Methodological Approaches to Risk Assessment of the Implementation of State Programs and their State Financing in the Field of Healthcare in the Regions of Russia

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Abstract

In the context of the permanent restructuring of the financial system of the state, the entire healthcare sector is also being transformed, including its financing. And in many respects, the development opportunities of the healthcare field depend on investments in it. The well-being of the country is determined by the accumulation of human capital, and its main value is the health of the people.

Purpose: Development of methodological tools for assessing the risks of implementing state programs and their public financing in the healthcare field as the most significant factor in the human capital development.

Design/methodology/approach: Methods of economic, system analysis and mathematical statistics formed the investigation methodological base. The methodological tools were tested on the official data of the Federal State Statistics Service and the Ministry of Finance of the Russian Federation for 2019–2021.

Findings: The results of the study determine approaches to assessing the risks of implementing state programs and their public financing in the healthcare field.

Originality/value: The ranking of the regions of the Russian Federation makes it possible to classify them into risk categories: from an extremely high risk level to a low risk level.

Keywords

State programs · Evaluation of efficiency · Rating of regions of the Russian Federation · Consolidated standardized coefficient · Target indicator · Value-oriented budget strategy

JEL Code

H7 · H21 · H61 · H51

1 Introduction

The basis of the methodological tools for diagnosing the effectiveness of the implementation of social state programs is the method of standardizing the indicators included in the system, reflecting the groups of resource financial support and target results, characterizing the potential for providing a value-oriented financial policy of the state, in which the achievement of the goal is assessed from the standpoint of universal human values, such as truth., goodness, socially and personally significant values—life.

Attention to the problem of state financing of healthcare has always been paid by scientists and practitioners in many countries of the world (Alfonso & Miguel, 2005; Anderson & Poullier, 1999; Arrow, 1963; Berger & Messer, 2002; Blomqvist, 2011; Bokhari et al., 2007; Getzen, 2000; Kulkarni, 2016; Tae & Shannon, 2013), and in the light of recent events—the COVID-19 pandemic, it is obvious that the healthcare system has become one of the most vulnerable systems that requires a special approach in terms of financing and public policy development.

It has been noted that despite the growth in government funding for the healthcare sector, which is especially noticeable during periods of crisis, it belongs to inefficient expenditure items (Anton & Onofrei, 2012; Chakraborty et al., 2013).

Scientists (Anton & Onofrei, 2012; Novignon et al., 2012) revealed that different levels of GDP and healthcare financing explain differences in population health, which is consistent with the results of other researchers (Bhalotra, 2007; Rajkumar & Swaroop, 2008). Methodological principles on which a number of studies were based (Anton & Onofrei, 2012; Bhalotra, 2007; Rajkumar & Swaroop, 2008) are associated with the use of regression analysis of structured

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E. G. Popkova (ed.), *Sustainable Development Risks and Risk Management*, Advances in Science, Technology & Innovation,
https://doi.org/10.1007/978-3-031-34256-1_19

statistical data and econometric methods (Gerdtham & Jonsson, 2000). At the same time, a number of studies (Alfonso & Miguel, 2005; Berger & Messer, 2002; Bokhari et al., 2007; Kulkarni, 2016; Tae & Shannon, 2013) refute the existence of a direct relationship between government spending on healthcare and population health indicators and demonstrate contradictory results.

Scientists (Berger & Messer, 2002) also showed that the increase in health insurance coverage in twenty OECD countries has a greater effect on reducing mortality than the level of public spending on healthcare. The strengthening of the role of additional private health insurance as one of the guarantees for improving the health indicators of the population was also emphasized in (Rebba, 2014).

Earlier, in the works of the authors of this article (Yashin et al., 2018; Yashina et al., 2017), a system was proposed for a comprehensive assessment of the effectiveness of financing and managing the healthcare system, according to the peculiarities of the government's financial policy for the human capital development and the socio-economic situation of the country.

In the context of crisis phenomena, the key in the field of budget policy is the transformation of the budget mechanism into an effective tool for macroeconomic stabilization and the use of all reserves of budget expenditures to finance the development of the economy and human capital (Bogolib, 2015).

