

ISMGE 2020**II International Scientific and Practical Conference "Individual and Society in the
Modern Geopolitical Environment"****DEVELOPMENT POTENTIAL FOR MEDICAL TOURISM
IN THE REGIONS OF RUSSIA**

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Abstract

Health is a necessary requirement for an active and normal life. There are many reasons that encourage people to seek treatment abroad, which gives rise to the so-called medical tourism. It has a wide geographic range, types of services and specifications. In the framework of this article, we adhere to the concept of medical tourism as the targeted medical service that patients receive outside their usual place of residence with the opportunity to visit attractions. World experience shows that the development of medical tourism brings the development of infrastructure, the increase in the number of enterprises, the creation of new jobs and the improvement in the level of healthcare of local residents. Considering the scope of the country, geographical location, climatic conditions and regional characteristics, not all regions of Russia have the same conditions and opportunities to develop medical tourism. And also, not all regions at this stage are ready to be included in the process of the development of this sector, since the state and development of medical tourism are influenced by many social and economic factors. The authors analyze the eight federal districts in Russia from the perspective of four blocks and determine the most significant development factors. In the ranking of the regions with the most potential for medical tourism development in Russia, the Central Federal District ranks first, and the Volga Federal District ranks second.

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1. Introduction

The main direction of the development of modern society is to ensure a high quality of life, one of the components of which is public health. Health is valued by individuals as well as society as a whole. Medical tourism has become one of the modern ways of improving the health of a population. Medical tourism (health-improving) is currently booming around the world. On the one hand, there is the need for people to improve their health; on the other, it is the driver of the development of national economies.

With the development of economic globalization, medical globalization has risen (Demenko et al., 2017). Medical tourism has become an important source of foreign currency earnings in many countries. Exports of medical tourism services have a positive impact on production growth in the national economy with an average contribution of up to 26.8% (Beladi et al., 2019). According to a forecast by the World Health Organization, by 2022, medical tourism will become one of the defining global industries. According to the reports from the Oxford Economics research corporations and Visa research corporations, by 2025, the world's turnover of medical tourism will reach more than 3 trillion dollars and in the next 10 years, will grow by at least 25% per year (Visa, 2014).

Today's medical tourism is not only a competitive type of economic activity but also a fairly popular phenomenon in social life. People are trying to effectively combine high-quality and effective treatment and leisure. At present, the countries with medical tourism attractions include Austria, Hungary, Germany, Israel, India, China, South Korea, Singapore, United States, Thailand, Czech Republic and Switzerland. Each country has its own specialization: cosmetology, dentistry, orthopedic, cardiovascular, cancer, etc. Russians also belong to the group of consumers of medical tourism. Russians have different preferences when choosing a country for rest and treatment, which is determined by Russia's unique geographic location and the location of their residence.

According to estimates by the World Tourism Organization, Russia occupies the 5th place in the world in terms of attracting tourists, but only 59th in realizing tourism potential. The World Medical Tourism Association ranks countries in the world on the basis of the Medical Tourism Index (MTI). According to the latest ranking result for 2020-2021, Russia ranks 41st among the 46 most attractive countries in medical tourism. Due to the overall price level and the low wages of medical personnel, Russia has the lowest cost of medical services among developed and developing countries. The low cost of treatment in Russia could become one of the main competitive advantages if the country fully enters the medical tourism market.

If a country wants to effectively develop an industry, then it must have corresponding development potential. The development of the medical tourism industry is based on the level of economic development and is closely related to the level of tourism development and medical services resources. Infrastructure construction is the most important and a fundamental factor in the development of economic industries. In this article, the authors attempt to assess the potential of regional medical tourism in Russia based on the following four aspects: medical potential, tourism potential, economic development, and infrastructure. Based on the factor analysis method using the SPSS program, scores and ratings of the possible development of regional medical tourism in eight federal districts (Central Federal District, Northwestern Federal District, Southern Federal District, North Caucasus Federal District, Volga

Federal District, Ural federal district, Siberian Federal District, Far Eastern Federal District) of the Russian Federation were obtained.

2. Problem Statement

Issues related to the export of medical services in Russia have been raised for several years. For example, in the Decree that was promulgated by the President of the Russian Federation on May 7, 2018, "On the National Goals and Strategic Tasks of the Russian Federation until 2024", the following tasks are specified: "... to ensure an increase in the volume of export of medical services by at least four times compared to 2017 per year (up to a maximum of 1 billion US dollars per year)"; and "... to ensure the improvement of the export mechanism of medical services". And also start to implement the Federal project "Development of the export of medical services", which aims to establish and develop mechanisms and conditions that ensure the growth of exports of medical technologies on the territory of the Russian Federation, and thereby create additional sources of financing for the healthcare system of the Russian Federation (Table 01).

