

# *Improving the quality of medical care in Russia: aspects of digital measurement problem*

Zoubets A.N.

Financial University under the Government of the Russian  
Federation  
Moscow, Russia  
ANZubets@fa.ru

Novikov A.V.

Financial University under the Government of the Russian  
Federation  
Moscow, Russia  
AVNovikov@fa.ru

Oborskiy A.Yu.

Financial University under the Government of the Russian Federation  
Moscow, Russia  
AYOborskiy@fa.ru

**Abstract** — The subject of the research is the process of improving the quality of medical care for the Russian population. The relevance of the topic considered in the article is determined by the problems of studying the real state of the medical services quality for the population in Russia in the digital dimension of a social problem, as well as fair compensation to the population of damage suffered during various natural, man-made and other nature emergencies.

The national health care system of Russia is taking measures to improve the quality and accessibility of medical care provided to the population. However, the socio-economic reforms carried out in the country require the achievement of a real effect from the measures being implemented to ensure the accessibility and quality of medical care to the population in the country's health care system. Currently, the Russian public health system does not actually conduct a public opinion survey on the responsiveness of the national health system to the expectations of the country's population in improving the quality and accessibility of medical care.

The authors identified the need for a digital measurement of this social problem to identify dynamic changes in its condition in terms of the need to regulate legal regulation of ensuring a healthy lifestyle for the population, ensuring accessibility of high-quality medical care for the population, and responsiveness of the Russian health care system to the population's expectations. Data on dynamic changes in the state of these areas should be controlled by monitoring using a single officially adopted methodology for measuring the opinion of the Russian population about the quality of medical care provided in the country's health system.

To evaluate in digital terms the quality of medical care, as well as the "cost" of life of the population in Russia, based on the analysis of statistical data to calculate a fair compensation for the damage suffered in various natural, man-made and other emergency situations.

To analyze theoretical and methodological approaches for selecting a system of indicators and methods for assessing the quality of medical services for the population, including the "cost" of living for the population in Russia.

The empirical level research methodology is based on the application of general scientific research methods: analysis and synthesis, induction and deduction, abstraction and concretization, polling of the population, as well as an

interdisciplinary analysis of the target attitudes of the Russian population, associated with the expectation of improving the quality of life in the country, including a fair reimbursement of the "cost" of life.

The initial data were the materials of the federal authorities of the Russian Federation; data from academic research institutes; expert evaluations of specialists on the "cost" of living in the country and in economically developed foreign countries; assessing the dynamic changes in the quality of life in the country; periodical materials.

**Results/conclusions.** The analysis of the theoretical and methodological approaches to the study of the quality of medical services for the population, including the "cost" of life of the population in Russia in the context of the growth of the Russian economy and expectations of improving the quality of life in the country, has been carried out. Systems of criteria, indicators, as well as methods for digital assessment of the quality of medical services and methods for determining the "cost" of life for the population in Russia in conditions of moderate socio-economic growth in the short term, have been developed.

The use of a single system of indicators and uniform methods for the digital assessment of the quality of medical care and the "cost" of life corresponds to the strategic goal of improving the quality of life of the Russian population.

The authors also proposed a number of practical recommendations for improving the quality of medical care for the Russian population.

**Keywords** — *health, health care, quality of life, quality of care quality of medical care, life expectancy.*

## I. INTRODUCTION

Currently, the high quality of medical care provided to the population by the national health care system is one of the most important components of a high quality of life - the phenomenon of happiness - achieving the highest good as a complete, self-valuable, self-sufficient state of life, the generally accepted ultimate subjective goal of human activity. At the same time, the phenomenon of happiness has a positive effect on the state of a healthy human life and its duration.

The quality of medical care for the Russian population in the Russian health care system is an integral component of improving the quality of life of the population, a strategic

objective and a criterion for the effectiveness of the country's socio-economic reforms. [1 - 12].

The real state of the medical services quality for the population in Russia needs a digital dimension and numerical expression of social problems generated by the organization of the existing national health care system.

The quality of medical services provided to the Russian population is an integral component of the quality of life, while paradoxically, despite the formal laws of logic, the opinion of the end user - the Russian population - about the quality of medical care is not taken into account when planning the development of the Russian health system (!).

