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The mortality consequences of the onset of transition: case of Latvia

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INTRODUCTION

A relatively high standard of the health care, sanitary culture, and economic development on the territory of Latvia, as well as Estonia and Lithuania, determined a higher level of life expectancy in comparison with other regions of the European Russia during the 19th century. On the eve of the 20th century, life expectancy at birth (LEB) for males in Latvia was 43 years and for females 47 years. It was over ten years higher than the average of 50 provinces of the European Russia, and exceeded LEB in Austria, Germany, Italy.

During a more than 20-year period of the political independence LEB in Latvia increased remarkably. It was 54 years in the mid 1920s and reached 58 in mid 1930s. An essential influence on demographic development was caused by the following events: World War II, the repressions against the civil residents after the incorporation of Latvia into the former USSR, the durable backwardness of a long period of Soviet rule, as well as by the recent collapse of the USSR and the onset of transition which has led Latvia from a centrally planned economy to the market economy.

The purpose of this paper is to examine the recent mortality changes and differentiation in Latvia and factors behind them during a transition from the centrally planned soviet type economy to the market oriented economy and democratic society. The analysis is mainly based on published and partly on unpublished statistical data of the post-war period. Year 1989 is used as a general baseline to evaluate impact of socio-economic changes on mortality and health status.

1. HISTORICAL BACKGROUND TO THE RECENT HEALTH CRISIS

1.1 LIFE EXPECTANCY TRENDS

The first 15-20 years of Soviet regime did not have a negative effect on the level of mortality, if we do not deal with mortality caused by the war or mass repression in the 1940s and the beginning of the 1950s. At the end of the 1950s LEB in Latvia as well as in other two Baltic republics was higher than in Southern and Eastern Europe but after 1965 Latvia started lagging behind developed countries and European average.

Against the background of a continuous decline of mortality in the younger age groups, a general growth of mortality from the mid-1960s to the late 1970s took place for the

working-age males (Table 1)[1], while for females an increase occurred in the age-group preceding retirement and the first few years after retirement.

Table 1. **Contribution made by different age groups to the changes in LEB for males and females in Latvia, 1958-1959 - 1986-87, in years**

Years	Total	0-24	25-64	65+
		Males		
1958-1959 to 1964-1965	1.73	0.98	0.43	0.32
1964-1965 to 1978-1979	-3.12	0.20	-2.61	-0.71
1978-1979 to 1986-1987	2.51	0.77	1.69	0.05
		Females		
1958-1959 to 1964-1965	2.08	0.92	0.81	0.35
1964-1965 to 1978-1979	-0.64	0.07	-0.55	-0.16
1978-1979 to 1986-1987	1.15	0.48	0.52	0.15

Decrease in LEB in 1964-1979 took place in Latvia mainly due to increase of mortality from diseases of the circulatory system and accidents, poisoning and injuries. For males the contribution was more essential than for females (J.Krumins,1994, pp.410-411). These two groups of causes were of great importance in the changes of LEB in the mid 1980s, and especially during the 1990s.

The campaign against alcohol consumption, which began in mid-1980s, undoubtedly contributed to a decrease of mortality from accidents, poisoning and injuries in Latvia like in other former Soviet republics. This policy (almost released in 1987) achieved only a transitory decline in the mortality which reached the pre-campaign level in 1990.

1.2 TERRITORIAL DIFFERENTIATION OF LIFE EXPECTANCY AND MORTALITY

Territorial differences in age-specific mortality, especially infant mortality, and life expectancy existed in Latvia during the 1920s and 1930s. Age-specific death rates in all age groups, excluding early adult and late retirement ages, in the eastern part of Latvia - Latgale were higher than in another parts of country (J.Krumins, 1992, p.58). Latgale was lagging behind the rest of the country in economic development, living standard and supply of health services.

A series of life tables were calculated for the largest cities and all administrative districts in Latvia for the years around 1979 and 1989 population censuses. They confirmed that there is no correlation between the size of city and LEB, but life expectancy continued to

[1] To identify the impact of different age groups and categories of causes of death on changes in life expectancy a method of decomposition of life expectancy differences is used (Arriaga, 1984).

be lower in the Eastern Latvia than in other parts of the country. Situation was better in the central part of the country. An interesting feature of the Latvian LEB was its association to distance from the capital city Riga of different districts. The more the district was distant the worse was the LEB.

Regional differences in infant mortality rates also continued to exist, but they had become lower in comparison with the pre-war period. According the analysis of territorial differentiation of infant mortality rates during 1971-1986 made by Z.Klintaja, the main reasons for an excess infant mortality in several regions in Latvia were worse ecological situation and undeveloped social infrastructure (Z.Klintaja, 1990, pp.85-86). Some authors explained territorial differentiation of mortality in Latvia not only with differences in quantitative indicators of health services used in social statistics (hospital beds and personnel) but by a complex of factors: socio-economic, medical and organisational (B.Olshanskiy and V.Nodelman, 1981, p. 70).

Regional standard deviation in life expectancy decreased from 1.41 to 1.13 for both sexes (from 1.94 to 1.44 for males) between 1978-1979 and 1988-1989. The large difference in life expectancy existed among central cities and their neighbour administrative districts[2].

1.3 SOCIO-ECONOMIC DIFFERENTIATION OF LIFE EXPECTANCY AND MORTALITY

Socio-economic differentials did exist in the Soviet period. Despite the limitation of data and their reliability the results of calculations show substantial mortality differentiation amongst social groups. The 1970 Population census indicated the following standardised death rates according to social groups: employees - 9.1 %o, workers - 11.5 %o, collective farmers - 12.6 %o (J.Krumins, 1995, p.441).

According to the 1978-1979 data, mortality among workers aged 16-64 years engaged mainly in physical labour was more than twice higher for males and about 1.5 times higher for females then the mortality among persons mainly engaged in intellectual professions (P.Zvidrins, J.Krumins, 1993, p. 154). These differences were greater than in many Western and Northern European countries, but very similar to those existed in the former USSR[3].

The only mortality and life expectancy indicators by level of education in Latvia came out from the calculations for 1988-1989. They covered both economically active and inactive adult population, and they were based on the two year period vital statistics and 1989 Population census. According to the Soviet social statistics, level of education was characterised by categories of education, but not by years of education as in many Western

[2] Calculation of the hypothetical Life table based on the minimal age-specific probabilities of death in cities and administrative districts of country for late 1980s shows an increase of life expectancy at birth for both sexes from the real average 70.8 years to hypothetical average 74.1 years.

[3] For instance, in the late 1970s mentioned death rates were from 1.3 to 1.6 times higher for males in England and Wales, France, Denmark and Finland (Valkonen, 1987). In 1979 age-specific rates were from 1.5 to 3.0 times higher for males in Moscow (Virganskaya, 1990, p.30). Unfortunately there are no tabulations of such death rates for the time period around the 1989 Population census in Latvia.

countries. The regularities between level of education and life expectancy in Latvia are well expressed in the different ages (Table 2).

Table 2. **Male and female life expectancy at specific ages by level of education in Latvia, 1989**

Age	Males			Females		
	1	2	3	1	2	3
25	50.1	44.6	37.5	55.6	55.2	48.5
35	40.6	35.8	30.3	45.8	45.5	40.2
45	31.4	27.3	23.0	36.3	36.2	31.7
55	22.9	19.5	16.5	27.5	27.1	23.3
65	16.1	12.7	11.0	19.6	18.6	15.7

Legend to table 7: 1 - Higher education (complete and incomplete), 2 - Secondary education (specialised and general), 3 - Primary education and lower.
Source: J.Krumins, 1993, p.123.

