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**ALCOHOL AND EARLY DEATH IN RUSSIA:
THE POLITICAL ECONOMY
OF SELF-DESTRUCTIVE DRINKING**

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Russia's mortality rate has risen sharply since 1990. Most experts agree that a major cause of this has been increasing alcohol abuse. But why have ever more Russians been drinking themselves to death? Various evidence suggests the main reason is not public despair in the face of painful economic change, as some have argued, but a dramatic increase in the affordability of vodka, the price of which fell by 77 percent in real terms between December 1990 and December 1994. Variation in the affordability of vodka — both over time and across Russia's regions — closely matches variation in the death rate. Although increased market competition and failure to collect excise taxes may have contributed, the main reason the real price of vodka fell appears to have been populist price regulation by governments at all levels during periods of high inflation.

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1. Introduction¹

During the last 15 years, Russia's mortality rate has risen dramatically. In 1990, 11.2 of every thousand Russians died; by 2003, the figure was 16.4 per thousand. Experts agree that alcohol abuse is among the most important causes². The sharp increase in the death rate coincided with rapid growth in vodka sales and an upsurge of alcohol-related health problems. What is less clear is why such abuse should have risen so alarmingly during these years. Why — to put it bluntly — have growing numbers of Russians been drinking themselves to death?

The recent mortality spike coincided with the introduction of painful economic reforms and many have suggested a connection. Some have attributed self-destructive drinking to the disorientation induced by rapid economic and social change. Russians, it is argued, may have sought in the vodka bottle an “escape of a sort from the increasing harshness and bewildering uncertainties of daily life” (Ryan 1995). In this paper, I challenge this conclusion. Stress caused by the transition may certainly have contributed in some cases, but the evidence does not suggest this was a general cause. The levels of anxiety and despair reported by Russian survey respondents actually correlate negatively over time with the death rate. Mortality declined in the years in which social tension and dependency were greatest and rose as the self-reported contentment of respondents increased. In cross-sections of individuals, those who expressed greater pessimism or dissatisfaction with life did not report more frequent or heavier drinking. At least in the early 1990s, it appears to have been the more satisfied and optimistic Russians — and those with higher income — who drank to excess.

I identify another potentially important but insufficiently appreciated cause of Russia's deadly attraction to hard liquor. After price liberalization in January 1992, most prices — and eventually wages — soared. However, the real price of vodka fell precipitously. At the same time, less dangerous forms of alcohol such as beer and wine became relatively more expensive. At the end of 1990, the average Russian monthly income was enough to buy 10 liters of vodka; by late 1994, it would buy more than 46 liters. I present

¹ I am grateful to Dora Costa, Sebastian Edwards, Tim Frye, Scott Gehlbach, Tim Groseclose, Al Harberger, Matthew Kahn, Jerry Nickelsburg, Andrei Shleifer, and Jeff Timmons for comments.

² See, for example, Shkolnikov et al. (1998), Walberg et al. (1998), Leon et al. (1997), and Brainerd and Cutler (2005). One dissenting voice is Vlassov (1999), but his facts are challenged in replies by Notzon et al. (1999) and Leon and Shkolnikov (1999).

evidence that this induced both an increase in alcohol consumption and a substitution of more lethal for less lethal forms. As numerous studies have shown, alcohol demand is sensitive to price: as real prices fall, consumption increases. Similar health crises have occurred as hard liquor became more affordable in Moldova, Kazakhstan, and to a lesser degree other former communist and developing countries.

If price dynamics are a key part of the story, this raises the question why the real price of vodka fell so sharply. I examine several possible answers. First, intense competition among legal and illegal vodka producers and traders might have held prices down as markets were liberalized at the start of economic reform. If vodka markets were more competitive than those for other goods, that might explain why the relative price of vodka fell. Second, in the 1990s Russia's tax collection agencies were struggling to do their job. An increasing failure to collect the excise taxes on vodka might have reduced its retail price. In either of these cases, the underlying cause of the problem would be excessive market liberalization or weakness of the state. But a third hypothesis attributes low vodka prices not to too much market freedom but to misguided state interventions. Vodka was one of the commodities whose prices federal and regional governments sought to regulate in the early 1990s. Preventing too rapid an increase in the price of vodka was thought to be important for political reasons.

In Section 2, I review the evidence implicating alcohol abuse in Russia's mortality upsurge. Section 3 then explores why reported vodka consumption rose so much during this period. Section 4 turns to the question why real vodka prices fell so sharply, and attempts to assess the roles of market competition, poor tax collection, and state price regulation. Section 5 concludes, comparing Russia's experience to that of some other countries.

2. Death in Russia

2.1. The role of alcohol

So far, Russia's mortality crisis has passed through four phases (see Table 1)³. Between 1990 and 1994, the crude death rate rose from 11.2 people per thousand to 15.7 per thousand; it then fell back to 13.6 per thousand in

³ For an excellent review, see Brainerd and Cutler (2005). See also Shleifer and Treisman (2005).

1998, before rising to 16.4 per thousand in 2003⁴. Finally, the rate moderated to 15.2 per thousand in 2006. For comparison, in recent years the crude death rate was 5.7 per thousand in Israel, 7.3 per thousand in Ireland, 9.2 per thousand in France and Spain, 10.3 per thousand in the UK, 13.9 per thousand in Serbia, 16.1 per thousand in Ukraine, 17.5 per thousand in Nigeria, and 18.4 per thousand in Rwanda⁵.

An obvious initial question is whether the reported changes are real or represent some statistical artifact. There are various reasons to worry about the accuracy of Russian vital statistics (Anderson et al. 1994). However, scholars who have tried to assess the quality of mortality data have concluded that they are reasonably reliable (Gavrilova et al. 2000, Leon et al. 1997). Except for certain regions within Russia (the North Caucasus and Tuva), death reporting is believed to be high, although the cause of death reporting can be more problematic (Andreev 1999). The parallel shifts in the rates of death from different causes might seem to indicate some artifact in reporting such as errors in the population statistics — the denominator of the respective death rates. But the relative stability of cancer mortality in the early 1990s suggests this is unlikely (Leon et al. 1997).

The evidence connecting higher mortality in Russia to alcohol abuse — in particular binge⁶ drinking of vodka — is strong and has strengthened over time. First, the rise in the death rate was particularly rapid among groups known to engage more in heavy drinking. It struck not the old or the young — usually the most vulnerable age groups — but the middle-aged. Infant mortality fell significantly, from 17.4 deaths per 1,000 live births in 1990 to 11.0 per 1,000 live births in 2005. The death rate for children aged 0 to 14 was lower in 2005 than in 1990, and the rates for men and women aged over 70 hardly changed⁷. By contrast, mortality for men and women aged 35–44 almost doubled between 1990 and 2005 (see Table 1). Total mortality has corre-

⁴ The “crude” death rate measures the total number of deaths per 1,000 inhabitants. The “standardized” death rate is the number of deaths per 1,000 inhabitants, adjusted for differences across countries or across time in the age-composition of the population.

⁵ Figures for Israel, Ireland, France, Spain, the UK, Serbia, and Ukraine are for 2003, from WHO European Regional Office, European Health for All Database, <http://data.euro.who.int/hfad/>; for Nigeria and Rwanda, the figures are for 2000–05, from Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2006 Revision* and *World Urbanization Prospects: The 2005 Revision*, <http://esa.un.org/unpp>, downloaded April 28, 2007.

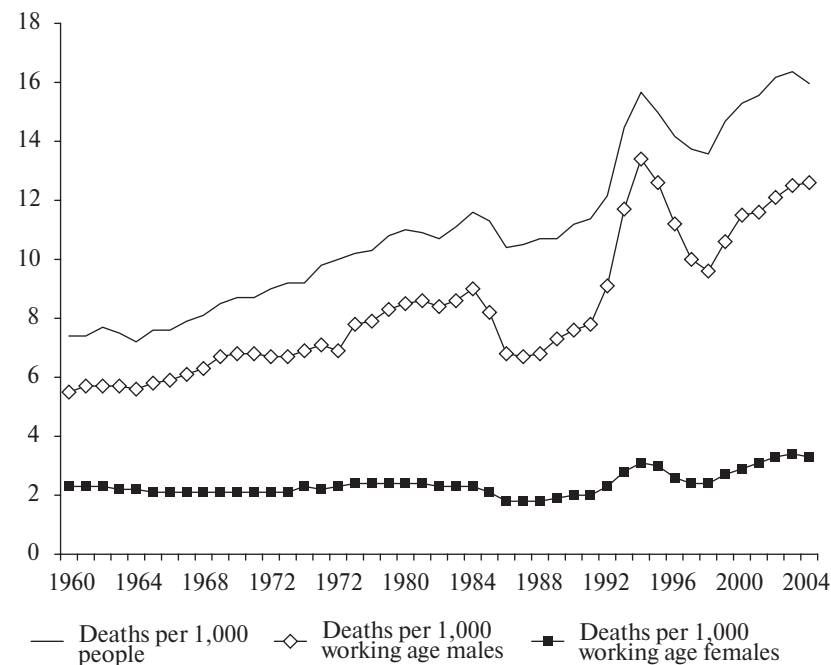
⁶ Among 80–84-year-old men, the death rate was lower in 2005 than in 1990 (Goskomstat Rossii, *Demograficheskiy yezhegodnik Rossii*, 1996 and 2006).

⁷ The alcohol consumption estimates are from Nemtsov (2002), who averaged the estimates of three separate researchers for the years 1980–94.

