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REGIONAL POLICY IN THE FIELD OF PUBLIC HEALTH IN RUSSIA

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Abstract

Significant differentiation of socio-economic indicators in Russian regions indicates essential regional differences in initial conditions of demographic development. In recent decades, birthrate and mortality statistics in Russia allow us to speak of positive trends in the changing medical and demographic situation in the country, but general positive trend consists of epidemiological situation trajectories in certain regions, and they can hardly be called similar. However, the analysis of federal and regional normative documents in Russian Federation on health protection of population, and demographic development involves mainly the unified principles and approaches. The primary review of some socio-economic indicators makes it possible to talk about the existence of different models of health formation in the regions. We conducted a factor analysis of social and economic situation in the regions with subsequent clustering based on the list of selected statistical indicators that allowed us to work out common approaches to improving public health policies for each group of Russian regions considering their main historical, geographical and socio- economic characteristics. Regions of the country are divided into four groups, and for each of them there are some recommendations on socio-economic policies aimed at increasing the average life expectancy. Also, the need to recognize the problem of inequality in health at the federal level was substantiated.

Keywords: Regional differentiation, life expectancy, public health, demographic policy, regional policy, multivariable statistical analysis.

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1. Introduction

The significant differentiation of the socio-economic indicators in the Russian regions indicates essential regional differences in the initial conditions of demographic development. In recent decades, the statistics of fertility and mortality in Russia allow us to speak of positive trends in medical and demographic situation in the country, but the trajectories of changing epidemiological situation in the subjects of the Russian Federation, which form the general positive all-Russian trend, can hardly be called similar. Methods of assessment of public health and health system's effectiveness, the factors affecting public health and demographic trends, incl. regional aspects, were studied by Shishkina, Kakorina, Ermakova, Lisitsyna, Eremin, Shabanova, Sabgaida, Vishnevsky, Andreeva, Kozlova, Kuklina, Kuzmin and others.

2. Problem Statement

At the same time, the approaches to assessment (including comparative assessment) of socioeconomic policy's influence on public health in countries and regions with significant regional differentiation, based on the available capabilities of a particular subject, remain studied insufficiently. This is the reason for topicality of improving approaches to socio-economic policy based on the priority of public health in the regions of Russia. In addition, in recent decades, approaches to understanding the process of forming the population health have significantly expanded: if traditionally these issues were exclusively attributed to the health system, modern theories indicate a significant number of other factors affecting the health status. Thus, the health factors are largely determined by the socio-economic status of a person, which includes a level of education, income level and occupation and the differences in which are the most fundamental cause of inequalities in health (Adler, 2002).

3. Research Questions

In our study, we investigate which social and economic factors have the greatest influence on public health in the regions of Russia. Statistical factor analysis in a comparative interregional aspect will allow to build a scientifically founded policy in this area, and it'll help to improve the state of public health and, as a result, to increase the economic potential of the territories.

4. Purpose of the Study

The purpose of the study is to develop measures to improve public health policy at the regional level in Russia, based on public health factors.

5. Research Methods

The choice of indicators characterizing the life conditions and lifestyle of the Russian population is significantly limited by the content of federal statistical observations. We have selected the available socio-economic indicators that affect the population health and which, in their turn, can be influenced by the policy of state regulation. The primary review of these indicators allows us to put forward a

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hypothesis about the existence of different models of health forming in the regions - we evaluated the contribution of each of selected factors to the process of forming public health in order to identify such models. For this purpose, a factor analysis of the social and economic situation in the regions was carried out, followed by their clustering based on the list of selected statistical indicators, which allowed developing common approaches to improving the policy in the field of public health protection for each group of subjects of the Russian Federation, with considering their main historical, geographical and social -economic characteristics. Statistical analysis with using multivariate statistical methods (correlation, factor, regression, dispersion and cluster analysis) was carried out in the STATISTICA system (Hill & Lewicki,2007; StatSoft, 2013). For the statistical analysis, the system of 22 indicators was used: population number, average life expectancy at birth, some objective standard of living indicators (economic, social, environmental) and indicators of the health system's resource availability in the subjects of the Russian Federation (socio-economic health indicators - SEHI). As a database, we used the values of SEHI in 2013 from the official statistical digests of Federal State Statistics Service of the Russian Federation.