2 Methodology

The first stage includes the analysis of data from the Ministry of Finance of the Russian Federation, the Federal State Statistics Service in order to determine comprehensive risk criteria for the implementation of state programs in the field of education, healthcare and social protection of the population.

Information on indicators should allow determining for each region the meaning of the criterion «probability of financing risk» (criterion «probability of timely and full public financing of state programs in the field of healthcare»), the meaning of the criterion «achievability of target indicators of government programs» (criterion «achievability»).

Risk is understood as the degree of timely and full financing of state social programs, as well as the degree of achievability of target indicators.

When determining the meaning of the criterion «probability of the risk of financial security», a system of budget indicators is used: indicators of independence, tax revenues from the economy, entrepreneurship, financial solvency, management expenses, interest expenses, socially oriented policy, production expenses, security of financing expenses for the socio-cultural sphere with their own income, security of financing expenses for the socio-cultural sphere with income taxes that form a regional product, etc.

When determining the meaning of the criterion «achievability of target indicators of state programs» (criterion «achievability»), a system of coefficients is used that characterizes the effectiveness of the implementation of state programs, indicated in Table 1.

The system of indicators that characterize the risks of implementing state programs and the potential for financing healthcare in the regions of Russia is built taking into account the structure of revenues, budget expenditures, target indicators-results of the implementation of state programs in the field of healthcare. The interpretation of indicators is given taking into account the interest of the subjects of analysis. The analysis is important for public authorities at

Table 1 The system of indicators characterizing the achievability of target indicators of state programs (fragment)

Target indicators	Interpretation of indicators taking into account the interest of the subjects of analysis
Total fertility rates	Maximization
Crude death rates	Minimization
Mortality of the working-age population	Minimization
Infant mortality rates	Minimization
Number of hospital beds per 10,000 population	Maximization
Population per hospital bed	Minimization
Capacity of outpatient clinics per 10,000 people	Maximization
The number of doctors of all specialties per 10,000 people	Maximization
Population per doctor	Minimization
Population per employee of paramedical personnel	Minimization
Number of nurses per 10,000 people	Maximization
Per 1000 women aged 15–49 Termination of pregnancy (abortion)	Minimization
Per 100 births termination of pregnancy (abortions)	Minimization я
Incidence per 1000 population	Minimization
The ratio of ambulances and medical staff	Maximization
GRP per capita	Maximization

Source: Developed and compiled by the authors based on data from the Federal State Statistics Service of the Russian Federation

Criterion «risk of financing healthcare» (F)				
	Low risk F3	F 3 – THC 1 IV category	F 3 – THC 2 III category	F 1 - THC 3 I category
	Low risk F2	F 2 – THC 1 V category	F 2 – THC 2 IV category	F 2 - THC 3 II category
	Low risk F1	F 1 – THC 1 VI category	F 1 – THC 2 V category	F 1 - THC 3 III category
		Low risk THC 1	Medium risk THC 2	High Risk THC 3
		Achievability Criteria for Health Targets (THC)		

Fig. 1 Combination matrix of the criterion «health financing risk» and the criterion «achievability of healthcare target criteria». *Source*: Calculated and built by the authors

all levels, public-private partnership structures, and the population. Some indicators are debatable, caused by a similar controversial principle of providing «medical care» or «medical service».

Based on the goal-setting of the provision of «medical care» or «medical services», both funding and criteria-results will strive for the maximum or minimum value.

The second stage is the standardization of indicators. Standardized indicators vary from 0 to 1 based on their calculation by formulas (1) and (2).

The first group (maximization of coefficients):

$$SC_{ij}^{*} = \frac{SC_{i\ max} - SC_{ij}}{SC_{i\ max} - SC_{i\ min}}. \quad (1)$$

The second group (minimization of coefficients):

$$SC_{ij}^{*} = \frac{SC_{ij} - SC_{i\ min}}{SC_{i\ max} - SC_{i\ min}}, \quad (2)$$

where SC_{ij}—actual value and SC_{ij}^{*}—standardized value of the *i*-th coefficient in the *j*-th region, $SC_{i\ max}$—the largest and $SC_{i\ min}$—the lowest calculated value of the *i*-th coefficient among the regions of the country.

At the third stage, the summary standardized coefficient is determined (SSC_j) according to formula (3).

$$SSC_j = \sum_{i=1}^{n} SC_{ij}^{*} \quad (3)$$

The region with the lowest value of the composite standardized coefficient has the best result SSC_j.

