattern of occasional excessive intake of vodka (binge drinking), is associated with tremendous effect on public health in the Russian Federation^[1,2]. Many commentators believe that binge drinking of vodka is a major cause of strikingly high mortality from external causes in Russia^[3-5]. Previous studies have documented significant contemporaneous effects of changes in vodka consumption per capita on violent mortality rates in this country^[5,6].

A number of studies have examined the impact of alcohol prices on alcohol-related mortality^[7-11]. These studies generally have concluded that increases in the prices of alcoholic beverages would significantly reduce deaths from liver cirrhosis, suicides, motor vehicle crashes and other injuries^[9-11]. There is also evidence that a decline in the relative price of vodka was a key contributor to the mortality crisis in Russia in the early-1990s^[12,13]. The results of the panel regressions of regional mortality in Russia suggest that lower vodka prices were associated with statistically significant increases in mortality rates for working age males^[13].

Natural experiments, such as sudden changes in alcohol price, provide an opportunity to test the efficacy of policy measures to reduce alcohol-related harm. Russia, due to its high overall level of consumption and hazardous drinking pattern provides an important contextual setting for this type of analysis^[1]. During the last decade, the Russian government adopted a series of the alcohol policy measures in an attempt to curb the alcohol-related burden^[14]. The policies included substantial increase of excise taxes on alcohol products, which resulted in an increase of consumer prices^[15]. Making vodka less affordable through differential taxation was an essential element of the Russian alcohol policy^[14]. The excise tax rates on vodka in Russia have been increased dramatically between 2010 and 2015^[16].

Against this background, the aim of this study was to assess the relationship between the real price of vodka and mortality from external causes in Russia from 2010 to 2015.

Methods

The data on mortality from external causes (fatal alcohol poisonings (ICD 10 code X45), fatal motor road accidents (V01-V89), suicides (X60-X84), homicides (X85-Y09), accidental drowning (W65-W74), mortality due to exposure to smoke, fire and flames (X00-X09), fatal falls (W019-W09)) per 100.000 of the population and excise tax rates on vodka are taken from the Russian State Statistical Committee (Rosstat) reports. To examine the relation between dependent variable (mortality from external causes) and independent variables (the real price of vodka) a Spearman correlation analysis was performed using the statistical package "Statistica 12.StatSoft."

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Results

The real price of vodka has increased 2.4 times (from 230 to 559 rubles per 0.5 liter) between 2010 and 2015 (Figure 1). During the same period the violent mortality rate has decreased by 30.0% (from 151.8 to 113.1 per 100.000 of the population), the fatal motor road accidents rate has decreased by 12.9% (from 14.0 to 12.2 per 100.000 of the population), the suicides rate has decreased by 25.6% (from 23.4 to 17.4 per 100.000 of the population), the homicides rate has decreased by 38.4% (from 13.3 to 8.2 per 100.000 of the population), the accidental drowning rate has decreased by 48.8% (from 8.4 to 4.3 per 100.000 of the population), the mortality due to exposure to smoke, fire and flames has decreased by 39.7% (from 6.3 to 3.8 per 100.000 of the population), the mortality due to accident falls has decreased by 13.2% (from 6.8 to 5.9 per 100.000 of the population).

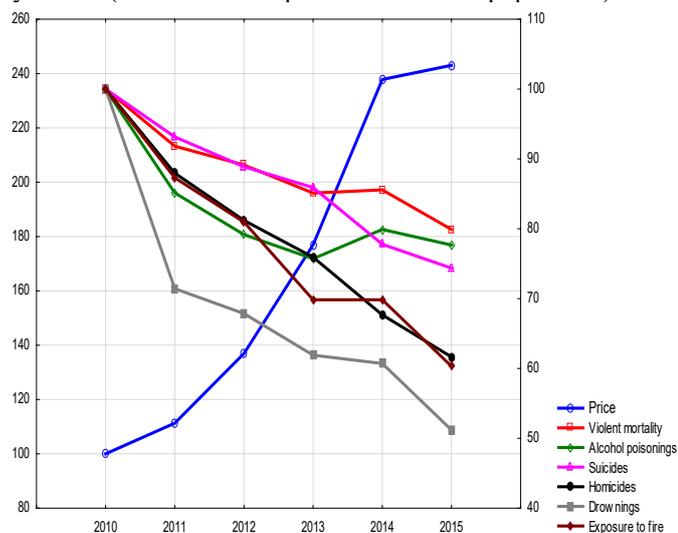


Figure 1: Indices of the real price of vodka (left scale) and violent mortality rates (right scale) in Russia between 2010 and 2015 (2010=100%).

A Spearman's correlation analysis suggests a statistically significant inverse relationship between the price of vodka and suicides, homicides, accidental drowning, mortality due to exposure to smoke, fire and fatal falls. The relationship between the price of vodka and fatal alcohol poisonings, fatal motor road accidents was also negative, but statistically nonsignificant (Table 1).

Table 1: Spearman's correlation analysis

mortality	price	
	r	p
violent mortality	-0.94	0.005
alcohol poisonings	-0.71	0.111
suicides	-0.99	0.000
homicides	-0.99	0.000
road accidents	-0.14	0.913
drowning	-0.99	0.000
fatal falls	-0.90	0.015
exposure to fire	-0.96	0.000

Discussion

The results of the analysis suggest an inverse relationship between the real price of vodka and mortality from external causes in Russia at the aggregate level. In fact, simple correlation can not prove a causal link between alcohol prices and deaths from external causes but it entirely consists with the population con-

sumption theory^[9]. These results also confirmed earlier findings based on Russian data that higher alcohol prices are associated with decreased alcohol-related mortality^[13].

It is important to acknowledge that in any natural experiments there are many potential confounders. In relation to this, some experts consider that the decline in violent mortality in Russia can be attributed to the macro economic stabilization that happened to coincide with the dramatic increase in the price of vodka^[16]. Further, there may also have been potential problems with the violent mortality data, because there was a sharp increase of deaths classified as injury with undetermined intent in Russia in the post-Soviet period^[17].

In conclusion, the results from this study suggest an inverse aggregate-level relationship between the price of vodka and violent mortality rates in Russia. These findings are in agreement with the arguments that increase in alcohol prices is the most consistent alcohol policy intervention. It should be emphasized, however, that pricing policies must be combined with other alcohol control measures.

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