Table 1. Mortality rate in Russia, 1990–2005 (deaths per thousand people of corresponding group)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total	11.9	12.0	12.7	15.0	16.1	15.3	14.3	13.7	13.3	14.3	14.7	14.9	15.3	15.7	15.0	15.1
	Standardized death rate															
Total	11.2	11.4	12.2	14.5	15.7	15.0	14.2	13.8	13.6	14.7	15.3	15.6	16.2	16.4	16.0	16.1
	Crude death rate															
Male	11.6	11.9	13.1	16.1	17.8	16.9	15.8	15.0	14.8	16.3	17.3	17.8	18.6	18.9	18.6	18.8
Female	10.9	11.0	11.4	13.0	13.8	13.3	12.8	12.7	12.6	13.4	13.5	13.6	14.1	14.1	13.7	13.8
By age, male																
0–4	4.4	4.4	4.3	4.5	4.6	4.6	4.5	4.5	4.5	4.6	4.4	4.4	4.1	3.9	3.6	3.3
5–9	0.7	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5
10–14	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
35–39	5.6	5.9	7.1	9.3	10.6	10.0	8.6	7.7	7.5	8.4	9.1	9.4	9.9	10.2	10.2	10.3
40–44	7.6	8.0	9.8	13.3	15.2	14.1	12.2	10.6	10.2	11.5	12.7	13.1	13.9	14.4	14.2	14.3
65–69	46.6	47.3	49.4	59.4	64.2	61.3	58.3	56.9	55.3	59.0	59.5	59.9	61.2	60.6	59.2	58.8
–70	103.6	104.0	105.7	118.8	121.4	112.0	105.1	100.0	97.0	100.8	104.1	103.1	106.3	107.5	104.8	—
By causes, total																
Diseases of circulatory system	617	620	646	769	837	790	758	751	749	816	846	865	907	928	895	908
Diseases of respiratory organs	59.3	55.7	57.9	74.5	80.8	73.9	67.7	63.7	57.2	64.9	70.2	65.5	70	70.5	64.6	66.2
Diseases of digestive organs	28.7	28.9	32.8	38.3	44.1	46.1	42.1	39.2	38.1	41.9	44.4	47.9	52.4	56.8	59.3	65.5
Alcohol poisoning	10.8	11.2	17.6	30.9	37.8	29.5	24.0	19.1	17.8	20.5	25.6	28.4	31.0	31.4	29.7	28.6
Suicide	26.4	26.5	31.0	38.1	42.1	41.4	39.4	37.6	35.4	39.3	39.1	39.5	38.4	36.1	34.3	32.2
Homicide	14.3	15.2	22.8	30.6	32.6	30.7	26.6	23.9	23.0	26.2	28.2	29.6	30.7	29.1	27.3	24.9

Sources: Goskomstat Rossii, Rossiiskiy statisticheskiy yezhegodnik, various years, Demograficheskiy yezhegodnik Rossii various years, and Current Statistical Survey 2007, 1. Standardized death rate is from WHO European Regional Office, European Health for All Database, <http://data.euro.who.int/hfad>.



Source: Goskomstat Rossii.

Figure 1. Mortality in Russia, 1960–2004

lated extremely closely over time with the mortality of working age males ($r = .97$ between 1960 and 2004) and very closely with that of working age females ($r = .79$, same period) (see Figure 1). In Russia, men are far more likely to engage in heavy drinking than women (Nemtsov 2002). In line with this, the jumps in mortality have been much greater for men, whose crude death rate peaked at 17.8 per thousand in 1994 and then reached 18.9 per thousand in 2003.

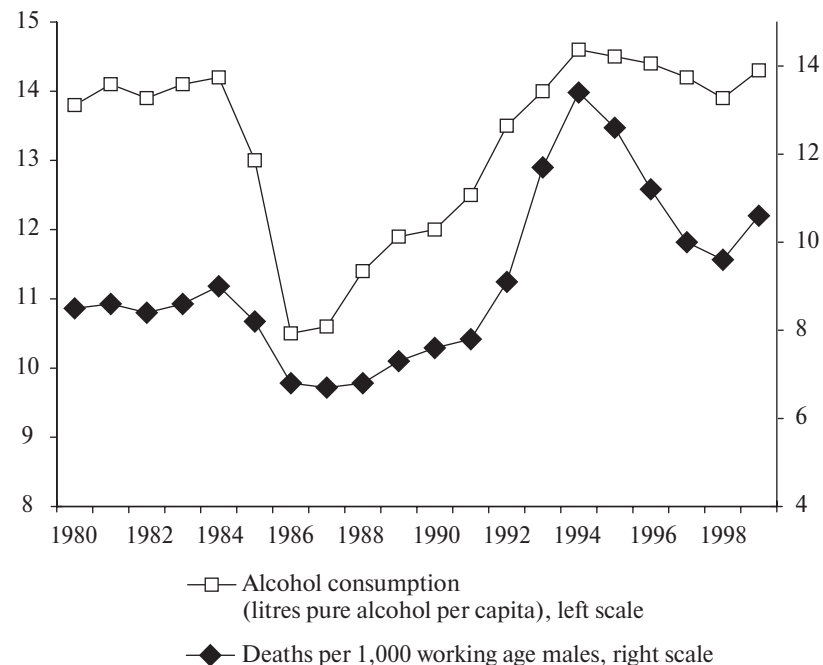
Second, most of the additional deaths were caused by diseases and conditions known to be associated with or exacerbated by heavy drinking. Of the 648,000 additional deaths in 2005 compared to 1990, 384,000 were attributed to diseases of the circulatory system. Research has established a link between heavy drinking of hard liquor – especially binge drinking – and various kinds of heart disease (Shkolnikov et al. 1997, McKee and Britton 1998). Annual cases of alcohol poisoning increased by 24,800. There were

6,900 more suicides and 14,500 more homicides in 2005, both of which are associated with alcohol in Russia, as well as 15,000 more deaths from alcoholic liver diseases and 4,500 more deaths from “mental and behavioral disorders due to use of alcohol”. These figures probably underestimate the role of alcohol because in Russia alcohol-related deaths are often certified as due to other causes (Moiseev and Ogurtsov 1995). By contrast, some non-alcohol-related causes of death experienced impressive declines in this period. Annual deaths from diseases of the respiratory and intrathoracic organs, diseases of digestive organs, and endocrine, nutritional and metabolic diseases together fell by almost 33,000. The rate of lung cancer fell sharply during the 1990s (Brainerd and Cutler 2005).

Third, the temporal pattern of Russian mortality fits closely with changes in estimated alcohol consumption. Although statistics on alcohol consumption are notoriously unreliable in Russia because of home brewing and unofficial sales, and although the total amount of alcohol consumed is less important than *how* it is consumed (in small quantities or in binges, in hard liquor or wine and beer), estimates suggest that total consumption fell sharply during Mikhail Gorbachev’s anti-alcohol campaign in the mid-1980s but then rose dramatically in the early 1990s. Nemtsov (2002) estimates that the average Russian drank 14.2 liters of pure alcohol in 1984, 10.6 liters in 1987, 12 liters in 1990, and 14.6 liters in 1994, before moderately reducing the quantity until 1998. The decrease, increase, and then decrease in alcohol consumption coincide with parallel movements in life expectancy. These changes in the aggregate death rate reflected big changes in alcohol-related causes of death. Across Russia’s regions, a larger improvement during Gorbachev’s anti-alcohol campaign was typically followed by a larger deterioration after it ended (Shkolnikov et al. 1997). Figure 2 shows the patterns of change in estimated alcohol consumption and mortality for working age males⁸. Nemtsov estimates that between 1986 and 1991, the anti-alcohol campaign saved 1.22 million lives (Nemtsov 2002), and that between 400,000 and 700,000 people died prematurely because of alcohol between 1990 and 2001 (Tapilina 2007).

Even at the micro level, the time trends of mortality and alcohol consumption match: deaths in Russia increase on the weekends, when binge drinking is most common. Chenet et al. (1998) studied death certificates in Moscow in 1993–5, and found that deaths from alcohol poisoning, accidents, violence, and cardiovascular diseases were all significantly higher on Saturdays,

⁸ John Thornhill, “Russia: Zyuganov moves against Yeltsin,” *Financial Times*, 10 May 1999.



Source: Nemtsov (2002) for estimated alcohol consumption, Goskomstat Rossii for mortality data.

Figure 2. Estimated alcohol consumption per capita and mortality rate for working age males, Russia 1980–1999

Sundays, and Mondays. Among 35 to 39-year-olds, they found “almost 10 percent⁹ fewer deaths than would be expected on Tuesdays and almost 15 percent more deaths than expected on Saturdays” (Ibid, p. 773).

Some alcohol-related diseases such as cirrhosis of the liver take years to develop to critical stages. So it might seem strange to see a relationship between increased heavy drinking and death within a single year – or even a weekend. Of course, a single binge may be enough to explain cases of homicide, suicide, accidents or alcohol-poisoning. Perhaps more surprisingly, recent research has established that binge drinking can also lead to sudden death from myocardial infarction (Chenet et al. 1998). Binge drink-

⁹ These figures are for adults aged 18–59; trends are similar for other age groups (Zooohori et al. 2004).

ing is widespread in Russia. For instance, in the Siberian city of Novosibirsk a survey in 1994–5 found that 51 percent of male respondents binged (i.e. drank at least 80g of pure alcohol at one sitting) at least once a month (Malyutina et al. 2001). For comparison, in the US in 1997, 24 percent of men were estimated to drink more than 60g of pure alcohol at least once a month (Ibid, p. 993). Even with cirrhosis, an increase in heavy drinking by people whose livers are already compromised can turn a chronic condition into a life-threatening crisis.

Finally, geography offers additional evidence for the role of alcohol. Not all of Russia's 89 regions experienced a large increase in mortality in the 1990s. The increase – and the mortality rate itself – were much lower in predominantly Muslim regions, where the use of alcohol is culturally discouraged. In Dagestan, for instance, the crude mortality rate actually fell from 6.2 per thousand people in 1990 to 5.9 per thousand in 2005, while the national rate was increasing from 11.2 to 16.1. Although one cannot infer directly from regional to individual level relationships, the change in mortality between 1990 and 2005 correlates negatively with the estimated proportion of Muslims in the region's population at $r = -.53$.

2.2. Other causes

A number of other factors might have contributed to falling life expectancy. Some have suggested that poverty and malnutrition after the Soviet collapse were the real causes. In 1999, the Communist faction in parliament tried to impeach Yeltsin for, among other things, “genocide against the Russian people by pursuing economic policies that impoverished the country”¹⁰.

On the role of poverty, the evidence is mixed. On one hand, there is a *negative* correlation over time ($r = -.46$) between the proportion of the Russian population in poverty and the death rate. In both 1993–94 and after 2000, the death rate soared as the poverty rate was falling. If poverty were responsible, one would expect the biggest jump in mortality to occur among the most economically vulnerable groups, children and the elderly (Cutler et al. 2002). In fact, the largest increase occurred among Russians of working age. On the other hand, studies have identified an association between higher poverty and a higher mortality rate at the regional level, which I confirm below (Ivaschenko 2005). It is quite possible that poverty contributed,

although other factors such as alcohol abuse were more important in determining the time trend and age breakdown.