Life expectancy increased with the level of education both for males and females. This regularity was observed in urban and rural areas. Quite remarkably the growing gap in male-female life expectancy was partially smoothed by the differences in the level of education as well.

Due to multi-ethnic composition of population the analysis of the ethnic differential in mortality was important in Latvia as well[4]. According to the pre-war data, infant mortality was higher for those children whom mothers were Russians and Poles, but lower for - Jews and Germans. For Latvians infant mortality were slightly lower than the national average (J.Krumins,1993, p. 131).

Life expectancy for the ethnic Latvians also was higher than national average in 1934-1936. Important role in the ethnic differentiation of mortality in Latvia was played by socio-economic factors - level of education, etc. For example, level of literacy above age 10 according 1935 census was 98 % for Germans, 90 % for Jews, 90 % for Latvians, 71 % for poles, 69 % for Russians. A level of infant mortality in 1939 among main ethnic groups in the eastern part of country (where a level of socio-economic development was much lower than in other parts) was higher than the rate for Latvia in total (J.Krumins, 1993, p. 132).

A differentiation of mortality among ethnic groups can also be observed during a post-war period. Life tables for the post-war years around the population censuses were calculated for two major ethnic groups - Latvians and Russians.

Although urban-rural mortality differences diminished during a post-war period, they have to be taken into account when dealing with the ethnic differentiation of LEB. The percentage of urban population among Latvians changed from 47 % in 1959 to 60 % in

[4] Mortality and life expectancy by ethnicity has to be evaluated carefully because the problem of the numerator-denumerator bias exist in interpretation of death rates. Information on ethnicity of the deceased is registered documentary (from passports for adults or birth certificates for children), but information on ethnicity in censuses is reported by the respondents without reference to documents. The census data on the ethnic structure of population are influenced by subjectivity, especially in populations with a great share of ethnically mixed marriages as in Latvia.

1989, while the same percentage for Russians increased from 73 to 85. Urban-rural standardized LEB for both sexes shows that Latvians have had higher LEB compared to Russians for all census years during the entire post-war period (Table 3).

Table 3. Standardized LEB by ethnicity in Latvia, years

	Latvians	Russians	Difference
1958-1959	69.5	69.4	0.1
1969-1970	70.3	69.8	0.5
1978-1979	69.6	67.9	1.7
1988-1989	71.4	69.7	1.7

Note: Standard - urban-rural distribution of all population

It should be remarked that the immigrants from the Russian Federation in large numbers came to Latvia from the neighbouring regions, where according to calculations life expectancy was lower than in Latvia and other (central and southern) regions of Russia (V.Shkolnikov and Vassin, 1994).

Marital status was another significant factor of mortality[5].

Table 4. **Life expectancy by marital status in Latvia, 1979 and 1989, years**

Age, years	Males				Females			
	1	2	3	4	1	2	3	4
				1979				
20	47.2	35.8	38.0	43.4	57.4	50.2	54.2	54.9
40	29.9	20.0	21.5	27.4	38.3	32.1	35.9	36.1
60	15.2	10.1	11.6	17.0	20.9	16.9	19.3	18.6
				1989				
20	49.0	35.7	42.8	43.0	58.4	51.6	56.4	54.7
40	30.9	19.3	25.4	26.6	39.1	33.7	37.6	36.0
60	15.7	7.4	12.0	14.1	21.6	20.5	20.4	18.5

Legend: 1 - Married, 2 - Never married, 3 - Widowed, 4 - Divorced.
Calculations made by J.Krumins.

As shown in table 4 life expectancy was higher for married males and females followed as expected by divorced or widowed.

2. HEALTH AND MORTALITY DURING TRANSITION

2.1 LIFE EXPECTANCY CHANGES BY GENDER AND AGE-GROUPS

Amongst other breakdowns, the decline of life expectancy in Latvia from 1989 showed some peculiarities according to gender, age group and causes of death. The decrease in male life expectancy was extremely pronounced, reaching the lowest value in 1993 (Table

[5] Legal marital status (based on records in passports) is usually recorded in the death certificates. Consensual unions are enumerated as marriages in censuses. Because there was no other way to link data and to evaluate mortality differentiation by marital status calculations of death rates and life tables were done on the basis of census data and vital statistics around population censuses of 1979 and 1989

5). As a consequence of this the male excess mortality peaked at the highest value since the WWII.

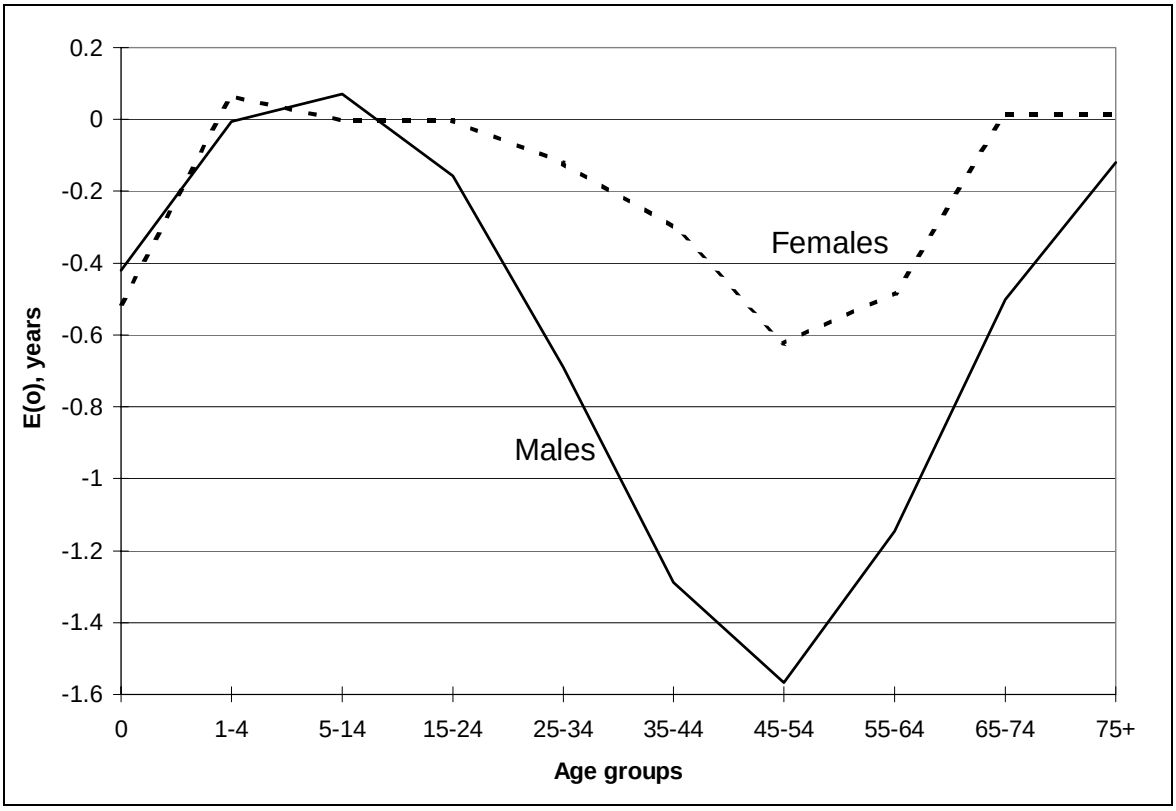
Table 5. LEB by gender in Latvia, years

Year	LEB			
	Female	Male	Difference	Total
1988	75.14	66.26	8.88	70.70
1989	75.16	65.25	9.91	70.21
1990	74.58	64.21	10.37	69.40
1991	74.75	63.85	10.90	69.30
1992	74.83	63.25	11.58	69.04
1993	73.84	60.52	13.32	67.18
1994	72.87	60.72	12.15	66.80
1995	73.10	60.76	12.34	66.93
1996	75.62	63.94	11.68	69.78

Source: Demographic Yearbook of Latvia 1997, p.107.
Note: LEB for both sexes are calculated as an average from LEB by gender

The overall change in life expectancy at birth in Latvia masks divergent trends in the child and adult mortality during a 1990s. There has been no increase in the health status of adults, but a slow improvement in infant and children health (Figure 1). Decline in life expectancy affected by changes of infant mortality is overestimated due to changes in the definition of live births. About 80 % of the total life expectancy decrease in 1988-1995 both for men and women is due to mortality increase in working ages (especially in ages from 25 to 64 years).

