

## The Spatial Regularities of Violent Mortality in European Russia and Belarus: Ethnic and Historical Perspective

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### Abstract

**Objectives:** The present article seeks contribution to understanding of spatial regularity in violent mortality.

**Methods:** The spatial pattern of violent mortality in European part of Russia and Belarus over the period 1980-2013 has been studied. The distribution in ranking between 73 regions-subjects of Russian Federation and 6 regions of Belarus was investigated. This analysis was followed by a more detail examination of the violent mortality distribution across the north-south axis by using latitudinal approach both for European part of Russia and Belarus.

**Results:** The findings show the long-term continuity in the violent mortality geographical pattern. In the example with Russian regions the Spearman's rank order correlation was found significant, for the maximum interval data available. The stable south-north gradient in violent mortality is manifested on the European territory of Russia and Belarus.

**Conclusions:** These data emphasize the role of historical and anthropological factors in determination of violent death geography. Attention was made on correspondence of mortality pattern with direction of Old Slavs migration in the early medieval period. Besides the historical vision accentuation the multidisciplinary background of this problem is discussed.

**Keywords:** Violent mortality rate; South and north regions; Russian Federation; Belarus; Rank order correlation; Ethnic history

### Introduction

The pioneer works in the realm of social and moral statistic provided by Morselli et al. revealed the noticeable spatial continuity in distribution of violent deaths rate indices [1,2]. The most prominent difficulties with interpretation demonstrate the spatial analysis of suicide [3,4]. Foremost, question is about the fixed gradient in suicide distribution with the growing to the north and north-east of European continent [5,6]. During the centuries the spatial pattern in European suicide statistics stays unchanged [7]. It means that Mediterranean and British islands regularly have a lower suicide rate than northern and eastern European territories. The same gradient is noticeable on the territory of distinct European countries, as France and Italy, where northern and eastern regions have a higher suicide rate comparing to the south [8]. That suggests the continuation of discussion about health disparities between European regions, known as Yugoslavian or Albanian paradox, focusing on the Eastern part of the continent [9,10]. This problem applies for the reasons why southern regions less prosperous in economic and social terms have a more preferable health indices comparing to the north. In addition, the same hypothetical factor presumably is responsible for regularity in violent deaths spatial distribution.

The number of explanatory causal pathways on anthropological, social, cultural and environmental ground had been proposed, but the main theoretical controversies are still preserved [11,12]. The most accepted among potential explanations of this phenomenon has socio-cultural approach postulated by Durkheim; the existence of north-south gradient in suicide hypothesizing the differences in the social organization and the lag in modernity processes on the southern territories. In contrast to cultural vision, representatives of Italian anthropological school in the genesis of violent behavior have considered the pivotal role of psycho-anthropological association, what suggests the significance of hereditary component. Noteworthy, that in the discussion on nature of long term south to north regional polarity Morselli has pointed on the possible impact of ethno historical

processes connected with historical migration of Old Germanic tribes and their domination in the northern territories. Thus, it was suggested the existence of time-space relationship between- historical migration process - anthropological structure of regional population- and with the sum of behavioral traits predisposing for some forms of violent behavior (e.g. suicide), these predisposition implies both cultural and biological mechanism.

The North-South gradient in the spatial distribution of violent mortality is also visible across the territory of European Russia and Belarus [13-15]. The general pattern of mortality from external causes in Russia resembles that in some other European regions: the southern regions have a lower suicide rate than the northern regions. Walberg, et al. noted that the variations in the health indices during the transitional period could not be explained by only using socio-economic variables. Kondrichin showed that the north-south variations in social variables in the European part of Russia involved the total mortality rate, suicide, homicide crime rates and some aspects of electoral behavior. Furthermore, suicide rates of regional distribution were not in line with Durkheim's classic theory. Therefore, the number of divorces had an inverse relationship with the suicide rate. Kondrichin further suggested that the reasons of such variation might be rooted in the history of the ethnic formation of the Russian people. Violent mortality rate variations present on the territory of Belarus and Russia give spectacular possibilities for long historical frame study. On this territory, enormous in comparison with the rest of Europe, a relationship between the

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geography of social and demographic indicators and the history of territorial divisions appears to be most revealing. These countries, formerly constituent of the USSR and earlier- of the Russian Empire, have many common historical features. It is a unique social space where a relative social and economic homogeneity was achieved under the Soviet rule.

Both countries have a similar geographical pattern of ethno-historical division. On the territory of European part of Russia and Belarus the south- north gradient in ethnic composition exists [16,17]. The population of Slavic origin is dominant in both countries but for European part of Russia south-north ethno-historical variations are connected with historical influence of Finno-Ugrian ethnic substratum dominantly on the north, thus the similar pattern of ethno-historical differentiation on Belarusian territory is formed by historical dominance of Baltic peoples (the processes of intensive ethnic contacts and fusions mostly have occurred mostly in early Medieval period, in V-IX centuries). As a result, the main geographical pattern of ethno-historical (and anthropological) division on territory of European Russia and Belarus resemble the same from Italy and France. Thus, the south-north spatial variations in violent mortality in two Eastern European countries will support the Morselli hypothesis about long term relation between violent mortality indices and historical and ethnic factors in the processes of population formation. In other words, it will be an additional argument in discussion on anthropological (or evolutionary) background of violent behavior manifestations.

