

Comparative assessments of the effectiveness of health care and health saving institutions in Russian regions

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Abstract. The relevance of the study is related to the global controversy about the indicators of "impact on the determinants of health and reduction of health inequalities" proposed by the WHO European Committee in the framework of the policy "Health 2020". The aim of the work is to test the hypothesis that the level of development of formal and informal norms and rules, established in the spheres of health care and health saving and at their intersections, affects the quantitative and qualitative characteristics of health of an individual, groups of people, the population as a whole, and also significantly determines the regional differentiation of the analysed parameters. Based on the results of the evaluation of the effectiveness of the functioning of health care and health-saving institutions using the DEA (Data Envelopment Analysis) method, the assumption about the influence of the level of development of health care and health-saving institutions on the dynamics of preservation and accumulation of health capital of senior citizens was confirmed. The novelty of the study is the use of DEA methodology "at the input" - resource indicators characterising health care and health saving in the Russian Federation in the regional aspect, and at the output - subjective assessments of satisfaction of the elderly with the work of the analysed institutions. Proposals on transformations necessary to improve the effectiveness of health care and health-saving institutions as an important condition for reducing regional inequality in health for the elderly citizens are formulated.

1 Introduction

In modern scientific literature, health care and health saving are considered from at least four positions: humanistic, legal, social and economic, each of which determines the specifics of

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forms and tools for implementing public policy in this area, as well as technologies for maintaining and strengthening physical health, psychological comfort, social well-being of individuals, groups of people, and the population as a whole [1].

The authors consider health care and health savings mainly in the context of the institutional approach [2]. Based on the objectivity of socioeconomic factors of health inequality, the paper puts forward the hypothesis that the level of development of formal and informal norms and rules in the spheres of health care and health saving and at their intersections affects the quantitative and qualitative characteristics of health of an individual, groups of people, the population as a whole, and also largely determines the differentiation of the analysed parameters by regions of Russia.

The paper attempts to assess the effectiveness of the functioning of health care institutions and health saving in the regions of the Russian Federation using the DEA (Data Envelopment Analysis) method. The novelty of the study is the use of DEA methodology "as an input": resource indicators characterising health care and health saving in the Russian Federation in the regional aspect, and as an output: subjective assessments of satisfaction of the elderly with the work of the analysed institutions. The obtained estimates became the basis for the conclusion about the significance of regional health inequalities among older people in Russia and the development of recommendations for overcoming them in terms of the development of health care and health saving institutions.

2 Health inequalities: socio-economic factors from a regional perspective

The global increase in life expectancy entails not only an increase in the number and proportion of the elderly population [3]. An important effect of global ageing is a more conscious investment of individuals and society in health, the desire to improve it. The growth of the standard of living and quality of life changes the social norm: it becomes prestigious and fashionable to take care of health, lead a healthy lifestyle, additional opportunities appear for this, including new institutions in the field of health care, informal practices of health-saving behaviour are institutionalized, including among older citizens [4].

However, the general vector of modern society to preserve health is unfolding against the background of contradictions, a significant proportion of which is due to health inequalities. This term is widely used to define differences, changes and disparities in the health of individuals and population groups. Obviously, not all health disparities are unjust (for example, they may be due to genetic or behavioural factors), so the concept of health inequity focuses on the distribution of resources and processes that shape health inequalities between social groups that are more and less advantaged socially and economically [5]. Thus, the term "health inequalities" does not usually refer to all differences, but only to optional, avoidable differences that may be related to income, social status, physical environment, working conditions, and access to health and health-saving institutions.

Research interest in the problem of health differentiation in Russia is intensified by regional socio-economic differences, nuances of life in urban and rural areas, social stratification, which is based on different positions of individuals in the labour market, in the property structure, differentiation of education and income levels, including different age groups of the population [6]. In 2014, under the Oxfam Programme (An international association of 17 organisations working in more than 90 countries around the world. The aim of the organisation is to address poverty and related injustices around the world) on Empowering Civil Society in an Unequal Multipolar World initiated by BRICSAM (BRICSAM includes Brazil, Russia, India, China, South Africa and Mexico) a project to analyse inequalities in Russia (both economic and inequalities in access to health care) was implemented [7].

