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ORIGINAL ARTICLE

Alcohol Consumption and Mortality in Russia since 2000: Are there any Changes Following the Alcohol Policy Changes Starting in 2006?

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Abstract — Aims: To elucidate the possible effects of Russian alcohol control policy on alcohol consumption and alcohol-related mortality for the period 2000–2010. Methods: Narrative review including statistical analysis. Trends before and after 2006 are compared, 2006 being the date of implementation of the Russian government’s long-term strategy to reduce alcohol-related harms. Mortality data were taken from the World Health Organization (WHO) database ‘Health for All’. Data on recorded alcohol consumption were taken from the WHO, based on the Russian Statistical Service (Rosstat). For unrecorded consumption, the calculations of Alexandre Nemtsov were used. Russian public opinion surveys on drinking habits were utilized. Treatment data on alcohol dependence were obtained from the Moscow National Research Centre on Addictions. Information on alcohol policy was obtained from official reports. Results: Marked fluctuations in all-cause and alcohol-associated mortality in the working-age population were observed during the reviewed period. A decrease in total consumption and mortality was noted since the end of 2005, when the Russian government initially adopted the regulation of alcohol production and sale. The consumption changes were driven by decreases in recorded and unrecorded spirit consumption, only partly compensated for by increases in beer and wine consumption. Conclusions: Alcohol is a strong contributor to premature deaths in Russia, with both the volume and the pattern of consumption being detrimental to health. The regulations introduced since 2006 seem to have positive effects on both drinking behavior and health outcomes. However, there is an urgent need for further alcohol-control strategies to reduce alcohol-related harm.

INTRODUCTION

Alcohol consumption has played a huge role in shaping Russian mortality patterns in the last 30 years, as evidenced by both individual-level and aggregate-level studies (Nemtsov, 1995, 2001, 2003a, b; Leon et al., 1997; Shkolnikov and Chervyakov, 2000; Khalturina and Korotaev, 2006a,b; Rehm et al., 2007c; Leon et al., 2009; Zaridze et al., 2009a; Tomkins et al., 2012).

The alcohol-attributable fraction, defined as the proportion of all-cause mortality caused by alcohol consumption, was estimated to be over 50% in the 15–54-year old segment of the population in one publication (Zaridze et al., 2009a). Other estimates were high as well, in particular for men (Leon et al., 2009; Razvodovsky, 2012b), exceeding the attributable fractions of other countries in Europe and elsewhere (Rehm et al., 2009; Rehm et al., 2012a). Differences in attributable fractions for Russia are due to the methodology used, i.e. which dimensions of alcohol consumption were incorporated (average drinking or binge drinking or both; inclusion of surrogate alcohol (Leon et al., 2009; Tomkins et al., 2012)), whether misclassification of alcohol-poisoning deaths was taken into consideration (Zaridze et al., 2009b), whether the general methodology was based on individual- or aggregate-level data, and which statistical model was used. However, all analyses came to the conclusion that a sizable portion of the premature mortality in Russia was attributable to alcohol.

There have been changes in Russian alcohol policy since 2000, most notably the laws on new licensing and sales restrictions, which started in 2006 as part of the long-term strategy to reduce alcohol-related harms of the Russian government (Levintova, 2007). Different parts of the strategy have since been implemented and some parts have been changed (see Table 1). Some authors have reported changes in Russian drinking and positive effects on mortality as a consequence of these policy changes (Khalturina, 2006; Khalturina and Korotaev, 2006a,b; Klimova, 2007).

This paper analyses the associations between different measures of alcohol policies and consumption of alcoholic beverages as well as mortality. The main research questions thus concern the analyses of whether the policy changes mentioned (in particular the policy changes in relation to the long-term strategy to reduce alcohol-related harms) were associated with the intended effects in consumption, and secondly, whether they were associated with mortality changes as well.

It is difficult to understand the events of 2000–2010 without a short description of the previous period, as alcohol consumption and related harm seem to oscillate within a long-term downward trend (Nemtsov, 2011). The oscillations seem to be partly triggered by policy, starting with the anti-alcohol campaign of 1985, together with the following market reforms of 1992. The first decline of mortality thus happened in 1985–1987 and the second in 1995–1998, whereas increases were observed in 1989–1994 and in 1999–2004 (Nemtsov, 2011). Each of these periods seems to have had multiple causes, except for 1985–1987, when the only driving force was the anti-alcohol campaign.