## II. MATERIALS AND METHODS

A study conducted by the Financial University in 2018 showed that for residents of Russian cities the following components of quality of life are of primary importance:

- the state of the medical infrastructure, the quality of medical care;
- the state of the education system;
- the state of housing, the volume of housing construction in the city, as well as the work of the housing and utilities system - the quality and speed of maintenance of the housing stock;
- good work, providing a level of income that is sufficient to maintain the necessary food consumption, as well as other goods and services;
- the quality of the cultural environment (cultural infrastructure) in the city;
- the ability to purchase a car and use it, which implies a good condition of road facilities: city roads, the work of public transport, the work of the traffic police.

## III. LITERATURE REVIEW

It should be noted that the basics of understanding the healthy lifestyle of various social groups and the desire of a person to happiness and self-preservation were laid in the works of Aristotle, Democritus, Pythagoras, Socrates, Plato, etc.

The works of following authors are dedicated to the study of a healthy lifestyle: F. Bacon, F. Spinoza, Julien Offray de La Mettrie, M.V. Lomonosov, A.N. Radishev, P.A. Sorokin, M.M. Kovalevsky, N.K. Mikhailovsky and others.

In the 70s-80s. of XX century. the following authors devoted their work to the problem of providing high-quality medical care to the population (as part of the study of quality of life): R. Aron, D. Bell, Z. Zbigniew Kazimierz Brzeziński, A. Burgess, L. Berry, M. Weber, Louis Wirth, John Kenneth Galbraith, William Edwards Deming, L. Jeffers, J. Dobbs, Kaoru Ishikawa, F. Crosby, A. Campbell, A. Midow, Martha Craven Nussbaum, R. Park, M. Sirgi, G. Samly, Genichi Taguchi, Arnold Joseph Toynbee, Walter Andrew Shewhart, D. Evans.

The results of the studies of these authors revealed a complex relationship between the health status of the population and the quality of life of the society, as well as the influence of the dynamics of development of the deviant and delinquent behavior of the population on a healthy lifestyle and the dependence of accessibility to the population of high-quality medical care on social differentiation and stratification of society. These authors also noted the problems of the

authorities related to the organization of the provision of high-quality medical care to the population.

The following scientists devoted their works to the quality of life study: L.I. Abalkin, G.V. Osipov, V.G. Alekseeva, V.N. Bobkov, V.I. Verkhovin, Z.T. Golenkova, T.I. Zaslavskaya, V.V. Radaev, N.M. Rimashevskaya, R.V. Ryvkina, Zh.T. Toshenko, N.P. Fedorenko and others.

Socio-economic adaptation of the population in a changing environment was investigated in the works of: A.G. Agabegyan, S.A. Ayvazyan, M.K. Gorshkov, T.I. Zaslavskaya, V.K. Levashov, D.S. Lvov, M.A. Shabanova, V.V. Radaev, L.F. Orlov, E.B. Frolova, O.A. Mukhanova, V.D. Patrushev, A.N. Leontiev, V.A. Yadov and others. At the same time, most scientists distinguish objective and subjective indicators of the quality of life and the quality of medical care to the population.

The works of following scientists were dedicated to the studies of the quality of life and the organization of a socially healthy lifestyle interdependence : I.I. Brekhman, Yu.P. Lisitsin, S.B. Dobchinov and others. Problems associated with the social management of the formation of a healthy lifestyle were considered in the works of: V.K. Bochkarev, Yu.V. Kiriyanova, N.N. Klintsova, P.D. Kosinsky, V.I. Savinkov, A.S. Yakunin and others.

However, it should be noted that the following aspects are not sufficiently developed in modern Russian scientific literature:

- theoretical and methodological approaches to a comprehensive study of improving the quality of medical services provided to the Russian population, including using various methods of a sociological survey of the population about the quality of medical care provided;
- methods of digital assessment of socio-economic processes that cause negative changes in the quality of life of the population, including reducing the quality of medical care provided to the population;
- strategies of socio-economic adaptation for various social groups and segments of the population, including marginal ones, to changes in the quality of medical care provided.

## IV. RESULTS

International approaches to determining the quality of health care are usually grouped around its assessment by the following parameters:

- average life expectancy (or average healthy life expectancy);
- availability of medical care for the population;
- low financial burden on household budgets caused by the need for medical care - financial affordability of health care.