Against this background, the aim of this study was:

1. To demonstrate the continuity in spatial patterns of mortality indices in Russia and Belarus and scale over which these patterns are occur, thus to strengthen the fact of this phenomena existence;
2. To reveal the correspondence of regional mortality pattern in Russia (European part) and Belarus;
3. Try to define the theoretical and methodological fames of the problem.

## Data and Method

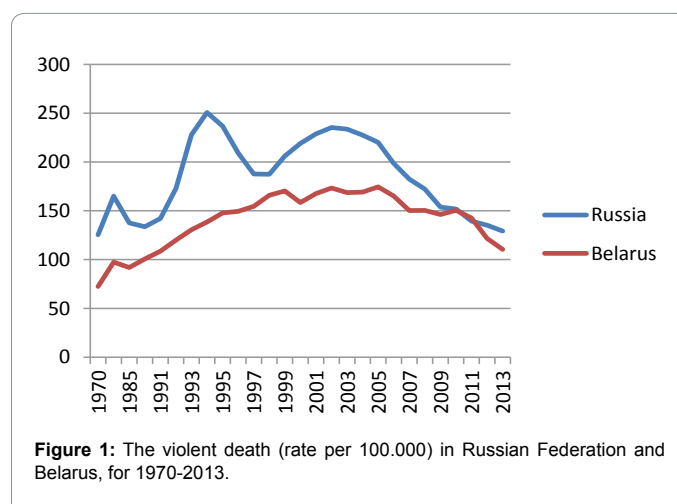
The study embraces the territory of Russian Federation and Belarus. The analysis was made on the ground of territorial administrative division in 1988. There were 73 administrative units in Russia (10 national autonomies, 52 oblasci (provinces), 3 krajs (territory), and two large cities Moscow and St. Petersburg with a separate administrative status. Certain territorial changes which occurred in Russian Federation after 1991 have not impact greatly on the primarily chosen set of regions. The three newly appeared administrative unites, previously incorporated in other larger one, being treated in previous borders to maintain historical continuity. To investigate the spatial similarity of the violent death pattern (including total violent mortality rate, suicide, homicide and lethal alcohol intoxication) in Russian Federation over the period 1988-2013 the data sets were subjected to correlation analysis (Spearman's rank order correlation). Presuming the role of ethnic factor in regional differentiation of violent mortality and taking in consideration the social and cultural differences between national autonomies (e.g. thus the territory of Chechen and Ingush Republics during war conflict) as the next step correlation analysis was made for all other regions of Federation with exception of national autonomies. To investigate the main pattern of violent mortality geographic distribution on the territory of Russia (European part) the researched sample consisted of 40 regions was chosen. The regions can be divided in three major groups: central, northern and southern. The

extreme latitudes of the Moscow region were used as the separation line between the northern and southern groups of regions. The area mostly situated from latitude 54° to 57° N formed the central group. Twelve regions formed the northern group, 11 regions formed the central group and 17 regions, including Stavrapolski and Krasnodarski krai (territories) formed the southern group. This method of geographical division in regional death indices study was used in the previous works. General demographical characteristics of the grouping areas are indicated in Table 1. People of Russian nationality are a majority in all 40 regions consisting of more than 80% of the population for each region in 1989. The regional distribution of violent mortality rate in European Russia is presented for two periods: 1985 and 2013. To compute the differences in mortality rates between selected groups of regions a t-test was employed. For Belarus there are 7 administrative unites: 6 voblastsi and Minsk-city. The territory of Belarus in south to north direction is situated from latitude 51°16' to 56°10' N, and division line between the studied groups of regions is close to latitude 53° N. There are no changes in administrative division of Belarus in studied period. Data sets by the regions of Belarus were presented in graphic form. The comparison of the mean figures of mortality rates from external meanings for southern (2 regions) and northern (4 regions) was made for Belarus over period 1985-2013. Capital Minsk-city was excluded from analysis. Regional figures on mortality from external causes, ICD 9 E 800 - E 999, (crude rates per 100 000 inhabitants) during the period 1980-2006 in both countries were collected from published official documents (demographic annuals): annual reports of Goskomstat (State Statistics Committee of Russian Federation) and Ministry of Statistics and Analysis of Belarus. Russian Federation and Belarus, formerly incorporated in the USSR, now are the states with the similar standards of mortality reporting (Figures 2-5). The reliability of official mortality data and its limitations for both countries gave have been discussed by several authors [18].