METHODS

The all-cause methodology was a narrative review, coupled with descriptive and simple analytical statistical analyses. Alcohol policy measures were identified on the basis of the literature (Levintova, 2007; Putiy and Ayala, 2010) and
Table 1. Russian alcohol policy since 2006, an overview

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 2000</td>
<td>Excise duties on alcohol rise steeply, ~40% in average.</td>
</tr>
<tr>
<td>May 2000</td>
<td>The government agency ‘Rosspirtprom’ is established, as an umbrella for 100 state-owned distilleries, and with the right to fix the quotas of ethyl spirit distribution among producers.</td>
</tr>
<tr>
<td>January 2001</td>
<td>The Russian government begins to amend the law on alcohol regulation, a process still going on. Public consumption of any alcoholic beverages (including beer) is forbidden for minors. Alcohol advertisement is forbidden in public transport, stadiums and mass gatherings. Beer advertisement is allowed only at night.</td>
</tr>
<tr>
<td>February 2005</td>
<td>The Federal Law ‘On restrictions on the retail sale and consumption (drinking) beer and beverages, manufactured on the basis thereof’ comes into force.</td>
</tr>
<tr>
<td>January 2006</td>
<td>Amendments to the ‘Law on Regulation of Ethyl Alcohol’ are submitted, initiating new regulations about registration and licensing for alcohol producers and distributors and restricting sale locations. Authorized capital is substantially increased for producers and distributors of alcohol and many small companies are driven from the market as a result. The centralized information system for collecting data on produced alcohol (EGAIS), including the use of raw materials and leftovers, is introduced. New excise stamps are adopted and it is forbidden to use the old ones. First new stamps are released by the end of the month and only for 0.5 l vodka bottles, so the period is prolonged until July.</td>
</tr>
<tr>
<td>March 2006</td>
<td>The Federal Service for Surveillance on Consumer Rights Protection and Human Well-Being bans imports of wine from Moldova and Georgia, saying that they do not meet Russian consumer standards.</td>
</tr>
<tr>
<td>July 2006</td>
<td>A list of four obligatory denaturizing additives for non-beverage ethanol is approved, making the use of surrogate alcohol for human consumption more difficult. Serious disorganizations of the alcohol market were observed. Owing to implementation difficulties with regard to EGAIS and a shortage of excise stamps, part of the alcoholic products produced cannot be placed on the market. Retailers report empty shelves, with the most severe shortages occurring in vodka and hard liquor.</td>
</tr>
</tbody>
</table>

Sources: see Methods section.

official reports from The Federal Service for Alcohol Market Regulation (Rosalkogolregulirovanie: http://fsrar.ru 20 August 2012, date last accessed). In addition, the following sources were used: the internet portal ‘No to excessive drinking’ (The Federal Service for Alcohol Market Regulation (Rosalkogolregulirovanie), 2012).

With respect to different measures of alcohol consumption and mortality, data from databases and publications were reviewed.

(a) Data on total and beverage-specific volume of recorded alcohol consumption per capita (age over 15) were taken from the WHO (WHO Global Information System on Alcohol and Health—GISAH: www.who.int/substance_abuse/activities/gisah/en/index.htm 20 August 2012, date last accessed) which are based on the estimates of the Russian Federal State Statistics Service-Rosstat (http://www.fedstat.ru/indicators/start.do 27 August 2012, date last accessed).

(b) Estimates of unrecorded consumption were based on the calculations of (Nemtsov, 1998, 2000, 2009, 2011); for WHO GISAH and this publication, he extended the timeframe of previously published calculations using the
same method. This method basically uses the strong correlations between alcoholic psychosis, alcohol-poisoning deaths and total consumption to estimate the latter.

(c) Self-reports on the preference of alcoholic beverages were obtained from surveys undertaken by Russia Public Opinion Research Center (WCIOM http://wciom.com/27 August 2012, date last accessed).