6. Findings

Correlation analysis of SEHI (based on the Pearson correlation coefficients r and Spearman's rank correlation coefficients) revealed significant correlation relationships of different pairs of indicators. With the help of factor analysis, four factors that have the strongest impact on the population health were identified. We developed four-factorial and seven-factorial models using the principal component analysis, and with the use of the Kaiser criterion, four factors (factor indicators) were identified with the following meaningful (socio-economic) interpretation: F1 - composite economic factor (per capita monthly incomes, per capita gross regional product), F2 - health factor (morbidity per 1000 population, number of hospital beds, number of visits to outpatient clinics per shift, number of doctors, number of nurses per 10 thousand people), F3 - composite welfare factor (the proportion of the population with incomes below the subsistence minimum, the total area of living space per capita); F4 - the share of the employed population with higher education. The constructed regression linear relationship between standardized integral demographic indicator (average life expectancy at birth) and F1-F4 was estimated as strong (the coefficient of determination r2 ≈0,64). The economic factor F1 is insignificant ($p \approx 0.25 > 0.10$) affects the average life expectancy at birth, the welfare factor F3 is statistically significant ($0.050 > p \approx 0.018 > 0.005$), and the health factor F2 and the factor of the employed population with higher education F4 is high significant ($0.0005 > p$). Moreover, the correlation between the average life expectancy at birth and F2, F3 is negative.

As a result of application of k-means clustering and hierarchical clustering, using Ward's method and Euclidean distance, a qualitative partition of 83 regions into 9 clusters was obtained: a relative (3×3) classification of regions in a nominal scale of measurements was carried out. Based on socio-economic and historical-geographical characteristics, clusters isolated through statistical analysis were combined into several groups. Let's consider them in more details.

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6.1. The first group of Russian regions.

Relatively prosperous regions of Central Russia, the Volga region, the North-West, as well as the industrialized regions of the Ural, Siberia, and the Far East (Table 01). They are characterized by medium standard of living and medium life expectancy (in exceptional cases - high, as in Moscow (76.37 years in 2013) and St. Petersburg (74.22)).

Regions in this group are closest to the end of the epidemiological transition, a large proportion of deaths are due to reasons strongly associated with age, so the increase of life expectancy should be achieved mainly by increasing the average age of death from various causes. There is a so-called avoidable mortality methodology, which is applicable in countries with different levels of economic development (Charlton, 1986). Avoidable mortality is considered as an opportunity to reduce the loss of population from causes that are susceptible to influence by health institutions and is defined as "mortality due to causes identified by experts as preventable by health system efforts based on current knowledge and practice in certain age and sex groups of the population" (Mikhailova & Ivanova, 2006; Sabgaida, 2013). The most effective strategy for the improvement of public health for these regions is to concentrate efforts on reducing preventable losses through medico-social prevention and rehabilitation, the introduction of high-tech methods of treatment, the revitalization of lifestyle activities.

Table 01. The first group of Russian regions

Central Federal District	**Volga Federal District**	**Northwestern Federal District**	**UralFederal District**	**Siberian Federal District**
Moscow	Perm Krai	Saint Petersburg	Sverdlovsk Oblast	Tomsk Oblast
Voronezh Oblast	Bashkortostan	Komi Republic	Chelyabinsk Oblast	Novosibirsk Oblast
Moscow Oblast	Samara Oblast	Karelia	Tyumen Oblast	Omsk Oblast
Lipetsk Oblast	Nizhny Novgorod Oblast	Arkhangelsk Oblast	Khanty–Mansi Autonomous Okrug – Yugra	Krasnoyarsk Krai
Yaroslavl Oblast		Murmansk Oblast	Yamalo-Nenets Autonomous Okrug	**Far Eastern Federal District**
				Sakha (Yakutia)

In the world practice, specialized programs have proven themselves (for the prevention of cardiovascular diseases, for control of the spread of cancer and others), when specialists of certain types of pathologies causing mortality develop a system of measures to reduce mortality in order of priority and taking into account the economic and social effectiveness of these measures. In Russia, many factors that result in high morbidity and mortality are not exclusively the responsibility of the Ministry of Healthcare of the Russian Federation, and government policies in these areas should include interagency cooperation, such as anti-drug policies or the prevention of road traffic deaths. For example, the death from road injuries depends on medical factors (the speed of medical care for victims of road accidents and its quality), but also non-medical (road infrastructure, automobile safety, abidance of traffic rules).