The modern trend in the economically developed countries of the world is the development of the health industry in accordance with the rating assessments of the quality of medical services, which will inevitably influence the development of the health care system in Russia

Table 1 shows the comparative data on the main indicators of the quality of medical care (averages for 2000-2017) of Russia, the EU, the OECD and the world average.

TABLE I. COMPARISON OF RUSSIA WITH THE EU, OECD COUNTRIES AND WORLD AVERAGE INDICATORS FOR THE MAIN INDICATORS OF THE QUALITY OF MEDICAL CARE (AVERAGE FOR 2000-2017)

The name of indicators	European Union	OECD countries	Russia	Worldwide average
Average per capita health care costs from all sources, in PPP dollars	2781.0	3612,8	891.5	925.3
Average life expectancy at birth, years	79.4	78.9	68.1	70.4
Expenditure on health from household budgets, in PPP dollars per person per year	430.6	558.9	300.6	211.9
Share of those who fell below the subsistence minimum of \$ 3.1 in PPP prices for 2011 due to excessive medical expenses,%	0.3	0.4	0.1	1.9
Percentage of residents spending more than 10% of the household budget for medical purposes,%	7.7	6.8	3.3	10.8
Percentage of residents spending more than 25% of the household budget for medical purposes,%	1.1	1.4	0.5	2.4
Basic Healthcare Accessibility Index	78.6	79.9	63.1	63.8
The proportion of the population for which the cost of surgery may be excessive,% of the population	4.8	6.5	43.8	44.2
Percentage of the population for whom the need to pay for surgery can lead to poverty,% of the population	1.1	3.4	18.2	46.8

TABLE II. ATTITUDE TOWARDS MEDICAL CARE AMONG RESIDENTS OF LARGE AND MEDIUM-SIZED RUSSIAN CITIES

How satisfied are you with the quality of care you use?	2015	2016	2017	2018
Completely satisfied	17%	20%	15%	18%
Rather satisfied	48%	46%	52%	50%
Rather not satisfied	23%	23%	21%	21%
Not at all satisfied	10%	10%	11%	11%
The proportion of those who are completely or mostly satisfied with the quality of medical services that he receives personally	65%	65%	65%	68-70%
Satisfaction with the quality of medical care by type of medical institution				
Free medicine	64%	64%	65%	65%
Insurance medicine	69%	76%	85%	81%
Paid medicine	64%	65%	68%	72%

According to the research of the Financial University in 2018, consumer perception of the quality of public health services is gradually improving. As can be seen from Table 2, the proportion of Russians is growing, completely or mostly satisfied with the quality of medical care they receive personally.

Today, the proportion satisfied with the quality of medical care rose to almost 70% versus 65% a year earlier. Most Russians are satisfied with the health care services they receive under policies purchased at their own expense or at the employer's expense. From the data given in Table 3, it is clear that the proportion of Russians who have recently had no reason to sue doctors and medical institutions for negligence, mistakes and other omissions is growing.

The share of Russians who did not face a shortage of funds for medicines is also growing - in 2018 it was 65% versus 61% in 2015 (Table 4).

In our country, the problems worsened with the availability of medical care to the population. The share of those who recently had to turn to medical institutions in other regions or abroad is constantly increasing. Over the past two or three years, more than a quarter of residents of large and medium-sized cities were forced to travel to another city or abroad for the necessary medical care, compared with 20% in 2015 (Table 5).

The number of Russians is declining, who believe that there are enough medical institutions in their city to provide quality medical care to the population - in 2018 their share fell to 22%. According to the study, the most scarce things for Russians today are general clinics, diagnostic centers and specialized medical clinics (Table 6).