(d) Self-reports on frequency of alcohol consumption were taken from surveys undertaken by The Public Opinion Foundation (FOM http://fom.ru/27 August 2012, date last accessed).

(e) Prevalence and incidence rates of alcohol dependence based on treatment statistics were retrieved from the National Research Center on Addictions, Moscow (http://reabcentr.ru/images/stories/july_2011/nov_probl/21.pdf 27 August 2012, date last accessed).

(f) Age-standardized cause and sex-specific mortality rates were taken from the European mortality database as part of the Health for All database of the WHO Regional Office for the European region (http://data.euro.who.int/hfamdb/). The following categories were used: mortality by all causes, cardio-vascular diseases (CVDs), external cause of poisonings and injuries and neoplasms. Death rates of liver cirrhosis in particular or liver disease in general were available neither from the WHO database nor from Rosstat directly.

(g) Data on GDP PPP (in $) were taken from the CIA world factbook (https://www.cia.gov/library/publications/the-world-factbook/24 November 2012, date last accessed).

In order to test for changes between the time period 2000–2005 and the period 2006–2010, two-tailed t-tests were conducted for each of the indicators. This can be seen as conservative first tests to indicate overall differences. As we describe yearly data only for 10 years, there is not enough statistical power for time series analyses (Rehm and Gmel, 2001).

RESULTS

Alcohol policy changes since 2005
The main changes in alcohol policy in the decade considered happened in the second half. Table 1 gives an overview.

Overall, Russia has experienced a number of more or less integrated measures of alcohol policy to reduce consumption and alcohol-attributable harm. The next points will examine whether these measures have been successful.

Alcohol consumption 2000–2010
In the following (Fig. 1), the temporal development of alcohol consumption in Russia as adult per capita consumption is shown (adults defined as people 15 years and older; for a detailed discussion of this measure and its underlying sources see (Rehm et al., 2007a)). In this graph, it is assumed that unrecorded consumption (i.e. illegally produced alcohol, surrogate alcohol and other alcohol not being recorded and taxed as alcohol intended for human purposes) consists entirely of spirits, which may be an overestimate, although the studies of McKee et al. (2005) and Solodun et al. (2011) have shown that the main type of unrecorded consumption is of spirits.

There is a clear downward trend in the consumption of alcohol since 2006, driven by a decrease in spirit consumption. Adult per capita consumption of spirits, comprising recorded and unrecorded consumption, oscillated around the value of 13.51 per capita until 2004. According to the Rosstat data on sales of alcoholic beverages, the sold and consumed alcohol per capita table 1 gives an overview.

Fig. 1. Alcohol adult per capita consumption estimates for Russia by type of beverage, including unrecorded consumption. Sources: for unrecorded consumption (Nemtsov, 1998, 2000, 2009, 2011); the WHO Global Information System on Alcohol and Health—GISAH (www.who.int/substance_abuse/activities/gisah/en/index.htm) with the assumption that all of the unrecorded consumption is of spirits.
thus recorded volume of vodka and hard liquor was between 7.05 and 7.28 l per year for the period 2000–2004. Starting from 2003, sales started to decrease by ~3–4% on average per year until 2010. The strongest decreases were from 2006 to 2007 and from 2008 to 2009. In 2010, spirit consumption had decreased by >22% when compared with 2000; it was <18% from 2005.

As unrecorded consumption represents a large portion of the total spirits consumed, nearly the same development can be outlined: a period of stagnation until 2004, a downtrend beginning in 2004 and a steep decline between 2005 and 2006. Overall, unrecorded consumption decreased from 6.52 l per capita in 2000 to 2.35 in 2010, a reduction of nearly 65%.

At the same time, a noticeable increase of beer consumption can be observed from 2000 (2.17 l per capita) to 2007 (4.75 l per capita), followed by a slight decline afterwards. Beer consumption stabilized above 4.1 after 2006, which is a historical height. Significant differences between the two time windows (2000–2005 vs. 2006–2010) were found for all analysed groups: unrecorded consumption ($t = 7.666; \text{df} = 9, P < 0.001$), total spirits ($t = 7.495; \text{df} = 9; P < 0.001$), total alcohol consumption ($t = 6.083; \text{df} = 9; P < 0.001$), beer ($t = -5.149; \text{df} = 9; P = 0.001$) and wine ($t = -4.792; \text{df} = 9; P = 0.001$).