According to a representative population survey in 2013, Russians believed that the two forms of inequality most affecting the well-being of the population were income inequality (72% of respondents) and inequality in access to healthcare (47% of respondents). Despite the fact that the Russian population is officially fully covered by the healthcare system and the right to free healthcare is enshrined in the Constitution, experts identified three main dimensions of inequality in access to healthcare in Russia: geographical, social (including discrimination against certain groups such as the homeless, migrants and prisoners) and economic. At the same time, the main programme documents on the development of health care in Russia do not focus on the problem of social inequality in health, while in many countries it is recognised, discussed, and there are examples of the development of national strategies in this direction (for example, in Australia, New Zealand, Great Britain, Norway, Sweden, Canada (Public Health Agency of Canada, 2023) and other countries) [8].

Thus, the problem of health inequality in Russia objectively exists, it is recognised at the international level, however, its specificity in the regional aspect and the peculiarities of the health care system in the Russian Federation is not the same as in other countries. This paper explores the relationship between (1) the level of development of formal and informal institutions in the spheres of health care and health saving and at their intersections and (2) quantitative and qualitative (including subjective) characteristics of the health of older people in the regions of Russia.

3 Materials and methods

It was decided to analyse the state of health and health-saving institutions:

1. In terms of the organisation of medical care, the functioning of institutions for the formation of a healthy lifestyle, the level of their financing in the region and the country (at the systemic or macro level, which affects the entire population);
2. In terms of the accessibility of health services and health promotion tools to the individual (at the individual or micro level, which affects the individual).

This paper has focused on three basic mechanisms of health differentiation: economic; organisational and managerial; and socio-cultural.

Basis economic mechanism commercial relations in the sphere of health care services are the main factors of health differentiation [9]. At the system level, this is manifested in the concentration of health care and health-saving institutions (especially high-tech treatment methods, effective preventive measures (check-up)), on solvent population groups. Economic barriers at the system level (high cost of services, lack of available alternatives) lead to the fact that citizens with low incomes may be deprived of certain types of medical care or consume them in insufficient amounts to obtain a positive effect.

Organisational and management mechanism characterises infrastructural limitations in the activity of health care and health saving institutions (at the federal level, at the level of the constituent entity of the Russian Federation, at the local level). The most important here is the provision of qualified workers (doctors, paramedical staff, auxiliary staff), medical equipment, equipment, etc. [10]. Significant factors here include disparity in the organisation and management of health care in large, medium, small cities, in rural areas of the country.

Sociocultural mechanism has its source in the prevailing type of medical culture. At the behavioural level, it is expressed in health strategies, which each person chooses depending on the ability to recognise his or her problems in this area and search for ways to solve them [11]. At the systemic level, the options of positive social actions in relation to health care institutions and health saving are limited by cultural stereotypes, values, features of education, religion and other characteristics of society.

The identified mechanisms of health differentiation became the basis for the analysis of the effectiveness of the functioning of health care institutions and health saving in the

following aspects: (1) differences in the quality of health care services (organisational and management mechanism); (2) inequality of access to health care services for people with different socio-economic status (economic mechanism); (3) use of health care resources, including contacts with specialists, hospitalisation, etc. (socio-cultural mechanism). (sociocultural mechanism). It was decided to supplement this list with indicators characterising the availability of resources and the state of health care and health-saving institutions in terms of their accessibility to older citizens.

4 A system of indicators characterising the effectiveness of the functioning of health care and health-saving institutions

At present, there is no consensus in the scientific community as to which indicators best characterise the health of the population, which methods of assessing health inequalities are the most adequate, and how to assess the effectiveness of the functioning of health care institutions and health saving. As a rule, efficiency assessment in this sphere is carried out in the context of the following positions: medical efficiency (assessment of the quality and efficiency of medical care); social efficiency; economic efficiency (efficiency of resource provision).

Medical efficacy traditionally characterised by the degree of achievement of expected results in prevention, diagnosis, treatment, dispensary and rehabilitation of patients. The main reference point here can be considered the Programme for Assessing the Quality and Effectiveness of Health Care, which was launched in 2001 by the OECD member countries [12] Its goal was to develop comparable indicators to compare the effectiveness of health care systems in the member countries of this organisation. Over the next 20 years, data were collected and analysed, the set of thematic blocks was gradually expanded, and the number of countries involved in the study increased. As of the end of 2021, this programme contains 64 indicators in 7 blocks: primary health care - 5 indicators; primary health care appointments - 11 indicators; emergency care - 9 indicators; mental health care - 6 indicators; cancer care - 7 indicators; patient safety - 7 indicators; patient experience - 11 indicators [13]. Note that the priorities in the development of health care systems and the data used to assess their medical efficiency in many OECD countries are determined by the fact that the second demographic transition in them has already been completed, and the average life expectancy exceeds 80 years. In the Russian Federation, such indicators are not collected at the moment, but the possibilities of their collection and prospects for their application are being discussed quite actively.