Figure 1. **Contribution made by different age groups to the difference between life expectancies at birth for males and females in 1988 and 1995, years**



Year 1995 and especially 1996 seems to be more favourable than previous years. Life expectancy increased for all subgroups of population. That increase corresponds to positive changes in socio-economic situation in general.

2.2 MORTALITY BY CAUSES OF DEATH

The epidemiological pattern of mortality during the transition seems to confirm the role of the two main groups of causes of death that is: External causes and Diseases of the circulatory system. As from table 6 these are the most important causes affecting males. For females the predominant role is kept only by the DCS.

Table 6. **Chances (per 100) of eventually dying from the main causes of death in Latvia and other Baltic and selected WHO European region countries, 1994**

	Males				Females			
	DCS	MN	EXT	OCD	DCS	MN	EXT	OCD
Baltic countries								
LATVIA	47.6	13.7	22.1	16.6	63.7	12.7	7.0	16.6
Estonia	47.8	15.2	22.2	14.8	64.7	13.7	7.7	13.9
Lithuania	45.7	16.9	19.9	17.5	64.8	14.1	5.8	15.3
Other Eastern European countries								
Bulgaria	58.6	14.8	7.3	19.3	68.2	11.7	2.5	17.6
Hungary	44.8	23.4	9.9	21.9	57.9	20.1	6.1	15.9
Poland	49.5	21.0	8.6	20.9	58.8	16.2	3.5	21.5
Russia	44.6	13.5	22.6	19.3	64.5	12.0	7.2	16.3

Abbreviations: DCS - diseases of circulatory system (25-30), MN - malignant neoplasms (08-14), EXT - external causes (E47-E56), OCD - other causes of death.
Source: WHO, 1996. Pp. B784-B797.

Situation with mortality from malignant neoplasms seems to be much better in Latvia, as well as in other two Baltic countries, than in some Eastern European countries.

In terms of contribution to the decline in LEB the situation is different. External causes of death are the main causes in determining the decline in LEB for males followed by DCS. To be noted the high proportion of change in LEB explained by OCD amongst women

Table 7. **Contribution of age groups and specified causes of death to changes in male and female life expectancies at birth in Latvia during 1989-1994, years**

	Total	0-24	25-64	65+	Total	0-24	25-64	65+
All causes	-5.8	-0.5	-4.7	-0.6	-1.9	-0.4	-1.5	0.0
Malignant neoplasms	0.1	0.0	0.2	-0.1	0.0	0.0	0.0	0.0
Dis.of the Circul.sys.	-1.8	0.0	-1.7	-0.1	0.0	0.0	-0.7	0.7
Respiratory system dis.	-0.3	0.0	-0.3	0.0	-0.1	0.0	-0.1	0.0
Digestive system dis.	-0.2	0.0	-0.2	0.0	-0.1	0.0	-0.1	0.0
External causes	-2.3	-0.1	-2.1	-0.1	-0.5	0.0	-0.5	0.0
Other causes of death	-1.3	-0.4	-0.6	-0.3	-1.2	-0.4	-0.1	-0.7

Calculated from national life tables and Demographic Yearbooks of Latvia.

It should be remarked that changes in that residual group of the causes of death is influenced much by the changes in diagnostic procedures, mainly for Diseases of the

Circulatory system. There is a very similar changes in the growth of life expectancy due to decrease of mortality from Circulatory system diseases and in the fall of life expectancy due to increase of mortality from the Other causes of death for females in retirement ages. We think that contribution of Circulatory system diseases to changes in life expectancy during analysed period is underestimated and contribution of Other causes of death - overestimated.

2.3 TERRITORIAL DIFFERENTIATION OF MORTALITY

The process of decreasing regional mortality differential characterised the pre-transition. What changes occurs in the 1990s ? Before to start to answer it is better stress some problems of the reliability of data.

The reliability of data is very important issue in the analysis of territorial differentiation of mortality in small country like Latvia. Problems arose due to small numbers of deaths (mostly in the younger age groups) and due to small numbers of population (mostly in the older age groups).

With every year we are moving away from census year, the reliability of population age structure and age-specific death rates for small territorial units are diminishing. The most reliable indicators of mortality in such situation are age-standardised mortality rates (ASDR) by indirect method. In case of indirect standardisation we do not need age-specific death rates for administrative units. ASDR calculation were done using age-specific death rates for the total population of country and population by five-year age groups by territorial units for both sexes to eliminate influence of small numbers of population.

Calculations of age structure of population for all cities and districts in Latvia restarted from January 1st, 1987. Therefore we can compare the situation in the late 1980s with the data from 1994-1995. During the transition regional standard deviation in ASDR increased from 1.09 to 3.87 for both sexes. ASDR in mid-1990s are lower in the central part of country. A pattern of excess mortality is common to districts located further from capital Riga, especially in the Eastern Latvia.

The coefficient of variation of cause-specific mortality patterns varies differently by categories of causes of death (Table 8) ranging from 36.7 to 16.0 percent.

Table 8. **Coefficients of variation (CV) for ASDR in Latvia, 1994-1995, percent**

	CV	Ratio over All ccauses
Diseases of digestive system	27.4	1.21
External causes of death	20.0	0.88
Malignant neoplasms	16.3	0.72
Diseases of the circulatory system	13.9	0.62
All causes	22.5	1.00

The main feature of regional differentiation of mortality over the 1989-1995 period is the presence of relatively high external mortality in the eastern part of country with a relatively

low external mortality in the west. Differentiation of mortality from the diseases of circulatory system and malignant neoplasms has a different and more disperse pattern.

One additional territorial characteristic seems to affect the spatial dispersion of mortality, namely the distance from the district centre (the main town) to the capital Riga. This feature is not only a pure geographical one, but in the current circumstances, also a social or even health care characteristic.

This is could explained by the fact that the basic health care programme in Latvia is provided by state health care institutions (located mainly in large cities, especially in Riga) and local government health care institutions and is covered by the regional sickness insurance offices funded by local government budget resources. In many cases so called regional isolationism exist. Due to unwillingness of local authorities to transfer a funding to centre, people are pressed to get a medical care in local institutions, which frequently has less qualified personnel than in the specialised institutions in Riga, capital city. More close place of residence is located to capital, more easy for population is to get more qualitative health care.

2.4 SOCIO-DEMOGRAPHIC DIFFERENTIATION OF MORTALITY

Mortality was traditionally higher in the rural areas in Latvia during a post-war period than in the towns. The transition especially in 1993 almost stopped the trend of traditionally more relative rapid growth of mortality in rural areas. Age-specific excess of rural death rates over urban decreased, excluding malignant neoplasms and several age groups of other categories of causes of death (Table 9). Mortality in rural areas still is much higher than in towns especially for children and for elderly.