As a result of the applied standardization methods, consolidated standardized risk indicators are determined, which make it possible to calculate a consolidated standardized coefficient showing the risk of implementing state programs ($CSSC_{THC}$), and a consolidated standardized coefficient characterizing the risk of healthcare financing (SSC_f) in the regions of Russia.

When determining both the meaning of the criterion «risk of financing healthcare» (F), the meaning of the criterion «risk of implementing state programs—achievability of target health criteria» (THC), a rating scale is used—«low score—level 1», «medium score—level 2» or «high score—3 level».

Based on risk analysis (Fig. 1) each region is assigned a risk category:

- extremely high risk—I category, the meaning of the criteria «achievability of target healthcare criteria» and «risk of healthcare financing» are determined by the rating scale as «high»;
- high risk—category II, the meaning of the criterion «achievability of target healthcare criteria» is determined by the scale of assessments as «high», and the criterion «risk of financing healthcare»—as «medium»;
- significant risk—III category, the meaning of the criterion «achievability of target healthcare criteria» is determined on the scale of assessments as «high», the meaning of the criterion «risk of financing healthcare»—as «low» or the meaning of the criterion «achievability of target healthcare criteria»—as «medium», the meaning of the criterion «health financing risk»—as «high»;
- medium risk—category IV, the meaning of the criteria «reachability of target healthcare criteria» and «risk of healthcare financing» are determined on a scale of assessments as «medium» or the meaning of the criterion «reachability of target criteria for healthcare»—as «low», and «risk of healthcare financing»—as «high»;
- Moderate risk—Category V, the meaning of the criterion «achievability of target healthcare criteria» is determined on the scale of assessments as «medium», the meaning of the criterion «risk of financing healthcare»—as «low» or the meaning of the criterion «achievability of target healthcare criteria»—as «low», the meaning of the criterion «health financing risk»—as «average»;
- low risk—category VI, the meaning of the criteria «achievability of target healthcare criteria» and «health financing risk» are determined by the rating scale as «low».

If the objects of control have the same values of the criterion «risk of financing healthcare» and the criterion «risk of implementing state programs», the priority for

understanding the risk of implementing state programs and financing healthcare in the regions of Russia is the region where the population is larger.

3 Results

Empirical results of the assessment of financial resilience to budgetary stresses in the regions are presented in Table 2.

Based on the calculations, the regions were identified by risk categories (I-VI):

- Extremely high risk: Republic of Dagestan. Altai Republic;
- High risk: Astrakhan region, Chelyabinsk region, Irkutsk region, Arkhangelsk region;
- Significant risk: Lipetsk Region, Republic of Buryatia, Zabaikalsky Krai, Karachay-Cherkess Republic;
- Medium risk: Smolensk region, Kirov region, Republic of Tatarstan, Sverdlovsk region, Nizhny Novgorod region;
- Moderate risk: Moscow region, Tyumen region, St. Petersburg, Leningrad region;
- Low risk: Moscow, Sakhalin region.

For example, the Nizhny Novgorod region, according to the presented methodology, falls into the fourth category of risk or medium risk. The Nizhny Novgorod region ranks 53rd and 58th, taking into account the «Covid» indicators in the ranking. Based on statistical data on the healthcare department, it can be concluded that the Nizhny Novgorod region has indicators significantly lower than the national average in terms of overall birth rates, mortality, the number of doctors, nurses, population per doctor, morbidity, such as neoplasms, respiratory diseases, etc.

If the objects of control have the same meanings of the criterion «risk of financing healthcare» and the criterion «risk of implementing state programs», the priority for understanding the risk of implementing state programs and financing healthcare in the regions of Russia is the region where the population is larger. Let us highlight the risk factors for the implementation of state programs and their state financing in the healthcare sector in the regions of the Russian Federation.

- Public spending on health is reduced (in real prices, in % of GDP), priorities are being chosen to improve the health of the population, incl. Children, adolescents, a decrease in primary morbidity, a decrease in the mortality of Russian men;
- The low efficiency of healthcare in the regions is a shortage of doctors and nurses.
- Unsatisfactory quality of medical care, lack of funding and consistency in the training and advanced training of doctors;
- Increasing negative dynamics of «effective managers» in healthcare, lack of professionalism in management, based not only on knowledge in the field of management, economics and finance, but also on high moral ideals of a person.

