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DEMOGRAPHIC SITUATION IN THE VOLGA ECONOMIC REGION

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Abstract

At the present stage of Russian society development, scientific understanding of the new demographic realities, their comprehensive analysis in order to stabilize the reproductive processes in the regions and to develop a socially sound concept of regional socio-economic development are necessary. Population is an essential prerequisite for the existence of social production and the development of its social forms. The obvious need to take into account the demographic factor in the development of education, health care, services, housing construction, solving employment problems. Depopulation is a fait accompli in the most Russian regions' demographic history. Depopulation processes allow us to talk about the crisis form of regional demographic development. The relevance of the study makes it necessary to focus society's attention on the negative socio-economic consequences of the current demographic situation in Russia and possible ways to overcome them. The purpose of this study is to determine an objective assessment of the negative processes taking place in the sphere of demographic situation in the Volga economic region. The work carried out a statistical and economic study of some trends in demographic development, which provides an opportunity to carry out preliminary demographic and social examination of management decisions taken, to develop the basis of a strategy for balanced regional economic and demographic development. The work used data of the Russian Federation State Statistics Committee, the Samara Regional State Statistics Committee.

Keywords: Comparative analysis, demographic situation, natural population movement.

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1. Introduction

Russia has the largest territory in the world - more than 17 million square kilometers, which is almost double the territory of such countries as China, the USA, Canada. At the same time, its population is not so large (ninth place in the world after China (1373.5 million people according to 2017), India (1266.9), the USA (323.9), Indonesia (258.3), Brazil (205.8), Pakistan (201.9), Nigeria (186.0), Bangladesh (171.7) and is unevenly distributed over the territory. Negative processes taking place in the sphere of the Russian Federation demographic situation give reason to talk about the threat of entering the era of demographic catastrophe (Maleva, Makarentseva, & Tretyakova, 2017). The market economy principles, their consumer orientation assume a scopes variety of perspective demographic calculations applied results as means of economic entities and public institutes' information needs satisfaction (Fernihough, 2017). In this regard, the need for demographic factors' statistical and economic analysis as a prerequisite for the development of the most rational schemes for the organization of socially oriented spheres of society and possible directions for their development is only increasing.

The study of the regional demographic situation and the identification of its differentiation aspects should be carried out on the comparative analysis basis for a certain geographically compact set of regions (Arregui, Aleta, Sanz, & Moreno, 2018). We will accept the Volga economic district as the object of the study, which has eight subjects of the Russian Federation. By comparing socio-economic indicators of the demographic situation between the individual territories, we will identify the characteristics of their differences.

2. Problem Statement

The Volga and Samara regions, including traditionally belong to the group of regions with a tense demographic situation. Therefore, all the demographic processes inherent in Russia have been adequately reflected in the Samara region.

One of the important means of studying the territorial features of the population natural movement is its comparative analysis. As a result of the comparisons, the regions are streamlined and systematized by the nature of the socio-demographic situation, and a qualitatively new level of the population values reproduction indicators is ensured (Hallett, Farrer, Suding, Mooney, & Hobbs, 2018). Considering the Volga regions according to various of the population's natural movement private indicators, we can conclude about their significant differences in some of them.

3. Research Questions

The basis of demographic processes on the territory of Russia are huge differences between the country's subjects in terms of climatic, economic, social, national, political and other conditions. Thus, the identification of socio-demographic situation certain types is possible through a statistical analysis of the territorial differentiation of the indicators complex that determine the state of population reproduction at the regional level.

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4. Purpose of the Study

Population is an essential prerequisite for the existence of social production and the development of its social forms. The obvious need to take into account the demographic factor in the development of education, health care, services, housing construction, solving employment problems. The purpose of this study is to conduct a comparative analysis of the demographic indicators complex and to compile a rating estimate of the vital movement of the Volga regions' population.

5. Research Methods

One of the important means of studying the territorial features of the population natural movement is its comparative analysis. As a result of the comparisons, the regions are streamlined and systematized by the nature of the socio-demographic situation, and a qualitatively new level of the population values reproduction indicators is ensured (Wilson, 2016).

Recently, non-parametric methods of multivariate statistical analysis have been widely used as a method for conducting a comparative analysis of the socio-economic situation in the regions development (Ragsdale & Gutenkunst, 2017). These include the places' sum method, the "Pattern" method, the relative differences method, the multidimensional average method, etc. (Kobzar, 2006).

To conduct a comparative analysis of the demographic situation of the Volga regions, we selected five indicators characterizing the population's natural movement:

1. Birth rate;
2. Mortality rate;
3. Infant mortality rate;
4. Life expectancy;
5. Natural growth.

The values of these indicators, indicated by numbers in the above sequence, are given in the table 01.

Table 01. Initial data of a comparative analysis of the socio-demographic situation in Volga economic region, 2017

Regions	Birth rate	Mortality rate	Infant mortality rate	Life expectancy	Natural growth
Republic of Tatarstan	12,4	11,3	5,1	73,39	1,1
Republic of Kalmykia	11,0	9,9	8,0	73,47	1,1
Penza region	8,9	13,1	5,6	73,34	-5,2
Samara region	10,8	13,7	5,1	71,73	-2,9
Saratov region	9,5	13,6	6,5	72,88	-4,1
Ulyanovsk region	10,1	14,0	6,9	72,34	-3,9
Astrakhan region	12,0	11,4	5,7	73,35	0,7
Volgograd region	10,0	13,1	5,8	73,54	-3,1

Source: authors based on Statistics on Russia, Regional maps (Statistics on Russia, 2019).