Table 9. **Age-specific excess of rural mortality over urban mortality by main causes of death in Latvia, 1989 and 1995 (per cent)**

	1989					1995				
	1	2	3	4	5	1	2	3	4	5
All ages	93	155	175	100	137	91	123	129	72	110
0-19	114	151	136	125	219	89	94	320	567	193
20-39	112	133	158	97	147	125	90	87	30	130
40-59	105	120	147	122	148	112	113	94	75	122
60-79	81	124	146	96	109	90	113	142	76	85
80+	54	121	132	42	60	54	108	158	67	65

Legend: 1 - Malignant neoplasms, 2 - Diseases of the circulatory system, 3 - Diseases of the respiratory system, 4 - Diseases of the digestive system, 5 - External causes.

Calculations from: CSB, 1990; CSB, 1996.

Nevertheless LEB continues to be higher in the urban areas of Latvia than in the villages, as it was a case during the whole Soviet period. The residual excess of rural mortality could be explained by differences in the level of education and standards of hygiene, by poorer medical services and higher alcohol consumption in countryside (J.Krumins and P.Zvidrins, 1992, p. 268).

During the 1980s, the urban-rural difference in LEB gradually reduced and reached 3.08 years for men and 0.88 years for women in 1989. Higher urban LEB continued to exist

during transition period as well, especially for men. For women it practically has no changed (excluding 1994 when it was only 100.7 %).

This differential for men were stable during 1989-1992, but have been lowered radically in 1993 with slight increase during next two years reaching the previous gap in 1996. What happened in 1993 ? In that year deaths from external causes (especially homicides and suicides) dramatically increased by almost 1.6 times and they were concentrated in cities and districts close to large towns (Riga, Jelgava, Ventspils). The following recorded a drop in homicides related deaths and a stabilisation of suicides which smoothed the gradient of such as differential.

Ethnic differences in mortality also continue to exist. A number of population by age categories and main ethnic groups was estimated by CSB of Latvia for January 1, 1995. On the basis of those data and current mortality statistics the age-specific mortality rates and ASDR for Latvians and largest minority - Russians were calculated for 1994-1995 and compared to ASDR in 1988-1989 (Table 10).

Table 10. **Age-standardised death rates for Latvians and Russians in Latvia (‰)**

Ethnic group	1988-1989		1994-1995	
	Males	Females	Males	Females
Latvians	16.8	9.4	21.7	10.3
Russians	18.4	10.6	25.4	11.7
Index: Russians/Latvians, %	110	113	117	114

Note: Standard - age composition of the total population of Latvia in January 1, 1995.

ASDR both before transition and in mid 1990s were lower for Latvians than for Russians. ASDR for Latvian and Russian females increased both by 110 per cent, but for Russian males faster (140 %) than for Latvian males (131 %).

Despite this data is difficult to get a fully correct answer to the question - are the ethnic differentials really increasing during transition period, for which causes and why. There are several explanations why it is so. Firstly, there are no statistics on causes of death by ethnicity of deceased. Secondly ethnic differences are mediated by changes of other socio-economic variables (for instance level of education). Thirdly, transition correspond in time with a Latvian national revival after a long period of russification. During the 1990s processes of assimilation has changed and therefore it is more difficult to evaluate changes in the age structure of population by ethnicity and to calculate reliable age-specific death rates[6].

The same is true regarding the role of changes in structure and death rates of population by marital status. There are no data on marital status of population stock after the Population census 1989 and therefore no age-specific death rates by marital status of deceased. It is impossible now to get an answer to question - is the marital status a significant variable in explaining mortality differentials during transition period and health crisis in Latvia.

[6] More precise picture of ethnic differences in mortality and their determinants will be available only after next population census in 2000.

2.5 CHANGES IN HEALTH STATUS INDICATORS

In addition to mortality rates evaluation of other measures of health status (prevalence/ incidence indicators, self reported health status) are carried out. Morbidity rates are based on visits to health institutions. Due to reorganisation taking place in the health care system, changes in morbidity rates during 1994-1995 have to be evaluated carefully (MSB, 1996, p. 4). Trends are not reliable. Exceptions are infectious diseases.

Decline in general living standard causes expansion of social and infectious diseases, data on which are more reliable (Table 11). More and more cases of salmonella infections, tick-born encephalitis, diphtheria and other diseases are registered. In 1994, there were registered two times as many cases of gonorrhoea in Latvia as compared to 1990. Tuberculosis becomes a very serious problem, too. The number of new cases of active tuberculosis during the 1990s increased about a twice. 2/3 from new cases of tuberculosis was found in 1996 among alcoholics, former prisoners, unemployed and homeless people.

Table 11. **Reported cases of selected diseases in Latvia, 1980-1995** (per 100,000 population)

	1980	1990	1991	1992	1993	1994	1995
	8	61	58	62	45	47	37
Bacillary dysentery	95	295	81	82	79	56	44
Tick-borne encephalitis	7	5	8	11	30	54	53
Influenza thsd	32	20	17	14	11	12	15
Diphtheria	-	0.1	0.2	0.3	0.5	9.8	14.7
Scabies	38	24	45	81	112	105	107
Active tuberculosis, new cases	38.5	27.4	28.8	29.3	33.6	44.4	50.6
Gonorrhea	173	104	101	136	195	208	207

Source: CSB, 1996. Pp. 149,151,154.

Decline in income and an increase of commercial health care services determined fall in the number of patients attending health care institutions. Share of household expenditure accounted for by expenses for health services increased from 0.5 to 3.0 per cent during 1990-1994. Number of visits to a health institution (including dentists and visits by a doctor at home) decreased in the same period from 25 to 15 millions (Aasland, 1996, p. 75). It becomes more and more difficult for socially vulnerable groups to pay for health services.

Several studies involving an epidemiological cross-section of the most prevalent chronic non-infectious diseases revealed that not only objective statistical data, but also the psychological attitude of the population towards health is negative. According the study realised in Latvia in 1991 only 30 % of men and 18 % of women considered their health to be “good”.

In 1992, the Institute of Economy (Latvian Academy of Sciences) conducted in Riga a sample survey in which 15-60 years old respondents were asked to evaluate their own health, using the same wording as in NORBALT living conditions survey conducted in 1994 (survey covered persons 18-60 years of age). There is a considerable increase in the number of people who gave a negative assessment of their health over a two-year period from 1992 to 1994 (Table 12). This trend is particularly more expressed among females than males.

Table 12. **Subjective health condition, Riga 1992-1994 (per cent)**

	Men		Women	
	1992 survey	1994 survey	1992 survey	1994 survey
Very good	6.3	7.7	2.5	1.8
Good	39.6	33.9	29.6	22.6
Satisfactory	46.8	48.2	60.0	56.6
Bad	5.8	8.3	7.1	16.0
Very bad	1.5	1.9	0.8	3.0

Source: Aasland A. (ed.), 1996, p. 79.

The self-evaluation of health varies by the gender of respondents. The share of women who report "bad" or even "very bad" health is considerably larger than that of men, which corresponds to results of surveys from many other countries showing that women generally tend to report poorer health than men.

