

RESEARCH ARTICLE

The modern outline of the “triple helix” system: generating ideas in the fight against the pandemic

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ABSTRACT

The article examines the directions of improving the "triple helix" system in the current conditions of a pandemic. The basis of the process is the generation of knowledge by national research centers, universities, with direct support from the authorities and constructive interaction with business. The modern contour of this spiral ensures the development and implementation of innovative domestic developments, methods and technologies, expands the possibilities for the treatment of various diseases by introducing new equipment and pharmaceuticals. The key element of the system is the introduction to the market of the results of intellectual activity, carried out through the prompt implementation of science-intensive technologies and industries in all spheres, complexes and sectors of the country's economy. The results of effective realization of the potential of the "triple helix" model in the first city of science - Obninsk and Kaluga region are demonstrated. Examples of developments of scientific organizations that are part of innovative clusters are given, which made it possible to formulate a treatment regimen for diseases in the shortest possible time, create the necessary drugs, and apply them in the realities of the spread of coronavirus infection. The authors substantiate the opinion that an adequate response to emerging dangerous challenges is prepared in advance, thanks to the conduct of active research activities, and an effectively formed "triple helix" system acts as a guarantor of the successful implementation of intellectual activities that can save the lives of millions of people.

KEYWORDS:

triple helix model,
innovation clusters, science city
Obninsk regional development,
pandemic, quality of life.

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INTRODUCTION

The forced implementation of quarantine measures related to the pandemic led to a freeze in economic activity. The pandemic acted as a marker that revealed the low rates of domestic structural reforms, the predominance of the resource-based development path, the inadequacy of the level of public administration to modern requirements. There is a decrease in the growth rates of the Russian economy, primarily due to the shortage, and additional retirement, of

labor resources. At the same time, over the past five years, the revenues of the Russian budget have increased by 9,5%, corporate profits have grown by 52,9%, and real incomes of citizens have decreased by 7,4%, which demonstrates the process of polarization between the living standards of different segments of the population. A significant group of the population is forced to reduce the purchase of necessary goods and the receipt of quality services. Economic growth is a priority task for Russia, encompassing not a narrow group of wealthy citizens, but the entire population of the country.

Growth must include the following mandatory core provisions:

- a system that guarantees all Russians a decent, adequately increasing standard of living;
- ensuring the construction of an all-encompassing, safe infrastructure, including both free access to services provided by the primary health care system and receiving high-tech medical care;
- designing a system of affordable, decent education to realize the potential of each person, ensuring the implementation of social tone, including mass participation in the discussion and adoption of government decisions [1, 2].

EXPERIMENTAL METHODS

In the course of the study, modern methods of qualitative analysis were applied, using information and communication technologies. Including, the method of systemic, comparative analysis of statistical, monographic and textual material, including content analysis of publications in the media, as well as the method of expert assessments. The authors came to the conclusion that the liberal model of socio-economic development is giving way to new concepts. The new order will be based on expanding the functions of the state and strengthening economic sovereignty, supported by the country's own population. The changes taking place in the world are of a breakthrough nature of transformations and are accompanied by numerous challenges, including crisis phenomena in health care, a decrease in people's trust in social institutions, and deepening economic inequality. The priority task is inclusive economic growth, covering the entire population of the country, the creation of a health care system that guarantees all citizens access to modern, high-quality services. The new functions of the state are designed to ensure the protection of the interests of every citizen by forming a "triple helix" system that meets modern needs, uniting the potentials of state power, scientific, educational and business communities, societies, and individuals.

RESULTS

Leading world and domestic experts assess the international situation that has developed in recent years as extremely negative, which does not contribute to a constructive dialogue, but complicates relations between countries.

The leaders of states and peoples inhabiting the planet seemed to have suffered "gaps in memory" about the terrible consequences of the strongest epidemics that covered the territories of countries and continents, making them deserted, threatening the very existence of human civilization. The whole bitter historical experience of the development of mankind, it would seem, warns that on the eve of, and during a pandemic, political, ideological, economic and many other conflict situations should fade into the background, since human life and health act as the most important value.