Self-reports on frequency of drinking and preferred types of beverages are consistent with the objective data, indicating the declining total consumption of alcohol and a decreasing consumption of spirits in particular. Reported drinking frequency for the years 2002, 2004 and 2006 (Klimova, 2007) suggested that daily or weekly drinking became less common.

Other all-Russian surveys, undertaken by Russia Public Opinion Research Center WCIOM, indicate that beer became very popular during the last decade as beer consumption was reported more often than consumption of vodka or any other alcoholic beverage.

Total cause-specific mortality rates 2000–2009

Between 2000 and 2010 all-cause mortality of the working-age population (here defined as people between 25 and 64) showed substantial temporal fluctuations. Figures 2 and 3 show these trends of standardized death rates (SDRs) for men and women, divided into four categories: mortality by all causes (blue), CVD (red), external cause of poisonings and injuries (green) and neoplasms (brown). The first three groups (all cause, CVD and injuries) show a very similar fluctuation, steadily increasing until 2003, stagnating at around the same level for the next 2 years, steeply declining between 2005 and 2007 and steadily decreasing since then, with a rise of overall mortality and CVD in 2010 again. The neoplasm group demonstrates more stability with a very small downward trend since 2000, but a rise between 2009 and 2010.

All-cause mortality for men was steadily increasing until 2005, although a small reduction can be outlined for the year 2004, when the rate fell by 2.5% compared with the previous year. A steep decline of 11% was observed between 2005 and 2006, followed by a 7.5% decline between 2006 and 2007 and a 6% decline between 2008 and 2009. In 2010, the rate increased again by 2.9% compared with 2009, but overall still amounted to only 84.12% of the numbers for the year 2000.

In women, all-cause mortality demonstrates a similar pattern, with increasing rates until 2004, then a 2.3% decrease between 2004 and 2005, followed by a substantial fall of 9.5% between 2005 and 2006 and a 7.4% decline between 2007 and 2008. The rates rose again by 3.5% between 2009 and 2010 and, in 2010, amounted to 88.72% of the numbers for the year 2000. This means that between 2000 and 2010, all-cause mortality for working-age men decreased by 15.88% and by 11.28% for working-age women, with the biggest decline occurring in the years 2006 and 2007.

![Fig. 2. SDRs per 100,000 for working-age men (25–64). Source: WHO Mortality Indicator Database MDB](http://data.euro.who.int/hfamdb/).
Corresponding changes can be observed in cause-specific mortality from CVDs and external causes. For men, SDRs from CVD fell by 11.7% between 2005 and 2006 and by 8.7% for the next year, before rising again by 4.5% between 2009 and 2010. Male mortality from external causes such as injuries and poisonings fell by 12.1% between 2005 and 2006 and by a further 8.73% between 2006 and 2007, and has been declining since then. For women, CVD mortality rates fell by 12.1% between 2005 and 2006 and by 11.6% between 2006 and 2007, rising again between 2009 and 2010 by 6%. Female mortality from external causes decreased by 11% and 10.4% for the years 2006 and 2007, respectively; and has been slightly decreasing since then.

Mortality from neoplasms decreased steadily between 2000 and 2009, by 15.8% for men and by 7% for women. The figure rose again between 2009 and 2010, by 4.4% for men and by 3.6% for women. The temporal fluctuations of SDR in the four causes of death categories were similar for both sexes, but rates for women are of smaller amplitude. Neoplasms showed the same relative invariance as in men but a higher rate than external cause mortality. This means that more women died of neoplasms than of external causes whereas men showed an inverse pattern.