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This group of signs includes both direct indicators, an increase in the values of which positively characterizes the state of the demographic situation, and inverse indicators. The direct ones should include the 1,4,5th indicators, the reverse 2,3rd.

The simplest non-parametric estimation methods in a state comparative analysis of the Volga region demographic situation is the places' sum method. Having established the order of regions places for each indicator so that the first places are assigned to regions with the most prosperous demographic situation, the places' sum for each region is calculated. The criterion for improving the demographic situation is the total amount reduction.

The lowest values of most private vital indicators are typical for the Republic of Tatarstan. At the same time the republic of Kalmykia owns two first places out of five considered. However, Kalmykia has the highest infant mortality rate.

In the Samara region, as in Tatarstan, the lowest infant mortality rate. Samara Region also has a fourth rating in terms of birth rate and natural population growth. The most unfavorable demographic situation is observed in the Ulyanovsk and Saratov regions, having the largest places' sum.

The method of the places' sum has a significant disadvantage: the differences between the values of the characteristics by neighbouring regions have the same step - unit. In reality, this is not so. Moreover, the differences can be several hundredths or several times.

In order to summarize rating estimates more fully reflect the measure of actual differences of private indicators, in non-parametric statistics, multidimensional average method, the «Pattern» method and the relative differences method are used.

The «Pattern» method allows to obtain a single expression of different scale characteristics of a multidimensional phenomenon with preservation of a differences measure between regions. The calculation of multidimensional estimates by the «Pattern» method leads to a certain bias in the integral estimates of the demographic situation in comparison with the previous method, although the statistical assessment overall picture of the regions remains.

The «Pattern» method essence is that the best values of the measures are used as the normalized values base:

$$t_{ij} = \frac{X_{ij}}{Xi_{max}}, (1)$$

At the final stage, for all the calculated indicators of each region, a multivariate estimate is calculated, based on which the regions are ranked by the nature of the demographic situation.

The relative differences method close to the «Pattern» method. The vital indicators integral estimate is determined by the ratio of the considered difference and the best coefficients to the difference of the best and worst coefficients:

$$t_{ij} = \frac{X_{ibest}}{X_{ibeststst} - X_{iworst}} * 100\ \%, (2)$$

The results of the comparative analysis for all the considered methods, as well as for the multidimensional average method, are shown in table 02.

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Table 02. The results of a comparative analysis of the natural population movement indicators in the Volga economic region by non-parametric estimation methods

Regions	Regions ratings			
	The places' sum method	**The «Pattern» method**	**The relative differences method**	**The multidimensional average method**
Republic of Tatarstan	1	1	1	1
Republic of Kalmykia	2	3	2	2
Penza region	5	5	6	7
Samara region	4	6	5	5
Saratov region	7	8	7	6
Ulyanovsk region	6	7	8	8
Astrakhan region	2	2	3	3
Volgograd region	3	4	4	4

Source: authors.

The calculation results of the generalizing assessment of the demographic situation by various non-parametric methods have small differences in the regions rating. However, the differences between the evaluation structures of the above methods are not fundamental.

According to their demographic characteristics, the Volga regions are divided into four typical groups, conditionally divided into regions with a «relatively prosperous», «pre-crisis», «crisis» and «deeply crisis» demographic situation. The group with a «relatively prosperous» demographic situation in the Volga region includes the republics of Tatarstan and Kalmykia. The «pre-crisis» level is observed in the Astrakhan and Volgograd regions. Saratov region and Samara region are included in the group characterized by the «crisis» level of demographic situation, the «deep crisis» socio-demographic situation is observed in the Penza and Ulyanovsk regions.

6. Findings

The comparative interregional analysis of demographic indicators of the Samara region with other regions of the Volga region showed that the Samara region is characterized by unfavourable demographic situation. The negative point is the lowest life expectancy of all regions of the Volga economic region, as well as the high mortality rate. The highest rating in the Volga region (with a relatively favorable demographic situation) is held by the republics of Tatarstan and Kalmykia. In general, in the regions of the Volga region most demographic indicators coincide with the average Russian level (Ivliev & Cheremisina, 2014). The comparative analysis has rather large goals for researchers. Taking into account territorial differences in the level of demographic situation is necessary not only for the purpose of comparing individual regions by demographic indicators, but also for the development of goals and means of regional policy, in order to identify the role of certain factors in the formation of demographic situation and, where possible, influence on them.

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7. Conclusion

The study of the demographic development results involves the widespread use of mathematical and economic-statistical analysis and modeling methods (Roth & Caswell, 2016). This is due to the need to develop and implement a strategy for the region social and economic development. During the expansion of market relations in general and territorial self-accounting in particular, the territorial administration bodies will constantly face problems related to the evaluation of enterprises' economic initiatives, their associations, ministries or other sectoral management bodies. Encouraging or blocking such initiatives will inevitably affect investment flows, and often population dynamics (Kurdova & Efimova, 2018). Therefore, in the development and implementation of regional economic and social policies, as well as in particular in the examination of economic projects, territorial governments will need information on the relationship between economic and demographic development in the region.

At present, when the family and the population reproduction problems have become particularly acute, when the depopulation pace is rapidly increasing, the demographic development problems of our country and the adequate demographic policies development have been brought to the attention of both the Government, Parliament and political parties and movements.

The national project «Demography» was a significant event in this regard, marking the transition to demographic issues awareness as one of the limiting factors of the socio-economic development of our country. This is one of the key national projects in Russia for the period from 2019 to 2024, which sets out priorities of activities in each of the demographic development areas. It is necessary to act, conduct research, develop and conduct a scientifically based family-demographic policy.

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