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# THE EFFECTS OF BEVERAGE TYPE ON SUICIDE RATE IN RUSSIA

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## *SUMMARY*

***Background:*** *Research evidence has suggested that the consumption of different types of alcoholic beverage may have a differential effect on suicide rate. The aim of this study was to examine the relation between the consumption of different beverage types and suicide rates in Russia.*

***Subjects and methods:*** *Age-standardized sex- and age-specific suicide rate for the period 1980-2005 and data on beverage-specific alcohol sale were obtained from the Russian State Statistical Committee. Time-series analytical modeling techniques (ARIMA) were used to examine the relationship between the sale of different alcoholic beverages and suicide rates.*

***Results:*** *Vodka consumption as measured by sale was significantly associated with both male and female suicide rate. The consumption of beer and wine were not associated with suicide rate. The estimates of the age specific models for men were positive (except for the 75+ age group) and ranging from 0.069 (60-74 age group) to 0.123 (30-44 age group). The estimates for women were positive for the 15-29 age group (0.08), 30-44 age group (0.096) and 45-59 age group (0.057).*

***Conclusions:*** *These findings suggest that public health efforts should focus on both reducing overall consumption and changing beverage preference away from distilled spirits in order to reduce suicide rate in Russia.*

***Key words:*** *beverage specific alcohol sale - suicide - ARIMA time series analysis - Russia - 1980-2005*

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## INTRODUCTION

Suicide is one of the main causes of premature mortality in Russia (Pridemore & Spivak 2003). High suicide rate in this country and its profound fluctuations over the past decades have attracted considerable interest. (Wasserman et al. 1994, Lester 1998, Varnic et al. 1998, Makinen 2000, 2006). There is strong evidence of a crucial role of alcohol in the explanation of this phenomenon (Wasserman et al. 1994, Lester 1998, Nemtsov 2003, Pridemore 2006). Several studies highlighted a significant aggregate level association between alcohol and suicide in Russia. In his time series analysis data for the period 1965-99 Nemtsov (2003) has reported that a 1-litre increase in alcohol consumption is expected to increase suicide rate by 12% for total population (13% for men and 6% for women). A more recent update suggests that 1 litre increase in per capita consumption is associated with an increase in overall suicide rate of 7.2% (8% for male and 4.3% for female) (Landberg 2008). In another study Pridemore has highlighted a close cross-sectional link between alcohol and suicide in Russian regions during the mid-1990s (Pridemore 2006).

Several researchers have focused on the role of drinking culture as a possible explanation of the extremely high suicide rates in Russia (Pridemore 2006). The distinctive traits of Russian drinking culture are the heavy episodic (binge) drinking pattern, the preference for distilled spirits, and sociocultural tolerance for heavy drinking. A world wide assessment of drinking pattern showed that Russia and former Soviet republics had the most hazardous pattern of drinking (Rehm et al. 2006). The findings suggest that binge drinking and suicide mortality are positively related phenomena in Russia. In his time series analysis Pridemore and Chamlin (2006) found a positive association between alcohol-related mortality and suicide in Russia between 1956 and 2002. The results from another study based on Russian data from 1956 to 2005 showed a positive association between fatal alcohol poisoning (as a proxy for binge drinking) and suicide rate (Razvodovsky 2009a).

Research evidence has suggested that the consumption of different types of alcoholic beverage may have a differential effect on suicide rate in Russia. The results from recent time series analysis based on data from 1970 to 2005 highlight that the relationship between alcohol and suicide was stronger in case of vodka sale compared to overall alcohol as well as wine/beer sale: 1 litre changes in per capita vodka sale was associated with increase in suicide rates by 9.3% for men and by 6% for women (Razvodovsky 2009b). This piece of evidence provides additional support for the hypothesis that unfavorable mixture of binge drinking of vodka may be a major reason for the strong association between alcohol consumption and suicide rate in Russia.

In this study we will further test the hypothesis of beverage specific effect on suicide in Russia by analyzing time series data on sex and age-specific suicide rate between 1980 and 2005.

