

# Alcohol poisoning in Russia and the countries in the European part of the former Soviet Union, 1970–2002

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**Background:** To investigate the phenomenon of alcohol poisoning in Russia and the countries in the European part of the former Soviet Union in the period 1970–2002. **Methods:** Four time points were chosen spanning the late Soviet and post-Soviet periods. Data relating to alcohol poisoning deaths were collected at each point for the countries in the region—Belarus, Estonia, Latvia, Lithuania, Russia and Ukraine. Age-standardized death rates from alcohol poisoning were subsequently calculated for the total population and separately for men and women. **Results:** In 1970, the alcohol poisoning rates in the countries in this region were exceptionally high in comparative terms. Rates continued to rise in the late Soviet period in all the countries, only falling in the period following Gorbachev's anti-alcohol campaign. Mortality from alcohol poisoning became more common amongst women during the study period. In post-Soviet society alcohol poisoning mortality is occurring on an unprecedented scale although there may be some divergence in trends between the Slavic and Baltic countries which had mirrored each other in the Soviet period. Extremely high poisoning rates are probably explained by a combination of the volume of alcohol being consumed, what exactly is drunk and how it is being drunk. The consumption of illicitly produced alcohol in the post-Soviet period may also be contributing to the high mortality rates. **Conclusions:** Acute alcohol poisoning has now reached unprecedented rates in parts of the ex-USSR with worrying trends among men as well as among women. Effective action by the governments concerned is now essential.

**Keywords:** alcohol poisoning, alcohol surrogates, Baltic countries, episodic heavy drinking, Russia, women's drinking

## Introduction

Alcohol is an important contributor to the global burden of disease. In the year 2000 it caused over 1.8 million deaths, or 3.2% of all fatalities worldwide.<sup>1</sup> Its contribution is especially striking in post-Soviet Russia where >30% of all deaths have been attributed either directly or indirectly to alcohol during the political transition, i.e. over 7 million deaths between 1990 and 2001.<sup>2,3</sup> Specifically, alcohol has been linked to deaths from accidents and violence, including both homicide and suicide,<sup>4–6</sup> and cardiovascular deaths.<sup>7–9</sup>

Although it is a relatively uncommon contributor to alcohol-related death in other parts of the world, deaths from accidental poisoning by alcohol are common in this region, with rates that have fluctuated dramatically in recent years. Most attention has focused on Mikhail Gorbachev's anti-alcohol campaign, when the age-standardized death rate from alcohol poisoning among men in Russia fell from 35.2 to 14.5 cases per 100 000 between 1984 and 1987.<sup>10</sup>

The human toll from accidental alcohol poisoning in Russia is huge, accounting for over 41 000 deaths in 2001, equating to

a rate of 28.5/100 000 of the population or over 120 times the European average.<sup>11,12</sup> Moreover, Russia is not unique among former Soviet countries. In 2001, mortality in the Commonwealth of Independent States (CIS) as a whole was over 47 times higher than in the European Union, while in the Baltic countries, it ranged from being over 37 times higher in Latvia to nearly 109 times higher in Estonia.<sup>12</sup> Yet, despite the many deaths from this cause in the former Soviet Union, it remains a comparatively 'neglected problem' both now but especially in the past as research was limited by the decision of the Soviet authorities in the early 1930s to withhold all statistics relating to alcoholism and alcohol abuse, so that no data concerning these phenomena were available for almost 60 years.<sup>13</sup> Prior to the late 1980s, when these statistics began to become available, researchers had to use indirect methods to estimate the scale of the problem.<sup>14</sup>

This study examines the phenomenon of alcohol poisoning in Russia and in some of the countries—Belarus, Estonia, Latvia, Lithuania and Ukraine—that were situated in the European part of the Soviet Union. Studying the regional and sex-specific changes in alcohol poisoning mortality from the late Soviet to post-Soviet period provides a new perspective that transcends the political changes of the late 20th century. It also goes beyond previous studies that have been confined primarily to Russia with few examples from elsewhere,<sup>15,16</sup> even though other former Soviet republics have experienced similar fluctuations in mortality.<sup>12,17</sup>

## Methods

Data were collected for four points in time: 1969–70, 1978–79, 1988–89 and 2001–02. These points were chosen as they coincided with census years in the Soviet period and for Russia in 2002 as well as covering time points before the anti-alcohol campaign that began in 1985 and after its impact on mortality began to dissipate.<sup>18</sup> Data on age- and sex-specific mortality