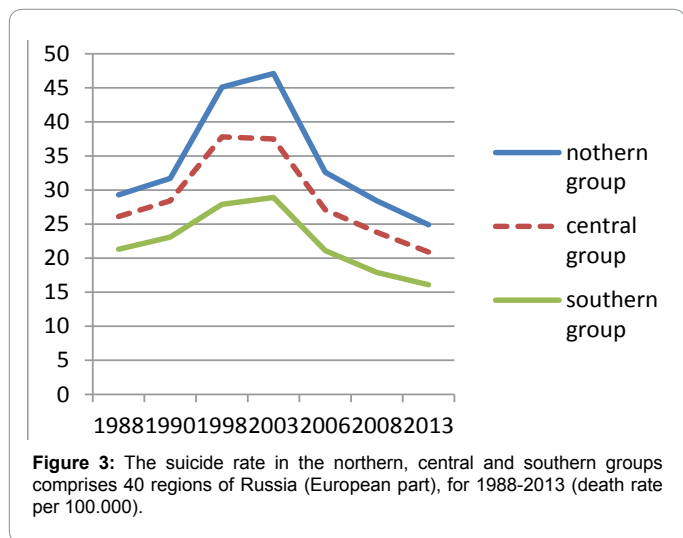
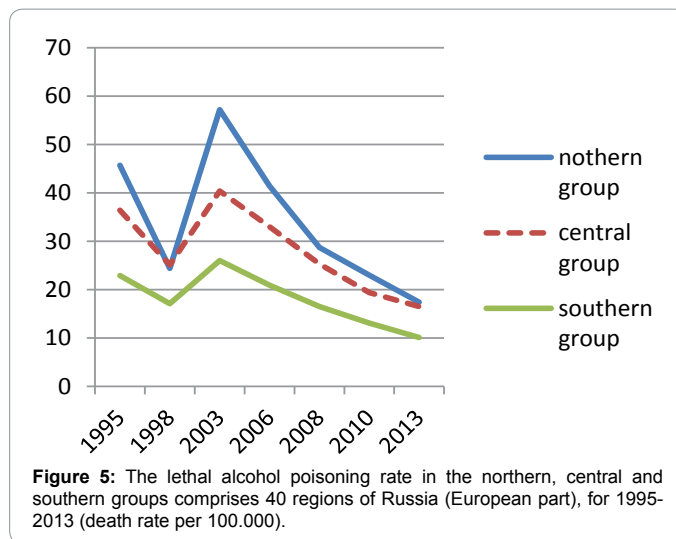
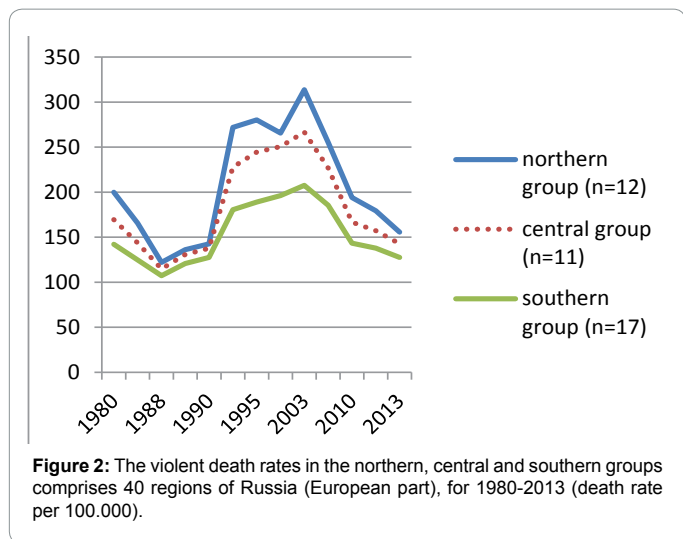
Geographical groups of regions	territory (shous. km²)	population (mil.)	density popul. per 1 km²
nothern (n=12)	1731.3	20.8	12.0
central (n=11)	493.7	24.4	50.0
southern (n=17)	1008.6	37.1	37.0

\*geographical position of the central regional group is generally corresponde to latitude of Moscow region- range between 54°-57° N

**Table 1:** The territory and population size for 3 geographical groups of regions in European part of Russia', data for 1990.