The essence of every living object functioning in the biosphere is the same - the desire to survive in this boundless, destructive, completely unknown world. The

instinct of self-preservation is the vector of activity of every living being, aimed at activities that preserve his life, favors it, and also contributes to the solution of the sacred task of procreation.

At the same time, in the biological sphere, there is a unique type of living organism - a reasonable person, that is, having a mind, thanks to which he is able to consciously choose the trajectory of his existence. It is necessary to overcome the subordination of the human essence to the animal principle, to understand that the inertial movement of the world in this direction leads humanity to catastrophes in the form of massive epidemics and pandemics, financial bubbles and global economic crises, small and large wars.

The situation requires a new paradigm of human behavior, it is necessary to think and act on a larger scale, to make innovative systemic decisions focused on the human aspects of consciousness. World experience convincingly proves that the mobilization of political leaders and all peoples, in the face of universal danger, is achieved through political, economic, social integration of states, scientific, cultural and business communities, societies and individuals.

In the meantime, the world, in the onset of a pandemic, is faced with a powerful, unfortunately, "tree of problems", the "branches" of which can be systematized as follows:

- reigning chaos in covid-19 vaccination activities;
- making not scientific, medical decisions, but political decisions;
- the desire for a number of countries to achieve "sanitary and epidemiological sovereignty";
- an insufficient amount of produced vaccines;
- the excess of demand for vaccine over the capabilities of existing global production facilities;
- fierce competition for the right to use a particular vaccine;
- lack of clarity, order in the use of vaccines in different countries;
- introduction of special permits for the export of produced vaccines;
- lack of a unified system of joint procurement of vaccines and vaccination;
- the presence of numerous cases of drug supply delays;
- introduction of measures to restrict the export of manufactured vaccines;
- failure to meet equity and equity requirements in vaccine distribution;
- lack of transparent statistics;
- the slow process of domestic immunization associated with the restrained attitude of Russians to the vaccine;
- the rate of domestic vaccination, in the country as a whole, is too low;
- a widespread, global disinformation campaign regarding the domestic vaccine and its use (preferential offer of the vaccine to other countries, and not to its own citizens);

- Russia does not have sufficient production capacity to fulfill short-term contracts;

Russia's disagreement with a number of approaches of the European Agency and its requirements for documentation for medical products.

According to the expert community, for several months of vaccination in the countries of the European Union (EU), delays and lateness are constantly observed, which forced the EU members to develop and introduce special permits for the export of drugs produced in the countries of the Union. Despite delays, 1,2 billion doses of three types of approved vaccines are guaranteed to all 28 EU countries.

The Government of Great Britain, in May 2020, decided to form a special structure for the development of a vaccine, which united the University of Oxford and the pharmaceutical company AstraZeneca. At the same time, the issue of financial support for its activities in the amount of £ 65,5 million was resolved. It is AstraZeneca that does not ensure the regularity of vaccine supplies to the countries of the European Union, having fulfilled only 30% of the planned amount, citing the UK's priority in obtaining the vaccine, which the company produces.

In response, the European Commission has developed special permits for pharmaceutical companies that export vaccines from the EU, justifying the measures taken by the need to ensure fairness and equity in the distribution of vaccines.

Member of the EU - French Republic, formulated its position as follows: on the issue of vaccines, not political, but scientific decisions are made; any vaccine that has been proven to be safe and effective is accepted into service; problems arising from the shortage of masks and ventilators require the country to achieve "sanitary and epidemiological sovereignty"; a course for obtaining drugs from various countries has been formed, regardless of political aspects.

The leaders of Austria, Hungary, Germany, the Czech Republic adhere to a similar position, with certain additions: it is important to get a safe vaccine as soon as possible, regardless of the country of origin; a vaccine of any production can be included in the selection line; it is possible to organize the production of any vaccine on the territory of the country, if it is accredited in the European Union [5, 6].

