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**Did the economic crisis cause the mortality fluctuation in Russia
in the 1990s?**

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Introduction

During the last ten years the level of life expectancy in Russia changed significantly. After dramatic drop in 1990-1994 the new life expectancy increase has began. It was continuing till 1998 and the increase in life expectancy was about the same as its previous increase during the anti-alcohol campaign. In 1999-2000 the life expectancy decreased again.

There are at least three different point of views (Cornia, Panicià, 2000; Ellman, 1994; Shkolnikov et al., 1998; Shkolnikov, Nemtsov, 1997; Vichnevskii, 2000). According to the first one the main cause of mortality increase is Russia's economic and social crisis. The second one creates that the mortality fluctuation is a result of the anti-alcohol campaign only and mortality growth is the artefact. The third one states that the latest mortality trend is only a continuation of the previous one disturbed by the anti-alcohol campaign (Figure 1).

In this paper we made an attempt to estimate a role of these three components to mortality dynamics in Russia after 1990

Data and methods

Our study was based on the mortality data for 6 countries: Belarus, Estonia, Latvia, Lithuania, Russia and Ukraine. All presented in the paper indicators for Russia are the result of the author's calculation based for 1965-1994 on (Mille, Shkolnikov and Vallin, 1996) and for 1995-1999 on WHO Mortality Data Base (<http://www.who.int/whosis/mort/download.htm>). The same data source was used for the rest 5 countries for period 1981-1999. The main mortality indicators in the previous years for Belarus, Estonia, Latvia, Lithuania, and Ukraine¹ are from (Council of Europe, 2000) or the HFA-DB of the WHO Regional Office for Europe (<http://www.who.dk/country/country.htm>).

Average absolute deviations of estimates of life expectancy according to the HFA-DB from the results of our calculation for period 1990-1999 is 0.10 and according the Council of Europe publication – 0.16. The more significant deviation in the last case was caused by the Ukraine's data, which were presented in this publication without decimals. Since the values of life expectancy from these three sources are enough close, it is possible to use them in one study.

Our analysis focuses mainly on the dynamics of life expectancy. We used the method of components (Andreev, 1982) for decomposing of a difference between two life expectancies by age and causes of death that permits to weigh changes of age-cause specific mortality rates in terms of life expectancy.

Mortality in Russia before 1991

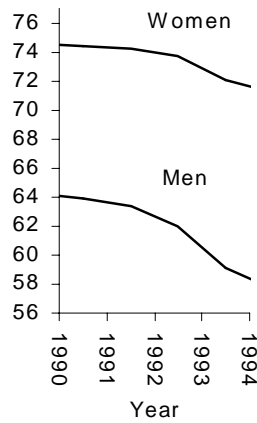
The post-World War II mortality decline did not start immediately after the end of hostilities it was delayed by the 1947 famine (Andreev et al, 1998). Then, from 1948, life expectancy rose steadily until the mid-1960s. At that time, mortality began to show negative tendency: there was an increase of mortality of men due to diseases of the circulatory system at younger ages and in mortality from accidents. There was also stabilization at a relatively high level of infant mortality from infectious and respiratory diseases. A decline of expectation of life at birth for Russia's population was experienced throughout the period 1965-1980.

¹ We did not include in our analysis the Republic of Moldova due to the problems of data quality for the period before 1980.

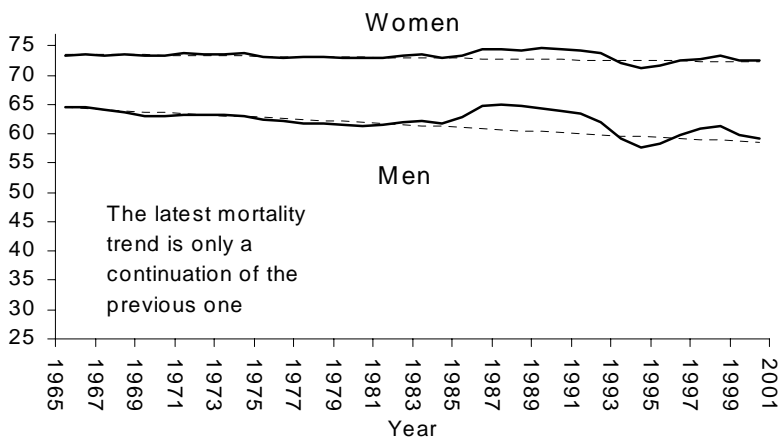
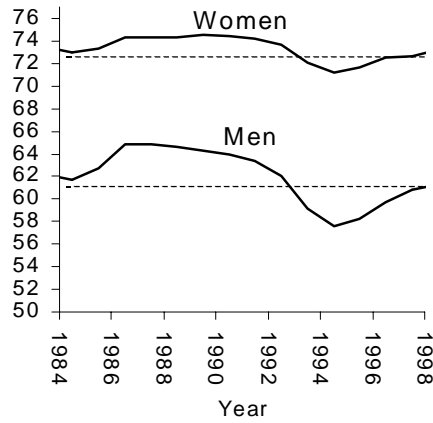
Figure 1. The trend of life expectancy in Russia after 1965



The main cause of mortality increase is economic and social crisis



The mortality fluctuation is a result of the anti-alcohol campaign only



The latest mortality trend is only a continuation of the previous one

The main causes of death that reduced life expectancy were accidents and diseases of the circulatory system (Table 1).

Table 1. Decomposition of life expectancy changes in Russia in 1965-1980 and 1980-1994 by age groups and causes of death

	Men		Women	
	1965-1980	1980-1994	1965-1980	1980-1994
Total	-3.072	-3.906	-0.326	-1.740
0-14	0.317	0.425	0.375	0.378
15-64	-2.796	-3.969	-0.504	-1.639
65+	-0.593	-0.362	-0.197	-0.479
Infectious and parasitic diseases	0.312	0.093	0.200	0.143
Tuberculosis	0.381	-0.062	0.242	0.002
Neoplasm's	0.148	-0.235	0.418	-0.131
Malignant neoplasm of stomach and intestine	0.278	0.141	0.345	0.094
Malignant neoplasm of trachea, bronchus and lung	-0.119	-0.131	-0.004	-0.012
Diseases of the circulatory system	-1.638	-1.772	-0.768	-1.053
Ischaemic heart diseases	-1.397	-0.845	-0.753	-0.191
Cerebrovascular diseases	-0.282	-0.362	-0.191	-0.430
Diseases of the respiratory system	-0.203	0.454	0.131	0.568
Acute upper respiratory infections, influenza, Pneumonia	0.056	0.320	0.172	0.402
Diseases of the digestive system	-0.025	-0.127	0.062	-0.113
Congenital malformations and conditions originating in the perinatal period	0.074	-0.223	0.083	-0.206
Pregnancy, childbirth and the puerperium			0.043	0.031
All other diseases	-0.084	-0.165	-0.009	-0.240
Injury and poisoning	-1.657	-1.929	-0.487	-0.740
Transport accidents	-0.169	-0.107	-0.073	-0.072
Suicide	-0.294	-0.205	-0.054	0.003
Homicide	-0.160	-0.589	-0.086	-0.168

The decline in life expectancy of males continued almost steadily until the early 1980s, accelerating somewhat during influenza epidemics (Andreev, Biriukov, 1998), or slowing down for a short period, as a reaction to attempts to limit alcohol consumption (in the early 1970s and in 1981). These short-lived drops in mortality from accidents basically involved the 15-29 age group.

