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## Alcoholism and the Russian Mortality Crisis

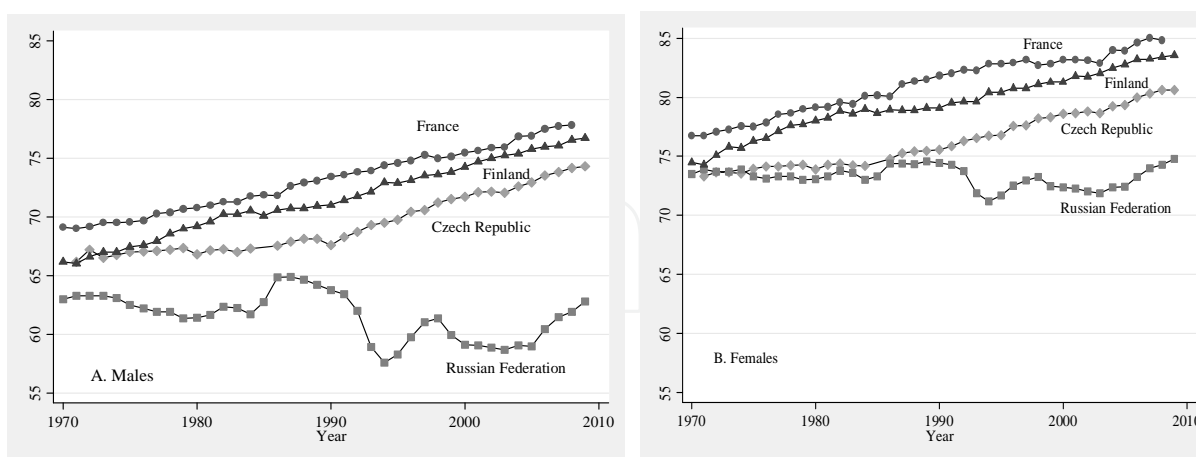
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### 1. Introduction

Life expectancy is the key aggregated indicator of a country's well-being along with gross domestic product and living standards. While Russia approaches the group of developed countries in terms of per capita GDP, it is strikingly different in terms of the living standards and the dynamics of life expectancy. Thus, life expectancy among males in Russia has not only not increased since the 1970s, but has dropped to barely above 60 years (Fig.1). The low living standards and lack of improvement in life expectancy dynamics in Russia are in contrast with the experience of the majority of developed countries and countries with transitional economies. Thus, male life expectancy at birth in Finland has increased from 66 years in 1970 to 76 years in 2007, in Norway from 71 to 77 years and in Sweden from 72 to 78 years during the same period. In the Czech Republic male life expectancy has increased from 66 to 68 years. Female life expectancy in these countries reveals comparable dynamics. Russia has still to go into an upward trend (both for men and for women) characteristic of all the developed and the majority of the developing countries.



Source: European Health for All Database, 2011.

Fig. 1. Life expectancy at birth, 1970-2007, male (left) and female (right). Top down: France, Finland, the Czech Republic, and the Russian Federation.

Numerous studies of the causes of high mortality among the Russian population all confirm the negative impact of excessive alcohol consumption (Leon et al, 1997; Shkolnikov et al,

1998; Brainerd and Cutler, 2005; Leon, 2007; Nemtsov, 2002). The majority of studies use aggregated death certificate data, which limits a more detailed study of the impact of alcohol consumption patterns on health and ultimately on the risk of death<sup>1</sup>. The data of the Russian Longitudinal Monitoring Survey (RLMS-HSE) make it possible to identify types of alcohol consumption and analyze the impact of the main types on health and the risk of death. Section 2 analyzes aggregate alcohol consumption in Russia and Europe. Section 3 is devoted to the structure of alcohol consumption in Russia. Section 4 reports the results of the assessment of the impact of alcohol consumption on health and mortality in Russia. Section 5 is devoted to the experience of European countries in implementing active anti-alcohol policies. Section 6 concludes.

## 2. Alcohol consumption in Russia and Europe

The total registered consumption of alcohol in Russia in 2008 reached 11.5 litres of pure alcohol per person above the age of 15 (Fig.2). The consumption of spirits increased by 233% between 1988 and 1998, the consumption of beer by 31%, while the consumption of wine dropped slightly by 6% (World Drink Trends, 1999, Global Status Report on Alcohol, 2004). The production of illicit (unregistered) products adds almost 5 litres, according to expert assessments<sup>2</sup>. That adds up to 16 litres of pure alcohol per citizen over 15 years of age (the Ministry of Healthcare and Social Development puts the figure at 18 litres). It has to be noted that unregistered alcohol consumption is not a peculiarly Russian phenomenon. In the majority of West European countries unregistered consumption is put by experts at between 5 and 20%, and sometimes at as much as a third of registered consumption.

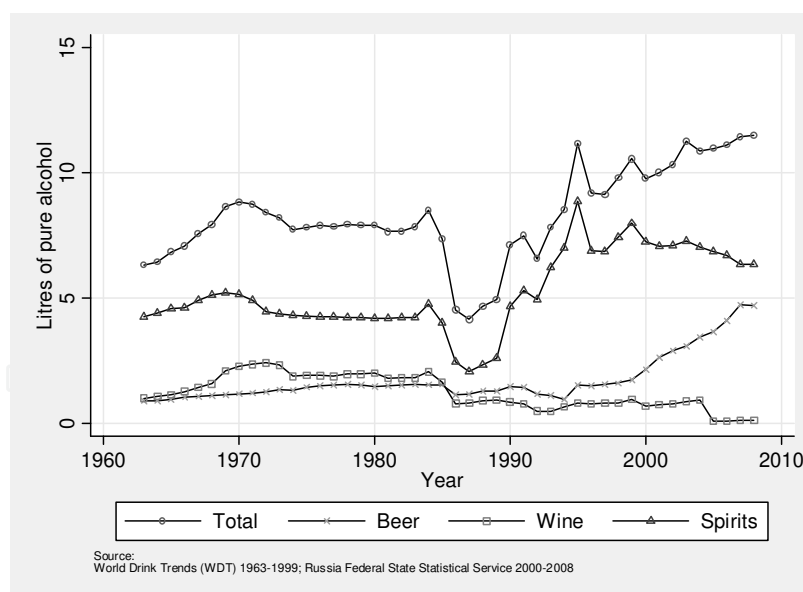


Fig. 2. Total (registered) consumption of alcohol in Russia, consumption of beer, spirits and wine. Litres of pure alcohol per capita of 15 + per year.

<sup>1</sup> A small group of studies are based on micro-data collected either with the express purpose of identifying the impact of harmful habits on the risk of death (surveys of the relatives of the dead in Izhevsk), or for other purposes (lipids test program).

<sup>2</sup> European Addiction Research (2001), Gilinskiy Y. (2000).

Aggregate consumption in Russia is higher than in the countries of Europe, although not much higher than in the Czech Republic, France and Germany. At the same time, the general trend of consumption in Europe and the US is a gradual decline in alcohol consumption (in litres of pure alcohol) since the 1980s, with the trend more manifest in Europe than in the US. Strong drinks are being replaced with lighter ones. Thus, for example, in the period between 1988 and 1998 consumption of spirits in Italy dropped by 50%, consumption of wine by 18% while consumption of beer increased by 15%. In Great Britain consumption of spirits and beer dropped by 28% and 17% respectively while wine consumption increased by a third (27%). During the same period in Europe as a whole consumption of spirits dropped by 23.2%, consumption of wine dropped by 3.6%, while consumption of beer increased by 3.6%<sup>3</sup>. Similar trends have been noted not only in developed countries. Thus in the majority of Latin American countries consumption of alcohol is going down and consumption of beer is going up.

For Russia the experience of North European countries where consumption patterns are historically similar to Russia is of the greatest interest. Figs. 3 and 4 show the dynamics of aggregate registered consumption of alcohol, beer, spirits and wine in Iceland, Finland, Norway and Sweden. As seen from the charts, all these countries witnessed dramatic changes in the structure of alcohol consumption in the 1980s and 1990s. The consumption of spirits dropped significantly: by 1.5 litres of pure alcohol per person in Norway, by 2 litres in Iceland and Finland and by almost 3 litres in Sweden. At the same time the total consumption of alcohol has not diminished and has actually grown a little because the consumption of spirits has been replaced with the consumption of beer and wine. As a result these countries moved from the group of countries with predominant consumption of strong spirits to countries with predominant consumption of beer.