On the territory of the Russian Federation, the vaccination process is carried out at a pace that is not typical for a country that successfully, first developed drugs. The low activity of the population is determined by the negative phenomena that accompanied the implementation of the priority national project in the field of healthcare. Along with the positive aspects associated with the construction of high-tech medical centers, in the period before the onset of the pandemic, there was a practical degradation of the primary health care system, the work of doctors and medical personnel became less prestigious, and the authority of people employed in this industry fell. The emergency state

measures adopted already during the pandemic, relying on the "triple helix" model, managed to turn the situation in a positive direction, the vaccination rate increased from the beginning of 2021, but reached the required indicator - 20% of the population, by the end of March of this year, has not yet succeeded [3, 4].

Biological and pharmaceutical clusters formed in Russia continue to increase their production capacity. At the same time, contracts were concluded for the supply of vaccines from production sites in Brazil, India, Kazakhstan, China, Turkey, South Korea and other countries. Large-scale deliveries of the vaccine to dozens of countries in Europe, South America, Central and Southeast Asia and Africa are expected to be carried out in the second half of this year, after the completion of the vaccination campaign for all willing Russians.

It is indicative to demonstrate the modern contours of the "triple helix" system using the example of the Kaluga region, which has a powerful human potential in scientific and technical activities. The total number of personnel engaged in research and development activities totals about 11 thousand people. Among them there are about 200 doctors of sciences and 800 candidates of sciences [14]. Scientific and design activities cover a number of science-intensive areas that create a reliable basis for the development of the country's industrial potential, as well as a comfortable and prosperous life for the population living in the region.

The greatest scientific research activity is distinguished, first of all, in Kaluga and Obninsk - the first science city in Russia. In the subject of the Federation, innovative clusters have been created and are developing, more than 20 scientific organizations are functioning. Scientific leaders are: Medical Radiological Scientific Center (MRSC) named after A.F. Tsyba, a member of the National Medical Research Center (NMRC) of Radiology of the Ministry of Health of Russia, Physics and Power Engineering Institute named after A.I. Leipunsky, Obninsk NPP "Technology" named after A.G. Romashin, Scientific Research Institute of Physics and Chemistry named after V.I. L. Ya. Karpov. The leading universities that carry out scientific research are KSU named after K.E. Tsiolkovsky, KB MSTU named after N.E. Bauman, National Research Nuclear University "MEPhI" (NRNU MEPhI) - Obninsk Institute of Atomic Energy (IATE).

The priority areas of research are: radiation technologies and the safety of nuclear installations, biotechnology, medicine, information and telecommunication technologies, ecology and environmental management.

As a large-scale, promising scientific project, the Innovative Scientific and Technological Center, the core of which is the Park of Atomic and Medical Technologies, which is being formed on the basis of the Obninsk Institute of Atomic Energy and the MRSC named after A.F. Tsyba [10].

As the main problem, it should be noted the age of scientists in the Kaluga region, signaling the aging process of leading

researchers who are at the origins of effective scientific activity. In general, more than 25% of scientists are in older age groups. Thus, the average age of doctors of sciences in the region is 64 years, corresponding members of the RAS - 68, and academicians of the RAS - 75 years. For comparison, in the composition of the Imperial Academy of Sciences and Arts of Russia, the average age of academicians was 32 years.

Undoubtedly, contemporaries, even those at the peak of their age, make a significant contribution to the development of scientific developments of the Russian and world level, at the same time, the issues of ensuring the optimization of the scientific active age of Kaluga scientists are being comprehensively resolved. The Russian science and technology sector ranks ninth in terms of domestic spending on research and development, fifth in terms of budgetary allocations for civil science, and fourth in terms of the number of people employed in this field.

The amount of funds allocated to ensure the development of domestic science is increasing. In 2021, more than 486 billion rubles have been allocated for civil scientific research, by 2023 this figure is planned to be increased to 532 billion rubles. In general, about 636 billion rubles were allocated for the implementation of the national project "Science" in 2019 - 2024. For comparison, in the period from 2019 to 2024, funding will quadruple. The country's leadership approved the Program of Basic Scientific Research in the Russian Federation for a long-term period (until 2030). It is planned to allocate about 2,2 trillion rubles for its implementation. Special attention is paid to activities aimed at attracting young people to the scientific field. A government decision was made to allocate additional budgetary places in universities, while priorities are given to regional educational institutions and the most important area.