Table 01. The target of the national project for the export of medical services of the Russian Federation

Index	2017	2018	2019	2020	2021	2022	2023	2024
Number of treated foreign citizens (thousand people)	300	432	564	696	828	960	1080	1200
Volume of exports of medical services (million dollars)	250	360	470	580	690	800	900	1000

To achieve these goals, a comprehensive analysis of the regional potential of Russia in the field of medical tourism is required.

3. Research Questions

The uniqueness of medical tourism lies in its location at the intersection of the fields of medicine and economics (Matova, 2019). The rapid development of the medical tourism industry shows the main trend of market globalization, privatization and corporatization of medical resources (Connell, 2016).

In many countries, the development of medical tourism is becoming a priority (Suzdalova et al., 2017). Russia is one of them. At present, it is both a major importer of medical tourism services and a major exporter. Under such circumstances, an analysis of the development potential of each federal district is very important. In the analysis process, the differences in the economic situation, population, development level of tourism, medical resources, etc. of each federal district must be considered (Klijs et al., 2016).

In order to better describe the field of medical tourism and highlight its conceptual breadth, it is proposed to conduct an Index evaluation system based on a multidimensional structure (Fetscherin & Stephano, 2016).

4. Purpose of the Study

To assess the development potential of medical tourism in eight constituent entities of the Russian Federation. As a result of data analysis, the advantages and disadvantages of the development of medical

tourism in various regions will be obtained, which will provide directions for the further development of the medical tourism industry in regions of Russia.

5. Research Methods

There is no precise definition of medical tourism. Scholars define it from different angles. One is to define medical tourism as an act of leaving one's place of residence to travel for the purpose of maintaining, strengthening or recovering from physical or psychological conditions; the second point of view is that the medical tourism industry is an emerging industry that provides medical tourists with appropriate technology at the right place, arranges travel matters for them, contacts doctors and sends treatment records on their behalf; while the third is that the medical tourism industry is an economic development strategy, that provides output, jobs and income for the country by providing services to foreign patients. In general, the selected country is not only regarded as a place to rest, but more so, it is the place to receive medical services.

In order to conduct research, the authors identified a total of 29 indicators from four major blocks through a literature method: medical service, tourism, economic development, and infrastructure. Data are taken from the website of the Federal State Statistics Service and the Federal Agency for Tourism. The indicators for assessing the development potential of regional medical tourism in Russia are presented in Table 02.

Table 02. Indicators for assessing the development potential of regional medical tourism in Russia

Sphere	Indicators
S1 Medical service	Number of sanatoriums, S1-1
	Number of rooms in sanatoriums, S1-2
	Number of clinics, S1-3
	Number of hospitals, S1-4
	Number of hospital beds, S1-5
	Number of hospital beds per 10,000 people, S1-6
	Number of nurses, S1-7
	Number of nursing staff per 10,000 people, S1-8
	Number of doctors, S1-9
	Number of doctors per 10,000 people, S1-10
	Turnover of Healthcare and Social Services, S1-11
S2 Tourism	Number of ecological trails and routes in national nature reserves, S2-1
	Number of ecological trails and routes in national parks, S2-2
	Average number of employees in travel agencies and other organizations providing tourism services, S2-3
	Number of superior rooms in hotels and other accommodation facilities, S2-4
	Number of dining establishments, S2-5
	Number of travel agencies, S2-6
	Turnover of travel agencies and other organizations providing tourism services, S2-7
	Number of foreign tourists received, S2-8
S3 Economic development	Gross regional product by constituent entities of the Russian Federation, S3-1
	Per capita gross regional product by constituent entities of the Russian Federation, S3-2
	Total amount of paid services, S3-3
	Cash income per capita, S3-4

S4 Infrastructure	Total investment in fixed assets, S3-5
	Cost of major repairs of fixed assets for environmental protection, S4-1
	Number of public buses per 100,000 people, S4-2
	Passenger traffic turnover, S4-3
	Length of public roads of local importance owned by municipalities, S4-4
	Number of mobile base stations, S4-5

Given the heterogeneity of statistical data (due to inconsistent measurement of the indicators), we first standardize the initial data. To standardize the data, we use the Z-Score method (1-3).

$$Z_{ij} = (S_{ij} - \mu) / \sigma \quad (1)$$

$$\mu = \frac{1}{n} \sum S_{ij} \quad (2)$$

$$\sigma = \sqrt{\frac{1}{n-1} \sum (S_{ij} - \mu)^2} \quad (3)$$

In the formula, S_{ij} represents the j -th index data in the i -th index, Z_{ij} represents the dimensionless standard value of S_{ij} , μ - average value, σ - standard deviation, and n - number of all elements.