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where alcohol poisoning was the underlying cause of death were obtained from official state statistical agencies for the years after 1969, and age standardized, using the European Standard Population. Data for Russia and Ukraine were recalculated accordingly to the Soviet ICD9 (1988).<sup>19,20</sup> Where it was not possible to obtain data from national sources, i.e. for Ukraine in 2001–02, data were taken from the World Health Organization's Health for All Mortality Database.<sup>12</sup> Throughout this region, and over the study period, it has been a legal requirement that sudden and unexpected deaths are investigated, almost always involving an autopsy. Attribution of alcohol poisoning is based on the presence of a high blood alcohol concentration (typically above 250 mg/dl) in the absence of any other obvious cause.<sup>21</sup>

## Results

In 1970, alcohol poisoning death rates varied considerably among the countries in the region (table 1). The rate in Russia was over 40% higher than that in the next nearest country, Latvia (15.1/100 000 vs 10.5), and nearly twice as high as in Ukraine. There were also differences between the Baltic countries as a combined rate of 8.8/100 000 masked similar rates in Latvia and Lithuania but a much lower rate in Estonia (4.8). Male poisoning rates were much higher than female rates in all of the countries (table 2).

During the 1970s alcohol poisoning rates rose substantially in nearly all of the countries (table 1). For Russia and the combined Baltic countries this rise was between 55 and 60% but there were large differences between the Baltic countries themselves. While little change occurred in Latvia, the Estonian rate rose markedly. A substantial increase was also

observed in Belarus where the alcohol poisoning rate was almost 2.3 times higher in 1979 than in 1970. In Russia and the Baltic States the increase during the 1970s was seen among both men and women (table 2). However, the change was greatest for men when measured as the number of deaths per 100 000 persons at risk, but greatest for women when measured as a proportional increase; in Russia the female death rate rose by more than double the percentage increase among men (92% vs 40%). In each of the Baltic States women were also disproportionately affected between 1970 and 1979, again reducing male–female rate ratios.

At the end of the 1980s, deaths from alcohol poisoning across the region fell markedly in the wake of Gorbachev's anti-alcohol campaign, although in Belarus the reduction was much more modest (~20%). Death rates fell among men and women in all of the countries but in both Russia and Lithuania the female rate actually fell relatively faster than the male rate, resulting in an increase in the male–female ratio in these countries (table 2).

By 2001–02, Russia, Ukraine and Belarus had alcohol-poisoning rates that far exceeded their level in 1978–79, but in Latvia and Lithuania the rates were actually lower. This divergence between the Baltic and Slavic countries may relate to broader societal changes taking place at the time, such as those associated with the forthcoming European Union membership in 2004, although the situation in Estonia remains an anomaly. It is, however, a matter of considerable concern that in the other countries alcohol poisoning rates are higher in 2001–02 than in any other time in the 30-year period. Moreover, the relative increases have been generally greater among women everywhere as witnessed by a narrowing of the male–female rate ratio in all of the countries for which we have comparative data.

**Table 1** Alcohol poisoning deaths in Russia and the countries in the European part of the former Soviet Union, 1970–2002 (per 100 000)

Country	Year			
	1969–70	1978–79	1988–89	2001–02
Russia	15.1	23.4	8.7	28.7
Ukraine	8.2 <sup>a</sup>	13.4 <sup>a</sup>	8.0 <sup>a</sup>	20.6 <sup>b</sup>
Belarus	4.9 <sup>c</sup>	11.1 <sup>c</sup>	8.6	25.4
Baltic Countries (combined)	8.8	14.0	5.3	12.2
Estonia	4.8	16.3	8.9	19.1
Latvia	10.5	11.6	3.4	8.0
Lithuania	9.3	14.9	5.2	12.4

a: Calculated from<sup>19</sup>

b: Two-year average calculated from WHO data<sup>12</sup>

c: Single year (1970 and 1979) non-standardized estimates taken from unpublished Ministry of Statistics reports

**Table 2** Male and female alcohol poisoning SDRs and rate ratios in Russia and the countries in the European part of the former Soviet Union, 1970–2002 (per 100 000)