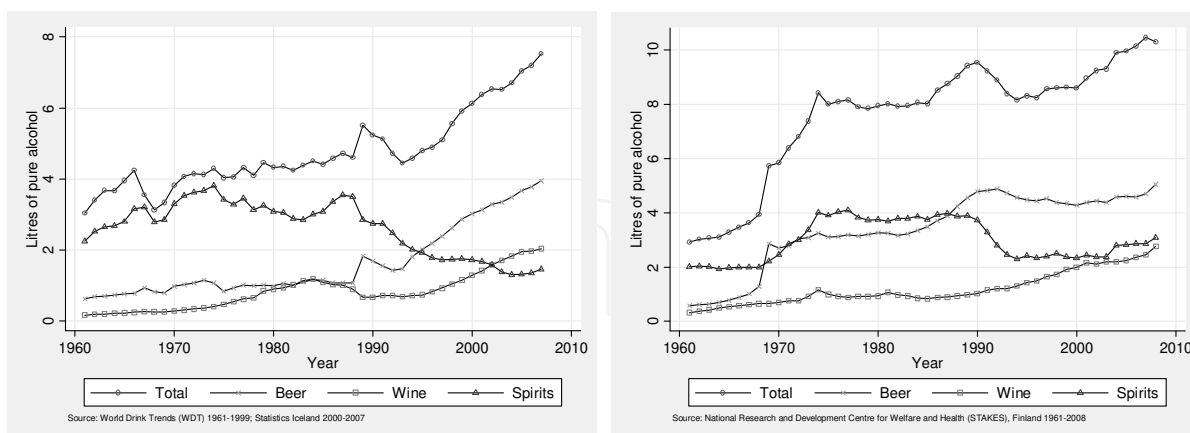


Fig. 3. Aggregate (registered) consumption of alcohol in Iceland (left) and Finland (right), consumption of beer, strong spirits and wine. Litres of pure alcohol per capita of 15 + per year.

<sup>3</sup> The calculations use data not from all the European countries, but from countries with larger populations (Belgium, Great Britain, France, Germany, Spain, Italy, Poland, the Czech Republic, Portugal and Switzerland).

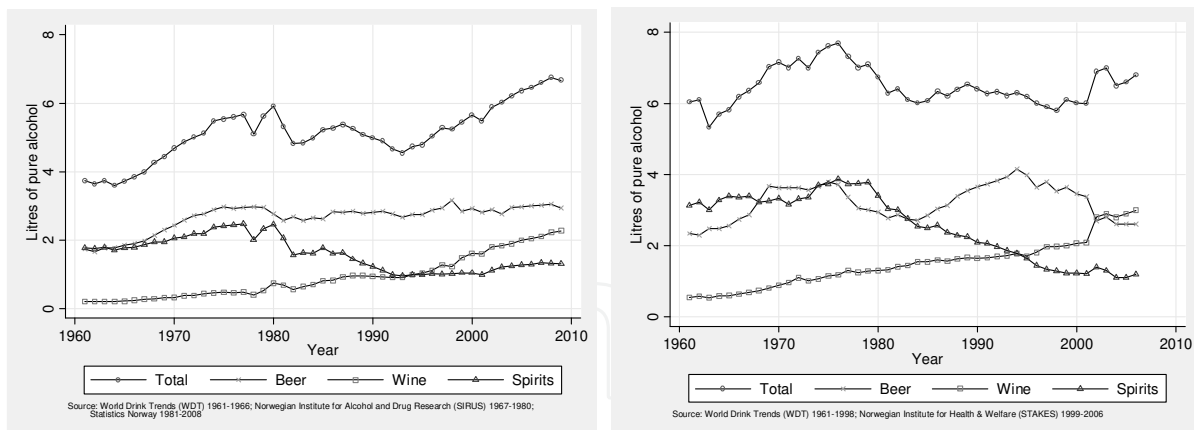


Fig. 4. Aggregate (registered) consumption of alcohol in Norway (left) and Sweden (right), consumption of beer, strong alcoholic beverages and wine. Litres of pure alcohol per capita of 15 + per year.

Changes in the structure of consumption, while not the only cause of increased life expectancy in the North European countries, have undoubtedly had a positive impact on bringing down the death rate and increasing life expectancy in these countries (see Fig.1). The change in the structure of alcohol consumption in Northern Europe has been the result of a massive, large-scale and sustained anti-alcohol policy in these countries. These measures will be discussed in more detail in Section 5.

It has to be noted that the switch from predominant consumption of spirits (hard liquor) to the consumption of beer or wine does not in itself guarantee lower risks of death. Another crucial factor is the frequency and volumes of alcohol consumption. Thus, France, which is traditionally a wine-drinking nation (Fig.5) has managed to reduce alcohol consumption almost by half between the 1960s and 2000 due to the reduction of wine consumption. The drop in consumption reduced the deaths from cardiovascular diseases (Fig.6). At the same time growing alcohol consumption, above all of spirits, in Russia has resulted in a growing death rate from these diseases.

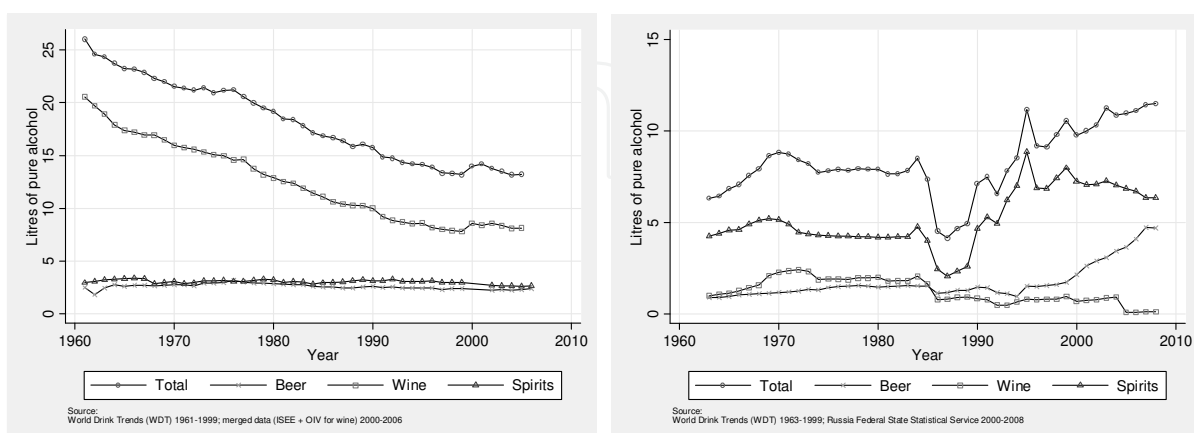
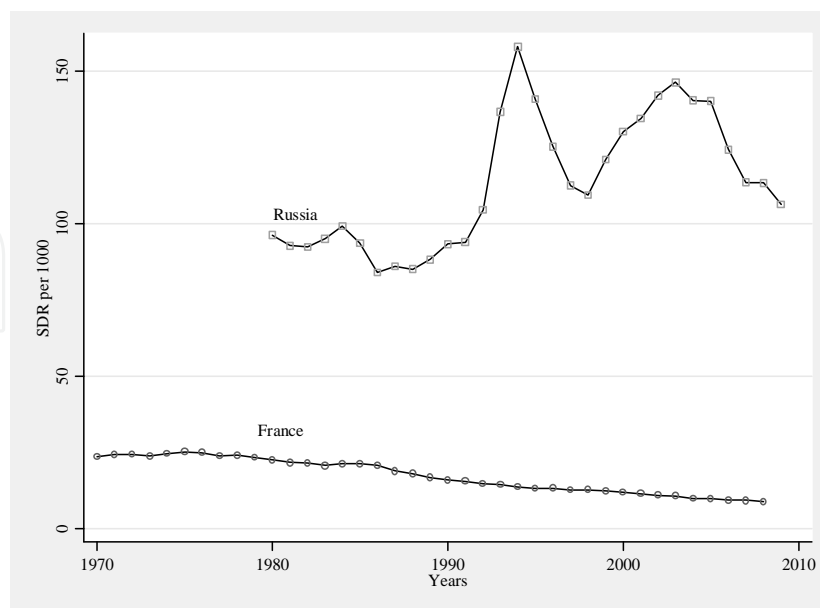


Fig. 5. Total (registered) alcohol consumption in France (left) and Russia (right), consumption of beer, strong alcoholic beverages and wine. Litres of pure alcohol per capita of 15 + per year.