However, there is little evidence that malnutrition had anything to do with falling life expectancy. Far from deteriorating, surveys suggest that the average nutrition of Russians improved during the 1990s. Using the nationally representative RLMS panel survey, researchers found no evidence of serious malnutrition in Russia during the crisis years of 1992–3 (Shkolnikov, McKee, and Leon 2001). In fact, the share of people whose body weight increased during these years exceeded the share who lost weight. Nor did this reflect a deterioration in the quality of diets: “In some ways, the nutrition was even healthier than before the reforms because of a decrease in fat consumption which was very high in the early 1980s” (Shkolnikov, McKee, and Leon 2001). Caloric intake was quite stable between 1992 and 2000 “with perhaps a small overall increase (5%) in calories for all groups” (Stillman 2006). The share of energy intake from fat dropped from 39.5 percent in 1992 to 34 percent in 2003, while the share from protein was roughly constant, ranging between 12.5 and 14.3 percent¹¹. As of 1998–2000, only 5 percent of the population was undernourished – a lower rate than in Brazil (10 percent), Bulgaria (15 percent), Croatia (18 percent), or Venezuela (21) – and by 2001–3, Russia's rate had dropped to 3 percent, on a par with Estonia¹². Especially early on in the transition, consumption of fruit and vegetables was lower. However this “fell by less than 4 percent” between 1989 and 2000, “implying a change in mortality only 3 percent of what was observed” (Brainerd and Cutler 2005, p. 124).

Some observers have blamed underfunding of Russia's healthcare system (Rozenfeld 1996, DaVanzo and Grammich 2001). Since 1991, government spending on healthcare has ranged between about 2 and 3.25 percent of GDP. Given the fall in GDP during the early 1990s, this made for a large contraction in real terms in 1992 and then again right after the 1998 financial crisis. Chronic problems certainly afflict Russian healthcare. Even as of 2003, one third of hospitals did not have hot water, and nine percent did not have running water at all. In panel regressions, regional government spending on healthcare has been found to correlate negatively with mortality (Ivaschenko 2005).

Still, some are skeptical that deteriorating health care provision explains much of the recent mortality changes (Shkolnikov et al. 1998; Gavrilova et

¹⁰ United Nations, Food and Agriculture Organization, Rome, *The State of Food Insecurity in the World*, 2002 and 2006, <http://www.fao.org/docrep/009/a0750e/a0750e00.htm>.

¹¹ Goskomstat Rossii, *Zdravokhranenie v Rossii*, 2001.

¹² Some argue, however, that they are narrowly and inappropriately trained (DaVanzo and Grammich 2001).

al. 2002, p. 9). Although hospitals remain poorly equipped, in some ways they have improved. In 1995, even larger shares of hospitals had no hot or running water (40 and 13 percent respectively)¹³. The rate of doctors per person in Russia – already one of the highest in the world – increased in the 1990s¹⁴. Various measures of health care performance improved. As noted, after an initial rise, infant mortality fell consistently. Rates of vaccination for tuberculosis, diphtheria and other diseases increased. As of 1999, Russia inoculated a larger share of one-year-olds against tuberculosis and measles than did France, Italy, Ireland, Greece, Korea, Chile, and many other countries (96 and 97 percent respectively). The proportion of the adult population that received scheduled medical checkups rose from 89 percent in 1990 to 92 percent in 2005¹⁵.

Emergency medicine might have been especially hard hit. If deteriorating acute care were the problem, one would expect to see more fatalities for a given number of heart attacks, strokes, and so on. However, “the fatality rate after an adverse health event seems to have changed little during the 1990s” (Brainerd and Cutler 2005, p. 114). What increased was the number of adverse health events. Did the number of heart attacks and strokes rise because patients could no longer afford their medications? This may, indeed, have been a problem; reliable data are not available. But, at least based on the RLMS survey, there does not seem to have been a decline in the overall share of the population taking regular medications (Ibid, p. 115).

One might think to associate the jump in mortality with environmental degradation¹⁶. However, most indicators of pollution have improved significantly since 1990. Emission of pollutants into the atmosphere from stationary sources fell from 34.1 million tons a year in 1990 to 20.4 million tons in 2005. Despite the huge increase in cars, emission of pollutants from automobiles fell in the same period from 21.0 to 15.4 million tons a year. Discharges of sewage and industrial pollutants into rivers and estuaries fell from 28 billion cubic meters in 1990 to 18 billion in 2005¹⁷. Mortality of children from respiratory diseases has not increased (Shkolnikov et al. 1998, p. 2007–8).

¹³ Goskomstat Rossii, *Rossiiskiy statisticheskiy yezhegodnik* 2006, and the UN’s *Human Development Report* 2002.

¹⁴ Feshbach (1999) argued that: “Environmental issues lurk behind much of the public-health problem”.

¹⁵ Goskomstat Rossii, *Rossiiskiy statisticheskiy yezhegodnik* 2006.

¹⁶ Data from the Russian Longitudinal Monitoring Survey suggest that the prevalence of smoking among men increased from 57 percent in 1992 to 63 percent in 2003 (and from 7 to 15 percent for women) (Perlman et al. 2007).

¹⁷ Goskomstat Rossii, *Zdravokhranenie v Rossii* 2005, figures for cancer of the trachea, bronchial tubes, and lungs; Goskomstat Rossii, *Demograficheskiy yezhegodnik Rossii*, 2006.

Finally, some other widely noted health problems cannot explain the crisis. Although smoking is widespread in Russia and probably increased slightly during the 1990s, higher mortality does not appear to have been caused by an increase in smoking related illnesses¹⁸. Rates of and deaths from lung cancer have both fallen. New lung cancer diagnoses fell from 46 per 100,000 people in 1990 to 41 per 100,000 in 2004. The crude death rate from malignant tumors of the respiratory organs and thorax fell from 48 per 100,000 in 1990 to 42 per 100,000 in 2005¹⁹. Tuberculosis has been spreading in Russia and deaths from the disease have tripled since 1990, to 23 per 100,000 in 2005. Still, the rise in TB deaths represents less than three percent of the total increase during these years. Although HIV infection is also spreading fast, the number of deaths from AIDS remains minute – about 1 per 100,000 people in 2005, or about .06 percent of the total – so this cannot explain the trend.

Of course, alcohol abuse is not the only cause of Russia’s falling life expectancy. Other factors certainly contributed. The point here is just that the evidence linking heavy drinking to the rise in premature deaths in Russia is strong – and appears even stronger when compared to the evidence for other factors often blamed for the country’s mortality crisis.

3. Why the increase in dangerous drinking?

If the 1990s saw a rapid increase in alcohol abuse, especially among Russian working age males, what can explain this? It might be that Russians were driven to drink by the stress of economic transition. Gavrilova et al. (2000, p. 415) argue that: “Social and economic instability, loss of social capital, and an uncertain future increased the level of aggression and anxiety in Russian society which led to an increase in alcohol consumption.” Walberg et al. (1998, p. 317) quote Durkheim: “whenever serious readjustments take place in the social order, whether or not due to a sudden growth or to an unexpected catastrophe, men are more inclined to self destruction”²⁰. Some indirect evidence has been found linking economic change to higher death rates in cross-sectional regressions of Russian regions. Walberg et al. (1998)

¹⁸ See also Shkolnikov et al. (1998), Brainerd and Cutler (2005).

¹⁹ In recent years, the team from VCIOM moved to the so-called Levada Centre, which continued the surveys.

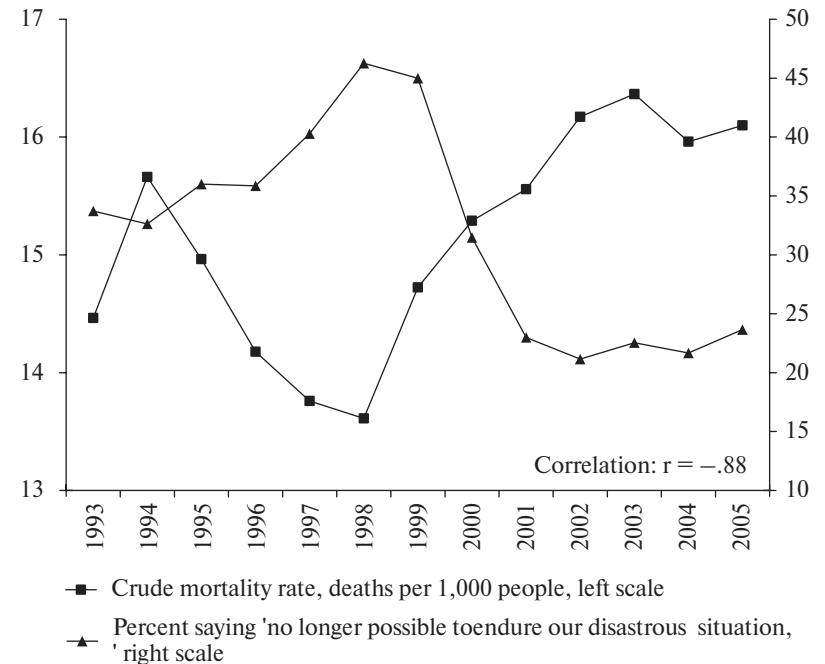
²⁰ VCIOM poll of 1,608 respondents, available at <http://sofist.socpol.ru>.

found that regions with greater labor turnover had larger drops in life expectancy in the early 1990s.

