Peculiarities of Health Care System in the Union State Countries and Priority Directions of Their Marketing Development and Interaction

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Keywords: Union State, Foreign Economic Relations, Health System, Morbidity, Outpatient Facilities, Sanctions Regime, Risks and Threats.

Abstract: The modern health care system is transforming, not only in the Union State countries but also worldwide. The introduction of new technologies, digitalization, and the transition to a new technological way of life are giving states a different perspective on the healthcare system, its key gaps, and problems of development. The presented article is aimed at the research of the key indices in the health care system of the Union State countries, construction of the econometric model of the correlation between the indices of physical volume of paid medical services to the population and the volume of paid services to the population of Russia as well as calculation of forecasts of some economic indices in the mentioned sphere. In addition, the relations of the Union State countries in the field of health care are investigated, and, on this basis, the directions of their cooperation are improved. As a theoretical and methodological basis, the article uses historical, logical, dialectical principles and contradictions, the scientific abstraction method. The process-system approach, which was used in an in-depth analysis of key indicators in the given area, has become essential in the argument about the need to strengthen the relations between the countries of the integration group in the socio-economic sphere. Based on in-depth economic analysis and econometric model formation, the priority directions of healthcare development in the Union State countries are outlined. The emphasis is shifted to the development of large-scale projects between the countries of the Union State in the field of healthcare, with the attraction of public and private investments, development of new technologies for the dynamic development of this sphere and reduction of import dependence. The study of the health care system of the Union State countries, identification of problems and contradictions in this field open up opportunities for further elaboration of the priority directions of development of the mentioned field.

1 INTRODUCTION

In the current context, a new world economic order is taking shape globally (Malakhova and Kolesnikov, 2019). Russian-Belarusian relations in the format of the Union State have always implied a balance of interests of the two countries, which were formed taking into account political and economic transformations and upheavals at the end of the XX century. Today the Union State is more than 20 years old. The partner countries strive not only to maintain the mentioned format but also to strengthen mutual relations in various spheres, including the healthcare system.

2 RESEARCH METHODOLOGY

In modern conditions, the research in health care is carried out by the famous Russian scientists A.A. Redko, V.N. Anisimov, A.V. Finagentov, V.H. Khavinson, A.V. Shabrov (Redko, Anisimov, Finagentov, Khavinson & Shabrov, 2020), considering the problems of creating a system of integrated medical and social care in Russia, T.V.

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Chubarova, E.E. Shestakova (Chubarova and Shestakova, 2019), denoting that the state remains the key regulator of social relations and social support for citizens, G.E. Ulumbekova, A.V. Moklyachenko (Ulumbekova and Moklyachenko, 2017), exploring the current state of the Russian healthcare system and analyzing indicators to assess the performance of medical organizations, etc. Also, special attention to this topic is paid by B. Rozenfeld (Rozenfeld, 2021), who notes that the uneven development of the health care system has become increasingly evident, the dissatisfaction of the population with medical personnel, and the quality of services provided has increased, P.L. Ferreira, A.I. Tavares, C. Quintal, P. Santana (Ferreira, Tavares, Quintal and Santana, 2018), highlighting that to date, a significant number of tools and analytical tools have been developed and used to classify health systems, but most proposed typologies include a small number or incomplete set of countries, etc. On this basis, it can be noted that the mentioned topic is researched and considered by scientists from different positions, which makes it possible to analyze the healthcare system using both Russian and foreign experience.