## SUBJECTS AND METHODS

The data on age-adjusted sex- and age-specific suicide mortality rate per 1000,000 of the population are taken from the Russian vital statistics registration

system. The Goscomstat's cause of death classification has undergone several changes in recent decades. Until 1988 the cause of death classification was based upon the Soviet nomenclature which had a limited number of causes of death in comparison with the International Classification of Diseases (ICD) system. From 1989-1998 Rosstat used a coding scheme that was based on ICD-9. From 1999 a new coding system based on ICD-10 was introduced. Rosstat issued a table of correspondence between its classification system and ICD-9 and ICD-10 and it has been claimed that the Russian system of coding was and is compatible with the ICD. For example Goscomstat's code 173 (1989-1998) "suicide and self-inflicted injury) corresponds with ICD-9 code E 950.0-E 959.9 and code 249 (since 1999) corresponds with ICD-10 code X 60.0-X 84.9.

### Statistical analysis

To examine the relation between changes in the sale of different types of alcoholic beverage and suicide mortality across the study period a time-series analysis was performed using the statistical package "Statistica". Bivariate correlations between the raw data from two time-series can often be spurious due to common sources in the trends and due to autocorrelation (Norstrom & Skog 2001). One way to reduce the risk of obtaining a spurious relation between two variables that have common trends is to remove these trends by means of a 'differencing' procedure, as expressed in formula:

$$\nabla x_t = x_t - x_{t-1}$$

This means that the annual changes $\nabla$ in variable 'X' are analyzed rather than raw data. The process whereby systematic variation within a time series is eliminated before the examination of potential causal relationships is referred to as 'prewhitening'. This is subsequently followed an inspection of the cross-correlation function in order to estimate the association between the two prewhitened time series. It was Box and Jenkins (1976) who first proposed this particular method for undertaking a time series analysis and it is commonly referred to as ARIMA (autoregressive integrated moving average) modeling. We used this model specification to estimate the relationship between the time series suicide mortality rate and beverage-specific alcohol sale in this paper. In line with previous aggregate studies (Norstrom & Rossov 1999; Ramstedt 2001) we estimated semi-logarithmic models with logged output. The following model was estimated:

$$\nabla LnM_t = a + \beta \nabla A_t + \nabla N_t \ ,$$

where $\nabla$ means that the series is differenced, M is suicide mortality rate, $a$ indicates the possible trend in suicide mortality due to other factors than those included in the model, A is the alcohol sale, $\beta$ is the estimated regression parameter, and N is the noise term. The percentage increase in suicide mortality rate associated with a 1-litre increase in alcohol sale is given by the expression: $(\exp(\beta_1)-1)*100$.

A semi-logarithmic model is based on the assumption that the risk of suicide increases more than proportionally for a given increase in alcohol consumption because alcohol may trigger the impact of other suicidogenic factors (Norstrom & Rossov 1999). The temporal structure of the error term was estimated by using autoregressive (AR) or moving average (MA) parameters in the model. A diagnostic test for residual correlation is given by the Box-Ljung Q-test, which indicates whether the model has been adequately fitted.

## RESULTS

Sex- and age-specific suicide rate yield patterns that vary little from each other over time Figures 1-4. The time series fluctuated over the period: it dropped sharply in 1984-1986, than increased substantially from 1991 to 1994 (especially for working-age men). This increase was followed by a steep decline between 1995 and 1998, with a new increase emerging in 1999. It is important to point out, however, that the pattern of suicide mortality for men and women was not uniform. Suicide rate dropped more sharply for males than for females during the anti-alcohol campaign. Further, the rates of suicide increased for both sexes during the transition, but it appears that males were more adversely affected during this period. In general, the male suicide rate tends to fluctuate across time series to a much greater extent than the female rate. It should be also emphased that working-age males showed greater decrease in suicide mortality in the mid-1980s and subsequent increase in the early 1990s. The graphical evidence also suggests that the trends for suicide and vodka sale are rather similar over the time series for both sexes in the age groups 30-44 and 45-59 (Figures 1-4).