There can be no question that some Russians sought relief from the dislocations of transition in heavy drinking. However, what direct evidence exists about the pattern of pessimism and anxiety over time and across Russia's regions does not support the claim that this was a major cause of increased alcohol abuse and death. The Russian Centre for Public Opinion Research (VCIOM), probably the country's most respected polling organization, conducted regular nationally representative surveys between 1993 and the present²¹. One question asked respondents: "Which of the following statements most closely corresponds to the current situation? 1. Everything is not so bad, and it is possible to live. 2. It is difficult to live, but it is possible to endure. 3. It is no longer possible to endure our disastrous situation." The frequency with which respondents chose the third answer seems a reasonable proxy for the level of stress and despair in society (at least among those not too despondent to answer the survey). Figure 3 plots the share of respondents that picked the third option. As can be seen, the proportion saying they could no longer endure their disastrous situation is very strongly *negatively* correlated over time with the mortality rate ($r = -.88$). The death rate actually fell in the years that more people reported reaching the end of their endurance. Another question asked respondents: "What would you say about your mood in recent days?" and gave the options "excellent," "normal, balanced," "tense, irritated," and "fearful, melancholy". The proportion picking the option "fearful, melancholy" also correlated negatively over time with the mortality rate ($r = -.79$). By almost any indicator, public discontent and anxiety rose in the mid-1990s, peaking around 1998, and then fell sharply as the economic recovery began and the Putin administration appeared to be restoring some aspects of social order. But the death rate from alcohol-related causes dropped in the mid-1990s, and then began rising again after 1998.

Some scholars recognize that mortality was falling in the years 1994–98, as unemployment rose, wage arrears accumulated, and strikes became relatively

²¹ Information about the survey is available at <http://www.cpc.unc.edu/rllms/>. Respondents were from a stratified sample of about 4,000 households. The total number of individuals was 11,284 in 1994, 8,701 in 1998, and 10,499 in 2002. Baltagi and Geishecker (2006) used the RLMS to test a model of rational alcohol addiction. They concluded that the data for women were not consistent with the predictions, and that those for men were only consistent if one assumed a negative discount rate. Brainerd and Cutler (2005), exploiting the panel nature of the survey, found that higher reported alcohol consumption was significant in predicting future death.



Sources: VCIOM, Monitoring obshchestvennogo mnenia: Ekonomicheskie i sotsialnie peremeni, Moscow: VCIOM, various issues; Russiavotes.org. Mortality data from Goskomstat Rossii.

Figure 3. Stress, despair, and the mortality rate, Russia 1993–2005

frequent. Gavrilova et al. (2000, p. 415–6) account for this by arguing that although conditions might be objectively worse during these years, Russians were increasingly adapting to the changes: "The recent decline in mortality demonstrates the capacity of the Russian people to adapt to changes in life style and living standards." Walberg et al. (1998, p. 317) note that Durkheim expected self destructive behaviors to recede once individuals repositioned themselves in the new social order. However, in opinion surveys, Russians deny that by the late 1990s they were increasingly adapting to the new realities. Since 1998, VCIOM and its offshoot, the Levada Center, included a question asking: "Have you and your family already adapted to the changes that happened in the country during the last ten years?" As of October 1998, only 28 percent said that they and their family had adapted, and 40 percent said they would "never be able to adapt". It was precisely in the period after

1999 – as the mortality rate was rising sharply again – that growing numbers of survey respondents started to say they were adapting to the new reality. As the death rate climbed during the next four years, the proportion saying they “could never adapt” fell to 25 percent in December 2002.

Some additional evidence on this comes in answers to several questions on the Russian Longitudinal Monitoring Survey, which interviewed a nationally representative sample of Russian households at yearly intervals during the 1990s. As Table 2 shows, the proportion of respondents that said they drank alcohol at least once a week was 20 percent in 1994, had fallen to 16 percent by 1998, but then rose again to 25 percent in 2002. The share saying that during the previous month they had drunk 80 grams or more of liquor in one day, which I take as a working definition of “bingeing,” was relatively stable at around 27–29 percent.

Admitting to heavy or frequent drinking might carry a social stigma or provoke disapproval of other family members, so there is reason to worry that respondents are not giving complete and accurate accounts of their consumption. Although the time trend in self-reported drinking levels in the RLMS corresponds to the trend in other estimates – and to the mortality trend – measures of total alcohol consumption based on the RLMS are lower than those derived using other methodologies (e.g. from sales data and estimates of underground sales and production) (Nemtsov 2004). Some other elements of the RLMS can serve as a rudimentary check on the reliability of respondents’ answers. First, interviewers recorded whether the respondent answered the survey alone or in the presence of family members or friends. Second, interviewers recorded their impression of how sincere and open the respondent was. One might expect respondents who were interviewed alone and who seemed particularly open and sincere to give more accurate – and presumably higher – estimates of their drinking. However, this was not the case (see Table 2, rows 2 and 3). In fact, these respondents gave very similar answers to the questions about the frequency and amount of their drinking – and in some cases were less likely to report bingeing²². This provides at least some reassurance about the reliability of answers, although caution is still in order.

As found in other surveys, both frequent drinking and bingeing were much more common among men than women, and among the young and middle-aged than among the old. Those with higher income tended to drink both

²² It could be that bingers, while admitting to heavy drinking, tended to appear insincere answering other questions – for instance, how much they earned or spent on family necessities.

Table 2. Characteristics of Heavy Drinkers in Russia

	Percent of respondents answering the question who reported...					
	Frequent drinking (drinking alcohol at least once a week during previous 30 days)		Bingeing (drinking 80 grams or more of vodka, home brew, or other hard liquor in one day)			
	1994	1998	2002	1994	1998	2002
Among all respondents	20	16	25	29	29	27
Among respondents who were alone when answering survey	19	18	24	30	29	27
Among respondents judged to be “significantly more sincere and open than most respondents”	19	15	23	29	26	22
Gender						
Male	35	28	41	45	40	40
Female	8	8	13	16	21	16
Age						
Over 50	15	12	18	29	31	28
20 – 50	25	21	32	47	42	40
Residence						
Urban ^a	21	18	27	30	30	28
Rural ^a	17	13	21	29	28	25
Income						
Highest third	29	24	34	50	45	42
Middle third	15	13	19	31	31	27
Lowest third	17	13	22	32	29	17

Percent of respondents answering the question who reported...	Frequent drinking (drinking alcohol at least once a week during previous 30 days)			Bingeing (drinking 80 grams or more of vodka, home brew, or other hard liquor in one day)		
	1994	1998	2002	1994	1998	2002
	In 12 months time, you and your family will live...					
Much better	31	19	26	42	41	27
Much worse	18	13	17	37	33	27
How satisfied are you overall with your life at present?						
Completely satisfied	24	17	25	39	29	28
Completely dissatisfied	18	13	22	34	32	33
How worried you may lose your job?						
Very worried	22	19	28	44	44	42
Not worried at all	31	24	37	50	44	42
“I cannot cope with my problems.” ^a						
Completely agree			17			21
Completely disagree			29			34
“I often feel helpless before the problems that arise in my life.” ^b						
Completely agree			15			21
Completely disagree			33			35

Source: Author's calculations from Russian Longitudinal Monitoring Survey.
^a “urban” = regional center or city; “rural” = small settlement or countryside. ^b question only asked in 2002 survey.

more frequently and more heavily, and those living in large cities may have drunk slightly more frequently than those in the countryside, although this is less clear. Most relevant to the issue at hand, the RLMS asked a number of questions about respondents' mood. One asked: “What do you think – in 12 months will you and your family live better or worse than today?” and allowed answers ranging from “much better” to “much worse.” As Table 2 shows, those who anticipated living “much worse” – which I take as a proxy for stress and despair – were in most cases somewhat *less* likely to drink and drink regularly than those who anticipated living much better. Another question asked: “How satisfied are you overall with your life these days?” and allowed answers from “completely satisfied” to “completely dissatisfied.” Those who said they were “completely dissatisfied” were slightly less likely to report drinking at least once a week than those who were “completely satisfied.” In 1994, “completely dissatisfied” respondents were also less likely to confess to bingeing, but this pattern reversed in 1998 and 2002.

Those who, in answer to another question, said they were “not worried at all” about losing their jobs were more likely to drink frequently than those who were “very worried,” and in 1994 were more likely to binge. Finally the 2002 survey asked some more detailed questions about respondents' psychological state. Those who completely agreed with the statements that they “could not cope” with and felt “helpless before” their problems reported drinking less frequently and less heavily than those who completely disagreed with these statements. Bearing in mind the necessary caveats, the RLMS data do not support the notion that it was the more depressed, anxious, and pessimistic individuals that were drinking to excess.

Regional opinion polls from the early 1990s were not available. However, one can perhaps get a rough idea of the regional pattern of anxiety caused by the economic crisis by examining the results of a national referendum held in April 1993. On the second question of this referendum, respondents were asked: “Do you support the social-economic policies undertaken by the President and the Government of Russia from 1992?” One might take a high regional “no” vote on this question as an indicator of greater discontent caused by the transition. However, across regions there is a moderately strong *negative* correlation between the share of respondents voting “no” on this question and the regional increase in the mortality rate between 1990 and 1994 ($r = -.46$). In regions where a larger share of the population rejected the government's radical economic reforms, the death rate rose relatively more slowly. It might be that those driven to self-destructive behavior would not vote in any case. But regional turnout in the referendum was not correlated at all with the change in mortality.

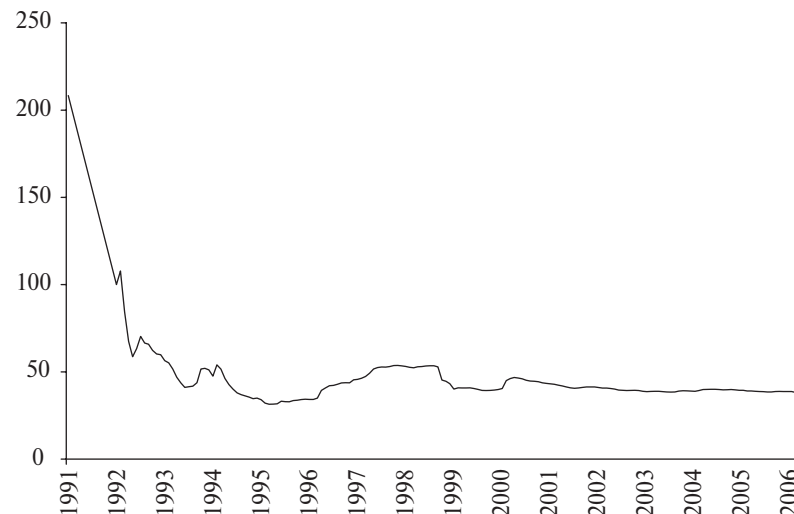
It could still be, however, that in the regions where reforms were proceeding the fastest, causing the most dislocation, there were greater extremes of opinion – on the one hand, more supporters of reform, on the other more desperate losers from the transition. This would not explain the negative correlation between the national death rate and the level of reported stress over time. But some have presented indirect evidence for a cross-sectional effect. The pattern of labor turnover across regions correlates in the early 1990s with the change in mortality rates. I will return to this in the discussion below.

