

Analysis of the Location of the Medical Industry in the Volga Federal District

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ABSTRACT

The article is devoted to the analysis, characteristics and factors of location of the enterprises of pharmaceutical, medical and microbiological branches of the medical industry in the Volga Federal District. It was revealed that the pharmaceutical industry is developing practically throughout the entire territory of the Volga Federal District. It has good product coverage and, thus, specializes depending on the raw materials, which are present in territorial subjects. The results of the research are presented in the form of a series of diagrams, as well as in the form of a density map of medical industry enterprises by separate sub-sectors. The work is based on the resource base pfo.spr.ru for pharmaceutical, medical and microbiological enterprises in the Volga Federal District. The result of its processing was presented in the form of a table with the name of the enterprise, the set of indicators, for example, the main product or service, produced or provided by the enterprise, the sub-industry and the presence of the enterprise's website on the Internet. The deep analysis of the medical industry is necessary at the current stage of development of Russia, since the growth of population and the trend towards import substitution are triggers for the development of this industry. It was also noted the dependence of the number of production facilities on the economic and geographical location of territorial subject.

Key words: VFR production, Medical industry, Pharmaceutical industry, Microbiological industry, Industry.

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INTRODUCTION

In the modern world, the location of enterprises of pharmaceutical, medical and microbiological branches of medical industry is an urgent issue for research. For a comfortable living of the ever-increasing population and improvement of human activity, it is simply necessary to have a production of medicines, drugs and medical equipment, appliances and instruments, produced for medical institutions and healthcare organizations and for the needs of the country's population.

PARTICIPANTS AND METHODS

The empirical base of the research is the data of the information resource (pfo.spr.ru) [1]. The theoretical basis was the works of the researchers, dealing with the issues of location of the enterprises of pharmaceutical, medical and microbiological industries [2-7]. The methodological basis of the research was based on abstract-logical, comparative, system methods of analysis, etc.

On the basis of the resource pfo.spr.ru for the enterprises of pharmaceutical, medical and microbiological industry of the Volga Federal District, the table was compiled. It includes the following data columns: the name of the enterprise, location - the name of the settlement, the subject of the Volga Federal District where it is located, the main product or service produced or provided by the enterprise, the sub-industry, and the presence of the enterprise's website on the Internet. As a result, 518 enterprises were listed in the table. Further, on the basis of the obtained table, the analysis of production facilities of the selected sub-sectors was carried out, and conclusions were drawn. The maps in ArcGIS program have also been compiled, based on the research results.

RESULTS AND DISCUSSION

In the Volga Federal District, the following picture of location of the medical industry can be observed. The regions, where economic and geographical position is more favorable, and the economy is more developed than in its neighbors, have the largest number of production facilities. This trend can be traced not only in the medical sector, but also in many different industries [8].

The undisputed leaders in the number of enterprises of medical industry are the Nizhny Novgorod Region (85

enterprises), the Republic of Tatarstan (69 enterprises) and the Perm Territory (77 enterprises). Also, a fairly large number of enterprises are located in such territorial subjects as the Republic of Bashkortostan (49 enterprises), Saratov (42 enterprises) and Samara Region (52 enterprises) (Figure 1).

Such factors as the presence of good raw material base of various minerals (oil, gas, etc.), hydropower resources (the cascade of hydroelectric power stations on the Volga River and its tributaries), the development of machine-building industry, oil and gas processing, as well as other branches of chemical industry contribute to the growth of enterprises. The Nizhny Novgorod Region and the Republic of Tatarstan are close to the capital of Russia and have good transport links with it. Due to this, all innovations in the field of science and technology are much more quickly introduced into the technology of production of medical goods, than in more distant regions. And in the case of the Perm Territory, the proximity of the Ural Mountains with large reserves of mountain natural resources has a great influence.

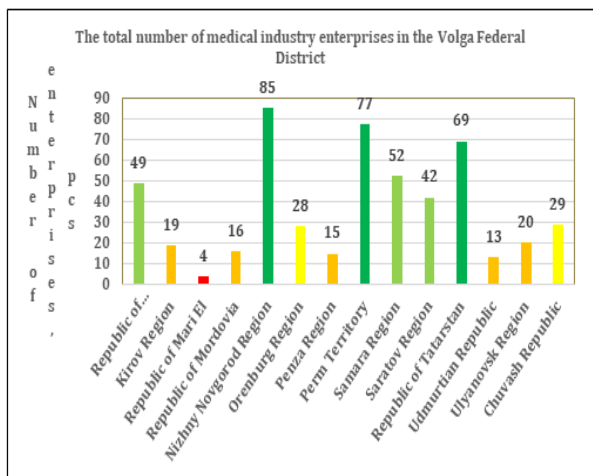


Figure 1: The histogram of the total number of medical industry enterprises in the volga federal district.