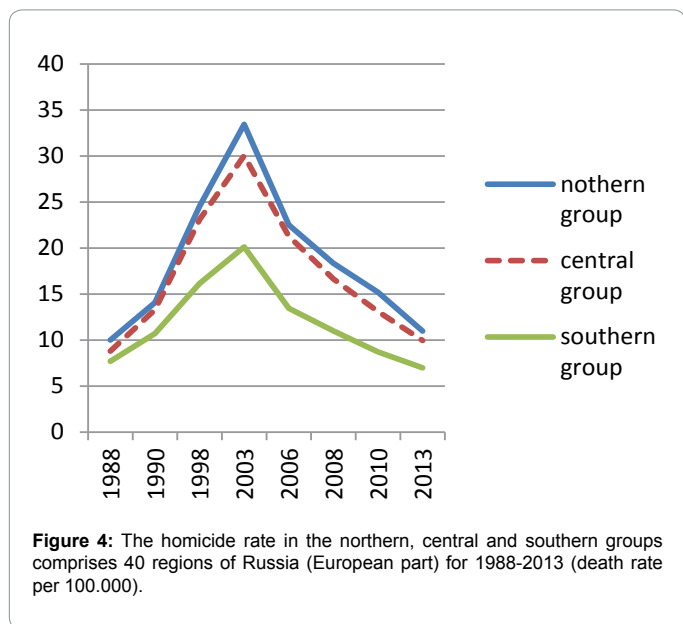


**Figure 1:** The violent death (rate per 100.000) in Russian Federation and Belarus, for 1970-2013.



### Characteristics of Violent Mortality in Russian Federation and Belarus

While the study concern is investigation of regularity in violent mortality region pattern the problem of unique time trends of violent mortality on the former USSR's territory and the evident geopolitical consequences of huge people losses has appeared in the contexts of such discussion. In last decades Russian Federation and Belarus, have the heights mortality rate from external causes among the world nations providing health statistics. It is need to emphasize, that huge violent mortality is only one component of depopulation processes and nearest demographic consequences seems to be dramatic for all region. For these reasons study of differentiation in regional mortality presents multidirectional interest. The general similarity in violent death trends between Russian Federation and Belarus is noted (Figure 1). In period of perestrojka (1985-1990) both countries have mortality decline, with rapid increase after period of USSR dissolution in 1991. Noteworthy, those mortality rate fluctuations were more noticeable in Russia then Belarus. For all period 1970-2013, the difference between countries in average mortality rate was 23,2%, but in last year's there is a tendency for leveling off the rates in both countries. The structural composition of death mortality from external reasons is shown on Tables 2 and 3.



In both counties the rate was higher in population of working-age (males 15-59 years, females 16-54 years); in 2005 in Russian Federation and Belarus it was respectively 269 and 207 (in contrast to crude rates, 220 and 172). The peak of violent mortality rate was in the age group 50-59. As data shows, in Belarus in comparison with Russia the lethal alcohol intoxication are taking a higher share in the violent mortality structure (18,5 vs. 11,7), thus in Russia the share of homicides are more significant (10,2 vs. 4,6). In both counties the rate was higher in population of working-able age (males 15-59 years, females 16-54 years), in 2005 in Russian Federation and Belarus it was respectively 269 and 207 (in contrast to crude rates, 220 and 172). The peak of violent mortality rate was in the age group 50-59.

### Death Rates from External Causes in Russia: Regional Pattern

Table 4 shows the rank order correlation coefficients for regional death rates from external reasons at all and separately for suicide, homicide and lethal alcohol intoxication in Russian Federation between

Geographical groups of regions	Territory (shous. km <sup>2</sup> )	Population (mil.)	Density popul. per 1 km <sup>2</sup>
northern (n=4)	134.2	5.5	41.8
southern (n=2)	57.8	3.1	42.5

\*division line between southern and northern groups corresponded 53°N

**Table 2:** The territory and population size for two geographical groups of regions in Belarus\*, data for 1990.

Death causes %	Russia	Belarus
lethal alcohol intoxication	11,7	18,5
homicide	10,2	4,6
suicide	15,2	17,8
drowning	4,3	6,7
traffic accidents	13,5	13,2
other reasons	45,1	39,2

**Table 3:** The structure of violent death (%) in Russian Federation and Belarus, for 2006.

Indices of death/years	1988	1990	1998	2003	2006	2008	2010	2013
violent deaths	1,0	,86	,64	,74	,74	,72	,73	,64
suicide	1,0	,86	,79	,77	,72	,70	,72	,66
homicide	1,0	,86	,79	,82	,83	,81	,76	,78
alcohol poisoning		1995 1,0	,85	,73	,72	,69	,64	,61

**Table 4:** The rank order correlation coefficients of violent death rate in total and separately for suicide, homicide and alcohol poisoning for 73 administrative regions of Russian Federation, years 1988-2013 (year 1988 as primary).

the year 1988 and following years till the year 2013. The regional death indices show the significant positive correlation over period, what means the definite regularity of violent mortality pattern and absence of large changes or death rate fluctuations between the regions. The death indices constantly are lower in the Caucasus region, in Moscow and St. Petersburg cites, and in the southern territories of European Russia. The highest indices have national autonomies and territories Siberia (Tuva, Buryatia) and on the North of the European continent. The margin places in the ranking position for different violate causes for years 1988 and 2013 (the most proximal years available) are presented in Table 5. The lowest rates as usually have the national autonomies of the Caucasus region, thus the national autonomies of East-Siberian region have the highest one. In spite the questionable accuracy of statistical data in some autonomous territories it is no possibility to ignore the fact that spatial pattern of violent mortality in Russian Federation is closely related with the ethnicity [19]. The present ranking order and significant variations in violent mortality rates for national autonomies have confirmed it. To minimize the influence of the ethnic and cultural components in formation of spatial difference in violent mortality on the next stage of analysis data by all national autonomies and two largest cities Moscow and St. Petersburg were excluded. In that case rank order correlation coefficient is less than in previous case but stays significant (Table 6). Noteworthy, the correlation coefficient is gradually decline, what means that geographic pattern of violent mortality was changing in response to changes in social, economic and population composition of Russian regions during the transition period. It means the existence of two concurrent processes is defining the regional mortality pattern: one determines it spatial continuity, thus other is directed on changes. It is logically to suggest that combined effect of their interplay shapes long term trends of regional mortality and rapid changes in population structure (e.g. in a result of mass migration) may consequently lead to changes in regional mortality indices. Additionally evaluated rank correlation