I argue here that the increase in heavy drinking of hard liquor in Russia, which explains much of the increase in deaths, resulted largely from a change in the affordability of vodka brought about, initially, by a change in relative prices. In the early 1990s, as price liberalization caused most prices to soar, increases in the nominal price of vodka were much slower. As a result the real price of vodka fell sharply (see Figure 4)²³. While the average price of a liter of vodka increased by 465 times between December 1990 and December 1994, the consumer price index went up by 2,041 times. In December 1990, the average monthly income in Russia would buy 10 liters of vodka; four years later, it would buy almost 47 liters. During the same period, the number of liters of domestic beer one could buy with the average monthly income fell from 278 to 209 liters. The price ratio of vodka to beer fell from 27 to 1 to just 4.5 to 1 – and it fell to just 4 to 1 as of 1999. Although statistics on sales of alcohol were probably quite incomplete because of unofficial trade, the figures nevertheless changed as economic theory would predict. Officially registered sales of vodka rose by 52 percent, while recorded sales of beer fell by 12 percent. The pattern of change in the affordability of vodka is plotted along with change in mortality of working age males in Figure 5.

The data for one year – 1991 – do not fit the pattern. On examination, this turns out to be the exception that proves the rule. The affordability of vodka shot up during 1991 from 10 liters per monthly income at the start of the year to 38 bottles at the end. Mortality, on the other hand, rose only very slightly. The explanation is simple. During 1991, prices were administratively set, the supply system remained largely under state ownership, and almost every consumer good – including vodka – was in short supply. Even in Moscow, a “land of plenty” compared to the ²⁴ provinces, vodka was being

²³ Data on prices of vodka and other consumer goods are gathered by agents of the state statistical agency, Goskomstat Rossii, who monitor retail prices in trade enterprises of all ownership forms, including sales by individuals (Goskomstat Rossii, *Metodologicheskie polozhenia po statistike*, Moscow, 1996, p. 430).

²⁴ See, e.g., Larisa Kislinskaya, “Control Bodies Warn Food Shortage Will Worsen in Moscow,” ITAR-TASS, November 13, 1991.



Source: Goskomstat Rossii. Data are monthly, with values between December 1990 and December 1991 interpolated from the end year figures.

Figure 4. Price of vodka relative to consumer price index, December 1991 = 100

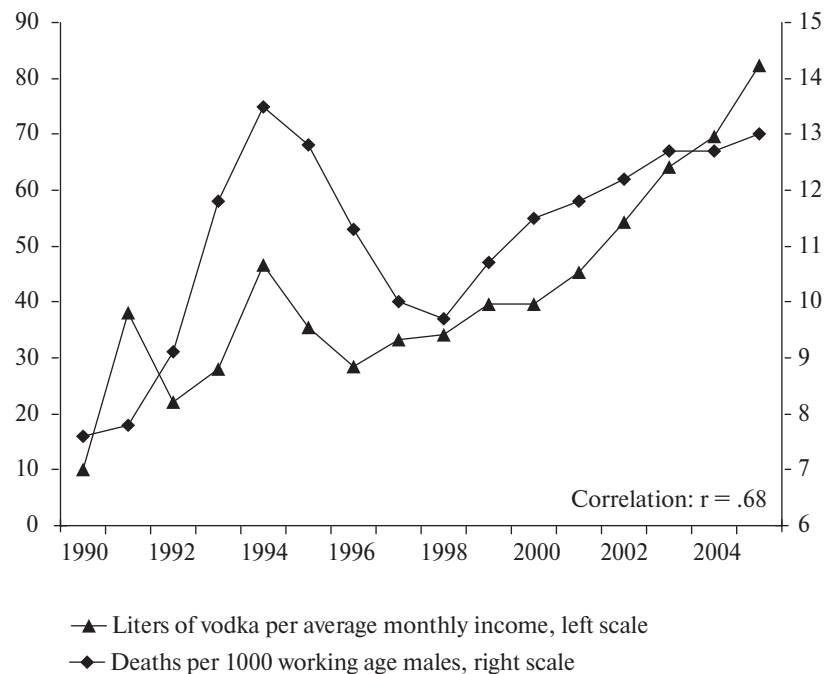
sold only with ration cards as of November 1991²⁵. Muscovites were allowed to buy only one liter a month²⁶. As a result, the greater affordability of vodka in theory did not prompt an upsurge in binge drinking, alcohol poisoning, accidents, or heart attacks.

The importance of the affordability of vodka is suggested also by panel regressions of the regional mortality rate in the years 1995–2005²⁷. Regional vodka prices varied greatly. In 1992, in the most expensive region, Karachaevo-Cherkessia, a liter of vodka cost 4.5 times the price in the cheapest region, Mordovia. In 2006, the price still differed between the most expensive region, Chukotka, and the cheapest, Ingushetia, by a factor of 4.3. The coefficient of variation of the regional price fell from 1992 to 2000, only to start rising again to 2006.

²⁵ Sergei Shargorodsky, “Soviets Brace for Another Hard Winter, Food Shortages,” Associated Press, September 10, 1991.

²⁶ Data were available for male and female working age mortality rates by region only from 1994, so regressions including lagged dependent variables could begin only from 1995.

²⁷ Of course, it might seem more natural to relate prices and incomes first to consumption, and then consumption to mortality; unfortunately, reliable data on consumption of hard liquor broken down by region were not available.



Source: Goskomstat Rossii.

Figure 5. Affordability of vodka and death rate, Russia 1990–2005

Table 3 shows panel regressions of the regional death rates for working age men and women on the real average price of vodka in the region and real average personal income, both deflated by the regional CPI. It is not clear whether one should expect a linear relationship between the vodka price and income, on the one hand, and the death rate, on the other, or a relationship in which a proportional change in one variable induces a proportional change in the other. Following some previous studies, I show models here in which the death rates along with the price and income variables are logged, permitting one to interpret the coefficients as elasticities. However, I obtain qualitatively similar results using un-logged values. I control for the (logged) previous year's death rate to adjust for the strong temporal correlation in the dependent variable. The first three models are estimated using OLS with panel corrected standard errors (Beck and Katz 1995) that adjust for contemporaneous correlation and heteroskedasticity. I start with the simplest models

(1), then add various controls (2), and finally add region fixed effects (3). Models (4) and (5) are estimated using the Arellano-Bond dynamic panel GMM estimator, first without and then with controls.

In models (2), (3) and (5), I control for the proportion of the region's population that was Muslim. Because of the Islamic proscription of alcohol, one would not expect the affordability of liquor to affect mortality in the same way within the Muslim population²⁸. Previous analyses found that unemployment, and more generally job turnover, were associated with higher mortality, and interpreted this as showing the effects of psychological distress caused by economic transition. I therefore control for both the unemployment rate and the rate of job turnover (total job gains plus job losses per 100 workers in large and medium enterprises; data were unavailable for smaller firms). Following other studies, I control for the crime rate, an indicator of lack of social cohesion; the poverty rate; and, to capture differences in performance of the health system, the logged regional government spending per capita on healthcare (Walberg et al. 1998, Ivaschenko 2005, Kennedy, Kawachi, and Brainerd 1998)²⁹. As in Ivaschenko (2005), I lag the healthcare spending variable by one year to reduce the risk of picking up an effect of mortality on healthcare spending rather than the reverse. As suggested by Brainerd and Varavikova (2001), I also control for the square of the inflation rate to measure economic dislocation. Since some controls are only available for later years, including them reduces the number of years in the panel. Variable definitions and sources are in the appendix.

Although one should be cautious making cross-level inferences from this sort of ecological regression, the results suggest that increases in the affordability of vodka were associated with statistically significant increases in mortality. For a given average income, lower vodka prices were associated with a higher regional mortality rate; for given vodka prices, higher income also correlated with more frequent deaths. Focusing on the fully controlled regressions (models 3 and 5), a ten percent fall in the relative price of vodka was associated with a 1.6–1.8 percent increase in the death rate for working age men in the next year, and a 2.2–2.5 percent increase for working age women. (Although the elasticity is higher for women, the absolute impact was lower because the death rate for women was lower to begin with.

²⁸ I used data from the 1989 and 2002 censuses and interpolated entries for the other years, assuming that the proportion Muslim changed linearly along the trend defined by the two census points.

²⁹ The data are actually for “healthcare and sport” — a finer breakdown of regional spending was not available for all years. Spending on sports was relatively small.

Table 3. Affordability of Vodka and Mortality in Russia's Regions, 1993—2005 (Dependent variable is log of deaths per 1,000 people in relevant category)

	-----Working age males (age 16-64)-----					-----Working age females (age 16-59)-----				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Previous year log death rate	.97*** (.05)	.91*** (.06)	.62*** (.09)	.64*** (.03)	.62*** (.04)	.98*** (.04)	.90*** (.05)	.57*** (.08)	.63*** (.03)	.56*** (.04)
Log average income (in 1992 th. rubles, deflated with CPI)	.04 (.02)	.05** (.02)	.13** (.06)	.14*** (.01)	.14*** (.03)	.02 (.02)	.07*** (.02)	.13*** (.05)	.13*** (.02)	.13*** (.04)
Log vodka price (end year, in 1992 rubles, deflated with CPI)	-.11** (.04)	-.10*** (.03)	-.16*** (.04)	-.27*** (.01)	-.18*** (.02)	-.10** (.05)	-.10*** (.03)	-.22*** (.03)	-.35*** (.02)	-.25*** (.03)
Percent of population Muslim		-.01 (.02)	-.98*** (.31)		-.1,36*** (.32)		-.03 (.02)	-.1,19*** (.37)		-.1,81*** (.36)
Unemployment (as percent of ec. active population, end year, from household surveys)		-.001*** (.0005)	-.001 (.001)		-.0013** (.0006)		-.001 (.001)	-.001 (.001)		-.00 (.00)
Labor turnover (sum of job gains and losses per 100 workers, large and medium enterprises)		.001*** (.0002)	.002*** (.0003)		.0018*** (.0003)		.0010*** (.0003)	.0021*** (.0004)		.0026*** (.0003)
Crime rate (crimes registered per 100 inhabitants)		.006 (.005)	.010 (.010)		.001 (.006)		.010** (.005)	.016* (.009)		.013** (.006)
Poverty rate (share of population with income below minimum subsistence level)		.11*** (.02)	.13*** (.03)		.14*** (.03)		.14*** (.03)	.15*** (.03)		.15*** (.03)