We import standardized data into SPSS and use factor analysis to analyze the four blocks. We extract their common factors, and accurately find out which factors have greater influence and how much influence they have. The scores of the eight federal districts are calculated at each block, and finally, the scores of the four blocks are combined to calculate the total score of the eight federal districts' potential for medical tourism development which gives them a rank. Medical service is the most basic and one of the most important elements in the development of medical tourism. It includes 11 indicators that accurately describe the state of medical services, including the number of hospitals, clinics, doctors, and nurses.

Two common factors can be extracted with eigenvalues of 1 or higher from the factor analysis result of the medical service block, and the cumulative variance is 83.12% (Table 03). In other words, these two common factors can explain 83.15% of all variables in the medical service.

Table 03. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.574	59.762	59.762	6.574	59.762	59.762	6.015	54.683	54.683
2	2.569	23.353	83.115	2.569	23.353	83.115	3.128	28.432	83.115
3	0.904	8.222	91.338						
4	0.567	5.153	96.491						
5	0.302	2.749	99.24						
6	0.051	0.462	99.702						
7	0.033	0.298	100						
8	2.11E-16	1.92E-15	100						
9	-1.97E-17	-1.79E-16	100						
10	-1.18E-16	-1.07E-15	100						
11	-3.68E-16	-3.35E-15	100						

Extraction Method: Principal Component Analysis.

In order to better explain the common factors, we obtained the rotated component matrix by using the orthogonal rotation method (Table 04). Table 04 more clearly shows that the common factor 1 is strongly related to the indicators S1-3, S1-4, S1-5, S1-7, S1-9, and S1-11. The common factor 2 is closely related to the indicators S1-1, S1-2, S1-6, S1-8, and S1-10.

Table 04. Rotated Component Matrix

	Component	
	1	2
Zscore: S1-1	0.524	0.71
Zscore: S1-2	0.095	0.853
Zscore: S1-3	0.989	0.104
Zscore: S1-4	0.983	0.072
Zscore: S1-5	0.963	0.113
Zscore: S1-6	-0.175	-0.713
Zscore: S1-7	0.974	0.204
Zscore: S1-8	-0.13	-0.785
Zscore: S1-9	0.974	0.173
Zscore: S1-10	0.082	-0.808
Zscore: S1-11	0.953	0.132
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 3 iterations.		

We can summarize factor 1 as the absolute amount of medical resources, and factor 2 as the relative amount of medical resources per capita.

In the next step, we use the regression method to obtain the factor score for each federal district (Table 05).

Table 05. REGR factor score

	FAC1_1	FAC2_1
Central Federal District	1.75707	0.45023
Northwestern Federal District	-0.10856	-1.01202
Southern Federal District	-0.59414	1.65096
North Caucasus Federal District	-1.15977	0.92033
Volga Federal District	1.14157	0.22213
Ural federal district	-0.58909	-0.29125
Siberian Federal District	0.25221	-0.6671
Far Eastern Federal District	-0.6993	-1.27328

The percentage of variance after rotation of each common factor is used as the weight, and the factor score is weighted to get scores and rankings for medical service development potential S1 of each region (Table 06). We can see that the central federal district ranks first in the medical service development potential block.

We perform the same calculation process for the other three blocks (tourism, economic development, infrastructure).

The second block, tourism, directly plays an important role in the development of medical tourism (Shamne & Shishkina, 2017). We took 8 indicators as a basis, such as the number of travel companies, number of travel routes, number of accommodation and dining facilities that can receive foreign tourists, and the turnover of travel agencies and so on. Three common factors were extracted and the cumulative

percentage of variance is 86.63%. Indicators with a strong correlation with factor common 1 are S2-3, S2-4, S2-5, S2-6 and S2-7. This can be interpreted as the absolute number of practitioners and support facilities related to tourism. The Central Federal District remains in first place in terms of these indicators (Table 06).

The third block is to evaluate regional economic development. For the analysis, five indicators were used: gross regional product, per capita gross regional product, the total amount of paid services, cash income per capita and total investment in fixed assets. Through principal component analysis, we extracted a common factor, which explained 75.63% of all factors in the block. The indicators highly related to the common factor 1 are S3-1, S3-3, and S3-5, which represent total regional production, total paid services, and total fixed capital investment, respectively. This can also be interpreted as the aggregate economic volume. The Central Federal District still ranks first (Table 06).