3 RESEARCH RESULTS

In modern conditions, the health care system in Russia and Belarus is undergoing a significant transformation. On this basis, let us analyze some indicators characterizing the current state of healthcare in the Union State countries. It should be noted that the number of hospital facilities in Russia and Belarus is decreasing every year. For example, in Russia, the number of hospital facilities in 2000 was 10,704, 6,308 in 2010, 5,433 in 2015, 5,293 in 2017 and 5,257 in 2018. In 2018, compared to 2000, the number of hospital facilities decreased by 5,447 units. A similar trend was observed in the Republic of Belarus. In 2000, the number of hospital facilities was 830, in 2015 - 640, in 2016. - 636, in 2017. - 622, in 2018. - 612 units. In 2018, compared to 2000, the number of hospital facilities decreased by 218 units. If we examine the CIS countries by this indicator, only Tajikistan and Uzbekistan showed a positive trend in this indicator for the specified period of time. For example, in Tajikistan, the number of hospitals in 2000 was 441, in 2010 - 444, in 2015 - 474, in 2017 - 484, in 2018 - 490. In Uzbekistan, this indicator is unstable, but no significant reductions in the number of hospitals have been observed. In 2000 there were 1,162 units, in 2010 - 1,158, in 2015 - 1,071, in 2017 - 1,135, in 2018 - 1,165 units. In 2018, compared to 2000, the number of hospitals increased by 3 units. In the rest of the CIS countries, a decrease in hospital facilities was observed over the specified period. Based on this trend, the number of hospital beds in Russia and Belarus is also decreasing. There were 126,000 hospital beds in Belarus in 2000. A sharp decline occurred in 2015. So, in 2015 the number of hospital beds was 82 thousand, in 2016 - 80, in 2017 - 80, in 2018 - 80 thousand. In 2018, the number of hospital beds decreased by 46,000 compared to 2000. A similar trend was observed in Russia. In 2000, the number of hospital beds was 1,672 thousand, in 2010 - 1,339, in 2015 - 1,222, in 2017 - 1,183, in 2018 - 1,173 thousand. Compared to 2000, in 2018 the number of hospital beds in Russia decreased by 499 thousand. The number of hospital beds, including for children, in the Union State countries was also decreasing. In Russia in 2000 there were 229 thousand of them, in 2010 - 179, in 2015 - 163, in 2017 - 158, in 2018 - 157 thousand. The number of hospital beds for children decreased by 72,000 in 2018 compared to 2000. In the Republic of Belarus, there were no significant reductions in this indicator. In 2000, their number was 15 thousand, in 2015 - 11, in 2016 - 11, in 2017 - 11, in 2018 - 11 thousand. In 2018, the number of hospital beds for children decreased by 4,000 compared to 2000. Among the CIS countries, Kazakhstan, Tajikistan and Uzbekistan had the most stable indicators. In Kazakhstan, the number of hospital beds for children in 2000 was 19 thousand, in 2010 - 19, in 2015 - 18, in 2017 - 18, in 2018 - 19 thousand. In Tajikistan, in 2010, the number of hospital beds for children was 9 thousand, in 2015 - 9, in 2017 - 11, in 2018 - 10 thousand. In Uzbekistan in 2000 there were 29 thousand hospital beds for children, in 2010 - 29, in 2015 - 27, in 2017 - 27 thousand. It is also important to analyze the number of outpatient facilities in the Union State countries. In the Republic of Belarus, their number has increased over the period under analysis. In 2000, the number of outpatient clinics was 1.8 thousand, in 2015 - 2.3, in 2016 - 2.3, in 2017 - 2.2, in 2018 - 2, 2 thous. In 2018, the number of outpatient facilities in the Republic of Belarus increased by 0.4 thousand compared to 2000. In Russia, the number of outpatient clinics in 2000 was 21 thousand, in 2010 - 16, in 2015 - 19, in 2017 - 20, in 2018 - 20 thousand. Compared to 2010, the number of outpatient clinics increased by 4,000 in 2018. The capacity of outpatient clinics (number of visits per shift) in Russia is increasing every year. In 2000, this indicator was 3,534 thousand, in 2010 - 3,696, in 2015 - 3,861, in 2017 - 3,967, in 2018 - 3,998 thousand. The number of visits per shift increased by

464,000 in 2018 compared to 2000. As statistics and calculations show, this indicator has been increasing over the years in many CIS countries. For example, in Uzbekistan, the capacity of outpatient clinics (number of visits per shift) in 2000 was 415 thousand, in 2010 - 423, in 2015 - 407, in 2017 - 405, in 2018 . - 441 thousand. The capacity of outpatient clinics in Kazakhstan was rather unstable. In 2000, this indicator was 252 thousand, in 2010 - 263, in 2015 - 269, in 2017 - 215, in 2018 - 268 thousand. In 2018, compared to 2000, this indicator increased by 16 thousand. In Armenia, the capacity of outpatient clinics in 2000 was 42 thousand, in 2015 - 39, in 2016 - 40, in 2017 - 40, in 2018 - 40 thousand. The commissioning of health care facilities is of particular importance in the health care system. Figure 1 shows statistical data (in dynamics) for Russia and Belarus on outpatient and polyclinic facilities (visits per shift) from 2000 to 2019 and forecast calculation till 2025.