A statistical comparison of mortality rates before and after 2006 with a two-tailed t-test revealed significant differences for male mortality from external causes (t = 7.354; df = 9; P < 0.001), all-cause mortality (t = 6.863; df = 9; P < 0.001), CVD (t = 5.297; df = 9; P < 0.001) and neoplasms (t = 4.409; df = 9; P = 0.002), and also significant differences for the four groups of working-age women mortality: external causes (t = 7.034; df = 9; P < 0.001), CVD (t = 6.942; df = 9; P < 0.001), all-cause mortality (t = 6.240; df = 9; P < 0.001) and neoplasms (t = 4.165; df = 9; P = 0.002).

Incidence and prevalence of alcohol dependence 2000–2009

Corresponding dynamics were found in the epidemiological reports on registered alcohol use disorders of the Russian National Research Center on Addictions. Table 2 gives an overview of the dynamics of incidence and prevalence rates of alcohol dependence in the Russian Federation for the period 2000–2009. Here, data on alcohol psychoses were also included, as they might appear separately in the Russian statistics. Incidence was defined as the number of new cases of alcohol dependence registered in the system.

Incidence of alcohol dependence increased by 22.2% between 2000 and 2003 and fell between 2003–2004 and 2004–2005, by 4.8 and 4.7%, respectively. More substantial drops of incidence were observed between 2005 and 2006 by 8.2% and by another 9.1% between 2006 and 2007. Since then, rates have continued to decline, albeit much less markedly.

The prevalence rates were increasing between 2000 and 2004 by 0.35–1.47% each year. Since then, the rate has declined each year, by 2% between 2005 and 2006, followed by 1.8% for 2006–2007, 1.7% for 2007–2008 and 2.7% for the period 2008–2009.

A two-tailed independent samples t-test for the groups 2000–2005 vs. 2006–2009 revealed a significant difference for incidence rates (t = 3.623; df = 8; P = 0.007) as well as for prevalence rates (t = 3.198; df = 8; P = 0.013).

DISCUSSION

Alcohol consumption and harm seem to have declined in the second half of the first decade of the 21st century in Russia. The decline in consumption and treatment incidence seems to have started in 2004, whereas the decline in other health outcomes and various indicators of mortality started in 2006 with the implementation of the alcohol policy reforms.

Was this mortality decline attributable to alcohol consumption? The first indication supporting this hypothesis is that the proportional drop in mortality is highest in external causes (between 2006 and 2010: 34% in men; 34% in
women), which of the four broad categories of death is most related to alcohol, particularly in countries with the heavy session drinking pattern seen in Russia (Zatonski et al., 2008; Zaridze et al., 2009a; Shield et al., 2012); for a characterization of the relation between patterns of drinking and outcomes, see Rehm et al. (2010a) and Rehm et al. (2006). On the other hand, the rate of cancers showed a pattern unmarked by substantive drops in the years where alcohol policy was implemented. Although alcohol is a known carcinogenic (International Agency for Research on Cancer, 2010; Lachenmeier et al., 2012) and has been shown to have a public health impact on cancer in Europe (Schütze et al., 2011), we would not expect to see the effect of alcohol policy and consumption changes within 15–20 years (Rehm et al., 2007b; Holmes et al., 2012). Thus, any drops in the second half of the decade and increases after 2010 would have been attributable to the drinking changes during the Gorbachev reform (Shkolnikov and Nemtsov, 1997; Nemtsov, 2011). However, since competing mortality in Russia is high, we would not expect to see any such long-term effect very clearly.

Cardio-vascular mortality has been related to alcohol in Russia for a number of reasons: first, the drinking pattern in Russia is clearly not cardioprotective (Puddey et al., 1999; Roerecke and Rehm, 2010); secondly, many of the CVDs that are detrimentally impacted by alcohol are prevalent in Russia such as haemorrhagic stroke (Patra et al., 2010), alcoholic cardiomyopathy (Leon et al., 2010), arrhythmias (Samokhvalov et al., 2010; Gordeeva et al., 2011)) or hypertension (Taylor et al., 2009). Finally, there is good evidence that a sizable number of alcohol-poisoning deaths are actually misdiagnosed as CVD deaths (Kladov et al., 2007; Zaridze et al., 2009b). As a result, the link between alcohol and CVD deaths is quite strong, suggesting that more per capita consumption is associated with higher rates of CVD mortality (Leon et al., 1997; Shkolnikov and Nemtsov, 1997). Russia is also one of the countries where, even on the aggregate level, we find a significant detrimental association for ischemic heart disease. In countries with more regular drinking patterns, this association usually indicates a cardioprotective effect (Gmel et al., 2003; Razvodovsky, 2012a,b).