As can be seen from Figures 1-4 there were sharp trends in the time series data across the study period. These trends were removed by means of a first-order differencing procedure. The specification of the bivariate ARIMA model and outcome of the analyses are presented in Tables 1-2. Overall alcohol and vodka sales are significantly associated with both male (except for the 75+ age group) and female (except for the 60-74 and 75+ age groups) suicide rate. At the same time, there is no relationship between the level of wine/beer sale and suicide rates. The estimated effects of total alcohol sale on the age-specific suicide rate for men ranging from 0.026 (60-74 age group) to 0.057 (30-44 age group) and for women raging from 0.021 (45-49 age group) to 0.047 (30-44 age group). The estimated effects of vodka sale on age specific rates for men were also positive and ranging from 0.069 (60-74 age group) to 0.123 (30-44 age group). The estimates for women were positive for the 15-29 age group (0.08), 30-44 age group (0.096) and 45-59 age group (0.057).

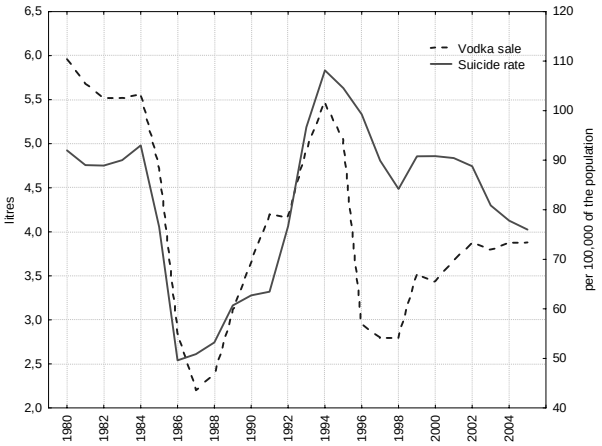


**Figure 1.** Trends in per capita vodka sale and suicide rate for men age group of 30-44 years

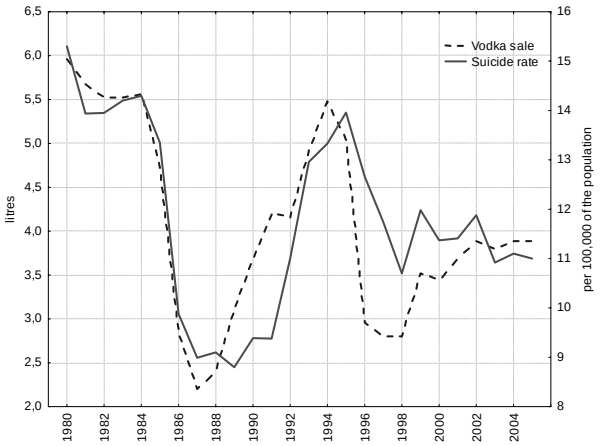


**Figure 3.** Trends in per capita vodka sale and suicide rate for women age group of 30-44 years

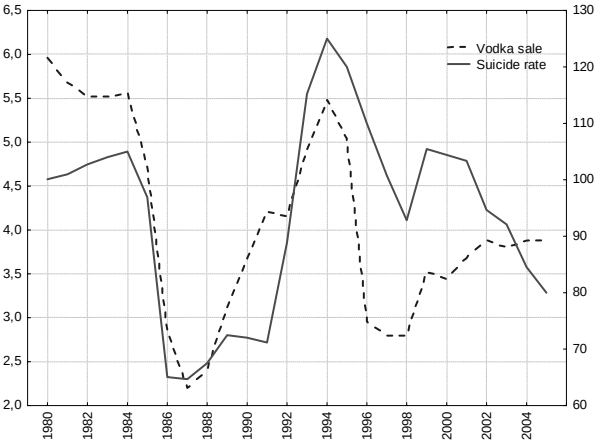


**Figure 2.** Trends in per capita vodka sale and suicide rate for men age group of 45-59 years

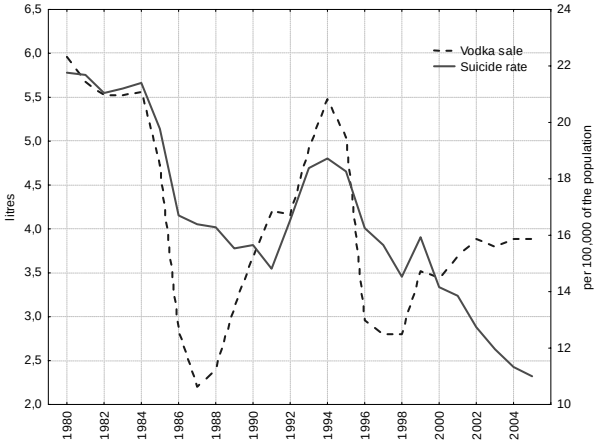


**Figure 4.** Trends in per capita vodka sale and suicide rate for women age group of 45-59 years

**Table 1.** Estimated effects (bivariate ARIMA model) of total alcohol sale per capita on suicide rate

| | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|
| | Model | Estim. | St. Error | p | Model | Estim. | St. Error | p |
| 15-29 | 1,1,0* | 0.056 | 0.017 | 0.003 | 1,1,0 | 0.037 | 0.023 | 0.003 |
| 30-44 | 0,1,1 | 0.057 | 0.020 | 0.009 | 0,1,1 | 0.047 | 0.023 | 0.000 |
| 45-59 | 0,1,1 | 0.050 | 0.020 | 0.024 | 0,1,1 | 0.021 | 0.017 | 0.004 |
| 60-74 | 1,1,0 | 0.026 | 0.015 | 0.050 | 1,1,0 | 0.005 | 0.016 | 0.050 |
| 75+ | 0,1,1 | 0.009 | 0.017 | 0.613 | 0,1,1 | 0.006 | 0.017 | 0.369 |

*The general form of non-seasonal ARIMA model is (p,d,q), where p - the order of the autoregressive parameter, d - the order of differencing, and q - the order of the moving average parameter. Q test for residuals are satisfactory in all models