To assess the social effectiveness of the functioning of health care institutions and health saving, indicators characterising socially significant results of health care services for external consumers (population) are usually used, for example, life expectancy, mortality of the population from the main causes and by age groups, morbidity, etc. These are the key indicators for the National Project "Healthcare", implemented in the Russian Federation since 2018.

Economic efficiency of the functioning of health care and health-saving institutions involves correlation of the results of activity and incurred costs. It is focused on the search for opportunities for the most economical use of resources and is based on such indicators as: labour resources involved, use of the bed fund, the number of medical services to the population, per capita budget expenditures on health care, etc. Here we should mention the methodology for assessing the effectiveness of national health care systems of Bloomberg agency, which includes life expectancy, health care financing, the ratio of public and private expenditures in health care, their share in GDP [14]. The highest score in this rating is given to countries that have achieved the highest life expectancy (as the best result).

Assessing regional inequalities in health, the authors identified groups of regions with a similar level of development and quality of functioning of health care and health saving institutions and analysed their impact on the health of elderly citizens. Objective limitations for the selection of primary materials were the openness and availability of data in the context of Russian regions, as well as the statistical content of data on older age groups (quantitative sufficiency of respondents aged 60+).

The system of indicators and sources of information for the analysis are presented in Figure 1.

The following were selected as the resulting indicators of regional population health:

1) subjective assessment of health by respondents, %:

- proportion of respondents who consider their health to be very good, good or average;
- share of respondents with disabilities;
- proportion of respondents with: chronic endocrine system diseases, diabetes or high blood sugar; chronic hypertension, high blood pressure; chronic heart disease; oncological diseases; chronic GI diseases.

2) objective demographic indicators, per 1,000 population:

- total morbidity of the population (registered diseases in patients diagnosed for the first time in their lives);
- morbidity by disease classes: circulatory diseases, endocrine diseases, digestive diseases, neoplasms;
- total number of persons with disabilities.

The study covered 32 regions of Russia from different federal districts. Using data from sociological surveys, three older age groups were analysed: Group 1 (pre-retirement age) - women aged 50-54, men aged 55-59; Group 2 (active retirement age) - women aged 55-66, men aged 60-66; Group 3 (incapacitated retirement age) - women aged over 67, men aged over 67.

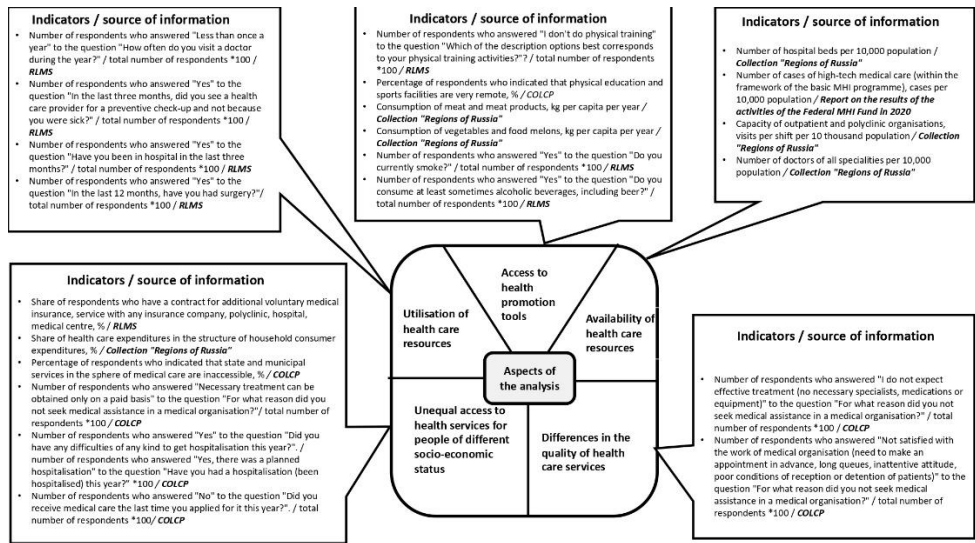


Fig. 1. Indicators characterising the effectiveness of the functioning of health care and health-saving institutions. Health saving, and sources of information for analysis