On the aggregate level, the adult per capita consumption of alcohol in Russia is not much higher than in other European countries (Shield et al., 2011; World Health Organization, 2011) and cannot explain the observed high levels of alcohol-related mortality by itself (for comparisons using the same method, see Rehm et al., 2012b). Thus, the specific pattern of consuming alcohol with non-daily irregular binge drinking with very heavy volume per binge can be seen as the key characteristic of alcohol consumption leading to the detrimental health outcomes (Rehm et al., 2003; Popova et al., 2007); for the link to outcomes, see Tomkins et al., (2012) and Zaridze et al., (2009a). There is also growing evidence that this pattern of hard liquor-preference and binge drinking is associated with a quicker and deeper level of intoxication, increasing the chance of alcohol-attributable lethal outcomes (Kharchenko et al., 2005).

The decline of binge drinking with spirits (as suggested by the data on vodka turnover), the changes in the preferred types of beverages and the reduction in drinking frequency over time suggest these factors as the main reason for the observed changes in mortality statistics. We believe that the decline of hard liquor consumption and its replacement by lower alcohol containing beverages is crucial, as the experiences of other countries with a northern consumption pattern indicated that this switch may have had implications for alcohol-related mortality (Simpura and Karlsson, 2001; Leifman et al., 2002). It should be noted that the temporal correlation of an improved disease/mortality situation and the decrease of hard liquor consumption in favor of alcoholic beverages containing less alcohol was also outlined in other Russian studies (Khalturina, 2007; Kiselev et al., 2009; Ilyk et al., 2012).

However, if the distribution of alcohol switches, the formulas used to calculate unrecorded consumption-based partially on alcohol poisoning (see above) may no longer be that applicable, as alcohol poisoning is strongly linked to high intake in short time, and thus to spirit consumption. Table 1 thus probably underestimates unrecorded consumption in the second half of the decade. We probably need to find new proxy indicators for this variable in the future. Such a new indicator is also needed, as it would avoid the circularity of estimating unrecorded via a fraction of mortality on the one hand, and alcohol-attributable deaths in most epidemiological studies via total consumption, on the other hand (Rehm et al., 2010c). While the overall contribution of alcohol-poisoning deaths to mortality is <3%, and the circularity is thus limited, the conceptual problem still exists.

It is also not clear what the contribution of unrecorded consumption is beyond the impact of alcohol (for review, see Rehm et al. 2010b). On the one hand, there was a strong association between the consumption of surrogate alcohol and high mortality (Leon et al., 2007). On the other hand, most examinations of unrecorded beverages in Russia found few indications of chemical contamination that could lead to added mortality of public health relevance (e.g. Nuzhnyi, 2004; Rehm and Gmel, 2007; Solodun et al., 2011). The exception may be the work of McKee et al., (2005), but we do not see a lot of evidence that the long-chain alcohols found in the concentration of their samples could indeed explain significant over-mortality. Thus, any association between unrecorded consumption and mortality may just be driven by the fact that unrecorded alcohol, which usually is the cheapest alcohol available (Lachenmeier et al., 2007; Gil et al., 2008), is consumed in a more dangerous pattern of very heavy drinking occasions and often by people with

Table 2. Prevalence/incidence of alcohol dependence treatment per 100,000 population

<table>
<thead>
<tr>
<th>Year</th>
<th>Prevalence</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>1618.3</td>
<td>130.2</td>
</tr>
<tr>
<td>2001</td>
<td>1612.6</td>
<td>139.4</td>
</tr>
<tr>
<td>2002</td>
<td>1636.2</td>
<td>153.4</td>
</tr>
<tr>
<td>2003</td>
<td>1648.2</td>
<td>159.1</td>
</tr>
<tr>
<td>2004</td>
<td>1660.2</td>
<td>153.1</td>
</tr>
<tr>
<td>2005</td>
<td>1654.4</td>
<td>147.4</td>
</tr>
<tr>
<td>2006</td>
<td>1621.8</td>
<td>135.4</td>
</tr>
<tr>
<td>2007</td>
<td>1594.5</td>
<td>123.1</td>
</tr>
<tr>
<td>2008</td>
<td>1566.9</td>
<td>122.2</td>
</tr>
<tr>
<td>2009</td>
<td>1524.4</td>
<td>112.5</td>
</tr>
</tbody>
</table>