**Table 2.** Estimated effects (bivariate ARIMA model) of vodka sale per capita on suicide rate

| | Males | | | | Females | | | |
|---|---|---|---|---|---|---|---|---|
| | Model | Estim. | St. Error | p | Model | Estim. | St. Error | p |
| 15-29 | 1,1,0 | 0.103 | 0.026 | 0.001 | 1,1,0 | 0.080 | 0.023 | 0.003 |
| 30-44 | 0,1,1 | 0.123 | 0.028 | 0.000 | 0,1,1 | 0.096 | 0.023 | 0.000 |
| 45-59 | 0,1,1 | 0.116 | 0.029 | 0.001 | 0,1,1 | 0.057 | 0.017 | 0.004 |
| 60-74 | 0,1,1 | 0.069 | 0.021 | 0.004 | 0,1,1 | 0.029 | 0.016 | 0.050 |
| 75+ | 0,1,1 | 0.046 | 0.026 | 0.094 | 0,1,1 | 0.015 | 0.017 | 0.369 |

## DISCUSSION

The dramatic development in suicide rates in Russia coincided with two major political events: the anti-alcohol campaign during the mid-1980s, and the political and economic transition following the break up of the Soviet Union in 1991. Some researchers believe that increase in suicide rate in 1990s was driven by the socioeconomic instability, which has been detrimental for mental health of Russian population (Leon & Shkolnikov 1998, Gavrilova et al. 2000, Andreeva et al. 2008). The impact of acute socioeconomic transition has been exacerbated by a lack of social cohesion, erosion of social capital and rising income inequality (Cornia & Poniccia 2000). It seems plausible that the psychosocial distress resulting from the "shock therapy" economic reforms and sudden collapse of the Soviet paternalist system was the main cause of increased demand for alcohol at this time. This demand met by factors that increased supply following the repeal of state alcohol monopoly in 1992 (Nemtsov & Razvodovsky 2008).

There is strong evidence of a key role of alcohol in explaining of Russian suicide mortality crisis in the early-1990s. In his well design study Makinen (2000) has reported that alcohol consumption was powerful predictor of suicide rate in "high-suicide, unequal sex distribution" group of Eastern Bloc countries (including Russia) witch experienced a large drop in suicide rates in 1985-89, especially for middle-age males, followed by a large general increase in 1989-93. Similarly, it was shown that the pattern of the age-specific distribution of suicides and fatal alcohol poisonings coincided during the anti-alcohol campaign and nearly coincided during the transition (Nemtsov 2003). Collectively, this evidence supports the hypothesis that increase in alcohol consumption was the main determinant of suicide mortality crisis in Russia in the early-1990s.