In general, for countries that have achieved some success in the struggle to increase life expectancy in 1994-2013, the following development trends are typical:

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- optimization of health care costs, saving money for re-equipping medical institutions, retraining staff and raising salaries (the Baltic countries and Armenia);

- introduction of healthy lifestyle standards - tobacco control (Turkey and Hungary) and programs for increasing physical activity and weight loss (Slovenia and Singapore);

- intensification of contacts between the population and the health care system through the introduction of the family doctor's institute, which in fact fulfills the role of the prophylactic medical examination programs (Armenia, Brazil, Lithuania) (Sorokin (Ed.), 2014).

For Russia, one of the main potential areas of life expectancy growth is the possibility of increasing this indicator in the working-age population, in particular, among the men. Russian healthcare system, based on the decisive priority of treatment, rather than prevention, actually gives priority to the interests of those who have not reached working age or have emerged from it. It is important to raise medical prevention to a level adequate to its role in the possible reduction of morbidity and mortality in comparison with the actual medical care, perhaps to consider the mechanism of public-private partnership in organizing the medical examination of the working population.

In many ways, over-mortality of male population of working age can be influenced by a decrease of alcohol consumption. The main measures of the alcohol policy are known: a healthy lifestyle propaganda, available treatment and prevention programs, pricing policy, developing and adopting technical regulations for alcohol and alcohol-containing products, restricting the retail sale of alcohol and advertising. However, we would recommend to pay attention to the structure of alcohol consumption in Russia, because it’s the high level of consumption of strong alcoholic beverages that leads to such high alcohol mortality. World experience shows that changing the structure of alcohol consumption is much more effective than prohibitive measures. It’s also known that people with low incomes consume more alcohol than people with high and medium incomes, and exactly such a dependence of consumption exists in connection with the level of culture and education (Nemtsov, 2010), i.e. the main source of depopulation in Russia is people with low education and income. Therefore, it’s important to study the social and economic circumstances that lead to dangerous abuse of alcohol; to evaluate the effectiveness of psychological and therapeutic methods before putting them into practice; to determine the potential contribution of various departments in the fight against alcohol and smoking, including health, education, law enforcement, trade management and the labor market management.

6.2. The second group of Russian regions.

The problematic regions of various districts of the country (Table 02), which are at the same stage of the epidemiological transition as the regions of the first group, but have some developmental lag - a lower standard of living and / or a lower life expectancy (The lowest in the group - 68.90 years in 2013 - in Orenburg Oblast).

Table 02. The first group of Russian regions

CentralFederal District	Volga Federal District	Southern Federal District	Northwestern Federal District
VladimirOblast	Orenburg Oblast	Kalmykia	Vologda Oblast
Smolensk Oblast	Mordovia	Adygea	Kaliningrad Oblast

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Ivanovo Oblast	Penza Oblast	Krasnodar Krai	Leningrad Oblast
Tula Oblast	Belgorod Oblast	Astrakhan Oblast	**Siberian Federal District**
Kaluga Oblast	Tatarstan	Volgograd Oblast	Altai Krai
Kostroma Oblast	Mari El Republic	RostovOblast	
Ryazan Oblast	Kirov Oblast	**North Caucasian Federal District**	
Tambov Oblast	Chuvash Republic	North Ossetia-Alania	
Oryol Oblast	Udmurt Republic	Stavropol Krai	
BryanskOblast	Saratov Oblast		
KurskOblast	Ulyanovsk Oblast		

Regions of this group have a higher mortality rate with medium development level, so they need, by expert analysis, to identify the main problem areas in the mortality structure (for reasons, sex and age groups) and to focus on them when developing population and health policies. The same recommendations are relevant, of course, for other regions, but these regions need to remember that the presence of unresolved problems of social and economic development (for example, low income levels of the population, as in the Altai Krai, or spatial polarization of the suburbs around St. Petersburg and peripheral municipalities of the Leningrad Region) in many ways interferes the success of the life expectancy increasing measures.