So, in 2020, out of 11,5 thousand new budgetary places, 9,5 thousand were transferred to the constituent entities of the Federation. Preferences are made for the following areas: medicine, engineering and pedagogy. This year, the number of additional budgetary places in higher educational institutions of Russia will be 33 thousand. The capital of the region has completed the construction of a modern campus KSU named after K.E. Tsiolkovsky, in the shortest possible time, a medical institute was formed and operates, successfully solving the problem of training highly qualified personnel for regional health care. The construction of a unique innovative campus of the Kaluga branch of the Moscow State Technical University named after N.E. Bauman. The scientific centers of the region (Kaluga, Obninsk) successfully operate children's technological parks "Quantorium" [8].

Government officials are aware of the fact that in order to develop and implement promising science-intensive projects based on Russian developments, it is necessary to coordinate the efforts of the scientific community and business structures.

The task is to radically change the situation in which the main source of funding for domestic science is public funds, and

the share of the real sector of the economy is about 30%. A set of measures has been outlined, which are designed to increase the share of funding by the entrepreneurial community of scientific research in the amount of at least two-thirds.

The content of the adopted law on tax cuts for IT companies is quite indicative. From January 1, 2021, income tax for such companies will decrease from 20 percent to 3%, and insurance premiums - from 14% to 7,6%. The most attractive investment environment for the development of the IT industry is being formed [9].

But even in the difficult conditions of the spread of coronavirus infection, lack of resource provision, the scientific organizations of the region successfully solved the applied problems of nuclear medicine in the fight against COVID-19, achieving results in approbation of new equipment and pharmaceuticals for the treatment of various diseases complicated by the coronavirus.

It was in the difficult year of 2020 that new methods of diagnosis and treatment of a number of diseases were developed. The collection of clinical material on inhalation radionuclide therapy, which contributes to the implementation of the anti-inflammatory effect, has been carried out. Scientists have begun testing a new treatment method - inhalation with minimal radiation exposure, which allows you to fight such a terrible consequence of COVID-19 as a cytokine storm, which manifests itself as a particularly severe form of systemic inflammatory response. The research results allow us to make an optimistic forecast that this method will find application in the treatment of infectious processes, will contribute to the treatment of pneumonia in the acute phase of COVID-19.

The measure of the depth and relevance of the results of research work is practical application. To speed up the process of introducing scientific ideas into reality, a cluster of pharmaceuticals, biomedicine, biotechnologies was formed in the Kaluga Region with a center in the city of Obninsk. The policy of clustering the regional economy provides a promising, comprehensive development of state policy. The cluster acts as a supporting structure that harmoniously unites all the components of the "triple helix" model on a mutually beneficial basis. The power structures of the constituent entity of the Federation ensured the creation of an innovative development environment for scientific and educational institutions, conditions for increasing labor productivity, the efficiency of business structures, attractiveness for comfortable living and prestigious work of the population.

The gift of foresight made it possible to correctly assess the scientific potential of the first scientific city of Obninsk and build a system of investment attractiveness for the capital of the world's leading pharmaceutical companies. The Park of Active Molecules presented at the site of the cluster in Obninsk was a revelation for the world leaders in pharmaceuticals. Russian scientists have demonstrated their

achievements, in particular, in the form of more than a hundred active molecules capable of serving as the basis for the development of exclusive drugs for seemingly incurable diseases (from AIDS to Alzheimer's disease). According to their characteristics, the new drugs being developed are capable of ensuring competitiveness on a global scale.

The leading Obninsk research centers presented above, as well as the world's largest companies, have joined the integration process of the cluster development: "Hemofarm", "STADA C.I.S.", "NEARMEDIC", "AstraZeneca", "BerlinChemie", "Novo Nordisk", "Sfera-Pharm" and others.

By 2020, the volume of products manufactured in the cluster of pharmaceuticals, biomedicine, biotechnology has increased 30 times, respectively, from 5 billion to 150 billion rubles. Its enterprises produce more than 50 names of medicinal products, more than ten names are in the registration stage, and several dozen more medicinal products are in prospective development [12]. Thus, a process is ensured, from the development of a scientific idea to the mass production of the drug.