level of violent mortality separately for urban and rural population in the regions of the Russian Federation, between 1980 and 2006. For all 73 subjects of the federation, the correlation coefficient for the urban population amounted to  $r(s)=0.72$ ;  $p<0.0001$ ; and for rural  $r(s)=0.77$ ;  $p<0.0001$ . This result, which suggests that the level of urbanization is not the lead in determining the stability of the geographical distribution of mortality. In addition, a number of studies indicate that the observed regional variations apply to all age groups and often duplicated in the male and female population [20]. The potential importance of the factor of regional economic development in the formation of regional differences in the rate of violent deaths was discussed in several studies. Most authors agree that the causes of socio-economic nature should not be seen as responsible for regional specific mortality in the former USSR (Walberg, et al.). Recall the example of national autonomies of the North Caucasus, where per capita income is among the lowest in the country. For study of relationship between violent mortality rates and regional per capita income the rank order correlation analysis for 73 regions for year 2006 was performed:  $r(s)=-0.03$ ; (n. s). That confirmed the primarily assumption about low significance of economic factor in formation of the long term violent mortality geographical pattern on the former USSR territory. Study of total and separate violent mortality regional patterns between three geographical groups composing from 40 regions on the territory of European Russia (excepting national autonomies and two large cities) demonstrates the stable differentiation in north to south direction (Table 6). Noteworthy, the difference between northern and southern groups of region is statistically significant (t test) during all the period (with exception of years 1985-1990 for total violent death). The climbing mortality rate in 90-eth corresponds to increase in cross regional differences. The results reveal an overall continuity of spatial pattern in violent death mortality indices distribution between the Russian Federation.

Violent mortality rate (per 100.000)	1988		2013	
	highest rate	lowest rate	highest rate	lowest rate
violent death (all cases)	Tuva Republic 192,4	Republic of Dagestan 56,3	Tuva Republic 326,9	Chechen Republic 23,6
suicide	Republic of Mari El 41,2	Republic of Dagestan 3,9	Republic of Buryatia 58,3	Chechen Republic 0,7
homicide	Tuva Republic 42,2	Republic of Dagestan 2,7	Tuva Republic 56,6	Ryazan region 3,3
alcohol poisoning	Altai territory 93,5	Republic of Dagestan 0,6	Tuva Republic 47,3	Chechen Republic 0,2

All correlations are significant for all period; 0.01 level (2-tailed);  $p<0.0001$

**Table 5:** The regions of Russian Federation with minimal and maximal violent death rate in years 1988 and 2013.

mortality rate / years	1988	1990	1998	2003	2006	2008	2010	2013
violent mortality	1,0	,80	,61	,69	,63	,64	,59	46
suicide	1,0	,83	,81	,74	,68	,67	,70	,65
homicide	1,0	,82	,79	,73	75	,71	,74	,74
alcohol poisoning		1995 1,0	,76	,61	,56	,55	,47	,47

All correlations are significant for all period; 0.01 level (2-tailed);  $p<0.0001$

**Table 6:** The rank order correlation coefficients of violent death rate in total and separately for suicide, homicide and alcohol poisoning for 55 administrative regions of Russian Federation, with exception of national autonomies and cities Moscow and St. Petersburg for period 1988-2013 (year 1988 as primary).

## Regional Pattern of Mortality from Violent Causes in Belarus

The rank order distribution in all violent mortality between the regions of Belarus for the period 1970-2013 is presented in Table 7. The rank order for the entire period was characterized by a noticeable regularity; some variations were observed only between regions occupy adjacent positions, while "at the poles," the region's position remained practically unchanged. Thus, the pattern of geographical distribution between southern and northern group of regions in Belarus for the period 1990-2010 showed a stable polarity: the southern, Brest and Homel regions have lower rates comparing to the northern group. The dynamics of the average rate by separate death causes in the two groups of regions is shown in Figures 6-9.

The difference in the violent mortality average rate (all reasons) between these polar groups for all studied period was 21.8%; the deference by the separate reasons presented in the Table 8. Thus, on the territory of Belarus, as well as between the regions of the European part of Russia registered a steady gradient in the distribution of mortality from external causes, with the growth rate in a northerly direction. Moreover, a comparison of the regional trend indicates that the two countries during social and economic instability 90 characterized by a significant increase in mortality in the northern regions group.