TABLE III. WILLINGNESS TO SUE DOCTORS AND MEDICAL INSTITUTIONS AMONG THE POPULATION

Have you recently had cases where you had a reason and desire to file a trial lawsuit against the doctor or medical institutions for negligence, errors and other omissions?	2015	2016	2017	2018
Yes	24%	25%	26%	16%
I did not come across it myself, but among my friends there were such cases	6%	8%	8%	11%
No, and among my friends there were no such situations.	70%	67%	66%	73%

TABLE IV. LACK OF FUNDS FOR MEDICINES AMONG RUSSIANS

<b>During the last year, have you encountered a situation when you could not buy the necessary medicine because of its high cost?</b>				
	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Yes, there were several such cases.	25%	25%	26%	27%
Yes, there was such a case	14%	13%	10%	8%
No, I did not encounter such a problem.	61%	62%	64%	65%

TABLE V. APPEALS OF THE RUSSIAN POPULATION FOR MEDICAL CARE IN OTHER REGIONS OR ABROAD

<b>Have you, your relatives or friends recently had cases when you had to apply for medical help to another region, to Moscow or abroad?</b>				
	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Yes	20%	23%	23%	26%
None	80%	77%	77%	74%

TABLE VI. ATTITUDE OF THE POPULATION TO THE ADEQUACY OF THE NUMBER OF MEDICAL INSTITUTIONS IN THEIR CITY

<b>What medical institutions in your city are missing?</b>				
	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
The city lacks medical facilities	27%	29%	33%	22%
Not enough general clinics	25%	26%	26%	27%
Hospitals	9%	10%	8%	11%
Specialized medical clinics	14%	16%	14%	18%
Diagnostic centers	21%	23%	20%	27%
Other	4%	3%	5%	0%

Currently in the Russian Federation, a number of different state and municipal (Ministry of Health of Russia, Rosstat of Russia, Special Communication and Information Service of the Federal Security Service of Russia, executive authorities of the Russian Federation, municipal authorities, etc.) and public organizations (Levada Center, FOM, Rosgosstrakh, the National Medical Chamber, and others) are conducting a study of patient and population satisfaction with the quality of medical care provided. At the same time, for each applied research, its own methods and tools are developed, which is why the obtained results are fragmented, which does not allow for a holistic picture of the quality of medical care to the population. Comparison and further use of the research results conducted using various techniques and different tools is not possible, which casts doubt on the effectiveness of the use of labor and financial resources attracted for these studies. In addition, due to the irregular nature of these studies, it is extremely difficult to objectively analyze the dynamic changes in improving the quality of medical care provided in outpatient settings, in day care and inpatient settings, in emergency care settings, and in determining public expectations.

The results of the study show that among the Russian population the proportion of those who are fully or mostly satisfied with the work of health care in the country is 47%, and the share of those who are completely or mainly satisfied with the quality of medical services received personally is 65%, despite the fact that recently in the Russian national health care system effective measures have been taken to improve the quality of medical care provided to the population, using high-performance and high-tech therapy in ambulatory, stationary conditions and the conditions of emergency medical care provision.

The results of the study found that:

- 74% of residents of large and medium-sized cities use the services of free medical facilities funded under the obligated medical insurance system, and 42% also use paid private medical institutions;

- The share of consumers of paid medical services among the population has increased by more than a third since 2011, while the proportion of holders of voluntary medical insurance policies acquired at their own expense or provided by the employer remains low — 3% and 8% respectively
- insurance medicine is distinguished by the fastest growing assessment of the quality of medical care - 85% of residents of large and medium-sized cities are satisfied with it completely or mainly;
- a third of research participants believe that there are enough medical institutions in their city, although earlier it was noted that the most general polyclinics and diagnostic centers are lacking;
- the proportion of Russians who lack money for medicines is decreasing - 64% of respondents said that over the past year they have not had cases when they did not have enough money to buy medicines;
- the proportion of those who have recently had to seek medical assistance in other regions, Moscow or abroad is not reduced, and an increase in the proportion of those who have recently had an excuse and intention to sue doctors or medical institutions for mistakes, negligence or omission.

## V. DISCUSSION

In accordance with the calculated final index of the quality of medical care for the population in Russian cities (where a study was conducted in 2017 according to the results of citizen surveys), the highest quality of medical services for the population is in the following Russian cities: Nizhny Novgorod, Grozny, Kazan, Ufa, St. Petersburg, Tyumen, Orenburg, Novokuznetsk, Penza, Tomsk.

Data on the assessment of the "cost" of life, obtained on the basis of population surveys are of a great interest. In the course of sociological research conducted in 2017–2018 by the financial university, the respondents determine the amount of the payment, which they consider to be a sufficient and fair

reimbursement to the family of a person who died in transport, at work or in other emergencies in the amount of 5.2 million rubles. According to the Russians, the median value of the

“cost” of human life is significantly less - 1.4 million rubles. (Fig. 1).