The fourth block is infrastructure. The complete infrastructure determines the convenience of people's lives. Perfect transportation and infrastructure can cope with and adapt to the improving market access threshold and increasing travel needs (Davis et al., 2017; Ormond, 2015). We selected five infrastructure indicators that are closely related to people's lives. One common factor was obtained with a percentage of the variance of 74.34%. Therefore, only one factor can explain the five original indicators. We interpret this common factor as the total number of various types of infrastructure. Volga Federal District occupies the first place in infrastructure construction (Table 06).

Table 06. Scores and rankings of regions in different blocks

	S1 score	S1 ranking	S2 score	S2 ranking	S3 score	S3 ranking	S4 score	S4 ranking
Central Federal District	108.88	1	106.93	1	142.45	1	108.83	2
Northwestern Federal District	-34.71	5	7.84	4	2.38	3	-15.34	4
Southern Federal District	14.45	3	9.63	3	-38.83	7	-18.67	5
North Caucasus Federal District	-37.25	6	-71.94	8	-86.81	8	-93.55	8
Volga Federal District	68.74	2	13.91	2	-1.22	4	110.39	1
Ural federal district	-40.49	7	-56.1	7	33.31	2	-36.9	6
Siberian Federal District	-5.18	4	3.45	5	-34.67	6	7.63	3
Far Eastern Federal District	-74.44	8	-13.73	6	-16.61	5	-62.4	7

We calculated the standard deviation of the scores of each block according to the score statistics of the four blocks in Table 6. The percentage of the standard deviation of each block is taken as the weight to calculate the comprehensive score of medical tourism development potential in each region, using (4-6):

$$Z_i = \sum F_i \cdot W_i \quad (4)$$

$$W_i = \delta_i / \sum(\delta_i) \quad (5)$$

$$\delta_i = \sqrt{\frac{\sum_{j=1}^n [F_{ij} - M^2(F_{ij})]}{n}} \quad (6)$$

F_{ij} - the score of the j -th region of the i -th index;

$M(F_{ij})$ - the average value of the i -th index;

W_i - the weight of the i -th index;

δ_i - the standard deviation of the i -th index;

F_i - the score of the i -th indicator;

n - number of indicators included in category i -th index

Z_j - score of the development potential of medical tourism in District j .

Table 07 lists the scores and rankings of the constituent entities of the Russian Federation.

Table 07. Scores and rankings of the development potential of regional medical tourism

Ranking	Region	Score
1	Central Federal District	108.88
5	Northwestern Federal District	-34.71
3	Southern Federal District	14.45
6	North Caucasus Federal District	-37.25
2	Volga Federal District	68.74
7	Ural federal district	-40.49
4	Siberian Federal District	-5.18
8	Far Eastern Federal District	-74.44

6. Findings

The analysis shows that the Central Federal District is the region with the most potential for medical tourism development, and Volga Federal District ranks second. The development potential in other regions is negative, indicating that the basic conditions for the development of medical tourism are still lacking. Judging from the actual situation, the Central Federal District is located in Europe and is the seat of the nation's political, economic, and cultural center. It has a developed economy and abundant resources. The analysis for the four aspects (blocks) using the principal factor analysis method also verifies this conclusion, that is, no matter which common factors are extracted from which aspect, they all reflect the respective absolute amount of resources or economic aggregate. The Central Federal District has an absolute advantage in the number of related resources, so it is the region with the most potential for the development of medical tourism.

7. Conclusion

As an important part of social security, health services have always been the focus of attention in many countries. The development of the medical tourism industry not only contributes to the development of the national tourism industry but also brings huge economic income to medical institutions, thereby increasing internal wealth. This is because medical tourism transforms original non-trade medical services into tradable medical services that can generate direct foreign income, that is, medical tourism is an important source of foreign exchange income (Beladi et al., 2015; Tarakanov et al., 2019). The key to issue of whether to vigorously develop medical tourism today is that the export of medical tourism services will occupy domestic public resources, especially public medical resources. The country needs to effectively manage the medical tourism industry, formulate reasonable government policies, and promote the effective use of related resources to promote the common and sustainable development of the country's public and private sectors (Ganguli & Ebrahim, 2017). The analysis of the development potential of regional medical tourism in Russia can help regions understand their current status and existing problems, which may help their further development.

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