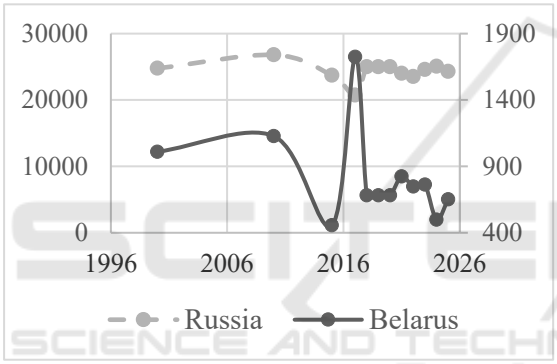

Figure 1: Commissioning of health facilities. Outpatient facilities (visits per shift) from 2000 to 2019 and projection to 2025. (calculated by the authors)

Calculations showed that outpatient clinics (visits per shift) in the Republic of Belarus in 2021 will be 824.4, in 2022 - 747.9, in 2023 - 762.7, in 2024 - 499, 0, in 2025 - 651.2. Compared to 2015, this indicator may increase by 195.2 in 2025. In Russia, based on the calculations carried out, in 2021 this indicator will be 24,013.2, in 2022 - 23,525.3, 2023 - 24,577.1, in 2024 - 25,064.7, in 2025 - 24,301.5. Compared to 2015, it could increase by 592.5 in 2025.

The number of medical personnel is an important indicator when assessing the health care system in the Union State countries. Let us analyze this indicator in more detail in the dynamics from 2000 to 2018. The number of medical personnel will be represented per 10,000 people in Russia and Belarus. Overall, Russia and Belarus did not experience a significant reduction in this indicator. In the Republic of Belarus in 2000 this indicator was 46 people, in 2010 - 54, in 2015 - 43, in 2017 - 44, in 2018 - 45 people. There were 12 general practitioners in 2000, 14 in 2010, 18 in 2015, 19 in 2017 and 20 in 2018. There were also more surgeons during the analyzed period of time. In 2000 there were 6 of them, in 2010 - 7, in 2015 - 13, in 2017 - 13, in 2018 - 14 people. A similar trend was evident with pediatricians. In 2000, there were 18 of them in Belarus, in 2010 - 21, in 2015 - 22, in 2017 - 22, in 2018 - 22 people. The number of pediatricians increased by 4 per 10,000 population in 2018 compared to 2000. The number of nursing staff is gradually increasing. In general, the total number of nursing staff includes all persons with a secondary medical education. In addition, they are employed in medical and sanitary organizations, social welfare institutions, preschools, schools, orphanages, etc. In 2000, the number of nursing staff was 123 people, in 2010 - 129, in 2015 - 133, in 2017 - 133, in 2018 - 134 people. In 2018, the number of nursing staff increased by 11 compared to 2000. Of these, the number of nurses was also increasing. In 2000, this indicator was 77 people, in 2010 - 90, in 2015 - 93, in 2017 - 93, in 2018 - 93 people. Compared to 2000, the number of nurses increased by 16 in 2018. In Russia, the situation is less stable and positive according to the indicators presented above. In 2000, the number of doctors of all specialties per 10,000 thousand people of the population was 47 people, in 2010 - 50, in 2015 - 46, in 2017 - 48, in 2018 - 48 people. Compared to 2010, in 2018 the number of specialty doctors decreased by 2 persons. Let us analyze this indicator in more detail with a breakdown by specialty. In general, the number of general practitioners has not changed significantly. In 2000, this indicator was 11 people, in 2010 - 12, in 2015 - 11, in 2017 - 12, in 2018 - 12 people. Compared to 2000, the number of general practitioners in 2018 increased by 1 person. The number of surgeons in Russia also did not increase significantly (in 2000 - 4 people, in 2010 - 5, in 2015 - 5, in 2017 - 5, in 2018 - 5 people). There has been a fairly significant reduction in the number of pediatricians over the period under analysis. In 2000, there were 28 of them per 10,000 people of the population of Russia, in 2010 - 32, in 2015 - 23, in 2017 - 23, in 2018 - 20 people. In 2018, the number of pediatricians decreased by 8 compared to 2000. The number of dentists during the analyzed period has not changed. In both 2000 and 2018, there were 4 per 10,000 people in Russia. There were 2 psychiatrists and narcologists in 2000, 2 in 2010, 1 in 2015, 2 in 2017, and 2 in 2018. It is important to analyze the number of nursing staff. As in the Republic of Belarus, Russia saw a decrease in this indicator. In 2000, the number of paramedical personnel was 108 people, in 2010 - 106, in 2015 -

