

Cardiovascular mortality trends in Russia: possible mechanisms

Sergei V. Jargin

I read with interest the Review by Professor Majid Ezzati *et al.* ([Contributions of risk factors and medical care to cardiovascular mortality trends. *Nat. Rev. Cardiol.* 12, 508–530; 2015](#)).¹ In the abstract, the authors write: “In Russia and some other former Soviet countries, changes in volume and patterns of alcohol consumption have caused sharp rises in cardiovascular disease (CVD) mortality since the early 1990s.”¹ I believe that this statement is questionable for the reasons outlined in this Correspondence. The cause of the high CVD mortality registered in the former Soviet Union, and of its increase after 1990, is evident to anatomical pathologists. Since the Soviet era, an autopsy has remained obligatory for all patients who die in hospitals, but the autopsy rate has decreased and the quality deteriorated, especially during the 1990s—autopsies are often perfunctorily performed.² Decreases in the quality of anatomical pathology, and in health care in general, during the 1990s coincided with the increase in cardiovascular-related³ and hypertension-related⁴ mortality. If a cause of death is not entirely clear, it has been usual in Russia to write ‘ischaemic heart disease with cardiac insufficiency’ or a similar formulation on the death certificate. A tendency to overdiagnose CVD also exists for people dying at home who do not undergo autopsy. In support of this concept is the statement that “Increases and decreases in mortality [have been] related to CVD, particularly to ‘other forms of acute and chronic ischaemia’ and ‘atherosclerotic heart disease’, but not to myocardial infarction, the proportion of which in Russian CVD-related mortality is extremely low.”⁵ The diagnosis of myocardial infarction is usually based on clear clinical or morphological criteria, whereas ischaemic or atherosclerotic heart disease with cardiac insufficiency is often diagnosed *post mortem* without strong evidence.⁶ I believe that a tendency exists in Russian literature to exaggerate alcohol abuse and its cause–effect relationship with mortality, particularly CVD-related mortality.^{7–11}

In this way, responsibility for the increase in mortality after 1990, partly caused by shortcomings of the health-care system and toxicity of some legally sold alcoholic beverages,⁹ is shifted onto the patients, as being a result of self-inflicted diseases caused by excessive alcohol consumption.

In an autopsy study, all 654 deceased individuals who had had a high alcohol intake were diagnosed *post mortem* with cardiomyopathy.⁸ According to a later publication by the same authors, cardiomyopathy was diagnosed in 696 of 787 deceased individuals who had abused alcohol, whereas in almost all 172 deceased individuals who had been treated for alcoholism, cardiomyopathy was graded as pronounced.¹² Registered cardiomyopathy mortality in Russia is about 100-fold higher than in Finland, France, and the USA.¹³ One study showed that clinically significant cardiomyopathy was diagnosed in ~50% of habitual alcohol consumers.⁷ Accordingly, the diagnosis of cardiomyopathy was routinely used in cases of sudden death of alcohol consumers,⁸ whereas the actual cause could have been poisoning or an unknown disease.⁵

Stroke has also been overdiagnosed *post mortem*. Contrary to myocardial infarction, gross features of a brain infarction can be mimicked by artificially destroying brain tissue, for example by a junior pathologist or postgraduate student not inclined or unable (such as because of a lack of toxicological tests) to search for the true cause of death. I observed such cases of false–positive autopsy diagnosis of brain infarctions in an academic institution, and they probably happened more frequently in pathology departments of hospitals with no quality control.² Unreliable *post-mortem* diagnostics are one of the probable reasons that, in 2002, reported stroke mortality among men aged 45–54 years was tenfold higher in Russia than in France, Germany, or Italy.^{14,15}