As for the subjects with a less developed medical industry (Figure 1), there is only one such subject - the Republic of Mari El (4 enterprises).

This is the region with the most critical number of manufacturing facilities for the medical industry, because it has a poorly developed economy and industry.

The rest of the subjects occupy an intermediate position, which characterized by the average level of economy and industry, the presence of a lesser variety of natural resources, less hydropower resources, etc.

The enterprises of medical (medical-instrumental) industry occupy the largest part in the structure of the medical industry of the Volga Federal District (63.51%)

(Figure 2). More than a half of all medical enterprises in the region are engaged in the production of various medical products, medical equipment and technology, dental equipment and related products. This is due to the fact, that many enterprises produce small and easy-to-manufacture medical equipment, goods, appliances, etc. But at the same time, there are few enterprises, producing sophisticated medical equipment and appliances. This is due to the fact, that domestic industries are under pressure and cannot withstand competition from the world's leading foreign manufacturers of medical equipment and devices.

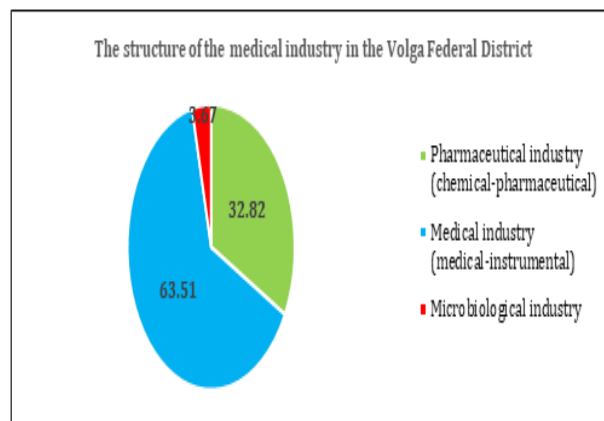


Figure 2: Diagram of the structure of the medical industry in the Volga Federal district.

The pharmaceutical industry occupies an intermediate position between the medical and microbiological industries, and accounts for 32.82% of the total number of medical industry enterprises, located in the Volga Federal District (Figure 2). Here, as in the medical-instrumental industry, foreign manufacturers of pharmaceuticals dominate over domestic ones. The only difference is that the medical-instrumental industry compensates for itself at the expense of easy-to-manufacture products, which are more profitable to buy in our country. However, medicines require not only a complex multi-stage production, but also a lot of funding, aimed at the development of modern types of drugs.

The enterprises of microbiological industry occupy the smallest part in the structure of the medical industry (3.67%) (Figure 2). This is due to the fact, that microbiological industry is very young and appeared not so long ago. It is science-intensive, requires highly qualified labor resources and, at the same time, causes great damage to the environment. But the need for the products of microbiological industry is increasing every year, since it allows the use of waste from oil and gas processing, timber processing, agricultural and other industries, as well as to receive very useful products for humans (amino acids, vitamins, enzymes, antibiotics, bacterial fertilizers, etc.) from this waste.

Another characteristic feature of all branches of the medical industry is the location of its production facilities close to the consumer (near large residential places). The diagram (Figure 3) shows that this trend is also observed

in the Volga Federal District. This is due to the fact, that the entire chemical industry, including medical, is characterized by the location of production near the points of sale, i.e., close to the consumer.

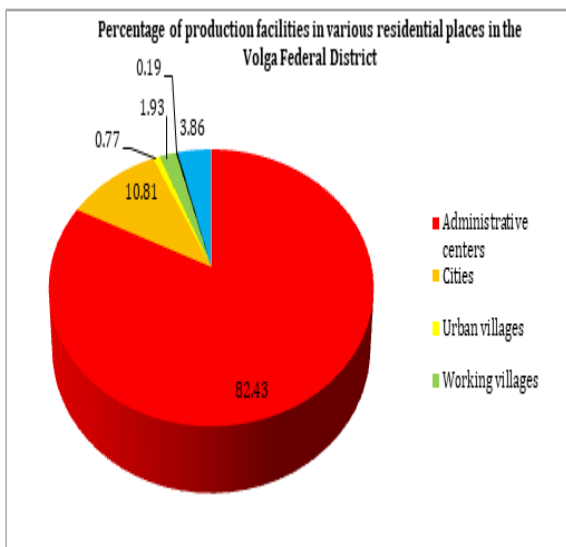


Figure 3: Diagram of the percentage of production facilities in various residential places in the volga federal district.