Country	Year											
	1969–70			1978–79			1988–89			2001–02		
	M	F	Ratio	M	F	Ratio	M	F	Ratio	M	F	Ratio
Russia	28.9	4.9	5.9	40.5	9.4	4.3	14.8	3.4	4.4	47.4	12.7	3.7
Ukraine <sup>a</sup>	16.5	2.2	7.5	24.8	4.3	5.8	14.3	2.7	5.3	36.3 <sup>b</sup>	7.5 <sup>b</sup>	4.8
Belarus	–	–	–	–	–	–	14.8	3.1	4.8	42.9	10.1	4.2
Baltic Countries	16.6	2.7	6.1	25.2	4.8	5.3	9.4	1.9	4.9	20.8	4.9	4.2
Estonia	9.2	1.3	7.1	30.5	4.9	6.2	15.3	3.5	4.4	33.1	7.4	4.5
Latvia	19.6	3.5	5.6	20.8	4.0	5.2	6.1	1.2	5.1	13.4	3.3	4.1
Lithuania	17.5	2.8	6.3	26.3	5.5	4.8	9.2	1.8	5.1	21.0	5.1	4.1

a: Data for Ukraine in 1969–89 taken from<sup>19</sup>

b: Two-year average calculated from WHO data<sup>12</sup>

## Discussion

Before considering the implications of this study it is necessary to discuss issues of data quality. For the Soviet period, a recent study has confirmed the reliability of the statistics on violent death,<sup>22</sup> while in the post-Soviet period virtually all unexplained deaths are still subjected to forensic autopsies, which include not only gross inspection but also blood alcohol levels and histological examination of organs. Nemtsov has nevertheless suggested that in Russia the true alcohol poisoning mortality figure may be up to 65% higher than that recorded in the official statistics. His calculations are based on the observation of a discordance between rates of alcohol poisoning and alcoholic psychosis in some regions. He calculated the ratio between the two in those regions where the rates of the former were highest and applied this ratio to the other regions.<sup>3</sup> In contrast, there is direct evidence that cases are being coded appropriately. This comes from a study undertaken in Russia that reported *postmortem* blood alcohol levels in people undergoing forensic autopsies.<sup>23</sup> While this study cannot be generalized to all of this region, our enquiries elsewhere indicate that the approach to diagnosis is quite consistent.

For the present study what is important is to be reassured that there was *consistency* in the classification and recording of alcohol poisoning deaths across time and space. During the period 1969–91 the Soviet death classification was changed three times. This happened in 1970, 1981 and 1988. The Soviet list from 1965 was based on ICD8 and the lists of 1981 and 1988 based on ICD9.

A detailed analysis of concordance showed that the first two changes did not influence the registration of death from alcohol poisoning in the USSR, at least at ages up to 65.<sup>24</sup> The effect of the third change (1988) was simply to merge the previous division of alcohol poisoning into two subgroups 'employment-related' and 'non-employment-related'. The situation after 1991 is more complicated. Ukraine continues to use ICD9 thus it is reasonable to assume that data for 1988–89 and 2001–02 are comparable. Belarus transferred to ICD10 in 2002, Russia in 1999, Lithuania in 1998, Estonia in 1997 and Latvia in 1996. However a comparison of data from Russia and the three Baltic countries shows no discontinuity, suggesting that data from before and after the transition in coding are comparable.

We must acknowledge a recent observation of a deterioration of the precision of statistics on violent mortality in Russia.<sup>25</sup> This is manifest as an increase in cases of violence of undetermined cause. This most likely reflects a lack of diligence by the police in determining whether a case was a homicide or unintentional injury but it is unlikely to have any direct implications for our findings. In summary, we conclude that the observed results are real and not artefactual.

Deaths from alcohol poisoning were comparatively high in Russia and the other countries in this region throughout the study period. Even as early as in the late 1970s their scale was extreme. Comparisons with other parts of the world must be undertaken with caution because of differences in the coding of alcohol poisoning.<sup>26</sup> For example, a recent study has suggested that there may be a substantial under-coding of alcohol poisoning mortality in some Western European countries.<sup>27</sup> However, with this caveat it is instructive to compare Russia with the United States, where the alcohol poisoning rate was 0.18/100 000, over 100 times less than in Russia at this time.<sup>13</sup>

Although an upward trend in alcohol poisoning rates across the 1970s was broken in the 1980s, it has resumed in the post-Soviet period to produce alcohol poisoning rates in the Slavic countries, which are on a historically unprecedented