The tendency to exaggerate the cause–effect relationship between alcohol and CVD mortality is new to Russian medical

literature. Researchers in an epidemiological study from 1977 reported that the prevalence of CVD including hypertension was not significantly higher among men who drank excessively than in the general male population.¹⁶ A lower prevalence of atherosclerosis was reported in alcoholic individuals aged >40 years than in controls.¹⁷ A hazardous drinking pattern, with spirits consumed in intense drinking spells,¹ was proposed as an explanation for the relationship between CVD mortality and alcohol consumption in Russia.¹¹ Without denying the risks associated with heavy binge drinking, it should be noted that this hazardous drinking pattern has clearly been in decline in Russia since 2000 or before, particularly among young people in cities, but also in some rural areas.^{18–20} The drinking of vodka has been partly replaced by an increase in the moderate consumption of beer.²¹ I believe that the main causes of this change have been a more responsible way of life as a result of the market economy, and intimidation and crime against alcoholics, with the aim of appropriating their apartments, houses, and other property.^{22,23} As for younger people, they are seemingly adopting the moderate alcohol consumption style prevailing in the West.

Furthermore, according to the published data, between 1984 and 1994, mortality in Russia initially underwent a rapid decline followed by an even steeper increase.²⁴ The magnitude of the fluctuations raises questions about the validity of reported death rates.²⁴ The decline can be explained by a decrease in alcohol consumption during the anti-alcohol campaign (1985–1988), and the subsequent mortality increase caused by widespread drunkenness after the campaign, the toxicity and poor quality of some alcoholic beverages,⁹ and the decline in the standards of health care.^{6,24} Apparently there was also an artefact underlying the “huge variation in Russian mortality”.²⁴ Statistical data from the former Soviet Union generally had both meaning and significance; however, the release of information was

controlled, sometimes being designed to mislead—examples of data manipulation for propaganda purposes are documented.²⁵ Manipulation of scientific statistics was not unusual in the former Soviet Union.^{26,27} The mortality decrease after 1985 might have initially been overstated to highlight the successes of the anti-alcohol campaign, which has subsequently been compensated for by overstated mortality figures. Habitual *post-mortem* overdiagnosis of CVD is compatible with the “absence of any substantial variation in mortality rates from neoplasms, including those related to alcohol, during the period 1984–94”,²⁴ because neoplasms are rarely diagnosed without evidence. Moreover, cancer statistics provide evidence in support of a deterioration in diagnostics: mortality from lung cancer (requiring radiography or autopsy for diagnosis) in men decreased by 17% over the period 1998–2007, whereas mortality from breast cancer, which rarely remains undiagnosed, “increased considerably”.⁵

In regard to the high CVD and stroke mortality in Russia, irregular treatment of hypertension continues to be a major problem.²⁸ Regular treatment of chronic diseases cannot be afforded by many people with low incomes. A sex-specific aspect also exists, partly explaining why “men have been most affected by the recent fluctuations in mortality”.²⁴ Middle-aged and elderly men are notably under-represented among patients in governmental polyclinics. Medical surveillance and regular check-ups of employees, maintained in many factories and organizations during the Soviet time, have been reduced or discontinued. Mistrust has grown towards medicine because of its commercialization. Therefore, many elderly people stay at home even if they have symptoms, receiving no adequate treatment for chronic conditions.

In conclusion, the following causes of the high mortality in Russia compared with other countries should be noted: insufficient quality

and availability of health care and toxicity of some alcoholic beverages, including those sold legally in shops. Insufficient availability of modern health care for large segments of the population has contributed to the cardiovascular-related and hypertension-related mortality, whereas the role of alcohol has apparently been exaggerated in some publications. Overstated correlations between alcohol consumption and CVD mortality reported from Russia might cause general overestimation of cardiovascular risks associated with ethanol intake.

People's Friendship University of Russia,
Clementovski per 6-82, 115184 Moscow,
Russia.
sjargin@mail.ru

Competing interests

The author declares no competing interests.