The same mortality dynamics was observed in all former European republics of the USSR (Figure 2). The dashed lines show a linear approximation of the life expectancy changes in 1965-1981. The method of least squares was used. The coefficient of determination varied for men from 0.77 (Estonia) to 0.93 (Latvia, Russia, Ukraine), for women from 0.60 (Estonia) to 0.87 (Russia, Ukraine). We estimated also the average increase of life expectancy at birth (Table 2).

Table 2. Average increase of life expectancy at birth in 1965-1980

	Men	Women
Belarus	-0.18	0.00
Estonia	-0.18	-0.03
Latvia	-0.21	-0.01
Lithuania	-0.16	0.03
Russia	-0.19	-0.03
Ukraine	-0.20	-0.04

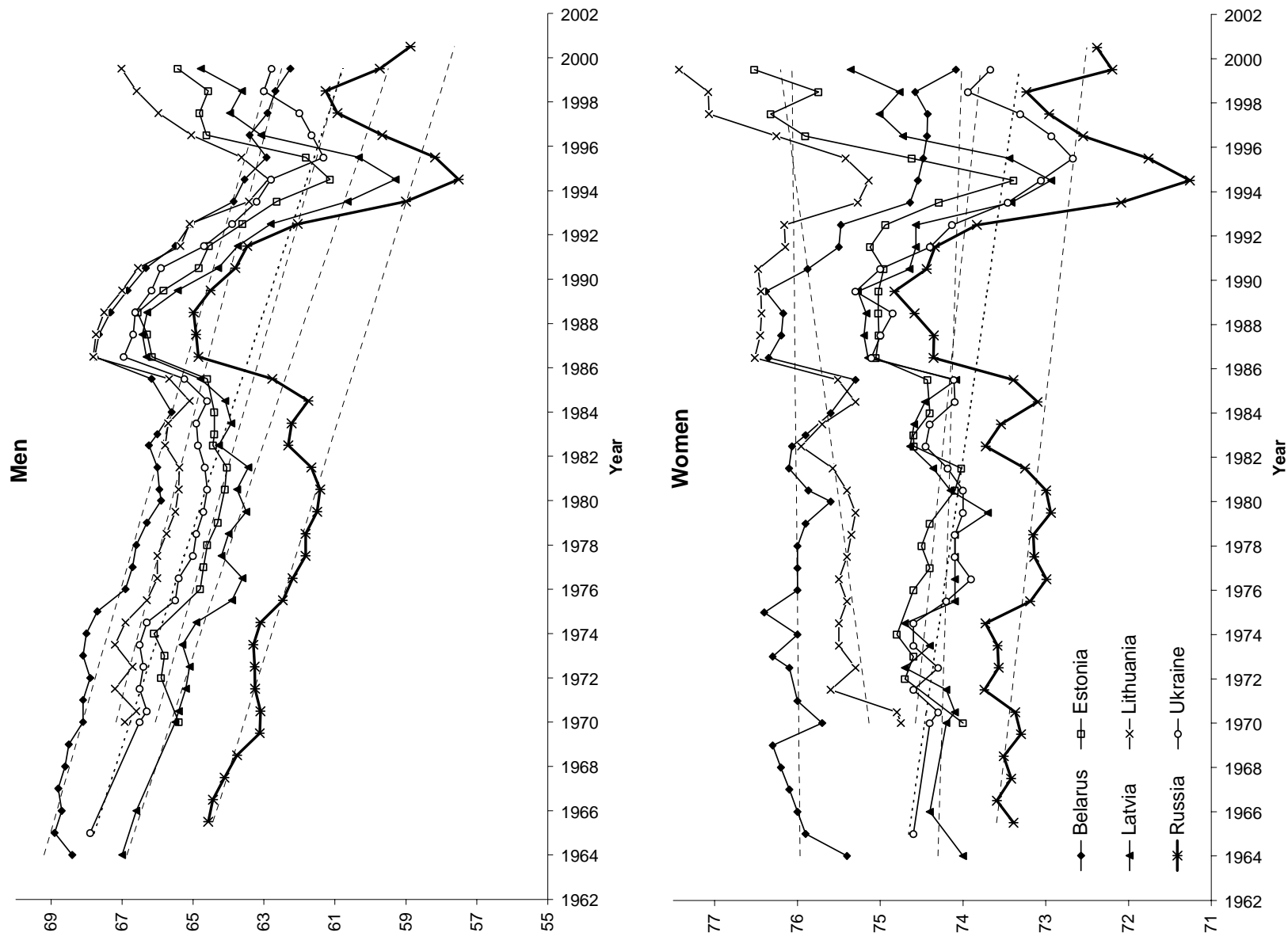


Figure 2. Life expectancy dynamics in the 6 countries

Whereas life expectancy of men was decreasing in six countries on the average by 0.16 – 0.21 year during 1 year, woman’s life expectancy was nearly stable. Life expectancy in the early 1980s is presented in Table 3.

Table 3. Life expectancy at birth in the 6 countries in the early 1980s

Country	Period	Men	Women
Belarus	1980	65.9	75.5
Estonia	1980	64.1	74.1
Latvia	1979-1980	63.6	73.9
Lithuania	1979-1980	65.5	75.4
Russia	1979-1980	61.5	73.0
Ukraine	1979-1980	64.6	74.0

The period from 1981 to 1983 saw a brief period of stability in life expectancy, obviously due to the dual effect of another rise in prices for alcoholic drinks and the absence of major influenza epidemics. In 1984, however, life expectancy dropped again, by about 0.5 year both for men and women.

During the 20 years from 1965 to 1984 in Russia, the infant mortality rate changed insignificantly, from 26.6 to 20.9 per 1,000 newborns; for men life expectancy at birth fell by 2.9 years, and for women, by 0.4 years. Life expectancy at age 25: by 3.4 years for men and 0.8 years for women.

The campaign against excessive alcohol drinking that was launched in May 1985 resulted in unprecedented increase in life expectancy both for men and women. The decline of number of deaths by calendar months started just in June 1985 (Figure 3 (a)). However whether this increase in life expectancy in 1986-1988 was only due to the anti-alcohol campaign, or a role of some other factors were significant too, is still debated.