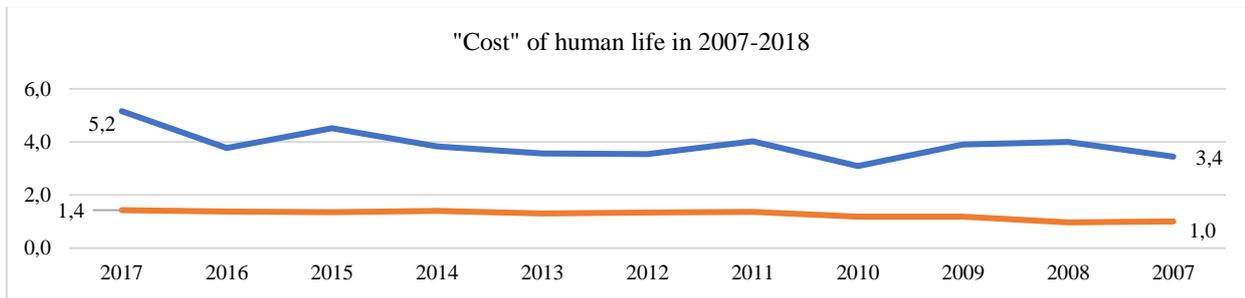


Fig. 1 Estimation of the “cost” of human life on the basis of data from sociological surveys of the Financial University in 2018.

Of particular interest are the assessments of Russians regarding the “cost” of disability - a fair and decent monetary compensation in connection with disability. In the course of sociological research, respondents named fair payments in

connection with disability in the amount of 4.2 million rubles - average and 1.2 million rubles – median value (Fig. 2), which is slightly lower than the compensation of the “cost” of life

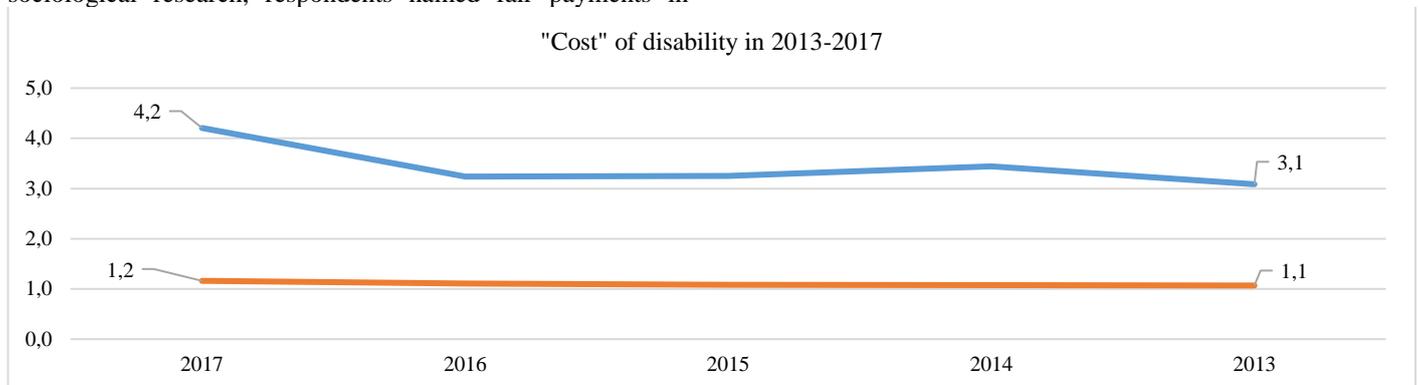


Fig. 2. The “cost” of disability based on data from sociological surveys of the Financial University in 2018.

Calculations according to the data on the dynamics of life satisfaction in Russia, per capita consumption and life expectancy in 2005-2015 show that the “cost” of living in our country is 38.2 million rubles. Calculations made on the basis of data on life expectancy, household income and migration flows in the Russian regions in 2010-2016 showed that the “cost” of human life is 27.3 million rubles. [13-16]

## VI. CONCLUSION

Currently, the level of medical care provided to the population in Russia cannot be recognized as complying with international standards. Analysis of the theoretical and methodological approaches to the assessment of the quality of life of people and the quality of medical services for the population that have emerged in modern science has shown that problems in the quality of medical services exist in all economically developed countries of the world. However, they depend mainly on the existing level of inequality and social injustice in each country.