Source: European health for all database, 2011

Fig. 6. Standardized coefficients of death from ischemic heart disease chronic diseases per 1000 persons in France and Russia.

On the whole aggregate alcohol consumption in Russia, although higher than in developed countries, is not so much higher as to explain the differences in mortality rate and life expectancy. It is true that the rate of alcohol-related deaths per litre consumed in Russia is substantially higher than similar indicators in Western Europe. The main reasons for that, as noted by scholars (e.g., Nemtsov, 2009) are the specific structure of consumption (a larger share of strong drinks), the northern type of alcohol consumption (large doses within a short time), the low standard of healthcare (especially the treatment of drug and alcohol addiction) as well as the traditional neglect of Russian people of their state of health.

### 3. Structure of alcohol consumption: frequency, volumes, beverages

As noted above, the type of consumption is a key characteristic of alcohol consumption (no less important than the amounts). The pattern of consumption is determined by the type of drinks in terms of strength and quality and the time and places when and where alcohol is consumed. Epidemiological studies in various countries show that the risk of cardiovascular diseases among those who drink a glass of wine a day is on average 32% less than among those who do not drink at all. A similar indicator for beer is 22% (Di Castelnuovo et al, 2002). Nemtsov (2009) notes that the impact of the pattern of consumption on the nation's health has been poorly studied by Russian narcologists. At the same time studies in other countries note that the "ideal structure" of alcohol consumption - the ratio that minimizes negative consequences - is consumption in which beer accounts for 50%, wine for 35% and spirits for 15% (Edwards et al., 1994). In 2002, according to official alcohol sales figures (that do not take into account illicit alcohol)

strong beverages accounted for 35% of the total consumption. The figure is obviously grossly understated because it does not take into account illicit production (both industrial and domestic).

The Russian Longitudinal Monitoring Survey (RLMS-HSE) makes it possible to analyze the structure of alcohol consumption by Russian households on the basis of respondents' answers<sup>4</sup>. According to the RLMS-HSE, about three quarters of the adult Russian population consume some kind of alcohol (Fig.7). The figure of drinkers is higher among males in all the age groups. The share of alcohol consumption is higher in the main age groups and a little lower in the 18-25 age group and among over 55s.

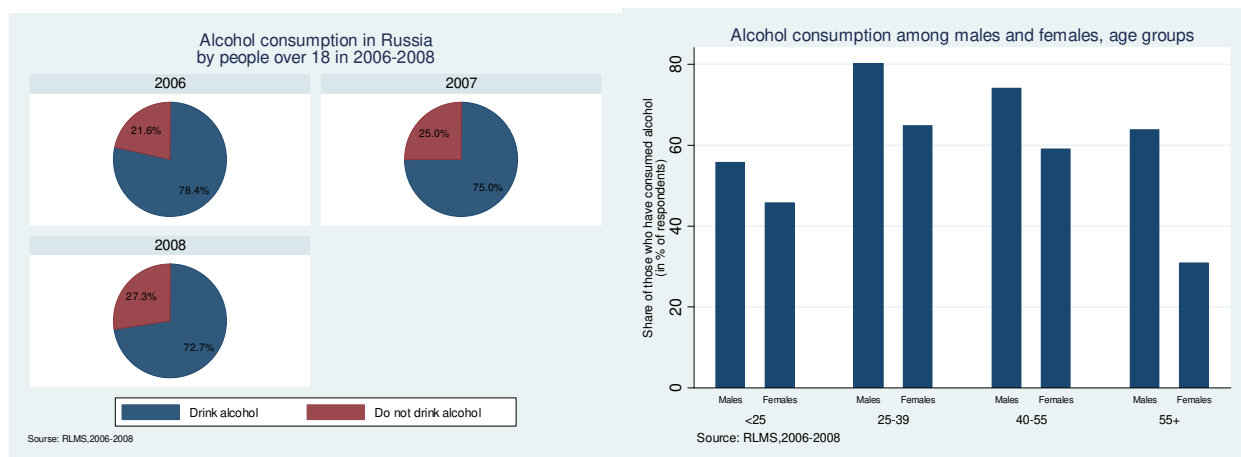


Fig. 7. Alcohol consumption in Russia<sup>5</sup>: total (left) and men and women by age groups (right). Percentage of total number of respondents.

It has to be noted that the share of alcohol drinkers is higher in groups with higher incomes and among those who have finished vocational training schools (PTU) or have higher education, although the difference in consumption depending on education is not great (Fig.8).

<sup>4</sup> RLMS-HSE is a nationally representative longitudinal survey of Russian households conducted since 1992 by the Demoscope Centre, the RAS Sociology Institute and the University of North Carolina at Chapel Hill (USA) Population Center. The National Research University Higher School of Economics (Moscow) joined the group in 2008. Cooperation with the top world centers for the study of the behavior of households in forming the sample, developing the questionnaire, recruiting and training interviewers earned this study a high degree of trust among Russian and foreign scholars and decision-makers. The RLMS-HSE data are nationally representative and are based on a survey of more than 4,000 households per year which amounts to more than 10,000 adults per year. The sample is from a two-stage random draw of dwellings from the population from the micro census of 1989. The dwellings are surveyed each year with some additional dwellings added in the later periods of the survey to meet the national representation criteria (<http://www.cpc.unc.edu/projects/rlms-hse>).

<sup>5</sup> Respondents were asked whether they had consumed any alcohol (including beer) in the last 30 days.



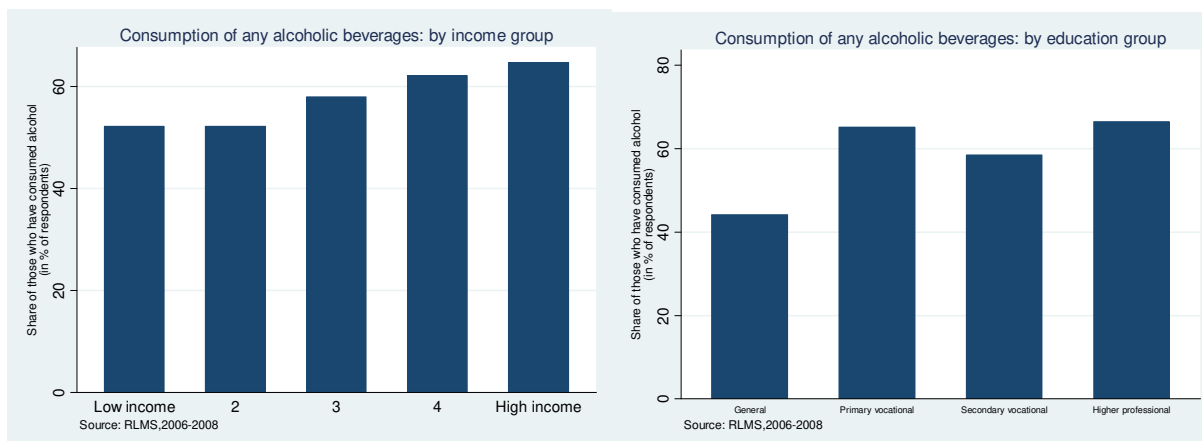


Fig. 8. Consumption of alcohol in Russia: by income group (left) and educational group (right). Percentage of total answers.

The share of abstainers (those who do not drink any alcohol) in the 18-24 and 14-16 age groups is shown in Fig.9. Among teenagers aged 14-16 about 25% consume alcohol and 75% are abstainers. The share of those who do not consume alcohol has grown somewhat in recent years. A similar trend of growing abstinence is revealed in the 18-24 age group: among women that share increased from 23% in 2006 to almost 30% in 2008; among men the share of non-drinkers in the 18-24 age group increased from 14.4% to 20.4%.