106, in 2017 - 104, in 2018 - 102 people. Compared to 2000, the number of nursing staff decreased by 6 persons in 2018. Of these, there were 70 nurses in 2000, 73 in 2010, 73 in 2015, 73 in 2017, and 73 in 2018. If we analyze individual CIS countries by these indicators, a negative trend was observed in many countries. For example, the number of pediatricians in Kazakhstan in 2000 was 14 people, in 2010 - 16, in 2015 - 12, in 2017 - 1, in 2018 - 3. On this basis, the number of pediatricians in Kazakhstan in 2018 compared to 2000 decreased by 11 people. A similar situation took place in Kyrgyzstan. In 2000, the number of pediatricians was 10 people, in 2010 - 4, in 2015 - 4, in 2017 - 4, in 2018 - 4 people. In 2018, compared to 2000, the indicator decreased by 6 persons. The number of ambulance stations (departments) in Belarus in 2018 was 147 units, and in Russia - 2,276 units.

Particular attention should be paid to final consumption expenditures of public administration by function (Table 1). Let us compare the health care system with other socio-economic and political spheres. Based on the data presented in Table 1, it should be noted that every year there has been an increase in public administration final consumption expenditures. This trend was also observed in defense (in 2015 - 1,345.6 billion rubles, in 2016 - 1,832.3, in 2017 - 1,892.8, in 2018 - 1,900.4, in 2019 - 2174.0 billion rubles), and on economic issues (in 2015 - 1,381.2 billion rubles, in 2016 - 1,574.3, in 2017 - 1,676.7, in 2018 - 1,881.2, in 2019 - 2,028.9 billion rubles), etc. The increase was particularly significant in health care. In 2015, this indicator was 1,987.2 billion rubles, in 2016 - 1,994.1, in 2017 - 2,130.2, in 2018 - 2,487.7, in 2019 - 2,559.2 RUB bln On this basis, it is important to forecast the future state of the analyzed indicator (Population, Employment and Living Conditions in the Countries of the Commonwealth of Independent States, 2019).

Table 1. As can be seen, the forecast of this indicator increases under either option. If we consider the forecast with a low probability, then expenditures on final consumption of public administration in the health care sector in 2021 will amount to 2,723 billion rubles, in 2022 - 2,863, in 2023 - 3,014 billion rubles. As for the forecast with a high probability, the expenditures on final consumption of public administration in the health care sector in 2021 will be 3,105 billion rubles, in 2022 - 3,300, in 2023 - 3,494 billion rubles. In the first and in the second case, costs are projected to increase.

Figure 2 shows the calculation of the forecast (high and low probability) of public administration final consumption expenditure in health care. Note that the calculations were made based on the dynamics of public administration final consumption expenditure in health care for 2015-2019 presented in

Table 1: Public administration final consumption expenditure by function for 2015-2019, bln. rub. (National Accounts of the Commonwealth of Independent States, 2020).

Public administration final consumption expenditure	Years				
	2015	2016	2017	2018	2019
General government services	1766.6	1801.0	1978.3	2141.5	2247.4
Defense	1345.6	1832.3	1892.8	1900.4	2174.0
Public order and safety	2120.7	2148.9	2200.4	2384.2	2424.0
Economic issues	1381.2	1574.3	1676.7	1881.2	2028.9
Environmental protection	22.9	20.9	27.6	29.7	32.0
Housing and utilities	360.4	365.1	416.8	406.5	434.7
Health	1987.2	1994.1	2130.2	2487.7	2559.2
Recreation, culture and religion	147.7	149.4	160.2	172.0	178.3
Education	638.0	599.8	620.5	666.4	657.6
Social protection	1409.7	1506.8	1569.6	1615.7	1695.6
Other functions	3580.7	3817.1	4057.8	4708.8	4947.3