### Recommendations

In order to improve the quality of medical care for the population, it is necessary to make a number of changes and additions to the Federal Law of 21.11.2011 No. 323 FZ "On the basis of health protection of citizens in the Russian Federation."

To accomplish this goal, the Government of the Russian Federation, as a subject of legislative initiative in accordance

with the Constitution of the Russian Federation, needs to develop and introduce, in accordance with the established procedure, to the Federal Assembly of the Russian Federation the said changes and additions to this Federal Law in the form of a draft federal legislative act.

The Government of the Russian Federation must establish the following procedure:

1. The Ministry of Health of the Russian Federation shall carry out, in the established procedure, the preparation of a draft legislative act providing for the introduction of the following amendments and additions to the Federal Law of 21.11.2011 No. 323 FZ "On the basis of the protection of public health in the Russian Federation":

1.1 In Article 2 "The basic concepts used in this Federal Law" to make the following concepts:

- healthy lifestyle - ...;
- availability of high-quality medical care for the population in the form of timely provision of guaranteed medical services ... .;
- the responsiveness of the health care system to the population’s expectations in providing quality medical care - ...;
- system of continuing medical education ...;
- shortage of medical personnel of all skill levels - ...;
- control over the conduct of an independent assessment of the quality of medical services - ...;
- methodology for assessing the quality of medical services - ...;

- method of assessing the "value" of human life "- ... ..

1.2 Clause 1 of Article 14 "Powers of federal public authorities in the field of health care" shall be supplemented with sub-paragraphs 21), 22), 23) of the following content:

21) organization and implementation of control over the availability of high-quality medical care for the population in the form of timely provision of guaranteed medical services, responsiveness of the health care system to the expectations of the population to provide high-quality medical care;

22) organization of the system of continuous medical education and monitoring the shortage of medical personnel of all skill levels;

23) the organization of the system of control over the conduct of an independent assessment of the quality of medical care to the population in medical organizations subordinated to the federal executive bodies, as well as medical organizations providing medical care to the population on a commercial basis, in the manner established by the authorized federal executive body;

1.3 Clause 6 of Article 14 "Powers of Federal State Authorities in the Sphere of Health Protection" shall be added with the following words: "Taking into account the assessment of the "cost" of human life, carried out according to a single methodology, approved by the authorized federal executive body in the established order", and state this clause as follows: "The implementation of measures aimed at saving lives and preserving people's health in emergency situations, eliminating the medical and sanitary consequences of emergency situations, informing the public about the health situation in the emergency zone and the measures taken, taking into account the assessment of the "cost" of human life a uniform methodology approved by the established procedure by an authorized federal executive body";

1.4 Clause 8 of Article 79.1 "Independent assessment of the quality of conditions for the provision of services by medical organizations" shall be added with the following words: "According to a uniform methodology for assessing the quality of medical services, approved by the established procedure by an authorized federal executive body", and shall be amended as follows: "An independent assessment of the quality of the conditions for the provision of services by medical organizations is carried out by public councils on independent quality assessment no more than once a year and no less than once every three years in relation to the same medical organization according to a uniform methodology for

assessing the quality of medical services approved by order authorized by the federal executive body."

2. The Ministry of Health of the Russian Federation, the Ministry of the Russian Federation for Civil Defense, Emergencies and Disaster Relief, the Federal Service for Supervision of Consumer Rights Protection and Human Welfare, the Federal Service of State Statistics with the participation of state authorities of the Russian Federation, Financial University under the Government of the Russian Federation in the sphere of its authority and in accordance with the principles of interdepartmental cooperation to develop and submit, in accordance with the established procedure, for approval by the Government of the Russian Federation:

3. To the governors of the subjects of the Russian Federation, mayors and heads of Russian cities to use the research databases of the Financial University for: calculation of transfers that are planned to be sent to the health sector to improve the quality of medical services provided to the Russian population in accordance with the Decree of the Government of the Russian Federation of December 26, 2017 No. 1640 "On Approval of the State Program of the Russian Federation" Health Care Development "with changes and amendments dated March 1, 2018 of the year;

- methodology for monitoring the quality of medical services provided to the population of the Russian Federation with a study of the opinions of the Russian population about healthy lifestyles, the availability of high-quality medical care and the responsiveness of the Russian health care system to the population's expectations of quality medical care

- methodology of assessing the "cost" of human life, with a study of the opinion of the Russian population about the fair amount of compensation payments to the families of the victims and those who received injuries of varying severity in natural and man-made emergencies.