The administrative centers attract more than 82.5% of production facilities. And only a negligible percentage of enterprises (less than 10%) remain in the form of a single piece production, built in Soviet times, under the program of division of labor. Some settlements stand out from the general picture.

This is due to the fact, that a lot of a certain resource is located there, or there are other types of industry, which perfectly cooperate and combine with the branches of the medical industry.

The diagram below shows that more than a half of organizations (63.51%) do not have an electronic website, and 10% have it in inoperative state (Figure 4).

And only 26.64% of enterprises have a website.

The existence of the Internet site allows to strengthen the competitive advantages over other manufacturers of medical products, because the potential sales market will increase not only in Russia, but also abroad.

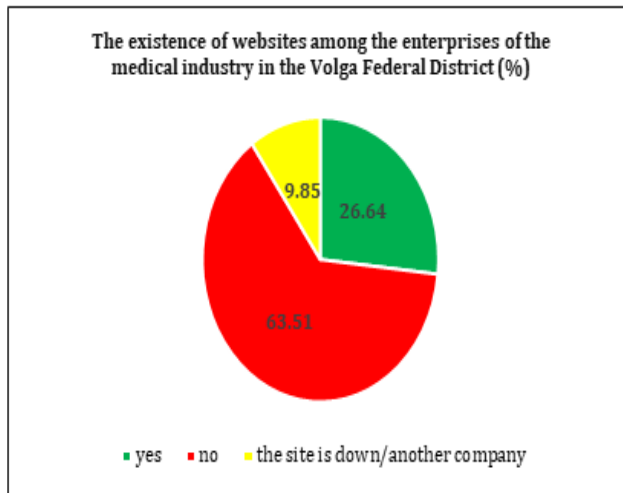


Figure 4: Diagram of the existence of websites among the enterprises of the medical industry in the volga federal district.

CONCLUSION

As a result of the research, the characteristics and factors of the location of the pharmaceutical, medical and microbiological industries were defined, and the location of their enterprises in the Volga Federal District was analyzed.

The pharmaceutical industry has very good product coverage that allows its development in the regions in the form of highly specialized enterprises, depending on the raw materials, which are present in the area. Conditions for the development of the pharmaceutical industry are favorable practically throughout the entire territory of the Volga Federal District, with the exception of the Penza Region, the Republic of Mari El and the Udmurt Republic. The leaders are the Republic of Tatarstan (19 enterprises), the Perm Territory (18 enterprises) and the Chuvash Republic (22 enterprises) (Figure 5).

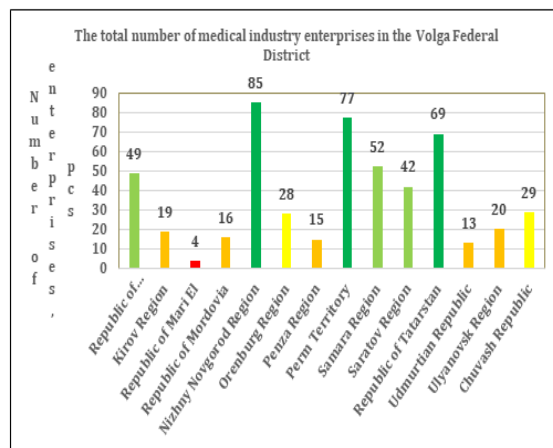


Figure 5: Schematic map of the number of pharmaceutical enterprises in the volga federal district.

In the structure of the pharmaceutical branch of the medical industry in the Volga Federal District, most of the enterprises are engaged in the production of medicines

(99.41%). Almost the entire industry in the region produces medicines, and pharmaceuticals is developing as a result of advances in science and technology. However, 0.59% of the industry is engaged in the collection and processing of medicinal plants, where the factor of location near the sources of raw materials plays a leading role.

The enterprises for the production of drugs are concentrated in the Republic of Tatarstan and the Perm Territory. All the conditions for the development of this industry have been created here, as well as the attraction towards new factors of placement, such as research intensity and, as a result, highly qualified labor resources. These regions with a fairly developed economy receive a large business investment, which contributes to the development of pharmaceuticals, in general, and development of new drugs, in particular.

In the Chuvash Republic, the situation is slightly different. The development of the pharmaceutical industry here is a response to the division of labor and specialization of industry since the days of the USSR.

Currently, in the sub-sector of collection and processing of medicinal plants of the pharmaceutical industry in the Volga Federal District, there is only one region where this activity is carried out - the Udmurt Republic. Today this industry is becoming obsolete and losing its economic benefits.

In turn, the medical industry leans towards the centers of mechanical engineering, woodworking, depending on the type of production. The peculiarity of the medical industry in Russia is that a large number of enterprises are engaged in the manufacture of simple and small products with easy production technology, while sophisticated equipment and machinery is supplied from abroad.