In 1988, men’s life expectancy grew by more than 3 years since 1981, including two year owing to a decline in mortality from accidents (see Annex, Table A1). Similar life expectancy growth was observed in Belarus (1.6 year), Estonia (2.3 year), Latvia (3.0 year), Lithuania (2.4 year), and Ukraine (2.1 year). From 40 to 65 percent of life expectancy growth was the result of decline of mortality from accidents. In 5 countries (excluding Belarus) life expectancy of women increased by 0.8-1.1 and it was almost stable in Belarus.

Life expectancy collapse: 1991-1994

Growth of the level of mortality in Russia resumed in 1988, before the anti-alcohol campaign had been abandoned. However life expectancy was declining at about the same speed as it was in the mid-1970s, and the process was basically due to growth of mortality from accidents (Table A2).

From 1991 to 1994 life expectancy of men in Russia decreased by more than 6 years and women - 3 years. The structure of this decline by ages and causes of death is presented in the Annex (Table A3). The main causes of death that caused the forth life expectancy decline in this period were the same as those in 1965-1980: accidents and diseases of circulatory system. Mortality just from these causes of death declined in the period of anti-alcohol campaign.

The transition to a free market economy started at the beginning of 1992 with liberalization of prices including prices for alcohol and abolition of the state monopoly for alcohol trading. Since that time anyone can buy vodka anywhere 24 hours a day and at a relatively low price. The reversal of alcoholic situation should result in growth of mortality from accidents it has taken place. Rapid growth of the number of deaths by months started just in February 1992 (Figure 3 (b)).

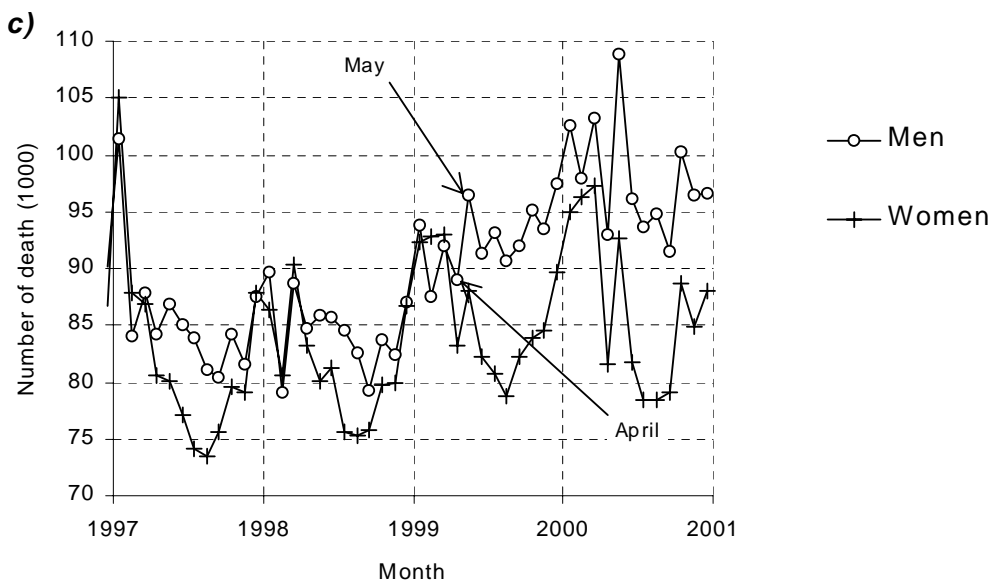
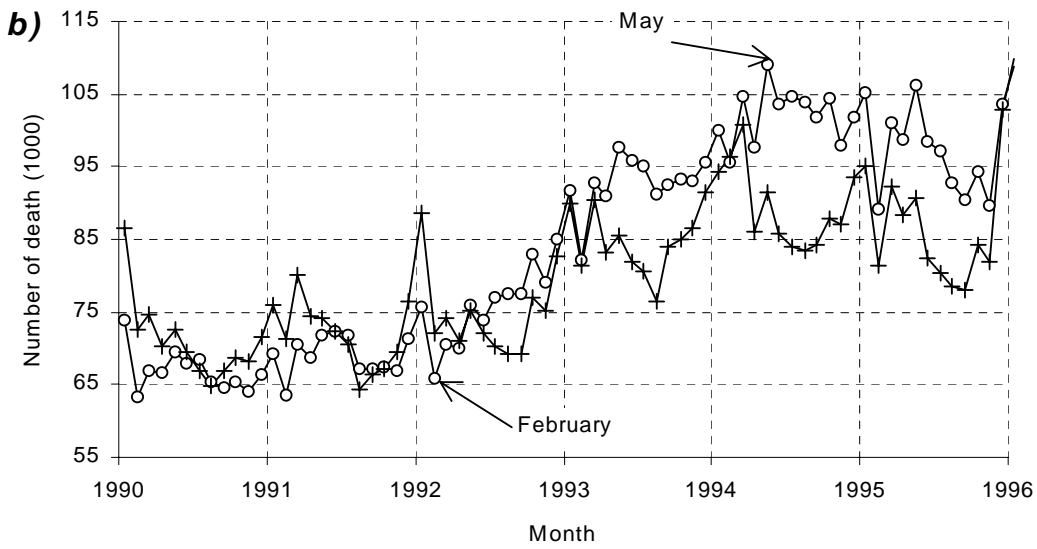
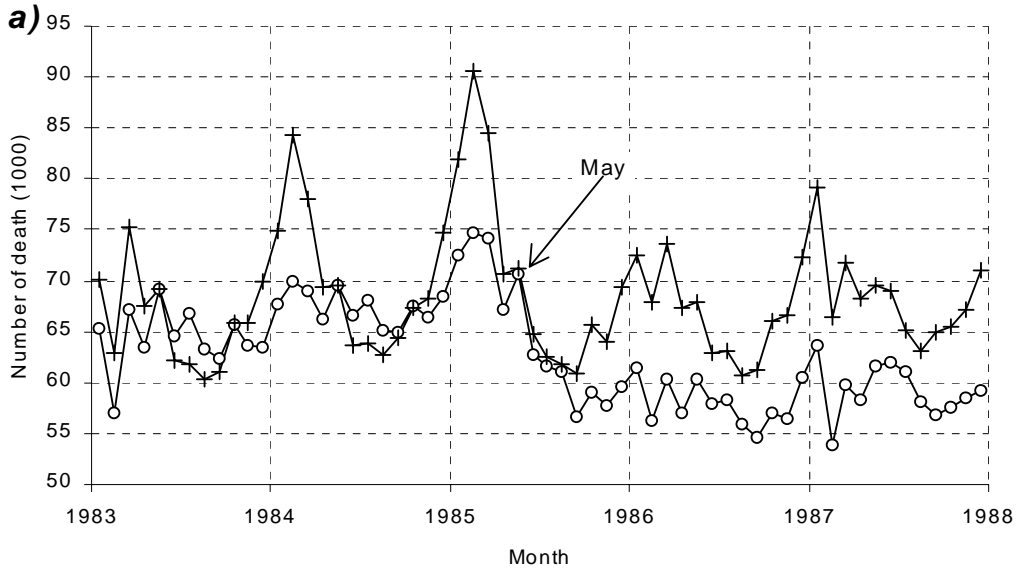


Figure 3. Number of deaths by calendar months in Russia

However the level of life expectancy in 1993-1996 was almost the same as was predicted by linear extrapolation of its trend in 1965-1981 (Figure 2).