Urban-rural and regional differentiation of health from NORBALT survey data are found to be minimal and hardly statistical significant. However several other factors which are strongly correlated with the subjective evaluation of state of health were found, particularly level of education. Due to more healthy lifestyle, better working conditions and better living conditions persons with a higher educational level evaluate their health conditions as being "good" or "very good" more frequently than persons with lower level of education. Persons who have experienced economic hardship during a previous year (measured by an economic hardship index) according to NORBALT survey data tend to report poorer health than those who did not face any economical problems. Those working age persons with poor health also constitute a larger proportion among unemployed, compared with those who enjoy average a good health (Aasland, 1996, p. 78-79).

Decrease of living standard and rise of unemployment are resulting on the state of people's mental health. According to survey results more than half of Latvia's adult women and about one third of men has experienced mental stress. Age has a negligible impact on the degree of distress, although reported stress varies greatly between genders.

Another survey was conducted in November 1996 by the Baltic Data House. Two broad categories of population - Latvian and Russian speakers (altogether 1006 persons) were face-to-face interviewed, including questions about physical and mental health (Table 13).

Table 13. **Subjective health condition, Latvia, November 1996 (per cent)**

	Physical health		Emotional and mental health	
	Latvian-speakers	Russian-speakers	Latvian-speakers	Russian-speakers
Very good	2	1	1	2
Good	27	21	21	18
Average	49	56	57	56
Poor	17	18	18	19
Very poor	5	4	4	5

Source: Rose R. New Baltic Barometer III: A Survey Study. Glasgow, 1997, p. 55.

Among Latvian-speakers (all of them are citizens of Latvia) are relatively more persons which evaluate mental and especially physical health as "good" and "very good" compared to Russian-speakers (of which 33 per cent are citizens of Latvia, 66 per cent - permanent residents and 1 per cent - temporary residents). Answers "poor" and "very poor" health

varies insignificantly. In comparison with surveys conducted in 1992 and 1994 in the last survey from 1996 a share of respondents evaluated their health as “poor” and “very poor” has increased considerably.

3. SOCIO-ECONOMIC CHANGES AND FACTORS AFFECTING MORTALITY DURING A HEALTH CRISIS

3.1 The extend of the economic crisis: macroeconomic framework, consumption and poverty

A first picture of the extend of the economic crisis followed the onset of transition is provided by Table 14.

Table 14. **Real GDP growth in Latvia, other Baltic countries, in Eastern Europe and the CIS, 1990-1995 (percentage change on previous year)**

	1990	1991	1992	1993	1994	1995	1995 (1989 =100)
Latvia	3	-8	-35	-15	2	1	54
Estonia	-8	-11	-14	-7	6	6	74
Lithuania	-5	-13	-38	-24	2	5	42
E. Europe and Baltic States	-8	-10	-3	1	4	5	88
CIS average	-4	-12	-18	-13	-17	-4	48

Source: Latvia. UNDP, 1996. P.44.

The decline in the real GDP in Latvia during 1989-1995, as well as in other two Baltic states, was more pronounced than in Eastern European countries, but it was not so steep (excluding Lithuania) as in the CIS. The main economic shock in the former republics of the USSR occurred in 1992, a year after collapse of the Soviet Union. Real GDP per capita (PPP$) has decreased in Latvia from 6060 in 1992 to 3178 in 1994 (UNDP, 1996, p. 104). Other socio-economic indicators witness how the Latvia’s population was affected by shock exactly in the year of collapse of the USSR - in 1991, when in the autumn of that year was abolish control over consumer prices and real wages and salaries fall approximately by 1/3. The crisis deepened in 1992 which shows the worst situation for many indicators (Table 19).

Table 15. **Trends in selected socio-economic indicators in Latvia during 1990-1995, as per cent to previous year**

	1990	1991	1992	1993	1994	1995
Real wages and salaries	100	68.4	68.2	105	112	99.6
Consumer price index	100	272	1051	209	136	125
Registered nonworking persons	100	113	261	336	126	91
of which unemployed persons	-	-	100	485	138	98

Source: Calculated from CSB, 1996, Pp. 76, 88, 148, 164. Cornia and Paniccia, 1995, p.39.

The drop in real income was immediately translated to an increase in poverty. During the 1993-1994 70 per cent of Latvia’s population lived under value of complete minimum consumer basket of goods and services while 55-60 per cent of population had an income

per capita below the crisis minimum basket[7]. Relatively widespread income poverty in Latvia is a new phenomenon and is the result of the changes brought about by transition process.

A big share of Latvia's population lives below the critical minimum (Table 16). The lowest headcount indices of poverty are in Riga. The worst situation is in the Eastern part of country.

Table 16. Poverty **index for 3rd poverty threshold - PT (crisis subsistence minimum, Ls 52) in Latvia, 1996 (per cent)**

	Third PT
Population living below the PT	
All residents	67.9
Urban residents	65.4
Rural residents	73.8
Households living below the PT	
One children	69.7
Two children	77.9
Three and more children	90.5
No pensioners	61.9
One pensioner	60.8
Two pensioners	65.8

Source: Latvia Human Development Report 1997. UNDP. Riga, 1997, pp.35-38.

Unemployment could be considered an accelerator for households to fall into poverty, as well. Practically all households with two and more unemployed are below level of poverty. A similar but not so pronounced regularity is for households with children (under age of 16). A more children, a larger risk to fall into poverty. A lowest level of poverty is for single person households. Households with one or two retired persons are relatively less affected by poverty in comparison to households with unemployed persons and children.

According to public opinion polls on the material position of households, in the 4th quarter of 1995, 60 per cent of households could hardly meet their needs, 9 per cent of respondents had started to draw on their savings, 20 per cent had run into debts, while only 6 per cent admitted that they had enough money to live on and even had made some savings, and 5 per cent of households could not assess their material position.

Decline of income influenced significant decrease in consumption of the main food products (Table 17). From household budget survey data we can not discover one radical shift in food consumption. Regular decline in consumption started earlier than macroeconomics shock. But consumption of meat and meat products, milk and dairy products, fish and fish products declined in 1992 more than in other years during the 1990s.

[7] It consists of the amount of goods and services that meet the needs of the lowest level of living standards and provides for the most pressing daily necessities under economic crisis, this basket is calculated by the Ministry of Welfare.

Table 17. **Annual consumption of food in Latvia (according to household budget survey data, per capita; kg)**

	1990	1991	1992	1993	1994	1995
Meat and meat products	82	73	62	57	51	52
Milk and dairy products	482	476	381	371	344	348
Bread and cereal products	80	84	91	92	89	89
Potatoes	92	98	101	111	108	105
Vegetables	67	70	68	59	58	61
Fruit and berries	37	35	34	39	33	37
Sugar	30	27	22	24	23	23
Margarine and other fats	2.4	1.2	1.3	2.5	2.6	2.7
Vegetable oil	2.3	2.2	2.2	3.6	5.3	6.9

Source: CSB. 1996, p. 105.

Decrease in food products consumption has resulted in the total consumption of calories. In 1989 annual consumption per capita in Latvia was 2617 calories, in 1992 it declined to 2491, in 1993 to 2372, but in 1994 to 2290 calories (CSB, 1995a, p. 36).

Since 1991 a marked stratification in food consumption expenditure by income level according to household survey statistics widened in Latvia's society (Table 18).

Table 18. **Selected items of food consumption expenditure by income level of households, Latvia (per household member, 1993 as percent of 1992)**

	Households with median income level per household member per month					
	under 15.0	15.01-25.00	25.01-35.00	35.01-45.00	45.01-55.00	55.01+
Meat and meat products	84.8	89.2	92.5	99.3	101.4	101.1
Milk and dairy products	94.0	93.9	100.1	104.1	99.3	104.5
Eggs	86.2	90.9	98.7	106.0	96.1	101.9
Sugar and confectionery	96.6	107.1	112.4	113.2	112.6	113.4
Fruit and berries	91.7	113.2	116.9	119.3	119.1	123.5
Cereal products	101.6	105.1	105.2	108.9	112.6	113.9

Source: CSB, 1994, p. 106.