The outcome of the present study replicates previous findings from other settings, which highlighted that the relationship between alcohol and suicide is stronger for distilled spirits relative to total alcohol and wine/beer consumption. On the basis of pooled cross-sectional time series analysis of US data Gruenewald and coauthors (1995) found that only spirits sale displayed a significant relationship with suicide rate whereas wine and beer sale were not associated with suicide. Similarly, in his time series analysis Norstrom and Rossov (1999) based on data from Norwegian and Sweden reported that in both countries the suicide rate was related to spirits sale but not to wine sale: a 1 litre increase in spirits sales in Norway was associated with a 11% increase in the male suicide rate; the corresponding figure for Sweden was 14%. In a more recent time series analysis based on Belarusian data from 1970 to 1999 Razvodovsky (2001) found a positive association between vodka sale and suicide rate, which was stronger than for total alcohol sale.

The strong aggregate level association between vodka sale and suicide rate in Russia might be an outcome of a preference for spirits among heavy drinkers (Nemtsov & Razvodovsky 2008). The effects of drinking spirits may also be exacerbated by the way they are drunk as a heavy episodic drinking pattern is widespread. The heavy drinking of spirits in Russia may result in high suicide rates due to so-called "Mellanby effect" i.e. the more rapid rise of blood alcohol concentration and thus intake of spirits implies a large extent of immediate impairment (Smart 1996). Acute alcohol intoxication may trigger self-destructive behavior by provoking depressive thoughts, decreasing self-control and constricting cognition that impairs the generation of an effective coping strategy to avoid psychosocial distress (Hufford 2001; Pircola et al. 2000; Cherpitel, 2004; Varnik et al. 2006; Kolves et al. 2006; Pompilli et al. 2010). In addition, the expectations of aggressive behavior associated with spirits intake might trigger autoagressive behavior (Gruenewald et al. 1995).

It is important to point out, that the size of the bivariate association between vodka sale and suicide for men is substantially greater than for women. Beverage preference and harmful drinking pattern might be responsible for the gender difference in suicide rate as vodka continue to be the drinking of choice for the majority of men in Russia, while women not only drink less often than men, but those who do drink, consume vodka less frequently than men. Indeed, according to a population survey 44% of men and only 6% women reported that they drink an equivalent of 25 cl of vodka or more at one occasion (Bobak et al. 1999). According to a more recent study 28% of men and 4% of women consume at least 200g (86+ g of pure alcohol) on one occasion at least once every 2-3 weeks (Pomerleau et al. 2008). Furthermore, the results of the population survey carried out in Archangelsk suggest that 61.9% of male and 25.7% of female industrial workers had a consumption pattern that was hazardous according to the AUDIT definition (Averina et al. 2003).

It should be noted that the oldest age groups of both men and women did not experience a sharp fluctuations in their suicide rates during the anti-alcohol campaign, while increases and decreases in suicide rates for working-age males were more pronounced during the 1980s and 1990s. We also found that the relationship between overall alcohol/vodka sale and suicide rate was stronger for working-age males. In principle, this is not surprising, given that the previous studies identified an unhealthy lifestyle among middle-age working class Russian males with the high level of alcohol consumption (Cockerham 2000). Moreover, this describes a harmful pattern of drinking featuring big doses of vodka in a short period of time with a small snack. An analysis of frequency of drinking by male age groups indicates that the frequency climbs steadily to a peak between ages 30-39, before decreasing slightly in the 40-44 and 45-49 year-old and from age 50 declines significantly (Cockerham et al. 2000). A recent study based on the data from the Russian Longitudinal Monitoring Survey (RLMS) showed that frequent,

heavy drinking was significantly more common amongst men aged 40-59 years than in older and younger men (Perilman 2010).

There is indirect evidence that fluctuations in vodka sale per capita during the 1990s may have been related to changes in it availability. When the price of vodka fell relative to basic food stuffs and alcohol supply increased in the early-1990s the vodka sale rose substantially (Nemtsov & Razvodovsky 2008). Alternatively, several factors including better regulation of the alcohol market resulted in a relative increase in price for vodka compared to those for food products and impoverishment and a decrease in the purchasing capacity of the population due to unpaid or delayed salaries were behind the decrease in vodka consumption after 1994 (Nemtsov & Razvodovsky 2008).