In general, the regions of this group need a more thorough analysis of the mortality structure, as well as a factor analysis of the standard of living of the population and the subsequent application of the best practices of neighboring regions with a similar resource and economic potential. In the Northwest Federal District, the Republic of Komi can serve as an example: it managed to improve the standard of living of the population, and to increase the average life expectancy by 12.3% to 69.27 years (with the average Russian indicator of 70.76 years) for 10 years (since 2003).

6.3. The third group of Russian regions.

Republics of the North Caucasus (Dagestan, Chechen Republic, Karachay-Cherkess Republic, Ingushetia, Kabardino-Balkar Republic) are regions with unique natural and climatic conditions of life. They are characterized by high life expectancy (much higher than the average for Russia, in particular, in Ingushetia - 78.84 years in 2013), despite the low living standards of the population.

The indigenous population of the Caucasian region has a natural historically elevated concentration of long-term people, called the phenomenon of group longevity, which arose and became entrenched, that is, it has been traced for quite a long time. This phenomenon is the result of a complex harmonic interaction of environmental factors, genetic and psychological characteristics of national-ethnic groups, in particular, the gerontocratic nature of traditional ethnic culture. These regions have a demographic potential that is rare for Russia (high birth rate, low mortality, small proportion of the population over working age), which makes investments in human capital very promising. To further increase life expectancy, it is necessary to improve the quality of life, the cultural level of the population,

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the development of health, education, physical education and sports, as well as the equalization of municipalities in terms of the level and quality of life.

6.4. The fourth group of Russian regions.

The regions of Siberia, the Far East and other regions, lags far behind in its development of the national average (Table 03). These regions are characterized by low life expectancy (the Tyva Republic – 61,79 years in 2013, lower than average indicators for Russia by 12.7%) and low standard of living, but also the apparent incompleteness of the epidemiological transition.

Table 03. The fourth group of Russian regions

Far Eastern Federal District	Siberian Federal District	Northwestern Federal District
Jewish Autonomous Oblast	Altai Republic	Novgorod Oblast
Amur Oblast	Buryatia	Pskov Oblast
Kamchatka Krai	Tuva Republic	Nenets Autonomous Okrug
PrimorskyKrai	ZabaykalskyKrai	**Central Federal District**
Khabarovsk Krai	Irkutsk Oblast	Tver Oblast
Magadan Oblast	Khakassia	**Ural Federal District**
Chukotka Autonomous Okrug	Kemerovo Oblast	Kurgan Oblast
Sakhalin Oblast		

Analysis of mortality from external causes in the regions of this group shows that it causes significant demographic losses in years of life. Therefore, life expectancy rise by reducing the traumatic mortality rate, especially at working age, should be one of the main directions of the population health policy. High mortality from external causes is due to both behavioral and environmental risk factors. The indispensable conditions for the reduction of traumatic mortality are the reduction of poverty and inequality, the organization of safe working conditions, recreation, movement, infrastructure development, the creation of a social environment with the choice and achievement of decent living conditions, the strengthening of the police and judicial system, as well as socio-economic and cultural development generally. Prevention of behavioral risk factors should include measures for the formation of self-preserving (vital) behavior in the population (including the promotion of a healthy lifestyle, adherence to safety practices, the prevention of risky, aggressive behavior, stress reduction programs, the development of social skills, helplines), the implementation of alcohol policy, etc. Using the Haddon matrix is one of the effective tools for combating mortality from external causes (Yumaguzin, 2015).

Also, a significant indicator characterizing the epidemiological situation in the regions of this group is the high mortality from infectious and parasitic diseases. It largely depends not only on the sanitary and epidemiological well-being of the territory, but also on socio-economic factors - poor living conditions, low incomes, lack of work, etc. Ultimately, the most important mechanism for the spread of infectious diseases is the social and property differentiation of the population. Therefore, along with such point-based measures as improving the organization of medical care, strengthening the surveillance of the biological safety of food and water and the surveillance of socially conditioned infectious and parasitic

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diseases (viral hepatitis, tuberculosis, etc.), the complex socio-economic development of the territory is necessary.