Necessity to economise on main groups of food has been related to expenditures on recreation and education, and medical care. In 1994 expenditures on food in the tenth decile group of families according to per capita money income was 35.02 Lats per month per capita or almost five times (ratio 4.8) higher than in the first decile group, where they were 7.36 . Those ratios for medical care was 5.6 and for recreation and education - 10.1.

3.2 The consumption of alcohol

Alcohol consumption is increasing steadily in Latvia during the transition. Official figures of alcohol consumption are underestimated because of large quantities of home made alcohol (mainly in rural areas) are produced and especially - illegally imported bad quality alcohol (Table 19).

Table 19. Registered consumption of alcoholic beverages in Latvia, per capita annually

	1980	1990	1991	1992	1993	1994	1995	1996

Source: CSB of Latvia, 1996, p.104; CSB of Latvia, 1997, p.109.

During the 1990s considerably increased alcohol consumption. The NORBALT survey showed that in September 1994 half of the respondents had consumed alcohol during the past two weeks (the proportions of men and women were 67 and 41 per cent respectively). The differences between men and women were statistically significant, but relatively small in the younger ages, tending to increase from the age of 40 and onwards (Aasland, 1996, p. 90). Survey results indicated that place of residence and ethnicity had a negligible impact on the frequency of alcohol consumption.

Table 20. **Alcoholism, drug abuse and some negative effects of alcohol consumption in the society, per 100 000 population**

	1980	1990	1991	1992	1993	1994	1995
Number of new cases:							
alcoholic psychosis	20	6	8	14	35	59	65
abuse of drugs	0.3	2.5	2.3	2.3	3.8	2.4	3.1
abuse of psychoactive substances	0.1	1.2	0.9	0.8	1.1	0.4	0.9
Number of cases (end of year) under surveillance of health care institutions with diagnosis:							
alcoholic psychosis	27	12	27	40	63	102	123
abuse of drugs	4.5	15.0	18.0	19.0	21.0	22.8	24.3
Deaths related to alcohol consumption:							
chronic alcoholism	3.5	4.9	4.8	4.2	8.9	15.1	12.1
poisoning by alcohol	13.2	4.3	5.3	6.7	10.1	16.7	12.0
alcoholic psychosis	0.4	0.04	-	0.1	0.2	0.6	2.5
cirrhosis hepatitis (in alcoholics)	1.8	0.6	0.5	0.5	0.9	2.1	3.9

Note: Cases of alcoholism and drug abuse-diagnosed in health institutions (excluding anonymous)
Source: CSB, 1996, pp.152-153.

An increase of drinking and drug abuse leads to increase of mortality related to alcohol consumption and toxicomania, as shown in Table 20.

3.3 LABOUR MARKET AND UNEMPLOYMENT

The onset of transition recorded a quick and fast growth of unemployment. In December 1992 31 thsd persons (2.3 percent of total economically active population) became unemployed.

Table 21. Number of unemployed persons in Latvia, at end of year

	1992	1993	1994	1995
Registered non-working persons, thsd	43.8	93.4	90.1	88.1
- per cent to economically active population	3.2	7.0	7.0	7.0
Of which unemployed persons, thsd	31.3	76.7	83.9	83.2
- per cent to economically active population	2.3	5.8	6.5	6.6
Of which receiving unemployment benefits, thsd	25.2	44.3	42.7	34.8
Over 6 months unemployed, thsd	3.7	25.3	36.1	37.5
Over 1 year unemployed, thsd	-	2.7	14.8	21.2

Source: CSB, 1996, p. 80.

As indicated in Table 21 many of unemployment figures doubled in 1993 reaching a stable average in the years after. Only the long-term unemployed persons continue to increase steadily.

Unemployment rate has large territorial variation. In some districts of Latgale region particularly hit by the demise of the agricultural sector the unemployment rate is more than triple the national average.

Unemployment has also an ethnic dimension. The number of registered unemployed persons among Russians grew a little faster than among Latvians: during 1993-1995 accordingly 113 and 105 per cent (CSB, 1996, p. 82). It seems that Russians, which dominate among employees of large state enterprises, affected by many economic difficulties, are more affected by unemployment than Latvians.

Taking into account the hidden unemployment, according to the estimates of CSB, in 1995 over an average of 7 % of the economically active population were actually out of work. Unemployment rate calculated from the data of NORBALT Survey in Autumn 1994 reached 17 per cent (Aasland, 1996, p.132). This figure is almost three times higher than the officially registered unemployment rate, showing the discrepancy between official CSB definition and the definition applied by the ILO.

The first Latvian Labour Force Survey (LLFS) was conducted in November 1995. According to the data of LLFS 227 thousand persons were unemployed. The unemployment rate for total population was 18.9 % (19.7 % for male and 18.0 % for female), for urban population - 21.2 % (in Riga - 20.6 %), for rural population - 12.9 % (CSB, 1996, p. 21,185).

As expected unemployment rate shows a significant differential related to the education level. Table 22 clearly the significant gradients amongst different levels of education

Table 22. Unemployment by level of education in Latvia, 1995

Level of education	Unemployment rate, %
Without formal education or with less than primary education	33.0
Primary education	27.3
Vocational education	21.1
Secondary education	18.8
Higher education	9.2

Source: CSB, 1996, p.191,199.

More than 53 thousand young people aged 15-24 years were unemployed in 1995, accounting for 24 % of total unemployment; for young people the unemployment rate was 30.1 %.

3.4 The Health care system

The former Soviet health care system has been characterised in Latvia by substantial fiscal constraints. It has functioned within the limitations of infrastructural insufficiencies, shortage of basic medical supplies as well as inadequacies in the production and supply of

medical technology. As in the rest of USSR it was enough adequated to deal with the new epidemiological pattern emerging from the 60s. Therefore the onset of Transition recorded an already not prepared and not sufficiently effective Health system. The situation worsened after 1992 with the introduction of budget cuts and financial restrictions to the Health Sector.

Table 23. **Trends in selected health care indicators in Latvia during 1990-1995, as percent to previous year**

	1990	1991	1992	1993	1994	1995
Real expenditures on health care, per capita	100	91	70	91	99	..
Physicians per 10000 population	100	98	87	77	72	72
Paramedical staff, per 10000 population	100	97	86	81	73	69
Hospital beds, per 10000 population	100	97	93	87	86	79

Source: Calculated from CSB, 1996, Pp. 76, 88, 148, 164. Cornia and Paniccia, 1995, p.39.

As documented in Table 23 the number of health care specialists in Latvia is decreasing along with the hospital beds per capita. For the latter one, as compared to other developed European countries, in Latvia a the hospital beds is still higher. In expert opinion it is necessary to change their profile: more beds should be allocated to nursing and rehabilitation, a small hospitals should be reorganised into nursing hospitals. The sharp decline in the real expenditures on health care led to not too much physicians and paramedical staff dismissals (even if the decrease is significant and pronounced especially for the paramedical staff) but to expenditure cuts for wages, purchase of intermediaries input and maintenance of equipment. In the following years - 1993 and 1994 wages and salaries increased more fast than inflation rate as expenditure on equipment and inputs remained insufficient. This resulted in a slight increase of real wages and salaries. But it happened on the basis of very low level of income.