	-----Working age males (age 16-64)-----					-----Working age females (age 16-59)-----				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Inflation rate squared		-.00 (.00)	-.00 (.00)		-.00 (.00)		.00 (.00)	-.00 (.00)		-.00 (.00)
Lagged log regional budget health and sports spending (in 1992 rubles, deflated with non-food CPI)		-.03*** (.01)	-.01 (.01)		-.02*** (.01)		-.03*** (.01)	-.01 (.01)		-.02** (.01)
Constant	.28*** (.10)	.27*** (.09)	.62*** (.12)	.94*** (.04)	.78*** (.09)	.24** (.10)	.20*** (.07)	.51*** (.10)	.93*** (.04)	.70*** (.10)
Regional fixed effects	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO
R-squared	.879	.898	.937	2648	2571	.893	.916	.949	2548	3086
Wald X²	481	2040	6885	770	606	823	1663	233344	770	606
N	847	684	684	770	606	847	684	684	770	606
Years	1995-05	1996-04	1996-04	1996-05	1997-04	1995-05	1996-04	1996-04	1996-05	1997-04
Method	OLS, PCSE	OLS, PCSE	OLS, PCSE	Arellano-Bond	Arellano-Bond	OLS, PCSE	OLS, PCSE	OLS, PCSE	Arellano-Bond	Arellano-Bond

Sources: See Appendix. PCSE: panel-corrected standard errors (Beck and Katz 1995), using pairwise option; *** $p < .01$, ** $p < .05$, * $p < .10$.

Price drops also affect mortality in subsequent years via the lagged dependent variable in the regressions.) Based on regressions with the variables not logged (not shown here; details available from the author), the drop in the average real regional vodka price between 1992 and 2005 (279 1992 rubles) was enough to explain about 1.7–1.8 of the 3.9 additional deaths per 1,000 working age men, and 0.6–0.7 of the 1.1 additional deaths per 1,000 working age women. The increase in incomes in 1992 rubles between 1992 and 2005 could explain another 0.7–1.1 percentage points for men, and 0.2–0.4 percentage points for women. As in previous studies, higher job turnover, more widespread poverty, lower regional spending on healthcare, and perhaps also higher crime and a smaller Muslim population share were associated with higher regional mortality, although the last two variables were not always significant. Among men, higher unemployment may have been associated, oddly, with a lower death rate.

Skeptics occasionally argue that consumption of addictive products such as alcohol is insensitive to price. In Russia, some opinion poll evidence suggests otherwise. In November 2006, the Levada Center asked a representative sample of 1,598 Russian adults whether anyone in their family drank hard liquor and if so, at what price they could afford to buy a half-liter bottle of vodka. The answers are given in Table 4. While 70 percent said that someone in his or her family drank hard liquor, only 26 percent said they would be able to buy vodka at a price of 120 rubles a half-liter. The average price in the average region in late 2006 was 88 rubles a half-liter, or roughly \$3.30. Based on these answers, one would certainly expect a decrease in purchases were the price to rise sharply.

Table 4. Proportion of respondents who said they could afford to buy a half-liter bottle of vodka at given prices, Russia, November 2006

Price in rubles	Percent of respondents
120	26
100	41
80	53
60	62
less than 60	70
No one in the family drinks hard liquor	28
Difficult to answer	2

Source: Levada Center. Figures adjusted to give total (rather than marginal) proportion that could afford at that price. *Source:* <http://sofist.socpol.ru>.

4. Why did the relative price of vodka fall?

If a fall in the relative price of vodka was an important contributor to Russia’s mortality crisis, what caused the price to fall in the early 1990s? There are several possibilities, which may have worked simultaneously. I discuss these in turn.

4.1. Intensified market competition

In the early 1990s, markets in Russia were liberalized – including the market for alcoholic beverages. A presidential decree of January 1992 permitted all Russians to engage in trade. Then, with another decree in June 1992, President Yeltsin abolished the preexisting state monopoly on the production and trade of alcohol. This decree stayed in effect until mid-1993, when Yeltsin signed another decree reversing the de-monopolization. Some have suggested that the intense competition between vodka producers and distributors, legal and illegal, forced prices down below their previous level in real terms. For instance, Korotaev and Khalturina (2006) argue that: “The main stimulus to the growth of alcohol consumption and alcohol-related death in Russia in the 1990s was the liberalization of the alcohol sector and the resulting increase in the availability of strong alcoholic drinks and spirits. On June 7, 1992, Boris Yeltsin abolished the state monopoly on vodka, with the result that its relative price fell by several times.”

Competition may have played a role. However, some evidence does not fit well with this hypothesis. A first issue has to do with timing. By far the largest drop in the real price of vodka came during 1991, before Yeltsin’s decree liberalizing trade and long before the demonopolization (see Figure 4). In 1991 alone, the real price of vodka fell by 52 percent. The second largest fall in the index of the relative price of vodka occurred between January and May 1992, when the index fell by 44.4 percent of the December 1991 level. During the year from June 1992 to June 1993 during which the state monopoly was abolished, the index fell by 28.8 percent of the December 1991 level. Looking at the price dynamic in Figure 4, this period does not stand out. A second question concerns why the competition in production and trade of vodka would have been so much more intense than that for most other products. Between December 1991 and December 1995, the average nominal price of vodka increased by 895 times. The change for other foods and drinks ranged from 362 times for oranges and mandarins (which had

previously been sold at free prices in farmers' markets) to 1,475 times for carrots, 3,262 times for domestic beer, 3,808 for macaroni, and 5,013 times for sour milk products. Finally, the large, persistent differences in prices of vodka across Russia's regions suggest that if the market was highly competitive, it was competitive within rather than across regions. Governors often controlled exports of spirits from and imports into local markets. The extent of regional variation, as measured by the coefficient of variation, was falling as one would expect if market competition were intensifying, during the years 1992–2000. However, between 2000 and 2006 the extent of regional variation increased quite sharply. Clearly, there were significant obstacles to competition in the market for vodka.

4.2. Drop in real alcohol taxes

A second possible reason for the drop in the relative price of vodka might be a progressive

decrease in the effective tax on vodka. Excises and VAT are levied on vodka production and sales. However, collecting these taxes was extremely difficult in the 1990s. The state statistical agency estimated that about half of alcohol sales went undeclared. In the mid and late 1990s vodka producers claimed to be operating at only 20 to 30 percent of capacity³⁰. Nevertheless, the number of licensed vodka producers rose from 423 in January 1997 to 828 in October 2000 (Panskov 2001). Some were eager to get into the business despite the appearance of overcapacity.

Besides the problem of collecting the taxes, the rate of the excise fell in real terms during the last decade. From 1992 until late 1997, excises were assessed as a percentage (80 or 85) of the cost of production. In late 1997, the system changed to one in which a fixed nominal tax was charged per liter of pure spirits produced. Although these fixed amounts were periodically adjusted for inflation, this required Finance Ministry officials to butt heads with the populists in the Duma as well as the Russian alcohol producers lobby. The real value of the excise seems to have dropped sharply over the subsequent decade. The excise per liter of pure spirits rose from 45 (redenominated) rubles in October 1997 to 162 rubles in early 2007. However, the consumer price index rose much faster during this period, resulting in a 44 percent drop in the real rate of the excise (deflated by the CPI). And nominal incomes rose even faster than the CPI. A rough calculation suggests that had the excise risen in line with the average nominal income since

³⁰ See, e.g., "O rynke alkogol'noi produktsii," *Statisticheskiiy Biulleten*, May 1999.

October 1997, vodka would have cost 315 rubles per liter (40 percent proof) in March 2007 instead of 171 rubles per liter. The average monthly income would have bought only 35 liters, rather than 64 liters³¹.

4.3. Regulation of vodka prices

However, as Figure 4 shows, most of the drop in the real price of vodka did not occur in the decade after 1997, but much earlier. A third possible explanation is that the fall was caused not by fierce market competition or weakness of the state, but by misguided policy – specifically the imposition of regulations to prevent the price rising too rapidly. The Soviet leadership had certainly learned from Gorbachev's anti-alcohol campaign in the mid-1980s that trying to take away Russians' vodka bottle would elicit loud protest. Throughout the period from 1990, officials at different levels repeatedly tried to prevent the price of vodka from rising in a way they feared would be politically unpopular.

The first – and most significant – occasion came in 1991, before the Soviet collapse. As of early 1991, prices of most goods were still administratively set. In April, the Soviet prime minister, Valentin Pavlov introduced a reform that raised the retail prices of about 55 percent of goods by 60 percent on average, while allowing another 30 percent of goods to be sold at market prices. However, the price of lower-grade vodka was kept frozen at its previous level³². President Gorbachev signed the decree, which applied to all Soviet republics. To compensate the public, Pavlov simultaneously increased salaries and benefits by 60 rubles a month per person.

As might have been expected, the rise in state prices along with the large rise in incomes set off a burst of inflation in the small market-price sector. By the end of the year, consumer prices were 2.6 times their level as of December 1990. The result was a huge increase in the relative affordability of vodka, which remained price-controlled. As of December 1991, the average money wage would buy 38 liters of vodka, compared to 10 liters at the start

³¹ The excise on one liter of vodka (40% proof) in October 1997 was 18 (redenominated) rubles (i.e. 0.40 liters of pure spirits times 45 R/liter). Between October 1997 and March 2007, the average monthly income rose from 944 to 10,950 redenominated rubles (Goskomstat RF, *Kratkrosrochnie ekonomicheskie pokazateli Rossiiskoi Federatsii*, December 2003 and March 2007) – i.e., an increase of 11.6 times in nominal terms. Had the excise risen at the same rate, it would have been 209 rubles. In fact, it was 0.40 times 162 R/liter = 64.8 rubles. So had the excise kept pace with incomes, the price of a liter of vodka would have been 209 – 64.8 = 144 rubles higher than the current price of 171 rubles per liter.