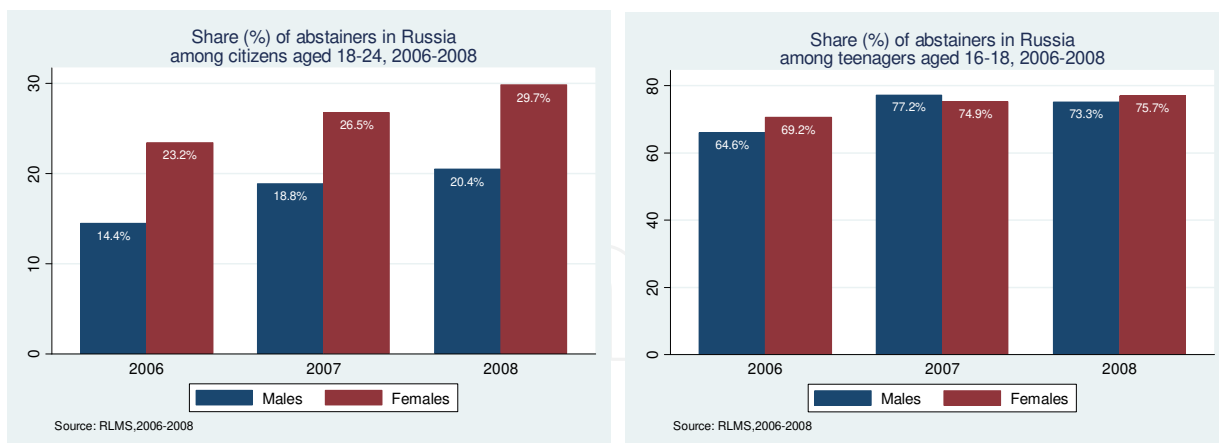


Fig. 9. Share of abstainers (non-drinkers) in Russia: 18-24 age group (left) and 14-16 age group (right). Percentage of total number of respondents in age groups.

The share of drinkers in different age groups is an important but not the only characteristic of a nation’s alcohol consumption. Thus, in France, which has managed to diminish total alcohol consumption in recent years, more than 90% of the adult population and nearly 80% of persons aged 17-19 consume alcohol (WHO Global Status Report on Alcohol, 2004).



However, the fact that the overwhelming majority drink dry wine, and then in small or medium doses, puts France in an upward trend in terms of life expectancy. Russia is still characterized by the predominant consumption on strong alcoholic beverages.

The structure of alcohol consumption in Russia as reflected in the share of those who consume this or that type of drink, is shown in Fig.10. As seen from the charts, in Russia about 70% of men and nearly 50% of women drink beer. The next most popular drink is vodka and other strong spirits, consumed by more than 60% of men and 37% of women. About 12% of men and 5% of women drink home-made alcohol. About 40% of women and 11% of men drink dry wine or champagne. Thus, the most popular alcoholic beverages in Russia are vodka and home-produced alcohol, on the one hand, and beer on the other. At the same time, if one recalls Fig.2 which shows total consumption of beer and spirits in Russia in litres of pure alcohol, the absolute predominance of vodka cannot be disputed, whereas beer and wine account for only a small share of total alcohol consumption. This indicates the type of consumption: vodka is drunk more frequently and in larger quantities whereas beer and wine is drunk less frequently and in smaller quantities.

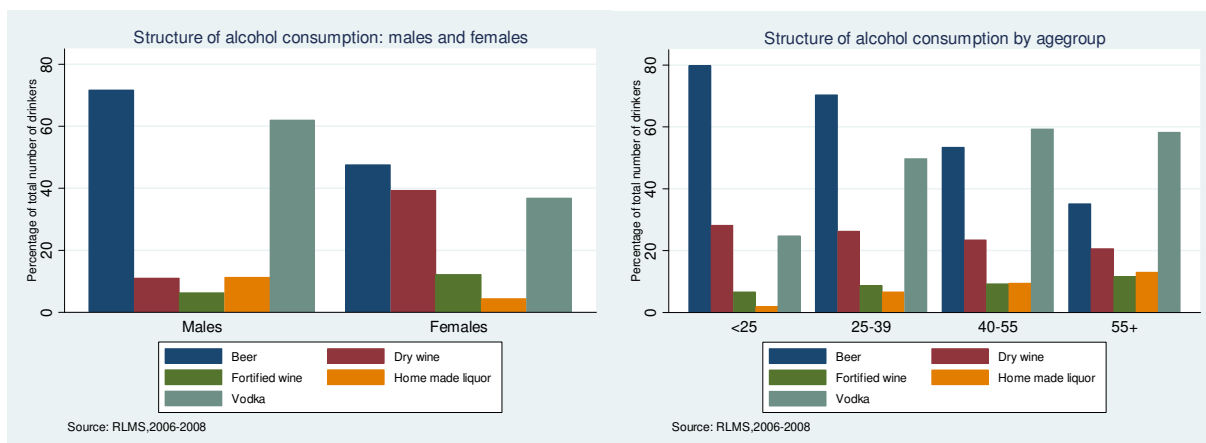


Fig. 10. Structure of alcohol consumption in Russia: by gender (left) and by age groups (right). Percentage of total number of drinkers.

It is notable that the consumption of beer, on the one hand, and of vodka and home brewed alcohol on the other reveals substantial differences by age group (Fig.10, right-hand side). Indeed, the distribution of beer consumers is tilted towards younger age groups whereas consumption of vodka is more characteristic of older age groups. This picture may attest to the beginnings of change in the pattern of consumption and a shift from predominantly strong alcoholic beverages towards beer. Whether the trend turns out to be sustained remains to be seen.

The structures of alcohol consumption by income groups and education are shown in Fig.11. The share of vodka and beer in the structure of consumption in different income groups is approximately the same, with beer consumption slightly higher in the lower-income groups. At the same time there is a marked trend of increased share of those who drink wine and champagne in the higher-income groups. Thus in the first (lowest) quantile only 16% of alcohol consumers drink wine and in the fifth (top) quantile the percentage is 31%. Similarly the consumption of wine and champagne is more common among people with a higher level of education. The lower share of vodka and beer drinkers in the groups with a higher

education may indicate a replacement of these drinks with wine among the better educated groups.

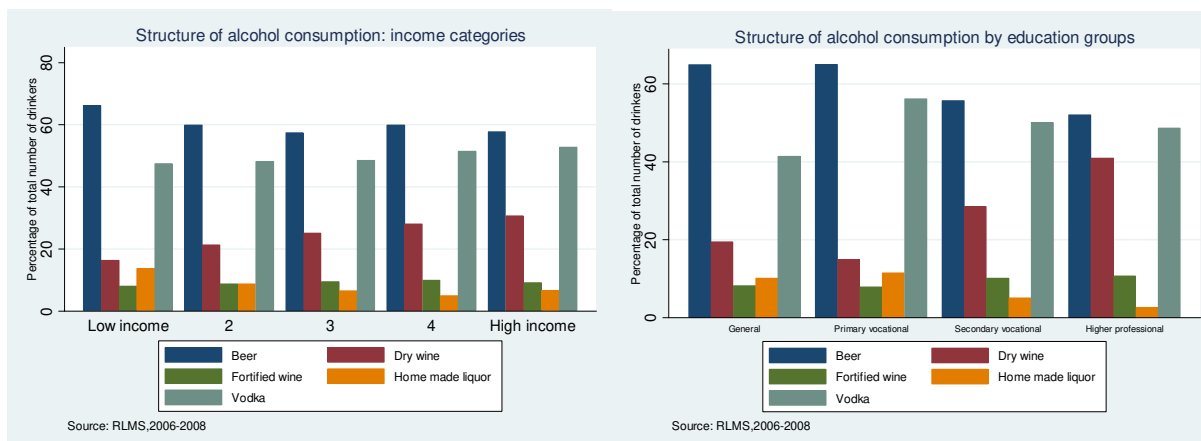


Fig. 11. Structure of alcohol consumption in Russia: by income group (left) and by educational group (right). Percentage of total number of drinkers.

A comparison of the frequency of alcohol consumption in Russia and some West European countries (Table 1) shows a similarity with Finland and Sweden. Indeed, the percentage of men who frequently consume alcohol (every day or 4-5 times a week) is 6.3% in Russia, 8% in Finland and 7% in Sweden. A further 35% of Russian men drink once or 2-3 times a week. Similar figures are reported in Sweden (40%) and Finland (50%). Russian women do not drink more frequently than women in the Nordic countries. This type of consumption contrasts with consumption in the southern countries: in Italy, for example, 45% of men and 30% of women drink (usually wine) every day or 4-5 times a week. The figures for France are 26% for men and 11% for women.