## Discussion

The study turns to the interpretation of regularity in violent mortality spatial variations. The strong rank order correlation of the violent mortality rate, persisted over the last decades, indicates clearly that responsible factors have an apparent fixation in time and space, what means that problem solution could be found in the realm of history. Integral and regular nature in distribution of violent mortality in the Russian Federation and Belarus indicates on the functioning of "deep" factors responsible for regional differences. In a certain way, they relate to long temporal and spatial scales that brings the matter under consideration within the scope of history. It is reasonable to suggest that in the historical time and space some resistant structures are functioning, which are in fact very close to what Braudel had in mind introducing his concept of *longue duree*. Braudel [21] and other representatives of Annals school for demonstration of long historical frames use the set of economic, religious, demographic and political indicators. In other words the conclusions on stability of historical structures were made on the ground of spatial pattern of social data which were used as markers of structures existed in historical coordinates. The rate of violent mortality should be added to the group of history frames markers. In spite evidence of fact that regularity in spatial differentiation of social indicators needs the explanation in historical perspective, also as can be illustrated in the historical continuity, there no possibility to explain the mechanisms of their origin, or define, in reasonable manner, the historical borders of theirs functioning.

Still, the fact that geographical variation of violent mortality indices corresponds with anthropological areas existing on the territory of each country is of principal interest. The formation of these areas was a result of inter-ethnic mixing which took place in the early history. On the territory of Russia and Belarus the main gradient of ethno-historical and anthropological variations has north to south direction. It's formed in Early Medieval period in process of Old Slavs migration to the North and their contacts with Old Baltic and Finno-Ugrians settled these territories before. The analysis demonstrates that regional variation in violent mortality rates corresponds with the anthropological and ethno-historical polarity between the regions. This means that regions are polar both in respect of anthropological and socio-demographic composition of population. Comparison of the ancient settlement of ethnic groups with the polarity in the distribution of the rate of violent deaths confirms the hypothesis, formulated in the XIX century anthropological material in Western Europe.

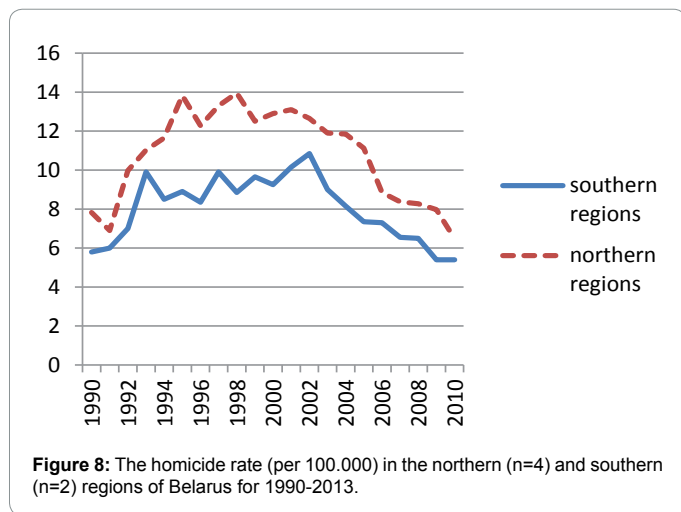
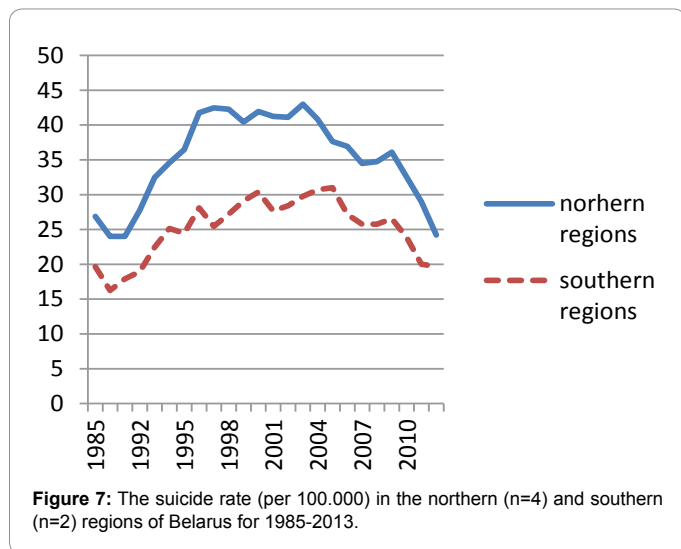
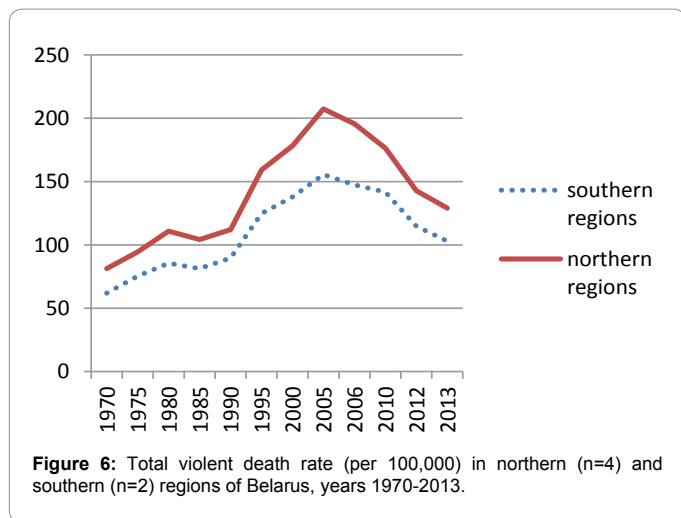
It should be recalled that the combined nature of the spatial distribution of anthropological (ethno-historical) and demographic characteristics can not serve as proof of the existence of a causal relationship between them, but the results of such comparisons should be viewed as an affordable and unique heuristic material that can be used in the process of formulation of hypotheses and plan further studies. On the other hand, the results of comparative analyses of violent death distribution on the European territory of the former USSR (Russia, Ukraine, Belarus) allow to doubt in significance of one of concurrent climatic or physics and meteorological theory. Natural environment and climatic factors are amongst basic which determine the course of ethnic development and besides expected effect on economic activity they have influence upon physiological and mental traits of population [22]. In other words these factors effect is connected with historical and evolutionary characteristics of regional populations. Quit different present's situation when researches are trying to consider the effect of climatic or environmental factors separately from historical background, such as solar insolation, soil and water chemical composition and others. The effects of environmental factors, in their physiological range, at times are considering as a reason for violent death variations. However the example of violent death geography in Russia, Ukraine and Belarus, taking in consideration the sizes of their territory and variety of climatic conditions, can allow minimizing the validity of such considerations.