The reasons for increase of mortality in Russia in 1965-1980 and in the later period have been widely and thoroughly discussed (Anderson and Silver 1990, 1994; Andreev 1990, 1994, 1999; Blum, 1994; Blum and Monnier, 1989; Feshbach and Friendly, 1992; Okolski, 1993; Shkolnikov, Mesle and Vallin, 1995; Zakharov, 1997). On the basis of these and other publications we have compiled a comprehensive schedule of factors, which could have negatively influenced Russia's mortality trends (Andreev, 1999). There are no grounds to believe that factors that produced the rising mortality in 1965-1980 period ('long-term negative factors') had lost their importance after 1990. Moreover the social and economic crisis of the 1990s could aggravated the effects of long-term negative factors that played a determining role in the growth of mortality of the Russian population in 1965-1980.

There are serious reasons to claim that following the decline and subsequent growth, the mortality rates in Russia have almost returned to the 1964-1980 trend. This hypothesis is based on a number of reasons (Andreev 1999). There is a mathematical model that forecasts similar mortality dynamics (Avdeev et al., 1997). The model forecasts also a new growth of life expectancy when the deaths postponed by the anti-alcohol campaign would happen.

A new feature in dynamics of mortality as compared to the period 1966-1980 was rapid increase of mortality from chronic diseases such as gastric and duodenal ulcer, anaemia, cirrhoses of liver (for females), diabetes mellitus (Figure 4), pancreatic diseases, epilepsy.

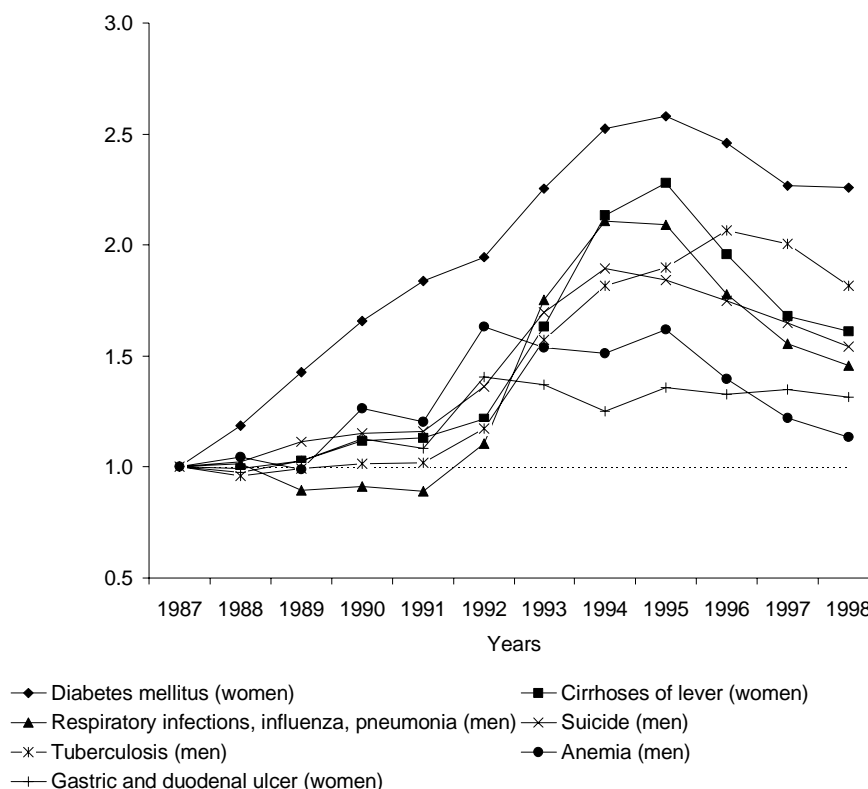


Figure 4. Growth of standardized mortality rates from several causes of death (level of 1987 = 1)

These chronic diseases usually did not contribute heavily to the total number of deaths. However, the increase of mortality from these causes can be explained only by the increase of mortality of chronic invalids, whose life depends directly from functioning of the health care system and access to medication. The return of traditional causes of death more typical for first than second part of twentieth century was probably consequence of the crisis: increase or mortality from tuberculosis, respiratory infections, influenza, and pneumonia or jump of mortality from diphtheria in 1993-1995 (Figure 4). However all causes of death mentioned above cover only 7 percent decrease of life expectancy in 1988-1994 for men and 4 percent - for women. We can consider also as consequences of crises the increase of mortality from suicides. Nevertheless mortality from suicides grew rather smoothly in 1964-1980 fell down in 1985-1987 thus the new growth looks like compensation of previous decline.

Table 4. Structure of life expectancy changes by causes of death in 1991-1994* in percent

	Belarus	Estonia	Latvia	Lithuania	Russia	Ukraine
Men	100	100	100	100	100	100
Infectious and parasitic diseases	1.9	-1.4	4.2	3.8	3.1	5.3
Neoplasm's	4.7	0.6	0.3	2.1	0.4	-1.3
Diseases of the circulatory system	39.5	14.2	36.2	19.4	34.4	40.8
Diseases of the respiratory system	1.6	6.9	5.0	2.7	6.8	7.5
Diseases of the digestive system	1.8	1.9	3.3	4.4	4.3	6.7
Congenital malformations and conditions originating in the perinatal period	0.1	-0.4	-0.8	2.1	1.1	0.6
All other diseases	11.0	14.3	6.5	18.7	4.3	9.1
Injury and poisoning	39.3	63.9	45.3	46.9	45.5	31.4
Women	100	100	100	100	100	100
Infectious and parasitic diseases	-1.0	4.4	2.4	5.1	1.5	3.5
Neoplasm's	-4.0	3.4	-6.3	9.6	1.6	0.3
Diseases of the circulatory system	30.2	18.8	42.0	13.8	49.3	52.2
Diseases of the respiratory system	-11.6	0.9	2.7	-0.3	2.7	2.4
Diseases of the digestive system	1.2	4.0	4.8	3.8	5.0	5.0
Congenital malformations and conditions originating in the perinatal period	10.5	1.9	7.0	6.0	2.6	2.0
All other diseases	53.5	2.1	3.7	31.9	6.1	19.3
Injury and poisoning	21.3	64.6	43.6	30.1	31.2	15.4

* for Ukraine – 1991-1995

Notice (Figure 2) that till 1994 the curves of life expectancy dynamics in Belarus, Estonia, Latvia, Lithuania, Russia and Ukraine were almost the same by form (not by level of this indicator). Whereas the decline of man's life expectancy in 1991-1994 varied between 6 countries from 2.8 in Belarus to 6.83 in Russia, the structures of life expectancy changes by main causes of death especially for men were very close (Table 4)². The correlation coefficients of columns of Table 4 are presented in Table 5. Their level also confirms similar mortality dynamics in these countries.

