Russian mortality trends for 1991-2001: analysis by cause and region
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Abstract


Design Analysis of data obtained from the Russian State statistics committee for 1991-2001. All cause mortality was compared between seven federal regions. Comparison of cause specific rates was conducted for young (15-34 years) and middle aged adults (35-69 years). The number of Russian adults who died before age 70 in the period 1992-2001 and whose deaths were attributable to increased mortality was calculated.

Main outcome measures Age, sex, and cause specific mortality standardised to the world population.

Results Mortality increased substantially after the economic crisis in 1998, with life expectancy falling to 58.9 years among men and 71.8 years among women by 2001. Most of these fluctuations were due to changes in mortality from vascular disease and violent deaths (mainly suicides, homicides, unintentional poisoning, and traffic incidents) among young and middle aged adults. Trends were similar in all parts of Russia. An extra 2.5-3 million Russian adults died in middle age in the period 1992-2001 than would have been expected based on 1991 mortality.

Conclusions Russian mortality was already high in 1991 and has increased further in the subsequent decade. Fluctuations in mortality seem to correlate strongly with underlying economic and societal factors. On an individual level, alcohol consumption is strongly implicated in being at least partially responsible for many of these trends.

Introduction
The huge fluctuations in Russian mortality during the 1990s have attracted much interest.1-3 Although Russian adult mortality was relatively high in 1991 compared with levels in western Europe, it increased rapidly in the immediate period after the break up of the Soviet Union, with a more marked increase among men. Subsequent to this, a sharp improvement was observed in the period 1995-8. Analyses of these trends identified vascular diseases and external causes as being responsible for most of the changes and focused on the role of alcohol and socioeconomic stress related to rapid economic changes.1-4 Individual level information on possible aetiological factors is, however, limited.
and 2001 seemed to be predominantly due to diseases of the circulatory system and external causes.

In 1998-2001 mortality from diseases of the respiratory system also increased, mainly due to an increase in death from pneumonia. Mortality from digestive diseases, mostly alcohol induced liver disease and cirrhosis, and from infectious diseases, mostly tuberculosis, increased moderately.

The one disease category that did not follow these trends was cancers, with moderate decreases among men and a constant rate among women during 1998-2001, after more substantial decreases in 1994-8.

### Mortality by region

When we compared all cause mortality between the seven different Russian regions, there were similar temporal trends (fig 1). High rates were consistently observed for the Siberian and Far Eastern regions, whereas the Southern regions experienced a considerably lower rate.

In 1991, mortality in Russian men was about 20% higher than in the Czech Republic, although mortality then decreased in the Czech Republic, resulting in an age standardised mortality in Russia of 1484/100 000 that was 100% higher than that in the Czech Republic (733/100 000). Mortality also decreased in Finland, with which Russia shares a border, over the period 1991-2001. In 2000, age standardised mortality in Russia was over twice that in Finland for men (1484 and 589/100 000 respectively) and women (678 and 333/100 000 respectively).

Finally, we calculated the numbers of extra premature deaths in adults (that is, age 15-69 years) in the period 1992-2001 on the basis of two different scenarios: the number of premature adult deaths that would have occurred if mortality in 1992-2001 had stayed constant at the level of 1991, and if Russian mortality in the period 1992-2001 had decreased at a similar level to that seen in the Czech Republic, about 3% per year (fig 2). Of the 8 317 789 premature deaths in men and the 3 699 717 premature deaths in women that occurred among adults aged 15-69, about 2 142 000 in men and 625 000 in women would have been avoided if mortality had stayed constant at 1991 levels. Furthermore, an additional 864 000 premature deaths in men and 492 000 premature deaths in women would have been prevented if Russian mortality had decreased as it did in the Czech Republic.

### Discussion

The reasons behind the trends in mortality between 1991 and 1998 have been discussed previously in detail. In particular, the trends are unlikely to have been artefactual because of trends in data collection or underestimation of the Russian population, especially given the relatively constant mortality for all neoplasms combined. Furthermore, even though Russian mortality may have been overestimated in the past decade due to a large number of new non-resident immigrants who are not counted in population estimates, the strong consistency of these results across the Russian geographical regions would also argue against an artefactual explanation due to population movement or misclassification.

### The role of lifestyle factors

Attention has previously focused on the role of lifestyle factors associated with rapid economic change as possible causes of these mortality trends, in particular alcohol consumption and "socioeconomic stress" associated with having to survive in a challenging economic climate. The role of alcohol consumption in explaining a large part of the mortality trends would seem reasonable. The largest relative changes have been observed for those conditions that are directly related to alcohol—namely, unintentional poisoning by alcohol and liver cirrhosis.

While changes in mortality from external causes were the main determinant for changes in overall mor-
An estimated extra 2.5-3 million Russian adults died in middle age in the period 1992-2001 than would have been expected based on 1991 mortality. Subsequent to the economic crisis in 1998, mortality increased again, with life expectancy falling to 58.9 among men and 71.8 among women by 2001.

**What this study adds**

The increase in mortality in 1998-2001 followed a similar cause specific pattern to the increase in 1991-4. Trends were similar in all parts of the Russian Federation. An estimated extra 2.5-3 million Russian adults died in middle age in the period 1992-2001 than would have been expected based on 1991 mortality.

Prospects

With regard to future mortality trends in Russia, it is clear that a period of constant economic stability is required. One sign of optimism is that while mortality increased between 2000 and 2001, among young adults overall mortality decreased, indicating that the most recent part of this story may have turned another corner.

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