After 5 years of transition the Health care expenditures as per cent of GDP in Latvia (1995) was 4.2. This indicator was among lowest in Europe. In Turkey it was 4, Lithuania 4.5, Greece 5.2, Estonia 6.2, Denmark 6.5, in comparison with 8.9 in Finland and 9.1 in France.

4. AN ASSESSMENT OF THE CAUSATION BEHIND THE MORTALITY CHANGES DURING THE TRANSITION

Some of recent publications have distinguished several main groups of determinants: biological factors, physical environment, lifestyle, social environment, health care system (See: RIVM, 1994, p.27), environmental pollution, diet and alcohol consumption, smoking, psycho-social stress (Cornia and Paniccia, 1996, pp. 118-123). There are several groups of factors affecting spatial differences in mortality used in demographic analysis depending on the aim of analysis and availability of data[8].

[8] For instance 120 different socio-economic and demographic variables and 18 aggregate variables were used in estimation of relations between mortality and life expectancy and socio-economic milieu in Poland during 1970s based on data from 49 regions (voivodships) and 24 big cities exceeding 100 000 population (Kedelski, 1983).

Our methodological approach is based on analysis of territorial differences in the changes of ASDR and their comparison with values of independent, explanatory variables by multiple regression method.

Analysis of independent variables affecting mortality in Latvia is facing several difficulties. First, Latvia is a small country with a relatively large number of administrative units (26 districts and 7 republican cities). Number of population and number of deaths in those units are varying significantly. Second, during a transition period to market economy an effect of many traditional risk factors is unstable. Changes are very fast, mechanism of time lags is not sufficiently investigated. And finally, to define an independent variables at disaggregated geographical level is not an easy task because of limitations in available regional data sets. Latvia's regional socio-economic statistics inherited from the former Soviet Union still is weak regardless to some improvements. Mortality data by gender on administrative level are available only for all causes of death and it seems the maximum disaggregation threshold of our analysis. Deaths by causes of death are also available but their usage is quite problematic because of the extreme variability, within the district, of the figure on mortality by cause due to the small size of the administrative units along with the presence of possible error in measurement, especially for CVD mortality, which was a key cause of death over the period 89-95.

4.1 The model adopted

The main features of the most recent social Latvian crisis, that is, a sudden and unexpected changes in society unemployment, growing uncertainty together with the epidemiological pattern of such crisis (mainly CVD and external causes two typical causes possibly affected by stress factors in the short term) has led us to form the hypothesis that the "psycho social stress (PSS)" model could explain a significant part of the big gradient in mortality recorded over the period 1989-1995. That hypothesis seems to us the most befitting.

Territorial differences and changes in available traditional quantitative regional characteristics of health care (number of recorded patients per 10000 population, physicians and hospital beds per 10000 population and visits to out-patient facilities per one inhabitant) are statistically insignificant and therefore they were not included in model.

In trying to asses the psycho-social stress model by using regional data we proceed with the following specification

$$\Delta Y_{kt} = f (Y_{k87-89} , \Delta X_{1kt} , ... , \Delta X_{ikt}) , \text{ where}$$

$\Delta Y_{kt} = Y_{k95} - Y_{k89}$

Y_{k95} - ASDR in k-th administrative unit in 1995;
Y_{k89} - ASDR in k-th administrative unit in 1989;

$\Delta X_{ik89-95} = X_{ik95} - X_{ik89}$;

X_{ikt} - i-th explanatory variable in the k-th administrative unit in the year t.

The dependent variable $\Delta Y_{kt} = Y_{k95} - Y_{k89}$ captures differences of mortality over the transition conditions and is calculated as difference between ASDR in k-th administrative unit over 1989-1995.

A key role is played by the independent variable Y_{k87-89}. It should reflect the level of pre-transition "initial conditions" and is calculated as the arithmetic average of the variable Y over 1987-1989 in the k-th unit. It is useful for testing whether or not the transition has followed the same pre-89 pattern of it has brought a different one.

The choice of the explanatory variables has made by using a stepwise method on set of variables both characterising sharp and sudden changes economic and social during transition period and control variables (see Table 24).

Table 24. **Independent variables included into regression analysis**

Variable	Abbreviation	Calculation
Pre-transition initial conditions		
Pre-transition mortality level	MORTLEV	Average ASDR in 1987-1989
Psycho-social stress indicators		
Unemployment rate	UNEMPL	Registered unemployed persons as percent of economically active population
Crude divorce rate	DIVORCE	Divorces per 1000 population
Recorded crime rate	CRIME	Recorded crimes per 10000 population
Demographic and geographic indicators		
Demographic burden, under working age	DBUNDER	Population under working age per 1000 working age persons
Demographic burden, over working age	DBOVER	Population over working age per 1000 working age persons
Crude marriage rate	MARRIAGE	Marriages per 1000 population
Share of urban population	URBAN	Urban population ratio to total population, percent
Share of Latvian population	LATVIAN	Latvian population ratio to total pop., percent

A capital Riga and Riga's district together with it's surrounding districts and towns, located in radius 50 kilometers from the capital (Jurmala and Jelgava towns, Bauskas, Cesu, Dobeles, Jelgavas, Limbazu, Ogres and Tukuma districts) is taken into account by adding to the regression as a dummy variable (DUMMY).

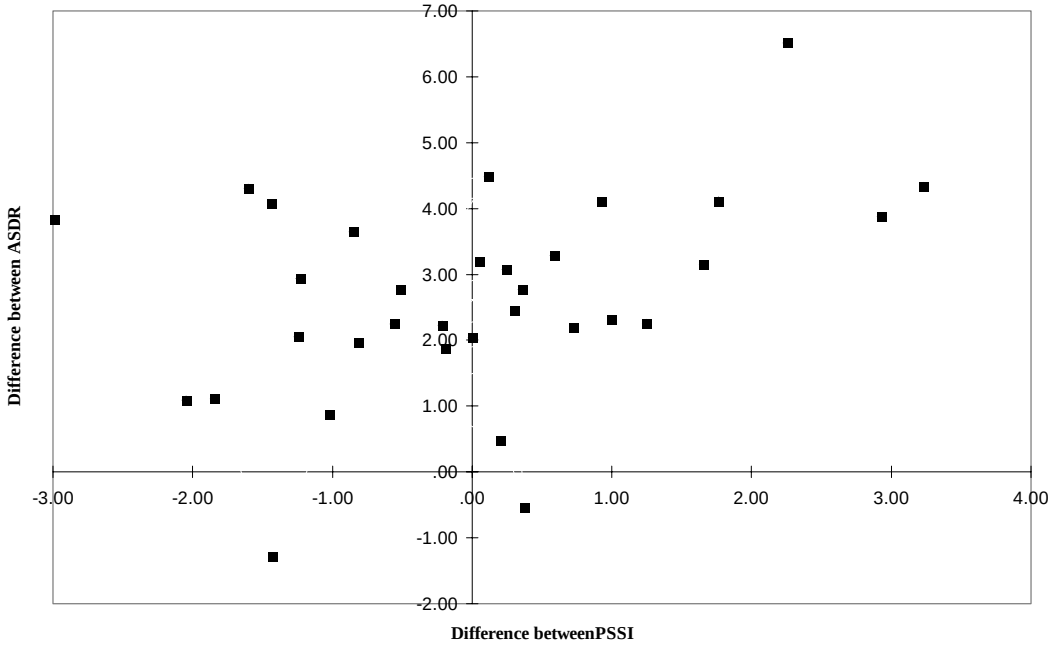
Practically all of selected psycho-social stress indicators demonstrate regional differences and are expressing adaptiveness to social stress during a transition period and inflexibility to new socio-economic circumstances.