²In Ukraine growth of mortality continued till 1995 thus we took for it the period 1991-1995 in Tables 2, 3 and A3.

Table 5. The correlation coefficients of structures of the change of life expectancy by causes of death in 1991-1994

Men	Belarus	Estonia	Latvia	Lithuania	Russia	Ukraine
Belarus	1.000	0.775	0.976	0.857	0.960	0.958
Estonia	0.775	1.000	0.848	0.970	0.859	0.661
Latvia	0.976	0.848	1.000	0.892	0.996	0.948
Lithuania	0.857	0.970	0.892	1.000	0.885	0.750
Russia	0.960	0.859	0.996	0.885	1.000	0.934
Ukraine	0.958	0.661	0.948	0.750	0.934	1.000

Women	Belarus	Estonia	Latvia	Lithuania	Russia	Ukraine
Belarus	1.000	0.243	0.422	0.841	0.453	0.640
Estonia	0.243	1.000	0.819	0.594	0.640	0.303
Latvia	0.422	0.819	1.000	0.475	0.941	0.744
Lithuania	0.841	0.594	0.475	1.000	0.408	0.405
Russia	0.453	0.640	0.941	0.408	1.000	0.899
Ukraine	0.640	0.303	0.744	0.405	0.899	1.000

It is known that the economic and social processes developed in 6 countries differently (see for example Table 6), therefore we can conclude that decline of life expectancy in 1991-1994 is mainly consequence of the anti-alcohol campaign which occurred synchronously in all republics of the former USSR and long-term negative factors which influenced mortality trends in the 6 countries in 1965-1980. Oddly enough impact of consequences of the crises was to be not considerable.

Table 6. Cumulative growth in real GDP (in percent, 1990=100)

	1991	1992	1993	1994	1995	1996	1997	1998	1999
Belarus	-1	-11	-17	-28	-35	-34	-26	-20	-17
Estonia	-14	-26	-33	-34	-31	-28	-21	-17	-18
Latvia	-10	-42	-50	-50	-50	-49	-44	-42	-42
Lithuania	-6	-26	-38	-44	-42	-39	-35	-32	-34
Russia	-5	-19	-26	-35	-38	-40	-40	-42	-40
Ukraine	-12	-24	-35	-50	-56	-60	-61	-62	-62

Calculated by: European Bank for Reconstruction and Development *Annual Report 2000*. P. 16

Mortality after 1995: what comes next?

From 1994 to 1998 in Russia men's life expectancy increased by 3.8 years and women's one - by 2.0 years. This rate of change in the figures is comparable to that during anti-alcohol campaign. Mortality from all basic groups of causes reduced. About 39 percent of the increase in life expectancy of men are attributed to the reduction of mortality from accidents, and approximately 34 percent to that of mortality from diseases of circulatory system. For women these percentages are 23 and 47 respectively. Mortality decrease compensated about 60 percent of losses in life expectancy due to growth of mortality of adults in 1991-1994. (Child mortality has been decreasing rather smoothly during the last 20 years.)

Growth of the number of deaths by calendar months stopped in May 1994 (Figure 3 (b)) when the economic situation in Russia got progressively worse. The above-mentioned mathematical model (Avdeev et al., 1997) explains this phenomena with changes of structure of population from the point of view of alcohol consumption.

In Estonia, Latvia and Lithuania mortality growth stopped in 1994, in Ukraine – in 1995, in Belarus it continued practically till 1999 (the last available year). During 3 years from 1994 to 1997 life expectancy increased in Estonia by 3.7 years for men and by 2.9 years for women, in Latvia - by 3.8 years and 1.8 years respectively, in Lithuania - by 3.1 and 1.9, in Russia – by 3.4 and 1.7 and in Ukraine from 1995 to 1998 life expectancy increased by 2.0 and 1.1

years for men and women respectively. Thus similarity of tendencies in 5 countries (excluding Belarus) before 1998 is doubtless.

In 1998 life expectancy growth in Estonia and Latvia interrupted. Men's expectation of life went down by 0,3 years and women's one – on 0.6 year in Estonia and by 0.2 year both for men and women in Latvia. However in 1999 the growth went on. In Ukraine similar life expectancy decrease (0.2 years for men and 0.3 year for women) was registered in 1999.

In Russia in 1998 the growth of life expectancy only slowed down, but in 1999 new decrease of life expectancy started. It was more significant than in Estonia, Latvia or Ukraine. Expectation of life decreased by 1.5 years for men and by 1.0 for women (Figure 2). According our preliminary estimation unlike Estonia and Latvia in 2000 this growth continued but slowed down.

The number of deaths by calendar months in Russia began to grow in April - May 1999 when after the end of epidemic of influenza the women's number of deaths went down and men's ones continued to grow (Figure 3 (c)). Thus, the hypothesis that the last changes in mortality were the consequences of the collapse of Russia's financial markets in August 1998 doesn't look plausible. The nearly simultaneous increase of mortality level in Estonia, Latvia, and Russia allows supposing that it is also mainly the consequence of anti-alcohol campaign as well as mortality growth in 1991-1994 and its decline in 1995-1998. Unfortunately the mechanism of this process has not been clear yet.

Decomposition of life expectancy changes in the 6 countries after 1994³ by age groups and causes of death are presented in Table A4. The basic fluctuations in life expectancy in 5 countries are related to working age groups. The main changes of life expectancy related with diseases of the circulatory system and accidents. However likeness of mortality dynamics by causes of death in different countries was disturbed. For example the impact of mortality from tuberculosis upon the changes of life expectancy of men in Belarus, Russia, and Ukraine is negative and rather high (-0.10 - -0.17), in Baltic countries its is from -0.03 to +0.03. Leave alone that expectation of life in Belarus continues to decrease. Thus we can suppose that after 1995 new country-specific factors of mortality became rather more significant as compared with anti-alcohol campaign and long-term factors which negatively influenced life expectancy trends in 1965-1980.

A comparison of decompositions of life expectancy changing by causes of death from 1991 to the last available year (1998 or 1999) for the 6 countries by the same method that was used in Table 5 gave us the next matrix of correlation coefficients (Table 7). We sorted countries by proximity of their vectors of decomposition of the life expectancy change by causes of death to the Russia's vector. Unlike the Table 3 we can see two groups of countries with high correlation of vectors in each group and with low or negative correlation coefficients between groups.