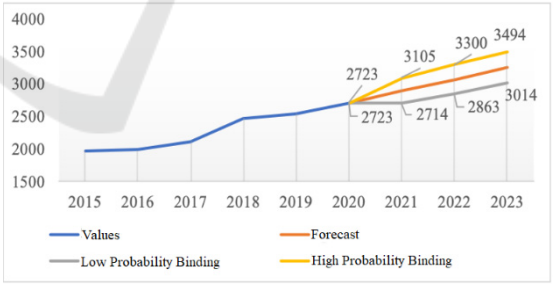

Figure 2: Calculation of projected (high and low probability) public administration final consumption expenditure on health (calculated by the authors)

On this basis, let us build an econometric model, which includes the ratio of indices of physical volume of paid medical services to the population and the volume of paid services to the population of Russia (Figure 3).

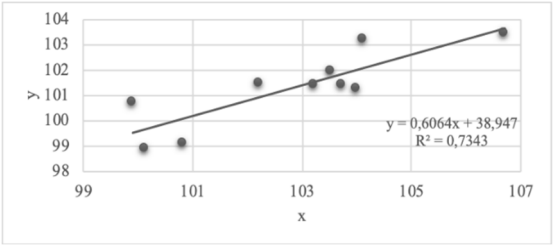

Figure 3: Econometric model of the ratio of indices of the physical volume of paid medical services to the volume of paid services to the population of Russia (calculated by the authors).

In general, Figure 3 shows the observations' uniformity presence, also there is the regression equation and the determination coefficient (R2). The minimum requirement for model building is for the coefficient of determination to be greater than 0.5%. Based on the data provided, this requirement is complied with.

The equation of the linear pairwise regression model describing the relationship between the index of physical volume of paid medical services to the population and the volume of paid services to the population is as follows:

$$y=38.947+0.606*x \quad (1)$$

It is important to analyze the quality of the presented model. To do this, we will estimate the regression coefficients significance using the Student's t-criteria. Then we will evaluate the model using variance and correlation analysis.

The Student's test value is 2.262. It is important to establish the significance of the coefficients a and b, so we assume that:

No_a: a = 0 - not statistically significant	No_b: b = 0 - not statistically significant
N1_a: a = 0 - not statistically significant	N1_b: b = 0 - not statistically significant
2.937 > 2.306	18.462 > 2.306
Ho_a is rejected with a probability of 95%	Ho_b is rejected with a probability of 95%
Coefficient a is statistically significant	Coefficient b is statistically significant

The next way to analyze the quality of the model is the Fisher F-criteria or regression dispersive analysis. The hypothesis is as follows:

Ho: b=0 (there is no linear relationship between x and y)

F critical – 5.318

F observed 22.114 > F critical 5.318, hence,

the Ho: b=0 hypothesis is deviated, i.e. there is a linear relationship between the x and y variables.

The multiple R is the correlation coefficient value (the linear relationship tightness measure between the x and y variables). The multiple R was 0.857, i.e., the relationship between x and y is strong and direct as the index ranges from 0.7 to 0.9. Next, we transfer the correlation coefficient into a percentage and it is 73.43%. Variation of the variable y (volume of paid services to population) by 73.43% is explained by variability of the variable x (index of physical volume of paid medical services to population). The effect of x on y is 73.43%. Consequently, 26.57% is accounted for by other factors not taken into account in the model. The average approximation error is 0.625%, which indicates the quality of the presented model. The approximation coefficient should be lower than 7%. It is important to calculate the forecast of the analyzed data. Thus, x was 104.876% and y was 102.547%. Thus, if x increases by 2% of the average value, then y will be 102.547%. The intervals of the predicted value y: min - 100.49%, max - 104.61%. With a 95% chance of increasing x by 2%, y will be in the range of 100.49% to 104.61%. The analysis showed that based on the current situation in the healthcare system in Russia, the maximum increase in y is most likely in the future.