The study supports the suggestion on certain similarity or overlapping of ethological factors for various violent death reasons. Alcohol abuse commonly is considered as such generalization mechanism with parallel multidirectional effect [23]. At the same time comparative analysis of the county's regions with similar social, economic and cultural characteristics needs some provisional explanation for regional specificity in drinking traditions, stressing the point of their existence also in the period of communist hegemony. In other words, in spite that alcohol abuse factor is significantly involve in violent mortality rate, it cannot explain geographic variations in violent

region	rank position	1970	1975	1980	1985	1990	1995	2000	2005	2006	2010	2012	2013
Brest	I	61,5	72,2	79,1	77,8	84,5	118,9	126	142,5	125,7	133,3	105,3	98,0
Homel	II	62,5	78,5	91,9	84,9	94,7	130,7	149,8	168,6	169,1	150,1	124,1	107,8
Mahiliou	III	75,1	<b>91,3</b>	<b>109</b>	<b>104</b>	<b>110,5</b>	<b>145</b>	<b>163,4</b>	187,4	175,5	162,3	132,2	120,4
Hrodna	IV	81,7	<b>85,4</b>	<b>103,8</b>	<b>97,2</b>	<b>103</b>	<b>144,9</b>	<b>153</b>	199,2	186,8	172,1	141,3	126,1
Minsk	V	84,2	<b>102,2</b>	<b>122</b>	106,7	117,1	159,2	178,7	206	195,3	184,6	<b>149,4</b>	132,7
Vitebsk	VI	84,4	<b>99,2</b>	<b>108,5</b>	109,1	117,6	187,7	199,9	218,1	205,1	186,6	<b>148,3</b>	136,8

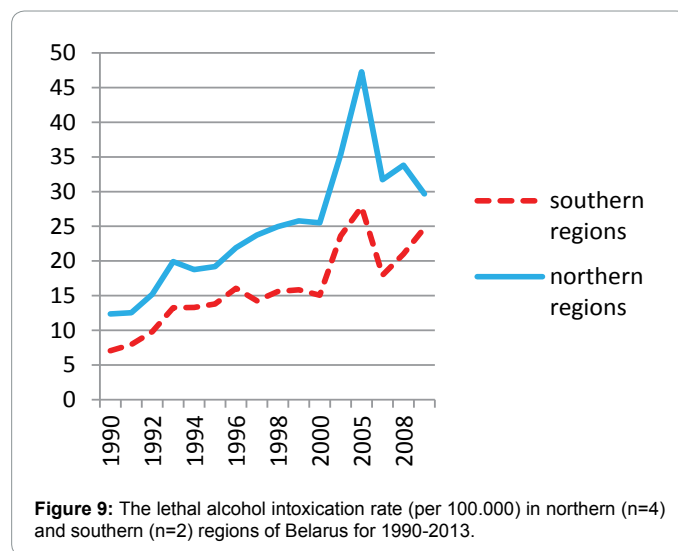
• Cases of changes in rank order correlation in italics

**Table 7:** The ranking of Belarus regions by violent mortality rate (per 100,000), in period 1970-2013.



mortality per se, considering the role of other hypothetical background reasons responsible for differentiation in drinking pattern between the northern and southern regions.