³ In Table A4 for each country the interval till last available year was taken: for Belarus, Estonia, Russia - 1994-1998, for Latvia and Lithuania 1994-1998. In Ukraine growth of mortality continued till 1995, thus we took for it the interval 1995-1999.

Table 7. The correlation coefficients of structures of the change of life expectancy by causes of death after 1991

<i>Men</i>	Russia	Belarus	Ukraine	Lithuania	Latvia	Estonia
Russia	1.000	0.985	0.898	0.337	0.319	0.020
Belarus	0.985	1.000	0.905	0.224	0.236	-0.090
Ukraine	0.898	0.905	1.000	-0.017	0.057	-0.343
Lithuania	0.337	0.224	-0.017	1.000	0.768	0.902
Latvia	0.319	0.236	0.057	0.768	1.000	0.813
Estonia	0.020	-0.090	-0.343	0.902	0.813	1.000
<i>Women</i>	Russia	Belarus	Ukraine	Estonia	Lithuania	Latvia
Russia	1.000	0.983	0.941	0.227	-0.131	-0.514
Belarus	0.983	1.000	0.967	0.083	-0.264	-0.543
Ukraine	0.941	0.967	1.000	0.132	-0.335	-0.700
Estonia	0.227	0.083	0.132	1.000	0.366	-0.294
Lithuania	-0.131	-0.264	-0.335	0.366	1.000	0.589
Latvia	-0.514	-0.543	-0.700	-0.294	0.589	1.000

We compared the actual levels of life expectancy in 1999 in the 6 countries with its projection based on linear extrapolation of the 1965-1981 trend (Table 8). The levels of life expectancy in the Baltic countries are evidently higher than the forecasted ones, especially for men. In Belarus the situation was getting worse than it can be expected based on the past tendencies. Ukraine and Russia take a middle position. Life expectancy of men is a little higher than the forecasted one and it is very close to the forecasted value for women. Therefore we admit a hypothesis that in 1995-1999 the countries under consideration could resist in different ways the negative mortality factors. In the Baltic countries where political situation was relatively stable and the transition to market economy is going more consistently the mortality fluctuation in the late-1990s was less significant.

Table 8. Comparison the actual level of life expectancy in 1999 and the result of linear extrapolation of the 1965-1981 trend

	Belarus	Estonia	Latvia	Lithuania	Russia	Ukraine
<i>Men</i>						
Actual level	62.3	65.4	64.8	67.0	59.7	63.3
Extrapolation	62.8	60.7	59.5	62.5	57.8	61.0
Differences	-0.5	4.7	5.3	4.5	1.9	2.3
<i>Women</i>						
Actual level	74.1	76.5	75.4	77.4	72.2	73.7
Extrapolation	76.1	73.8	74.0	76.2	72.5	73.4
Differences	-2.0	2.7	1.3	1.2	-0.3	0.4

The situation in Belarus needs a special study. It seems that stable mortality growth in the 1990s is the result of conservative economic policy. However remind that before 1985 Belarus took top positions by the levels of life expectancy and that the consequences of Chernobyl disaster in Belarus were more significant than in other countries.

Conclusion

A decline of life expectancy in Russia and other countries of the European part of the former USSR has been observed since the mid-1960s. This continuous process was interrupted in the mid-1980s by the anti-alcohol campaign but growth of the level of mortality resumed in 1988. Till the mid-1990s similarity of mortality tendencies in the six countries is doubtless

independently from the economic and social processes. Thus just the anti-alcohol campaign was a principal cause of the dramatic fluctuation of mortality in 1990-1995. The economic crisis and general economic and social instability accelerated these fluctuations and balked to resist negative factors. However after 1995 new country-specific factors of mortality became rather more significant as compared with anti-alcohol campaign and long-term factors which negatively influenced life expectancy trends in 1965-1980. The mortality fluctuations were less significant in the countries where political situation was relatively stable and transition to market economy was going more consistently. Thus, the economic crisis can not be considered as a main cause of the mortality fluctuation in Russia in the 1990s.

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Annex. Decomposition of life expectancy changes by age groups and causes of death
Table A1. 1981-1988

	Belarus	Estonia	Latvia	Lithuania	Russia	Ukraine
Men						
Total	1.650	2.251	2.988	2.353	3.251	2.053
0-14	0.414	0.200	0.493	0.516	0.324	0.281
15-64	1.343	1.802	2.476	1.799	2.752	1.635
65+	-0.107	0.249	0.019	0.037	0.175	0.136
Infectious and parasitic diseases	0.130	0.179	0.147	0.171	0.212	0.098
Tuberculosis	0.056	0.061	0.050	0.052	0.070	0.048
Neoplasm's	-0.326	0.020	-0.296	-0.202	-0.120	-0.293
Malignant neoplasm of stomach and intestine	-0.002	0.033	-0.009	0.049	0.065	-0.018
Malignant neoplasm of trachea, bronchus and lung	-0.220	-0.029	-0.132	-0.080	-0.083	-0.145
Diseases of the circulatory system	-0.070	0.321	0.315	-0.259	0.411	0.458
Ischaemic heart diseases	-0.086	0.168	0.240	-0.254	0.260	0.657
Cerebrovascular diseases	0.004	0.145	0.181	-0.042	0.092	-0.035
Diseases of the respiratory system	0.485	0.359	0.385	0.438	0.640	0.453
Acute upper respiratory infections, influenza, pneumonia	0.060	0.174	0.170	0.100	0.388	0.050
Diseases of the digestive system	0.188	0.103	0.142	0.105	0.142	0.172
Congenital malformations and conditions originating in the perinatal period	0.078	-0.192	0.044	0.105	-0.221	-0.025
All other diseases	0.281	0.394	0.499	0.470	0.121	0.379
Injury and poisoning	0.884	1.065	1.751	1.524	2.066	0.811
Transport accidents	0.123	0.131	0.345	0.317	0.172	0.112
Suicide	0.243	0.318	0.408	0.256	0.376	0.185
Homicide	0.004	0.060	0.061	0.083	0.141	0.050
Womem						
Total	0.093	0.999	0.783	0.877	1.106	0.808
0-14	0.254	0.129	0.311	0.383	0.323	0.225
15-64	0.225	0.805	0.594	0.514	0.805	0.464
65+	-0.387	0.064	-0.122	-0.019	-0.022	0.119
Infectious and parasitic diseases	0.081	0.183	0.097	0.129	0.149	0.058
Tuberculosis	0.014	0.096	0.015	0.036	0.021	0.017
Neoplasm's	-0.141	-0.188	-0.139	0.007	-0.034	-0.092
Malignant neoplasm of stomach and intestine	-0.006	-0.043	-0.048	0.052	0.040	-0.019
Malignant neoplasm of trachea, bronchus and lung	-0.020	0.045	-0.028	-0.008	-0.013	-0.001
Diseases of the circulatory system	-0.372	1.212	0.234	-0.099	0.160	0.334
Ischaemic heart diseases	-0.167	0.468	0.217	-0.077	0.147	0.860
Cerebrovascular diseases	-0.127	0.767	0.085	0.046	-0.023	-0.232
Diseases of the respiratory system	0.445	-0.095	0.177	0.388	0.442	0.340
Acute upper respiratory infections, influenza, pneumonia	0.153	-0.014	0.059	0.142	0.314	0.098
Diseases of the digestive system	0.022	-0.115	-0.017	0.067	0.051	0.045
Congenital malformations and conditions originating in the perinatal period	0.028	-0.065	0.105	0.070	-0.191	-0.018
Pregnancy, childbirth and the puerperium	-0.001	-0.015	-0.004	0.008	0.012	0.000
All other diseases	-0.072	-0.015	0.052	0.070	0.035	0.036
Injury and poisoning	0.102	0.098	0.278	0.237	0.483	0.104
Transport accidents	0.037	0.021	0.054	0.008	0.042	0.012
Suicide	0.010	0.098	0.014	-0.012	0.059	0.010
Homicide	0.003	0.038	0.060	0.048	0.063	0.012