Before concluding, it is necessary to say something about the potential limitations of this study. In particular, we relied on official alcohol sale data as a proxy measure for trends in alcohol consumption across the period. However, the unrecorded consumption of alcohol was commonplace in Russia throughout the study period especially in the early 1990s, when a considerable proportion of vodka came from illicit sources (Razvodovsky 2008). Further, there may also have been potential problems with the suicide mortality data we used. However, an earlier study has confirmed the reliability of the statistics on violent death for the Soviet period (Wasserman & Varnik 1998). In the post-Soviet period virtually all deaths from external causes are subjected to forensic autopsies, which include BAC inspection and histological examination of organs (Stickly et.al. 2007). Finally, there is also the risk of omitted variable bias in this work.

## CONCLUSION

The present study replicates previous findings from other settings suggesting that suicide rate tends to be more responsive to changes in distilled spirits consumption per capita than to the total level of alcohol consumption. Assuming that drinking spirits is usually associated with intoxication episodes, these findings provide additional evidence that drinking pattern is an important determinant in the alcohol-suicide relationship. The outcomes of this study also provide support for the hypothesis that suicide and alcohol are closely connected in a culture were an intoxication-oriented drinking pattern prevails and adds to the growing body of evidence that alcohol played a crucial role in the fluctuation in suicide mortality rates in Russia during the last decades. The findings from the present study have important implications as regards alcohol policy in Russia suggesting that any attempts to reduce overall consumption should also be linked with efforts through differential taxation to shift beverage preference away from spirits.

## REFERENCES

1. *Andreeva E, Ermakov S, Brenner H: The socioeconomic etiology of suicide mortality in Russia. International Journal Environment and Sustainable Development 2008; 7:21-48.*
2. *Averina M, Nilssen O, Brenn T, Brox J, Kalinin AG, Arkhipovsky VL: High cardiovascular mortality in Russia cannot be explained by the classical risk factors. The Archangelsk Study 2000. European Journal Epidemiol 2003; 18:871-878.*
3. *Bobak M, McKee M, Rose R, Marmot M: Alcohol consumption in a sample of the Russian population. Addiction 999; 94:857-866.*
4. *Box GEP, Jenkins GM: Time Series Analysis: forecasting and control. London. Holden-Day Inc. 1976.*
5. *Cherpitel CJ, Borges LG, Wilcox HC: Acute alcohol use and suicidal behavior: a review of the literature. Alcoholism: Clinical and Experimental Research 2004; 28:18-28.*
6. *Cockerham CW, Hinote BP, Abbot P: Psychological distress, gender, and health lifestyles in Belarus, Kazakstan, Russia, and Ukraine. Social Science & Medicine 2006; 63:2381-2394.*
7. *Cockerham CW: Health lifestyle in Russia. Social Science & Medicine 2000; 51:1313-1224.*
8. *Cornia GA, Poniccia P: The transition mortality crisis: evidence, interpretation and policy response. In: The mortality crisis in transitional economies. Edited by: Cornia G.A., Poniccia P. Oxford: Oxford University Press. 2000. 4-37.*
9. *Gavrilova NS, Semyonova VG, Evdokushkina GN, Gavrilov LA: The response of violent mortality to economic crisis in Russia. Population Research and Policy Review 2000; 19:397-419.*
10. *Gruenevald P, Ponicki WR, Mitchell PR: Suicide rates and alcohol consumption in the. United States, 1970-89. Addiction 1995; 90:1063-75.*
11. *Hufford MR: Alcohol and suicidal behavior. Clin Psychol Rev 2001; 21:797-811.*
12. *Kolves K, Varnik A, Tooding LM, Wasserman D: The role of alcohol in suicide: a case-control psychological autopsy study. Psychological Medicine 2006;2: 1-8.*
13. *Landberg J: Alcohol and suicide in eastern Europe. Drug and Alcohol Review 2008; 27:361-373.*
14. *Leon DA, Shkolnikov VM: Social stress and the Russian mortality crisis. JAMA 1998; 79:790-791.*
15. *Lester D: Suicide and homicide after the fall of communist regimes. Eur Psychiatry 1998; 13:98-100.*
16. *Makinen IH: Eastern European transition and suicide mortality. Social Science & Medicine 2000; 51:1405-1420.*
17. *Makinen IH: Suicide mortality of Eastern European regions before and after the communist period. Social Science & Medicine 2006; 63:307-319.*
18. *Nemtsov AV: Suicide and alcohol consumption in Russia, 1965-1999. Drug and Alcohol Dependence 2003; 1:161-168.*
19. *Nemtsov AV, Razvodovsky YE: Alcohol situation in Russia, 1980-2005. Social and Clinical Psychiatry 2008; 2:52-60.*
20. *Norstrom T, Rossov I: Beverage specific effects on suicide. Nord Stud Alcohol Drugs 1999; 16:109-18.*