- Ezzati, M. *et al.* Contributions of risk factors and medical care to cardiovascular mortality trends. *Nat. Rev. Cardiol.* **12**, 508–530 (2015).
- Jargin, S. V. The practice of pathology in Russia: on the eve of modernization. *Basic. Appl. Pathol.* **3**, 70–73 (2010).
- Zatonski, W. A. & Bhala, N. Changing trends of diseases in Eastern Europe: closing the gap. *Public Health* **126**, 248–252 (2012).
- Razvodovsky, Y. E. Contribution of alcohol to hypertension mortality in Russia. *J. Addict.* **2014**, 483910 (2014).
- Davydov, M. I. *et al.* Analysis of mortality in Russian population [Russian]. *Vestn. Ross. Akad. Med. Nauk* **7**, 17–27 (2007).
- Jargin, S. V. Health care and life expectancy: a letter from Russia. *Public Health* **127**, 189–190 (2013).
- Zayratyants, O. V., Vovk, E. I. & Vertkin, A. L. *Final diagnosis* [Russian] (GEOTAR-Media, 2009).
- Paukov, V. S. & Erokhin, Iu. A. Pathologic anatomy of hard drinking and alcoholism [Russian]. *Arkh. Patol.* **66**, 3–9 (2004).
- Nuzhnyi, V. P., Kharchenko V. I. & Akopian, A. S. Alcohol abuse in Russia is an essential risk factor of cardiovascular diseases development and high population mortality (review) [Russian]. *Ter. Arkh.* **70**, 57–64 (1998).
- Nemtsov, A. V. Alcohol-related human losses in Russia in the 1980s and 1990s. *Addiction* **97**, 1413–1425 (2002).
- Razvodovsky, Y. E. Estimation of alcohol attributable fraction of mortality in Russia. *Adicciones* **24**, 247–252 (2012).
- Erokhin, Iu. A., Paukov, V. S. & Kirillov, Iu. A. Causes of the people death from drunkenness and alcoholism [Russian]. *Arkh. Patol.* **74**, 33–36 (2012).
- Govorin, N. V. & Sakharov, A. V. *Alcohol-related mortality* [Russian] (Ivan Fedorov, 2012).
- Kim, A. S. & Johnston, S. C. Global variation in the relative burden of stroke and ischemic heart disease. *Circulation* **124**, 314–323 (2011).
- Razvodovsky, Y. E. Fraction of stroke mortality attributable to alcohol consumption in Russia. *Adicciones* **26**, 126–133 (2014).
- Kopyt, N. Ia. & Gudzhabidze, V. V. Effect of alcohol abuse on the health indices of the population [Russian]. *Zdravookhr. Ross. Fed.* **6**, 25–28 (1977).
- Gukasian, A. G. *Chronic alcoholism and condition of internal organs* [Russian] (Meditsina, 1968).
- Perlman, F. J. Drinking in transition: trends in alcohol consumption in Russia 1994–2004. *BMC Public Health* **10**, 691 (2010).
- Radaev, V. Impact of a new alcohol policy on homemade alcohol consumption and sales in Russia. *Alcohol Alcohol.* **50**, 365–372 (2015).
- Jargin, S. V. Letter from Russia: minimal price for vodka established in Russia from 1 January 2010. *Alcohol Alcohol.* **45**, 586–588 (2010).
- World Health Organization. Management of substance abuse. *Global status report on alcohol and health* [online], http://www.who.int/substance_abuse/publications/global_alcohol_report/en/ (2014).
- Jargin, S. V. Social vulnerability of alcoholics and patients with alcohol-related dementia: a view from Russia. *Alcohol Alcohol.* **45**, 293–294 (2010).
- Jargin, S. V. Alcohol abuse in Russia: history and perspectives. *J. Addict. Behav. Ther. Rehabil.* **4**, 1 (2015).
- Leon, D. A. *et al.* Huge variation in Russian mortality rates 1984–94: artefact, alcohol, or what? *Lancet* **350**, 383–388 (1997).
- Allen, E. L. Central Intelligence Agency. *The validity of Soviet economic statistics* [online], https://www.cia.gov/library/center-for-the-study-of-intelligence/kent-csi/vol4no3/html/v04i3a01p_0001.htm (2011).
- Vlasov, V. V. Emerging problems of medical ethics in Russia: medical practice and research [Russian]. *Kardiologija* **42**, 81–84 (2002).
- Jargin, S. V. Scientific misconduct: manipulation of statistics in medical research. *Dermatopathol. Pract. Concept.* **15**, 21 (2009).
- Roberts, B., Stickley, A., Balabanova, D., Haerpfer C. & McKee M. The persistence of irregular treatment of hypertension in the former Soviet Union. *J. Epidemiol. Community Health* **66**, 1079–1082 (2012).