Table A2. 1988-1990

	Belarus	Estonia	Latvia	Lithuania	Russia	Ukraine
Men						
Total	-1.325	-1.459	-2.132	-1.182	-1.113	-1.271
0-14	0.137	0.131	-0.282	0.135	0.225	0.088
15-64	-1.358	-1.472	-1.771	-1.143	-1.376	-1.307
65+	-0.105	-0.118	-0.079	-0.175	0.038	-0.052
Infectious and parasitic diseases	0.028	-0.057	-0.068	-0.046	0.050	0.001
Tuberculosis	-0.015	-0.017	-0.040	-0.048	-0.008	-0.014
Neoplasm's	-0.191	-0.181	0.013	-0.124	-0.069	-0.133
Malignant neoplasm of stomach and intestine	-0.003	-0.104	0.072	-0.042	0.031	0.007
Malignant neoplasm of trachea, bronchus and lung	-0.060	-0.168	0.022	-0.066	-0.038	-0.065
Diseases of the circulatory system	0.119	-0.277	-0.239	-0.289	-0.144	-0.040
Ischaemic heart diseases	0.301	-0.160	-0.065	-0.286	-0.018	0.050
Cerebrovascular diseases	0.003	-0.108	-0.141	0.012	0.016	-0.052
Diseases of the respiratory system	0.194	0.081	-0.095	0.133	0.090	0.015
Acute upper respiratory infections, influenza, pneumonia	-0.056	0.055	-0.115	0.083	0.094	-0.081
Diseases of the digestive system	-0.036	0.037	-0.047	-0.027	-0.009	-0.042
Congenital malformations and conditions originating in the perinatal period	0.026	0.306	-0.166	0.082	0.072	0.058
All other diseases	-0.568	-0.193	-0.192	-0.093	-0.003	-0.262
Injury and poisoning	-0.897	-1.175	-1.339	-0.818	-1.099	-0.868
Transport accidents	-0.459	-0.656	-0.680	-0.435	-0.273	-0.339
Suicide	-0.064	-0.062	-0.170	0.082	-0.131	-0.065
Homicide	-0.084	-0.195	-0.165	-0.114	-0.231	-0.116
Women						
Total	-0.319	-0.058	-0.549	0.028	0.086	-0.147
0-14	0.103	0.276	-0.173	0.131	0.193	0.098
15-64	-0.254	-0.408	-0.390	-0.253	-0.276	-0.247
65+	-0.168	0.074	0.013	0.150	0.168	0.002
Infectious and parasitic diseases	-0.015	0.068	-0.004	0.035	0.051	0.039
Tuberculosis	0.001	0.006	0.008	0.000	0.004	0.009
Neoplasm's	-0.116	0.095	-0.181	-0.052	-0.043	-0.077
Malignant neoplasm of stomach and intestine	-0.039	-0.051	-0.061	-0.016	0.016	0.000
Malignant neoplasm of trachea, bronchus and lung	0.010	-0.008	0.010	-0.014	-0.004	-0.007
Diseases of the circulatory system	0.558	1.761	0.371	0.125	0.214	0.529
Ischaemic heart diseases	0.572	1.888	0.258	0.092	0.238	0.614
Cerebrovascular diseases	0.098	-0.030	0.234	-0.025	0.118	0.047
Diseases of the respiratory system	0.168	0.092	0.098	0.106	0.112	0.126
Acute upper respiratory infections, influenza, pneumonia	0.014	0.003	0.044	0.083	0.096	0.019
Diseases of the digestive system	0.005	0.106	-0.199	-0.033	-0.004	-0.023
Congenital malformations and conditions originating in the perinatal period	0.056	0.180	0.202	0.013	0.047	0.049
Pregnancy, childbirth and the puerperium	0.006	0.015	0.015	0.002	0.011	0.010
All other diseases	-0.815	-2.105	-0.731	-0.068	-0.055	-0.622
Injury and poisoning	-0.168	-0.270	-0.120	-0.100	-0.247	-0.179
Transport accidents	-0.097	-0.145	-0.046	-0.088	-0.086	-0.072
Suicide	0.014	-0.142	0.053	0.047	-0.013	0.004
Homicide	-0.024	-0.012	-0.053	-0.041	-0.051	-0.033

Table A3. 1991-1994 (Ukraine 1991-1995)