The Union State is actively implementing the priority areas and priorities of its further development for 2018-2022. Particular attention is paid to improving the mechanism of health care provision to Russian citizens in the Republic of Belarus and citizens of Belarus in the Russian Federation, as well as health insurance for Russian and Belarusian citizens temporarily staying in the territory of the Union State (Figure 4).

Until 2022, the priority task is to ensure sanitary and epidemiological well-being in the territory of the Union State. This situation is about cooperation in sanitary and epidemiological well-being and jointly overcoming emerging risks and threats. Also, the development of information technologies and telemedicine; provision of accessibility and quality of specialized, including high-tech medical care; provision of continuous medical and pharmaceutical education using modern technologies, etc., are of particular importance in the priority areas of cooperation in healthcare.

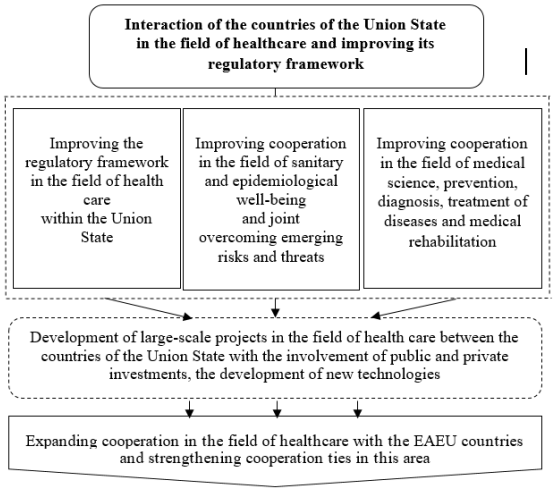

Figure 4: Interaction of the Union State countries in healthcare and improvement of its regulatory framework (compiled by the authors)

(Priority areas and priorities for further development of the Union State for 2018-2022, 2018). On this basis, it is important to improve further the mechanisms of relations between the Union State countries in health care development, active involvement of research centers for joint work in this area (Figure 4).

4 DISCUSSION OF RESULTS

Today it is possible to further form joint developments and programs in healthcare within the framework of the Union State. This is a strategically important area because countries need to move away from imported technology and medicines. This problem is especially relevant in the context of the prolongation of the sanctions regime by the countries of the European Union and the United States (Malakhova, 2019). Health care development in both the Union State and the EAEU countries is a priority area ensuring their national security. In addition, it should be noted that further development of the Eurasian Economic Union involves strengthening cooperation ties, including in healthcare. Some private projects directly related to healthcare (e.g., Teledoctor, Oriense, Button of Life, Medesc, 3D Bioprinting Solutions) are developing in Russia today. In addition to private projects, there are federal projects for which the Russian government is responsible (e.g., Demography, Health, etc.) (Borkova, Napolova, and Orlov, 2019). Undoubtedly, it is important to develop this key social sphere with the EAEU partner countries.

5 CONCLUSION

In modern conditions in the Union State countries, it is important to increase real incomes of the population, develop a socially-oriented model of economy, increase financing and efficiency of healthcare. These areas can lead to an improvement in the quality of life and, in the long term, allow for an increase in life expectancy. The statistical data analysis and construction of the econometric model showed that in the Union State countries, the number of hospital facilities, the number of hospital beds, including those for children, decreases every year. The capacity of outpatient clinics (number of visits per shift) in Russia was 3,534 thousand in 2000, and 3,998 thousand in 2018, i.e., the increase was by 464 thous.

Thus, firstly, the number of hospital facilities, the number of hospital beds, including those for children, the number of medical personnel, etc., were analyzed in detail. The problems and contradictions in the development of health care systems in Russia and Belarus associated with the reduction of the number of doctors for certain specialties and a parallel increase in the morbidity of the population on the main classes of diseases, including malignant tumors, respiratory diseases, diseases of the circulatory system, digestive diseases, etc. have been revealed.

Secondly, the priority areas and priorities of further development of the Union State for 2018-2022 have been investigated. Particular attention is paid to the development of cooperation in healthcare, as well as the improvement of the regulatory framework. On this basis, the priorities of the priority areas and options for their solutions are explored. It is proposed to pay special attention to the development of large-scale projects between the countries of the Union State in the field of healthcare with the attraction of public and private investments, development of new technologies, etc.

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