	Every day	4-5 times a week	2-3 times a week	Once a week	2-3 times a month	Once a month	Once or several times a year	Do not drink
<i>Males:</i>								
Finland	4	4	20	32	19	7	8	6
France	21	5	19	23	7	5	6	13
Germany	12	6	24	18	11	11	7	12
Italy	42	3	17	14	4	4	6	11
Sweden	3	4	16	24	23	12	12	7
UK	9	16	31	18	8	4	4	11
Russia (RLMS)	2.8	3.5	15.4	19.6	20.3	8.4	n.a.	30
<i>Females:</i>								
Finland	2	2	7	22	22	14	24	8
France	9	3	10	16	9	12	14	27
Germany	5	2	13	20	15	10	17	18
Italy	26	4	10	12	8	4	14	22
Sweden	1	1	5	17	2	17	23	13
UK	5	6	18	22	12	10	11	14
Russia (RLMS)	0.5	0.5	3.5	10	20.5	15	n.a.	50

Source: Alcohol in post-war Europe (2001), Table 5.1, p. 107 for Western Europe and authors' calculations for Russia

Table 1. Frequency (%) of alcohol consumption, West Europe and Russia, men and women

The frequency of alcohol consumption hardly varies in different income groups and varies only slightly by education group (Fig.12). The better educated drink less frequently: the share of those who drink every day or 4-6 times a week among graduates of vocational training schools is 7% and among graduates of secondary professional schools and higher education institutions 4%. The number of those who drink 2-3 times a month is 5% higher among university graduates: 37% versus 32% among graduates of vocational secondary schools. These differences reflect more moderate alcohol consumption among women who happen to be better educated.

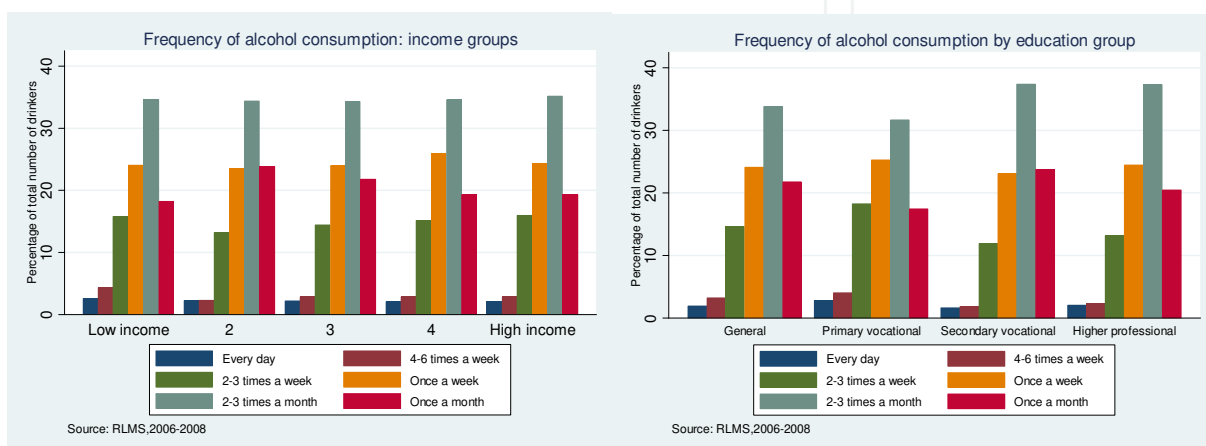
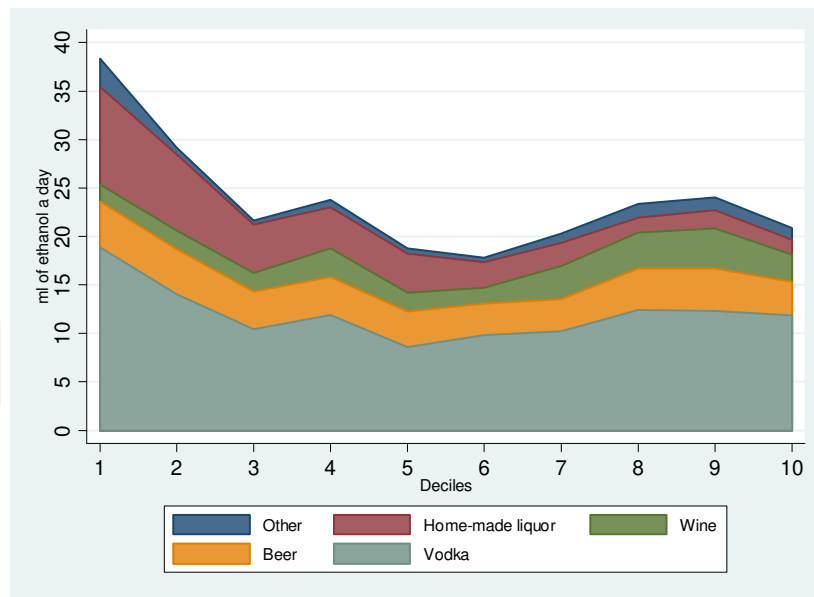


Fig. 12. Frequency of alcohol consumption in Russia: by income group (left) and by education group (right). Percentage of total number of drinkers.

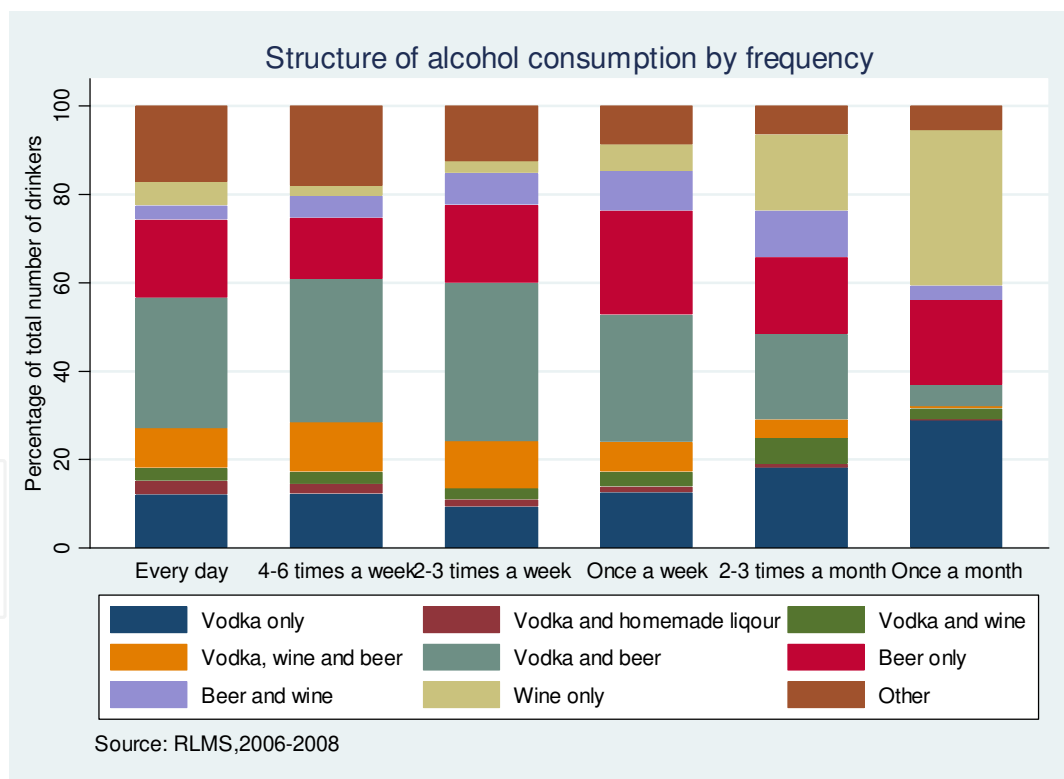
Differences in the structure of alcohol types and frequency of consumption manifest themselves in differences in the average quantity of ml of ethanol consumed. The differences in the average daily consumption of ethanol between different income groups are shown in Fig.13. As seen from the chart, consumption of ethanol is the highest in the first three income groups (the poorest) which is due to the prevalence of the consumption of vodka and home brewed alcohol in these groups. At the same time the high income groups in the 8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup> deciles show a high consumption of ethanol comparable to the 3<sup>rd</sup> and 4<sup>th</sup> income groups, which is a consequence of the high consumption of vodka in top deciles.

The structure of alcoholic drinks consumption by frequency is shown in Fig. 14. As seen from the chart, the prevalent type of alcohol consumption in Russia is the drinking of vodka separately or in combination with other drinks. This type of consumption is more pronounced among frequent drinkers: almost 60% of those who drink every day or 4-6 times a week drink vodka, separately or in combination with other drinks. Among those who drink less frequently vodka drinkers account for more than half. At the same time it is noticeable that the share of those who drink wine and beer, but do not drink vodka is higher among the groups of infrequent drinkers (once a year or 2-3 times a month) than among other groups.



Source: Authors calculations based on RLMS-HSE, 2005 using Andrienko and Nemtsov, 2005 approach.