21. Norstrom T, Skog OJ: Alcohol and mortality: methodological and analytical issue in aggregate analysis, Addiction 2001; 96: 5-17.
22. Perlman FJA: Drinking in transition: trends in alcohol consumption in Russia 1994-2004. BMC Public Health 2010; 10:691.
23. Pircola SP, Isometsa ET, Hikkinen M, Lonnqvist J: Suicides of alcohol misusers and non-misusers in nationwide population, Alcohol & Alcoholism 2000;35:70-75.
24. Pomerleau J, McKee M, Rose R, Haerpfer CW, Rotman D, Tumanov S: Hazardous alcohol drinking in the former Soviet Union: a cross-sectional study of eight countries. Alcohol Alcohol 2008;43:351-59.
25. Pompilli M, Serafini G, Innamorati M, Dominici G, Ferracuti S, Kotzalidis GD, et al.: Suicide behavior and alcohol abuse. International Journal Environment Research Public Health 2010; 7:1392-1431.
26. Pridemore WA: Heavy drinking and suicide in Russia. Social Forces 2006; 85:413-430.
27. Pridemore WA., Chamlin MB: A time-series analysis of the impact of heavy drinking on homicide and suicide mortality in Russia, 1956-2002. Addiction 2006; 101:1719-1729.
28. Pridemore WA, Spivak AL: Pattern of suicide mortality in Russia. Suicide and Life-Threating Behavior 2003; 33:132-150.
29. Ramstedt M: Alcohol and suicide in 14 European countries. Addiction 2001; 96:59-75.
30. Razvodovsky YE: The association between the level of alcohol consumption per capita and suicide rate: results of time-series analysis. Alcoholism 2001; 2:35-43.
31. Razvodovsky YE: Noncommercial alcohol in central and eastern Europe, ICAP Review 3. In: International Center for Alcohol Policies, ed. Noncommercial alcohol in three regions. Washington, DC: ICAP, 2008; 17-23.
32. Razvodovsky YE: Beverage-specific alcohol sale and suicide in Russia. Crisis 2009; 30:186-191.
33. Razvodovsky YE: Suicide and fatal alcohol poisoning in Russia, 1956-2005. Drugs: Education, Prevention and Policy 2009; 16:127-139.
34. Rehm J, Taylor B, Patra J: Volume of alcohol consumption, pattern of drinking and burden of disease in the European region. Addiction 2006; 101:1086-95.
35. Smart RG: Behavioral and social consequences related to the consumption of different beverage types. J Stud Alcohol 1996; 57:77-84.
36. Stickley A, Leinsalu M, Andreew E, Razvodovsky YE, Vagero D, McKee M: Alcohol poisoning in Russia and the countries in the European part of the former Soviet Union, 1970-2002. European Journal of Public Health 2007; 17: 444-449.
37. Varnik A, Kolves K, Vali M, Tooding L, Wasserman D: Do alcohol restriction reduce suicide mortality? Addiction 2006; 102:251-256.
38. Varnik A, Wasserman D, Dankowicz M, Eklund G: Age-specific suicide rates in the Slavic and Baltic regions of the former USSR during perestroika, in comparison with 22 European countries. Acta Psychiatr Scand 1998; 98(Suppl.394): 20-25.
39. Wasserman D, Varnik A: Reliability of statistics on violent death and suicide in the former USSR, 1970-1990. Acta Psychiatrica Scandinavica 1998; 394(Supplement):34-41.
40. Wasserman D, Varnik A, Eklund G: Male suicides and alcohol consumption in the former USSR. Acta Psychiatr Scand 1994; 89:306-313.

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