Source: Kirzhanova and Sidyuryuk, (2010).
alcohol dependence who already have a high risk of mortality (Harris and Barracough, 1998; Rehm et al., 2012a,b). Also, the fact that some unrecorded samples were unlabeled with respect to alcohol content and contained higher than usual percentages may worsen this effect (McKee et al., 2005).

What could be alternative explanations for the changes in alcohol consumption? There are theories about waves or long waves of consumption both in the alcohol field (Skog, 1986) as well as in other fields of substance use and abuse (Musto, 1987; Behrens et al., 2002), one version specifically concerning itself with alcohol consumption waves in Russia (see above and Nemtsov (2011)). In some sense, all these theories postulate that there is a cyclical nature of consumption based on micro-level processes (social networks, mutual reinforcement of social actors) and societal reactions to these changes. In most instances, it is assumed that negative consequences of substance use, which had led to the decrease in consumption, were forgotten after some time, thus leading to an increase in consumption again. While we cannot exclude such factors contributing to the changes in alcohol consumption in Russia in the last 30 years, there is some evidence that external factors (the Gorbachev reform or the alcohol policy since 2006) may have started the change. Micro-level processes alone do not seem to be able to explain the change in the 1980s, or in the first decade of the 21st century.

Another alternative explanation would refer to changes in economic wealth. However, changes in GDP PPP and adult per capita consumption were uncorrelated ($r = -0.11; t < 1$, n.s.). While this does not preclude more complex impact of the economic situation on alcohol consumption and harmful effect clearly the trends of consumption in the first decade of the 21st century cannot be seen as a simple consequence of overall changes in productivity.

In sum, we suggest that the high mortality fluctuations in the second half of the decade were at least partly attributable to the introduced alcohol policy and other events of 2006. That year reveals a remarkable coincidence of a steep decline in mortality, observed for the first time since 1998, and the government’s first serious attempts to regulate the alcohol market since the end of the Soviet era. We assume that the described regulations shaped the Russian mortality and morbidity outcomes since then, but the extent is not fully clear, as a general downward trend of alcohol consumption started earlier. When we talk about alcohol policies, we should concentrate not only on the overall level of consumption, but also on the patterns of drinking including beverage choice. Also, the regulations of 2006 led to some serious reorganization of the alcohol market and produced unintentional shortage of spirits sold in retail by 2006. This unintended consequence immediately resulted in fewer deadly poisonings in the summer and autumn of 2006, which as a ‘natural experiment’ demonstrated the importance of vodka for Russian public health again (Khaliturina and Korotaev, 2006a,b; Klimova, 2007).

In any case, the years between 2003 and 2006 might have been a turning point of Russian alcohol consumption and, therefore, mortality. It may be too early for final conclusions, but our analyses of the recent trends in Russia provide evidence that predictions of a continuing mortality crisis, as suggested by other studies (Leon et al., 2009), may be too negative and that both alcohol consumption and mortality kept on decreasing since 2006 (the only exception being the slight upturn in mortality in 2010, where we do not have enough data on to make a clear prediction whether this is a short-term exception or a reversal of trend). In conclusion, we suggest that the government’s attempts to curb the high alcohol-attributable mortality have been at least partly successful.

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REFERENCES


Gordeeva MV, Veleslavova OE, Baturina MA. (2011) Vnezapnya intoksikatsiya etilovym spirtom, a ne ego surrogatami-concentrate not only on the overall level of consumption, but •......


Zatonski W, Manczuk M, Sulkowska U and Team HEMP. (2008) Closing the Health Gap in European Union. Warsaw, Poland: Cancer Epidemiology and Prevention Division, the Maria Sklodowska-Curie Memorial Cancer Centre and Institute of Oncology.