- determining the fair and objective amount of compensation payments for damages to the life and health of the victims and their families in case of emergencies of various origins, within the framework of the general system of indemnification of damage from emergencies;

- assessing the quality of life and quality of medical care for the population of Russia, as well as planning and developing measures to improve the quality of life, the quality of medical care and its accessibility to the population, and the responsiveness of the Russian health care system to the expectations of the population.

## **Acknowledgements**

The article was prepared at the Financial University under the Government of the Russian Federation as part of the state assignment for 2018. Government of the Russian Federation, approved on December 28, 2017 No. 9980p-P17 on the subject of research "Study of the quality of medical care for the Russian population in the context of improving the quality of life."

## **References**

- [1] Korchagin Yu.A. The broad concept of human capital. Voronezh: CIRE, 2009.
- [2] Aganbegyan A.G. Achieving the highest level of life expectancy in Russia. *Economic policy*. 2012; (2): 134-156.
- [3] Aganbegyan A.G. On the goals and measures of health care reform in Russia. *Economic issues*. 2014; (2): 149-157.
- [4] Aganbegyan A.G. How much is human life in Russia? *Economic policy*. 2014; (1): 54-66.
- [5] Becker G. Economic view of life. Lecture of the Nobel Prize Laureate in Economic Sciences for 1992 *Bulletin of St. Petersburg University*; 1993. Series 5. Issue 3.
- [6] Ulumbekova G.E. Health of Russia. What to do: scientific substantiation of the Strategy for the development of health care in the Russian Federation until 2020. M.: GEOTAR-Media; 2010. 592 s.
- [7] Uralnis B.Ts. Problems of the dynamics of the population of the USSR. M.: The science; 1974. 336 p.
- [8] Cherkashin A.K. Assessment of quality of life based on the solution of the inverse problem of modeling population dynamics. *Population*. 2014; 1 (63): 54 - 67.
- [9] Dublin L.I., Lotka A.J. *The Money Value of a Man*. New York: Ronald Press, 1930.

- [10] Krupnick A., Ostro B., Lee R., et. Al. Resources for the Future's Health Benefits Models. December 1994 Report of Resources for the Future, N.W. Washington, D.C., 1994.
- [11] Murphy K., Topel R. The Value of Health and Longevity // *Journal of Political Economy*. 2006. Vol. 114. No 5. P. 871—904.
- [12] Mrozek J., Taylor L. What Determines the Value of Life? A Meta-Analysis // *Journal of Policy Analysis and Management*. 2001. Vol. 21. No 2. P. 253—270.
- [13] Loichinger E., Weber D. Trends in working life expectancy in Europe. *Journal of Aging and Health*. 2016;28(7):1194–1213. DOI: 10.1177/0898264316656509.
- [14] Kadefors R., Nilsson K., Rylander L., Östergren P.-O., Albin M. Occupation, gender and work-life exits: A Swedish population study. *Ageing & Society*. 2018;38(7):1332–1349. DOI: 10.1017/S 0144686X17000083
- [15] Dudel C., Myrskylä M. Recent trends in US working life expectancy at age 50 by gender, education, and race/ethnicity and the impact of the Great Recession. Max Planck Institute for Demographic Research. MPIDR Working Paper. 2016;(006). URL: <https://www.demogr.mpg.de/papers/working/wp-2016-006>.
- [16] pdf (access date: 19.07.2018).
- [17] 16. Leinonen T., Martikainen P., Myrskylä M. Working life and retirement expectancies at age 50 by socialclass: Period and cohort trends and projections for Finland. *Journals of Gerontology: Series B. Psychological Sciences and Social Sciences*. 2018;73(2):302–313. DOI: 10.1093/geronb/gbv104