Fig. 13. Structure of alcohol consumption by income groups in Russia (1 - the poorest, 10 - the richest), ml ethanol a day



Source: RLMS,2006-2008

Fig. 14. Structure of alcohol consumption by frequency (% of those who drank alcohol).

#### 4. The impact of alcohol consumption on health and risk of death

This section presents the results of the estimates of the impact of alcohol consumption on the health and risk of death in Russia based on the data of the Russian Longitudinal Monitoring

Survey. The RLMS-HSE questionnaire contains a wide range of questions characterizing various aspects of the behavior of individuals in the family and in the labor market and detailed information on harmful habits and health indicators. In addition, the longitudinal character of the study makes it possible to trace the behavior trajectories of respondents over many years and to study the causes of death.

The regressions cited below test the impact of frequent alcohol consumption on health (Tables 2 and 3) and the risk of death (Table 4) and separates the overall effect of frequent consumption of alcohol from frequent consumption of vodka (straight or in combination) and divide frequent alcohol consumption into frequent consumption of vodka (straight or mixed) and frequent consumption of beer (separately or mixed with drinks other than vodka). RLMS makes it possible to determine how frequently and what beverages an individual drinks. We have identified a group of those who consume alcohol every day or 4-6 times a week, calling it "frequent drinkers". In addition we have identified two subgroups among the frequent drinkers: those who drink vodka, separately or in combination with other drinks ("frequent vodka drinkers") and those who drink beer, but do not drink vodka ("frequent beer drinkers").

The health variable used is the person's own assessment of his/ her state of health (very bad, bad, satisfactory, good and very good). We use all the categories as well as define the binary variable: bad and very bad health versus all the other variants. Death is registered in the sample on the basis of the information provided by the household head when the unit is surveyed at least two rounds in a row. A household head is asked to report whether any household member is missing during the survey round and the reason for that member being not in the household. One of the reasons reported is the death of the household member. More details on the measurement and methodology could be found in Denisova (2010).

In all cases we control for gender, age, the respondent's education, per capita household income, place of residence, body mass index and smoking (whether or not the respondent smokes). We also control for the individual's assessment of his own social status on a nine-point scale ("respected - not respected"). This makes it possible to take into account the impact of constant psychological stress on a person's health and separate that impact from the impact from alcohol consumption.

The impact of alcohol consumption on health is estimated based on pooled cross-section for 1994-2007 (Table 2) and on a panel for the same years (Table 3). The impact of alcohol consumption on the risk of death is estimated with Gompertz proportional hazard model (Table 4).

The results of the estimates of the impact of alcohol consumption on health in Table 2 show that frequent alcohol consumption harms health. Thus, frequent alcohol consumption increases the probability of having bad or very bad health by 7 percentage points. Moreover, frequent alcohol consumption that includes vodka leads to health deterioration (the risk of bad health increases by 9 percentage points) whereas frequent consumption of beer does not have a statistically significant effect on health. The negative impact of frequent alcohol consumption on health is stable regardless of the method of assessment and of control for individual specific recorded effects in particular (Table 3). Frequent alcohol consumption increases the probability of bad or very bad health by 17 percentage points, with the entire effect caused by frequent consumption of vodka.

	Self-accessed health						Bad and very bad health		
	Males and females		Males		Females		Males and females	Males	Females
Age	-0.02	-0.02	-0.021	-0.021	-0.018	-0.018	0.035	0.037	0.032
	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.000]***	[0.001]***	[0.001]***	[0.001]***
Gender: Males	0.209	0.209					-0.202		
	[0.006]***	[0.006]***					[0.017]***		
Married	0.032	0.032	0.031	0.031	0.029	0.029	-0.14	-0.172	-0.12
	[0.005]***	[0.005]***	[0.009]***	[0.009]***	[0.007]***	[0.007]***	[0.015]***	[0.026]***	[0.019]***
Junior or secondary professional education	-0.01	-0.01	-0.029	-0.029	0.004	0.004	-0.085	-0.063	-0.099
	[0.006]*	[0.006]*	[0.009]***	[0.009]***	[0.007]	[0.007]	[0.016]***	[0.026]**	[0.020]***
Higher education	0.063	0.063	0.056	0.056	0.057	0.056	-0.211	-0.219	-0.193
	[0.008]***	[0.008]***	[0.012]***	[0.012]***	[0.009]***	[0.009]***	[0.022]***	[0.038]***	[0.027]***
Log of real per capita income, 1992 prices	0.022	0.022	0.019	0.019	0.023	0.023	-0.075	-0.088	-0.066
	[0.003]***	[0.003]***	[0.004]***	[0.004]***	[0.004]***	[0.004]***	[0.008]***	[0.012]***	[0.010]***
Self-perceived status, respect rank on 9-step ladder	0.027	0.027	0.035	0.036	0.018	0.018	-0.035	-0.053	-0.02
	[0.001]***	[0.001]***	[0.002]***	[0.002]***	[0.002]***	[0.002]***	[0.004]***	[0.006]***	[0.005]***
Frequent alcohol drinker	-0.025		-0.016		-0.021				
	[0.014]*		[0.015]		[0.033]				
Frequent vodka drinker (pure and in mix)		-0.029		-0.023		-0.025	0.092	0.084	0.066
		[0.017]*		[0.018]		[0.043]	[0.043]**	[0.048]*	[0.113]
Frequent beer drinker (no vodka)		0.002		0.012		0.021	-0.105	-0.122	-0.187
		[0.031]		[0.035]		[0.066]	[0.101]	[0.115]	[0.212]
Smokes	-0.06	-0.06	-0.041	-0.041	-0.07	-0.071	0.038	-0.024	0.07
	[0.006]***	[0.006]***	[0.007]***	[0.007]***	[0.008]***	[0.008]***	[0.017]**	[0.024]	[0.026]***
Body mass index	0.029	0.029	0.111	0.111	0.007	0.007	-0.064	-0.184	-0.017
	[0.017]*	[0.017]*	[0.025]***	[0.025]***	[0.011]	[0.011]	[0.003]***	[0.058]***	[0.028]
Body mass index squared/1000	-0.538	-0.539	-1.891	-1.891	-0.241	-0.241	1.158	2.998	5.03
	[0.304]*	[0.304]*	[0.468]***	[0.468]***	[0.195]	[0.195]	[0.047]***	[1.082]***	[0.452]
Unemployed	-0.002	-0.002	0.004	0.004	-0.002	-0.002	0.082	0.031	0.1
	[0.011]	[0.011]	[0.017]	[0.017]	[0.015]	[0.015]	[0.032]**	[0.052]	[0.042]**
Urban settlement	-0.061	-0.061	-0.062	-0.062	-0.06	-0.06	0.034	0.046	0.026
	[0.005]***	[0.005]***	[0.008]***	[0.008]***	[0.007]***	[0.007]***	[0.015]**	[0.023]**	[0.019]
Constant	3.197	3.196	2.288	2.287	3.575	3.575	-0.87	0.737	-1.705
	[0.230]***	[0.230]***	[0.321]***	[0.321]***	[0.155]***	[0.155]***	[0.084]***	[0.756]	[0.380]***
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	75037	75037	34083	34083	40954	40954	75265	34204	41061
R squared	0.19	0.19	0.17	0.17	0.18	0.18	0.12	0.12	0.12

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Table 2. Influence of alcohol consumption on health, pooled cross-section, 1994-2007