It seems possible, that local cultural traditions and physiological effect of alcohol should be considered in the sum with other factors, associated with anthropological (both physiological and cultural) background of population. In other words, there are definite basis to suggest that factor of alcohol abuse per se has been depended upon previously defined background mechanism, and simultaneously it preserving full significance in determination of vary violent death causes. In the previous work was suggested that role of this deep regulating mechanism, depending on ethic and historical components and determining different aspects of population live, can pretended the psychophysiological and psychosocial regional characteristics (as temperament, impulsivity and some others). In this context are promising the arguments about the existence of a universal gene with wide range of anthropological and psychological influence, including the predisposition to aggression. Similar arguments could be presented as an extended version of the hypothesis of a universal gene (Generalist gene hypothesis). The effect of this gene (or group of genes) can cause the various forms of destructive behavior on the scale of population. The similar questionable usefulness may have schematic approach accentuating the mechanism regulating formation of a certain background mental characteristics or dominant psychological type in population: temperament, impulsiveness, schizotype, etc. [24,25]. Into such reasoning hypothesis about the combined genesis of the different destructive behavior manifestations are grounded on different ethno-historical and anthropological foundations. In very close proximity (in the sense of common ethnic, historical and psychological basement) is Gumilev's concept of passionarity [26]. In the frame of previously mention Annals school, the particular reasoning has acquired the conception of regional mentality, which implying the summation of psychophysiological and cultural regional characteristics [27]. However all these factors, for obvious reasons, stay more or less appropriate for scientific discourse hypothesis, while the potential of it scientific verification is essentially limited.



mortality group	Difference (%)
violent deaths	21,8
suicide	28,7
homicide	24,9
alcohol poisoning	34,1

**Table 8:** The difference in violent deaths rate by separate causes between northern and southern group of region in Belarus (in %), mean for 1990-2010.

However, these "mechanistic" hypotheses about the role of genetic factors in the development of sustainable behavioral patterns that manifest themselves in the scale of the population, have significant limitations and can only be regarded as a heuristic scheme. In this case, along with the question of the specific mechanism of genetic influence, there is a question about the content of the background characteristics, which can determine the different manifestations of regional mentality. We cannot exclude the possibility that certain genetic traits of the population associated with the action of discussion "deep" or background determinants, but cannot be considered as an underlying cause. At the same time, the material of the study demonstrates the difficulties not only with proof of this hypothesis, but also points to the impossibility of defining the boundaries of such universal mechanisms of determination (because of the breadth of heterogeneous features), so this hypothesis is not able to overcome its speculative nature. More preferred of the existence of inheritance set of mental characteristics that manifests itself both on the individual and on the family and population levels. It should be emphasized that the mechanism of inheritance (even in a strictly biological sense) is much broader than the transfer and transformation of genetic information, and its transposition into the mainstream of social and historical development of the estimated factors make virtually imperceptible to the study. However, at the present stage of knowledge about man and society, would be more correct to restrict such generalized formulations.

## Conclusions

This study highlighted the stable south-north gradient in violent mortality rate on the European territory of Russia and Belarus. These data emphasize the role of historical and anthropological factors in violent deaths spatial regularity. The ecological analysis alone cannot resolve the problem with differentiation of cultural, biological or environmental mechanisms in shaping of mortality indices. At the same time it may be a useful tool in encompassing problem's frames, this method can allow to define main directions and aims for further analysis. Furthermore, on the ground of ecological investigations and from two century's experience in social statistics there is a possibility to postulate some principles for the regional data analysis. These principles can be formulated as the follow:

1) The study of geographical pattern regularity of violent mortality needs to be taken into account the role of historical background. In other words, the historical approach should be one of the basic components in investigation of regional diversity. The example of mortality pattern in Russian Federation and Belarus strongly supports the suggestion on existence of historical frames which are shaping the social space.

2) The influence of historic factor on mortality pattern is closely associated with regional differences in ethnic composition. While the ethnicity has determined the long term regional specificity the precise mechanism of ethnic factor is not clear: the problem is connected with complex interaction of cultural and biological components, in spite the cultural sphere superiority, the significance of biological or evolutionary processes cannot be totally neglected.

3) Social and cultural changes will lead to changes in mortality pattern. Although it is related both to the spatial characteristics and time trends, the latter have responded in more visible manner. The mortality dynamic after dissolution of the USSR conclusively demonstrate the role of social factor.

4) Multifactorial dimension in origin of social and demographic indicators, at once, is the principle property and the main

methodological barrier in investigation of violent geography. The sum of social, cultural, ethnic and environmental reasons are shaping the regional pattern, thus practical inability of methodological separation between factors set has a major limitation.

## Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this article.

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