But nevertheless, the enterprises of this industry are developed almost everywhere, with the exception of the Republic of Mordovia and Mari El. The medical-instrumental industry cooperates and is combined with the mechanical engineering, which is well developed in the Volga Federal District. Therefore, the leaders are the subjects of the Volga Federal District, which have engineering enterprises on their territory - the Republic of Bashkortostan (33 enterprises), the Nizhny Novgorod Region (67 enterprises), the Perm Territory (58 enterprises), the Samara Region (38 enterprises), the Saratov Region (26 enterprises), the Republic of Tatarstan (47 enterprises) (Figure 6).

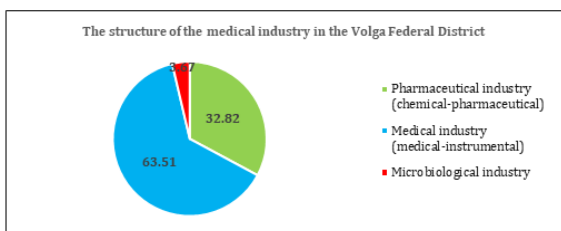


Figure 6: Schematic map of the number of medical industry enterprises in the volga federal district.

Among the types of production, more than a half of the medical industry enterprises are engaged in the manufacture of medical equipment (59.27%) and more highly specialized production of dental equipment (27.66%). A smaller number of enterprises in the medical industry are involved in the manufacture of medical products (13.07%). Since they are produced in large volumes and easily transported, there is no need for a large number of such enterprises. This sub-sector is well developed only in the Nizhny Novgorod Region. In the rest of the regions there are single small enterprises, or the goods are imported from other entities.

Dental production enterprises are located taking into account all the same factors of manufacture location as in the medical industry. Therefore, the leaders of placement are the regions with the specialization of machine-building industry - Saratov, Samara, Orenburg, Nizhny Novgorod regions, the Republic of Tatarstan and the Perm Territory. But at the same time, it is necessary to take into account the consumer factor for a more highly specialized production of dental equipment. For this reason, the enterprises are not developed in the Republic of Bashkortostan, and, on the contrary, they are developed in the Orenburg region.

In the subjects of the Volga Federal District, the microbiological industry is developed in the regions where raw materials, hydropower and consumer factors are combined. These regions are the Nizhny Novgorod and Saratov, the Republic of Tatarstan and Bashkortostan (Figure 7). The absence of enterprises in the Penza, Samara regions, the Udmurt Republic, and the Republic of Mari El only confirms the importance of all factors of production location in the aggregate, characteristic for this industry.

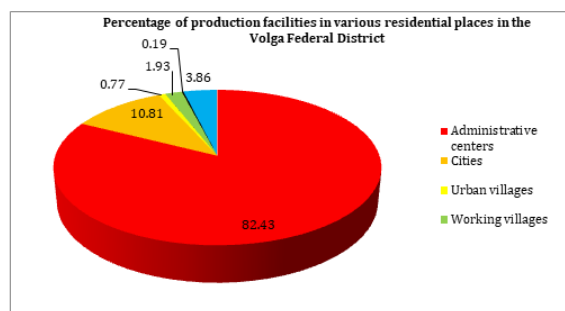


Figure 7: Schematic map of the number of enterprises of the microbiological industry in the volga federal district.

In the structure of the medical industry, a large share (84.21%) is occupied by the production of plant protection products, bacterial fertilizers, while the production of amino acids, vitamins, enzymes and antibiotics accounts for only (15.79%). This is due to the great need of the Volga Federal District for the intensification of agriculture, since the agro-industrial complex is the fourth most important in the specialization of this region. The manufacture of amino acids, vitamins, enzymes and antibiotics requires knowledge-intensive production, modern technological

process with environmental protection, therefore, large financial investments in development, which is not available for all subjects of the Volga Federal District. The main manufacturers of this sub-industry are located in the Nizhny Novgorod Region, the Republic of Tatarstan and the Perm Territory.

Such subjects as the Saratov Region and the Republic of Bashkortostan are the leaders in the location of enterprises, making plant protection products and bacterial fertilizers. In other regions, with the exception of the Penza, Samara regions, the Udmurt Republic and the Republic of Mari El, as well as the Perm Territory, there are one or several enterprises, engaged in the production of such products. For most subjects of the Volga Federal District, the agro-industrial complex plays an important role in the specialization of production and the economic sector. And this is the reason for the almost ubiquitous location of enterprises of this sub-branch of the microbiological industry. And the placement of the enterprises with such products is favorably for the intensification of production.

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