	Belarus	Estonia	Latvia	Lithuania	Russia	Ukraine
Men						
Total	-2.784	-3.701	-4.997	-3.677	-6.291	-4.127
0-14	-0.068	0.103	0.152	-0.267	-0.131	-0.079
15-64	-2.182	-3.607	-4.699	-3.070	-5.516	-3.452
65+	-0.534	-0.197	-0.450	-0.340	-0.644	-0.597
Infectious and parasitic diseases	-0.054	0.050	-0.209	-0.141	-0.198	-0.217
Tuberculosis	-0.019	-0.066	-0.146	-0.106	-0.164	-0.162
Neoplasm's	-0.132	-0.021	-0.016	-0.077	-0.026	0.053
Malignant neoplasm of stomach and intestine	-0.009	0.062	0.005	0.040	0.038	0.031
Malignant neoplasm of trachea, bronchus and lung	-0.074	0.033	-0.040	0.072	0.011	0.050
Diseases of the circulatory system	-1.101	-0.524	-1.809	-0.712	-2.163	-1.683
Ischaemic heart diseases	-0.785	-0.304	-0.962	-0.268	-1.175	-1.115
Cerebrovascular diseases	-0.245	-0.065	-0.211	-0.031	-0.459	-0.350
Diseases of the respiratory system	-0.044	-0.256	-0.249	-0.098	-0.429	-0.308
Acute upper respiratory infections, influenza, pneumonia	-0.158	-0.107	-0.257	0.374	-0.254	-0.306
Diseases of the digestive system	-0.050	-0.071	-0.166	-0.162	-0.273	-0.275
Congenital malformations and conditions originating in the perinatal period	-0.002	0.015	0.038	-0.077	-0.070	-0.026
All other diseases	-0.307	-0.530	-0.325	-0.687	-0.268	-0.374
Injury and poisoning	-1.095	-2.364	-2.262	-1.722	-2.864	-1.297
Transport accidents	0.258	0.146	0.127	0.317	-0.005	0.240
Suicide	-0.298	-0.191	-0.403	-0.639	-0.459	-0.212
Homicide	-0.116	-0.541	-0.375	-0.185	-0.495	-0.202
Women						
Total	-1.331	-1.572	-1.714	-1.340	-3.183	-2.174
0-14	-0.111	-0.037	-0.142	-0.210	-0.153	-0.115
15-64	-0.639	-1.727	-1.642	-0.917	-2.276	-1.354
65+	-0.582	0.192	0.070	-0.213	-0.754	-0.704
Infectious and parasitic diseases	0.014	-0.070	-0.041	-0.069	-0.048	-0.075
Tuberculosis	0.002	-0.022	-0.028	-0.031	-0.026	-0.030
Neoplasm	0.054	-0.053	0.107	-0.129	-0.052	-0.007
Malignant neoplasm of stomach and intestine	0.033	-0.052	0.074	0.015	0.030	0.042
Malignant neoplasm of trachea, bronchus and lung	0.000	0.002	0.020	0.028	0.003	0.015
Diseases of the circulatory system	-0.402	-0.296	-0.720	-0.185	-1.568	-1.134
Ischaemic heart diseases	-0.289	0.037	-0.420	0.239	-0.708	-0.875
Cerebrovascular diseases	-0.195	-0.100	-0.135	-0.006	-0.497	-0.292
Diseases of the respiratory system	0.155	-0.014	-0.047	0.004	-0.087	-0.052
Acute upper respiratory infections, influenza, pneumonia	0.072	0.119	-0.049	0.259	-0.070	-0.078
Diseases of the digestive system	-0.015	-0.063	-0.083	-0.051	-0.159	-0.108
Congenital malformations and conditions originating in the perinatal period	-0.140	-0.030	-0.120	-0.080	-0.084	-0.044
Pregnancy, childbirth and the puerperium	0.004	-0.009	-0.009	0.010	0.006	0.006
All other diseases	-0.716	-0.024	-0.055	-0.437	-0.199	-0.426
Injury and poisoning	-0.283	-1.015	-0.746	-0.403	-0.993	-0.334
Transport accidents	0.057	0.101	0.054	0.112	-0.017	0.054
Suicide	-0.046	-0.050	-0.084	-0.093	-0.059	-0.019
Homicide	-0.033	-0.156	-0.167	-0.056	-0.181	-0.061

Table A4. after 1995 (Ukraine after 1996)

	Belarus	Estonia	Latvia	Lithuania	Russia	Ukraine
Men						
Total	-1.290	4.298	4.325	3.709	2.224	1.449
0-14	0.067	0.382	0.022	0.448	0.149	0.193
15-64	-1.013	3.372	3.636	2.864	1.986	1.087
65+	-0.344	0.544	0.667	0.398	0.090	0.169
Infectious and parasitic diseases	-0.087	-0.059	0.031	0.077	-0.131	-0.117
Tuberculosis	-0.101	-0.032	0.005	0.027	-0.144	-0.173
Neoplasm	0.126	0.235	0.115	0.199	0.191	0.150
Malignant neoplasm of stomach and intestine	0.063	0.016	0.036	0.045	0.059	0.030
Malignant neoplasm of trachea, bronchus and lung	0.060	0.144	0.146	0.079	0.097	0.089
Diseases of the circulatory system	-0.632	1.324	1.951	1.090	0.561	0.323
Ischaemic heart diseases	-0.465	1.090	1.240	1.040	0.560	0.046
Cerebrovascular diseases	-0.147	0.439	0.527	0.371	0.103	0.226
Diseases of the respiratory system	-0.049	0.227	0.297	0.103	0.241	0.219
Acute upper respiratory infections, influenza, pneumonia	-0.067	0.102	0.365	-0.024	0.042	0.148
Diseases of the digestive system	-0.091	-0.018	0.020	-0.031	0.086	0.049
Congenital malformations and conditions originating in the perinatal period	0.006	0.180	0.004	0.244	0.104	0.030
All other diseases	0.072	0.564	0.071	0.879	0.147	0.233
Injury and poisoning	-0.634	1.846	1.836	1.148	1.025	0.562
Transport accidents	0.019	0.241	0.228	-0.179	0.258	0.178
Suicide	-0.168	0.255	0.184	0.192	0.082	-0.006
Homicide	0.004	0.501	0.310	0.147	0.194	0.094
Women						
Total	-0.461	3.131	1.831	1.941	0.938	1.072
0-14	0.178	0.277	0.116	0.379	0.083	0.199
15-64	-0.446	1.735	1.328	1.022	0.862	0.579
65+	-0.194	1.119	0.388	0.540	-0.007	0.295
Infectious and parasitic diseases	0.007	-0.114	0.011	0.012	-0.009	0.027
Tuberculosis	-0.010	-0.156	0.005	-0.026	-0.031	-0.021
Neoplasm's	0.044	-2.440	-0.072	0.124	0.068	0.079
Malignant neoplasm of stomach and intestine	0.029	-2.897	0.043	0.042	0.048	0.028
Malignant neoplasm of trachea, bronchus and lung	0.018	-0.229	-0.012	0.002	0.022	0.011
Diseases of the circulatory system	-0.826	-1.997	1.105	0.414	0.251	0.257
Ischaemic heart diseases	-0.582	5.649	0.733	0.345	0.348	-0.048
Cerebrovascular diseases	-0.262	1.335	0.653	0.445	0.088	0.272
Diseases of the respiratory system	0.001	-1.532	0.126	0.067	0.101	0.143
Acute upper respiratory infections, influenza, pneumonia	-0.045	-0.836	0.174	-0.045	0.003	0.114
Diseases of the digestive system	-0.067	0.778	-0.043	-0.054	0.028	0.047
Congenital malformations and conditions originating in the perinatal period	0.134	0.082	0.051	0.311	0.073	0.076
Pregnancy, childbirth and the puerperium	0.001	0.023	0.002	0.003	0.009	0.007
All other diseases	0.502	6.280	0.124	0.762	0.105	0.271
Injury and poisoning	-0.257	2.051	0.528	0.302	0.313	0.165
Transport accidents	-0.012	0.094	0.021	-0.037	0.075	0.055
Suicide	-0.013	0.491	0.040	0.015	0.015	0.003
Homicide	-0.014	0.043	0.100	0.081	0.038	0.011