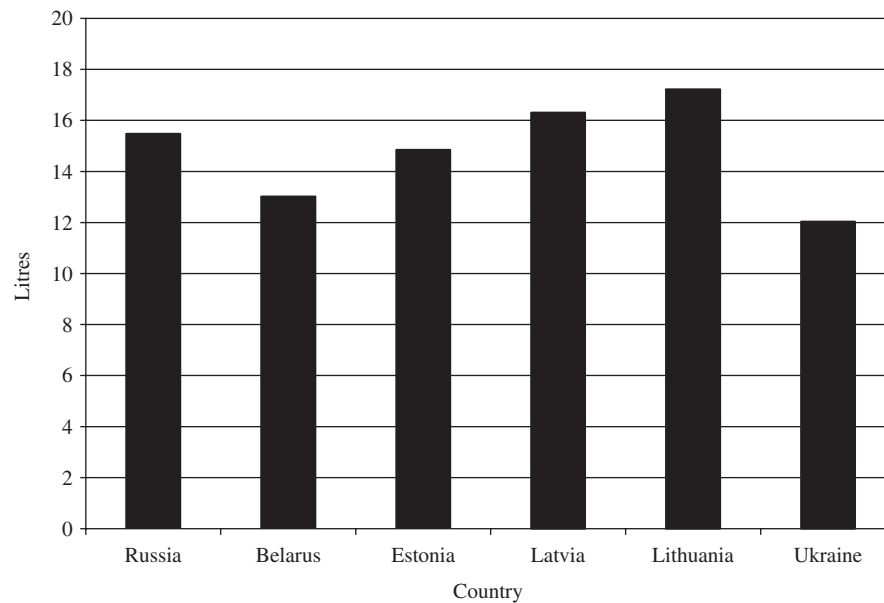
scale. Further, similar countrywide trends in the earlier period may now be beginning to diverge. Finally, both male and female alcohol poisoning rates had risen sharply in all these countries by 2001–02. However, the narrowing male–female rate ratios since 1988–89 suggest that the adverse effects of alcohol use among women may be becoming a pervasive feature of post-Soviet society. In trying to explain these developments across time it is necessary to focus on a number of factors that may have worked either individually or in conjunction with one another to produce the observed results.

Previous research has shown that a strong relationship exists between per capita consumption of alcohol and a range of alcohol-related health outcomes.<sup>28</sup> When trying to assess the impact of per capita alcohol consumption on alcohol poisoning rates it is important to have accurate consumption figures. This is particularly difficult in this region where both smuggling and the illegal production of alcohol have been commonplace, especially in the transition period<sup>29</sup> and where the results of some previous survey estimates of consumption are highly questionable.<sup>30</sup> Nonetheless, in recent years several researchers have produced per capita estimates of alcohol consumption for Russia and other former Soviet countries. These are used in figure 1 to show the problem with relying on consumption levels alone when trying to explain high alcohol poisoning rates. Creating a combined figure for recorded and unrecorded alcohol consumption estimates<sup>31</sup> it can be seen that Russia has a lower per capita consumption figure than Latvia and Lithuania, both of which have considerably lower alcohol poisoning rates than those recorded in Russia.

These findings coincide with recent research which suggests that it is the quantity of consumption in conjunction with *what* is drunk and the *way* it is drunk which may help explain differences in alcohol-related mortality.<sup>32</sup> As regards drinking pattern, episodic heavy drinking (or 'binge' drinking) may be especially harmful for a number of health outcomes.<sup>33</sup> This form of drinking has a long history in this region<sup>34</sup> and continues to be common in both the Slavic and to a lesser extent, non-Slavic populations across the ex-USSR.<sup>35,36</sup>

It is possible however, that the effects of this drinking pattern may in turn be exacerbated by the fact that spirits continue to be the drink of choice for the majority of men in the Slavic countries,<sup>37</sup> as they were in the past. According to Mäkinen and Reitan,<sup>38</sup> spirits constituted 90% of the total alcohol consumption in Russia in 1909. By 1997 the corresponding figure was 80%. In relation to this, Razvodovsky has shown how in Belarus, the level of per capita vodka consumption is a better predictor of the alcohol poisoning rate than the total level of alcohol consumption.<sup>15</sup> This finding has also been reproduced in Finland with regard to spirits sales.<sup>39</sup>

If the consumption of spirits in conjunction with episodic heavy drinking is an important determinant of alcohol poisoning, then the pattern displayed in the earliest period of this study suggests that within this region this was more of a Russian phenomenon in 1969–70 that may have subsequently spread. This drinking culture may also help explain why alcohol mortality is lower in the Baltic region than in the Slavic countries in the contemporary period, as beer is the most frequently consumed drink in the Baltic countries.<sup>29,40</sup> This being said, the alcohol poisoning rate is still very high in comparative terms in the Baltic countries, but even today it might still have a Russian flavour. Leinsalu<sup>41</sup> has highlighted this by showing how although Estonians drink more frequently, Russians living in Estonia, tend to drink more in binges. This Russian influence may even extend to other Slavic countries as a recent study of Ukraine found that heavy alcohol use was most prevalent in the southeast of



**Figure 1** Per capita consumption of pure alcohol in Russia and in the countries in the former European part of the Soviet Union in 2000/2001 (population aged 15+)

the country, which is heavily populated by Russians.<sup>42</sup> The question of alcohol-related mortality among Russians outside Russia is an important issue. There was a large movement of Russians into other Soviet republics during the communist period and their numbers vary greatly within the Baltic countries today—from being comparatively high in Estonia and Latvia (over one-quarter) to comprising about 6% of the population in Lithuania. The complexity of the effects of Russian drinking outside Russia proper has been highlighted by surveys in the three Baltic countries,<sup>29</sup> where Russians in each country have different drinking patterns.