³² *Izvestia*, 14 March, 1991.

of the year. As already discussed, however, the insensitivity to demand and increasing dislocation of the state supply system meant that vodka could not be obtained in many parts of the country at any prices, and was rationed in Moscow. The effect on health was consequently delayed.

A second key decision came in the decree by which President Yeltsin freed most prices in Russia as of January 2, 1992. Along with some kinds of bread, milk, baby food and a number of other products and services, vodka was included on the list of essentials whose prices would remain regulated by the state. The rise in the retail price of vodka and spirits (but not beer) was limited to 4.5 times. These federal limits were removed in mid-1992. However, regional governments were still permitted to restrict increases in vodka prices, and many did. The government's Center of Analysis of the Economic Situation conducted surveys of retail price regulation in a sample of 70 cities nationwide from 1993 to 1996. The proportion of the cities in which the price of vodka was regulated increased from 38 percent in early 1993 to 57 percent in the third quarter of 1994, before gradually falling to 17 percent in early 1996 (see Table 5).

Table 5. Percentage of cities sampled in which vodka price was regulated

1993				1994				1995				1996	
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
38	24	18	44	53	48	57	55	53	41	22	12a	17a	17a

Source: Center of Analysis of Economic Situation, cited in Serova (1999). ^a all liquors.

As of November 1992, the Moscow City Government limited the price for vodka to 296 rubles per liter. That this was far below the market-clearing level is suggested by the fact that inspectors found some private shops charging 500 rubles or more, despite the risk of being fined.³³ This also casts some doubt on the market competition hypothesis; at least at this time in Moscow, private traders were not undercutting state sellers but charging much higher prices.

As is clear from Figure 4, these periods of intensive price regulation – 1991 and early 1992 – were precisely those in which the relative price of vodka fell most sharply. In 1996, the government began setting an obligatory minimum price for vodka. The real price began working its way upward in 1997

³³ L. Nechiporuk, *Moskovskaya Pravda*, November 12, 1992, p. 1, 7.

and 1998, but another drop occurred in late 1998, simultaneously with the financial crisis and devaluation of the ruble. Again, the price of vodka rose by considerably less than that of other consumer goods. In part, producers' costs were lowered by the fact that the excise rate of 20 rubles per liter of 40 percent proof liquor remained fixed until the end of the year. In part, regional governments probably also held down rises in vodka prices for fear of public unrest as the effects of the financial crisis rippled across the country.

Governments may have been correct in believing they would be punished at the ballot box if they raised vodka prices. In April 1996, as the country's presidential election was heating up, VCIOM asked respondents in one of its polls whether the knowledge that the Communist candidate, Gennady Zyuganov, had promised to raise the tax on spirits would affect their vote. While 23 percent said this would make them more likely to vote for him, 34 percent said it would make them less likely to do so. Forty-two percent said it would not affect their vote³⁴.

5. Conclusion: Russia in comparative perspective

Excessive drinking of hard liquor, especially by middle-aged men, has been a major cause of Russia's mortality crisis in recent years. I presented evidence that the increase in such drinking resulted from a sharp drop in the real price of vodka relative to other goods, including beer. As repeated studies in many other countries have shown, "alcohol is no exception to the economic law of downward-sloping demand. The price level of alcoholic beverages influences per capita consumption levels of ethanol, as well as the incidence of alcohol abuse and its health-related consequences" (Cook and More 2002, p. 130)³⁵. The fall in the relative price of vodka may, in turn, have resulted partly from greater competition between suppliers along with the failure of government to tax the sector effectively. However, the evidence suggests another cause was far more important. Eighty-five percent of the drop in the real price of vodka between December 1990 and December 2005 oc-

³⁴ Russian Center for Public Opinion Research poll, 25–9 April 1996, 1,599 respondents, results at <http://sofist.socpol.ru>.

³⁵ For a similar view, see Edwards et al. 1995: "Taxation of alcohol is an effective mechanism for reducing alcohol problems...The notion that heavy or dependent drinkers are immune to the influence of price is demonstrably incorrect. Put simply, but with entire scientific accuracy, alcohol taxation is a readily available instrument which can be applied to save lives and avert alcohol-related suffering."

curred during two early periods (1991 and January–May 1992) during which state price regulation was holding down the nominal vodka price while other prices were allowed to rise substantially. In the face of such regulation, the relative price of vodka had no choice but to fall.

Such price limits were apparently motivated – in both cases – by populism and a fear of fueling political opposition. The largest drop in the real vodka price was the work of the last communist administration, of Mikhail Gorbachev and Valentin Pavlov. Under their leadership, the price ratio of vodka to beer fell from 27:1 to 14:1 in a single year. Ironically, the Russian drinker was saved from himself in 1991 by the failing Soviet planning and distribution system. Low priced vodka was in short supply and often purchaseable only with ration cards. But these very low real prices were the baseline that the Yeltsin government inherited. And, like the last communist government, the first government of economic liberals – although probably the bravest government Russia has ever had – apparently also feared the wrath of the Russian drinker. Limits on the rise in vodka prices were imposed in the decree that freed most other prices in January 1992. Finally, Russia’s regional governors, who took over the task of regulating vodka prices from mid-1992, must bear their share of the responsibility. From mid-1992 to February 1995, the real price of vodka fell to its lowest point, as regional governments imposed their own limits on price rises for hard liquor.

In the period from 1995, the price dynamic changed. The real vodka price recovered somewhat until 1999, after which point the trend turned down again. But from 1996 to 2005 the affordability of vodka almost tripled, caused this time by the dramatic recovery in real incomes. Rising real incomes induced a rise in recent years in consumption of both hard liquor and beer, which has seen its market grow. After 1998, alcohol-related deaths increased as well. Excise rates were not indexed sufficiently to keep up with the rise in nominal wages. And other restrictive policies that might have cut down on alcohol abuse and promoted the substitution of beer and wine for hard liquor were not introduced, at least until much later. The Putin administration, if it did not create the situation, did little initially to address it.

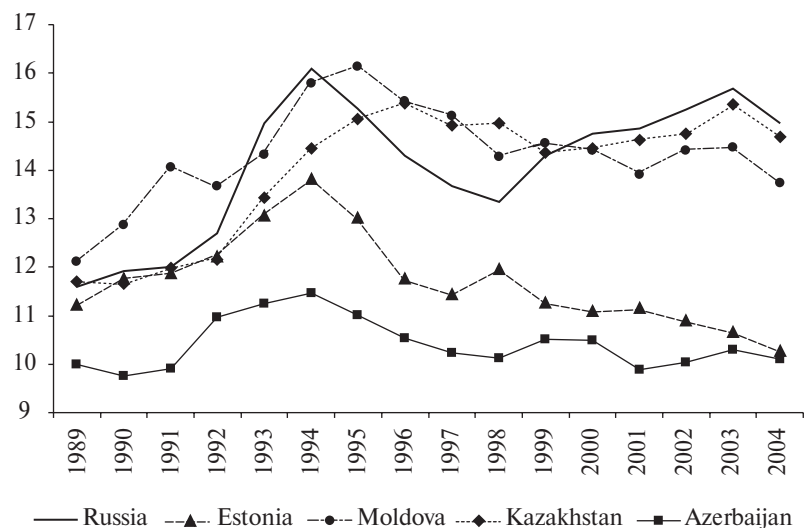
Russia’s alcohol-driven health crisis has been particularly extreme. However, the syndrome is by no means unique to Russia. Many other countries have suffered severe health problems as the affordability of alcohol increased before appropriate policies were developed. West European countries faced this problem in the 1950s and 1960s, as average incomes rose faster than the nominal price of spirits. Between the early 1950s and the early 1970s, estimated per capita alcohol consumption more than doubled in West Germany, Norway, Finland, and Denmark, and more than quadrupled in the

Netherlands. Mortality from cirrhosis of the liver also climbed alarmingly: the rate for men and women aged 35–64 increased by 328 percent in Sweden, 192 percent in Canada, 184 percent in West Germany, 124 percent in New Zealand, 115 percent in Finland, and 102 percent in Denmark³⁶. The impact on the aggregate death rate was offset, however, by other improvements in health care. Since the 1970s, effective alcohol policies and shifts in tastes from liquor to wine have cut consumption levels and related health problems in Western Europe.

Alcohol-related health crises have been quite common in the former communist world. Between the 1950s and the 1990s, Hungary suffered a remarkable increase in drinking and deaths caused by cirrhosis of the liver. Estimated total liquor consumption rose from 4.7 liters of pure alcohol per capita in 1950–54 to 16.2 liters in 1990–94 – a level higher than Russia has ever achieved (Munoz-Perez and Nizard 1998). The death rate from liver cirrhosis for men and women aged 35–64 increased by more than ten times, from 12.5 per 100,000 to 134 per 100,000. Among post-Soviet republics, Moldova and Kazakhstan (which contains a large Slavic population) had records similar to or worse than Russia’s in the 1990s (see Figure 6). Moldova’s rate of liver cirrhosis mortality tracked its total death rate quite closely. By 2002, Moldova had the highest age-standardized death rate from liver cirrhosis of any of the 191 countries for which the World Health Organization had data.

Not all the former Soviet Republics had such a large jump in the death rate. Azerbaijan – with a largely Muslim population – had a much lower rate. Estonia’s experience offers an interesting comparison. Initially, mortality rose and fell in parallel to Russia’s (see Figure 6). But from 1998, the paths diverge. Whereas Russia’s death rate rises again, as higher incomes permit greater vodka purchases, Estonia’s continues to fall. At least part of the explanation probably lies in the relative prices of different alcoholic beverages. In Russia, between 1994 and 2002, the price of beer increased relative to that of vodka; however, in Estonia, the relative price of beer fell, encouraging substitution into this less dangerous form of alcohol. In both countries, estimated total alcohol consumption increased in these years. But in Russia, estimated consumption of both spirits and beer increased, and the consumption of spirits remained more than four times as great as that of beer as of 2001. In Estonia, by contrast, estimated consumption of spirits fell sharply while that of beer soared. Whereas in 1994, Estonians consumed about three times as much pure alcohol in the form of spirits as in the form

³⁶ Both consumption and cirrhosis data come from Munoz-Perez and Nizard (1998).