Positive development factors that testify to the potential of public financing include a low tax burden, growth in non-oil and gas revenues, a low level of public debt, and an increase in the national wealth fund.

4 Conclusion

In general, the use of the developed methodological tools makes it possible to evaluate the regions of Russia in terms of the effectiveness of the implementation of state programs, providing the population with medical care in order to preserve and grow human capital in Russia.

The proposed methodology, based on a system of indicators that characterize the risks of implementing state programs and the potential for financing healthcare in the regions of Russia, makes it possible to implement a value-oriented budget strategy in order to financially ensure high standards of the quality of life of the population.

Table 2 Risk categories based on the analysis of the combination of the criterion «risk of healthcare financing» and the criterion «risk of the implementation of government programs»

Regions	Consolidated standardized coefficient characterizing the risk of healthcare financing	Levels according to the criterion «health financing risk»	Consolidated standardized coefficient showing the risk of implementing government programs	Levels according to the criterion «risk of implementing state programs»	Risk category
The republic of Dagestan	6990	3 F	44,56	THC 3	1
Altai Republic	7182	3 F	49,46	THC 3	1
Bryansk region	6309	2 F	45,63	THC 3	2
Chuvash Republic	6189	2 F	45,93	THC 3	2
Astrakhan region	5472	2 F	48,51	THC 3	2
Chelyabinsk region	5421	2 F	48,52	THC 3	2
Irkutsk region	5437	2 F	48,74	THC 3	2
Arhangelsk region	5869	2 F	48,84	THC 3	2
Mari El Republic	6543	2 F	51,27	THC 3	2
Kemerovo region—Kuzbass	5632	2 F	51,71	THC 3	2
Vologda region	5430	2 F	52,64	THC 3	2
Stavropol region	6099	2 F	37,32	THC 2	3
Lipetsk region	5376	2 F	37,47	THC 2	3
The republic of Buryatia	6533	2 F	37,48	THC 2	3
Zabaykalsky Krai	6271	2 F	37,66	THC 2	3
Karachay-Cherkess Republic	7045	3 F	39,86	THC 2	3
Kabardino-Balkarian Republic	7151	3 F	26,67	THC 1	4
Chechen Republic	7170	3 F	31,28	THC 1	4
Tambov region	6167	2 F	37,11	THC 2	4
The republic of Mordovia	6531	2 F	38,73	THC 2	4
Smolensk region	5581	2 F	40,42	THC 2	4
Kirov region	6234	2 F	41,96	THC 2	4
Republic of Tatarstan	5260	2 F	43,13	THC 2	4
Sverdlovsk region	5035	2 F	43,15	THC 2	4
Nizhny Novgorod region	5497	2 F	44,03	THC 2	4
Voronezh region	5331	2 F	33,25	THC 1	5
Khanty-Mansi autonomous Okrug—Yugra	3851	1 F	37,77	THC 2	5

(continued)

Table 2 (continued)

Regions	Consolidated standardized coefficient characterizing the risk of healthcare financing	Levels according to the criterion «health financing risk»	Consolidated standardized coefficient showing the risk of implementing government programs	Levels according to the criterion «risk of implementing state programs»	Risk category
Moscow region	4941	1 F	38,65	THC 2	5
Tyumen region	4218	1 F	38,95	THC 2	5
Saint Petersburg	3944	1 F	40,28	THC 2	5
Leningrad region	4375	1 F	43,64	THC 2	5
Moscow	4062	1 F	32,17	THC 1	6
Sakhalin region	4498	1 F	35,00	THC 1	6

Source: Developed and compiled by the authors based on data from the Ministry of Finance of the Russian Federation (Ministry of Finance of the Russian Federation, 2022) and the Federal State Statistics Service of the Russian Federation (Federal State Statistics Service, 2022)

Acknowledgments The study was carried out within the framework of the Strategic Academic Leadership Program «Priority 2030» of the Ministry of Education and Science of the Russian Federation, project N-426-99-2022-2023 «Socio-economic models and technologies for the development of creative human capital in an innovative society».

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