The expected existence of correlation amongst them forced us to build a "synthetic variable" - the psycho-social stress index (PSSI) from three social stress variables (see Table 24). This index is calculated as the first principal component from the above

variables. The percentage of variance extracted by the first principal component is quite significantly high and this allow us to proceed further to the estimate[9].

The differences of PSSI has proved to correlate significantly with the changes of ASDR over the period 1989-1995 (Figure 2).

Figure 2. Differences in Psycho-Social Stress Index vs. changes of ASDR in cities and districts over the period 1989-1995, Latvia.



Before to proceed to the estimate some words on the health care variables which have been omitted. Unfortunately the available variables representing the territorial differences and changes in quantitative regional characteristics of health care (number of recorded patients per 10000 population, physicians and hospital beds per 10000 population and visits to out-patient facilities per one inhabitant) are proved to be only partially representative of the medical care output in terms of quantity and effectiveness. Indeed they are statistically

[9] Table A. Initial statistics (Principal components Analysis) and Correlations

CRIME	1.0000	0.99693	33.2	81.6
DIVORCE	1.0000	0.55335	18.4	100.0

Correlations

	REGR factor 1	UNEMPL	DIVORCE	CRIME
UNEMPL	.784**	1.000	.413*	-.004
DIVORCE	.850**	.413*	1.000	-.174
CRIME	-.336	-.004	-.174	1.000

** Correlation is significant at the 0.01 level (2-tailed) * Correlation is significant at the 0.05 level (2-tailed)

insignificant, although is fairly reasonable to suppose a significant offset impact on the mortality spatial differentials. therefore they were not included in model.

The results of the regression carried out on cross-district and transition period data over 1989-1995 using backward method are reported in Table 25.

Table 25. **Results of the regression analysis on the determinants of changes in ASDR over 1989-1995 in Latvia**

Model estimate		Unstand. Coeff	Std. Error	Beta	t
Constant		12.237	2.472		4.949
MORTLEV- ALL		- 0.698	0.184	- 0.488	- 3.798
PSSI		0.695	0.175	0.450	3.969
DBOVER		- 0.022	0.004	- 0.689	- 5.355
R-square adj.	0.628				
Durbin- Watson	1.879				
All causes of death, males					
Constant		14. 574	3.290		4.429
MORTLEV- ALL		- 0.758	0.236	- 0.483	- 3.206
PSSI		1.136	0.290	0.534	3.923
DBOVER		- 0.020	0.007	- 0.461	- 3.102
R-square adj.	0.425				
Durbin- Watson	1.582				
All causes of death, females					
Constant		9.979	2.785		3.583
MORTLEV- ALL		- 0.628	0.214	- 0.390	- 2.939
PSSI		0.291	0.185	0.190	1.571
DBOVER		- 0.025	0.004	- 0.788	- 6.061
R-square adj.	0.541				
Durbin- Watson	2.360				

The following independent variables are involved in regression models the most frequently: MORTLEV (for all and separate categories of causes of death), PSSI and DBOVER.
The results support the hypothesis stressing three following issues:

1) The initial mortality conditions in pre-transition period has confirmed to be relevant. It explains a large share of variance and has a significant negative sign which means that the transition brought a regional mortality pattern different from the pre-transition period;
2) dominance of the psycho-social stress as a mortality increase generating factor. A parameter “Psycho- social stress index” is statistically significant. Psycho-social stress variable determines changes in ASDR for males much more than for females;
3) importance of changes in population distribution by main age groups: mainly relative increase of population over working age in comparison with working age subgroup. An increase of demographic burden (over working age) plays an important role in mortality changes for both sexes and in main categories of causes of death as well. That is mostly predetermined by main changes of mortality in working ages in comparison with changes in older age groups. A fact that retirement pensions are stable source of additional household’s income could explain that correlation as well;
4) The two main control variables (LATVIAN, DUMMY) were discarded by the stepwise analysis.

CONCLUSIONS

The Liberation from Soviet rule and moving in the transition to a market economy, that proves by data from the 1990s is a necessary but not sufficient condition to rise a life expectancy and improve people's health. Now Latvia is among those WHO European region countries with the lowest life expectancy. The gap in life expectancy between Latvia and Sweden has reached almost ten years. In comparison with North and West European countries chances per 1000 births of eventually dying from external causes of death (especially for males) and from diseases of circulatory system (especially for females) in Latvia as well as in other two Baltic countries are high, but cancer mortality is relatively low.

Latvia's population was affected by economic shock in 1991, when was abolish control over
consumer prices and real wages and salaries fall approximately by one third. The crisis deepened in 1992-1993. Decline of income influenced significant decrease in consumption of the main food products. The total consumption of calories during 1989-1994 declined by 13 per cent.

A large proportion of Latvia's population lives in poverty. It slow down a human development because without appropriate income is impossible to care about balanced nutrition, health and education. In such situation is danger of widening of alcoholism and crime.

Decline in income and an increase of commercial health care services determined fall in the number of patients attending health care institutions. Share of household expenditure accounted for by expenses for health services started to increase. It became more and more difficult for socially vulnerable groups to pay for health services.

The psychological attitude of the population towards health also has changed. There is a considerable increase in the number of people who gave a negative assessment of their health over 1992-1994. According to survey data from 1995 people of working age put the highest value on money, then career, and only then in third or fourth place come health.

A trend of traditionally more rapid growth of mortality in rural areas during the transition period has stopped. Urban males during radical socio-economic changes was more affected by stress factors than other groups of population, which resulted into sharp increase of mortality from external causes of death in cities and towns. Nevertheless mortality in rural areas still is higher than in towns. The residual excess of rural mortality could be explained by differences in the level of education and standards of hygiene, by poorer medical services and higher alcohol consumption in countryside. According to different criteria poverty is more wide in rural than urban areas of country.

The main causes of the sudden increase in mortality are related to two typical stress-related variables - diseases of the circulatory system and external causes of death, mostly amongst middle-aged men. Due to sudden, sharp and unexpected changes in Latvia during a transition period a psycho-social stress hypothesis was adopted and tested in model.

Predominance of initial mortality conditions in pre-transition period was discovered and approved to be relevant. More high mortality level in the pre-transition years determines smaller increase of mortality during transition. Therefore, a radical mortality changes occurred among population groups with better health indicators before transition (people living in large cities and urban areas).

Unemployment among other independent variables is involved in regression models the most frequently. It could be considered as an accelerator for households to fall into poverty. Practically all households with two and more unemployed in Latvia are below the level of poverty. Unemployment in Latvia is not only an economic indicator, but due to its very expressed regional and socio-demographic differentiation, also very important psycho-social stress factor. A rise of unemployment is resulting on the state of people's mental health.

The psycho-social stress is a mortality increase generating factor . It determines changes in male mortality more than for female mortality.

An increase of demographic burden (over working age) plays an important role in mortality changes for both sexes. That is mostly predetermined by main changes of mortality in working ages in comparison with changes in older age groups. Higher proportion of aged population is a stabilising factor during a health crisis in transition period.

The situation of people's health can be improved by a radical revision of the whole system of measures aimed at providing normal functions in activities in all spheres of life. A radical change in the system of health care and social security is necessary. General economic growth, social welfare, and security may play a much more important role in health than medicine ever can. In developing the health policy in Latvia the strategy of WHO program "Health for all - 2000" is taken as a basis.

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