Source: WHO European Regional Office, European Health for All Database, <http://data.euro.who.int/hfad/>

Figure 6. Standardized death rates, selected former Soviet republics (deaths per 1,000, all ages)

of beer, as of 2001, they derived roughly the same amount of alcohol from each. If we compare the pattern of drinking between 1990 and 2001, the contrast is even more extreme. In Estonia, spirits consumption falls while beer consumption rises; in Russia, spirits consumption soars, while beer consumption is roughly flat³⁷.

A country's susceptibility to an alcohol-related mortality crisis such as the one that struck Russia clearly depends on many factors besides sheer affordability. Among these are the country's traditionally favored form of alcoholic beverage (liquor vs. the less lethal wine or beer), religious tradition (Muslim or other), and, of course the public policy context (regulations limiting the number of outlets and times of sale). Still, the evidence that affordability matters extends beyond Russia. Across the European countries, the afford-

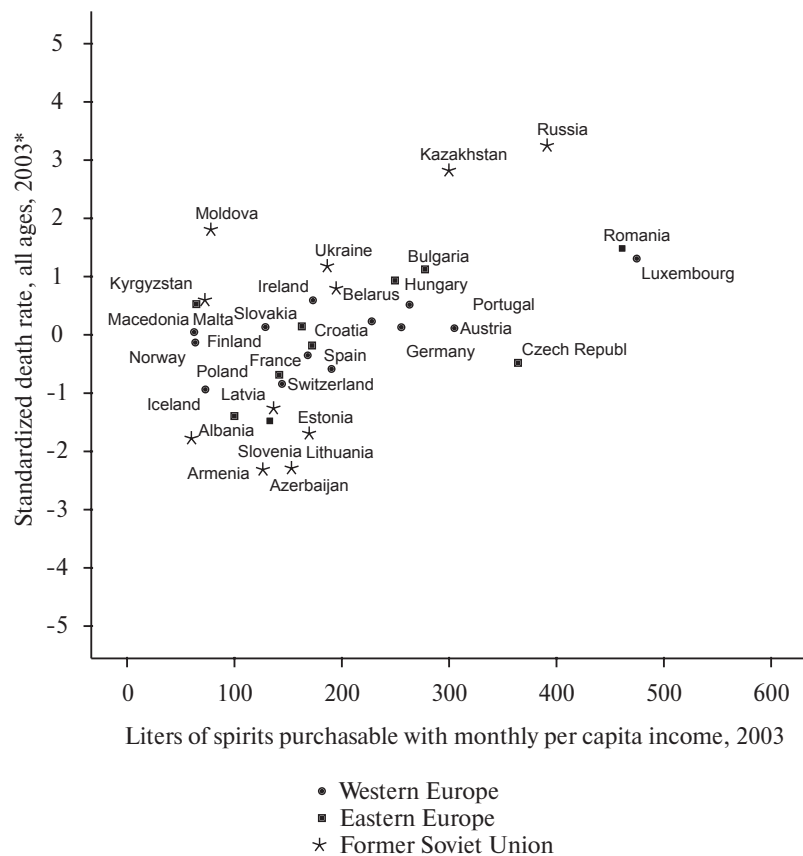
³⁷ These figures refer to the volume of pure alcohol consumed in spirits and beer; estimates from WHO 2004. A survey carried out in Estonia in 1994 and again in 1999 recorded a similar increase in the preference for beer relative to spirits (see Brunovskis and Ugland 2002, p. 14).

ability of spirits and low spirits prices relative to those of beer correlate with higher standardized death rates (see Figures 7 and 8). Given the importance of affordability, it is encouraging to note that – at least compared to other European countries, including some of its postcommunist neighbors to the West – Russia's tax policy has plenty of room to move on this dimension. Its current excise on vodka is unusually low (see Table 6).

Table 6. Excise rate on spirits (40 %), per liter, in Euros, July 2006

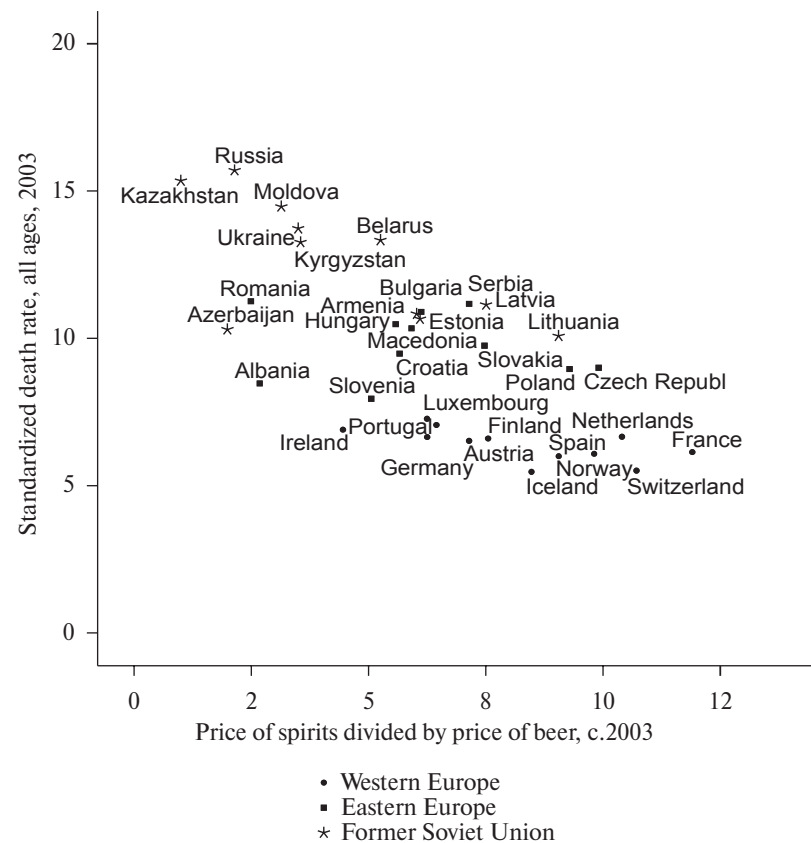
Sweden	21.5	Estonia	3.9
Ireland	15.7	Portugal	3.7
UK	11.5	Lithuania	3.7
Finland	11.3	Latvia	3.6
Malta	9.3	Czech Republic	3.6
Denmark	8.0	Hungary	3.5
Belgium	7.0	Spain	3.3
Netherlands	6.0	Italy	3.2
France	5.8	Slovak Republic	2.9
Germany	5.2	Slovenia	2.8
Poland	4.6	Cyprus	2.4
Greece	4.4		
Luxembourg	4.2		
Austria	4.0	Russia	1.9

Source: Calculated from Cnossen (2006). For Russia, author's calculations from excise of 159 Rs per liter of pure alcohol, July 2006.



Source: Estimates of World Health Organization Europe Office, $R^2 = .27$. * Standardized death rate here is adjusted for region (FSU, EE, WE) and gdp per capita: i.e. residual from regression of SDR on these variables is plotted.

Figure 7. Affordability of spirits and standardized death rate, Europe 2003



Source: Estimates of World Health Organization Europe Office, $R^2 = .27$. * Standardized death rate here is adjusted for region (FSU, EE, WE) and gdp per capita: i.e. residual from regression of SDR on these variables is plotted.

Figure 8. Pllice of liguor relative to beer and standardized death rate, Europe 2003

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Appendix

Table A1. Variables in Table 3

Variable	Definition	Sources
Death rate, working age males	male working age (16-64) deaths per 1000 working age males	Goskomstat Rossii, <i>Demograficheskiy yezhegodnik</i> Rossii, various years.
Death rate, working age females	female working age (16-59) deaths per 1000 working age females	Goskomstat Rossii, <i>Demograficheskiy yezhegodnik</i> Rossii, various years.
Log vodka price	Log10 of 1 + average price of a liter of vodka, end year in regional capital, 1992 Rs, deflated by the CPI.	Goskomstat Rossii, <i>Tseny v Rossii</i> 1996, pp.102-4;
		Srochnoe Soobshchenie ob izmenenii tsen na prodovolstvennie tovari po sostoyaniyu na 30 dek 1996, 1996; <i>Srednie tseny na prodovolstvennie tovary v dekabrya</i> , various years. Because of missing data, Dec 2000 = Feb 2001; Dec 2002 = Jan 2003; Dec 2003 = Jan 2004.
Log average income	Log10 of average monthly money income of the population, thousand 1992 Rs, deflated by CPI.	Goskomstat Rossii, <i>Regiony Rossii</i> 1999, 2006.
Percent of population Muslim	Proportion of population of predominantly Muslim ethnic groups, scaled 0-1,	Timothy, Heleniak, "Regional Distribution of the

	as classified by Heleniak, 2006, based on 2002 and 1989 censuses; proportion is linearly interpolated	Muslim Population of Russia," <i>Eurasian Geography and Economics</i> , Vol. 47, No. 4. (August 2006), pp. 426-448.
	from the proportions given in the 1989 and 2002 censuses.	
Unemployment	Unemployment rate as percent of economically active population, end year, from household surveys	Goskomstat Rossii, <i>Regiony Rossii</i> , various years.
Labor turnover	sum of job gains and losses per 100 workers in large and medium enterprises	Goskomstat Rossii, <i>Regiony Rossii</i> , various years.
		Goskomstat Rossii, <i>Rossiiskiy statisticheskiy yezhegodnik</i> , 1995, 1994, <i>Trud i Zaniatost v Rossii</i> , various years
Crime rate	crimes registered per 100 inhabitants	Goskomstat Rossii, <i>Regiony Rossii</i> , various years.
Poverty rate	Share of population with income below the minimum subsistence income (scaled 0-1).	Goskomstat Rossii, <i>Regiony Rossii</i> 2006, <i>Rossiiskiy statisticheskiy yezhegodnik</i> , 2000.
Inflation rate squared	squared inflation rate of CPI	Goskomstat Rossii, <i>Regiony Rossii</i> , various years.
Regional budget health and sports spending	regional budget health and sports spending per capita, in 1995 rubles, deflated by non-food CPI.	regional budget spending from Ministry of Finance reports on execution of regional budgets, various years, (some downloaded from budgetrf.ru), CPI non-food from <i>Regiony Rossii</i> various years.

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