	Self-accessed health						Bad and very bad health		
	Males and females		Males		Females		Males and females	Males	Females
Age	-0.016	-0.016	-0.023	-0.023	-0.01	-0.01	0.004	0.004	0.006
	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.000]***	[0.000]***	[0.000]***
Married	0.031	0.031	0.038	0.038	0.034	0.034	-0.002	-0.006	-0.001
	[0.007]***	[0.007]***	[0.011]***	[0.011]***	[0.008]***	[0.008]***	[0.003]	[0.003]	[0.005]
Log of real per capita income, 1992 prices	0.007	0.007	0.006	0.006	0.008	0.008	-0.005	-0.005	-0.006
	[0.003]**	[0.003]**	[0.004]	[0.004]	[0.004]**	[0.004]**	[0.001]***	[0.001]***	[0.002]***
Self-perceived status, respect rank on 9-step ladder	0.01	0.01	0.013	0.013	0.007	0.007	-0.002	-0.002	-0.003
	[0.001]***	[0.001]***	[0.002]***	[0.002]***	[0.002]***	[0.002]***	[0.001]***	[0.001]***	[0.001]***
Frequent alcohol drinker	-0.028		-0.008		-0.098		0.017		
	[0.013]**		[0.015]		[0.031]***		[0.006]***		
Frequent vodka drinker (pure and in mix)		-0.028		-0.008		-0.13	0.017	0.01	0.056
		[0.015]*		[0.017]		[0.039]***	[0.007]**	[0.007]	[0.021]***
Frequent beer drinker (no vodka)		0.017		0.042		-0.037	-0.005	-0.004	-0.015
		[0.029]		[0.035]		[0.059]	[0.014]	[0.015]	[0.032]
Smokes	-0.011	-0.012	0.01	0.01	-0.048	-0.048	-0.012	-0.012	0.003
	[0.010]	[0.010]	[0.013]	[0.013]	[0.014]***	[0.014]***	[0.005]***	[0.005]***	[0.008]
Body mass index	0.015	0.015	0.052	0.052	0.005	0.005	-0.008	-0.008	-0.005
	[0.003]***	[0.003]***	[0.008]***	[0.008]***	[0.003]	[0.003]	[0.001]***	[0.001]***	[0.003]***
Body mass index squared/1000	-0.15	-0.15	-0.71	-0.711	-0.057	-0.057	0.073	0.073	0.277
	[0.036]***	[0.036]***	[0.130]***	[0.130]***	[0.037]	[0.037]	[0.018]***	[0.018]***	[0.056]***
Constant	3.451	3.451	3.252	3.254	3.338	3.338	0.15	0.149	0.163
	[0.050]***	[0.050]***	[0.117]***	[0.117]***	[0.060]***	[0.060]***	[0.025]***	[0.025]***	[0.050]***
Number of observations	75054	75054	34097	34097	40957	40957	75283	75283	34219
Number of individuals (groups)	19026	19026	9025	9025	10002	10002	19056	19056	9043
R squared	0.16	0.16	0.15	0.15	0.16	0.16	0.06	0.06	0.05

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Table 3. Influence of alcohol consumption on health, panel fixed effects, 1994-2007

The results of the assessment of the impact of alcohol on risk of death are shown in Table 4. As seen from the table, frequent consumption of alcohol, above all of strong spirits, increases the risk of death. Simple consumption of vodka or beer does not yield a statistically significant effect. Frequent consumption of alcohol increases the risk of death by 60 percentage points. Frequent consumption of vodka increases the risk of death by 66 percentage points whereas frequent consumption of beer does not have a statistically significant effect.

	(1)	(2)	(3)	(4)
<i>Economic well-being</i>				
Household in poverty: the 1st poverty episode	0.86 [0.045]***	0.853 [0.045]***	0.86 [0.045]***	0.854 [0.045]***
Household in poverty: the 2nd, 3d, ... poverty episodes	1.373 [0.227]*	1.338 [0.230]*	1.369 [0.226]*	1.343 [0.232]*
Consumption decile (within year)	0.981 [0.154]	0.98 [0.155]	0.98 [0.155]	0.975 [0.154]
<i>Self-perceived status</i>				
Economic rank on 9-step ladder	0.973 [0.035]	0.97 [0.035]	0.972 [0.035]	0.971 [0.035]
Respect rank on 9-step ladder	0.947 [0.023]**	0.945 [0.023]**	0.946 [0.023]**	0.947 [0.023]**
<i>Stress indicator</i>				
Concern about getting necessities	1.088 [0.113]	1.065 [0.112]	1.083 [0.112]	1.077 [0.113]
<i>Habits</i>				
Smokes	1.582 [0.193]***	1.577 [0.191]***	1.584 [0.193]***	1.563 [0.188]***
Frequent alcohol drinker	1.594 [0.282]***			1.514 [0.273]**
Vodka/hard liquids drinker		1.142 [0.123]		1.117 [0.124]
Beer drinker		1.021 [0.136]		0.999 [0.132]
Frequent vodka drinker			1.663 [0.324]***	
Frequent beer drinker			1.243 [0.726]	
<i>Alcohol availability</i>				
Relative price of vodka to bread in locality	1.015 [0.011]	1.015 [0.011]	1.015 [0.011]	1.015 [0.011]
<i>Labor market experience</i>				
Unemployed	1.495 [0.363]*	1.503 [0.361]*	1.498 [0.365]*	1.498 [0.363]*
Experience as entrepreneur/self-employed	0.472 [0.182]*	0.472 [0.182]*	0.471 [0.181]*	0.472 [0.182]*
Mobile in labor market	0.488 [0.087]***	0.493 [0.087]***	0.489 [0.087]***	0.492 [0.087]***
<i>Health care accessibility</i>				
Could not afford or find prescribed medicine	1.179 [0.264]	1.144 [0.269]	1.174 [0.262]	1.149 [0.270]
Gender: Males	3.478 [0.453]***	3.484 [0.476]***	3.481 [0.453]***	3.434 [0.466]***
<i>Social and individual human capital</i>				
Married	1.081 [0.114]	1.07 [0.114]	1.077 [0.114]	1.073 [0.115]
Family size, number of people in family	1.161 [0.041]***	1.163 [0.042]***	1.161 [0.041]***	1.163 [0.042]***
Children in family	0.769 [0.112]*	0.754 [0.110]*	0.769 [0.112]*	0.753 [0.111]*
<i>Education: secondary school and below - reference category</i>				
Junior or secondary professional	0.847 [0.087]	0.836 [0.087]*	0.852 [0.089]	0.839 [0.087]*
University degree or higher	0.649 [0.123]**	0.647 [0.124]**	0.652 [0.124]**	0.649 [0.124]**
Urban settlement	0.758 [0.072]***	0.744 [0.076]***	0.755 [0.071]***	0.743 [0.076]***
<i>Health indicators</i>				
Yes***			Yes***	
<i>Gompertz function coefficients</i>				
0.053		0.053	0.053	0.053
	[0.004]***	[0.004]***	[0.004]***	[0.004]***
Observations	70715	70513	70715	70513
No. of subjects	17606	17596	17606	17596
No. of failures	420	418	420	418
Log Pseudolikelihood	-603.07	-602.64	-603.24	-600.36

Robust standard errors in brackets; \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Table 4. Determinants of mortality, working age population, 18-65, parametric Gompertz regression



The results obtained can be represented as differences in survival functions for those who frequently drink strong alcoholic beverages and those who rarely or never consume strong liquor. Such functions are represented in Fig. 15. As seen from the ratio of the curves, frequent consumption of vodka shortens life by an average 9-10 years. At the same time, as noted above, frequent beer consumption has not yielded a statistically significant result.

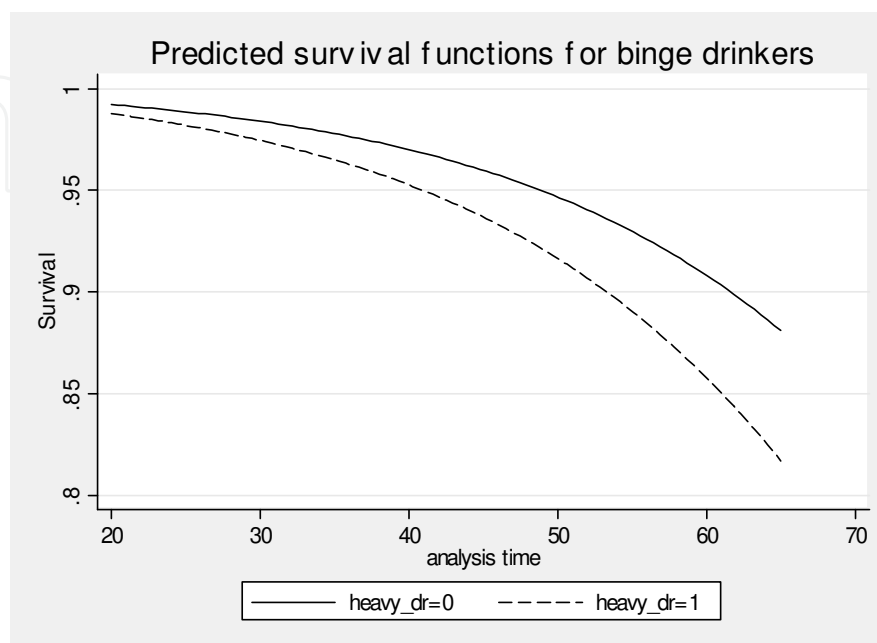


Fig. 15. Predicted survival curves: frequent drinkers of strong liquor (broken line) and infrequent drinkers and non-drinkers (solid line). The forecast is based on estimates presented in Table 3.