5 Results and discussion

From RLMS (data from the longitudinal household survey "Russian Monitoring of the Economic Situation and Health of the Population of the National Research University Higher School of Economics and Demoscope LLC, conducted with the participation of the Population Centre of the University of North Carolina and the Institute of Sociology of the Federal Research Sociological Centre of the Russian Academy of Sciences) for 2020, the survey data of 4,698 people were used in the study, of which: 828 respondents of pre-retirement age (17.6 per cent), active retirement age - 1798 (38.3 per cent), and incapable retirement age - 2072 (44.1 per cent). In the first age group there is a more even gender distribution of respondents (57 per cent of women and 43 per cent of men), in older age groups (due to the gender imbalance in life expectancy characteristic of the Russian Federation) women prevail: about 72 per cent of the total number of respondents.

Data COLCP ("Comprehensive observation of living conditions of the population" of the Federal State Statistics Service) for 2020 were used to a greater extent. Here the authors relied on the results of the survey of 25643 people, of which 4882 respondents of pre-retirement age (19.0%), active retirement age - 10010 (39.0%), incapable of working retirement age - 10751 (41.9%). Note that in the first age group, there is also an even gender distribution of respondents (57 per cent of women and 43 per cent of men), in the second - 71 per cent of women, in the third - slightly less (66 per cent). The indicators presented in Table 1 demonstrate significant differences in the performance of health care institutions and health saving by RF subjects, with clear leaders and outsiders inevitable here.

Table 1. System of indicators of the effectiveness of health care and health-saving institutions

Indicators, %	RF as a whole	Minimum by regions of the RF	Maximum by regions of the RF
1. Percentage of respondents with VHI contract	2.11	0.00	8.28
2. Share of health care expenditures in the structure of household consumer expenditures	4.00	3.00	6.00
3. Percentage of respondents who indicated that state and municipal services in the sphere of medical care are inaccessible	28.28	2.13	55.66
4. Percentage of respondents who had a need for medical care but did not seek it because the necessary treatment can be obtained only on a paid basis	5.62	080	16.34
5. Percentage of respondents who encountered difficulties during admission to inpatient care	32.11	8.33	80.00
6. Percentage of respondents who did not receive medical care when they sought it	2.42	0.33	7.68

7. Percentage of respondents who visit a doctor at least once a year	21.26	4.63	36.21
8. Percentage of respondents who visited a doctor for a preventive check-up	14.01	1.70	26.13
9. Percentage of respondents who had a need for medical care but did not seek it because we did not calculate effective treatment (no specialists, medications or equipment)	9.76	3.12	20.07
10. Share of respondents who had a need for medical care but did not seek it because they were not satisfied with the work of the medical organisation (need to make an appointment in advance, long queues, inattentive attitude, poor conditions of reception or custody of patients).	11.72	1.60	27.16
Compiled from: 1. Comprehensive observation of living conditions of the population (2020). Federal State Statistics Service. URL: https://www.gks.ru/free_doc/new_site/GKS_KOUZH-2020/index.html . 2. Russian Monitoring of the Economic Situation and Health of the Population (2020). Higher School of Economics. URL: https://www.hse.ru/rlms/			

The analysis has shown that the most important indicators of the effectiveness of health care institutions and health saving that influence the positive self-assessment of health by senior citizens are bed availability (Spearman correlation coefficient was 0.358) and doctors (0.404).

The Data Envelopment Analysis (DEA) method [15] was used for the comparative assessment of the effectiveness of regional health care systems and health saving in the Russian Federation. This method involves the construction of the so-called efficiency frontier, which is closely related to the concepts of "production possibilities frontier" and "production function". The DEA methodology studies the efficiency of functioning with which the studied objects transform inputs into outputs, and the degree of inefficiency is determined by the degree of remoteness of the resulting point from the efficiency frontier. It is important to note that the DEA method allows to determine the relative efficiency of objects, since they are compared only among themselves [16].