In addition, this harmful drinking style might be responsible for the observed gender differences in alcohol poisoning rates as women not only abstain more and drink less often than men in general, but those who do drink, consume spirits less frequently than men in all of the countries in the region and also engage less in episodic heavy drinking.<sup>29,37,40</sup> However, there are also some indications that Russian women are not only drinking more now,<sup>37,43</sup> but that the way they are drinking may be increasingly harmful<sup>44</sup> which is likely to be a factor in the narrowing of the male–female alcohol poisoning rate ratio. Of course, even though this ratio is falling, it is striking that the rate among men remains typically four or more times higher than for women.

There is also growing evidence pointing to the changing nature of what is being drunk as an important factor in explaining extreme alcohol poisoning rates. The impoverishment of a large section of the population in the early 1990s following the introduction of ‘shock therapy’ resulted in increasing numbers of people starting to use the illicitly produced alcohol products that began to flood the market when the state ended its alcohol monopoly. While the use of samogon and surrogates also occurred in the Soviet period,<sup>18</sup> it is likely that the scale of consumption is now much greater. In a survey conducted amongst rural families in three regions of Russia, Zaigraev<sup>43</sup> found that 4.8 times more samogon was consumed than vodka—in part because it was either half the price of vodka when bought or as little as one-fourth of the price when self produced. Moreover, this large-scale use of illicitly produced alcohol seems to be commonplace throughout the region. A survey undertaken in Moscow in 1991 found that 27% of men and 8% of women drank

‘moonshine’ at least occasionally, with 2 and 1%, respectively, drinking it at least weekly,<sup>45</sup> while another in the Russian city of Izhevsk, in 2003–04 reported that 7.3% of men aged 25–54 had drunk surrogates in the past year, with 4.7% drinking them weekly or more often.<sup>46</sup> A recent analysis of the surrogates and samogon consumed in Izhevsk found that medicinal compounds and other surrogates contained much higher concentrations of ethanol than vodka, with the latter containing typically about 94% ethanol.<sup>47</sup> Another recent study showed that these substances were also easily available in Tallinn, Estonia.<sup>48</sup> These substances are extremely cheap as they are untaxed. Many technical and home-produced spirits are exchanged by barter or in payment for informal labour, such as extra tuition by teachers or car repairs by mechanics. Others are domestic products that, elsewhere, are made from other chemicals but in Russia consist of highly concentrated ethanol. Examples include antifreeze, fire-lighting fluid and window cleaning fluid. However, among the surrogates are a number of ‘aftershaves’, which are very widely available in shops and sell at typically one-third the price of vodka. There can be little doubt that those producing them are aware that they are being drunk on a very extensive scale. Those who consume them report that they must be diluted before consumption but it is easy to see how, given their high concentration of ethanol, they may lead to poisoning in someone who is already intoxicated.

Finally, it is important to consider the possibility of an interaction between alcohol and narcotics, whose use has become common in this region in the most recent period. This is an issue that requires further research.

While there is nothing inevitable about heavy drinking in this region,<sup>49</sup> it is now very common.<sup>2,43</sup> Whether this situation will change in the Slavic countries in the foreseeable future may depend on such factors as whether an effective civil society can emerge in these countries—a development that has been linked with an improved mortality pattern in the Baltic countries since 1994.<sup>50</sup> Above all, it will depend on the state taking the issue of alcohol and its effects seriously—something it has failed to do so far across the course of both the Soviet and post-Soviet periods, as tens of thousands of alcohol-related fatalities unfortunately testify.

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### Key points

- Alcohol poisoning mortality has been exceptionally high in this region throughout the study period but is now occurring on an unprecedented scale in the Slavic countries in the post-Soviet period.
- Trends in alcohol poisoning rates may be beginning to diverge between the Slavic and Baltic countries which mirrored each other in the Soviet period.
- Women's drinking is becoming increasingly harmful in both the Slavic and non-Slavic countries as evidenced by falling male–female alcohol poisoning rate ratios.
- Urgent action is needed by the governments in the region to address the growing consumption of both legal, illegal and often highly toxic alcohol surrogates which seem to have an important role in the extreme level of alcohol poisoning in this region.

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