Thus, the regression analysis based on longitudinal data makes it possible to isolate the impact of various types of alcohol consumption on the health and mortality controlled for the impact of other groups of factors. Our results attest to a strong negative impact of frequent alcohol consumption on health and the risk of death. Moderate alcohol consumption does not exert a statistically significant effect. In addition, the negative impact of frequent consumption of strong alcoholic beverages is greater than the effect of frequent consumption of wine and beer: frequent consumption of vodka shortens life by an average 9-10 years, whereas no statistically significant impact of frequent beer drinking has been revealed.

##### 5. Anti-alcohol policy measures: The experience of European countries

The experience of the countries of Northern Europe in encouraging people to switch from the consumption of mainly strong alcoholic beverages to lighter ones (beer and wine) shows active use of excise policy measures. Table 5 contains information on excise rates on alcohol, intermediate products, wine and beer in European countries in 2010. As seen from the table, the excise rates in the North European countries are significantly higher than in other countries, and excise on alcohol is 2-4 times higher than excise on beer (in liters of pure alcohol). In some other European countries the gap between excise on spirits and beer is six-fold, although excise is much lower than in the North European countries in absolute terms.

Similar calculations of the ratio of excise on various types of alcoholic drinks in Russia could be found in the bottom line in Table 5. As seen from the table, excise on all alcoholic beverages in Russia is several times lower than in European countries. Moreover, the structure of excise tax in Russia differs drastically from the structure in excise in Europe. Russia has a very low excise on distilled spirits: 5.25 euros against 49.21 euros in Sweden (and even 85.36 euros in Norway) and 10 euros in Austria. The excise rate on wine in Russia is close to the rates of wine-consuming countries of southern Europe, a mere 80 eurocents. The rate of tax on beer increased significantly in 2010 but is much lower than the similar rates in North Europe, UK and Ireland in absolute terms. It is though comparable – and even higher if income differences are taken into account – with excise rates in beer-consuming countries. Beer excise amounts to 26 euros in Finland, 19.87 euros in Ireland, 18.08 euro in UK, 17.07 euros in Sweden, but is only 1.73 euros in Germany, 4.4 euros in Austria, 4.9 euros in Netherlands and 4.5 euros in Russia. In addition, strong beer (upward of 8.6%) is common in Russia, unlike in Europe.

<i>Country</i>	<i>Distilled spirits</i>	<i>Wine (11%)</i>	<i>Beer (5%)</i>
Austria	10.03	0	4.4
Belgium	17.52	4.28	3.76
Denmark	20.14	7.42	6.84
Finland	39.4	25.47	26
France	15.12	0.3	2.71
Germany	13.04	0	1.73
Greece	15.7	0	3.58
Ireland	31.13	23.81	19.87
Italy	8	0	5.17
Netherlands	15.04	6.23	4.9
Portugal	10	0	2.76
Spain	8.3	0	2
Sweden	49.21	19.25	17.07
UK	24.85	21.59	18.08
Russia	5.25	0.8	4.5

Source: CEPS, Summary of EU Member States at <http://www.europeanspirits.org/OurIndustry/TaxationIndustry.asp> (Rates as of January 2010) for Europe and Federal Law No. 171-FZ for Russia (converted according to 40 rubles per euro exchange rate).

Table 5. Alcohol excise rates (euros per litre of pure alcohol), Russia and Europe, 2010

On the whole excise rates on alcohol in Russia are rather low, especially for distilled spirits, even with due account of the differences in the purchasing power of the population in Europe and Russia. Excise rates on distilled spirits in Russia are strikingly low when compared to the rates in countries with unhealthy high alcohol consumption and high share of consumption of hard liquids. Moreover, the ratios of excise rates on distilled spirits and beer are in sharp contrast to those in all European countries. Wine excise rate is comparable to wine-consuming countries of Europe. The policy of reducing alcohol consumption dictates an increase of excise on all alcoholic products. If Russians are to be induced to consume less alcohol and strong alcoholic beverages in particular, excise on distilled spirits must grow faster than on other goods.

The effectiveness of the use of price mechanisms to limit alcohol consumption depends on how price-elastic demand for alcoholic beverages is. Assessments of the elasticity of demand for alcoholic beverages in the European countries and Russia will be found in Table 6.

<i>Country</i>	<i>Price elasticity</i>	<i>Income elasticity</i>
Finland, Sweden, Norway	-0.782	0.752
Austria, France, Greece, Italy, Portugal and Spain	-0.216	0.752
Belgium, Denmark, Ireland, UK	-0.495	0.752
Netherlands	-1.466	0.752
Russia		
Vodka	-1.774	0.524
Beer	-3.017	1.114
Wine	-1.045	1.304

*Source:* Leppanen et al, 2001 for European countries, Andrienko and Nemtsov, 2005 for Russia

Table 6. Elasticity of demand for alcoholic beverages in the countries of Europe and Russia

As seen from the table the assessment of the elasticity of demand for vodka, beer and wine depending on price in Russia is much higher than the same indicators for the European countries and is comparable to the elasticity of demand in the Netherlands. This suggests that price measures of influencing alcohol consumption – increasing excise on strong beverages in order to encourage people to switch to types of alcohol consumption that cause less harm to health – can be effective. In Russia the experience of the past decades has revealed a relative cheapening of vodka. Thus in the late 1980s the ratio of vodka and beer prices was such that one could buy nine bottles of beer for the price of one bottle of vodka. At present it can buy on average 3-4 bottles of beer (and some vodkas are even cheaper).

Along with price measures, an effective anti-alcohol policy must include other measures: the system of control of the production and sale of alcohol, restriction of the sale of alcohol outside restaurants, bars, etc., restrictions on the minimum age of the customer to whom alcohol can be sold, restrictions on alcohol advertising, on sponsorship of sporting and youth events, and on consumption of alcohol in public places. All the European countries, and not only the northern ones, have significantly strengthened their anti-alcohol policies in the last 50 years.

## 6. Conclusions

Mortality dynamics in Russia are due in large part to excessive alcohol consumption. In Russia consumption of strong alcoholic beverages exceeds the consumption of beer and wine both in terms of the aggregate volume and prevalence among the population. This “northern” type of consumption is characteristic of all the income and education groups.

There is a trend for vodka consumption to shift towards the older age group while young people are switching to the consumption of beer. Whether this is a sustained trend is unclear. There is a trend for better educated and wealthier people to switch to the consumption of wine rather than hard liquor.

An analysis of the impact on health and mortality attests to a strong negative impact of frequent alcohol consumption. Moderate alcohol consumption does not produce a statistically significant negative effect.

The negative impact of frequent consumption of hard liquor exceeds that of the consumption of wine and beer. Frequent consumption of vodka shortens the lifespan by an average 9-10 years while no statistically significant impact has been revealed of frequent consumption of beer.

An active anti-alcohol policy must include both price and non-price measures. The policy aimed at reducing alcohol consumption calls for a rise of excise on all the alcoholic products. If Russians are to be encouraged to switch to lighter drinks, excise on hard liquor must grow faster than other excise rates.

There is a large untapped potential for the use of non-price anti-alcohol measures aimed at reducing alcohol consumption in Russia. The experience of North European countries which have succeeded in switching from the consumption of predominantly hard liquor to the consumption of beer and wine and significantly cutting the consumption of hard liquor is of particular relevance.

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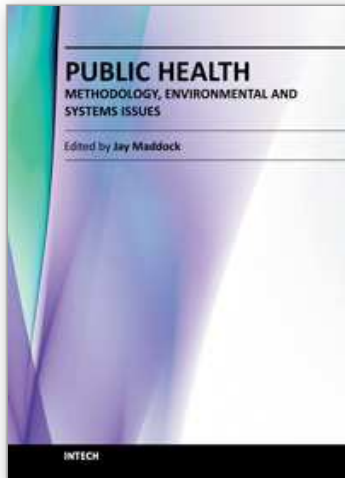
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## **Public Health - Methodology, Environmental and Systems Issues**

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Public health can be thought of as a series of complex systems. Many things that individual living in high income countries take for granted like the control of infectious disease, clean, potable water, low infant mortality rates require a high functioning systems comprised of numerous actors, locations and interactions to work. Many people only notice public health when that system fails. This book explores several systems in public health including aspects of the food system, health care system and emerging issues including waste minimization in nanosilver. Several chapters address global health concerns including non-communicable disease prevention, poverty and health-longevity medicine. The book also presents several novel methodologies for better modeling and assessment of essential public health issues.

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