DISCUSSION

Academician of the Russian Academy of Sciences V.M. Polterovich identified, as the most important reasons for the current crisis phenomena observed in the global democratic process, the slowdown in economic growth and deepening inequality. The researcher convincingly demonstrates that challenges can be overcome by transformations aimed at developing mechanisms for constructive interaction between the authorities and society. Based on the obtained results of the analysis of current trends, the academician proposed the concept of collaborative democracy, within which the participation of citizens in decision-making, control over their ethical content and increased management efficiency is ensured.

The modern outlines of the developed mechanism are based on a system of expert councils and collaborative platforms formed for making government decisions based on rules close to consensus. A.D. Artamonov, Chairman of the Federation Council Committee on Budget and Financial Markets, noted that the coronavirus has shown the importance of continuous research work that provides the country with promising ready-made developments of the necessary drugs and vaccines, thanks to which the health and very life of people are reliably protected. The basis that made it possible in the shortest possible time to form a system for treating a dangerous disease is the legislative, organizational, financial and material and technical integration of the authorities, business and the scientific community of the country and the region [13].

Researcher of the National Research University Higher School of Economics M. V. Nesena, studying the cultural diversity of Russian regions and assessing their economic value, came to the conclusion that internal and international migration in Russian regions with a high population density has an adverse

effect on productivity labor [7]. At the same time, the policy implemented by the Russian authorities for decades is aimed at preventing conflicts arising in the regions, and even in the conditions of polarization of society, negative effects do not have a sufficient social basis for growth.

The General Director of the Federal State Budgetary Institution "National Medical Research Center of Radiology" of the Ministry of Health of Russia, Academician of the Russian Academy of Sciences A.D. Kaprin, objectively assessed the situation associated with the global epidemic of coronavirus in 2020 as extremely difficult. At the same time, the academician stressed that even in a pandemic, Russian scientists demonstrated their richest scientific and human potential, made a number of unique discoveries, did not allow the closure of a single medical institution, research project, and also continued to provide the entire range of necessary high-tech services to patients.

Director General of the IPPE them. Leipunsky, Tuzov A.A., clearly orients the long-term development of the institute and the first city of science (Obninsk), with activities directly related to the well-being of people. The main task to be solved is the creation of a modern world-class research center. The mission of the center is scientific and technical support of civil nuclear energy and the development of promising technologies [11].

Director of the MRSC named after A.F. Tsyba - a branch of the Federal State Budgetary Institution "National Medical Research Center of Radiology" of the Ministry of Health of Russia, Doctor of Medical Sciences, Professor of the Russian Academy of Sciences, Ivanov S.A., assessed the innovative treatment methods developed in the center as meeting the world level and widely in demand from the first days of the onset of the pandemic.

CONCLUSION

The emerging modern world order demonstrates the process of changing the dominance of one country to the creation of a number of decision-making centers, which aggravates relations, giving rise to numerous conflict situations. The pandemic that swept the whole world, on the one hand, exacerbated the situation, giving rise to a lot of socio-economic problems, on the other hand, it showed that even strong economic systems of developed countries are not protected from powerful challenges and real threats to the health and very life of the population.

In addition, the economies of developed countries, as well as other economies, are not endowed with guaranteed stability, which puts forward a requirement to strengthen the role of the state, change its functions, when, along with solving the problems of introducing technologies, developing production and improving the financial system, a priority becomes ensuring a modern, innovative and guaranteed level of health care and education.

Comparing the importance of different goals, pragmatic approaches and the final results obtained, it is advisable to

continuously improve the modern outline of the "triple helix" system, which has proved a positive development trajectory with practical highly effective results. The trajectory initially concerned the stage of knowledge generation in the interaction of government structures and universities, then it was continued in the course of the transfer of technologies from universities to business structures.

The current stage of improving the system is distinguished by a new qualitative level, focusing knowledge, competence, skills from different harmonious elements of the triple helix at one base point, bringing a specific, practically measurable result that improves the quality of life of specific people and society as a whole.

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