7. Conclusion

The analysis makes it possible to conclude that, while developing an increasing life expectancy policy, it's necessary, first of all, to determine the main causes of death, then to identify the factors that determine the mortality from these causes. At the same time, it must be remembered that medical progress and the implementation of preventive measures in themselves undoubtedly have a positive effect on the level of health, but can also lead to increased inequalities in health. For Russia, the problem of social inequalities in health is extremely relevant in view of the historically established differences between different regions of the country, between urban and rural residents, inhabitants of small and large cities, and also due to the existing system of social stratification, which is based on the positions of the subjects on the labor market and in the structure of property relations, the level of education and income. In 2014, as part of the Oxfam's Programme on Empowering Civil Societies in an Unequal Multipolar World (ECSM BRICSAM (BRICSAM - Brazil, Russia, India, China, South Africa, Mexico)) (Kucheryavenko& Ukhova,2015), the important project was carried out to analyze the trends of inequality in Russia (economic inequality and inequalities in access to health care). According to the 2013 representative population survey, Russians think that the two forms of inequality most strongly affecting the well-being of the country's population are income inequality (72% of respondents) and inequality in access to healthcare (47%), despite the fact that officially the population of Russia is fully covered by the health system. Wherein, the main program documents on the development of the healthcare sector in Russia almost completely ignore this problem, while in many countries the problem of social inequality in health is recognized and solved at the governmental level through the implementation of appropriate strategies (Australia, New Zealand, Great Britain, Norway, Sweden, Canada (Social Determinants of Health, 2016), etc.). The practice of foreign countries shows that we often have to choose between absolute levels of health improvement and the reduction of inequalities in health, and some experts claim that the persistence of inequalities in health status is acceptable, while the population health or health of most social groups achieves some improvement (Phelan, 2010).

Thus, when developing scientifically based measures to improve the state demographic policy and health and social protection policies for each regions of the Russian Federation, it's necessary to analyze the process of forming the population health on its territory and to identify the dominant factors affecting health. At the level of federal socio-economic policy, we should pay more attention to the problem of inequalities in health. This problem is very actual for modern Russia and often reduces the effectiveness of measures taken at different levels of government.

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References

Adler, N.E. (2002). Socioeconomic Disparities In Health: Pathways And Policies. *Health Affairs, 2,* 60-76.

Charlton, J.R. (1986). Some international comparisons of mortality amenable to medical intervention.*BMJ, 292,* 295–301.

Hill, T., Lewicki, P. (2007). *STATISTICS: Methods and Applications*. StatSoft, Tulsa, OK.

Kucheryavenko, O., Ukhova, D. (2015). *Inequality and access to health care in Russia.* Oxfam. Retrieved from http://www.globalhealthcheck.org/?p=1745.

Mikhailova, Yu.V., Ivanova, A.E. (2006). *Preventable mortality in Russia and ways to reduce it.* Moscow: Federal Research Institute for Health Organization and Informatics of Ministry of Health of the Russian Federation.

Nemtsov, A.V. (2010). Alcohol mortality in Russia and ways to reduce alcohol losses. In: *Demographic prospects of Russia and the tasks of demographic policy* (pp. 66-74). Retrieved from http://www.demoscope.ru/weekly/2010/0425/analit01.php. In Russia

Phelan, J. C. (2010). Social Conditions as Fundamental Causes of Health Inequalities: Theory, Evidence and Policy Implications. *Journal of Health and Social Behavior, 51,* 28-40.

Sorokin, S. (Ed.). (2014). *Prolonging life* (Rep.). Retrieved July &aug., 2017, from ITAR-TASS Research Center with the assistance of experts from the Center for Social Economy. Website: https://republic.ru/images/infographix/voynarovskiy/life.pdf. In Russia

Sabgaida, T. P. (2013). Age features of preventable mortality in Russia.*Social aspects of population health, 5*(33). Retrieved January, 2017, from http://vestnik.mednet.ru/content/view/505/30/lang,ru/ In Russia

Social Determinants of Health [Advertisement]. (2016, June 27). Retrieved January, 2017, from http://cbpp-pcpe.phac-aspc.gc.ca/public-health-topics/social-determinants-of-health/.

StatSoft, Inc. (2013). Electronic Statistics Textbook.Tulsa, OK: StatSoft. WEB: http://www.statsoft.com/textbook/.

Yumaguzin, V. V. (2015). The Haddon matrix as an instrument to reduce mortality from external reasons. In: *XV April International Scientific Conference on the Problems of Development of the Economy and Society* (Vol.3, pp. 92-101). Hosted by Publishing House of the Higher School of Economics.