In this paper, it was decided to develop two models focused on one output (the resulting indicator) - subjective assessment of health and the level of morbidity recorded by the results of a survey of respondents. The first model uses statistical data on the resource endowment of health care (number of hospital beds, capacity of outpatient and polyclinic organisations, number of doctors per 10,000 people) as input indicators, while the second model uses indicators reflecting the subjective assessment of the sector (shares of respondents who visit a polyclinic once a year or more often; who underwent a preventive medical examination in the last quarter; who indicated acceptable accessibility of public services in the medical sphere; who applied for medical assistance). The common input data for both models were the proportions of respondents who do some form of physical exercise; do not smoke; and do not drink alcoholic beverages.

Figure 2 presents the results of the DEA method for assessing the effectiveness of health care and health saving institutions. Relatively efficient regions are marked in green,

inefficient regions in red (there are 14 of them), and each inefficient subject of the Russian Federation is connected with "reference" regions by vectors.

The study showed high efficiency of health care and health saving institutions in Moscow, Moscow, Kaluga, and Amur Regions. They received high marks both for the state of public health and the health care sector. The same conclusion can be drawn for Kabardino-Balkaria, Leningrad, Kurgan, Smolensk, Penza oblasts, where elderly respondents have high subjective assessment of health. Interestingly, when assessing efficiency through subjective indicators, there are fewer inefficient regions - only 10 (Fig. 3).

An equally important result of using the DEA method is that it can be used to carry out regional benchmarking of the effectiveness of health care and health saving institutions: not only to identify the most effective regions, but also to identify benchmark regions for ineffective territories, and to determine how far the latter are removed from the former. This means, for example, that Altai Krai can use the experience of the Kaluga, Kurgan, Smolensk Oblasts and the Republic of Kabardino-Balkaria to improve the effectiveness of regional health care and health saving institutions in favour of older citizens.

6 Conclusion

To improve the effectiveness of health care institutions and health promotion as an important condition for reducing regional inequalities in the health of elderly citizens, changes are needed aimed at:

- levelling territorial differences in the resource endowment of health care and health-saving institutions;
- improvement of staff planning and training of specialists to provide medical care to the population;
- improving the management system and resourcing of medical organisations;
- raising awareness of the population (especially older people) of their opportunities and rights in health care and the provision of health-saving services;
- strengthening control over compliance with official thresholds for waiting times for hospitalisation, diagnostic tests, and medical appointments;
- fixing the outcome (result) of service provision as a key criterion for the effectiveness of health care and health-saving institutions.

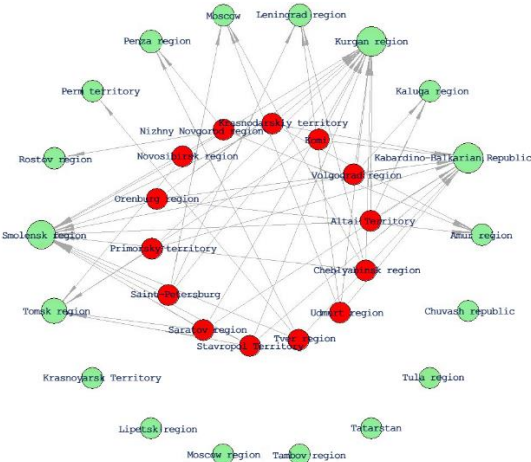


Fig. 2. Evaluation of the effectiveness of health care institutions and health saving according to DEA methodology: input parameters - objective indicators, output parameter - subjective assessment of respondents' health status

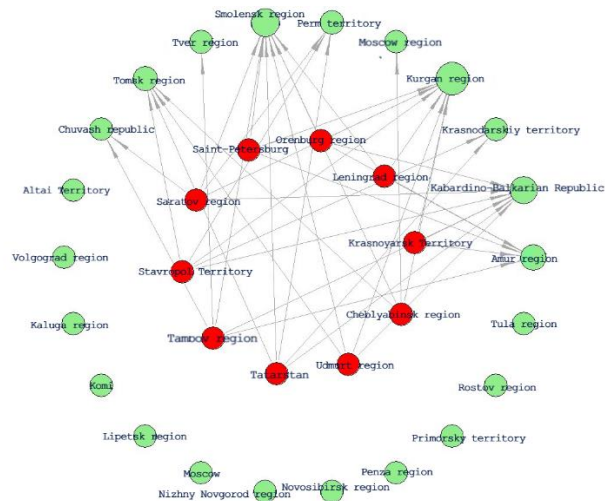


Fig. 3. Evaluation of the effectiveness of health care institutions and health saving according to DEA methodology: input parameters - subjective indicators, output parameter - subjective assessment of respondents' health status

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